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TITLE: OFFICIAL GAZETTE OF THE UNITED STATES PATENT
AND TRADEMARK OFFICE. PATENTS.

REEL NO: 10 Patents 4,870,705-4,878,254

VOLUME: 1107 Issues: 1-5

DATE: OCTOBER 3 - 31, 1989

PUBLICATION NO: 10,426

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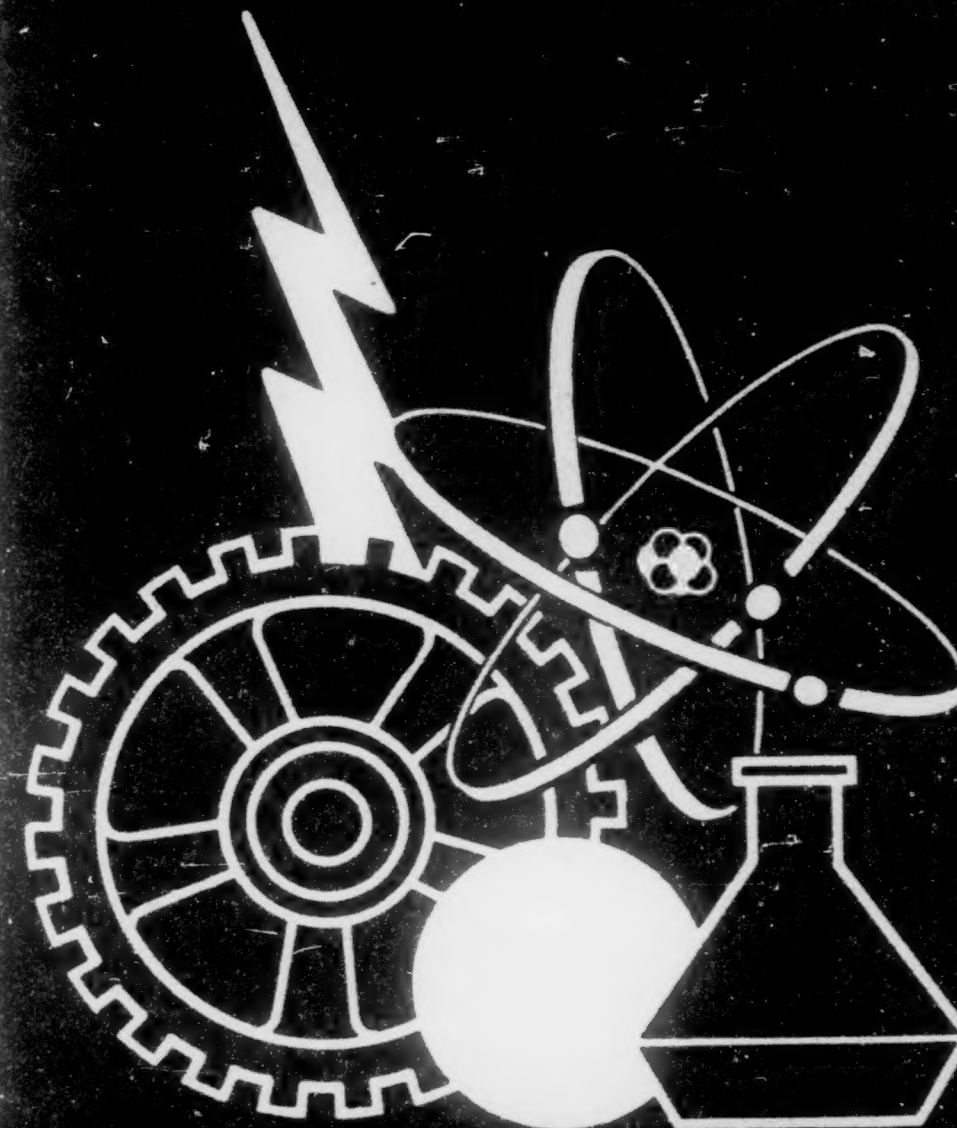
Patent
and
Trademark
Office

Vol. 1107 Number 1

OFFICIAL GAZETTE

of the
UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS
October 3, 1989



PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

CONTENTS

	Page
Patent and Trademark Office Notices	
Patent Cooperation Treaty (PCT) Information	1107 OG 2
Notice of Maintenance Fees Payable	1107 OG 2
Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees	1107 OG 3
Notification of Acceptance of Delayed Payment of Maintenance Fee	1107 OG 4
Patent Cooperation Treaty Update; Accession by Spain	1107 OG 5
Reissue Applications Filed	1107 OG 6
Requests for Reexaminations Filed	1107 OG 6
Errata	1107 OG 6
Amendments to Patent and Trademark Rules to Implement Trademark Law Revision Act; Miscellaneous Trademark Rule Amendments	1107 OG 7
Patent Certificates of Correction	1107 OG 39
Special Boxes for Mail	1107 OG 40
Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries	1107 OG 41
Condition of Patent Applications	1107 OG 42
Statutory Invention Registration	1
Reissue Patents Granted (33,074)	7
Plant Patents Granted (7,043)	11
Patents Granted	
General and Mechanical (4,870,705)	13
Chemical (4,871,370)	239
Electrical (4,871,883)	387
Design Patents Granted (303,727)	505
Index of Patentees	PI 1
Indices of Reissue, Design Plant Patentees and Statutory Invention Registrations	PI 63
Classification of	
Patents (Including Reissues)	PI 69
Designs, and Plants Applications	PI 72
Geographical Index of Residence of Inventors	
Patents (Including Reissues)	PI 73
Designs and Plant Applications	PI 74
Change of Address Form and Subscription Order Form	Back Page

The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed.
THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.
GENERAL INFORMATION concerning PATENTS.
GENERAL INFORMATION concerning TRADEMARKS.

COPIES OF PATENTS are furnished by the Patent and Trademark Office at \$1.50 each; PLANT PATENTS in color, \$10.00 each; copies of TRADEMARKS at \$1.50 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1107 O.G. 5 on Oct. 3, 1989.

For use of the European Patent Office as a Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 5 on Sept. 28, 1982.

For use of the European Patent Office as an international Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2 on July 7, 1987 and at 1091 O.G. 2 on June 7, 1988.

The Search fee of the European Patent Office was changed due to a difference in the exchange rate of the U.S. dollar in relation to the German Mark as of Sept. 1, 1989, and was announced in the *Official Gazette* at 1105 O.G. 36 on Aug. 15, 1989.

International PCT fees were changed on June 1, 1989 due to a difference in the exchange rate of the U.S. dollar in relation to the Swiss Franc and were announced in the *Official Gazette* at 1102 O.G. 90 on May 30, 1989.

Certain domestic PCT fees and charges for International Search and Preliminary Examination have been changed effective Apr. 17, 1989 and were announced in the *Official Gazette* at 1100 O.G. 24 on Mar. 7, 1989.

The current schedule of PCT fees is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office as Searching Authority (ISA)	
—No corresponding prior U.S. national application filed:	550.00
—Corresponding prior U.S. national application filed:	380.00
—Supplemental search fee, per additional invention:	150.00
European Patent Office as Searching Authority:	1040.00
Preliminary examination fee	
U.S. Patent and Trademark Office as Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as Searching Authority:	400.00
—Additional examination fee, per additional invention:	130.00
—Searching Authority not the USPTO:	600.00
—Additional examination fee, per additional invention:	200.00
International fees	
Basic fee:	436.00
Basic Supplemental fee (for each page over 30):	9.00
Designation fee per country or region for the first 10 national or regional offices:	106.00
Designation fee for 11th and subsequent designations:	No Charge
Handling fee:	134.00

U.S. National Stage fees

	Small Entity	Non-small Entity
U.S. Patent and Trademark Office was Preliminary Examining Authority (IPEA)	165.00	330.00
USPTO was ISA but not IPEA	185.00	370.00

USPTO was neither ISA nor IPEA	250.00	500.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(2) to (4)	25.00	50.00
—For each independent claim in excess of 3	18.00	36.00
—For each claim in excess of 20	6.00	12.00
—For each application containing a multiple dependent claim	60.00	120.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39.1	60.00	120.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39.1	30.00	30.00

September 12, 1989. DONALD J. QUIGG,
Assistant Secretary and Commissioner
of Patents and Trademarks.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on application filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Apr. 17, 1989. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the patent.

Attention is drawn to the patents which were issued on September 30, 1986, for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,613,991 through 4,615,045
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on September 28, 1982 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,351,065 through 4,352,210
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months and seven years and six months are set forth in 37 CFR 1.20(e), (f), (h) and (i), as amended effective Apr. 17, 1989, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or

OCTOBER 3, 1989

U. S. PATENT AND TRADEMARK OFFICE

1107 OG 3

after after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant.....	\$245.00"	4,528,735	06/594,024	07/16/85
"(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant.....	\$495.00"	4,528,749	06/489,007	07/16/85
"(h) For maintaining an original or reissue patent except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:		4,528,750	06/590,351	07/16/85
By a small entity (§1.9(f)).....	\$245.00	4,528,751	06/631,500	07/16/85
By other than a small entity.....	\$490.00"	4,528,752	06/646,464	07/16/85
"(i) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant:		4,528,754	06/479,799	07/16/85
By a small entity (§1.9(f)).....	\$495.00	4,528,759	06/514,925	07/16/85
By other than a small entity.....	\$990.00"	4,528,761	06/564,088	07/16/85
The amounts of the surcharges as amended effective Apr. 17, 1989, are set forth in 37 CFR 1.20 (k), (l) and (m) which are reproduced below:		4,528,767	06/544,792	07/16/85
"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982.....	\$120.00"	4,528,770	06/488,430	07/16/85
"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:		4,528,775	06/552,329	07/16/85
By a small entity (§1.9(f)).....	\$60.00	4,528,777	06/575,185	07/16/85
By other than a small entity.....	\$120.00"	4,528,779	06/443,740	07/16/85
"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been unavoidable.....	\$550.00"	4,528,780	06/459,115	07/16/85
		4,528,785	06/410,032	07/16/85
		4,528,793	06/437,815	07/16/85
		4,528,795	06/510,185	07/16/85
		4,528,796	06/490,587	07/16/85
		4,528,802	06/421,726	07/16/85
		4,528,805	06/616,163	07/16/85
		4,528,814	06/404,510	07/16/85
		4,528,827	06/570,239	07/16/85
		4,528,828	06/456,387	07/16/85
		4,528,846	06/529,404	07/16/85
		4,528,847	06/539,043	07/16/85
		4,528,849	06/539,234	07/16/85
		4,528,860	06/328,065	07/16/85
		4,528,861	06/362,291	07/16/85
		4,528,862	06/563,344	07/16/85
		4,528,863	06/546,329	07/16/85
		4,528,866	06/441,368	07/16/85
		4,528,873	06/527,872	07/16/85
		4,528,874	06/458,333	07/16/85
		4,528,875	06/467,942	07/16/85
		4,528,893	06/347,644	07/16/85
		4,528,905	06/243,652	07/16/85
		4,528,906	06/518,421	07/16/85
		4,528,915	06/487,272	07/16/85
		4,528,921	06/599,956	07/16/85
		4,528,925	06/568,901	07/16/85
		4,528,929	06/520,483	07/16/85
		4,528,939	06/623,875	07/16/85
		4,528,947	06/551,865	07/16/85
		4,528,959	06/573,236	07/16/85
		4,528,967	06/571,105	07/16/85
		4,528,977	06/477,002	07/16/85
		4,528,988	06/605,905	07/16/85
		4,528,991	06/393,710	07/16/85
		4,529,005	06/620,914	07/16/85
		4,529,016	06/513,278	07/16/85
		4,529,021	06/594,569	07/16/85
		4,529,023	06/475,067	07/16/85
		4,529,033	06/574,343	07/16/85
		4,529,041	06/575,079	07/16/85
		4,529,043	06/532,636	07/16/85
		4,529,046	06/594,295	07/16/85
		4,529,058	06/651,479	07/16/85
		4,529,061	06/573,235	07/16/85
		4,529,064	06/638,350	07/16/85
		4,529,068	06/508,761	07/16/85
		4,529,077	06/521,382	07/16/85
		4,529,086	06/511,215	07/16/85
		4,529,088	06/623,498	07/16/85
		4,529,089	06/676,733	07/16/85
		4,529,096	06/676,620	07/16/85
		4,529,097	06/667,563	07/16/85
		4,529,103	06/516,112	07/16/85
		4,529,109	06/564,169	07/16/85
		4,529,110	06/460,442	07/16/85
		4,529,111	06/391,552	07/16/85
		4,529,117	06/583,285	07/16/85
		4,529,120	06/547,624	07/16/85
		4,529,122	06/608,508	07/16/85
		4,529,132	06/427,093	07/16/85
		4,529,136	06/564,154	07/16/85
		4,529,149	06/424,557	07/16/85
		4,529,160	06/645,541	07/16/85
		4,529,170	06/475,305	07/16/85

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED JULY 16, 1989 DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,582,706	06/445,707	07/16/85
4,528,712	06/579,976	07/16/85
4,528,713	06/606,870	07/16/85
4,528,726	06/541,161	07/16/85
4,528,727	06/557,643	07/16/85
4,528,732	06/364,887	07/16/85

Patent Number	Serial Number	Issue Date	4,529,545	06/443,130	07/16/85
4,529,173	06/562,060	07/16/85	4,529,557	06/395,766	07/16/85
4,529,177	06/420,180	07/16/85	4,529,560	06/515,284	07/16/85
4,529,191	06/473,081	07/16/85	4,529,563	06/553,647	07/16/85
4,529,193	06/563,597	07/16/85	4,529,568	06/545,654	07/16/85
4,529,195	06/420,378	07/16/85	4,529,569	06/537,097	07/16/85
4,529,196	06/469,640	07/16/85	4,529,583	06/581,891	07/16/85
4,529,200	06/453,794	07/16/85	4,529,591	06/533,656	07/16/85
4,529,201	06/695,409	07/16/85	4,529,608	06/549,205	07/16/85
4,529,203	06/413,740	07/16/85	4,529,611	06/551,964	07/16/85
4,529,206	06/592,460	07/16/85	4,529,618	06/538,388	07/16/85
4,529,210	06/481,328	07/16/85	4,529,640	06/483,312	07/16/85
4,529,211	06/479,648	07/16/85	4,529,664	06/636,051	07/16/85
4,529,216	06/526,393	07/16/85	4,529,674	06/591,123	07/16/85
4,529,220	06/324,851	07/16/85	4,529,677	06/551,072	07/16/85
4,529,226	06/663,349	07/16/85	4,529,694	06/369,141	07/16/85
4,529,232	06/525,711	07/16/85	4,529,731	06/534,953	07/16/85
4,529,235	06/657,039	07/16/85	4,529,734	06/324,054	07/16/85
4,529,248	06/586,206	07/16/85	4,529,735	06/610,361	07/16/85
4,529,252	06/565,543	07/16/85	4,529,751	06/542,914	07/16/85
4,529,253	06/503,016	07/16/85	4,529,806	06/597,884	07/16/85
4,529,258	06/471,406	07/16/85	4,529,809	06/527,584	07/16/85
4,529,270	06/440,920	07/16/85	4,529,844	06/535,583	07/16/85
4,529,272	06/416,086	07/16/85	4,529,848	06/525,560	07/16/85
4,529,279	06/494,637	07/16/85	4,529,852	06/512,930	07/16/85
4,529,281	06/549,916	07/16/85	4,529,861	06/597,250	07/16/85
4,529,283	06/522,452	07/16/85	4,529,863	06/528,504	07/16/85
4,529,298	06/549,510	07/16/85	4,529,867	06/578,424	07/16/85
4,529,318	06/389,384	07/16/85	4,529,875	06/417,518	07/16/85
4,529,319	06/444,060	07/16/85	4,529,876	06/566,065	07/16/85
4,529,328	06/529,338	07/16/85	4,529,879	06/485,500	07/16/85
4,529,333	06/570,863	07/16/85	4,529,884	06/421,276	07/16/85
4,529,340	06/478,246	07/16/85	4,529,902	06/413,867	07/16/85
4,529,344	06/504,043	07/16/85	4,529,906	06/586,726	07/16/85
4,529,350	06/646,321	07/16/85	4,529,911	06/408,572	07/16/85
4,529,355	06/696,883	07/16/85	4,529,913	06/675,451	07/16/85
4,529,364	06/490,387	07/16/85	4,529,914	06/530,876	07/16/85
4,529,366	06/576,526	07/16/85	4,529,927	06/540,205	07/16/85
4,529,369	06/585,936	07/16/85	4,529,928	06/496,694	07/16/85
4,529,376	06/557,008	07/16/85	4,529,941	06/445,294	07/16/85
4,529,384	06/473,752	07/16/85	4,529,943	06/363,971	07/16/85
4,529,385	06/579,583	07/16/85	4,529,944	06/393,251	07/16/85
4,529,386	06/453,752	07/16/85	4,529,945	06/497,795	07/16/85
4,529,388	06/384,095	07/16/85	4,529,957	06/633,509	07/16/85
4,529,389	06/624,725	07/16/85	4,529,962	06/535,766	07/16/85
4,529,409	06/550,965	07/16/85	4,529,981	06/464,430	07/16/85
4,529,417	06/605,906	07/16/85	4,529,985	06/406,752	07/16/85
4,529,418	06/339,711	07/16/85	4,529,987	06/487,439	07/16/85
4,529,424	06/393,309	07/16/85	4,529,988	06/464,135	07/16/85
4,529,438	06/379,609	07/16/85	4,529,989	06/384,058	07/16/85
4,529,439	06/651,589	07/16/85	4,529,998	06/391,803	07/16/85
4,529,444	06/581,193	07/16/85	4,530,006	06/384,826	07/16/85
4,529,464	06/312,664	07/16/85	4,530,009	06/321,779	07/16/85
4,529,466	06/592,441	07/16/85	4,530,012	06/527,203	07/16/85
4,529,472	06/440,577	07/16/85	4,530,028	06/481,046	07/16/85
4,529,489	06/588,489	07/16/85	4,530,033	06/464,880	07/16/85
4,529,494	06/611,496	07/16/85	4,530,036	06/572,508	07/16/85
4,529,500	06/639,892	07/16/85	4,530,037	06/503,496	07/16/85
4,529,513	06/547,478	07/16/85	4,530,043	06/645,519	07/16/85
4,529,515	06/570,430	07/16/85	4,530,044	06/544,147	07/16/85
4,529,536	06/615,413	07/16/85	4,530,061	06/434,608	07/16/85
4,529,539	06/493,052	07/16/85	4,530,069	06/409,778	07/16/85
4,529,541	06/643,137	07/16/85	4,530,081	06/435,447	07/16/85
4,529,542	06/506,442	07/16/85	4,530,102	06/525,638	07/16/85

NOTIFICATION OF ACCEPTANCE OF DELAYED PAYMENT OF MAINTENANCE FEE
(35 U.S.C.41 (c); 37 CFR 1.378)

The patent(s) listed below is considered as not having expired but is subject of the conditions set forth in 35 U.S.C. 41(c)(2), in view of the Petition to Accept Late Payment of the maintenance fees which has been GRANTED BY THE COMMISSIONER OF PATENTS AND TRADEMARKS, as provided of under 35 U.S.C. 41(c)(1) and 37 CFR 1.378.

Patent No.	Serial No.	Patent Date	Application Filing Date	Delayed Payment Acceptance Date
4,316,463	06/228,628	02/23/82	01/26/81	08/31/89
4,450,134	06/291,466	06/22/84	08/12/81	08/31/89

Patent No.	Serial No.	Patent Date	Application Filing Date	Delayed Payment Acceptance Date
4,466,185	06/470,057	08/21/84	02/28/83	08/21/89
4,458,430	06/363,635	07/10/84	03/30/82	08/21/89
4,473,647	06/349,691	09/25/84	02/17/82	08/21/89
4,485,651	06/596,066	12/04/84	04/02/84	08/21/89

Patent Cooperation Treaty Update
Accession by Spain

The United States Patent and Trademark Office has recieved notification from the World Intellectual Property Organization that Spain deposited its instrument of accession to the Patent Cooperation Treaty (PCT) on 16 August 1989. Therefore, according to PCT Article 63(2), Spain may be designated in international applications filed on and after 16 November 1989.

The instrument of accession contains a declaration that Spain will not be bound by Chapter II (concerning international preliminary examination) of the PCT. This means that Spain will not be elected for international preliminary examination; however, if Spain is designated in the international application for a European patent together with at least one other State party to the European Patent Convention which is bound by Chapter II of the PCT, the 30-month time limit for entry into the regional phase before the European Patent Office under PCT article 39(1) applies also with respect to Spain, if the other State has been elected prior to 19 months from the priority date.

Listing of PCT Member Countries

Country	Ratification or Accession	Date of Ratification or Accession	Effective Date
(1)Central African Republic*	Accession.....	15 September 1971.....	01 June 1978
(2)Senegal*	Ratification.....	08 March 1972.....	01 June 1978
(3)Madagascar	Ratification.....	27 March 1972.....	01 June 1978
(4)Malawi	Accession.....	16 May 1972.....	01 June 1978
(5)Cameroon*	Accession.....	15 March 1973.....	01 June 1978
(6)Chad*	Accession.....	12 February 1974.....	01 June 1978
(7)Togo*	Ratification.....	28 January 1975.....	01 June 1978
(8)Gabon*	Accession.....	06 March 1975.....	01 June 1978
(9)United States of America	Ratification.....	26 November 1975.....	01 June 1978
(10)Germany, Federal Republic of**	Ratification.....	19 July 1976.....	01 June 1978
(11)Congo*	Accession.....	08 August 1977.....	01 June 1978
(12)Switzerland**	Ratification.....	14 September 1977.....	01 June 1978
(13)United Kingdom**	Ratification.....	24 October 1977.....	01 June 1978
(14)France**	Ratification.....	25 November 1977.....	01 June 1978
(15)Soviet Union	Ratification.....	29 December 1977.....	01 June 1978
(16)Brazil	Ratification.....	09 January 1978.....	01 June 1978
(17)Luxembourg**	Ratification.....	31 January 1978.....	01 June 1978
(18)Sweden**	Ratification.....	17 February 1978.....	01 June 1978
(19)Japan	Ratification.....	01 July 1978.....	01 October 1978
(20)Denmark	Ratification.....	01 September 1978.....	01 December 1978
(21)Austria**	Ratification.....	23 January 1979.....	23 April 1979
(22)Monaco	Ratification.....	22 March 1979.....	22 June 1979
(23)Netherlands**	Ratification.....	10 April 1979.....	10 July 1979
(24)Romania	Accession.....	23 April 1979.....	23 July 1979
(25)Norway	Ratification.....	01 October 1979.....	01 January 1980
(26)Liechtenstein**	Accession.....	19 December 1979.....	19 March 1980
(27)Australia	Accession.....	31 December 1979.....	31 March 1980
(28)Hungary	Ratification.....	27 March 1980.....	27 June 1980
(29)Democratic People's Republic of Korea (North Korea)	Accession.....	08 April 1980.....	08 July 1980
(30)Finland	Ratification.....	01 July 1980.....	01 October 1980
(31)Belgium**	Ratification.....	14 September 1981.....	14 December 1981
(32)Si Lanka	Accession.....	26 November 1981.....	26 February 1982
(33)Mauritania*	Accession.....	13 January 1983.....	13 April 1983
(34)Sudan	Accession.....	16 January 1984.....	16 April 1984
(35)Bulgaria	Accession.....	21 February 1984.....	21 May 1984
(36)Republic of Korea (South Korea)	Accession.....	10 May 1984.....	10 August 1984
(37)Mali*	Accession.....	19 July 1984.....	19 October 1984
(38)Barbados	Accession.....	12 December 1984.....	12 March 1985
(39)Italy**	Ratification.....	28 December 1984.....	28 March 1985
(40)Benin*	Accession.....	26 November 1986.....	26 February 1987
(41)Burkina Faso	Accession.....	21 December 1988.....	21 March 1989
(42)Spain**	Accession.....	16 August 1989.....	16 November 1989

*Members of African Intellectual Property Organization (OAPI) regional patent system. Only regional patent protection is available for OAPI countries. A designation of any country is an indication that all OAPI countries have been designated. Only one designation fee is due regardless of the number of OAPI member countries designated.

****Member of European Patent Convention (EPC) regional patent system.** Either national or European patents for member countries are available through PCT, except for France, Belgium and Italy, for which only European patents are available if PCT is used. Note: Only one PCT designation fee is due if European regional patent protection is sought for one, several or all EPC member countries under the PCT.

September 6, 1989

DONALD J QUIGG

Assistant Secretary and Commissioner
of Patents and Trademarks

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

4,459,232, Re. S. N. 339,524, Filed Apr. 17, 1989, Cl. 368/223, TIMEPIECE, Charles S. Coster, et al., Owner of Record: *Charles S. Coster, Cambridge, Mass.*, Attorney or Agent: David M. Driscoll, Ex. Gp.: 217

4,472,470, Re. S. N. 367,127, Filed July 27, 1989, Cl. 482/145, TRANSPARENT MEMBRANE STRUCTURES, Frank J. Modic, Owner of Record: *General Electric, Waterford, N.Y.*, Attorney or Agent: Mark R. Warfield, Ex. Gp.: 158

4,527,216, Re. S. N. 396,270, Filed Aug. 21, 1989, Cl. 361/156, SUB-MILLIAMP MECHANICAL RELAY CONTROL, Thomas E. Stammely, Owner of Record: *International Business Machine Corporation, Armonk N.Y.*, Attorney or Agent: Joselyn G. Cockburn, Ex. Gp.: 214

4,638,426, Re. S. N. 299,177, Filed Jan. 19, 1989, Cl. 364/200, VIRTUAL MEMORY ADDRESS TRANSLATION MECHANISM WITH CONTROLLED DATA PERSISTENCE, Albert Chang, et al., Owner of Record: *International Business Machine Corporation, Armonk, N.Y.*, Attorney or Agent: David J. Cushing, Ex. Gp.: 231

4,658,760, Re. S. N. 340,854, Filed Apr. 20, 1989, Cl. 122/13R, PRESSURE TRANSFER FLUID HEATER, William H. Zebuhr, Owner of Record: *Inventor*, Attorney or Agent: Joseph H. Bom, Ex. Gp.: 344

4,670,741, Re. S. N. 360,268, Filed June 2, 1989, Cl. 340/630, SMOKE DETECTION APPARATUS, Martin T. Cole, Owner of Record: *Inventor*, Attorney or Agent: John K. McCulloch, Ex. Gp.: 268

4,670,741, Re. S. N. 360,268, Filed June 2, 1989, Cl. 340/630, SMOKE DETECTION APPARATUS, Martin T. Cole, Owner of Record: *Inventor*, Attorney or Agent: John K. McCulloch, Ex. Gp.: 268

4,680,212, Re. S. N. 396,260, Filed Aug. 21, 1989, Cl. 428/97, STAIN RESISTANT NYLON FIBERS, Randolph C. Blyth, et al., Owner of Record: *Monsanto Company, St. Louis, Mo.*, Attorney or Agent: John W. Whisler, Ex. Gp.: 154

4,683,233, Re. S. N. 382,152, Filed July 19, 1989, Cl. 514/253, SALTS OF 2-KETO-2H,3H-1,2-BENZISOTHIAZOLE 1,1-DIOXIDE AS MICROBICIDES, Herbert Salzburg, et al., Owner of Record: *Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany*, Attorney or Agent: Leonard Horn, Ex. Gp.: 125

4,688,170, Re. S. N. 396,226, Filed Aug. 18, 1989, Cl. 364/200, COMMUNICATION NETWORK FOR COMMUNICATING WITH COMPUTERS PROVIDED WITH DISPARATE PROTOCOLS, David P. Waite, et al., Owner of Record: *Tau System Corporation, Falls Church, Va.*, Attorney or Agent: Mitchell B. Wasson, Ex. Gp.: 237

4,689,380, Re. S. N. 397,697, Filed Aug. 22, 1989, Cl. 526/283, CYCLOOLEFIN COPOLYMERIZATION METHOD, FEED COMPOSITION AND PRODUCT, Steven H. Nahm, Owner of Record: *Hercules Incorporated, Wilmington, Del.*, Attorney or Agent: W. Stanley Alexander, Ex. Gp.: 155

4,761,786, Re. S. N. 397,662, Filed Aug. 23, 1989, Cl. 372/10, MINIATURIZED Q-SWITCHED DIODE PUMPED SOLID STATE LASER, Thomas M. Baer, Owner of Record: *Spectra-Physics Inc., San Jose, Calif.*, Attorney or Agent: James H. Shaler, Ex. Gp.: 251

4,772,420, Re. N. S. 395,062, Filed Aug. 16, 1989, Cl. 252/377, GAS SEPARATION, Alwyn Pinto, Owner of Record: *Imperial Chemical Industries PLC, London, England*, Attorney or Agent: Watson T. Scott, Ex. Gp.: 126

4,848,621, Re. S. N. 395,451, Filed Aug. 17, 1989, Cl. 220/023, FUEL CAP WITH COMPARTMENT, D. Jon Radiff, Owner of Record: *Inventor*, Attorney or Agent: Joseph W. Brown, Ex. Gp.: 241

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

3,845,351, Reexam. No. 90/001,832, Requested Aug. 28, 1989, Cl. 315/293, METHOD AND APPARATUS FOR THE ADJUSTMENT OF A PLURALITY OF FLOODLIGHTS, Fritz von Ballmoos, et al., Owner of Record: *Variable-Parameter Fixture Dev. Corp., New York, N.Y.*, Attorney or Agent: Kenyon & Kenyon, Ex. Gp.: 260, Requester: Morpheus Lights Inc., San Jose, Calif.

4,653,056, Reexam. No. 90/001,830, Requested Aug. 24, 1989, Cl. 327/27, LASER DIODE PUMPED SOLID STATE LASERS, Thomas M. Baer, et al., Owner of Record: *Spectra-Physics, Inc., San Jose, Calif.*, Attorney or Agent: James H. Shalik, Ex. Gp.: 250, Requester: Owner

4,701,929, Reexam. No. 90/001,831, Requested Aug. 24, 1989, Cl. 372/7, LASER DIODE PUMPED SOLID STATE LASERS, Thomas M. Baer, et al., Owner of Record: *Spectra-Physics, Inc., San Jose, Calif.*, Attorney or Agent: James H. Shalik, Ex. Gp.: 250, Requester: Owner

Errata

The following registration number, listed in the "Trademark Registrations Issued" section of the Trademark Official Gazette of September 12, 1989, was listed inadvertently:

TM 242 1,555,526 September 12, 1989

Consequently, the certificate of registration bearing the above-identified registration number was not issued on the date indicated, and the registration number has been vacated.

September 7, 1989

PATRICIA M. DAVIS
Administrator for Trademark
Operations

DEPARTMENT OF COMMERCE

Patent and Trademark Office

37 CFR PARTS 1 AND 2

[Docket No. 90374-9181]

[RIN: 0651-AA38]

Amendments to Patent and Trademark Rules
to Implement Trademark Law Revision Act;
Miscellaneous Trademark Rule Amendments

Agency: Patent and Trademark Office, Commerce.

Action: Final Rule.

Summary: The Patent and Trademark Office (PTO) is amending the rules of practice in trademark cases, and the rules of practice in patent cases which are applicable to trademark cases, to implement the provisions of the Trademark Law Revision Act of 1988 [Title I of Pub. L. 100-667, 102 Stat. 3935 (15 U.S.C. 1051)], codify changes in practice resulting from a Trademark Trial and Appeal Board decision commonly known as the "Crocker" decision, and otherwise codify, clarify, and/or revise certain procedures for the examination of applications.

Effective Date: November 16, 1989.

For Further Information Contact: Carlisle E. Walters by telephone at (703) 557-7464 or by mail marked to her attention and addressed to Box 5, Office of the Assistant Commissioner for Trademarks, Commissioner of Patents and Trademarks, Washington, D.C. 20231.

Supplementary Information: In a notice of proposed rulemaking published in the *Federal Register* on May 4, 1989, at 54 FR 19286, the Patent and Trademark Office *Official Gazette* of May 16, 1989, at 1102 O.G. 47-70, and the Bureau of National Affairs' *Patent, Trademark, & Copyright Journal*, at 38 PTCJ 43-71, (May 11, 1989), the Patent and Trademark Office proposed to amend Parts 1 and 2 of Title 37 of the Code of Federal Regulations by amending or revising §§ 1.1, 1.8, 2.6, 2.18, 2.21, 2.24, 2.31, 2.33, 2.38, 2.39, 2.41, 2.44, 2.45, 2.47, 2.51, 2.52, 2.53, 2.56, 2.57, 2.58, 2.61, 2.64, 2.65, 2.66, 2.69, 2.71, 2.72, 2.73, 2.75, 2.81, 2.82, 2.83, 2.84, 2.86, 2.87, 2.99, 2.101, 2.111, 2.129, 2.133, 2.161, 2.162, 2.181, 2.185 and 2.187; and adding §§ 2.2, 2.59, 2.76, 2.77, 2.88 and 2.89. The notice of proposed rulemaking was designed primarily to implement certain provisions of the Trademark Law Revision Act of 1988 [Title I of Pub. L. 100-667, 102 Stat. 3935 (15 U.S.C. 1051)] (hereinafter "Pub. L. 100-667"), which was enacted on November 16, 1988, and will become effective on November 16, 1989. The text of the law was published in the *Congressional Record*, S. 1883, 100th Cong., 2d Sess., 134 Cong. Rec. 149, H10411 (daily ed. October 19, 1988), and in *BNA's Patent, Trademark & Copyright Journal*, at 36 PTCJ 751 (October 27, 1988).

Written comments were submitted by one firm, eight individuals, and six organizations. Six individuals testified at the oral hearing. Four of those individuals testified on behalf of two organizations, both of which also submitted written comments. Of the two individuals who testified on their own behalf, one also submitted written comments.

The following includes a summary of the "intent-to-use" provisions of Pub. L. 100-667, a summary of the other provisions of Pub. L. 100-667 which are relevant to PTO practice, a list of rules being changed as a result of Pub. L. 100-667, a brief discussion of other rules being changed and the reasons for those changes, a detailed section-by-section analysis of the final rules, and an analysis of all comments received in response to the notice of proposed rulemaking.

Discussion of "intent-to-use" provisions of Pub. L. 100-667:

Pub. L. 100-667 substantially revises the Trademark Act of 1946 ("Act"). Previously, the Act permitted the filing of an application for Federal registration of a trademark based upon use of the mark in commerce in connection with goods or services, under Section 1 of the Act; or, ownership of a foreign application or registration, under Section 44 of the Act. The new law adds a third basis for the filing of an application, namely, a bona fide intention to use a mark in commerce in relation to specific goods or services. For these "intent-to-use" applications, actual use of the mark in commerce will be a prerequisite to the ultimate issuance of a registration.

Section 103, Pub. L. 100-667, 102 Stat. 3935, amends Section 1 of the Act to permit the filing of an application for Federal registration of a trademark based upon either use of the mark in commerce or a bona fide intention to use the mark in commerce. Use-based applications will be governed by an amended and redesignated Section 1(a) of the Act. A new Section 1(b) of the Act authorizes the filing of "intent-to-use" applications and sets forth the filing requirements of such applications.

Section 113, Pub. L. 100-667, 102 Stat. 3940, amends Section 12 of the Act, concerning examination of applications and publication, to provide that if the Trademark Examining Attorney examines an "intent-to-use" application and finds that the applicant would be entitled to registration upon the acceptance of a statement of use, the mark will be published in the *Official Gazette* for purposes of opposition.

Section 114, Pub. L. 100-667, 102 Stat. 3940, amends Section 13 of the Act, concerning opposition to registration of marks on the Principal Register, to add a new Section 13(b) to govern the handling of applications which are not successfully opposed. New Section 13(b) provides that, unless registration is successfully opposed, a notice of allowance will be issued to the applicant in an "intent-to-use" application.

Section 103, Pub. L. 100-667, 102 Stat. 3935, further amends Section 1 of the Act by adding a new Section 1(c), which permits an "intent-to-use" applicant, at any time during examination, to amend the application to bring it into conformity with the requirements for an application based on use; and by adding a new Section 1(d) which sets forth the registration requirements for an "intent-to-use" application following issuance of a notice of allowance.

Section 1(d)(1) of the Act requires that, within six months after the issuance of the notice of allowance, the applicant must file specimens evidencing use of the mark in commerce, the prescribed fee, and a verified statement which asserts that the mark is in use in commerce and contains certain averments related to that use.

Section 1(d)(2) provides that the time for filing the statement of use will be extended for a period of six months upon written request of the applicant, if the request is filed before expiration of the six-month period for filing a statement of use. The request must be accompanied by the prescribed fee and a verified statement that the applicant has a continued bona fide intention to use the mark in commerce, specifying those goods or services identified in the notice of allowance for which that intention exists.

Section 1(d)(2) provides that further extensions of time for filing a statement of use may be granted by the Commissioner, for periods aggregating not more than 24 months, upon a showing of good cause by the applicant. A written request must be filed before the expiration of the last granted extension and accompanied by the prescribed fee and by a verified statement (of continued bona fide intention to use the mark in commerce) as required for the first extension of time. The Commissioner is to issue regulations setting forth what constitutes good cause for a further extension of time for filing a statement of use.

Section 1(d)(3) of the Act provides that any applicant who files a statement of use will be notified of the acceptance or refusal thereof and, if the statement is refused, of the reasons for the refusal, and that the statement of use may be amended.

Section 1(d)(4) of the Act provides that the failure of an applicant to timely file a statement of use, as required under Section 1(d) of the Act, will result in the abandonment of the application.

Discussion of other provisions of Pub. L. 100-667:

The new law includes certain other provisions which significantly affect practice in the PTO. Section 104, Pub. L. 100-667, 102 Stat. 3937, amends Section 2(f) of the Act, pertaining to registration of a mark used by the applicant which has become distinctive of the applicant's goods in commerce. The amendment will permit the Commissioner to accept, as prima facie evidence that a mark has become distinctive, proof of substantially exclusive and continuous use as a mark by the applicant in commerce for "five years before the date on which the claim of distinctiveness is made." The Act

previously permitted such a showing by the applicant to be only for "the five years next preceding the date of the filing of the application."

Section 109, Pub. L. 100-667, 102 Stat. 3938, adds a new Section 7(c) to the Act to provide, *inter alia*, that contingent on the registration of a mark on the Principal Register, the filing of an application to register such mark on the Principal Register shall constitute constructive use of the mark and confer nationwide priority.

Section 110, Pub. L. 100-667, 102 Stat. 3939, amends Section 8(a) of the Act to provide that each certificate of registration shall remain in force for ten (rather than twenty) years. Section 110 further amends Section 8(a) of the Act to require that the affidavit, which must be filed during the sixth year after issuance of a registration, set forth "those goods or services recited in the registration on or in connection with which the mark is in use in commerce and attaching to the affidavit a specimen or facsimile showing current use of the mark, ..." instead of the previous requirement for a "showing that said mark is in use in commerce ..."

Section 111, Pub. L. 100-667, 102 Stat. 3939, amends Section 9(a) of the Act to reduce the term for which a registration may be renewed from twenty years to ten years. Similarly, Section 135, Pub. L. 100-667, 102 Stat. 3948, amends the Act by adding a new section, Section 51, which provides that certificates of registration which issue from applications pending in the PTO on November 16, 1989, the effective date of the new law, shall remain in force for a period of ten years.

Section 118, Pub. L. 100-667, 102 Stat. 3941, amends Section 18 of the Act to expand a portion of the description of the actions which may be taken by the Trademark Trial and Appeal Board ("Board"), in an inter partes proceeding, from "may refuse to register the opposed mark, may cancel or restrict the registration of a registered mark, or may refuse to register any or all of several interfering marks..." to "may refuse to register the opposed mark, may cancel the registration, in whole or in part, may modify the application or registration by limiting the goods or services specified therein, may otherwise restrict or rectify with respect to the register the registration of a registered mark, may refuse to register any or all of several interfering marks..." The same section of the new law further amends Section 18 of the Act to provide, with respect to inter partes proceedings before the Board, that no final judgment shall be entered in favor of an intent-to-use applicant before the mark is registered, if such applicant cannot prevail without establishing constructive use pursuant to Section 7(c) of the Act, as amended by Section 109, Pub. L. 100-667, 102 Stat. 3938.

Section 121, Pub. L. 100-667, 102 Stat. 3942, amends Section 23 of the Act, which governs applications for registration on the Supplemental Register, to delete the requirement that the mark must have been in lawful use in commerce for the year preceding the filing of the application; and to substitute a requirement that the mark must be in lawful use in commerce by the owner.

Section 122, Pub. L. 100-667, 102 Stat. 3943, amends Section 24 of the Act, which governs petitions to cancel registrations on the Supplemental Register, to delete the requirement that such a petition be verified, and to add a provision that (in such a cancellation proceeding) no final judgment shall be entered in favor of an intent-to-use applicant before the mark is registered, if such applicant cannot prevail without establishing constructive use pursuant to Section 7(c) of the Act, as amended.

Finally, Section 133, Pub. L. 100-667, 102 Stat. 3946, amends Section 44 of the Act to require that an application filed pursuant to Section 44(d) or 44(e) of the Act include a statement that the applicant has a bona fide intention to use the mark in commerce. The new law further amends Section 44(e) of the Act to specify that use in commerce shall not be required prior to registration in the case of an application under that section of the Act.

Specific rules changed or added:

The existing rules of practice in Parts 1 and 2 of Title 37 of the Code of Federal Regulations which are amended as

a result of the enactment of Pub. L. 100-667 are §§ 1.1, 1.8, 2.6, 2.21, 2.33, 2.38, 2.39, 2.41, 2.44, 2.45, 2.47, 2.51, 2.52, 2.53, 2.56, 2.57, 2.61, 2.64, 2.65, 2.69, 2.71, 2.72, 2.73, 2.75, 2.81, 2.82, 2.84, 2.86, 2.87, 2.99, 2.101, 2.111, 2.129, 2.133, 2.161, and 2.162. In addition, new §§ 2.2, 2.59, 2.76, 2.77, 2.88, and 2.89 are added. The amendments made to existing rules, and the provisions of the new rules which are added, are described in detail hereafter.

Other changes are made in the rules of practice in trademark cases as a result of the decision of the Board in *Crocker National Bank v. Canadian Imperial Bank of Commerce*, 223 USPQ 909 (TTAB 1984) ("Crocker"). Prior to *Crocker*, an applicant applying under Section 44 of the Act was allowed, under present § 2.39, to omit certain of the allegations required for an application based on use, namely, the allegation that the mark sought to be registered was in use in commerce, and the statements of the applicant's date of first use of the mark, and first use of the mark in commerce, on or in connection with the specified goods or services. Nevertheless, it was the practice of the PTO to require such an applicant to allege use of the mark (somewhere in the world) and to submit specimens of the mark as used on or in connection with the specified goods or services. The Board held in *Crocker*, however, that an applicant filing in accordance with Section 44 need not allege use or submit specimens. The practice of the PTO was thereafter modified to bring it into accordance with the Board's decision. The rules of practice which are amended to codify the present practice are §§ 2.21, 2.33, 2.39, 2.41, 2.44, 2.45, 2.47, 2.51, 2.56, and 2.72. As indicated above, those rules are also amended to implement changes in practice required as a result of the enactment of Pub. L. 100-667.

Additionally, certain miscellaneous amendments are made to codify, clarify, and/or revise procedures for the examination of applications. Specifically, § 2.18 is amended to clarify the practice of the PTO regarding correspondence with foreign applicants. Section 2.24 is amended to correct a cross-reference. Section 2.31 is amended to indicate that it is preferable that an application be on approximately "lettersize" (i.e., 8 1/2 inches by 11 inches) rather than legal-size, paper. Section 2.52(e) is amended to simplify the drawing color linings for the colors orange and yellow or gold. Sections 2.56 and 2.57 are amended to reduce the number of specimens or facsimiles required to be filed, in those instances where specimens are necessary, from five to three, and to indicate that specimens or facsimiles may not exceed eleven inches in length. When specimens exceeding the size limitations are submitted, the applicant will be required to submit proper substitute specimens. Section 2.83, which governs procedure in the case of conflicting marks, is amended to delete a provision which does not conform to present PTO practice, namely, the provision that a notice will be sent, if practicable, to the applicants involved informing them of the publication or issuance of the earliest-filed mark (or, if the conflicting applications have the same effective filing date, of the publication or issuance of the application with the earliest date of execution). Finally, § 2.187 is amended to revise the conditions under which a certificate of registration will be issued in the name of an applicant's assignee, or in an applicant's new name.

Discussion of Specific Sections Changed or Added:

In this discussion, "Patent and Trademark Office" is abbreviated as "PTO," "Trademark Trial and Appeal Board" is abbreviated as "Board," the Trademark Act of 1946 is abbreviated as "the Act," and all references to sections of the Act are as amended by Pub. L. 100-667, unless otherwise stated.

Section 1.1, which specifies the address to be used on communications intended for the PTO, and also provides special box designations which may be used on certain types of communications to the PTO, is amended to add new paragraph (h) which establishes a new separate receipt box for statements of use under Section 1(d) of the Act and requests for extensions of time to file such statements. The new paragraph encourages, but does not require, applicants to use the designation "Box ITU" when submitting the identified papers. Use of the box designation will permit prompt and efficient processing of the identified papers. The proposed rule also included amendments

to allege use under Section 1(c) of the Act as papers which should be identified by the new "Box ITU" designation. However, as a result of a change in planned internal workflow, that proposal is withdrawn. Amendments to allege use under Section 1(c) of the Act should not be identified with the "Box ITU" designation.

Section 1.8, which provides that certain papers will be considered filed in the PTO on the date the papers are certified as mailed, subject to specified conditions, is amended to add new paragraphs (a)(2)(xiv) through (a)(2)(xvi) to exclude the following papers from the "Certificate of Mailing" procedure established under the section: statements of use under new § 2.88 (15 U.S.C. 1051(d)), requests for extensions of time to file such statements, and amendments to allege use under new § 2.76 (15 U.S.C. 1051(c)). The specified papers are excluded due to the nature and significance of the papers and the importance of their prompt receipt in the PTO. Before a registration can be issued in an application under Section 1(b) of the Act, either an amendment to allege use or a statement of use must be filed and accepted. An amendment to allege use may be submitted only during the examination of an application prior to approval of the mark for publication for opposition in the Trademark Official Gazette. After issuance of a notice of allowance in an application under Section 1(b) of the Act, applicant must file either a statement of use or request a six-month extension of time to file a statement of use within six months thereafter (successive extension requests may not aggregate more than 36 months from the notice of allowance). Each of these papers is required to be filed within tight time frames and should be processed by the PTO expeditiously. Thus, to avoid problems related to mail delays, these papers are excluded from the "Certificate of Mailing" procedure.

Section 2.2 is added to establish a definitions section for Part 2 of 37 CFR.

Section 2.2(a) is added to state that all references to "the Act" pertain to the Trademark Act of 1946, as amended.

Section 2.2(b) is added to state that all references, for example in §§ 2.101 and 2.111, to "entity" include both natural and juristic persons.

Section 2.6, which governs trademark fees, is amended to add paragraphs (u) and (v) to establish two new fees for the filing of papers required or permitted under Section 1(c) or 1(d) of the Act. Section 2.6(a) establishes the fee for filing an application, per class, and it is applicable to all new applications filed in the PTO, regardless of the basis asserted for filing. Section 2.6(u) is added to establish a filing fee of \$100.00 for an amendment to allege use under new § 2.76 (15 U.S.C. 1051(c)) or for a statement of use under new § 2.88 (15 U.S.C. 1051(d)). Section 2.6(v) is added to establish a filing fee of \$100.00 for any request, under new § 2.89 (15 U.S.C. 1051(d)), for a six-month extension of time to file a statement of use.

The PTO is amending § 2.6 to establish new fees required under provisions of Pub. L. 100-667. A fee is required under Section 1(b)(2) of the Act for the filing of an application under Section 1(b) of the Act ("intent-to-use"). A fee is required under Section 1(d)(1) of the Act for the filing of a statement of use in an application under Section 1(b) of the Act; and a fee is required under Section 1(d)(2) of the Act for the filing of a request for an extension of time to file a statement of use. A fee is being established for an amendment to allege use, which is filed under Section 1(c) of the Act, to bring an application under Section 1(b) of the Act into conformity with the requirements of Section 1(a) of the Act ("use in commerce"). These actions are consistent with Section 103(a) of Pub. L. 100-703 which governs the way fees established under Section 31 of the Act may be adjusted.

Section 103(a) of Pub. L. 100-703 provides that the Commissioner cannot establish additional fees under Section 31 of the Act during fiscal years 1989, 1990 and 1991. However, Pub. L. 100-667 requires that the fees for filing an application under Section 1(b) of the Act, a statement of use, and a request for an extension of time to file a statement of use be established. Further, Congressman Kastenmeier has stated that "the Commissioner is not precluded from charging a new fee for a new service or material or from charging a different fee where a significant and material improvement in service or

material, such as in promptness or quality is offered. Under any circumstances, augmented fees ought to be clearly justified and reported to the Congress." *Congressional Record*, S. 1883, 100th Cong., 2d Sess., 134 Cong. Rec. 149, H9677 (daily ed. October 5, 1988). Amendments to allege use filed under Section 1(c) of the Act create a new examination practice that was not contemplated when the fees were established for activities performed under the Act and this fee is clearly not an increase in an existing fee.

On February 15, 1989, a final rule was published in the *Federal Register* at 54 FR 6893 to adjust patent and trademark fees. Effective April 17, 1989, three trademark fees were reduced: the fee for filing an application for trademark registration was reduced from \$200 to \$175 per class, and two fees for recording trademark assignments or other papers relating to a registered mark or application for registration were reduced from \$100 to \$8.

In establishing the new fees related to Pub. L. 100-667, the PTO followed the fee methodology which was described in the February 15, 1989, *Federal Register* notice (54 FR 6893), and is summarized as follows:

Cost Calculations: The PTO calculated unit costs for the new fees based on OMB Circular A-25, "User Fees," and OMB Circular A-130, "Management of Federal Information Resources." Costs were determined from the best available records (for example, the FY 1987 end-of-year financial statements for the Office) and included direct and indirect costs to the PTO for carrying out the activity, as directed by OMB Circular A-25. To estimate costs for the three-year period from November 1989 to October 1992, the 1987 actual costs were adjusted by the Administration's inflation projection (*Budget of the United States Government, Fiscal Year 1990, Part 3, "The Economy and the Budget"*). This methodology was utilized in conjunction with an analysis of the worksteps and procedures that will be involved in the processing of a new application to register a mark under Section 1(b) of the Act. The PTO has determined that the processing and examination of an application under Section 1(b) of the Act from the filing date through issuance of a notice of allowance is expected to cost the same as the processing and examination of an application under Section 1(a) of the Act from the filing date through issuance of the certificate of registration. Therefore, the fee for applications filed under Section 1(a) or 1(b) is the same.

Workload Projections: The PTO has estimated that there will be a one-time, twenty-five percent (25%) increase in trademark applications filed in FY 1990, bringing the estimated trademark application filings for FY 1990 to approximately 100,000. In FY 1991, the PTO estimates that approximately 86,700 trademark applications will be filed and that, thereafter, trademark application filing increases will drop to normal levels (approximately six percent (6%) over the previous year) for the remainder of the fee cycle. The PTO estimates that sixty percent (60%) of the total applications filed in FY 1990 and subsequent years in this fee cycle will be filed under Section 1(b) of the Act.

The PTO estimates that, beginning in FY 1991, the first requests for extensions of time to file a statement of use will be filed; and that these requests will be filed in approximately ten percent (10%) of the Section 1(b) applications filed in the prior year. In FY 1992, the filing of requests for extensions of time to file a statement of use will increase to sixteen percent (16%) of the new Section 1(b) applications filed in the previous year and remain at that level during the remainder of the fee cycle.

The PTO estimates that approximately twenty-five percent (25%) of all applications filed under Section 1(b) of the Act will be abandoned before the filing of either an amendment to allege use, under Section 1(c) of the Act, or a statement of use, under Section 1(d) of the Act.

The PTO estimates that twenty-five percent (25%) of all applications filed under Section 1(b) of the Act will be amended to conform to the provisions of Section 1(a) of the Act (by the filing of an amendment to allege use under new § 2.76) during the first examination of the application, before approval of the mark for publication for opposition; and that this filing will increase first examination processing by a factor of forty percent (40%).

The PTO estimates that a statement of use under new § 2.88 will be filed in fifty percent (50%) of all applications filed under Section 1(b) of the Act; and that the second examination required under Section 1(d)(1) of the Act will require additional processing time equal to forty percent of the processing time required for the first examination.

Fee Adjustment Methodology: Based on the fee methodology described in the February 15, 1989, *Federal Register* notice (54 FR 6893), the projected revenue from these fees, when coupled with the fees generated by all other trademark fees, does not exceed the costs associated with the filing and processing of an application for the registration of a trademark or other mark and for all other services performed by, and materials furnished by, the PTO related to trademarks and other marks.

The PTO has detailed cost calculation worksheets for each fee item, which are available for public inspection in Suite 904 of Building 2, Crystal Park at 2121 Crystal Drive, Arlington, Virginia.

Section 2.18, which specifies to whom correspondence will be sent by the PTO, is revised to add a new sentence to the section to clarify PTO policy regarding correspondence with foreign applicants. The new sentence provides that PTO correspondence will be sent to the domestic representative of a foreign applicant unless the application is being prosecuted by an attorney at law or other qualified person duly authorized, in which event correspondence will be sent to the attorney at law or other qualified person duly authorized. The section, as amended, conforms to present § 2.24.

Section 2.21(a), which governs the requirements for receiving an application filing date, is amended by revising paragraphs (a)(5) and (a)(6) and adding new paragraphs (a)(5)(i), (a)(5)(ii), (a)(5)(iii) and (a)(5)(iv) to revise the minimum filing requirements for applications under Section 1(a) or 44 of the Act, and to add minimum filing requirements for applications under Section 1(b) of the Act. A requirement that an application be verified by the applicant in order to receive a filing date is added for all types of applications. The minimum filing requirements for an application under Section 44 are revised to comply with the *Crocker* decision and to implement the provisions of Pub. L. 100-667.

Section 2.21(a)(5), which presently specifies the filing date requirement of at least one specimen or facsimile of the mark as actually used, is revised to delete that requirement from the paragraph and to indicate that the four new paragraphs added thereunder all relate to the assertion of a basis for filing.

Section 2.21(a)(5)(i) is added to specify all filing requirements which pertain only to the assertion of a basis for filing an application under Section 1(a) of the Act, namely, the statement of a date of first use in commerce and at least one specimen or facsimile of the mark as actually used.

Section 2.21(a)(5)(ii) is added to specify all filing requirements which pertain only to the assertion of a basis for filing an application under Section 44(e) of the Act, namely, a claim of a bona fide intention to use the mark in commerce and a certification or a certified copy of the foreign registration on which the application is based. In accordance with *Crocker*, the new paragraph contains no requirement for a statement of use of the mark anywhere or for the filing of a specimen or facsimile of the mark as used.

Section 2.21(a)(5)(iii) is added to specify all filing requirements which pertain only to the assertion of a basis for filing an application pursuant to Section 44(d) of the Act, namely, a claim of a bona fide intention to use the mark in commerce and a claim of the benefit of a prior foreign application. In accordance with *Crocker*, the new paragraph contains no requirement for a statement of use of the mark anywhere or for the filing of a specimen or facsimile of the mark as used.

Section 2.21(a)(5)(iv) is added to specify all filing requirements which pertain only to an assertion of a basis for filing an application under Section 1(b) of the Act, namely, a claim of a bona fide intention to use the mark in commerce.

Section 2.21(a)(6), which presently includes certain of the filing requirements incorporated in new paragraphs (a)(5)(i), (a)(5)(ii), and (a)(5)(iii), is revised to require that an application include a verification in accordance with § 2.33(b), signed by the applicant, as a condition for receiving a filing date.

The proposed requirement is in accordance with Sections 1 and 44 of the Act.

Section 2.24, which relates to the designation of a representative by a foreign applicant, is revised to clarify language concerning official communications from the PTO to indicate that such communications will be addressed to the domestic representative unless the application is being prosecuted by an attorney at law or other qualified person duly authorized, in which event the communication will be sent to the attorney at law or other qualified person duly authorized. Additionally, the section is revised to correct cross-references. Cross-references to § 10.14 of the subchapter, which now governs qualifications of individuals to practice before the PTO in trademark and other non-patent cases, are substituted for the cross-references to § 2.12, which has been removed.

Section 2.31, which presently states that it is preferable that an application be on legal or lettersize paper, is revised to state that it is preferable that an application be on lettersize (i.e., 8 1/2 inches by 11 inches) paper. This amendment conforms generally to the standards of Federal court practice.

Section 2.33, which specifies the complete requirements for a written application, is amended by changing the section title from "Requirements for application" to "Requirements for written application," revising certain existing paragraphs, redesignating and revising certain other existing paragraphs, and adding three new paragraphs to, *inter alia*, incorporate in this section the requirements for an application under Section 44 of the Act, and add the requirements for an application under Section 1(b) of the Act. The application requirements for an application under Section 44 of the Act are in accordance with the *Crocker* decision.

Section 2.33(a)(1)(ii), which requires a statement of applicant's citizenship, is revised to clarify the language of the section and to codify the requirement that an applicant which is a partnership must specify in the application the state or nation under the laws of which the partnership is organized.

Section 2.33(a)(1)(iv), which presently requires a statement that applicant has adopted and is using the mark shown in the accompanying drawing, is revised to limit this requirement to an application under Section 1(a) of the Act; and to add, for an application under Section 1(b) or 44 of the Act, a requirement for a statement that applicant has a bona fide intention to use the mark shown in the accompanying drawing in commerce.

Section 2.33(a)(1)(v), which presently requires an identification of the particular goods on or in connection with which the mark is used, is revised to include a reference to services, as well as goods; to limit the requirement to an application under Section 1(a) of the Act; and to add, for an application under Section 1(b) or 44 of the Act, the requirement for an identification of the particular goods or services on or in connection with which the applicant has a bona fide intention to use the mark. The paragraph is further amended to incorporate the provision, presently included in § 2.39, that the goods or services specified in an application under Section 44 may not exceed the scope of the goods or services covered by the foreign application or registration.

Section 2.33(a)(1)(vi), which presently requires a statement of the class of merchandise according to the official classification, if known to the applicant, is revised to substitute the words "goods or services" for the word "merchandise."

Section 2.33(a)(1)(vii), which presently requires a statement of the date of applicant's first use of the mark as a trademark on or in connection with goods specified in the application, is revised to include references to a service mark, as well as a trademark, and to services, as well as goods; to limit the requirement to an application under Section 1(a) of the Act; and to add for such an application the requirement, presently stated in paragraph (a)(1)(viii) of the section, for a statement of applicant's date of first use of the mark in commerce on or in connection with the goods or services listed in the application, specifying the nature of such commerce.

Section 2.33(a)(1)(viii), which presently requires a statement of the date of applicant's first use in commerce of the mark as a trademark on or in connection with goods specified in the application, specifying the nature of such commerce, is revised to remove this requirement, which is added to paragraph (a)(1)(vii); and to incorporate the requirements, presently stated

in § 2.39(a), concerning submission, with an application under Section 44(e) of the Act, of a certificate of the trademark office of the applicant's country of origin and, if the certificate is not in the English language, of a translation thereof.

Section 2.33(a)(1)(ix), which presently requires a statement of the mode, manner or method of applying, affixing or otherwise using the mark on or in connection with the goods specified, is redesignated as (a)(1)(x); revised to indicate that this requirement pertains only to an application under Section 1(a) of the Act; and amended to include a requirement, for an application under Section 1(b) of the Act, for a statement of the intended mode, manner or method of applying, affixing or otherwise using the mark on or in connection with the goods or services specified.

A new Section 2.33(a)(1)(ix) is added to require, for an application claiming the benefit of a foreign application in accordance with Section 44(d) of the Act, that the application comply with the requirements of § 2.39.

Section 2.33(a)(2), which presently provides that if more than one item of goods is specified in the application, the dates of use required in present paragraphs (a)(1)(vii) and (viii) of the section need be for only one of the items specified, provided the particular item to which the dates apply is designated, is revised to refer to services as well as goods and to delete the cross-reference to paragraph (a)(1)(viii), the present substance of which is incorporated in paragraph (a)(1)(vii).

Section 2.33(b), which presently states the requirement that an application include certain averments concerning ownership of the mark, use of the mark in commerce, and the truth of the statements contained in the application, is redesignated as (b)(1); revised to indicate that the requirement of the paragraph pertains only to an application under Section 1(a) of the Act; and revised to clarify the language of the paragraph and to make such language gender neutral.

Section 2.33(b)(2) is added to specify, for an application under Section 1(b) or 44 of the Act, a requirement that the application include certain averments concerning ownership of the mark, the truth of the statements contained in the application, and applicant's bona fide intention to use the mark in commerce on or in connection with the specified goods or services.

Section 2.33(c), which concerns the applicability of this section to an application for the registration of a mark for goods or services falling within multiple classes, is revised to correct a cross-reference which presently is correct but would be incorrect when the amendments to §§ 2.86 and 2.87 become effective. Specifically, § 2.33(c) is revised to refer to § 2.86 rather than § 2.87.

Section 2.33(d) is added to state that an applicant may not file under both Sections 1(a) and 1(b) of the Act in a single application, nor may an applicant in an application under Section 1(a) of the Act amend that application to seek registration under Section 1(b) of the Act. An application which is filed under both Sections 1(a) and 1(b) of the Act will not be accorded a filing date and will be returned to the applicant. The provision that an applicant under Section 1(a) of the Act is precluded from amending the application to seek registration under Section 1(b) of the Act is based upon the language of Section 1(b) of the Act which requires that an application under the section include, upon filing, a verified statement of a bona fide intention to use the mark in commerce; however, an application filed under Section 1(a) of the Act does not include such a statement and cannot be based on a bona fide intention to use a mark. There is no prohibition against amending the basis for an application from Section 1(b) to Section 1(a) of the Act because Section 1(a) requires that an application assert use in commerce prior to the filing date of the application. This is a factual assertion that is verifiable at any time.

Section 2.38 is revised to change a cross-reference which presently is correct but would be incorrect when the amendments to § 2.33 become effective. Specifically, § 2.38 is revised to refer to § 2.33(a)(1)(vii) rather than § 2.33(a)(1)(vii) and (viii).

Section 2.39, which presently contains provisions concerning the omission of an allegation of use in commerce and statements of dates of first use in applications filed under Section 44 of the Act, as well as provisions specifying certain requirements

for such applications, is amended by changing the section title from "Omission of allegation of use in commerce by foreign applicants," to "Priority claim based on foreign application," and revising paragraphs (a) and (b). The purpose of the amendments is to delete the omission provisions and the provisions specifying requirements for applications under Section 44(e) of the Act which are subsumed by § 2.33 as amended; and to add certain provisions concerning applications claiming the benefit of a prior foreign application in accordance with Section 44(d) of the Act.

In the notice of proposed rulemaking, present paragraphs (a) and (b) of § 2.39 were proposed to be revised and a new paragraph (c) was proposed to be added. As the result of a written comment concerning proposed paragraph (a) (see "Response to Comments on the Rules"), paragraph (a) is withdrawn, and proposed paragraphs (b) and (c) are redesignated (a) and (b), respectively.

Section 2.39(a), which presently contains provisions concerning the omission of an allegation of use in commerce and statements of dates of first use by applicants filing under Section 44(e) of the Act, as well as provisions specifying requirements for such applications, is revised to delete those provisions, which are subsumed by § 2.33 as amended; to add requirements, presently specified in paragraph (b) of the section, for filing an application in accordance with Section 44(d) of the Act.

Section 2.39(b), which presently contains provisions concerning the omission of an allegation of use in commerce and of statements of dates of first use by applicants filing under Section 44(d) of the Act, and a statement of certain other requirements for an application in accordance with Section 44(d) of the Act, is revised to delete the omission provisions, which are subsumed by § 2.33 as amended. The paragraph is further revised to provide that before an application filed in accordance with Section 44(d) of the Act can be approved for publication, a basis for registration under Section 1(a), 1(b) or 44(e) of the Act must be established.

Section 2.41(a), which relates to proof of distinctiveness of a mark, pursuant to Section 2(f) of the Act, is revised to indicate that allegations and evidence of acquired distinctiveness must be based upon use of the mark on or in connection with goods or services "in commerce."

Section 2.41(b) is revised in the same manner as § 2.41(a) above, and is revised further to implement Section 104 of Pub. L. 100-667. Section 2(f) of the Act presently requires an applicant relying upon an allegation of five years of substantially exclusive and continuous use of a mark in commerce in support of a claim of distinctiveness to assert that such use was made during the five years next preceding the filing date of the application. Section 104 of Pub. L. 100-667 amends Section 2(f) of the Act to permit an applicant to rely upon such use made for the five years before the date on which the claim of distinctiveness is made.

Section 2.44, which presently requires that an application to register a collective mark include certain statements concerning the class of persons entitled to use the mark, their relationship to the applicant, and the nature of applicant's control over the use of the mark, is amended to redesignate the present paragraph as (a); revise redesignated paragraph (a) to indicate that it pertains only to applications under Section 1(a) of the Act; and add a new paragraph (b) which requires, for collective mark applications under Section 1(b) or 44 of the Act, that the application include certain statements concerning the class of persons entitled to use the mark, their relationship to the applicant, and the nature of applicant's control over the use of the mark.

Section 2.45, which presently requires that an application to register a certification mark include certain statements concerning the use of the mark, applicant's control thereover, and that applicant is not engaged in the production or marketing of the goods or services to which the mark is applied, is amended to redesignate the present paragraph as (a); revise redesignated paragraph (a) to indicate that it pertains only to applications under Section 1(a) of the Act; and add a new paragraph (b) which requires, for certification mark applications under Section 1(b) or 44 of the Act, that the application include certain statements concerning the intended use of the mark, applicant's intended control thereover, and that applicant will not engage

in the production or marketing of the goods or services to which the mark is applied.

Section 2.47, which governs applications to register on the Supplemental Register, is amended to redesignate the present paragraph as (a); revise redesignated paragraph (a); and add new paragraphs (b), (c) and (d) to implement certain provisions of Pub. L. 100-667.

Section 2.47(a), as redesignated, is revised to implement Section 23 of the Act by eliminating provisions pertaining to the requirement for one year of use of the mark for an application for registration on the Supplemental Register.

Section 2.47(b) is added to provide, in accordance with the *Crocker* decision, that in an application to register on the Supplemental Register under Section 44 of the Act, the statement of lawful use in commerce may be omitted.

Section 2.47(c) is added to provide that a mark in an application to register on the Principal Register under Section 1(b) of the Act is eligible for registration on the Supplemental Register only after an acceptable allegation of use under Section 1(c) or (d) of the Act has been timely filed. Section 23 of the Act requires lawful use in commerce as a prerequisite for an application for registration on the Supplemental Register. This requirement bars an application under Section 1(b) of the Act from the Supplemental Register until an acceptable allegation of use has been submitted.

Section 2.47(d) is added to provide that an application for registration on the Supplemental Register must conform to the requirements for registration on the Principal Register under Section 1(a) of the Act so far as applicable.

Section 2.51, which specifies certain general requirements for drawings, is amended by redesignating present paragraph (a) as (a)(1), revising paragraph (a)(1), adding new paragraphs (a)(2) and (a)(3), redesignating present paragraph (b) as (b)(1), revising paragraph (b)(1), adding new paragraphs (b)(2) and (b)(3), revising paragraph (c), redesignating and republishing present paragraph (d) as (e), and adding a new paragraph (d) to codify existing practice and to specify certain drawing requirements for applications under Sections 1(b) of the Act and applications under Section 44 of the Act.

Section 2.51(a), which presently requires that the drawing of a trademark be a substantially exact representation of the mark as used on or in connection with the goods, is redesignated as (a)(1) and revised to indicate that it pertains only to applications under Section 1(a) of the Act.

Section 2.51(a)(2) is added to provide that, in an application under Section 1(b) of the Act, the drawing of a trademark shall be a substantially exact representation of the mark as intended to be used on or in connection with the goods specified in the application and, that once an amendment to allege use under new § 2.76, or a statement of use under new § 2.88 has been filed, the drawing of the trademark shall be a substantially exact representation of the mark as used.

Section 2.51(a)(3) is added to provide that, in an application under Section 44 of the Act, the drawing of the trademark shall be a substantially exact representation of the mark as it appears in the drawing in the registration certificate of a mark duly registered in the country of origin of the applicant.

Section 2.51(b), which presently specifies, for service marks, requirements similar to those specified in paragraph (a) for trademarks, is amended by redesignating the present paragraph as (b)(1) and adding paragraphs (b)(2) and (b)(3) to parallel, for service marks, the provisions of new paragraphs (a)(1), (a)(2) and (a)(3).

Section 2.51(c), which presently provides that, when appropriate and necessary, the drawing in an application for registration on the Supplemental Register may be the drawing of a package or configuration of goods, is revised to delete that provision, which is outdated, and to add a provision codifying the practice that the drawing of a service mark may be dispensed with in the case of a mark not capable of representation by a drawing, but in any such case the application must contain an adequate description.

Section 2.51(d) is redesignated as (e) and a new paragraph (d) is added to provide that broken lines should be used in the drawing of a mark to show placement of the mark on the goods, or on the packaging, or to show matter not claimed as part of the mark, or both, as appropriate, and to provide further that, in an application to register a mark with three-

dimensional features, the drawing shall depict the mark in perspective in a single rendition. These proposed provisions codify existing practice.

Section 2.52(a), which pertains to the character of drawings, is revised to correct a cross-reference which presently is correct but would be incorrect when the amendments made herein to § 2.51 become effective. Specifically, § 2.52(a) is amended to refer to paragraph (e), rather than (d), of § 2.51.

Section 2.52(d), which pertains to drawing headings and which presently includes, *inter alia*, a requirement that the heading of a drawing (except for a drawing in an application under Section 44 of the Act) not exceed one-fourth of the sheet and specify dates of use, is revised to indicate that the heading should not exceed one-third of the sheet and that the dates of use requirement pertains only to an application under 1(a) of the Act; to add a requirement that the heading of a drawing in an application filed in accordance with Section 44(d) of the Act specify the priority filing date of the relevant foreign application; and to add a provision that, if a drawing is in special form, the heading of the drawing should include a description of the essential elements of the mark.

Section 2.52(e), which pertains to drawing linings for color, is revised to simplify the conventional color linings for orange and yellow or gold.

Section 2.53 is revised to change a cross-reference which presently is correct but would be incorrect when the amendments made herein to § 2.51 become effective. Specifically, § 2.53 is amended to refer to paragraph (e), rather than (d), of § 2.51.

Section 2.56, which concerns specimens for trademarks, is revised to indicate that the requirement for the filing of specimens pertains only to an application under Section 1(a) of the Act, an amendment to allege use under new § 2.76, and a statement of use under new § 2.88; remove the redundant word "actually," in accordance with Section 1(a)(1)(C) of the Act; add a provision, in accordance with Section 45 of the Act, that if placement of the mark on labels, tags, containers or displays associated with the goods is impracticable, then specimens may be documents associated with the goods or their sale; and reduce the maximum size limit for specimens (the proposed maximum size limit parallels the preferable size of paper for a trademark application as specified in amended § 2.31). When specimens exceeding the size limitations are submitted, the applicant will be required to submit proper substitute specimens. The paragraph is revised further to reduce the number of specimens required from five to three. The present requirement for five specimens was adopted to permit members of the public to obtain specimens directly from the application file. Advances in copying technology have rendered the requirement for five specimens unnecessary because members of the public may now obtain quality photocopies of the specimens in the file, making removal of specimens unnecessary in most cases. The requirement for three specimens will provide one specimen for the file and make two specimens available for removal by third parties.

Section 2.57, which pertains to facsimiles in the case of a trademark, is amended to revise paragraph (a) to reduce the number of facsimiles required from five to three, and to reduce the maximum size limit for specimens (the maximum size limit parallels the preferable size of paper for a trademark application as specified in amended § 2.31); and to revise paragraph (b) by removing the redundant word "actually," in accordance with Section 1(a)(1)(C) of the Act. When facsimiles exceeding the size limitations are submitted, the applicant will be required to submit proper substitute specimens. Section 2.58, which concerns the filing of audio cassette tape recordings as specimens for service marks not used in written or printed form, was proposed to be amended to reduce the number of audio tapes required from three to two. As a result of comments received with respect to this proposal, it has been withdrawn.

Section 2.59, entitled "Filing substitute specimens," is added to specify the requirements related to the filing of substitute specimens for applications under Section 1(a) or 1(b) of the Act. The new section codifies existing practice with respect to applications under Section 1(a) of the Act and sets forth the requirements which will apply to applications under Section 1(b) of the Act.

Section 2.59(a) is added to provide that, in an application based upon use in commerce, the applicant may submit substitute specimens of the mark as used on or in connection with the goods, or in the sale or advertising of the services, provided that any substitute specimens are properly verified as to their use in commerce at least as early as the filing date of the application; and that the verification requirement shall not apply if the specimens are duplicates or facsimiles, such as photographs, of specimens already of record in the application.

The new provision is in accordance with Section 1(a) of the Act, which requires use in commerce, evidenced by specimens, as a prerequisite to the filing of an application thereunder.

Section 2.59(b) is added to provide that, after filing either an amendment to allege use under new § 2.76 or a statement of use under new § 2.88, in an application under Section 1(b) of the Act, the applicant may submit substitute specimens of the mark as used on or in connection with the goods, or in the sale or advertising of the services, provided that the use in commerce of any substitute specimens submitted is supported by applicant's affidavit or declaration in accordance with § 2.20; and to provide further that, in the case of a statement of use under new § 2.88, the applicant must verify that the substitute specimens were in use in commerce prior to the filing of the statement of use or prior to the expiration of the time allowed to applicant for filing a statement of use. Since use in commerce is not required before filing an application under Section 1(b) of the Act, there is no requirement that a substitute specimen have been in use at the time of the filing of the application. Furthermore, because an applicant may file a statement of use at any time during the six-month period following the notice of allowance, or at any time during any extension of time for filing a statement of use, a substitute specimen need not be in use any earlier than the expiration of the relevant period.

Section 2.61, which concerns the examination of an application, is amended to provide also for the examination of amendments to allege use under Section 1(c) of the Act and statements of use under Section 1(d) of the Act.

Section 2.61(a) is revised to indicate that not only applications for registration, but also amendments to allege use under Section 1(c) of the Act and statements of use under Section 1(d) of the Act will be examined.

Section 2.61(c) is revised to clarify the language.

Section 2.64, which relates to final action by the Trademark Examining Attorney and the applicant's permissible responses thereto, is amended by adding new paragraphs (c)(1), (c)(2), and (c)(3) concerning examination of an amendment to allege use under new § 2.76, filed during the six-month response period after issuance of a final action.

Section 2.64(c)(1) is added to provide that if an amendment to allege use under new § 2.76 is filed during the six-month response period after issuance of a final action, the Trademark Examining Attorney shall examine the amendment, but that the filing of such an amendment will not extend the time for filing an appeal or petitioning the Commissioner.

Section 2.64(c)(2) is added to provide that if the amendment to allege use under new § 2.76 is acceptable in all respects, the applicant will be notified of its acceptance.

Section 2.64(c)(3) is added to provide that if a new refusal or requirement is necessary as a result of the examination of the amendment to allege use under new § 2.76, the final action will be withdrawn and all unresolved refusals or requirements will be stated in a new non-final action.

Section 2.65(c) is added to provide that if an applicant in an application under Section 1(b) of the Act fails to timely file a statement of use under new § 2.88, the application shall be deemed to be abandoned. The new paragraph is in conformity with Section 1(d)(4) of the Act.

Section 2.66, which governs the revival of abandoned applications, is amended by redesignating the present paragraph as (a), and revising redesignated paragraph (a), which presently provides for the filing of a petition to revive an application abandoned for failure to respond, to pertain also to an application abandoned for failure to timely file a statement of use under new § 2.88, in an application under Section 1(b) of the Act. Section 2.66 is further amended by transferring the last sentence

of paragraph (a), which states the requirements for a petition to revive for failure to respond, to new paragraph (b), and by adding new paragraphs (c) and (d).

Section 2.66(c) is added to state the requirements for a petition to revive an application abandoned for failure to timely file a statement of use under new § 2.88, in an application under Section 1(b) of the Act. The requirements parallel those stated in present § 2.66 and new paragraph (b).

Section 2.66(d) is added to provide that a petition to revive must be filed promptly, but that no petition to revive will be granted in an application under Section 1(b) of the Act if granting the petition would permit the filing of a statement of use more than 36 months after the issuance of a notice of allowance under Section 13(b)(2) of the Act. The 36-month limit for the filing of a statement of use is in accordance with the provisions of Section 1(d) of the Act. Usually a petition to revive will be considered filed promptly if it is filed within two months of the date the application was abandoned for failure to respond.

Section 2.69, which pertains to inquiry by a Trademark Examining Attorney as to the applicant's compliance with other laws, is revised to delete the words "before allowance." The word "allowance," as presently used in the section, signifies approval of a mark for publication. The purpose of the deletion is to prevent confusion between this word and the new "notice of allowance" provided in Section 13(b)(2) of the Act.

Section 2.71, which concerns amendments to correct informalities in applications, is amended by changing the section title from "Amendments to application," to "Amendments to correct informalities,"; revising paragraphs (a), (b), and (c); and adding new paragraphs (d)(1), (d)(2), and (d)(3) to govern amendments to the dates of use.

Section 2.71(a), which presently provides for the amendment of applications to correct informalities and for other reasons, and also contains a provision concerning amendments to dates of use, is revised by deleting the provision concerning dates of use, which is transferred to a new paragraph designated as (d)(1).

Section 2.71(b), which presently provides that additions to the identification of goods or services will not be permitted unless certain specified conditions are met, is revised to provide that the identification of goods or services may be amended to clarify or limit the identification, but that additions thereto will not be permitted. The purposes of the requirement for the identification of goods or services are to give notice to third parties of the scope of the rights claimed by the applicant and to permit an accurate search for conflicting marks. Addition of goods or services to the identification, after the filing of an application, would frustrate these purposes. Moreover, Section 7(c) of the Act provides that, contingent on the registration of a mark on the Principal Register, the filing of the application to register such mark shall constitute constructive use of such mark on or in connection with the goods or services specified in the registration.

Section 2.71(c), which presently provides, in essence, that a defect in the verification or declaration may be corrected only by filing a substitute or supplemental verification or declaration, is revised to clarify the language. The paragraph is further revised to provide that a verification or declaration required under §§ 2.21(a)(6), 2.76(e)(3) or 2.88(e)(3), to be properly signed, must be signed by the applicant, a member of the applicant firm, or an officer of the applicant corporation or association; that a verification or declaration which is signed by a person having color of authority to sign is acceptable for the purpose of determining the timely filing of the paper; but that a properly signed substitute verification or declaration must be submitted before the application will be approved for publication or registration, as the case may be. Persons having color of authority to sign are those who have first-hand knowledge of the truth of the statements in the verification or declaration and who also have actual or implied authority to act on behalf of the applicant. In the case of a corporate applicant, a person having color of authority might include, within the contemplation of the amended section, managers or similar persons who are in positions of authority, although not actually officers, if they have first-hand knowledge of the truth of the statements in the application and actual or implied authority to act on behalf of the applicant. However, an

applicant's attorney ordinarily will not be considered a person having color of authority to sign.

Section 2.71(d)(1) is added to provide that no amendment to the dates of use will be permitted unless the amendment is supported by applicant's affidavit or declaration in accordance with § 2.20 and by such showing as may be required. This provision, which is the second sentence of present § 2.71(a), is transferred to new paragraph (d)(1) to be grouped with two other new paragraphs, designated (d)(2) and (d)(3), relating to amendments to the dates of use.

Section 2.71(d)(2) is added to codify the practice that, in an application under Section 1(a) of the Act, no amendment to specify a date of use which is subsequent to the filing date of the application will be permitted. The new provision is in accordance with Section 1(a) of the Act, which requires use in commerce as a prerequisite to the filing of an application thereunder.

Section 2.71(d)(3) is added to provide that after the filing of a statement of use under new § 2.88, in an application under Section 1(b) of the Act, no amendment will be permitted to the statement of use to recite dates of use which are subsequent to the expiration of the time allowed to applicant for filing a statement of use. The reason for this limitation is that Section 1(d) of the Act requires use of the mark in commerce, in an application under Section 1(b) of the Act, within a specified period of time and imposes certain absolute limitations on extensions of that period. Any use later than the time permitted would not comply with the requirements of Section 1(d) of the Act.

Section 2.72, which governs amendments to the description or drawing of a mark, is amended by redesignating the present paragraph as (b), revising redesignated paragraph (b), and adding new paragraphs (a), (c), and (d).

Section 2.72(a) is added to provide that amendments may not be made to the description or drawing of the mark if the character of the mark is materially altered, and that the Trademark Examining Attorney will determine whether a proposed amendment materially alters the character of the mark by comparing the proposed amendment with the description or drawing of the mark as originally filed. Concerning material alteration of a mark see *Torres v. Cantine Torresella S.r.l.*, 808 F.2d 46, 1 USPQ 2d 1483 Fed. Cir. 1986; *In re Holland American Wafer Co.*, 737 F.2d 1015, 222 USPQ 273 (Fed. Cir. 1984); *United Rum Merchants, Ltd. v. Distillers Corp. (S.A.) Ltd.*, 9 USPQ 2d 1481 (TTAB 1988); *Visa International Service Assn. v. Life-Code Systems, Inc.*, 220 USPQ 740 (TTAB 1983). The first of these two provisions is the last sentence of present § 2.72. The second provision is added to codify present practice, the purpose of which is to prevent an applicant from repeatedly amending the mark sought to be registered until it bears little resemblance to the mark as originally filed.

Section 2.72(b), as redesignated, is revised to transfer the last sentence, which specifies the general rule concerning amendments to marks, to new paragraph 2.72(a). The remainder of the paragraph, which presently provides that amendments to the description or drawing of the mark may be permitted only if warranted by the specimens (or facsimiles) as originally filed, or supported by additional specimens (or facsimiles) verified as to their use prior to the filing date of the application, is further revised to indicate that the provisions of the paragraph pertain only to applications under Section 1(a) of the Act. The amendment is in accordance with Section 1(a) of the Act, which requires use in commerce as a prerequisite to the filing of an application thereunder.

Section 2.72(c) is added to provide that, in applications under Section 1(b) of the Act, amendments to the description or drawing of the mark, which are filed after submission of an amendment to allege use under new § 2.76 or a statement of use under new § 2.88, may be permitted only if warranted by the specimens (or facsimiles) filed, or supported by additional specimens (or facsimiles) and a supplemental affidavit or declaration in accordance with § 2.20 alleging that the mark shown in the amended drawing is in use in commerce; and that in the case of a statement of use under new § 2.88, applicant must verify that the mark shown in the amended drawing was in use in commerce prior to the filing of the statement of use or prior to the expiration of the time allowed to applicant for filing a statement of use. The reason for the latter requirement,

in the case of a statement of use, is that Section 1(d) of the Act requires use of the mark in commerce, in an application under Section 1(b) of the Act, within a specified period of time and imposes certain absolute limitations on extensions of that period. Any use later than the time permitted would not comply with the requirements of Section 1(d) of the Act.

Section 2.72(d) is added to codify the practice that in applications under Section 44 of the Act, amendments to the description or drawing of the mark may be permitted only if warranted by the description or drawing of the mark in the foreign registration certificate.

Section 2.73, which governs amendments to recite concurrent use, is amended by redesignating the present paragraph as (a), revising redesignated paragraph (a), and adding new paragraph (b).

Section 2.73(a), as redesignated, which presently provides that an application may be amended so as to be treated as an application for a concurrent registration, provided the application as amended satisfies the requirements of § 2.42, is revised to indicate that this provision pertains only to an application under Section 1(a) of the Act. The Trademark Examining Attorney will determine whether the application, as amended, is acceptable.

Section 2.73(b) is added to provide that an application under Section 1(b) of the Act may not be amended so as to be treated as an application for a concurrent registration until an acceptable amendment to allege use under new § 2.76 or statement of use under new § 2.88 has been filed in the application, after which time such an amendment may be made, provided the application as amended satisfies the requirements of § 2.42. To provide otherwise would be to permit an application for concurrent registration based on an intent to use concurrently, which would be in conflict with the well-established legal principle that an applicant for concurrent registration must have adopted and used the mark in good faith without knowledge of the prior right of another in the same or similar mark for the same or similar goods or services. The Trademark Examining Attorney will determine whether the application, as amended, is acceptable.

Section 2.75, which governs amendments to change register, is amended to redesignate the present paragraph as (a), revise redesignated paragraph (a), and add new paragraph (b).

Section 2.75(a), as redesignated, which presently provides for amendments to change applications from one register to another and also contains provisions relating to the effect of such an amendment on the filing date of an application, is revised to indicate that the paragraph pertains only to applications under Section 1(a) or 44 of the Act; and to delete the provisions concerning the effect on the filing date. Prior to the enactment of Pub. L. 100-667, Section 23 of the Act required that the mark in an application for registration on the Supplemental Register have been in use for one year prior to the filing of the application, whereas there is no such requirement for an application to register on the Principal Register. However, Section 23, as amended, does not require use of a mark for one year prior to application on the Supplemental Register. Thus, under the Act, as amended, an amendment to change registers has no effect on the filing date of an application under Section 1(a) or 44 of the Act.

Section 2.75(b) is added to provide that an application under Section 1(b) of the Act may be amended to change the application to a different register only after submission of an acceptable amendment to allege use under new § 2.76 or statement of use under new § 2.88, and that when such an application is changed from the Principal Register to the Supplemental Register, the effective filing date of the application is the date of the filing of the allegation of use under Section 1(c) or 1(d) of the Act. The amendment is in accordance with Section 23 of the Act, both in its prior and amended forms, which requires use in commerce as a prerequisite to filing an application thereunder.

Section 2.76, entitled "Amendment to allege use," is added to govern amendments to allege use under Section 1(c) of the Act in an application under Section 1(b) of the Act.

Section 2.76(a) is added to specify the time when such an amendment may be filed, namely, at any time between the filing of the application and the date the Trademark Examining Attorney approves the mark for publication or the date of

expiration of the six-month response period after issuance of a final action, and to specify further that, thereafter, an allegation of use may be submitted only as a statement of use under new § 2.88 after the issuance of a notice of allowance under Section 13(b)(2) of the Act. If an amendment to allege use is filed outside the time period specified, it will be returned to the applicant. The paragraph is in accordance with Section 1(c) of the Act, which provides that an amendment to allege use may be filed at any time during examination of an application. The examination of an application extends from the filing of the application to the date the mark is approved for publication or the expiration of the six-month response period after issuance of a final action. The date a mark is approved for publication is the date the approval is entered into the TRAM (Trademark Reporting and Monitoring) System. The date of approval for publication is immediately available to the public through TRAM.

Section 2.76(b) is added to specify the elements of a complete amendment to allege use, namely, three specimens or facsimiles, conforming to the requirements of §§ 2.56, 2.57 and 2.58, of the mark as used in commerce; the fee prescribed in § 2.6; and a verified statement by the applicant containing certain averments concerning applicant's ownership of the mark and use of the mark in commerce, specifying the date of the applicant's first use of the mark and first use of the mark in commerce, the type of commerce, those goods or services specified in the application on or in connection with which the mark is in use in commerce and the mode or manner in which the mark is used on or in connection with such goods or services.

Section 2.76(c) is added to provide that an amendment to allege use may only be filed when the applicant has made use of the mark in commerce on or in connection with all of the goods or services, as specified in the application, for which applicant will seek registration in that application, unless the amendment is accompanied by a request, in accordance with amended § 2.87, to divide out from the application the goods or services to which the amendment pertains; and that if more than one item of goods or services is specified in the amendment to allege use, the dates of use required in paragraph (b)(1) of the section need be for only one of the items specified in each class, provided the particular item to which the dates apply is designated. The first provision in the paragraph prevents piecemeal prosecution of an application. The second provision in the paragraph is in conformity with both present and amended § 2.33(a)(2).

Section 2.76(d) is added to provide that the title "Amendment to allege use under § 2.76" should appear at the top of the first page of the paper.

Section 2.76(e) is added to specify minimum requirements for an amendment to allege use, namely, that the amendment be filed within the time period specified in paragraph (a) of the section, and include the fee prescribed in § 2.6, at least one specimen or facsimile of the mark as used in commerce, and a verification or declaration signed by the applicant stating that the mark is in use in commerce. The paragraph corresponds in principle to § 2.21, which sets forth minimum requirements for the filing of an application.

Section 2.76(f) is added to provide that a timely filed amendment to allege use which meets the minimum requirements specified in paragraph (e) of this section will be examined in accordance with §§ 2.61 through 2.69. If, as a result of the examination of the amendment to allege use, applicant is found not entitled to registration for any reason not previously stated, applicant will be notified and advised of the reasons and of any formal requirements or refusals. The notification shall incorporate all unresolved refusals or requirements previously stated. The amendment to allege use may be amended in accordance with §§ 2.59 and 2.71 through 2.75. If the amendment to allege use is acceptable in all respects, the applicant will be notified of its acceptance. The filing of such an amendment shall not constitute a response to any outstanding action by the Trademark Examining Attorney.

Section 2.76(g) is added to provide that if the amendment to allege use is filed within the permitted time period but does not meet the minimum requirements specified in paragraph (e) of this section, applicant will be notified of the deficiency. The deficiency may be corrected provided the mark has not

been approved for publication or the six-month response period after issuance of a final action has not expired. If an acceptable amendment to correct the deficiency is not filed prior to approval of the mark for publication or prior to the expiration of the six-month response period after issuance of a final action, the amendment will not be examined.

Section 2.76(h) is added to provide that an amendment to allege use may be withdrawn for any reason prior to approval of a mark for publication or expiration of the six-month response period after issuance of a final action.

Section 2.77, entitled "Amendments between notice of allowance and statement of use," is added to provide that an application under Section 1(b) of the Act may not be amended during the period between the issue date of the notice of allowance under Section 13(b)(2) of the Act and the filing of a statement of use under new § 2.88, except to delete specified goods or services. Other amendments filed during this period will be placed in the application file and considered when the statement of use is examined.

The heading entitled "PUBLICATION AND ALLOWANCE," for §§ 2.80 through 2.84, is changed to "PUBLICATION AND POST PUBLICATION." The amended heading more accurately reflects the scope of the sections which follow. The word "allowance," as presently used in the heading, signifies approval of a mark for registration. The purpose of the deletion is to prevent confusion between the word "allowance" and the new "notice of allowance" provided in Section 13(b)(2) of the Act.

Section 2.81 is amended by changing the section title from "Allowance of application," to "Post publication,"; redesignating the present paragraph as (a); revising redesignated paragraph (a), which presently concerns the preparation of an application for registration after publication, to indicate that it does not apply to applications under Section 1(b) of the Act for which no amendment to allege use under new § 2.76 has been submitted and accepted; and adding new paragraph (b) concerning the post-publication processing of applications under Section 1(b) of the Act for which no amendment to allege use under new § 2.76 has been submitted and accepted. The word "allowance," as presently used in the section title, signifies approval of a mark for registration. The purpose of the title change is to prevent confusion between this word and the new "notice of allowance" provided in Section 13(b)(2) of the Act.

Section 2.81(b) is added to provide that, in a application under Section 1(b) of the Act, for which no amendment to allege use under new § 2.76 has been submitted and accepted, if no opposition is filed within the time permitted or all oppositions filed are dismissed, and if no interference is declared, a notice of allowance will issue stating the serial number of the application, the name of the applicant, the correspondence address, the mark, the identification of goods or services, and the issue date of the notice of allowance; that the mailing date that appears on the notice of allowance will be the issue date of the notice of allowance; and that thereafter, the applicant shall submit a statement of use under new § 2.88. The paragraph is in accordance with the provisions of Section 13(b)(2) of the Act.

Section 2.82, which concerns the processing of an application for registration on the Supplemental Register after the examiner has approved the application for issuance, is revised to clarify the language of the section.

Section 2.83, which concerns the processing of conflicting marks, is amended by revising paragraph (a) to delete a provision stating "a notice will be sent, if practicable, to the applicants involved informing them of the publication or issuance of the earliest filed mark," and by revising paragraph (b) to delete a provision stating "a notice will be sent, if practicable, to the applicants involved informing them of the publication or issuance of the application with the earliest date of execution." These provisions are deleted because they do not conform to present practice.

Section 2.84, which concerns jurisdiction over published applications, is amended by deleting the words "or allowed" from the section title, which presently reads "Jurisdiction over published or allowed applications,"; and revising paragraphs (a) and (b) to clarify the provisions and to add provisions concerning jurisdiction over applications under Section 1(b)

of the Act which have been published. The words "allowed" and "allowance," as presently used in the section title and in paragraphs (a) and (b), signify approval of a mark for registration. The purpose of the amendments deleting these words is to prevent confusion between the words "allowed" and "allowance" and the new "notice of allowance" provided in Section 13(b)(2) of the Act.

Section 2.86, which presently concerns applications with a plurality of goods or services comprised in a single class, is amended by changing the section title from "Plurality of goods or services comprised in single class may be covered by single application." to "Application may include multiple goods or services comprised in single class or multiple classes."; redesignating the present paragraph as (a); and adding new paragraphs (b) and (c).

Section 2.86(a), as redesignated, which presently provides that an application may recite a plurality of goods or services comprised in a single class provided the particular identification of goods or services is stated and the mark has actually been used in connection with all of the goods or services specified, is revised to clarify the language of the paragraph and to add, as an alternative to the requirement of use, a requirement that the applicant have a bona fide intention to use the mark on or in connection with all the goods or services specified.

Section 2.86(b) is added to incorporate in § 2.86 the provisions of the present § 2.87, which governs the filing of an application to register a mark for goods and/or services which fall within a plurality of classes; clarify the language of those provisions; and add certain requirements relating to multiple class applications under section 1(b) of the Act.

Section 2.86(c) is added to prohibit applicants from alleging use as to certain goods or services and a bona fide intention to use as to other goods or services in the same application, regardless of the number of classes contained therein.

Section 2.87, which presently governs the filing of an application to register a mark for goods and/or services which fall within a plurality of classes, is amended by changing the section title from "Combined applications." to "Dividing an application."; redesignating the present paragraph as (a); revising redesignated paragraph (a); and adding new paragraphs (b) and (c), to govern the division of applications.

Section 2.87(a), as redesignated, is revised by deleting the existing paragraph, which is incorporated in revised form in new paragraph (b) of amended § 2.86, and adding the new provisions that an application may be physically divided into two or more separate applications upon submission by the applicant of a request therefor; that in the case of a request to divide out some, but not all, of the goods or services in a class, a fee for each new separate application to be created by the division must be submitted; and that any outstanding time period for action by the applicant in the original application at the time of the division will be applicable to each new separate application created by the division.

Section 2.87(b) is added to provide that an application may be divided at any time between the filing of the application and the date the Trademark Examining Attorney approves the mark for publication or the date of expiration of the six-month response period after issuance of a final action; or during an opposition, upon motion granted by the Board. The paragraph provides further that an application under Section 1(b) of the Act also may be divided upon request filed with a statement of use under new § 2.88 or at any time between the filing of a statement of use and the date the Trademark Examining Attorney approves the mark for registration or the date of expiration of the six-month response period after issuance of a final action. The date a mark is approved for publication is the date the approval is entered into the TRAM (Trademark Reporting and Monitoring) System. The date of approval for publication is immediately available to the public through TRAM.

Section 2.87(c) is added to provide that a request to divide an application should be made in a separate paper from any other amendment or response in the application. The title "Request to divide application," should appear at the top of the first page of the paper. Failure to make the request to divide in a separate paper or to title it as a "Request to divide application" will delay action on the request.

A new heading, entitled "POST NOTICE OF ALLOW-

ANCE," and two new sections, designated §§ 2.88 and 2.89, are added to govern the filing of statements of use, and requests for extensions of time, under Section 1(d) of the Act, in applications under Section 1(b) of the Act, after issuance of a notice of allowance under Section 13(b)(2) of the Act.

Section 2.88, entitled "Filing statement of use after notice of allowance," is added to govern statements of use under Section 1(d) of the Act in an application under Section 1(b) of the Act.

Section 2.88(a) is added to specify the time when such a statement may be filed, namely, within six months after the date on which the notice of allowance under Section 13(b)(2) of the Act is issued to an applicant under Section 1(d)(2) of the Act. A statement of use filed prior to the issue date of a notice of allowance is premature, will not be considered, and will be returned to the applicant.

Section 2.88(b) is added to specify the elements of a complete statement of use under Section 1(d) of the Act, namely, three specimens or facsimiles, conforming to the requirements of §§ 2.56 and 2.57, as amended, and § 2.58, of the mark as used in commerce; the fee prescribed in amended § 2.6; and a verified statement by the applicant containing certain averments concerning applicant's ownership of the mark and use of the mark in commerce, specifying the date of the applicant's first use of the mark and first use of the mark in commerce, the type of commerce, those goods or services specified in the application on or in connection with which the mark is in use in commerce and the mode or manner in which the mark is used on or in connection with such goods or services.

Section 2.88(c) is added to provide that a statement of use under Section 1(d) of the Act may only be filed when the applicant has made use of the mark in commerce on or in connection with all of the goods or services, as specified in the application, for which applicant will seek registration in that application, unless the statement of use is accompanied by a request in accordance with amended § 2.87 to divide out from the application the goods or services to which the statement of use pertains; and that if more than one item of goods or services is specified in the statement of use, the dates of use required in proposed paragraph (b)(1) of this section need be for only one of the items specified in each class, provided the particular item to which the dates apply is designated. The latter provision in the paragraph is in conformity with both present and amended § 2.33(a)(2).

Section 2.88(d) is added to provide that the title "Statement of use under § 2.88," should appear at the top of the first page of the paper.

Section 2.88(e) is added to specify minimum requirements for a statement of use, namely, that the statement be filed within the time period specified in paragraph (a) of the section, and include the fee prescribed in amended § 2.6, at least one specimen or facsimile of the mark as used in commerce, and a verification or declaration signed by the applicant stating that the mark is in use in commerce. The paragraph corresponds in principle to amended § 2.21, which sets forth minimum requirements for the filing of an application.

Section 2.88(f) is added to provide that a timely filed statement of use which meets, at least, the minimum requirements specified in paragraph (e) of this section will be examined in accordance with §§ 2.61 through 2.69. If, as a result of the examination of the statement of use, applicant is found not entitled to registration, applicant will be notified and advised of the reasons and of any formal requirements or refusals. The statement of use may be amended in accordance with §§ 2.59 and 2.71 through 2.75. If the statement of use is acceptable in all respects, the applicant will be notified of its acceptance. The provision of the new paragraph permitting amendment of the statement of use is in accordance with section 1(d)(3) of the Act, which specifically provides that an applicant may amend the statement of use.

Section 2.88(g) is added to provide that if the statement of use does not meet the minimum requirements specified in paragraph (e) of this section, applicant will be notified of the deficiency. If the time permitted for applicant to file a statement of use has not expired, applicant may correct the deficiency. After the filing of a statement of use during a permitted time period for such filing, the applicant may not

withdraw the statement to return to the previous status of awaiting submission of a statement of use, regardless of whether the statement is in compliance with paragraph (e) of this section.

Section 2.88(h) is added to provide that the failure to timely file a statement of use which meets the minimum requirements specified in paragraph (e) of this section shall result in the abandonment of the application. The new paragraph is in conformity with section 1(d)(4) of the Act.

Section 2.88(i)(1) is added to provide that the goods or services specified in a statement of use must conform to those goods or services identified in the notice of allowance; and that an applicant may specify the goods or services by stating "those goods or services identified in the notice of allowance" or, if appropriate, "those goods or services identified in the notice of allowance except. . ." followed by an identification of the goods or services to be deleted. The requirement that the goods or services specified in the statement of use must conform to those goods or services identified in the notice of allowance is in accordance with Section 1(d)(1) of the Act. The suggested format for specifying goods or services in the statement of use will prevent inadvertent errors in the applicant's recital of the goods or services and facilitate examination of statements of use by the PTO.

Section 2.88(i)(2) is added to provide that if any goods or services specified in the notice of allowance are omitted from the identification of goods or services in the statement of use, the Trademark Examining Attorney shall inquire about the discrepancy and permit the applicant to amend the statement of use to include any omitted goods or services, provided that the amendment is supported by a verification that the mark was in use in commerce, on or in connection with each of the goods or services sought to be included, prior to the expiration of the time allowed to applicant for filing a statement of use. The paragraph is in accordance with Section 1(d)(3) of the Act, which specifically provides that the applicant may amend the statement of use.

Section 2.88(i)(3) is added to provide that the statement of use may be accompanied by a separate request to amend the identification of goods or services in the application, as stated in the notice of allowance, in accordance with amended § 2.71(b). The paragraph is in conformity with new § 2.77, which provides that an application under Section 1(b) of the Act may not be amended during the period between issuance of the notice of allowance under Section 13(b)(2) of the Act and the filing of a statement of use, except to delete specified goods or services. Other amendments filed during this period will be placed in the application file and considered when the statement of use is examined.

In the notice of proposed rulemaking, § 2.88(j) was proposed to be added to provide that the mark shown in the specimens submitted with the statement of use must be materially the same as the mark depicted in the drawing of record. However, because this provision duplicates requirements already stated in §§ 2.51 and 2.72, the provision is withdrawn. The provision that was proposed as § 2.88(k) is redesignated as § 2.88(j).

Section 2.88(j) is added to provide that the statement of use may be accompanied by a separate request to amend the drawing in the application in accordance with amended §§ 2.51 and 2.72.

Section 2.89, entitled "Extensions of time for filing a statement of use," is added to govern the filing and examination of requests for extensions of time for filing statements of use under new § 2.88.

Section 2.89(a) is added to provide that an applicant may request a six-month extension of time to file the statement of use under new § 2.88 by submitting a written request, before the expiration of the six-month period following the issue date of a notice of allowance under Section 13(b)(2) of the Act, accompanied by the fee prescribed in amended § 2.6 and a verified statement by the applicant that the applicant has a continued bona fide intention to use the mark in commerce, specifying those goods or services identified in the notice of allowance on or in connection with which the applicant has a continued bona fide intention to use the mark in commerce. The paragraph is in conformity with Section 1(d)(2) of the Act.

Section 2.89(b) is added to provide that an applicant may request further six-month extensions of time for filing the

statement of use by submitting a written request, prior to the expiration of a previously granted extension of time, accompanied by the fee prescribed in amended § 2.6; a verified statement by the applicant that the applicant has a continued bona fide intention to use the mark in commerce, specifying those goods or services identified in the notice of allowance on or in connection with which the applicant has a continued bona fide intention to use the mark in commerce; and a showing of good cause, as specified in paragraph (d) of this section.

Section 2.89(c) is added to provide that extensions of time, for good cause, under § 2.89(b) will be granted only in six-month increments and may not aggregate more than 24 months. The provision is in conformity with Section 1(d)(2) of the Act.

Section 2.89(d) is added to provide that the showing of good cause which is required as part of a request for an extension of time under § 2.89(b) must include certain specified elements listed in paragraphs (d)(1) and (d)(2).

Section 2.89(d)(1) is added to require that the showing of good cause which is required as part of a request for an extension of time under §§ 2.89(b) must include, in part, an allegation that the applicant has not yet made use of the mark in commerce on all the goods or services specified in the notice of allowance on or in connection with which the applicant has a continued bona fide intention to use the mark in commerce.

Section 2.89(d)(2) is added to require that the showing of good cause which is required as part of a request for an extension of time under § 2.89(b) must include, in part, a statement of applicant's ongoing efforts to make use of the mark in commerce on or in connection with each of the goods or services specified in the verified statement of continued bona fide intention to use required under § 2.89(b); that the efforts may include, without limitation, product or service research or development, market research, manufacturing activities, promotional activities, steps to acquire distributors, steps to obtain required governmental approval, or other similar activities; and that, in the alternative, a satisfactory explanation for the failure to make such efforts must be submitted. The paragraph is in compliance with Section 1(d)(2) of the Act, which requires the Commissioner to issue regulations setting forth what constitutes good cause for a request for an extension of time for filing a statement of use under Section 1(d)(2) of the Act. The listing in the paragraph of examples of efforts to make use of the mark in commerce is intended to be illustrative rather than exhaustive. The inclusion in the examples of "steps to obtain required governmental approval" is not intended to imply that any use of a mark prior to such approval may not constitute "use in commerce" as that term is defined in Section 45 of the Act.

Section 2.89(e)(1) is added to provide that at the time of the filing of a statement of use, or during any time remaining in the existing six-month period in which a statement of use is filed, the applicant may file one request, in accordance with paragraph (a) or (b) of the section, for a six-month extension of time for filing a statement of use, provided that the time requested would not extend beyond 36 months from the issue date of the notice of allowance; and that, thereafter, applicant may not request any further extension of time. This paragraph permits an applicant to obtain additional time to submit a substitute statement of use in case the original statement of use is rejected, as fatally defective, by the PTO near or after the expiration of the six-month period in which such original statement was filed.

Section 2.89(e)(2) is added to provide that a request for an extension of time that is filed at the time of the filing of a statement of use, or during any time remaining in the existing six-month period in which a statement of use is filed, must comply with all the requirements of paragraph (a) of this section, if it is applicant's first extension request, or paragraph (b) of this section, if it is a second or subsequent extension request. The new rule further provides that in a request under paragraph (b), applicant may satisfy the requirement for a showing of good cause by asserting that applicant believes it has made valid use of the mark in commerce, as evidenced by the submitted statement of use, but that if the statement of use is found by the PTO to be fatally defective, applicant will need additional time in which to file a new statement of use.

Final § 2.89(e)(2) includes a provision which was not included in the proposed rule, namely, a request for an extension of time that is filed at the time of the filing of the statement of use, or during any time remaining in the existing six-month period in which a statement of use is filed, must comply with all of the requirements of paragraph (a) of this section if it is applicant's first extension request, or paragraph (b) of this section, if it is a second or subsequent extension request. The additional provision was included in the final rule in order to clarify the rule. It is not a material change since proposed and final paragraph (e)(1) of this section requires that an extension request be filed "in accordance with paragraph (a) or (b)" of the section.

Section 2.89(f) is added to provide that the goods or services specified in a request for an extension of time for filing a statement of use must conform to those goods or services identified in the notice of allowance. The requirement is in accordance with Section 1(d)(2) of the Act. The paragraph also provides that any goods or services specified in the notice of allowance which are omitted from the identification of goods or services in the request for extension of time will be presumed to be deleted and the applicant may not thereafter request that the deleted goods or services be reinserted in the application. Finally, the paragraph provides that an applicant may specify the goods or services by stating "those goods or services identified in the notice of allowance" or, if appropriate, "those goods or services identified in the notice of allowance except . . ." followed by a list of the goods or services to be deleted. The format will prevent inadvertent errors in the applicant's recital of the goods or services and facilitate examination of such a request by the PTO.

Section 2.89(g) is added to provide that the applicant will be notified of the grant or denial of a request for an extension of time, and of the reasons for a denial; that failure to notify the applicant of the grant or denial of the request prior to the expiration of the existing or requested extension does not relieve the applicant of the responsibility of timely filing a statement of use under new § 2.88; that if, after denial of an extension request, there is time remaining in the existing six-month period for filing a statement of use, applicant may submit a substitute request for extension of time; that otherwise, the only recourse available after denial of a request for an extension of time is a petition to the Commissioner in accordance with amended § 2.66 or § 2.146; that a petition from the denial of a request for an extension of time to file a statement of use shall be filed within one month from the date of mailing of the denial of the request; and that if the petition is granted, the term of the requested six-month extension of time which was the subject of the petition will run from the date of the expiration of the previously existing six-month period for filing a statement of use. The paragraph parallels §§ 2.163 through 2.165, concerning affidavits and declarations under Section 8 of the Act, except that the paragraph does not permit a request for reconsideration, but rather provides a petition to the Commissioner as the only recourse after a denial of a request for an extension of time.

Section 2.99(g), which presently lists the types of applications and registrations that are not subject to concurrent use registration proceedings, is revised to provide, additionally, that applications to register under Section 1(b) of the Act are subject to concurrent use registration proceedings only after an acceptable amendment to allege use under new § 2.76 or statement of use under new § 2.88 has been filed.

Section 2.99(h) is added to provide that the Board will consider and determine concurrent use rights only in the context of a concurrent use registration proceeding. The amendment parallels an amendment to add § 2.133(c) to provide that geographic limitations will be considered and determined only in the context of a concurrent use registration proceeding.

Section 2.101(b), which pertains to the filing of an opposition, is amended to be gender neutral, and to specify that an opposition need not be verified and may be signed by the opposer or the opposer's attorney or other authorized representative. The amendment parallels an amendment to § 2.111(b) relating to petitions to cancel. At one time, Sections 13, 14 and 24 of the Act required verification for oppositions, petitions to cancel registrations on the Principal Register, and petitions to cancel registrations on the Supplemental Register, respectively. The

verification requirement was deleted from Sections 13 and 14 of the Act by Pub. L. 97-247, enacted August 27, 1982. Through inadvertence, a provision deleting, from Section 24 of the Act, the verification requirement for petitions to cancel registrations on the Supplemental Register was omitted from Pub. L. 97-247. The omitted provision was incorporated, however, in Pub. L. 100-667. Accordingly, it is now appropriate to amend §§ 2.101(b) and 2.111(b) to indicate that verification is not necessary.

Section 2.111(b), which pertains to the filing of a petition for cancellation, is amended to be gender neutral, and to specify that a petition to cancel need not be verified and may be signed by the petitioner or the petitioner's attorney or other authorized representative. This amendment parallels an amendment to § 2.101(b) relating to oppositions. The section is amended further to indicate that a petition may seek to cancel a registration in whole or in part. It has been the practice of the Board to entertain a petition which seeks to "partially cancel" a registration by restricting the identification of goods or services therein. See *Alberto-Culver Co. v. F.D.C. Wholesale Corp.*, 3 USPQ2d 1460 (TTAB 1987), and *U.S. Steel Corp. v. National Copper & Smelting Co.*, 131 USPQ 397 (TTAB 1961). Cf. *Stanspec Co. v. American Chain & Cable Co., Inc.*, 531 F.2d 563, 566 n.9, 189 USPQ 420, 423 n.9 (CCPA 1976), and *Pegasus Petroleum Corp. v. Mobil Oil Corp.*, 227 USPQ 1040, 1043-1044 (TTAB 1985). However, there has been some question as to the Board's authority, under Section 18 of the Act, to "partially cancel" a registration in a cancellation proceeding. See *Selfway, Inc. v. Travelers Petroleum, Inc.*, 579 F.2d 75, 198 USPQ 271 (CCPA 1978). Section 118 of Pub. L. 100-667 resolves this question by amending Section 18 of the Act (which specifies the actions that the Board, acting on behalf of the Commissioner, may take in inter partes proceedings) to provide that the Board may, *inter alia*, "cancel the registration, in whole or in part," "modify the application or registration by limiting the goods or services specified therein," and "otherwise restrict or rectify with respect to the register the registration of a registered mark." Accordingly, § 2.111(b) is amended to indicate the availability of a petition for "partial cancellation."

Section 2.129(d) is added to provide that when a party to an inter partes proceeding before the Board cannot prevail without establishing constructive use pursuant to Section 7(c) of the Act in an application under Section 1(b) of the Act, the Board will enter judgment in favor of that party, subject to the party's establishment of constructive use; and that the time for seeking judicial review under Section 21 of the Act shall run from the date of the judgment.

Section 2.133, which governs the amendment of an application or registration involved in an inter partes proceeding before the Board, is amended to redesignate and republish the present paragraph as (a) and to add new paragraphs, designated (b), (c), and (d), to reflect the expanded authority granted to the Board under Section 18 of the Act, as amended. At present, the Board, in determining an inter partes proceeding other than a concurrent use registration proceeding, is bound to determine the proceeding based on the defendant's application or registration as presented, including the identification of goods or services specified therein, and cannot consider restrictions or limitations to defendant's use (such as restrictions or limitations as to types of goods, trade channels, or classes of purchasers) which may exist although not incorporated in the identification of goods or services in the application or registration. See, for example, *Canadian Imperial Bank v. Wells Fargo Bank*, 811 F.2d 1490, 1 USPQ2d 1813 (Fed. Cir. 1987); *CTS Corp. v. Cronstons Manufacturing, Inc.*, 515 F.2d 780, 185 USPQ 773 (CCPA 1975); *USTA Trademark Review Commission, Report and Recommendations on the United States Trademark System and the Lanham Act*, 77 TMR 375, 452-453 (1987); and Daniel L. Skoler, *Trademark Identification -- Much Ado About Something?*, 76 TMR 224, 237-239 (1986).

As a result, the Board must often decide, for example, the issue of likelihood of confusion on a hypothetical rather than "real world" basis. Section 118 of Pub. L. 100-667 remedies this situation by amending Section 18 of the Act to confer upon the Board (acting on behalf of the Commissioner) the authority to "cancel the registration in whole or in part," "modify the application by limiting the goods or services

specified therein," and "otherwise restrict or rectify with respect to the register the registration of a registered mark."

Section 2.133(b) is added to provide that if, in an inter partes proceeding, the Board finds that a defendant is not entitled to registration in the absence of a specified restriction to the defendant's involved application or registration, the Board will allow the defendant time in which to amend the application or registration to conform to the findings of the Board, failing which judgment will be entered against the defendant.

Section 2.133(c) is added to provide that geographic limitations will be considered and determined by the Board only in the context of a concurrent use registration proceeding. The amendment parallels an amendment to add § 2.99(h) to provide that the Board will consider and determine concurrent use rights only in the context of a concurrent use registration proceeding.

Section 2.133(d) is added to provide that a plaintiff's pleaded registration will not be restricted in the absence of a counterclaim or another proceeding between the same parties or their privies to cancel the registration in whole or in part.

Section 2.161, which concerns the cancellation of a registration for failure to file an affidavit or declaration during the sixth year of the registration pursuant to Section 8 of the Act, is revised to clarify the language of the section and to implement the provisions of Section 110 of Pub. L. 100-667. Section 8(a) of the Act presently requires, *inter alia*, that the registrant file in the PTO an affidavit "showing that said mark is in use in commerce, or showing that its nonuse is due to special circumstances . . ." Section 110 of Pub. L. 100-667 amends Section 8(a) of the Act to require, *inter alia*, that the registrant file in the PTO an affidavit "setting forth those goods or services recited in the registration on or in connection with which the mark is in use in commerce and attaching to the affidavit a specimen or facsimile showing current use of the mark, or showing that any nonuse is due to special circumstances . . ."

Section 2.162, which concerns requirements for the affidavit or declaration which must be filed during the sixth year of a registration pursuant to Section 8 of the Act, is amended by revising paragraphs (e) and (g) to implement the above-specified provisions of Section 110 of Pub. L. 100-667, and by revising paragraph (f) to clarify the language of the paragraph.

Section 2.181, which concerns the terms of original registrations and renewals, is amended by redesignating present paragraph (a) as (a)(1), revising redesignated paragraph (a)(1), and adding new paragraph (a)(2) to implement the provisions of Sections 110 and 111 of Pub. L. 100-667. Section 110 of Pub. L. 100-667 amends Section 8(a) of the Act to reduce the term of a registration from twenty years to ten years, and Section 111 of Pub. L. 100-667 amends Section 9(a) of the Act to reduce the term of a renewal from twenty years to ten years.

Section 2.181(a)(1), as redesignated, is revised to indicate that registrations issued or renewed under the Act prior to November 16, 1989, whether on the Principal Register or on the Supplemental Register, remain in force for twenty years from their date of issue or expiration, and may be renewed for periods of ten (rather than twenty) years from the expiring period unless previously cancelled or surrendered.

Section 2.181(a)(2) is added to indicate that registrations issued or renewed under the Act on or after November 16, 1989, whether on the Principal Register or on the Supplemental Register, remain in force for ten years from their date of issue or expiration, and may be renewed for periods of ten years from the expiring period unless previously cancelled or surrendered. The paragraph is in conformity with Section 51 of the Act, added by Section 135 of Pub. L. 100-667.

Section 2.187 presently provides that a certificate of registration will be issued to the assignee of an applicant, or in a new name of applicant, provided that an appropriate document is of record in the Assignment Search Room of the PTO no later than the time the notice of publication is mailed, or if such document is not of record, then if a statement that such document has been filed for recordation is in the application file by the time the application is being prepared for issuance of the certificate of registration; and that the address of the assignee must be made of record in the application

file or in the recorded document. The paragraph is revised to provide that a certificate of registration will be issued to an assignee of an applicant, or in a new name of an applicant, provided that the party makes a written request in the application record by the time the application is being prepared for issuance of the certificate of registration, and the appropriate document is of record in the Assignment Search Room of the PTO, or if the assignment or name change document is not of record in the Assignment Search Room, the written request must state that the document has been filed for recordation. The purpose of the revision is to permit an assignee or an applicant whose name has been changed to ensure, by complying with the requirements of the paragraph, that the certificate of registration will be issued in the name of such party. The paragraph is revised further to provide that the address of the assignee must be made of record in both the application file and the recorded document. This revision will help to ensure that the certificate of registration, and any subsequent papers which the PTO may need to send to the owner of the registration, will be mailed to the proper address.

Response to Comments on the Rules:

The comments received in response to the notice of proposed rulemaking have been given careful consideration, and a number of the suggested modifications have been adopted. The comments and responses are discussed below.

Comment: Section 1.8 was proposed to be amended to exclude three new papers from the certificate of mailing procedure established under the section, namely, statements of use under new § 2.88, requests for extensions of time to file such statements, and amendments to allege use under new § 2.76. The certificate of mailing procedure permits papers to be mailed later than they otherwise could be and still be considered timely filed.

Two organizations and one individual expressed concern that this proposal was too restrictive. They suggested that the certificate of mailing procedure should be extended to cover these new papers, if possible.

Response: An amendment to allege use may be submitted only during the examination of an application prior to approval of the mark for publication for opposition in the Trademark Official Gazette. An amendment to allege use which is filed immediately before approval of the mark for publication may not be received in the Law Office until after the application is in the publication cycle. In such a case, the mark would have to be withdrawn from publication. Withdrawal of a mark from publication is a significant administrative problem. Use of the certificate of mailing procedure to file amendments to allege use would result in an increase in the number of applications which would have to be withdrawn from the publication cycle.

Both statements of use and requests for an extension of time to file such a statement are required to be filed during specified six-month periods. If a statement of use or an extension request is not filed during the time allowed, the application stands abandoned as a matter of law and the PTO amends its public records to reflect the abandonment. A statement of use or an extension request which is filed immediately before the expiration of the six-month period for filing a statement of use may not be received by the ITU Unit, which processes such papers, until after the application has been "abandoned" by the PTO. In such a case, the application would have to be reinstated. Reinstatement of an application is a significant administrative problem. Use of the certificate of mailing procedure to file statements of use and extension requests would result in an increase in the number of applications which would have to be reinstated. Moreover, during the time prior to reinstatement, the public records of the PTO would incorrectly indicate that these applications stood abandoned.

Accordingly, the suggestion that the certificate of mailing procedure be extended to cover these three papers has not been adopted.

Comment: Section 2.6 was proposed to be amended to establish two new fees for the filing of papers required or permitted under Section 1(c) or 1(d) of the Act, namely, a filing fee of \$100.00 for an amendment to allege use under new § 2.76 or for a statement of use under new § 2.88, and

a filing fee of \$100.00 for any request, under new § 2.89, for a six-month extension of time to file a statement of use. In addition, § 2.6(a) establishes the fee for filing an application, per class, and it was proposed to be made applicable to all new applications filed in the PTO, regardless of the basis asserted for filing.

Two organizations commented that the proposed amendment favors foreign Convention "intent-to-use" applicants over domestic applicants because foreign Convention applicants who perfect a basis for registration under Section 44 of the Act do not need to submit evidence of actual use to support an application and, hence, will not need to avail themselves of the "intent-to-use" process beyond the initial application filing fee; whereas, domestic "intent-to-use" applicants will have to pay not only the initial application filing fee, but also the fee for an amendment to allege use or a statement of use and for any extensions of time they may request. To ameliorate this perceived inequity, the organizations recommended that the basic filing fee for an application asserting "intent-to-use" as a basis for filing should be increased to approximately \$400.00 for all applicants and that the fees for the other three new papers be reduced to truly token amounts. An alternative suggestion was to require foreign applicants to pay an additional fee for reliance on a foreign registration without use in commerce.

Response: The proposed fee increase would be inconsistent with the trademark fee schedule that took effect on April 17, 1989 as described in the February 15, 1989 *Federal Register* notice (54 FR 6893). The PTO will review the trademark fee structure approximately 18 months from implementation and propose fee adjustments, if warranted. Neither the Act nor the Paris Convention permit the PTO to charge a Section 44 applicant an additional fee to register without asserting use in commerce. Accordingly, the suggested fee modifications have not been adopted.

Comment: Section 2.21(a)(5)(ii) was proposed to be added to specify all the filing requirements which pertain only to the assertion of a basis for filing an application under Section 44(e) of the Act, including a certification or certified copy of the foreign registration on which the application is based. Section 7(c) of the Act states, in part, that contingent upon registration of the mark on the Principal Register, the filing of the application to register such mark shall constitute constructive use of the mark, conferring a right of priority.

One individual commented that in view of the provisions of Section 7(c) of the Act and the delay which is sometimes encountered in receiving a certified copy of a foreign registration from a foreign applicant, it would be more equitable to foreign applicants if they could obtain a filing date without the certified copy of the foreign registration.

Response: Section 44(e) of the Act specifically requires that an application filed thereunder "shall be accompanied (emphasis added) by a certification or a certified copy of the registration in the country of origin of the applicant." In view thereof, the PTO believes that the statute requires submission of a certification or certified copy of the foreign registration as a necessary condition for receipt of a filing date. Accordingly, the suggested modification has not been adopted.

Comment: Section 2.21(a)(6) was proposed to be revised to require that an application include the verification in accordance with § 2.33(b), signed by the applicant, as a condition for receiving a filing date. One organization and four individuals objected to the proposed requirement.

The organization suggested that the PTO reconsider the necessity for imposing this requirement in the case of use-based applications under Section 1(a) of the Act, where the verification of the applicant's bona fide intent is not at issue.

One individual suggested that the proposed rule be modified to allow an applicant who seeks registration on the basis of foreign trademark rights, and/or on use of a mark in commerce, to receive a filing date for the application even without the applicant's personal signature. This individual stated that one can, in virtually any country of the world, file a trademark application through counsel and obtain an effective filing date; that this has been the practice in the United States for many decades; that no reason exists to change the current practice; and that the proposed practice would be more burdensome to foreign nationals.

One individual suggested that signature by applicant's attorney or agent should be sufficient to receive a filing date and that when the signature is by applicant's agent or attorney, a substitute verification or declaration signed by the applicant could be required thereafter. This individual expressed his belief that requiring signature by the applicant in order to obtain a filing date would frustrate one of the purposes of Pub. L. 100-667 (namely, to encourage the earliest possible filing of applications) by unnecessarily delaying the filing of applications, especially in the case of foreign applicants.

One individual noted that, at present, a trademark applicant is allowed to file an unsigned application and receive a filing date, and to submit the verification later. The individual expressed his belief that obtaining a filing date without signature is in accordance with Sections 1 and 44 of the Act, and that no change has been made to the Act which would require this amendment to the rules.

Another individual also objected to the proposed requirement, noting that in dealing with foreign applicants there may be a delay in obtaining a signed declaration. This individual suggested that the proposed requirement be deleted or, in the alternative, that a filing date be allowed on the basis of a facsimile copy, to be ratified and confirmed subsequently by a paper copy.

Response: Section 7(c) of the Act provides, in part, that contingent upon registration of a mark on the Principal Register, the filing of the application to register the mark shall constitute constructive use of the mark, conferring a right of priority. Thus, upon registration, all registrants on the Principal Register obtain a new substantive right, effective from the filing date of the application. For this reason a verified assertion, signed by the applicant, of the basis for filing the application is believed to be essential. However, for the purpose of determining the timely filing of a paper which must contain applicant's verification or declaration, amended § 2.71(c) permits the verification or declaration to be signed by a person having color of authority to sign for the applicant.

Although the Trademark Operation cannot receive any documents by "fax," for filing date purposes, a "fax" copy of an appropriately signed written application statement will be accepted, provided that the original document is later submitted.

Accordingly, the suggested changes have not been adopted.

Comment: Section 2.31, which presently states that it is preferable that an application be on legal or lettersize paper, was proposed to be amended to delete the reference to legal-size paper. One individual questioned whether the PTO could also allow the use of A-4 size paper.

Response: It is understood that A-4 size paper is 8 9/32 inches by 11 11/16 inches. The processing of papers of differing sizes is an administrative problem for the PTO. However, it should be noted that the paper size is expressed in the rule as a preference rather than as a mandatory requirement. An application filed on paper of a different size will not be denied a filing date for that reason. Accordingly the suggested change has not been adopted.

Comment: Section 2.33(a)(1)(vii) was proposed to be amended, and § 2.88(b) was proposed to be added, to require, in part, that an application under Section 1(a) of the Act, and a statement of use under Section 1(d) of the Act, respectively, include a statement of applicant's date of first use of the mark in commerce on or in connection with the applicant's goods or services, specifying the nature of such commerce.

One individual commented that the proposed rules could be improved by including acceptable descriptions of "such commerce." The descriptions suggested by the individual were "interstate, federal (in the case of commerce in the District of Columbia), territorial (in the case of Puerto Rico and similar geographic areas) or foreign (when the nature of the commerce on the date of first use is of more than one type, then any of such types may be specified)."

Response: Section 45 of the Act defines commerce as "all commerce which may lawfully be regulated by Congress." The types of commerce which fall within this definition are many and varied, and are the subject of a large body of case law. Any attempt to include descriptions of such commerce in the rules could be perceived as limiting the types of commerce falling within the definition, and would also make the rules

unduly lengthy. Accordingly, the suggested change has not been adopted.

Comment: Section 2.33(d) was proposed to be added to provide, in part, that an applicant in an application under Section 1(a) of the Act may not amend that application to seek registration under Section 1(b) of the Act.

Two organizations objected to this proposed provision. The organizations commented that a bona fide intention to use a mark in commerce is manifested clearly by the filing of an application based upon use of that mark in commerce; that the proposed provision would result in a loss of the application filing date (and the constructive use priority which would attach thereto, pursuant to Section 7(c) of the Act, upon registration) if the use forming the basis for an application under Section 1(a) proves to be defective; and that this provision discriminates against domestic applicants.

Response: Section 1(b) of the Act provides, in part, that a person who has a bona fide intention to use a mark in commerce may apply to register the mark on the Principal Register by filing in the PTO a written application, verified by the applicant and specifying, *inter alia*, applicant's bona fide intention to use the mark in commerce. Since the statement of a bona fide intention to use the mark in commerce is the sole statutory basis for filing an application under Section 1(b) of the Act, the statement must be included in the application at the time of its filing. An application filed pursuant to Section 1(a), based upon use of a mark in commerce, does not include such a statement and, hence, does not meet the requirements for an application under Section 1(b) of the Act.

If an applicant has any doubt concerning the sufficiency of its use of a mark in commerce, the applicant may file its application under Section 1(b) of the Act. Thereafter, the applicant may submit an amendment to "allege use under Section 1(c) of the Act, claiming use prior to the application filing date."

Accordingly, the suggested changes have not been adopted.

Comment: One individual commented, with respect to proposed §§ 2.33(a)(1)(ix) and 2.39(a), that the two rules contain cross-references to each other which are confusing.

Response: Upon further consideration, it is believed that the cross-reference in proposed § 2.39(a) to § 2.33 is unnecessary. The cross-reference to § 2.33 has been deleted from § 2.39(a).

Comment: Section 2.39(b) (redesignated in the final rule as § 2.39(a)) was proposed to be revised to provide, in part, that an application claiming the benefit of a foreign application in accordance with Section 44(d) of the Act shall specify the foreign application upon which it is based. One organization suggested that the rule should specify that the foreign application must be for a substantially identical mark and include the same goods or services as set forth in the U.S. application.

Response: The requirements concerning conformance of mark and goods in a U.S. application to its underlying foreign application are addressed in the rules. Section 2.33(a)(1)(v) provides, in part, that the goods or services asserted in an application under Section 44 may not exceed the scope of the goods or services covered by the foreign application or registration. Sections 2.51(a)(3) and (b)(3) provide that, in an application under Section 44 of the Act, the drawing of a mark shall be a substantially exact representation of the mark as it appears in the drawing in the registration certificate of a mark duly registered in the country of origin of applicant. Accordingly, the suggested changes have not been adopted.

Comment: Section 2.39(c) (redesignated in the final rule as §§ 2.39(b)) was proposed to be added to provide that before an application filed in accordance with Section 44(d) of the Act can be approved for publication, a basis for registration under Section 1(a), 1(b) or 44(e) of the Act must be established; that the PTO will assume that basis to be Section 44(e) unless otherwise stated in the application within six months of the filing date of the foreign application forming the basis of the Section 44(d) claim; and that the filing of a paper, which claims a different basis for registration, more than six months after the filing date of the foreign application will result in a loss of priority under Section 44(d).

One individual commented that the proposed paragraph is inconsistent with Pub. L. 100-667 "in requiring that U.S. applications claiming the priority of a foreign application, must

forfeit the claim of priority in the event that registration is based on anything other than a foreign registration issuing on the priority application," and that it is also inconsistent with the Paris Convention. The individual expressed his belief that the basis for receiving a filing date under the Act can be separated into two categories, namely, use of a mark in commerce under Section 1(a) of the Act and a bona fide intention to use a mark in commerce under Section 1(b) of the Act; and that the second category includes applications under Section 44 of the Act.

One individual commented that the assertion of a different basis might destroy not only the priority claim, but also the jurisdictional basis of the application as of the filing date; and that even if a different basis is asserted within six months of the filing date of the foreign application, a different basis might result in the loss of a priority claim. The individual suggested that the paragraph be revised to indicate that the loss of priority is not the only possible consequence that might follow from assertion of a different basis for registration.

One individual commented (without reference to a specific proposed rule) that "since Section 44 applications are now required to include a statement of a bona fide intention to use a mark, it would appear equitable to permit such applicants to convert Section 44 applications to Section 1(b) applications." The individual noted that "this is especially true where the applicant may begin to use the mark prior to the date on which a registration from its home country issues."

Response: The proposed paragraph did not require "that U.S. applications claiming the priority of a foreign application must forfeit the claim of priority in the event that registration is based on anything other than a foreign registration issuing on the priority application." Rather, the proposed paragraph provided only that assertion of a different basis for registration, including reliance on a different registration under Section 44(e) of the Act, more than six months after the filing date of the foreign application would result in a loss of priority. This provision was intended to apply to applications which, at the time of their filing, contained only a claim of priority pursuant to Section 44(d), and no other asserted basis for filing under Section 1(a), 1(b) or 44(e) of the Act. There is no provision in either Pub. L. 100-667 or the Paris Convention which prohibits the PTO from requiring an applicant, who filed an application in the U.S. asserting only a claim of priority under Section 44(d) of the Act, to assert a basis for registration (i.e., under Section 1(a), 1(b) or 44(e) of the Act) within a certain period of time after the filing date of the foreign priority application. Thus, this provision is not contrary to either Pub. L. 100-667 or the Paris Convention.

The PTO believes that the subject matter of these sentences may be addressed more appropriately in the *Trademark Manual of Examining Procedure*. Accordingly, the proposal to add these two sentences to § 2.39 is withdrawn.

It should be noted that although an application filed under Section 44 of the Act is required to include a statement that the applicant has a bona fide intention to use the mark in commerce, the PTO will not construe such an application to be an application filed also under Section 1(b) of the Act unless the applicant specifically asserts Section 1(b) as a basis for filing. An application asserting only a claim of priority under Section 44(d) may not be amended to assert Section 1(b) of the Act as a basis for filing without loss of the foreign priority date unless the amendment is submitted within six months of the filing date of the foreign application. Cf. *In re Daiwa Seiko, Inc.*, 230 USPQ 794 (Comm'r Pats. 1983).

Comment: Section 2.44, which presently specifies the requirements for an application to register a collective mark, including the requirement that an applicant state the nature of applicant's control over the use of the mark, was proposed to be amended to indicate that the present paragraph pertains only to applications under Section 1(a) of the Act, and to add a new paragraph specifying the requirements for an application to register a collective mark under Section 1(b) or 44 of the Act, including the requirement that an applicant state the nature of the control applicant intends to exercise over the use of the mark.

One individual commented that there are some types of collective organizations, such as a university alumni association, which cannot reasonably be expected to exercise control over

use of their indicia of membership once it has been given to a new member upon enrollment. The individual suggested that § 2.44 should be amended "so that only in appropriate cases would it be necessary for the applicant to show the exercise of control."

Response: Proposed new paragraph (b) requires only that the applicant specify, *inter alia*, "the nature of the control applicant intends to exercise over the use of the mark." Thus, the rule does not require that a particular degree of control be exercised, or intended to be exercised, over the use of a mark. This reflects the requirement under Section 4 of the Act that an applicant exercise legitimate control over the use of the mark that it seeks to register. Accordingly, the suggested modification has not been adopted.

Comment: One individual commented (without reference to a specific proposed rule) that the proposed rules do not specify the procedure for filing a statement of use if the applicant amends to the Supplemental Register.

Response: Section 2.47(c) was proposed to be added to provide that a mark in an application to register on the Principal Register under Section 1(b) of the Act is eligible for registration on the Supplemental Register only after an acceptable amendment to allege use under § 2.76 or statement of use under § 2.88 has been timely filed. Section 23 of the Act requires lawful use in commerce as a prerequisite for an application for registration on the Supplemental Register. This requirement bars an application under Section 1(b) of the Act from the Supplemental Register until an acceptable allegation of use has been submitted. Moreover, Section 1(b) of the Act only provides for filing an application based upon a bona fide intention to use a mark in commerce on the Principal Register. Accordingly, no modification of the rules is necessary.

Comment: Section 2.51(d) was proposed to be revised to provide that broken lines should be used in the drawing of a mark to show placement of the mark on the goods, or on packaging, or to show matter not claimed as part of the mark, or both, as appropriate, and to provide further that, in an application to register a mark with three-dimensional features, the drawing shall depict the mark in perspective in a single rendition. One individual commented that when a mark is three-dimensional, or when placement of the mark on the goods or packaging is significant, multiple drawings should be permitted; each drawing should be labeled with figure numbers as in the case of utility and design patent applications; and the trademark application should include a description of the figures.

Response: A drawing with multiple renditions, although suitable for a patent application, is not satisfactory for trademark purposes. The drawing of a trademark should depict the mark as it is seen by the consumer; the consumer does not see the mark in multiple renditions or from more than one perspective at a time. For the same reason, the labeling of a trademark drawing with figure numbers would be inappropriate. It has been the experience of the PTO that a three-dimensional mark can be adequately depicted in a single rendition, particularly when the application includes an appropriate description of the mark. Cf. *In re Weber-Stephen Products Co.*, 3 USPQ2d 1659, 1661 (TTAB 1987); *In re Vico Products Mfg. Co., Inc.*, 229 USPQ 364, 366 (TTAB 1985); *In re Pierre Faber S.A.*, 221 USPQ 1210, 1211 (TTAB 1984); *In re Ovation Instruments, Inc.*, 201 USPQ 116, 123 (TTAB 1978). Accordingly, the suggested modification has not been adopted. If an applicant believes that its mark is incapable of being depicted in a single rendition, it may file a petition to the Commissioner, pursuant to § 2.146(a)(5), to waive the requirement of the rule.

Comment: Section 2.52(d), which pertains to drawing headings and which presently includes, *inter alia*, a requirement that the heading of a drawing (except for a drawing in an application under Section 44 of the Act) specify dates of use, was proposed to be revised to indicate that the requirement pertains only to an application under Section 1(a) of the Act; and to add a requirement that the heading of a drawing in an application filed in accordance with Section 44(d) of the Act specify the priority filing date of the relevant foreign application.

One individual commented that proposed § 2.52(d) does not reflect current practice because it continues the existing

requirement that the heading must not exceed one fourth of the sheet; whereas, in the individual's experience, the PTO routinely accepts drawings when the heading occupies one-half or, in some cases, even two-thirds of the sheet. The individual suggested that the paragraph be modified to enlarge the heading size limit from one-fourth to one-half of the sheet.

One organization suggested that § 2.52(d) be amended to provide that when a significant element of a special form drawing is unclear or ambiguous, the heading should include a brief description of the mark in the drawing. The organization noted that such a description would provide more accurate information in the paper search file and facilitate accurate coding of marks for entry into the computer search system. The organization emphasized, however, that the suggested provision should be encouraging rather than mandatory in nature.

Response: The suggested modifications have been adopted, except that the heading size limit has been enlarged only to one-third of the sheet instead of the suggested one-half of the sheet. If a drawing had a heading of one-half of the sheet and a special form depiction of the mark which was four inches by four inches in size, there would not be enough room remaining for the required margins.

Comment: Sections 2.56, 2.57 and 2.58, which pertain to the specimens of use in an application, were proposed to be amended to reduce the number of specimens required from five to two in §§ 2.56 and 2.57 and from three to two in § 2.58. Similarly, the PTO proposed to require that two specimens be filed in connection with an amendment to allege use under proposed § 2.76 and a statement of use under proposed § 2.88.

Four organizations objected to the reduction in the required number of specimens from five to two. They commented that original specimens show color and detail more effectively than photocopies and provide valuable information enabling practitioners to better evaluate potential conflicts. One of the organizations recommended requiring at least three specimens, while the other three organizations favored maintaining the present requirement for five specimens.

Response: Having five specimens in an application or registration file increases the amount of storage space required for these files. Moreover, it is unusual for more than one party to ask to remove a specimen from the same application or registration file. A requirement for three specimens would provide one specimen to remain in the file and make two specimens available for removal by third parties. The PTO believes that this number requirement will meet the needs of both the public and the PTO. Since § 2.58(b) presently requires three audio cassettes, no change to that rule is required and the proposed amendment is withdrawn. Accordingly, the suggestion that the PTO require three specimens has been adopted in the final rules.

Comment: Section 2.59(a) was proposed to be added to provide that, in an application based upon use in commerce, the applicant may submit substitute specimens of the mark as used on or in connection with the goods, or in the sale or advertising of the services, provided that any substitute specimens are properly verified as to their use in commerce at least as early as the filing date of the application.

One individual commented that there should be no need to submit a verification in support of substitute specimens which are, in fact, "faithful photographic reproductions" of the specimens already of record and recommended that proposed § 2.59(a) be modified to indicate that a verification will not be required in such circumstances.

Response: This suggestion codifies present practice set out in Section 808.10 of the *Trademark Manual of Examining Procedure* and has been adopted.

Comment: Section 2.66(d) was proposed to be added to provide that a petition to revive an abandoned application must be filed promptly, but that no petition to revive will be granted in an application under Section 1(b) of the Act if granting the petition would permit the filing of a statement of use more than 36 months after the issuance of a notice of allowance under Section 13(b)(2) of the Act.

One organization commented that "in view of the constructive use awarded applications under the new law, it will be more important than ever for practitioners to be able to rely on the fact that an application uncovered in a search has truly

been abandoned in the PTO without the specter of its revival after an indeterminate period of time." The organization recommended that "the rules should place an outside limit of six months or one year on petitions to revive either 1(a) or 1(b) applications."

Response: Usually a petition to revive will be considered filed promptly if it is filed within two months of the date the application was abandoned for failure to respond. Section 12(b) of the Act provides, in part, that an application "shall be deemed to have been abandoned, unless it can be shown to the satisfaction of the Commissioner that the delay in responding was unavoidable, whereupon such time may be extended." The Commissioner cannot determine in advance that facts asserted beyond a certain time limit cannot show unavoidable delay. Accordingly, the suggested modification has not been adopted.

Comment: Section 2.71(b), which presently provides that additions to the identification of goods or services will not be permitted unless certain specified conditions are met, was proposed to be revised to provide that the identification of goods or services may be amended to clarify or limit the identification, but that additions will not be permitted. It was indicated in the notice of proposed rulemaking that the purposes of the requirement for the identification of goods or services are to give notice to third parties of the scope of the rights claimed by the applicant and to permit an accurate search for conflicting marks; and that addition of goods or services to the identification, after the filing of an application, would frustrate these purposes. It was also noted that Section 7(c) of the Act provides that, contingent on the registration of a mark on the Principal Register, the filing of the application to register such mark shall constitute constructive use of such mark on or in connection with the goods or services specified in the registration.

One individual commented that he agreed in principle with the proposed rule and the reasoning offered, but that the PTO should not apply the proposed amendment without some flexibility that allows an applicant to minimally enlarge the scope of the initially claimed goods or services in an application. The individual expressed his belief that such flexibility would not defeat either of the two legitimate reasons cited for the proposal and that "strict adherence to the proposed change would result in additional workload due to refiled or additional applications to comprehensively cover goods or services that the applicant inadvertently failed to claim." The individual suggested that the rule be modified to provide that the identification of goods or services may be amended to clarify or limit the identification, but that "substantive additions" will not be permitted.

Response: For the reasons stated in the notice of proposed rulemaking, the PTO believes that it would be inappropriate to allow any additions to the identification of goods or services in an application. Accordingly, the suggested modification has not been adopted.

Comment: Section 2.71(c), which presently provides that a defect in the verification or declaration may be corrected only by filing a substitute or supplemental verification or declaration, was proposed to be revised to clarify the language. The paragraph was proposed to be further revised to provide that a verification or declaration required under §§ 2.21(a)(6), 2.76(e)(3) or 2.88(e)(3), to be properly signed, must be signed by the applicant, a member of the applicant firm, or an officer of the applicant corporation or association; that a verification or declaration which is signed by a person having color of authority to sign, is acceptable for the purpose of determining the timely filing of the paper; but that a properly signed substitute verification or declaration must be submitted before the application will be approved for publication or registration, as the case may be. It was indicated in the notice of proposed rulemaking that persons having color of authority to sign are those having first-hand knowledge of the truth of the statements in the verification or declaration; that in the case of a corporate applicant, a person having color of authority might include, within the contemplation of the amended section, managers or similar persons who are in positions of authority, although not actually officers, if they have first-hand knowledge of the truth of the statements in the application; and that an applicant's

attorney ordinarily will not be considered a person having color of authority to sign, unless he/she is an officer.

One individual expressed his belief that the language "amendment of the verification or declaration will not be permitted" in the present and proposed rule could lead some people to believe that there is no way in which an amendment of a declaration or verification can be effected when, in fact, it can be effected by the submission of a substitute document. The individual suggested that the rule be revised to state that changes may not be made in the verification or declaration document already in the PTO file, but that any amendment would have to be made by the filing of a substitute or supplemental amendment.

Three organizations commented that the definition in the proposed rule of persons having color of authority to sign a verification or declaration could include many persons not authorized to act on behalf of the applicant. One of the organizations suggested that the proposed definition ("those having first-hand knowledge of the truth of the statements in the verification or declaration") should be clarified by adding "and who are authorized to act on behalf of the applicant."

Response: In response to the comment by the individual, the beginning of the final rule has been modified to read: "If the verification or declaration filed with the application is defective, the defect may be corrected only by the submission of a substitute or supplemental verification or declaration in accordance with §§ 2.20."

In response to the comments of the organizations, the definition of persons having color of authority to sign has been modified in the final rule to read: "Persons having color of authority to sign are those who have first-hand knowledge of the truth of the statements in the verification or declaration and who also have actual or implied authority to act on behalf of the applicant."

Comment: Section 2.77 was proposed to be added to provide, in part, that an application under Section 1(b) of the Act may not be amended during the period between the issue date of the notice of allowance under Section 13(b)(2) of the Act and the filing of the statement of use under § 2.88, except to delete specified goods or services.

Four organizations expressed their concern that the word "delete" may be unnecessarily limiting and may restrict the ability of parties to negotiate settlement of potential conflicts. The organizations suggested that the rule be modified to allow amendments "to delete or restrict" the specified goods or services during this time period.

Response: An amendment seeking to restrict the specified goods or services would require examination by the Trademark Examining Attorney. However, the application file will not be in the possession of the Examining Attorney during the time between issuance of the notice of allowance and submission of the statement of use. Inasmuch as this rule applies only to the specified time period, it will not affect the settlement of oppositions or potential oppositions, which take place prior to issuance of the notice of allowance. Moreover, the last sentence of new § 2.77, which in the notice of proposed rulemaking read:

"Other amendments filed during this period will not be considered unless resubmitted at, or after, the time of filing the statement of use," has been modified to read: "Other amendments filed during this period will be placed in the application file and considered when the statement of use is examined." This change has been made so that the applicant will not have to resubmit the proposed amendment at the time of filing the statement of use. Thus, during the period covered by the rule, amendments restricting the goods may be filed for later consideration by the Trademark Examining Attorney at the time of examination of the statement of use. Accordingly, the proposed modification has not been adopted.

Comment: Section 2.83, which concerns the processing of conflicting marks, was proposed to be amended by revising paragraph (a) to delete a provision stating "a notice will be sent, if practicable, to the applicants involved informing them of the publication or issuance of the earliest filed mark," and by revising paragraph (b) to delete a provision stating "a notice will be sent, if practicable, to the applicants involved informing them of the publication or issuance of the application with the earliest date of execution."

One individual commented that interferences are sometimes declared, and that the rule ought to make provision for interferences so that the declaration of an interference cannot be challenged on the ground that there is no provision for interferences in the rules.

One individual commented that the rule should not be amended to delete the notice provisions presently set forth in paragraphs (a) and (b). The individual expressed his belief that such notice is helpful to applicants who do not subscribe to the *Official Gazette* and that "providing notice does not in any way inconvenience the PTO or add to the workload of Examiners who are aware of the conflicting applications and, as a matter of good practice, have both files before them when they act on either one."

Response: Provision is made in § 2.91 for the declaration of interferences.

The provisions concerning notice were proposed to be deleted because they do not conform to present practice. The Trademark Examining Attorney notifies applicants of conflicting applications during examination. To provide a second notice upon publication of the earlier filed, or earlier executed, application would require that a system be developed for monitoring the progress of that application and for sending the second notice. Thus, sending second notices would be unduly burdensome to the PTO.

Accordingly, the suggestion has not been adopted.

Comment: Section 2.84, which governs jurisdiction over published applications, was proposed to be revised to provide, in part, that after publication of an application under Section 1(b) of the Act, the examiner may exercise jurisdiction over the application after issuance of the notice of allowance under Section 13(b)(2) of the Act.

One individual suggested that the phrase "the examiner may exercise jurisdiction" be modified to read "the examiner must exercise jurisdiction." In this regard, the individual noted that after the issuance of the notice of allowance the examiner must exercise jurisdiction over the application to examine the statement of use, and that jurisdiction must also be exercised over requests for extensions of time to file a statement of use.

Response: The purpose of both present and proposed § 2.84 is to specify when an examiner is allowed to exercise jurisdiction over an application, not to specify when an examiner must exercise jurisdiction over an application. Accordingly, the proposed modification has not been adopted.

Comment: Section 2.86, which presently provides that an application may recite a plurality of goods or services comprised in a single class, provided the goods or services are specifically identified and the mark has actually been used in connection with all of the specified goods or services, was proposed to be amended by, *inter alia*, redesignating the present paragraph as (a); and to add, as an alternative to the requirement of use, a requirement that the applicant have a bona fide intention to use the mark on or in connection with all the specified goods or services.

Two organizations expressed their concern about the requirement that applicants state a bona fide intention to use the mark on all goods recited in the application. The organizations noted that registration will be granted to domestic applicants only for those goods for which actual use in commerce is made, but that foreign applicants could specify overly extensive lists of goods, secure registration for them, and, if no use occurs during the first six years of registration, simply re-file for these same goods to circumvent the requirements of Section 8 of the Act. The organizations recommended that the PTO "require use at least somewhere for all goods specified prior to granting registrations to Section 44 applicants."

One organization recommended that the beginning of the proposed paragraph, which states "an application may recite more than one item of goods, or more than one service comprised in a single class provided the goods or services are specifically identified and...." be revised by inserting thereafter the phrase "and in accordance with subsection (c) of this rule." Proposed subsection (c) provides that the applicant may not allege use as to certain goods or services and a bona fide intention to use as to other goods or services in the same application, regardless of the number of classes contained therein.

Response: To require "use at least somewhere for all goods specified prior to granting registration to Section 44 foreign applicants" would be inconsistent both with the Act and the Paris Convention.

The PTO believes that the suggested modification of proposed paragraph (a) to include a reference to proposed paragraph (c) would not further clarify the rule and is unnecessary.

Accordingly, the suggested modifications have not been adopted.

Comment: Section 2.86(b), which governs multiple class applications, provides, in part, that "A single certificate of registration for the mark shall be issued."

The organization suggested that the phrase "unless the application is divided pursuant to Rule 2.87" be added to the provision.

Response: The suggested modification is adopted.

Comment: Sections 2.76 and 2.88 were proposed to be added to govern amendments to allege use under Section 1(c) of the Act and statements of use under Section 1(d) of the Act, respectively. Proposed paragraphs (d) and (e) of the new sections required that an amendment to allege use and a statement of use be made in a separate paper from any other filing.

Three organizations and one individual expressed their belief that the proposed requirement would be unduly harsh since violation could result in the abandonment of the application.

Response: The proposed requirement has been withdrawn.

Comment: Sections 2.76(c) and 2.88(c) were proposed to be added to provide, *inter alia*, that if more than one item of goods or services is specified in an amendment to allege use or a statement of use, the dates of use required to be specified need be for only one of the items specified, provided the particular item to which the dates apply is designated.

One individual commented that under the proposed paragraphs dates of use are apparently not required to be stated for each class of goods or services. The individual questioned whether this was an inadvertent omission.

Response: The PTO did not intend to imply that dates of use did not need to be specified for each class of goods or services. A requirement for a specification of dates of use for each class has been included in the final rules.

Comment: Section 2.88(f) was proposed to be added to provide, in part, that if a statement of use does not comply with all of the requirements specified in paragraph (e) of the proposed section, applicant will be notified of the deficiency.

One organization recommended that the proposed paragraph be modified to require that applicant be given "a statement of reasons for finding a statement of use to be defective."

Response: The proposed paragraph specifically provides that "applicant will be notified of the deficiency." A "notification of a deficiency" is a description of the nature of the deficiency, i.e., of the reason why the statement of use was found to be defective. Accordingly, the suggested modification has not been adopted.

Comment: Section 2.88(e) was proposed to be added to specify minimum requirements (in addition to timeliness) for a statement of use, namely, the prescribed fee, one specimen or facsimile of the mark as used in commerce, and a verification or declaration signed by the applicant stating that the mark is in use in commerce, and specifying the date of the applicant's first use of the mark in commerce and the goods or services on or in connection with which the mark is used in commerce. Proposed § 2.88(f) provided, in part, that if a statement of use does not comply with the requirements of proposed paragraph (e), applicant may correct the deficiency only if the time permitted for applicant to file a statement of use has not expired; and that after the filing of a statement of use during a permitted time period for such filing, the applicant may not withdraw the statement to return to the previous status of awaiting submission of a statement of use.

Section 2.89, governing extensions of time for filing a statement of use, was proposed to be added to, *inter alia*, specify the requirements for a request for an extension of time for filing a statement of use; permit an applicant to file, during the six-month period in which a statement of use is filed, one last request for a six-month extension of time; and provide that any defect in an extension request may be corrected only if there is time remaining in the six-month period for filing a statement of use.

Comments relating to these proposed provisions and their interrelationship were submitted by six organizations, one firm and three individuals.

One organization commented that the proposed sections require an applicant to remedy defects in a statement of use or a request for an extension of time to file a statement of use "within the original or an extended six-month period" for filing a statement of use; and that failure to remedy a defect within the specified period causes the application to become abandoned in the case of a statement of use, or requires the applicant to file a petition to the Commissioner in the case of a request for extension of time. The organization expressed its concern that "an applicant's valuable trademark rights will be destroyed or jeopardized for minor informalities in a statement of use or request for an extension of time." The organization recommended that a new § 2.65(d) be added to provide, in effect, that when a timely filed statement of use "is a bona fide attempt to respond to a notice of allowance, and is substantially complete, but compliance with some requirement has been inadvertently omitted, opportunity to explain and supply the omission should be given before the question of abandonment is considered."

Another organization and a firm offered comments to the same effect and also expressed their belief that the provision in proposed § 2.89 for the filing of one last extension request during the six-month period in which a statement of use is filed is not "an acceptable solution" because, *inter alia*, an applicant would have to submit a fee for such a request which might otherwise not be needed, and because the extension request might be rejected as informal and, therefore, be useless.

Three other organizations and one individual recommended that the applicant be afforded an automatic one or two-month period to respond to a notice of a deficiency in a statement of use. One of these organizations commented that an applicant should not be forced to either risk abandonment, or undergo the inconvenience and expense of filing an additional and probably unnecessary request for an extension of time. This organization expressed its belief that the plain language of the Act "requires that the PTO permit the applicant to amend the statement of use regardless of the expiration of any extension period, including the last one;" and that Section 1(d)(2) of the Act provides for an aggregate of 36 months for an applicant to file a statement of use.

One individual commented with respect to proposed § 2.88(g), that "it is not clear what will happen in cases where the statement of use is filed near the end of the total 36 months from the notice of allowance if the statement of use is deficient but does include the fee, a specimen and a verification or declaration of use."

One individual commented, in effect, that it is not clear why requirements for amendments to allege use and statements of use are specified in both paragraphs (b) and (e) of proposed §§ 2.76 and 2.88, respectively, and why the specified requirements vary.

One organization expressed its belief "that an intent-to-use applicant should be allowed to withdraw a statement of use and restore the application to its prior status;" that "such withdrawal, while prohibited by proposed § 2.88(f), is not prohibited by the statute;" and that allowance of such a withdrawal would parallel the permissible withdrawal of an amendment to allege use.

Response: Paragraphs (b) of proposed §§ 2.76 and 2.88 specify the requirements for a complete amendment to allege use and statement of use, respectively. Paragraphs (e) of the proposed sections specify the minimum requirements for such papers. The provisions of the proposed rules have been modified in the final rules to clarify this distinction. Moreover, the minimum requirements specified in proposed §§ 2.76(e) and 2.88(e) have been reduced in the final rule to the prescribed fee, at least one specimen or facsimile of the mark as used in commerce, and a verification or declaration signed by the applicant stating that the mark is in use in commerce.

Section 1(d) of the Act sets forth certain minimum requirements for a statement of use. In view of the statutory requirements, § 2.88 provides that a timely statement of use which does not meet the minimum requirements specified in paragraph (e) may be corrected only if the time permitted for applicant to file a statement of use has not expired.

Further, Section 1(d) of the Act requires that a statement of use be filed within six months after the issuance of the notice of allowance, and provides that the time for filing the statement of use may be further extended upon proper request, but that such time may not be extended beyond 36 months after the issuance of the notice of allowance. The Act, as amended, does not allow every applicant a period of 36 months from the notice of allowance in which to make use of its mark in commerce and file a statement of use; rather, only those applicants who file proper requests for five successive extensions of time, and are able to meet the specified requirements for such extensions, will have the benefit of the full 36-month period. Nor does the Act provide that an applicant may file a statement of use, then withdraw the statement of use and ask for an extension of time for filing a statement of use.

In view of the statutory requirements in Section 1(d) of the Act, a statement of use must be filed within the six months after the issuance of a notice of allowance, or within an extension of time granted to applicant for filing a statement of use. Use of the mark in commerce must be made during such period. If the use upon which a statement of use is based is not valid trademark use, applicant may make a new use, and amend the statement of use to rely upon the new use, only if the new use is made prior to the expiration of applicant's time for filing a statement of use. Once a statement of use has been filed, applicant may not withdraw the statement of use and request an extension or a further extension of time for filing a statement of use. Section 1(d) of the Act permits amendment of the statement of use, but does not provide for withdrawal of the statement of use once it is filed.

The fears of some commenters that, under proposed § 2.88, an applicant's trademark rights would be destroyed or jeopardized for minor informalities in a statement of use, are not well-founded. The intent of § 2.88 is to permit a timely statement of use which meets the minimum requirements specified in paragraph (e) to be amended, in accordance with §§ 2.59 and 2.71 through 2.75, at any time during examination to meet any of the remaining requirements for a complete statement of use specified in paragraph (b) of the section or to overcome other refusals or requirements which may be raised by the examiner. See proposed §§ 2.88(g) and (h) and final § 2.88(f). The time period for filing a statement of use and the right to amend a statement of use are independent of each other.

For example, under final § 2.88, a timely statement of use which meets the specified minimum requirements may be amended to, *inter alia*:

(1) Add or correct dates of use (provided that the amendment is in accordance with § 2.71(d), i.e., that it is properly verified and the amended dates are not subsequent to the expiration of the time allowed to applicant for the filing of a statement of use);

(2) Specify the type of commerce in which the mark is used;

(3) State the goods or services specified in the notice of allowance on or in connection with which the mark is in use (provided that the amendment is in accordance with § 2.88(i)(2), i.e., that it is supported by a verification that the mark was in use in commerce, on or in connection with each of the goods or services sought to be included, prior to the expiration of the time allowed to applicant for filing a statement of use);

(4) State the mode or manner in which the mark is used on or in connection with the goods or services;

(5) Substitute a statement of use verification signed by the applicant for a verification signed by a person having color of authority (see § 2.71(c)); and

(6) Submit substitute specimens (provided that the amendment is in accordance with § 2.59(b), i.e., that the use in commerce of any substitute specimen submitted is supported by applicant's verification that the substitute specimens were in use in commerce prior to the filing of the statement of use or prior to the expiration of the time allowed to applicant for filing a statement of use).

Once the minimum requirements are met, the rules allowing amendment to a statement of use, in accordance with §§ 2.59 and 2.71 through 2.75, are more liberal than the proposal by several commenters suggesting an applicant should receive

an automatic one to two-month period to respond to a notice of deficiency in a statement of use.

For the foregoing reasons, the modifications suggested by the commenters have not been adopted in § 2.88. The rule was revised to clarify the rule and reduce the minimum requirements for a statement of use. Section 2.76, concerning amendments to allege use, has been revised to be consistent with § 2.88 as appropriate.

Comment: One individual questioned why, in a verification for an amendment to allege use or a statement of use, the applicant is required, under proposed §§ 2.76(b)(1) and 2.88(b)(1), respectively, to state that it believes it is the owner of the mark sought to be registered. The individual noted that there is no such requirement "for other types of applications provided for in the Act or the rules."

Response: Section 22 of the Act provides that registration on the Principal Register "shall be constructive notice of the registrant's claim of ownership [of the mark]." Therefore, the PTO believes that each application must contain a claim of ownership, and that ownership should be reaffirmed upon the filing of an allegation of use under § 2.76 or § 2.88.

Comments: Section 2.89(d)(2) was proposed to be added to provide that a showing of good cause for a request for an extension of time for filing a statement of use must include, in part, a statement of facts demonstrating ongoing efforts to make use of the mark in commerce on or in connection with each of the goods or services specified in applicant's verified statement of continued bona fide intention to use the mark in commerce. The proposed paragraph further provides that those efforts may include, without limitation, product or service research or development, market research, manufacturing activities, promotional activities, steps to acquire distributors, steps to obtain required governmental approval, or other similar activities.

One organization expressed its concern that this rule may be administered by the PTO to require an applicant to disclose details of highly sensitive or confidential market research or business plans. The organization noted that Section 1(d)(2) of the Act requires only that applicant provide "a showing of good cause" to support a request for an extension of time. The organization suggested "facts demonstrating ongoing efforts to make use of the mark" could be sensitive or confidential market research or business information. It recommended that the first sentence of proposed § 2.89(d)(2) be amended to substitute the word "applicants" for the words "facts demonstrating." One individual submitted comments to the same general effect.

Response: The rule does not require a particular showing to establish good cause for a request for an extension of time to file a statement of use. The suggested modification has been adopted in the final rule.

Comment: Section 2.89(f) was proposed to be added to provide, in part, that the goods or services specified in a request for an extension of time for filing a statement of use must conform to those goods or services identified in the notice of allowance; and that any goods or services specified in the notice of allowance which are omitted from the identification of goods or services in the request for extension of time will be presumed to be deleted and the applicant may not thereafter request that the deleted goods or services be reinserted in the application.

Section 2.89(g) was proposed to be added to provide, in part, that the applicant will be notified of the grant or denial of a request for an extension of time; that if, after denial of an extension request, there is time remaining in the existing six-month period for filing a statement of use, applicant may submit a substitute request for extension of time; and that otherwise, the only recourse available after denial of a request for an extension of time is a petition to the Commissioner in accordance with §§ 2.66 or 2.146.

One individual pointed out that proposed § 2.88(i)(2) provides that if any goods or services specified in the notice of allowance are omitted from the identification of goods or services in the statement of use, the examiner shall inquire about the discrepancy and permit the applicant to amend the statement of use to include any omitted goods or services, provided that the amendment is supported by a verification that the mark was in use in commerce, on or in connection with each of

the goods or services sought to be included, prior to the expiration of the time allowed to applicant for filing a statement of use. The individual noted that there is no comparable provision in proposed § 2.89 relating to requests for extensions of time to file a statement of use. The individual commented that "an applicant could unwittingly forfeit rights by failing to specify all goods and services for which the extension is sought," and that "if Examiners can ask about the completeness of statements of use, they can ask about the completeness of extensions to file such statements."

Two organizations commented, with respect to proposed § 2.89(g), that it is unduly harsh and time consuming for the PTO to permit the only recourse from a denial of an extension request to be a petition to the Commissioner. The organizations recommended that the examiner should be required to state what is needed for acceptance of the extension request and reasonable time should be allowed for response. The organizations also recommended that the filing of a petition concerning the denial of an extension request should allow an automatic extension of time in connection with the application (subject to the caveat that the Act "appears to provide 36 month maximum pendency permitted for an 'intent to use' application regardless of the difficulty encountered in prosecution").

Response: Although § 2.88 includes certain provisions relating to the amendment of timely statements of use, § 2.89 includes no analogous provisions with respect to a request for an extension of time to file a statement of use. This is because the Act, as amended, specifically provides that a statement of use may be amended, but makes no provision for the amendment of an extension request. Moreover, the inclusion in § 2.89 of amendment provisions similar to those in § 2.88 would require that the PTO track not only extension period deadlines, but also deadlines for responding to PTO notifications of extension request deficiencies. This would create a serious administrative problem.

Furthermore, to avoid inadvertently omitting goods or services from a request for an extension of time to file a statement of use, the PTO permits and encourages applicants to identify goods or services in an extension request by incorporating by reference the goods or services listed in the notice of allowance.

The Act permits extension of the time for filing a statement of use only upon proper written request. The Act does not provide for an automatic extension of time upon the filing of a petition, pursuant to § 2.89(g), from the denial of an extension request.

Accordingly, the suggested modifications have not been adopted.

Comment: One organization recommended that the first sentence of proposed § 2.89(g), which provides that the applicant will be notified of the grant or denial of a request for an extension of time to file a statement of use, be modified by inserting at the end of the sentence the words "and if denied, the reasons for denial." The organization also noted that the rule fails to clarify when the new extension period will begin when a petition to the Commissioner from a denial of an extension request is granted.

Response: The organizations' suggestion for modification of the first sentence of proposed § 2.89(g) has been adopted. It is understood that a denial would include the reasons for denial. A six-month extension of time in which to file a statement of use will always run from the expiration of the preceding six-month period regardless of whether applicant has been notified of the grant or denial of the request, or of a petition to the Commissioner relating thereto, prior to the expiration of the existing period. Accordingly, final § 2.89(g) includes the following new sentence: "If the petition is granted, the term of the requested six-month extension which was the subject of the petition will run from the date of the expiration of the previously existing six-month period for filing a statement of use."

Comment: Section 2.111(a), which pertains to the filing of petitions for cancellation, was proposed to be amended to provide, in part, for the filing of a petition to cancel a registration "in whole or in part." One individual expressed his concern that the phrase "in whole or in part" could perhaps be interpreted as a reference to a geographical cancellation. The

individual suggested that it might be helpful to revise the paragraph to provide for cancelling the registration "for all or part of the goods or services."

The individual also suggested that § 2.101(b), which pertains to the filing of oppositions, should be amended to provide for opposing an application for "all or part of the goods or services."

Response: The language "in whole or in part" parallels the language of Section 18 of the Act. Further, § 2.99(h) provides that the Board will consider and determine concurrent use rights only in the context of a concurrent use proceeding, and § 2.133(c) provides that geographic limitations will be considered and determined by the Board only in the context of a concurrent use proceeding. Accordingly, the suggestion pertaining to § 2.111(b) has not been adopted.

The language of § 2.101(a) parallels the language of Section 13(a) of the Act. Modification of the section to provide for opposing an application for "all or part of the goods or services" is unnecessary in view of the Board's authority, under Section 18 of the Act, to modify the application by limiting the goods or services specified therein. Accordingly, the suggestion pertaining to § 2.101(b) has not been adopted.

Comment: Section 2.129(d) was proposed to be added to provide that when a party to an inter partes proceeding before the Board cannot prevail without establishing constructive use pursuant to Section 7(c) of the Act in an application under Section 1(b) of the Act, the Board will enter a "declaratory judgment" in favor of that party, subject to the party's establishment of constructive use; and that the time for filing an appeal or for commencing a civil action under Section 21 of the Act shall run from the date of the declaratory judgment.

Four organizations and one individual commented variously that "declaratory judgment" is a term of art for a different type of proceeding; that use of the term "declaratory" is inconsistent with the language of Sections 18 and 21(a)(4) of the Act, which refers only to "judgments"; and that a phrase such as "conditional judgment," "contingent judgment," or "judgment" should be substituted for the phrase "declaratory judgment."

One individual commented that the better procedure would be for the Board to acknowledge the rights of the intent-to-use applicant, but then suspend proceedings until after the intent-to-use applicant has established its right to a constructive date of first use, following which a final judgment could be issued.

One individual suggested that the language of the proposed paragraph should be clarified by inserting the phrase "but will prevail in whole or in part upon establishing constructive use" after the opening phrase "When a party to an inter partes proceeding before the Trademark Trial and Appeal Board cannot prevail without establishing constructive use pursuant to Section 7(c) of the Act in an application under Section 1(b) of the Act, . . ."

One individual expressed a belief that where a situation of the type described in the proposed paragraph arises in a cancellation or an interference proceeding, the opinion of the Board might be advisory, but that in an opposition proceeding it would not, because in such a proceeding there is "a case or controversy involving present rights of two parties." The individual suggested that the last sentence of the proposed paragraph be amended to read:

The time for filing an appeal or for commencing a civil action under section 21 of the Act shall run from the date of the entry of the declaratory judgment in an opposition proceeding, and from the date of acceptance of a statement of use in all other inter partes proceedings.

Response: The PTO believes that the use of the term "judgment" is more appropriate in this situation. Accordingly, the word "declaratory" has been omitted from the final rule.

Sections 18 and 21(a)(4) of the Act prohibit the entry of a final judgment in favor of an applicant under Section 1(b) of the Act before the applicant's mark is registered in those cases where an applicant cannot prevail without establishing constructive use under Section 7(c). If possible, the time for appeal should not be deferred until use has been established. If the time for appeal is deferred until after acceptance of the statement of use, appellant would be deprived of a speedy

determination of the issues on appeal. Accordingly, the suggestions to defer the time for seeking judicial review have not been adopted.

The purpose of "intent-to-use" would be best accomplished if judicial review can occur promptly after entry of a judgment by the Board. Nevertheless, the PTO recognizes, as have other commentators, that there is an issue whether a Board decision is "ripe" for judicial review prior to the time an applicant under Section 1(b) of the Act establishes its right to register its mark. This issue was called to the public's attention in the notice of proposed rulemaking, 54 Fed. Reg. at 19300. The PTO also published a notice in the *Official Gazette* calling attention to the issue and asking for comments. 1102 OG 58 (May 16, 1989). The Subcommittee on Courts, Civil Liberties and the Administration of Justice expressed concern with respect to any provision which permitted an intent-to-use applicant to sue before it made use of the mark and the mark was granted registration. "Permitting a plaintiff to sue before use occurs . . . raises serious questions about whether Federal jurisdiction and a case or controversy exists, and about whether such a case is 'ripe.'" See H.R. Rep. 1028, 100th Cong., 2d Sess., at 4 (1988).

Ultimately, the issue will be resolved by Federal courts. In order to permit early resolution of the issue, it has been decided to provide in § 2.129(d) that the 60-day time period for seeking judicial review runs from the date the Board enters its judgment.

With respect to the suggestion that the phrase "but will prevail in whole or in part upon establishing constructive use" be inserted in the rule, the PTO does not believe that the phrase is necessary or would serve to clarify the rule. Accordingly, the suggested modification has not been adopted.

Comment: One individual suggested that § 2.162, which governs the requirements for an affidavit or declaration during the sixth year after registration, should be amended to require that each affidavit or declaration include the current street address of the person submitting the declaration. The individual commented that "while many registrants currently do this, the fact remains that it is not required, and it should be mandatory."

Response: While the PTO encourages registrants to state their current address in a Section 8 affidavit, it is not a statutory requirement for an acceptable affidavit and it would be an administrative burden to process substitute affidavits. Accordingly, the suggested modification has not been adopted. However, the *Trademark Manual of Examining Procedure* will be amended to recommend that this useful information be included in an affidavit or declaration under Section 8 of the Act.

Comment: Section 2.162(f), which specifies certain of the requirements for an affidavit or declaration during the sixth year, was proposed to be revised to provide, in part, that if the registered mark is not in use in commerce on or in connection with the goods or services recited in the registration, the affidavit or declaration must recite facts to show that nonuse as to those goods or services is due to special circumstances which excuse such nonuse and is not due to any intention to abandon the mark as to those goods or services.

One organization suggested that after the phrase "on or in connection with," the phrase "any or all" should be substituted for the word "the."

Response: The suggested language could be construed to imply that an allegation of use on less than all of the goods or services will suffice to maintain the registration for all of the goods or services; or that if the affidavit or declaration does not include an allegation of use or excusable nonuse as to all of the goods or services, the affidavit or declaration will not be accepted and the registration will be cancelled in its entirety. In fact, in the latter situation, the affidavit or declaration would be accepted and those goods or services not included in the allegation of use or excusable nonuse would be deleted from the registration. Accordingly, the suggested modification has not been adopted.

Comment: Section 2.181, which concerns the terms of original registrations and renewals, was proposed to be amended by redesignating present paragraph (a) as (a)(1); revising redesignated paragraph (a)(1) to provide that registrations issued under the Act prior to November 16, 1989, whether on the

Principal Register or on the Supplemental Register, remain in force for twenty years from their date of issue or renewal, if that date is prior to November 16, 1989, and may be renewed for periods of ten (rather than twenty) years from the expiring period unless previously cancelled or surrendered; and adding new paragraph (a)(2) to provide that registrations issued under the Act on or after November 16, 1989, whether on the Principal Register or on the Supplemental Register, remain in force for ten years, and may be renewed for periods of ten years from the expiring period unless previously cancelled or surrendered.

Four organizations and two individuals commented that the renewal term provisions in the proposed rule are ambiguous because "renewal" may be deemed to take place either (a) on the twentieth anniversary of the registration's issuance, or (b) when a proper renewal application is filed, or (c) when the renewal application is processed and a renewal certificate is issued. They recommended that the rule be revised and clarified to provide that the anniversary of the date of the original registration will control the length of the renewal term.

One organization recommended that, if the rule is not amended to reflect the aforesaid comments, the words "or renewed" should be inserted in proposed paragraphs (a)(1) and (2) of the rule after the words "Registrations issued."

Response: The PTO believes that the date of the grant of the renewal application controls whether the term of renewal of a registration is 20 years or ten years. Accordingly, the recommendation that the rule be modified to provide that the anniversary of the date of the original registration will control the length of the renewal term, has not been adopted. However, with respect to registrations due to expire before November 16, 1989, the PTO will do everything possible to maximize the chance that the renewal will be granted prior to November 16, 1989, so that the term of renewal will be twenty years. Registrations due to expire on or after November 16, 1989, will be renewed, on or after that date, for periods of ten years from the date of expiration, regardless of the filing date of the renewal application.

The recommendation that the words "or renewed" be inserted at the beginning of paragraphs (a)(1) and (2) after the words "Registrations issued" has been adopted and the paragraphs have been further modified for purposes of clarity. Specifically, the word "expiration" has been substituted in paragraph (a)(1) for the words "renewal, if that date is prior to November 16, 1989" and the phrase "from their date of issue or expiration" has been inserted in paragraph (a)(2) after the words "remain in force for ten years."

Comment: Section 2.185(a)(1) was proposed to be revised to liberalize certain requirements for the recordation in the PTO of assignments.

One organization recommended that, since any documents affecting title to registrations and applications are recorded pursuant to this rule, the words "and other documents affecting title" should be added to the section title. The organization also recommended that the proposed rule be revised and reorganized to eliminate lengthy, confusing and redundant wording. The organization submitted a suggested substitute draft of the rule.

Response: To permit further review of the language of this section, the proposal is withdrawn.

Comment: Several comments were submitted which do not relate to any rule amendment proposed in the notice of proposed rulemaking.

Response: To the extent that the comments suggest changes to existing rules, the changes cannot be made without affording members of the public an opportunity to comment.

Environmental, Energy, and other considerations

The rule change will not have a significant impact on the quality of the human environment or the conservation of energy resources.

The rule change is in conformity with the requirements of the Regulatory Flexibility Act (Pub. L. 96-354), Executive Orders 12291 and 12612, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq.

The General Counsel of the Department of Commerce has certified to the Chief Counsel for Advocacy, Small Business Administration, that the rule change will not have a significant

adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act, Pub. L. 96-354) because the rule change includes no additional or increased fees for existing filings. Pub. L. 100-667 creates a new statutory right to file an application based upon a bona fide intention to use a mark in commerce ("intent-to-use"). The rule change includes fees for intent-to-use applications. However, filing an intent-to-use application under the new law is permissive. Such a filing will reduce the substantial burden of securing and protecting trademark rights by enabling small entities to obtain trademark rights prior to the use of a mark and the expending of funds in relation thereto. Thus, substantive rights to use valuable trademarks are not adversely affected and, in some instances, can be established prior to the expenditure of large amounts of funds.

The Patent and Trademark Office has determined that this rule change is not a major rule under Executive Order 12291. The annual effect to the economy will be less than \$100 million. There will be no major increase in costs or prices for consumers, individual industries, federal, state or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

The PTO has also determined that this notice has no Federalism implications affecting the relationship between the National Government and the States as outlined in Executive Order 12612.

The rule change will not impose any additional burden under the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq. in relation to any existing filings. However, Pub. L. 100-667 creates a new additional basis for filing an application, as well as certain other new filings in relation thereto, namely, an amendment to allege use under Section 1(c) of the Act, a statement of use under Section 1(d) of the Act, and requests for extensions of time, under Section 1(d) of the Act, to file a statement of use. The public reporting burden for these new collections of information is estimated to vary from .25 hours to .50 hours per filing, with an average of .35 hours per filing, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collections of information. Send comments regarding the burden estimate or any other aspect of these collections of information, including suggestions for reducing this burden, to the Commissioner of Patents and Trademarks, Office of Management and Organization, Washington, D.C. 20231; and to the Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, D.C. 20503, Attention: Paperwork Reduction Project 0651-0023.

List of Subject Terms in 37 CFR Part 1:

Administrative practice and procedure, Courts, Freedom of information, Inventions and patents, Reporting and recordkeeping requirements, Small businesses.

List of Subject Terms in 37 CFR Part 2:

Administrative practice and procedure, Courts, Lawyers, Trademarks.

For the reasons set forth in the preamble and pursuant to the authority contained in Section 41 of the Act (15 U.S.C. 1123), parts 1 and 2 of Title 37 of the Code of Federal Regulations are amended as set forth below.

PART 1--RULES OF PRACTICE IN PATENT CASES

1. The authority citation for Part 1 continues to read as follows:

Authority: 35 U.S.C. 6, unless otherwise noted.

2. Section 1.1 is amended by adding new paragraph (h) to read as follows:

§ 1.1 All communications to be addressed to Commissioner of Patents and Trademarks.

(h) In applications under section 1(b) of the Trademark Act, 15 U.S.C. 1051(b), all statements of use filed under section 1(d) of the Act, and requests for extensions of time therefor, should be additionally marked "Box ITU."

3. Section 1.8 is amended by adding new paragraphs (a)(2)(xiv) through (a)(2)(xvi) to read as follows:

§ 1.8 Certificate of Mailing.

(a) ***

(2) ***

(xiv) In an application under section 1(b) of the Trademark Act (15 U.S.C. 1051(b)), the filing of a statement of use under § 2.88 (15 U.S.C. 1051(d)).

(xv) In an application under section 1(b) of the Trademark Act (15 U.S.C. 1051(b)), the filing of a request, under § 2.89 (15 U.S.C. 1051(d)), for an extension of time to file a statement of use under § 2.88 (15 U.S.C. 1051(d)).

(xvi) In an application under section 1(b) of the Trademark Act (15 U.S.C. 1051(b)), the filing of an amendment to allege use in commerce under § 2.76 (15 U.S.C. 1051(c)).

PART 2--RULES OF PRACTICE IN TRADEMARK CASES

4. The authority citation for Part 2 continues to read as follows:

Authority: 15 U.S.C. 1123; 35 U.S.C. 6, unless otherwise noted.

5. Section 2.2 is added to read as follows:

§ 2.2 Definitions.

(a) "The Act" as used in this Part means the Trademark Act of 1946, 60 Stat. 427, as amended, codified in 15 U.S.C. 1051 et. seq.

(b) "Entity" as used in this Part includes both natural and juristic persons.

6. Section 2.6 is amended by adding new paragraphs (u) and (v) to read as follows:

§ 2.6 Trademark fees.

The following fees and charges are established by the Patent and Trademark Office for trademark cases:

(u) For filing an amendment to allege use under section 1(c) of the Act or a statement of use under section 1(d)(1) of the Act, per class.....100.00

(v) For filing a request under section 1(d)(2) of the Act for a six-month extension of time for filing a statement of use under section 1(d)(1) of the Act, per class.....100.00

7. Section 2.18 is revised to read as follows:

§ 2.18 Correspondence, with whom held.

Correspondence will be sent to the applicant or a party to a proceeding at its address unless papers are transmitted by an attorney at law, or a written power of attorney is filed, or written authorization of other person entitled to be recognized is filed, or the applicant or party designates in writing another

address to which correspondence is to be sent, in which event correspondence will be sent to the attorney at law transmitting the papers, or to the attorney at law designated in the power of attorney, or to the other person designated in the written authorization, or to the address designated by the applicant or party for correspondence. Correspondence will continue to be sent to such address until the applicant or party, or the attorney at law or other authorized representative of the applicant or party, indicates in writing that correspondence is to be sent to another address. Correspondence will be sent to the domestic representative of a foreign applicant unless the application is being prosecuted by an attorney at law or other qualified person duly authorized, in which event correspondence will be sent to the attorney at law or other qualified person duly authorized. Double correspondence will not be undertaken by the Patent and Trademark office, and if more than one attorney at law or other authorized representative appears or signs a paper, the Office reply will be sent to the address already established in the file until another correspondence address is specified by the applicant or party or by the attorney or other authorized representative of the applicant or party.

8. Section 2.21 is amended by revising paragraphs (a)(5) and (a)(6) to read as follows:

§ 2.21 Requirements for receiving a filing date.

(a) ***

(5) A basis for filing:

(i) A date of first use of the mark in commerce, and at least one specimen or facsimile of the mark as used, in an application under section 1(a) of the Act, or

(ii) A claim of a bona fide intention to use the mark in commerce and a certification or certified copy of the foreign registration on which the application is based in an application under section 44(e) of the Act, or

(iii) A claim of a bona fide intention to use the mark in commerce and a claim of the benefit of a prior foreign application in an application filed in accordance with section 44(d) of the Act, or

(iv) A claim of a bona fide intention to use the mark in commerce in an application under section 1(b) of the Act;

(6) A verification or declaration in accordance with § 2.33(b) signed by the applicant.

9. Section 2.24 is revised to read as follows:

§ 2.24 Designation of representative by foreign applicant.

If an applicant is not domiciled in the United States, the applicant must designate by a written document filed in the Patent and Trademark Office the name and address of some person resident in the United States on whom may be served notices or process in proceedings affecting the mark. If this document does not accompany or form part of the application, it will be required and registration refused unless it is supplied. Official communications of the Patent and Trademark Office will be addressed to the domestic representative unless the application is being prosecuted by an attorney at law or other qualified person duly authorized, in which event Official communications will be sent to the attorney at law or other qualified person duly authorized. The mere designation of a domestic representative does not authorize the person designated to prosecute the application unless qualified under paragraph (a), (b) or (c) of § 10.14 of this subchapter and authorized under § 2.17(b).

10. Section 2.31 is revised to read as follows:

§ 2.31 Application must be in English.

The application must be in the English language and plainly written on but one side of the paper. It is preferable that the

application be on lettersize (i.e., 8 1/2 inches, 21.6 cm., by 11 inches, 27.9 cm.) paper, typewritten double spaced, with at least a one and one-half inch (3.8 cm.) margin on the left-hand side and top of the page.

11. Section 2.33 is amended by revising the section title, revising paragraphs (a)(1)(ii), (a)(1)(iv), (a)(1)(v), (a)(1)(vi), (a)(1)(vii), and (a)(1)(viii), redesignating paragraph (a)(1)(ix) as (a)(1)(x), revising redesignated paragraph (a)(1)(x), adding a new paragraph (a)(1)(ix), revising paragraphs (a)(2), (b), and (c), and adding new paragraph (d) to read as follows:

§ 2.33 Requirements for written application.

(a)(1) The application shall include a request for registration and shall specify:

(ii) The citizenship of the applicant; if the applicant is a partnership, the state or nation under the laws of which the partnership is organized and the names and citizenship of the general partners or, if the applicant is a corporation or association, the state or nation under the laws of which the corporation or association is organized;

(iv) In an application under section 1(a) of the Act, that the applicant has adopted and is using the mark shown in the accompanying drawing, or, in an application under section 1(b) or 44 of the Act, that the applicant has a bona fide intention to use the mark shown in the accompanying drawing in commerce;

(v) In an application under section 1(a) of the Act, the particular goods or services on or in connection with which the mark is used or, in an application under section 1(b) or 44 of the Act, the particular goods or services on or in connection with which the applicant has a bona fide intention to use the mark, which in an application under section 44 may not exceed the scope of the goods or services covered by the foreign application or registration;

(vi) The class of goods or services according to the official classification, if known to the applicant;

(vii) In an application under section 1(a) of the Act, the date of applicant's first use of the mark as a trademark or service mark on or in connection with goods or services specified in the application and the date of applicant's first use in commerce of the mark as a trademark or service mark on or in connection with goods or services specified in the application, specifying the nature of such commerce (see § 2.38);

(viii) In an application under section 44(e) of the Act for registration of a mark duly registered in the applicant's country of origin, as that term is defined in section 44(c), accompanying the application, a certificate of the trademark office of the applicant's country of origin showing that the mark has been registered in such country and also showing the mark, the goods or services for which the mark is registered, the date of filing of the application on the basis of which registration was granted and that said registration is in full force and effect and, if the certificate is not in the English language, a translation thereof;

(ix) In an application claiming the benefit of a foreign application in accordance with section 44(d) of the Act, compliance with the requirements of § 2.39;

(x) In an application under section 1(a) of the Act, the mode, manner or method of applying, affixing or otherwise using the mark on or in connection with the goods or services specified or, in an application under section 1(b) of the Act, the intended mode, manner or method of applying, affixing or otherwise using the mark on or in connection with the goods or services specified.

(2) If more than one item of goods or services is specified in the application, the dates of use required in paragraph (a)(1)(vii) of this section need be for only one of the items specified, provided the particular item to which the dates apply is designated.

(b)(1) In an application under section 1(a) of the Act, the application must include averments to the effect that the applicant is believed to be the owner of the mark sought to be registered; that the mark is in use in commerce, specifying the nature of such commerce; that no other entity, to the best of the declarant's knowledge and belief, has the right to use such mark in commerce, either in the identical form or in such near resemblance as to be likely, when applied to the goods or services of such other entity, to cause confusion, or to cause mistake, or to deceive; that the specimens or facsimiles show the mark as used on or in connection with the goods or services; and that the facts set forth in the application are true; or

(2) In an application under section 1(b) or 44 of the Act, the application must include averments to the effect that the applicant is believed to be the owner of the mark sought to be registered; that the applicant has a bona fide intention to use the mark in commerce on or in connection with the specified goods or services; that no other entity, to the best of the declarant's knowledge and belief, has the right to use such mark in commerce, either in the identical form or in such near resemblance as to be likely, when applied to the goods or services of such other entity, to cause confusion, or to cause mistake, or to deceive; and that the facts set forth in the application are true.

(c) For an application for the registration of a mark for goods or services falling within multiple classes, see § 2.86.

(d) An applicant may not file under both sections 1(a) and 1(b) of the Act in a single application, nor may an applicant in an application under section 1(a) of the Act amend that application to seek registration under section 1(b) of the Act.

12. Section 2.38(a) is revised to read as follows:

§ 2.38 Use by predecessor or by related companies.

(a) If the first use, the date of which is required by paragraph (a)(1)(vii) of § 2.33, was by a predecessor in title, or by a related company (sections 5 and 45 of the Act), and such use inures to the benefit of the applicant, the date of such first use may be asserted with a statement that such first use was by the predecessor in title or by the related company as the case may be.

13. Section 2.39 is revised to read as follows:

§ 2.39 Priority claim based on foreign application.

(a) An application claiming the benefit of a foreign application in accordance with section 44(d) of the Act shall specify the filing date and country of the first regularly filed foreign application or, if the application is based upon a subsequent regularly filed application in the same foreign country, the application shall so state and shall show that any prior filed application has been withdrawn, abandoned or otherwise disposed of, without having been laid open to public inspection and without having any rights outstanding, and has not served as a basis for claiming a right of priority.

(b) Before the application can be approved for publication, a basis for registration under section 1(a), 1(b) or 44(e) of the Act must be established.

14. Section 2.41 is revised to read as follows:

§ 2.41 Proof of distinctiveness under section 2(f).

(a) When registration is sought of a mark which would be unregistrable by reason of section 2(e) of the Act but which is said by applicant to have become distinctive in commerce of the goods or services set forth in the application, applicant may, in support of registrability, submit with the application, or in response to a request for evidence or to a refusal to register, affidavits, or declarations in accordance with § 2.20, depositions, or other appropriate evidence showing duration,

extent and nature of use in commerce and advertising expenditures in connection therewith (identifying types of media and attaching typical advertisements), and affidavits, or declarations in accordance with § 2.20, letters or statements from the trade or public, or both, or other appropriate evidence tending to show that the mark distinguishes such goods.

(b) In appropriate cases, ownership of one or more prior registrations on the Principal Register or under the Act of 1905 of the same mark may be accepted as prima facie evidence of distinctiveness. Also, if the mark is said to have become distinctive of applicant's goods by reason of substantially exclusive and continuous use in commerce thereof by applicant for the five years before the date on which the claim of distinctiveness is made, a showing by way of statements which are verified or which include declarations in accordance with § 2.20, in the application may, in appropriate cases, be accepted as prima facie evidence of distinctiveness. In each of these situations, however, further evidence may be required.

15. Section 2.44 is revised to read as follows:

§ 2.44 Collective mark.

(a) In an application to register a collective mark under section 1(a) of the Act, the application shall specify and contain all applicable elements required by the preceding sections for trademarks, but shall, in addition, specify the class of persons entitled to use the mark, indicating their relationship to the applicant, and the nature of the applicant's control over the use of the mark.

(b) In an application to register a collective mark under section 1(b) or 44 of the Act, the application shall specify and contain all applicable elements required by the preceding sections for trademarks, but shall, in addition, specify the class of persons intended to be entitled to use the mark, indicating what their relationship to the applicant will be, and the nature of the control applicant intends to exercise over the use of the mark.

16. Section 2.45 is revised to read as follows:

§ 2.45 Certification mark.

(a) In an application to register a certification mark under section 1(a) of the Act, the application shall specify and contain all applicable elements required by the preceding sections for trademarks. It shall, in addition, specify the manner in which and the conditions under which the certification mark is used; it shall allege that the applicant exercises legitimate control over the use of the mark and that the applicant is not engaged in the production or marketing of the goods or services to which the mark is applied.

(b) In an application to register a certification mark under section 1(b) or 44 of the Act, the application shall specify and contain all applicable elements required by the preceding sections for trademarks. It shall, in addition, specify the manner in which and the conditions under which the certification mark is intended to be used; it shall allege that the applicant intends to exercise legitimate control over the use of the mark and that the applicant will not engage in the production or marketing of the goods or services to which the mark is applied.

17. Section 2.47 is revised to read as follows:

§ 2.47 Supplemental Register.

(a) In an application to register on the Supplemental Register under section 23 of the Act, the application shall so indicate and shall specify that the mark has been in lawful use in commerce, specifying the nature of such commerce, by the applicant.

(b) In an application to register on the Supplemental Register under section 44 of the Act, the application shall so indicate. The statement of lawful use in commerce may be omitted.

(c) A mark in an application to register on the Principal Register under section 1(b) of the Act is eligible for registration on the Supplemental Register only after an acceptable

amendment to allege use under § 2.76 or statement of use under § 2.88 has been timely filed.

(d) An application for registration on the Supplemental Register must conform to the requirements for registration on the Principal Register under section 1(a) of the Act, so far as applicable.

18. Section 2.51 is revised to read as follows:

§ 2.51 Drawing required.

(a)(1) In an application under section 1(a) of the Act, the drawing of the trademark shall be a substantially exact representation of the mark as used on or in connection with the goods; or

(2) In an application under section 1(b) of the Act, the drawing of the trademark shall be a substantially exact representation of the mark as intended to be used on or in connection with the goods specified in the application, and once an amendment to allege use under § 2.76 or a statement of use under § 2.88 has been filed, the drawing of the trademark shall be a substantially exact representation of the mark as used on or in connection with the goods; or

(3) In an application under section 44 of the Act, the drawing of the trademark shall be a substantially exact representation of the mark as it appears in the drawing in the registration certificate of a mark duly registered in the country of origin of the applicant.

(b)(1) In an application under section 1(a) of the Act, the drawing of a service mark shall be a substantially exact representation of the mark as used in the sale or advertising of the services; or

(2) In an application under section 1(b) of the Act, the drawing of a service mark shall be a substantially exact representation of the mark as intended to be used in the sale or advertising of the services specified in the application and, once an amendment to allege use under § 2.76 or a statement of use under § 2.88 has been filed, the drawing of the service mark shall be a substantially exact representation of the mark as used in the sale or advertising of the services; or

(3) In an application under section 44 of the Act, the drawing of a service mark shall be a substantially exact representation of the mark as it appears in the drawing in the registration certificate of a mark duly registered in the country of origin of applicant.

(c) The drawing of a mark may be dispensed with in the case of a mark not capable of representation by a drawing, but in any such case the application must contain an adequate description of the mark.

(d) Broken lines should be used in the drawing of a mark to show placement of the mark on the goods, or on the packaging, or to show matter not claimed as part of the mark, or both, as appropriate. In an application to register a mark with three-dimensional features, the drawing shall depict the mark in perspective in a single rendition.

(e) If the application is for the registration of only a word, letter or numeral, or any combination thereof, not depicted in special form, the drawing may be the mark typed in capital letters on paper, otherwise complying with the requirements of § 2.52.

19. Section 2.52 is amended by revising paragraphs (a), (d) and (e) to read as follows:

§ 2.52 Requirements for drawings.

(a) *Character of drawing.* All drawings, except as otherwise provided, must be made with the pen or by a process which will provide high definition upon reproduction. A photolithographic reproduction or printer's proof copy may be used if otherwise suitable. Every line and letter, including color lining and lines used for shading, must be black. All lines must be clean, sharp, and solid, and must not be fine or crowded. Gray tones or tints may not be used for surface shading or any other purpose. The requirements of this paragraph are not necessary in the case of drawings permitted and filed in accordance with paragraph (e) of § 2.51.

(d) *Heading.* Across the top of the drawing, beginning one inch (2.5 cm.) from the top edge and not exceeding one third of the sheet, there must be placed a heading, listing in separate lines, applicant's complete name; applicant's post office address; the dates of first use of the mark and first use of the mark in commerce in an application under section 1(a) of the Act; the priority filing date of the relevant foreign application in an application claiming the benefit of a prior foreign application in accordance with section 44(d) of the

Act; and the goods or services recited in the application or a typical item of the goods or services if a number of items are recited in the application. This heading should be type-written. If the drawing is in special form, the heading should include a description of the essential elements of the mark.

(e) *Linings for color.* Where color is a feature of a mark, the color or colors employed may be designated by means of conventional linings as shown in the following color chart:

20. Section 2.53 is revised to read as follows:

§ 2.53 Transmission of drawings.

Drawings transmitted to the Patent and Trademark Office, other than those typed in accordance with § 2.51(e), should be sent flat, protected by a sheet of heavy binder's board, or should be rolled for transmission in a suitable mailing tube to prevent mutilation or folding.

21. Section 2.56 is revised to read as follows:

§ 2.56 Specimens.

An application under section 1(a) of the Act, an amendment to allege use under § 2.76, and a statement of use under § 2.88 must each include three specimens of the trademark as used on or in connection with the goods in commerce. The specimens shall be duplicates of the labels, tags, or containers bearing the trademark, or the displays associated with the goods and bearing the trademark (or if the nature of the goods makes use of such specimens impracticable then on documents associated with the goods or their sale), when made of suitable flat material and of a size not to exceed 8 1/2 inches (21.6 cm.) wide and 11 inches (27.9 cm.) long.

22. Section 2.57 is revised to read as follows:

§ 2.57 Facsimiles.

(a) When, due to the mode of applying or affixing the trademark to the goods, or to the manner of using the mark on the goods, or to the nature of the mark, specimens as above stated cannot be furnished, three copies of a suitable photograph or other acceptable reproduction, not to exceed 8 1/2 inches (21.6 cm.) wide and 11 inches (27.9 cm.) long, and clearly and legibly showing the mark and all matter used in connection therewith, shall be furnished.

(b) A purported facsimile which is merely a reproduction of the drawing submitted to comply with § 2.51 will not be considered to be a facsimile depicting the mark as used on or in connection with the goods or in connection with the services.

23. Section 2.59 is added to read as follows:

§ 2.59 Filing substitute specimens.

(a) In an application under section 1(a) of the Act, the applicant may submit substitute specimens of the mark as used on or in connection with the goods, or in the sale or advertising of the services, provided that any substitute specimens submitted are supported by applicant's affidavit or declaration in accordance with § 2.20 verifying that the substitute specimens were in use in commerce at least as early as the filing date of the application. The verification requirement shall not apply if the specimens are duplicates or facsimiles, such as photographs, of specimens already of record in the application.

(b) In an application under section 1(b) of the Act, after filing either an amendment to allege use under § 2.76 or a statement of use under § 2.88, the applicant may submit substitute specimens of the mark as used on or in connection with the goods, or in the sale or advertising of the services, provided that the use in commerce of any substitute specimens submitted is supported by applicant's affidavit or declaration in accordance with § 2.20. In the case of a statement of use under § 2.88, the applicant must verify that the substitute specimens were in use in commerce prior to the filing of the statement of use or prior to the expiration of the time allowed to applicant for filing a statement of use.

24. Section 2.61 is amended by revising paragraphs (a) and (c) to read as follows:

§ 2.61 Action by examiner.

(a) Applications for registration, including amendments to allege use under section 1(c) of the Act, and statements of use under section 1(d) of the Act, will be examined and, if the applicant is found not entitled to registration for any reason, applicant will be notified and advised of the reasons therefor and of any formal requirements or objections.

(c) Whenever it shall be found that two or more parties whose interests are in conflict are represented by the same attorney, each party and also the attorney shall be notified of this fact.

25. Section 2.64 is amended by adding new paragraph (c) to read as follows:

§ 2.64 Final action.

(c)(1) If an applicant in an application under section 1(b) of the Act files an amendment to allege use under § 2.76 during the six-month response period after issuance of a final action, the examiner shall examine the amendment. The filing of such an amendment will not extend the time for filing an appeal or petitioning the Commissioner.

(2) If the amendment to allege use under § 2.76 is acceptable in all respects, the applicant will be notified of its acceptance.

(3) If, as a result of the examination of the amendment to allege use under § 2.76, the applicant is found not entitled to registration for any reason not previously stated, applicant will be notified and advised of the reasons and of any formal requirements or refusals. The Trademark Examining Attorney shall withdraw the final action previously issued and shall incorporate all unresolved refusals or requirements previously stated in the new non-final action.

26. Section 2.65 is amended by adding new paragraph (c) to read as follows:

§ 2.65 Abandonment.

(c) If an applicant in an application under section 1(b) of the Act fails to timely file a statement of use under § 2.88, the application shall be deemed to be abandoned.

27. Section 2.66 is revised to read as follows:

§ 2.66 Revival of abandoned applications.

(a) An application abandoned for failure to timely respond, or for failure to timely file a statement of use under § 2.88 in an application under section 1(b) of the Act, may be revived as a pending application if it is shown to the satisfaction of the Commissioner that the delay was unavoidable.

(b) A petition to revive an application abandoned for failure to timely respond must be accompanied by (1) the required fee, (2) a showing which is verified or which includes a declaration in accordance with § 2.20 of the causes of the delay, and (3) the proposed response, unless a response has been previously filed.

(c) A petition to revive an application abandoned for failure to timely file a statement of use under § 2.88 in an application under section 1(b) of the Act must be accompanied by (1) the required petition fee, (2) a showing which is verified or which includes a declaration in accordance with § 2.20 of the causes of the delay, (3) the required fees for the number of requests (in accordance with § 2.89 for extensions of time to file a statement of use) which should have been filed if the application had not been abandoned, and (4) either a statement of use in accordance with § 2.88 (unless the same has been previously filed) or a request in accordance with § 2.89 for an extension of time to file a statement of use. (d) The petition must be filed promptly. No petition to revive will be granted in an application under section 1(b) of the Act if granting the petition would permit the filing of a statement of use more than 36 months after the issuance of a notice of allowance under section 13(b)(2) of the Act.

28. Section 2.69 is revised to read as follows:

§ 2.69 Compliance with other laws.

When the sale or transportation of any product for which registration of a trademark is sought is regulated under an Act of Congress, the Patent and Trademark Office may make appropriate inquiry as to compliance with such Act for the sole purpose of determining lawfulness of the commerce recited in the application.

29. Section 2.71 is revised to read as follows:

§ 2.71 Amendments to correct informalities.

(a) The application may be amended to correct informalities, or to avoid objections made by the Patent and Trademark Office, or for other reasons arising in the course of examination.

(b) The identification of goods or services may be amended to clarify or limit the identification, but additions will not be permitted.

(c) If the verification or declaration filed with the application is defective, the defect may be corrected only by the submission of a substitute or supplemental verification or declaration in accordance with § 2.20. A verification or declaration required under §§ 2.21(a)(6), 2.76(e)(3) or 2.88(e)(3), to be properly signed, must be signed by the applicant, a member of the applicant firm, or an officer of the applicant corporation or association. A verification or declaration which is signed by a person having color of authority to sign, is acceptable for the purpose of determining the timely filing of the paper. Persons having color of authority to sign are those who have first-hand knowledge of the truth of the statements in the verification or declaration and who also have actual or implied authority to act on behalf of the applicant. However, a properly signed substitute verification or declaration must be submitted before the application will be approved for publication or registration, as the case may be.

(d)(1) No amendment to the dates of use will be permitted unless the amendment is supported by applicant's affidavit or declaration in accordance with § 2.20 and by such showing as may be required.

(2) In an application under section 1(a) of the Act, no amendment to specify a date of use which is subsequent to the filing date of the application will be permitted.

(3) In an application under section 1(b) of the Act, after the filing of a statement of use under § 2.88, no amendment will be permitted to the statement of use to recite dates of use which are subsequent to the expiration of the time allowed to applicant for filing a statement of use.

30. Section 2.72 is revised to read as follows:

§ 2.72 Amendments to description or drawing of the mark.

(a) Amendments may not be made to the description or drawing of the mark if the character of the mark is materially altered. The determination of whether a proposed amendment materially alters the character of the mark will be made by comparing the proposed amendment with the description or drawing of the mark as originally filed.

(b) In applications under section 1(a) of the Act, amendments to the description or drawing of the mark may be permitted only if warranted by the specimens (or facsimiles) as originally filed, or supported by additional specimens (or facsimiles) and a supplemental affidavit or declaration in accordance with § 2.20 alleging that the mark shown in the amended drawing was in use prior to the filing date of the application.

(c) In applications under section 1(b) of the Act, amendments to the description or drawing of the mark, which are filed after submission of an amendment to allege use under § 2.76 or a statement of use under § 2.88, may be permitted only if warranted by the specimens (or facsimiles) filed, or supported by additional specimens (or facsimiles) and a supplemental affidavit or declaration in accordance with § 2.20 alleging that the mark shown in the amended drawing is in use in commerce. In the case of a statement of use under § 2.88, applicant must verify that the mark shown in the amended drawing was in use in commerce prior to the filing of the statement of use or prior to the expiration of the time allowed to applicant for filing a statement of use.

(d) In applications under section 44 of the Act, amendments to the description or drawing of the mark may be permitted only if warranted by the description or drawing of the mark in the foreign registration certificate.

31. Section 2.73 is revised to read as follows:

§ 2.73 Amendment to recite concurrent use.

(a) An application under section 1(a) of the Act may be

amended so as to be treated as an application for a concurrent registration, provided the application as amended satisfies the requirements of § 2.42. The examiner will determine whether the application, as amended, is acceptable.

(b) An application under section 1(b) of the Act may not be amended so as to be treated as an application for a concurrent registration until an acceptable amendment to allege use under § 2.76 or statement of use under § 2.88 has been filed in the application, after which time such an amendment may be made, provided the application as amended satisfies the requirements of § 2.42. The examiner will determine whether the application, as amended, is acceptable.

32. Section 2.75 is revised to read as follows:

§ 2.75 Amendment to change application to different register.

(a) An application for registration on the Principal Register under section 1(a) or 44 of the Act may be changed to an application for registration on the Supplemental Register and vice versa by amending the application to comply with the rules relating to the appropriate register, as the case may be.

(b) An application under section 1(b) of the Act may be amended to change the application to a different register only after submission of an acceptable amendment to allege use under § 2.76 or statement of use under § 2.88. When such an application is changed from the Principal Register to the Supplemental Register, the effective filing date of the application is the date of the filing of the allegation of use under section 1(c) or 1(d) of the Act.

33. Section 2.76 is added to read as follows:

§ 2.76 Amendment to allege use.

(a) An application under section 1(b) of the Act may be amended to allege use of the mark in commerce under section 1(c) of the Act at any time between the filing of the application and the date the examiner approves the mark for publication or the date of expiration of the six-month response period after issuance of a final action. Thereafter, an allegation of use may be submitted only as a statement of use under § 2.88 after the issuance of a notice of allowance under section 13(b)(2) of the Act. If an amendment to allege use is filed outside the time period specified in this paragraph, it will be returned to the applicant.

(b) A complete amendment to allege use must include:

(1) A verified statement that the applicant is believed to be the owner of the mark sought to be registered and that the mark is in use in commerce, specifying the date of the applicant's first use of the mark and first use of the mark in commerce, the type of commerce, those goods or services specified in the application on or in connection with which the mark is in use in commerce and the mode or manner in which the mark is used on or in connection with such goods or services;

(2) Three specimens or facsimiles, conforming to the requirements of §§ 2.56, 2.57 and 2.58, of the mark as used in commerce; and

(3) The fee prescribed in § 2.6.

(c) An amendment to allege use may be filed only when the applicant has made use of the mark in commerce on or in connection with all of the goods or services, as specified in the application, for which applicant will seek registration in that application unless the amendment to allege use is accompanied by a request in accordance with § 2.87 to divide out from the application the goods or services to which the amendment pertains. If more than one item of goods or services is specified in the amendment to allege use, the dates of use required in paragraph (b)(1) of this section need be for only one of the items specified in each class, provided the particular item to which the dates apply is designated.

(d) The title "Amendment to allege use under § 2.76" should appear at the top of the first page of the paper.

(e) The Office will review a timely filed amendment to allege use to determine whether it meets the following minimum requirements:

(1) The fee prescribed in § 2.6;

(2) At least one specimen or facsimile of the mark as used in commerce; and

(3) A verification or declaration signed by the applicant stating that the mark is in use in commerce.

(f) A timely filed amendment to allege use which meets the minimum requirements specified in paragraph (e) of this section will be examined in accordance with §§ 2.61 through 2.69. If, as a result of the examination of the amendment to allege use, applicant is found not entitled to registration for any reason not previously stated, applicant will be so notified and advised of the reasons and of any formal requirements or refusals. The notification shall restate or incorporate by reference all unresolved refusals or requirements previously stated. The amendment to allege use may be amended in accordance with §§ 2.59 and 2.71 through 2.75. If the amendment to allege use is acceptable in all respects, the applicant will be notified of its acceptance. The filing of such an amendment shall not constitute a response to any outstanding action by the Trademark Examining Attorney.

(g) If the amendment to allege use is filed within the permitted time period but does not meet the minimum requirements specified in paragraph (e) of this section, applicant will be notified of the deficiency. The deficiency may be corrected provided the mark has not been approved for publication or the six-month response period after issuance of a final action has not expired. If an acceptable amendment to correct the deficiency is not filed prior to approval of the mark for publication or prior to the expiration of the six-month response period after issuance of a final action, the amendment will not be examined.

(h) An amendment to allege use may be withdrawn for any reason prior to approval of a mark for publication or expiration of the six-month response period after issuance of a final action.

34. Section 2.77 is added to read as follows:

§ 2.77 Amendments between notice of allowance and statement of use.

An application under section 1(b) of the Act may not be amended during the period between the issuance of the notice of allowance under section 13(b)(2) of the Act and the filing of a statement of use under § 2.88, except to delete specified goods or services. Other amendments filed during this period will be placed in the application file and considered when the statement of use is examined.

35. The undesignated center heading for §§ 2.80 through 2.84 is revised to read as follows:

PUBLICATION AND POST PUBLICATION

36. Section 2.81 is amended by revising the section title, redesignating the present paragraph as (a), revising redesignated paragraph (a), and adding new paragraph (b) to read as follows:

§ 2.81 Post publication.

(a) Except in an application under section 1(b) of the Act for which no amendment to allege use under § 2.76 has been submitted and accepted, if no opposition is filed within the time permitted or all oppositions filed are dismissed, and if no interference is declared and no concurrent use proceeding is instituted, the application will be prepared for issuance of the certificate of registration as provided in § 2.151.

(b) In an application under section 1(b) of the Act for which no amendment to allege use under § 2.76 has been submitted and accepted, if no opposition is filed within the time permitted or all oppositions filed are dismissed, and if no interference is declared, a notice of allowance will issue. The notice of allowance will state the serial number of the application, the name of the applicant, the correspondence address, the mark, the identification of goods or services, and the issue date of the notice of allowance. The mailing date that appears on the notice of allowance will be the issue date of the notice of allowance. Thereafter, the applicant shall submit a statement of use as provided in § 2.88.

37. Section 2.82 is revised to read as follows:

§ 2.82 Marks on Supplemental Register published only upon registration.

In the case of an application for registration on the Supplemental Register the mark will not be published for opposition but if it appears, after examination or reexamination, that the applicant is entitled to have the mark registered, a certificate of registration will issue as provided in § 2.151. The mark will be published in the *Official Gazette* when registered.

38. Section 2.83 is amended by revising paragraphs (a) and (b) to read as follows:

§ 2.83 Conflicting marks.

(a) Whenever an application is made for registration of a mark which so resembles another mark or marks pending registration as to be likely to cause confusion or mistake or to deceive, the mark with the earliest effective filing date will be published in the *Official Gazette* for opposition if eligible for the Principal Register, or issued a certificate of registration if eligible for the Supplemental Register.

(b) In situations in which conflicting applications have the same effective filing date, the application with the earliest date of execution will be published in the *Official Gazette* for opposition or issued on the Supplemental Register.

* * * * *

39. Section 2.84 is revised to read as follows:

§ 2.84 Jurisdiction over published applications.

(a) The examiner may exercise jurisdiction over an application up to the date the mark is published in the *Official Gazette*. After publication of an application under section 1(a) or 44 of the Act the examiner may, with the permission of the Commissioner, exercise jurisdiction over the application. After publication of an application under section 1(b) of the Act, the examiner may exercise jurisdiction over the application after the issuance of the notice of allowance under section 13(b)(2) of the Act. After publication, and prior to issuance of a notice of allowance in an application under section 1(b), the examiner may, with the permission of the Commissioner, exercise jurisdiction over the application.

(b) After publication, but before the printing of the certificate of registration in an application under section 1(a) or 44 of the Act, or before the printing of the notice of allowance in an application under section 1(b) of the Act, an application which is not the subject of an inter partes proceeding before the Trademark Trial and Appeal Board may be amended if the amendment does not necessitate republication of the mark or issuance of an Office action. Otherwise, an amendment to such an application may be submitted only upon petition to the Commissioner to restore jurisdiction of the application to the examiner for consideration of the amendment and further examination. The amendment of an application which is the subject of an inter partes proceeding before the Trademark Trial and Appeal Board is governed by § 2.133.

40. Section 2.86 is revised to read as follows:

§ 2.86 Application may include multiple goods or services comprised in single class or multiple classes.

(a) An application may recite more than one item of goods, or more than one service, comprised in a single class, provided the goods or services are specifically identified and the applicant either has used the mark on or in connection with all of the specified goods or services, or has a bona fide intention to use the mark on or in connection with all of the specified goods or services.

(b) An application also may be filed to register the same mark for goods and/or services comprised in multiple classes provided the goods or services are specifically identified; a

fee equaling the sum of the fees for filing an application in each class is submitted; and the application includes either dates of use and three specimens for each class, or a statement of a bona fide intention to use the mark on or in connection with all of the goods or services specified in each class. An amendment to allege use under § 2.76 or a statement of use under § 2.88, filed in a multiple class application under section 1(b) of the Act, must include, for each class, the required fee, dates of use and three specimens. A single certificate of registration for the mark shall be issued, unless the application is divided pursuant to § 2.87.

(c) The applicant may not allege use as to certain goods or services and a bona fide intention to use as to other goods or services in the same application, regardless of the number of classes contained therein.

41. Section 2.87 is revised to read as follows:

§ 2.87 Dividing an application.

(a) An application may be physically divided into two or more separate applications upon submission by the applicant of a request therefor, in accordance with paragraph (c) of this section. In the case of a request to divide out some, but not all, of the goods or services in a class, a fee for each new separate application to be created by the division must be submitted. Any outstanding time period for action by the applicant in the original application at the time of the division will be applicable to each new separate application created by the division.

(b) A request to divide an application may be filed at any time between the filing of the application and the date the Trademark Examining Attorney approves the mark for publication or the date of expiration of the six-month response period after issuance of a final action; or during an opposition, upon motion granted by the Trademark Trial and Appeal Board. Additionally, a request to divide an application under section 1(b) of the Act may be filed with a statement of use under § 2.88 or at any time between the filing of a statement of use and the date the Trademark Examining Attorney approves the mark for registration or the date of expiration of the six-month response period after issuance of a final action.

(c) A request to divide an application should be made in a separate paper from any other amendment or response in the application. The title "Request to divide application," should appear at the top of the first page of the paper.

42. A new undesignated center heading, and two new sections, designated §§ 2.88 and 2.89, are added to read as follows:

POST NOTICE OF ALLOWANCE

§ 2.88 Filing statement of use after notice of allowance.

(a) In an application under section 1(b) of the Act, a statement of use, required under section 1(d) of the Act, must be filed within six months after issuance of a notice of allowance under section 13(b)(2) of the Act, or within an extension of time granted under § 2.89. A statement of use that is filed prior to issuance of a notice of allowance is premature, will not be considered, and will be returned to the applicant.

(b) A complete statement of use must include:

(1) A verified statement that the applicant is believed to be the owner of the mark sought to be registered and that the mark is in use in commerce, specifying the date of the applicant's first use of the mark and first use of the mark in commerce, the type of commerce, those goods or services specified in the notice of allowance on or in connection with which the mark is in use in commerce and the mode or manner in which the mark is used on or in connection with such goods or services;

(2) Three specimens or facsimiles, conforming to the requirements of §§ 2.56, 2.57 and 2.58, of the mark as used in commerce; and

(3) The fee prescribed in § 2.6.

(c) The statement of use may be filed only when the applicant has made use of the mark in commerce on or in connection with all of the goods or services, as specified in the notice

of allowance, for which applicant will seek registration in that application, unless the statement of use is accompanied by a request in accordance with § 2.87 to divide out from the application the goods or services to which the statement of use pertains. If more than one item of goods or services is specified in the statement of use, the dates of use required in paragraph (b)(1) of this section need be for only one of the items specified in each class, provided the particular item to which the dates apply is designated.

(d) The title "Statement of use under § 2.88." should appear at the top of the first page of the paper.

(e) The Office will review a timely filed statement of use to determine whether it meets the following minimum requirements:

(1) The fee prescribed in § 2.6;

(2) At least one specimen or facsimile of the mark as used in commerce;

(3) A verification or declaration signed by the applicant stating that the mark is in use in commerce.

(f) A timely filed statement of use which meets the minimum requirements specified in paragraph (e) of this section will be examined in accordance with §§ 2.61 through 2.69. If, as a result of the examination of the statement of use, applicant is found not entitled to registration, applicant will be notified and advised of the reasons and of any formal requirements or refusals. The statement of use may be amended in accordance with §§ 2.59 and 2.71 through 2.75. If the statement of use is acceptable in all respects, the applicant will be notified of its acceptance.

(g) If the statement of use does not meet the minimum requirements specified in paragraph (e) of this section, applicant will be notified of the deficiency. If the time permitted for applicant to file a statement of use has not expired, applicant may correct the deficiency. After the filing of a statement of use during a permitted time period for such filing, the applicant may not withdraw the statement to return to the previous status of awaiting submission of a statement of use, regardless of whether it is in compliance with paragraph (e) of this section.

(h) The failure to timely file a statement of use which meets the minimum requirements specified in paragraph (e) of this section shall result in the abandonment of the application.

(i)(1) The goods or services specified in a statement of use must conform to those goods or services identified in the notice of allowance. An applicant may specify the goods or services by stating "those goods or services identified in the notice of allowance" or, if appropriate, "those goods or services identified in the notice of allowance except . . ." followed by an identification of the goods or services to be deleted.

(2) If any goods or services specified in the notice of allowance are omitted from the identification of goods or services in the statement of use, the Trademark Examining Attorney shall inquire about the discrepancy and permit the applicant to amend the statement of use to include any omitted goods or services, provided that the amendment is supported by a verification that the mark was in use in commerce, on or in connection with each of the goods or services sought to be included, prior to the expiration of the time allowed to applicant for filing a statement of use.

(3) The statement of use may be accompanied by a separate request to amend the identification of goods or services in the application, as stated in the notice of allowance, in accordance with § 2.71(b).

(j) The statement of use may be accompanied by a separate request to amend the drawing in the application, in accordance with §§ 2.51 and 2.72.

§ 2.89 Extensions of time for filing a statement of use.

(a) The applicant may request a six-month extension of time to file the statement of use required under § 2.88 by submitting:

(1) A written request, before the expiration of the six-month period following the issuance of a notice of allowance under section 13(b)(2) of the Act;

(2) The fee prescribed in § 2.6; and

(3) A verified statement by the applicant that the applicant has a continued bona fide intention to use the mark in commerce, specifying those goods or services identified in the notice of

allowance on or in connection with which the applicant has a continued bona fide intention to use the mark in commerce.

(b) The applicant may request further six-month extensions of time for filing the statement of use by submitting:

(1) A written request, prior to the expiration of a previously granted extension of time;

(2) The fee prescribed in § 2.6;

(3) A verified statement by the applicant that the applicant has a continued bona fide intention to use the mark in commerce, specifying those goods or services identified in the notice of allowance on or in connection with which the applicant has a continued bona fide intention to use the mark in commerce; and

(4) A showing of good cause, as specified in paragraph (d) of this section.

(c) Extensions of time under paragraph (b) of this section will be granted only in six-month increments and may not aggregate more than 24 months.

(d) The showing required by paragraph (b)(4) of this section must include:

(1) An allegation that the applicant has not yet made use of the mark in commerce on all the goods or services specified in the notice of allowance on or in connection with which the applicant has a continued bona fide intention to use the mark in commerce, and

(2) A statement of applicant's ongoing efforts to make use of the mark in commerce on or in connection with each of the goods or services specified in the verified statement of continued bona fide intention to use required under paragraph (b) of this section. Those efforts may include, without limitation, product or service research or development, market research, manufacturing activities, promotional activities, steps to acquire distributors, steps to obtain required governmental approval, or other similar activities. In the alternative, a satisfactory explanation for the failure to make such efforts must be submitted.

(e)(1) At the time of the filing of a statement of use, or during any time remaining in the existing six-month period in which a statement of use is filed, applicant may file one request, in accordance with paragraph (a) or (b) of this section, for a six-month extension of time for filing a statement of use, provided that the time requested would not extend beyond 36 months from the issuance of the notice of allowance. Thereafter, applicant may not request any further extensions of time.

(2) A request for an extension of time that is filed at the time of the filing of a statement of use, or during any time remaining in the existing six-month period in which a statement of use is filed, must comply with all the requirements of paragraph (a) of this section, if it is applicant's first extension request, or paragraph (b) of this section, if it is a second or subsequent extension request. However, in a request under paragraph (b), applicant may satisfy the requirement for a showing of good cause by asserting that applicant believes that it has made valid use of the mark in commerce, as evidenced by the submitted statement of use, but that if the statement of use is found by the Patent and Trademark Office to be fatally defective, applicant will need additional time in which to file a new statement of use.

(f) The goods or services specified in a request for an extension of time for filing a statement of use must conform to those goods or services identified in the notice of allowance. Any goods or services specified in the notice of allowance which are omitted from the identification of goods or services in the request for extension of time will be presumed to be deleted and the applicant may not thereafter request that the deleted goods or services be reinserted in the application. If appropriate, an applicant may specify the goods or services by stating "those goods or services identified in the notice of allowance" or "those goods or services identified in the notice of allowance except . . ." followed by an identification of the goods or services to be deleted.

(g) The applicant will be notified of the grant or denial of a request for an extension of time, and of the reasons for a denial. Failure to notify the applicant of the grant or denial of the request prior to the expiration of the existing period or requested extension does not relieve the applicant of the responsibility of timely filing a statement of use under § 2.88.

If, after denial of an extension request, there is time remaining in the existing six-month period for filing a statement of use, applicant may submit a substitute request for extension of time. Otherwise, the only recourse available after denial of a request for an extension of time is a petition to the Commissioner in accordance with §§ 2.66 or 2.146. A petition from the denial of a request for an extension of time to file a statement of use shall be filed within one month from the date of mailing of the denial of the request. If the petition is granted, the term of the requested six-month extension which was the subject of the petition will run from the date of the expiration of the previously existing six-month period for filing a statement of use.

43. Section 2.99 is amended by revising paragraph (g) and adding new paragraph (h) to read as follows:

§ 2.99 Application to register as concurrent user.

* * * * *

(g) Registrations and applications to register on the Supplemental Register and registrations under the Act of 1920 are not subject to concurrent use registration proceedings. Applications to register under section 1(b) of the Act of 1946 are subject to concurrent use registration proceedings only after an acceptable amendment to allege use under § 2.76 or statement of use under § 2.88 has been filed.

(h) The Trademark Trial and Appeal Board will consider and determine concurrent use rights only in the context of a concurrent use registration proceeding.

44. Section 2.101 is amended by revising paragraph (b) to read as follows:

§ 2.101 Filing an opposition.

* * * * *

(b) Any entity which believes that it would be damaged by the registration of a mark on the Principal Register may oppose the same by filing an opposition, which should be addressed to the Trademark Trial and Appeal Board. The opposition need not be verified, and may be signed by the opposer or the opposer's attorney or other authorized representative.

* * * * *

45. Section 2.111 is amended by revising paragraph (b) to read as follows:

§ 2.111 Filing petition for cancellation.

* * * * *

(b) Any entity which believes that it is or will be damaged by a registration may file a petition, which should be addressed to the Trademark Trial and Appeal Board, to cancel the registration in whole or in part. The petition need not be verified, and may be signed by the petitioner or the petitioner's attorney or other authorized representative. The petition may be filed at any time in the case of registrations on the Supplemental Register or under the Act of 1920, or registrations under the Act of 1881 or the Act of 1905 which have not been published under section 12(c) of the Act, or on any ground specified in section 14(c) or (e) of the Act. In all other cases the petition and the required fee must be filed within five years from the date of registration of the mark under the Act or from the date of publication under section 12(c) of the Act.

* * * * *

46. Section 2.129 is amended by adding new paragraph (d) to read as follows:

§ 2.129 Oral argument; reconsideration.

* * * * *

(d) When a party to an inter partes proceeding before the Trademark Trial and Appeal Board cannot prevail without establishing constructive use pursuant to section 7(c) of the Act in an application under section 1(b) of the Act, the Trademark Trial and Appeal Board will enter a judgment in favor of that party, subject to the party's establishment of constructive use. The time for filing an appeal or for commencing a civil action under section 21 of the Act shall run from the date of the entry of the judgment.

47. Section 2.133 is revised to read as follows:

§ 2.133 Amendment of application or registration during proceedings.

(a) An application involved in a proceeding may not be amended in substance nor may a registration be amended or disclaimed in part, except with the consent of the other party or parties and the approval of the Trademark Trial and Appeal Board, or except upon motion.

(b) If, in an inter partes proceeding, the Trademark Trial and Appeal Board finds that a party whose application or registration is the subject of the proceeding is not entitled to registration in the absence of a specified restriction to the involved application or registration, the Trademark Trial and Appeal Board will allow the party time in which to file a request that the application or registration be amended to conform to the findings of the Trademark Trial and Appeal Board, failing which judgment will be entered against the party.

(c) Geographic limitations will be considered and determined by the Trademark Trial and Appeal Board only in the context of a concurrent use registration proceeding.

(d) A plaintiff's pleaded registration will not be restricted in the absence of a counterclaim to cancel the registration in whole or in part, except that a counterclaim need not be filed if the registration is the subject of another proceeding between the same parties or anyone in privity therewith.

48. Section 2.161 is revised to read as follows:

§ 2.161 Cancellation for failure to file affidavit or declaration during sixth year.

Any registration under the provisions of the Act and any registration published under the provisions of section 12(c) of the Act (§ 2.153) shall be cancelled as to any goods or services recited in the registration at the end of six years following the date of registration or the date of such publication, unless within one year next preceding the expiration of such six years the registrant shall file in the Patent and Trademark Office an affidavit or declaration in accordance with § 2.20 setting forth those goods or services recited in the registration on or in connection with which the mark is in use in commerce and attaching a specimen or facsimile showing current use of the mark, or an affidavit or declaration under § 2.20 showing that its nonuse as to any goods or services recited in the registration is due to special circumstances which excuse such nonuse and is not due to any intention to abandon the mark as to those goods or services.

49. Section 2.162 is amended by revising paragraphs (e), (f), and (g) to read as follows:

§ 2.162 Requirements for affidavit or declaration during sixth year.

* * * * *

(e) State that the registered mark is in use in commerce, list the goods or services recited in the registration on or in connection with which the mark is in use in commerce, and specify the nature of such commerce (except under paragraph (f) of this section). The statement must be accompanied by a specimen or facsimile, for each class of goods or services, showing current use of the mark. If the specimen or facsimile is found to be deficient, a substitute specimen or facsimile

may be submitted and considered even though filed after the sixth year has expired, provided it is supported by an affidavit or declaration pursuant to § 2.20 verifying that the specimen or facsimile was in use in commerce prior to the expiration of the sixth year;

(f) If the registered mark is not in use in commerce on or in connection with the goods or services recited in the registration, recite facts to show that nonuse as to those goods or services is due to special circumstances which excuse such nonuse and is not due to any intention to abandon the mark as to those goods or services. If the facts recited are found insufficient, further evidence or explanation may be submitted and considered even though filed after the sixth year has expired; and

(g) Contain the statement of use in commerce or statement as to nonuse and appropriate specimen or facsimile, as required in paragraphs (e) and (f) of this section, for each class to which the affidavit or declaration pertains in this registration.

50. Section 2.181(a) is revised to read as follows:

§ 2.181 Term of original registrations and renewals.

(a)(1) Registrations issued or renewed under the Act, prior to November 16, 1989, whether on the Principal Register or on the Supplemental Register, remain in force for twenty years from their date of issue or expiration, and may be renewed for periods of ten years from the expiring period unless previously cancelled or surrendered.

(2) Registrations issued or renewed under the Act on or after November 16, 1989, whether on the Principal Register or on the Supplemental Register, remain in force for ten years from their date of issue or expiration, and may be renewed for periods of ten years from the expiring period unless previously cancelled or surrendered.

* * * * *

51. Section 2.187 is revised to read as follows:

§ 2.187 Certificate of registration may issue to assignee.

The certificate of registration may be issued to the assignee of the applicant, or in a new name of applicant, provided that the party makes a written request in the application record, by the time the application is being prepared for issuance of the certificate of registration, and an appropriate document is of record in the Assignment Search Room of the Patent and Trademark Office. If the assignment or name change document is not of record in the Assignment Search Room, then the written request must state that the document has been filed for recordation. The address of the assignee must be made of record in the application file and in the recorded document.

Aug. 2, 1989

DONALD J. QUIGG
Assistant Secretary and Commissioner
of Patents and Trademarks

PATENT NOTICES

Certificates of Correction For Week of October 3, 1989

D. 265,653	4,780,326	4,804,726	4,819,741
4,076,644	4,780,411	4,805,125	4,819,896
4,370,175	4,783,947	4,805,157	4,820,292
4,509,249	4,784,693	4,805,286	4,820,519
4,574,928	4,785,311	4,805,625	4,820,773
4,589,184	4,785,579	4,805,742	4,820,790
4,623,366	4,786,474	4,805,874	4,820,969
4,627,053	4,786,567	4,806,208	4,821,086
4,668,936	4,786,828	4,806,797	4,821,261
4,706,455	4,786,882	4,807,250	4,821,682
4,729,876	4,786,932	4,807,253	4,821,833
4,731,850	4,788,278	4,807,540	4,821,969
4,732,686	4,788,718	4,807,559	4,822,408
4,735,097	4,788,737	4,808,325	4,822,428
4,735,390	4,789,662	4,808,498	4,822,521
4,735,964	4,789,724	4,808,550	4,822,602
4,736,349	4,790,549	4,808,681	4,822,882
4,738,581	4,790,749	4,808,848	4,822,904
4,740,471	4,791,078	4,809,334	4,823,066
4,740,567	4,792,896	4,809,375	4,823,417
4,744,406	4,794,079	4,809,928	4,823,421
4,751,078	4,794,241	4,811,132	4,824,444
4,751,958	4,794,535	4,811,529	4,824,459
4,753,289	4,796,316	4,812,362	4,825,162
4,758,082	4,796,718	4,813,039	4,825,985
4,759,950	4,798,753	4,813,992	4,826,569
4,763,538	4,798,800	4,814,736	4,826,734
4,766,161	4,798,838	4,814,820	4,826,973
4,767,423	4,799,262	4,815,418	4,827,004
4,767,928	4,800,513	4,815,937	4,827,247
4,771,622	4,800,969	4,816,343	4,827,673
4,771,782	4,801,495	4,817,321	4,828,133
4,775,722	4,802,181	4,817,502	4,829,338
4,777,120	4,802,199	4,817,695	4,829,398
4,777,209	4,802,682	4,817,717	4,829,908
4,777,808	4,802,824	4,818,167	4,830,558
4,777,917	4,803,383	4,818,950	4,830,695
4,778,665	4,803,592	4,819,096	
4,779,551	4,803,800	4,819,511	

SPECIAL BOXES FOR MAIL

Special PTO mail box numbers should be used to allow forwarding of particular types of mail to the appropriate areas as quickly as possible. Such mail is forwarded directly to the appropriate area without being opened. Only the specified type of document should be placed in an envelope addressed to one of these boxes. If any documents other than the specified type identified for each box are addressed to that box, they will be delayed in reaching the appropriate area for which they are intended.

The following special boxes should be used only for their specified purpose. Address mail as follows:

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Box 3	Mail for the Office of Personnel from NFC.
Box 4	Mail for the Assistant Commissioner for External Affairs and the Office of Legislation and International Affairs.
Box 5	"No fee" mail related to trademarks.
Box 6	Mail for the Office of Procurement.
Box 7	Reissue applications for patents involved in litigation and subsequently filed related papers.
Box 8	All papers for the Office of the Solicitor except communications relating to pending litigation.
Box 9	Coupon orders for U.S. patent and trademark copies.
Box 10	Orders for certified copies of patent and trademark applications.
Box 11	Electronic Ordering Service (EOS).
Box 12	Contributions to the Examiner Education Program.
Box 13	Mail for the Employee and Labor Relations Division.
Box AF	Expedited procedure for processing amendments and other responses after final rejection.
Box FWC	Requests for File Wrapper Continuation Applications.
Box Interference	Communications relating to interferences and applications and patents involved in interference.
Box Issue Fee	All communications following the receipt of a PTOL-85, "Notice of Allowance and Issue Fee Due," and prior to the issuance of a patent should be addressed to Box Issue Fee, unless advised to the contrary. Assignments are the exception. Assignments should be submitted in a separate envelope and not be sent to Box Issue.
Box M. Fee	Correspondence related to a patent that is subject to the payment of a maintenance fee.
Box Non Fee	Non-fee amendments to patent applications. (Use Box AF for responses after final rejection.)
Box OED	Mail for the Office of Enrollment and Discipline.
Box Pat. Ext.	Applications for patent term extension.
Box PCT	Mail related to applications filed under the Patent Cooperation Treaty.
Box Reexam	Mail related to Reexamination.
Box SN	For fee and petitions under 37 CFR 1.182 to obtain date received and/or serial number for patent application prior to the Office's standard notification (return post card or the official "Filing Receipt," "Notice to File Missing Parts," or "Notice of Incomplete Application").
PATENT APPLICATION	New patent application and associated papers and fees.
TRADEMARK APPLICATION	New trademark application and associated papers and fees.
Box Assignments	All assignment documents except those filed in new patent applications.

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The following libraries, designated as Patent Depository Libraries (PDLs), receive current issues of U.S. Patents and maintain collections of earlier-issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections, which are organized in patent number sequence, are available for use by the public free of charge. Each of the PDLs, in addition, offers supplemental reference publications of the U.S. Patent Classification System, including the *Manual of Classification*, *Index to the U.S. Patent Classification*, *Classification Definitions*, and provides technical staff assistance in their use to aid the public, in gaining effective access to information contained in patents. CASSIS (Classification And Search Support Information System), which provides direct, on-line access to Patent and Trademark Office data, is available at all PDLs. Facilities for making paper copies of patents from either microfilm or paper collections are generally provided for a fee.

Since there are variations in the scope of patent collections among the PDLs and in their hours of service to the public, anyone contemplating use of the patents at a particular library is urged to contact that library, in advance, about its collection and hours in order to avert possible inconvenience.

State	Name of Library	Telephone Contact
Alabama	Auburn University Libraries	(205) 844-1747
	Birmingham Public Library	(205) 226-3680
Alaska	Anchorage: Z. J. Loussac Public Library	(907) 261-2916
Arizona	Tempe: Noble Library, Arizona State University	(602) 965-7607
Arkansas	Little Rock: Arkansas State Library	(501) 682-2053
California	Los Angeles Public Library	(213) 612-3273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale Patent Clearinghouse	(408) 730-7290
Colorado	Denver Public Library	(303) 571-2347
Connecticut	New Haven: Science Park Library	(203) 786-5447
Delaware	Newark: University of Delaware Library	(302) 451-2965
Dist. of Columbia	Washington: Howard University Libraries	(202) 636-5060
Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami-Dade Public Library	(305) 375-2665
	Orlando: University of Central Florida Libraries	(407) 275-2562
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 269-2865
	Springfield: Illinois State Library	(217) 782-5430
Indiana	Indianapolis-Marion County Public Library	(317) 269-1741
Iowa	Des Moines: State Library of Iowa	(515) 281-4118
Kentucky	Louisville Free Public Library	(502) 561-8617
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library and Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 376
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4281
Nebraska	Lincoln: Engineering Library, University of Nebraska-Lincoln	(402) 472-3411
Nevada	Reno: University of Nevada-Reno Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7782
	Piscataway: Library of Science and Medicine, Rutgers University	(201) 932-2895
New Mexico	Albuquerque: University of New Mexico General Library	(505) 277-4412
New York	Albany: New York State Library	(518) 473-4636
	Buffalo and Erie County Public Library	(716) 858-7101
	New York Public Library (The Research Libraries)	(212) 714-8529
North Carolina	Raleigh: D.H. Hill Library, North Carolina State University	(919) 737-3280
Ohio	Cincinnati and Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 292-6175
	Toledo/Lucas County Public Library	(419) 259-5212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 744-7086
Oregon	Salem: Oregon State University	(503) 378-4239
Pennsylvania	Philadelphia, The Free Library of	(215) 686-5331
	Pittsburgh, Carnegie Library of	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 455-8027
South Carolina	Charleston: Medical University of South Carolina Library	(803) 792-2371
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	Dallas Public Library	(214) 670-1468
	Houston: The Fondren Library, Rice University	(713) 572-8101 Ext.2587
	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Utah	Richmond: Virginia Commonwealth University Library	(804) 367-1104
Virginia	Seattle: Engineering Library, University of Washington	(206) 543-0740
Washington	Madison: Kurt F. Wendt Library, University of Wisconsin	(608) 262-6845
Wisconsin	Madison	(608) 262-6845
	Milwaukee Public Library	(414) 278-3247

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner
JAMES E. DENNY, Deputy Assistant Commissioner
CONDITION OF PATENT APPLICATIONS AS OF August 26, 1989

PATENT EXAMINING GROUPS

Actual Filing Date of Oldest
New Case Awaiting Action

CHEMICAL EXAMINING GROUPS

GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	5-26-87
ORGANIC CHEMISTRY GROUP 120—S. N. ZAHARNA, Director	6-16-87
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	4-15-87
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	5-14-87
BIOTECHNOLOGY, GROUP 180—J. E. KITTLE, Director	7-30-86

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INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—G. SHAW, Acting Director	5-12-87
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ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director	8-18-87
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	7-2-87
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SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	2-26-88
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	10-3-88

Expiration of patents: The patents within the range of numbers indicated below expire during August 1989, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents	Numbers 3,680,149 to 3,688,313 inclusive
Plant Patents	3,245 to 3,261 inclusive

STATUTORY INVENTION REGISTRATIONS

PUBLISHED OCTOBER 3, 1989

A statutory invention registration is not a patent. It has the defensive attributes of a patent but does not have the enforceable attributes of a patent. No article or advertisement or the like may use the term patent, or any term suggestive of a patent, when referring to a statutory invention registration. For more specific information on the rights associated with a statutory invention registration see 35 U.S.C. 157.

II682

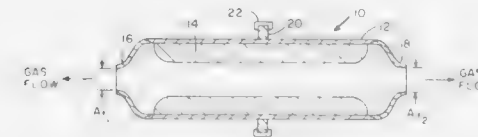
EROSION RATE DETERMINATOR: ROCKET NOZZLE
Robert E. Betts, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 27, 1989, Ser. No. 316,199

Int. Cl.⁴ G01N 17/00

U.S. Cl. 73—86

3 Claims



1. A method for the determination and the evaluation of the erosion rate of a rocket nozzle, said method comprising:

- (i) providing a first nozzle constructed of carbon, or molybdenum or other non-eroding material and designed to a predetermined coefficient of thrust C_{F1} and area of throat A_{t1} ;
- (ii) providing a second nozzle constructed of components of phenolics filled with glass or asbestos or an eroding metal material and designed to a predetermined coefficient of thrust C_{F2} and area of throat A_{t2} said C_{F2} equal to said C_{F1} and said A_{t1} equal to said A_{t2} ;
- (iii) providing a rocket motor comprising a rocket motor case with a solid propellant grain contained within said rocket motor case, said rocket motor case adapted for attachment of said first nozzle and said second nozzle in a dual nozzle arrangement whereby said solid propellant grain when fired discharges products of combustion at an equal rate of force F_1 and F_2 through each of said nozzles initially, and when said A_{t2} of said second nozzle erodes, said F_2 is greater than said F_1 ;
- (iv) fitting said rocket motor case containing solid propellant grain with said first nozzle and said second nozzle to provide a balanced thrust and flow rate of said products of combustion at initial firing of said propellant grain;
- (v) providing means for measuring thrust and pressure simultaneously; and
- (vi) firing said solid propellant grain to generate products of combustion to achieve a mass discharge rate at any time (T) equal to $M = P_c A_t (total) C_D$, wherein C_D is coefficient of discharge, A_t total equals $A_{t1} + A_{t2} + \Delta A_{t2}$, and wherein erosion is correlated to mass flow rate of said solid rocket motor at any time (T) by the relationship $F_2 = P_{c2} (A_{t2} + \Delta A_{t2}) C_{F2}$ wherein P_{c2} is chamber pressure, A_{t2} is throat area, ΔA_{t2} is change in throat area due to erosion, and C_{F2} is the thrust coefficient, and the erosion rate of said eroding nozzle is determined and evaluated as a result of the increase of thrust and flow rate which results in an imbalance because of erosion products and change in value of said A_{t2} plus ΔA_{t2} .

II683

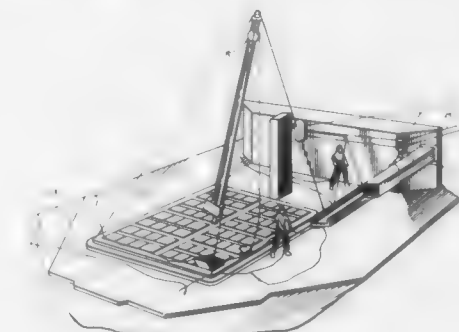
METHOD FOR RELOADING A VERTICAL LAUNCHING SYSTEM WITH MISSILES FROM A SUPPLY SHIP
James E. Brubaker, Pittsburgh, Pa., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 27, 1989, Ser. No. 315,755

Int. Cl.⁴ F41F 3/04, 9/00

U.S. Cl. 89—1.802

14 Claims



1. A method of loading a cell of a vertical launching system missile launcher on a combatant ship with a canistered missile from a supply ship comprising the steps of:

- (a) transferring the canistered missile from the supply ship to a fixed guide on the deck of the combatant ship;
- (b) upending the canistered missile in the guide;
- (c) moving the upended canistered missile away from the guide to a position over the cell of the missile launcher; and
- (d) lowering the canistered missile into the cell.

II684

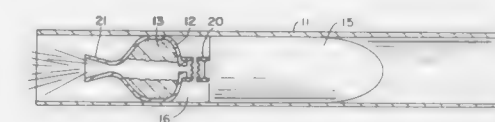
VENTED IN-TUBE BURNING ROCKET
Jerrold H. Arszman; Albert R. Maykut, both of Huntsville, and John M. Tate, Arab, all of Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 11, 1988, Ser. No. 256,796

Int. Cl.⁴ F42B 15/10

U.S. Cl. 102—377

3 Claims



1. A rocket for firing from a tube having open ends, comprising

- (a) a motor containing a propellant and having in a rear end thereof a nozzle for discharge of combustion products formed when the propellant is burned, said motor having a front end containing a vent for venting a portion of said combustion products into the tube in front of the motor,
- (b) a projectile positioned in front of and spaced from the motor, and
- (c) a frangible collar secured to and positioned between the motor and the projectile, said collar surrounding said vent

and being provided with a port for allowing vented combustion products to flow into the tube between the motor and the projectile.

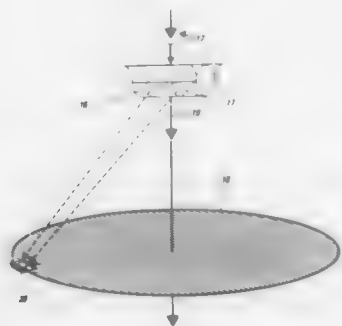
H661

DEPLOYABLE FIN CONFIGURATION FOR FREE FLIGHT CONTROL OF CYLINDRICAL BODIES

Donald N. Olson, Lutherville, and Miles C. Miller, Joppatown, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Jun. 20, 1988, Ser. No. 209,258
Int. Cl.⁴ F42B 13/32

U.S. Cl. 244—3.29

2 Claims



1. A deployable fin configuration for free flight control of an elongated cylindrical body comprising:

two fins, longitudinally attached on opposite sides of the said cylindrical body and along the whole length of the said cylindrical body, said fins angularly positioned on the same side of said cylindrical body and curved in a 90 degree arc concave against airflow, whereby, when said cylindrical body descends in flight it always lands on the side of said body opposite said fins.

H666

ELECTRO-OPTICAL LIGHT MODULATOR FOR PROTECTION OF OPTICAL SYSTEMS AGAINST PULSED LASERS

William D. Mullins, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 7, 1988, Ser. No. 268,313
Int. Cl.⁴ G02F 1/13; G02B 5/30

U.S. Cl. 350—352

14 Claims



1. A device for protecting optical systems from pulsed laser radiation, comprising:

an electro-optic shutter for alternating between clear state and dark state to respectively admit or inhibit radiation, a shutter control circuit coupled to drive said shutter to cause said shutter to alternate between the clear and dark states, a housing for containing said control circuit and means for mounting said shutter on an optical system such that said electro-optic shutter is disposed between the optical system to be protected and impinging radiation.

H667

VIDEO MICROIMAGING SYS. EM

C. Denton Marrs, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 17, 1989, Ser. No. 341,599
Int. Cl.⁴ G01N 21/32; G01B 11/26

U.S. Cl. 356—237

4 Claims



2. A non-destructive testing method for detecting and observing sites of optical surface defect in an optical element, comprising the steps of:

illuminating an optical sample by means of a coherent source at an intensity which is below the damage threshold for the optical sample being tested;
collecting non-specular light, reflected in a predetermined direction from said optical sample, in a short focal length telescope which produces a magnified image of said optical sample;
recording the magnified image provided by said short focal length telescope; and
reproducing the recorded image for viewing by an observer, wherein sites of optical defect will appear as bright spots on the surface of the optical sample.

H668

PROCESS FOR SURFACE MODIFICATION OF POLYETHYLENE TEREPHTHALATE FILM

Warren S. Sobatka, Circleville, Ohio, and William R. Wolfe, Jr., Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 16, 1988, Ser. No. 207,536
Int. Cl.⁴ C07C 3/24; C08F 2/52

U.S. Cl. 204—165

12 Claims

1. A process for treating a polyester film with a corona discharge in an apparatus comprising at least one electrode and a housing provided with a means for admitting a gas and substantially excluding ambient air, comprising the steps of:

(a) providing an atmosphere, within the housing, of nitrogen containing up to about 350 parts per million molecular oxygen;
(b) adjusting the energy density of the corona discharge to a value of about 90 to about 140 watts per square inch;
(c) continuously passing said film through said housing; and
(d) exposing said film, within said housing provided with said nitrogen atmosphere, to said corona discharge, wherein the exposure of said film to said corona discharge is from about 2 to about 64 watt minutes of corona energy per square foot of film.

H669

FUEL PIN

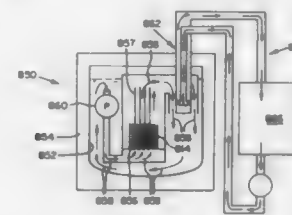
David W. Christiansen, Kennewick; Richard A. Karneaky, Richland; Robert D. Leggett, Richland, and Ronald B. Baker, Richland, all of Wash., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 24, 1987, Ser. No. 124,709

Int. Cl.⁴ G21C 3/00

U.S. Cl. 376—361

21 Claims



1. A fuel pin for a liquid metal nuclear reactor comprising: a generally cylindrical cladding member; and metallic fuel material disposed within said cladding member, with at least a portion of said fuel material extending radially outwardly to the inner diameter of said cladding member, said fuel material defining at least one void space to facilitate swelling of said fuel material during fission.

H690

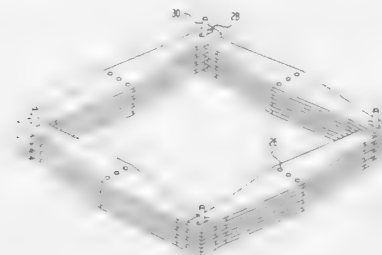
DEVICE TO ALLOW FOR EXPANSION OF NUCLEAR FUEL ASSEMBLIES

Alfred J. Martenson, Richland, Wash., assignor to Advanced Nuclear Fuels Corporation, Bellevue, Wash.

Filed Sep. 30, 1988, Ser. No. 252,293
Int. Cl.⁴ G21C 3/02

U.S. Cl. 376—445

1 Claim



1. A fuel assembly for a nuclear reactor comprising:

a bundle of fuel rods;
an upper tie plate assembly arranged at the upper end of said bundle, said tie plate assembly comprising:
an upper tie plate having holes to receive tie rods forming part of said bundle and openings for the flow therethrough of cooling water;
a plurality of lower side members mounted on and bounding said tie plate;
a plurality of spring seats mounted on said lower side members, one spring seat being located at each corner of said tie plate;
a plurality of upper side members mounted on said spring seats, one upper side member being mounted at each side of said tie plate and spaced above said lower side members;
a plurality of leaf springs mounted above said lower side members and below said upper side members, said leaf springs having their ends located within said spring seats and being formed of a plurality of superposed leaves, said

springs being bowed upwardly at their midpoints when in an unstressed condition;
a plurality of sliders supported by said upper side members, one of said sliders engaging the upper surface of each of said springs adjacent its midpoint, and each of said sliders being adapted to engage a fixed portion of said reactor, whereby on expansion of said assembly, said sliders bend springs through positions in which they are substantially flat to positions in which they are downwardly bowed;
said leaf springs being mounted within said spring seats in such a manner that the ends of said springs are free to accommodate extension of said springs as the midpoints of said springs are depressed by said sliders.

H691

HEAT DEVELOPABLE PHOTOGRAPHIC ELEMENT

Hiroshi Kitaguchi, and Masatoshi Kato, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Japan

Continuation of Ser. No. 809,627, Dec. 16, 1985, abandoned.

This application Feb. 1, 1988, Ser. No. 153,535

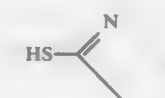
Claims priority, application Japan, Dec. 20, 1984, 59-268926

Int. Cl.⁴ G03C 5/54, 1/34

U.S. Cl. 430—203

9 Claims

1. A heat-developable photographic element comprising a support having thereon (a) a light-sensitive layer comprising a light-sensitive silver halide and a binder, (b) a dye fixing layer fixing a released and then diffused mobile dye comprising a mordant, and (c) a dye providing substance releasing a mobile dye on heat-development, a base precursor and a photographic reagent capable of releasing a compound represented by the general formula (I) by reaction with a base:



(I)

wherein Y is an atomic group necessary for forming a 5-, 6- or 9-membered heterocyclic ring.

H692

PEST CONTROL

Michael D. Matthewson, and Gerald G. Blackman, both of Berkhamsted, England, assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Continuation of Ser. No. 365,532, Apr. 5, 1982, which is a division of Ser. No. 213,930, Dec. 8, 1980, abandoned, which is a continuation of Ser. No. 29,337, Apr. 12, 1979, abandoned, which is a continuation of Ser. No. 863,736, Dec. 23, 1977, abandoned.

This application Oct. 27, 1987, Ser. No. 151,237

Int. Cl.⁴ A61K 31/275

U.S. Cl. 514—52

1 Claim

1. A method of repelling flies from an animal which comprises depositing on said animal a non-toxic effective fly repellent amount of (—)-α-cyano-3-phenoxybenzyl-(+)-cis-2,2-dimethyl-3-(2,2-dibromovinyl) cyclopropane-1-carboxylate.

H693

PYX TWISTER WITH SUPERCONDUCTING CONFINEMENT

Herbert A. Leupold, Eatontown, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 24, 1989, Ser. No. 316,374

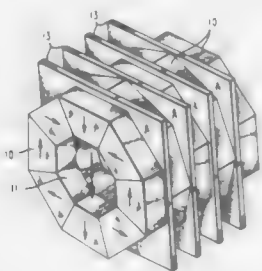
Int. Cl.⁴ H01F 7/02; H01J 25/22

U.S. Cl. 335—216

3 Claims

1. A magnetic structure comprising a plurality of hollow substantially cylindrical flux sources, each having a generally centrally disposed hole therethrough, arranged concentrically on an elongate axis with said holes in substantial registration along said axis to define an elongate axial passage extending

through said structure; each respective hollow substantially cylindrical flux source displaced radially on said elongate axis from its respective adjacent source so as to produce a helically



oriented magnetic field; and superconducting sheets interspersed between adjacent flux sources and also covering the end faces of the array.

H0594

MOVABLE THERMAL AND RADAR VEHICULAR DECOY

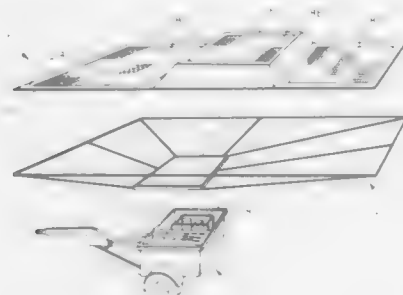
Edward H. Czajkowski, Jr., Ellicott City, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 24, 1988, Ser. No. 172,533

Int. Cl.⁴ H04K 3/00

U.S. Cl. 342-13

1 Claim



1. A decoy for misleading thermal and radar sensors in search of a target having particular thermal and radar wave reflection signatures, the decoy adapted to be readily towed by a to-be-protected armor vehicle and comprising:

movable trailer means for providing total mobility and performing the proposed decoy target operation during transportability; the movable trailer means including power means and means for controlling the energy supplied by the power means;

a platform positioned above the trailer means;

frame means interposed between the platform and the trailer means for rigidly supporting the platform on the trailer means;

the frame means being a plurality of tubular members cantilevered to a base member for providing air circulation to the power means and to the energy control means;

a platform positioned above the trailer means; the top surface of the platform being covered by a layer of millimeter radar wave reflective material, the platform having at least one upraised section including a number of substantially vertical surfaces for reflecting radar energy projected thereto;

a plurality of heat generating means positioned on top of the platform at selected portions thereof, the heat generating means including thermal panel means having a heat output corresponding to the amount of current supplied by the power means;

each of the thermal panel means being independently powered by the power means via the energy control means; wherein the plurality of heat generating means produces a contrasting heat pattern substantially representative of the thermal signature of the target;

the heat generating means being powered by the power means, the amount of heat generated by each of the heat generating means being regulated by the energy control means;

wherein the combination of the heat generating means and the platform produces the thermal and radar wave reflection signatures for identifying the decoy as the target to the sensors.

H0595

HIGH ENERGY OPTICALLY CONTROLLED KILOVOLT SEMICONDUCTOR SWITCH

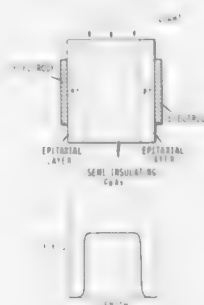
Maurice Weiner, Ocean; Lawrence J. Bovino, Eatontown; Terence Burke, Ocean, and Anderson H. Kim, Eatontown, all of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 23, 1987, Ser. No. 111,746

Int. Cl.⁴ H01L 27/14; H01J 40/14

U.S. Cl. 357-30

11 Claims



1. A high energy, optically controlled kilovolt semiconductor switch comprising a bulk piece of high resistivity semiconductor for illumination by a high speed laser, said semiconductor having a thick highly doped epitaxial layer of P+ impurity grown on one side of the semiconductor, and a thick highly doped epitaxial layer of N+ impurity grown on the opposite side of the semiconductor with metallic electrodes deposited on the respective epitaxial layers.

H0596

SYSTEM FOR ACCESSING SHARED RESOURCE DEVICE BY INTELLIGENT USER DEVICES

Willard S. Davidson, Ramsey, Minn., assignor to CPT Corporation, Minneapolis, Minn.

Continuation of Ser. No. 627,001, Jul. 3, 1984, abandoned. This application Sep. 10, 1987, Ser. No. 96,278

Int. Cl.⁴ G06F 1/00; H04J 3/17; G05B 23/02

U.S. Cl. 364-900

14 Claims

MICROFICHE APPENDIX INCLUDED

(3 Microfiche, 139 Pages)

1. A shared resource system for sharing at least one or more remote high performance peripheral devices such as a fixed disk drive, the shared resource system comprising:

(a) a plurality of intelligent user devices including processor means for word processing and data processing;

(b) a high speed serial synchronous data link interconnecting the remote high performance peripheral devices to each of the user devices;

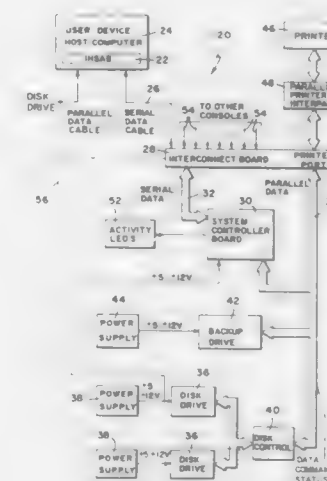
(c) a unique intelligent high speed adaptor board means electrically interconnected to each of the user device for receiving via parallel interface bus means requests to use any one of the high performance peripheral devices origi-

nated at the user devices and transmitting the requests on the serial synchronous data link such that each of the user devices is interconnected to its own unique intelligent high speed adaptor board means;

(d) a system controller board means electrically interconnected to the high performance peripheral devices of the shared resource system for receiving the requests transmitted on the high speed serial synchronous data link by the intelligent high speed adaptor board means and transmitting the requests to the high performance peripheral device via parallel interface bus means, the system controller board means being interconnected to a plurality of the intelligent high speed adaptor board means by a plurality of ports, the system controller board means further including polling means for periodically polling each of the ports to ascertain whether the intelligent high speed adaptor board means electrically interconnected to the respective port being polled has any requests for any of the high performance peripheral devices, the system controller board means including switch means for switching to the high performance peripheral device requested, the system controller board further including means for receiving the results of any operations performed at the high performance peripheral devices and transmitting the results so as received on the high speed serial synchronous data link to the intelligent high speed adaptor board means making the request; and

(e) the intelligent high speed adaptor board means including means for receiving the results transmitted on the high speed serial synchronous data link and for transmitting the results so received to the user devices via the parallel

interface, whereby multiple user device such as word processing and data processing devices can operate with



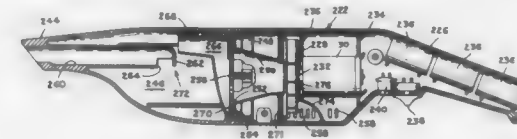
shared or dedicated high performance peripheral devices without substantial modifications.

REISSUES

OCTOBER 3, 1989

Matter enclosed in heavy brackets [] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue

Re. 33,074
WET-DRY VACUUM CLEANER
 Morris M. Levine, Scarsdale, N.Y., assignor to CIC Int'l Corp., New York, N.Y.
 Original No. 4,542,557, dated Sep. 24, 1985, Ser. No. 627,899, Jul. 5, 1984. Continuation-in-part of Ser. No. 587,227, Mar. 7, 1984, Pat. No. 4,536,914. Application for reissue Sep. 23, 1987, Ser. No. 100,239
 The portion of the term of this patent subsequent to Aug. 27, 2002, has been disclaimed.
 Int. Cl.⁴ A47L 5/24, 7/00
 U.S. Cl. 15—344 13 Claims

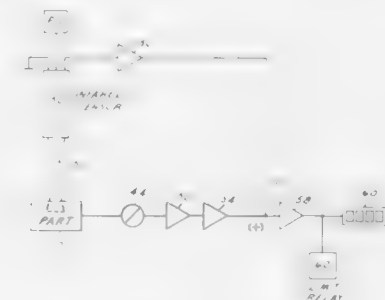


8. A vacuum cleaner comprising:
 a housing having a front end and a back end,
 a motor positioned in said housing,
 a blower driven by said motor and disposed within said housing,
 rotation of said blower producing a vacuum,
 a canister removably attached to said front end of said housing,
 said canister having an intake nozzle for reception of dirt, liquid and air drawn into said nozzle in response to a vacuum developed by said blower,
 said canister including a chamber for storage of the dirt and liquid drawn in through said nozzle,
 air conduit means disposed upstream of said blower and guiding the air stream from said canister to said blower, said air conduit means communicating with an entry port for receiving air from said canister,
 said entry port comprising a protrusion extending from said air conduit means into said canister to an opening in the protrusion offset from the location of said chamber so as to be above said chamber and inhibit the passage of any of the liquid from said chamber into said air conduit means when said vacuum cleaner is oriented with a horizontal orientation placing said chamber beneath said nozzle, and
 deflection means in said canister positioned adjacent said nozzle for separating liquid and dirt drawn in through said nozzle away from said air stream and directing said liquid and dirt into said chamber while permitting air flow into said opening of said entry port communicating with said air conduit means.

Re. 33,075
METHOD AND APPARATUS FOR DETECTING LEAKS
 Albert E. Holm, Marine City, and Grant A. Holm, St. Clair, both of Mich., assignors to Testrite, Inc., Marine City, Mich.
 Original No. 4,625,545, dated Dec. 2, 1986, Ser. No. 720,037, Apr. 5, 1985. Application for reissue Nov. 29, 1988, Ser. No. 277,278
 Int. Cl.⁴ G01M 3/26
 U.S. Cl. 73—40 14 Claims

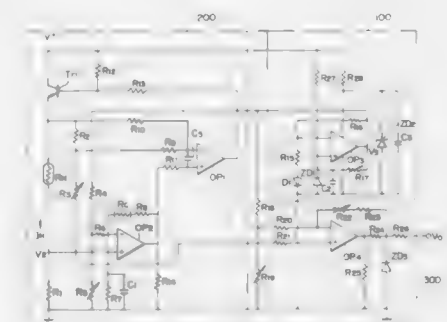
11. A method of quickly determining leakage of a succession of parts being manufactured in a production environment comprising the steps of:
 a. temporarily attaching a releasible connector successively to each part to sealingly define a test chamber at least partially bounded by the part;
 b. applying gas pressure to the test chamber;

c. generating a pressure signal representative of the pressure in the test chamber;
 d. remotely sensing the infrared radiation from a surface of the part and generating a radiation signal representative of the radiation;



e. comparing the two signals at at least two points in time to determine chamber leakage; and
 f. disconnecting the releasible connector from the part.

Re. 33,076
AIR FLOW METER CIRCUIT WITH TEMPERATURE COMPENSATION CIRCUIT
 Noboru Sugiura, Mito, Japan, assignor to Hitachi, Ltd., Tokyo, Japan
 Original No. 4,581,929, dated Apr. 15, 1986, Ser. No. 667,134, Nov. 1, 1984. Application for reissue Apr. 15, 1987, Ser. No. 38,703
 Claims priority, application Japan, Nov. 4, 1983, 58-205795
 Int. Cl.⁴ G01F 1/68
 U.S. Cl. 73—204.15 12 Claims



1. An air flow meter circuit comprising:
 an air flow rate detection circuit for generating an output signal in accordance with an air flow rate;
 an output circuit for receiving the output signal of said air flow rate detection circuit as an input signal and amplifying the input signal to produce an output signal whose value is so adjusted as to be related to the value of the input signal in a predetermined relationship;
 a constant voltage circuit for supplying as an output signal a predetermined constant voltage to said detection and output circuits; and
 temperature compensation means for adjusting the temperature coefficient of the output signal of said constant voltage circuit such that temperature coefficients of said detection and output circuits are cancelled out to substan-

tially zero a change in the output signal of said output circuit due to a change in the temperature of the entirety of said air flow meter circuit.

Re. 33,077

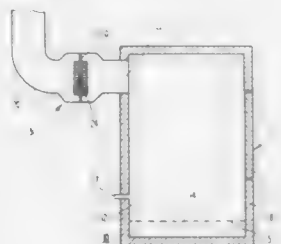
WOOD BURNING STOVE

Robert V. Van Dewoestine, Caton, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Original No. 4,373,452, dated Feb. 15, 1983, Ser. No. 353,834, Mar. 1, 1982. Continuation-in-part of Ser. No. 173,155, Jul. 28, 1980. Application for reissue Jan. 30, 1985, Ser. No. 858,650

Int. Cl.⁴ F23J 15/00

U.S. Cl. 110—203



19. In a woodburning stove of the type having:
a combustion chamber, and a flue for removing exhaust gas from said chamber, the improvement comprising:
a ceramic catalytic converter for oxidizing oxidizable species in said exhaust, located in said woodburning stove, at a location wherein the temperature produced by heat liberated from fuel being combusted in said combustion chamber is sufficiently high to light off and sustain the catalytic oxidation of the volatiles in the exhaust, free of any external source of heat other than heat liberated from fuel being combusted in said combustion chamber.

Re. 33,078

OPTICAL CONFIGURATION OF FIBER OPTIC SENSOR FOR SYMMETRIC DYNAMIC RESPONSE ABOUT THE OPTICAL NULL

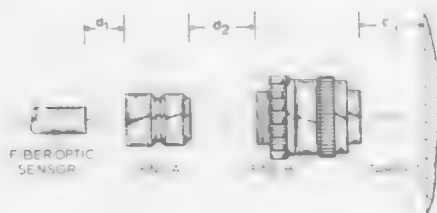
Gregory Hull-Allen, Jupiter, Fla., assignor to Mechanical Technology Incorporated, Latham, N.Y.

Original No. 4,711,577, dated Dec. 8, 1987, Ser. No. 49,005, May 7, 1987. Continuation of Ser. No. 709,560, Mar. 8, 1985, abandoned. Application for reissue May 18, 1988, Ser. No. 195,493

Int. Cl.⁴ G01B 11/14

U.S. Cl. 356—373

5 Claims



2. A method of determining the displacement of a fiber optic sensor from a target comprising the steps of:
positioning a first lens at a fixed distance from said target;
positioning a second lens at a first variable distance from said first lens;
positioning a fiber optic sensor at a second variable distance from said second lens; and
selecting values for said first and second variable distances whereby reflected light is guided from said target to receiving

fibers in said fiber optic sensor such that a curve of received optical power versus axial motion in a direction perpendicular to a face of said target is symmetrical about a null point which represents an in focus condition.

Re. 33,079

HOMOPOLYMERIZATION OF ACETYLENE SUBSTITUTED POLYIMIDE POLYMERS

26 Claims Norman Bilow, Los Angeles; Abraham L. Landis, Northridge, and Leroy J. Miller, Canoga Park, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

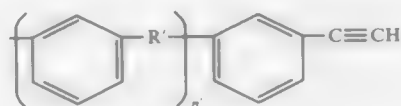
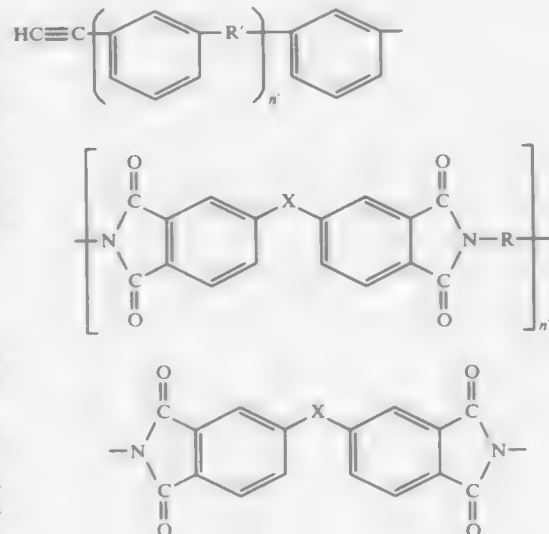
Original No. 3,879,349, dated Apr. 22, 1975, Ser. No. 415,083, Nov. 12, 1973. Continuation-in-part of Ser. No. 413,473, Nov. 6, 1973, Pat. No. 3,845,018, which is a continuation-in-part of Ser. No. 347,501, Apr. 3, 1973, abandoned. Application for reissue Mar. 5, 1979, Ser. No. 16,451

Int. Cl.⁴ C08G 8/02, 14/00

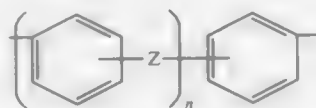
U.S. Cl. 528—125

8 Claims

1. A cured resin derived by the homopolymerization of acetylene substituted polyimide oligomer having the following general structure:



wherein R is



wherein Z is O, CH₂, S, CO, SO₂-CF₂-m, or -CF₂-O-CF₂-, and wherein n is 0-5, m is 0-5, and wherein R' is O, S, CO, CH₂, SO₂, -CF₂-m, or -CF₂-O-CF₂-, and wherein X is O, S, CH₂, CO, SO₂-CF₂-m, or -CF₂-O-CF₂-, and wherein n' [is 0] average about 1 to 5 and n'' is 0 to 5.

Re. 33,080

ADAMANTANE CATALYZED PARAFFIN ISOMERIZATION

George M. Kramer, Berkeley Heights, N.J., assignor to Exxon Research and Engineering Company, Florham Park, N.J.

Original No. 4,357,483, dated Nov. 2, 1982, Ser. No. 298,117, Aug. 31, 1981. Continuation of Ser. No. 630,440, Jul. 13, 1984, abandoned. Application for reissue Aug. 14, 1986, Ser. No. 858,228

Int. Cl.⁴ C07C 5/13

U.S. Cl. 585—740

11 Claims

1. An isomerization process comprising contacting a C₄-C₆ non-cyclic paraffinic hydrocarbon with a strong acid system selected from HBr, HF, HCl, H₂SO₄, HSO₃F, CF₃SO₃H and mixture thereof in the presence of an adamantane hydrocarbon containing at least one unsubstituted bridgehead position, wherein the molar concentration of the adamantane hydrocarbon in solution in the paraffin hydrocarbon is from about 0.1M to 1M at a temperature of about -100° to 150° C., thereby producing a branched isomer of said paraffinic hydrocarbon.

Re. 33,081

AUTOMATIC FOCUSING SYSTEM FOR VIDEO CAMERAS

Toshio Murakami, and Kentaro Hanma, both of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Original No. 4,531,158, dated Jul. 23, 1985, Ser. No. 460,664, Jan. 24, 1983. Application for reissue Jul. 17, 1987, Ser. No. 74,938

Int. Cl.⁴ H04N 3/26

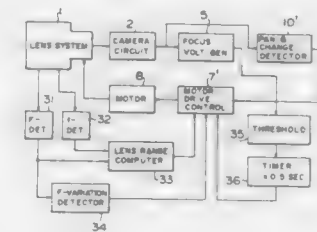
U.S. Cl. 358—227

24 Claims

17. An automatic focusing system for a video camera comprising:
(a) means for providing a focus signal on the basis of a video signal of an object being photographed by the video camera;
(b) lens-system position control means including a motor for controlling the position of a lens system in response to said

focus signal thereby bringing the lens system to a focus position;

- (c) picture-contents change detecting means for detecting a change of the contents of the object;
(d) motor drive control means for controlling driving of said motor in response to the output signal of said picture-contents change detecting means; and
(e) said picture-contents change detecting means including at least one of picture-contents change indication signal generating means including a low-pass filter having a low cut-off frequency and a level comparator for generating a signal



indicative of a change of the picture contents by detecting a change of the level of the output signal of said low-pass filter through which the video signal from the object is passed, reduction-factor change detecting means for generating such a picture-contents change indication signal on the basis of a change of the output voltage of a detector detecting the reduction factor of the video camera, and momentary change detecting means for generating such a picture-contents change indication signal by detecting an abrupt change of the focusing signal generated from said focusing signal providing means.

PLANT PATENTS

GRANTED OCTOBER 3, 1989

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

7,043
DISTINCT VARIETY OF BEGONIA PLANT NAMED
SONATA
Jan Man, Lisse, Netherlands, assignor to Oglevee Ltd., Con-
nellsville, Pa.
Filed Sep. 29, 1988, Ser. No. 251,686
Int. Cl.⁴ A01H 5/00

U.S. Cl. Plt.—68

1. A new and distinct variety of Begonia characterized by long lasting and abundant floriferousness, vigorous growth and flowering, contrast between creamy white flower and dark foliage as herein shown and described.

7,044
ANTHURIUM PLANT NAMED STARLIGHT
Calvin K. Hayashi, P.O. Box 242, Pahoa, HI. 96778
Filed Aug. 29, 1988, Ser. No. 237,408
Int. Cl.⁴ A01H 5/00

U.S. Cl. Plt.—88

1. A new and distinct cultivar of *Anthurium andraeanum* substantially as described and illustrated, known by the cultivar name Starlight and characterized by the combined features of red speckled, generally heart-shaped spathe and an indentation along an edge thereof; long, straight pedicels which carry and position the spathe well above the leaves; dark green leaves; slightly spreading growth habit and excellent blooming habit.

1 Claim

PATENTS

GRANTED OCT. 3, 1989

ERRATA

For CLASS	See PATENT NO.
081-426	4,870,876
087-009	4,870,887
105-206	4,870,914
552-239	4,871,481
562-818	4,871,486
429-061	4,871,553
562-473	4,871,712
071-094	4,871,856
200-016	4,871,893
388-829	4,871,952
354-484	4,872,069
324-174	4,872,208
330-294	4,872,209
340-569	4,872,210
343-778	4,872,211
361-424	4,872,212
364-180	4,872,213
364-766	4,872,214

PATENTS

GRANTED OCTOBER 3, 1989

GENERAL AND MECHANICAL

4,870,705

NECK ROLL APPARATUS AND METHOD

Edwin A. Higby, Cedar City; G. Weston Meier, and Breck D. Fife, both of Salt Lake City, all of Utah, assignors to Fife Meier, Inc., Salt Lake City, Utah

Filed May 5, 1988, Ser. No. 190,572

Int. Cl.⁴ A41D 13/00

U.S. Cl. 2—2

10 Claims



1. A neck protective apparatus to be worn by a sports participant as a neck protection device during sporting activities comprising:

- a generally cylindrical neck roll having a diameter sufficient to provide cushioning protection to the neck upon backward movement of the head, said neck roll having a length generally corresponding to the distance across the back of said neck;
- a first strap of fabric attached to a first end of said neck roll and being adapted to pass around a first side of said neck and having a first length sufficient to reach a position generally adjacent the navel of said sports participant;
- a second strap of fabric attached to a second end of said neck roll and being adapted to pass around a second side of said neck and having a second length corresponding to said first length; and
- hand grasping means for hand grasping said first strap and said second strap for pulling downwardly on a said first strap and said second strap to reposition said neck roll against the back of said neck, said hand grasping means comprising a tab joining the end of said first strap to the end of said second strap so as to place said tab in a position adjacent said navel when said neck protective apparatus is worn by said sports participant.

4,870,706

SPORTS PROTECTION GARMENT

Kenneth E. Ketcham, 1192 Broadway; John Barry, 1193 Broadway, both of Masury, Ohio 44438, and David V. Hofius, Sharon, Pa., assignors to Kenneth E. Ketcham and John Barry, both of Masury, Ohio

Filed May 5, 1988, Ser. No. 190,679

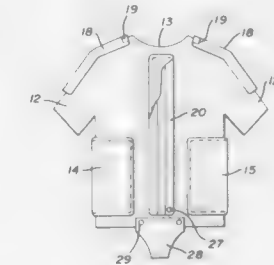
Int. Cl.⁴ A41D 13/00

U.S. Cl. 2—2

3 Claims

1. A sports protection garment of lightweight material comprising a shirt having a neck opening, oppositely disposed arms thereon, a plurality of paired receptacle pockets positioned on said shirt, an elongated spinal pocket positioned between one of said pairs of receptacle pockets, each of said pockets having an access flap thereon, a multi-chambered inflatable pad within

each of said pockets, said chambers formed by intermittent sealed seams slit within their sealed portions, a plurality of



spaced nonaligned valve openings between said chambers, means for inflation of said inflatable pads.

4,870,707

MULTIPLE-PURPOSE SCARF

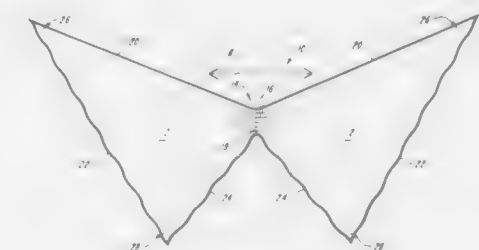
Alia S. Hayes, 177 Center St., Concord, N.H. 03301

Filed May 27, 1988, Ser. No. 199,385

Int. Cl.⁴ A41D 23/00, 3/08

U.S. Cl. 2—207

10 Claims



1. A multi-purpose woman's garment comprising a piece of a fabric that has a butterfly configuration including a pair of mirror image, generally triangular panels arranged along a first direction on opposite sides of a central neck portion joining the triangular panels, each of said triangular panels having a third corner that is trimmed at said neck portion, said neck portion being pleated with said pleats extending generally along said first direction over substantially the full height of said neck portion in a direction perpendicular to said first direction.

4,870,708

UNDERGARMENT HAVING KNITTED, REINFORCED KNEES

William L. Staley, 1737 Southwood St., Sarasota, Fla. 34236

Filed Jan. 6, 1989, Ser. No. 294,283

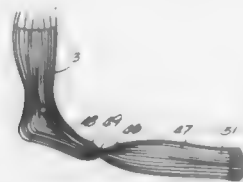
Int. Cl.⁴ A41B 9/02

U.S. Cl. 2—404

9 Claims

1. A one-piece undergarment, comprising:
an underpant portion having a pair of leg openings;
a pair of knitted leg portions made of a resilient fabric secured to said leg openings; and
a pair of sock portions continuously knitted with said leg portions at respective ends thereof remote from said leg openings, and made of a heavier fabric than said leg portions a pair of outer socks,

means for securing said outer socks at respective toe ends thereof with a tow end of each of said sock portions, each



of said outer socks being capable of being doubled over said sock portions when said undergarment is worn.

4,870,709

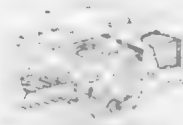
APPARATUS FOR WASTE COLLECTION AND STORAGE

William E. Thornton, Jr., Friendswood, and Henry B. Whitmore, San Antonio, both of Tex., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Apr. 7, 1987, Ser. No. 35,401
Int. Cl.⁴ A47K 11/06, 11/02

U.S. Cl. 4-482

19 Claims



1. A waste collection system for collection and storage of human fecal material comprising:

a body enclosing a waste collection area and a waste storage area with a seat thereon and a seat opening therethrough, said waste collection area adapted for directly receiving human waste;

sweeping means comprising a piston slidably mounted in said body and having a face thereon conformally configured to the cross section of said waste collection area and storage area and adapted to sweep said waste through said collection area into said storage area;

a replaceable sheet of facing material removably mounted on said piston face and sized to completely cover said piston face and be in wiping contact at its periphery with interior walls of said body in said collection and storage areas;

means for selectively actuating said sweeping means to sweep said waste; and

ventilation means adapted to move air from said piston prior to extension of said piston;

a seat valve sealing and unsealing said seat opening in response to said extension and said retraction of said piston;

vacuum means creating a low pressure within said body;

valve means drawing air from within said body through said valve means and out of said body when said vacuum means is in operation;

filter means receiving and passing therethrough said air from said body, said filter means removing liquids and odors from said air; and

coupling means coupling said sweeping means with said valve means to open said valve means prior to sealing said seat opening and to close said valve means subsequent to sealing said seat opening.

4,870,710 BODY-LIQUID COLLECTING AND MATTRESS PROTECTING APPARATUS

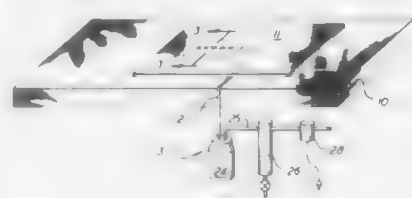
Richard Hartmann, Box 91, New Baltimore, N.Y. 12124

Filed Mar. 3, 1989, Ser. No. 318,557

Int. Cl.⁴ A61G 7/02

U.S. Cl. 5-90

13 Claims



1. For use with body-liquid collecting and mattress protecting apparatus, a flexible liquid-impervious laminated mattress pad comprising

- (a) an extended central flexible tube sealed at one end,
- (b) upper and lower liquid-impervious inner sheets joined together and enclosing that tube end portion which is sealed,
- (c) upper and lower liquid-impervious outer sheets joined together and enclosing the respective inner sheets and a portion of the tube not enclosed within the inner sheets,
- (d) the lower outer sheet defining an aperture through which the remainder of the tube extends, and
- (e) a plurality of aligned body-liquid collecting holes through the upper outer and upper inner sheets and the wall of the tube end portion enclosed by the inner sheets.

4,870,711

METAL FOUNDATION FOR BEDS

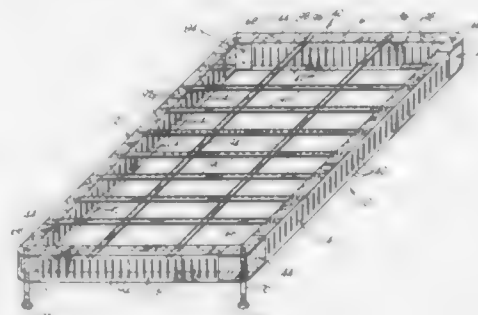
Arthur O. Felix, 10316 Wiley Burke, Downey, Calif. 90241

Filed Nov. 14, 1988, Ser. No. 271,031

Int. Cl.⁴ A47C 19/00

U.S. Cl. 5-200 R

6 Claims



1. A metal foundation for a bed comprising a modular system of components easily assembled into a finished foundation without conventional fasteners, the assembly including:

a pair of parallel and elongated tubular side members of rectangular cross-section each formed by a pair of nestable L-shaped sheet metal pieces interlocked together along the length of the rectangular member;

a pair of parallel tubular rectangular end members each formed by interlocking nestable, L-shaped sheet metal pieces substantially identical in cross section to the side frame members, the end members being spaced apart longitudinally between the ends of the spaced apart and parallel side members for use in forming a rectangular outer frame;

corner connectors at each corner of the assembled frame,

each corner connector comprising a generally L-shaped and tubular connector of rectangular cross section to provide sockets to slidably receive corresponding ends of the rectangular side and end frame members at each corner of the foundation; and

lateral cross-slats of inverted U-shaped channel configuration slidably fitted into corresponding slots formed on the inside faces of the rectangular side members, the lateral cross-slats providing interior cross-bracing along the length of the assembled rectangular outer frame of the foundation.

4,870,712

ICE/SNOW SCRAPING SYSTEM

Franklyn M. Markus, 5720 Rembrandt Avenue, #702, Cote St. Luc, P.Q., Canada H4W 3A1

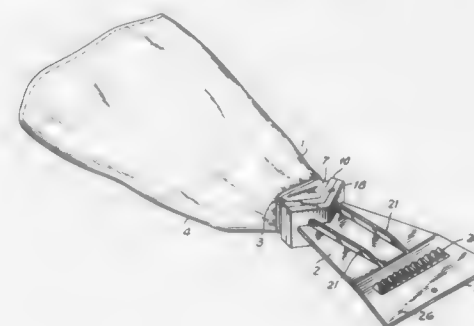
Continuation of Ser. No. 906,479, Jun. 12, 1986, Pat. No. 4,748,711. This application Jun. 3, 1988, Ser. No. 202,743

The portion of the term of this patent subsequent to Jun. 7, 2005, has been disclaimed.

Int. Cl.⁴ B60S 3/00

U.S. Cl. 15-227

1 Claim



1. An ice/snow scraping system which comprises:

a handle having a front end, a back end and a reference centerline,

a first abutment on a front end of the handle, a key hole located in a forward face of the abutment for receiving a key post,

a scraper head having a front edge, a top surface, a bottom surface, a back end and a reference centerline,

a key post at said back end of the scraper head, extending along its reference centerline, and shaped for substantially close fit with respect to said keyhole,

a second abutment located between said back end and said front edge for substantial mating engagement with the first abutment upon the post being inserted into the key hole,

said front edge comprising a substantially rigid edge for scraping of ice or snow and extending at an angle with respect to the scraper head's reference centerline,

a forward portion of the head being biased such that a reference plane which includes the front edge forms an acute angle with respect to the reference centerline, a plurality of raised serrations located on the top of the scraper on the biased portion for use in abrading,

a substantially flexible sleeve which encloses a portion of the handle and sealingly disposed around the handle behind the first abutment and being formed with an opening giving the user hand access to the back of the handle and providing sufficient space about said handle to permit hand holding thereof from within the sleeve,

said first abutment being substantially V-shaped and positioned with the apex of the V located substantially on the centerline of the handle and the second abutment being V-shaped;

said handle including a relatively constricted neck portion

located behind and relatively close to the first abutment in the region where the sleeve makes seal with the handle; said sleeve being shaped such that the width of said opening being greater than the width of said handle where they are in joining contact.

4,870,713

SELF CLEANING TRUCK MIRROR

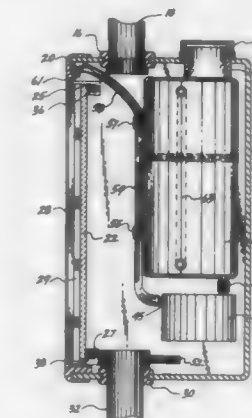
George L. Raynor, Rte. 1, Box 50, Verona, Mo. 65769

Filed Jul. 21, 1988, Ser. No. 222,046

Int. Cl.⁴ B60S 1/48

U.S. Cl. 15-250.01

11 Claims



1. A new and improved self cleaning truck mirror, comprising:

a housing having an aerodynamically curved forwardly facing exterior surface and a planar rearwardly facing exterior surface;

a mirror on said planar surface of said housing;

a wiper for wiping said mirror;

a pair of parallel slots at opposite ends of said mirror, said slots communicating with an interior of said housing;

a pair of spaced parallel leg portions perpendicularly connected at opposite ends of said wiper, said leg portions extending through said slots into said housing interior;

an elongated slide bearing rod in said housing, said bearing rod extending in parallel relation adjacent one of said slots;

a bearing block attached to one of said leg portions at one end of said wiper and supported for sliding movement along said slide bearing rod;

a threaded carriage screw in said housing, said carriage screw having at least one helical thread and extending in parallel relation adjacent the other of said slots;

a wiper actuation electric motor in said housing; a first bevel gear connected to a rotary output shaft of a gear reduction unit on said wiper actuation electric motor; a second bevel gear on said carriage screw;

a second bearing block attached to the other of said leg portions at an end of said wiper opposite said first bearing block and having a cam pin in engagement with said helical thread on said carriage screw for reciprocating said wiper across said mirror;

means in said housing for spraying washer fluid on said mirror;

support means for mounting said housing on a truck; and

means in said housing for rotating said mirror about said support means.

4,870,714

PORTABLE BLOWER/VACUUM SYSTEM

Johathan L. Miner, Timonium, Md., assignor to Black & Decker Inc., Newark, Del.

Filed Nov. 9, 1987, Ser. No. 118,073

Int. Cl.⁴ A47L 5/00

U.S. Cl. 15—327 C

17 Claims



1. A vacuum system comprising:

a motor-fan unit having a fan rotatably mounted in a fan scroll for drawing air from an inlet and for exhausting the air to an outlet;

an inlet tube having a first opening at one end and another opening at the other, said first opening being larger in diameter than said other opening and in a plane substantially perpendicular to the longitudinal axis of said inlet tube; and

means for detachably connecting said inlet tube at its other end to said inlet of said motor-fan unit, said inlet tube tapering from said first opening to said other opening throughout substantially the entire length of said inlet tube.

4,870,715

CASTER INCLUDING SPRING OPERATED BRAKE

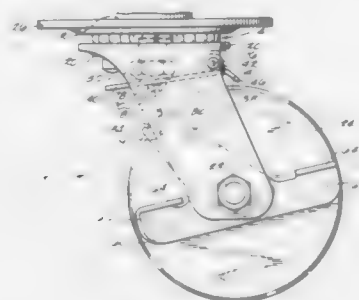
Henry A. Schaeff, 4902 N. 62nd St., Milwaukee, Wis. 53222

Filed Mar. 18, 1987, Ser. No. 27,539

Int. Cl.⁴ B60B 33/00

U.S. Cl. 16—35 R

7 Claims



1. A caster comprising:

a load supporting member having a central longitudinal axis and adapted to support a load, said load supporting member including a lower end portion;

a yoke including a pair of generally parallel downwardly extending parallel arms,

a wheel housed between said generally parallel arms and supported for rotation by the generally parallel arms about a first axis,

means for rotatably joining said yoke to said load supporting member for rotation about a second axis, and

means for selectively braking said wheel against rotation about said first axis and said yoke against rotation about said second axis, said means for braking including a brake member supported by said yoke for pivotal movement between a disengaged position and a braking position, the brake member including opposite ends and being supported for pivotal movement intermediate said opposite ends,

one of said opposite ends of said brake member including an aperture, said one of said opposite ends of said brake member being movable between a disengaged position wherein said one of said opposite ends of said brake member is spaced from said lower end of said load supporting member and a second position wherein said lower end portion of said load supporting member is housed in said aperture, said aperture having a configuration for engaging said lower end of said load supporting member such that one of said opposite ends of said brake member prevents rotation of said load supporting member with respect to said brake member, and

means for causing movement of said brake member from said disengaged position to said braking position, said means for causing movement of said brake member including a brake lever having opposite ends supported for pivotal movement about said axis of rotation of said wheel between a brake engaging position and a brake release position, and spring means between said brake lever and said brake member, said spring means being in compression and applying a force on said brake member to bias said brake member toward said braking position when said brake lever is moved to said brake engaging position.

4,870,716

COVERING ELEMENT FOR FURNITURE HINGES

Alfred Grass, Höchst, Austria, assignor to Alfred Grass Ges.m.b.H. Metallwarenfabrik, Höchst/Vlb., Austria

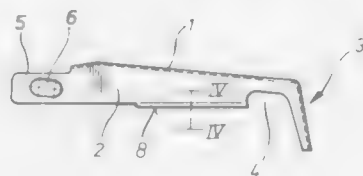
Filed Dec. 4, 1987, Ser. No. 128,935

Claims priority, application Fed. Rep. of Germany, Jul. 24, 1987, 8710126[U]

Int. Cl.⁴ E05D 11/00

U.S. Cl. 16—251

3 Claims



1. A covering element for a furniture hinge comprising: a channel portion having a substantially U-shaped cross section formed by a base and two sides; longitudinal extensions of said sides beyond one end of said base, each of said extensions having a hole formed therein; a pin associated with the furniture hinge and extending through said holes; an extension of said base at its other end remote from said side extensions, said base extension being angled to substantially close the end of said channel; excisions formed in said channel sides adjacent said base extension; and turned edge extensions along the edges of each of said channel sides between said longitudinal extensions and said excisions whereby the covering element pivotally opens to expose the hinge for adjustment and closes to form a snap fit and protects the hinge from damage and accidental displacement.

4,870,717

MEAT TENDERIZING DEVICE

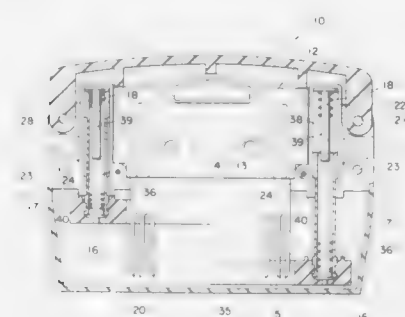
Tsugutoshi Hirano, Narita, Japan, assignor to Kabushiki Kaisha Hirano Seisakusho, Japan

Filed Apr. 26, 1988, Ser. No. 186,249

Int. Cl.⁴ A22C 9/00

U.S. Cl. 17—31

28 Claims



1. A meat tenderizer for tenderizing meat by cutting fibrous tissues and the like contained in the meat in pieces, comprising: a body case comprised of a pair of case halves defining an inner hollow space when the case halves are assembled into the body case;

a body case cover enclosing said inner space and detachably mounted on said body case to permit access to said inner space, said case cover serving as handle means;

a cutting blade assembly releasably retained within said inner space of the body case, said cutting blade assembly comprising at least one cutter blade means having a plurality of substantially parallel cutter blades aligned in a row and a holder plate integrally formed with the cutter blade means in such a manner that the cutter blades extend downwardly from the holder plate during use of the tenderizer and

pressing means slidably supported by said body case, said pressing means comprising an elongated plate having a lower surface for abutting against the meat to be treated and provided with at least one slit through which said cutter blades extend and comprising post members extending vertically from lateral end portions of an upper surface of the elongated plate, said post members being slidably engaged within said body case in a downwardly biased manner.

4,870,718

APPARATUS FOR SUSPENDING OR SECURING OBJECTS

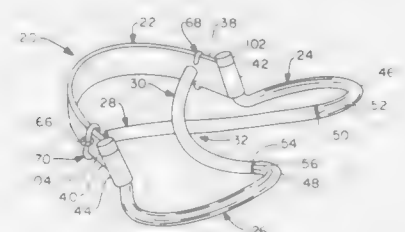
Jacob Guenther, 32224 Pineview Avenue, Clearbrook, B.C., Canada V2T 1R3

Filed Nov. 1, 1988, Ser. No. 266,084

Int. Cl.⁴ A22B 1/00; A01K 37/00

U.S. Cl. 17—44.1

20 Claims



1. An apparatus to releasably engage and support an object,

said apparatus having a front end and a rear end and comprising:

a. a base having first and second laterally spaced side sections defining therebetween a forwardly open gripping area to receive said object;

b. a pair of first and second arms, each having first end portions pivotally connected to said first and second side sections, respectively, and also having second outer end portions, said arms being movable from a forwardly extending open position rearwardly and toward one another to a gripping position;

c. a pair of first and second flexible gripping members, each having a first end and a second end, the first end of the first gripping member being connected to the second outer end portion of the first arm, and also having a second end connected to said second section, said second flexible gripping member having a first end connected to the second end portion of the second arm and a second end connected to said first section; and

d. said arms and said gripping members being arranged in a manner that in the open position, the two gripping members extend oppositely across said gripping area, and in the gripping position said first and second gripping members form first and second loops, respectively, to engage said object in said gripping area.

4,870,719

OYSTER SHELL SEPARATOR

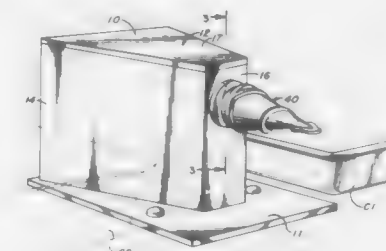
James Harris, 3312 Livonia Ave., Los Angeles, Calif. 90034

Filed Oct. 24, 1988, Ser. No. 261,090

Int. Cl.⁴ A22C 29/04

U.S. Cl. 17—74

4 Claims



1. A powered shell separator comprising:

a generally wedge shaped hollow housing defined by a generally vertical, flat, rear wall joined to two lateral walls aligned towards each other in a wedge alignment and a vertical strip joining said lateral walls at the edges thereof opposite said rear wall;

an electric motor mounted within said housing;

a reduction gear assembly mounted in said housing and conformed for engagement with said motor, said gear assembly including an output shaft extending through said vertical strip to the exterior of said housing; and

a conical mandrel fixed to said output shaft on the exterior of said housing for rotary advancement thereby, said mandrel including a flat surface extending from the apex thereof and faired as a spiral projection along said mandrel.

4,870,720

ROVING GUIDE APPARATUS

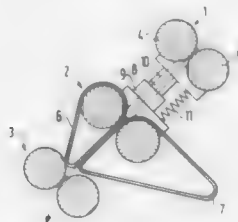
Helmut Nickolay, Uhingen, and Manfred Lattner, Ebersbach-Sulpach, both of Fed. Rep. of Germany, assignors to Zinser Textilmaschinen GmbH, Fed. Rep. of Germany
Filed May 12, 1988, Ser. No. 193,339

Claims priority, application Fed. Rep. of Germany, Dec. 5, 1987, 3715811; Jan. 21, 1988, 3801687

Int. Cl.⁴ D01H 5/72

U.S. Cl. 19—288

17 Claims



1. Apparatus for guiding roving travel between successive pairs of nip rollers at an operating station of a textile spinning machine, comprising guide means defining a roving guide channel between opposite end portions of said guide means and being selectively variable in length for disposition between the successive roller pairs with at least one of said end portions of said guide means projecting into the nip areas of a respective one of the roller pairs.

4,870,721

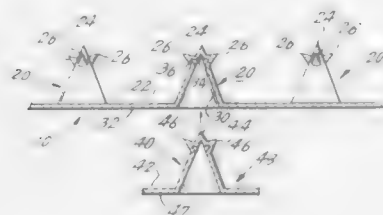
MULTI-PRONG SURFACE CONNECTOR

Nathan Cohen, 160 West End Ave., New York, N.Y. 10023
Filed Mar. 7, 1989, Ser. No. 320,069

Int. Cl.⁴ B65D 63/00

U.S. Cl. 24—16 PB

16 Claims



1. A connector sheet comprising a sheet having first and second opposite surfaces;

a plurality of projections defined on and projecting from the first surface; the projections having a first predetermined shape, which is generally uniform from projection to projection; the projections being generally uniformly arrayed and uniformly spaced from each other across a substantial portion of the first surface of the sheet in a plurality of directions, for enabling a variety of orientations of the first surface with a respect to the second surface when the first and second surfaces are brought together;

a plurality of recessed receptacles defined in from the second surface of the sheet; the receptacles being generally complementary in shape to the projections on the first surface of the sheet, such that projections on the first surface are adapted to be fitted into receptacles on the second surface of the same sheet and on a corresponding surface of another of the sheets;

the receptacles being generally uniformly arrayed over a substantial portion of the second surface of the sheet in the same generally uniform array as the projections are dis-

tributed over the first surface, such that the first surface can be overlaid on the second surface of the same sheet and on the second surface of another of the sheets and the projections on the one surface will be received in the receptacles on the second surface for connecting the surfaces together.

4,870,722

CABLE CLAMP STRIP

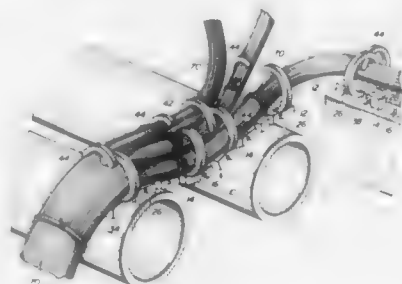
Forney L. Shell, Jr., Orange, Calif., assignor to Northrop Corporation, Hawthorne, Calif.

Filed Dec. 15, 1987, Ser. No. 132,302

Int. Cl.⁴ B65D 63/10

U.S. Cl. 24—16 R

10 Claims



1. An improved cable clamp strip for securing together wires of a cable bundle in a predetermined orientation and for routing such secured wires in a predetermined path comprising:

a mounting base formed of a flexible, molded plastic with notches formed in its side edges for increased flexibility in a first direction and with notches formed in its lower surface for increased flexibility in a second direction; apertured mounting projections extending upwardly from the upper surface of the mounting base,

clamping rings having upper and lower ends adjustably secured with respect to the mounting projections with a lower aperture extending through the lower end of each clamping ring and with a plurality of upper apertures extending through the upper end of each clamping ring, a long ring pin positioned through the lower apertures of the clamping rings and the mounting projections to secure the clamping rings in a predetermined orientation on the mounting base; and

a short ring pin positioned through one of the plurality of upper apertures of each clamping ring to secure the clamping rings in a predetermined orientation with respect to each other for thereby defining the size of the opening through the clamping ring.

4,870,723

MULTIPLE-FUNCTION OPERATING DEVICE PARTICULARLY FOR SKI BOOTS

Alessandre Pozzobon, Paderno Di Ponzano Veneto, and Roberto Gorza, Pedavena, both of Italy, assignors to Nordica S.p.A., Montebelluna TV, Italy

Continuation of Ser. No. 946,240, Dec. 24, 1986, abandoned.

This application Nov. 14, 1988, Ser. No. 274,692

Claims priority, application Italy, Jan. 13, 1986, 19064 A/86

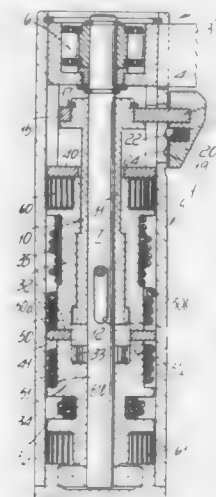
Int. Cl.⁴ A43C 11/00

U.S. Cl. 24—68 SK

29 Claims

1. Multiple function operating device for ski boots comprising a containment body, at least one actuating member, at least one axle, at least one selector, winding pulleys including at least one first winding pulley, and at least one second winding pulley, brake means for braking said first winding pulley and said second winding pulley, at least one first cable and at least one second cable, said first winding pulley, said second wind-

ing pulley and said selector being rotatably mounted in said containment body, said first winding pulley being adapted for winding said first cable, said second winding pulley being adapted for winding said second cable, said selector being rotatable in a cable winding direction and in a cable unwinding direction and having means for providing a temporary coupling engagement relationship with said first winding pulley and for disengagement from said first winding pulley for as-



suming a temporary coupling engagement relationship with said second winding pulley for consecutively winding said first cable and said second cable, said actuating member and said selector being mounted on said axle, at least one of said winding pulleys being mounted on said selector, said selector comprising a bush radially disposed between said axle and said first winding pulley and being connected to said axle so as to rotate with said axle.

4,870,724

SEPARABLE SLIDE FASTENER

Yoshinori Fujisaki, Karube, and Kazuo Ida, Toyama, both of Japan, assignors to Yoshida Kogyo K. K., Tokyo, Japan

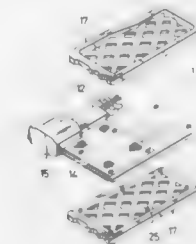
Filed Sep. 8, 1987, Ser. No. 93,608

Claims priority, application Japan, Sep. 9, 1986, 61-211876

Int. Cl.⁴ A44B 19/36

U.S. Cl. 24—433

9 Claims



1. A separable slide fastener comprising:

(a) a pair of stringer tapes, each tape having a bottom end portion, said bottom end portion being flat and extending in the same plane as the rest of the tape;

(b) a layer of reinforcement material disposed on said bottom end portion of each said stringer tape and overlying opposite surfaces of said stringer tape substantially over the entire width thereof for reinforcing said bottom end portion, said reinforcement layer extending along an inner

longitudinal edge of said stringer tape and having a uniform thickness throughout the entire area thereof;

(c) a pair of rows of coupling elements secured to respective inner longitudinal edges of said stringer tapes;

(d) a slider threaded on said pair of rows of coupling elements, for movement therealong to take said coupling elements into and out of mutual engagement, said slider having a pair of side flanges projecting from opposite side edges thereof so as to define a guide channel for the passage of said rows of coupling elements;

(e) a separable end assembly attached to said reinforced bottom end portions of said stringer tapes and including:

(i) a pin member secured to the inner longitudinal edge of one of said stringer tapes and extending immediately from a terminal one of said coupling elements, said pin member being disposed on said reinforcement layer, and

(ii) a socket member having an integral post secured to the inner longitudinal edge of the other confronting stringer tape and extending immediately from a terminal one of said coupling elements, said socket member having a bore for receiving said pin member and being disposed on said reinforcement layer; and

(f) a pair of grip tabs each secured to said reinforced bottom end portion of a respective one of said stringer tapes and adapted to manipulate said separable end assembly, each said grip tab having a thickness greater than the thickness of said reinforced bottom end portion of said stringer tape, each said grip tab overlying said reinforcement layer and having an inner grip tab overlying said reinforcement layer and having an inner longitudinal portion disposed adjacent to but spaced from said separable end assembly by a predetermined spacing with said reinforcement layer being exposed between said inner longitudinal portion and said separable end assembly, each said grip tab having a plurality of connecting portions extending through said reinforced bottom end portion of said stringer tape, said spacing being large enough to allow passage therethrough of one of said side flanges of said slider, wherein said connecting portions of each said grip tab includes separate male and female pieces having rivets and holes, respectively, said rivets being snappingly received in said holes.

4,870,725

POP-THROUGH TOUCH FASTNER

John M. Dubowik, Nashua, N.H., assignor to Velcro Industries B.V., Amsterdam, Netherlands

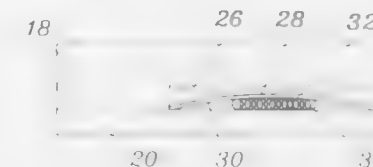
Continuation of Ser. No. 2,032, Jan. 12, 1987, abandoned. This

application Jan. 15, 1988, Ser. No. 147,013

Int. Cl.⁴ A44B 18/00

U.S. Cl. 24—442

12 Claims



1. A touch fastener system attached to a first structure, for fastening said first structure to a second structure, said touch fastener system comprising a first part, attached to said first structure, carrying a plurality of projecting elements of a shape comprising one of hooks, loops, mushrooms, balls on stems, and pigtails, said elements capable of engaging cooperating elements of a shape comprising one of hooks, loops, mushrooms, balls on stems, and pigtails, said cooperating elements carried by a second part of the touch fastener system capable of attachment to said second structure, for fastening the two structures together, comprising:

- (a) a resilient member having said first part of the touch fastener system attached to a surface thereof at least adjacent a center portion thereof; and
- (b) restraining means, comprising an opening in said first structure, defining a curvature of said resilient member to form a bi-stable spring able to be moved from a first of two stable positions to a second of the two stable positions, whereby in said first stable position the elements of said first part are capable of engagement with the cooperating elements of said second part, so that when pressure sufficient to move said resilient member to its second stable position is applied to press said first and second parts together, said first and second structures are drawn closer together as a result of the movement of said resilient member to its second stable position.

4,870,726

SEAT BELT BUCKLE

Erik L. Eksell, Boras, and Artur L. Haglund, Vargarda, both of Sweden, assignors to Allied Engineering Company S.A., Luxembourg, Luxembourg

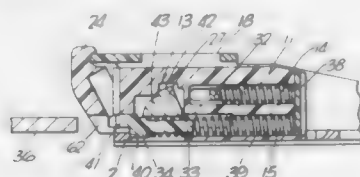
Filed Sep. 15, 1987, Ser. No. 96,585

Claims priority, application United Kingdom, Sep. 16, 1986, 8622111

Int. Cl.⁴ A44B 11/26

U.S. Cl. 24—636

10 Claims



1. A buckle for use with a safety belt to receive and retain a tongue present on the safety belt said buckle comprising a locking member does not engage the tongue, and a locking position in which the locking member engages said tongue to retain the tongue in the buckle, the buckle further incorporating a slider member, the slider member having first means to engage and retain said locking member in the locking position when the slider is in a first position, and second means to engage and retain said locking member, the slider member being spring biased to the first position, and movable against the spring bias to a second position to permit the locking member to move to the release position, the arrangement being such that if the buckle is subjected to a severe force which moves the slider against the spring bias the slider moves to a third position in which the said second means engage and retain the locking member in the locking condition.

4,870,727

METHOD FOR DETECTING ANOMALIES IN CORDUROY PREPARATION

G. Carlo Ribolla, Bergamo; Federico Taroni, Curno; Domenico Peiretti, and Antonio Pepino, both of Turin, all of Italy, assignors to Legitex S.r.l., Italy

Division of Ser. No. 683,592, Dec. 19, 1984, Pat. No. 4,701,985.

This application Jul. 14, 1987, Ser. No. 72,870

Claims priority, application European Pat. Off., Dec. 22, 1983, 83810611

Int. Cl.⁴ D06C 13/08

U.S. Cl. 26—10 C

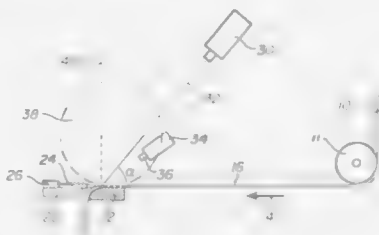
8 Claims

1. A method of detecting web anomalies in a cutting machine for the manufacture of corduroy fabric webs, such as a cutting machine which is operable for advancing a corduroy base web having lengthwise rows of weft yarn loops over a horizontal supporting bar to a plurality of needle-like cutters for introduction of a cutter into each yarn loop to effect severing of the weft rows, the method comprising:

projecting at least one laser beam to sweep over a path that

is substantially transverse to the advancing direction of said web, over the total width of the web and at the location where the needle-like cutters are working within the weft yarn loops and the web is being fed to said cutters, detecting an intensity of light from the laser beam diffused by the web or caused by light reflectance from emergence of one of said needle-like cutters from a respective weft row, of caused by abnormal light absorption by web defects, detecting changes in said intensity indicative of such anomalies in the web, namely such emergence of cutters or such defects, generating an anomaly signal in response to such detected changes, for indicating detection of an anomaly in the web; and generating a signal for stopping the corduroy cutting machine and the advance of the web in response to an anomaly signal.

6. A method of detecting web anomalies in a cutting machine for the manufacture of corduroy fabric webs, said cutting machine having cutter needles for cutting weft yarn loops of a corduroy fabric web which is fed to said cutter needles, comprising the steps of:



creating a light band by projecting light toward the portion of the web where the cutter needles are working within the weft yarn loops and the web is being fed to said cutters, thereby producing a light scattering pattern above the zone; monitoring said pattern for intensity changes caused by anomalies such as fabric web defects and the emergence of cutter needles from weft yarn loops of the corduroy fabric web; and stopping said cutting of said corduroy fabric web in response to the detection of any anomaly; wherein said light band is created by sweeping at least one laser beam transversely over the width of said web; and wherein the laser beam is provided by employing a laser to continuously emit a main beam, dividing the main beam into two partial beams, and employing a rotating mirror device to produce two sweeping beams capable of covering the two halves of said web, said two sweeping beams overlapping each other in the middle section of the web and overshooting the edges of the web.

4,870,728

APPARATUS FOR CREATING AIR TURBULENCE

Thomas L. Nelson, Georgetown, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 46,090, May 5, 1987, Pat. No. 4,809,412.

This application Aug. 26, 1988, Ser. No. 236,766

Int. Cl.⁴ D02G 1/16; D02J 1/06

U.S. Cl. 28—271

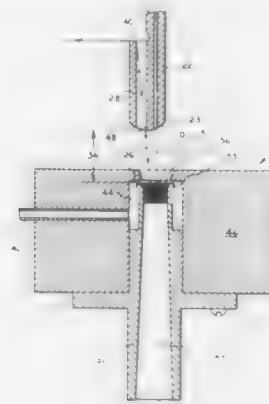
2 Claims

1. An apparatus for creating air turbulence comprising:

(a) an entanglement jet having a jet tube having an inlet and outlet connected by a tube passage diverging from the inlet to the outlet;

(b) a housing having a chamber in communication with the inlet end of the jet tube, the housing also having an open-

- ing of less than about 0.006 inches in line with and in communication with the inlet end of the jet tube;
- (c) means to supply high pressure gas to the chamber; and



- (d) an external lip and an internal curved surface forming the jet tube inlet, the internal curved surface having a surface finish greater than 20AA.

4,870,729

METHOD OF MAKING A NOISE FILTER

Takeshi Ikeda, 5-6-213 Sanno-2, Ohta-Ku, Tokyo 143, Japan

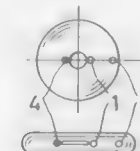
Division of Ser. No. 141,321, Jan. 6, 1988. This application Sep. 6, 1988, Ser. No. 240,719

Claims priority, application Japan, Jan. 14, 1987, 62-004968

Int. Cl.⁴ H01G 4/32

U.S. Cl. 29—25.42

4 Claims



1. A method of making a noise filter comprising the steps of: connecting a first terminal to a current carrying foil conductor of a selected length and a ground terminal to a ground foil conductor of the same selected length; winding said conductors with a first dielectric sheet of at least the same selected length therebetween and a second dielectric sheet of at least the same selected length on the other side of either of the two conductors from the first dielectric sheet with each of the inner ends of the four layers and the outer ends of the foil conductors substantially in alignment around a winding shaft with said first and ground terminals separated by approximately $\frac{1}{4}$ to $\frac{3}{4}$ of a turn and extending in the same direction as each other; connecting a second terminal to said current carrying foil conductor on or near the extension line of the center of said winding shaft and said first or ground terminal and extending from the same edge of the current carrying conductor as the first terminal; and compressing the winding into an elliptical shape by exerting pressure on the winding substantially perpendicular to said extension line to arrange said first, second and ground terminals spaced apart from each other and substantially in-line along the long axis of the elliptical shape.

4,870,730

TOOL MOUNTING CONSTRUCTION

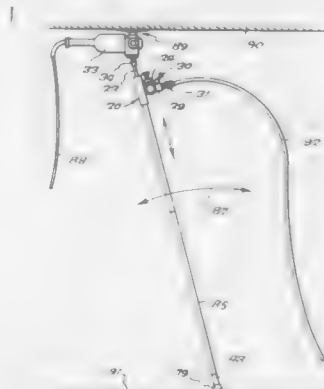
John C. Belknap, 1740 Amherst St., Buffalo, N.Y. 14214

Filed Oct. 13, 1987, Ser. No. 107,650

Int. Cl.⁴ B23B 39/00, 45/14

U.S. Cl. 29—26 A

24 Claims



18. A tool construction including a tool body, a tool on said tool body, first motor means in said tool body for operating said tool, means in said tool body for urging said tool against a workpiece with a substantially constant force, and means for applying a constant reactive force against said last-mentioned

4,870,731

ROLLER FOR REMOVING OR IMPARTING SHRINKAGES ON A METAL OR CLOTH SHEETING

Akechi Yano, 2, Kirasuidori 4-chome, Moriguchi-shi, Osaka-fu, Japan, assignor to Akechi Yano, Osaka-fu, Japan

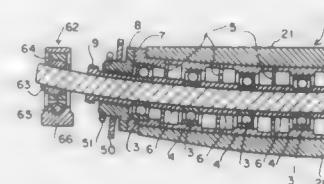
Continuation of Ser. No. 927,864, Nov. 7, 1986, abandoned. This application Nov. 30, 1987, Ser. No. 127,624

Claims priority, application Japan, Nov. 13, 1985, 60-255584; Nov. 21, 1985, 60-263552; Mar. 7, 1986, 61-51092

Int. Cl.⁴ B21B 27/00

U.S. Cl. 29—116.1

21 Claims



1. A roller for feeding articles comprising an arched support shaft disposed in a fixed position under a no-load condition, a roller surface layer mounted to rotate around said arched support shaft without the rotation of said shaft, said roller surface layer having a circumference which decreases progressively from its central portion to the ends thereof with said roller surface layer deforming with cyclical expansion and contraction in the direction of its width while being rotated about said arched support shaft such that at least one axial straight line is defined along an external periphery of said roller surface layer.

4,870,732

STAINLESS STEEL WELD CLAD CYLINDER ROLLER INTERCONNECTED BY A GROOVE AND GAP ALSO WELD COVERED BY STAINLESS STEEL

John H. Becker, Portsmouth, N.H., assignor to Harris Graphics Corporation, Dover, N.H.

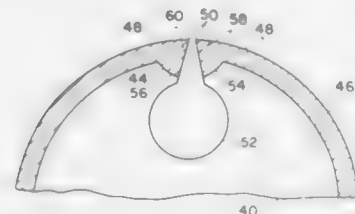
Division of Ser. No. 185,866, Apr. 25, 1988, Pat. No. 4,826,071.

This application Oct. 13, 1988, Ser. No. 257,397

Int. Cl.⁴ B21B 31/08; B41F 13/10; B23K 9/04

U.S. Cl. 29—121.5

3 Claims



1. A printing roller which comprises a stainless steel cylinder having

- a longitudinal groove formed in said cylinder, the groove having opposed edges extending from the outer surface of the cylinder inwardly with reference to the longitudinal axis of the cylinder, a weld covering on said cylinder and extending into said groove and covering said edges, the depth of the weld on the edge being greater than the depth of the weld on said surface.

4,870,733

MANUFACTURING METHOD OF A PISTON FOR AN INTERNAL COMBUSTION ENGINE

Yasuhiro Kawabata, Anjo, and Soichi Hara, Toyota, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

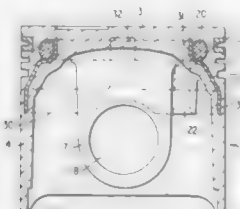
Filed Mar. 9, 1988, Ser. No. 165,799

Claims priority, application Japan, Mar. 12, 1987, 62-057276

Int. Cl.⁴ B23P 15/10

U.S. Cl. 29—156.5 R

4 Claims



1. Manufacturing method of a piston for an internal combustion engine, comprising the steps of:

- fixing a soluble core on a plurality of projections of strut means, said strut means to be incorporated into the piston for preventing thermal expansion of the piston;
- mounting said strut on a punch mold member in a casting mold;
- setting a fiber assembly in an annular groove of a lower mold member in the casting mold;
- casting a piston having said fiber assembly and said soluble core therein in said casting mold; and
- dissolving said soluble core to form an oil cooling gallery in said piston.

4,870,734

METHOD OF MANUFACTURING HIGH EFFICIENCY HEAT EXCHANGE TUBE

Kevin J. Sulzberger, Orange, Calif., assignor to TUI Industries, Placentia, Calif.

Continuation of Ser. No. 34,786, Apr. 3, 1987, abandoned. This

application Dec. 28, 1988, Ser. No. 290,864

Int. Cl.⁴ B21D 53/02

U.S. Cl. 29—157.3 R

8 Claims



1. A method of manufacturing a high efficiency multi-wall heat exchange tube comprising the steps of:

- inserting an inner wall inside of an outer wall to form a gap therebetween;
- sealing the outer wall to the inner wall to close the gap at one end of the heat exchange tube while leaving the gap open at an end opposite the one end;
- evacuating the gap through the open end of the heat exchange tube opposite the one end; and
- inserting a liquid with a boiling point above a maximum operating temperature of the heat exchange tube into the evacuated gap through the open end of the heat exchange tube until the gap is substantially filled with the liquid.

4,870,735

REFRIGERATION CABINET CONSTRUCTION

Richard T. Jahr, Jr., Conway, Ark., and Marcus N. Holt, St. Cloud, Minn., assignors to White Consolidated Industries, Inc., Cleveland, Ohio

Division of Ser. No. 80,750, Jul. 31, 1987, Pat. No. 4,826,040.

This application Jul. 5, 1988, Ser. No. 214,779

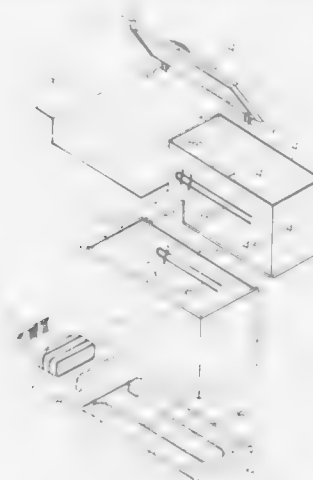
Int. Cl.⁴ B21D 53/08; B23P 15/26, 19/04

U.S. Cl. 29—157.3 C

3 Claims

- 1. The method of manufacturing a heat exchange member of a refrigeration cabinet of the type having a sheet metal panel and a metal tube secured thereto in heat transferring relationship comprising forming the panel, forming the tube to have a predetermined configuration, applying beads of thermal mastic to the panel at predetermined locations corresponding to the intended location of the tube on the panel, placing the tube on said panel at a predetermined position with the tube in abutting

contact with said panel and said mastic beads, clamping said tube to said panel, applying a hot melt adhesive to said tube and



said panel at a plurality of predetermined locations, allowing the adhesive to cool, and thereafter unclamping the tubing.

4,870,736

METHOD OF ASSEMBLING A MOLDED HUB AND TIRE

Christ D. Kacalief, St. Louis County, Mo., assignor to Chris

Kaye Plastics Corp., St. Louis, Mo.

Filed Jan. 19, 1988, Ser. No. 145,256

Int. Cl.⁴ B21K 1/40

U.S. Cl. 29—159.1

4 Claims



1. A method making a wheel consisting of a hub and a tire for the hub, the method comprising the steps of:

- (a) molding the hub of a plastic material to form a circumferential rim presenting an outer raised surface having a rim notch formed therein at a first predetermined side and such that on cooling the hub, the hub and rim shrink to assume a substantially fixed size so as to become dimensionally stable;
- (b) molding the tire of a plastic material that on cooling, also like the cooling of the hub, shrinks and becomes dimensionally stable;
- (c) first allowing the hub to cool and become dimensionally stable; and
- (d) thereafter slidably joining the tire to the rim from a second predetermined side of the rim opposite the rim notch prior to the tire cooling such that upon cooling and shrinking the tire becomes fixed to the outer surface of the rim and locks on to the rim notch from said first predetermined side of the rim.

4,870,737

BRAKE SPRING REMOVAL TOOL

Roger Navarro, 3501 Kemp Ave., El Paso, Tex. 79904-5413

Filed Aug. 9, 1988, Ser. No. 229,972

Int. Cl.⁴ B23D 19/04

U.S. Cl. 29—227

1 Claim



1. A tool for removing and installing a coiled brake spring end from engagement with a mounting post comprising, in combination:

- an elongated handle;
- a block rigidly affixed to one end of said elongated handle;
- spring engaging means extending laterally from two opposite sides of said block;
- said spring engaging means includes a pair of spurs extending laterally from each said opposite side of said block and being normally arranged in relation to said handle, each of said pair of spurs including one spur having a length greater than the length of the other spur; and
- said spurs having an outside diameter slightly less than the inside diameter of said coiled spring, whereby said spur is insertable into said spring to facilitate removal of said spring.

4,870,738

VEHICLE MOUNTED DRILL ROD HOLDING DEVICE

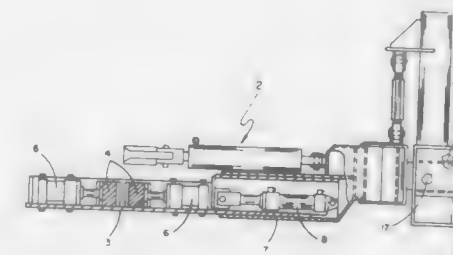
Charles L. Rassieur, St. Louis County, Mo., assignor to Central Mine Equipment Company, St. Louis, Mo.

Filed Jun. 9, 1988, Ser. No. 204,573

Int. Cl.⁴ B25B 13/50

U.S. Cl. 29—240

9 Claims



- 1. In a vehicle mounted drill rod holding device, a longitudinally extending clamp support mounted at one end to said vehicle to be capable of extending in longitudinal cantilever fashion therefrom at an angle to the line of movement of said vehicle, said support including clamping means thereon to clamp and firmly hold a drill rod, means to allow rotation of said longitudinally extending cantilevered clamp support coincidentally about its longitudinal axis to accommodate for departure from a horizontal plane of the longitudinal axis of said

vehicle when said vehicle is positioned on a hill with said clamp support extending at an angle to the vehicle line of movement;

actuating means connected to said clamp support to ensure flush, positive engagement of the gripping face of said clamping means with the outer surface of a drill rod; and means to permit adjustable rotation of said clamp support about its longitudinal axis in a controlled manner.

4,870,739

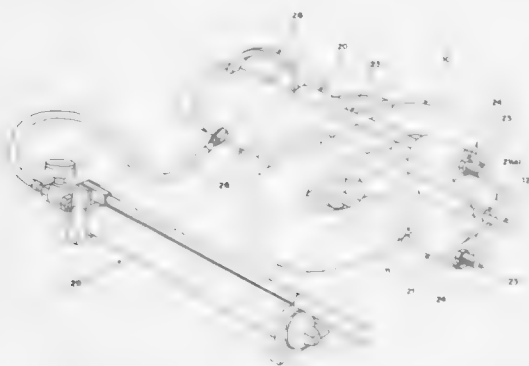
APPARATUS FOR REMOVING PINS FROM CONNECTING LINK BOAT HARDWARE

Raymon E. Richards, Rte. 3, Box. 429, Ellisville, Miss. 39437
Filed Jan. 23, 1988, Ser. No. 210,566

Int. Cl.⁴ B23P 19/04

U.S. Cl. 29—252

1 Claim



1. An apparatus for removing pins from connecting link hardware which comprises:

- a plunger;
- a means for supporting and operating said plunger, said means allowing for the longitudinal movement of said plunger;
- a front side shoe releasably secured to said means for supporting said plunger, said front side shoe having a passageway for the longitudinal movement of said plunger, said front side shoe also having a face side for accepting a connecting link so that said front side shoe aligns said connecting link pin with said plunger; and
- a back side shoe releasably attachable to said front side shoe, said back side shoe having a passageway for accepting a connecting link pin, said back side shoe also having a face side for accepting a connecting link so that said back side shoe aligns said connecting link pin with said passageway for accepting a connecting link pin;

whereby the backside shoe is detached from said front side shoe and a connecting link is placed against the face side of said front side shoe so that the plunger is aligned with the hole in which the connecting link pin is secured; the face side of said back side shoe being aligned with the side of the connecting link pin opposite the front side shoe, so that the back side shoe passageway is opposite said plunger, and said back side shoe being secured to said front side shoe, said means for operating said plunger then being activated to force said plunger against said connecting link pin thereby pushing the connecting link pin out of the connecting link and into the backside shoe passageway.

4,870,740 DEVICE FOR PRESSING IN AND PULLING OFF BEARINGS OR SLEEVES, IN PARTICULAR FOR AXLE BEARINGS AND/OR WHEEL FLANGE HUBS ON MOTOR VEHICLES

Horst Klann, Terra Wohnpark 12, 7730 Villingen-Schwenningen
24, Fed. Rep. of Germany

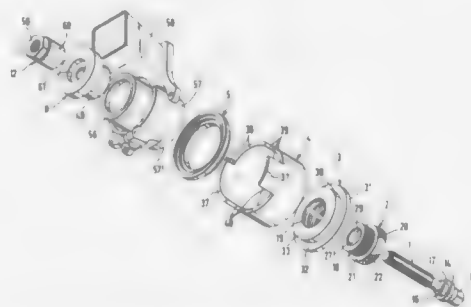
Filed Aug. 30, 1988, Ser. No. 238,543

Claims priority, application Fed. Rep. of Germany, Sep. 8, 1987, 3730017

Int. Cl.⁴ B23P 19/04

U.S. Cl. 29—263

10 Claims



1. A device for pressing in and pulling off bearings and sleeves, in particular for axle roller bearings and wheel flange hubs of motor vehicles, comprising: a threaded spindle having an abutment shoulder, a threaded nut engaged on the threaded spindle, a cylindrical spacer tube having a detachable front wall, said front wall having a thrust step bearing engageable with said abutment shoulder of said threaded spindle and arranged concentrically thereon, said spacer tube being formed on at least one end face with a surface with the centering support of a workpiece bearing housing, selectable exchangeable axial pressure piece arranged on said threaded spindle between said threaded nut and said workpiece and provided with a distinct selectable centering projection, said spacer tube having at least one end face, at least one of an end ring surface interrupted by at least one wall cutout and a centering rabbet, said front wall being loosely inserted in said spacer tube and being centered by said centering rabbet.

4,870,741

WALL RACKING TOOL

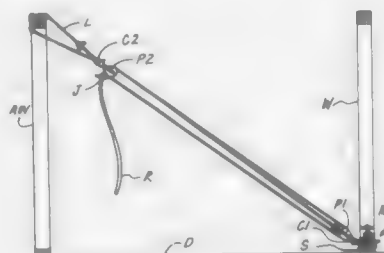
Thomas A. Hansmann, 10594 Combie Rd. #6340, Auburn, Calif. 95603

Filed Aug. 2, 1988, Ser. No. 227,132

Int. Cl.⁴ B23Q 1/00

U.S. Cl. 29—271

11 Claims



1. A wall racking tool for aligning walls and framing construction comprising:

- a pair of spaced parallel right angle channel side rails;
- a vertically upstanding mounting tab secured at a midpoint on a top surface of each of said side rails, each of said mounting tabs having a horizontal slot;

an elongated cross bar having opposite bifurcated end yoke portions, each of said end yoke portions provided with a transverse bore;

said cross bar extending transversely between said side rails, said yoke end portions engaged in said mounting tabs and a pivot pin extending through each of said transverse bores in said yoke portions and through said mounting tab slots;

a vertically extending journal bore formed through said cross bar;

an elongated threaded rod extending vertically upwardly through said journal bore, said rod having an enlarged head portion in abutment with a bottom surface of said cross bar and a non threaded portion of said rod adjacent said head portion received for rotation within said journal bore and secured against axial movement;

a generally rectangular traverse plate having a central threaded bore in threaded engagement with said threaded rod;

a handle fixedly secured to a top end of said threaded rod, above said traverse plate, for rotating said threaded rod;

a first pair of elongated pivotal links, each having a first end pivotally attached to a first end face of said traverse plate;

a second pair of elongated pivotal links, each having a first end pivotally attached to a second end face of said traverse plate, opposite said first end face;

a first pair of slightly spaced apart vertically upstanding levers secured adjacent a first end of each of said side rails;

each of said first pair of elongated pivotal links having a second end pivotally mounted between one pair of said first pairs of levers;

a second pair of slightly spaced apart vertically upstanding levers secured adjacent a second end of said side rails;

each of said second pair of elongated pivotal links having a second end pivotally mounted between one pair of said second pairs of levers;

an attachment loop centrally attached on a top surface of each of said side rails;

a first pulley having a connector ring secured to one of said attachment loops;

a second pulley having a jam cleat;

a rope around said first and second pulleys and engaged by said jam cleat; and

a line attached to said second pulley for securement to a framed wall.

4,870,742

COIL WINDING MACHINE

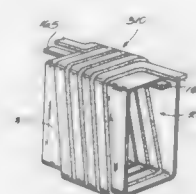
Frederick W. Roloff, Milwaukee, Wis., assignor to Cooper Power Systems, Inc., Houston, Tex.

Filed Jan. 2, 1987, Ser. No. 279

Int. Cl.⁴ B21F 3/027, 3/04; H01F 41/04

U.S. Cl. 29—335

26 Claims



1. A coil winding machine for winding an electric conductor into an electric coil for use in electrical apparatus comprising, a frame, a control for regulating the operation of the machine, an electric conductor supply for storing the conductor to be wound into coils, a mandrel mounted in position to receive the conductor from said conductor supply, a clamp on said mandrel adapted to clamp the leading end of the conductor to the mandrel, means connected for rotating said mandrel for winding the clamped conductor about the mandrel, means con-

nected to feed said mandrel axially while it is rotating for winding the conductor about the mandrel in a helical path to form an electric coil and means on said mandrel operable to enable the removal of the completed coil from said mandrel.

4,870,743

QUICK CHANGE TOOL ASSEMBLY FOR ULTRASONIC MACHINE TOOL

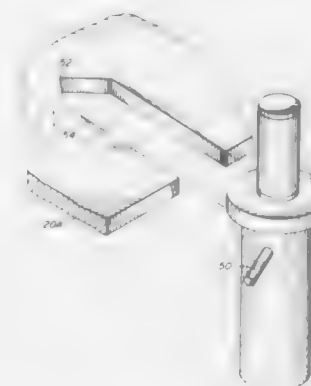
James R. Gilmore, Ligonier, Pa., assignor to Extrude Hone Corporation, Irwin, Pa.

Filed Oct. 13, 1987, Ser. No. 107,309

Int. Cl.⁴ B23K 27/00

U.S. Cl. 29—568

2 Claims



1. In an ultrasonic machine tool having an ultrasonic tool assembly comprising a transducer having a booster affixed thereto with a sonotrode affixed to the booster, and an ultrasonic machine tool table to which the ultrasonic tool assembly is attachable, a structure for quickly and accurately aligning said ultrasonic tool assembly onto said ultrasonic machine tool table comprising: a fixturing plate attached to the tool assembly at a node point on said tool assembly; a slot through said table having a V-groove at the end thereof through which said tool assembly is inserted and serves to control the position of said tool assembly in the horizontal plane position, said table having a flat surface upon which said fixturing plate can rest to properly position said tool assembly vertically; a first engaging means protruding downward from said table and a second engaging means protruding laterally from said tool assembly below said fixturing plate which jointly serve to properly align the tool assembly radially when the two engaging means are in contact; and, means for securing said tool assembly in position.

4,870,744

TOOL EXCHANGE SYSTEM FOR MACHINING TOOLS

Hiroshi Araki, Hisao Ishii, Yoshihisa Akiyama, Hiroshi Kamada, and Takashi Nagatomi, all of Tokyo, Japan, assignors to Fanuc Ltd., Minamitsuru, Japan

PCT No. PCT/JP87/00619, § 371 Date Jun. 16, 1988, § 102(e) Date Jun. 16, 1988, PCT Pub. No. WO88/01554, PCT Pub. Date Mar. 10, 1988

PCT Filed Aug. 21, 1987, Ser. No. 204,430

Claims priority, application Japan, Sep. 1, 1986, 61-203803

Int. Cl.⁴ B23Q 3/157

U.S. Cl. 29—568

6 Claims

6. A tool exchanger apparatus comprising:

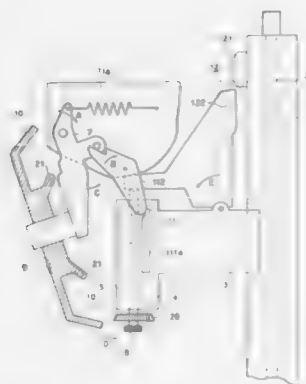
a spindle head having a spindle and being slidably mounted on a support column for vertical reciprocating movement;

tool attachment/removal means disposed within the spindle head;

a magazine having a support pivotally mounted adjacent the spindle head and being rotatably connected to the support;

a plurality of elastic members disposed on the magazine at spaced intervals;

a first cam mechanism having a first portion associated with the spindle head and a second complementary portion associated with the magazine, for pivoting the magazine supporter in response to vertical movement of the spindle head; and



a second cam mechanism having a first portion associated with the spindle head and a second complementary portion associated with the support columns for actuating the tool attachment/removal means upon the spindle head attaining a predetermined height.

4,870,745

METHODS OF MAKING SILICON-BASED SENSORS

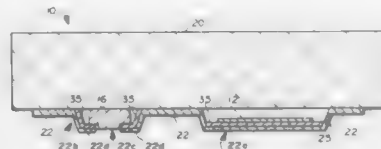
Ki W. Lee, Williamsburg, Va., assignor to Siemens-Bendix Automotive Electronics L.P., Troy, Mich.

Filed Dec. 23, 1987, Ser. No. 137,219

Int. Cl.⁴ H01C 17/02

U.S. Cl. 29—610.1

9 Claims



8. A method of making a sensor of the type having a sensor element and a metallic bonding pad adapted to permit interconnection between said sensor element and electronic circuitry, said method comprising the steps of:

- forming respective trough areas in a silicon substrate for said sensor element and said bonding pad;
- doping said respective trough areas with an etch-stop dopant so that at least one of said trough areas includes at least one undoped region;
- forming said bonding pad and said sensor element in said one and the other said trough areas, respectively; and
- etching away undoped regions of said silicon substrate, including said at least one undoped region of said one trough area, so that said doped trough areas remain and so that said bonding pad is exposed.

4,870,746

METHOD OF MAKING A MULTILAYER PRINTED CIRCUIT BOARD HAVING SCREENED-ON RESISTORS

John J. Klaser, Springfield, Mo., assignor to Litton Systems, Inc., Springfield, Mo.

Filed Nov. 7, 1988, Ser. No. 268,306

Int. Cl.⁴ B23P 19/00

U.S. Cl. 29—620

20 Claims

1. A method for producing a multilayer printed circuit board comprising:

- generating a first electrical circuit portion on a first

substrate comprising a resin impregnated glass fiber matrix;

- printing a preselected number of resistor elements on said first substrate using a resistive ink comprising a mixture of a resin and carbon particles in a solvent;
- curing the resistive ink to produce a preselected number of resistors having a resistance values;



- generating at least a second electrical circuit on at least one other substrate also comprising a resin impregnated glass fiber matrix;
- repeating steps (2) and (3) for the at least one other substrate; and
- laminating the first and the at least one other substrates to each other to form a multilayer printed circuit board.

4,870,747

WIRE INSERTION TOOLING ASSEMBLY

Werner Maack, Seeheim, and Richard Zandler, Erback, both of Fed. Rep. of Germany, assignors to AMP Incorporated, Harrisburg, Pa.

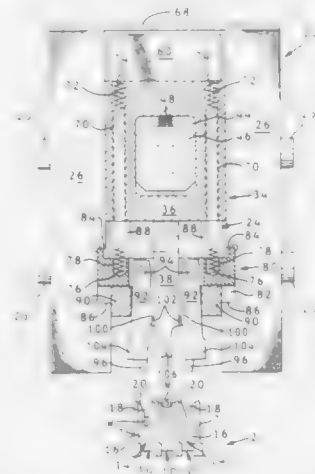
Filed Sep. 22, 1988, Ser. No. 247,803

Claims priority, application United Kingdom, Sep. 25, 1987, 172544

Int. Cl.⁴ B23P 19/04; H01R 43/01

U.S. Cl. 29—753

9 Claims



1. A wire insertion tooling assembly for inserting an electrical wire into a wire slot in a wire connecting portion of an electrical terminal, the assembly having a wire insertion tool mounted in a frame for movement relative thereto through a wire insertion stroke and a return stroke, the wire insertion tool comprising wire connecting portion support tools mounted in the frame on each side of the wire insertion tool and having wire connection portion support surfaces facing the wire insertion tool, said wire connecting portion support tools being driven in the same direction as the wire insertion tool during working and return strokes and being relatively moveable with respect to the wire insertion tool during said working stroke between a first position in which said support surfaces are spaced from each other to receive respective wire connecting portions between them and a second position in which said

supporting surfaces serve to support said wire connecting portion on either side of the wire slot therein as the wire is being inserted therein by the insertion tool said support tools returning to their first position as the wire insertion tool is moved through its return stroke.

4,870,748

APPARATUS FOR ASSEMBLING ELEMENTS OF A SMOKING ARTICLE

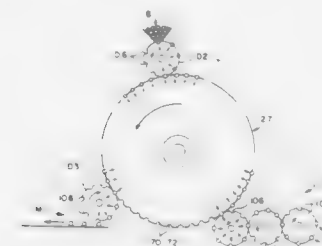
Gerhard Hensgen, Hamburg; Wolfgang Steiniger, Bornsen; Werner Hinz, Lauenburg; Erwin Oesterling, Glinde, and Siegfried Schlissio, Geesthacht, all of Fed. Rep. of Germany, assignors to R. J. Reynolds Tobacco Co., Winston-Salem, N.C.

Filed Jul. 17, 1987, Ser. No. 74,811

Int. Cl.⁴ A24C 5/18; B23P 21/00

U.S. Cl. 29—773

74 Claims



1. Apparatus for making aerosol generating modules for smoking articles, the apparatus comprising: a rotatable drum; a plurality of stations mounted on the drum, each station comprising jacket holding means for receiving and holding at least one jacket segment and cartridge holding means for receiving and holding at least one aerosol generating cartridge; and means for inserting the cartridges into the jacket segments.

4,870,749

JAW AND FEEDER ASSEMBLY FOR ADVANCING HINGE TO A WORK STATION

Armand E. Roy, Attleboro, and Leo T. Roy, South Attleboro, both of Mass., assignors to Craft, Inc., Attleboro, Mass.

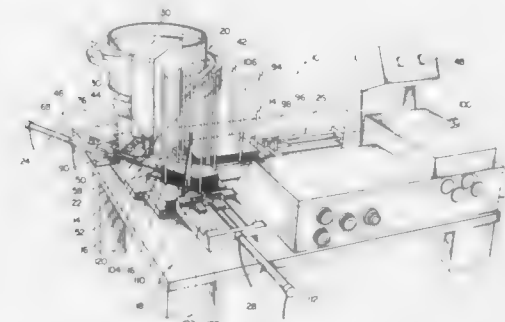
Division of Ser. No. 113,667, Oct. 23, 1987, Pat. No. 4,785,531.

This application Sep. 13, 1988, Ser. No. 243,613

Int. Cl.⁴ R23P 19/04

U.S. Cl. 29—798

3 Claims



1. A jaw and feeder assembly for advancing a hinge to a work station, said hinge comprising first and second, substantially flat plate portions having first and second fastening elements thereon, respectively, and a barrel portion hingeably connecting said plate portions, said hinge being receivable in a collapsed disposition wherein said first and second plate portions overlay one another with said fastening elements facing outwardly, said jaw and feeder assembly comprising feed means for advancing a hinge in said collapsed disposition to a

first station, jaw means operable at said first station for releasably securing said hinge in said jaw means, and means for advancing said jaw means to a second station, said second station defining said work station, said jaw means comprising an elongated base member, a jaw plate extending outwardly from said base member, and a movable jaw member mounted on said base member and biased toward said jaw plate, said feed means feeding said hinge to said jaw means so that the barrel portion of said hinge is received between said jaw member and said jaw plate with said plate portions extending outwardly from said jaw means.

4,870,750

DEVICE FOR MACHINE-FASTENING ROOFING MATERIALS TO ROOFS

Harold Zahn, In der Etzweise 17, 6906 Leimen/Heidelberg, Fed. Rep. of Germany

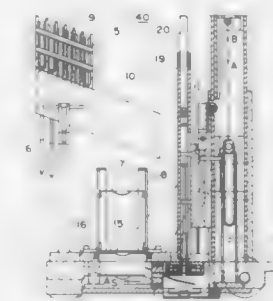
Filed Feb. 29, 1988, Ser. No. 161,980

Claims priority, application Fed. Rep. of Germany, May 28, 1987, 8707666[U]

Int. Cl.⁴ B25C 1/02

U.S. Cl. 29—809

17 Claims



1. An apparatus for the machine fastening of roofing materials to a roof, comprising:

- a mobile frame having wheels;
- a bracket magazine, mounted on said frame, for storing mounting brackets;
- a roofing screw magazine, mounted on said frame, for storing roofing screws;
- a bracket separator situated in said frame beneath said bracket magazine for separating a single bracket from the brackets stored in said bracket magazine;
- a screw separator for separating a single screw from the screws stored in said screw magazine and placing the single, separated screw into a screw mounting position;
- a depressible pressure column, having a moveable piston therein mounted on said frame;
- a slide, moveable along a slide path, operatively connected to said piston and said bracket separator for moving the single, separated bracket into a bracket mounting position; and
- a power screwdriver for screwing the mounted screw through the mounted bracket and the roofing materials and into the roof for fastening the roofing materials to the roof.

4,870,751

METHOD OF MANUFACTURING PRINTED CIRCUIT BOARDS

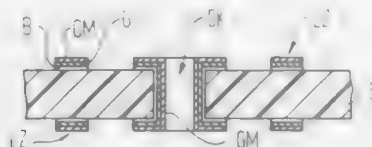
Mattelin Antoon, Oostkamp, Belgium, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany
Filed Mar. 31, 1988, Ser. No. 176,325

Claims priority, application Fed. Rep. of Germany, Apr. 24, 1987, 3713792

Int. Cl.⁴ H05K 3/02, 3/10

U.S. Cl. 29—846

20 Claims



1. A method for the manufacture of printed circuit boards using additive technology, wherein conductor material is applied onto an electrically insulating substrate by nucleation, activation and by at least chemical metal deposition of chemical and galvanic metal deposition, comprising:
applying by chemical metal deposition a nucleation, B, over the substrate;
removing by an ablation with electromagnetic radiation the nucleation, B, in regions of the substrate that do not correspond to electrically conductive paths; and
applying the conductor material to the electrically conductive paths.

4,870,752

CABLE HARNESS MANUFACTURING AND ELECTRICAL TESTING SYSTEM

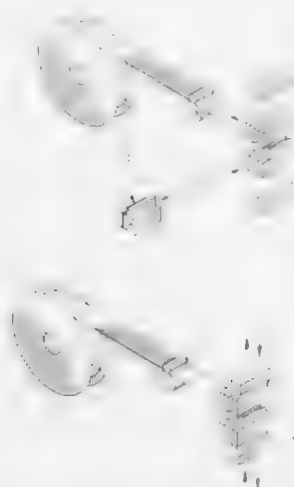
Christopher K. Browa, Camp Hill; Carl L. Moyer, Mt. Penn; Joanne E. Shipe, Harrisburg, and Herman D. Walter, Marysville, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Division of Ser. No. 132,310, Dec. 15, 1987. This application Oct. 14, 1988, Ser. No. 258,241

Int. Cl.⁴ A01R 43/04; B23P 19/00

U.S. Cl. 29—866

9 Claims



1. Electrical connector terminating and testing apparatus for planar multi-conductor cable, wherein a cable section of predetermined length is terminated by at least one preassembled connector, said connector consisting of a housing portion containing a plurality of insulation displacement terminals and a cover portion in sliding engagement with said housing por-

tion from a first position wherein an opening exists between the two portions for receiving said cable section therein and a second position wherein the two portions are in cable terminating engagement; said apparatus including a connector terminating station and an electrical testing means for detecting the presence of short circuits or open circuits within a terminated connector, between terminated connectors, and between a terminated connector and said cable shearing means, and arranged so that when said short or open circuits are present, said cable section is severed and discarded,

said connector terminating station having:

a plurality of connector modules arranged for holding a plurality of said connectors with their two portions in said first position and their openings in mutual alignment for receiving said cable section;

a single press for engaging one of said modules and terminating a connector contained therein to said cable section; and

means for moving each of said modules in seriatim into operating engagement with said single press.

4,870,753

METHOD OF MANUFACTURING A LIGHT SOCKET

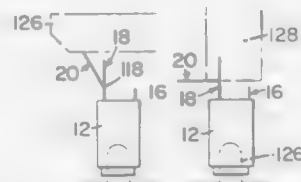
George B. Pfeffer, Minnetonka, and Wayne A. Johnson, Minneapolis, Minn., assignors to ADC Telecommunications, Inc., Minneapolis, Minn.

Division of Ser. No. 764,948, Aug. 12, 1985, Pat. No. 4,753,609. This application Nov. 25, 1987, Ser. No. 125,555

Int. Cl.⁴ H01R 43/16

U.S. Cl. 29—884

2 Claims



1. A method for manufacturing a lamp socket from a housing and a formed conductive sheet, said housing including a row of sockets for receiving lamps, said sheet including a terminal strip, a row of contact members and a carrier, said housing including first means on a first side of said row of sockets for receiving said strip and second means on a second side of said row of sockets for receiving said contact members, said method comprising the steps of:

(a) inserting said terminal strip on said sheet into said first receiving means of said housing;

(b) breaking said strip from said sheet;

(c) inserting said row of contact members on said sheet into said second receiving means of said housing;

(d) breaking said carrier from said row of contact members; and

(e) pressing said strip and said row of contact members into a final location with respect to said housing.

4,870,754

CASSETTE KITCHEN UTENSILS SET

Jeng-Jong Chion, 3F-1, No. 337, Sec. 4, Hsin Yi Rd., Taipei, Taiwan

Filed Mar. 17, 1988, Ser. No. 169,061

Int. Cl.⁴ B26B 1/00; B65D 1/34

U.S. Cl. 30—123

1 Claim

1. A cassette kitchen utensils set comprising:

a plurality of elongated handle bars, each having a longitudinal axial channel hole with a cutting plane along a portion of the circumference thereof;

a set of kitchen utensils including a knife, fork, spoon, bottle opener and can opener, each utensil having an integral

handle defining a cutting plane therealong adapted to match the cutting plane in the bar when the utensil handle is inserted in the axial channel hole therein, said utensils further including a corkscrew having an integral handle and a handle bar grip mounted on the utensil handle at the center of said grip with said grip extending perpendicular to said utensil handle;

a flat locating seat, a plurality of mutually space U-shaped holders extending in a row along one edge, each U-shaped holder adapted to receive a utensil handle each holder except one defining a cutting plane to match the cutting plane on a utensil handle and each holder having an upper, resilient nose protruding internally therefrom for releas-

a blade carried on the support for joint movement therewith and projecting from the housing at a work area, and drive means in the housing for causing the reciprocal movement, an improvement comprising:

a bulb connected to the housing adjacent the support, elastically compressible and expandable between a large volume and a small volume, and having a bulb outlet;

actuator means operatively connected between the blade support and the bulb for compressing the bulb each time the support reciprocates thereby emitting a gust of air from the bulb outlet; and

nozzle means mounted on the bulb outlet and open at the work area for directing the gust of air at the work area, thereby blowing chips and dust created by the blade from the work with each reciprocation of the blade.

4,870,756

STRIP CUTTER

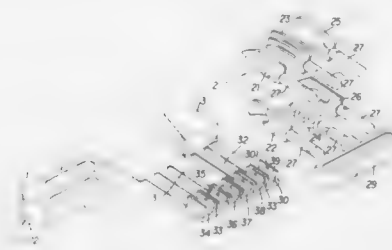
Alan J. Burkhalter, 5330 Rivoli Dr., Macon, Ga. 31210

Filed Jul. 13, 1988, Ser. No. 218,230

Int. Cl.⁴ B26B 3/04

U.S. Cl. 30—304

19 Claims



ably retaining a handle therein said seat forming mutually spaced channels extending from each of said holders having a cutting plane adapted to receive the utensil end of the handle disposed in the respective holder, said holder not having a cutting plane being centrally located along said row and adapted to receive the corkscrew handle, said seat further defining on a side opposite said holders a substantially L-shaped locating plate for receiving end of said handle bars;

a cassette case having a lower cover and an upper cover hingedly interconnected at an edge thereof said cassette adapted to receive said seat, utensils and handle bars and closure means carried by said case for releasably securing said covers together.

4,870,755

JIGSAW WITH PNEUMATIC DUST BLOWER

Albrecht Schatzler, Nürtingen, Fed. Rep. of Germany, assignor to Metabowerke GmbH & Co., Fed. Rep. of Germany

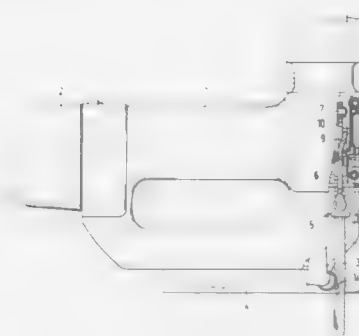
Filed Sep. 6, 1988, Ser. No. 240,808

Claims priority, application Fed. Rep. of Germany, Oct. 8, 1987, 3734013

Int. Cl.⁴ B25F 3/00

U.S. Cl. 30—123.3

7 Claims



1. In a power tool having

a housing,

a blade support mounted for reciprocal movement in the housing,

11. A strip cutter, comprising:

a holder having first, second and third substantially flat members defining a generally U-shaped channel, said first and third flat members being parallel and joined by said second flat member extending perpendicularly therebetween, said third flat member having a perpendicularly extending lip on an end thereof remote from said second flat member;

A hollow body having a plurality of end and side walls defining a chamber therebetween with top and bottom ends, said body being removably received in said channel with said first and third flat members extending at least partially over said top and bottom ends, said first and third flat members resiliently engaging said body in an interference fit, said first flat member being shorter than said third flat member in a direction perpendicular to said second flat member exposing a corner of said body adjacent said first flat member and remote from said second flat member said body being received between said lip and said second flat member;

a plurality of parallel spacers loosely mounted in said chamber in said body and retained therein by at least one of said flat members of said holder; and

a plurality of blades loosely mounted in said chamber between the respective spacers and retained therein by said one flat member.

4,870,757

DRYWALL CUTTING TOOL

Hugh J. Kirkpatrick, 505 May Dr., Madison, Tenn. 37115;

Thomas J. Lee, and James M. Lee, both of 403 Goldie Ct., Goodlettsville, Tenn. 37072

Filed Jul. 5, 1988, Ser. No. 215,347

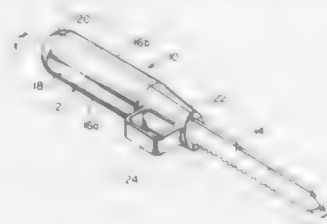
Int. Cl.⁴ B25G 3/00

U.S. Cl. 30—344

4 Claims

1. A drywall cutting tool having an elongated handle portion and an elongated blade portion arranged serially along a longitudinal axis of the tool, the handle portion being of cylin-

drical configuration over a major portion of its length and having a tapered first end portion nearest the blade and a rounded end portion at the handle end opposite the blade, a closed loop finger guard projecting laterally from the tapered portion of the handle to receive a finger of the user and facilitate manipulation of the tool, and the blade portion being an elongated thin blade member having an inner end captured in embedded relation in the handle and a pointed tip end at the opposite end of the blade remote from the handle, the blade having substantially uniform width and thickness along its length from the handle to the tip end and the tip end having a pair of inclined sharpened edges converging to form a point, the blade having a first and second spaced longitudinal edges paralleling the longitudinal axis of the tool, the first longitudinal blade edge being sharpened along a portion of its length from a juncture with the inclined sharpened edges forming said



pointed tip and the second longitudinal edge of the blade being formed with a row of saw teeth along its entire length, said blade being removably captured in said handle portion, the handle portion being formed in two halves having flat faces to be disposed in abutment with each other in assembled relation, the flat faces of the handle halves having like blade receiving cavities therein shaped to conform to and receive an end portion of the blade therein in tightly nested relation, the blade having a hole in the end portion thereof received in the handle cavities and the handle having a fastener screw extending through a portion of a handle halves and through said hole in the blade, one edge of the end portion of the blade received in said cavities in said handle halves having a triangular notch therein and said recesses having a triangular nose formation conforming to said notch in the blade end portion to be interfitted therein and assist in retaining the blade in assembled relation in the handle.

4,870,758

PORTABLE CIRCULAR SAW

Fusuo Fushiya, Anjo, Japan, assignor to Makita Electric Works, Ltd., Anjo, Japan

Filed May 6, 1988, Ser. No. 190,831

Claims priority, application Japan, Dec. 5, 1987, 62-185706[U]

Int. Cl.⁴ B23D 45/16

U.S. Cl. 30—388

3 Claims

1. A portable circular saw comprising:
 - a housing;
 - an electric motor mounted in said housing;
 - a circular saw blade attached to said housing and adapted to be driven by said electric motor;
 - a handle carried by said housing;
 - a base plate disposed below said housing and having an opening therein for receiving substantially the lower half of said saw blade;
 - support means mounted on said base plate adjacent the front end thereof for supporting said housing for pivotal movement relative to said base plate; and
 - a locking lever mounted on said support means for temporarily locking said housing to said base plate in any selected pivoted position, said locking lever having a stand portion disposed thereon and projecting forwardly therefrom into laterally spaced apart aligned relation to the

front end of said base plate to define a rest means for said circular saw;



wherein said circular saw may be rested in an upright position by the front end of said base plate and said stand portion of said locking lever.

4,870,759

ACTIVITY ENTRY APPARATUS FOR MAKING TIME ENTRIES ON PRE-ESTABLISHED TIME LOG FORMS

John F. Burton, Rt. 2, Box 31B, Worley, Id. 83876, and Fred A.

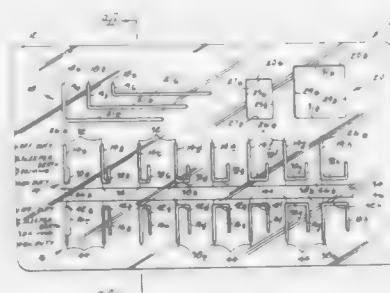
Rogers, Rt. 3, Box 842, Otis Orchards, Wash. 99027

Filed Oct. 6, 1988, Ser. No. 254,449

Int. Cl.⁴ B43L 7/00; G01B 3/10

U.S. Cl. 33—563

20 Claims



1. An activity entry apparatus for making hand-drawn activity entries onto a pre-established vehicle driver's time log activity form, the time log form comprising a series of neighboring activity sections having a series of common time indicator lines for indicating driver activity over a pre-established period of time, the neighboring activity sections comprising:
 - (a) an off duty section for indicating when a driver is off duty,
 - (b) a sleeper berth section for indicating when a driver is in a sleeper berth (c) a driving section for indicating when a driver is driving on duty, and (d) an on duty but not driving section for indicating when a driver is on duty but not driving, the activity entry apparatus comprising:

- a time log form overlay sheet of resilient and significantly transparent material having a series of writing instrument guides extending therethrough, the guides having an open width at least great enough to receive the pointed end of a writing instrument therethrough;
- the guides defining a series of activity change segments having lengths at least great enough to extend from one time log form activity section to a directly adjacent time log form activity section;
- at least one such activity change segment having a length great enough to extend from and between activity sections on the time log form having maximum separation from one another;

the series of activity change segments defining selected adjacent pairs of activity change segments, the activity change segments of the selected adjacent pairs being separated from one another by distances equal to predetermined distances between log form time indicator lines which represent selected intervals of time during the pre-established time period for a given activity on the time log form; and

each guide defining at least one time interval segment extending between and interconnecting the activity change segments within each selected adjacent pair.

4,870,760

METHOD AND AN APPARATUS FOR DRYING BULK MATERIAL, PREFERABLY OF PLASTIC GRANULES

Roderich W. Gräff, Egerländer Str. 2-4, 6108 Weiterstadt, Fed. Rep. of Germany

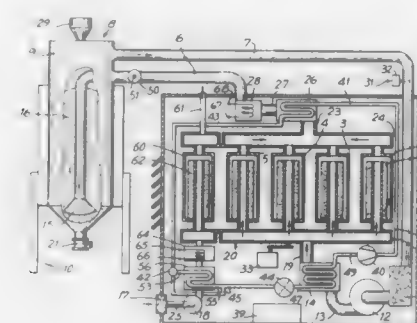
Filed May 5, 1988, Ser. No. 191,894

Claims priority, application Fed. Rep. of Germany, Jul. 24, 1986, 3625013; Japan, Jan. 23, 1988, 63-013474

Int. Cl.⁴ F26B 21/06

U.S. Cl. 34—32

12 Claims



1. A method for drying bulk material of plastic granules, in a drying hopper by means of dry air, comprising the steps of: cooling exhaust air escaping from the drying hopper in a heat-adsorbing portion of a heat pump; drying the cooled air from the drying hopper by humidity adsorbing means contained in a drier; and feeding the dried exhaust air emanating from the drier into the drying hopper as dry air for drying the bulk material.

4,870,761

SHOE CONSTRUCTION AND CLOSURE COMPONENTS THEREOF

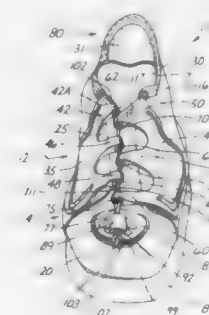
Richard J. Tracy, 1002 Forest Dr., Elgin, Ill. 60120

Filed Mar. 9, 1988, Ser. No. 165,768

Int. Cl.⁴ A43C 11/22, 1/02, 1/04, 1/06

U.S. Cl. 36—51

19 Claims



1. A shoe construction, comprising:

a foot receiving body portion having means defining a front access opening;

a closure component having at least one transversely extending individual finger means disposed at least partially over said access opening;

cord means secured between said finger means and the body portion; and

said finger means and said cord means being composed of stretchable material to stretch in opposition to one another to permit the foot to enter the shoe and to snap back resiliently to a closed position to enable said closure to confine yieldingly the foot of the user;

said finger means including eyelet means receiving an intermediate portion of said cord means threaded there-through;

means for attaching adjustably the end portions of said cord means to said body portion to enable said cord means to be tensioned adjustably in opposition to said finger means.

4,870,762

SAFETY SHOE STRUCTURE

Martin Lee, Suite 704, President Building, 592, Lin-Shen North Road, Taipei, Taiwan

Filed Sep. 28, 1988, Ser. No. 250,163

Int. Cl.⁴ A43C 13/14

U.S. Cl. 36—77 R

8 Claims



1. A safety shoe structure comprising a sole, an upper having an outer layer and a lining and being provided over and around the front periphery of said sole to define a toe receiving portion at the front end portion of said shoe, and a protective cap provided above said toe receiving portion and between said outer layer and said lining, said protective cap being formed in a shape as to have a generally U-shaped forward edge and an approximately arch-shaped rear edge, said safety shoe further comprises:

- a lateral flange extending horizontally and inwardly from said forward edge of said protective cap;
- a soft piece connected at said rear edge of said protective cap having a forward stepped portion adapted to engage beneath the lower surface of said rear edge and a rear body portion flushly extending from said rear edge and tapered to an edge so as to be snugly interposed between said outer layer and said lining;
- a hard raised portion formed at the front end of the upper surface of said sole and adapted to provide a base for resting said lateral flange;
- a sponge member provided onto the remaining portion of said upper surface of said sole; and
- an insole provided on said lateral flange and said sponge member.

4,870,763

MULTI-PORT STEAM CHAMBER METERING VALVE FOR STEAM IRON

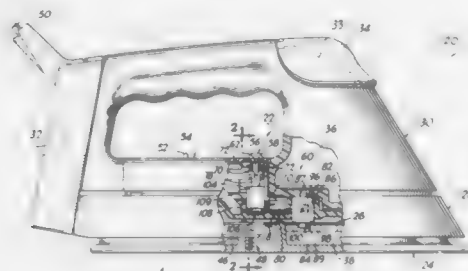
James D. Campbell, Bollingbrook, Ill., assignor to Sunbeam Corporation, Downers Grove, Ill.

Filed Jul. 22, 1988, Ser. No. 231,387

Int. Cl.⁴ D06F 75/18

U.S. Cl. 38—77.7

27 Claims



1. A variable steam flow iron comprising:
 a soleplate having a plurality of steam discharge ports;
 a steam generator in communication with said steam discharge ports having a water inlet port;
 a heating element disposed in said soleplate to heat said steam generator;
 a housing which includes a water reservoir at least partially located above said steam generator having a discharge port in communication with said water inlet port of said steam generator and a fill port; and
 means for controlling the amount of water flow from the water reservoir to the steam generator which includes a valve disposed between said water inlet port of said steam generator and said discharge port of said housing, said valve having a plurality of flow passageways selectable by a single valving member to provide a plurality of rates of water flow from said water reservoir to said steam generator.

4,870,764

GREETING CARD ARRANGEMENT

Stephen D. Boone, Louisville, Ky., assignor to Instant Product Inc., Louisville, Ky.

Filed Jun. 15, 1987, Ser. No. 61,714

Int. Cl.⁴ G09F 1/00

U.S. Cl. 40—124.1

1 Claim



1. a message device including a planar panel having an opening, a waterproof cup having a perimetral configuration similar to said opening and an outwardly extending flange means surrounding a portion of said cup and an open end where said cup defines an enclosure and where said flange is adapted to be

attached to the said planar panel with the open end adjacent said planar panel and the cup extending through said opening, a water soluble capsule containing an exposable material cut in the shape of a message so that the said water soluble capsule melts when it is exposed to water and allows the message to expand in said enclosure; and back panel means to be received over said cup opening wherein said back panel is a fold hingedly connected to said planar panel.

4,870,765

PICTURE DISPLAY CASE

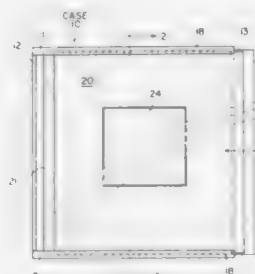
Whitney G. McLeod, Gunther Islands, Eureka, Calif. 95501

Filed Feb. 19, 1987, Ser. No. 16,297

Int. Cl.⁴ A47G 1/06

U.S. Cl. 40—152

2 Claims



1. A display case comprising: a flat viewing cover sheet having opposite sides; a frame comprising a pair of opposite end members and a pair of opposite side members, the side frame members having inner faces having substantially parallel grooves therein, for slidably receiving the cover sheet; said grooves extending the length of the side frame members over the end frame members for permitting insertion and removal of the cover sheet from either end; and securing means of size for insertion within said grooves for securing the cover sheet against sliding along said grooves.

4,870,766

PICTURE SUPPORT

Irene M. Topping, 78 Kenilworth Road, Overport, Durban Natal Province, South Africa

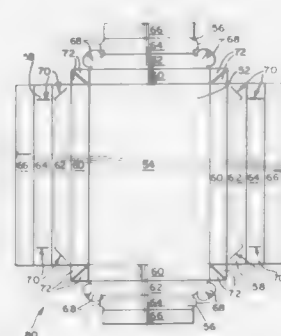
Filed Dec. 17, 1987, Ser. No. 134,246

Claims priority, application South Africa, Dec. 19, 1986, 86/9581; Jan. 12, 1987, 87/0181

Int. Cl.⁴ G09F 1/12

U.S. Cl. 40—154

14 Claims



1. A picture support for hanging a picture on a wall, comprising a foldable sheet element having a rectangular central portion with first through fourth sides and having first through fourth flaps respectively connected to said first through fourth

sides by respective fold lines, said first and third flaps extending from one pair of opposing sides and said second and fourth flaps extending from the other pair of opposing sides of said central portion, each of said flaps comprising:

- a first flap portion connected directly to the corresponding side of said central portion and extending substantially perpendicular to said central portion when said sheet element is in a folded state;
- a second flap portion connected directly to said first flap portion and extending substantially parallel to a front face of said central portion and substantially perpendicular to said first flap portion when said sheet element is in said folded state;
- a third flap portion connected directly to said second flap portion and extending toward a rear face of said central portion and substantially perpendicular to said second flap portion and to said central portion when said sheet element is in said folded state; and
- a fourth flap portion connected directly to said third flap portion and extending toward a corresponding side edge of said central portion and substantially parallel to and in abutment with said rear face of said central portion when said sheet element is in said folded state;

wherein said flaps are suitably formed to avoid interference with one another when said sheet element is in said folded state and comprise interlocking means for interlocking certain flap portions when said sheet element is in said folded state, said interlocking means in turn comprising first through fourth pairs of tongue means respectively extending from opposite ends of said second and third flap portions of said first and third flaps and first through fourth pairs of slit means respectively formed in said second and third flap portions of said second and fourth flaps, said tongue means and slit means being arranged whereby each of said tongue means interlocks a respective one of said slit means, whereby said picture support is held in a box-like configuration.

4,870,767

VISIBLE FILE POCKETS

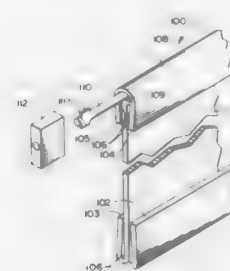
Alan F. Davies, 673 Market Hill, Vancouver, B.C., Canada V5Y 1E9

Continuation of Ser. No. 461,537, Jan. 27, 1983, abandoned. This application Dec. 16, 1986, Ser. No. 943,662

Int. Cl.⁴ B65D 27/00

U.S. Cl. 40—360

28 Claims



1. A visible file pocket for captively retaining and displaying documents on both sides thereof, said file pocket comprising, in combination:

- (a) a central rectangular web defining uninterrupted front and back document supporting faces and having first and second transverse parallel edges;
- (b) a first pair of longitudinally extending flanges integral with and extending out of the plane of said central rectangular web along said first transverse parallel edge, said first pair of longitudinally extending flanges being folded in opposite directions out of the plane of said web through angles on the order of 180° and heat set so as to respectively overlie the front and back surfaces of said central rectangular web adjacent said first transverse parallel

4,870,768

MOVING PICTURE DEVICE

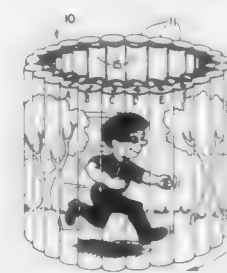
James A. Watt, and Stanley A. Watt, both of 5507 Ledbrooke Dr. S.W., Calgary, Alberta, Canada T3E 5Y1

Filed Feb. 11, 1988, Ser. No. 155,137

Int. Cl.⁴ G09F 19/00

U.S. Cl. 40—430

12 Claims



1. A display device, comprising:
 a plurality of positive lenses disposed in an outwardly curved lens array as seen by an observer;
 a plurality of substantially concavely curved pictures respectively associated with said lenses;
 said pictures each being disposed behind the respective lens and being located substantially at or within the focal length of the respective lens;
 said pictures each comprising a plurality of picture elements such that, when said lens array is viewed from different angles by an observer, the observer is able to perceive a composite substantially planar image formed from magnified images of the picture elements of different ones of said pictures.

4,870,769
HIGN

David P. Ogilvie, Alyth, Scotland, assignor to Signald Limited, Dundee, Scotland

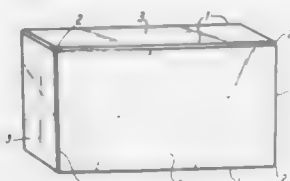
Filed Feb. 1, 1988, Ser. No. 151,005

Claims priority, application United Kingdom, Jan. 31, 1987, 8702185; Mar. 26, 1987, 8707263

Int. Cl.⁴ G09F 13/04

U.S. Cl. 40—564

8 Claims



1. An elongate frame member in the form of a body having a longitudinal axis and being of uniform cross-section transverse to said longitudinal axis along the length of the body; said body comprising:

- a first face;
- a second face directed generally at right angles to said first face;
- a first recess formed in said first face and bounded at said first face by a pair of flanges defining a first slot therebetween;
- a second recess formed in said second face and bounded at said second face by a pair of flanges defining a second slot therebetween, whereby mutually perpendicular panel members can be received in said first and second slots; and
- a corner recess at the junction of said first and second faces and bounded at each of said faces by a single flange such that said corner recess is open in directions perpendicular to both of said first and second faces.

4,870,770

SAFETY MECHANISM FOR FIREARMS

Melvin D. Forbes, Granville, and William F. Malone, Jr., Morgantown, both of W. Va., assignors to Ultra Light Arms, Inc., Granville, W. Va.

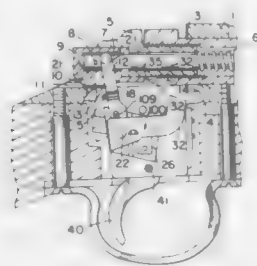
Continuation-in-part of Ser. No. 680,328, Dec. 10, 1918, Pat. No. 4,730,406. This application Mar. 14, 1988, Ser. No. 167,591

The portion of the term of this patent subsequent to Mar. 15, 2005, has been disclaimed.

Int. Cl.⁴ F41C 17/08

U.S. Cl. 42—70.01

15 Claims



1. In a safety mechanism for a firearm having a bolt including a slidable firing pin, a trigger housing, a sear movably mounted to said trigger housing for controlling the firing of said firing pin, and a safety pivotally mounted to said trigger housing for rotation about a pivot pin by means of manually induced pivotal movement of a lever arm portion of said safety between a "safe" position, in which a bolt lock arm portion of said safety is brought into bolt movement blocking position

and an inner arm portion of said safety is brought into sear movement blocking position, and a "fire" position, in which movement of said bolt and sear are unobstructed by said safety, the improvement comprising:

means, responsive to translational movement of said lever arm portion while said safety is in said "safe" position, to temporarily back said bolt lock arm portion out of said bolt movement blocking position while said inner arm portion remains in said sear movement blocking position, whereby said bolt can be withdrawn without pivoting said safety toward said "fire" position.

4,870,771

REVOLVER HOLDER

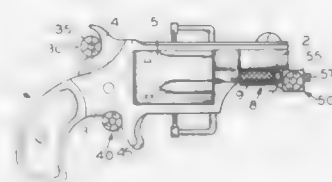
Gary C. McClellan, 4011 Saddler Ln., Vale, Oreg. 97918

Filed Apr. 28, 1989, Ser. No. 344,664

Int. Cl.⁴ A45C 11/00; F41C 33/00

U.S. Cl. 42—90

20 Claims



1. A revolver holder for revolvers having a frame, hammer, and cylinder and further provided with a cylinder retention pin having a spring biased keeper, said holder comprising:

- a plate having a front face and a rear face;
- hammer engagement means upstanding from the front face of said plate for engaging the hammer;
- frame engagement means upstanding from the front face of said plate for engaging the frame; and
- keeper engagement means upstanding from the front face of said plate for engaging said keeper to hold the revolver in a fixed mounted relationship relative to said plate.

4,870,772

FLY TYING TOOL

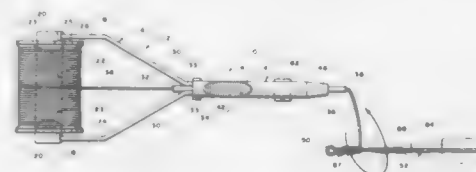
Robert R. Johns, 2224 Connes Square, Oxnard, Calif. 93030

Filed Jul. 1, 1987, Ser. No. 68,441

Int. Cl.⁴ A01K 97/00; D03J 3/00

U.S. Cl. 43—1

11 Claims



9. A combination tool for tying flies, comprising in combination:

- a bobbin for receiving a spool of thread having a rearward portion on which is mounted a set of aligned spool receiving hubs and a forward portion including a tube for receiving and carrying the thread from the spool and having a forward tip from which the thread extends and is exposed for wrapping about a shank of a fish hook, and
- a knot tying element connected to said rearward portion of said bobbin and extending therefrom in a direction opposite to that of said forward portion of said bobbin comprising a right angle rod connected to one of the hubs and extending rearwardly therefrom, said knot tying element having a tapered conical end with a cavity for receiving

an eye on the shank of the fish hook for forming a knot solely over the tapered end of said element.

rotation of said sleeve relative to said handle, due to forces acting on said landing net at its lateral edges.

4,870,773

COLLAPSIBLE AND TELESCOPING FISHING NET

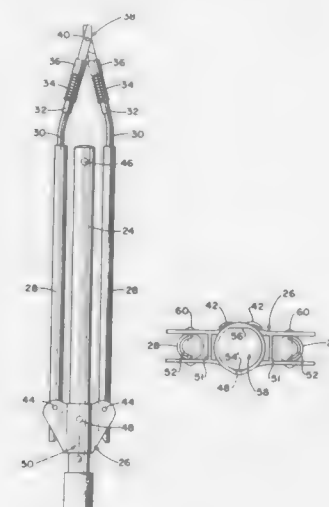
Wayne A. Schmucker, West Unity, and Ronald L. Rupp, Fayette, both of Ohio, assignors to Fishers of Men Corp., Ohio

Continuation-in-part of Ser. No. 4,066, Jan. 16, 1987, abandoned. This application Jul. 18, 1988, Ser. No. 220,326

Int. Cl.⁴ A01K 77/00

U.S. Cl. 43—12

9 Claims



1. In a collapsible fish landing net including a collapsible rim assembly mesh netting, a yoke assembly and a substantially circular primary handle;

- said rim assembly having two hollow rigid housing cylinder and two flexible arcuate members telescopicable thereto, but not detachable therefrom, each said arcuate member being attached to a lockable pivot point for securing said rim assembly in an operating configuration;
- said pivot point being lockable by spring caps urged into locking position by compression springs, thereby causing said caps to extend over parts of both arcuate members simultaneously so as to hold said members in aligned position when the landing net is in its operating configurations;

said netting being strung on said rim assembly;

said primary handle having a spring operated release button for optionally maintaining said landing net in its operating configuration, or for collapsing it to its storage configuration;

said yoke assembly having a hollow central circular sleeve through which said primary handle slides when the landing net is being collapsed or opened, and

said yoke assembly also being pivotally attached to said hollow rigid cylinders and having an opening through which said release button can extend, the improvement comprising providing said sleeve with a flat peripheral wall parallel to its longitudinal axis, thereby forming a first portion, and providing said primary handle with a flat peripheral wall parallel to its longitudinal axis, and extending the length of said primary handle thereby forming a second portion, said first and second portions being positioned adjacent to each other in mating relationship wherein each of said flat peripheral walls is formed on a chord of the generally circular cross-section of said sleeve or said primary handle extending over a substantial arc of said circular cross-section so as to prevent the transverse

4,870,774

FISHING ROD

Yoshiro Yamato, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Dec. 28, 1987, Ser. No. 138,702

Claims priority, application Japan, Dec. 27, 1986, 61-199993

Int. Cl.⁴ A01K 87/00

U.S. Cl. 43—23

6 Claims



1. A fishing rod, comprising:

- a rod body having a root portion and a rod-tip portion;
- a reel mounting device mounted at said root portion of said rod body at one radial side thereof; and
- a grip formed of a flexible material and mounted on said rod body between said reel mounting device and said rod-tip portion of said rod body; said grip including a substantially flat finger-bearing surface comprising means for enabling an angler to control the drawing out of a fishing line from a reel mounted on said reel mounting device via at least one finger of his hand gripping said grip by pressing the fishing line against said finger-bearing surface means, said finger-bearing surface means (i) being formed of a harder material than the material of which the rest of said grip is formed, (ii) having a predetermined width, and (iii) being located on a surface of said grip positioned at said one radial side of said rod body at which said reel mounting device is mounted, whereby responsive to said fishing line being pressed by said at least one finger of said angler against said finger-bearing surface means, said fishing line is enabled to form a straight line between a portion thereof pressed by said at least one finger against said finger-bearing surface means and a portion thereof located at said fishing line guide located nearest said grip.

4,870,775

DIRECTIONAL REVERSING LURE

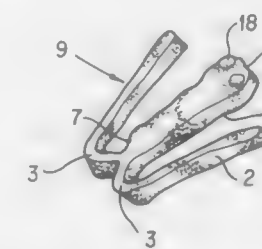
Henry Schrader, P.O. Box 93, State Line, Miss. 39362

Filed Sep. 17, 1987, Ser. No. 97,686

Int. Cl.⁴ A01K 85/00

U.S. Cl. 43—42.02

15 Claims



1. A fishing lure comprising:

- (a) a body having at least one appendage including a paddle;
- (b) at least one elastic connection between said body and

paddle having length and width with elastic memory to the contracted position attached at one end to the body wherein the elastic connection has elastic memory along the height and width of the said elastic connection to prevent twisting of the paddle when the elastic connection unbends along its length;

(c) said paddle being attached to the elastic connection at the end opposite the connection with the body and having a face, the face shaped so as to resist the flow of water as the lure moves through the water so that the paddle face tends to move to and from the contracted position without twisting.

4,870,776

WEIGHT, ACTION, AND COLOR ADJUSTABLE FISHING LURE

Herold Schock, 509 - 825 Granville St., Vancouver, B.C., Canada V6Z 1K9

Filed Aug. 22, 1988, Ser. No. 234,521

Int. Cl.⁴ A01K 85/00

U.S. Cl. 43-42.33

7 Claims



1. A fishing lure comprising a tube with at least one hole in the wall of the main body thereof and having a protruding lip with at least one hole therein, the said holes adapted to be threaded by a fishing line, and the tube adapted to receive at least one colored bead or like object that has been threaded onto the fishing line.

4,870,777

FISHING LINE DEVICE

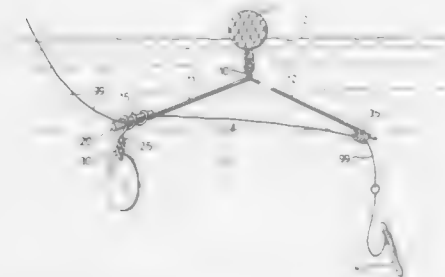
Toshio Morita, 177 Donlands Avenue, Toronto, Canada M4J 3P3

Filed Dec. 22, 1987, Ser. No. 136,605

Int. Cl.⁴ A01K 91/00

U.S. Cl. 43-42.74

10 Claims



1. A hanger for use with a continuous fishing line and lure, comprising:

(a) float means;

(b) an elongate member having two arms and being pivotally connected, at an intermediate portion thereof, to said float means;

wherein said first arm has means adapted for fastening a first portion of the fishing line, and said second arm has means adapted for fastening a second portion of the continuous fishing line.

4,870,778

LIVE BAIT AND FISH CONTAINER

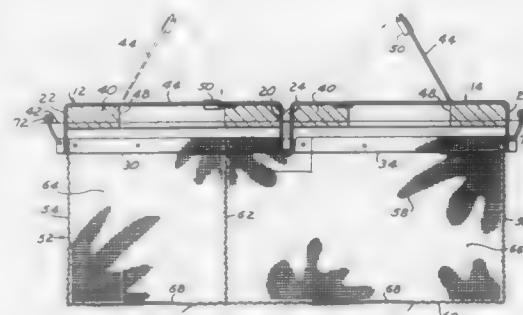
Harold A. Sheppard, P.O. Box 367, Okay, Okla. 74446

Filed Sep. 14, 1988, Ser. No. 243,965

Int. Cl.⁴ A01K 97/00, 97/04

U.S. Cl. 43-55

5 Claims



1. A fish and live bait container, comprising:

a pair of end abutting box-like half sections each having a planar panel and depending side and end walls hingedly connected along the respective abutment surface for folding and unfolding movement of the two halves about an axis lying in a plane common to the lower edge surfaces of the side and end walls;

a box-like plastic screen material collapsible panel assembly having a bottom wall and vertical side and end walls respectively secured at their upper limit to the depending edge portions of said half sections side walls and the end walls remote from the abutted surfaces;

a partition transversely dividing said panel assembly for forming a pair of chambers;

means including a flap door supported by each said half section providing access to the interior of said chambers; and,

an elongated normally closed opening in said bottom wall on opposing sides of said partition.

4,870,779

MAGNETIC RODENT CONTROL METHOD

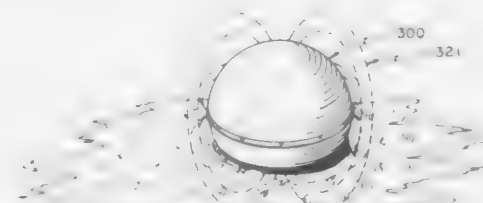
Neale E. Johnson, Monterey, Calif., and Carmen F. Markham, P.O. Box 1294, Pebble Beach, Calif. 93953, assigns to Carmen F. Markham, Monterey, Calif.

Continuation-in-part of Ser. No. 873,043, Jun. 3, 1986, abandoned, which is a continuation of Ser. No. 526,359, Aug. 25, 1983, abandoned. This application Feb. 1, 1988, Ser. No. 148,158

Int. Cl.⁴ A01M 1/20

U.S. Cl. 43-174

16 Claims



1. Apparatus for generating a low frequency randomly varying magnetic field for the control and eradication of rodents, insects, and the like, said apparatus comprising:

magnetic means having a principal direction for providing a magnetic field in said principal direction, said principal direction oriented parallel to the earth's surface and the local geomagnetic North direction, said magnetic field

having a maximum field strength of less than 0.06 mT; modulating means coupled to said magnetic means for randomly varying said magnetic field in frequency and intensity, said magnetic field having a primary frequency in a range greater than zero but less than or equal to 40 Hertz; and

mounting means for mounting and supporting said magnetic means and said modulating means, said mounting means disposed so as to mount said magnetic means in close proximity to the earth's surface.

4,870,780

AGRICULTURALLY USED RODENT BAIT STATION WITH SIGNAL WAND

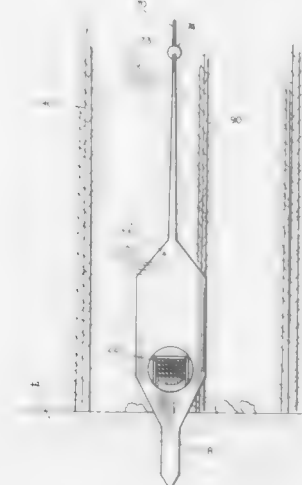
Daniel A. Sherman, 1355 Bobolink Pl., Los Angeles, Calif. 90059

Filed Feb. 23, 1989, Ser. No. 313,881

Int. Cl.⁴ A01M 1/20

U.S. Cl. 43-131

5 Claims



1. A rodent bait station; said station having a vertical conical geometrical shape; said geometrical shape being spherical in dimension, said sphere being breached by a portal leading to an interior chamber; said chamber containing an independent bait holder; said bait holder being capable of being mounted to an interior wall by a plurality of means; said station having an interior wall rising to form an interior pyramid at its top; the exterior of said pyramid having a removable signal wand extending upward; said signal wand having a disk capable of being picked up by an independent mechanical picking device; said station having an interior wall dropping to form a v-shaped chamber at its bottom; the exterior of said bottom v-shaped chamber having an extension forming an elongated peg that is integral to said station for mounting said baiter into the ground; said station having two elements that cooperate to allow for the opening of said station to allow the addition of additional rodent bait.

4,870,781

COMBINATION TREE SUPPORT AND FEEDER STAKE

Timothy D. Jones, 1202 Churchill Dr., Gastonia, N.C. 28054

Filed Apr. 28, 1988, Ser. No. 187,971

Int. Cl.⁴ A01G 17/06, 29/00

U.S. Cl. 47-43

1 Claim

1. A combination tree support and feeder stake comprising an elongated and tapered body portion, at least part of which is intended to be positioned in use beneath the surface of the ground, said body portion including an anchoring unit extending from one side of the body portion at an upper end portion thereof for attaching the stake to a tree, flanges and ribs extending laterally from the body portion and tapering down-

wardly and inwardly to the bottom of the stake for reinforcement, said ribs extending generally parallel to the anchoring unit, said flanges extending generally perpendicular to the ribs and having a greater cross-sectional dimension in the radial direction than the ribs, said body portion having an open top and an internal chamber communicating with the open top and



located in use at least partially beneath the surface of the ground for the reception of fertilizer, and said body portion also having a plurality of openings providing communication between at least that portion of the internal chamber beneath the surface of the ground and the area surrounding the stake, whereby a tree may be supported and fed.

4,870,782

AUTOMATIC GATE OPENING AND CLOSING DEVICE

Murray Purves, Lot 110, Cooyong Road, Terrey Hills, NSW. 2084, Australia

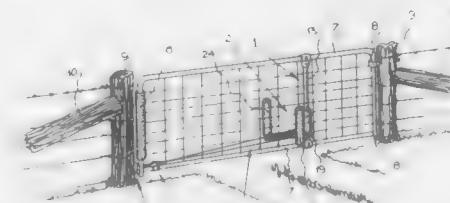
Filed May 8, 1987, Ser. No. 47,329

Claims priority, application Australia, May 9, 1986, PH5818

Int. Cl.⁴ E05B 65/00

U.S. Cl. 49-364

4 Claims



1. An automatic opening and closing device for a substantially elongated and transverse gate comprising:

a kingpost fixedly attached to, and extending substantially vertically between, an upper frame member and a lower frame member of said gate;

a pushbar assembly, including a pair of pushbars, being pivotally mounted on and relative to said kingpost;

a first pushbar being disposed on one side of said gate and a second pushbar being disposed on the other side of said gate;

said pushbars being generally "L" shaped in formation and each having a base extending outwardly from said kingpost and an upwardly extending arm portion substantially parallel to but spaced apart from said kingpost;

each arm position mounting a freely rotatable sleeve, and said pushbars and sleeves being located adjacent a lower portion of said gate;

a spring-urged bolt being located adjacent to said lower frame member of the gate for preventing an animal from wedging its head under said bolt, said spring-urged bolt being located adjacent a free outer frame member c' said gate and being adapted to maintain said gate in a closed position when said bolt engages with a co-acting latch means mounted to a gate post; and

a cable extending between the base of each push bar and said

bolt, so that applying a force to an upwardly extending arm portion of a pushbar and a sleeve in a general direction toward said gate causes turning movement of said pushbar assembly and tensioning of one cable for disengaging said bolt from said latch means, to allow said gate to spring open, and removing the force allows said one cable to restore said pushbar assembly to an initial position of rest so that when said gate returns to a closed position, said bolt can reengage with said latch means.

4,870,783

ELASTOMERIC PROFILED SEALING MEMBER

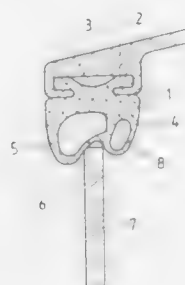
Dietmar Hermann, Garbsen, and Michael Bethge, Hanover, both of Fed. Rep. of Germany, assignors to Continental Aktiengesellschaft, Hanover, Fed. Rep. of Germany
Filed Sep. 26, 1988, Ser. No. 249,598

Claims priority, application Fed. Rep. of Germany, Oct. 17, 1987, 3735248

Int. Cl.⁴ E06B 7/22

U.S. Cl. 49—477

3 Claims



1. In a profiled sealing member that is made of elastomeric material and is disposed along a closeable opening of a motor vehicle body to seal off a window or windows, especially side door window panes, relative to the opening of the vehicle body, with said profiled sealing member having a resiliently flexible sealing portion and a hollow space therein that can be pressurized and evacuated, the improvement therewith comprising:

a sealing and support element that is connected to said sealing portion and delimits said hollow space outwardly, remote from said vehicle body opening on which said profiled sealing member is disposed; when said hollow space is under pressure, said sealing and support element with the hollow space pressurized, engages predominantly externally about that edge portion of a window enveloped in a location that faces away from the inside of said vehicle both to achieve a satisfactory sealing effect at greater manufacturing gap tolerances and also to prevent unwelcome rattling noises as well as higher speeds.

4,870,784

LENS EDGING MACHINE AND METHOD

Rolando P. Ramos, Des Plaines; Wilfredo P. Loreto, Hoffman Estates, and Yordan Valich, Oak Lawn, all of Ill., assignors to AIT Industries, Inc., Schaumburg, Ill.

Division of Ser. No. 551,148, Nov. 14, 1983, Pat. No. 4,807,398.

This application Jan. 9, 1989, Ser. No. 294,236

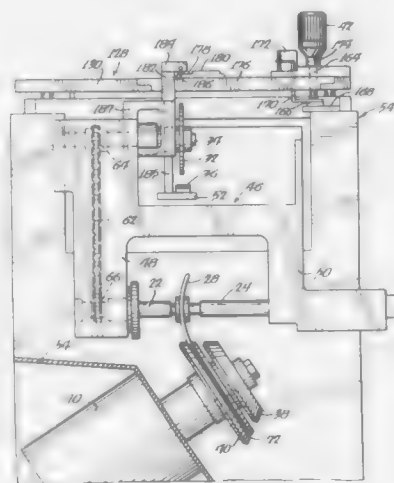
Int. Cl.⁴ B24B 9/14

U.S. Cl. 51—165 R

11 Claims

1. Apparatus for grinding bevels on the peripheries of ophthalmic lenses, comprising a rotatable grinding wheel having a grinding surface and a groove in and circumferentially around said surface; a workholder for supporting and rotating a lens about an axis; motor means for translating said workholder from a reference position to an operative position whereat the periphery of the lens is in position to be ground; means for moving said workholder and grinding wheel together, after said workholder is in said operative position, to move the

rotating lens periphery into said groove to grind a bevel on the periphery; and circuit means for controlling operation of said motor means in accordance with the base curve of the lens being ground, so that the distance said workholder is translated



from said reference to said operative position is in accordance with the base curve to position the lens periphery with respect to said groove so that when said workholder and grinding wheel are moved together the bevel is ground on the periphery toward the front face of the lens.

4,870,785

LENS HOLDER FOR AN APPARATUS FOR GRINDING THE EDGES OF A LENS

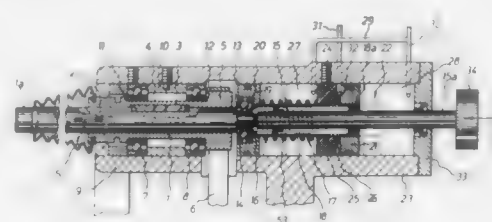
Fritz Kötting, Dormagen, Fed. Rep. of Germany, assignor to Wernicke & Co. GmbH, Düsseldorf, Fed. Rep. of Germany
Filed Apr. 4, 1988, Ser. No. 177,107

Claims priority, application Fed. Rep. of Germany, Apr. 4, 1987, 8705045[U]

Int. Cl.⁴ B24B 13/005

U.S. Cl. 51—217 L

4 Claims



1. A lens holder for an apparatus for grinding the edges of a lens, said lens holder including two coaxial, rotatable shaft halves having adjacent ends between which said lens is held, with one of said shaft halves being axially shiftable via application of pressure to permit insertion, securing, and removal of said lens and keeping the lens in its grinding position; said lens holder in combination further comprising:

a housing through which said axially shiftable shaft half extends; and

two separate adjustment systems including resilient means to urge said axially shiftable shaft half lightly with a nominal pressure in a predetermined direction toward the lens kept thereby in its grinding position as well as rigid mechanical means disposed in said housing independently of said resilient means and operatively connected directly to said axially shiftable shaft half to exert a pressure directly on the lens greater than the nominal pressure to keep the lens in its grinding position for securing said lens during grind-

ing thereof, with said rigid mechanical means being movable with said axially shiftable shaft half.

4,870,786

WORKSTOCK

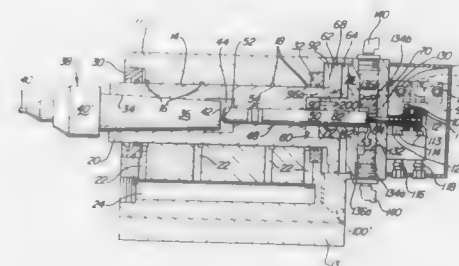
Lawrence I. Millay, Springfield, and Guenther F. Burghacher, Proctorville, both of Vt., assignors to Bryant Grinder Corporation, Springfield, Vt.

Continuation of Ser. No. 914,035, Nov. 1, 1986, abandoned. This application Jul. 1, 1988, Ser. No. 214,306

Int. Cl.⁴ B23B 23/04

U.S. Cl. 51—281 R

10 Claims



1. In a method for loading a workpart between spaced opposing workpart centers, the steps of mounting at least one of the workpart centers in a housing for translational movement therein toward the other workpart center, moving said one of the workpart centers toward the other workpart center to attempt to engage a workpart that should have been positioned between the opposing centers, including moving said one of the workpart centers (1) to a position where engagement with the workpart should occur if the workpart length is within tolerance, (2) past said position where engagement should occur in the event the workpart is too short or not present between the opposing workpart centers or (3) short of said position where engagement should occur in the event the workpart is too long, sensing the translational position of said one of the workpart centers as it moves toward the other workpart center, generating position signals indicative of translational position and inputting the position signals to a control unit to determine if an abnormal relative positional condition exists between the workpart and said one of the workpart centers indicative of a workpart that is too short, too long or not present between the opposing workpart centers.

4,870,787

SANDING WHEEL

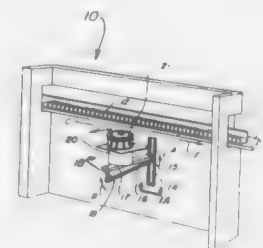
Theodore Voorhees, 331 Greenacres Dr., Anderson, Calif. 96007

Continuation-in-part of Ser. No. 899,069, Aug. 20, 1986, Pat. No. 4,744,180. This application May 16, 1988, Ser. No. 195,109

Int. Cl.⁴ B24D 17/00

U.S. Cl. 51—358

3 Claims



1. A sanding wheel, having an axis, for use in sanding surfaces utilizing a contoured abrasive strip having a base, comprising:

a substantially cylindrical top section having:

a top surface;

a first mating surface;

a first cylinder surface extending substantially between said top surface and said first mating surface, and

a substantially circumferential extension extending outward from said first cylindrical surface substantially adjacent to said top surface having a first substantially circumferential slot angled toward said axis of said sanding wheel extending from said first substantially cylindrical surface toward said top surface, further having serrations extending inward toward said axis of said sanding wheel;

a substantially cylindrical bottom section having:

a bottom surface;

a second mating surface sized and shaped to mate against said first mating surface of said substantially cylindrical top section;

a second cylindrical surface of substantially the same diameter as said first cylindrical surface, extending substantially between said bottom surface and said second mating surface, and

a substantially circumferential extension extending outward from said second cylindrical surface substantially adjacent to said bottom surface having a second substantially circumferential slot angled toward said axis of said sanding wheel and extending from said second substantially cylindrical surface toward said bottom surface, further having serrations extending inward toward said axis of said sanding wheel, and

positioning means for holding said first and second mating surfaces of said substantially cylindrical top and bottom sections against each other whereby said contoured abrasive strip having a base of proper size and shape to fit against said first and second cylindrical surfaces and into said first and second substantially circumferential slots is held in position on said sanding wheel during operation thereof.

4,870,788

BUILDING PANELS

Melvin Hassan, Apt. 1603, 3303 Don Mills Road, Willowdale, Ontario, Canada M2J 4T6

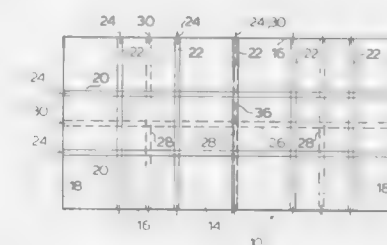
Continuation-in-part of Ser. No. 149,361, Jan. 28, 1988. This application Oct. 7, 1988, Ser. No. 254,766

Claims priority, application Canada, Oct. 20, 1987, 549697

Int. Cl.⁴ E04B 1/00

U.S. Cl. 52—105

10 Claims



1. In a drywall sheet having an obverse face, a reverse face, bounding edges and a field extending between said bounding edges, said sheet being intended for securement to a stud framework with at least one stud secured in a field position, the improvement comprising:

indicia locating in the field of said reverse face to indicate the intended position of said stud, and

complementary indicia locating on said obverse face to indicate the positioning of screw means for securement of said panel to said stud.

4,870,789 MANUFACTURED BUILDING ADJUSTABLE LEVELING AND SUPPORT DEVICE

Steven J. Clark, 19222 Old Ward's Ferry Rd., Sonoma, Calif. 95370, and William C. Fields, 17786 Black Bart Dr., Jamestown, Calif. 95327

Filed Jan. 4, 1988, Ser. No. 140,608
Int. Cl.⁴ F16M 13/00

U.S. Cl. 52—126.6

9 Claims



1. An adjustable support device for a building and the like comprising:

- a base plate for resting on a generally horizontal support surface;
- a tubular housing having an upper end and a lower end secured at said lower end to and extending normal to said base plate for normally extending vertically therefrom;
- a base frame assembly defined by cross frame members on said base plate for securing said tubular housing to said base plate;
- a tubular bearing member having a length greater than said housing telescopically mounted in said housing and having means defining an upper bearing surface;
- a mainframe support bracket having an upwardly opening channel configuration for receiving a mainframe member of a building; and
- a screw and nut assembly secured to said support bracket for adjustably supporting same in said tubular bearing member, wherein said base frame assembly comprises a plurality of elongated rectangular plates defining said cross frame members secured to and extending outwardly from said tubular housing and a lateral support leg having a lower end secured to the outer end of each of said plates and an upper end secured to said housing at a position upward from the lower end thereof.

4,870,790

STRUCTURE FOR GARAGING MOTOR VEHICLES

Omar Mezi, Bergamo, Italy, assignor to The Dynamic Energy Research S.R.L., Bergamo, Italy

Filed May 31, 1988, Ser. No. 200,492

Claims priority, application Italy, Jun. 5, 1987, 84941 A/87
Int. Cl.⁴ E04H 6/42

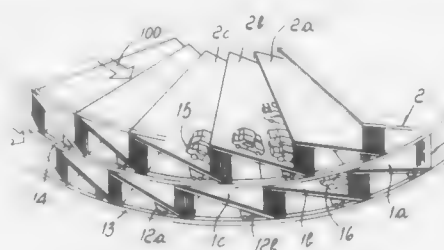
U.S. Cl. 52—175

4 Claims

1. A structure for garaging motor vehicles comprising:
- a plurality of carousels mounted for rotation about a common vertical axis of rotation and defining a radial direction and a rotation direction, each of said carousels lying in an horizontal plane and comprising a plurality of radial sectors, said radial sectors extending along said radial direction and being inclined with respect to said horizontal plane, each of said sectors having an upper rim and a lower rim, said sectors being furthermore arranged in a partially overlapping configuration and being adapted to accommodate motor vehicles arranged in a substantially perpendicular direction with respect to said radial direction, said plurality of carousels comprising at least an upper carousel and a lower carousel, said upper carousel having upper sectors and said lower carousel having lower sectors;

an entrance provided at said upper carousel, on top of said structure, to permit a motor vehicle to accommodate in one of said upper sectors;

driving means and control means for rotating said carousels



so that each of said upper sectors can be brought in correspondence of one of said lower sectors, the lower rim of said upper sector being adjacent to the upper rim of said lower sector, a motor vehicle being thereby able to move from said upper sector to said lower sector;

an exit provided at said lower carousel to permit a motor vehicle to clear said lower sector.

4,870,791

ALIGNMENT CLIP MEMBER FOR WINDOWS AND ASSOCIATED METHOD

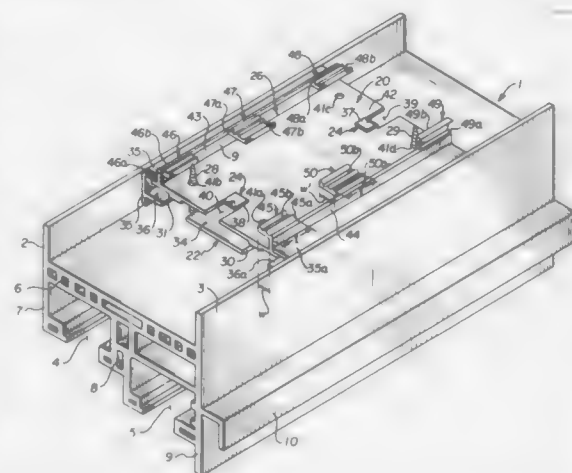
Dwight C. Nelson, Cherry Tree, Pa., assignor to Season-all Industries, Inc., Indiana, Pa.

Filed Nov. 23, 1987, Ser. No. 123,776

Int. Cl.⁴ E06B 1/04

U.S. Cl. 52—217

61 Claims



1. An alignment clip member for use in a window frame having a recess adjacent to a window receiving opening comprising

- base means for positioning within said recess of said window frame,
- alignment clip element means adjacent to said base means having deformable tab means for adjusting the spacing between said window frame and said window receiving opening,
- spring means operatively associated with said base means and said alignment clip element means for biasing said alignment clip element means with respect to said base means, and
- screw means engaging said alignment clip element means, said window frame and said window receiving opening, whereby said alignment clip element means may be altered to compensate for variations in said window receiving opening by either rotating said screw means so as to

alter the relative spacing between said base means and said alignment clip element means or by adjusting said tab means or both.

4,870,792

PASSAGE OF PRESSURIZED FLUIDS THROUGH MASONRY WORK

Daniel Belisaire, Cesson-Sevigne, France, assignor to Legris SA, Rennes, France

Filed Jan. 11, 1988, Ser. No. 141,780

Claims priority, application France, Jan. 12, 1987, 87 00305
Int. Cl.⁴ E04B 5/48

U.S. Cl. 52—220

10 Claims



1. A box assembly for the passage of pressurized liquids through masonry work, which comprises:

- a plurality of boxes embedded in pairs in the masonry work;
- a plurality of sheaths disposed in the masonry work and interconnecting said boxes;
- a plurality of pipes respectively positioned in said sheaths for transporting pressurized liquids through said masonry work,
- said boxes having an inlet and outlet for said pipes and said boxes having a parallelepipedic shape with a top portion flush with a surface portion of the masonry work, a rectangular lid flush with said top portion and having a plurality of removable weakened portions, wherein side portions of the boxes opposite said weakened portions include a plurality of stub members at least equal in number to said weakened portions, wherein each of said stub members comprises a housing for an end portion of each of said sheaths, said boxes including a plurality of curved groove portions extending over substantially $\frac{1}{4}$ of a circle and which connect together passages formed upon removal of said weakened portions; and
- a freely rotatable wheel which has a profile for substantially matching a peripheral portion of said pipes and for positioning said pipes at a bottom portion of said groove.

4,870,793

SUPPORT BASE SYSTEM FOR ARCHITECTURAL PANELS

Martin G. Tomlinson, Middletown, Ohio, assignor to Mound Steel Corporation, Springboro, Ohio

Filed Dec. 15, 1987, Ser. No. 134,102

Int. Cl.⁴ F04H 1/00

U.S. Cl. 52—241

8 Claims



1. A support base system for securely holding one or more architectural panels in adjustable height positions to accommo-

date uneven floor surfaces and architectural design needs, comprising:

- (a) an elongated U-shaped support base with a channel extending from a top surface and having a sufficient width to slidably receive a panel;
- (b) a U-shaped insert positioned in a bottom portion of the channel, said insert having an inside cross dimension of sufficient width to receive and hold the panel in a laterally substantially immovable position;
- (c) a pair of locking angles positioned along a top surface of the support base, each of said locking angles extending substantially the length of the support base with a first leg lying substantially flat with the top surface of the support base and a second leg extending into the channel, further wherein a face of said second leg has a series of gripping ribs to engage a face of the panel; and
- (d) a series of set screw holes along at least one side of the support base with set screws therein for communication with the locking angle to adjustably secure the locking angle to the panel such that the panel can be adjustably positioned in the channel prior to individually tightening the set screws.

4,870,794

CLIP FOR OUTWARDLY OPENING C-STUD

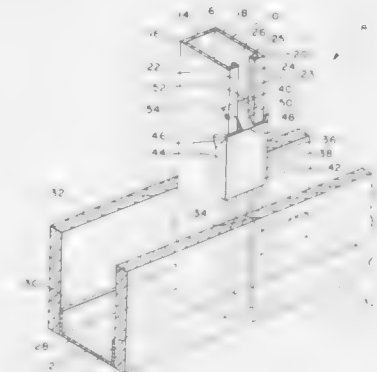
Robert J. Menchetti, Buffalo, N.Y., assignor to National Gypsum Company, Dallas, Tex.

Filed Dec. 9, 1988, Ser. No. 281,619

Int. Cl.⁴ E04B 2/00

U.S. Cl. 52—281

11 Claims



1. In combination, an outwardly opening C-shaped metal stud and a wallboard attachment clip, said stud comprising an elongate back wall, a pair of perpendicularly directed elongate web portions and an open front side, said open front side having a pair of elongate opposed flanges with an elongate opening between said opposed flanges, said wallboard attachment clip comprising a channel shaped body portion and a hanger portion, said body portion including a face portion extending across said stud open front side and a pair of rearwardly directed narrow side portions which extend from said face portion rearwardly along a portion of said stud web portion, said hanger portion including a narrow neck and a wide upper end, said upper end having tabs disposed inwardly of said stud flanges, said hanger portion being adjoined to said face portion along a fold line, said hanger portion being inwardly bent along said fold line relative to the plane of said face portion at an angle of between about 20° and 80° and having a spring-like tendency to return to a lesser angle, whereby said flanges are grasped by said tabs.

4,870,795
CERAMIC WALL OR FLOOR COVERING CONSISTING OF SINGLE TILE-SHAPED ELEMENTS
 Martin Bard, Amberg, and Hans G. Baumgart, Schwarzenfeld, both of Fed. Rep. of Germany, assignors to Buchtal GmbH, Fed. Rep. of Germany

Filed Jun. 22, 1988, Ser. No. 210,099
 Claims priority, application Fed. Rep. of Germany, Jun. 22, 1987, 3720598

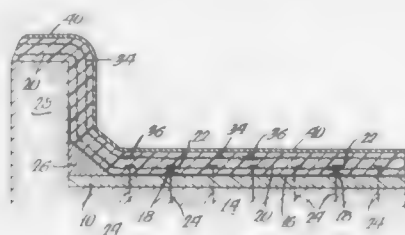
Int. Cl.⁴ E04F 13/08
 U.S. Cl. 52—389 10 Claims



1. An electrically conductive, ceramic covering for floors or walls comprising:
 - a plurality of electrically conductive, ceramic tile elements; each of said tile elements having two sides, at least one flat side and at least one edge or flank;
 - each said tile element placed in juxtaposition with another said tile element on a non-conductive substructure, forming a joint, such that each said flat side defines a portion of approximately the same plane;
 - electrically conductive means interposed between said tile elements in said joint and approximately in said plane;
 - said electrically conductive means electrically communicating with said edges or flanks.

4,870,796
WEATHERPROOF ROOFING MEMBRANE AND METHOD FOR CONSTRUCTING THE SAME
 Eric R. Hart, Rt. 1 Box 193, Woodburn, Ky. 42101, and Ernest M. Hepler, 2726 Central - Apt. 4B, Evanston, Ill. 60201

Filed Nov. 16, 1983, Ser. No. 552,361
 Int. Cl.⁴ E04B 5/00
 U.S. Cl. 52—409 16 Claims



1. A membrane for weatherproofing a roof, comprising:
 - a plurality of layers of extensible reinforcing fabric overlying and covering the roof;
 - a multiplicity of spaced apart fasteners securing at least the bottom layer, but not the top layer, of said layers of fabric to the roof;
 - each of said layers of fabric being coated with an elastomeric polymer so as to fill the voids of each of said layers of fabric and to bond each of said layers of fabric together, but not to the roof, for providing a spot anchored, flexible, weatherproof membrane.

4,870,797
PANEL JOINT
 Bruce A. Hagemeyer, Pella, Iowa, assignor to Reiscree Company, Pella, Iowa

Filed Jul. 2, 1987, Ser. No. 69,055
 Int. Cl.⁴ E06B 1/06

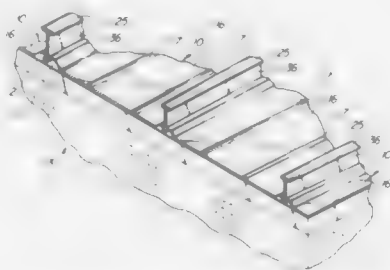
U.S. Cl. 52—455 10 Claims



1. A panel joint comprising,
 - a pair of panel members each having mortices to receive a spline,
 - said mortices extending to an exterior edge of said panel members,
 - a wood elongated spline having a length, width and thickness defining opposite ends, sides and side edges,
 - said spline positioned in said mortices and being exposed along one side edge which is substantially coplanar with said exterior edge of said panel members, and
 - screw means accessible from said one side edge of said spline extending angularly from said one side edge to an adjacent end of said spline into at least one of said panel members for pulling said one panel member tight against said other panel member.

4,870,798
DOUBLE LOCK STANDING SEAM ROOF SHEET
 Allen R. Richter, Romeo, Mich., assignor to Walcon Corp., Southfield, Mich.

Filed Feb. 6, 1989, Ser. No. 306,059
 Int. Cl.⁴ E04B 1/00
 U.S. Cl. 52—528 2 Claims



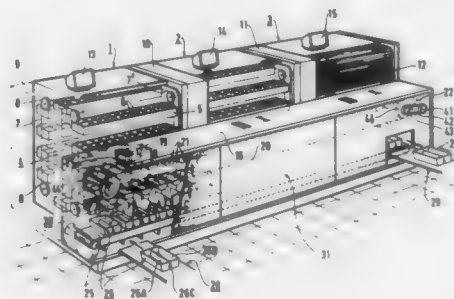
1. A metal roof panel, of the type adapted to form a roof panel structure having a standing seam joint between an adjoining pair of said panels which are adapted to seat on the surface of a roof, characterized in that:
 - (a) said panel comprises a planar sheet portion having an upstanding integral flange along each longitudinal edge thereof, which extend generally perpendicular to the plane of the panel;
 - (b) the flange along one longitudinal edge of the panel has integrally formed, on the lower end thereof, a lower male

- locking means, and on the upper end thereof an upper female locking means;
- (c) the flange along the other longitudinal edge of the panel has integrally formed, on the lower end thereof, a lower female locking means, and on the upper end thereof an end thereof an upper male locking means; and,
 - (d) whereby, the upper male locking means on one of an adjoining pair of said panels is interengaged with the upper female locking means on the other of an adjoining pair of said panels by relative upward forward movement along a line generally perpendicular to the planar sheet portions of said pair of panels, and the lower male locking means on the other of said pair of panels is adapted to engage and slide downward along the upstanding flange carrying the lower female locking means on said one of said pair of panels and into an interlocking engagement with said lower female locking means upon the application of a mechanical seaming force on the interengaged upper male and upper female locking means to clinch the upper male and upper female locking means together in a water tight condition for forming a double lock standing seam between an adjoining pair of said panels.

4,870,799
INSTALLATION FOR MAKING UP BATCHES OF ARTICLES

Jean-Marcel Bergerioux, Chateaufort Sur Isere; Claude Pavie, Houilles; Christian Plent, Bourg Les Valence, and Bernard Constant, Beaumont Les Valence, all of France, assignors to Societe Anonyme dite: Compagnie Generale D'Automatisme CGA-HBS, Paris, France

Filed Feb. 26, 1988, Ser. No. 160,949
 Claims priority, application France, Feb. 27, 1987, 87 02671
 Int. Cl.⁴ G07F 7/02; B65B 57/20
 U.S. Cl. 53—55 8 Claims



1. An installation for making up batches of articles, the installation comprising:
 - at least one work station for one operator, said station including a storage member for storing said articles species-by-species, said articles each being provided with automatically readable identification means, said station also including a reader for automatically reading the said identification means, an opening, a chute beneath said opening and a flap selectively closing off said opening to said chute, an article being placeable in said chute through said opening;
 - an endless chain of buckets disposed in such a manner that the buckets pass beneath the chutes, each of said buckets being provided with a controllable pivoting device to tip said buckets in order to cause an article contained therein to fall beneath the chain of buckets;
 - a moving belt disposed beneath the buckets, said belt cooperating with an inlet station for supplying said belt with empty boxes for receiving articles dropped from said buckets in order to make up batches of articles, and with an outlet station from which loaded boxes are removed;
 - and
 - a controlling computer which controls the opening and closing of said flaps and of said chutes and also the pivot-

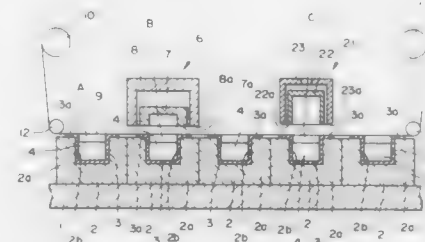
ing of the buckets in accordance with a program which is established depending on the batches to be made up.

4,870,800
INERT GAS-FILLING AND SEALING DEVICE, HEAT SEALING DEVICE AND PACKAGING APPARATUS USING THESE DEVICES

Ryusuke Kasei, Kiyose, Japan, assignor to Nikka Co., Ltd., Kanagawa, Japan

Filed Nov. 18, 1988, Ser. No. 272,812
 Claims priority, application Japan, Apr. 5, 1988, 63-83585; May 25, 1988, 63-69020

Int. Cl.⁴ B65B 31/06; B30B 15/34
 U.S. Cl. 53—88 8 Claims



1. An inert gas filling and sealing apparatus which is adapted to fill an inert gas in containers, each having a content, and seal the containers one by one after coverage of an opening of the container with a sealing film, the apparatus comprising:
 - a plurality of buckets for individually receiving a container having an upper opening, the plurality of buckets being moved in a predetermined direction;
 - a film supplying means for supplying a sealing film arranged to move over the plural buckets in synchronism with a moving speed of the plural buckets and to cover one of the plural containers in position;
 - a vertically movable keep pad having a contact member and capable of moving downward to keep the sealing film in contact with the upper face of the bucket through the contact member when the film is placed in position for coverage of the opening of the container, the contact member having grooves provided at right-angle sides with respect to the direction of the movement of the plural buckets, through which a nozzle is inserted to inject an inert gas and air in the container is expelled by the action of the injected gas, respectively;
 - a nozzle located at one side of the moving buckets and capable of moving laterally substantially at right angles with respect to the direction of the movement of the plural buckets and injecting the inert gas from the tip thereof through the insertion groove of the keep pad when the film is brought into contact with the upper face of the bucket; and
 - a vertically movable heat sealing means normally located above the plural buckets, surrounded with the keep pad so that the keep pad and the heat sealing means are separately movable, and having a tip member of a form corresponding to a margin of the opening of the container, whereby when the sealing film is urged against the upper face of the bucket, the nozzle is advanced until the tip is inserted through the nozzle insertion groove, from which an inert gas is injected into the container to expel the air to outside from the other groove, and the heat-sealing means descends to heat seal the film along the margin of the container.

4,870,801

PROCESS AND APPARATUS FOR MAKING AN INERT ATMOSPHERE IN AIRTIGHT PACKAGES

Jean-Luc Mizandjian, Igny; Jean-Louis Penn, Monthébert, and Jean Amen, Versailles, all of France, assignors to L'Air Liquide, Paris, France

PCT No. PCT/FR86/00139, § 371 Date Dec. 10, 1986, § 102(e) Date Dec. 10, 1986, PCT Pub. No. WO86/06347, PCT Pub. Date Nov. 6, 1986

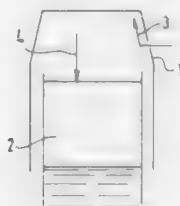
Continuation of Ser. No. 2,757, Dec. 10, 1986, abandoned. This PCT application Apr. 23, 1986, Ser. No. 253,434

Claims priority, application France, Apr. 29, 1985, 8506479

Int. Cl.⁴ B65B 31/04

U.S. Cl. 53—432

2 Claims



1. A process of inerting an airtight package containing a consumable product, comprising

passing the package, while open and containing the consumable product, into and through an elongated insulating gap for protecting the open package from entry therein of oxygen, the transverse width of said gap having a dimension only slightly greater than the transverse dimension of the packages and extending downwardly a substantial proportion of the height of said packages;

feeding inert gas into the interior of said elongated insulating cap above the level of the top of the package in a direction which is at first horizontal and then upwards in the interior of the insulating cap to flush the atmosphere above the package downwardly through spaces between packages and lateral walls of the cap;

simultaneously and separately feeding inert gas downwardly through a vertical tubes into said package to purge gaseous medium therefrom; and sealing said package.

4,870,802

MACHINES AND METHODS FOR DOUBLING THE CAPACITY OF PACKAGING MACHINES

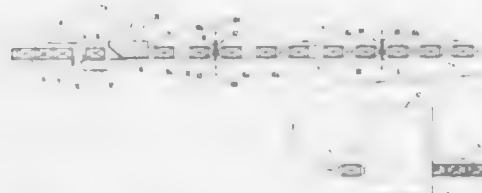
Alain A. Cerf, Largo, Fla., assignor to Polycerf, Inc., Largo, Fla.

Filed Nov. 9, 1988, Ser. No. 269,228

Int. Cl.⁴ B65B 53/02, 9/06, 57/10

U.S. Cl. 53—442

14 Claims



1. A method of wrapping packages in a plastic wrapper, comprising the steps of:

arranging a plurality of packages in serial alignment with one another;
rotatably mounting at least one roll of plastic adjacent said array of packages;
partially unrolling said at least one roll of plastic;
forming a yieldable wall of plastic with an unrolled portion of said plastic;

positioning said yieldable wall of plastic forwardly of a lead package in said serial array of packages;

conveying said packages, in a common forwardly direction, toward said yieldable wall of plastic so that said lead package impinges against said wall and displaces it in said forward direction of package travel, causing said at least one roll to further unroll so that plastic from said at least one roll covers at least the tops and bottoms of packages following said lead package;

positioning a first sealing and cutting element forwardly of said wall of yieldable plastic, in longitudinally spaced relation thereto;

positioning at least a second sealing and cutting element forwardly of said first sealing and cutting element, in longitudinally spaced relation thereto;

positioning a first sensing means rearwardly of said first sealing and cutting element;

positioning a second sensing means rearwardly of said second sealing and cutting element;

activating said first sealing and cutting element when said first sensing means detects the trailing edge of an even numbered package in said array of packages; and

activating said second sealing and cutting element when said second sensing means detects the trailing edge of an odd numbered package in said array of packages;

whereby said first and second sealing and cutting elements operate independently of one another;

whereby said first and second sealing and cutting elements operate at substantially the same speed; and

whereby the number of packages individually wrapped per unit of time is twice the number of packages capable of being individually wrapped by a single sealing and cutting element.

4,870,803

METHOD AND APPARATUS FOR PACKING ENVELOPES IN CARTONS

Martin Blümle, Horhausen, Fed. Rep. of Germany, assignor to Winkler & Duennebler Maschinenfabrik und Eisengiesserei KG, Neuwied, Fed. Rep. of Germany

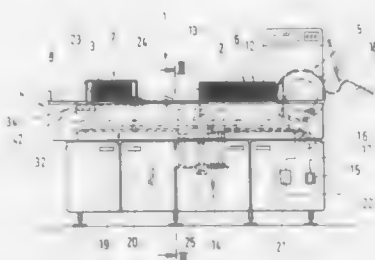
Filed May 3, 1988, Ser. No. 189,629

Claims priority, application Fed. Rep. of Germany, May 7, 1987, 3715191

Int. Cl.⁴ B65B 35/50

U.S. Cl. 53—447

8 Claims



1. A method of packing envelopes into cartons, cardboard boxes, or the like, comprising the following steps:

(a) depositing envelopes one behind the other in a substantially upright on-edge position on a stacking stage for forming a stack of envelopes on said stacking stage;

(b) moving said stack by means of a pusher member over a first short path distance at a high speed;

(c) moving said stack over a second longer path distance at a low speed, which is slower than said high speed, to a boxing station;

(d) placing a carton, box, or the like over said stack in said stacking station; and

(e) moving said carton together with said stack of envelopes away from said boxing station.

4,870,804

METHOD OF FORMING A PARALLELEPIPED CONTAINER MADE OF MACHINE-GLAZED PAPER TO BE FILLED WITH LIQUID

Yoshimitsu Yokoyama, Ishikawa, Japan, assignor to Milliken Research Corporation, Spartanburg, S.C.

Filed Nov. 22, 1988, Ser. No. 274,852

Int. Cl.⁴ B65B 3/02, 43/04, 43/10, 43/32

U.S. Cl. 53—450

1 Claim



1. A method of forming a parallelepiped container made of machine-glazed paper to be filled with liquid characterized by a process consisting of the following stages: a longitudinal sealing process in which the two side ends of a piece of machine-glazed paper are overlapped and fused with each other to form a tube-like part; a corner-formation process in which corners are formed with the longitudinal sealing line located vertically on the center back surface of the parallelepiped container, the central portions of the side surfaces are filled inward, and without pressing the folded-in ends, the corner portions are pressed; a transportation stage of the flat tube part after the corner formation stage, an opening stage in which the two sides of the flat tube part are pressed towards the center; an inserting and cutting stage in which the opened tube part is set on a mandrel and the tube part is cut to a length required for the container; a bottom sealing stage on the mandrel; a filling stage in which the mandrel is removed from the container and the liquid is filled into the container through its upper opening portion; and a top sealing process in which the upper opening portion is sealed.

4,870,805

METHOD OF PACKAGING A FLUID UNDER PRESSURE, AND PACKAGING CONTAINER FOR USE WITH THE METHOD

Bruno Morane, Neuilly, France, assignor to L'Oreal, Paris, France

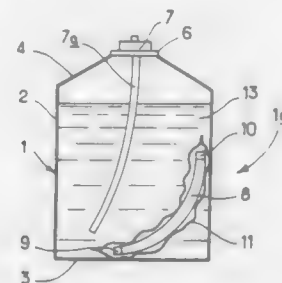
Filed Jun. 7, 1988, Ser. No. 203,696

Claims priority, application France, Jun. 19, 1987, 87 08605

Int. Cl.⁴ B65D 83/14

U.S. Cl. 53—470

13 Claims



1. A method of packaging under pressure of a fluid to be dispensed in paste, liquid or aerosol form, comprising the steps of:

disposing in a flexible gas-tight, hermetically sealed pouch a closed cartridge with a propellant in the liquid phase, and introducing the pouch with the cartridge into the outer envelope of a packaging container having an opening at one of its ends;

plugging the opening of the container with a plugging means having valve means, the thus-closed container permitting at least the dispensing of said fluid;

introducing the fluid into the container, the cartridge then

being openable so that the propellant will spread over the entire free internal volume of the pouch, changing at least in part to the gaseous phase, at a pressure suitable to assure the dispensing of the fluid, surrounding the pouch, from said valve characterized in that the cartridge is of the type wherein at least one zone of the wall delimiting the propellant can be degraded by simple contact with the propellant until the cartridge opens, within a period of time at least equal to that necessary for assuring the complete packaging and closure of said container;

said cartridge having a degradable wall zone made of a material for which the propellant used is at least in part a solvent, said material being a silicon rubber and the propellant being at least one of: the chlorofluorinated hydrocarbons known by the trade name "Freons", butanes and dimethyl ether, and the method includes the step of introducing into the cartridge an agent for accelerating stress cracking.

4,870,806

METHOD AND APPARATUS FOR MONITORING THE SUPPLY OF CAP MEMBERS OF CAPPING MACHINES

Helmut Sprenger, Guldental, Fed. Rep. of Germany, assignor to Seitz Eazinger Noll Maschinenbau Aktiengesellschaft, Mannheim, Fed. Rep. of Germany

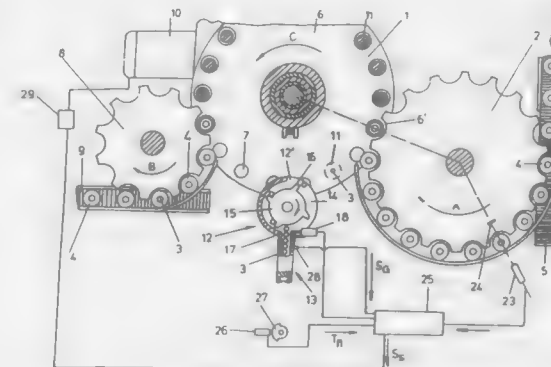
Filed Nov. 30, 1988, Ser. No. 277,706

Claims priority, application Fed. Rep. of Germany, Dec. 3, 1987, 3740991

Int. Cl.⁴ B65B 57/08, 57/18; B67B 3/26

U.S. Cl. 53—485

17 Claims



1. A method of monitoring the supply of cap members from a magazine or supply bin, via a channel, to the capping mechanism of a capping machine, whereby at least one signal emitter, which is provided at said channel, generates an emitted signal that changes as said cap members move past, with a disruption signal being derived from said emitted signal if said emitted signal does not change during a specified time interval; said method including the steps of:

deriving from said capping machine a cycle signal that corresponds to the working or machine cycle of said capping machine; and

generating said disruption signal if in two successive first and second cycles, the sum of which corresponds to a full period of said cycle signal, no change of said emitted signal is determined.

4,870,807
METHOD AND APPARATUS FOR PACKAGING
PRINTED MATTER

Sesto Palamides, Stuttgart; Aldo Palamides, Renningen, and Stefano Palamides, Stuttgart, all of Fed. Rep. of Germany, assignors to Palamides GmbH, Renningen, Fed. Rep. of Germany

Filed Feb. 8, 1988, Ser. No. 153,064
 Claims priority, application Fed. Rep. of Germany, Feb. 18, 1987, 3705169

Int. Cl.⁴ B65B 13/20

U.S. Cl. 53—528

16 Claims



1. Apparatus for packaging preferably folded, glued or stitched copies of printed matter, comprising loading means adapted for receiving the copies from a preceding station, said loading means comprising first conveyor means for conveying the copies, a press for pressing the copies, and second conveyor means for conveying the compressed copies; said second conveyor means running at reduced delivery speed and being provided with braking means operating in synchronism with stacking means for stopping the compressed copies, said stacking means following the loading means; and transfer means for transferring stacked copies from said stacking means to a packaging unit, said transfer means comprising means for gripping and holding the stacked copies received within said stacking means, said means for gripping and holding hold and grip said stacked copies under pressure during transferring said stack from said stacking means to said packaging unit.

4,870,808
VOLUMETRIC DOSING UNIT WITH
ADJUSTABLE-VOLUME DOSER CELLS FOR
CONTINUOUSLY OPERATING MACHINES
PRODUCING DUAL-USE FILTER SACHETS

Andrea Romagnoli, San Lazzaro di Savena, Italy, assignor to CSENTIND - Centro Studi Industriali - S.r.l., Pietro Terme, Italy

Filed Feb. 10, 1988, Ser. No. 154,652
 Claims priority, application Italy, Mar. 9, 1987, 3377 A/87
 Int. Cl.⁴ B65B 29/02

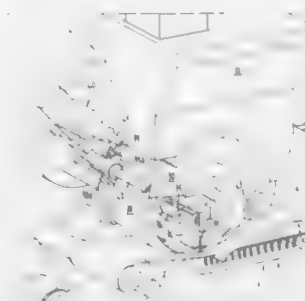
U.S. Cl. 53—529

3 Claims

1. An apparatus for making infusion packets, comprising: means for feeding a strip of thermally weldable filter paper along a transport path; means for storing a product to be dosed along said path; and a dosing unit beneath said means for storing, said unit including: a cylindrical dosing drum between said means for storing and said path rotatable about a horizontal axis of rotation, said drum having an uppermost and lowermost positions and being formed with an external cylindrical surface provided with a plurality of circumferentially spaced radial bores for receiving respective fractional doses of the product to be dosed from said means for storing at said uppermost position of said drum, compacting means extending tangentially to said path and

running from said means for storing to said path along said cylindrical surface, respective pistons slidable radially in the respective bores; and

cam means for displacing the respective pistons between maximum and minimum distances thereof from said surface, each of said pistons being at said maximum distance from said surface as each bore passes beneath said means for storing to receive said product and being at said mini-



mum distance from said surface at said uppermost position to define a volume of said fractional dose of the product to be dosed, said minimum distance being maintained as said drum rotates said bores toward said lowermost position at which said cam means displaces said pistons to deposit the respective fractional dose onto said strip, said cam means being formed with an actuator track of continuously adjustable width, so that the volume of said doses can be varied by varying said width.

4,870,809
PACKAGING DEVICE WITH IMPROVED SUPPLY
STATION

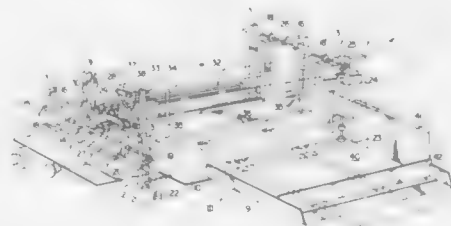
Jan J.J. Van Oord, Ulvenhout, Netherlands, assignor to Breda Packaging B.V., Netherlands

Filed May 10, 1988, Ser. No. 192,668
 Claims priority, application Netherlands, May 14, 1987, 8701165

Int. Cl.⁴ B65B 35/30

U.S. Cl. 53—531

11 Claims



1. In a packaging machine for receiving objects to be packed and including a belt conveyor receiving the objects successively at one end of the conveyor belt and grouping the objects into groups of finite numbers of objects adjacent the opposite end of the conveyor belt for delivery to packaging mechanism, means for holding and feeding a stack of flat blanks longitudinally beneath the conveyor belt and forming means for successively folding the edges of individual flat blanks into trays disposed beyond and beneath a group of objects which has been grouped, the improvement comprising a carrier for receiving a further stack of collapsed blanks at substantially the height of the means for holding and feeding but in laterally displaced position relative thereto, and transfer means for transferring the further stack onto the means for holding and

feeding to augment and expand the stack of blanks being held and

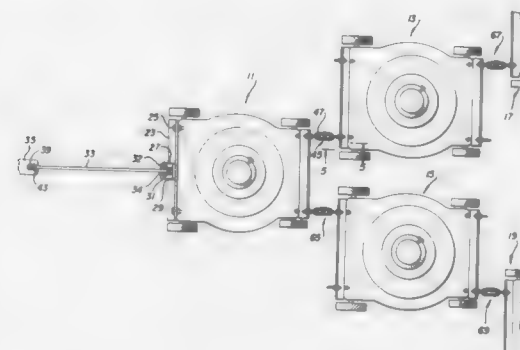
4,870,810
LAWN MOWER ASSEMBLY

Donald G. Gordy, Rte. 1, Box 213, Lawrence, Miss. 39336
 Filed Jul. 14, 1988, Ser. No. 220,041

Int. Cl.⁴ A01D 34/66

U.S. Cl. 56—6

8 Claims



1. In a lawn mower towing assembly including a lead towing vehicle and a plurality of trailing rotary-type lawn mowers movable along a supporting surface, each of said mowers having two front and two rear wheels, a hitch assembly comprising

a substantially rigid bar adapted to be pivotally attached between said towing vehicle and the front of the first of said trailing lawn mowers, the point of attachment of said bar to said towing vehicle being of a substantially greater height above said supporting surface than the point of attachment to said first of said trailing lawn mowers; a connector having first and second eyebolts connected by a rigid link, said first eyebolt being adapted for attachment substantially adjacent the interior of one of the rear wheels of said first lawn mower; said second eyebolt being adapted for attachment substantially adjacent the interior of one of the front wheels of a second of said plurality of trailing lawn mowers.

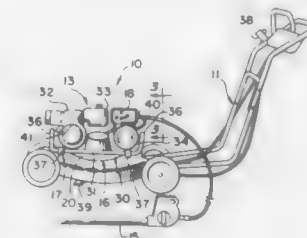
4,870,811
GASOLINE POWERED ELECTRICAL LAWN MOWER

Robert M. Steele, 124 Dogwood Ln., West Columbia, S.C. 29169
 Filed Nov. 28, 1988, Ser. No. 276,919

Int. Cl.⁴ A01D 34/03, 34/37, 75/00

U.S. Cl. 56—10.5

4 Claims



1. An apparatus, in combination with a conventional electrically powered hand or rider lawn mower, one or more auxiliary electrical hand tools, and a gasoline engine powered electrical generator which independently supplies electrical current for said lawn mower and said hand tools, comprising: a control means, electrically connected between said electrical generator and said lawn mower and/or hand tool, for

controlling the amount of the voltage of the electricity delivered by said electrical generator, a carrier means, attached to said electrical generator and to said control means, for supporting said electrical generator and said control means as contiguous units, a mounting means for detachably mounting said carrier means on said electrically powered hand or rider law mower.

4,870,812
ROUND BALER WITH VARIABLE BALE CHAMBER

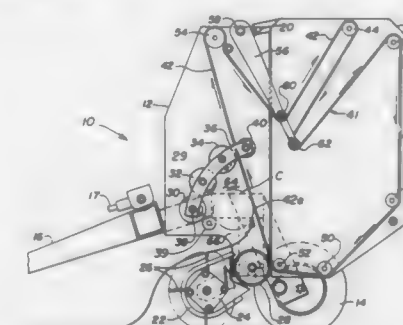
Richard E. Jennings, Manheim; Wilburn H. Potter, Strasburg, and Shaun A. Seymour, New Holland, all of Pa., assignors to Ford New Holland, Inc., New Holland, Pa.

Filed Apr. 27, 1988, Ser. No. 186,984

Int. Cl.⁴ A01D 39/00

U.S. Cl. 56—341

7 Claims



1. A round baler comprising: a main frame; a tailgate pivotally connected to said main frame; a sledge assembly mounted on said main frame for movement between a bale starting position and a full bale position, said sledge assembly including a plurality of rollers extending transversely of said main frame, said sledge assembly carrying idler means at one end thereof; an apron movably supported on a drive member which is rotatably mounted in said main frame and on a plurality of guide members which are rotatably mounted in said tailgate, said apron engaging said idler means and having an inner course extending between one of said plurality of guide members and said idler means while cooperating with said rollers of said sledge assembly to define a bale starting chamber when said sledge assembly is in said bale starting position; arm means carrying an additional guide member for supporting said apron, said arm means being movable between an inner position and an outer position as said sledge assembly moves between said bale starting and full bale positions, respectively; said idler means being located rearwardly of said drive member when said sledge assembly is in said bale starting position; said idler means and said additional guide member moving in substantially opposite directions relative to said one guide member upon movement of said sledge assembly from aid bale starting position toward said full bale position and upon movement of said arm means from said inner position toward said outer position; and said idler means being located forwardly of said drive member when said sledge assembly is in said full bale position.

4,870,813

PLY-TWIST HEAT SET CARPET YARNS

Thomas L. Nelson, Georgetown, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Division of Ser. No. 58,215, Jan. 4, 1987, Pat. No. 4,779,408.
This application Jan. 3, 1988, Ser. No. 201,890
Int. Cl.⁴ D02G 3/28, 3/38

U.S. Cl. 57—204



1. A ply-twisted crimped continuous multifilament yarn suitable for cut-pile carpets characterized by at least 40 twist reversals per meter.

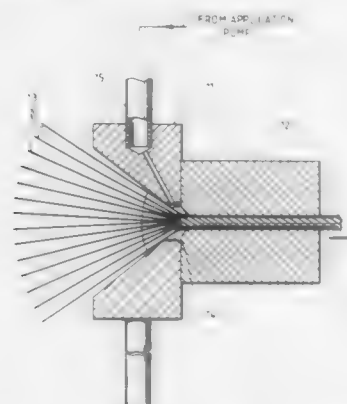
4,870,814

PROCESS FOR MANUFACTURING CORROSION RESISTANT CABLE

Tharayil Chacko, Moberly; Wayne Soucie, Columbia; Elroy J. Toner, and Robert Heimann, both of Moberly, all of Mo., assignors to Orscheln Co., Moberly, Mo.
Filed Apr. 29, 1988, Ser. No. 187,745
Int. Cl.⁴ D07B 1/16, 1/14

U.S. Cl. 57—217

15 Claims



12. A corrosion resistant wire cable comprising wire completely coated with inorganic silicate and zinc, wherein said zinc comprised about 80% to about 90% of said coating, and further comprising an outside coating of plastic.

4,870,815

METHOD TO WIND DOWN A YARN PACKAGE AND DEVICE TO PERFORM THE METHOD

Mirko Marchiori, Pordenone; Danny Lant, Basiliano; Fabio Lancerotto, Milan, and Umberto Geria, Pordenone, all of Italy, assignors to Cerit SpA, Pordenone, Italy
Filed Mar. 29, 1988, Ser. No. 174,877
Claims priority, application Italy, Apr. 3, 1987, 83346 A/87
Int. Cl.⁴ D01H 1/38

U.S. Cl. 57—299

15 Claims

1. A method to wind down a yarn package, on a spinning machine having a spindle to rotate the yarn package in a spinning direction, means to wind yarn on the yarn package and drafting rolls to feed the yarn, comprising:

forming underwinding coils by rotating the yarn package on the spindle in a direction opposite to the spinning direction.

10. An apparatus for winding down a yarn package comprising:
a spindle to rotate the yarn package; and
means to wind yarn on the yarn package; and

drafting rolls to feed the yarn to the winding means; and an underwinding sleeve located on said spindle and rotatable relative to the spindle; and
a spacer ring, solidly fixed to the spindle above the underwinding sleeve, comprising:



an upper annular hollow end to accommodate the yarn package;
a lower annular hollow end having a substantially sharp annular edge; and
an annular protruding surface positioned between the upper and lower ends of said spacer ring.

4,870,816

ADVANCED RECUPERATOR

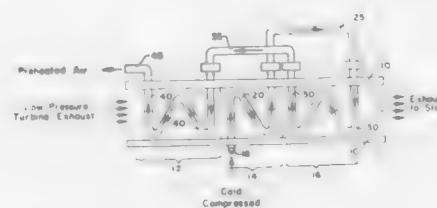
Michael Nakhamkin, Fanwood, N.J., assignor to Gibbs & Hill, Inc., New York, N.Y.

Filed May 12, 1987, Ser. No. 48,849

Int. Cl.⁴ F07C 6/16; F02C 7/10

U.S. Cl. 60—39.02

23 Claims



16. A method for heating high density and low temperature compressed air in a recuperator having a plurality of exhaust gas sections, each such section having associated therewith a tube section which is sufficiently heated so as to prevent the formation of corrosive condensate thereon, comprising the steps of:

heating said compressed air initially in a first exhaust gas section and corresponding tube section wherein said first exhaust gas section and corresponding tube section operate in a parallel-flow manner; and

heating said initially heated air in a second exhaust gas section and corresponding tube section serially connected to said tube section of said first exhaust gas section, wherein said second exhaust gas section and corresponding tube section operate in a counter-flow manner;

wherein said tube sections transfer heat from an exhaust gas having high temperature and low density within said recuperator to said compressed air and the temperature of surfaces of said tube sections exposed to said exhaust gas does not decrease below a dew point of said exhaust gas.

4,870,817

GAS TURBINE ENGINE STARTING MECHANISM

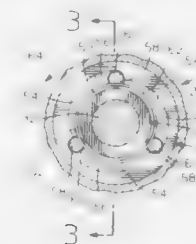
Francis E. Conn, Plainfield, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 6, 1988, Ser. No. 202,339

Int. Cl.⁴ F02C 7/275

U.S. Cl. 60—39.141

2 Claims



1. In an aircraft propulsion gas turbine engine including a source of hot gas motive fluid,
a first rotor rotatable by said hot gas motive fluid in a propelling direction about a main axis of said engine and having a compressor portion,
a second rotor rotatable by said hot gas motive fluid about said main axis in said propelling direction independently of said first rotor and drivingly connected to a variable pitch aircraft propeller,
said second rotor having a feathered condition corresponding to a feathered condition of said propeller wherein a moving airstream imparts substantially no energy to said propeller and a plurality of progressively more unfeathered conditions corresponding to progressively more unfeathered positions of said propeller characterized by progressively increasing energy transfer between said moving air stream and said propeller so that said moving air stream rotates said second rotor in said propelling direction as said propeller moves from said feathered position through said plurality of unfeathered positions,

an in-flight starting mechanism comprising:

a ring-like inner race rotatable as a unit with one of said first and said second rotors and having a cylindrical inner race surface,

a ring-like outer race around said inner race rotatable as a unit with the other of said first and said second rotors and having an inside surface facing said inner race surface, means on said outer race defining a plurality of pockets in said inside surface opening toward and circumferentially spaced around said inner race surface,

a plurality of rolling elements disposed in respective ones of said pockets each moveable between a first position in said pocket remote from said inner race surface and corresponding to an off condition of said starting mechanism and a second position wedged between said outer race and said inner race surface and corresponding to an on condition of said starting mechanism, each of said rolling elements being centrifugally biased to said first position when each of said first and said second rotors is rotated in said propelling direction by said hot gas motive fluid at speeds corresponding generally to an idle speed of said engine, and

means on said outer race and on said inner race operative to move said rolling elements from said first positions to said second positions in response to rotation of said second rotor in said propelling direction after each of said first and said second rotors is substantially stopped whereby said second rotor is drivingly connected to said first rotor through said rolling elements so that said second rotor in said unfeathered conditions is operative to backdrive said first rotor.

4,870,818

FUEL NOZZLE GUIDE STRUCTURE AND RETAINER FOR A GAS TURBINE ENGINE

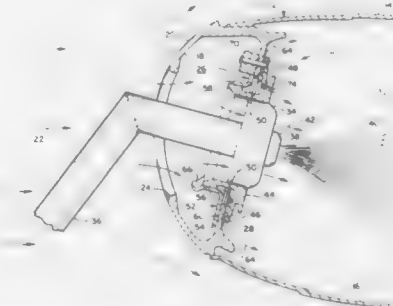
William G. Saliga, Rocky Hill, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Apr. 18, 1986, Ser. No. 853,599

Int. Cl.⁴ F07C 1/00

U.S. Cl. 60—740

7 Claims



1. A fuel nozzle guide assembly disposed between a planar bulkhead and a fuel nozzle insertable through an opening in the bulkhead, comprising:

a nozzle bushing disposed between the fuel nozzle and the bulkhead, the bushing fitting closely about the fuel nozzle and further defining an annular gap between the bushing and the bulkhead opening;

a heat shield, secured to one end of the bushing and extending outward therefrom parallel to the bulkhead and terminating at an outer edge beyond the bulkhead opening;

means, disposed between the heat shield and the bulkhead for spacing the heat shield from the bulkhead, the spacing means, bulkhead and heat shield further defining a plurality of flow paths for establishing fluid communication between the annular gap and the outer edge of the heat shield; and

an annular retainer, disposed about the bushing opposite the heat shield with respect to the bulkhead and including a flat flange portion extending parallel to the bulkhead, the flat flange portion slidably contacting the bulkhead,

the annular retainer further including an inner attachment ring closely fitting about and secured to the other end of the bushing, the retainer having a plurality of flow openings disposed therein adjacent the annular gap for admitting a flowing stream of cooling air directly into the gap.

4,870,819

CONTROL DEVICE FOR A HYDROSTATIC DRIVE FOR AT LEAST TWO ACTUATORS

Winfried Walzer, Elchingen, Fed. Rep. of Germany, assignor to Hydromatik GmbH, Fed. Rep. of Germany

Filed Jan. 22, 1988, Ser. No. 147,236

Claims priority, application Fed. Rep. of Germany, Jan. 23, 1987, 3702000

Int. Cl.⁴ F16D 31/02

U.S. Cl. 60—422

4 Claims

1. A control device for a hydrostatic drive comprising at least two actuators connected in parallel to a variable displacement pump whose adjusting device can be acted on as a function of the displacement and/or of the flow pressure, each actuator has associated with it, in a separate hydraulic supply line having at one end a direct hydraulic path to the pump output, a control valve and a preceding displacement controller in the form of a pressure compensator, the controller associated with an electronic regulating device which, depending on a measuring element that detects the opening position of the pressure compensator, controls, by means of an adjusting

member associated with the adjusting device, the displacement setting of the pump, increasing it as the opening of at least one



of the pressure compensators becomes larger and decreasing it as the opening becomes smaller.

4,870,820

HST (HYDRO-STATIC-TRANSMISSION) SYSTEM DRIVING SPEED CHANGING APPARATUS

Shusuke Nemoto, Yao, Japan, assignor to Kanzaki Kokyukoki Mfg. Co. Ltd., Japan

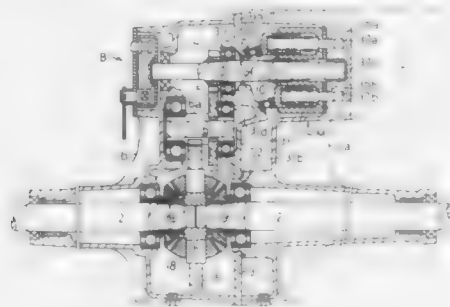
Filed Apr. 8, 1988, Ser. No. 179,630

Claims priority, application Japan, Apr. 15, 1987, 62-57686[U]

Int. Cl.⁴ F16D 39/00

U.S. Cl. 60—487

8 Claims



1. An HST system driving speed changing apparatus comprising:

- a transmission case divided into first and second transmission case portions;
- a first axle being journaled to said first transmission case portion;
- a second axle being journaled to said second transmission case portion;
- a driving power transmission system disposed within said second transmission case portion;
- a differential gear unit disposed within said second transmission case portion;
- a piston holder disposed within said first transmission case portion;
- a plurality of pistons fitted within said piston holder;
- a swash plate base disposed between said first and second transmission case portions and supporting a thrust bearing, whereby said pistons abut against said thrust bearing;
- a hydraulic motor disposed within said transmission case, said hydraulic motor comprising a hydraulic motor shaft journaled at said first transmission case portion and fixing said piston holder;
- said hydraulic motor shaft disposed parallel to said first and second axles; and
- said hydraulic motor shaft extending from said first transmission case portion through said fixed swash plate base and

into said second transmission case portion for connection with said driving power transmission system.

4,870,821

RECIPROCATION APPARATUS WITH SEALING MECHANISM

Terumaru Harada, Moriguchi; Kenichi Inoda; Tatsuo Fujita, both of Hirakata, and Kinichi Adachi, Takarazuka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Division of Ser. No. 947,780, Dec. 30, 1986, Pat. No. 4,769,992.

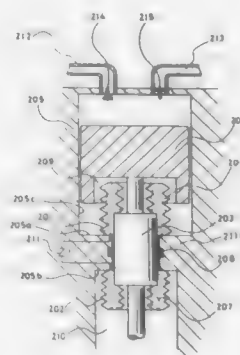
This application Aug. 18, 1988, Ser. No. 233,429

Claims priority, application Japan, Jul. 2, 1985, 60-145501; Jul. 2, 1985, 60-145526

Int. Cl.⁴ F11B 29/10; F02G 1/04

U.S. Cl. 60—520

2 Claims



1. A reciprocation apparatus with sealing mechanism comprising:

- a chamber having a side wall for supporting a sealing member;
- at least one reciprocation member movably provided in said chamber;
- a sealing member for slidably contacting with said reciprocation member;
- a first double bellows having a peripheral part and an inside part, said bellows contacting with said side wall at said peripheral part and with said reciprocation member at said inside part;
- a second double bellows having a peripheral part and an inside part, said bellows disposed at a position opposing to said first double bellows said sealing member contacting with said side wall at said peripheral part and with said reciprocation member at said inside part;
- a first liquid room enclosed by said first double bellows, said side wall and said reciprocation member; and
- a second liquid room enclosed by said second double bellows, said side wall and said reciprocation member.

4,870,822

INTAKE AIR CONTROL SYSTEM FOR AN AUTOMOTIVE ENGINE HAVING A TURBOCHARGER

Shinji Kamimaru, Higashikurume, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 9, 1988, Ser. No. 165,928

Claims priority, application Japan, Dec. 3, 1987, 62-058473

Int. Cl.⁴ F02B 37/12

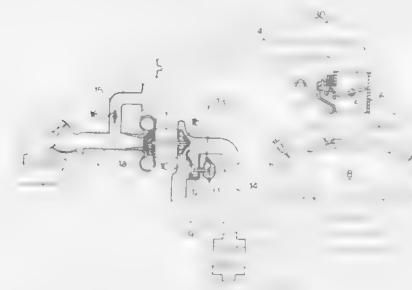
U.S. Cl. 60—600

8 Claims

1. In an intake air control system for an automotive engine having an accelerator pedal, a throttle valve provided in an intake pipe of the engine and operatively connected to the accelerator pedal by a connecting rod, a turbocharger including a turbine operated by exhaust gas of the engine and a compressor provided in the intake pipe and driven by the turbine to compress intake air, a wastegate provided in a first bypass around the turbine, and actuating means communicat-

ing with the intake pipe downstream of the compressor through a passage for actuating the wastegate when pressure of the intake air compressed by the compressor becomes higher than a predetermined value, the improvement in the system which comprises

a second bypass around the compressor, a control valve disposed in the second bypass, and connecting means for operatively connecting the control valve with the connecting rod and for closing the control valve when the accelerator pedal is depressed beyond a predetermined degree, the latter representing a partial load of the engine with the control valve being open so as



to return surplus of said intake air compressed by the compressor to the compressor through the second bypass so as to reduce pumping loss of the turbocharger, to minimize time lag in the turbocharger at change from low engine speed to high engine speed, and to improve combustion efficiency of the engine, and

the connecting means comprises a lever operatively engaged with the connecting rod and arranged to be pivoted when the accelerator pedal is depressed beyond said predetermined degree, and a cable connected between the lever and the control valve so as to close the control valve in dependency on pivoting of the lever.

4,870,823

LOW LOAD OPERATION OF STEAM TURBINES

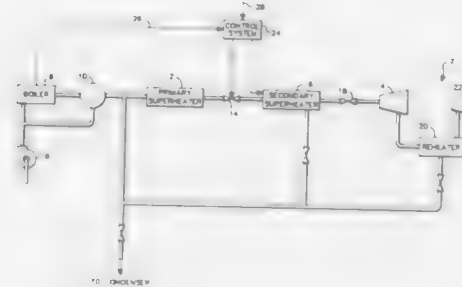
George J. Silvestri, Jr., Winter Park, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 30, 1988, Ser. No. 277,831

Int. Cl.⁴ F01K 13/00

U.S. Cl. 60—652

4 Claims



1. In the operation of a turbine system composed of means for generating steam and a turbine first stage having inlet nozzles connected to be supplied with steam from the steam generating means, the steam generating means being composed of a cascade arrangement of a boiler producing steam at a selected pressure which has an assigned lower limit value, primary superheater means, division valve means presenting a steam flow passage having a controllable cross-sectional area, and secondary superheater means connected between the division valve means and the inlet nozzles, a method for reducing the output of the system at low load levels comprising:

reducing the cross-sectional area of the steam flow passage presented by said division valve means; and increasing the rate at which heat is supplied to the steam in said secondary superheater means by an amount coordinated with the reduction imparted to the cross-sectional area of the steam flow passage by said reducing step.

4,870,824

PASSIVELY COOLED CATALYTIC COMBUSTOR FOR A STATIONARY COMBUSTION TURBINE

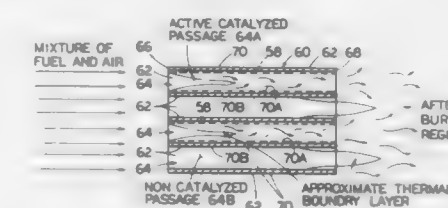
William E. Young, Churchill Borough, Pa., and Dan E. Carl, Orchard Park, N.Y., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 24, 1987, Ser. No. 92,848

Int. Cl.⁴ F02C 1/00

U.S. Cl. 60—723

7 Claims



1. In a catalytic combustor unit for a stationary combustion turbine, the combination comprising:

- (a) a substrate composed of a plurality of intersecting walls having surface regions and defining a plurality of generally parallel passages open at their opposite ends and exposed to a heated flow of fuel and air mixture there-through; and
- (b) a catalyst applied on selected ones of said wall surface regions exposed to certain ones of said passages, selected others of said wall surface regions exposed to certain others of said passages being free of said catalyst so as to provide said substrate with an arrangement of catalyzed passages in which said mixture is catalytically reacted and non-catalyzed passages in which said mixture is substantially not reacted but instead provides passive cooling of said substrate;
- (c) each of said selected wall surface regions which are free of said catalyst being on a common wall section with one of said selected wall surface regions having catalyst coating thereon such that non-reactive cooling occurs in passages bordered by said non-catalyzed wall surface regions of said common wall sections concurrently as catalytic reactions occur in passages bordered by said catalyzed wall surface regions of said common wall sections.

4,870,825

ROTARY FUEL INJECTION SYSTEM

William I. Chapman, Birmingham, Mich., assignor to Williams International Corporation, Walled Lake, Mich.

Filed Jun. 9, 1988, Ser. No. 204,268

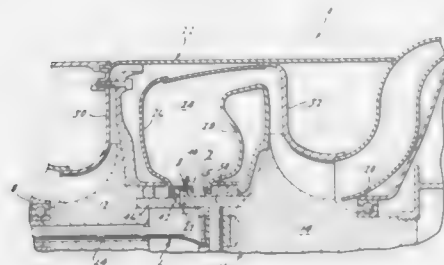
Int. Cl.⁴ F02C 7/22

U.S. Cl. 60—745

1 Claim

1. A gas turbine comprising a compressor, a turbine, an axially extending cylindrical shaft sleeve mounted for rotation with said compressor and turbine, an annular combustion chamber encircling a portion of the shaft sleeve and in direct communication therewith, whereby said shaft sleeve defines a radially inner wall of said combustion chamber, a fuel slinger for injecting fuel from the interior of said shaft sleeve directly into said combustion chamber comprising a cylindrical axially extending impervious slinger sleeve

concentric with the shaft axis and spaced radially outwardly therefrom,
 a first radial wall extending outwardly from the shaft sleeve of said turbine to the slinger sleeve,
 a second radial wall portion extending radially inwardly from the slinger sleeve toward said shaft sleeve but terminating in spaced relation thereto so as to define a fuel discharge lip,
 means for supplying fuel to said fuel slinger, and



a third radially outwardly extending wall on said shaft sleeve between said first and second radially extending walls, said third wall terminating in radially spaced relation to the slinger sleeve portion of said fuel slinger but extending radially outwardly to a diameter greater than the diameter of the fuel discharge lip on said second wall portion so as to define a generally U-shaped hydraulic trap whereby relatively low pressure fuel from said supply means is pressurized by centrifugal force in said fuel trap for injection over said discharge lip directly into the combustion chamber of said engine.

4,870,826

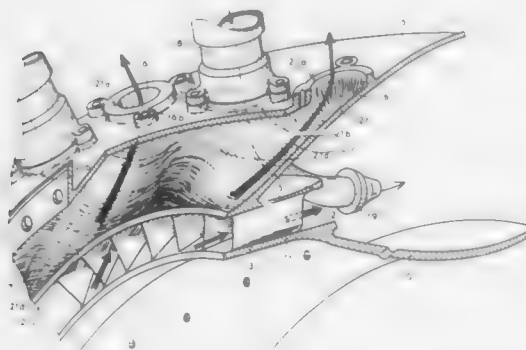
CASING FOR A TURBOJET ENGINE COMBUSTION CHAMBER

Alain P. M. Dagnet, Evry; Pierre A. Glowacki, Fontaine Le Port, and Hervé Lassignardie, Nangis, all of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation (SNECMA), Paris, France
 Filed Jun. 8, 1988, Ser. No. 203,765

Claims priority, application France, Jun. 18, 1987, 87 08503
 Int. Cl.⁴ F02C 7/04

U.S. Cl. 60—751

11 Claims



1. A casing for an annular combustion chamber of a gas turbine engine having an air compressor and an exhaust gas turbine, comprising:

- (a) an inner annular wall having upstream and downstream ends, the inner annular wall disposed radially inwardly of the annular combustion chamber;
- (b) an outer annular wall disposed generally concentrically about the inner annular wall and radially outwardly of the

annular combustion chamber, the outer annular wall having an upstream end, a downstream end, and defining:

- (i) a plurality of fuel injector orifices circumferentially spaced apart; and
- (ii) a plurality of air tapping orifices circumferentially spaced apart and alternating circumferentially with the fuel injector orifices;
- (c) air diffuser means located adjacent to the upstream ends of the inner and outer annular walls and radially spaced from the outer annular wall; and,
- (d) a partition extending between the air diffuser means and the outer annular wall dividing the radial space therebetween into a plurality of first cavities communicating with the air tapping orifices and a plurality of second cavities communicating with the interior space between the inner and outer annular walls wherein the partition has an undulating annular cross-sectional shape taken in a plane extending generally perpendicular to an axis extending between upstream and downstream ends of the outer annular wall.

4,870,827

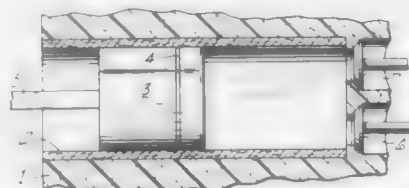
HYBRID COMPOSITE COMPRESSOR

David J. McFarlin, Ellington; Antonio B. Caruolo, Vernon; Eric Minford, South Windsor, and Karl M. Prew, Vernon, all of Conn., assignors to United Technologies, Hartford, Conn.

Filed Aug. 12, 1987, Ser. No. 84,370
 Int. Cl.⁴ F25B 9/00

U.S. Cl. 62—6

18 Claims



- 10. An air conditioner, comprising: a compressor, in flow connection with a condenser, in flow connection with an expansion valve, in flow connection with an evaporator, in flow connection with said compressor, said compressor comprising: a housing having a substantially continuous first inner surface, said first inner surface defining a compression chamber, and a compressive means, movably received within said compression chamber, for compressing a fluid, wherein the improvement comprises using as the housing a fiber reinforced resin matrix composite housing having a noncompliant fiber reinforced glass or glass-ceramic matrix composite liner, said liner having an outer surface and a substantially continuous second inner surface, said outer surface being rigidly attached to said first inner surface, and said second inner surface defining a compression chamber, resulting in a low weight air conditioner having improved performance.

4,870,828

COOLING SYSTEM IN MOTOR VEHICLE

Yoshiaki Hidaka, Tokyo, Japan, assignor to Nihon Radiator Co., Ltd., Tokyo, Japan

Filed Feb. 16, 1988, Ser. No. 155,731

Claims priority, application Japan, Feb. 25, 1987, 62-40167
 Int. Cl.⁴ F25B 19/00; F02M 15/00, 31/20, 53/00

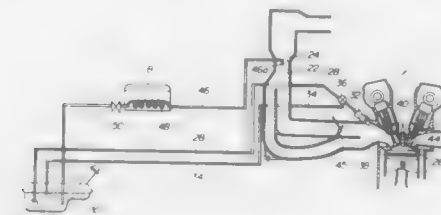
U.S. Cl. 62—7

9 Claims

- 1. A cooling system for use with a fuel injected engine which is operated on evaporable fuel supplied from a fuel tank

through a fuel supply line to at least one fuel injection valve, said cooling system comprising:

- a tube extending from said fuel tank to a given portion of an air induction part of the engine where a vacuum is produced under operation of the engine;
- said tube having a nozzle portion extending into an exterior of said given portion;
- an expansion valve connected to a part of said tube between said fuel tank and said nozzle portion, said expansion valve opening the tube when a pressure in the tube downstream of the valve is reduced to a certain degree;



an evaporator device connected to said tube between said expansion valve and said nozzle portion; and means for defining an enclosed space about said evaporator device;

- a fuel return line to return a portion of the fuel to the fuel tank during operation of the engine; and
- a pressure regulator valve connecting the return line to the fuel supply line for controlling the amount of fuel supplied to the engine.

4,870,829

BIOLOGICAL FREEZING APPARATUS

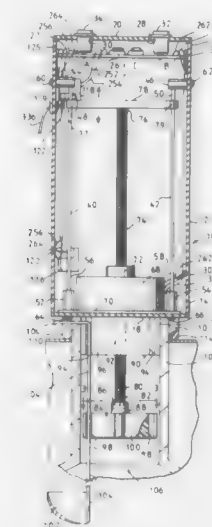
Lucille A. Onlette, 8812 Cockrane Ct., Gaithersburg, Md. 20879, and Stephen C. Scott, 1702 Dogwood Dr., Frederick, Md. 21701

Filed Jul. 11, 1988, Ser. No. 217,718

Int. Cl.⁴ F25B 19/00

U.S. Cl. 62—51.1

15 Claims



- 1. Biological freezing apparatus for freezing biological specimens using a liquid cryogen storage container having means for storing samples in the interior of the container including provisions for at least one handle extending into the interior of the liquid cryogen container, said biological freezing apparatus comprising: specimen holding means for holding said biological specimens, said specimen holding means comprising a non-metallic material having a portion thereof sized and

shaped to receive a portion of the handle of said sample storing means; mounting means for mounting said specimen holding means in said liquid cryogen storage container; and means for controlling the temperature of biological specimens located in said specimen holding means comprising means for lowering said specimen holding means into said liquid cryogen storage container at a predetermined rate.

4,870,830

CRYOGENIC FLUID DELIVERY SYSTEM

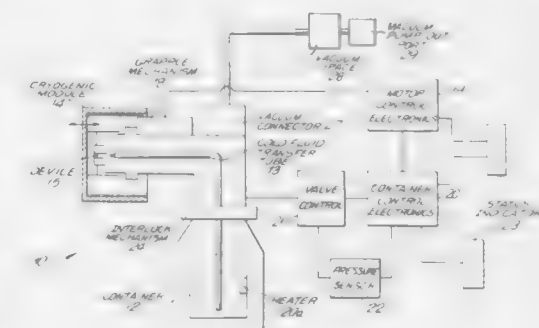
Gert K. G. Hohenwarter, Madison, Wis., and John A. Grange, Brooklyn, N.Y., assignors to Hypres, Inc., Elmsford, N.Y.

Filed Sep. 28, 1987, Ser. No. 101,763

Int. Cl.⁴ F17C 7/02

U.S. Cl. 62—50.7

21 Claims



- 1. A cryogenic delivery and cooling system, comprising: first means for storing a cryogenic fluid; second means for holding a device to be cooled; third means for transferring the cryogenic fluid to said second means; fourth means for adaptively interlocking said first means and said third means; and fifth means for drawing said second means into a coupled arrangement with said third means.

4,870,831

MULTI-TYPE AIR CONDITIONER SYSTEM WITH OIL LEVEL CONTROL FOR PARALLEL OPERATED COMPRESSOR THEREIN

Manabu Kitamoto, Fuji, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

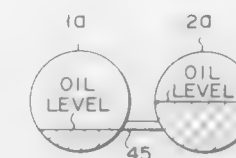
Filed Feb. 2, 1989, Ser. No. 305,906

Claims priority, application Japan, Feb. 9, 1988, 63-28112; Feb. 9, 1988, 63-28115; Feb. 10, 1988, 63-29277

Int. Cl.⁴ F25B 39/04

U.S. Cl. 62—84

32 Claims



- 1. An air conditioner comprising: an outdoor unit having at least two variable-capability compressors and an outdoor heat exchanger coupled to said compressors having lubricating oil supplying sections coupled together by an oil-balancing member; a plurality of indoor units each coupled to said outdoor unit for forming a refrigerating cycle and each having at least an indoor heat exchanger and means for outputting demand capability data according to an air conditioning load of said indoor heat exchanger; and

control means for generating, in accordance with said demand capability data, a parallel operation command for parallel operation involving both of said compressors of said outdoor unit with capability according to a sum of said demand capability data from said indoor units, said parallel operation command being a repetition of a normal operation command for performing a normal operation over a given time and first and second oil-balancing operation commands for every given cycle, said first and second oil-balancing operation commands having a mutually complementary relation in preceding and succeeding stages of said normal operation.

4,870,832

POSITIVE VENTILATION COOLING AUGMENTOR
Charles R. Crawley, 513 Commagere Blvd., Bay St. Louis, Miss. 39520

Filed Oct. 3, 1988, Ser. No. 253,254
Int. Cl.⁴ F25D 17/06; F25B 39/04

U.S. Cl. 62—89

5 Claims



1. A process for increasing the efficiency of air conditioning, in a building having an air conditioning system with a heat exchange external to the building and having an attic thereof comprising:

- diverting a portion of the heated air emitted by said heat exchanger;
- ducting said diverted heated air through a substantially vertical flow path creating an adiabatic rising effect therein;
- ducting said heated air from said vertical flow path into the attic of said building.

4,870,833

CAR AIR CONDITIONING APPARATUS AND CONTROLLING METHOD THEREFOR

Toshiharu Matsuda, and Yoshinao Okumoto, both of Kudamatsu, Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Aug. 19, 1987, Ser. No. 86,829

Claims priority, application Japan, Aug. 27, 1986, 61-198835; Dec. 3, 1986, 61-286630

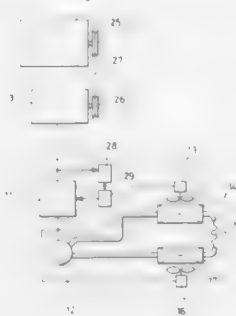
Int. Cl.⁴ B60H 1/32; F25B 49/00

U.S. Cl. 62—134

7 Claims

1. A car air conditioning apparatus, comprising:
- a generator driven by a variable rotational speed main engine for running a car,
 - a compressor provided with a driving motor,
 - a condenser,
 - an expansion means,
 - an evaporator,
 - a condenser blower provided with a motor,

an evaporator blower provided with a motor, and an inverter controlling means for supplying electric power generated by said generator to said compressor driving motor, condenser blower motor and evaporator blower motor, and for decreasing the frequency of the electric power supplied to said compressor driving motor, con-



4,870,834

VAPOR PRESSURE-ADJUSTING VALVE AND REFRIGERATION SYSTEM USING SAME

Shinji Ogawa, Aichi; Yoshihara Kajikawa, Hekinan; Isao Kuroyanagi, Anjo; Norimasa Baba, Nagoya, and Toshio Ohara, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

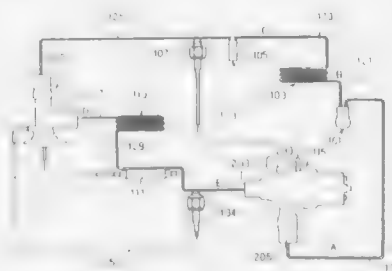
Filed May 27, 1988, Ser. No. 199,659

Claims priority, application Japan, May 29, 1987, 62-137119

Int. Cl.⁴ F25B 41/04

U.S. Cl. 62—197

7 Claims



1. A refrigeration system comprising:
- a compressor for compressing a vapor-phase refrigerant to increase the temperature and the pressure;
 - a condenser for removing heat from the vapor-phase refrigerant compressed by the compressor to change the refrigerant into a liquid-phase refrigerant;
 - an expansion valve for expanding the liquid-phase refrigerant to change it into a low-temperature, low-pressure mist;
 - an evaporator for causing the mist of refrigerant to absorb heat and evaporate; and
 - a vapor pressure-adjusting valve which is disposed in a passage extending from the evaporator to the compressor and which, when the vapor pressure decreases below a certain value, reduces the flow of refrigerant from the evaporator to the compressor to maintain the vapor pressure constant, said vapor pressure-adjusting valve including means for adding a part of the liquid-phase refrigerant on the downstream side of the condenser to the refrigerant evaporated by the evaporator when the vapor pressure-adjusting valve reduces the flow of refrigerant from the evaporator to the compressor so that a resulting mixture refrigerant is introduced into the compressor.

4,870,835

REFRIGERATED CONTAINER

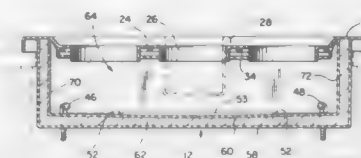
George R. Wolfe, and John J. Wolfe, both of P.O. Box 520, Savannah, Tenn. 38372

Filed May 4, 1988, Ser. No. 190,124

Int. Cl.⁴ A47F 3/04

U.S. Cl. 62—246

23 Claims



4. A condiment holder comprising a top plate containing at least one opening therein, a condiment container inserted into said opening, a refrigerant path encased in said top plate and in heat exchange communication with the outer surface of said top plate so as to cool said top plate and form a layer of frost thereon, means positioned below said top plate and forming an enclosure for the space below the plate whereby the refrigerant path cools the enclosed space and the portion of the container therein, means for collecting condensate from said frost layer formed on said top plate, said collecting means including a fluid discharge means for directing fluid on said collecting means to clean said collecting means from contaminants formed therein, said collecting means including a drain means to remove said condensates and discharged fluid from said condiment holder, said top plate including fibrous mat reinforced thermosetting resin outer and inner walls, a layer of material for conducting heat, the layer of material being located adjacent the outer wall, the refrigerant path being located adjacent the layer of material in heat exchange communication therewith, and means for retaining the refrigerant path in heat exchange communication with the layer of material.

4,870,836

AIR FLOW CONTROL FOR GLASS TOP REFRIGERATOR CONTAINER

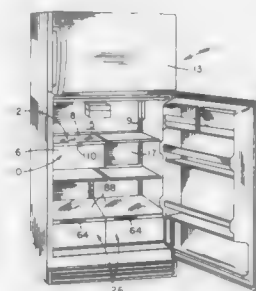
John J. Pink, Cedar Rapids, Iowa, assignor to Amana Refrigeration, Inc., Amana, Iowa

Filed Mar. 6, 1989, Ser. No. 319,502

Int. Cl.⁴ F25D 25/02

U.S. Cl. 62—382

12 Claims



1. In combination:
- a substantially rectangular horizontal frame adapted for supporting a slide-out food drawer in a refrigerator, said frame having a cover and a rear air inlet for receiving cold air, said frame further having a track extending from the front back along one side to the rear of said frame;
 - a flexible band slidably coupled to said track and extending from the front of said frame back along said one side to the rear of said frame;
 - operator actuable means for moving said flexible band along said track from the front of said frame wherein lateral motion of said band at the front imparts lateral motion of

said band in the opposite direction at the rear of said frame; and
damper means responsive to lateral motion of said flexible band at the rear of said frame for opening and closing said rear air inlet.

4,870,837

DEVICE FOR MAINTAINING THE CHILL ON A BOTTLE OF WINE

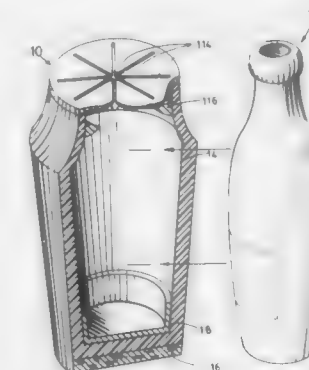
Janine J. Weins, 6 Allen St., Lebanon, N.H. 03766

Continuation of Ser. No. 908,658, Sep. 18, 1986, abandoned. This application Dec. 9, 1987, Ser. No. 132,612

Int. Cl.⁴ F25D 3/08

U.S. Cl. 62—457.4

11 Claims



1. A vessel for containment of a container comprising:
- an inner sidewall forming passage;
 - an outer sidewall spaced apart from said inner sidewall;
 - a bottom attached to said inner sidewall and said outer sidewall and closing the passage to form a central cavity;
 - a top having an opening to allow access to said central cavity, the top being attached to said inner sidewall and said outer sidewall so as to form a sidewall cavity, said sidewall cavity being filled with a fluid having a selected melting point; and
 - a flexible port covering said opening.

4,870,838

CRYOSTAT

Geoffrey H. Zeamer, 583 Winter St., Holliston, Mass. 01746

Filed Mar. 21, 1988, Ser. No. 170,759

Int. Cl.⁴ F25B 19/00

U.S. Cl. 62—51.1

9 Claims

1. A cryostat comprising:
- a temperature control assembly including:
 - a sample tube defining a sample chamber therein, said sample tube having a selectively sealable open end and a closed base end distant from said open end;
 - a cryogen jacket encasing a section of said sample tube including said base end, and spaced below said sample tube first end;
 - and an exchange gas system including an exchange gas inlet line in communication with an opening formed in said sample tube base end, and said sample tube forming at least one vent opening above said cryogen jacket; and
 - a vacuum tail, housing said temperature control assembly, including:
 - a manifold shell defining a manifold shell open end said sample tube is inserted into, said manifold shell defining a manifold space in communication with said sample tube vent openings, a selectively sealable manifold coupling to said manifold space; and
 - a vacuum jacket integral with said vacuum jacket including an outer vacuum sleeve, and an inner vacuum sleeve

coaxial with and within said outer vacuum sleeve, said inner vacuum sleeve spaced apart from said outer vacuum sleeve so as to define a vacuum space therebetween, the interior of said inner vacuum sleeve defining a housing



space for containing said cryogen jacket encased-sample tube base end therein; and
(C) a coupling means for sealing attaching said sample tube to first end into said manifold shell open end.

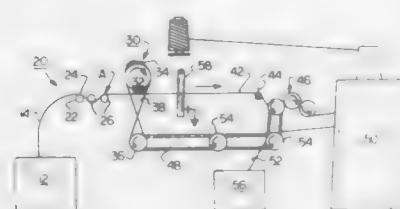
4,870,839

APPARATUS FOR DEKNITTING ELASTIC YARNS
Carl J. Odham, Asheboro, N.C., assignor to Asheboro Elastics, Corp., Asheboro, N.C.

Filed Dec. 22, 1987, Ser. No. 136,858
Int. Cl.⁴ D04B 15/50, 19/00

U.S. Cl. 66—125 A

34 Claims



1. An apparatus for feeding and unravelling a knitted elastic yarn package to a textile fabric making machine under substantially uniform and constant tension comprising:

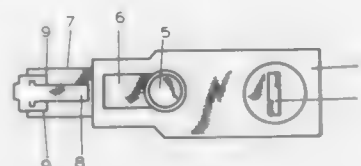
- (a) takeup means for moving the yarn ends of the package in the direction of the machine;
 - (b) tension means for providing resistance to the movement of the yarn package in the direction of the machine;
 - (c) an unravelling assembly positioned between said takeup means and said tension means for movably engaging the yarn ends; and
 - (d) drive means connected to said unravelling assembly for moving said unravelling assembly with respect to said yarn ends in a direction opposite to the direction of movement of the yarn ends towards the machine;
- whereby the moving engagement of said assembly with the yarn ends is operable to unravel the knitted yarn package uniformly.

4,870,840
MODULAR COMMUNICATIONS JACK LOCK
Edward Klein, 2 Professional Dr., Ste. 232, Gaithersburg, Md. 20879

Filed Feb. 6, 1989, Ser. No. 306,681
Int. Cl.⁴ E05B 73/00

U.S. Cl. 70—57

6 Claims



1. A modular communications jack lock comprising a lock mechanism disposed in a case with a connecting plug mounted on said case for snap engagement in a modular communications socket and leaf spring means for snap locking said plug within said socket, said leaf spring means being resiliently attached to said plug at a point remote from the attachment of said plug to said case; said lock mechanism preventing disengagement of the connecting plug from the socket by causing displacement into said leaf spring means of a sliding wedge means disposed in said case to prevent depressing thereof in the locked position and permitting said wedge to be withdrawn from leaf spring means when the lock mechanism is in the unlocked position to permit disengagement of the plug from the socket.

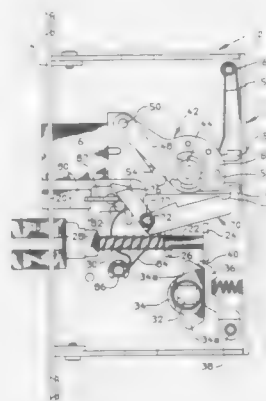
4,870,841

LOCK DEADBOLT PROTECTOR
Charles A. Cudd, Duluth, Ga., assignor to Yale Security Inc., Monroe, N.C.

Filed Oct. 6, 1988, Ser. No. 254,170
Int. Cl.⁴ E05B 59/00

U.S. Cl. 70—107

2 Claims



1. A mortise lock comprising

- a. a box-like housing having an apertured face plate adapted to be mounted in the end surface of a door
- b. an outwardly biased latchbolt protruding through the face plate
- c. an operator for said latchbolt
- d. a deadbolt mounted in the housing for reciprocation through the face plate
- e. an operator for the deadbolt comprising:
 - (1) a drive body mounted in the housing for rotation about an axis perpendicular to the door, the body having pins on its periphery and parallel to its axis, the deadbolt operator being connected to the body at its axis,
 - (2) a link connecting one of the pins to the end of the deadbolt,

- f. a guardbolt mounted in the housing for reciprocation through the face plate
 - g. deadbolt blocking means comprising:
 - (1) an outwardly biased auxiliary latchbolt normally extending through the end plate,
 - (2) a lever pivoted intermediate its ends in the housing and having a hook on one end adapted when the lever is in a first position to hook around one of the pins in the body to block the operator from turning,
- and in a second position to clear said pin to permit turning of the operator, part of the lever being accessible to the inner end of the guardbolt,
- whereby when the guardbolt is moved inward as by engagement with a door strike or by manual manipulation it moves the lever from first to second position.

4,870,843
SECURITY SYSTEM FOR CYCLES AND THE LIKE
Herbert J. Lundberg, Conklin Trailer Park, #19, West Belmar, N.J. 07719

Filed Nov. 4, 1988, Ser. No. 267,495
Int. Cl.⁴ E05B 71/00

U.S. Cl. 70—233

10 Claims



1. A self-retracting security tether assembly for cycles and the like comprising:

- a rigid, hollow tube having first and second open ends;
- first and second tether sections mounted in the tube, each section including a flexible chain or cable having a washer fixed at one end and a locking means fixed at the other end for locking engagement with each other;
- first and second plugs each slideably mounted on one of the chains or cable and each being fixed to said tube at a different one of said open ends with said locking means extending therefrom; and
- first and second helical coil springs, each mounted about one of said chains or cable and extending between said corresponding washer and plug so that said springs, when in an expanded state, forces said chains into said tube and are compressed between the plug and washer when said chains or cable are pulled from said tube through said plugs.

4,870,844

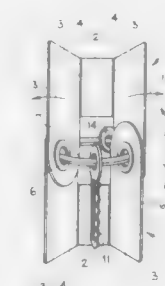
OBJECT SEPARATOR SUPPORTED AND HOOKED TO A SINGLE RING-LIKE COMPONENT
Furio M. Sandrini, Milan, Italy, assignor to Fashion Design Studio S.r.l., Milan, Italy

Filed Jun. 21, 1988, Ser. No. 210,663

Claims priority, application Italy, Jun. 24, 1987, 21027 A/87
Int. Cl.⁴ A47G 29/10

U.S. Cl. 70—456 R

1 Claim



1. A separator for supporting and separating keys and the like which comprises one first and one second alike components (1), each component (1) being composed of two sectors (3) hinged to an intermediate sector (2) along folding lines (4), each of said sectors (3) having an extension at its upper end an orifice in each of said upper ends of said sectors, an eyelet in each orifice, said two components being arranged one with the two upper ends at the top and the other component being inverted with the orifices and the eyelets at the bottom, a ring-like element passing through said eyelets in such a manner that one of the eyelets of said one first component is on the exterior with respect to one eyelet of said second component and the other eyelet of the first component being arranged in

4,870,842
SECURITY LOCKING SYSTEM FOR VEHICLE WHEEL NUTS

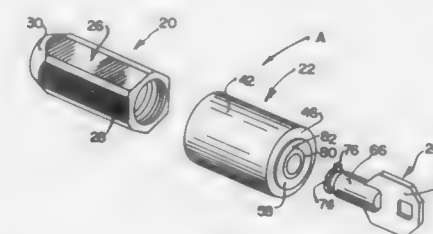
Mark J. Plumer, Los Angeles, Calif., assignor to Consolidated International Automotive, Inc., Los Angeles, Calif.

Filed Dec. 28, 1987, Ser. No. 138,565

Int. Cl.⁴ F16B 41/00

U.S. Cl. 70—232

20 Claims



1. A non-tumbler key operated lock mechanism which may be constructed in a small compact size, said lock mechanism comprising:

- (a) a body having a central bore and a locking element receiving slot formed therein,
- (b) a slidable locking element disposed in said locking element receiving slot and capable of shifting movement in said slot from a non-locking position in the body outwardly of the body to a locking position, said locking element also having a recess therein,
- (c) a plate located with respect to said central bore,
- (d) a plunger retained by the plate and extendable through a portion of said central bore into a position where it may extend into said recess in said locking element to hold the latter in the locking position and which may be biased out of the recess to permit a movement of the locking element to the non-locking position,
- (e) means on said locking element to coact with a key and cause a movement of the locking element through a camming action with movement of the key,
- (f) an arcuately shaped key receiving opening formed in an end wall of the body and sized to receive the shank of a key, and
- (g) means associated with said key receiving opening to coact with the key and provide key combinations to thereby determine if the key has a proper configuration to open and close the lock mechanism.

the interior with respect to the other eyelet of said second component, said keys being suspended from said ring-like element, said components being free to rotate on said ring-like element whereby one, two, three or four partitions may be obtained for separating one of said keys.

4,870,845

WORKING APPARATUS FOR CRANKSHAFT

Kiyoshi Nakagawa, Kyoto, Japan, assignor to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

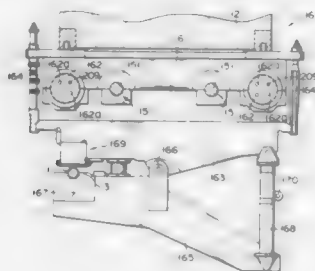
Filed Dec. 28, 1987, Ser. No. 138,588

Claims priority, application Japan, May 2, 1986, 61-102261

Int. Cl.⁴ B21K 1/08; B21D 55/00

U.S. Cl. 72-1

6 Claims



1. A working apparatus for working a crankshaft having a journal portion and a crank pin, comprising:

- a first follow-up mechanism comprising first and second support members for clamping the journal portion therebetween so as to be rotatable, the second support member being arranged so as to be movable in relation to the first support member;
- a second follow-up mechanism comprising third and fourth support members for clamping the crank pin therebetween in order to be rotatable, the fourth support member being arranged so as to be movable in relation to the third support member;
- a first actuator provided between the first and second support members and comprising a movable member, for controlling the position of the second support member relative to the first support member;
- a second actuator provided between the third and fourth support members and comprising a movable member, for controlling the position of the fourth support member relative to the third support member;
- a first fillet roller provided on the first support member and pressed against the journal portion, to roll on a peripheral surface of the journal portion;
- a second fillet roller provided on the third support member and pressed against the crank pin, to roll on a peripheral surface of the crank pin;
- a drive mechanism for rotating the second follow-up mechanism, to rotate the crankshaft;
- detecting means for detecting the displacement of the movable members, to thereby determine the change in the displacement of the first fillet roller with respect to the journal portion, and also the change in the displacement of the second fillet roller with respect to the crank pin; and
- a control device for actuating the first and second actuator in response to a signal from the detecting means so as to control the pressure contact of the first and second fillet rollers.

4,870,846

METHOD AND APPARATUS FOR EMBOSSING THE INSIDE SURFACE OF A CUP-SHAPED ARTICLE

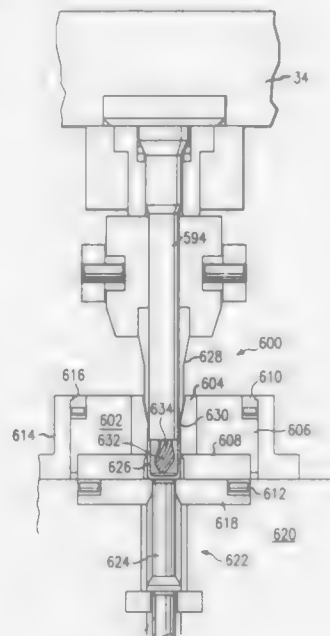
John D. Budreau, DeMotte, Ind., and John A. Kirpatrick, Chicago Heights, Ill., assignors to Allie Products Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 29,460, Mar. 23, 1987, Pat. No. 4,785,648. This application Mar. 15, 1988, Ser. No. 168,265

Int. Cl.⁴ B21D 24/00

U.S. Cl. 72-77

1 Claim



1. Embossing apparatus for embossing a spiral design on the interior of a cup, comprising:

- die means including fixed die housing means, a rotatable die holder located in said housing means, a rotatable annular anvil supporting said die holder, a die having an opening and a reduced diameter part defining an annular protuberance on an interior surface thereof, located for rotation with said holder and supported by said anvil, an upper thrust bearing located between said holder and housing means and a lower thrust bearing located between said anvil and said housing means;
- an embossing punch having a spiral-type embossing design on that exterior thereof and having an outside diameter somewhat smaller than the inside diameter of said reduced diameter part, and moveable for at least partial insertion into said opening proximate said reduced diameter part;
- sleeve means engageable with said cup for forcing said cup between said punch and said protuberance of said die to effect said embossing;
- means for positioning said punch with respect to said reduced diameter part of said die and for operating said sleeve means for forcing said cup between said punch and said protuberance of said die;
- lift out means carried by said housing means and including a moveable lift out haft sized to project upwardly through said die after said cup has been embossed to force said cup out of the opening in said die;
- said lower thrust bearing supporting the downwardly directed load exerted during embossing of said cup to permit rotation of said die during embossing; and
- said upper thrust bearing supporting the upwardly directed force exerted during removal of said punch from said cup and removal of said cup from said die and to permit rotation of said die during removal of the embossing punch from the cup.

4,870,847

METHOD AND APPARATUS FOR FORMING OUTWARDLY PROJECTING BEADS ON CYLINDRICAL OBJECTS

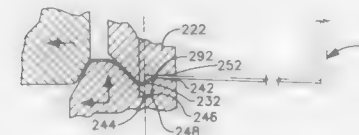
Martin P. Kitt, Arvada, Colo., assignor to Ihly Industries, Inc., Englewood, Colo.

Filed May 20, 1988, Ser. No. 196,952

Int. Cl.⁴ B21D 19/12

U.S. Cl. 72-84

27 Claims



1. A method for forming an outwardly projecting bead in the sidewall of a cylindrical object, said method comprising:

- (a) supporting a cylindrical object for rotation;
- (b) rotating said cylindrical object about its longitudinal axis;
- (c) supporting an interior portion of the cylindrical object sidewall adjacent to where the outwardly projecting bead is to be formed;
- (d) providing a recess adjacent to an exterior portion of said sidewall;
- (e) applying pressure to exterior portions of said sidewall which are adjacent to each side of said recess; and
- (f) pressing said exterior of said sidewall in a direction radially inward and axially forward until an outwardly projecting bead is formed in said sidewall.

4,870,849

METHOD FOR TUBE BENDING WITH CONTROLLED CLAMP DIE ARRANGEMENT

Zeno P. Traub, Vista, Calif., assignor to Eaton Leonard Technologies, Inc., Carlsbad, Calif.

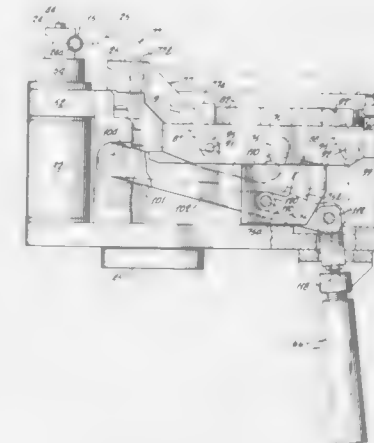
Division of Ser. No. 101,063, Sep. 25, 1987, Pat. No. 4,760,726.

This application May 16, 1988, Ser. No. 194,336

Int. Cl.⁴ B21D 7/04

U.S. Cl. 72-149

4 Claims



1. A method of bending a tube comprising: positioning a first portion of a tube at a bend die, moving a clamp die to clamp the tube against the bend die, restraining a second portion of the tube, and rotating the bend and clamp dies about a bend axis to bend the tube in a bend plane,

said step of moving a clamp die comprising:

- employing a guide slot and guide bolt to constrain motion of the clamp die along a first path from a first position displaced from said bend plane to a second position substantially in said bend plane and close to said bend die, and along a second path in said bend plane from said second position to a tube clamping position, securing to the clamp die a cam plate having a cam slot with an actuator rod therein,
- driving the actuator rod along a first portion of the cam slot to drive the clamp die along said first path to said second position, and
- driving the actuator rod along a second portion of said cam slot to drive the clamp die with a constant force along said second path to said tube clamping position.

4,870,848

TAPERED ROLLED THREAD BAR JOINT

Anton M. Kies, Oisterwijk; Harry C. van den Nieuwelaar, Gilze, and Geoff M. Bowmer, Oisterwijk, all of Netherlands, assignors to Erico International Corporation, Solon, Ohio

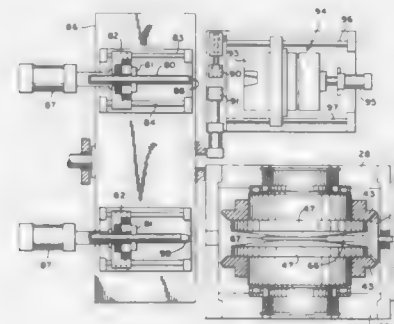
Division of Ser. No. 27,319, Mar. 28, 1987, Pat. No. 4,819,469.

This application Sep. 30, 1988, Ser. No. 251,315

Int. Cl.⁴ B21H 3/04

U.S. Cl. 72-89

22 Claims



1. A machine for rolling tapered threads of uniform taper angle on the end of a concrete reinforcing bar comprising a

4,870,850

METHOD AND DEVICE FOR LEVELING METAL STRIP TO BE FED INTO CONTINUOUS ANNEALING FURNACE

Yasuhiro Yamaguchi; Yuji Shimoyama; Tateo Ohnishi; Hiroobu Ohno; Isamu Shioda, and Yoji Nakazono, all of Chiba, Japan, assignors to Kawasaki Steel, Japan
Filed Sep. 4, 1987, Ser. No. 94,662

Claims priority, application Japan, Sep. 9, 1986, 61-211909; Sep. 30, 1986, 61-230125

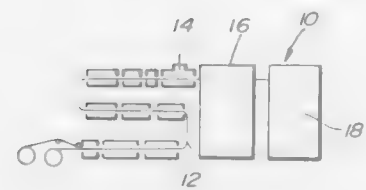
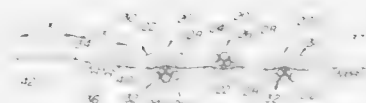
Int. Cl.⁴ B21D 1/02

U.S. Cl. 72-164

17 Claims

1. A method for leveling a metal strip fed into an annealing furnace having spaced-apart hearth rolls, which metal strip is formed into a series of strips by connecting coils at a joint, comprising the steps of:

- providing offset leveling roll assemblies constituted of first and second roll components disposed between opposite sides of a path through which the metal strip is fed;
- providing means for exerting a predetermined magnitude of tension force to said metal strip during the leveling operation;
- depressing said first and second components of said leveling roll assembly with a predetermined pressure for leveling said metal strip;
- releasing said first component of said leveling roller assembly from the mating surface of said metal strip for releasing said metal strip from depressing pressure upon encountering a joint of the series of metal strips;



rotatingly driving at least said first component while it is released from said metal strip; and
adjusting said tension force exerted on the metal strip during said leveling operation to adjust the elongation of said metal strip in a predetermined relationship with said distance to satisfy the following equation:

$$\phi \geq 0.0082(\pi/8 L)^{1.45}$$

where

ϕ is the elongation (%);
 x is said distance; and

L is the span between hearth rolls in said annealing furnace.

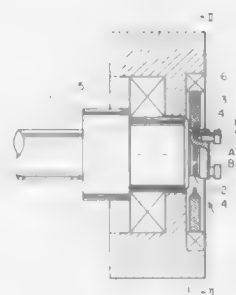
4,870,851

APPARATUS FOR PRODUCING STRANDED CABLE

Tamotsu Nishijima, and Toshihiro Fujino, both of Numazu, Japan, assignors to Yazaki Corporation, Tokyo, Japan
Filed Dec. 23, 1988, Ser. No. 288,731

Int. Cl.⁴ B21C 23/08
U.S. Cl. 72-261

4 Claims



1. An apparatus for producing a stranded cable, comprising a rotatable member mounted for rotation around a fixed axis and having an annular groove formed in a periphery thereof, a plurality of dies disposed on a single circumferential line on an axial end face of said rotatable member, a circular shoe having a periphery for engaging in said annular groove of said rotatable member, and means for supporting said circular shoe for rotation around an axis spaced from said fixed axis of said rotatable member relative to said rotatable member such that said periphery of said circular shoe is partially engaged in said annular groove of said rotatable member to define therebetween a wire stock passageway having a varying sectional area, whereby wire stock is supplied into said wire stock passageway at a portion having a relatively greater sectional area and is then successively extruded from said dies on said rotatable member through a portion of said wire stock passageway having a minimum sectional area to form wires which are to be subsequently stranded into a stranded cable.

4,870,852

Patent Not Issued For This Number

4,870,853

TOOL AND METHOD OF COINING CORNER BREAKS IN A STATOR OF A POWER STEERING VALVE

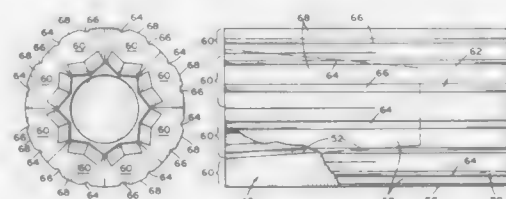
Donald E. Ferguson, Mentor, Ohio, assignor to Bethandale Corporation, Mentor, Ohio

Filed Dec. 28, 1987, Ser. No. 138,839

Int. Cl.⁴ H02K 15/00

U.S. Cl. 72-393

6 Claims



1. An apparatus for coning a valve sleeve member, said apparatus comprising;

a generally elongated member having opposed first and second ends;
a recess extending axially inward from said first end and terminating short of said second end;
plural land regions extending substantially along the axial length of said member, said land regions defining a radially outermost peripheral portion of said member;
axially extending grooves interposed between said land regions; and
separate arm portions extending axially from said first end toward said second end, said arm portions integrally joined together at said second end and being independently movable relative to one another at said first end, said arm portions each including first and second tapered surfaces defined along an interior face for facilitating radial outward movement of said elongated member.

two known height levels of the fiber material of specific type; and storing the generated detector signals in the microcomputer, whereby calibration of the apparatus for the fiber material of said specific type is obtained.

4,870,855

GAS SENSOR PROTECTION DEVICES AND ASSEMBLIES

J. Howard Shafer, Sunnyvale, Calif., assignor to Delphian Corporation, Northvale, N.J.

Filed Dec. 22, 1987, Ser. No. 136,659

Int. Cl.⁴ G01N 27/00

U.S. Cl. 73-23

6 Claims

METHOD OF CALIBRATING AN APPARATUS FOR DETECTING THE FILL LEVEL IN A FIBER STORING DEVICE

Fritz Hüsel, Mönchengladbach, Fed. Rep. of Germany, assignor to Trützschler GmbH & Co. KG, Mönchengladbach, Fed. Rep. of Germany

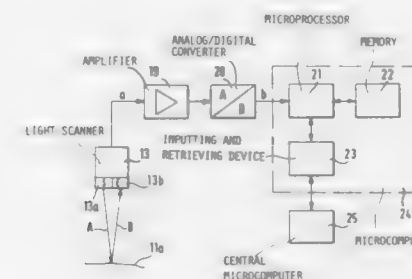
Division of Ser. No. 65,567, Jun. 23, 1987. This application Sep. 28, 1988, Ser. No. 250,448

Claims priority, application Fed. Rep. of Germany, Jun. 23, 1986, 3621009

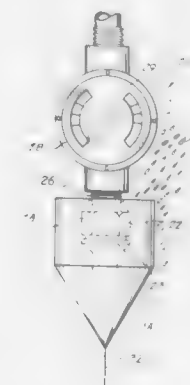
Int. Cl.⁴ G01F 25/00

U.S. Cl. 73-1 H

3 Claims



1. A method of calibrating and adjusting an apparatus for determining the fill level of a selected specific fiber material in a filling chute of a fiber storing device; said filling chute having a side wall; said apparatus including an optical device being situated above an expected maximum fill level in the filling chute and including a light emitter arranged to direct a light beam from above onto an upper face of the fiber material and a light detector arranged to receive a light beam reflected from said upper face, a microcomputer, including a microprocessor, operatively connected to said apparatus for receiving detector signals from said apparatus; comprising the steps of providing two vertically spaced fixed markings on said side wall; charging said filled chute with a fiber material of a specific type; generating detector signals when the level of the fiber material in the filling chute reaches the lower and the upper markings, respectively, whereby the generated detector signals represent



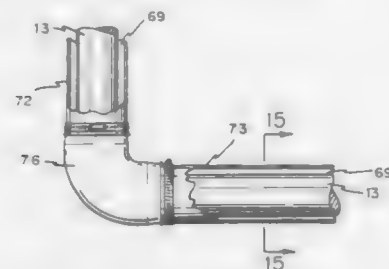
1. A hazardous gas sensor assembly comprising a hazardous gas sensor comprising a sensor body containing hazardous gas detection means for detecting at least one hazardous gas, and porous sampling means for enclosing the gas detection means within an enclosed sensor zone in the sensor body while permitting diffusive gas interchange between the enclosed sensor zone and the ambient atmosphere, said sensor body having a predetermined external shape, which is radially or rectilinearly symmetrical about the axis, and having external dimensions within a range of from about 0.1 inch to about 3.0 inches in width, and from about 0.25 to about 6 inches in length, and a reticulated foam splash guard at least partially enclosing the hazardous gas detector, said reticulated foam splash guard having a recess at its proximal end having a width less than that of the hazardous gas sensor body, and a depth sufficient to accommodate the sensor body, said reticulated foam splash guard having a minimum wall thickness of at least about 0.5 inch between the inner surface of the recess and the outer surface of the splash guard body and a limited density of less than about 7.0 pounds per cubic foot and a pore size characterized by a pore density of from about 10 to about 100 pores per lineal inch.

4,870,856
SPLIT FITTINGS USEFUL IN FORMING A SECONDARY SEMI-RIGID PIPELINE OVER PRIMARY PIPELINES
 Bruce R. Sharp, 4090 Rose Hill, Cincinnati, Ohio 45229
 Filed May 25, 1988, Ser. No. 198,454

The portion of the term of this patent subsequent to May 26, 2004, has been disclaimed.
 Int. Cl.⁴ G01M 3/08

U.S. Cl. 73—40.5 R

34 Claims



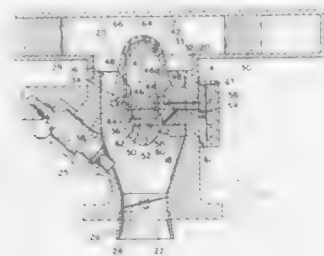
1. A split fitting for use in installation of a secondary semi-rigid pipeline over a primary pipeline, comprising:

- a pair of housing halves such that when mated and secured together a complete housing enclosure is formed which has at least two extremities with openings through which the primary pipeline passes, said housing enclosure being capable of enclosing a portion of the primary pipeline and capable of having a secondary semi-rigid pipeline held in place by clamping means to at least one extremity through which the primary pipeline passes;
- sealing means positioned on each mated surface of the housing halves to form a liquid tight seal when said housing halves are secured together; and
- clamping means for holding the secondary semi-rigid pipeline to the housing enclosure in a liquid tight relationship.

4,870,857
THROTTLE BODY WITH INTERNALLY MOUNTED ANEMOMETER
 David H. Smith, Mercer Island, Wash., assignor to AirSensors, Inc., Seattle, Wash.
 Continuation of Ser. No. 887,821, Jul. 28, 1986, Pat. No. 4,739,651. This application Dec. 1, 1987, Ser. No. 127,114
 The portion of the term of this patent subsequent to Apr. 26, 2005, has been disclaimed.
 Int. Cl.⁴ G01M 19/00

U.S. Cl. 73—118.2

13 Claims



1. A throttle body for an internal-combustion engine for use with an annular air cleaner mountable on the body concentric therewith at the body intake end, comprising:

- a hollow body having a substantially smooth walled interior sidewall defining a longitudinal air duct leading from an open intake end to an open discharge end;
- a throttle plate within said duct toward said body discharge end;
- a hollow venturi member having a first member portion

positioned toward said body intake end, and a second member portion positioned generally centrally within said duct upstream from said throttle plate, said second member portion having a central exterior surface portion extending around and spaced inward from said body interior sidewall to form a restricted circumferential venturi air passage therebetween, said second member portion further having a first end exterior surface portion tapering from said central surface portion toward said body intake end and a second end exterior surface portion tapering from said central surface portion toward said body discharge end, said first and second member portion defining an enclosed air channel therewithin having at least one entry opening in said first member portion for the entry of air into said channel and a plurality of circumferentially spaced apart exit openings in said second member portion exiting through said central exterior surface portion and communicating with said venturi air passage for the exit of air from said channel into said air passage in a circumferentially distributed manner, said channel and said entry and exit openings defining a path of sample airflow from a location at said body intake end to a location adjacent to said venturi air passage representative of the air mass flow through said duct, said first member portion having a convexly and continuously curved exterior surface portion tapering toward and terminating at a terminal end positioned toward said body intake end, said first member exterior surface portion being shaped to create a perimeter boundary-layer separation region and downstream thereof a low pressure zone when airflow through said duct is reversed due to engine back-flow pulsations, with said first member exterior surface portion shape forming a bluff body which induces formation of a partial vacuum in said low pressure zone at said first member exterior surface portion when airflow through said duct is reversed due to engine back-flow pulsations, and the low pressure at said first member exterior surface portion being substantially the same as the low pressure at said venturi air passage, said entry opening being positioned sufficiently downstream of said perimeter boundary-layer separation region in said low pressure zone so as to produce pressure at said entry opening substantially equal to the pressure created in said venturi air passage from the reversed airflow, whereby little or no pressure differential exists between said exit and entry openings during engine back-flow and erroneous measurement of said sample airflow through said channel is prevented, said first member portion terminating with said first member exterior surface portion positioned generally concentric with said body and exterior of said duct at said body intake end and facing generally axially outward, said at least one entry opening including a plurality of circumferentially spaced apart entry openings positioned to draw air into said channel generally uniformly from the air space around said first member exterior surface portion and outward of said duct, said entry openings each comprising a generally circular bore in said first member exterior surface portion extending generally axially and opening in a direction facing away from the direction of the airflow through said duct when reversed due to engine back-flow pulsations, whereby said entry openings are positioned substantially equidistant from any portion of the air cleaner mounted concentric with said body at said body intake end and localized clogging of a portion of the air cleaner will not sufficiently affect said sample airflow;

means for supporting said venturi member in said duct; and an anemometer sensor positioned within said channel in said sample airflow path.

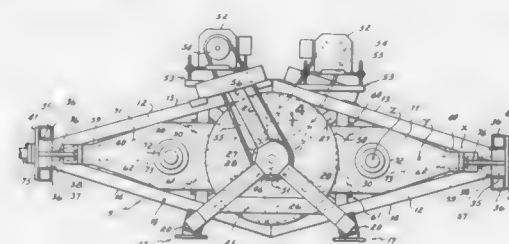
4,870,858
TIRE TESTING MACHINE
 Patrick A. Smith, Northfield, and Glen Thompson, Akron, both of Ohio, assignors to Eagle-Picher Industries, Inc., Cincinnati, Ohio

Filed Oct. 21, 1988, Ser. No. 260,494

Int. Cl.⁴ G01M 17/02

U.S. Cl. 73—146

6 Claims



- A tire testing machine comprising: two spaced parallel diamond shaped support structures, each support structure formed by two triangular trusses each having a vertical base;
- a pair of spaced parallel transverse beams forming a base, said diamond structures each having lower structural elements fixed to said base;
- a pair of road wheels independently mounted on respective diamond shaped structure at the center thereof;
- a motor mounted on each support structure and drivably connected to a respective road wheel; and
- four tire wheel carriages, two of said carriages being mounted on each side of said support structure and on opposite sides of a respective road wheel, means mounting said carriages for movement toward and away from said road wheel.

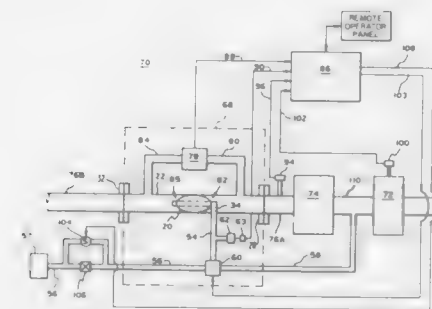
4,870,859
FLOWMETER CONTROLLER FOR AN AIR INLEAKAGE MONITORING SYSTEM
 Michael Tverdochlib, Oviedo, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 25, 1988, Ser. No. 160,421

Int. Cl.⁴ G01F 5/00

U.S. Cl. 73—203

3 Claims



1. A method for controlling the operation of a normally open bladder bypass valve in a steam turbine air leakage exhaust vent pipe, the valve being used to bypass a flowmeter connected in a bypass pipe parallel with the valve, the flowmeter providing signals representative of flow therethrough, the method comprising the steps of:

- comparing the signals from the flowmeter representative of flow therethrough to a reference signal corresponding to a first predetermined flow rate;
- generating a valve closure signal when the step of compar-

ing demonstrates that the flow through the flowmeter is less than the first predetermined flow rate;

converting the signals from the flowmeter while the valve is closed to signals for displaying air leakage exhaust flow rate;

determining when the exhaust flow rate exceeds a second predetermined value;

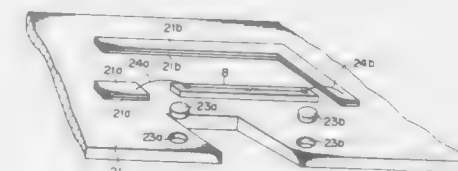
generating a valve open signal for bypassing the air leakage exhaust through the valve when the step of determining demonstrates that the flow rate through the flowmeter is greater than the second predetermined value; and repeating each of the recited steps in sequence for controlling operation of the valve.

4,870,860
DIRECT-HEATED FLOW MEASURING APPARATUS HAVING IMPROVED RESPONSE CHARACTERISTICS
 Minoru Ohta, Okazaki; Kazuhiko Miura, Aichi; Seizi Huzino, Anjo; Kenji Kanehara, Aichi, and Tadashi Hattori, Okazaki, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan
 Continuation of Ser. No. 828,452, Feb. 11, 1986, abandoned.
 This application Feb. 25, 1988, Ser. No. 163,164
 Claims priority, application Japan, Feb. 14, 1985, 60-25232; Feb. 19, 1985, 60-29286; Feb. 25, 1985, 60-34413

Int. Cl.⁴ G01F 1/68

U.S. Cl. 73—204.26

25 Claims



- A direct-heated flow measuring apparatus for measuring the flow rate within a passage comprising: a planar substrate that is formed of monocrystalline silicon; a film resistance pattern formed partially at said substrate; a supporting plate, fixed to said passage, for supporting said substrate, said supporting plate having good heat dissipation characteristics;
 - at least one adiabatic member disposed between said substrate and said supporting plate; and
 - electric power control means, connected to said film resistance pattern, for controlling the heat generated by said film resistance pattern,
- one part of a surface of said planar substrate and one part of a surface of said supporting plate being superimposed on each other via said adiabatic member, the cross-section of said adiabatic member being smaller than the superimposed area of said planar substrate and said supporting plate.

4,870,861
LIQUID LEVEL INDICATOR
 Yukio Ohtani, and Yoshitake Sato, both of Shimada, Japan, assignors to Yazaki Corporation, Japan
 Filed Oct. 23, 1987, Ser. No. 111,718
 Claims priority, application Japan, Oct. 24, 1986, 61-162338; Oct. 24, 1986, 61-162337; Jul. 24, 1987, 62-112725[U]

Int. Cl.⁴ G01F 23/56

U.S. Cl. 73—317

4 Claims

- A liquid level indicator comprising: (a) an indicator frame (3) having a bearing (3b) and resistor lock claws (3a);

- (b) a resistor (6) fixed to said indicator frame by the resistor lock claws (3a);
- (c) a contact holder (4) formed into a crank shape having a first arm (4a) provided with a pair of slits (4g), a pair of stepped portions (4h) and a float arm hole (4e), a second arm (4c) provided with at least one split hook member (4b), and a crank shaft portion extending between said first and second arm substantially parallel to the bearing (3b) of said indicator frame (3).
- (d) a contact (5) formed with a pair of vertical members (5b) each including a lock claw (5c) to be locked open into engagement with one of the stepped portions of said



- contact holder when the vertical members are fitted to the slits of said contact holders; and
- (e) a float arm (2) having a free end, a pivotal end, and an intermediate portion between said free end and said pivotal end, a float (1) fixed at said free end, said pivotal end fitted to the bearing (3b) of said indicator frame and the float arm hole (4e) of said contact holder, and said intermediate portion of said float arm fixed to the split hook member (4b) of the second arm (4c) of said contact holder, wherein said resistor, said contact holder, said contact, and said float arm are assembled with said indicator frame by movement in a single assembly direction.

4,870,862

PRESSURIZED MAGNETIC FLOAT LEVEL INDICATOR FOR RECEPTACLES CONTAINING LIQUIDS AT HIGH PRESSURE AND TEMPERATURE

Giulio Bonetti, Milan, Italy, assignor to Cesare Bonetti, Garbagnate Milanese, Italy

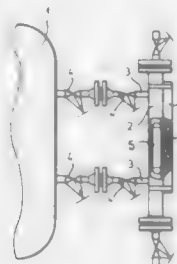
Filed Jun. 3, 1988, Ser. No. 202,973

Claims priority, application Italy, Jun. 8, 1987, 20814 A/87

Int. Cl.⁴ G01F 23/72, 23/76

U.S. Cl. 73—322.5

10 Claims



1. A pressurized magnetic float level indicator for a receptacle containing a liquid at high pressure and temperature, said indicator comprising:

a tubular body with a vertical axis which is closed at its ends

and communicates at the top and bottom with a receptacle containing a liquid whose level is to be indicated;

a plurality of orientatable magnetic dipoles in an array along-side and parallel to said tubular body; and

a hollow sealed float in said body provided with a magnetic element designed to orient said plurality of rotary magnetic dipoles in accordance with the position of said float along said body, the float being provided with spaced apart inner rings and being pressurized by an evaporating ternary mixture contained in the float and having a vapor pressure which varies with variations in the internal temperature of the float along a curve corresponding to the variation of the pressure with the temperature of the liquid contained in the receptacle and in the tubular body externally of the float, this vapor pressure within the float at least partially balancing out the pressure outside it, the ternary mixture having a vaporizable liquid, a gas soluble in said liquid and adapted to be driven out of said liquid, and a light gas pressurizing the interior of said float at ambient temperature.

4,870,863

MODULAR SWITCH DEVICE

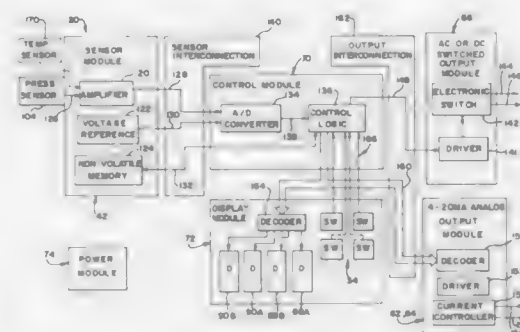
William M. Duncan; George E. Glass, both of Asheville; Jeffrey L. Johnson; Edward A. McMillan, both of Fletcher; Frank S. Maney, Waynesville; James R. McConnell, Jr., Arden; Kenneth P. Roberts, and Timothy R. Sanders, both of Asheville, all of N.C., assignors to Square D Company, Palatine, Ill.

Filed Sep. 17, 1987, Ser. No. 98,360

Int. Cl.⁴ G01D 21/02, 21/00; G01K 1/02; G01L 19/12

U.S. Cl. 73—431

22 Claims



1. A modular switch device adapted to be connected to a selected one of a pressure sensor or a temperature sensor, which modulate an electrical analog data signal to represent respective temperature or pressure values, and to a user's electrical wires at least for indicating particular pressure or temperature values selected by said user occurring at said selected sensor, said device comprising:

A. a housing having an opening adapted to receive said electrical wires from said user, said housing also having a passage adapted for selected connection to said pressure and temperature sensor;

B. at least one sensor module having an input port of signals and an output port of signals, said input port of signals being adapted for connection to said selected sensor and said sensor module further having an analog amplifier to amplify the analog data signal received from the sensor and to transmit same to said output port;

C. a control module secured in said housing having at least one input port of electrical signals, at least one output port of electrical signals, A/D converter means for converting said amplified analog data signal received at said input port to a digital data signal, and control logic means for producing a switch signal to said output port when said

- digital data signal equals said particular values selected by said user;
- D. input connection means secured in said housing for connecting said output port of signals of said sensor module to said input port of signals of said control module;
- E. at least one output module having an input port of signals, a communications port of signals adapted to be connected to said user's electrical wires and electronic indicator means adapted for effecting said indication of particular pressure or temperature values at said user's wires in response to said switch signal produced by said control logic; and
- F. output connection means secured in said housing for connecting said output port of signals of said control module to said input port of signals of said output module.

4,870,864

ACCELEROMETER

Shinichi Ito, Kanagawa, Japan, assignor to Atsugi Motor Parts Company Limited, Kanagawa, Japan

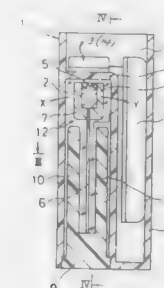
Filed Jun. 17, 1987, Ser. No. 63,263

Claims priority, application Japan, Jun. 20, 1986, 61-144472

Int. Cl.⁴ G01P 15/08, 15/11

U.S. Cl. 73—517 R

9 Claims



1. In an accelerometer
- a first proximity sensor disposed in a casing;
- a second proximity sensor disposed in a casing close to said first proximity sensor and;
- a magnet movably supported within the casing on a flexible member so as to be movable from a neutral position in a first and second opposite directions, said first and second proximity sensors being arranged so that when said magnet is moved in said first direction the output of the first sensor increases and the second sensor decreases and when the magnet moves in the second direction the output of said second sensor increases and the output of the first one decreases, wherein said casing includes a wall portion which hermetically divides the interior of the casing into first and second sections, wherein said magnet and the flexible member on which the magnet is supported being disposed in the first section and wherein the first and second proximity sensors are disposed in said second section.

4,870,865

DEVICE FOR TESTING FORMATION OF CONNECTION

Kazuhiro Hane, Nagoya, and Shuzo Hattori, Aichi, both of Japan, assignors to Nagoya University, Aichi, Japan

Filed Aug. 24, 1988, Ser. No. 235,597

Claims priority, application Japan, Oct. 15, 1987, 62-258197

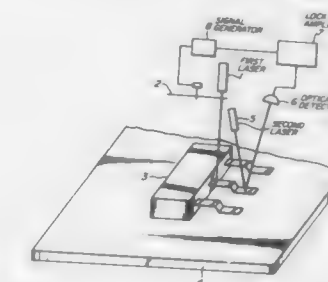
Int. Cl.⁴ G01N 21/00

U.S. Cl. 73—512

9 Claims

1. A device for testing formation of electronic connection, comprising a first laser outputting a first laser beam directed to a first point in the proximity of a connection to be tested, a modulator for modulating the first laser beam at a modulation frequency, a second laser outputting a second laser beam directed to a second point in the proximity of the connection,

and an optical detector for detecting scattering of the second laser beam from the second point, the optical detector being in phase with the modulating frequency of the modulator so as to measure a modulation-frequency component in the scattered second laser beam, the modulation-frequency component rep-



resenting intensity of that photo-thermo elastic wave which is generated at the first point and propagated to the second point, whereby strength of the connection is tested based on thus measured modulation-frequency component of the scattered second laser beam.

4,870,866

ULTRASONIC METHOD FOR MEASURING INTERNAL CONTACT PRESSURE BETWEEN MATING SOLID PARTS SEPARATED BY A LIQUID FILM

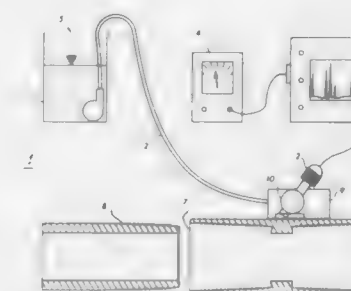
Maurice W. Slack, Edmonton, Canada, assignor to Centre for Frontier Engineering Research, Edmonton, Canada

Filed Dec. 31, 1987, Ser. No. 140,140

Int. Cl.⁴ G01N 29/00

U.S. Cl. 73—599

15 Claims



1. A method for determining a measure of contact pressure wherein a thin liquid film is undergoing compression in the interfacial region between two solid surfaces, said film having been applied to one or both of the solid surfaces prior to compression of the film by the solid surfaces, said film forming a part of the interfacial region, comprising:
- directing an acoustic pulse at said thin compressed liquid film; and
- establishing a measure or measures of the reflection coefficient or transmission coefficient of the interfacial region to provide the measure of contact pressure.

4,870,867

CROSSED LINEAR ARRAYS FOR ULTRASONIC MEDICAL IMAGING

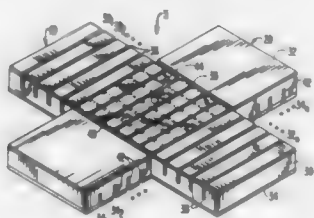
Avner Shaulov, Monsey, N.Y., assignor to North American Philips Corp., New York, N.Y.

Filed Dec. 27, 1988, Ser. No. 290,472

Int. Cl.⁴ G01N 29/00

U.S. Cl. 73—625

13 Claims



1. An ultrasonic transducer comprising: a cross shaped plate of piezoelectric material defining first and second arms, and having upper and lower surfaces; first and second conductive electrodes disposed on said upper and lower surfaces of said plate; a first series of transverse grooves extending along said first arm of said plate, said first series of grooves extending through said first electrode and at least partially through said piezoelectric material; a second series of transverse grooves extending along said second arm of said plate, said second series of grooves extending through said second electrode and at least partially through said piezoelectric material; and said grooves in said first and second electrodes defining first and second independently addressable arrays of piezoelectric transducers.

4,870,868

VIBRATION SENSING APPARATUS

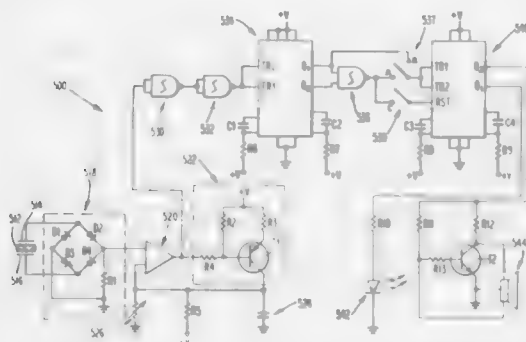
Raymond F. Gastgeb, Doylestown, and Edward Tom, Philadelphia, both of Pa., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed Apr. 27, 1988, Ser. No. 186,843

Int. Cl.⁴ G01N 29/00

U.S. Cl. 73—649

21 Claims



1. An apparatus for sensing and indicating when the point of impact between an object and a member occurs at a preselected location on said member, comprising: a piezoelectric sensor for producing an oscillatory electrical signal having an amplitude and frequency which are proportional to the vibration in said member generated by the collision between said object and said member; means for attaching said piezoelectric sensor to said member at a location remote from the point of impact of said member; circuit means responsive to said oscillatory electrical signal

for producing a control signal when the amplitude and frequency of said oscillatory electrical signal correspond to a point of impact at said preselected location on said member; and indicating means responsive to said control signal for indicating that the point of impact on said member occurred at said preselected location.

4,870,869

ROTOR COMPOSITE ENGINE

Shigeo Nagatani, 29-1, Nagai Ohimachi, Ohi-Gun, Fukui-Ken, 919-21, Japan

PCT No. PCT/JP87/00603, § 371 Date Apr. 8, 1988, § 102(e)

Date Apr. 8, 1988, PCT Pub. No. WO88/01342, PCT Pub.

Date Feb. 25, 1988

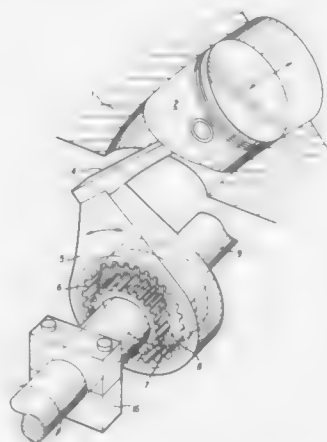
PCT Filed Aug. 11, 1987, Ser. No. 183,749

Claims priority, application Japan, Aug. 12, 1986, 61-187706

Int. Cl.⁴ F02B 53/00, 75/32; F16H 37/12

U.S. Cl. 74—52

1 Claim



1. A rotor composite engine comprising: a cylinder block defining a cylinder having a predetermined curved surface; a piston received in said cylinder and having a surface curved correspondingly to said curved surface of said cylinder, whereby said piston can reciprocate along a curved path in said cylinder; a rotatable power shaft mounted to said cylinder block; a connecting rod connected to said piston; and means connected between said connecting rod and said power shaft for converting reciprocating movements of said piston into rotation of said power shaft, wherein said converting means comprises: a stationary center gear, and a rotor journal mounted between said power shaft and said connecting rod and having rotor teeth meshing with said center gear.

4,870,870

SHAKER

Michael J. Quirk, and Timothy E. Drake, both of Westfield, N.Y., assignors to Renold, Inc., Westfield, N.Y.

Filed Mar. 13, 1989, Ser. No. 322,559

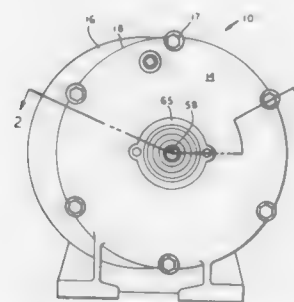
Int. Cl.⁴ F16H 33/00

U.S. Cl. 74—61

22 Claims

1. A shaker comprising a hollow housing with an open end and a closed end, a generally circular end cover covering said open end, said generally circular end cover having a concentric opening therethrough, said housing being in the form generally of a hollow cylindrical member,

attaching means attaching said generally circular end cover to said housing,
a first shaft and second shaft,
a first bearing means on said first shaft and supported on said housing,
a second bearing means on said second shaft and supported on said generally circular end cover at said concentric opening therethrough,
said second shaft extends through said concentric opening in said generally circular end cover,



- sealing means supported on said generally circular end cover engages said second shaft,
a first eccentric weight being supported on said first shaft by a first hub,
a second eccentric weight being supported on said second shaft by a second hub supporting said second weight on said second shaft,
coupling means connecting said first shaft to said second shaft,
said closed end terminates in a permanent closure thereon remote from said open end supporting said first bearing.

4,870,871

ADJUSTABLE ACCELERATOR AND BRAKE PEDAL MECHANISM

Steve D. Ivan, St. Clair Shores, Mich., assignor to Wickes Manufacturing Company, Southfield, Mich.

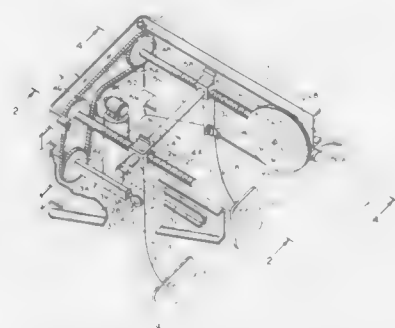
Continuation of Ser. No. 53,886, May 22, 1987, abandoned. This

application Nov. 25, 1988, Ser. No. 277,426

Int. Cl.⁴ G05G 1/14

U.S. Cl. 74—513

4 Claims



1. A pedal assembly for a motor vehicle comprising a support, a threaded shaft, pedal lever mounting means threadably mounted to the threaded shaft, a pedal lever pivotably mounted on the pedal lever mounting means, and an actuator, characterized by the actuator having an elongate threaded bore, a threaded rod connected to the pedal lever and engaged within the bore, and power means operatively connected to the threaded shaft and the actuator for rotating the shaft and the actuator to move the pedal lever mounting means and the

threaded rod relative to the support while maintaining the angular orientation of the pedal lever relative to the support.

4,870,872

CAM MECHANISMS

Bryan N. V. Parsons, Stoney Stanton, United Kingdom, assignor to Jaguar Cars Limited, United Kingdom

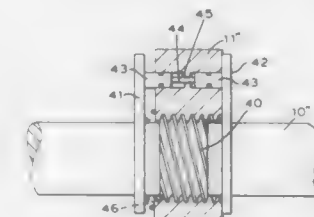
Filed Aug. 23, 1988, Ser. No. 235,239

Claims priority, application United Kingdom, Aug. 25, 1987, 8700051

Int. Cl.⁴ F16H 53/00; F01L 1/04

U.S. Cl. 74—568 R

5 Claims



1. A cam mechanism including a cam shaft; a cam mounted on a helical thread of said shaft and rotatable relative thereto; and means for restricting relative rotation of the cam with respect to the shaft, said means controlling the angular extent of rotation of the cam relative to the shaft as a function of the speed of rotation of the shaft.

4,870,873

BICYCLE TOE CLIP

George J. Tackles, San Jose, Calif., assignor to Specialized Bicycle Components, Inc., Morgan Hill, Calif.

Filed Jul. 26, 1988, Ser. No. 224,377

Int. Cl.⁴ G05G 1/14

U.S. Cl. 74—594.6

3 Claims



1. A bicycle toe clip having a wide mouth for facilitating entry and exit of a bike shoe, comprising: a base having shape and dimension, including the width thereof, conformed to a shoe of selected size range and shaped; a flange formed integrally with said base for mounting the toe clip to a bicycle pedal; strap carrier means formed integrally with said base and conformed to the shape and dimension of the upper of said shoe, including the longitudinal profile of said shoe, said strap carrier means having a generally H-shaped configuration defined by first and second substantially parallel longitudinally-extending strap carriers connected at one end thereof to said base and laterally spaced apart and supported by a transverse cross-member connected to said strap carriers intermediate the length thereof and having holes formed in opposite free ends thereof for receiving a strap; whereby a strap cinched through said pedal and strap holes forms a rectangular wide-mouth shape in the transverse plane of said shoe and said spaced-apart strap carriers and said base together define a rectangular wide mouth shape

in the transverse plane of said shoe substantially along the length of said strap carriers, for facilitating entry and exit thereof.

4,870,874 STARTING AND REVERSE TRANSMISSION APPARATUS

Toshifumi Ito, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Oct. 9, 1987, Ser. No. 106,270
Claims priority, application Japan, Oct. 11, 1986, 61-241778
Int. Cl.⁴ F16H 37/06, 5/52; F02N 15/02
U.S. Cl. 74—665 T

5 Claims

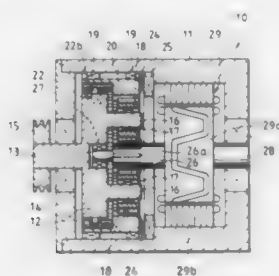


1. Power transmission apparatus for a vehicle effective to operate said vehicle in a starting mode of operation and in a reversing mode of operation, comprising:
a starter motor having an output shaft;
a starting drive;
a reversing drive;
a first planetary gear reduction system for operatively interconnecting said starter motor output shaft and said starting drive;
means for selectively connecting said first gear reduction system and said second gear reduction system to said starter motor; and
said first and second gear reduction systems being arranged for operation in series when said starter motor output shaft is operatively interconnected with said reversing drive.

4,870,875 DRIVING DEVICE FOR AUXILIARY DEVICE

Akira Morishita, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 30, 1988, Ser. No. 175,436
Claims priority, application Japan, Apr. 3, 1987, 62-83157
Int. Cl.⁴ F16H 3/44
U.S. Cl. 74—785

4 Claims



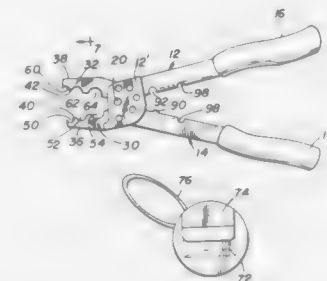
1. A driving device for an auxiliary device of an engine, comprising a carrier to be rotated by a crankshaft of the engine, a plurality of planet gears supported by shafts formed on

said carrier, an internal gear meshed with said planet gears and supported rotatably, a clutch means for engaging said internal gear with and disengaging it from a stationary portion of said device, an engaging means for engaging said carrier with said internal gear when a rotation speed of said carrier reaches a value not less than a predetermined value to rotate said internal 10 gear at the same speed as that of said carrier and an output shaft having a sun gear meshed with said planet gears and supported rotatably by said stationary portion of said device.

4,870,876 PLIERS FOR INSERTING BUSHINGS

Ernesto Rodriguez, 221 East Ave. P-5, Palmdale, Calif. 93550
Continuation of Ser. No. 97,700, Sep. 17, 1987, abandoned. This application Oct. 11, 1988, Ser. No. 256,269
Int. Cl.⁴ B25B 7/02
U.S. Cl. 81—426.5

2 Claims



1. Pliers in combination with a chassis-bushing comprising a first handle element and a second handle element, a first power jaw element and a second power jaw element, said power jaw elements being substantially coplanar for gripping and holding objects therebetween, each said power jaw element comprising a power-gripping surface,

each said power-gripping surface comprising a plurality of semicircular-shaped cutouts, each cutout on each said surface having a radius of curvature different from another one of said plurality of cutouts, each said cutout being juxtapositioned oppositely a like cutout of the other said surface when said jaw elements are in their closed, mutually-contacting positions; one of said plurality of cutouts of each said surface having a radius of curvature of at least 0.25 inches, said one cutouts being juxtapositioned oppositely to each other;

each said plurality of cutouts of each said surface comprising a completely unbroken, smooth surface by which an object may be gripped without damage to the object; said first and second handle elements being angularly offset with respect to said first and second power jaw elements in order to space said handle elements from said first and second power jaw elements, so that proper clearance is provided for the hand gripping said handle elements during use;

a bushing for gripping and securing an electrical cord in a chassis hole, said bushing comprising a first main section defining a hollow interior in which is positioned a portion of an electrical cord to be secured, said first main section defining an open mouth portion, and an arcuate outer circumferential surface forming a portion of a cylinder, said outer surface having a first portion and a second anchoring portion for anchoring the bushing in a chassis hole; and a second securing section having an arcuate outer circumferential surface forming a portion of a cylinder having a first part thereof corresponding to said first portion of said first section, and a second anchoring part corresponding to said second anchoring portion of said first section; said second section also comprising a projecting retaining bead member for forced and tight insertion

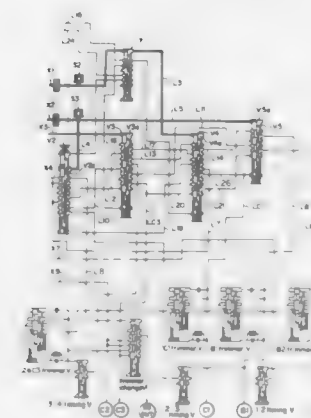
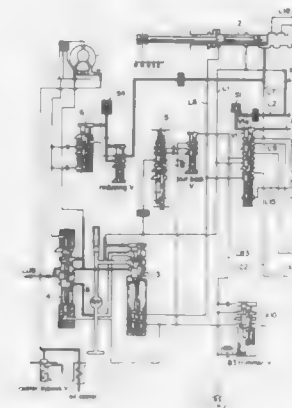
into said hollow interior of said first section through said open mouth thereof to retain a portion of an electrical cord in said hollow interior which portion of the cord is first positioned adjacent said open mouth, whereby said bead member forces said cord portion into said hollow interior during insertion and retains it therein due to the tight fit; said first portion of said first section and said first part of said second section defining together a circular gripping surface having a first annular portion which is positioned and retained in one of said plurality of cutouts of said first jaw element, and a second annular portion which is positioned and retained in one of said plurality of cutouts of said second jaw element juxtapositionally corresponding to said one cutout of said first jaw element; said first anchoring portion and said second anchoring part together defining a snap retainer for retaining the bushing in a chassis hole.

4,870,877 HYDRAULIC CONTROL CIRCUIT FOR AUTOMATIC TRANSMISSION

Hiromi Hasegawa, Oobu, and Toshiaki Ishiguro, Nagoya, both of Japan, assignors to Aisin Seki Kabushiki Kaisha, Kariya City, Japan

Filed Sep. 29, 1987, Ser. No. 102,393
Claims priority, application Japan, Sep. 30, 1986, 61-231552; Sep. 30, 1986, 61-231553; Sep. 30, 1986, 61-231554
Int. Cl.⁴ B60K 41/06
U.S. Cl. 74—869

31 Claims



1. A hydraulic control circuit for an automatic transmission of at least 5 forward gear shift stages, which comprises:
a first solenoid valve connected to each spool controlling

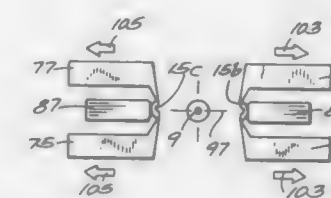
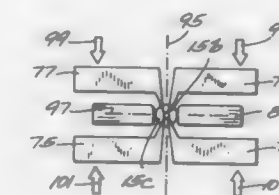
hydraulic line pressure passage of a 1-2 shift valve and a 3-4 shift valve; and
a second solenoid valve connected to a spool controlling hydraulic line pressure passage of a 4-5 shift valve;
a third solenoid valve connected to a spool controlling hydraulic line pressure passage of at least 2-3 shift valve wherein each of said gear shift stages is established based on combination of ON-OFF operation of each of said solenoid valves.

4,870,878 APPARATUS AND METHOD FOR REMOVING A SLUG OF INSULATION ALONG A LENGTH OF INSULATED WIRE

John D. Butler, Germantown, and Keith A. Johnson, Pewaukee, both of Wis., assignors to Mechtrix Corporation, Menomonee Falls, Wis.

Filed May 20, 1988, Ser. No. 197,088
Int. Cl.⁴ H02G 1/12
U.S. Cl. 81—9.51

39 Claims



1. Apparatus for center notching an insulated electrical conductor comprising:

a. first cutting means for circumferentially slicing the insulation of the insulated electrical conductor at predetermined locations therealong to thereby define the length of a slug of insulation; and
b. second cutting means for translating in a four-stroke stripping cycle to longitudinally penetrate the insulation slug during one of the strokes to create two hollow cylindrical insulation halves and to strip the two insulation halves from the conductor during another of the strokes.

4,870,879
QUICK-SET DIAL TYPE TORQUE WRENCH
James Shieh, P.O. Box 209, Feng Yuan 420, Taiwan
Filed Jul. 5, 1988, Ser. No. 215,263
Int. Cl.⁴ B25B 23/142
U.S. Cl. 81—483

1 Claim



1. A torque wrench comprising the combination of:
(a) a ratchet arm (1) having a ratchet head (10) and an actuator (12) on one end thereof and a tapered portion (15) on an opposite end thereof; a butt (16) on a rear end of said

tapered portion (15) having a screw (14) being threadable therein for adjusting a range of motion of said butt (16), and a shank pin (13) being fixed in a cavity (130) on a slanted rear end of said butt (16);

(b) a substantially hollow shank (3), said hollow shank (3) having a cylindrical portion and a flattened portion; said flattened portion receiving said tapered portion (15); said hollow shank (3) also having threads (33) on a rear inner surface thereof;

(c) a torque assembly (2) comprising a roller seat (23), a sleeve (24), a spring (25), a pad (26), a screw pile (27), and a helical rod (28) which are encompassed by a rear portion of said shank (3), said roller seat being adjacent to said sleeve (24) which is adjacent to said spring (25) which is adjacent to said pad (26) which is adjacent to said screw pile (27), said screw pile (27) being threadably engaged with and secured by the threads (33) on the rear inner surface of said shank (3); said screw pile (27) threadably receiving said helical rod (28); a front end of said helical rod (28) contacting said pad (26); said roller seat (23) having a recess (232) at the front end thereof and a roller (231) being rotatably fixed at a front end thereof so as to be substantially encompassed by said recess (232), said roller seat (23) having a plurality of steel balls (233) in a slot (234) at the front end thereof for rotatably stabilizing said roller (231) in conjunction with said shank pin (13), said shank pin being fixed in a cavity (130) on a rear end of said tapered portion (15); and

(d) an axially fixed handle (40) which fixedly encompasses a rear portion of said shank (3); said handle (40) having a pointer (401) proximate to a rearmost circumference thereof; an inner portion of said rearmost end of said handle (40) having a dial seat (402) for receiving and engaging a stepped protrusion (412) of a dial (41); an inner cylinder of said stepped protrusion (412) engaging with a rear portion of said helical rod (28); said dial (41) having a scale (411) thereon for aligning with said pointer (401) on said handle (40);

said dial (41) being rotatable to a desired setting by a user to as to urge said helical rod (28) to rotate and axially urge said screw pile (27) and pad (26); said spring (25) being compressible by said screw pile (27) and pad (26), said spring (25) exerting force on said sleeve (24), said roller seat (23) and said roller (231); said roller (231) exerting force on said shank pin (13) when said dial (41) is rotated by said user wherein an amount of torsional force is needed to overcome a turning resistance in said roller (231) and to allow said tapered portion (15) to rotate slightly about said neck pin (21), and whereby said amount of torsional force achieved within one turn of the dial and is indicated by alignment of said pointer with a portion of said scale has been added before.

4,870,880

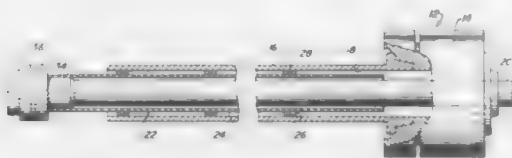
BAR STOCK FEED MECHANISM FOR MACHINE TOOL
Fredrick L. Cantabery, Rte. 3, Box 578K, Muscatine, Iowa 52761

Continuation of Ser. No. 121,376, Nov. 16, 1987, abandoned.
This application Nov. 4, 1988, Ser. No. 267,401

Int. Cl.⁴ B23B 13/00

U.S. Cl. 82—124

4 Claims



1. For use with a machine tool including a work receiver rotatable on a horizontal axis and having an axial through bore for receiving bar stock; bar stock supporting and feed mecha-

nism comprising an elongated tubular spindle coaxial with the work receiver and having a front end affixed to the receiver for rotation with the receiver and further having a rear end relatively remote from the receiver and the interior of the spindle being a coaxial extension of the receiver through bore, an elongate filler tube coaxially loosely received in the spindle and having a front end proximate to the receiver and a rear end proximate to the rear end of the spindle, said filler tube being adapted to coaxially receive bar stock, the inside diameter of the filler tube being tolerably greater than the outside diameter of the bar stock so that the filler tube supports the bar stock while enabling the bar stock to move axially forwardly relative to the filler tube, spacer means including a plurality of rings spaced axially apart and coaxially surrounding and affixed to the filler tube and engaging the interior of the spindle for centering the filler tube within the spindle and also for effecting rotation of the filler tube with the spindle, a piston coaxially within the rear end of the filler tube for abutting the proximate end of the bar stock, and means at the rear ends of the spindle and filler tube for connection to a source of fluid pressure for moving the piston forwardly to advance the bar stock.

4,870,881

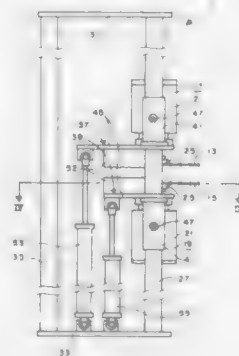
VERTICAL EDGER

Ennis J. Hurdle, Jr., Hwy. 57 East, Moscow, Tenn. 38057
Filed May 2, 1988, Ser. No. 189,355

Int. Cl.⁴ B27B 7/02

U.S. Cl. 83—102.1

5 Claims



1. A vertical edger for cutting parallel horizontal kerfs in a log, said edger comprising:

(a) a first horizontal cutting blade;
(b) a second horizontal cutting blade;
(c) a first drive means coupled to said first horizontal cutting blade for rotatably driving said first horizontal cutting blade; said first drive means including a motor and a drive shaft for being rotated by said motor; said first horizontal cutting blade being nonslidably attached to said drive shaft of said first drive means;

(d) a second drive means coupled to said second horizontal cutting blade for rotatably driving said second horizontal cutting blade; said second drive means including a motor and a drive shaft for being rotated by said motor; said second cutting blade being nonslidably attached to said drive shaft of said second drive shaft;

(e) a stationary first vertical column;
(f) a stationary second vertical column spaced from said first vertical column;

(g) slide means for attaching said first horizontal cutting blade and said first drive means to said vertical columns and for allowing said first horizontal cutting blade to move vertically along said vertical columns; said slide means including a first sleeve member slidably attached to said first vertical column, a second sleeve member slidably attached to said second vertical column, and a connector

extending between said first and second sleeve members; said first and second sleeve members limiting the movement of said slide means to vertical movement along the longitudinal axes of said first and second vertical columns; said first drive means and said first horizontal cutting blade being attached to said connector intermediate said first and second columns; and

(h) means coupled to said slide means for causing said slide means to move vertically along said vertical columns and for causing said first horizontal cutting blade to move vertically along said vertical columns.

4,870,882

RADIAL ARM SAW CONTROL MECHANISM

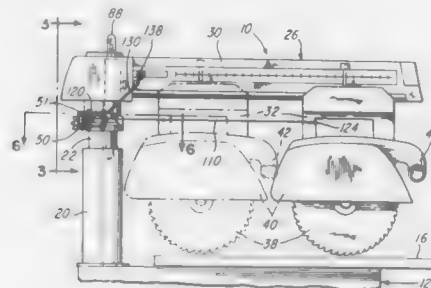
Robert L. Faxon, Sr., P.O. Box 17064, Pensacola, Fla. 32522,
assignor to Albert David Kyte and Robert L. Faxon, Sr., both of Pensacola, Fla.

Filed Aug. 18, 1988, Ser. No. 233,225

Int. Cl.⁴ B27B 5/20; B23D 45/02

U.S. Cl. 83—471.3

26 Claims



1. A saw control mechanism for a radial arm saw assembly provided with an upwardly extending support post, an elongate arm supported by the support post and pivotally movable about the central axis of the support post, a saw unit supported by the arm and movable along the arm, comprising:

a base member, connection means attaching the base member to the support post, a housing attached to the base member, the housing having a cavity therein, the cavity having a first portion and a second portion, a piston within the cavity and axially movable within the cavity between the first portion and the second portion of the cavity, a piston rod attached to the piston and axially movable with the piston, a threaded shaft operably attached to the piston rod and axially movable therewith, a wheel rotatably supported by the base member, threaded means joining the wheel to the threaded shaft for axial movement of the threaded shaft with rotative movement of the wheel,

a cable encompassing the wheel and extending therefrom, means attaching the cable to the saw unit, a by-pass conduit joining the first portion and the second portion of the cavity, the cavity and the conduit being adapted to contain fluid and to provide for flow of fluid therethrough, whereby movement of the saw unit along the arm draws successive portions of the cable from the wheel, whereby the wheel is forced to rotate as successive portions of the cable are drawn from the wheel, whereby rotation of the wheel rotates the threaded means, whereby rotation of the threaded means forces axial movement of the piston rod and axial movement of the piston, whereby axial movement of the piston forces movement of the fluid within the cavity as the fluid flows from the first portion of the cavity through the conduit and to the second portion of the cavity, whereby the rate of movement of the saw unit along the arm is controlled by the rate of flow of fluid from the cavity into the first portion of the by-pass conduit.

4,870,883

TUNING DEVICE FOR RIMLESS DRUMS

Gary L. Gauger, 15108 Highland La., Minnetonka, Minn. 55343
Filed Jan. 12, 1987, Ser. No. 947,934

Int. Cl.⁴ G10D 13/02

U.S. Cl. 84—413

35 Claims



1. A drum head tuning device actuable by a drummer and usable with a drum head having a membrane with obverse and reverse faces lying substantially within a plane, the membrane having a periphery fixed to and encompassed by a supporting frame having an inside, outside and upper and lower edges, the upper and lower edges being spaced upwardly from and downwardly, respectively, from the membrane, to permit controlled tuning of the drum head pitch, comprising:

a tuning band having a lower edge and a central axis and positionable within the frame and against the reverse face of the membrane;

a multiplicity of tuning assemblies engaging said tuning band, each said assembly including:

a frame engaging yoke member constructed and arranged to closely engage the upper edge and inside lower edge of the supporting frame;

force applying means movably connected with said yoke member and contacting said tuning band to selectively move said band relative to said assembly and toward the membrane to vary the pitch of the drum head; and

said tuning assemblies cooperating with one another to force said tuning band against the reverse face of the membrane to thereby raise the pitch of the drum head in response to actuation of said force applying means by the drummer.

4,870,884

INCENDIARY PROJECTILE, METHOD OF INTRODUCING THE INCENDIARY COMPOSITION INTO THE PROJECTILE AND ARRANGEMENT FOR IMPLEMENTING THE METHOD

Rudolf Schubert, and Wolfgang Schwarz, both of Nuremberg, Fed. Rep. of Germany, assignors to Diehl GmbH & Co., Nuremberg, Fed. Rep. of Germany

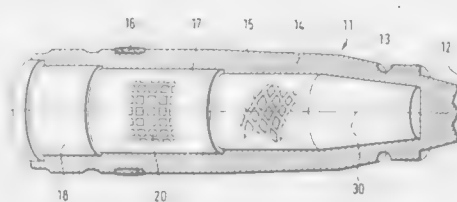
Filed Jul. 15, 1988, Ser. No. 219,664

Claims priority, application Fed. Rep. of Germany, Jul. 29, 1987, 3725091

Int. Cl.⁴ C06D 1/08; F42B 3/00; B41F 31/02

U.S. Cl. 86—20.12

10 Claims



1. A method for the production of a projectile having a structured coating of an incendiary composition, on its inner mantle surface, said projectile having an explosive material filler for defined fragmentation disintegration of its wall structure; said explosive material filler extending to said structured coating; said coating defining a grid-shaped channel structure; said method comprising the steps of:

introducing a segmented matrix into the projectile which defines recesses;
introducing a removable auxiliary material to fill said recesses of said matrix and adhere to said inner mantle surface of said projectile;
removing said matrix from said auxiliary material structure to expose said mantle not coated by said auxiliary material; coating said mantle surface exposed upon removal of said matrix with said incendiary composition by a centrifugal casting process, such that incendiary composition is divided into regions throughout the structure;
removing the auxiliary material structure; and
filling said projectile with said explosive material filler; such that said explosive material filler contacts and adheres to said inner mantle exposed upon removal of said auxiliary material.

4,870,885

DEVICE FOR CARRYING AND RELEASING A LOAD SUCH AS A MISSILE

Daniel Grosselin, Roissy, and Pierre F. Coutin, Paris, both of France, assignors to R. Alkan & Cie, France

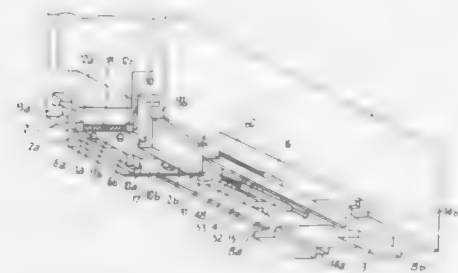
Filed Jan. 3, 1988, Ser. No. 202,068

Claims priority, application France, Jun. 5, 1987, 87 07889

Int. Cl.⁴ F41F 3/06, 7/00

U.S. Cl. 89—1,819

11 Claims



1. A device for carrying and releasing a load such as a missile under an aircraft, which comprises:

- (a) a carrier member fixed to the aircraft,
- (b) front and rear longitudinal slides on said carrier member,
- (c) front and rear rails connected together to form a mobile assembly and co-acting respectively with said front and rear longitudinal slides to move along said slides, the front and rear rails supporting coupling lugs situated at the front and at the rear of the load respectively,
- (d) means for locking the load in a suspended position to the rails preventing any translational movement thereof in a carrying position, said means for locking comprising at least one front stop engaging the front part of the load and retracting inside the carrier member under the action of a return spring and at least one fixed rear stop rigid with the carrier member and engaging the rear part of the load,
- (e) and means controlling a release movement of the mobile assembly along said longitudinal slides between the carrying position and a release position to free the lugs of the load from the rails so that the load can be released.

4,870,886

TEMPERATURE COMPENSATING VARIABLE STROKE PROJECTILE POSITIONING SYSTEM

Calvin T. Candland, Eden Prairie, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 31, 1988, Ser. No. 264,921

Int. Cl.⁴ F41F 9/06

U.S. Cl. 89—7

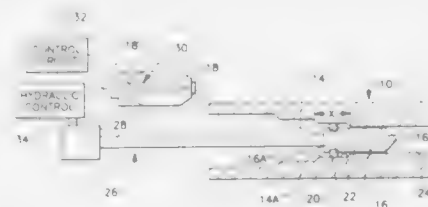
10 Claims

1. A temperature compensating variable stroke projectile positioning apparatus for adjusting the volume of a chamber, said projectile positioning apparatus comprising:

- (a) means for moving the projectile at a forward end of the

chamber where its position defines the volume of the chamber;

- (b) means for measuring the temperature of a propellant charge to be placed in the chamber for firing the projectile and having temperature dependent performance characteristics; and



- (c) means responsive to the measured temperature of the propellant charge for controlling said moving means in moving the projectile to cause said moving means to place the projectile at an exact position where it adjusts the amount of chamber volume to provide the correct degree of compensation for the measured temperature.

4,870,887

BRAIDED SLEEVE

Marie C. Tresslar, Plymouth Meeting; Joseph S. Kite, III, West Chester; Michael J. Piotrowski, Plymouth, and Thomas B. Conaghan, Exton, all of Pa., assignors to The Bentley-Harris Manufacturing Company, Lionville, Pa.

Continuation-in-part of Ser. No. 170,216, Mar. 18, 1988,

abandoned. This application Feb. 27, 1989, Ser. No. 314,391

Int. Cl.⁴ D04C 1/02, 1/06

U.S. Cl. 87—9

16 Claims



1. A braided sleeve which comprises:

- (a) first yarns each comprising a tow of relatively flexible filaments; and
- (b) second yarns comprising at least one relatively rigid filament;

the second yarns being distributed evenly around the circumference of the sleeve, and the number of second yarns being from about one third to about two thirds the number of first and second yarns, said second yarn being prestressed to a relatively tight helical form, and said sleeve being braided under tension sufficient to elongate the helices of the yarns in the braid by at least 30% during braiding.

10. A method of making a braided sleeve, which comprises braiding together:

- (a) first yarns each comprising a tow of relatively flexible filaments; and
- (b) second yarns comprising at least one relatively rigid filament, said relatively rigid filament having a Young's modulus of 10×10^6 to 40×10^6 p.s.i. and an axial stiffness of about 100 to about 7500 pounds;

the number of braider carriers bearing the second yarn being from about one third to about two thirds of the total number of carriers used to form the sleeve, and the second yarns being

prestressed to a relatively tight helical form and being distributed evenly around the circumference of the sleeve, said sleeve being braided under tension sufficient to elongate the sleeve by at least 30% during the braiding operation.

4,870,888

TRAVELING WAVE ACCELERATORS

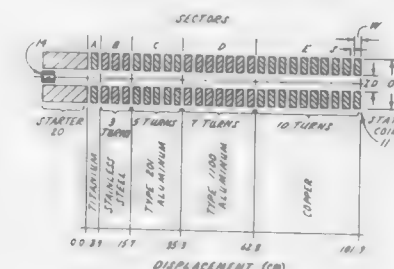
William F. Weldon, and Mircea D. Driga, both of Austin, Tex., assignors to Board of Regents, University of Texas System, Austin, Tex.

Filed Aug. 18, 1987, Ser. No. 86,706

Int. Cl.⁴ F41F 1/02

U.S. Cl. 89—8

12 Claims



1. A magnetic induction projectile accelerator of the kind having a stator coil including a number of stages, said stages being aligned in sequence along an axis from a breech to a muzzle, said accelerator further including a distribution circuit connecting said stages in parallel to a common pulsed DC electrical power supply during acceleration, said steps stages sequentially receiving current from said power supply to form a magnetic wave having a magnitude decreasing along said axis toward said muzzle and propagating along said axis toward said muzzle, wherein the improvement comprises each electrical circuit including a respective one of the stages and connecting the respective stage in parallel to the pulsed DC electrical power supply during acceleration having a respective impedance including a resistance component and an inductance component, wherein the ratio of the resistance to the inductance for the respective stages is a decreasing function of the position of the respective stage along said axis, said ratio being a maximum for the stage nearest the breech and being a minimum for the steps nearest the muzzle.

4,870,889

HYDRAULIC DEVICE FOR FUEL PUMPING APPARATUS

Robin C. Wall, Rochester, England, assignor to Lucas Industries Public Limited Company, Birmingham, England

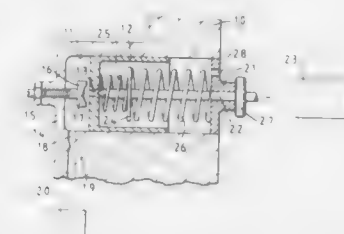
Filed Apr. 4, 1988, Ser. No. 177,109

Claims priority, application United Kingdom, Apr. 11, 1987, 8708745

Int. Cl.⁴ F15B 15/22

U.S. Cl. 91—49

7 Claims



1. A hydraulic device comprising an actuating piston slidable in a cylinder under the action of fluid under pressure supplied to one end of the cylinder, spring means for opposing

the movement of the piston by the fluid under pressure, a thrust rod for coupling the piston to a mechanism to be operated by the piston, an abutment plate mounted on the thrust rod, said spring means including a first spring acting between the abutment plate and the piston and a second spring acting between the abutment plate and an end closure at the other end of the cylinder, and means for limiting the movement of the thrust rod under the action of the second spring, characterized in that the piston defines an orifice through which fluid can flow from said one end of the cylinder, said thrust rod after a predetermined movement of the piston being engaged by said piston to close said orifice and acting to increase the pressure difference between the ends of the piston.

4,870,890

AUTOMATIC REVERSING VALVE

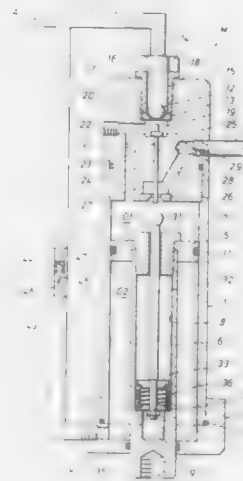
Philip L. Cowan, 901 Ashland, Houston, Tex. 77008

Continuation of Ser. No. 909,594, Sep. 17, 1986, abandoned, which is a continuation-in-part of Ser. No. 776,562, Sep. 16, 1985, abandoned. This application Aug. 22, 1988, Ser. No. 235,045

Int. Cl.⁴ F01L 15/02, 31/00; F01B 25/02

U.S. Cl. 91—50

27 Claims



1. A fluid energized double acting motor, comprising:

- (a) housing means forming an internal chamber;
- (b) piston means being disposed for reciprocation within said internal chamber and having a load operating extension movable in sealed relation through a wall of said housing for connection to a load, said piston means dividing said internal chamber into first and second chambers and presenting differing piston areas to said first and second chambers;
- (c) fluid supply means being in communication with said first and second chambers;
- (d) exhaust means in communication with said first chamber;
- (e) reversing valve means being positionable to block the flow of fluid from said fluid supply means to said first chamber, to communicate said exhaust means with said first chamber and to permit the flow of fluid from said fluid supply means to said second chamber for fluid pressure induced movement of said piston and load operating extension in one direction, said reversing valve means being oppositely positionable to block communication of said first chamber and said exhaust means and permit simultaneous communication of said fluid supply means with said first and second chambers for movement of said piston and load operating extension in the opposite direction, said reversing valve means being maintained at each

blocking position thereof by the pressure of said fluid supply means;

- (f) valve operator means being operative to shift said reversing valve means between the blocking positions thereof and including means developing a shifting force on said reversing valve means increasing with piston movement until said shifting force overcomes pressure induced force acting on said reversing valve means and suddenly shifts said reversing valve means to the opposite blocking position thereof; and
- (g) driving fluid restriction means retarding initial load induced piston movement in said opposite direction to a sufficient extent permitting positive shifting and seating of said reversing valve by said shifting force developing means, thus preventing stalling and short cycling of said motor.

4,870,891

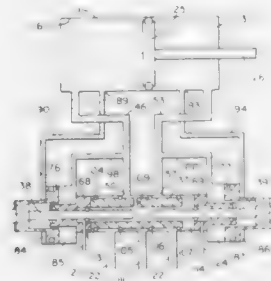
PNEUMATICALLY CONTROLLED AIR MOTOR

Jerry D. Shew, Niles, and Stuart A. Evans, Wilmette, both of Ill., assignors to Stewart Warner Corporation, Chicago, Ill. Continuation of Ser. No. 161,211, Feb. 17, 1988, abandoned, which is a continuation of Ser. No. 904,478, Sep. 8, 1986, abandoned. This application Mar. 13, 1989, Ser. No. 323,186

Int. Cl.⁴ F01L 25/04, 25/02

U.S. Cl. 91—291

11 Claims



11. A reciprocating piston and cylinder device, comprising: a cylinder slidably receiving a piston, a shiftable valve connected to selectively port fluid under pressure to the cylinder to cause reciprocation of the piston therein, and an actuator responsive to pressure in a pilot passage in the cylinder as the piston passes thereover for shifting the valve, a pilot valve member controlled by the actuator for selectively porting fluid to one side of the valve for shifting the valve, the pilot valve member being reciprocally mounted in the valve with one end projecting therefrom, said actuator being located adjacent to the projecting end of the pilot valve member.

4,870,892

CONTROL MEANS FOR A HYDRAULIC SERVOMOTOR
Flemming Thomsen, Aabenraa; Harry S. Nissen; Kjeld Ravn, both of Sonderborg, and Carl C. Dixon, Sonderborg, all of Denmark, assignors to Danfoss A/S, Nordborg, Denmark

Filed Feb. 13, 1989, Ser. No. 309,173

Claims priority, application Fed. Rep. of Germany, Feb. 16, 1988, 3804744

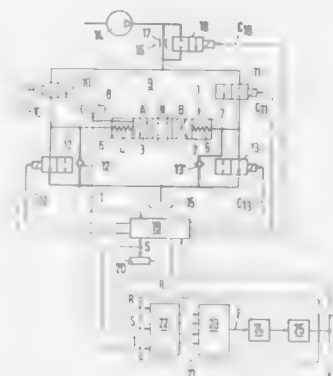
Int. Cl.⁴ F15B 13/16

U.S. Cl. 91—361

14 Claims

1. Control means for a hydraulic servomotor having a slide member and means resiliently retaining the slide member in a neutral position while permitting movement from the neutral position to a first operative position by application of fluid pressure to a first fluid chamber of the servomotor to extend into the servomotor second fluid chamber, comprising a source of pressurized fluid, a container, a first magnetic valve fluidly connected between the second chamber and container, a second magnetic valve fluidly connected between the source and the first chamber for controlling the application pressurized

fluid from the source to the first chamber, the first valve being normally open in a de-energized condition, the second valve being normal closed in a de-energized condition, and energizing means for generating a first and a second train of control pulses and applying the pulses to the valves to open the valves



4,870,893

WOBBLE PLATE TYPE COMPRESSOR WITH A DRIVE SHAFT ATTACHED TO A CAM ROTOR AT AN INCLINATION ANGLE

Hareo Takahashi, Takasaki; Hideharu Hatakeyama, and Shuzo Kumagai, both of Iseaki, all of Japan, assignors to Sanden Corporation, Gumma, Japan

Filed Jan. 11, 1988, Ser. No. 142,694

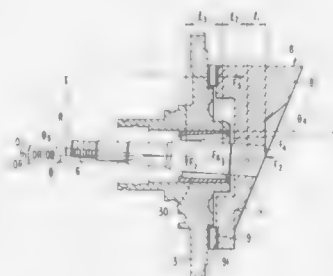
Claims priority, application Japan, Jan. 10, 1987, 62-22631; Jan. 10, 1987, 62-2635; Jan. 10, 1987, 62-2636

The portion of the term of this patent subsequent to Sep. 26, 2006, has been disclaimed.

Int. Cl.⁴ F04B 1/26

U.S. Cl. 92—71

11 Claims



1. In a wobble plate type compressor including a compressor housing having therein a plurality of cylinders and a crank chamber adjacent said cylinders, a reciprocative piston slidably fitted within each of said cylinders, a front end plate with a central opening attached to one end surface of said compressor housing, a drive mechanism coupled to said pistons to reciprocate said pistons within said cylinders, said drive mechanism including a drive shaft rotatably supported by a radial bearing within said central opening of said front end plate and a wedge-shaped cam rotor having an annular outer end surface and being connected to said drive shaft, the improvement comprising having one outer peripheral end surface of said wedge-shaped cam rotor at a predetermined angle θ_2 with said annular outer end surface of said wedge-shaped cam rotor,

wherein θ_2 is greater than 0° and less than or equal to θ_1 , wherein θ_1 is greater than or equal to $\tan^{-1}(c/l)$ and wherein c is the clearance between the interior surface of said radial bearing and the exterior surface of said drive shaft at one end of said radial bearing and l is the axial length of said radial bearing.

4,870,894

WOBBLE PLATE TYPE COMPRESSOR WITH A DRIVE SHAFT ATTACHED TO A CAM ROTOR AT AN INCLINATION ANGLE

Hiroshi Toyoda, Iseaki; Shigemi Shimizu, Sakai; Hideharu Hatakeyama; Shuzo Kumagai, both of Iseaki, and Hareo Takahashi, Takasaki, all of Japan, assignors to Sanden Corporation, Gumma, Japan

Filed Jan. 11, 1988, Ser. No. 142,184

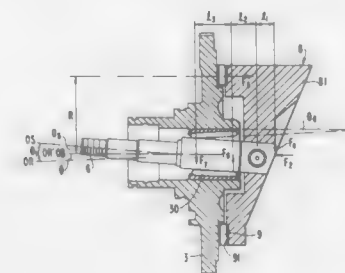
Claims priority, application Japan, Jan. 10, 1987, 62-2630; Jan. 10, 1987, 62-2634

The portion of the term of this patent subsequent to Sep. 26, 2006, has been disclaimed.

Int. Cl.⁴ F04B 1/14

U.S. Cl. 92—71

5 Claims



1. In a wobble plate type compressor including a compressor housing having therein a plurality of cylinders and a crank chamber adjacent said cylinders, a reciprocative piston slidably fitted within each of said cylinders, a front end plate with a central opening attached to one end surface of said compressor housing, a drive mechanism coupled to said pistons to reciprocate said pistons within said cylinders, said drive mechanism including a drive shaft rotatably supported by a radial bearing within said central opening of said front end plate and a wedge-shaped cam rotor attached to said drive shaft, the improvement comprising said drive shaft being connected to an end surface of said cam rotor at a predetermined angle θ_1 therewith, said angle θ_1 having a value greater than or equal to the $\tan^{-1}(c/l)$, wherein l is the length of said radial bearing in the axial direction, and c is the clearance between the interior surface of said radial bearing and the exterior surface of the drive shaft.

4,870,895

SYSTEM FOR VENTILATING THE INTERIOR OF A VEHICLE

Erhard Mayer, Holzkirchen, Fed. Rep. of Germany, assignor to Fraunhofer Gesellschaft zur Förderung, München, Fed. Rep. of Germany

PCT No. PCT/DE88/00258, § 371 Date Dec. 29, 1988, § 102(e) Date Dec. 29, 1988, PCT Pub. No. WO88/08374, PCT Pub. Date Nov. 3, 1988

PCT Filed Apr. 29, 1988, Ser. No. 300,064

Claims priority, application Fed. Rep. of Germany, Apr. 29, 1987, 3714223

Int. Cl.⁴ B60H 1/26

U.S. Cl. 98—2

20 Claims

1. A system for ventilating the interior of a vehicle by introducing processed outside air into the interior of the vehicle via a roof of the vehicle, wherein outlet opening means are located in the roof of the vehicle and are individually allocated to the seats of the vehicle and substantially congruent to their seat

surfaces; inlet air means for directing said outside air to said outlet opening means; said outlet opening means directing said



outlet air in a vertical direction toward the respective seat surface; and wherein used-air openings are provided under the vehicle seats for expelling air from the vehicle interior.

4,870,896

INSTALLATION METHOD OF A KNEADING TROUGH IN AN OVEN AND ITS APPARATUS

Takashi Asahina, Yamatokoriyama; Mitsuo Akiyoshi, Nara; Yoshio Mitsumoto, Kashihara; Satoru Kodama, Nara, and Masaharu Tsujimoto, Higashiosaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

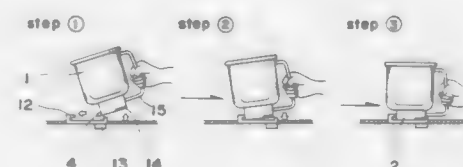
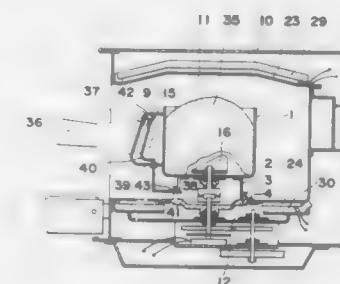
Filed Dec. 28, 1988, Ser. No. 291,296

Claims priority, application Japan, Dec. 28, 1987, 62-332023; Jan. 28, 1988, 63-18024; Jul. 18, 1988, 63-178631

Int. Cl.⁴ A47J 27/00; B23Q 7/00; B23P 11/00

U.S. Cl. 99—348

14 Claims



1. A heating and cooking apparatus which comprises: a heating chamber having a side opening for heating an object to be cooked therein; a heating means for heating said heating chamber; a kneading trough detachably installed through said side opening in said heating chamber; a kneading vane for kneading the object to be cooked in said kneading trough; a motor for rotating said kneading vane; a transmission means for transmitting the rotating force of said motor; a first engagement arrangement having strong engaging force by insertion motion substantially perpendicular to the plane of said side opening and provided at the inner side of said heating chamber; and

a second engagement arrangement which is easy to be engaged and disengaged and, provided at the opening side of said heating chamber.

14. An installation method of the kneading trough into the heating chamber of a heating and cooking apparatus, which comprises: a heating chamber having a side opening for heating an object to be cooked, therein a heating means for heating said heating chamber, a kneading trough detachably installed through said side opening in said heating chamber, a kneading vane for kneading the object to be cooked in said kneading trough, a motor for rotating said kneading vane and a transmission means for transmitting the rotating force of said motor, comprising the steps of:

- 1 inserting by insertion motion substantially perpendicular to the plane of said side opening a projected portion formed in the lower part of the kneading trough into a first to-be-engaged part in the depth at the bottom of the heating chamber so as to be coupled with each other;
- 2 coupling the kneading trough with a rotary driving unit by moving the kneading trough to the side of the bottom of the heating chamber; and
- 3 coupling an engaging portion formed in the lower part of the kneading trough correspondingly to a second to-be-engaged part with said second to-be-engaged part provided at the opening side at the bottom of the heating chamber.

4,870,897

PANCAKE FRYING APPARATUS

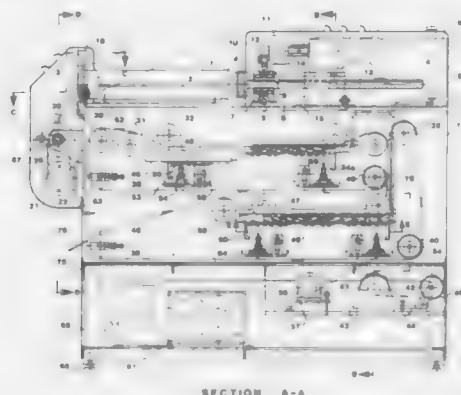
Emilia Hindrich, and Hermann Knipscheer, both of 2815 Carnation Ave., Baldwin, N.Y. 11510

Continuation-in-part of Ser. No. 928,364, Nov. 18, 1986, abandoned. This application Oct. 22, 1987, Ser. No. 112,318

Int. Cl.⁴ A47J 37/12

U.S. Cl. 99-404

9 Claims



1. An apparatus for cooking pancakes, comprising: a first movable surface for transporting pancakes, which surface forms a course having at least three portions, the third portion of which is substantially vertical; means for placing a raw pancake upon the first movable surface at a first portion of its course, with the bottom side of the pancake facing the first movable surface; means for frying the pancake, operatively disposed adjacent to a second portion of the course of the first movable surface so as to cook the bottom side of the pancake; a second movable surface for transporting a pancake which forms a course having at least three portions, the first portion of which is substantially vertical and is juxtaposed to the third portion of the course of the first movable surface; means for removing the pancake from the first movable surface at the third portion of its course and placing the removed pancake upon the second movable surface, with

the top side of the pancake facing the second movable surface;

means for frying the pancake operatively disposed adjacent to the second portion of the course of the second movable surface so as to cook the top side of the pancake; and means for removing the cooked pancake from the third portion of the course of the second movable surface.

4,870,898

TRASH COMPACTOR WITH PIVOTING PLATEN PORTION

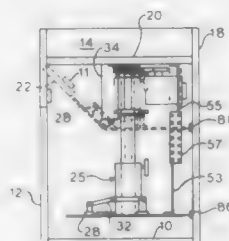
William D. Spencer, 3 Hillwinds, Brattleboro, Vt. 05301

Filed Sep. 19, 1988, Ser. No. 246,213

Int. Cl.⁴ B39B 15/06, 1/18

U.S. Cl. 100-53

4 Claims



1. Trash compactor comprising a receptacle for receiving waste material, said receptacle including an upwardly swinging door for insertion of waste therethrough, a vertically reciprocable platen having an upwardly and downwardly pivotable leaf portion disposed adjacent the swinging door to enable trash to be disposed within the receptacle below said platen, a telescopic multi-stage, drive-screw mechanism rigidly connected to said platen to reciprocally raise and lower said platen, an electric motor disposed to driveably engage the drive-screw mechanism, at least one pair of linkages independent of said drive-screw mechanism and mounted in spanning relation between the platen and the leaf portion thereof to control the upward and downward movement of the pivotable leaf, an actuator member disposed in stationary relation within the compactor and located to engage and trip the linkages to pivot said leaf portion upwardly and downwardly in response to the reciprocable raising and lowering of the platen.

4,870,899

PREWIPE DEVICE

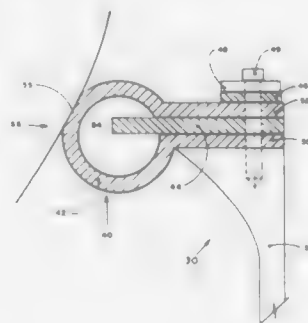
Robert T. Bowden, 3495 Capricorn Crescent, Mississauga, Ontario, Canada L4T 1S5

Filed Dec. 9, 1987, Ser. No. 130,431

Int. Cl.⁴ B41F 9/08

U.S. Cl. 101-155

15 Claims



1. A device for wiping ink from a cylindrical printing surface, said device being formed from a single piece of flexible

material and folded to form a pair of spaced apart legs joined by a deformable folded portion, and stiffening means disposed between said legs for maintaining said legs in said spaced apart relationship, said folded portion adapted to press against and conform to a segment of said cylindrical printing surface so as to wipe ink from said printing surface as said folded portion moves over said printing surface.

4,870,900

COMBINED BEARER WIPER ASSEMBLY AND FINGER GUARD FOR PRINTING APPARATUS

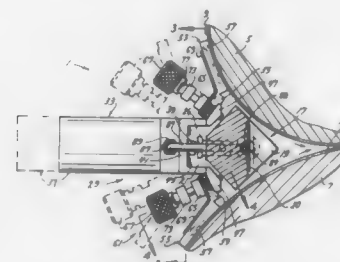
Albert W. Robertson, Christopher, Ill., assignor to Air Stamping, Inc., Christopher, Ill.

Continuation-in-part of Ser. No. 118,659, Nov. 9, 1987, which is a continuation of Ser. No. 827,755, Feb. 7, 1986, Pat. No. 4,704,964. This application Oct. 14, 1988, Ser. No. 258,014

Int. Cl.⁴ B41F 5/00, 35/02

U.S. Cl. 101-216

11 Claims



1. In a printing apparatus having upper and lower printing rolls for which rotatable bearer members are provided at the respective ends thereof, a bearer wiper assembly comprising:

- (a) guard means extending longitudinally of the rolls in a spaced relation thereto at the point of contact between the rolls to prevent an operator's fingers, and other articles from being drawn therebetween;
- (b) a first ram means attached to one end of the guard means and a second ram means attached to the opposite end thereof, each ram means being located adjacent an associated bearer member on the rolls and each ram means including a piston means and a cylinder means, one of said means being connected to the guard means and the other of said means being movable relative to said guard means;
- (c) bearer-engagable wiper means attached to said movable means; and
- (d) actuation means for the ram means to move the wiper means into and out of engagement with the bearers.

4,870,901

APPARATUS FOR ATTACHING A PRINTING BLANKET TO A PRINTING CYLINDER

Christopher P. Norkus, Arlington, Mass., assignor to W. R. Grace & Co.-Conn., Lexington, Mass.

Continuation of Ser. No. 191,839, May 6, 1988, which is a continuation of Ser. No. 51,556, May 18, 1987, abandoned, which is a continuation of Ser. No. 817,959, Jan. 13, 1986, abandoned. This application Dec. 6, 1988, Ser. No. 280,628

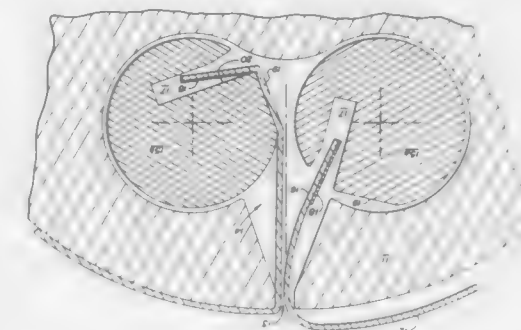
Int. Cl.⁴ B41F 1/28

U.S. Cl. 101-415.1

9 Claims

1. A reel rod comprising a rotatable spindle having an axial groove into which an end or ends of a printing blanket are inserted, and a substantially planar surface extending from an inner edge of the axial groove and crossing over the center of

said spindle to an edge of the reel rod substantially perpendicular to the inner edge so that a portion of the blanket adjacent



the blanket ends meets and conforms to the substantially planar surface.

4,870,902

INITIATING SYSTEM

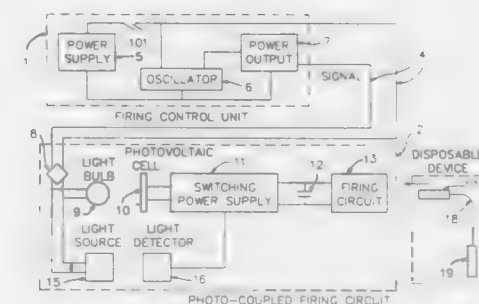
James R. Simon, Lachute; Donald C. True, Brownsburg, and Jacques Lafond, Lachute, all of Canada, assignors to CXA Ltd./CXA LTEE, Montreal, Canada

Filed Mar. 29, 1988, Ser. No. 175,035

Int. Cl.⁴ F42C 11/00

U.S. Cl. 102-201

6 Claims



1. An initiating system for providing firing energy and an activating signal to a detonator, comprising:

- (a) at least one means for generating a pulsating, coded light energy;
- (b) at least one means for receiving said pulsating, coded light energy and converting said light energy to low level electrical energy insufficient to activate a detonator;
- (c) means isolated from said light energy generating means for identifying said coded signal and converting said low level electrical energy to a high level of electrical energy sufficient to activate a detonator, comprising, in circuit arrangement, an inductor connected in series with said means for converting light energy to electrical energy;
- (d) means to store the said high level electrical energy comprising a capacitor connected in series with said inductor; and
- (e) means to transfer the said stored high level electrical energy to a resistor element of a detonator; whereby said generated, pulsating, coded light energy is converted to usable electrical energy in response to said light energy identifying means; said usable electrical energy is transferred to said detonator and said transferred electrical energy comprises said firing energy, and whereby when said light energy generating means is ON, energy is stored in said inductor, and, when said light energy generating means is OFF, said energy stored in said inductor is transferred to said capacitor.

4,870,903

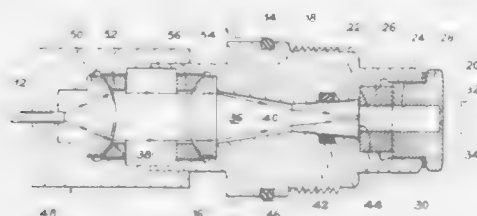
PHOTOPYROTECHNICAL DETONATION DEVICE AND PHOTOPYROTECHNICAL CHAIN USING THIS DEVICE
 Claude Carel, Saint Aubin de Medoc, and Alain Josse, Saint Medard en Jalles, both of France, assignors to Aerospatiale Societe Nationale Industrielle, Paris Cedex, France

Filed May 17, 1988, Ser. No. 194,854

Claims priority, application France, May 20, 1987, 87 07069
Int. Cl.⁴ F42C 19/00

U.S. Cl. 102—201

13 Claims



1. A photopyrotechnical detonating device comprising a body with:

- a cavity to house a pyrotechnical charge,
- an input for an energy beam of a given wavelength, used to actuate this charge, and
- a passage for the energy beam between said input and the cavity,

said photopyrotechnical device further comprising:
 a transparent barrier placed in the passage, in the path of the beam, said barrier withstanding the effects of mechanical forces generated during the operation of the charge and being made of a material which is transparent to the wavelength of this beam, and having a first surface on the input side and a second surface on the pyrotechnical charge side, its position and the shape of its two surfaces being defined so as to focus, on a given point, a parallel energy beam, having said given wavelength and penetrating this transparent barrier through its first surface, and tight-sealing means between this barrier and the body of the device,

wherein the transparent barrier has the shape of a truncated cone that widens out towards the cavity, and wherein the tight-sealing means constitute an O-ring seal.

4,870,904

RELEASABLE BODY PROVIDED WITH AERODYNAMIC BRAKING MEANS

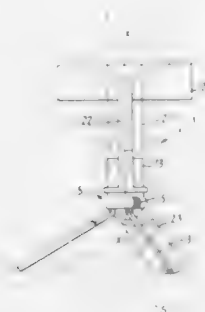
Jacques Picot, Velly-Villacoublay, France, assignor to Aerospatiale Societe Nationale Industrielle, Paris, France

Filed Nov. 18, 1988, Ser. No. 272,931

Claims priority, application France, Nov. 30, 1988, 87 16582
Int. Cl.⁴ F42B 25/24; B64D 1/04

U.S. Cl. 102—383

12 Claims



1. A releasable body, of the type comprising outspreadable arms articulated at one of the ends of said body and actuation

means adapted to pass said arms, in the course of aerial descent of said body, from a position folded along said body to a spread out position substantially perpendicular to said body in order to brake descent thereof,

wherein it comprises first means for controlling said actuation means to control retraction of said arms along said body when the latter has reached the ground after its aerial descent, said body then being in standby state, and second means for controlling said actuation means to control outspreading of said arms to pass from the standby state to an active state in which the arms support the body on the ground.

4,870,905

SPIN STABILIZED PROJECTILE

Achim Sippel, Heinz-Josef Kruse, both of Ratingen, and Klaus D. Karius, Jüchen, all of Fed. Rep. of Germany, assignors to Rheinmetall GmbH, Düsseldorf, Fed. Rep. of Germany

PCT No. PCT/EP87/00662, § 371 Date Jan. 30, 1988, § 102(e)
Date Jan. 30, 1988, PCT Pub. No. WO88/05899, PCT Pub. Date Aug. 11, 1988

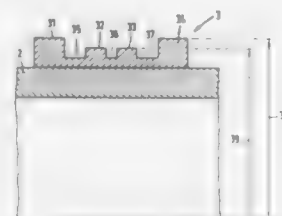
PCT Filed Nov. 3, 1987, Ser. No. 213,606

Claims priority, application Fed. Rep. of Germany, Jan. 31, 1987, 3702866

Int. Cl.⁴ F42B 31/00

U.S. Cl. 102—524

9 Claims



1. In a spin stabilized projectile having a rotating band disposed on the shell body, wherein, in order to receive the rotating band material sheared off toward the rear when the projectile passes through a gun barrel having rifling grooves, said rotating band is provided with a plurality of circumferential grooves so that the spin is transferred with the aid of annular rotating band zones which form respective spin transfer rings; the improvement wherein: the diameter of the rearmost one of said spin transfer rings is larger than the diameter of the rifling grooves of the gun barrel; and the diameter of at least one of the remaining spin transfer rings is smaller than the diameter of the rifling grooves but larger than the caliber of the gun barrel.

4,870,906

DUAL SWITCH SYSTEM FOR COMMON USE BY TRACK GUIDED RAIL VEHICLES AND MAGNETIC VEHICLES

Gottfried Schaffer, Immenstaad, and Gert Schwindt, Gröbenzell, both of Fed. Rep. of Germany, assignors to Thyssen Industrie AG, Fed. Rep. of Germany

Filed Mar. 16, 1988, Ser. No. 168,693

Claims priority, application Fed. Rep. of Germany, Mar. 24, 1987, 3709619

Int. Cl.⁴ E01B 25/12

U.S. Cl. 104—130.1

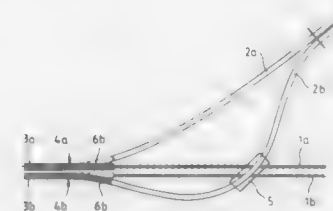
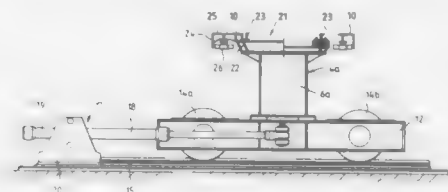
9 Claims

1. Dual switch system for common use by track-guided rail vehicles and magnetic vehicles, comprising:

- (a) a combined track (3a) on which the rail and magnetic vehicles can commonly run, and branch tracks (1a, 2a) on which both the rail vehicles and magnetic vehicles or only rail vehicles or only magnetic vehicles can run, wherein

the tracks on which the magnetic vehicles can run have first functional components, said components and the magnetic vehicles at least partially embracing each other for avoiding derailments of the latter, and wherein the tracks on which the rail vehicles can run are provided with first rails for the rail vehicles;

- (b) a flexible track section (21) on which rail vehicles and magnetic vehicles can run and which is disposed between said combined track and said branch tracks, wherein said track section has a beginning for fixed connection to the combined track and an end for selective alignment with one of said branch tracks, wherein said track section has second functional components for the magnetic vehicle, said second functional components substantially corresponding to said first functional components and said second functional components and said magnetic vehicles at least partially embracing each other for avoiding derailments of the latter, wherein said track section is further



provided with second rails for the rail vehicles, said second rails substantially corresponding to said first rails, and wherein gaps (30, 55) are provided both between said second rails and said first rails of said branch tracks and said second functional components and said first functional components of said branch tracks for permitting the flexing of said track section;

- (c) a flexible beam carrying said second functional components and said second rails of said track section;
- (d) at least one actuating means (12-20) for commonly flexing said beam (6a) and said second functional components and said second rails of said track section;
- (e) means for opening and closing said gaps (30) between said second rails and the first rails of each of said branch tracks on which said rail vehicles can run;
- (f) and means for opening and closing said gaps (55) between said second functional components and the first functional components of each of said branch tracks on which said magnetic vehicles can run.

4,870,907

TOWEL RACK CONVENIENCE SHELF

Roy L. McKee, 1610 Melrose Cir., Garland, Tex. 75042

Filed Aug. 9, 1988, Ser. No. 229,968

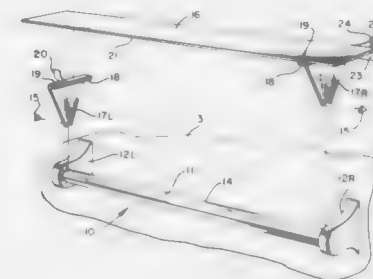
Int. Cl.⁴ A47B 23/00

U.S. Cl. 108—42

3 Claims

1. A towel rack mountable convenience shelf comprising: a transversally extended shelf element mountable above a wall mounted towel rack; vertically downward extending brackets with first fastening means on the top of each for being fastened to said shelf element and having bottoms adapted for engaging and resting on a towel bar of said towel rack inboard of opposite end towel rack mounting brackets; mounting flange means

at the wall engaging side of said transversally extended shelf element; and second fastening means for fastening of said shelf element to said wall mounting of said towel rack; wherein said first fastening means on the top of each vertically downward extending bracket is double-sided adhesive faced tape positioned on a top flange of each of said vertically downward extending brackets whereby said brackets are fastened to the bottom of the shelf with various spacings to fit within and adjacent to the inner sides of towel bar mounting brackets in being adapted to different length towel racks; said double-sided adhesive faced tape has a pull away facing strip that upon being pulled away, the vertically downward extending brackets are pressed against the bottom of said shelf element; said flange means at the rear of said transversally extended shelf



element is at right angles to an article supporting shelf of said shelf element; said second fastening means for fastening of said shelf element to the wall mounting said towel rack is double-sided adhesive faced tape positioned on said flange means; said double-sided adhesive faced tape positioned on said flange means has a pull away facing strip that upon being pulled away, said shelf element is pressed against the wall for fastening of the shelf element to the wall; wherein said shelf element mounting brackets are triangular in shape from a broad flange top narrowing down to a truncated relatively narrow bottom; said bracket truncated relatively narrow bottoms have triangular knock-outs that are removable for the bracket bottoms to receive the top upward corner of a towel bar rotated forty five degrees, from a top surface horizontal state, that the shelf brackets are mounted on.

4,870,908

OFFICE SPACE DIVIDING SYSTEM

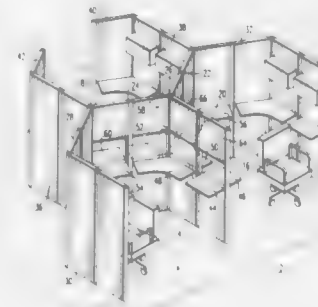
Richard H. Wolters, Grand Rapids Twp., Kent County, Mich.; Gerald A. Thoenig, Crete, Ill., and Robert E. Jeffers, Ada, Mich., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 5, 1988, Ser. No. 215,115

Int. Cl.⁴ A47B 57/00

U.S. Cl. 108—60

26 Claims



1. An office space dividing system comprising:

first and second work areas, a barrier panel separating said first and second work areas, said barrier panel having first and second sides adjacent to the first and second work areas, respectively, an opening in the barrier panel which communicates with the first and second work areas, convertible panel means, means mounting said convertible panel means for slidable engagement with the barrier panel, means accessible from either side of the barrier panel for operating said convertible panel means between first and second positions which open and close, respectively, the opening in the barrier panel, and a substantially horizontally oriented work surface adjacent to at least one of the first and second sides of the barrier panel, and wherein the opening in the barrier panel is above the work surface.

4,870,909

SEALING DEVICE FOR SEALING OPENINGS IN SHELTERS

Klaus Richter, Berlin, Fed. Rep. of Germany, assignor to ABS Allgemeiner Brandschutz, G.m.b.H., Fed. Rep. of Germany
Filed Nov. 25, 1987, Ser. No. 125,219

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1986, 3640466; Nov. 27, 1986, 3640467

Int. Cl.⁴ E06B 3/34; E05G 1/04

U.S. Cl. 109—59 T

19 Claims



1. A sealing device for sealing an opening in a walled shelter against heat action, comprising:

- at least one sealing element for normally closing the opening in the shelter, the sealing element being complementarily configured to that of the opening and constructed similarly to that of the shelter;
- a support structure for supporting the sealing element;
- a locking system disposed within the sealing element, the support structure including a pair of support arms for supporting the sealing element independent of the walls of the shelter, the support structure being positioned within the interior of the shelter;
- an operating device for operating the locking system, the operating device being accessible from within the shelter and exteriorly thereof;
- means for outwardly pivoting the sealing element;
- an understructure mounted within the bottom of the shelter;
- an outer floor on which the shelter is disposed; and wherein the support structure transfers the load of the sealing element to the understructure.

4,870,910

WASTE INCINERATION METHOD AND APPARATUS

Kenneth C. Wright, Sapulpa, and Jerry L. Stuck, Tulsa, both of Okla., assignors to John Zink Company, Tulsa, Okla.

Filed Jan. 25, 1989, Ser. No. 301,452

Int. Cl.⁴ F23N 5/02

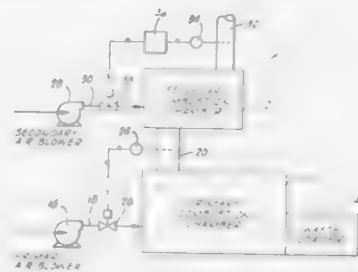
U.S. Cl. 110—190

15 Claims

1. In a method of incinerating successive batches of waste material wherein each batch is introduced into a primary combustion zone and substoichiometrically combusted with pri-

mary air introduced therein, the combustion gases produced in the primary combustion zone are conducted to a secondary combustion zone wherein they are combined with secondary air and further combusted and the resulting combustion gases are withdrawn from said secondary combustion zone, the improvement comprising: during the peak incineration stage of each batch,

controlling the rate of secondary air combined with said combustion gases conducted to said secondary combustion zone in accordance with changes in the temperature of the combustion gases withdrawn therefrom whereby said temperature is maintained at a substantially constant selected temperature level; and



during the loading, initial and final incineration stages of each batch when said selected temperature level cannot be maintained as a result of the rate and combustibility of said combustion gases conducted to said secondary combustion zone being too low, controlling the rate of secondary air combined with said combustion gases in accordance with a predetermined timed sequence which simulates the increase and decline in the rate and combustibility of the combustion gases conducted to said secondary combustion zone during the loading, initial and final incineration stages whereby the average temperature of the combustion gases withdrawn from said secondary combustion zone is maintained at a relatively high level, but the formation of smoke is prevented.

4,870,911

APPARATUS FOR WASTE DISPOSAL AND METHOD

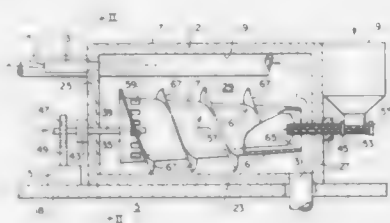
Robert C. W. Chang, Wilkins; Steven C. Vorndran, Hempfield Township, Westmoreland County, and Michael F. Joseph, Monroeville, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 5, 1988, Ser. No. 228,410

Int. Cl.⁴ A47J 36/00; F23B 1/32

U.S. Cl. 110—246

9 Claims



1. An incinerator or pyrolyzer for continuously processing waste materials, comprising: an insulating furnace enclosing an afterburner chamber having a gas inlet within the furnace and a gas outlet to the exterior of the furnace; means for heating the chamber to a temperature in excess of 1800° F.; a tubular kiln rotatably mounted within the furnace;

the furnace having a bottom wall under the kiln and the bottom wall having a waste material outlet; inlet means for delivering waste materials into one end of the kiln; outlet means for dumping solid waste materials at the other end of the kiln and onto the bottom wall; means for moving the solid waste materials across the bottom wall to the waste material outlet; and means for allowing gaseous reaction products to escape from the kiln and to enter the gas inlet to the afterburner chamber.

4,870,912

AUTOMATIC COMBUSTION CONTROL METHOD FOR A ROTARY COMBUSTOR

Suh Y. Lee, Monroeville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

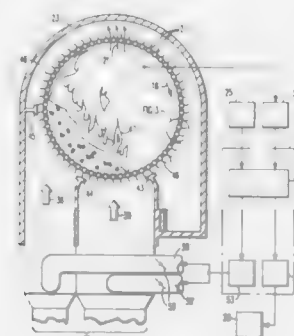
Continuation of Ser. No. 160,451, Feb. 25, 1988, abandoned.

This application Feb. 15, 1989, Ser. No. 311,383

Int. Cl.⁴ F23N 5/02; F27B 7/38

U.S. Cl. 110—246

13 Claims



1. A method of automatically controlling combustion in a rotary combustor having a rotating combustion barrel in which solid waste material is burned by air supplied to the barrel through holes disposed throughout its length and periphery, the air being supplied through a plurality of ducts into three portions of the barrel, an inlet portion adjacent the end into which solid waste is introduced into the barrel, an outlet portion disposed adjacent the end from which exhaust gases exit the barrel and an intermediate portion disposed between the inlet and outlet portions, the ducts being further divided to supply both underfired air and overfired air to each portion of the barrel, said method comprising the steps of:

- individually varying the overfired and underfired air to each portion of the barrel in response to changes in the temperature in the barrel and changes in the percent of oxygen in exhaust gases; and
- varying the speed at which the barrel rotates in response to changes in the temperature in the barrel to provide generally complete combustion of the solid waste at a temperature which prevents clinker formation within the barrel.

4,870,913

GRATE COOLER FOR COOLING HOT BULK MATERIAL

Richard Schneider, Wermelskirchen, Fed. Rep. of Germany, assignor to Klöckner-Humboldt Deutz Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 7, 1988, Ser. No. 258,184

Claims priority, application Fed. Rep. of Germany, Oct. 8, 1987, 3734043

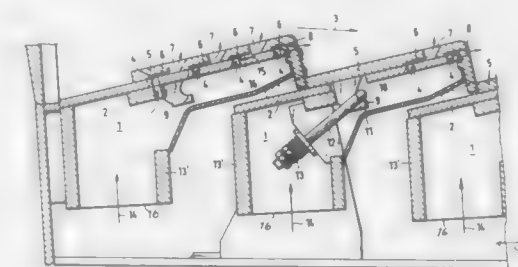
Int. Cl.⁴ F23H 3/00

U.S. Cl. 110—299

10 Claims

1. An improved cooling grate plate construction for cooling hot bulk material with cooling air comprising in combination: a plurality of successive grate plates each arranged to deliver

to a successive plate at a downstream delivery end and arranged for cooling conveyed hot bulk material; a grate plate carrier having planar cover plates extending in a product conveying direction positioned in sequence and arranged each for supporting a grate plate; means defining air passage openings through said cover plates; means securing each grate plate to a cover plate;



recess passages in the lower surface of said grate plates in alignment with said cover plate openings with the upper surface of the cover plate forming a wall for a portion of the extent of the recess passage and for conducting air between the grate plates and the upper surfaces of the cover plates, said passages leading to upwardly facing slots in the upper surfaces of the grate plates; and individual air delivery conduits in the carrier leading to said cover plate openings of each cover plate.

4,870,914

DIAGONALLY BRACED RAILWAY TRUCK

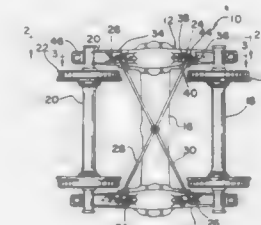
Robert P. Radwill, Burr Ridge, Ill., assignor to AMSTED Industries Incorporated, Chicago, Ill.

Filed Jan. 22, 1988, Ser. No. 146,379

Int. Cl.⁴ B61F 5/50

U.S. Cl. 105—206.2

6 Claims



1. A sideframe for use in a railway truck, said sideframe comprising a top compression member and a bottom tension member, said bottom tension member having one or more angled sections that extend to and connect to said top compression member and a pedestal jaw, each of said angled sections having a receiving bracket on a lower surface thereof, each receiving bracket comprising an upper edge with two side edges, one side edge depending from said angled section and the other side edge de-

pending from said pedestal jaw, to form a generally rectangular, three sided receiving bracket, and each receiving bracket has a flange extending inwardly of each of the two side edges.

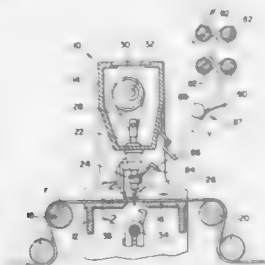
4,870,915

YARN FEED SYSTEM FOR TUFTING MACHINES
Arthur F. Bagnall, Manchester, England, assignor to Spencer Wright Industries, Inc., Dalton, Ga.
Filed Feb. 24, 1989, Ser. No. 315,322
Claims priority, application United Kingdom, Mar. 2, 1988, 8804927

Int. Cl. D05C 15/30

U.S. Cl. 112—80.41

14 Claims



1. In a tufting machine having a multiplicity of needles, means for reciprocally driving said needles in a first path, means for laterally shifting said needles in a path transverse to said first path, a multiplicity of loop seizing members cooperating with said needles for forming loops, and control means adapted to effect said lateral shifting in accordance with a predetermined sequence, yarn feed apparatus operable in synchronism with said needles and said control means for feeding yarn to a respective needle, said yarn feed apparatus intermediate said needle and a yarn supply, said feed roller having a surface about which yarn is wrapped, said surface being relatively smooth such that slippage occurs between said yarn and said roller until the tension on the yarn intermediate the needle and the roller overcomes said slippage and the yarn is drivingly engaged by the roller and fed to said needle, said tension being induced by the reciprocation of said needle to provide a first tension and by the shifting of said needle laterally to provide an additional tension, whereby a variable rate of yarn is fed to said needle to accommodate changes in yarn requirements arising from lateral needle shift.

4,870,916

SEWING MACHINE CAPABLE OF BEING EQUIPPED WITH ONE OF A PLURALITY OF OPERATING PANELS
Tetsuo Kozawa, Toyosake, and Satoru Asano, Inazawa, both of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed May 4, 1988, Ser. No. 190,145

Claims priority, application Japan, May 11, 1987, 62-69762

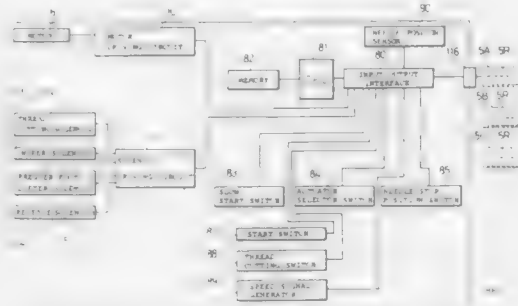
Int. Cl. D05B 19/00

U.S. Cl. 112—121.11

6 Claims

1. A sewing machine comprising a control device and a plurality of driving devices adapted to be controlled by said control device, said control device having a central processing unit, a memory connected to said central processing unit and an input/output interface connected to said central processing unit, wherein said memory preliminarily stores a basic control program for normal operation of said sewing machine and a plurality of additional control programs to be executed in addition to said basic control program, and is adapted to store parameters to be used with said additional control programs, the sewing machine further comprising a plurality of operating panels for selecting one of said additional control programs and inputting said parameters, wherein said operating panels are selectively connectable to said control device, and when

one of said operating panels is connected to said control device, said control device controls said driving devices according to said basic control program, one of said additional control programs selected and said parameters input through said



4,870,917

WORK HOLDER FOR SEWING MACHINES

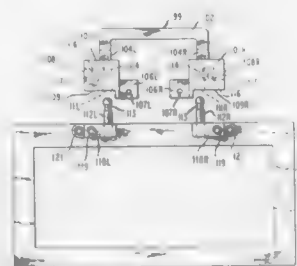
Ricky J. Frye, Miamisburg, Ohio, assignor to MIM Industries, Inc., Miamisburg, Ohio

Continuation-in-part of Ser. No. 232,810, Aug. 16, 1988, which is a continuation of Ser. No. 68,256, Jun. 30, 1987, Pat. No. 4,763,587. This application Sep. 28, 1988, Ser. No. 250,379

Int. Cl. D05B 3/00, 21/00

U.S. Cl. 112—121.12

13 Claims



1. In a sewing machine comprising a sewing surface, work holder means comprising means comprising a cloth plate and clamping means movably mounted in juxtaposition to the cloth plate to grasp a workpiece, a needle reciprocally movable to form stitches in the workpiece, a work holder connected to the cloth plate and clamping means to control the operation thereof to grasp and release each workpiece, and means connected to the work holder to move it and the workpiece about on the sewing surface according to a stitching program to form a predetermined pattern of the stitches in the workpiece, the invention comprising:

(a) first quick-release means to connect the clamping means firmly but releasably to the work holder, the first quick-release means comprising:

- (i) first guiding means attached to the work holder and precisely positioned with respect to it, and
- (ii) second guiding means attached to the clamping means and precisely positioned with respect to it, the second guiding means interfittng precisely with the first guiding means, whereby the clamping means will be in a precise position relative to the work holder; and
- (b) second quick-release means to connect the cloth plate firmly but releasably to the work holder.

10. In a sewing machine comprising a sewing surface on which one workpiece after another is to be placed to have a pattern of stitches formed in it, a needle reciprocally movable to form the stitches, a work holder comprising multi-part clamp support means and first and second clamp means supported by separately movable parts of the support means to be moved by the latter toward and away from the sewing surface to hold and release each workpiece, and positioning means connected to the work holder to move it about on the sewing surface relative to the path of the needle according to the pattern of stitches, the invention comprising:

- (a) first and second interconnectable attachment means attached separately to spaced-apart regions of the support means;
- (b) at least a third interconnectable attachment means on the first clamp means to interconnect firmly but releasably with the first interconnectable attachment means to attach the first clamp means firmly but releasably to a first part of the support means; and
- (c) at least fourth interconnectable attachment means on the second clamp means to interconnect firmly but releasably with the second interconnectable attachment means to attach the second clamp means firmly but releasably to a second part of the support means separately movable from the first part toward and away from the sewing surface, both the first and second parts of the support means being connected to the work holder, whereby the first and second clamp means and the support means move parallel to the sewing surface as a rigidly joined unit while the first and second clamp means are so attached to the support means.

4,870,918

METHOD FOR SETTING A WORKPIECE CORRECTLY ON A SKIRT-ZIPPER SEWING MACHINE

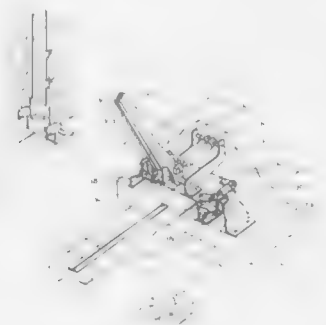
Tooru Hiramatsu, and Shigeru Tobita, both of Chofu, Japan, assignors to Tokyo Juki Industrial Co., Ltd., Tokyo, Japan
Division of Ser. No. 117,236, Nov. 5, 1987, Pat. No. 4,821,658.
This application Dec. 22, 1988, Ser. No. 289,972

Claims priority, application Japan, Aug. 11, 1986, 61-266259

Int. Cl. D05B 97/00

U.S. Cl. 112—265.2

2 Claims



1. A method for setting a workpiece correctly on a skirt-zipper sewing machine to prevent the formation of shrink marks on the workpiece before it is sewn to a zipper, said method including the following steps:

centering the zipper upon a lower frame of a cassette having an upper and lower frame;
aligning a first side of the workpiece to be sewn with a first side of the zipper;
pressing the first side of the workpiece against the first side of the zipper so as to stretch said first side of said workpiece;
aligning a second side of the workpiece to be sewn with a second side of the zipper; and
pressing the second side of the workpiece against the second side of the zipper so as to stretch said second side of said workpiece.

4,870,919

CATAMARAN TYPE BOAT

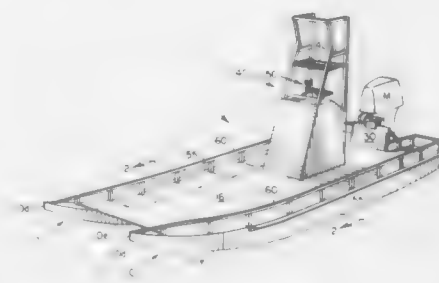
Bill W. Allison, 3603 Rychlik, Rosenberg, Tex. 77471

Filed May 23, 1988, Ser. No. 197,215

Int. Cl. B63B 1/20

U.S. Cl. 114—61

11 Claims



1. A catamaran type boat comprising:
a pair of elongated hollow floats;
a plurality of transversely disposed truss means rigidly connecting said floats in spaced parallel relationship;
the rearmost truss means being located forward of the rear ends of said hollow floats;
a first wall secured to the bottom surfaces of said truss means and positioned above the water level when said floats are engaged therewith, thereby defining a longitudinally extending air tunnel extending to the rearmost truss means;
each said float having a quadrilateral cross-section throughout its length including:
(1) a second wall defining a smooth planing surface curved upwardly and laterally tapered at its forward end;
(2) a generally vertical outer wall, and
(3) an upstanding inner wall inclined upwardly and outwardly toward said generally vertical outer wall, thereby retaining water in said tunnel when said floats traverse shallow water.

4,870,920

PROCESS OF SMOOTHING A COATED-LAYER AND THE APPARATUS FOR USE IN SUCH METHOD

Takashi Kageyama, Hino, and Makoto Yoshida, Nagashiyama, both of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Division of Ser. No. 910,851, Sep. 24, 1986, abandoned, which is a continuation of Ser. No. 815,290, Dec. 30, 1985, abandoned, which is a continuation of Ser. No. 662,893, Oct. 19, 1984, abandoned. This application Sep. 11, 1987, Ser. No. 97,326
Claims priority, application Japan, Oct. 22, 1983, 58-197914

Int. Cl. B05C 11/02

U.S. Cl. 118—103

12 Claims

1. An apparatus for smoothing a layer of liquid coated on a support, the layer of liquid including areas of irregular thickness, the apparatus comprising:
unifying means;

smoothing means, said unifying means and said smoothing means being surfaces on a single bar; transport means for transporting the support in a first direction past said unifying means and said smoothing means; said unifying means for unifying the areas of irregular thickness by moving the areas of irregular thickness of the layer



of liquid in a direction transverse to the first direction when the transport means transport the support past the unifying means; and said smoothing means for smoothing the unified coated layer when the transport means transports the support past the smoothing means.

4,870,921

DEVICE FOR POSITIONING A NUMBER OF WORKING IMPLEMENTS RELATIVE TO A CAR BODY

Dick L. Svensson, Nacka, and Claes-Erik Söderman, Saltsjöbaden, both of Sweden, assignors to Atlas Copco Aktiebolag, Nacka, Sweden

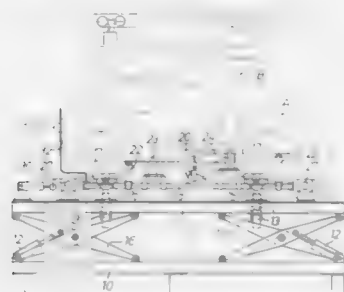
Filed Oct. 6, 1988, Ser. No. 254,493

Claims priority, application Sweden, Oct. 7, 1987, 8703858

Int. Cl.⁴ B05C 1/02; B62D 65/00

U.S. Cl. 118—676

8 Claims



1. Device for positioning a number of working implements relative to certain working or treatment points on a conveyor supported car body, comprising:

- a vertically movable base structure,
- a working implement carrying frame movably supported on said base structure,
- activating means (12) on said base structure for displacing said frame in a substantially parallel movement up toward the underside of the car body,
- means (30) for moving said frame substantially in a horizontal plane to place said frame in a preliminary horizontal position relative to the car body;
- position sensing means (22) for engagement with the car body and producing signals in response to the attainment of a preliminary vertical position of said frame (18) in relation to the car body,
- position adjusting means (13) for accomplishing displacement of said frame (18) in relation to said base structure (10, 11) from said preliminary position to an intended final vertical position determined by the actual position of the car body,

arresting means (23, 24) for locking said frame (18) relative to the car body as said final position is attained, and control means (56, 58) for activating said activating means (12) for attaining said preliminary position and for activating said position adjusting means (13) for attaining said final position of said frame (18) in response to the signals produced by said sensing means (22), and for activating said arresting means (23, 24), thereby docking said frame (18) to the car body.

4,870,922

APPARATUS FOR MARKING FRAGILE SURFACES

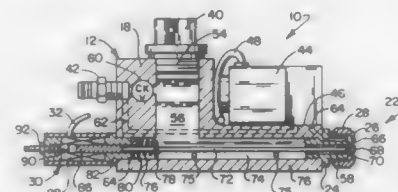
John A. Robertson, Chillicothe, Ohio, assignor to Telesis Controls Corporation, Chillicothe, Ohio

Filed May 11, 1988, Ser. No. 192,860

Int. Cl.⁴ B05C 11/10; B05B 7/06, 12/02

U.S. Cl. 118—702

12 Claims



1. Apparatus for marking fragile surfaces at elevated temperatures with an identification mark employing marking fluid nebulized from a source of air under pressure comprising:

- a housing mountable in the vicinity of said surface;
- supply means for supplying said marking fluid;
- nozzle means mounted on said housing, having a fluid outlet communicating with said supply means and actuatable for releasing a quantity of said fluid sufficient only to form said identification mark while avoiding damage to said surface induced by localized cooling effects, having an air inlet and an air outlet which is adjacent and in substantially surrounding relationship with said fluid outlet for receiving air under pressure at said inlet and effecting a nebulization of said released fluid;
- air valve means connectable with said source of air under pressure and with said nozzle means air inlet and actuatable to supply air under pressure to said nozzle means air inlet;
- control means for selectively actuating said nozzle means and said air valve means in pulsed fashion wherein said air valve means effects commencement of entraining air flow from said nozzle means air outlet to said surface subsequent to which said nozzle means expresses a said quantity of marking fluid within a first predetermined interval sufficient only to effect creation of a said identification mark, and said air valve means effecting termination of said air flow subsequent to said first predetermined interval to define a second predetermined interval of said air flow having a minimal duration selected to effect nebulization of said expressed quantity of marking fluid and avoid damage to said fragile surface due to thermal effects.

4,870,923

APPARATUS FOR TREATING THE SURFACES OF WAFERS

Kenji Sugimoto, Kyoto, Japan, assignor to Dainippon Screen Mfg. Co., Ltd., Japan

Filed Jun. 27, 1988, Ser. No. 211,773

Claims priority, application Japan, Jun. 26, 1987, 62-98829[U]

Int. Cl.⁴ C23C 16/00

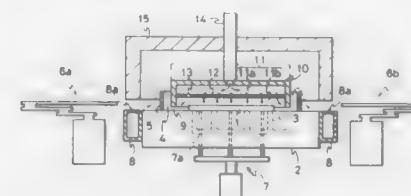
U.S. Cl. 118—715

6 Claims

1. An apparatus for treating a wafer with treating vapor, said apparatus comprising:

- a plate member adapted to receive a wafer;

a cover member for covering the wafer and for forming a treating chamber between said cover member and said plate member; means for placing said cover member over said plate member with a gap interposed therebetween so as to allow excess vapor to escape from said treating chamber; means for introducing treating vapor into said treating chamber;



a discharge chamber comprising slits and means for introducing said excess vapor into said discharge chamber through said slits; and

an outer wall provided about said cover member, said outer wall and said cover member defining a space therebetween, said outer wall having a lower rim and an upper rim, said lower rim contacting said plate member and said upper rim being higher than said gap such that the flow of vapor from said treating chamber to said discharge chamber follows a tortuous path.

4,870,924

DISPOSABLE LITTER BOX SYSTEM

Steven M. Wolfe, 2024 N. Argyle, Apt. #E, Los Angeles, Calif. 90068

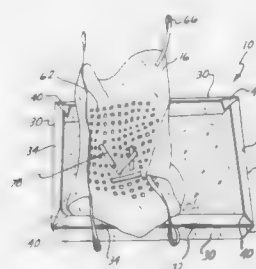
Division of Ser. No. 933,232, Nov. 20, 1986, Pat. No. 4,784,082.

This application Sep. 14, 1988, Ser. No. 244,001

Int. Cl.⁴ A01K 29/00

U.S. Cl. 119—1

2 Claims



1. For use in a rectangular litter box having a bottom wall and side walls extending upwardly from the bottom wall, the said box having litter material deposited therein, a filter for extracting feces of an animal deposited in such litter material, said filter comprising a sheet disposed below the litter material on the bottom wall of the box and extending at least partly up the side walls of the box, said sheet material presenting a grid of orifices substantially covering said bottom wall of the box and said sheet having means extendable at least partly toward the top of the side walls of the box to enable said sheet to be gripped, each of said orifices being approximately $\frac{1}{4}$ " square and separated from adjacent orifices by a distance of approximately $\frac{1}{2}$ " of an inch.

4,870,925

APPARATUS FOR CONTAINING A PET IN A VEHICLE TRUNK

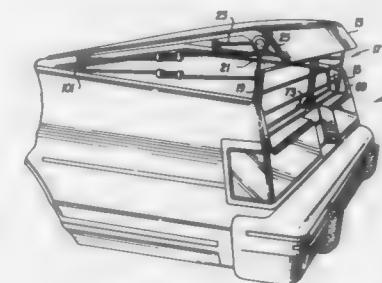
Charles E. Troutman, Old Canyon Rd., Rt. No. 1, Murtaugh, Id. 83404

Filed Mar. 28, 1988, Ser. No. 174,308

Int. Cl.⁴ A01K 1/035

U.S. Cl. 119—15

9 Claims



1. Grillwork for containing a pet within a partially open trunk lid of a vehicle comprising

- a rear grill panel adjustable in length and adapted to rest on the inner rear of the trunk of a vehicle so that said rear grill extends upwardly from said trunk;
- first and second side grill panels rotatably mounted to opposite ends of said rear grill panel, said side grill panels being adjustable in length;
- means on the distal ends of said side grill panels adapted to rest in and slide along the rain troughs in the trunk of a vehicle;
- first means adapted to removably secure said grill panels to the underside of the lid of a trunk of a vehicle; whereby said rear grill panel raises and lowers with said trunk lid and the distal ends of said side grill panels slide along the rain troughs in said trunk; and
- second means adapted to secure said grillwork in place when said trunk is partially closed.

4,870,926

INSECTICIDE APPLICATOR FOR ANIMALS

A. E. Smith, R.R. 3, Smith Center, Kans. 66967

Filed Mar. 3, 1988, Ser. No. 163,866

Int. Cl.⁴ A01K 29/00

U.S. Cl. 119—157

6 Claims



1. A groomer tube, comprising, an elongated hollow tubular member having first and second ends, a top and a bottom, first means closing said first end, second means closing said second end, a pesticide dust material in said tubular member, means at one of said first and second ends for mounting said tubular member in an operative position above the ground to permit animals to rub there against,

said tubular member having a plurality of longitudinally spaced-apart transverse annular troughs formed on the interior thereof, to direct the flow of dust material downwardly to a lowermost point in said annular troughs, said tubular member having a plurality of longitudinally spaced opening formed therein along the bottom thereof, and a normally closed valve means mounted in each of said openings whereby animal contact therewith will release the pesticide dust material within said tubular member.

4,870,927

DEVICE FOR PREVENTING THERMAL STRATIFICATION IN A STEAM GENERATOR FEED PIPE

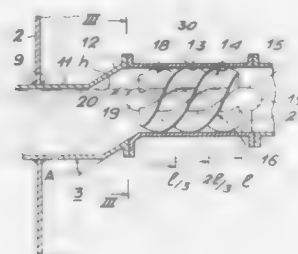
Patrick Sundheimer, Saint Maur des Fosses, France, assignor to Framatome, Courbevoie, France

Filed Jun. 30, 1988, Ser. No. 213,564

Claims priority, application France, Jun. 30, 1987, 87 09219 Int. Cl.⁴ F22B 37/22

U.S. Cl. 122-412

6 Claims



1. Device for preventing thermal stratification for a steam generator feed pipe (11, 12, 13), said device comprising a fixed helix (14), located downstream of an upward break of said feed pipe, which is itself downstream of an area of said feed pipe (11) where thermal stratification is to be prevented, said fixed helix 14 being constituted by a central hub (15) and blades (16) joining said hub (15) to said feed pipe (13), said blades (16) forming at least one half-turn around said hub (15) and defining twisted channels (17) so arranged that feed water, flowing by gravity in said channels, flows downstream of said helix (14) only after having entirely filled said feed pipe (11) upstream of said break.

4,870,928

TWO-CYLINDER ENGINE

Hitomi Miyake, Miki, and Shigeru Nishimura, Kobe, both of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Japan

Filed Dec. 14, 1988, Ser. No. 284,717

Claims priority, application Japan, Dec. 17, 1987, 62-192191[U]

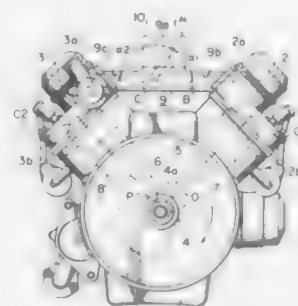
Int. Cl.⁴ F02M 27/00

U.S. Cl. 123-52 MV

2 Claims

1. A two-cylinder engine comprising:
a first cylinder and a second cylinder adapted to perform explosions at such timing that an interval from explosion in said first cylinder to explosion in said second cylinder is shorter than an interval from the explosion in said second cylinder to the explosion in said first cylinder,
a single carburetor, and
an intake manifold communicating between said carburetor and said cylinders for supplying an air-fuel mixture into the latter,
said intake manifold having an intake passage communicated with said carburetor, a first branch passage branched from said intake passage and communicating with said first cylinder and a second branch passage branched from said

intake passage and communicating with said second cylinder, said intake passage, said first branch passage and said second branch passage being arranged such that an angle formed



4,870,929

MULTI-CYLINDER ENGINE WITH UNIFORM CYLINDER SENSITIVITY TO KNOCKING

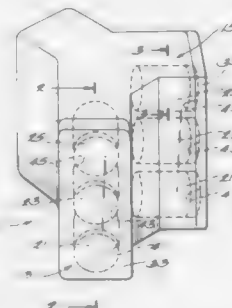
James E. Macier, Beach Park; Gregory J. Binversie; David C. Calamia, both of Grayslake, and John M. Daniels, Round Lake Park, all of Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Jul. 6, 1988, Ser. No. 215,575

Int. Cl.⁴ F02B 75/04

U.S. Cl. 123-78 R

3 Claims



1. An internal combustion engine comprising first and second cylinders and first and second cylinder head cavities respectively aligned and communicating with said first and second cylinders to define respective compression ratios associated with said first and second cylinders, and means for providing said first and second cylinders with respectively different non-variable compression ratios selected to maximize the power produced in each cylinder without knocking.

4,870,930

ENGINE VALVE CONTROL APPARATUS

Toru Yagi, Musashino, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 20, 1988, Ser. No. 196,713

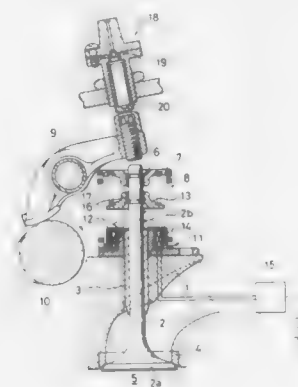
Claims priority, application Japan, May 22, 1987, 62-123647 Int. Cl.⁴ F01L 1/04, 9/04

U.S. Cl. 123-90.11

5 Claims

1. A valve control apparatus for an internal combustion engine wherein an intake valve and an exhaust valve are opened by valve-opening operation of a cam and closed by valve-closing operation of a return spring, at least one of said

intake valve and exhaust valve being provided with a valve-holding means which is controlled according to operating conditions of the engine so that said at least one valve opened by said cam is held in its open position by said valve-holding means and closed by said return spring when said valve-holding means is released, said valve holding means comprising: an electromagnetic actuator including an electromagnetic sole-



noid fixed to a cylinder head of said engine adjacent said at least one valve; and a magnetic pole member fixed to said at least one valve and positioned to provide a small gap with said solenoid when said valve is in said open position, said magnetic pole member being held by said solenoid when said at least one valve is in said open position upon activation of said solenoid by control means.

4,870,931

ROCKER ARM HAVING WEAR RESISTANT SCUFFING RESISTANT PORTION

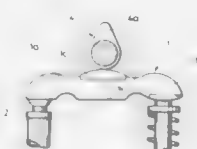
Yoshikatsu Nakamura, Omiya; Osamu Kawamura, Urawa, and Souichi Shimomura, Yono, all of Japan, assignors to Nippon Piston Ring Co., Ltd., Tokyo, Japan

Filed May 25, 1988, Ser. No. 198,250

Claims priority, application Japan, May 30, 1987, 62-133489 Int. Cl.⁴ F01L 1/18, 1/16

U.S. Cl. 123-90.39

2 Claims



1. A rocker arm for use in an internal combustion engine, said rocker arm having a portion abutting an opponent mechanical component, at least said portion being formed of a cast iron consisting of from 2.5 to 3.7 wt % of carbon; from 1.0 to 2.0 wt % of silicon; from 0.5 to 1.0 wt % of manganese; from 10 to 20 wt % of chromium; from 0.3 to 0.7 wt % of nickel; not more than 0.3 wt % of phosphorus; not more than 0.1 wt % of sulfur; and balance iron and impurities; carbide mainly containing chromium being uniformly precipitated from at least one of pearlitic and martensitic matrix in said cast iron.

4,870,932

FUEL INJECTION HEATING SYSTEM

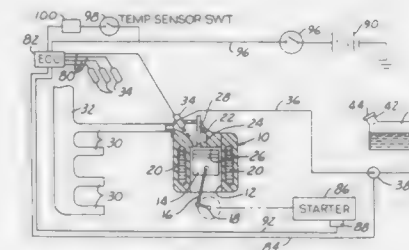
Thomas W. Asmus, Oak Park, Mich., assignor to Chrysler Motors Corporation, Highland Park, Mich.

Filed Nov. 21, 1988, Ser. No. 274,079

Int. Cl.⁴ F02M 31/12

U.S. Cl. 123-179 H

5 Claims



1. A heating system and apparatus for a fuel injector of an internal combustion engine of a vehicle, comprising: a fuel injector including a hollow housing with a fuel inlet and a fuel outlet; an electric fuel pump for delivering fuel to the inlet of the injector; the fuel injector having a valve member therein cooperative with the outlet and movable from a closed position to an opened position for regulating fuel flow from the fuel pump, through the housing and from the injector; electric coils in the injector housing for moving the valve member to the opened position when energized; an electric control unit to energize the injector coil in accordance with fuel requirements of a running engine during a starting and running mode; a temperature sensing device which signals the electric control unit to initiate a timed injector heating mode when the engine temperature is below a predetermined low temperature characterized by an insufficient vapor pressure of the fuel, wherein the fuel pump is deactivated and the injector coils are continuously energized in the injector heating mode so that sufficient heat is stored in the injector for heating fuel in a subsequent engine starting and running operation.

4,870,933

FUEL CONTROL SYSTEM FOR AN AUTOMOTIVE ENGINE

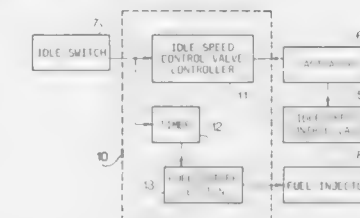
Shigeo Mizuno, Mitaka, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 16, 1988, Ser. No. 156,383

Claims priority, application Japan, Feb. 27, 1987, 62-046598 Int. Cl.⁴ F02D 41/12

U.S. Cl. 123-325

6 Claims



1. A fuel control system for a motor vehicle driven by an automotive engine which has a throttle valve and at least one fuel injector for injecting fuel into the engine, the system comprising:
an air bypass around the throttle valve;
an idle speed control valve provided in the bypass, for controlling air passing in the bypass;
an electrically operated actuator for operating the idle speed control valve;
an idle switch for generating an idle signal whenever an

accelerator pedal of the motor vehicle is released; the accelerator pedal being operatively connected to the throttle valve;

control means responsive to the idle signal for operating the actuator so as to gradually close the idle speed control valve to a closed position in accordance with a predetermined dashpot characteristic so as to prevent engine speed from suddenly reducing;

timer means responsive to the idle signal for producing a timer signal whenever the idle signal is generated after a set time has elapsed; and

fuel cutoff means responsive to the timer signal for cutting off fuel supply by the fuel injector so as to reduce deceleration shock upon release of the accelerator pedal.

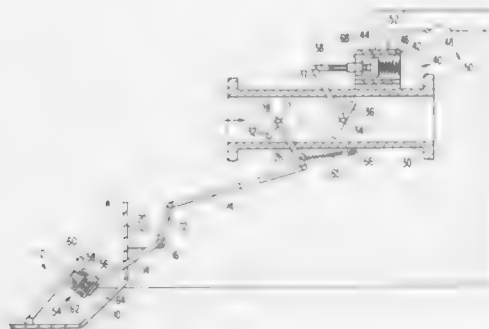
4,870,934

APPARATUS FOR CONTROLLING ENGINE SPEED
Aldo Vanetta, Ingolstadt; Helmut Burkhart, Gaimersheim, and Herbert Weinert, Ingolstadt, all of Fed. Rep. of Germany, assignors to Audi AG, Ingolstadt, Fed. Rep. of Germany
Filed Oct. 20, 1987, Ser. No. 110,394
Claims priority, application Fed. Rep. of Germany, Nov. 7, 1986, 3637958

Int. Cl.⁴ F01D 11/02

U.S. Cl. 123—336

17 Claims



1. An apparatus for a motor vehicle with an internal combustion engine as a drive source, an accelerator pedal and transmission means for controlling the power of the internal combustion engine, comprising:

- a switch movable between an activated and a non-activated state by the accelerator pedal;
- said switch in the non-activated state, cooperating with said drive source to prevent the internal combustion engine from delivering power exceeding its idling power;
- said switch being arranged directly on the accelerator pedal to which pressure is applied by the operator; and
- the force required to activate said switch being less than the force required to actuate the accelerator.

4,870,935

SPARK IGNITION TIMING CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE WITH ACCELERATION RESPONSIVE SPARK ADVANCE RETARDING CONTROL

Akihiko Araki, Gunma, Japan, assignor to Japan Electronic Control Systems Company, Limited, Isezaki, Japan
Filed Jul. 13, 1988, Ser. No. 218,266

Int. Cl.⁴ F02P 5/15

U.S. Cl. 123—422

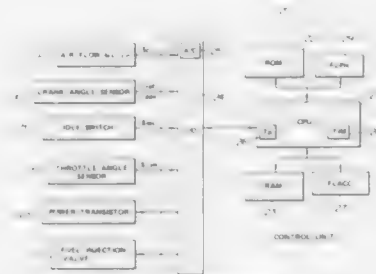
15 Claims

1. A spark ignition control system for an internal combustion engine, comprising:

- an ignition system for performing spark ignition;
- a first sensor for monitoring preselected engine operation parameters including an engine load to produce a first sensor signal indicative thereof;
- a second sensor for monitoring magnitude of acceleration

demand for producing a second sensor signal indicative thereof; and

a controller deriving a basic spark advance on the basis of said first sensor signal, said controller being responsive to said second sensor signal for performing acceleration responsive advance correction in a first mode while said



4,870,936

FUEL INJECTION PUMP FOR INTERNAL COMBUSTION ENGINES

Franz Eheim, deceased, late of Stuttgart (by Helga Eheim, heir-ess), and Max Straubel, Stuttgart, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

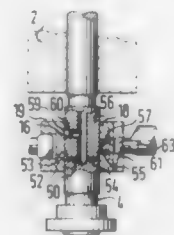
Filed Dec. 22, 1987, Ser. No. 136,806

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1986, 3644148

Int. Cl.⁴ F02M 39/00

U.S. Cl. 123—449

23 Claims



1. A fuel injection pump for internal combustion engines comprising a housing (1), a pump cylinder (3) in said housing, a pump piston (4) simultaneously reciprocating and rotating in said pump cylinder (3) and thus serving as a distributor for the pump fuel injection quantity to a plurality of injection locations, said pump piston defining a pump work chamber (6) in said pump cylinder (3), a relief conduit (14) in said piston extending from said pump work chamber axially to a radial bore (15) which includes a first outlet opening (16) on the pump piston circumference leading to a relief chamber (7), an annular slide (18) that is axially displaceable on the pump piston (4), said annular slide including a jacket face (56) and being rotatable, a fuel injection quantity regulator (25) which actuates said annular slide inside the relief chamber, said fuel injection quantity regulator being acted upon by an adjusting lever (35) for indicating a torque demand, said annular slide having a first control edge (19) which is oriented normal to the direction of the pump piston axis and a control opening (57)

disposed on the jacket face (56) of the inner ring of said annular slide communicating with the relief chamber via a conduit (55) extending in the annular slide (18), in which said control opening is disposed below said first control edge (19) and spaced apart from the first control edge (19), and said control opening (57) cooperates with a second outlet opening (52) of the relief conduit (14) which is axially spaced relative to said first outlet opening (16), a throttle (54) provided between that portion of said relief conduit situated downstream of a connection point of said radial bore (15) to said relief conduit and said second outlet opening (52), and an actuating device (64, 97) for interrupting a possibility of communication between the second outlet opening (52) and the relief chamber (7), said interruption being effected as a function of load.

4,870,937

AIR FUEL MIXTURE A/F CONTROL SYSTEM

Hiroshi Sanbuchi, Yokohama; Katsunori Terasaka, Yokosuka, and Toyooki Nakagawa, Yokohama, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan
Filed Dec. 31, 1986, Ser. No. 948,073

Claims priority, application Japan, Jan. 13, 1986, 61-5839

Int. Cl.⁴ F02D 41/18

U.S. Cl. 123—488

18 Claims



1. A method of operating an internal combustion engine comprising the steps of:

- measuring a signal which varies with the amount of air inducted into said engine;
- recording first and second values of said signal at a predetermined time interval;
- calculating a time period which begins at the time of one of said first and second samplings and which includes a factor which is approximately one half the time required for one induction cycle of said engine;
- approximating, based on the difference between said first and second values and said time period, the amount of air which will be inducted during an instant induction phase of the engine; and
- determining the amount of fuel to be supplied to the engine during the instant induction phase based on the approximated induction air amount.

4,870,938

ELECTRONIC AIR-FUEL RATIO CONTROL APPARATUS IN INTERNAL COMBUSTION ENGINE

Shinpei Nakaniwa, Isezaki, Japan, assignor to Japan Electronic Control Systems Co., Ltd., Gunma, Japan

Filed Sep. 7, 1988, Ser. No. 241,195

Claims priority, application Japan, Sep. 11, 1987, 62-226606

Int. Cl.⁴ F02M 51/00

U.S. Cl. 123—489

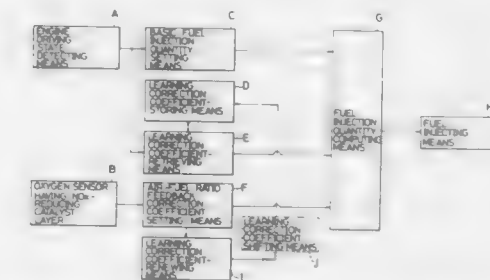
9 Claims

1. An electronic air-fuel control apparatus in an internal combustion engine, which comprises:

- an engine driving state-detecting means for detecting the driving state of the engine, including at least a parameter participating in the quantity of air sucked in the engine;
- an oxygen sensor disposed in the exhaust system of the engine to detect the air-fuel ratio of an air-fuel mixture sucked in the engine through the oxygen concentration in

the exhaust gas, said oxygen sensor comprising a nitrogen oxide-reducing catalyst layer for promoting the reaction of reducing nitrogen oxides and emitting a lean or rich signal with the point of the theoretical air-fuel ratio corresponding to the oxygen concentration including the oxygen in the nitrogen oxide concentration in the exhaust gas being as the boundary;

- a basic fuel injection quantity-setting means for setting a basic fuel injection quantity based on said parameter detected by the engine driving state-detecting means;
- a rewritable learning correction coefficient-storing means for storing a learning correction coefficient for correcting the basic fuel injection quantity according to the engine driving state;
- a learning correction coefficient-retrieving means for retrieving a corresponding learning correction coefficient of the engine driving state according to the actual driving state of the engine from the learning correction coefficient-storing means;
- an air-fuel ratio feedback correction coefficient-setting means for increasing or decreasing by a predetermined



quantity the air-fuel ratio feedback correction coefficient for correcting the basic fuel injection quantity according to the rich or lean signal from the oxygen sensor;

- a fuel injection quantity-computing means for computing a fuel injection quantity based on the basic fuel injection quantity set by the basic fuel injection quantity-setting means, the learning correction coefficient retrieved by the learning correction coefficient-retrieving means and the air-fuel ratio feedback correction coefficient set by the air-fuel ratio feedback correction coefficient-setting means;
- a fuel-injecting means for injecting and supplying a fuel to the engine in an on-off manner according to a driving pulse signal corresponding to the fuel injection quantity computed by the fuel injection quantity-computing means; and
- a learning correction coefficient-renewing means for learning the deviation of the air-fuel ratio feedback correction coefficient from the reference value according to the engine driving state and rewriting the learning correction coefficient of the learning correction coefficient-storing means so as to reduce said deviation.

4,870,939

DISTRIBUTION-TYPE FUEL INJECTION SYSTEM CONTROLLED BY ELECTROMAGNETIC VALVE

Masataka Ishikawa, and Nobukazu Takagi, both of Higashimatsuyama, Japan, assignors to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Sep. 22, 1988, Ser. No. 247,603

Claims priority, application Japan, Sep. 28, 1987, 62-240992

Int. Cl.⁴ F02M 39/00

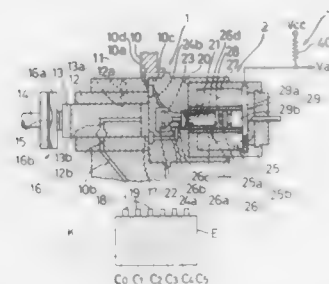
U.S. Cl. 123—506

3 Claims

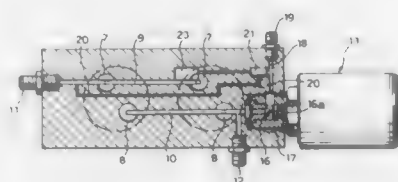
1. A distribution-type fuel injection system controlled by an electromagnetic valve, comprising:

- (a) a distribution-type fuel injection pump including;
- (i) pump housing means having a low-pressure chamber,

- (ii) plunger barrel means mounted to said pump housing
- (iii) a plunger fitted in said plunger barrel means for rotation and for reciprocative movement,
- (iv) a fuel pressurizing chamber defined by an inner peripheral surface of said plunger barrel means and one end face of said plunger, said fuel pressurizing chamber being variable in volume by the reciprocative movement of said plunger,
- (v) supply passage means through which fuel within said low-pressure chamber is supplied to said fuel pressurizing chamber,
- (vi) forcible-delivery passage means through which the fuel within said fuel pressurizing chamber is supplied successively to a plurality of injection valves mounted respectively to plurality of cylinders of an engine, and
- (vii) relief passage means through which the fuel is permitted to escape from said fuel pressurizing chamber to said low-pressure chamber,
- (b) an electromagnetic valve mounted to said pump housing means of said fuel injection pump, for controlling opening and closing of said relief passage means, wherein for a period of time within which said electromagnetic valve is opened during each forward stroke of said plunger decreasing the volume of said fuel pressurizing chamber, the fuel is permitted to escape from said fuel pressurizing chamber to said low-pressure chamber through said relief passage means, while for a period of time within which said electromagnetic valve is closed during the forward



4,870,940
INJECTION PUMP FOR FUEL INJECTION SYSTEMS WITH CONTROL LED INJECTORS FOR I.C. ENGINES
 Renato Filippi, Vinovo, and Mario Ricco, Bari, both of Italy, assignors to Weber S.r.l., Turin, Italy
 Filed Aug. 25, 1988, Ser. No. 236,619
 Claims priority, application Italy, Aug. 25, 1987, 67734 A/87
 Int. Cl.⁴ F02M 39/00
 U.S. Cl. 123—506 1 Claim

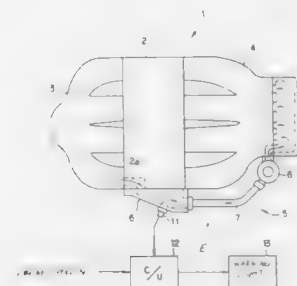


- stroke of said plunger, the fuel is permitted to be supplied to said fuel injection valves from said fuel pressurizing chamber through said forcible-delivery passage means;
- (c) running-condition detecting means for detecting running conditions of the engine;
- (d) target timing arithmetic means for calculating a target fuel injection starting timing and/or a target fuel injection termination timing, on the basis of a detecting signal from said running-condition detecting means;
- (e) rotation detecting means for detecting substantially a rotational position of the engine;
- (f) cylinder detecting means for detecting which one of said cylinders is a subject of fuel injection operation of said fuel injection pump, on the basis of a detecting signal from said rotation detecting means;
- (g) timing detecting means for detecting substantially actual fuel injection starting timings and/or actual fuel injection termination timings for the respective cylinders;
- (h) delay time detecting means for detecting, in the fuel injection operations of said fuel injection pump for the respective cylinders, injection starting delay times and/or injection termination delay times for the respective cylinders, on the basis of respective differences between said actual fuel injection starting timings detected by said timing detecting means and starting points of below-mentioned drive pulses for the respective cylinders and/or on the basis of respective differences between said actual injection termination timings detected by said timing

1. An injection pump for fuel injection systems with controlled injectors for diesel engines, comprising: a body carrying at least one cylinder-and-piston pumping unit driven by a shaft with eccentrics and connected through an intake valve and a delivery valve to inlet and outlet means for fuel, and a solenoid pressure-regulating valve interposed between the outlet means and the injectors and including a body having an inlet and a discharge outlet the communication of which is controlled by a valve obturator whose closure can be varied by means of an electromagnetic actuator, the solenoid pressure-regulating valve being fitted directly to the body of the pump, the discharge outlet of the solenoid pressure-regulating valve being connected to the fuel inlet means through a branch passage formed in the body of the pump and with which a diverter valve with a thermostatic control sensitive to the temperature of the fuel in the inlet means is operatively associated to interrupt the communication between the solenoid regulating valve and the discharge outlet and to open the communication between the solenoid regulating valve and the injectors.

branch passage when the temperature of the fuel in the inlet means is below a predetermined threshold value.

4,870,941
EXHAUST GAS RECIRCULATION SYSTEM FOR INTERNAL COMBUSTION ENGINE
 Masahiro Hisatomi, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan
 Filed May 24, 1988, Ser. No. 197,885
 Claims priority, application Japan, May 27, 1987, 62-80372
 Int. Cl.⁴ F02M 25/06
 U.S. Cl. 123—571 8 Claims

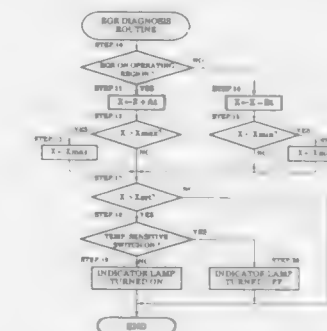


1. An exhaust gas recirculation system for an internal combustion engine, comprising:
 means defining an EGR passage for fluidly connecting an exhaust system and an intake system of the internal combustion engine, a part of exhaust gas from the exhaust system being capable of flowing through said EGR passage;
 an EGR valve disposed in said EGR passage to control amount of exhaust gas flowing through said EGR passage; and
 means for detecting abnormality in said exhaust gas recirculation system in accordance with temperature of exhaust gas flowing through said EGR passage, said abnormality detecting means including a temperature sensor for detecting said temperature and outputting a signal representing said temperature, said temperature sensor being disposed in said EGR passage upstream of said EGR valve.

4,870,942
DIAGNOSIS DEVICE FOR EXHAUST GAS RECYCLING DEVICE OF INTERNAL COMBUSTION ENGINE
 Norio Shibata; Hideaki Mizuno, both of Toyota; Kouichi Satoya, Susono; Nobuki Uchitani, Tokushima; Tatsuyoshi Kamohara, Toyota; Kenichi Harada; Mamoru Yoshioka, both of Susono; Takashi Kato, Mishima, and Hidemi Ohnaka, Susono, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan
 Filed Jul. 25, 1988, Ser. No. 223,890
 Claims priority, application Japan, Oct. 2, 1986, 61-235263; Feb. 3, 1987, 62-024179; Jul. 29, 1987, 62-189884; Jul. 29, 1987, 62-189883; Jul. 29, 1987, 62-116433
 Int. Cl.⁴ F02M 25/06
 U.S. Cl. 123—571 6 Claims

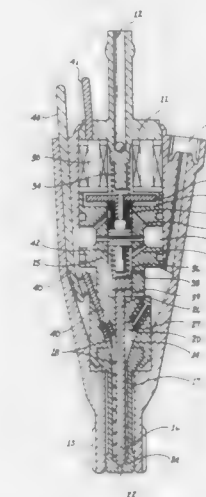
1. A diagnosis device for an exhaust gas recycling device having: a temperature detecting means which detects the temperature of an exhaust gas recycling passage; an exhaust gas recycling operating region detection means which detects whether or not the operating region is such as to carry out exhaust gas recycling; a counter which is incremented when said exhaust gas recycling operating region detection means detects that the operating region is such as to carry out exhaust gas recycling, and is decremented when the operation region is determined not to be such as to carry out exhaust gas recycling; and a decision means which determines that the exhaust

gas recycling has failed when the count value of said counter is at least a certain amount and the temperature detected by



said temperature detection means is determined not to be more than a certain value.

4,870,943
THERMAL LIQUID PUMP
 Curtis E. Bradley, 4517 Calle Ventura, Phoenix, Ariz. 85018
 Continuation of Ser. No. 881,004, Jul. 1, 1986, abandoned. This application Oct. 14, 1988, Ser. No. 258,047
 Int. Cl.⁴ F02M 31/12
 U.S. Cl. 123—558 6 Claims



1. A method for injecting liquid fuel into a combustion space comprising the steps of:
 (a) passing said fuel through a first into a pressurizing chamber;
 (b) closing said first passageway to confine said fuel in said chamber;
 (c) heating said fuel in said chamber to a temperature higher than the fuel's auto ignition temperature to thereby thermally expand said liquid and increase its pressure without vaporization to permit hypergolic ignition of said fuel when injected into said combustion space;
 (d) discharging the pressurized fuel from said chamber through a second passageway into said combustion space to create hypergolic combustion;
 (e) closing said second passageway after the required amount of fuel has been discharged; and
 (f) repeating steps through.

4,870,944

AUXILIARY AIR CONTROL VALVE FOR ENGINE
Osamu Matsumoto, and Hirokazu Machara, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

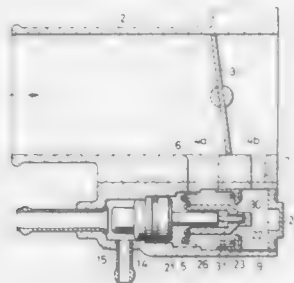
Filed Dec. 28, 1987, Ser. No. 137,895

Claims priority, application Japan, Dec. 26, 1986, 61-203256[U]

Int. Cl.⁴ F02D 9/00, 41/08

U.S. Cl. 123—585

2 Claims



1. An auxiliary air control valve for an engine, comprising: an actuator;
 - a valve casing having an air inlet port and an air outlet port connected to bypass for bypassing the throttle valve of said engine;
 - a valve seat having a valve port of prescribed diameter and provided on an internal air passage extending to connect said air inlet port and said air outlet port to each other;
 - a valve element disposed in the face of said valve seat to control the cross-sectional area of said internal air passage in response to movement of said actuator, said valve element having a tapered portion movably fitted in said valve port to control the cross-sectional area of said internal air passage depending on the positional relation between said valve element and said valve seat, and a cylindrical portion extending from the maximum-diameter part of said tapered portion such that said cylindrical portion has the same diameter as said maximum diameter part, said cylindrical portion being dimensioned so as to be slidably movable in said valve port to make the cross-sectional area of said internal air passage minimum and allow said actuator to be moved to an extreme position while said cross-sectional area is kept to a minimum in order to avoid over-stressing the valve seat;
 - a spring which urges said valve element in such a direction as to open said valve;
- wherein movement of said actuator depends on at least one operational parameter of said engine.

4,870,945

SPRING PISTON AIR WEAPON

Roy Hutchison, 55 Dale View Ave., Chingford, England E4
Filed Apr. 22, 1988, Ser. No. 184,935

Claims priority, application United Kingdom, Apr. 10, 1985, 8520117

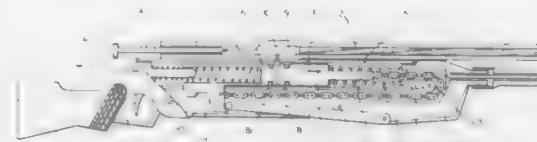
Int. Cl.⁴ F41B 11/00

U.S. Cl. 124—68

5 Claims

1. A spring piston air weapon, comprising: a first piston running in a cylinder, said cylinder having a slot in a wall thereof;
- a connecting block secured to the first piston, said connecting block extending radially outwardly through the slot in the cylinder wall;
- a pulley;
- a second piston running in a cylinder;
- spring means for urging the second piston towards the first piston;
- a trigger mechanism having a trigger and a latch operated by said trigger for engaging a surface associated with one of

the first and second pistons for latching said one piston in a cocked position; and
a flexible connecting means connected at one end thereof to the connecting block and extending therefrom around the pulley to an axially outer end of the second piston, the flexible connecting means being connected at another end thereof to said axially outer end of said second piston;



whereby, when the trigger is operated to release the latch, the second piston will be urged by the spring means toward the first piston and the first piston will be constrained by the flexible connecting means to move in an opposite direction to the second piston at substantially equal and opposite velocity, at least one of the first and second pistons being operative during such movement to compress propellant gas in the cylinder.

4,870,946

FLUID-COOLED APPARATUS FOR CUTTING CONCRETE MATERIAL AND THE LIKE

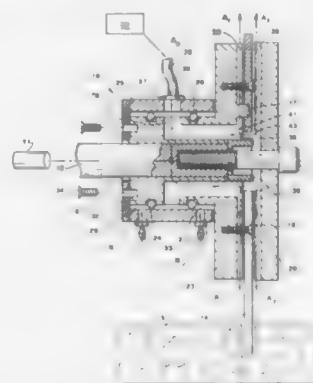
Richard D. Long, Santa Clara; David L. Long, San Jose; Clifford D. Long, San Jose, and Kenneth E. Clark, San Jose, all of Calif., assignors to Longco, Inc., Santa Clara, Calif.

Filed May 7, 1987, Ser. No. 46,730

Int. Cl.⁴ B28D 1/04

U.S. Cl. 125—13 R

5 Claims



1. An improve hub assembly for coupling a saw blade having a predetermined array of openings formed therein to a motor driven shaft and applying coolant to both sides of the blade, said array of openings including a central opening, a drive pin opening, and a plurality of screw openings, comprising: a cylindrical, rotatable hub having a central bore extending into one end thereof for receiving an end of the drive shaft, said hub further having coolant inlet openings, an arbor at the opposite end of said hub for mating with the central opening in the blade and having coolant discharge openings for discharging coolant to both sides of the blade, means forming at least one passageway in said hub for connecting said inlet openings and said discharge openings, and a blade engaging flange disposed at said opposite end of said hub and including a plurality of threaded bores formed therein, said flange further including a drive pin extending from said flange for mating with

said drive pin opening to driveably engage said blade, said drive pin having a predetermined relationship to said threaded bores such that when said drive pin is in engagement with said drive pin opening, a screw opening is in alignment with each of said threaded bores;

a fixed outer sleeve surrounding a portion of said hub and having an inlet port disposed in communicating relationship with said inlet openings of said hub;

sealing means disposed on opposite sides of said inlet openings and said inlet port for providing seals between said fixed sleeve and said hub and restricting the flow of coolant from said inlet port to said inlet openings; and

fastening means including a plurality of screws for passage through said screw openings in said blade and for engaging said threaded bores to secure said blade and hub to said shaft, whereby coolant entering said inlet port under pressure flows into said inlet openings, along said passageway and out said discharge openings to cool both sides of the blade.

4,870,947

RADIANT TUBE BURNER

Masao Kawamoto, Yokohama, Japan, assignor to Nippon Furnace Kogyo Kaisha, Ltd., Yokohama, Japan
Division of Ser. No. 195,107, May 16, 1988. This application

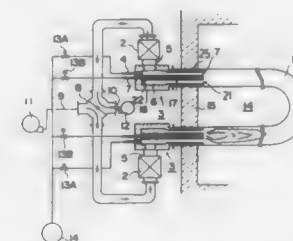
Dec. 15, 1988, Ser. No. 284,596

Claims priority, application Japan, May 26, 1987, 62-126989; Sep. 29, 1987, 62-242715; Apr. 14, 1988, 63-90365

Int. Cl.⁴ F24C 3/00

U.S. Cl. 126—91 A

10 Claims



1. A radiant tube burner comprised of: a primary combustion chamber which is placed outside of a furnace and of which a combustion gas injection outlet is located approximately more inside of the furnace than the bung of a radiant tube;
- a primary fuel nozzle which injects a primary fuel into said primary combustion chamber to create a primary combustion; and
- a secondary fuel nozzle surrounded with refractory materials which injects secondary fuel into said radiant tube from the area adjacent to said combustion gas injection outlet, wherein the primary combustion is created by supplying said primary fuel and about a total amount of combustion air for the burner into said primary combustion chamber to generate primary combustion gas, and the secondary combustion is created in said radiant tube by supplying said secondary fuel to the generated primary combustion gas having a low concentration of oxygen.

4,870,948

PARTIALLY COLLAPSIBLE ENCLOSURE FOR TRASH BURNING RECEPTACLE

Donna L. Wallace, 710 W. Fifth St., West Frankfort, Ill. 62896
Filed Mar. 2, 1989, Ser. No. 317,960

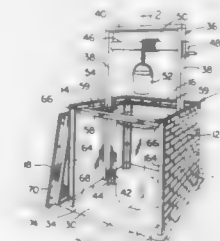
Int. Cl.⁴ F23G 5/00

U.S. Cl. 126—224

10 Claims

1. A partially collapsible enclosure for a trash burning receptacle, said enclosure including an open top enclosure structure incorporating upstanding fire resistant peripheral wall means extending about and projecting upwardly above a central horizontal support means area upon which an upwardly open-

ing trash burning receptacle may be placed for burning trash therein, said wall means including a first pair of opposite side wall portions defining horizontally spaced apart corresponding upstanding margins establishing a passageway therebetween for horizontal entrance into and exit from said enclosure, a third wall portion removably positionable in position extending between said margins to close said passageway, a pair of uprights having first upper ends and second lower ends and disposed inward of and adjacent said opposite side wall por-



tions on opposite sides of said area and pivotally mounted at their second lower ends for angular displacement about horizontal axes extending between said second lower ends and swinging between generally vertical upright positions and generally horizontal positions extending through said passageway with said first upper ends disposed outward of said upstanding margins, horizontal support means extending and secured between said first upper ends, and latch means releasably latching said uprights, relative to said wall means, in said upright positions thereof.

4,870,949

WIND RESISTANT TWO AXIS TRACKER FOR ENERGY OR RADIATION CONCENTRATORS

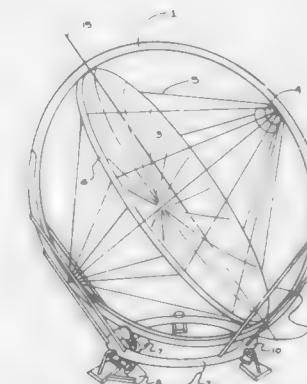
Barry L. Butler, 980 Santa Estrella, Solana Beach, Calif. 92075

Filed Jul. 27, 1987, Ser. No. 77,758

Int. Cl.⁴ F24J 3/02

U.S. Cl. 126—424

15 Claims



1. A wind resistant two axis tracker for reflectors, comprising: (a) A base;
- (b) An elevation drive ring, supported in a vertical position by dolly wheels rotatably attached to said base, adapted for centerless rotation on said dolly wheels about a horizontal axis;
- (c) A reflector attached at two points along the circumference of the elevation drive ring, without direct attachment to said base; and
- (d) A plurality of support members extending from the elevation drive ring to the periphery of the reflector.

4,870,950 ENDOSCOPE SYSTEM

Kouji Kanbara, 1-12-6-205, Minamiohsawa; Kenichi Kikuchi, Olympus Daini Ishikawaryo, 2974-24 Ishikawa-cho, both of Hachioji-shi, Tokyo; Yoshihito Shimizu, 3528-1-102, Kamitsuruma, Sagami-ken; Shinichiro Hattori, 5-9-32, Tamagawa-cho, Akishima-shi, Tokyo; Yoshikazu Tojo, Olympus Kyodojutsu 145, 7-14-11, Ohwada-cho; Akira Hasegawa, Hachioji, 560-11, Kitano-cho, both of Hachioji-shi, Tokyo; Tatsuya Yamaguchi, Hinoshirayamadajutsu 106, 6-7-8, Asahigaoka, Hino-shi, Tokyo; Takashi Tsukaya, 888-11, Katakura-cho, Hachioji-shi, Tokyo; Kazunari Kobayashi, 1405-19, Katakura-cho, Hachioji-shi, Tokyo; Masanao Murata, Mezondonobamu Hachioji 107, 560-11, Kitano-cho, Hachioji-shi, Tokyo; Tsutomu Yamamoto, Takao Pakuhatsu B-705, 1231-19, Hatsusawa-cho, Hachioji-shi, Tokyo, and Takeaki Nakamura, 6-9-8, Asahigaoka, Hino-shi, Tokyo, all of Japan

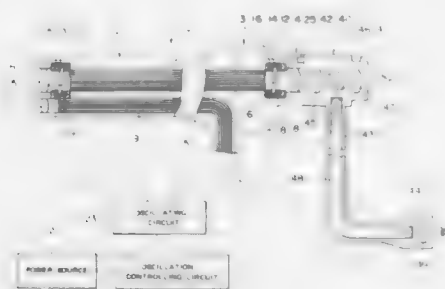
Filed Jul. 8, 1988, Ser. No. 216,600

Claims priority, application Japan, Jul. 8, 1987, 62-105669; Jul. 9, 1987, 62-169780; Jul. 17, 1987, 62-177305; Jul. 29, 1987, 62-115936; Apr. 1, 1988, 63-081801

Int. Cl.⁴ A61B 1/06

U.S. Cl. 128—6

26 Claims



1. An endoscope system, comprising:

an endoscope having an elongated insertable member, an objective optical system provided in a tip portion of said insertable member, an eyepiece member provided on a rear end portion of said insertable member and an image transmitting means having a fiber bundle for transmitting to said eyepiece member an image formed by said objective optical system;

an image receiving means including a plurality of pixels arranged at a predetermined pattern operable connected to said eyepiece member of said endoscope having an image receiving portion on which the image transmitted by said image transmitting means is formed through said eyepiece member; and

a vibrating means for relatively vibrating said image receiving portion and said image formed on said image receiving portion to thereby prevent generation of moiré caused by a fiber arrangement of said fiber bundle and by said plurality of pixels of said image receiving portion.

4,870,951 ENDOSCOPE HAVING VARYING DIAMETER CONTENTS IN THE INSERTABLE PART

Akira Suzuki, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jul. 21, 1988, Ser. No. 222,590

Claims priority, application Japan, Aug. 4, 1987, 62-195902; Aug. 18, 1987, 62-126236[U]

Int. Cl.⁴ A61B 1/06

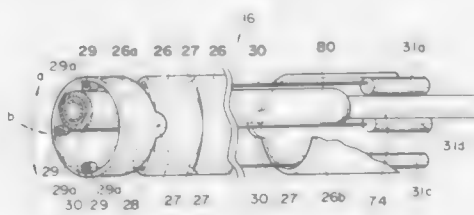
U.S. Cl. 128—6

22 Claims

1. An endoscope comprising:

an elongate insertable part having an observing window in a tip part;

a observing means for observing an object by receiving a light entering through said observing window; contents which are contained within said insertable part, at least one of said contents varies in outside diameter so as to be smaller in diameter on a proximal side;



driven parts provided in said insertable part; and a driving means driving said driven parts and arranged to be closer to a proximal end side than a position in which said contents vary in outside diameter within said insertable part.

4,870,952

FIBER OPTIC ILLUMINATOR FOR USE IN SURGERY

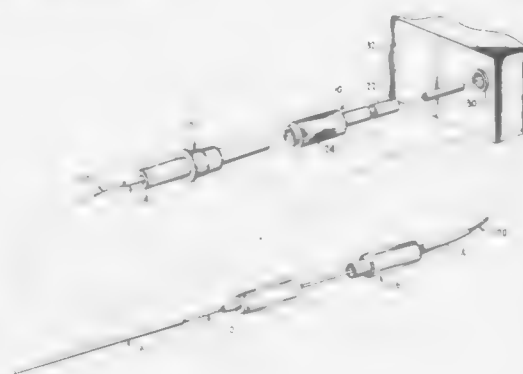
Miquel Martinez, 2202 Apricot, Irvine, Calif. 92714

Filed Oct. 28, 1983, Ser. No. 546,414

Int. Cl.⁴ A61B 1/06

U.S. Cl. 128—23

8 Claims



1. A fiber optic illuminator for use in surgery and adapted for use with a light source having an adjacent socket comprising:

a reusable adapter having a body having a conical bore therein, a barrel extending from said body adapted to be received in the light source socket and having an axial bore therethrough communicating with said conical bore in axial alignment therewith, and a light conducting rod mounted in said barrel axial bore adapted to collect light from the light source;

a disposable interconnector having a first end with a conical configuration received with a force fit, in said conical bore in said adapter body to be removable a second end and an axial bore through said interconnector;

a disposable support hub having a proximal end and a distal end;

a disposable cannula having a proximal end and mounted in said distal end of said support hub and a distal end;

a disposable length of flexible tubing connected with said second end of said interconnector and with said proximal end of said support hub; and

a disposable fiber optic element formed of a single strand of fiber optic plastic material having a proximal end supported at said first end of said interconnector and positioned adjacent said light conducting rod in said adapter and a distal end positioned at said distal end of said can-

nula, said fiber optic element passing through said interconnector axial bore, said flexible tubing, said support hub and said cannula whereby light from the light source is conducted to said distal end of said cannula via said light conducting rod and said fiber optic element.

4,870,953

INTRAVASCULAR ULTRASONIC CATHETER/PROBE AND METHOD FOR TREATING INTRAVASCULAR BLOCKAGE

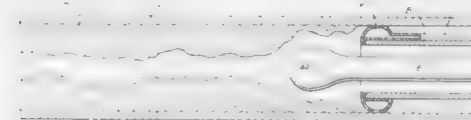
T. Anthony DonMicheal, 309 Panorama Dr., Bakersfield, Calif. 93305; Robert J. Siegel, 2304 Strongs Dr., Venice, Calif. 90291, and Eugene A. DeCastro, 112 Hunter St., Jamestown, N.Y. 14701

Filed Nov. 13, 1987, Ser. No. 120,390

Int. Cl.⁴ A61H 23/00

U.S. Cl. 128—24 A

43 Claims



1. An ultrasonic apparatus for the treatment of a patient having blood vessels obstructed by deposits of atherosclerotic plaque or blood clots, comprising:

an ultrasonic energy source;

an elongated, solid, flexible probe having first and second ends and coupled at the first end to the ultrasonic energy source and having a tip at the second end, the probe length selected so as to provide both longitudinal and transverse motion of the probe tip, the probe tip having a blunt, rounded shape formed to be substantially free of any tendency to perforate a blood vessel and the probe having a degree of flexibility selected to prevent perforation of the blood vessel upon contact with the probe tip;

a hollow catheter for internally carrying a portion of the probe, the catheter having first and second ends, the tip of the probe having a diameter less than the internal diameter of the hollow catheter; and

means adapted to slide the probe within the catheter to extend the probe from the second end of the catheter into a mass of atherosclerotic plaque or blood clots.

4,870,954

ULTRASONIC DIAGNOSTIC APPARATUS HAVING PIVOTABLE AND SLIDABLE OPERATIONAL TABLE

Tomohiro Satoh, Ootawara, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 20, 1988, Ser. No. 208,480

Claims priority, application Japan, Jun. 22, 1987, 62-156348

Int. Cl.⁴ A61B 10/00

U.S. Cl. 128—24 A

10 Claims

1. An ultrasonic diagnostic apparatus, comprising:

an ultrasonic diagnostic body for obtaining ultrasonic information, the diagnostic body having a front;

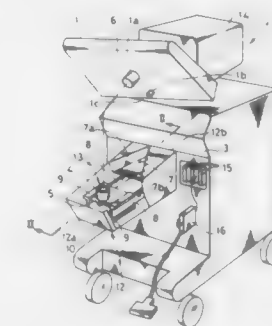
an operational table having a pivot axis and arranged in front of the body;

means for pivotally supporting the table around the pivot axis;

means, connected to the pivotal means, for slidably supporting the pivotal support means, the slidable support means being secured to the front side of the body so the pivotal support means is slidable relative to the body to adjust the position of the table relative to the body; and

stopper means, mounted to the slidable support means, for

gradually and variably restricting the pivotal movement of the table depending on the position of the table relative



to the body to prevent the table from pivoting into contact with the body.

4,870,955

MASSAGE BELT INCLUDING ROTATABLE BLOCKS

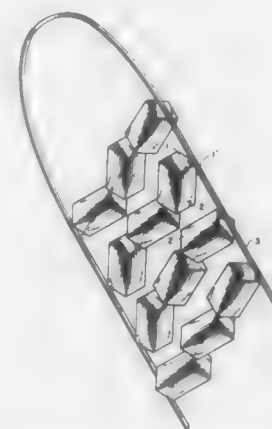
Karl Adamek-Hetzel, Wolbecker Strasse 84, Münster, Fed. Rep. of Germany (4400)

Continuation of Ser. No. 196,858, May 20, 1988, abandoned, which is a continuation of Ser. No. 21,153, Mar. 3, 1987, abandoned. This application Dec. 19, 1988, Ser. No. 287,549

Int. Cl.⁴ A61H 11/00

U.S. Cl. 128—58

8 Claims



1. A massage belt comprising a peripheral, closed profile member defining a rim and formed of resilient material, wherein wire rails or rods extend transversely from one side of the profile member to the other, with at least three elongated, rectangular blocks of wood of substantially square cross-section being rotatably slipped onto each wire rail, each block defining a central longitudinal axis and wherein each block includes a linear bore for passing the wire rail therethrough, said bore defining an angle of between 6° and 25° relative to said central axis of said block.

4,870,956

KNEE BRACE

Wade Fatool, Sunbury, and Robert J. Ferraro, Winfield, both of Pa., assignors to Competitive Athletics Technology, Inc., Winfield, Pa.

Filed Jul. 21, 1988, Ser. No. 222,528

Int. Cl.⁴ A61F 3/00

U.S. Cl. 128—80 C

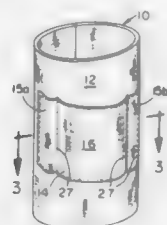
11 Claims

1. A knee brace comprising:

a resilient sleeve sized to enclose the knee and adjacent leg portions of a person wearing the brace, said sleeve includ-

ing an overlying pocket panel secured to the sleeve, the sleeve and panel defining a wide compartment overlying the knee and at least one adjacent narrow compartment extending along one side of the wide compartment and along the knee;

at least one narrow resilient support member fitted in the narrow compartment;



a wide resilient, absorbing pad fitted in the wide compartment to overlie the knee; and,

an annular pad, said annular pad being smaller than the wide pad and sized to closely surround the patella of the knee to locate, support and protect the patella, the annular pad being located in the center of the wide compartment between said sleeve and said wide pad.

4,870,957

LIGAMENT ANCHOR SYSTEM

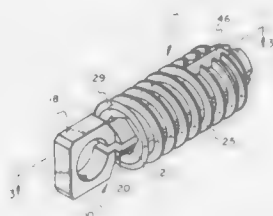
E. Marlowe Goble, 850 E. 1200 North, and W. Karl Somers, 651 N. 150 West, both of Logan, Utah 84321

Filed Dec. 27, 1988, Ser. No. 289,728

Int. Cl.⁴ A61F 5/04

U.S. Cl. 128—92 YF

23 Claims



1. A ligament anchor system comprising, a pair of longitudinally open externally threaded footings; means for turning each said threaded footings into a tapped bone cortex; a pair of stud means, each stud means including a flared end, a body that has a diameter to fit through the longitudinal passage of said threaded footing, and means for maintaining a ligament means thereto, said stud means flared end terminating in a lip wherefrom a lock wall extends to intersect said stud means body, said lip diameter being slightly greater than said threaded footing longitudinal opening wall diameter, which said stud means flared end is cut longitudinally into said stud means body to receive and maintain a ligament means fitted therealong to allow for collapse of said flared end reducing said lip diameter to less than said threaded footing longitudinal opening wall diameter; and ligament means for arrangement between said pair of stud means.

4,870,958

UNDERWEAR WITH PARTITIONING LINER

Maynard A. Webster, Box 2470, New Sharon, Me. 04955

Filed Nov. 30, 1987, Ser. No. 126,515

Int. Cl.⁴ A61F 5/40

U.S. Cl. 128—159

10 Claims

1. A mens underwear undergarment comprising:

a pair of boxer type shorts having a front and back and

comprising waist portion, pants portion with crotch, and short leg portions extending below the crotch;

partitioning liner means secured at the inside of the shorts comprising a cup portion adjacent to the front of the shorts, said cup portion being open in the front to form first and second side partitions for positioning in a wearer's clefts on either side of the groin to prevent chafing;

first panel means securing one side of the cup portion comprising the first partition to a first location on one side of the front of the shorts;



second panel means securing the other side of the cup portion comprising the second partition to a second location on the other side of the front of the shorts spaced from the first location; and

a third panel means securing the liner to the crotch of the shorts;

said panel means being constructed and arranged to space the partitioning liner means from the shorts and suspend the partitioning liner means within the shorts.

4,870,959

PROTECTIVE BREATHING MASK

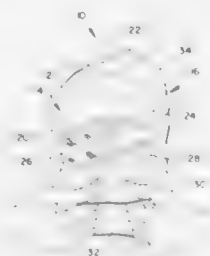
Ron Reisman, 5 Hasat St., Jerusalem, and Uri Amit, Moshav, Timrat, Migdal Haemek, both of Israel

Filed Feb. 5, 1988, Ser. No. 152,888

Int. Cl.⁴ A62B 18/04, 7/00; A42B 1/04

U.S. Cl. 128—201.25

10 Claims



1. A protective breathing mask comprising: fire-resistant stretchable material of not less than about 300% stretchability shaped as a hood and having an access opening through which the head is placed for wearing the mask over the head and enclosing it such that a substantially airtight closure is provided at the neck, said stretchability inherently providing, without ancillary tightening means, a minimum unoccupied interior volume of said hood such that, upon donning, the inrush of surrounding air is minimized, at least a portion of the mask providing a transparent viewing area for the eyes, a mouth location of such stretchable material being replaced by filter materials sealed thereto and comprising a plurality of fire-resistant flexible layers at least one of which has imbedded therein activated charcoal particles.

4,870,960

BACKUP BREATHING GAS SUPPLY FOR AN OXYGEN CONCENTRATOR SYSTEM

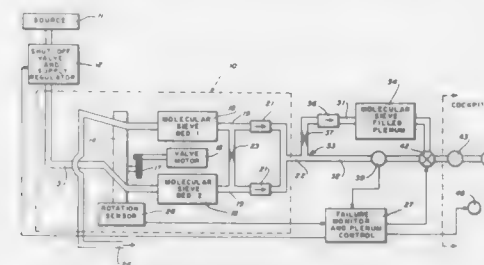
Richard W. Hradek, Davenport, Iowa, assignor to Litton Systems, Inc., Davenport, Iowa

Continuation of Ser. No. 785,236, Oct. 7, 1985, abandoned. This application Jan. 12, 1987, Ser. No. 62,131

Int. Cl.⁴ A61M 16/00

U.S. Cl. 128—202.22

2 Claims



1. A backup breathing gas supply for use with an oxygen concentrator in which a source gas is coupled by a rotary valve to a plurality of beds of molecular sieve material in the concentrator to produce an enriched product gas at the concentrator outlet for delivery as a breathing gas to a breathing regulator, wherein the rotary valve periodically alternates the flow of the source gas to the plurality of beds of molecular sieve material in order to produce breathing gas, the backup breathing gas supply comprising:

- a plenum chamber for storing a quantity of breathing gas,
- a quantity of molecular sieve material contained in the plenum chamber, whereby the capacity of plenum chamber to contain breathing gas is increased by the addition of molecular sieve material,
- a plenum line coupling the outlet of the oxygen concentrator to the plenum chamber,
- a bypass line coupled to the outlet of the oxygen concentrator in parallel with the plenum line,
- control means for selectively coupling either the plenum chamber or the bypass line to the breathing regulator, said control means comprising a three-way valve coupled to the outlet of the plenum chamber and the bypass line,
- a check valve in the plenum line upstream of the plenum chamber whereby breathing gas fills said plenum chamber whenever the concentrator outlet pressure exceeds the plenum pressure, and whereby loss of stored gas from the plenum input through the bypass line to the breathing regulator when the concentrator outlet pressure is less than the plenum pressure is prevented,
- a rotation sensor means for detecting the failure of the rotary valve, said sensor means causing said control means to deliver breathing gas from the plenum chamber to the breathing regulator upon said failure, and
- restrictor means in the plenum line upstream of the plenum chamber for limiting the fill rate of the plenum chamber during periods when the concentrator output pressure exceeds the plenum pressure.

4,870,961

MEDICAL VENTILATOR TUBE AND MANIFOLD ASSEMBLY

Gordon D. Barnard, P.O. Box 60942, Oklahoma City, Okla. 73146

Filed Sep. 22, 1986, Ser. No. 909,593

Int. Cl.⁴ A62B 9/04

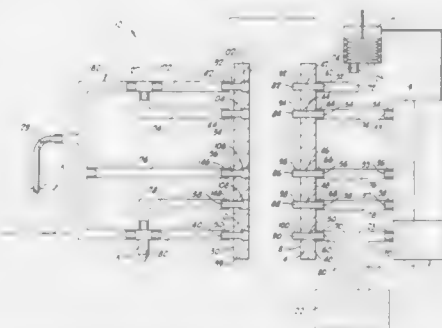
U.S. Cl. 128—202.27

20 Claims

14. A replaceable medical ventilator circuit assembly for use in connecting a patient breathing tube and a humidifier to a medical ventilator of the type having a pressurized air supply device, a spirometer, a pneumatic control device with first,

second and third pressure signal fittings thereon, said circuit assembly comprising:

- a single ventilator manifold defining:
 - an inhalation passageway;
 - an exhalation passageway;
 - an exhalation valve means drive passageway;
 - a patient pressure passageway; and
 - nebulizer means passageway;
- a first inhalation tube having means for connecting said inhalation passageway to the humidifier and the medical ventilator;
- a spirometer tube having means for connecting said exhalation passageway to the spirometer on the medical ventilator;
- a first exhalation valve means drive tube having means for connecting said exhalation valve means drive passageway to the first pressure signal fitting on the pneumatic control device of the medical ventilator;
- a first patient pressure tube having means for connecting said patient pressure passageway to the second pressure signal fitting on the pneumatic control device;
- a first nebulizer means drive tube having means for connecting pressure signal fitting on the pneumatic control device;
- a single circuit manifold removably attached to said ventilator manifold such that said ventilator manifold and said circuit manifold have a connected operating position wherein all connections to the ventilator are connected simultaneously and a disconnected position wherein all of



said connections to said ventilator are disconnected simultaneously, said circuit manifold defining:

- an inhalation passageway being positioned in said circuit manifold so as to be in fluid communication with said inhalation passageway of said ventilator manifold when said manifolds are in said operating position;
- an exhalation passageway being positioned in said circuit manifold so as to be in fluid communication with said exhalation passageway of said ventilator manifold when said manifolds are in said operating position;
- an exhalation valve means drive passageway being positioned in said circuit manifold so as to be in fluid communication with said exhalation valve means drive passageway of said ventilator manifold when said manifolds are in said operating position;
- a patient pressure passageway being positioned in said circuit manifold so as to be in fluid communication with said patient pressure passageway of said ventilator manifold when said manifolds are in said operating position; and
- a nebulizer means passageway being positioned in said circuit manifold so as to be in fluid communication with said nebulizer means passageway of said ventilator manifold when said manifolds are in said operating position;
- a second inhalation tube having means for connecting said inhalation passageway of said circuit manifold to the patient pressure breathing tube;

a nebulizer means for controlling flow of medication into said second inhalation tube;
 an exhalation tube having means for connecting said exhalation passageway of said circuit manifold to the patient breathing tube;
 an exhalation valve means for controlling flow of exhaled air through said exhalation tube;
 a second exhalation valve means drive tube connecting said exhalation valve means drive passageway of said circuit manifold to said exhalation valve means;
 a second patient pressure tube having means for connecting said patient pressure passageway of said circuit manifold to the patient breathing tube; and
 a second nebulizer means drive tube connecting said nebulizer means passageway of said circuit manifold to said nebulizer means.

4,870,962

DISPOSABLE SELF-INFLATING MANUAL RESUSCITATOR BAG

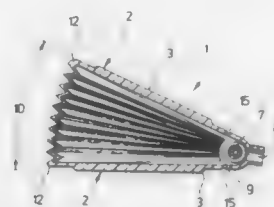
Lee Sitnik, 200 Kirkstone Rd., Irmo, S.C. 29063

Filed Sep. 14, 1987, Ser. No. 96,464

Int. Cl.⁴ A62B 7/00

U.S. Cl. 128—205.13

10 Claims



1. A manually actuated, self-inflating and self-distending resuscitator bag, for restoring breathing to

a patient whose breathing process has been interrupted or impaired, where the bag, by alternating compression and inflation of the same, is utilized to generate a known, rhythmic supply of pressurized breathing gas, wherein said bag consists of:

a normally expanded bellows;

said bellows having a pair of substantially stiff, similar, opposing, upper and lower plates, a substantially stiff semi-cylindrical binding, of a length equal to that of opposing peripheral side edges of said upper and lower plates, hingedly joined along the longitudinal edges thereof to the opposing peripheral side edges of said upper and lower plates, respectively, a pleated collapsible side wall, which is flexible and elastic in comparison to the plates, adjoining the remaining edges of the opposing pair of plates and the binding, a pressurizable chamber formed by the combination of the plates, binding and sidewall,

a breathing gas intake valve thereon that opens under a slight vacuum, enabling gas to be drawn into the chamber, and closes under slight positive pressure and a breathing gas outlet thereon through which the gas within the chamber of the bellows is expelled;

said bellows forming a unitary structure and composed of moldable plastic resilient material; each of said pair of opposing plates being reinforced with a thicker cross section of moldable resilient plastic material therein imparting further structural stiffness;

said semi-cylindrical binding having walls closing opposite ends of the length thereof, respectively, which extend beyond the arc defined by the perimeter of the ends toward said pleated collapsible sidewall, said binding serving to prevent said bound edges of the plates from collapsing against one another during compressing;

the pleats in the pleated collapsible lateral walls symmetri-

cally radiating from the binding end walls at an angle that is a fractional component of that angle formed by the pair of opposing plates, such that as the latter angle becomes more acute, as during compression of the bag, the angle cut by the pleats becomes more acute and strained, and that this strained angle causes the pleated collapsible wall to react as a compressed spring, and exerts a countering force which serves to make the bag inherently self-distending and self-inflating;

said breathing gas outlet consisting of an opening in said bag which fluidically communicates with said chamber and means for connecting the opening to a patient breathing gas administration means which includes an externally ridged tube connected to the opening and protruding from said bag; and

said breathing gas intake valve consisting of an opening in said bag which fluidically communicates with said chamber, means for connecting the opening to a source of breathing gas which includes no externally ridged tube connected to the opening and protruding from said bag and one-way valve means for opening when a slight vacuum is produced within said bag during inflation of the same and sealing said opening when a slight positive pressure is produced within said bag during compression of the same.

4,870,963

RESPIRATORY AID DEVICE

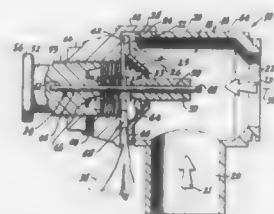
William Carter, Indianapolis, Ind., assignor to Carol Russell, Fort Myers, Fla.

Filed May 6, 1988, Ser. No. 190,960

Int. Cl.⁴ A62B 9/02, 7/02

U.S. Cl. 128—205.24

14 Claims



1. A respiratory aid device carrying a face mask body which fits over the nose and mouth of a patient, the device and mask body providing positive pressure inhalation and exhalation for a patient, comprising, in combination:

a body member means having a chamber;

the body member means having an inlet means for communicating with an associated source of pressurized respiratory air for the patient, a first outlet means communicating with the patient's face mask body, and a second outlet means which provides a vent;

the inlet means, the first outlet means, and the second outlet means being in communication with the chamber of the said body member means;

the second outlet means being provided with a closure valve body having inner and outer perimeters, a valve seat means associated with the second outlet means;

a control body means carrying said closure valve body and being relatively movable with respect to the closure valve body, and having abutment means which abuttingly engage the closure valve body adjacent its inner perimeter and said seat means being engagable with said closure valve body around its outer perimeter;

said closure valve body being movable into and between positions of (a) toward or into a closed position of non-venting, where the inlet means imparts pressure to the first outlet means and face mask body and hence to the patient for inhalation instead of being vented out the second

outlet means, and (b) an open position of venting the body member means chamber of both the pressure in the inlet means and the pressure in the first outlet means and face mask body, during periods of exhalation by the patient, and to vent excess air not being used during periods of dwell and inhalation;

means permitting said closure valve body to move into a partially open position even when a portion of said closure valve body is accidentally restrained against movement from said closed position, said means including a rockable mounting for said closure valve body on said control body means;

there being provided support means for the control body means which support the control body means so as to enable it to move along an axis perpendicular to the general plane of the valve seat means, said control body being movable along said axis between three different positions, including: (a) a first position in which the entirety of the abutment means and the entirety of the valve seat means both engage said inner and outer perimeters of said closure valve body, respectively, (b) a second position in which said inner perimeter of said closure valve body engages the entirety of said abutment means and the outer perimeter of said closure valve body is spaced from said valve seat, and (c) a third position constituting said partially open position in which the inner and outer perimeters of said closure valve body engage only a portion of said abutment means and said valve seat means, respectively;

the relative movability of the control body means and the closure valve body providing that if debris or other external cause prevents a portion of the closure valve body from being moved from said closed position of non-venting, the closure valve body is movable with respect to the control body means, thereby providing that other portions of the closure valve body are permitted to be moved to the open position to vent the chamber of the body member means.

4,870,964

OPHTHALMIC SURGICAL DEVICE AND METHOD WITH IMAGE DATA REFLECTED OFF OF THE EYE

Paul F. Bailey, Jr., 4885 NW. Barnes Rd., Portland, Oreg. 97210; Isidro G. Nilsson, Marysville, and George M. Alf, Everett, both of Wash., assignors to Paul F. Bailey, Jr., Portland, Oreg.

Filed Jun. 16, 1988, Ser. No. 207,545

Int. Cl.⁴ A61B 17/36

U.S. Cl. 128—303.1

9 Claims



1. In an ophthalmic procedure wherein a surgeon performs surgery on a patient's eye and data related to the surgery are monitored by external equipment, the improvement of: reflecting an image, which is interpretable by the surgeon as

indicative of the data, off of a visible region of the patient's eye for visual monitoring by the surgeon.

4,870,965

UMBILICAL CORD CUTTING AND CLAMPING DEVICE

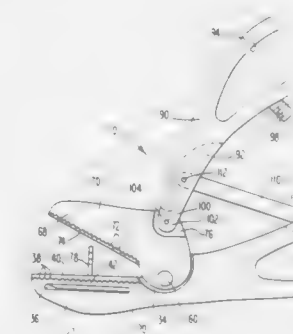
Mohammed S. Jahanger, 500 Egg Harbor Rd., Turnersville, N.J. 08012

Filed Mar. 4, 1988, Ser. No. 164,447

Int. Cl.⁴ A61B 17/32

U.S. Cl. 128—318

20 Claims



1. An umbilical cord cutting and clamping device for severing an umbilical cord to form a maternal cord end and a fetal cord end and for clamping the maternal cord end and the fetal cord end, the device being adapted for use with a fetal cord end clip which is detachable from the device, the device comprising:

a lower assembly including a lower jaw and lower handle means the lower jaw including a lower clamping member for clamping the maternal end, a lower severing member for severing the umbilical cord, and lower support means for supporting and positioning the fetal cord end clip, the lower clamping member being unitary with the lower jaw; an upper jaw including an upper clamping member for clamping the maternal cord end, an upper severing member for severing the umbilical cord, and support means for supporting and positioning the fetal cord end clip, the upper clamping member being unitary with the upper jaw; the upper jaw being pivotably affixed to the lower assembly and adapted to be pivoted from an open position for admitting an umbilical cord between the upper jaw and the lower jaw and a closed position for severing and clamping the cord;

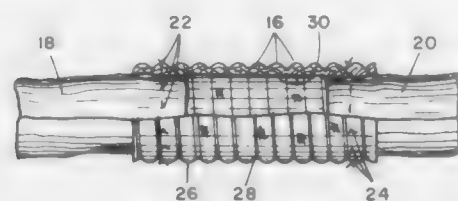
an upper handle means pivotably affixed to the upper jaw; and

lever means pivotably affixed to the upper handle means and the lower handle means, the distance between the upper jaw-lower assembly pivot and the lower assembly-lever means pivot being greater than the distance between the upper jaw-upper handle means pivot and the upper handle-lever means pivot and the distance between the lower assembly-upper jaw pivot and the upper jaw-upper handle means pivot being less than the distance between the upper handle means-lever means pivot and the lower assembly-lever means pivot, so as the device is closed the upper jaw-upper handle pivot moves in and arc about the jaw-lower assembly pivot.

4,870,565
BIOABSORBABLE SURGICAL DEVICE FOR TREATING NERVE DEFECTS

Arnold L. Dellon, Baltimore, Md., and Susan E. Mackinnon, Toronto, Canada, assignors to American Cyanamid Company, Stamford, Conn.

Filed Feb. 1, 1988, Ser. No. 150,594
Int. Cl.⁴ A61B 17/04; A61F 2/06, 2/04
U.S. Cl. 128—334 R 18 Claims



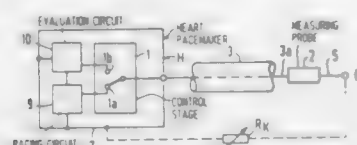
1. A medical device adaptable for use in the treatment of a nerve gap or defect comprising a flexible, porous tube of a bioabsorbable polymer material, said tube having a plurality of corrugations on its exterior surface positioned so as to allow said tube to be bent without crimping the internal surface of said tube and having a plurality of flats provided on its interior surface to provide a relatively smooth interior surface and having a substantially constant internal diameter to promote longitudinal axon growth within the tube device and across the nerve gap, and being capable of enclosing and protecting the ends of a severed or lacerated nerve.

4,870,967
MEASURING ARRANGEMENT FOR CONTROLLING AN IMPLANTABLE BODY-ASSIST DEVICE

Roland Heinze, Munich, and Hans D. Liem, Muensing, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 12, 1987, Ser. No. 84,204
Claims priority, application Fed. Rep. of Germany, Aug. 18, 1986, 3627933

Int. Cl.⁴ A61N 1/00; H05G 00/00
U.S. Cl. 128—419 PG 13 Claims



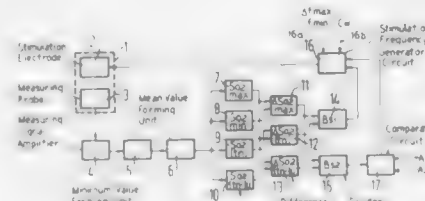
1. A measuring arrangement for operating a body-assist device having means for generating electrical signals and implanted in a patient, said measuring arrangement comprising: control means for forming control signals from a signal corresponding to a body variable of said patient for controlling said means for generating electrical signals; a measuring probe in said patient for obtaining said signals corresponding to a body variable of said patient for use by said control means in forming said control signals; a single current conductor means for electrically connecting said control means and said measuring probe and for forming a first current path therebetween; and electrode means connected to said measuring probe and to said control means and spaced so that body tissue of said patient is disposed therebetween and adapted for utilizing said body tissue as a second current path between said measuring probe and said control means.

4,870,968
SYSTEM AND METHOD FOR CONTROLLING THE STIMULATION FREQUENCY OF HEART PACEMAKERS

Alexander Wiertfeld, Thanning, and Roland Heinze, Otto-brunn, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 746,738, Jun. 20, 1985, abandoned.
This application Apr. 2, 1987, Ser. No. 33,883
Claims priority, application Fed. Rep. of Germany, Jan. 20, 1984, 3422913

Int. Cl.⁴ A61N 1/36
U.S. Cl. 128—419 PG 16 Claims



1. A control system for matching the stimulation frequency of a heart pacemaker to the load condition of a patient, said system comprising: controllable means for stimulating said patient's heart with stimulation pulses supplied thereto at said stimulation frequency; means for obtaining in successive intervals measurement values representing the momentary central venous blood oxygen saturation in said patient's heart; means for forming and storing a maximum signal corresponding to a maximum blood oxygen saturation occurring during a selected time consisting of a plurality of successive intervals; means for forming and storing a minimum signal corresponding to a minimum blood oxygen saturation occurring during said selected time; means for forming and storing a current signal corresponding to the blood oxygen saturation during a current one of said intervals; means for forming a first difference signal which is the difference between said maximum signal and said minimum signal; means for forming a second difference signal which is the difference between a selected one of said maximum signal or said minimum signal and said current signal; and means for generating a control signal for controlling said means for stimulating said patient's heart, said control signal including a factor which is the ratio of said first and second difference signals, said means for stimulating changing the stimulation frequency in a direction and magnitude as a function respectively of the sign and the magnitude of said ratio.

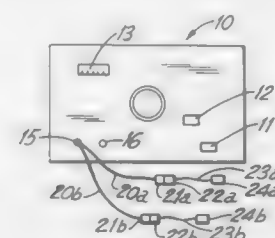
4,870,969
ELECTRODE APPLICATION SYSTEM AND METHOD FOR ELECTROCONVULSIVE THERAPY

Conrad M. Swartz, Lake Forest, Ill., assignor to Somatics, Inc., Lake Bluff, Ill.

Filed Sep. 16, 1988, Ser. No. 245,355
Int. Cl.⁴ A61N 1/38 7 Claims

1. The system in electroconvulsive therapy (ECT) including: an ECT instrument means which, under operator control, produces a burst of electrical waves sufficient to induce a seizure in the brain of a human patient; a one-use disposable connector-pad assembly comprising a connector plug portion removably electrically connected to said ECT instrument means, a flexible multi-layer lami-

nated electrode pad and a wire connected to said plug portion; said pad applying said electrical waves to the skin of the patient and including an adhesive conductive layer which is a plastic conductive film having first and second surfaces, a metal foil layer electrically connected to said wire and covering said adhesive layer second surface, an



insulative layer covering said metal foil layer; and a cover layer removably covering said adhesive layer first surface; wherein said wire is a multi-strand wire of at least three metal strands and said strands at their ends are separated, extend across and are electrically connected to the said metal foil layer.

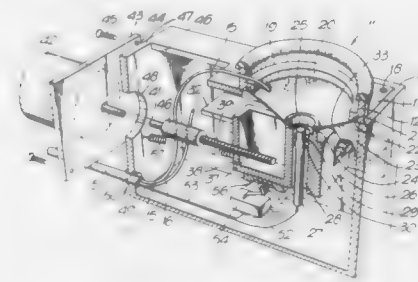
4,870,970
ULTRASONIC INVESTIGATION APPARATUS

Nigel Gray; Simon Knibbs; Patrick A. Finlay, and Robert L. Crocker, all of Slough, Great Britain, assignors to Fulmer Limited, Bucks, United Kingdom

PCT No. PCT/GB87/00570, § 371 Date May 6, 1988, § 102(e) Date May 6, 1988, PCT Pub. No. WO88/01151, PCT Pub. Date Feb. 25, 1988

PCT Filed Aug. 12, 1987, Ser. No. 190,689
Claims priority, application United Kingdom, Aug. 12, 1986, 8619579

Int. Cl.⁴ A61B 8/00
U.S. Cl. 128—660.09 12 Claims



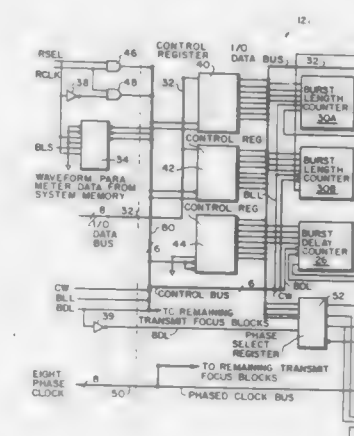
1. An apparatus for transmitting acoustic ultrasonic pulses and for receiving "echos" of the transmitted pulses, said apparatus comprising a first housing, an upstanding wall mounted on the housing defining the mouth of a well, the well having an upper region adjacent the mouth and a lower region, a transducer located in the first housing so that the operative part of the transducer is located in the well, the transducer being mounted in a moveable housing which is moveable linearly relative to said upstanding walls and which is provided with controllable means to move the housing, a flexible membrane being provided in the lower region of the well and being sealingly connected to the said wall defining the well and being sealingly connected to part of the moveable housing so that the membrane forms the bottom of the well, the well being substantially water-tight and being provided with means for introducing water or other fluids to the well, or being pre-filled with fluid, the means to move the housing engaging the housing at a point separated from said well by said membrane.

4,870,971
TRANSMIT FOCUS GENERATOR FOR ULTRASOUND IMAGING

Robert H. Russell, Manhattan Beach, and Lawrence D. Acker, Anaheim, both of Calif., assignors to North American Philips Corporation, New York, N.Y.

Continuation of Ser. No. 82,247, Aug. 5, 1987, Pat. No. 4,841,492, This application Feb. 1, 1989, Ser. No. 306,266
Int. Cl.⁴ A61B 8/00; G01N 79/00

U.S. Cl. 128—661.01 7 Claims



1. In an ultrasound pulse echo imaging system having at least one array of transducer elements, transmitting stage circuitry which direct scan lines of ultrasound energy to a focal zone, and array control means which can said focal zone with respect to an object, a circuit to enable said at least one array of transducer elements to transmit a focused wavefront of coherent ultrasound energy comprising: system clock means which produce m coherent, pulsed clock phase signals, where m is an integer greater than one; system memory means which store waveform parameters which specify a clock phase delay, a burst delay and a burst length for each transducer element in said at least one array for each of a plurality of desired focussed scan lines; a plurality of transmit focus blocks, each being connected to an associated one of said transducer elements, which apply a desired one of the clock phase signals to the associated transducer element in response to values of waveform parameters; a clock bus, connecting each of said transmit focus blocks to the system clock means, which supplies all of the clock signals to each of the transmit focus blocks;

a control bus, connecting each of the transit focus blocks to the array control means, supplies control signals from the array control means to the transmit focus blocks;
 a data bus, connecting the system memory means to each of the transmit focus blocks, which sequentially loads selected waveform parameter data from the system memory means into the transmit focus blocks for each desired scan line;
 wherein each of the transmit focus blocks comprises:
 a plurality of control registers which store a set of the waveform parameters, which are associated with the particular transducer element to which the block is connected, for a particular desired scan line;
 means which select one of the clock phase signals from said clock bus based on the value of a clock phase parameters stored in the control registers for application to the transducer element;
 means which delay the selected clock phase signal by a number of cycles determined by the value of said burst delay parameter stored in the control registers;
 means which apply to the transducer element a number of pulses of the selected and delayed clock phase signal which number is determined by the value of the burst length parameter stored in the control registers.



4,870,972

MULTIPLE-FREQUENCY ACOUSTIC TRANSDUCER, ESPECIALLY FOR MEDICAL IMAGING

Charles Maerfeld, Antibes, and Jean F. Gelly, Valbonne, both of France, assignors to Thomson-CSF, Paris, France

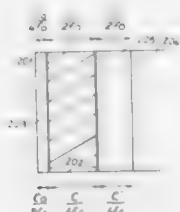
Filed Mar. 17, 1988, Ser. No. 169,272

Claims priority, application France, Mar. 19, 1987, 87 03839

Int. Cl.⁴ A61B 8/00

U.S. Cl. 128—662.03

7 Claims



1. A multiple-frequency acoustic transducer, especially for medical imaging, which comprises:
 a piezoelectric transducer for being excited in order to emit vibrations, and at least one passive strip placed on at least one side of said piezoelectric transducer to enable said piezoelectric transducer and said at least one passive strip to resonate on at least two distinct frequencies,
 and a backing which acts as a support to said piezoelectric transducer wherein said backing has impedance substantially equal to zero at a first frequency and a thickness of said piezoelectric transducer and a first strip of said at least one passive strip comprises a half-wave thickness at a first resonance frequency and quarter-wave thickness at a second resonance frequency equal to half said first frequency and wherein said piezoelectric transducer comprises a segmented transducer.

4,870,973

ELECTRONIC BLOOD PRESSURE METER HAVING MEANS FOR DETECTING ARTIFACTS

Satoshi Ueno, Kyoto, Japan, assignor to Omron Tateisi Electronics Co. and Isao KAI, both of Kyoto, Japan

Filed May 11, 1988, Ser. No. 192,574

Claims priority, application Japan, May 13, 1987, 62-116435

Int. Cl.⁴ A61B 5/02

U.S. Cl. 128—680

3 Claims



1. An electronic blood pressure meter, comprising:
 a cuff;
 pressurization means for pressurizing the cuff;
 depressurization means for depressurizing the cuff;
 pressure detecting means for detecting the pressure in the cuff;
 blood vessel information detecting means for detecting blood vessel information during the process of pressurization or depressurization of the cuff; and
 blood pressure values determining means for determining a systolic blood pressure and a diastolic blood pressure according to output signals from the blood vessel information detecting means and the pressure detecting means;
 further comprising:
 pulse wave component detecting means connected to the cuff, the pulse wave component detecting means being for obtaining pulse wave data;
 non-negative time period measuring means for measuring a non-negative time period of the pulse wave data obtained by the pulse wave component detecting means, the non-negative time period being measured relative to a certain reference level;
 abnormal state detecting means for detecting an abnormal state when the non-negative time period measured by the non-negative time period measuring means is greater than a certain threshold level; and
 wherein the abnormal state detecting means comprises a microprocessor which is repeatedly activated at a certain time interval by interrupting a main routine for normal measurement of blood pressure values.

4,870,974

APPARATUS AND METHOD FOR DETECTING HEART CHARACTERISTICS BY WAY OF ELECTRICAL STIMULATION

Xiangsheng Wang, Beijing, China, assignor to Chinese PLA General Hospital and CITIC Technology, Inc., both of Beijing, China

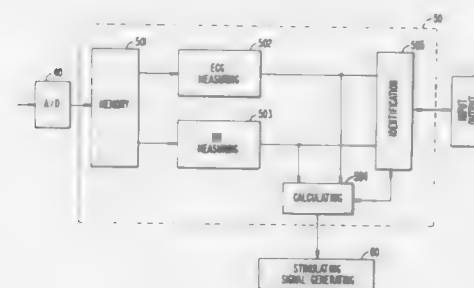
Filed Mar. 31, 1988, Ser. No. 175,514

Claims priority, application China, Sep. 30, 1987, 87106622; Mar. 12, 1988, 88101253

Int. Cl.⁴ A61B 5/04; A61N 1/36

U.S. Cl. 128—700

18 Claims



1. An apparatus for detecting heart characteristics, comprising:
 a plurality of ECG detecting electrodes;
 a blood pressure (BP) sensor;
 a preamplifier circuit, whose inputs are connected respectively to said ECG detecting electrodes and said BP sensor, for providing parallel multiplex outputs of ECG and BP signals;
 an A/D convertor, whose inputs are connected to said parallel multiplex outputs of said preamplifier circuit, for converting said analog ECG and BP signals into digital data;
 a data processing unit, whose inputs are connected to the digital output of said A/D convertor, for processing said digital data to generate stimulating instructions and to identify waveforms of said ECG and BP signals;
 a stimulating signal generating unit for generating heart stimulation signals under the control of said stimulating instructions issued by said data processing unit;
 two pairs of intracardiac electrodes, which are connected to the outputs of said stimulating signal generating unit, for applying said heart stimulation signals to atrium and ventricle, respectively; and
 an input-output device, which is connected to said data processing unit for inputting operating instructions therein and providing its processed results and identified waveforms as output;
 wherein said data processing unit includes means for processing the ECG and BP signals detected by said ECG detecting electrodes and BP sensor, and for issuing instructions for heart stimulation to said stimulating signal generating unit according to said processed results, said stimulating signal generating unit generating stimulating signals of specific waveforms according to said instructions and applying said stimulating signals to atrium and ventricle, respectively, via said intracardiac electrodes, said data processing unit including means for identifying the change of ECG and BP waveforms under the effects of the stimulating signals, for issuing instructions for stopping stimulation to said stimulating signal generating unit upon the identification of ME (NST) or VT waveforms, and for providing the identified waveforms and the amplitude of the stimulating signal which induces said waveforms to said input-output device.

4,870,975

SUCTION CANISTER ASSEMBLY FOR THE COLLECTION OF BODY FLUIDS AND TISSUE SPECIMENS

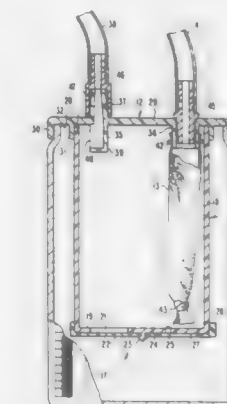
Scott Cronk, 8176 Shorewalk Dr., #D, Indianapolis, Ind. 46236, and Michelle Thomas, 402 Tower Ct., Noblesville, Ind. 46060

Filed Jul. 5, 1988, Ser. No. 215,324

Int. Cl.⁴ A61M 1/00

U.S. Cl. 128—749

11 Claims



1. A suction canister assembly for the collection of body fluids and tissue specimens from a patient, comprising:
 an outer collection bottle having a bottle mouth;
 an inner canister nested within said bottle and having a canister mouth and a bottom end and having valve means for selectively permitting the passage of material out of said canister;
 a dual closure lid openably closing both the bottle mouth and the canister mouth, said lid having an outlet port adapted for connection with a source of suction and an inlet port for receiving therethrough body fluids and tissue specimens from a patient, both the inlet port and the outlet port opening into said canister; and
 a fluid porous specimen receptacle suspended from said lid and within said canister and disposed about said inlet port so as to filter any material entering said canister through said inlet port.

4,870,976

INTRAVENOUS INJECTION SHIELD ASSEMBLY Thomas A. Denny, 3609 Crescent Ave., Farmington, N. Mex. 87401

Continuation-in-part of Ser. No. 923,616, Oct. 27, 1986, abandoned. This application Sep. 28, 1987, Ser. No. 101,827

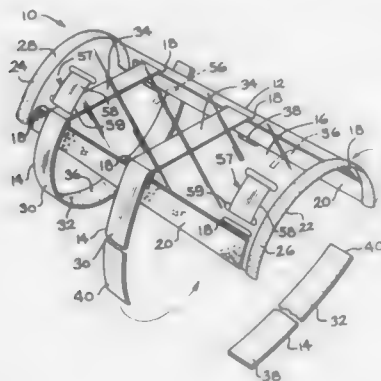
Int. Cl.⁴ A61F 13/00

U.S. Cl. 128—877

28 Claims

1. An improved intravenous injection shield assembly for positioning on a limb comprising, in combination:
 a laterally flexible protective shield member adaptable for secure positioning along the sides of such limb, said shield member having an arcuate surface, said surface extending from opposed free ends to a central uppermost point of said shield, said shield defining a plurality of strap openings spaced from the uppermost surface of said shield member;
 at least two adjustable strap members each having an upper limb portion and a lower portion, each of said strap members extending through said strap openings;
 whereby said portion of each of said strap members which is adapted for contact with the upper portion of such limb is in contact with the upper surface of such limb and said portion of each of said strap members which is adapted for contact with the lower portion of such limb is in contact with the lower surface of such limb, said uppermost sur-

face of said shield member being held in a spaced apart relationship with the upper surface of such limb such that an intravenous needle and tubing can be positioned in the space defined between the uppermost surface of said shield member and the upper surface of such limb; and



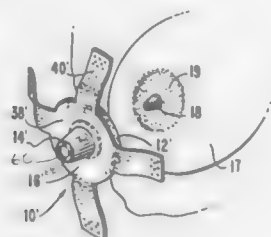
fastening means positioned on each of said strap members and said shield member for holding the shield assembly in a predetermined position on such limb.

4,870,977

SURGICAL PROTECTOR FOR RAISED WOUNDS
Maurice M. Imonti, Dana Point, Calif., assignor to CooperVision, Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 28,673, Mar. 20, 1987, Pat. No. 4,754,750. This application Jul. 14, 1987, Ser. No. 73,081. The portion of the term of this patent subsequent to Jul. 5, 2005, has been disclaimed.

Int. Cl.⁴ A61J 13/00; A61F 13/00; A61M 27/00
U.S. Cl. 128—890 36 Claims



1. A method of caring for the areola and nipple area of a patient's breast following a radical mastectomy comprising: providing a wound protector bandage comprising a protector cap having a base opening and configured to receive the patient's reconstructed nipple therein; up through said base opening, a pad attached to said protector cap at the base thereof, and said protector cap defining a plurality of suture holes therethrough, positioning said wound protector bandage over the patient's reconstructed nipple with said nipple being disposed in said cap, attaching the pad of said positioned wound protector bandage to the patient's breast, and suturing through said suture holes said nipple to position it relative to said cap.

23. A surgical wound protector comprising:
a sterile pad having an upper surface, a lower surface, and a centrally-located opening therethrough engaging said upper and lower surfaces,
a cone-shaped protector member formed of tissue-compatible, generally transparent plastic, and having a base portion and a top portion,

said protector member having at said base portion a radially-disposed flange with an upper annular flange surface, a securing means for securing said base portion to said sterile pad upper surface and over said centrally-located opening, and for securing said sterile pad to a patient so that said protector encompasses a raised projection on the patient which passes up through said opening and into said protector member,
said securing means directly securing said flange to said upper surface to said pad,
said securing means including a continuous tape member engaging said upper annular flange surface and a plurality of tape strips radially disposed out from said pad, and said top portion defining at least one air hole passing therethrough for aerating the patient's raised projection positioned in said protector member.

4,870,978

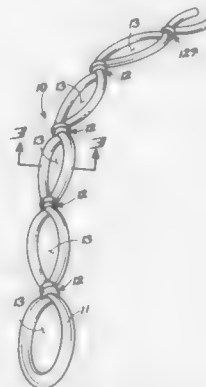
METHOD OF FORMING AN ADJUSTABLE TOURNIQUET DEVICE

Sharon L. Atwell, 10211 Schaper Dr., Galveston, Tex. 77554
Filed Apr. 25, 1988, Ser. No. 185,798

Int. Cl.⁴ A61B 17/12

U.S. Cl. 128—898

1 Claim



1. A method of forming a tourniquet device comprising providing a first finite length of elastomeric resilient tubing, and

subsequently doubling said tubing upon itself by overfolding said length of elastomeric tubing upon itself to form a second finite length of said tubing, and knotting said tubing along the formed second finite length to create a series of loops and a series of knots terminating in a terminal knot, and projecting said terminal knot through one of said series of loops to effect a constricting force upon a limb requiring a tourniquet application, and wherein said loops are formed of decreasing size as measured from a first loop formed by a first knot terminating in a final loop proximate said terminal knot, and wherein said knotting includes knotting said tubing upon itself, and

wherein said step of providing a finite length of elastomeric tubing includes providing tubing including a high co-efficient of friction for effecting a non-slip intercommunication with said tubing to itself in formation of knots and in application of said device as a tourniquet,

and

wherein the step of creating a series of loops includes forming at least three to ten loops.

4,870,979

SMOKER'S PIPE

Shane C. Browning, Newtownabbey; Robert Carlisle, Larne, and Alexander H. Wright, Belfast, all of Ireland, assignors to Gallaher Limited, England

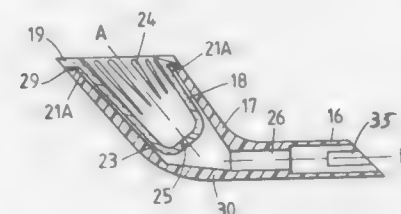
Filed Dec. 28, 1987, Ser. No. 138,595

Claims priority, application United Kingdom, Dec. 31, 1986, #631089

Int. Cl.⁴ A24F 5/00

U.S. Cl. 131—196

11 Claims



1. In a smoker's pipe having a moulded plastics bowl with an elongate stem having a stem axis, and within said bowl, a refractory cup-shaped liner having a liner axis; said liner having a smoke outlet in a bottom thereof leading, via a smoke duct through said stem, to a mouthpiece of the pipe; said smoke duct lying on said stem axis and said smoke outlet lying on said liner axis; an upper edge of said liner being formed with an integral, radially outwardly projecting flange overlying an upper rim of said bowl; substantially the whole of said liner beneath said flange being held out of direct contact with said bowl with an annular thermally insulating zone therebetween, said zone being sealed at an upper end thereof; the improvement wherein said liner and stem are juxtapositioned such that said liner axis is inclined at an obtuse angle to said stem axis and intersects said stem axis at a point outside said liner and above a bottom of said bowl, said obtuse angle being such that the stream of smoke leaving said smoke outlet of said liner is bent through a shallow acute angle as it flows to said smoke duct, said bottom of said liner being spaced from said bottom of said bowl by a distance such that direct impingement of the flowing smoke stream on the bottom of the bowl is lessened or avoided and overheating of said plastics bowl prevented; said liner and said bowl being asymmetrical about said liner axis such that a plane defined by said upper rim of said bowl and upper edge of said liner is inclined to said liner axis and is substantially parallel to said stem axis, and wherein complementary lugs and notches are provided at an upper end of said liner and on said bowl to angularly locate said liner about said liner axis in a desired position relative to said bowl.

4,870,980

TOBACCO EXPANSION PROCESS AND APPARATUS
Gerald R. Lowry, Winston-Salem, N.C., assignor to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed Apr. 10, 1987, Ser. No. 36,938

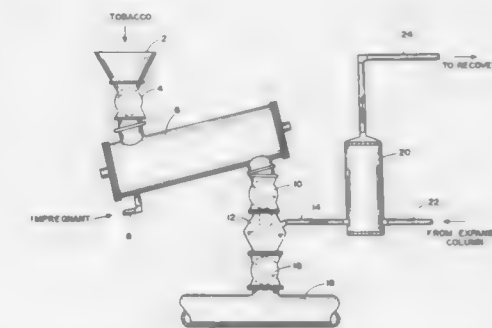
Int. Cl.⁴ A24B 3/18

U.S. Cl. 131—296

16 Claims

1. A process for increasing the filling capacity of tobacco comprising the steps:
impregnating tobacco with a volatile impregnant in a first zone;
recovering impregnated tobacco from the first zone and rapidly passing the impregnated tobacco through a discrete second zone wherein a gaseous phase containing a portion of the volatile impregnant is removed;
expanding tobacco from the second zone in a third discrete

zone by contacting the tobacco with a stream of hot gases; and



recovering the volatile impregnant removed in the second zone.

4,870,981

SETTING CHAMBERS FOR CONCRETE PARTS

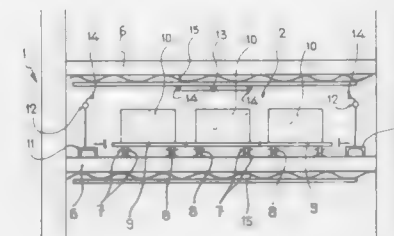
Alberto B. Serrano, Avda. Nazaret 10, 28009 Madrid, Spain
Filed Mar. 23, 1988, Ser. No. 172,703

Claims priority, application European Pat. Off., Apr. 1, 1987, #750012.7

Int. Cl.⁴ B08B 3/02

U.S. Cl. 134—56 R

12 Claims



1. An apparatus for setting concrete parts in a chamber comprising:

a plurality of floors, each said floor having a floor gate; beams mounted on each said floor;
wheels mounted on said beams;
panels slideably disposed upon said wheels so that said panels can transport said concrete along a rolling path;
a roller conveyor belt to convey said panels from an originating location;
a lifter for picking up and raising said panels to one of said floors, said lifter having side mounted gusset plates suitably mounted to cause the opening of said floor gates by direct pressure so that said panels and said concrete can be introduced onto said floors;
a transfer unit for transferring said panels from said roller conveyor belt to said lifter, said transfer unit designed to move in both vertical directions;
a pushing element attached to said lifter, said pushing element having a pusher, a rear fixed stop and a front counterweight stop, a said panel is placed on said pusher between said rear fixed stop and said front counterweight stop, said front counterweight stop being positioned and designed to push the panel previously introduced onto the floor to make room for the panel carried by said pusher, said front counterweight stop also to prevent panel carried by said pusher from being deposited upon panel previously introduced onto the floor;
said floor inclined at a suitable angle to encourage movement of panels along the rolling path; and
a spary watering system to promote the desired humidity within said chamber.

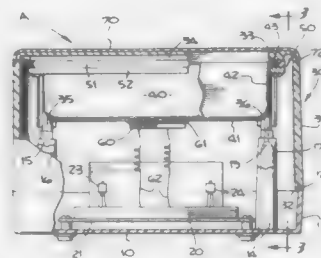
4,870,982
ULTRASONIC CLEANING APPARATUS FOR
HOUSEHOLD USE

Chung-Chi Liu, Brea, Calif., assignor to Tatung Company of
America, Inc., Long Beach, Calif.

Filed Jan. 9, 1989, Ser. No. 294,864
Int. Cl.⁴ B08B 3/12

U.S. Cl. 134—135

10 Claims



1. An ultrasonic cleaning apparatus comprising:
a base;
an open-topped hollow housing supported upon said base and extending upwardly therefrom, said housing having a circumferential side wall, an intumed flange at the top of said side wall, and a downwardly turned circumferential rib beneath the inner edge of said flange;
electric circuit means supported on said base within the lower portion of said housing;
an open-topped liquid tank disposed within the upper portion of said housing, said liquid tank having a bottom wall, and a circumferential side wall with an outwardly extending circumferential flange at its upper extremity, said circumferential flange having a mating relationship with the under surface of said housing rib;
elastomeric gasket means disposed between the upper surface of said liquid tank flange and the under surface of said housing rib;
an electro-mechanical transducer secured to the under surface of said bottom wall of said tank, said electric circuit means being coupled to said transducer for drivingly energizing the same; and
removable means securing said tank flange and said housing rib together to thereby compress said gasket means therebetween so as to prevent any liquid from spilling from said tank onto said electric circuit means.

4,870,983
INFLATING ARTICLE WITH INTEGRALLY
ASSOCIATED PUMP

Cheng-Chung Wang, 12th Fl., No. 440, Sec. 4, Jen-Ai Rd., Taipei, Taiwan

Filed Jun. 27, 1988, Ser. No. 211,755
Int. Cl.⁴ A45B 19/02

U.S. Cl. 135—20 B

8 Claims



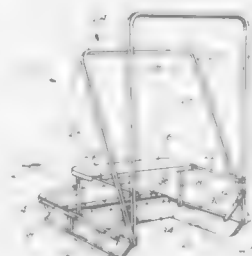
1. An inflatable umbrella comprising:

- an inflatable envelope having an enclosing wall made of a flexible material;
- a pump means having an enclosed pump housing made of a flexible material, said enclosed pump housing having a first open flange end fixed to said enclosing wall and an opposite second end, said pump housing being compressible and expandable so that it can be operated for pumping air;
- an interior portion of said pump means, extending from said first end to said second end of said housing so that an inner chamber of said interior portion is in fluid communication with said inflatable envelope, forms an outer chamber between an exterior wall of said interior portion and said pump housing;
- a first single-direction valve disposed in said enclosing wall and in fluid communication with said outer chamber; and
- a second single-direction valve disposed in said pump housing and in fluid communication with said outer chamber for the inlet of air.

4,870,984
PORTABLE SHELTER WITH WIND BREAK
Leo E. Roth, 70354 Sunrise Dr., Edwardsburg, Mich. 49112
Filed Jan. 17, 1989, Ser. No. 297,207
Int. Cl.⁴ A47C 21/00

U.S. Cl. 135—109

4 Claims



1. A portable shelter comprising a pair of spaced apart runners, a frame carried upon said runners, said frame adapted to support a cover with said cover extending downwardly to at least said runners and having at least three enclosing sides, one of said sides adapted to extend to and along each runner, and hinged plate means extending between said runners and shiftable between a lowered position extending to the bottom of said runners for blocking the flow of air between the runners under said covering when supported by said frame and a raised position to allow non-interfering movement of the runner across a supporting surface.

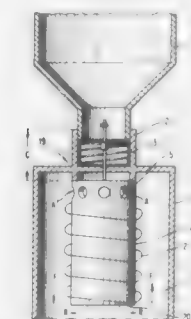
4,870,985
FLOW CONTROL VALVE
Rene Mariotti, Saint Cloud, France, assignor to Ore-Ida Vended Products, Inc., Boise, Id.
Continuation of Ser. No. 927,481, Nov. 6, 1986, abandoned. This application Nov. 4, 1988, Ser. No. 267,648
Claims priority, application France, Nov. 8, 1985, 85 16548
Int. Cl.⁴ A47J 37/12

U.S. Cl. 137—102

12 Claims

1. A flow control valve inserted in a closed circuit for the flow of a fluid likely to be at two different temperatures, said valve comprising: a flow tube having at least one admission orifice for said fluid at its first temperature from a reservoir to a receiver where the temperature variation occurs and at least one return passage for said fluid at its second temperature from the receiver towards the reservoir where an inverse temperature variation occurs, first means adapted to close off the return passage whilst the admission orifice is open, and second means adapted to close off the admission orifice whilst the return passage is open, wherein the flow tube is immersed in

the reservoir, wherein the return passage opens out into the reservoir at a substantial distance from the admission orifice whereby no appreciable mixing occurs between the fluid at its first temperature and ready to be admitted into the receiver and the fluid at its second temperature and returned from the receiver, wherein the flow tube includes a common section for both the admission and the return flow, positioned downstream

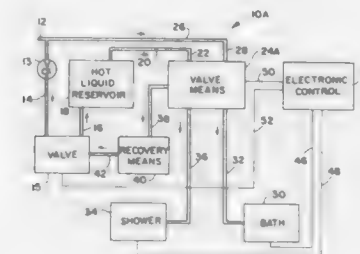


of the admission orifice in the direction of admission of the fluid, wherein said admission orifice is formed in the wall of said flow tube and in that said return passage is formed by a space left vacant between a section of the tube itself and a mobile mushroom valve in the tube and able to cooperate with a narrowed portion of said section for closing said outlet passage, said mushroom valve thus forming said first closure means.

4,870,986
DISPENSING SYSTEM
John P. Barrett, 879 Harbor Island, Clearwater, Fla. 33515; Daniel R. Schulz, P.O. Box 892, Crystal Beach, Fla. 33523; David E. Kent, Box 5286, Palm Harbor, Fla. 33563; Robert J. deFasselle, 8603 Chardon Rd., Kirtland, Ohio 44094, and Henry E. Zega, 2242 Jaffa Pl., Clearwater, Fla. 33546
Division of Ser. No. 869,278, Jun. 20, 1986, Pat. No. 4,753,265, which is a division of Ser. No. 691,681, Jan. 14, 1985, Pat. No. 4,700,884, which is a continuation-in-part of Ser. No. 510,750, Jul. 5, 1983, Pat. No. 4,635,844, which is a division of Ser. No. 428,921, Sep. 30, 1982, Pat. No. 4,409,694. This application Mar. 1, 1988, Ser. No. 162,659
Int. Cl.⁴ E03C 1/044

U.S. Cl. 137—119

9 Claims



1. A liquid recovery system for use with a hot liquid pressure line and a cold liquid pressure line; the hot liquid pressure line emanating from a hot liquid reservoir, comprising in combination:
valve means interconnecting the hot liquid pressure line and the cold liquid pressure line to a mixed liquid outlet means;
a divert output in said valve means;
said valve means having a divert position for diverting liquid from said valve means into said divert output dependent

upon the temperature of the liquid from the mixed liquid outlet means and
recovery means interconnecting said divert outlet to the hot liquid reservoir for recovering liquid entering said valve means which is below a preselected temperature desired at said liquid outlet means.

4,870,987
RELATING TO A FLOW REGULATOR FOR
INTRAVENOUS INJECTION DEVICE
Ton-Lin Cheng, No. 23, Lane 70, Min-Tsu 2nd Rd., Kaohsiung, Taiwan

Filed Jul. 22, 1988, Ser. No. 223,013
Int. Cl.⁴ F16K 31/22

U.S. Cl. 137—192

3 Claims



1. A flow regulator for an intravenous injection device comprising:
a cylindrical outer container having a cylindrical outer wall which has a top end and a lower portion with a bottom outlet;
an inner container disposed in said outer container and having an inner wall substantially conforming to the shape of said lower portion of said outer wall, said inner wall abutting an inner side of said lower portion of said outer wall, said inner wall having a top open end remote from said top end of said outer container and a restricted tubular bottom end extending out of said bottom outlet of said outer wall,
a first cover plate closing said open top end of said inner container, said cover plate having a central opening,
a second plate positioned in said inner container below said first plate, said second plate having a first valve seat;
a flexible tube sleeved on said restricted tubular bottom end of said inner container,
a float valve body provided in said inner container and having an elongated slender upper portion which is suddenly restricted at an upper side of said float body, and an elongated tapered lower portion at a lower side of said float body, said slender upper portion extending through said central opening, said tapered lower portion having an upper portion passing through said valve seat and an end portion extending beyond said restricted tubular bottom end of said inner container and then entering said flexible tube, said upper portion of said tapered lower portion having a first surface portion to contact tightly said first valve seat.

4,870,983

ONE-PIECE DRAIN HOSE OFR AN AUTOMATIC WASHER

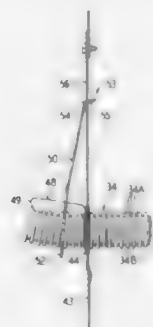
Richard D. Hood, Jr., Benton Township, Berrien County; John D. Cleminshaw, St. Joseph, and Jack E. Blakeman, Oronoko Township, Berrien County, all of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Continuation of Ser. No. 105,347, Oct. 7, 1987, abandoned. This application Nov. 2, 1988, Ser. No. 267,682

Int. Cl.⁴ F16L 3/00; F16M 13/00

U.S. Cl. 137—343

16 Claims



1. A drain system for an automatic washer having a cabinet surrounding a wash tube connected to an exterior drain by means of a conduit extending from said tube to a pump and from said pump to said drain comprising:

- a one-piece hose having a coupling integrally formed on a first end, said coupling being sized to attach to a discharge outlet of said pump,
- an opening formed in a wall of said washer cabinet sized at least slightly larger than a diameter of said hose,
- a stop means on said hose for engaging said cabinet wall upon sufficient withdrawal of said hose through said opening; and
- an interference means for removably engaging said hose with a first portion and for engaging said cabinet wall with a second portion;

such that said first end of said hose is secured to said pump discharge outlet and said second end of said hose is directed through said opening to be retained in a slightly exposed position by said interference means during a shipping period until grasped to withdraw additional portions of said hose from the interior of said cabinet until said stop means engages said cabinet wall as said second free end is directed toward a drain.

4,870,989

HIGH TEMPERATURE SAFETY RELIEF SYSTEM

Cleo M. Bickford, Cypress; Walter W. Powell, Sugar Land, and Larry A. Sample, Houston, all of Tex., assignors to Keystone International, Inc., Houston, Tex.

Division of Ser. No. 209,194, Jun. 20, 1988. This application Nov. 7, 1988, Ser. No. 268,191

Int. Cl.⁴ G05D 16/00

U.S. Cl. 137—489

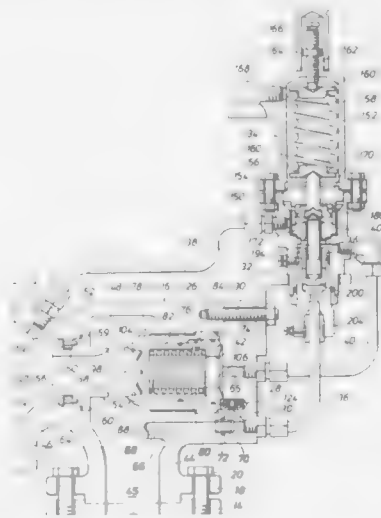
13 Claims

1. In a high temperature safety relief system for a pressure vessel having a flowline connected to the pressure vessel;

- an improved high temperature main pressure relief valve in the flowline having a reciprocal relief valve member and a dome fluid chamber adjacent the valve member for control fluid, and an improved non-flowing pilot valve in fluid communication with the flowline and the dome chamber for controlling the operation of the main relief valve;

said improved main pressure relief valve having a valve body with inlet and outlet flow passages having longitudinal axes generally at right angles to each other and an annular valve seat about the outlet flow passage, said valve member being mounted within the valve body for

reciprocal movement generally along the longitudinal axis of said outlet flow passage between open and closed positions relative to said valve seat, said valve member having an inner end thereof adapted for seating on said valve seat and an outer end exposed to dome pressure, the effective fluid pressure area of the outer end of the reciprocal valve member exposed to dome pressure and the effective fluid pressure area of the inner end of the reciprocal valve member exposed to outlet fluid pressure, said piston valve member having an annular area radially outwardly of said valve seat being exposed to inlet fluid pressure in said valve body in closed seated position on said valve seat; fluid cushioning means associated with said reciprocal relief valve member of said main relief valve to provide fluid



cushioning of said relief valve member during return movement of the relief valve member to closed position on said valve seat after being opened, said fluid cushioning means including a fluid metering chamber and fluid flow restriction means therefor to effect fluid cushioning during said return movement; and

said improved non-flowing pilot valve having an inlet chamber in fluid communication with said flowline from said pressure vessel, an outlet fluid chamber in fluid communication with atmosphere, an intermediate fluid chamber in fluid communication with said dome chamber of said main valve, and a reciprocal valve member in the intermediate chamber movable between open and closed positions relative to said outlet chamber.

4,870,990

DOUBLE-FLOW BUTTERFLY VALVE PART

Rudolf Bierling, Schwaigern; Max Ruf, and Wilhelm Hannibal, both of Neckarsulm, all of Fed. Rep. of Germany, assignors to Audi AG, Neckarsulm, Fed. Rep. of Germany

Filed Feb. 17, 1989, Ser. No. 312,955

Claims priority, application Fed. Rep. of Germany, Feb. 18, 1988, 3805031

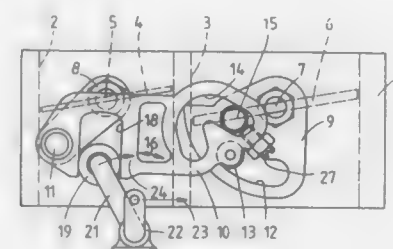
Int. Cl.⁴ F02D 9/02; F02M 11/02

U.S. Cl. 137—595

5 Claims

1. A double-flow butterfly valve part having a first flow channel with a first butterfly valve, a second flow channel with a second butterfly valve, having a shaft means for swiveling the first butterfly valve, a rod linkage for connecting the shaft of the first butterfly valve with the shaft of the second butterfly valve in such a manner that the second butterfly valve commences to open up only when the first butterfly valve is moved beyond a partially open position and is then moved together with the first butterfly valve into a completely open position, and spring means which urges the two butterfly valves to

return to their closed position, the rod linkage having a first lever that is non-rotatably connected to the first butterfly valve shaft and a second lever that is non-rotatably connected to the second butterfly valve shaft, the levers being connected together by means of a coupling element, the lines of action of the two levers are parallel to one another in the open position and in the closed position of the butterfly valves, the second lever has a first arched slot, which is engaged by a roller dis-



posed on the coupling element, the coupling element has a second arched slot, which is engaged by a second roller disposed on the second lever, the two arched slots being so shaped and the two rollers being so disposed, that the coupling element forcibly shifts the second butterfly valve in the opening direction as well as in the closing direction, and the spring means being coupled with the first butterfly valve or a member non-rotatably connected thereto.

4,870,991

LAWN SPRINKLER FERTILIZER DEVICE

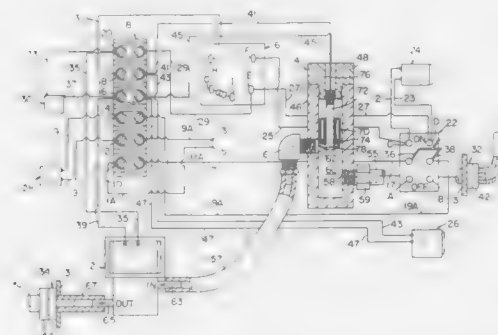
Thomas A. McMillan, 101 Dory Rd., North Palm Beach, Fla. 33408, and Henry W. Mitchell, 9744 Dogwood Ave., Palm Beach Gardens, Fla. 33410

Filed Aug. 17, 1988, Ser. No. 233,259

Int. Cl.⁴ F16K 31/18

U.S. Cl. 137—624.12

18 Claims



1. An apparatus for directing a liquid additive into an irrigation system for covering a specific area including conduit means for directing a flow of liquid additive therethrough, said conduit means having an inlet and an outlet; a float switch device; solenoid valve means; said float switch device having an electric switch and a float in a chamber for actuating it; said solenoid valve means having an on-off valve and a solenoid for actuating it; said chamber and on-off valve being located in series in said conduit means; an electrical circuit means for opening and closing said solenoid valve; said electrical circuit means having an on TM off switch for connection to a electrical source, an automatic timer device for conducting electricity therethrough for a predetermined period of time after electricity has been directed thereto then automatically stopping the flow of electricity; said on-off switch, automatic timer device,

solenoid, and electric switch being in series in said electrical circuit means.

4,870,992

BACKFLOW PREVENTION DEVICE

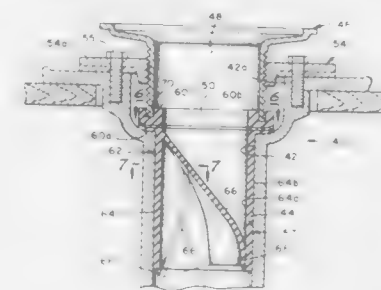
Lawrence F. Irwin, Los Angeles, and Frank Irwin, Oceano, both of Calif., assignors to Augerscope, Inc., Sylmar, Calif.

Continuation-in-part of Ser. No. 938,417, Dec. 5, 1986, abandoned. This application Dec. 28, 1987, Ser. No. 138,807

Int. Cl.⁴ F16K 15/14

U.S. Cl. 137—846

4 Claims



1. A backflow prevention device for use in fluid conduits having an inlet opening and a longitudinally extending surface proximate thereto comprising:

- (a) a first member having a fluid inlet, a fluid outlet and an edge portion circumscribing said fluid outlet;
- (b) connector means for removably connecting said first member to the fluid conduit proximate the inlet opening thereof; and
- (c) valving means disposed intermediate said edge portion of said first member and said inlet opening of said fluid conduit for permitting free flow of fluids into said inlet opening but blocking fluid flow in the opposite direction, said valving means comprising a valve member including:
 - (i) an annular portion;
 - (ii) a body portion having a yieldable deformable, generally cylindrically shaped wall connected to and extending generally perpendicular away from said annular portion, said walls having an inner surface and an outer surface, said outer surface being normally disposed in close engagement with said longitudinally extending surface of said fluid conduit; and
 - (iii) a yieldably deformable tongue portion having spaced apart edge portions interconnected with said inner surface of said walls of said body, said tongue portion having inner and outer surfaces, a portion of said outer surface being normally disposed in close engagement with said inner surface of said walls to prevent fluid flow in a first member, said portion of said outer surface of said tongue being yieldably deformable in response to fluid pressure to a position spaced a part from said inner surface of said walls to permit fluid flow in a second direction away from said fluid inlet of said first member.

4,870,993

MULTI-GAS VALVES COMPACT SET FOR COOKERS

Jose G. Casuso, Francisco Salazar, 14-6 Izda., 39004 - Santander, Spain

Continuation of Ser. No. 797,135, Nov. 12, 1985, abandoned.

This application Jan. 6, 1988, Ser. No. 140,870

Claims priority, application Spain, Jun. 27, 1985, 287.704

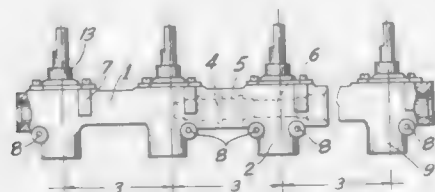
Int. Cl.⁴ F16K 1/00

U.S. Cl. 137—883

13 Claims

1. A multi-gas valve compact set for cookers comprising one or more contiguous self-contained bodies, each comprising an outlet to a burner; a means for regulating gas flow; a longitudinal passage extending through said body for allowing gas to

flow to said burner and to said other bodies, said longitudinal passage being threaded along the interior surface of each of its ends; a substantially perpendicular passage extending from said longitudinal passage to said means for regulating gas flow; and a passage extending from said means for regulating gas flow to said burner; and



an externally threaded sleeve with watertight seals for engaging said threads of said longitudinal passages of two contiguous bodies, said sleeve having a length such that when tightened, said bodies meet, such that about half of said sleeve lies within one body and about half of said sleeve lies within the next body, said threaded sleeve being completely internal to said connected contiguous bodies.

4,870,994 AIR ACCUMULATOR

James H. Raymond, 459 Cross St., Boylston, Mass. 01505
Filed Jan. 19, 1988, Ser. No. 145,464
Int. Cl.⁴ A01G 25/09

U.S. Cl. 137—899.4

6 Claims



1. A portable air accumulator for pneumatic tools for use with a compressor assembly having a motor, an air compressor and an air storage tank, said accumulator comprising:

- (a) an enclosed container for holding a quantity of compressed air,
- (b) a supporting base which is fixed to the bottom of the container,
- (c) an inlet fixture which is connected to the container for operatively connecting the container to said air compressor at a remote location by an air line, and
- (d) at least two outlet fixtures which are connected to the container for operatively connecting said container to at least two pneumatic tools at remote locations by means of air lines, each of said outlet fixtures having an independently adjustable air pressure valve.

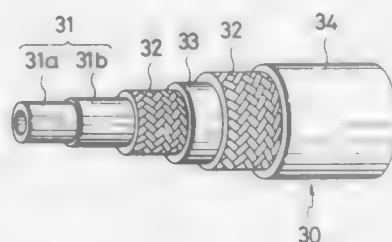
4,870,995 HOSE

Shigeru Igarashi, and Osamu Ozawa, both of Hiratsuka, Japan, assignors to The Yokonama Rubber Co., Ltd., Tokyo, Japan
Continuation of Ser. No. 137,615, Dec. 24, 1987, abandoned.
This application Oct. 11, 1988, Ser. No. 256,178
Claims priority, application Japan, Dec. 27, 1986, 61-309891; Dec. 27, 1986, 61-309892

Int. Cl.⁴ F16L 09/14

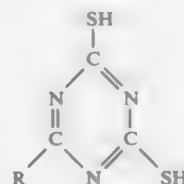
U.S. Cl. 138—126

6 Claims



1. A hose comprising:

- (a) an inner tube having an inner layer and an outer layer; and
- (b) a reinforcement layer laminated peripherally on said inner tube;
- (c) said inner layer being formed of at least one rubber composition, said rubber composition including a copolymer rubber comprising 10-45 weight percent of units of an unsaturated acrylonitrile, 0-5 weight percent of units of a conjugated diene, and 90-50 weight percent of units of an unsaturated ethylenic monomer other than an unsaturated acrylonitrile and/or units of a conjugated diene hydrogenate; and
- (d) said outer layer being formed of a second rubber composition comprising:
a sulfur-vulcanizable starting rubber, sulfur in an amount of 0.1-10 parts by weight based on 100 parts by weight of said starting rubber,
an organic peroxide in an amount of 0.2-15 parts by weight based on 100 parts by weight of said starting rubber, and
a 6-R-2,4-dimercapto-1,3,5-triazine compound in an amount of 0.2-15 parts by weight based on 100 parts by weight of said starting rubber, said triazine compound being represented by the formula



where

R is a mercapto, alkoxy, mono- or di-alkylamino, mono- or di-cycloalkylamino, mono- or di-arylamino, or N-alkyl-N'-arylamino group.

4,870,996 IMPROVEMENTS IN THE GRIPPER TRANSPORTATION SYSTEM OF A SHUTTLELESS LOOM

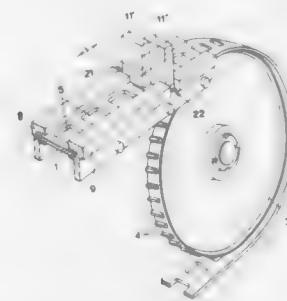
Luciano Corain, and Gianni Maitan, both of Vicenza, Italy, assignors to Nuovopignone-Industrie Meccaniche e Fonderia S.p.A., Florence, Italy

Filed Jul. 20, 1988, Ser. No. 225,865

Claims priority, application Italy, Sep. 18, 1987, 21956 A/87
Int. Cl.⁴ D03G 1/00

U.S. Cl. 139—1 R

3 Claims



1. A lubrication system for use in a shuttleless loom gripper transport mechanism of the perforated tape and toothed sprocket type wherein the gripper is attached to one end of a flexible perforated tape, the perforated tape being slidably mounted in first and second horizontal U-shaped guides located along the tape's two edges and where the teeth of the sprocket mesh with the perforations of the tape so that the tape reciprocates when the sprocket is rotated in alternate directions, wherein the improvement comprises:

said first and second U-shaped guides each having first and second transverse slots in close proximity to the sprocket through which slots a solid stick of porous synthetic material impregnated with liquid lubricant can move; and means for urging the stick of porous material against the tape with adjustable pressure.

4,870,997

LOOM WITH SELECTIVELY POSITIONABLE SHUTTLE MECHANISM

Charles M. Brown, and Robert B. Doughty, Jr., both of Starkville, Miss., assignors to Niagara Lockport Industries Inc., Quincy, Fla.

Filed Jul. 1, 1988, Ser. No. 214,209

Int. Cl.⁴ D03D 43/06

U.S. Cl. 139—172

15 Claims



1. In a loom having a shuttle raceway extending across the weaving path of the loom between opposite ends of the loom weaving surface and in which a shuttle moves reciprocatingly across said raceway between two multiple cell shuttle box assemblies, said shuttle being propelled by picking apparatus positioned adjacent each said shuttle box assembly, each said multiple cell shuttle box assembly having a plurality of shuttle

cells with each said cell being mounted for selective movement between a position in alignment with the path of a shuttle moving along said raceway and at least one position out of alignment with the path of said shuttle along said raceway, said loom including support structure for carrying said raceway, said shuttle multiple cell box assemblies and said picking apparatus, the improvement comprising:

said loom being configured for mounting said multiple cell shuttle box assemblies and said picking apparatus at any of a plurality of positions along said raceway, whereby the loom may be configured to have a waving width substantially narrower than the total width of the raceway for weaving a fabric substantially narrower than the total width of the raceway.

4,870,998

LOW STRETCH PAPERMAKING FABRIC

William T. Westhead, Waycross, Ga., assignor to SCAPA, Inc., Waycross, Ga.

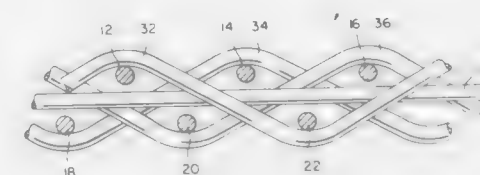
Continuation of Ser. No. 014,397, Feb. 13, 1987, abandoned.

This application Oct. 6, 1988, Ser. No. 253,915

Int. Cl.⁴ D21F 1/10

U.S. Cl. 139—383 A

26 Claims



1. A stretch- and shrinkage-resistant dryer fabric comprising:

a low tension finished woven structure including a plurality of machine direction yarns and a plurality of cross-machine direction yarns made from at least one of polyester and polyamide material interwoven according to a preselected weave pattern to define the woven structure having at least a top plane and a bottom plane, and

a plurality of load control yarns extending in the machine direction between said top and bottom planes and between said cross-machine direction yarns, said load control yarns being essentially straight and passing linearly and substantially uncrimped through the interior of the woven fabric structure, and

said load control yarns being made from an aramid synthetic material having high strength and low shrinkage characteristics capable of withstanding high tensile loads without appreciable stretch under high heat and high tension, and being resistant to shrinkage under high heat and low tension,

the plurality of machine and cross-machine direction yarns being arranged to cover the load control yarns so as to protect said load control yarns from wear and heat deterioration and the plurality of machine and cross-machine direction yarns having better abrasion characteristics than said load control yarns so that full advantage is taken of the strength and resistance to stretch and shrinkage characteristics of said load control yarns.

4,870,999

PROCESS FOR FORMING EMBELLISHED FABRIC BY
CORE YARN REMOVAL

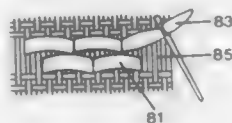
Linda H. Dennis, 130 Applewood Ln., Spartanburg, S.C. 29302

Filed Jan. 3, 1989, Ser. No. 293,560

Int. Cl.⁴ D03D 13/00

U.S. Cl. 139—233 R

1 Claim



1. A process for forming an embellished fabric comprising the steps of:

- providing:
 - a woven flat fabric,
 - said flat fabric having four (4) edges and being generally square or rectangular,
 - a discontinuity near each said edge and parallel thereto and coextensive therewith,
 - said discontinuity being of a core yarn of greater size than the yarn forming the bulk of the fabric to define a central square or rectangle within the center of said fabric and border areas along each said edge,
 - removing said core yarns to leave a relic where said core yarn existed;
 - weaving an embellishment through said relic about said central square or rectangle.

4,871,000

METHOD AND APPARATUS FOR THE CONTINUOUS
MEASUREMENT OF THE DEPTH OF A RADIOACTIVE
GLASS MELT FLOWING INTO A CONTAINER

Harald Ritter, Isernhagen, Fed. Rep. of Germany, assignor to Deutsche Gesellschaft für Wiederaufarbeitung von Kernbrennstoffen mbH, Hanover, Fed. Rep. of Germany

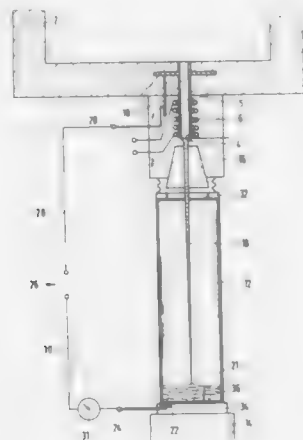
Continuation of Ser. No. 886,653, Jul. 18, 1986, abandoned. This application May 26, 1988, Ser. No. 201,286

Claims priority, application Fed. Rep. of Germany, Jul. 31, 1985, 3527349

Int. Cl.⁴ B67C 3/20; G01F 23/24

U.S. Cl. 141—95

4 Claims



1. A method for measuring the depth of fill of an electrically conductive liquid flowing in a stream from a point of discharge of a first container into a second container, the depth of fill being the depth of the liquid in the second container, the method comprising:

- causing electricity to flow in the stream from the first container to the second container; measuring an electrical

characteristic of the electricity flowing in the stream; calculating the depth of fill utilizing the electrical characteristic; in which the calculation of the depth of fill includes the steps of: calculating the length of the stream from the point of discharge to the fill, utilizing the electrical characteristic; and calculating the depth of fill utilizing the calculated length of the stream; in which the step of causing electricity to flow in the stream includes causing an electrical current to flow in the stream, and the step of measuring an electrical characteristic of the electricity includes measuring the electrical current in the stream; in which the step of measuring an electrical characteristic of the electricity includes measuring the electrical resistance of the electrical current in the stream; and in which the step of calculating the length of the stream includes calculation of the length of the stream according to the relationship: $L = (R \times F) / P$, where L equals the length of the stream, R equals the measured electrical resistance, F equals a cross-sectional area of the stream, and P equals the density of the liquid in the stream.

4,871,001

DEVICE FOR FILLING VISCOUS MATERIAL

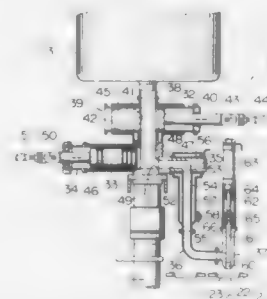
Masao Nobuta, Naruto, and Tetsuya Iuchi, Tokushima, both of Japan, assignors to House Food Industrial Company, Ltd., Japan

Filed Dec. 28, 1987, Ser. No. 138,840

Int. Cl.⁴ B65B 3/12

U.S. Cl. 141—279

4 Claims



1. A device for filling a container with a fluid substance of high viscosity, the container being transported on a path by a conveyor, comprising:

- tank means for receiving the fluid substance;
- a filling nozzle having a downwardly oriented discharge outlet and spool means for opening and closing said discharge outlet, said discharge outlet being disposed just above the path of the conveyor;
- communicating means for fluid-connecting said tank means with said filling nozzle, said communicating means including discharging means for discharging the fluid substance at a constant flow rate, said discharging means comprising shut-off means for opening and shutting said communicating means and cylinder-piston means for filling the container with the fluid substance;
- a vibratable arm having an upper portion and a lower portion, said filling nozzle being mounted on said lower portion of said arm;
- a horizontal axle supporting said upper portion of said arm in a freely rotatable and reversible manner; and
- vibrating means serving as a vibration center for vibrating said arm on said horizontal axle.

4,871,002

ROUTER FIXTURE

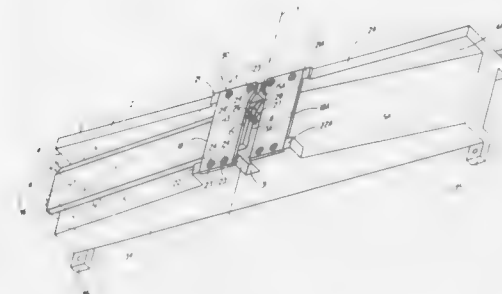
Michael T. Turner, 811 E. Street Ext., Victor, N.Y. 14564

Filed Feb. 2, 1989, Ser. No. 305,160

Int. Cl.⁴ B27C 5/10

U.S. Cl. 144—144 R

9 Claims



1. A fixture for use with a router for trimming an end of a first molding strip to fit against the corresponding face of another molding strip, said fixture comprising:

- (a) a longitudinal rear guide member for aligning one edge of said first molding strip thereto;
- (b) a work surface member being fixed to said longitudinal rear guide member at an angle of declination from a given point on said longitudinal rear guide member for supporting a face of said first molding strip thereon;
- (c) a horizontal router support member being mounted above said given point on said longitudinal rear guide member,
- (i) said horizontal router support member having an edge guide for guiding a cutter of said router across said end of said first molding strip; and
- (d) a means for fixing said horizontal router support member transverse to said work surface member and said longitudinal rear guide member for trimming said end of said first molding strip.

4,871,003

LOG SURFACE HEWING PROCESS

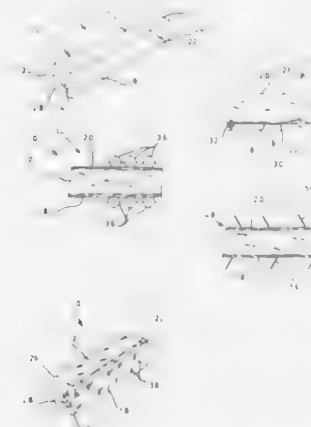
Gordon H. Lucas, and Randy K. Giles, both of Jefferson County, Tenn., assignors to Hearthstone Builders, Inc., Dandridge, Tenn.

Filed Sep. 22, 1988, Ser. No. 247,717

Int. Cl.⁴ B27L 5/02

U.S. Cl. 144—369

19 Claims



1. A log surface hewing process for reconfiguring the surfaces of a construction log used in the construction of log

structures to produce a log having the appearance of a hand-hewn log, said process being applied to a construction log comprising an elongated body defining a substantially rectangular cross-section, and including first and second end portions and a longitudinal axis extending therebetween, said body further defining front and rear oppositely disposed surfaces and longitudinally extending upper and lower forward edge portions and longitudinally extending upper and lower rearward edge portions, said process comprising the steps of:

- chamfering at least said upper and lower forward edge portions of said body using a first power driven rotary cutting means to produce irregularly beveled upper and lower forward corners;
- cutting a plurality of indentations in at least said front surface of said body using a second power driven rotary cutting means; and
- scoring at least said front surface of said body using a third power driven cutting means to provide a plurality of substantially laterally disposed scoring cuts in said front surface.

4,871,004

RUBBER CONTAINING ARAMID PULP
REINFORCEMENT

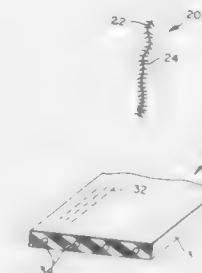
Robert J. Brown, Cuyahoga Falls, and Richard M. Scriver, Atwater, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Feb. 17, 1988, Ser. No. 156,769

Int. Cl.⁴ B60C 9/18; C08K 3/00

U.S. Cl. 152—209 R

25 Claims



1. A process for preparing a vulcanized elastomer composite which comprises:

- (a) forming a premix consisting essentially of fibrillated aramid fibers and one or more particulate reinforcing agents selected from the group consisting of carbon black, silica and clay, said premix containing the entire quantity of aramid fibers desired in said composite and sufficient quantity of said reinforcing agent to cause partitioning of said aramid fibers and thereby promote subsequent compounding of said aramid fibers with elastomers, said aramid fibers being composed of
 - (1) a trunk portion having a length in the range of about 0.2 to about 5 millimeters, a diameter in the range of about 0.005 to about 0.02 millimeters and an aspect ratio greater than about 100, and
 - (2) a plurality of fibrils extending outwardly from said trunk and having diameters substantially smaller than the diameter of the trunk from which they extend, said fibers having a surface area in the range of about 4 to about 20 square meters per gram,
- (b), mixing said premix with a vulcanizable elastomeric matrix material, additional amounts of said one or more particulate reinforcing agents and additional tire compounding ingredients in the absence of a solvent to form an unvulcanized elastomer composition, the quantity of said aramid fibers in said composition not exceeding 5 parts by weight per 100 of elastomer, and
- (c) curing the resulting composition.

4,871,005

VEHICLE TIRE INTENDED TO BE FITTED WITH SPIKES

Unto Lindén, Hämeenlinna, Finland, assignor to Neste OY, Finland

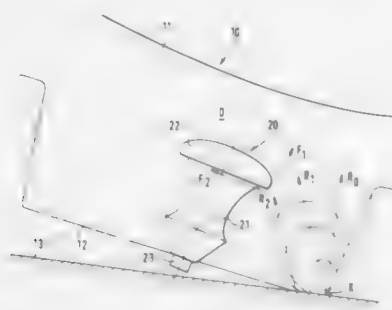
PCT No. PCT/FI87/00124, § 371 Date Apr. 20, 1988, § 102(e) Date Apr. 20, 1988, PCT Pub. No. WO88/01944, PCT Pub. Date Mar. 24, 1988

PCT Filed Sep. 18, 1987, Ser. No. 187,535

Claims priority, application Finland, Sep. 19, 1986, 863802 Int. Cl.⁴ B60C 11/14

U.S. Cl. 152-210

17 Claims



1. A vehicle tire fitted with at least one spike, said tire comprising at least one asymmetric or non homogeneous region disposed in said tire to generate a force component turning the spike fitted in the tire to meet a road surface in substantially perpendicular position at initial contact with the road surface, upon rotation of said tire.

4,871,006

DUAL FLUTED SHADE

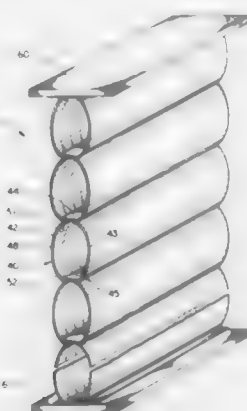
James Kao, 2400 S. Whitehall Dr., #2060, Mundelein, Ill. 60060, and Joseph Hsu, 35 Lane 46, Chung-Shan N. Rd., Sec. 5, Taipei, Taiwan (111)

Filed Jan. 19, 1988, Ser. No. 145,369

Int. Cl.⁴ A47H 5/00; B32B 3/12

U.S. Cl. 160-84.1

2 Claims



1. An insulating dual fluted shade, comprising: a first one-piece panel and a second parallel one-piece panel each having a plurality of adjacent deep flutes having a large radius peak and leg portions, each of the flutes having an arc greater than 90 degrees, said first and second panels being attached to each other in opposed relation so the flute arcs extend outwardly on both sides to uniformly spread and not concentrate light impinging on the outside of the deep flutes on either panel, the leg portions of adjacent flutes forming sharp points, the points on the first panel being aligned with the points on the second panel, and a connecting strip connecting each of the aligned points on the first and second panels, said strips being directly

connected to the first and second panels without any intermediate layers of material, and said first and second panels being sufficiently flexible so that the shade is collapsible in a direction perpendicular to the strips, said flutes being open-ended and non-inflatable.

4,871,007

OVERHEAD DOOR CONSTRUCTION FOR PROVIDING INCREASED DOOR OPENING CLEARANCE

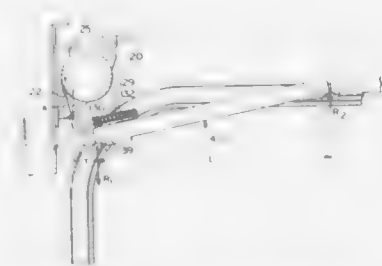
Andrew Abolins, Langhorne, Pa., assignor to Strick Corporation, Langhorne, Pa.

Filed Sep. 19, 1988, Ser. No. 245,893

Int. Cl.⁴ E05D 15/20

U.S. Cl. 160-201

18 Claims



1. In an overhead door assembly comprising a door for closing a door opening, said door comprising a plurality of door panels and a plurality of hinges, each said door panel hingedly connected to at least one adjacent door panel by said hinges so as to form a generally rectangular door having parallel side edges, a lowermost edge and an uppermost edge; a plurality of rollers rotatably connected to one of said door panels and said hinges, said rollers extending over the side edges of the door; a pair of guide tracks, said guide tracks guiding said rollers for movement therein, said door being supported by said guide tracks through said rollers for movement between an open and a closed position such that in said closed position a bottom one of said plurality of door panels substantially contacts the lower edge of said door opening; a load balancing operator fixedly mounted proximate at least one of said plurality of guide tracks, said load balancing operator including a cable having a first distal end connected to said operator and a second distal end connected to said bottom door panel; the improvement comprising a cable anchor having a first portion secured to the door and a second portion moveable with respect to the door, the second distal end of the cable being connected to the second portion of the cable anchor such that the second distal end of the cable is moveably connected to the door such that when the door is in said open position the cable is attached to said cable anchor at a point beyond the lowermost edge of said door.

4,871,008

METHOD OF MAKING METAL MATRIX COMPOSITES

Ratnesh K. Dwivedi, Wilmington, and Virgil Irick, Jr., Hockessin, both of Del., assignors to Lanxide Technology Company, LP, Newark, Del.

Filed Jan. 11, 1988, Ser. No. 142,385

Int. Cl.⁴ B22D 19/14; B22C 1/00

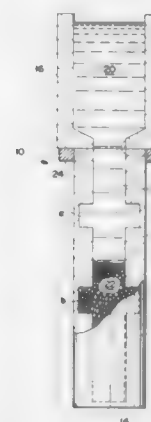
U.S. Cl. 164-6

25 Claims

1. A method of producing a metal matrix composite, comprising:

(a) forming a substantially impervious mold by the steps comprising of:

- (i) providing a permeable preform having a cavity and comprised of a first filler material;
- (ii) contacting a molten parent metal with said preform and with an oxidant to react molten parent metal with said oxidant to form an oxidation reaction product within a temperature range extending from a temperature above the melting point of said parent metal to a temperature below the melting point of said oxidation reaction product;
- (iii) maintaining at least a portion of said oxidation reaction product in contact with and extending between said molten parent metal and said oxidant to progressively draw molten parent metal through the oxidation reaction product towards the oxidant and into said preform so that the oxidation reaction product continues to form within said preform at the interface between said oxidant and previously formed oxidation reaction product;



- (iv) continuing said oxidation reaction within said temperature range to embed at least a portion of said preform within said oxidation reaction product by growth of the oxidation reaction product to thereby provide an impervious mold with said cavity; and
- (v) removing at least a portion of excess metal from said cavity which has not reacted with said oxidant to form oxidation reaction product;
- (b) emplacing a permeable mass of a second filler material within said cavity of said impervious mold, and contacting said mass of second filler with at least one molten metal selected from the group consisting of aluminum and magnesium;
- (c) hermetically sealing the mold contents for a period of time sufficient to spontaneously infiltrate said mass of second filler with said at least one molten metal; and
- (d) upon completion of step (c), solidifying said at least one molten metal to provide said metal matrix composite.

4,871,009

ANTI-SHIFT ASSEMBLY FOR MOLD MATCHBOARDS

Adolf P. E. Volkmann, 425 N.E. 80th Ave., Portland, Oreg. 97213

Filed Mar. 31, 1989, Ser. No. 331,234

Int. Cl.⁴ B22C 7/00, 9/02

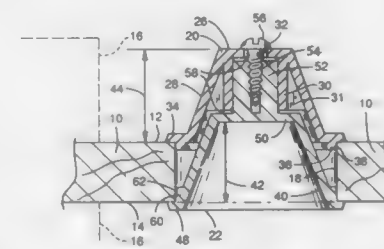
U.S. Cl. 164-243

8 Claims

1. An anti-shift assembly for mold matchboards of the type having opposite pattern supporting surfaces, said assembly comprising:

- first insert means having a portion thereof arranged to be engaged with one surface of the matchboard and in alignment with a bore in the matchboard,
- second insert means having a portion thereof arranged to be engaged with the opposite surface of the matchboard at the bore,
- said first and second insert means having impression forming

portions arranged to make recessed and projecting contours respectively in impression material with a close tolerance interfitting engagement when in facing relation to provide anti-shifting connection to opposed portions of the impression material,



said first insert means being arranged to project outwardly from the surface of the matchboard against which it is seated and said second insert means being arranged to project into the bore,

said first and second insert means having telescopically engaging portions precisely aligning said first and second insert means in their impression forming functions.

4,871,010

VERTICAL INJECTION APPARATUS FOR DIE CASTING MACHINE

Sadayuki Dannoura, Yamaguchi, Japan, assignor to Ube Industries, Ltd., Ube, Japan

Continuation of Ser. No. 81,345, Aug. 4, 1987, Pat. No. 4,779,664, which is a division of Ser. No. 830,971, Feb. 19, 1986, abandoned. This application Jul. 15, 1988, Ser. No. 219,737

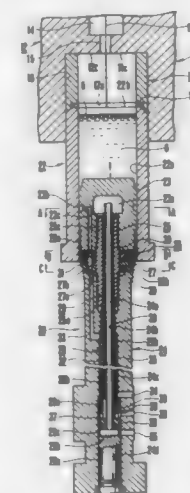
Claims priority, application Japan, Feb. 20, 1985, 60-30539; Feb. 20, 1985, 60-21996; Apr. 5, 1985, 60-70790

The portion of the term of this patent subsequent to Oct. 25, 2005, has been disclaimed.

Int. Cl.⁴ B22D 17/14

U.S. Cl. 164-253

9 Claims



1. A vertical injection apparatus for a die casting machine comprising:

- a die having a die cavity;
- an injection sleeve slidably fitted in an injection bore formed in the lower end portion of said die;
- a stationary sleeve fixedly mounted in the injection bore and engagable with said injection sleeve; and
- plunger means, slidable in said injection sleeve, for injecting a molten material poured into said injection sleeve, a first portion of said injection sleeve, which comes into contact

with said molten material poured into said injection sleeve, permitting the intrusion of ambient air; evacuation means for evacuating ambient air from said die and said injection sleeve prior to the initiation of said injection of said molten material, said evacuation means including a timing means for controlling said evacuation means such that said ambient air is evacuated from said first portion of said injection sleeve a predetermined amount of time prior to the evacuation of said ambient air from said die.

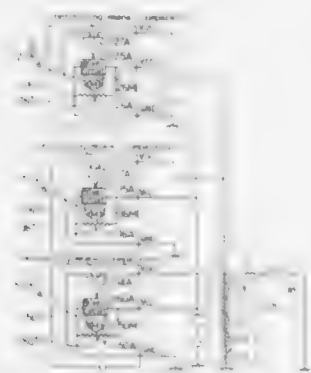
4,871,011

AIR-CONDITIONING EQUIPMENT FOR VEHICLE

Tadahiro Takahashi; Shinichi Ooi, and Masami Takemasa, all of Saitama, Japan, assignors to Diesel Kiki K.K., Tokyo, Japan
Filed May 24, 1988, Ser. No. 180,566

Claims priority, application Japan, Mar. 12, 1986, 61-53886; Mar. 28, 1986, 61-70016

Int. Cl.⁴ F25B 29/00; B60H 1/00; G05D 23/24
U.S. Cl. 165—16 2 Claims



1. Air-conditioning equipment for a vehicle comprising:
a duct mounted within said vehicle for conducting air into a compartment of said vehicle;
a first shutter mounted at an inlet of said duct to control an outside air/inside air ratio of said air;
a blower provided within said duct for blowing said air into said vehicle compartment;
air temperature regulation means including a refrigerant evaporator and a heater mounted within said duct for respectively cooling and heating said air;
a second shutter mounted within said duct for controlling a mixing ratio of said cooled and heated air;
a heat load detected device having at least a temperature setting device and a compartment temperature sensor connected together to produce an analog heat load signal;
first separate shutter control means including a first electric motor for moving said first shutter, a first drive circuit for driving said first electric motor, a first controlling device directly connected to said heat load detecting device to control said first drive circuit to thereby control said first shutter between outside and inside air intake modes in accordance with said heat load signal, and a first housing for encasing said first electric motor, first drive circuit, and first controlling device as a unit;
second separate shutter control means including a second electric motor for moving said second shutter, a second drive circuit for driving said second electric motor, a second controlling device directly connected to said heat load detecting device to control said second drive circuit to thereby control an opening of said second shutter in accordance with said heat load signal, and a second housing for encasing said second electric motor, second drive circuit, and second controlling device as a unit; and
blower control means responsive to changes in output of said second shutter control means to change a flow rate of

said air from high to low and then low to high when said opening of said second shutter linearly changes.

4,871,012

VARIABLE CONDUCTANCE THERMAL INSULATION BLANKET

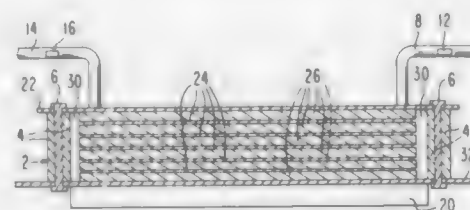
Ying-Yan Kuo, Palo Alto, Calif., assignor to Ford Aerospace Corporation, Newport Beach, Calif.

Filed Apr. 11, 1988, Ser. No. 179,804

Int. Cl.⁴ F28F 27/00; B64G 1/50

U.S. Cl. 165—41

2 Claims



1. A variable conductance heat insulation blanket for regulating the temperature of a component on the surface of a spacecraft, comprising:

- a sealed container having an interior and first, second, and third dimensions, with the first and second dimensions covering the component and being substantially greater than the third dimension;
- means for selectively introducing a gas into the interior of the sealed container;
- several stacked layers of radiation shielding within the interior of the sealed container, said layers having low emittance, high thermal conductivity, and extended surface areas along the first and second dimensions;
- a perimeter seal defining the outer boundary of the sealed container along the first and second dimensions, said perimeter seal disposed on the surface of the spacecraft and surrounding the component;
- a thin outer skin defining the outer boundary of the sealed container along the third dimension, said outer skin covering the component from the point of view of outer space, being joined to the perimeter seal, having a first face facing the interior of the sealed container, and having a second face that is exposed to outer space and is coated with a coating having an emissivity substantially higher than that of the radiation shielding layers; and
- alternately interspersed between the layers of radiation shielding, several layers of gas permeable low thermal conductivity material for spacing the layers of radiation shielding apart from each other while inhibiting heat conduction from the component to outer space when gas is not present within the sealed container; wherein:
the radiation shielding layers and associated layers of gas permeable low thermal conductivity material extend transversely along the first and second dimensions within the sealed container almost as far as the perimeter seal, so that a small amount of space is formed between ends of said radiation shielding layers and said associated layers of gas permeable low thermal conductivity material, on the one hand, and the perimeter seal within the interior of the sealed container, on the other hand, said space enabling the gas to diffuse between said radiation shielding layers more quickly than it would diffuse in the absence of said space; whereby:
when gas is not present within the sealed container, the blanket acts as a thermal insulator keeping heat within the component; and
when gas is present within the sealed container, the blanket conducts heat away from the component into outer space.

4,871,013

DEVICE TO PREVENT THROUGH-FLOW OF A PORT IN A PLATE HEAT EXCHANGER

Bo G. Nilsson, and Torgny Andersson, both of Kivlinge, Sweden, assignors to Alfa-Laval Thermal, AB, Tumba, Sweden

PCT No. PCT/SE88/00008, § 371 Date Aug. 30, 1988, § 102(e) Date Aug. 30, 1988, PCT Pub. No. WO88/05894, PCT Pub. Date Aug. 11, 1988

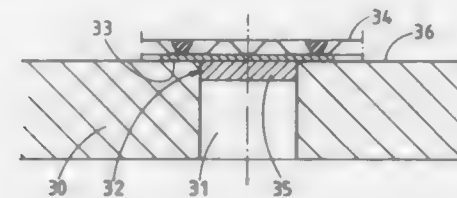
PCT Filed Jan. 18, 1988, Ser. No. 238,344

Claims priority, application Sweden, Feb. 4, 1987, 8700419

Int. Cl.⁴ F28F 9/00

U.S. Cl. 165—75

3 Claims



1. Plate heat exchanger comprising several heat exchange plates arranged between two end plates (30), at least one of which has through-ports (31) and a side surface (36) facing against the heat exchange plates, and being unmachined around the ports (31), at least one of said ports (31) being provided with a cover (32, 40, 50, 60) preventing through-flow, characterized in that said cover (32, 40, 50, 60) is applied against the side surface (36) of the end plate (30) facing the heat exchange plate, and comprises at least two cooperating parts, a first thin part (33, 41, 51, 61) abutting said side surface (36) and a second thick part (35, 43, 52, 63) mainly placed within and essentially covering said port (31), said first part (33, 41, 51, 61) being dimensioned to withstand shearing forces, and said second part (35, 43, 52, 63) being dimensioned to withstand bending forces acting on the cover (32, 40, 50, 60) as a result of an internal pressure in the plate heat exchanger.

4,871,014

SHELL AND TUBE HEAT EXCHANGER

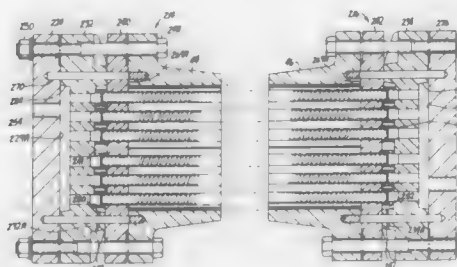
Kevin J. Salzberger, Orange, Calif., assignor to Tui Industries, Anaheim, Calif.

Division of Ser. No. 795,240, Nov. 5, 1985, abandoned, which is a continuation-in-part of Ser. No. 582,975, Feb. 23, 1984, abandoned, which is a continuation of Ser. No. 479,234, Mar. 28, 1983, abandoned. This application May 23, 1988, Ser. No. 197,658

Int. Cl.⁴ F28F 9/06

U.S. Cl. 165—76

13 Claims



1. An elongated shell and tube, high efficiency multi-pass heat exchanger with substantial freedom from thermal stress causing mechanical distortions comprising:
an exterior housing defining an outer shell with inner and outer surfaces;
a modular, cylindrical, heat conductive, axially extending inner shell having inner and outer surfaces disposed within the exterior housing and comprising a plurality of modular extrusions which are sealingly interlocking and axially

slidable relative to adjacent extrusions, the modular shell and the exterior housing defining a thin axially extending annular space therebetween, the modular extrusions defining a plurality of internal chambers within the modular shell providing a second heat exchange fluid flow path having a plurality of serially connected axially extending individual flow paths through the shell for a second heat exchange fluid;

inlet means and outlet means connected at opposite ends of the second heat exchange fluid flow path;
means for circulating a first heat exchange fluid through the heat exchanger tubes in multi-pass counter flow to the second heat exchange fluid;
means on the outside surfaces of the modular shell separating it from the inner surface of the heat exchanger housing to define a thin gap for the circulation of a thin equalizing layer of second heat exchange fluid therein to maintain shell temperature and heat exchanger housing temperature within selected pressure vessel limits; and
means for circulating the second heat exchange fluid between the modular shell and heat exchanger housing.

4,871,015

COOLING ARRANGEMENT

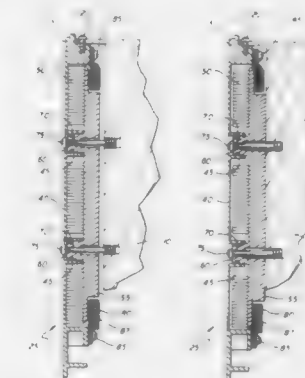
John P. Foley, Greenwich; Gary P. Millan, Windsor, and Daniel L. Elliott, Southington, all of Conn., assignors to United Technologies, Hartford, Conn.

Filed Jul. 13, 1988, Ser. No. 218,745

Int. Cl.⁴ F28F 5/00, 13/00

U.S. Cl. 165—76

7 Claims



1. In an arrangement for mounting a thermal load to a heat exchanger having an outer wall and adapted for cooling said load, a heat conductor disposed between said heat exchanger and load for conducting heat from said load to said heat exchanger, and fasteners for attaching said heat conductor to said load, the improvement characterized by:

- said heat conductor being spaced from said heat exchanger outer wall and defining therewith, a conduit which accommodates fluid flow therebetween;
- first and second elongate locators on said heat exchanger outer wall and heat conductor respectively, said locators being interengageable with one another over a range of relative spacings between said heat exchanger outer wall and heat conductor; and
- first resilient sealing means disposed between said first and second locators for sealing said locators to one another, whereby clearances between said heat conductor and load may be taken up by drawing said heat conductor away from said heat exchanger outer wall, into firm contact with said load, without risk of leakage of said fluid from between said heat conductor and heat exchanger outer wall.

4,871,016

TUBE SUPPORT FOR HEAT EXCHANGER

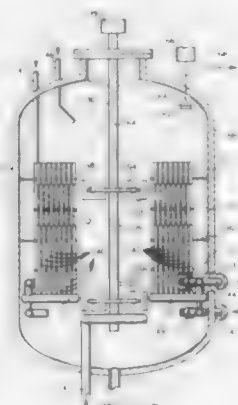
Harold H. Hunt, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 118,822, Nov. 9, 1987, Pat. No. 4,823,866. This application Oct. 24, 1988, Ser. No. 261,816

Int. Cl.⁴ F28F 13/12

U.S. Cl. 165—109.1

4 Claims



1. A process for exchanging heat with a fluid in a stirred vessel, said process comprising flowing said fluid through tube bundles formed from parallel rows of parallel tubes lined up along chords extending into said stirred fluid from adjacent a generally cylindrical portion of a sidewall of said vessel; wherein each tube bundle is formed from about 2 to 20 rows of tubes and the tubes in adjacent rows are displaced so that the tubes are laid out in triangular pitch; and individual tubes in each row being provided with radial support by a pair of rod baffles, wherein each rod baffle contains sufficient rods so that each tube in the tube bundle is supported on two sides by each rod baffle and the pair of rod baffles together support all four sides of each tube to provide each tube of the tube bundle with radial support.

4,871,017

HEADERS FOR THERMOPLASTIC PANEL HEAT EXCHANGERS

Anthony J. Cesaroni, 33 Davisbrooke Dr., Agincourt, Ontario, Canada M1T 2H6

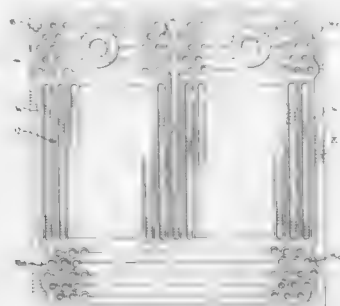
Filed Aug. 16, 1988, Ser. No. 232,681

Claims priority, application United Kingdom, Aug. 18, 1987, 8719473

Int. Cl.⁴ F28F 3/12

U.S. Cl. 165—170

7 Claims



1. A panel heat exchanger formed from a thermoplastic polymer, said heat exchanger comprising first and second panels and inlet and outlet header means, said panels being generally planar and bonded together to define fluid flow passages extending between the inlet and outlet header means, each of said panels having an orifice therein cooperatively located at each of the inlet and outlet header means, each of said inlet and outlet header means being comprised of a distributor ring with planar ends, an inlet distributor nipple and a mating flange, said distributor ring having an axial fluid-flow

passage and at least one radial fluid-flow passage, said inlet distributor nipple having a flange connected to a distributor pipe, the distributor pipe having at least one radial orifice adjacent to the flange and attachment means on the external surface of the pipe opposed to the flange, said mating flange being adapted to attach onto the distributor pipe by means of said attachment means, and said header means being adapted for flow of fluid into or out of the panel heat exchanger.

4,871,018

PLUGGING APPARATUS FOR A GRAVEL PACKER

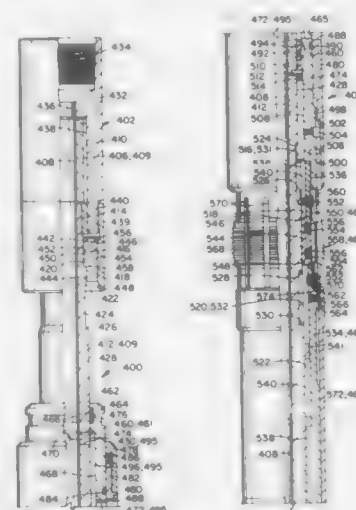
Kenneth D. Caskey, Duncan, Okla., and Scott MacLaughlin, Palm Beach Gardens, Fla., assignors to Halliburton Company, Duncan, Okla.

Filed Jun. 30, 1988, Ser. No. 213,758

Int. Cl.⁴ E21B 33/12

U.S. Cl. 166—142

20 Claims



1. An apparatus for plugging a packer set in a well bore, said apparatus comprising:
collet means for engaging an inner portion of said packer;
operating mandrel means for connecting to a tool string and comprising:
a portion defining an upper and lower spaced grooves; and
a collet support disposed between said portion and said collet means;
wherein, said portion is movable such that said upper groove may be positioned adjacent to said collet support allowing said collet support to be biased into said upper groove so that said collet means may flex inwardly for engaging said inner portion of said packer, a section of said portion between said grooves may be positioned adjacent to said collet support causing said collet support to lockingly engage said collet means with said inner portion of said packer, and said lower groove may be positioned adjacent to said collet support allowing said collet support to be biased into said lower groove such that said collet means may again flex inwardly for disengaging from said inner portion of said packer; and
sealing means for sealingly engaging an inner surface of said packer.

4,871,019

WELLBORE FLUID SAMPLING APPARATUS

Jerry L. Haley, Richardson; Weldon H. Barber, Wylie, and Kevin J. Morris, Plano, all of Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Sep. 7, 1988, Ser. No. 241,535

Int. Cl.⁴ E21B 34/06, 49/08

U.S. Cl. 166—167

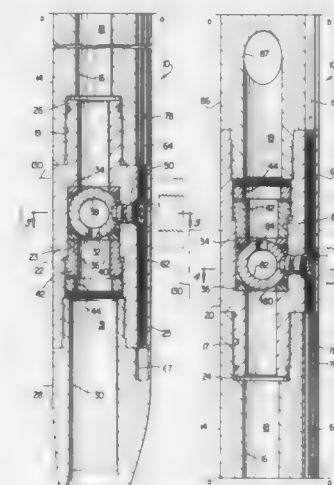
12 Claims

1. A wellbore fluid sampling apparatus comprising:
an elongate barrel member including a passage extending therein and defining a fluid sample chamber;

spaced apart valve closure members supported on said barrel member and operable, respectively, to be moved from open positions permitting flow of fluid into and through said chamber to closed positions to trap a sample of fluid in said chamber; and

means for moving said closure members between open and closed positions to trap a sample of wellbore fluid in said chamber comprising an actuator member operable connected to said closure members, means for urging said actuator member in a direction to move said closure mem-

ber and a rotatable member mounted within each slot; each of said plurality of slots has its major dimension along a first axis parallel to the longitudinal axis of said body member and is oriented with respect to the other slots so as to form a helicoidal array for maximizing the total surface contact area between the rotatable members and the pipe and for decreasing the forces acting on each rotatable member; each rotatable member has a first central portion with a thickness t so as to act as a thrust bearing for minimizing frictional forces and an end portion with a thickness T wherein $t > T$ each end portion having a radius substantially equal to about half of said thickness T so as to minimize contact area, and each rotatable member rotates within said slot about a second axis substantially transverse to said first axis wherein the hardness of the material from which said rotatable members are formed have a hardness of from at least about 50 to about 150 Brinell Hardness less than the hardness of the material from which the production tube is made wherein the relative hardness is maintained over time at the service temperatures encountered downhole in the well, that is, at temperatures of 300° F.



bers from an open position to a closed position, means for retaining said actuator member in a position corresponding to an open position of said closure members, respectively, a member engaged with said means for retaining and movable at will to effect operation of said actuator member and means interconnecting said actuator member and said closure members, respectively, and operable to move said closure members to the closed position in response to said operation of said actuator member.

4,871,020

SUCKER ROD CENTRALIZER

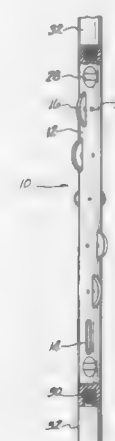
Olegario Rivas, and Alejandro Newski, both of Caracas, Venezuela, assignors to Intevep, S.A., Caracas, Venezuela

Filed Sep. 21, 1987, Ser. No. 98,929

Int. Cl.⁴ E21B 17/10

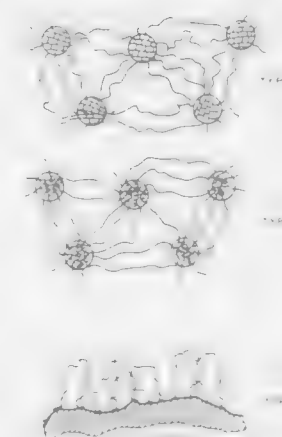
U.S. Cl. 166—241

6 Claims



1. A device for centralizing at least one sucker rod within a production pipe downhole in a well and for reducing frictional forces between said pipe and said at least one sucker rod which comprises an elongate, substantially cylindrical body member having a longitudinal axis, a plurality of slots within said mem-

1. A method for permeability control of a subterranean formation and for enhancing oil recovery from said subterranean formation, said method comprising injecting into said subterranean formation an aqueous solution comprised of a block copolymer having the structural form of ABA triblock or (AB)_n multiblock wherein A is a crosslinkable polymer, B is a non-crosslinkable polymer or a polymer having low reactivity to crosslinking agents, n is a number of at least 2 and a crosslinking agent, wherein A is selected from the group consisting of polyacrylic acid, partially hydrolyzed polyacrylamide, highly hydrolyzed polyacrylamide, partially hydrolyzed polyacrylic ester, highly hydrolyzed polyacrylic ester, polyvinyl alcohol and mixtures thereof and B is selected from the group consisting of polyacrylamide, partially hydrolyzed polyacrylamide, polyalkylene ethers, polyvinyl alcohol and polyvinylpyridine.



4,871,022

METHOD FOR REMOVING POLYMER PLUGGING IN WELL BOREHOLES

Mark S. McGlathery, Huntington Beach, Calif., assignor to Exxon Chemicals Patents, Inc., Darien, Conn.

Filed May 11, 1988, Ser. No. 193,254

Int. Cl.⁴ E21B 43/22, 43/27

U.S. Cl. 166—300

10 Claims

1. A method for removing polymeric material from a well borehole penetrating an underground formation comprising:
- introducing into the borehole containing residual material or formation containing residual polymeric material an aqueous medium containing an oxidant selected from the group consisting of chlorine dioxide, sodium chlorite and mixtures thereof, said oxidant being present in an amount sufficient to degrade said polymeric material to a desired degree;
 - maintaining said aqueous medium in contact with said polymeric material for a period of time sufficient to effect a desired amount of degradation of said polymeric material; and
 - thereafter removing said portion at least of the degraded polymeric material from or away from the borehole or the formation.

4,871,023

METHOD FOR CONTROLLING THE PH OF STEAM FLUIDS

Andrew Nigrini, La Habra Heights, and Rong J. Hwang, Hacienda Heights, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Mar. 7, 1988, Ser. No. 164,924

Int. Cl.⁴ E21B 43/24, 43/27, 47/00

U.S. Cl. 166—252

21 Claims

1. A method for controlling pH in the liquid and vapor phases of wet steam having such phases formed in a steam generation system from feedwater having therein at least one carbonate species which in the presence of steam forms a vapor phase component tending to lower the pH of the vapor phase of the steam upon condensation and a liquid phase component tending to raise the pH of the liquid phase of the steam, comprising:

- converting the feedwater in a steam generation system to steam having a vapor phase and a liquid phase; and
 - adding to the steam generation system, a pH altering compound, selected from the group of phosphorus, arsenic, antimony, and bismuth containing compounds which are capable of forming a nonvolatile anionic component and a cationic component that, in the presence of said steam, yields hydrogen ions for reducing the pH of the liquid phase of said steam and an alkaline component for increasing the pH of the vapor phase of said steam upon condensation.
2. A method, according to claim 1, wherein said pH altering compound is selected from the group of phosphonium salts, arsinium salts, antimonium salts, and bismuthium salts.

4,871,024

FLUID FOR TREATMENT OF A SUBTERRANEAN WELL FOR ENHANCEMENT OF PRODUCTION

Arthur Cizek, Houston, Tex., assignor to Baker Performance Chemicals Inc., Houston, Tex.

Filed Aug. 1, 1988, Ser. No. 226,468

Int. Cl.⁴ E21B 41/02, 43/27

U.S. Cl. 166—307

13 Claims

1. The method of inhibiting a high alloy steel surface positioned within a subterranean well against acid corrosion, comprising the steps of:
- introducing into said well through said high alloy steel surface a fluid for treatment of a subterranean well for enhancement of production within the well comprising an acidic injection medium, and acid corrosion inhibitor; and an intensifier for deposition on and effective treatment

contact said high alloy surface comprising an acid soluble copper metal salt; and

- forming a fine film on said high alloy steel surface through which said fluid is introduced into said well by contacting said surface with said acid corrosion inhibitor in an amount of from between about 0.01% and about 6% of said acidic injection medium and said intensifier in an amount of from between about 0.001% and about 1% of said acidic injection medium, to thereby provide an electro-chemical attraction of the copper ion of said intensifier within said film to the high alloy steel surface.

4,871,025

LEVELLING MACHINE

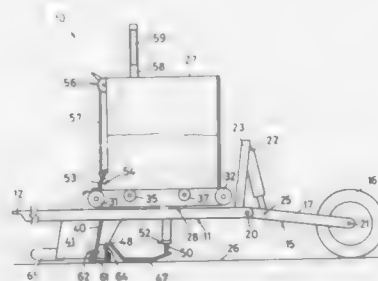
Trevor K. Mayfield, and Lindsay F. Radcliffe, both of Ninth Street, Kerang, Victoria, Australia 3579

Filed Nov. 9, 1987, Ser. No. 118,650

Int. Cl.⁴ E02F 3/76; E01C 19/20

U.S. Cl. 172—4.5

7 Claims



1. A mobile ground levelling machine comprising:
- a main frame;
 - a pivotal sub-frame pivotally connected to the main frame so as to lie in trailing relationship therewith;
 - a hopper carried on the main frame for containing a supply of filling material such as soil or sand;
 - an elongate scraper blade mounted on the main frame and extending thereacross;
 - an elongate ski-foot removable secured along the lower edge of said scraper blade and projecting rearwardly thereof for engagement with the ground so as to allow the scraper blade to ride smoothly over ground over which the machine travels;
 - discharged means associated with the hopper to control the discharge of filling material from the hopper, and arranged in use to discharge filling material forwardly of the scraper blade;
 - a plurality of ground-engaging wheels carried by and evenly spaced across the width of the sub-frame in trailing relationship to the scraper blade;
 - power means operatively connected between the main frame and the sub-frame to effect said pivotal movement of said sub-frame relative to the main frame and in turn the raising and lowering of the main frame, together with said scraper blade, relative to the ground over which the machine travels; and
 - control means for controlling the operation of said power means to in turn control elevation of the scraper blade relative to a preselected reference plane.

4,871,026

TRENCH FORMING DEVICE AND GUIDANCE METHOD

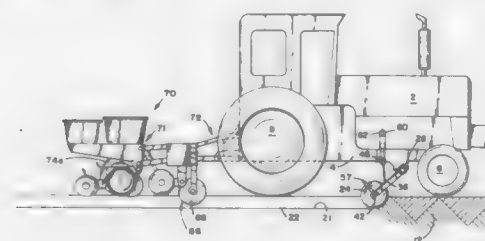
Emeric E. Bernard, Tintah, Minn., assignor to Bernard-Hensch, Inc., Austin, Tex.

Filed Mar. 15, 1988, Ser. No. 168,380

Int. Cl.⁴ A01B 69/00

U.S. Cl. 172—26

30 Claims



15. A guidance trench forming device for attachment to a tractor, the tractor having an undercarriage and ground engaging wheels including front wheels and rear wheels said trench forming device comprising generally wedge-shaped trench forming means for compacting ground to form a guidance trench in ground traversed by the tractor, said guidance trench forming means being attached to the undercarriage of the tractor and being located behind and generally aligned with the front wheels and in front of the rear wheels of the tractor such that a guidance trench can be formed in front of the rear wheels when the tractor traverses the ground and said trench forming means are engaged in the ground.

4,871,027

MULTIPLE-EDGE SOD CUTTER FOR VIBRATORY FLOW

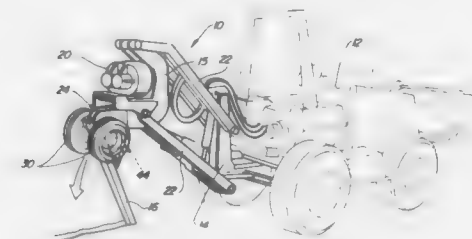
Edgar K. Lindstrom, and Marvin L. Morris, both of Wichita, Kans., assignors to J. I. Case Company, Racine, Wis.

Filed Jul. 7, 1988, Ser. No. 216,068

Int. Cl.⁴ E02F 5/02; F16L 1/00

U.S. Cl. 172—40

1 Claim



1. A vibratory plow assembly comprising:
- a forward frame member connected to a vehicle, a rearward frame member, and spaced apart side frame members pivotally connecting said forward and rearward frame members to permit vertical movement of said rearward frame member relative to said forward frame member;
 - a vibrator mounted on said rearward frame member, a blade holder pivotally mounted to said rearward frame member for pivotal movement about a vertical axis, a cable-laying plow blade secured to said blade holder, and said vibrator operatively connected to said plow blade, said blade holder includes opposed hanger arms and said plow blade is secured between said hanger arms, and said blade holder including opposed ground-engaging wheels on opposite sides of said plow blade; and
 - a cutter assembly mounted to said blade holder at a location forward of said plow blade, and said cutter assembly including a cutting blade having multiple cutting edges

and multiple cutting positions such that the cutting blade is selectively movable into a new cutting position when one of said cutting edges becomes worn; wherein the cutting blade is polygonal in shape; wherein the cutting blade includes a plurality of mounting openings which are arranged in a plurality of triangular patterns; and wherein the cutter assembly includes a mounting member for attaching said cutting blade to said blade holder, said mounting member attached to said blade holder between said hanger arms, and said mounting member includes a plurality of mounting holes which are arranged in a triangular pattern for mounting said cutting blade.

4,871,028

ARTICULATED IMPLEMENT FRAME WITH SWING HITCH

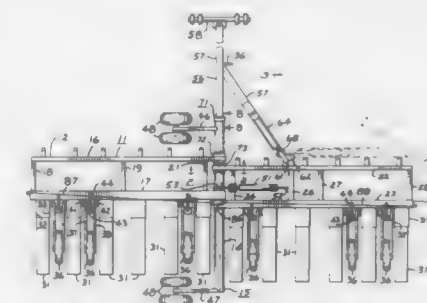
David L. Murray, 3714 N.E. Chapel Dr., Lee's Summit, Mo. 64063

Filed Jan. 13, 1989, Ser. No. 296,628

Int. Cl.⁴ A01B 73/00

U.S. Cl. 172—248

15 Claims



12. An agricultural implement comprising:
- a wide frame elongated horizontally in a direction transverse to the direction of travel of the implement during a field working operation and including two subframes pivotally interconnected on a fore and aft axis for relative pivotal movement during a field working operation;
 - a plurality of field support wheels spaced from one another in said transverse direction for supporting said implement during a field working operation;
 - suspension components operatively mounting said field support wheels on said frame;
 - power means interconnected between said frame and said suspension components operable to adjust said wheels vertically relative to said frame;
 - transport wheels for supporting said implement when the latter is transported endwise;
 - adjustable mounting means mounting said transport wheels on said frame;
 - power means operatively interposed between said mounting means and said frame operable to adjust said transport wheels vertically relative to said frame between a raised position out of ground contact and a lowered position in which said transport wheels support said implement for endwise transport;
 - a hitch having a front end adapted for draft connection to a towing tractor, a rear end pivotally connected to said frame on a vertical pivot axis and a rearwardly extending portion spaced laterally from said pivot axis, said hitch being swingable about said vertical axis between a forwardly extending field working position and an endwise transport position in which said front end is spaced laterally outward from one lateral end of said frame;
 - a latch for releasably connecting said rearwardly extending portion of said hitch to said frame including a first latch part mounted on said hitch portion and a second latch part mounted on said frame, one of said latch parts being mov-

able relative to the other latch part between latched and unlatched positions and latch operating means on said implement connected to said one latch part and operatively associated with said power means operable to automatically move said one latch part to its unlatched position when said power means moves said transport wheels to their lowered position.

4,871,029

RAKE HEAD ATTACHMENT FOR A GOLF CLUB

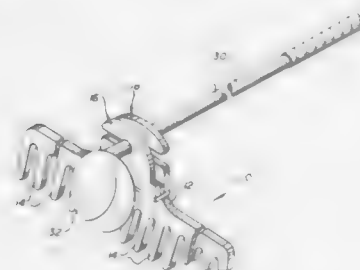
Stanley A. Rosin, 115 S. Indian Ave., Palm Springs, Calif. 92262

Filed Apr. 25, 1989, Ser. No. 342,804

Int. Cl.⁴ A01D 7/00

U.S. Cl. 172-378

4 Claims



1. A rake head attachment to be removably mounted on a handle member, said rake head attachment comprising: a rake blade consisting of an elongated support member having forward and rear sides, and a plurality of rake teeth extending perpendicularly outwardly from said support member; and first and second coupling pieces centrally mounted on said elongated support member in spaced and parallel relationship with one another and respectively positioned on the forward and rear sides of said elongated support member, said coupling pieces having respective slots therein adjacent to one another and extending in opposite directions parallel to the longitudinal axis of said support member toward the opposite ends of said support member.

4,871,030

FARM IMPLEMENT HAVING TRANSPORT WHEELS AND SOIL WORKING ROLLERS ON ROTATING FRAME

Oliver M. Kruse, Menasha, Wis., assignor to Brillion Iron Works, Inc., Menasha, Wis.

Filed Jan. 31, 1989, Ser. No. 304,719

Int. Cl.⁴ A01B 63/22

U.S. Cl. 172-397

9 Claims



1. A farm implement comprising a drawbar having a front and rear end, a hitch on said front end for connection with a towing vehicle, a transverse frame pivotally connected to said rear end of said drawbar for pivotal movement between a work position and a transport position, said pivotal movement being about an axis substantially normal to said drawbar, means supporting earth working rollers on said frame for engagement with the earth when said frame is in said work position, said rollers supporting said frame when said frame is in said work position, a plurality of wheel arms fixed on said frame, a wheel rotatably mounted on each wheel arm, said wheels being elevated when said frame is in said work

position and being in engagement with the earth when said frame is in said transport position.

4,871,031

ROTARY HOE TOOL

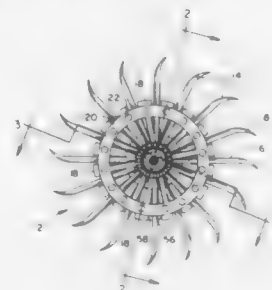
Frederick J. Kestel, Rte. 1, Box 44, New Lenox, Ill. 60451

Filed Dec. 19, 1988, Ser. No. 285,998

Int. Cl.⁴ A01B 21/04

U.S. Cl. 172-544

16 Claims



2. A rotary hoe tool assembly comprising rotatable hub means rotatable in a forward and rearward direction of rotation, a plurality of elongated tool members for cutting and digging into the ground each having a pivot end for pivotal connection to said hub means and a working free end, each of said elongated tool members being pivotally connected to said rotatable hub means for limited pivotal movement thereon in the same forward and rearward directions as said hub means is rotatable, resilient spacing and biasing means having respective portions interposed between and in engagement with adjacent ones of said plurality of tool members to thereby hold each of said tool members so engaged by said respective portions of said resilient spacing and biasing means therebetween in a normal unstressed position at a substantially equal distance from a forwardly positioned next adjacent tool member pivotally mounted on said hub means next adjacent in said forward direction of rotation and a rearwardly positioned next adjacent tool member pivotally mounted on said hub next adjacent in said rearward direction of rotation, to also permit each of said tool members to pivot under pressure toward said rearwardly positioned next adjacent tool, to propel in the opposite direction toward said forwardly positioned next adjacent tool a distance beyond said normal unstressed position, and to thereafter return such tool member in the opposite direction to said normal unstressed position.

4,871,032

DEEP TILLAGE IMPLEMENT

William G. McGuire, Mt. Macedon, and Hartley F. Young, Melton, both of Australia, assignors to Ralph McKay Limited, Maidstone, Australia

Continuation-in-part of Ser. No. 36,707, Apr. 10, 1987, abandoned. This application Apr. 28, 1988, Ser. No. 187,583

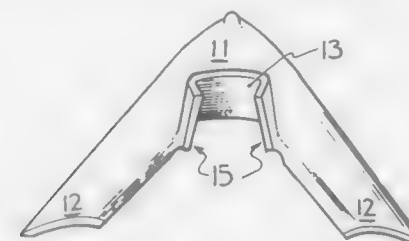
Int. Cl.⁴ A01B 23/02

U.S. Cl. 172-749

4 Claims

1. An earth engaging implement for deep tillage work comprising an earth engaging portion and an attachment portion having a recess defined by flange portions extending upwardly from said earth engaging portion configured to embrace and wedgingly frictional attach to a tine of an agricultural machine, said recess decreasing in cross sectional area in a direction

away from the earth engaging portion and being shaped to fit over and closely conform to a complementary shaped portion



of a tine to provide a wedge-like fitting and be solely retained thereby.

4,871,034

RAMMER

Paul Schmidt, Reiterstrasse 1, 5940 Lennestadt 1 (Saarlanssen), Fed. Rep. of Germany

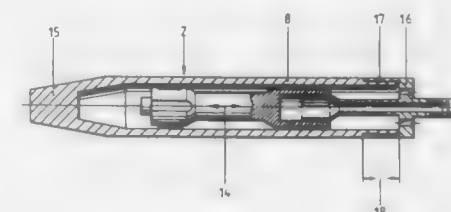
Filed Feb. 26, 1988, Ser. No. 161,018

Claims priority, application Fed. Rep. of Germany, Apr. 1, 1987, 3710928

Int. Cl.⁴ E21B 1/00

U.S. Cl. 173-90

2 Claims



1. A rammer for driving in pipe comprising an axially extending housing having a front end and a rear end and arranged to receive an axially reciprocating piston so that the piston imparts its thrust to an impact head forming the front end of said housing, said housing is threaded at its rear end with a cover in threaded engagement on the rear end, wherein the improvement comprises that said cover (16) has a plate-like member extending transversely of and closing the rear end of said housing and a tubular extension extending in the axial direction of said housing from said plate-like member toward the front end of said housing, said tubular extension having an internal thread screwed onto an externally threaded end section (18) of said housing, said plate-like member having a front side facing toward the front end of said housing and said front side bearing against the rear end of said housing and axially limiting a piston space within said housing.

4,871,033

MOTOR-DRIVEN HAND TOOL WITH BRAKING TORQUE DEVICE

Walter Odoni, Fürstentum, Liechtenstein, and Richard Boesch, Rüthi, Switzerland, assignors to Hilti Aktiengesellschaft, Fürstentum, Liechtenstein

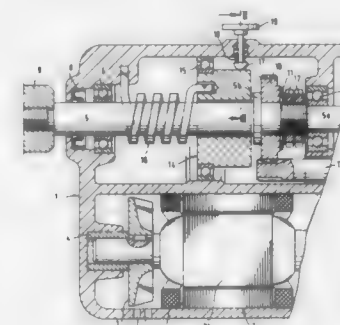
Filed Jan. 23, 1989, Ser. No. 300,482

Claims priority, application Fed. Rep. of Germany, Jan. 30, 1988, 3802740

Int. Cl.⁴ B25B 23/14

U.S. Cl. 173-12

6 Claims



1. Motor driven hand tool, such as a drill, hammer drill, grinder or the like, comprising a housing, a drive motor located within said housing, a driven shaft located within said housing, means within said housing extending between said drive motor and said driven shaft for rotating said shaft, said driven shaft projecting out of said housing and arranged to hold and rotate a bit, an inert mass rotatably supported in said housing and disposed coaxial with said driven shaft, a spring element connecting said inert mass to said housing, wherein the improvement comprises that said inert mass is annular and encircles said driven shaft, said spring element encircles said driven shaft and is displaceable from a first condition in spaced relation to said driven shaft to a second condition in gripping engagement with said driven shaft for exerting a braking action on said shaft in the event of rotation of said housing relative to said inert mass.

4,871,035

DAMPING DEVICE FOR A PERCUSSION ROCK DRILLING MACHINE

Börnst Ekwall, Saltjöbaden, Sweden, assignor to Atlas Copco Aktiebolag, Stockholm, Sweden

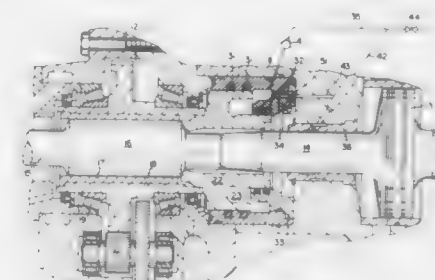
Filed Oct. 7, 1987, Ser. No. 106,134

Claims priority, application Sweden, Oct. 15, 1986, 8604362

Int. Cl.⁴ B23B 45/16

U.S. Cl. 173-139

10 Claims



1. Device for a percussion rock drilling machine for transferring a feeding force to a drill string (15), said device comprising a damping chamber (23) operatively connected between a feeding force influenced means (11) and the drill string and valve means (41) for controlling the supply of pressure gas from a supply conduit (35) to the damping chamber, the drill string being movable by the gas pressure in the damping chamber when the feeding force is not applied but being balanced by the gas pressure when normal feeding force is applied, said

device characterized by valve means operatively associated with said damping chamber for venting the damping chamber (23), said valve means allowing pressurization of the damping chamber at a selectable pressure level after said damping chamber is vented.

4,871,036

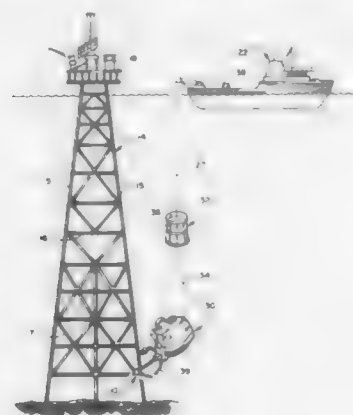
COMPLIANT ROTARY POWERED TOOL

Gary A. Parrott, NE, 81 Gladwin Rd., Belfair, Wash. 98528
Filed Nov. 24, 1986, Ser. No. 934,471

Int. Cl. F21B 3/00

U.S. Cl. 173-163

19 Claims



1. A compliant rotary tool comprising:
 - a) an elongated arm assembly having a forward end and a rearward end;
 - b) a driveshaft journaled in the rearward end of said arm assembly so that said arm assembly can pivot around said driveshaft, said driveshaft having a longitudinally extending axis;
 - c) a driven shaft journaled in the forward end of said arm assembly, said driven shaft having a longitudinally extending axis;
 - d) first drive means rigidly mounted on said driveshaft having a radius R_1 as measured from said longitudinal axis of said driveshaft, second drive means rigidly mounted on said driven shaft having a radius R_2 as measured from the longitudinal axis of said driven shaft, R_1 being greater than R_2 thereby creating an angle of pull;
 - e) closed loop means passing around the radius R_1 of said first drive means and around the radius R_2 of the second drive means for transmitting the rotational motion of said driveshaft to said driven shaft;
 - f) a frame member which is journaled on said driveshaft;
 - g) a motor for rotating said driveshaft and it is affixed to said frame member; and
 - h) means for producing a drag on said driven shaft. drag.

4,871,037

EXCAVATION APPARATUS, SYSTEM AND METHOD

Tommy M. Warren, Coweta, and Warren J. Winters, Tulsa, both of Okla., assignors to Amoco Corporation, Chicago, Ill.

Filed Sep. 15, 1988, Ser. No. 244,766

Int. Cl. E21B 10/18

U.S. Cl. 175-67

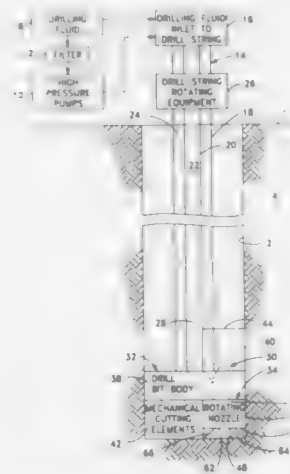
14 Claims

1. An excavating apparatus, comprising:
 - a) drill bit means, including an axis of rotation, for excavating rock in response to rotating said drill bit means about said axis of rotation and contacting rock with said drill bit means;
 - b) a nozzle rotatively and externally mounted on said drill bit means so that said nozzle rotates about an axis of rotation

which is different from the axis of rotation of said drill bit means; and wherein said nozzle includes a port defined therein to emit a fluid jet therefrom in a direction angularly offset from a radius of said nozzle so that a force exerted along said direction in response to the fluid jet rotates said nozzle in a direction about the axis of rotation of said nozzle opposite to the direction of said drill bit means rotates about the axis of rotation thereof.

11. A method of excavating an earthen formation to form a wellbore therein, comprising the steps of:

- (a) contacting the earthen formation with cutting elements



- of a drill bit on which a nozzle is rotatably and externally mounted;
- (b) rotating the drill bit about a first axis of rotation with the cutting elements contacting the earthen formation so that a portion of the earthen formation across an excavation cross-sectional area thereof is mechanically loosened by the cutting elements; and
- (c) simultaneously with said step (b), ejecting fluid from the nozzle and rotating the nozzle about a second axis of rotation so that the fluid being ejected impinges upon the earthen formation across substantially all of the excavation cross-sectional area thereof during one rotation of the drill bit about the first axis of rotation.

4,871,038

COMBINATIONAL WEIGHING SYSTEMS

Jonathan M. Isberwood, Leamington Spa, and Robert W. Tansley, Stratford-Upon-Avon, both of England, assignors to Driver Southall Limited, England

Filed Feb. 29, 1988, Ser. No. 162,001

Claims priority, application United Kingdom, Mar. 9, 1987, #709481

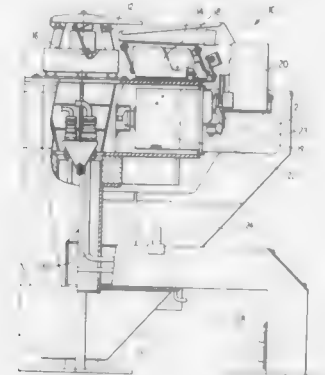
Int. Cl. G01G 13/00, 23/14

U.S. Cl. 177-25.18

17 Claims

1. A combinational weighing system comprising:
 - (A) a plurality of weighing machines each comprising a weighing hopper and a associated hopper module arranged to provide a measurement of the weight of the contents of the associated hopper;
 - (B) means for feeding articles into said hoppers, including a plurality of channels via which articles are respectively fed from a common source directly into each of said hoppers;
 - (C) means for utilizing the weight measurements provided by said hopper modules to select from said hoppers a number of hoppers whose contents have a total weight substantially equal to a target weight;
 - (D) means for discharging said selected number of hoppers to provide a batch of articles of substantially said target

- weight, said hoppers being arranged to discharge directly into a collection chute to feed said batch of articles of substantially said target weight to a collection point; and
- (E) each said hopper module being associated with a respective control means for individually controlling the feeding of articles to the hopper associated with that hopper module in dependence on the weight of articles in that hopper, each said respective control means including
 - (i) means for initiating said feeding of articles to said hopper,
 - (ii) means for producing a first signal of analogue form indicative of the weight measure by said hopper module,



- (iii) digital-to-analogue converter means for producing a second signal in response to a signal received from a central control means of the system,
- (iv) a microprocessor for detecting when said first signal substantially equals said second signal,
- (v) means for causing the feeding of articles to said hopper to stop when said first signal equals said second signal, and
- (vi) means for communicating said first signal as detected to said central control means.

4,871,039

POWER STEERING SYSTEM INCORPORATING ELECTRIC MOTOR

Toshihiko Daido; Mitsugu Fujiwara, and Shigeo Nishimura, all of Osaka, Japan, assignors to Koyo Seiko Co., Ltd., Osaka, Japan

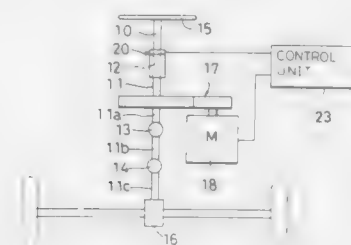
Filed Mar. 29, 1988, Ser. No. 174,911

Claims priority, application Japan, Apr. 3, 1987, 62-83536

Int. Cl. B62D 5/04

U.S. Cl. 180-79.1

2 Claims



1. A power steering system having an electric motor incorporated therein and having an input shaft fixed to a steering wheel, an output shaft coupled to the motor via a reduction gear, and a torsion bar provided between the input and output shafts, wherein the output shaft being rotatable by a resultant torque from a rotation of the steering wheel by a person and the torque of the motor, the power steering system comprising:
 - a) a sensor means for detecting the relative angular displacement between the input shaft and the output shaft; and
 - b) a microcomputer means having stored therein the relationship between the relative angular displacement and the

current target value for determining the direction of rotation of the motor and a motor current target value from the output of the sensor means to produce output signals, wherein the microcomputer means for operating at a time interval of up to 2 milliseconds from the detection of an input from the sensor means to the detection of another input therefrom following the production of the motor current target value, and for operating at a time interval of up to 500 microseconds from the detection of the input until the production of the target value.

4,871,040

ELECTROMAGNETIC CONTROL APPARATUS FOR VARYING THE DRIVER STEERING EFFORT OF A HYDRAULIC POWER STEERING SYSTEM

Jeffery A. Zaraski, Saginaw; Andrzej M. Pawlak, Troy; David W. Graber, Millington, and James W. Bahineau, Saginaw, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

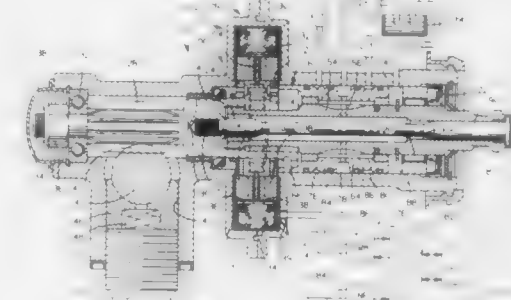
Continuation of Ser. No. 211,738, Jun. 27, 1988, abandoned.

This application Feb. 23, 1989, Ser. No. 314,249

Int. Cl. B62D 5/04

U.S. Cl. 180-142

15 Claims



1. In a vehicular power assist steering system wherein a pair of relatively rotatable hydraulic elements are connected between a driver manipulated steering shaft and a steering gear, the hydraulic elements being adapted to generate hydraulic flow for producing power assist steering force in relation to their relative rotation such that driver steering effort applied to the steering shaft produces a corresponding level of power assist steering force, apparatus for varying the driver steering effort required to produce a given power assist steering force, the apparatus comprising:

rotary magnetic circuit means including a permanent magnet element connected for rotation with one of said pair of hydraulic elements, and a rotary magnetic flux conducting element connected for rotation with the other of said pair of hydraulic elements such that magnetic flux developed by the permanent magnet element enters the rotary flux conducting element to develop a permanent magnet centering force which is rotationally balanced in a centered relative position of said rotary magnetic elements corresponding to a minimum flow relative position of said hydraulic elements, but which resists relative rotation therefrom; and

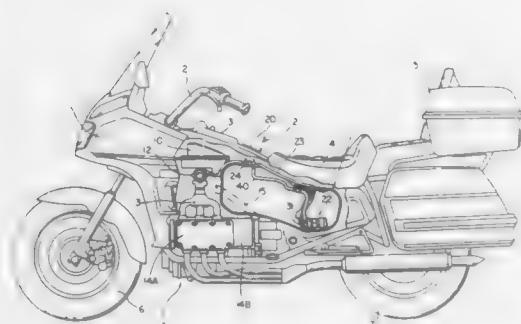
stationary magnetic circuit means including an annular exciting coil disposed about the rotary magnetic circuit means and a stationary flux conducting element for completing an electromagnetic flux path between the rotary and stationary magnetic circuit means so that magnetic flux developed in the electromagnetic flux path during energization of said exciting coil produces an electromagnetic centering force which combines with the permanent magnet centering force to produce an overall centering force which is variable with the coil energization, whereby the

driver steering effort required to produce a given relative rotation of said rotatable hydraulic elements, and hence a given level of power steering assist force, is variable with such coil energization.

4,871,041

MOTORCYCLE FUEL TANK AND FUEL PUMP APPARATUS

Hiroshi Saito, and Koichi Hikichi, both of Tokyo, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Feb. 5, 1988, Ser. No. 152,840
Claims priority, application Japan, Apr. 14, 1987, 62-91638
Int. Cl.⁴ B62K 11/04, 19/30
U.S. Cl. 180—219 15 Claims

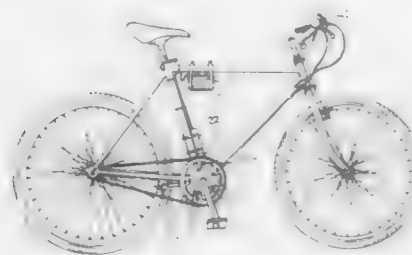


1. A vehicle, such as a motorcycle, or the like, comprising: an engine; fuel supply means operably connected to said engine; a fuel tank carried by said vehicle; a fuel pump in the bottom of said fuel tank; a fuel supply pipe extending from said fuel pump through the top of said fuel tank and connecting with said fuel supply means; and a fuel supply port in said fuel tank; a tank shell carried by said vehicle enclosing at least the top of said fuel tank; an opening in said tank shell for accessing said fuel supply port; and said fuel supply pipe extending between said fuel tank and said tank shell and being accessible from said tank shell opening.

4,871,042

ELECTRIC BICYCLE

Chi-chu Hsu, 4F. No. 144, Chu Lin Rd., Yung Ho, Taipei; Ching Yn, 31, Lane 4, Tunhua Rd., Taipei; Suyueh Chao, 2-1, Lane 162, Szu Wei Rd., Taipei, and Miguel C. J. Huang, 183, Neihu Rd., Sect. 2, Taipei, all of Taiwan
Filed Sep. 1, 1988, Ser. No. 239,429
Int. Cl.⁴ B62K 11/00
U.S. Cl. 180—220 2 Claims



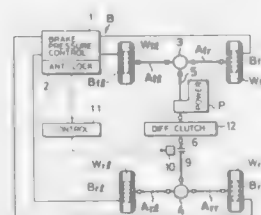
1. An electric bicycle comprising: a sprocket wheel defining an inner ring and an outer ring,

said inner ring having a plurality of teeth members extending therefrom; power drive means for electrically actuating said electric bicycle, said power drive means including a motor rotatively coupled to a set of reduction gear members, said reduction gear members being coupled to a main bevel gear, said main bevel gear matingly engaging a direction changing bevel gear and a first balance bevel gear on opposing sides thereof, said direction changing bevel gear matingly engaging said main bevel gear and a second balance bevel gear on opposing sides thereof; a clutch mounted on a shaft member passing centrally through said direction changing bevel gear and said first balance bevel gear, said clutch including a plurality of ball bearings rotatively mounted in an outer raceway of said clutch; a transmission gear fixedly secured to said shaft member for engaging said teeth members of said sprocket wheel inner ring; means for electrically powering said electric bicycle, said electrical power means including a battery and a solar cell, said solar cell and said battery being electrically coupled each to the other; means for controlling the speed of said electric bicycle, said speed controlling means including a rotatably actuated variable resistor electrically coupled to said means for electrically powering said electric bicycle, said rotatably actuated variable resistor being secured within a speed changing handle, said variable resistor being actuated by rotation of said speed changing handle for varying electrical current to said motor whereby rotational speed of said motor may be varied.

4,871,043

FOUR WHEEL-DRIVE ANTI-LOCKING BRAKING

Etsuo Fujii; Makoto Sato, and Seichi Hirai, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Division of Ser. No. 876,144, Jun. 19, 1986, This application Jun. 13, 1988, Ser. No. 205,976
Claims priority, application Japan, Jun. 21, 1985, 60-135501; Jun. 25, 1985, 60-138308; Nov. 15, 1985, 60-256326
Int. Cl.⁴ B60K 23/08; B60T 8/32
U.S. Cl. 180—248 6 Claims



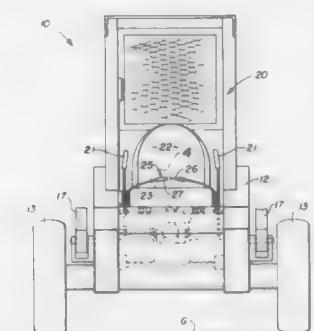
1. A four-wheel-drive vehicle, comprising: a set of front wheels; a set of rear wheels; brakes on all of said wheels; an axle for each of said wheels; a front differential providing motive power to each of said axles of said front wheels; a rear differential providing motive power to each of said axles of said rear wheels, said front and rear differentials being normally connected together in four wheel drive; anti-locking means for preventing the locking of at least one of said set of rear wheels; and a motive power transmission system linking said front differential and said rear differential, whereby braking torque applied to said front wheels is transmitted to said rear wheels;

wherein said power transmission system includes a lockable central differential disposed between said front and rear differentials, and means for reducing braking torque transmitted from said front wheels to said rear wheels through said motive power transmission system when said anti-locking means are operating; wherein said reducing means comprises means for disconnecting said front and rear differentials; and wherein said disconnecting means comprises means for releasing locking of said central differential.

4,871,044

SERVICE OVERRIDE FOR LOADER INTERLOCK

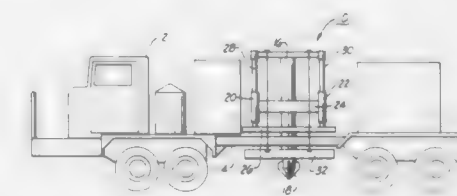
Richard P. Strosser, Akron, and Dale A. Ashcroft, New Holland, both of Pa., assignors to Ford New Holland, Inc., New Holland, Pa.
Filed Feb. 10, 1988, Ser. No. 154,741
Int. Cl.⁴ B60K 28/04; B60R 22/00
U.S. Cl. 180—273 5 Claims



1. In an implement having a mobile frame; an operator station mounted on said frame and including a seat in which the operator sits during the operation of the implement; an operator restraint mechanism having an operative position in which the operator is not restrained on said seat; working means movably supported on said frame for performing tasks selected by said operator and being controllable by said operator from said seat; actuation means operably associated with said working means for selectively effecting the movement of said working means relative to said frame; first and second sensor means operably connected to said operator seat and to said operator restraint mechanism, respectively, to sense the presence of the operator in said seat and to sense the placement of said operator restraint mechanism into said operative position; and power means supported on said frame for operatively powering said actuation means and the mobile movement of said implement, the improvement comprising:

an interlock controller operably associated with said first and second sensor means, said actuation means, and said power means to enable the starting of said power means and the operation of said actuation means only in conjunction with a predetermined sequential operation of said first and second sensor means; and bypass means operatively associated with said interlock controller to permit upon selective engagement thereof the starting of said power means without requiring said predetermined operation of said sensor means, the engagement of said bypass means effecting a disabling of said actuation means so that said implement may have said power means started for servicing thereof without fully enabling the entire operation of said implement.

4,871,045
TELESCOPING TUBE OMNI-DIRECTIONAL SHEAR WAVE VIBRATOR
Jack Cole, Ponca City, Okla., assignor to Conoco Inc., Ponca City, Okla.
Filed Feb. 2, 1987, Ser. No. 9,989
The portion of the term of this patent subsequent to Apr. 5, 2005, has been disclaimed.
Int. Cl.⁴ G01V 1/02
U.S. Cl. 181—114 22 Claims

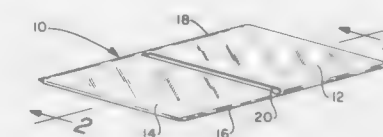


1. Apparatus for generating and coupling shear waves into an earth medium, comprising: support means positionable over said earth medium; a single telescoping tube means stabilized by said support means and extending one end for earth engagement; actuation means for elongating said tube means to force said one end into the earth medium and to continually maintain firm energy coupling engagement; and wave generation vibration means coupled to said tube means adjacent said one end and exerting a force therethrough to impart elliptically polarized shear waves into said earth medium.

4,871,046

DISPOSABLE STETHOSCOPE HEAD SHIELD

Kenneth R. Turner, 36 Orchard Rd., Akron, Ohio 44313
Filed May 23, 1988, Ser. No. 197,303
Int. Cl.⁴ A61B 7/02
U.S. Cl. 181—131 14 Claims



1. A shield for a stethoscope, comprising: a unitary, continuous, uninterrupted bottom portion; and first and second top portions connected to said bottom portion, said top portions having respective first edges in juxtaposition to each other defining an opening therebetween, said top portions being connected to said bottom portion at respective second edges thereof, and said top portions being further connected to said bottom portions at respective third and fourth edges thereof, thereby defining an envelope which is sealed except at said opening, said opening being adapted for receiving a head of the stethoscope.

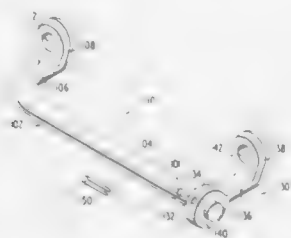
4,871,047

ADJUSTABLE GRAB IRON

Leonard A. McLean, Jacksonville, Fla., assignor to CSX Transportation, Incorporated, Baltimore, Md.
Filed Sep. 1, 1988, Ser. No. 239,363
Int. Cl.⁴ E06C 9/04
U.S. Cl. 182—90 12 Claims

1. An adjustable grab iron configuration for rolling stock, comprising:

a first member having a mounting flange portion and a rod member, said rod member having a series of rod member pin holes that are spaced along at least a portion of said rod member, said rod member pin holes being formed at a common angle;



a second member having a mounting flange portion, and a base portion, said base portion having a ring portion having a hole sized to receive said rod member and a pin hole being formed at said common angle, thereby permitting alignment with any of said rod member pin holes.

4,871,048

CONTROL SYSTEM FOR VEHICLE TRANSMISSIONS

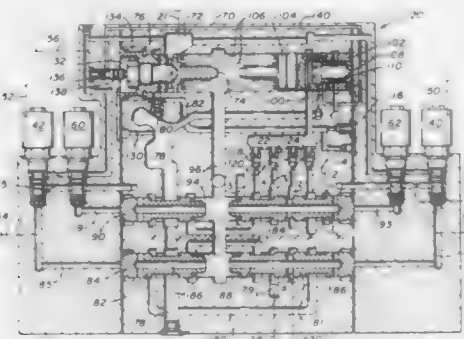
Probir K. Chatterjee, Mt. Prospect, Ill., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Sep. 21, 1987, Ser. No. 99,348

Int. Cl.⁴ F16D 25/11

U.S. Cl. 192—3.58

12 Claims



1. A control system for actuating a transmission that includes a hydraulic clutch, said system comprising:

valve means for controlling fluid flow to and from the clutch, said valve means including a valve housing having a flow passageway therethrough, a valve spool located in said housing for movement between positions permitting and preventing flow through said passageway to the clutch, and means for moving said valve spool between said positions;

clutch fill control means for rapidly filling the clutch when the clutch is to be actuated, said fill control means including a signal pressure chamber in the housing, a relief passageway in the housing connecting said chamber to atmospheric pressure, and an orifice in said flow passageway causing a differential pressure thereacross when said valve spool is in the open position permitting flow there-through, a fill control trigger member movable in said housing to permit and prevent flow through said relief passageway in response to said differential pressure, said trigger member, when moved by said differential, reducing the pressure in said signal chamber to atmospheric, resilient means biasing said trigger member toward the closed position, preventing flow from said chamber, and conduit means arranged to connect said signal chamber with the clutch whereby filling of the clutch essentially stops flow through said orifice, reducing said differential

pressure, permitting said resilient means to move said trigger member to the closed position and stopping flow from said signal chamber to atmospheric pressure; and pressure control means for lowering the pressure fluid in the clutch after filling and for gradually increasing the pressure in the clutch until the clutch is fully engaged.

5. A method of shifting a transmission including a hydraulic clutch, the method comprising the steps of: rapidly filling the clutch with hydraulic fluid; sensing a differential pressure across an orifice when rapidly filling the clutch; shifting a trigger valve member when said differential ceases reducing the pressure in the clutch; and applying pressure at a controlled rate to engage the clutch to complete the shift without transmission shock.

4,871,049

COUPLING DEVICE OF MAGNETIC PARTICLE TYPE

Ryosuke Okita, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP87/00422, § 371 Date Apr. 29, 1988, § 102(e) Date Apr. 29, 1988, PCT Pub. No. WO88/00298, PCT Pub. Date Jan. 14, 1988

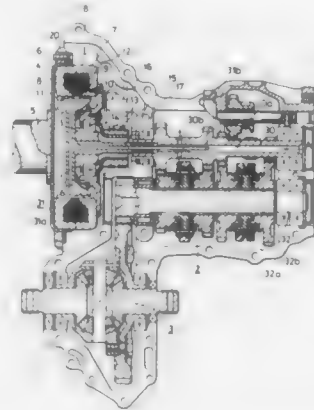
PCT Filed Jun. 25, 1987, Ser. No. 181,290

Claims priority, application Japan, Jun. 30, 1986, 61-153354

Int. Cl.⁴ F16D 37/02, 13/72

U.S. Cl. 192—21.5

3 Claims



1. A magnetic-particle-type coupling device for transmitting the rotation of a crankshaft of an engine to an input shaft of a transmission, said input shaft having an axial internal opening, said coupling device comprising:

an annularly-shaped driving body having an inside circumferential surface;

a driven body whose outside circumferential surface faces the inside circumferential surface of said driving body with a gap therebetween, said driven body being coupled to said input shaft;

magnetic particles disposed in said gap;

an excitation coil circumscribing said driven body for magnetizing said particles to control the state of connection of said driving and driven bodies; and

an elongate heat pipe having one end thereof embedded in said driven body and another end of said pipe inserted in the internal opening of said input shaft, wherein cooling oil is supplied into said internal opening to cool said other end of said pipe, and wherein said one end of the heat pipe is radially ramified in the radial direction of the driven body.

4,871,050

CLUTCH ARRANGEMENT

Achim Link, Schweinfurt, and Reinhold Weidinger, Unterspessheim, both of Fed. Rep. of Germany, assignors to Fichtel & Sachs AG, Schweinfurt, Fed. Rep. of Germany

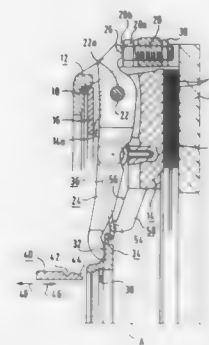
Filed Nov. 25, 1987, Ser. No. 125,538

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1986, 3643072

Int. Cl.⁴ F16D 13/50, 23/14

U.S. Cl. 192—70.29

14 Claims



1. A clutch arrangement, especially for motor vehicles, comprising:

a clutch cover (12) with a clutch cover axis (A),

a thrust plate (14) mounted non-rotatably but axially movably on said clutch cover (12), for pressing a clutch plate (20) in a first axial direction,

a primary spring system (16) acting upon the thrust plate in said first axial direction (14) and supported on the clutch cover (12),

a plurality of release levers (24) arranged in distribution at angular intervals about the axis (A) of the clutch cover (12),

a radially outer region of the release levers (24) being articulatedly supported on the clutch cover (12),

a radially middle region of the release levers (24) being articulatedly connected with the thrust plate (14), and

a radially inner region of the release levers being formed with abutment faces (32) facing in said first axial direction, a release ring resting on said abutment faces, clutch disengagement being obtainable by a pulling action onto said release ring (34) in a second axial direction opposite to said first axial direction through a traction force transmission part (40) of said release bearing, said traction force transmission part (40) being connectable with said release ring (40) by a snap connection (38, 42) under a predetermined axial pressure acting onto said traction force transmission part (40) and against said release ring (34) in said first axial direction, said release ring (34) being urged into engagement with the abutment faces (32) of the release levers (34) by a secondary spring system (36) exerting a spring force onto said release ring (34) in said second axial direction which spring force is insufficient to withstand said predetermined pressure, said release ring (34) being maintained in contact with said abutment faces through an auxiliary support system fitted on the thrust plate (50, 52, 54, 36a) which prevents the release ring (34) from escaping in said first axial direction under said predetermined pressure, said auxiliary support system (50, 52, 54, 36a) being settable out of operation after establishing said snap connection (38, 42) by a first clutch disengage operation at the latest.

4,871,051

CLUTCH BOOSTER CONTROL VALVE SYSTEM

Randal Whitmer, Mukilton, Wash., assignor to Paccar Inc., Bellevue, Wash.

Filed Jul. 20, 1988, Ser. No. 221,926

Int. Cl.⁴ F16D 25/06

5 Claims



4. A clutch booster system for a vehicle having a clutch operating lever adapted to disengage a clutch on the vehicle, a pedal, and linkage means interconnecting the pedal and the clutch operating lever, said system comprising:

a fluid-powered booster cylinder connected to a clutch operating lever for moving the lever; and

control means operatively connected between the clutch operating lever and a pedal, and connecting fluid pressure to the booster cylinder to connect motion of the pedal into movement of the booster cylinder for assisting operating the clutch operating lever responsive to the pedal motion, said control valve means including a proportioning device which restricts the fluid pressure to the booster cylinder for simulating the same clutch pedal response characteristics as in a nonpressure boosted clutch pedal operating system.

4,871,052

CONVEYOR BALL UNIT

Thomas Huber, Iffeldorf, Fed. Rep. of Germany, assignor to Bavaria Cargo Technologie GmbH, Munich, Fed. Rep. of Germany

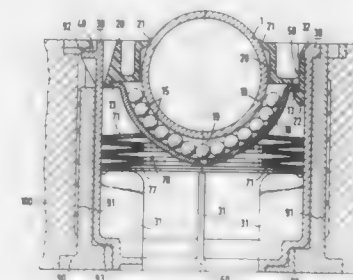
Filed May 18, 1988, Ser. No. 195,340

Claims priority, application Fed. Rep. of Germany, Feb. 22, 1988, 3805494

Int. Cl.⁴ B65G 13/00

U.S. Cl. 193—35 MD

5 Claims



1. A conveyor ball unit for a conveyor track comprising: a housing defining a recess therein having a center axis and an opening which in a position of use of the conveyor ball unit faces upwardly; a mounting shell means disposed in said recess; a spring means operatively disposed between said mounting shell means and said housing to urge said mounting shell means towards said opening; a plurality of mounting balls disposed on said mounting shell means; a conveyor ball member which is

mounted rotatably in concentric relationship with the center axis of said housing on said mounting balls and which projects through said opening outwardly of said housing; a ball guide means extending around said conveyor ball member in an annular configuration thereby to secure said conveyor ball member and therewith said mounting balls movably on said mounting shell means, whereby said conveyor ball member, said mounting balls and said mounting shell means constitute an assembly movably disposed in said housing and adapted to be urged downwardly along said axis against the force of said spring means;

said mounting shell means being generally of an aspherical configuration such as to define an annular region of said mounting shell means, which is concentric with respect to said center axis and so disposed that said conveyor ball member is supported by way of said mounting balls only at said annular region;

said spring means being in the form of a pack of annular plate springs of an outside dimension adapted to the adjoining inside dimension of said recess of said housing; and said mounting shell means being supported by way of said annular region thereof on the inward edge of the uppermost annular plate spring of said pack;

wherein said ball guide means loosely embraces the conveyor ball member in an annular configuration, and further including a sealing lip, adapted to seal relative to the conveyor ball member, disposed at an upper inner edge portion of said annular ball guide means;

wherein said mounting shell means includes a horizontal flange portion at its upper edge, and wherein said ball guide means is provided at the peripheral edge thereof with a plurality of circumferentially distributed snap-engagement projections which in the assembled condition engage snappingly under said flange portion.

4,871,053

FRACTURABLE-KEY ACTIVATED CONTROL SYSTEM
Dara Cosgrave, 38 Gordon Street, Clontarf, New South Wales 2094, and John Roydhouse, 14/10-14 Dural Street, Hornsby, New South Wales 2076, both of Australia

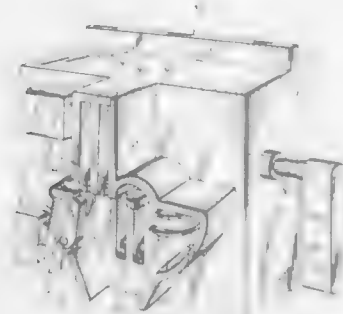
PCT No. PCT/AU86/00337, § 371 Date Aug. 7, 1987, § 102(e) Date Aug. 7, 1987, PCT Pub. No. WO87/02810, PCT Pub. Date May 7, 1987

PCT Filed Nov. 5, 1986, Ser. No. 94,731

Claims priority, application Australia, Nov. 5, 1985, PH3261
Int. Cl.⁴ G07F 7/02

U.S. Cl. 194—208

5 Claims



1. A key activated control unit to be activated by a key having a shank portion and a blade portion, said unit comprising:

a hollow body;
a key insertion slot formed in a side surface of said body for insertion of said key to locate said blade portion within said body, said slot being shaped to locate said blade portion at a predetermined position within said body;
key detection means at a further position angularly spaced

from said predetermined position relative to a longitudinal axis of said shank portion, and positioned radially relative to said slot for engaging said blade portion upon rotation thereof about said axis of said shank portion from said predetermined position to said further position, and responsive to engagement by said blade portion for detecting that said key has been inserted; and

key destruction means engaging said blade portion at said further position for deforming the blade portion thus limiting further use of the key, said destruction means including an abutment surface preventing movement of the blade portion back to said predetermined position without deformation of the blade portion.

4,871,054

VENDING MACHINE

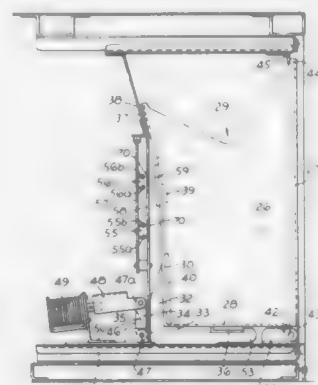
David R. V. Murray, St. Albans, United Kingdom, assignor to Sankey Vending Limited, West Midlands, United Kingdom
Filed Aug. 25, 1988, Ser. No. 236,193

Claims priority, application United Kingdom, Aug. 28, 1987, 8720297

Int. Cl.⁴ G07F 11/06

U.S. Cl. 194—212

11 Claims



10. A vending machine for renting re-usable articles and comprising means for validating a user input to allow a user to operate the machine; a plurality of containers each adapted for receiving an article and each having a latched closed state in which an article in the container is not available to a machine user and an open state in which an article can be removed from or replaced in the container by the user, each container having associated therewith an opto-electronic sensor and an opto-electronic emitter, each container also having an identifying code and each articles having an identifying code and an identifying element arranged to be presented to the emitter and the sensor when the article is in the container and the latter is in its closed state, the identifying element being so located on the article and being such that when subject to the output of the emitter it causes a signal to be generated by the sensor; control means having a rental mode and a return mode; user-operable input means to input a code; the control means being capable of being activated by the user when the control means is in rental mode to open a selected container and being capable of being activated by the inputting of an article code via the input means when the control means is in return mode to open an empty container to receive the article; and a memory associated with the control means and which holds the codes of empty containers and also the code of each article in the machine against the code of the container in which the article is held from time to time, the memory being updated every time an article is rented and returned; the control means being arranged to open an empty container when a valid article code is inputted via the input means in the return mode of the control means and to permit the container to be returned to and remain latched in its closed state if the identifying element on

an article placed therein is presented, when the container is closed, to the emitter and sensor associated with the container, and a single flashing source is associated with a plurality of optical fibres, each optical fibre providing an emitter for a container.

4,871,055

AMUSEMENT DEVICE FOR COLLECTING COINS

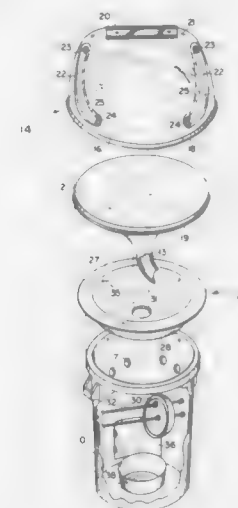
Cecil A. Poythress, 898 S. Myrtle Ave., and Ronald Wharton, 1390 Tumblin Dr., both of New Smyrna Beach, Fla. 32069

Continuation-in-part of Ser. No. 97,958, Sep. 17, 1987. This application Jan. 15, 1988, Ser. No. 144,332

Int. Cl.⁴ G07F 9/06

U.S. Cl. 194—344

9 Claims



1. An amusement device for use with coins or the like comprising:

a circular transparent funnel shaped element having an outlet portion to permit an article deposited in said funnel shaped element to drop therethrough by gravity;
an essentially hemispherical reflector having a concentric opening therethrough, said reflector disposed below said funnel and spaced apart therefrom with said outlet portion thereof extending through said opening;

support means for supporting said funnel shaped element and said reflector;

a transparent dome disposed over said funnel shaped element;

at least one article directing chute molded into an external surface of said dome, said chute having an input end for accepting an article and an output end including an opening into said dome through which said article is injected tangentially onto an inner surface of said circular funnel shaped element causing said article to spiral downward along said surface and to drop through said outlet, said reflector causing said article to appear to float in air; and
a gong disposed below said outlet to permit said article to strike said gong as said article drops through said outlet.

4,871,056

BALUSTRADE FOR PASSENGER CONVEYER

Chiichi Saito, Katsuta, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed May 26, 1988, Ser. No. 199,268

Claims priority, application Japan, Jun. 3, 1987, 62-139416
Int. Cl.⁴ B65G 15/00

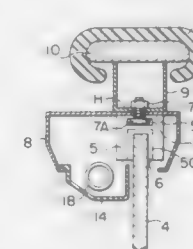
U.S. Cl. 198—335

4 Claims

1. A balustrade for a passenger conveyer, the balustrade comprising:

a vertically upright balustrade panel;

a main deck fixedly mounted to an upper end of said vertically upright balustrade panel;
a guide rail;
a guide frame arranged on said main deck for slidably guiding said handrail; and
a plurality of fixing instruments each having an inverted U-shaped fitting groove on one side and a fixing section on the other side, said fixing instruments being spaced from each other at intervals longer than a length of each of said



fixing instruments, said fitting groove in said fixing instrument being fitted about the upper end of said balustrade panel to mount said fixing instruments to the upper end of said balustrade panel, said main deck being attached to said fixing section of said fixing instruments wherein said main deck is fixed onto said fixing instruments with spaces left between said main deck and an upper end of said balustrade panel in the intervals between the said fixing instruments.

4,871,057

METHOD OF, AND APPARATUS FOR, TEMPORARILY REMOVING A PRODUCT FROM A SERIES OF PRODUCTS BEING TRANSPORTED

Mathias L. C. Aarts, Bilthoven, Netherlands, assignor to Product Suppliers AG, Zug, Switzerland

Filed Dec. 9, 1987, Ser. No. 130,690

Claims priority, application Netherlands, Dec. 17, 1986, 8603110

Int. Cl.⁴ B65G 47/00

U.S. Cl. 198—346.1

9 Claims



1. Apparatus for temporarily removing each product from a series of products being transported on a conveyor line comprising: a supply conveyor for supplying a series of successive products; a discharge conveyor; a movable carrier for taking over the product to be removed from the series in a starting position in the vicinity of the supply conveyor; and moving means for removing the carrier with product from the starting position and thereafter returning the carrier with product to the starting position for putting the product from the carrier back into the series at that position, said carrier having a carrying surface for carrying the product, said carrying surface forming a common portion of a carrier track at said starting position which is to be traversed by the carrying surface and the carrier, and the conveyor line crossing said carrier track in

line with said supply conveyor and said discharge conveyor for conveying the products between the supply conveyor and the discharge conveyor, wherein said moving means returns said carrier and product to said starting position to return said product to said series while said carrier simultaneously takes over a subsequent product for removal from said series, said carrier track being an endless track.

4,871,058

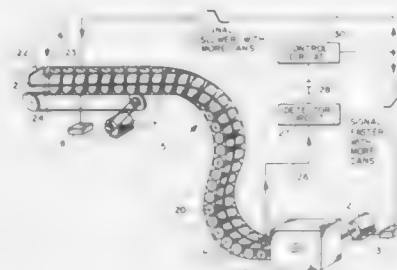
MACHINE CONTROL APPARATUS USING WIRE CAPACITANCE SENSOR

Winston E. Shields, 8612 W. 127th St., Palos Park, Ill.
Filed Mar. 1, 1988, Ser. No. 162,755

Int. Cl.⁴ B65G 43/00

U.S. Cl. 198—444

9 Claims



1. In a control system for controlling the operating speed of a can machine having an input conveyor with a metal frame for temporarily storing a plurality of cans while moving said cans along a path toward said machine the improvement comprising: a substantially flexible metal wire extending along said conveyor in the direction of travel of said cans; means for mounting said wire physically spaced and electrically isolated from said frame to form an input capacitance with said frame, the value of said input capacitance being modified proportional to the number of cans in said conveyor; circuit means for forming a capacitance bridge circuit having one branch including said input capacitance; oscillator circuit means for exciting said bridge circuit; detector circuit means coupled to said bridge circuit means for generating an output signal representative of the number of cans in said conveyor; and drive circuit means including isolation circuit means receiving said output signal of said detector circuit means for transmitting a control signal to a remotely located variable speed drive controller for a machine to control said controller as a function of the number of cans in said conveyor.

4,871,059

MEANS FOR FORMING WOOD PORTIONS FROM A WOOD FLOW

Raimo Rantanen, Lahti; Pentti Huhta, Salpakangas, and Hans-Erik Winqvist, Hyvinkää, all of Finland, assignors to Kone Oy, Helsinki, Finland

Continuation-in-part of Ser. No. 867,673, May 28, 1986, abandoned. This application Sep. 28, 1987, Ser. No. 101,695

Claims priority, application Finland, Jun. 13, 1985, 852352

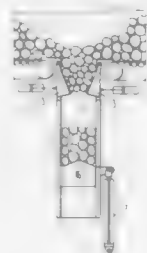
Int. Cl.⁴ B65G 47/04

U.S. Cl. 198—532

4 Claims

1. Apparatus for dividing a supply of elongate wood logs into a plurality of portions, comprising:
means (1,2; 11,12) defining an aperture for receiving the wood logs;
first means (6; 13) comprising a pair of facing gripper members disposed on opposite sides of the aperture and movable between an inwardly directed clamping position for restraining said wood logs from falling through said aperture and an open position permitting downward passage of wood logs under gravity;
second, support means (3; 16) disposed immediately below the first means and movable vertically upwardly and

downwardly relative to said aperture to directly receive a plurality of said wood logs constituting one of said portions released by the first means and to allow said one portion to descend therewith at a controlled rate; and means for operating said first means from said open position



to said clamping position after a downward movement of said support means, so as to restrain further wood logs from falling through said aperture and onto said support means, such that a remainder of said wood logs is temporarily restrained from descending with said one portion and said support means.

4,871,060

SCRAPING CONVEYOR

Christian Dahl, Svanebjerggaard, and Thøge Dall, Aftensang 22, both of Egtved, Denmark

PCT No. PCT/DK82/00088, § 371 Date May 31, 1983, § 102(e) Date May 31, 1983, PCT Pub. No. WO83/01245, PCT Pub. Date Apr. 14, 1983

PCT Filed Sep. 30, 1982, Ser. No. 499,157

Claims priority, application Denmark, Sep. 30, 1981, 4324/81

Int. Cl.⁴ B65G 19/14

U.S. Cl. 198—716

3 Claims



1. A scraper conveyor comprising a conveyor chain or wire, a plurality of transverse scraper members connected to said wire or chain, a stationary conveyor channel means or tube means for at least partially defining a closed path along which said conveyor chain or wire travels, said closed path extending from a material inlet station and passing through at least one receiver station in which material conveyed by the conveyor is dispensable through outlet openings provided in said stationary conveyor channel means or tube means, a driving wheel means for driving the conveyor chain or wire, said driving wheel means being adapted to frictionally engage at least a portion of said transverse scraper members and including a circumferentially substantially smooth wheel having a solid body construction and a profiled outer surface which conditions a frictional engagement between radially narrow frictional portions of outer edges of the respective scraper members, said profiled outer surface of said driving wheel means including an outer recess means disposed along a periphery thereof for receiving approximately one-half of the respective transverse

scraper members and a pair of annular recess means disposed in opposed inner wall portions of said outer recess means for respectively rigidly receiving opposed V-belt members defining said radially narrow frictional portions of the wheel, and wherein means are provided for tightening a movable element of the conveyor about the driving wheel means sufficiently to ensure a firm frictional engagement between the conveyor and the driving wheel means.

4,871,061

FURNITURE CONTAINER

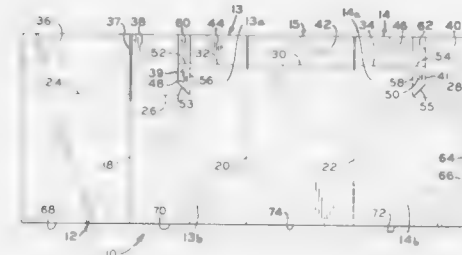
Stanley A. Schneider, Jasper, and John G. Knust, Ferdinand, both of Ind., assignors to Kimball International, Inc., Jasper, Ind.

Filed Aug. 10, 1988, Ser. No. 230,784

Int. Cl.⁴ B65D 85/00

U.S. Cl. 206—326

10 Claims



1. A blank for a body portion of a shipping container comprising:

- a lower front panel, two L-shaped side panels and a rear panel, said panels being interconnected by parallel fold lines, each of said panels having lower edges that are substantially colinear, said side panels each having an upper portion and a lower portion, upper edges of said side panel lower portions and an upper edge of said lower front panel being substantially colinear, upper edges of said side panel upper portions and an upper edge of said rear panel being substantially colinear;
- a front shelf panel foldably attached to said upper edge of said lower front panel, side shelf panels foldably attached to said upper edges of said side panel lower portions, a top panel foldably attached to an upper edge of said rear panel, and side top panels foldably attached to upper edges of said side panel upper portion; and
- a pair of side flaps each having an upper edge and side edges foldably attached along a side edge to a side edge of a respective side panel upper portion, said upper edges of said side flaps being substantially colinear with said upper edges of said side panel upper portions, said side flaps having lower edges, said side flaps further having side flap top panels foldably attached to said upper edges of said side flaps, said front shelf panel having a free edge that is spaced from said upper edge of said lower front panel by a distance substantially equal to the length of said upper edge of said side panel lower portion between the fold line of said side panel lower portion and the side edge of the respective side panel upper portion.

4,871,062

PIN CARRIER

Herbert L. Gordon, Jr., Elizabethtown, Pa., assignor to Inter-Con Systems, Inc., Harrisburg, Pa.

Filed Dec. 6, 1988, Ser. No. 280,338

Int. Cl.⁴ B65D 73/02

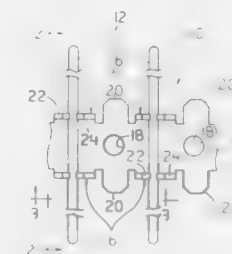
U.S. Cl. 206—328

12 Claims

- 1. A pin carrier formed from metal strip stock comprising
 - (a) an elongate strip; and
 - (b) a first plurality of pin retention members extending from

the strip at regular intervals along the length of the strip, each member having

- i. a locating finger,
- ii. a spring finger spaced from the locating finger to define an open ended pin-receiving slot between the fingers,
- iii. the spring finger including a rigid post away from the slot having an end adjacent the open end of the slot and a spring beam spaced from the post and extending along one side of the slot, one end of the spring beam joining



the end of the post and the other end of the spring beam joining the spring retention finger at the bottom of the slot, said spring beam being spaced from the post to permit flexing of the spring beam away from the slot, and

- iv. a first pin contact surface on the center of the spring beam facing the slot and a second pin contact surface on the surface of the locating finger facing the slot across from the first pin contact surface.

4,871,063

PALLET COVER

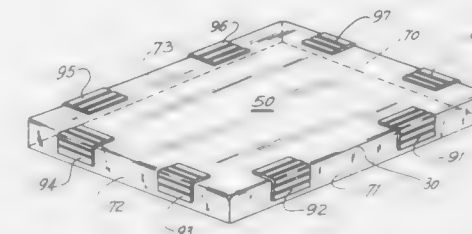
John F. Kumbier, 30789 Cedar Dr., Burlington, Wis. 53105

Filed Nov. 21, 1988, Ser. No. 273,771

Int. Cl.⁴ B65D 19/00

U.S. Cl. 206—386

9 Claims



- 1. A cover for a load supported by a pallet comprising: a plurality of formed layers of said material means; adhesive means; said layers of said material means alternating with layers of said adhesive means; said alternating layers forming a shape; said shape having a generally horizontal upper surface and a plurality of independent integral flanges, each attached to said upper surface along a single bend line; each said layer of said material means has a grain; said grain having a direction; said direction of said grain of each said layer of said material means having a direction different from each adjacent said layer of said material means; whereby the strength of said cover is improved.

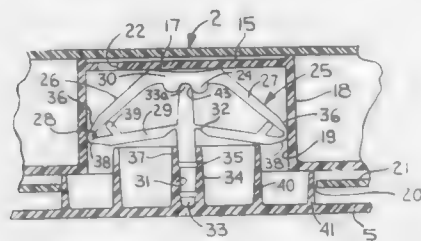
4,871,064

CASSETTE STORAGE CONTAINER

Bruce A. Hehn; James T. Weisburn, both of Massillon; Richard R. Lewellen, and Mark W. Gets, both of Wooster, all of Ohio, assignors to Alpha Enterprises, Inc., North Canton, Ohio
Filed Jul. 18, 1988, Ser. No. 220,682
Int. Cl.⁴ B65D 85/672

U.S. Cl. 206—387

22 Claims



1. A container for storing a tape cassette having at least one tape reel hub comprising a bottom wall and a cylindrical sidewall defining a recess in the hub, said hub recess being accessible through an opening formed in a bottom wall of the cassette, said storage container including enclosure means for receiving and enclosing a tape cassette in the storage container; and hub engaging means mounted in the storage container and located for entering the hub recess through the access opening when a cassette is placed in said container for preventing rotation of the tape reel hub, said hub engaging means including a pair of toggles movable between expanded and retracted positions, said toggles being engaged by the bottom wall of said hub upon placing a cassette into the storage container, so that the toggles move toward the expanded position and into engagement with the cylindrical sidewall to prevent rotation of the tape reel hub within the cassette.

4,871,065

COMPACT DISC SECURITY PACKAGE

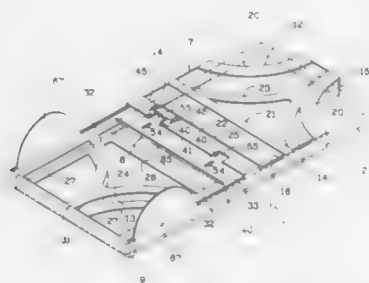
Bruce A. Hehn, Massillon, and Andrew W. Mook, Brecksville, both of Ohio, assignors to Alpha Enterprises, Inc., Canton, Ohio

Filed Aug. 19, 1988, Ser. No. 234,375

Int. Cl.⁴ B65D 85/672

U.S. Cl. 206—387

16 Claims



1. A package construction for holding an elongated, rectangular container of the type having opposite end portions and a compartment formed in at least one of said end portions for receiving a rectangular storage box containing a digital audio compact disc, said package including:

(a) a housing formed out of a piece of material and having a storage compartment formed therein, said compartment having an access opening for inserting and removing a compact disc container into and from the compartment, said housing being formed by an elongated, generally rectangular integral one-piece member having a generally closed end and a generally opposite open end which pro-

vides the access opening, and having spaced top and bottom faces, a spaced pair of side walls and a closed end wall defining the storage compartment;

- (b) a cover integrally formed out of the same piece of material as said housing and pivotally mounted on the housing and movable between open and closed positions for allowing and preventing, respectively, insertion and removal of a compact disc container into and from the access opening of the storage compartment;
- (c) lock means for releasably securing the cover in the closed position, said lock means comprising at least one locking tab and at least one camming surface formed on the housing, and further comprising at least one locking projection formed on the cover, so that said locking projection is slideably engageable with the camming surface and locking tab for retaining said cover in the closed position; and
- (d) separate key means engageable with the housing locking tab for moving said tab out of engagement with the cover locking projection to enable the cover to be slid from locking engagement with the housing and moved to the open position for removing a compact disc container from the storage compartment through the access opening.

4,871,066

TELESCOPING FILE FOLDERS

David LaWall, Ardmore, Pa., assignor to David Eckhart, Westlake Village, Calif., a part interest

Filed Aug. 5, 1988, Ser. No. 229,570

Int. Cl.⁴ B56D 26/10

U.S. Cl. 206—425

13 Claims



1. A container, comprising:
- means defining a pocket for receipt of articles, the pocket holding the articles within the container;
- a connecting flap connected along a fold line to an edge of the rear panel, the connecting flap having a width closely dimensioned to a width of the pocket, the connecting flap of a first said container being fittable in the pocket of a second said container when the connecting flap of the first container is folded backwards on the fold line with said rear panels; and,
- the flap having a portion spaced from an abutting portion of the pocket when the first and second containers are in registry, the first container being attachable in registry with the second container by placing the connecting flap of the first container in the pocket of the second container, whereupon the first container and the second container are supported solely by the connecting flap of the first container and the second said container is movable out of registry with the first container until the connecting flap portion abuts the portion of the pocket to fix the first said container to the second said container, exposing the second container along an edge thereof.

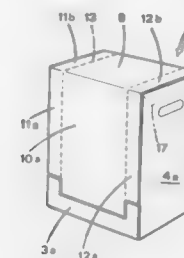
4,871,067

PERFECTED CASE FOR PACKAGING PRODUCTS OF DIFFERENT KINDS IN CASES

Dante Valenti, Imola, Italy, assignor to In-Pak S.p.A., Italy
Continuation of Ser. No. 113,613, Oct. 26, 1987, abandoned.
This application Mar. 17, 1989, Ser. No. 326,411
Claims priority, application Italy, Oct. 30, 1986, 5040/86[U]
Int. Cl.⁴ B65D 5/54

U.S. Cl. 206—427

2 Claims



1. A perfected case for products of different kinds comprising: a base piece; two side pieces and two head pieces; two strengthening projections located along vertical edges of each of said head pieces, providing outer faces along the sides thereof; two end flaps, folding on upper ends of said head pieces, said flaps folded over said strengthening projections, providing top faces thereon; two tabs, holding said end flaps folded in place on the strengthening projections, said two tabs folding on either end of each end flap, which are in their turn folded down and glued to the outer face of each strengthening projection, facing towards the outside of the case; a lid to close said case, said lid being obtained from a single blank divided by two preformed transverse fold lines into a central area and two wings, said two wings articulated to said central area and located opposite each other, said wings having free ends cut to have an outline that corresponds and is complimentary to the shape of corresponding upper edges of said side pieces, two longitudinal perforated lines extending along free edges of said central area and of said wings, to delineate two strips, each strip divided by said transverse fold lines into three portions, one portion corresponding to said central area and two portions corresponding to said wings, said strips being designed to be completely glued to said outer faces and top faces with said free ends adjoining said upper edges of said side pieces, wherein after said lid has been fitted to the case, said central area and wings can be detached from said portions of said strips along said perforated lines, so that said wings and central area can be removed.

4,871,068

PACKAGING ARRANGEMENT FOR A GROUP OF CONTAINERS INCLUDING A HANDLE ON A TYING STRAP

Roger Dreyfus, Strasbourg, France, assignor to I.C.P., S.A., Fegersheim, France

Continuation of Ser. No. 943,666, Dec. 18, 1986, abandoned.

This application Jun. 15, 1988, Ser. No. 206,892

Claims priority, application France, Dec. 18, 1985, 85 18900; Dec. 18, 1985, 85 18901

Int. Cl.⁴ B65D 5/46

U.S. Cl. 206—428

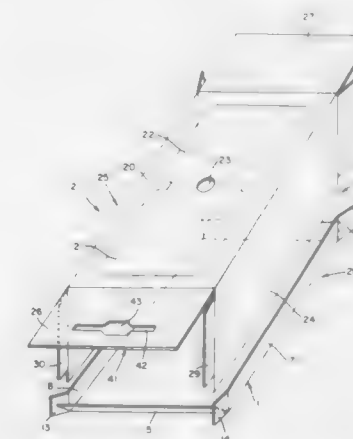
20 Claims

1. A packaging arrangement for a group of containers, comprising:

- a first ray-shaped bottom member having a substantially planar bottom wall and circumferential sidewalls extending substantially perpendicularly upwardly from said bottom wall and constituting a peripheral rim that at least initially peripherally confines said group of containers arranged in a predetermined pattern upon said bottom wall;
- a strap-shaped tying member, having handle means disposed

thereon, tightly encircling said group of containers so as to hold said containers in said predetermined pattern;

a second cover member, separate and distinct from said first tray member, including a top wall and circumferential sidewalls extending substantially perpendicularly downwardly from said top wall so as to envelop said group of containers disposed upon said bottom tray member, and said strap-shaped tying member, and having means for



securing said cover member to said bottom member so as to form a package therewith; and

means defining an opening within a sidewall of said cover member for the passage of said handle means there-through from the interior of said package to the exterior of said package.

6. The packaging arrangement as defined in claim 1, wherein said handle means is of one piece with said tying member.

4,871,069

CUSHIONED CONTAINER

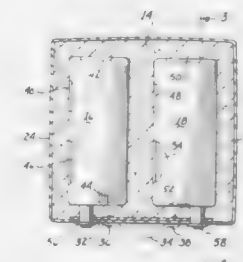
Patricia A. Guimont, 2543 W. Catalina Dr., Phoenix, Ariz. 85017

Filed Feb. 29, 1988, Ser. No. 161,907

Int. Cl.⁴ A45C 11/20; B65D 81/38

U.S. Cl. 206—545

1 Claim



1. A portable seat cushion comprising:

a seat cover;

a resilient thermal insulating material within said seat cover, said material being molded to form at least one cavity having inner walls that are impermeable to fluids; and

a spigot connected to a wall of said cavity, said spigot having an outer tubular member and a telescoping inner tubular member that extends through said seat cover, said inner tubular member being alternatively moveable to an open position and to a closed position to respectively permit and prevent a flow of fluid from said cavity through said tubular members to the outside of said seat cover.

4,871,070

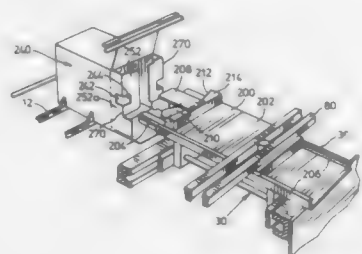
CARTON END CLOSURE

Marius J. M. Langen, Toronto, and Peter Guttinger, Milton, both of Canada, assignors to H. J. Langen & Sons Limited, Mississauga, Canada

Division of Ser. No. 133,606, Dec. 16, 1987. This application Oct. 28, 1988, Ser. No. 263,700
Int. Cl.⁴ B65D 5/00

U.S. Cl. 206—591

1 Claim



1. In a carton having a load storage compartment formed therein, the improvement of first and second oppositely disposed side closure flaps hingedly connected to opposite side walls of the carton along first hinges, said first and second side flaps each comprising a proximal panel which extends from its associated first hinge and a distal panel which is hingedly connected to the proximal panel along a second hinge which extends parallel to the first hinge, the proximal panel having an extension which projects beyond the second hinge and is initially co-extensive with the distal panel, a through passage formed in each side closure flap which across the second hinge to provide an access notch in each proximal panel and its associated distal panel, said notches serving to provide clearance for a tucking blade to extend therethrough to tuck the distal panel in behind the proximal panel in use.

4,871,071

VENT OPENING SCORING IN CONTAINER LID

John Zimmermann, Scarborough, Canada, assignor to Paperboard Industries Corporation, Toronto, Canada

Filed Feb. 9, 1989, Ser. No. 308,198
Int. Cl.⁴ B65D 5/54, 5/64

U.S. Cl. 206—628

22 Claims



1. In a paperboard lid having first and second side edges which meet at a corner, an upper face and a lower face, the improvement of:

(a) first and second weakened score lines formed in said upper and lower faces of said lid respectively, and extending obliquely across the lid at said corner to form a frangible corner panel, said first score line being located between the corner and the second score line,

(b) a third weakened score line extending inwardly from the corner to the second score line,
(c) the path of the first and third score lines intersecting one another at an intersection point, one of the first and second score lines being a discontinuous score line and the other being a continuous score line, the discontinuous score line being interrupted closely adjacent the intersection point such that the first and third score lines do not overlap at the intersection point,
(d) said corner panel being severable from the remainder of the lid by depressing the corner panel to cause it to buckle inwardly upon itself along the third score line and simultaneously causing it to tear between the first and second score lines to form an opening between the corner panel and the remainder of the lid.

4,871,072

METHOD AND DEVICE FOR TUBE SELECTION

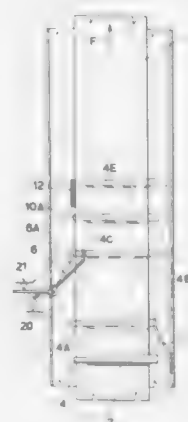
Luigi Colli, Pordenone, Italy, assignor to Savio, S.p.A., Pordenone, Italy

Filed Jun. 14, 1988, Ser. No. 206,586

Claims priority, application Italy, Jun. 30, 1987, 21108 A/87
Int. Cl.⁴ B07C 9/00

U.S. Cl. 209—656

5 Claims



1. A method for separating tubes containing residual wound yarn for textile machines from a conveyor for conveying tubes with and without residual yarn comprising:

(a) positioning an individual tube by a lateral positioning means in a substantially central region of a supporting bar means connected to the conveyor, as the conveyor and supporting bar means moves upwardly;
(b) providing said supporting bar means with a toothed element for separating tubes with residual yarn from those which do not have residual yarn;
(c) sensing the presence of residual yarn on a tube by an elastically yieldable lateral lever means cooperating with said toothed element so as to maintain a tube with residual yarn in position on the supporting bar and axially displacing a tube without residual yarn along the length of the supporting bar;
(d) discharging the tube having the residual yarn by raising and removing it from said supporting bar means by means of a fixed lateral cam which only contacts and moves the tube with residual yarn from the support bar; and
(e) accumulating the tubes with residual yarn in a collection box after removing them from said supporting bar means.

4,871,073

DISC SCREEN SEPARATOR DEVICE

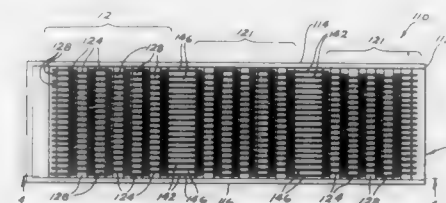
John R. Berry, Cockeysville, and David N. Chon, Baltimore, both of Md., assignors to National Ecology, Inc., Timonium, Md.

Filed Oct. 2, 1987, Ser. No. 103,963

Int. Cl.⁴ B07B 1/16

U.S. Cl. 209—672

9 Claims



1. A disc screen separator device comprising:

a frame structure;
a plurality of sets of first shafts, the shafts of each set being spaced apart and parallel to each other and journal mounted to the frame structure, the sets of shafts being spaced from each other by an interval larger than the space between adjacent shafts of the sets;
a second shaft located in each interval between sets of first shafts with the space between the second shaft and adjacent ones of the first shafts of the sets adjacent thereto being larger than the spacing between adjacent ones of the first shafts of the sets;
a plurality of separator discs mounted on each first shaft coaxial with the first shaft and coaxial with each other, and for rotation with the first shaft, the separator discs on each first shaft being spaced from adjacent separator discs on the same first shaft along the longitudinal axis of the first shaft;
a plurality of first spacers mounted on each first shaft coaxial with the first shaft, coaxial with the separator discs, and coaxial with each other, and for rotation with the first shaft, the first spacers being located between adjacent separator discs to maintain the space between adjacent separator discs;
the separator discs on each first shaft of a set are interspaced with the separator discs on adjacent first shafts of the same set;
a plurality of agitator discs mounted on the second shaft coaxial with the second shaft and coaxial with each other, and for rotation with the second shaft, the agitator discs being spaced from adjacent agitator discs along the longitudinal axis of the second shaft;
a plurality of second spacers mounted on the second shaft coaxial with the second shaft, coaxial with the agitator discs, and coaxial with each other, and for rotation with the second shaft, the second spacer discs being located between adjacent agitator discs to maintain the space between adjacent agitator discs; and
the agitator discs on the second shaft are interspaced with the separator discs on the first shafts of the shaft sets adjacent to the second shaft.

4,871,074

HAIR APPLIANCE ORGANIZER

Ronald D. Bryson, and Linda L. Bryson, both of 19 Hillcrest Rd., Enola, Pa. 17025

Filed Dec. 1, 1988, Ser. No. 278,482

Int. Cl.⁴ A47F 7/00

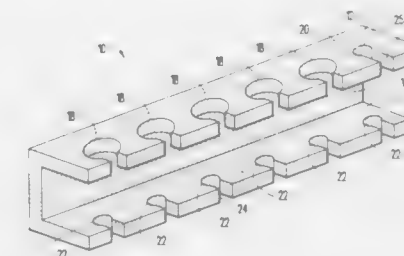
U.S. Cl. 211—13

8 Claims

1. A hair appliance organizer rack for holding hair appliances, comprising:

first and second spaced parallel rectangular support surfaces;
a transverse wall connecting back longitudinal edges of said

first and second support surfaces, forming an open rectangular channel;
a plurality of pairs of spaced aligned circular apertures extending through said first and second support surfaces;
a plurality of slots extending from a front edge of said first and second support surfaces and intersecting said circular apertures;
a plurality of frusto conical hollow inserts in said circular apertures;



each of said inserts having a slotted side wall portion in alignment with said slots formed in said first and second supporting surfaces;
each of said inserts having a radially extending flange overlying one of said first and second supporting surfaces; and
at least one of said inserts having a maximum diameter substantially smaller than the diameter of the associated receiving aperture, and is surrounded by an O-ring.

4,871,075

SHIPPING RACK FOR VEHICLE AIR DAMS

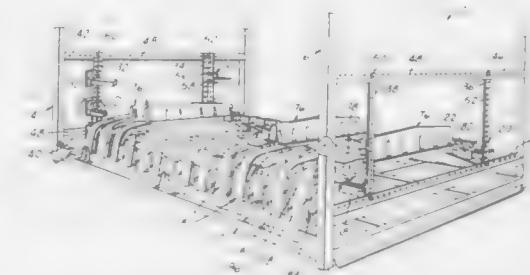
Julie M. Moulds, Royal Oak, Mich., assignor to Chrysler Motors Corporation, Highland Park, Mich.

Filed Apr. 4, 1988, Ser. No. 177,197

Int. Cl.⁴ A47F 7/00

U.S. Cl. 211—13

4 Claims



1. In a shipping rack for vehicle air dams of the type fabricated of flexible plastic material and comprising an elongated central portion for positionment beneath the bumper of a vehicle, relatively short end portions extending from the central portion, the end portions adapted to wrap around the sides of a vehicle, each end portion having, when positioned on the rack, a generally vertically extending wall section with an opening provided therein, the central portion having, when positioned on the rack, a generally horizontally extending tab at each end thereof, each of said tabs extending towards the wall section of the adjacent end portion, the improvement comprising at least two oppositely disposed air dam support members mounted on the rack, the air dam support members each having a generally triangular shape defining a generally horizontal support surface and a generally vertical support surface for supporting an outer end and end portion of an air dam, a pin extending outwardly from one side of each air dam support member adjacent to the generally vertical support

surface for extending through said air dam opening, each air dam support member having a slot therein adjacent to the generally horizontal support surface for receiving said air dam tab.

4,871,077
TAMPER RESISTANT, TAMPER EVIDENT LEAK
PROOF CONTAINER

Stanley D. Ogden, Clovis, and William C. Dixon, Fresno, both of Calif., assignors to Dextech, Inc., Fresno, Calif.
Continuation-in-part of Ser. No. 43,904, Apr. 27, 1987, Pat. No. 4,813,563. This application Apr. 1, 1988, Ser. No. 176,529
Int. Cl.⁴ B65D 39/00

U.S. Cl. 215—366

12 Claims

4,871,076
MODULAR SYSTEM FOR THE ERECTION OF DISPLAY
APPARATUS

Werner Schramm, Munich, Fed. Rep. of Germany, assignor to PFP-Anstalt für Produktentwicklung und -Verwertung, Schaan, Fed. Rep. of Germany

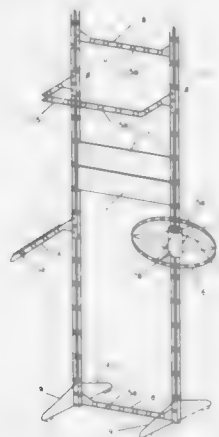
Filed Sep. 18, 1987, Ser. No. 98,509

Claims priority, application Fed. Rep. of Germany, Oct. 4, 1986, 3633889; May 13, 1987, 8706885

Int. Cl.⁴ A47F 43/00

U.S. Cl. 211—189

22 Claims



1. A modular system for the erection of apparatus for the display of merchandise, said modular system comprising:
at least one column for being supported by a base;
said at least one column having a longitudinal direction;
said at least one column including four parallel, round bars extending in said longitudinal direction;
said at least one column having a plurality of more than two discs disposed transversely of said longitudinal direction within and fastened to said bars;
each of said discs being circular and having a predetermined diameter;
said bars being disposed equally about each of said discs with an angle of about 90 degrees therebetween;
said plurality of discs being distributed at substantially uniform intervals one from the other in said longitudinal direction along a length of said column to provide support for and rigidity to said bars throughout said length of said column; and
at least one member including connecting means for connecting said member to at least one of said bars and said discs of said at least one column said connecting element for being deposited at said end of said column between said bars extending beyond said at least one of said discs and for being interlocked with said connecting element for preventing any substantial rotation between said connecting element and said column.

1. Joinable components for a tamper resistant, tamper evident container, comprising:

- a cup of hard, relatively rigid material comprising an annular sidewall and having a closed bottom end and an open upper end, said cup having inwardly extending peripheral first lip means formed about the upper inner surface thereof;
- a cover of size and configuration for insertion into the open end of the cup, said cover comprising a hard, relatively flexible, annular sidewall and having outwardly extending, peripheral second lip means formed about the outer surface thereof, the relative flexibility of said cover permitting insertion of the second lip means into the cup to engage said first lip means and, in combination with the relative rigidity of said cup and first lip means, providing secure locking engagement of the first and second lip means, and said cover further comprising an integral tubular spout having top and bottom ends and a sealing member across the spout; and
- a lockable plug for the spout comprising an open tubular body of size and configuration adapted for sliding insertion into the spout, said body having a cap formed on the upper end thereof, peripheral third lip means extending laterally from said upper end and peripheral fourth lip means extending laterally from the bottom thereof, said plug lip means being spaced apart a selected distance for locking the plug onto the top and bottom ends of the spout.



4,871,078
STORAGE TANKS WITH FORMED JACKET FOR
SECONDARY CONTAINMENT

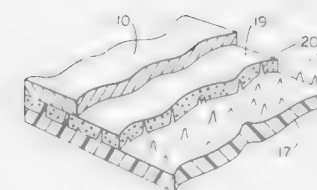
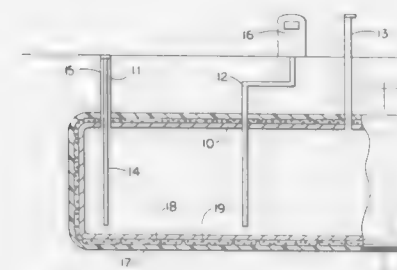
Bruce R. Sharp, 4090 Rose Hill, Cincinnati, Ohio 45229
Continuation-in-part of Ser. No. 853,974, Apr. 21, 1986, which is a continuation-in-part of Ser. No. 824,680, Jan. 31, 1986, Pat. No. 4,653,312, which is a continuation-in-part of Ser. No. 745,540, Jun. 17, 1985, abandoned, and a continuation-in-part of Ser. No. 740,869, Jun. 3, 1985, Pat. No. 4,607,522, which is a continuation-in-part of Ser. No. 544,013, Oct. 21, 1983, Pat. No. 4,523,454, and a continuation-in-part of Ser. No. 580,800, Feb. 16, 1984, Pat. No. 4,524,609, which is a continuation-in-part of Ser. No. 544,012, Oct. 21, 1983, abandoned. This application Mar. 7, 1988, Ser. No. 165,153

The portion of the term of this patent subsequent to Mar. 31, 2004, has been disclaimed.

Int. Cl.⁴ G01M 3/16

U.S. Cl. 220—1 B

7 Claims



1. A storage tank for liquids having secondary containment capability and sufficient integral structural strength to withstand external load forces normally encountered by underground storage tanks, comprising:

- (a) a rigid inner tank for storing the liquid;
- (b) an open-cell synthetic foam as a separating agent on an outside surface of the inner tank, said foam characterized in having its outside surface at least partly sealed to retard penetration of liquid resinous material; and
- (c) a jacket made of a fibrous reinforced resinous material which completely covers the storage tank to form a closed space, said packet characterized in having resin support column extending from its underside, further wherein said jacket is structurally independent from the rigid inner tank because of the separating agent, yet is in close proximity to the storage tank so that said jacket and inner tank reinforce one another to achieve the integral structural strength.

4,871,079
FLOATABLE COOLER CHEST

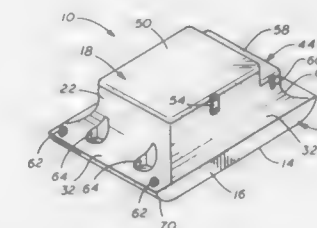
Kenneth E. Doucette, 5435 Barber Loop, and Chris W. Jennings, 810 Bayview Dr., both of Baytown, Tex. 77520

Continuation-in-part of Ser. No. 162,157, Feb. 29, 1988, abandoned, Continuation of Ser. No. 897,328, Aug. 18, 1986, abandoned. This application May 2, 1988, Ser. No. 189,215

Int. Cl.⁴ B65D 1/24

U.S. Cl. 220—1 R

7 Claims



1. A floating cooler chest comprising:

- (a) an integral molded body having:
 - (i) a storage chest having:
 - (a) rectangular sides and a rectangular bottom defining a first inner cavity,
 - (b) the first inner cavity having rectangular sides and a rectangular bottom defining a first common inner surface, and
 - (c) the sides and bottom of the storage chest being of sufficient thickness to provide thermal insulation;
 - (ii) a personal effects safe having:
 - (a) rectangular sides and a rectangular bottom defining a second inner cavity;
 - (b) the second inner cavity having rectangular sides and a rectangular bottom defining a second common inner surface; and
 - (c) one of the rectangular sides formed in common with the lower portion of one of the rectangular sides of the storage chest;
 - (iii) the sides of the storage chest that are not formed in common with a side personal effects safe and the sides of the personal effects safe that are not formed in common with a side of the storage chest defining an outer side surface;
 - (iv) the bottom of the storage chest and the bottom of the personal effects safe defining a continuous lower surface;
 - (v) the lower portion of the outer side surface extending outwardly in all directions to form a barge member having barge side surfaces, a barge top surface and a barge bottom surface, and having a displacement volume sufficient to provide buoyancy for the floating cooler chest;
 - (vi) the barge bottom surface formed in common with the continuous lower surface of the storage chest and personal effects safe;
 - (vii) the lower portion of the outer side surface immediately above the barge member curving downwardly and outwardly as a radius merging with the barge top surface, and defining curved side surfaces;
 - (viii) a plurality of cylindrical cavities formed in the upper portion of the barge member through the barge top surface and curved side surface, and defining inner cylindrical cavity surfaces;
 - (ix) two opposite barge side surfaces curving downwardly and under the barge to merge with the barge bottom surface, and defining end bottom curve surfaces;
 - (x) end recesses formed in opposite ends of the bottom of the barge through the end bottom curve surfaces, and defining inner end recess surface;
 - (xi) the outer side surface, continuous lower surface, barge bottom surface, barge top surface, barge side surfaces,

- curved side surfaces, inner cylindrical cavity surfaces, end bottom curve surfaces and inner end recess surfaces defining a common exterior surface; and
- (b) a closure lid (in hinged connection with the) on top of the storage chest, releasing latching means for latching said closure lid in closed position, and sealing means for sealing the juncture of the closure lid with the top of the storage chest;
- (c) a closure cover in removably (latched and) sealed relation with the top of the personal effects safe;
- (d) towing eyes attached to the top of the barge near two corners at the same end of the barge; and
- (e) the first common inner surface, second common inner surface, and common exterior surface being formed in a mold as skins which enclose a cavity being filled with a hardened buoyant foam material.

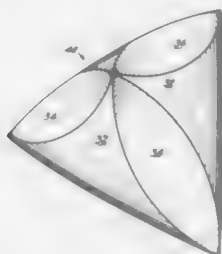
4,871,080

THREE DIMENSIONAL OBJECTS AND METHODS OF MAKING SAME

Herbert G. Bennett, 195 E. 31st St., Brooklyn, N.Y. 11226
Continuation-in-part of Ser. No. 928,613, Nov. 4, 1986, abandoned, which is a continuation of Ser. No. 704,751, Feb. 25, 1985, abandoned. This application Sep. 4, 1987, Ser. No. 94,055
Int. Cl.⁴ B65D 5/00

U.S. Cl. 220-1 R

11 Claims



1. An element capable of forming a three-dimensional object comprising:

a flat, flexible material having inscribed thereupon one or more polygons, each having at least one side of a length different from the other sides, and the arcs from two circles inscribed on each side of the polygon in such a manner that the arcs of the circles pass through the end points of each polygon and each other to form a pair of inner and outer arcs around each side of the polygon, the radius of said circles being equal in length to the side of the polygon whose end points the arcs of the circles intersect, the area between each pair of inner and outer arcs along a side of the polygon defining a side component of the element, with the area between the inwardly extending arcs of each polygon defining a face component of the element, wherein the perimeter of the element is formed by the outermost arcs of the inscribed circles which extend outward from the sides of the polygons, said element perimeter completely surrounding all polygons and their respective side and face component, wherein the element includes at least one face component and at least three side components, said element capable of forming a three dimensional object by folding said element along said inscribed inner and outer arcs.

4,871,081

DUAL WALL VESSEL FOR PRIMARY AND SECONDARY LIQUID CONTAINMENT

A. Herbert Ershig, Bellingham, Wash., assignor to Ershig's, Inc., Bellingham, Wash.

Continuation of Ser. No. 148,852, Jan. 27, 1988, abandoned. This application Oct. 26, 1988, Ser. No. 262,705
Int. Cl.⁴ B65D 6/00

U.S. Cl. 220-5 A

6 Claims



1. A double walled vessel for containment of potentially dangerous liquid comprising:
- a first, exterior fluid impermeable cylindrical shell;
- a first floor of sandwich construction sealingly attached to the first cylindrical shell including a first fluid impermeable sheet secured in spaced relationship to a second fluid impermeable shell with support media located between the sheets secured to both sheets providing uniform support, said support media permitting free flow of liquid between the sheets;
- a second, interior fluid impermeable cylindrical shell coaxial with the first cylindrical shell and spaced inwardly therefrom;
- a second floor of sandwich construction, sealingly closing the bottom of the second cylindrical shell, said second floor located above the first floor and having a core permitting fluid flow between the exterior fluid impermeable elements;
- support means spacedly supporting the second floor, said support means permitting free fluid flow; and
- leak detection means located in each of the floors.

4,871,082

SERVING ENSEMBLE FOR HOLDING HOT COOKED MEAT

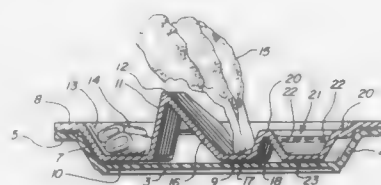
John R. Jarosky, 106 N. Main, Glenwood, Ill. 60425

Filed Jan. 28, 1988, Ser. No. 212,685

Int. Cl.⁴ B65D 25/00

U.S. Cl. 220-22

6 Claims



1. A compartmented metal serving tray comprising an up-standing peripheral wall, said peripheral wall describing the external dimensions of said tray, together with first, second, and third elongated walled compartments contained within

said peripheral wall, said compartments extending longitudinally of said tray and being aligned laterally of said tray, said second elongated compartment having a canted longitudinal area extending substantially vertically for a significant distance above the horizontal plane generally described by said tray, whereby a cooked portion of meat may be displayed and served upon said canted area.

4,871,083

GAS CYLINDER LOCKING MECHANISM

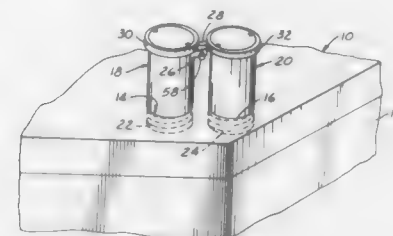
John T. DiNardo, Shelby Township, Oceana County, Mich., assignor to Chrysler Motors Corporation, Highland Park, Mich.

Filed Oct. 25, 1988, Ser. No. 262,388

Int. Cl.⁴ B65D 21/02, 41/04

U.S. Cl. 220-23.4

4 Claims



1. A gas cylinder locking mechanism comprising a manifold, the manifold having at least two internally threaded adjacent openings, a least two gas cylinders, each gas cylinder having an externally threaded portion on one end thereof, each gas cylinder being threadingly received in one of said openings, each gas cylinder having a detachable laterally outwardly extending locking tab, said tabs being detached when the gas cylinders are threaded into said openings and attached thereafter, the tabs of the gas cylinders being in interfering position with respect to each other in a relationship wherein attempted unthreading of one cylinder will result in pressure contact of that cylinder's tab with the tab of the other cylinder causing the other cylinder to more tightly thread into its opening thereby preventing unthreading of said one cylinder and visa-versa.

4,871,084

TANK SECONDARY CONTAINMENT SYSTEM

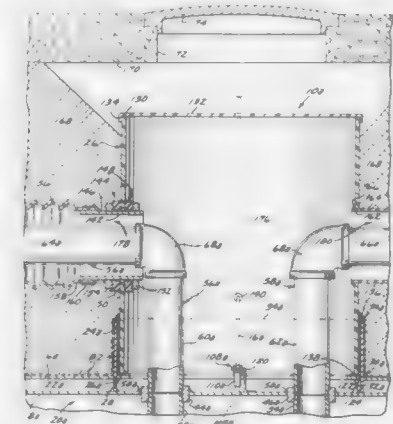
Howard J. Robbins, 8561 El Paseo Grande, La Jolla, Calif. 92037

Filed Sep. 9, 1987, Ser. No. 94,584

Int. Cl.⁴ B65D 6/00

U.S. Cl. 220-85 F

21 Claims



1. In a fluid storage tank having primary fluid containment

wall means, a secondary fluid containment system which comprises:

- access pipe fitting means on an upper portion of said wall means providing fluid access between the inside and outside of said wall means;
- function pipe means connected to said fitting means and extending generally upwardly from said fitting means outside of said wall means;
- generally tubular secondary containment cover means extending generally upwardly from said wall means and over at least a lower portion of said pipe means, said cover means being connected and sealed to said wall means;
- said cover means generally surrounding said fitting means and said portion of said pipe means and being sized so as to provide secondary fluid containment space within said cover means between said cover means, and said fitting means and said portion of said pipe means; and
- fluid sensor means within said cover means proximate a lowermost point within said secondary containment space.

4,871,085

APPARATUS FOR IDENTIFYING AND INDICATING THE CONTENT OF DOCUMENT CANISTERS

Harry T. Graef; Kevin H. Newton; Timothy B. Allison, and Jeffrey M. Eastman, all of Stark County, Ohio, assignors to Diebold Incorporated, Canton, Ohio

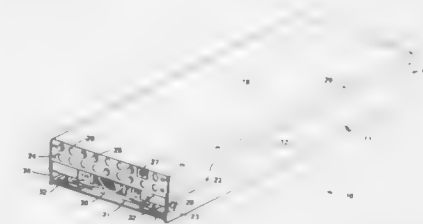
Continuation of Ser. No. 749,960, Jun. 27, 1985, abandoned.

This application Nov. 17, 1986, Ser. No. 931,010

Int. Cl.⁴ G07F 11/00

U.S. Cl. 221-4

6 Claims



1. A system for dispensing a selected variety of document from a document dispensing machine, said machine having document selection means for selecting a variety of document to be dispensed and a plurality of documents of at least two varieties each variety being contained in and dispensable from an interchangeable document canister, said canisters being mounted on said machine in a plurality of canister positions, comprising:

a machine readable indicia, labelling each canister said indicia including the presence or absence of a characteristic at a plurality of selected locations on said canister, an arrangement of said characteristics representative of the document variety in said canister;

reading means reading said indicia associated with said machine, said reading means generating signals representative of canister positions in said machine and document variety therein;

processor means interpreting said signals and storing information on each canister's position and contained document variety in a memory;

means controlling said machine according to said document selection means and the information stored in said memory, to dispense a document from a canister containing the selected document variety.

4,871,086

DISPENSING APPARATUS WITH PIVOTABLE ARTICLE CONTAINERS

Robert Davies, Stafford, and John P. Johnrow, Wolverhampton, both of United Kingdom, assignors to Sankey Vending Limited, West Midlands, England

PCT No. PCT/GB87/00197, § 371 Date Sep. 12, 1988, § 102(e) Date Sep. 12, 1988, PCT Pub. No. WO87/05730, PCT Pub. Date Sep. 24, 1987

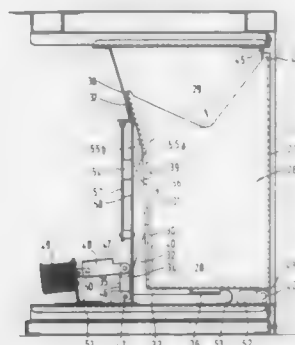
PCT Filed Mar. 20, 1987, Ser. No. 246,656

Claims priority, application United Kingdom, Mar. 21, 1986, 8607059

Int. Cl.⁴ G07F 11/06

U.S. Cl. 221-4

8 Claims



1. Article dispensing apparatus comprising a row of substantially identical containers pivotally mounted side-by-side on a supporting structure, each container being in the form of a pocket closed at one end and open at the other end and having a transparent front panel so that an article in the container can be seen by a user of the apparatus, each container being pivoted at a position adjacent the corner between its front face and its closed end to the structure so as to be pivotable between a closed position, wherein an article in the container is inaccessible, and an open position wherein an article can be removed from or replaced in the container by a user of the apparatus, latch means associated with each container to hold it in its closed position and operable to release the container to enable it to move to its open position, and control means operable by said user to operate a selected latch means to allow the associated container to move to its open position, the apparatus also comprising first sensing means to sense whether or not the container is in its open or closed position and second sensing means to sense whether or not there is an article in the container when it is closed, the control means being associated with the second sensing means and operable by said user to operate a latch means of a selected one of the containers if it contains an article to enable the container to move to its open position, and disabling means associated with the first sensing means which prevents operation of the control means to open a selected container if any one of the containers is not in its closed position.

4,871,087

REUSABLE CONTAINER DISPENSER FOR ULTRA HIGH PURITY CHEMICALS AND METHOD OF STORAGE

David S. Johnson, R.D. #1 Box 104A, Howard, Pa. 16841

Filed Apr. 4, 1988, Ser. No. 176,873

Int. Cl.⁴ B67D 5/00

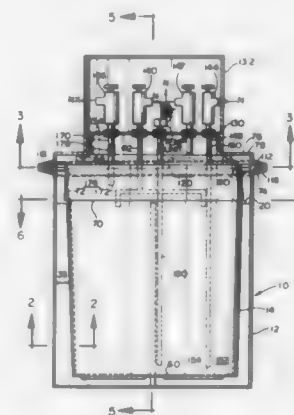
U.S. Cl. 222-1

20 Claims

10. A container for an ultra high purity chemical comprising:

an inner container having thin fluorocarbon polymer walls and an inner container lid;

an outer container made of metal with an inner covering of fluorocarbon polymer, the outer container enclosing and



spaced apart from said inner container to form an interspace about the entirety of said inner container; and an inert gas disposed in said interspace.

4,871,088

PNEUMATIC DISPENSERS FOR VISCOUS MATERIALS

John P. A. Cox, Hungerford, England, assignor to P.C. Cox (Newbury) Limited, Berkshire, United Kingdom

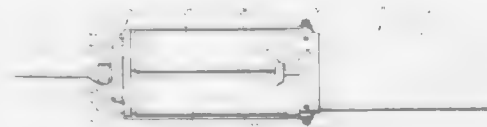
Continuation of Ser. No. 20,484, Mar. 2, 1987, abandoned. This application May 5, 1988, Ser. No. 190,589

Claims priority, application United Kingdom, Mar. 3, 1986, 8605210

Int. Cl.⁴ B67D 5/22

U.S. Cl. 222-47

1 Claim



1. A pneumatic dispenser for a multi-part pasty viscous material comprising a pneumatic cylinder containing a piston; spaced parallel piston rods mounted on said piston and extending from one end of said cylinder, parallel cylindrical containers mounted at said one end of said cylinder and extending away therefrom and containing the components of said material, one of said containers aligned with each of said rods, said rods each having a piston head moveable through one of said containers to forcibly express therefrom the contents of the containers, yoke means secured to said cylinder to hold the containers against the forces exerted by the rods, said dispenser having a single discharge nozzle supported against the pressure exerted by said rods, both said piston and said piston heads being concealed from the operator, an indicator rod mounted on said piston and extending therefrom parallel to said piston rods externally of said containers and moveable with and at the same rate as said piston rods, the ends of said indicator rod being so related to said piston heads that said end informs an operator of the position of said piston heads within said containers whereby the operator can observe the quantity of material remaining in said containers.

4,871,089

HOT WATER DISPENSER

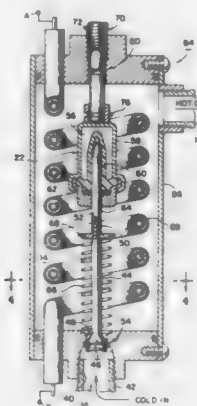
Edward F. Rader, and Eileen Rader, both of 1019 S. Blanchard, Wheaton, Ill. 60187

Continuation-in-part of Ser. No. 912,251, Sep. 29, 1986, abandoned. This application Nov. 27, 1987, Ser. No. 126,004

Int. Cl.⁴ A47J 31/057

U.S. Cl. 222-54

13 Claims



1. A hot water dispenser for dispensing a selected volume of heated water comprising:

means for defining a predetermined sized cavity for maintaining a predetermined volume of water therein, having an inlet means for receiving cold water and an outlet means for dispensing hot water, said inlet means being directly connected to a water supply line for providing an unmeasured quantity of water;

valve means disposed within said inlet means for opening and closing said inlet means;

heating means for heating water contained within said cavity;

manually operable means for selecting a dispensed volume by energizing said heating means and for selecting a time period for maintaining said heating means energized, said selected time period being proportional to said selected volume; and

thermally responsive means for dispensing water from said outlet responsive to a preselected water temperature of said heated water, said thermally responsive means including a thermal actuator extending within said cavity and connected to said valve means for opening said valve means responsive to said preselected water temperature.

4,871,090

CARTRIDGE ASSEMBLY FOR FLOWABLE MASSES

Armin Hoffmann, Germering, Fed. Rep. of Germany, assignor to Hilti Aktiengesellschaft, Fürstentum, Liechtenstein

Filed Jul. 21, 1988, Ser. No. 222,277

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1987, 3725291

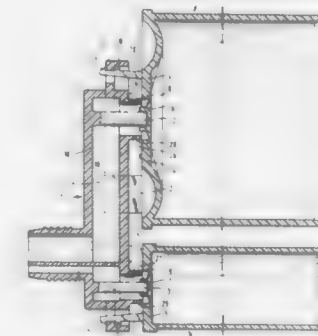
Int. Cl.⁴ B67B 7/24

U.S. Cl. 222-81

8 Claims

1. A cartridge assembly for dispensing at least one flowable mass comprises at least one axially extending hollow cylindrical container having a first end and a second end spaced apart in the axial direction, and a discharge member having a discharge conduit for dispensing the flowable mass out of said container, wherein the improvement comprises said container and discharge member are separable parts with said discharge member mounted on the first end of said container and being displaceable in the axial direction of said container from a first position for storage and transport of said cartridge assembly to a second position for dispensing the flowable mass, said discharge member and said container having cooperating stop means thereon for limiting the displacement of said dis-

charge member and said container into the second position, said container having a closure in the first end thereof, said closure is displaceable by an ejector on said discharge member for forming an opening when said discharge member and container are in the second position for dispensing the flowable mass out of the container, cooperating detent means are formed on said discharge member and container for intercon-



4,871,091

DISPOSABLE PACKAGE FOR LIQUIDS

Robert Preziosi, West Orange, N.J., assignor to Mason-Keller Corporation, Roseland, N.J.

Filed Sep. 29, 1988, Ser. No. 250,611

Int. Cl.⁴ B65D 37/00

U.S. Cl. 222-92

7 Claims



1. A package for shipping, storing and controlled dispensing of a unit or single use quantity of liquid comprising:

a pair of flexible, liquid-impermeable sheets superposed one over the other, each of said sheets having a longitudinal axis and comprising a first substantially rectangular section of a first predetermined width, a second substantially rectangular section of a second predetermined width, said second predetermined width being less than said first predetermined width, and a transition section intermediate said first and second sections having a width tapering from said first predetermined width adjacent said first section to said second predetermined width adjacent said second section, one of said sheets having a recess, co-axial with its longitudinal axis, pre-formed therein defining a pocket substantially disposed within said first section and said transition section of said sheet, said pocket having a volume only slightly larger than the volume of said unit or single use quantity of liquid, the other of said pair of sheets defining a cover extending across and covering said recess enabling compression of said pocket and pressurization of

said liquid by squeezing thereof between a user's thumb and forefinger without contaminating said liquid, said sheets being of sufficient resiliency and flexibility to enable expansion of said pocket and cessation of pressurization of said liquid upon release of such user compression thereof, said recess further comprising a portion defining an elongated and narrow spout portion co-axial with said sheet longitudinal axis, extending generally outwardly of said pocket from said transition section into said second section;

sealing means for hermetically sealing said sheets together peripherally completely around said pocket and spout portion to protect said liquid from contamination and being manually peelable in the region of said spout to enable manual peeling back of the second portions of said sheets in the region of said spout to a controlled extent less than the length of said spout portion to provide a restricted opening near an end of said spout portion and an aseptic annular rim defined by a portion of said peeled sheets so that during expression of pressurized liquid through said restricted opening said liquid only touches material theretofore previously sealed to retain said liquid sterile as it is expressed outwardly through said spout portion and said restricted opening, said sealing means having a stop line which defines a generally straight line edge substantially perpendicularly disposed to said longitudinal axes across said second sections in the region of said spout, said stop line peripherally permanently affixing said sheets one to the other;

means defining an arcuately shouldered notch centered at each end of said stop line in each of said pair of sheets so that when the ends of said second sections are peeled back to said stop line, and folded back upon respective transition sections, the portions of said sheets proximate said aseptic annular rim arcuately taper backwardly from said aseptic annular rim.

4,871,092

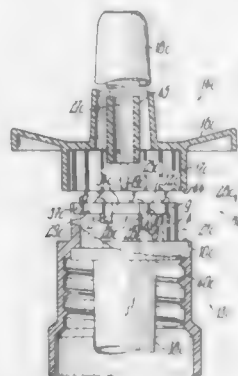
ATOMIZING OR METERING PUMP

Leo Maerte, Sipplingen, Fed. Rep. of Germany, assignor to Ing. Erich Pfeiffer GmbH & Co. KG, Fed. Rep. of Germany
Continuation of Ser. No. 899,414, Aug. 22, 1986, abandoned, which is a continuation-in-part of Ser. No. 511,103, Jul. 6, 1983, abandoned. This application Oct. 3, 1988, Ser. No. 253,400
Claims priority, application Fed. Rep. of Germany, Jul. 10, 1982, 3225910

Int. Cl.⁴ G01F 11/06

U.S. Cl. 222-153

29 Claims



27. A variable-output dispensing pump structure (11c), comprising:

- a base means (13c) for holding a pump;
- an operating pusher (14c) displaceable relative to the base means (13c) from an initial position along a pump axis (1) for effecting a pump stroke; and,
- control means for selectively varying a maximum output of

the pump structure (11c) for any stroke by varying a maximum length of possible axial displacement of the operating pusher (14c) before reaching a corresponding end position, the control means comprising:

- a neck (21c) provided on the base means (13c), the neck (21c) and the operating pusher (14c) having two control elements mounted for manual rotation about the pump axis (1) relative to each other into at least two rotational operating positions; abutment means formed at least partly on both of two cooperating members formed by the operating pusher (14c) and at least partly on the neck (21c), respective abutment profiles (19c, 2, 3, 4) of the abutment means engaging one another in the rotational operating positions to limit a length of displacement of the operating pushers (14c) through a portion of the maximum length; and, catch means (7) for resiliently securing the control means in each of the rotational operating positions and in the initial position of the operating pusher (14c), said catch means (7) being formed by the abutment profiles (2, 3, 4) of one of said cooperating members.

4,871,093

CONTAINER FOR DISPENSING A MATERIAL

Esther Burstein, and Shlomo Bareket, both of Humlebackgade 10 st tv, 2200 Copenhagen N, Denmark
PCT No. PCT/DK84/00116, § 371 Date May 23, 1985, § 102(e) Date May 23, 1985, PCT Pub. No. WO85/02597, PCT Pub. Date Jun. 20, 1985

Continuation of Ser. No. 740,914, May 23, 1985, abandoned.

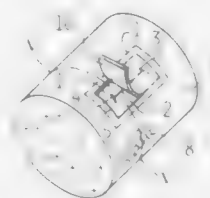
This PCT application Nov. 28, 1984, Ser. No. 132,667

Claims priority, application Denmark, Dec. 14, 1983, 83/5758

Int. Cl.⁴ B65D 37/00

U.S. Cl. 222-213

8 Claims



1. A container, comprising

- (a) a housing formed of flexible material and having at least one wall portion;
- (b) said wall portion including at least one internal dispenser unit connected with at least one inner side surface of said wall portion, said dispenser unit extending in contiguous relation with said wall portion and comprising at least one flexible dispenser sheet of elastically resilient material;
- (c) said dispenser sheet containing at least one slit which defines a dispensing aperture which opens upon manipulation of said housing to dispense the contents of the housing and which automatically closes after dispensing; and
- (d) said housing wall portion containing at least one weakened line within the periphery of said dispenser sheet to define an impassable unbroken layer of flexible material integrally connected with said housing, said layer being at least partially removable to expose said dispensing slit.

4,871,094

MEANS AND METHOD FOR DISPENSING SUBSTANCES

Russell A. Gall, Cupertino, Calif.; Don A. Clements, Arlington, and Michael J. Kent, Fort Worth, both of Tex., assignors to Alcon Laboratories, Inc., Fort Worth, Tex.

Continuation-in-part of Ser. No. 948,207, Dec. 31, 1986, abandoned. This application Apr. 29, 1988, Ser. No. 188,355

Int. Cl.⁴ A61M 35/00

U.S. Cl. 222-386

21 Claims



1. A dispensing means for substances including solids, liquids, semi-solids, and gels, comprising:

- a forward member having a bore extending between front and back opposite ends, said bore terminating in an application orifice at said front end;
- a rearward member being translateably movable with respect to said forward member and having a plunger means which extends through said back and is slidable movable within said bore of said forward member;
- said substance being positionable in said bore between said front and back ends so that movement of said rearward member with respect to said forward member causes said plunger to expel said substance from said application orifice; and
- said substance being contained within a capillary-type container which is positionable within said bore, said capillary-type container comprising a tubular means having first and second open ends, said substance being normally held by capillary action within the interior hollow of said tubular means.

4,871,095

CONTAINER FOR DISPENSING A MEASURED AMOUNT OF A GRANULATED SOLID

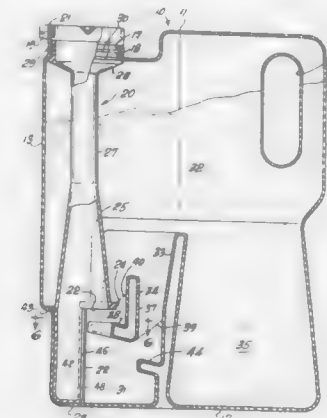
Won I. Song, 8806 Imperial Hwy., Downey, Calif. 90242

Filed Sep. 15, 1988, Ser. No. 244,326

Int. Cl.⁴ G01F 11/28; B67D 3/00

U.S. Cl. 222-437

17 Claims



1. An improved container for dispensing a measured amount of a granulated solid, said container being of the type which is generally rectangular in shape having a top, a bottom, a front or pouring edge, a back or handle edge, a first side and a second side, said container comprising:

- a circular opening formed in the top of said container near the pouring edge, said circular opening including a cylin-

drical portion, said container being free of any impediments to essentially complete filling through said circular opening;

- a removable, hollow tube securely held by said cylindrical portion of said circular opening, said hollow tube having a top and a bottom and extending from said cylindrical opening to the bottom of said container, said tube having a bottom portion with a circular cross-sectional shape, the side wall of said bottom portion having an opening formed therein extending upwardly from the bottom to an opening top, said tube being turnable within said container so that said opening faces generally forward in a first position and faces generally rearwardly in a second position;

- a generally L-shaped partition formed in said container, said partition having a generally vertical portion and a generally horizontal portion having an arcuate edge which fits against the outer surface of the hollow tube and said generally horizontal portion being formed below said opening top; and

- a measuring compartment formed in said container between the bottom, sides and the pouring edge thereof by a partition extending upwardly from the bottom thereof and terminating within said container.

4,871,096

LIQUID DISPENSER FOR A BOTTLE

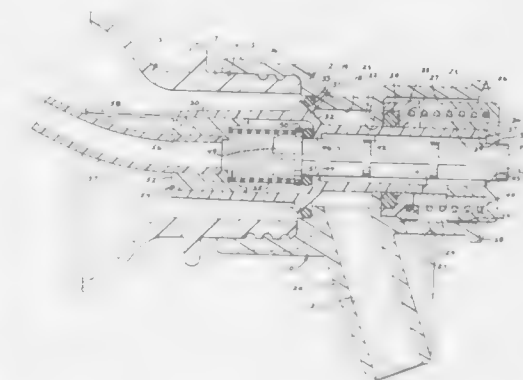
Robert L. Horian, 357 N. Spaulding Cove, Heathrow, Fla. 32746

Filed Apr. 4, 1988, Ser. No. 177,302

Int. Cl.⁴ F16K 24/04

U.S. Cl. 222-487

8 Claims



1. A dispenser for a liquid contained in a bottle having a threaded neck comprising:

- a housing having an integral annular portion with a threaded first aperture for receiving the bottle neck, an inner chamber opening into the threaded first aperture, and a conduit for carrying liquid from said inner chamber out of the housing;

- a tubular valve plunger extending within said housing from the first aperture through said inner chamber and through an opening in said housing, and having a first means for releasably sealing the inner chamber from the threaded first aperture, said valve plunger having a longitudinal aperture extending from a first end to a second end which is proximate to the first aperture of said housing and having an inner wall extending into the longitudinal aperture spaced from the first and second ends, the inner wall having an aperture therethrough, and having a cap at said first end with an aperture therethrough;

- a vent plunger within said tubular valve plunger and extending through the aperture in the inner wall and out of the first end of said valve plunger through the aperture in the cap, said vent plunger including a second means for releasably sealing the aperture in the inner wall; and

- a first spring biasing said cap with respect to said housing;

a tube collar held within the second end of said valve plunger and having an aperture therethrough;
a second spring within said valve plunger biasing said vent plunger with respect to said tube collar.

4,871,097

DISPLAY HANGER WITH FINGER CLAMPS

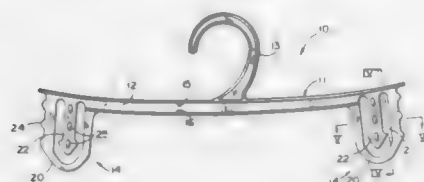
Russell O. Blanchard, Zeeland, and James G. Hansen, Holland, both of Mich., assignors to Batts, Inc., Zeeland, Mich.

Filed Nov. 14, 1988, Ser. No. 270,242

Int. Cl.⁴ A47G 25/30, 25/48

U.S. Cl. 223—85

5 Claims



1. A hanger for lightweight clothing such as underwear, said hanger having an elongated body and support means at its center by which it can be suspended, said hanger having a depending U-shaped garment anchor member at each end and a depending garment clamping finger centered within each anchor member, the lower end of said finger being adjacent but spaced from the lower end of its associated anchor member, the improvement in said hanger comprising: a plurality of vertically spaced garment engaging first projections extending laterally outwardly in the plane of the hanger body from the outer edge of the outer leg of each anchor member and a plurality of vertically spaced forwardly extending second projection on the front face of each of the clamping fingers, a plurality of vertically spaced third projections extending outwardly from the rear face of the outer one of the legs of each of the anchor members, said first and second projections cooperating to engage and hold a garment extending across the front of the hanger and wrapped around the ends of the anchor members, behind the legs of the anchor members and in front of the fingers with sufficient tension to cause the garment to seat firmly against said first, second and third projections with both the anchor members and fingers concealed from the front behind the garment and the fingers and their projections pressing the garment against said third projections to retain said garment from moving either lengthwise or vertically of the hanger.

5. A hanger for lightweight clothing such as underwear, said hanger having an elongated body and support means at its center by which it can be suspended, said elongated body having an I-shaped cross section intermediate the ends thereof with upper and lower flanges separated by a vertical web, said hanger having a depending U-shaped garment anchor member at each end and a depending garment clamping finger within and centered between the legs of each anchor member and with the anchor member forming a U-shaped space between the anchor member and the finger, the lower end of said finger being adjacent but spaced from the lower end of its associated anchor member, the improvement in said hanger comprising: the lower flange of said body terminating at said anchor member and the upper ends of said U-shaped space extending upwardly through said web substantially to the upper one of said flanges; a plurality of vertically spaced garment engaging first projections extending laterally outwardly in the plane of the hanger body from the outer edge of the outer leg of each anchor member and a plurality of vertically spaced forwardly extending second projections on the front face of each of the clamping fingers, said first and second projections cooperating to engage and hold the ends of a garment wrapped around the ends of the anchor members, behind the legs of the anchor members and in front of the fingers with sufficient tension to cause the garment to seat firmly against both the first and

second projections, the upper ends of the U-shaped space permitting the top of the garment to be located substantially at the top flange of said body.

4,871,098

HOOK SOCKET FOR GANGING HANGERS

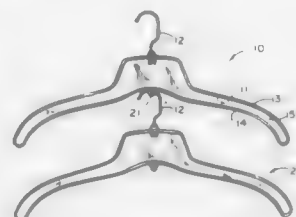
Robert A. Bredeweg, and Russell O. Blanchard, both of Zeeland, Mich., assignors to Batts, Inc., Zeeland, Mich.

Filed May 23, 1988, Ser. No. 197,598

Int. Cl.⁴ A47G 25/18

U.S. Cl. 223—85

7 Claims



1. A molded plastic garment hanger having means for supporting beneath it a wire hook equipped second hanger, said hanger having generally parallel front and back faces and a lengthwise, elongated body therebetween, a second hanger engaging means depending from said body and centered between both the ends and the faces of said body, said means comprising: a closed loop formed by a pair of legs, said legs being spaced apart lengthwise of said hanger and integrally joined at their lower ends to provide a hook receiving opening of a width lengthwise of said body sufficient to permit the wire hook of a second hanger to be passed therethrough; the joinder of said lower ends of said legs including a connecting member formed by foot portions extending generally horizontally from the lower ends of said legs in opposite directions and in a fore and aft direction being joined together by an integral bridging portion therebetween, with part of said foot portions forming extensions of the bridging portion and with said bridging portion providing support for the hook of the second hanger, said legs being spaced apart normal to said faces of said body a distance sufficient to permit the wire hook of a second hanger to be seated between said legs while said hook is aligned with and all of said hook and the body of the second hanger are positioned between the front and back faces of said body.

4,871,099

FISHING ROD HOLDER

Earl M. Bogar, Jr., 6 Broad Oaks La., Houston, Tex. 77056

Filed Jun. 24, 1988, Ser. No. 211,192

Int. Cl.⁴ A01K 97/10

U.S. Cl. 224—42.45 R

2 Claims

1. A fishing rod holder comprising, a plurality of horizontally spaced supports adapted to be secured to a boat, a plurality of vertically extending tubular rod holders connected to and supported from the horizontal supports, the top of each rod holder including a first downwardly and inwardly tapered slot for receiving and holding a reel and a second downwardly extending slot diametrically opposed to the first slot, an enclosure extending vertically between and supported

from two of said horizontally spaced supports, said enclosure forming a sheath shaped to receive and entirely cover



a knife blade, ends of said enclosure being positioned in recesses in said two horizontally spaced supports.

4,871,100

SHOPPING BAG

Brian Posner, Sutton Grange, Parvey Lane, Sutton, Macclesfield, Cheshire, England

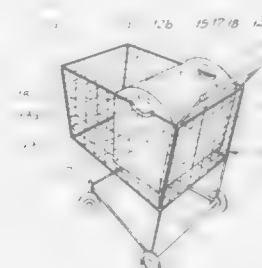
Filed Jun. 29, 1988, Ser. No. 213,117

Claims priority, application United Kingdom, Sep. 17, 1987, 8721877

Int. Cl.⁴ B65D 33/14

U.S. Cl. 224—42.46 R

8 Claims



1. A shopping bag adapted for use with supermarket shopping carts, the bag comprising: a stiffened rectangular base so dimensioned as to fit into a typical supermarket shopping cart and so that the bag can accommodate a considerable volume of purchases; foldable sides upstanding from the base so as to afford an open top to the bag; two opposed sides of said foldable sides having stiffened upper edges; hanger means provided in said stiffened upper edges whereby said opposed sides are adapted to hang from the upper edges of a shopping cart, whereby to hold said opposed sides open in said cart, and, structure-forming arcuate slots formed in said stiffened upper edges of the two opposed sides of the bag, the arcuate slots being convex towards the base of the bag whereby to adapt the two opposed sides of the bag to hook over the upper edges of the side walls of the supermarket shopping cart, thereby to hang the bag therefrom.

4,871,101

BACK-PACK FRAME

Rosa Bunz; Christine Dzionara, both of Radstadt, and Karl Tömpe, Hallein-Neualm, all of Austria, assignors to Maschinenvertrieb Kohlbrat & Bunz Gesellschaft mbH, Radstadt, Austria

PCT No. PCT/AT86/00025, § 371 Date Feb. 24, 1987, § 102(e) Date Feb. 24, 1987, PCT Pub. No. WO87/00013, PCT Pub. Date Jan. 15, 1987

PCT Filed Mar. 28, 1986, Ser. No. 31,469

Claims priority, application Austria, Jun. 28, 1985, 1925/85; Nov. 5, 1985, 3182/85

Int. Cl.⁴ A45F 4/00, 4/08

U.S. Cl. 224—153

22 Claims



1. A frame for carrying loads, to be used as a back-pack frame or a sled, said frame comprising:

four longitudinal beams provided in a spatial arrangement so as to correspond approximately to the edges of a prism said four longitudinal beams forming a first pair of longitudinal beams which define a carrier side of the frame and a second pair of longitudinal beams which define a load side of the frame, when used as a back-pack and a sliding plane when used as a sled, each longitudinal beam of said first pair combining with an adjacent longitudinal beam of said second pair to define a narrow side of the frame, said four longitudinal beams being arranged in such a manner and having means for enabling two such frames to be connected end-to-end so as to form a platform that can either be carried or pulled along the ground;

cross beams connecting said second pair of longitudinal beams;

load securing elements being arranged on the carrier side longitudinal beams, being made of flexible material, and being connectable to each other on the carrier side as well as on the load side to enclose the load outside the spatial arrangement of the longitudinal beams;

at least one holding element being provided on each of the two narrow sides of the frame at a distance from said sliding plane so as to not lie in or interrupt the sliding plane;

at least one load supporting shackle extending beyond said sliding plane when used as a back-pack and having two sides that are removable held by a pair of said holding elements; and

carrying straps arranged on the carrier side of the frame.

22. A method of carrying loads comprising: providing a frame constructed of four longitudinal beams provided in a spatial arrangement so as to correspond

approximately to the edges of a prism and forming a first pair of longitudinal beams, defining a carrier side of the frame and a second pair of longitudinal beams, defining a load side, when used as a back-pack and a sliding plane when used as a sled, each longitudinal beam of said first pair combining with an adjacent longitudinal beam of said second pair to define a narrow side of the frame, said four longitudinal beams being arranged in such a manner and having means for enabling two such frames to be connected end-to-end so as to form a platform that can either be carried or pulled along the ground; cross beams connecting said second pair of longitudinal beams; load securing elements being arranged on said first pair of longitudinal beams, being made of flexible material, and being connectable to each other on the carrier side as well as on the load side to enclose the load outside the spatial arrangement of the longitudinal beams; at least one holding element being provided on each of the two narrow sides of the frame at a distance from said sliding plane so as to not lie in or interrupt the sliding plane; at least one load supporting shackle extending beyond said sliding plane when used as a back-pack and having two sides that are removably held by a pair of said holding elements; carrying straps arranged on the carrier side of the frame; and a pair of tubular coupling means, being formed as a female coupling sleeve and the other as a male plug that can be inserted into the coupling sleeve, producing a tension proof connection for the coupling means, each coupling means having outside recessed portions receiving lower end sections of a load side and a carrier side longitudinal beam; and

connecting two such frames end-to-end by inserting said male plug coupling means of a first frame into said female coupling sleeve of a second frame thereby forming a large transportation sled which can be dragged along the ground or a platform that can be carried.

4,871,102

SKI RETAINING DEVICE

John M. Wickersham, 1905 Spruce Wood, Daytona, Fla. 32014

Filed Nov. 9, 1988, Ser. No. 269,726

Int. Cl.⁴ A63C 11/00

U.S. Cl. 224—191

17 Claims



1. A ski retaining device, comprising:
 - a nesting portion dimensioned to releasably hold a pair of skis therein;
 - straddle portions affixed to and extending from said nesting portion;
 - said straddle portions forming a mounting area therebetween for positioning said nesting portion alternatively, on a person's shoulder or ankle wherein said straddle portions are oriented with the respect to said nesting portion such that said skis, when held in said nesting portion, would extend transverse to the shoulder of a person when said straddle portions are positioned on said person's shoulder and;
 - a securing strap operatively associated with said straddle portions for reversibly affixing said nesting portion to a person's ankle for storing said device while skiing.

4,871,103

SUPPORTING ARRANGEMENT FOR A MAST ON A VEHICLE

Lars M. R. Martinsson, Silkeä 7238, S-915 00, Robertsfors, Sweden

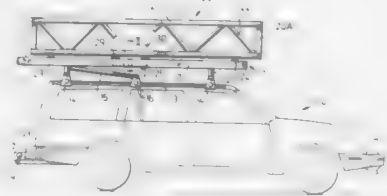
Filed Nov. 25, 1987, Ser. No. 125,599

Claims priority, application Sweden, Nov. 28, 1986, 8605109

Int. Cl.⁴ B66B 9/20

U.S. Cl. 224—310

3 Claims



1. An assembly for supporting an elongate mast in horizontal position atop a vehicle and for pivotal movement of the mast into a substantially vertical position behind the vehicle, the assembly including an elongate support frame, attachment means for securing the frame atop the vehicle in substantially horizontal position with one end of the frame toward the rear of the vehicle and an opposite end of the frame toward the front of the vehicle, bearing means carried by the mast, longitudinal guide means on the frame receiving the bearing means for lengthwise movement of the bearing means along the guide means whereby the mast is supported for lengthwise movement along the frame, and pivot means providing a pivot connection between the mast and the bearing means, the pivot means defining a transverse pivot axis at a lengthwise location along the mast adjacent a point of lengthwise balance of the mast, the mast having an inboard position on the frame wherein the mast is supported horizontally on the frame and the pivot axis is remote from said one end of the frame between said one end of the frame and the point of lengthwise balance of the mast, and the mast having an outboard position on the frame wherein the pivot axis is adjacent said one end of the frame and the mast can be pivoted to a substantially vertical position about the pivot axis, wherein the frame includes a pair of spaced longitudinal guide rails with elongate grooves defining the guide means, wherein the bearing means comprises wheels received in the respective grooves and wherein the pivot means comprises transverse stub axles connected between the mast and the wheels.

4,871,104

AUTOMATIC VERTICAL GLASS CUTTING MACHINE

Antoine Cassese, Les Essarts No. 7, Saint-Germain Laxis, F-77950 Maincy, France

Filed Dec. 29, 1987, Ser. No. 138,868

Claims priority, application France, Dec. 30, 1986, 86 18327

Int. Cl.⁴ C03B 33/02

U.S. Cl. 225—96

16 Claims

1. An automatic vertical glass cutting machine comprising: a horizontal support intended to receive the glass plate to be cut on edge, a vertical post serving as the bearing point for the glass plate during the cutting operation, a vertical ramp, a cutting-wheel holder carriage slidably mounted on the ramp and placed facing the vertical post, mobile stops on the horizontal support, position reading devices interconnected with the mobile stops, pneumatic actuator means for moving the cutting-wheel holder carriage vertically on the ramp from bottom to top and top to bottom over a predetermined height of the vertical ramp, the cutting-wheel holder carriage including a body, a cutting-wheel holder and a rocker arm, the cutting wheel holder being secured to the body by means of the

rocker arm which is movable with respect to the body of the carriage, a mechanism for locking said rocker arm, and fixed



means on the machine for acting on elements movable with the carriage for locking the rocker arm and controlling the pneumatic actuator.

4,871,105

METHOD AND APPARATUS FOR APPLYING FLUX TO A SUBSTRATE

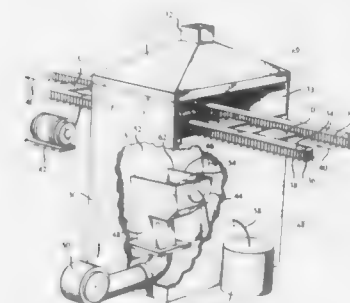
John R. Fisher, Langhorne; Leslie A. Guth, Holland, both of Pa., and James A. Mahler, East Windsor, N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Division of Ser. No. 178,114, Apr. 6, 1988. This application Feb. 1, 1989, Ser. No. 304,522

Int. Cl.⁴ H05K 3/34

U.S. Cl. 228—33

6 Claims



1. Apparatus for applying a controlled amount of liquid low-solids flux to a circuit board, CHARACTERIZED BY:
 - means for producing a laminar gas stream;
 - means for pumping liquid low-solids flux from a storage tank;
 - means, coupled to said flux pumping means, for disintegrating the liquid low-solids flux into a fog of tiny flux droplets and for injecting said droplets into said stream;
 - means for directing said stream containing said flux droplets towards a circuit board to coat the board with flux;
 - means for indicating the concentration of flux solids on the circuit board; and
 - means, responsive to said indicating means, for adjusting the concentration of flux solids on the circuit board to achieve a uniform coating which does not exceed a predetermined concentration of flux solids.

4,871,106

NON-DEDICATED PALLET ASSEMBLY FOR WAVE SOLDERING PACKAGED INTEGRATED CIRCUITS

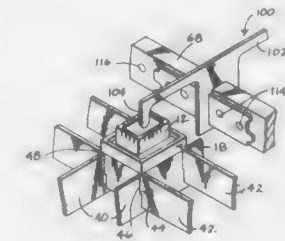
Charles R. Wharff, 3312 Valley Square La., San Jose, Calif. 95117

Filed Oct. 28, 1988, Ser. No. 264,453

Int. Cl.⁴ B23Q 3/00; B23K 37/04

U.S. Cl. 228—47

7 Claims



1. A modular object support holder in combination with a fixture including one or more receiving positions in the nature of a square hole and including one or more gate subassemblies adapted to vertically secure said holder in one of said square holes, comprising:

- a platform portion conforming to the shape of the object to be supported thereon; and
- a post portion adapted to slidably engage the square hole so as to firmly laterally engage such hole, at least an axial hole-engaging portion of said post portion being formed to have a regular octagonal cross section.

4,871,107

METHOD FOR BONDING CERAMICS TO EACH OTHER OR A CERAMIC TO A METAL

Toshihiro Yamada, and Akiomi Kohno, both of Ibaraki, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

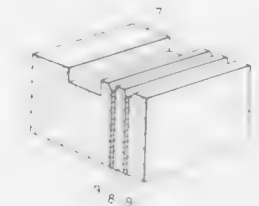
Continuation-in-part of Ser. No. 846,346, Mar. 31, 1986, abandoned. This application Dec. 31, 1987, Ser. No. 140,224

Claims priority, application Japan, Apr. 1, 1985, 60-66445

Int. Cl.⁴ B23K 1/04

U.S. Cl. 228—121

9 Claims



1. A method for bonding ceramics to each other or a ceramic to a metal by inserting an inserting material between the bonding surfaces of ceramics or between the bonding surface of a ceramic and that of a metal and heating, wherein a three-layer clad plate comprising a core piece made of aluminum alloy and surfaces made of an aluminum-silicon alloy is used as said inserting material and bonding is carried out at a bonding temperature higher than the solidus of the aluminum-silicon alloy and lower than the melting point of the aluminum alloy while pressurizing the inserting material, said ceramic is a member selected from the group consisting of silicon nitride, sialon, and silicon carbide, said aluminum-silicon alloy is aluminum-silicon-magnesium alloy and said metal is a member selected from the group consisting of carbon steel, alloy steel and copper alloy.

4,871,108
SILICON CARBIDE-TO-METAL JOINT AND METHOD
OF MAKING SAME

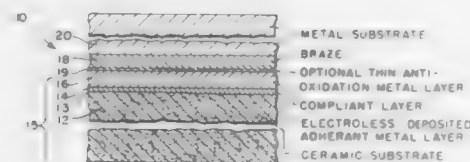
Wolfgang D. G. Boecker, Lewiston, and Laurence N. Hailey,
Niagara Falls, both of N.Y., assignors to Stemcor Corpora-
tion, Cleveland, Ohio

Continuation of Ser. No. 866,815, Jul. 14, 1986, abandoned,
which is a division of Ser. No. 692,944, Jan. 17, 1985, Pat. No.
4,610,934. This application Nov. 16, 1987, Ser. No. 120,728

Int. Cl.⁴ B23K 20/00, 20/22, 31/00

U.S. Cl. 228—122

21 Claims



1. A method of preparing a surface of a silicon carbide article for joining by metal brazing to metal comprising:

- micro-roughening that surface of the silicon carbide article which is to be brazed;
- applying catalyst consisting essentially of aqueous PdCl₂ directly to the micro-roughened surface in the absence of pretreatment of said surface with stannous chloride; and
- electrolessly depositing a thin layer of metal selected from the group consisting of Ni, Cr, Au, Ag and Cu on said catalyst-treated surface.

4,871,109
VAPOR PHASE SOLDERING USING CERTAIN
PERFLUORINATED POLYETHERS

Dennis J. Kalota, Fenton; John S. McConaghy, Jr., St. Louis;
David O. Fisher, Chesterfield, all of Mo., and Ronald E.
Zielinski, Fort Wayne, Ind., assignors to Monsanto Company,
St. Louis, Mo.

Filed Jan. 29, 1988, Ser. No. 149,773

Int. Cl.⁴ B23K 1/02

U.S. Cl. 228—180.1

16 Claims

1. In a method of vapor phase heating wherein a fluorinated organic compound in a vapor phase is used as a heat source, the improvement comprising using heated vapor of a perfluorinated polyether selected from the group consisting of linear polyethers having the formula $R_f-(OCF_2CF_2)_n-OR'_f$ wherein n is an integer of about 3-11 and each of R_f and R'_f is independently selected from the group consisting of perfluorinated C₁-C₅ alkyl radicals.

4,871,110
METHOD AND APPARATUS FOR ALIGNING SOLDER
BALLS

Hideyuki Fukasawa; Mamoru Kobayashi, and Masahiro
Wanami, all of Hadano, Japan, assignors to Hitachi, Ltd.,
Tokyo, Japan

Filed Jul. 26, 1988, Ser. No. 224,355

Claims priority, application Japan, Sep. 14, 1987, 62-230406
Int. Cl.⁴ B23K 3/06

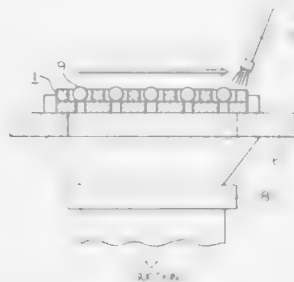
U.S. Cl. 228—245

10 Claims

1. A method for aligning solder balls having an outer diameter comprising the steps of:

- supplying solder balls onto an aligning plate having through-holes formed therein, each of said through-holes having a first hole and a second hole connected to said first hole, said first hole having a slightly larger diameter than the outer diameter of the solder ball to be aligned and being open to one surface of said aligning plate, and said second hole having a diameter smaller than the outer diameter of the solder ball and being open to another surface of said aligning plate;

applying a vacuum from said another surface of said aligning plate through said through-holes;



attracting and fitting solder balls existing on said aligning plate into said first holes with said vacuum; and positioning and attracting solder balls into said second holes.

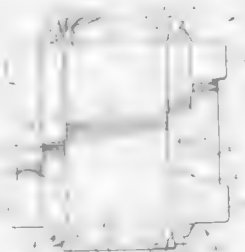
4,871,111
TAPERED TRAY WITH PRE-GLUED ELEVATING LEGS
Duane R. Mode, Bloomington, Minn., assignor to Waldorf Corporation, St. Paul, Minn.

Filed Apr. 20, 1988, Ser. No. 183,971

Int. Cl.⁴ B65D 5/26

U.S. Cl. 229—104

16 Claims



- A collapsible package for holding food comprising:
 - a substantially flat central panel for supporting said food, said panel having first and second pairs of opposed, substantially linear panel edges and four corners; and
 - first and second substantially flat side walls, each of said side walls being attached to one of said first pair of opposed central panel edges at an inner fold line substantially coinciding with said central panel edge, each said side wall being disposed at approximately 90 degrees relative to said central panel, and comprising:
 - an inner panel extending above the plane of said central panel;
 - an outer panel joined to said inner panel at an outer fold line substantially parallel to said inner fold line and adhered against said inner panel to form a double layer above the plane of said central panel, said outer panel having a maximum width, as measured perpendicular to said inner fold line, that is greater than the width of said inner panel measured perpendicular to said inner fold line, said outer panel extending in a single layer below the plane of said central panel to the extent of said greater width;
 - a pair of opposed end walls, each attached to said central panel at one end fold line located at one of the second pair of opposed edges of said central panel; and
 - hook and slit locking means adjacent each corner of the central panel for locking together adjacent side walls and end walls to maintain said side walls disposed at approximately 90 degrees relative to said central panel.

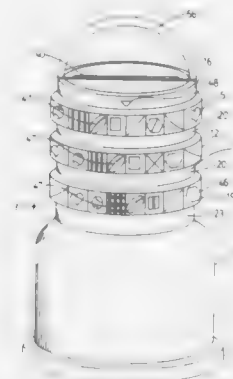
4,871,112
MONEY SAVING BOX
Grant C. Emslie, 579 Craven Road, Toronto, Ontario, Canada
(M4L 2Z6)

Filed May 2, 1988, Ser. No. 189,115

Int. Cl.⁴ A47G 29/00

U.S. Cl. 232—4 R

4 Claims



1. A money saving box comprising a housing having an openable hinged lid at a top thereof and having an opening for the insertion of money; an elongate locking key including a shaft and wards and being vertically aligned with and slidable with respect to a cylindrical upper part of the housing, by means of upper and lower pegs of the key, respectively slidable in upper and lower similar oval apertures in the upper part of the housing; rotatable operating rings located around the upper part of the housing and the shaft of the key, the rings having slots to accommodate the wards of the key and indicia indicating alignment of the slots with the wards of the key, in which alignment the key is movable between an upper position and a lower position over a distance limited by the oval apertures, the key being spring biased towards said upper position; and a latch pivotally arranged on the upper supporting peg such that, when the key is in said lower position, the latch is pivotally arranged to engage said lid, and such that, when the key is in said upper position, the latch is spring biased to be pivotally arranged to disengage the lid.

4,871,113
VEHICLE HEATING CONTAINER APPARATUS
Hideo Kawamura, Samukawa, Japan, assignor to Isuzu Motors Limited, Tokyo, Japan

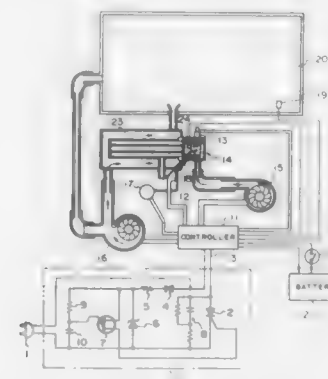
Filed Dec. 29, 1986, Ser. No. 946,943

Claims priority, application Japan, Dec. 28, 1985, 60-299344

Int. Cl.⁴ G05D 23/00

U.S. Cl. 237—2 A

6 Claims



1. A vehicle heating container apparatus for supplying heat

to a heating container, associated with a vehicle having an engine, to keep the contents of the heating container within a temperature range having upper and lower limits, said vehicle heating container apparatus comprising:

- a burner for combusting fuel;
- fuel supply means, including an atomizer connected to said burner, for supplying the fuel to said burner and atomizing the fuel supplied to said burner;
- first air blower means for supplying air to said burner;
- second air blower means for introducing air into the heating container;
- heat exchanger means for recovering heat generated by said burner to heat the air to be introduced into the heating container;
- a container temperature sensor for producing a temperature signal indicative of the temperature inside the heating container;
- temperature control means for controlling, in dependence upon the temperature signal from said temperature sensor disposed in the heating container, said first and second air blower means and said fuel supply means to maintain the temperature in the heating container within the temperature range, said first and second air blower means and said fuel supply means each having a first setting for supplying air and fuel when said temperature control means initially detects that the temperature inside the heating container is below the lower limit of the temperature range and a second setting for supplying increased amounts of air and fuel when said temperature control means detects that the temperature inside the heating container is below the lower limit of the temperature range and said first and second air blower means and said fuel supply means are respectively supplying air and fuel;
- a first power supply operatively connected to said temperature control means and associated with the vehicle;
- a second power supply remote from the vehicle; and
- voltage control means for controlling the voltage supplied from said second power supply so that the voltage supplied from said second power supply can be selected to be equal to a given voltage supplied from said first power supply, and for operating said temperature control means and said first and second air blower means with electric power from said second power supply when the engine of the vehicle is stopped.

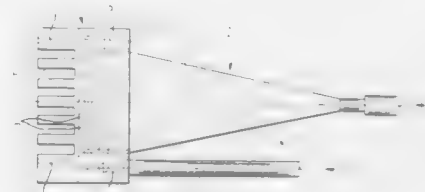
4,871,114
APPARATUS FOR POWER SPRAYING OPERATING
WITH FLAME JET

Tibor Kenderi, Kelenhegyi u. 49., 1118 Budapest, Hungary
Continuation of Ser. No. 929,029, Sep. 29, 1986, abandoned. This
application Oct. 19, 1988, Ser. No. 262,158

Int. Cl.⁴ B05B 9/06, 1/24, 1/26

U.S. Cl. 239—79

15 Claims



2. Apparatus for powder spraying operated with a flame jet, comprising a spray head for feeding the powder carrier by a gas into a combustion space, pipe means for supplying a combustible gas to said spray head, a spray head body having rows of bores formed therein for emitting and guiding the combustible gas to the combustion space for forming a flame jet mixture with said powder, a plurality of side plates and

endplates extending over the spray head body on the side facing the combustion space, said combustion space includes teeth of comb-type extensions confining the combustion space, said teeth being fixed in a heat conducting manner to a side member lying perpendicularly to a surface of the spray head.

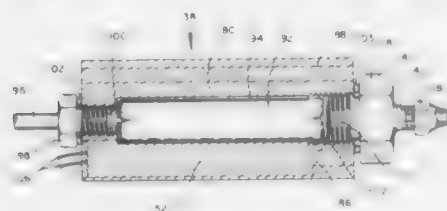
4,871,115

SMOKE GENERATING APPARATUS

B. Russell Healey, 3533 Legendary Dr., Las Vegas, Nev. 89121
Filed Aug. 24, 1987, Ser. No. 88,375
Int. Cl.⁴ B05B 1/24

U.S. Cl. 239—136

15 Claims



1. Portable smoke-generating apparatus comprises a housing,

a pressurized source of smoke-generating liquid, vaporizing means comprising a solid base member having an elongate interior vaporizing chamber formed by chamber walls,

an elongate, solid vaporizing member mounted in the vaporizing chamber and having a cross-sectional geometric configuration corresponding to the cross-sectional configuration of the vaporizing chamber, exterior walls of the vaporizing member and the chamber walls defining a fluid passageway in the vaporizing means, said exterior walls and said chamber walls consisting essentially of smooth surfaces,

said chamber having a length slightly greater than the length of the vaporizing member such that the vaporizing member is longitudinally movable within the chamber, heating means to maintain the temperature of the vaporizing chamber at a level sufficient to vaporize the smoke-generating liquid,

inlet means to permit the passage of smoke-generating liquid under pressure into the vaporizing chamber, smoke outlet means comprising a nozzle having an orifice through which smoke exits from the vaporizing chamber, and

conduit means for passing smoke-generating liquid from the pressurized source to the vaporizing chamber.

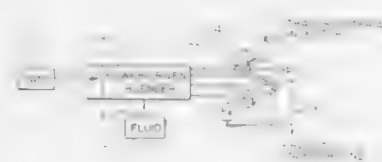
4,871,116

METHOD AND APPARATUS FOR PROPORTIONALLY ADDING MINUTE QUANTITIES OF AN ACTIVE INGREDIENT TO A FLOWING STREAM OF MATERIAL

Ralph W. Banner, Alberto, Canada, assignor to R. A. Tracer Service Ltd., Canada
Filed Jul. 15, 1987, Ser. No. 73,604
Claims priority, application Canada, Jul. 15, 1986, 513801
Int. Cl.⁴ B02C 19/12

U.S. Cl. 241—21

15 Claims



1. A method of adding minute quantities of radioactive

material to frac material being pumped underground comprising

(a) providing, in solid plug form, a filler material having a minor portion of radioactive material distributed evenly therethrough,

(b) providing a lead shielded container for said solid plug of filler and radioactive material,

(c) reducing said solid plug into particles and metering outflow of said filler and radioactive material from the container at a selected rate in its particulate form, and

(d) directing said metered outflow of particle form material into the frac material as it is being pumped.

4,871,117

LOW-CONTAMINATION METHOD FOR COMMUNUTING SOLID SILICON FRAGMENTS

Rolf Baueregger, Burgkirchen, Fed. Rep. of Germany; Erich Bildl, Post Franking, Austria, and Josef Dietl, Neutetting, Fed. Rep. of Germany, assignors to Heliotronic Forschungs- und Entwicklungsgesellschaft für Solarzellen-GmbH, Burghausen, Fed. Rep. of Germany

Filed Mar. 22, 1989, Ser. No. 327,025

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1988, 3811091

Int. Cl.⁴ B02L 23/08

U.S. Cl. 241—23

10 Claims

1. A low contamination method for communuting solid silicon fragments comprising the steps of:

producing a first temperature gradient within said solid silicon fragments by establishing a surface temperature of 400° to 1400° C. on the surface thereof by the external application of heat

producing a second, at least partially reversed, temperature gradient within the solid silicon fragment by rapidly lowering said surface temperature by at least 300° C.; and, thereafter communuting the solid silicon fragments by the application of mechanical force.

4,871,118

MACHINE FOR DENSIFYING PLASTIC CONTAINERS AND THE LIKE

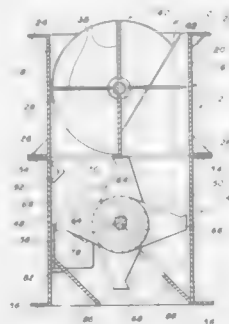
Daniel T. Maloney, Cahokia, Ill., assignor to Simplicity Engineering, Inc., Durand, Mich.

Filed Nov. 2, 1988, Ser. No. 266,187

Int. Cl.⁴ B02C 19/14

U.S. Cl. 241—99

7 Claims



1. A machine for densifying plastic containers and the like comprising a feeder and a shredder,

said feeder including an enclosure having a front panel, rear panel and side panels and an inlet and an outlet with a rotatable shaft rotatably journaled in the side panels between the inlet and the outlet, a paddle wheel mounted on the rotatable shaft with radial vanes having a length and width sufficient to effectively block the return of material from the shredder between the paddle wheel and the enclosure and having a plurality of radial slots at the tip of

the radial vanes, a plurality of scraper blades attached to the interior of the rear panel correspondingly spaced apart and aligned with the slots in the radial vanes such that the scraper blades pass through the radial vanes as they are rotated upwards towards the rear panel; and

said shredder including an enclosure having a front panel, rear panel and side panels and an inlet and an outlet with a shredder shaft rotatably journaled in the side panels between the inlet and the outlet, a plurality of rotary shredder elements mounted on the shredder shaft in spaced apart relationship on the shaft, each of which includes a rotary knife with a generally radially extending cutting edge that slopes in a direction opposite of rotation of said knife, a plurality of stationary shredder elements mounted on the inside of the front panel in spaced apart relationship, each of which includes a stationary knife with a generally transversely extending cutting edge that slopes in the direction of rotation of the rotary knives and intersects the cutting circle of the rotary knives, said stationary knives aligned such that the rotary knives pass between them to provide a cooperative scissoring action, and a scraper plate mounted on the rear panel adjacent the outlet of the enclosure and inclined upward towards the shredder shaft and inwards towards the front panel, said scraper plate including a plurality of slots that are correspondingly spaced apart and aligned with rotary knives such that the rotary knives pass therethrough and are cleaned of any material which might be caught thereon; and,

wherein the front and rear panels of the feeder and shredder are oriented in the same direction and the outlet of the feeder is attached to the inlet of the shredder.

4,871,119

IMPACT CRUSHING MACHINE

Hiroyuki Murata, Kobe; Takeshi Tanaka, Kure; Chouji Hino, Kobe; Harunaga Kiuchi, Kure, and Masahiro Chiji, Akashi, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

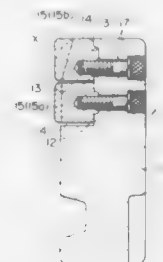
Filed Mar. 4, 1988, Ser. No. 164,181

Claims priority, application Japan, Mar. 6, 1987, 62-32838; Mar. 6, 1987, 62-32839; Jul. 10, 1987, 62-173673; Jul. 10, 1987, 62-106884

Int. Cl.⁴ B02C 13/28

U.S. Cl. 241—189 R

4 Claims



1. An impact crushing machine, comprising:

a casing;

a rotor supported for rotation on a main shaft extended within said casing;

a plurality of strikers fixed to the circumference of the rotor; an impact plate liner extending around the rotor at a predetermined distance from the rotor;

a plurality of seats arranged axially in at least one row and radially of the rotor and which are removably fixed to each striker;

a plurality of hard metal chips fixed, respectively, to said seats wherein said hard metal chips are removably attached to said seats, and at least a contact surface between the seat provided on the radially outer line and each hard

metal chip joined to said seat is inclined toward the direction of rotation of said rotor at an angle of 3° to 25°.

4,871,120

GUIDE DEVICE FOR TOOTHED ROLL SHREDDER

Harold B. Carr, 311 Lloyd St., Akron, Ohio 44301

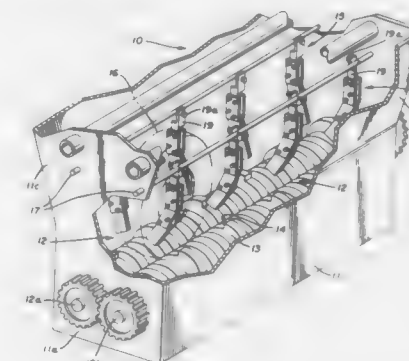
Continuation of Ser. No. 161,497, Feb. 29, 1988, abandoned.

This application Jan. 31, 1989, Ser. No. 304,767

Int. Cl.⁴ B02C 23/02

U.S. Cl. 241—224

7 Claims



1. In a toothed roll shredder, a device for aligning articles for entry into opposed and intersecting shredding rolls and a housing, comprising:

(a) at least two arm members positioned in opposition to each other above the shredding rolls and hingedly mounted with respect to the housing for pivotal movement about an axis parallel to the axis of rotation of the shredding rolls;

(b) said arm members mounted transversely and extending to a point adjacent to a plane wherein the rolls of the shredder intersect;

(c) each of said arm members having at least two segments hingedly connected to each other by a joint with said segments also being hingedly mounted with respect to said housing; and

(d) means carried by said segments for limiting movement of said segments around said joint.

4,871,121

METHOD AND TANK FOR STORING A SUBMARINE OPTICAL CABLE

Kazuyuki Kodaka, Tokyo; Mitsuo Kitamura, Kawasaki, and Mitsuhiro Motegi, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

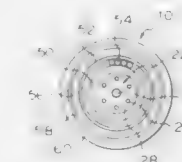
Filed Jan. 11, 1988, Ser. No. 141,843

Claims priority, application Japan, Jan. 9, 1987, 62-002690; Jan. 9, 1987, 62-002691

Int. Cl.⁴ B68H 17/32; G02B 5/16

U.S. Cl. 242—54 R

18 Claims



1. A method for storing a submarine optical cable provided with optical repeaters and the like at predetermined intervals, in such a manner that said optical cable is spirally wound as a coil in a cable tank, the method comprising:

coiling said optical cable in said cable tank having a wall which forms at least a portion of a cable storing space in which said cable is accommodated and is parallel to an axis of said coiled optical cable, said coiled optical cable having a self-inductance when supplied with an electric current, and counter-balancing the self-inductance with a metal plate provided along and covering an entire peripheral region of said wall.

4,871,122

ROLL DISPENSER UNIT

Robert M. G. Fielding, 65 Clarendon Rd., Lythan-St. Annes, Lancashire, England (FY8 3HX)

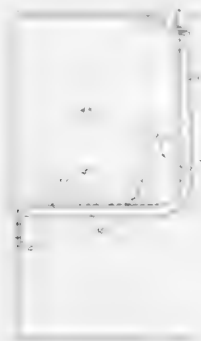
Filed Dec. 4, 1987, Ser. No. 128,627

Claims priority, application United Kingdom, Dec. 5, 1986, 862139

Int. Cl.⁴ B65H 19/00

U.S. Cl. 242—55.2

3 Claims



1. A roll dispenser unit comprising a support bracket and a roll to be dispensed mounted on said bracket, said bracket having first and second arms of substantially flat material and arranged substantially at right angles to each other and having longitudinal edges, said edges of said first arm being curved over at least part of their length, wherein the curvature, size and separation of said curved edges are chosen such that in use the frictional forces between the inside surface of said roll and said curved edges are greater than the inertial forces of the rotation of said roll, said curved edges defining flanges of an angle of substantially 85° with the rest of said first arm, having a radius of curvature of up to 5 mm and being separated by 40 mm to 70 mm; and said arms each having a free end, said free ends being provided with integral attachment means, the unit further comprising a generally cylindrical cover disposed on said bracket, with portions of said cover being engaged by said integral attachment means.

4,871,123

PAPER ROLL HOLDING DEVICE

Raymond N. Lee, 9512 Woody Ln., Great Falls, Va. 22066

Continuation of Ser. No. 13,787, Feb. 12, 1987, abandoned. This application Jun. 28, 1988, Ser. No. 212,080

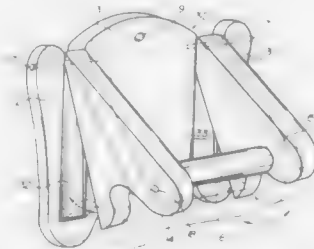
Int. Cl.⁴ B65H 16/04

U.S. Cl. 242—55.2

4 Claims

1. A paper roll dispensing device which comprises: a base member having a front face, a top face and first and second side faces, said top face having first and second recesses therein, first and second side slots located on said front face and extending to said first and second recesses respectively, each of said first and second slots having opposed supporting walls and being formed as a groove in said front face, said groove of each of said first and second slots opening into said first and second recesses respectively, first and second side support members attached to said base member by attaching means, said first and second side

support members being positioned in said first and second recesses respectively, said attaching means attaching said first and second side support members including a pivot pin extending from one of said base member side faces and through a hole located in the side support positioned in each of said first and second recesses, each of said first and second support members being pivotally mounted by said pivot pin for movement in a plane substantially parallel to the other support member and perpendicular to said base member and receiving lateral support from said side slot opposed supporting walls,



a mounting bar secured to one of said side support members and located between said first and second support members, and said side support members being dimensioned to position said mounting bar so that a paper roll to be mounted on said mounting bar is always suspended free from contact with said base member, whereby upon the pivotal rotation of one of said side support members, the paper roll can be readily mounted to or removed from said mounting bar secured to one of said side support members.

4,871,124

METHOD OF WINDING FABRIC ONTO A CLOTH BEAM AND A TRANSPORTER THEREFOR

Schilling Hugo, Winterthur, Switzerland, and Günter Veith, Münsingen-Dottingen, Fed. Rep. of Germany, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

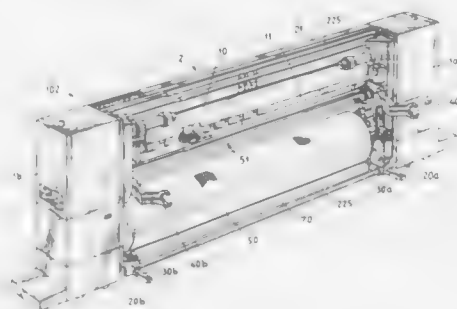
Filed Jun. 13, 1988, Ser. No. 206,196

Claims priority, application Switzerland, Jun. 16, 1987, 02270/87

Int. Cl.⁴ B65H 18/08, 19/20

U.S. Cl. 242—56 R

11 Claims



1. A method of winding fabric onto a cloth beam in a transporter for a weaving mill, said method comprising the steps of placing a free end of the fabric over an empty cloth beam in the direction of rotation thereof during winding; placing a blade tangentially of the empty cloth beam and against the free end of the fabric to hold the fabric against the cloth beam;

moving a wind-on beam circumferentially about the cloth beam to wrap the cloth about the cloth beam and to position the blade between the beams with the free end of the fabric resting on the wind-on beam; and thereafter rotating the cloth beam to wind the cloth thereon and over the free end of the fabric.

4,871,125

STORAGE DEVICE

Ernst Haueter, Längenel, Switzerland, assignor to Autelca AG, Gmüligen, Switzerland

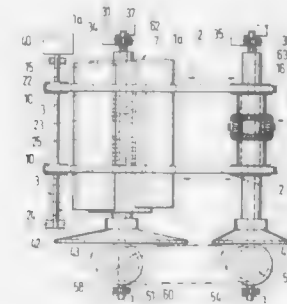
Filed Apr. 5, 1988, Ser. No. 178,069

Claims priority, application Switzerland, May 11, 1987, 01 778/87

Int. Cl.⁴ B65H 29/66; B65B 63/04

U.S. Cl. 242—67.3 R

11 Claims



1. A storage device for sheet-like, flexible objects, especially bank notes, having a belt (2) connected between a belt reel (6) and a storage reel (3), wherein for storing the objects (1), as the belt (2) is unwound from a belt coil (5) on the belt reel (6) the objects (1) to be stored are wound together with the belt (2) onto the storage reel (3) for the formation of a storage coil (7), and for delivering the stored objects (1), said belt (2) together with previous stored objects are unwound from the storage coil (7) as the belt (2) is wound onto the belt coil (5), comprising

guide means (31, 32) for guidingly supporting the storage reel (3) and belt reel (6) for substantially vertical displacement; a first fixedly mounted backing roller (12) and a second fixedly mounted backing roller (13) supporting the storage coil (7) and belt coil (5) respectively; reversible belt drive means (9, 10, 40) in engagement with said belt (2) for alternately withdrawing the belt (2) from the belt coil (5) and the belt together with stored objects (1) from the storage coil (7), thereby rotating in the unwinding direction the belt coil (5) or the storage coil (7), respectively, and the said first or second backing roller (12, 13) supporting the respective coil; and transmission means (51—54, 57—60) operatively connected for transmitting the rotation of the first or second backing roller (13, 12) supporting the respective belt coil (5) and storage coil (7) which is rotating in the unwinding direction, to the other respective first or second backing roller (12, 13) for rotating the other respective storage coil (7) or belt coil (5) in the windup direction such that the circumferential speed of the other respective first or second backing roller (12, 13) in the windup direction slightly exceeds the circumferential speed of the respective backing roller (13, 12) rotating in the unwinding direction, thereby tensioning the belt (2).

4,871,126

FISHING REEL

Seiji Myojo, and Jun Sato, both of Sakai, Japan, assignors to Shimano Industrial Company Limited, Osaka, Japan

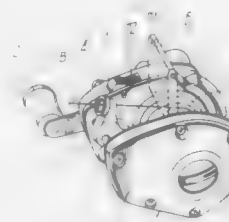
Filed Jul. 20, 1984, Ser. No. 632,821

Claims priority, application Japan, Jul. 22, 1983, 58-114572[U]

Int. Cl.⁴ A01K 89/00

U.S. Cl. 242—84.1 R

4 Claims



1. A fishing reel, comprising: a reel body having a pair of side frames; a spool rotatably disposed between said side frames; a thumb rest mounted on and between said side frames at said reel body, said thumb rest having a width dimension extending longitudinally along a portion of said reel body and including swinging means disposed at one end of said width dimension of said thumb rest, for swinging said thumb rest between a first position at which said thumb rest is laid down along outer peripheries of said side frames and a second position at which said thumb rest is raised with respect to the outer peripheries of said side frames; a holding means for holding said thumb rest in the first position; and a level wind guide mechanism for guiding a fishing line, said level wind guide mechanism being positioned ahead of said spool relative to a direction in which a fishing line is drawn out of said spool, said thumb rest being positioned such that when said thumb rest occupies said first position it covers said level wind guide mechanism from above.

4,871,127

PORTABLE DEVICE FOR STORING AN ENDLESS METALLIC OR FIBER-OPTIC CABLE

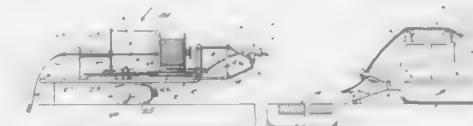
Albert L. Clark, 4125 Highway D, West Bend, Wis. 53095

Filed Dec. 3, 1987, Ser. No. 128,060

Int. Cl.⁴ B65H 75/40

U.S. Cl. 242—86.5 R

43 Claims



1. Apparatus for temporarily storing an elongated flexible cable comprising: a. a frame; b. elongated support means mounted to the frame for receiving a portion of the cable therein along substantially the full length of the support means; c. stationary reel means surrounding and permanently fixed to a first portion of the support means for receiving a portion of the cable intermediate the cable ends; d. drum means rotatably mounted to a second portion of the support means adjacent the support means first portion and adjacent the reel means for receiving a portion of the

cable therein and for winding the cable onto the reel means; and
e. guide means attached to the drum means for guiding the cable onto the reel means.

4,871,128

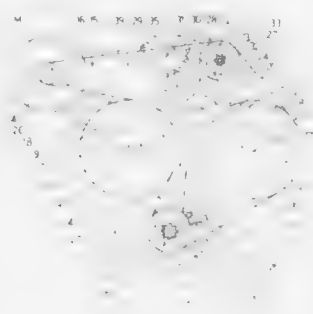
AUTO REVERSE MECHANISM FOR TAPE RECORDER/PLAYBACK DEVICES

Taro Tanaka, and Joji Tanaka, both of Tokyo, Japan, assignors to Wako Kabushiki Kaisha, Kanagawa, Japan
Filed May 19, 1988, Ser. No. 195,839

Claims priority, application Japan, May 20, 1987, 62-123549
Int. Cl.⁴ G11B 15/44

U.S. Cl. 242-201

5 Claims



1. An auto reverse mechanism for tape record/playback devices, comprising:

- a pair of reel turntables;
- a pair of capstans;
- a pair of pinch rollers, one said pinch roller disposed adjacent to and selectively engageable with one of said capstans and the other said pinch roller disposed adjacent to and selectively engageable with the other of said capstans;
- clutch means for selectively driving one or the other of said reel turntables;
- a drive belt means for driving said capstans and for driving said clutch means to selectively drive said reel turntables;
- change-over means for switching said clutch means from driving one of said reel turntables to driving the other of said reel turntables and for switching from one said pinch roller engaging its respective capstan to the other said pinch roller engaging its respective capstan;
- drive force transmission means driven by said drive belt means for transmitting a driving force from said drive belt means;
- intermittent drive means driven by said drive force transmission means for driving said change-over means to switch said clutch means and said pinch rollers;
- detection means for detecting stoppage of a said reel turntable through said clutch means; and
- trigger means engaged with said drive force transmission means for causing said intermittent drive means to be driven by said drive force transmission means when said detection means detects stoppage of a said reel turntable, whereby said detection means detecting stoppage of a said reel turntable causes said change-over means to switch said clutch means and said pinch rollers.

4,871,129

SPEED CHANGE OF FISHING REEL

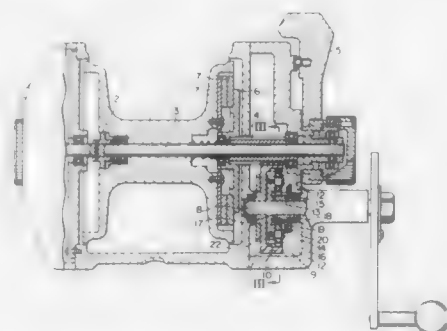
Hiroshi Hashimoto, Tokyo, Japan, assignor to Daiwa Seiko Inc., Tokyo, Japan

Filed Mar. 6, 1989, Ser. No. 319,194

Claims priority, application Japan, Mar. 25, 1988, 62-71051
Int. Cl.⁴ A01K 89/01

U.S. Cl. 242-255

2 Claims



1. A speed change gear of a fishing reel comprising:
a reel frame comprising two side plates;
a pinion for rotating a spool rotatably mounted on a spool shaft;
a driving gear having an inner peripheral surface mounted rotatably to a handle shaft and engaged with said pinion;
an internal gear formed on the inner peripheral surface of said driving gear;
a planetary gear supported rotatably by a support formed integrally with said handle shaft and engaging with said internal gear;
a clutch gear having inner and outer end portions fitted slidably to said handle shaft and engaging with said planetary gear;
first and second anchor portions disposed at the inner and outer end portions of said clutch gear respectively, and third and fourth anchor portions formed on said support and on one of said side plates, respectively; and
an operation lever disposed on one of said side plates for axially sliding the clutch gear on the handle shaft to selectively engage the first anchor portion with the third anchor portion, or the second anchor portion with the fourth anchor portion.

4,871,130

PROPULSION APPARATUS FOR AN AIRCRAFT

Walter Schulze, In der Oeverscheidt 127, D-4600 Dortmund 76, Fed. Rep. of Germany

Filed Jun. 21, 1988, Ser. No. 209,633

Int. Cl.⁴ B64D 27/02

U.S. Cl. 244-55

6 Claims



1. In combination with an aircraft having a fuselage, a high empennage connected to the rear of the fuselage, a center of gravity and a longitudinal axis, a propulsion arrangement comprising an internal combustion engine mounted to the fuselage

near the center of gravity of the aircraft, said rotary engine having a power output shaft with an axis which is inclined upwardly and rearwardly toward the empennage with respect to the longitudinal axis of the aircraft, an extension shaft coaxially connected to said power output shaft and extending to the empennage, a propeller shaft mounted for rotation near the rear of the aircraft, said propeller shaft being parallel to and spaced above the longitudinal axis of the aircraft and located in a portion of said empennage, a pusher propeller connected to the rear of said propeller shaft and a single redirection transmission coupled between said extension shaft and said propeller shaft for transmitting rotation of said power output shaft to said propeller shaft, said propeller shaft being spaced above the longitudinal axis of the aircraft to an extent so that said pusher propeller is not affected by negative wake flow of the fuselage.

4,871,131

EJECTION SEAT HAULBACK SYSTEM

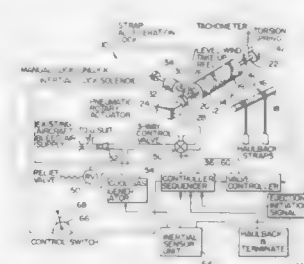
Coral A. Bernier, Des Moines, and Douglas E. Swanson, Bellevue, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Sep. 19, 1988, Ser. No. 246,413

Int. Cl.⁴ B64D 25/06

U.S. Cl. 244-122 AG

18 Claims



1. An ejection seat haulback system, comprising:
a rotatably mounted haulback reel having at least one haulback strap wound thereon;
a pneumatic actuator coupled to said haulback reel so that pressurized fluid applied to said actuator rotates said reel in a direction that winds said haulback strap on said reel;
haulback velocity measurement means for generating a velocity signal having a characteristic indicative of the velocity of said haulback reel;
a source of pressurized fluid;
an electrically operated pneumatic servovalve connected between said source of pressurized fluid and said pneumatic actuator to control the haulback force exerted by said haulback reel; and
valve controller means receiving the velocity signal from said velocity measurement means and, upon receipt of an initiation signal, applying a control signal to said servovalve to rotate said haulback reel at a predetermined rate regardless of the torque that said pneumatic actuator must apply to said haulback reel to achieve said predetermined rate.

16. A method of positioning a pilot in an ejection seat prior to ejection from an aircraft, said ejection seat including a rotatably mounted haulback reel having at least one haulback strap wound thereon and adapted to be connected to said pilot, said method comprising:

- rotating said haulback reel to wind said haulback strap on said reel in the event of an emergency ejection from said aircraft, thereby drawing said pilot toward said seat;
- measuring the velocity of said haulback as said haulback strap is wound onto said reel; and
- comparing the measured velocity of said haulback with a desired haulback velocity and adjusting the rotational velocity of said haulback reel as a result of said comparison so that said desired haulback velocity is achieved.

4,871,132

AERODYNAMIC STRUCTURAL PIPE FOR HANG GLIDERS

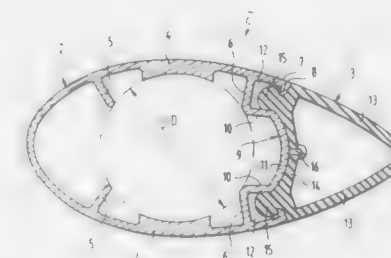
Thomas Finsterwalder, Pagodenburgstrasse 8, 8000 Muenchen 60, Fed. Rep. of Germany

Continuation of Ser. No. 67,807, Jan. 26, 1987, abandoned. This application Dec. 16, 1988, Ser. No. 287,572

Claims priority, application France, Sep. 9, 1986, 86 12950
Int. Cl.⁴ B64C 7/00

U.S. Cl. 244-130

9 Claims



1. An aerodynamically profiled structural pipe having a tear-shaped cross-sectional profile for hang gliders comprising a supporting pipe (2) and a part (3) of elastic soft material, having a substantially triangular crosssection, accurately connected with said supporting pipe and forming the rear part of said structural pipe, wherein said supporting pipe (2) has reinforcing elements (4, 5, 6, 9) extend inwardly from the profile of said structural pipe to define an inside diameter (D) for inserting connecting pieces of circular cross-section and further has, in an area adjacent said part (3), two strips (7) situated on opposite sides and forming part of the profile of said structural pipe (1), said strips (7) having inwardly directed claws (8), said reinforcing elements comprising, in an area adjacent said strips (7), ribs (6, 9) to define with said strips (7) and said claws (8) rearwardly facing partly open chambers (12), and said part (3) of elastic soft material has beads (15) which can be forced into said chambers (12) and captively secured therein by said claws (8).

4,871,133

KITE BRIDLE AND METHOD

Frank Alonso, Pacoima, Calif., assignor to Lluimar Star Kites, Inc., Pacoima, Calif.

Filed Jul. 24, 1987, Ser. No. 77,416

Int. Cl.⁴ B64C 31/06

U.S. Cl. 244-153 R

11 Claims



1. In a kite apparatus having a frame comprising a vertical member and a cross member, and a sail distributively attached to said frame members, a bridle comprising a control loop for attachment to a kite control line held by the kite flier, said control loop having lower and upper ends attached to said kite frame, the improvement comprising a pair of control loop end

anchor means opposite respectively said loop lower and upper ends, said anchor means each comprising a self-adhesive flexible web having opposed openings and wrapped upon itself so that said openings are in registration and said web is adhered to said frame whereby said registered tab openings define an attachment means for said control loop ends wherein said loop upper and lower ends are fixed relative to said kite frame against control-impairing shifting along said frame during flying of the kite.

4,871,134

CLIP FOR SECURING A WIRING HARNESS

Ryuetsu Oikawa, Kōsei, Japan, assignor to Yazaki Corporation, Tokyo, Japan

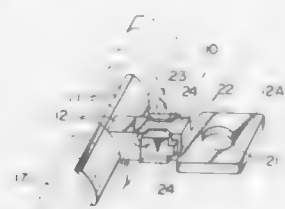
Filed Dec. 2, 1988, Ser. No. 278,757

Claims priority, application Japan, Dec. 9, 1987, 62-186379[U]; Feb. 12, 1988, 63-16406[U]

Int. Cl.⁴ F16L 3/08

U.S. Cl. 248—65

5 Claims



1. A clip for securing a wiring harness in position for use in a vehicle e.g. an automobile, comprising a holder portion for longitudinally holding the wiring harness and a flange portion transversely extending from the holder portion, which flange portion being provided, at the end thereof opposite to said holder portion, with latch means engageable with a fixed part of the automobile structure while being provided in the middle thereof, with a flexibly bendable constrictive portion, wherein reinforcement means is provided for reinforcing said flexibly bendable constrictive portion as unbendable or rigid.

4,871,135

TWO-PART SHELF HOOK

David R. Thalenfeld, Bear Creek, Pa., assignor to Trion Industries Inc., Wilkes-Barre, Pa.

Filed Oct. 28, 1988, Ser. No. 264,151

Int. Cl.⁴ G09F 3/18

U.S. Cl. 248—221.4

4 Claims

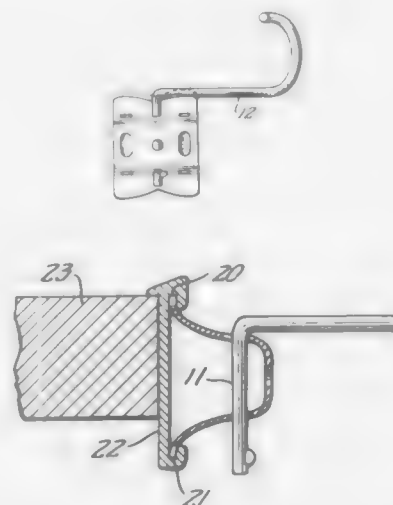
1. A two-part swivel hook for installation in a shelf tag rail or the like and the type comprising a base member of springy sheet-like material formed in a generally U-shaped configuration in which the closed end of the U-shaped forms the front wall of the base member and spaced upper and lower arms, forming the open end of the U-shape, project toward the tag rail, said arms having flange means for interengagement with tag holding flanges of the tag rail, a wire-like display hook member including a generally vertically extending support portion and an integral angularly extending display portion for supporting display articles, and aligned openings in the upper and lower arms of said base member for the reception and swivel mounting of said support portion, the improvement characterized by

- (a) both of said aligned openings being provided with radially outwardly projecting notches,
- (b) said support portion having a radial projection thereon of a size and shape to enable its passage through said openings only when aligned with said notches,
- (c) at least the lower one of said notches and said projection being so oriented with respect to said display portion as to be aligned only when said display portion is in a predeter-

mined, generally rearwardly directed orientation with respect to said base member,

(d) said projection being positioned on said support portion so as to be located below the lower one of the arms of said base member when said display hook member and said base member are assembled, whereby to preclude disassembly of said hook member from said base member unless said hook member is in said predetermined rearwardly directed orientation,

(e) said lower notch, said radial projection, and said display portion being so oriented that said display portion projects



rearwardly over said flange means when said radial projection and said lower notch are aligned for assembly,

(f) the spacing between the upper and lower arms of said base member, and the height of the flange means on said upper arm, being so related to the length of said support portion and the location thereon of said radial projection, that said arms must be resiliently squeezed toward each other to permit passage of said radial projection through the opening in said lower arm,

(g) said display portion, after being pivoted away from its assembly orientation, being blocked from returning thereto by the flange means on said upper arm.

4,871,136

INTERLOCK SHELF AND BRACKET

Walter L. Bessinger, Grand Haven, and Michael J. Hogan, Ada, both of Mich., assignors to Knappe & Vogt Manufacturing Co., Grand Rapids, Mich.

Filed Aug. 10, 1987, Ser. No. 83,374

Int. Cl.⁴ A47B 96/06

U.S. Cl. 248—250

19 Claims

1. A cantilever shelf bracket assembly comprising a bracket having a vertical wall engagement member,

a shelf support platform protruding horizontally from said wall engagement member, and

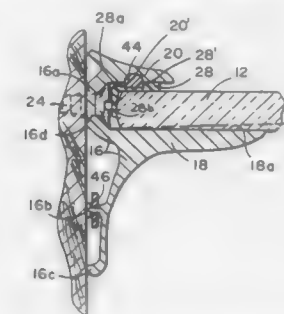
a shelf retainer protruding horizontally from said wall engagement member, overhanging said platform and spaced therefrom;

said wall engagement member, said platform and said retainer defining a throat for receiving an edge portion of a shelf;

a cushioning interlock means in said throat for cushioning the shelf in said throat and interlocking the shelf within said throat, comprising a resilient cushion located at least at the ends of said throat, having a first leg engageable between the shelf inner edge and said wall engagement

member, and having a second leg engageable between said shelf retainer and the top of the shelf;

said resilient cushion having an adherent character allowing said cushion to be adhered to the shelf;



said second leg and said shelf retainer having mutually facing grooves extending lengthwise of said bracket from the ends thereof; and

interlock means in said grooves for locking a shelf to which said cushion is adhered, into said bracket.

4,871,137

SEAT LIFTING APPARATUS

Isao Ikegaya, Kōsei, Japan, assignor to Fujikiko Kabushiki Kaisha, Tokyo, Japan

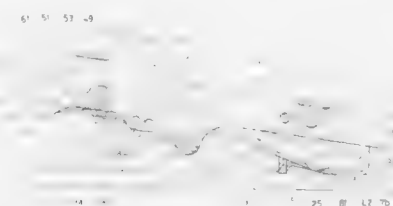
Filed Jul. 11, 1988, Ser. No. 217,163

Claims priority, application Japan, Jul. 31, 1987, 62-117969[U]

Int. Cl.⁴ A45D 19/04

U.S. Cl. 248—396

12 Claims



1. a seat lifting apparatus comprising:

a seat having opposing front and rear sides, a base frame and a seat frame;

front and rear seat lifting means, disposed between the base frame and the seat frame for independently moving the front and rear sides of the seat frame up and down so as to adjust the height of the seat;

front shaft means disposed in the front seat lifting means and connecting both opposite front sides of the seat to support and vertically move the front side of the seat;

rear shaft means disposed in the rear seat lifting means and connecting both opposite rear sides of the seat to support and vertically move the rear side of the seat independently of the front shaft means;

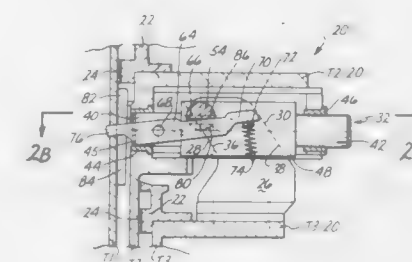
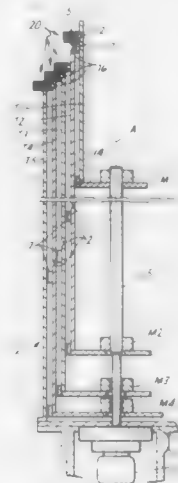
front engaging means disposed in the front shaft means; rear engaging means disposed in the rear shaft means; and single balance spring means connected at both ends thereof to the front and rear shaft means through the front and rear engaging means, respectively; said balance spring means balancing the lifting operation of the seat on the front and rear sides thereof such that the force of the balance spring means on the rear side of the seat is stronger than that on the front side of the seat.

4,871,138
TELESCOPIC DEVICE WITH UNAMBIGUOUS
SEQUENCE OF DEPLOYMENT AND RETRACTION
Josef Sauter, Oberteuringen, Fed. Rep. of Germany, assignor to Dornier GmbH, Friedrichshafen, Fed. Rep. of Germany
Filed Mar. 14, 1988, Ser. No. 167,795
Claims priority, application Fed. Rep. of Germany, Mar. 14, 1987, 3708326

Int. Cl.⁴ F16B 7/10

U.S. Cl. 24 8—408

13 Claims



1. In a telescopic, length extensible device, having a plurality of telescoping hollow elements, including an innermost one, at least one further, and an outermost one, further including drive means connected for obtaining telescopic extension and retraction, a device for ensuring a predetermined sequence in the extension and retraction of the elements, comprising:

a first pin; means for mounting the first pin for radial displacement, on one of any two mutually adjacent ones of the elements, the first pin having a central opening; the first pin provided for selective insertion into and retraction from a third one of the elements;

a counter latch element for latching insertion and connected to another one of the two elements, such that when latching obtains, the first pin is retracted from the third element;

a second pin having a nose for lateral engagement with notches in the first pin; and

a control lever, operating in response to positions of the third element, for locking and unlocking the second pin so that the second pin releases or locks the first pin in a protracted position of insertion in the third element or for maintaining retraction therefrom.

4,871,139

PORTABLE, KNOCK-DOWN, RECONFIGURABLE BOOK STAND

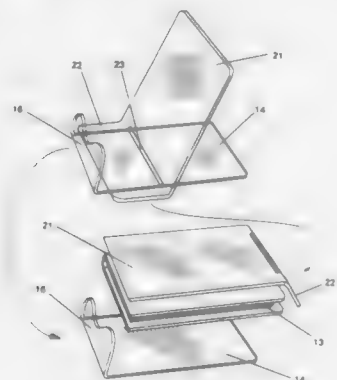
Eunice R. Loewke, 1307 Jasmine Cir., Rohnert Park, Calif. 94928, and Daniel D. Loewke, 3060 N.E. Wheeler St., Poulsbo, Wash. 98370

Filed Apr. 25, 1988, Ser. No. 185,956

Int. Cl.⁴ A47B 97/08

U.S. Cl. 248—460

7 Claims



1. A portable book stand for supporting an open book including base means for engaging a horizontal surface, support means releasably secured to said base means and upwardly extending therefrom to support and display a book inclined against said support means, means for separating and reconfiguring said support means and base means as a protective enclosure to be secured about a book, said base means including a base member, said base member including a base panel adapted to impinge on the horizontal surface, said base member further including a front panel extending from one edge of said base panel and defining an acute angle therewith, said front panel including an upper edge having a pair of rounded lobes extending generally upwardly therefrom and spaced apart laterally to engage lower edge portions of opposed pages of an open book supported by said stand.

4,871,140

HANGING DEVICE

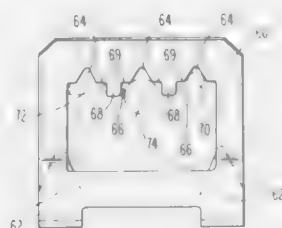
Marlin J. Hoskinson, Philadelphia, Pa.; Eugene M. Lorincz, Cinnaminson, N.J., and George W. Samson, Blue Bell, Pa., assignors to Moore Push-Pin Company, Wyndmoor, Pa.

Filed May 20, 1988, Ser. No. 196,675

Int. Cl.⁴ A47G 1/16

U.S. Cl. 248—496

1 Claim



1. In combination, a foam board and a hanging device, the foam board having upper and lower ends, the hanging device having a body and at least one prong, the prong being inserted into the foam board and being oriented towards the upper end of the board, the body of the hanging device being located outside of the foam board, the body extending generally towards the upper end of the board, wherein the body comprises means for suspending the foam board from a mounting means, wherein at least part of the foam in the foam board is

compressed by the prong, and wherein the body of the hanging device includes a plurality of generally triangular indentations, the indentations being spaced apart from each other, and a plurality of generally rectangular recesses, the indentations and recesses being superimposed on each other, wherein the device can be suspended from either a rectangular member or a nail, at the same position on the device, and wherein the recesses are defined, in part, by protrusions, having parallel vertical walls, located between pairs of recesses, and horizontal walls adjoining the upper ends of said vertical walls, said body of the hanging device including two segments, one of the segments being nearer to the prong and being designated as the lower segment, and the other segment being designated as the upper segment, wherein the upper and lower segments form an obtuse angle with respect to each other, and wherein the lower segment is non-parallel with the prong, and forms an acute angle with the prong.

4,871,141

ADJUSTABLE UMBRELLA SUPPORT

David Chen, No. 17, Pai Sha Road, Chien Hsi LI, Shin Chu City, Taiwan

Filed Jul. 18, 1985, Ser. No. 756,180

Int. Cl.⁴ F16M 13/00

U.S. Cl. 248—534

5 Claims



1. An adjustable umbrella support comprising
 - (a) a tubular fixing seat having a narrow, longitudinally extending, opening for clipping the fixing seat to a chair,
 - (b) a plurality of protuberances disposed internally of the fixing seat,
 - (c) a hole disposed in the fixing seat for reception of an umbrella rod,
 - (d) an umbrella rod and
 - (e) at least one flexible component connected to the umbrella rod for selected adjustment of the umbrella.

4,871,142

MOUNTING SYSTEM FOR VIBRATION ISOLATION

Charles F. deMey, II, West Redding, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Jan. 3, 1989, Ser. No. 292,759

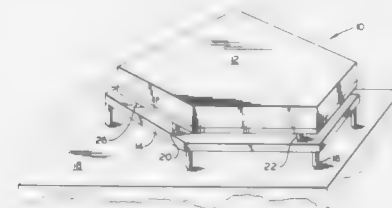
Int. Cl.⁴ F16M 13/00

U.S. Cl. 248—632

14 Claims

1. A mounting system for isolating an apparatus from external vibrations, including a carriage member section of an apparatus being isolated from external vibrations, and a bench member having at least one support assembly thereon positioned to support the carriage member and thereby the apparatus;
 - the support assembly comprising a pin affixed perpendicu-

larly to the bench member and an elastomer isolating ring with a central hole-press fitted onto the pin; the carriage member having an aperture therein generally aligned with the support assembly, the aperture including a slot portion and a ring engagement portion, the ring engagement portion being defined by an outer wall, the outer wall being press fitted over the isolating ring with



the slot portion being unfilled by the isolating ring wherein; the isolating ring is retained in compression between the pin and the outer wall such that elastomer overfill of the isolating ring can expand into the slot portion sufficiently to compensate for tolerance misalignment between the support member and the aperture without substantial thickening of the isolating ring.

4,871,143

GATE VALVE WITH SUPPLEMENTAL ACTUATOR

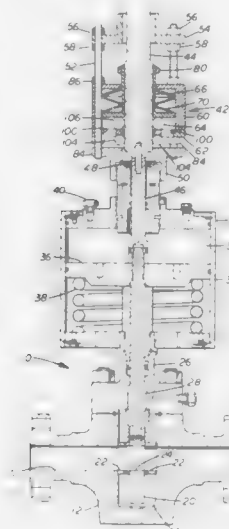
Gerald S. Baker, Houston, Tex., assignor to Cameron Iron Works USA, Inc., Houston, Tex.

Filed Feb. 15, 1989, Ser. No. 310,696

Int. Cl.⁴ F16K 31/122, 31/52

U.S. Cl. 251—58

11 Claims



1. A gate valve comprising
 - a body having a chamber with an inlet and an outlet extending through the body into the chamber;
 - a gate positioned for reciprocation in said chamber to open and close flow through said inlet and outlet,
 - a gate actuator connected to said gate for reciprocating said gate,
 - a supplemental actuator including an operating stem, a plurality of levers having rollers positioned to be in contact with the exterior of said operating stem of said supplemental actuator during all of the closing movement of the operation stem except the last portion thereof, and biasing means exerting a force on one of said rollers of each lever, and

means for connecting said supplemental actuator to said gate actuator so that said operating stem moves with said gate, said supplemental operating stem having an external configuration providing a shoulder facing in a direction opposite to the direction of closing movement of said operating stem for engagement by one of said lever rollers during only the last portion of the closing movement of said gate to automatically transmit the force of said biasing means to assist in the closing movement of said gate.

4,871,144

REGULATOR KEY

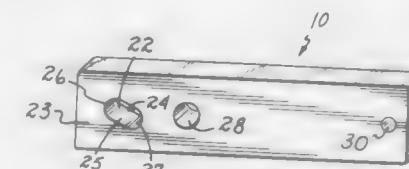
John Kaniaris, 6347 Castle Hill Dr., Middletown, Ohio 45044

Filed Feb. 14, 1989, Ser. No. 309,885

Int. Cl.⁴ F16K 31/60

U.S. Cl. 251—291

3 Claims



1. A key for use with a medical gas regulator-flow meter assembly of the type having a main valve including a flat stem and a yoke which can be turned to seat the assembly on a cylinder, said key comprising:
 - an elongated body having a longitudinal axis,
 - a first elongated opening having two opposed flat walls, said elongated opening being adapted to snugly receive the stem of said main valve, said flat walls of said elongated opening being disposed at an acute angle to the longitudinal axis of said body, and
 - a second opening of circular cross-section, said second opening being dimensioned to snugly receive the yoke of said regulator, said second opening being spaced from said first opening toward the mid portion of said key.

4,871,145

DEVICE FOR EXTENSION OF ALUMINUM DUCTS

Finn Martinsen, Orje, Norway, assignor to Finn Martinsen A/S, Orje, Norway

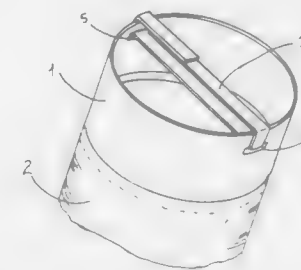
PCT No. PCT/NO84/00011, § 371 Date Oct. 22, 1984, § 102(e) Date Oct. 22, 1984, PCT Pub. No. WO84/03345, PCT Pub. Date Aug. 30, 1984

PCT Filed Feb. 22, 1984, Ser. No. 666,085

Claims priority, application Norway, Feb. 23, 1983, 830636 Int. Cl.⁴ B21F 9/00

U.S. Cl. 254—199

2 Claims



1. An attachable device for pulling out a compressed, extendible aluminum duct (2), said device comprising:
 - a pair of cylindrical end pieces (1) made of steel having opposite inner and outer edges,

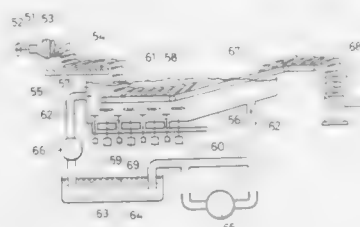
said cylindrical end pieces having at least a portion at said inner edge sized slightly different from that of said duct, and said inner edge of said cylindrical end pieces being insertably fixed to respective ends of said duct, and a strip (3) of plastics being fixed to diametrically opposed positions at said outer edge of said end pieces and extending across the open outer edge thereof; whereby, with said end pieces fixedly coupled to opposite ends of said compressed, extensible aluminum duct, one of said attachable end pieces may be secured to a fixed member via said strip, permitting a single person to pull the other end of the duct to increase the length of the duct by pulling on said strip of the end piece fixed to the other end of said cut.

4,871,146

APPARATUS FOR HEAT TREATMENT OF STEEL RODS
Katsuhiko Yamada; Kunio Ojima; Takashi Asakura; Yusuke Yamamori, and Yukihiko Nakamura, all of Hyogo, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan
Division of Ser. No. 51,256, May 13, 1987, Pat. No. 4,770,722, which is a continuation of Ser. No. 773,158, Sep. 6, 1985, abandoned. This application Feb. 5, 1988, Ser. No. 152,730
Claims priority, application Japan, Sep. 7, 1984, 59-188636; Oct. 15, 1984, 59-215397; Oct. 17, 1984, 59-218948
Int. Cl.⁴ C21D 9/573

U.S. Cl. 266—106

9 Claims



1. An apparatus for direct heat treatment of a steel rod, comprising: a loop layer device for dropping a rod in the form of a spiral coil; a horizontal conveyor that transports the dropped rod in the form of a sequence of non-concentric rings; a heat treating vessel for performing a first patenting process; an adjustable chain conveyor operative between at least a first position in which said chain conveyor transports said rod to a slow cooling line and a second position in which said chain conveyor transports said rod to a quench line in said heat treating vessel; said quench line comprising a plurality of cascade-connected chain conveyors ending with an upwardly inclined withdrawing chain conveyor disposed within said heat treating vessel; a delivery conveyor staggered in height and travelling speed with respect to said multiple cascade connected chain conveyors; a heat holding vessel covering said delivery conveyor and operative to provide a second patenting process for removing form said rod residual defects from said first patenting process; and a unit for supplying a coolant to said heat treating vessel.

4,871,147
APPARATUS FOR THE PYROMETALLURGICAL PROCESSING OF FINE-GRAINED SOLIDS
Edgar Muschelkautz, Stuttgart; Ernst Becker, Esslingen; Adalbert Bartsch, Marzen; Lars Kersten; Georg Gospo, both of Hamburg, and Gerhard Berndt, Sevetal, all of Fed. Rep. of Germany, assignors to Norddeutsche Affinerie Aktiengesellschaft, Hamburg, Fed. Rep. of Germany
Continuation of Ser. No. 834,738, Feb. 28, 1986, abandoned.
This application Jul. 2, 1987, Ser. No. 70,105
Claims priority, application Fed. Rep. of Germany, Mar. 2, 1985, 3507371
Int. Cl.⁴ F27B 15/08
U.S. Cl. 266—182

8 Claims

1. An apparatus for a pyrometallurgical processing of fine-grained solids suspended in high-oxygen gas, comprising: a cylindrical vessel generally extending in a horizontal direction and having a longitudinal axis also extending in said horizontal direction, said vessel having a wall forming said vessel, said vessel having a first and a second end, said ends being opposite each other; means to allow said high-oxygen gas to escape which means are defined by a circular gas outlet opening in said wall at said first end; means for discharging molten particles of said fine-grained solids which means are defined by an elongate discharge slot in said wall adjacent said second end and extending for a length substantially parallel to said axis; means to convey molten particles of said suspended fine-grained solids to said slot, and means being on said vessel and defining a spiral-shaped passage in said wall at said second end, and said elongate discharge slot positioned directly beneath said passage; and a combustion shaft vertically mounted on said vessel and having a mouth opening tangentially into said passage, said mouth defining a bottom of said shaft.

4,871,148
VORTEX INHIBITOR FOR MOLTEN METAL DISCHARGE

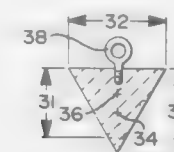
Robert J. Koffron, Farmington Hills, Mich., assignor to Tetron, Inc., Farmington Hills, Mich.
Filed Aug. 9, 1988, Ser. No. 230,065
Int. Cl.⁴ B22D 41/10

U.S. Cl. 266—230

8 Claims

1. A vortex inhibitor for molten metal pouring from a discharge nozzle comprising: a uniform castable refractory body having a specific gravity less than the specific gravity of molten metal and having a

regular pyramidal shape geometrically proportioned so that its center of gravity is below its center of buoyancy and toward the apex of said pyramidal shape, wherein said geometric proportion comprises a height to base length



ratio in the range of 0.5:1 to 1:1, wherein the base length is defined as the diameter of a circle circumscribing the outermost edges of the base, whereby said body is self-orienting in an apex downward position when supported in molten metal.

4,871,149

LOCKABLE PNEUMATIC SPRING

Dominique Dony, Brailans, and Andre Jaillet, Auxon Dessus, both of France, assignors to Airax, Montferland le Chateau, France
Continuation of Ser. No. 168,569, Mar. 7, 1988, abandoned, which is a continuation of Ser. No. 896,198, Aug. 14, 1986, abandoned. This application Apr. 26, 1989, Ser. No. 344,528
Claims priority, application France, Aug. 28, 1985, 85 12836
Int. Cl.⁴ F16F 5/00

U.S. Cl. 267—64.12

11 Claims



1. A lockable pneumatic spring comprising: a cylinder containing pressurized gas; a piston slidably mounted in said cylinder and dividing said cylinder into first and second chambers; and a slide valve allowing mutual communication between the chambers, said slide valve having a one-piece movable slide having a cylindrical first part which sealingly contacts a first annular seal element to form a lock seal between said chambers, a depressible cylindrical second part of constant diameter projecting outside said cylinder, said lock seal being openable upon said second part being depressed, allowing exchange of pressurized gas between said chambers, a diameter of said first part being larger than a diameter of said second part, and an intermediate part for connecting said first and second parts, the intermediate part being tapered and adjoining the first part at a first end thereof and the second part at a second end thereof, the diameter of said intermediate part always being at least as large as the diameter of said second part and at most as large as the diameter of said first part.

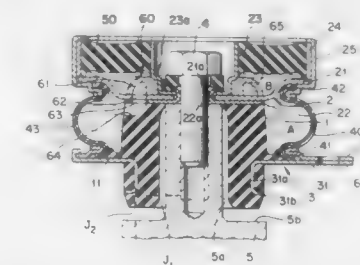
4,871,150

ELASTICALLY YIELDABLE SUPPORT IN PARTICULAR FOR THE SUSPENSION OF A VEHICLE ENGINE
Le Salver, Chanteloup Les Vignes, and Dominique Poupard, Chaville, both of France, assignors to Automobiles Peugeot, Paris and Automobiles Citroen, Neuilly/Seine, both of France

Continuation of Ser. No. 145,879, Jan. 20, 1988, abandoned. This application Jan. 9, 1989, Ser. No. 294,981

Claims priority, application France, Jan. 20, 1987, 87 00589
Int. Cl.⁴ B60K 5/12; F16F 13/00; F16M 4/00
U.S. Cl. 267—140.1

12 Claims



1. An elastically yieldable support for interposition between two units, such as a power unit and the structure of an automobile vehicle, said support comprising an axis and two frames of which frames one is adapted to be connected to one of said two units and a fixing element which extends throughout the support along the axis of the support is provided for fixing the other frame to the other unit, a mass composed of an elastomeric material of annular shape and disposed between said two frames, at least two annular chambers filled with hydraulic liquid, at least one passageway between the two annular chambers, one of said chambers being radially inwardly defined by said mass of elastomeric material, and being radially outwardly defined by a flexible membrane of substantially semi-toric shape connected in a sealed manner to each of said frames.

4,871,151

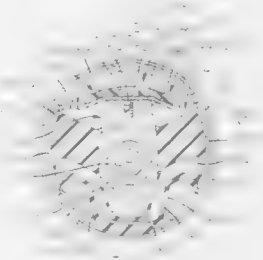
FLUID-FILLED RESILIENT BUSHING

Ryouji Kanda, Inuyama, Japan, assignor to Tokai Rubber Industries, Ltd., Japan

Continuation-in-part of Ser. No. 66,017, Jun. 24, 1987; Pat. No. 4,749,173. This application Mar. 24, 1988, Ser. No. 172,382

Claims priority, application Japan, Jun. 30, 1986, 61-100815
Int. Cl.⁴ F16M 1/02, 5/00
U.S. Cl. 267—140.1

9 Claims



1. A fluid-filled resilient bushing, comprising: an inner sleeve; an outer sleeve disposed in a radially outwardly spaced-apart relationship with said inner sleeve; a generally annular resilient member interposed between said inner and outer sleeves so as to connect the inner and outer sleeves, and having a pocket and an axial void which

are located opposite to each other in a diametric direction of said inner sleeve parallel to a vibration-input direction in which the bushing receives a vibrational load, said void being formed over an entire axial length of said resilient member, said inner and outer sleeves being disposed eccentrically with respect to each other in said vibration-input direction;

said outer sleeve and said annular resilient member cooperating to define a fluid-tight pressure-receiving chamber such that said pocket is fluid-tightly closed by the outer sleeve, said pressure-receiving chamber being filled with an incompressible fluid;

a pair of elastically yieldable thin-walled partition members disposed in said axial void, so as to form a pair of recesses, respectively, said outer sleeve and said pair of partition members cooperating to define a pair of equilibrium chambers such that said pair of recesses are fluid-tightly closed by the outer sleeve, said pair of equilibrium chambers being filled with said incompressible fluid, said pair of partition members being spaced apart from said inner sleeve due to said axial void located therebetween;

a thick-walled resilient member disposed along an inner circumferential surface of said outer sleeve between said pair of thin-walled partition members, said pair of thin-walled partition members being connected to said thick-walled resilient member;

a stopper block supported by said inner sleeve, and having a stopper portion disposed in said axial void, said stopper portion extending between said pair of thin-walled partition members substantially in said vibration-input direction toward said thick-walled resilient member, and being abutable upon said thick-walled resilient member when an excessively large vibrational load is exerted to the bushing in said vibration-input direction; and

means for defining a pair of orifices each of which communicates with said pressure-receiving chamber and a corresponding one of said pair of equilibrium chambers, and which permits flows of said incompressible fluid between the pressure-receiving chamber and said corresponding one of the pair of equilibrium chambers.

4,871,152

FLUID-FILLED RESILIENT BUSHING STRUCTURE WITH RADIAL VANES

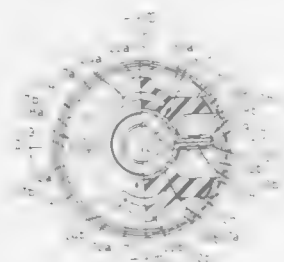
Yoshiaki Funahashi, Iwakura, Japan, assignor to Takai Rubber Industries, Ltd., Japan

Continuation of Ser. No. 69,203, Jul. 1, 1987, abandoned. This application Mar. 10, 1989, Ser. No. 320,891

Claims priority, application Japan, Jul. 4, 1986, 61-158363 Int. Cl.⁴ F16M 5/00; F16F 9/16; F16B 1/00

U.S. Cl. 267—140.1

11 Claims



1. A fluid-filled resilient bushing structure having an inner sleeve, an outer sleeve disposed radially outwardly of the inner sleeve, and a generally annular resilient member interposed between the inner and outer sleeves for elastically connecting the inner and outer sleeves, and thereby primarily damping and isolating vibrations applied in a first diametric direction of the bushing structure, said bushing structure comprising:

first means for defining a pair of first fluid chambers which are disposed in mutually opposed relation with each other

in said first diametric direction, such that said inner sleeves is disposed between said first fluid chambers in said first diametric direction;

second means for defining a pair of second fluid chambers which are disposed in mutually opposed relation with each other in a second diametric direction perpendicular to said first diametric direction, such that said inner sleeve is disposed between said second fluid chambers in said second diametric direction;

said first and second pairs of fluid chambers being filled with a working fluid;

third means for defining at least one orifice through which said pair of first fluid chambers communicate with each other, so as to permit said working fluid to flow between said first fluid chambers upon application of said vibrations; and

a pair of vanes fixedly supported on said inner sleeve so as to extend therefrom in said pair of second fluid chambers, respectively, toward said outer sleeve, such that said second means and a periphery of each of said pair of vanes cooperate to define a predetermined gap in a plane of said each vane parallel to an axis of the bushing structure, said working fluid filling each of said pair of second fluid chambers being forced to flow through said predetermined gap due to oscillating movement of said pair of vanes relative to said outer sleeve in said first diametric direction upon application of said vibrations in the first diametric direction, said second means comprising said outer sleeve and said resilient member, the predetermined gap in each of said pair of second fluid chamber being defined between the periphery of a corresponding one of said pair of vanes and each of an inner surface of said outer sleeve and axially opposed surfaces of said resilient member which surfaces partially define said each of said pair of second fluid chambers.

4,871,153

SPRING FOR BIASING A BRAKING MEMBER OF A TAPE CASSETTE

Kimio Tanaka; Takateru Satoh, and Haruo Shiba, all of Nagano, Japan, assignors to TDK Corporation, Japan

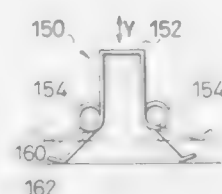
Division of Ser. No. 790,733, Oct. 24, 1985, Pat. No. 4,771,351. This application Jun. 13, 1988, Ser. No. 205,827

Claims priority, application Japan, Oct. 24, 1984, 59-160944; Dec. 15, 1984, 59-190232

Int. Cl.⁴ F16F 1/04

U.S. Cl. 267—155

6 Claims



1. A spring for biasing a braking member of a tape cassette to lock reels thereof during non-use, said spring comprising a pair of ends and a portion for attachment to the braking member intermediate of the ends thereof, and a pair of coils, each said coil situated along said spring between said attachment portion and one of said respective ends thereof,

wherein each said coil is substantially 360°, said attachment portion is substantially rectangularly-shaped and open facing said coils, and said ends of said spring are flared outwardly from said coils.

4,871,154

WORK HOLDING DEVICE FOR HANDICAPPED PERSONS

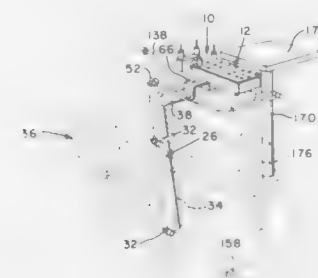
John S. Seney, P.O. Box 152, Sugarloaf Key, Fla. 33044

Filed Oct. 24, 1988, Ser. No. 261,734

Int. Cl.⁴ B23Q 1/04

U.S. Cl. 269—97

24 Claims



1. A work holding device for handicapped persons comprising in combination,

a. a base member having object-engaging means thereon, b. a secondary member supported for movement toward and from portions of said base member,

c. object-engaging means on said secondary member cooperable with object-engaging means on said base member to secure an object therebetween by monitored and controlled pressure,

d. reversible electric motor means supported by one of said base or secondary members and having a drive shaft connected to screw means coengageable with a threaded bore carried by the other of said members and operable to rotate one of said members relative to the other and thereby effect relative movement of one of said members toward and from the other to clamp or release an object between said object-engaging means at monitored pressure provided by a yieldable spring extending between said screw means and the object-engaging means on said secondary member,

e. electric switch means connected between a source of current and said motor, and

f. actuating means for said switch operable selectively by human body means to effect movement of said object-engaging means toward and from each other.

4,871,155

MATERIAL RESTING SURFACE

Klaus Bievert, Spenge; Wolfgang Bruder; Manfred Geilhaupt, both of Bielefeld; Gerd Küpper, Bad Salzungen, and Siegfried Zabinski, Bielefeld, all of Fed. Rep. of Germany, assignors to Durkopp Systemtechnik GmbH, Fed. Rep. of Germany

Filed Jul. 21, 1987, Ser. No. 76,123

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1986, 3625799

Int. Cl.⁴ B23Q 3/00

U.S. Cl. 269—289 R

5 Claims



1. A workpiece support for use with a cutting jet, comprising in combination:

a substrate; and

a material resting surface which comprises a substantially flat layer of nonmetallic kneadable composition on said

substrate, said composition layer being penetrable by such cutting jet, and being mechanically kneadable thereafter, to repair any damage caused by such cutting jet, and to restore said layer to substantial flatness.

4,871,156

MAT BEVEL CUTTING MACHINE

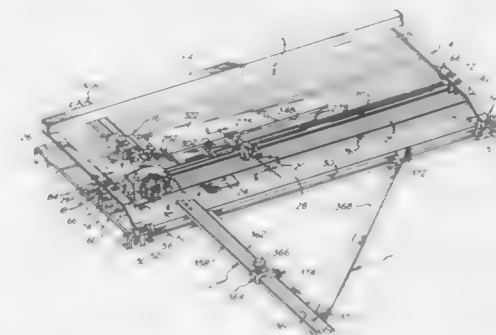
Vincent T. Kozyraki, Plainville, and Alan R. Peters, Milford, both of Conn., assignors to The Fletcher-Terry Company, Farmington, Conn.

Division of Ser. No. 13,578, Feb. 11, 1987. This application Nov. 4, 1988, Ser. No. 267,502

Int. Cl.⁴ B26D 5/08, 7/02, 7/26

U.S. Cl. 269—303

5 Claims



1. In a mat cutting machine, the combination comprising: a base;

a handle assembly pivotably mounted upon said base for movement between a position overlying the upper, mat-supporting surface of said base, and a position displaced therefrom;

a clamping bar assembly pivotably mounted by said handle assembly and including an elongated clamping bar and substantially coextensive guide rail, said clamping bar having a substantially planar bottom surface and being adapted to rest with said bottom surface substantially upon said upper surface of said base with said handle assembly in said overlying position thereof, and said guide rail being affixed to the upper side of said clamping bar and adapted to slidably mount a cutting head assembly for movement therealong; and

a stop assembly slidably mounted upon said rail for movement therealong, said stop assembly comprising a body having a clamping portion slidably mounted upon said rail and including clamping means for securing said stop assembly in selected positions therealong, and a supporting portion extending laterally from said clamping portion, said supporting portion having an elongated rule body slidably mounted thereon for extension along an axis parallel to the axis of said rail, with cooperating means thereon for affixing said rule body in selected positions of extension, said rule body in turn having a stop element mounted thereon for adjustable extension therefrom along said parallel axis, said supporting portion also having a locating subassembly mounted thereon and including a spring element extending from said supporting portion along another axis generally parallel to said rail axis and in the direction of extension of said stop element, and a locating element adjacent a free end of said spring element, said locating element normally being disposed above said upper surface of said base with said handle assembly in said overlying position thereof, and being resiliently deflectable on said spring element into contact therewith.

4,871,157 ZIGZAG FOLDING APPARATUS HAVING WEB CUTTER MEANS

Thomas Hermann, Darmstadt; Josef Herd, Münster, and Reiner Pfahl, Dieburg, all of Fed. Rep. of Germany, assignors to Maschinenfabrik GOEBEL GmbH, Darmstadt, Fed. Rep. of Germany

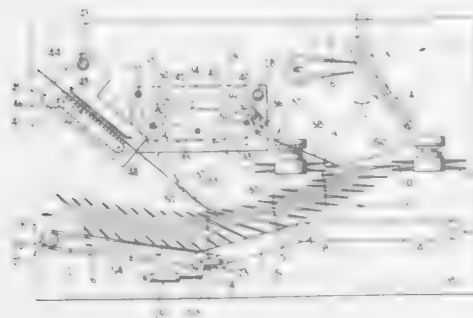
Filed Dec. 21, 1987, Ser. No. 135,454

Claims priority, application Fed. Rep. of Germany, Jan. 7, 1987, 3700238; Apr. 30, 1987, 3714483

Int. Cl.⁴ B41L 1/32

U.S. Cl. 270—39

13 Claims



1. A zigzag folding apparatus, comprising a machine frame, means at a folding station for zigzag folding a continuous web along spaced apart foldlines thereof into a zigzag fold of interconnected web segments, conveyor means on said frame for supporting and transporting the zigzag fold edgewise in a forward direction from said folding station to a discharge station, the zigzag fold having a forward leaning attitude on said conveyor means, an apparatus for separating the interconnected web segments along selected foldlines thereof form groups of interconnected, folded web segments before reaching the discharge station, said separating apparatus comprising a web cutting device including a flexible web cutting element and means for moving said element between extended and retracted positions between selected folds of the webs, said element being angled essentially to said forward leaning attitude to permit entry of said element between adjacent web segments in an initial extended position thereof, said web cutting device being mounted on said frame for pivotal movement about an axis perpendicular to said forward direction to permit said cutting element to pivot and due to its flexibility to flex for matching the attitude of the moving zigzag fold after said entry thereof to effect web separation, said conveyor means comprising a plurality of first conveyors movable at a predetermined speed, a second conveyor movable at a speed lower than said predetermined speed, said second conveyor being initially retracted relative to one of said first conveyors and being located adjacent said discharge station, means for shifting a portion of said second conveyor relative to said one conveyor for supporting the zigzag fold by said portion to delay movement to said discharge station for achieving groups of scales.

4,871,158 VERY HIGH SPEED DUPLICATOR WITH FINISHING FUNCTION

Joseph N. May, Fairport, N.Y.; Stephen A. Rhinehart, New Orleans, La., and Robert G. Zambelli, Rochester, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Feb. 27, 1989, Ser. No. 316,583

Int. Cl.⁴ B42B 1/02

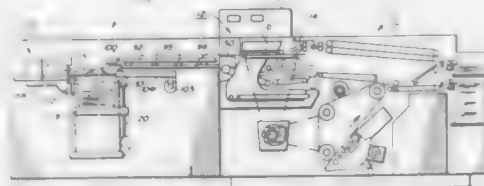
U.S. Cl. 270—53

3 Claims

1. In a reproduction system having a document handling apparatus adapted to transport individual document sheets from a supply stack to an exposure station and effecting an exposure of each of the document sheets before returning the

same to the supply stack, and a processor for reproducing copy sheets of the exposed sheets, the combination of:

a finishing apparatus adapted to receive collated sets of copy sheets of a set of document sheets and to bind the same, said apparatus including at least one stapling device having a clamping position whereat a staple is driven through a set of copy sheets during a stapling operation, said finishing apparatus including a compiling station whereat collated copy sheets are collected and having a movable member upon which, in a supporting position, sheets are supported during collection in a set prior to



binding, said member being movable in a generally horizontal plane and arranged to guide sheets along the same while being moved into said clamping position, means for registering the copy sheets being collected along the leading edge thereof to provide an aligned edge for the set being collected, said aligned edge being within said clamping position of said stapling device whereby stapling of the set may be enacted along said edge without further movement of said set, and means for moving said member out of said supporting position during the stapling operation to effect removal of the set from said compiling station.

4,871,159 SHEET INSERTION APPARATUS

Godber Petersen, Augsburg, Fed. Rep. of Germany, assignor to Man Roland Druckmaschinen AG, Offenbach-am-Main, Fed. Rep. of Germany

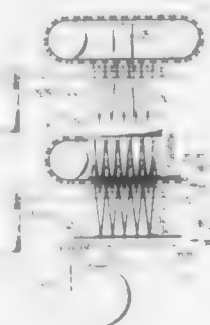
Filed Dec. 23, 1987, Ser. No. 137,243

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1986, 3644423

Int. Cl.⁴ B65H 5/30

U.S. Cl. 270—55

11 Claims



1. Sheet insertion apparatus to place insert sheets (2') into a first carrier structure (3, 3'), particularly into folded sheet products (2) supported on the first carrier structure, wherein the first carrier structure (3, 3') is adapted to retain a plurality of folded sheets in essentially V-shaped open position, said carrier structure defining V-shaped open pocket-like elements; a second carrier structure (4, 4') is provided, located at a predetermined position at least approximately parallel to

said first carrier structure, and retaining a plurality of said insert sheets (2') for transfer of each of the respective insert sheets to said first carrier structure and into said open pocket-like elements, and

comprising an auxiliary holder system (19-26) operatively associated with second carrier structure (4, 4'), including means for individually holding each of said plurality of insert sheets (2') and means for moving second carrier structure (44') away from said predetermined position after said individual holding means are holding said insert sheets to permit insertion of the insert sheets (2') into said first carrier structure (3, 3') upon release of the insert sheets (2') by said holder means.

4,871,160 SHEET FEEDING APPARATUS

Shigeru Yoshino, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

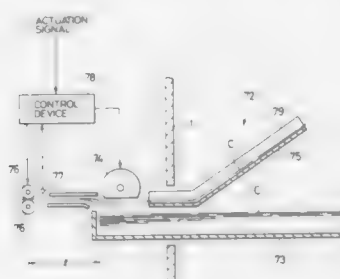
Filed Mar. 11, 1988, Ser. No. 167,286

Claims priority, application Japan, Mar. 20, 1987, 62-64291

Int. Cl.⁴ B65H 3/44, 5/26, 3/06

U.S. Cl. 271—9

3 Claims



1. A sheet feeding apparatus comprising: a pair of conveying rollers in an automatic sheet feeding mode; a sheet accommodating cassette; a semicircular roller disposed above said cassette for feeding sheets automatically from said cassette to said conveying rollers in an automatic sheet feeding mode; a manually inserted sheet tray for guiding a manually inserted sheet to said conveying rollers along a path under said semicircular roller in a manual sheet feeding mode; a sheet detecting sensor provided upstream of said conveying rollers for sensing either a manually inserted sheet or a sheet fed from said cassette by said semicircular roller towards said conveying rollers; and control means operatively connected to said semicircular roller, said sheet detecting sensor and said conveying rollers and responsive to an actuation signal in the manual sheet feeding mode for stopping said semicircular roller and responsive to receiving a sheet detection signal from said sensor indicating either the presence of a manually fed sheet or a sheet fed by said semicircular roller from said cassette for driving, after a time delay, said conveying rollers to further feed said sheets in either manual or automatic sheet feeding modes.

4,871,161 SEPARATING AND FEEDING GARMENT PARTS

Hubert Blessing, Dallas, and Richard L. Harrington, Farmersville, both of Tex., assignors to Levi Strauss & Co., San Francisco, Calif.

Continuation-in-part of Ser. No. 649,503, Sep. 11, 1984, Pat. No. 4,688,781. This application Oct. 3, 1986, Ser. No. 915,148

The portion of the term of this patent subsequent to Aug. 25, 2004, has been disclaimed.

Int. Cl.⁴ B65H 3/22

U.S. Cl. 271—10

27 Claims

1. Apparatus for the seriatim removal of parts of garment material from a shingled stack of the parts and feeding the removed parts to a predetermined destination, said shingled

stack having a top part and remaining parts beneath the top part, each part in the stack having a top portion, a bottom portion, a leading edge portion and a trailing edge portion, said apparatus comprising:

support surface means forming a support surface for supporting at least a portion of the stack including the parts to be removed from the stack at a predetermined position on said support surface;



hold down means for exerting a clamping force against the trailing edge portion of the top part operable for holding remaining parts while the top part is being removed; and, engagement means for effecting a gripping engagement with the top part and imparting a rapid acceleration thereto to remove the engaged top part from beneath the hold down means and away from the remaining parts in the stack.

4,871,162 SHEET TAKE-OUT APPARATUS

Shigetoshi Imai, 4-17, Torikaihaccho 1-chome, Settsu-shi, Osaka-fu, and Takao Akioka, 5-10, Minamimukonosoo 1-chome, Amagasaki-shi, Hyogo-ken, both of Japan

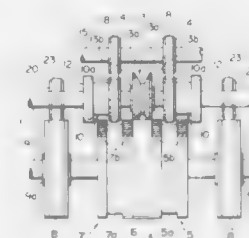
Filed Feb. 25, 1988, Ser. No. 160,284

Claims priority, application Japan, Feb. 26, 1987, 62-27636[U]

Int. Cl.⁴ B65H 3/04

U.S. Cl. 271—35

4 Claims



1. A sheet take-out apparatus for taking out sheets one by one from stacker means, said sheet take-out apparatus comprising:

feed roller means for feeding sheets one by one by engaging with a bottom surface of the lowermost sheet in said stacker means, take-out roller means having at least two grooves extending circumferentially on a peripheral surface thereof, said take-out roller means being disposed downstream of said feed roller means with respect to the direction of the feeding of sheets and rotated synchronously with the rotation of said feed roller means, said take-out roller means including a plurality of take-out rollers, a plurality of pulley means disposed facing at least two grooves and rotating in a direction opposite to that in which the sheets are fed, two annular rings of said plurality of pulley means projecting radially into a plane defining an outermost periphery of said take-out rollers and each of said two annular rings being spaced outwardly from a different peripheral end

face of said take-out rollers which extends perpendicular to the direction of the feeding of sheets, and an additional at least one annular ring being located centrally between said two annular rings, and contacting the peripheral surface of the take-out rollers between said at least two grooves, and

endless belt means made of frictional material, said endless belt means being mounted on said plurality of pulley means so that a part of said endless belt means is positioned in said at least two grooves and being moved in a direction opposite to that in which the sheets are fed, said sheets being fed by being held between the peripheral surface of said take-out roller means and said endless belt

4,871,163

PAPER CONTROL GATE

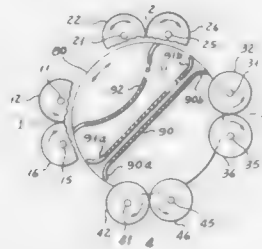
Ben Zion Lands, Edmonton, Canada; Christopher J. Blake, Apalachin; Gerald R. Housworth, Owego, both of N.Y., and Shai Lior, Rehovot, Israel, assignors to Savin Corporation, Stamford, Conn.

Continuation of Ser. No. 871,800, Jun. 9, 1986, abandoned. This application May 20, 1988, Ser. No. 196,410

Int. Cl.⁴ B65H 5/00

U.S. Cl. 271—225

23 Claims



7. A sheet gate including in combination a rotatable shaft, a plurality of at least three stations angularly disposed about the shaft, vane means for directing a sheet along a path from any of said stations to any other of said stations, said vane means including at least a first vane mounted on the shaft, and means for rotating the shaft to a plurality of angular positions at each of which the vane means is operative to deflect a sheet from one of said stations through an appreciable angle to another of said stations.

4,871,164

CYCLE EXERCISER

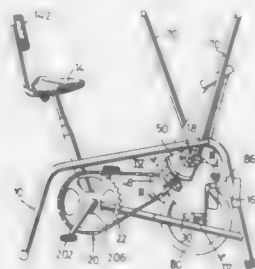
D. H. Tseng, No. 116, Mei Kang Rd., Mei Kang Village, Ta Tsun Hsiang, Chang Hua Hsien, Taiwan

Filed Apr. 14, 1989, Ser. No. 337,927

Int. Cl.⁴ A63B 21/00, 69/06

U.S. Cl. 272—73

4 Claims



1. A cycle exerciser having a frame with a pair of supporting plates extending downward therefrom, a seat, pedaling means,

an energy absorbing wheel and means to link the pedaling to the energy absorbing wheel, wherein the improvement comprises:

- a pair of frame plates being respectively secured to said supporting plates of the frame by a support rod, a lower portion of said frame plates also being secured to the frame, said support rod being fixedly disposed across said pair of frame plates with two opposite ends extending outward from said frame plates, a respective cover plate being fixed on each of said frame plates;
- a compound shaft including a stationary shaft and a hub, said stationary shaft being secured to said cover plates, said hub having a one-way sprocket and a pair of one-way pinions rotatably mounted thereon, said hub being rotated by the pedaling means through a chain and said one-way sprocket; and
- connecting means for interconnecting two lever arms to said two opposite ends of said support rod by a pair of toothed elements, said connecting means allowing said lever arms to swivel laterally, said toothed elements engaging and driving corresponding one-way pinions to turn said hub; said energy absorbing wheel being fixedly mounted on an axle with a coaxial brake disk, said brake disk being secured to and rotatable with said energy absorbing wheel, said axle being fixed to said frame plates at said respective lower portions of said frame plates, said energy absorbing wheel being rotated by the pedaling means and/or said lever arms.

4,871,165

PORTABLE FRICTION RESISTANT EXERCISE DEVICE

Howard B. Marshall, 301 W. 53rd St., New York, N.Y. 10019; Gordon E. Kaye, Garrison, and Raymond J. Prohaska, East Northport, both of N.Y., assignors to Howard B. Marshall, New York, N.Y.

Division of Ser. No. 60,686, Jun. 11, 1987, Pat. No. 4,779,866.

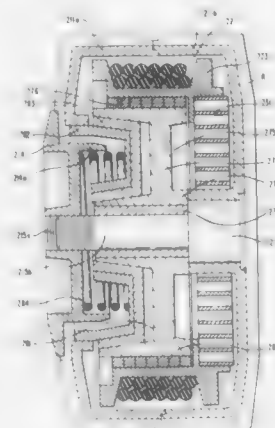
This application Jun. 24, 1988, Ser. No. 210,920

The portion of the term of this patent subsequent to Oct. 25, 2005, has been disclaimed.

Int. Cl.⁴ A63B 21/00

U.S. Cl. 272—132

2 Claims



- 1. A portable exercise device comprising,
 - a. a housing assembly;
 - b. sheave means rotatably mounted in said housing assembly;
 - c. cord means removably wound about said sheave means and having, a free end extending from said housing assembly;
 - d. handle means connected to the free end of the cord means to enable the cord means to be unwound from said sheave means;
 - e. means connected to the sheave means for normally maintaining the cord means in the wound position and for

- rewinding the cord means on the sheave means during use of the portable exercise device;
- f. brake drum means in said housing assembly mounted in alignment with and concentrically within said sheave means for rotatable coaction with said sheave means during unwinding of said cord means;
- g. intermediate means for operatively engaging said brake drum means with said sheave means during the unwinding of said cord means;
- h. brake means disposed for operative coaction with said brake drum means;
- i. means defining a friction surface operatively connectable between said brake drum means and said brake means for restricting the rotational movement of said sheave means with respect to said brake means during unwinding of said cord means;
- j. means connected to said brake means to adjust the forces exerted by said friction surface means during the unidirectional unwinding of the cord means from the housing assembly.

4,871,167

GENERAL PURPOSE DISPLAY CONTROLLER FOR ELECTRONIC GAMES

John J. Pastier, Jr., Schaumburg, Ill., assignor to Bally Manufacturing Corporation, Chicago, Ill.

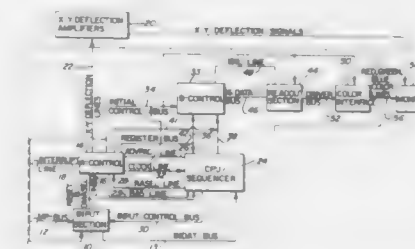
Continuation of Ser. No. 388,883, Jun. 16, 1982, abandoned.

This application Aug. 8, 1985, Ser. No. 764,503

Int. Cl.⁴ A63F 9/00

U.S. Cl. 273—1 E

9 Claims



1. In a video display system having a first processing means for controlling system operations, a video display controller for controlling, independently of the first processing means, the display of a plurality of movable objects to form a video presentation of on a raster scan display, the video presentation being formed of a series of frames each frame being formed of a plurality of parallel scan lines comprising:

- object memory means for storing a digital representation of each object to be displayed during a video presentation, said data being stored at fixed addresses;
- input means for receiving data from said first processing means, said data representing addresses to said object memory means for the objects to be displayed during one frame of the video presentation and the locations at which said objects are to be displayed on the raster scan display;
- line buffer memory means coupled to the input means for storing the address data to said object memory means for each object to be displayed on one scan line at positions within the line buffer memory means corresponding to the locations on the display at which the objects are to be displayed;
- means coupled to the raster scan display for controlling the intensity of the display; and
- second processing means responsive to the data in the line buffer memory means for causing data in the object memory means for said one scan line to be transferred to the intensity control means to generate the scan line of the display from the object memory in real time.

4,871,168

BALL BAT

Joseph A. Autorino, and Jeffrey P. Crouch, both of 170 Brittany Farms Rd., New Britain, Conn. 06053

Filed Oct. 20, 1988, Ser. No. 260,120

Int. Cl.⁴ A63B 69/40

U.S. Cl. 273—26 B

5 Claims

- 1. A system for adjustably supporting a user at a plurality of heights and angles for doing exercises such as bench presses, sit-ups, leg extensions and leg curls, comprising: a lower bench, an upper bench separate from the lower bench, the upper and lower benches having each an integral frame and a plurality of fixed legs extending downwardly therefrom, a seat structure, means for attaching the seat structure to the upper bench, means permitting nesting the upper bench, in a first position, on the lower bench, means for supporting the upper bench, in a second position, on the lower bench at an inclined angle to the lower bench, and means for standing the upper bench, in a third position, on the lower bench.

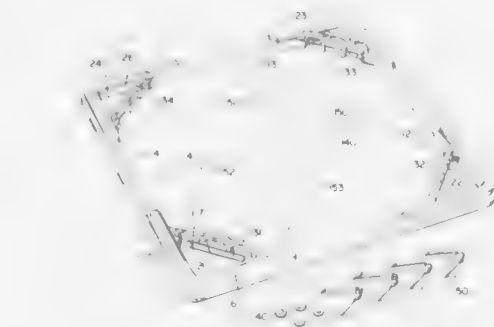
- 1. An elongated ball bat comprising a first member defining a handle end of the bat and having an enlarged outer end portion opposite said handle end, a second member defining an outer end of the bat, said second member having an inner end portion corresponding in size and shape to said first member outer end portion, means coupling said inner and outer end portions, said coupling means defining an elongated cavity of constant cross section, said cavity containing a fluid and said cavity closed at one end by said first member and closed at its opposite end by said second member, a weighted piston slidably received in said cavity, said piston defining an opening for passing said fluid therethrough as a result of sliding movement of said piston in said cavity, means on said piston for impeding

movement thereof from said one cavity end toward said opposite cavity end, said coupling means defining a transparent

fast-moving pucks, said finger-guard means comprising a guard at the distal end which guard extends in a proximal



window adjacent said elongated cavity to permit observation of said piston position.



direction for a substantial distance to cover the player's fingers.

4,871,169 GAME BALL

Joseph A. Autorino, and Jeffrey P. Crouch, both of 170 Brittany Farms Rd., New Britain, Conn. 06053
Filed Oct. 20, 1988, Ser. No. 260,119
Int. Cl.⁴ A63B 37/14

U.S. Cl. 273—26 R

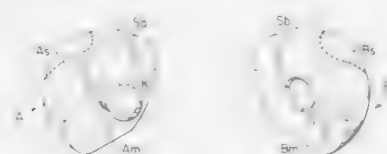
14 Claims

4,871,171 GAME DEVICE INCLUDING MEANS SIMULATING RELEASE OF A BALL

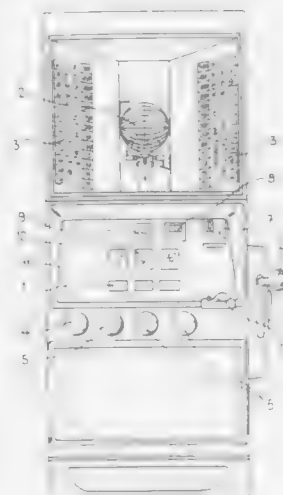
Francisco B. Rivero, Madrid, Spain, assignor to Recreativos Franco, S.A., Madrid, Spain
Filed Mar. 28, 1988, Ser. No. 174,122
Claims priority, application Spain, Mar. 30, 1987, 87/01027; Mar. 30, 1987, 87/01030
Int. Cl.⁴ A63F 5/00

U.S. Cl. 273—138 A

7 Claims



1. A game ball comprising two generally hemispherically shaped components, means movably coupling said components to one another such that the ball has a generally spherically shaped external surface, one or both of said ball components defining said generally spherically shaped surface also defining a minor surface segment having a configuration such that it creates an aerodynamic effect markedly different from that of the major spherical surface area of the ball and the will perform marked undulations in its flight when thrown.



1. A complementary game for electronically controlled slot machines of the type which comprise a cabinet having a front panel;

a front window located at a top of the front panel;

a set of small windows extending across the center of the panel below the front window in which capricious symbols are shown, a corresponding set of pushbuttons below said windows, operable respectively to effect voluntary transfer of the symbol appearing in the top window to respective of the windows therebelow to force a winning combination;

at least one further window adjacent the top window showing forward moves allowing other similar attempts; the complementary game being activatable if a player has not obtained a prize in the basic game and a window and button or suitable projection being arranged to indicate the possibility of playing the complementary game;

4,871,170 SQUEEZE SPORT

Ed Carini, Mahopac, N.Y., assignor to The Astro-Stream Corporation, Levittown, N.Y.

Filed Apr. 6, 1988, Ser. No. 178,179
Int. Cl.⁴ A63F 9/00; A63B 67/14

U.S. Cl. 273—126 R

19 Claims

1. Squeeze apparatus, for propelling a puck means, said squeeze apparatus comprising:

a pair of arms;

each arm connected to the other by spring means; and

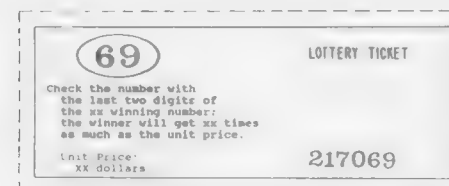
said spring means connecting the arms and biasing the arms towards an acute angle to each other;

each arm comprising an outer surface, an inner surface, a proximal end at the spring means, and a distal end opposite the proximal end, the outer surface of each arm having finger-guard means for protecting a player's fingers from

the complementary game comprising a drum mounted for rotation in the cabinet; numbered balls confined in the drum; and, means to release a prize ball from the drum for simulation in the front window thereby to indicate the prize.

4,871,172
PLAYING RULES FOR LOTTERY-LIKE GAME
Cheng-Hsuan Hwang, No. 2078, Tong Men Market 2nd Floor, Hsinchu City, Taiwan
Filed May 11, 1988, Ser. No. 193,535
Int. Cl.⁴ A63F 3/06
U.S. Cl. 273—138 R

7 Claims



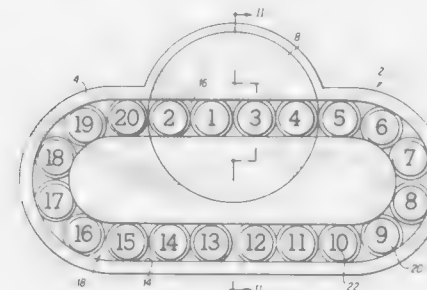
1. A system for playing a lottery-like game comprising: a number of tickets for sale, each ticket having a major number with at least 5 digits and a sub-number containing 2 or 3 consecutive digits of the major number of the ticket, a set of the tickets comprising a collection of tickets having an identical major number, each ticket having printed thereon the sub-number which is enlarged to an extent and distinguishingly circled by a particular mark for each selection by a buyer wherein near each circled sub-number specifications for matching the sub-number and awards for a winning sub-number are expressly listed and whereby each ticket in the game can have a substantially doubled chance to win a reasonable prize by providing awards for the major number as well as the sub-number.

4,871,173 PUZZLE OR GAME HAVING TOKEN FILLED TRACK AND TURNTABLE

Ferdinand Lammertink, Holland, Netherlands, assignor to Binary Arts Corporation, Alexandria, Va.
Filed Sep. 2, 1988, Ser. No. 239,684
Int. Cl.⁴ A63F 9/08

U.S. Cl. 273—153 S

6 Claims

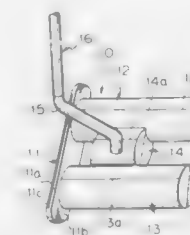


1. An amusement device comprising: means forming an endless track; means defining a plurality of indicia bearing token independently movable in said track, said tokens filling said track; turntable means for rotating a first portion of said track relative to a second portion of said track about an axis substantially perpendicular to the length of said first portion such that an order of tokens in said first portion may be reversed while the position of said first portion relative to the remainder of said track is unaltered, wherein said

first portion of said track has a length relative to the sizes of said tokens such that an even number of said tokens are positioned in said first portion at any time, and wherein said track has such a length relative to the sizes of said tokens that an even number of tokens are positioned in and fill said track.

4,871,174
GOLF CLUB
Masashi Kobayashi, Matsudo, Japan, assignor to Maruman Golf Co., Ltd., Tokyo, Japan
Continuation of Ser. No. 44,532, May 1, 1987, abandoned. This application Feb. 24, 1989, Ser. No. 314,261
Claims priority, application Japan, May 31, 1986, 61-124636
Int. Cl.⁴ A63B 53/04
U.S. Cl. 273—164

6 Claims



1. A golf club having a head and a shaft, said head comprising:

a thin face plate having a generally flat hitting surface extending between toe and heel sides of said head and a generally flat back surface extending substantially in parallel to said hitting surface;

a pair of cylindrical bodies each having one end thereof fixed to said back surface of said face plate such that one of said pairs is fixed at a position adjacent to said toe side and the other is fixed at a position adjacent to said heel side of said face plate, said pair of cylindrical bodies extending backward in a direction perpendicular to said hitting surface of said face plate with a clearance between said pair of cylindrical bodies;

a shaft-mounting body disposed between said pair of cylindrical bodies and fixed to at least one of said face plate and said pair of said cylindrical bodies such that a center of gravity of said head is in said shaft-mounting body; and a hosel member attached to said shaft-mounting body, said hosel member including a first portion extending upwardly from said shaft-mounting body, a second portion extending further upwardly from said first portion at a first angle with respect to said shaft-mounting body to a position near a plane containing said face plate and third portion being bent from said second portion at a second angle greater than said first angle, said second portion being connected to said shaft in a manner such that the axis of said shaft passes in front of said center of gravity of said head.

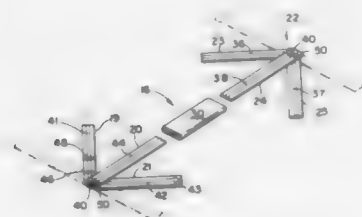
4,871,175
ALIGNMENT TRAINING DEVICE FOR GOLFERS
Steven D. Levin, 1371 Abbey Way, and William A. Swenson, 1384 Abbey Way, both of Bensalem, Pa. 19020
Filed Jul. 14, 1988, Ser. No. 220,961
Int. Cl.⁴ A63B 69/36

U.S. Cl. 273—187 R

6 Claims

1. An alignment, device for golfers comprising: two sets of three elongated strips, each said set including one central strip and two adjoining strips, each of said three strips having first and second ends;

two connectors, respective ones of which rotatably join the second ends of said three strips of each strip set; set connecting means operable to adjustably attach together the central strips of each set; and indicia on selective ones of said strips so that when the central strip of one set is joined to the central strip of the



other set at their first ends and said adjoining strips of each set are rotated on said connectors to be perpendicular to said central strips, said device becomes I-shaped and when placed on the ground indicates a desired flight path of the golf ball, degree of club retraction and proper tee placement.

4,871,176

GAMING METHOD AND APPARATUS

Robert C. Knetzger, Kirkland, Wash., assignor to NeoToy Partnership, Arlington Heights, Ill.

Filed Mar. 9, 1988, Ser. No. 165,766

Int. Cl.⁴ A63F 9/00

U.S. Cl. 273-237

29 Claims



1. A gaming apparatus for use by one or more players with a conventional playing device for playing prerecorded material, comprising prerecorded game material containing a plurality of messages adapted to be used by one or more players and played in said playing device, monitoring means for presenting a message from said prerecorded game material played on said playing device, selectively activating means for selectively playing said prerecorded game material, said selectively activating means being connected to said playing device and to said monitoring means for presenting at least one of said messages, two or more tokens having a coded segment for operating said selectively activating means, said selectively activating means having a token receiving portion for receiving at least two or more of said tokens at a time for rendering said selectively activating means operable to connect or disconnect said playing device to said monitoring means for presenting at least one message from said prerecorded game material, whereby one or more messages may be presented from said prerecorded game material on said monitoring means when said coded segments of said two or more tokens causes said selectively activating means to connect said playing device to said monitoring means.

4,871,177
BOARD GAME

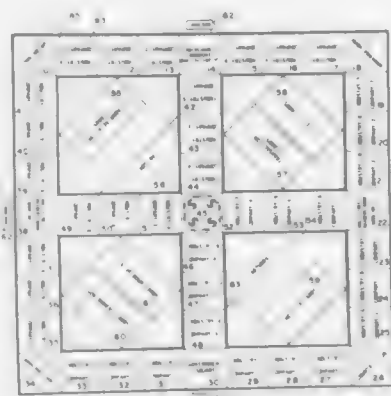
Roger C. Mock, 424 Carrier NE., Grand Rapids, Mich. 49505

Filed Dec. 28, 1987, Ser. No. 138,593

Int. Cl.⁴ A63F 3/00

U.S. Cl. 273-256

15 Claims



1. A business board game for play by two or more players comprising:

- a board having a closed loop having four quadrants looped around a centrally located enclosed space constituting the starting point of play;
- a plurality of spokes extending outwardly from said centrally located space to said loop path;
- said closed loop path and said spokes being divided into a plurality of spaces on which some of the spaces is imprinted a business name and on which others of said spaces is imprinted the name of a bank or one of several other designated organizations; each of said businesses being designated a segment of a designated industry imprinted in the space;

two or more playing pawns employed to designate movement of the player on the closed loop path and spokes; chance means operated by the players for determining the movement of the pawns from one space to another space on the loop path and/or spokes;

said spaces for businesses of each of said industries being located on different quadrants of said loop path or on different ones of said spokes so that any one industry does not have more than one business in each of said quadrants or in each of said spokes; said spaces for each of said businesses being imprinted thereon a cost for each share so as to designate the purchase price of a share when a player lands on a space for any business thereby permitting the player the opportunity to purchase at least one share thereof;

a plurality of cards for each of said other designated organization spaces, said cards having imprinted thereon instructions which may have a detrimental effect on the progress toward winning the game;

said spaces for each bank and other designated organizations being located between the spaces for businesses of each industry located on said closed loop whereby a pawn moving around said closed loop cannot land on two businesses of the same industry without the risk of landing on one of said spaces for a bank or other organization which might have a detrimental effect on the progress towards winning the game;

a plurality of asset means which are purchased by each player, said asset means including one or a combination of play money and stock certificates;

said stock certificates provided for each of said businesses, and available for purchase with said asset means when a player lands on a space for a business; said purchase of said stock certificates being available until one player obtains a predetermined number of stock certificates in each and

every business in any one industry, at which point the player is declared the winner of the game.

4,871,178

BODY-SUPPORTED HOOP GAME AND DEVICE

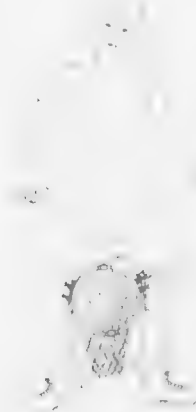
Wilfredo S. Diaz, Urb. Carioca, Third Street, #1, Guayama, P.R. 00654

Filed Nov. 28, 1988, Ser. No. 276,690

Int. Cl.⁴ A63B 67/00

U.S. Cl. 273-411

11 Claims



1. A game for two opposing teams, each team having a plurality of players and a goalie, comprising:

- (a) a plurality of hoop devices, one for each goalie, said hoop device comprising a hoop made of a plurality of pivotally attached curvilinear sections, and means for attaching the hoop to the goalie; and
- (b) a projectile means of a size to fit through the hoop; whereby the object of the game is for the players of each team to cause the projectile means to enter the hoop attached to the goalie of the same team and to prevent the projectile from entering the hoop attached to the goalie of the opposing team, each of said pivotally attached curvilinear sections on each hoop device being positionally movable with respect to each of the other sections on the same hoop device while the hoop is attached to the goalie, said movement of said sections with respect to the movement of the other sections facilitating movement of the goalie.

4,871,179

INFLATABLE PACKER WITH ROUGHENED MANDREL

William T. Bell, Huntsville; Richard C. Ellis, and Robert E. Snyder, both of Kingwood, all of Tex., assignors to Completion Tool Company, Houston, Tex.

Filed Jan. 24, 1983, Ser. No. 460,313

Int. Cl.⁴ F16J 15/46; E21B 33/127; F16L 33/16

U.S. Cl. 277-34.6

6 Claims

1. An inflatable packer for use in a well bore comprising: a tubular mandrel constructed of a load supporting steel pipe member, said tubular mandrel having a length of ten feet or more, an elastomeric tubular sleeve disposed on said tubular mandrel and attached at its ends to said tubular mandrel, said tubular sleeve normally being in contact with the outer surface of said tubular mandrel and being adapted to expand outwardly relative to said tubular mandrel into contact with the wall of a well bore upon the application of a cement slurry fluid upon pressure between said tubular sleeve and said tubular mandrel, and said steel pipe member having an irregular outer surface configuration along its length providing protrusions along the said outer surface configuration for engagement with the tubular sleeve so that said irregular outer surface

configuration provides a substantial coefficient of friction for preventing the tubular sleeve from relative longitudinal displacement relative to the steel pipe member while going in the well bore and so that upon expansion of the



tubular sleeve, the cement slurry fluid is in direct contact with the tubular mandrel and the tubular sleeve whereby a cement bond log can be obtained in a well bore through the length of said steel pipe member.

4,871,180

SEAL CONSTRUCTION IN BELL AND SPIGOT TYPE CONCRETE PIPE CONNECTION

Gerhard H. Preisendörfer, Theodor-Heuss-Strasse 13, 6056 Heusenstamm, Fed. Rep. of Germany

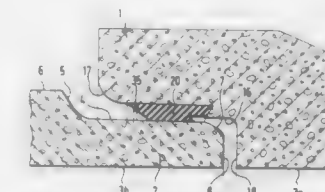
Filed Jan. 25, 1988, Ser. No. 148,065

Claims priority, application Fed. Rep. of Germany, Jan. 28, 1987, 3702477

Int. Cl.⁴ F16J 15/00

U.S. Cl. 277-207 A

8 Claims



1. A concrete pipe comprising a bell end and a spigot end, said bell end containing an annular chamber for accommodating said spigot end; a seal; said seal having a seating portion and a sealing portion; said sealing portion having an annular recess of triangular cross section in said sealing portion before being pressed together; said annular chamber having a radial recess which is relatively shallow and formed with shoulder means for receiving and supporting said seating portion of said seal after said concrete pipe has hardened; said radial recess including shoulder means for supporting said seating portion of said seal when being inserted, thereby forming a relatively compact body functioning as a combined compression and lip seal.

4,871,181

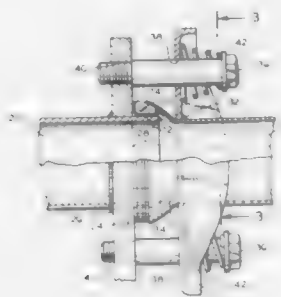
REINFORCED SQUEAK FREE SEAL FOR EXHAUST COUPLINGS

Peter P. Usher, Union; Eugene J. Gavaletz, Toms River, and John Sloskmes, South Amboy, all of N.J., assignors to Metex Corporation, Edison, N.J.

Filed Apr. 9, 1987, Ser. No. 36,338
Int. Cl.⁴ F16J 15/12; F16L 27/06

U.S. Cl. 277-229

8 Claims



1. A heat cured exhaust seal for an articulated ball-and-socket type joint adapted to be interposed between a pair of confronting pipes biased together in sealing relationship therewith, comprising

- (A) a one-piece substantially rigid grommet;
- (B) a heat cured seal body of annular configuration and flat radial surfaces of different area at either end, said seal body comprising a mixture of metallic fibers, non-metallic filler, a thermally stable lubricant and a resin binder, said grommet being coextensive with at least the inner circumferential surface of said seal body, at least 20% of the large flat radial surface at one end of said seal body and at least partially the small flat radial surface of said seal body at the other end thereof; and
- (C) wire mesh disposed intermediate said grommet and the entirety of said inner circumferential surface and at least partially said large flat radial surface of said seal body.

4,871,182

FIFTH WHEEL UNLOCKING AND SAFETY LATCH DEVICE

Russell G. Altherr, Munster, Ind.; Richard L. Glaser, Glendale Heights, Ill.; Francis E. Madura, Whiting, Ind., and Robert P. Radwill, Vero Beach, Fla., assignors to AMSTED Industries Incorporated, Chicago, Ill.

Filed Feb. 26, 1988, Ser. No. 160,638
Int. Cl.⁴ B62D 53/10, 53/12

U.S. Cl. 280-434

19 Claims



1. In a fifth wheel apparatus for over the road tractors of the type comprising a depending skirt about the periphery of an underside of said fifth wheel and having a pivotable jaw to engage a trailer king pin and a locking mechanism on said underside engagable with said jaw to secure and release said jaw, the improvement comprising:

- an operating rod connected to said locking mechanism and extending through a port in said skirt on said underside of said fifth wheel, said operating rod having a shaft with a follower at one end beneath said fifth wheel and a handle at an opposite end exterior of said fifth wheel;
- and a guide means on the underside of said fifth wheel spaced from said skirt, said guide means receiving said follower of said operating rod and including sections which define locked and unlocked positions of said locking mechanism.

4,871,183

TRAILER DOLLY

Randy L. Moss, Cherryville, N.C., assignor to Moss Metal Fabrications, Cherryville, N.C.

Filed Feb. 12, 1987, Ser. No. 13,753

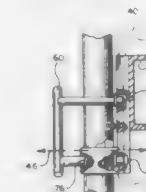
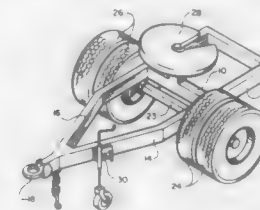
Int. Cl.⁴ B60S 9/02

U.S. Cl. 280-475

2 Claims

- 1. An improved trailer dolly comprising in combination:
 - a. wheel and axle assembly;
 - b. a frame assembly including a tongue;
 - c. a tongue support assembly;
 - d. means for attaching said tongue support assembly to said frame such that a tongue jack forming a part of said tongue support assembly is rotatable between a tongue support position and a trailer use position, said tongue support assembly also including a first substantially flat plate adapted for attaching to said tongue and having a

plurality of holes therein a second substantially flat plate having a second plurality of holes therein adapted for mounting said tongue jack, means for rotatively attaching first plate to said second plate such that said first and second plates are substantially parallel to each other and are rotatable with respect to each other to position said plates in at least first and second angular positions with respect to each other such that a plurality of said first holes coincide with a plurality of said second holes and



latching means including a U-shaped bracket having an open end affixed to said second plate, a latching device having at least first and second ends, at least one of said ends extending through an opening in said U-shaped bracket and spring means between the closed end of said U-shaped bracket and said latching device for moving said ends of said latching device into said coinciding plurality of holes for securing said first and second plates in at least said first and second positions corresponding to said coinciding holes.

4,871,184

GUIDE ASSEMBLY FOR A TRAILER HITCH STRUCTURE

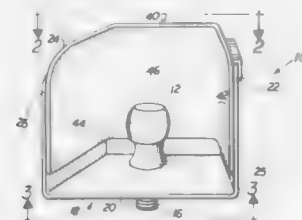
Roy C. Johnson, 412 SW. 18th Rd., Miami, Fla. 33129

Filed Nov. 14, 1988, Ser. No. 270,071

Int. Cl.⁴ B60D 1/06

U.S. Cl. 280-477

12 Claims



1. A guide assembly for use in combination with a hitch ball on a vehicle and structured to guide a coupling tongue into mounting connection with the hitch ball, said assembly comprising:

- a. a base plate removably mountable in adjacent, at least partially surrounding relation to the hitch ball,
- b. said base plate comprising a base portion and spaced-apart side walls secured to said base portion and extending outwardly therefrom in a common direction,
- c. said side walls disposed at an angular orientation to one another and converging towards one another from leading edges thereof towards spaced-apart trailing edges thereof,
- d. said trailing edges defining opposite peripheral edges of an opening back portion of said base plate, said open back

portion being of sufficient dimension and configuration to allow passage therethrough of the hitch ball,

- e. a receiving means formed in said base portion and disposed in communicating relation to said open back portion and dimensioned for slidably receiving a portion of the hitch ball therein,
- f. a stop plate comprising two angularly oriented guide walls disposed in converging relation to one another from an open front portion to an inner-connecting back portion, said back portion positioned rearwardly of the hitch ball in overlying relation to said open back portion of said base plate, and
- g. mounting means secured to said stop plate and disposed and structured for removable connection of said stop plate to said base plate.

4,871,185

UNIVERSAL TRAILER HITCHING ALIGNMENT GUIDE

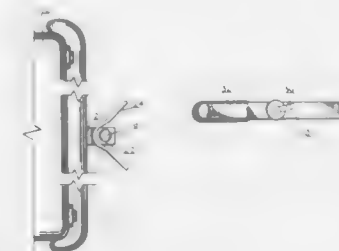
Richard O. Chakroff, Worthington, and Christopher N. Chakroff, Columbus, both of Ohio, assignors to Middleton Enterprises, Inc., Worthington, Ohio

Filed May 2, 1988, Ser. No. 189,377

Int. Cl.⁴ B60D 1/06

U.S. Cl. 280-477

16 Claims



1. A trailer tongue alignment guide for use with a hitch of the type having a vehicle mounted draw bar with a flat upper surface, a hole through the draw bar and a hitch ball connected to the draw bar by a fastener extending from the ball through the draw bar hole, the guide comprising:

- (a) a base plate having a flat bottom surface and a hole for alignment with the draw bar hole for clamping the base plate between the ball and the draw bar by means of the ball fastener;
- (b) a rigid V-guide removably mounted to the base plate by means of engaging male and female coupling members formed on the base plate and the guide to permit the guide to be lifted and removed from the base plate after a trailer is connected to the ball; and
- (c) adjustable guide wall means mounted to the interior surface of the guide facing the ball, each adjustable wall means being movable relatively nearer and farther from the ball at distances to position a hitch socket on the tongue above the ball when the forward end of the tongue seats against the adjustable wall means.

4,871,186

SIMPLIFIED ADJUSTABLE SKI BINDING STRUCTURE

James E. Klostermann, 466 Chatham Dr., Dayton, Ohio 45429

Continuation of Ser. No. 17,265, Feb. 20, 1987, Pat. No. 4,772,041. This application Aug. 26, 1988, Ser. No. 236,855

The portion of the term of this patent subsequent to Sep. 20, 2005, has been disclaimed.

Int. Cl.⁴ A63C 9/08

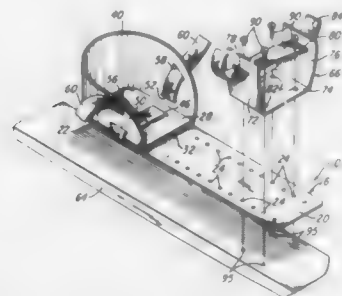
U.S. Cl. 280-611

21 Claims

1. The method of producing a ski binding structure for attachment to a snow ski and for receiving a boot or the like having a heel portion and a toe portion, comprising:

forming a flat sheet of material into an attachment portion

and a pair of side portions and an enclosure portion, the enclosure portion being attached to the attachment portion, the side portions being attached to the enclosure portion, followed by moving the side portions to positions one upon the other and upon the attachment portion, whereby the



side portions cover a part of the attachment portion, followed by folding the enclosure portion angularly with respect to the attachment portion and to a position which partially encompasses the attachment portion and the side portions to form a receptacle which is adapted to receive a heel portion of a boot or the like.

4,871,187

WHEEL SUSPENSION FOR A MOTOR VEHICLE
Walter Schaible, Hemmingen, Fed. Rep. of Germany, assignor to Dr. Ing. H.C.F. Porsche Aktiengesellschaft, Weissach, Fed. Rep. of Germany

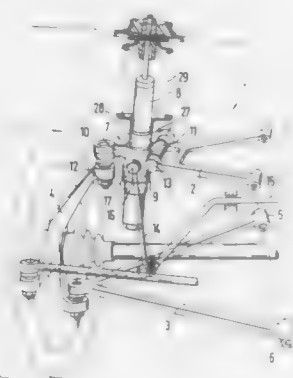
Filed Sep. 19, 1988, Ser. No. 245,640

Claims priority, application Fed. Rep. of Germany, Oct. 21, 1987, 3735544

Int. Cl.⁴ B60G 3/20, 15/00

U.S. Cl. 280—667

15 Claims



1. A wheel suspension for a motor vehicle, comprising a shock absorber means supported at a relatively fixed part of the vehicle, an upper cross guide member, and an intermediate member arranged between a wheel carrier means and the upper cross guide member, said intermediate member being connected to an intermediate part of the shock absorber means.

4,871,188

WHEELED VEHICLE SUSPENSION

Bobby G. Baxter, Warren County, Mo., assignor to Reel 4926, Frames 491 & 492, Warrenton, Mo.

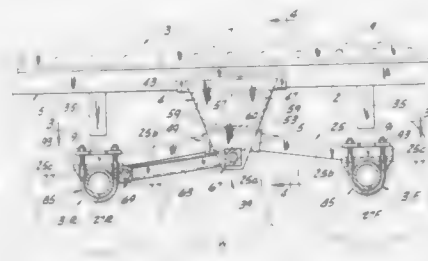
Continuation-in-part of Ser. No. 9,503, Feb. 2, 1987, Pat. No.

4,789,181. This application Jul. 18, 1988, Ser. No. 220,606

Int. Cl.⁴ B60G 5/00

U.S. Cl. 280—680

25 Claims



1. A suspension for tandem axles of a vehicle comprising: a pair of walking springs, one for the right side and one for the left side of the vehicle, each comprising a composite leaf spring comprising fibers embedded in a resin matrix, the fibers generally extending lengthwise of the spring; a pair of axles, one constituting a forward axle and the other a rearward axle; the forward axle being secured to the springs adjacent their forward ends and the rearward axle being secured to the springs adjacent their rearward ends, each axle being secured to the springs against movement relative to the springs; means located generally centrally of the springs mounting the springs toward the sides of the body of the vehicle below the bottom of the body with each spring extending longitudinally of the vehicle and movable longitudinally relative to said mounting means and swingable generally about the center of the length of the spring in a generally vertical plane one way or the other from a horizontal position; and means for limiting the longitudinal movement of each spring relative to its mounting means comprising link means pivotally connected at one end to the respective mounting means and at the other end to the spring adjacent the attachment of one of the axles to the spring.

4,871,189

TRUCK CAB SUSPENSION SYSTEM

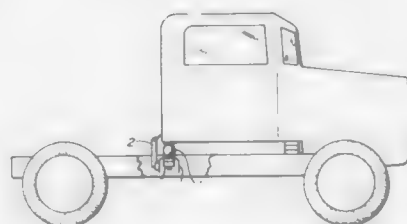
Charles A. Van Breemen, 825 Evergreen St., Burbank, Calif. 91505

Filed Aug. 28, 1987, Ser. No. 90,571

Int. Cl.⁴ B60G 17/04, 13/10; B62D 25/00

U.S. Cl. 280—711

12 Claims



1. A truck cab gas suspension system which comprises:
(a) at least one gas spring,
(b) a gas reservoir,
(c) said gas reservoir being closely connected to said gas

spring by interconnecting means, said interconnecting means being sealed to prevent gas leakage from said system by a sealing means, and having means for restricting the flow of gas, interposed between said gas spring and said gas reservoir; such that the spring rate of said gas spring is lowered by the additional gas volume in said gas reservoir, and the free vibrations of the cab suspension system are damped by nonlinear gas damping, and wherein said reservoir stays in communication with said gas spring independent of the displacement said spring is subjected to.

4,871,190

SAFETY APPARATUS

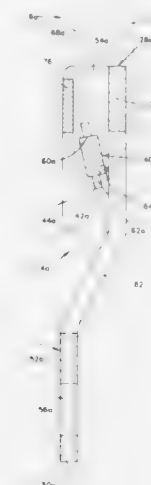
Ronald A. Willey, Port Huron, Mich., assignor to TRW Vehicle Safety Systems Inc., Lyndhurst, Ohio

Filed Oct. 8, 1987, Ser. No. 106,146

Int. Cl.⁴ B60R 21/10

U.S. Cl. 280—801

11 Claims



1. A safety apparatus for use in restraining an occupant of a vehicle in a vehicle seat against movement relative to the vehicle seat, said safety apparatus comprising:

a belt for restraining the occupant of the vehicle in the vehicle seat, said belt having a first portion extendable across the lap of the occupant of the vehicle and a second portion extendable across the torso of the occupant of the vehicle, said belt being located on one side of the vehicle seat when not restraining the occupant of the vehicle;
a buckle to be secured adjacent to the other side of the vehicle seat; and
a tongue assembly slidably mounted on said belt and connectable with said buckle to secure the first portion of the belt across the lap of the occupant of the vehicle and to secure the second portion of the belt across the torso of the occupant of the vehicle, said tongue assembly including:

a base comprising a base plate, spaced facing flanges extending from said base plate, and a belt clamp portion located between said flanges;
said spaced flanges defining a first opening through which said belt enters said tongue assembly in a direction generally parallel to said base plate and a second opening through which said belt extends when not restraining the occupant of the vehicle; and
a lock bar having a belt locking portion located between said spaced flanges and slidable relative to said base plate between a first belt clamping position in which said belt is clamped between said belt clamp portion and said belt locking portion of said lock bar and a second non-clamping position in which said belt extends through said tongue assembly and said first and second

openings along a substantially linear path to allow said tongue assembly to freely slide along said belt; each of said spaced flanges having a longitudinally extending slot for receiving an end of said lock bar and for supporting said lock bar for sliding movement along said longitudinally extending slots between said first belt clamping and second non-clamping positions.

4,871,191

WEBBING GUIDING STRUCTURE FOR AUTOMOBILE SEAT BELT SYSTEM

Katsuyasu Ono, Fujisawa, Japan, assignor to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

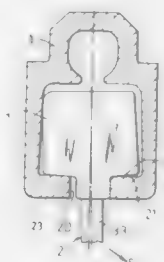
Filed May 17, 1988, Ser. No. 196,065

Claims priority, application Japan, May 20, 1987, 52-75483[U]

Int. Cl.⁴ B60R 22/06

U.S. Cl. 280—804

10 Claims



1. In a webbing guiding structure for an automobile seat belt system, said structure including a slide rail and a movable runner displaceable along the slide rail, the improvement wherein the slide rail defines a slide surface for allowing the movable runner to run on the slide surface, the movable runner is provided with a slidable shoe having a contact surface which is brought into contact with the slide surface of the slide rail, the slidable shoe is received in the slide rail, the movable runner extends outwardly at a part thereof through a slot formed in the rail, and the slide surface extending from one of edges of the slot and the contact surface of the slidable shoe are formed in such a way that the interval between the slide surface and the contact surface increases as the distance from the edge becomes greater.

4,871,192

RETENTION MECHANISM FOR A SAFETY-BELT BAND OF MANUALLY ADJUSTABLE POSITION

Gérard Escaravage, Valentigney, and Michel Henriot, Ecurcey, both of France, assignors to ECIA-Equipements Et Composants Pour L'Industrie Automobile, Audincourt, France

Filed Oct. 7, 1988, Ser. No. 254,644

Claims priority, application France, Oct. 7, 1987, 87 13865

Int. Cl.⁴ B60R 22/20

U.S. Cl. 280—808

9 Claims

1. Retention mechanism for a safety-belt band of manually adjustable position, adapted to be fastened to a part of a vehicle structure (10) and consisting of: a body (20) with a base (21) and mounts (22) for anchoring the base to the structure (10); a band support (50) having a reinforcement (53) which partial defines an aperture (55) and which is movably connected to the body to adjust the position of the safety belt band; wherein the base (21) and the anchoring mounts (22) of the body (20) are arranged so as to form a recess (211) of the rear of the base, the body further including a guide (30) in line with the recess (211) and equipped with at least two cells (312), with each of which a stay (313) is associated; and at least one spring (40) generating a force in line with each cell (312) and in the direction of the latter; wherein the the band support (50) is movably connected

to the body (20) in such a way that its aperture (55) has the base (21) and the guide (30) passing through it, and in such a way that the reinforcement (53) can engage into a cell (312) and rest



against a stay (313) or travel in the recess (212), the force generated by the spring (50) normally pushing the reinforcement (53) into a cell (312).

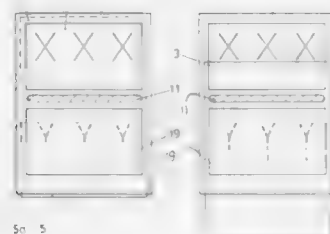
4,871,193

PROCESS FOR IRREVERSIBLE RECORDING, RECORDING CARRIER, AS WELL AS USE OF THE PROCESS OR OF THE RECORDING CARRIER

Gerhard A. Würndli, Lerrhenbühlstrasse 14, 6045 Meggen, Switzerland

PCT No. PCT/CH85/00177, § 371 Date Nov. 18, 1987, § 102(e) Date Nov. 18, 1987, PCT Pub. No. WO87/03990, PCT Pub. Date Jul. 2, 1987

PCT Filed Dec. 19, 1985, Ser. No. 95,155
Int. Cl.⁴ B42D 11/00, 15/00; B41L 1/16; D21H 1/02
U.S. Cl. 283—72 15 Claims



1. A method for preventing an amendment of a notation on a notation sheet arrangement, the method comprising the steps of: providing a pocket of at least two sheets joined along at least major portions of edges thereof; providing at least one intermediate sheet between said two sheets, said at least one intermediate sheet being adapted to generate a contrast corresponding to a notation applied on said pocket on at least one of said two sheets, said contrast being visible from outside of said pocket, applying a notation from an outside of said pocket on an area of said pocket so as to generate by said at least one intermediate sheet the contrast on at least one of said two sheets, tearing said at least one intermediate sheet out of a removal slit in said pocket and out of an area containing the contrast generated by said at least one intermediate sheet, and preventing a re-introduction of said contrast generating sheet into the area containing the contrast by automatically adhesively joining said at least two sheet of said pocket at least in one of the area containing the contrast generated by said intermediate sheet and down stream of

the area containing the contrast with respect to a tearing direction of said intermediate sheet by exposing an adhesive area provided between said at least two sheets by removal of said intermediate sheet from said adhesive area.

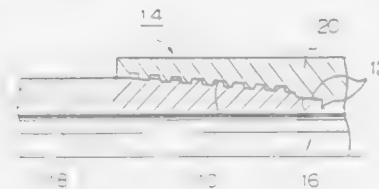
4,871,194

OIL WELL PIPE JOINT AND MANUFACTURING METHOD THEREFOR

Hisakazu Kawashima, Takarazuka; Yoshiyasu Morita, Nara; Minoru Nishihara, Kyoto; Tetsuzo Arai, Takarazuka, and Kunihiro Fukui, Kawanishi, all of Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka, Japan

PCT No. PCT/JP86/00229, § 371 Date Dec. 31, 1987, § 102(e) Date Dec. 31, 1987, PCT Pub. No. WO87/06673, PCT Pub. Date Nov. 5, 1987

PCT Filed May 2, 1986, Ser. No. 146,367
Int. Cl.⁴ F16L 15/00
U.S. Cl. 285—55 20 Claims



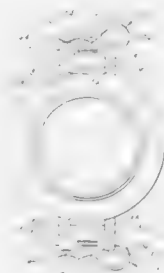
1. An oil well pipe joint which comprises a threaded portion and a metal sealing portion and which has a plating layer at least on the metal sealing portion, characterized in that the plating layer is a blast-plated layer of particles of a soft metal or an alloy thereof having a melting point higher than the service temperature of the oil well pipe joint.

4,871,195

SAFE LOCKING QUICK DISCONNECT COUPLING

James R. Parrish, Enid, Okla., assignor to Central Machine and Tool Company, Enid, Okla.

Filed Sep. 26, 1988, Ser. No. 248,624
Int. Cl.⁴ F16L 55/00
U.S. Cl. 285—91 1 Claim



1. A safe locking quick disconnect coupling comprising: a tubular male plug defining an annular groove in the exterior surface thereof; a socket telescopically receiving said plug and defining a pair of opposed apertures on opposite sides of the socket and aligned with said annular groove when said plug is sealingly seated in, and engaged with, said socket; means for sealing between the plug and the socket; a pair of lever arms including arms disposed on opposite sides of the socket, each of said lever arms having: an elongated handle portion; a pivot head pivotally connected to said socket adjacent one of said apertures; and

a cam portion carried on said pivot head and projecting through the adjacent aperture into camming engagement with said annular groove; two pairs of lugs secured to said socket on the opposite sides thereof, each lug in each of said pairs including an ear portion, with the ear portions in each lug pair being aligned and having aligned locking pins holes formed therethrough and being positioned on opposite sides of one of said handles when the lever arms are in their locking positions; and a removable locking pin having a first straight leg extending through the aligned pin holes in each pin of aligned ear portions, and having said straight leg extending across one of said elongated handle portions to retain the respective lever arm carrying said one handle portion in close proximity to said socket and said respective lever arm in a locking status, and each of said locking pins further having a bent, angulated second leg having a free end and being of generally W-shaped configuration including two contiguous V-shaped bends each defining an obtuse angle, and each forming a point in said second leg, with said points spaced from each other and located in the midportion of said second leg and being located relatively closer to said first straight leg than the remaining portions of said bent, angulated second leg, said pair of points in said bent, angulated second leg being positioned for each successively contacting at different times, at least one of said ear portions when the respective locking pin is pulled in a direction to extricate said straight leg from aligned locking pin holes whereby a double tactile warning indication is communicated to a person removing said locking pin before said locking pin will release the respective lever arm, said first and second legs being joined through a finger grip loop section at one of the ends of the two legs and having a free end at the opposite end of each of said legs, said legs diverging from each other adjacent said opposite free ends thereof and having said opposed free ends spaced from each other a distance less than the distances said aligned pin holes are spaced inwardly in the respective ear portions in which they are located whereby each ear portion can pass between said free ends to wedgingly bias the legs of the removable locking pin apart from each other.

4,871,196

DOUBLE SHIELD FITTING

Kenji A. Kingsford, Devore, Calif., assignor to Mace Corporation, Upland, Calif.

Filed Feb. 1, 1988, Ser. No. 150,776
Int. Cl.⁴ F16L 21/04
U.S. Cl. 285—138 8 Claims



4. A fitting arrangement, comprising: a first elongate plastic tube terminating in a first free end and defining a first flow passage therethrough; a second elongate plastic tube disposed in substantially concentric and surrounding relationship to said first plastic tube and defining therebetween an annular second flow passage which is disposed within said second tube in surrounding relationship to said first tube, said second tube terminating in a second free end which is in the vicinity of said first free end; a fitting body having a third flow passage therethrough, said

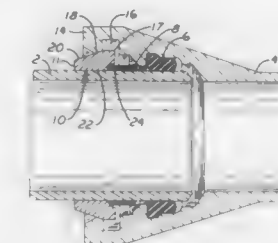
fitting body having an annular collar portion which snugly fits over said first free end so that said first flow passage and said third flow passage are axially aligned and communicate with each other, said collar portion being externally threaded; an intermediate annular body disposed in surrounding relationship to said first and second elongate plastic tubes, said intermediate annular body being of unitary construction and having an annular nut part defined adjacent one end thereof and an annular collar part defined adjacent the other end thereof; said annular nut part having an internally threaded bore opening disposed inwardly from a free end thereof in threaded engagement with said collar portion; said collar part of said intermediate body being snugly, fittingly disposed over the end of said second tube and externally threaded; and an annular nut of unitary construction disposed in surrounding relationship to said second tube, said nut having a threaded bore opening disposed coaxially inwardly from one end thereof in threaded engagement with said collar part; and means for sealingly retaining said first and second elongate plastic tubes within said fitting body.

4,871,197

EARTHQUAKE RESISTANT PIPE JOINTS

Charles N. Coddling, III, Vestavia Hills; George F. Rhodes, Leeds, and Philip I. McGrath, Jr., Birmingham, all of Ala., assignors to United States Pipe and Foundry Company, Birmingham, Ala.

Filed Aug. 15, 1988, Ser. No. 232,079
Int. Cl.⁴ F16L 21/02
U.S. Cl. 285—231 9 Claims



1. In combination a first pipe in locking, overlapping engagement with a second pipe and means to lock the two pipes together, said means comprising: a. said first pipe having a bell portion, said bell portion having a radially, inwardly, circumferentially extending projection integrally mounted to said bell portion at one end of said first pipe, said projection forming one end of a circumferential groove, said projection having a surface remote from said bell portion facing toward the interior of said first pipe and forming a contacting surface, said projection further having at least one recess connecting to said circumferential groove; b. a plurality of arcuate shaped locking segments corresponding in shape to said circumferential groove and conforming to the outer circumference of said second pipe, each of said segments having a leg portion; said leg portion having a contacting surface, c. said second pipe having a spigot end and a circumferential weldment protruding radially from its outside surface near the spigot end, and d. a collapsible, metallic member encircling said spigot end and abutting said weldment in a direction away from the open end of said spigot end, and abutting said locking segments, e. said locking segments being installed through said recess

and into slidable engagement with the outside surface of the plain end of said second pipe between said collapsible member and said projection and thereafter moved out of alignment with said recess, after said contacting surface of said leg portions abut with said contacting surface of said projection.

4,871,198

CORRUGATED PLASTIC PIPE COUPLING

Kenichi Hattori, Kanagawa, and Kazuya Imamatsu, Hiratsuka, both of Japan, assignors to The Furukawa Electric Co., Ltd., Tokyo, Japan

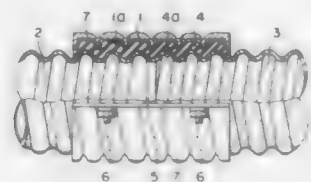
Filed Feb. 22, 1988, Ser. No. 158,343

Claims priority, application Japan, Mar. 4, 1987, 62-30359[U]

Int. Cl.⁴ F16L 21/06

U.S. Cl. 285—373

11 Claims



1. A clamp-type corrugated plastic pipe coupling, comprising:

split mold means adapted to surround outer surfaces of corrugated plastic pipes to be connected;
an outer coupling member adapted to be received within said split mold means and having a corrugation at least on its inner surface; and

a packing member arranged inside said outer coupling member, wherein the packing member is urged against the outer surfaces of the pipes to be connected when said outer coupling member is clamped from the outside by said split mold means,

the corrugation on the inner surface of said outer coupling member corresponds in form to corrugations on the outer surfaces of the pipes to be connected,

said packing member has an inner surface with a corrugation that conforms substantially identically to the corrugations on the outer surfaces of the corrugated plastic pipes to be connected, and

said packing member is made of a material having a rubber hardness of not more than 25 and a compression set of not more than 60%.

4,871,199

DOUBLE BEAD TUBE FITTING

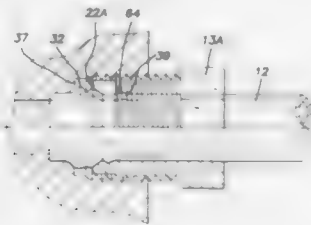
Ralph G. Ridenour, 626 Lexington-Ontario Rd., Rte. 12, Mansfield, Ohio 44903, and Thomas Stanton, 921 Curtis Dr., Mansfield, Ohio 44906

Filed Apr. 25, 1988, Ser. No. 185,849

Int. Cl.⁴ F16L 19/02

U.S. Cl. 285—382.5

18 Claims



1. A tube fitting assembly comprising, in combination, a tube

and first and second interengageable threaded fitting members, said assembly comprising:

a first outwardly deformed area of the tube wall near one end of said tube;

a second outwardly deformed area of said tube wall outward of said first deformed area;

an annular bead as part of said second deformed area;

a U-shaped portion of said tube wall between said first and second deformed areas to establish with said first and second deformed areas four lateral portions of the tube wall spaced longitudinally from each other;

said first threaded fitting member surrounding said tube and having a radially inwardly extending first shoulder inboard of said first and second deformed areas;

said second threaded fitting member having an annular second shoulder at an acute angle to the longitudinal axis of the tube with the acute angle facing said second outwardly deformed area; and

the end of said tube sliding inside said second threaded fitting member, whereby as the first threaded fitting member is threaded into engagement with said second threaded fitting member the annular second shoulder of said second threaded fitting member abuts said annular bead to axially compress said four lateral portions between said first and second shoulders and to radially inwardly compress said annular bead with the resistance to radially inward compression to establish a seal between said tube and the second fitting member against leakage of fluid pressure.

4,871,200

FIXTURE FOR TYING FISHING KNOTS

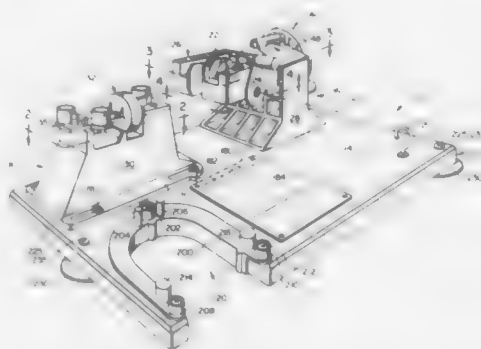
Francis E. Ryder, and Fred E. Williams, Jr., both of Arab, Ala., assignors to Ryder International Corporation, Arab, Ala.

Filed Jun. 17, 1988, Ser. No. 208,386

Int. Cl.⁴ D03J 3/00

U.S. Cl. 289—17

24 Claims



1. A fixture for facilitating the tying of a given knot in a fishing line, said fixture comprising: a platform member providing a flat surface for mounting of a plurality of assemblies, said plurality of assemblies comprising a spool assembly including spool means for respectively taking up or letting out line, spool crank means for rotating said spool means in at least one direction, spool frame means for mounting said spool means for rotation about a first axis of rotation defined by the spool means, and spool frame base means for mounting said spool frame means to said platform; a spinner assembly comprising spinner base means mounted to said platform and spinner means bidirectionally freely rotatably mounted to said spinner base means for rotation about a second axis of rotation; said spool base means and said spinner base means being mounted in side-by-side relationship and spaced apart on said platform in such a manner as to align the first and second axes of rotation substantially at right angles to each other and wherein said spool assembly and said spinner assembly are

mounted to said platform and arranged thereupon in such a manner as to facilitate the tying of said given knot in a fishing line.

4,871,201

RECESSED LATCH DEVICE

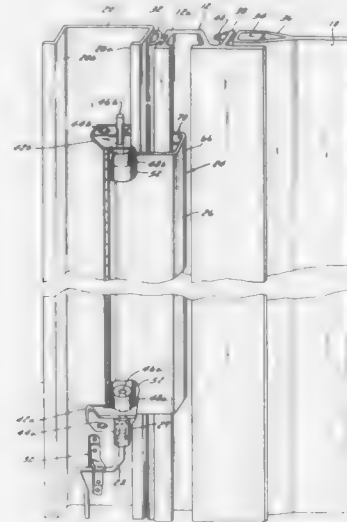
Thomas H. Milbauer, Marion, and LeDell E. Benson, Clintonville, both of Wis., assignors to Marion Body Works, Inc., Marion, Wis.

Filed May 31, 1988, Ser. No. 201,044

Int. Cl.⁴ E05C 5/02

U.S. Cl. 292—113

23 Claims



1. A latching mechanism for releasably securing and tensioning one end of a cover comprising:

(a) rotatable means including a rotatable curved member for rotating from an open position to a closed position;

(b) securing means for releasably latching said one end of said cover; and

(c) linking means including at least one curved segment for pivotably connecting said rotatable means to said securing means, said curved segment abutting said curved member and having a center of curvature approximately the same as said curved member when said rotatable means is in said closed position.

4,871,202

LOCK FOR DOORS OR THE LIKE

Bernd Friedrichs, Arolsen, and Willi Hankel, Waldeck, both of Fed. Rep. of Germany, assignors to HEWI Heinrich Wilke GmbH, Arolsen, Fed. Rep. of Germany

Filed Sep. 16, 1987, Ser. No. 97,646

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1986, 3631516

Int. Cl.⁴ E05C 1/16

U.S. Cl. 292—169

15 Claims



1. A lock for doors or the like, comprising: a case having a longitudinal axis; a locking member slidably mounted in the

case parallel to the longitudinal axis, said locking member having at least one slide coupled thereto, said slide having a guide track inclined with respect to the longitudinal axis; an actuator bush rotatably mounted in the case about an axis of rotation arranged at right angles to the longitudinal axis, said bush having a lever arm projecting away radially with respect to the axis of rotation, said slide and said lever arm being arranged between the bush and the locking member, and said lever arm being provided with a driving pin for cooperation with said guide track; at least one first return spring biasing said bush by first spring forces into a normal rest position in which a portion of said bush rests against a wall of said case; at least one second return spring biasing said locking member by second spring forces into a locking position but rendering possible to slide the locking member against said second spring forces into a retracted open position; and a drive mechanism comprising said slide and said lever arm for converting rotary movements of the bush into sliding movements of the locking member and for at least sliding the locking member out of said locking position into said open position by rotation of said bush in a direction against said first spring forces and by cooperation of said guide track and said driving pin.

4,871,203

REVERSIBLE MOUNT GATE LATCH WITH MANUAL LATCH LOCKING

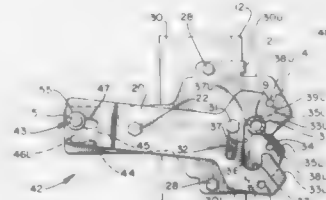
Gerald H. Rogers, Palmer, Tex., assignor to J & J Hardware, Inc., Hutchins, Tex.

Filed Jan. 4, 1988, Ser. No. 141,404

Int. Cl.⁴ E05C 3/26

U.S. Cl. 292—238

20 Claims



1. A reversible mount left hand gate to right hand gate latch assembly and striker bar comprising: latch striker bar means with a striker bar extension mountable on the front face opposite the rear face of a pivotally mounted gate panel pivotal into open and closed states; a gate latch and latch mounting back plate assembly with the back plate mountable on a fence gate member and having a striker bar receiving opening with a rear end that absorbs striker bar closing impact directly with closing of said gate panel; a pivotal latch member pivotally mounted on said latch mounting back plate for pivotal movement up and down; pivotal mounting means pivotally mounting said pivotal latch member on said latch mounting back plate; pivotal latch member pivot position limiting means mounted on said latch mounting back plate; cam surface means on said pivotal latch member engageable by said latch striker bar to cam pivot lift said pivotal latch member as said gate panel is being moved to the closed state after which the pivotal latch member drops down to a latched state with the gate panel in the closed state; a striker bar receiving opening in said pivot latch member having a rear edge recessed back from the rear end of said striker bar receiving opening to prevent contact of said rear edge with said latch striker bar as said gate panel is being pivoted to the closed state insuring that the back plate absorb striker bar closing impact directly rather than such impact being imposed on the pivotal latch member and on said pivotal mounting means; the striker bar receiving opening in said latch mounting back plate is provided with upper and lower divergent entrance cam surfaces that guide entrance of the striker bar into the striker bar receiving opening with

closing movement of said pivotally mounted gate panel and aid in insuring proper gate alignment and mutual support as the gate is drawn to the closed and latched state; and with said pivot latch member having two entrance lifting ramps symmetrical about the longitudinal axis of said pivot latch member with only one of said two entrance lifting ramps in use at a time depending on right or left gate mounting of said gate latch and latch mounting back plate assembly.

4,871,204

TOUCH BAR RELEASE LOCKING SYSTEM

Robert C. Cook, Redondo Beach, and Mark R. Barton, Los Angeles, both of Calif., assignors to Securitron-Magnalock Corporation, Torrance, Calif.

Filed Sep. 8, 1988, Ser. No. 241,585

Int. Cl.⁴ E05B 47/00

U.S. Cl. 292—251.5

18 Claims



1. A quick release locking system comprising: electromagnetic locking means for maintaining a door closed; switch means for releasing said electromagnetic locking means to permit opening of the door; circuit means having an input sensitive to increased capacitance for operating said switch means; and a touch bar, including an extended conductive member coupled to the input to said circuit means, and means for mounting said bar on a door; whereby when said bar is touched or pushed by a person seeking to pass through the door, the locking means is released and the door is free to open.

4,871,205

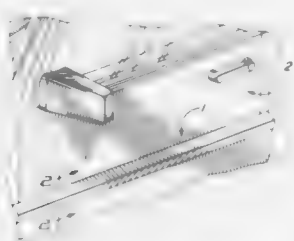
VEHICLE FINISH PROTECTION APPARATUS

Charles E. Bray, 3750 Arville St., #418, Las Vegas, Nev. 89103
Continuation-in-part of Ser. No. 62,075, Aug. 15, 1987, abandoned. This application Jun. 14, 1988, Ser. No. 206,505

Int. Cl.⁴ B60R 13/02

U.S. Cl. 293—128

17 Claims



1. Vehicle finish protection apparatus adapted for temporary installation when a vehicle is parked closely adjacent another vehicle and is therefore susceptible to finish damage as a result of the edge of a door of such adjacent vehicle impacting against the side of the vehicle to be protected, said finish protection apparatus having a unitary body comprising:

- (A) a first elongated section having first and second ends;
- (B) a second elongated section having first and second ends;
- (C) said first and second elongated sections each being fabricated from a resilient, flexible material;
- (D) first magnet means distributed along the length of said first elongated section;
- (E) second magnet means distributed along the length of said second elongated section;
- (F) living hinge means coupling said second end of said first elongated section to said first end of said second elongated section such that said first and second elongated sections are normally aligned in a deployed configuration in use, but may be folded together at said hinge means to effect a storage configuration; and
- (G) anti-theft means fixed to one of said elongated sections, said anti-theft means including an outwardly extending hook portion having a double bight adapted to engage a vehicle door edge and be retained thereby when the vehicle door is closed.

4,871,206

DEVICE FOR HOLDING TEXTILE ARTICLES

Vinicio Gazzarrini, Florence, Italy, assignor to SOLIS S.R.L., Florence, Italy

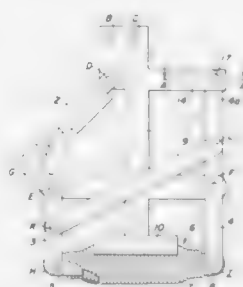
Filed Jan. 15, 1988, Ser. No. 144,403

Claims priority, application Italy, Oct. 14, 1987, 9509 A/87

Int. Cl.⁴ B66C 1/10

U.S. Cl. 294—99.1

4 Claims



1. A device for picking up and holding porous textile articles, comprising: a holder having a holding end and an opposite textile engaging end, said holder including a support structure having a lever pivotally mounted on each side thereof, a tension spring pivotally connected between said levers at said textile engaging end, which spring is engageable with the article to be picked up, and means connected to said levers for pivoting said levers to stretch such spring, said spring comprising a coil spring having adjacent coils which are spread by said levers and engage and hold the material therebetween upon release of said levers.

4,871,207

COACH SEAT LOCKING MECHANISM

Robert Bateman, 42 Lavender Ln., Levittown, Pa. 19054

Continuation of Ser. No. 74,346, Jul. 16, 1987, Pat. No. 4,784,425. This application Jul. 5, 1988, Ser. No. 215,361

The portion of the term of this patent subsequent to Nov. 15, 2005, has been disclaimed.

Int. Cl.⁴ B60N 1/02

U.S. Cl. 296—65.1

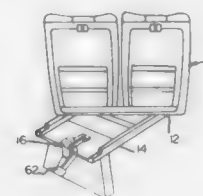
7 Claims

1. A seat locking mechanism for coach seats of the type having a fixed seat lower frame, a seat upper frame rotatable about the lower frame and seat rotational linkage operationally positioned intermediate the seat lower frame and the seat upper frame comprising

- a body secured to the seat lower frame, the body being provided with a bore;
- a pedal arm movably secured to the body, the pedal arm

comprising a forward leg and operating finger means extending from the forward leg, the pedal arm forward leg being movable between a first position and a second position;

a locking rod means in movable relationship within the said bore, the locking rod means being reciprocal between a first, locked position and a second, unlocked position to alternately lock and unlock the seat upper frame relative to the seat lower frame as the pedal arm forward leg is moved between the said first and second positions, the locking rod means comprising a locking rod, the operating



finger means extending sufficiently to engage a portion of the locking rod means when the pedal arm forward leg is moved from its said first position to the said second position, and the locking rod being laterally spaced from the said seat rotational linkage;

whereby the movement of the pedal arm forward leg from its first position to its second position will cause simultaneous movement of the locking rod means from its first, locked position to its second, unlocked position to allow rotational movement of the seat upper frame relative to the seat lower frame.

4,871,208

CHAIR TILT CONTROL MECHANISM

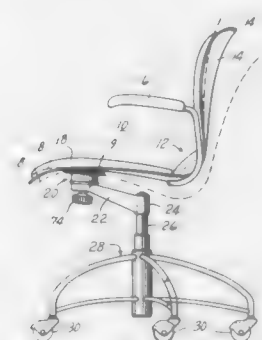
Dewey Hodgdon, 48 Forster Rd., Manchester, Mass. 01944

Filed Sep. 6, 1988, Ser. No. 241,074

Int. Cl.⁴ A47C 1/02

U.S. Cl. 297—304

11 Claims



1. A manually adjustable tilt control mechanism for permitting control of the front to back and side to side tilt of a chair assembly on a support frame comprising:

- a lower support means extending off of said support frame;
- an upper support means arranged on said chair assembly;
- a manually adjustable resilient block arranged between said upper and lower support means; said block having an opening which extends therethrough, which opening is eccentrically or non-symmetrically disposed in said block; and
- a longitudinally movable adjustment means extending through said opening, connecting said upper and lower support means to permit manual variation of the resilience of said block, said block mounted to permit rotational adjustment thereof about said adjustment means, where-

upon rotation of said block about said opening permits the varying of compressability characteristics of said block and hence the tiltability of the chair assembly on said upper support means—inserted therefor.

4,871,209

FOLDING STADIUM SEAT

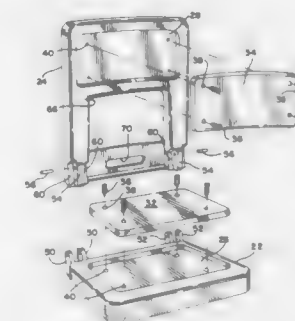
Robert L. Handelman, Chicago, Ill., assignor to K R Industries, Inc., Chicago, Ill.

Filed Jun. 1, 1988, Ser. No. 200,799

Int. Cl.⁴ A47C 7/02

U.S. Cl. 297—378

12 Claims



1. A foldable, portable stadium seat of molded, rigid plastic comprising a seat from having a front and rear portion, and a backrest frame which, in the erected or open position, includes a lower portion and an upper portion, the two frames being joined by a hinge assembly at the rear portion of the seat frame and at the lower portion of the backrest frame, said seat frame having a recess therein and the upper portion of said back frame also having a recess therein, a soft resilient cushion pad located in each recess for comfortable cushioning the person using the stadium seat in the open or unfolded position, and means permanently fastening said resilient cushion pads in the recesses of said frames including openings in the pads matching openings in the frame recesses and fasteners extending through the opening to secure the pads to the frames, each fastener having a head adapted to indent the pad and form a concave recess therein such that the head is surrounded by the cushion, and a shank extending through said cushion and frame openings, said shank including a shoulder spaced from the head and sized larger than said frame opening to space the head from the frame a predetermined distance and function as a stop when assembling the fastener with the pad and frame, and radially extending fins flexibly extending from the shank beyond the shoulder and sized larger than the frame opening such that when forcibly driven through the frame opening the fins expand and lock the fastener to the frame.

4,871,210

CHILD HOLDER

Cynthia R. Alexander, 10 Sherburne Hills Rd., Danville, Calif. 94526, and Dianne J. Pollard, 69 Jackson Way, Alamo, Calif. 94507

Filed Jun. 16, 1988, Ser. No. 207,777

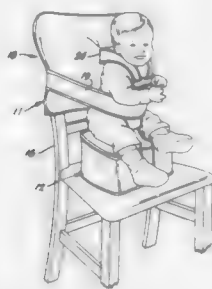
Int. Cl.⁴ A47D 1/10

U.S. Cl. 297—435

15 Claims

1. A holder for restraining a child in a chair, comprising: a halter arrangement of flexible material such as fabric, including: a pocket having an open bottom edge for positioning over the back of a chair; a T-shaped strap attached to the front of the pocket and including a crotch strap attached to the pocket and an elongated abdomen strap having opposite ends adapted for attachment at a common point on the back of the pocket; fastening means attached to the back surface of the pocket for securing and position-

ing the abdomen strap against movement relative to the pocket; a chest restraint strap having first and second sections defining a neck opening, the strap being attached intermediate the first and second strap sections to the front side of the pocket and being adapted for fitting over the shoulder and about the neck of a person seated in the



chair, the first and second strap sections also being adapted for releasably attaching at a common point on the abdomen strap; and a slide mounted on the first and second strap sections for adjusting the size of the neck opening thereof to restrain movement of the child relative to the intermediate attachment point.

4,871,211

METHOD OF RESTORING REFRACTORY LINING FOR REPEATED USE USING THERMAL SHOCK AND MILLING PROCEDURES

Christian C. J. L. Aussel, 43 Avenue du Grand Gour, Martiques, France (13500)

PCT No. PCT/GB87/00443, § 371 Date Apr. 25, 1988, § 102(e) Date Apr. 25, 1988, PCT Pub. No. WO88/00322, PCT Pub. Date Jan. 14, 1988

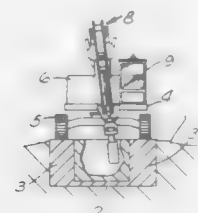
PCT Filed Jun. 24, 1987, Ser. No. 187,446

Claims priority, application United Kingdom, Jun. 24, 1986, #615431

Int. Cl.⁴ B08B 9/00; C21B 7/14

U.S. Cl. 299—10

12 Claims



1. A method of restoring a refractory lining for repeated use, the lining, having residue thereon, being present on an underlying wall surface, comprising the steps of:

- while the lining is still hot from a previous use, inducing thermal shock in the lining so as to loosen the residues;
- prying the loosened residue pieces away from the wall surface;
- removing the loose pieces from the wall surface area;
- milling the residual lining to expose the sound, underlying wall surface; and
- removing fine particles, dust, and milled-off pieces from the wall surface area, whereby the underlying wall surface is speedily available for relining and reuse.

4,871,212

DEVICE FOR BUILDING UP DIRECTIONAL FORCE

Jury A. Lebedev, Gorno-Altaiak, U.S.S.R., assignor to Gorno-Altaiak Gosudarstvenny Pedagogichesky Institut, Gorno-Altaiak, U.S.S.R.

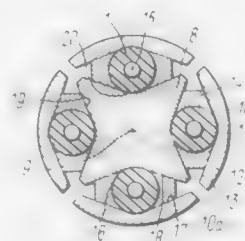
Filed Sep. 16, 1988, Ser. No. 271,950

Claims priority, application PCT Int'l Appl., Jan. 23, 1987, PCT/SU87/00008

Int. Cl.⁴ E21C 37/06, 37/04

U.S. Cl. 299—21

3 Claims



1. A device for building up directional force, comprising: at least one tubular vessel (1) made of elastic material and adapted for communicating with a pressure fluid medium source, the ends (2) of each vessel being tightly secured in rigid holders (5) interconnected by means of a rigid rectilinear pivot (8) which is in contact with each tubular vessel (1);

at least two puncheons (10) located diametrically opposite with respect to the geometrical axis (9) of the rigid rectilinear pivot (8), each of said puncheons adjoining the outside surface of a tubular vessel (1) with the middle portion (11) of its inside surface (12) having two flat bevels (13) diverging therefrom at an obtuse angle,

wedge-shaped inserts (14) located diametrically opposite relative to the geometrical axis (15) of each tubular vessel (1), each of said inserts having a surface (16) adjoining the outside surface of each tubular vessel (1) out of contact with each of said puncheons (10) and two flat lateral surfaces (17, 18) positioned at an acute angle to each other, one (17) of which adjoins one of the flat bevels (13) of a respective puncheon (10), and

means (21) for pressing each of said puncheons (10) against a tubular vessel (1), wherein the rigid rectilinear pivot (8) is so positioned between the tubular vessels (1) so that the tubular vessels (1) are located symmetrically with respect to the geometrical axis (9) of said pivot (8), the pivot (8) having flat bevels (19) adjoining the other flat lateral surfaces (18) of the wedge-shaped inserts (14), whereas the pivot is in contact with the tubular vessels (1) through the agency of the surfaces (20) adjoining the outside surfaces of the tubular vessels (1), the puncheons (10) being located relative to the geometrical axes (15) of the tubular vessels (1) diametrically opposed to the surfaces (20) of the rigid rectilinear pivot (8) which are in contact with the outside surfaces of the tubular vessels (1).

4,871,213

EXCAVATING APPARATUS WITH ADJUSTABLE BREAKER BAR

Raymond A. Hanson, Spokane, Wash., assignor to R. A. Hanson Company, Inc., Spokane, Wash.

Division of Ser. No. 4,338, Jan. 16, 1987, Pat. No. 4,785,560.

This application Aug. 31, 1988, Ser. No. 238,841

Int. Cl.⁴ E02F 3/24; E21C 25/10

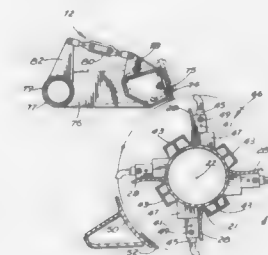
U.S. Cl. 299—64

3 Claims

1. An excavating apparatus for breaking and removing pay material away from an upright face of pay material, the apparatus comprising:

a rotary cutting head adapted for rotation about a longitudi-

nal axis, the cutting head having peripheral cutter elements; breaker bar means extending along the cutting head and positioned away from the cutting head at a predetermined radial distance relative to the cutting head axis for causing material cut by the cutter elements to be of a predetermined size; pivotal connection means for selectively varying the predetermined radial distance for enabling the predetermined



size to be selectively varied, the pivotal connection means comprising:

- means mounting the breaker bar means for pivotal movement toward and away from the cutting head for selective pivoting of the breaker bar means in a radial direction relative to the cutting head axis; and
- adjustment means for elevationally moving the rotary cutting head, breaker bar means, and pivotal connection means in unison relative to the upright face.

4,871,214

CHEEKING DEVICE, PARTICULARLY FOR THE HANGING ROOF IN MINES, UNDERGROUND WORKING POINTS, OR HEADING AND SIMILAR

Bernard Pradelle, Haute Vienne, France, assignor to Sories, France

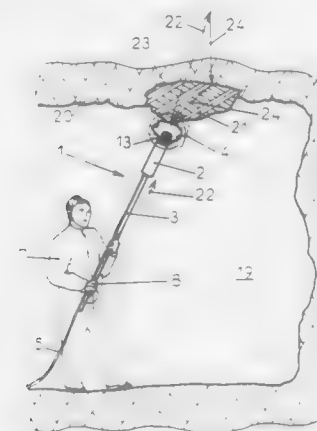
Filed Aug. 5, 1988, Ser. No. 230,243

Claims priority, application France, Aug. 6, 1987, 87 11384

Int. Cl.⁴ E21C 3/04

U.S. Cl. 299—69

7 Claims



1. A cheeking device for a hanging roof of an underground mine working point, comprising:

- (a) a pneumatic hammer, the pneumatic hammer comprising a first end connected to a pole and a second end which attaches to a striking head, the striking head comprising:
 - (1) a shank; and
 - (2) a percussion bit, the bit being attached to the bit comprising: an inner section and an outer section, the inner section having a plurality of hollow, honeycombed cells;
- (b) the pole having a top end and a bottom end, the top end

supporting the pneumatic hammer and the bottom end comprising a gripping handle; and

(c) a trigger mechanism connected to the pole for remote control of the pneumatic hammer.

4,871,215

VEHICLE BRAKING SYSTEM

Toshio Takayama, Kanagawa, Japan, assignor to Tokico Ltd., Japan

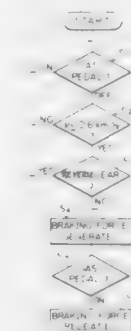
Continuation of Ser. No. 21,614, Mar. 2, 1987, abandoned, which is a division of Ser. No. 767,511, Aug. 20, 1985, abandoned. This application May 11, 1988, Ser. No. 198,609

Claims priority, application Japan, Aug. 20, 1984, 59-172773; Aug. 20, 1984, 59-126122[U]; Oct. 19, 1984, 59-158155[U]

Int. Cl.⁴ B60K 29/02

U.S. Cl. 303—100

4 Claims



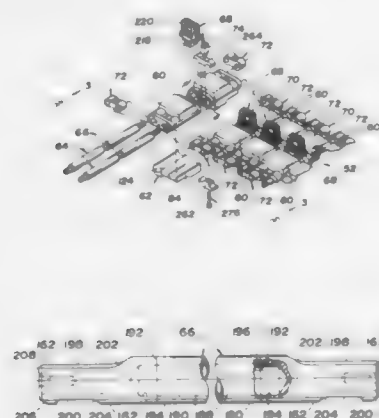
1. A vehicle braking system comprising: a braking force applying and releasing means; detecting means for detecting whether the transmission of the vehicle is in reverse position; and control means to which said detecting means is connected, said control means having a first deciding means for deciding whether a braking force applying condition for a vehicle exists and for supplying a braking force applying signal to said braking force applying and releasing means to apply a braking force when it is determined that said braking force applying condition exists, said braking force applying condition comprising the gas pedal of the vehicle being in a non-depressed condition, the transmission being in a position other than the reverse position and the speed of the vehicle being zero or lower than a predetermined level, and a second deciding means for deciding whether a braking force releasing condition of the vehicle exists and for supplying a braking force releasing signal to said braking force applying and releasing means to release said braking force being applied when it is determined that said braking force releasing condition exists, said braking force releasing condition comprising the gas pedal being in a depressed condition, means for keeping said first deciding means supplying said braking force applying signal to the braking force applying and releasing means even if said detecting means detects that said transmission is shifted to reverse position, while said braking force applying and releasing means is applying a braking force.

4,871,216 HOLLOW PIN ASSEMBLY FOR SHOE ASSEMBLY OF TRACK LAYING VEHICLE

Robert M. Cory, Roseville, Mich., assignor to General Dynamics Land Systems, Inc., Warren, Mich.
Continuation of Ser. No. 35,605, Apr. 7, 1987, abandoned, which is a division of Ser. No. 752,186, Jul. 3, 1985, Pat. No. 4,700,992.
This application Mar. 13, 1989, Ser. No. 323,065
Int. Cl.⁴ B62D 55/21

U.S. Cl. 305—58 R

9 Claims



1. In an endless track for a track laying vehicle, said endless track being of the type including a plurality of shoe assemblies and end connectors that extend between the shoe assemblies, and each shoe assembly including a pair of pin assemblies each of which comprises: an elongated pin that extends through the associated shoe assembly and has a rectilinear central axis; said pin having a hollow intermediate portion extending along the central axis and having a tubular shape for providing a lightweight construction, the tubular hollow intermediate portion of the pin having inner and outer surfaces and including opposite ends each of which has a surface that extends between the inner and outer surfaces and faces axially along the central axis; the pin including a pair of opposite ends of a solid construction; each solid pin end having a surface that faces axially along the central axis; and connections that secure the axially facing surfaces of the solid ends of the pin in an engaged relationship with the entire extent of the axially facing surfaces of the opposite ends of the tubular hollow intermediate portion between the inner and outer surfaces thereof with the solid ends extending along the central axis to provide high strength locations for attachment of the end connectors that extend between the shoe assemblies.

4,871,217 PLASTIC CARRIER BOX

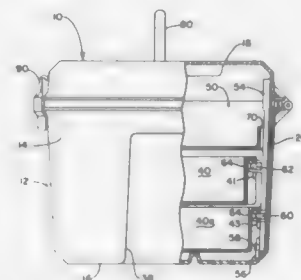
Gerald W. Taylor, and Lawrence C. Stanek, both of Akron, Ohio, assignors to Myers Industries, Akron, Ohio
Filed Mar. 28, 1988, Ser. No. 174,355
Int. Cl.⁴ E05B 65/46

U.S. Cl. 312—216

8 Claims

1. An article carrier or tool chest comprising:
a carrier case forming an enclosure having ends and a bottom;
a pair of support walls positioned inside said enclosure with one support wall at each end of said enclosure, said enclosure having a front with an opening therein and a tray slidably supported at its ends on said support walls and being movable out through said enclosure opening; and
a pivotal lock bar provided adjacent a rear wall of said carrier case positioned for limited movement in a vertical plane, in a manner that, in one pivoted position, said lock bar will engage a lock tab on the outer rear wall of said

tray to retain said tray in said carrier case and to prevent outward sliding movement of said tray, and, in another



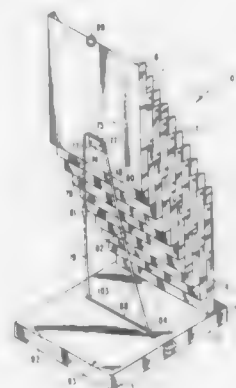
pivoted position, said lock bar will not engage said lock tab.

4,871,218 COLLAPSIBLE STORAGE AND DISPLAY DEVICE

Owen I. Swinson, Rte. 2, Box 43A, Middletown, Ind. 47356
Filed Oct. 20, 1987, Ser. No. 110,326
Int. Cl.⁴ A47B 57/00

U.S. Cl. 312—312

11 Claims



1. A storage and display device for storing and displaying books, pamphlets, sheets and the like, comprising:
a base;
a plurality of horizontally stacked bins including a front bin anchored to said base, a rear bin and at least one intermediate bin, each bin connected for limited vertical sliding movement with each adjacent bin;
wherein the storage and display device has a storage position wherein all of said bins are resting in horizontal alignment from front to back upon said base;
wherein the storage and display device has a display position reached from said storage position by lifting the rear bin from said base, the rear bin and successively each bin therefrom pulling the bin adjacently therefrom upward until each bin behind the front bin is higher than the bin adjacently therefrom;
wherein each bin behind the front bin has a pair of opposed, parallel and forwardly extending side flanges, and wherein each bin in front of the rear bin nests entirely horizontally between the side flanges of and adjacent to the bin therebehind;
wherein each bin in front of the rear bin is slidably connected to the forwardly extending side flanges of the bin immediately therebehind to permit motion therebetween only between said storage position and said display position;
wherein the storage and display device further comprises support means, connected between the rear bin and said

base, for holding the display device in said display position; and,
wherein each side of each bin defines a pair of vertically extending slots and each flange defines a pair of holes, the pair of holes of one flange aligning with the pair of slots of the corresponding side of the bin therefrom, the display device further including pins, each pin extending through one hole and one corresponding slot and keeping the one corresponding hole aligned with the one corresponding slot.

4,871,219 WIDE SPECTRAL BAND INFRARED REFRACTIVE LENS

Erwin E. Cooper, Carrollton, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.
Continuation of Ser. No. 122,953, Nov. 19, 1987, abandoned.
This application Jul. 12, 1988, Ser. No. 218,420
Int. Cl.⁴ G02B 3/00, 9/12, 23/00

U.S. Cl. 350—1.4

31 Claims



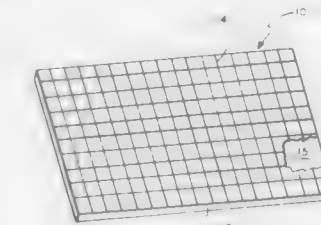
1. A wide spectral band infrared refractive lens system comprising:
a first lens comprising a chalcogenide glass;
a second lens comprising germanium; and
a third lens comprising zinc sulfide;
said first lens having a predetermined refractive index and dispersion to maintain said lens system simultaneously essentially focused to a common image plane at all of the frequencies in the range of 3 to 13 microns.

4,871,220 SHORT WAVELENGTH PASS FILTER HAVING A METAL MESH ON A SEMICONDUCTING SUBSTRATE

Margaret Kohin, Woburn, Mass., assignor to Litton Systems, Inc., Lexington, Mass.
Filed Jun. 15, 1988, Ser. No. 206,793
Int. Cl.⁴ G02B 1/02, 5/20; H05K 9/00

U.S. Cl. 350—1.7

9 Claims



1. A filter which transmits electromagnetic signals in the infrared and/or visible wavelength and which rejects electromagnetic signals in the microwave wavelength, said filter including:
a. a substrate manufactured from a semiconducting material which transmits infrared and/or visible radiation with minimum absorption, said substrate having a front surface and rear surface; and
b. a conductive metal mesh for rejecting electromagnetic signals in the microwave wavelength said metal mesh being placed in contact with said substrate;
whereby signals in the infrared and/or visible portion of the electromagnetic spectrum pass through said filter with

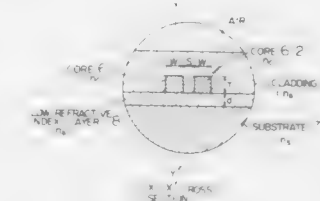
minimum absorption and signals in the microwave portion of the electromagnetic spectrum are rejected.

4,871,221 OPTICAL WAVEGUIDE DEVICE

Katsuyuki Imoto, Sayama, Japan, assignor to Hitachi, Ltd., Tokyo, Japan
Filed Dec. 15, 1988, Ser. No. 284,633
Claims priority, application Japan, Dec. 25, 1987, 62-327143
Int. Cl.⁴ G02B 6/10

U.S. Cl. 350—96.12

6 Claims



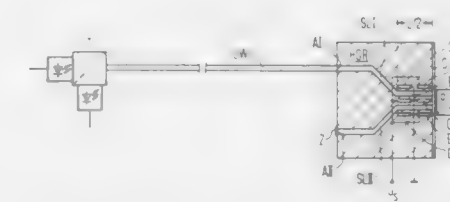
1. An optical waveguide device, comprising a low refractive index layer having a refractive index n_0 , a core layer having a refractive index n_c (where $n_c > n_0$) and a cladding layer having a refractive index n_d (where $n_d < n_c$) formed on a substrate, wherein thermal expansion coefficients of said low refractive index layer, said core layer and said cladding layers, respectively, are made substantially equal to each other at respective boundaries.

4,871,222 REFLEX TRANSMITTER FOR A BIDIRECTIONAL LIGHT WAVEGUIDE COMMUNICATION SYSTEM

Hartmut Burghardt, Holzkirchen; Juergen Jahns, Erlangen, and Stefan Kindt, Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany
Filed Aug. 1, 1988, Ser. No. 226,882
Claims priority, application Fed. Rep. of Germany, Jul. 31, 1987, 3725479
Int. Cl.⁴ G02B 6/10, 6/28

U.S. Cl. 350—96.14

4 Claims



1. A reflex transmitter for a bi-directional waveguide communications system having a light source of light sources preferably formed by a laser or lasers at only one end of said light waveguide, characterized in that said reflex transmitter comprises a substrate having a pair of strip waveguides mounted thereon and arranged in a form of one-half of a controllable optical directional coupler (HOR) that has its input/output (AI) connected to said light waveguide (LWL), said pair of strip waveguides (SLI, SLII) arranged in a form of one-half of a controllable optical directional coupler terminated with a partially reflecting mirror (S), and control electrodes (E,O) mounted adjacent said pair of strip waveguides and said control electrodes supplied with a signal which is to be transmitted.

4,871,223

ARRANGEMENT COMPRISING AT LEAST ONE INTEGRATED OPTICAL WAVEGUIDE ON A SUBSTRATE OF ELECTRO-OPTICAL MATERIAL AND COMPRISING AT LEAST ONE ELECTRODE

Franz Amacher, Baierbrunn, and Bernd Noll, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

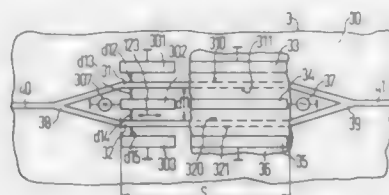
Filed Jun. 23, 1988, Ser. No. 210,412

Claims priority, application Fed. Rep. of Germany, Aug. 25, 1987, 3728347

Int. Cl.⁴ G02B 5/14

U.S. Cl. 350-96.14

12 Claims



1. In an arrangement having at least one integrated optical waveguide on the surface of a substrate of electro-optical material, means for modulating light conducted in each waveguide including a modulation electrode being allocated to each waveguide and being arranged on the surface of the substrate and separated therefrom by an electrically insulating layer and means for applying a modulating voltage to the electrode, the improvements comprising at least one separate secondary electrode being allocated to each waveguide and means for applying a predetermined constant voltage to the secondary electrode, said secondary electrode being applied directly to the surface of the substrate at a distance from the associated waveguide.

4,871,224

DEVICE FOR OPTICAL CONNECTIONS OF ONE OR MORE OPTICAL EMITTERS WITH ONE OR MORE OPTICAL DETECTORS OF ONE OR MORE INTEGRATED CIRCUITS

Holger Karstensen, Munich, and Ekkehard Klement, Graefelfing, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Mar. 13, 1989, Ser. No. 322,410

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1988, 3811028

Int. Cl.⁴ G02B 6/26

U.S. Cl. 350-96.15

23 Claims



1. A device for optical connection of an optical emitter to an optical detector of an integrated circuit, said device comprising a substrate, each optical emitter, integrated circuit and optical detector being constructed as a component and being fastened on said substrate, a spacer being fastened on said substrate, said spacer having a first surface facing away from said substrate, a cover member having a second surface being secured to the spacer with the second surface facing toward said substrate and optical means for guiding the light emitted by an optical emitter to the optical detector, said means being attached to one of said first and second surfaces.

4,871,225

FIBER OPTIC DISTRIBUTION NETWORK

John J. Schembri, Daly City, Calif., assignor to Pacific Bell, San Francisco, Calif.

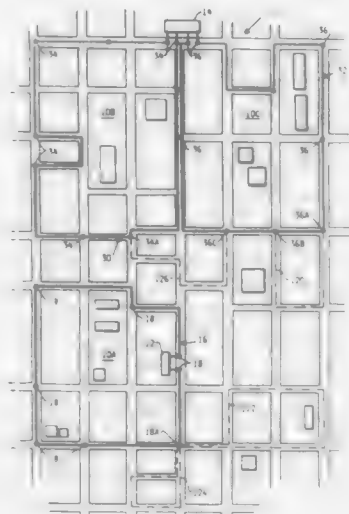
Continuation of Ser. No. 644,206, Aug. 24, 1984, abandoned.

This application Apr. 2, 1987, Ser. No. 34,087

Int. Cl.⁴ G02B 6/28; G02F 1/00

U.S. Cl. 350-96.76

16 Claims



1. A fiber optic distribution system for providing communication access between a central office and a plurality of users generally in a localized area, said fiber optic distribution system comprising:

an optical fiber primary loop comprising at least 4 optical fibers in communication with the central office, said primary loop leaving said central office from a first point therein and returning to a second point in said central office, said primary loop being arranged to pass in the vicinity of each user of the group of users, and patch means arranged in said primary loop for coupling a selected user with the central office through said primary loop, said patch means including means for interrupting two optical fibers in said primary loop to create first and second pairs of optical fibers, each said pair of optical fibers providing a bidirectional communication path between said user and said central office, said first pair of optical fibers providing a bidirectional communication path to said first point in said central office and said second pair of optical fibers providing a bidirectional communication path to said second point in said central office, each said pair of optical fibers coupling no more than one said user to said central office.

10. A method for providing redundant fiber optic communication access from a central office to a user, said method comprising the steps of

forming a primary loop of at least four optical fibers in communication with the central office, arranging different portions of said primary loop along different routes from the central office to a point in the vicinity of the user, and interconnecting the user into said primary loop at said point by interrupting two optical fibers in said primary loop, said optical fibers not currently providing a communication path between any user and said central office, thus forming first and second secondary loops between the central office and user, each said secondary loop comprising means for establishing a bidirectional communication path between said user and said central office, said first and second secondary loops being arranged along different routes from said central office.

4,871,226

MOUNTING OF OPTICAL FIBERS TO INTEGRATED OPTICAL CHIPS

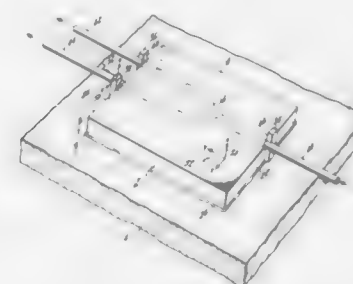
Daniel P. Courtney, Wilbraham, and Timothy J. Bailey, Longmeadow, both of Mass., assignors to United Technologies Corporation, Hartford, Conn.

Filed Oct. 1, 1987, Ser. No. 103,325

Int. Cl.⁴ G02B 6/30

U.S. Cl. 350-96.17

6 Claims



1. A method of joining an optical fiber to a light port in a mounting surface of an integrated optical (I/O) device having an anisotropic thermal expansion property along a known optic axis, which is one of three orthogonal axes, comprising the steps of:

positioning a fiber carrier, having an anisotropic thermal expansion property along a known optic axis which is one of three orthogonal axes, with the I/O device such that said carrier optic axis is parallel to the device optic axis and such that an auxiliary surface of said carrier is parallel to the device mounting surface, said fiber carrier having a substantially similar anisotropic thermal expansion property along its optic axis as that of the I/O device; bonding an optical fiber which has been cleaved on one end to form a cleaved facing surface to said fiber carrier so that the plane of said cleaved surface substantially lies in the plane of said auxiliary surface; placing said cleaved surface in registration with the light port; and bonding said carrier auxiliary surface to the device mounting surface.

4,871,227

OPTICAL FIBER CONNECTOR

Wilhelm Tilse, Birkenfeld, Fed. Rep. of Germany, assignor to Inovan GmbH & Co. KG, Metalle und Bauelemente, Birkenfeld, Fed. Rep. of Germany

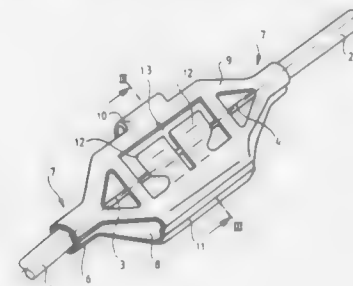
Filed Mar. 15, 1988, Ser. No. 168,247

Claims priority, application Fed. Rep. of Germany, Apr. 4, 1987, 3711457

Int. Cl.⁴ G02B 6/38

U.S. Cl. 350-96.21

7 Claims



1. An optical fiber connector for joining the ends of at least one pair of light conducting fibers in such a manner that the fibers of each pair are arranged in axial alignment and the end

faces of each pair of fibers are disposed in abutment with, or at a predetermined distance from, one another, said connector comprising a mounting plate having for each pair of fibers a guide groove formed therein for the reception of said fiber ends, a pressure plate structure disposed on top of said mounting plate and having a resilient hinge strap at one side and a latch at the opposite side for connection to said mounting plate, the guide grooves for each pair of fibers being formed only in said mounting plate and having a depth greater than the radius of said fibers and each guide groove further having a parabolic cross-section with the parabola half parameter being equal to or slightly smaller than the radius of the optical fibers to be joined, said pressure plate structure having formed therefrom for each fiber end an elastic clamping member projecting toward said mounting plate so as to resiliently engage the fiber end in the respective guide groove when said pressure plate structure is latched onto said mounting plate with the clamping members for each joint being longitudinally spaced from one another at the fiber joint so as to provide for visibility of and access to the fiber joints, said mounting and pressure plates further having a cooperating clamping structure for firmly engaging said light conducting fibers.

4,871,228

IMAGE TRANSFER APPARATUS UTILIZING OPTICAL FIBERS

Jan Roos, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

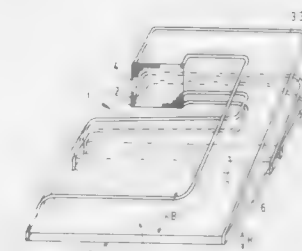
Continuation of Ser. No. 516,163, Jul. 20, 1983, abandoned. This application Feb. 7, 1986, Ser. No. 828,085

Claims priority, application Netherlands, Jul. 21, 1982, 8202935

Int. Cl.⁴ G02B 6/06

U.S. Cl. 350-96.25

17 Claims



1. In an image transfer apparatus including an image display device and an image magnifier comprising a plurality of laminar fiber arrays, each fiber array comprising a plurality of fibers, and each fiber having a first end optically coupled to a substantially rectangular entrance face and a second end optically coupled to a substantially rectangular exit face, said first fiber ends in each array having a first predetermined pitch, said second fiber ends in each array having a second predetermined pitch, said second pitch being greater than said first pitch, the fibers in each laminar fiber array being juxtaposed in a plane at said entrance face, said laminar fiber arrays likewise being juxtaposed at said entrance face, the improvement wherein each laminar fiber array has a planar converging portion extending from the second ends of the fibers in an array to a region of initial juxtaposition remote from said entrance face, said second end of each fiber in said fiber array being disposed substantially perpendicular to said exit face, said planar converging portion being disposed at an acute angle relative to said exit face, and said region of initial juxtaposition being arranged at a minimal distance from a line defined by said second fiber ends of said fiber array and having a pitch substantially equal to said first predetermined pitch, the volume defined by the projection extending perpendicular to said entrance face in a direction opposite to the direction of incoming

light intersecting the volume defined by the projection extending perpendicular to said exit face in a direction opposite to the direction of outgoing light.

4,871,229

METHOD FOR ASSEMBLING OPTICAL FIBER BUNDLES IN AN ENDOSCOPE

Yoshio Tashiro, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

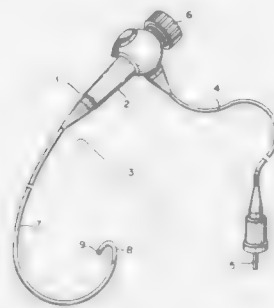
Filed Nov. 4, 1988, Ser. No. 267,503

Claims priority, application Japan, Nov. 11, 1987, 62-282966

Int. Cl.⁴ A61B 1/06

U.S. Cl. 350—96.26

10 Claims



1. A method for assembling optical fiber bundles in an endoscope, comprising:
 - a insertion step of passing at least one optical fiber bundle through a flexible tube constituting an insertion section of the endoscope;
 - a fitting step of fitting a reinforcement pipe member in at least one end portion of the optical fiber bundle passed through the flexible tube; and
 - a coupling step of coupling the opposite end portions of the optical fiber bundle, on which the reinforcement pipe member is fitted, individually to a control section and a distal end member of the endoscope.

4,871,230

SINGLE MODE PHOSPHATE LASER GLASS FIBER

Toohihara Yamashita; Sho Amano, both of Hachioji; Hidemi Tajima, Hamura; Isao Masuda, Nakano, and Tetsuro Izumitani, Hino, all of Japan, assignors to Hoya Corporation, Tokyo, Japan

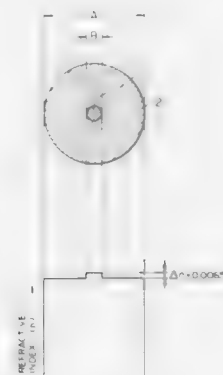
Filed Jun. 24, 1988, Ser. No. 211,056

Claims priority, application Japan, Jun. 24, 1987, 62-157416

Int. Cl.⁴ G02B 6/16

U.S. Cl. 350—96.34

4 Claims



1. A laser glass fiber comprising:
 - (a) a phosphate laser glass as a core glass, containing, as

essential components, 45–70 mole % of P_2O_5 , 4–20 mole % of Al_2O_3 , 0–35 mole % of $R'O$, wherein $R'O$ is at least one member selected from the group consisting of MgO , CaO , BaO , PbO , SrO and ZnO , 0–30 mole % of R'_2O , wherein R'_2O is at least one member selected from the group consisting of Li_2O , Na_2O and K_2O , the sum of $R'O$ and R'_2O being 4–45 mole %, and 0.1–6 mole % of Nd_2O_3 ; and

(b) a phosphate glass as a clad glass for the core glass, having a refractive index lower than that of the core glass and containing, as essential components, 45–70 mole % of P_2O_5 , 4–20 mole % of Al_2O_3 , 0–35 mole % of $R'O$ and 0–30 mole % of R'_2O , the sum of $R'O$ and R'_2O being 4–45 mole %;

said laser glass fiber giving single mode oscillation at a lasing wavelength of 1.054 μm .

4,871,231

THREE DIMENSIONAL COLOR DISPLAY AND SYSTEM

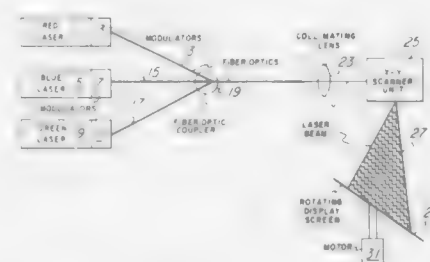
Felix Garcia, Jr., Williamson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 16, 1987, Ser. No. 109,545

Int. Cl.⁴ G02B 27/22

U.S. Cl. 350—144

8 Claims



1. A color display system comprising:
 - (a) a plurality of light sources, each of different predetermined frequency;
 - (b) light modulating means associated with each said light source for continually and variably controlling the intensity of light of each of said predetermined frequency;
 - (c) fiber optic means for receiving said light of said predetermined frequencies from said light modulating means along individual paths coupled to said light modulating means, combining said received light from each said path and transmitting said combined light along a single fiber optic path; and
 - (d) display means for receiving said combined light transmitted along said single fiber optic path to provide a three dimensional image of the light transmitted along said single fiber optic path of a color determined by the intensity of each of the light sources as controlled by the light modulating means, said display means providing a three dimensional display including:
 - (e) scanning means forming and projecting therefrom a two dimensional image from said light on said single fiber optic path,
 - (f) a generally flat display screen substantially defining a plane, and
 - (g) means for rotating the generally flat display screen about an axis of rotation passing obliquely through said plane of said display screen.

4,871,232

METHOD AND APPARATUS FOR ULTRA HIGH FREQUENCY SPECTRUM ANALYSIS

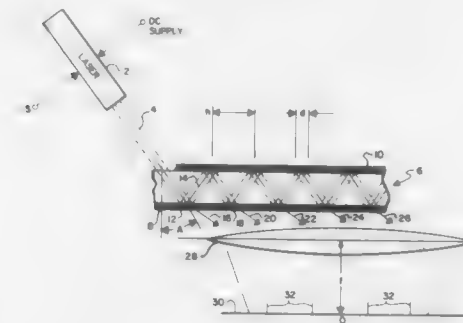
Jan Grinberg; Emanuel Marom, both of Los Angeles; Bernard H. Soffer, Pacific Palisades; Thomas R. O'Meara, Malibu, and Adrian E. Popa, Newbury Park, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Dec. 7, 1987, Ser. No. 130,032

Int. Cl.⁴ G01R 23/17

U.S. Cl. 350—162.11

30 Claims



14. A high frequency spectrum analyzer, comprising:
 - means for modulating an optical beam with a high frequency signal to be analyzed,
 - means for substantially simultaneously sampling periodically spatially-spaced and substantially parallel portions of the modulated beam, and
 - means for spectrum analyzing said sample portions.

4,871,233

THIN PLATE PRISM AND STEREOSCOPIC SYSTEM

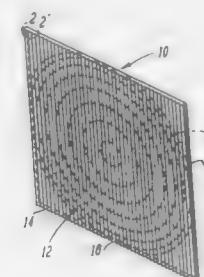
David M. Sheiman, 1401 Alvarado Ter., Los Angeles, Calif. 90006

Filed May 12, 1987, Ser. No. 49,313

Int. Cl.⁴ G02B 5/04, 3/08

U.S. Cl. 350—286

16 Claims



1. A thin plate optical element formed entirely of optically transparent material as an integral, single element and having:
 - a. an integral prism face to effect refraction and comprising a plurality of straight and parallel closely spaced prisms of face angles from 35 to 135 degrees;
 - b. an opposite integral face to effect magnification and comprising a plurality of concentric and geometrically spaced circular prisms of face angles from 30 to 170 degrees with progressively decreasing face angles and progressively increasing heights in a medial direction outwardly from the center of said face.

4,871,234

LIQUID CRYSTAL DISPLAY DEVICE

Mitsuya Suzuki, Tokyo, Japan, assignor to Seiko Instruments Inc., Japan

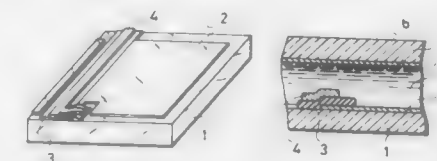
Continuation of Ser. No. 249,226, Sep. 22, 1988, abandoned, which is a continuation of Ser. No. 863,199, May 14, 1986, abandoned. This application Mar. 14, 1989, Ser. No. 325,100

Claims priority, application Japan, May 15, 1985, 60-103141

Int. Cl.⁴ G02F 1/13; H01L 45/00

U.S. Cl. 350—333

49 Claims



1. A matrix electro-optical device comprising: a pair of substrates facing each other; an electro-optical material layer sandwiched between the substrates; a plurality of electro-optical switching elements formed on the inner surface of one of the substrates, each of the switching elements including a first electrode layer, a non-linear-resistive layer and a pixel electrode electrically connected to the first electrode layer through the non-linear-resistive layer, the non-linear resistive layer substantially comprised of an amorphous material composed principally of silicon and oxygen, or principally of silicon and nitrogen, or principally of silicon, oxygen and nitrogen, each of these constituents having a ratio less than 90 atomic percent; and a second electrode layer formed on the inner surface of the other of the substrates.

42. A matrix electro-optical device comprising: a pair of opposed substrates; an electro-optical material layer sandwiched between the substrates and having optical properties which vary by applying a voltage thereacross; a plurality of electro-optical switching elements formed on the inner surface of one of the substrates, each of the switching elements including a first electrode layer defining one of row and column electrodes, a non-linear-resistive layer and a pixel electrode at least partly overlapping the first electrode layer and electrically connected to the first electrode layer through the non-linear-resistive layer, the non-linear-resistive layer being substantially comprised of an amorphous material composed of plural constituents each of which is less than 90 atomic percent; and a second electrode layer defining the other of the row and column electrodes and formed on the inner surface of the other of the substrates; wherein the atomic ratio of the plural constituents, the overlap area of the first and pixel electrodes, and the thickness of the non-linear-resistive layer are set so that the following relationships are satisfied:

$$10^7 < R_I(V_{ON}) < 2 \times 10^8$$

$$3 \times 10^9 < R_I(V_{NON}) R_{LC} [R_I(V_{NON}) + R_{LC}]$$

$$R_I(V_{OFF}) > 2 \times 10^8$$

$$C_I < C_{LC}/5$$

where $R_I(V_{ON})$, $R_I(V_{NON})$ and $R_I(V_{OFF})$ denote the resistances of the switching elements when a turn-on voltage, a non-selection voltage and a turn-off voltage are applied respectively, C_I denotes the capacitance of the switching elements, and R_{LC} and C_{LC} denote the resistance and capacitance of the electro-optical material layer respectively.

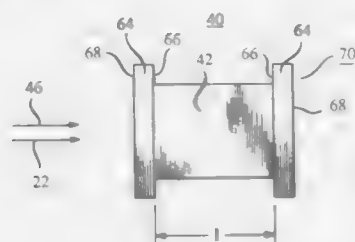
4,871,235

OPTICAL SYSTEM INCLUDING ETALON FOR OPTICALLY PROCESSING ELECTROMAGNETIC RADIATION AT A REPETITION RATE GREATER THAN ABOUT 1.25×10^4 HZ

Benjamin I. Greene, Westfield; Kuochoo Tai, North Plainfield, and Mrinal Thakur, Summit, all of N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Continuation-in-part of Ser. No. 23,453, Mar. 9, 1987, which is a continuation-in-part of Ser. No. 875,268, Jun. 17, 1986. This application Jun. 9, 1988, Ser. No. 207,004

Int. Cl.⁴ G02B 5/23, 6/10; G02F 1/01; H01S 3/10
U.S. Cl. 350—354 11 Claims



1. An optical system, comprising:

at least a first source of electromagnetic radiation; means, in optical communication with said first source, for processing the electromagnetic radiation emitted by said first source, said means including an etalon and at least a second source of electromagnetic radiation in optical communication with said etalon; and a detector of electromagnetic radiation, in optical communication with said means, characterized in that said etalon includes a material region, essentially free of inorganic semiconductor material, exhibiting a nonlinear optical response at one or more resonant, and/or a substantial nonlinear optical response at one or more nonresonant, wavelengths of electromagnetic radiation and an associated induced absorption at one or more other wavelengths of electromagnetic radiation, the wavelength, duration and intensity of the electromagnetic radiation emitted by said second source, and the composition of said material region, being chosen to achieve a resonant, and/or a substantial nonresonant, nonlinear optical response and an associated induced absorption, essentially free of any relatively slow component, in said material region, at a repetition rate greater than about 1.25×10^4 Hz.

4,871,236

ORGANIC THIN FILM DISPLAY ELEMENT

Nobuhiro Gemma, Yokohama; Akira Miura, Toride; Koichi Mizushima, Kamakura; Makoto Azuma, Yokohama, and Yasushi Mori, Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 16, 1986, Ser. No. 908,014

Claims priority, application Japan, Sep. 18, 1985, 60-205729; Jun. 9, 1986, 61-133204

Int. Cl.⁴ G02F 1/01, 1/07, 1/03

U.S. Cl. 350—355 19 Claims

1. A thin organic film display element, comprising:

a thin organic film layer including at least one first thin organic film containing donor molecules and at least one second thin organic film containing acceptor molecules, wherein said thin organic film layer has at least two interfaces between said first thin organic film and said second thin organic film; and

means for causing a charge transfer between the donor

molecules and the acceptor molecules, said charge transfer varying the optical characteristics of the thin organic



film layer, whereby the organic thin film layer displays an image.

4,871,237

METHOD AND APPARATUS FOR ADJUSTING IMAGING PERFORMANCE OF PROJECTION OPTICAL APPARATUS

Satoru Anzai, Zama, and Koichi Ohno, Inagi, both of Japan, assignors to Nikon Corporation, Tokyo, Japan

Continuation of Ser. No. 4,775, Jan. 9, 1987, abandoned, which is a continuation of Ser. No. 632,335, Jul. 19, 1984, abandoned. This application Nov. 12, 1987, Ser. No. 120,232

Claims priority, application Japan, Jul. 27, 1983, 58-137377; Oct. 5, 1983, 58-186269; Dec. 26, 1983, 58-249093

Int. Cl.⁴ G02B 1/06, 7/10

U.S. Cl. 350—419 19 Claims



1. A method for adjusting imaging performance of a projection lens system having a plurality of lens elements arranged at predetermined intervals, comprising the steps of:

- measuring variation in barometric pressure of an outer atmosphere;
- selecting a first space from a plurality of spaces defined by said plurality of lens elements such that variation of a predetermined amount in the pressure of said first space changes a first imaging performance of said projection lens system by a minimum amount relative to other spaces, and selecting a second space from a plurality of spaced defined by said plurality of lens elements such that variations of a predetermined amount in the pressure of said second space changes a second imaging performance of said projection lens system by a minimum amount relative to other spaces, one of said first and second imaging performances being the position of an imaging plane and the other being a magnification factor of said projection lens system;
- determining internal pressure of said first space so as to maintain said second imaging performance of said projection lens system in spite of variation in barometric pressure

of the outer atmosphere, and determining internal pressure of said second space so as to maintain said first imaging performances of said projection lens system in spite of variation in barometric pressure of the outer atmosphere; and

- controlling the pressure in said first and second spaces independently of each other so that said internal pressures therein coincide with the internal pressures determined in said step (c), respectively.

4,871,238

PHOTOGRAPHIC OPTICAL DEVICE WITH VARIABLE MAGNIFICATION

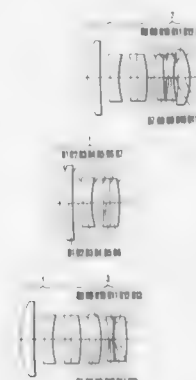
Yasuhisa Sato, Kanagawa; Yasuyuki Yamada, Tokyo; Hiroki Nakayama, and Kouji Oizumi, both of Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 27, 1987, Ser. No. 19,687

Claims priority, application Japan, Mar. 6, 1986, 61-049329; Apr. 17, 1986, 61-088738

Int. Cl.⁴ G02B 15/02

U.S. Cl. 350—422 9 Claims



1. A photographic optical device comprising:

- a master lens unit, having a positive refractive power, which determines a photographic optical path and is disposed to move along an optical axis thereof so as to change magnification;
 - focus detecting means for detecting the focal adjustment of said photographic device and wherein at least part of said master lens unit is moved to effect focusing based on the detection result of said focus detecting means;
 - a first auxiliary lens unit having a positive refractive power and capable of being placed on and off said photographic optical path; and
 - a second auxiliary lens unit having a negative refractive power and capable of being placed on and off said photographic optical path;
- wherein said first auxiliary lens unit is located on the image-plane side of said master lens unit and forms a photographic unit giving a low ratio of magnification, said second auxiliary lens unit is located on the image-plane side of said master lens unit and forms another photographic unit giving a high ratio of magnification, and said first and second auxiliary lens units are placed outside of said photographic optical path to form another photographic unit giving a middle ratio of magnification.

4,871,239

ZOOM LENS SYSTEM FOR MINIMAL LENS SYSTEM LENGTH AND MINIMAL ABERRATIONS

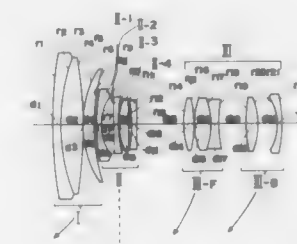
Hisayuki Masamoto, Sakai, and Akira Fukushima, Osaka, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Sep. 9, 1987, Ser. No. 95,168

Claims priority, application Japan, Sep. 9, 1986, 61-212965; Sep. 9, 1986, 61-212966; Oct. 29, 1986, 61-258769

Int. Cl.⁴ G02B 15/14, 13/18

U.S. Cl. 350—427 32 Claims



1. A zoom lens system comprising:

- a first lens group having a positive refractive power;
- a second lens group having a negative refractive power located at the image side of the first lens group with a first variable air space between the first and second lens groups; and
- a third lens group having a positive refractive power, located at the image side of the second lens group with a second variable air space between the second and third lens groups, including a positive front lens unit and a positive rear lens unit with at least one aspheric surface located at the image side of the front lens unit with a third variable air space between the front and rear lens units; wherein the first lens group and the front and rear lens units of the third lens group are shiftable to the object side in the zooming operation from the shortest focal length to the longest focal length with changing of the first, second and third variable air spaces; and wherein the lens system fulfills the following condition;

$$(|X| - |X_0|) / C_0(N' - N) < 0$$

wherein;

C_0 represents the curvature of the basic spheric surface of the aspheric surface;
 N represents the refractive index of a material located at the object side of the aspheric surface;
 N' represents the refractive index of a material located at the image side of the aspheric surface; and
 X represents the configuration of the aspheric surface in a coordinate system in a direction parallel to the optical axis of the lens system at the height Y measured from the optical axis as represented by;

$$X = X_0 + A_4 Y^4 + A_6 Y^6 + A_8 Y^8 + A_{10} Y^{10} + \dots$$

wherein; X_0 represents the configuration of the based spheric surface as represented by;

$$X_0 = C_0 Y^2 / [1 + (1 - C_0^2 Y^2)^{1/2}]$$

and

A_i represents the aspheric coefficients, where $i = 1, 2, 3, \dots$

4,871,240

ZOOM LENS SYSTEM HAVING A LENS UNIT WITH A VARIABLE REFRACTIVE POWER

Shigeyuki Seda, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

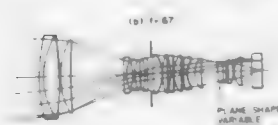
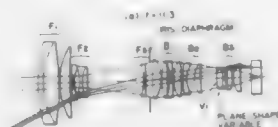
Filed Dec. 17, 1987, Ser. No. 134,154

Claims priority, application Japan, Dec. 22, 1986, 61-303935; Dec. 22, 1986, 61-303936

Int. Cl.⁴ G02B 15/16, 3/14

U.S. Cl. 350-427

12 Claims



1. A zoom lens comprising a first lens unit movable on an optic axis for a first magnification change, a second lens unit whose refractive power is variable for a second magnification change, and a correcting lens unit for correcting the movement of an image surface during a first or second magnification change.

4,871,241

COMPACT ZOOM LENS SYSTEM

Hirofumi Matsuo, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 8, 1988, Ser. No. 153,700

Claims priority, application Japan, Feb. 6, 1987, 62-26788

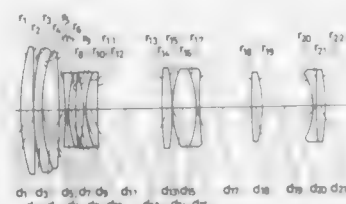
Int. Cl.⁴ G02B 15/14

U.S. Cl. 350-427

5 Claims

1. In a compact zoom lens system which comprises, in order from the object side, a first lens unit having a positive refractive power, a second lens unit having a negative refractive power, and a third lens unit having a positive refractive power, the improvement wherein said first lens unit comprises a positive, a negative and a positive lens element, said second lens unit comprising two cemented negative lenses, each of which comprises a negative lens element on the object side cemented to a positive lens element, and said third lens unit comprising a

front sub-unit comprising a positive lens element and a cemented positive lens comprising a positive lens element on the object side cemented to a negative lens element, an intermediate sub-unit consisting solely of a positive lens element and a



rear sub-unit consisting solely of a cemented negative meniscus lens comprising a negative lens elements on the object side cemented to a positive lens element and which has a convex surface on the image side, said lens system further satisfying the following conditions:

$$1.3 < f_t/f_s < 1.5 \quad (1)$$

$$0.37 < |f_{III}|/f_s < 0.45 \quad (2)$$

$$0.4 < f_{III}/f_s < 0.5 \quad (3)$$

$$(v_1 + v_3)/2 > 70, v_2 < 40 \quad (4)$$

$$(n_4 + n_5 + n_6 + n_7)/4 > 1.73 \quad (5)$$

$$0.4f_s < r_8 < 0.7f_s \quad (6)$$

$$0.4f_s < r_{11} < 0.6f_s \quad (7)$$

$$0.6 < f_{III}/f_{III} < 0.8 \quad (7)$$

$$0.5 < f_{III}/f_{III} < 0.7 \quad (8)$$

$$0.1f_s < d_{17} < 0.35f_s \quad (8)$$

$$0.1f_s < d_{19} < 0.35f_s$$

where

 f_s : focal length of the overall system at the wide-angle end f_f : focal length of the first lens unit f_{II} : focal length of the second lens unit f_{III} : focal length of the third lens unit v_i : Abbe number of the i th lens element counted from the object side n_i : refractive index at the d line of an i th lens element counted from the object side r_j : radius of curvature of a j th lens element counted from the object side f_{III} : focal length of the front sub-unit in the third lens unit f_{III} : focal length of the intermediate sub-unit in the third lens unit d_j : distance between a j th surface and a $(j+1)$ surface as counted from the object side.

4,871,242

SOFT-FOCUS OPTICAL ELEMENT

Toshio Sonza, Narashino; Koichi Wakamiya, Tokyo; Hiroshi Wakabayashi, Yokohama; Hachiro Kanai, Kawasaki, and Hidenori Miyamoto, Ichikawa, all of Japan, assignors to Nikon Corporation, Tokyo, Japan

Filed Feb. 26, 1988, Ser. No. 161,057

Claims priority, application Japan, Mar. 3, 1987, 62-48355

Int. Cl.⁴ G02B 5/02

U.S. Cl. 350-431

9 Claims

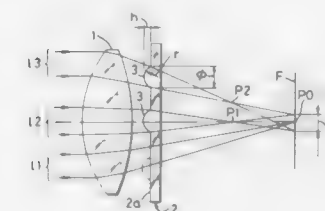
1. A soft-focus optical element comprising a plurality of lens-shaped portions formed on a light transmitting surface of

a transparent optical element, said soft-focus optical element being designed and fabricated to satisfy the following relations:

$$0.05 \text{ mm} \leq \phi \leq 0.5 \text{ mm}$$

$$0.5 \mu \leq h \leq 3 \mu$$

$$5\% \leq S \leq 35\%$$



where

ϕ : the diameter of each of said lens-shaped portions,
 h : the distance between said light-transmitting surface of said transparent element and the vertex of a lens-shaped surface of each of said lens-shaped portions and
 S : the ratio of the total area occupied by said plurality of lens-shaped portions to the area of said light-transmitting surface.

4,871,243

PHOTOGRAPHIC LENS OF IMPROVED NEAR DISTANCE PERFORMANCE

Hideki Ogawa, Tokyo, and Takashi Matsushita, Kanagawa, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

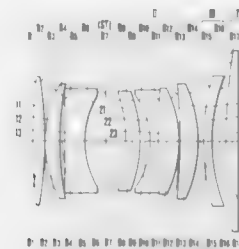
Filed Mar. 30, 1988, Ser. No. 175,351

Claims priority, application Japan, Apr. 3, 1987, 62-082251

Int. Cl.⁴ G02B 15/22, 9/64

U.S. Cl. 350-463

9 Claims



1. A photographic lens comprising, from front to rear, a first lens unit of positive refractive power, a stop, a second lens unit of positive refractive power, a third lens unit of negative refractive power, and a fourth lens unit of positive refractive power, said first lens unit including a negative lens having a strong concave surface facing said stop, said second lens unit including at least one negative lens having a strong concave surface facing said stop, and, when focusing is performed from an infinitely distant object to a close object, said first lens unit and said second lens unit are moved forward in unison, while said third lens unit is moved by a less amount of movement than the amount of movement of the first and second lens units.

4,871,244

MOVABLE MEMBER MOUNTING

Ian W. Stanley, Ipswich, England, assignor to British Telecommunications public limited company, United Kingdom

PCT No. PCT/GB86/00628, § 371 Date Jun. 12, 1987, § 102(e)

Date Jun. 12, 1987, PCT Pub. No. WO87/02472, PCT Pub.

Date Apr. 23, 1987

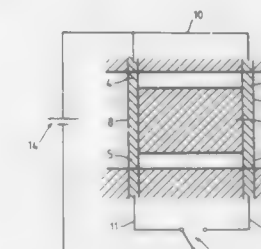
PCT Filed Oct. 16, 1986, Ser. No. 80,469

Claims priority, application United Kingdom, Oct. 16, 1985, 8525458; Oct. 16, 1985, 8525459; Oct. 16, 1985, 8525460; Oct. 16, 1985, 8525461; Oct. 16, 1985, 8525462; Oct. 23, 1985, 8526189

Int. Cl.⁴ G02B 2/08

U.S. Cl. 350-486

23 Claims



1. An assembly of:
 at least two supports and
 a movable member mounted by respective connecting members between the supports,
 the electrical conductivity of the assembly being such that at least one electrically conductive path extends from a support to the movable member and thereafter to a support,
 the resistivity of the path being such that the passage of a working current along the path causes thermal expansion of at least one of the connecting members and the movable member thereby causing movement of the movable member relatively to the supports.

4,871,245

SURGICAL MICROSCOPE

Tomonori Ishikawa, Tokyo; Takashi Fukaya, Ias; Toshiyuki Tsunoda, Sagami-hara, and Hiroshi Fujiwara, Tokyo, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Oct. 26, 1987, Ser. No. 112,440

Claims priority, application Japan, Oct. 27, 1986, 61-255474

Int. Cl.⁴ G02B 21/36, 21/06

U.S. Cl. 350-502

6 Claims



1. A surgical microscope comprising an objective lens, an illuminating optical system, an observing optical system, and a photographing optical system, the improvement comprising a light merging means capable of being selectively inserted, only during photographing, into an illuminating optical system for observation and an illuminating optical system for photographing so that part of illuminating light for observation and part of

illuminating light for photographing are merged into a single light beam to be projected onto a region to be viewed through a common optical path.

4,871,246

DEVICE FOR TRANSMITTING, WITHOUT VIBRATIONS, MOVEMENTS FROM AN ELECTRIC CONTROL TO A MIRROR-HOLDER PLATE OF A REARVIEW MIRROR

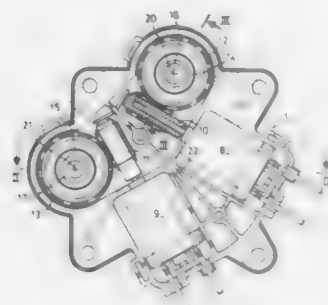
Bernard Manzoni, Saint-Claude, France, assignor to Societe Massumi Bouchot, France

Filed Jun. 6, 1988, Ser. No. 202,884

Claims priority, application France, Jun. 5, 1987, 87 07951
Int. Cl.⁴ B60R 1/06; G02B 7/18; F16H 1/26

U.S. Cl. 350—635

5 Claims



1. In combination with a rearview mirror of the type having an electric control for transmitting vibration-free up-down and left-right movements from the electric control to said rearview mirror, said rearview mirror having a casing; a mirror-holder plate adjacent said casing, a cover member attached at one end to said mirror-holder plate and an opposite end mounted to said casing; said casing defining a body member having a bottom portion; at least one control motor mounted to said bottom portion of said bottom member; means for transmitting rotary motion to translatory motion mounted between said at least one control motor and said mirror holder plate, said means for transmitting rotary motion to translatory motion having a spherical head screw located at one end of said at least one control motor; a tangent wheel gear located inside of said casing and communicating with said spherical head screw of said at least one control motor; said tangent wheel gear further having a control nut integrally mounted; a ball joint actuator having one end mounted to said tangent wheel gear and an opposite end having a ball joint mounted to said mirror-holder plate, the improvement comprising:

- a spherical depression made in said bottom portion of said body member, said spherical depression defining a spherical concave seat within said casing; said spherical depression further defining a spherical convex surface seat on the outside surface of said casing, said spherical depression further having an aperture therein;
- said tangent wheel gear having an outward extending portion, said outward extending portion being mounted in said aperture of said spherical depression, said outward extending portion further having a spherical surface circumscribing said outward extending portion for cooperation with said spherical depression in said bottom portion of said body member;
- a washer member mounted to said spherical convex surface seat on the outside surface of said casing for cooperation therewith; and
- means for fastening said washer member to said spherical convex surface seat on the outside surface of said casing, said fastening means being mounted to said outward extending portion of said tangent wheel gear.

4,871,247 CORNEA-BORNE IMAGE AND LIGHT DISPLAY DEVICE

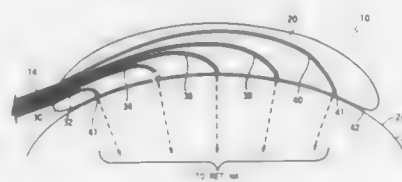
John B. Haynes, 8615 Balboa Blvd., Apt. 35, Northridge, Calif. 91325

Filed Feb. 29, 1988, Ser. No. 162,118

Int. Cl.⁴ A61B 3/02, 3/00

U.S. Cl. 351—219

1 Claim



1. A cornea-borne image and light display device comprising:
- (a) projector means for generating desired images,
 - (b) a pair of viewing scleral-riders positionable on the corneas of the viewer's eyes where an opaque layer covers the outer surface of said scleral-riders and a plurality of mirror surfaces are formed on the inner surface of said opaque layer, and
 - (c) a pair of fiber-optic bundles each connecting said projector means to a respective end of said scleral-riders where the individual optical fibers of each of said bundles extend into said scleral-riders and terminate adjacent to one of said mirror surfaces to cause light from said optical fibers to be reflected by said mirror surfaces to the retina of the viewer's eye.

4,871,248

METHOD OF PARTICLE SIZE DETERMINATION

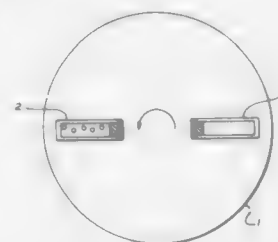
Richard L. Hoffman, Wilbraham, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed Aug. 11, 1987, Ser. No. 84,271

Int. Cl.⁴ G01N 15/04

U.S. Cl. 356—36

8 Claims



1. A method of particle size analysis of a substance comprising particles in the range of 0.05 to 50 microns, in a particle size distribution analyzer comprising (a) a horizontal rotating disc centrifuge in which a sample cell and a reference cell are inserted and (b) an optical system for determination of light absorbance over an interval of time at a position intermediate to the top and bottom ends of the sample cell, wherein the method comprises dispersing the particulate substance in a liquid dispersion medium, filling the sample cell with a clear liquid which is miscible with the liquid dispersion medium and a narrow band of the dispersion situated at the top or bottom of the cell, filling the reference cell with the clear liquid, inserting the sample and reference cells horizontally into the centrifuge so that the narrow band of the dispersion orients along a side of the sample cell, accelerating the centrifuge to a selected speed allowing the narrow band of the dispersion to reorientate at the top or bottom end of the sample cell and the particles of the dispersion to migrate therefrom to the opposite end of the sample cell under the influence of the centrifugal force, determining absorbance data of the sample cell during the time of

migration of the particulate substance and determining the particle size distribution of the particulate substance from the absorbance data.

4,871,249

LIGHT COLLECTING DEVICE WITH CHAMBER INCLUDING ELLIPSOIDAL SURFACE AND SPHERICAL SURFACE

James V. Watson, Great Shelford, United Kingdom, assignor to Medical Research Council, Cambridge, England

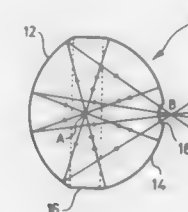
Filed Jul. 1, 1988, Ser. No. 214,192

Claims priority, application United Kingdom, Jul. 10, 1987, 8716285

Int. Cl.⁴ G01N 21/53, 21/64, 21/85; G02B 17/06

U.S. Cl. 356—73

8 Claims



1. A light collecting device comprising an internally reflecting chamber for collecting light from a point source within the chamber over a solid angle of substantially 4 pi and directing all the collected light through an exit point at or adjacent the wall of the chamber, said chamber being in the form of an ellipsoidal surface extending over a solid angle of substantially 2 pi and a spherical surface extending over a solid angle of substantially 2 pi, the first conjugate focus of the ellipsoidal surface being coincident with the centre of curvature of the spherical surface and the second conjugate focus of the ellipsoidal surface being located at or adjacent the spherical surface at the centre point of the curved surface area thereof, whereby in use light from a point source located at the said first conjugate focus is directed through the said second conjugate focus, some by virtue of a single reflection at the ellipsoidal surface and the rest by virtue of an initial reflection at the spherical surface followed by a reflection at the ellipsoidal surface.

4,871,250

BEAM MONITOR FOR A HIGH-OUTPUT LASER

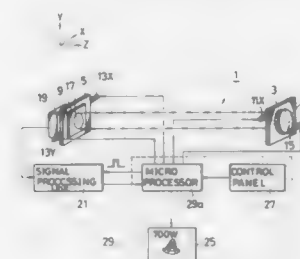
Ryoji Koseki, Buena Park, Calif., assignor to Amada Engineering Service Co., Inc., La Mirada, Calif.

Continuation-in-part of Ser. No. 810,767, Dec. 19, 1985, abandoned. This application Sep. 17, 1987, Ser. No. 97,275

Int. Cl.⁴ G01J 1/00

U.S. Cl. 356—121

12 Claims



1. A gas laser system provided with lasing condition adjusting means comprising:
- an output mirror;

- a rear mirror having a predetermined transmittance positioned opposite said output mirror;
- an optical cavity defined by said output mirror and said rear mirror;
- a pair of discharge electrodes for generating a discharge within a gas supplied to the cavity;
- a pulse generating unit for applying a pulse voltage between said pair of electrodes;
- means for adjusting the orientations of said output mirror and said rear mirror;
- a matrix sensor means comprising a plurality of resistance temperature elements located behind said rear mirror for receiving a laser beam passing through said rear mirror;
- a display means for visually indicating an instant mode resonance pattern taking place in said optical cavity on the basis of the output of said matrix sensor means;
- a control panel means for manually inputting a correction value of the orientation of said mirrors with reference to said mode pattern displayed;
- a processor means for controlling said orientation adjustment means in accordance with said correction value;
- means for calculating output power based upon the output of said matrix means; and
- means for controlling the pulse generating unit in accordance with said output power, so that the discharge current is adjusted to the optimum corresponding to an instantaneous output power.

4,871,251

APPARATUS AND METHOD FOR PARTICLE ANALYSIS

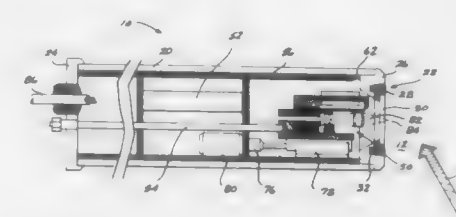
Fritz K. Preikschat, 16020 Lake Hills Blvd., Bellevue, Wash. 98008, and Ekhard Preikschat, 9048 N.E. 41st Street, Bellevue, Wash. 98004

Continuation-in-part of Ser. No. 43,223, Apr. 27, 1987, abandoned, which is a continuation-in-part of Ser. No. 821,781, Jan. 23, 1986, abandoned. This application Nov. 12, 1987, Ser. No. 119,797

Int. Cl.⁴ G01N 15/02

U.S. Cl. 356—336

29 Claims



1. An apparatus for analyzing particles contained in a fluent medium, the apparatus comprising:
- a body including a window;
 - illumination means mounted to the body, the illumination means comprising an optical source and an optical system for receiving light from the optical source and focusing the light at a focal spot adjacent to the window in the fluent medium, the illumination means including means for adjusting the distance between the focal spot and the window;
 - photodetector means for detecting pulses of light resulting from the backscattering of light by particles in the focal spot, and for producing a corresponding electrical signal;
 - detection means connected to receive the electrical signal, the detection means including size measurement means for measuring the length of time that individual particles are in the focal spot and for thereby providing an indication corresponding to the size of particles in the fluent medium, the detection means further including means for producing an integrated amplitude signal having a magnitude corresponding to the average amplitude of the elec-

trical signal, whereby said distance may be adjusted based upon the integrated amplitude signal.

4,871,252 METHOD AND APPARATUS FOR OBJECT POSITIONING

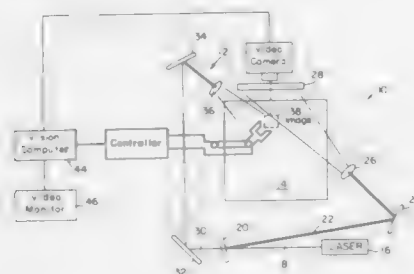
Gerardo Beni, Santa Barbara; Alan Mar, and C. John Landry, both of Goleta, all of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Oct. 30, 1986, Ser. No. 926,074

Int. Cl.⁴ G01B 9/021

U.S. Cl. 356—347

7 Claims



1. A method of positioning a three-dimensional object at a preselected position within a workstation, comprising producing a 3-dimensional holographic image of the object at such preselected position, measuring the macroscopic volume overlap of the object and the image, moving the object in a direction which increases the volume overlap of the object with the image, repeating said measuring and moving until the object and image produce a detectable pattern of illumination-beam interference fringes, analyzing the fringe pattern to determine the direction of object movement needed to maximize the spacing between the pattern fringes; incrementally shifting the object in such direction, and repeating said analyzing and shifting steps until a desired increase in fringe spacing is achieved.

4,871,253 READOUT APPARATUS FOR A LASER ANGULAR RATE SENSOR

Joseph E. Killpatrick, 2901 32nd Ave., NE., Minneapolis, Minn. 55418, and Glen A. Sanders, 5230 Cottonwood La., Plymouth, Minn. 55442

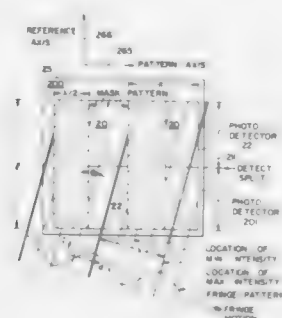
Continuation of Ser. No. 733,297, May 10, 1985, abandoned.

This application Aug. 12, 1987, Ser. No. 85,218

Int. Cl.⁴ G01C 19/64

U.S. Cl. 356—350

21 Claims



1. A readout apparatus responsive to clockwise and counter-clockwise counter-rotating light beams that have a frequency

difference relatable to the rate of rotation of a ring laser gyroscope, said readout apparatus comprising:

means for removing a portion of the light beams from the ring of said ring laser gyroscope;
means for displacing the removed counter rotating beams to overlap a portion of the light of the removed beams to form a first spot beam having fringe motion characterized by an array of alternating regions of high and low intensity light within said first spot;
a single mask having an array of co-parallel, alternating transparent and opaque stripes;
said mask being positioned to be normal to said first spot beam and to direct said fringe motion of said first spot beam through said single mask;
said single mask array of alternating and opaque regions being aligned to form a second spot beam having a moire fringe motion characterized by an array of alternating regions of high and low intensity light within said spot moving transverse to said fringe motion within said first spot beam; and
means for receiving said second spot beam and for detecting said moire fringe motion within said second spot beam characterized by an array of alternating regions of high and low intensity light within said second spot moving transverse to said fringe-motion of said first spot beam.

4,871,254 METHOD AND DEVICE FOR DETECTING PROPAGATION TIME VARIATIONS IN A RING INTERFEROMETER AND APPLICATION THEREOF TO WAVE LENGTH CONTROL

Hervé Lefevre, Paris, and Didier Rolly, Marcoussis, both of France, assignors to Thomson-CSF, Paris, France

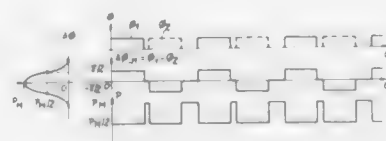
Filed Mar. 25, 1988, Ser. No. 173,548

Claims priority, application France, Mar. 27, 1987, 87 04268

Int. Cl.⁴ G01B 9/02

U.S. Cl. 356—350

7 Claims



1. A method of detecting propagation time variations in a ring interferometer, comprising the steps of:
providing a source of coherent light;
coupling said source to an optical fiber arranged in a ring;
modulating the light at one end of the ring using an asymmetric square wave modulation with the period of modulation being twice the mean propagation time in the fiber;
detecting an output light signal;
extracting from the detected signal pulses at a frequency twice the modulation frequency;
separating the extracted pulses into a first signal indicative of a non-reciprocal phase shift and a second signal whose duration varies as the propagation time.

4,871,255 OPTICAL NONDESTRUCTIVE TESTING METHOD OF COMPOSITE MATERIALS

Koji Tezjinbayashi, Tsukuba, Japan, assignor to Agency of Industrial Science & Technology and Ministry of International Trade & Industry, both of Tokyo, Japan

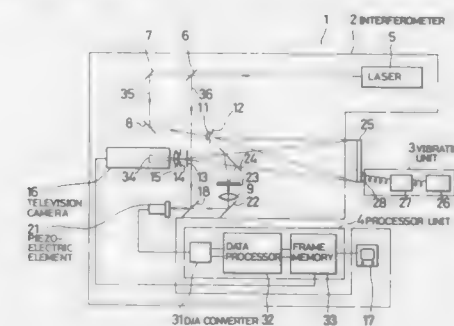
Filed Mar. 28, 1988, Ser. No. 174,430

Claims priority, application Japan, Apr. 17, 1987, 62-96020

Int. Cl.⁴ G01B 9/02

U.S. Cl. 356—354

4 Claims



1. An optical nondestructive testing method of composite materials, comprising the steps of:
utilizing optical interferometry to obtain a resonant vibration mode on a front surface of a target part of an object being inspected and also determining resonant frequency at that time;
then obtaining another resonant frequency exhibiting the same resonant vibration mode from a rear surface of said part of the object being inspected; and
using the two said resonant frequencies to derive the position of a defect in a thickness direction of the part of the object being inspected.

4,871,256 MEANS FOR PROJECTING PATTERNS OF LIGHT

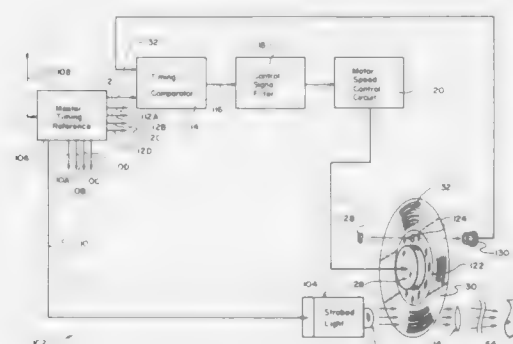
John R. Grindon, Hazelwood, Mo., assignor to LBP Partnership, St. Louis, Mo.

Filed Apr. 29, 1987, Ser. No. 44,057

Int. Cl.⁴ G01B 11/24

U.S. Cl. 356—376

30 Claims



1. A projector for projecting energy onto a remote object comprising a projector housing having an opening therein, a rotatable assembly mounted in the housing, a mask member mounted on the rotatable assembly and having arcuate areas arranged in an annular pattern, each arcuate area being formed of spatially variant light conductivity forming a pattern thereon, the pattern of each area on the mask member being formed of a plurality of elongated arcuately extending energy conducting and energy non-conducting portions forming distinct energy edges therebetween, the positions of the energy edges in at least one of the areas being at different distinct locations therein than the energy edges in any other area,

means for rotating the rotatable assembly with the mask member thereon, a radiant energy source having an energy producing portion located in the housing on one side of the mask member in alignment with the housing opening, means to project radiant energy flashes from the energy source through selected ones of the arcuate areas on the mask and through the housing opening for projection onto the remote object, and means to synchronize the timing of the energy flashes with the rotation of the mask member so as to project portions of different ones of the predetermined arcuate areas of the pattern which have the energy edges therein at distinctively different positions.

4,871,257 OPTICAL APPARATUS FOR OBSERVING PATTERNED ARTICLE

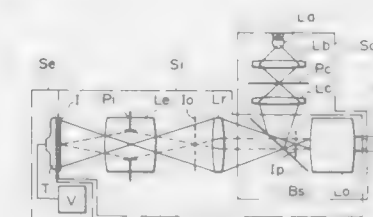
Akiyoshi Suzuki, Tokyo, and Michio Kohno, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation-in-part of Ser. No. 169,131, Mar. 10, 1988, abandoned, and Ser. No. 122,581, Nov. 16, 1987, abandoned, which is a continuation of Ser. No. 910,817, Sep. 23, 1986, abandoned, which is a continuation of Ser. No. 555,523, Nov. 23, 1983, abandoned, said Ser. No. 169,131, is a continuation of Ser. No. 102,808, Sep. 22, 1987, abandoned, which is a continuation of Ser. No. 773,771, May 14, 1985, abandoned. This application Jul. 29, 1988, Ser. No. 225,826

Claims priority, application Japan, Dec. 1, 1982, 57-210908; May 17, 1984, 59-100297; May 30, 1984, 59-110064; May 31, 1984, 59-111548

Int. Cl.⁴ G01B 11/00; G01N 21/88, 21/47

U.S. Cl. 356—400

5 Claims



1. An optical apparatus for detecting an image without patterns in predetermined orthogonal directions, comprising:
optical illumination means for illuminating an object by projecting a light beam along an optical axis of said optical illumination means, said optical illumination means including a first aperture member having a light blocking portion and a light transmitting portion, with said light blocking portion located on the optical axis of said optical illumination means;
optical imaging means for projecting an image of the object along an optical axis of said optical imaging means, said optical imaging means including a second aperture member having a light transmitting portion and a light blocking portion, said light transmitting portion of said second aperture member being located on the optical axis of said optical imaging means, said second aperture member being located at a position optically conjugate with said first aperture member; and
means for detecting an image formed by said optical imaging means, wherein said light blocking and light transmitting portions of each of said first and second aperture members are configured so that when an image of said first aperture member is projected on said second aperture member, said light transmitting portion of said first aperture member is imaged on said light blocking portion of said second aperture member, and at such a position which is not interposed between either of two sets of parallel lines tangential to the light transmitting portion of said second aperture and

extending in the directions corresponding to the orthogonal directions.

4. An optical apparatus for observing a pattern defined by a plurality of linear pattern elements extending in different directions, comprising:

- means for irradiating the pattern with a light beam;
- means for receiving the light beam from the pattern to observe the pattern; and
- means effective for sequentially forming, on said observing means, a dark field image of a pattern element of the pattern extending in a direction and a dark field image of another pattern element extending in another direction, said dark field image forming means including first and second aperture stop members which are disposed in an optically conjugate relation with each other and which are cooperable with each other in the formation of the dark field image, said dark field image forming means being disposed in a path of the light beam from said irradiating means and the pattern and/or in a path of the light beam from the pattern to said observing means.

4,871,258

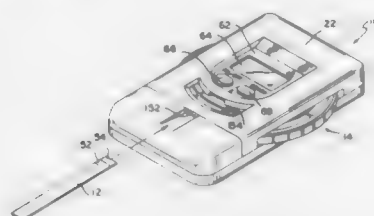
COLOR TEST METER

Bernad G. Herpichboehm; George H. Sierra; Robert B. Summers, and Thomas M. Watlington, all of Indianapolis, Ind., assignors to Boehringer Mannheim Corporation, Indianapolis, Ind. Filed Apr. 29, 1988, Ser. No. 187,857

Int. Cl.⁴ G01J 3/52

U.S. Cl. 356-422

3 Claims



3. A meter for measuring the color to which a chemical test piece has turned after being contacted with a test specimen, the meter comprising a case including means for locating and holding the test piece, a color chart, means for mounting the color chart relative to the case, the chart containing colors which the chemical test piece may assume after being contacted with the test specimen, means for generating an electrical signal when the color to which the test piece has turned corresponds generally to a color on the chart, a display, and means for coupling the means for generating an electrical signal to the display to provide a meter readout related to the color to which the test piece has turned, the means for generating the electrical signal when the color to which the test piece has turned corresponds generally to a color on the chart comprising a plurality of switches, means for mounting the switches in the case adjacent the color chart, selection of a color from the color chart which corresponds generally to the color of the test piece and actuation of a switch that color causing the display to provide a meter readout related to the color to which the test piece has turned.

4,871,259

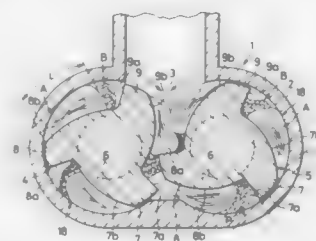
RUBBER-LIKE MATERIAL KNEADING APPARATUS

Jumei Harada, and Kazuhisa Nishigai, both of Tokyo, Japan, assignors to Bridgestone Corporation, Tokyo, Japan Continuation of Ser. No. 84,231, Aug. 11, 1987, abandoned. This application Mar. 3, 1989, Ser. No. 319,825

Claims priority, application Japan, Aug. 13, 1986, 61-190293 Int. Cl.⁴ B01F 7/08; B29B 7/20

U.S. Cl. 366-85

2 Claims



1. A rubber-like material kneading apparatus comprising: a case having a chamber cocoon-shaped in section; and a pair of rotors mounted in said chamber, each of said rotors comprising a shaft and three vanes arranged at equal angular intervals therearound and extending radially therefrom, each of said vanes defining a curved leading edge and a substantially straight trailing edge according to a direction of rotation of said shaft, one said curved leading edge and a succeeding said substantially straight trailing edge defining an area of turbulence therebetween in which kneading occurs, such that said vanes of different respective rotors are engaged with each other during rotation of said rotors, thereby to knead rubber-like material in said chamber;

each of said vanes comprising one long vane and one short vane, wherein each said long vane extends for at least one-half of the axial length of the respective shaft, each said long vane extending to a respective short vane three short vanes such that each of said vanes extends from one end to the other end of the shaft associated therewith, and such that a cutting angle formed by the trailing edges of said long vanes and the tangential line at an outer end, in a radial direction of, said long vanes is not similar than forty degrees but not larger than one hundred forty degrees.

4,871,260

ROTARY PROCESSOR APPARATUS AND METHOD FOR EXTENSIVE AND DISPERSIVE MIXING

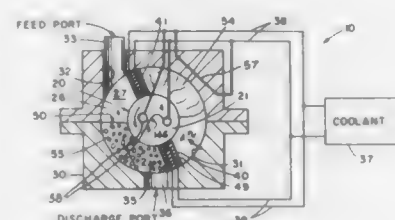
Zehev Tadmor, 641 Standish Rd., Teaneck, N.J. 07666; Arthur D. Siegel, 24 Goldenrod Ct., Cheshire, Conn. 06410, and Jan-Chin Yang, 6 Millstone Ct., Pittsford, N.Y. 14534

Filed Sep. 15, 1987, Ser. No. 96,927

Int. Cl.⁴ B01F 7/10

U.S. Cl. 366-99

55 Claims



1. A rotary processor for high-shear processing of plastic or polymeric materials and additives thereto, the rotary processor comprising:

- (A) a rotor having two coaxial end discs and at least one coaxial mixing disc positioned therebetween, said discs

being mounted parallel and spaced apart on a central shaft thereby defining annular processing channels flanking each mixing disc;

- (B) a housing defining a surface closely surrounding the outer peripheral surfaces of the rotor and closing the annular processing channels to form annular processing chambers;
- (C) means for rotating the rotor within the housing;
- (D) means for inputting and removing materials from the annular processing chambers;
- (E) at least one channel block means extending from the housing into each annular processing chamber, the channel block means of adjacent annular processing chambers being circumferentially spaced apart;
- (F) means establishing a sealing relationship between the housing and said end discs of the rotor; and
- (G) the outer peripheral surface of at least one mixing disc and the surrounding surface of the housing defining a high-shear-mixing transfer gap between the annular processing chambers flanking that mixing disc, whereby a portion of the material collected near the channel block means is directed through the high-shear-mixing transfer gap as a part of extensive mixing of the material and the material is dispersively mixed during transfer.

4,871,261

VACUUM MIXING APPARATUS FOR DENTAL MATERIALS

Ronald M. Randklev, White Bear, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sep. 29, 1988, Ser. No. 251,543

Int. Cl.⁴ B01F 13/06

U.S. Cl. 366-139

15 Claims



1. Sub-atmospheric mixing apparatus comprising: a capsule having structure defining an internal compartment adapted to contain a quantity of ingredients; a holding mechanism for releasably supporting said capsule; means for oscillating the holding mechanism in order to mix the ingredients in the capsule; a source of vacuum; and means defining a passageway communicating with said source of vacuum and terminating at a first port carried by said holding mechanism, said capsule having a second port in communication with said compartment, said second port being in communication with said first port when said capsule is supported by said holding mechanism in order to enable said source of vacuum to establish sub-atmospheric conditions in said compartment.

4,871,262

COSMETIC DISPENSING SYSTEM

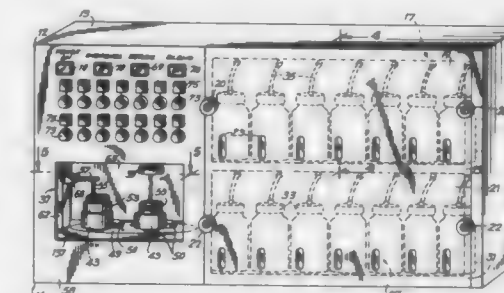
Andre Krauss, Brooklyn, N.Y.; Harry Martin, Buxford, and Richard Pazenny, Gloucester, both of Mass., assignors to Hydrocosmetics, Inc., New York, N.Y.

Filed Feb. 4, 1988, Ser. No. 152,109

Int. Cl.⁴ B01F 15/02, 15/04

U.S. Cl. 366-160

53 Claims



1. A cosmetic dispensing system for blending selected cosmetic additives into a cosmetic base comprising: a plurality of storage means, each of the storage means being for storage of one of said additives; means for containing said base at a first position in said system; means for transferring each of said additives from each of said storage means to said containing means; means for selecting at least one of said additives for transfer by said transferring means; said selecting means comprising a plurality of switches for permitting actuation of said transferring means; and means for mixing said base after transfer of at least one of said additives to said container.

4,871,263

PROTECTIVE TUBE FOR A TEMPERATURE SENSOR

Richard F. Wilson, Fort Wayne, Ind., assignor to Pyromation, Inc., Fort Wayne, Ind.

Filed May 16, 1988, Ser. No. 194,148

Int. Cl.⁴ G01K 1/12

U.S. Cl. 374-139

41 Claims



1. A protective tube for a temperature sensor, comprising: metal inner tube means having first and second open ends; refractory ceramic fiber means surrounding at least a portion of an outer surface of one end of said inner tube means; means for bonding said refractory ceramic fiber means to said outer surface of said first portion of said inner tube means; non-metallic, thermally conductive plug means having an inner bore portion for receiving the temperature sensor; and means for joining said thermally conductive plug means to said inner tube means so as to close said first open end of said tube means; wherein said temperature sensor and said first end of the metal inner tube means are protected by the non-metallic plug and the refractory ceramic fiber means, and wherein at least a portion of said thermally conductive plug means is exposed for contacting a material having a temperature to be measured.

4,871,264

BAG CLOSURE DEVICE AND METHODS OF FABRICATING THE SAME

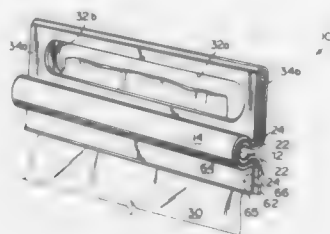
Edward S. Robbins, III, 499 N. Court St., Florence, Ala. 35630, and Theodore J. Onocki, Florence, Ala., assignors to Edward S. Robbins, III, Florence, Ala.

Filed Jan. 5, 1988, Ser. No. 141,042

Int. Cl.⁴ B65D 33/16

U.S. Cl. 383—68

28 Claims

**1. A bag closure device comprising:**

elongate male and female members each having a wall which is generally U-shaped in cross-sectional configuration so as to establish an interior space which is generally cylindrical in configuration;

said wall of each of said male and female members terminating in a pair of opposing, separated edge regions which define therebetween a slot extending the axial length thereof and being of a dimension which is less than the cross-sectional dimension of said generally cylindrical space;

said wall of each of said male and female members also being formed of a resilient, shape-retaining material means which permits said opposing edge regions to be resiliently displaced relative to one another so as to facilitate the entry of said male member into said generally cylindrical space of said female member, whereby said male and female members are frictionally nestable with one another so as to capture, and thus close, a bag therebetween, and locking means for releasably locking said male and female members in said nesting relationship, and locking means including,

- (i) a locking member, and
- (ii) an open ended slot in adjacent registry with said locking member when said male and female members are in said nesting relationship,
- (iii) said locking member being foldable into and out of engagement with said slot thereby releasably locking said male and female members in said nesting relationship.

4,871,265

RESEALABLE BAG

James M. Peck, St. Paul, Minn., assignor to Minnesota Mining & Manufacturing Company, St. Paul, Minn.

Filed May 18, 1988, Ser. No. 195,211

Int. Cl.⁴ B65D 33/16

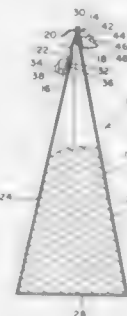
U.S. Cl. 383—89

11 Claims

1. A resealable bag holding product contents, comprising: an enclosure for holding the product contents having a top portion and opposite flat sides forming a front and a back, said enclosure including means for opening said top portion, said enclosure having first receiving location on the front and a second receiving location on the back; means for providing a pressure-sensitive adhesive coating at one of said first and second receiving locations; means for forming a defined release surface at the other of said first and second receiving locations; said enclosure being foldable so that said surface forming means contacts said adhesive coating providing means, said adhesive coating providing means bonding both said enclosure and the surface forming means and in tension delaminating from the surface forming means before de-

laminating from the enclosure such that the adhesive coating providing means remains on the enclosure when the surface forming means separates from the adhesive coating providing means; and a release liner covering the adhesive coating such that said adhesive coating providing means has the further characteristic in tension of delaminating from said liner prior to delaminating from said enclosure;

whereby when said enclosure is opened at said opening means and said liner is stripped from said adhesive coating, said enclosure can be closed by folding said enclosure to bring said surface forming means and said adhesive coating into contact with one another.



4,871,266

SLIDE ASSEMBLIES

Isao Oda, Nagoya, Japan, assignor to NGK Insulators, Ltd., Nagoya, Japan

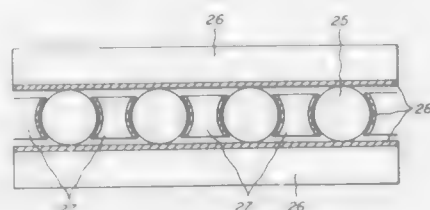
Filed Dec. 21, 1987, Ser. No. 135,276

Claims priority, application Japan, Jun. 24, 1987, 62-155400; Oct. 19, 1987, 62-261770

Int. Cl.⁴ F16C 33/62, 29/02

U.S. Cl. 384—42

13 Claims



1. A slide assembly comprising a metallic member and a ceramic member, wherein at least a sliding surface of the metallic member which contacts said ceramic member is coated with a mixture consisting essentially of a solid lubricant and a binder, said mixture being a combination selected from the group consisting of LiF+MoO₃, PbO+Cu, LiF+Ni—Cr—Mo—Si, and LiF+Co—Mo—Cr—Si.

4,871,267

FOIL THRUST BEARING

Alston L. Gu, Rancho Palos Verdes, Calif., assignor to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Jun. 7, 1988, Ser. No. 203,384

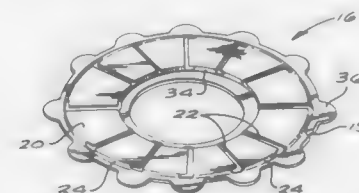
Int. Cl.⁴ F16C 17/04

U.S. Cl. 384—105

23 Claims

1. A fluid bearing comprising: a pair of members arranged for relative rotation with respect to one another, one of the said pair of members adapted to rotatably support the other; and a compliant foil bearing operably disposed between said pair

of relatively rotatable members and mounted to one of said pair of relatively rotatable members, said compliant foil bearing including a foil thrust bearing disk, said foil thrust bearing disk having a major bearing surface including a plurality of generally radially extending slots to define therebetween radially inwardly converging integral bearing pads, said plurality of slots extending into said circumferential step and said circumferential step defines



the radially outer edge of said bearing pads, said circumferential step having a first height h_1 at a leading edge of said bearing pads and second height h_2 at a trailing edge of said bearing pads and said second height is greater than said first height, wherein said first height h_1 is in the range of from 0.0002 cm to 0.025 cm and said second height h_2 is equal to the quantity of h_1 plus from 0.0001 cm to 0.01 cm.

4,871,268

ROLLING BEARING

Kyozaburo Furumura, Kanagawa; Tomoki Muraoka, Fujisawa; Yasuo Murakami, Yamato, and Tsutomu Abe, Fujisawa, all of Japan, assignors to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

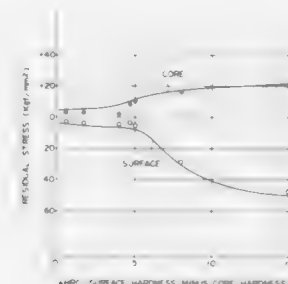
Filed Jan. 13, 1988, Ser. No. 143,389

Claims priority, application Japan, Jan. 17, 1987, 62-007451; Dec. 10, 1987, 62-310833

Int. Cl.⁴ C21D 9/36

U.S. Cl. 384—492

12 Claims



1. A rolling-type bearing having an inner race, an outer race and a rolling member, at least one of said inner race, outer race and rolling member being made with an alloy steel consisting essentially of Fe with 0.4 to 0.7% by weight of C and at least two elements selected from the group consisting of 0.2 to 1.7% by weight of Mn, 0.2 to 1.2% by weight of Si, 0.2 to 1.7% by weight of Cr, 0.1 to 0.3% by weight of Mo and 0.1 to 1.0% by weight of Ni, said alloy having been subjected to carburizing hardening to obtain

- (a) a carburized amount at the surface portion of 0.35 to 0.6% by weight and
- (b) a dissolved carbon content at the surface portion of 0.75 to 1.1% by weight, and having
- (c) a hardness at the core portion as HRC of 57 to 64 and
- (d) a difference in hardness between the surface portion and the core portion within ± 5 as HRC.

4,871,269

PORTABLE LABEL PRINTING APPLICATOR APPARATUS

Shinsuke Murata, Iwate, Japan, assignor to Kabushiki Kaisha Sato, Japan

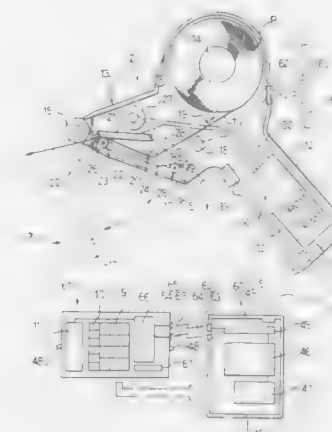
Filed Apr. 25, 1988, Ser. No. 185,958

Claims priority, application Japan, Apr. 28, 1987, 62-103284

Int. Cl.⁴ B41J 3/20

U.S. Cl. 400—88

10 Claims



1. A portable label printing system, comprising: a self-contained, hand held, main label printer unit, the label printer unit including: means for supporting a roll of labels, printing means for imprinting information on labels, a passageway extending between the label supporting means and the printing means, conveying means for conveying the labels from the label supporting means to the printing means, the printer unit being of a size which permits the holding thereof in one hand while applying imprinted labels to articles, the printer unit further including a first memory for storing therein printing data, a second memory for storing therein a program, and control means for controlling the overall operation of the label printer unit, the label printer unit being suitable for imprinting information on labels which are adhered to a backing sheet and further including peeling means for peeling the labels from the backing sheet and further including label applicator means in the printer unit for applying peeled labels to articles;

a self-contained, hand held, data input keyboard unit including a keyboard for entering therewith data which specifies the information to be imprinted on the labels; and first cable;

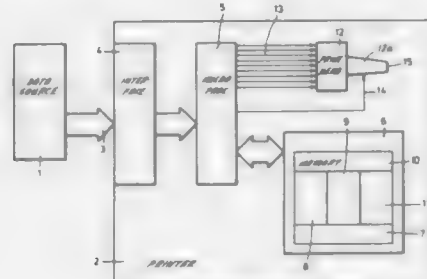
a self-contained, hand holdable, power supply unit suited for being carried by the body of an operator of the label printer unit and directly connected to the printer unit by means of the first cable and effective for supplying electrical power thereto, the printer unit being hand holdable and weldable independently of the data input keyboard unit and the power supply unit during application of labels to articles and the data input keyboard unit being weldable independently of the printer unit and the power supply unit during data input operations; and coupling means for enabling the data input keyboard to communicate with the power supply unit.

4,871,270
METHOD OF PRINTING MODIFIED CHARACTERS BY MEANS OF A MATRIX PRINTER
 Johannes Werbach, Nersingen, Fed. Rep. of Germany, assignor to Manncmann AG, Dueseldorf, Fed. Rep. of Germany
 Filed Dec. 14, 1984, Ser. No. 681,617
 Claims priority, application Fed. Rep. of Germany, Dec. 19, 1983, 3346297

Int. Cl.⁴ B41J 3/12

U.S. Cl. 400—121

3 Claims



1. Method of printing characters by means of a matrix printer, having a print head movable across a print media, the head having at least one column of print styli and including means for selective energization of the print styli to obtain the printing of characters composed of elemental imprints such as dots, comprising the steps of:

- providing a character generator for controlling the selective energization of the print styli;
- using the generator and its content for obtaining the printing of particularly normal size characters, whereby the content of the generator is used for obtaining a selection of styli energization;
- using the same generator and the same content thereof for obtaining the printing of reduced in size characters as compared with said normal size by selectively reassigning for each character the selection of the respective content of the generator as to styli energization;
- selecting as to print size during printing from among said two using steps; and
- shifting the vertical position of the styli concurrently with the selecting step.

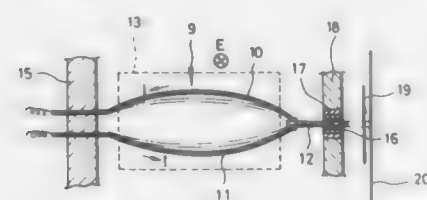
4,871,271
PRINTING HEAD FOR A WIRE DOT PRINTER
 Kazuo Watanabe, Yutaka Takahashi, and Masaaki Takimoto, all of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Japan

Filed Aug. 18, 1987, Ser. No. 86,444
 Claims priority, application Japan, Aug. 20, 1986, 61-194839; Aug. 20, 1986, 61-194840; Aug. 20, 1986, 61-194841; Aug. 20, 1986, 61-194842; Aug. 20, 1986, 61-194843; Aug. 20, 1986, 61-194844

Int. Cl.⁴ B41J 3/12

U.S. Cl. 400—124

19 Claims



1. A printing head for a wire dot printer wherein a printing pin is adapted to hit a platen roller through an ink ribbon and

a printing paper wrapped around the platen roller so as to print an ink dot on the printing paper, said printing head comprising: magnetic means providing a magnetic field; electrically conductive actuating means fixedly holding said printing pin, said actuating means being disposed in said magnetic field so as to resiliently deform under an electromagnetic force in order to give said printing pin a thrust motion from a position where said printing pin rests to a position where said printing pin hits said platen roller; and anti-rebound damping means for retaining said printing pin in said rest position, said anti-rebound damping means being in direct cooperation with said printing pin and including a pair of electrically conductive members one of which is fixed to said printing pin and the other to a fixed part of said printing head, an electromagnetically attractive force being produced between said pair of electrically conductive members upon an application of voltages contrary in polarity to each other to said pair of electrically conductive members, respectively, so as to electromagnetically attract one of said electrically conductive member to the other of said electrically conductive members in order to restrict said printing pin in said rest position.

4,871,272
METHOD AND DEVICE FOR RESTARTING TYPEWRITERS AND PRINTERS WITH STEPPING MOTOR

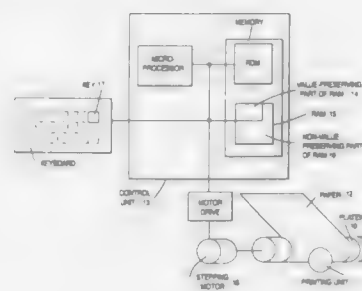
Hans P. Stein, Armin Weise, and Reinhold Will, all of Nuremberg, Fed. Rep. of Germany, assignors to TA Triumph-Adler Aktiengesellschaft, Nuremberg, Fed. Rep. of Germany

Filed Jul. 27, 1987, Ser. No. 78,147
 Claims priority, application Fed. Rep. of Germany, Jul. 26, 1986, 3625387

Int. Cl.⁴ B41J 11/42

U.S. Cl. 400—583

12 Claims



1. A method for operating a machine for printing on a paper, such as a typewriter, printer or the like, said machine having a control unit comprising a microprocessor and a memory, said memory storing a control program for said microprocessor and including a RAM for storing variable data, said RAM being of the value-preserving type at least in part of its storage area, a stepping motor connected to the control unit and supplied with sequences of energization patterns under the control of said control unit, to move the paper, a basic step input device which causes, by each actuation thereof by an operator of the machine, the stepping motor to be supplied with a respective corresponding sequence of at least one of said energization patterns by the control unit, so that the stepping motor executes at least one predetermined step to move the paper by at least one corresponding, predetermined fraction of a normal line spacing for each said actuation, wherein any successive pair of said energization patterns of each said corresponding sequence are different from each other, said method comprising:

said control unit storing an information identifying the ener-

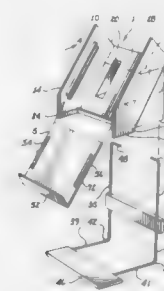
gization pattern last applied to the stepping motor at at least one first address located in said value-preserving part of said RAM; said control unit storing a first bit pattern, contained in the control program, in identical form at at least one second address in the value preserving part of the RAM; and upon the restart of the machine after a shut-off of power thereto, said control unit comparing a bit pattern then in storage at the at least one second RAM address with said first bit pattern contained in the control program; wherein, (1) in the event of coincidence from the comparing, the stepping motor is energized so that the first energization pattern sequence applied after said restart starts from said energization pattern identified by said information stored at said first RAM address, and (2) in the event of non-coincidence, the stepping motor is energized after said restart at least once with a predetermined one of said energization patterns identified by a further information contained in the control program, and the first energization pattern sequence thereafter applied starts from said predetermined energization pattern identified by said further information contained in the control program.

4,871,273
ADJUSTABLE PAPER HANDLER APPARATUS
 Robert A. Fields, Phoenix, Ariz., assignor to Multiple Marketing Systems, Inc., Phoenix, Ariz.

Filed May 13, 1985, Ser. No. 733,371
 Int. Cl.⁴ B41J 11/46

U.S. Cl. 400—613.2

17 Claims

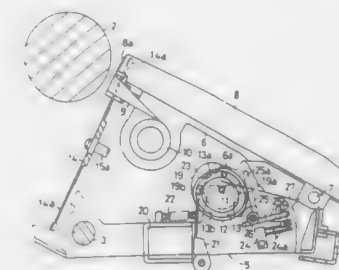


1. An apparatus for handling paper entering into and emerging from a printer, comprising:

- a printing means integral to said printer for operably accommodating paper;
- a paper handler means suitable for communication with said printing means;
- a storage means integral to said paper handler means for accommodating said paper prior to entry into said printing means;
- a guide means integrally incorporated into said paper handler means for guiding said paper operably accommodated by said printing means;
- a tray means removably and adjustably mounted onto said paper handler means for accommodating said paper upon emergence from said printing means;
- a stand means removably connected to said paper handler means for adjustably seating said paper handler means in order to suitably function with said printing means; and
- a support means integrally joined to said paper handler means for removably and adjustably accommodating said stand means, said paper handler means comprises a generally U-shaped member, said U-shaped member has at least two upwardly extending members removably originating from a bottom side member, said U-shaped member comprises a lip means integrally connected to the lower portion of said U-shaped member for supporting said paper upon entering into said printing means.

4,871,274
TYPEWRITER
 Yuichi Harada, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Japan
 Filed Dec. 24, 1987, Ser. No. 137,767
 Claims priority, application Japan, Dec. 26, 1986, 61-313595
 Int. Cl.⁴ B41J 29/00, 11/62
 U.S. Cl. 400—697.1

5 Claims



2. A typewriter wherein a ribbon holder mounted on a carriage movable along a platen holds both a print ribbon and a correction ribbon thereon and is displaceable between a first lift position for facing said print ribbon to said platen and a second lift position for facing said correction ribbon to said platen, which comprises:

- a single switch member mounted on said carriage;
- a first actuating member mounted on said carriage, said first actuating member turning said single switch member on or off upon the displacement of said ribbon holder for detecting the lift position of said ribbon holder;
- a second actuating member fixed at a position corresponding to a predetermined original position of said carriage, said second actuating member turning said single switch member on or off when said carriage is at its original position;
- first moving means for moving said carriage at a predetermined amount away from said original position thereof to ensure the disengagement of said switch member from said second actuating member;
- first confirming means for confirming said ribbon holder being at its predetermined lift position after the movement by said first moving means;
- second moving means for moving said carriage per said predetermined amount toward said original position thereof after the confirmation by said first confirming means; and
- second confirming means for confirming said carriage being placed at its original position.

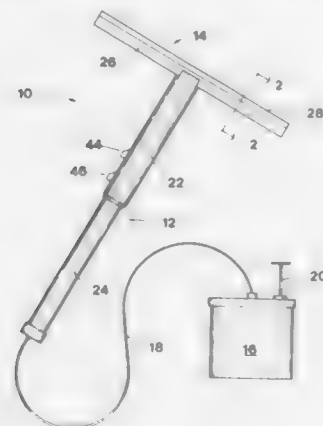
4,871,275
WINDOW WASHING DEVICE
 Glenn R. Aldous, 5483 Blackrock Rd., Pocatello, Id. 83204
 Filed Jun. 28, 1988, Ser. No. 211,770
 Int. Cl.⁴ A47L 1/08

U.S. Cl. 401—23

7 Claims

- 1. A window washing device, comprising:
 - a. an elongate handle operatively connected to a pressurized cleaning fluid reservoir;
 - b. a cleaning head assembly affixed to the handle and having
 - (i) first wiping means adapted to remove aqueous films from a planar window surface,
 - (ii) second abrasive wiping means adapted to remove particulates and nonaqueous fluid films from said window surface,
 - (iii) actuating means interconnected with the pressurized cleaning fluid reservoir such that when activated the second wiping means is deformed from a first inoperative position not in contact with said window surface to a second operative position in contact with said window surface,
 - (iv) means delivering the pressurized cleaning fluid to the

window through the second abrasive wiping means when the actuating means is actuated; and



c. trigger means adjacent the elongate handle to enable an operator to manually activate the actuating means.

4,871,276

PRELOADED JOINT DEVICE

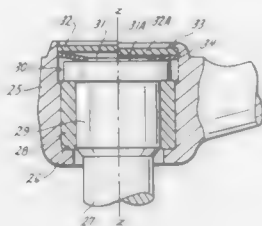
Louis P. Fister, St. Louis, Mo.; Lawrence H. Fitch, Cahokia, Ill., and Herby O. Pearson, Chesterfield, Mo., assignors to Moog Automotive, Inc., St. Louis, Mo.

Filed Nov. 21, 1988, Ser. No. 273,826

Int. Cl.⁴ F16C 11/06

U.S. Cl. 403—162

6 Claims



1. In a joint device consisting of a housing having a cylindrical bore therein opening out of the housing at one end and having an opposite end formed with a seat for a headed member operatively mounted in said housing bore and having a stud member extending through said opposite end such that the headed member is supported in said housing on said seat, the improvement of a cover plate fitted onto said one end of said housing, a concavely shaped load exerting resilient element having a rim surface with a diameter which fits in said bore under said cover, and retaining flange means on said housing engaged with said cover for pressing on said cover against said concavely shaped load exerting resilient element thereunder, said load exerting element in its unstressed condition having a peripheral rim surface substantially parallel with said cylindrical bore surface, and in its flattened stressed condition by pressure from said cover reacting such that the rim surface is shaped such that it bites into said bore and forms a stop seat.

4,871,277

JOINT ASSEMBLY

Yasuhiro Fuchigami, Osaka, Japan, assignor to Nippon Sheet Glass Co., Ltd., Osaka, Japan

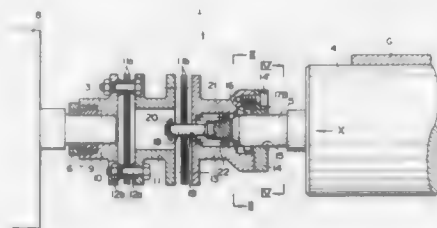
Filed Jun. 24, 1988, Ser. No. 211,547

Claims priority, application Japan, Jun. 25, 1987, 62-97563[U]

Int. Cl.⁴ F16D 1/00

U.S. Cl. 403—166

10 Claims



1. A joint assembly interconnecting first and second rotatable shafts, comprising:
an engaging member mounted on a shaft portion of the first rotatable shaft;
a tubular assembly including a first tubular member in which said shaft portion is coaxially inserted and which has an engaged member for engaging said engaging member, and a second tubular member coupled to said second rotatable shaft; and
urging means disposed in said first tubular member for normally urging said first tubular member and said first rotatable shaft axially away from each other to maintain said engaging member and said engaged member in engagement with each other.

4,871,278

BOLT-OPERATED CLAMPING DEVICE

Wolfgang Gerlach, Castrop-Rauxel, and Reimund Malczok, Dortmund, both of Fed. Rep. of Germany, assignors to Uhde GmbH, Dortmund, Fed. Rep. of Germany

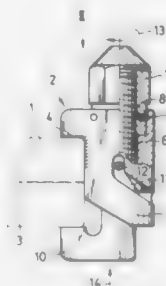
Filed May 26, 1988, Ser. No. 199,134

Claims priority, application Fed. Rep. of Germany, May 27, 1987, 3717978

Int. Cl.⁴ F16D 1/00

U.S. Cl. 403—338

3 Claims



1. A device for clamping and unclamping a cover of a vessel by way of a cover flange and a vessel flange, comprising:
a hook provided so as to be clampable on one of the flanges;
a bolt extending from said hook so as to transfer a clamping force;
an externally operable, turnable nut provided on said bolt;
a fixture for holding said nut so that said nut remains in a defined position therein, said fixture being attached to one of the flanges; and
means on the fixture for guiding said hook extending from said bolt so that said hook can move up and down and

swivel at least 45° about its longitudinal axis so as to unclamp the flanges.

4,871,279

SLALOM POST

Hans Hinterholzer, Post Box 118, N-1545, Hvitsten, Norway

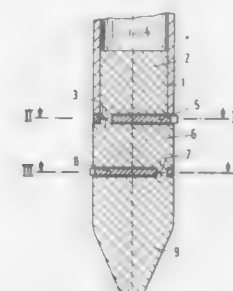
Filed Aug. 4, 1988, Ser. No. 228,275

Claims priority, application Austria, Aug. 10, 1987, 2008/87; Fed. Rep. of Germany, Feb. 3, 1988, 3803150

Int. Cl.⁴ E01F 9/00

U.S. Cl. 404—10

11 Claims



1. A slalom post having a central longitudinal axis and a cylindrical outer surface, and having at its lower end an anchoring means, said anchoring means comprising: a sleeve around said post, a disc-like anchoring element below said sleeve having an area substantially equivalent to the circular cross-sectional area of the cylindrical surface of said post, a pivot for said element on an axis offset and parallel to the central vertical axis of said post, and a guide means on said sleeve engaging said anchoring element for limiting the relative oscillations of said anchoring element to the oscillations of said post about its central vertical axis, whereby oscillation of said post about its central vertical axis causes said anchoring element to move about its offset axis from an ineffective position substantially within the cross-sectional area of said post to an effective anchoring position projecting radially outwardly from the cylindrical surface of said post, and vice versa.

4,871,280

RETRACTABLE PAVEMENT MARKER/REFLECTOR

Delbert J. Modlin, 130 Moss Rock Ct., Folsom, Calif. 95630

Filed Mar. 9, 1987, Ser. No. 23,139

Int. Cl.⁴ E01F 9/04

U.S. Cl. 404—10

6 Claims



1. A retractable pavement marker/reflector comprising, in combination:
a base with a depressible cap projecting upwardly therefrom, and said cap having complete freedom of rotation; said base includes:
a plurality of cylindrical walls having:
a first inside surface of a preselected first inside diameter and a preselected first length having a first end and a second end; and
at least a second inside surface of a second inside diameter preselected to be smaller than said first inside diameter

and a preselected second length having a first end and a second end;

a stop connecting said second end of said first inside surface and said first end of said second inside surface;

a bottom having substantially a disk shape of a diameter equal to the outside diameter of said cylindrical wall having said first inside surface and connected to said first end of said cylindrical wall;

said depressible cap includes;

a top circular portion of a preselected diameter smaller than the inside diameter of said second inside surface of said base and having a convex upper surface;

cap cylindrical walls having, a first end and a second end, an outside diameter equal to the outside diameter of said top portion and connected by said first end to the periphery of said top portion by the surface opposite said convex upper surface, said walls having a preselected length approximately equal to the length of said second inside surface;

a circular plate, having a preselected diameter larger than the inside diameter of said second inside surface of said base and smaller than the inside diameter of said first inside surface of said base, connected to said second end of said cap cylindrical walls whereby the periphery of said circular plate extends beyond the outside cylindrical surface of said cap cylindrical walls;

whereby under the condition of said bottom detached from said cylindrical wall and said depressible cap axially insertable, top circular portion first, into said base through said first inside surface and then into said second inside surface, said top portion of said depressible cap extends above the second end of said second inside surface and said periphery of said circular plate is substantially adjacent to said stop.

4,871,281

TRENCHING TOOL FOR INSTALLING PERFORATED PIPE

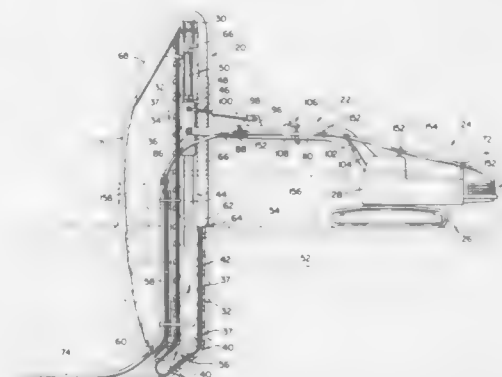
Donald R. Justice, P.O. Box 150219, Cape Coral, Fla. 33915-0219

Filed Feb. 28, 1988, Ser. No. 153,441

Int. Cl.⁴ E02F 5/10

U.S. Cl. 405—181

12 Claims



1. A trenching apparatus for installing perforated pipe, said trenching apparatus comprising:
drive means for moving along a path of burial of perforated pipe;
a boom having two ends, one end being connected to said drive means,
a trenching tool, the other end of said boom being pivotally connected to said trenching tool, said trenching tool including earth excavating means for forming a trench by lifting excavated earth, and height adjustment means for

vertically adjusting the height of said earth excavating means with respect to said boom.

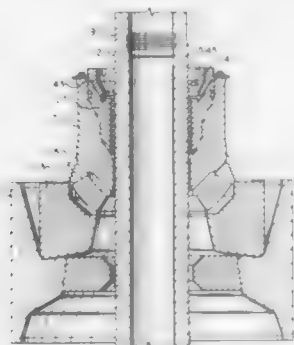
said excavating means including a continuous chain having spaced cutting means trained about a frame for digging of earth, said frame being substantially straight except for an angled terminal end which initiates excavation of the earth by said cutting means, said terminal end being angled so as to provide an entry path into the trench dug by said trenching tool for a guide for perforated pipe and thereby to prevent blockage of said guide by the earth.

4,871,282

TENSION LEG PLATFORM TENDON TOP CONNECTOR
Charles E. Jennings, Houston, Tex., assignor to Vetco Gray Inc., Houston, Tex.

Filed Dec. 30, 1987, Ser. No. 139,671

Int. Cl.⁴ E02B 17/06; B63B 35/44; F16L 19/07; F16B 37/08
U.S. Cl. 405—224 6 Claims



1. In a floating platform having a plurality of tendons extending in tension from the sea floor to the platform, an improved means for connecting the upper end of each tendon to the platform, comprising in combination:

a housing supported by the platform and having a bore with a conical shoulder formed therein;

a terminal segment on the upper end of each tendon, having external grooves and extending through the bore of the housing;

a plurality of dogs carried on the shoulder in the housing, each having an inner face containing grooves for mating with the grooves of the terminal segment, each dog having an inclined surface;

a cam ring mounted rotatably to the housing above the dogs, the cam ring having an inclined surface that mates with the inclined surface of each of the dogs; and

means, including an inclined guide slot located in one of the inclined surfaces and a pin protruding from the other of the inclined surfaces and engaging the guide slot, for causing each dog to slide down the conical shoulder into contact with the grooves of the tendon when the cam ring is rotated in one direction relative to the dogs, and for causing each dog to slide upward on the conical shoulder and disengage from the grooves of the tendon when the cam ring is rotated in the other direction relative to the dogs.

6. A method for making an upper connection between a floating platform and a tendon extending in tension from the sea floor to the platform, comprising in combination:

mounting a housing to the platform and providing the housing with a bore having a conical shoulder formed therein; securing a terminal segment having external grooves to the upper end of the tendon, and extending the terminal segment through the bore of the housing;

placing a plurality of dogs on the shoulder in the housing, each dog having an inner face containing grooves for mating with the grooves of the terminal segment;

while pulling upward on the terminal segment, sliding the

dogs downward on the conical shoulder from an outer position spaced outward from the grooves of the terminal segment to an inner position contacting the grooves of the terminal segment;

providing a locking member having a locking element containing inner grooves; and securing the locking member to the terminal segment on top of the dogs with the grooves of the locking element engaging the grooves of the terminal segment to prevent the dogs from sliding upward on the conical shoulder.

4,871,283

CONTINUOUS MIXING AND INJECTION OF LIME-FLY ASH SLURRY

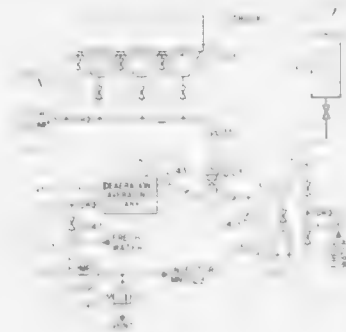
Paul J. Wright, Ft. Worth, Tex., assignor to GKN Hayward Baker, Inc., Odenton, Md.

Continuation-in-part of Ser. No. 14,854, Feb. 13, 1987, abandoned. This application Jul. 27, 1988, Ser. No. 224,884

Int. Cl.⁴ E02D 3/12

U.S. Cl. 405—263

10 Claims



1. A method of treating subsurface layers of earth for controlling movement of subsurface water and building strength of said subsurface layers comprising injecting at a plurality of predetermined depths and at a plurality of predetermined spaced apart locations a lime-fly ash slurry consisting essentially of treatment water, particulate hydrated lime and particulate fly ash; said particulate lime and fly ash being present as particulate solids in a proportion of from twenty-five percent (25%) by weight of said treatment water to as much as two hundred percent (200%) by weight of said treatment water; said particulate solids comprising lime to fly ash in proportion ranging from 3:1 to 1:10; said injection being carried out by pumping the slurry of one said particulate solid in water through a jet slurry mixing apparatus means for aspirating in said dry other particulate solid when the slurry of said one particulate solid is pumped therethrough and said other dry particulate solid is fed thereto; such that injection occurs within less than ten minutes from the time the combined slurry of both particulate solids and water pass through a high pressure injection pump that is employed to build up pressure sufficient to affect injection into the subsurface layers through injectors; such that injection occurs and said subsurface layers are treated in situ to obtain additional strength and to obtain stabilized moisture content without requiring removal, admixture into homogeneous mass, replacement and compaction.

4,871,284

HYDRAULIC TRANSPORTATION

Geoffrey G. Duffy, Auckland, New Zealand, assignor to Fibre Dynamics Limited, New Zealand

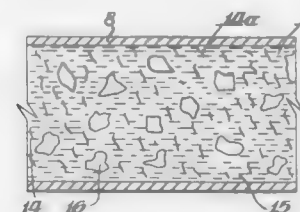
Continuation-in-part of Ser. No. 791,230, Oct. 25, 1985, abandoned, which is a continuation-in-part of Ser. No. 545,347, Oct. 25, 1983, Pat. No. 4,605,329. This application Oct. 13, 1987, Ser. No. 107,941

Claims priority, application New Zealand, Oct. 29, 1982, 201/118

Int. Cl.⁴ B65G 53/30

U.S. Cl. 406—49

2 Claims



1. A body of liquid in which is suspended interlinked fiber flocs that support solids introduced into the liquid body, the interlinking being effected by a quantity of engagement lattice having securely interlocked strands with cells between about 1 and about 20 millimeters wide that inter-engage with the fibers of the fiber flocs and increase their solid-supporting effectiveness.

4,871,285

CYLINDER BORING APPARATUS AND METHOD

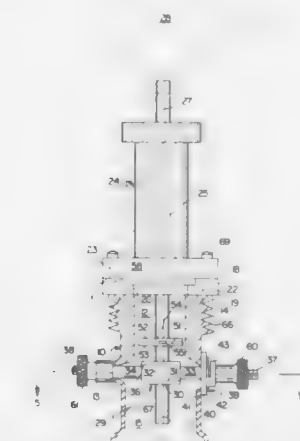
John W. Moore, 206 York La., Yorktown, Va. 23690

Filed Jul. 28, 1988, Ser. No. 225,485

Int. Cl.⁴ B23B 41/12

U.S. Cl. 408—80

6 Claims



1. An engine cylinder reboring apparatus adapted for use on a conventional piston driven internal combustion engine having a block, deck, cylinder, crankshaft bearing, cylinder head bolt holes, crankcase and crankcase gasket surface, said apparatus comprising:

(a) an alignment plate having upper and lower surfaces and a circular aperture communicating between said upper and lower surfaces and having counterbored holes and head attachment means spaced about said aperture, said alignment plate being adapted for attachment to said deck in a manner disposing said aperture in coaxial alignment with said cylinder;

(b) boring head means having a centered rotatable cylindrical

bar in coaxial alignment with said circular aperture, said bar having lower and upper extremities, said lower extremity disposed below said aperture, said upper extremity being associated with means for rotating and downwardly advancing said bar, said boring head means being positioned by engagement with said head attachment means,

(c) a lower support assembly comprising:

(1) a bearing block having front and rear extremities and a bore adapted to rotatively secure said bar adjacent its lower extremity;

(2) front and rear cylindrical support shafts fixedly held by said front and rear extremities, respectively, said shafts being perpendicularly disposed to the axis of said bore and having distal extremities provided with lateral positioning means, the distal extremity of said rear shaft being adapted to penetrate said crankshaft being in close-fitting engagement therewith, and

(3) a side support plate having front and rear surfaces and a circular opening permitting close-fitting passage of said front shaft, said rear surface being flat and adapted to abut against the gasket-receiving surface of the crankshaft, and clamping means associated with said front surface for securing said front shaft and thereby preventing movement of said bearing block,

(d) a circular centering plug having a centered cylindrical channel, upper and lower surfaces and at least one inwardly recessed annular abutment shoulder defining a coaxial cylindrical sectors having different diameters, a first of said sectors being adapted for insertion into said cylinder in close circumferential conformity with the wall of the cylinder, the associated abutment shoulder being adapted to define a lower limit of insertion upon contact with said deck, and a second sector disposed above said first sector and of larger diameter and adapted to accept the circular aperture of said alignment plate in close circumferential conformity, thereby coaxially aligning said circular aperture and engine cylinder,

(e) an alignment shaft adapted to extend in close-fitting passage through the channel of said centering plug and the bore of said bearing block,

(f) said centering plug and alignment shaft being removable following completion of their aligning function, and

(g) cutting means extending radially from said boring bar and axially positionable thereupon, and adapted to cut the cylinder wall in a rotational spiral manner.

4,871,286

GROOVING OR THREADING TOOL

Carl E. Hunt, Davisburg, Mich., assignor to GTE Valenite Corporation, Troy, Mich.

Continuation of Ser. No. 262,762, Oct. 24, 1988, abandoned.

This application May 5, 1989, Ser. No. 348,140

Int. Cl.⁴ B23B 27/00

U.S. Cl. 408—144

6 Claims

1. An elongated grooving and threading tool of the type having a radially projecting cutting edge, said tool comprising a cutting section having an axially extending bore and a radially projecting cutting edge,

a hollow cylindrically shaped rearward section comprising cemented carbide,

a cylindrically shaped intermediate section having a threaded axially aligned bore extending therethrough, said intermediate section positioned intermediate said cutting section and said cemented carbide section,

a first connection formed at the juncture of said intermediate section and said cutting section,

a fastener threadingly engaging said threaded bore for holding said cutting section and said intermediate section together at said first connection,

a second connection formed at the juncture of said intermediate section and said rearward section,

a drawbar connected between said cutting section and said rearward cemented section under tension for holding said intermediate section and said rearward section in axial alignment along said axis under a compressive force,



means for centering said drawbar relative to the rearward section for preventing relative radial movement between the forward end of said drawbar and the rearward section, each of said first and said second connections comprising a key and a keyway and a pair of first and second surfaces.

4,871,287

ANNULAR CUTTER HAVING RADIAL CLEARANCE
Everett D. Hogen, Hogen Manufacturing Company, Inc. P.O. Box 2005, Flint, Mich. 48501-2005

Filed Mar. 18, 1988, Ser. No. 170,219

Int. Cl.⁴ B23B 41/02

U.S. Cl. 408-204

25 Claims



1. An annular cutter comprising a body portion having a plurality of teeth circumferentially spaced about the lower end thereof and a plurality of flutes extending upwardly in the outer periphery of said body portion between said teeth, said flutes being defined by leading and trailing side walls and a bottom wall, said teeth being configured to cut a plurality of chips which, when cut, are fed into said flutes and discharged; said teeth having at least first leading and second trailing cutting edges generally radially and circumferentially separated by said bottom wall of said adjacent flute such that said first cutting edge leads said second cutting edge as said cutter is rotated with each cutting edge cutting a separate chip, said chips having a radial width when cut at least equal to the radial width of said respective cutting edges; and
a radial clearance radially generally adjacent said second trailing cutting edge communicating with said adjacent

flute receiving a portion of the radial width of said chip as said chip is formed by said trailing cutting edge facilitating the unobstructed feeding of said chip into said adjacent flute.

4,871,288

SCREEN LINING

Gerhard Schmidt, Ettlingen, and Kurt Hoppe, Hilden, both of Fed. Rep. of Germany, assignors to Hein, Lehmann AG, Dusseldorf and Isenmann Drahterzeugnisse GmbH, Karlsruhe, both of, Fed. Rep. of Germany

Filed Feb. 24, 1987, Ser. No. 18,286

Claims priority, application European Pat. Off., Mar. 13, 1986, 86103385

Int. Cl.⁴ F16B 13/06

U.S. Cl. 411-45

5 Claims



1. A screen lining assembly comprising:
a supporting substructure having at least one elongated bar provided with a plurality of throughgoing holes spaced along the bar;
at least two screen elements having respective lateral edges extending parallel next to one another along and above the bar;
a plastic section lying on the bar, interposed between the edges and the bar, and extending parallel to the bar, the plastic section having an upper region provided with formations engaging the lateral edges for holding same together and an underside formed at locations spaced along the plastic section with respective downwardly extending spreadable projections received in the holes and extending therethrough, whereby spreading of the projections locks the plastic section to the bar, each of the projections being formed with a vertically throughgoing passage having an inner wall surface and opening at the upper region; and
a plurality of bolts each extending downward from the upper region into a respective one of the passages at least to the level of the substructure at the respective hole within the respective projection and having an outer wall surface, at least one of the surfaces being tapered away from the upper region to spread the respective projection on insertion of the respective bolt therein, the wall surfaces of the bolts and the passages being provided with mutually engaging locking means for retaining the bolts in the passage and locking each projection in the respective hole, whereby the projections securely retain the plastic section on the bar in spite of enlargement of the holes.

4,871,289

EXPANSION FASTENER

Stanley W. Choiniere, Southwick, Mass., assignor to Olympic Manufacturing Group, Inc., Agawam, Mass.

Filed Nov. 25, 1988, Ser. No. 276,368

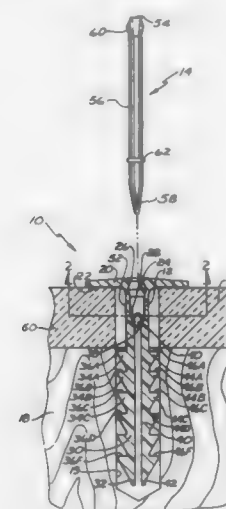
Int. Cl.⁴ F16B 13/04, 13/06

U.S. Cl. 411-48

14 Claims

1. An expansion fastener comprising:
fastener body means comprising a head portion defining an axially extending throat, said throat defining a socket, a pair of axially extending anchoring members integrally extending from said head portion and having opposing

interior surfaces defining an axial through slot communicating with said throat, a series of axially spaced teeth projecting from said anchor members, said anchor members having a rounded shank portion interposed between said head portion and said teeth;
expander pin means comprising a head, a generally radially projecting shoulder portion defined by converging sur-



faces forming a quasi-V-shaped section adjacent said head, and a longitudinal body terminating in a tip, said pin means being dimensioned for reception in said throat, so that said expander pin means may be inserted in said throat and driven into said fastener body means wherein the pin means extends into said slot and interacts with said opposing interior surfaces to force apart said anchor members and said pin shoulder is locked in said socket.

4,871,290

AUTOMATIC HANDLING APPARATUS FOR PLATE-SHAPED OBJECTS

Ulrich Kaczynski, Bad Nauheim; Peter Schmidt, Huettenberg, and Hans-Helmut Paul, Wetzlar, all of Fed. Rep. of Germany, assignors to Ernst Leitz Wetzlar GmbH, Wetzlar, Fed. Rep. of Germany

Filed May 16, 1988, Ser. No. 194,224

Claims priority, application Fed. Rep. of Germany, May 17, 1987, 3716549

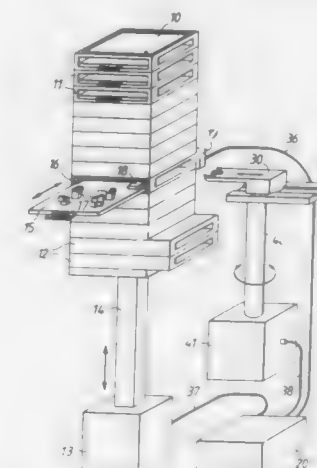
Int. Cl.⁴ H01L 21/68

U.S. Cl. 414-331

9 Claims

1. A handling apparatus for plate shaped objects, comprising:
a magazine having horizontal compartments arranged one above the other;
means for adjusting the height of the magazine;
a manipulator capable of linear and swiveling motion;
a plurality of gripping arms, each being engageable by the manipulator;
object engaging means on each gripping arm, the engaging means having varying sizes and shapes adapted to the sizes and shapes of the plate shaped objects;
coding means for each compartment, the coding means indicating the contents of the compartment, the magazine having compartments adapted both for the storage of plate shaped objects and for the storage of gripping arms;
reading means for sensing the information provided by the coding means, the reading means being fixed in height; and
control means responsive both to the reading means and to inputted information designating a desired plate shaped object or gripping arm to be handled, the control means

causing the height adjusting means to horizontally align the appropriate compartment with the manipulator to



effect the handling of the designated object or gripping arm.

4,871,291

RETAINER BLADE ARM LOCKING MEANS FOR WHEEL LIFT APPARATUS

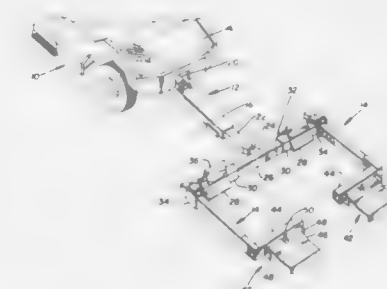
Vernon S. Moore, Ringgold, Ga., and Reed K. Hamman, Newbern, Tenn., assignors to Holmes International Inc., Chattanooga, Tenn.

Filed Jun. 7, 1988, Ser. No. 203,271

Int. Cl.⁴ B60P 3/12

U.S. Cl. 414-563

20 Claims



1. Apparatus for use with wheel lift towing equipment for supporting the tires of a vehicle lifted and towed thereby, said apparatus comprising a transversely elongated tow bar adapted to be positioned beneath said vehicle, mounting means for carrying a cradle at a respective opposite end portion of said tow bar for supporting a respective tire of said vehicle, each of said cradles having front support means for supporting a front surface portion of the respective tire and rear support means for supporting a rear surface portion thereof, said rear support means including an elongated arm and tire engaging means extending transversely to the arm, adjustable means for mounting said arm at a respective end portion of said tow bar such that said tire engaging means is appropriately spaced from said front support means, said adjustable means comprising a receptacle carried by said mounting means, said receptacle having a passageway extending generally horizontally in a front to rear direction for telescopically receiving said arm, said arm having a plurality of bores spaced apart in the direction of elongation of said arm, and locking means for securing said arm within said receptacle, said locking means comprising a bracket pivotably mounted for movement relatively to said receptacle from

an unlocked position where the bracket permits movement of the arm within the receptacle to a locking position, said bracket including a leg carrying stop means for substantially abutting a lateral surface of said arm when in the locking position to substantially preclude lateral movement of the arm, and said stop means carrying an extendible locking pin adapted for receipt within a selected one of said bores to lock the arm to the receptacle.

4,871,292

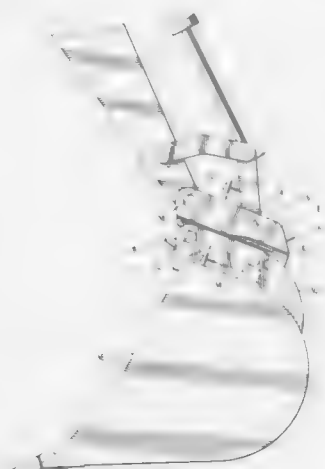
SYSTEM FOR ATTACHING AND LOCKING MATERIAL HANDLING TOOLS TO A DIPPER BOOM

Richard Milanowski, 3105 Martin Rd., Mosinee, Wis. 54455
Filed Dec. 17, 1987, Ser. No. 134,059

Int. Cl.⁴ E02F 3/28

U.S. Cl. 414—723

28 Claims



21. A material handling tool attachment system, comprising:
a plurality of models of brackets, each of said brackets adapted to be mounted to an arm of an excavating device, and each model of said brackets including first forward and first rearward means for attaching that model bracket to conventional forward and rearward attachment fixtures on a particular model of a conventional material handling tool;

a plurality of models of material handling tools, each of said material handling tools including a fixed forward attachment fixture and a fixed rearward attachment fixture, the size and spacing of the forward and rearward attachment fixtures being the same on all models;

second means mounted on each of the models of brackets for attaching the bracket to the fixed rearward attachment fixtures of the plurality of models of material handling tools, said first forward attaching means including means for engaging the fixed forward attachment fixture of the plurality of models, said first forward attaching means and said second attaching means being spaced the same as the spacing of the fixed forward attachment fixture and the fixed rearward attachment fixture on the plurality of models, said second attaching means being a different element than said first rearward attaching means and the distance between the second attaching means and the first forward attaching means being different than the distance between the first rearward attaching means and the first forward attaching means;

whereby any of said models of brackets is usable with a particular conventional material handling attachment by means of the first forward and first rearward attaching means and with each of the plurality of models of material handling tools having the fixed forward and fixed rearward attachment fixtures by means of the first forward attaching means and the second attaching means.

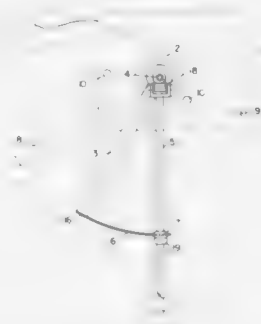
4,871,293 MECHANICAL POSITIONING OR TRANSFERRING SYSTEM

Curtis R. Cowles, R.D. 2, Corning, N.Y. 14830
Filed Jan. 5, 1988, Ser. No. 141,003

Int. Cl.⁴ B66C 23/00

U.S. Cl. 414—744.3

3 Claims



2. Apparatus for transferring an article from one position to another based on the angular position and elevation of a driven pickup arm means having a holder, comprising:

- a driven pickup arm means with a holder;
- said driven pickup arm means being mounted to have a vertical axis around which it may be driven and a horizontal axis around which it may be driven;
- driving arm means for angularly driving said pickup arm means around the vertical axis according to a pre-selected program;
- a shaped cam mechanism attached to said driving arm means;
- stop and guide means angularly positioned about the vertical axis with respect to pickup and discharge locations; and
- said driving arm means and said pickup arm means being rotatably mounted around the vertical axis, said pickup arm means being hinged horizontally to selectively change its elevation with respect to the driving arm as pre-determined by contact with said shaped cam mechanism and said stop and guide means disposed at locations where the elevation of the pickup arm is to be changed.

4,871,294

AXIAL-FLOW FAN

Sergei K. Ivanov, ulitsa Artema, 102b, kv. 44; Viktor E. Dudkin, ulitsa Avtotransportnikov, 1, kv. 72; Valery P. Peredery, prospekt Dzerzhinskogo, 6, kv. 88., and Viktor N. Molchanov, prospekt Semashko, 26, kv. 42., all of Donetsk, U.S.S.R.

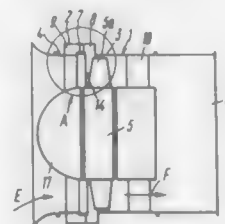
Filed Jun. 27, 1983, Ser. No. 508,241

Claims priority, application U.S.S.R., Jun. 29, 1982, 3465201; Feb. 2, 1983, 3539801

Int. Cl.⁴ F04D 29/66

U.S. Cl. 415—58.7

5 Claims



1. An axial-flow fan comprising: a hollow housing having an inlet step and an outlet step, said outlet step having an inside diameter smaller than an inside diameter of said inlet step; an

inlet tube adjoining said housing on a side of said inlet step and having an inside diameter substantially equal to an inside diameter of said outlet step through which a main flow of air passes; a ferrule disposed coaxially in said inlet step of said housing and spaced a specific distance from said inlet tube and forming an annular chamber between said ferrule and said inlet step of said housing; an outlet passage of said annular chamber disposed between said inlet tube and said ferrule; a rotor having blades disposed on an inner side of said inlet step of said housing and having an inlet passage of said annular chamber disposed between said rotor and said ferrule, said blades being arranged so that forward tips of said blades are disposed in said inlet step of said housing; guide vanes arranged in said annular chamber and rigidly affixed to said ferrule to facilitate passage of said main flow; and heels of said guide vanes pointing to and extending up to said inlet tube, said heels of said guide vanes being disposed between said inlet tube and said ferrule and being curved in a radial annular grill to direct stall flow against the rotation of said rotor.

4,871,295

MODULAR RANKINE CYCLE VAPOR TURBINE

Uri Kaplan, Rehovot, Israel, assignor to Ormat Turbines (1965) Ltd., Yavne, Israel

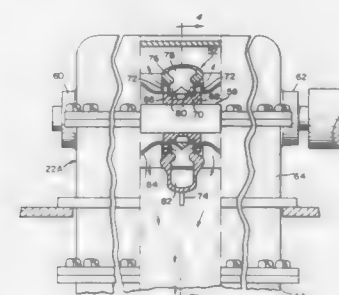
Division of Ser. No. 486,498, Apr. 19, 1983, Pat. No. 4,537,032.

This application Jun. 13, 1985, Ser. No. 744,245

Int. Cl.⁴ F01D 17/00

U.S. Cl. 415—94

5 Claims



1. A turbine operable with an organic working fluid for driving a load comprising:

- a shaft rotatably mounted in a housing;
- a plurality of modular units each of which has a pair of axially spaced discs couples together and mounted on the shaft for rotation together;
- axial-flow blades on the periphery of each disc, the blades on the discs of each unit being arranged in axial-counter-flow fashion, such that each disc with its blades acts as a single-stage turbine;
- a nozzle ring for each unit supported by the housing and having an annular chamber that is fixed in the axial space between the discs of the unit, and having a plurality of nozzles that are directed toward the blades of the unit;
- deflectors in the housing between adjacent units for deflecting exhaust vapor exiting the blades of the units, the housing serving as the exhaust manifold for the turbine;
- a throttle valve associated with each nozzle ring for controlling the application of working fluid to said nozzle ring; and
- a control responsive to the load on said turbine for controlling the throttle valves so that, under any load condition, only one of the throttle valves at a time is variable and all of the other throttle valves are either fully open or fully closed.

4,871,296

DECOUPLER SHAFT AND AIR TURBINE STARTER HAVING SUCH A DECOUPLER

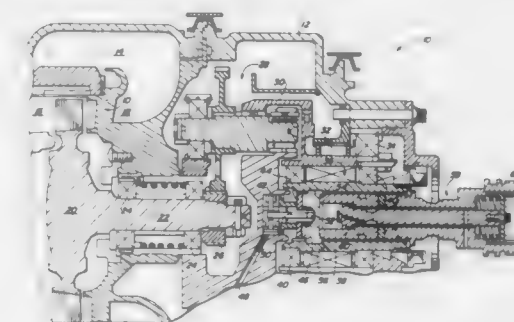
David L. Lescalle, Phoenix; Todd S. Carlson, Chandler; Andrew J. Krochmalny, and Leroy C. Anderson, both of Tempe, all of Ariz., assignors to Allied-Signal Inc., Phoenix, Ariz.

Filed Nov. 7, 1988, Ser. No. 268,311

Int. Cl.⁴ F01D 15/12

U.S. Cl. 415—123

20 Claims



1. A decoupler shaft comprising: a first and a second axially adjacent elongate and coaxial shaft portions, each one of said shaft portions defining respective torque transmitting coupling means for inter-engaging with one of a respective driving mechanism and driven mechanism, said shaft portions also each defining respective driving surfaces and ramp surfaces interengaging in a first relative position of said shaft portions and both extending radially, said driving surfaces of said shaft portions extending substantially axially to transmit driving torque in a first sense between said shaft portions, said ramp surfaces extending both axially and circumferentially to transmit reverse torque in a second sense opposite said first sense with a resulting axial separating force between said shaft portions, a frangible tensile bar member extending between said shaft portions to retain the latter in said first relative position in opposition to said separating force, upon said reverse torque reaching a certain level said tensile bar fracturing to allow said separating force to relatively move said shaft portions to a second spaced apart relative position wherein said driving and ramp surfaces do not interengage.

4,871,297

REACTOR COOLANT PUMP SEALING SURFACES WITH TITANIUM NITRIDE COATING

David J. Boes, Monroeville, and Gene Zottola, Pittsburgh, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 35,832, Apr. 8, 1987, abandoned. This application Aug. 24, 1988, Ser. No. 236,292

Int. Cl.⁴ F01D 11/00

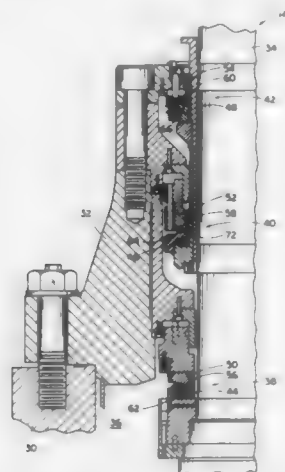
U.S. Cl. 415—170.1

11 Claims

1. In a pump having a shaft and a housing containing pressurized fluid, a rubbing-type sealing assembly for sealably and rotatably mounting said shaft within said housing, said sealing assembly comprising:

- an annular runner circumscribing and mounting around said shaft for rotation therewith;
- an annular seal ring circumscribing and mounted within said housing in non-rotational relationship thereto;
- said runner and seal ring having surfaces facing and in rubbing contact with one another; and

(d) a coating of titanium nitride incorporated on at least one of said surfaces;



(e) said runner and seal ring surfaces being composed of stainless steel.

4,871,298

FALCIFORM BLADE FOR A PROPELLER AND ITS APPLICATION IN PARTICULAR IN MOTORIZED FANS FOR AUTOMOBILES

Jean C. Vera, Valentigney, France, assignor to ECIA - Equipments Et Composants Pour L'Industrie Automobile, Audincourt, France

Filed Jul. 8, 1988, Ser. No. 216,461

Claims priority, application France, Jul. 9, 1987, 87 09773
Int. Cl.⁴ F04D 29/38

U.S. Cl. 416—189

7 Claims



1. A propeller for a fan for an automobile vehicle, said propeller being rotatable about an axis and comprising a peripheral outer part in the form of a sleeve (30), a central hub (20), at least one blade (10) having a foot (12) connected to said hub (20), a head (13) connected to said sleeve (30) and leading (14) and trailing (15) edges which are both curved and arranged relative to each other in such a manner as to impart to the blade a falciform configuration which narrows from said foot to said head in a direction parallel to said axis, wherein the lengths of said foot and head measured in said direction parallel to said axis are in a ratio on the order of 0.4, wherein respective concavities of the curved leading and trailing edges face in a downstream direction with respect to a direction of a fluid flow through the propeller, and wherein the trailing edge (15) is formed by two arcs (152, 153) which have different respective radii (p₂, p₃) and which are interconnected without an angular point.

4,871,299 SCREW COMPRESSOR UNIT INCLUDING A CENTRIFUGAL CLUTCH

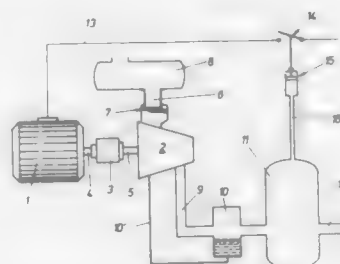
Hans Hrabal, Vienna, Austria, assignor to Hoerbiger Ventilwerke Aktiengesellschaft, Braunhubergasse, Vienna, Austria
Filed Feb. 4, 1988, Ser. No. 152,400

Claims priority, application Austria, Feb. 5, 1987, 237/87

Int. Cl.⁴ F04B 35/00

U.S. Cl. 417—319

6 Claims



1. A compressor unit which comprises a drive motor having a drive shaft, a screw compressor having a driven shaft, and a centrifugal clutch which is connected between said drive shaft and said driven shaft and which can engage said driven shaft with said drive shaft or disengage said driven shaft from said drive shaft based on a speed of rotation of said drive shaft, said centrifugal clutch comprising

an elongated driving clutch member which is connected to said drive shaft,

a driven clutch member which is rotatably mounted on said elongated driving clutch member and is connected to said driven shaft,

a plurality of inner and outer friction discs which are positioned together around said elongated driving clutch member and which are axially movable relative thereto and to one another, said inner friction discs being rotatable with said driving clutch member and said outer friction discs being rotatable with said driven clutch member,

a control member mounted on said elongated driving clutch member by ball bearing means so as to be freely rotatable with respect to said elongated driving clutch member and operable to engage or disengage said inner and outer friction discs and thereby determine whether said drive and driven shafts are engaged or disengaged; said control member including a retention ring, an axially movable pressure plate, a plurality of return springs connected between said retention ring and said pressure plate to bias said pressure plate towards said retention ring, thereby enabling said inner and outer friction plates to be disengaged, and a plurality of weights positioned between said retention ring and said pressure plate which, when forced radially outwardly due to rotation of said control member by said elongated driving clutch member, will move said pressure plate against the bias of said return springs and away from said retention plate, thereby causing said inner and outer friction plates to become engaged.

4,871,300

COMPRESSOR SPRING MOUNTING

Svend E. Outzen, Sonderborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Filed Jul. 14, 1988, Ser. No. 218,849

Claims priority, application Fed. Rep. of Germany, Aug. 12, 1987, 3726758

Int. Cl.⁴ F04B 39/12

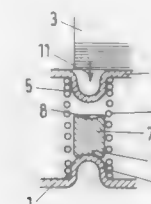
U.S. Cl. 417—363

14 Claims

1. A compressor spring mounting, comprising a compressor base having a lower spring support, a compressor upper spring support movable relative to the lower spring support in at least two dimensions and spaced therefrom, a helical spring dis-

posed between the upper and lower spring supports in abutting relationship to the spring supports and having an interior, and a movable insert disposed in the spring interior and being elongated in the direction of spacing of the supports from one another and movable away from each of the supports, the insert having at least one arcuately curved recessed end, the

fluid is automatically lowered by passage through the bearings causing it to be at a substantially reduced pressure when exiting from the bearings adjacent the impeller, thereby reducing the pressure of said lubricating fluid applied to the impeller as it exits from said bearings.



spring support adjacent to the recessed end having a portion adjacent to and arcuately curved to generally correspond to the adjacent arcuately curved recessed end to permit the insert pivoting in all directions relative to the support portion when the insert is supported by the support portion, the support portion extending into the spring to be abutable against the insert.

4,871,301

CENTRIFUGAL PUMP BEARING ARRANGEMENT

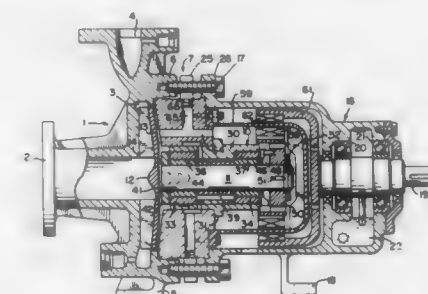
Frederic W. Buse, Allentown, Pa., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Feb. 29, 1988, Ser. No. 161,585

Int. Cl.⁴ F04B 39/02

U.S. Cl. 417—420

5 Claims



1. Centrifugal pump of the sealless type comprising: a housing containing a pumping chamber, a pump inlet passage extending from an inlet in the housing and opening into the pumping chamber and a pump outlet passage running from the pumping chamber to an outlet in the housing; a shaft mounted in said housing for rotation; a pump impeller attached to the forward end of the shaft for rotation with the shaft in the pumping chamber and a magnet holder attached to the rear end of the shaft carrying a first magnetic means adapted to be magnetically coupled to a second magnetic means rotated by a rotary driving device such as an electric motor, said shaft being mounted in at least two bearings spaced from each other along the length of the shaft and located between the impeller and the magnet holder, a shell surrounding the shaft bearings, and magnet holder to seal the pump from the exterior and prevent the pumped fluid from leaking, said shell being located between the two magnetic means and being able to transmit magnetic forces between the two magnetic means for magnetically coupling said two magnetic means together, said housing containing a passage for conducting lubricating fluid to the part of the shaft located rearward of the bearings relative to the impeller and forward of the magnet holder, and means for feeding the lubricating fluid forwardly along the length of said shaft through both bearings before exiting from the bearings adjacent the impeller whereby the pressure on the lubricating

4,871,302 APPARATUS FOR REMOVING FLUID FROM THE GROUND AND METHOD FOR SAME

T. J. Clardy, Seguin, and Henry Meno, Arlington, both of Tex., assignors to Milam/Clardy, Inc., San Antonio, Tex.

Filed Jan. 26, 1988, Ser. No. 148,777

Int. Cl.⁴ F04B 47/08

U.S. Cl. 417—404

10 Claims



1. A hydraulically-driven down hole pump for lifting formation fluids from a formation comprising:

a pump cylinder having a top end and a bottom end;
a power cylinder having a top end and a bottom end;
a power piston located in and sized to fit snugly within said power cylinder;
a pump piston located in and sized to fit snugly within said pump cylinder for lifting formation fluids;
a connecting rod connecting said power piston to said pump piston;

a drive fluid line for feeding a drive fluid from a pressure source to said power cylinder, the drive fluid providing the force for moving said power piston, wherein said drive fluid line is connected to the top end of a cycling valve, and said cycling valve is connected to the top end of said power cylinder;

said cycling valve on said power cylinder for reciprocating said pistons between a first injecting step wherein the drive fluid is injected into the top end of said power cylinder when said power piston has completed the upward stroke to force said power piston downward while simultaneously allowing the drive fluid beneath said power piston to escape therefrom into an outer annulus and a second injecting step wherein the drive fluid is injected into the bottom end of said power cylinder when said power piston has completed the downward stroke to force said power piston upward while simultaneously allowing the drive fluid above said power piston to escape therefrom into the outer annulus;

wherein said cycling valve further comprises:
means for carrying the drive fluid from said drive fluid line to the top end of said power cylinder during the first injecting step of said cycling valve and from said drive fluid line to the bottom end of said power cylinder

during the second injecting step of said cycling valve, wherein said carrying means further includes:

a first poppet valve, said first poppet valve being substantially hollow and having walls defining two sets of ports, said first poppet valve having a first end substantially open to the drive fluid source and a second end, the second end being closed and extending into the power cylinder; and

a second poppet valve, said second poppet valve being substantially hollow and having walls defining a port, said second poppet valve having a first end substantially open to the top end of the power cylinder and with a second end, the second end being closed and extending into the drive fluid source; means for diverting the drive fluid between the first injecting step and the second injecting step wherein said diverting means includes:

a spool with walls, the walls defining a multiplicity of ports and further defining channels, said spool sized to slidably contain a portion of each of said poppet valves and capable of engaging in a first position a first set of the ports of said first poppet valve with the port of said second poppet valve through a first port of the multiplicity of ports of said spool for a first injecting of the drive fluid into the top end of the cylinder, while further capable of simultaneously directing fluid removed from the bottom end of the cylinder through the channels and around said diverting means and said carrying means and in a second position for engaging a second set of ports of said first poppet valve with a second port of the multiplicity of ports of said spool for a second injecting of the drive fluid into the bottom of the cylinder, while allowing the drive fluid expelled from the top end of the cylinder to enter said second poppet valve and pass there-through to an exterior of the pump through the port of said second poppet valve and through a third port of the multiplicity of ports of said spool;

a valve body with walls defining ports, said ports adapted to allow the passage of the drive fluid therethrough, said valve body sized to contain said diverting means and said carrying means; and

trip means connected to said power piston for alternating said cycling valve between the first injecting step and the second injecting step;

wherein said trip means activates said diverting means causing said cycling valve to reciprocate between the first injecting step and the second injecting step.

4,871,303

FUEL DRAIN SAFETY SYSTEM FOR FUEL PUMPS AND THE LIKE

Carl A. Roessler, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Aug. 1, 1988, Ser. No. 226,744

Int. Cl.⁴ F04B 21/00

U.S. Cl. 417-434

17 Claims

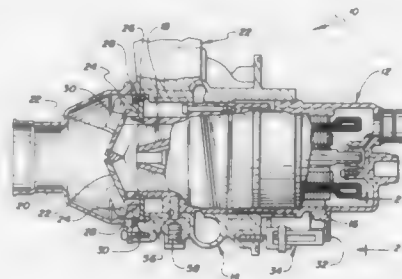
7. In a fuel pump for an aircraft fuel tank and the like, a fuel drain system comprising:

a housing including an inlet; closure means for opening and closing said inlet; a pump cartridge positionable in the housing for removal therefrom;

means operatively associated between the pump cartridge in the closure means for closing the inlet in response to at least initial removal movement of the pump cartridge; drain means removably mounted on and projecting from the pump cartridge for draining residual fuel from the pump cartridge prior to removal of the cartridge from the housing; and

stop means located in a path of movement of the projecting drain means to prevent removal of the pump cartridge

from the housing unless the drain means is removed from the pump cartridge, whereby removal of the drain means



is effective to verify closing of the inlet by the closure means.

4,871,304

AXIAL FLOW FLUID COMPRESSOR

Toshikatsu Iida, Yokohama, and Takayoshi Fujiwara, Kawasaki, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

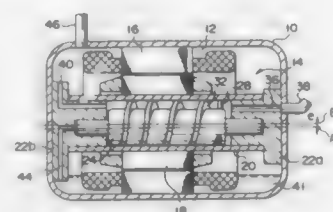
Filed Jul. 11, 1988, Ser. No. 217,883

Claims priority, application Japan, Jul. 31, 1987, 62-191564; Jul. 31, 1987, 62-191565

Int. Cl.⁴ F04B 39/02

U.S. Cl. 418-220

17 Claims



1. A fluid compressor comprising:

a cylinder having a suction-side end and a discharge-side end;

a columnar rotating body located in the cylinder so as to extend along the axial direction of the cylinder and be eccentric thereto, and rotatable relative to the cylinder while part of said rotating body is in contact with the inner peripheral surface of the cylinder, said rotating body having a spiral groove on the outer peripheral surface thereof, said groove having pitches gradually narrowing with distance from the suction-side end of the cylinder;

a spiral blade fitted in the groove so as to be slidable, substantially in the radial direction of the rotating body, having an outer peripheral surface intimately in contact with the inner peripheral surface of the cylinder, and dividing the space between the inner peripheral surface of the cylinder and the outer peripheral surface of the rotating body into a plurality of operating chambers having volumes gradually decreasing with distance from the suction-side end of the cylinder; and

drive means for relatively rotating the cylinder and the rotating body to successively transport a fluid introduced from the suction-side end of the cylinder into the cylinder toward the discharge-side end of the cylinder through the operating chambers.

4,871,305

MACHINE FOR VULCANIZING TIRES, WITH DEVICES FOR COLLECTING AND UNLOADING THE TIRE BEING TREATED

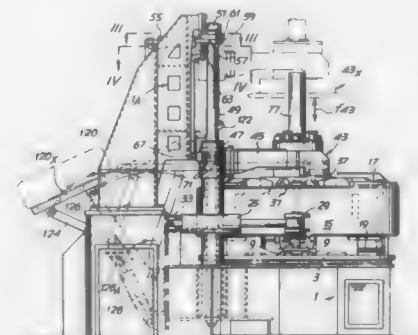
Tiziano Galigani, Pistoia, Italy, assignor to Cima Impianti S.p.A., Pistoia, Italy

Filed Apr. 27, 1988, Ser. No. 186,595

Claims priority, application Italy, Apr. 30, 1987, 9381 A/87 Int. Cl.⁴ B29C 35/00

U.S. Cl. 425-35

16 Claims



1. A device for vulcanizing tires comprising: moving element means for moving a tire to be vulcanized from a collection location to a mold location and for moving a vulcanized tire from the mold location to a removal location; a top mold section connected to said moving element means; collection centering means for collecting the tires to be vulcanized and centering a rim of the tire to be vulcanized; grasping means connected to said moving element means for retaining the rim against the top mold section after the interior rim edge has been centered and for releasing the rim from the top mold section prior to vulcanizing the tire, said grasping means including oscillatable elements connected to said moving element means and connected to grasping elements for moving the grasping elements between a grasped position and a disengaged position; radially movable mold segments positioned at said mold location, said segments movable radially toward the tire to be vulcanized to be positioned about the tire to be vulcanized upon the tire to be vulcanized being moved from the collection location to the mold location; flexible chamber means positionable within the tire to be vulcanized after said radially movable mold parts are positioned about the tire to be vulcanized to maintain the tire to be vulcanized in a centered position with respect to the top mold section and the radially movable mold parts; and, piston means for moving said grasping means after said grasping element have been disengaged from the tire to be vulcanized from within the mold sections to a location above said top mold section after the flexible chamber means centers the tire to be vulcanized.

4,871,306

AUTOMATIC MOULD UNLOADER FOR HAMS AND THE LIKE

Giovanni Imperi, Cecchian Di Albano, Italy, assignor to Cesare Fiorucci S.p.A., Italy

Filed Oct. 20, 1988, Ser. No. 260,502

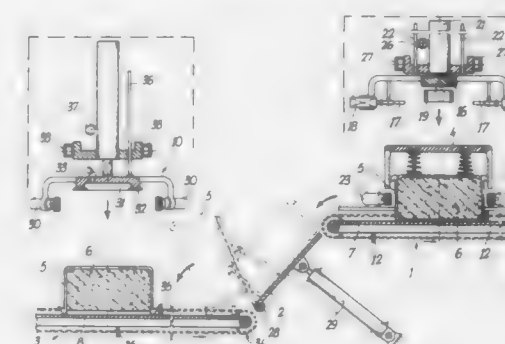
Claims priority, application Italy, Nov. 16, 1987, 48617 A/87 Int. Cl.⁴ A22C 17/00; B29C 41/42

U.S. Cl. 425-437

18 Claims

1. A mould unloader for moulds in which meat products are processed, said moulds being closed by lids removably hooked thereto, said unloader comprising first, intermediate and second stations arranged sequentially along a working line, opening means at said first station for unlocking and removing said lids to thereby expose the products contained in said moulds, overturning means at said intermediate station for overturning

the thus opened molds containing said products, mold removal means at said second station for removing the thus overturned



molds from said products, and means for transferring the thus removed molds from said second station.

4,871,307

FLAME IGNITION AND MONITORING SYSTEM AND METHOD

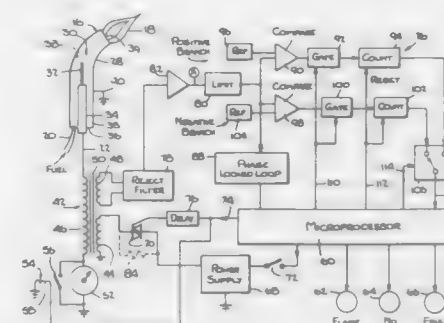
George W. Harris, 301 Wilcrest #5310, Houston, Tex. 77042, and John D. Echols, 32503 Pintlall, Brookshire, Tex. 77423

Filed Nov. 2, 1988, Ser. No. 266,478

Int. Cl.⁴ F23Q 23/00

U.S. Cl. 431-25

20 Claims



1. A flame ignition and monitoring system comprising:

an electrode assembly positioned at a fuel passage for directing electric current into the passage for ignition and monitoring of a burning of fuel;

current generating means connected to said electrode assembly for generating said current, said generating means including a transformer for outputting alternating current at a frequency less than approximately 400 Hz and a high voltage in excess of approximately 4000 volts, said transformer outputting a monitoring signal proportional to said current; and

signal processing means connected to said transformer for processing said monitoring signal to determine the presence of a flame at said passage, said processing means including means for sensing a harmonic component of said monitoring signal to determine presence of a flame.

4,871,308

METHOD AND APPARATUS FOR HEATING A FLUID STREAM

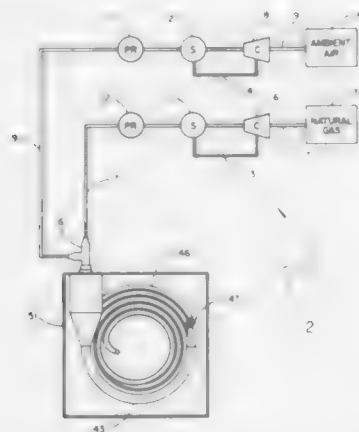
John P. Norton; Steven Schneider; William D. Wilder, and Stephen J. Hunsell, all of Hamilton County, Ohio, assignors to Combustion Concepts Inc., Detroit, Mich. and Williams Company, Cincinnati, Ohio

Filed Nov. 25, 1987, Ser. No. 125,168

Int. Cl.⁴ F24H 1/00

U.S. Cl. 432—29

50 Claims



1. An improved flow through process for heating fluids comprising:

- compressing a combustible fuel gas to a preselected pressure level in a first compression zone;
- compressing a combustion supporting gas to a preselected pressure level in a second compression zone;
- passing said compressed gases from said first and second compression zones through an injection and mixing zone having entrance and exit sections in a preselected manner to thoroughly mix said compressed gases;
- passing said mixture of compressed gases through a combustion zone having entrance and exit sections, igniting the mixture while therein;
- passing said products of combustion from said combustion zone through a heat exchange zone wherein said products are progressively contracted from inlet to outlet to increase the velocity thereof;
- passing a fluid to be heated through said heat exchange zone in flow-through heat exchange relation therewith; and,
- exhausting said contracted products of combustion directly to ambient from said heat exchange zone.

4,871,309

APPARATUS FOR PREPARING SAMPLES

David J. Chapman, East Hawthorn, Australia, assignor to D. J. C. Electrical Engineering Pty. Ltd., Victoria, Australia

Filed Jul. 21, 1988, Ser. No. 222,722

Claims priority, application Australia, Aug. 6, 1987, PI3575

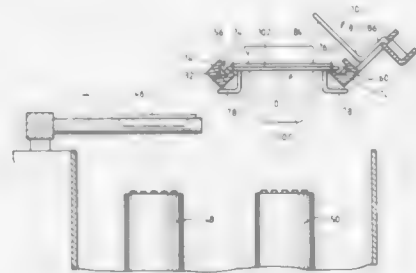
Int. Cl.⁴ F27B 14/00

U.S. Cl. 432—156

15 Claims

1. An apparatus for producing a sample, said apparatus comprising a tilting mechanism for tilting a crucible and a support means for supporting a dish into which the contents of the crucible can be poured, said tilting mechanism including means for supporting a crucible holder, a crucible holder for location in said means such that the crucible can be located in the holder and the tilting mechanism actuated to pour the contents of the crucible into the dish, and wherein the tilting mechanism includes retainer means for holding the crucible in

the crucible holder when the tilting mechanism tilts the crucible, pivot means supporting said retainer means for pivotal



movement between crucible release and crucible clamping position.

4,871,310

FUNCTIONAL ORTHOPEDIC MAGNETIC APPLIANCES (FOMA)

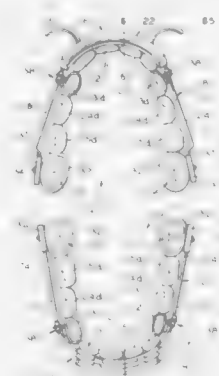
Alexander D. Vardimon, 1337 E. Madison Park, Chicago, Ill. 60615

Filed Jul. 29, 1987, Ser. No. 79,133

Int. Cl.⁴ A61C 7/00

U.S. Cl. 433—19

44 Claims



1. A functional orthopedic magnetic appliance ("FOMA") for correcting skeletal malocclusions (Class II & Class III) of the upper and lower jaws over treatment time when one of the jaws protrudes further anteriorly within a sagittal plane than the other jaw, comprising:

- an upper support secured to the teeth of the upper jaw;
- an upper anterior magnetic unit mounted to the upper support adjacent to the anterior end of the upper dental arch;
- a lower support secured to the teeth of the lower jaw;
- a lower anterior magnetic unit mounted to the lower support adjacent to the anterior end of the lower dental arch, said anterior magnetic unit associated with said protruding jaw being positioned anterior from said other magnetic unit when the mouth is in an open condition and substantially no magnetic force is present, the poles of said upper and lower magnetic units being arranged for magnetically attracting each other, said lower magnetic unit contacting said upper magnetic unit to pull the lower jaw toward the upper jaw in the direction to reduce the malocclusion when the mouth moves toward a closed condition; and
- sagittal adjustment means associated with one of the anterior magnetic units for varying the distance of said one anterior magnetic unit from the corresponding anterior end of the dental arch in the postero-anterior direction within the sagittal plane and simultaneously increasing the sagittal distance between the upper and lower anterior magnetic units to increase the force acting on said lower jaw but

maintaining the anterior magnetic unit associated with the protruding jaw anterior from the other anterior magnetic unit, when the mouth is in said open condition during said treatment time.

4,871,311

IMPROVEMENTS IN A METHOD OF AND A RETRACTION CORD FOR UNCOVERING AND DRAINING THE PREPARATION LIMIT LINE OF TEETH

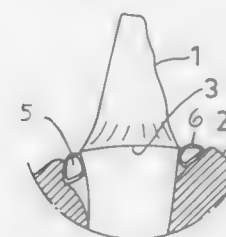
Leif Hagge, Compognapark a, CH-7430 Thusis, Switzerland

Filed Nov. 25, 1987, Ser. No. 125,317

Int. Cl.⁴ A61C 5/14

U.S. Cl. 433—136

10 Claims

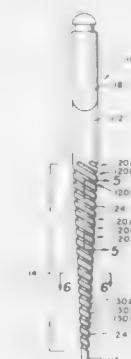


1. A method for uncovering and draining the preparation limit line of a tooth where the tooth emerges from gum tissue which is subject to bleeding during the course of conducting a procedure such as the taking of a dental impression, the cementing of a crown and the performance of conservative caries therapy,

said method comprising:

- (a) providing a retraction cord made at least in part of an externally accessible superabsorbent swelling material;
- (b) inserting said cord in a gingival crevice extending perimetrically of a tooth having a preparation limit line, where the tooth emerges from gum tissue, between the tooth and the gum tissue, and permitting the cord to absorb moisture so that the cord swells and thereby mechanically uncovers said preparation limit line and mechanically compresses said gum tissue, tending to stop bleeding of such gum tissue.

a helical land at the periphery of the working portion of said shank extending between adjacent flutes; and



helical shoulders having a substantially neutral rake angle at the periphery of said working portion of said shank.

4,871,313

DENTAL PIN

Pierre-Luc Maillefer, Canton of Vaud, Switzerland, assignor to Les Fils d'Auguste Maillefer, Societe Anonyme a Ballaigues, Switzerland

Filed Aug. 31, 1988, Ser. No. 238,745

Claims priority, application Switzerland, Sep. 8, 1987, 3464/87

Int. Cl.⁴ A61C 5/04

U.S. Cl. 433—225

6 Claims



1. A dental pin comprising a stem provided with a head, in which at least an apical part of said stem is tubular, and is provided with at least one outer thread and one helical groove.

4,871,314

TOY BALANCE CONCEPT-DEVELOPING DEVICE

Hsu-Shen Shih, No. 75, Lane 101, Nan Yuan St., Tainan, Taiwan

Filed Jan. 9, 1989, Ser. No. 294,300

Int. Cl.⁴ G09B 19/02

U.S. Cl. 434—194

1 Claim

1. A toy balance concept-developing device for helping children to develop a concept of balance, comprising a housing, a positioning means, a beam, a model, a plurality of weights and a clip, characterized in that:

- said housing has first and second apertures located thereon and an ornamental means on the front side thereof;
- said positioning means is substantially U-shaped and has a first conical member secured thereunder for engaging with said first aperture, a notch being formed on each side of said positioning means to support said beam;
- said beam has a tip means formed on the middle bottom thereof so as to contact said notches at a point, a transverse bore being formed on said beam and being aligned with said tip means for receiving a spindle, a container

4,871,312

DENTAL COMPACTOR INSTRUMENT

Derek E. Heath, Johnson City, Tenn., assignor to Quality Dental Products, Inc., Johnson City, Tenn.

Filed Nov. 4, 1988, Ser. No. 267,531

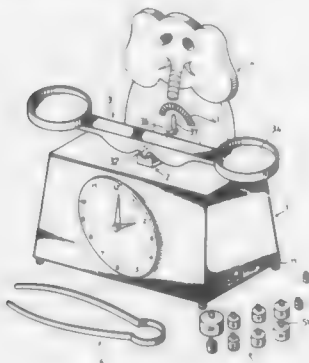
Int. Cl.⁴ A61C 3/08

U.S. Cl. 433—164

6 Claims

- 1. A dental compactor instrument comprising:
- a shank terminating at a pilot tip end;
- a tapered working portion along at least a portion of the length of said shank;
- flute means formed in the working portion of the shank defining at least two continuous helical flutes having helical shoulders at the periphery of said working portion of said shank;

being attached to each distal end of said beam by fitting a protrusion protruding from said each distal end of said beam to a recess formed on each said container thereunder, and a pointer which has a hole at a bottom end thereof to receive said spindle;



said model has a scale thereon, a cavity being below said scale and aligned with said bore; said cavity receiving said spindle therein, a second conical member being attached under said model to engage with said second aperture; said weights each having a lug connected thereon to facilitate picking up thereof by children with said clip; each said weight being different in weight.

4,871,315

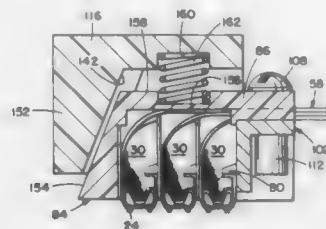
RIBBON CABLE CONNECTOR

Rocco Noschese, Wilton, Conn., assignor to Burndy Corporation, Norwalk, Conn.

Filed Mar. 30, 1988, Ser. No. 175,209
Int. Cl.⁴ H01R 9/09

U.S. Cl. 439-67

51 Claims



11. A cable holder subassembly for terminating ribbon cable including a plurality of side by side cable strips, each cable strip having at least a pair of longitudinally spaced outwardly projecting contacts thereon, said subassembly comprising:

a cable holder block including:

an elongated main body having first and second opposed sidewalls and a laterally extending ridge having an extreme surface distant from said main body and defining a pair of opposed laterally extending recesses; and a plurality of parallel, spaced apart ribs in each of the recesses and integral with said main body and said ridge thereby defining a plurality of side by side slots; and

a cable spring array including:

a laterally extending elongated spine fixed to said extreme surface of said ridge;

a plurality of pairs of spring members integral with said spine at spaced locations along the length thereof, individual members of each said spring pair extending in opposite directions from said spine, each of said individual spring members being bowed and snugly received in an associated one of the slots of said holder block and terminating at a free end proximate to, but spaced from, said spine; thereby enabling the cable strips to be drawn across said first

sidewall, then around said spring array such that each cable strip is aligned with an associated pair of said spring elements, then across said second sidewall, the cable being fixed, together with said cable spring array, to said extreme surface of said ridge, said free ends of each of said spring members being aligned with an associated contact on an associated cable strip so as to bias the contact in a direction away from said holder block.

4,871,316

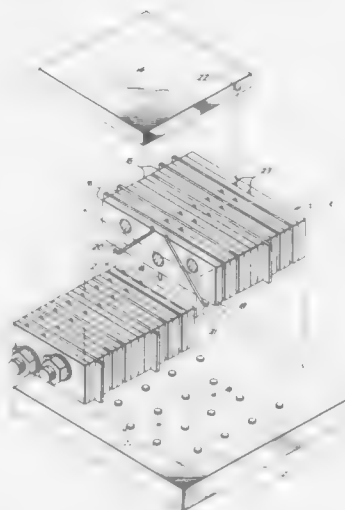
PRINTED WIRE CONNECTOR

Dennis J. Herrell, Austin, Tex., and Omkarnath R. Gupta, Englewood, Colo., assignors to Microelectronics and Computer Technology Corporation, Austin, Tex.

Filed Oct. 17, 1988, Ser. No. 258,939
Int. Cl.⁴ H01R 9/09

U.S. Cl. 439-66

19 Claims



1. A printed wire connector for connecting components, comprising a series of modules positioned adjacent each other, said modules including an insulative layer and electrically conductive wires extending across one face of said insulative layer to connect elements at opposite ends of said wires, wherein said modules further including a conductive layer positioned on the side of said insulative layer opposite said conductive wires.

4,871,317

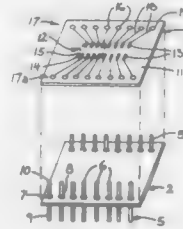
SURFACE MOUNTED COMPONENT ADAPTOR FOR INTERCONNECTING OF SURFACE MOUNTED CIRCUIT COMPONENTS

Robert E. Jones, Saint Peters, Mo., assignor to A. O. Smith Corporation, Milwaukee, Wis.

Filed Dec. 2, 1987, Ser. No. 127,786
Int. Cl.⁴ H01L 23/12

U.S. Cl. 439-68

9 Claims



1. A surface component adaptor assembly for use with a

through-hole prototyping hardware vector boards, comprising a plurality of similar base means formed of an insulating material, each of said base means including through-holes secured to said base means in first and second spaced parallel rows, each row including a plurality of pins connected to said holes and projecting from said base means a first series of said base means including a predetermined array of surface mounted solder pads located in first and second parallel rows of spaced solder pads in alignment with said parallel rows of holes and secured to said base means in accordance with the contact array of a first series of surface mounted components and providing a plurality of said arrays with a pad for each hole in said base means, a second series of said base means including a predetermined array of surface mounted solder pads secured to said base means in first and second parallel rows of spaced solder pads in alignment with said parallel rows of holes and in accordance with the contact array of a second series of surface mounted components different than said first series and providing a plurality of said second arrays with a pad for each hole in said second series of base means, said second series of surface mounted components having a contact array different than said first series of surface mounted components, said first and second series of base means being located in parallel spaced relation to said parallel rows of holes, and printed circuit means secured to said base means in both said series and including a plurality of separate leads connecting each of said holes to selected solder pads to establish a direct and separate connection for each of said pads to said pins, said pins projecting from one side of said base means in both said series and providing for connecting of hard-wired components to the circuit of said surface mounted components and projecting from the opposite side providing for plug-in connection of the base means.

4,871,318

TAPERED STRAIN RELIEF ELECTRICAL INTERCONNECTION SYSTEM

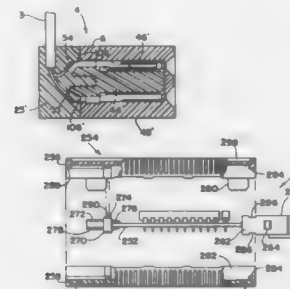
Roy A. Gobets, and John N. Tengler, both of Chico, Calif., assignors to Minnesota Mining & Manufacturing Company, Saint Paul, Minn.

Division of Ser. No. 897,112, Aug. 14, 1986, Pat. No. 4,718,860.
This application Jan. 11, 1988, Ser. No. 142,831

Int. Cl.⁴ H01R 9/07, 9/09

U.S. Cl. 439-76

7 Claims



1. A printed circuit board termination assembly, comprising a printed circuit board having plural printed circuit conductor traces thereon,

plural electrical contact means for effecting electrical connection between a respective said conductor of said printed circuit board and a further member, said electrical contact means having a connecting means for connecting with a respective said conductor of said printed circuit board and having contacting means for contacting with such further member,

carrier means for carrying said contact means, said carrier means including plural parallel fingers for supporting said contact means in one plane while permitting freedom of movement of said contact means in a direction parallel to said one plane, a space between respective adjacent fin-

gers, and base means for holding said fingers in relative position, said contacting means being positionable to extend in a generally parallel overlying relation with a respective finger,

said electrical contact means being arranged in a pair of parallel rows, said contact means in one row being arranged in spaced apart parallel relation to said contact means in the other row, and each said connecting means of said electrical contact means including a connecting portion, said connecting portions being arranged in a pair of respective parallel rows and said rows being spaced apart a distance less than the spacing of said contacting means, housing means for holding together in snap fit relation said carrier means and contact means, and

said printed circuit board being positioned between said parallel rows of said connecting portions and further comprising connections between respective circuits on said printed circuit board and said connecting portions, said carrier means including a slot disposed between said rows of contact means, and said printed circuit board having an edge portion inserted in said slot.

4,871,319

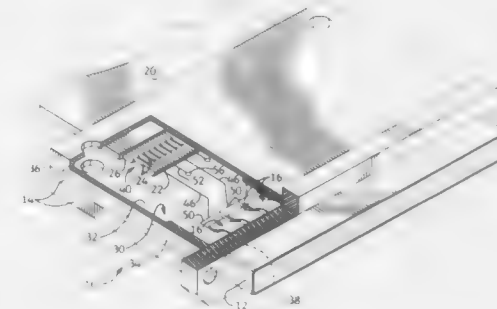
MOLDED CIRCUIT BOARD FOR RIBBON CABLE CONNECTOR

David A. Babow, Scottsdale, Ariz., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 21, 1988, Ser. No. 288,047
Int. Cl.⁴ H01R 9/09

U.S. Cl. 439-77

11 Claims



1. A transition adapter having circuit paths thereon for providing an electrical connection transition between ends of closely spaced conductors of at least one ribbon cable and respective terminals spaced more widely apart in at least one plane, for an electrical connector terminating the at least one ribbon cable, comprising:

a molded substrate having first and second major surfaces extending from a cable-proximate edge to a connector-proximate edge, said substrate having on at least one of said first and second major surfaces a wire-terminating region proximate said cable-proximate edge including wire-terminating pads corresponding to said conductors of said at least one cable and spaced to correspond to the centerline spacing of said conductors in said cable, said substrate further including on at least one of said first and second major surfaces a terminal-connecting region proximate said connector-proximate edge including terminal-connecting pads therealong corresponding to said terminals of a connector, and said substrate further including circuit paths electrically connecting associated wire-terminating pads and terminal-connecting pads, with said circuit paths, said wire-terminating pads and said terminal-connecting pads being plated on said substrate; and said substrate having serrate ridges included in each said wire-terminating region separating adjacent ones of said wire-terminating pads, defining wire-receiving grooves

therebetween with respective said wire-terminating pads along bottoms thereof, whereby when a said cable is placed adjacent said substrate with exposed conductor wire ends above a respective said wire-terminating region, said wire ends are appropriately located and aligned by said ridges within respective grooves upon being wiped thereinto without alignment tooling, for solder termination to respective said wire-termination pads along said groove bottoms.

4,871,320 PIN HOLDER

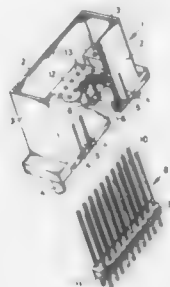
Bob Mouissie, Berticum, Netherlands, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Filed Oct. 6, 1988, Ser. No. 254,181

Claims priority, application Fed. Rep. of Germany, Oct. 16, 1987, 8713932[U]

Int. Cl.⁴ H01R 9/09

U.S. Cl. 439—78

4 Claims



1. A pin holder for a separable electronic plug connection, comprising a holder having located therein a pin carrier provided with a plurality of pins and an intermediate wall which is provided with openings through which the pins extend, said pin carrier detachably fixed in the holder by means of fixing elements, said fixing elements having a plurality of resilient lips which are formed on the holder and are provided at their free ends with inwardly protruding hook-shaped parts, and further including outwardly directed protruding parts which are formed on the pin carrier and, in the assembled state, engage behind the hook-shaped parts, said hook-shaped parts being provided with obliquely running contact surfaces which can interact with said protruding parts in such a way that, when the pin carrier is pushed into the holder, the resilient lips are initially pushed away sideways and thereafter, due to their spring force, engage with their hook-shaped parts behind the protruding parts, said holder further including stopping means to prevent the pin carrier from being pushed further into the holder.

4,871,321 ELECTRICAL CONNECTOR

Lennart B. Johnson, Milford, N.H., assignor to Teradyne, Inc., Boston, Mass.

Filed Mar. 22, 1988, Ser. No. 171,909

Int. Cl.⁴ H01R 9/00

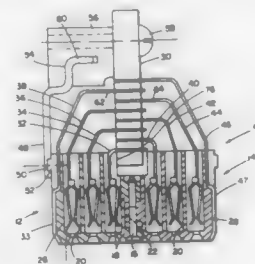
U.S. Cl. 439—79

16 Claims

1. A daughter board connector element for electrically connecting a daughter board to a perpendicular backplane comprising

a first housing piece that includes an upper portion for connection to a major surface of said daughter board near one end of said daughter board and a lower portion that extends downward beyond said end toward the backplane, said first housing piece being substantially located on one side of a plane passing through said daughter board between its major faces, means to secure said first housing piece to a second housing piece for a second connector element adapted to be con-

nected to the other major surface of said daughter board near said end of said daughter board and to be substantially located on the other side of said plane passing through said daughter board, said means extending from said lower portion transverse to and through said plane below said end, and



a plurality of contacts extending from said lower portion of said first housing piece and through said upper portion of said first housing piece, said contacts being located in said housing outward from said plane of said means to secure.

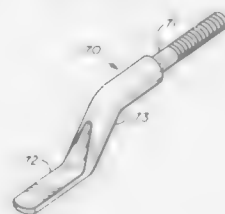
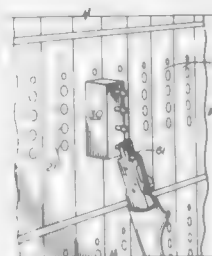
4,871,322 CONNECTOR

Robert E. Hardcastle, 2019 Sandydale, Houston, Tex. 77039
Filed Jun. 24, 1988, Ser. No. 211,251

Int. Cl.⁴ H01R 13/00

U.S. Cl. 439—169

5 Claims



1. An improved electrical connector for use with a clip, comprising:
an externally threaded stem;
clip jaws receiving means having opposed flattened surfaces;
neck means linking said stem to said clip jaws receiving means in a laterally offset relationship, said neck means having an obtuse angled relationship to each of said stem and said receiving means.

4,871,323 CONNECTOR WITH CONNECTION CHECK DEVICE

Hideki Ohsumi, Shizuoka, Japan, assignor to Yazaki Corporation, Tokyo, Japan

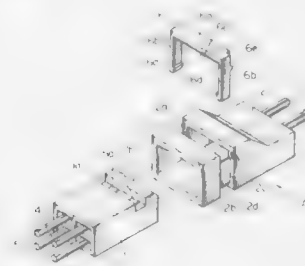
Filed Nov. 23, 1988, Ser. No. 275,197

Claims priority, application Japan, Nov. 24, 1987, 62-177478[U]

Int. Cl.⁴ H01R 29/00

U.S. Cl. 439—188

4 Claims



1. A connector with a connection check structure comprising first and second connector housings to be engaged with each other at respective forward portions thereof, said respective forward portions being formed with lateral slots adapted to be in registration at the time of full engagement:
at least two connection check conductors housed in one of said first and second connector housings to be exposed externally of said engaging connector housings through said slots;
a spacer adapted to be inserted into said slots from outside said connector housings; and
conductive short circuit means provided between said at least two connection check conductors and said spacer within said slots, said conductive short circuit means straddling said at least two connection check conductors.

4,871,324 BACKPLANE FOR SUPPORTING REMOVABLE MODULAR

Johannes Brune, Erlangen, and Hans-Peter Latussek, Feucht, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

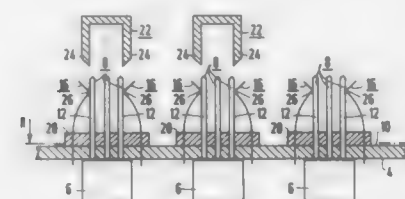
Filed Mar. 18, 1988, Ser. No. 170,145

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1987, 3709119

Int. Cl.⁴ H01R 9/22, 13/70

U.S. Cl. 439—189

12 Claims



1. A backplane for a subrack having modules, comprising: a plurality of socket connectors arranged in parallel next to each other on a side of the backplane facing the modules; each of said socket connectors comprising a plurality of pins and bus contact pins on the side of the backplane facing away from said modules;
said pins and said bus contact pins of said socket connectors together forming a pin field on the side of the backplane facing away from said modules;

at least one bus having at least one bus line;
a plurality of resilient contact pins corresponding to a bus contact pin of each socket connector, said resilient contact pins being electrically connected with spring force to said associated bus contact pin;
said resilient contact pins of a bus being electrically interconnected with the bus line; and
means for separating each of said resilient contact pins from its associated bus contact with a handling means made of insulating material.

4,871,325 CONNECTOR

Toshiro Maejima, and Shigemitsu Inaba, both of Shizuoka, Japan, assignors to Yazaki Corporation, Japan

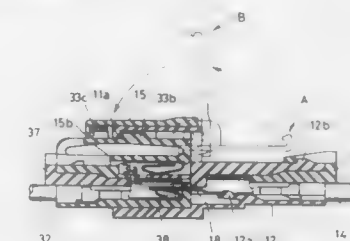
Filed Sep. 30, 1988, Ser. No. 251,448

Claims priority, application Japan, Sep. 30, 1987, 62-148273[U]

Int. Cl.⁴ H01R 13/627

U.S. Cl. 439—353

3 Claims



3. A connector having a first housing formed with a first wire connector terminal housing, a deformable engage beam block portion and an arm locking bridge portion, and a second housing formed with a second wire connector terminal housing and an engage projection portion engaged with the deformable engage beam block portion when said first and second connector housings are connected to each other for wire connection, wherein said second housing is provided with a pivotal locking member partially pivotable in one pivotal direction when said first and second housings are engaged and further locked to the arm locking bridge portion when said pivotal locking member is further pivoted along said one pivotal direction for connector locking operation to allow a worker to confirm both engagement and locking conditions of the first and second housings on the basis of two pivotal positions of said pivotal locking member.

4,871,326

ELECTRICAL HARNESS HAVING ONE CONNECTOR INTENDED FOR CIRCUIT BOARD MOUNTING

Paul A. Coon, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Aug. 17, 1988, Ser. No. 233,195

Int. Cl.⁴ H01R 9/09

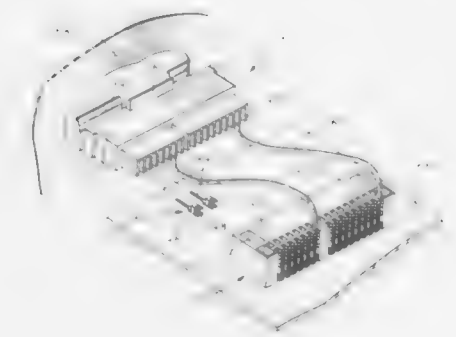
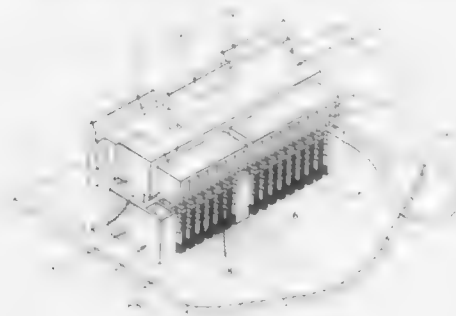
U.S. Cl. 439—502

20 Claims

1. An electrical harness which is destined for installation in an apparatus which has a circuit board, the circuit board having circuit board conductors thereon, the harness comprising first and second electrical connector housings having first and second terminal means therein and flexible conductors which extend between the first and second terminal means, the first housing being destined for installation in the apparatus at a first location which is on the circuit board, the second housing being destined for installation in the apparatus at a second location which is not on the circuit board, the harness being characterized in that:

the first and second housings are adjacent to each other and are disengageably secured to each other, the flexible conductors forming a loop which extends from the first housing to the second housing, and

the first terminal means have surface portions for soldering to circuit board conductors whereby, the first housing can be mounted on the circuit board and the first terminals means soldered to the circuit board conductors while the



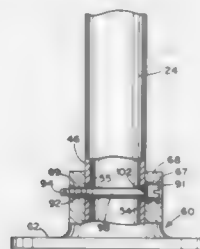
first and second housings are secured to each other, and thereafter the circuit board can be installed in the apparatus, the second housing can be disengaged from the first housing, and the second housing can be installed in the apparatus at the second location.

4,871,327 COMBINED ELECTRICAL GROUNDING AND MECHANICAL LOCKING MEANS FOR CEILING MOUNTED DEVICE

Paul A. Ridgway, Julian, and William P. Butterfield, Ramona, both of Calif., assignors to H.P. Incorporated, Ramona, Calif.
Filed Nov. 14, 1988, Ser. No. 271,897
Int. Cl.⁴ H01R 13/73

U.S. Cl. 439-543

8 Claims



1. Apparatus for releasably electrically and mechanically attaching an electrical device to an overhead support, comprising:

a downrod depending downwardly from said support and attached thereto and coupling means to couple the lower end of said downrod to an upwardly extending hub on said device, said coupling means comprising a male-female

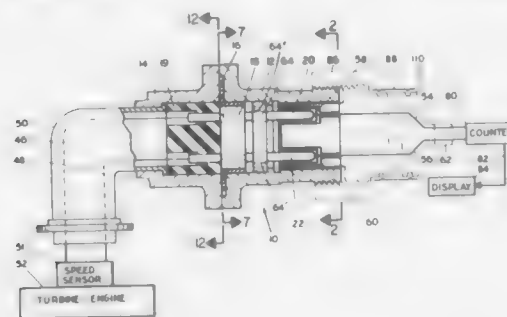
joint between said downrod and said hub, said downrod and said hub having mutually interfitting walls; a pair of openings in opposite sides of each of said interfitting walls, said openings all being aligned; and rod means extending through said aligned openings, said rod means having a head at one end thereof, which passes through one opening on the outer of said downrod and hub and contacts the outer surface of the wall of the inner of said downrod and hub, with a threaded portion disposed at the end of said rod means opposite to said head for engaging an internal thread of the opposite opening on said outer of said downrod and hub, said rod means electrically and mechanically securing said downrod and said hub.

4,871,328 HERMETICALLY SEALING CONNECTOR AND METHOD OF USE THEREOF

James R. Wright, Guilford; James R. Hall, Bainbridge, and Keith D. Theobald, Sidney, all of N.Y., assignors to Simmonds Precision Products, Inc., Wilmington, Del.
Filed Sep. 14, 1988, Ser. No. 244,199
Int. Cl.⁴ H01R 13/40

U.S. Cl. 439-589

24 Claims



1. A hermetically sealing connector, comprising: an electrical insulator, at least one electrically conducting contact, a malleable sealing flange, and a first and a second housing, each of said housings having an end flange which extends radially from the central axis of the housing, at least one of said housing flanges having a groove in the side thereof, the other of said housing flanges having a tongue in the side thereof, said flange of said connector being positioned between said tongue and said groove, said connector flange forming a hermetic seal between said housing flanges, said housing flanges being bolted together, said insulator being supported by said flange, said contact being supported by said insulator, said sealing flange extending radially outward from said insulator.

4,871,329 SNAP-LOCK CONNECTION

Johannes A. Van Der Meer, Drachten, Netherlands, assignor to U.S. Philips Corporation, N.Y., N.Y.

Filed Nov. 2, 1987, Ser. No. 116,601

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1986, 8629518[U]

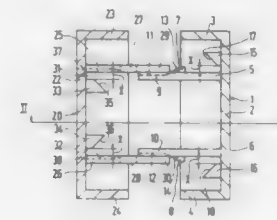
Int. Cl.⁴ H01R 13/506, 13/639

U.S. Cl. 439-594

22 Claims

1. A snap-lock connection between housing parts of an electrical apparatus, comprising at least one latching hook connected to a first housing part and arranged to engage in a latching element connected to a second housing part, each latching hook and each latching element being elastically movable into and out of latching engagement, wherein at a distance from each latching element a stop for a latching hook

is formed on the facing second housing part and at a distance from each latching hook a further stop for the latching element is formed on the facing first housing part to preclude inadvertent disengagement, movement of each latching element and of each latching hook after latching engagement being limited by a stop associated therewith.



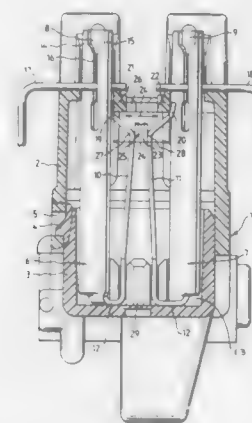
tent disengagement, movement of each latching element and of each latching hook after latching engagement being limited by a stop associated therewith.

4,871,330 ELECTRICAL CONNECTOR CONSTRUCTION

Manfred Muller, and Lutz Biederstedt, both of Berlin, Fed. Rep. of Germany, assignors to Krone Aktiengesellschaft, Fed. Rep. of Germany
Filed May 9, 1988, Ser. No. 191,553
Claims priority, application Fed. Rep. of Germany, May 8, 1987, 3715876

U.S. Cl. 439-709

Int. Cl.⁴ H01R 9/22



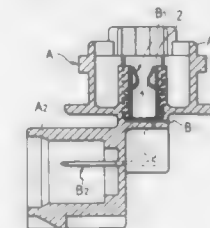
1. A connecting strip comprising: a housing defining spaced-apart electrical cutting/clamping element receiving channels and including wall portions intermediate said cutting/clamping receiving channels defining an electrical connecting plug-in channel; a plurality of cutting/clamping elements, each of said plurality of cutting/clamping elements being positioned in one of said cutting/clamping element receiving channels; a plurality of break contact flaps, each of said plurality of break contact flaps including a lower portion connected to one of said plurality of cutting/clamping contacts, an angled bend portion and an extension, each of said angle bend portion extending in a direction toward an associated opposite angle bend portion of an associated opposite break contact flap, each extension resting on a cooperating one of said wall portions to provide a gap between opposite break contact flaps to delimit said electrical connecting plug-in channel.

4,871,331 BULB SOCKET FOR WEDGED-BASE BULB

Hiroyuki Kondo; Tadashi Harada, and Kihachiro Uchida, all of Shizuoka, Japan, assignors to Yazaki Corporation and Koito Manufacturing Co., Ltd., both of Tokyo, Japan
Filed May 25, 1988, Ser. No. 198,257
Int. Cl.⁴ H01B 13/00

U.S. Cl. 439-736

3 Claims



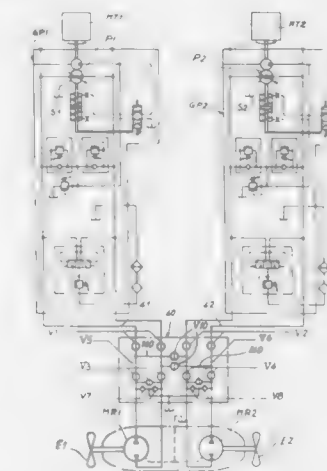
1. A socket for a wedge-base bulb, comprising: a molded-resin body, and a plurality of terminals partially embedded in said body as said body is molded, bulb contact parts of said terminal being formed with a wall having an approximately U shape so as to completely surround contact portions which pinch parts of said bulb on at least three sides, said wall acting as a barrier to the flow of molding material as said body is molded.

4,871,332 NAVAL PROPULSION PLANT WITH HYDRAULIC TRANSMISSION

Riccardo Rodriguez, Messina, Italy, assignor to Nautical Propulsion Research Limited, London, England
Continuation of Ser. No. 48,910, May 12, 1987, abandoned. This application Aug. 22, 1988, Ser. No. 235,732
Claims priority, application Italy, May 12, 1986, 12475 A/86
Int. Cl.⁴ B63H 21/165

U.S. Cl. 440-5

5 Claims



1. Naval propulsion plant comprised of:
(a) a main engine,
(b) a pump operated by said main engine,
(c) a naval propulsor driven by said pump, said naval propulsor including a single propeller, and
(d) a hydraulic flow circuit connecting said pump and said naval propulsor, with each said main engine, pump, hydraulic circuit and naval propulsor being present in pairs capable of independent operation, with said single propellers of said

paired naval propulsors consisting of contrarotating propellers in relation to each other, and
(e) a hydraulic flow distributor positioned between said respective pairs of pumps and naval propulsors and common to each said hydraulic circuit, said hydraulic flow distributor including means to maintain independent operation of each said hydraulic circuit as well as to connect either of said pumps with both of said naval propulsors, said propulsion plant comprising two parallel and symmetrical units, each formed by one said main engine, one said pump, a hydraulic motor and one said propeller,

wherein said propellers, driven by said hydraulic motors, are mounted on a support, and further including means for rotation of said support about a horizontal axis and means for rotation of said support about a vertical axis, and wherein each said hydraulic motor and each respective driven propeller are mounted on said support by at least a pair of elastic supports able to absorb the radial and axial forces developed by said propellers.

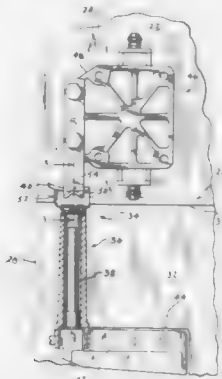
4,871,333

COWL-LOCKING MECHANISM

Mark D. Curtis, Oshkosh, and David Heidel, Green Lake, both of Wis., assignors to Brunswick Corporation, Skokie, Ill.
Filed Jan. 30, 1988, Ser. No. 213,542
Int. Cl.⁴ B63H 21/26

U.S. Cl. 440-77

5 Claims



1. In a two piece cowl for a marine engine a locking mechanism for securing an upper cowl piece to a lower cowl piece, said locking mechanism comprising:

- a latch mounted on one of the cowl pieces and movable about a vertical axis between a locking position and a release position,
- said latch having a handle portion disposed within a recess on the exterior of the side of the cowl piece so that when said latch is in said locking position said handle is flush with the side of the cowl piece and said latch having a clamp portion disposed within said cowl piece and operably connected to said handle, and
- a coupling piece disposed within the other of the cowl pieces and engageable by said clamp portion when said latch is moved to its locking position.

4,871,334

MARINE PROPULSION DEVICE WITH IMPROVED EXHAUST DISCHARGE

Daniel F. McCormick, Oshkosh, Wis., assignor to Brunswick Corporation, Skokie, Ill.
Filed Aug. 4, 1988, Ser. No. 228,322
Int. Cl.⁴ B63H 21/32

U.S. Cl. 440-89

8 Claims

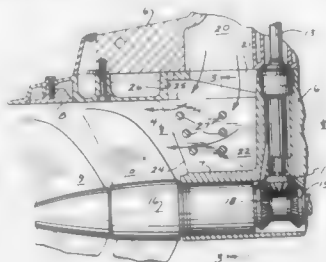
1. In a marine propulsion device, the combination comprising:

- (a) a generally vertically extending drive housing (6) con-

nected to a marine engine (4) and adapted to extend downwardly into the water,

(b) a generally horizontal fore-to-aft extending torpedo housing (7) disposed at the lower end portion of said drive housing,

(c) propeller means designed for surface running and being mounted aft of said torpedo housing and drivingly connected through the latter and said drive housing to said engine,



(d) a substantially closed-walled generally vertical engine exhaust passage (20) disposed in said drive housing and connected to said engine, said exhaust passage having a discharge portion at the lower passage end,

(e) and essentially total exhaust discharge means (21,22) communicating with said exhaust passage discharge portion and disposed forwardly of said propeller means for discharging substantially all of the engine exhaust into the path of said propeller means to enhance performance of the latter.

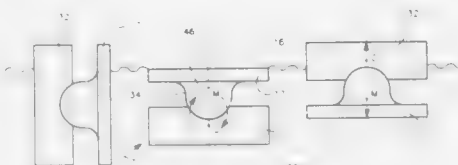
4,871,335

WATER-SKI LOCATOR DEVICE

Charles E. Grams, 11417 W. 59th Ave., Arvada, Colo. 80004
Filed May 13, 1988, Ser. No. 193,901
Int. Cl.⁴ A63C 15/00, 15/06

U.S. Cl. 441-68

6 Claims



1. A water-ski locator device for use in association with a conventional water ski having a toe piece with a front cuff region adapted to removably secure the front portion of the skier's foot to said ski, said water-ski locator device comprised of a buoyant body, having a pouch filled with a buoyant material, and positioning means securing the buoyant body to the front cuff region on top of the toe piece.

4,871,336

ADJUSTABLE TOE WATER SKI BINDER

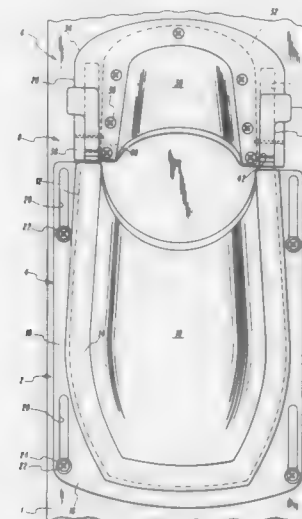
Robert S. Scheurer, P.O. Box 539, Wichita Falls, Tex. 75307
Continuation-in-part of Ser. No. 945,570, Dec. 23, 1986, Pat. No. 4,759,734. This application Jul. 25, 1988, Ser. No. 224,453
Int. Cl.⁴ A63C 15/06

U.S. Cl. 441-70

12 Claims

1. Adjustable toe binder apparatus comprising:
a flexible instep and toe cover having peripheral edges; grip means for gripping the peripheral edges; slide means for

supporting the grip means and peripheral edges; guiding means coupled to the slide means for guiding the slide means forward and rearward; first locking means mounted on the slide means and second locking means connected to a fixed heel support for cooperating with the first locking



means to selectively permit and prevent movement of the slide means; said slide means including a toe plate having an upper plate portion for supporting a skier's foot, and having a track passage extending beneath said upper plate portion for receiving said guiding means.

4,871,337

BINDING WITH LONGITUDINAL AND ANGULAR ADJUSTMENT

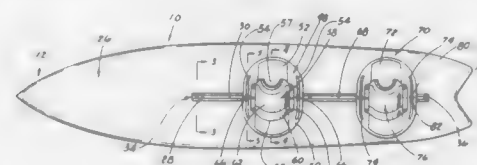
Troy L. Harris, Oklahoma City, Okla., assignor to Treon Corporation, Oklahoma City, Okla.

Filed Jul. 27, 1987, Ser. No. 78,415

Int. Cl.⁴ B63B 35/80

U.S. Cl. 441-74

23 Claims



14. A riding apparatus comprising:

- a rider support surface;
- a first riding plate supported by the rider support surface; means for angularly positioning the first riding plate with respect to the rider support surface comprising:
- at least one elongate slot formed in the periphery of the first riding plate;
- at least one fastener recess formed in the rider support surface;
- at least one fastener supported by the first riding plate, extending through the peripheral slot formed therein and projecting within a corresponding fastener recess; and
- means for releasably engaging the fastener within its corresponding fastener recess; and
- means for attaching at least one of a rider's limbs to the riding plate.

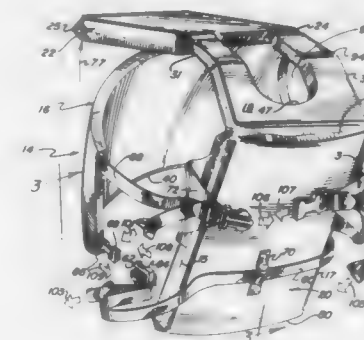
4,871,338

PERSONAL FLOATATION DEVICES

Richard S. Hoffman, 1175 NE. 125 St., North Miami, Fla. 33161
Filed Nov. 4, 1988, Ser. No. 267,354
Int. Cl.⁴ B63C 9/10

U.S. Cl. 441-116

11 Claims



1. A personal flotation device comprising:

- A. a vertically symmetrical back panel sized to overlay the back of a wearer and having an inner surface and an outer surface and having an upper zone and a lower zone, said back panel having,
- (a) a lower edge sized to extend across the back of a wearer at about the bottom of the rib cage and about the sides of a wearer toward the front of the wearer,
- (b) an upper edge shorter than said lower edge sized to extend across the shoulders of a wearer at the neck of a wearer, and
- (c) a pair of side edges on the lower portion each extending generally upwardly vertically from the lower edge to the upper portion and each converging inwardly and upwardly defining a fair curve extending to the upper edge from the side edges of the lower zone,
- B. a front panel sized to overlay the chest of a wearer and having an inner surface and an outer surface and having,
- (a) a lower edge which in use is generally parallel to the bottom edge of the back panel and extends slightly below the level of the bottom edge of the back panel,
- (b) an upper edge which in use extends across the upper portion of the chest of a wearer below the shoulders, and
- (c) a pair of spaced side edges each extending between the upper and lower edges of the front panel,
- C. a shoulder panel having an opening for passage of the head of a wearer and having a front edge, rear edge and side edges,
- D. a first zone between the front edge of the shoulder panel and the upper edge of the front panel comprising a bendable zone extending between the side edges of the shoulder panel and the side edges of the front panel, and a second zone between the upper edge of the back panel and the back edge of the shoulder panel comprising a bendable zone extending between the side edges of the shoulder panel and side edges of the back panel,
- E. means connecting said panels together at said first and second zones,
- F. a girth strap having a first end zone and a second end zone and an intermediate zone,
- G. said girth strap being sized to extend about the girth of a wearer and the back and front panels adjacent the lower edges of said front and back panels,
- H. means securing the intermediate zone of the girth strap to the lower zone of the back panel and adjacent the lower edge of said back panel with said first end zone extending from one side edge of said back panel, and wherein said second end zone extends from the other side edge of said back panel,

- I. said first and second end zones each having an end, and mutually interengageable releasable fastening means on the end of the first end zone and second end zone,
 J. means on the front panel to maintain the girth strap in position adjacent the lower edge of the front panel,
 K. chest and upper back strap means sized to extend around the chest of a wearer and the back and front panel adjacent the upper edge of the front panel and across the lower zone of the back panel between the girth strap and the upper edge of the back panel,
 L. means securing said back strap means to said back panel,
 M. fastener means on the back strap means for hooked-up engagement about the body of a wearer.

4,871,339

SPARK PLUG CRIMPING DIE AND PROCESS

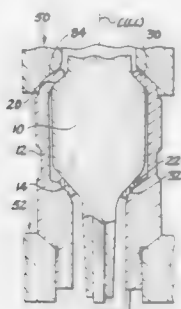
Ali M. Sadegh, Closter, N.J., assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 6, 1988, Ser. No. 240,287

Int. Cl.⁴ H01T 21/02

U.S. Cl. 445-7

11 Claims



8. A method of making a spark plug by crimping and internally sealing a metal shell and an insulator body in the metal shell, comprising:

- (a) forming an assembly having the insulator body disposed in the metal shell including (1) positioning a flat, annular shoulder of the insulator body and an annular, deformable lip on the metal shell adjacent one another with said annular shoulder inclined at a first acute angle relative to the longitudinal axis of the spark plug and (2) positioning an annular, axially deformable gasket between the insulator body and the metal shell remote from said insulator body shoulder, and
 (b) relatively moving the assembly and a crimping die along the longitudinal axis of the spark plug to (1) initially engage the lip with a flat, annular leading die working surface inclined at an acute leading angle relative to said longitudinal axis less than said first acute angle to initially plastically deform the lip inwardly onto the annular shoulder and (2) subsequently engage the lip with a flat, annular trailing die working surface inclined at an acute trailing angle relative to said longitudinal axis generally equal to said first acute angle so as to be oriented generally parallel to the annular shoulder to complete the crimping of the lip thereon and force the insulator body against the gasket to plastically deform and seal same between said insulator body and said metal shell.

4,871,340

MAGNETIC ACTION TOY

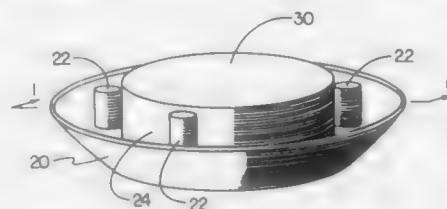
Bruce Ross, 8 Kiaska Ct., Randallstown, Md. 21133

Filed Oct. 11, 1988, Ser. No. 255,968

Int. Cl.⁴ A63H 33/26

U.S. Cl. 446-132

11 Claims



1. A hand held magnetic track toy comprising:

- a permanent magnet,
 a rolling permanent magnet having its axis of rotation in alignment with its magnetic axis,
 a track surface, whereby a smooth path is provided for said permanent rolling magnet,
 means for positioning said permanent magnet behind said track surface whereby the magnetic attraction of opposite magnetic poles between said permanent magnet and said rolling permanent magnet provides support for said rolling permanent magnet on said track surface and alignment of the magnetic axis of said rolling permanent magnet relatively parallel to the magnetic axis of said permanent magnet,
 bowl shaped means having curved inner and outer sides for retaining said loose rolling permanent magnet and providing a comfortably curved holding surface whereby the outer side is curved to fit the palm of one hand to provide for maximum control of play and ease of insertion and removal of said rolling permanent magnet,
 whereby the rolling permanent magnet is provided with the ability to move at a high rate of speed with respect to the permanent magnet while maintaining its magnetic pole alignment and position on said track surface.

4,871,341

PUPPET MOUTH CONSTRUCTION

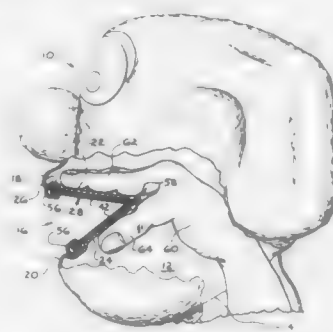
Valerie D. Sommers, Jackson, Mich., assignor to National Child Safety Council, Jackson, Mich.

Filed Nov. 4, 1988, Ser. No. 267,321

Int. Cl.⁴ A63H 3/14, 3/36

U.S. Cl. 446-329

6 Claims



1. The method of forming the mouth of a puppet utilizing a semi-rigid sewable base material having a peripheral portion and first and second sides and first and second fabric layers, comprising, the steps of:

- (a) layering the fabric layers upon each other and upon a pair of substantially identical pieces of the base material

- whereby the first fabric layer is adjacent the first base material side,
 (b) affixing the fabric layers to the base material pieces adjacent the peripheral portion to form a pair of assemblies,
 (c) cutting both fabric layers to fit adjacent the base material peripheral portion in conformation thereto,
 (d) slitting the second fabric layer with a plurality of slits extending from adjacent the base material peripheral portion to the edge of the second fabric layer which is substantially opposed to the base material peripheral portion,
 (e) folding the second layer slit portions over the base material second side to enclose the base material peripheral portion,
 (f) affixing the second fabric layer to the base material second side adjacent the peripheral portion,
 (g) superimposing the pair of base material and fabric layer assemblies upon each other with the peripheral portions aligned and the base material first sides disposed toward each other, and
 (h) attaching the pair of assemblies to each other adjacent the base material edges opposed to the base material peripheral portions to define a hinge.

4,871,342

DRIVE-TRAIN TORQUE-TRANSMITTING DISK

Franz Boss, Kressbrunn, and Udo Wolz, Friedrichshafen, both of Fed. Rep. of Germany, assignors to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Fed. Rep. of Germany

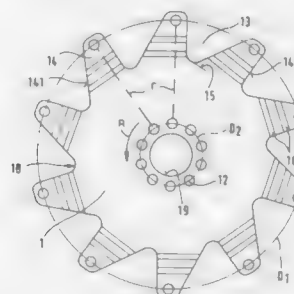
Filed Aug. 12, 1988, Ser. No. 231,886

Claims priority, application Fed. Rep. of Germany, Aug. 14, 1987, 3727090

Int. Cl.⁴ F16D 3/06, 3/78

U.S. Cl. 464-98

6 Claims



1. In a drive system having
 an engine with an output element rotatable about an axis,
 a drive train having an input element rotatable generally about the same axis, and
 a coupling disk having an inner ring of bores by means of which it is bolted to the output element and an outer ring of bores by means of which it is bolted to the input element, the improvements wherein
 the disk is formed with a plurality of radially outwardly projecting and radially outwardly tapering generally saw-tooth tabs separated by radially outwardly open, generally triangular, and radially inwardly tapering cutouts and each formed with a respective one of the outer bores, the cutouts extending radially inward past regions of contact between the tabs and the input element, the tabs each being formed with generally tangentially extending corrugations and each having a leading flank and a trailing flank relative to a normal direction of rotation of the elements about the axis, each leading flank extending at an acute angle to a centerline of the respective tab and each trailing flank extending generally parallel to the respective centerline.

4,871,343

BELT-AND-PULLEY TYPE CONTINUOUSLY VARIABLE TRANSMISSION

Toru Hattori, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

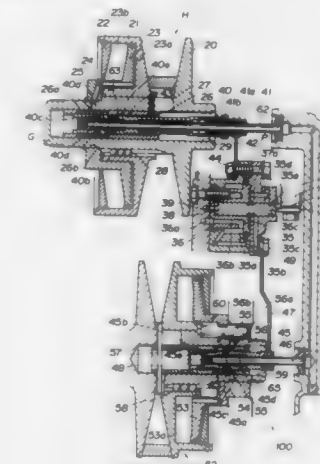
Filed Apr. 29, 1988, Ser. No. 187,858

Claims priority, application Japan, Apr. 30, 1987, 62-107020; Jul. 9, 1987, 62-171826

Int. Cl.⁴ F16H 11/02

U.S. Cl. 474-28

11 Claims



1. A belt-and-pulley type continuously variable transmission comprising:

- an input shaft;
 a driver pulley mounted on said input shaft;
 an output shaft;
 a driven pulley mounted on said output shaft;
 a V-belt trained around said driver and driven pulleys;
 said driver pulley comprising a fixed conical member and a movable conical member;
 said driven pulley comprising a fixed conical member and a movable conical member;
 said movable conical members of said driven pulley and said fixed conical member of said driven pulley being disposed on one side and the other side of said V-belt, respectively;
 and
 main servomechanism means operatively coupled to said movable conical members for controlling axial movement of said movable conical members on said input and output shafts to vary the effective diameters of said driver and driven pulleys for controlling a transmission ratio;
 wherein said main servomechanism means comprises:
 a servo piston and a servo cylinder which jointly define a servo hydraulic pressure chamber, one of said servo piston and said servo cylinder being fixed in position and the other being movable with respect to said one of the servo piston and the servo cylinder;
 a pilot valve slidably fitted in a bore coaxial with said servo piston and said servo cylinder;
 the other of the servo piston and the servo cylinder having an oil supply passageway held in communication with an oil pressure source at all times and an oil drain passageway held in communication with said servo hydraulic pressure chamber at all times; and
 said pilot valve having an oil pressure supply groove which is selectively communicable with said oil supply passage of the other of the servo piston and the servo cylinder for supplying oil pressure to said servo hydraulic pressure chamber, and an oil drain groove which is selectively communicable with said oil drain passageway for connecting said servo hydraulic pressure chamber to an oil reservoir.

4,871,344

POWER TRANSMISSION CHAIN BELT

Kunio Morisawa, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

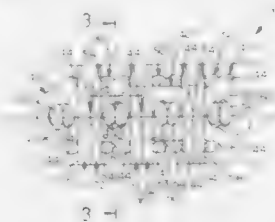
Filed Sep. 19, 1988, Ser. No. 246,671

Claims priority, application Japan, Sep. 24, 1987, 62-239497; Sep. 24, 1987, 62-239498; Sep. 24, 1987, 62-239499; Apr. 15, 1988, 63-94066; Apr. 15, 1988, 63-94067

Int. Cl.⁴ F16G 13/06

U.S. Cl. 474—206

24 Claims



1. A power transmission endless chain belt connecting a pair of pulleys each having an outer groove, comprising:
 - an endless belt body including multiple sets of link plates each set consisting of a plurality of link plates which are arranged in parallel with each other in a transverse direction perpendicular to a rotating direction of the chain belt, each of said plurality of link plates of said each set having a pair of pin holes, said belt body further including a multiplicity of pins which are inserted into said pin holes of said multiple sets of link plates such that the link plates of one set are pivotally connected to the link plates of the adjacent sets, whereby said multiple sets of link plates are flexibly looped in said rotating direction;
 - multiple pairs of blocks each pair having opposed mutually rolling surfaces, each of said pair of blocks having an aperture through which the link plates of a corresponding one of said multiple sets extend;
 - said multiplicity of pins constituting first pivot means which define a plurality of first bending points of the chain belt;
 - one of said pair of pin holes formed in said each link plate having a larger size than the other pin hole, and cooperating with the corresponding one of said multiplicity of pins, to define a clearance therebetween;
 - the link plates of said each set are arranged such that each of said multiplicity of pins extends through said one of said pair of pin holes in at least one of the link plates of said each set, and the other of said pair of pin holes in the remainder of the link plates of said each set;
 - said multiple pairs of blocks constituting second pivot means such that said opposed mutually rolling surfaces define a plurality of second bending points of the chain belt, each of said second bending points being located between adjacent ones of said first bending points, whereby a bending pitch of said chain belt is equal to a distance between each of said first bending point and said each second bending point.

4,871,345

METHOD OF MAKING STRIP OPENABLE SHIPPING/DISPLAY CONTAINER AND BLANKS THEREFOR

Charles L. Wosaba, II; Peter W. Hamilton, and Robert J. Kisser, all of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 123,098, Nov. 20, 1987, Pat. No. 4,784,271.

This application Aug. 1, 1988, Ser. No. 226,694

Int. Cl.⁴ B31B 1/90, 1/18

U.S. Cl. 493—59

12 Claims

1. A method of making a blank for erecting an easy-open shipping/display container having top, bottom, and side panels, said method comprising the steps of:

(a) providing a continuous web of corrugated paperboard

having an inner liner, a corrugated medium, and an outer liner, each having an outer surface, an inner surface, and a longitudinal axis;

(b) cutting said web along a line parallel to said longitudinal axis thereby defining a butt joint, said butt joint separating said web into a top cover section and a bottom tray section;

(c) providing a continuous web of securing means having a continuous strip of splitting means attached thereto;

(d) attaching said securing means to said outer or said inner surface of said web of corrugated paperboard, said secur-



- ing means bridging said butt joint, said splitting means being substantially superimposed over said butt joint, whereby said splitting means splits said securing means into a top portion and a bottom portion when pulled, thereby separating said top cover section from said bottom tray section, substantially all of said top portion of said securing means remaining attached to said top cover section and substantially all of said bottom portion of said securing means remaining attached to said bottom tray section; and
- (e) stamping and cutting said blank from said continuous web of corrugated paperboard.

4,871,346

APPARATUS FOR MANUFACTURING BAGS MADE OF PLASTIC MATERIAL

Louis Colin, via Ca'dell'Orbo, 29-a0055 Villanova Di Castenaso (Province of Bologna), Italy

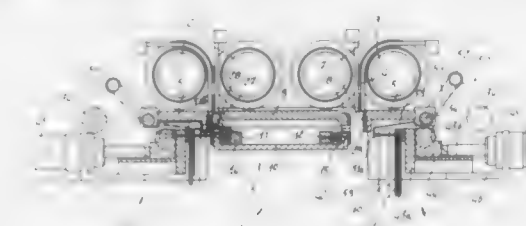
Filed Jul. 19, 1988, Ser. No. 221,203

Claims priority, application Italy, Jul. 28, 1987, 3575 A/87

Int. Cl.⁴ B65H 35/06

U.S. Cl. 493—194

6 Claims



1. Apparatus for manufacturing bags made of plastic material comprising:
 - intermittent advancement means for intermittently advancing tubular webs of plastic material along two parallel vertical planes,
 - at least one welding device having at least one pair of fixed jaws and at least one movable jaw, said fixed jaws being arranged facing each other on a horizontal plane, said movable jaw being movable between said pair of fixed jaws for clamping tubular webs on said fixed jaws, thereby welding said webs intermittently advancing along said

4,871,348

CARTON ERECTING APPARATUS

Yukio Konaka, Kanazawa, Japan, assignor to Shibuya Kogyo Co. Ltd., Ishikawa, Japan

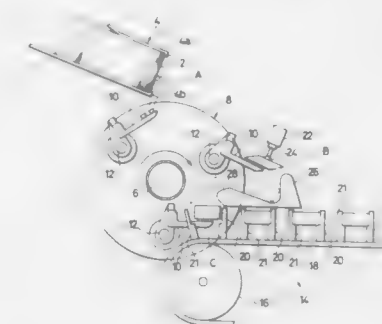
Filed Jul. 15, 1987, Ser. No. 73,814

Claims priority, application Japan, Dec. 29, 1986, 62-303161

Int. Cl.⁴ B31B 5/78, 5/80

U.S. Cl. 493—315

11 Claims



- parallel vertical planes, said movable jaw defining a direction of movement,
- at least one cutting element cooperating with said movable jaw for cutting said tubular webs of plastic material upon clamping said movable jaw on said fixed jaws,
- extraction means for extracting and accumulating completed bags, said extraction means including a plurality of needles arranged at each of said fixed jaws, and reciprocating means for reciprocating each said plurality of needles in said direction of movement defined by said movable jaw for penetrating a bag clamped between said movable jaw and one of said fixed jaws,
- means for placing said bag adjacent to previously produced bags supported on said needles, and
- means for unloading a stack of manufactured bags.

4,871,347

APPARATUS FOR FORMING A FLEXIBLE TUBING FROM A SINGLE-PLY OR MULTI-PLY WEB

Friedhelm Brinkmeier, Lengerich, Fed. Rep. of Germany, assignor to Windmoller & Holscher, Lengerich, Fed. Rep. of Germany

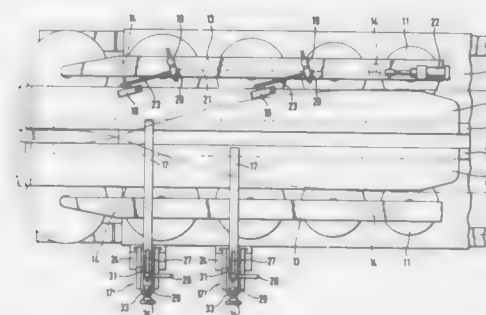
Filed Nov. 18, 1987, Ser. No. 122,297

Claims priority, application Fed. Rep. of Germany, Nov. 25, 1986, 3640219

Int. Cl.⁴ B31C 13/00

U.S. Cl. 493—302

3 Claims



1. Apparatus for forming a flexible tubing from a single-ply or multi-ply web as the web is continuously advanced, said apparatus comprising:
 - a machine frame,
 - two size-defining metal plates to define the width of the flattened tubing and said plates extending substantially parallel to each other and being movably mounted in said machine frame, said plates having receiving end portions about which the web is deflected to raise edge portions of the web which are in-folded to overlap each other, and adjustment means for controlling a distance between said receiving end portions, and said plates being provided at delivery end portions with arms for controlling a distance between said plates,
 - guide means for longitudinally slidably guiding a free end portion of each of said arms relative to said machine frame and said guide means being adapted to be fixed in position relative to said machine frame, and said guide means including slots formed in said arms, and guide lever members fixed to said machine frame, said guide lever members extending through said slots and being secured to slidable members, said slidable members being slidably mounted in tracks of said machine frame and means for moving said slidable members along said tracks.

1. An apparatus for erecting cartons, comprising:
 - a magazine having collapsed cartons stored therein, an outlet opening on said magazine from which stored cartons can be removed, an elongated conveyor having at least one sprocket means rotatable about a first axis of rotation, and a conveyor element guided by said sprocket means, said conveyor element having conveying means thereon oriented a finite distance from said outlet opening on said magazine and adapted to support an opened carton thereon, a primary shaft having a second axis of rotation oriented between said outlet opening on said magazine and said conveying means and parallel to said first axis of rotation, a rotatable member continuously rotatable about said second axis of rotation of said primary shaft, a plurality of circumferentially spaced suction mechanisms mounted on said rotatable member and rotatable therewith, plural support means for supporting each of said suction mechanisms for rotation relative to said rotatable member and about axes remote from and parallel to said second axis of rotation of said primary shaft, said suction mechanisms having suction means for releasably gripping said collapsed cartons at said outlet opening on an attachment side thereof, and carton manipulating means for effecting a movement of said suction mechanisms relative to said rotatable member to remove said collapsed cartons from said magazine, open said collapsed cartons to an erected condition and delivering open and erected cartons to said conveyor with said attachment side of said cartons facing said conveying means, said conveying means including laterally spaced conveyor members adapted to engage and support said open and erected carton following a delivery thereto by said continuously rotating rotatable member and said suction mechanisms moving therewith, each said suction mechanism including carton positioning means supporting said suction means for movement, in response to the control of said suction mechanism provided by said carton manipulating means, into and out of a region between said laterally spaced conveyor members to facilitate and orienting of each of said erected carton in an upstanding relation above said suction mechanism as a release of said suction mechanism from said erected carton occurs leaving said erected carton supported on said laterally spaced conveyor members, said lateral spacing thereby facilitating a maintaining of said finite distance between said outlet opening and said conveyor members even when different height cartons are presented to said outlet opening and said laterally spaced conveyor members.

4,871,349

CENTRIFUGE FOR SEPARATING MIXTURES OF LIQUIDS

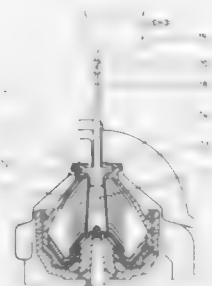
Aloys Tenthoff, Oelde, Fed. Rep. of Germany, assignor to Westfalia Separator AG, Oelde, Fed. Rep. of Germany
Filed Jan. 10, 1989, Ser. No. 295,418

Claims priority, application Fed. Rep. of Germany, Jan. 27, 1988, 3802306

Int. Cl.⁴ B04B 11/00, 15/06

U.S. Cl. 494—56

1 Claim



1. In a centrifuge having a drum for separating mixtures of liquids, of which the drum has an upper diversion chamber and a lower diversion chamber that divert fractionated constituents of the liquid out of the drum and that are separated by a removable lid, wherein at least one of the diversion chambers has a peeling structure with channels and an intake pipe that supplies the mixture of liquids, the improvement comprising: a cleaning assembly for substituting for the lid, intake pipe and peeling structure including a second chamber lid, a second peeling structure with second channels and a second intake pipe wherein the second channels in the second peeling structure open into the second intake pipe and the second chamber lid unites the two diversion chambers into a single chamber.

4,871,350

METHODS AND COMPOSITIONS FOR PREVENTING SECONDARY CATARACTS

Dominic M.-K. Lam, and Peter J. Kelleher, both of The Woodlands, Tex., assignors to Baylor College of Medicine, Houston, Tex.

Continuation-in-part of Ser. No. 927,318, Nov. 4, 1986, abandoned. This application Jan. 8, 1988, Ser. No. 204,168

Int. Cl.⁴ A61M 31/06

U.S. Cl. 604—49

4 Claims

1. A method for inhibiting posterior lens capsule opacification after extracapsular cataract extraction, said method comprising: introducing, in conjunction with extracapsular cataract extraction, into the anterior chamber of the eye in an amount sufficient to inhibit proliferation of lens epithelial cells, a cytotoxic agent capable of binding to said epithelial cells and killing the cells without additional agents, wherein said cytotoxic agent comprises a monoclonal antibody or fragment thereof conjugated to a toxin molecule or cytotoxic moiety of a toxin molecule.

4,871,351

IMPLANTABLE MEDICATION INFUSION SYSTEM

Vladimir Feingold, 49 Gumnat Road, Cherrybrook, New South Wales 2120, Australia

Continuation of Ser. No. 775,593, Sep. 13, 1985, abandoned. This application Aug. 26, 1987, Ser. No. 89,957

Claims priority, application Australia, Sep. 28, 1984, PG7415

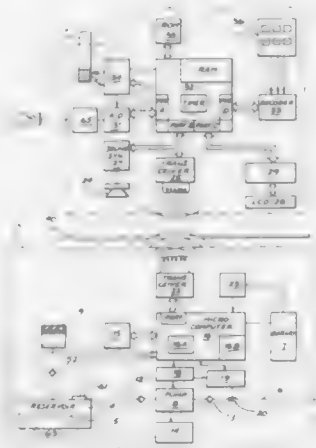
Int. Cl.⁴ A61M 5/20

U.S. Cl. 604—66

8 Claims

1. A medical infusion system intermittently switchable at selected times between an open loop system without feedback and a closed loop system with feedback, said system comprising an implantable unit including means for controllably dis-

persing medication into a body, an external controller, and an extra-corporeal sensor; wherein said implantable unit comprises an implantable transceiver means for communicating with a similar external transceiver means in said external controller to provide a telemetry link between said controller and said implantable unit, a first reservoir means for holding medication liquid, a liquid dispensing device, a pump connected between said reservoir means and said liquid dispensing device, and a first electronic control circuit means connected to said implantable transceiver means and to said pump to operate said pump; wherein said external controller comprises a second electronic control circuit means connected with said external transceiver means, a transducer means for reading said sensor,



said transducer means having an output connected to said second electronic control circuit means, and a manually operable electric input device connected to said second electronic control circuit means; wherein said pump is operable by said first electronic control circuit means to pump said medication liquid from said first reservoir means to said liquid-dispensing device at a first predetermined rate independent of the output of said extra-corporeal sensor, and wherein said input device or said transducer means include means which selectively operable at intermittent times to respectively convey commands or output of said transducer representing the reading of said sensor to said second control circuit to instruct said first control circuit via said telemetry link to modify the operation of said pump.

4,871,352

SELF-REGULATED THERAPEUTIC AGENT DELIVERY SYSTEM AND METHOD

Loi H. Tran, Wheaton, Ill., assignor to Controlled Release Technologies, Inc., Batavia, Ill.

Filed Dec. 7, 1987, Ser. No. 129,159

Int. Cl.⁴ A61M 37/00; A61F 13/16; G11C 13/02

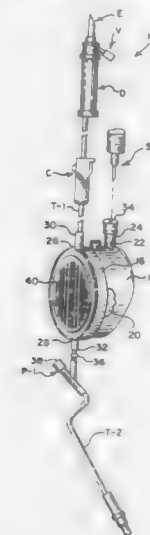
U.S. Cl. 604—82

25 Claims

1. A therapeutic agent delivery system comprising:

- a first housing defining a donor chamber and being adapted to retain at least one ionized therapeutic agent in the donor chamber;
- a second housing defining a receiving chamber and having an inlet and an outlet in fluid communication with the receiving chamber adapted to receive a physiologically tolerable liquid for flow communication from the inlet to the outlet; and

a rate-controlling electret membrane in fluid contact with and separating the donor chamber from the receiving



chamber, the membrane having a donor side and a receiving side.

4,871,353

METHOD AND APPARATUS FOR INJECTING FLUIDS INTO IV LINE

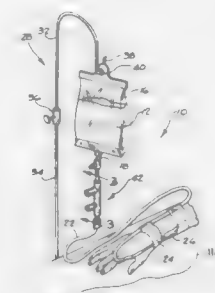
John Thomsen, 1749 Bay Shore Rd., Nokomis, Fla. 34275

Continuation of Ser. No. 66,083, Jun. 24, 1987, abandoned. This application Sep. 30, 1988, Ser. No. 253,308

Int. Cl.⁴ A61M 5/14, 37/00

U.S. Cl. 604—83

18 Claims



1. An assembly for use in creating of a flow of solution through tubing to establish an IV line from a supply of solution to a patient during an operation and for allowing the selectively injecting of supplemental fluid under pressure into the flow of solution, the assembly comprising:

- a manifold including a connector having a female taper at one end and a male taper at the other end releasably couplable with a length of tubing intermediate its length and having a cylindrical bore extending therethrough, the manifold also including a plurality of risers extending radially from the connector with each riser having a bore extending therethrough in fluid communication with the bore of the connector; and
- a check valve operatively associated with each riser with each check valve including a body positioned over the radially exterior end of a riser and having a cylindrical bore extending therethrough in fluid communication with the bore of its associated riser and the connector, the radially exterior end of each body being formed with a female taper for the support of a syringe adapted to provide a supply of supplemental fluid under pressure, each check valve also including a poppet positioned between its

associated body and riser to seal the bore of the body for precluding the flow of supplemental fluids therethrough and, upon the application of the pressure of supplemental fluid from a syringe, to resiliently displace the poppet, to unseal the bore of the body and to thereby allow the flow of supplemental fluid from the syringe to the solution flowing through the connector and to the patient.

4,871,354

WET-DRY BAG WITH LYPHOZATION VIAL

Kirk O. Conn, Cogan Station; William Finlay, Jr.; Carol S. Suty, both of Montoursville, and Michael G. Maietta, Cogan Station, all of Pa., assignors to The West Company, Phoenixville, Pa.

Continuation of Ser. No. 889,004, Jul. 24, 1986, abandoned. This application May 23, 1988, Ser. No. 197,307

Int. Cl.⁴ A61J 1/00; B65D 25/08

U.S. Cl. 604—89

8 Claims



1. A composite medicament container comprising a first vial member for a first component of the medicament, an outlet opening in the vial, a closure member slidably mounted in said outlet opening for normally sealing said outlet opening, a flexible container member having a discharge outlet fitting with a port and a plug member for the port, means mounting said closure and plug members so that the outlet opening and port are axially aligned and plunger rod means disposed completely interiorly of said flexible container member cooperatively associated with said closure and plug members actuatable axially to a discharge position to displace said closure and plug members into said first vial member and thereby establish fluid communication between said first and second members, guide means for guiding said plunger rod means during actuation thereof axially to said discharge position, said plunger rod means being of a cross-sectional configuration to permit fluid flow around the periphery of said plunger rod when in said discharge position, the diameter of said closure member being greater than the diameter of said plug member and said plunger rod manipulatable externally of said flexible container to actuate the same axially and engageable with said plug member to ensure displacement of both said closure and plug member into said first vial member.

4,871,355

INJURY RESISTANT NEEDLE AND BLOOD COLLECTION TUBE HOLDER

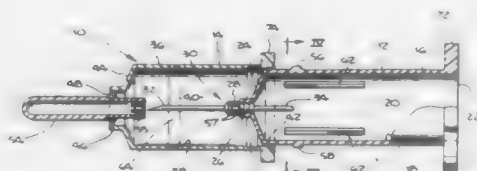
Steven Kikkawa, 15825 Del Prado Dr., Hacienda Heights, Calif. 91745

Filed May 17, 1988, Ser. No. 195,072

Int. Cl.⁴ A61M 5/32

U.S. Cl. 604—198

12 Claims



1. An injury resistant needle and blood collection tube holder adapted for use in collecting multiple blood samples comprising:

an inner tube having a cylindrical exterior surface and an interior cylindrical surface defining a blood collection tube receptacle chamber having a longitudinal axis, said inner tube having an open rear end through which the blood collection tubes are introduced into said receptacle chamber and a restricted forward end including means for mounting a needle to said forward end, said needle having a forward end extending outwardly along said chamber longitudinal axis and a rearward end extending into said chamber along said longitudinal axis when said needle is mounted to said inner tube forward end;

an outer tube having a cylindrical exterior surface and an interior cylindrical surface defining a needle protection chamber having a longitudinal axis and a diameter of sufficient size to receive said inner tube therein, said outer tube having an open rear end through which said inner tube is introduced into said needle protection chamber and a restricted forward end including a resilient diaphragm having a central opening and radially extending slits whereby needle sheaths of varying diameters may be inserted into said central opening, said diaphragm being sufficiently resilient to provide holding of said sheaths within said central opening, said outer tube being of sufficient longitudinal length so that said needle forward end is housed completely within said needle protection chamber when said inner tube forward end is located in a retracted position towards said outer tube rear end, said inner tube being movable within said outer tube between said retracted position where said needle forward end is housed within said needle protection chamber to prevent accidental injury by said needle and an extended position wherein said inner tube forward end is extended into said outer tube and located toward said outer tube forward end to expose said needle for use in collecting blood; and retracted position locking means for releasably engaging said inner tube to said outer tube when said inner tube is located in said retracted position to prevent said inner tube from being completely removed from said outer tube.

4,871,356

CATHETER DEVICE

Hans Haindl, Melsungen, and Jürgen Fuchs, Emstal-Sand, both of Fed. Rep. of Germany, assignors to B. Braun Melsungen AG, Melsungen, Fed. Rep. of Germany

Filed May 17, 1988, Ser. No. 195,112

Claims priority, application Fed. Rep. of Germany, Jun. 27, 1987, 3721299; European Pat. Off., Jan. 20, 1988, 88100702.5

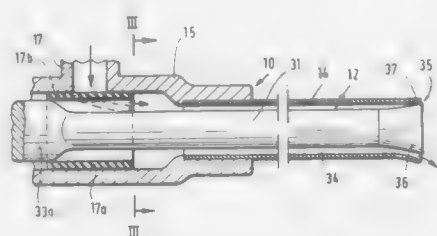
Int. Cl.⁴ A61M 5/00

U.S. Cl. 604—247

12 Claims

1. A catheter device comprising:

a retentive catheter including a cannula tube having a first end and a second end, a connecting means including a lateral injection port adjacent the first end of the cannula tube, a mandrin insertable through the connector into the catheter for blocking blood inflow into the second end of the cannula tube, said mandrin sealingly secured to said connector means,



the mandrin and the cannula tube being mutually configured to define therebetween a substantially longitudinal fluid channel extending substantially between the injection port and the second end of the cannula tube, and a valve formed by the mandrin and the cannula tube adjacent the second end of the cannula tube.

4,871,357

IONIC HEPARIN COATING

Li-Chien Hsu, Mission Viejo, and Sun D. Tong, Tustin, both of Calif., assignors to Baxter International Inc., Deerfield, Ill.

Continuation of Ser. No. 820,670, Jan. 21, 1986, abandoned. This application Sep. 14, 1987, Ser. No. 97,295

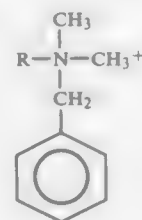
Int. Cl.⁴ A61M 25/00

U.S. Cl. 604—266

12 Claims

1. A blood contacting medical article comprising:

- a substrate polymeric surface; and
- an anti-thrombogenic, saline stable surface coating of a complex of heparin and at least 50% by weight of a cationic alkylbenzyl dimethyl ammonium salt having the following formula:



where R is an alkyl group having from 16 to 18 carbon atoms.

4,871,358

EXTERNALLY-BASED INVERSIONARY TUBE

Steven K. Gold, 2611 Woodberry Rd., Broomall, Pa. 19008

Filed Nov. 9, 1987, Ser. No. 117,947

Int. Cl.⁴ A61M 5/00

U.S. Cl. 604—271

9 Claims

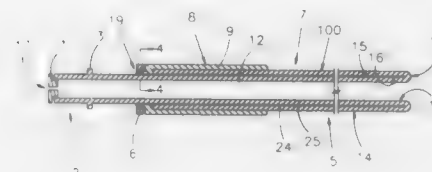
1. An externally based inversionary tube for use as a catheter and the like, comprising:

- a grip member having a first passageway therethrough;
- a hollow tube secured to said grip member and having the tube interior aligned with said first passageway through said grip member;
- said hollow tube being inwardly folded upon itself to provide a telescoping tube assembly having inner and outer tubular portions of variable length with a first extremity of said tube secured to said grip member, with a

second extremity of said tube defining an end of said inner portion and extending outwardly from said first passageway in a direction oppositely to said direction of tube assembly emergence from said grip towards said position of tube inversion at which said tube is folded upon itself, with said inner and outer tubular portions being connected by said portion of said tube which is folded upon itself, with a portion of said inner tube adjacent said portion which is folded upon itself annularly expanding and successively defining said portion of said tube which is folded upon itself and a portion of said outer tube adjacent said portion of said tube which is folded upon itself as said inner tubular portion is urged through said grip member in a direction to reduce length of said inner tubular member, towards said area at which said tube is folded upon itself; and

d. means for locking said inner tubular member passing through said grip member at a variably selected position relative to said grip member, wherein said locking means further comprises:

- an annular ring disposed about and spaced from said tube, moveable axially relative to said tube;



- resilient finger means for releasably engaging said tube, extending radially inwardly from said ring towards said tube at an angle to the axis of said tube, having length greater than distance by which said annular ring is spaced from said inner tube portion;

- sleeve means between said ring and said tube;

- said sleeve means having a radial second passageway therethrough, said radial second passageway defining orifices at respective outer and inner surfaces of said sleeve and receiving said finger means, said radial second passageway tapering from said outer surface orifice to said inner surface orifice so that said outer surface orifice is larger than said inner surface orifice to permit said finger means to remain in a relatively unflexed condition in a first position of said annular ring relative to said tube and causing said finger means to contact a wall portion of said second passageway and be deflected radially inwardly thereby exiting said second passageway at said inner surface orifice of said sleeve and intersectingly contacting said tube to grippingly engage and immobilize said tube relative to said ring upon movement of said annular ring axially relative to said tube.

4,871,359

ADAPTER FOR DROP UNIT

Göran Sjönell, Lidingö, Sweden, assignor to Presidentia Medical AB, Stockholm, Sweden

Filed Jan. 30, 1987, Ser. No. 4,156

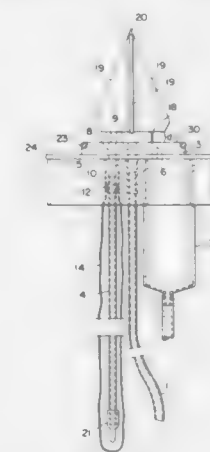
Int. Cl.⁴ A61M 5/14

U.S. Cl. 604—411

3 Claims

1. An adapter for a disposal package having a bottom and a top, said adapter comprises a main member intended to sealingly be attached to the package, which package in use occupies a position with the adapter positioned in the bottom, which main member is provided with a first through hole for emptying the contents of the package, a second through hole for an aeration tube, a third through hole for a transparent tube, that the main member is provided with cutting means of pyramid shape to penetrate the package material, said cutting

means having a base provided with a space for receiving between said cutting means and the main member the package material to thereby lock the member to the package when the main member and therewith the cutting means are turned, characterized in that the aeration tube before the use is extended outside the adapter with its end, intended to be placed in the package and above the liquid level, withdrawn into the second hole, that a stocking is fitted to the second hole and



surrounds the extended aeration tube, that the other end of the tube is provided with an air and liquid tight separate cap removable from the end, said cap being replaceably separable from said tube other end, that the second hole is provided with a gasket sealingly engaging the displaceable aeration tube, and that the space makes a distance between the base of the cutting means and the main member which is greater than the thickness of the package material.

4,871,360

SYSTEM FOR INTRAVENOUS DELIVERY OF A BENEFICIAL DRUG AT A REGULATED RATES

Felix Theeuwes, Los Altos, Calif., assignor to Alza Corporation, Palo Alto, Calif.

Continuation of Ser. No. 588,165, Mar. 9, 1984, which is a continuation of Ser. No. 312,491, Oct. 19, 1981, Pat. No.

4,552,555, which is a continuation-in-part of Ser. No. 289,082, Jul. 31, 1981, abandoned. This application Apr. 21, 1986, Ser.

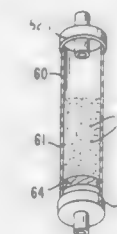
No. 854,452

The portion of the term of this patent subsequent to Mar. 27, 2001, has been disclaimed.

Int. Cl.⁴ A61K 9/22

U.S. Cl. 604—892.1

6 Claims



1. A drug formulation chamber for use with an intravenous delivery system for administering a beneficial drug at a controlled rate for the care of a patient on intravenous therapy, which formulation chamber is moisture proof and comprises:

- a wall that surrounds an internal lumen;
- an inlet in the wall of the formulation chamber adapted and sized for placing the formulation chamber into an

intravenous delivery system and for letting an intravenously administrable fluid enter the formulation chamber; (c) a beneficial intravenously administrable drug in a therapeutically effective amount up to 20 grams in the formulation chamber, said drug in a pharmaceutically acceptable solid dosage form selected from the group consisting of crystalline, microcrystalline, particle, pellet, granule, powder, dried, lyophilized, compressed forms and friable layers, and wherein when the formulation chamber is in operation the beneficial drug is added to fluid that enters the formulation chamber at a rate regulated by the fluid flow through the intravenous delivery system and by the rate of dissolution of the solid dosage form in the fluid that enters the formulation chamber to provide a fluid drug formulation acceptable for intravenous therapy; and, (d) an outlet in the wall of the formulation chamber adapted and sized for placing the formulation chamber in an intravenous delivery system for letting the fluid drug formulation leave the formulation chamber.

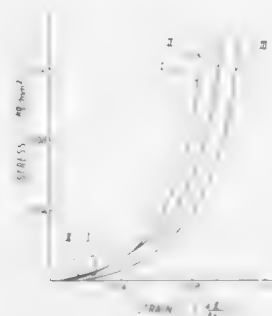
4,871,361

ARTIFICIAL VESSEL

Kazuki Kira, Kobe, Japan, assignor to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan
Continuation-in-part of Ser. No. 900,052, Aug. 25, 1986, abandoned. This application Jun. 1, 1987, Ser. No. 55,970
Claims priority, application Japan, Feb. 26, 1987, 62-43713
Int. Cl.⁴ A61F 2/06; A01N 1/02

U.S. Cl. 623—1

3 Claims



1. An artificial vessel consisting essentially of a porous vessel wall which contains pores throughout the thickness of the vessel wall from the inner surface of the vessel wall to the outer surface of the vessel wall, said vessel wall consisting essentially of concentric layers of porous thermoplastic elastomeric material, wherein each layer of porous elastomeric material has a substantially uniform porosity percentage, the innermost elastomeric layer has a thickness of 30 to 500μ and a porosity percentage of 95 to 80%, the remaining elastomeric layers have a lower porosity percentage than the innermost elastomeric layer, and the overall porosity percentage of the elastomeric layers is 90 to 75%.

4,871,362

INTRAOCULAR LENS

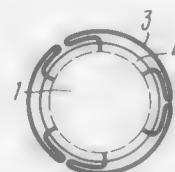
Narzy N. Nurmedov, Valery I. Gonchar, Babamurad A. Bazarov, Arslan Nurmukhamedov, Irena V. Skrylnikova, all of Ashkhabad; Ilyas A. Mustae, and Valery L. Varshavsky, both of Moscow, all of U.S.S.R., assignors to Otdelenie Vsesojuznogo Nauchno-Issledovatel'skogo i Proektno-Konstruktor'skogo Tekhnologicheskogo, Ashkhabad, U.S.S.R.
Continuation of Ser. No. 22,661, Mar. 6, 1987, abandoned. This application Jul. 20, 1988, Ser. No. 222,359
Int. Cl.⁴ A61F 2/16

U.S. Cl. 623—6

6 Claims

1. An intraocular lens, for implantation in the eye comprising an optic lens having a principal optic axis and provided with supporting elements radially arranged and rigidly fixed

on said lens; said supporting elements shaped as rods with bent-out ends and made of a material that automatically deforms said supporting elements into a contracted configuration when subjected to a temperature at least as cold as a first predetermined temperature and that automatically deforms



said supporting elements into an expanded configuration when subjected to a temperature at least as hot as a second predetermined temperature higher than said first predetermined temperature said supporting elements when expanded exhibiting bends in said elements to provide a different configuration than when said elements are in said contracted state.

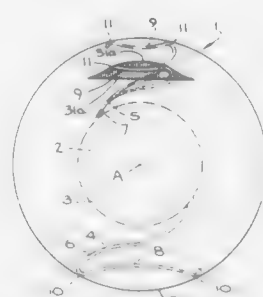
4,871,363

CORRECTIVE INTRAOCULAR LENS

Charles D. Kelman, 721 Fifth Ave., New York, N.Y. 10022
Filed Jul. 21, 1988, Ser. No. 222,133
Int. Cl.⁴ A61F 2/16

U.S. Cl. 623—6

11 Claims



1. Corrective intraocular lens for use as an anterior chamber lens with an intact natural eye lens for correcting high myopia thereof, by insertion through an incision into the eye and implantation in the anterior chamber in spaced relation to the natural lens, which comprises

a lens body, and a pair of generally diametrically opposed resiliently deflectable position fixation haptics extending outwardly from the lens body and arranged for positioning the intraocular lens in the eye in spaced relation to the natural lens,

the haptics constituting a leading haptic and a trailing haptic, each comprising a pliable strand having a stem portion attached to the lens body and a limb portion extending from the stem portion and terminating in a transverse edge portion disposed crosswise of a longitudinal diametric line passing through the lens body and intersecting both transverse edge portions, each transverse edge portions having a pair of laterally spaced apart and outwardly projecting contact lobes at the corresponding transverse ends thereof for engaging an adjacent eye tissue portion at a corresponding pair of spaced apart tissue points, whereby to form two generally diametrically opposed pairs of laterally spaced apart fixation points for positioning the intraocular lens in the eye,

the trailing haptic transverse edge portion having a length of about 2-3 mm, the lens body having a diameter of at least about two times the length of the trailing haptic transverse edge portion, and the leading haptic transverse edge por-

tion having a length substantially larger than about 2-3 mm, inserted into the eye through an incision of length corresponding substantially to the lens body diameter, by first snaking the leading haptic through the incision, next passing the lens body through the incision and positioning the leading haptic contact lobes in engagement with a said eye tissue portion distal from the incision, and then passing the trailing haptic through the incision by maintaining the lips of the incision slightly spaced apart to form an enlarged gap between the lips in which the widest part of the gap is located centrally of the incision, and moving the trailing haptic through the widest part of the gap, while exerting minimum pressure on the intraocular lens in a direction towards the previously positioned leading haptic contact lobes just sufficient to deflect the trailing haptic inwardly of the gap, and while manipulating the trailing haptic transverse edge portion to clear the gap and approach and engage its contact lobes with a corresponding said eye tissue portion proximate to the incision, for positioning the intraocular lens in spaced relation to the natural lens, with minimum risk of contact with the natural lens by the intraocular lens during the implantation.

4,871,364

METAL CORE OSSICULAR REPLACEMENT PROSTHESIS

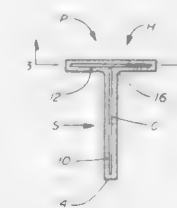
F. Barry Bays, Seminole, Fla., and Sam R. Marchand, Memphis, Tenn., assignors to Richards Medical Company, Memphis, Tenn.

Filed Apr. 18, 1983, Ser. No. 486,268

Int. Cl.⁴ A61F 2/18

U.S. Cl. 623—10

19 Claims



1. A middle ear ossicular replacement prosthesis made of porous polymeric material sufficient to accommodate tissue ingrowth, comprising:

a head portion with a top surface adapted to fit against the tympanic membrane and a bottom surface;
a shaft formed integral with and attached to a proximal end to the bottom surface of the head portion and adapted to bridge the middle ear for sound conduction to the inner ear; and

a core inside the prosthesis formed of a material more dense than the material of which the remainder of the prosthesis is formed, the core extending through at least a portion of the head, from the head through at least a substantial portion of the shaft for enhancing sound conduction through the prosthesis;
the shaft and (metal) core being formed of materials that can be bent without destroying the structural integrity of the prosthesis so that the prosthesis can be fitted to particular ear configurations.

4,871,365

PARTIALLY ABSORBABLE PROSTHETIC TUBULAR ARTICLE HAVING AN EXTERNAL SUPPORT

Barry L. Damican, Newtown, Conn., assignor to American Cyanamid Company, Stamford, Conn.
Continuation of Ser. No. 727,326, Apr. 25, 1985, Pat. No. 4,652,264. This application Dec. 24, 1986, Ser. No. 929,577
The portion of the term of this patent subsequent to Mar. 24, 2004, has been disclaimed.

Int. Cl.⁴ A61F 2/02

U.S. Cl. 623—11

4 Claims

1. A tubular article useful in prosthetic surgery comprising a plurality of at least three different fibers, the first and second fibers manufactured from two different absorbable polymers, and the third fiber manufactured from a nonabsorbable polymer; and further comprising an external support helically wrapped about and permanently adhered to the outside surface of the article.

4,871,366

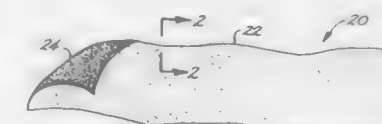
SOFT TISSUE IMPLANTS FOR PROMOTING TISSUE ADHESION TO SAME

Andreas F. von Recum, and Francis W. Cooke, both of Clemson, S.C., assignors to Clemson University, Clemson, S.C.
Continuation of Ser. No. 868,118, May 27, 1986, abandoned.
This application May 23, 1988, Ser. No. 198,612

Int. Cl.⁴ A61F 2/02, 2/06

U.S. Cl. 623—11

8 Claims



1. A soft tissue implant, comprising:
a flexible main body portion having tissue-facing surfaces;
a thin non-porous layer of pure titanium covering said tissue-facing surfaces of said main body portion; and
a thin layer of titanium oxide covering said pure titanium layer, said oxide layer forming a free surface of said implant for adhesion of soft tissue thereto.

4,871,367

SURGICALLY IMPLANTED PROSTHESIS

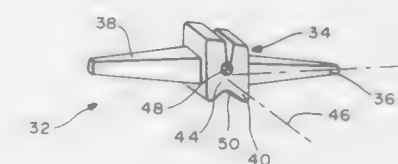
James M. Christensen, Los Angeles County, and David A. Westfield, San Diego County, both of Calif., assignors to Sutter Biomedical Corporation, San Diego, Calif.

Filed Sep. 3, 1987, Ser. No. 92,415

Int. Cl.⁴ A61F 2/42

U.S. Cl. 623—21

12 Claims



1. A surgically implantable prosthesis for replacing a knuckle joint, comprising:

(a) a one-piece main body of flexible inert material including first and second spaced-apart end sections and a narrower web extending between and joining said end sections together for flexing movement about a particular flexing axis through the web, whereby the main body functions as a hinge, said end sections and said web together defining

a key-hole shaped groove across one side said web between said end sections, said groove including a lowermost through-hole segment having a circular cross-section defining the top of the web and a generally v-shaped segment extending up from and opening into said through-hole between said end sections; and

- (b) first and second stems connected to and extending out from the first and second end sections of said main body in directions normal to said flexing axis and away from one another, said first and second stems being implantable within cooperating intramedullary canals of adjacent metacarpal and proximal phalanx bones, respectively, defining said knuckle joint.

4,871,368

ARTIFICIAL ACETABULUM

Heinz Wagner, Schwarzenbruck, Fed. Rep. of Germany, assignor to Sulzer Brothers Limited, Winterthur and Protek AG, Berne, both of, Switzerland

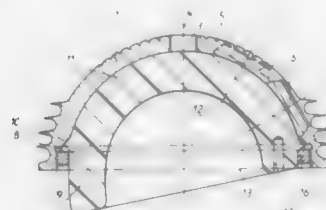
Filed Mar. 28, 1988, Ser. No. 174,107

Claims priority, application Switzerland, Mar. 30, 1987, 1219/87

Int. Cl.⁴ A61F 2/32, 2/30

U.S. Cl. 623—22

8 Claims



1. An artificial acetabulum comprising an outer metal shell having a cavity and an annular shoulder about said cavity;
- a one piece synthetic acetabular body mounted in said cavity of said metal shell, said body including a socket for receiving a spherical joint head and an annular flange seated on said shoulder of said shell; and
- a ring mounted in said metal shell and against said flange to clamp said flange against said shoulder to prevent displacement of said body in said shell.

4,871,369

LONG STEM HIP IMPLANT

Charles J. Muller, Gillette, N.J., assignor to Pfizer Hospital Products Group, Inc., New York, N.Y.

Filed Nov. 23, 1987, Ser. No. 124,134

Int. Cl.⁴ A61F 2/32

U.S. Cl. 623—23

8 Claims



1. A long stem hip joint prosthetic device for implantation into the reamed or broached out medullary canal of the femur comprising:

a femoral component having an intramedullary stem having a proximal and a distal portion the combined length of which, when implanted, is longer than the distance in the intramedullary canal from the femur lesser trochanter to the isthmus, said proximal portion of said intramedullary stem being substantially over its major extent, said distal portion made up of a first component and a second component, wherein (a) said first component is the projection of said distal curve on the A-P plane and is a simple curve having its center of curvature (when positioned in the body upon implantation) lying posteriorly with respect to the axis of the femur; and (b) said second component is the projection of said distal curve on the M-L plane and is a simple curve having its center of curvature (when positioned in the body upon implantation) lying laterally with respect to the axis of the femur, said curvature of said second component beginning at a point closer to a tip of said distal portion than the curvature of said first component.

CHEMICAL

4,871,370

STABLE CRYSTALLINE CELLULOSE III POLYMORPHS

Lawrence Y. Yatsu, New Orleans; Timothy A. Calamari, Jr., Metairie, and Ruth R. Benerito, New Orleans, all of La., assignors to The United States of America as represented by the Secretary of the Agriculture, Washington, D.C.

Filed Jun. 18, 1987, Ser. No. 63,357

Int. Cl.⁴ D06M 1/00

U.S. Cl. 8—116.1

6 Claims

1. A process for producing cellulosic fiber with improved resistance to abrasion and increased permeability to chemicals comprising: treating cellulosic fiber with ammonia vapors for sufficient time at a temperature from about ambient to about 140° C. and at a pressure from about 100 psi to about 1700 psi to sufficiently alter the interatomic planar distances to produce a highly stable crystalline cellulose III polymorph.

4,871,371

TINT COMPOSITIONS USEFUL FOR PROVIDING COLORATION TO AQUEOUS AND NON-AQUEOUS LIQUIDS

Jeffery R. Harris, Spartanburg, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

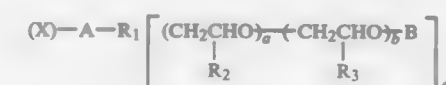
Filed Oct. 24, 1988, Ser. No. 261,205

Int. Cl.⁴ D06P 5/13

U.S. Cl. 8—403

3 Claims

1. A two component tint composition which comprises as a first component, a colorant of the formula:



wherein

X is a polar group selected from sulfonic acids, sulfonic acid salts, sulfonamides, sulfonates, carboxylic acids, carboxylic acid salts, carboxylic acid amides, carboxylic aldehydes, carboxylic acid esters, ureas, thioureas, nitro groups, hydroxy groups, polyethers, and hydroxyalkylethers;

R₁ is selected from nitrogen, oxygen, or sulfur;

R₂ is hydrogen;

R₃ is a lower alkyl group;

a is an integer of from 2—10;

b is an integer of from 2—10;

c is one when R₁ is oxygen or sulphur and two when R₁ is nitrogen;

A is a chromophore selected from nitro, nitroso, monazo, diazo, diarylmethane, triarylmethane, acridine, methine, thiazole, indamine, oxazine, or anthraquinone; and B is —H, —alkyl, or —alkyl carboxylate; and

as a second component a diluent selected from alkoxyated fatty acids and alkoxyated long chain alcohols, the weight ratio of diluent to colorant being from about 2.5 to about 5 parts diluent to 1 part colorant.

4,871,372

DYE COMPOSITION FOR KERATINOUS FIBER

Tsutomu Mano, Saitama; Jiro Kawase, Funabashi; Daisuke Mitsu, Ichikai, and Michio Obayashi, Utsunomiya, all of Japan, assignors to Kao Corporation, Tokyo, Japan

Filed Jul. 12, 1988, Ser. No. 217,776

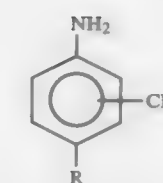
Claims priority, application Japan, Jul. 17, 1987, 62-178441; Sep. 29, 1987, 62-245085; Sep. 29, 1987, 62-245084

Int. Cl.⁴ F16B 23/00, 35/06

U.S. Cl. 8—410

2 Claims

1. A dye composition for keratinous fibers comprising a developer and a coupling substance, wherein said developer is a trifluoromethylated aniline derivative represented by the following formula (I) or a salt thereof:



(I)

in which R represents a hydroxyl group or a group represented by —NHR', wherein R' represents a C₂₋₆ mono- or polyhydroxyalkyl group, a C₁₋₂₀ alkyl group, or a group represented by —(CH₂)_n—O—R'', [wherein R'' stands for a C₁₋₄ alkyl group, a C mono- or polyhydroxyalkyl group, a group represented by —(CH₂)_n—O—R', (wherein R³ and R⁴ may be same or different and denote hydrogen atoms, C₁₋₂₀ alkyl groups, or C₂₋₆ mono- or polyhydroxyalkyl groups, and n denotes an integer of 1 to 4), or —(CH₂)_n—COOR⁵ (wherein R⁵ is a hydrogen atom, a C₁₋₆ alkyl group, or a C mono- or polyhydroxyalkyl group, and n denotes an integer of 1 to 4), and n denotes an integer of 1 to 4].

4,871,373

CONTINUOUS PREPARATION OF SOLUTIONS OF LOW VISCOSITY SOLVENTS AND HIGH VISCOSITY, PASTY PRODUCTS

Volker Kiener, Weissenheim; Guenther Nonn, Dackenheim; Bernhard Seid, Frankenthal; Harald Schewski, Weissenheim, and Karl Buellmeyer, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

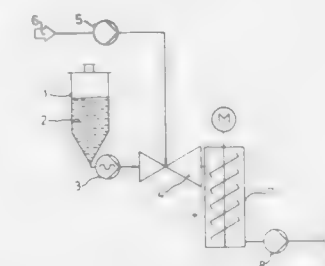
Filed Dec. 17, 1987, Ser. No. 134,107

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1986, 3644459

Int. Cl.⁴ B01D 1/30

U.S. Cl. 23—306

2 Claims



1. A continuous process for preparing a homogeneous solution of water and paste-like formulation of sodium dithionite which comprises passing the water and said sodium dithionite formulation first through a static mixer which consists of a plurality of bores uniformly distributed over the periphery of a conical nozzle and a larger bore arranged at the end of the nozzle which serves as a flow blowoff orifice and thence through a dynamic mixer while avoiding the ingress of air therein, with the passage through both mixers being accomplished in a matter seconds, and with said static and dynamic mixers being arranged such that they are connected in series without any dead space therebetween.

4,871,374

FUEL OILS STABILIZED WITH IMINE-ENAMINE CONDENSATES AND METHOD THEREOF

Jerry J. Weers, Ballwin, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

Filed Jan. 14, 1988, Ser. No. 143,894

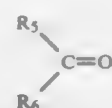
Int. Cl.⁴ C10L 1/22

U.S. Cl. 44—63

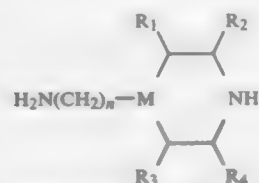
12 Claims

1. A distillate fuel oil containing a stabilizing amount of an

imine-enamine additive which is the condensation product of a member selected from the group consisting of aldehydes having at least two carbon atoms, ketones and mixtures thereof of the formula



wherein R_5 is a member selected from the group consisting of alkyl, aryl, aralkyl alkaryl, cycloalkyl and heterocyclyl and R_6 is a member selected from the group consisting of hydrogen, alkyl, aryl, aralkyl, alkaryl, cycloalkyl and heterocyclyl, and a polyamino compound of the formula



where n is 0 or an integer from 1 to 6, M is CH or nitrogen and R_1, R_2, R_3 and R_4 are independently selected from the group consisting of hydrogen, alkyl, aryl, aralkyl, alkaryl, cycloalkyl, alkenyl, aralkenyl, cycloalkenyl and heterocyclyl groups.

4,871,375 FUELS FOR OTTO ENGINES

Franz-Dieter Martischius, Neustadt; Knut Oppensender, Ludwigshafen, and Hans-Henning Vogel, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jul. 20, 1988, Ser. No. 221,757

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1987, 3725272; Jan. 16, 1988, 3901107

Int. Cl.⁴ C10L 1/18, 1/22

U.S. Cl. 44-71 8 Claims
1. A fuel for Otto engines containing a fuel and 10 to 2000 ppm of an additive of an alkali-metal or alkaline-earth-metal salts of amic acids of the formula



or of analogous partial amides of tricarboxylic or tetracarboxylic acids whose carbamoyl groups have the formula



where A is the bivalent radical vinylene, ethylene, trimethylene, or tetramethylene and R^1 and R^2 are identical or different, substituted or unsubstituted alkyls or alkenyls of from 5 to 75 carbon atoms or R^1 is hydrogen and R^2 is the group of the formula



where R^3 and R^4 are identical or different hydrocarbon radicals of from 1 to 18 carbon atoms, n is 3 or 4, and x is from 4 to 99.

4,871,376 RESIN SYSTEMS FOR COATED PRODUCTS; AND METHOD

Carolyn G. DeWald, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 14, 1987, Ser. No. 132,485

Int. Cl.⁴ C09K 3/14

U.S. Cl. 51-296 22 Claims
1. A coated abrasive article comprising:

- a substrate backing;
- abrasive material bound to said substrate backing; and
- a bond system adhering said abrasive material to said substrate backing; said bond system comprising: a resinous adhesive, inorganic filler, and, a coupling agent in an effective amount to provide bridging association between the adhesive and the filler.

4,871,377 COMPOSITE ABRASIVE COMPACT HAVING HIGH THERMAL STABILITY AND TRANSVERSE RUPTURE STRENGTH

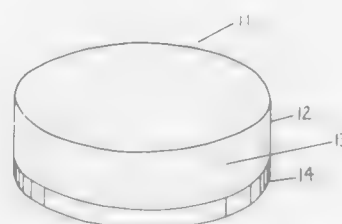
Robert H. Frushour, 2313 Devonshire, Ann Arbor, Mich. 48104

Continuation-in-part of Ser. No. 892,196, Jul. 30, 1986, abandoned, which is a continuation of Ser. No. 690,136, Jan. 10, 1985, abandoned, which is a continuation-in-part of Ser. No. 425,289, Sep. 29, 1982, abandoned. This application Feb. 3, 1988, Ser. No. 151,942

Int. Cl.⁴ B24B 3/02

U.S. Cl. 51-309

13 Claims



1. A composite abrasive compact having high thermal stability at temperatures of at least 850° C. and transverse rupture strength of at least 70 Kg/mm² which includes
 - a relatively thick table of well sintered abrasive particles bonded in particle-to-particle contact with interstices between adjacent particles,
 - a strong chemically inert binder matrix dispersed throughout the table in the interstices, and
 - a relatively thin layer of metal having a melting point above 1000° C. bonded directly to the table in a HP/HT press.

4,871,378 ULTRATHIN ETHYLCELLULOSE/POLY(4-METHYLPENTENE-1) PERMSELECTIVE MEMBRANES

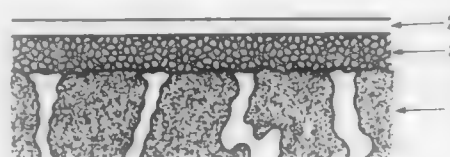
Ingo Pinnas, Austin, Tex., assignor to Membrane Technology & Research, Inc., Menlo Park, Calif.

Filed Dec. 11, 1987, Ser. No. 131,875

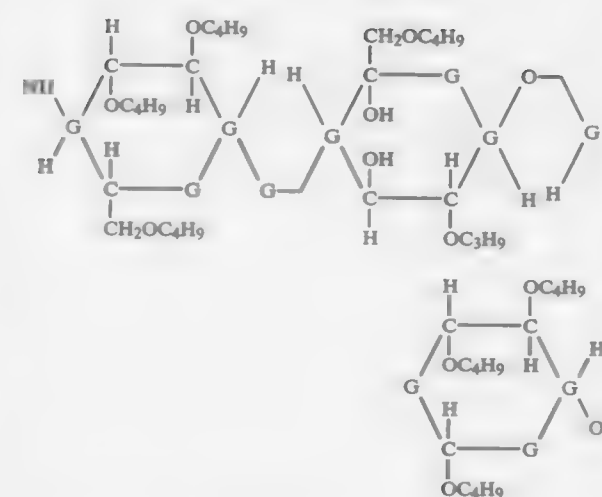
Int. Cl.⁴ B01D 53/22

U.S. Cl. 55-16

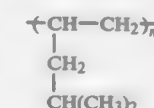
13 Claims



1. A membrane useful for gas separation, comprising: an ultrathin, permselective ethylcellulose layer having the general formula



wherein the ethoxyl content is in the range 35% to 50%; and an ultrathin, permselective poly(4-methylpentene-1) layer having the formula



said poly(4-methylpentene-1) layer forming a coating on one surface of said ethylcellulose layer, said membrane having an O₂/N₂ selectivity which is greater than the intrinsic O₂/N₂ selectivity of said ethylcellulose and which is greater than 90% of the intrinsic O₂/N₂ selectivity of said poly(4-methylpentene-1).

5. A process for separating a gas A from a gas B in a first gas mixture containing A and B, comprising the steps of:
 - contacting the feed side of the membrane of claim 1 with said gas mixture; and
 - withdrawing from the permeate side of said membrane a second gas mixture wherein the proportion of gas A is enriched, and the proportion of gas B depleted, compared to said first gas mixture.

4,871,379 MODULAR, SHELL-LESS, AIR PERMEATOR

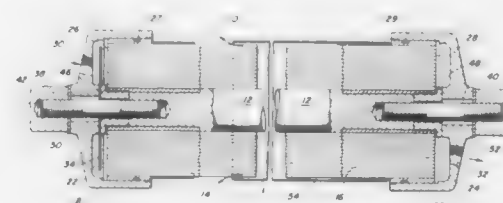
Donald W. Edwards, Wilmington, Del., assignor to E. I. Du Pont De Nemours and Company, Wilmington, Del.

Filed Dec. 22, 1987, Ser. No. 136,845

Int. Cl.⁴ B01D 53/22

U.S. Cl. 55-158

8 Claims



1. A shell-less gas permeator comprising an elongated bundle of hollow fibers having a tubesheet on both ends, end caps enclosing both tubesheets and forming pressure chambers in combination with said hollow fibers, the first chamber being an inlet and the second chamber being a residue gas outlet, a support rod in the center of the bundle of hollow fibers passing through and rigidly attached to each tubesheet and end cap,

and a passage establishing fluid communication between the outside of each end cap and the chamber within such cap.

4,871,380 CARTRIDGE MOUNT FOR POWDER COLLECTOR

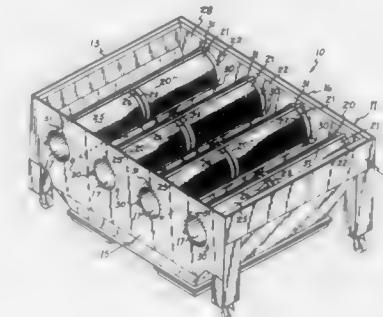
Reuven I. Meyers, Minneapolis, Minn., assignor to Nordson Corporation, Westlake, Ohio

Filed Aug. 8, 1988, Ser. No. 229,431

Int. Cl.⁴ B01D 46/00

U.S. Cl. 55-350

7 Claims



1. A powder collector comprising:
 - a housing including first and second spaced parallel walls, the first said wall having an opening,
 - a cartridge disposed horizontally between said walls, said cartridge including an elongated hollow member formed of filter media and a closed end cap on one end and an open end cap on the other end,
 - means forming a cage between said walls surrounding said cartridge to position and support said cartridge horizontally in said housing,
 - said open end cap overlying the opening in said first wall, a gasket between said end cap and said first wall, said gasket surrounding the opening in said first wall,
 - means compressing said gasket between said first wall and said end cap having an opening,
 - said compressing means comprising a rod passing through said second wall and substantially coaxial with said filter, and means for forcing said rod against said closed end cap.

4,871,381 AIR FILTER HOUSING ASSEMBLY FOR GASOLINE ENGINE POWER TOOLS

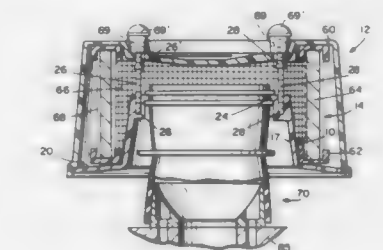
George C. Smith, 1738 Edeline Ave., McKinleyville, Calif. 95521

Filed Jun. 28, 1988, Ser. No. 212,567

Int. Cl.⁴ B01D 46/02

U.S. Cl. 55-385.3

16 Claims



1. A housing assembly for an air cleaner element mountable on an internal combustion engine of a chain saw, said element having upper and lower surfaces and at least one peripheral side surface, the housing assembly comprising:
 - (a) a lower base component comprising a peripheral flange

portion for supporting the air cleaner element, and a centrally located hub portion defined by an upstanding peripheral wall which extends upwardly a distance greater than one-half the height of the filter element, said flange portion extending radially outwardly from a lowermost end of the hub portion; said flange portion including at least one aperture for introducing air into the assembly, and said hub portion having an outlet at an upper end of said upstanding peripheral wall;

- (b) an upper component adapted for mating engagement with said lower component, and comprising a cover for surrounding and enclosing at least the upper and peripheral side surface of the air cleaner element; the upper component further including means enabling releasable attachment of the upper component to the lower component; and
- (c) a coupling for flexibly connecting the housing to the engine.

4,871,382

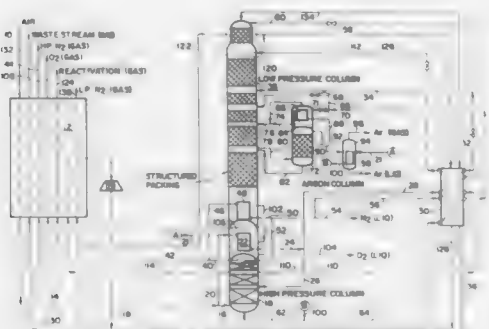
AIR SEPARATION PROCESS USING PACKED COLUMNS FOR OXYGEN AND ARGON RECOVERY

Robert M. Thorogood, Macungie; Douglas L. Bennett, Allentown, both of Pa.; Rodney J. Allam, Westacre; Alan L. Prentice, Surbiton, both of United Kingdom, and Bruce K. Dawson, Bethlehem, Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Continuation-in-part of Ser. No. 132,535, Dec. 14, 1987, Pat. No. 4,783,210. This application Apr. 29, 1988, Ser. No. 187,682
Int. Cl.⁴ F25J 3/00

U.S. Cl. 62—18

3 Claims



1. In a process for the separation of mixtures, which comprise oxygen, nitrogen, and argon, by cryogenic distillation in an integrated multi-column distillation system of at least three distillation columns, having a higher pressure column, low pressure column and an argon sidearm column wherein the argon sidearm column integrally communicates with the low pressure column, and wherein each column of the integrated distillation system, a liquid phase stream and a vapor phase stream are intimately contacted thereby allowing mass transfer; the improvement for increasing argon recovery comprises effectuating the intimate contact of the liquid and vapor phase streams in the low pressure column and the argon sidearm column by utilizing a structured packing.

4,871,383

METHOD OF MANUFACTURING OPTICAL FIBRES

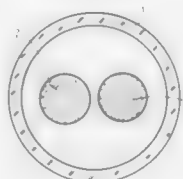
Peter K. Bachmann; Hans-Jürgen E. Hagemann, both of Aachen, Fed. Rep. of Germany; Jacques P. M. Warnier, Eijsden, Netherlands, and Howard J. C. Wilson, Aachen, Fed. Rep. of Germany, assignors to U.S. Philips Corp., New York, N.Y.
Filed Jun. 14, 1988, Ser. No. 206,644

Claims priority, application Fed. Rep. of Germany, Jun. 16, 1987, 3720028

Int. Cl.⁴ C03B 37/018

U.S. Cl. 65—3.12

6 Claims



1. In a method of manufacturing an optical fibre, comprising depositing glass in layers on the inner wall of a glass tube which is heated to a temperature between 1100° and 1300° C., and simultaneously depositing glass on a glass rod which is arranged inside the glass tube, by leading a reactive gas mixture through the glass tube at a pressure between 1 and 30 hPa, while inside the glass tube a plasma is made to reciprocate strokewise between two reversal points, then collapsing the glass tube after the deposition of a quantity of glass which corresponds to the intended construction of the optical fibre, so as to form a solid preform from which optical fibres are drawn, the improvement wherein at least two glass rods are arranged inside the tube in such a way that their longitudinal axes run parallel to the longitudinal axis of the glass tube and the at least two glass rods are arranged such that the thickness of the layers deposited on said inner wall varies with a predetermined period along the periphery of said inner wall of the glass tube, and that the glass rods are removed from the glass tube upon completion of the glass deposition and prior to collapse; the presence of the at least two glass rods resulting in the optical fibre being formed as a polarization retaining optical fibre.

4,871,384

PROCESS FOR SURFACE MODIFICATION OF INORGANIC BIOMATERIAL

Toshihiro Kasuga, Akishima, Japan, assignor to Hoya Corporation, Tokyo, Japan

Filed Apr. 28, 1988, Ser. No. 187,457

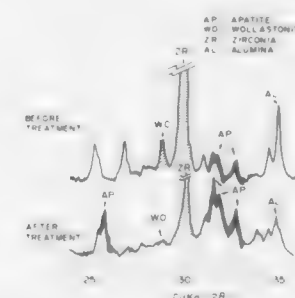
Claims priority, application Japan, Apr. 28, 1987, 62-106068
Int. Cl.⁴ C03C 10/00, 10/06, 10/04, 21/00

U.S. Cl. 65—30.1

6 Claims

1. A process for modifying the surface of a bioactive ceramic-crystallized-glass-composite biomaterial, which comprises providing said biomaterial, as a biomaterial which contains a crystallized glass of at least 12–56% CaO, 1–27% P₂O₅ and 22–50% SiO₂ and a reinforcing amount of a reinforcing ceramic of zirconia and/or alumina ceramic dispersed in the crystallized glass, contacting said biomaterial with an aqueous solution containing calcium ion and/or phosphate ion to dissolve CaO and/or P₂O₅ from said biomaterial into said solution and precipitate a calcium phosphate crystal on the surface of said biomaterial, said contacting being effected for sufficient time and temperature to improve bioactivity of the biomaterial

and to completely cover the composite biomaterial with calcium phosphate crystal, and removing said composite biomaterial



from the aqueous solution as a calcium-phosphate-covered biomaterial with increased bioactivity.

4,871,385

PROCESS AND DEVICE FOR COOLING OF SHEETS OF BENT GLASS SO AS TO PRODUCE EDGE STRESSES

Jean Lecourt, Paris, France; Denise Legros, Jemeppe, and Andre Granville, Anvelais, both of Belgium, assignors to Saint-Gobain Vitrage, Courbevoie, France

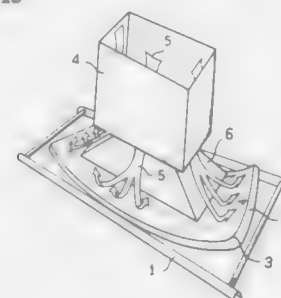
Filed Dec. 20, 1988, Ser. No. 286,859

Claims priority, application France, Dec. 22, 1987, 87 17885

Int. Cl.⁴ C03B 27/04

U.S. Cl. 65—115

16 Claims



1. An apparatus for blowing gas on a glass sheet as to create a compression stress on the periphery of the glass sheet, comprising:

- a duct connected to a source of gas flow, a downstream end of the duct, in a direction of the gas flow, being positioned for directing the gas flow issuing therefrom onto a glass sheet; and
- a pyramidal deflector having an axis extending substantially parallel to the direction of gas flow with the vertex of the pyramidal deflector being positioned to the upstream in the direction of gas flow, said pyramidal deflector being positioned, relative to the duct so as to divert the gas flow issuing from said duct along sides of said pyramidal deflector, whereby the gas flow is diverted from a central portion of the glass sheet to the periphery of the glass sheet, whereby said central portion is covered by the deflector and is cooled at a lower rate than is said periphery.
12. A process for cooling glass sheets while creating compression stresses on the periphery thereof, comprising the steps of:
- causing a gas to flow in an initial gas flow direction;
- using deflecting means for deflecting said gas to flow in a deflected direction having a radially outward component with respect to said initial gas flow direction so that a region downstream from said deflecting means receives a reduced gas flow as compared to a region along said deflected gas flow; and
- positioning a glass sheet downstream of said deflecting means and at a position such that only the periphery of the

glass sheet receives said deflected gas flow while a central portion of said glass sheet is covered by said deflector.

4,871,386

BIOLOGICAL CONTROL OF WILD POINSETTIA AND OTHER WEEDY SPURGES WITH A FUNGAL PATHOGEN

Joe A. Riley, Ruston, La., assignor to Mycogen Corporation, San Diego, Calif.

Continuation-in-part of Ser. No. 856,614, Apr. 25, 1986, Pat. No. 4,755,208. This application Jul. 6, 1987, Ser. No. 70,008

The portion of the term of this patent subsequent to Jul. 5, 2005, has been disclaimed.

Int. Cl.⁴ A01N 63/00; C12N 1/14

U.S. Cl. 71—79

10 Claims

1. A composition for controlling wild poinsettia and weedy spurges comprising a novel isolate of the fungus *Alternaria euphorbiicola* Simmons and Engelhard, having the identifying characteristics of deposit NRRL 18227, in association with an agricultural carrier.

4,871,387

PYRIMIDYL-OXY-AND -THIO-BENZOIC ACID DERIVATIVES USEFUL AS HERBICIDES AND PLANT GROWTH REGULANTS

Klaus Sasse, Bergisch Gladbach; Reiner Fischer, Monheim; Hermann Hagemann; Hans-Joachim Santel, both of Leverkusen; Robert R. Schmidt, and Kalus Lürsen, both of Bergisch Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 4, 1986, Ser. No. 938,203

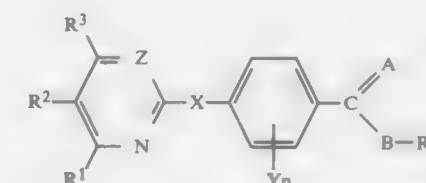
Claims priority, application Fed. Rep. of Germany, Dec. 5, 1985, 3543037; Jan. 24, 1986, 3602016

Int. Cl.⁴ A01N 43/40; C07D 417/00, 221, 02, 239/02

U.S. Cl. 71—92

9 Claims

1. A pyrimidyl-oxy- or -thio-benzoic acid derivative of the formula



in which

R¹, R² and R³, each independently represent hydrogen; alkyl having 1 to 6 carbon atoms; alkenyl having 2 to 6 carbon atoms; unsubstituted C₁–C₄-alkoxy or C₁–C₄-alkoxy which is substituted by C₂–C₄-alkenyl or C₁–C₂-alkoxy; alkylamino or dialkylamino having 1 to 4 carbon atoms in each of the individual alkyl moieties, where, in the case of dialkylamino, the alkyl substituents can form a 5- to 6-membered heterocyclic ring with the nitrogen atom to which they are attached said heterocyclics being pyrrolidine, piperidine, morpholine and piperazine; amino; alkenylamino or dialkenylamino having 3 to 4 carbon atoms in each of the individual alkenyl moieties; or trifluoromethyl; or R¹ and R² and R³ together represent a 5- or 6-membered saturated or unsaturated carbocyclic ring; with the proviso that at least one of the radicals R¹, R², or R³ represents alkyl having 1 to 6 carbon atoms, trifluoromethyl or forms a part of the fused 5- or 6-membered carbocyclic ring,

Z represents a nitrogen atom,

X represents oxygen or sulphur,

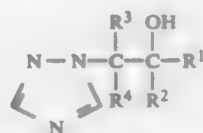
Y represents fluorine; chlorine; bromine; iodine; nitro; cyano; or amino; alkyl, alkoxy, haloalkyl, alkylcarbonylamino or alkoxycarbonylamino, in each case with 1 to 4 carbon atoms in the alkyl moiety and, in the case of haloalkyl having 1 to 5 halogen atoms, where halogen represents fluorine, chlo-

2-imidazolin-2-yl)-m-toluic acid, methyl ester and 2-(5-isopropyl-5-methyl-4-oxo-2-imidazolin-2-yl)-p-toluic acid, methyl ester, and said water miscible organic solvent is N-methylpyrrolidone, dimethylsulfoxide, dimethylformamide or a mixture of tetrahydrofurfuryl alcohol, diacetone alcohol or butyrolactone in combination with the C₁-C₄ alkyl alcohol.

4,871,390 HETEROCYCLIC COMPOUNDS

Raymond Elliott, Nr Reading; Raymond Sanley, Twyford, and David A. Griffin, Bracknell, all of England, assignors to Imperial Chemical Industries PLC, London, England
Filed Apr. 21, 1986, Ser. No. 833,915
Claims priority, application United Kingdom, May 3, 1985, 8511344

Int. Cl.⁴ A01N 43/653; C07D 249/12
U.S. Cl. 71-92 6 Claims
1. A compound having the general formula:



and stereoisomers thereof, wherein R¹ is tertiary butyl, optionally substituted with halogen; R² is selected from the group consisting of —C≡C—X, —CH=CH—X and —CH₂—CH₂—X where —X is alkyl containing from 3 to 5 carbon atoms and optionally substituted by halogen; R³ is hydrogen and R⁴ is alkyl of up to 4 carbon atoms and esters, acid-addition salts and metal complexes thereof.

4,871,390

1-HYDROXYETHYL-AZOLE COMPOUNDS AND AGRICULTURAL COMPOSITIONS

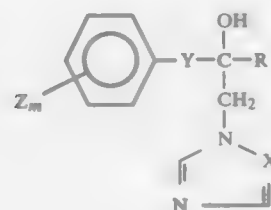
Graham Holmwood, Wuppertal; Karl H. Büchel, Burscheid; Klaus Lürsen, Berg-Gladbach; Paul-Ernst Frohberger, Leverkusen, and Wilhelm Brandes, Leichlingen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 549,867, Nov. 8, 1983, which is a continuation of Ser. No. 260,479, May 4, 1981, abandoned. This application May 8, 1985, Ser. No. 732,193

Claims priority, application Fed. Rep. of Germany, May 16, 1980, 3018866; Feb. 19, 1981, 3106076

Int. Cl.⁴ A01N 43/50; A61K 31/415; C07D 233/60
U.S. Cl. 71-92 49 Claims

1. 1-Hydroxyethyl-azole compound of the formula



wherein

R is an alkyl radical with 1 to 4 carbon atoms; a cycloalkyl radical which has 3 to 7 carbon and is optionally substituted by alkyl with 1 or 2 carbon atoms or a phenyl radical which is optionally substituted by halogen, alkyl with 1 to 4 carbon atoms or haloalkyl with 1 or 2 carbon atoms and 1 to 5 halogen atoms; or else is phenyl which is optionally mono- or di-substituted by identical or different substituents selected from fluorine, chlorine, methyl and trifluoromethyl,
X is —CH—;

Y is a grouping —OCH₂—;
Z is a halogen atom, an alkyl radical with 1 to 4 carbon atoms; a cycloalkyl radical with 5 to 7 carbon atoms, an alkoxy radical with 1 to 4 carbon atoms, an alkylthio radical with 1 to 4 carbon atoms, a haloalkyl radical with 1 or 2 carbon atoms and 1 to 5 halogen atoms, a haloalkoxy radical with 1 or 2 carbon atoms and 1 to 5 halogen atoms, a haloalkylthio radical with 1 or 2 carbon atoms and 1 to 5 halogen atoms, a phenyl radical which is optionally substituted by halogen or alkyl with 1 to 4 carbon atoms, a phenoxy radical which is optionally substituted by halogen or alkyl with 1 to 4 carbon atoms, a phenylalkyl radical which has 1 or 2 carbon atoms in the alkyl part and is optionally substituted by halogen or alkyl with 1 to 4 carbon atoms, or a phenylalkoxy radical which has 1 or 2 carbon atoms in the alkoxy part and is optionally substituted by halogen or alkyl with 1 to 4 carbon atoms; and m is 0, 1, 2 or 3
and physiologically acceptable acid addition salts thereof or metal salt complexes thereof.

4,871,391

HERBICIDAL

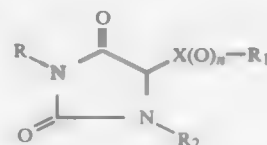
5-SUBSTITUTED-2,4-IMIDAZOLIDINEDIONES

Slok H. H. Wee, Berkeley, and Michael P. Pribyla, Richmond, both of Calif., assignors to ICI Americas Inc., Wilmington, Del.

Filed Jul. 18, 1988, Ser. No. 220,298

Int. Cl.⁴ A01N 43/50; C07D 233/86, 233/72
U.S. Cl. 71-92 60 Claims

21. A method of controlling undesirable vegetation comprising applying to said vegetation or the locus thereof, an herbicidally effective amount of a compound having the formula



wherein

R is C₁-C₃ alkyl, phenyl or phenyl substituted with one or more alkyl, alkoxy, halo, haloalkyl or nitro;
R₁ is phenyl or phenyl substituted with one or more alkyl, alkoxy, halo, haloalkyl or nitro;
R₂ is lower alkyl, phenyl or phenyl substituted with one or more alkyl, halo or haloalkyl;
X is sulfur or oxygen; and
n is an integer from 0 to 2.

4,871,392

AQUEOUS SUSPENSION CONCENTRATE COMPOSITIONS OF PENDIMETHALIN

Leonard J. Morgan, and Mark Bell, both of Hampshire, England, assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 867,106, May 23, 1986, abandoned. This application May 7, 1987, Ser. No. 45,457
Int. Cl.⁴ A01N 53/06

U.S. Cl. 71-121 12 Claims

1. An aqueous suspension concentrate composition comprising, on a weight to volume basis: about 5.0% to 50.0% solid pendimethalin having 4% orange crystal form to 96% yellow crystal form to 100% orange crystal form; about 3.0% to 30.0% non-pesticidal coformulants; and about 20.0% to 92.0% water.

4,871,393

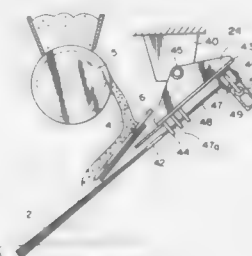
APPARATUS AND METHOD FOR FEEDING SINTERING RAW MIX

Masami Fujimoto; Tadahiro Isezami; Katsuhiko Satoh, all of Kitakyushu; Eichi Shimozawa, Kimitsu; Yasuhiko Awa, Kimitsu; Fumihiko Sato, Kimitsu; Kenro Nozaki, Kimitsu; Akira Gushima, Kitakyushu; Yoshinobu Suemura, Kitakyushu; Nobuo Kusakabe, Kitakyushu; Kunihiko Imada, Kitakyushu; Masatoshi Arichi, Tokyo; Mitsunori Tanaka, Kitakyushu; Yoshinori Umezu, Kitakyushu, and Tsuneo Ikeda, Kitakyushu, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Apr. 6, 1988, Ser. No. 178,341

Claims priority, application Japan, Apr. 6, 1987, 62-85543; Jun. 8, 1987, 62-88240; Jul. 31, 1987, 62-193451; Jul. 31, 1987, 62-193452; Sep. 10, 1987, 62-138862; Oct. 1, 1987, 62-151492

Int. Cl.⁴ C22B 1/20
U.S. Cl. 75-5 11 Claims



10. A method of feeding a sintering raw mix from a downwardly inclined chute onto a pallet of a sintering apparatus moving in an advancing direction comprising: pouring the sintering raw mix from the chute onto a screen of individual side-by-side bars sloping downwardly in the direction of falling of the sintering raw mix which sloping direction is the opposite of the direction of advance of the pallet and the lower ends of the bars being free and the upper ends being mounted for being individually movable to change the angle of sloping; sensing a characteristic of the layer of mix on the pallet as it undergoes sintering as a measure of the permeability of the layer; rotating the bars around their longitudinal axes; and in response to the sensed characteristic and for adjusting the permeability of the layer in the direction of a desired permeability, adjusting one of the angle of inclination of the chute, the sloping angle of the screen, the sliding distance of the chute, and the gap between the lower end of the screen and the layer of raw mix.

oil, having a void volume not less than 30% of the total volume of the facing, obtained by sintering, in the presence of silica and



graphite, copper powder which is in dendritic form and of apparent density not greater than 1.3 g/cm³.

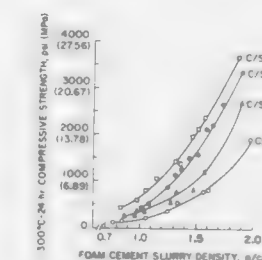
4,871,395

HIGH TEMPERATURE LIGHTWEIGHT FOAMED CEMENTS

Toshifumi Sugama, Mastic Beach, N.Y., assignor to Associated Universities, Inc., Washington, D.C.

Filed Sep. 17, 1987, Ser. No. 97,737

Int. Cl.⁴ C04B 7/02
U.S. Cl. 106-88 4 Claims



1. A lightweight foamed cement slurry composition having, when exposed to temperatures up to 350° C., a slurry density of between 1.1 g/cc and 2.0 g/cc and, upon curing, a compressive strength of greater than 1,000 psi which consists essentially of:

- a cementitious matrix comprising a cement and silica flour wherein the cement to silica flour ratio is approximately 1.0;
- a retarder to retard the setting of the cement;
- a foam generator comprising a foaming agent and a foam stabilizer wherein the addition of said foam generator to said cementitious matrix results in a foamed cement containing a uniform distribution of fine foam bubbles in the size range of from approximately 5 μm to 20 μm;
- a reinforcement material; and
- water.

4,871,396

GRANULAR COMPOSITION AND DENTIFRICE CONTAINING THE SAME

Satoshi Tsujita; Koji Maeda, and Yasuteru Eguchi, all of Utsunomiya, Japan, assignors to Kao Corporation, Tokyo, Japan
Filed Nov. 12, 1987, Ser. No. 119,559

Claims priority, application Japan, Nov. 25, 1986, 61-280331
Int. Cl.⁴ C09D 1/00

U.S. Cl. 106-286.8 14 Claims

1. A granular composition, which comprises a water-soluble powder material selected from the group consisting of dibasic calcium phosphate, tribasic calcium phosphate, insoluble sodium metaphosphate, silica, aluminum hydroxide, magnesium phosphate, calcium carbonate, calcium pyrophosphate, zeolite, complex aluminosilicate, magnesium carbonate, red iron oxide,

4,871,394

SINTERED METAL FRICTION FACING

Ralph Baker, Buxton, and Stephen N. Foulkes, Chapel en le Frith, both of United Kingdom, assignors to Ferodo Limited, Manchester, England

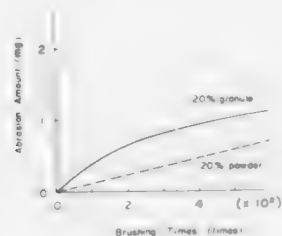
Filed Nov. 8, 1988, Ser. No. 268,722

Claims priority, application United Kingdom, Nov. 19, 1987, 8727140

Int. Cl.⁴ C22C 29/12
U.S. Cl. 75-232 7 Claims

7. Sintered copper friction facing suitable for operation in

calcium sulfate and a mixture of two or more of them and a binder selected from the group consisting of colloidal silica, magnesium aluminate metasilicate, bentonite, montmorillonite, synthesized aluminum silicate, calcium silicate, aluminum hydroxide gel, alumina sol, magnesium carbonate, synthetic hydrotalcite, magnesium oxide, magnesium hydroxide and a



mixture of two or more of the same; said composition containing granules having a diameter such that 80 wt. % or more of the granules are capable of passing through a No. 32 mesh of an analytical sieve, but are incapable of passing through No. 200 mesh of the sieve, and which collapse under a load of 0.1-10 g. per grain of granule.

4,871,397

PROCESS FOR DECOLORIZING AQUEOUS SUGAR SOLUTION

Rex R. Stevens, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed May 9, 1988, Ser. No. 192,749

Int. Cl.⁴ C13D 3/14, 3/12

U.S. Cl. 127-55

20 Claims

1. An improved process for decolorizing an aqueous sugar solution by contacting the solution with an anion exchange resin, the improvement comprising using an adsorbent anion exchange resin prepared by aminating a macroporous, chloromethylated copolymer with a polyamine with amine groups selected from primary and secondary amine groups and a combination thereof under conditions sufficient to promote crosslinking of unreacted amine sites with chloromethyl groups on the copolymer.

4,871,398

METHOD FOR PREGELATINIZED, SPRAY-DRIED STARCH AGGLOMERATES

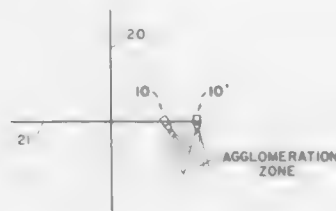
Jay H. Katcher, Cranbury, N.J.; John T. Mabon, Andover, Mass.; Jennifer W. Matherly, Cherry Hill, N.J.; Lawrence T. McCarty, Dover, Del., and Robert E. Schara, Princeton Junction, N.J., assignors to General Foods Corporation, White Plains, N.Y.

Filed Dec. 9, 1988, Ser. No. 282,403

Int. Cl.⁴ C08B 30/00

U.S. Cl. 127-71

5 Claims



1. A continuous process for the production of a cold-water dispersible, gelatinized, agglomerated and spray-dried starch for use in instant food mixes comprising the steps of:

- (a) atomizing an aqueous starch slurry into a plurality of enclosed chambers, said slurry having a starch solids content of from 30 to 42% by weight, the atomized, spher-

ical particles having a size range of about 20 to 200 microns;

- (b) interjecting steam into the atomized slurry within each enclosed chamber to gelatinize the starch, each chamber containing a vent aperture which is shaped and positioned to enable the atomized mixture to exit the chamber, the size and shape of the chamber and the vent aperture being effective to maintain the temperature and moisture content of the starch for a period of time effective to gelatinize the starch;
- (c) passing a stream of gelatinized starch particles through each of the vent apertures and into a common drying tower, said tower being supplied with a stream of heated air which is effective to dry the starch particles;
- (d) intersecting the flow paths of the streams of gelatinized starch particles exiting the vent apertures at an angle of from 120 to 30 degrees, said intersecting occurring at a position which is spaced far enough from the vent apertures to avoid globbing or clumping of the spray particles and at a position which is close enough to the vent aperture that the surface of the starch particles is still tacky, in order to effect agglomeration of the particles such that the agglomerates of loosely-bound clusters of starch particles are formed;
- (e) continuing to dry the resulting agglomerates to a moisture content of from about 3 to 9% by weight.

4,871,399

COPPER ALLOY FOR USE AS WIRING HARNESS TERMINAL MATERIAL AND PROCESS FOR PRODUCING THE SAME

Akira Sugawara, and Naoyuki Kanahara, both of Hachioji, Japan, assignors to Dowa Mining Co., Ltd. and Yazaki Corporation, both of Tokyo, Japan

Filed Apr. 26, 1988, Ser. No. 186,176

Claims priority, application Japan, May 1, 1987, 62-106426

Int. Cl.⁴ C21D 8/06

U.S. Cl. 148-11.5 C

8 Claims

1. A process for producing a copper alloy for use as a wiring harness terminal material which comprises reducing the thickness of a blank of a copper alloy that consists essentially of 1.0-3.0% Ni, 0.5-1.5% Ti (the ratio of Ni/Ti in weight percent being in the range of 1-3), 0.1-2.0% Zn, 0.01-0.5% Mg, no more than 50 ppm of oxygen, and the balance being Cu and incidental impurities, all percents being on a weight basis to a final thickness dimension by at least three cold rolling operations;

after at least one of said cold rolling operations other than the final two of said at least three cold rolling operations and when said blank has been reduced in size to not more than twice the size of said final thickness dimension, solution heat treating said blank which has been reduced in size to not more than twice the size of said final thickness dimension at a temperature of not lower than 900° C. followed by quenching with water;

after at least one cold rolling operation which is subsequent to said solution heat-treatment, aging at a temperature of 500° C. to 600° C. for a period of 5 to 720 minutes wherein no further solution heat treating occurs after said aging; and

final cold rolling followed by a subsequent aging heat-treatment at a temperature less than 500° C.

4,871,400

METHOD FOR PRODUCING TITANIUM STRIP HAVING SMALL PROOF STRENGTH ANISOTROPY AND IMPROVED DUCTILITY

Takaji Shindo, Hiromitsu Naito, and Makoto Takenchi, all of Kawasaki, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

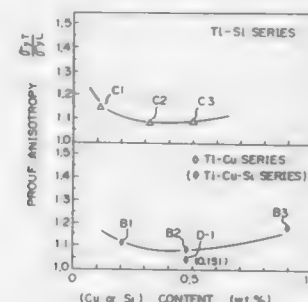
Filed Apr. 26, 1988, Ser. No. 186,159

Claims priority, application Japan, Apr. 28, 1987, 62-103230

Int. Cl.⁴ C22F 1/18

U.S. Cl. 148-12.7 B

15 Claims



1. A method for producing a titanium strip having a small proof strength anisotropy and an improved ductility, comprising the steps of:

- (a) reheating a hot-rolled titanium strip containing at most about 0.1% by weight of oxygen and 0.1 to 0.5% by weight of iron at a β region temperature and cooling by water;
- (b) aging the thus obtained titanium strip at a temperature of 200° C. to 500° C. for at least 30 minutes;
- (c) cold rolling the thus obtained aged titanium strip at a rolling reduction of at least 30%;
- (d) annealing the cold rolled titanium strip at a temperature of 600° C. to 800° C.

4,871,401

FLUIDIZED BED METHOD OF FORMING A NITRIDE OR CARBONITRIDE LAYER

Tohru Arai, Junji Endo, and Hiromasa Takeda, all of Aichi, Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Japan

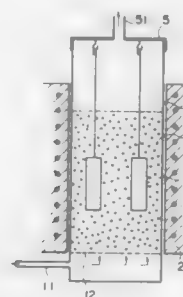
Filed Nov. 13, 1987, Ser. No. 123,662

Claims priority, application Japan, Nov. 18, 1986, 61-276371

Int. Cl.⁴ C21D 1/74

U.S. Cl. 148-14

19 Claims



1. A method of forming a nitride or carbonitride layer of at least one metal selected from the group consisting of chromium, vanadium and titanium on the surface of an iron or iron alloy article, which comprises the steps of:

- (a) disposing in a fluidized bed furnace a treating agent comprising a refractory powder, a metal powder of at least one metal selected from the group consisting of chromium, vanadium, titanium and a metal containing at

least one of said chromium, vanadium and titanium, and a halide powder; and introducing a nitrogen-containing gas into said fluidized bed furnace;

- (b) heating said fluidized bed furnace to a temperature which is not higher than 650° C.; and
- (c) disposing said article in said fluidized bed furnace during or after said steps (a) and (b).

4,871,402

SEPARATING-AGENT COMPOSITION AND METHOD USING SAME

Nazmi Tokar, Monroeville, and Leroy R. Price, Allison Park, both of Pa., assignors to Allegheny Ludlum Corporation, Pittsburgh, Pa.

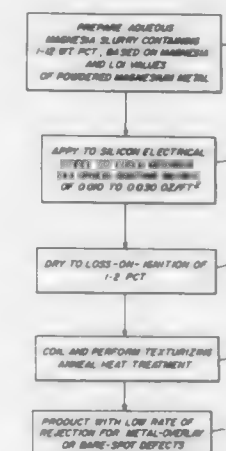
Division of Ser. No. 947,002, Dec. 29, 1986, Pat. No. 4,781,769.

This application Jan. 21, 1988, Ser. No. 209,593

Int. Cl.⁴ B05D 1/00

U.S. Cl. 148-113

11 Claims



4. A method of finishing the processing of grain-oriented silicon containing electrical steel in strip form which comprises the steps of:

- applying to said strip a separating-agent coating by passing said strip through a slurry bath comprising principally 86 to 89 weight percent water, 12 to 14 weight percent finely divided magnesium oxide, and up to 1 weight percent of magnesium sulphate heptahydrate, under conditions to afford an as-dried coating weight of 0.010 to 0.050 ounces per square foot;
- providing along with said separating-agent coating a quantity of magnesium metal powder effective to prevent the development of coating defects on the surface of said steel during a subsequent annealing thereof;
- coating said strip; and
- subjecting said strip to a texturizing annealed heat treatment.

4,871,403

METHOD FOR PRODUCING ELECTRICAL STEEL CORE LAMINATIONS

Gregory Ludkovsky, Munster, Ind., assignor to Inland Steel Company, Chicago, Ill.

Filed Jul. 25, 1988, Ser. No. 223,807

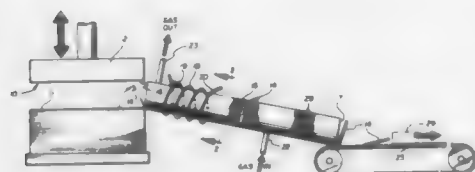
Int. Cl.⁴ C21D 1/42

U.S. Cl. 148-121

10 Claims

1. In a method for manufacturing core laminations from electrical steel strip which has been decarburized to the extent desired, and wherein (a) core laminations are stamped from said strip at a stamping press, (b) said laminations are conducted away from said press in a downwardly inclined chute located adjacent said press, and (c) the laminations are then annealed without decarburization, the improvement comprising the steps of:

totally enclosing the laminations in said chute; performing said annealing step by induction heating the laminations in said chute, as the laminations are conducted away from said press;



and maintaining said laminations in said chute in tightly packed, face to face, abutting relation without intentional spacing between adjacent laminations, during the totality of the time the laminations are undergoing induction heating.

4,871,404

METHOD FOR PRODUCING AN OPTICAL INFORMATION RECORDING DISK

Yasushi Murata; Kunizoh Ogochi, and Fumio Matsui, all of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Oct. 13, 1987, Ser. No. 106,690

Claims priority, application Japan, Oct. 13, 1986, 61-243541

Int. Cl.⁴ B29C 45/14, 65/08; G11B 7/24

U.S. Cl. 156-73.1

8 Claims



1. A method of producing an optical information recording disk comprising the steps of:

forming a transparent circular substrate having a circular center substrate hole;

forming a metal lamination disk member having an outer diameter larger than the diameter of said circular center substrate hole and having a circular center mounting hole of a diameter smaller than said diameter of said circular center substrate hole, said mounting hole being formed of highly accurate dimensions such that said metal lamination disk member can be mounted on and maintained in high positional accuracy with respect to a mounting spindle of a stamper;

mounting said metal lamination disk member on a main surface of said circular substrate through an adhesive agent;

concentrically positioning said circular center mounting hole of said metal lamination disk member relative to said circular substrate;

hardening said adhesive agent;

concentrically mounting, relative to said housing hole, a main surface of said circular substrate on said stamper having a transfer surface, and forming optical information tracks concentric with said mounting hole by using a setting resin in a liquid phase and hardening said setting resin so as to transfer a pattern of said transfer surface; and wherein said metal lamination disk member comprises a circular support having a center hole and a projecting cylindrical portion surrounding said center hole and a circular metal plate fixed to a flat main surface of said circular support, said metal plate having a smaller circular hole than said center hole of said circular support, said

smaller hole of said metal plate corresponding to said circular center mounting hole.

4,871,405

METHOD OF BONDING A SEMICONDUCTOR TO A PACKAGE WITH A LOW AND HIGH VISCOSITY BONDING AGENT

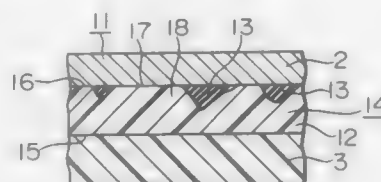
Masahiko Denda, Itami, Japan, assignor to Director General, Agency of Industrial Science and Technology, Japan

Filed Mar. 30, 1988, Ser. No. 175,182

Int. Cl.⁴ C09J 5/04

U.S. Cl. 156-74

5 Claims



1. A process for bonding a semiconductor element to a package comprising:

applying a relatively high-viscosity bonding agent to said package to provide a relatively hard layer having an irregular free surface defining projections and cavities therein, the projections of said hard layer defining a portion of a bonding surface;

applying a relatively low-viscosity bonding agent to said irregular free surface of said hard layer to fill the cavities with said low-viscosity bonding agent to provide a relatively soft layer portion of said bonding surface, said bonding surface being continuous and partially defined by said projections of said hard layer and partially defined by said soft layer filled in said cavities of said hard layer; and pressing a semiconductor element onto said continuous bonding surface defined by said hard layer and said soft layer.

4,871,406

PROCESS FOR ON-LINE LAMINATION OF PLASTIC

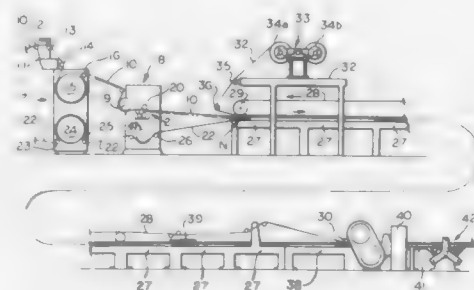
Edwin D. Griffith, Canton, Ohio, assignor to Nekooosa Packaging Corporation, Toledo, Ohio

Filed Mar. 16, 1988, Ser. No. 168,958

Int. Cl.⁴ B32B 31/08

U.S. Cl. 156-82

23 Claims



1. The method of manufacturing a plastic film laminated corrugated paperboard comprising the steps of

(a) continuously moving a web of single face corrugated paper having a single face liner adhesively attached to the corrugated medium toward a drying zone;

(b) continuously supplying a smooth and wrinkle free web of a preformed plastic film in the direction of movement of the single face corrugated paper;

(c) moving said film into surface contact with the single face liner paper of said single face corrugated web in the proximity of the entry of said drying zone; and
(d) pressing the film and corrugated paper together to laminate the two in the drying zone.

4,871,407

IMAGE RECORDING MATERIAL CAPABLE OF FORMING THREE-DIMENSIONAL IMAGES

Shigeo Honma, and Kazuyoshi Hara, both of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

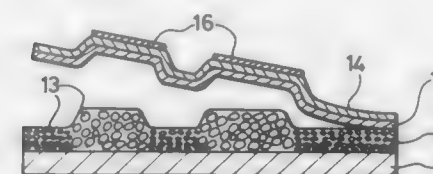
Filed Jul. 21, 1988, Ser. No. 222,816

Claims priority, application Japan, Jul. 29, 1987, 62-115123[U]

Int. Cl.⁴ B41M 5/00

U.S. Cl. 156-83

18 Claims



1. An image recording material for recording a toner-free, three-dimensional image suitable for use in a three-dimensional image forming method wherein a toner image of an original is formed on the recording material according to an electrophotographic method and heat is applied selectively to the image area formed by the toner to raise the image area, said image recording material comprising:

a sheet of base material;
a thermoexpansive coating layer formed by application on the base material, said thermoexpansive coating layer comprising thermoexpansive microspheres and a binder for bonding to the base material, said microspheres being dispersed in said binder; and
a film layer releasably attached to an outer surface of said recording material, said film layer comprising a material which permits fixation of a toner image thereto and an adhesive layer which releasably bonds to said outer surface of said recording material, said film layer permitting the formation of a toner image thereon according to an electrophotographic method, whereby the toner image can be removed from said recording material by peeling said film layer from said recording material surface after the image area has been raised by the application of heat.

15. An image processing method for forming a toner-free, three-dimensional image on a recording material, which method comprises the steps of:

providing a recording material, said recording material comprising a base material, a thermoexpansive coating layer provided on the base material, said thermoexpansive coating layer comprising thermoexpansive microspheres dispersed in a binder, and a film layer releasably attached to an outer surface of said recording material;

forming a toner image of an original on said film layer of said recording material;

applying heat selectively to the toner image area formed on said recording material, whereby the toner image-existing area is raised to effect a three-dimensional image recording; and

peeling said film layer from the recording material, whereby the toner image is removed from said recording material surface and a toner-free, three-dimensional image is formed.

4,871,408

IMAGE RECORDING MATERIAL FOR RECORDING IMAGES IN THREE DIMENSIONS AND THREE-DIMENSIONAL IMAGE PROCESSING METHOD USING SAME

Shigeo Honma; Sanji Inagaki, and Kazuyoshi Hara, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

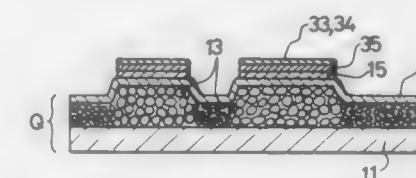
Filed Jul. 21, 1988, Ser. No. 222,817

Claims priority, application Japan, Jul. 29, 1987, 62-115125[U]; Feb. 24, 1988, 63-22450[U]

Int. Cl.⁴ B41M 5/00

U.S. Cl. 156-83

20 Claims



1. An image recording material for recording an image in three dimensions suitable for use in a three-dimensional image forming method wherein a toner image of an original is formed on the recording material according to an electrophotographic method and heat is applied selectively to the image area formed by the toner to raise the image area, said image recording material comprising:

a sheet of base material;
a thermoexpansive coating layer formed by application on the base material, said thermoexpansive coating layer comprising thermoexpansive microspheres and a binder for bonding to the base material, said microspheres being dispersed in said binder; and
a film layer formed on the upper surface of said thermoexpansive coating layer said film layer comprising a material having a heat resistance capable of resisting heat generated from said image area by light irradiation or heat generated at the time of coloring said image area using a laminate film having a heat transferable coloring material layer; wherein said film layer material permits substantial fixation of said toner image thereto and substantially prevents bonding thereto by an adhesive of said laminate film; and wherein said film layer is substantially void of cracks when expanded in a planar direction of the raised image

15. An image processing method for recording an image on a recording material in three dimensions and coloring the image, which method comprises the steps of:

providing a recording material, said recording material comprising a base material, a thermoexpansive coating layer provided on the base material, said thermoexpansive coating layer comprising thermoexpansive microspheres and a binder for the microspheres, and a film layer formed on the thermoexpansive coating layer;

forming a toner image of an original on said film layer of said recording material;

applying heat selectively to the toner image area formed on said recording material, whereby the toner image-existing area is raised to effect a three-dimensional image recording; and

thereafter applying to said film layer of said recording material a laminate film comprising a coloring material layer of a desired color bonded to a heat- and pressure-sensitive adhesive layer whereby said adhesive layer contacts said film layer of said recording material followed by the application of heat and pressure whereby said adhesive layer bonds to said toner image and does not bond to said film layer; and

peeling said laminate film from the recording material,

whereby the three-dimensional toner image is colored in the desired color.

4,871,409

APPARATUS FOR LAYING A CONTINUOUS STRIP OF ELASTOMERIC MATERIAL ONTO A SURFACE

David J. B. Perkins, Woolton, United Kingdom, assignor to Apsley Metals Limited, United Kingdom

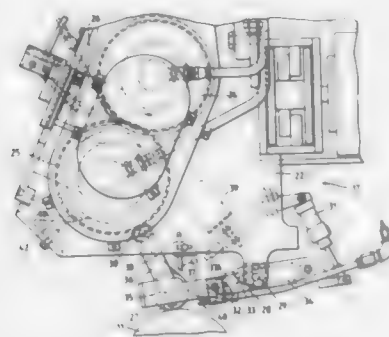
Filed Nov. 5, 1987, Ser. No. 116,780

Claims priority, application United Kingdom, Nov. 18, 1986, B627501

Int. Cl.⁴ B29D 7/14; B65H 81/00

U.S. Cl. 156—110.1

14 Claims



1. Apparatus suitable for laying a continuous helically wound strip of elastomeric material onto a mandrel to form a cylindrical ply thereon and which comprises:

- a head unit mounted on a carriage for movement during laying of the strip;
- said head unit having a body;
- a pair of calender rolls mounted on the body to receive an extrudate strip and produce therefrom a calendered strip of uniform thickness;
- a support means pivoted to the body;
- an application roller mounted on the support means for receiving the calendered strip and laying the strip onto a surface;
- a take-up arm which is pivoted at one end thereof to the support means and a take-up roller, the calendered strip being arranged to pass around the take-up roller before passing to the application roller, the take-up arm being free to pivot to take-up excess length of calendered strip between the calender rolls and the application roller.

4,871,410

METHOD OF EXTRUDING AND BLOW MOLDING OF GAS-IMPERMEABLE COMPOSITE ARTICLES HAVING WATER-RESISTANT POLYVINYL ALCOHOL FILM LAYER

Claude Bonnebat, Pontault-Combault; Louis Macabrey, Mitry-le-Neuf, and Gilbert Rouillet, Clamecy, all of France, assignors to Rhone-Poulenc, S.A., Courbevoie, France

Division of Ser. No. 751,491, Jul. 3, 1985, Pat. No. 4,731,266, which is a continuation-in-part of Ser. No. 735,721, May 20, 1985, abandoned, and a continuation-in-part of Ser. No. 716,101, Mar. 26, 1985, abandoned, which is a continuation of Ser. No. 384,760, Jun. 3, 1982, abandoned, said Ser. No. 735,721, is a continuation of Ser. No. 556,556, Nov. 30, 1983, abandoned. This application Oct. 30, 1987, Ser. No. 115,043

Claims priority, application France, Jun. 3, 1981, 81 11119; Dec. 1, 1982, 82 20119

Int. Cl.⁴ B29C 49/04, 49/22, 47/80, 47/88

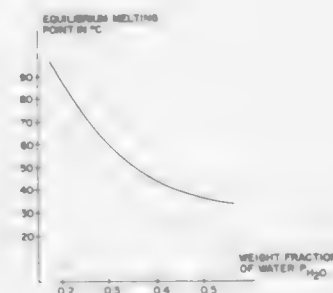
U.S. Cl. 156—244.14

19 Claims

1. A process for the production of a composite, biaxially oriented, thermoplastic hollow shaped article, comprising externally barrier covering a thermoplastic tubular blank, parison or preform with a relatively thick barrier layer consist-

ing essentially of water and water-resistant and highly crystalline polyvinyl alcohol, said barrier layer having been prepared by

- (a) introducing into an extruder flakes or granules of a mixture of polyvinyl alcohol and water having a water content ranging from 25 to 35% by weight of said mixture said flakes or granules of polyvinyl alcohol having an ester number less than 20;
- (b) fluxing and melting the flakes or granules at a temperature at least 100° C. above the equilibrium melting point of said mixture such as to avoid any phase heterogeneity in the molten mass; and



- (c) forming a barrier covering of said molten mass of flakes having said water content of from 25 to 35% by weight on a substrate of said thermoplastic tubular blank, parison or perform while maintaining the temperature of said molten mass, if necessary by cooling, at a value which is below the temperature at which the vapor pressure of the water in the mixture would cause surface expansion and bubbling of the barrier layer but above or equal to the equilibrium melting point of said mixture; and
- biaxially orienting and blow molding the barrier covered substrate of step (c) into a final configuration.

4,871,411

METHOD OF PREPARING VOLUME TYPE HOLOGRAM FILM

Nobuo Kushibiki, Yamato; Yoko Yoshinaga, Machida; Naosato Taniguchi, Atsugi, and Tetsuro Kawayama, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 18, 1988, Ser. No. 195,644

Claims priority, application Japan, May 21, 1987, 62-122419; May 21, 1987, 62-122420; May 21, 1987, 62-122421; Oct. 30, 1987, 62-273349

Int. Cl.⁴ B32B 31/18

U.S. Cl. 156—249

31 Claims

1. A method of preparing a volume type phase hologram film, comprising forming a volume type phase hologram in a polymer film formed on a substrate and comprised of a polymer of vinylcarbazoles, and separating said polymer film from said substrate in a liquid inert to said hologram.

4,871,412

BONDING THERMOPLASTIC LAYERS VIA ELECTRICAL HEATING

Michael C. Felix, Newmarket; Nicola S. Taylor, Cambridge, and Colin C. Hardy, Linton, all of England, assignors to The Welding Institute, Cambridge, England

Filed Feb. 24, 1988, Ser. No. 159,726

Claims priority, application United Kingdom, Mar. 2, 1987, 8704881

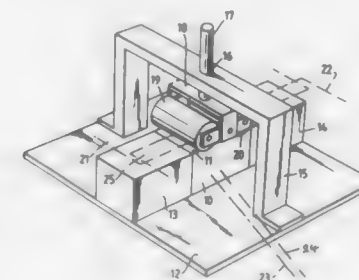
Int. Cl.⁴ B32B 31/20

U.S. Cl. 156—273.9

9 Claims

1. A method of bonding a thermoplastic layer to a substrate, the thermoplastic layer and the substrate each comprising at least one layer which consists of substantially unidirectional

electrical conductors embedded in and individually coated with thermoplastic material, the method comprising placing said thermoplastic later in contact with said substrate; and



applying an alternating electromagnetic field so as to induce electric currents in conductors whereby heat generated by said currents passing through said conductors causes thermoplastic materials to bond said later to said substrate.

4,871,413

APPARATUS FOR MANUFACTURING TUBULAR LINING MATERIAL

Masakatsu Hyodo; Koji Kusumoto, and Isaburo Yagi, all of Osaka, Japan, assignors to Ashinori Industry Co., Ltd., Osaka, Japan

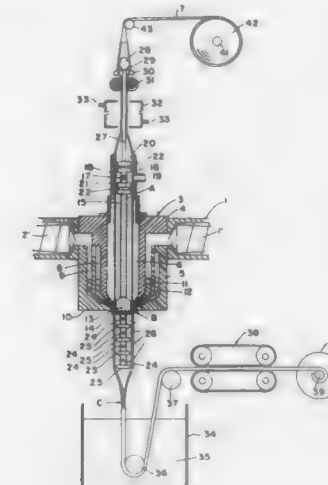
Continuation of Ser. No. 852,211, Apr. 15, 1986, abandoned, which is a division of Ser. No. 703,908, Feb. 21, 1985, abandoned.

This application Apr. 5, 1988, Ser. No. 178,883

Int. Cl.⁴ B29C 47/02

U.S. Cl. 156—382

6 Claims



1. An apparatus for coating a tubular textile jacket in the manufacturing of a tubular lining material for pipe lines which comprises

- an annular extrusion head having multiple extruders each with a downwardly opened annular nozzle at the lower end thereof, each extruder communicating with said corresponding nozzle through concentric annular passages capable of simultaneous extruding plural, separately distinct synthetic resins annularly in the form of laminated layers on the external surface of a tubular textile jacket,
- a mandrel located on the central axis of said apparatus, spaced from said annular nozzles, which has an outer diameter substantially equal to or slightly smaller than the inner diameter of said tubular textile jacket,
- a means for evacuating the interior of said tubular textile jacket downstream of said mandrel said evacuation means

including a hollow shaft extending through said mandrel, a lower end portion of said shaft extending downward beyond said mandrel having formed therein at least one hole for communicating between the interior of said tubular textile jacket and the interior of said hollow shaft, and at least one disc laterally mounted on said lower end portion of said shaft to maintain said tubular textile jacket in an inflated condition, said mandrel and said at least one disc defining an evacuated space therebetween, the interior of said hollow shaft communicating with a vacuum source located at an upstream section of said annular extrusion head, means for solidifying said synthetic resins in the form of said laminated layers coated on said tubular textile jacket and means for introducing said tubular jacket to and withdrawing said laminated tubular jacket from said manufacturing apparatus.

4,871,414

APPARATUS FOR CONNECTING OVERLAPPING ENDS OF THERMOPLASTIC BAND MATERIAL

Franklin F. Niedrig, Berikon, Switzerland, assignor to Strapex AG, Wohlen, Switzerland

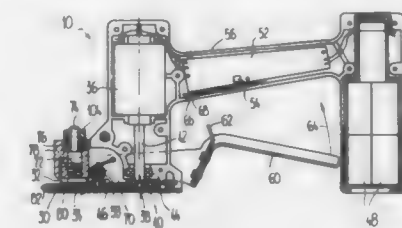
Filed Dec. 23, 1985, Ser. No. 812,441

Claims priority, application Switzerland, Dec. 27, 1984, 8102/84

Int. Cl.⁴ B65B 13/32; B32B 31/18

U.S. Cl. 156—494

8 Claims



5. A connection apparatus for connecting overlapping ends of a strap formed of thermoplastic material tensioned about at least one article by a separate strap tensioning device, comprising:

- a said plate;
- said base plate serving to support said connection apparatus at the at least one article to be wrapped with said strap;
- means defining a gap arranged above said base plate and serving for receiving overlapping portions of said strap;
- said gap defining means including a welding jaw;
- means for driving said welding jaw substantially transverse to a longitudinal axis of said overlapping ends of said strap;
- said driving means displacing said welding jaw with a to-and-fro oscillating motion which produces a frictional weld of said overlapping ends of said strap;
- clamping means defining a clamping surface located opposite and facing said welding jaw;
- said welding jaw being positioned in the vicinity of said base plate and substantially directly below said clamping surface;
- said welding jaw having a gripping surface;
- said gripping surface of said welding jaw facing upwards and acting upon a lowermost end of said overlapping ends of said strap;
- said gripping surface of said welding jaw and said clamping surface of said clamping means cooperating in producing said frictional weld of said overlapping ends of said strap during oscillation of said welding jaw relative to said clamping means;
- a cutter;
- means for coupling said cutter with said welding jaw such that operation of said cutter is essentially synchronous

with said welding jaw located opposite and facing said clamping means and such that said cutter moves with the same stroke as said welding jaw substantially transverse in said to-and-fro oscillating motion relative to said overlapping ends of said strap; and said cutter being coupled to said clamping means in order to sever an uppermost end of said strap.

4,871,415

APPARATUS AND METHOD FOR CURING A DEFECT IN A GRILLE FORMED ON A PANEL OF A COLOR CATHODE RAY TUBE

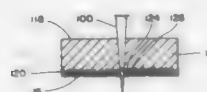
Yong S. Park, South Barrington, and Thomas M. Remec, Des Plaines, both of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

Filed Dec. 30, 1988, Ser. No. 292,278

Int. Cl.⁴ B44C 1/22; C03C 15/00, 25/06

U.S. Cl. 156—626

27 Claims



21. A method for curing a defect in a grille formed on an interior face of a color cathode ray tube panel, comprising the steps of:

- viewing said grille on said panel by means of a camera mounted on a support structure, said camera including a magnifying lens and being connected to a display monitor so that the grille is viewable;
- positioning said panel such that the defect may be viewed, said defect being comprised of excess material of the grille on said panel; and
- removing the defect by means of a laser apparatus mounted to said support structure, said laser apparatus producing a beam of laser energy which vaporizes said excess material.

4,871,416

METHOD AND DEVICE FOR CLEANING SUBSTRATES

Hisashi Fukuda, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Nov. 15, 1988, Ser. No. 271,307

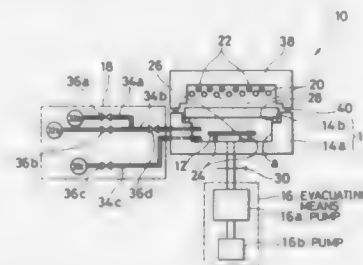
Claims priority, application Japan, Nov. 19, 1987, 292927

U.S. Cl. 156—635

15 Claims

- A method of cleaning substrates comprising the steps of:
 - evacuating a reaction furnace of a substrate cleaning device in which a substrate has been installed;
 - introducing a reducing gas into said reaction furnace of a substrate cleaning device;
 - removing a natural oxide film on said substrate by heating it in an atmosphere of reducing gas;

- evacuating said reaction furnace;
- introducing a reactive gas into said reaction furnace; and



- removing contaminants on said substrate by etching said substrate in said reactive gas that has been chemically activated by UV radiation.

4,871,417

METHOD AND APPARATUS FOR SURFACE TREATING OF SUBSTRATES

Hisao Nishizawa, Shiga; Masaru Morita, Minami, and Masato Tanaka, Nagahama, all of Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan

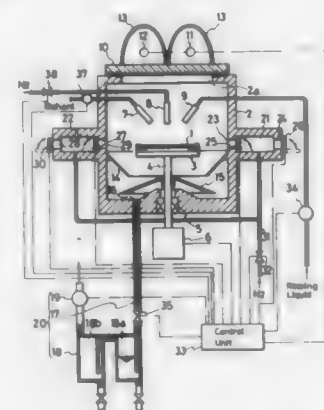
Filed Jun. 30, 1987, Ser. No. 69,541

Claims priority, application Japan, Jul. 4, 1986, 61-158497

Int. Cl.⁴ H01L 21/306; B08B 3/10

U.S. Cl. 156—640

19 Claims



- A method for surface treating of a substrate having trenches formed on a surface thereof, comprising the steps of:
 - securing said substrate horizontally on spinning means and soining said spinning means about a vertical axis in a chamber;
 - supplying a treating liquid to said trenched surface of the substrate during said spinning;
 - varying a pressure of the inside of said chamber from atmospheric pressure;
 - restoring said chamber pressure to atmospheric pressure; and
 - repeating said liquid supplying and pressure varying and restoring steps a predetermined number of times to thereby promote introduction of said treating liquid into said trenches of said substrate.

4,871,418

PROCESS FOR FABRICATING ARBITRARILY SHAPED THROUGH HOLES IN A COMPONENT

Jürgen Wittlinger, Bieblingen; Johann Greschner, Pflanzhausen; Thomas Bayer, and Johann W. Barth, both of Sindelfingen, all of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

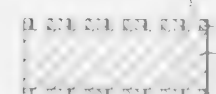
Filed Mar. 23, 1988, Ser. No. 172,736

Claims priority, application European Pat. Off., Mar. 27, 1987, 87104580.3

Int. Cl.⁴ B29C 37/00

U.S. Cl. 156—643

19 Claims



- Process for fabricating arbitrarily shaped through holes in a component, comprising the steps of:

- producing photoresist mask on the front and back side of a substrate by:
 - applying photoresist layers (2) to the front and back side of a substrate (1) of polymeric material, wherein the polymeric material comprises polyoxymethylene (POM) homo- or copolymers;
 - simultaneously generating the desired pattern by image-wise exposure on the front and the back side of the photoresist layers (2);
 - developing the photoresist layers (2);
- fabricating the through holes by reactive ion etching (RIE) of the polymeric substrate (1), first from the front and then from the back side, each time until a predetermined etch depth has been obtained;
- stripping the photoresist masks from the front and the back side of polymeric substrate (1)

4,871,419

METHOD OF FORMING PATTERN OF A TWO-LAYER METAL FILM

Hirofumi Nakano, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 24, 1987, Ser. No. 125,462

Claims priority, application Japan, Nov. 24, 1986, 61-280396

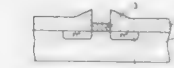
Int. Cl.⁴ C23F 1/00

U.S. Cl. 156—643

49 Claims

- A method of forming a pattern of a two-layer metal film, said method comprising:
 - preparing a semiconductor substrate having a major surface; forming a composite film pattern of a prescribed configuration consisting of a first metal film and a thin insulation film on said major surface of said semiconductor substrate, said pattern including therewithin a lower layer of a first metal film pattern formed by said first metal film and an upper layer of a thin film pattern formed by said thin insulation film, said thin insulation film defining a space at least equal in thickness to a second metal film to be formed thereafter;
 - forming a resist film on said major surface of said semiconductor substrate to be in contact with the periphery of said composite film pattern, the thickness of said resist film

being at least equal to the sum of the thickness of said first metal film and that of said second metal film; removing both the portion of said resist film formed on said composite film pattern and said thin film pattern from said composite film pattern to expose said first metal film pattern;



thereafter forming said second metal film on said exposed first metal film pattern left by removal of said thin film pattern and said resist film; and removing said resist film with the portion of said second metal film formed on said resist film.

4,871,420

SELECTIVE ETCHING PROCESS

Frank B. Alexander, Jr., Totowa; Pang-Dow Foo, Berkeley Heights, and Ronald J. Schutz, Warren, all of N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

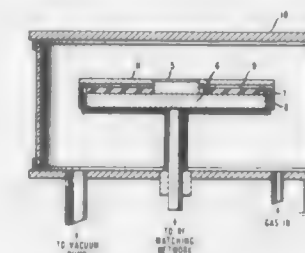
Continuation of Ser. No. 682,776, Dec. 18, 1984, abandoned.

This application Feb. 10, 1988, Ser. No. 150,490

Int. Cl.⁴ H01L 21/306; C03C 15/00

U.S. Cl. 156—643

7 Claims



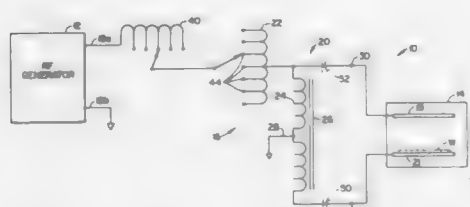
- A process for fabricating a device comprising the steps of:
 - in a vessel, etching a first material of a substrate by contact with chlorine-containing entities from a gas plasma while a second material of said substrate is also, during said etching, subjected to said entities; and
 - completing said device characterized in that said plasma is confined to a region that extends laterally from the periphery of said substrate a distance less than 20 percent of the effective diameter of said substrate, wherein said second material is substantially unaffected by said etching and wherein said confinement is accomplished by capacitively coupling the vicinity of said substrate to ground.

4,871,421

SPLIT-PHASE DRIVER FOR PLASMA ETCH SYSTEM

John Ogle, Milpitas, and Gerald Z. Yin, San Jose, both of Calif., assignors to Lam Research Corporation, Fremont, Calif.

Filed Sep. 15, 1988, Ser. No. 245,082

Int. Cl.⁴ H01L 21/306; B44C 1/22; C03C 15/00, 25/06
U.S. Cl. 156—643 9 Claims

7. A method for plasma etching semiconductor wafers, said method comprising:

- placing a wafer on a first planar electrode in a reactor vessel at a fixed dc reference voltage;
- driving said first electrode and a second, opposed planar electrode with radio frequency voltages having substantially identical magnitudes but which are 180° out-of-phase; and
- wherein said drive voltages are fixed relative to said reference voltage.

4,871,422

ETCHING SOLUTIONS CONTAINING AMMONIUM FLUORIDE AND ANIONIC SULFATE ESTERS OF ALKYLPHENOL POLYGLYCIDOL ETHERS AND METHOD OF ETCHING

Michael Scardera, Hamden, and Thomas S. Roche, Cheshire, both of Conn., assignors to Olin Corporation, Cheshire, Conn. Continuation-in-part of Ser. No. 7,067, Jan. 27, 1987, Pat. No. 4,761,245. This application May 16, 1988, Ser. No. 194,621
Int. Cl.⁴ C09K 13/08

U.S. Cl. 156—662 29 Claims

1. An etching solution comprising an aqueous solution of ammonium fluoride and a wetting amount of an anionic sulfate ester of an alkylphenol polyglycidol ether.

4,871,423

ENHANCED DITHIONITE BLEACHING

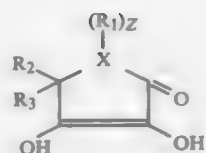
S. Allen Grimsley, Portsmouth; James C. Robinson, Chesapeake, and Mark A. Schroeder, Norfolk, all of Va., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Filed Aug. 10, 1987, Ser. No. 83,202

Int. Cl.⁴ D21C 9/12

U.S. Cl. 162—72 10 Claims

1. A method for minimizing brightness reversion of bleached high yield wood pulps containing chromophores, comprising the addition of a furanone to said pulps at 0.1% to 5% by weight, based on the weight of dry pulp, to obtain increased retention of brightness gains created by bleaching wherein said bleaching is reductive bleaching or peroxide oxidative bleaching, said furanone being added before, during, or after said bleaching if said furanone is water insoluble or after substantial dewatering of said pulps if said furanone is water soluble, said furanone being selected from the group consisting of compounds having the formula, 3,4-dihydroxy-2(5H)-furanone, and the following structural formula:



wherein X is O, S, N, Si, C, Z is a whole number from 0-2, R₁ is hydrogen or an alkyl having 1-5 carbon atoms, and R₂ and/or R₃ is any substituent that does not attack the furanone ring.

4,871,424

PROCESS FOR CONTROLLING PITCH DEPOSITION FROM PULP IN PAPERMAKING SYSTEMS

David D. Dreisbach, and Gilbert S. Gomes, both of Jacksonville, Fla., assignors to Betz Laboratories, Inc., Trevose, Pa.

Continuation of Ser. No. 881,378, Jul. 2, 1986, abandoned. This application Jan. 7, 1988, Ser. No. 205,566

The portion of the term of this patent subsequent to May 17, 2005, has been disclaimed.

Int. Cl.⁴ D21H 3/44

U.S. Cl. 162—168.1 30 Claims

1. A process for controlling pitch deposition from pulp in papermaking systems comprising adding to the pulp an effective amount of a water-soluble polyvinyl alcohol having 50% to 100% hydrolysis.

4,871,425

FIXATION DEVICE

Harald Gunderson, Oslo, Norway, assignor to Alfson & Gunderson A/S, Oslo, Norway

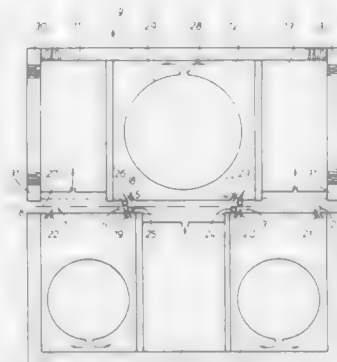
PCT No. PCT/NO87/00046, § 371 Date Feb. 16, 1988, § 102(e) Date Feb. 16, 1988, PCT Pub. No. WO87/07663, PCT Pub. Date Dec. 17, 1987

PCT Filed Jun. 11, 1987, Ser. No. 158,272

Claims priority, application Norway, Jun. 16, 1986, 862395

Int. Cl.⁴ F26B 17/10

U.S. Cl. 162—290 4 Claims



1. Fixation device for permeable web materials, where air at controlled temperature and pressure is passed through the web from jets in at least one pressure chamber on one side of the web, to at least one corresponding suction chamber on the other side of the web, the device comprising an upper housing on one side of a web and a lower housing positioned below said upper housing and spaced therefrom on the other side of the web, whereby said web moves from an upstream position to a downstream position between said housings, during operation, the housings including means defining an upstream pressure chamber and means defining a corresponding upstream suction chamber located on an opposite side of a web, means defining

a downstream pressure chamber and means defining a corresponding downstream suction chamber located on an opposite side of the web, and means defining at least one middle pressure chamber and means defining a corresponding middle suction chamber positioned between said upstream and downstream pressure chambers and corresponding suction chambers so that no two pressure chambers or suction chambers are next to each other, each pressure chamber being positioned with two jets arranged in an acute angle to the web and towards each other, with one upstream jet and one downstream jet, thereby establishing and maintaining an overpressure between the jets and the web, the jets arranged in the pressure chambers respectively in said upper and lower housing and adjacent each other thereby directing air past each other in such a way that air from one pressure chamber substantially is prevented from penetrating into the adjacent suction chamber, and ducts in the upper housing constructed and arranged to receive an air flow having a controlled temperature, at which deformations of the upper housing due to temperature influences from the heated air in the fixation process are prevented, and further including sealing devices extending across the length of the pressure chambers between the web and the pressure chambers, on both sides of each pressure chamber and arranged between the jets of the pressure chambers and adjacent suction chambers, thereby preventing air from the upstream or downstream pressure and suction chambers from penetrating into the air system of the middle pressure and suction chamber.

4,871,426

PROCESS FOR REPROCESSING WASTE MATERIAL

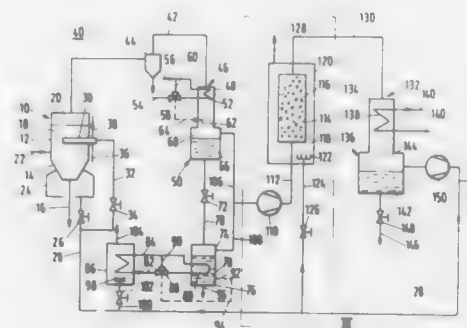
Hans Lechert; Volkert Woeb-Goeck; Song Qun, all of Hamburg; Walter Kaminsky, Plauenberg-Waldenau, and Hansjörg Sina, Norderstedt, all of Fed. Rep. of Germany, assignors to Asen Brown Boveri Aktiengesellschaft, Mannheim, Fed. Rep. of Germany

Filed Dec. 23, 1988, Ser. No. 289,608

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1987, 3743752

Int. Cl.⁴ C10B 53/00; C07C 4/00

U.S. Cl. 201—2.5 16 Claims



1. Process for reprocessing waste material containing hydrocarbon compounds, the waste material being decomposed pyrolytically and pyrolysis gas generated being converted by cooling into a liquid fraction and a gas fraction, which comprises cooling the pyrolysis gas until gaseous benzene contained therein as well as gaseous pyrolysis gas constituents boiling higher than benzene pass into the liquid phase and a benzene-containing liquid phase is formed, stripping a gas mixture containing benzene and toluene out of the benzene-containing liquid fraction, contacting the gas mixture together with the gas fraction with a zeolitic catalyst at a temperature of 300° to 450° C., and separating the catalytically treated gas mixture by cooling into both a fraction which is liquid at ambient pressure and a residual gas fraction.

8. Process for reprocessing waste material containing hydrocarbon compounds, the waste material being decomposed pyrolytically and pyrolysis gas generated being converted by

cooling into a liquid fraction and a gas fraction, which comprises cooling the pyrolysis gas to a temperature at which a specific gas fraction is produced in which contents of C₂ and C₃-olefines and of C₆ and C₇-aromatics are in a molar ratio of 0.8 to 1.2, contacting the specific gas fraction with a zeolitic catalyst at a temperature of 300° to 450° C., and separating the catalytically treated specific gas fraction by cooling into both a fraction which is liquid at atmospheric pressure and a residual gas fraction.

4,871,427

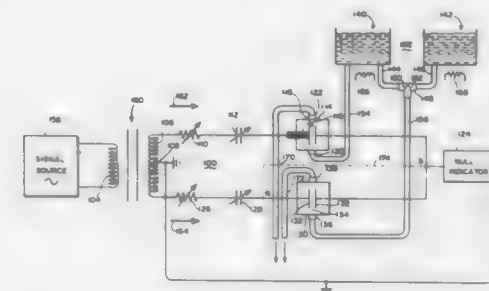
ION DETECTION USING A DIFFERENTIAL RESISTANCE MEASUREMENT OF AN ION EXCHANGE MEMBRANE

Edward S. Kolesar, Jr., Beavercreek, Ohio, assignor to United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jun. 24, 1988, Ser. No. 211,512

Int. Cl.⁴ G01N 27/04

U.S. Cl. 204—1 T 24 Claims



1. Electrolytic measuring apparatus comprising the combination of:

a first electrolytic measurement cell having first and second electrodes that are disposed in adjustable electrode separation;

a second electrolytic measurement cell having fixed position electrodes and two electrode chambers that are separated by a diffusion membrane;

a source of alternating current electrical energy coupled to said first and second electrolytic cells in phase opposite polarities;

first and second adjustable electrical resistance elements connected in electrical series with said alternating current energy source and said first and second electrolytic cells, respectively;

first and second adjustable electrical reactance elements connected in electrical series with said alternating current energy source, said first and second adjustable electrical resistance elements, and said first and second electrolytic cells, respectively;

electrical null indicating means connected to indicate electrical unbalance between a first series electrical path which includes said energy source, said first electrolytic cell, said first electrical resistance element and said first electrical reactance element and a second series electrical path which includes said energy source, said second electrolytic cell, said second electrical resistance element and said second electrical reactance element.

13. An electrolytic cell and electrical bridge circuit method for measuring changes in low concentration unknown electrolyte conductivity, said method comprising the steps of:

connecting a first electrolytic cell having adjustable electrode separation and a second electrolytic cell having fixed electrode separation and a removable ion selective membrane into first and second arms of an alternating current electrical bridge circuit;

immersing said electrodes in said cells in identical unknown electrolyte solutions;

adjusting the electrode separation in said first electrolytic cell to the condition of best attainable electrical balance in said alternating current bridge circuit with said membrane in the removed condition;
 adding electrical capacitance to the arms of said electrical bridge circuit to optimize the bridge balance;
 introducing said removable ion selective membrane to said unknown solution filled fixed electrode cell;
 altering the electrical resistance values in said bridge arms until an optimum rebalanced condition results;
 determining from the resistance altering in said altering step the electrical resistance attributable to said membrane and unknown electrolyte ionic conduction therein.

21. An electrolytic measurement apparatus comprising the combination of:

a measurement cell body member comprised of rigid electrically insulating material;
 a fluid flow path extending through a portion of said body member and terminating in flow path ports received on said body member;
 a first fixed position electrode member received along said flowing path in communication with fluids flowing there-through, said electrode member including electrical conductor means communicating between said electrode member and a first electrical terminal member received on said body member;

a second adjustable position electrode member received along said flow path in communication with fluids flowing therethrough, said second electrode member including position adjusting means in communication with a second electrical terminal of said cell for precisely altering the relative position of said second electrode member with respect to said first electrode member;

sealing means communicating between said adjustable position electrode member and said body member for restraining leakage flow of electrolyte between said flow path and the exterior of said cell along said adjustable position electrode member;

a selective ion diffusion membrane member disposed intermediate said first and second electrode members in said fluid flow path;

means for measuring incremental values of electrical resistance between said first and second terminals.

24. A chemical warfare agent detector for water supply and other fluids comprising the combination of:

an alternating current electrical bridge circuit having one each of an unknown and reference electrolytic measurement cell element and an electrical impedance element disposed in each of two circuit arms thereof;

an ion selective diffusion membrane member disposed in one of said electrolytic measurement cell elements in the inter electrode electrolyte path thereof, said membrane member being selectively responsive to ions of a predetermined group of chemical warfare agent constituent elements;

means for nulling said electrical bridge circuit in the presence of uncontaminated fluid samples in each of said electrolytic measurement cells;

means for introducing a chemical warfare agent contaminated fluid sample into one of said electrolytic measurement cells;

means to re-balance said bridge circuit in the presence of said warfare agent.

4,871,428

METHOD FOR IN SITU FORMING LEAD-ACID BATTERIES HAVING ABSORBENT SEPARATORS
 Sudhan S. Misra, Lansdale, and Terrence M. Noveske, Pipersville, both of Pa., assignors to C & D Charter Power Systems, Inc., Plymouth Meeting, Pa.

Filed Mar. 24, 1988, Ser. No. 173,194

Int. Cl.⁴ H01M 10/12

U.S. Cl. 204—2.1

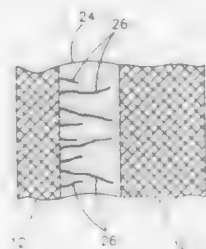
25 Claims

1. A method for in situ forming a lead-acid battery having an electrolyte-absorbent plate separator to produce lead and lead

dioxide surfacing of lead metal plates on respective sides of said separator, for electrochemical reaction between said plates and resultant electrical energy production by said battery, comprising the steps of:

a. cooling a supply of lead-acid battery electrolyte to below room temperature;

b. introducing into the battery a quantity of said cooled lead-acid battery electrolyte less than the one hundred percent electrolyte-saturated capacity of said plates and said separators;



c. charging said battery to oxidize and to reduce lead at the surfaces of respective plates to a preselected intermediate degree;

d. filling said battery with water and/or acid sufficiently to provide at least the one hundred percent electrolyte-saturated capacity of said plates and separators; and

e. further charging said battery to respectively further oxidize and reduce lead at said respective plates to a preselected degree defining a fully charged state of said battery.

4,871,429

LIMITING TIN SLUDGE FORMATION IN TIN OR TIN/LEAD ELECTROPLATING SOLUTIONS

Fred I. Nobel, Sands Point; Barnet D. Ostrow, Roslyn, and David N. Schram, Freeport, all of N.Y., assignors to Lea-Ronal, Inc., Freeport, N.Y.

Continuation of Ser. No. 852,063, Apr. 15, 1986, abandoned, which is a continuation-in-part of Ser. No. 778,353, Sep. 20, 1985, Pat. No. 4,167,097, which is a continuation-in-part of Ser. No. 564,516, Dec. 22, 1983, Pat. No. 4,599,149, which is a continuation-in-part of Ser. No. 301,390, Sep. 11, 1981, abandoned. This application Apr. 29, 1988, Ser. No. 188,233. The portion of the term of this patent subsequent to Jan. 21, 2003, has been disclaimed.

Int. Cl.⁴ C25D 3/32, 3/60

U.S. Cl. 204—44.4

21 Claims

1. An electrolyte for limiting the formation of tetravalent tin oxide sludge when electroplating tin or tin-lead alloys therefrom, which electrolyte comprises a soluble divalent tin compound; a soluble alkyl sulfonic acid in an amount sufficient to provide a solution having a pH less than about 3; at least one wetting agent; and resorcinol in an amount sufficient to reduce or prevent the formation of tetravalent tin and stannic oxide sludge when electroplating.

4,871,430

NOVEL MULTIFUNCTIONAL COMPOUNDS AND ELECTROLYTIC OXIDATIVE COUPLING PROCESS
 Stephen A. Noding, Brusly, La., assignor to The Dow Chemical Company, Midland, Mich.

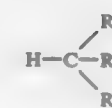
Filed Feb. 19, 1987, Ser. No. 16,595

Int. Cl.⁴ C25B 3/00, 11/12

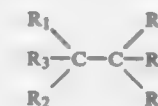
U.S. Cl. 204—72

9 Claims

1. A process which comprises the electrochemical oxidation in a nitric solvent of a compound of the formula



wherein R_1 and R_2 are independently selected from $-CN$, $-CO_2Et$, $-CO_2H$, $-R_4CO_2Et$, $-CO_2R_4$, and $-COCH_3$; R_3 is selected from H, Br, and Et; and R_4 is C_{1-12} alkyl to produce a compound of the general formula



wherein R_1 , R_2 and R_3 have the definition given above provided that each R_1 , R_2 , and R_3 group on the first central carbon atom of the product are the same as on the second central carbon atom and in which the anode is a non-porous graphite anode impregnated with an electrode binder pitch.

4,871,431

APPARATUS FOR THE REMOVAL OF DISSOLVED SOLIDS FROM LIQUIDS USING BIPOLAR MEMBRANES

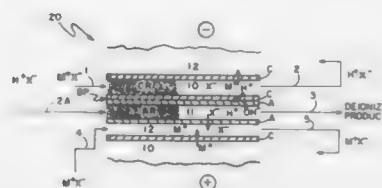
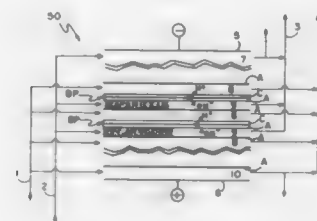
Edgardo J. Parsi, Lexington, Mass., assignor to Ionics, Incorporated, Watertown, Mass.

Filed Jul. 11, 1988, Ser. No. 217,905

Int. Cl.⁴ B01D 13/02

U.S. Cl. 204—182.4

17 Claims



11. A process for the removal of weakly ionized acidic substances such as silica from an aqueous solution using a multi-compartment electrodeionization apparatus having two end electrode compartments containing an anode and cathode respectively and located between said electrodes a plurality of alternating base producing and acid producing compartments defined by alternately arranged anion exchange membranes and bipolar membranes, said bipolar membranes positioned in the apparatus with the cation exchange resin side facing the cathode and the anion exchange resin side facing the anode, at least said base producing compartments containing a fluid permeable filler of anion exchange material; said process comprising passing said aqueous solution to be treated as a feed stream through said base producing compartments, passing an aqueous solution through said acid producing and electrode compartments, passing a direct electric current transversely through said compartments and membranes to cause the generation of base from the interface between the cation and anion resin laminate of the said bipolar membrane into said anion resin filled compartments and removing the effluent from said

base producing compartment as a product containing a lesser amount of weakly ionized acids than was originally present in said feed solution and recirculating at least a portion of the effluent product from the base producing compartment back as an aqueous feed stream to said acid producing or electrode compartments.

4,871,432

RECOVERY PROCESS

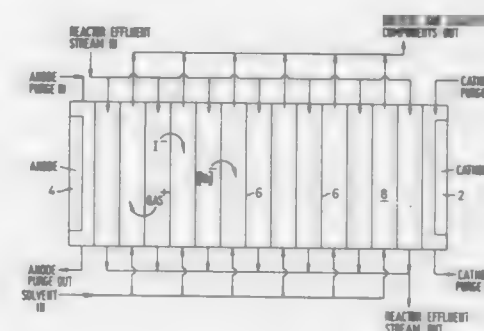
Richard B. A. Pardy, Cherry Burton, Nr. Beverley, England, assignor to BP Chemicals Limited, London, England
 Filed May 21, 1987, Ser. No. 52,052

Claims priority, application United Kingdom, May 30, 1986, #613221

Int. Cl.⁴ B01D 13/02

U.S. Cl. 204—182.4

12 Claims



1. A process for recovering a Group VIII noble metal employed to catalyze a carbonylation reaction, said process comprising the steps of:

providing a liquid medium comprising the Group VIII noble metal and tar, said tar having been formed as a by-product during the carbonylation reaction;

feeding said liquid medium to a first compartment of an electro dialysis cell;

feeding a solvent for at least said Group VIII noble metal to second compartments of said electro dialysis cell adjacent either side of said first compartment;

applying a voltage across the electro dialysis cell to cause migration of the Group VIII noble metal in ionic form from said liquid medium into said solvent; and

removing said solvent and the Group VIII noble metal in ionic form from said second compartments.

4,871,433

METHOD AND APPARATUS FOR IMPROVING THE UNIFORMITY ION BOMBARDMENT IN A MAGNETRON SPUTTERING SYSTEM

Israel Wagner, Monsey, N.Y., and Steven D. Harwitz, Park Ridge, N.J., assignors to Materials Research Corporation, Orangeburg, N.Y.

Continuation of Ser. No. 848,750, Apr. 4, 1986, abandoned. This application Sep. 10, 1987, Ser. No. 95,560

Int. Cl.⁴ C23C 14/34

U.S. Cl. 204—192.12

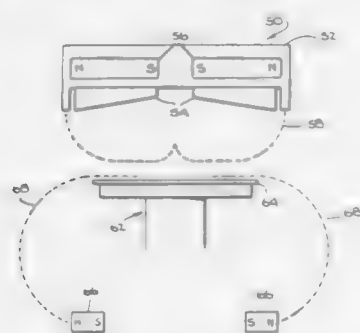
30 Claims

1. A sputtering method for imparting a uniform secondary ion flux distribution upon a substrate, comprising the steps of:

providing a cathode assembly including a cathode target of coating material and cathode magnet means, in opposed, spaced relation with a substrate to be coated;

inducing a cathode magnetic field with said cathode magnet means, said cathode field including a fringing field portion in the vicinity of said substrate, said fringing field having one or more regions near the substrate where its magnetic

field lines have components perpendicular to the surface of the substrate;
creating a primary ion flux and a secondary ion flux, both originating from within said cathode magnetic field in the space between said fringing portion and said cathode target;
bombarding said cathode target with said primary ion flux, to eject portions of coating material;



impacting said substrate with said secondary ion flux; and
generating a counter magnetic field, in the vicinity of said substrate, having magnetic field components in a direction perpendicular to the substrate which are located so as to oppose the components of the cathode magnetic field perpendicular to the substrate in each of said one or more regions.

4,871,434

PROCESS FOR EQUIPMENT TO COAT TOOLS FOR MACHINING AND FORMING TECHNIQUES WITH MECHANICALLY RESISTANT LAYERS

Wolf-Dieter Münz, Freigericht; Bernd Hensel, Eschborn; Michael Scherer, Rodenbach, and Otto Knotek, Aachen, all of Fed. Rep. of Germany, assigns to Leybold-Heraeus GmbH, Cologne, Fed. Rep. of Germany

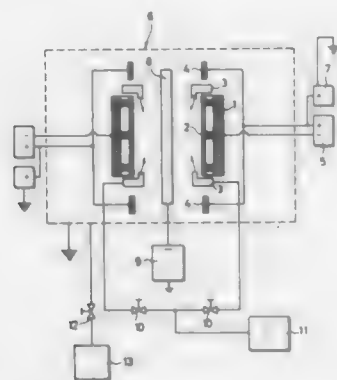
Filed Aug. 15, 1986, Ser. No. 896,936

Claims priority, application Fed. Rep. of Germany, Apr. 5, 1986, 3611492

Int. Cl. C23C 14/34

U.S. Cl. 204—192.16

7 Claims



1. Process for coating a tool having a cutting edge with a layer of a compound which contains at least one of carbon and nitrogen and at least one of titanium, zirconium, chromium, tungsten, tantalum, vanadium, niobium, hafnium, and molybdenum, the process preventing thermal damage and wear of edge material of the tool, comprising magnetron-cathode sputtering said tool with said compound, wherein said compound is cathodically sputtered from at least two targets in a sputtering apparatus, said targets positioned on either side of said tool, said sputtering taking place in an atmosphere containing at least one nitrogen or carbon containing reactive gas, which is

supplied to said targets by gas distributors disposed along at least two long sides of the said two targets, said tool being kept at a bias of -40 to -200 V relative to ground, wherein contact of said tool with electrons and ions produced by cathode sputtering is achieved by anode means disposed at edge regions and along at least two long sides of said targets, which anode means are positioned beyond said gas distributors and at a voltage of +10 to +200 V relative to ground, wherein electrons leaving plasma in said cathode sputtering are accelerated through the gas towards said anode means so as to cause formation of further ions by collision of said electrons with particles of said reactive gas.

2. Process of claim 1, wherein said target contains from 5 to 60 atom percent of aluminum.

4,871,435

ELECTROPLATING APPARATUS

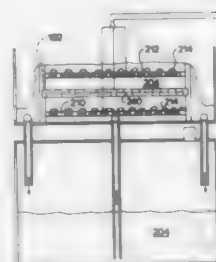
Charles Denofrio, 117 Oregon Ave., West Dundee, Ill. 60118

Filed Oct. 14, 1988, Ser. No. 258,211

Int. Cl. C25D 17/02, 17/06, 21/06

U.S. Cl. 204—224 R

12 Claims



1. An apparatus for coating of a printed circuit board by electroplating with an coating solution while suspending said printed circuit board in a horizontal position in a coating chamber by flooding said chamber and applying an electric charge thereto, wherein:

- said apparatus includes a housing for said apparatus;
- said housing includes a coating chamber therein;
- said coating chamber includes a support means for supporting said printed circuit board therein in a horizontal fashion;
- said coating chamber includes an anode assembly with at least one upper anode mounted above said support means and at least one lower anode mounted below said support means said support means includes anode assembly;
- said apparatus includes an overflow chamber surrounding said coating chamber and receiving coating solution from said coating chamber;
- said printed circuit board divides said coating chamber into an upper coating chamber and a lower coating chamber when said printed circuit board is mounted in said support means;
- an adjustable power source provides electric current to said at least one upper anode and said at least one lower anode, and said power source serves to adjust a thickness of a coating being applied to said printed circuit board;
- said printed circuit board seals said upper coating chamber and from said lower coating chamber when said printed circuit board is mounted in said support means;
- a coating solution connecting means joins said lower coating chamber to a storage chamber and provides for flowing of said coating solution from a storage chamber to said lower coating chamber;
- an outward coating flow means connects said overflow chamber with said storage chamber; and
- said coating solution flows into said lower coating chamber, through said printed circuit board, into said upper

coating chamber, then into said overflow chamber and from overflow chamber to said storage chamber.

4,871,436

SUSPENSION BAR FOR ANODE AND/OR CATHODE SHEETS IN THE ELECTROLYTIC REFINING OF METALS AND A METHOD FOR THE MANUFACTURE OF SUCH A SUSPENSION BAR

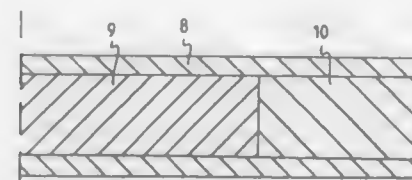
Gerardus H. J. den Hartog, F.A. Molijlamm 78, 8071 AH Nunspeet, Netherlands

Filed Mar. 1, 1988, Ser. No. 162,557

Claims priority, application Netherlands, Mar. 5, 1987, 8700837

Int. Cl. C25B 9/02; C25C 7/02

U.S. Cl. 204—286



1. In a suspension bar for an anode or cathode sheet in the electrolytic refining of metals, having an elongated core for the bar consisting of a first portion and a second portion arranged in end-to-end abutting relation with the first portion extending throughout the major length of the core and exhibiting a high resistance to bending and high mechanical resistance and the second portion arranged at least at one end of the first portion and exhibiting improved electrical conduction properties but inferior resistance to bending and mechanical resistance compared with the first portion, the invention characterized by:

a tube having electrical-conducting properties similar to said second portion and drawn in situ over both said first and second portions and extending from end to end thereof to form a continuous electrolyte-imperious sheath around the core throughout the length of the core, and said second portion extending within such sheath over a length of at least 3 cm. and not more than about 5 cm.

4,871,437

CERMET ANODE WITH CONTINUOUSLY DISPERSED ALLOY PHASE AND PROCESS FOR MAKING

Steven C. Marschman, and Norman C. Davis, both of Richland, Wash., assigns to Battelle Memorial Institute, Richland, Wash.

Filed Nov. 3, 1987, Ser. No. 116,475

Int. Cl. C25B 11/04

U.S. Cl. 204—291

24 Claims

1. A process for producing an electrically conductive cermet electrode having an oxide phase and an alloy phase for use in the electrolytic reduction of a metal from a metal compound dissolved in a molten salt, the process comprising the following steps:

combining NiO-nickel/iron/oxide powder with copper and nickel powder to produce a base mixture;
forming the base mixture into a desired shape;
sintering the shaped base mixture to produce a desired NiO-nickel/iron/oxide-Cu-Ni cermet having an oxide phase of NiO-nickel/iron/oxide and an alloy phase of Cu-Ni; and
catalyzing the reaction sintering step by including in the base mixture an effective amount of at least one additional metal which reacts to disperse the copper and nickel continuously throughout the NiO-nickel/iron/oxide oxide phase an an alloy to produce a cermet electrode having higher electrical conductivity than were the additional metal not included in the base mixture, the effective

4,871,438

CERMET ANODE COMPOSITIONS WITH HIGH CONTENT ALLOY PHASE

Steven C. Marschman, and Norman C. Davis, both of Richland, Wash., assigns to Battelle Memorial Institute, Richland, Wash.

Filed Nov. 3, 1987, Ser. No. 116,474

Int. Cl. C25B 11/04

U.S. Cl. 204—291

9 Claims

1. A process for producing a cermet electrode having an oxide phase and a metal phase for use in the electrolytic reduction of a metal from a metal compound dissolved in a molten salt, the process comprising the following steps:

combining an oxide containing powder comprising nickel-iron/oxide and NiO with a metal containing powder comprising Ni-Cu to produce a base mixture, the metal containing powder comprising at least Cu and Ni each having a defined melting point when pure, with the Cu melting point being less than a temperature at which the base mixture sinters into a cermet, the Cu and Ni metals having a combined weight concentration of at least 20%;
forming the base mixture into a desired shape;
densifying the formed base mixture by heating to a sintering temperature to:

(a) alloy the Cu and Ni to produce an alloy comprising at least Cu and Ni and which has a melting point which is greater than the pure Cu metal melting point, the alloy melting point being greater than the sintering temperature at which the oxide and alloy comprising at least Cu, Ni form a densified cermet; and

(b) produce a cermet electrode composition having an oxide phase comprising NiO-nickel/iron/oxide and an alloy phase comprising at least Cu and Ni, the weight concentration of the alloy phase being at least 20% of the cermet electrode composition;

wherein the step of densifying by heating the base mixture comprises:

raising the temperature of the formed base mixture to a value just below the melting point of Cu, and holding the formed base mixture at such a value to allow the metal alloy to form and stabilize; and

then, raising the temperature of the formed base mixture further to a sintering temperature.

3. A cermet electrode produced by the process according to claim 1, and wherein:

copper in the alloy phase is present in a weight concentration in excess of 20% of the densified composition.

4,871,439

DISPOSABLE SELF-CALIBRATABLE ELECTRODE PACKAGE

Steven Enzer, 12740 Monroe Pike, Brooklyn, Mich. 49230; Bruce M. Burgess, 115 Longman La., Ann Arbor, Mich. 48103; Jack S. Wyman, 3267 Springbrook, Ann Arbor, Mich. 48104, and Ricky Hendershot, 934 Raymond, Ann Arbor, Mich. 48103

Continuation of Ser. No. 14,219, Feb. 5, 1987, abandoned, which is a continuation of Ser. No. 770,835, Aug. 29, 1985, abandoned.

This application Jan. 29, 1988, Ser. No. 148,155

The portion of the term of this patent subsequent to Nov. 22, 2005, has been disclaimed.

Int. Cl. G01N 27/30

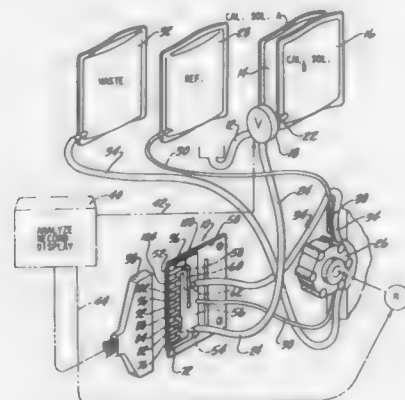
U.S. Cl. 204—401

18 Claims

1. In a system employing a chemistry analysis machine, for measuring a plurality of distinct characteristics of a body fluid sample or a calibration fluid and having means for receiving electrical signals proportional to each of the characteristics, the improvement separate from the analysis machine including: a replaceable cartridge of a given shape, having a box-like

body adapted to be plugged into the analysis machine and to be thus connected for a single use in electrical and mechanical engagement with the analysis machine and to be disconnected after use for replacement with a fresh cartridge, the cartridge including;

- (a) a fluid flow channel and a plurality of planar ion and gas sensor electrodes in a bank adjacent to the fluid flow channel positioned so as to be contacted by fluid contained in the channel, each electrode being adapted to generate an electrical signal proportional to the respective ion or gas concentration characteristic of the fluid sample;
- (b) reference electrode disposed in a reference solution well which has a reference fluid channel communicating with the fluid flow channel at a point downstream of the sensor so as to provide a stable liquid junction between the reference electrode and the fluid in the fluid flow channel;



- (c) first and second containers, the first container containing a calibration liquid with zero head space, of known chemical characteristics, tonometered with gas, and isotonic with relation to blood and the second container containing a reference solution hypertonic with relation to the blood and the calibration liquid;
- (d) cartridge inlet means adapted to receive a body fluid test sample;
- (e) a reference flow line establishing fluid communication between the container of reference solution and the reference solution well, said well and said reference flow line being separated from the fluid flow channel by said liquid junction; and
- (f) means to selectively and repeatedly direct the flow of said tonometered liquid or said body fluid sample over the bank of electrodes, whereby said cartridge is adapted to generate a plurality of electrical signals proportional to the ion or gas concentration of the sample.

4,871,440 BIOSENSOR

Yasuhiro Nagata, Kusatsu, and Hidetaka Fujimura, Kyoto, both of Japan, assignors to Daiken Industries, Ltd., Osaka, Japan
Filed Jul. 6, 1988, Ser. No. 215,756

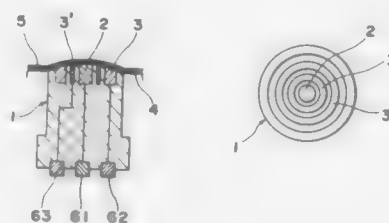
Claims priority, application Japan, Jul. 6, 1987, 62-168181
Int. Cl.⁴ G01N 27/54; C12Q 1/00, 1/54

U.S. Cl. 204-403

15 Claims

1. A biosensor comprising:
an enzyme electrode body,
a foundation electrode provided on the enzyme electrode body and including a working electrode, a counter electrode surrounding the working electrode, and a reference electrode surrounding the counter electrode,
an enzyme film provided on the surface of the foundation electrode and fixed with physiologically active material so that an electric signal is generated in the foundation electrode on the basis of the result of the enzyme reaction to measure the density of an objective material, and an electric circuit including terminals each connected to the

respective electrodes and a means for applying a bias potential between the working electrode and the refer-



ence electrode corresponding to the change of the potential of the counter electrode.

4,871,441

ION ACTIVITY MEASURING DEVICE

Yuzo Tsunekawa; Hikaru Tsuruta, both of Minami-ashigara, and Takehiko Sato, Asaka, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 133,503, Dec. 16, 1987, abandoned.

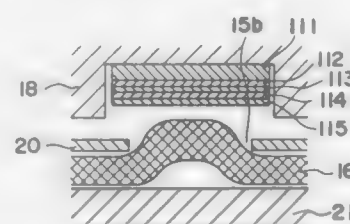
This application Mar. 17, 1989, Ser. No. 326,428

Claims priority, application Japan, Dec. 16, 1986, 61-300545

Int. Cl.⁴ G01N 27/30

U.S. Cl. 204-409

6 Claims



1. A device for measuring ion activity in a liquid sample comprising at least a pair of ion-selective electrode sheets which are electrically insulated from each other and selectively generate potential for a specific ion, liquid-guiding portions for guiding a reference liquid and a liquid sample to each active surface of said pair of ion-selective electrode sheets respectively, and a bridge for electrically connecting both liquids supplied on the electrode sheets to each other, wherein:
said each ion-selective electrode sheet is arranged in such a manner that the active surface of the ion-selective electrode is placed upside down;
said each liquid guiding portion comprises a horizontal passage for conveying said liquid sample or said reference liquid supplied from the outside in the horizontal direction to the position just below the active surface of the ion-selective electrode, the horizontal passage being formed in

a lower position than the active surface of the ion-selective electrode; and

said horizontal passage is provided with a swellable porous distributor in the form of a belt and having deformations therein which protrude upwardly, said deformations being positioned at a spaced-apart distance from the active surface from the ion-selective electrode, such that when a sample liquid or reference liquid is introduced to the porous distributor, the deformations swell upwardly such as to bring the deformed portion of the liquid distributor and the liquid which it contains into contact with the active surface of the ion-selective electrode.

4,871,442

ION SENSOR

Shuichiro Yamaguchi, Fuji; Norio Daikuhara, and Takeshi Shimomura, both of Fujinomiya, all of Japan, assignors to Terumo Corporation, Tokyo, Japan

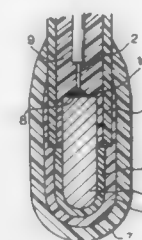
Filed Apr. 29, 1987, Ser. No. 44,062

Claims priority, application Japan, May 1, 1986, 61-101724; May 13, 1986, 61-109128; May 26, 1986, 61-120564

Int. Cl.⁴ G01N 27/30

U.S. Cl. 204-418

23 Claims



1. An ion sensor comprising:
an electrically conductive substrate;
a redox layer coating a surface of said electrically conductive substrate;
a barrier layer coating a surface of said redox layer; and
an ion-selective layer coating a surface of said barrier layer;
said barrier layer made from a material which functions to prevent mutual contamination between said ion-selective layer and said redox layer with substances constituting these layers, and to transmit a potential produced in said ion-selective layer by contact with an ion from said ion-selective layer to said redox layer.

4,871,443

NOVEL METHOD FOR EXTRACTION OF SALTS FROM COAL TAR AND PITCHES

Herbert Beneke, Castrop-Rauxel; Arnold Alacher, Essen; Rudolf Oberkubusch, Duisburg; Siegfried Peter, Uttenreuth-Weiher, and Wolfgang Jaumann, Nuremberg, all of Fed. Rep. of Germany, assignors to Rütgerswerke AG, Fed. Rep. of Germany

Continuation of Ser. No. 100,470, Sep. 24, 1987, abandoned. This application Mar. 30, 1989, Ser. No. 331,592

Claims priority, application Fed. Rep. of Germany, Oct. 28, 1986, 3636560

Int. Cl.⁴ C10C 3/02, 3/08

U.S. Cl. 208-39

9 Claims

1. A method of selectively removing salts from coal tars and coal pitches without reducing the α -resin content comprising washing coal tar or coal pitch in a pressure container with water and a carbon dioxide containing gas at a temperature and pressure near the critical point of the carbon dioxide gas, removing the liquid or dissolved tar or pitch to obtain tar or pitch with a low salt content and removing the aqueous phase.

4,871,444

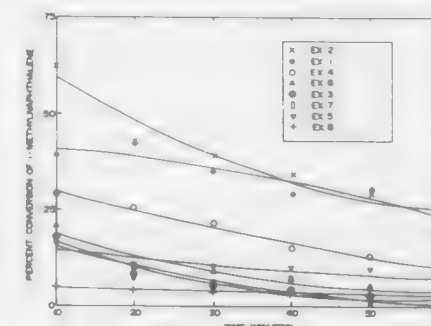
DISTILLATE FUEL QUALITY OF FCC CYCLE OILS
Nai Y. Chen, Titusville; Billy K. Huh, Lawrenceville; Anil B. Ketkar, Cranbury, and Chaya Venkat, Princeton, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 127,306, Dec. 2, 1987, abandoned. This application Nov. 10, 1988, Ser. No. 271,398

Int. Cl.⁴ C10G 71/00

U.S. Cl. 208-46

4 Claims



1. A method for improving the ignition quality of a fluid catalytic cracking cycle oil boiling within the range of about 150° C. (300° F.) to about 288° C. (550° F.), said oil having an aromatic hydrocarbon content determined by silica gel separation of at least about 50 wt %, a substantial portion of said aromatic hydrocarbons being polynuclear aromatics, which method comprises:

contacting said oil and olefin having three to about nine carbon atoms or a mixture thereof with a catalyst comprising a zeolite having the crystal structure of ZSM-20, said contacting being conducted under a combination of conditions of space velocity, temperature and pressure effective to alkylate said polynuclear aromatics with said olefin; and
recovering a hydrocarbon oil having improved ignition quality.

4,871,445

HYDROCARBON CONVERSION

Jeffery W. Koepke, La Habra, and Suhail F. Abdo, Diamond Bar, both of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Division of Ser. No. 880,312, Jun. 30, 1986, Pat. No. 4,777,157. This application Sep. 13, 1988, Ser. No. 243,709

Int. Cl.⁴ C10G 47/20, 65/12

U.S. Cl. 208-89

32 Claims

1. A hydrocracking process comprising catalyzing a hydrocracking reaction by contacting a hydrocarbon feedstock with a hydrocracking catalyst under hydrocracking conditions to produce a product hydrocarbon having an increased octane number than said hydrocarbon feedstock, wherein the hydrocracking catalyst consists essentially of at least one niobium component, at least one Group VIII metal component and at least one cracking component.

4,871,446

CATALYTIC CRACKING PROCESS EMPLOYING MIXED CATALYST SYSTEM

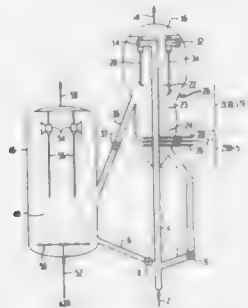
Joseph A. Herbst, Turnersville; Hartley Owen, Belle Mead, both of N.J., and Paul H. Schipper, Wilmington, Del., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 903,186, Sep. 3, 1986, abandoned, which is a continuation-in-part of Ser. No. 903,351, Sep. 3, 1986, abandoned, which is a continuation-in-part of Ser. No. 903,189, Sep. 3, 1986, abandoned. This application Sep. 2, 1987, Ser. No. 92,243

Int. Cl.⁴ C10G 11/18, 37/02

U.S. Cl. 208—152

11 Claims



1. A fluidized catalytic cracking (FCC) process wherein a feed contacts a conventionally sized FCC catalyst and an additive catalyst which has a slower deactivation rate than the conventional cracking catalyst in a conventional catalytic cracking riser reactor to produce cracked products, deactivated conventional catalyst and relatively less deactivated additive catalyst which are separated into a product fraction and a catalyst fraction, the catalyst fraction is stripped in a catalyst stripper to produce stripped catalyst which is then regenerated and returned to the riser reactor, and the product fraction passes through at least a final catalyst/vapor separation before discharge of cracked products, characterized by using an additive catalyst with different physical properties from the conventional catalyst and separating the additive catalyst from the conventional catalyst before the catalyst enters the regenerator and before the final catalyst/vapor separation and recycling the additive catalyst, without regeneration, to the catalytic cracking reactor and wherein said additive has a faster settling rate than the conventional FCC catalyst and the riser reactor has an upper section and a lower section and at least one of said sections has an enlarged diameter section relative to said riser and wherein said enlarged diameter section reduces the superficial vapor velocity and increases the residence time of said additive in said enlarged diameter section riser reactor.

4,871,447

RECOVERY OF ELEMENTAL SULPHUR FROM PRODUCTS CONTAINING CONTAMINATED ELEMENTAL SULPHUR BY FROTH FLOTATION

Ira I. Adamache, Calgary, Canada, assignor to Canterra Energy Ltd., Calgary, Canada

Filed Feb. 17, 1987, Ser. No. 14,975

Claims priority, application Canada, Feb. 20, 1986, 502290

Int. Cl.⁴ B03D 1/02

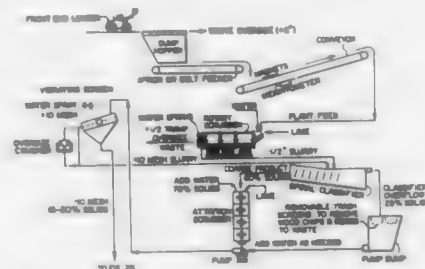
U.S. Cl. 209—166

24 Claims

2. A process for the recovery by froth flotation of elemental sulphur from contaminated products resulting from exploitation processes using wells for the application of heat to reservoirs in order to recover elemental sulphur, which comprises the steps of:

- coarse screening the contaminated elemental sulphur;
- treating the coarse screening undersize to wet scrubbing in a rotary scrubber and hydraulically sizing the rotary scrubbed slurry to produce a coarse fraction slurry and a fine fraction slurry, attrition scrubbing said coarse fraction slurry;
- size classifying at least one of said attrition scrubbed coarse fraction slurry or said fine fraction slurry to pro-

duce an undersize slurry of minus 10 mesh and adjusting said undersize slurry to at least 25% solids, returning the oversized fraction from said size classifying to said hydraulic sizing;



- conditioning the minus 10 mesh undersize slurry with two classes of reagents using a frother reagent and a promoter/collector reagent;
- subjecting the slurry-reagent composition to at least one stage of froth flotation to produce an elemental sulphur concentrate; and
- filtering and dewatering the resultant elemental sulphur concentrate.

4,871,448

MECHANICAL FLOTATION MACHINE

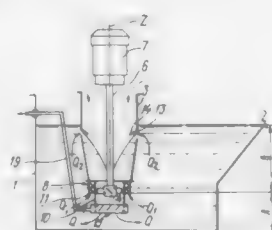
Valentin I. Dobryakov, Leningrad; Galina V. Zhevzhik, Soligorak; Valery A. Seballo; Evgeny V. Zhukov, both of Leningrad; Altar Z. Ententeev, Berezniiki; Vyacheslav N. Struzhkov, Moscow, and Alexandr S. Gorbachev, Soligorak, all of U.S.S.R., assignors to Gosudarstvenny Proektno-Konstruktorskiy I Eksperimentalny Institut Po Obogatitelnomu Oborudovaniyu, Leningrad, U.S.S.R.

Filed Jun. 14, 1988, Ser. No. 206,379

Int. Cl.⁴ B03D 1/20

U.S. Cl. 209—169

4 Claims



1. A mechanical flotation machine adapted for obtaining from a pulp containing material to be floated a product enriched in said material, comprising:

- a flotation cell adapted for receiving said pulp, having a bottom, an upper portion and a lower portion and provided with an overflow lip in said upper portion, said lip serving to discharge said product therethrough;
- a vertically arranged circulating pipe installed in said flotation cell, said pipe extending vertically from its top to bottom relative to said cell and having a side wall, an upper end disposed above said overflow lip and a lower end disposed in said lower portion of the flotation cell;
- an axial flow impeller rotatable about a vertical axis of rotation between said lower end of said circulating pipe and said bottom of said flotation cell, having an upper inlet side above said impeller and a lower outlet side below said impeller, said impeller provided with blades extending radially inwardly from outer points toward the axis of rotation and inclined with respect to a plane in which said blades rotate, said impeller facing the lower end of said circulating pipe with its inlet side for movement of said pulp from the interior of said circulating pipe to the space at the outlet side of said impeller;
- a drive means adapted to set said impeller in rotary motion;
- a means communicating the space at the outlet side of said impeller with the interior of said circulating pipe, said

means comprising an outer hollow cylinder having an upper end and a lower end installed below the lower end of said circulating pipe and secured by its upper end to the lower end of said circulating pipe, an inner hollow cylinder having an upper end and a lower end, said inner cylinder being concentrically located radially inward of said outer hollow cylinder thereby defining an annular gap therebetween, said inner cylinder enclosing said impeller, and vanes radially arranged in said annular gap and inclined to the axis of rotation of said impeller in the direction opposite to the slope of the impeller blades to direct the pulp flow from the space below said impeller to the interior of said circulating pipe in the direction opposite to that of rotation of said impeller.

4,871,449

CLARIFIER AND SCREW COMPACTOR LIQUID-SOLID SEPARATOR

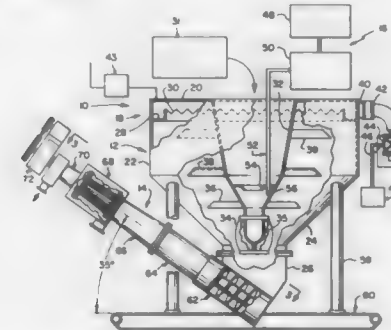
W. Gerald Lott, 1857 Post Oak Park Dr., Houston, Tex.

Filed Jun. 27, 1988, Ser. No. 211,828

Int. Cl.⁴ B01D 21/24, 29/42

U.S. Cl. 210—110

21 Claims



1. Transportable liquid clarifying and liquid-solids separation apparatus comprising:

- a pressurized clarifier vessel portably mounted on a skid type base with a top and sides converging at a bottom of said vessel for attachment to a screw conveyor/compactor;
- a liquid inlet entering said vessel and extending to near said bottom of said vessel;
- an entry flow check valve means connected to said liquid inlet and constructed and configured for opening at a designated pressure to admit liquid from said liquid inlet to within said vessel at the converged bottom of said vessel;
- a plurality of dispersion baffles vertically mounted apart within said vessel to diverge liquid passing upwardly within said vessel from the converged bottom of the vessel out along the peripheral sides of said vessel;
- a notched flow weir means connected near the top and around the periphery of said vessel to cause an even discharge of effluent liquid around the top periphery of said vessel;
- a pressure responsive effluent discharge flow control valve means connected through a conduit to said weir means to provide a designated back pressure within said vessel while controlling the discharge flow of effluent liquid from said vessel;
- a screw conveyor/compactor being connected to receive sludge at the bottom of said vessel and including a rotatable drive shaft and a screw conveyor means extending upwardly through the interior of said conveyor/compactor;
- a sludge receiving chute and housing means mounted to receive a sludge with said screw conveyor means carrying said sludge upwardly to a connected sludge compactor housing;
- a compactor housing being tapered to compact said sludge as said screw conveyor means carries said sludge to a liquid extracting means;

- a liquid extraction means having a tapered and longitudinally slotted screen to further compact said slurry while extracting liquid being forced out of said slurry as said slurry is being further compacted by said screw conveyor means;
- said liquid extraction means including drainage means to collect and carry off said liquid; and
- said screw conveyor means carrying said sludge farther to a sludge disposal means where said sludge is further compacted and passed out of said apparatus.

4,871,450

WATER/WASTEWATER TREATMENT APPARATUS

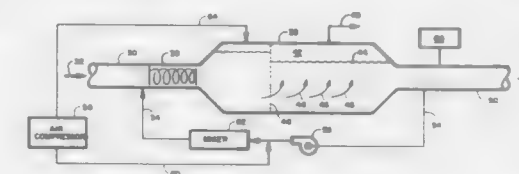
James A. Goodrich, Irvine, Calif., and Steven J. Medlar, Washington Crossing, Pa., assignors to Camp Dresser & McKee, Inc., Boston, Mass., a part interest

Filed Aug. 20, 1987, Ser. No. 87,326

Int. Cl.⁴ C02F 1/24; B01D 17/035

U.S. Cl. 210—151

3 Claims



1. A water treatment apparatus which comprises: an inlet pipe adapted to receive water from a source at line pressure; water injection means to inject higher pressure water into said inlet pipe; static mixer means in said pipe to mix source water and injected water; a first chamber to receive mixed water from said inlet pipe; an outlet pipe to receive water from a second chamber; means for withdrawing a selected percentage of the treated water at about said outlet pipe; pump means for increasing the pressure of said withdrawn water; gas injecting means for injecting gas into the resulting high pressure water; mixing means for mixing said injected gas and high pressure water prior to injecting of said high pressure water into said inlet pipe by said water injection means; a perforated plate dividing said first and second chamber positioned substantially perpendicular to the direction of water flow through said chambers and about 25 to 40% of the length of said chambers from said inlet, said plate functions to reduce the pressure between said inlet and outlet and for maintaining a first headspace above the mixed water in said first chamber adjacent to said inlet and means for maintaining a second headspace above the mixed water in said second chamber adjacent to said outlet, said second headspace being greater in volume than said first headspace for evacuating gases from said second headspace.

4,871,451

FLOOR DRAIN PLATE ASSEMBLY

James Piskula, P.O. Box 26174, Milwaukee, Wis. 53226

Filed Sep. 19, 1988, Ser. No. 246,434

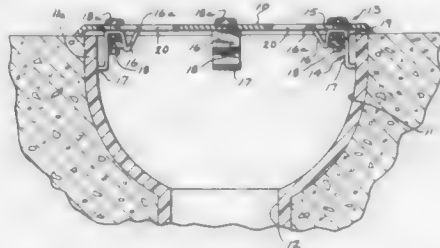
Int. Cl.⁴ E04D 13/00

U.S. Cl. 210—164

3 Claims

1. A floor drain plate assembly for closing the open mouth of a drain, said assembly comprising a floor drain plate with a plurality of slots in the top thereof, and fastening means comprising at least two jam clips each having a pair of legs and means for attaching the clips to the underside of the plate so that one leg of each clip is anchored in a separate slot and the other leg of each clip can be moved outwardly to engage the wall of a mouth of a drain to secure the drain plate closing said

mouth, said jam clips each having a space between said two legs and one of said legs being bent upwardly so that it can



engage a slot in the drain plate and the second of said legs having a lateral projection to engage a wall of the drain mouth.

4,871,452

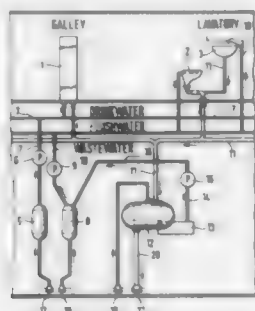
ON-BOARD WATER SUPPLY

Karl Kohler, and Dirk V. Reith, both of Hamburg, Fed. Rep. of Germany, assignors to Messerschmitt-Boelkow-Blohm GmbH, Bremen, Fed. Rep. of Germany
Filed May 12, 1988, Ser. No. 193,383
Claims priority, application Fed. Rep. of Germany, May 12, 1987, 3715759

Int. Cl.⁴ C02F 9/00

U.S. Cl. 210—167

2 Claims



1. Water supply in aircraft for on-board use in conjunction with water outlets in lavatories and a galley, comprising:
 - a waste water tank connected to at least some of the waste discharge outlets on board of the aircraft;
 - a water purifying plant connected to and receiving water from the waste water tank;
 - a fresh water tank having outlet means, connected at least to some of the water outlets and having an inlet connected to said water purification plant, for receiving therefrom purified waste water; and
 - said water purifying plant including a mechanical filter, a pump, a carbon filter, an ozone stage, an osmosis stage and a disinfecting stage, all these components connected in series in the stated sequence, from the waste water tank to the fresh water tank, so that potable water be received by the fresh water tank from the purifying plant.

4,871,453

CHROMATOGRAPHIC SEPARATION METHOD AND ASSOCIATED APPARATUS

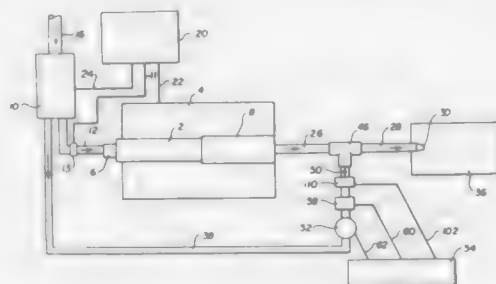
M. Lalith Kumar, Pittsburgh, Pa., assignor to Suprex Corporation, Pittsburgh, Pa.
Division of Ser. No. 157,020, Feb. 17, 1988, Pat. No. 4,814,889.
This application Nov. 22, 1988, Ser. No. 274,753
Int. Cl.⁴ B01D 15/08

U.S. Cl. 210—198.2

19 Claims

1. An automated apparatus for effecting supercritical fluid chromatographic separation comprising
 - a column,
 - oven means disposed in close adjacency to said column to elevate the temperature thereof,

injector means for introducing a sample into a carrier fluid to create a fluid sample which is delivered into said column, a pump operatively associated with said injector means for delivering said carrier fluid to said injector means, discharge passageway means for receiving a processed first fluid portion from said column, said discharge passageway means having restrictor means for altering the pressure of said first fluid portion, automated pressure control inlet means operatively associated with said discharge passageway means for receiving said first fluid portion from said restrictor means, and



said pump being operatively associated with said automated pressure control inlet means for delivering a second fluid portion thereto, whereby introduction of said second fluid portion into said pressure control inlet means at a predetermined pressure will cause the flow rate of said fluid sample in said column to be at a desired level under automated conditions.

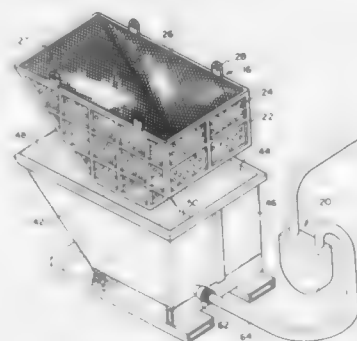
4,871,454

PORTABLE DUMPSTER SLURRY SEPARATING SYSTEM

W. Gerald Lott, 1857 Post Oak Park Dr., Houston, Tex. 77027
Filed Jun. 27, 1988, Ser. No. 211,836
Int. Cl.⁴ B01D 29/16

U.S. Cl. 210—205

6 Claims



1. Portable apparatus for removing liquid from a liquid-solid slurry, comprising:
 - (a) a transportable and tiltable receiving hopper vessel adapted to receive a liquid-solid slurry and adapted to be discharged when tilted;
 - (b) a removable rigid screen cage frame conforming to the entire interior of said hopper vessel and providing flow passage for liquid flow from within said cage frame out through the sides and bottom of said cage frame to the bottom of said hopper vessel;
 - (c) a flow screen attached to the interior of said cage frame and providing liquid flow through said flow screen into said flow passages;
 - (d) said flow screen being comprised of rigid perforated plate adapted to structurally reinforce said screen cage framework;
 - (e) a plurality of lifting eyes attached with the top of said cage frame to facilitate lifting said cage frame out of said hopper vessel;
 - (f) a removable filter media conforming to the interior of

said flow screen and being supported by said flow screen, wherein said removable filter media is constructed and arranged to allow said media and its contents to be lifted out of said flow screen and screen cage frame;
(g) a flow passage permitting flow of liquid out from the bottom of said hopper vessel;
(h) a moveable flow conduit connected through a quick-disconnect coupling means to said flow passage and also connected to a suction connection of a suction pump means; and
(i) said suction pump means being a peristaltic pump.

4,871,455

FILTER ASSEMBLY WITH LOCKABLE LUG MEANS

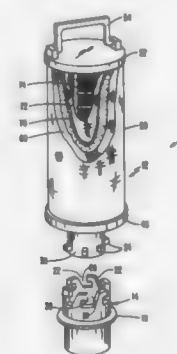
Ralph D. Terhune, Broken Arrow, Okla., and James D. Murphy, London, England, assignors to Facet Enterprises, Inc., Tulsa, Okla.

Filed Jun. 3, 1986, Ser. No. 870,237

Int. Cl.⁴ B01D 27/08

U.S. Cl. 210—232

14 Claims



1. A filter/coalescer assembly for mounting in a fuel tank comprising
 - a base for supporting and providing fluid connection to a removable filter cartridge, said base being adapted for mounting at a port of said fuel tank and having a hollow connecting end for mating with said cartridge;
 - a removable filter cartridge comprising a cylindrical filter medium and having a connecting end shaped to mate coaxially with said end of said base in a rotatable, telescopic relationship, said filter medium being adapted for inside-out flow, thereby causing said cartridge to be biased away from said base in use,
 - said filter medium including material causing coalescing of water in fuel passing through said medium,
 - the telescopically related mating ends of said base and cartridge providing radially opposed surfaces of circular cross section about the mutual axis of the connecting ends of said base and cartridge,
 - the connecting end of one of said base and said cartridge having lug means extending radially toward the end of the other,
 - the other said connecting end having corresponding passage means for lockably receiving said lug means,
 - said passage means extending in a first circumferential direction along a first circumferential path at a first axial position to an angular position and in an axial direction from said first circumferential path at said angular position to a locked position at a second axial position that is different from said first axial position, there being a stop member at a position along a second circumferential path at said second axial position such that said lug means is prevented from circumferential movement along said second circumferential path in a second circumferential direction opposite to said first circumferential direction,
 - a circular elastomeric sealing ring providing a radial seal

between said circular cross-section surfaces, preventing liquid flow past it between said telescopic ends, and a locking mechanism biasing said lug means relative to said passage means in said axial direction into said locked position, said biasing being in the direction to cause said cartridge to be biased away from said base, whereby said cartridge can be easily secured to said base and removed from said base, and unintended disconnection of said cartridge from said base owing to vibration is avoided.

4,871,456

STACKED FILTER CARTRIDGE WITH POROUS FILTER SUPPORT

Kyoichi Naruo, Sumio Ohtani, Masahiro Etoh, and Ikuro Moriya, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 12, 1987, Ser. No. 84,364

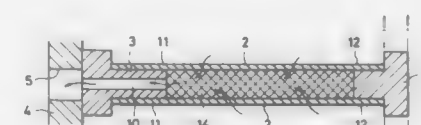
Claims priority, application Japan, Aug. 12, 1986, 61-187910;

Aug. 28, 1986, 61-200179; Sep. 17, 1986, 61-217304

Int. Cl.⁴ B01D 13/00, 29/04

U.S. Cl. 210—321.84

8 Claims



1. A flat-plate laminated filter cartridge, comprising at least one filtering unit, in which said filtering unit comprises:
 - an inner rim;
 - an outer member surrounding an outer periphery of and spaced apart from said inner rim;
 - upper and lower filtering films extending between said inner rim and said outer member and each having an entire inner periphery which is bonded to said inner rim, and an entire outer periphery which is bonded to at least one of another said outer periphery and said outer member so as to form a space therebetween serving as a path of a solution to be filtered; and
 - at least one film supporting member made of one of paper, unwoven cloth and net, disposed on at least one of both sides of said upper and lower filtering films, and between said upper and lower filtering films.

4,871,457

DISK FILTER

Mordeki Drori, 89 Zahal Street, Kiron, Israel

Continuation of Ser. No. 872,490, Jun. 10, 1986, Pat. No. 4,707,258. This application Oct. 9, 1987, Ser. No. 106,398
Claims priority, application Israel, Jun. 10, 1985, 75473

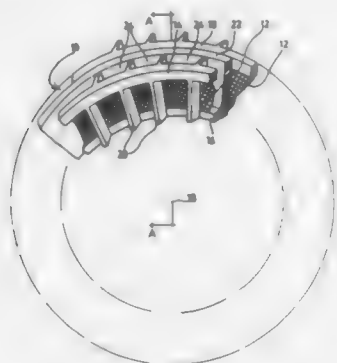
Int. Cl.⁴ B01D 27/12, 29/38

U.S. Cl. 210—333.1

17 Claims

1. A filter comprising:
 - a housing including an inlet coupled to a fluid inlet and an outlet coupled to a fluid outlet; and
 - a filter assembly disposed inside the housing and arranged to intercept the flow of fluid from the fluid inlet to the fluid outlet, said filter assembly comprising means for providing enhanced effective filtration surface area substantially greater than the external cylindrical surface area of a cylinder including:
 - a stack of identical filter screen elements arranged about a longitudinal axis,
 - each filter screen element having an overall disk like configuration and lying generally perpendicular to the longitudinal axis and comprising a generally annular screen and support and spacer means fixedly associated with each

screen for support thereof and defining at least one inlet chamber adjacent each annular screen at an upstream side thereof for collection of contaminants and at least one outlet passage adjacent each annular screen at a downstream side thereof for permitting drainage of filtered



fluid, whereby fluid passes through a single filter element from the upstream side to the downstream side, said filter assembly defining a multiplicity of inlet contaminant collection chambers adjacent a multiplicity of annular screens.

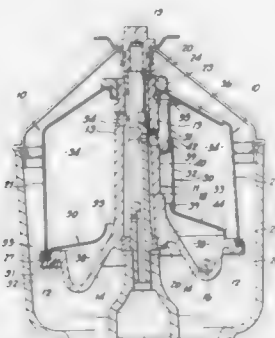
4,871,458 CENTRIFUGAL FILTERS

Ronald J. Purvey, Axminster, England, assignor to AE PLC, Rugby, England
Filed Apr. 29, 1988, Ser. No. 188,472
Claims priority, application United Kingdom, May 9, 1987, 8711007

Int. Cl.⁴ B01D 21/26

U.S. Cl. 210—360.1

4 Claims



1. A cleaning rotor for a centrifugal oil filter, the rotor comprising a central support of generally tubular form and which support is adapted to receive bearings for rotation about a shaft in a centrifugal oil filter, a base plate which is formed integrally with said central support and which base plate includes reaction drive nozzles, a cover member of generally domed shape and which extends between the upper end of said support and the outer periphery of said base plate to define a rotor chamber, an internal oil-flow directing member of generally annular form having a central aperture which extends around said central support to form an open annulus therebetween for the passage of oil from the rotor chamber into a nozzle chamber formed between said flow directing member and said base plate, the outer periphery of said flow directing member having a radially outwardly directed flange supported by said base plate, and there being a sealing member held in compression between the top surface of said outwardly di-

rected flange and the inner, lower periphery of said cover member to prevent a flow of oil between the outer periphery of said flow directing member and said base plate.

4,871,459 FILTER BED CLARIFIER

Juha S. Titoff, Kerimäki, Finland, assignor to A. Ahlstrom Corporation, Noormarkku, Finland

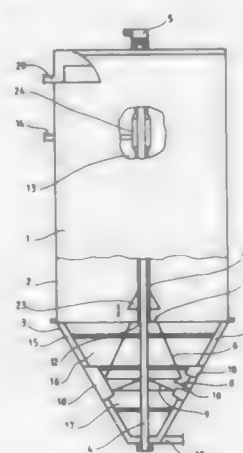
Filed Sep. 8, 1988, Ser. No. 241,452

Claims priority, application Finland, Sep. 14, 1987, 873971

Int. Cl.⁴ B01D 21/06

U.S. Cl. 210—519

14 Claims



1. A filter bed clarifier for separating solids and a liquid forming a sludge one from the other, comprising:
a tank having an outer wall including an upper, generally cylindrical part and a lower, generally tapered part, said lower tapered part narrowing in a downward direction;
a centrally disposed feed pipe in said tank for feeding the sludge into said tank and having an outlet means, said feed pipe being spaced from said tank wall to define a region in said tank for forming a filter bed;
a truncated conical member disposed in said lower tapered part of said tank and having a top inlet opening and a lower edge, said lower edge being larger in diameter than said inlet opening;
said feed pipe outlet means being disposed at an elevation in said tank generally corresponding to or higher than the elevation of said inlet opening to feed sludge into said inlet opening of said conical member and to aspirate material from said filter bed through said inlet opening for mixing and circulating the material of the filter bed and the sludge from said feed pipe outlet means one with the other;
said top inlet opening being larger in diameter than the diameter of said feed pipe; and
the lower edge of said conical member and said lower tapered part defining an annular opening therebetween for flowing at least part of the mixture upwardly into the filter bed.

4,871,460 ISOLATION/PURIFICATION OF ISOCYANATE CONDENSATES BY EXTRACTION WITH LIQUID OR SUPERCRITICAL GAS

Jean Robin, Lyons, and Andre Blind, Caluire, both of France, assignors to Rhone-Poulenc Chimie, Courbevoie, France

Filed Mar. 22, 1989, Ser. No. 327,033

Claims priority, application France, Mar. 22, 1988, 88 04051

Int. Cl.⁴ B01D 11/04

U.S. Cl. 210—634

13 Claims

1. A process for the isolation and purification of isocyanate condensates containing free NCO groups from a crude reac-

tion mixture thereof which comprises unreacted excess di- or polyisocyanate monomer and at least one isocyanate antagonist compound, comprising extracting such crude reaction mixture with an inert gas in either the liquid or supercritical state.

4,871,461 POLYMER COMPOSITE MEMBRANE

Hiroki Karakane, Yasushi Maeda, and Michio Tsuyumoto, all of Himeji, Japan, assignors to The General Director of the Agency of Industrial Science and Technology, Tokyo, Japan

Filed Jan. 15, 1988, Ser. No. 144,812

Claims priority, application Japan, Jan. 22, 1987, 62-11337; Mar. 4, 1987, 62-47495; Jul. 3, 1987, 62-165284; Jul. 3, 1987, 62-165285

Int. Cl.⁴ B01D 13/00

U.S. Cl. 210—638

14 Claims

1. A process comprising separating water from an aqueous solution of an organic substance or a gaseous mixture of water with an organic substance by pervaporation or vapor permeation, by contacting said solution or said mixture with a membrane made of a synthetic polymer having an anionic group associated with a synthetic polymer having a cationic group by an ionic bond to form a polyion complex on the surface of the membrane and/or in the membrane under conditions effective to cause water vapor to permeate through said membrane.

4,871,462 ENHANCED SEPARATION OF BLOOD COMPONENTS

Richard J. Fischel, Minneapolis, Minn., and Albert V. Shatzel, Glenview, Ill., assignors to Haemonetics Corporation, Braintree, Mass.

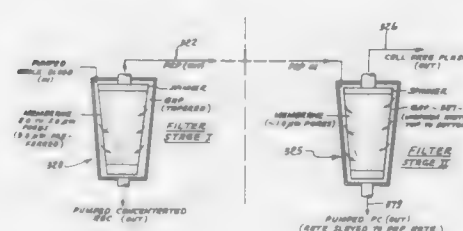
Continuation-in-part of Ser. No. 812,936, Dec. 23, 1985, Pat. No. 4,755,300. This application Jun. 5, 1987, Ser. No. 58,549

The portion of the term of this patent subsequent to Jul. 5, 2005, has been disclaimed.

Int. Cl.⁴ B01D 13/00

U.S. Cl. 210—651

7 Claims



1. In the method of separating blood plasma from particles including blood cells, in the blood, the steps that include:

- providing a membrane with holes therethrough of a size to pass the particulate, and supplying blood to one side of the membrane,
- moving the membrane at sufficiently high velocity that shear conditions created in the blood adjacent the membrane cause particles in the blood to move or remain away from the surface of the membrane and from said holes,
- creating a pressure differential across the membrane sufficient to cause plasma to pass through the holes from said one side of the membrane to the opposite side thereof,
- the holes being allowed to reduce in cross-sectional area as by protein collection on the membrane at the holes, or by expansion of the membrane material, and the holes maintained sufficiently open, by virtue of their original size, to continue to pass the plasma therethrough,
- platelet rich plasma being passed through the holes of the membrane,
- providing a second moving membrane and supplying platelet rich plasma to one side of the second membrane,

- the second membrane having holes therethrough of a size to pass plasma and to prevent passage of platelets,
- whereby a platelet concentrate is produced at said one side of the second membrane.

4,871,463 VERTICAL REACTION VESSEL

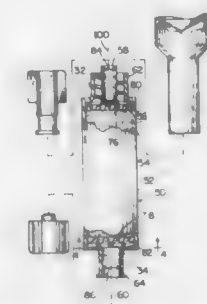
Michael A. Taylor, Encinitas, and Timothy Rogler-Brown, Cardiff By-The-Sea, both of Calif., assignors to Sepratech, Carlsbad, Calif.

Filed Aug. 23, 1988, Ser. No. 235,375

Int. Cl.⁴ E01D 23/10

U.S. Cl. 210—161

19 Claims



1. A vertical reaction vessel having a uniform fluid flow design, comprising:

- a body defining a reaction medium receptacle having a receptacle cross-sectional area;
- a reaction medium in the receptacle;
- a fluid inlet and a fluid outlet each communicating with the reaction medium receptacle and each having inlet and outlet cross-sectional areas substantially smaller than the receptacle cross-sectional area;
- manifold chambers adjacent to the fluid inlet and the fluid outlet having manifold cross-sectional areas substantially equal to the receptacle cross-sectional area to provide fluid pathways from the fluid inlet, across the receptacle cross-sectional area and to the fluid outlet; and
- fluid-permeable back pressures means, located between the manifold chambers and the reaction medium, for gently compensating for volumetric changes of said reaction medium and for evenly distributing fluid through the fluid pathways to encourage substantially uniform fluid flow through the reaction medium.

4,871,464 METHOD FOR EXTRACTING METAL IONS

Tsugio Kaneko, Fumiya Ishikawa, Yoshinobu Nishiyama, and Toshiharu Shibata, all of Kitakyushu, Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

Filed Feb. 23, 1988, Ser. No. 158,740

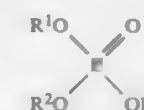
Claims priority, application Japan, Feb. 23, 1987, 62-39552

Int. Cl.⁴ E01D 15/04

U.S. Cl. 210—682

2 Claims

1. A method for extracting rare earth metal ions from an aqueous solution containing rare earth metal ions and aluminum ions, said aqueous solution having a pH of no more than about 0, or containing phosphoric acid, which comprises contacting the aqueous solution containing said rare earth metal ions and aluminum ions with an acidic phosphoric acid ester of the formula:



wherein R¹ is an alkylphenyl group having from 7 to 18 carbon atoms, and R² is an alkyl group having from 1 to 18 carbon atoms.

4,871,465

CHLORINE-FREE SILVER PROTECTIVE LUBRICANT COMPOSITION (II)

David A. Hutchison, Naperville, Ill., assignor to Amoco Corporation, Chicago, Ill.

Filed Sep. 30, 1987, Ser. No. 103,185
Int. Cl.⁴ C10M 105/72, 105/58

U.S. Cl. 252-47

18 Claims

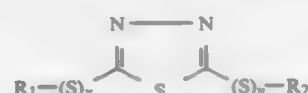
1. A lubricating composition for use in railway diesel engine which is essentially free of zinc dialkyldithiophosphate wear inhibitors and which comprises a major proportion of an oil of lubricating viscosity and a minor effective amount of a silver protective additive comprising the combination of (I) an organo sulfur compound selected from the group consisting of sulfurized olefins, sulfurized fatty acids, sulfurized hydroxyaromatics, 1,3,4-thiadiazoles, and dithiocarbamates; and (II) the reaction product obtained by reacting polybutyl-succinic anhydride in which the polybutyl group has a number average molecular weight of from about 300 to about 5000 with (a) an aminoguanidine compound having the formula:



wherein R is H or C₁ to C₁₅ hydrocarbyl and wherein R' and R'' being the same or different are H or C₁ to C₂₀ hydrocarbyl;

or (b) salts of said aminoguanidine compound, under reaction conditions giving rise predominantly to formation of a polybutenyl-substituted 1,2,4-triazole.

10. A method for protecting silver engine parts in an internal combustion engine comprising the step of contacting the internal portion of said engine with a lubricating composition essentially free of zinc dialkyldithiophosphate wear inhibitors and comprising a major proportion of an oil of lubricating viscosity and a minor effective amount of a silver protective additive composition comprising the combination of (I) a thiadiazole compound having the general formula:



wherein x and y, being the same or different, are integers from 1 to 5 and R₁ and R₂, being the same or different, are H, or C₁ to C₃₀ hydrocarbyl; and (II) the reaction product obtained by reacting a substantially aliphatic, substantially saturated hydrocarbon substituted dicarboxylic and wherein the hydrocarbon group contains at least about 20 aliphatic carbons, with (a) an aminoguanidine compound having the formula:



wherein R is H or C₁ to C₁₅ hydrocarbyl and wherein R' and R'' being the same or different are H or C₁ to C₂₀ hydrocarbyl;

or (b) salts of said aminoguanidine compound, under reaction conditions giving rise predominantly to formation of a hydrocarbon-substituted 1,2,4-triazole.

NOVEL COLLECTORS AND PROCESSES FOR MAKING AND USING SAME

Samuel S. Wang, Cheshire, and D. R. Nagaraj, Stamford, both of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Oct. 15, 1987, Ser. No. 108,611
Int. Cl.⁴ B03D 1/02

U.S. Cl. 252-61

9 Claims

7. A composition of matter consisting of a C₈-C₂₂ alcohol solution of fatty hydroxamic acid of 6-22 carbon atoms.

4,871,467

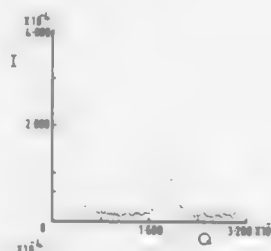
NON-SEDIMENTING LIQUID DETERGENT COMPOSITIONS RESISTANT TO SHEAR

Brian J. Akred, Whitehaven; Edward T. Messenger, Workington, and William J. Nicholson, Whitehaven, all of England, assignors to Albright & Wilson Limited, Oldbury, England Division of Ser. No. 730,349, May 3, 1985, Pat. No. 4,659,497, which is a division of Ser. No. 464,019, Feb. 4, 1983, Pat. No. 4,515,704. This application Apr. 17, 1987, Ser. No. 39,671 Claims priority, application United Kingdom, Feb. 2, 1982, 8203398; Apr. 13, 1982, 8210670; Jul. 2, 1982, 8219227; Dec. 23, 1982, 8236664

Int. Cl.⁴ C11D 1/12, 7/14, 7/16

U.S. Cl. 252-135

17 Claims



1. A Pourable, fluid, Non-Sedimenting, aqueous-based detergent composition consisting essentially of

- (a) surfactant;
- (b) Builder, at least a portion of said Builder being present as solid particles, suspended in said composition;
- (c) dissolved surfactant-desolubilizing Electrolyte, including any dissolved surfactant-desolubilizing portion of said Builder, in a stabilizing amount above the minimum such amount at which the composition is able to recover after exposure to shear to provide a Non-Sedimenting composition which exhibits a higher Viscosity than before such exposure; and
- (d) water in an amount above the minimum at which the composition is Pourable and below the maximum at which the composition is Non-Sedimenting.

4,871,468

METHOD AND COMPOSITION FOR THE REMOVAL OF HYDROGEN SULFIDE AND CARBON DIOXIDE FROM GASEOUS STREAMS

Gaines C. Jeffrey, Houston, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 16,167, Feb. 19, 1987, Pat. No. 4,781,901, which is a continuation-in-part of Ser. No. 857,863, May 1, 1986, Pat. No. 4,774,071. This application Aug. 29, 1988, Ser. No. 237,488

Int. Cl.⁴ C09K 3/00

U.S. Cl. 252-190

4 Claims

1. An oxidation stable aqueous alkaline scrubbing solution suitable for removing hydrogen sulfide and carbon dioxide from a sour gaseous stream in a contact zone without substantial oxidative degradation of a higher valence polyvalent metal chelate present in said scrubbing solution, said scrubbing solution consisting of:

an alkali, a lean carbon dioxide selective absorbent, a mixture of a lower valence polyvalent metal chelate and a higher valence polyvalent metal chelate, said lower valence polyvalent metal chelate present in said mixture in an amount which is greater than about five times the amount of said higher valence polyvalent metal chelate, and at least one buffering agent to maintain said aqueous alkaline solution within a pH range of about 7 to about 10.

4,871,469

NEMATIC LIQUID-CRYSTALLINE PHASES

Volker Reiffenrath, Darmstadt; Joachim Krause, Dieburg; Thomas Geelhaar, Mainz; Rudolf Eidenschink, Münster; Hans-Adolf Kurmeier, Seeheim-Jugenheim; Elke Poetsch, Mühlthal, all of Fed. Rep. of Germany; Bernhard Scheuble, Yokohama, Japan, and Georg Weber, Erzhausen, Fed. Rep. of Germany, assignors to Beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

PCT No. PCT/EP87/00218, § 371 Date Jan. 4, 1988, § 102(e) Date Jan. 4, 1988, PCT Pub. No. WO87/06602, PCT Pub. Date Nov. 5, 1987

PCT Filed Apr. 22, 1987, Ser. No. 154,254

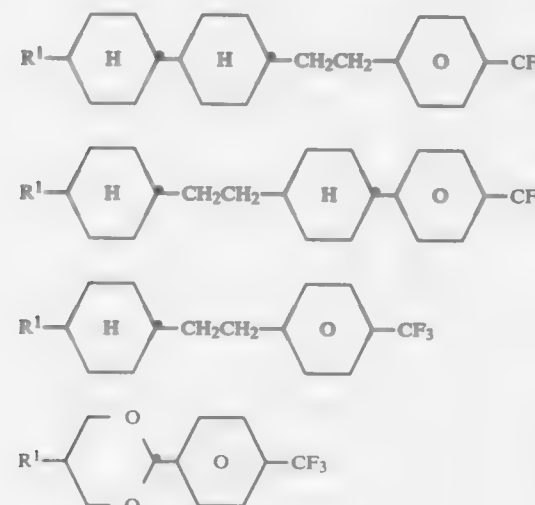
Claims priority, application Fed. Rep. of Germany, May 2, 1986, 3614778

Int. Cl.⁴ G02F 1/13; C09K 19/34, 19/30, 19/20

U.S. Cl. 252-299.61

4 Claims

1. A nematic liquid-crystalline phase comprising at least two components, wherein at least one component is a trifluorotoluene derivative selected from the following formulae:



wherein

R¹ is alkyl having 1 to 12 carbon atoms.

4,871,470

CYCLOHEXANE DERIVATIVES

Andreas Wächter, Griesheim; Joachim Krause, Dieburg; Rudolf Eidenschink, Mühlthal, and Georg Weber, Erzhausen, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit Beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

PCT No. PCT/EP87/00090, § 371 Date Oct. 30, 1987, § 102(e) Date Oct. 30, 1987, PCT Pub. No. WO87/05293, PCT Pub. Date Sep. 11, 1987

PCT Filed Feb. 17, 1987, Ser. No. 130,358

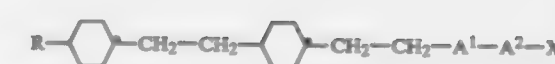
Claims priority, application Fed. Rep. of Germany, Mar. 1, 1986, 3606788; Nov. 4, 1986, 3637442

Int. Cl.⁴ C09K 19/30; C07C 13/28, 69/753, 121/46, 49/313, 43/21, 39/17

U.S. Cl. 252-299.63

10 Claims

1. A cyclohexane derivative of the formula I



in which

R is an alkyl group which has 1-12 C atoms and in which one or two non-adjacent CH₂ groups can also be replaced by O, —CO—O— or —OCO—,

A¹ and A² each independently of one another are trans-1,4-cyclohexylene or unsubstituted or fluorine-substituted 1,4-phenylene, and one of the groups A¹ and A² can also be a single bond,

X is fluorine or chlorine.

4,871,471

PHOSPHOR FOR CATHODE RAY TUBE

Hiroshi Okada, Nagakakyō, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 12, 1988, Ser. No. 193,441

Claims priority, application Japan, May 20, 1987, 62-134275 Int. Cl.⁴ C09K 11/84

U.S. Cl. 252-301.4 S

2 Claims

1. A phosphor for a cathode ray tube comprising Y₂O₂S:Eu and from about 0.1 to about 5.0 wt. % barium fluoride based on the weight of the Y₂O₂S:Eu, said phosphor being obtained by firing a mixture of a trivalent europium-activated yttrium sulfide and oxide phosphor of the formula Y₂O₂S:Eu and from about 0.1 to about 5.0% by weight barium fluoride based on the weight of said Y₂O₂S:Eu, said firing being conducted at a temperature of from about 1300° C. to about 1400° C. in a weakly reducing atmosphere, said atmosphere preventing the oxidation of said mixture.

4,871,472

ESTERS IN FERROELECTRIC MIXTURES

Joachim Krause, Dieburg; Volker Reiffenrath, Darmstadt, and Thomas Geelhaar, Mainz, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit Beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

PCT No. PCT/EP87/00055, § 371 Date Oct. 9, 1987, § 102(e) Date Oct. 9, 1987, PCT Pub. No. WO87/05013, PCT Pub. Date Aug. 27, 1987

PCT Filed Feb. 5, 1987, Ser. No. 124,789

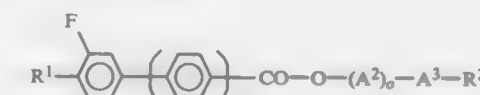
Claims priority, application Fed. Rep. of Germany, Feb. 13, 1986, 3604462

Int. Cl.⁴ G02F 1/13; C09K 19/30; C07C 69/76

U.S. Cl. 252-299.65

2 Claims

1. A ferroelectric liquid crystal phase comprising at least two liquid crystal components, wherein at least one component is of the formula I



wherein

R¹ and R² each independently of one another is R, OR, OCOR, COOR or OCOOR,

R is straight-chain alkyl of 5 to 12 C atoms,

A² and A³ are each 1,4-phenylene, and

n and o are each independently 0 or 1.

4,871,473 WOOD PRESERVATIVE

Reimer Goettische, Baden-Baden, and Hans-Norbert Marx, Buehl-Vimbuch, both of Fed. Rep. of Germany, assignors to Dr. Wolman GmbH, Binzheim, Fed. Rep. of Germany
Filed Dec. 16, 1988, Ser. No. 285,614

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1987, 3742834

Int. Cl.⁴ C09K 15/16, 15/22; C09D 5/18; A61K 33/30
U.S. Cl. 252-400.52 16 Claims

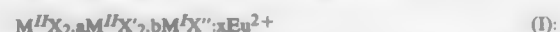
1. A wood preservative, consisting essentially of about 5 to 40% by weight of zinc metal or a zinc compound, about 10 to 40% by weight of a C₅-C₂₀ aliphatic mono- or di-carboxylic acid, and about 5 to 40% of a polyamine having 3 to 9 carbon atoms and 2 to 4 nitrogen atoms.

4,871,474 PHOSPHOR

Takayuki Katoh, Yuichi Hosoi, and Kenji Takahashi, all of Kaisai, Japan, assignors to Fuji Photo Film Co., Ltd., Japan
Continuation of Ser. No. 110,535, Oct. 20, 1987, abandoned, which is a continuation of Ser. No. 797,972, Nov. 14, 1985, abandoned. This application Aug. 26, 1988, Ser. No. 237,692
Claims priority, application Japan, Nov. 16, 1984, 59-240451
Int. Cl.⁴ C09K 11/61 6 Claims

U.S. Cl. 252-301.4 H

1. A divalent europium activated alkaline earth metal complex halide phosphor having the formula (I):



in which M^{II} is at least one alkaline earth metal selected from the group consisting of Ba, Sr and Ca; M' is at least one alkali metal selected from the group consisting of Li and Na; each of X and X' is at least one halogen selected from the group consisting of Cl, Br and I, and X≠X'; X'' is at least one halogen selected from the group consisting of F, Cl, Br and I; and a, b and x are numbers satisfying the conditions of 0.1 ≤ a ≤ 10.0, 10⁻⁴ ≤ b ≤ 5 × 10⁻² and 0 < x ≤ 0.2, respectively.

4,871,475 POLYSULFONE AND POLYETHERSULFONE OLIGOMERS

Hyman R. Labowitz, Rolling Hills Estates, Calif., and Clyde H. Sheppard, Bellevue, Wash., assignors to The Boeing Company, Seattle, Wash.

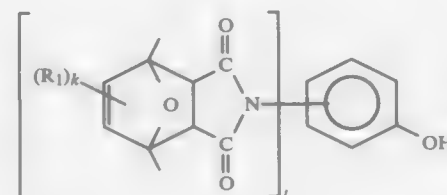
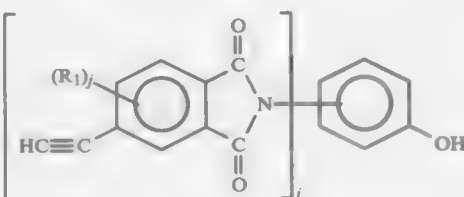
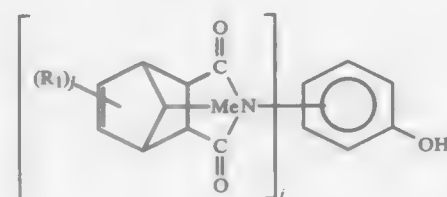
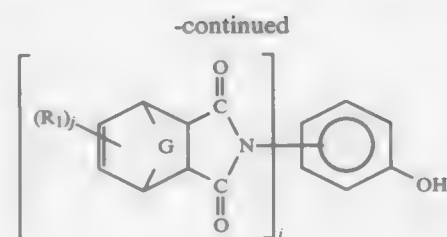
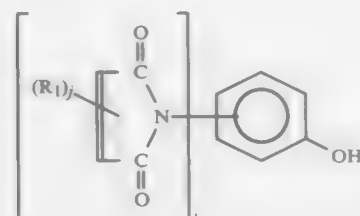
Filed Oct. 7, 1985, Ser. No. 785,364

The portion of the term of this patent subsequent to Oct. 9, 2004, has been disclaimed.

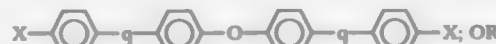
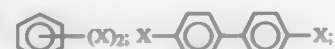
Int. Cl.⁴ H01B 1/00, 1/04

U.S. Cl. 252-500 15 Claims

1. A method for preparing an oligomer, by condensing 2 moles of an end cap imidophenol; n+1 moles of a dihalogen moiety; and n moles of a diol, wherein the imidophenol is selected from the group consisting of:



wherein
R₁=lower alkyl, lower alkoxy, aryl, aryloxy, substituted aryl, halogen, or mixtures thereof;
j=0, 1, or 2;
i=1 or 2;
G=—CH₂—, —O—, —S—, or —SO₂—; and
k=1 or 2;
wherein the dihalogen moiety is selected from the group consisting of:



wherein

X=halogen; and

q=—S—, —SO₂—, —CO—, —(CH₂)₂C—, and —(CF₃)₂C—;

wherein the diol is selected from the group consisting of:

hydroquinone;

bisphenol A;

p, p'-biphenol;

4, 4'-dihydroxydiphenylsulfide;

4, 4'-dihydroxydiphenylether;

4, 4'-dihydroxydiphenylisopropane;

4, 4'-dihydroxydiphenylhexafluoropropane;

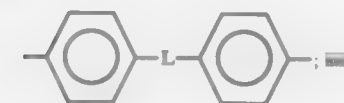
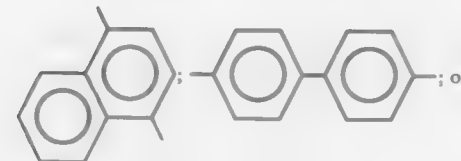
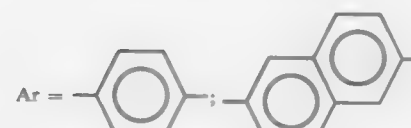
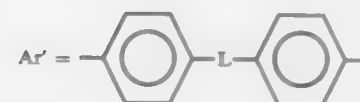
HO—Ar—OH;

HO—Ar—L—Ar—L—Ar—OH; and

HO—Ar—L—Ar—L—Ar—OH;

wherein

L=—CH₂—, —(CH₂)₂C—, —(CF₃)₂C—, —O—, —S—, —SO₂—, or —CO—;



wherein n=an integer such that the oligomer has a formula wherein between about 1,000 and 40,000.

6. A conductive or semiconductive oligomer, comprising:

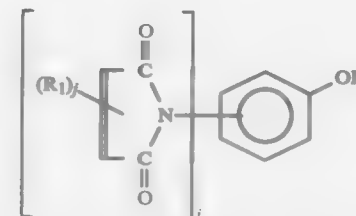
(a) the product of the process of condensing;

2 moles of an end cap imidophenol;

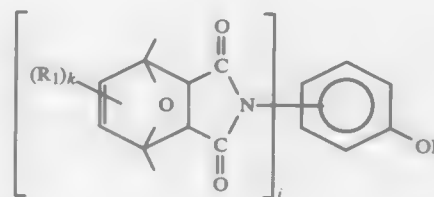
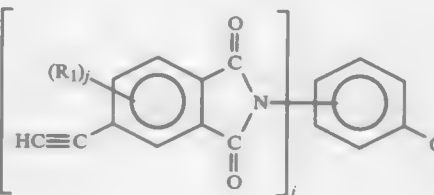
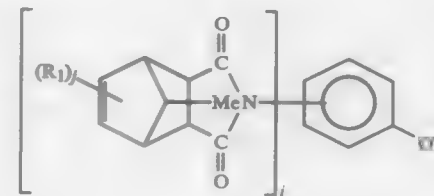
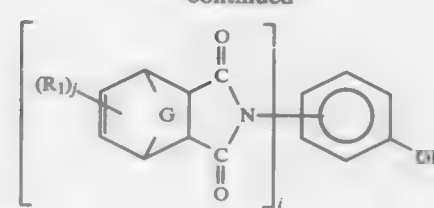
n+1 moles of a dihalogen moiety; and

n moles of a diol,

wherein the imidophenol is selected from the group consisting of:



-continued



wherein

R₁=lower alkyl, lower alkoxy, aryl, aryloxy, substituted aryl, halogen, or mixtures thereof;

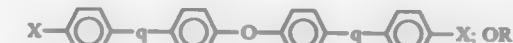
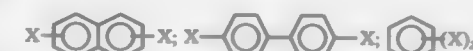
j=0, 1, or 2;

i=1 or 2;

G=—CH₂—, —O—, —S—, or —SO₂—; and

k=1 or 2;

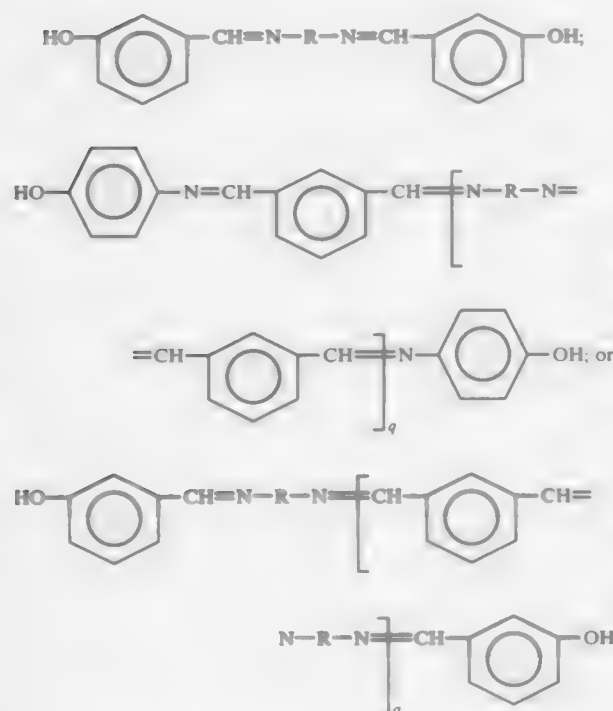
wherein the dihalogen moiety is selected from the group consisting of:



wherein

X=halogen, preferably chlorine; and

$q = -S-, -SO_2-, -CO-, -(CH_2)_2C-,$ and $-(CF_3)_2C-$; and wherein the diol is selected from the group consisting of:



wherein R is selected from the group consisting of:
phenyl;
biphenyl;
naphthyl; or
a compound of the general formula:



wherein
 $W = -CH_2-$ or $-SO_2-$; and
 $q =$ a small integer;
wherein $n =$ an integer such that the oligomer has a formula weight between about 1,000 and 40,000; the reaction occurring under an inert atmosphere in the presence of excess base; and
(b) a suitable amount of a suitable dopant.

4,871,476

SYNTHETIC LUBRICATING FLUID

Narihiko Yoshimura, Michihide Tokashiki, and Tetsuo Ishii, all of Saitama, Japan, assignors to Toa Nenryo Kogyo K.K., Tokyo, Japan

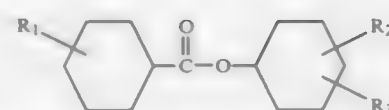
Filed Jul. 31, 1987, Ser. No. 80,004

Int. Cl.⁴ C10M 105/34, 107/02

U.S. Cl. 252-565

3 Claims

1. A synthetic lubricating fluid comprising:
(i) ester or its derivative of cyclohexanol and cyclohexanecarboxylic acid represented by the formula



wherein R_1 , R_2 and R_3 are independently selected from hydrogen and alkyl groups containing from 1 to 8 carbon atoms; and
(ii) from 10 to 50% by weight of branched poly- α -olefin selected from the group consisting of branched poly- α -olefins having an average molecular weight of 900 to 5,000.

4,871,477

FIRE PROTECTED FOAMED POLYMERIC MATERIALS
Felix Dimanshteyn, West Hartford, Conn., assignor to Firestop Chemical Corporation, Chicopee, Mass.

Continuation-in-part of Ser. No. 230,054, Aug. 9, 1988, abandoned, which is a continuation-in-part of Ser. No. 88,832, Aug. 24, 1987, abandoned, which is a continuation-in-part of Ser. No. 891,202, Jul. 28, 1986, abandoned, which is a continuation-in-part of Ser. No. 608,728, May 10, 1984, Pat. No. 4,612,239, which is a continuation-in-part of Ser. No. 466,375, Feb. 15, 1983, abandoned. This application Oct. 20, 1988, Ser. No. 260,400

Int. Cl.⁴ C09K 21/00; C09D 5/16, 5/18

U.S. Cl. 252-609

19 Claims

1. A fire protected foamed polymeric material comprising the product of reaction of a mixture of
I a foamable polymer composition,
II fire resistant inorganic particles, said particles comprising a member selected from the group consisting of:
(A) inorganic particulate material which, when heated to a preselected temperature above the temperature at which said foamable polymer composition is foamed, endothermically releases a nonflammable gas,
(B) the particulate material of part A enveloped by a solid, fracturable, inorganic external phase having a fusion point above said preselected temperature, to produce particles comprising at least two phases, said two-phase particulate material, upon exposure to sufficient heat, being microexplosive to release said nonflammable gas, and operable subsequently to form a nonflammable vitreous barrier, and
(C) mixtures of materials A and B; and
III particulate, expandable alkali metal silicate,
said foamed polymeric material being self fire extinguishing, substantially non-dripping, and forming a vitreous surface barrier layer when directly exposed to flame.

4,871,478

METHOD OF IMPROVING THE CRITICALITY SAFETY IN A LIQUID-LIQUID EXTRACTION PROCESS FOR SPENT NUCLEAR FUEL OR BREEDER REACTOR MATERIALS

Georg Petrich, and Helmut Schmieder, both of Karlsruhe, Fed. Rep. of Germany, assignors to Kernforschungszentrum Karlsruhe GmbH, Karlsruhe, Fed. Rep. of Germany
Filed Nov. 9, 1987, Ser. No. 117,848

Claims priority, application Fed. Rep. of Germany, Nov. 14, 1986, 3,039,064

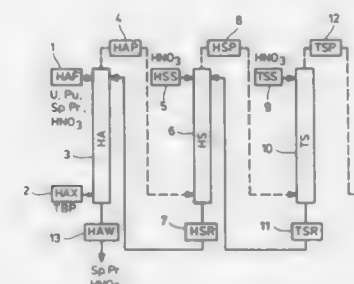
Int. Cl.⁴ C21C 19/42; C01G 56/00, 57/00; B01D 11/00

U.S. Cl. 252-627

4 Claims

1. In a process for the extraction of uranium and plutonium from spent nuclear fuels or breeder reactor materials comprising dissolving the spent nuclear fuels or breeder reactor materials in nitric acid to provide an aqueous acid solution comprising uranium, plutonium and at least one of neptunium, other transuranium, elements, fission products, corrosion products, activation products and other contamination products, and

feeding the aqueous acid solution as an aqueous phase at a controlled flow rate into a liquid-liquid extraction apparatus where said aqueous phase is brought into contact with an organic solvent phase which is fed into said extraction apparatus at a controlled flow rate, said organic phase comprising an



extraction agent, the improvement of adjusting at least one of the temperature of solutions in the extraction apparatus and the concentration of the aqueous acid solution before feeding said aqueous acid solution into the extraction apparatus, to satisfy the following inequality:

$$T_E > 401 + (0.06676 U_f - 0.3367 Pu_f - 327.4 H_f) \cdot$$

$$e^{0.0008179 (U_f + Pu_f) H_f H_f} - 0.9593$$

where

T_E = the temperature of the solutions in the extraction apparatus ($^{\circ}\text{C}$);

U_f = the uranium concentration of the feed solution (g/l);

Pu_f = the plutonium concentration of the feed solution (g/l);

H_f = nitric acid concentration of the feed solution (M/l); and

e = base of the natural logarithm system.

4,871,479

PROCESS FOR PRODUCING SINTERED MIXED OXIDES WHICH ARE SOLUBLE IN NITRIC ACID FROM SOLUTIONS OF NITRATES

Roland Bachelard, Lyons, and Patrick Germanaz, Aix En Provence, both of France, assignors to Comurhex Societe pour la Conversion de l'Uranium en Metal et Hexafluorure, Courbevoie, France

Continuation of Ser. No. 26,687, Mar. 17, 1987, abandoned. This application Jun. 22, 1988, Ser. No. 211,160

Claims priority, application France, Mar. 25, 1986, 86 04631

Int. Cl.⁴ C01G 43/01, 43/025; C09K 11/04

U.S. Cl. 252-636

16 Claims

1. A process for producing sintered mixed metal oxide nuclear fuel pellets containing UO_2 and the oxide of at least one other fissile or fertile or rare earth element M, said pellets being directly soluble in nitric acid without nitric acid additives or prior treatment of the pellets, comprising the steps of:

- mixing together aqueous solutions of uranium nitrate and the nitrate of said at least one other element M;
- concentrating the mixture of solutions;
- thermally denitrating said concentrated mixture, without additives, to obtain an at least partially denitrated intermediate mixed oxide powder of high reactivity, with the uranium in valence VI;
- optionally calcining said intermediate mixed oxide powder to the extent necessary to convert uranium oxide to U_3O_8 and to complete the conversion of difficult to decompose nitrates into oxides;
- directly reducing, without grinding, the resulting mixed oxide powder to bring the uranium to valence IV;
- optionally stabilizing the uranium oxide UO_2 in the reduced oxide mixture;
- shaping and pressing the resulting reduced oxide mixture

to obtain pellets of green material suitable for manufacturing the mixed oxide fuel;

(h) sintering said pellets of green material at high or low temperature in a reducing and/or gently oxidizing atmosphere;

(i) grinding said sintered pellets,

said process providing as a result of steps (c), (d), (e) and (f) mixed oxide powders of high flowability and good sinterability without crushing, whereby no troublesome effluent or dangerous aerosol of solids is produced as a result of crushing.

4,871,480

AUDIORADIOGRAPHY ENHANCER AND METHOD OF USE

Coleman Beas, Chestnut Hill, Mass., assignor to Electron Microscope Supplies Corporation, Chestnut Hill, Mass.

Filed Nov. 24, 1987, Ser. No. 124,827

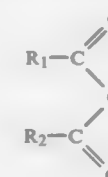
Int. Cl.⁴ C09K 11/00, 11/04, 11/06; G21G 4/00

U.S. Cl. 252-645

12 Claims

1. A reusable autoradiography enhancer composition comprising

a. 5-95% by weight of an acid anhydride of the formula



where R_1 and R_2 are selected from a group consisting of straight chain, branch chain, and substituted alkyl groups;
b. about 1-47.5% by weight of a water miscible acid; and
c. about 0.01-25% by weight of a scintillation fluor.

4,871,481

PREPARATION OF

1,4-DIAMINO-2,3-DICYANOANTHRAQUINONE

Peter Miederer, Hassloch, and Eberhard Michaelis, Wein-garten, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Dec. 24, 1987, Ser. No. 137,826

Claims priority, application Fed. Rep. of Germany, Dec. 31, 1986, 3644824

Int. Cl.⁴ C07C 97/24

U.S. Cl. 552-239

18 Claims

1. A process for preparing 1,4-diamino-2,3-dicyanoanthraquinone by reacting 1,4-diaminoanthraquinone-2-sulfonic acid or a salt thereof with cyanide ions in water within the pH range of from 8 to 9 in the presence of an oxidizing agent at elevated temperatures, which comprises carrying out the reaction in a mixture of water and one organic liquid selected from the group consisting of 1-methoxy-2-propanol, 2-methoxy-1-propanol and a mixture thereof, the ratio water:organic liquid being $\geq 3:1$ parts by weight.

4,871,482

PROCESS FOR THE PREPARATION OF 1-METHYLANDROSTA-1,4-DIENE-3,17-DIONE, AND THE NOVEL INTERMEDIATES FOR THIS PROCESS
Klaus Nickisch, and Hansfried Arnold, both of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Filed May 6, 1988, Ser. No. 190,977

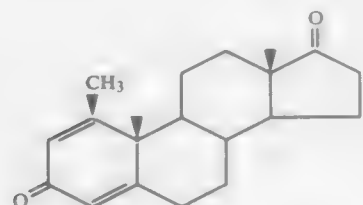
Claims priority, application Fed. Rep. of Germany, May 7, 1987, 3715869

Int. Cl.⁴ C07J 1/00

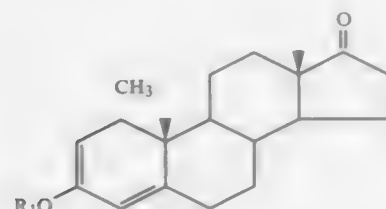
U.S. Cl. 260—397.3

17 Claims

1. A process for the preparation of 1-methylandrosta-1,4-diene-3,17-dione of Formula I



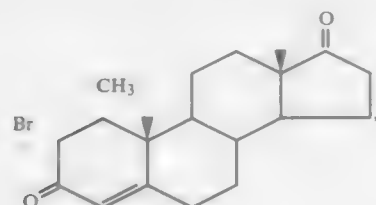
comprising reacting a 3-enol ester or 3-enol ether of Formula II



wherein

R₁ is alkyl of 1-3 carbon atoms or alkanoyl or trialkylsilyl each of up to 10 carbon atoms in total with elemental bromine or with a brominating agent

wherein the active bromine atom is present bound to amidic nitrogen, to obtain the bromo steroid of Formula III



wherein the bromine substituent is in the α- or β-position, and dehydrobrominating the compound of Formula III in the presence of an alkali or alkaline earth metal oxide or carbonate to form the compound of Formula I.

4,871,483

NOVEL NON-DEPOSITING DEFOAMING COMPOSITIONS

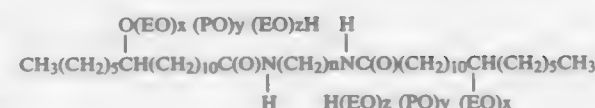
Thomas C. Friel, Jr., Winder, and Anthony J. O'Lenick, Lilburn, both of Ga., assignors to GAF Corporation, Wayne, N.J.
Filed Apr. 16, 1987, Ser. No. 39,306

Int. Cl.⁴ C09F 5/00

U.S. Cl. 260—404.5

8 Claims

1. A compound conforming to the following structure;



wherein;

EO is ethylene oxide

PO is propylene oxide n is an integer from 1 and 10 each x, y, and z are integers from 0 to 20 with the proviso that the sum of x+y+z is greater than 0

4,871,484

PROCESS FOR THE PREPARATION OF 2,2-BIS-CHLORO-METHYLLALKANECARBOXYLIC ACID CHLORIDES

Helmut Fiege, Leverkusen; Manfred Jauteit, Burscheid, and Dieter Arit, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany
Filed May 15, 1987, Ser. No. 50,993

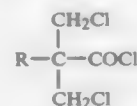
Claims priority, application Fed. Rep. of Germany, May 30, 1986, 3618142

Int. Cl.⁴ C07C 51/58; C09F 7/00

U.S. Cl. 260—408

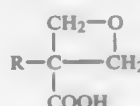
4 Claims

1. A process for the preparation of a 2,2-bis-chloromethylalkanecarboxylic acid chloride of the formula



in which R is hydrogen, alkyl having 1 to 12 carbon atoms, cycloalkyl having 3 to 8 carbon atoms or phenyl which is optionally substituted by halogen and/or alkyl having 1 to 4 carbon atoms,

which comprises reacting an oxetane-3-carboxylic acid of the formula



or a salt thereof, with an inorganic acid chloride at a temperature between 20° C. and the boiling point of the reaction mixture in the presence of pyridine or dimethylformamide as catalyst.

4,871,485

CONTINUOUS HYDROGENATION OF UNSATURATED OILS

Jacob B. Rivers, Jr., 2801 NW. Expressway, Suite 125, Oklahoma City, Okla. 73112

Continuation-in-part of Ser. No. 540,037, Oct. 7, 1983, Pat. No. 4,613,410, and a continuation-in-part of Ser. No. 719,220, Apr. 2, 1985, Pat. No. 4,623,489. This application Jul. 30, 1986, Ser. No. 891,771

Int. Cl.⁴ C11C 3/12; B01J 9/04

U.S. Cl. 260—409

42 Claims

1. A method of determining and controlling the hydrogenation quality of an oil stream which, is being subjected to hydrogenation reaction, comprising the

(a) passing a portion of the processing oil stream through a plurality of calibrated interstices at a predetermined flow rate;

(b) cooling the oil stream portion to a predetermined and discrete temperature between each of the calibrated interstices;

- (c) measuring the pressure drop across each of the calibrated interstices;
- (d) calculating the viscosity of the oil stream portion according to the relationship of differential pressure divided by flow rate for each interstice;
- (e) preparing a viscosity operating curve of the calculated viscosities versus mean temperatures of the calibrated interstices; and
- (f) comparing the viscosity operating curve to selected viscosity reference curves prepared by conducting steps (a) through (e) above with oil of known degrees of hydrogen unsaturation.

4,871,486

PROCESS FOR MAKING METHYLPHOSPHONIC DICHLORIDE

John A. Wojtowicz, Cheshire, Conn., assignor to Olin Corporation, Cheshire, Conn.

Filed Dec. 12, 1984, Ser. No. 680,629

Int. Cl.⁴ C07F 9/42

U.S. Cl. 562—818

5 Claims

1. A process for producing methylphosphonodichloride comprising:

reacting dimethyl methylphosphonate with a chlorinating agent selected from the group consisting of thionyl chloride and phosgene at a temperature from about 50° C. to about 181° C. in the presence of a catalytic amount of an inorganic halide selected from the group consisting of NH₄Cl, NaCl, NaBr, NaI, KBr, CaF₂, CaCl₂, MnF₂, MnCl₂, MnI₂, TiI₄, NiBr₂, FeI₂, YCl₃ and VCl₂.

4,871,487

METHOD OF MAKING A POLYMERIC OPTICAL WAVEGUIDE BY COEXTRUSION

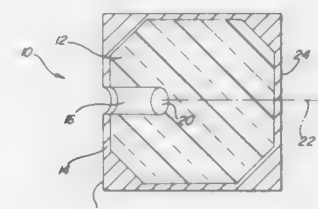
Larry J. Laursen, Midland; Virgil W. Coomer, Shepherd, and Walter J. Schrenk, Midland, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 16, 1987, Ser. No. 3,774

Int. Cl.⁴ B29D 11/00; G02B 6/16

U.S. Cl. 264—1.5

10 Claims



1. A method of constructing an optical waveguide, comprising the steps of:
- heat plasticizing a core material which is capable of conducting light;
- heat plasticizing a cladding material which has an index of refraction that is lower than the index of refraction of said core material;
- coextruding said cladding material around said core material to form a rod having a predetermined shape having at least one concave side;
- drawing said rod to modify said predetermined shape so that said rod is formed with at least one substantially flat side and a substantially parallel core and cladding interface along said side; and
- cooling said rod below the glass transition temperatures of said cladding and core materials so that said rod will maintain said substantially flat side.

4,871,488

RECONSTITUTING VIRAL GLYCOPROTEINS INTO LARGE PHOSPHOLIPID VESICLES

Raphael J. Mannino, Newtonville, and Susan G. Fogerite, Waterford, both of N.Y., assignors to Albany Medical College of Union University, Albany, N.Y.

Division of Ser. No. 725,601, Apr. 22, 1985, Pat. No. 4,663,161.

This application Apr. 13, 1987, Ser. No. 37,751

Int. Cl.⁴ A61K 9/64, 37/22, 45/05; B01J 13/02

U.S. Cl. 264—4.6

6 Claims

1. A method for the efficient reconstitution of membrane proteins into large phospholipid vesicles with large internal aqueous spaces, which method comprises in combination:

- (A) extracting out the desired membrane protein from a source biological material with an extraction buffer comprising a detergent;
- (B) mixing the extract with a negatively charged phospholipid, removing detergent and contacting with a calcium solution to form a cochleate intermediate; and
- (C) forming large phospholipid vesicles with integrated membrane protein in a biologically active state by contacting a solution of the cochleate intermediate of (B) with a calcium chelating agent, said large phospholipid vesicles being produced by a rotary dialysis procedure against a buffered calcium chelating agent solution as said calcium chelating agent.

4,871,489

SPHERICAL PARTICLES HAVING NARROW SIZE DISTRIBUTION MADE BY ULTRASONIC VIBRATION

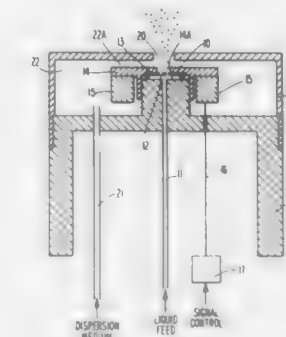
Thomas D. Ketcham, Big Flats, N.Y., assignor to Corning Incorporated, Corning, N.Y.

Continuation of Ser. No. 916,285, Oct. 7, 1986, abandoned. This application Apr. 19, 1988, Ser. No. 185,298

Int. Cl.⁴ B29B 9/10

U.S. Cl. 264—9

29 Claims



1. An apparatus for the commercial scale production of liquid droplets having a narrow size distribution comprising:
- containment means for containing a body of liquid under pressure;
- an orifice plate in communication with said containment means having a thickness of up to about 25 microns and a plurality of orifices therein, said orifices having a mean orifice diameter of up to about 20 microns and a spacing between said orifices of up to about 100 microns, the diameter of the largest orifice in said orifice plate being not greater than about three times the diameter of the smallest orifice in said orifice plate;
- means for forcing said liquid from said containment means through said orifices to produce a plurality of thin streams of liquid;
- means for vibrating said liquid streams to cause the breakup of said streams into droplets having a narrow size distribution; and

means for converting said droplets to particles, said particles having a narrow size distribution.

15. A process for the commercial scale production of particles having a narrow size distribution said process comprising:

- forming a plurality of thin liquid streams by forcing said liquid under pressure through a plurality of orifices in an orifice plate having a thickness of up to about 25 microns, the mean diameter of said orifices being up to about 20 microns, the largest of said orifices in said orifice plate having a diameter which is not greater than about three times the diameter of the smallest orifice in said orifice plate and the spacing between said orifices being up to about 100 microns;
- vibrating said thin liquid stream to cause the breakup of said streams into liquid droplets; and
- processing said droplets to produce particles therefrom, said particles having a narrow size distribution.

4,871,490

METHOD OF MANUFACTURING HYDROGEL DRESSINGS

Jannex Rosiak; Anna Ruci ska-Rybus, both of Piotrkowska, and Wladyslaw Pekala, Laczna, all of Poland, assignors to Politechnika Lodzka, Lodz, Ul. Zwirki, Poland

Filed Dec. 30, 1987, Ser. No. 140,150

Claims priority, application Poland, Dec. 30, 1986, 263410

Int. Cl.⁴ B29C 35/08

U.S. Cl. 264—22

1 Claim

1. A method of manufacturing hydrogel dressings from polymers by radiation cross-linking, comprising an aqueous solution containing 2–10 per cent by weight of polyvinylpyrrolidone, no more than 3 percent by weight of agar and 1–3 percent by weight of poly(ethylene) glycol; pouring the solution into a mould to shape the dressing; tightly closing the mould and subjecting the mould to an ionizing radiation dose in the range of 25–40 KGy.

4,871,491

PROCESS FOR PREPARING COMPOSITE ARTICLES FROM COMPOSITE FIBER BLENDS

Paul E. McMahon, Mountainside; Tai-Shung Chung, Summit, and Lincoln Ying, Bridgewater, all of N.J., assignors to BASF Structural Materials Inc., Charlotte, N.C.

Continuation of Ser. No. 589,823, Mar. 15, 1984, abandoned.

This application Jan. 6, 1987, Ser. No. 4,219

The portion of the term of this patent subsequent to Jan. 24, 2006, has been disclaimed.

Int. Cl.⁴ D01G 13/00; B29C 43/02

U.S. Cl. 264—29.2

23 Claims



1. A process for preparing a composite article which comprises:

- forming a continuous tow of continuous carbon fibers;
- forming a continuous tow of continuous thermoplastic polymer fibers having a melting point of at least about 50° C.;
- uniformly and continuously spreading the thermoplastic polymer fiber tow to a selected width to preserve the separation of the individual fibers;
- uniformly and continuously spreading the carbon fiber tow to a width that is essentially the same as the selected width for the thermoplastic polymer fiber tow;
- intimately, uniformly and continuously intermixing the spread carbon fiber tow and the spread thermoplastic polymer fiber tow in a relatively tension-free state by

bringing the tows into simultaneous contact with each other in substantially the same area such that there is provided a substantially uniform distribution of the thermoplastic fibers and the carbon fibers within an intimately intermixed tow;

- continuously withdrawing the intimately intermixed tow;
- applying the intimately intermixed tow to a mold; and
- heating the intermixed tow to a temperature above the melting point of the thermoplastic fibers.

4,871,492

METHOD FOR ALIGNING BLOW MANDREL

Markus Spoetzl, Munich, Fed. Rep. of Germany, assignor to Krauss-Maffel A.G., Fed. Rep. of Germany

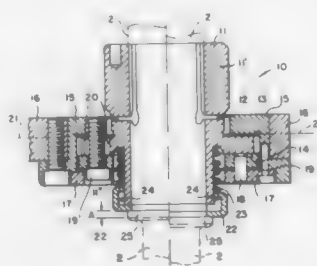
Filed Jul. 1, 1987, Ser. No. 68,331

Claims priority, application Fed. Rep. of Germany, Jul. 9, 1986, 3623099

Int. Cl.⁴ B29C 49/50, 49/58, 49/74

U.S. Cl. 264—39

4 Claims



1. A process for operating a blow molding sizing unit, wherein said sizing unit comprises:

- at least one blow mandrel; and
- at least one blow mandrel holder comprising: a sleeve connected to said mandrel by means for adjustably securing said mandrel in an axial direction; a flange connected to said mandrel by means for adjustably securing said mandrel in a radial direction; and a blow mandrel carrier attached to said sizing unit and detachably connected to said at least one blow mandrel holder

wherein said process comprises:

lowering said at least one blow mandrel connected to a blow mandrel holder having radial and axial motion onto a sizing plate having at least one opening wherein radial positioning is automatically accomplished upon lowering said at least one blow mandrel by tapered geometry of said at least one blow mandrel aligning with the sizing plate opening; and tightening said sleeve, said flange, or both in either order for restraining axial and/or radial motion of said at least one blow mandrel.

4,871,493

PROCESS AND APPARATUS FOR EXTRUSION OF THERMOPLASTIC RESIN FILMS

Sumio Goto, Oita, Japan, assignor to Showa Denko Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP87/00493, § 371 Date Mar. 10, 1988, § 102(e)

Date Mar. 10, 1988, PCT Pub. No. WO88/00522, PCT Pub.

Date Jan. 28, 1988

PCT Filed Jul. 10, 1987, Ser. No. 178,745

Claims priority, application Japan, Jul. 10, 1986, 61-160794

Int. Cl.⁴ B29C 47/92, 47/86; B29D 7/01

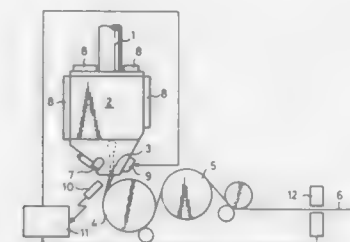
U.S. Cl. 264—40.6

8 Claims

1. A process for preparing a film of a thermoplastic resin by extruding a molten thermoplastic resin onto the surface of a cooling roll from a die, wherein a heater in which a tempera-

ture profile varying in the width direction can be set is arranged in the width direction on the die in the vicinity of a die lip of the die, a temperature sensor for directly detecting a resin temperature profile in the vicinity of the outlet of the die lip is disposed in the vicinity of the die lip and apart from the die, and a thickness sensor capable of detecting a thickness profile in the width direction of a film is disposed, and the output of said heater is controlled according to signals from the temperature sensor and thickness sensor, whereby the thickness of the film in the width direction is automatically adjusted.

5. An apparatus for the preparation of thermoplastic resin films, which comprises a die for extruding a molten thermoplastic resin and at least one cooling roll for cooling a resin film



extruded in the molten state from said die, said apparatus further comprising (a) a heater which is disposed on said die in the vicinity of a die lip of said die and in which a temperature profile varying in the width direction of the film can be set, (b) a temperature sensor for directly detecting a resin temperature profile in the vicinity of the outlet of said die lip, said temperature sensor being disposed in the vicinity of the outlet of the die lip and apart from the die, (c) a thickness sensor capable of detecting a thickness profile in the width direction of the film and (d) a controller for controlling the output of said heater while receiving signals from said thickness sensor and temperature sensor, wherein the thickness in the width direction of the film can be automatically adjusted.

4,871,494

PROCESS FOR FORMING ASYMMETRIC GAS SEPARATION MEMBRANES HAVING GRADED DENSITY SKINS

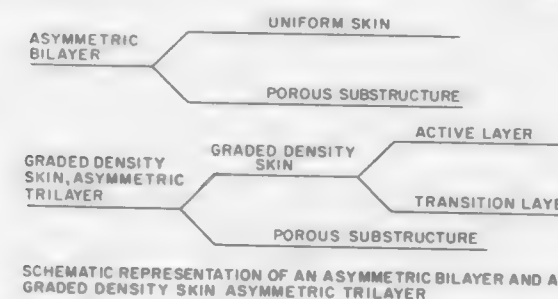
Robert E. Kesting, Eisenfeld, Fed. Rep. of Germany; Alfred K. Fritzsch, Manchester; Milton K. Murphy, Clayton, both of Mo.; Alan C. Handermann, Matthews, N.C.; Clint A. Cruse, St. John, and Raymond F. Malon, Edmundson, both of Mo., assignors to Permea, Inc., St. Louis, Mo.

Continuation-in-part of Ser. No. 897,566, Aug. 15, 1986, abandoned. This application Jul. 6, 1987, Ser. No. 66,751

Int. Cl.⁴ D01D 5/247

U.S. Cl. 264—41

24 Claims



1. A process for forming asymmetric gas separation membranes having graded density skins and macrovoid free morphology comprised of hydrophobic polymers, the membranes having increased free volume as evidenced by the membrane

first heat T_g which is greater than the T_g of a bulk sample of the polymers, comprising:

- dissolving the polymers in a solvent solution of Lewis acids and Lewis bases and complexes formed of the Lewis acids and bases, wherein the Lewis acids, Lewis bases, Lewis acid:base complex solvent system has a Hildebrand parameter less than about 1.5 cal^{1/2}/cm^{3/2} of the Hildebrand parameter of the polymer;
- creating a dope of the solvent system and polymers which is near the gel point, the dope comprised of greater than about 30% by weight total solids sol;
- configuring the dope into a form suitable for use as an asymmetric gas separation membrane;
- coagulating the formed dope;
- desolvating the resulting formed asymmetric gas separation membrane having graded density skin and macrovoid free morphology through rapid disassociation of solvent complex;
- washing the membrane at ambient temperatures in a polar medium; and
- drying the membrane at temperatures of from about ambient to about 20° C. below the glass transition temperature.

4,871,495

PROCESS FOR PRODUCING POROUS CERAMIC FILTER FOR FILTERING OF PARTICULATES FROM DIESEL EXHAUST GASES

Richard L. Helferich, Clayton, and Robert C. Schenck, Kettering, both of Ohio, assignors to The Duriron Company, Inc., Dayton, Ohio

Filed Dec. 2, 1987, Ser. No. 127,784

The portion of the term of this patent subsequent to Mar. 14, 2006, has been disclaimed.

Int. Cl.⁴ B28B 1/50; B29C 71/00; C04B 38/10

U.S. Cl. 264—43

5 Claims

1. A process for producing a porous refractory ceramic filter for use in the filtering of particulates from diesel exhaust gases, said filter having an inlet surface for receipt of diesel exhaust gases and an outlet surface for discharge of diesel exhaust gases which have traversed through said filter, comprising the steps of:

- providing a foamable ceramic composition comprised of an aqueous admixture of (1) an alkali metal silicate and an alkali metal aluminate, each in an amount effective to form therebetween an aluminosilicate hydrogel which binds all components of said composition, after foaming, into a self-supporting body in the desired shape of said filter; (2) refractory ceramic materials; (3) metal powder in an amount effective to react with alkali metal in said composition and generate as a product hydrogen gas in an amount effective to bring about foaming and expansion of said foamable ceramic composition; (4) a surfactant in an amount effective to form from said hydrogen gas small bubbles which provide a predominantly open-celled porosity in the foamed and expanded foamable ceramic composition, and (5) a gel strengthening and viscosity-modifying agent;
- introducing a quantity of said foamable ceramic composition into a shape-defining area for a time sufficient to permit reaction among the components of said composition to produce a foamed, porous aluminosilicate hydrogel-bound, self-supporting ceramic precursor of predominantly open-celled porosity in the shape of said shape-defining area;
- removing said self-supporting precursor from said shape-defining area;
- contacting said self-supporting precursor with water for a time effective to remove therefrom leachable alkali metal compounds;

- (e) thereafter contacting said self-supporting precursor with a dilute solution of non-alkali metal inorganic salt to effect substantially complete exchange of the ion of said non-alkali metal inorganic salt for the alkali metal ion of remaining alkali metal compounds in said self-supporting precursor; and
- (f) thereafter firing said self-supporting precursor to form ceramic bonds therein and produce said porous refractory ceramic filter having a predominantly open-celled porosity.

4,871,496

COMPOSITES COMPRISING SILICON CARBIDE FIBERS DISPERSED IN MAGNESIA-ALUMINATE MATRIX AND FABRICATION THEREOF AND OF OTHER COMPOSITES BY SINTER FORGING

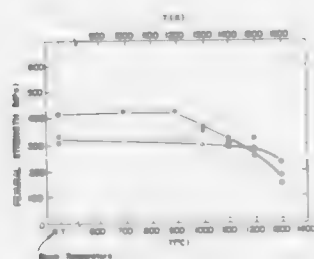
Prakash C. Panda; Edgar R. Seydel, and Rishi Raj, all of Ithaca, N.Y., assignors to Jupiter Technologies, Inc. and Cornell Research Foundation, Inc., both of Ithaca, N.Y.

Continuation of Ser. No. 815,857, Jan. 3, 1986, abandoned. This application Aug. 11, 1988, Ser. No. 230,738

Int. Cl.⁴ B29C 67/04, 43/00; C04B 33/32

U.S. Cl. 264—65

5 Claims



1. A process for preparing ceramic-ceramic composite net shape parts which are relatively flaw free and need little or no machining, the ceramic-ceramic composite comprising a uniform dispersion of silicon carbide fibers in a matrix of $MgO \cdot Al_2O_3$, the silicon carbide fibers being present in said composite in an amount ranging from about 10% to about 50% by volume, the $MgO \cdot 2Al_2O_3$ being present in said composite in an amount ranging from about 90% to about 50% by volume, said process comprising steps of

- (a) cold pressing a starting powder to obtain a preform of green density ranging from about 30% to about 75% of the theoretical density of the composite, said starting powder comprising particles consisting essentially of a dispersion of silicon carbide fibers in a matrix containing MgO and Al_2O_3 in a mole ratio of 2 moles of Al_2O_3 to 1 mole of MgO , the silicon carbide fibers and said MgO and Al_2O_3 phase being present in relative amounts to provide said volume percentages on formations of $MgO \cdot 2Al_2O_3$,
- (b) isothermally sinter forging uniaxially in an open die the preform formed in step (a) to substantially final shape in an inert atmosphere utilizing a temperature within the range of about 1200° C. to about 1625° C. and strain rate within the range of about 10^{-4} seconds⁻¹ to about 10^{-2} seconds⁻¹, the temperature and strain rate being such that surface cracks do not occur, said sinter forging being carried out to obtain a shear deformation greater than 30% and a density at least about 98% of the theoretical density of the composite, to provide a matrix of $MgO \cdot 2Al_2O_3$ wherein said silicon carbide fibers are uniformly dispersed.

4,871,497

SLIP CASTING METHOD

Tatsuo Natori, Chiba; Takashi Shimaguchi, Ibaraki; Akihiko Watanabe, Ibaraki, and Toshihiro Yamada, Ibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

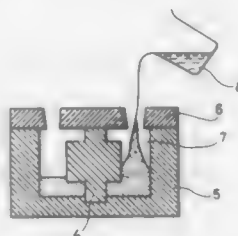
Filed Feb. 10, 1986, Ser. No. 827,637

Claims priority, application Japan, Feb. 8, 1985, 60-21696; Feb. 13, 1985, 60-24323

Int. Cl.⁴ B28B 1/26

U.S. Cl. 264—86

16 Claims



1. A slip casting method, comprising casting a slip containing an organic solvent as a medium of said slip into a mold and removing said mold after solidification of said slip, wherein said mold is formed with an organic binder and an aggregate, said organic binder is soluble in said organic solvent, and said aggregate is particles insoluble in said organic solvent.

4,871,498

PROCESS FOR PREPARATION OF GRANULAR STABILIZER FOR CHLORINE-CONTAINING POLYMER

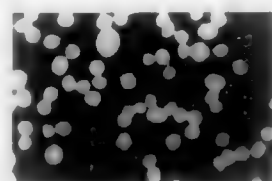
Seiichi Nakamura; Mamoru Saito, and Toshiaki Sugawara, all of Tsuruoka, Japan, assignors to Mizusawa Industrial Chemicals, Ltd., Osaka, Japan

Continuation of Ser. No. 812,521, Dec. 23, 1985, abandoned, which is a division of Ser. No. 639,068, Aug. 9, 1984, Pat. No. 4,659,506. This application Dec. 22, 1987, Ser. No. 136,536

Int. Cl.⁴ B29B 9/02, 9/08

U.S. Cl. 264—115

13 Claims



1. A process for the preparation of a granular stabilizer for chlorine-containing polymers, which comprises the steps of mixing a powdery stabilizer for chlorine-containing polymer, or a mixture of said powdery stabilizer with a powdery stabilizer aid, said powdery stabilizer being substantially infusible at the processing temperature, with an organic solid binder medium selected from the group consisting of metal soap, wax and mixtures thereof in an amount of 2 to 15 parts by weight per 100 parts by weight of said powdery stabilizer or said powdery mixture under dry pulverizing conditions at a temperature lower than the melting point of the organic solid binder, whereby the powdery stabilizer and the organic solid binder are mixed to thereby form primary particles of the powdery stabilizer, and (1) the particle size distribution is shifted toward the smaller particle size side, (2) the average particle size is reduced, (3) the shape of particles is changed to a spherical

shape from a needle-like shape, (4) the water repellency is increased, (5) the angle of repose is decreased, (6) the dispersability in a vinyl chloride resin is improved and (7) the x-ray diffraction intensity is hardly changed; the amount of the organic solid binder medium corresponding to 15 to 85% of the critical liquid absorption of said powdery stabilizer or said powdery mixture, defined as the amount of the organic binder added to 100 g of the powdery stabilizer, with kneading and at a temperature higher than the melting point of said binder, to the point at which the particles of said powdery stabilizer are formed into one mass from the disintegrated state, to surface-treat respective primary particles of said powder with said organic solid binder medium, and granulating the surface-treated powder into particles having an average particle size of 0.1 to 2 mm at a temperature higher than the melting point of the organic solid binder medium.

4,871,499

METHOD OF MOLDING A FLEXIBLE TUBE OF LOW THERMAL LONGITUDINAL COEFFICIENT OF EXPANSION

Christian Andoux; Edouard Rivas, and Georges Rossignol, all of Montereau, France, assignors to Societe Industrielle de Liaisons Electriques and Societe Anonyme de Telecommunications, Paris, France

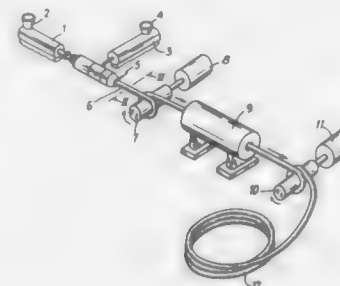
Filed Sep. 8, 1987, Ser. No. 93,673

Claims priority, application France, Sep. 8, 1986, 86 12575

Int. Cl.⁴ B29C 47/06

U.S. Cl. 264—173

9 Claims



1. A method of manufacturing a flexible tube having a low thermal longitudinal coefficient of expansion comprising the steps of:

- (a) preparing a two layer tubular preform by extrusion having a base layer (Mb) made of a polymer having a higher thermal coefficient of expansion in a longitudinal direction of said preform, and a coating layer (Mc) having a thickness which is such that the influence of said coating layer on said thermal coefficient of expansion is negligible;
- (b) heating said preform at a stretching temperature which is lower than the melting temperature of the polymer of said base layer and simultaneously longitudinally stretching said preform to a ratio such that the thermal coefficient of said base layer is considerably reduced after stretching and no fibril is formed in said coating layer; and
- (c) submitting said stretched preform to a stabilization heat treatment at a temperature which is at least 10° C. greater than the maximum in use temperature.

4,871,500

PROCESS FOR PROVIDING A HIGH-TEMPERATURE RESISTANT POLYIMIDE FILM

Haio Harma, Gmunden; Manfred Schobesberger, Seewalchen; Herbert Solradl, Emmerting, and Klaus Weinrotter, Vocklabruck, all of Austria, assignors to Lenzing Aktiengesellschaft, Lenzing, Austria

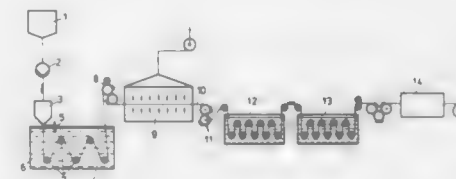
Filed Jun. 9, 1988, Ser. No. 204,680

Claims priority, application Austria, Jun. 9, 1987, 1446/87

Int. Cl.⁴ B29C 47/00, 67/24, 71/02

U.S. Cl. 264—178 R

4 Claims



1. A process for producing a high-temperature resistant film of a polyimide polymer which does not undergo undesired shrinkage at elevated temperatures, comprising providing a solution of said polyimide polymer in an organic solvent, causing said solution to flow out through a slot spinneret of a film forming arrangement so as to obtain a liquid film of said solution, causing said liquid film formed in the slot spinneret to freely fall directly through a short air gap into an aqueous precipitation bath containing said organic solvent to form and to obtain a film made up of coagulated liquid which is white and opaque, stripping said coagulated film from said precipitation bath and subjecting said stripped film to thermal treatment to convert it into a transparent golden-yellow film, and subsequently removing said organic solvent from said transparent golden-yellow film and drying said film.

4,871,501

PROCESS FOR MELT SPINNING AROMATIC POLYESTER

Hiroaki Sugimoto, Takatsuki; Kazuo Hayatsu, Ibaraki; Toshiyuki Kobashi, and Seiji Takao, both of Okayama, all of Japan, assignors to Sumitomo Chemical Company and Japan Exlan Company, Ltd., both of Osaka, Japan

Continuation of Ser. No. 794,793, Nov. 4, 1985, abandoned. This application Jul. 13, 1987, Ser. No. 73,342

Claims priority, application Japan, Nov. 9, 1984, 59-236965; Nov. 21, 1984, 59-246728

Int. Cl.⁴ D01D 1/10; D01F 6/62

U.S. Cl. 264—211.22

4 Claims

1. A process for melt spinning an aromatic polyester with a flow temperature of 280° to 380° C. showing optical anisotropy in the molten state, which comprises melting powders, granules or pellets of the aromatic polyester using a screw-type extruder having a compression ratio of 2.5 to 4.0; thereby inhibiting entrapment in the resultant molten polyester of gases present in or on the powders, granules or pellets being melted; and by back pressure of the molten polyester sending gas generated by decomposition of the molten polyester to a back portion of the extruder; and then extruding and melt spinning the molten polyester at a temperature of 280° C. to 420° C.

4,871,502

METHOD FOR MANUFACTURING AN OTOPLASTIC
 Helmut LeBisch; Rainer Basel, both of Erlangen; Georg Fuchs, Hemhofen; Hermann Dietmar, Scheinfeld; Ernst Wipfelder, Munich, and Wilhelm Hecke, Kolbermoor, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Apr. 22, 1988, Ser. No. 185,794

Claims priority, application Fed. Rep. of Germany, May 6, 1987, 3715082

Int. Cl.⁴ B29C 33/40

U.S. Cl. 264—222

11 Claims



1. A method for manufacturing an otoplastic using a die and a flowing otoplastic material comprising the steps of:

- (a) drawing a deformable envelope onto the die that simulates the outside contour of an in-the-ear hearing aid module;
- (b) introducing and positioning an apparatus composed of the die and the envelope into the auditory canal of the ear of a hearing impaired person to be fitted therewith;
- (c) injecting the otoplastic material into the apparatus between the die and the envelope via an admission channel until the envelope has adapted to the shape of the auditory canal of the ear and until an interspace between the die and the envelope is completely filled with otoplastic material;
- (d) after hardening of the otoplastic material, removing the apparatus from the ear of the person; and
- (e) removing the die from the withdrawn apparatus.

4,871,503

METHOD FOR PRODUCING MOLDED PRODUCTS HAVING UNEVENNESS TUNED WITH INK PATTERNS
 Taiji Ishii, Tokyo, and Masayuki Shibata, Miyoshi, both of Japan, assignors to Dai Nippon Insatsu Kabushiki Kaisha, Japan

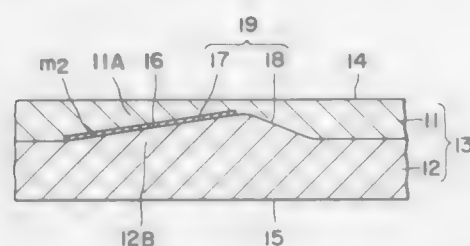
Filed Feb. 13, 1987, Ser. No. 15,094

Claims priority, application Japan, Feb. 14, 1986, 61-30537; Jul. 31, 1986, 61-181171; Sep. 2, 1986, 61-206445

Int. Cl.⁴ B29C 43/04, 51/14, 65/02

U.S. Cl. 264—248

8 Claims



1. A process for producing a press molded laminate having inner unevenness tuned with an ink pattern, said process comprising the steps of:

- applying pressure, to a molding stock obtained by stacking at least two thermoplastic resin layers and an ink pattern layer, in a direction substantially perpendicular to said layers at a heating temperature above the glass transition temperature of said layers at which hot melt behavior of said thermoplastic resin layers is different from that of said ink pattern layer, thereby melting said ink pattern layer and said at least two thermoplastic resin layers at a whole

or a part of an interface of said thermoplastic resin layers and vicinity thereof;

compressing said molding stock such that said at least two thermoplastic resin layers flow horizontally to create a surface unevenness in said interface at a location tuned to said ink pattern layer, and to decrease a total thickness of said thermoplastic resin layers from 95% to 40% of a thickness before pressurization to obtain a compressed product; and

cooling the compressed product, thereby forming unevenness at the interface of said thermoplastic resin layers tuned with said ink pattern wherein said unevenness can be viewed through at least one surface of said formed laminate.

4,871,505

MOLD AND PROCESS FOR MANUFACTURING HELICAL SHAPED ITEMS

James M. Lapeyre, New Orleans, La., assignor to The Laitram Corporation, Harahan, La.

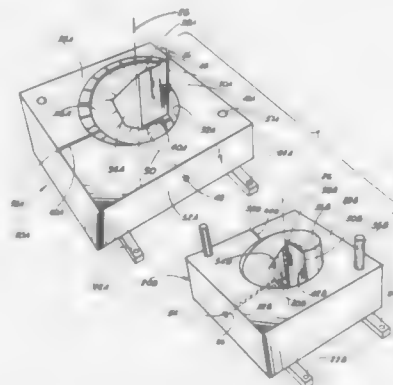
Continuation of Ser. No. 22,119, Mar. 5, 1987, abandoned, which is a continuation of Ser. No. 598,374, Apr. 9, 1984, Pat. No. 4,693,861. This application Jul. 22, 1988, Ser. No. 223,710

The portion of the term of this patent subsequent to Sep. 15, 2004, has been disclaimed.

Int. Cl.⁴ B29C 45/36

U.S. Cl. 264—328.1

17 Claims



1. A reusable mold for forming, from a plastic material, a helical shaped device which includes an axial member with a non-circular cross-section having a first and second end integrally joined with a helical shaped flight member and having front and back surfaces, said flight member further extending axially between said first end and said second end for not more than 360 degrees coaxially around said axial member, said mold having a center axis and comprising:

a first section partially defining an elongated cavity portion with a non-circular cross-section extending along and around said center axis for forming a portion of said axial member, said first section further defining a helical surface extending axially a distance equal to the distance between said first end and said second end of said axial member, said helical surface being disposed coaxially around and along said center axis and extending a selected radial dimension from said elongated cavity portion, which dimension is greater than the radial dimension of said elongated cavity extending from said center axis to said helical surface, and for a selected amount of rotation up to 360 degrees for forming one of said front and back surfaces of said helical shaped flight member;

a second section adapted for movement between an open and closed position with respect to said first section, said movement limited to reciprocating movement along said center axis said second section partially defining said non-circular elongated cavity portion extending along and

around said center axis for forming another portion of said non-circular axial member, said second section further defining a helical surface extending axially a distance equal to the distance between said first end and said second end of said axial member and disposed coaxially around and along said center axis and extending said selected radial dimension for said selected amount of rotation for forming the other one of said front and back surfaces of said helical shaped flight member;

said first and second sections being substantially the same and cooperating such that when in said closed position, said helical surfaces of each section are substantially parallel to each other, and are maintained at a selected and constant spring, substantially less than said selected distance, so that said sections define a substantially enclosed cavity having an elongated axial portion with a non-circular cross-section and a helical shaped slight portion which extends axially a distance equal to the distance between said first end, and said second end, and which has a selected cross-section extending radially a selected distance from said center axis and coaxially therewith for said selected amount of rotation, said selected cross-section having substantially a rectangular shape with a pair of long sides which converge toward each other from the axial member to a selected angle, and a pair of short sides, the dimension of said long sides being several times the dimension of said short sides;

a central rod member positioned coaxially with said center axis and having a selected non-circular cross-section wherein said selected cross-section of said rod member is smaller than the cross-section of said elongated cavity, and said central rod member extending at least a portion of the length of said elongated cavity such that said axial shaped member defines a non-circular shaped aperture extending into and coaxially therewith;

at least one of said first and second sections defining a plurality of passageways extending from said enclosed cavity to the outside of said mold such that said reusable mold is suitable for receiving a selected material selected from the group consisting of thermosetting rubber, polyethylene, polypropylene and polyurethane transferred from outside of said mold to fill said cavity and integrally form said helical shaped flight member and axial member;

said mold sections further cooperating such that said helical shaped device formed in said cavity may be removed by moving said second section along said center axis to said open position without twisting; and

said elongated axial portion of said enclosed cavity defining a first axial end having a selected shape and a second axial end having a cooperating shape such that a multiplicity of helical shaped devices formed by said mold and having cooperating axial ends may be joined axially one to another to produce an elongated helical shaped device of a selected length having flight members encircling more than 360 degrees.

4,871,506

PROCESS FOR MANUFACTURING FILMS FROM SEMI-CRYSTALLINE FLUID POLYMERS BY COEXTRUSION AND TUBULAR FILM BLOWING
 Jean-Claude Moulies, and Gerard Reignier, both of Serquigny, France, assignors to Atochem, Paris La Defense, France

Filed Dec. 24, 1987, Ser. No. 138,507

Claims priority, application France, Jan. 21, 1987, 87 00667

Int. Cl.⁴ B29C 47/06

U.S. Cl. 264—514

1 Claim

1. A process for manufacturing thermoplastic polymer films by coextrusion comprising coextruding by blow extrusion to form a co-extrudate consisting of polyvinylidene fluoride and low density polyethylene, the film thickness of the low density polyethylene being between 0.5 and ten times greater than that of the film of the polyvinylidene fluoride, the viscosity of polyvinylidene fluoride being lower than 10³ Pa's in the molten state, and the polyvinylidene fluoride degree of crystallinity

being greater than 10% in the solid state, cooling the coextrudate, separating the resulting films, and recovering at least the semi-crystalline polyvinylidene fluoride film thus formed in the form of a film of substantially uniform thickness.

4,871,507

METHOD FOR FORMING HOLLOW PARTIALLY CRYSTALLINE BIAXIALLY ORIENTED HEAT SET POLYETHYLENE TEREPHTHALATE ARTICLES

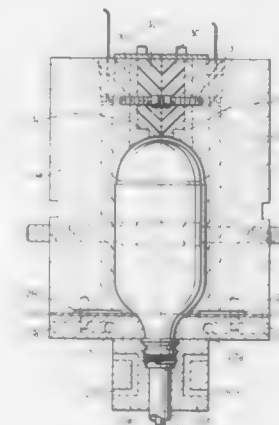
Prakash R. Ajmera, Toledo, Ohio, assignor to Owens-Illinois Plastic Products Inc., Toledo, Ohio

Continuation of Ser. No. 20,813, Mar. 2, 1987, abandoned. This application May 18, 1988, Ser. No. 198,723

Int. Cl.⁴ B29C 49/18, 49/48, 49/64, 49/66

U.S. Cl. 264—521

10 Claims



1. A method of forming a hollow biaxially oriented heat set partially crystalline polyethylene terephthalate container having side walls and a closed base opposite an open neck area, said closed base being of outwardly convex, hemispherical shape and comprising a major portion and a central portion surrounded by said major portion, the ratio of the diameter of said central portion of the base of the container to the diameter of the base of the container ranging from about 0.2 to 0.4, said method comprising the steps of:

closing a mold around a biaxially oriented hollow polyethylene terephthalate container, said mold having side walls and a mold base portion comprising a major mold base portion corresponds to said major portion of the base of said container and a central mold base portion corresponding to the central portion of the base of said container,

maintaining the side walls and major portion of the base of the mold at a temperature in the range of from 120° C. to 250° C., which corresponds to a temperature which effects heat setting of polyethylene terephthalate, while maintaining only said central portion of the base of the mold at a temperature substantially not greater than 150° C., said central portion of the base of the mold being maintained at a temperature substantially less than the temperature of the side walls of the mold,

introducing fluid pressure internally of the hollow container to maintain contact between the container and internal mold surfaces for a time sufficient to heat set and partially crystallize the side walls of the container and the major portion of the base of the container while also crystallizing the central portion of the base of the container a substantially lesser amount than the sidewalls and major portion of the base of the container, and quenching the container to preclude shrinkage thereof, said heat setting of side walls of said container and of said central and major portions of the base of the container being sufficient to prevent the container from sticking to said internal mold

surfaces and to eliminate deformation of or blow out of the central portion of the base of the container upon opening of said mold while maintaining internal pressure within said container.

4,871,508

METHOD FOR OPERATION OF A LIGHT WATER BOILING REACTOR

Johann Lindner, Västerås, Sweden, assignor to AB ASEA-ATOM, Västerås, Sweden

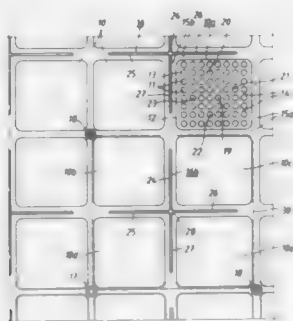
Filed Nov. 30, 1987, Ser. No. 126,504

Claims priority, application Sweden, Dec. 1, 1986, 8605139

Int. Cl.⁴ G21C 19/00

U.S. Cl. 376—260

7 Claims



1. A method for the operation of a light water boiling reactor with a core comprising a plurality of vertical fuel assemblies having an at least substantially square cross-section, each fuel assembly consisting of a bundle of fuel rods surrounded by a fuel channel, and a plurality of control rods, each control rod comprising four vertical blades arranged in a cruciform and provided with a neutron absorber material, the fuel assemblies being arranged in a symmetrical lattice with each fuel assembly included in two rows of fuel assemblies which are perpendicular to each other and the control rods being arranged with each one of their blades between two fuel assemblies located in the same row, so that each control rod together with four fuel assemblies arranged around the blades of the control rod form one unit, a control rod unit having an at least substantially square cross-section, the control rod units being arranged in a symmetrical lattice, with each control rod unit included in two rows of control rod units perpendicular to each other, said method comprising the steps of (a) operating said light water boiling reactor for an operating period until refuelling is needed, and then (b) exchanging in some control rod units control rods used during the operating period for new control rods having a reactivity worth which in a cold shut-down reactor is at least 6% higher than the original reactivity worth of the exchanged control rods, while maintaining in other control rod units control rods used during the operating period, the number of control rods with a higher reactivity worth after the exchange amounting to 40–60% of the total number of control rods of the reactor core.

4,871,509

FUEL COLUMN RETAINER USING RADIALLY COMPRESSED SPRING

Eric B. Johansson, San Jose, Calif., assignor to General Electric Company, San Jose, Calif.

Filed May 2, 1988, Ser. No. 189,443

Int. Cl.⁴ G21C 3/00

U.S. Cl. 376—412

10 Claims

1. In a fuel rod construction including a fuel rod having an inside cylindrical diameter; cylindrical fuel pellets placed within said rod;

said cylindrical fuel pellets having a diameter less than the inside cylindrical diameter and being stacked end to end

for a distance less than the length of said fuel rod inside said fuel rod;

Zircaloy end plugs for sealing said rod at either end;

a compression spring adjacent one end of the rods for biasing said pellets to and towards the other end of said rod, the improvement in said Zircaloy spring comprising:

a helical spring having at least a first small diameter helical portion and a second large diameter helical portion means interconnecting said first and second spring portions; said



first small diameter helical portion having an outside diameter less than the inside diameter of fuel rod; said first helical spring portion compressed against the fuel pellets whereby the pellets are urged under force against the end of the rod remote from said spring;

the second spring portion having a normal outside diameter larger than the inside diameter of the fuel rod, said second helical spring portion keyed to the inside diameter of said fuel rod.

4,871,510

FUEL ASSEMBLY AND REACTOR CORE

Motoo Aoyama, Hitachi, and Renzo Takeda, Kawasaki, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

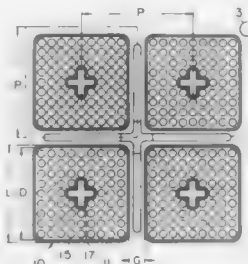
Filed Apr. 7, 1988, Ser. No. 178,902

Claims priority, application Japan, Apr. 8, 1987, 62-84766

Int. Cl.⁴ G21C 3/32

U.S. Cl. 376—444

9 Claims



1. A fuel assembly to be loaded in a reactor core with a pitch P from the other ones, said fuel assembly comprising:

a plurality of fuel rods;

a water rod disposed within said fuel rods; and

a channel box surrounding the bundle of said fuel rods, said channel box having a width L between outer walls thereof and a width D between inner walls thereof, both of which satisfy the following equation:

$$0.12 \leq (P - L)/D.$$

4,871,511

MARAGING STEEL

Darrell F. Smith, Jr., Huntington, and Louis G. Coffee, Ceredo, both of W. Va., assignors to Inco Alloys International, Inc., Huntington, W. Va.

Filed Feb. 1, 1988, Ser. No. 151,120

Int. Cl.⁴ C22C 38/08

U.S. Cl. 420—96

9 Claims

1. A maraging steel characterized by a combination of (a) high yield strength, (b) K_{IC} fracture toughness and (c) the ability to absorb impact energy as determined by the Charpy V-Notch impact test, said steel consisting essentially of 16.5 to 20% nickel, over 1 to about 1.4% titanium, about 2 to about 4% molybdenum, up to 0.05% carbon, up to 1% aluminum, the balance being iron, said alloy having been aged at a temperature of from above 950 to less than 1100° F. and the yield strength is at least 200,000 psi, the K_{IC} fracture toughness is over 75 ksi \sqrt{in} and the impact energy is over 25 foot pounds.

rus segregates when the sheet saturated with water is applied to a surface of a metallic material.

4,871,514

FLAPPER VALVE

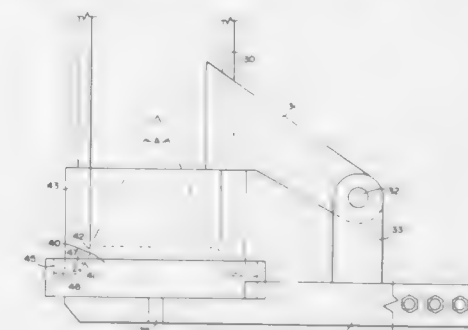
Mark S. Ross, Lawrenceville, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 9, 1987, Ser. No. 118,080

Int. Cl.⁴ F27B 15/02, 15/09

U.S. Cl. 422—145

13 Claims



1. In a fluid catalytic cracking unit including a cracking riser, a reactor vessel at the top of the cracking riser, a regenerator and at least one cyclone separator for separating cracking catalyst from gases, the separator having a dependent dipleg which has at its lower end a flapper valve for retaining catalyst in the dipleg, the improvement comprising a flapper valve having

- (i) a movable support member hinged to the dipleg about a horizontal hinge axis, which support member is movable about the hinge axis between a closed position and an open position for the valve,
- (ii) a valve seat member at the bottom of the dipleg having a frusto-conical seating surface axially aligned with the dipleg;
- (iii) a valve body member on the support member having a frusto-conical face complementary to the frusto-conical seating surface,
- (iv) an upstanding annular retaining ring around a lower portion of the valve body member, said upstanding annular retaining ring having an inner diameter larger than the outer diameter of the dipleg.

4,871,515

ELECTROSTATIC FILTER

Ernst-Michael Reichle, Karlsruhe, and Matthias Seel, Munich, both of Fed. Rep. of Germany, assignors to MAN Technologie GmbH, Munich, Fed. Rep. of Germany

Filed Jun. 22, 1988, Ser. No. 210,422

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1987, 3723544

Int. Cl.⁴ F01N 3/10

U.S. Cl. 422—174

20 Claims

1. An electrostatic filter for separating combustible particles

4,871,512

ALLOYS FOR EXHAUST VALVE

Yoshiaki Takagi, Saitama; Susumu Isobe, Aichi, and Kenkichi Matsunaga, Gunma, all of Japan, assignors to Daido Tokushuko K.K. and Honda Giken Kogyo K.K., both of Japan

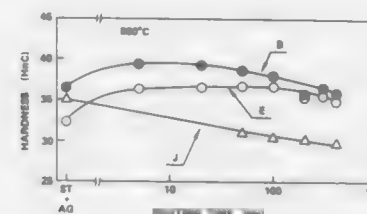
Continuation-in-part of Ser. No. 798,061, Nov. 14, 1985, abandoned. This application Oct. 2, 1986, Ser. No. 914,408

Claims priority, application Japan, Nov. 16, 1984, 59-240432

Int. Cl.⁴ C22C 19/05

U.S. Cl. 420—448

4 Claims



1. An alloy for use in an exhaust valve consisting by weight percentage of 0.01 to 0.15% of C, not more than 2.0% of Si, not more than 2.5% of Mn, 15 to 25% of Cr, 0.4 to 3.1% of Mo and 0.2 to 3.8% of W so that $(Mo + \frac{1}{2}W)$ is 0.5 to 5.0%, 0.3 to 2.02% of Nb+Ta, 1.5 to 3.5% of Ti, 0.5 to 2.5% of Al, 0.001 to 0.02% of B, not more than 5% of Fe and the balance being substantially Ni.

4,871,513

TEST MEDIUM AND METHOD FOR DETECTING PHOSPHORUS SEGREGATES IN METALLIC MATERIAL

Yoshiko Funahashi; Yoshikazu Kamino; Yasuharu Matsumura, and Senichi Harimaya, all of Chiba, Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Division of Ser. No. 765,245, Aug. 13, 1985, Pat. No. 4,681,857.

This application Jun. 12, 1987, Ser. No. 61,210

Claims priority, application Japan, Aug. 15, 1984, 59-170227;

Aug. 22, 1984, 59-174828

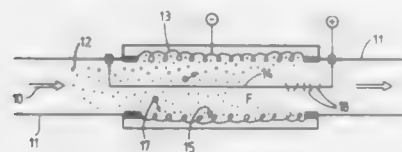
Int. Cl.⁴ G01N 1/48, 33/20

U.S. Cl. 422—56

4 Claims

4. A test medium for use in detecting phosphorus segregates in a metallic material, comprising a sheet of paper having an effective amount of copper ion supplying compound and nitrate ion supplying compound incorporated therein in a dry state such that there will be formed an aqueous solution containing 0.00005 to 0.2 mol/l of copper ion and 0.0001 to 1.0 mol/l of nitrate ion and having a pH of at least 6 when the

from a gas containing oxygen comprising a housing having inlet means for a gas containing oxygen and combustible particles and outlet means for discharge of the gas from which the combustible particles have been separated and burned, two electrodes arranged in said housing for producing an electrostatic field through which a flow of said gas is passed, one of said electrodes being in the form of a collecting electrode constructed with trapping openings and positioned so that



combustible particles in the gas are attracted thereto, means for applying a voltage of high potential to the other of said electrodes to produce a corona discharge of sufficient intensity to ionize the oxygen in the gas and produce oxygen or ozone ions which oxidize said combustible particles, and heating means associated with the collecting electrode for providing heat for burning the oxidized combustible particles within the housing, the gas from which the combustible particles have been separated and combusted flowing to said outlet means.

4,871,516

APPARATUS AND METHOD FOR CONDUCTING CHEMICAL REACTIONS

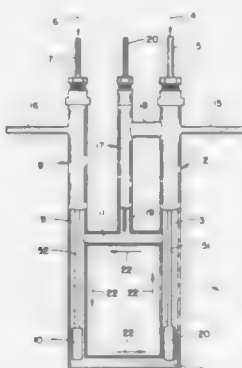
Jawad H. Murib, Cincinnati, Ohio, assignor to National Distillers and Chemical Corporation, New York, N.Y.

Continuation of Ser. No. 31,828, Mar. 30, 1987, abandoned. This application Jun. 13, 1988, Ser. No. 206,979

Int. Cl.⁴ B01J 10/00

U.S. Cl. 422-189

7 Claims



1. An apparatus for conducting sequential chemical reactions, comprising:

- a first vertical conduit having an interior for holding a liquid reaction medium;
- a second vertical conduit having an interior for holding an intermediate liquid mixture;

gas injecting and liquid circulating means extending into the first and second vertical conduits to introduce a first gaseous reactant into the first vertical conduit, to introduce a second gaseous reactant into the second vertical conduit, and to circulate continuously the liquid reaction medium and the intermediate liquid mixture between the interiors of the first and second vertical conduits, wherein the first gaseous reactant reacts with the liquid reaction medium in the first vertical conduit to form said intermediate liquid mixture, and the second gaseous reactant reacts with the

intermediate liquid mixture in the second vertical conduit to form a gaseous product;

communication means connected to both the first and second vertical conduits and in liquid communication with the interiors thereof to conduct the liquid reaction medium and the intermediate liquid mixture between the interiors of the first and second vertical conduits while maintaining the first and second gaseous reactants separated, and including

- (i) lower conduit means connected to and in fluid communication with the interiors of both the first and second vertical conduits, and

- (ii) upper conduit means connected to and in fluid communication with the interiors of both the first and second vertical conduits at a level above the lower conduit means;

a first gas vent connected to the first vertical conduit in fluid communication with the interior thereof to vent unreacted first gaseous reactant therefrom; and

a second gas vent connected to the second vertical conduit in fluid communication with the interior thereof to vent unreacted second gaseous reactant therefrom;

the gas injecting and liquid circulating means including

- (i) means extending into the first vertical conduit to conduct the first gaseous reactant thereinto and to discharge the first gaseous reactant into the first vertical conduit at a level below the upper conduit means, and

- (ii) means extending into the second vertical conduit to conduct the second gaseous reactant thereinto and to discharge the second gaseous reactant into the second vertical conduit at a level below the upper conduit means,

the communication means further including a third gas vent connected to and in fluid communication with the upper conduit means to vent gas therefrom.

4,871,517

APPARATUS FOR PARTING WAFER-SHAPED SILICON BODIES, USEFUL FOR SOLAR CELLS, FROM A SILICON TAPE MANUFACTURED IN A HORIZONTAL TAPE-DRAWING METHOD

Richard Falkenberg, Wald; Gerhard Hoyler, Munich, and Josef Grabmaier, Berg, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

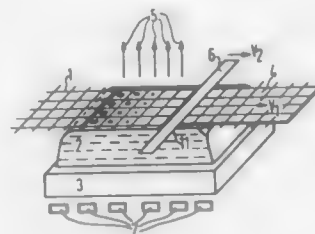
Continuation of Ser. No. 49,823, May 15, 1987, abandoned. This application Sep. 26, 1988, Ser. No. 251,970

Claims priority, application Fed. Rep. of Germany, Jun. 6, 1986, 3619018

Int. Cl.⁴ B01D 9/00

U.S. Cl. 422-248

10 Claims



1. An apparatus for forming a continuous silicon tape with spaced dividing lines which comprises:

- a heated crucible containing a bath of molten silicon therein, a refractory fabric,
- means for drawing said refractory fabric tangentially across said bath to crystallize molten silicon therefrom,
- at least one reflector positioned above said bath and,
- means for driving said reflector in synchronism with the movement of said fabric.

4,871,518

RECOVERY OR REMOVAL OF URANIUM BY THE UTILIZATION OF ACORNS

Myongwhan Yoon, Seoul; Seongtae Whang, Chungcheongnam; Insoon Chang, Chungcheongnam, and Pilsoun Han, Chungcheongnam, all of Rep. of Korea, assignors to Korea Advanced Energy Research Institute, Chungcheongnam, Rep. of Korea

Filed Dec. 21, 1987, Ser. No. 135,409

Claims priority, application Rep. of Korea, Sep. 30, 1987, 87-10910

Int. Cl.⁴ C01G 43/00; G21F 9/10

U.S. Cl. 423-11

6 Claims

1. A method of treating a solution containing uranium, and not containing calcium ions, comprising the steps of:

- (a) extracting dry acorns with water until the extract becomes colorless;
- (b) mixing 0.2 to 20% by volume of the extract with the solution containing uranium;
- (c) adding 0.05 to 5 g per liter of CaCl_2 to the solution obtained in step (b);
- (d) stirring the solution obtained in step (c) and adjusting the pH of the solution to 8 to 11 to precipitate a uranium-containing compound;
- (e) separating the precipitate from the solution in step (d) to obtain a sludge and a mother liquor; and
- (f) filtering and drying the sludge.

4,871,519

METHOD OF MAKING MAGNESIUM OXIDE AND HYDRATES THEREOF

Miroslav Zikmund; Cestmir Hybl, both of Bratislava; Vendelin Macho, Novaky, and Valer Adam, Bratislava, all of Czechoslovakia, assignors to Vysokumy ustav pre petrochemiu Prievidza, Prievidza, Czechoslovakia

Continuation of Ser. No. 890,294, Jul. 29, 1986, abandoned. This application Feb. 11, 1988, Ser. No. 154,699

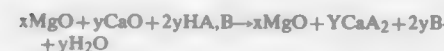
Int. Cl.⁴ C01F 5/06, 5/16, 11/06

U.S. Cl. 423-169

20 Claims

1. A method of producing magnesium oxide and hydrates thereof from an admixture consisting essentially of magnesium oxide and calcium oxide, the steps comprising:

- (a) reacting said admixture at a temperature of from 0° to 100° C. with an aqueous solution containing at least one organic amine, or a salt formed of an organic amine and an acid capable of forming a water soluble calcium salt with said organic amine, in stoichiometric amounts sufficient to dissolve at least a portion of the calcium oxide and its hydrates and to form a residue according to the equation;



wherein:

HA is a monoacid or a mixture of acids,
B is the organic amine or a mixture thereof and
HA,B is a salt of an acid or acids with the organic amine, and

- (b) separating said solution from the residue, said residue consisting essentially of magnesium oxide and hydrates thereof.

4,871,520

PROCESS AND COMPOSITION FOR H_2S REMOVAL

Donald C. Olson, Houston, Tex.; John J. Miller, deceased, late of Houston, Tex.; Wayne R. Miller, executor, Omaha, Nebr.; George C. Blytas, and Zaida Diaz, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 769,195, Aug. 23, 1985, abandoned. This application Jul. 16, 1987, Ser. No. 75,196

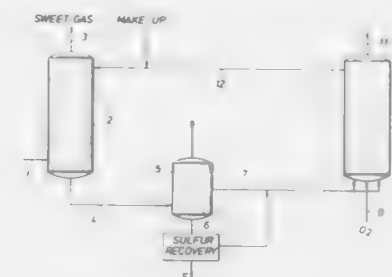
Int. Cl.⁴ C01B 17/16, 31/20, 17/02

U.S. Cl. 423-221

30 Claims

1. A process for the removal of H_2S from and H_2S -containing gaseous stream comprising contacting the H_2S -containing gaseous stream with aqueous

reactant solution in a contacting zone, at a temperature below the melting point of sulfur, the reactant solution containing ammonium ferric nitrilotriacetate chelate and ammonium ferrous nitrilotriacetate chelate, the ratio of the ammonium ferric nitrilotriacetate chelate to ammonium ferrous nitrilotriacetate chelate in the reactant solution being from about 0.2 to about 6, at least about 0.1 percent, molar basis, with respect to said ammonium ferric and ammonium ferrous nitrilotriacetate chelates, of aqueous ammonia, an amount of thiosulfate ion sufficient to



inhibit ligand degradation, a total iron content of from about 0.5 percent to about 7 percent by weight, based on the weight of the solution and iron, and a total concentration of sodium and potassium ions present in the reactant solution less than that sufficient to precipitate sodium and potassium ferrous nitrilotriacetate chelate, and having a pH of from about 5 to about 8.5, under conditions to convert H_2S , producing a gaseous stream having reduced H_2S content and an aqueous admixture containing solid sulfur and additional ammonium ferrous nitrilotriacetate chelate in solution.

4,871,521

SULFUR RECOVERY PROCESS USING METAL OXIDE ABSORBENT WITH IMPROVED PURGE

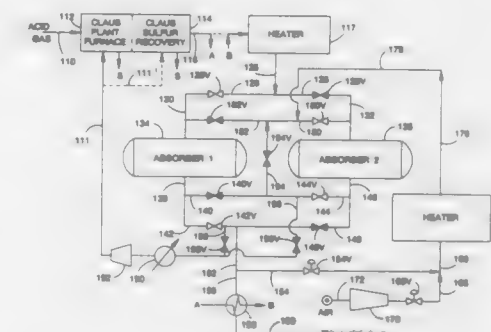
Paul T. Pendergraft, Tulsa, Okla., assignor to Amoco Corporation, Chicago, Ill.

Continuation of Ser. No. 98,775, Sep. 18, 1987, abandoned, which is a continuation of Ser. No. 902,248, Aug. 28, 1986, abandoned. This application Jul. 6, 1988, Ser. No. 218,526

Int. Cl.⁴ C01B 17/16, 31/20, 17/02

U.S. Cl. 423-230

12 Claims



1. In a method for absorbing at least H_2S from a Claus plant effluent stream by (1) sulfidization of ZnO , thereby producing ZnS , (2) the ZnS then being regenerated to ZnO producing SO_2 in the presence of molecular oxygen O_2 and (3) the ZnO returned to absorbing at least H_2S from the Claus plant effluent stream, said method additionally comprising the steps of:

- (a) following the step of regeneration of ZnS to ZnO in a first reactor, passing at least a portion of the total Claus

plant effluent stream in contact with regenerated ZnO producing a purge effluent comprising increased amounts of sulfur dioxide SO₂ relative to SO₂ concentrations in the Claus plant effluent; and
(b) passing the purge effluent in contact with ZnO in a second reactor under conditions including temperature and composition for removing SO₂ therefrom.

4,871,522

COMBINED CATALYTIC BAGHOUSE AND HEAT PIPE AIR HEATER

John B. Doyle, Massillon, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.

Filed Jul. 25, 1988, Ser. No. 224,419
Int. Cl.⁴ B01J 8/00; C01B 21/00, 17/00

U.S. Cl. 423—239 4 Claims

1. A method of controlling emissions of a fossil fuel fired boiler which produces flue gases containing SO_x, NO_x and particulate, the flue gases being supplied along a flue gas stream, comprising the steps of:

- providing a hot catalytic baghouse and a heat pipe air heater in series along the flue gas stream with the baghouse upstream of the air heater, the heat pipe air heater having heating surfaces;
- coating the heating surfaces of the heat pipe air heater with catalyst for catalyzing a reaction between NO_x and ammonia in the air heater;
- injecting alkali and ammonia into the flue gas stream upstream of the baghouse for reacting with the SO_x and NO_x in the baghouse to clean the hot flue gas;
- supplying the clean hot flue gas to the heat pipe air heater to heat the air heater, and to further reduce NO_x in the flue gas; and
- passing combustion air through the heat pipe air heater for heating the air therein, the heated combustion air being for use in the boiler.

4,871,523

VANADIUM TETRACHLORIDE STABILIZATION

Sudhin Datta, Scotch Plains, N.J., and Trazollah Ouhadi, Liege, Belgium, assignors to Exxon Chemical Patents Inc., Linden, N.J.

Filed May 15, 1987, Ser. No. 50,946
Int. Cl.⁴ C01G 31/04; C08F 2/00, 4/44

U.S. Cl. 423—265 26 Claims

1. A method of stabilizing a solution of vanadium tetrachloride in an inert organic solvent outside of a polymerization zone, which method comprises incorporating into the solution a decomposition-retarding amount of a halogenated organic compound having at least two halogen atoms attached to the same carbon atom, the halogen atoms being activated by an electron donor group adjacent the carbon atom to which they are attached and/or by a carbon-carbon double bond as a decomposition retardant for the vanadium tetrachloride, and excluding co-catalyst for the VCl₄ therefrom.

4,871,524

HYDROGEN PURIFICATION PROCESS

Robert H. Allen, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Sep. 3, 1987, Ser. No. 92,638
Int. Cl.⁴ C01B 33/02; B05D 7/00

U.S. Cl. 423—349 11 Claims

1. In a process for producing polysilicon in a fluidized bed reactor wherein silane is decomposed on a bed of seed silicon particles fluidized by hydrogen gas and the hydrogen gas from the fluidized bed reactor is recycled to fluidize said bed of seed silicon particles, the improvement comprising contacting said hydrogen gas with activated carbon at cryogenic temperature so as to remove boron and/or phosphorus-containing contaminant from said hydrogen gas prior to recycling said hydrogen gas to said fluidized bed reactor.

4,871,525

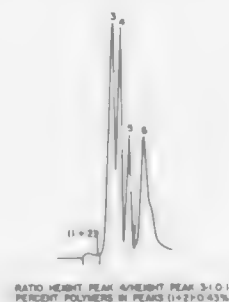
ANTIPERSPIRANT COMPOSITION AND METHOD OF PREPARATION

Rocco Giovanniello, Port Jervis, and Stephen M. Howe, Walden, both of N.Y., assignors to Westwood Chemical Corporation, Middletown, N.Y.

Continuation-in-part of Ser. No. 922,753, Oct. 24, 1986, abandoned, which is a continuation of Ser. No. 817,047, Jan. 8, 1986, abandoned. This application Aug. 3, 1987, Ser. No. 81,638

Int. Cl.⁴ C01F 7/56; C01G 25/04; A61K 7/34

U.S. Cl. 423—463 24 Claims



1. An aluminum zirconium hydroxy halide glycinate complex having the empirical formula:



wherein x has a numerical value from 0 to 1.5, y has a numerical value from 0.7 to 3.0 and X is chlorine, bromine or iodine and whose polymer distribution is characterized by a size exclusion chromatograph test is:

- (a) a peak height ratio of peak 4 to peak 3 of 0.5 to 1.8:1, and
- (b) peaks (1+2) contain less than 4% of the polymer distribution by weight.

4,871,526

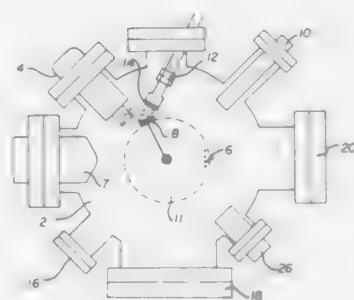
HETEROGENEOUS CATALYTIC OXIDATION OF ORGANOPHOSPHONATE ESTERS

Vincent S. Smentkowski, Pittsburgh, Pa.; Patrick L. Hagans, Midland, Mich., and John T. Yates, Jr., Allison Park, Pa., assignors to University of Pittsburgh of the Commonwealth System of Higher Education, Pittsburgh, Pa.

Filed Oct. 20, 1988, Ser. No. 260,478

Int. Cl.⁴ C01B 25/12

U.S. Cl. 423—659 20 Claims



1. A method of catalytic oxidation of organophosphonate esters comprising, introducing said organophosphonate esters in gaseous form into contact with a molybdenum catalyst and in the presence of oxygen, whereby said organophosphonate esters will be oxidized by said molybdenum catalyst.

4,871,527

NO-CARRIER-ADDED

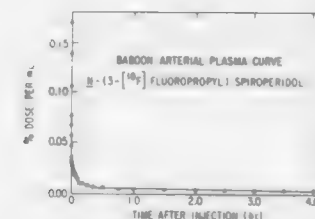
[¹⁸F]-N-FLUOROALKYLSPIROPERIDOLS

Chyng-Yann Shue, East Setauket; Alfred P. Wolf, Setauket; Lan-Qin Bai, and Ren-Tai Teng, both of Upton, all of N.Y., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 29, 1987, Ser. No. 43,824

Int. Cl.⁴ A61K 49/02; C07D 471/10

U.S. Cl. 424—1.1 4 Claims



1. No-carrier-added [¹⁸F]-N-fluoroalkylspiroperidols wherein the alkyl group contains from 2-6 carbon atoms.

4,871,528

PHARMACEUTICAL COMPOSITIONS HAVING ANTINEOPLASTIC ACTIVITY

Sergio Tognella; Michele Tedeschi; Roberto Assereto; Odoardo Tofanetti, and Ennio Cavalletti, all of Milan, Italy, assignors to Boehringer Biochemia Robin SpA, Milan, Italy

Continuation-in-part of Ser. No. 102,746, Sep. 24, 1987, abandoned, which is a continuation of Ser. No. 857,344, Apr. 30, 1986, abandoned. This application Oct. 7, 1987, Ser. No. 105,169

Claims priority, application Italy, Oct. 7, 1986, 21925 A/86; Ser. 1, 1987, 48339 A/87

Int. Cl.⁴ A61K 37/00

U.S. Cl. 424—10 18 Claims

1. A method of potentiating the anti-tumor activity of a platinum complex anti-tumor agent in a patient to which said anti-tumor agent is administered, said method comprising administering to said patient a potentiating amount of glutathione, wherein the amount of said glutathione is about 1500 to 3000 mg/m², and the glutathione is administered no more than 30 minutes prior to said platinum complex anti-tumor agent.

4,871,529

AUTOPHOBIC SILICONE COPOLYOLS IN HAIRSPRAY COMPOSITIONS

John A. Sramek, County of Racine, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.

Filed Jun. 29, 1988, Ser. No. 213,050

Int. Cl.⁴ A61K 7/11, 7/06

U.S. Cl. 424—47 23 Claims

1. An aerosol hairspray composition having improved body consisting essentially of from 0.5% to 8.0% by weight of an ethanol soluble hairspray resin dissolved in a sufficient amount of an ethanol solvent system to render the composition sprayable in aerosol form, said composition further containing an effective amount of an autophobic silicone copolyol to cause the sprayed film to contract on the hair at between 20° C. to 37° C. rather than to spread into an even film upon drying, said silicone copolyol consisting essentially of organosiloxane units selected from the group consisting of dimethylsiloxane units, CH₃SiO(C₂H₄)_x(OCH₂CH₂)_y(OCHCH₃CH₂)_zOR, (CH₃)₂SiO(C₂H₄)_x(OCH₂CH₂)_y(OCHCH₃CH₂)_zOR, and trimethylsiloxane units, and having a number average molecular weight of about 1500 to 6000 wherein x has a value of from 1 to 12, R is hydrogen or alkyl of 1 to 4 carbon atoms, y is greater than or equal to 1 and z is greater than or equal to 0 and the sum of y+z and the amount of dimethylsiloxane units and trimethylsiloxane units present is such that the silicone copolyol causes an ethanolic solution of the hairspray resin to contract on the hair

rather to spread into an even film at 20° C. to 37° C. upon drying and a 0.1% by weight solution of the silicone copolyol in water has a cloud point of less than 30° C. and said ethanol solvent system consists essentially of at least 70% by weight of ethanol and any remaining solvent is selected from the group consisting of water. R¹OH where R¹ is an alkyl of 3 or 4 carbon atoms, and mixtures thereof.

4,871,530

AQUEOUS DELAYED-FOAMING COSMETIC COMPOSITION FOR HAIR AND SKIN TREATMENT

Jean F. Grollier, Paris; Claude Dubief, Le Chesnay, and Daniele Cauwet, Paris, all of France, assignors to L'oreal, Paris, France

Filed Mar. 19, 1987, Ser. No. 28,133

Claims priority, application Luxembourg, Mar. 19, 1986, B3361

Int. Cl.⁴ A61K 7/075, 7/15, 7/11, 7/50

U.S. Cl. 424—47 30 Claims

1. A cosmetic composition suitable for the treatment of the hair or of the skin in the form of a delayed-foaming gel, which consists essentially of one surface-active agent, one heteropolysaccharide and one delayed-foaming agent which is able to form a foam after the composition is spread on the hair or the skin, in a cosmetically acceptable medium.

4,871,531

ORAL COMPOSITIONS

Gregory R. Hartlaub, and Melvin A. Barbera, both of 11511 Reed Hartman Highway, Cincinnati, Ohio 45241

Continuation-in-part of Ser. No. 828,120, Feb. 10, 1986, abandoned. This application Dec. 18, 1986, Ser. No. 943,869

The portion of the term of this patent subsequent to Apr. 28, 2004, has been disclaimed.

Int. Cl.⁴ A61K 9/68, 7/18, 33/16

U.S. Cl. 424—48 20 Claims

1. An oral composition in the form of a toothpaste, mouthwash, topical dental gel, lozenge or chewing gum comprising:
(a) a safe and effective amount of a polymer selected from the group consisting of polyacrylic acid polymers, copolymers of acrylic acid and mixtures thereof;
(b) a safe and effective amount of a soluble strontium ion source;
(c) a safe and effective amount of a soluble fluoride ion source; and
(d) a pharmaceutically acceptable carrier.

4,871,532

MOUTH CARE PRODUCTS

Hendrik Hoogendoorn, Krimpen, Netherlands, assignor to Douwe Egberts Koninklijke Tabaksfabriek Koffiebranderijen-Theehandel N.V., Utrecht, Netherlands

Filed Jan. 7, 1988, Ser. No. 142,052

Claims priority, application Netherlands, Jan. 8, 1987, B700025

Int. Cl.⁴ A61K 7/16, 7/22, 7/28

U.S. Cl. 424—50 8 Claims

1. An oxidoreductase-containing tooth-cleaning agent comprising an oxidoreductase yielding hydrogen peroxide upon breaking down a substrate in a quantity of between 0.01 and 500 units per gram/milliliter of tooth cleaning agent, each unit of enzyme being the quantity which breaks down 1 μ-mol of substrate per minute at 30° C. and under standard conditions; a 8-hydroxyquinoline, ester thereof or acid addition salt thereof; and a water-soluble compound yielding Zn ions, said 8-hydroxyquinoline, ester and acid addition salt thereof being present in a concentration of between 5×10⁻⁵ and 10⁻¹ % by weight and said zinc in ionic form being present in a concentration of between 10⁻⁵ and 10⁻¹ % by weight and said zinc in ionic form being present in a concentration of between 10⁻⁵ and 10⁻¹ % by weight.

4,871,533

COMPOSITION FOR STRENGTHENING FINGERNAILS

Tammy Lagatore, 1400 Maple St., Columbia, S.C. 29205

Filed Jul. 20, 1987, Ser. No. 75,637

Int. Cl.⁴ A61K 7/04, 33/15

U.S. Cl. 424-61

9 Claims

1. A solution for strengthening nails, consisting essentially of:

- (a) about 9% by weight of potassium iodide; and
- (b) about 91% by weight of one or more inert ingredients suitable for placing said potassium iodide in solution.

4,871,534

ODORLESS ARTIFICIAL FINGERNAIL COMPOSITION AND METHOD OF USING THE SAME

Robert E. Montgomery, Los Angeles, Calif., assignor to REM Systems, Inc., Los Angeles, Calif.

Filed Oct. 7, 1988, Ser. No. 254,733

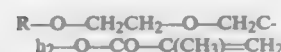
Int. Cl.⁴ A61K 7/043

U.S. Cl. 424-61

15 Claims

1. A substantially odorless artificial fingernail composition comprising:

- (a) an odorless, non-toxic liquid binder comprising at least one methacrylate monomer having the following formula:



where R is $\text{CH}_3(\text{CH}_2)_n$ and $n=0-3$

- together with one or more di-, tri-, or multi-functional methacrylates, and a tertiary amine accelerator; and
- (b) a polymeric powder containing a finely divided methacrylate polymer or copolymer, and a peroxide polymerization initiator.

4,871,535

COMPOSITIONS USED IN PERMANENT STRUCTURE ALTERING OF HAIR

Michael W. Helioff, Westfield; Carmen D. Bires, Long Valley, and Robert B. Login, Oakland, all of N.J., assignors to GAF Corporation, Wayne, N.J.

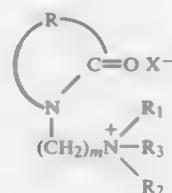
Continuation-in-part of Ser. No. 922,923, Oct. 24, 1986, Pat. No. 4,732,990. This application Jun. 10, 1987, Ser. No. 60,285

Int. Cl.⁴ A61K 7/09

U.S. Cl. 424-71

27 Claims

1. A permanent hair structure altering composition containing a permanent hair structure altering vehicle and an effective hair fiber penetrating amount of a quaternized amino lactam having the formula:



wherein m is an integer having a value of from 1 to 4; R is alkylene linear having from 3 to 8 carbon atoms and is optionally substituted with C_1 to C_4 alkyl; R_1 , R_2 and R_3 are each independently selected from the group of alkyl, alkyleneoxy alkyl alkylhydroxy, alkoxy, aryl, aralkyl, alkaryl, and alkylene amidoalkyl radicals, said groups each having from 1 to 30 carbon atoms and at least one of R_1 , R_2 and R_3 is a radical having from 8 to 30 carbon atoms; and X^- is a chloride, bromide or iodide anion.

5. The composition of claim 4 wherein the reducing lotion is an aqueous solution of ammonium thioglycolate and the quaternized amino lactam, is a quaternized amino pyrrolidone

wherein R^1 is methyl or alkyl containing from 14 to 22 carbon atoms.

4,871,536

COMPOSITION BASED ON CATIONIC POLYMERS, ANIONIC POLYMERS AND WAXES FOR USE IN COSMETICS

Jean-Pierre Arraudeau; Jeanne Patraud, both of Paris, and Louis Le Gall, Bures-sur-Yvette, all of France, assignors to L'Oréal, France

Continuation of Ser. No. 834,120, Feb. 26, 1986, abandoned, which is a continuation of Ser. No. 505,265, Jun. 17, 1983, abandoned. This application Jul. 28, 1988, Ser. No. 225,583

Claims priority, application Luxembourg, Jun. 17, 1983, 842110

Int. Cl.⁴ A61K 7/021, 7/031, 7/032, 7/42

U.S. Cl. 424-59

14 Claims

1. In a wax based cosmetic composition containing a polymer and from about 5 to 40% by weight of a wax selected from the group consisting of vegetable, animal, mineral and synthetic wax, said wax having a melting point of 60 to 110 degrees C., and a needle penetration according to ASTM Method D5 at 25 degrees C. of 3 to 40 and said wax being solid and rigid at a temperature below 50 degrees C., wherein the improvement comprises said polymer being the combination of a cationic polymer and an anionic polymer, said cationic polymer being present in the cosmetic composition in an amount of about 0.1 to 10% by weight and having a molecular weight of 1,000 to 3,000,000, said cationic polymer being a polymer of the polyamine, polyamino-polyamide or poly-(quaternary ammonium) type, the amine or ammonium group forming a part of or being joined to the polymer chain, said anionic polymer being present in the cosmetic composition in an amount of about 0.1 to 10% by weight and having a molecular weight of 500 to 3,000,000, said anionic polymer containing carboxylic, sulphonic or phosphoric acid groups.

4,871,537

6,12-DIMETHYLPENTADECAN-2-ONE AND ITS USE IN MONITORING AND CONTROLLING THE BANDED CUCUMBER BEETLE

Tatsuji Chuman, Tokyo, Japan; Paul L. Guss, deceased, late of Brookings, S. Dak. (by Patricia Guss, executrix); Robert E. Doolittle, Gainesville, Fla.; John R. McLaughlin, Gainesville, Fla., and James H. Tumlinson, III, Gainesville, Fla., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Jun. 16, 1988, Ser. No. 207,591

Int. Cl.⁴ A01N 35/02

U.S. Cl. 424-84

10 Claims

1. The substantially pure compound 6,12-dimethylpentadecan-2-one.

4,871,538

INSOLUBLE COPPER-ALPHA INTERFERON COMPLEX

Zachary Yim, Paramus; Martin Zupun, Basking Ridge, and Imtiaz Chaudry, Denville, all of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Filed Jul. 13, 1987, Ser. No. 72,487

Int. Cl.⁴ A61K 45/02; C07K 15/26

U.S. Cl. 424-85.7

10 Claims

1. A pharmaceutical composition comprising a parenterally acceptable insoluble cupric ion-alpha interferon complex wherein the alpha interferon is present at 0.01 to 1 mg/ml complex.

4,871,539

BIODEODORIZER AND PROCESS FOR PREPARING SAME

Kosei Hata, and Toshiyuki Maruoka, both of Osaka, Japan, assignors to Seikenai Foundational Juridical Person, Osaka, Japan

Filed Jul. 17, 1985, Ser. No. 755,985

Int. Cl.⁴ A61K 35/74; C12N 1/20

U.S. Cl. 424-93

1 Claim

1. A process for deodorizing in vivo comprising administering a biodeodorizer comprising (a) at least one strain selected from the group consisting of *Lactobacillus deodorans*, *Lactobacillus clearans* and a mixed strain of *Lactobacillus sulfurica* and *Lactobacillus nitrosus* and (b) *Streptococcus faecalis* having the ability to produce antibiotics, wherein the proportion of *Lactobacillus* to *Streptococcus faecalis* is about 150:1 to about 0.01:1.

4,871,540

PROCESS FOR PRODUCING A BIOLOGICALLY ACTIVE SUBSTANCE AND COMPOSITIONS CONTAINING THE SAME

Yasuhiko Kojima, 244-9, Kosugaya-cho, Totsuka-ku, Yokohama-shi, Kanagawa-ken, Japan, and Sadao Tamamura, Tokyo, Japan, assignors to Yasuhiko Kojima, Japan

Filed Jul. 17, 1986, Ser. No. 887,168

Claims priority, application Japan, Jul. 17, 1985, 60-157843

Int. Cl.⁴ A61K 35/78

U.S. Cl. 424-195.1

10 Claims

1. A water-soluble, biologically active substance isolated from a tissue of a plant selected from the plants of the genus *Zea* and variants thereof capable of producing said active substance, said active substance being capable of inhibiting the formation of IgE antibodies and promoting the formation of IgG and IgM antibodies and having interferon inducing activity, polyclonal B lymphocyte activating activity, mitogenic activity, adjuvant activity and anti-tumour activity, and when substantially purified being in the form of light brownish powder having the following physico-chemical

4,871,541

INSECT REPELLING/KILLING COMPOSITION AND METHOD OF USE THEREOF

Ichiro Shibana, Tokyo, Japan, assignor to Japan Liquid Crystal Co., Ltd., Tokyo, Japan

Division of Ser. No. 774,197, Sep. 9, 1985, Pat. No. 4,636,343.

This application Aug. 8, 1986, Ser. No. 894,977

Claims priority, application Japan, Sep. 10, 1984, 59-188212

The portion of the term of this patent subsequent to Jan. 13, 2004, has been disclaimed.

Int. Cl.⁴ A01N 25/34, 43/04; A61K 31/74, 31/745

U.S. Cl. 424-411

12 Claims

1. An insect repelling/killing film made according to the process comprising preparing a clathrate compound of fenitrothion in cyclodextrin, drying the clathrate compound, granulating the dried clathrate compound into a dry powder, mixing the melting the dry powder and a synthetic resin material in a weight ratio of clathrate compound to synthetic resin material ranging from 0.1 to 4%, molding the molten mixture into pellets and molding the pellets into a film.

4,871,542

METHOD AND APPARATUS USEFUL FOR DELIVERING MEDICINAL COMPOSITIONS INTO THE BLADDER AND URINARY TRACT

Hans Vilhardt, Esbjerg, Denmark, assignor to Ferring Service Center, N.V., Netherlands Antilles

Filed Apr. 30, 1987, Ser. No. 57,298

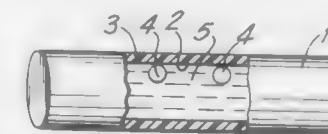
Int. Cl.⁴ A61F 2/00; A61K 9/22

U.S. Cl. 424-423

15 Claims

1. A method for delivering medicinals to animal or human bladders and urinary tracts which comprises: inserting into said bladder a polymeric, minicellular porous container, said container comprising an internal reservoir

containing said medicinal and a flotation means effective to keep said container floating above the bladder outlet, wherein



said medicinal diffuses through the pores of said container and into said bladder and urinary tract in an effective amount at a programmed, continuous, and controlled rate.

4,871,543

INTRAVAGINAL DEVICES

Inga M. Lindskog, Helsingborg; Bengt C. H. Sjögren, Viken, and Sven-Börje Andersson, Odåkra, all of Sweden, assignors to Aktiebolaget Leo, Helsingborg, Sweden

Filed Jun. 12, 1987, Ser. No. 60,833

Claims priority, application Sweden, Jun. 16, 1986, 8602666

Int. Cl.⁴ A61K 9/00, 31/74

U.S. Cl. 424-432

8 Claims

1. An intravaginal device for use by hypopostrogenic women in the form of a ring which consists of a core of a pharmacologically acceptable elastomer and an outer elastomer layer surrounding said core, said core having 17 beta-estradiol homogeneously suspended therein in such a way that the 17 beta-estradiol will be continuously released from the ring at an essentially constant rate of about 0.5 to 25 μg per 24 hours for at least a month.

4,871,544

RUMINANT DISPENSING DEVICE

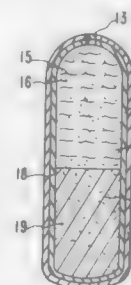
James B. Eckenhoff, Los Altos, Calif., assignor to ALZA Corporation, Palo Alto, Calif.

Division of Ser. No. 42,197, Apr. 24, 1987, which is a continuation of Ser. No. 766,456, Aug. 16, 1985, Pat. No. 4,704,118. This application Nov. 27, 1987, Ser. No. 126,460

Int. Cl.⁴ A23K 1/18

U.S. Cl. 424-438

1 Claim



1. A laminated arrangement use for manufacturing a delivery system for delivering a beneficial agent to an animal, wherein the laminated arrangement comprises a first lamina consisting essentially of (1) a hydrogel that absorbs an aqueous fluid and exhibits a 2 to 50 fold increase in size, said hydrogel consisting essentially of (2) a dense material selected from the group consisting of iron, steel, iron magnesium alloy, mixture of cobalt and iron, copper oxide, iron oxide and a mixture of copper oxide and iron.

4,871,545

PHARMACEUTICAL COMBINATION OF NIFEDIPINE AND SALBUTAMOL

Uwe Dethlefsen, Aachen, Fed. Rep. of Germany, assignor to Euro-Celtique S.A., Luxembourg

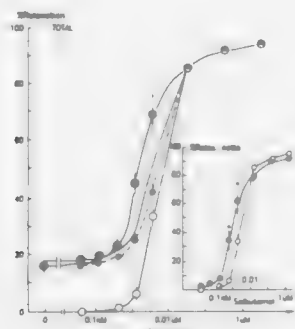
Filed Oct. 15, 1987, Ser. No. 108,910

Claims priority, application Fed. Rep. of Germany, Oct. 18, 1986, 3635522

Int. Cl.⁴ A61K 9/26

U.S. Cl. 424—470

18 Claims



1. A pharmaceutical preparation comprising nifedipine or a pharmaceutically acceptable salt thereof and salbutamol or a pharmaceutically acceptable salt thereof wherein the weight ratio of nifedipine or its salt to salbutamol or its salt is from about 5:1 to 1:1.

4,871,546

GASTROINTESTINAL PROTECTIVE COATING FORMULATIONS

Dennis R. Feltz, Succasunna; Saul S. Kornblum, Springfield, and Samuel B. Stoopak, West Caldwell, all of N.J., assignors to Sandoz Pharm. Corp., E. Hanover, N.J.

Continuation of Ser. No. 67,989, Jun. 29, 1987, abandoned, which is a continuation of Ser. No. 534,830, Sep. 22, 1983, abandoned. This application Apr. 22, 1988, Ser. No. 184,656

Int. Cl.⁴ A61K 9/32

U.S. Cl. 424—482

2 Claims

1. A method of protecting the gastric mucosa from the effects of gastric irritating drugs which comprises releasing a gastric irritating drug core formulation from a gastric mucosa protecting polymeric coating material comprising from about 10 to 30 parts of polymethyl methacrylate, from about 20 to 55 parts of polyethylene glycol, from about 20 to 60 parts of polyvinylacetate, and from about 5 to 10 parts of diethylphthalate, wherein the gastrointestinal fluid permeates the coating, dissolves the gastric irritating drug allowing it to diffuse in solution in the gastrointestinal area.

4,871,547

POLYADDITION SILICONE ELASTOMER DOSAGE FORMS FOR THE CONTROLLED RELEASE OF IODINE VALUES

Guy Cyprien, L'Hay les Roses; Alain Fisch, Paris; Johnny Haggiage, Lyons; Hugues Porte, Caluire; Thierry Prazuck, Paris, and Ghislaine Torres, Lyons, all of France, assignors to Rhone-Poulenc Chimie, Courbevoie, France

Filed Feb. 26, 1988, Ser. No. 161,173

Claims priority, application France, Feb. 26, 1987, 87 02884

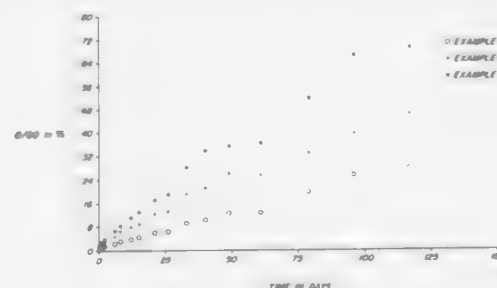
Int. Cl.⁴ A61K 31/78

U.S. Cl. 424—81

18 Claims

1. A polyaddition silicone composition curable by hydrosilylation, comprising (A) at least one organopolysiloxane containing at least two vinyl groups bonded to silicon per molecule; (B) at least one organopolysiloxane containing at least three hydrogen atoms bonded to silicon; (C) a catalytically effective amount of a platinum group metal compound; and (D) a therapeu-

peutically effective amount of at least one water soluble, non-toxic, organic and/or inorganic iodine compound which is in



solid or liquid state at ambient temperature and which does not inhibit the catalytic activity of the platinum group metal compound (C).

4,871,548

CONTROLLED RELEASE DOSAGE FORM COMPRISING DIFFERENT CELLULOSE ETHERS

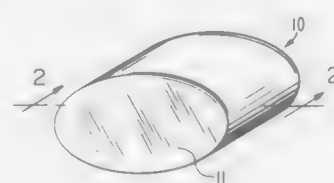
David E. Edgren, El Granada; Judy A. Magruder, Palo Alto, and Gurdish K. Bhatti, Fremont, all of Calif., assignors to ALZA Corporation, Palo Alto, Calif.

Filed Apr. 17, 1987, Ser. No. 39,405

Int. Cl.⁴ A61K 9/14

U.S. Cl. 424—488

3 Claims



1. A dosage form for delivering a beneficial drug to an environment of use, which dosage form comprises: a matrix adapted for entrance into the environment of use, said matrix comprising from 30 to 99.9% of a cellulosic ether formulation, which formulation comprises from 10 to 99% of at least one hydroxypropylmethylcellulose comprising a high number average molecular weight of from 30,000 to 350,000, from 5 to 80% of at least one hydroxypropylmethylcellulose comprising a low number average molecular weight of from 9,000 to 30,000, from 2 to 30% of a hydroxypropylcellulose comprising a hydroxypropoxy content of 7 to 16%, and a dosage amount of the beneficial drug.

4,871,549

TIME-CONTROLLED EXPLOSION SYSTEMS AND PROCESSES FOR PREPARING THE SAME

Yoshio Ueda, Kobe; Takehisa Hata, Mito; Hisami Yamaguchi, Nishinomiya; Satoshi Ueda, Kawanishi, and Masateru Kodani, Ikeda, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Filed Jul. 10, 1986, Ser. No. 884,071

Claims priority, application United Kingdom, Jul. 19, 1985, 8518301

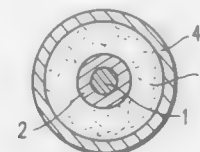
Int. Cl.⁴ A61K 9/16, 9/46

U.S. Cl. 424—494

8 Claims

1. A Time-Controlled Explosion System in which drug release is caused by explosion of a membrane after a definite time period, said System comprising a preparation in the form of a bead or granule, said preparation comprising a core which

is covered with an outer layer of drug, a further outer layer of disintegrating agent or synthesized polymer selected from the



group consisting of polyvinylacetate and polyacrylic acid, and an outer membrane of a water-insoluble coating material.

4,871,550

NUTRIENT COMPOSITION FOR ATHLETES AND METHOD OF MAKING AND USING THE SAME

Phillip L. Millman, 15823 Dodrill Dr., Hacienda Heights, Calif. 91745

Filed Sep. 5, 1986, Ser. No. 904,546

Int. Cl.⁴ A61K 33/42, 31/425, 33/00, 33/14, 31/70, 31/595, 31/195, 31/165, 31/14, 31/135

U.S. Cl. 424—601

6 Claims

1. A palatable, orally ingestible nutrient composition for athletes, comprising: electrolytes, carbohydrates, nutrient factors, and free amino acids, wherein the amino acids, expressed as an approximate weight percent of total free amino acids, comprise:

L-Isoleucine	15.50% ± 2%
L-Leucine	16.00% ± 2%
L-Valine	10.69% ± 2%
L-Lysine	13.92% ± 2%
L-Methionine	2.10% ± 1%
L-Phenylalanine	0.41% ± 0.2%
L-Threonine	2.90% ± 1.5%
L-Tryptophan	1.02% ± 0.5%
L-Alanine	9.30% ± 2%
L-Arginine	8.22% ± 2%
L-Aspartic Acid	0.32% ± 0.15%
Aminoacetic Acid	3.91% ± 1.8%
L-Histidine	4.02% ± 2%
L-Proline	8.38% ± 2%
L-Serine	2.39% ± 1%
L-Tyrosine	0.47% ± 0.2%
L-Cysteine	0.45% ± 0.2%

4,871,551

PIGMENTATION SUPPLEMENTS FOR ANIMAL FEED COMPOSITIONS

Kenneth G. Spencer, Poway, Calif., assignor to Microbio Resources, Inc., San Diego, Calif.

Filed Feb. 8, 1988, Ser. No. 153,308

Int. Cl.⁴ A23K 1/00

U.S. Cl. 426—2

27 Claims

1. A pigmentation supplement composition consisting essentially of comminuted Haematococcus alga having an average particle size below about 10 μm, wherein the Haematococcus was comminuted while in the dried encysted state said composition also containing a degradation inhibiting material.

4,871,552

HYDANTOINS AS ANIMAL FOOD SUPPLEMENTS
Robert W. Bragdon, Nashua, and Roger R. Gandette, Hudson, both of N.H., assignors to W. R. Grace & Co.-Conn., Lexington, Mass.

Continuation-in-part of Ser. No. 911,688, Sep. 25, 1986, Pat. No. 4,744,990. This application Mar. 29, 1988, Ser. No. 174,651. The portion of the term of this patent subsequent to May 17, 2005, has been disclaimed.

Int. Cl.⁴ A23K 1/00

U.S. Cl. 426—2

15 Claims

1. A method of feeding warm-blooded animals including poultry comprising administering thereto a nutritionally-effective amount of a 5-alkylidene, or 5-hydroxy-5-alkyl, substituted hydantoin analogue of an α-keto acid analogue of valine, isoleucine or leucine.

4,871,553

CELL CIRCUIT INTERRUPTER

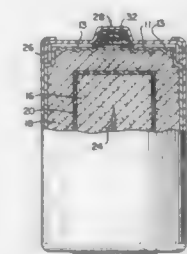
Harry R. Huhndorff, Bay Village, Ohio, assignor to Eveready Battery Company, Inc., St. Louis, Mo.

Filed Oct. 27, 1988, Ser. No. 263,303

Int. Cl.⁴ H01M 2/34

U.S. Cl. 429—61

19 Claims



1. A sealed galvanic cell comprising a conductive container having an upstanding wall open at one end and closed at the opposite end and including in said container a positive electrode, a negative electrode and an electrolyte, said conductive container being in electrical contact with one of said electrodes; a first cover mounted over, secured to and electrically insulated from said open end of said conductive container and in electrical contact with the other electrode; a second cover secured over the closed end of the container and the center portion of the second cover electrically insulated from the center portion of closed end of the container with the peripheral portion of the second cover in electrical contact with the container thereby adapting said second cover as the terminal for the electrode in electrical contact with said container; the surface of said closed end of the container weakened by disturbances in the surface so that the surface will bulge to a greater degree than a surface of a closed end of an identical container that has no disturbances when the surfaces are subjected to an internal pressure buildup within the container; and wherein the closed end of the container will bulge upon a predetermined pressure buildup within the container to force the second cover to break the electrical contact with the container thereby breaking the electrical contact between the second cover and the electrode in electrical contact with said container.

4,871,554

CALCIUM FORTIFIED FOOD PRODUCT

Rose H. Kalala, Orlando; Joe R. DeLeon, Longwood, and Thomas P. Maculan, Apopka, all of Fla., assignors to Coca-Cola Company, Atlanta, Ga.

Filed Aug. 12, 1987, Ser. No. 84,680
Int. Cl.⁴ A23L 2/02

U.S. Cl. 426—74 48 Claims

1. A calcium fortified beverage comprising:
 - (a) water;
 - (b) a concentrated fruit juice; and
 - (c) a solubilized calcium component derive from a salt blend wherein 50%–80% by weight of total calcium is tribasic calcium phosphate and about 20%–50% by weight of total calcium is calcium lactate.

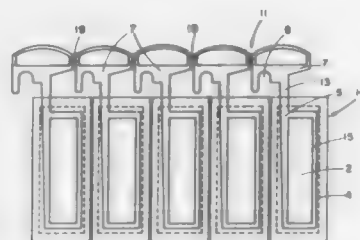
4,871,555

INFUSION, STIRRING AND HANGING DEVICE FOR PREPARING BEVERAGE

Erez Schwartz, and Zvi Schwartz, both of 15 Kinereth Street, Bnei-Brak, Israel 51201

Filed Mar. 30, 1988, Ser. No. 175,173
Claims priority, application Israel, Sep. 27, 1981, 63942
Int. Cl.⁴ B65D 33/02, 30/02, 33/06; B65B 29/04

U.S. Cl. 426—82 6 Claims



1. A disposable infusion stirring and hanging device for preparing a beverage comprising:

- a porous flexible bag made of a liquid permeable material, an infusible substance contained in said bag and a thin, flat premolded rigid nontoxic element;
- said bag comprising side edges and a top and bottom edge;
- said element comprising a lower section located within and enveloped by the porous bag and an integral upper section protruding vertically out of the bag;
- said lower section comprising a thin bar extending longitudinally within the bag along one of said side edges approximately from the top of the bag to approximately the bottom of the bag with two thin protrusions extending transverse to said bar and either at least partially across the bag or around the perimeter of said bag to form either a partial frame or full frame, respectively, within the bag sufficient to impart rigidity to said bag;
- said upper section including a first portion that is a continuation of said thin bar and extending longitudinally from said thin bar and protruding out of the bag along approximately said one side edge, said upper section further including an enlarged portion extending transverse from said longitudinally oriented first portion, and beyond the plane extending normal from said one side edge, said enlarged portion including a longitudinally oriented groove in said enlarged portion that is positioned beyond the plane extending normal from said one side edge, said groove being of a size sufficient to fit on the rim of a cup or glass, said enlarged portion further including an aperture of a size sufficient to allow one to press the thumb against the forefinger through the aperture and employ said rigid element as a stirrer, said length of the element from said enlarged portion to the bottom of said lower section being of a size such that when said groove is fitted onto a rim of said cup or glass said bag hangs on the wall and floats in the liquid in said cup or glass.

4,871,556

INHIBITION OF WARMED-OVER FLAVOR AND PRESERVING OF UNCURED MEAT CONTAINING MATERIALS

Allen J. St. Angelo, Metairie, and John R. Vercellotti, Covington, both of La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Jun. 16, 1988, Ser. No. 207,588
Int. Cl.⁴ A23B 4/14

U.S. Cl. 426—92 17 Claims

1. A manufacture comprising, an uncured meat containing material combined with an amount of N-carboxymethyl-chitosan effective to inhibit warmed-over flavor.

4,871,557

GRANOLA BAR WITH SUPPLEMENTAL DIETARY FIBER AND METHOD

Susan E. Linscott, Grand Rapids, Mich., assignor to Amway Corporation, Ada, Mich.

Filed Jun. 15, 1988, Ser. No. 207,118
Int. Cl.⁴ A23L 1/10

U.S. Cl. 426—93 22 Claims

1. A granola bar with supplemental dietary fiber comprising: a mixture of granola ingredients selected from the group consisting of grains, fruits, and nuts; supplemental dietary fiber in the form of compressed flakes, wherein the compressed flakes of supplemental dietary fiber have a mean particle size between about 100 and about 5 U.S. mesh and comprise between about 5 and about 20 percent of the granola bar.

4,871,558

OIL OR FAT COATED SUBSTANCE AND METHOD OF MAKING THE SAME

Toru Tackikawa, and Yoshihiko Fuseya, both of Kawasaki, Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan
Continuation of Ser. No. 18,529, Feb. 25, 1987, abandoned. This application May 9, 1988, Ser. No. 191,803

Claims priority, application Japan, Mar. 17, 1986, 61-59008
The portion of the term of this patent subsequent to Jun. 28, 2005, has been disclaimed.
Int. Cl.⁴ A23L 1/229

U.S. Cl. 426—99 6 Claims

1. A coated substance, comprising: a core material coated with a film comprising a mixture of a solid fat having a melting point between 50°–70° C. and an edible wax having a melting point between 65°–85° C., wherein said core material is a 5'-ribonucleotide, and wherein said film comprises about 2–50 parts by weight of said edible wax per 100 parts by weight of said solid fat.
5. A method of preparing a coated substance comprising the step of: coating a core material with a molten mixture comprised of a solid fat having a melting point between 50°–70° C. and an edible wax having a melting point between 65°–85° C. and cooling and solidifying said molten coating, wherein said core material is a 5'-ribonucleotide, and wherein said film comprises about 2–50 parts by weight of said edible wax per 100 parts by weight of said solid fat.

4,871,559

METHODS FOR PRESERVATION OF FOODSTUFFS
Joseph E. Dunn, Rancho La Costa; R. Wayne Clark, Del Mar; John F. Amun, La Jolla; Jay S. Pearlman, Rancho Palos Verde, all of Calif.; Keith Boyer, Los Alamos, N. Mex.; Francois Painchaud, Charlesbourg, Canada, and Gunter A. Hofmann, San Diego, Calif., assignors to Maxwell Laboratories, Inc., San Diego, Calif.

Continuation-in-part of Ser. No. 794,573, Nov. 4, 1985, abandoned, which is a continuation-in-part of Ser. No. 731,665, May 7, 1985, abandoned, which is a continuation-in-part of Ser. No. 555,383, Nov. 23, 1983, abandoned, which is a continuation-in-part of Ser. No. 703,289, Feb. 20, 1985, abandoned, which is a continuation-in-part of Ser. No. 930,646, Nov. 13, 1986, abandoned. This application Apr. 28, 1988, Ser. No. 187,281

Int. Cl.⁴ A23L 3/00, 3/28; A61L 2/00

U.S. Cl. 426—248 27 Claims

1. A method for preserving a perishable foodstuff to provide a preserved food product having improved keeping qualities with respect to deterioration resulting from microbiological surface growth or enzymatic degradation, comprising the steps of providing a solid food product to be treated,

illuminating the surface of said solid food product with a first very short pulse of intense polychromatic incoherent light having a duration in the range of from about 0.001 to about 100 milliseconds, an energy density in the range of from about 0.01 to about 50 joules per square centimeter at the surface of the food product, a wavelength distribution such that at least about 70 percent of the energy of said pulse of intense polychromatic incoherent light is distributed at wavelengths between 170 nanometers and 2600 nanometers, substantially instantaneously with the duration of said first polychromatic incoherent light pulse, heating a superficial surface layer of said surface of said food product through absorption of said short intense polychromatic incoherent light pulse to a temperature effective to inactivate enzymes and microorganisms at said superficial surface layer of said solid food product before substantial thermal conduction occurs from said superficial surface layer to the interior of said food product,

permitting the heat deposited in said superficial surface layer by said first very short intense pulse to dissipate from said superficial surface layer for a heat dissipation time period in the range of from about 0.001 to about 30 seconds, and illuminating the surface of said solid food product with at least one subsequent very short pulse of intense polychromatic incoherent light having a duration in the range of from about 0.001 to about 100 milliseconds, an energy density in the range of from about 0.01 to about 20 joules per square centimeter at the surface of the food product, a wavelength distribution such that at least about 70 percent of the energy of said at least one subsequent pulse of intense polychromatic incoherent light is distributed at wavelengths between 170 nanometers and 2600 nanometers, substantially instantaneously with the duration of said at least one subsequent short intense polychromatic incoherent light pulse heating a superficial surface layer of said surface of said food product through absorption of said at least one subsequent short intense polychromatic incoherent light pulse to a temperature effective to inactivate enzymes or microorganisms at said superficial surface layer of said solid food product before substantial thermal conduction occurs from said superficial surface layer to the interior of said food product to provide a surface sterilized food product having improved keeping qualities.

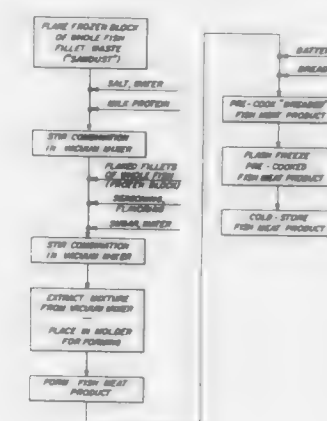
4,871,560

METHOD OF COMBINING FISH SAWDUST WITH FLAKED FISH

Alexander Brokman, Quail Run Rd., Rte. 3, Box 123-12, Denton, Md. 21629

Filed Dec. 31, 1987, Ser. No. 140,103
Int. Cl.⁴ A23L 1/325

U.S. Cl. 426—272 5 Claims



1. A process for manufacturing formed fish meat projects from the waste trimmings and cuttings of frozen whole fish fillets using only fish meat as a natural binding means, comprising the steps of:

- (a) flaking, shaving, or grinding into granular particles of fish meat from a frozen block of whole fish fillet waste cuttings and/or trimmings in the form of fish meat sawdust;
- (b) adding to the flaked, shaved, or ground fish meat sawdust means for initiating and enhancing the formation of fibrous protein gells to bind together the fish meat sawdust mixture;
- (c) mixing or stirring the fish meat sawdust mixture with a predetermined amount of water to facilitate the mixing or stirring at a temperature in the range of 30–35° F. and pressure of approximately 20 psi until the protein gells form and the fish meat sawdust mixture becomes a tacky or pasty binding means;
- (d) combining the tacky or pasty fish meat sawdust mixture with frozen fillets of whole fish which have been flaked, shaved, or ground into granular particles of fillet fish meat to bind together the fish meat sawdust and fillet fish meat combination;
- (e) mixing or stirring the fish meat combination with a predetermined amount of water to facilitate the mixing or stirring at a temperature in the range of 30–35° F. and pressure of approximately 20 psi until the entire fish meat combination is uniformly mixed together;
- (f) molding or forming the fish meat combination into a predetermined shape or shapes;
- (g) applying a covering of batter and breading to the formed fish meat combination, pre-cooking the breaded formed fish meat combination and, flash freezing the pre-cooked breaded fish meat combination.

4,871,561

METHOD FOR SALTING MEAT

Raymond G. Parker, High Wycombe, England, assignor to W. R. Grace & Co.-Conn., Duncan, S.C.

Filed Mar. 14, 1988, Ser. No. 167,819

Claims priority, application United Kingdom, Apr. 2, 1987, 8707945

Int. Cl.⁴ A23B 4/02

U.S. Cl. 426—281 9 Claims

1. Method for curing meat with salt which comprises inject-

ing into meat saturated brine having suspended therein solid salt having a particle size not greater than 100 micrometers.

4,871,562

PROCESS FOR THE PROCESSING OF CACAO BEANS
Masakazu Terauchi, Tokyo, and Gentaro Suzuki, Kanagawa, both of Japan, assignors to Meiji Seika Kaisha, Ltd., Tokyo, Japan

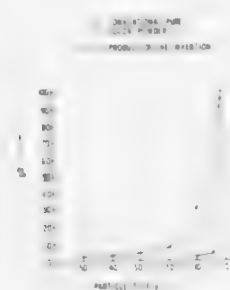
Continuation of Ser. No. 818,918, Jan. 15, 1986, Pat. No. 4,758,444, which is a continuation of Ser. No. 589,833, Mar. 15, 1984, abandoned. This application Jan. 11, 1988, Ser. No. 141,804

Claims priority, application Japan, Mar. 15, 1983, 58-41561
The portion of the term of this patent subsequent to Jul. 19, 2005, has been disclaimed.

Int. Cl.⁴ A23G 1/00

U.S. Cl. 426—330.3

13 Claims



1. A process for producing cocoa butter comprising:

- (1) uniformly mixing (a) alkali-treated cacao mass, which has been obtained from roasted cacao beans or nibs, having a pH of about 6.0 to about 8.5 or (b) alkali-treated cocoa powder, which has been obtained from roasted cacao beans or nibs, having a pH of about 6.0 to about 8.5 with (c) about 3 to about 10 times by weight of hot water based on the weight of the cacao mass or cocoa powder, in the presence of (d) from about 0.2 to about 20% by weight of ethanol based upon the weight of the cacao mass or cocoa powder;
- (2) maintaining the resulting mixture of step (1) at a temperature of 70° to 130° C. for about 1 hour to dissolve a water-ethanol soluble portion of the cacao mass or cocoa powder and to produce a colloidal form mixture; and
- (3) separating cocoa butter from the resulting colloidal form mixture of step (2) so as to obtain said cocoa butter.

4,871,563

PROCESS FOR CONTROL OF FOOD PATHOGENS
Sita R. Tatnai, St. Paul, Minn., assignor to Regents of the University of Minnesota, Minneapolis, Minn.

Filed May 22, 1987, Ser. No. 53,353
Int. Cl.⁴ A23C 4/00

U.S. Cl. 426—334

4 Claims

1. The process for controlling foodborne pathogens in low-acid anaerobically packaged foods comprising the steps of:
- (a) adding from about 0.1% to about 1% diacetyl to a low-acid food product; and
 - (b) heating the food product and diacetyl at a temperature of greater than about 75° and less than about 110° C. whereby the foodborne pathogens are substantially inhibited or killed.

4,871,564

COFFEE AROMATIZING METHOD

Oscar W. Stoeckli, Rye, N.Y., and David J. Berry, Montvale, N.J., assignors to General Foods Corporation, White Plains, N.Y.

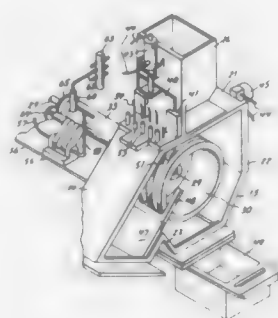
Continuation of Ser. No. 358,757, Mar. 16, 1982, Pat. No. 4,496,596, which is a continuation of Ser. No. 220,927, Dec. 29, 1980, Pat. No. 4,355,571. This application Jul. 16, 1984, Ser. No. 430,411

The portion of the term of this patent subsequent to Jan. 29, 2002, has been disclaimed.

Int. Cl.⁴ A23F 5/46

U.S. Cl. 426—388

3 Claims



1. A method for aromatizing a mass or adsorbent coffee particulates with a carrier oil enriched with coffee aroma, said method comprising:

- (a) dividing a mass of coffee particulates into a bulk stream and a fraction stream;
- (b) forming the fraction stream of coffee particulates into at least one continuously moving ribbon of particulates;
- (c) injecting a carrier oil enriched with coffee-aroma into each continuously moving ribbon of particulates at a predetermined liquid to solids weight ratio;
- (d) blending the aroma enriched fraction stream into said bulk stream to form a uniform dispersion of aroma-enriched coffee particulates in said mass of coffee particulates.

4,871,565

METHOD OF PRODUCING RETORT PACKAGED FISH
Ko Sugisawa, Yasushi Matsumura, both of Nara; Hidefumi Okamoto, Sakai, and Kumiko Abe, Kurashiki, all of Japan, assignors to House Food Industrial Company Limited, Osaka, Japan

Filed Sep. 1, 1987, Ser. No. 91,870

Claims priority, application Japan, Sep. 11, 1986, 61-214789
Int. Cl.⁴ B65D 81/34; B65B 55/04; A23L 3/00; A23B 4/00
U.S. Cl. 426—407

7 Claims

1. A method of producing packaged fish which is substantially free of drips during retort sterilization, which consists essentially of:

- (a) subjecting broiled fish to hot-water processing by either soaking said broiled fish in hot water having a temperature of 65° to 98° C. for 10 to 150 seconds, or blowing steam onto said broiled fish for 3 to 240 seconds;
- (b) drying said hot-water processed broiled fish;
- (c) enclosing said dried, hot-water processed, broiled fish in a sealed package; and
- (d) retort sterilizing said sealed package containing said dried, hot-water processed, broiled fish, wherein said packaged fish is selected from the group consisting of sardine, horse mackerel, pacific saury, mackerel, salmon, yellow tail, spanish mackerel, herring, eel conger eel, flat fish, sea bream and pollack, said broiled fish having a hardness of 85 g to 1500 g before said hot-water processing.

4,871,566

OIL-BEARING NUT COMPOSITION AND PROCESS OF MAKING

Colin E. Farnum, Etobicoke; Allan A. Torney, Brampton, and Bruce P. McKeown, Guelph, all of Canada, assignors to Canada Packers Inc., Ontario, Canada

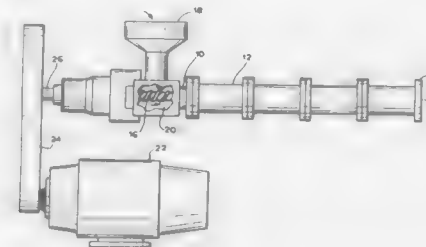
Filed Jun. 15, 1988, Ser. No. 206,661

Claims priority, application Canada, Jun. 15, 1987, 539681

Int. Cl.⁴ A23L 1/20; A23P 1/06

U.S. Cl. 426—632

15 Claims



1. A substantially free flowing, solid, particulate, oil-bearing nut composition for use in edible products, the composition comprising nut particles;

from about 15–70% by weight of the product, based on the initial weight of oil-bearing nuts, being in the form of nut particles having a maximum dimension greater than 500 microns;

from about 12–80% by weight, on the same basis, being in the form of nut particles having a maximum dimension less than 150 microns;

the composition being substantially free of nut particles having a maximum dimension greater than 15 millimeters; the composition containing substantially all of its original natural nut oil from 12–85% thereof being disposed within the nut particles so as to be unextractable from the nut particles by aqueous detergent washing at 25° C. under non shear conditions.

4,871,567

METHOD FOR PREPARING RECONSTITUTABLE REFRIED BEANS CONTAINING CRUSHED AND WHOLE BEANS

Mark H. Sterner, 5553 Wentworth, Riverside, Calif. 92505; Mark M. Sterner, 1772 Melqua Rd., Roseburg, Oreg. 97470, and Ronald S. O. Zane, 5533 Wentworth, Riverside, Calif. 92505

Continuation-in-part of Ser. No. 935,265, Nov. 26, 1986, Pat. No. 4,735,816, which is a continuation-in-part of Ser. No. 775,756, Sep. 13, 1985, abandoned. This application Mar. 18, 1988, Ser. No. 169,819

Int. Cl.⁴ A23B 7/02; A23L 1/20

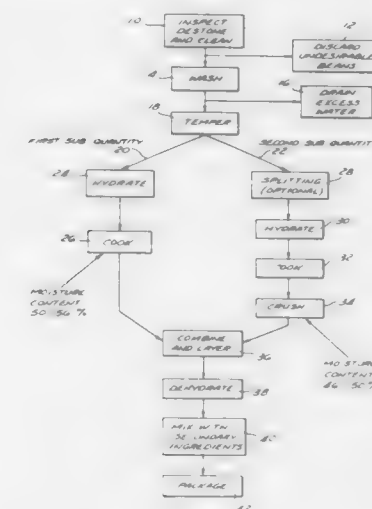
U.S. Cl. 426—461

20 Claims

1. A method of preparing a reconstitutable bean preparation containing both crushed and whole beans, said method comprising the steps of:

- a. exposing a quantity of washed whole beans to air for a time sufficient to temper said quantity of whole beans;
- b. dividing said quantity of whole beans into first and second sub-quantities of beans;
- c. separately hydrating said first and said second sub-quantity of beans;
- d. separately cooking said first and said second sub-quantities of beans;
- e. pressing said second sub-quantity of beans to provide crushed beans;
- f. dehydrating said first sub-quantity of whole beans and said second sub-quantity of crushed beans to a moisture content of approximately 7% to 10%;

g. combining said first sub-quantity of whole beans with said second sub-quantity of crushed beans to form a reconstitutable bean preparation.



able, dehydrated bean preparation containing both crushed and whole beans.

4,871,568

METHOD FOR PITTING OLIVES

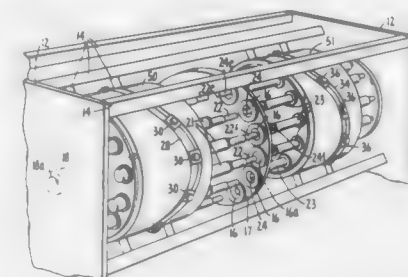
Fred J. Cimperman, Castro Valley, Calif., assignor to Ashlock Company, San Leandro, Calif.

Filed Mar. 23, 1988, Ser. No. 172,308

Int. Cl.⁴ A23N 4/08

U.S. Cl. 426—484

4 Claims



1. A method for pitting an olive, including the steps of:

- (a) translating a pocket, having a first surface, dimensioned to receive an olive, along a portion of a substantially circular pocket path;
- (b) translating each of a first knife and a second, opposed matching knife along a path substantially parallel to the pocket path;
- (c) while the pocket occupies a first segment of the pocket path, simultaneously advancing the first knife and the second knife so that both knives simultaneously penetrate opposite ends of an olive positioned between the knives, wherein the olive has an axis extending between the opposite ends thereof;
- (d) while the pocket and the olive occupy a second segment so the pocket path, extracting a pit from within the olive by unidirectionally translating the first knife and the second knife in a manner so that the second knife retracts along the axis while the first knife advances along the axis; and
- (e) while the pocket and pitted olive occupy a third segment of the pocket path, retracting the first knife and the second knife away from the pitted olive and the pocket.

4,871,569

DUAL-STREAM JUICE PROCESSING FOR
RECOVERING JUICE SOLIDS FROM EXTRACTOR
CORE MATERIALBarry J. Anderson, Blue Ash, Ohio, and Dale S. Arand, Winter
Haven, Fla., assignors to The Procter & Gamble Company,
Cincinnati, Ohio

Filed May 17, 1988, Ser. No. 194,792

Int. Cl.⁴ A23P 1/00

U.S. Cl. 426—489

17 Claims

1. A method for processing citrus fruit to provide improved
juice yields, which comprises the steps of:

- processing citrus fruit in a reciprocating cup-type extrac-
tor to provide a primary juice stream and extractor core
material; and
- processing the extractor core material having a quick fiber
content of at least 60 ml in a centrifugal filter to provide a
secondary juice stream, said processing being carried out
at a centrifugal force of from about 300 G to about 1500 G
force for a period of from about 0.5 sec to 15 sec.

4,871,570

FOODSTUFFS CONTAINING HYDROBENZENE
ORGANIC ACIDS AS SWEETNESS MODIFYING AGENTSRonald E. Barnett, and Ronald G. Yarger, both of Suffern, N.Y.,
assignors to General Foods Corp., White Plains, N.Y.

Continuation of Ser. No. 477,790, Mar. 22, 1983, abandoned,

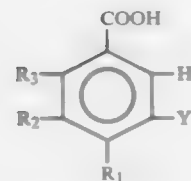
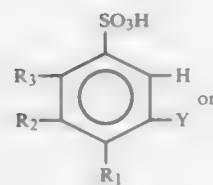
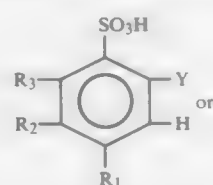
which is a continuation-in-part of Ser. No. 274,035, Jun. 15,

1981, abandoned. This application Nov. 6, 1984, Ser. No. 669,051

Int. Cl.⁴ A23L 1/22, 1/236

U.S. Cl. 426—535

12 Claims

1. A composition comprising a foodstuff or pharmaceutical
preparations and a sweetness inhibiting agent, said sweetness
inhibiting agent being present in amounts to perceive a sweet-
ness inhibiting effect in said composition and having the struc-
ture selected from the group consisting of:

Wherein Y is an OH group or salt thereof; R₁, R₂ and R₃ each
are selected from the group consisting of hydrogen, alkyl
group containing from 1 to 3 carbon atoms, OH, OCH₃,
OCH₂CH₃, CHO, COCH₃, COOH, COOCH₃, OCOCH₃,
CONH₂, SO₂NH₂ and NH₂ and with the proviso that in struc-
ture (iii), R₁, R₂ and R₃ are not all hydrogen and a further
proviso that R₂ and R₃ are not NH₂.

4,871,571

DIETETIC FOODSTUFF CONTAINING LOW CALORIE
BULKING AGENTVilly J. Jensen, Bagsvaerd; Sven Pedersen, Gentofte, and Hans
A. S. Olsen, Holte, all of Denmark, assignors to Novo Industri
A/S, Bagsvaerd, Denmark

Filed Jan. 30, 1987, Ser. No. 67,871

Int. Cl.⁴ A23L 1/236, 2/00; A23G 9/00; A21D 13/00

U.S. Cl. 426—548

3 Claims

1. A dietetic foodstuff formed from a foodstuff composition
comprising nutrients, an artificial sweetener and a bulking
agent the bulking agent being in an amount of 1-50% by
weight of said composition, said bulking agent being in substi-
tution for simple soluble carbohydrates that otherwise would
be present in said foodstuff composition, said bulking agent
being a glucose oligomer of DP 3 or 4 or a mixture thereof,
each oligomer having one beta-1,3glucosidic bond, all addi-
tional bonds being beta-1,4glucosidic bonds whereby the food-
stuff is dietetic in character.

4,871,572

REPLACEMENT OF MUNG BEAN STARCH BY
MODIFIED POTATO AND SWEET POTATO STARCH IN
ORIENTAL NOODLESChung-Wai Chiu, Westfield, N.J., and Hunter Chua, Bukit
Batok, Singapore, assignors to National Starch and Chemical
Corporation, Bridgewater, N.J.

Filed Dec. 16, 1987, Ser. No. 133,777

Int. Cl.⁴ A23L 1/16

U.S. Cl. 426—557

12 Claims

1. An extruded oriental noodle, consisting essentially of a
starch and water, characterized in that the starch used in the
preparation of the noodle is a mixture of mung bean starch and
a granular crosslinked potato starch or a granular crosslinked
sweet potato starch, the granular potato starch being cross-
linked sufficiently to have a sediment volume of about 2-16 ml
and the sweet potato starch being crosslinked to have a sedi-
ment volume of about 2-6 ml.

4,871,573

(ii) PRODUCT AND PROCESS FOR THE PRODUCTION OF
A MILK POWDERHans-Ueli Bohren, Saint-Legier; Theo W. Kuypers, Richigen,
and Niklaus Meister, Grosshochstetten, all of Switzerland,
assignors to Nestec S. A., Vevey, Switzerland

Filed Oct. 30, 1986, Ser. No. 926,380

Claims priority, application European Pat. Off., Nov. 23,
1985, 85114889.0Int. Cl.⁴ A23C 9/18

U.S. Cl. 426—588

16 Claims

1. A process for producing a milk powder having lactose in
essentially crystallized form and from 20% to 30% fats by
weight of dry matter of which from 20% to 90% are in the free
state comprising seeding a material of essentially lactic origin
with fine lactose crystals in an amount sufficient for initiating
crystallization of lactose from the material and thereby form-
ing a dispersion, cooling the dispersion and maintaining it at a
temperature at or below 20° C., adding milk fats to the cooled
dispersion in an amount sufficient for forming a cooled mixture
having a fat content of from 20% to 30% by weight dry matter,
then spray drying the cooled mixture under conditions for
maintaining the lactose in its crystalline state and for obtaining
a powder having from 20% to 90% of the fats in the free state.

4,871,574

PROCESS FOR PREPARING FLOUR FROM
JERUSALEM ARTICHOKE TUBERSHiroshi Yamazaki, Nepean; Howard W. Modler, Kemptville;
John D. Jones, and James I. Elliot, both of Ottawa, all of
Canada, assignors to Canadian Patents And Development
Limited/Societe Canadienne Des Brevets Et d'Exploitation
Limitee, Ottawa, Canada

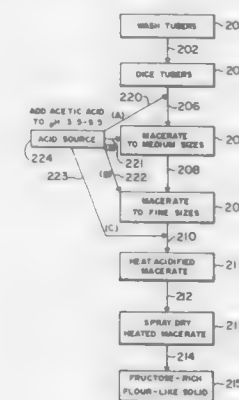
Filed Aug. 4, 1988, Ser. No. 228,266

Claims priority, application Canada, Aug. 7, 1987, 544021

Int. Cl.⁴ A23L 1/214

U.S. Cl. 426—622

35 Claims



1. A process for the preparation of flour from the inulin in
tubers of Jerusalem artichoke or similar inulin-containing
plants, which process comprises the steps of:

- macerating said tubers to a homogenate;
- heating said homogenate at a temperature ranging from
about 150° C. to about 90° C. for a time ranging, respec-
tively from about 15 seconds to about 10 minutes;
- subjecting said heated homogenate to spray drying in a
stream of hot gas; and
- recovering a flour comprising a mixture of monosaccha-
rides, small oligosaccharides and large oligosaccharides.

4,871,575

FLAVOR AND TEXTURE IMPROVED CANNED ANIMAL
FLESH AND PROCESSTimothy Callahan, Delhi, N.Y., and Jack Herz, Weston, Conn.,
assignors to Deltown Chemurgic Corporation, Greenwich,
Conn.

Filed Mar. 7, 1988, Ser. No. 164,611

Int. Cl.⁴ A23L 1/325

U.S. Cl. 426—643

6 Claims

1. A composition of canned tuna fish flesh of enhanced
flavor and improved texture, comprising said tuna fish flesh in
combination with a water soluble or dispersible rice flour
which has been neutralized and hydrolyzed by a proteolytic
enzyme.

4,871,577

NEW MODIFIED GLUTEN PRODUCT AND BREAD
IMPROVER COMPOSITIONShigeru Endo, Kawagoe; Yoshie Negishi, and Kiwamu Shiiba,
both of Saitama, all of Japan, assignors to Nissin Flour
Milling Co., Ltd., Tokyo, Japan

Filed Apr. 21, 1987, Ser. No. 40,815

Claims priority, application Japan, Apr. 25, 1986, 61-96205;
May 14, 1986, 61-110103; May 14, 1986, 61-110104Int. Cl.⁴ A21D 2/00

U.S. Cl. 426—653

11 Claims

1. A bread improver intended for addition to wheat flour or
dough for improvement of the volume, the crumb structure
and the crumb smoothness of bread, wherein the bread im-
prover is selected from the group consisting of (A) a bread

improver consisting essentially of a water-insoluble, modified
gluten product which is prepared by kneading a mixture of
wheat flour, one or more oxidizing agents and water, then
washing the resulting hydrated flour mixture so kneaded with
water and separating the water-insoluble proteinaceous sub-
stance of said hydrated flour mixture, (B) a bread improver
consisting essentially of a water-soluble proteinaceous sub-
stance which is prepared by kneading a mixture of wheat flour,
one or more oxidizing agents and water to produce a hydrated
flour mixture including starch, a water-soluble proteinaceous
substance, a water-insoluble modified gluten product and other
water-insoluble matters, then washing the resulting hydrated
flour mixture so kneaded with water and separating the water-
soluble proteinaceous substance for the starch, the water-
insoluble modified gluten product and the other water-insolu-
ble matters present in said hydrated flour mixture, and (C) a
bread improver consisting essentially of a proteinaceous com-
position which is prepared by admixing the aforesaid water-
insoluble, modified gluten product of the bread improve (A)
with the aforesaid water-soluble proteinaceous substance of
the bread improve (B).

4,871,578

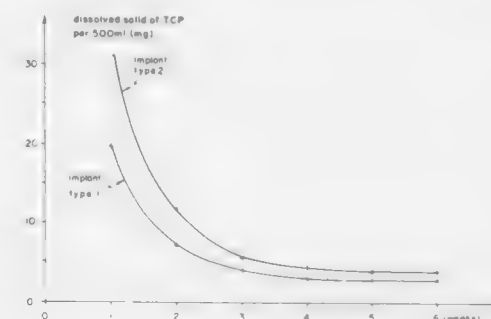
HYDROXYLAPATITE COATING ON METAL OR
CERAMICPeter Adam, Dachau; Adolf Nebelung, Ketsch, and Michael
Vogt, Moerlenbach, all of Fed. Rep. of Germany, assignors to
MTU Motoren- und Turbinen-Union Muenchen GmbH, Mu-
nich and Benckiser-Knapack GmbH, Ladenburg, both of,
Fed. Rep. of Germany

Filed Apr. 4, 1988, Ser. No. 177,246

Claims priority, application Fed. Rep. of Germany, Apr. 4,
1987, 3711426Int. Cl.⁴ B05D 1/10; A61C 13/30; A61F 1/64

U.S. Cl. 427—2

10 Claims



1. A process for the production of a layer of hydroxylapatite
(HA) on metallic and non-metallic bodies for implants, com-
prising the steps of:

- applying a layer of α - or β -tricalcium phosphate (TCP);
- completely converting said layer into pure HA by reaction
with water at an elevated temperature.

4,871,579

PROCESS AND DEVICE FOR SPRAYING A REACTION
MIXTURE CAPABLE OF FORMING A TRANSPARENT
PROTECTIVE LAYER OF HIGH OPTICAL QUALITYJean-Louis Bravet; Francois Toyot, both of Thourrette; Gerd
Leyens, Aachen; Siegfried Pikhart, Roetgen, and Herbert
Bayer, Aachen, all of France, assignors to Saint-Gobain Vitre,
Courbevoie, France

Continuation of Ser. No. 4,240, Jan. 2, 1987, Pat. No. 4,783,344.

This application Aug. 30, 1988, Ser. No. 238,110

Claims priority, application France, May 2, 1984, 84 06783

Int. Cl.⁴ B05D 1/02, 1/04

U.S. Cl. 427—31

11 Claims

1. A process for coating a transparent glass article with high

optical quality having thereon an energy-absorbing layer and an inside protective layer, which comprises spraying a polymerizable mixture of reaction components to form said inside protective layer on said energy-absorbing layer of said glass article, wherein the mixture of reaction components to form said inside protective layer is sprayed by high-speed centrifugal spraying with the spray head revolving at a speed between about 1,000 and 80,000 rpm, and polymerizing the resultant layer; and wherein a pretreatment of the glass article to be coated is effected, said pretreatment comprising chemically coating the surface of said support with an organosilane adhesion promoter to improve adhesion of a subsequently formed protective layer thereon.



gal spraying with the spray head revolving at a speed between about 1,000 and 80,000 rpm, and polymerizing the resultant layer; and wherein a pretreatment of the glass article to be coated is effected, said pretreatment comprising chemically coating the surface of said support with an organosilane adhesion promoter to improve adhesion of a subsequently formed protective layer thereon.

4,871,580

METHOD OF TREATING SURFACES OF SUBSTRATES WITH THE AID OF A PLASMA

Daniel C. Schram, and Gerardus M. W. Kroesen, both of MB Eindhoven, Netherlands, assignors to Faculty of Physics Eindhoven University of Technology, Eindhoven, Netherlands

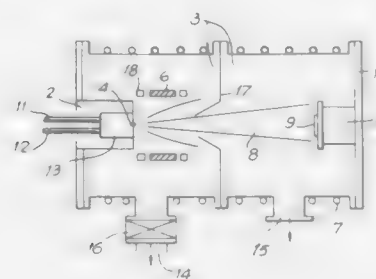
Filed Jun. 13, 1988, Ser. No. 206,181

Claims priority, application Netherlands, Jun. 30, 1987, 170150

Int. Cl.⁴ B05D 3/06

U.S. Cl. 427—38

19 Claims



1. A method of treating the surfaces of substrates with the aid of a plasma, comprising the steps:

- supporting a substrate in a plasma treatment chamber,
- providing at least one plasma-generator connected by at least one plasma-inlet to the plasma treatment chamber,
- introducing a reactant via at least one inlet into said plasma-generator,
- generating a plasma in said plasma-generator,
- maintaining in the treatment chamber a pressure lower than that in the said plasma-generator whereby a stream of plasma flows through the plasma-inlet from the said plasma-generator to the said plasma treatment chamber, and
- flushing through the plasma-generator a flushing gas.

4,871,581

CARBON DEPOSITION BY ECR CVD USING A CATALYTIC GAS

Shunpei Yamazaki, Tokyo, Japan, assignor to Semiconductor Energy Laboratory Co., Ltd., Atsugi, Japan

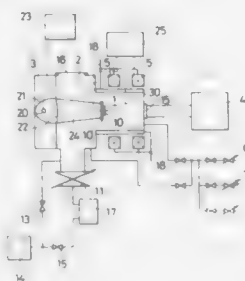
Filed Jul. 8, 1988, Ser. No. 216,333

Claims priority, application Japan, Jul. 13, 1987, 62-175559

Int. Cl.⁴ B05D 3/14

U.S. Cl. 427—39

8 Claims



1. A method of depositing a material consisting mainly of carbon comprising the steps of:

- placing an object for deposition in a reaction chamber;
- introducing a carbon compound gas into said reaction chamber; and
- inputting a power to said reaction chamber in order to decompose said carbon compound gas and deposit the carbon product of the decomposition on the surface of said object,

wherein a catalytic gas is introduced into said reaction chamber in order to expedite the deposition of said carbon product, said catalytic gas being the halide or the hydride of germanium.

4,871,582

METHOD OF MANUFACTURING MAGNETIC RECORDING MEDIUM

Takeshi Miyabayashi, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

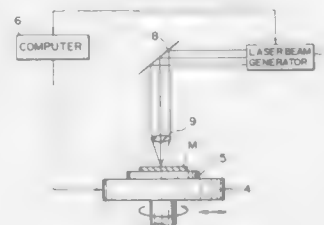
Filed Aug. 20, 1987, Ser. No. 87,633

Claims priority, application Japan, Sep. 12, 1986, 61-216804

Int. Cl.⁴ B05D 3/06

U.S. Cl. 427—53.1

6 Claims



1. A method of manufacturing a magnetic recording medium comprising the steps of:

- forming a non-magnetic layer on a substrate by using a non-magnetic material made of amorphous Ni-P alloy which is magnetizable by heat at a predetermined temperature, and then locally heating with a laser beam in an inert gas atmosphere said nonmagnetic layer to magnetize the heated part to thereby locally form a magnetic layer made of crystalline Ni-P alloy thereat.

4,871,583

HOUSING FOR AN ELECTRONIC DEVICE

Michel J. Monnier, Montgeron, France, assignor to U.S. Philips Corporation, New York, N.Y.

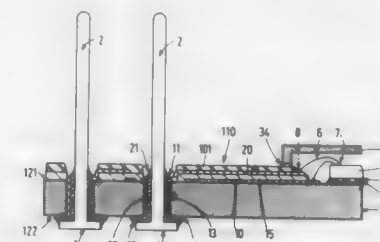
Division of Ser. No. 809,633, Dec. 16, 1985, abandoned. This application Jun. 30, 1987, Ser. No. 68,735

Claims priority, application France, Dec. 21, 1984, 84 19660

Int. Cl.⁴ B05D 5/12

U.S. Cl. 427—96

17 Claims



1. A method for the manufacture of a housing for an electronic device, characterized by the following steps:

- forming a ceramic substrate,
- piercing holes in the substrate to accommodate mounting pins of a housing and providing an area for accommodation of an electronic device,
- metallizing the holes and forming conducting rings around the holes on each side of the substrate, these operations being carried out by screen-printing using a conducting ink which is made of, at least, copper and a vitreous-crystalline material, said conducting ink being fired in a neutral atmosphere at a temperature lower than the melting temperature of copper, said operations comprising the steps of depositing an amount of said conducting ink at the opening of the holes, diffusing the ink in the holes by reflowing, and firing the layers of said conducting ink thus obtained,
- depositing a first conducting layer in a pattern to form conductors for interconnecting part of the terminals of the electronic device to part of the pins, leaving free the area for accommodating the electronic device, said deposition being carried out by screen-printing using a conducting ink comprising copper, said ink being identical to or compatible with the ink used for metallizing the holes and the rings; and firing said first conducting layer,
- depositing an insulating layer in a pattern where two successive conducting layers are isolated, thereby leaving free the area for accommodating the electronic device as well as the conducting rings and the ends of the conductors located opposite the terminals of the electronic device, said deposition process being carried out by screen-printing using an insulating vitreous-crystalline ink fired in a neutral atmosphere at a temperature compatible with that of the conducting ink, said insulating ink having a coefficient of expansion very close to that of the substrate up to the firing temperature of said insulating layer, and firing said insulating layer.

- alternately depositing conducting and insulating layers, respectively, to form a multilayer circuit in a pattern of a network of conductors necessary for interconnecting the terminals of the electronic device and the pins of the housing, thereby leaving free said area for accommodating the electronic device as well as the conducting rings and the ends of the conductors located opposite the terminals of the device, said alternate deposition processes being carried out by screen-printing with types of ink being alternately conductive and insulative, said types of ink being identical to or compatible with the conducting and insulating ink forming the preceding layers, the last layer of said alternate layers being a protective insulating layer, and firing said alternating conducting and insulating layers individually one by one upon depositing each alternating layer,
- temporarily protecting the zones which are formed by

the area for accommodating the electronic device and the ends of the conductors located opposite said area by using a varnish resistant to a solder used for fixing metal mounting pins,

- locating said metal mounting pins consisting of a shank provided with a flat head, said shank going through said substrate at the location of the holes, said pins sufficiently projecting from one of the faces to ensure a proper fixation of the housing, said flat head being supported by the conducting ring located at the other face of the substrate, and, subsequently, soldering the pins using a metal alloy which is compatible with the metal coating of the holes and rings at a melting temperature being lower than or substantially equal to the firing temperature of the multilayer circuit layers,
- removing the protective varnish,
- locating and fixing the electronic device in the area reserved at the substrate,
- providing flexible metal wires between the terminals of the electronic device and the ends of the conductors of the multilayer circuit which are left free, and
- fixing as protective cap over the electronic device.

4,871,584

PROCESS OF COATING AND DRYING BOTH SIDES OF PRINTED CIRCUIT BOARDS

Erich Weber, Effnerstr. 89, D-8000 Muenchen 80, Fed. Rep. of Germany

PCT No. PCT/DE87/00026, § 371 Date Nov. 23, 1987, § 102(e) Date Nov. 23, 1987, PCT Pub. No. WO87/04584, PCT Pub. Date Jul. 30, 1987

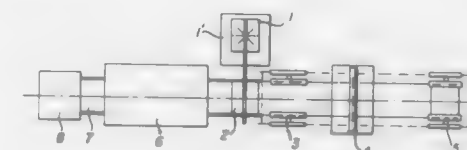
PCT Filed Jan. 22, 1987, Ser. No. 128,830

Claims priority, application Fed. Rep. of Germany, Jan. 27, 1986, 3602350

Int. Cl.⁴ B05D 5/12

U.S. Cl. 427—96

2 Claims



1. A process for coating both sides of printed circuit boards with a photosensitive lacquer comprising the steps of:

- feeding a circuit board to a conveyor belt;
- depositing said circuit board from said conveyor belt into a movable board holder which grips said board only at the outer edges of said board;
- moving said board holder and said circuit board in a first linear direction to and through a coating device where a first side of said board is coated with photosensitive lacquer in a horizontal position;
- moving said board holder with the circuit board, coated on one side, in said first linear direction to a turning station where said board holder, with the board gripped thereon, is turned around by 180°;
- passing back the board holder and the board, in a turned alignment to said coating device in a second linear direction, opposite to said first linear direction;
- coating a second side of said board in said coating device with photosensitive lacquer in a horizontal position;
- moving said board holder and said board, coated on opposite sides in said second linear direction to a drying station where the photosensitive lacquers on both sides of said board are concurrently dried.

4,871,585

METHOD OF PLATING TREATMENT

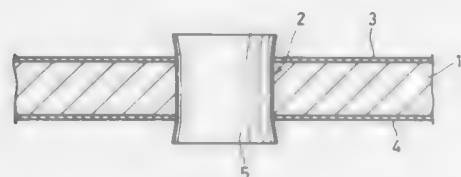
Osamu Kano, Yoshihiko Takano, and Atsuo Senda, all of Kyoto, Japan, assignors to Murata Manufacturing Co., Ltd., Japan
Filed Apr. 5, 1988, Ser. No. 177,964

Claims priority, application Japan, Apr. 6, 1987, 62-84267

Int. Cl.⁴ B05D 5/12

U.S. Cl. 427—98

13 Claims



1. A method of plating treatment for forming a plated coating on the surface of a workpiece except on a region thereof, comprising the steps of:

- preparing a masking member made from water swelling rubber,
- disposing said masking member in opposed relation the region of the surface of a workpiece where no plating is desired,
- imparting water to said masking member to thereby bring about the volumetric self-swelling of said water swelling rubber which constitutes said masking member so as to ensure that said masking member closely contacts said region of the surface of said workpiece, and then
- immersing said workpiece in a plating bath with said masking member closely contacted with said region, thereby applying plating to the surface of said workpiece except the region protected by said masking member against entrance of the plating solution.

4,871,586

PROCESS FOR THE PREPARATION OF AN IRON ARMATURE FOR USE WITH SLABS OR REINFORCED ARTICLES FROM AN AGGLOMERATE OF SILICEOUS SAND, MARBLE, GRANITE OR, IN GENERAL, STONE

Marcello Toncelli, Via Giovanni XXIII, 2, Bassano del Grappa (Vicenza), Italy

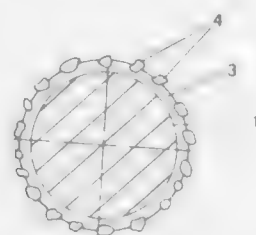
Filed Mar. 16, 1988, Ser. No. 168,666

Claims priority, application Italy, Mar. 20, 1987, 85522 A/87

Int. Cl.⁴ B05D 1/12

U.S. Cl. 427—204

4 Claims



1. A process for the preparation of an iron armature for use with slabs or reinforced articles which consists of making an agglomerate of siliceous sand, marble, granite or, other, stone with cement as a binder, covering an iron armature rod (1) with said agglomerate to obtain a rod covered with a layer of said agglomerate, immersing said covered rod in a vessel (2) containing a resin (3) whereby a film of resin on said covered rod is obtained, spreading on the surface thereof granules of siliceous sand or other stone material (4) whereby adherence is achieved between said iron rod and said agglomerate, and resistance to oxidation is achieved.

4,871,587

PROCESS FOR COATING AN OBJECT WITH SILICON CARBIDE

Harry Levin, 19831 Friar Street, Woodland Hills, Calif. 91367
Continuation of Ser. No. 932,029, Nov. 18, 1986, abandoned, which is a continuation-in-part of Ser. No. 749,661, Jun. 28, 1985, Pat. No. 4,668,493, and a continuation-in-part of Ser. No. 618,712, Jan. 8, 1984, Pat. No. 4,737,348, and a continuation-in-part of Ser. No. 390,920, Jun. 22, 1982, abandoned, said Ser. No. 749,661, is a continuation-in-part of Ser. No. 390,920. This application Aug. 8, 1988, Ser. No. 230,740

Int. Cl.⁴ C23C 16/00

U.S. Cl. 427—249

5 Claims

1. A process for coating a carbon or graphite object with silicon carbide by contacting it for a period of time with silicon liquid and vapor in a reaction chamber, said process comprising the steps of:

- (a) passing a stream comprising silicon-containing precursor material from the group consisting of silane halosilanes and halosilicic acids in gaseous phase below the decomposition temperature of said material and a co-reactant, carrier or diluent gas such as hydrogen through a hole within a high emissivity, thin, insulating septum into said reaction chamber; said reaction chamber being maintained at a temperature above the melting point of silicon, said temperature being at least 1400° C.; said thin septum having one face below the decomposition temperature of said gas and an opposite face exposed to the reaction chamber, whereby said precursor gas is decomposed to silicon liquid in said reaction chamber;
- (b) removing a stream of any decomposition gas and any unreacted precursor gas from said reaction chamber; and
- (c) contacting said object in said reaction chamber with said silicon liquid, and recovering said object from said reaction chamber after it has been coated with silicon carbide.

4,871,588

METHOD AND APPARATUS FOR ACCENT COATING OF LAP PANELS

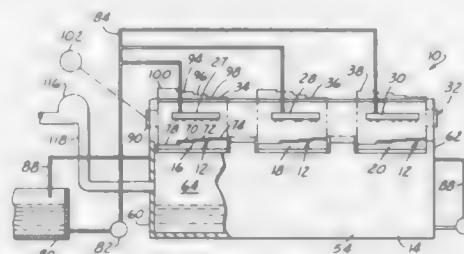
Jared G. Cuddy, Utica, and William H. Juntunen, Southfield, Mich., assignors to Abitibi-Price Corporation, Troy, Mich.

Filed Aug. 29, 1988, Ser. No. 237,954

Int. Cl.⁴ B05D 3/04, 3/12, 5/00; B05C 11/06

U.S. Cl. 427—264

26 Claims



1. A method of coating panels having a plurality of embossed panel portions extending lengthwise thereof and at least one transition zone connecting the adjacent embossed panel portions, comprising the steps of moving said panels lengthwise along a predetermined path, and, during movement of said panels along said path, applying a liquid coating to said panel portions and transition zones of said panels, wiping only some of the liquid coating thus applied from said embossed panel portions but not wiping said transition zones, and withdrawing excess liquid coating thus applied from said transition zones by a flow of gas over and closely adjacent thereto.

12. Apparatus for coating panels having a plurality of embossed panel portions extending lengthwise thereof and at least

one transition zone connecting the adjacent embossed panel portions, comprising means for moving said panels lengthwise along a predetermined path, a roll, means supporting said roll in a position extending across the path of panel movement, said roll having a plurality of roll portions respectively juxtaposed to said embossed panel portions and of appropriate radius to contact said embossed panel portions but not to contact said transition zones, means for applying a liquid coating to such embossed panel portions and transition zones of said panels upstream of said roll, means for reverse rotating said roll to wipe some of such liquid coating from said embossed panel portions without wiping said transition zones, and means for producing a flow of gas over and closely adjacent to said transition zones to withdraw excess liquid coating therefrom.

4,871,589

METHOD OF COATING A GOLF BALL

Katsutoshi Kitah, Kobe, and Akihiko Hamada, Kakogawa, both of Japan, assignors to Sumitomo Rubber Industries, Ltd., Hyogo, Japan

Filed Sep. 23, 1988, Ser. No. 248,353

Claims priority, application Japan, Sep. 26, 1987, 62-241572

Int. Cl.⁴ A63B 37/12; B05D 3/00, 3/12

U.S. Cl. 427—322

3 Claims

1. A method of coating a golf ball comprising coating a surface of a golf ball with a solution of ethylene-imine, carbodi-imide or the derivatives thereof and then coating it with a paint.

4,871,590

REACTIVE, THIXOTROPIC HOT-MELT ADHESIVE ON SILANE BASIS

Peter W. Merz, Rüschlikon, and Lutz-Dieter Zabel, Birmensdorf, both of Switzerland, assignors to Silka AG, vorm. Kaspar Winkler & Co., Zurich, Switzerland

Filed Nov. 6, 1987, Ser. No. 118,298

Claims priority, application Switzerland, Oct. 9, 1987, 3944/87

Int. Cl.⁴ B05D 3/02

U.S. Cl. 427—387

31 Claims

1. Reactive hot-melt adhesive composition, comprising the following ingredients in admixture:

- at least one thermoplastic material having reactive silane groups; and
- at least one thixotropic agent.

4,871,591

FINISH COATING METHOD

Yasu Sugimura, Odawara; Tadashi Watanabe, Hiratsuka; Yutaka Sugiyama, Ayase; Kazuhiko Ohira, Nagoya; Nobushige Numa, Ebina; Sachio Yamaguchi, and Akira Kasari, both of Hiratsuka, all of Japan, assignors to Kansai Paint Company, Limited, Amagasaki, Japan

Filed Jan. 26, 1988, Ser. No. 148,538

Claims priority, application Japan, Jan. 27, 1987, 62-16646; Jan. 29, 1987, 62-19543; Feb. 3, 1987, 62-22957

Int. Cl.⁴ B05D 3/02, 1/36, 7/00

U.S. Cl. 427—388.5

12 Claims

1. A finish coating method for forming a finish coat, comprising the steps of applying to a substrate a base coating composition containing a pigment and applying a clear top coating composition to the coated surface, the method being characterized in that:

- (1) the clear top coating composition is a curable coating comprising predominantly a nonaqueous dispersion of a polymer of a radically polymerizable monomer, the dispersion being prepared by polymerization of the radically polymerizable monomer in an organic solvent in which the monomer is soluble and in which the polymer produced from the monomer is insoluble and in the presence of a fluorolefin polymer as a dispersion stabilizer which is soluble in the organic solvent and which has a weight-average molecular weight of about 5,000 to about 120,000

and a fluorine content of about 1 to about 60% by weight,

- (2) the top coat formed from the top coating composition is comprised of a continuous phase composed of the fluorolefin polymer and polymer particles produced from the radically polymerizable monomer and dispersed in the top coat.

4,871,592

SPINNING PREPARATIONS FOR MELT SPINNING SYNTHETIC FIBERS

Albert Loewenstein, Haan, and Heidi Fiedler, Korachenbroich-Liedberg, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Dueseldorf, Fed. Rep. of Germany

Division of Ser. No. 681,707, Dec. 13, 1984, Pat. No. 4,654,153. This application Nov. 13, 1986, Ser. No. 930,599

Claims priority, application Fed. Rep. of Germany, Jan. 23, 1984, 3402155

Int. Cl.⁴ B05D 3/02

U.S. Cl. 427—389.9

7 Claims

1. A process for obtaining a permanent cohesion-promoting effect in the melt spinning of synthetic fibers of polyamide, polyester or polyolefin, comprising the steps of:

- A. melt spinning said synthetic fibers;
- B. applying to the synthetic fibers from about 0.3 to about 2.0% by weight, expressed as active substance, of a spinning preparation containing a smoothing agent, an emulsifier, a wetting agent, an antistatic agent and from about 1 to about 30% by weight, based on the weight of said spinning preparation, of at least one epoxidized compound selected from:
 - a. a C₈-C₂₄ mono- or di-olefinically unsaturated fatty acid;
 - b. a C₈-C₂₄ mono- or di-olefinically unsaturated fatty alcohol;
 - c. a C₁-C₃ alkyl ester of a C₈-C₂₄ mono- or di-olefinically unsaturated fatty acid;
 - d. a glyceride of a C₈-C₂₄ mono- or di-olefinically unsaturated fatty acid; and
 - e. a C₈-C₂₄ mono- or di-olefin, and
- C. heat treating the resulting synthetic fibers at a temperature of from about 150° to about 250° C.

4,871,593

METHOD OF STREAKLESS APPLICATION OF THIN CONTROLLED FLUID COATINGS AND SLOT NOZZLE-ROLLER COATER APPLICATOR APPARATUS THEREFOR

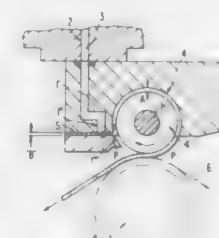
Frederic S. McIntyre, Wellesley, Mass., assignor to Acumeter Laboratories, Inc., Marlborough, Mass.

Filed Mar. 17, 1988, Ser. No. 169,389

Int. Cl.⁴ B05D 1/40

U.S. Cl. 427—428

34 Claims



1. A method of eliminating streaking effects caused by entrapped particulate matter and the like in the applying of fluid coating material transversely along a moving web-substrate, that comprises, metering the fluid material along a

zig-zag path with transverse expansion intermediate the path parallel to the transverse dimension of the web to produce at an exiting region a flowing transverse sheet of the material with substantially uniform pressure drop and fluid displacement therealong; impinging the sheet of material on an immediately adjacent rotatable transversely extending cylindrical surface of rotational axis parallel thereto to form a coating on said cylindrical surface; rotating the cylindrical surface about its axis to carry the coating upon the cylindrical surface along a circular path away from the region of exiting, said circular path being at least partly bounded by said transversely extending rotating cylindrical surface and a coaxial closely spaced transversely extending cylindrical outer surface, the coating upon said rotating cylindrical surface being carried within a transversely extending annular space between the coaxially disposed cylindrical surfaces; drawing the web-to-be-coated past and immediately adjacent a further region of the circular path to cause the rotating cylindrical surface to apply and meter the coating carried thereby to the web substrate; and adjusting the said immediately adjacent positions of the rotating cylindrical surface from the exiting region and the web substrate from the further region of the circular path, while adjusting the cylindrical surface rotational speed synchronously with relation to web speed and the fluid metering, to determine the resultant coating thickness and streakfree nature of the coating.

4,871,594

USE OF AQUEOUS CATIONIC DISPERSIONS OF SYNTHETIC RESINS FOR IMPREGNATING AND PRIMING OF ABSORBENT SUBSTRATES

Erhard Bister, Gross-Zimmern; Hans-Ulrich Huth, Langen, and Werner Stelzel, Bad Soden am Taunus, all of Fed. Rep. of Germany, assignors to Hoechst AG, Fed. Rep. of Germany
Filed Apr. 5, 1988, Ser. No. 177,680

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1987, 3711681

Int. Cl.⁴ B05D 1/18

U.S. Cl. 427—430.1

8 Claims

1. In a method of impregnating and priming of absorbent substrates with aqueous dispersion of synthetic resins, the improvement comprising using as the dispersions synthetic resins which are cationic dispersions containing cationic dispersion polymers with the polymer particles of the dispersions having a mean particle diameter of 0.02 to 0.2 μm .

4,871,595

LYOTROPIC LIQUID CRYSTALLINE ORIENTED POLYMER SUBSTRATE FOR PRINTED WIRE BOARD

Richard W. Laignea, Brighton, and William A. Stevenson, Concord, both of Mass., assignors to Foster Miller, Inc., Waltham, Mass.

Filed Dec. 16, 1986, Ser. No. 942,150
Int. Cl.⁴ C09K 19/00

U.S. Cl. 428—1

20 Claims

1. A method of forming a multilayer PWB substrate, comprising bonding together several poly-benzobisthiazole film layers, none of which exceeds about 0.0025 inches in thickness, thereby forming a multilayer board having a plurality of laminated poly-benzobisthiazole film layers

4,871,596

ARTIFICIAL MARBLE

Takashi Kamiya; Masaya Suzuki; Yoshinori Obata, all of Nagoya; Masaaki Watanabe, Inazawa, and Isao Matsuoka, Nagoya, all of Japan, assignors to Aica Kogyo Co., Ltd., Nagoya, Japan

Filed Dec. 8, 1987, Ser. No. 130,184
Claims priority, application Japan, Dec. 11, 1986, 61-295403; Dec. 11, 1986, 61-191025; Feb. 24, 1987, 62-41100
Int. Cl.⁴ A01N 1/00; B32B 15/00

U.S. Cl. 428—15

7 Claims



1. Artificial marble which comprises a molded sheet of a plurality of a porous, fibrous substrates impregnated with a melamine resin composition and laminated one on top of the other, said melamine resin composition comprising a melamine resin selected from the group consisting of a melamine-formaldehyde resin and an alcohol-etherified melamine-formaldehyde resin, said melamine resin having a formaldehyde to melamine ratio of from 1.2 to 3.0 and a modifier for the resin an amount of from 5 to 50% by weight based on the weight of the resin, said modifier being selected from the group consisting of alcohol, glycol, acrylic monomer, acrylic oligomer, and vinyl acetate monomer or mixtures thereof, said melamine resin composition being present in an amount of from 60 to 200% by weight based on the weight of the substrates.

4,871,597

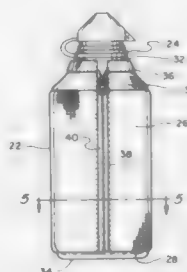
LIGHT-WEIGHT MULTI-LAYER INSULATING ENCLOSURE

Michael A. Hobson, 80 Varick St., #4D, New York, N.Y. 10013
Filed Feb. 8, 1988, Ser. No. 153,065

Int. Cl.⁴ B32B 27/00

U.S. Cl. 428—36.1

6 Claims



1. A light-weight multi-layered insulating enclosure having an opening for receiving or removing a container, wherein said enclosure completely surrounds a container and is formed of four differing layers of materials laminated, stitched or adhesively joined

- (a) an inner-most knitted fabric liner layer,
- (b) a second inner most insulating layer next to said inner-most layer which includes polymer foam,
- (c) a third inner most polymer film reflective layer next to said inner most layer constructed of a polymer film coated with a reflective metallic material on the outer surface thereof,
- (d) an outermost knitted fabric mesh layer next to said third inner-most layer wherein said third inner-most polymer film reflective layer is constructed of a polymer film having an outer surface coated with a reflective metallic material visible through said outer-most fabric mesh layer.

4,871,598

CONTAINER WITH FLEXIBLE WALLS

Eugen Potente, Aachen, and Herbert Scheller, Würselen, both of Fed. Rep. of Germany, assignors to Uniroyal Engelbert Reifen GmbH, Aachen, Fed. Rep. of Germany

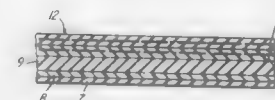
Filed Jul. 1, 1988, Ser. No. 214,639

Claims priority, application Fed. Rep. of Germany, Jul. 6, 1987, 3722255

Int. Cl.⁴ B65D 90/02; B64D 37/00

U.S. Cl. 428—36.1

6 Claims



1. A container for fluid content including fuel and having multi-layer flexible walls that comprise, in sequence: an inner lining in the form of a rubber layer compatible with fluid content; a barrier layer that holds the fluid content in the container; at least one natural layer that is thicker than said inner lining and that can expand and swells when in contact with the fluid content for a self sealing of any puncture thereof that occurs; and at least one reinforcement layer in the form of a high-strength load-carrying member of coated cord fabric comprising cords disposed in a coating cover material, with said cords being disposed in a wavy cord arrangement having a multi-plane meandering pattern so that said cords can extend as well as elongate into a different plane in conjunction therewith for cord length reserve to allow the cords to extend themselves in a more straightened manner and to withstand projectile impact forces kept from puncturing the container with only at most small and limited damage locations quickly subject to the self sealing of any puncture thereof without any overlap folds and to avoid any large loss of fluid content, and said cover material having a slight adhesion to said cords therein in order to help consume impact energy when the cords extend and elongate in the more straightened manner.

4,871,599

SUPPORT HELIX FOR A RADially EXPANDED RESILIENT SLEEVE

Winfried Knorr, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 14, 1988, Ser. No. 181,732

Claims priority, application Fed. Rep. of Germany, May 13, 1987, 3715915

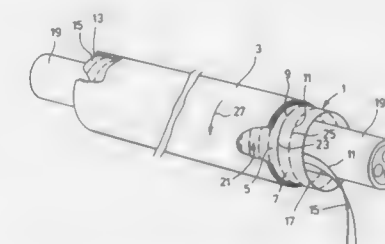
Int. Cl.⁴ F16L 11/00

U.S. Cl. 428—36.9

4 Claims

1. A support helix for a radially expanded sleeve of resilient material which may be used as an enclosure of an elongate object such as an electrical cable, comprising a molded tubular base body having an undulating exterior surface defining a helical groove along the entire length of the base body, circumferentially spaced cuts being formed through the wall of the base body in the helical groove along the entire length of the base body, one end portion of the helix being separated

from the helix into a strip extending from one end of the helix through the support helix and out of the other end thereof



where it may be manually grasped, the connection areas between the spaced cuts being dimensioned so that the support helix can be manually unwound by pulling on the end portion.

4,871,600

BREATHABLE LAMINATE FABRIC

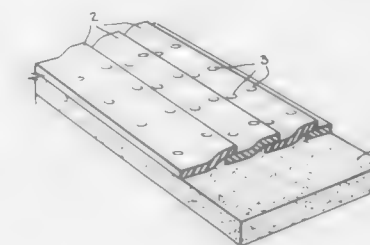
John Amann, 19 Alameda Pl., Mount Vernon, N.Y. 10552, assignor to John Amann, Mount Vernon, N.Y.

Filed Mar. 22, 1988, Ser. No. 171,661

Int. Cl.⁴ B32B 3/14

U.S. Cl. 428—56

12 Claims



1. A breathable, laminate fabric which is impervious to water, aqueous solutions and organic solvents comprising a base layer formed from a porous, absorbent material which is bonded at spaced points to a second layer comprised of a series of parallel strips, impervious to water, aqueous solutions and organic liquids, said strips being disposed transversely to the edges of said underlying base layer, said strips having leading and trailing edges, and extending longitudinally along said base layer in an overlapping manner such that the leading edge of one strip overlaps the trailing edge of the next succeeding strip in the series, said base layer or said second layer being comprised of a thermoplastic material.

4,871,601

OPTICAL INFORMATION RECORDING CARRIER

Kyo Miura, Yokohama; Hiroyuki Sugata, Yamato; Yoshihiro Oguchi, Kawasaki, and Hitoshi Yoshino, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 22, 1988, Ser. No. 159,310

Claims priority, application Japan, Feb. 25, 1987, 62-040415; Feb. 25, 1987, 62-040419

Int. Cl.⁴ B32B 3/02

U.S. Cl. 428—64

14 Claims



1. A closely contacted encapsulation optical information

recording carrier comprising an optical recording layer provided on a transparent substrate, film coating layer laminated without adhesion to provide a microscopic space layer on said optical recording layer, and further a fixing layer laminated thereon to fix said film coating layer.

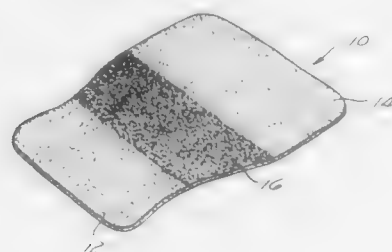
4,871,602

FLOOR MAT WITH BAND OF HIGHER DENSITY TUFTING

Ken Luker, 6209 Rockinghorse Way, Orange, Calif. 92669
Filed Jun. 29, 1988, Ser. No. 212,886

Int. Cl.⁴ B32B 33/00

U.S. Cl. 428—88



6. A vehicle floor mat having a forward edge to extend toward the front of a vehicle, a rear edge extending toward the front seat of the vehicle, and side edges extending between the front and rear edges, said mat having a forward section and a rear section formed of single tufted carpeting, and a central band of double tufted carpeting formed integral with the front and rear sections, and extending transversely across the mat from one side to the other, said band being sized and located to include an area adapted to be positioned such that the driver's heel normally engages the high density double tufting.

4,871,603

CARPET TILE WITH CUSHIONED BACKING

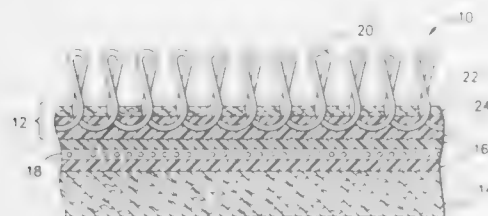
Thomas J. Malone, One Twin Oaks Ct., Spartanburg, S.C. 29301

Filed Sep. 29, 1988, Ser. No. 251,407

Int. Cl.⁴ B32B 3/02, 33/00

U.S. Cl. 428—95

3 Claims



1. A carpet tile comprising: a primary carpet layer having pile yarns projecting upwardly therefrom, a nonwoven base layer below said carpet layer and a thermoplastic material securing said primary carpet layer to said nonwoven base layer, said nonwoven base layer being substantially all synthetic fibers needled together to form a thickness of between 3/16" and 1/4" and a weight in the range of 20-80 ozs./yd².

4,871,604

BINDER POWDER CARPET FIBER

Lewis R. Hackler, Colonial Heights, Va., assignor to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Apr. 4, 1988, Ser. No. 177,221

Int. Cl.⁴ B32B 3/02, 33/00

U.S. Cl. 428—96

15 Claims

1. Tufted pile carpet having enhanced carpet tuft resilience and improved wear resistance comprising tufted pile yarn selected from the group consisting of wool, cotton, rayon polypropylene, nylon-6, nylon-6,6 and polyester, said pile yarn comprising points of intersecting fiber bonded with 0.1 to 5.0 weight percent, based on weight of the pile yarn, of a heat-activated adhesive with a melting point range of 110 to 170°C.

4,871,605

INORGANIC FIBER MAT BASED BITUMINOUS SHEET MATERIALS

Charles A. Pagen, Hurst, Tex.; George Stepien, Jr., Montclair, N.J., and Paul A. Morris, Bedford, Tex., assignors to Genstar Building Materials Company, Irving, Tex.

Filed Aug. 5, 1983, Ser. No. 520,843

Int. Cl.⁴ B32B 9/00

U.S. Cl. 428—141

10 Claims

1. A building sheet product comprising an inorganic fiber based mat precoated with a polymer/bitumen composition prior to the application of an conventional asphalt topcoating, wherein the polymer is an elastomer.

4,871,606

MAGNETIC RECORDING MEDIUM

Takeshi Matsuura; Akira Morioka, both of Kyoto, and Yoshiyuki Takahira, Osaka, all of Japan, assignors to Hitachi Maxell, Ltd., Osaka, Japan

Continuation of Ser. No. 536,434, Sep. 27, 1983, abandoned. This application Feb. 11, 1987, Ser. No. 13,286

Claims priority, application Japan, Sep. 30, 1982, 57-171293; Jul. 30, 1983, 58-139960; Sep. 9, 1983, 58-167321

Int. Cl.⁴ G11B 5/72

U.S. Cl. 428—147

37 Claims

1. A magnetic recording medium comprising a plastic base film, a magnetic layer formed on one side of the base film and a backing layer formed on the other side of the base film, characterized in that said magnetic layer has a surface roughness of at most 0.08 μ m, and said backing layer having a surface roughness of from 0.05 to 0.6 μ m and is composed essentially of first particles of an inorganic pigment having an average particle size of from 0.02 to 0.5 μ m and a Mohs hardness of from 2 to 4 and second particles of an inorganic pigment having an average particle size of from 0.04 to 0.5 μ m and a Mohs hardness of from 5 to 7 present in a weight ratio of 1:9 to 5:5, dispersed in a thermoset or radiation-cured binder the ratio of the total of said particles to said binder being 4:1 to 1:1.

4,871,607

HUMIDITY EXCHANGER ELEMENT

Tosimi Kuma, 25-8, 3-chome, Maimatsubara, Higashi-ku, Fukuoka-shi, Fukuoka-ken, Japan, and Hiroshi Okano, Fukuoka, Japan, assignors to Kabushiki Kaisha Seibu Giken and Tosimi Kuma, both of Fukuoka, Japan, part interest to each

Continuation of Ser. No. 21,212, Mar. 3, 1987, abandoned. This application Jul. 11, 1988, Ser. No. 217,034

Claims priority, application Japan, Mar. 10, 1986, 61-35177

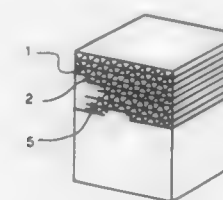
Int. Cl.⁴ B01D 53/06

U.S. Cl. 428—186

12 Claims

1. A humidity exchanger element comprising: a matrix consisting of a block formed by laminating single-faced corrugated sheets, the main constituent of said sheets being an inorganic fiber selected from the group consisting of ceramic fiber, glass fiber, slag fiber, carbon fiber and mixtures thereof, the thickness of said sheets being in the range of 0.18-0.25 mm, the wave length of

said corrugated sheets being in the range of 2.5-4.2 mm, and the wave height of said corrugated sheets being in the range of 1.5-2.3 mm; and



a layer of just-synthesized active silica-alumina aerogel bonded to and combined with surfaces of said sheets and fiber gaps of said matrix, the composition of said aerogel being 97-85% of silicon dioxide and 3-15% of aluminum oxide.

4,871,608

HIGH-DENSITY WIRING MULTILAYERED SUBSTRATE

Kazuo Kondo; Asao Morikawa; Hiroshi Iwata, and Yoshimasa Shibata, all of Aichi, Japan, assignors to NGK Spark Plug Co., Ltd., Aichi, Japan

Filed Dec. 10, 1987, Ser. No. 133,817

Claims priority, application Japan, Dec. 10, 1986, 61-294459; May 21, 1987, 62-122486; May 26, 1987, 62-129441

Int. Cl.⁴ B32B 9/00

U.S. Cl. 428—209

2 Claims



1. A high-density wiring multi-layered substrate comprising a plurality of sequentially laminated green sheets of crystallizable glass, each of said green sheets having a conductor paste on the surface thereof, the conductive component of said conductor paste comprising at least about 80% of one copper component selected from copper and copper oxide and at least one member selected from up to about 15 parts by weight of MnO₂ and up to about 10 parts by weight of Ag₂O based on 100 parts by weight of said copper component in terms of metallic copper.

4,871,609

MULTICOLOR THERMOSENSITIVE IMAGE TRANSFER SHEET

Akira Suzuki, Mishima; Nobuo Mochizuki, Shizuoka, and Kuni-chika Morohoshi, Numazu, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Sep. 10, 1987, Ser. No. 94,876

Claims priority, application Japan, Sep. 10, 1986, 61-211511; Jul. 15, 1987, 62-174907

Int. Cl.⁴ B41M 5/26

U.S. Cl. 428—195

7 Claims

1. A multicolor thermosensitive image transfer sheet, comprising:
(i) a substrate and
(ii) at least three thermosensitive ink layers each having a different color and each having a different critical surface tension, which layers are formed side-by-side in an increasing or decreasing order with respect to critical surface tension, each of said thermosensitive ink layers com-

prising a thermofusible ink component having a different color and a different critical surface tension from the color



and surface tensions of the ink components in the other thermofusible ink layers.

4,871,610

EXTERIOR WATER-PROOF ORNAMENTAL SHEET AND METHOD OF CONSTRUCTION IT

Shigeru Takata; Takeki Aono, and Gentaro Fujieda, all of Toyo, Japan, assignors to L'Oreal, Ehime, Japan

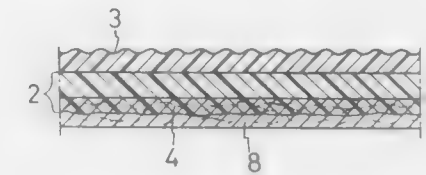
Filed Nov. 13, 1987, Ser. No. 120,318

Claims priority, application Japan, Nov. 15, 1986, 61-272646

Int. Cl.⁴ B32B 7/00

U.S. Cl. 428—246

6 Claims



1. An exterior water-proof ornamental sheet comprising: a fibrous sheet member which is a non-woven fabric having a unit quantity of 10 to 100 g/m², a thickness of 0.03-1 mm and an permeability of 1 second or less; an ornamental layer; and an intermediate water-proof layer in which a part of said water-proof layer is a water-proof paint-impregnated portion formed by impregnating 30-70% of a thickness of said fibrous sheet member with water-proof paints.

4,871,611

BREATHABLE BACKING OR RELEASE LINER AND PROCESS FOR FORMING THE SAME

Andrew P. LeBel, Aurora, Ill., assignor to Mead Release Products, Inc., West Chicago, Ill.

Continuation of Ser. No. 799,215, Nov. 15, 1985, abandoned. This application Jun. 23, 1987, Ser. No. 63,799

Int. Cl.⁴ B32B 7/00

U.S. Cl. 428—266

20 Claims



1. A breathable backing or release liner comprising a breathable, woven or non-woven support member having a silicone-release coating on essentially only one side thereof, said coating being formed by applying a radiation-curable composition containing a polysiloxane to one side of said support and expos-

ing said composition to radiation such that said composition does not substantially penetrate said support, and said support member having a moisture vapor transmission rate greater than 250 g/sq.m./24 hrs./20° C./80% RH and air permeability greater than 80 cu. ft./min./sq. ft.

4,871,612

INTERIOR MEMBER FOR VEHICLES AND METHOD FOR ITS MANUFACTURE

Toyohiko Okina; Hiroshi Goto; Fumio Kousaka; Akinori Teranishi; Satoshi Kawabata; Tetsuo Ohyama; Makoto Ohya, and Norio Kozaki, all of Anjo, Japan, assignors to Inoue MTP Kabushiki Kaisha, Aichi, Japan

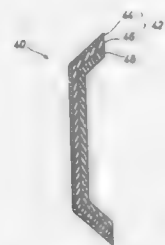
Filed Sep. 2, 1987, Ser. No. 92,212

Claims priority, application Japan, Sep. 5, 1986, 61-136966[U]; Oct. 17, 1986, 61-247106; Oct. 24, 1986, 61-163018[U]

Int. Cl.⁴ B32B 3/26, 7/00

U.S. Cl. 428—269

5 Claims



1. An interior member for vehicles, comprising:
 - a substrate containing a reinforcing fiber mat with a polyisocyanurate permeated therethrough, said polyisocyanurate being obtained by a reaction of a polyol and a polyisocyanate in the presence of a trimerization catalyst; and
 - a surface layer integrally formed on said substrate, wherein the density of the polyisocyanurate in said substrate is 1.2 to 1.9 times the density of the same polyisocyanurate in its free foaming state and wherein the amount of polyisocyanate used for obtaining said polyisocyanurate is 250 to 3,000 on the isocyanate index.

4,871,613

PACKAGING MATERIAL

Mutsuo Akao, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-Ashigara, Japan

Filed Apr. 6, 1987, Ser. No. 34,844

Claims priority, application Japan, Apr. 7, 1986, 61-50918

Int. Cl.⁴ B32B 27/00, 5/16

U.S. Cl. 428—328

14 Claims



1. A packaging material which comprises a simultaneously coextruded film prepared in the absence of a substrate by T die extrusion or by the inflation process and comprising a conductive ethylene-ethyl acrylate copolymer resin layer containing more than 50 wt. % of ethyleneethyl acrylate copolymer resin of which the content of ethyl acrylate is more than 6 wt. %, 7 to 20 wt. % of carbon black and 0.01 to 1 wt. % of a lubricant and having a surface resistance of less than 10¹⁰Ω and a polyolefin resin layer.

4,871,614

OPTO-MAGNETIC RECORDING MEDIUM HAVING THREE EXCHANGE-COUPLED MAGNETIC LAYERS

Tadaaki Kobayashi, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

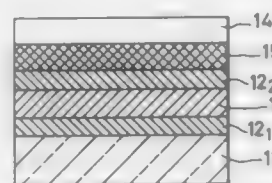
Continuation of Ser. No. 71,081, Jul. 8, 1987, abandoned. This application Mar. 16, 1988, Ser. No. 170,053

Claims priority, application Japan, Jul. 9, 1986, 61-159716; Jul. 9, 1986, 61-159717; Jul. 9, 1986, 61-159719; Jul. 9, 1986, 61-159720; Jul. 9, 1986, 61-159721

Int. Cl.⁴ G11B 5/64

U.S. Cl. 428—336

6 Claims



1. An opto-magnetic recording medium comprising:
 - a substrate;
 - a first magnetic layer formed on said substrate, said first magnetic layer having the following composition:



- wherein $0 \leq x \leq 1$, $0 \leq y \leq 0.3$, and $0 \leq z \leq 0.2$, and M is one element selected from the group consisting of Cr or Al; and
- two second magnetic layers respectively formed on the two surfaces of said first magnetic layer, each of said second magnetic layers having a lower coercive force and a higher Curie temperature than those of said first magnetic layer, and being exchange-coupled to said first magnetic layer, and each of said magnetic layers having the following composition:



- wherein $0 \leq w \leq 0.2$, and M is one element selected from the group consisting of Cr or Al.

4,871,615

TEMPERATURE-ADAPTABLE TEXTILE FIBERS AND METHOD OF PREPARING SAME

Tyrone L. Vigo, and Cynthia M. Frost, both of Knoxville, Tenn., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 626,850, Jul. 2, 1984, which is a continuation-in-part of Ser. No. 409,266, Aug. 18, 1982, abandoned. This application Jan. 13, 1986, Ser. No. 818,567

Int. Cl.⁴ D02G 3/00

U.S. Cl. 428—398

7 Claims

1. Temperature-adaptable hollow textile fibers which store heat when the temperature rises and release heat when the temperature decreases, the hollow of said fibers filled with a material consisting essentially of a phase-change or plastic crystalline material which stores heat when the temperature rises and releases heat when the temperature decreases and which is chemically and physically compatible with said fibers, wherein said fibers are selected from the group consisting of rayon, polyethylene, polyester and polyamide.

2. Temperature-adaptable hollow textile fibers which store heat when the temperature rises and release heat when the temperature decreases, the hollow of said fibers filled with a material consisting essentially of a phase-change or plastic crystalline material which stores heat when the temperature rises and releases heat when the temperature decreases and which is chemically and physically compatible with said fibers, wherein said phase-change material is selected from the group consisting of congruent inorganic salt hydrates and polyethyl-

ene glycols, and wherein said plastic crystalline material is a polyhydric alcohol.

4,871,616

SURFACE-TREATED POLY METHYL SILSEQUOXANE POWDER

Hiroshi Kimura, and Akira Takagi, both of Ohta, Japan, assignors to Toshiba Silicone Co., Ltd., Japan

Filed Oct. 14, 1987, Ser. No. 108,845

Claims priority, application Japan, Oct. 20, 1986, 61-247344

Int. Cl.⁴ C08G 77/04; C07F 7/08; G03G 9/00

U.S. Cl. 428—407

6 Claims

1. A surface-treated poly methyl silsesquioxane powder characterized by surface-treatment with an agent comprising a compound which has at least two radicals attached to a metal atom or a silicon atom, said radical is selected from the group consisting of a hydroxyl radical, a hydrolyzable radical and a movement hydrocarbon radical substituted by a polar group, wherein the average particle diameter of said powder is 5μm or smaller, said powder is spherical, and said powder has a particle size distribution that 80% or more of the particles have a diameter within the range of ±30% of the average particle diameter.

4,871,617

OHMIC CONTACTS AND INTERCONNECTS TO SILICON AND METHOD OF MAKING SAME

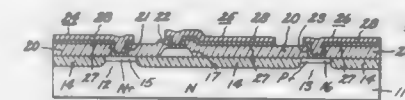
Manjin J. Kim; Dale M. Brown, both of Schenectady; Simon S. Cohen, Schenectady; Bernard Gorowitz, Clifton Park, and Richard J. Sala, Scotia, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 2, 1984, Ser. No. 595,800

Int. Cl.⁴ B32B 5/16; H01L 3/00, 5/00

U.S. Cl. 428—450

10 Claims



1. In combination,
 - a conductive member of silicon semiconductor material of one type conductivity and of low resistivity;
 - a layer of insulating material overlying said conductive member of silicon, said insulating material having an opening in said layer exposing a portion of said conductive member of silicon;
 - a first conductor of an alloy of titanium and tungsten sintered to the portion of said conductive member of silicon exposed by said opening to form a low resistance contact therewith and bonded to said layer of insulating material; and
 - a second conductor of a metal selected from the group consisting of molybdenum and tungsten overlying and bonded to said first conductor.

4,871,618

LAMINAR STRUCTURES PREPARED WITH POLYKETONE STRUCTURAL ADHESIVES

Peter A. Kinneberg, Houston, Tex., and Thomas A. Armer, Westboro, Mass., assignors to Shell Oil Company, Houston, Tex.

Filed Dec. 4, 1987, Ser. No. 128,972

Int. Cl.⁴ B32B 15/08, 27/08

U.S. Cl. 428—461

8 Claims

1. A laminar structure consisting of a substrate and a structural adhesive consisting essentially of:
 - a linear alternating polymer of carbon monoxide and at least one ethylenically unsaturated hydrocarbon, wherein said linear alternating polymer is of the formula:



wherein B is the moiety of an ethylenically unsaturated α-olefin of at least 3 carbon atoms polymerized through the ethylenic unsaturation, the ratio of y:x is no more than about 0.5 and wherein said adhesive is produced by contacting a carbon monoxide and at least one ethylenically unsaturated hydrocarbon under polymerization conditions, in the presence of a catalytic amount of a catalyst formed from a compound of the Group VIII metal, the anion of a non-hydrohalogenic acid of a pKa of less than about 6, and a bidentate ligand selected from the group comprising: phosphorus, arsenic, and antimony.

4,871,619

ELECTRONIC COMPONENTS COMPRISING POLYIMIDE DIELECTRIC LAYERS

Constance J. Araps, Wappingers Falls; Steven M. Kandetzke, Fishkill, and Mark A. Takacs, Poughkeepsie, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 839,456, Mar. 11, 1986, Pat. No. 4,654,223, which is a continuation of Ser. No. 556,731, Nov. 30, 1983, abandoned. This application Nov. 20, 1986, Ser. No. 933,457

Int. Cl.⁴ B32B 15/08, 27/34

U.S. Cl. 428—473.5

11 Claims

1. An electronic component comprising of a film of dielectric material formed on a substrate by in situ curing and imidizing a layer of a polymerizable oligomer selected from the group consisting of polyamic acids, the corresponding polyamic esters, the corresponding polyisimides, and mixtures thereof, wherein the end groups of the polymerizable oligomer are end-capped with a vinyl or acetylenic end group and wherein said curing is carried out at temperatures up to about 300° C. to form a polyimide which exhibits low extrinsic and intrinsic stress.

4,871,620

TYPEWRITER RIBBON HAVING A THIN SUPPORT AND A TRANSFERABLE MASS, FOR TYPING ON VARIED SURFACES

Ernst Kunkel, and Wolfhard Rutz, both of Hanover, Fed. Rep. of Germany, assignors to Pelikan Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Continuation of Ser. No. 879,497, Jun. 24, 1986, abandoned, which is a continuation-in-part of Ser. No. 712,441, Mar. 18, 1985, abandoned. This application May 31, 1988, Ser. No. 201,375

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1984, 3409936

Int. Cl.⁴ B32B 9/04

U.S. Cl. 428—484

28 Claims

1. A typewriter ribbon comprising (a) a thin support and (2) a transferable mass, wherein said transferable mass consists essentially of a film-forming resin, a wax, at least one finely dispersed coloring agent, and
 - (2.1) a surface active dispersing agent which is at least one member selected from the group consisting of a base of an oxyalkylated fatty alcohol, an unsaturated oxyalkylated fatty acid, an oxyalkylated ester of an unsaturated fatty acid, a fat, a fatty acid, an alkylphenol, and an amino salt of a fatty acid condensation product, and
 - (2.2) a surface-active resin dissolved in a medium-boiling alcohol solvent, said surface-active resin being at least one member selected from the group consisting of a polyacrylamide, a styrene/acrylic copolymer, a vinyl propanoate/acrylate copolymer, and a surface active modified acrylic resin.

4,871,621

METHOD OF ENCASING A STRUCTURE IN METAL
Rodney D. Bagley, Big Flats, and Raja R. Wastrika, Painted Post, both of N.Y., assignors to Corning Incorporated, Corning, N.Y.

Filed Dec. 16, 1987, Ser. No. 133,303
Int. Cl. B22F 7/00

U.S. Cl. 428—549

42 Claims

1. An article comprising an object encased in metal where said metal casing comprises a sheet of sinterable particulate or powdered metal admixed with a binder which sheet has been (a) wrapped around said article (b) has been subsequently fired into a unitary metal structure.

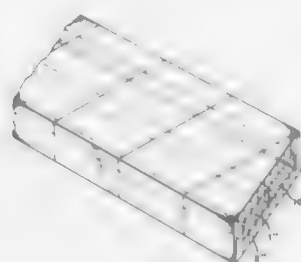
4,871,622

FLEXIBLE MULTILAYERED BRAZING MATERIALS
Anatol Rabinkin, Morris Plains, N.J., assignor to Allied Signal Inc., Morris Township, Morris County, N.J.

Filed Apr. 15, 1988, Ser. No. 181,890
Int. Cl. B23K 35/16, 35/18

U.S. Cl. 428—576

9 Claims



1. A cold rolled flexible multilayered brazing material comprising, in combination, at least one layer of ductile brazing foil defining a core body having two major surfaces and at least one minor surface, and at least one layer of ductile brazing foil substantially covering said two major surfaces and at least one minor surface of said core body, wherein said core body is formed of ductile brazing foil which is at least about 50% amorphous and wherein said at least one layer of ductile brazing foil is at least about 50% amorphous and wherein said at least one layer of ductile brazing foil has not been subjected to permanent deformation in excess of 3%.

4,871,623

SHEET-MEMBER CONTAINING A PLURALITY OF ELONGATED ENCLOSED ELECTRODEPOSITED CHANNELS AND METHOD

Timothy L. Hoopman, River Falls, Wis.; Dee L. Johnson, Woodbury, and Harlan L. Krinke, May Township, Washington County, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 19, 1988, Ser. No. 157,914
Int. Cl. F28F 3/12; C25D 1/02

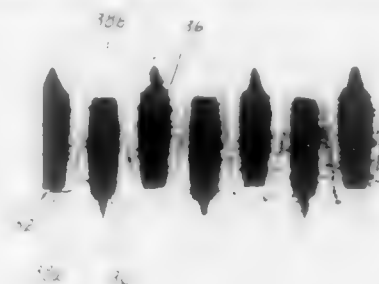
U.S. Cl. 428—586

14 Claims

8. A method for constructing a sheet member having a plurality of channels said method comprising the steps of:

- providing a mandrel having a base portion and a plurality of elongated ridge portions projecting from the base portion and having elongated edges spaced above the base portion, the ridge portions defining elongated grooves between the ridge portions, and the ridge portions having conductive surfaces; and
- electrodepositing a conductive material on the conductive surfaces with the conductive material being deposited on the edges of the ridge portions at a faster rate than on the surfaces defining inner surfaces of the grooves until the conductive material bridges across between the ridge portions to envelope central portions of the grooves and

form the sheet member having a base layer and a plurality of elongated projections extending from the sheet member



base layer into each of the grooves, with each of the projections containing an elongated enclosed channel.

4,871,624

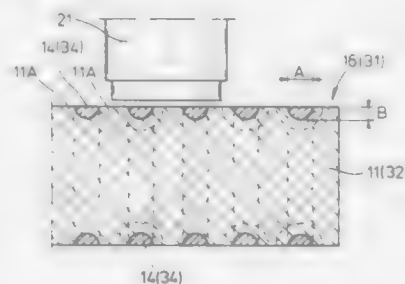
MAGNETIC SCALE AND METHOD OF MANUFACTURING THE SAME

Hiromi Nakamura, Zama, Japan, assignor to Toshiba Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 22, 1988, Ser. No. 158,707
Int. Cl. C21D 1/09

U.S. Cl. 428—611

19 Claims



1. A scale comprising a magnetic base member and a thin film formed on a surface of said magnetic member by plating or flame spraying, said magnetic member having a plurality of nonmagnetic portions on the surface thereof at spaced intervals in a longitudinal direction of said base member, said non-magnetic portions comprising a fused member formed by heating said thin film so as to be fused with said magnetic member.

4,871,625

SYNTHETIC LUBRICANT FOR LUBRICATING THIN FILM AND MAGNETIC RECORDING MEDIUM

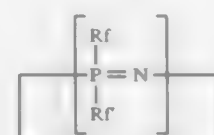
Takateru Dekura, Kamakura, and Juro Endo, Kumagaya, both of Japan, assignors to Hitachi Metals, Ltd. and Maruwa Bussan K.K., both of Tokyo, Japan

Filed Mar. 28, 1988, Ser. No. 174,410
Claims priority, application Japan, Apr. 16, 1987, 62-94122
Int. Cl. G11B 5/64

U.S. Cl. 428—695

4 Claims

1. A synthetic lubricant on a magnetic thin film recording medium, said lubricant containing a phosphonitrile ester obtained by cyclic polymerization or ring opening polymerization and represented by the following formula (I):



(I)

wherein n represents 3 to 10, and Rf and Rf' represent one or two groups selected from the following groups:



wherein the molecular weight of Rf and Rf' is 300 to 50,000 and wherein l represents 3 to 250, m represents 1 to 250, and Y represents a member selected from the group consisting of F—, CF₃—, C₂F₅—, CF₃O—, C₂F₅O— and C₃F₇O— and an intermediate protective film between the lubricant and the magnetic thin film layers.

4,871,626

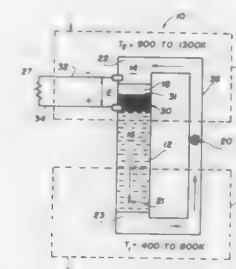
CURRENT COLLECTOR FOR AMTEC

Roger M. Williams, Azusa, Calif., assignor to California Institute of Technology, Pasadena, Calif.

Filed Aug. 6, 1987, Ser. No. 82,888
Int. Cl. H01M 6/36, 10/44

U.S. Cl. 429—11

19 Claims



1. An electrode for an alkali metal thermoelectric converter comprising in combination
a body of solid, microcrystalline, ceramic electrolyte capable of transporting sodium ions from a first surface to a second surface;
a film of a first metal applied to one of said surfaces, said metal being non-volatile at a temperature up to 1300K and including an early transition metal; and
an open, metal current collector grid applied to the film, said metal of the current collector having a coefficient of thermal expansion greater than that of the solid electrolyte, and
a restraining element covering the open grid.

4,871,627

MULTI-CELL METAL/AIR BATTERY

David S. Strong, Battersea, and John A. Dawson, Amberstview, both of Canada, assignors to Alcan International Limited, Montreal, Canada

Filed Oct. 21, 1987, Ser. No. 111,989
Claims priority, application Canada, Oct. 22, 1986, 521112
Int. Cl. H01M 4/00, 2/36, 2/04

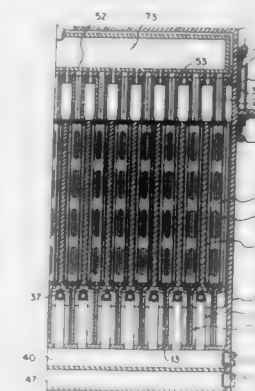
U.S. Cl. 429—27

22 Claims

1. A metal air battery comprising
(a) a tank defining a single continuous reservoir for liquid electrolyte;
(b) a plurality of air cathode assemblies removably supported from a top support framework for insertion into

the reservoir, each assembly comprising a pair of air cathodes supported in an electrically non-conductive frame in electrically isolated relation to each other and defining between first surfaces thereof a liquid-tight air chamber open to ambient atmosphere, and said assemblies being removably insertable in the reservoir to expose second cathode surfaces remote from the air chamber to electrolyte therein;

(c) a plurality of metal anodes, one for each cathode assembly, removably carried by said cathode assemblies and disposed for immersion in electrolyte in the reservoir in spaced juxtaposed relation to the cathode second surfaces to constitute therewith a plurality of anode-cathode pairs each electrically coupled by electrolyte;



(d) circuit means for connecting said anode-cathode pairs in series to each other and to an external load; and

(e) engaging means includes electrically non-conductive fins projecting from each side of said frame and an electrically non-conductive fin projecting from the bottom of said frame for engaging said tank when the assembly is inserted in the reservoir, to divide the reservoir into a plurality of separate and substantially electrically isolated electrolyte-holding zones each containing one anode and the cathode second surface juxtaposed thereto, so as to inhibit anode-to-anode current flow through the electrolyte, and each electrolyte-holding zone including a refuse collecting zone located below the bottoms of the anode and cathode.

4,871,628

BATTERY TERMINAL POST PROTECTOR

David H. Parker, 2255 Jefferson St., Torrance, Calif. 90501

Filed Oct. 14, 1988, Ser. No. 257,838
Int. Cl. H01M 2/10, 6/42

U.S. Cl. 429—96

2 Claims



1. In combination with a battery operated device, said de-

vice having a battery compartment, a pair of batteries mounted in an in-line position within said battery compartment, one said battery having a front face, a battery terminal post mounted on said front face, the other said battery having a rear face constituting a battery terminal connection, said terminal post to be in tight contact with said battery terminal connector, the improvement comprising:

a protector comprising a resilient member located directly adjacent said battery terminal post, said resilient member being snugly held in position between said front face and said rear face, said resilient member comprising a disc, said disc surrounding said battery terminal post, said disc including an adhesive on one said surface, said adhesive to facilitate attachment of said disc to said front face, whereby upon said battery operated device incurring an exterior shock force that could possibly damage said battery terminal post the said resilient member absorbs enough of the shock transmitted to said battery terminal post to minimize the chance of damage to said battery terminal post and make such inoperative.

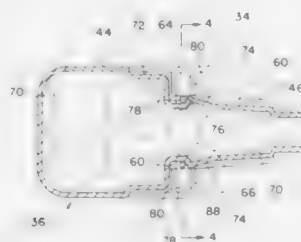
4,871,629

LATCHING ARRANGEMENT FOR BATTERY PACKS
Roderick F. Bunyea, Westminster, Md., assignor to Black & Decker Inc., Newark, Del.

Filed Feb. 4, 1988, Ser. No. 152,107
Int. Cl.⁴ H01M 2/10; E05B 15/02

U.S. Cl. 429-97

25 Claims



1. A latching arrangement for latching a battery pack in an electric device, comprising:
a shoulder formed on a casing of the battery back;
a displaceable limb mounted inside the electric device, the limb being resiliently biased towards said casing;
a manually actuatable latch release member mounted in the electric device and movable between a latching position and a release position;
said limb contacting said casing and blocking said shoulder in said latching position to latch said battery pack in the electric device; and
said release member displacing said limb away from said casing and clear of said shoulder in said release position to unlatch said battery pack and allow withdrawal thereof from said electric device.

4,871,630

MASK USING LITHOGRAPHIC IMAGE SIZE REDUCTION

Nicholas J. Giammarco, Newburgh, N.Y.; Alexander Gimpelson, Allston, Mass.; George A. Kaplita, New Windsor, N.Y.; Alexander D. Lopata, Fishkill, N.Y.; Anthony F. Scaduto, Newburgh, N.Y., and Joseph F. Shepard, Hopewell Junction, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

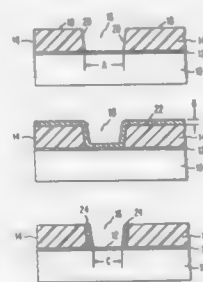
Division of Ser. No. 924,223, Oct. 28, 1986, Pat. No. 4,707,218.
This application Jul. 31, 1987, Ser. No. 79,990
Int. Cl.⁴ G03C 5/00

U.S. Cl. 430-14

2 Claims

1. A lithographic mask comprising:
a substrate;

an underlayer of polyimide or photoresist formed on the substrate;
a release layer formed on the underlayer;
a radiation-sensitive imaging layer formed on the release layer and having at least one opening extending through the imaging layer, the opening having substantially vertical walls; and
inorganic sidewalls of a common and uniform thickness



formed on the interior surface of all of the substantially vertical walls, the bottom edge of the sidewalls being adjacent to the release layer, whereby the size of the opening is decreased to a size smaller than that obtainable by lithography;
the mask being suitable for use as an ion implantation mask, a contact mask, a mask for growing a recessed isolation oxide or a mask for forming narrow conductor or insulator lines.

4,871,631

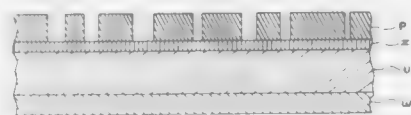
ADHESIVELY SECURABLE MULTILAYER RELIEF PLATE FOR FLEXOGRAPHIC PRINTING

Hartwig Pieper, Frankenthal; Reiner Michels, Neunkirchen, and Heinz-Ulrich Werther, Wachenheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Oct. 21, 1987, Ser. No. 110,868
Int. Cl.⁴ B41N 1/12

U.S. Cl. 430-14

3 Claims



1. In a multilayer flexographic relief printing plate which comprises the following layers firmly adhered to each other in the following order:

- a relief layer (P) prepared by imagewise irradiation with actinic light of a photopolymerizable layer containing the following components:
 - from 50 to 99% by weight of an elastomer,
 - from 1 to 50% by weight of one or more photopolymerizable olefinically unsaturated monomers substantially compatible with said elastomer,
 - and from 0.01 to 10% by weight of photoinitiator; followed by washing out the non-irradiated and thus nonphotopolymerized parts of said photopolymerizable layer with a developer solvent, thereby obtaining said relief layer (P);
- a first adhesion promoting layer;
- an interlayer (Z) which is insoluble in and impermeable to the developer solvent used in preparing the relief layer (P) and the printing ink solvents;
- a second adhesion promoting layer; and
- a base layer (U) containing an elastomeric material; the improvement which comprises:

(vi) a doublesided adhesive sheet (W) which transmits actinic light and which on one side is firmly bonded to the base layer (U) and which has on the other side a contact adhesive layer having an adhesive force of from 1 to 6 N/25 mm, the sheet having a higher adhesive force on the side bonded to the base layer (U), whereby the multilayer flexographic relief printing plate can be repeatedly adhered to and removed from a printing cylinder without damaging or destroying the plate.

4,871,632

PHOTOSENSITIVE MEMBER COMPRISING CHARGE GENERATING LAYER AND CHARGE TRANSPORTING LAYER

Synji Iino, Hirakata; Izumi Osawa, Ikeda, and Hideo Hotomi, Suita, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

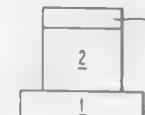
Filed Sep. 25, 1987, Ser. No. 101,281

Claims priority, application Japan, Sep. 26, 1986, 61-229392; Sep. 26, 1986, 61-229393; Sep. 26, 1986, 61-229396; Sep. 26, 1986, 61-229397; Sep. 26, 1986, 61-229431; Sep. 26, 1986, 61-229432; Sep. 26, 1986, 61-229435; Sep. 26, 1986, 61-229436; Sep. 26, 1986, 61-229439; Sep. 26, 1986, 61-229440

Int. Cl.⁴ G03G 5/14, 5/082

U.S. Cl. 430-58

11 Claims



1. A photosensitive member comprising:
an electrically conductive substrate;
a charge generating layer comprising amorphous silicon as a matrix containing germanium atoms in an amount of up to about 30 atomic % based on the combined amount of silicon atoms and germanium atoms and at least one of hydrogen and halogen atoms in an amount of about 10 to about 35 atomic % based on the combined amount of silicon atoms and hydrogen atoms or of silicon atoms and halogen atoms, said charge generating layer having a thickness of about 0.1 to about 5 microns; and
a charge transporting layer comprising amorphous carbon containing hydrogen in an amount of about 30 to about 60 atomic % based on the combined amount of hydrogen atoms and carbon atoms, said charge transporting layer having a thickness of about 5 to about 50 microns and containing at least one of halogen atoms in an amount of about 0.1 to about 25 atomic %, oxygen atoms in an amount of about 0.01 to about 7.0 atomic % and nitrogen atoms in an amount of about 0.01 to about 5.0 atomic % based on all the constituent atoms therein.

4,871,633

PHOTOSENSITIVE MEMBER COMPRISING AZO COMPOUND HAVING PYRIDINE-N-OXIDE OR PYRIDAZINE-N-OXIDE

Masakazu Takata, Hirakata; Takamasa Ueda, Ibaraki; Kimiyuki Ito, Kawasashi; Tsuneaki Hirashima, Sakai; Souichi Yamamoto, Yao; Yoshio Ishino, Kyoto, and Toshinobu Ohno, Moriguchi, all of Japan, assignors to Minolta Camera Kabushiki Kaisha and Osaka Municipal Government, both of Osaka, Japan

Filed Nov. 24, 1987, Ser. No. 124,613

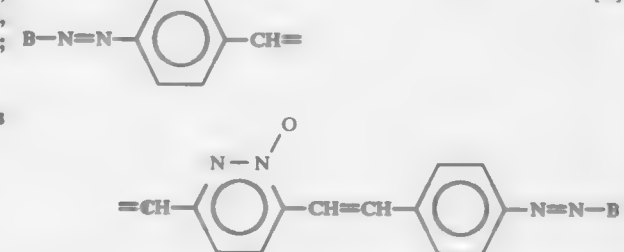
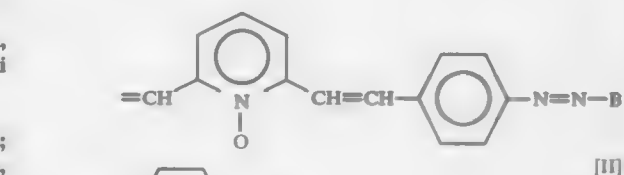
Claims priority, application Japan, Nov. 25, 1986, 61-281543
Int. Cl.⁴ G03G 5/06

U.S. Cl. 430-58

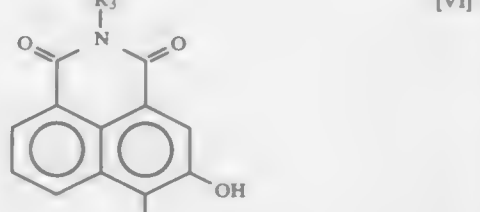
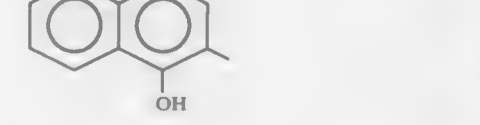
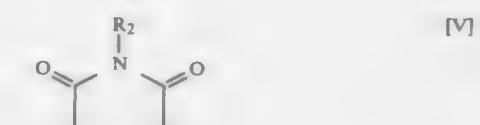
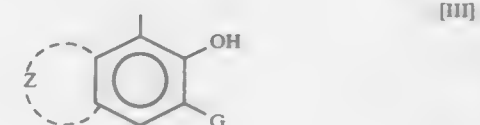
7 Claims

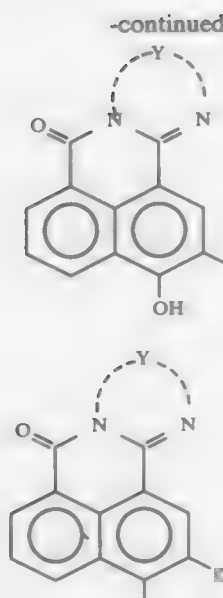
1. A photosensitive member comprising a charge generating layer and a charge transporting layer, within the charge gener-

ating layer comprises a bisazo compound represented by the following General Formula (I) or (II):



wherein B represents a coupler expressed by any one of Formula (III) through (VIII):





where,

Z represents a group of atoms necessary for forming an aromatic carbon ring or an aromatic heterocycle each of which may have a substituent;

G represents a carbamoyl group or a sulfamoyl group, each of which may have a substituent;

R₁ represents a hydrogen atom, an alkyl group, an amino group or a carbamoyl group, each of which may have a substituent, a carboxyl group or an ester group thereof, or a cyano group;

M represents an aryl group which may have a substituent; R₂ and R₃ independently represent an alkyl group or an aralkyl group, each of which may have a substituent or an unsubstituted aryl group;

Y represents a bivalent aromatic hydrocarbon group or a group having a nitrogen atom within a ring.

4,871,634

ELECTROPHOTOGRAPHIC ELEMENTS USING HYDROXY FUNCTIONALIZED ARYLAMINE COMPOUNDS

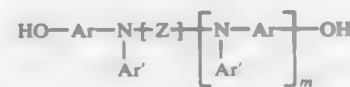
William W. Limburg, Penfield; John F. Yanus; Dale S. Renfer, both of Webster; Richard L. Schank, Pittsford, all of N.Y., and Beag S. Ong, Mississauga, Canada, assignors to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 61,247, Jan. 10, 1987, abandoned. This application May 24, 1988, Ser. No. 198,254 Int. Cl.⁴ G03G 5/06, 5/14

U.S. Cl. 430—54

11 Claims

1. An electrostatic imaging member comprising a support layer and at least one electrophotographic layer, said imaging member comprising a photogenerating material and a hydroxy arylamine compound represented by the formula:

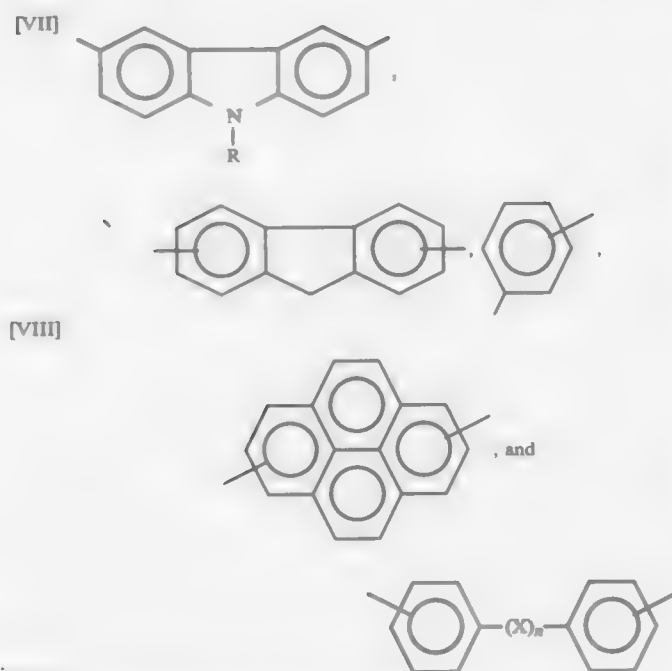


wherein:

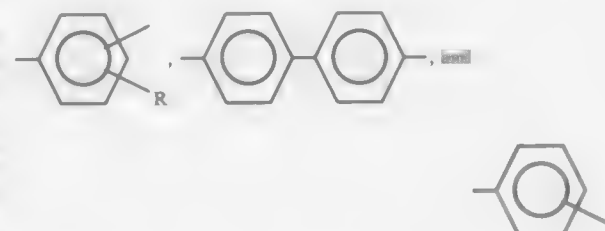
m is 0 or 1,

Z is selected from the group consisting of:

n is 0 or 1,

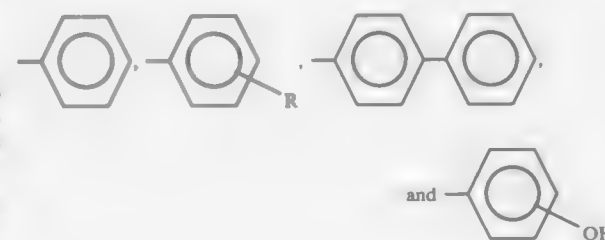


Ar is selected from the group consisting of:

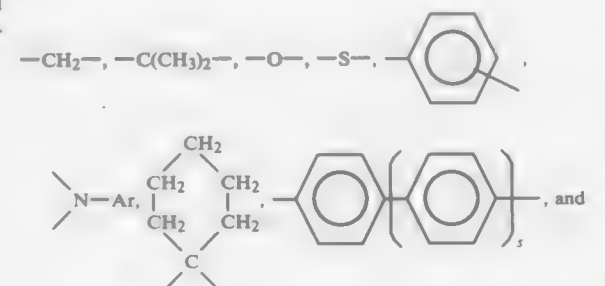


R is selected from the group consisting of —CH₃, —C₂H₅, —C₃H₇, and —C₄H₉.

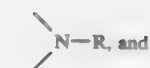
Ar' is selected from the group consisting of:



X is selected from the group consisting of:



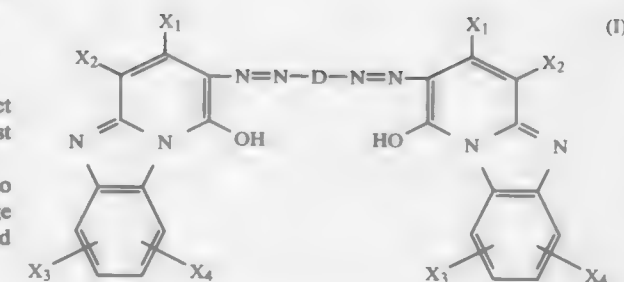
-continued



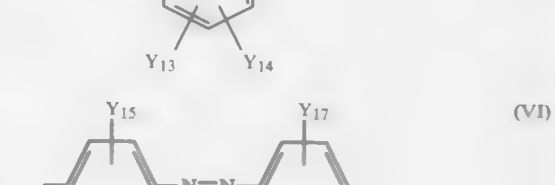
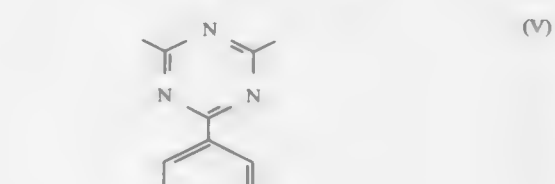
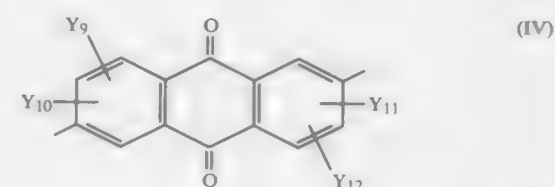
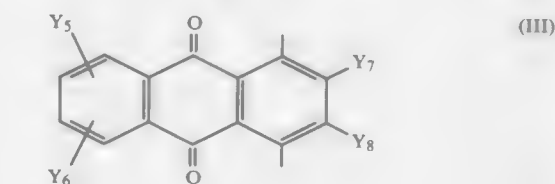
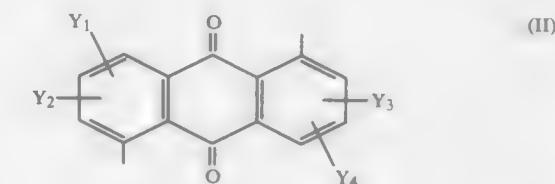
s is 0, 1 or 2,

said hydroxy arylamine compound being free of any direct conjugation between the —OH groups and the nearest nitrogen atom through one or more aromatic rings.

2. An electrostatic imaging member according to claim 1 wherein said imaging member comprises a charge generating layer comprising said photogenerating material and a charge transport layer.



wherein, X₁ stands for an alkyl group which may have a substituent(s) or a phenyl group which may have a substituent(s), X₂ stands for a hydrogen atom, a cyano group, a carbamoyl group, an ester group, an acetyl group or a propionyl group, each of X₃ and X₄ stands for a hydrogen atom, a halogen atom, a nitro group, an alkoxy group or an alkyl group which may have a substituent(s), and D stands for one of the structures represented by the following general formulae (II) to (X);



4,871,636

AZO PHOTOCONDUCTOR FOR ELECTROPHOTOGRAPHY

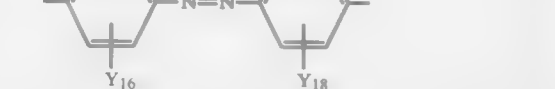
Yoshimasa Hattori, and Noboru Furusho, both of Kawasaki, Japan, assignors to Fuji Electric Co., Ltd., Kawasaki, Japan Filed Dec. 21, 1988, Ser. No. 287,093

Claims priority, application Japan, Dec. 25, 1987, 62-329136 Int. Cl.⁴ G03G 5/06

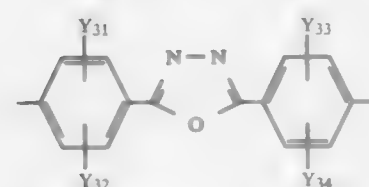
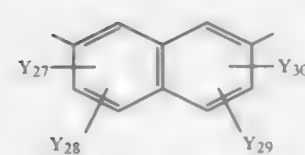
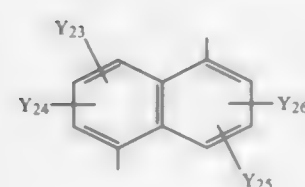
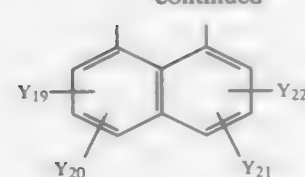
U.S. Cl. 430—77

3 Claims

1. A photoconductor for electrophotography comprising: at least one azo compound represented by the following general formula (I) as a charge generating substance:



-continued



wherein, each of Y₁ to Y₃₄ stands for a hydrogen atom, a cyano group, an ester group, an acyl group, a hydroxyl group, a halogen atom or an alkyl group, an alkenyl group, an aralkyl group, an aryl group or an aromatic heterocyclic group each of which may have a substituent(s).

4,871,637

ELECTROCONDUCTIVE COMPOSITION AND ELECTROPHOTOGRAPHIC PHOTORECEPTOR USING THE SAME COMPRISING BISAZO COMPOUNDS

Katsugi Kitatani, and Satoshi Hoshi, both of Ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

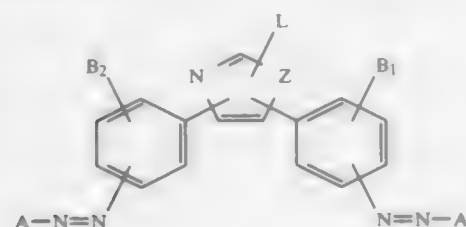
Filed Sep. 19, 1988, Ser. No. 246,056

Claims priority, application Japan, Sep. 18, 1987, 62-234613
Int. Cl.⁴ G03G 5/06

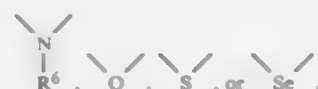
U.S. Cl. 430—77

17 Claims

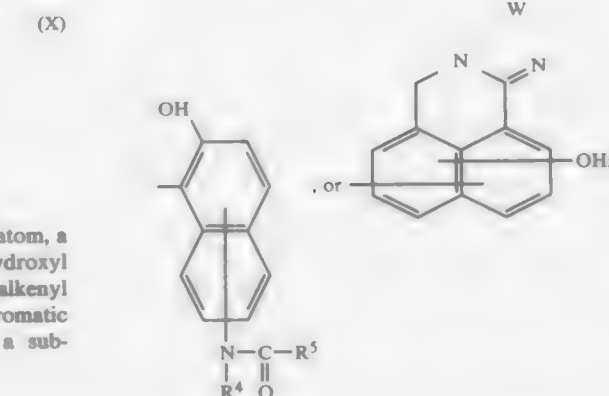
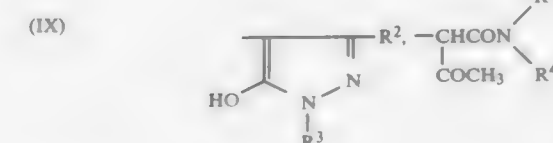
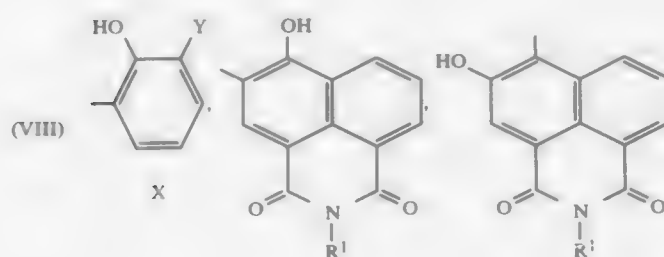
1. A photoconductive composition comprising at least one bisazo represented by the following formula (I):



wherein
Z represents



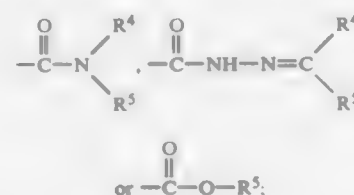
(VII) in which R⁶ represents hydrogen atom, an alkyl group, an aryl group, or a substituted group thereof;
A represents



B₁ and B₆, which may be the same or different, independently represent hydrogen atom, a halogen atom, an alkyl group, an alkoxy group, or a substituted group thereof;

X represents a group that forms an aromatic ring or a heterocyclic ring, which is substituted or unsubstituted, by condensation with the benzene ring in the aforesaid formula having hydroxyl group and Y on the ring;

Y represents

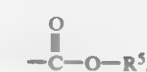


R¹ represents an alkyl group, a phenyl group or a substituted group thereof;

R² represents hydrogen atom, an alkyl group, a carbomoyl group, a carboxyl group, an alkoxy carbonyl group, an aryloxy carbonyl group, or a substituted or unsubstituted amino group;

R³ represents an alkyl group, an aromatic group, a heteroaromatic group, or a substituted group thereof;

R⁴ and R⁵ independently represent hydrogen atom, an alkyl group, an aromatic group, a heteroaromatic group, or a substituted group thereof, provided that both R⁴ and R⁵ are not hydrogen-atoms at the same time, and when Y represents



R⁵ is not hydrogen atom;

W represents a divalent group that forms an aromatic hydrocarbon or a divalent group that forms a hetero ring which contains one or more nitrogen atoms in the ring, and the ring is unsubstituted or substituted; and

L represents an alkyl group, an aryl group, or a substituted group thereof.

4,871,638

ELECTROPHOTOGRAPHIC PHOTSENSITIVE MATERIAL WITH BINDER COMBINATION

Eiichi Kato; Kazuo Ishii, and Ryosuke Itakura, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 9, 1988, Ser. No. 165,949

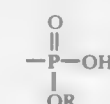
Claims priority, application Japan, Mar. 9, 1987, 62-52186

Int. Cl.⁴ G03G 5/087

U.S. Cl. 430—96

11 Claims

1. An electro-photographic photosensitive material comprising a support having provided thereon a photoconductive layer containing at least an inorganic photoconductive material and a binder, wherein said binder comprises, in a mixture at least resin (A) having a weight average molecular weight of from 1×10³ to 1×10⁴ and containing from 0.05 to 20% by weight a copolymer component having at least one acid group selected from —PO₃H, —COOH, —SO₃H, —OH, —SH, and



wherein R represents a hydrocarbon group; and resin (B) having a weight average molecular weight of at least 3×10⁴, said resin (B) not containing the aforesaid acid group nor a basic group.

4,871,639

CARRIER FOR ELECTROPHOTOGRAPHIC DEVELOPER

Takayoshi Aoki; Ikutaro Nagatsuka; Masayuki Takeda, all of Kanagawa; Toshio Honjo, Chiba; Kazuhiro Itoh, Chiba, and Kenji Uchida, Chiba, all of Japan, assignors to Fuji Xerox Co., Ltd. and Nippon Iron Powder Co., Ltd., both of Japan

Filed Jun. 17, 1987, Ser. No. 63,053

Claims priority, application Japan, Jun. 17, 1986, 61-139183

Int. Cl.⁴ G03G 9/10

U.S. Cl. 430—108

10 Claims

1. Carrier particles for providing a triboelectric charge to toner particles by mixing with said toner particles, said carrier particles comprising:

(1) a binder resin consisting essentially of a polyolefin having a weight average molecular weight of from about 500 to 20,000, and

(2) a magnetic powder having an average particle diameter of not more than 5μm dispersed in said binder resin, said carrier particles being produced by a process comprising the steps of

(A) mixing and heating a carrier material containing said binder resin and said magnetic powder and essentially free of solvent to obtain a molten dispersion of the magnetic powder in the binder resin;
(B) spraying the molten dispersion into droplets; and
(C) cooling the droplets to solidify the droplets into carrier particles.

4,871,640

METHOD FOR PRODUCING AN ORIGINAL FOR USE IN AN OVERHEAD PROJECTOR

Shoichi Tsuge, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed May 11, 1988, Ser. No. 193,276

Claims priority, application Japan, May 15, 1987, 62-119750; May 30, 1987, 62-136992

Int. Cl.⁴ G03G 13/22

U.S. Cl. 430—126

6 Claims

1. A method of producing an image film for use in an overhead projector from a document, the method comprising:

providing a transparent film, a first light-transmissive toner, and a second light transmissive toner;

a first process applying a uniform layer of said first light-transmissive toner onto one surface of said transparent film;

a second process producing a diffusive surface on said surface of said transparent film by fixing said uniform layer of said first light-transmissive toner onto said transparent film;

a third process applying said second light-transmissive onto said diffusive surface so as to correspond to an image on said document; and

a fourth process forming an image portion having a smooth surface corresponding to said image on said document by fixing said light transmissive toner on said diffusive surface.

3. The method of producing an image film as set forth in claim 1, wherein said third process comprises the steps of:

providing a photosensitive member and a second light-transmissive toner developing unit, said second light-transmissive toner unit accommodating said second light-transmissive toner therein;

charging a surface of said photosensitive member at a predetermined potential;

exposing the charged surface of said photosensitive member so as to form an electrostatic latent image on said surface of said photosensitive member corresponding to said image on said document;

developing said electrostatic latent image on said surface of said photosensitive member by transferring said second light-transmissive toner from said second light-transmissive toner unit to said surface of photosensitive member; and

transferring said second light-transmissive toner from said surface of said photosensitive member onto said diffusive surface.

4,871,641

LIGHT-SENSITIVE MATERIAL CONTAINING SILVER HALIDE REDUCING AGENT AND POLYMERIZABLE COMPOUND AND PROCESS FOR PREPARATION THEREOF

Fujio Kakimi, Minami-ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 11, 1987, Ser. No. 24,431

Claims priority, application Japan, Mar. 11, 1986, 61-52994

The portion of the term of this patent subsequent to Apr. 5, 2005, has been disclaimed.

Int. Cl.⁴ G03C 1/42, 1/68

U.S. Cl. 430—138

13 Claims

1. In a light-sensitive material comprising a light-sensitive layer which contains silver halide, a reducing agent and a polymerizable compound containing carbon to carbon unsaturation provided on a support, the improvement wherein the silver halide and the polymerizable compound are contained in microcapsules which are dispersed in the light-sensitive layer, and the light-sensitive layer further contains a binder which is arranged outside of the microcapsules.

4,871,642

LIGHT-SENSITIVE MATERIAL COMPRISING LIGHT-SENSITIVE LAYER PROVIDED ON A SUPPORT COMPRISING A WATER RESISTANT COATING LAYER
Shigehisa Tamagawa, Shizuka, and Masayuki Kuroishi, Kanagawa, both of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 4, 1987, Ser. No. 81,390

Claims priority, application Japan, Aug. 4, 1986, 61-183050
Int. Cl.⁴ G03C 1/72, 1/87, 1/76

U.S. Cl. 430—138

13 Claims

1. A light-sensitive material comprising a light-sensitive layer containing silver halide, a reducing agent and an ethylenic unsaturated polymerizable compound provided on a support, wherein the paper support comprises a coating layer containing a hydrophobic polymer having a cross-linked structure provided on a base paper, said cross-linked structure being formed by a reaction of the hydrophobic polymer with a hardening agent, and the paper support has a low water absorptiveness of 0.1 to 1 g/m² on the surface of the coating layer on which the light-sensitive layer is provided, said water absorptiveness being a value measured according to Cobb test method.

4,871,643

IMAGE-FORMING METHOD EMPLOYING LIGHT-SENSITIVE MATERIAL AND IMAGE-RECEIVING MATERIAL COMPRISING MICROCAPSULES AND SPECIFIED PAPER SUPPORT
Shigehisa Tamagawa, Shizuka, and Masayuki Kuroishi, Kanagawa, both of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 28, 1988, Ser. No. 149,331

Claims priority, application Japan, Jan. 28, 1987, 62-18085;
Apr. 7, 1987, 62-85532Int. Cl.⁴ G03C 1/89, 1/12

U.S. Cl. 430—138

22 Claims

1. An image-forming method which comprises: imagewise exposing a light-sensitive material comprising a light-sensitive layer containing silver halide, a reducing agent and an ethylenically unsaturated polymerizable compound provided on a support to form a latent image of the silver halide; simultaneously or thereafter developing the light-sensitive material to imagewise polymerize the polymerizable compound; and pressing the light-sensitive material on an image-receiving material comprising an image-receiving layer provided on a paper support to transfer the unpolymerized polymerizable compound to the image-receiving material, wherein the paper support of the image-receiving material employs a base paper sheet having such a distribution of fibers that the total coefficient of variation relating to the distribution curve of laser beam transmittance is not more than 15%, said distribution curve of laser beam transmittance being obtained by helium-neon laser scanning; such a distribution of fiber length that the amount of residual pulp on a 24 mesh screen and on a 42 mesh screen is in the range of 30 to 60 weight % based on the total amount of pulp contained in the base paper sheet; and a density in the range of 0.85 to 1.10 g/m².

4,871,644

PHOTORESIST COMPOSITIONS WITH A BIS-BENZOTRIAZOLINE

Sigrid Baer, Paudex, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Sep. 22, 1987, Ser. No. 99,880

Claims priority, application Switzerland, Oct. 1, 1986, 3918/86/7

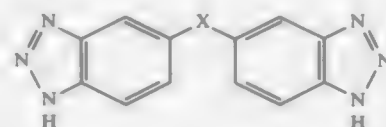
Int. Cl.⁴ G03C 1/60

U.S. Cl. 430—191

3 Claims

1. A photoresist composition which operates positively and

comprises a mixture of a light sensitive o-quinone diazide compound present in sufficient amount to produce a positive resist image, and of from 1 to 15 percent by weight, based on the total solids in the compositions, of at least one compound of the formula I



in which X is —C_nH_{2n}—, —O—, —S— or —C(O)—, n being a number from 1 to 6.

4,871,645

POSITIVE-WORKING PHOTORESIST COMPOSITION
Kazuya Uemishi, Tadayoshi Kokubo, and Yasumasa Kawabe, all of Shizuka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 6, 1988, Ser. No. 202,780

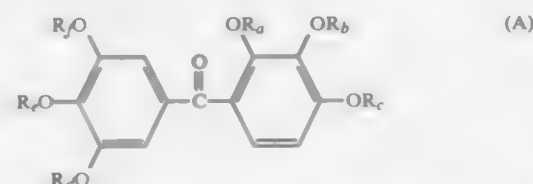
Claims priority, application Japan, Jun. 5, 1987, 62-141115

Int. Cl.⁴ G03C 5/24

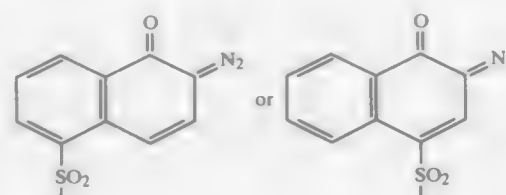
U.S. Cl. 430—192

12 Claims

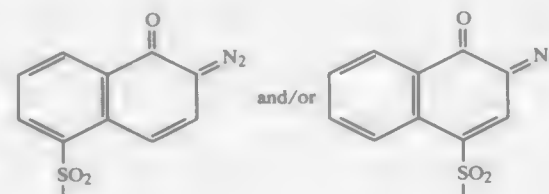
1. A positive-working photoresist composition comprising a light-sensitive compound represented by general formula (A) and an alkali-soluble novolak resin



wherein R₁, R₂, R₃, R₄, R₅ and R₆, which may be the same or different, each represents H, —X—R₁,

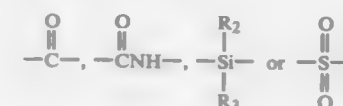


provided that among the six substituents represented by R₁ to R₆ the number of said substituents representing H is a real number of more than 0 and not more than 3 calculated in terms of average value per molecule of said light-sensitive compound, the number of said substituents representing —X—R₁ is a real number of not less than 0.3 calculated in terms of average value per molecule of said light-sensitive compound, and the number of said substituents representing



is a real number of not less than 2.5 calculated in terms of

average value per molecule of said light-sensitive compound; X represents a simple bond,



R₁ represents a substituted or unsubstituted aliphatic group or a substituted or unsubstituted aromatic group; and R₂ and R₃, which may be the same or different, each represents H or a substituted or unsubstituted aliphatic group or a substituted or unsubstituted aromatic group.

4,871,646

POLYSILANE COMPOUND AND PHOTSENSITIVE COMPOSITION

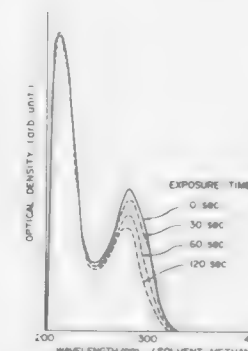
Shizu Hayase, Kawasaki; Rumiko Horiguchi, Yokohama; Yasunobu Onishi, Yokohama, and Toru Ushirogouchi, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 13, 1988, Ser. No. 193,688

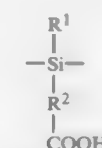
Claims priority, application Japan, May 21, 1987, 62-122409;
Sep. 30, 1987, 62-244341Int. Cl.⁴ G03C 1/52

U.S. Cl. 430—192

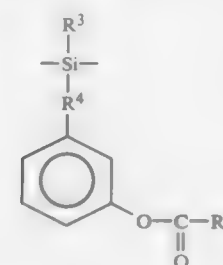
16 Claims



1. A polysilane containing at least one unit selected from the group consisting of units represented by the following formulas I, II, and III:

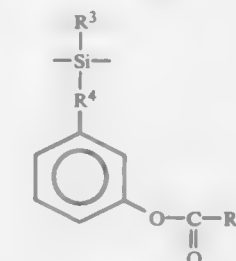


wherein R¹ represents a substituted or unsubstituted alkyl or aryl group and R² represents a substituted or unsubstituted alkylene or arylene group;



wherein R³ to R⁵ represent the following:

R³: a substituted or unsubstituted alkyl or aryl group;
R⁴: An alkylene group having 1 to 10 carbon atoms; and
R⁵: a halogenated alkyl group;

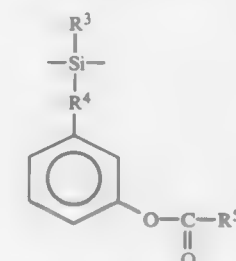


wherein R⁶ to R¹¹ represent the following:

R⁶, R⁹ and R¹⁰: an alkyl group having 1 to 10 carbon atoms or a substituted or unsubstituted aryl group;
R⁷ and R⁸: hydrogen and an alkyl group having 1 to 10 carbon atoms or a substituted or unsubstituted aryl group; and
R¹¹: an alkylene group having 1 to 5 carbon atoms.
3. A photosensitive composition comprising a polysilane containing at least one unit selected from the group of units represented by the following formulas I and II:



wherein R¹ represents a substituted or unsubstituted alkyl or aryl group and R² represents a substituted or unsubstituted alkylene or arylene group;



wherein

R³ to R⁵ represent the following:
R³: a substituted or unsubstituted alkyl or aryl group;
R⁴: An alkylene group having 1 to 10 carbon atoms; and
R⁵: a halogenated alkyl group.

4,871,647

METHOD OF FORMING COLOR DIFFUSION TRANSFER IMAGE BY HEAT DEVELOPMENT

Tawara Komamura, Satoru Ikeuchi, Masaru Iwagaki, Takashi Sasaki, and Wataru Ishikawa, all of Tokyo, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan
Continuation of Ser. No. 852,374, Apr. 16, 1986, abandoned, which is a continuation of Ser. No. 529,028, Sep. 2, 1983, abandoned. This application Apr. 22, 1988, Ser. No. 185,374
Claims priority, application Japan, Sep. 13, 1982, 57-160698;
Dec. 30, 1982, 57-22964

Int. Cl.⁴ G03C 5/54

U.S. Cl. 430—201

9 Claims

1. A method of forming a color diffusion transfer image by heat development comprising
(1) imagewise exposing a thermally developable photosensi-

tive material containing a photosensitive silver halide, an organo siler salt, and a thermally non-diffusing color providing material capable of releasing a chelatable and sublimable dye upon heat development,

- (2) thermally developing the exposed photosensitive material to form an imagewise pattern of said dye, and
- (3) diffusing and heat transferring at least part of said imagewise pattern into an image-receiver containing a polyvalent metallic ion, superimposed on said photosensitive material, thereby forming an imagewise pattern of said dye which has chelated with the polyvalent metallic ion on said image-receiver.

4,871,648

STRIPPING LAYERS FOR IMAGING ELEMENTS

Wayne A. Bowman, Walworth, and Daniel J. Harrison, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 5, 1988, Ser. No. 229,363
Int. Cl.⁴ G03C 5/54, 1/90

U.S. Cl. 430—215 10 Claims
1. In a photographic element for forming a viewable image comprising a support, a silver halide emulsion layer and a stripping layer therebetween, the improvement wherein the stripping layer comprises an N-alkyl substituted acrylamide copolymer in such location, concentration and composition that clean separation between the stripping layer and an adjacent layer is obtained, said copolymer having the formula:



where:

- A represents randomly recurring units of one or more hydrophilic polymerized N-alkyl- or N,N-dialkylacrylamides;
B represents randomly recurring units of one or more polymerized nonionic alkyl-, hydroxyalkyl-, or oxaalkyl-acrylate or methacrylate monomers, or a carboxylic acid group containing monomer;
C represents randomly recurring units of one or more polymerized cross-linking monomers having two or more polymerizable groups;
x, y and z represent the weight percent of the A, B and C recurring units, respectively
x represents 30 to 90 weight percent;
y represents 0 to 60 weight percent, no more than 5 weight percent being a polymerized carboxylic acid group containing monomer;
z represents 0 to 15 weight percent;
the sum of y and z represents 10 to 70 weight percent; and
the sum of x, y and z represents 100 weight percent.
3. The photographic element of claim 1 wherein said silver halide emulsion layer has a diffusible dye image-forming material associated therewith so that a viewable image can be formed in a mordant layer which is between the support and the stripping layer.

4,871,649

OPTICAL RECORDING MEDIUM AND OPTICAL RECORDING METHOD USING THE SAME

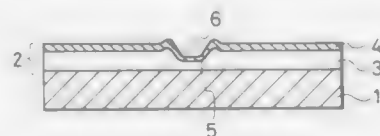
Hiroyuki Imataki, Kawasaki; Mizuho Hiraoka, Isehara; Sachiko Ichikawa; Yoshihiro Ogawa, both of Sagami, and Hitoshi Yoshino, Atsugi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 19, 1987, Ser. No. 28,129

Claims priority, application Japan, Mar. 20, 1986, 61-60613
Int. Cl.⁴ G03C 1/72

U.S. Cl. 430—270 6 Claims
1. An optical recording method which comprises irradiating an optical recording medium having an absorptive layer and a reflective layer placed thereon, with light beams to generate heat, allowing the heat to cause the thermal deformation of the absorptive layer to form concave portions on the surface of the

absorptive layer, deforming the reflective layer as a consequence of the thermally deformed concave portions of the absorptive layer, thereby allowing the deformed reflective



layer to cover the concave portions of the absorptive layer such that the concave portions of the absorptive layer are not exposed and to form concave pits corresponding to the concave portions of the absorptive layer.

4,871,650

COATING PLATE CYLINDERS OR SLEEVES WITH A CONTINUOUS, SEAMLESS PHOTOSENSITIVE LAYER

Guenter Wallbillich, Neustadt, Fed. Rep. of Germany, and Jan H. Van Heuvelen, Losser, Netherlands, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Feb. 9, 1988, Ser. No. 153,936

Claims priority, application Fed. Rep. of Germany, Feb. 14, 1987, 3704695

Int. Cl.⁴ G03F 7/18

U.S. Cl. 430—300 8 Claims
1. A process for coating a printing cylinder or a sleeve with a continuous, seamless, photosensitive layer which comprises: winding a prefabricated, thin, web-like, solid, thermoplastically processable, essentially solvent-free, unsupported photosensitive layer at least twice around the printing cylinder or sleeve without bubbles and with the displacement of the air between the individual strata to form two or more strata lying one on top of the other; heating the total applied photosensitive layer material under pressure to bond the individual strata of the layer; shaping the continuous and bonded photosensitive layer to form an exactly cylindrical surface, and smoothing the surface of the layer.

4,871,651

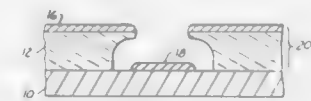
CRYOGENIC PROCESS FOR METAL LIFT-OFF

Robert C. McCune, Jr., Birmingham; Louis Toth, Garden City, both of Mich., and Robert S. Bailey, Newport News, Va., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jun. 27, 1988, Ser. No. 211,648

Int. Cl.⁴ G03C 5/00

U.S. Cl. 430—315 9 Claims



1. A process for the cryogenic lift-off of metal/resist material from a surface of a substrate, which process comprises: providing a layer of resist material in a desired pattern on a surface of a substrate, said substrate possessing a thermal coefficient of expansion different from that of said resist material and said layer (i) defining uncovered surface

areas of said substrate and (ii) having undercut side walls adjacent said uncovered surface areas;
then applying a layer of metal whereby a first portion of said metal deposits on the surface of said resist material and a second portion of said metal deposits on said uncovered surface areas of said substrate forming a layered article, said metal being adherent to said surface of said substrate, said first portion and said portion thereof not being in contact with each other; and
then subjecting said layered article to a temperature sufficiently low to cause said resist layer to detach from said surface of said substrate.

3. The process according to claim 1, wherein said substrate is a semiconductor material.

4,871,652

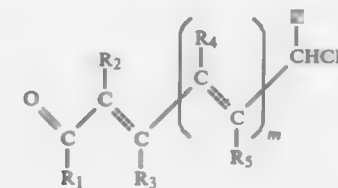
PHOTOGRAPHIC SILVER HALIDE MATERIAL AND PROCESS

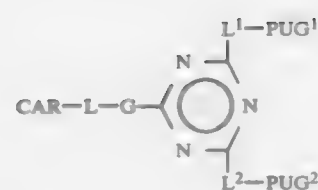
Sharon E. Normandin, Macedon, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 7, 1988, Ser. No. 241,512

Int. Cl.⁴ G03C 7/36, 7/38

U.S. Cl. 430—387 6 Claims
1. A photographic element comprising a support bearing at least one photographic silver halide emulsion layer and a photographic coupler represented by the formula:





wherein:

CAR represents an organic carrier moiety capable of undergoing a redox reaction, which moiety may contain a ballasting group rendering said compound non-diffusing in a hydrophilic colloid medium in wet alkaline conditions,

L represents a chemical group cleavable or releasable from the carrier moiety by a redox reaction taking place in alkaline conditions in dependence on and as a function of the development of a silver halide emulsion layer incorporating such compound,

G represents a bridging group, each of L¹ and L² (same or different) represents a chemical bond, a polyvalent atom, a polyvalent atom group, or a hydrocarbon group,

PUG¹ represents a photographically useful group selected from the group consisting of

a dye group and a dye precursor group, and

PUG² represents a photographically useful group selected from the group consisting of

a dye group, a dye precursor group, an UV-absorber group, and a

singlet oxygen scavenger group, and wherein, when PUG² is a dye

group or a dye precursor group, it may have the same or a different composition as PUG¹.

4,871,655

LIGHT-SENSITIVE SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL CONTAINING MULTI-FUNCTIONAL DYE

Mitsuo Fujiwara; Takashi Uchida, and Toshihiko Kimura, all of Hino, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Dec. 30, 1987, Ser. No. 139,640

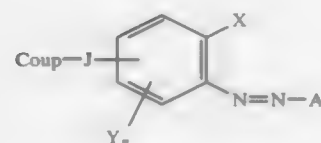
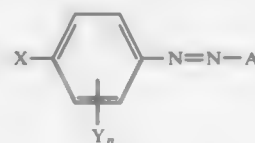
Claims priority, application Japan, Jan. 16, 1987, 62-6050

Int. Cl.⁴ G03C 1/84, 7/34, 7/26

U.S. Cl. 430—519

8 Claims

1. A light-sensitive silver halide color photographic material, comprising at least one photographic constituent layer containing a gelatin and a multi-functional dye represented by Formula I or II:



wherein, Coup is a coupler residue linked to J at the active site; J is a divalent group; A is an aryl group having a hydroxyl group at the o-position or the p-position relative to the azo group; X is a hydroxyl group or an amino group; Y is a monovalent organic group or a monovalent atom, and may form a naphthalene ring together with the benzene ring in Formula I

or II; and n is an integer ranging from 0 to 4, provided that when said multi-functional dye is represented by Formula I, X is a hydroxyl group, an unsubstituted amino group or a monoalkylamino, and wherein said multi-functional dye becomes substantially colorless in the presence of the oxidized product of a color developing agent by reacting with said oxidized product, and becomes substantially colorless in the absence of said oxidized product of said color developing agent during a color-photographic processing step.

4,871,656

PHOTOGRAPHIC SILVER HALIDE ELEMENTS CONTAINING INFRARED FILTER DYES

Richard L. Parton, Webster; Anthony D. Gingello, Rochester; David J. Collett, Walworth; David A. Stegman, Churchville, and Anthony Adin, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 41,955, Apr. 24, 1987. This

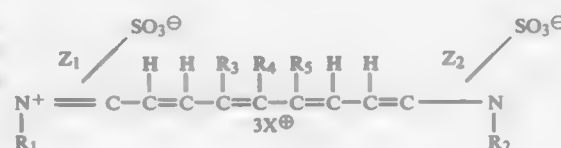
application Mar. 10, 1988, Ser. No. 166,134

Int. Cl.⁴ G03C 1/84

U.S. Cl. 430—522

6 Claims

1. A photographic element comprising a support having thereon a hydrophilic colloid layer comprising infrared-sensitive silver halide and a hydrophilic colloid layer, which is the same as or different from said silver halide layer, comprising an amount effective as a photographic filter dye of a compound having the formula:



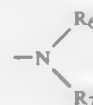
wherein:

R₁ and R₂ each independently represents sulfoalkyl carboxy-alkyl, or sulfoalkyl containing from 2 to 4 carbon atoms, having 2 carbon atoms in the alkyl chain between the nitrogen atom of each Z ring and the sulfo or sulfato group, and 1 carbon atom in the alkyl chain between the nitrogen of each Z ring and the carboxy group,

R₃ and R₄ are each hydrogen or together represent the atoms necessary to complete a 5- or 6-membered carbocyclic ring,

R₄ represents hydrogen, alkyl of 1 to 4 carbon atoms, aryl, cyano, halogen, or

II.



where R₆ and R₇ each independently represents alkyl of from 1 to 6 carbon atoms or aryl or together represent the non-metallic atoms necessary to form a 5- or 6-membered heterocyclic ring,

X⁺ represents a cation, and

Z₁ and Z₂ each independently represents the atoms that complete an indole, naphthindole or benzindole nucleus.

4,871,657

COLOR PHOTOGRAPHIC RECORDING MATERIAL WITH EASILY DISPERSIBLE COLOR COUPLERS

Erich Wolff, Solingen, Fed. Rep. of Germany, assignor to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 909,630, Sep. 22, 1986, abandoned. This application Feb. 28, 1989, Ser. No. 317,109

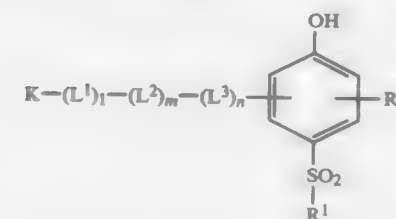
Claims priority, application Fed. Rep. of Germany, Oct. 3, 1985, 3535247

Int. Cl.⁴ G03C 7/32

U.S. Cl. 430—548

1 Claim

1. Colour photographic recording material having at least one silver halide emulsion layer and at least one coupler containing a phenyl group substituted with a hydroxyl group and a sulphonyl group, characterized in that the coupler corresponds to the following general formula I



wherein

K represents the residue of a coupler selected from the group consisting of yellow couplers of the type of α-acetylacetanilide, magenta couplers of the type of 3-anilino- or 3-acylamino-1-arylpyrazolone and pyrazolotriazole, and naphtholic cyan couplers

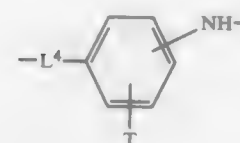
R¹ represents alkyl, aralkyl, aryl or amino,

R² represents hydrogen or a group of the formula

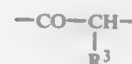


wherein

L¹ represents —NH— or



L² represents —CO—, —CO—CH₂—CH₂—CO—,

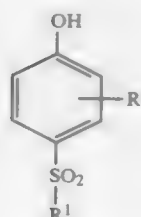


or —R⁴—;

L³ represents O, NH or —NH—L⁵—;

L⁴ represents O, S, NR⁵, or R⁶;

L⁵ represents R⁷ or a saturated 6-membered carbocyclic ring condensed to the phenyl ring of the group



T represents hydrogen, halogen or alkoxy,

R³ and R⁵ represent hydrogen or alkyl with 1 to 20 carbon atoms,

R⁴, R⁶ and R⁷ represent alkylene with 2 to 4 carbon atoms, and

l, m and n independently of one another have the value 0 or 1.

4,871,658

SILVER HALIDE PHOTOGRAPHIC MATERIAL THAT IS RESISTANT TO FOGGING DURING STORAGE

Eiichi Sakamoto; Yutaka Kaneko; Hidetaka Ninomiya; Takashi Kamio; Atsuo Ezaki; Hideo Akamatsu, and Hideaki Haraga, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 4,579, Jan. 20, 1987, abandoned. This application Dec. 2, 1988, Ser. No. 279,081

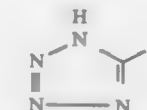
Claims priority, application Japan, Jan. 24, 1986, 61-14536; Feb. 20, 1986, 61-35500; Feb. 21, 1986, 61-37622; Feb. 21, 1986, 61-37623; Feb. 21, 1986, 61-37624

Int. Cl.⁴ G03C 1/34, 7/36, 7/38

U.S. Cl. 430—551

5 Claims

1. A silver halide photographic material comprising a support which is coated with photographic layers including one or more silver halide emulsion layers, said emulsion being a negative-working emulsion containing surface latent image type grains, at least one of said silver halide emulsion layers containing silver halide grains with a silver iodide content of 3.0–15 mol %, and at least one of said photographic layers containing a compound represented by the following formula (I):



where Y is a 5- or 6-membered heterocyclic group selected from the group consisting of 2-pyridyl, 3-pyridyl, 4-pyridyl, 2-quinolyl, 3-quinolyl, 4-quinolyl, 6-quinolyl, 2-thienyl, 3-furyl, 3-pyryl, 2-imidazolyl, 2-pyrimidinyl, 3-pyridazinyl, 3-isoxazolyl, 2-thiazolyl, and 5,6-benzo-1,4-diazinyl, the compound of formula (I) being present in an amount effective to inhibit the occurrence of fogging.

4,871,659

REAGENT FOR DETECTING NON-A, NON-B VIRAL HEPATITIS (NANBH) AND AN IMMUNOENZYMATIC METHOD FOR DETECTING NANBH ANTIGENS IN FECAL EXTRACTS

Jacques Pillot, Gif-Sur-Yvette, France, assignor to Institut Pasteur, Paris, France

Filed Apr. 7, 1987, Ser. No. 35,172

Claims priority, application France, Apr. 16, 1986, 86 05437

Int. Cl.⁴ G01N 33/569, 33/535

U.S. Cl. 435—5

12 Claims

1. A method for diagnosing epidemic non-A, non-B hepatitis (NANBH) virus infection, wherein the method comprises:

(A) providing IgM isolated from serum of a monkey artificially infected with an extract of feces from a patient known to be suffering from epidemic NANBH, wherein the IgM is fixed to a solid support;

(B) providing enzyme-labeled, purified IgG form serum of a patient convalescing from epidemic NANBH;

(C) incubating the IgM for 1 hour at 37° C. with a fecal extract from a human to be diagnosed, to thereby form an immunological complex;

(D) incubating the enzyme-labeled IgG with the immunological complex in order to bind the IgG to the complex; and

(E) developing the enzyme with a substrate for the enzyme.

4,871,660

LUMINESCENCE IMMUNO-TEST KITS, METHOD FOR STABILIZING SAME AND QUALITY CONTROL THEREOF

Andre Gadow, Berlin, Fed. Rep. of Germany, assignor to Henning Berlin GmbH, Berlin, Fed. Rep. of Germany
Filed Mar. 11, 1987, Ser. No. 24,470

Claims priority, application Fed. Rep. of Germany, Mar. 14, 1986, 3608546

Int. Cl.⁴ G01N 33/00; C12Q 1/30

U.S. Cl. 435—7

14 Claims

1. Luminescence immuno-test kit consisting essentially of an antigen or antibody labeled with a phthalic hydrazide capable of showing luminescence, an antibody or antigen and an oxidizing agent inducing the luminescence to occur, characterized in that the oxidizing agent is a pre-fabricated solution of catalase and that an initiator is a pre-fabricated peroxide solution which is at least 20 minutes old.

4,871,661

PROCESS FOR TESTING THE CARCINOGENICITY OF A MATERIAL OR THE PRESENCE OF CANCER-INDUCING FACTORS IN AN ENVIRONMENT

Thomas E. Webb; Dorothy E. Schumm; Margaret Hanascek-Walaszek; Zbigniew Walaszek, and Raymond W. Lang, all of Columbus, Ohio, assignors to The Ohio State University Research Foundation, Columbus, Ohio

Continuation-in-part of Ser. No. 554,439, Nov. 23, 1983. This application Jun. 18, 1985, Ser. No. 745,924

The portion of the term of this patent subsequent to May 24, 2005, has been disclaimed.

Int. Cl.⁴ C12Q 1/00, 1/02; G01N 33/564, 33/53

U.S. Cl. 435—7

19 Claims

1. A process for determining the ability of a material to induce cancer in a test animal, said process comprising administering said material to said test animal and thereafter assaying biological material from said test animal for the presence of a phosphoprotein having the following characteristics:

- (a) not being precipitated by 30% saturated aqueous ammonium sulfate solution at 25° C.;
- (b) having a molecular weight of approximately 60,000;
- (c) being precipitated from aqueous solution by 3.3% streptomycin sulfate;
- (d) having substantially no autophosphorylation activity but being phosphorylated with adenosine triphosphate in the presence of an exogenous protein kinase;
- (e) having substantially no protein kinase activity;
- (f) having the capacity to liberate ribonucleic acid from cell nuclei; and
- (g) not being present in the maternal blood of non-cancerous normal pregnant mammals of the species to which said test animal belongs.

4,871,662

DEVICE FOR SHIPPING MICROBIOLOGY TEST SAMPLES

Eugene Rosov, Manchester, N.H., assignor to WaterTest Corporation, Manchester, N.H.

Continuation of Ser. No. 895,186, Aug. 11, 1986, abandoned. This application Sep. 9, 1987, Ser. No. 96,265

Int. Cl.⁴ C12Q 1/24

U.S. Cl. 435—30

20 Claims

1. A device for receiving a water sample, for retaining bacteria from said sample, for stably maintaining said bacteria for a period of time permitting shipment of said bacteria to a laboratory for later bacterial analysis, and for shipping said device with said bacteria therein to said laboratory, said device comprising:

- a first compartment having one end adapted for receiving a water sample;
- a second compartment removably secured at one end to the other end of said first compartment;

filter means secured between said first and second compartment;

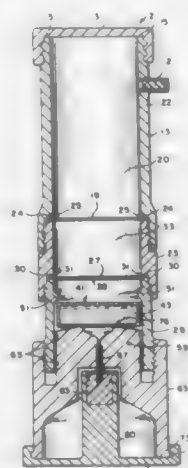
means for drawing the water sample, positioned in said first compartment, through said filter means and into said second compartment such that bacteria in said sample and a portion of said water sample are absorbed by said filter means;

means for adding a bacterio-static nutritional medium to said filter means;

said means for adding includes a sealed vial in which said medium is disposed, means for rupturing said vial, and means for directing said medium to said filter means after said vial has been ruptured, whereby said medium contacts said filter means to maintain said bacteria for later analysis;

a third compartment movably secured at one end to the other end of said second compartment; and

means for positioning said vial such that said vial is disposed between said second and third compartments, said means for rupturing includes urging said third and second compartments into closer engagement, and said means for directing said medium include holding said device with said third compartment uppermost so that said medium, after said vial is ruptured, is urged by gravity toward said pad.



16. A method of use of a device by non-technical persons to take and maintain microbiological samples from water samples taken at a remote site for shipment to a central laboratory for analysis, said method comprising the steps of:

- (a) removing a first cap from one end of said device;
- (b) adding a water sample to a first compartment in the device, while holding the device in a first direction;
- (c) removing a second cap from the other end of said device;
- (d) replacing the first cap;
- (e) drawing the water sample into a second compartment through a filter and an absorbent pad, which is removably secured to said filter;
- (f) retaining a microbiological sample in said filter;
- (g) draining the water from the second compartment which passed through the filter and pad;
- (h) replacing the second cap;
- (i) inverting the device;
- (j) disposing a vial containing nutritional, bacteriostatic medium in said second compartment;
- (k) breaking said vial disposed in said second chamber so that said medium is released therefrom, whereby said medium flows toward said pad and is absorbed thereby;
- (l) disposing said filter in contact with said pad whereby said medium and microbiological sample are in contact with one another such that said microbiological sample is stabilized and maintained for shipment to a laboratory; and

(m) shipping said container with said microbiological sample therein to a laboratory for analysis.

4,871,663

EXPRESSION VECTOR FOR HUMAN TNF

Takehiro Oshima; Shoji Tanaka, and Shigekazu Matsukura, all of Osaka, Japan, assignors to Santory Limited, Osaka, Japan
Filed Sep. 16, 1986, Ser. No. 907,816

Claims priority, application Japan, Sep. 30, 1985, 60-217740

Int. Cl.⁴ C12P 21/00, 21/02; C12N 15/00, 7/00

U.S. Cl. 435—68

3 Claims

1. A plasmid capable of efficient expression of human tumor necrosis factor (TNF) in *Escherichia coli* (*E. coli*), which plasmid is selected from the group consisting of pPLT4TNFST8, pT4TNFST8 and pT4TNFST8 rop⁻.

4,871,664

TYPE II RESTRICTION ENDONUCLEASE DSA I WITH PROCESS FOR OBTAINING IT AND THE USE THEREOF

Nigel L. Brown, Sea Mills, and Anthony E. Walsby, Stoke Bishop, both of England, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

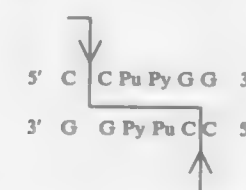
Filed Feb. 9, 1987, Ser. No. 12,192

Int. Cl.⁴ C12P 19/34; C12N 9/22; C12R 1/01

U.S. Cl. 435—91

8 Claims

1. Type II restriction endonuclease recognizing all nucleotide sequences defined by



and having a cleavage position defined by the arrows.

4,871,665

PROCESS FOR THE PREPARATION OF EXOCELLULAR BIOPOLYMERS

Holger Viehweg, Langenfeld, Fed. Rep. of Germany, assignor to Henkel Kommanditgesellschaft auf Aktien, Duesseidorf, Fed. Rep. of Germany

Filed Dec. 19, 1986, Ser. No. 944,684

Int. Cl.⁴ C12P 19/06

U.S. Cl. 435—104

11 Claims

1. In a process for the preparation of exocellular biopolymers having a thickening effect in aqueous media by aerobic culture of microorganism strains that form the biopolymers in a culture medium comprising an aqueous nutrient medium which is present as a disperse aqueous phase in an oil phase in a water/oil emulsion stable under fermentation conditions, the improvement wherein in the culturing step (a) the oil phase is used in quantities below 50% by volume, based on the culture medium, and (b) an emulsifying effective quantity of at least one fatty acid dialkanolamide is employed as an emulsifier.

4,871,666

PROCESS FOR PREPARING A LIPID COMPOSITION HAVING UPON SAPONIFICATION A HIGH GAMMA-LINOLENIC ACID CONTENT

Akira Seto, Yokohama, Japan, assignor to Nisshin Oil Mills, Ltd., Japan

Filed Jul. 23, 1985, Ser. No. 758,023

Claims priority, application Japan, Jul. 31, 1984, 59-159275

Int. Cl.⁴ C12P 7/64; C12N 1/14; C12R 1/645

U.S. Cl. 435—134

8 Claims

1. A process for preparing a lipid composition having, upon

saponification, a high γ -linolenic acid content of 20% by weight or more, comprising:

culturing mold fungi *Thamnidium elegans* NRRL-1613 or *Thamnidium elegans* NRRL-2468 in an aqueous nutrient culture medium having a relatively high concentration of a carbon source including 70–200 g/liter of glucose; and recovering the lipid composition from the cultured mold fungi, said lipid composition, upon saponification, being capable of resulting in a fatty acid composition having a γ -linolenic acid content of 20% by weight or more.

4,871,667

PROCESS FOR PREPARING MUCONIC ACID

Yukio Imada, Tokyo; Nobuji Yoshikawa, Kanagawa; Sumiko Mizuno, Tokyo, and Takashi Mikawa, Kanagawa, all of Japan, assignors to Agency of Industrial Science & Technology and Ministry of International Trade and Industry of Japan, both of Tokyo, Japan

Filed Nov. 20, 1985, Ser. No. 800,027

Claims priority, application Japan, Nov. 26, 1984, 59-248205; Nov. 26, 1984, 59-248207; Jul. 30, 1985, 60-166902

Int. Cl.⁴ C12P 7/44, 7/40

U.S. Cl. 435—142

2 Claims

1. A process for producing muconic acid, which comprises: culturing a microorganism selected from the group consisting of:

- (i) *Arthrobacter* sp. T-8626, FERMBP-1035, *Arthrobacter* sp. T-8626-11, FERMBP-1036
- (ii) *Corynebacterium acetoacidophilum* ATCC 21421, *Corynebacterium acetoacidophilum* ATCC 13870,
- (iii) *Brevibacterium flavum* ATCC 13826, *Brevibacterium saccharolyticum* ATCC 14066, *Brevibacterium divaricatum* ATCC 21642, *Brevibacterium lactofermentum* ATCC 13655, *Microbacterium ammoniaphilum* ATCC 21645 and ATCC 15354,

wherein said culturing is carried out in the presence of benzoic acid as the carbon source, and obtaining muconic acid from the culture.

4,871,668

MICROORGANISM ATCC53716 AND PROCESS FOR PRODUCING ACETOPHENONE

Matthew D. Hilton, and Wendy J. Cain, both of Terre Haute, Ind., assignors to Pittman-Moore, Inc., Terre Haute, Ind.

Filed Jul. 18, 1988, Ser. No. 220,085

Int. Cl.⁴ C12P 7/24; C12R 1/01, 1/38

U.S. Cl. 435—147

5 Claims

1. The microorganism ATCC 53716.

2. A process for producing acetophenone, comprising: fermenting the microorganism ATCC 53716 in an aqueous nutrient medium containing cinnamate as the carbon source; and recovering the acetophenone formed during the fermentation.

4,871,669

PRODUCTION OF NATURAL FLAVOR ALDEHYDES FROM NATURAL SOURCE PRIMARY ALCOHOLS C₂-C₇

William D. Murray; Sheldon J. B. Duff, both of Ottawa, and Patricia H. Lanthier, Wilson's Corners, all of Canada, assignors to Canadian Patents & Development Limited, Ottawa, Canada

Filed Jun. 27, 1988, Ser. No. 211,879

Int. Cl.⁴ C12P 7/24; C12R 1/72, 1/84, 1/78

U.S. Cl. 435—147

20 Claims

1. A process of oxidizing primary C₂-C₇ alcohols to aldehydes comprising:

- (a) providing non-growing living whole cells of methylo-

trophic yeasts containing an active methanol-induced alcohol oxidase system in an alkaline buffer which is capable of forming a complex with the aldehyde product at high pH while maintaining the high pH so that the aldehyde is not released from said complex;

- (b) incubating the cells with the primary alcohol substrate in oxygen rich gas to facilitate the alcohol to aldehyde oxidation, the aldehyde forming a complex with the buffer,
- (c) reducing the pH to release the aldehyde from said complex; and
- (d) recovering the aldehyde.

4,871,670

MOLECULAR CLONING AND CHARACTERIZATION OF A GENE SEQUENCE CODING FOR HUMAN RELAXIN

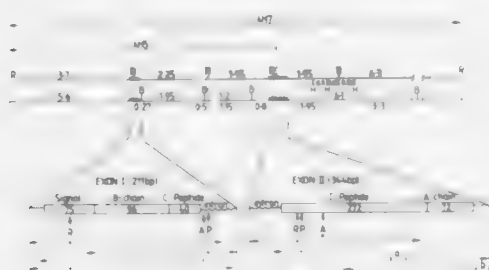
Peter J. Hudson, Bulleen; John Shine, Swinger Hill; Hugh D. Niall, Elwood, and Geoffrey W. Tregear, Hawthorn, all of Australia, assignors to Howard Florey Institute of Experimental Physiology and Medicine, Victoria, Australia

Continuation of Ser. No. 522,956, Aug. 12, 1983, abandoned.

This application May 12, 1986, Ser. No. 863,819

Claims priority, application Australia, Aug. 12, 1982, 17 Claims

Int. Cl.⁴ C12N 15/00, 1/00, 1/20; C07H 15/12
U.S. Cl. 435—172.3



1. An isolated DNA sequence consisting essentially of a DNA sequence encoding human HI-preprorelaxin.

4,871,671

IMMOBILIZATION OF BIOLOGICAL CELLS IN POLYTETRAFLUOROETHYLENE MATRIX

Louis A. Errede, North Oaks, and George R. Hunt, Mahtomedi, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 728,199, Apr. 29, 1985, Pat. No. 4,722,898. This application Sep. 28, 1987, Ser. No. 101,654

The portion of the term of this patent subsequent to Feb. 2, 2005, has been disclaimed.

Int. Cl.⁴ C12N 11/04, 11/08, 5/00

U.S. Cl. 435—182 41 Claims

1. A composite structure comprising:
 - (a) a surfactant and soap-free polytetrafluoroethylene fibril matrix containing micropores uniformly throughout said matrix, and
 - (b) 0.005 to 15 parts of viable cells per part of polytetrafluoroethylene by weight entrapped within the micropores of said matrix, such that almost all of said viable cells are separated from each other and are unbound within said matrix such that when said matrix is cut the cells at the cut edge are free to escape from said fibril matrix, said entrapped viable cells being capable of their usual and continuous biochemical and biological performances.

4,871,673

PROCESS FOR THE DECONTAMINATION OF SOIL BY MEANS OF MICROORGANISMS

Hans J. Rehm, Ludwig, Wokertstrasse 17, 4400 Münster, and Kurt Kirchner, Im Wingert 33, 6236 Eschborn/TS, both of Fed. Rep. of Germany

Filed Aug. 20, 1987, Ser. No. 87,306

Int. Cl.⁴ C12N 11/00; C12P 1/00

U.S. Cl. 435—262 6 Claims

1. A process for the decontamination of soil containing harmful substances using harmful-substance-specific microorganisms comprising bringing harmful-substance-specific microorganisms into soil contaminated with one or more harmful substances in the presence of water, oxygen and mineral salts, said microorganisms being fixed at a high cell concentration to a porous carrier material that is adsorptive with respect to a harmful substance and has a high inner pore surface of from 100 to 1,500 m²/g, the microorganisms having been fixed to said carrier by contacting the carrier material with a suspension of the microorganisms for a sufficient length of time to effect an approximate cell saturation charge, whereby said microorganisms fixed to said carrier support decompose said harmful substance to decontaminate the soil.

4,871,674

CULTURE CELL

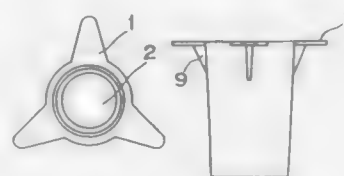
Shigeaki Matsui, Hirakata; Eiichi Hirai, Takarazuka, and Junji Nakamura, Suita, all of Japan, assignors to Kurashiki Boseki Kabushiki Kaisha, Kurashiki, Japan

Filed Oct. 11, 1988, Ser. No. 255,565

Claims priority, application Japan, Oct. 12, 1987, 62-156202[U]

Int. Cl.⁴ C12M 3/00; B01L 3/00

U.S. Cl. 435—284 1 Claim



1. A culture cell comprising:
 - (a) a hollow chamber, having a top and a bottom, wherein the bottom of said chamber is formed by the attachment of a membrane filter,
 - (b) a plurality of discontinuous projections extending radially outward from the top of said chamber beyond a side-wall of the chamber,
 - (c) each said projection having attached to the bottom of the projection in an outwardly radially extending right triangular rib, each said rib being attached at the radially innermost end thereof to said chamber, each said rib being further oriented such that the right angled corner of said right triangular rib abuts the point of contact of said projection with said chamber.

4,871,675

STORAGE CONTAINER OF SAMPLES FOR ANALYSIS

Jiri Coupek, 1580 Kotoraka, Praha 4; Stanislav Voza, 20/214 Bradinska, Praha 9; Borivoj Strejc, 13/1361 Lipanska, Ricany n Praha, and Zdenka Tomsova, 1 Radhostaka, Praha 3, all of Czechoslovakia

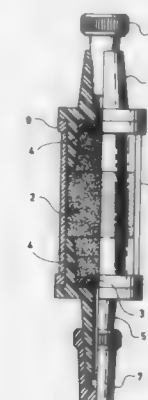
Continuation of Ser. No. 801,554, Nov. 25, 1985, abandoned.

This application Aug. 13, 1987, Ser. No. 85,213

Claims priority, application Czechoslovakia, Nov. 23, 1984, 9011-84

Int. Cl.⁴ B01L 3/00; C12M 1/16

U.S. Cl. 435—288 6 Claims



1. A storage container for storing samples before analysis comprising:
 - a cylindrical tube made from plastic or glass and packed with a sorbent,
 - two plastic fittings, each said two plastic fittings being disposed at an opposite end of said cylindrical tube, said two plastic fittings defining openings into said cylindrical tube, one of said two plastic fittings defining a conically widening portion and the other of said two plastic fittings defines a conically narrowing portion of the same taper, thereby allowing connection of said container to a syringe, connection of a plurality of said containers in series, or closing of said container by closure means,
 wherein said sorbent has a particle size in the range from 20 to 150 um and is selected from the group consisting of high purity polymeric macroporous silicon dioxide and C₁-C₁₈ alkyl, CN, NH₂, NR₃, NR₂ and SO₃ derivatives, wherein R is an alkyl group, and macroporous organic polymers with particles of vertical shape carrying immobilized selective functional groups selected from the group consisting of enzymes, inhibitors of enzymes, and antigens, or carrying the covalently bonded non-selective functional groups selected from the group consisting of C₁ to C₁₈ alkyls, NR₃, NR₂, SO₃, OPO₃⁻, and COO⁻, wherein R is an alkyl group.

4,871,676

CELL CULTURE INCUBATOR

Koji Yamada, Osaka, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed May 25, 1988, Ser. No. 198,435

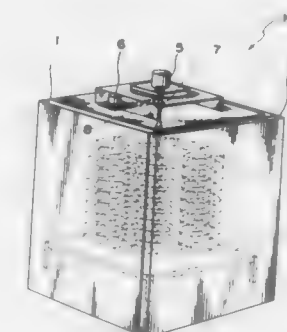
Claims priority, application Japan, May 28, 1987, 62-81595; May 28, 1987, 62-81596

Int. Cl.⁴ C12M 1/38

U.S. Cl. 435—290 1 Claim

1. An incubator for cell culture comprising:
 - an incubator housing having a main door,
 - a tray stock disposed in said incubator housing for supporting a plurality of trays for cell culture,
 - a driving mechanism for rotating said tray stock,
 - said driving mechanism being provided outside said incubator housing and including a control means for stopping drive of said tray stock at a desired rotational position

wherein said control means includes an encoder for detecting the rotational position of said tray stock, an auxiliary door disposed on said incubator housing, and a link mechanism including an arm coupled with said auxiliary door, a support member for supporting said arm and



a compression coiled spring held by said support member such that said arm is urged toward said auxiliary door by said compression coiled spring, and a motor for driving said link mechanism, to open and close said auxiliary door perpendicularly to said main door.

4,871,677

METHOD OF COLLECTING AND ANALYZING A SAMPLE OF BLOOD WHEN MONITORING HEPARIN THERAPY

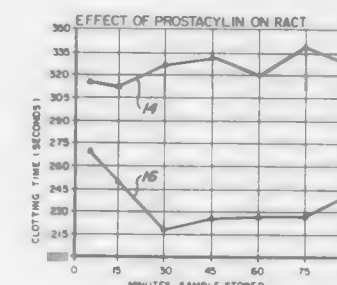
Robert F. Baugh, Aurora, and Cynthia A. Taylor, Deaver, both of Colo., assignors to Hemotec, Inc., Englewood, Colo.

Division of Ser. No. 705,507, Feb. 25, 1985, Pat. No. 4,782,026.

This application Aug. 17, 1988, Ser. No. 233,207

Int. Cl.⁴ G01N 33/86

U.S. Cl. 436—69 7 Claims



1. A method of collecting and analyzing a sample of blood when monitoring heparin therapy, comprising the steps of:
 - drawing a sample of blood from the patient;
 - collecting the sample as it is drawn in a collection medium which includes a calcium chelating agent;
 - mixing an inhibitor with the blood sample approximately simultaneously with collection of the sample, the inhibitor being effective to inhibit a platelet-related procoagulant activity which otherwise normally occurs and substantially concludes within approximately thirty minutes after drawing the blood sample from the patient; and thereafter performing a recalcified activated clotting time test on the blood sample to obtain data useful in monitoring the amount of heparin to be administered.

4,871,678

AGENT AND PROCESS FOR THE DETERMINATION OF CALCIUM

Hans P. Wahl, Reinheim, and Uwe Würzburg, Dieburg, both of Fed. Rep. of Germany, assignors to Beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Apr. 24, 1986, Ser. No. 855,254

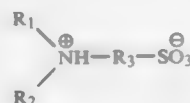
Claims priority, application Fed. Rep. of Germany, Apr. 24, 1985, 3514695

Int. Cl.⁴ G01N 33/20

U.S. Cl. 436—79

18 Claims

1. An agent useful for determining calcium in a liquid, comprising an effective amount for determining the presence of calcium of orthocresolphthalein complexone, an acid and a zwitterionic buffer which is at least one sulphonic acid amine of the formula



wherein

R₁ is H, alkyl, hydroxyalkyl or cycloalkyl each having up to 8 C atoms,

R₂ is H, alkyl, hydroxyalkyl or cycloalkyl each having up to 8 C atoms, and

R₃ is alkyl or hydroxyalkyl each of up to 8 C atoms.

4,871,679

INTEGRAL MULTILAYER ANALYTICAL ELEMENT FOR DETERMINING CALCIUM AND ITS USE

Mitsutoshi Tanaka; Fuminori Arai; Kaoru Terashima, and Nakatsugu Yaginuma, all of Saitama, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 15, 1987, Ser. No. 73,759

Claims priority, application Japan, Jul. 15, 1986, 61-164570; Jul. 18, 1986, 61-168091

Int. Cl.⁴ G01N 33/20, 31/22

U.S. Cl. 436—79

3 Claims

1. An integral multilayer analytical element for analysis of calcium compounds comprising, in this order, a water-impermeable light-transmissive support, a reagent layer containing a water-soluble indicator capable of reacting with an analyte containing calcium to produce an optically detectable change, and a porous spreading layer containing an acid capable of decomposing the calcium compound in a sample, and a pH buffer capable of maintaining the reaction with said indicator at its optimum pH incorporated in said reagent layer or an intermediate layer between said reagent layer and said porous spreading layer.

3. A method of analyzing calcium compounds with comprises spotting an aqueous liquid sample on a spreading layer of an integral multilayer analytical element for analysis of calcium comprising, in this order, a water-impermeable light-transmissive support, a reagent layer containing a water-soluble indicator capable of reacting with an analyte containing calcium to produce an optically detectable change, and a porous spreading layer containing an acid capable of decomposing the calcium compound in a sample, and a pH buffer capable of maintaining the reaction with said indicator at its optimum pH incorporated in said reagent layer or an intermediate layer between said reagent layer and said porous spreading layer, releasing calcium ion from said calcium compound in the presence of said acid contained in said spreading layer, producing said optically detectable change by supplying said acid treated sample to said reagent layer to interact with said indicator, and detecting said change optically.

4,871,680

PROCESS FOR THE DETECTION OF MOLECULAR OR IONIC SPECIES

André Barraud, Bures sur Yvette; Gléle Derost, Saint Cyr l'Ecole; Laurence Henrion, Boulogne, and Annie Ruandel-Teixier, Verrieres le Buisson, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

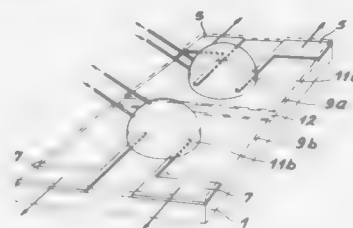
Filed Jul. 2, 1987, Ser. No. 69,248

Claims priority, application France, Jul. 3, 1986, 86 09677

Int. Cl.⁴ G01N 33/48

U.S. Cl. 436—103

12 Claims



1. A process for the detection of molecular or ionic species present in a gaseous or liquid medium which comprises:

(a) contacting said gaseous or liquid medium with a film comprising at least one monomolecular layer of an amphiphilic tetracyanoquinodimethane (TCNQ) compound selected from the group consisting of electrically conductive tetracyanoquinodimethane (TCNQ) charge transfer complexes, electrically conductive tetracyanoquinodimethane (TCNQ) salts, electrically insulating (TCNQ) charge transfer complexes capable of becoming electrically conductive by reaction with the molecular or ionic species to be detected, and electrically insulating (TCNQ) salts capable of becoming electrically conductive by reaction with the molecular or ionic species to be detected, and

(b) measuring the change in electrical resistance of the film contacted with said medium.

4,871,681

METHOD FOR THE COLORIMETRIC DETERMINATION OF THE CYANIDE CONCENTRATION OF AQUEOUS SOLUTIONS

Edgar Bilger, Hasselroth, and Hubert Wolf, Hammersbach, both of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

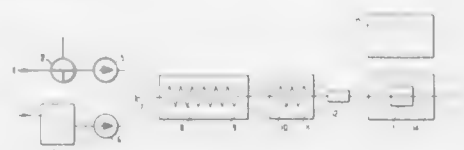
Filed Nov. 30, 1987, Ser. No. 126,095

Claims priority, application Fed. Rep. of Germany, Dec. 3, 1986, 3641251

Int. Cl.⁴ G01N 21/78

U.S. Cl. 436—109

9 Claims



1. A process for colorimetrically determining the cyanide concentration of aqueous solutions in the range from 0.001 to 5 mg/liter, of free cyanide and cyanide released by chelating complexing agents from cyano-complexes comprising:

(a) continuously combining the aqueous solution to be tested with picric acid, with a chelating complexing agent and with chemicals to adjust the pH while retaining an aqueous, alkaline solution of reaction,

(b) heating the solution of reaction to 50° to 120° C. while forming a red cyanide-picric color complex,

(c) cooling the reaction solution containing the red color complex, and

(d) spectrophotometrically measuring the absorbency of the cooled reaction solution at a wave length approximately 520 nm with comparison to a cyanide-free blank sample and ascertaining by means of a calibration curve the cyanide concentration associated with said absorbency.

where the combination of (a) and the heating of (b) take place in a closed, gas-tight system wherein the formation of a gas phase is avoided by means of back pressure.

4,871,682

DILUENT CARRYOVER CONTROL

John C. Mazza, El Toro, Calif., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

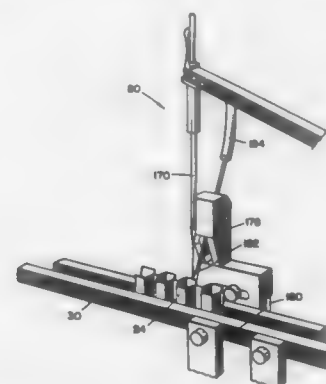
Continuation of Ser. No. 858,217, Apr. 30, 1986, abandoned.

This application Oct. 1, 1987, Ser. No. 106,018

Int. Cl.⁴ G01N 1/14, 21/11

U.S. Cl. 436—179

10 Claims



1. A method of avoiding contamination and dilution of sample in the course of analyzing a biological sample where multiple aliquot are taken from the biological sample comprising the steps of:

dispensing from the tip end of a tubular sample probe a sample material into a cuvette with a reagent material and diluent to partially fill the cuvette without permitting the sample probe to contact the reagent material;

while the tip end of the sample probe remains positioned above the cuvette, flushing the interior of the sample probe after the sample material has been dispensed into the cuvette with an amount of diluent sufficient to adjust the contents of the cuvette to a predetermined volume;

withdrawing the sample probe from the cuvette; and

directing a stream of air at the sample probe during the withdrawing step such that the tip end of the sample probe passes through the air stream to eject therefrom and into the cuvette any diluent remaining on the tip end.

4,871,683

APPARATUS AND METHOD USING A NEW REACTION CAPSULE

Paul C. Harris, Edmonds, Wash., and Linda J. Stone, Chino, Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Continuation-in-part of Ser. No. 724,711, Apr. 18, 1985, abandoned. This application Jan. 13, 1987, Ser. No. 2,908

Int. Cl.⁴ G01N 33/53, 33/545, 35/02

U.S. Cl. 436—531

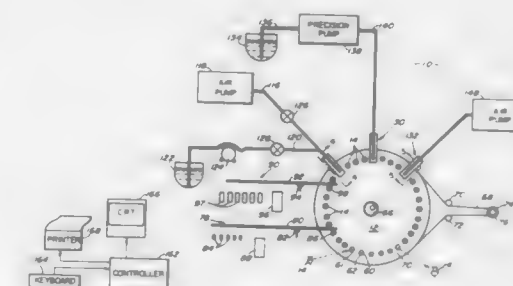
20 Claims

13. A method of performing an immunoassay comprising the steps of:

adding a solid support coated with a first analyte, a patient sample containing a second analyte and a third analyte having a label attached thereto to a reaction capsule, the

reaction capsule having a hydrophobic membrane at a lower end thereof;

allowing an immunoassay reaction to occur between the first, second and third analytes;



applying pressure to the reaction capsule to initiate liquid flow through the membrane; and

flowing gas through the membrane to return the membrane to a hydrophobic state.

4,871,684

SELF-ALIGNED POLYSILICON EMITTER AND CONTACT STRUCTURE FOR HIGH PERFORMANCE BIPOLAR TRANSISTORS

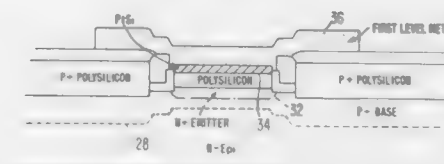
Reinhard Glang, Reston, Va., and San-Mei Ku, Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 29, 1987, Ser. No. 114,190

Int. Cl.⁴ H01L 21/265

U.S. Cl. 437—31

14 Claims



1. A process for forming a bipolar device having a self-aligned emitter region which includes a surface not subjected to deleterious processes during the formation of other active regions in the device comprising the steps of,

forming an epi-layer on a substrate to be of a first conductivity type suitable as a collector region,

forming and defining first and second overlying insulating layers of different materials at a selected point on the epi-layer for a future emitter region of the device,

forming and controlling a linking region of a second conductivity type in the epi-layer to be adjacent to the future emitter region,

forming and defining an insulating layer of a third isolating material on the layer as a sidewall surrounding the first and second overlying layers, the sidewall serving as a mask for aligning subsequent and sequentially formed emitter and intrinsic base regions,

depositing and planarizing a layer of a fourth insulating material to expose the second insulating layer overlying the future emitter region,

implanting through the deposited and planarized fourth insulating material the second conductivity type to form an extrinsic base region therebeneath, the exposed second insulating layer serving as a mask to the second conductivity type,

removing the exposed second insulating layer to expose the first insulating layer overlying the future emitter region,

implanting into the exposed first insulating layer, the second conductivity type and heating the substrate to drive the

second conductivity into the epi-layer to serve as an intrinsic base region which is connected to the extrinsic base region through the linking region, implanting the first conductivity type into the first exposed layer and heating the substrate to drive-in the first conductivity type to form an emitter region disposed within the intrinsic base region, and forming metal connections to the emitter, base and collector regions whereby the device has enhanced performance due to the absence of deleterious processes affecting the surface of the layer overlying the emitter and linking regions.

4,871,685

METHOD OF MANUFACTURING BIPOLAR TRANSISTOR WITH SELF-ALIGNED EXTERNAL BASE AND EMITTER REGIONS

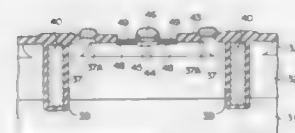
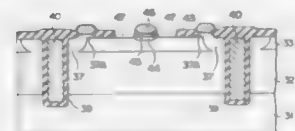
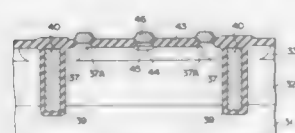
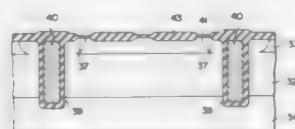
Shin-ichi Taka, Yokosuka, and Jiro Ohshima, Kawasaki, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 11, 1988, Ser. No. 230,823

Claims priority, application Japan, Aug. 13, 1987, 62-202384
Int. Cl.⁴ H01L 21/265

U.S. Cl. 437—33

14 Claims



1. A method of manufacturing a bipolar transistor wherein an external base region and an emitter region are formed in self-alignment, comprising steps of:

- forming a buried layer of a second conductivity type in a major surface of a semiconductor substrate of a first conductivity type;
- forming an epitaxial layer of the second conductivity type on said buried layer, said epitaxial layer having an impurity concentration lower than that of said buried layer;
- selectively forming a field oxide film on said epitaxial layer except for prospective emitter and base regions;
- doping an impurity of the first conductivity type in said epitaxial layer by using said field oxide film as a mask, thereby forming a base region;
- doping an impurity of the second conductivity type in said base region by using said field oxide film as a mask, thereby forming an emitter region;

forming a metal layer on said emitter region and a bird's beak of said field oxide film by selective CVD method; selectively removing said field oxide film using said metal layer as part of a mask to expose a surface portion of said epitaxial layer at a prospective external base region; and doping an impurity in said epitaxial layer by using said metal layer and said field oxide film as masks to form external base region of the first conductivity type.

4,871,686

INTEGRATED SCHOTTKY DIODE AND TRANSISTOR

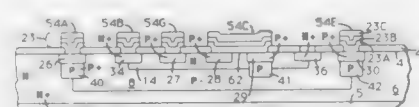
Robert B. Davies, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 28, 1988, Ser. No. 173,795

Int. Cl.⁴ H01L 29/56

U.S. Cl. 437—39

16 Claims



1. A process for forming a semiconductor device having an integral Schottky diode, comprising:
 - providing a semiconductor substrate of a first type and first impurity concentration and having a principal surface;
 - providing a first doped region of a second type opposite the first type and of a second impurity concentration and which forms a first junction with the substrate extending to the surface;
 - providing a second doped region of the first type and a third impurity concentration in the first region and which forms a second junction with the first region extending to the surface;
 - then in either order, (a) providing a third doped region of the second type and a fourth impurity concentration located at the intersection of the first junction and the surface and a fourth doped region of the second type and a fifth impurity concentration laterally within the second region at the surface, and (b) providing a fifth doped region of the first type and a sixth impurity concentration located at the intersection of the second junction and the surface;
 - exposing first, second and third portions of the surface, respectively, on the third, fourth and fifth doped regions and a fourth portion of the surface laterally within the second region adjacent to the second portion of the surface; and
 - providing a Schottky contact to the fourth portion of the surface and ohmic contact to the second portion of the surface.

4,871,687

METHOD OF FABRICATING A MESFET TRANSISTOR WITH GATE SPACED ABOVE SOURCE ELECTRODE BY LAYER OF AIR OR THE LIKE

Giampiero Donzelli, Milan, Italy, assignor to Telettra Telefonica Elettronica e Radio S.p.A., Milan, Italy

Division of Ser. No. 201,353, May 26, 1988, Pat. No. 4,807,002.

This application Oct. 24, 1988, Ser. No. 261,142

Claims priority, application Italy, Jan. 28, 1988, 19262 A/85

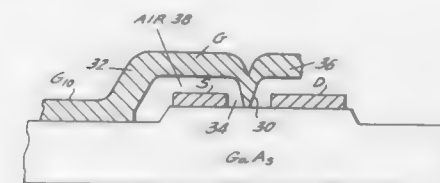
Int. Cl.⁴ H01L 23/48

U.S. Cl. 437—40

4 Claims

1. A process for fabricating a metal-semiconductor field effect transistor, comprising the steps of:
 - providing a semiconductor substrate with source and drain electrodes on a major surface of a semiconductor substrate;
 - applying photoresist over at least the source electrode while leaving exposed a first portion of said major surface between the source and drain electrodes and a second portion of the major surface on an opposite side of the source

electrode from the first portion and which is adapted to receive gate metallization to implement a gate bonding pad; forming gate metallization over the photoresist that overlies the source electrode and on the first and second areas of the major surface of the semiconductor surface, whereby



the connection of the gate metallization to the first area constitutes the active gate connection of the device while the connection to the gate metallization to the second area implements a gate bonding pad; and removing the photoresist between the gate and source electrodes whereby said electrodes are dielectrically separated by each other by a gaseous medium.

4,871,688

SEQUENCE OF ETCHING POLYSILICON IN SEMICONDUCTOR MEMORY DEVICES

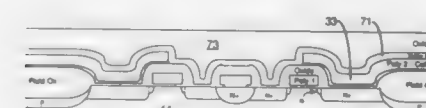
Tyler A. Lowrey, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.

Filed May 2, 1988, Ser. No. 189,412

Int. Cl.⁴ H01L 21/22

U.S. Cl. 437—47

6 Claims



1. A method of forming DRAM semiconductor circuit devices which include, as a part of each device, a plurality of memory cells and active circuit elements to control signals, the cells and active circuit elements forming a repeating pattern on the device, the method comprising:

- (a) preparing a silicon substrate;
- (b) defining active and isolation regions of the substrate by oxidizing the substrate in a pattern;
- (c) forming an insulation film on a surface of the substrate, said step of forming the insulating film including the formation of gate dielectric in the active regions;
- (d) removing a portion of the insulating film from said substrate surface to define buried contact regions;
- (e) forming a polysilicon film, as a first polysilicon layer, over said insulating film and on the portion of said substrate from which the insulating film was removed;
- (f) introducing impurities into the first polysilicon layer so as to form buried contacts at predetermined portions of the substrate;
- (g) substantially etching said first polysilicon layer to define a pattern of transistor gates and bit lines from polysilicon connected to said buried contacts;
- (h) forming a capacitor dielectric layer over the substrate;
- (i) depositing a second layer of polysilicon over the capacitor dielectric layer; and
- (j) isotropically etching said second layer of polysilicon, thereby forming capacitor plates over the capacitor dielectric layer.

4,871,689

MULTILAYER TRENCH ISOLATION PROCESS AND STRUCTURE

Bridgette A. Bergami, Gilbert, and Phillip H. Williams, Mesa, both of Ariz., assignors to Motorola Inc., Schaumburg, Ill.

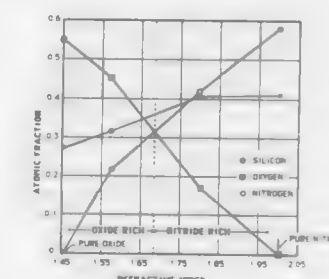
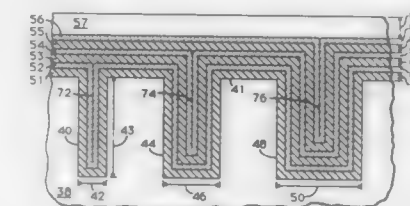
Continuation of Ser. No. 122,091, Nov. 17, 1987, abandoned.

This application Dec. 23, 1988, Ser. No. 290,809

Int. Cl.⁴ H01L 21/76

U.S. Cl. 437—67

18 Claims



8. A process for forming dielectric filled trenches, comprising:

- providing a substrate having a surface;
- providing multiple trenches in the substrate, comprising a first trench having a first width and at least a second trench having a second width larger than the first width; and
- at least partially filling the trenches with alternating dielectric layers, at least two in the first trench and at least four in the second trench, wherein odd-numbered layers have a first composition and a first etch rate and even-numbered layers have a second composition different than the first composition and a second etch rate different than the first etch rate, and the layers are thicker than layers formed from a native oxide.

4,871,690

SEMICONDUCTOR STRUCTURES UTILIZING SEMICONDUCTOR SUPPORT MEANS SELECTIVELY PRETREATED WITH MIGRATORY DEFECTS

Nick Holonyak, Jr., Urbana, Ill., and Robert D. Burnham, Palo Alto, Calif., assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 820,044, Jan. 21, 1986, This application Jan.

27, 1988, Ser. No. 148,737

Int. Cl.⁴ H01L 21/203, 33/00

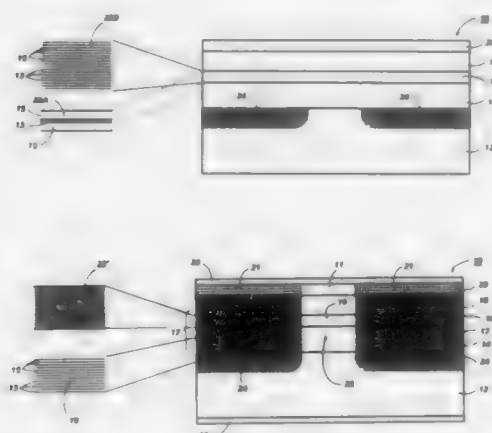
U.S. Cl. 437—105

7 Claims

1. A method of converting selected areas of a multilayer semiconductor region, epitaxially deposited on a semiconductor support means of single crystal and low defect density, said region comprising at least one first active well layer interposed between second barrier layers into a disordered alloy of both said first and second layers, said alloy exhibiting higher band-gap and refractive index properties than said first layer and comprising the steps of

- (a) initially treating selected areas of said support means to provide dislocation effects therein,

(b) epitaxially depositing said semiconductor region, said dislocation effects propagating from said support means selected areas into contiguous areas of said semiconductor region as the same is being deposited,

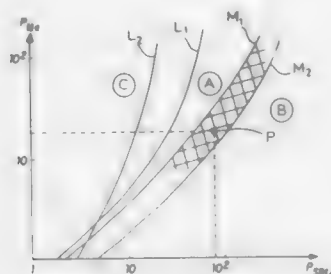


(c) thereafter annealing said structure to convert said region selected areas into said disordered alloy.

4,871,691

SELECTIVE DEPOSITION PROCESS OF A REFRACTORY METAL SILICIDE ONTO SILICON AREAS

Joaquim Torres, Saint Martin Le Vinoux; Roland Madar; Claude Bernard, both of Eybens, and Jean-Francois Million-Brodax, Chambéry, all of France, assignors to Etat Français Centre National de la Recherche Scientifique, France
Filed Nov. 8, 1988, Ser. No. 269,754
Claims priority, application France, Nov. 9, 1987, 87 15885
Int. Cl.⁴ H01L 21/44; C23C 16/42
U.S. Cl. 437—200 8 Claims



1. A selective deposition method of a refractory metal silicide onto the apparent silicon surfaces of a wafer partially coated with SiO₂, comprising the following steps:

flowing inside a cold-wall airtight chamber comprising said wafer a gaseous silane composite at a first partial pressure P_{SiH₄} and an halogenide of said metal at a second partial pressure P_{MX};
heating the wafer to a first temperature (T1) for a first duration (t1), T1, P_{SiH₄} and P_{MX} being chosen so as to allow a metal silicide deposition to be formed on the wafer, silicon being overstoichiometric; and
heating the wafer to a second temperature (T2) lower than the first one for a second duration (t2), T2 being chosen as a function of P_{SiH₄} and P_{MX} so as to allow a stoichiometric metal silicide deposition.

4,871,692

PASSIVATION OF GROUP III-V SURFACES

Hong H. Lee, 9221 NW 9th Ave., Gainesville, Fla. 32606, and Sang H. Lee, 6519 Newberry Rd., #914, Gainesville, Fla. 32606

Filed Sep. 30, 1988, Ser. No. 251,521
Int. Cl.⁴ H01L 21/00, 21/02, 21/306, 21/31
U.S. Cl. 437—235 3 Claims



1. A method of passivating a surface of a Group III-V compound substrate comprising exposing said surface to a compound selected from the group consisting of P₂S₅, P₂Se₅, P₂Te₅ and P₂PO₅ for a time sufficient for deposition and chemisorption thereon of an amount of said compound sufficient to prevent formation of segregated surface atoms and oxides, thereby minimizing the density of surface states thereof.

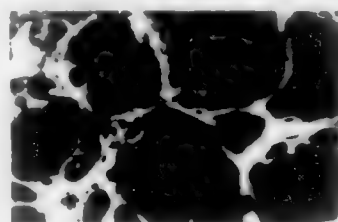
4,871,693

POROUS CORDIERITE CERAMICS

Senya Inoue, Saitama; Akira Ono, Tokyo; Mikio Kobayashi, Saitama, and Hiroshi Yokoo, Tokyo, all of Japan, assignors to Kanto Kagaku Kabushiki Kaisha, Tokyo, Japan
Division of Ser. No. 726,325, Apr. 23, 1985, Pat. No. 4,698,317.
This application Sep. 24, 1987, Ser. No. 100,998
Claims priority, application Japan, Apr. 24, 1984, 59-81180; Apr. 24, 1984, 59-81181; Dec. 21, 1984, 59-268442
The portion of the term of this patent subsequent to Oct. 6, 2004, has been disclaimed.
Int. Cl.⁴ C04B 38/08 8 Claims

U.S. Cl. 501—9

8 Claims



1. Porous cordierite ceramics having an interconnecting open cellular structure, which have been formed by the process which comprises providing a starting solution containing in an organic or aqueous organic solvent an alkyl silicate and aluminum and magnesium salts soluble in said organic solvent in a proportion of 44–65% by weight, 25–43% by weight and 10–16% by weight in terms of SiO₂, Al₂O₃ and MgO, respectively, subjecting said starting solution to spray thermal decomposition in the presence of an oxidizing gas to form a hollow microspherical cordierite glass powder, processing said glass powder to a shaped body after an optional heat treatment, and thereafter firing said shaped body at a temperature above 1000° C., wherein said interconnecting open cellular structure comprises individual hollow spheres having spherical shells which are interconnected with a number of open pores existing in the spherical shells.

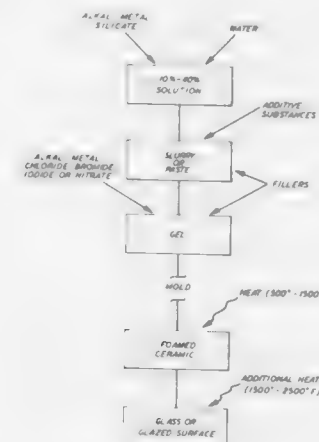
4,871,694

CELLULAR CERAMIC MATERIAL AND METHOD OF PRODUCTION THEREOF

David J. Legare, 11 Bonnie Ave., New Hartford, N.Y. 13413
Continuation-in-part of Ser. No. 840,071, Mar. 17, 1986, abandoned. This application Sep. 17, 1987, Ser. No. 97,707
Int. Cl.⁴ C03C 11/00

U.S. Cl. 501—39

10 Claims



1. A method of forming a silicate gel which exhibits intumescence upon application of heat said method comprising adding about 0.5 to 12 parts by weight of at least one alkali metal chloride, bromide, iodide or nitrate to 10 parts of an approximately 10 to 40% (by weight) aqueous solution of sodium or potassium silicate, wherein the soluble SiO₂ to alkali metal oxide ratio is between about 2:1 and 5:1 producing a gel by a polymerization reaction being characterized by the essential absence of precipitation of insoluble silicate from said solution.

4,871,695

PROCESS FOR THE PRODUCTION OF GLASS

Koji Seki, Tokyo; Hiroshi Morishita, Kawasaki; Kiyoshi Ohno, Yokohama, and Hiroshi Yokota, Tokyo, all of Japan, assignors to Japan Oxygen Co., Ltd., Japan
Continuation of Ser. No. 42,570, Apr. 22, 1987, abandoned, which is a continuation of Ser. No. 767,194, Aug. 19, 1985, abandoned. This application Oct. 17, 1988, Ser. No. 277,452
Claims priority, application Japan, Aug. 30, 1984, 59-181586; Aug. 30, 1984, 59-181587; Aug. 30, 1984, 59-181588; Aug. 2, 1985, 60-170663; Aug. 2, 1985, 60-170664
Int. Cl.⁴ C03C 3/06, 3/04 8 Claims

U.S. Cl. 501—54

8 Claims

1. A process for the production of a high-purity quartz glass comprising the steps of:

incorporating an accelerator for phase conversion into silica powder having a particle size of not greater than about 0.02 μm to form accelerator-containing silica powder having a particle size of 50 μm–500 μm, said accelerator for phase conversion containing at least one alkali metal; placing the resulting powder in a vessel and heating the same to form a self-supporting porous sintered body consisting essentially of β-cristobalite phase;
transferring the porous sintered body to a vacuum melting furnace while maintaining the temperature of the porous sintered body at a temperature not lower than the inversion temperature from β-cristobalite phase to α-cristobalite phase;
heating the porous sintered body in the vacuum melting furnace while maintaining the β-cristobalite phase to degas the accelerator and any other impurities contained in the porous sintered body; and
raising the temperature in the vacuum melting furnace to a temperature higher than the melting point of the porous

sintered body to melt the sintered body and form quartz glass.

4,871,696

METHOD FOR PRODUCING SUBSTANTIALLY PURE MATERIALS

Marc S. Newkirk, Newark, Del., and Mark G. Mortenson, North East, Md., assignors to Lanxide Technology Company, LP, Newark, Del.
Continuation-in-part of Ser. No. 907,934, Sep. 16, 1986. This application Mar. 15, 1988, Ser. No. 168,198
The portion of the term of this patent subsequent to Apr. 11, 2006, has been disclaimed.
Int. Cl.⁴ C04B 35/02 8 Claims

U.S. Cl. 501—94

8 Claims

1. A method for upgrading the quality of a corresponding filler material comprising the steps of:

(a) positioning a parent metal comprising a material selected from the group consisting of silicon, titanium, tin, zirconium and hafnium adjacent to a corresponding mass of filler material, said corresponding mass of filler material containing at least one impurity which is reducible by the parent metal, so that formation of an oxidation reaction product of the parent metal will occur in a direction towards and into said mass of corresponding filler material;
(b) heating said parent metal to a temperature range above its melting point but below the melting point of its oxidation reaction product to form a body of molten parent metal and reacting the molten parent metal with an oxygen-containing vapor-phase oxidant at said temperature to form said oxidation reaction product, and at said temperature maintaining at least a portion of said oxidation reaction product in contact with and extending between said body of molten metal and said oxidant, to draw molten metal through the oxidation reaction product towards the oxidant and towards and into the adjacent mass of corresponding filler material so that fresh oxidation reaction product continues to form within said mass of corresponding filler material at an interface between the oxidant and previously formed oxidation reaction product, and continuing said reacting for a time sufficient to embed at least a portion of said corresponding mass of filler material within said oxidation reaction product to produce a ceramic body comprising an oxide of said parent metal and at least one residual metallic constituent, whereby said at least one impurity is at least partially reduced and is contained in said at least one residual metallic constituent;
(c) comminuting said ceramic body;
(d) providing at least one leachant capable of dissolving or removing said at least one residual metallic constituent without substantially degrading said oxidation reaction product and embedded filler material in the produced ceramic body and contacting said comminuted ceramic body with said at least one leachant for a time sufficient to remove or dissolve away said at least one residual metallic constituent from said comminuted ceramic body to produce a substantially pure material having a purity which is greater than the purity of said corresponding filler material;
(e) recovering said substantially pure material.

4,871,697

METHOD OF PRODUCING HOMOGENEOUS SILICON NITRIDE SINTERED BODIES

Issei Hayakawa, and Noriyuki Ueki, both of Nagoya, Japan, assignors to NGK Insulators, LTD., Nagoya, Japan
Filed Jan. 7, 1988, Ser. No. 141,496

Claims priority, application Japan, Jan. 23, 1987, 62-13815
Int. Cl.⁴ C04B 35/58

U.S. Cl. 501—97

4 Claims

1. A method of producing a homogeneous silicon nitride sintered body, comprising:

placing a shaped body consisting essentially of silicon nitride powder and sintering aid into a high density silicon carbide sagger having a bulk specific gravity of at least about 3.0 and an apparent porosity of not greater than about 1.0%; and

firing the shaped body in a temperature range of about 1,500°–1,800° C. and at about atmospheric pressure.

4,871,698

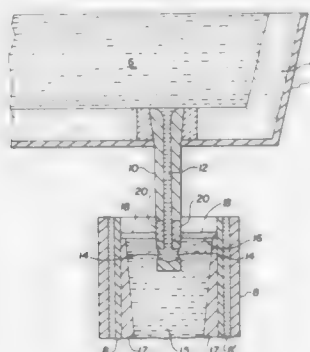
CARBON BONDED REFRACTORY BODIES

Mark K. Fishler, and Dale B. Hoggard, both of Pittsburgh, Pa., assignors to Vesuvius Crucible Company, Pittsburgh, Pa.
Filed Nov. 9, 1987, Ser. No. 120,733

Int. Cl.⁴ C04B 35/58

U.S. Cl. 501—97

6 Claims



1. A fired carbon-bonded refractory body consisting essentially of, by weight:

- carbon from about 4% to 50% supplied predominantly from a graphite source;
- fully reacted SiAlON in an amount of from about 20% to 90%, and wherein the SiAlON has a composition $\text{Si}_6\text{Al}_z\text{O}_{10-2z}\text{N}_8$, having one or more "z" values wherein $0 < z \leq 5$;
- one or more members selected from the group consisting of clay, alumina, zirconia, silica, silicon carbide, mullite and chromia in an aggregate amount from 0% to about 70%; and
- an antioxidant constituent comprising at least one member selected from the group consisting of silicon and boron containing compound in an amount from about 2% to 8% by weight.

4,871,699

PROCESS FOR REDUCING COKE ON SPENT CATALYST IN A FLUID CATALYTIC CRACKING UNIT

Robert J. Fahrig, Lansing, Ill.; William D. Fitzharris, Houston, Tex., and James L. Aderhold Jr., Wheaton, Ill., assignors to Amoco Corporation, Chicago, Ill.

Continuation of Ser. No. 142,485, Jan. 11, 1988, abandoned. This application Dec. 16, 1988, Ser. No. 285,847

Int. Cl.⁴ B01J 38/04

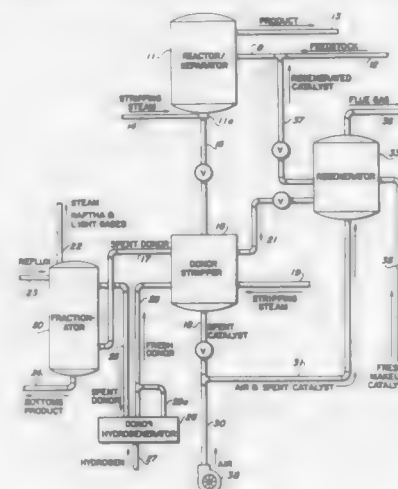
U.S. Cl. 502—34

14 Claims

1. The process of reducing coke and increasing volatile product yield in a catalytic cracking system wherein there is

provided a hydrocarbon conversion zone, a stripping zone and a regeneration zone comprising:

- introducing hydrocarbon feed material and cracking catalyst into the hydrocarbon converting zone under conditions causing substantial cracking of the feed material to light product and spent catalyst;
- separating product from the spent catalyst;
- conveying the spent catalyst to the stripping zone maintained at a pressure of from about 5 to about 50 psi within less than about minute from completion of cracking con-



tacting the catalyst with a hydrogen donor in the vapor phase at a temperature above the boiling point of the donor, whereby a substantial portion of absorbed coke adhering to the catalyst is removed, prevented from forming or both;

(d) separating the donor from the catalyst and conveying the catalyst to the regeneration zone; and

(e) burning off any remaining absorbed coke from the catalyst in the regeneration zone and conveying the restored catalyst to the conversion zone.

4,871,700

REACTIVATING MO-BI-FE CATALYST USED IN PRODUCTION OF UNSATURATED ALDEHYDES

Shin-ichi Uchida, Himeji; Kozi Deguchi, Hyogo, and Masamitsu Sasaki, Himeji, all of Japan, assignors to Nippon Shokubai Kagaku Kogyo Co., Ltd., Osaka, Japan

Filed May 12, 1988, Ser. No. 193,065

Int. Cl.⁴ B01J 23/94, 23/92; C07C 45/27, 45/28

U.S. Cl. 502—51

16 Claims

1. A method of reactivating a catalyst having reduced activity as a result of having been used in producing an unsaturated aldehyde as a main product by catalytic vapor-phase oxidation reaction of propylene, isobutylene or tertiary butanol, said catalyst being a catalytic oxide comprising molybdenum, bismuth and iron with a Mo:Fe atomic ratio of 12:at least 0.1; which method comprises heat-treating the used catalyst at a temperature of 300° to 380° C. in the presence of a flowing oxidizing gas containing at least 5% by volume of molecular oxygen and at least 0.1% by volume of steam.

4,871,701

ALKALI-FREE PREPARATION OF LARGE PENTASIL CRYSTALS AS COATED CATALYSTS AND FULLY CRYSTALLINE CATALYSTS

Alfred Danner, Bensheim; Ulrich Mueller, Schlangenbad; Klaus Unger, Seelheim, and Wolfgang Hoelderich, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Aug. 24, 1988, Ser. No. 235,620

Claims priority, application Fed. Rep. of Germany, Aug. 26, 1987, 3728451

Int. Cl.⁴ B01J 29/28

U.S. Cl. 502—62

4 Claims

1. A process for the alkali-free preparation of large pentasil crystals as coated catalysts and fully crystalline catalysts, in which the individual pentasil crystals are larger than 5 μm , by hydrothermal treatment of SiO_2 , wherein the SiO_2 moldings are subjected to a hydrothermal treatment at from 140° to 220° C. in an alkali-free mixture of water, an amine and/or a tetraalkylammonium compound, with or without ammonia.

4,871,702

AMMONIUM ACTIVATION OF ZEOLITES IN THE PRESENCE OF GASEOUS AMMONIA

Clarence D. Chang; Cynthia T.-W. Chu; Carol S. Lee, all of Princeton, and Randall D. Partridge, Trenton, all of N.J., assignors to Mobil Oil Corp., New York, N.Y.

Continuation-in-part of Ser. No. 140,359, Jan. 4, 1988, Pat. No. 4,837,398, which is a continuation-in-part of Ser. No. 081,955, Aug. 5, 1987, abandoned. This application Sep. 19, 1988, Ser. No. 246,391

Int. Cl.⁴ B01J 29/06, 29/38

U.S. Cl. 502—86

24 Claims

1. A method for modifying a composition to increase its acid catalytic activity, said composition comprising a solid source of aluminum and a zeolite characterized by an effective silica to alumina mole ratio of at least about 50 and a constraint index of about 1 to 12, which method comprises contacting said composition at a temperature of about 60° to 200° C. for about 2 to 72 hours with an aqueous ammonium solution under ammonia gas pressure such that a pH of at least about 10 is maintained in said solution.

2. The method of claim 1 wherein the silica to alumina mole ratio is an effective mole ratio of at least about 100.

4. The method of claim 1 wherein said ammonium is provided by an ammonium source selected from the group consisting of $(\text{NH}_4)_2\text{CO}_3$, NH_4OH and $(\text{NH}_4)_2\text{HPO}_4$.

4,871,703

PROCESS FOR PREPARATION OF AN ELECTROCATALYST

Richard N. Beaver; Lloyd E. Alexander, both of Angleton, and Carl E. Byrd, Richwood, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 68,773, Jun. 26, 1987, Pat. No. 4,760,041, which is a continuation of Ser. No. 848,516, Apr. 7, 1986, abandoned, which is a continuation of Ser. No. 499,626, May 31, 1983, abandoned. This application Dec. 17, 1987, Ser. No. 134,269

Int. Cl.⁴ H01M 4/88; C25B 13/00

U.S. Cl. 502—101

17 Claims

1. A method for preparing electrocatalytic oxides and applying them to fluoropolymer substrates that cannot be heated to temperatures sufficiently high to convert electrocatalytic salts into electrocatalytic oxide comprising:

- dissolving SaHs of Ru and Ni in a solvent to form an electrocatalytic salt solution;
- evaporating the solvent from the electrocatalytic salt solution, leaving a electrocatalytic salt residue;
- heating the electrocatalytic salt residue in the presence of oxygen to a temperature and for a time sufficient to con-

vert substantially all of the electrocatalytic salt into a electrocatalytic oxide; and
(d) bonding the so-formed electrocatalytic oxide to a fluoropolymer substrate that would be detrimentally affected if the substrate were to be heated to 480°–500° C.

4,871,704

CATALYST FOR OLEFIN POLYMERIZATION

Tadano Kohara, Kanagawa, and Satoshi Ueki, Saitama, both of Japan, assignors to Toa Nenryo Kogyo K.K., Tokyo, Japan
Filed Oct. 7, 1988, Ser. No. 255,085

Claims priority, application Japan, Oct. 8, 1987, 62-252423

Int. Cl.⁴ C08F 4/64

U.S. Cl. 502—114

7 Claims

1. A catalyst comprising (i) a catalyst component obtained by reacting (i) a pentadiene with (b) an alkali metal and contacting the product therefrom with (c) a Group 4b metal compound, and (ii) an aluminoxane.

4,871,705

PROCESS FOR PRODUCTION OF A HIGH MOLECULAR WEIGHT ETHYLENE α -OLEFIN ELASTOMER WITH A METALLOCENE ALUMOXANE CATALYST

Elvin L. Hoel, Westfield, N.J., assignor to Exxon Chemical Patents Inc., Linden, N.J.

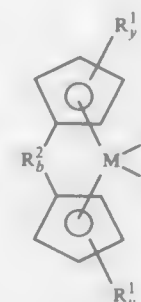
Filed Jan. 16, 1988, Ser. No. 207,819

Int. Cl.⁴ C08F 4/64

U.S. Cl. 502—117

9 Claims

1. A prepolymerized catalyst for producing EPC elastomers in liquid olefin slurry polymerization, comprising: an inorganic support which has been dried and treated with an aluminoxane followed by addition of zirconocene of structure:



wherein each R^1 independently is a C_1 – C_{20} linear, branched or cyclic alkyl group or a C_2 – C_4 cyclic alkylene group which forms a fused ring system group; R^2 is a C_1 – C_6 linear, branched or cyclic alkylene, a Si_1 – Si_2 alkyl substituted silanylene group or an alkyl substituted silalkylene group; each X independently is a halide, hydride, an oxygen bridge of a zirconocene dimer, or a hydrocarbyl radical; "y" is a number 2, 3, or 4, and "b" is either 0 or 1;

followed by a prepolymerization treatment with ethylene or an α -olefin to increase the weight of the catalyst by at least 50 wt. %.

4,871,706

CATALYST FOR THE AMMOXIDATION OF PARAFFINS

James F. Brazdil, Jr., Mayfield Village; Linda C. Glaeser, Lyndhurst, and Mark A. Toft, Lakewood, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Dec. 16, 1987, Ser. No. 133,661

Int. Cl.⁴ B01J 23/18, 27/16, 27/188, 27/198

U.S. Cl. 502—209

4 Claims

1. A complex metal oxide catalyst having the elements and proportions which are represented by the following empirical formula:



where

A is one or more of W, Sn, Mo, B, P and Ge;
H is one or more of Fe, Co, Ni, Cr, Pb, Mn, Zn, Se, Te, Ga, Zr, In and As;
C is one or more of an alkali metal and Ti;
T is one or more of Ca, Sr, Mg and Ba; and
where m is 0.1-1; a is 0.7-10; b is 0-10; c is 0-1; t is 0-10; the ratio $(a+b+c+t):(1+m)$ is 0.1-6; no more than 2 atoms of Mo are present per atom of V; wherein x is determined by the oxidation state of the other elements, and wherein the antimony has an average valency higher than +3 and the vanadium has an average valency lower than +5, wherein A includes at least 0.2 atom of W per atom of V and at least 0.5 atom of P per atom of V, and wherein the foregoing catalyst contains a support/diluent material selected from silica-alumina and alumina containing 20 to 100 weight percent alumina.

4,871,707

METHOD FOR PREPARING A CATALYST FOR THE SYNTHESIS OF 1,2-DICHLOROETHANE

Enrico Cavaterra, Saronno, and Alessandro Bossi, Novara, both of Italy, assignors to Ausimont S.p.A., Milan, Italy
Continuation of Ser. No. 777,341, Sep. 18, 1985, abandoned. This application Dec. 15, 1986, Ser. No. 940,204

Claims priority, application Italy, Sep. 19, 1984, 22717 A/84
Int. Cl.⁴ B01J 21/04, 27/122, 27/138

U.S. Cl. 502-225

5 Claims

1. A method for preparing a catalyst for the synthesis of 1,2-dichloroethane by oxychlorination of C_2H_4 within a fluidized bed, said catalyst containing from 1 to 10% by weight of Cu, from 0.4 to 1.2 moles of magnesium per mole of Cu, and a carrier consisting of microspheroidal Al_2O_3 , said carrier having a surface area ranging from 80 to 170 m^2/g , and said method being characterized in that the carrier is impregnated with an aqueous solution containing both CuCl_2 and MgCl_2 , but without using aqueous HCl during preparation of the catalyst, according to the dry impregnation technique, whereby the molar ratio:

$$X = \frac{\text{Al on the surface}}{\text{Cu on the surface}}$$

as defined in the specification, is at least 40% higher than the molar ratio:

$$Y = \frac{\text{Total Al present within the catalyst}}{\text{Total Cu present within the catalyst}}$$

the ratio $W = X:Y$ being therefore ≥ 1.40 , after which the catalyst is dried and activated.

4,871,708

PYROPHORICALLY ACTIVATED IRON OR NICKEL FOIL AND METHOD OF TREATING SAME

Alfonso L. Baldi, Wynnewood, Pa., assignor to Alloy Surfaces Company, Inc., Wilmington, Del.

Continuation-in-part of Ser. No. 830,767, Feb. 19, 1986, and a continuation-in-part of Ser. No. 757,606, Jul. 22, 1985, and a continuation-in-part of Ser. No. 605,248, Apr. 30, 1984, abandoned, and a continuation-in-part of Ser. No. 559,334, Dec. 8, 1983, and a continuation-in-part of Ser. No. 479,211, Mar. 28, 1983, Pat. No. 4,476,244, and a continuation-in-part of Ser. No. 281,405, Jul. 8, 1981, Pat. No. 4,708,913, and a continuation-in-part of Ser. No. 488,103, Apr. 25, 1983, Pat. No. 4,615,920. This application May 13, 1986, Ser. No. 862,712

Int. Cl.⁴ B01J 25/00

U.S. Cl. 502-301

2 Claims

1. The method of treating a pyrophorically activated Raney iron or nickel foil about 2 to about 6 mils thick, which method

is characterized by contacting the activated metal with a solution of an acid, which solution has a pH between about 1 and about 4, to cause gas generation, maintaining the contact at least about $\frac{1}{2}$ minute after gas generation begins to thereby increase the maximum pyrophoric temperature and the high temperature dwell of the metal, and the foil is folded to further increase the high temperature dwell at least a further 60%.

2. A pyrophorically activated iron or nickel foil about 2 to about 6 mils thick, the foil being folded so that upon exposure to air it undergoes a pyrophoric heat generation which keeps it hot at least 60% longer than the unfolded foil.

4,871,709

OZONE CRACKING CATALYST

Masaru Tatsushima, Isehara, and Makoto Sakura, Atsugi, both of Japan, assignors to Nikki-Universal Co., Ltd., Tokyo, Japan

Filed Jul. 1, 1988, Ser. No. 214,178

Claims priority, application Japan, Jul. 14, 1987, 62-176110; Dec. 26, 1987, 63-331516

Int. Cl.⁴ B01J 23/34

U.S. Cl. 502-324

12 Claims

1. An ozone cracking catalyst which comprises active manganese oxide carried on a ceramic fiber aggregate, characterized in that said active manganese oxide is carried on said ceramic fiber aggregate in such a manner as to provide micropores of 100-2000 Å in diameter and in an amount of more than 0.02 cc/g, said ceramic fiber aggregate being composed of walls having vacant pores larger than 5000 Å in diameter and in an amount of more than 0.1 cc/g.

4,871,710

AGGLOMERATE ABSORBENTS COMPRISING COPPER AND ZINC FOR SULPHUR COMPOUNDS REMOVAL

Patrick J. Denny, Durham, and Peter Wood, Cleveland, both of England, assignors to Imperial Chemical Industries PLC, London, United Kingdom

Filed Apr. 16, 1987, Ser. No. 39,070

Claims priority, application United Kingdom, Apr. 25, 1986, R610196

Int. Cl.⁴ B01J 20/08, 20/06, 27/232; B01D 53/02

U.S. Cl. 502-414

8 Claims

1. Agglomerates capable of absorbing carbonyl sulphide, mercaptans, and hydrogen sulphide, said agglomerates having

a size in the range 1 to 10 mm;

a BET surface area of at least 80 m^2/g , measured on samples of the agglomerates that have been calcined for 4 hours at 350° C.;

a calcined density of not more than 1.5 g/cm^3 ;

a porosity of not less than 0.6; and comprising

(i) compounds of

(a) copper, and

(b) zinc and aluminum,

said compounds being in the form of at least one compound selected from oxides, hydroxides, carbonates and/or basic carbonates; and

(ii) calcium aluminate cement binder;

said compounds being in such proportions that the copper atoms form 30-97% of the total number of copper, zinc, and aluminum atoms in said agglomerates;

said agglomerates having a total copper and zinc compound content such that, after ignition at 900° C., the cupric oxide plus zinc oxide content of the ignited composition is at least 70% by weight; and

said binder constituting 5-10% by weight of said agglomerates.

4,871,711

ACTIVE MATERIAL PRODUCED FROM METAL OXIDE/HYDROXIDE PARTICLES AND PHOSPHATE ESTERS

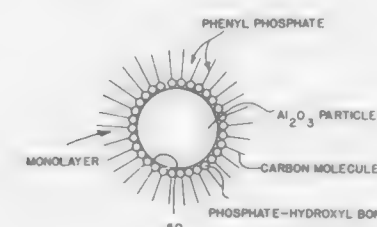
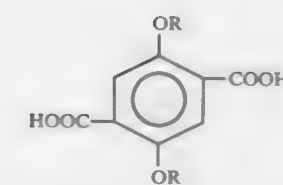
Edward S. Matin, New Kensington, and Larry F. Wieserman, Apollo, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 946,870, Dec. 29, 1986, abandoned. This application Mar. 9, 1987, Ser. No. 23,312
Int. Cl.⁴ B01J 20/08, 20/22; B01D 15/08; B32B 9/00

U.S. Cl. 502-415

38 Claims

wherein R is an alkyl group having 8 to 12 carbon atoms.



1. A process for chemically bonding a monomolecular layer of phosphoric acid ester to metal oxide/hydroxide particles comprised of alumina to form an active material having good chemical stability over a pH range of from 2 to 11 which comprises:

(a) providing a liquid containing a phosphoric acid ester therein selected from the class consisting of:

(i) phosphoric acid monoester having a formula $(\text{RO})\text{OP}(\text{OH})_2$; and

(ii) phosphoric acid diester having a formula $(\text{RO})(\text{R}'\text{O})\text{PO}(\text{OH})$;

where R and R' are selected from the group consisting of long and short chain aliphatic hydrocarbons, aromatic hydrocarbons, carboxylic acids, aldehydes, ketones, amines, amides, thioamides, imides, lactams, anilines, pyridines, piperidines, carbohydrates, lactones, ethers, alkenes, alkynes, alcohols, nitriles, oximes, organosilicones, ureas, thioureas and combinations of these groups;

(b) contacting said metal oxide/hydroxide particles with said liquid to chemically bond said phosphoric acid ester to substantially all of the reactive sites on said metal oxide/hydroxide to form a monomolecular layer of said organic material thereon forming said active material; and

(c) treating said metal oxide/hydroxide particles with a washing solution after said contacting step to remove weakly adsorbed phosphoric acid ester molecules on said metal oxide/hydroxide particles to ensure that all of said molecules remaining are bonded to the hydroxyl groups on said metal oxide/hydroxide particles and not to one another to ensure formation of said monomolecular layer thereon.

4,871,712

DECYLOXY-SUBSTITUTED TEREPHTHALIC ACID COMPOUNDS AND METHOD OF SYNTHESIS

Bruce A. Reinhardt, New Carlisle, and Marilyn R. Uaroe, Dayton, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Sep. 8, 1988, Ser. No. 241,646

Int. Cl.⁴ C07C 65/00

U.S. Cl. 562-473

3 Claims

1. A dialkoxy-substituted terephthalic acid of the formula:

4,871,713

HEAT-SENSITIVE RECORDING MATERIAL

Katsumi Matsuo, Kensuke Ikeda, and Ken Iwakura, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 14, 1988, Ser. No. 168,117

Claims priority, application Japan, Mar. 12, 1987, 67-57832
The portion of the term of this patent subsequent to Dec. 5, 1988, has been disclaimed.

Int. Cl.⁴ B41M 5/18

U.S. Cl. 503-209

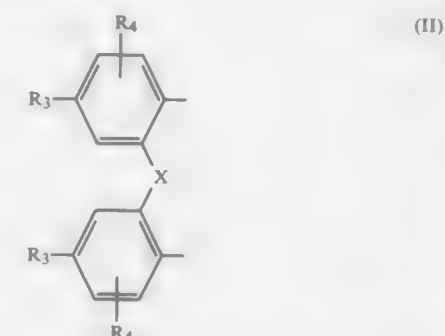
6 Claims

1. A heat-sensitive recording material which comprises:

- (1) an electron-donating colorless dye,
- (2) an electron-donating compound, and
- (3) a nickel compound represented by formula (I):



wherein R₁ and R₂ are linked with each other to form a group represented by formula (II):



wherein R₃ and R₄ each represents a hydrogen atom, an alkyl group, an alkoxy group, an aryl group, a halogen atom, a cyano group, or a nitro group; and X represents $-\text{SO}_m-$, $-\text{CHR}_5$, or $-\text{CO}-$, wherein R₅ represents a hydrogen atom or an alkyl group and m represents 0, 1, 2; L represents an organic ligand which forms a complex salt by connecting to the nickel ion via its hetero atom; and n represents an integer of 0, 1 or 2.

4,871,714

THERMALLY-TRANSFERABLE FLUORESCENT DIPHENYL ETHYLENES

Gary W. Byers, and Derek D. Chapman, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 31, 1988, Ser. No. 238,652

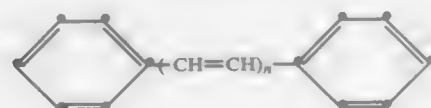
Int. Cl.⁴ B41M 5/035, 5/26

U.S. Cl. 503-227

16 Claims

9. A process of forming a transfer image comprising image-wise-heating a donor element comprising a support having on one side thereof a fluorescent material dispersed in a polymeric

binder, and on the other side thereof a slipping layer comprising a lubricant, and transferring an image to a receiving element, said fluorescent material comprising a diphenyl ethylene having the formula:



wherein:

n is 1 to 6, with the proviso that when n is 1, at least one of the phenyl rings must be substituted with a conjugated moiety.

4,871,715

PHTHALATE ESTERS IN RECEIVING LAYER FOR IMPROVED DYE DENSITY TRANSFER

Daniel J. Harrison, Rochester, and Kin K. Lam, Webster, both of N.Y., assignors to Eastman Kodak Co., Rochester, N.Y.

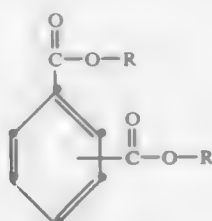
Filed Jul. 1, 1988, Ser. No. 214,363

Int. Cl.⁴ B41M 5/035, 5/26

U.S. Cl. 503—227

20 Claims

8. In a process of forming a dye transfer image comprising imagewise-heating a dye-donor element comprising a support having thereon a dye layer and transferring a dye image to a dye-receiving element to form said dye transfer image, said dye-receiving element comprising a support having thereon a dye image-receiving layer, the improvement wherein said dye image-receiving layer contains a phthalate ester having the following formula:



wherein R is a substituted or unsubstituted aryl group having from about 6 to about 10 carbon atoms or an aralkyl group having from about 7 to about 12 carbon atoms.

4,871,716

MAGNETICALLY RESPONSIVE, HYDROPHILIC MICROSPHERES FOR INCORPORATION OF THERAPEUTIC SUBSTANCES AND METHODS OF PREPARATION THEREOF

William E. Longo, Richard A. McCluskey, and Eugene P. Goldberg, all of Gainesville, Fla., assignors to University of Florida, Gainesville, Fla.

Continuation-in-part of Ser. No. 825,789, Feb. 4, 1986, Pat. No. 4,671,954, which is a continuation of Ser. No. 560,952, Dec. 13, 1983, abandoned. This application Dec. 3, 1986, Ser. No. 937,611. The portion of the term of this patent subsequent to Jun. 9, 2004, has been disclaimed.

Int. Cl.⁴ A61K 37/02, 33/26

U.S. Cl. 514—2

33 Claims

1. A method of preparing novel hydrophilic, magnetically responsive microspheres consisting essentially of cross-linked protein or polypeptide particulate and a magnetically responsive material comprising

(a) providing a dispersion of an aqueous solution or dispersion of polypeptide or protein microspheres and a particulate magnetically responsive material in an organic, substantially water immiscible solvent solution of a high molecular weight polymer, said organic solvent being substantially a non-solvent for said microspheres and said

polymer solution stabilizing the dispersion of microspheres and magnetically responsive material, (b) incorporating a polyfunctional cross-linking agent for said protein or polypeptide in said dispersion, and (c) allowing said cross-linking agent to react with said protein or polypeptide microspheres for a time sufficient to cross-link at least a portion of the microspheres, thereby providing magnetically responsive microspheres containing free reactive functional groups.

4,871,717
PEPTIDES

David H. Coy, New Orleans, and William A. Murphy, Covington, both of La., assignors to Administrators of the Tulane Educational Fund, New Orleans, La.

Filed Jan. 7, 1987, Ser. No. 1,245

Int. Cl.⁴ A61K 37/02; C07K 7/26

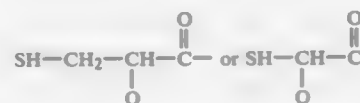
U.S. Cl. 514—11

14 Claims

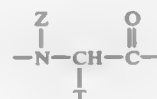
1. A heptapeptide of the formula



wherein A₁ is



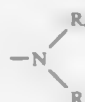
(where Q is H or a C₁-C₈ alkyl group); A₂ is o-, m-, or p-substituted X-Phe or X-D-Phe (where X is H, halogen, NH₂, NO₂, OH, C₁-C₃ alkyl, or C₁-C₃ alkoxy); A₃ is X-Trp, X-D-Trp, α-N-methyl-X-Trp, or α-N-methyl-D-X-Trp (where X is a substituent on the benzene ring and is H, halogen, NH₂, NO₂, OH, C₁-C₃ alkyl, or C₁-C₃ alkoxy); A₄ is Lys, α-N-methyl-Lys, or ε-N-R₁-Lys (where R₁ is C₁-C₃ alkyl); A₅ is Val or Thr; A₆ is Pro or



where Z is H or CH₃ and T is H, CH₂OH, CH₂CH₂OH, CH₂CH₂CH₂OH, CH(CH₃)OH, isobutyl, benzyl (substituted in the o-, m-, or p-positions with H, halogen, NH₂, NO₂, OH, C₁-C₃ alkyl, or C₁-C₃ alkoxy), CH₂-β-naphthyl (substituted on the benzene ring with H, halogen, NH₂, NO₂, OH, C₁-C₃ alkyl, or C₁-C₃ alkoxy), or CH₂-pyridyl (substituted on the benzene ring with H, halogen, NH₂, OH, C₁-C₃ alkyl, or C₁-C₃ alkoxy); and A₇ is



(where R₂ is H or C₁-C₃ alkyl), CH₂OH, CH₂OCR₃ (where R₃ is C₁-C₃ alkyl, C₈-C₁₂ aralkyl, or phenoxy), or



(where R₄ is H or C₁-C₃ alkyl and R₅ is H, C₁-C₃ alkyl, phenyl, or C₇-C₁₀ aralkyl); or a pharmaceutically acceptable salt thereof.

4,871,718

COMPOSITION OF MATTER FOR INCREASING INTRACELLULAR ATP LEVELS AND PHYSICAL PERFORMANCE LEVELS AND FOR INCREASING THE RATE OF WOUND REPAIR

Francis J. Carniglia, Windsor Locks, Conn., assignor to Raymond A. Roacari, Windsor Locks, Conn.

Filed Dec. 29, 1987, Ser. No. 139,288

Int. Cl.⁴ A61K 31/70

U.S. Cl. 514—23

17 Claims

1. A composition of matter for increasing the intracellular level of ATP comprising: amino acids selected from the group of amino acids which are the metabolic precursors of ATP; at least one metabolite selected from the group consisting of choline chloride and inositol; electrolyte; and ribose.

4,871,719

COMPOSITION FOR CONTROLLING PARASITES IN PRODUCTIVE LIVESTOCK

Peter Maienfisch, Aesch, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Mar. 16, 1988, Ser. No. 168,766

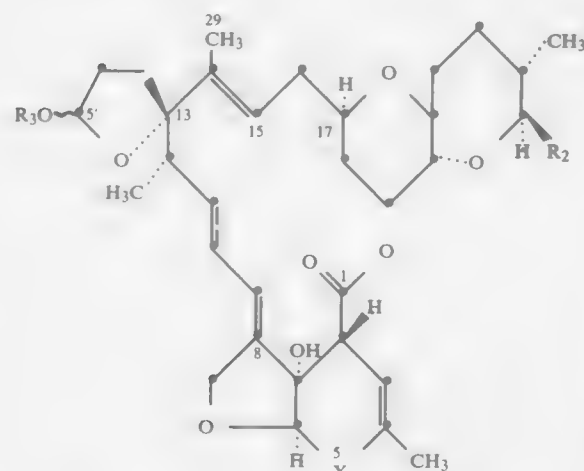
Claims priority, application Switzerland, Mar. 24, 1987, 1117/87; Dec. 15, 1987, 4878/87

Int. Cl.⁴ A61K 31/35, 31/695; C07D 493/22, 313/06

U.S. Cl. 514—63

19 Claims

1. A compound of formula I



in which

X represents one of the groups —CH(OR₁)—, —C(=O)— or —C(=N—OH)—;

R₁ represents hydrogen or a OH-protecting group;

R₂ represents methyl, ethyl, isopropyl or sec-butyl or the group —C(CH₃)=CH—A in which A represents methyl, ethyl or isopropyl; and

R₃ represents hydrogen; C₁-C₁₀ -alkyl; C₁-C₁₀-alkyl substituted by at least one substituent selected from the group consisting of halogen, C₁-C₆-alkoxy, C₂-C₆-alkoxyalkoxy, C₃-C₉-alkoxyalkoxyalkoxy, C₁-C₆-alkylthio, C₃-C₇-cycloalkyl, C₁-C₃-alkyl-substituted C₃-C₇-cycloalkyl, hydroxy, benzyloxy, C₁-C₆-acyl and C₁-C₆-acyloxy, it being possible for each of the above-mentioned radicals representing or containing an alkoxy group to be terminally substituted at a terminal alkoxy group by hydroxy, halogen, C₁-C₆-acyl or by C₁-C₆-acyloxy; C₃-C₇-cycloalkyl; C₃-C₇-cycloalkyl substituted by at least one substituent selected from the group consisting of halogen and C₁-C₃-alkyl; C₃-C₇-cycloalkenyl; C₂-C₁₀-alkenyl; C₂-C₁₀-alkynyl; a radical selected from the group consisting of C₂-C₁₀-alkenyl and C₂-C₁₀-alkynyl, which radical is substituted by halogen,

C₁-C₆-alkoxy or by C₁-C₆-acyloxy; 1-adamantylmethyl; menthyl; carveyl; phenyl; benzyl; naphthyl; a radical selected from the group consisting of phenyl, benzyl and naphthyl, which radical is substituted by at least one substituent selected from the group consisting of halogen, C₁-C₃-alkyl, C₁-C₃-haloalkyl, C₁-C₃-alkoxy, C₁-C₃-haloalkoxy, C₁-C₃-alkylthio, nitro and cyano; benzyl substituted by a phenoxy group; or a four- to six-membered heterocyclic radical that has from one to three hetero atoms selected from the group consisting of oxygen, sulphur and nitrogen and that is unsubstituted or is substituted by at least one substituent selected from the group consisting of halogen, C₁-C₃-alkyl, C₁-C₃-haloalkyl, C₁-C₃-alkoxy, C₁-C₃-haloalkoxy, C₁-C₃-alkylthio, nitro and cyano, it being possible for the said heterocyclic radical also to be bonded via a C₁-C₆-alkylene bridge to the oxygen atom in the 5'-position of the tetrahydrofuran ring.

4,871,720

AROMATICALLY SUBSTITUTED AZACYCLOALKYL-ALKANEDIPHOSPHONIC ACIDS USEFUL FOR THE TREATMENT OF ILLNESSES THAT CAN BE ATTRIBUTED TO CALCIUM METABOLISM DISORDERS

Knut A. Jaeggi, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Nov. 16, 1987, Ser. No. 121,268

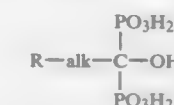
Claims priority, application Switzerland, Nov. 21, 1986, 444/86

Int. Cl.⁴ A61K 31/675; C07F 9/65

U.S. Cl. 514—79

21 Claims

1. An aromatic substituted azacycloaliphatic diphosphonic acid of the formula



wherein R denotes a pyrrolidino piperidino, 1,2,5,6-tetrahydropyridino, piperazino, hexahydroazepino, 3-aza-bicyclo(3.1.1.0^{1,5})hept-3-yl, 3-aza-bicyclo(3.2.0^{1,5})hept-3-yl or octahydroazocino radical R' each of which is substituted by a phenyl, naphthyl, pyrrol, furyl, thienyl, pyridyl, pyrimidinyl or quinolynyl group R₂, these groups R₂ being unsubstituted or substituted by one or two substituents selected from the group consisting of lower alkyl, lower alkoxy and halogen and alk represents a C₂-C₆alkylene or a pharmaceutically acceptable salt thereof.

20. A pharmaceutical composition for the treatment of illnesses that can be attributed to calcium metabolism disorders, consisting of a therapeutically effective amount of a compound according to claim 1 and one or more pharmaceutically acceptable carriers.

21. A method for the treatment of illnesses that can be attributed to calcium metabolism disorders, wherein a therapeutically effective amount of a compound according to claim 1 or a pharmaceutically acceptable salt thereof is administered to a warm-blooded organism in need of such treatment.

4,871,721

PHOSPHORUS-CONTAINING SQUALENE SYNTHETASE INHIBITORS

Scott A. Biller, Ewing, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

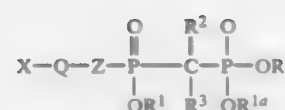
Filed Jan. 11, 1988, Ser. No. 141,744

Int. Cl.⁴ A61K 31/66; C07F 9/40

U.S. Cl. 514—102

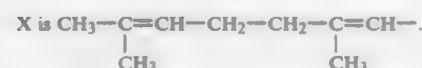
18 Claims

1. A compound having the structure



wherein Q is $-(\text{CH}_2)_2-\text{C}(\text{CH}_3)=\text{CH}-$ or a bond;

Z is $-(\text{CH}_2)_n-$ or $-(\text{CH}_2)_p-\text{CH}=\text{CH}-(\text{CH}_2)_m-$, wherein n is 1 to 5; p is 0, 1 or 2; m is 0, 1 or 2; R, R¹ and R^{1a} are the same or different and are H, lower alkyl, lower alkyl substituted with halo, CF₃, alkoxy, aryl, alkyl-aryl, haloaryl, cycloalkyl, alkylcycloalkyl, alkanoylamino, arylcarbonylamino, nitro, cyano, thio or alkylthio, or a metal ion; R² and R³ may be the same or different and are H or halo-gen; and



18. A method of inhibiting cholesterol biosynthesis which comprises administering to a patient in need of such treatment an effective cholesterol biosynthesis inhibiting amount of a compound as defined in claim 1.

4,871,722

SYNERGISTIC VETERINARY COMPOSITION AND/OR FODDER PREMIX AND PROCESS FOR PREPARING SAME

Károly Magyar; János Varga; Ferenc Simon; Hedvig Szauder née Laukó; Pál Fekete; Attila Romváry; János Egri, and Katalin Zakovics née Someg, all of Budapest, Hungary, assignors to EGIS Gyógyszergyár, Budapest, Hungary

Filed Feb. 22, 1988, Ser. No. 158,757

Claims priority, application Hungary, Feb. 25, 1987, 719/87 Int. Cl.⁴ A61K 31/635

U.S. Cl. 514—157

5 Claims

1. A synergistic veterinary composition and/or fodder premix for the prevention or curing of bacterial infections occurring in poultry, which comprises 1 to 100 parts by mass of 2,4-diamino-5-(3,4,5-trimethoxybenzyl)pyrimidine and/or 1 to 100 parts by mass of 2,4-diamino-5-(3,4-dimethoxybenzyl)pyrimidine as well as 1 to 100 parts by mass of 2,6-dimethoxy-4-sulfanilamidopyrimidine or a pharmaceutically acceptable salt thereof and 1 to 100 parts by mass of 8-hydroxyquinoline or a pharmaceutically acceptable acid addition salt thereof optionally in admixture with carrier(s) and/or additive(s) commonly used in the pharmaceutical industry or for the preparation of premixes.

4,871,723

METHOD FOR TREATING PSORIASIS BY EXTERNALLY ADMINISTERING TO A PATIENT A PHARMACEUTICAL COMPOSITION CONTAINING ACTIVE-TYPE VITAMIN D

Yuji Makino; Yoshiki Suzuki, both of Hino, and Takashi Aoyagi, Sapporo, all of Japan, assignors to Teijin, Limited, Osaka, Japan

Continuation-in-part of Ser. No. 784,305, Oct. 4, 1985, abandoned. This application Nov. 21, 1986, Ser. No. 933,326 Claims priority, application Japan, Oct. 8, 1984, 59-209631; Jul. 25, 1985, 60-162893

Int. Cl.⁴ A61K 31/59

U.S. Cl. 514—167

5 Claims

1. A method for treating psoriasis, which comprises administering externally to a patient suffering from psoriasis an ointment consisting essentially of (A) an effective amount of 1 α ,24-dihydroxycholecalciferol, (B) a solvent selected from the

group consisting of fatty acid esters, higher alcohols with 10 or more carbons and propylene carbonate and (C) an oily carrier selected from the group consisting of white vaseline, yellow vaseline and liquid paraffins.

4,871,724

NOVEL 11-ARYLOESTRANE AND 11-ARYLPREGNANE DERIVATIVES

Marinus B. Groen, Schayk, and Hendrik P. de Jongh, Oss, both of Netherlands, assignors to Akzo N.V., Arnhem, Netherlands

Filed Apr. 20, 1988, Ser. No. 183,851

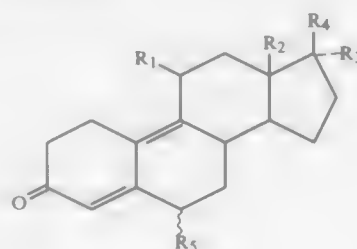
Claims priority, application Netherlands, Apr. 24, 1987, 8700970

Int. Cl.⁴ A61K 31/58, 31/585, 31/56; C07J 1/00

U.S. Cl. 514—173

8 Claims

1. 11-aryloestrane and 11-arylpregnane derivatives having the following structure:



wherein

R₁ is an aryl group with an



group as substituent, X and Y each being separately or a (1-4C) hydrocarbon radical or together a (2-6 C) hydrocarbon radical;

R₂ is an alkyl group containing 1-4 carbon atoms;

R₃ is H, OH, a saturated or unsaturated hydrocarbon radical containing 1-8 carbon atoms, at least provided with a hydroxyl, oxo, halogen, azido or nitrile group; and acyloxy or an alkoxy group;

R₄ is a hydroxyl, an acyloxy or an alkoxy group or an acyl group optionally provided with a hydroxyl, alkoxy, acyloxy or halogen group; or R₃ and R₄ together form an oxygen containing heterocyclic 5-member ring system; and

R₅ is a hydrocarbon group containing 1-4 carbon atoms.

4,871,725

1-METHYL-15 α -(1-OXYALKYL)ANDROSTA-1,4-DIENE-3,17-DIONES, PROCESSES FOR THEIR PRODUCTION, AND PHARMACEUTICAL PREPARATIONS CONTAINING THEM

Ulrich Kerb; Yukishige Nishino, and David Henderson, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Filed Feb. 19, 1988, Ser. No. 157,568

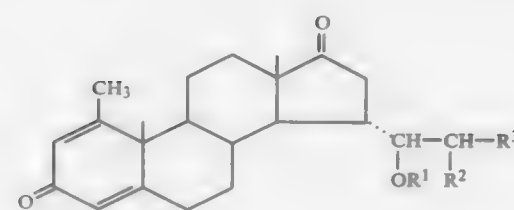
Claims priority, application Fed. Rep. of Germany, Feb. 20, 1987, 3705990

Int. Cl.⁴ A61K 31/56; C07J 1/00

U.S. Cl. 514—177

20 Claims

1. 1-Methyl-15 α -(1-oxyalkyl)androsta-1,4-diene-3,17-diones of the formula



wherein

R¹ is H or C₁₋₁₀-alkanoyl,

R² is OR⁴, NHR⁵ or S(O)_nR⁶, R⁴ being C₁₋₁₀ alkyl, R⁵ being

a C₁₋₁₀-alkanoyl, R⁶ being C₁₋₁₀-alkyl or C₆₋₁₀-aryl,

R³ is H or C₁₋₈-alkyl and n is 0, 1 or 2.

4,871,726

INCREASING THE BIOAVAILABILITY OF ALPHA-ETIOCHOLANOLONE

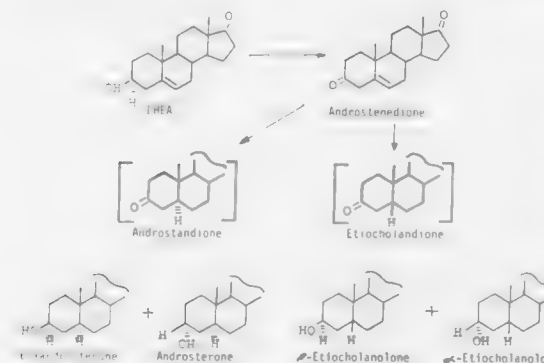
Norman Applezweig, New York, and H. Leon Bradlow, Holliswood, both of N.Y., assignors to Progenics, Inc., New York, N.Y.

Filed Jul. 28, 1987, Ser. No. 78,610

Int. Cl.⁴ A61K 31/56

U.S. Cl. 514—177

18 Claims



1. A method for treating a condition selected from the group consisting of obesity, diabetes syndrome, diabetes-associated hypercorticism and combinations thereof comprising administering to a mammal in need of such treatment an obesity-, diabetes- or hypercorticism-antagonistic amount of etiocholanedione.

4,871,727

ANTI-INFLAMMATORY AND ANTIDEGENERATIVE COMPOUNDS ISOLATED FROM L-681,512

Richard W. Burg, New Providence; Eugene L. Dulaney, Summit; Otto D. Hensens, Red Bank; Jerrold M. Liesch, Princeton Junction; John G. Ondeyka, Fanwood, and Carol F. Wichmann, Westfield, all of N.J., assignors to Merck & Co, Inc., Rahway, N.J.

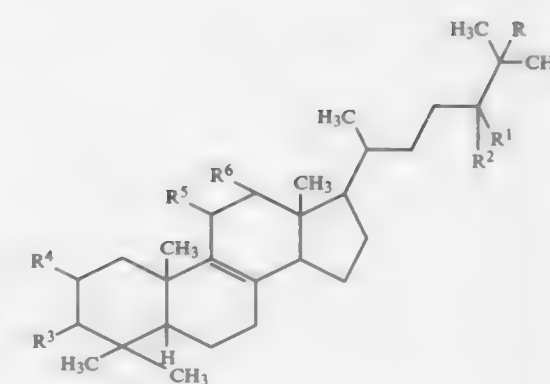
Filed Dec. 21, 1987, Ser. No. 135,949

Int. Cl.⁴ A61K 31/56; C07J 9/00, 1/00

U.S. Cl. 514—179

4 Claims

1. A compound having the formula:



wherein:

R is OH or H;

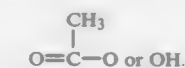
R¹ and R² together form $=\text{CH}_2$, $-\text{CH}_2\text{O}-$;

R³ is H, OH, HSO₃O, HOCOCH₂CH₂CO₂;

R⁴ is OH, HOC₁₅H₃₀CO₂, AcO, or is H except that when R⁴ is H, the double bond in the cyclopentane ring is absent;

R⁵ is O=, OH, AcO; and,

R⁶ is



4,871,728

PHARMACEUTICAL COMPOSITION COMPRISING AN ORGANIC ZINC COMPLEX AND A PROCESS FOR PREPARING THE ACTIVE SUBSTANCE

Gyula Sebestyén; István Simonyi; Gizelle Miholics; Márta Kovács; Frigyes Görgényi; Márton Fekete; Pál Vágó; István Sere; János Egri, and Mária Szeli, all of Budapest, Hungary, assignors to EGIS Gyógyszergyár, Budapest, Hungary Division of Ser. No. 38,656, Apr. 15, 1987. This application Aug. 12, 1988, Ser. No. 232,162

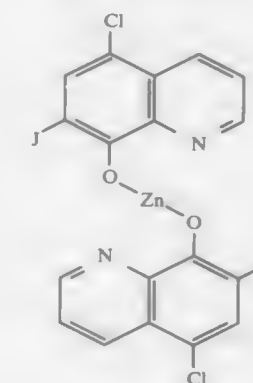
Claims priority, application Hungary, Apr. 18, 1986, 1623/86 The portion of the term of this patent subsequent to Sep. 19, 2006, has been disclaimed.

Int. Cl.⁴ A61K 31/555

U.S. Cl. 514—187

1 Claim

1. A pharmaceutical composition in the form of an ointment, vaginal suppository or dusting powder having antimycotic activity comprising 0.1 to 90 percent of a zinc complex of 5-chloro-7-iodo-8-hydroxyquinoline of formula (I)



(I)

and at least one pharmaceutically acceptable carrier.

4,871,729
BISPLATINUM COMPLEXES AS
CHEMOTHERAPEUTIC AGENTS

Nicholas Farrell, Winoski; Miles P. Hacker, Williston; John J. McCormack, Burlington, and Sergio G. DeAlmeida, Winoski, all of Vt., assignors to University of Vermont and State Agricultural College, Burlington, Vt.

Division of Ser. No. 889,397, Jul. 25, 1986, Pat. No. 4,797,393.

This application Jan. 9, 1989, Ser. No. 294,790

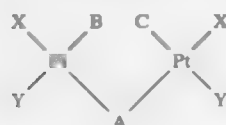
Int. Cl.⁴ A61K 31/555

U.S. Cl. 514—188

20 Claims



1. A method of inhibiting tumor growth in a mammal comprising the administration to the mammal of a tumor-inhibiting amount of a bis-platinum complex having the structure:



in which X and Y are the same or different ligands and are halide, sulphate, phosphate, nitrate, carboxylate, substituted carboxylate, or dicarboxylate; B and C are the same or different groups selected from primary and secondary amines and pyridine type nitrogens; and A is a diamine or polyamine wherein the primary amine N atoms are coordinated to the Pt atom such that platinum is present as Pt²⁺.

4,871,730
CEPHEM COMPOUNDS

Takao Takaya, Kawanishi; Zenzaburo Tozuka, Toyonaka; Nobuyoshi Yasuda, Nishinomiya, and Kohji Kawabata, Osaka, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Continuation of Ser. No. 631,898, Jul. 18, 1974, abandoned. This application Nov. 24, 1986, Ser. No. 931,978

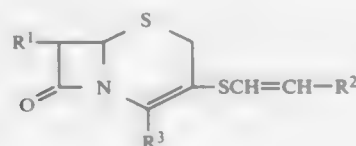
Claims priority, application United Kingdom, Aug. 1, 1983, 8320673; Nov. 15, 1983, 8330472

Int. Cl.⁴ C07D 501/36; A61K 31/545

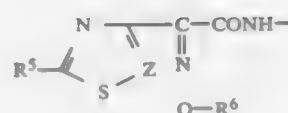
U.S. Cl. 514—206

11 Claims

1. A cephem compound of the formula:



wherein R¹ is a group of the formula:



in which

R⁵ is amino or protected amino,

R⁶ is hydrogen, lower alkyl, lower alkenyl, lower alkynyl, carboxy(lower) alkyl, protected carboxy(lower)alkyl, cyclo(lower)alkyl or cyclo(lower)alkenyl, and Z is CH or N;

R² is hydrogen, phenyl, pipedyl which may have a lower alkyl group or cyano; and

R³ is carboxy or protected carboxy; and pharmaceutically acceptable salt thereof.

4,871,731
CAPTOPRIL AND DILTIAZEM COMPOSITION AND
THEIR USE

Steven D. Walker, Kansas City, Mo., assignor to Marion Laboratories, Inc., Kansas City, Mo.

Filed Oct. 7, 1987, Ser. No. 105,244

Int. Cl.⁴ A61K 31/40, 31/55

U.S. Cl. 514—211

25 Claims

1. A pharmaceutical composition useful for treating hypertension comprising a mixture of captopril or its pharmaceutically acceptable salt(s) and diltiazem or its pharmaceutically acceptable salt(s) in a ratio of diltiazem or its said salt(s) to captopril or its said salt(s) about from 2:1 to 3:1 by weight.

4,871,732
SUBSTITUTED
IMIDAZO(2,1-B)QUINAZOLIN-5(3H)-ONES AND
RELATED TRICYCLIC COMPOUNDS AND USE AS
BRONCHODILATORS

Norton P. Peet, Cincinnati, Ohio, and Shyam Sunder, Indianapolis, Ind., assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

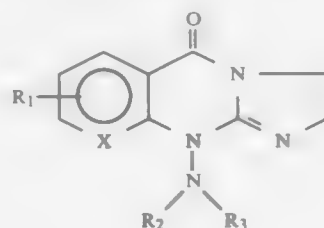
Filed Sep. 22, 1988, Ser. No. 247,797

Int. Cl.⁴ A61K 31/505, 31/535; C07D 471/14, 487/04

U.S. Cl. 514—212

14 Claims

1. A compound of the formula:



wherein

R₁ is H, halogen, or CH₃;

NR₂R₃ is di(lower alkyl) amino, 1-pyrrolidinyl, 1-piperidinyl, 1-homopiperidinyl, 4-methyl-1-piperazinyl, or 4-morpholinyl; and

X is —CH= or —N=.

4,871,733
COUGH/COLD MIXTURES COMPRISING
NON-SEDATING ANTIHISTAMINE DRUGS

Abraham Sunshine, New York; Eugene M. Asaka, Larchmont, and Carole E. Siegel, Mamaronck, all of N.Y., assignors to Analgesic Associates, Larchmont, N.Y.

Division of Ser. No. 42,120, Apr. 24, 1987, Pat. No. 4,783,465, which is a continuation-in-part of Ser. No. 887,205, Jul. 24, 1986, Pat. No. 4,738,966, which is a division of Ser. No. 752,546, Jul. 8, 1985, Pat. No. 4,619,934, which is a division of Ser. No. 598,502, Apr. 9, 1984, Pat. No. 4,552,899. This application Aug. 11, 1988, Ser. No. 230,887

Int. Cl.⁴ A61K 31/19, 31/44, 31/55, 31/445, 31/495, 31/505

U.S. Cl. 514—212

29 Claims

24. A method for the treatment of cough, cold, cold-like and/or flu symptoms and the discomfort, pain, fever and general malaise associated therewith, in a mammalian organism in need of such treatment comprising administering to such organism a symptom relieving antihistaminically, analgesically and anti-inflammatory effective amount of a composition comprising (i) at least one of the propionic acid NSAIDs, ibuprofen, naproxen, benoxaprofen, flurbiprofen, fenoprofen, fenbuten, ketoprofen, indoprofen, pirofen, carprofen, oxaprozin, pranoprofen, mirofen, tiaprofen, alminoprofen, tiaprofenic acid, fluprofen and bucloric acid or pharmaceutically acceptable salt thereof, in combinatory immixture with (ii) at least one non-sedating antihistamine AHR-11325, azelastine, ebastine, lodoxamide, levocabastine, mequitazine, oxatamide, setastine, tazifylline, or pharmaceutically acceptable salt thereof.

4,871,734
SUBSTITUTED THIENOIMIDAZOLE-TOLUIDINE
DERIVATIVES AS INHIBITORS OF GASTRIC ACID
SECRETION

Hans-Jochen Lang, Hofheim am Taunus; Manfred Röser, Eppstein/Taunus; Weidmann, Klaus, Kronberg/Taunus; Robert Rippel, Hofheim am Taunus, and Andreas W. Herling, Dreieich, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Nov. 20, 1987, Ser. No. 123,262

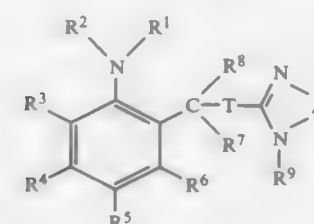
Claims priority, application Fed. Rep. of Germany, Nov. 22, 1986, 3639926

Int. Cl.⁴ A61K 31/55; C07D 495/04

U.S. Cl. 514—212

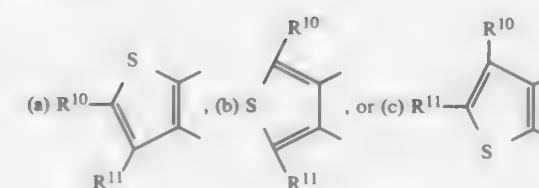
12 Claims

1. A compound of the formula I



in which

A represents



T is —S—, —SO— or —SO₂—,

R¹ and R² are identical or different and are hydrogen, wherein:

(C₁-C₆)-alkyl, (C₃-C₆)-cycloalkyl, (C₃-C₆)-alkenyl or (C₃-C₆)-alkynyl, or

R¹ and R² together represent a methylene chain —[CH₂]_n—, which can contain a double bond, in which n is 4 or 5, or represent said methylene chain in which, when n is 5, the CH₂ in para position to the N-atom to which R¹ and R² are attached is replaced by oxygen, sulfur or NR¹²,

R³, R⁴, R⁵ and R⁶ are identical or different and represent hydrogen, halogen, cyano, trifluoromethyl, benzyloxy, (C₁-C₆)-alkyl-Y or phenyl-Y, in which Y is oxygen, sulfur, sulfinyl, sulfonyl, or —[CH₂]_m— with m being 0, 1 or 2, —CO—R¹³, —SO₂NR¹⁴R¹⁵, —O—COR¹⁴, —NR¹⁴—COR¹⁵, —NR¹⁴—SO₂R¹⁵ or —NR¹⁴R¹⁵,

R⁷ and R⁸ are identical or different and are hydrogen or methyl,

R⁹ is hydrogen, (C₁-C₆)-alkanoyl, (C₁-C₆)-alkyl-carbamoyl, or another physiologically tolerated N^{im} protective group which is acid-labile and/or can be eliminated under physiological conditions,

R¹⁰ and R¹¹ are identical or different and are hydrogen, halogen, cyano, nitro, trifluoromethyl, (C₁-C₆)-alkyl, (C₁-C₆)-alkoxy, (C₁-C₆)-alkylmercapto, (C₁-C₆)-alkyl-carbonyl, (C₁-C₆)-alkoxycarbonyl, (C₁-C₆)-alkylcarbamoyloxy, (C₃-C₆)-cycloalkyl, phenyl, benzyl, benzyloxy, phenoxy, phenylmercapto, phenylsulfinyl, phenylsulfonyl, sulfamoyl, N-(C₁-C₄)-alkylsulfamoyl or N,N-di-(C₁-C₄)-alkylsulfamoyl, or, if A is defined as above under (a) or (c), can also together be a methylene chain —[CH₂]_n— wherein n is 3, 4, 5 or 6, or said methylene chain wherein one or two non-adjacent CH₂ groups is replaced by oxygen,

R¹² is hydrogen, (C₁-C₄)-alkyl or (C₁-C₄)-acyl, R¹³ is (C₁-C₅)-alkyl, (C₃ or C₆)-cycloalkyl, hydroxyl, (C₁-C₄)-alkoxy or —NR¹⁴R¹⁵,

R¹⁴ and R¹⁵ are identical or different and are hydrogen, (C₁-C₄)-alkyl, phenyl or phenyl which is mono-, di-, or trisubstituted by (C₁-C₃)-alkyl, (C₁-C₄)-alkoxy, trifluoromethyl and/or halogen, or

R¹⁴ and R¹⁵ together represent a methylene chain —[CH₂]_q—, in which q is 3, 4, 5 or 6, or said methylene chain wherein a methylene group is replaced by oxygen, or a physiologically tolerated salt thereof.

12. A process for inhibiting gastric acid secretion, which comprises administration to a host of an effective amount of a compound of the formula I as claimed in claim 1, or its physiologically tolerated salt.

4,871,735
NAPHTHYL DERIVATIVES, PHARMACEUTICAL
COMPOSITIONS CONTAINING THESE COMPOUNDS
AND PROCESSES FOR PREPARING THEM

Joachim Heider, Warthausen; Manfred Pistor; Andreas Bombard, both of Biberach; Norbert Hanel, Biberach-Bachlangen; Berthold Narr, Biberach; Klaus Noll, Warthausen, all of Fed. Rep. of Germany; Christian Lillie; Walter Kobinger, both of Vienna, all of Fed. Rep. of Germany, and Jürgen Dammgen, Sulmingen, Austria, assignors to Dr. Karl Thomae GmbH, Biberach an der Riss

Filed Sep. 11, 1987, Ser. No. 96,097

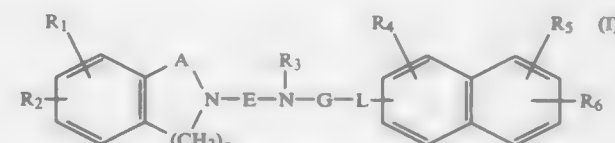
Claims priority, application Fed. Rep. of Germany, Sep. 12, 1986, 3631013

Int. Cl.⁴ A61K 31/55; C07D 222/16

U.S. Cl. 514—213

7 Claims

1. A compound of the formula



4,871,742

PROCESS AND PHARMACEUTICAL COMPOSITIONS FOR THE TREATMENT OF GLAUCOMA

Claude Bonne, Montpellier; Claude Coquelet, St Gely Du Fest, and Elisabeth Latour, Montpellier, all of France, assignors to Laboratoires Chauvin, Montpellier, France

Filed Dec. 4, 1987, Ser. No. 128,579

Claims priority, application France, Dec. 12, 1986, 8617430

Int. Cl.⁴ A61K 31/52, 31/50, 31/495

U.S. Cl. 514—262

6 Claims

1. A process for the treatment of glaucoma comprising administering to a human in need thereof a therapeutically effective amount for the treatment of glaucoma of a compound selected from the group consisting of allopurinol, oxypurinol and the flavonoids.

4,871,743

L-GLUTAMIC ACID DERIVATIVES

Edward C. Taylor, Princeton, N.J.; Philip M. Harrington, Plainwell, Mich., and Chuan Shih, Indianapolis, Ind., assignors to The Trustees of Princeton University, Princeton, N.J. and Eli Lilly and Company, Indianapolis, Ind.

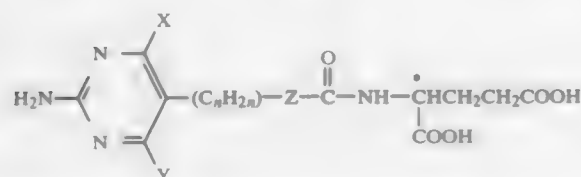
Filed Jan. 19, 1988, Ser. No. 144,970

Int. Cl.⁴ A61K 31/505; C07D 239/42, 239/49, 239/50

U.S. Cl. 514—272

15 Claims

1. A compound of the formula:



in which each X and Y, independently of the other is hydroxy or amino;

Z is 1,4-phenylene unsubstituted or substituted with one to four chlorine or fluorine atoms; cyclohexa-1,4-diyl; or a straight or branched chain alkylene group of 2 to 5 carbon atoms;

n has a value of 2 to 6; and

the configuration about the carbon atom designated * is L; and the pharmaceutically acceptable salts thereof.

4,871,744

CERTAIN

2,3-DIHYDRO-INDOLE-1-CARBOXAMIDO-N-[8-AZABICYCLO(3.2.1)OCTAN-3-YL]DERIVATIVES HAVING 5-HT-ANTAGONIST ACTIVITY

Francis D. King, and Karen A. Joiner, both of Harlow, England, assignors to Beecham Group p.l.c., Brentford, England

Filed Jun. 3, 1988, Ser. No. 202,224

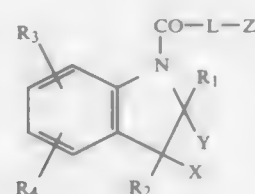
Claims priority, application United Kingdom, Mar. 23, 1988, 8806990

Int. Cl.⁴ C07D 451/12, 451/14; A61K 31/395

U.S. Cl. 514—299

12 Claims

1. A compound of formula (I), or a pharmaceutically acceptable salt thereof:



wherein

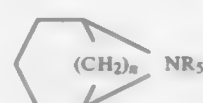
L is NH;

X and Y are independently selected from hydrogen or C₁₋₄ alkyl;

R₁ and R₂ are independently selected from hydrogen, C₁₋₆ alkyl, C₂₋₆ alkenyl-C₁₋₄ alkyl, or together are C₂₋₄ polymethylene;

R₃ and R₄ are independently selected from hydrogen, halogen, CF₃, C₁₋₆ alkyl, C₁₋₆ alkoxy, C₁₋₆ alkylthio, C₁₋₇ acyl, C₁₋₇ acylamino, C₁₋₆ alkylsulphonylamino, N-(C₁₋₆ alkylsulphonyl)-N-C₁₋₄ alkylamino, C₁₋₆ alkylsulphonyl, hydroxy, nitro, amino, aminocarbonyl, aminosulphonyl, aminosulphonylamino or N-(aminosulphonyl)-C₁₋₄ alkylamino optionally N-substituted by one or two groups selected from C₁₋₆ alkyl, C₃₋₈ cycloalkyl, C₃₋₈ cycloalkyl C₁₋₄ alkyl, phenyl or phenyl C₁₋₄ alkyl groups or optionally N-disubstituted by C₄₋₅ polymethylene;

Z is a group of formula (a),



wherein n is 2 or 3; and R₅ is C₁₋₇ alkyl, C₃₋₈ cycloalkyl, C₃₋₈ cycloalkyl-C₁₋₂ alkyl or C₂₋₇ alkenyl-C₁₋₄ alkyl.

10. A method of treatment of migraine and cluster headache in mammals, which comprises the administration to the mammal in need of such treatment, an effective amount of a compound according to claim 1.

4,871,745

2- OR 3-ARYL SUBSTITUTED IMIDAZO(1,2-A)PYRIDINES AND THEIR USE AS ANTIKECHETORY AGENTS

Jeffery B. Press, Rocky Hill, N.J., assignor to Ortho Pharmaceutical Corporation, Raritan, N.J.

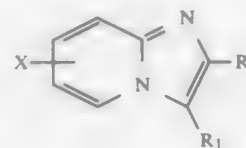
Division of Ser. No. 90,111, Aug. 31, 1982, Pat. No. 4,291,117, which is a continuation-in-part of Ser. No. 909,648, Sep. 22, 1996, Pat. No. 4,727,145. This application Oct. 17, 1988, Ser. No. 258,346

Int. Cl.⁴ A61K 31/395, 31/40

U.S. Cl. 514—300

4 Claims

1. A method for inhibiting gastric acid secretion of a mammal which comprises administering to a mammal an effective amount of a compound of the formula



where

X is one or more of hydrogen, halogen, hydroxy, alkoxy having 1-3 carbon atoms, benzyloxy, or C₁₋₆alkyl, combination;

R is H or Ar;

R₁ is H, CH₃ or Ar;

Ar is



R₂ is C₁₋₆ alkyl;

N is 0 or 1 when R is Ar or 1 when R₁ is Ar; and m is 2-6, with the proviso that both R and R₁ are not Ar at the same time and at least one of R and R₁ is Ar, or a pharmaceutically acceptable salt thereof.

4,871,746

N-[N-(TETRAHYDOPYRIDO[2,3-d]PYRIMIDINYL)METHYL]-AMINOMETHYLBENZOYL]GLUTAMIC ACID DERIVATIVES AS NEOPLASTIC GROWTH INHIBITORS

Edward C. Taylor, Princeton; James M. Hamby, Plainsboro, both of N.J., and Chuan Shih, Indianapolis, Ind., assignors to The Trustees of Princeton University, Princeton, N.J. and Eli Lilly and Company, Indianapolis, Ind.

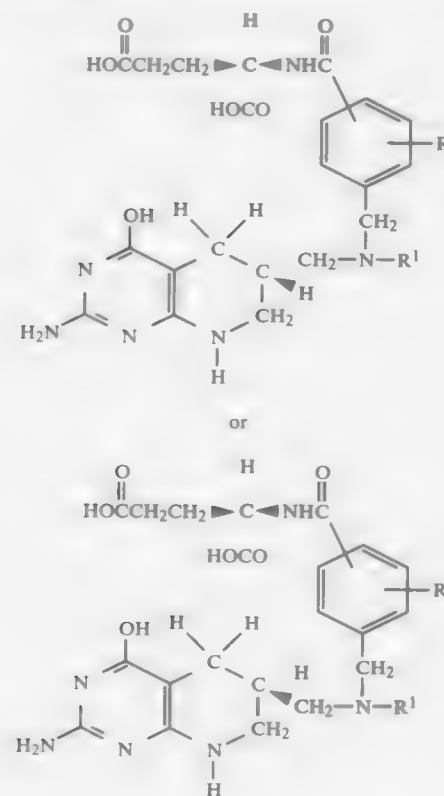
Filed May 31, 1988, Ser. No. 200,136

Int. Cl.⁴ A61K 31/505; C07D 471/00

U.S. Cl. 514—303

11 Claims

1. A compound selected from the group consisting of a glutamic acid derivative having the formula:



in which:

R¹ is hydrogen, alkyl of 1 to 6 carbon atoms, or alkanoyl of 1 to 6 carbon atoms; and R³ is hydrogen or halo; and a pharmaceutically acceptable salt thereof.

9. The method of inhibiting neoplastic growth in a mammal which growth is dependent on folic acid or a metabolic derivative of folic acid as a substrate, which comprises administering to the mammal in a single or multiple dose regimen an effective amount of a compound according to claim 1.

4,871,747

3-AMINO-4,5-DIHYDROXYPIPERIDINES, PROCESS FOR THEIR PREPARATION AND THEIR USE

Günther Kinast; Matthias Schüller, and Theo Schröder, all of Wuppertal, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 3, 1986, Ser. No. 937,645

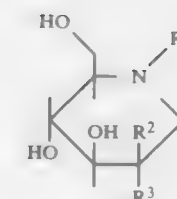
Claims priority, application Fed. Rep. of Germany, Dec. 20, 1985, 3545463; Jun. 20, 1986, 3620645

Int. Cl.⁴ A61K 31/445; C07D 211/42

U.S. Cl. 514—315

19 Claims

1. A 3-amino-4,5-dihydroxypiperidine of the formula



in which

R¹ represents hydrogen, alkyl having up to 8 carbon atoms, aralkyl having 7 to 14 carbon atoms, or represents a group of the formula



R⁴ denotes straight-chain or branched alkyl having up to 8 carbon atoms, straight-chain or branched alkoxy having up to 8 carbon atoms, or aralkoxy having up to 10 carbon atoms, and

R² and R³ represent hydrogen or represent the group NHR⁵, R⁵ having the same meaning as R¹ and being identical to or different from the latter,

with the proviso that, in every case, one substituent of R² or R³ represents hydrogen and the other substituent of R² or R³ represents NHR⁵, and physiologically acceptable salts thereof.

7. A method of treating prediabetes in a patient which comprises administering to said patient a therapeutically effective amount of a 3-amino-4,5-dihydroxypiperidine according to claim 1 sufficient to treat prediabetes in said patient.

4,871,748

PHENYLPROPARGYLAMINE DERIVATIVES

Leslie R. Hatton, Chelmsford, England, assignor to May & Baker Limited, England

Filed Jan. 23, 1985, Ser. No. 693,729

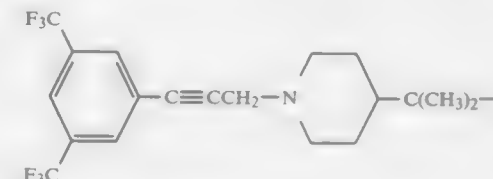
Claims priority, application United Kingdom, Feb. 8, 1984, 8403362; Dec. 12, 1984, 8431375

Int. Cl.⁴ C07F 237/30, 237/00, 9/02; A61K 39/445

U.S. Cl. 514—317

17 Claims

1. A phenylpropargylamine derivative of the formula:



wherein R is a hydroxymethyl group, a straight- or branched-chain alkoxyethyl group containing from 2 to 6 carbon atoms, an unsubstituted or substituted phenoxyethyl group, substituted on the phenyl moiety by one or more substituents selected from halogen, trifluoromethyl, C₁₋₄ straight- or branched-chain alkyl, and C₁₋₄ straight- or branched-chain alkoxy, a straight- or branched-chain alkanoyloxymethyl group containing from 3 to 10 carbon atoms, an unsubstituted or substituted benzoyloxymethyl group, substituted on the phenyl moiety by one or more substituents selected from halogen, trifluoromethyl, C₁₋₄ straight- or branched-chain alkyl, and C₁₋₄ straight- or branched-chain alkoxy, a straight- or branched-chain alkylsulphonyloxymethyl group containing from 2 to 9 carbon atoms, an unsubstituted or substituted phenylsulphonyloxymethyl group, substituted on the phenyl moiety by one or more substituents selected from halogen, trifluoromethyl, C₁₋₄ straight- or branched-chain alkyl, and C₁₋₄ straight- or branched-chain alkoxy, a formyl group, an unsub-

stituted or substituted aminomethyl group, substituted by one or two straight- or branched-chain alkyl groups, which may be the same or different and each said alkyl group contains from 1 to 4 carbon atoms, or a hydroxyaminomethyl group; and acid addition salts thereof.

4,871,749

4-HETEROPENTACYCLIC-4-(N-PHENYL)AMIDO) PIPERIDINE DERIVATIVES AND PHARMACEUTICAL COMPOSITIONS AND METHOD EMPLOYING SUCH COMPOUNDS

Bor-Sheng Lin, Berkeley Heights; Linas V. Kudzma, North Bergen, and H. Kenneth Spencer, Chatham, all of N.J., assignors to BOC, Inc., Murray Hill, N.J.
Continuation of Ser. No. 139,899, Dec. 31, 1987, Pat. No. 4,791,120. This application Oct. 11, 1988, Ser. No. 256,792. The portion of the term of this patent subsequent to Dec. 13, 2005, has been disclaimed.

Int. Cl.⁴ A61K 31/445; C07D 417/00

U.S. Cl. 514—326 3 Claims

1. A compound of the formula 1-[2-(1H-pyrazol-1-yl)ethyl]-4-(4-methylthiazol-2-yl)-4-(N-phenylpropionamido)piperidine or its pharmaceutically acceptable salt form.

3. A method for providing analgesia in a mammal, comprising administering to such mammal an analgesically effective amount of 1-[2-(1H-pyrazol-1-yl)ethyl]-4-(4-methylthiazol-2-yl)-4-(N-phenylpropionamido)piperidine or its pharmaceutically acceptable salt form.

4,871,750

USE OF DIOXOPIPERIDINE DERIVATIVES AS ANALGESICS

Malcolm H. T. Roberts, Cowbridge, United Kingdom, assignor to National Research Development Corporation, London, England

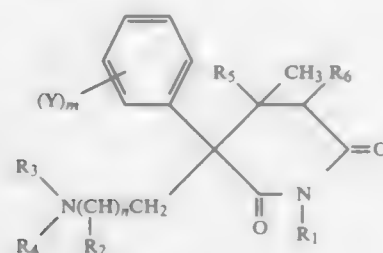
Filed Jun. 14, 1988, Ser. No. 206,273

Claims priority, application United Kingdom, Jun. 16, 1987, 8714033; Jun. 19, 1987, 8714374

Int. Cl.⁴ A61K 31/445

U.S. Cl. 514—328 15 Claims

1. A method for the analgesic treatment of pain, other than migraine headache, which comprises administering to a patient suffering pain an analgesic effective amount of a compound of the following Formula I



wherein:

R₁ represents hydrogen or C₁-C₄ alkyl;
n is 1 or 2;
R₂ represents hydrogen or methyl, provided that one R₂ is hydrogen when n is 2;
R₃ represents hydrogen or C₁-C₂ alkyl;
R₄ represents C₁-C₂ alkyl;
R₅ and R₆ independently represent hydrogen or methyl;
m is 0 to 3; and
each Y is in a meta or para position and independently represents hydroxy, C₁-C₂ alkoxy, C₁-C₂ alkyl, C₁-C₂ hydroxyalkyl, halogen, or trifluoromethyl, provided that hydroxy and alkoxy are not in the para position, or a pharmacologically acceptable salt thereof.

4,871,751

1,2,6-TRIPHENYL-4(1H)-PYRIDINONE DERIVATIVES, AND THEIR USE AS FUNGICIDES

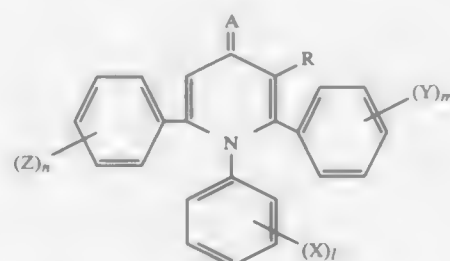
Norihisa Yonekura, Shizuoka; Takashi Yumita, Hamamatsu; Yukio Nezu, Fujieda; Yoshiyuki Kojima, Kakegawa; Shin-ichiro Maeno, Shizuoka, and Shigeharu Yaguchi, Shizuoka, all of Japan, assignors to Kumai Chemical Industry Co., Ltd., Tokyo, Japan and Ihara Chemical Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 29,944, Mar. 26, 1987, Pat. No. 4,757,081. This application Apr. 6, 1988, Ser. No. 178,421. Claims priority, application Japan, Mar. 26, 1986, 61-67438; May 19, 1986, 61-114030; Aug. 5, 1986, 61-183876

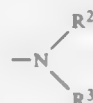
Int. Cl.⁴ A61K 31/44; C07D 213/62, 213/78

U.S. Cl. 514—345 15 Claims

1. A 4(1H)-pyridinone derivative represented by the formula



wherein X, Y and Z are the same or different and are independently a halogen atom, a nitro group, a cyano group, a hydroxy group, aldehyde group (—CHO), a lower alkyl group, a halogen-substituted lower alkyl group, a lower cyanoalkyl group, a lower hydroxyalkyl group, a lower alkoxyalkyl group, a lower alkoxy group, a halogen-substituted lower alkoxy group, a lower alkoxyalkoxy group, a lower alkenyl group, a lower alkenyloxy group, a lower alkynyl group, a lower alkynyloxy group, a lower alkanoyl group, a lower alkanoyloxy group, a phenyl group, a phenoxy group, a carbamoyl group, a lower alkylcarbamoyloxy group, a carboxyl or carboxylate group of the formula —COOR¹ where R¹ is a hydrogen atom or a lower alkyl group, or a substituted or unsubstituted amino group of the formula



where R² and R³ are the same or different and are each a hydrogen atom, a lower alkyl group or a lower alkanoyl group; or X, Y and Z are independently a group of the formula —(O)_p—S—R⁴ is a lower alkyl group and p is an integer of 0 to 3; or X, Y and Z are independently a trimethylene group or a methylene-dioxo group bonded to and bridging between the adjacent two carbon atoms of the same benzene ring to which X, Y and Z is linking so that X, Y and Z taken together with said two adjacent two carbon atoms of the same benzene ring forms a 5-membered ring,

l, m and n are independently an integer of 0 to 5,

R is a halogen atom, a cyano group, a lower alkyl group, a halogen-substituted lower alkyl group, a lower alkoxy group, a lower alkenyl group, a lower alkynyl group, a phenyl group, a benzyl group, a trimethylsilyl ethynyl group, a carboxyl or carboxylate group of the formula —COOR¹ where R¹ is as defined above, or a substituted methyl group of the formula —CH₂OR⁵ where R⁵ is a hydrogen atom, a lower alkyl group or a benzoyl group, A is an oxygen atom or a sulfur atom, provided that when R is methyl and A is an oxygen atom, l, m and n do not denote zero simultaneously; and provided that when R and X are each a methyl group, A is an oxygen atom and

l is 1, m and n do not denote zero simultaneously, and a salt of the compound of the formula (I) above.

15. A fungicidal composition for agricultural and horticultural utilities, which comprises a compound of the formula (I) as defined in claim 1 or a salt thereof as the active ingredient, in combination with a carrier for the active ingredient.

4,871,752

USE OF ARYLOXYCARBOXYLIC ACID DERIVATIVES AGAINST DERMATOLOGICAL DISEASES

Laazlo Ilg, Zermatter Strasse 29, 2800 Bremen 41, Fed. Rep. of Germany, and Mario Gligora, A. Kovacica 22a, 5100 Rijeka, Yugoslavia

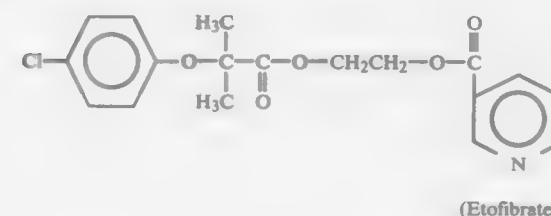
Filed Jun. 30, 1987, Ser. No. 68,100

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1986, 3621861

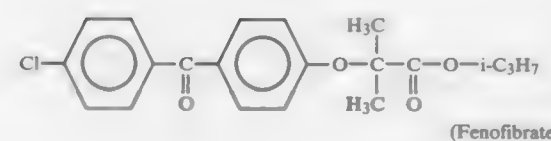
Int. Cl.⁴ A61K 31/44, 31/235

U.S. Cl. 514—355 3 Claims

1. A method for treating a dermatological disease selected from the group consisting of striae distense, ulcus cruris, cellulitis, psoriasis, folliculitis decalvans, alopecia mucinosa, necrobiosis lipoidica diabetorum and mesenchymal tumors which comprises topically, parenteral, subcutaneously or intrarectally administering to a patient a dermatological disease treating effect amount of an aryloxy-carboxylic acid derivative selected from the group consisting of



(Etofibrate)



(Fenofibrate)

4,871,753

3-PHENYL-5-TRIFLUOROMETHYL-1,2,4-OXADIAZOLE COMPOUNDS WHICH ARE USEFUL PESTICIDES

Otto Rohr, Therwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

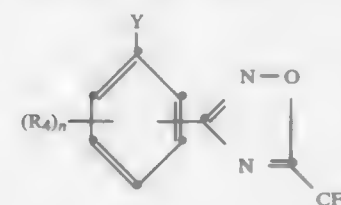
Filed Dec. 9, 1987, Ser. No. 130,833

Claims priority, application Switzerland, Dec. 12, 1986, 4948/86; Dec. 12, 1986, 4949/86; Oct. 22, 1987, 4134/87

Int. Cl.⁴ C07D 271/06

U.S. Cl. 514—364 18 Claims

18. A method of controlling phytopathogenic microorganisms on plants or of preventing cultivated plants from being attacked by said microorganisms, comprising the step of applying a compound of the formula



in which

Y represents OR' or HNR"

R' represents hydrogen, C₁-C₄-alkyl, phenyl, naphthyl, halophenyl, halonaphthyl, C₁-C₄-alkyl-phenyl, C₁-C₄-alkyl-naphthyl, mono-, di- or trihalomethylphenyl, mono-, di- or trihalomethylnaphthyl, mono-, di- or trihaloethylphenyl, mono-, di- or trihaloethylnaphthyl, C(X)NR₁(R₂), C(O)XR₃ or COR₃;

R₁' represents C₁-C₉-alkyl, C₁-C₄-alkoxy, C₂-C₄-alkenyl, phenyl, naphthyl, halophenyl, halonaphthyl, C₁-C₄-alkyl-phenyl, C₁-C₄-alkyl-naphthyl, mono-, di- or trihalomethylphenyl, mono-, di- or trihalomethylnaphthyl, mono-, di- or trihalomethylethylphenyl, or mono-, di- or trihalomethylnaphthyl,

R₂' represents hydrogen or C₁-C₄-alkyl;

R₃' represents C₁-C₁₅-alkyl, C₂-C₄-alkyl, phenyl or naphthyl;

R₄ represents halogen, C₁-C₄-alkoxy or nitro; and

n represents 0, 1 or 2;

X represents oxygen or sulfur;

R'' represents C(O)NR₁(R₂'), C(S)NR₁(R₂'), COOR₃', COSR₃' or COR₃';

R₁'' represents C₁-C₄-alkyl, C₁-C₄-alkoxy, phenyl or naphthyl;

R₂'' represents hydrogen or C₁-C₄-alkyl and

R₃'' represents C₁-C₉-alkyl, C₁-C₄-haloalkyl, C₃-C₄-alkenyl, phenyl or naphthyl;

or an acid addition salt thereof.

4,871,754

AQUEOUS FORMULATION OF 1,2-BENZISOTHAZOLIN-3-ONE

Wolfgang Bauer, Maintal, and Willi Steckelberg, Hofheim, both of Fed. Rep. of Germany, assignors to Cassella Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 18, 1986, Ser. No. 943,145

Claims priority, application Fed. Rep. of Germany, Jan. 8, 1986, 3600271

Int. Cl.⁴ A01N 43/80

U.S. Cl. 514—373 8 Claims

1. An aqueous formulation containing the lithium salt of 1,2-benzisothiazolin-3-one, water and a water-miscible organic solvent in a weight ratio of 5 to 30 : 95 to 30 : 0 to 40, respectively, said formulation prepared by reacting lithium hydroxide lithium carbonate or trisodium phosphate in water or in a water miscible organic solvent with 1, 2-benzisothiazolin-3-one.

4,871,755

METHOD FOR TREATING DIABETES OBESITY AND CONDITIONS CHARACTERIZED BY INCREASED PROTEIN BREAKDOWN WITH NOVEL OXAZOLIDINES

Leo Alig, Kaiseraugst, and Marcel Müller, Frenkendorf, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 667,186, Nov. 1, 1984, Pat. No. 4,743,604.

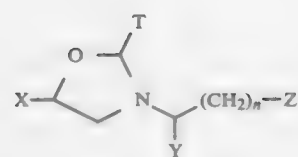
This application Feb. 5, 1988, Ser. No. 152,522

Claims priority, application Switzerland, Nov. 10, 1983, 6070/83; Sep. 20, 1984, 4499/84

Int. Cl.⁴ A61K 31/42, 31/495

U.S. Cl. 514—376 9 Claims

1. A method of treating disease conditions characterized by an increased protein breakdown, which method comprises administering a pharmaceutically effective amount of a compound of the formula



wherein

n is the number 1 or 2,

T is lower-carbalkoxy,

X is phenoxymethyl optionally mono-fluorinated or mono-chlorinated in the ortho-position or phenyl optionally monosubstituted by fluorine, chlorine, trifluoromethyl or lower-alkoxy,

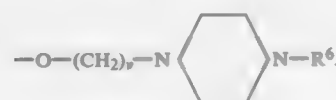
Y is hydrogen or methyl,

Z is a group of the formula



R¹ is lower-alkyl, optionally N-mono-lower-alkylated or N-di-lower-alkylated aminomethyl or a residue —C(O)R², —C(R³)=CH—(CH₂)_m—C(O)R², —C(H,R³)—(CH₂)_{m+1}—C(O)R², —C(H,R³)—(CH₂)_p—OH or —C(R³)=CH—C(CH₃)=CH—COOCH₃,

R¹¹ is hydroxy, lower-alkoxy, lower-alkanoyloxy, sulphamoyl, benzyloxy or phenoxy or a group R¹, —O—(CH₂)_q—OH, —O—(CH₂)_q—COOR⁴



R² is hydroxy, lower-alkyl, lower-alkoxy, dimethylaminoethoxy, lower-alkoxycarbonylethyl or optionally mono-lower-alkylated or di-lower-alkylated amino,

R³ is hydrogen or methyl,

R⁴ is lower-alkyl,

R⁵ is hydrogen, lower-alkyl or phenyl optionally para-substituted by chlorine, fluorine, trifluoromethyl, lower-alkyl or lower-alkoxy,

R⁶ is lower-alkyl or phenyl optionally para-substituted by fluorine, chlorine, lower-alkyl or lower-alkoxy,

m and p are whole numbers of 0 to 6,

v is a whole number of 2 to 4,

q and t are whole numbers of 1 to 6, or a physiologically compatible salt thereof.

4,871,756

LEUKOTRIENE ANTAGONISTS

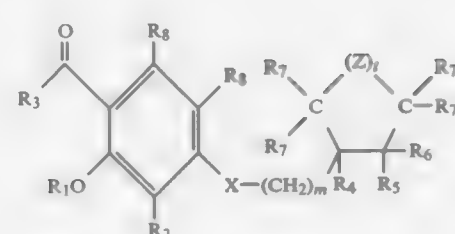
John Gillard, Pointe Claire; Joshua Rokach, Laval, and Patrice C. Belanger, Dollard des Ormeaux, all of Canada, assignors to Merck Frost Canada, Inc., Kirkland, Canada
Division of Ser. No. 713,927, Mar. 20, 1985, Pat. No. 4,667,055, which is a continuation-in-part of Ser. No. 566,858, Dec. 29, 1983, abandoned. This application Feb. 17, 1987, Ser. No. 15,823 The portion of the term of this patent subsequent to May 19, 2004, has been disclaimed.

Int. Cl.⁴ C07C 149/40; A61K 31/215

U.S. Cl. 514—381

8 Claims

1. A compound of the formula:



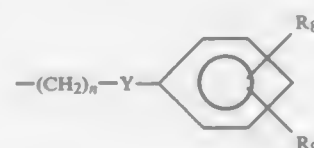
wherein:

R₁ is H, alkyl of 1 to 6 carbon atoms, R₃-CO-, or R₃OCH₂-;

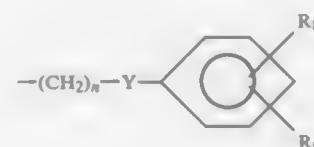
R₂ is alkyl of 1 to 6 carbon atoms which may be straight chain or branched, alkenyl of 3 to 6 carbon atoms, which may be straight chain or branched;

R₃ is H or alkyl of 1 to 6 carbon atoms;

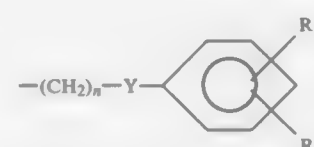
R₄ is H; OR₁ provided that m is 1; or



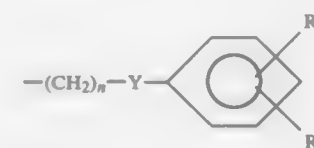
provided that m and n are not both zero;
R₅ is H; OR₁, provided that R₆ is not OR₁; or



R₆ is H; OR₁; or



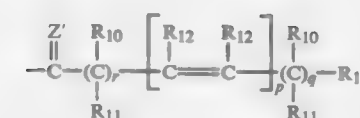
with the proviso that not all of R₄, R₅ and R₆ are simultaneously



but at least one must be OH;

each R₇ is independently H or alkyl of 1 to 6 carbon atoms; each R₈ is independently H; OH; alkyl of 1 to 6 carbon atoms which may be straight chain or branched; alkenyl of 2 to 6 carbon atoms which may be a straight chain or branched; trifluoromethyl; alkoxy of 1 to 6 carbon atoms which may be straight chain or branched; SH; thioalkyl of 1 to 6 carbon atoms which may be straight chain or branched; phenyl; phenyl substituted by alkyl of 1 to 3 carbon atoms or by halogen; benzyl; phenethyl; halogen; N(R₇)₂; COOR₇; CH₂OR₇; formyl; CN; trifluoromethylthio; or nitro;

R₉ is



wherein the broken line represents an optional triple bond and Z' is O; S; CH₂; H and OH; alkenyl of 1 to 4 carbons; or N—R₁₄;

each R₁₀ is independently H or alkyl of 1 to 4 carbons;

each R₁₁ is independently H, OH, or alkyl of 1 to 4 carbons;

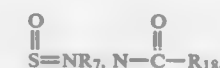
each R₁₂ is independently H, or alkyl of 1 to 4 carbons, and is absent when a triple bond is present;

R₁₃ is COOR₇, CH₂OH, CHO, tetrazole, NHSO₂R₁₄, hydroxymethylketone, CN, or CON(R₇)₂;

each R₁₄ is independently OH, alkyl or alkoxy of 1 to 6 carbon atoms, perhaloalkyl of 1 to 6 carbon atoms, phenyl or phenyl substituted by alkyl or alkoxy groups of 1 to 3 carbon atoms, halogen, hydroxy, haloalkyl, COOH, CN, formyl or acyl of 1 to 6 carbon atoms;

X is O, S, SO or SO₂;

each Y is independently O, S, SO, SO₂,



or N—CN;

Z is —C(R₇)₂ or O;

m is 0 or 1;

n is 0 or 1 provided that both m and n are not O, or that both m and n are not 1;

t is 1 or 2, provided that one but not both Z units is —C(R₇)₂ when t is 2;

p is 0 or 1;

q and r are each independently 0 to 20 provided that the total of q and r does not exceed 20;

and pharmaceutically acceptable salts thereof.

4,871,757

HETEROCYCLIC COMPOUNDS

Christoph Lüthy, Schwerzenbach, and René Zurflüh, Bülach, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Jul. 3, 1986, Ser. No. 882,102

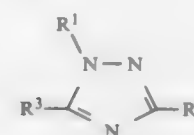
Claims priority, application Switzerland, Jul. 12, 1985, 3042/85; Apr. 29, 1986, 1748/86

Int. Cl.⁴ A01N 43/653; C07D 249/10

U.S. Cl. 514—383

42 Claims

41. A composition for the control of insects and mites which contains an effective amount of at least one compound of the formula



wherein

R¹ is phenyl or phenyl substituted with 1 to 3 chlorine atoms, a bromine atom, an iodine atom, 1 to 3 fluorine atoms, 1 or 2 C₁₋₂-alkyl groups, 1 or 2 halomethyl groups, a C₁₋₂-alkoxy group, a C₁₋₂-haloalkoxy group, a nitro group and/or a cyano group,

R² is phenyl substituted with 1 or 2 chlorine atoms, a bromine atom, an iodine atom, 1 to 3 fluorine atoms, 1 or 2 C₁₋₂-alkyl groups, a halomethyl group and/or 1 or 2 methoxy groups, at least one of the substituents being situated in an o-position, and

R³ is halogen or methyl, or an acid addition salt thereof, as well as formulation adjuvants.

4,871,758

PHARMACOLOGICALLY ACTIVE CHOLINERGIC COMPOSITIONS, AND METHODS FOR MAKING SAME AND USE THEREOF IN TREATING DISEASE

Jerome M. Schulman, c/o City University of New York at Queens College, Dept. of Chemistry Kissena Blvd. @ Horace Harding Blvd., New York, N.Y. 11367, and Raj K. Goyal, c/o Beth Israel Hospital, 330 Brookline Ave., Boston, Mass. 02215

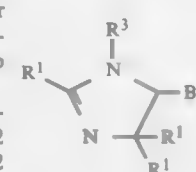
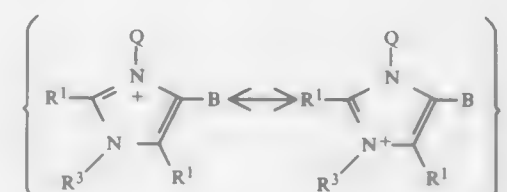
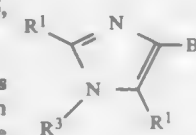
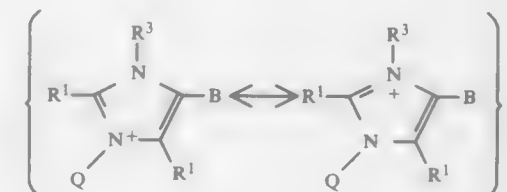
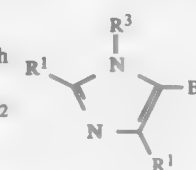
Filed Mar. 18, 1987, Ser. No. 27,575

Int. Cl.⁴ A61K 31/415; C07D 233/60

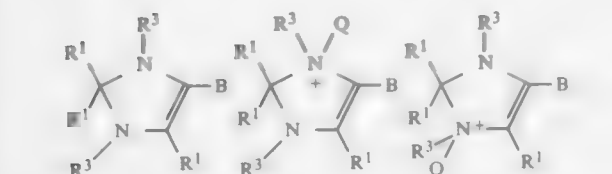
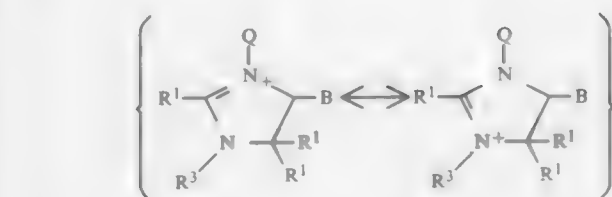
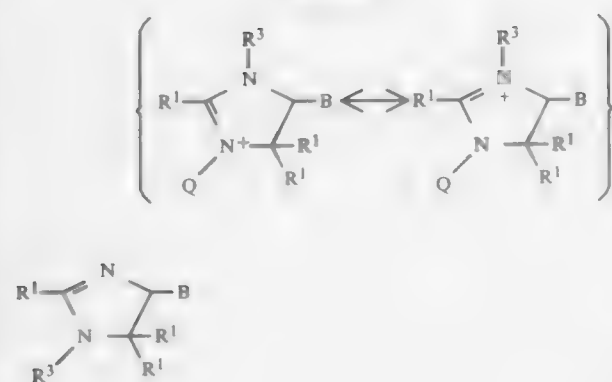
U.S. Cl. 514—397

14 Claims

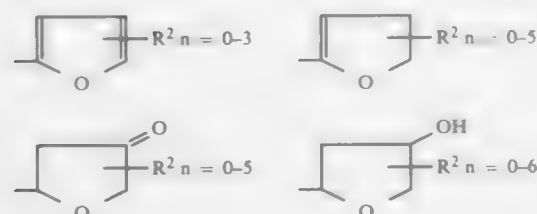
1. Compounds useful as cholinergic drugs having the formula A—B and pharmaceutically acceptable salts thereof having the formula [(A—B)Q]³⁰M^{-q} wherein M is a pharmaceutically acceptable anion, Q is a proton or lower alkylating group, q is an integer from 1 to 3, A is



-continued



and B is



wherein R¹ and R² are each independently hydrogen, halo, branched or straight-chain C₁-C₆ alkyl, branched or straight-chain C₁-C₆ haloalkyl, branched or straight-chain C₁-C₆ alkoxy, hydroxyl, keto or aryl; and R³ is H, lower alkyl or monocyclic aryl.

4,871,759

METHOD OF TREATMENT OF MESENTERIC ADENITIS

James B. Mercer, 13109 W. 95th St., Lenexa, Kans. 66215
Continuation-in-part of Ser. No. 407,808, Aug. 13, 1982, Pat. No. 4,537,775, which is a continuation-in-part of Ser. No. 64,072, Aug. 6, 1979, Pat. No. 4,346,095, which is a continuation-in-part of Ser. No. 876,618, Feb. 10, 1978, Pat. No. 4,177,281, which is a continuation-in-part of Ser. No. 656,336, Feb. 9, 1976, Pat. No. 4,073,988, which is a continuation-in-part of Ser. No. 514,798, Oct. 15, 1974, Pat. No. 3,952,103, which is a continuation-in-part of Ser. No. 370,952, Jun. 18, 1973, Pat. No. 3,856,966. This application Apr. 4, 1985, Ser. No. 720,021

Int. Cl.⁴ A61K 31/415

U.S. Cl. 514-398

4 Claims

1. A method for treating a human host having virally induced mesenteric adenitis; the method comprising:
(a) repeatedly orally administering a pharmaceutically ac-

ceptable amount of an anti-mesenteric adenitis effective antiviral agent comprising metronidazole and possessing sufficient bioavailability to be transported to a situs of viral infection.

4,871,760
USE OF

2-[N-2,6-DICHLOROPHENYL-N-ALLYLAMINO]-2-IMIDAZOLINE AS CYTOPROTECTIVE AGENT

Dietrich Arndts, Appenheim; Günter Schingnitz, Bad Kreuznach; Ilse Streller, Stromberg, and Alexander Walland, Ingelheim am Rhein, all of Fed. Rep. of Germany, assignors to Boehringer Ingelheim KG, Ingelheim am Rhein, Fed. Rep. of Germany

Filed Jun. 18, 1987, Ser. No. 63,617

Claims priority, application Fed. Rep. of Germany, Jun. 18, 1986, 3620433

Int. Cl.⁴ A61K 31/415

U.S. Cl. 514-401

1 Claim

1. A method for treating cerebral brain disturbances, cerebral oxygen deficiency, cerebral sclerosis or cerebral apoplexy which method comprises administering to an animal suffering from one of the said conditions a therapeutically effective amount of 2-[N-2,6-dichlorophenyl-N-allylamino]-2-imidazoline or a pharmaceutically acceptable acid addition salt thereof.

4,871,761

SUBSTITUTED PROPYLAMINE PESTICIDES

Detlef Wollweber, Wuppertal, and Stefan Dutzmann, Duesseldorf, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 18, 1988, Ser. No. 170,522

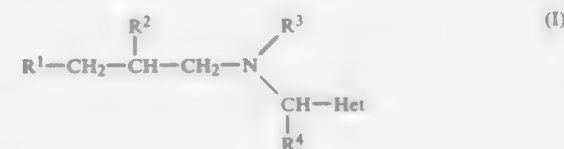
Claims priority, application Fed. Rep. of Germany, Apr. 3, 1987, 3711345

Int. Cl.⁴ A01N 43/16, 43/08; C07D 309/04, 307/14

U.S. Cl. 514-438

10 Claims

1. A substituted propylamine of the formula



in which

R¹ represents in each case optionally monosubstituted to polysubstituted cycloalkyl or cycloalkenyl in each case having 3 to 10 carbon atoms, the substituents being independently selected from the group consisting of straight-chain or branched alkyl having 1 to 8 carbon atoms or cycloalkylalkyl having 1 to 8 carbon atoms in the straight-chain or branched alkyl part and 3 to 7 carbon atoms in the cycloalkyl part; or it represents in each case optionally monosubstituted to polysubstituted tetrahydronaphthyl or decahydronaphthyl, the substituents being identical or different and being: in each case straight-chain or branched alkyl or alkoxy in each case having 1 to 8 carbon atoms; or represents in each case monosubstituted to polysubstituted phenyl or naphthyl, the substituents being independently selected from the group consisting of halogen, straight-chain or branched alkyl having 1 to 8 carbon atoms, in each case straight-chain or branched alkoxy or alkylthio in each case having 1 to 4 carbon atoms, in each case straight-chain or branched halogenoalkyl, halogenoalkoxy or halogenoalkylthio in each case having 1 to 4 carbon atoms and 1 to 9 identical or different halogen atoms, cycloalkyl having 3 to 7 carbon atoms, aryl or aryloxy having 6 to 10 carbon atoms which is in each case optionally monosubstituted to polysubstituted by identical

4,871,762

LIPID PEROXIDE LOWERING 1,3-BENZOXATHIOLE DERIVATIVE COMPOSITIONS AND METHOD OF USE THEREFOR

Takao Yoshioka; Eichi Kitzawa; Mitsuo Yamazaki, and Yoshio Iizuka, all of Hiromachi, Japan, assignors to Sankyo Company, Limited, Tokyo, Japan

Continuation of Ser. No. 36,250, Apr. 9, 1987, abandoned, which is a division of Ser. No. 716,171, Mar. 26, 1985, Pat. No. 4,691,027. This application Dec. 24, 1987, Ser. No. 139,180

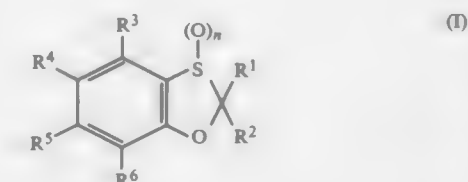
Claims priority, application Japan, Mar. 28, 1984, 59-60196

Int. Cl.⁴ C07D 327/04, 407/10; A61K 31/39

U.S. Cl. 514-439

13 Claims

1. A pharmaceutical composition for lowering lipid-oxide levels comprising an effective amount of a therapeutic agent in admixture with a pharmaceutically acceptable carrier or diluent, wherein the therapeutic agent is selected from the group consisting of compounds of formula (I):



in which:

R¹ represents a hydrogen atom, an alkyl group, a substituted alkyl group, a C₂-C₆ alkenyl group, a C₆-C₁₀ carbocyclic aryl group, a substituted C₆-C₁₀ carbocyclic aryl group or an alkoxy carbonyl group wherein the alkoxy part has from 1 to 6 carbon atoms, said substituents on said alkyl and aryl groups being selected from the group consisting of:

halogen atoms, hydroxy groups, C₁-C₇ aliphatic acyloxy groups, C₆-C₁₀ carbocyclic aryl carboxylic acyloxy groups, α-alkoxyalkoxy groups where both alkoxy parts have from 1 to 6 carbon atoms, a tetrahydro-2-furanyloxy- or tetrahydro-2-pyranyloxy group, trialkylsilyloxy groups where each alkyl part has from 1 to 6 carbon atoms, aralkyloxy groups where the aryl part is C₆-C₁₀ carbocyclic aryl and the alkyl part is C₁-C₆ alkyl, C₁-C₆ alkoxy groups, C₁-C₆ aminoalkoxy groups, alkylaminoalkoxy groups where the alkyl and alkoxy parts both have from 1 to 6 carbon atoms, dialkylaminoalkoxy groups where the alkyl and alkoxy parts all have from 1 to 6 carbon atoms, carboxy groups, alkoxy carbonyl groups where the alkoxy part has from 1 to 6 carbon atoms, carbamoyl groups, alkylcarbamoyl groups where the alkyl part has from 1 to 6 carbon atoms, dialkylcarbamoyl groups where both alkyl parts have from 1 to 6 carbon atoms and, as substituents on aryl groups only, C₁-C₆ alkyl groups;

R² represents a hydrogen atom, a C₁-C₆ alkyl group or a C₃ or C₄ alkenyl group;

R³ represents a hydrogen atom or a C₁-C₆ alkyl group;

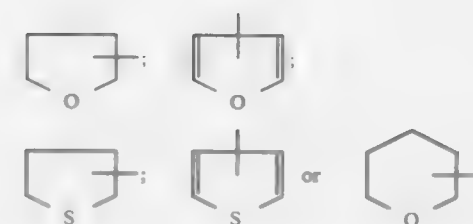
R⁴ represents a hydroxy group, a C₁-C₂₁ aliphatic acyloxy group or a C₆-C₁₀ carbocyclic aryl carboxylic acyloxy group;

R⁵ represents a C₁-C₁₂ alkyl group, a C₁-C₆ alkoxy group, a hydroxy group, a C₁-C₇ aliphatic acyloxy group or a C₆-C₁₀ carbocyclic aryl carboxylic acyloxy group;

R⁶ represents a hydrogen atom, a C₁-C₆ alkyl group or a C₁-C₆ alkoxy group; and

n is 0, 1, or 2;

and pharmaceutically acceptable salts thereof.



the substituents being independently selected from the group consisting of in each case straight-chain or branched alkyl, alkoxy, alkylthio or alkoxy carbonyl in each case having 1 to 4 carbon atoms in the individual alkyl parts, and in each case straight-chain or branched halogenoalkyl, halogenoalkoxy or halogenoalkylthio in each case having 1 to 4 carbon atoms and 1 to 9 identical or different halogen atoms, or an acid-addition salt thereof.

4,871,763

METHOD OF TREATING LIVER DISEASES USING PURE SILIBININ

Rolf Madans, Köln; Klaus Görler, Bergisch Gladbach, and Hartwig Soicke, Köln, all of Fed. Rep. of Germany, assignors to Dr. Madans GmbH & Co., Cologne, Fed. Rep. of Germany. Continuation of Ser. No. 800,052, Nov. 28, 1985, abandoned.

This application Mar. 18, 1988, Ser. No. 171,176. Claims priority, application Fed. Rep. of Germany, Nov. 22, 1984, 3442641; Oct. 23, 1985, 3537656.

Int. Cl.⁴ A61K 31/335

U.S. Cl. 514—45.2

2 Claims

1. A method of treating liver cirrhosis or toxic-metabolic liver damage comprising administering to a patient a therapeutically effective amount of substantially pure silibinin.

4,871,764

12-HALOGENATED FORSKOLIN DERIVATIVES

Gregory M. Shutske, Somerset, N.J., assignor to Hoechst-Roussel Pharmaceuticals, Inc., Somerville, N.J.

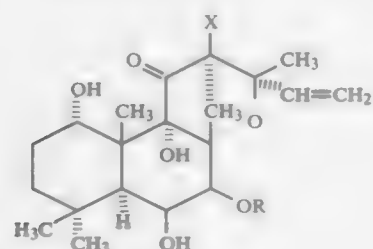
Filed Nov. 20, 1986, Ser. No. 932,553

Int. Cl.⁴ A61K 31/35; C07D 311/92

U.S. Cl. 514—455

26 Claims

19. A method of reducing intraocular pressure in mammals comprising administering to a mammal requiring intraocular pressure reduction an intraocular pressure reducing effective amount of a compound of the formula



wherein X is F, Cl, Br or I; R is hydrogen or



where R₁ is a lower alkyl, or an optical or geometric isomer thereof.

4,871,765

AMINE DERIVATIVE AND ITS SALT AND ANTI-ULCER AGENT CONTAINING THE SAME

Shiro Hirai, Toyama; Hiroshi Hirano, Oyabe; Hirotohi Arai, Toyama; Hisanari Shibata, Toyama; Yoshikazu Kusayanagi, Toyama, and Kazuhiko Hashiba, Higashitonami, all of Japan, assignors to Toyama Chemical Co., Ltd., Tokyo, Japan.

Filed Aug. 26, 1988, Ser. No. 236,726

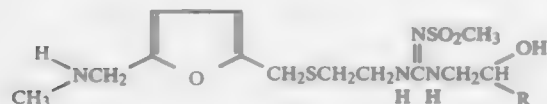
Claims priority, application Japan, Aug. 28, 1987, 62-214292

Int. Cl.⁴ A61K 31/34; C07D 307/52

U.S. Cl. 514—471

12 Claims

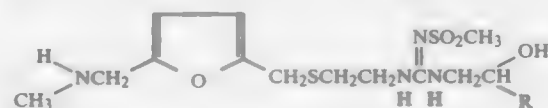
1. An amine derivative represented by the formula:



wherein R is a 4-hydroxyphenyl group, a 4-carbamoylphenyl group or a 3-methanesulfonylamino-phenyl group, or its salt.

9. A method for treating a patient with a peptic ulcer, com-

prising administering a therapeutically effective amount of an amine derivative represented by the formula:



wherein R is a 4-hydroxyphenyl group, a 4-carbamoylphenyl group, or a 3-methanesulfonylamino-phenyl group, or its salt.

4,871,766

OIL-IN-WATER PESTICIDAL EMULSION

Shigenori Tsuda, Kyoto; Yukio Manabe, Toyonaka, and Kozo Tsuji, Nara, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan.

Filed Dec. 29, 1986, Ser. No. 947,271

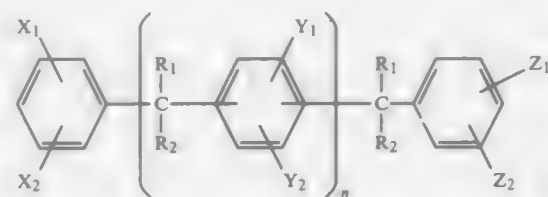
Claims priority, application Japan, Jan. 17, 1986, 61-8455

Int. Cl.⁴ A01N 31/14, 37/34, 53/00, 57/00

U.S. Cl. 514—521

4 Claims

1. An oil-in-water pesticidal emulsion which comprises one or more, of hydrocarbons represented by the formula,



wherein X₁, X₂, Y₁, Y₂, Z₁ and Z₂, which may be the same or different, represent a hydrogen atom or an alkyl group having two or less carbon atoms, R₁ and R₂, which may be the same or different, represent a hydrogen atom or a methyl group, and n represents 0 or 1, in an oil-in-water pesticidal emulsion containing an active ingredient or mixture thereof having a pesticidal activity, wherein the melting point is 0° C. or higher and the solubility of the active ingredient or mixture thereof at 0° C. in the hydrocarbons represented by the above formula is 10 wt. % or more.

4,871,767

MEDICAMENT PREPARATIONS

Bernhard Beckermann; Hans-Dieter Dell, both of Bergisch-Gladbach; Harald Horstmann, Wuppertal, and Reinhold Kraus, Cologne, all of Fed. Rep. of Germany, assignors to Tropenwerke GmbH & Co, KG, Cologne, Fed. Rep. of Germany.

Filed Sep. 4, 1987, Ser. No. 93,839

Claims priority, application Fed. Rep. of Germany, Sep. 24, 1986, 3632359

Int. Cl.⁴ A01N 37/12

U.S. Cl. 514—536

5 Claims

1. A medicament preparation comprising etofenamate and dimethyl sulphoxide, the ration of etofenamate to DMSO ranging from about 1:15 to 1:1.

4,871,768

DIETARY SUPPLEMENT UTILIZING ω-3/MEDIUM CHAIN TRIGLYCERIDE MIXTURES

Bruce R. Bistran, Ipswich; Vigen K. Babayan, Waban; George L. Blackburn, Jamaica, and Edward A. Mascioli, Needham, all of Mass., assignors to New England Deaconess Hospital Corporation, Boston, Mass.

Continuation-in-part of Ser. No. 630,732, Jul. 12, 1984, Pat. No. 4,752,618. This application Sep. 3, 1987, Ser. No. 92,438.

Int. Cl.⁴ A61K 31/225

U.S. Cl. 514—547

24 Claims

1. A synthetic triglyceride comprising a glycerol backbone having three fatty acids attached thereto, said fatty acids being selected from a first group consisting of ω3 fatty acids, and a second group consisting of caprylic acid, capric acid, and mixtures thereof;

whereby at least one of said fatty acids is selected from said first group and at least one of said fatty acids is selected from said second group.

7. A method of minimizing the effects of infection and minimizing the effects of subsequent infection in at risk patients by administering a diet containing 10 to 80% by weight of an oily fraction, said oily fraction comprising a glycerol backbone having three fatty acids attached thereto, said fatty acids being selected from a first group consisting of ω3 fatty acids and from a second group consisting of caprylic acid, capric acid, and mixtures thereof, whereby at least one of said fatty acids is selected from said first group and at least one is selected from said second group.

16. A dietary supplement comprising 10 to 40% by weight of an oily lipid fraction, said oily lipid fraction comprising 10 to 90% by weight of a synthetic triglyceride having a glycerol backbone and three fatty acids bound thereto, at least one of said fatty acids being said ω3 fatty acid and at least one of said fatty acids being selected from a group consisting of caprylic acid, capric acid, and mixtures thereof.

4,871,769

2-TRICHLOROACETOXY-3,4,5,6-TETRACHLOROBENZOIC ACID AND COMPOSITIONS CONTAINING SAME FOR TREATING BENIGN MAMMALIAN NEOFORMATIONS

Gianfranco Fedeli, Milan; Giuseppe Diamantini, Fano; Wiktor Djaczenko, and Maria Strumillo, both of Rome, all of Italy, assignors to Wiktor Djaczenko and Maria Strumillo, both of Rome, Italy.

Continuation-in-part of Ser. No. 815,092, Dec. 9, 1985,

abandoned. This application Feb. 5, 1987, Ser. No. 11,468

Claims priority, application Italy, Apr. 16, 1984, 48046 A/84

Int. Cl.⁴ A61K 31/22; C07C 69/63

U.S. Cl. 514—550

10 Claims

1. The compound 2-trichloroacetoxy-3,4,5,6-tetrachlorobenzoic acid.

2. A composition for treating benign mammalian neoformations which comprises from 1 to 25% of the compound as claimed in claim 1 in an oily or a lipidic solution.

4,871,770

METHOD OF INHIBITING THE ACTIVITY OF PEROXIDASES AND STIMULATING TUMOR GROWTH

Johnathan L. Kiel, San Antonio, Tex., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Continuation of Ser. No. 652,370, Sep. 19, 1984, Pat. No.

4,766,150, which is a division of Ser. No. 251,694, Apr. 7, 1981,

Pat. No. 4,486,408. This application Dec. 16, 1987, Ser. No.

133,675

U.S. Cl. 514—567

1 Claim

1. A method of inhibiting the activity of the endogenous peroxidases and stimulating tumor growth comprising adminis-

tering an effective amount of 3-aminotyrosine to a mammal to thereby stimulate tumor growth.

4,871,771

LEUKOTRIENE ANTAGONISTS

John G. Gleason, Downingtown; Sylvia T. Hoffstein, Haverford; Charles M. Kinzig, Merion Station; Seymour Mong, Wayne, and Henry M. Sarau, Harleysville, all of Pa., assignors to SmithKline Beckman Corporation, Philadelphia, Pa.

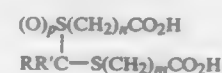
Filed Feb. 4, 1988, Ser. No. 152,191

Int. Cl.⁴ A61K 31/19

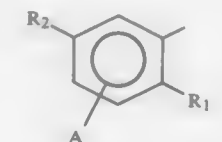
U.S. Cl. 514—570

16 Claims

1. A method for inhibiting the effects of LTB₄ comprising administration to a subject in need thereof an effective amount to inhibit the effects of LTB₄ of a compound represented by the following structural formula (I):



wherein m is 1, 2, or 3; n is 1, 2 or 3; p is 0, 1, or 2; R' is hydrogen or methyl; R is



wherein

R₁ is (S)_a—(CH₂)_b—(T)_c—B;

a is 0 or 1;

b is 5 to 12;

c is 0 or 1;

S and T are independently sulfur, oxygen, or CH₂ with the proviso that S or T are not sulfur when p is 1 or 2;

B is C₁₋₄alkyl, ethynyl, trifluoromethyl, or phenyl optionally monosubstituted with Br, Cl, F, CF₃, C₁₋₄alkoxy, C₁₋₄alkyl, methylthio, or trifluoromethylthio;

R₂ and A are independently selected from hydrogen, bromo, chloro, methyl, trifluoromethyl, methoxy or nitro; or R₁ is hydrogen and

R₂ is (S)_a—(CH₂)_b—(T)_c—B wherein a, b, c,

S, T, and B are as defined above;

or a pharmaceutically acceptable salt thereof.

4,871,772

PROCESS FOR MAKING A STABLE PHARMACEUTICAL PREPARATION OF PROSTAGLANDIN E COMPOUNDS, AND/OR 15R FORMS THEREOF

Kohtaro Miwa; Kazuo Igusa, and Toshichika Ogasawara, all of Tokyo, Japan, assignors to Chugai Seiyaku Kabushiki Kaisha, Tokyo, Japan.

Continuation of Ser. No. 96,824, Sep. 10, 1987, abandoned, which is a continuation of Ser. No. 802,606, Nov. 25, 1985, abandoned. This application Oct. 6, 1988, Ser. No. 253,902.

Claims priority, application Japan, Nov. 30, 1984, 59-253825

Int. Cl.⁴ A61K 31/19, 31/557, 47/00

U.S. Cl. 514—573

8 Claims

1. A stable pharmaceutical preparation which comprises a hard capsule containing a solution or dispersion of prostaglandin E₁ in tricaprylin or 15(R)-15-methyl prostaglandin E₂.

4,871,773

N-ALKYLAMIDES OF D(+)-CARNITINE HAVING ANTIBACTERIAL ACTIVITY, PROCESS FOR THEIR PREPARATION AND PHARMACEUTICAL AND COSMETIC COMPOSITIONS CONTAINING SAME

Paolo Cavazza, and Giulio Fiorentini, both of Rome, Italy, assignors to Avantgarde S.p.A., Pomezia, Italy

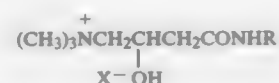
Division of Ser. No. 56,595, Jan. 1, 1987, abandoned. This application Jan. 11, 1989, Ser. No. 295,914

Claims priority, application Italy, Jan. 4, 1986, 48097 A/86

Int. Cl.⁴ A61K 31/16, 7/22, 7/32; C07C 103/58

U.S. Cl. 514—626 3 Claims

1. A method of inhibiting bacterial action comprising subjecting the bacteria to a compound of the formula (I)



wherein:

X⁻ is OH⁻ or the anion of a pharmacologically acceptable acid, and

R is a straight C₁₀—C₁₆ alkyl radical.

4,871,774

MEDICAL TREATMENT

John A. Rees, Nottinghamshire, England, assignor to The Boots Company PLC, United Kingdom

Division of Ser. No. 159,542, Feb. 23, 1988, Pat. No. 4,816,488. This application Aug. 18, 1988, Ser. No. 233,358

Claims priority, application United Kingdom, Feb. 28, 1987, #704777

Int. Cl.⁴ A61K 31/135

U.S. Cl. 514—646 6 Claims

1. A method for the treatment of Parkinson's disease comprises administering to a human patient in need thereof a pharmaceutically effective amount of a compound of the formula [I]



in which Ar is optionally substituted phenyl, R₁ is an optionally substituted aliphatic group and R₂ and R₃ are H or optionally substituted alkyl groups and a pharmaceutically effective amount of at least one member selected from the group consisting of a dopamine precursor and a dopa decarboxylase inhibitor in conjunction with a pharmaceutically acceptable diluent or carrier.

4,871,775

SUBSTITUTED PHENOXYALKANOLAMINES AND PHENOXYALKANOL-CYCLOALKYLAMINES IN PHARMACEUTICAL FORMULATIONS AND USE THEREOF

Erich Cohnen, Heilwigstrasse, Fed. Rep. of Germany, assignor to Beiersdorf AG, Hamburg, Fed. Rep. of Germany

Division of Ser. No. 883,208, Jul. 8, 1986, which is a continuation of Ser. No. 722,906, Apr. 12, 1985, abandoned, which is a continuation of Ser. No. 450,161, Dec. 16, 1982, abandoned. This application Oct. 17, 1988, Ser. No. 258,953

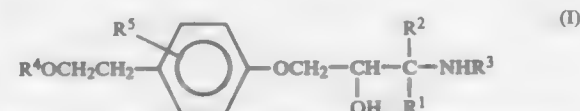
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1981, 3151201

Int. Cl.⁴ A61K 31/135

U.S. Cl. 514—652 14 Claims

1. A method of treating an ophthalmic condition in a patient afflicted therewith which comprises administering to such patient afflicted therewith an ophthalmically beneficial amount

of a substituted phenoxyalkanamine or phenoxyalkanol-cycloalkylamine of the general formula I



in which R¹ and R², which can be identical or different, denote alkyl groups with in each case 1 to 4 carbon atoms, or R¹ and R² together denote the group —(CH₂)_n—, wherein n is the number 4 or 5, R³ denotes hydrogen, R⁴ denotes an alkyl group with 1 to 4 carbon atoms or the cyclopropylmethyl group and R⁵ denotes hydrogen, halogen or alkyl, or an acid addition salt thereof.

4,871,776

2,5-ANHYDRO-1,6-DIHALO-1,6-DIDEOXY-D-MANNITOL

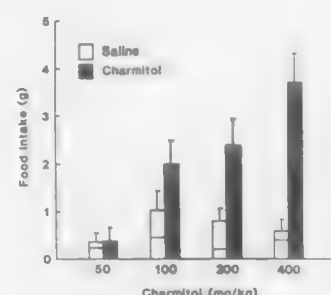
Michael J. DiNovi, Philadelphia, Pa.; Robert J. Rafka, Groton Long Point, Conn.; Mark I. Friedman, Merion, and Michael G. Tordoff, Philadelphia, both of Pa., assignors to Monell Chemical Senses Center, Philadelphia, Pa.

Continuation-in-part of Ser. No. 910,698, Sep. 23, 1986, Pat. No. 4,808,626. This application Oct. 22, 1987, Ser. No. 112,260. The portion of the term of this patent subsequent to Feb. 28, 2006, has been disclaimed.

Int. Cl.⁴ A61K 31/045

U.S. Cl. 514—738

12 Claims



1. A novel composition useful for modifying the food intake of mammals, comprising:

2,5-anhydro-1,6-dihalo-1,6-dideoxy-D-mannitol.

4,871,777

EMULSIFYING COMPOSITIONS FOR SUPPOSITORY BASES AND SUPPOSITORIES PRODUCED THEREFROM

Willi Breitzke, Duesseldorf, Fed. Rep. of Germany, assignor to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Mar. 24, 1988, Ser. No. 173,348

Claims priority, application Fed. Rep. of Germany, Mar. 25, 1987, 3709861

Int. Cl.⁴ A61K 9/02

U.S. Cl. 514—785

12 Claims

1. In a composition for a suppository base consisting essentially of water insoluble fat and an emulsifier, the improvement wherein the emulsifier is an adduct of from about 5 to about 50 moles of ethylene oxide per mole of hardened castor oil.

4,871,778

PROCESS FOR THE PRODUCTION OF A PERMSELECTIVE AND FLEXIBLE ANION EXCHANGE MEMBRANE

Andreas Reiner, Merzhausen, Fed. Rep. of Germany, assignor to Fraunhofer-Gesellschaft zur Förderung der angewandten Forschung e.V., Munich, Fed. Rep. of Germany

Continuation of Ser. No. 808,159, Dec. 12, 1985, abandoned.

This application Jul. 30, 1987, Ser. No. 80,174

Claims priority, application Fed. Rep. of Germany, Dec. 27, 1984, 3447483

Int. Cl.⁴ C08D 5/20

U.S. Cl. 521—27

6 Claims

1. A process for preparing an anion exchange membrane which comprises: applying to a carrier material a solution comprising (1) a copolymer consisting of vinylpyridine and styrene and (2) a member selected from (a) polyvinylbenzyl halide and (b) a copolymer consisting of vinylbenzyl halide and styrene; subjecting said solution to cross linking and quaternization; removing solvent to form a dried membrane; and optionally removing said membrane from said carrier, the styrene content in each copolymer being 40–60% and the stoichiometric ratio of said vinylpyridine/styrene copolymer to said member being 1:3:1 whereby both a high degree of permselectivity and a high degree of flexibility are imparted to said membrane.

4,871,779

ION EXCHANGE/CHELATION RESINS CONTAINING DENSE STAR POLYMERS HAVING ION EXCHANGE OR CHELATE CAPABILITIES

George R. Killat, and Donald A. Tomalia, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 23, 1985, Ser. No. 812,479

Int. Cl.⁴ C08D 5/20

U.S. Cl. 521—28

22 Claims

1. An ion exchange resin comprising a normally solid, water-insoluble substrate having deposited thereon or chemically bonded thereto a dense star polymer in an amount effective to enable the resin to function as an ion exchange resin, said dense star polymer having at least one dendritic branch emanating from a core, each dendritic branch having at least two terminal ion exchange moieties provided that (1) the ratio of terminal groups to the branches emanating from the core is 2:1 or greater, (2) the density of terminal groups in the dense star polymer is at least 1.5 times that of an extended conventional star polymer having similar core and monomeric moieties and a comparable molecular weight and number of core branches wherein each of such branches of the extended conventional star polymer bears only one terminal group, (3) a molecular volume that is equal to or less than 80 percent of the molecular volume of said extended conventional star polymer, and (4) the two-dimensional molecular diameter of the dense star polymer is in the range from about 12 to about 2000 Angstroms.

4,871,780

POROUS COPOLYMER RESINS

Zaev Sharaby, Cleveland Heights, Ohio, assignor to The B.F. Goodrich Company, Akron, Ohio

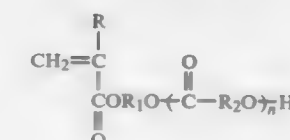
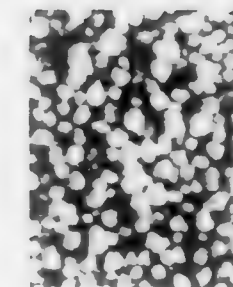
Filed May 31, 1988, Ser. No. 200,496

Int. Cl.⁴ C08J 9/02

U.S. Cl. 521—56

19 Claims

1. A method for improving the porosity of a vinyl halide copolymer resin consisting of suspension copolymerization of a monomer composition consisting of vinyl halide and 1 to 20 phm acrylated caprolactone by weight per 100 phm by weight of vinyl halide, wherein said acrylated caprolactone monomer is represented by the following average formula:



wherein R is hydrogen, lower alkyl or phenyl, R₁ and R₂ are independently alkylene of 1 to about 8 carbon atoms and n is 1 to 20.

4,871,781

POLYDIORGANOSILOXANES WHICH CAN BE CURED TO FORM ELASTOMERIC FOAMS

Carlos Weise, Burghausen, Fed. Rep. of Germany, assignor to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Apr. 15, 1988, Ser. No. 181,871

Claims priority, application Fed. Rep. of Germany, Apr. 16, 1987, 3713130

Int. Cl.⁴ C08J 9/02

U.S. Cl. 521—88

8 Claims

1. A composition which can be cured to form elastomeric foams consisting essentially of (A) polydiorganosiloxanes having vinyl groups, (B) polyorganohydrogensiloxanes having terminal groups which are selected from the group consisting of hydrogen, alkyl radicals having from 1 to 8 carbon atoms, aryl radicals and fluoroalkyl radicals having from 3 to 8 carbon atoms, (C) a platinum catalyst, and (D) a saturated polyhydric alcohol which is free of carbonyl groups and Si atoms and contains at least two hydroxyl groups per molecule.

4,871,782

LOW VISCOSITY SILICONE FOAM COMPOSITIONS

Frank J. Modic, Scotia, and Richard A. Striker, Troy, both of N.Y., assignors to General Electric Company, Waterford, N.Y.

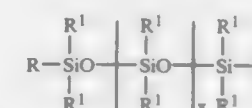
Filed Jul. 29, 1988, Ser. No. 225,903

Int. Cl.⁴ C08J 9/02

U.S. Cl. 521—88

19 Claims

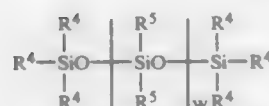
1. A foamable composition comprising:
(a) 100 parts by weight vinyl-containing polysiloxane comprising:
(i) vinyl endcapped polysiloxane composition having a viscosity between about 10,000 and 1,000,000 centipoise at 25° C. and containing vinyl endcapped polysiloxane having the formula:



where R is vinyl and R¹ is selected from substituted or unsubstituted hydrocarbon radicals of from 1 to 20

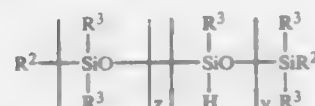
carbon atoms, such that the polymer contains from 0.0002 to 3% by weight vinyl and x varies such that the viscosity of said vinyl endcapped polysiloxane varies from 100 to 1,000,000 centipoise at 25° C., and

- (ii) in an amount of from 1/9 to 9/1 by weight to said vinyl endcapped polysiloxane composition a low viscosity vinyl containing polysiloxane composition comprising low viscosity vinyl-containing polysiloxane having the formula:



where R^4 and R^5 are selected from substituted or unsubstituted hydrocarbon radicals of from 1 to 20 carbon atoms, at most, one R^4 is vinyl, the polymer contains 0.0002 to 1% by weight vinyl, and w varies such that the viscosity of said low viscosity vinyl containing polysiloxane varies from 50 to about 2,000 centipoise at 25° C.;

- (b) from 1 to 50 parts by weight of a hydride polysiloxane of the formula:



where R^2 is selected from the group consisting of independently, hydrogen, alkyl radicals of from 1 to 8 carbon atoms, aryl radicals of from 1 to 8 carbon atoms, haloalkyl radicals of 3 to 8 carbon atoms and simultaneously, a single —O— to form a cyclic polymer and R^3 is selected from the group consisting of alkyl radicals of from 1 to 8 carbon atoms, aryl radicals of from 1 to 8 carbon atoms, and fluoroalkyl radicals of 3 to 8 carbon atoms, where the hydride polysiloxane has a hydrogen content varying from 0.3 to 1.6% by weight and z and y vary such that the polymer has a viscosity varying from 1 to 500 centipoise at 25° C.;

- (c) a hydroxyl source selected from the group consisting of water, organic alcohol, hydroxylated siloxane, and combinations thereof in an amount to provide a molar ratio of from about 0.02/1 to about 5/1 of hydroxyl radicals to silicon-bonded hydrogen atoms of component (b); and
- (d) from about 1 to about 250 parts per million of platinum catalyst.

4,871,783

MODIFIED POLYOLS AND THEIR USE IN THE MANUFACTURE OF POLYMER POLYOLS

Rudolphe C. Cloetens, Geneva; Werner A. Lidy, Collogne-Belle-rive, both of Switzerland; Brian D. Phillips, Penarth, and David B. Thomas, Rogerstone, both of Wales, assignors to BP Chemicals Limited, London, England

Filed Sep. 12, 1988, Ser. No. 243,344

Claims priority, application United Kingdom, Sep. 15, 1987, 8721712

Int. Cl.⁴ C08G 18/14

U.S. Cl. 521—137

1. A modified polyol of formula:



wherein:

- (a) $m=1$ to 3
- (b) X is an alkoxy group derived from a polyether polyol and
- (c) the R groups are selected from alkyl groups and aryl groups with the proviso that at least one R is selected from

$HS-R^1$ or $HS-R^1-(SiR_2O)_n$ —wherein R^1 is an alkylene or phenylene group, the R^2 groups are either methyl or Phenyl and n is from 1 to 20.

4,871,784

MINUTE-CELLULAR POLYESTER FILM

Satoshi Otonari; Yoshinori Sato, both of Machida; Narihiro Masuda, and Tomoyuki Kotani, both of Yokohama, all of Japan, assignors to Diafoil Company, Limited, Tokyo, Japan

PCT No. PCT/JP88/00110, § 371 Date Sep. 15, 1988, § 102(e)

Date Sep. 15, 1988, PCT Pub. No. WO88/05797, PCT Pub.

Date Aug. 11, 1988

PCT Filed Feb. 5, 1988, Ser. No. 245,318

Claims priority, application Japan, Feb. 5, 1987, 62-25245

Int. Cl.⁴ C08J 9/32, 9/36; B29C 55/12

U.S. Cl. 521—138

1. A polyester film containing minute closed cells having a diameter of 1 to 300 μ m in the surface and inner parts thereof, which comprises an aromatic polyester, 3 to 40 wt %, based on the amount of said polyester, of a crystalline polypropylene having a melt flow index of 0.2 to 120, and 0.001 to 3 wt %, based of the total amount of said polyester and said polypropylene, of a surface-active agent, wherein the film is stretched at least one direction of the machine and transverse directions.

4,871,785

CLOUDING-RESISTANT CONTACT LENS COMPOSITIONS

Michael Froix, 3433 Woodstock La., Mountain View, Calif. 94041

Continuation-in-part of Ser. No. 896,603, Aug. 13, 1986. This application Feb. 16, 1988, Ser. No. 156,359

Int. Cl.⁴ C08J 00/00

U.S. Cl. 523—106

1. A protein-resistant medical device constructed of a composition comprising a copolymer which includes 1–69% of at least one unsaturated monoester of a polyethylene glycol of the formula $HO(CH_2CH_2O)_nR$, wherein n is 8–300 and wherein R is H or lower alkyl (1–4C).

4,871,786

ORGANIC FLUORIDE SOURCES

Steven M. Aasen; Joel D. Oxman, and F. Andrew Ubel, III, all of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 3, 1988, Ser. No. 252,530

Int. Cl.⁴ C08K 5/49

U.S. Cl. 523—113

1. A polymerizable composition which releases fluoride to dental tissue and which comprises one or more polymerizable monomers and, as a fluoride source, an organic compound comprising one or more tetrafluoroborate salt moieties, the cations of which are selected from the group consisting of quaternary ammonium, iodonium, sulfonium and phosphonium, the fluoride source being capable of providing fluoride to the surrounding tissue, and being present in the polymerizable composition in an amount sufficient to inhibit the progression of and/or prevent dental caries, and being substantially soluble in and/or polymerizable with the polymerizable monomer.

4,871,787

FLAME RETARDANT ELECTRICAL INSULATING COMPOSITION HAVING ANTIFUNGAL ACTION

Yasuaki Yamamoto; Hiroaki Tsukada; Masami Sorimachi, and Akihiro Hori, all of Ibaraki, Japan, assignors to Hitachi Cable Ltd., Tokyo, Japan

Filed Jan. 22, 1988, Ser. No. 209,598

Claims priority, application Japan, Jan. 23, 1987, 62-156126; Jan. 19, 1988, 63-7481

Int. Cl.⁴ C08K 5/18, 5/46; C08L 31/04, 31/02

U.S. Cl. 523—122

1. A flame retardant electrical insulating composition having an antifungal action, which comprises 100 parts by weight of an ethylene-vinyl acetate copolymer with a vinyl acetate content of at least 20 wt% or an ethylene-ethyl acrylate copolymer with an ethyl acrylate content of at least 20 wt%, 50–300 parts by weight of a metal hydroxide, at least 0.2 parts by weight of an amine compound, and at least 0.5 parts by weight of a hydroxyl group containing lubricant.

4,871,788

IONOMERIC COUPLING AGENTS BASED ON AMIC ACID-FUNCTIONAL SILANES

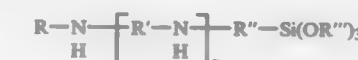
Edwin P. Plueddemann, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Jan. 3, 1988, Ser. No. 202,164

Int. Cl.⁴ C08K 9/06

U.S. Cl. 523—213

1. An ionomeric silane composition prepared by reacting (I) an amine-functional silane represented by the formula



wherein R is selected from the group consisting of hydrogen and an alkyl radical having 1–4 carbon atoms, R' is a divalent hydrocarbon radical having 2 to 4 carbon atoms, R'' is a divalent hydrocarbon radical having 3 to 6 carbon atoms, R''' is selected from the group consisting of methyl, ethyl and propyl radicals, and n is 0, 1 or 2;

(II) from about 1.1 to 1.5 equivalents of a dicarboxylic organic acid having 4 to 36 carbon atoms for each equivalent of reactive hydrogen atom of said amine-functional silane (I) so as to result in a stoichiometric excess of carboxylic acid functionality; and

(III) a sufficient amount of an ionic compound, having a cation selected from the group consisting of monovalent and divalent metal ions, to neutralize from about 10% to 80% of said excess carboxylic acid functionality on a molar equivalent basis.

4,871,789

REINFORCED POLYMER COMPOSITIONS HAVING EXCELLENT DISTINCTNESS OF IMAGE

Eloy C. Martinez, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Apr. 18, 1988, Ser. No. 182,548

Int. Cl.⁴ C08K 7/00, 3/34

U.S. Cl. 523—220

1. A filled polymer composition comprising a polyurethane and/or polyurea matrix having dispersed therein a filler mixture comprising

(A) a reinforcing filler having particles of an average aspect ratio of at least 4 and an average particle length of at least about 20 μ , except the average particle length is at least about 40 μ when the reinforcing filler is wollastonite, said reinforcing filler being present in an amount which provides enhanced physical properties to the polymer composition; and

(B) a supplementary filler comprising a wollastonite having an aspect ratio of 7 or less and a particle length of about 35 μ or less or an inorganic compound other than wollas-

tonite having an average aspect ratio of about 4 or less and a median particle size of about 10 μ or less, and characterized in that the filled polymer composition exhibits a distinctness of image of at least 80 DOI units.

4,871,790

COLLOIDAL METALS IN MONOMERS OR POLYMERS

William M. Lamanna, Stillwater; Fred B. McCormick, Maplewood, and Robin E. Wright, Iver Grove Heights, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 25, 1987, Ser. No. 125,600

Int. Cl.⁴ C08K 3/08; C08G 18/22

U.S. Cl. 523—333

1. A method for preparing a colloidal elemental metal-containing composition comprising a polymer having dispersed therein submicron size colloidal elemental metal particles in an amount of 0.001 to 10 percent (wt/vol) comprising the steps of Method I, Method II, or Method III;

Method I:

- (a) providing, by the metal atom technique, a metal colloid in a polymerizable aqueous-free liquid monomer,
- (b) effecting polymerization of said monomer, and
- (c) isolating the resultant colloidal metal-containing polymer;

Method II:

- (a) providing a non-polymerizable, non-aqueous organic liquid, performing in either order steps (b) and (c), provided that when step (c) precedes step (b) sufficient liquid is present to provide a dispersion of metal in a liquid,
- (b) forming a colloidal metal dispersion by the metal atom technique in said liquid,
- (c) dissolving into or swelling a solid polymer in said liquid, and
- (d) isolating the resultant colloidal metal-containing polymer; and

Method III:

- (a) providing a colloidal metal dispersion, by the metal atom technique, in an aqueous free liquid polymer,
- (b) effecting further polymerization of the polymer, and
- (c) isolating the resulting colloidal metal-containing polymer;

said metal atom technique comprising forming metal vapors and contacting them with said liquid.

4,871,791

PERMANENTLY PLASTICIZED, CELLULOSE-BASED PRODUCT

Klaus-Dieter Hammer, Mainz; Manfred Siebrecht, Wiesbaden, and Hermann Winter, Wiesbaden-Biebrich, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 5, 1988, Ser. No. 177,974

Claims priority, application Fed. Rep. of Germany, Apr. 6, 1987, 3711571

Int. Cl.⁴ C08L 1/02; C08J 5/18; A22C 13/00

U.S. Cl. 524—35

1. A cellulose-based synthetic sausage casing, comprising a fiber-reinforced, cellulose-based tube and, located in the cellulose, a primary, permanent plasticizer which comprises at least one crosslinked copolymer, wherein at least one of the components of said copolymer comprises monomer units containing a terminal, ethylenically unsaturated, polymerizable group or units of compounds of maleic acid or fumaric acid, and wherein a further component of said copolymer comprises polymerized units containing thermally crosslinked groups.

4,871,792

SINGLE COMPONENT POLYURETHANE-MODIFIED BITUMEN COMPOSITIONS

Heinz Lucke, Dossenheim, Fed. Rep. of Germany, assignor to Teroson GmbH, Heidelberg, Fed. Rep. of Germany
Division of Ser. No. 134,408, Dec. 17, 1987, Pat. No. 4,795,760.
This application Sep. 12, 1988, Ser. No. 242,923
Claims priority, application Fed. Rep. of Germany, Jan. 3, 1987, 3700100

Int. Cl.⁴ C08K 5/01

U.S. Cl. 524—59

11 Claims

1. A liquid, hardenable polyurethane-modified bitumen composition, comprising
(a) a polyether and/or polyester urethane prepolymer,
(b) bitumen,
(c) butylurethane-formaldehyde-carbamate resin,
(d) 2,3-dibenzyltoluene, and
(e) stabilizer, the weight ratio of (a) to (b) being in the range of 70:30 to 30:70, the weight ratio of (a) + (b) to (c) + (d) being in the range of 40:60 to 90:10, the weight ratio of (a) to (c) being in the range of 40:60 to 85:15 and the weight ratio of (b) to (d) being in the range of 40:60 to 90:10.

4,871,793

POLYPHENYLENE SULFIDE RESIN COMPOSITIONS HAVING IMPROVED RESISTANCE TO DETERIORATION WHEN EXPOSED TO LIGHT AND CONTAINING ALKYLIDENE BIS (BENZOTRIAZOLYLPHENOLS)

Yutaka Nakahara, 1-25-6 Asahi, Okegawa City, Saitama; Atsushi Nishimura, 4-19-13 Washinomiya, Washinomiya, Saitama, and Toshio Nakajima, 4-10-13 Tsuji, Urawa City, Saitama, all of Japan

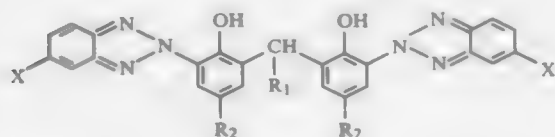
Filed Jan. 21, 1987, Ser. No. 5,710

Claims priority, application Japan, Jan. 23, 1986, 86-12635
Int. Cl.⁴ C08K 5/34

U.S. Cl. 524—91

23 Claims

1. A polyphenylene sulfide resin composition having improved resistance to deterioration when exposed to light, comprising a polyphenylene sulfide resin and an alkylidene bis(benzotriazolyl phenol) having the formula:



wherein:

- R₁ is selected from the group consisting of hydrogen and alkyl having from one to about eleven carbon atoms;
R₂ is selected from the group consisting of alkyl having from one to about twelve carbon atoms; and arylalkyl having from seven to about eighteen carbon atoms; and
X is selected from the group consisting of hydrogen; halogen; alkyl having from one to about twelve carbon atoms; aryl alkyl having from seven to about eighteen carbon atoms; alkoxy having from one to about twelve carbon atoms; phenoxy; arylalkoxy having from seven to about eighteen carbon atoms; and phenyl.

4,871,794

PNEUMATIC TIRES

Michio Itoh, Kodaira; Hisao Yamamoto, Higashimurayama, and Nobuyuki Okamura, Kodaira, all of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Jun. 29, 1988, Ser. No. 212,990

Claims priority, application Japan, Jun. 30, 1987, 62-160852
Int. Cl.⁴ C08K 3/04, 5/18; C08L 7/00, 9/06

U.S. Cl. 524—254

2 Claims

1. A pneumatic tire comprising a tread made from a rubber

composition, wherein said rubber composition consists essentially of;

- (A) 2.5 to 20.0 parts by weight of a derivative of p-phenylene diamine selected from the group consisting of N-methacryloyl-N'-phenyl-p-phenylene diamine, N-(methacryloyloxy-2-hydroxypropyl)-N'-phenyl-p-phenylene diamine, N-methacryloyl-N'-isopropyl-p-phenylene diamine, N-methacryloyl-N'-cyclohexyl-p-phenylene diamine, N-acryloyl-N'-phenyl-p-phenylene diamine and N-(acryloyloxy-2-hydroxypropyl)-N'-phenyl-p-phenylene diamine, and
(B) 40 to 150 parts by weight of carbon black having a specific surface area of nitrogen adsorption (N₂SA value) of 110–190 m²/g and a dibutyl phthalate adsorption (DBP value) of 100–140 ml/100 g based on 100 parts by weight of a rubber ingredient composed of natural rubber, styrene-butadiene copolymer rubber or a mixture thereof.

4,871,795

FLAME RETARDANT ADDITIVE FOR THERMOPLASTICS

Prakash K. Pawar, 3 Clove Ct., Clifton Park, N.Y. 12065
Continuation of Ser. No. 45,104, May 1, 1987, abandoned. This application Jul. 22, 1988, Ser. No. 224,183

Int. Cl.⁴ C08K 3/32

U.S. Cl. 524—267

24 Claims

1. A flame retarded composition comprising:
(A) 100 parts by weight a thermoplastic resin and
(B) from about 2 to about 30 parts by weight a flame retardant additive comprising:
(i) 20 to 60% by weight of a silicone oil;
(ii) 10 to 40% by weight a silicone resin;
(iii) 5 to 60% by weight a gassing agent selected from the group consisting of compounds containing both phosphorus and nitrogen or a mixture of phosphorus containing compounds with nitrogen containing compounds; and
(iv) a polyhydric alcohol in a weight ratio to said gassing agent ranging from about 1/9 to about 1/2.6.

4,871,796

METHOD OF PRODUCTION OF THERMOPLASTIC ELASTOMER COMPOUNDS

Masato Komatsu, Oozu Kasanai 200-2, Hanno City, Saitama Prefecture; Isao Baba, Nishitsurugoka 1-4-6, Ooi-machi, Iruma-gun, Saitama, Prefecture, and Noboru Yamamoto, Hayamiya 1-52-13 #101, Nerima-ku, Tokyo, all of Japan
PCT No. PCT/US87/00448, § 371 Date Nov. 2, 1987, § 102(e) Date Nov. 2, 1987, PCT Pub. No. WO87/05310, PCT Pub. Date Sep. 11, 1987

PCT Filed Mar. 19, 1987, Ser. No. 154,342

Claims priority, application Japan, Mar. 3, 1986, 61-44025
Int. Cl.⁴ C08K 3/16, 5/01, 5/14; C08L 9/06

U.S. Cl. 524—474

1 Claim

1. A method of manufacture of thermoplastic elastomer comprising thermally blending a composition comprising (A) polypropylene 10–90 weight parts, (B) halobutyl rubber 90–10 weight parts, wherein (A)+(B)=100 weight parts, (C) olefinic rubber 10–120 weight parts, and (D) mineral oil softening agent 5–120 weight parts, in the presence of (E) metal oxides and/or metal chlorides, and blending 100 weight parts of said thermally treated composition with (F) polyolefin 100–600 weight parts, and (G) vulcanizable olefinic rubber 50–500 weight parts, and further thermally treating said blend of (A) through (G) in the presence of (H) organic peroxide, and homogeneously blending 100 weight parts of the resulting composition with (I) styrenic rubber 5–100 weight parts.

4,871,797

AQUEOUS DISPERSION OF AN ADDITION POLYMER ROELOF BUTER, DIEREN, NETHERLANDS, ASSIGNOR TO AKZO N.V., ARNHEM, NETHERLANDS

Filed Dec. 21, 1987, Ser. No. 135,254

Claims priority, application Netherlands, Dec. 30, 1986, 8603374

Int. Cl.⁴ C08J 51/00

U.S. Cl. 524—505

6 Claims

1. An aqueous dispersion of an addition polymer built up from at least one of an acrylate monomer and a methacrylate monomer, which dispersion also contains a dispersion stabilizer in an amount of 5–100 percent by weight, based on the addition polymer, characterized in that the dispersion stabilizer is obtained by successive copolymerization in random order of 10–60 parts by weight of a monomer mixture A consisting of 20–60 mole % of at least one member selected from the group consisting of styrene and methyl styrene, 20–60 mole % of at least one member selected from the group consisting of acrylic acid and methacrylic acid and 0–40 mole % of a different monoethylenically unsaturated compound, and 10–60 parts by weight of a monomer mixture B consisting of 20–60 mole % of at least one member selected from the group consisting of styrene and methylstyrene, 40–80 mole % of (cyclo)alkyl methacrylate having 1–12 C-atoms in the (cyclo)alkyl group, and 0–40 mole % of a different monoethylenically unsaturated compound in the presence of 10–60 parts by weight of a polymer built up from at least 60 percent by weight of 1,3-butadiene and having a number average molecular weight of 1500–10,000, in such a way that the total amount of the two monomer mixtures and the polybutadiene is 100 parts by weight, with the carboxylic acid groups from said at least one member selected from the group consisting of acrylic acid and methacrylic acid being at least partly ionized.

4,871,798

PROCESS FOR THE PREPARATION OF AQUEOUS POLYURETHANE-POLYUREA DISPERSIONS

Jeffrey Dormish, Pittsburgh, Pa., and Wolfgang Henning, Kuersten, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Bayerwerk, Fed. Rep. of Germany

Filed Oct. 14, 1988, Ser. No. 258,230

Claims priority, application Fed. Rep. of Germany, Oct. 21, 1987, 3735587

Int. Cl.⁴ C08L 75/04

U.S. Cl. 524—591

17 Claims

1. A process for the preparation of a stable polyurethane-polyurea dispersion in a multi-stage process which comprises forming an isocyanate-terminated prepolymer having an ionic group content of up to about 50 milliequivalents per 100 g of solids by
(1) reacting an organic polyisocyanate (a) with a compound (b1) having at least two isocyanate-reactive groups and at least one ionic or potential ionic hydrophilic group
(2) reacting the resulting product with a compound (b2) which contains at least two isocyanate-reactive groups and has a molecular weight of 300 to about 6000 and does not contain at least one ionic or potential ionic hydrophilic group and optionally a compound (b3) containing at least one isocyanate-reactive group and hydrophilic ethylene oxide units in a terminal and/or lateral position to form a prepolymer and
(3) dispersing said prepolymer in water.

4,871,799

THERMOPLASTIC POLYMER COMPOSITION

Shigeo Kobayashi, Ootsu, and Takashi Nishida, Kyoto, both of Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 922,908, Oct. 24, 1986, abandoned.

This application Sep. 14, 1988, Ser. No. 246,016

Claims priority, application Japan, Oct. 28, 1985, 60-241812
Int. Cl.⁴ C08L 67/00, 77/00

U.S. Cl. 525—64

8 Claims

1. A thermoplastic polymer composition which comprises:
(a) a polyester or polyamide thermoplastic polymer; and
(b) a block graft copolymer which comprises (i) as the backbone portion at least one of a block copolymer or a hydrogenated block copolymer consisting of blocks of a vinyl-substituted aromatic compound polymer in a weight range of 5 to 60 weight percent and blocks of a conjugated diene compound polymer in a range of 95 to 40 weight percent, and (ii) as the graft portion, a polymer which in the presence of radicals disintegrates into smaller molecules by the cleavage of molecular chains in preference to rebonding and crosslinking of broken molecules, said block graft copolymer having been chemically modified with molecular units containing a functional group which combines with or interact with said thermoplastic polymer (a), the block copolymer and the radical disintegrative polymer being in a ratio of 20:1 to 1:2 by weight.

4,871,800

THERMOPLASTIC COMPOSITION OF POLYPHENYLENE ETHER, ETHYLENE-METHACRYLIC ACID COPOLYMER, AND STYRENE-GLYCIDYL METHACRYLATE COPOLYMER

Susumu Fujii, Shimodate, Japan, and Sai-Pei Ting, Delmar, N.Y., assignors to General Electric Company, Selkirk, N.Y.
Division of Ser. No. 801,731, Nov. 26, 1985, Pat. No. 4,728,461.
This application Feb. 25, 1988, Ser. No. 160,170

Int. Cl.⁴ C08L 33/02, 51/04, 71/04

U.S. Cl. 525—68

13 Claims

1. A thermoplastic composition comprising
(a) a polyphenylene ether resin or a polyphenylene ether resin combined with one or more alkenyl aromatic polymers selected from the group consisting of nonrubber-modified poly(alkenyl aromatic) homopolymers, rubber-modified poly(alkenyl aromatic) resins, rubber-modified alkenyl aromatic copolymers, rubber-modified alkenyl aromatic terpolymers and non rubber-modified alkenyl aromatic terpolymers; and
(b) less than 50 percent by weight, based upon 100 percent by weight of (a) and (b) combined of a combination of (i) a copolymer of ethylene and methacrylic acid and (ii) a copolymer of styrene and glycidyl methacrylate.

4,871,801

REACTIVE POLYVINYL CHLORIDE AND POLYMER PRODUCTS MADE THEREFROM

Zaev Sharaby, South Euclid, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Nov. 25, 1988, Ser. No. 276,175

Int. Cl.⁴ C08F 8/00

U.S. Cl. 525—69

10 Claims

1. A graft copolymer composition comprising the reaction product of:
I. a hydroxyl containing base polymer comprising the reaction product of
(a) a vinyl halide monomer; and
(b) at least one other ethylenically unsaturated monomer having at least one pendant hydroxyl functional group; and
II. a cyclic polyanhydride functionalizing agent, the grafting occurring by the reaction between the hydroxyl groups on the base polymer and a cyclic anhydride group(s) on

the functionalizing agent, wherein said functionalizing agent after grafting onto the base polymer has free cyclic anhydride group(s) available for further reaction; and

- III. a coreactive second moiety containing at least one group which is capable of reacting with said free pendant cyclic anhydride group(s) forming a covalent linkage between said base polymer and said coreactive second moiety, wherein said coreactive second moiety is selected from the group consisting of hydroxyl terminated polyesters, caprolactone polyols, silanol terminated polydimethylsiloxanes, reactive polystyrene, reactive styrene/acrylonitrile/oxazoline terpolymers, epoxidized soybean oil, epoxidized linseed oil, cycloaliphatic epoxides, aliphatic epoxides, 2,2-bis(p-glycidyloxyphenyl) propane condensation product with 2,2-bis(p-hydroxyphenyl) propane, hydroxyl containing polystyrene, hydroxyl containing styrene/acrylonitrile copolymer, hydroxyl containing styrene/acrylonitrile/alpha-methylstyrene terpolymer, hydroxyl containing plasticizers, coreactive lubricants, coreactive impact modifiers, —NH— group containing polymers, coreactive polymers of vinyl halides, acrylic esters, polyolefins, vinylidene aromatics, wherein each polymer contains pendant hydroxyl, oxazoline or epoxy functionalities.

4,871,802

PROCESS FOR THE PREPARATION OF A THERMOPLASTIC WITH HIGH MONOMER CONVERSION

Wilhelmus G. Duyzings, Born, and Lambert Van Lumig, Grahth, both of Netherlands, assignors to Stamicarbon B.V., Geleen, Netherlands

Filed Feb. 9, 1988, Ser. No. 153,930

Claims priority, application Netherlands, Feb. 9, 1987, #700297

Int. Cl.⁴ C08L 33/08, 51/04

U.S. Cl. 525—84 6 Claims

1. Process for the preparation of a thermoplastic consisting of a vinylaromatic compound, acrylonitrile and a butadiene rubber, by means of a two-step polymerization reaction, characterized in that 0.1–10 wt% of the butadiene rubber, based on the entire composition, is replaced by an acrylate rubber in the second step.

4,871,803

HOT MELT ADHESIVES CONTAINING AN ADDITIVE DERIVED FROM EPOXY REACTIVE HYDROGEN CONTAINING POLYMERS AND COMPOUNDS AND A POLYEPOXY COMPOUND

John M. Zimmer, St. Paul; Pamela M. Klinkenberg, Roseville; William L. Bunnelle, Stillwater, and Keith C. Knutson, Columbia Heights, all of Minn., assignors to H. B. Fuller, St. Paul, Minn.

Continuation of Ser. No. 823,607, Jan. 29, 1986, abandoned. This application Feb. 3, 1988, Ser. No. 150,006

Int. Cl.⁴ C08L 33/08, 53/02, 63/02

U.S. Cl. 525—89 20 Claims

1. A hot melt adhesive composition suitable for providing improved adhesivity to hard-to-stick surfaces including fluorocarbon surfaces, which comprises:

- (a) an effective amount of a thermoplastic polymer to form a hot melt adhesive;
- (b) an effective tackifying amount of a tackifying resin; and
- (c) an effective bond improving amount of a hot melt adhesive additive composition comprising the reaction product of:
 - (i) a polymer having at least one free epoxy reactive hydrogen;
 - (ii) an epoxy compound having at least two reactive epoxy groups; and
 - (iii) an epoxy reactive hydrogen containing compound;
 wherein for each mole of epoxy reactive hydrogen in the polymer there are about 0.1 to 10 moles of the epoxy com-

pound and about 0.1 to 10 moles of the epoxy reactive hydrogen containing compound and the reactants of the additive composition are used in proportions that prevent crosslinking or gel formation.

4,871,804

RESIN COMPOSITION OF STYRENE RESIN AND POLYAMIDE BLOCK COPOLYMER

Katuyoshi Murabayashi, Sakai, Japan, assignor to Daicel Chemical Industries, Ltd., Sakai, Japan

Division of Ser. No. 743,536, Jun. 11, 1985, Pat. No. 4,716,198.

This application Sep. 4, 1987, Ser. No. 93,354

Claims priority, application Japan, Jun. 19, 1984, 59-124493

The portion of the term of this patent subsequent to Dec. 29, 2004, has been disclaimed.

Int. Cl.⁴ C08L 77/12

U.S. Cl. 525—92 13 Claims

1. A resin composition suitable for injection molding, comprising:

- (i) 100 parts by weight of a thermoplastic injection moldable resin component consisting of
 - (a) a first thermoplastic injection moldable resin selected from the group consisting of rubber-modified polystyrene, a copolymer consisting essentially of styrene and an unsaturated monomer copolymerizable with styrene, a copolymer consisting essentially of styrene, acrylonitrile and an unsaturated monomer copolymerizable with styrene, and a copolymer consisting essentially of acrylonitrile, butadiene, styrene and an unsaturated monomer copolymerizable with styrene, said unsaturated monomer copolymerizable with styrene being selected from the group consisting of α -methyl styrene, acrylate esters, methacrylate esters, unsaturated dicarboxylic acids and anhydrides thereof; and
 - (b) up to 50 percent by weight of a second thermoplastic injection moldable resin different from said first resin; and
- (ii) 0.01 to 50 parts by weight of a polyamide block copolymer consisting essentially of
 - (a) 10 to 99 percent by weight of polyamide blocks prepared by polymerizing amino carboxylic acids having 6 to 12 carbon atoms, lactams having 6 to 12 carbon atoms, nylon salts prepared from diamines having from 6 to 12 carbon atoms and dicarboxylic acids having from 6 to 12 carbon atoms, and the balance is
 - (b) (1) polyester blocks or (2) polyol blocks linked to said polyamide blocks by ester bonds, wherein said second thermoplastic injection moldable resin is different from said polyamide block copolymer.

4,871,805

POLYPROPYLENE COMPOSITION

Yozo Shimomura, Ichiharashi; Kinya Mori, Chibashi, and Osamu Kojima, Ichiharashi, all of Japan, assignors to Chisso Corporation, Osaka, Japan

Filed Nov. 19, 1987, Ser. No. 122,741

Claims priority, application Japan, Dec. 19, 1986, 61-302985

Int. Cl.⁴ C08L 53/02, 23/12, 23/16, 23/06

U.S. Cl. 525—98 3 Claims

1. A polypropylene composition having a styrene-ethylene butylene-styrene block copolymer or a styrene-ethylene propylene block copolymer each in 5 to 30% by weight based on the weight of said composition, blended with a highly crystalline propylene homopolymer having a relationship between its isotactic pentad ratio (P) and melt flow rate (MFR) represented by an expression of

$$1.00 \geq P \geq 0.015 \log MFR + 0.955.$$

4,871,806

REACTIVE COATINGS COMPRISING AN ACID-FUNCTIONAL COMPOUND, AN ANHYDRIDE-FUNCTIONAL COMPOUND, AN EPOXY-FUNCTIONAL COMPOUND AND A HYDROXY-FUNCTIONAL COMPOUND

Mohamad D. Shalati, Richton Park, and James A. Marquart, Chicago Heights, both of Ill., assignors to The Sherwin-Williams Company, Cleveland, Ohio

Filed Nov. 16, 1987, Ser. No. 120,888

Int. Cl.⁴ C08L 33/08, 37/00, 63/02, 67/02

U.S. Cl. 525—108 37 Claims

1. A multicomponent curable composition, which is reactive upon mixing of the components, and which comprises:

- (i) an acid-functional polymer having an average of at least two carboxylic acid groups per molecule wherein the acid-functional polymer is obtained by the half-ester reaction of a hydroxy-functional polymer and at least one cyclic anhydride having one anhydride group per molecule to form acid groups and ester groups; and
- (ii) an anhydride-functional compound having an average of at least two cyclic carboxylic acid anhydride groups per molecule; and
- (iii) an epoxy-functional compound having an average of at least one epoxy group per molecule; and
- (iv) a hydroxy-functional compound which is different from epoxy-functional compound (iii) and which has an average of at least two hydroxyl groups per molecule; wherein at least one of the compounds (i), (ii), (iii) or (iv) comprises a film forming polymer.

4,871,807

WATER-DILUTABLE PAINT BINDERS HAVING IMPROVED CORROSION RESISTANCE

Werner Startitzbichler, Gert Dworak, and Wolfgang Daimer, all of Graz, Austria, assignors to Vianova Kunstharz, A.G., Werdorf, Austria

Filed Dec. 23, 1987, Ser. No. 136,981

Claims priority, application Austria, Dec. 23, 1986, 3413/86

Int. Cl.⁴ C08L 33/08, 33/10, 63/02, 75/08

U.S. Cl. 525—113 6 Claims

1. Process for producing low organic solvent containing binders for stoving coating compositions, water-dilutable upon partial or total salt formation with ammonia or amines, based on a combination of a film-forming water-dilutable polycarboxy compound and a film-forming water-soluble polyhydroxy compound, comprising the steps of condensing

- (A) 10 to 90% by weight of a water-dilutable polycarboxy compound selected from the group consisting of
 - (Aa) at least one addition product of maleic acid anhydride with unsaturated oils or fatty acids, the anhydride groups of which are opened with water or a monoolcohol and which has an acid value of between 50 and 400 mg KOH/g and an intrinsic viscosity of from 4.5 to 8.0 ml/g measured in N,N-dimethylformamide at 20° C., and
 - (Ab) at least one copolymer having an acid value of between 100 and 200 mg KOH/g, and an intrinsic viscosity of between 4.5 and 8 ml/g measured in N,N-dimethylformamide at 20° C., at from about 80 to 140° C. to an intrinsic viscosity of from 14 to 19 ml/g measured in N,N-dimethylformamide at 20° C. with
- (B) 90 to 10% by weight of a water-insoluble polyhydroxy compound which is an epoxy resin amine adduct which is substantially insoluble in water under processing conditions, having a hydroxyl value of between about 50 and 300 mg KOH/g and an intrinsic viscosity of from about 9 to 12 ml/g measured in N,N-dimethylformamide at 20° C.

4,871,808

BINDERS WATER-DILUTABLE BY PROTONATION WITH ACID

Thomas Schwerzel, Ludwigshafen; Rolf Osterloh, Erftstadt; Eberhard Schupp, Gruenstadt; Thomas Perner, Ludwigshafen, and Klaus Ahlers, Muenster, all of Fed. Rep. of Germany, assignors to BASF Lacke + Farben Aktiengesellschaft, Muenster, Fed. Rep. of Germany

Filed Nov. 5, 1987, Ser. No. 116,868

Claims priority, application Fed. Rep. of Germany, Nov. 20, 1986, 3639570

Int. Cl.⁴ C08G 59/14; C08L 63/02

U.S. Cl. 525—113 5 Claims

1. A binder which is water-dilutable on protonation with acid and is obtained by reaction of

- (A) an epoxy resin having a number average molecular weight of from 300 to 6,000 and on average from 1.5 to 3.0 epoxide groups per molecule and
- (B) from 20 to 80 mol%, based on the amount of epoxide groups present in epoxy resin (A), of a saturated secondary monoamine of from 3 to 40 carbon atoms selected from the group consisting of an aliphatic secondary monoamine, a cycloaliphatic secondary monoamine, a secondary alkanolamine and a mixture thereof, and subsequent reaction with
- (C) a copolymer which is based on butadiene and acrylonitrile and contains primary and/or secondary amino groups, the amount of (C) being so dimensioned that the number of primary and secondary amino groups corresponds to from 1 to 50 mol% of the epoxide groups present in the epoxy resin (A), and also
- (D) with an aliphatic primary or secondary amine or a dicycloaliphatic diprimary diamine or a mixture thereof to convert any epoxide groups still present.

4,871,809

RAILROAD FLANGWAY FILLER AND EXPANSION JOINT SEALER

Paul J. Szarka, Livonia, Mich., assignor to Szarka Enterprises, Inc., Livonia, Mich.

Filed Oct. 27, 1986, Ser. No. 923,195

Int. Cl.⁴ C08L 7/00, 9/00, 75/04; E01B 25/28

U.S. Cl. 525—131 9 Claims

1. A method of preparation of a filled flangeway opening of a railroad crossing comprising the steps of:

- A. Preparing a flangeway filler composition by:
 - (i) placing cryogenically granulated elastomeric particles in a suitable containment means;
 - (ii) adding a polyurethane moisture curable binder type resin to said cryogenically granulated elastomeric particles;
 - (iii) mechanically mixing said cryogenically granulated elastomeric particles and said polyurethane resin; wherein said cryogenically granulated elastomeric particles have an average particle size of from about .01mm to about 3mm and the ratio of said cryogenically granulated elastomeric particles to said polyurethane resin is from about 6:1 by weight to about 14:1 by weight;
- B. Placing said flangeway filler composition in the flangeway space and substantially leveling said filler with the railroad crossing; and
- C. Allowing said composition to cure.

4,871,810

COMPOSITION COMPRISING MELT BLENDED PRODUCT OF THERMOPLASTIC RESIN AND TWO ETHYLENE COPOLYMERS CONTAINING COREACTIVE GROUPS

Robert P. Saltman, Townsend, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Filed Nov. 13, 1987, Ser. No. 117,942
Int. Cl.⁴ C08L 23/08

U.S. Cl. 525—133

9 Claims

1. A partially grafted, multi-phase, flexible thermoplastic composition formed by melt blending:

(a) 25–50 volume percent of at least one thermoplastic resin selected from polyethylene, polypropylene and copolymers thereof, poly(butene-1), poly-4-methylpent-1-ene, polystyrene and copolymers thereof, polyphenylene oxide, polyphenylene sulfide and polysulfone, said thermoplastic comprising at least one continuous phase of the composition,

(b) 10–74 volume percent of at least one ethylene copolymer, E/X/Y, where E is ethylene is at least 50 weight percent of E/X/Y, X is 1–35 weight percent of an acid-containing unsaturated mono-carboxylic acid, and Y is 0–49 weight percent of a moiety derived from at least one alkyl acrylate, alkyl methacrylate, alkyl vinyl ether, carbon monoxide, sulfur dioxide, or mixtures thereof where the alkyl groups contain 1–12 carbon atoms, and further wherein the acid groups in the acid-containing moiety are neutralized from 0–100% by a metal ion, and

(c) 1–50 volume percent of at least one polymeric grafting agent which contains reactive groups selected from at least one of epoxides, isocyanates, aziridine, silanes, alkyl halides, alpha-halo ketones, alpha-halo aldehydes, or oxazoline, which grafting agents react with the acid-containing moieties in component (b) and wherein the quantity of reactive groups provided to the composition by the grafting agent expressed as MMOLS of reactive groups per one hundred grams of component (b) plus component (c) is between 1 and 35; and further wherein the weight percent of monomers containing the reactive groups is 0.5–15 weight percent of the polymeric grafting agent, component c, the remainder of the polymeric grafting agent contains at least 50 weight percent of ethylene and 0–49 weight percent of a moiety derived from at least one alkyl acrylate, alkyl methacrylate, alkyl vinyl ether, carbon monoxide, sulfur dioxide or mixtures thereof where the alkyl groups contain 1–12 carbon atoms, the above volume percentages for components (a), (b) and (c) being based on the total of component (a), component (b), and component (c) only and being calculated from the densities of the individual components prior to mixing.

4,871,811

HOT MELT ADHESIVE COMPOSITION

Morio Gaku, Saitama, and Hidenori Kinbara, Tokyo, both of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan
Division of Ser. No. 118,910, Nov. 10, 1987, Pat. No. 4,820,769, which is a continuation of Ser. No. 914,976, Oct. 3, 1986, abandoned. This application Aug. 23, 1988, Ser. No. 235,814
Claims priority, application Japan, Oct. 3, 1985, 60-219254; Oct. 30, 1985, 60-241268; Feb. 17, 1986, 61-30969
Int. Cl.⁴ C08L 31/04

U.S. Cl. 525—148

7 Claims

1. A hot melt adhesive composition consisting essentially of (A) 99 to 80 wt % of an ethylene-vinyl acetate copolymer, (B) 1 to 20 wt % of a monofunctional or polyfunctional cyanate ester compound having at least one cyanate group in the molecule, and

(C) a monofunctional or polyfunctional maleimide compound or a cross-linking catalyst for the ethylene-vinyl acetate copolymer (A) in an amount of from 0.1 to 5% by

weight based on the weight of the component (A) and the component (B).

4,871,812

MOLDABLE MEDICAL ADHESIVE

Donald H. Lacast, North St. Paul; Donald R. Battles, Arden Hills, and Steven S. Kantner, St. Paul, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 936,820, Nov. 28, 1986, Pat. No. 4,737,410. This application Oct. 15, 1987, Ser. No. 106,414. The portion of the term of this patent subsequent to Apr. 12, 2005, has been disclaimed.

Int. Cl.⁴ B05D 3/04, 3/12; C08L 79/04

U.S. Cl. 525—186

30 Claims

1. A pressure-sensitive adhesive mass comprising a blend of the following:

a. a terpolymer pressure sensitive adhesive of A, B and C monomers where A is a hydrophobic monomeric acrylic acid ester of a non-tertiary alcohol, said alcohol having from 4 to about 14 carbon atoms; B is at least one polar monomer copolymerizable with said A monomer having hydroxyl, carboxylic, sulfonic or phosphoric functionality, the amount of weight of B monomer being about 2 to 30% of the total weight of all monomers in the copolymer; and C is a hydrophilic macromolecular monomer of the formula X—Y—Z wherein X is a vinyl group copolymerizable with the A and B monomers, Y is a divalent linking group, and Z is a monovalent polymeric moiety comprising a polyether essentially unreactive under free radical initiated copolymerization conditions, the amount by weight of C monomer being about 5 to 30% of the total weight of all monomers in the terpolymer;

b. at least one carbonylamido group-containing polymer; said carbonylamido group-containing polymer being present in sufficient amounts to provide said adhesive mass with a tensile strength of at least 400 KPa and maximum elongation of about 1,000 percent; and said adhesive mass, when measured as a 1 mil (0.025 mm) thick film having a moisture vapor transmission of at least 1,000 grams per square meter per 24 hours at 40° C. and a relative humidity differential of about 80 percent.

4,871,813

POLYMER COMPOSITIONS BASED ON LINEAR LOW DENSITY POLYETHYLENE AND PROPYLENE COPOLYMERS

Alain Senez, Cabries, France, assignor to BP Chemicals Limited, London, England

Filed Aug. 31, 1987, Ser. No. 91,758

Claims priority, application France, Sep. 2, 1986, 86 12329

Int. Cl.⁴ C08L 23/18, 23/08

U.S. Cl. 525—240

12 Claims

1. A polymer composition comprising:

(a) from 99 to 75 weight percent of linear low density polyethylene consisting of a copolymer of ethylene with at least one alpha-olefin containing 3–12 carbon atoms, and (b) from 1 to 25 weight percent of a copolymer (CP) of propylene with 7 to 40 weight percent (based on total weight of copolymer CP) of one or more C₄ to C₁₂ alpha olefins and 0 to 10 weight percent of ethylene, the weight content of the ethylene, if any, in copolymer CP being less than the weight of the C₄ to C₁₂ alpha olefin therein, said copolymer having a fusion enthalpy of not more than 75 J/g.

4,871,814

HIGH IMPACT, HIGHLY TRANSPARENT LINEAR STYRENE-DIENE BLOCK COPOLYMERS WITH FIVE OR MORE BLOCKS AND THEIR PREPARATIONS BY ANIONIC DISPERSION POLYMERIZATION

Binnur Z. Gunesin, New York, N.Y.; Paul A. Pindris, Red Bank, and Frederick C. Schwab, Metuchen, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.
Division of Ser. No. 901,506, Aug. 28, 1986, abandoned. This application Jun. 22, 1987, Ser. No. 65,658
Int. Cl.⁴ C08F 297/04

U.S. Cl. 525—314

26 Claims

1. A process for preparing a linear block copolymer having a number average molecular weight of 80,000 to 200,000 containing 5 or more alternating blocks of (A) polymerized styrene or alkyl styrene units, and (B) polymerized conjugated diene units, terminated by the (A) units, and comprising at least about 70% by weight of the blocks (A) and not more than about 30% by weight of the blocks (B), which process comprises anionic dispersion polymerization in a paraffinic or monoolefin dispersing medium which is not a solvent for the polymer in the presence of a block copolymer dispersant containing A and B units which produces the linear block polymer at a concentration of 20 to 40 weight percent in the dispersing medium.

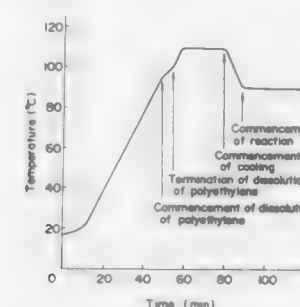
4,871,815

METHOD OF MAKING CHLOROSULFONATED POLYETHYLENE

Tatsushi Nakagawa, Shinnanyo; Mamoru Narui, Kudamatsu, and Yasuhiro Sakanaka, Shinnanyo, all of Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Shinnanyo, Japan
Division of Ser. No. 161,243, Feb. 19, 1988, abandoned, which is a continuation of Ser. No. 942,047, Dec. 16, 1986, abandoned, which is a continuation of Ser. No. 715,762, Mar. 25, 1985, abandoned, which is a continuation of Ser. No. 515,902, Jul. 21, 1983, abandoned. This application Feb. 2, 1989, Ser. No. 305,261
Claims priority, application Japan, Jul. 21, 1982, 57-125848
Int. Cl.⁴ C08F 8/38

U.S. Cl. 525—344

2 Claims



1. A process for producing an excellent cold-proof chlorosulfonated polyethylene comprising:

dissolving polyethylene in a halogenated hydrocarbon solvent by heating the halogenated hydrocarbon solvent to a temperature higher than the dissolution temperature region of the polyethylene to form a homogeneous solution, then lowering the temperature of the homogenous solution to a temperature of not greater than the dissolution temperature region of the polyethylene, and maintaining the homogenous solution, and then reacting the polyethylene with a reactant consisting essentially of sulfuric chloride, said reaction being conducted in the presence of a radical generating agent.

4,871,816

TRIBLOCK POLYARYLENE POLYETHER WITH POLYSILOXANE SEGMENT AND IMPACT-IMPROVED BLENDS THEREOF

Virgil Percec, Pepper Pike; Paul P. Nicholas, Broadview Heights, both of Ohio, and Dana Garcia, Plainsboro, N.J., assignors to The B.F. Goodrich Company, Akron, Ohio
Continuation-in-part of Ser. No. 837,717, Mar. 10, 1986, abandoned. This application Oct. 22, 1987, Ser. No. 111,317
Int. Cl.⁴ C08G 65/48

U.S. Cl. 525—393

18 Claims

1. A substantially linear, thermally crosslinkable, and predominantly vinyl terminated triblock oligomer formed through a hydrosilylation reaction in which one of the reactants is a vinyl terminated polyarylene polyether or polyarylene polythioether (PAPE) oligomer represented by the following structure:



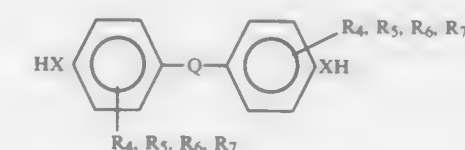
wherein, X represents O or S,

R1 represents an organic connecting group selected from benzyldiene

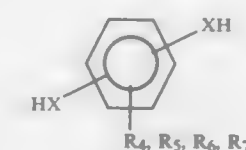


R2 represents H or CH3, and, n represents an integer corresponding to Mn 700 to 10,000 for the vinyl-terminated PAPE;

Ar1 and Ar2 represent the same or different monoarylene or diarylene segments derived from a dihydric phenol or dihydric thiophenol selected from (5) or (6), and a dihalo-substituted arene, and when Ar1 and Ar2 represent the same monoarylene segment, said PAPE includes a single tetraalkylsubstituted biphenylene linking group to provide for end groups as in (1) on said PAPE in which said structures (5) and (6) are



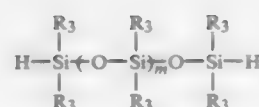
III



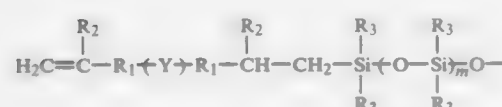
(6)

wherein, Q represents a bond between aromatic carbon atoms or a divalent connecting radical selected from the group consisting of C=O, —O—, —S—, —SO2—, —Si— and divalent organic radicals; and,

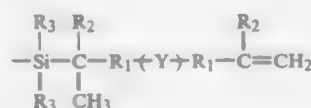
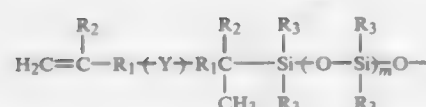
R4, R5, R6, and R7 are inert substituents on each ring C atom, the same or different and are selected from the group consisting of NO2, C1–C18 alkyl, without regard for spatial configuration; C1–C18 alkoxy; and hydrogen; and the other reactant is a α,ω-dihydrosiloxane represented by



wherein m represents an integer in the range from about 8 to about 80; and, R_3 represents lower (C_1 to C_4) alkyl; so that the structure of the triblock formed is represented by the following formulae



and



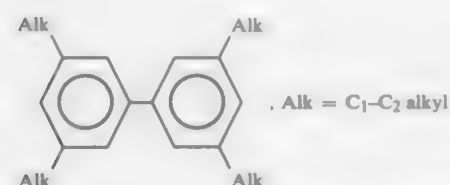
wherein Y is defined as the structure



when Ar_1 and Ar_2 represent different segments; and, when Ar_1 and Ar_2 represent the same monoarylene segments Y becomes the structure



wherein Ar_2 =



with $n'+n''=n$; and, said triblock has Mn in the range from about 2000 to about 25000.

4,871,817

POLYETHERIMIDE-LIQUID CRYSTAL POLYMER

ILENDE

John A. Rock, Becket, Mass., assignor to General Electric Company, Pittsfield, Mass.

Filed Dec. 31, 1986, Ser. No. 948,046
Int. Cl.⁴ C08L 67/00, 79/08

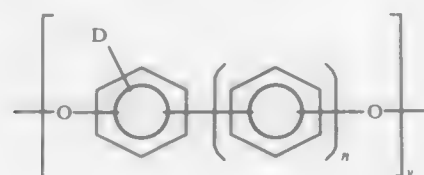
U.S. Cl. 525-425

19 Claims

1. A composition comprising a blend of a polyetherimide and (b) liquid crystal polymer which exhibits melt anisotropy wherein the liquid crystal polymer is a copolyester having

recurring moieties of Formulas I and III or of Formulas I, II and III or of Formulas IV and V,

(3)



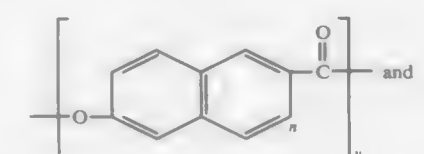
(I)



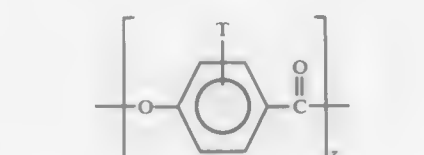
(II)



(III)



(IV)



(V)

wherein n is 0 or 1 and v, w, x, y, and z are integers greater than 1 and D is selected from the class consisting of hydrogen, an alkyl radical having 1 to 4 carbon atoms, an aryl radical having 1 to 4 carbon atoms, an alkaryl radical having 6 to 10 carbon atoms or a halogen radical and T is selected from the class consisting of hydrogen, an alkyl radical having 1 to 4 carbon atoms, an alkoxy radical of 1 to 4 carbon atoms, halogen radical or mixtures thereof wherein Formula I of said copolyester having recurring moieties of Formula I and III is derived from at least phenyl ethyl hydroquinone.

4,871,818

POLYESTER-BASED SPANDEX FILAMENT

Gary A. Loden, Fishersville, Va., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

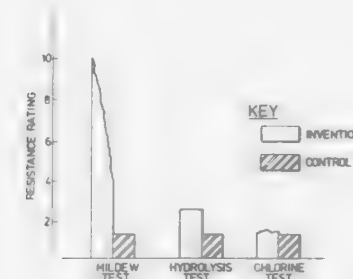
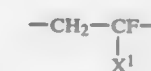
Continuation-in-part of Ser. No. 78,153, Jul. 27, 1987, Pat. No. 4,767,828, which is a division of Ser. No. 913,406, Sep. 30, 1986, abandoned. This application Jun. 30, 1988, Ser. No. 213,895
Int. Cl.⁴ C08F 20/00

U.S. Cl. 525-440

7 Claims

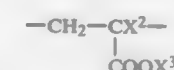
1. An improved elastic filament or film formed from a spandex polymer having a hindered polyester soft segment and a hard segment derived from an organic diisocyanate and an aliphatic diamine chain extender, the improvement comprising, the filament or film having enhanced mildew resistance

and the hindered polyester segment being made substantially from a poly(2,2-dimethyl-1,3-propane dodecanedioate)glycol



wherein X^1 is (i) $-COOH$, $-COOM$ wherein M is an alkali metal, Ca, Mg, Zn, Fe, Ni, Hg, Cu, Cd or NH_3 , or C_1-C_{20} alkyl group-containing primary or tertiary amine salt, or (ii) a group $-CONR^4R^5$ (wherein R^4 is hydrogen or C_1-C_{20} alkyl group and R^5 is hydrogen, C_1-C_{20} hydroxyalkyl group, C_1-C_{20} alkyl group containing $-SO_3H$, SO_3M wherein M is an alkali metal, $-COOH$ or $-COOM$ wherein M is an alkali metal or a group $-R^6NHR^7$);

(2) 0 to about 95% by weight of a structural unit represented by the formula



that has a glycol acidity of no more than 15 milliequivalents per kilogram.

4,871,819

ETHYLENE COPOLYMER AND PROCESS FOR THE PRODUCTION THEREOF

Akiyoshi Oonishi; Iwao Ishino; Takeo Shimada, and Yuji Ozeki, all of Mie, Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

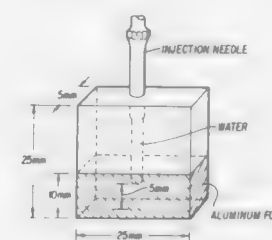
Filed Jun. 28, 1985, Ser. No. 749,798

Claims priority, application Japan, Jul. 9, 1984, 59-141776

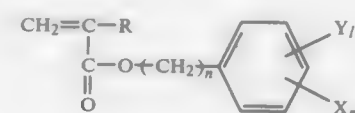
Int. Cl.⁴ C08F 259/02, 259/08

U.S. Cl. 526-245

5 Claims



1. An ethylene copolymer for use as electrical insulation derived from ethylene and an ethylenically α,β -unsaturated acid halogenated phenyl ester represented by the formula (1):



(1)

(wherein R is hydrogen or a methyl group, X is fluorine, chlorine, bromine, or iodine, Y is an alkyl group having 4 to 18 carbon atoms, n is 0 or 1, m is an integer of 1 to 5, and l is 0 or an integer of 1 to 4), wherein the halogenated phenyl ester group unit content is about 0.005 to about 10 mol %.

4,871,820

ALPHA-FLUOROACRYLIC ACID POLYMER AND ITS

Akira Ohmori, Ibaraki, and Takashi Yasuhara, Settsu, both of Japan, assignors to Daikin Industries, Ltd., Osaka, Japan
Filed Feb. 4, 1988, Ser. No. 152,296

Claims priority, application Japan, Feb. 17, 1987, 62-35401

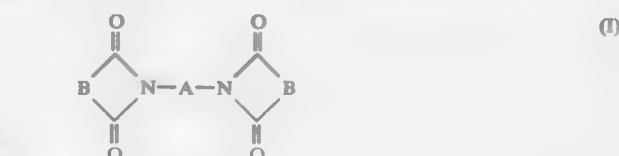
Int. Cl.⁴ C08F 18/20

U.S. Cl. 526-245

2 Claims

1. An α -fluoroacrylic acid polymer comprising:

(1) about 5 to about 100% by weight of a structural unit represented by the formula



(II)

in which B represents a divalent radical containing a carbon-carbon double bond and A is a divalent radical containing at least two carbon atoms and

(b) at least one alkenyl compounds of formula II



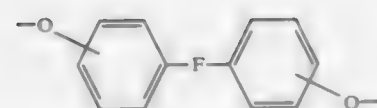
II

in which m is an integer from 1 to 4, G represents a phenyl ring substituted by at least one alkenyl group and D represents (i) a group of formula IIa



IIa

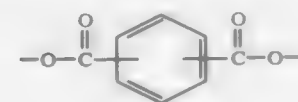
in which E is a n-valent group and n is an integer from 1 to 4, (ii) a divalent group of formula IIb



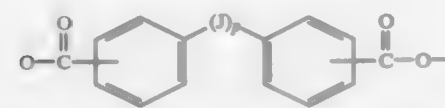
in which F is a divalent group chosen from $-\text{SO}_2-$, $-\text{SO}-$, $-\text{CMe}_2-$, $-\text{O}-$, $-\text{C}(\text{CF}_3)_2-$, $-\text{CH}_2-$ or $-\text{CO}-$, (iii) a group of formula IiC



in which F is as defined in (ii) above, (iv) a divalent group of formula IiD



or (v) a divalent group of formula IiE



in which J is a divalent group chosen from $-\text{SO}_2-$, $-\text{SO}-$, $-\text{CMe}_2-$, $-\text{O}-$, $-\text{C}(\text{CF}_3)_2-$, $-\text{CH}_2-$ or $-\text{CO}-$ and p is 0 or 1.

4,871,822

REACTION PRODUCT OF OLEFINICALLY UNSATURATED COMPOUNDS WITH COMPOUNDS CONTAINING ACTIVE HYDROGEN, PROCESSES FOR THEIR PREPARATION AND 2-COMPONENT LACQUERS BASED THEREON

Gerhard Brindöpke, Frankfurt am Main; Gerd Walz, Wiesbaden; Karl Waldmann, Bad Soden am Taunus; Manfred Schön, Rodgau, and Hans-Jörg Kleiner, Kronberg/Taunus, all of Fed. Rep. of Germany, assignors to Hoechst AG, Fed. Rep. of Germany

Continuation of Ser. No. 718,941, Apr. 2, 1985, abandoned. This application Jun. 16, 1986, Ser. No. 874,688

Claims priority, application Fed. Rep. of Germany, Apr. 4, 1984, 3412658; Mar. 8, 1985, 3508399

Int. Cl.⁴ C08F 122/04

U.S. Cl. 526—271

17 Claims

1. A cured reaction product obtained via the Michael reaction in the presence of at least one catalyst selected from the group consisting of diazabicyclooctane (DABCO), fluorides of quaternary ammonium compounds, on their own or as a mixture with alkyl silicates, amidines, tertiary phosphanes of the formula $\text{P}(\text{CH}_2-\text{Y})_3$ in which the Ys are identical or different and denote the radical $-\text{OH}$, $-\text{CH}_2\text{CN}$ or $-\text{N}(\text{Z})_2$ in which Z is an alkyl radical having 1 to 5 carbon atoms, tertiary phosphanes of the formula $\text{P}(\text{R}^4, \text{R}^5, \text{R}^6)$ in which the radicals R^4 , R^5 and R^6 denote an alkyl radical having 1 to 12 carbon atoms or a phenyl radical which is unsubstituted or substituted by at least one alkyl, alkoxy or dialkylamino group each of which has 1 to 4 carbon atoms in the alkyl radical, and R^4 , R^5 and R^6 are identical or different, but at least one of the radicals represents a phenyl radical, and aminophosphoranes of formula $(\text{R}^7, \text{R}^8, \text{R}^9)\text{P}=\text{N}-\text{C}(\text{R}^{10}, \text{R}^{11}, \text{R}^{12})$ in which R^7 , R^8 and R^9 are identical or different and denote an alkyl radical having 1 to 12 carbon atoms or a phenyl radical which is unsubstituted or substituted by at least one alkyl, alkoxy or dialkylamino group

IiB

each of which has 1 to 4 carbon atoms in the alkyl radical, and R^{10} , R^{11} and R^{12} are identical or different and each represents an alkyl radical having 1 to 5 carbon atoms or a phenyl radical of (A) compounds containing at least two $\text{R}^1\text{R}^2\text{C}=\text{CR}^3-\text{X}$ groups (I) with (B) compounds which contain

(a) malonic acid moieties attached by an ester linkage

(b) at least two groups containing active H atoms of the type $-\text{CH}$ or $-\text{SH}$ (II) or

(c) at least one active H atom and at least one group of the type (II), in which, in formula (I), X denotes $-\text{CO}-$ which is attached to a further $\text{R}^1\text{R}^2\text{C}=\text{CR}^3$ group either directly or via the radical of a polyhydric alcohol or of an amine, R^1 denotes hydrogen or a hydrocarbon radical having 1 to 10 carbon atoms, R^2 denotes hydrogen, a hydrocarbon radical having 1 to 10 carbon atoms, an ester group containing the radical R^4 of a monohydric alcohol having up to 12 carbon atoms, $-\text{CN}$, $-\text{NO}_2$ or a $-\text{CO}-\text{NHR}^1$ or $-\text{CO}-\text{R}^1$ group, and R^3 has the same meaning as R^2 and is identical with or different from the latter.

4,871,823

1-ALKENE/EXCESS MALEIC ANHYDRIDE POLYMERS

Fred L. Billman; Lih-Bin Shih, and Calvin J. Verbrugge, all of Racine, Wis., assignors to S. C. Johnson & Son, Inc., Racine, Wis.

Filed Sep. 11, 1987, Ser. No. 95,799

Int. Cl.⁴ C08F 222/04

U.S. Cl. 526—272

16 Claims

1. A composition of matter comprising a free-radical addition polymer containing at least 55 to about 95 mole percent of units derived from maleic anhydride and from about 5 to 45 mole percent of units derived from at least one 1-alkene having at least 4 to 60 carbon atoms wherein the polymer has an average of at least one unit derived from a 1-alkene per polymer chain based on the number average molecular weight of the polymer and wherein the maleic anhydride units are substantially randomly distributed throughout the polymer chains making up said polymer.

4,871,824

VARIABLY CROSSLINKED POLYMERIC SUPPORTS

Steven M. Heilmann, Afton; Jerald K. Rasmussen, Stillwater; Larry R. Krepski, White Bear Lake; Dean S. Milbrath, Stillwater, and Patrick L. Coleman, Minneapolis, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 25,605, Mar. 13, 1987, Pat. No. 4,737,560. This application Feb. 19, 1988, Ser. No. 158,258

The portion of the term of this patent subsequent to Apr. 12, 2005, has been disclaimed.

Int. Cl.⁴ C08F 20/58

U.S. Cl. 526—304

21 Claims

1. A crosslinked, hydrophilic, azlactone-functional polymer bead having more than 5 and up to 99 molar parts of ethylenically unsaturated crosslinking monomer incorporated therein.

4,871,825

BINDER COMPOSED OF A GRAFT COPOLYMER OF HIGH MOLECULAR WEIGHT LIGNIN MATERIAL AND AN ACRYLIC MONOMER

Stephen Y. Lin, Wausau, Wis., assignor to Reed Lignin Inc., Rothschild, Wis.

Filed Oct. 28, 1987, Ser. No. 114,623

Int. Cl.⁴ B01F 17/52

U.S. Cl. 527—400

22 Claims

1. As a composition of matter, a sulfonated lignin binder that is a copolymer of high molecular weight sulfonated lignin material and an acrylic monomer, at least about 35% by weight of said lignin material having molecular weights in excess of about 5,000 daltons as determined by gel permeation chroma-

tography, said copolymer made by reacting said high molecular weight sulfonated lignin material with 0.0125 to 0.5 parts, per part of said lignin material, of said acrylic monomer.

4,871,826

LEWIS BASE ADDUCTS OF DECABORANE FOR FORMING NEW PRECERAMIC POLYMERS, USING AS BINDERS, FORMING SHAPED BODIES AND FORMING FIBERS

Dietmar Seyferth, Lexington, and William S. Rees, Jr., Arlington, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Jun. 22, 1987, Ser. No. 65,224

Int. Cl.⁴ C08G 79/08; C04B 35/58

U.S. Cl. 528—4

19 Claims

1. A preceramic polymer soluble in polar organic solvents formed by reacting

$\text{B}_{10}\text{H}_{14-n}\text{R}_n$ where R is a lower alkyl group having from 1 to about 8 carbon atoms, a substituted or unsubstituted cycloalkyl group having from 3 to about 8 carbon atoms, a substituted or unsubstituted lower alkenyl group having from 2 to about 8 carbon atoms, or a substituted or unsubstituted lower aryl group having from 6 to about 10 carbon atoms, and n is a number from zero to about six, with a diamine in an organic solvent for a sufficient time to form said soluble preceramic polymer.

4,871,827

METHOD OF IMPROVING SHELF LIFE OF SILICONE ELASTOMERIC SEALANT

Jerome M. Klosowski, Bay City, and Michael D. Meddaugh, Midland, both of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Mar. 3, 1986, Ser. No. 835,814

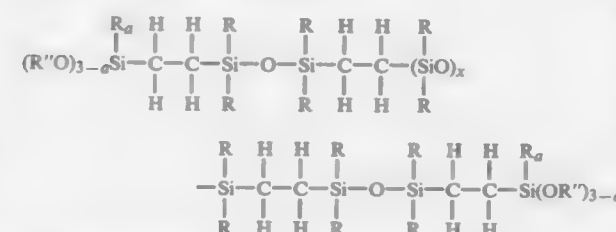
The portion of the term of this patent subsequent to Aug. 18, 2004, has been disclaimed.

Int. Cl.⁴ C08G 77/06

U.S. Cl. 528—17

11 Claims

1. The polymer having the formula



where each R is free of aliphatic unsaturation and is of the group monovalent hydrocarbon, monovalent halohydrocarbon, and monovalent cyanoalkyl radicals of 1 to 18 inclusive carbon atoms, each R'' is methyl, ethyl, propyl, or butyl, a is 0 is 1, and x is of a value such that the polymer has a viscosity of from 0.5 to 1000 Pas at 25° C.

4,871,828

PURIFICATION/ISOLATION OF ISOCYANATE CONDENSATES

Andre Blind; Gerard Collas, both of Caluire; Jean Robin, and Ferenc Sagi, both of Lyon, all of France, assignors to Rhone-Poulenc Chimie, Courbevoie, France

Filed Sep. 26, 1988, Ser. No. 249,305

Claims priority, application France, Sep. 24, 1987, 87/13478

Int. Cl.⁴ C08G 18/82

U.S. Cl. 528—44

19 Claims

1. A process for the purification and isolation of an isocyanate condensate containing free NCO groups from an impure admixture thereof, said isocyanate condensate impure admixture having been prepared by reacting a stoichiometric excess of an aromatic di- or polyisocyanate with a reactant compound

containing at least two functional groups which are reactive with NCO groups, and comprising extracting unreacted excess di- or polyisocyanate from said impure admixture with an inert gas in either the liquid or supercritical state.

4,871,829

ORGANOMINERAL PRODUCTS, A PROCESS FOR THEIR MANUFACTURE AND THEIR USE

Karl-Heinz Hiltnerhaus, Georgsmarienhütte, Fed. Rep. of Germany, assignor to KVT Kunststoffverfahrestechnik GmbH & Co. and F. William GmbH & Co., both of Dortmund, Fed. Rep. of Germany

Division of Ser. No. 741,342, Jun. 5, 1985, Pat. No. 4,827,005.

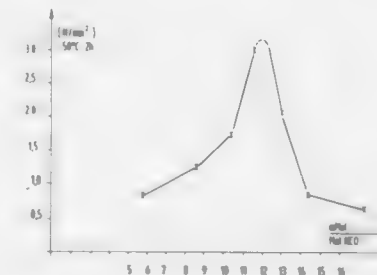
This application Mar. 13, 1989, Ser. No. 322,525

Claims priority, application Fed. Rep. of Germany, Jun. 6, 1984, 3421086

Int. Cl.⁴ C08G 18/08, 18/16; B32B 27/00, 27/40

U.S. Cl. 528—48

1 Claim



1. A method of coating, glueing, sealing or insulating, whereby the material to be coated, glued, sealed or insulated is brought in contact with a mixture of a polyisocyanate and an aqueous alkali silicate solution in the presence of a catalyst prompting the trimerization of the polyisocyanate, characterized in that, considering the composition and amount of the aqueous alkali silicate solution, in relation to the amount of the polyisocyanate, the catalyst is used in such an amount per mole of NCO groups in the reaction mixture that interwoven networks of inorganic and organic polymer are formed during the reaction.

4,871,830

POLYESTERCARBONATE CONTAINING DIVALENT RESIDUE OF POLYMERIZED ALKADIENE MONOMER

Victor Mark, deceased, late of Evansville; by Carol M. Mark, representative; by Ester H. Mark, representative, both of 701 Marigold Ct., Evansville, Ind. 47712, and Edward N. Peters, 51 West St., P.O. Box 775, Lenox, Mass. 01240

Division of Ser. No. 797,258, Nov. 12, 1985, Pat. No. 4,728,716.

This application Sep. 8, 1987, Ser. No. 93,926

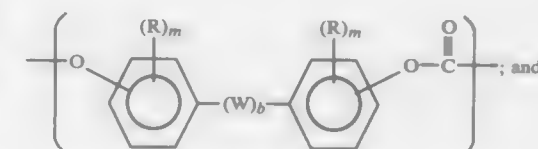
Int. Cl.⁴ C08G 63/62, 63/12

U.S. Cl. 528—192

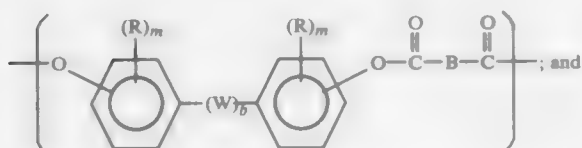
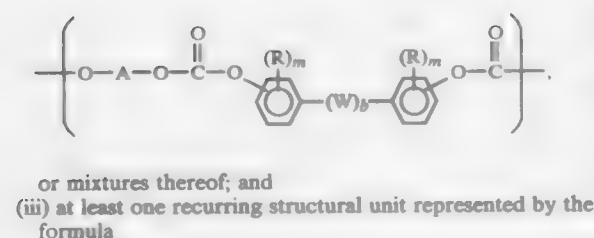
11 Claims

1. An aromatic ester carbonate resin comprised of:

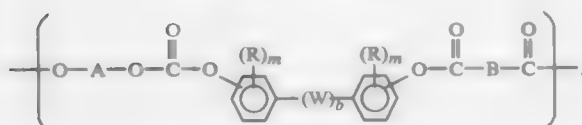
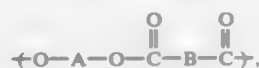
(i) at least one recurring structural unit represented by the formula



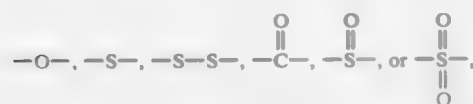
(ii) at least one recurring structural unit selected from structural units represented by the formulae



(iv) at least one recurring structural unit selected from structural units represented by the formulae



or mixtures thereof;
wherein R is independently selected from halogen, monovalent hydrocarbon radicals, or monovalent hydrocarboxy radicals,
W is selected from divalent hydrocarbon radicals,



A is the divalent residue of at least one polymerized conjugated alkadiene and has a weight average molecular weight of at least about 600,
m is independently selected from integers having a value of from 0 to 4, and
b is either zero or one, and
wherein B is the divalent residue of an ester precursor.

4,871,831

COMPLETE ETHER CAPPING OF OLIGOMERIC POLYPHENOLS

Andrew M. Zweig, Schaumburg, and Jeffrey P. Conrad, Chicago, both of Ill., assignors to Allied-Signal Inc., Morristown, N.J.

Filed Nov. 30, 1987, Ser. No. 126,314
Int. Cl.⁴ C08G 63/38

U.S. Cl. 528-205

30 Claims

1. A method of ether-capping oligomeric polyphenols with complete functionalization by both unsaturated and saturated ether moieties comprising reacting in the presence of a strong base at reaction conditions a solution of a polyphenol having at least four hydroxyl groups per molecule and both unsaturated and saturated phenolic hydroxyl-reactive halides in a polar aprotic solvent which maintains homogeneity of the reaction mixture with respect to all organic components therein, where

said unsaturated halides contribute at least 40% of said ether moieties.

4,871,832

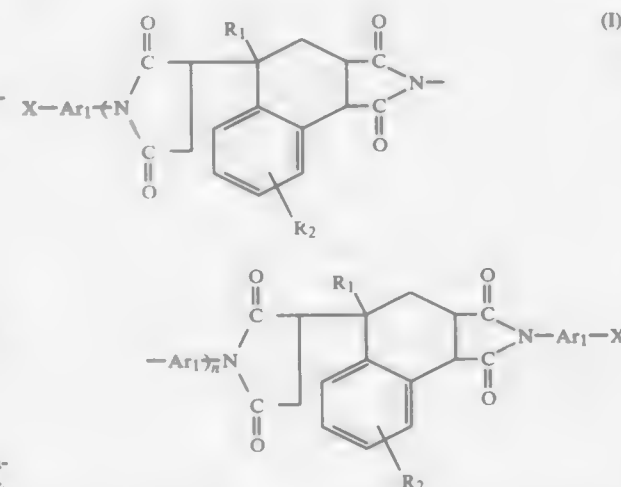
THERMOSETTABLE IMIDE COMPOUND AND EPOXY RESIN COMPOSITION CONTAINING THE SAME
Yasuhisa Saito; Shuichi Kanagawa; Katsuya Watanabe, and Kunimasa Kamio, all of Osaka, Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan
Continuation-in-part of Ser. No. 890,652, Jul. 30, 1986, abandoned. This application Jan. 21, 1988, Ser. No. 146,684
Claims priority, application Japan, Jul. 31, 1985, 60-170052; Mar. 12, 1986, 61-53922; European Pat. Off., Jul. 31, 1986, 86305901.0

Int. Cl.⁴ C08G 69/26

U.S. Cl. 528-353

5 Claims

1. An imide compound represented by the general formula (I),



wherein X represents a hydroxyl or amino group, Ar₁ and Ar₂ independently represent an aromatic residue, R₁ represents a hydrogen atom or a C₁-C₁₀ alkyl group, R₂ represents a hydrogen atom, a C₁-C₂₀ alkyl or alkoxy group or a hydroxyl group, and n represents a number of from 0 to 6.

4,871,833

POLYAMIC ACIDS, POLYIMIDES PREPARED FROM THESE AND PROCESS FOR PRODUCING HIGH-TEMPERATURE RESISTANT LAYERS
Bernd Hupfer, North Kingstown, R.I., assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed May 4, 1987, Ser. No. 45,570

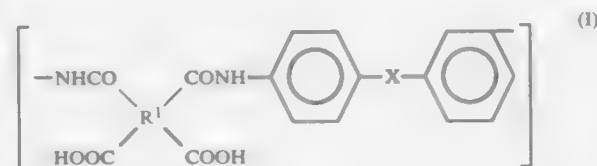
Claims priority, application Fed. Rep. of Germany, May 3, 1986, 3615039

Int. Cl.⁴ C08G 69/26

U.S. Cl. 528-353

10 Claims

1. A polyamic acid comprising at least 50 mole-% of a recurring unit having the formula I:



wherein

R¹ is a mono-, di-, tri- or tetranuclear aromatic group and

X is O, S, CO, SO₂ or CR²R³, each one of R² and R³ being H or CH₃.

4,871,834

MONOCLONAL ANTIBODIES SPECIFIC TO CEA
Yuji Matsuoka, 4-23-504, Minamisho 5-chome, Sawara-ku, Fukuoka-shi, Fukuoka-ken, and Masahide Kuroki, 45-1, Nanakuma 7-chome, Jyonan-ku, Fukuoka-shi, Fukuoka-ken, both of Japan
Continuation of Ser. No. 508,432, Jun. 27, 1983, abandoned.
This application Dec. 10, 1985, Ser. No. 807,113
Claims priority, application Japan, Jun. 30, 1982, 57-113780
Int. Cl.⁴ A61K 39/00; G01N 33/577

U.S. Cl. 530-387

12 Claims

1. In a process for producing monoclonal antibodies specific to a carcinoembryonic antigen by immunizing a first mammal with a first carcinoembryonic antigen to produce cells capable of producing antibodies, collecting the cells from the first mammal, fusing the collected cells with the cells of a line of myeloma of a second mammal, subjecting the thus-obtained fused cells to cloning, and culturing the thus-obtained hybridomas and recovering the desired monoclonal antibodies from the resulting spent culture, the improvement which comprises: selecting said fused cells by using the first carcinoembryonic antigen as a first marker on the basis of its capacity to produce antibodies reactive thereto and wherein said recovering step includes using at least one carcinoembryonic antigen other than said first carcinoembryonic antigen, normal faecal antigen-1, normal faecal antigen-2 and non-specific cross-reacting antigen of normal adult human faecal origin as a second marker for said hybridomas on the basis of the reactivities of hybridomas antibodies produced by said first monoclonal with said second marker antigen(s).

5. A monoclonal antibody produced by a process of claim 1.

4,871,835

ANALOGS OF HGH HAVING ANTAGONISTIC ACTIVITY, AND USES THEREOF

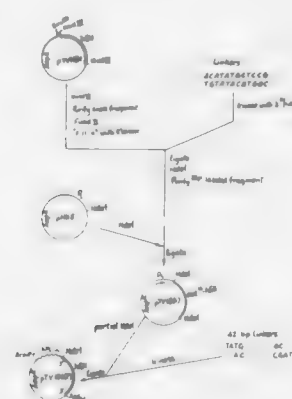
Haim Avir; Marian Gorecki, both of Rehovot; Avigdor Levanon, Netania; Amos Oppenheim, Jerusalem; Tikva Vogel, Rehovot; Pinhas E. Zeelon, Hashiva, and Menachem Zeevi, Ramat Gan, all of Israel, assignors to Bio-Technology General Corp., New York, N.Y.

Continuation-in-part of Ser. No. 514,188, Jul. 15, 1983. This application Jan. 14, 1985, Ser. No. 691,230

Int. Cl.⁴ C07K 13/00

U.S. Cl. 530-399

3 Claims



1. A polypeptide which inhibits the activity of naturally-occurring human growth hormone (hGH) or naturally-occurring prolactin (PRL), said polypeptide having the sequence of naturally-occurring hGH from what the first thirteen amino acids have been deleted and which has the methionine which occurs at position 14 of the naturally-occurring polypeptide at the N-terminus.

4,871,836

BORONIC ACID ADDUCTS OF RHENIUM AND RADIOACTIVE ISOTOPES OF RHENIUM DIOXIME COMPLEXES

Lynn C. Francesconi, Bridgewater, N.J., and Elizabeth N. Treher, Washington Crossing, Pa., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Oct. 13, 1987, Ser. No. 107,209

Int. Cl.⁴ C07F 13/00; A61K 43/00, 49/02

U.S. Cl. 534-10

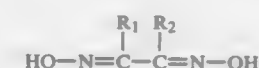
18 Claims

1. Boronic acid adducts of rhenium dioxime complexes which incorporate radioactive isotopes of rhenium having the formula



wherein X is an anion;

Y is a vicinal dioxime having the formula



or a pharmaceutically acceptable salt thereof, wherein R₁ and R₂ are each independently hydrogen, halogen, alkyl, aryl, amino or a 5 or 6-membered nitrogen or oxygen containing heterocycle, or together R₁ and R₂ are $\text{---}(\text{CR}_3\text{R}_9)_n\text{---}$ wherein n is 3, 4, 5 or 6 and R₃ and R₉ are each independently hydrogen or alkyl; and

Z is a boron derivative of the formula



wherein R₃ is hydroxy, alkyl, alkenyl, cycloalkyl, cycloalkenyl, alkoxy, carboxyalkyl, carboxyalkenyl, hydroxyalkyl, hydroxyalkenyl, alkoxyalkyl, alkoxyalkenyl, haloalkyl, haloalkenyl, aryl, arylalkyl or (R₄R₅N)-alkyl and R₄ and R₅ are each independently hydrogen, alkyl or arylalkyl, or R₄ and R₅ when taken together with the nitrogen atom to which they are attached form a 5 or 6-membered nitrogen containing heterocycle.

4,871,837

HYDROXY PROTECTION GROUPS

Hans G. Magnusson, and Karl Jansson, both of Lund, Sweden, assignors to Symbicom Aktiebolag, Umea, Sweden

Filed Jan. 27, 1987, Ser. No. 7,330

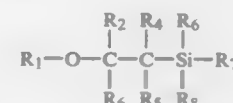
Claims priority, application Denmark, Jan. 27, 1986, 398/86

Int. Cl.⁴ C08F 297/02; C07H 5/06

U.S. Cl. 536-4.1

28 Claims

1. A method for preparing an unprotected hydroxy compound from a protected hydroxy compound of the general formula I



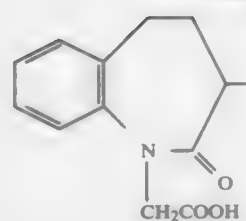
in which

R₁ is the non-hydroxy moiety of a hydroxy compound selected from the group consisting of hydroxy-containing amino acids, peptides containing at least one such acid, and carbohydrates or derivatives thereof;

R₂, R₃, R₄ and R₅ which may be the same or different are hydrogen, C₁₋₄ alkyl or aryl;

and R₆, R₇ and R₈ which may be the same or different are C₁₋₄ alkyl phenyl, substituted phenyl or a carrier in which the compound of formula I is reacted with a Lewis acid followed by reaction with water forming a hydroxy compound of the general formula II

-continued



wherein R^4 is lower alkyl; R^1 is hydrogen, lower alkyl or phenyl-lower alkyl; R^2 is hydrogen, lower alkyl, phenyl-lower alkyl, lower alkanoyl, benzoyl, phenyl-lower alkoxy-carbonyl or lower alkoxy-carbonyl; and X is C_{1-7} alkylene; or a pharmaceutically acceptable salt thereof.

4. A compound according to claim 1, which is 3(RS)-[5-(4-piperidyl)-1-(RS)-carboxypentyl]amino-2-oxo-2,3,4,5-tetrahydro-1H-benzazepine-1-acetic acid.

4,871,843

CYCLIC BENZENESULFONAMIDES, PROCESS FOR THEIR PREPARATION AND THEIR USE AS ACTIVE SUBSTANCE OF PHARMACEUTICAL COMPOSITIONS
Pierre Roger, Montigny-les-Bretonneux; Patrick Choay, Paris, and Jean-Paul Fournier, Versailles, all of France, assignors to DROPIE-Société Civile de gestion de droits de Propriété Industrielle, Paris, France

Division of Ser. No. 662,178, Oct. 18, 1984, Pat. No. 4,760,062.

This application Jul. 26, 1985, Ser. No. 224,549

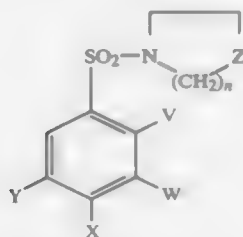
Claims priority, application France, Oct. 18, 1983, 83 1655

Int. Cl.⁴ C07D 243/08, 295/22

U.S. Cl. 540—575

6 Claims

1. A compound corresponding to the formula:



in which:

V represents hydrogen or an OR_1 group in which R_1 represents an alkyl group of 1 to 4 carbon atoms;

W represents hydrogen or the CF_3 group;

X represents hydrogen, halogen, the NO_2 , NH_2 groups, a $NH-CO-R_2$ group in which R_2 represents an alkyl group of 1 to 4 carbon atoms or aryl or an OR_1 group in which R_1 represents an alkyl group of 1 to 4 carbon atoms;

Y represents hydrogen, halogen, the NO_2 , NH_2 , CF_3 groups, a $NH-CO-R_2$ group in which R_2 represents an alkyl group of 1 to 4 carbon atoms or aryl, an OR_1 group in which R_1 represents an alkyl group of 1 to 4 carbon atoms or an SO_2-R_3 group in which R_3 represents an alkyl group of 1 to 4 carbon atoms;

n is 2 or 3; and

Z represents an NR_4 group in which R_4 represents:

a hydrogen,

a lower alkyl group of 1 to 6 carbon atoms,

a hydroxyalkyl group of 1 to 3 carbon atoms,

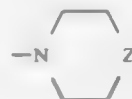
a cycloalkanoyl group of 3 to 10 carbon atoms,

an aryl group unsubstituted or substituted by halogen, by the CF_3 group, or by an OR_1 group in which R_1 represents an alkyl group having from 1 to 4 carbon atoms,

an alkyl group in which the aliphatic chain has 1 to 4 carbon atoms and can include $C=O$ and $C-OH$ groups, and in which the aryl group is unsubstituted or substituted

(iv)

by halogen, by the CF_3 group, by an OR_1 group in which R_1 is an alkyl group having from 1 to 4 carbon atoms, or an aroyl group or its isomers unsubstituted or substituted by halogen, a CF_3 group, or an OR_1 group in which R_1 is an alkyl group of 1 to 4 carbon atoms; provided that, when $n=2$,



represents a



group and

either V represents OR_1 , and at least one of the elements W,

X or Y is other than hydrogen,

or Y or W represents CF_3 .

4,871,844

DIAZEPINIUM DYES

Thap DoMinh, and Donald R. Diehl, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 799,893, Nov. 20, 1985, Pat. No. 4,668,606.

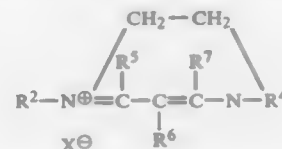
This application Apr. 28, 1987, Ser. No. 43,396

Int. Cl.⁴ C07D 243/08

U.S. Cl. 540—575

2 Claims

1. A diazepinium compound having the structural formula:



wherein R^2 and R^4 are individually alkyl of 3 to 7 carbon atoms, and R^5 , R^6 , R^7 and individually H or methyl; and X is an anion.

4,871,845

CATALYSTS FOR THE CURING OF A WATER-CURABLE ISOCYANATE-FUNCTIONAL PREPOLYMER

Richard S. Buckania, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 784,344, Oct. 4, 1985, Pat. No. 4,705,840.

This application Aug. 6, 1987, Ser. No. 82,821

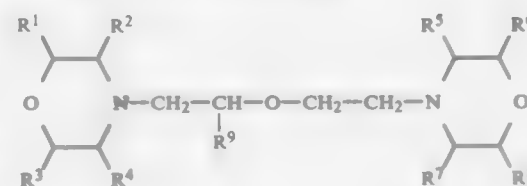
The portion of the term of this patent subsequent to Nov. 10, 2004, has been disclaimed.

Int. Cl.⁴ C07D 265/32

U.S. Cl. 544—87

7 Claims

1. A compound having the formula:



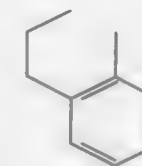
wherein:

each of R^1-R^8 are individually hydrogen or lower alkyl; and

R^9 is a methyl group or phenyl group wherein the phenyl group may have one or more lower alkyl substituents.

-continued

(d)



with the compound of the formula IIa



(IIa)

in the presence of a dehydrating agent.

4,871,846

PROCESS FOR THE PREPARATION OF CONDENSED AS-TRIAZINE DERIVATIVES

Sándor Bátori; György Hajós; András Messmer; Pál Benkó; László Pállos; Lujza Petőcz; Katalin Grasser; Ibolya Kósóczy, and Enikő Szirt né Kiszely, all of Budapest, Hungary, assignors to EGIS Gyógyszergyár, Budapest, Hungary

Filed Apr. 28, 1987, Ser. No. 43,600

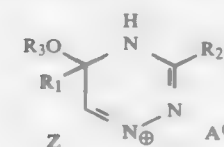
Claims priority, application Hungary, May 6, 1986, 1857/86

Int. Cl.⁴ C07D 253/08

U.S. Cl. 544—183

6 Claims

1. The process for the preparation of a condensed as-triazine derivative of the formula I



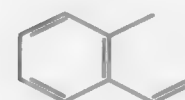
and isomers thereof where

R_1 is C_{1-10} alkyl, phenyl or naphthyl, wherein the two latter groups may optionally bear one or more identical or different halo, nitro, amino, hydroxy, C_{1-4} alkyl and/or C_{1-4} alkoxy substituent(s);

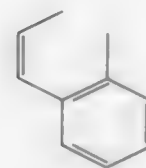
R_2 is hydrogen, halogen, hydroxy, C_{1-4} alkyl, phenyl or naphthyl, wherein the two latter groups may optionally bear one or more identical or different halo, nitro, amino, hydroxy, C_{1-4} alkyl and/or C_{1-4} alkoxy substituent(s);

R_3 is hydrogen;

Z is a group of the formula (a)

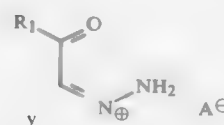


or (b)

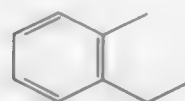


and

A^- is an anion, which comprises: reacting a compound of the formula II



where Y is a group of the formula c or d



4,871,847
HERBICIDAL SULFONAMIDES

(I) Craig L. Hillemann, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 121,656, Nov. 16, 1987, abandoned,

which is a division of Ser. No. 826,682, Feb. 10, 1986, abandoned,

which is a continuation-in-part of Ser. No. 801,165, Nov. 22,

1985, abandoned, which is a continuation-in-part of Ser. No.

720,702, Apr. 10, 1985, abandoned, which is a

continuation-in-part of Ser. No. 613,412, May 24, 1987,

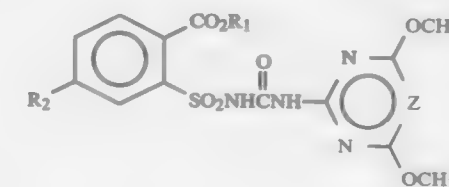
abandoned. This application Aug. 1, 1988, Ser. No. 240,355

Int. Cl.⁴ C07D 251/46

U.S. Cl. 544—211

3 Claims

1. A compound of the structural formula:



(a)

where

R_1 is $-CH_3$ or $-CH_2CH_3$;

R_2 is OCH_2CF_3 ; and

Z is N;

and their agriculturally suitable salts.

(b)

4,871,848

COMPOSITIONS PREPARED FROM HYDROCARBYL SUBSTITUTED NITROGEN-CONTAINING AROMATIC HETEROCYCLIC COMPOUNDS, AN ALDEHYDE AND/OR KETONE AND AN AMINE

Duane S. Treybig, and Robert G. Martinez, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 7,315, Jan. 27, 1987, Pat. No. 4,740,320,

which is a continuation-in-part of Ser. No. 757,830, Jul. 22, 1985,

abandoned. This application Jan. 19, 1988, Ser. No. 145,349

Int. Cl.⁴ C07D 213/38, 215/12, 239/26, 241/12

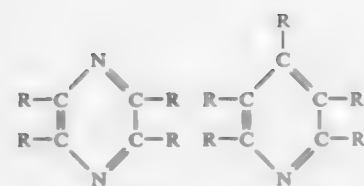
U.S. Cl. 544—224

8 Claims

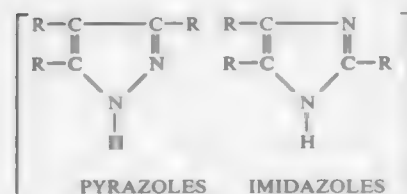
1. A composition of matter which comprises the product resulting from reacting at a temperature of from about 25° C. to about 250° C. for a time sufficient to complete the reaction of

(A) at least one aromatic heterocyclic material having one or more rings, at least one nitrogen atom located in the heterocyclic ring and at least one substituent group which has at least one reactive hydrogen atom attached to a carbon atom which is attached to a carbon atom in the aromatic heterocyclic ring selected from the group consisting of heterocyclic compounds represented by the following formulas:

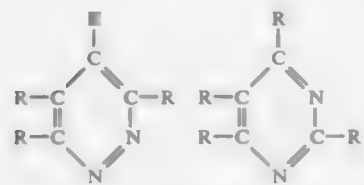
(c)



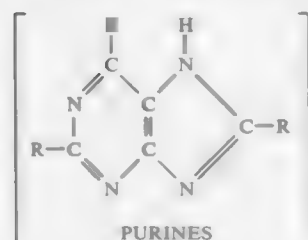
PYRAZINES PYRIDINES



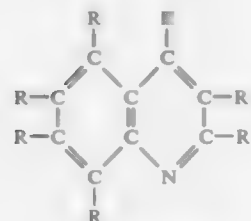
PYRAZOLES IMIDAZOLES



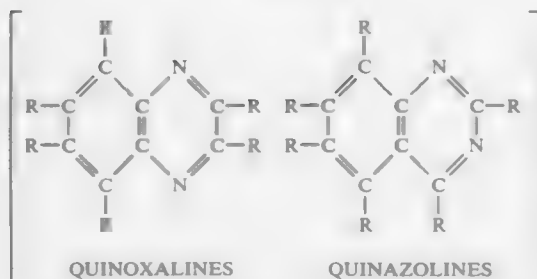
PYRIDAZINES PYRIMIDINES



PURINES



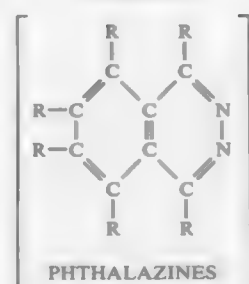
QUINOLINES



QUINOXALINES

QUINOXALINES

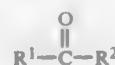
-continued



PHTHALAZINES

wherein each R is independently hydrogen or a hydrocarbyl group and wherein at least one of such R groups has at least one reactive hydrogen atom attached to a carbon atom which is attached to a carbon atom in the aromatic heterocyclic ring;

(B) at least one aldehyde, ketone or combination thereof represented by the formula:



wherein each R¹ and R² are independently hydrogen, hydrocarbyl or halo, nitro, alkoxy or amino substituted hydrocarbyl groups having from 1-30 carbon atoms; and (C) (1) at least one monoamine having a combined total of from about 10 to about 20 carbon, nitrogen, oxygen or sulfur atoms and at least one reactive amine hydrogen atom; (2) a polyamine or a mixture of (1) and (2); and wherein the components are employed in quantities which provide a mole ratio of (A):(B):(C) of from about 1:0.25:0.25 to about 1:5:5.

4,871,849

1-METHYLAMINO-QUINOLINE-CARBOXYLIC ACID DERIVATIVES

István Hermecz; Géza Kereszturi; Lelle Vasvári; Ágnes Horváth, all of Budapest; Mária Balogh, Dunakeszi; Gábor Kovács, Budapest; Tamás Szűts, Budapest; Péter Rittl, Budapest; Judit Sipos, Budapest, and Anikó Pajor, Budapest, all of Hungary, assignors to Chinoin Gyógyszer és Vegyszeti Termékek Gyára Rt., Budapest, Hungary

PCT No. PCT/HU86/00067, § 371 Date Jun. 24, 1987, § 102(e) Date Jun. 24, 1987, PCT Pub. No. WO87/03586, PCT Pub. Date Jun. 18, 1987

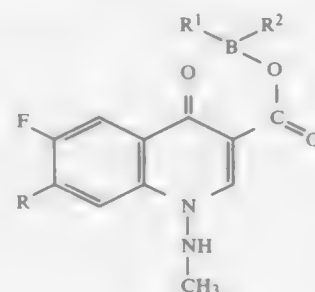
PCT Filed Dec. 9, 1986, Ser. No. 105,299

Claims priority, application Hungary, Dec. 9, 1985, 4691/85 Int. Cl.⁴ C07D 403/04

U.S. Cl. 544-229

5 Claims

1. A compound of the Formula (IV)



(IV)

wherein

R is piperazinyl or 4-methyl-piperazinyl;
R¹ and R² are each halogen, C₂ to C₆ aliphatic acyloxy

optionally substituted by halogen, or C₇ to C₁₁ aromatic acyloxy.

4,871,850

NEW TRIAZOLOPYRIMIDINES AND THEIR USE AS INITIATORS

Christian Lindner, Cologne; Dickoré Karitried, Leverkusen; Carikams Silling; Siegfried Korte, both of Odenthal, and Wolfgang Podszus, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 6, 1988, Ser. No. 141,875

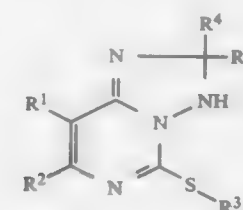
Claims priority, application Fed. Rep. of Germany, Jan. 16, 1987, 3701065; Jan. 28, 1987, 3702392

Int. Cl.⁴ C07D 487/04; C08F 4/00

U.S. Cl. 544-256

4 Claims

1. A 2,3-dihydro[1,2,4]triazolo[1,5-c]pyrimidine of the formula I



in which

R¹ denotes CN, C₁-C₉-alkylsulfonyl, C₆-C₁₂-arylsulfonyl or C₆-C₁₂-aryl,

R² denotes H, C₁-C₉-alkyl or C₁-C₉-alkylthio,

R³ denotes C₁-C₉-alkyl, C₇-C₁₃-aralkyl, propenyl or allyl,

R⁴ denotes C₁-C₉-alkyl, C₇-C₁₃-aralkyl or C₆-C₁₂-aryl and R⁵ denotes C₁-C₉ alkyl, C₇-C₁₂-aralkyl or C₆-C₁₂-aryl, or

R⁴ and R⁵, together with the carbon atoms which they substitute, denote a carbocyclic ring of the type selected from the group consisting of methylcyclohexane, trimethylcyclohexane, tetralene, fluorene and cyclopentane, wherein R⁴ is not methyl or aryl when R¹ is CN, R² is H, R³ is methyl and R⁵ is methyl or aryl.

4,871,851

CYANO-TRICHLORO-PYRIDO-PYRIMIDINE AND A PROCESS FOR PREPARING CYANO-TRICHLORO-PYRIDO-PYRIMIDINE

Gunther Beck, Leverkusen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 14, 1987, Ser. No. 132,502

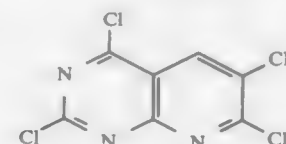
Claims priority, application Fed. Rep. of Germany, Dec. 19, 1986, 3643456

Int. Cl.⁴ C07D 471/04

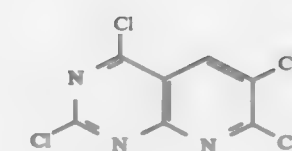
U.S. Cl. 544-279

8 Claims

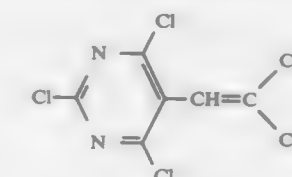
1. A cyano-trichloro-pyrido-pyrimidine of the formula



2. A process for the preparation of a cyano-trichloro-pyrido-pyrimidine of the formula



comprising heating a malodinitrile condensate of the formula



at a temperature of 100° to 300° C., with or without a catalyst, the process being carried out with the exclusion of moisture.

4,871,852

QUINOLINE-CARBOXYLIC ACID DERIVATIVES

Isao Hayakawa; Shogo Atarashi; Shuichi Yokohama, and Masazumi Imamura, all of Tokyo, Japan, assignors to Daiichi Seiyaku Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 808,720, Dec. 13, 1985, abandoned.

This application Nov. 27, 1987, Ser. No. 129,424

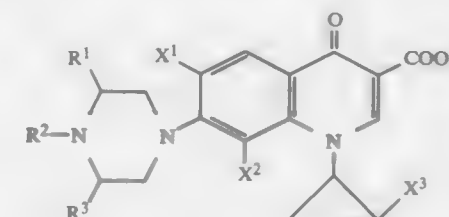
Claims priority, application Japan, Dec. 14, 1984, 59-264221; Feb. 26, 1985, 60-37008

Int. Cl.⁴ C07D 401/70

U.S. Cl. 544-363

3 Claims

1. A compound having the formula



wherein X¹ represents a fluorine atom, X² represents a fluorine or hydrogen atom, X³ represents a fluorine atom, and R¹ and R² each represents a hydrogen atom, and R³ represents a methyl group or an ethyl group, the quinoline moiety and the X³ moiety being bonded to cyclopropane in the cis configuration, and physiologically acceptable salt thereof.

4,871,853

AMINOPYRAZINONES

Beat Böhner, Binningen, and Willy Meyer, Riehen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 99,036, Sep. 21, 1987, Pat. No. 4,795,486.

This application Oct. 21, 1988, Ser. No. 260,643

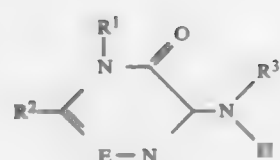
Claims priority, application Switzerland, Sep. 26, 1986, 3871/86

Int. Cl.⁴ C07D 241/18, 241/20

U.S. Cl. 544-408

2 Claims

1. A compound of the formula



in which E is =CR^4 , R^1 is C_1 - C_3 -halogeno-alkyl, C_1 - C_3 -alkoxy, C_1 - C_3 -halogenoalkoxy, C_1 - C_3 -alkylthio, C_1 - C_3 -alkylsulfinyl, C_1 - C_3 -alkoxyethoxy, C_1 - C_3 -alkylsulfonyl, halogen or $\text{-NR}^5\text{R}^6$, R^3 is hydrogen or C_1 - C_3 -alkyl, R^4 is hydrogen, C_1 - C_3 -alkyl, C_1 - C_3 -halogenoalkyl, C_1 - C_3 -alkoxy, cyclopropyl, C_1 - C_3 -halogenoalkoxy, C_1 - C_3 -alkylthio, C_2 - C_4 -alkoxyalkyl, C_3 - C_5 -dialkoxymethyl, halogen or $\text{-NR}^5\text{R}^6$ and R^5 and R^6 independently of one another are hydrogen or C_1 - C_3 -alkyl, with the proviso that R^3 is C_1 - C_3 -alkyl if R^1 is methyl, R^2 is hydrogen and E is the group =CCl- or =CH- .

4,871,854

CURE CATALYST FOR POLYURETHANES

Adolf E. Oberth, and Julius Rothenstein, both of Fair Oaks, Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C. Filed Jan. 28, 1982, Ser. No. 392,995
Int. Cl. 4 C07F 15/02

U.S. Cl. 546-7

3 Claims

1. A method for producing ferric-bis(acetylacetonato)oxinate which comprises combining a ferric halide, acetylacetone and 8-hydroxyquinoline in a molar ratio of 1:2:1, respectively, in a suitable liquid media, adding sufficient base to neutralize the resulting mixture and precipitate the product and recovering said product.

4,871,855

LIGAND-ACCELERATED CATALYTIC ASYMMETRIC DIHYDROXYLATION USING DIHYDROQUINIDINE AND DIHYDROQUINIDINE ESTERS AS LIGANDS

Istvan E. Marko, Arlington, and K. Barry Sharpless, Brookline, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation-in-part of Ser. No. 142,692, Jan. 11, 1988, abandoned. This application Feb. 23, 1988, Ser. No. 159,068
Int. Cl. 4 C07D 453/02

U.S. Cl. 546-134

3 Claims

1. An alkaloid derivative selected from the group consisting of:

- a. dimethylcarbamoyl dihydroquinidine
- b. benzoyl dihydroquinidine;
- c. 4-methoxybenzoyl dihydroquinidine;
- d. 4-chlorobenzoyl dihydroquinidine;
- e. 2-chlorobenzoyl dihydroquinidine;
- f. 4-nitrobenzoyl dihydroquinidine;
- g. 3-chlorobenzoyl dihydroquinidine;
- h. 2-methoxybenzoyl dihydroquinidine;
- i. 3-methoxybenzoyl dihydroquinidine;
- j. 2-naphthoyl dihydroquinidine;
- k. cyclohexanoyl dihydroquinidine;
- l. p-phenylbenzoyl dihydroquinidine;
- m. dimethylcarbamoyl dihydroquinine;
- n. benzoyl dihydroquinine;
- o. 4-methoxybenzoyl dihydroquinine;
- p. 4-chlorobenzoyl dihydroquinine;
- q. 2-chlorobenzoyl dihydroquinine;
- r. 4-nitrobenzoyl dihydroquinine;
- s. 3-chlorobenzoyl dihydroquinine;
- t. 2-methoxybenzoyl dihydroquinine;
- u. 3-methoxybenzoyl dihydroquinine;
- v. 2-naphthoyl dihydroquinine;
- w. cyclohexanoyl dihydroquinine; and
- x. p-phenylbenzoyl dihydroquinone.

4,871,856

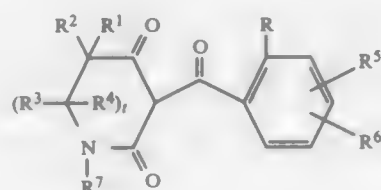
CERTAIN 3-BENZOYL-4-OXOLACTAMS

Jeff K. Curtis, Berkeley, Calif., assignor to Stauffer Chemical Company, Westport, Conn.
Division of Ser. No. 21,811, Mar. 13, 1987, Pat. No. 4,808,720, which is a continuation-in-part of Ser. No. 871,973, Jan. 9, 1986, abandoned. This application Nov. 7, 1988, Ser. No. 268,093
Int. Cl. 4 A01N 43/40

U.S. Cl. 71-94

31 Claims

1. The method of controlling undesirable vegetation comprising applying to the area where control is desired, an herbicidally effective amount of a compound having the formula



wherein

R is halogen; C_1 - C_2 alkyl; C_1 - C_2 alkoxy; nitro; cyano; C_1 - C_2 haloalkyl; or R^nSO_m wherein n is 0 or 2 and R^n is C_1 - C_2 alkyl;
 R^1 is hydrogen or C_1 - C_4 alkyl;
 R^2 is hydrogen or C_1 - C_4 alkyl; or
 R^1 and R^2 together are alkylene having 2-5 atoms;
 R^3 is hydrogen or C_1 - C_4 alkyl;
 R^4 is hydrogen or C_1 - C_4 alkyl; or
 R^3 and R^4 together are carbonyl; and
 R^5 and R^6 independently are (1) hydrogen; (2) halogen; (3) C_1 - C_4 alkyl; (4) C_1 - C_4 alkoxy; (5) trifluoromethoxy; (6) cyano; (7) nitro; (8) C_1 - C_4 haloalkyl; (9) R^bSO_m wherein m is the integer 0, 1 or 2; and R^b is (a) C_1 - C_4 alkyl; (b) C_1 - C_4 alkyl substituted with halogen or cyano; (c) phenyl; or (d) benzyl; (10) $\text{-NR}^c\text{R}^d$ wherein R^c and R^d independently are hydrogen or C_1 - C_4 alkyl; (11) $\text{R}^c\text{C}(\text{O})$ wherein R^c is C_1 - C_4 alkyl or C_1 - C_4 alkoxy; (12) $\text{-SO}_2\text{NR}^c\text{R}^d$ wherein R^c and R^d are as defined; or (13) $\text{-N(R}^c\text{C}(\text{O})\text{R}^d)$ wherein R^c and R^d are as defined;
 R^7 is C_1 - C_4 alkyl or phenyl; and
t is the integer 1 are as defined and their salts.

4,871,857

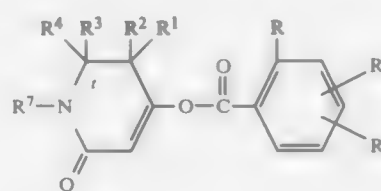
CERTAIN 3-BENZOYL-4-OXOLACTAMS

Jeff K. Curtis, Berkeley, Calif., assignor to Stauffer Chemical Company, Westport, Conn.
Division of Ser. No. 21,811, Mar. 13, 1987, Pat. No. 4,808,720. This application Nov. 7, 1988, Ser. No. 268,094
Int. Cl. 4 C07D 211/86

U.S. Cl. 546-220

1 Claim

1. An intermediate compound having the structural formula



wherein

R is halogen; C_1 - C_2 alkyl; C_1 - C_2 alkoxy; nitro; cyano; C_1 - C_2 haloalkyl; or R^nSO_m wherein n is 0 or 2 and R^n is C_1 - C_2 alkyl;
 R^1 is hydrogen or C_1 - C_4 alkyl;
 R^2 is hydrogen or C_1 - C_4 alkyl; or
 R^1 and R^2 together are alkylene having 2-5 carbon atoms;

4,871,859

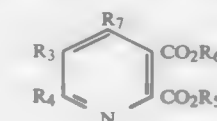
PROCESS FOR PREPARING PYRIDINE CARBOXYLIC ACID ESTERS

B. Franklin Gupton, Virginia Beach; James H. Rea, Portsmouth, both of Va., and Werner H. Mueller, East Greenwich, R.I., assignors to Hoechst Celanese Corporation
Filed Mar. 2, 1988, Ser. No. 163,252
Int. Cl. 4 C07D 213/08, 211/78

U.S. Cl. 546-250

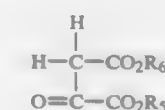
15 Claims

1. A method for the preparation of substituted and disubstituted pyridine-2,3-dicarboxylates of formula I:



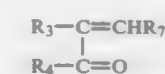
(I)

wherein R_3 is hydrogen, halogen, C_1 - C_6 straight or branched alkyl, alkenyl, phenyl R_4 and R_7 are each hydrogen, C_1 - C_6 straight or branched alkyl, alkenyl, phenyl, substituted-phenyl; and R_5 and R_6 are each C_1 - C_4 alkyl; comprising reacting a β -ketoester of formula II;



(II)

wherein R_5 and R_6 are defined above with an α,β -unsaturated aldehyde or ketone of formula III:



(III)

wherein R_3 , R_4 and R_7 are as described in formula I in the presence of at least 1 molar equivalent of an ammonium salt in a solvent in the presence of a dehydrogenation catalyst and at a temperature range of ambient temperature to the boiling point of the solvent until the reaction is essentially complete.

4,871,860

SYN-ISOMER OF

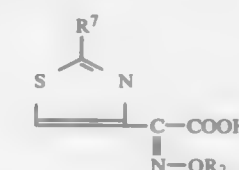
3,7-DISUBSTITUTED-3-CEPHEM-4-CARBOXYLIC ACID COMPOUNDS AND PROCESSES FOR THE PREPARATION THEREOF

Takao Takaya, Sakai; Takashi Masugi, Toyonaka; Hisashi Takasugi, Osaka, and Hiromu Kochi, Sakai, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan
Division of Ser. No. 525,499, Aug. 22, 1983, Pat. No. 4,804,752, which is a division of Ser. No. 401,976, May 21, 1979, which is a division of Ser. No. 767,700, Feb. 11, 1977, Pat. No. 4,166,115. This application May 31, 1984, Ser. No. 615,721
Claims priority, application United Kingdom, Apr. 12, 1976, 14916; Jun. 7, 1976, 23490; Japan, Oct. 19, 1976, 51-125826
Int. Cl. 4 C07D 277/46, 277/48

U.S. Cl. 548-195

15 Claims

1. A syn isomer of a compound having a formula selected from the group consisting of



and

R^3 is hydrogen or C_1 - C_4 alkyl;
 R^4 is hydrogen or C_1 - C_4 alkyl; or
 R^3 and R^4 together are carbonyl; and
 R^5 and R^6 independently are (1) hydrogen; (2) halogen; (3) C_1 - C_4 alkyl; (4) C_1 - C_4 alkoxy; (5) trifluoromethoxy; (6) cyano; (7) nitro; (8) C_1 - C_4 haloalkyl; (9) R^bSO_m wherein m is the integer 0, 1 or 2; and R^b is (a) C_1 - C_4 alkyl; (b) C_1 - C_4 alkyl substituted with halogen or cyano; (c) phenyl; or (d) benzyl; (10) $\text{-NR}^c\text{R}^d$ wherein R^c and R^d independently are hydrogen or C_1 - C_4 alkyl; (11) $\text{R}^c\text{C}(\text{O})$ wherein R^c is C_1 - C_4 alkyl or C_1 - C_4 alkoxy; or (12) $\text{-SO}_2\text{NR}^c\text{R}^d$ wherein R^c and R^d are as defined; and (13) $\text{-N(R}^c\text{C}(\text{O})\text{R}^d)$ wherein R^c and R^d are as defined;
 R^7 is C_1 - C_4 alkyl or phenyl; and
t is the integer 1.

4,871,858

METHOD OF PRODUCING FORMAMIDE COMPOUNDS

Hajime Matsushita, Yokohama; Makoto Shibasaki, Kawasaki, and Kyoko Takahashi, Tokyo, all of Japan, assignors to Japan Tobacco Inc., Tokyo, Japan

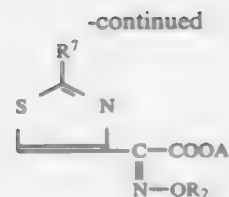
Filed Dec. 7, 1987, Ser. No. 129,663
Claims priority, application Japan, Dec. 11, 1986, 61-293468
Int. Cl. 4 C07D 401/04, 211/22; C07C 103/22, 103/37

U.S. Cl. 546-244

9 Claims

1. A method of producing a formamide compound in liquid phase comprising the steps of:

- (a) preparing a mixture containing (1) a solution of an amine reactant in dimethylformamide, and (2) a solid catalyst comprising a metal oxide selected from the group consisting of silica gel, titania, zirconia, alumina, silica alumina, and zeolite, said amine reactant being a member selected from the group consisting of an "alkyl amine having 2-10 carbon atoms, cycloalkylamine having 3 to 8 carbon atoms, dicyclohexylamine, phenylamine, naphthylamine, benzylamine, α -benzylamine, pyrrolidine, piperidine or nicotine";
 - (b) placing said mixture under formylation conditions for said amine reactant with said dimethylformamide to produce a formamide compound corresponding to said amine, said formylation conditions including heating said mixture at a temperature of 100°C . to 180°C ;
 - (c) removing said solid catalyst from said mixture; and
 - (d) separating the thus-produced formamide compound from the mixture.
3. A method of producing of formamide compound in gaseous phase, comprising the steps of:
- (a) heating a mixture of an amine reactant and dimethylformamide to a temperature sufficient to vaporize said mixture, said amine reactant being a member selected from the group consisting of an "alkyl amine having 2-10 carbon atoms, cycloalkylamine having 3 to 8 carbon atoms, dicyclohexylamine, phenylamine, naphthylamine, benzylamine, α -benzylamine, pyrrolidine, piperidine or nicotine";
 - (b) bringing said vaporized mixture into contact with a solid catalyst bed comprising a metal oxide selected from the group consisting of silica gel, titania, zirconia, alumina, silica alumina and zeolite to react said amine reactant with said dimethylformamide, thereby producing the corresponding formamide compound;
 - (c) cooling and condensing the gaseous mixture containing the produced formamide compound; and
 - (d) separating the thus-produced formamide compound from the condensate.



wherein R^7 is a protected amino group; R_2 is selected from the group consisting of carboxy (lower) alkyl and lower alkoxy carbonyl (lower) alkyl; and A is lower alkyl.

4,871,861

SUBSTITUTED 5-AMIDOTETRAZOLES

Eugene F. Rothgery, North Branford, and Steven A. Manke, Wallingford, both of Conn., assignors to Olin Corporation, Cheshire, Conn.

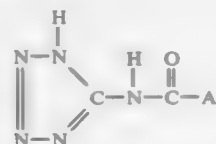
Filed Jul. 6, 1987, Ser. No. 70,454

Int. Cl.⁴ C07D 257/06

U.S. Cl. 548—251

4 Claims

1. Tetrazole compounds represented by the formula:



wherein

A represents NRR' ,

R represents a lower alkyl group, and

R' represents a lower alkyl group.

4,871,862

 α -SUBSTITUTED KETONITRONE DERIVATIVES

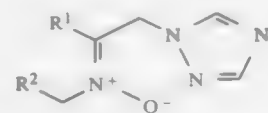
Vassil S. Georgiev, Penfield, and George B. Mullen, Avon, both of N.Y., assignors to Flisons Corporation, Rochester, N.Y. Continuation-in-part of Ser. No. 900,856, Aug. 27, 1986, Pat. No. 4,803,282. This application Oct. 6, 1988, Ser. No. 254,548

Int. Cl.⁴ C07D 249/08

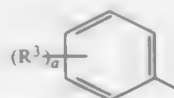
U.S. Cl. 548—262

8 Claims

1. A compound of the formula:



wherein; R^1 is selected from 2-naphthyl, 2-furanyl, 2-thienyl, and a phenyl radical of the formula:



wherein a is 1 or 2 and R^3 is selected from hydrogen, lower alkyl, lower alkoxy, halogen and combinations thereof, provided that the ortho position is hydrogen or fluorine, and R^2 is selected from hydrogen and phenyl.

4,871,863
II HALOGENATED BIS-IMIDE FLAME RETARDANTS
Mo A. Khuddus, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Feb. 1, 1988, Ser. No. 150,753

Int. Cl.⁴ C07D 209/48

U.S. Cl. 548—462

10 Claims

1. A process for enhancing the properties of a dried alkylene (C_1-C_6)-bis-(tetrabromophthalimide) or bis-(tetrabromophthalimide) product produced by the bromination, respectively, of alkylene(C_1-C_6)-bis-(phthalimide) or bis-(phthalimide) with a brominating agent in the presence of oleum, said process comprising curing the alkylene(C_1-C_6)-bis-(tetrabromophthalimide) or bis-(tetrabromophthalimide) product at a temperature above about 150° C. and below the melting point of the tetrabromophthalimide being cured for a period within the range of from about 36 hours to about 5 hours.

4,871,864

CARBAMOYLOXYTHIOPHENE FUNGICIDES

Werner Daum, Krefeld; Gerd Hünzler, Leverkusen, and Pieter Ooms, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany Division of Ser. No. 165,685, Mar. 9, 1988, Pat. No. 4,839,381, which is a division of Ser. No. 37,918, Apr. 13, 1987, Pat. No. 4,757,085. This application Feb. 13, 1989, Ser. No. 310,405

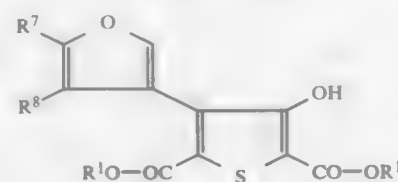
Claims priority, application Fed. Rep. of Germany, Apr. 24, 1986, 3613792

Int. Cl.⁴ C07D 409/00

U.S. Cl. 549—60

1 Claim

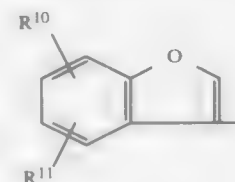
1. A hydroxythiophene derivative of the formula



in which

R^1 represents alkyl, alkoxyalkyl, alkylthioalkyl, fluoroalkyl, cyanoalkyl, alkenyl, alkynyl, or cycloalkyl,

R^7 and R^8 denote hydrogen or, together with the furyl radical to which they are bound, represent a benzofuryl radical of the formula



in which

R^{10} and R^{11} , independently of one another, denote hydrogen, halogen, alkyl or alkoxy.

4,871,865

TRICYCLIC AROMATIC COMPOUNDS

O. William Lever, Jr., Skillman, N.J., and Harry J. Leighton, Chapel Hill, N.C., assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Filed Aug. 7, 1986, Ser. No. 894,306

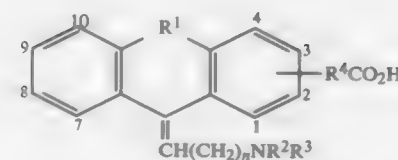
Claims priority, application United Kingdom, Aug. 17, 1985, 8521004

Int. Cl.⁴ C07D 313/12; C07C 87/459

U.S. Cl. 549—354

3 Claims

1. A compound of formula (I)



or a pharmacologically and pharmaceutically acceptable salt thereof; wherein R^1 is $-CH_2-O-$, R^2 and R^3 are the same or different and are each hydrogen or C_{1-4} alkyl, R^4 is a C_{1-2} bivalent hydrocarbon group and is joined to the aromatic ring system at the 2 position and n is 2.

4,871,866

LYSOCELLIN SOLIDS PURIFICATION PROCESS

Alexander H. T. Chu, and M. James Levi, both of Terre Haute, Ind., assignors to Pitman-Moore, Inc., Terre Haute, Ind.

Filed Aug. 24, 1987, Ser. No. 88,293

Int. Cl.⁴ C07D 407/00, 407/14

U.S. Cl. 549—414

19 Claims

1. A lysocellin purification process suitable for removing fatty acid and fatty acid ester salt impurities from lysocellin solids, consisting essentially of the steps of:

mixing lysocellin solids containing the impurities with sufficient halogen acid to convert the fatty acid ester salt impurities into water-soluble metal halogen salts and water-insoluble free fatty acids and to convert the lysocellin salts into water-soluble metal halogen salts and water-insoluble lysocellin acid;

separating the aqueous solution containing the halogen salts from the lysocellin acid and fatty acid solids;

mixing the lysocellin acid and fatty acid solids with sufficient caustic reagent to convert the free fatty acids into water-soluble alkali metal salts and to convert the lysocellin acid into a water-insoluble alkali metal lysocellin salts; and

separating the aqueous solution containing the water-soluble fatty acid alkali metal salts from the alkali metal lysocellin solids, thereby producing a purified lysocellin product containing greater than 90% alkali metal lysocellin and less than 10% impurities in the form of fatty acids and fatty acid ester salts.

4,871,867

PROCESS FOR PRODUCING A POLYGLYCIDYLAMINO COMPOUND

Toshio Hidaka, Hiratsuka, Japan, and Tetsuo Mizuno, Forest Hills, N.Y., assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Mar. 31, 1988, Ser. No. 176,180

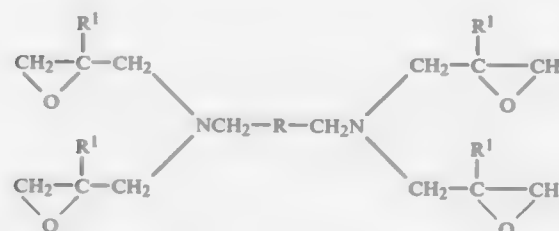
Claims priority, application Japan, Apr. 3, 1987, 62-81050

Int. Cl.⁴ C07D 301/27

U.S. Cl. 549—514

16 Claims

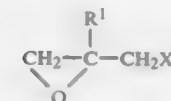
1. In a process for producing a polyglycidylamino compound represented by the general formula (I)



wherein R represents a phenylene group or cyclohexylene group and R^1 represents a hydrogen atom or methyl group, by reacting a diamine represented by the general formula (2)



(I) wherein R is as defined above, with an epihalohydrin represented by the general formula (3)



wherein R^1 is as defined above, and X represents a chlorine or bromine atom,

and then carrying out a dehydrohalogenation reaction of the reaction mixture; the improvement which comprises:

(I) reacting the diamine with an excess amount, based on the diamine, of an epihalohydrin in the presence of water and at a temperature not to exceed 60° C.,

(II) conducting a primary dehydrohalogenation reaction step in which the addition reaction mixture obtained in step (I) is reacted with a halogen-removing agent in the co-presence of at least one phase transfer catalyst,

(III) adding water to the product obtained in step (II), separating an organic phase from an aqueous phase, and distilling off unreacted epihalohydrin from the organic phase, (IV) washing the product obtained in step (III) with water, and

(V) subjecting the washed product to a secondary dehydrohalogenation reaction step in which the crude polyglycidylamino compound from step (IV) is reacted with a halogen-removing agent in the co-presence of at least one phase transfer catalyst,

(VI) washing the obtained reaction mixture with water, and recovering the desired polyglycidylamino compound.

4,871,868

PRODUCTION OF SUBSTITUTED ACETYLENIC COMPOUNDS

Yuzuru Saito, Takatsuki, and Kokichi Yoshida, Suita, both of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Mar. 3, 1988, Ser. No. 163,849

Claims priority, application Japan, Mar. 11, 1987, 62-56371

Int. Cl.⁴ C07D 309/12; C07C 33/042, 57/18

U.S. Cl. 549—416

7 Claims

1. A method of producing substituted acetylenic compounds which comprises: reacting an organic compound having the general formula of



(I)

wherein A represents a saturated or unsaturated aliphatic hydrocarbon residue of 1-20 carbon atoms which may have one or more substituents inactive in the reaction, and X represents a halogen atom or an arylsulfonyloxy group, with a metal acetylide having the general formula of



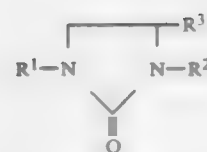
(II)

wherein M represents an alkali metal, and B represents (a) a hydrogen, (b) a saturated or unsaturated hydrocarbon residue which may have one or more substituents inactive in the reaction, or (c) a saturated or unsaturated hydrocarbon residue which has a substituent having the general formula of



(III)

wherein M represents an alkali metal, in the presence of an alkyl-2-imidazolidinone having the general formula of



wherein R^1 and R^2 independently represent a lower alkyl, and R^3 represents a hydrogen or a lower alkyl.

4,871,869

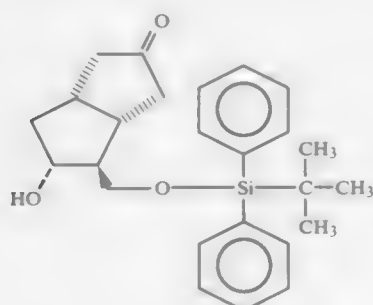
OPTICALLY ACTIVE BICYCLO[3.3.0]OCTANE AND PROCESSES FOR THE PREPARATION THEREOF
Kenji Mori, Tokyo, and Masahiro Tsuji, Saitama, both of Japan, assignors to Nissin Flour Milling Co., Ltd., Tokyo, Japan
Filed Jan. 4, 1989, Ser. No. 293,414
Claims priority, application Japan, Jan. 6, 1988, 63-339; Jan. 6, 1988, 63-340

Int. Cl.⁴ C07F 7/08

U.S. Cl. 556—436

3 Claims

1. An optically active (1R,5S,6S,7R)-6-tert-butyl-diphenylsilyloxymethyl-7-hydroxybicyclo[3.3.0]octan-3-one of formula (I)



4,871,870

IMMUNOMODULATORS AND METHOD OF MAKING SAME

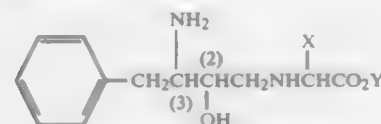
Sun H. Kim, Chestnut Hill, Mass., assignor to Biomeasure, Inc., Hopkinton, Mass.

Filed Mar. 16, 1987, Ser. No. 25,850
Int. Cl.⁴ C07C 101/30

U.S. Cl. 560—039

4 Claims

1. A compound having the formula:



or a pharmaceutically acceptable salt thereof, wherein X is H or an alkyl group having 1-6, inclusive, carbon atoms;

Y is a hydrogen atom, an alkyl group having 1-5, inclusive, carbon atoms, or an aralkyl group having 6-12, inclusive, carbon atoms;

carbon atom 2 is of the R configuration; and carbon atom 3 is of the R configuration.

(IV)

4,871,871
PROCESS FOR THE PREPARATION OF AROMATIC MONO- AND POLYISOCYANATES

Edward T. Shawl, Wallingford, and Haven S. Kesling, Jr., Drexel Hill, both of Pa., assignors to Arco Chemical Technology, Inc., Wilmington, Del.

Filed Nov. 3, 1988, Ser. No. 266,607
Int. Cl.⁴ C07C 71/00

U.S. Cl. 560—344

15 Claims

1. A process for the preparation of an aromatic mono- or poly-isocyanate having the formula:



wherein Ar is a mono-, di- or poly-valent aromatic radical which may be substituted with a halogen, ether, or nitro group or an alkyl group having from 1 to 10 carbon atoms and n is an integer of from 1 to 3 which comprises heating at a temperature within the range of from about 50° C. to about 220° C. an aromatic bis dialkyl urea having the formula



wherein Ar is as above described and R' and R'' which may be the same or different, are an alkyl group having from 1 to 10 carbon atoms which may be substituted or unsubstituted mono-, di-, or tri-valent radicals selected from saturated or monocyclic unsaturated straight or branched chain aliphatic or cycloaliphatic radicals and n is an integer of from 1 to 3, dissolved in or slurried in an organic solvent or mixture of solvents and in the presence of a tertiary amine hydrohalide as a promoter to convert the urea to the corresponding isocyanate, and thereafter separating and recovering the isocyanate.

4,871,872

2-[(2-AMINOACETYL)AMINO]ACETAMIDE DERIVATIVES

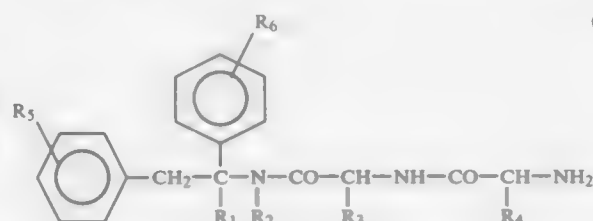
Ronald C. Griffith, Pittsford, N.Y., assignor to Fisons Corporation, Rochester, N.Y.

Filed Jan. 20, 1988, Ser. No. 145,866
Int. Cl.⁴ C07C 103/50

U.S. Cl. 564—157

6 Claims

1. A compound having the formula:



wherein R_1 , R_2 , R_3 and R_4 are hydrogen or methyl and where R_5 and R_6 are independently selected from hydrogen or fluorine.

4,871,873

PROCESS FOR SYNTHESIS OF ARYLGLYOXAL ARYLIMINES

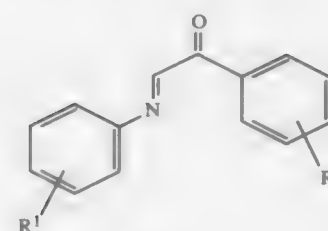
Richard Desmond, Metuchen; Sander G. Mills, Woodbridge; Ralph P. Volante, East Windsor, and Ichiro Shinkai, Westfield, all of N.J., assignors to Merck & Company Incorporated, Rahway, N.J.

Filed Mar. 18, 1988, Ser. No. 169,649
Int. Cl.⁴ C07C 131/00

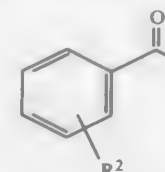
U.S. Cl. 564—276

14 Claims

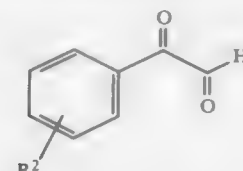
1. A process for preparing the 1,2-iminoketone



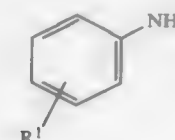
comprising the steps of
(a) contacting the arylketone



wherein R^2 is H, C_1 - C_4 linear or branched alkyl, C_6 - C_8 aryl, benzyl, nitro, halo, trifluoromethyl, C_1 - C_4 linear or branched alkoxy or C_6 - C_8 aryloxy, with aqueous HBr in DMSO solvent, at a temperature in the range of 50° to 150° C., thereby evolving DMS gas, for a sufficient time to substantially form the glyoxal II:



(b) contacting said glyoxal II from step a) with an aromatic amine III:



where R^1 is hydrogen, C_1 - C_4 linear or branched alkyl, C_6 - C_8 aryl, benzyl, nitro, halo, trifluoromethyl, C_1 - C_4 linear or branched alkoxy or C_6 - C_8 aryloxy, to form said 1,2-iminoketone.

4,871,875

PROCESS FOR PRODUCING DIPHENYLAMINES OR N,N'-DIPHENYLPHENYLENEDIAMINES

Teruyuki Nagata; Akihiro Tamaki; Nobuyuki Kajimoto, and Masaru Wada, all of Ohmura, Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Continuation of Ser. No. 903,427, Sep. 4, 1986, abandoned, which is a division of Ser. No. 710,662, Mar. 12, 1985, abandoned. This application Sep. 14, 1988, Ser. No. 246,014
Claims priority, application Japan, Mar. 14, 1984, 59-47119; Mar. 27, 1984, 59-57339; Jul. 6, 1984, 59-138894

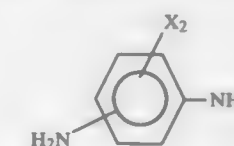
The portion of the term of this patent subsequent to Feb. 14, 2006, has been disclaimed.

Int. Cl.⁴ C07C 85/06, 85/08, 87/58

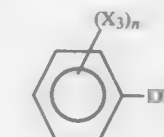
U.S. Cl. 564—402

4 Claims

(I) 1. Process for producing an N,N'-diphenylphenylenediamine from a phenylenediamine and a phenol which comprises heat-reacting a reaction system at 130° to 350° C. in the presence of a platinum group hydrogen transfer catalyst supported on a carrier, said reaction system being obtained by charging into a reaction vessel a phenylenediamine of the formula:



wherein X_2 is a member selected from the group consisting of hydrogen and a lower alkyl group, a phenol of the formula:



wherein X_3 is a member selected from the group consisting of a lower alkyl group and a lower alkoxy group, and n is an integer from 0 to 2, in an amount of 4 to 20 moles per mole of said phenylenediamine, and a cyclohexanone corresponding to the phenol in an amount of at least 0.5 mole per mole of said phenylenediamine, and causing a reaction of the phenylenediamine and the cyclohexanone to form a Schiff base, a dehydrogenation reaction of the resultant Schiff base to form an N,N'-diphenyl-phenylenediamine and a reaction of the phenols with a hydrogen from the dehydrogenation of the Schiff base to form a cyclohexanone to be carried in the same reaction vessel simultaneously in parallel thereby to complete the reaction into the N,N'-diphenylphenylenediamine.

4,871,876

PREPARATION OF 4,4' DICHLORODIPHENYL SULFONE

Gerhard Schaefer, Heidelberg, and Peter Neumann, Wiesloch, both of Fed. Rep. of Germany, assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Jan. 25, 1988, Ser. No. 147,759

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1987, 3704932

Int. Cl.⁴ C07C 147/06

U.S. Cl. 568—34

8 Claims

1. A process for the preparation of 4,4'-dichlorodiphenyl sulfone which comprises heating a mixture of (a) chlorobenzene, (b) chlorosulfonic acid or sulfur trioxide, and (c) thionyl chloride or phosgene to provide a molten reaction mixture at temperatures of from 165° C. upto 220° C., employing more than the stoichiometric amount, based on the amount of chlorobenzene, of chlorosulfonic acid or sulfur trioxide and less than the stoichiometric amount of thionyl chloride or phosgene.

4,871,874

PROCESS FOR PRODUCING DIENES

Joachim W. Wolfram, Houston, Tex., assignor to Ethyl Corporation, Richmond, Va.

Filed Jun. 15, 1987, Ser. No. 62,161
Int. Cl.⁴ C07C 87/29

U.S. Cl. 564—288

23 Claims

1. A process of producing alkadiene which comprises reacting alkenyltrialkylammonium halide in which the double bond is allylic or homoallylic relative to the nitrogen atom with a strong inorganic base in the presence of a phase transfer catalyst in a reaction medium composed of inert hydrocarbon and water so that alkadiene and trialkylamine are formed.

4,871,877

GEM-DISUBSTITUTED CYCLOHEXADIENONES AND THEIR PRODUCTION

G. Patrick Stahly, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed May 20, 1988, Ser. No. 196,680

Int. Cl.⁴ C07C 49/675, 45/71

U.S. Cl. 568—326

46 Claims

1. A process which comprises reacting under essentially anhydrous conditions a quinone with a perfluoroalkyltrihydrocarbylsilane in the presence of a catalyst and a proton source so that a gem-disubstituted cyclohexadienone is produced.

4,871,878

LOW PRESSURE RHODIUM CATALYZED HYDROFORMYLATION OF OLEFINS

Thomas A. Puckette, and Thomas J. Devon, both of Longview, Tex., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 83,330, Aug. 10, 1987, abandoned. This application Jul. 27, 1988, Ser. No. 225,103

Int. Cl.⁴ C07C 45/50

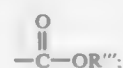
U.S. Cl. 568—454

19 Claims

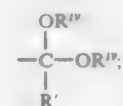
1. A method for the hydroformylation of unsaturated compounds to product aldehydes, wherein said unsaturated compounds are selected from the group consisting of:

C₂ up to C₂₀ mono-olefins, non-conjugated polyolefins, and substituted derivatives thereof, wherein the substituted derivatives contain one or more of the substituents selected from the group consisting of:

—OH,
—OR^{''}; wherein R^{''} is C₁ up to C₂₀ alkyl, aryl, alkaryl, alkaryl, or acyl radical,



wherein R''' is a C₁ up to C₂₀ alkyl, aryl, alkaryl or alkaryl radical,

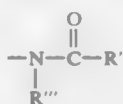


wherein R' is independently selected from H, C₁ up to C₁₂ alkyl radicals or substituted alkyl radicals, and C₆ up to C₁₂ aryl radical or substituted aryl radicals, and each R'' is independently selected from the members defined by R', where the R'' groups can be joined together to form a cyclic acetal or ketal,

—SR^{''}; wherein R^{''} is as defined above, and



wherein R''' is as defined above, said method comprising contacting at least one of said olefins with a soluble rhodium catalyst complexed with at least one phosphine compound having the following generic formula



wherein Ar is an aromatic ring having 6–14 carbon atoms;

each Z is independently:

a C₁ up to C₁₂ alkyl radical or substituted alkyl radical;
a C₆ up to C₁₂ aryl radical or substituted aryl radical;
a C₇ up to C₁₂ alkaryl or alkaryl radicals or substituted alkaryl or alkaryl radicals;

a halogen (except Cl, Br or I in the ortho position);

—OR or —CO₂R, wherein R is Z;

—SO₃ M, wherein M is H, an alkali metal or a quaternary ammonium moiety of the formula NR₄⁺, wherein each R⁺ is independently a C₁–C₂₀ alkyl, aryl, alkaryl or alkaryl moiety;

and wherein x is a whole number which varies in the range of 0 up to 4 when Ar is phenyl, 0 up to 6 when Ar is naphthyl and 0 up to 8 when Ar is phenanthryl or anthracenyl,

in the presence of hydrogen and carbon monoxide at a temperature in the range of 0 up to 190° C., an absolute pressure of hydrogen plus carbon monoxide within the range of about 15 up to 1500 psia, and a reactant space velocity in terms of volumes of reactant gas per volume of catalyst in the range of 1 up to 1000 standard cubic feet per minute.

4,871,879

RHODIUM RECOVERY FROM HYDROFORMYLATION REACTION PRODUCT

Keith A. Laird, Pampa, Tex., assignor to Hoechst Celanese Corporation, Somerville, N.J.

Filed Oct. 27, 1987, Ser. No. 114,171

Int. Cl.⁴ B01D 3/34; C07C 45/50

U.S. Cl. 568—454

10 Claims

1. In a process for catalytically hydroformylating propylene by the following steps: (a) reacting said propylene with carbon monoxide and hydrogen in the presence of a liquid reaction medium containing as the hydroformylation catalyst a complex of rhodium with a triorganophosphine to produce a liquid reaction mixture comprising triorganophosphine, butyraldehyde, and reaction by-products; (b) stripping said liquid reaction mixture by gas stripping, distillation, or evaporation during the course of said hydroformylation reaction to remove a vapor stream comprising said butyraldehyde and said hydroformylation catalyst overhead from said reaction mixture; (c) condensing said vapor stream and recovering a crude product condensate comprising said butyraldehyde; (d) distilling said condensate to form a distillate comprising the bulk of said butyraldehyde from said condensate and a residue comprising a crude reaction heavy ends mixture containing a minor amount of said butyraldehyde; and (e) distilling said crude reaction heavy ends mixture into (1) an overhead stream comprising those components of the crude reaction heavy ends mixture which are more volatile than said triorganophosphine and (2) a residue stream comprising those components of the crude reaction heavy ends mixture which are equal to or lower than said triorganophosphine in volatility and including any rhodium moiety initially contained in said vapor stream, the improvement which comprises:

prior to step (e), stripping said residue containing said crude reaction heavy ends mixture obtained from step (d) with nitrogen gas to remove therefrom said minor amount of butyraldehyde.

4,871,880

HYDROFORMYLATION PROCESS

Toshihiro Omatsu; Yasuo Tokitoh, and Noriaki Yoshimura, all of Kurashiki, Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Filed May 26, 1988, Ser. No. 198,860

Claims priority, application Japan, Jul. 22, 1987, 62-184135

Int. Cl.⁴ C07L 45/50

U.S. Cl. 568—454

8 Claims

1. A hydroformylation process which comprises reacting a compound of the formula



wherein x is a hydroxyl or formyl group and A is a group of the formula



in which n is an integer of 3–8 and m is an integer of 0–5, with a mixture of hydrogen and carbon monoxide in the presence of a rhodium compound and a tris (substituted phenyl) phosphite having an electronic parameter value (ν-value) of 2080–2090 cm⁻¹ and a steric parameter value (θ-value) of 135°–190°, within the temperature range 40°–140° C. and the pressure range 30–150 atmospheres (absolute).

4,871,881

HYDROLYSIS OF ACTIVATED OLEFINIC KETONES AND ALDEHYDES

Joseph E. Dolfini, and Jerome Glika, both of Cincinnati, Ohio, assignors to Mallinckrodt, Inc., St. Louis, Mo.

Division of Ser. No. 123,137, Nov. 20, 1987, which is a continuation-in-part of Ser. No. 10,902, Feb. 4, 1987, Pat. No. 4,709,098. This application Feb. 21, 1989, Ser. No. 313,025

Int. Cl.⁴ C07C 45/42

U.S. Cl. 568—491

6 Claims

1. A method of hydrolyzing an activated olefin to produce a carbonyl-containing compound comprising: reacting an acyclic olefin selected from the group consisting

of 1,2-dibenzoyl ethylene, 4-phenyl-3-buten-2-one and 3-decen-2-one at substantially neutral pH in the presence of water, and heating at a pressure of about 225 to about 2000 psi sufficient to effect said hydrolysis reaction.

4,871,882

PROCESS FOR THE PREPARATION OF DECABROMODIPHENYL ETHER WITH IMPROVED THERMAL STABILITY

Hyman Stollar; Khaim Khariton; Mark Grinberg, and Eva Ellmann, all of Beer-Sheva, Israel, assignors to Bromine Compounds Limited, Israel

Filed Oct. 13, 1987, Ser. No. 107,959

Claims priority, application Israel, Oct. 22, 1986, 80391

Int. Cl.⁴ C07C 41/20

U.S. Cl. 568—639

6 Claims

1. A process for the preparation of decabromodiphenyl ether comprising brominating one or more aromatic compounds selected from the group consisting of diphenyl ether and the partially brominated derivatives thereof in a reaction mixture including bromine, a bromination catalyst selected from the group consisting of aluminum, AlCl₃ and AlBr₃ and dibromomethane, whereby said decabromodiphenyl ether is produced having improved thermal stability.

ELECTRICAL

4,871,883

ELECTRO-MAGNETIC SHIELDING

Eric Guiol, Pleinfeld, Fed. Rep. of Germany, assignor to W. L. Gore & Associates, Inc., Newark, Del.

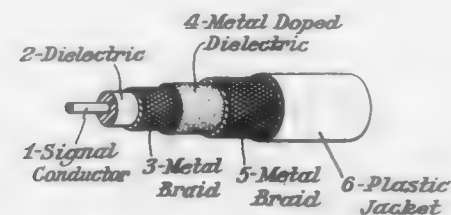
Filed Jul. 23, 1987, Ser. No. 76,623

Claims priority, application Fed. Rep. of Germany, Jul. 29, 1986, 3625631

Int. Cl.⁴ H01B 7/34

U.S. Cl. 174—36

5 Claims



1. An electro-magnetic shielded cable comprising at least one signal conductor surrounded by at least two shielding layers, wherein said first shielding layer formed by an electrical conductor in the form of a metal braid and a second shielding layer formed by a flexible, electrically non-conductive layer of polytetrafluoroethylene (PTFE) doped with non-magnetic metal particles.

4,871,884

ELECTRICAL CONNECTING BOX

Hideharu Hayashi, Shizuoka, Japan, assignor to Yazaki Corporation, Tokyo, Japan

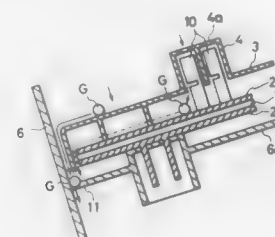
Filed Apr. 20, 1988, Ser. No. 183,951

Claims priority, application Japan, Apr. 22, 1987, 62-59858[U]

Int. Cl.⁴ H05K 5/00

U.S. Cl. 174—52.1

4 Claims



1. In an electrical connecting box comprising a box body and a bus bar circuit board provided in said box body, the improvement wherein:

said bus bar circuit board defines a sloped surface having an angle of inclination from a horizontal plane, which is parallel to a horizontal road, wherein said electrical connecting box further comprises a top plate disposed over said bus bar circuit board, said top plate have a portion disposed transverse to said bus bar circuit board and forming a gap between said transverse portion and said bus bar circuit board; and

at least one water discharge hole for discharging from said electrical connecting box water droplets falling on said bus bar circuit board and flowing down said sloped surface is formed in the bottom plate of said box body directly below said gap between said transverse portion and said bus bar circuit board.

4,871,885

COMBINED PUSH AND SLIDE SWITCH ASSEMBLY

Soetsu Kamada, Furukawa, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

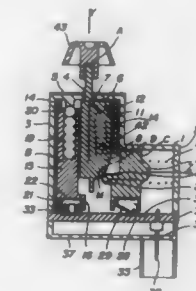
Filed Jan. 11, 1989, Ser. No. 295,952

Claims priority, application Japan, Mar. 30, 1988, 63-41073

Int. Cl.⁴ H01H 9/00, 13/50, 15/00

U.S. Cl. 200—5 R

4 Claims



1. A combined push and slide switch assembly comprising: a case having a front end and a rear end, said rear end having fixed first and second patterns contact; a first slider provided in said case and slidable in a first direction and a second direction within said case, said first slider having a cam at a rear end and portion thereof; an operating knob fixed to a front end of said first slider projectig outside said case; a second slider provided in said case and loosely fitted to said first slider in such a manner as to permit the sliding movement of only said first slider in said second direction, and permitting said second slider to be moved together with said first slider in said first direction; a first contactor provided in said second slider for effecting an operation of a slide switch; a first resilient member interposed between said first slider and said second slider to bias said first slider toward said front end of said case; a third slider provided in said case and moveable in a third direction different from both said first direction and said second direction, said third slider having an engageable portion engageable with said cam of said first slider; a second contactor provided in said third slider for effecting an operation of a push switch; and a second resilient member interposed between said third slider and said case for biasing said engageable portion of said third slider against said cam; wherein when said operating knob is moved in said first direction to slide said first slider in the first direction, said second slider is slidable together with said first slider to slide said first contactor to said engage first fixed contact patterns on said rear end of said case, thereby effecting the operation of said slide switch; further, when said operating knob is pushed against a biasing force of said first resilient member to move said first slider in said second direction, said cam of said first slider is brought into engagement with said engageable portion of said third slider against a biasing force of said second resilient member to move said third slider in said third direction and thereby sliding said second contactor in the third direction to engage said second fixed contact pattern of said rear end of said case, thereby effecting the operation of said push switch.

4,871,886

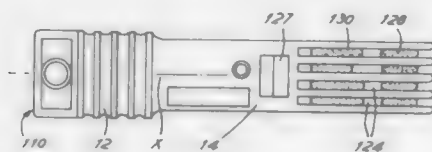
ELECTRONIC KEY AND RECEPTACLE THEREFOR
John E. Vaughan; David R. Smaile; Bernard Patry, all of Felixstowe, and John C. Heston, Ipswich, all of England, assignors to Schlumberger Industries Limited, Farnborough, England
Filed Jan. 13, 1987, Ser. No. 61,372

Claims priority, application United Kingdom, Jun. 16, 1986, 8614621; Oct. 27, 1986, 8625675

Int. Cl.⁴ H01R 31/08

U.S. Cl. 200—43.05

19 Claims



1. In combination, an electronic key-like device containing an electronic circuit, and a receptacle for receiving the device and establishing electrical contact with the electronic circuit, wherein:

the device comprises a head portion, and a body portion adapted to be inserted into the receptacle in a given direction, the body portion comprises guide means extending parallel to the direction of insertion of the body portion and a plurality of electrical contacts which are electrically connected to respective circuit points in the electronic circuit, the body portion being elongate in the direction of insertion, and the body portion having a first pair of oppositely disposed side surfaces interconnected by a second pair of oppositely disposed side surfaces whose width, perpendicular to the direction of insertion, is significantly less than that of the first pair, and said body portion having a recess disposed on one side surface of the first pair; the receptacle includes a keyway shaped to receive the body portion of the device means arranged to co-operate with the guide means on the body portion to guide the body portion into the keyway during insertion, and a plurality of electrical contacts each positioned to contact a respective one of the device contacts when the body portion is fully inserted into the keyway; the receptacle and the body portion are provided with respective cooperating locating means which engage with each other when the body portion is fully inserted into the keyway, said locating means on said body portion comprising said recess and said locating means on said receptacle comprising a projection which fits into said recess, and the receptacle further includes biasing means arranged to bias said body portion towards one side of the keyway on insertion, the receptacle locating means being disposed on said one side of the keyway.

4,871,887

FLUID-ACTUATED PRESSURE SWITCH FOR AN AUTOMATIC TRANSMISSION

Thomas D. Nogle, Troy, Mich., assignor to Chrysler Motors Corporation, Highland Park, Mich.

Filed Apr. 29, 1988, Ser. No. 188,605

Int. Cl.⁴ H01H 35/34

U.S. Cl. 200—83 R

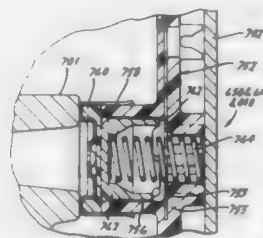
3 Claims

1. A fluid-actuated pressure switch assembly for indicating the absence or presence of a predetermined fluid pressure, said assembly comprising:

a housing having means forming a bore and abutting an opening of a fluid passageway of a transmission; electrical contact means disposed within the housing at one end of the bore which conducts a flow of electrical current from an electrical current source upon being closed and prevent current flow upon being open; cup means disposed within the bore between the contact means and the opening of the fluid passageway and being

movable in response to a fluid pressure from a fluid pressure source in the fluid passageway of the transmission for opening and closing said contact means;

diaphragm means disposed at the other end of the bore between the housing and the opening of the fluid passageway and being flexible to deform in response to fluid pressure for moving said cup means and for preventing fluid contamination of said contact means; and



including a retainer having aperture means for passing fluid therethrough disposed at the other end of the bore about the diaphragm and retaining said diaphragm to said housing to provide a leakage path to eliminate air trapped within the fluid; and

biasing means disposed with the bore between the cup means and the housing for biasing the cup means away from the contact means in the absence of a predetermined fluid pressure.

4,871,888

TUBULAR SUPPORTED AXIAL MAGNETIC FIELD INTERRUPTER

Ernest F. Bestel, 10584 W. Cortez Circle, Franklin, Wis. 53132

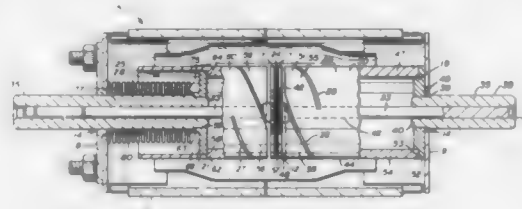
Continuation-in-part of Ser. No. 156,251, Feb. 16, 1988, Pat. No.

4,839,481. This application Jun. 29, 1988, Ser. No. 213,040

Int. Cl.⁴ H01H 33/66

U.S. Cl. 200—144 B

11 Claims



1. A vacuum interrupter, comprising:

a first electrode structure disposed in a vacuum vessel, said first electrode structure having a main electrode;

a second electrode structure disposed within the vacuum vessel, said second electrode structure having a main electrode;

means for moving at least one of said first and second electrode structures axially of the other;

means for generating an axial magnetic field about the main electrodes of said first and second electrode structures, said field generating means minimizing radial components of the magnetic field to enhance uniformity of distribution of current arcing between the main electrodes when said first and second electrode structures are parted, wherein said generating means includes a support rod attached to the main electrode of said first electrode structure and extending through said first electrode structure.

4,871,889

ARCING CONTACT ASSEMBLY FOR A CIRCUIT BREAKER

David A. Leone, and Clifford A. Buxton, both of Lawrenceville, Ga., assignors to Siemens Energy & Automation, Inc., Atlanta, Ga.

Filed Sep. 21, 1988, Ser. No. 247,462

Int. Cl.⁴ H01H 33/12

U.S. Cl. 200—146 R

12 Claims



1. A circuit breaker comprising:

at least three stationary contacts for carrying current;

at least three movable contacts for carrying current;

at least three pivoting contact arms each defining a first end, wherein each arm carries one movable contact at the first end;

at least two arc carrying leads each defining a first end and a second end, wherein the first ends are joined to form a contact surface and each of the second ends is positioned adjacent to a pivoting contact arm and each of the second ends is separated from an adjacent second end by the first end of a pivoting contact arm; and

means for pivotally attaching the second ends of the arc carrying leads at the first ends of the pivoting contact arms.

4,871,890

EASILY ASSEMBLEABLE PUSH-BUTTON SWITCH

Ricardo R. Herrera, C. Pi i Margall, 165 08830 Sant Boi De Llobregat, Barcelona, Spain

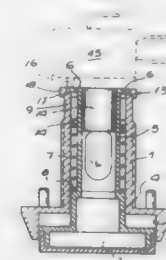
Filed Mar. 25, 1988, Ser. No. 173,421

Claims priority, application Spain, Mar. 25, 1987, 8700825

Int. Cl.⁴ H01H 9/16

U.S. Cl. 200—314

3 Claims



1. A switch, comprising

a button,

a casing in which said button is seated, at least part of said casing being formed into a substantially tubular body,

a driver coupled to said button and at least partially mounted in said tubular body for axial displacement therein,

a socket body mounted to extend within said tubular body from an end thereof opposite said button,

wherein said socket body comprises at least one opening and said tubular body comprises at least one leg at said end thereof opposite said button which is coupled to said

socket through said opening when said switch is assembled, and

said socket body comprises at least one notch and said tubular body comprises at least one projection extending from said end thereof opposite said button and situated to seat within said notch when said switch is assembled, a microswitch mounted on said socket body, means for biasing said driver away from said microswitch, wherein said driver additionally comprises a sleeve or neck connected to said button and defining an outer annular seat at one end of said driver, and a pair of legs mounted upon said sleeve or neck and extending away from said button, each said leg having a bent vane or tab on an end thereof remote from said sleeve or neck, and said biasing means comprise a helical spring mounted at one end thereof on said outer annular seat and, prior to assembly of said driver into said tubular body, mounted at an opposite end thereof on said bent vanes or tabs.

4,871,891

MICROWAVE OVEN PROVIDING DEFROSTING CONTROL

Michel Steers, La Queue-en-Brie; Jean-Pierre Hazan, Sucy-en-Brie, and Gilles Delmas, Paris, all of France, assignors to U.S. Philips Corporation, New York, N.Y.

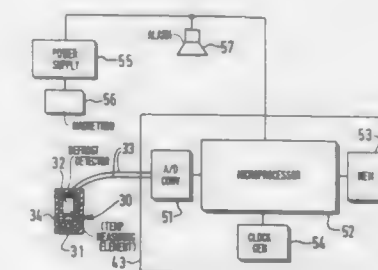
Filed Jun. 2, 1988, Ser. No. 202,160

Claims priority, application France, Jun. 2, 1987, 87 07684; Oct. 20, 1987, 87 14441

Int. Cl.⁴ H05B 6/68

U.S. Cl. 219—10.55 B

13 Claims



1. A microwave oven which provides controlled defrosting of frozen products, comprising a microwave source and a detector arranged in the oven cavity in the proximity of a given frozen product to be defrosted, the detector including a material which absorbs microwave energy, the absorption of microwave energy by the detector and by the given product causing their temperatures to rise so as to defrost said product, variations in the detector temperature being measured by a measuring element producing an electrical signal which varies in accordance with such temperature variations; characterized in that:

said oven comprises a computing and control device connected to said temperature measuring element for determining from the variations of said electrical signal with time when defrosting of the given product has been completed; and

said detector has a heat exchange characteristic with its environment such that the temperature rise thereof during defrosting of said given product is substantially the same as the temperature rise thereof during defrosting of each of a plurality of frozen products successively individually placed in said oven for defrosting.

4,871,892

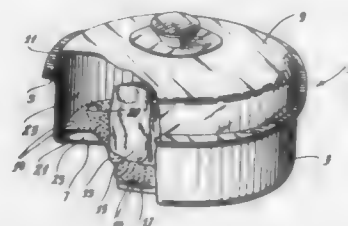
COOKING UTENSIL USEFUL FOR ASSURING DESTRUCTION OF HARMFUL BACTERIA DURING MICROWAVE COOKING OF POULTRY AND OTHER FOODS

Dean A. Samford, Chrisman, Ill., assignor to General Housewares Corporation, Stamford, Conn.

Filed Dec. 22, 1988, Ser. No. 288,465
Int. Cl.⁴ H05B 6/80

U.S. Cl. 219—10.55 E

19 Claims



1. A microwave cooking utensil useful for assuring destruction of harmful bacteria occurring in cooking liquids during the cooking of poultry in a microwave oven, said utensil including:

an outer container made of microwave reflective material, a microwave transmissive steam-confining cover enclosing said outer container,

a rack for supporting, essentially in contact thereon, a chicken or other food product, said rack being made of heat-conductive, microwave-reflective material, means for supporting said rack above the bottom surface of said container with the upper surface of said rack being spaced above said bottom surface, said rack and said bottom surface defining a chamber for said cooking liquids,

a set of apertures in said upper surface, each aperture in said set being large enough to permit the passage of microwave energy therethrough, said set of apertures having a total area large enough to permit passage therethrough, during a normal poultry cooking cycle, of sufficient microwave energy to pasteurize said harmful bacteria present in said cooking liquids, and small enough so that the microwave energy passing therethrough is not great enough to prevent condensation of said cooking liquids within said chamber,

whereby the user is protected from the threat of bacterial ingestion and infection from said cook liquids.

4,871,893

SLIDE CONTROL SWITCH

Michael J. Slovak; Raymond T. Griffin, both of San Antonio, Tex., and Steven R. Carson, Upper Saddle River, N.J., assignors to Lightolier, Inc., Secaucus, N.J.

Filed Jul. 29, 1988, Ser. No. 226,077

Int. Cl.⁴ H01H 15/00; H02G 13/14; H05K 15/03

U.S. Cl. 200—16 R

3 Claims

1. An electrical control switch for providing from an external power source a variable power input comprising:

housing means,

a printed circuit board including a fixed contact located in said housing means;

control circuit mounted within said housing means and at least partially mounted on said printed circuit board, said control circuit providing said variable power output and including:

(a) a linearly actuated device mounted on said printed circuit board;

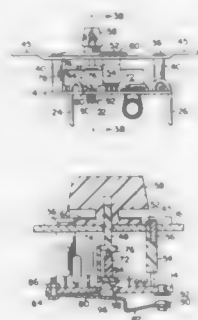
(b) a slide member boss on said linearly actuated device; and

(c) an actuator contact arm mounted on said printed circuit board, said actuator contact arm engaging said slide member boss to move said actuator contact arm into and out of contact engagement with said fixed contact

thereby connecting said external power source to said control circuit;

a strap enclosing said housing means and having mounting means for electrical control switch thereon;

a slide knob with a baffle plate for moving parallel to said



strap, said slide member engaging said slide knob through said strap for slidable movement of said slide knob and said slide member; and

a face plate over said strap with said slide knob extending therethrough, said face plate holding said slide knob in engagement with said slide member.

4,871,894

METHODS AND APPARATUS FOR MANUFACTURING PISTON RODS

Massami Suzuki, Tokyo, and Hiroyasu Kotzumi, Kanagawa, both of Japan, assignors to Nihon Radiator Co., Ltd., Tokyo, Japan

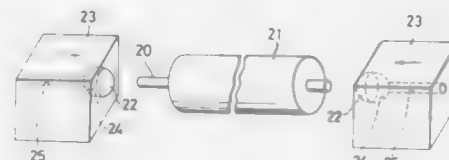
Filed Aug. 14, 1987, Ser. No. 85,969

Claims priority, application Japan, Aug. 25, 1986, 61-198856; Jan. 14, 1987, 62-7186; Jan. 14, 1987, 62-7187; Jan. 14, 1987, 62-3979[U]

Int. Cl.⁴ B23K 9/28

U.S. Cl. 219—93

20 Claims



1. A method for producing a piston rod wherein a ball is fixed on each end surface of a rod through projection welding comprising providing a first electrode, placing a ball in said first electrode, providing a second electrode, placing said rod in said second electrode, relatively moving said first and second electrodes to bring a ball into contact with one end of said rod, wherein said end has a reduced cross-sectional area, then providing a first electric current to flow between said first and second electrodes whereby the ball and the rod are projection welded in the zone of mutual contact, and then extracting said now welded ball and rod from the respective electrodes.

4,871,895

METHOD AND APPARATUS FOR WELDING A NEW STUD ON TO THE END OF A BROKEN OFF STUD AND NEW STUD

Gary N. Preston, P.O. Box 582, Okmulgee, Okla. 74447

Filed Sep. 30, 1988, Ser. No. 251,333

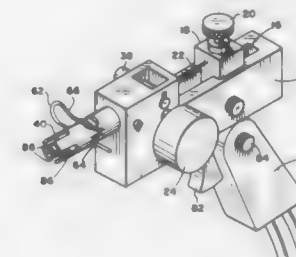
Int. Cl.⁴ B23K 9/20

U.S. Cl. 219—99

7 Claims

5. A method for welding a new stud onto the end of broken-

off stud which comprises placing the new stud in abutting relation with the end of broken-off stud and in axial alignment therewith, inserting a coated welding rod through a longitudinal bore in said new stud, providing a second bore of larger diameter than said first bore at the forward end of the new stud, providing slots on opposite sides of the new stud in the



area of the second bore, connecting a high frequency voltage between a metallic core of the welding rod and the broken-off stud to initiate a welding arc, subsequently connecting a d.c. welding current between the core of the rod and the broken-off stud and moving the welding rod through the new stud and towards the broken-off stud simultaneously with the connection of the d.c. welding current.

4,871,896

PROCESS AND DEVICE TO ENHANCE SYSTEM PERFORMANCE ACCURACY IN A LASER WRITING PROCESS

Meinrad Kempter, Lyss, and Paul Glauser, Effretikon, both of Switzerland, assignors to Lasarray Holding AG, Thundorf, Switzerland

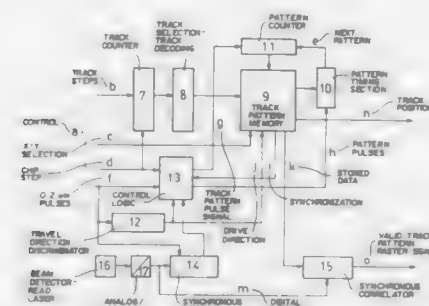
Filed Jun. 25, 1987, Ser. No. 66,369

Claims priority, application Switzerland, Jun. 25, 1986, 82563/86

Int. Cl.⁴ B23K 26/00

U.S. Cl. 219—121.6

4 Claims



1. A method of controlling with improved accuracy the related movement between a laser beam and a workpiece bearing a coded pattern, said method comprising the steps of:

(a) scanning the laser beam across the workpiece and its coded pattern;

(b) detecting the scanning laser beam reflected from the coded pattern and providing a pattern signal indicative thereof;

(c) storing a track pattern in a memory corresponding to a true coded pattern;

(d) applying the pattern signal to the memory to read out the true code pattern; and

(e) comparing the read out code pattern with the pattern signal and, if valid, using the validated pattern signal to control the relative movement between the work piece and the scanning laser beam.

4,871,897

NOZZLE FOR LASER PROCESSING

Steen E. Nielsen, Skarvinge, Denmark, assignor to Institutet for Produktudvikling, Lyngby, Fed. Rep. of Germany

PCT No. PCT/DK87/00103, § 371 Date Apr. 26, 1988, § 102(e) Date Apr. 26, 1988, PCT Pub. No. WO88/01553, PCT Pub. Date Mar. 10, 1988

PCT Filed Aug. 21, 1987, Ser. No. 192,789

Claims priority, application Denmark, Sep. 1, 1986, 4161/86 Int. Cl.⁴ B23K 26/16

U.S. Cl. 219—121.67

22 Claims



1. A nozzle for laser processing, such as a cutting, said processing allowing a laser beam to be directed towards an article being processed, and whereby the laser beam is supported by a gas flow directed towards the article through the nozzle, characterized by the nozzle being able to maintain a displacement of the focusing point of the laser beam relative to a center of gas pressure for the gas flow through the nozzle, whereby the laser beam is displaced forwards in the processing direction relative to the center of gas pressure.

4,871,898

CONSTANT ARC VOLTAGE GAS METAL ARC WELDING PROCESS

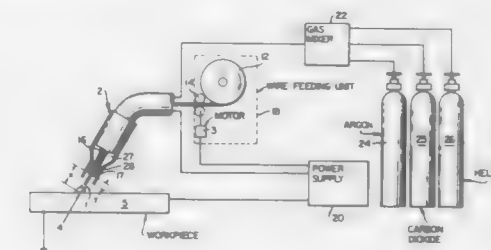
Lawrence Cherne, Hubertus, Wis., and Kevin A. Lyttle, Hopewell Junction, N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Aug. 17, 1988, Ser. No. 823,301

Int. Cl.⁴ B23K 9/16

U.S. Cl. 219—137 R

10 Claims



1. A process for gas metal arc welding with a consumable wire electrode comprising:

(a) forming an arc between said consumable wire electrode and a workpiece;

(b) maintaining a substantially constant arc voltage between said wire electrode and the workpiece;

(c) feeding the consumable wire electrode through a welding torch contact tube into said arc;

(d) transferring metal from the electrode to the workpiece; and

(e) shielding the arc with a gas mixture consisting essentially of:

- (A) 8 to 12 volume percent carbon dioxide;
(B) 20 to 45 volume percent helium;
(C) balance argon.

4,871,899

TITILABLE ELECTRIC THERMODE FOR MULTIPLE CONNECTION REFLOW SOLDERING

Gerald DuFrene, LaVerne, Calif., assignor to Unitek Corporation, Menlo Park, Calif.

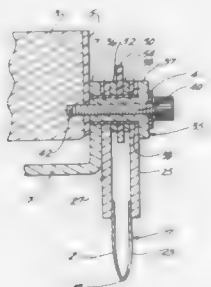
Continuation of Ser. No. 832,835, Feb. 24, 1986, abandoned.

This application Apr. 4, 1988, Ser. No. 180,631

Int. Cl.⁴ H05B 3/00; B23K 3/02

U.S. Cl. 219—233

8 Claims



1. A combination of a thermode and apparatus for releasably mounting the thermode to a support movable to position the thermode for multiple lead reflow soldering, which comprises:

a thermode including an electrical resistance heating element shaped to define an elongated pressing portion and opposite end electrical terminal portions, the heating element being capable of responding to current flowing through it so as to generate heat and raise the temperature of the heating element above the temperature at which solder flows, the pressing portion being sufficiently strong and rigid to apply sufficient pressure to a group of joints to be soldered to conduct heat to each such joint to make a soldered joint;

the thermode further including a pair of terminal plates, each terminal plate being electrically and rigidly connected to a respective one of the terminal portions of the heating element; and

an apparatus for releasably mounting said thermode comprising mounting means cooperating with the terminal plates for mounting the thermode to a movable support, the mounting means defining first and second electrically conductive surfaces bearing against cooperating electrically conductive surfaces of the terminal plates with sufficient pressure to effect electrical connections therebetween having lower resistance than the resistance of the heating element, and the mounting means including means for providing freedom of tilting movement of the thermode relative to the support so that the pressing portion of the thermode can tilt when brought into pressing contact with joints to be soldered having varying height tops.

4,871,900

BODY AIR DRYER

O'Neal Hickman, 354 Gould Ave., North, Whistler, Ala. 36612

Filed Aug. 26, 1988, Ser. No. 237,283

Int. Cl.⁴ F24H 9/02

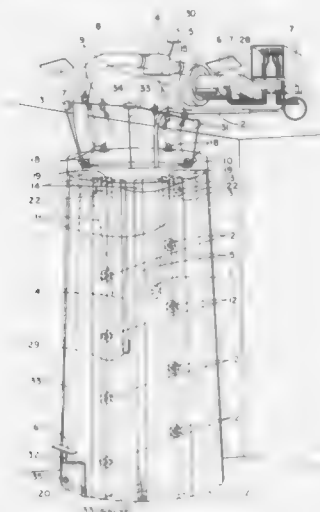
U.S. Cl. 219—366

16 Claims

1. A drying apparatus receiving hot air from a fan and heating element suspended from a ceiling comprising:

- (a) a mooring means suspended from the ceiling;
(b) a header with a top cavity for receiving the exhaust of the fan suspended from the mooring means and defining at least one bottom cavity;
(c) a flexible skirt having a top and a bottom, defining at least one flexible chamber which chamber defines a top open-

ing and at least one side opening which skirt is suspended from the header and having the chamber top opening fitting over and around the bottom cavity;



(d) a nozzle fitting over the side opening and directing the flow of air therefrom;

4,871,901

CONTROL DEVICE FOR A COFFEE ROASTER

Masaru Igusa, Takasaki, and Takashi Chiba, Iseaki, both of Japan, assignors to Sanden Corporation, Japan

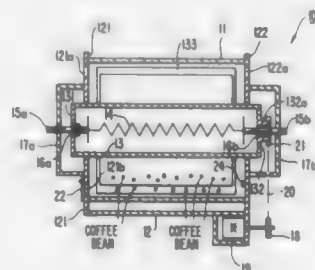
Filed Jun. 25, 1986, Ser. No. 878,353

Claims priority, application Japan, Jun. 26, 1985, 60-95085[U]; Dec. 25, 1985, 60-202172[U]

Int. Cl.⁴ F26B 11/04

U.S. Cl. 219—400

15 Claims



11. A roasting device apparatus for roasting coffee beans and the like comprising:

- a container to hold the material to be roasted;
a heater element to heat the material;
a power source connected to said heater element;
a blower device for circulating air within said container;
first controlling means for controlling the calorific value of said heater element to reduce the calorific value from a first positive value to a second positive value when the temperature within said container reaches a predetermined temperature;

said first controlling means comprising a first resistor element of a first value, a second resistor element of a second value different than said first value and connecting means for connecting either said first resistor element or said second resistor element in series with said heater element such that the voltage applied to said heater element varies depending upon which of said resistors is connected by said connecting means, and further comprising a condenser connected in series with said first and second

resistor elements, an alternating switching element connected in parallel across said condenser and said resistor elements and a trigger device connected between said condenser and said switching element such that said condenser will discharge during certain intervals and cause said trigger device to activate said alternating switching element which will produce a zero voltage level across said series combination of said resistor and said condenser to thereby increase the voltage across the heater element;

second controlling means for controlling the rate at which said blower device circulates air within said container, said second controlling means increasing the rate at which air is circulated by said blower device in response to an increase in the value of said power source, and decreasing the rate at which air is circulated by said blower device in response to a decrease in said power source.

4,871,902

ELECTRIC HOTPLATE AND APPARATUS FOR THE CONNECTION THEREOF

Robert Kicherer, Oberderdingen, Fed. Rep. of Germany, assignor to E.G.O. Elektro-Geräte Blanc u. Fischer, Fed. Rep. of Germany

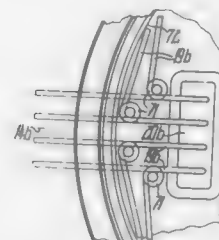
Filed Nov. 12, 1986, Ser. No. 930,492

Claims priority, application Fed. Rep. of Germany, Nov. 16, 1985, 3540815

Int. Cl.⁴ H05B 3/68

U.S. Cl. 219—458

78 Claims



1. An electric hotplate, comprising:
a hotplate body (2) defining an outer circumference and an underside providing a stacking side for supporting said hotplate in a stacking condition in a hotplate stack,
an insulating member (20) provided for passing heating resistor connecting leads (17) in a vicinity of said underside to form outer accessible connecting portions (19) of said connecting leads (17) having connecting ends constructed for connecting appliance lines (34) and adapted to be transferred between a stacking position and a connecting position, wherein in said stacking position the outer connecting portions (19) of the connecting leads (17) are located in a region extending from above said underside substantially at most to said underside of the hotplate body (2), said outer connecting portions (19) extending substantially parallel to said underside in said stacking position and providing inherently rigid, but resiliently movable connecting pins in said connecting positions.

4,871,903

APPARATUS FOR RAPIDLY ACCESSING A LARGE DATA BASE EMPLOYING AN OPTICAL DISC READING SYSTEM WITH MULTIPLE HEADS AND TRACK POSITION COMPENSATION MEANS

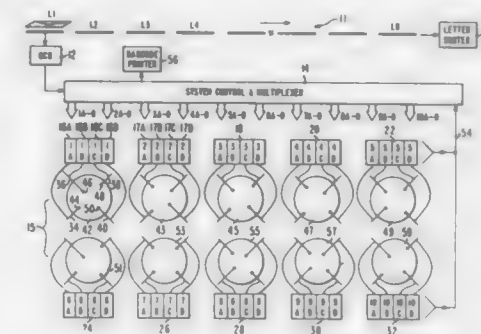
Ross M. Carrell, Cinnaminson, N.J., assignor to General Electric Company, Schenectady, N.Y.

Filed Jul. 31, 1987, Ser. No. 80,123

Int. Cl.⁴ G06F 15/40; G11B 27/19

U.S. Cl. 235—375

18 Claims



1. Apparatus for rapidly accessing data elements on a serially encoded optically readable disc, said elements comprising a plurality of radially spaced tracks of a given number and spacing along a reference radial line, said tracks surrounding the disc center and partitioned into a plurality of contiguous files, each file having a certain angular and radial position on the disc relative to a reference position, said file angular and radial position tending to periodically differ from disc to disc and within a disc at different times in an unknown way in response to thermal contraction and expansion due to changes in the ambient temperatures and due to manufacturing tolerances, the data elements on the different tracks tending to have different read data rates when said disc is rotated at a constant angular velocity, said apparatus comprising:

disc drive means for receiving and rotatably driving a disc at a constant angular velocity;

a plurality of optical disc read means associated with said disc drive means for reading said data elements from the disc then being driven by that drive means at respective ones of angular spaced locations at a constant data rate, each said read means including a respective actuator means responsive to an applied control signal representing a given file position for independently reading the data elements from the file corresponding to that given file position; and

control means for generating said control signal and for selectively applying said control signal to currently selected one of said read means, said control means including means for correlating each said radially spaced track to each said certain file position to provide in memory said certain file position and means for periodically updating in said memory the correlation of said tracks to said certain file position to provide a periodically corrected certain file position.

4,871,904

MULTIDIRECTIONAL OPTICAL SCANNER

Boris Metlitsky, St. y Brook, and Mark J. Kricher, Hauppauge, both of N.Y., assignors to Symbol Technologies, Inc., Bohemia, N.Y.

Filed Dec. 28, 1987, Ser. No. 138,563

Int. Cl.⁴ G06K 7/10

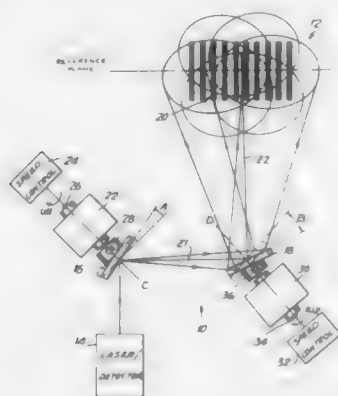
U.S. Cl. 235—467

31 Claims

1. A multidirectional optical scanner, comprising:
(A) director means for directing light along an optical path

to a light-reflecting target located in the vicinity of a reference plane lying generally normal to the optical path, and from the target in a field of view, said director means including

- (i) first and second light-directing optical elements spaced apart along the path;
(B) scanner means for multidirectionally scanning at least one of the target and the field of view, said scanner means including



- (i) first rotator means for mounting the first element at a first tilt angle of inclination relative to a first axis, and for rotating the first element about the first axis at a first angular speed to generate a first light cone extending along the path between the elements, and
(ii) second means for moving the second element and the first light cone impinging thereon to form a multidirectional scan pattern in the reference plane; and
(C) control means for changing the multidirectional scan pattern in the reference plane.

4,871,905

IC CARD READER/WRITER

Katsuya Mita, Kyoto; Yutaka Machida, Otsu, and Muneki Morishita, Takatsuki, all of Japan, assignors to Omron Tateisi Electronics Co., Hanazono, Japan

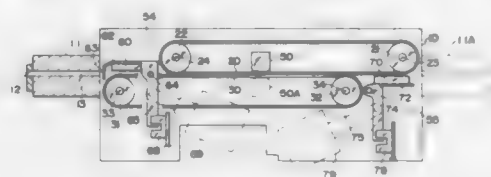
Filed Oct. 4, 1988, Ser. No. 252,930

Claims priority, application Japan, Oct. 9, 1987, 62-155056[U]; Oct. 15, 1987, 62-158143[U]

Int. Cl.⁴ G06K 7/08

U.S. Cl. 235-475

2 Claims



1. An IC card reader/writer comprising: a card conveying apparatus for carrying in an IC card inserted into a card inserting port of the IC card reader/writer and for carrying out the internal IC card to the card inserting port; and a connector having contact members adapted to be come into contact with contacts of the IC card conveyed to a predetermined position in the IC card reader/writer by the conveying apparatus,

wherein said card conveying apparatus includes an upper conveying belt reeved around pulleys and a lower conveying belt reeved around pulleys and conveys the IC card by sandwiching the IC card between the upper and lower conveying belts, and

said upper and lower conveying belts are arranged so as to deviate their positions from each other in the card conveying direction in order to form spaces to dispose said con-

nectors at both edge portions of the upper and lower conveying belts.

4,871,906

FOCUS DETECTING DEVICE USING CORRELATION

Kouichi Ueda; Akihiro Fujiwara; Hirofumi Suda; Masamichi Toyama, all of Kanagawa, and Kunihiro Yamada, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

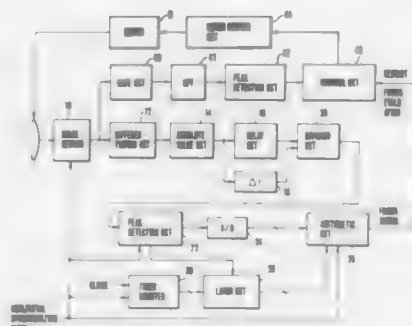
Filed Oct. 8, 1987, Ser. No. 107,451

Claims priority, application Japan, Oct. 8, 1986, 61-239787

Int. Cl.⁴ G01J 1/20; H04N 5/232

U.S. Cl. 250-201

24 Claims



1. A focus detecting device comprising:

- (a) detecting means for detecting a focused degree obtained at parts having a plurality of scanning lines on an image sensing plane which is being scanned;
(b) discriminating means for discriminating a correlation between said scanning line parts, related to an image of an object incident on said image sensing plane; and
(c) computing means arranged to determine an in-focus state by computing said focused degree detected at each of said scanning line parts which are found to have a correlation by said discriminating means.

4,871,907

FIBER OPTIC LINEAR POSITION TRANSDUCER

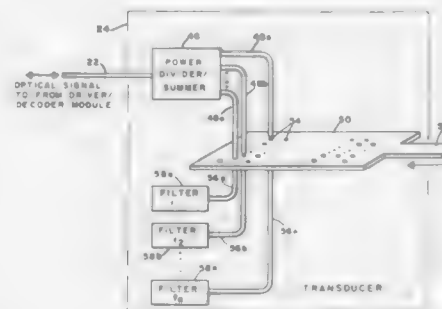
Paul A. Lux, Poway, and Ronald F. Mathis, Ramona, both of Calif., assignors to General Dynamics, Electronics Division, San Diego, Calif.

Filed Feb. 1, 1988, Ser. No. 150,926

Int. Cl.⁴ H01J 5/16, 40/14

U.S. Cl. 250-227

31 Claims



1. A system for detecting the position of an object comprising:

- driver means for generating an optical signal and intensity modulating said optical signal at a rate corresponding to a sum of N different frequencies;
transducer means adapted for coupling to an object and

responsive to a relative physical positioning of said object with respect to said transducer means, said transducer means for receiving said intensity modulated optical signal and filtering from said intensity modulated optical signal intensity modulation corresponding to certain ones of said N frequencies in accordance with said relative physical positioning; and

decoder means for receiving said filtered optical signal and responsive thereto for generating a position signal according to said certain ones of said N frequencies in said intensity modulation of said filtered optical signal, said position signal indicative of said relative physical positioning of said object with respect to said transducer means.

4,871,908

OPTICAL SWITCH DEVICE EMPLOYING FLUORESCENT SUBSTANCE IN COMBINATION WITH A RADIOACTIVE ELEMENT AS A LIGHT SOURCE

Sadao Kokubo, Aichi, Japan, assignor to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Japan

Continuation of Ser. No. 31,089, Mar. 26, 1987, Pat. No.

4,795,900. This application Dec. 8, 1988, Ser. No. 281,848

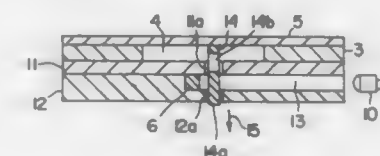
Claims priority, application Japan, Mar. 27, 1986, 61-45738;

Mar. 31, 1986, 61-47611; Mar. 31, 1986, 61-47610

Int. Cl.⁴ G01D 5/34; H01J 1/56

U.S. Cl. 250-229

1 Claim



1. An optical switch device comprising:

- (a) a fluorescent substance constantly emitting a fluorescence in combination with a radioactive element;
(b) a light detector disposed in opposite relation to said fluorescent substance for detecting the fluorescence emitted from said fluorescent substance, said light detector generating a switching signal when detecting the fluorescence emitted from said fluorescent substance; and
(c) a manually operable shutter member provided between said fluorescent substance and said light detector so that the fluorescence emitted from said fluorescent substance is allowed to impinge on said light detector while said shutter member is being manually operated.

4,871,909

OVERLOAD PROTECTION FOR FIBER OPTIC MICROBEND SENSOR

Eugene Skuratovsky, Mayfield Heights, Ohio, and James K. Kaudsen, East Greenwich, R.I., assignors to The Babcock & Wilcox Company, New Orleans, La.

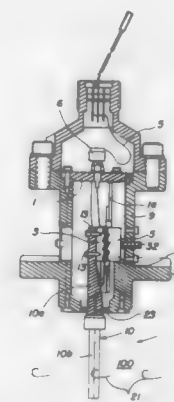
Continuation-in-part of Ser. No. 825,414, Feb. 3, 1986,

abandoned. This application Oct. 22, 1987, Ser. No. 112,650

Int. Cl.⁴ H01J 5/16

U.S. Cl. 250-227

5 Claims



1. A jaw arrangement for a microbend sensor comprising a pair of jaws each having corrugated surfaces for holding an optical fiber therebetween and being moveable with respect to each other for bending the optical fiber to modulate light passing through the optical fiber, each corrugated surface comprising a plurality of flat areas lying in a common plane in a direction perpendicular to the relative movement direction for the jaws, and a plurality of projections extending in the direction of relative movement of the jaws wherein the height of each projection of each jaw in the direction of relative movement of the jaws is selected to achieve optical fiber bending to a selected minimum radius, said projections alternating with said flat areas, projections of one of said jaws being positioned over flat areas of the other of said jaws to bend the optical fiber therebetween, said jaws being moveable together under an overload condition whereby the optical fiber is bent by projections of one jaw against flat areas of the other jaw.

4,871,910

METHOD AND APPARATUS FOR MEASURING THE SIZE OF WIRE ROD WITH LASER BEAM AND REFERENCE ROD

Toru Ueno; Yonichi Fukuoka, both of Hadano; Seichi Baba, Kamakura; Kaoru Miyoshi, Yokohama, and Kazuo Kinoshita, Tsukuba, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

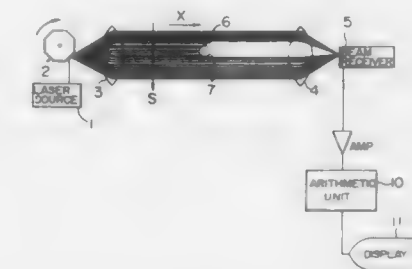
Filed Jul. 22, 1988, Ser. No. 223,097

Claims priority, application Japan, Jul. 24, 1987, 62-183720

Int. Cl.⁴ G01N 21/86; G01V 9/04

U.S. Cl. 250-560

6 Claims



1. An apparatus for measuring the size of a wire rod comprising:

- a laser beam source;
a scanning optical system for directing a laser beam emitted from said laser beam source toward a first wire rod having an unknown size, so as to scan said first wire rod;
an optical system for turning the laser beam from said scanning optical system into a parallel beam;
a condensing optical system for condensing the parallel beam after the parallel beam traverses said first wire rod;

a beam receiving element for receiving the laser beam from said condensing optical system thereby generating a corresponding electrical output signal;
a second wire rod disposed adjacent to said first wire rod in a direction of scanning with the laser beam, said second wire rod having an already known size larger than the diameter of the spot of the laser beam; and
means for calculating the size of said first wire rod on the basis of the electrical output signal of said beam receiving element.

4,871,911

ELECTRON BEAM APPARATUS COMPRISING A SEMICONDUCTOR ELECTRON EMITTER

Gerardus G. P. Van Gorkom; Arthur M. E. Hoebrechts, both of Eindhoven; Karel D. Van Der Mast, Pijnacker, and Harm Tolner, Eindhoven, all of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

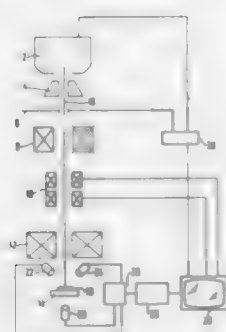
Continuation of Ser. No. 743,223, Jan. 10, 1985. This application Jul. 17, 1987, Ser. No. 77,060

Claims priority, application Netherlands, Feb. 14, 1985, 8500411

Int. Cl.⁴ G21K 7/00

U.S. Cl. 250—310

16 Claims



1. An electron beam apparatus comprising an evacuable housing, electron source means within said housing for generating an electron beam having a high emission current density, said electron source means including a semiconductor element electron emitter means for optimizing current intensity of said electron beam simultaneously with said current density, said semiconductor element electron emitter means having an emissive surface, and said semiconductor element electron emitter means having a reverse connected p-n junction disposed within said semiconductor element electron emitter means and parallel to said emissive surface, said reverse connected p-n junction having dimensions defining surface dimensions of said emissive surface, an electron-optical lens system within said housing for directing said electron beam from said semiconductor element electron emitter means, a specimen receiving said electron beam from said electron-optical lens system, and means for detecting radiation from said specimen and displaying information from said specimen.

4,871,912

CONTROL SYSTEM USING EXTERNAL COMPUTER FOR ELECTRON MICROSCOPE

Yasushi Kokubo; Keisuke Suzuki, and Seichiro Mori, all of Tokyo, Japan, assignors to JEOL Ltd., Tokyo, Japan

Filed Mar. 15, 1988, Ser. No. 168,266

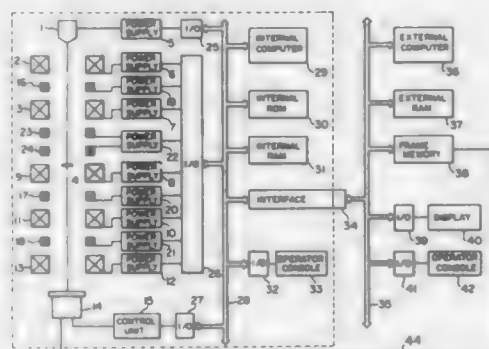
Int. Cl.⁴ H01J 37/26

U.S. Cl. 250—311

6 Claims

1. A method of controlling an electron microscope having electron lenses and deflector coils by an external computer, the

microscope incorporating an internal computer and a ROM in which are stored data correlating optimum values of electric currents and voltages supplied to the electron lenses and the deflector coils determined according to preset values of magnification and preset values of accelerating voltage such that an image does not rotate if the magnification or the accelerating voltage is changed, said method comprising the steps of:
transmitting the data stored in the ROM to an external RAM associated with the external computer;



calculating in the external computer data defining desired conditions of observation from the data held in the RAM wherein the data defining desired conditions of observation is calculated using an interpolation function; and
transmitting the data resulting from said calculations to the internal computer of the electron microscope for controlling the electron microscope according to the calculated data.

4,871,913

SIGNAL PROCESSING METHOD IN AUTORADIOGRAPHY

Tetsuo Kimura; Kazuhiro Hishinuma, and Misao Shiraishi, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 19, 1988, Ser. No. 161,247

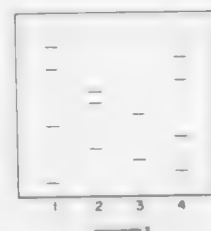
Claims priority, application Japan, May 4, 1984, 59-89615; Jul. 6, 1984, 59-140908

The portion of the term of this patent subsequent to May 12, 2004, has been disclaimed.

Int. Cl.⁴ G21H 5/02; G01T 1/20

U.S. Cl. 250—327.5

9 Claims



1. A signal processing method in autoradiography for determining base sequence of DNA or DNA fragment, employing at least four groups of base-specific synthetic products which are complementary to the DNA or DNA fragment and labeled with a radioactive element, said at least four groups comprising:

- (1) base-specific synthetic products including at least guanine-specific synthetic products;
- (2) base-specific synthetic products including at least adenine-specific synthetic products;

- (3) base-specific synthetic products including at least thymine-specific synthetic products; and
 - (4) base-specific synthetic products including at least cytosine-specific synthetic products;
- and being resolved one-dimensionally in parallel relation to each other to form resolved rows on a support medium, which comprises a process including:

- (1) determining on each of the resolved rows a scanning line for signal processing;
- (2) detecting on each of the resolved rows sampling points on said scanning line; and
- (3) comparing and identifying the positions of said sampling points on the scanning lines among the resolved rows to obtain locational information on guanine, adenine, thymine and cytosine;

said process being applied to digital signals corresponding to an autoradiograph having the locational information on the radioactively labeled synthetic products, said digital signals being obtained by causing a stimulative phosphor sheet to absorb radiation energy emitted by the radioactively labeled synthetic products in the support medium to record the autoradiograph of the radioactively labeled synthetic products on the phosphor sheet, irradiating said phosphor sheet with an electromagnetic wave to release at least a portion of the radiation energy stored in the phosphor sheet as stimulated emission, and detecting the stimulated emission photoelectrically.

4,871,914

LOW-COST RADON DETECTOR

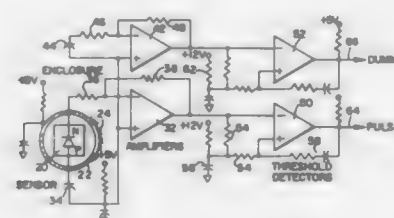
William E. Simon, Satellite Beach; Thomas L. Powers, Indian Harbor Beach, and Glenn W. Ernsberger, Melbourne, all of Fla., assignors to Sun Nuclear Corporation, Melbourne, Fla.

Filed May 5, 1987, Ser. No. 46,933

Int. Cl.⁴ G01T 1/24

U.S. Cl. 250—370.02

26 Claims



1. A detector for alpha particles produced by radioactive decay in a test medium, comprising:

- a solid state diode having a depletion layer disposed close enough to the test medium that alpha particles emitted in the test medium deposit energy in the depletion layer;
 - a first amplifier connected to amplify a signal produced by the diode, the first amplifier being operable to produce an output pulse upon energy being deposited in the depletion layer;
 - a second amplifier having at least one connection in common with the first amplifier, the second amplifier having inputs connected other than to the signal produced by the diode, whereby both the first and second amplifiers produce output pulses due to transients and only the first amplifier produces output pulses due to alpha particles; and,
- logic means operable to sense output pulses occurring on the first amplifier only, and to ignore output pulses occurring on both the first and second amplifiers.

4,871,915

DETECTOR FOR BREMSSTRAHLUNG-ISOCROMATIC-SPECTROSCOPY (BIS)

Kevin C. Prince, Jülich, Fed. Rep. of Germany, assignor to Kernforschungsanlage Jülich GmbH, Jülich, Fed. Rep. of Germany

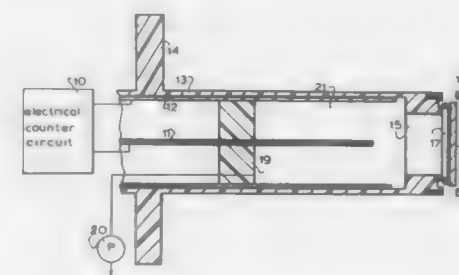
Filed Nov. 29, 1988, Ser. No. 277,549

Claims priority, application Fed. Rep. of Germany, Dec. 9, 1987, 3741675

Int. Cl.⁴ G01N 23/22, 21/62

U.S. Cl. 250—372

8 Claims



1. A detector for bremsstrahlung-isochromatic-spectroscopy (BIS) which comprises:

- a hollow metal cylinder forming an outer electrode of said detector;
- a wire extending axially through said cylinder and forming an inner electrode of said detector;
- means forming an MgF₂ window in said metal cylinder traversed by ultraviolet photons to be detected; and
- a gas mixture in said cylinder consisting of dimethylether CH₃-O-CH₃ and an inert gas.

4,871,916

SENSING OF METHANE

John C. Scott, Merewether, Australia, assignor to The Broken Hill Proprietary Company Limited, Victoria, Australia

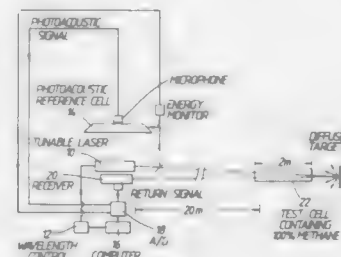
Filed May 6, 1988, Ser. No. 191,241

Claims priority, application Australia, May 8, 1987, 1711006/87

Int. Cl.⁴ G01J 1/00

U.S. Cl. 250—338.5

8 Claims



1. A spectroscopic method of sensing the presence of methane in an atmosphere, comprising directing through the atmosphere light emitted by a neodymium laser at a wavelength having a fluorescence linewidth which embraces at least one significant absorption line of the ν₂+2ν₃ band of methane, and monitoring said light after traversal of the atmosphere to detect said absorption line(s) for the presence of methane in the atmosphere traversed by the emitted light.

4,871,917

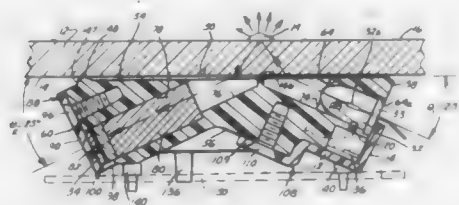
VEHICULAR MOISTURE SENSOR AND MOUNTING APPARATUS THEREFOR

Desmond J. O'Farrell; Kenneth Schofield, both of Holland; Mark L. Larson, Grand Haven; Karl-Heinz Hanft, Holland; Kenneth L. Schierbeck, Zeeland, and Richard D. Bentley, Ravenna, all of Mich., assignors to Donnelly Corporation, Holland, Mich.

Filed Apr. 19, 1988, Ser. No. 183,706
Int. Cl.⁴ G01N 21/41

U.S. Cl. 250—341

48 Claims



1. A moisture sensing assembly for mounting on one surface of a window to detect and indicate moisture or other particles accumulated on the opposite surface of the window, the window having inside and outside surfaces, said assembly comprising:

- emitter means for emitting radiant energy toward the window;
- detector means for detecting and receiving radiant energy from said emitter means after reflection and refraction by the window and any accumulated moisture or particles on the outside surface of the window;
- support means for supporting said emitter means and detector means in spaced angular relationship to one another;
- a mounting member attachment to the inside window surface;
- mounting means for engaging said mounting member and releasably mounting said support means on the inside window surface including biasing means for resiliently holding said support means against the inside window surface with said emitter means at a predetermined incident angle and said deflector means at a predetermined reflection angle; and
- releasable locking means on at least one of said mounting member and said mounting means for holding said mounting member and mounting means together until released.

4,871,918

HOLLOW-ANODE ION-ELECTRON SOURCE

Vašo I. Miljevic, Belgrade, Yugoslavia, assignor to The Institute for Atomic Physics, Belgrade, Yugoslavia

Filed Oct. 6, 1987, Ser. No. 105,712

Claims priority, application Yugoslavia, Oct. 23, 1986, 1810/86

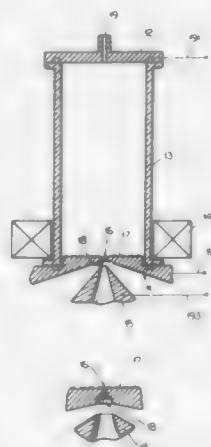
Int. Cl.⁴ H01J 27/02

U.S. Cl. 250—423 R

27 Claims

1. A hollow anode ion-electron source comprising:
- a housing or discharge tube, having a gas inlet opening;
 - a hollow anode within the housing, said anode comprising an aperture having an inner surface wherein only said inner surface is conductive, said aperture functioning as an exit aperture of the source;

a cathode within the housing spaced from the hollow anode aperture;



an extraction electrode; and connecting means for connecting the anode, cathode, and extraction electrode to power supplies.

4,871,919

ELECTRON BEAM LITHOGRAPHY ALIGNMENT USING ELECTRIC FIELD CHANGES TO ACHIEVE REGISTRATION

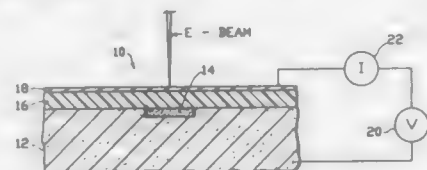
Thomas P. Donohue, Katonah; Fritz J. Hohn, Somers, and George A. Sai-Halasz, Mount Kisco, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 20, 1988, Ser. No. 196,397

Int. Cl.⁴ H01J 37/00

U.S. Cl. 250—491.1

12 Claims



8. A system for the detection of a buried feature in a semiconductor wafer having a surface covered by an insulative material comprising:

- a circuit providing a voltage across said insulative material and said wafer for generating electron-hole pairs in said insulative material, current sensing means in said circuit, and
- means for scanning an electron beam over said surface of said feature covered by said insulative material wherein said electron beam causes the generation of electrons that penetrate across said insulator creating electron-hole pairs, the drift/diffusion of which is a current detected by said circuit.

4,871,920

HIGH POWER WIDE BAND AMPLIFIER USING OPTICAL TECHNIQUES AND IMPEDANCE MATCHING TO SOURCE AND LOAD

Paul J. Stabile, Langhorne, Pa.; Arye Rosen, Cherry Hill, N.J., and Fred Sterzer, Princeton, N.J., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 18, 1988, Ser. No. 182,537

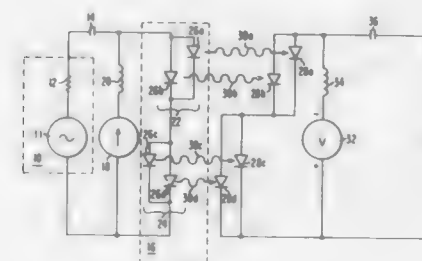
Int. Cl.⁴ G02B 27/00

U.S. Cl. 250—551

14 Claims

1. Apparatus for amplifying an input signal from a source having an impedance, said apparatus comprising:
- a first plurality of series coupled laser diodes adapted to receive said input signal and having an inherent impedance matched to the source impedance; and

PIN diode means, optically coupled to said laser diodes, for providing an output signal to a load having an impedance,



said PIN diode means having an inherent impedance matched to said load impedance.

4,871,921

DETECTOR ARRAY ASSEMBLY HAVING BONDING MEANS JOINING FIRST AND SECOND SURFACES EXCEPT WHERE DETECTORS ARE DISPOSED

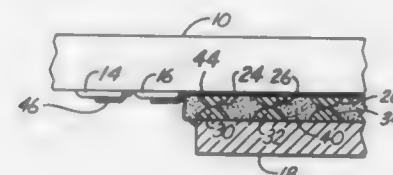
Mark N. Gurnee, Framingham, Mass., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Aug. 9, 1988, Ser. No. 230,164

Int. Cl.⁴ H01J 40/14

U.S. Cl. 250—578

17 Claims



1. A detector array comprising:
- a first substrate having a first surface;
 - a first plurality of electrically conductive bumps of material on the first surface at predetermined positions;
 - at least one detector on the first surface at a first location;
 - a second substrate having a second surface;
 - a second plurality of bumps of electrically conductive material on the second surface at positions corresponding to the predetermined positions; and
 - hardenable bonding means joining the first and second surfaces except proximate the first location, with a predetermined number of the first plurality of bumps contacting a corresponding number of the second plurality of bumps.

4,871,922

ENCLOSURE FOR ENGINE DRIVEN GENERATOR SET

Martin W. Heinrich, Cedar Grove, and Donald R. Fischer, Sheboygan, both of Wis., assignors to Kohler Co., Kohler, Wis.

Filed Aug. 22, 1988, Ser. No. 234,917

Int. Cl.⁴ F02B 63/04

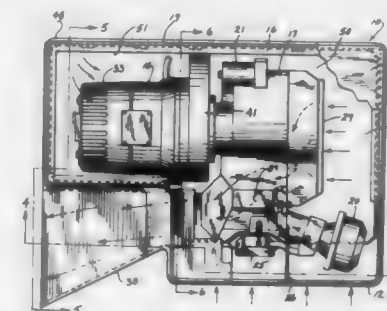
U.S. Cl. 290—1 B

14 Claims

1. An enclosure for an engine and a generator, the enclosure adapted to be positioned in the front of a motor vehicle and adjacent an inlet for the cooling air of the vehicle engine, the enclosure comprising:

- a housing enclosing both an engine and a generator;
- at least one air inlet opening and an air outlet opening spaced from said air inlet;
- an air outlet duct in fluid communication with the air outlet and adapted to extend to the outside of a motor vehicle,

the air outlet constructed and arranged to accommodate an exhaust pipe for a generator engine;



whereby the same duct accommodates both air exiting from the enclosure and the exhaust pipe so that the exiting air assists in cooling the exhaust pipe.

4,871,923

WIND POWER DEVICE

Hans-Ulrich Scholz, Fichtenweg 15, and Heinz-Konrad Proeve, Rudolf-Virchow-Strasse 2, both of 3100 Celle, Fed. Rep. of Germany

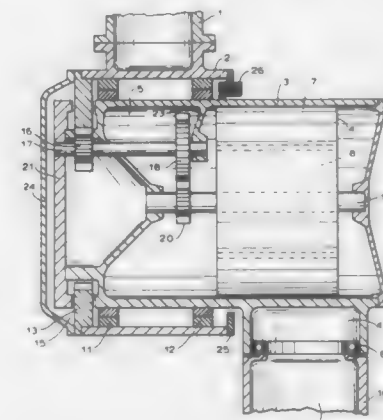
Filed Jul. 30, 1987, Ser. No. 79,837

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1986, 3625840

Int. Cl.⁴ F03D 1/06

U.S. Cl. 290—55

20 Claims



1. A wind power device, comprising a rotor having an axis of rotation which lies in a substantially horizontal plane; a machine for converting wind energy; a transmission for transmitting a rotary movement of said rotor to said machine; a tower formed so that said rotor, said transmission and said machine are arranged on said tower rotatably about a substantially vertical axis; a rotation-symmetrical housing accommodating said transmission and said machine, said rotor having a hub which is formed substantially as a circular ring which surrounds and is supported on said rotation-symmetrical housing, said rotor also having a plurality of vanes which are arranged substantially centrally of said hub; and bearing means including at least two bearing members arranged symmetrically at both sides of said rotor vanes as considered in an axial direction and supporting said hub on said housing.

4,871,924

SAFETY POWER RECEPTACLE WITH HOT WIRE SWITCH-THROUGH

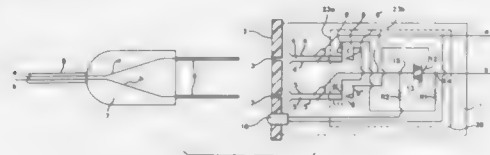
Christopher G. Sellati, 12281 S.W. 104 Ter., Miami, Fla. 33186

Filed Dec. 21, 1987, Ser. No. 135,924

Int. Cl.⁴ H02J 1/10

U.S. Cl. 307—86

15 Claims



1. A safety power outlet connected to a plurality of power lines for connection with a matching power plug, having an equal plurality of prongs, comprising: a receive terminal associated with each of the power lines; a front plate having a receive hole aligned with each receive terminal for receiving a respective prong; at least two series-connected switches, each having a movable contact; a pusher having two ends connected at one end to said moving contact, the other end disposed in proximity to a respective one of said receive terminals for generating a connect signal when each of said pushers is engaged by a respective prong being fully inserted into said receive terminal; and electrical connecting means being responsive to said connect signal for connecting at least one of said power lines with its respective receive terminal.

4,871,925

HIGH-VOLTAGE PULSE GENERATING APPARATUS
Kiyotaka Yamachi, Yoshihito Yoshizawa, and Shin Nakajima, all of Kumagaya, Japan, assignors to Hitachi Metals, Ltd., Tokyo, Japan

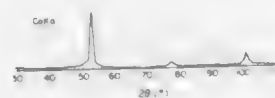
Filed Oct. 24, 1988, Ser. No. 261,296

Claims priority, application Japan, Oct. 23, 1987, 62-267830

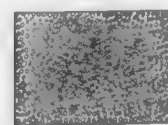
Int. Cl.⁴ H03K 3/00; H01F 27/24, 3/00

U.S. Cl. 307—106

10 Claims



(b)



1. A high-voltage pulse generating apparatus having at least one magnetic switch comprising a magnetic core comprising an Fe-base soft magnetic alloy ribbon wound in a toroidal form, said alloy having the composition represented by the general formula:



wherein M is Co and/or Ni, M' is at least one element selected from the group consisting of Nb, W, Ta, Zr, Hf, Ti and Mo, M'' is at least one element selected from the group consisting of V, Cr, Mn, Al, elements in the platinum group, Sc, Y, rare earth elements, Au, Zn, Sn and Re, X is at least one element selected from the group consisting of C, Ge, P, Ga, Sb, In, Be and As, and $\alpha, x, y, z, \alpha, \beta$ and γ respectively satisfy $0 \leq \alpha \leq 0.5$, $0.1 \leq x \leq 3$, $6 \leq y \leq 25$, $3 \leq z \leq 15$, $14 \leq y + z \leq 30$, $1 \leq \alpha \leq 10$, $0 \leq \beta \leq 10$ and $0 \leq \gamma \leq 10$, at least 50% of the alloy ribbon being

fine crystalline particles consisting of a bcc Fe solid solution and having an average particle size of 500 Å or less.

4,871,926

LOW POWER, THREE STATE POWER UP CIRCUIT

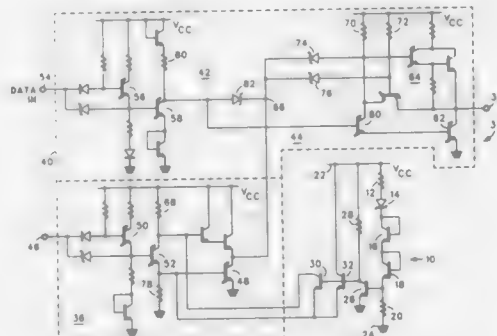
Eric Neely, Mesa, and Michael Wells, Chandler, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 6, 1988, Ser. No. 240,652

Int. Cl.⁴ H03K 5/153, 17/16, 17/20, 17/284

U.S. Cl. 307—272.3

4 Claims



1. In a logic circuit including an output stage and an enable gate having a transistor the collector-emitter conduction path of which is coupled to the output stage for disabling the same such that a high impedance is realized at the output of the output stage, the improvement comprising a power up circuit for disabling the output stage during power up of the voltage supply to the logic circuit, including:

first and second conductors across which the voltage supply is provided;
a detector circuit coupled between said first and second conductors which is responsive to the voltage supply for providing a control signal at an output thereof a predetermined time after the voltage supply is applied thereto; and first and second transistors each having a base coupled to the output of said detector circuit, a collector coupled to said first conductor and an emitter coupled to the base of the enable gate transistor for supplying current drive to the transistor, said first and second transistors being rendered non-conductive by said control signal from said detector circuit.

4,871,927

LATCH-UP PREVENTION IN A TWO-POWER-SUPPLY CMOS INTEGRATED CIRCUIT BY MEANS OF A SINGLE INTEGRATED MOS TRANSISTOR

Carlo Dallavalle, Vimercate, Italy, assignor to SGS-Thomson Microelectronics S.p.A., Catania, Italy

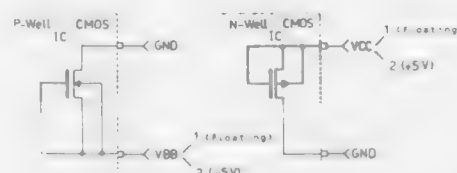
Filed Feb. 23, 1988, Ser. No. 159,267

Claims priority, application Italy, Mar. 3, 1987, 83609 A/87

Int. Cl.⁴ H03K 3/01

U.S. Cl. 307—296.5

4 Claims



1. A two-power-supply CMOS integrated circuit having a positive, a negative and a ground supply rails and a well region of a first polarity; MOS transistors having a channel of a sec-

ond polarity being formed within said well region and complementary MOS transistors having a channel of said first polarity being formed outside said well region; the integrated circuit having means for preventing latch-up when said well region is accidentally floated comprising at least an integrated MOS transistor having a channel of said second polarity and having a source, a drain and a body region and a gate terminal; said drain and said body regions being electrically connected in common with said gate terminal to the supply rail of said second polarity and said source region being electrically connected to ground; said integrated transistor being in a turn-off condition under correct supply conditions and functioning in a turn-on saturated condition when limiting the potential excursion of an accidentally floated well region.

4,871,928

BICMOS DRIVER CIRCUIT WITH COMPLEMENTARY OUTPUTS

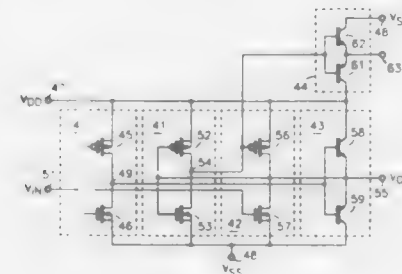
Thomas P. Busbey, Phoenix, Ariz., assignor to Motorola Inc., Schaumburg, Ill.

Filed Aug. 23, 1988, Ser. No. 235,128

Int. Cl.⁴ H03K 17/12

U.S. Cl. 307—44

6 Claims



1. A circuit comprising:
a first supply voltage terminal;
a second supply voltage terminal;
an input terminal;
a first output terminal;
a first bipolar transistor coupled between said first supply voltage terminal and said first output terminal;
a second bipolar transistor coupled between said first output terminal and said second supply voltage terminal;
first means coupled between said first and second supply voltage terminals and having an input coupled to said input terminal and an output coupled to a base of said first bipolar transistor and said second bipolar transistor for providing a voltage for biasing said first and second transistors, said first means providing a high impedance to said input terminal;
second means coupled between said first and second supply voltage terminals and having an input coupled to said input terminal and an output coupled to said output terminal for providing a voltage at said first output terminal that varies in magnitude from the voltage on said first and second supply voltage terminals in response to an input signal on said input terminal, said second means providing a high impedance to said input terminal; and
third means coupled between said first and second supply voltage terminals and having an input coupled to said first output terminal and an output coupled to said second output terminal means for biasing said second means.

4,871,929

ECL LOGIC GATE

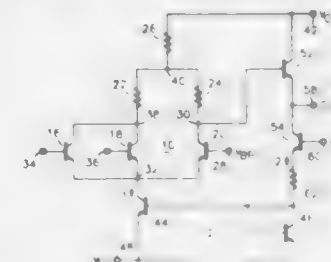
Roger L. Hollstein, Phoenix, and M. Nigheim Phan, Mesa, both of Ariz., assignors to Motorola Inc., Schaumburg, Ill.

Filed Jul. 7, 1988, Ser. No. 215,978

Int. Cl.⁴ H03K 19/013, 19/086, 19/092, 17/04

U.S. Cl. 307—455

5 Claims



1. A logic gate, comprising:
an input stage having a plurality of inputs and a first output;
an output stage coupled to said first output; and
current mirror means having first and second current paths for producing in said first current path a current which is a function of the current flowing in said second current path, said input stage coupled in series with said first current path, and said output stage coupled in series with said second current path.

4,871,930

PROGRAMMABLE LOGIC DEVICE WITH ARRAY BLOCKS CONNECTED VIA PROGRAMMABLE INTERCONNECT

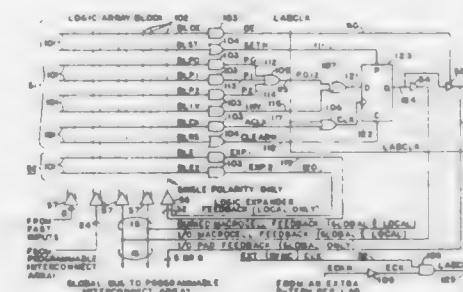
Sau-Ching Wong, Hillsborough; Hock-Chuen So, Milpitas; Stanley J. Kopec, Jr., and Robert F. Hartmann, both of San Jose, Calif., assignors to Altera Corporation, Santa Clara, Calif.

Filed May 5, 1988, Ser. No. 190,663

Int. Cl.⁴ H03K 19/177

U.S. Cl. 307—465

15 Claims



1. A programmable logic device for producing a plurality of first signals, each of which is a programmable logical function of a plurality of second signals, each of which is applied to a respective one of a plurality of word line conductors, said programmable logic device comprising:

a plurality of first P-term line conductors, each of which is programmably interconnectable to each of said word line conductors for producing on each of said first P-term line conductors a third signal which is a logical function of the second signals applied to the word line conductors to which that first P-term line conductor is interconnected; means for logically combining said third signals to produce a first of said first signals;
at least one second P-term line conductor which is programmably interconnectable to each of said word line conductors for producing on said second P-term line conductor a second of said first signals which is a logical function of the second signals applied to the word line conductors to

which said second P-term line conductor is interconnected; and
means for applying said second of said first signals to one of said word line conductors as the second signal applied to that word line conductor, wherein said first and second P-term line conductors comprise a macrocell, and wherein said apparatus includes a plurality of said macrocells, said word line conductors being common to all of said macrocells.

4,871,931

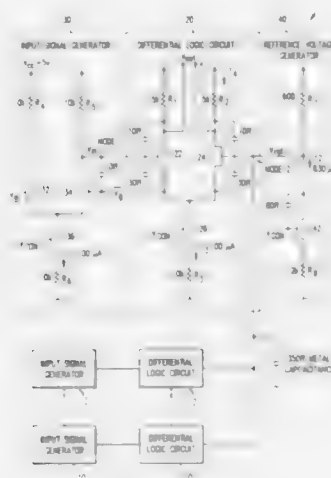
LOGIC CIRCUIT RESISTANT TO ERRORS DUE TO SUPPLY FLUCTUATIONS

Mark E. Fitzpatrick, San Jose; Gary R. Gouldsberry, Cupertino; Yat-Sum Chan, and Richard F. Pang, both of San Jose, all of Calif., assignors to Gazelle Microcircuits, Inc., Santa Clara, Calif.

Filed Oct. 30, 1987, Ser. No. 115,147
Int. Cl.⁴ H03K 17/16, 5/22; G06G 7/10

U.S. Cl. 307—491

14 Claims



1. An improved logic circuit comprising:
one or more input voltage generator means which produce input voltages whose magnitudes are related to an externally generated certain voltage level; and
a threshold detection means having a threshold level related to said certain voltage level and having applied to it said input voltages for determining the magnitudes of said input voltages, said one or more input voltage generator means and said threshold detection means having matched frequency responses and amplitude versus time responses so that said input voltages and said threshold level respond similarly to abrupt changes in said certain voltage level.

4,871,932

Patent Not Issued For This Number

4,871,933

HIGH-SPEED STATIC DIFFERENTIAL SENSE AMPLIFIER

Douglas C. Galbraith, Fremont, Calif., assignor to Actel Corporation, Sunnyvale, Calif.

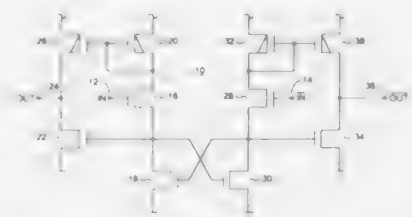
Continuation-in-part of Ser. No. 230,762, Aug. 10, 1988. This application Aug. 31, 1988, Ser. No. 239,130
Int. Cl.⁴ G01R 19/00; G06G 7/12; H03K 5/24

U.S. Cl. 307—530

2 Claims

1. A high-speed static differential sense amplifier, including:
a noninverting input node,
an inverting input node,

an inverting output,
a non-inverting output,
a first source follower connected to said noninverting input node,
a second source follower connected to said inverting input node,
a first pull-up current mirror having a current reference portion connected to said first source follower and an output driver portion connected to said noninverting output,



a second pull-up current mirror having a current reference portion connected to said second source follower and an output driver portion connected to said inverting output,
a first pull-down current mirror having a current reference portion connected to said second source follower and an output driver portion connected to said noninverting output,
a second pull-down current mirror having a current reference portion connected between said first source follower and an output driver portion connected to said noninverting output.

4,871,934

INDUCTION MOTOR

Kiyokazu Okamoto; Tetsuo Endo; Yukio Miyamoto, and Yoshiharu Suzuki, all of Tokyo, Japan, assignors to NEC Corporation, Japan

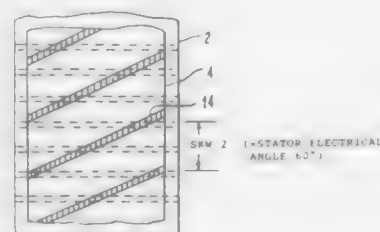
Filed Apr. 3, 1987, Ser. No. 35,622

Claims priority, application Japan, Apr. 4, 1986, 61-77839

Int. Cl.⁴ H02K 17/00

U.S. Cl. 310—166

6 Claims



1. An induction motor comprising:
a stator having slots for accommodating a primary winding therein, said stator being adapted to generate a rotary magnetic flux upon application of electrical energy to said primary winding; and
a rotor, having slots for accommodating a secondary winding comprising one of the groups consisting of coils and a squirrel-cage circuit to generate a torque by an interaction between the rotary magnetic flux crossing said secondary winding and a secondary current flowing in said secondary winding due to electromagnetic induction by said stator when the electrical energy is applied to said induction motor;
said stator slots and said rotor slots being skewed relative to each other by an amount of an integer multiple of a stator electrical angle of 60° between ends of an axial effective length of a torque generation portion of said rotor,

thereby minimizing a torque ripple which is an integer multiple of six times of the primary frequency of the electrical energy.

4,871,935

SLIP RING ASSEMBLY AND METHOD OF MANUFACTURE

David B. Sweet, Hartsville, and James T. Hindel, Munroe Falls, both of Ohio, assignors to The B.F. Goodrich Company, Akron, Ohio

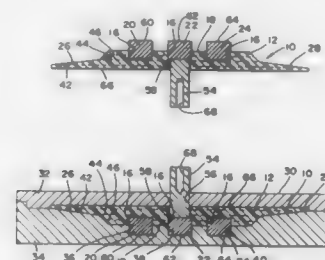
Division of Ser. No. 526,031, Sep. 26, 1983, Pat. No. 4,837,920.

This application Jul. 28, 1988, Ser. No. 225,125

Int. Cl.⁴ H01R 43/10, 39/08

U.S. Cl. 310—232

6 Claims



1. A slip ring assembly comprising a base member of dielectric composite material rotatable about an axis of rotation, at least two slip rings coaxial with said axis of rotation of said base member, a mounting portion of said base member extending radially from said slip rings for mounting said base member on a part rotating about said axis of rotation and electrical connections extending from said slip rings through said base member and means for attaching electrical conduits to distal ends of said connections, and said mounting portion of said base member including a circular flange extending radially from said slip rings, and said composite material being a molded body of resin impregnated material reinforced by layers of fabric.

4,871,936

COMMUTATOR FOR A STARTER MOTOR

Yoshifumi Akae; Takasi Yamamoto; Koji Arima, and Tetsuo Yagi, all of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

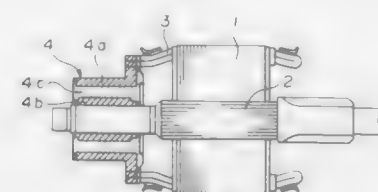
Filed Sep. 20, 1988, Ser. No. 246,841

Claims priority, application Japan, Nov. 5, 1987, 62-279920

Int. Cl.⁴ H02K 13/00; H01R 39/16

U.S. Cl. 310—233

2 Claims



1. A commutator for a starter motor which comprises a plurality of segments electrically connected to armature coils, an insert member fitted to an armature shaft and a glass-fiber-reinforced phenol resin molded to integrate said segments with said insert member, characterized in that a small amount of mica particles are uniformly contained in and said resin in a range of 5 wt % to 10%.

4,871,937

VIBRATION WAVE MOTOR

Sumio Kawai, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

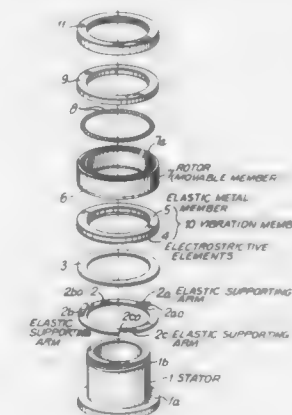
Filed Mar. 15, 1988, Ser. No. 168,178

Claims priority, application Japan, Mar. 27, 1987, 62-74955

Int. Cl.⁴ H01L 41/08

U.S. Cl. 310—323

4 Claims



1. A vibration wave motor comprising:

a ring-shaped vibration member having an elastic metal member and electrostrictive elements fixed to said elastic metal member, in which elliptic vibrations are produced on a surface of said elastic metal member when an AC voltage for driving is applied to said electrostrictive elements; and
a movable member frictionally contacted to said vibration member so as to be rotatably driven by said elliptic vibrations;
wherein the improvement that a supported surface of said vibration member different from its surface frictionally contacted to said movable member is supported by a plurality of elastic supporting arms, the bases of said elastic supporting arms being fixed to a stator and wherein electrically conductive rubber pieces are affixed to those surfaces of said elastic supporting arms which contact said supported surface of said vibration member.

4,871,938

POSITIONING DEVICE FOR A SCANNING TUNNELING MICROSCOPE

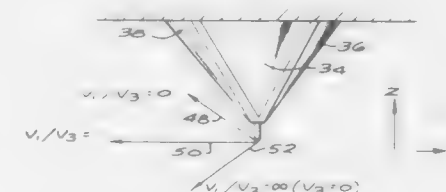
Virgil B. Elings, and John A. Gurley, both of Santa Barbara, Calif., assignors to Digital Instruments, Inc., Santa Barbara, Calif.

Filed Jun. 13, 1988, Ser. No. 206,091

Int. Cl.⁴ H01L 41/08

U.S. Cl. 310—328

35 Claims



1. A piezoelectric positioning device for controlling the three dimensional horizontal and vertical movement of a tip relative to the sample in a scanning tunneling microscope, including

a thin walled cone shaped member formed of piezoelectric material having an outer surface and an inner surface,
a tip member positioned at the apex of the cone member,
a plurality of substantially similar pie shaped members positioned around one of the surfaces of the cone shaped member to form opposite pairs of electrodes to control the horizontal movement of the tip in two of the three dimensions in accordance with voltages applied to the pairs of electrodes, and
a unitary member positioned around the other of the surfaces of the cone shaped member to form a unitary electrode to control the vertical movement of the tip in the third dimension in accordance with voltage applied to the unitary electrode.

4,871,939

PIEZOELECTRIC MOTOR

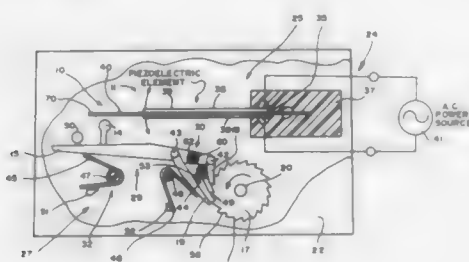
Michael T. Clouser, Indianapolis, Ind., assignor to Embart Industries, Inc., Indianapolis, Ind.

Filed Dec. 21, 1987, Ser. No. 135,718

Int. Cl.⁴ H01L 41/08

U.S. Cl. 310—332

6 Claims



1. A motor comprising:
means for electrically connecting to a source of alternating currents;
elongated piezoelectric means electrically connected to said means for connecting and responsive to said alternating current for bending in one direction substantially perpendicular to the axis of elongation when said alternating current is in the negative portion of its cycle and bending in the opposite direction to said one direction when said alternating current is in the positive portion of its cycle;
drive means for transmitting rotational motion; and
ratchet means responsive to said piezoelectric means for turning said drive means in a predetermined angular direction in response to said bending of said piezoelectric means, said ratchet means comprising:
a ratchet wheel;
a pivot axle and a pivot means pivotable about said axle in response to the bending of said piezoelectric means; and
drive pawl means for driving said ratchet wheel, said drive pawl means comprising a first drive pawl connected to said pivot member on one side of said pivot axle and a second drive pawl connected to said pivot member on the other side of said pivot axle.

4,871,940

COLOR DISPLAY TUBE WITH FIELD CONTROLLER

Masayuki Ishibashi, Chiba, and Hiroshi Yoshioka, Mobara, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 10, 1987, Ser. No. 12,997

Claims priority, application Japan, Mar. 7, 1986, 61-48302

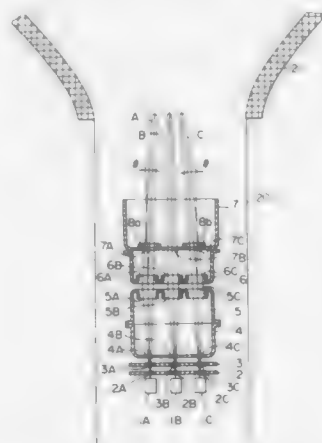
Int. Cl.⁴ H01J 29/51

U.S. Cl. 313—412

8 Claims

1. A color display tube for operating at a horizontal scanning frequency greater than the standard horizontal scanning frequency and having an in-line electron gun for emitting a plurality of electron beams comprising:
a convergence device for converging said plurality of elec-

tron beams emitted from said electron gun onto a predetermined point by using a magnetic field;
a deflection device for deflecting the electron beams converged by said convergence device into a predetermined direction by using a deflection magnetic field; and
a field controller disposed between said convergence device



and said deflection device in order to adjust magnetic flux distribution of leakage magnetic field from said deflection device so as to make said leakage magnetic field exert influence upon respective electron beams uniformly, said field controller comprising a magnetic material having relative permeability of 3,000 H/m or more and coercive force of 0.025 Oe or less.

4,871,941

GAS DISCHARGE LAMP WITH DIFFERENT FILM THICKNESSES

Yoshitomi Dobashi, Fujisawa, and Akihiro Inoue, Chigasaki, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

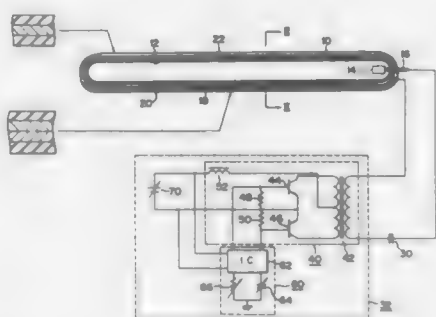
Filed Mar. 25, 1988, Ser. No. 173,117

Claims priority, application Japan, Mar. 28 1987, 62-74807

Int. Cl.⁴ G09G 03/10; H01J 61/06

U.S. Cl. 313—485

18 Claims



1. A gas discharge lamp comprising:
a tube bulb;
a gas discharge material filled in said bulb;
an internal electrode provided inside said bulb;
a belt-shaped external electrode formed on an outer surface of said bulb and extending along an axis of said bulb; and
a fluorescent material film formed on an inner surface of said bulb; adapted to be excited by a gas discharge, and having a non-uniform thickness along the axis of said tube that varies in accordance with a varying current density to cause a uniform brightness.

4,871,942

LOW-PRESSURE DISCHARGE LAMP

Adrianus L. J. Burgmans, and Petrus R. Van Ijzendoorn, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

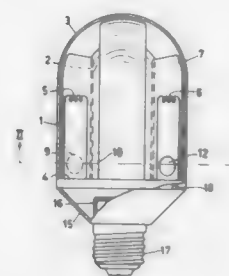
Continuation of Ser. No. 732,798, May 9, 1985, abandoned, which is a continuation of Ser. No. 512,316, Jul. 8, 1983, abandoned, which is a continuation of Ser. No. 237,301, Feb. 23, 1981, abandoned. This application Apr. 7, 1986, Ser. No. 849,350

Claims priority, application Netherlands, Mar. 4, 1980, 8001280

Int. Cl.⁴ H01J 61/10

U.S. Cl. 313—493

17 Claims



1. A low-pressure discharge lamp comprising:
an outer first wall which is permeable to light,
an inner second wall spaced from said outer first wall, said first and second walls defining and enclosing a discharge space therebetween,
an ionizable material contained in said discharge space, spaced electrodes disposed in said discharge space, between which electrodes a discharge takes place during normal operation of the lamp, and
a thin-walled member disposed between said walls and comprising first portions, second portions, and dividing portions, for dividing said discharge space into a plurality of compartments which are interconnected so as to define an elongated discharge path between said electrodes;
said first portions being permeable to light and being disposed proximate to respective corresponding portions of said first wall to define respective first barriers, and said second portions being disposed proximate to respective corresponding portions of said second wall to define respective second barriers;
each said dividing portion extending between a respective one of said first portions and a respective one of said second portions to separate adjoining compartments through which said discharge path extends, an inner adjoining compartment being defined by a respective first portion, two of said dividers and part of said second wall, and an adjoining outer compartment being defined by one of said two of said dividers, the respective second portion, another divider and part of said first wall whereby during normal operation said discharge takes place on both sides of respective dividing portions, on the inner side of said first portions, and the outer side of said second portions; the first barriers being arranged so as to prevent short-circuiting between the adjacent outer compartments, and the second barriers being arranged so as to prevent short-circuiting between the adjacent inner compartments.

4,871,943

PHOTOMULTIPLIER TUBE HAVING A SLIDABLE MULTIPLIER ELEMENT

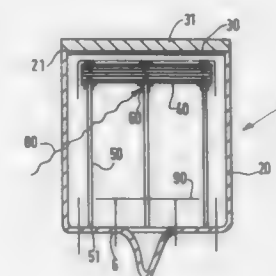
Gilbert Eachard, Brive la Gaillarde, France, assignor to U.S. Philips Corp., New York, N.Y.

Division of Ser. No. 87,066, Aug. 14, 1987, Pat. No. 4,795,390, which is a continuation of Ser. No. 932,057, Nov. 18, 1986, abandoned. This application Nov. 10, 1988, Ser. No. 270,156

Claims priority, application France, Jun. 3, 1986, 86 07967 Int. Cl.⁴ H01J 43/06

U.S. Cl. 313—526

4 Claims



1. A photomultiplier tube comprising:
a tube body having a window;
sliding means in the tube body, said sliding means being affixed to the tube body, said sliding means having a first end located in proximate to the window and having a second end located away from the window;
an electron multiplier arranged to slide on the sliding means in the tube body;
an evaporator arranged in the tube body; and
means for fixing the electron multiplier to the sliding means.

4,871,944

COMPACT LIGHTING UNIT HAVING A CONVOLUTED FLUORESCENT LAMP WITH INTEGRAL MERCURY-VAPOR PRESSURE-REGULATING MEANS, AND METHOD OF PHOSPHOR-COATING THE CONVOLUTED ENVELOPE FOR SUCH A LAMP

Henry Skwirut, Verona, and Robert C. Young, Nutley, both of N.J., assignors to North American Philips Corp., New York, N.Y.

Continuation-in-part of Ser. No. 11,832, Feb. 13, 1979, Pat. No. 4,300,073. This application Dec. 12, 1980, Ser. No. 216,216 The portion of the term of this patent subsequent to Nov. 10, 1998, has been disclaimed.

Int. Cl.⁴ H01J 7/44

U.S. Cl. 315—56

22 Claims



1. An electric lamp unit adapted for use in lighting apparatus

that requires a compact light source and includes socket means, said lamp unit comprising, in combination;

a fluorescent lamp comprising a sealed tubular envelope of light-transmitting vitreous material and convoluted configuration that contains an ionizable medium and a pair of electrodes and has four substantially straight leg segments that are joined by three U-bent segments and together therewith form three conjoined generally U-shaped sections which define a single serpentine discharge channel, said generally U-shaped sections being disposed in different planes and oriented so that the substantially straight leg segments of the generally U-shaped sections are in tridimensional array and two of said leg segments are disposed adjacent one another and terminate the discharge channel, said electrodes being located within the channel-terminating leg segments of the convoluted tubular envelope and connected to lead-in conductors that extend therefrom, said ionizable medium comprising a predetermined quantity of mercury and a gaseous filling at a pressure below about 10 Torr,

a base structure having a threaded base member with a pair of spaced contacts which provides a longitudinally extending screw-in type connector adapted to effect electrical contact with the socket means of said lighting apparatus, said base structure being coupled to the channel-terminating leg segments of the convoluted tubular envelope and together with said envelope constituting a compact unitary assembly,

circuit means connected to said lead-in conductors adapted to energize said discharge lamp when the base structure is connected to an electrical power source, and

a housing of light-transmitting material supported in enclosing relationship with said discharge lamp by the base structure,

said housing and base structure each having at least one vent opening therein which permits air to pass through the lamp unit and dissipate heat that is generated by the fluorescent lamp when the lamp unit is energized and in use, said circuit means being located within the confines of said unitary assembly and connected to the contacts of the base structure so that the resulting lamp unit is of single-ended construction and of such physical size that it is suitable for use in said lighting apparatus and the socket means thereof,

one of the said U-bent segments comprising a medial portion of the convoluted envelope and having a protruding sealed tip of vitreous material that defines a cavity within the envelope,

said fluorescent lamp being held in upstanding position relative to the base structure and being so oriented relative to the threaded base member that the sealed vitreous tip provides a region within the operating lamp that serves as a reservoir for condensed mercury and thus regulates the mercury-vapor pressure during lamp operation.

4,871,945

AUTOMATIC BRAKE LIGHT FLASHING ELECTRIC MODULE AND CIRCUIT

Robert W. Smith, 35 N. Harwood Ave., Upper Darby, Pa. 19082, and Stanislaw Bodziuch, 52 Shadeland Ave., Drexel Hill, Pa. 19076

Filed Feb. 8, 1988, Ser. No. 153,042
Int. Cl.⁴ B60Q 1/42; H05B 37/00

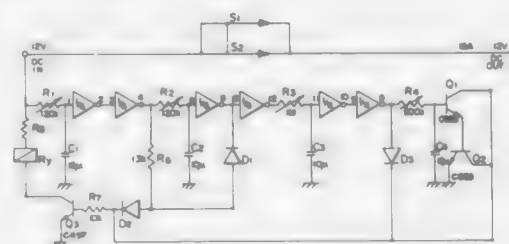
U.S. Cl. 315—77

2 Claims

1. An electric control module which comprises:
a means for coupling an input voltage to a relay actuator;
a relay terminal switch which routes input voltage to an output voltage port;
said relay actuator operatively connected to said relay terminal switch to interrupt the output voltage;
a means for coupling said relay actuator to a transistor which, when activated, closes the relay;
a charging circuit to create an increasing voltage over time;

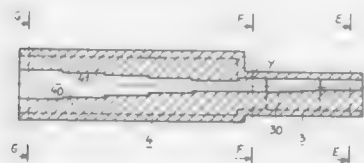
a means that senses said increasing voltage and outputs an inverted pulse at a given voltage level;
a means for coupling said charging circuit to said inverting means;

a means for coupling said inverting means to said transistor
a means of reinverting said inverted pulse and feeding it back to charge said transistor;
a means for coupling said reinverting means to a second charging circuit;



wave tube and the external circuit transmitting the energy of the tube, comprising:

- a first wave guide having a first and a second ridge located within said waveguide;
- a second wave guide coupling in a junction plane to the first wave guide and having a single ridge located within said waveguide, this single ridge having one end connected to



the delay line and one end connected to the first ridge, said second ridge being short circuited in the junction plane, said first guide comprising an impedance transformer, said second guide being with substantially constant impedance and the inside width of said second guide being at least substantially equal to that of the first guide in the junction plane and decreasing in the direction of the delay line.

4,871,951

PICTURE DISPLAY DEVICE INCLUDING A LINE SYNCHRONIZING CIRCUIT AND A LINE DEFLECTION CIRCUIT

Dirk J. A. Teuling, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

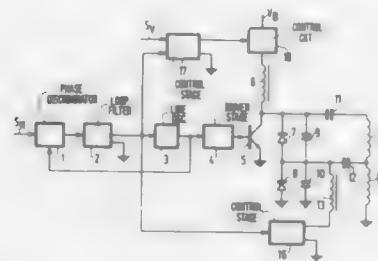
Continuation of Ser. No. 113,432, Oct. 23, 1987, abandoned.

This application Oct. 5, 1988, Ser. No. 253,795

Int. Cl.⁴ H01J 29/70, 29/76

U.S. Cl. 315-408

13 Claims



1. A picture display device, including a line synchronizing circuit implements as a phase control loop for synchronizing a line oscillator with incoming line synchronizing signals having various frequencies, and a line deflection circuit coupled to the oscillator for generating a line deflection current having a trace and a retrace through a line deflection coil, the coil being coupled to a correction device comprising adjusting means for continuously adjusting a value of the line deflection current, characterized in that an input of a control stage is coupled to the line synchronizing circuit and an output is coupled to the adjusting means for correcting, in dependence on the frequency of the line oscillator, a deflection error of the picture display device upon a change in the line frequency.

4,871,952

MOTOR SPEED CONTROL APPARATUS

Kouichi Ishizaka, and Akimitsu Ebina, both of Saitama, Japan, assignors to Jidosha Kiki Co., Ltd., Tokyo, Japan

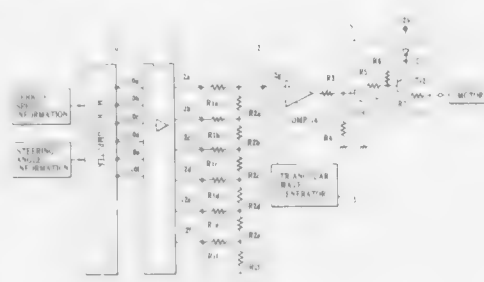
Filed Apr. 8, 1988, Ser. No. 179,416

Claims priority, application Japan, Apr. 9, 1987, 62-52690[U]

Int. Cl.⁴ H02P 7/06

U.S. Cl. 388-829

1 Claim



1. A motor speed control apparatus comprising:

- (a) vehicle measurement information generating means for generating measurement information vehicle speed and steering angle;
- (b) ladder resistor means for selectively receiving a voltage signal having a predetermined amplitude at a plurality of nodes, said ladder resistor means being arranged to change an output voltage value thereof in accordance with a voltage application position;
- (c) a microcomputer for receiving said vehicle measurement information from said vehicle measurement information generating means, and for, in accordance with said measurement information, supplying motor control information to said plurality of nodes of said ladder resistor means in the form of the voltage signal having the predetermined amplitude;
- (d) reference signal generating means for generating a triangular reference signal; and
- (e) comparing means for comparing a voltage value of the triangular reference signal with an output voltage value of said ladder resistor means and outputting a pulse output having a variable pulse width on the basis of a comparison result, wherein a motor speed is controlled on the basis of the pulse output.

4,871,953

REARVIEW MIRROR FOR A MOTOR VEHICLE

Christopher J. Anstee, Chichester, England, assignor to Britax Wingard Limited, England

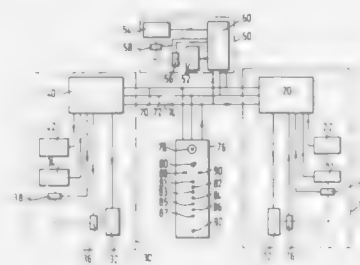
Filed Dec. 1, 1987, Ser. No. 127,224

Claims priority, application United Kingdom, Dec. 13, 1986, 8629826

Int. Cl.⁴ H02P 1/54

U.S. Cl. 318-466

4 Claims



1. A rear-view mirror system for a motor vehicle comprising

a plurality of mirror housings and an encoder at a location outside said mirror housings arranged to transmit a multiplicity of data signals, there being mounted in each mirror housing:

- a reflective member,
- electrically operated drive means for varying the orientation of the reflective member,
- a position sensor for producing a signal indicating the actual position of the reflective member, and
- a data processor comprising storage means for storing a value indicating a pre-selected orientation for the reflective member in said housing, means for comparing said value with the signal from the position sensor and producing a control signal for the drive means, and a decoder responsive to said encoder.

4,871,954

ACTUATING MEANS FOR A FLAP IN MOTOR VEHICLES

Gerhard Rathgeber, Pliening, Fed. Rep. of Germany, assignor to Bayerische Motoren Werke A.G., Munich, Fed. Rep. of Germany

PCT No. PCT/EP84/00033, § 371 Date Oct. 18, 1984, § 102(e) Date Oct. 18, 1984, PCT Pub. No. WO84/03369, PCT Pub. Date Aug. 30, 1984

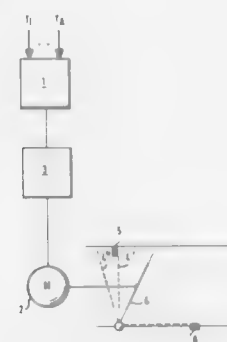
PCT Filed Feb. 9, 1984, Ser. No. 668,382

Claims priority, application Fed. Rep. of Germany, Feb. 18, 1983, 3305725

Int. Cl.⁴ G05D 3/10

U.S. Cl. 318-466

2 Claims



1. An actuating mechanism for a flap in motor vehicles, having an electric step motor for adjusting the flap between two end positions fixed by limit stops, the flap being adjustable to a desired position corresponding to a regulating command, further comprising:

- means for transmitting a command signal to the step motor, the magnitude of the signal exceeding the magnitude which would be necessary to adjust the flap to a first one of said end positions; and
- wherein at the time of the initial switching-on of the mechanism, the means for transmitting transmits a said command signal to the step motor to adjust the flap to said first one of said end positions which is closest to the desired position and subsequently to adjust the flap to the desired position intermediate the two end positions.

4,871,955

SYSTEM FOR STRICTLY POSITIONING AN OBJECT ALONG AN AXIS

Laurent Berger, Mennecy, France, assignor to Micro-Control, Evry, France

Filed Sep. 8, 1988, Ser. No. 241,865

Claims priority, application France, Sep. 8, 1987, 87 12435

Int. Cl.⁴ G05B 1/06

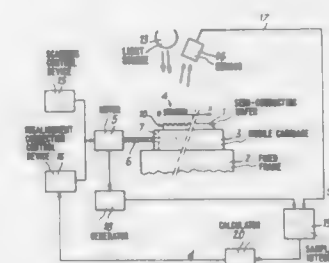
U.S. Cl. 318-640

5 Claims

1. A system for strictly positioning, along an axis of an object, such as a wafer of semi-conducting material in the

course of a process of constructing integrated circuits, said system comprising:

- a carriage mobile in translation along said axis under the action of controlled drive means, said object being fixed to said carriage;
 - a first optical grating which is fixed, linear and periodic, and perpendicular to said axis;
 - a second optical grating, fast with said object, likewise linear and periodic, said object being fixed on said carriage so that said second optical grating is perpendicular to said axis and said first and second optical gratings being at least approximately optically aligned, when said carriage occupies a determined stop position;
 - a light source for illuminating said first and second optical gratings; and
 - a photoelectric sensor for picking up the light coming from said optical gratings,
- wherein it comprises:
- means for controlling the drive means for causing said carriage to make a displacement of acquisition with respect to said stop position, of which the amplitude is at least equal to the step of said second optical grating, then to take said carriage to said stop position;
 - means for generating, during said displacement of acquisition,



tion, a periodic reference signal, of period equal to the step of said second grating, synchronized with the displacement of said carriage, so as to correspond to the pure periodic signal which would be generated by said photoelectric sensor during the displacement of the carriage, if, in said stop position of the latter, said first and second optical gratings are strictly aligned and if no parasitic light is superposed on this periodic signal;

multiplication means for forming, at a plurality of successive instants of said preliminary displacement, the product of the corresponding values of said periodic reference signal and of the signal actually delivered by said photoelectric sensor during this preliminary displacement;

means for summing, over a duration at least equal to the step of said second grating, the signal formed by the succession of said products delivered by said multiplication means; calculating means for determining, from the integrated signal delivered by said summing means, the possible offset existing between said first and second gratings when the carriage is in its initial position; and

means controlling the drive means for causing said carriage to make, from said stop position, a displacement of correction of which the amplitude corresponds to said offset, in order to bring said first and second optical gratings into strict alignment.

4,871,956

METHOD AND APPARATUS FOR CELL MONITORING AND CONTROL

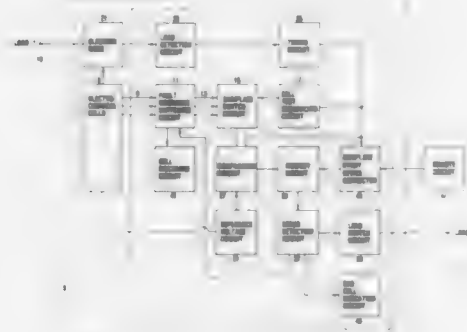
Joseph N. Barrella, Irvington, N.Y., assignor to Power Conversion Inc., Saddlebrook, N.J.

Filed Feb. 18, 1988, Ser. No. 158,285

Int. Cl.⁴ H02J 7/00; G08B 21/00; G01M 27/02

U.S. Cl. 320-13

3 Claims



1. A method for monitoring the voltage of a plurality of electrochemical cells connected to an external load, and controlling the output of said cells, comprising the steps of:

- comparing said voltage of each cell to a reference voltage;
- upon detection of a predetermined difference between said cell voltage and said reference voltage, automatically disconnecting said cells from said load and automatically connecting said cells to an impedance for safe discharge, said step of comparing said voltage of each cell with said reference voltage comprising the additional steps of:
 - storing the results of n comparisons for each cell;
 - making an $n+1$ comparison between said voltage of each cell and said reference voltage; and
 - comparing the stored results of each cell's n comparisons to the results of its $n+1$ comparisons.

4,871,957

METHOD AND APPARATUS FOR THE AUTOMATIC CONNECTION OF BATTERY CABLES

James Taranto, 41 Washington Ave., Waltham, Mass. 02154, and James H. Cullen, 5 Evans Ave., Bedford, Mass. 01730

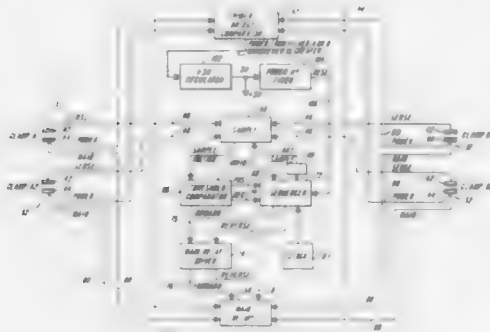
Filed Apr. 4, 1988, Ser. No. 176,821

The portion of the term of this patent subsequent to Apr. 26, 2005, has been disclaimed.

Int. Cl.⁴ H02J 7/00

U.S. Cl. 320-26

13 Claims



1. Anti-spark jumper cable apparatus for automatically inter-

connecting batteries via sets of battery cables, each set adapted to be connected to the terminals of a battery comprising: means coupled to said battery cables for automatically sensing the polarity of the voltages delivered by said batteries at the respective terminals and for automatically connecting said battery cables together such that the respective positive and negative terminals of said batteries are connected together, said battery polarity sensing means including means for sensing the polarity of the output voltages from both batteries, means for comparing the sensed polarities and means for setting said connecting means responsive to whether the sensed polarities are the same or different.

4,871,958

CHARGING CIRCUIT

Hiroichi Ishikawa, and Yasuo Nagasawa, both of Saitama, Japan, assignors to Toko, Inc., Japan

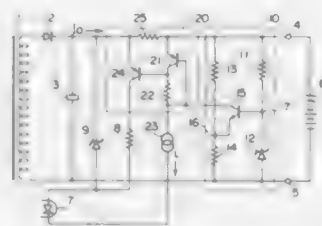
Filed Dec. 18, 1987, Ser. No. 134,710

Claims priority, application Japan, Dec. 26, 1986, 61-313478

Int. Cl.⁴ H02J 7/00

U.S. Cl. 320-32

2 Claims



- A charging circuit, comprising:
 - a transformer including a primary winding and a secondary winding;
 - a DC power source and switching means which are connected in series with the primary winding of said transformer;
 - a constant current source;
 - a comparator circuit including a first resistor and a second resistor, means connected to said first resistor for causing an output current to flow therethrough, means connected to said second resistor for causing a reference current to flow therethrough, said comparator circuit being arranged to compare said output current with said reference current to provide an error signal;
 - a control circuit responsive to said error signal to turn on or off said switching means in accordance with the amplitude of said error signal;
 - a current correcting circuit including a transistor operatively connected to said first resistor to be rendered conductive when the voltage of the output current is lower than a predetermined level, said transistor being operatively connected to said second resistor so that the collector current flows through said second resistor of said comparator circuit, a DC voltage being applied across the primary winding of said transformer and being turned on and off by said switching means so that a pulse voltage is induced in the secondary winding of said transformer, and said pulse voltage is rectified and smoothed out so that an output current is provided, the output current being controlled by feeding error signals back to said control circuit.

4,871,959

SOLAR TRICKLE CHARGER FOR LEAD ACID BATTERIES

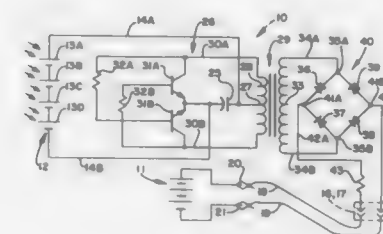
Carl E. Gali, 6414 Faircove Cir., Garland, Tex. 75043

Filed Jul. 15, 1988, Ser. No. 219,371

Int. Cl.⁴ H02J 7/00

U.S. Cl. 320-61

9 Claims



1. A solar trickle charger for batteries comprising: a multi-solar cell power source circuit; a DC to AC inverter multi-vibrator circuit connected to said multi-solar cell power source; a transformer with a primary coil a part of said DC to AC inverter multi-vibrator circuit; and a secondary coil; a four diode rectifier bridge circuit having a first set of opposite terminals connected to said secondary coil, and a second set of opposite terminals connectable to the two terminals of a battery; wherein there is a higher turns ratio with more turns in said secondary coil than in said primary coil yielding a higher AC voltage output from said secondary coil; said DC to AC inverter multi-vibrator circuit includes two transistors having a common electrode connection of first electrodes of said transistors connected to a first capacitor connected to a tap of said primary coil; said multi-solar cell power source circuit having a first lead and a second lead with said first lead connected to the junction of said first capacitor and said tap of said primary coil, and with said second lead connected to the junction of said first electrode of said transistors common connection and said first capacitor; and with opposite ends of said primary coil connected to second electrodes of said transistors and to resistors connected to the bases, respectively, of said transistors; said two transistors are NPN type transistors with said common electrode connection of said transistors a common connection between emitters of said two transistors; the opposite ends of said primary coil are connected to the collectors of said NPN transistors and each on through said resistors, respectively, to the base of the opposite transistor of said two transistors from transistor collector connections; a current limiting resistor is included in connection means to the two terminals of a battery; said connection means includes a two wire plug and socket connection; said multi-solar cell power source circuit has a two wire out line cable connection to circuitry within a circuit box containing said DC to AC inverter multi-vibrator circuit, said transformer, and said AC to DC four diode rectifier bridge circuit; the plug of said two wire plug and socket connection is mounted on said circuit box; said trickle charger is a pulse output trickle charger including a second capacitor connected across said second set of opposite terminals of the four diode rectifier bridge circuit; and trigger circuit means including a zener diode and a SCR with a control electrode connected to the anode of the zener diode, connected in said connection means from said four diode bridge rectifier subject to being biased to conduction in repeated successive pulses of conduction when said second capacitor is repeatedly charged to a voltage bias level that is said trigger circuit means voltage bias to conduction level.

4,871,960

OUTPUT VOLTAGE CONTROL SYSTEM FOR AN ELECTRIC GENERATOR

Sadamitsu Yoden, Iida, Japan, assignor to Tamagawa Seiki Kabushiki Kaisha, Tokyo, Japan

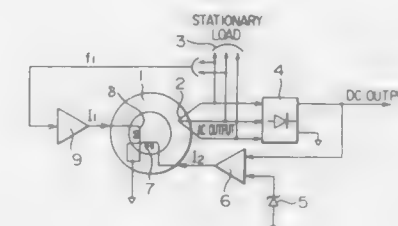
Filed Aug. 2, 1988, Ser. No. 227,161

Claims priority, application Japan, Aug. 21, 1987, 62-206450

Int. Cl.⁴ H02P 9/10, 9/14

U.S. Cl. 322-24

2 Claims



1. An output voltage control system for an electric generator wherein a rotary shaft of the generator is rotated by power means, such as an engine, for producing an output voltage, said control system comprising a first field winding, a second field winding and an output provided in the generator, a stationary load connected to the output, first control means adapted to supply an electric current inversely proportionate to the output frequency of the generator to said first field winding to produce a substantially constant output voltage for said stationary load, and second control means adapted for supplying an electric current derived from a portion of the output voltage produced at the output to said second field winding for producing a constant output voltage in the event of load fluctuations in the electric generator.

4,871,961

METHOD OF CONTROLLING THE SUPPLY OF POWER TO ELECTRICAL LOADS WITH A MINIMUM OF SWITCHING SURGES

Reinhard Kersten; Karl J. Köhlmoorgen, and Ebert Kuhl, all of Aachen, Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

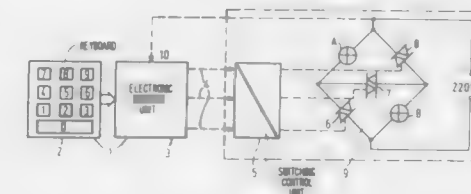
Filed Jul. 28, 1988, Ser. No. 225,339

Claims priority, application Fed. Rep. of Germany, Aug. 10, 1987, 3726535

Int. Cl.⁴ G05F 1/44

U.S. Cl. 323-267

22 Claims



1. A method of controlling the supply of power to electrical loads with a minimum of switching surges, which loads are each electrically subdivided into at least two equal subloads, which method comprises: connecting the subloads of each load arbitrarily in at least three main power stages in series arrangement alternately individually or in parallel arrangement to an A.C. mains, and for a finer power supply control switching the subloads to provide six intermediate power stages in which, starting from one of the three main power stages, in a continuously repeated cycle of six A.C. half waves in the first intermediate power stages during the third and sixth half waves in each cycle and in addition in the second intermediate power stages during the second and fifth half waves the subloads are

switched each time to a next lower main stage, which for the series arrangement switches off the power consumption.

4,871,962

METHOD FOR MEASURING THE SIZE OF VIAS
Robin W. Cheung, Cupertino, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Oct. 28, 1988, Ser. No. 263,906

Int. Cl. G01R 27/14

U.S. Cl. 324-65 R

12 Claims



1. A method for measuring the lateral size of openings which extend through a layer of material which comprises:

- measuring the voltage drop while flowing a known current through a given length of a first rectangular test pattern comprising a continuous layer of a material capable of carrying an electrical current;
- measuring the voltage drop while flowing the same known current through the same length of a second rectangular test pattern comprising another portion of said same layer of material and of identical width and length as said first test pattern but with openings formed through said second test pattern; and
- determining the lateral size of said openings in said second test pattern from the number of said openings and the electrically measured difference in voltage drops between said first and second test patterns.

4,871,963

METHOD AND APPARATUS FOR TESTING EPROM TYPE SEMICONDUCTOR DEVICES DURING BURN-IN
Lucio Cozzi, Agrate Brianza, Italy, assignor to SGS Microelettronica S.p.A., Varese, Italy

Division of Ser. No. 73,654, Jul. 15, 1987, Pat. No. 4,799,021.

This application Oct. 17, 1988, Ser. No. 258,962

Claims priority, application Italy, Jul. 22, 1986, 83633 A/86

Int. Cl. G01R 31/00, 31/02

U.S. Cl. 324-73 R

1 Claim



1. A process for functional testing and for determining the characteristics of EPROM type semiconductor devices during a burn-in treatment, characterized by the following steps:

- programming an "all 0" pattern the cells of the EPROM devices as received from the assembly lines;
- loading of the devices into tubes and storing at a temperature equal to or greater than 170° C. for at least 72 hours;
- automatic loading of single devices from said tubes on cards provided with suitable sockets; verification of the validity of the data programmed during step (A) and automatic rejection of nonvalidated devices;
- dynamic burn-in treatment at a temperature equal to or greater than 125° C. carried out in a burn-in chamber and subjecting the devices plugged into said sockets of said cards to the following tests while said devices are maintained in said burn-in treatment chamber:
 - verification of the "0" status of all the EPROM cells;
 - erasing;
 - programming of a test pattern;
 - verification of the test pattern;
 - repetition of steps (ii), (iii) and (iv) for a "n" number of different test patterns;
 - classification of the single devices according to particular quality classes;
 - programming of a special pattern for subsequent testing;
- automatic unplugging of the devices from the sockets of said cards and their classification by automatic insertion of the devices into classified tubes in accordance with particular quality grades;
- testing of dynamic (TAC) parameters of the devices and further classification of devices in function of the determined individual dynamic characteristics;
- stamping of the devices and final erasing of the data still present in the memory cells.

4,871,964

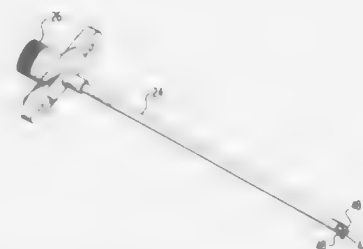
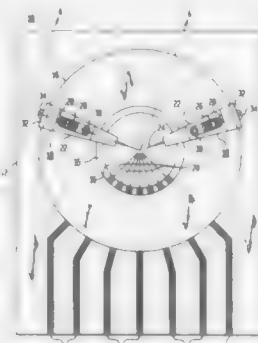
INTEGRATED CIRCUIT PROBING APPARATUS
Gregory G. Boll, Watchung, and Harry J. Boll, Berkeley Heights, both of N.J., assignors to G. G. B. Industries, Inc., Naples, Fla.

Filed Apr. 12, 1988, Ser. No. 180,457

Int. Cl. G01R 31/02, 1/06

U.S. Cl. 324-158 F

27 Claims



25. Probe apparatus comprising:

- a printed circuit board with a plurality of electrical conductors formed thereon;
- a plurality of needle-like probes with a separate one of same being coupled to a separate one of the electrical conductors, said needle-like probes being adapted to electrically contact portions of a device to be probed;
- a plurality of probe assemblies with each comprising a coaxial first transmission line (cable), support and positioning means and an electrical coupler;
- each of the coaxial first transmission lines having a center conductor separated from a surrounding outer conductor (shield) by an insulating member and being characterized by a substantially constant resistive impedance throughout the length thereof;
- the center conductor of each of the transmission lines extends beyond the shield of the transmission line at a first end of each of the transmission lines;
- an electrically conductive leaf spring member being electrically coupled by a first end to the each of the shields at a first end of each of the transmission lines and being separated from the portion of the center conductor which extends beyond the outer conductor at the first end of each of the transmission lines such that during probing of a device when the leaf spring member and the portion of the center conductor which extends past the shield both electrically contact the device, the impedance of the extension of the center conductor and the leaf spring member is essentially a resistive impedance;
- the length of each of the leaf spring members being approximately the same as or less than the diameter of the coaxial transmission line it is associated with;
- a probe contact end of the extension portion of each of the center conductors and a second (probe contact) end of each of the leaf spring members having geometric shapes suitable for contacting areas of an electrical device to be probed by the probing apparatus;
- the leaf spring members being positioned with respect to the extension portion of each of the center conductors such that during a probing operation the probe contact ends of the leaf spring members electrically contact a portion of a device being probed and then thereafter they flex and form acute angles with respect to the device so as to allow the probe contact ends of the extension portion of the center conductors to electrically contact other portions of the electrical device at acute angles;
- a plurality of support and positioning means with each for supporting a central portion of one of the transmission lines and for facilitating relatively accurate positioning of the probe contact ends of the leaf spring members and the probe contact ends of the extension of the center conductors in first, second and third directions;
- the support and positioning means being attached to the printed circuit board;
- a plurality of electrical couplers with a separate one being electrically coupled to the center conductor and to the shield at a second end of each of the first transmission lines and being connectable through one of a second plurality of transmission lines to a source of bias and/or testing signals; and
- a portion of each of the first transmission lines, including portions at and near the first end thereof, and the extension portion of the center conductor and the leaf spring member all extend beyond the support and positioning means and are cantilevered such that during the probing of a device the probe contact ends of the leaf spring members of one or more of probe assemblies electrically contact a portion of a device being probed and then thereafter they flex so as to allow the probe contact ends of the extension portion of the center conductors associated therewith to electrically contact other portions of the electrical device and then a portion of one or more of the cables having the contacting probe ends flex so as to allow the leaf spring members and center conductors of all of the probe assemblies to electrically contact the device with-

out causing substantial damage to the probe ends and to the device.

4,871,965

ENVIRONMENTAL TESTING FACILITY FOR ELECTRONIC COMPONENTS

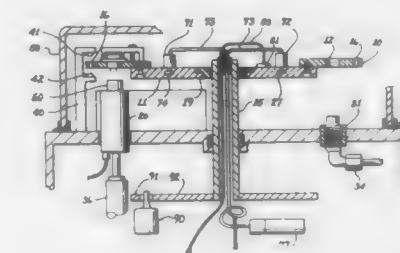
Hubert F. Elbert, Tucson, and Gary March-Force, Benson, both of Ariz., assignors to Apex Microtechnology Corporation, Tucson, Ariz.

Continuation of Ser. No. 27,116, Mar. 16, 1987, abandoned, which is a continuation of Ser. No. 820,029, Jan. 21, 1986, abandoned. This application Aug. 18, 1988, Ser. No. 235,751

Int. Cl. G01R 1/02, 1/04

U.S. Cl. 324-158 F

16 Claims



1. An environmental testing facility for electronic components, said testing facility comprising:
 - a chamber having gases evacuated therefrom;
 - component holder means in said chamber for holding a plurality of electronic components;
 - position means for automatically positioning each of said plurality of electronic components in said chamber when said gases are evacuated from said chamber;
 - interface means for testing one of said plurality of electronic components, said interface means including coupling means for electrically coupling to said one of said electronic components in response to control signals when said one of said plurality of electronic components is in a preselected position; and
 - temperature means for establishing a predetermined temperature condition on said component holder means when said gases are evacuated from said chamber.

4,871,966

APPARATUS AND METHOD FOR MULTIPLE ANGLE OBLIQUE MAGNETIC RESONANCE IMAGING

Stanton D. Smith, Bellport; David Hertz, Dix Hills; Robert B. Wolf, Medford, and Robert H. Olsen, Bethpage, all of N.Y., assignors to Fonar Corporation, Melville, N.Y.

Continuation of Ser. No. 931,333, Nov. 14, 1986, abandoned.

This application Nov. 16, 1988, Ser. No. 272,117

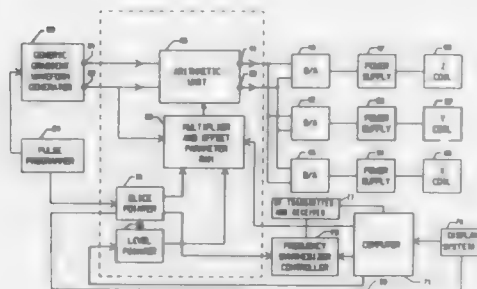
Int. Cl. G01R 33/20

U.S. Cl. 324-309

12 Claims

7. An apparatus for obtaining, in a course of a single scan, NMR image data for a plurality of selected planes, in an object, disposed at different angles relative to a predetermined direction, comprising:
 - means for providing generic gradient waveforms; and
 - means, coupled to said providing means, for generating

gradient waveforms in said single scan that produce slice selector magnetic field gradients having, respectively,



directions which are orthogonal to, respectively, said plurality of selected planes.

4,871,967

SPECTRAL COMPONENT SEPARATION IN MR IMAGING

Haim Rotem, Moshav Rishpon, and Yair Shimoni, Jerusalem, both of Israel, assignors to Elscint Ltd., Haifa, Israel

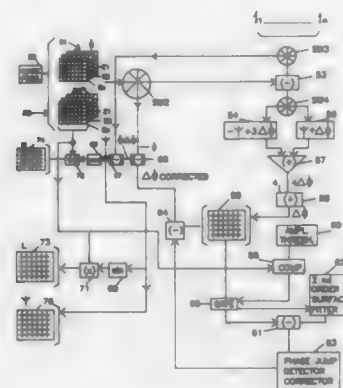
Filed Nov. 25, 1987, Ser. No. 125,533

Claims priority, application Israel, Nov. 30, 1986, 80814

Int. Cl.⁴ G01R 33/20

U.S. Cl. 324—309

12 Claims



1. A data acquisition method of acquiring separate first and second spectral data contributions to magnetic resonance images derived from first and second spectral components and for also simultaneously producing an inhomogeneity map of a sample being imaged during a single magnetic resonance imaging (MRI) scan, said images comprised of pixels corresponding to defined sections in selected portions of said sample, said method comprising the steps of:

measuring a phase angle β due to linear phase delays between a major spectral component and the horizontal axis of a Cartesian coordinate system, during occasional calibration scans,

acquiring data of the sample from echoes obtained using a gradient echo scan sequence simultaneously with a Hahn echo scan sequence;

shifting the Hahn echo with respect to the gradient echo to separate the two spectral components by 90 degrees and to obtain a first echo of amplitude E , that is a resultant of data for each of said two spectral components separated by the 90 degrees;

said simultaneous Hahn and gradient echo scan sequences providing the first echo amplitude E , and a phase angle ϕ_1 between the first echo and the horizontal axis in the Cartesian coordinate system;

said angle ϕ , being equal to the angle $\psi_1 + \Delta\phi + \beta$ where the angle ψ_1 is the angle between the first echo and the major

spectral component W , of the two spectral components, $\Delta\phi$ is the phase angle between the major spectral component W_1 and the horizontal axis due to the inhomogeneity of the sample, and β is the phase angle between the major spectral component W_1 and the horizontal axis due to system caused linear phase delays,

again shifting the Hahn echo with respect to the gradient echo to separate the two spectral components by $n \times 90$ degrees where n is any odd integer but not one or zero to obtain a second echo of amplitude E_2 that is the resultant of data for each of the two spectral components and a phase angle ϕ_2 between the second echo and the horizontal axis,

said angle ϕ_2 being equal to the angle $-\psi_2 + n\Delta\phi + \beta$ where: the angle ψ_2 is the angle between the second echo and the major spectral component W_2 and is practically equal to ψ_1 , the angle $n\Delta\phi$ is the angle between the major spectral component W_2 and the horizontal axis and where β is the phase angle between the major spectral component and the horizontal axis due to system caused linear phase delays,

computing sample inhomogeneity caused phase shift per pixel $\Delta\phi$,

said computing step comprising the steps of:

summing the per pixel phase angles between said first echo and the horizontal axis ϕ_1 and between the second echo and the horizontal axis ϕ_2 to obtain the sum $(n+1)\Delta\phi + 2\beta$,

subtracting twice the linear phase delay (2β) of the system, dividing the difference $(n+1)\Delta\phi$ by $(n+1)$ to obtain the per pixel sample caused inhomogeneity caused phase shift $\Delta\phi$, mapping the obtained values of $\Delta\phi$ to provide an uncorrected sample caused inhomogeneity map,

correcting said uncorrected sample caused inhomogeneity map for phase jumps to provide a corrected sample caused inhomogeneity map having corrected values of $\Delta\phi$ per pixel,

computing the angle ψ between the resultant echoes E_1 , E_2 and the main spectral components W_1 , W_2 , respectively, using the corrected values,

using the value ψ to compute the amplitudes of each of the spectral components per pixel according to the equations $E_1 \cos \psi = W_1$, $E_2 \cos \psi = W_2$, $E_1 \sin \psi = L_1$ and $E_2 \sin \psi = L_2$,

said step of correcting said sample caused inhomogeneity map including the steps of:

fitting said uncorrected sample caused inhomogeneity map to a second order surface,

subtracting said second order surface from said fitted uncorrected sample caused inhomogeneity map to provide a modified sample caused inhomogeneity map,

detecting phase jumps in said modified sample caused inhomogeneity map,

assigning each pixel having a determined phase jump a positive or a negative unity value depending on the direction of the detected phase jumps,

accumulating the values assigned to each pixel having a determined phase jump therein during a scan of the modified phase map,

multiplying the accumulated values for each pixel by 360 degrees, and

subtracting at each pixel the product of the accumulated value at the pixel multiplied by 360 degrees from the value of the map at the same pixel to correct the pixel for phase jump.

4,871,968

MAGNETIC RESONANCE APPARATUS

Shoichi Kanayama, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

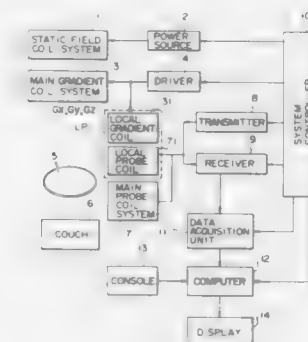
Filed Aug. 24, 1988, Ser. No. 235,499

Claims priority, application Japan, Aug. 25, 1987, 62-209205

Int. Cl.⁴ G01R 33/20

U.S. Cl. 324—318

14 Claims



8. A magnetic resonance apparatus comprising: static magnetic field producing means for producing a homogeneous static magnetic field for application to an object under examination; main gradient magnetic field producing means for producing a gradient magnetic field covering a relatively large region, which is superimposed upon the static magnetic field for application to the object; local gradient magnetic field producing means for producing a local gradient magnetic field which is superimposed upon the static magnetic field for application to the object; local probe means for applying a high frequency magnetic field to only a local region of the object and detecting a magnetic resonance signal produced in the local region of the object; system control means for controlling said static magnetic field producing means, said main gradient magnetic field producing means, said local gradient magnetic field producing means, and said local probe means in a predetermined pulse sequence; and processing means for controlling said system control means and processing the magnetic resonance signal detected by said local probe means to obtain output information.

4,871,969

RF SHIELD FOR RF COIL CONTAINED WITHIN GRADIENT COILS OF NMR IMAGING DEVICE

Peter B. Roemer, and William A. Edelstein, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 22, 1988, Ser. No. 288,605

Int. Cl.⁴ G01R 33/20

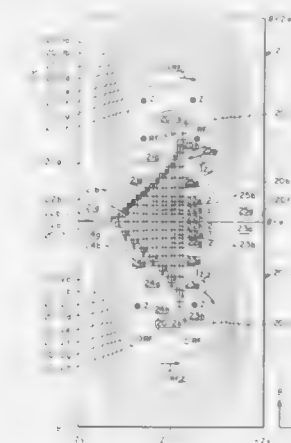
U.S. Cl. 324—318

12 Claims

1. A radio-frequency (RF) shield, for use interposed between a set of gradient coils, located beyond the RF shield, and at least one RF coil, located within the RF shield, in an NMR imaging device, comprises:

a single conductive sheet formed into a cylinder of generally circular cross-section and having opposed first and second half-cylinders each with at least a plurality of conductive streamline loop portions each defined by at least one nonconductive cut line etched through the sheet, between each pair of adjacent portions and parallel to RF current flow induced therein; each half-cylinder having a radial cut line separating each loop portion thereof into a generally C-shaped conductive loop portion; and means for interconnecting ends of the C-shaped portions to

provide a set of essentially short circuits for any RF current induced in the shield by the field of the at least one



RF coil, while passing any field from said gradient coil set in substantially unattenuated manner.

4,871,970

TEST CIRCUIT FOR SETTING THE SYNCHRONIZATION OF A DUAL IGNITION SYSTEM

Bodo Liebergessell, Schleissheimerstr. 270, D-8000 München, Fed. Rep. of Germany

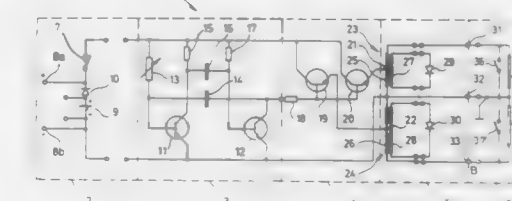
Filed Sep. 29, 1988, Ser. No. 251,408

Claims priority, application Fed. Rep. of Germany, Oct. 2, 1987, 3733401

Int. Cl.⁴ F02P 17/00

U.S. Cl. 324—389

4 Claims



1. A test circuit for setting the synchronization of a dual ignition system, particularly for the dual magneto system of an aircraft engine, comprising:

an oscillator circuit (3) for generating a periodic signal; a pair of transformers (23, 24) connected to said oscillator circuit (3) and in which the periodic signal is applied to a center-tap (21, 22) of the primary windings (25, 26) of said transformers and the primary windings (25, 26) are connected to a common potential (32) at one end of a primary winding;

at least two connections (31, 33) for connecting the test circuit (1) to each one of the two make/break contacts (36, 37) of the dual ignition system (6) being tested in which the connections (31, 33) are connected to each of the other end of the primary windings (25, 26); and a pair of indicator elements (29, 30), each of which is connected to a secondary winding (27, 28) of the transformers (23, 24) and which are activated whenever the voltage applied to the corresponding secondary winding (27, 28) exceeds a specified value.

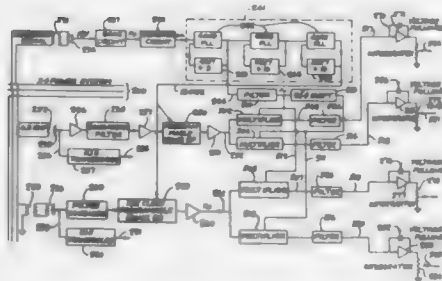
4,871,971

HIGH IMPEDANCE FAULT ANALYZER IN ELECTRIC POWER DISTRIBUTION NETWORKS

Donald I. Jeerings, 2715 Cypress Dr., Clearwater, Fla. 33575, and John R. Linders, 5747 Isanda Pl., Sarasota, Fla. 33581
Continuation-in-part of Ser. No. 3,585, Jan. 15, 1987. This application Jan. 11, 1988, Ser. No. 142,582

Int. Cl.⁴ G01R 31/08, 31/02; H02H 3/38
U.S. Cl. 324—509

24 Claims



1. A fault analyzer system for an electric power network, for detecting high impedance abnormalities in said network by detecting a phasor signature of such abnormality distinct from other sources of network disturbance, said system comprising:

- (a) means for producing a first reference signal representing substantially instantaneous power network voltage at a point in the network;
- (b) means for producing a second signal representing a substantially instantaneous power network current;
- (c) means for producing a third signal representing substantially instantaneous power network voltage at a point near the point of current signal measurement;
- (d) means for filtering and processing said first, second and third signals to produce signals representing the phasor values of a harmonic component in said second and third signals with respect to a fundamental component of said reference first signal, irrespective of nominal changes in electric power network frequency and minimizing ambiguity due to harmonic frequency difference, said filtering means comprising:

- i. means for establishing a second reference signal substantially in quadrature to said first reference signal, and
- ii. means for producing signals representing the product of a harmonic component of said second and said third signal respectively with both said reference signals respectively to produce signals representing the value of said harmonic phasors of said second and third signals respectively in rectangular coordinate form;

- (e) means for averaging said values of said harmonic phasor signals to produce signals representing the ambient values of each;
- (f) means for determining change in ambient value of each of said harmonic phasor signals;
- (g) means for establishing limits of such changes of said harmonic phasor signals in both magnitude and phase relationship with respect to said reference first signal, and
- (h) means for determining when said changes in said harmonic phasors are not within said limits thereby indicating a high impedance fault type abnormality on the circuit under observation.

4,871,972 APPARATUS FOR DETECTING FAULTY POWER LINE INSULATOR

Jacques T. Roy, 844, 10th St, St-Antoine, Quebec, Canada J7Z 3K5, and Germain R. Magnan, 3416, Metcalfe, Rawdon, Quebec, Canada (JOK 1S0)

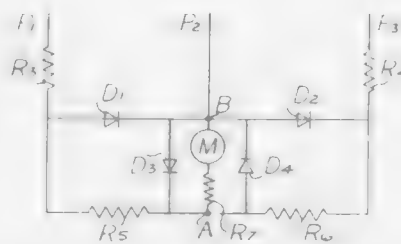
Filed Jul. 7, 1988, Ser. No. 216,130

Claims priority, application United Kingdom, Jul. 13, 1987, 8716419

Int. Cl.⁴ G01R 31/12

U.S. Cl. 324—551

10 Claims



1. An apparatus for comparing a string of two insulators of the suspension type adjacently mounted in series on an energized overhead distribution power line and for detecting an insulation defect of one of said insulators, said apparatus comprising:

- a fork member having a central prong and two lateral prongs, each lateral prong forming an electrical conducting line with the central prong, each prong having a metal tip member at their free end, said tips adapted to straddle said adjacently mounted insulators and to contact said power line;

- at least two high voltage resistors each having a resistance of about 1 to 100 megohms, each of said resistors being connected in each of said conducting lines, the total impedance value of the resistors being equal in each of said conducting lines;

- two ammeters selected from a milliammeter and a microammeter, each of said ammeters mounted in each of said conducting lines for registering the amperage in each line; means for comparing the values of said amperages.

4,871,973

DEMODULATOR INCLUDING SWEEP CONTROLLER FOR CONTROLLING SYNCHRONIZATION CAPTURE RANGE

Masashi Yoshihara, Tokyo, Japan, assignor to NEC Corporation, Japan

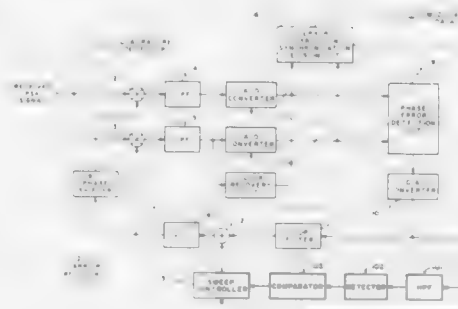
Filed May 12, 1988, Ser. No. 193,545

Claims priority, application Japan, May 19, 1987, 62-121959

Int. Cl.⁴ H03D 3/18

U.S. Cl. 329—308

6 Claims



1. A demodulator having error correction/synchronization decision circuit means for applying an error correction to two

sequences of demodulated data for making soft decisions which are produced on a basis of a received input PSK signal and a recovered carrier wave to produce error-corrected demodulated data and a synchronization decision signal, quadrature detector means for producing the two sequences of demodulated data, sweep controller means for generating a sweep signal when the synchronization decision signal is representative of a "not synchronous" condition, and for maintaining an output of said sweep controller means at a predetermined level when the synchronization decision signal is representative of a "synchronous" condition, a voltage controlled oscillator, and carrier recovery circuit means responsive to the two sequences of demodulated data for producing an error voltage, that is representative of a phase error which is determined with the two sequences of demodulated data for making a soft decision and for adding an output of a loop filter which is associated with the error voltage and an output of said sweep controller means to produce a control voltage for controlling said voltage controlled oscillator which produces the recovered carrier wave, said demodulator comprising:

filter means coupled to said carrier recovery circuit means and to said sweep controller means for filtering the error voltage, said filter means having a lower frequency limit which is close to an upper frequency limit of said loop filter;

detector means for detecting an output of said filter means; and

comparator means for comparing an output voltage of said detector and a reference voltage, said comparator means delivering a control signal to said sweep controller means when the output voltage is higher than the reference voltage;

said sweep controller means resuming a generation of the sweep signal in response to the control signal which is applied to said sweep controller while said sweep controller means is holding the predetermined level.

4,871,974

COHERENT PHASE SHIFT KEYED DEMODULATOR

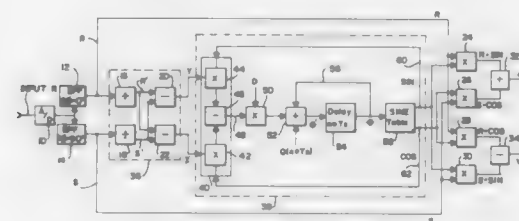
Gordon T. Davis, and Baiju D. Mandalia, both of Boca Raton, Fla., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Dec. 23, 1988, Ser. No. 289,064

Int. Cl.⁴ H03D 3/18; H03K 9/04

U.S. Cl. 329—345

22 Claims



1. Apparatus for demodulating a phase modulated input carrier signal, comprising:

means for sampling periodically an input carrier signal, converting each sample of the input carrier signal into a multi-bit input carrier signal representative of the input carrier signal at the moment of sampling, and generating instantaneous estimates of in-phase and quadrature-phase components of the current sample of the input carrier signal;

first control means for comparing the instantaneous estimates of the in-phase and quadrature-phase components of the current sample of the input carrier signal with pre-stored ideal components of an existing sample of the input carrier signal to determine phase angle deviation between the instantaneous estimates of the components and the ideal components; and

second control means for summing the phase angle deviation

with a phase angle of the existing sample of the input carrier signal and a phase shift proportional to the differential phase shift between the baud period in which the current sample of the input carrier signal was taken and the baud period from which the existing sample of the input carrier signal was taken to effect a new phase angle for deriving a trigonometric function of the input carrier signal corresponding to the new phase angle for comparing with a next sample of the input carrier signal; thereby incrementally effecting coherently demodulated and substantially ideal in-phase and quadrature-phase components of the input carrier signal.

4,871,975

CARRIER RECOVERY CIRCUIT FOR OFFSET QPSK DEMODULATORS

Hizuru Nawata, and Susumu Otani, both of Tokyo, Japan, assignors to NEC Corporation, Japan

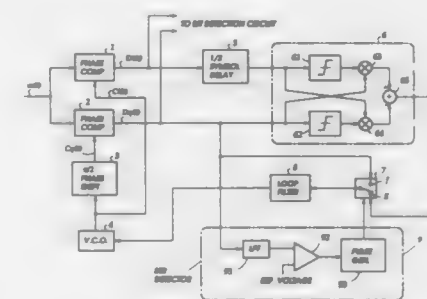
Filed Dec. 23, 1988, Ser. No. 289,617

Claims priority, application Japan, Dec. 24, 1987, 62-328049

Int. Cl.⁴ H04L 27/22

U.S. Cl. 329—124

5 Claims



1. A carrier recovery circuit for recovering a frequency reference for first and second channels of a received offset QPSK (quadrature phase shift keying) modulated signal, each of said channels having a carrier recovery field and a bit timing recovery field (BTR), the carrier recovery field of each of said channels and the BTR of said first channel having a series of binary digits of identical logic values and the BTR of said second channel having a series of binary digits of alternating logic values, comprising:

means including a voltage-controlled oscillator and a $\pi/2$ phase shifter coupled to the oscillator for generating carriers of quadrature phase relationship;

first and second phase comparators for respectively detecting phase differences between said first and second channels of said offset QPSK modulated signal and said carriers;

delay means for introducing a delay of $\frac{1}{2}$ symbol duration to a signal from one of said first and second phase comparators;

quadrature-phase detector means having stable phase angles at $\pi/4$, $(3/4)\pi$, $(5/4)\pi$ and $(7/4)\pi$ radian for receiving a signal from said delay means and a signal from said second phase comparator;

BTR detector means connected to said second phase comparator for detecting the BTR of said second channel and generating a pulse upon the detection of said BTR;

selecting means for selecting a signal from said quadrature-phase detector means in the absence of said pulse and briefly selecting a signal from said second phase comparator in the presence of said pulse; and

a loop filter for filtering the signal selected by said selecting means and supplying the filtered signal to said voltage-controlled oscillator as a frequency control signal.

4,871,976

AMPLIFIER CIRCUIT INCLUDING SINGLE CAPACITOR FOR DC DIFFERENTIAL-INPUT BALANCE
 Miyoichi Watanabe, Kyoto, and Shinobu Ueda, Kyoto, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

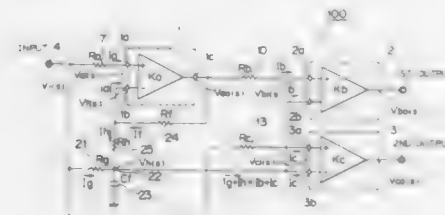
Filed May 26, 1988, Ser. No. 200,127

Claims priority, application Japan, May 27, 1987, 62-130681; May 27, 1987, 62-130682

Int. Cl.⁴ H03F 3/45

U.S. Cl. 330—69

11 Claims



1. An amplifier circuit comprising:
 one signal input for receiving an input signal containing a DC (direct current) voltage component;
 a differential-input preamplifier having a first input terminal for receiving one polarity input, a second input terminal for receiving the other polarity input opposite to that of the first input terminal, and an output terminal, said first input terminal being coupled to said one signal input;
 a first differential-input amplifier having a first input terminal for receiving one polarity input, a second input terminal for receiving the other polarity input opposite to that of the first input terminal thereof, and a first output terminal from which a first output signal of the amplifier circuit is derived, said first input terminal thereof being coupled to said output terminal of said preamplifier;
 a first resistor connected between the output terminal of said preamplifier and the second input terminal thereof so as to form a negative feedback path;
 a series circuit constructed of a second resistor and one capacitor, and connected between the second input terminal of said preamplifier and a ground, said capacitor being connected to the ground;
 a third resistor connected between said signal input and a junction of the series circuit; and,
 a second differential-input amplifier having a first input terminal for receiving said input signal via said signal input, a second input terminal, and a second output terminal from which a second output signal of the amplifier circuit is derived, said second input terminal of said second amplifier being connected together with said second input terminal of said first amplifier to the junction of said series circuit so as to apply a voltage appearing at said junction to both the first and second amplifiers as a reference voltage.

4,871,977

MONOLITHIC INTEGRATED WIDEBAND POWER AMPLIFIER

Harald Schilling, Freiburg, and Bernd Novotny, Kiel, both of Fed. Rep. of Germany, assignors to Deutsche ITT Industries GmbH, Freiburg, Fed. Rep. of Germany

Filed Oct. 31, 1988, Ser. No. 265,198

Claims priority, application European Pat. Off., Nov. 20, 1987, 87117136.9

Int. Cl.⁴ H03F 3/30, 3/45; H01L 29/72

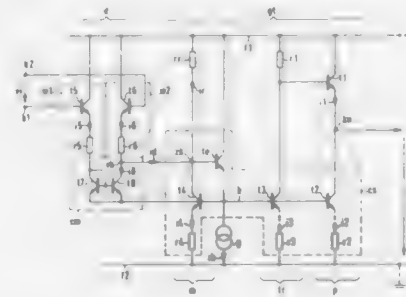
U.S. Cl. 330—255

17 Claims

1. A wideband power amplifier circuit comprising:
 a supply-voltage source having first and second supply lines;
 an output stage including first and second transistors connected in series in the same direction with a junction point provided as an output node in series between them,

wherein a collector of the first transistor is coupled to the first supply line and the emitter of the second transistor is coupled to the second supply line;

- a driver stage including a third transistor having its base connected by a common base lead to the base of the second transistor and its collector connected to the base of the first transistor;
- a difference stage having input terminals to which an input voltage signal is applied and which provides an output difference signal; and



an operating-point setter which is settable independently of the gain of the output stage and includes an intermediate node receiving the difference signal from the difference stage, a setting resistor connected between the first supply line and the intermediate node, a fourth transistor having its collector connected to the intermediate node in series with the setting resistor, its emitter connected to the second supply line, and its base connected to the common base lead, and a load-reducing transistor having its base connected to the intermediate node, its collector connected to the first supply line, and its emitter connected to the common base lead.

4,871,978

HIGH-SPEED STATIC DIFFERENTIAL SENSE AMPLIFIER

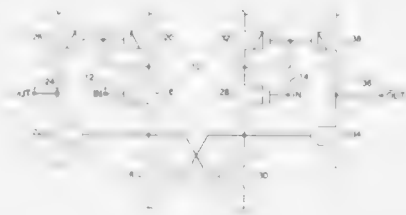
Douglas C. Galbraith, Fremont, Calif., assignor to Actel Corporation, Sunnyvale, Calif.

Filed Aug. 10, 1988, Ser. No. 230,762

Int. Cl.⁴ H03F 3/45; G11C 7/06

U.S. Cl. 330—253

2 Claims



1. A high-speed static differential sense amplifier, including:
 a noninverting input node,
 an inverting input node,
 a first source follower connected to said noninverting input node,
 a second source follower connected to said inverting node,
 a first current mirror connected to said first source follower and to said noninverting output,
 a second current mirror connected to said second source follower and to said inverting output,
 a third current mirror connected to said second source follower and said noninverting output,
 a fourth current mirror connected between said first source follower and said noninverting output.

4,871,979

VARIABLE FREQUENCY SYSTEM HAVING LINEAR COMBINATION OF CHARGE PUMP AND VOLTAGE CONTROLLED OSCILLATOR

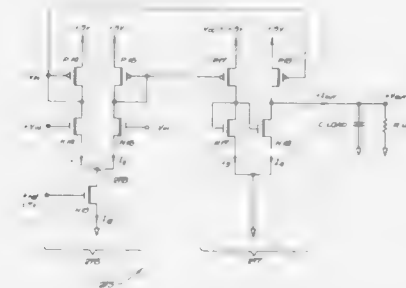
Gerald Shearer, Orange, Karl M. Lofgren, Long Beach, and Kenneth W. Ouyang, Huntington Beach, all of Calif., assignors to Western Digital Corporation, Irvine, Calif.

Filed Aug. 3, 1987, Ser. No. 80,957

Int. Cl.⁴ H03F 3/45

U.S. Cl. 330—253

7 Claims



1. A mirror isolated CMOS FET amplifier comprising:
 an input stage for receiving one or more input voltages, the input stage including:
 (a) a constant current source for conducting an input stage current of a substantially constant magnitude;
 (b) a current splitter, connected to the constant current source, for dividing the input stage current into competing first and second leg currents;
 (c) a first current conduction leg, coupled to the current splitter, for conducting the first leg current, the first current conduction leg having a first input voltage receiving FET of a first conductivity type for receiving a first of the input voltages at a gate thereof and for regulating the magnitude of the first leg current in response to the first input voltage, the first current conduction leg further having a first gate voltage regenerating FET of a second conductivity type connected to conduct the first leg current and means for generating a first gate voltage at the gate of the first regenerating FET for supporting the first leg current flowing therethrough;
 (d) a second current conduction leg, coupled to the current splitter, for conducting the second leg current, the second current conduction leg having a second gate voltage regenerating FET connected to conduct the second leg current and means for generating a second gate voltage at the gate of the second regenerating FET for supporting the second leg current flowing therethrough;
 wherein said FET amplifier further comprises an output stage including:
 (e) a third current conduction leg for conducting a third leg current, the third current conduction leg having a first current mirroring FET of said second conductivity type whose gate is coupled to the gate of the first regenerating FET such that the third leg current will be a mirrored copy of the first leg current.

4,871,980

HIGH EFFICIENCY POWER AMPLIFIER COMPRISING MULTILEVEL POWER SUPPLY

Zdzislaw Gulezynski, P.O. Box 441, Winchester, Mass. 01890
 Continuation-in-part of Ser. No. 27,561, Mar. 18, 1987, Pat. No. 4,782,306. This application Apr. 12, 1988, Ser. No. 180,433

Int. Cl.⁴ H03F 3/68, 3/45

U.S. Cl. 330—295

15 Claims

1. Power amplifier, comprising:
 a nonlinear amplifier means for amplifying an input signal of the power amplifier and providing a plurality of interim

signals each having a different transfer function with respect to the input signal; and



power amplifier means for separately amplifying each of the interim signals and providing at least a portion of an output signal of the power amplifier.

4,871,981

FAST HOPPING MICROWAVE FREQUENCY SYNTHESIZER

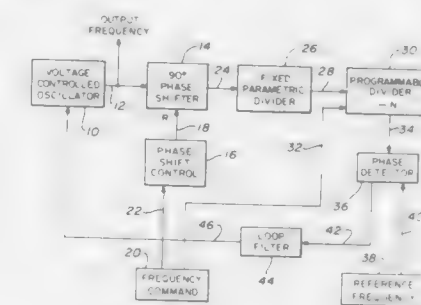
Jeffrey W. Franklin, Largo, Fla., assignor to E-Systems, Inc., Dallas, Tex.

Filed Nov. 21, 1988, Ser. No. 273,555

Int. Cl.⁴ H03L 7/18

U.S. Cl. 331—1 A

18 Claims



1. A fast hopping frequency synthesizer comprising:
 a voltage controlled oscillator for generating an output signal frequency;
 a reference frequency;
 a programmable phase shifter coupled to receive the voltage controlled oscillator output signal frequency for shifting the output frequency a predetermined number of 90° phase shifts in one period of the reference frequency;
 a frequency divider coupled to receive the output of said phase shifter and reduce the frequency of the phase shifted signal;
 a phase detector for comparing the reference frequency with the output of the divided, 90° phase shifted, output frequency and generating a control signal; and
 means for coupling the control signal to the voltage controlled oscillator to form a frequency synthesizer with a single phase-locked-loop.

4,871,962

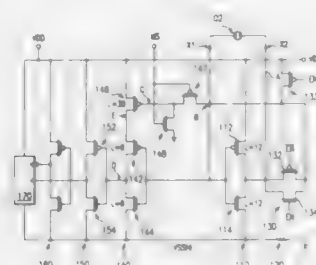
LOW-VOLTAGE OSCILLATOR WITH SEPARATE STARTUP MODE

Clark R. Williams, Plano, and Ching-Lin Jiang, Dallas, both of Tex., assignors to Dallas Semiconductor Corporation, Dallas, Tex.

Filed Oct. 28, 1988, Ser. No. 264,193
Int. Cl.⁴ H03B 5/36

U.S. Cl. 331-75

39 Claims



1. An integrated circuit oscillator, comprising: first and second resonator leads connectable to a resonator; first and second local power supply leads, at least one of said local power supply leads being connected through a resistance to a system power supply lead; an amplifier stage operatively connected to provide AC amplification between said first and second resonator leads, and operatively connected to be powered by said first and second local power supply leads; a first-stage output buffer, operatively connected to be powered by said first and second local power supply leads, including an output node, and a gain stage which has an input connected to said amplifier stage and which is connected to drive said output node toward the voltage of one of said power supply leads selectively in accordance with the voltage received from said amplifier stage, wherein said gain stage is controlled by logic so that, in a first mode, said gain stage has a significantly lower conductance, at equal input voltages, than said amplifier stage, and, in a second mode, said gain stage has a significantly higher conductance, at equal input voltages, than said amplifier stage.

4,871,983

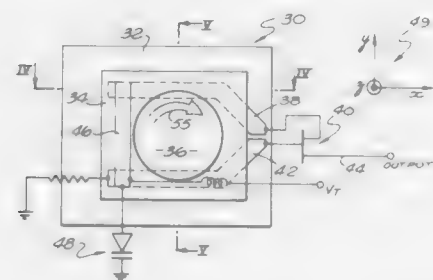
ELECTRONICALLY TUNED DIELECTRIC RESONATOR STABILIZED OSCILLATOR

Joseph M. Graycar, Redwood City, Calif., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed Jul. 6, 1988, Ser. No. 220,655
Int. Cl.⁴ H03B 5/18

U.S. Cl. 331-96

11 Claims



1. A dielectric resonator stabilized oscillator, comprising:

resonator means for selecting a particular band frequency; a first transmission line substantially disposed in a first plane, said first transmission line capable of carrying a high frequency input signal and coupled to said resonator; a second transmission line substantially disposed in a second plane and spaced apart from said first plane, said second transmission line spaced apart from and coupled to said resonator means; and, electronic means for fine tuning said resonator, said electronic means for fine tuning coupled to said second transmission line.

4,871,984

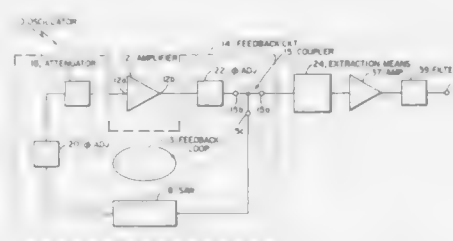
SURFACE ACOUSTIC WAVE OSCILLATOR

Richard W. Laton, Lexington; Charles E. Chase, Jr., Needham, and Gary K. Montross, Westford, all of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Jun. 24, 1988, Ser. No. 210,907
Int. Cl.⁴ H03B 5/12

U.S. Cl. 331-107 A

7 Claims



1. A microwave SAW stabilized oscillator, comprising: means for providing a closed loop having an integral multiple of 2π radians of phase shift and excess small signal gain at a frequency f_0 , said means comprising: an amplifier; and a SAW device having a frequency characteristic substantially equal to f_0 ; and means for extracting from said feedback circuit a signal having a frequency equal to nf_0 , where n is an integer greater than 1 and for preventing from being coupled from said feedback circuit a signal having the frequency component f_0 .

4,871,985

LOW NOISE RELAXATION OSCILLATOR

Adrianus Sempel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

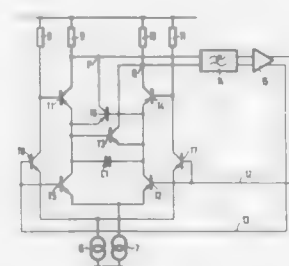
Filed Jun. 16, 1988, Ser. No. 208,187

Claims priority, application Netherlands, Jun. 23, 1987, #701461

Int. Cl.⁴ H03K 3/00

U.S. Cl. 331-111

11 Claims



1. A relaxation oscillator comprising: a capacitor, a charging circuit, a discharging circuit, switching means having a first position for charging the capacitor by means of the charging

circuit and having a second position for discharging the capacitor by means of the discharging circuit, and a feedback circuit which supplies a first feedback signal for setting the switching means from the first position to the second position after the capacitor voltage has reached a first value and which supplies a second feedback signal for setting the switching means from the second position to the first position after the capacitor voltage has reached a second value, wherein the feedback circuit comprises a first and a second transistor each having a control electrode and first and second main electrodes, said first and second transistors having their respective paths between control electrode and first main electrode connected in a mutually opposite orientation across the capacitor, the first and the second feedback signals, respectively, being derived from a voltage value on a second main electrode of the first transistor and the second transistor, respectively.

4,871,986

METHOD OF MAKING A CRYSTAL OSCILLATOR DESENSITIZED TO ACCELERATION FIELDS

Arthur Ballato, Long Branch, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 4, 1988, Ser. No. 268,829
Int. Cl.⁴ H03B 5/04, 5/32

U.S. Cl. 331-158

13 Claims

1. Method of making a crystal oscillator having a desired output frequency and desensitized to acceleration fields, said method including the steps of:
 - (A) manufacturing and mounting a crystal resonator to be included in said oscillator,
 - (B) performing acceleration tests upon the resonator to determine the acceleration sensitivity variation as a function of frequency in the vicinity of the resonance frequency of the resonator,
 - (C) including the resonator in the oscillator and operating the resonator and oscillator at a frequency that is not the resonator frequency but that is off resonance at a frequency where the resonator has the minimum acceleration sensitivity, and
 - (D) electronically producing the desired oscillator output frequency using electronic frequency synthesis techniques.

4,871,987

FSK OR AM MODULATOR WITH DIGITAL WAVEFORM SHAPING

Seiji Kawase, Yokohama, Japan, assignor to Kabushiki Kaisha Kenwood, Tokyo, Japan

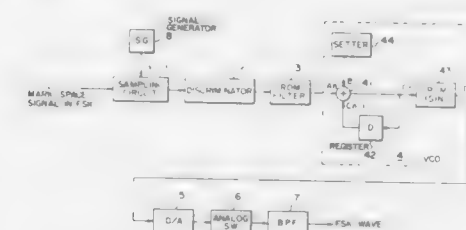
Filed Mar. 28, 1988, Ser. No. 174,170

Claims priority, application Japan, Mar. 28, 1987, 62-45042[U]; May 18, 1987, 62-72930[U]

Int. Cl.⁴ H04L 27/04, 27/12

U.S. Cl. 332-100

8 Claims



1. An FSK modulator for a mark-space signal comprising: first sequence generating means responsive to the beginning and end time points of each of the marks in the mark-space signal for generating a first sequence of digital values at every predetermined period, the magnitudes of the digital values in the rising and decaying intervals of the predetermined period being respectively defined as specific func-

tions stored in said generating means and the magnitude of the digital values in the intermediate interval being constant;

second sequence producing means for producing out of the first sequence of digital values a second sequence of digital values the magnitudes of which represent a sinusoidal wave, the instantaneous frequency of the sinusoidal wave corresponding to the magnitude of each of the digital values of the first sequence; and converting means for digital-analog converting the second sequence of digital values into an analog signal of said sinusoidal wave to form an FSK signal.

5. An AM modulator for a mark-space signal comprising: first sequence generating means responsive to the beginning and end time points of each of the marks in the mark-space signal for generating a first sequence of digital values at every predetermined period, the magnitudes of the digital values in the rising and decaying intervals of the predetermined period being respectively defined as specific functions stored in said generating means and the magnitudes of the digital values in the intermediate interval being constant;

second sequence producing means for producing out of the first sequence of digital values a second sequence of digital values the magnitudes of which represent a sinusoidal wave, the amplitude envelope of the sinusoidal wave corresponding to the magnitude envelope of each of the digital values of the first sequence; and converting means for digital-analog converting the second sequence of digital values into an analog signal of said sinusoidal wave to form an AM signal.

4,871,988

MICROWAVE TRANSMISSION LINE OF THE SYMMETRICAL TYPE AND WITH TWO COPLANAR CONDUCTORS

Luc Riviere, 37, avenue du Chateau, 92190 Meudon, and Alain Carencio, 4 rue Paul-Henry Thillois, 92340 Bourglareine, both of France

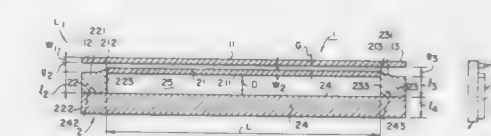
Filed Jun. 13, 1988, Ser. No. 205,930

Claims priority, application France, Jun. 22, 1987, 87 08729

Int. Cl.⁴ H01P 3/08

U.S. Cl. 333-238

9 Claims



1. A microwave transmission line of the symmetrical type having first and second asymmetrical ports, comprising

(a) a dielectric substrate having a major face;

(b) a first conductor comprising a first flat narrow conductive strip supported by said substrate major face and extending between first and second ends over the entire length of said line;

(c) a second flat conductor supported by said major face of said substrate and being arranged coplanar with said first conductor, said second conductor comprising:

- (1) a second flat narrow conductive strip extending parallel to said first narrow strip between said first and second ends of said first narrow strip;
- (2) first and second planar end conductors forming with said first and second ends of said first narrow conductive strip the first and second line ports, said planar end conductors being substantially rectangular and connected with the ends of said second narrow strip, respectively, said planar end conductors further having sides substantially parallel to said first and second ends of said first narrow strip, respectively; and

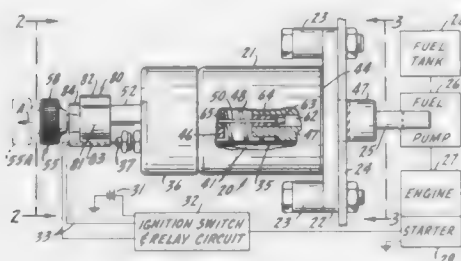
(3) a longitudinal wide planar conductive strip extending coplanar with and parallel to said first and second narrow strips over the entire length of said line, said second narrow strip being located between said first narrow strip and said wide planar strip, said wide planar strip having ends connected with said first and second end conductors, respectively, thereby forming in said second conductor a resonant cavity coplanar with said first and second conductors and bounded by longitudinal sides of said second narrow strip and said wide strip and by transverse opposite sides of said planar end conductors.

4,871,989

SOLENOID WITH MANUAL ACTUATION MECHANISM
David M. Gross, Mount Prospect, Ill., assignor to Synchro-Start Products, Inc., Skokie, Ill.
Filed Apr. 15, 1988, Ser. No. 182,093
Int. Cl.⁴ H01H 9/20

U.S. Cl. 335-164

6 Claims



1. In a solenoid of the kind comprising:
a housing;
a magnetic plunger in the housing, axially movable between an initial position and an actuation position, one end of the plunger being accessible through the front of the housing for an external operating connection;
spring means biasing the plunger toward its initial position; and electrical coil means for driving the plunger to its actuation position;
the solenoid including a manual actuation mechanism comprising:
a retraction rod axially movably mounted in the housing in alignment with the plunger, the retraction rod having a normal position effectively disengaged from the plunger; first connecting means for interconnecting the retraction rod and the plunger;
a manually operated rotary actuator mounted in the back of the housing and rotationally movable between a first position and a second position, movement of the actuator to its second position moving the retraction rod axially from its normal position to a retraction position, with movement of the rod to its retraction position driving the plunger to its actuation position;
and retainer means for retaining the rotary actuator in its respective first and second positions;
in which the retainer means comprises a spring retainer clamp mounted on the housing and projecting into firm, resilient gripping engagement with the rotary actuator to preclude vibrational or other incidental rotation of the actuator,
the spring retainer clamp comprising a double clamp having a first pair of resilient arms disposed in firm, resilient gripping engagement with a portion of the solenoid housing to mount the clamp on the housing and a second pair of resilient arms gripping the actuator.

4,871,990

CARTRIDGE FUSE

Tomohiro Ikeda; Yuji Hatagishi; Mitsuhiro Totsuka, and Toshiharu Kudoh, all of Shizuoka, Japan, assignors to Yazaki Corporation, Japan

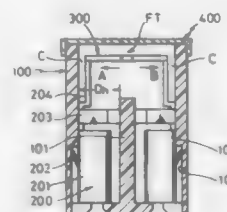
Filed Aug. 25, 1988, Ser. No. 236,245

Claims priority, application Japan, Aug. 25, 1987, 62-127998[U]

Int. Cl.⁴ H01H 85/36, 85/04

U.S. Cl. 337-238

4 Claims



1. An electrical cartridge fuse, comprising:
(a) a fuse housing having an insulating partition therein to form a pair of terminal compartments;
(b) a pair of opposing terminal members, each enclosed within a respective one of said terminal compartments, and each respective terminal member further including
(i) means for making electrical contact, housed within a respective terminal compartment,
(ii) a stay portion extending beyond said insulating partition, and
(iii) resilient means for urging said stay portions apart; and
(c) a fusible link joining said opposing terminal members so as to bridge said insulating partition.

4,871,991

HORN FOR AN AUTOMOTIVE VEHICLE

Kazushi Noda, Ichinomiya, and Makoto Kanai, Kani, both of Japan, assignors to Toyota Gosei Co., Ltd., Nishikasugai, Japan

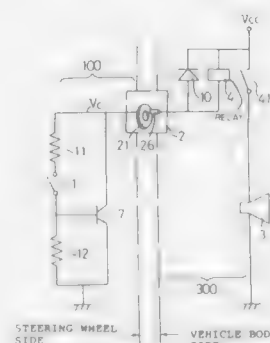
Filed Apr. 28, 1988, Ser. No. 187,248

Claims priority, application Japan, Apr. 30, 1987, 62-65350; Aug. 6, 1987, 62-120925

Int. Cl.⁴ B60Q 5/00

U.S. Cl. 340-384 E

9 Claims



1. A horn means for an automotive vehicle having a vehicle body comprising:
a horn circuit having a horn, the horn circuit being provided on the vehicle body, the body having a steering wheel;
a transistor amplifying circuit mounted in the steering wheel and having a horn switch which conducts current when closed, the transistor amplifying circuit comprising a transistor for amplifying the current flowing through the horn switch; and

a contact ring and a contact pin, which connect said transistor amplifying circuit to said horn circuit.

4,871,992

TACTILE DISPLAY APPARATUS

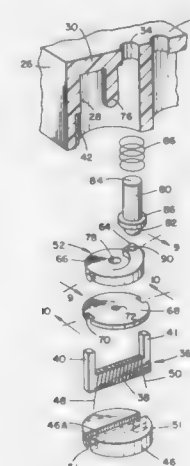
Robert C. Petersen, 37 Prospect Hill Rd., Noank, Conn. 06340

Filed Jul. 8, 1988, Ser. No. 216,880

Int. Cl.⁴ G08B 1/00; G09B 21/00

U.S. Cl. 340-407

20 Claims



1. Tactile display apparatus comprising:
a reference surface;
an electromagnet distant from said reference surface having first and second spaced poles of opposite, selectively reversible, polarity;
rotatable cam means proximate to said electromagnet having an axis of rotation transverse to said reference surface and including an integral permanent magnet with third and fourth spaced poles of opposite polarity equidistant from said axis of rotation, said cam means being rotatable between an active position at which said third and fourth poles, respectively, are attracted to and positioned adjacent said first and second poles, and an inactive position at which said fourth and third poles, respectively, are attracted to and positioned adjacent said first and second poles; and
a touch pin having a longitudinal axis transverse to said reference surface and including a follower end engageable with said cam means and a tip end distant from said follower end, said pin being movable on said cam means between a first position raised above said reference surface when said cam means is in said active position and a second position not projecting beyond said reference surface when said cam means is in said inactive position.

4,871,993

SELF-DIAGNOSTIC APPARATUS FOR VEHICLE METER

Takatoshi Hayashi, Kawasaki; Norio Fujiki, Yokohama; Yoichi Tanaka; Takashi Nishimoto, both of Tokyo, and Masakazu Kobayashi, Saitama, all of Japan, assignors to Kanto Seiki Co., Ltd., Ohmiya and Nissan Motor Co., Ltd., Yokohama, both of Japan

Filed Jul. 1, 1988, Ser. No. 214,071

Claims priority, application Japan, Jul. 3, 1987, 62-165485

Int. Cl.⁴ B60Q 1/00; G01R 11/32

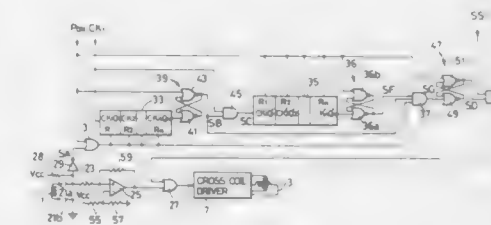
U.S. Cl. 340-439

6 Claims

1. A self-diagnostic apparatus for diagnosing a meter actuated by a sensor mounted on an automotive vehicle,
(a) detecting means for detecting a first sensor signal which

is generated when the sensor is disconnected from the meter;

(b) time measuring means, coupled to said detecting means, for measuring a predetermined time period after said detecting means has detected the first sensor signal; and



(c) pseudo signal generating means, coupled to said detecting means and said time measuring means, for generating a pseudo sensor signal to diagnose the meter only when said detecting means detects a second sensor signal which is generated when the sensor is reconnected to the meter after said time measuring means has measured the predetermined time period.

4,871,994

ALARM APPARATUS FOR AUTOMATIC TRANSMISSION VEHICLE

Yoshimitsu Takeda, Zama; Haruo Mochida, Kanagawa; Tsutomu Iwasaki, Yokohama, and Toshio Kanai, Ayase, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

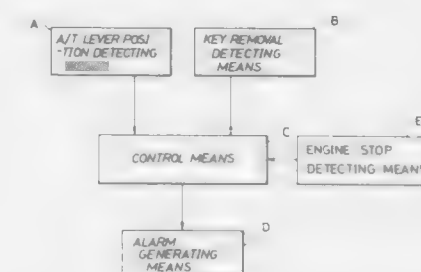
Filed Jul. 20, 1988, Ser. No. 221,797

Claims priority, application Japan, Jul. 21, 1987, 62-182020; Jul. 21, 1987, 62-111611[U]

Int. Cl.⁴ B60Q 1/00

U.S. Cl. 340-457

2 Claims



1. An alarm apparatus for an automatic transmission vehicle, comprising:

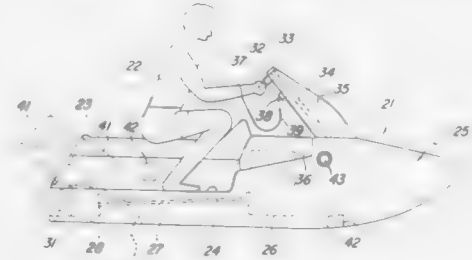
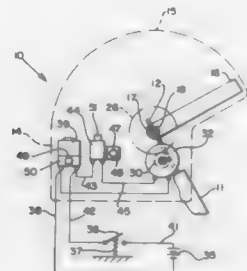
a shift lever;
an ignition key for inserting into a key cylinder;
a lever position detecting means for detecting whether the shift lever is set to the Park position;
a key removal detecting means for detecting whether the ignition key is removed from the key cylinder;
an engine stop detecting means for detecting whether an engine is at a stop;
a control means, coupled to said lever position detecting means, said key removal detecting means and said engine stop detecting means, for generating an alarm signal when said lever position detecting means detects that the shift lever is not set to Park position and said key removal detecting means detects that the ignition key is removed from the key cylinder, and also when said lever position detecting means detects that the shift lever is not set to Park position, and key removal detecting means detects that the ignition key is not removed from the key cylinder, and said engine stop detecting means detects that the engine is at a stop; and
alarm generating means, coupled to said control means, for

producing an alarm in response to the alarm signal generated from said control means.

hull, and powering means for powering said watercraft, and means for providing a warning signal that can be recognized

4,871,995
VEHICLE REAR WINDOW BRAKE APPLICATION
ACTIVATED SIGN RAISER
Dat T. Hoang, 915 Spring Valley Pl., #110, Richardson, Tex.
75081

Filed Dec. 16, 1987, Ser. No. 133,892
Int. Cl.⁴ B60Q 1/26
U.S. Cl. 340—487 10 Claims



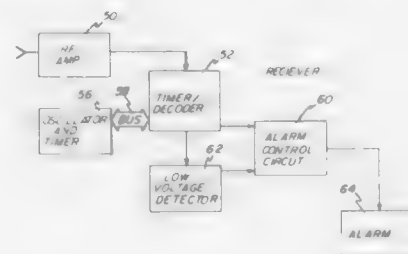
from a distance from the watercraft by a person other than the rider in response to the rider's area becoming unoccupied.

1. An electric power driven sign raiser mountable inside and below a vehicle window that when energized drives the sign up for showing through the rear window comprising: a sign with mounting rod means pivotally mounted in a pivot mount means with said sign with mounting rod means having a center of gravity to one side from the pivotal mount axis of rotation of said sign with mounting rod means so that when the sign is released from its raised state it falls back down to its lowered out of sight state; electric power drive means connected for driving said sign with mounting rod means pivotally from a lowered out of sight state up to a raised state with the sign showing through the rear window of a vehicle; electric circuit means connected to said electric power drive means connectable to electric power source means; and actuation switch means in said electric circuit means for activation driving of said electric power drive means and for power disconnect deactivation of said electric power drive means; also including an electromagnet in said electric circuit means; ferromagnetic bar means mounted for rotation with said sign with mounting rod means about the pivotal mounting thereof and rotation into engagement with said electromagnet when said sign with mounting rod means reaches the fully raised state; said electric circuit means having a first circuit section, and a second extension circuit section; said first circuit section connectable to said electric power source means, and including said actuating switch means and said electromagnet; and said second extension circuit section including a second switch positioned to be engaged and switched to the open state by sign raiser means with said second switch cutting current flow to said electric power drive means as said sign with mounting rod means reaches the fully raised state; and wherein said ferromagnetic bar means is separate from said mounting rod means.

4,871,996
WARNING SYSTEM FOR WATERCRAFT
Kanichi Tsunamoto, and Seiji Inoue, both of Hamamatsu, Japan, assignors to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan
Filed Jan. 7, 1987, Ser. No. 1,147
Claims priority, application Japan, Feb. 4, 1986, 61-22511
Int. Cl.⁴ G08B 19/00; B63B 21/52
U.S. Cl. 340—521 29 Claims

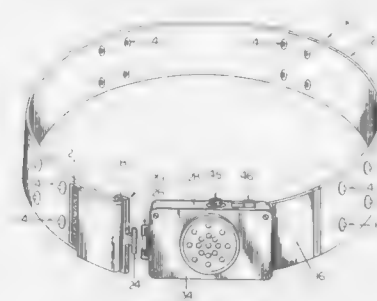
15. In a watercraft comprising a hull, a rider's area upon said

4,871,997
PROXIMITY SENSOR APPARATUS
Luc W. Adriessens, Berkeley, Calif.; Orlando A. Bustos, Dayton, and David Swanson, Moraine, both of Ohio, assignors to Tech-Age International Corporation, Dayton, Ohio
Filed Jun. 30, 1987, Ser. No. 68,173
Int. Cl.⁴ G08B 1/08; H04Q 7/00
U.S. Cl. 340—539 16 Claims



1. A radio frequency proximity sensing apparatus, comprising:
a transmitting device;
said transmitting device having oscillating circuit means for the propagation of a timed, pulsed electromagnetic signal;
said transmitting device includes means for providing control functions comprising a momentary action, push-button switch and circuit means for altering the timing of the pulsed signals from said oscillating circuit in response to the actuation of said switch;
a separate receiving device;
said receiving device having means for the detection of said timed, pulsed electromagnetic signal;
said receiving device including logic means for processing said timed, pulsed electromagnetic signal;
said receiving device including an alarm circuit such that said receiving device logic means actuates said alarm circuit when said receiving device is moved away from the proximity of said transmitting device and said detection means ceases to sense said timed, pulsed electromagnetic signal; and
said receiving device including means responsive to the altered timing of said pulsed signals for controlling the operation said alarm circuit.

4,871,998
POSTURE BELT
Michel B. Chaillon, 10746 N. Magnolia Ave., Santee, Calif. 92071
Filed Sep. 23, 1988, Ser. No. 248,498
Int. Cl.⁴ G08B 23/00
U.S. Cl. 340—573 5 Claims

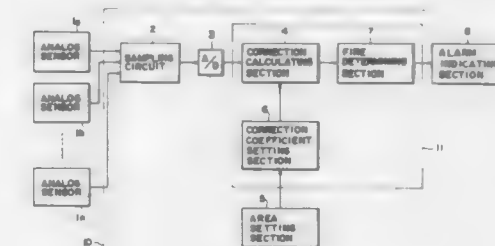


1. A posture belt comprising:
a buzzer housing having an upright rear wall, a top wall, a bottom wall, a left side wall, a right side wall, a removable front wall and means for fastening said front wall to said buzzer housing, a first slot is formed in said buzzer housing adjacent one of its side walls for detachably receiving buckle fastening structure;
an elongated belt having a predetermined length and predetermined height, said belt having a first end and a second end, a buckle having a forward end is attached to the first end of said belt, said buckle has a protrusion extending from its forward end and it is detachably received in said first slot formed in said buzzer housing;
said belt having an elastic section whose function is to absorb momentary stretching of the belt due to coughing, sneezing or the like;
a second slot is formed in said buzzer housing in one of its side walls and it has a height larger than the height of said belt so that it may freely pass in and out of said second slot due to the expansion of the waist of the person wearing said belt;
a buzzer alarm circuit having electric battery power therein mounted within said buzzer housing, an adjustable delay timer is also connected in said circuit that permits the user to select a few moments delay before the buzzer alarm is actuated; and
buzzer alarm actuating means connected to said second end of said belt, said buzzer alarm actuating means is also a component of said buzzer alarm circuit, said buzzer alarm actuating means comprising a pair of horizontally oriented coil springs each having a first end and a second end, said coil springs being vertically spaced from one another, the first ends of said coil springs being secured to their own anchors, the second ends of said springs being connected to a common vertically oriented end plate that is secured to one end of said elastic section, a removable contact terminal is mounted on said end plate and it is oriented toward a stationary terminal positioned on the inside wall surface of one of the end walls of said buzzer housing.

4,871,999
FIRE ALARM SYSTEM, SENSOR AND METHOD
Hiromitsu Ishii, Chiba, and Takashi Ono, Yokohama, both of Japan, assignors to Hochiki Kabushiki Kaisha, Shinagawa, Japan
Filed May 18, 1987, Ser. No. 51,576
Claims priority, application Japan, May 19, 1986, 61-114223
Int. Cl.⁴ G08B 17/00
U.S. Cl. 340—587 21 Claims

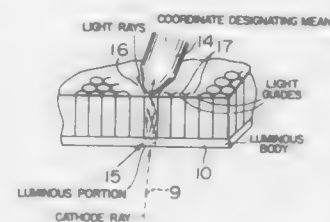
1. A fire alarm system comprising:

a plurality of analog sensors for detecting a change in ambient conditions caused by a fire;
a correcting means for providing correct data from the respective analog sensors on the basis of set supervisory regions for the respective analog sensors which are de-



finied by walls, beams or inwardly extending projections surrounding the respective analog sensors; and
a fire determining means for carrying out fire determination based on the correct data provided by said correcting means.

4,872,000
COORDINATE INPUT APPARATUS
Mitsunari Kano, Seto; Yoshihara Konishi, Kasugai, and Toshiko Matsuda, Owariasahi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Jul. 20, 1987, Ser. No. 75,526
Claims priority, application Japan, Jul. 21, 1986, 62-169724
Int. Cl.⁴ G09G 3/02
U.S. Cl. 340—706 7 Claims



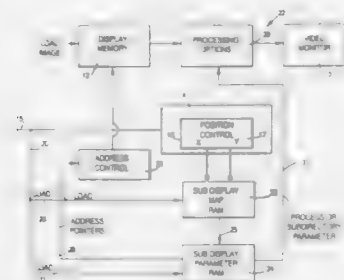
1. A coordinate input apparatus comprising a display unit provided with a display layer, and a transparent protecting layer provided on said display layer so that, when a desired coordinate position on said display layer is designated through said protecting layer to thereby input coordinate position information, said display layer produces a visible indication on the outer surface of said protecting layer, said protecting layer comprising a layer of light guides two-dimensionally arranged so as to transmit light from a spot on said display layer in the direction substantially perpendicular to said display layer to a spot on the outer surface of said protecting layer, so as to minimize apparent displacement between a designated coordinate position on said display layer and the position of a resulting visual indication on said outer surface of said protecting layer.

4,872,001
SPLIT SCREEN IMAGING
Zvi Netter, Haifa, Israel, assignor to Elscint Ltd., Haifa, Israel
Continuation of Ser. No. 730,201, May 3, 1985, abandoned. This application Jan. 15, 1988, Ser. No. 145,703
Claims priority, application Israel, May 25, 1984, 71925
Int. Cl.⁴ G09G 1/00
U.S. Cl. 340—721 3 Claims

1. A split screen image display system capable of displaying

a plurality of sub-display images each having different locations, shapes, sizes and processing parameters, said split screen image display system comprising:

- image display means,
- display memory means containing imaging data, said display memory means having a number of memory locations substantially equal to the number of pixels of said image display means,
- processing means for processing said imaging data obtained directly from said display memory means to generate images on said image display means from said imaging data,
- readout means for reading out said display memory means to



provide said imaging data directly to said processing means,

- a first random access memory (RAM) means providing instructions for determining the location of said imaging data in each of said sub-display images on said image display means,
- a second RAM means for providing instructions specifying the location in the memory means of the data being read out and for providing instructions specifying processes to be utilized by the processing means to determine the size and shapes of each of the sub-display images, and
- external interactive means for inputting said location and processing information into said first and second RAM means to designate desired split screen sub-display images.

4,872,002

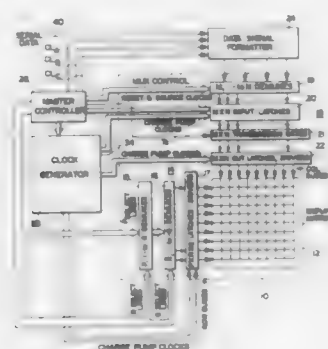
INTEGRATED MATRIX DISPLAY CIRCUITRY

Roger G. Stewart, Neshanic Station, and Dora Plus, S. Bound Brook, both of N.J., assignors to General Electric Company, Princeton, N.J.

Filed Feb. 1, 1988, Ser. No. 150,817
Int. Cl.⁴ G09G 3/20

U.S. Cl. 340—811

10 Claims



1. Apparatus for scanning a matrix of the type including column and row busses for applying potentials to matrix elements and including latch elements integrated with said matrix for coupling potentials to ones of said column or row busses,

said latch elements improved to enhance the switching speed thereof, comprising:

- a pair of cross coupled transistors including first and second transistors having respective first electrodes coupled to a common bus, having respective second electrodes coupled to respective output connections and having respective control electrodes, the control electrodes of said first and second transistors being coupled to the second electrodes of said second and first transistors respectively;
- first and second variable impedance load elements respectively coupled to the second electrodes of said pair of cross coupled transistors, said variable impedance load devices having control electrodes for applying potentials to control the impedance exhibited thereby;
- means coupled to apply input signals to said pair of cross coupled transistors; and
- means coupled to the control electrodes of said variable impedance load elements for conditioning said load elements to exhibit in sequence relatively high, relatively low then relatively high impedances to effect a state change of said latch, responsive to input signals applied to said pair of cross coupled transistors.

4,872,003

SERIAL INTERFACE SYSTEM FLEXIBLY APPLICABLE TO A ONE-TO-PLURALITY CONNECTION

Ikio Yoshida, Tokyo, Japan, assignor to NEC Corporation, Japan

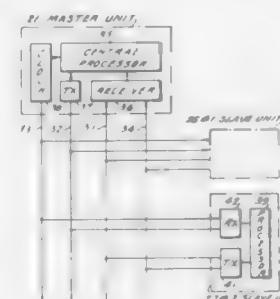
Continuation of Ser. No. 805,125, Dec. 3, 1985, abandoned. This application Jan. 1, 1988, Ser. No. 204,945

Claims priority, application Japan, Nov. 30, 1984, 59-251533; Dec. 28, 1984, 59-279194

Int. Cl.⁴ H04Q 1/00

U.S. Cl. 340—825.08

18 Claims



1. In a serial interface system comprising a master unit, a plurality of slave units, and a serial interface for use in slave-to-master or slave-to-slave communication, in combination with the foregoing, wherein:

- said slave units are assigned respective identification numbers;
- said master unit includes energizing means for transmitting or receiving through said interface data representative of the identification number of a particular one of the slave units which is to transfer information to another unit during said communication; and
- said system further comprises activating means for controllably activating said energizing means when said particular slave unit begins said communication, said activating means including a control path which couples said energizing means of said master unit with said plurality of slave units in parallel and which transfers an activating request generated by said particular slave unit to said master unit without prompting by prior polling of said particular slave unit by said energizing means.

4,872,004

PLURAL SOURCE ARBITRATION SYSTEM

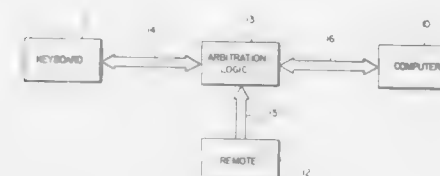
Karl R. Bahnick, Vernon Hills, and David E. Groe, Oakwood Hills, both of Ill., assignors to Sun Electric Corporation, Crystal Lake, Ill.

Filed May 2, 1988, Ser. No. 189,231

Int. Cl.⁴ H04Q 1/00

U.S. Cl. 340—825.500

5 Claims



1. A communications system including arbitration means for regulating communications between a keyboard and a remote control unit and a computer via a keyboard input to the computer and wherein each of said computer, said keyboard and said remote control unit include individual clock lines and individual data lines and each of said computer, keyboard and remote control unit includes clock signal generating means for placing a pulsed clock signal on its associated clock line when supplying a pulsed data signal on its associated data line, comprising:

- an arbitration logic network interconnected with said clock lines and said data lines;
- a plurality of flip flop latches in said logic network coupled to respective ones of said clock lines;
- logic means for developing a clock active signal in response to the presence of one or more clock signals on said clock lines; and
- retriggerable timer means responsive to said clock active signal for coupling a disable signal to said flip flop latches for latching the status of said clock lines;
- said timer means being retriggered by successive pulses of said clock active signal and maintaining said disable signal for a predetermined timeout period after said termination of clock active signal.

4,872,005

PAGING RECEIVER CAPABLE OF REMINDING A USER OF AN IMPORTANT MESSAGE EVENT

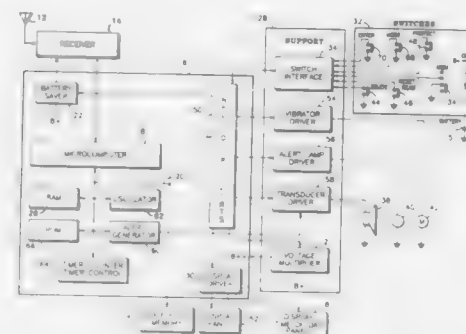
Joan S. DeLuca, Boca Raton; Thomas F. Holmes, Boynton Beach, and Mark J. Abbaticchio, Plantation, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 4, 1988, Ser. No. 140,364

Int. Cl.⁴ H04Q 7/00; G04B 47/00

U.S. Cl. 340—825.440

22 Claims



1. A paging receiver operative to receive a data message of a transmitted call signal including a field containing time data and to generate a future alert signal corresponding to said data

message and based on said time data thereof, said paging receiver comprising:

- memory means for storing data;
- a time of day clock for generating a signal representative of instantaneous time of day;
- an alarm means for generating an alert signal;
- means for receiving the call signal and decoding the data message therefrom;
- means for reading the time data from the decoded data message;
- means for storing the decoded data message and correspondingly read time data into respectively assigned portions of said memory means;
- means for computing a future alert time corresponding to the decoded data message based on the stored time data read therefrom;
- means for storing the future alert time in the memory means;
- means for comparing the stored future alert time to the signal generated by the time of day clock;
- and activating the alert means when said time of day signal matches substantially the stored future alert time.

4,872,006

DATA TRANSMISSION SYSTEM

Mitsuji Takao, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 57,651, Jun. 8, 1987, abandoned, which is a continuation of Ser. No. 615,548, May 31, 1984, abandoned.

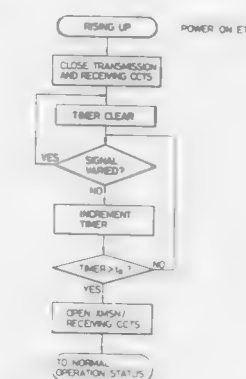
This application Mar. 13, 1989, Ser. No. 323,122

Claims priority, application Japan, Jun. 10, 1983, 58-102743; Jun. 10, 1983, 58-102778

Int. Cl.⁴ H04L 7/02; H04Q 5/00, 9/04

U.S. Cl. 340—825.52

11 Claims



1. A data transmission system for data transmission among called stations through a data transmission channel, each station comprising:

- means for generating plural sets of data to be transmitted;
- means for sequentially transmitting the plural sets of data generated from said generating means to the data transmission channel;
- means for controlling data transmission operation of said transmitting means, said control means being operable, if one set of data to be transmitted depends on another set of data which was previously transmitted, to cause said transmitting means to transmit the one set of data within a predetermined time after completion of transmission of said other set of data, and if the one set of data does not depend on the other set of data, to cause said transmitting means to transmit the one set of data after said predetermined time;
- means for measuring, in a start-up state of the respective station, a time in which, after completion of transmission of one set of data through the data transmission channel,

another set of data is absent from the data transmission channel; and means for receiving a set of data from the data transmission channel, said receiving means being operable to initiate a receiving operation of the set of data after the time measured by said measuring means exceeds said predetermined

4,872,007

TRANSDUCER FOR MEASURING PRESSURE IN GAS-FILLED CABLES

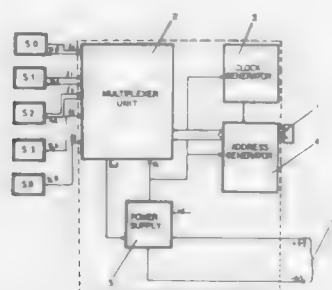
Gianpaolo Monterosso, Milan; Riccardo Marazzi, Vaprio d'Adda; Mario Nicotra, Segrate, and Luciano Manenti, Gussago, all of Italy, assignors to Nicotra Sistemi S.p.A., Milan, Italy

Continuation-in-part of Ser. No. 70,809, Jul. 7, 1987, abandoned. This application Nov. 16, 1987, Ser. No. 120,842

Claims priority, application Italy, Jul. 24, 1986, 21246 A/86 Int. Cl.⁴ G08C 19/00

U.S. Cl. 340—870.01

8 Claims



1. A pressure transducer for measuring the pressure within a plurality of gas-filled telephonic cables comprising: a plurality of pressure sensors, each detecting said pressure within said plurality of gas-filled telephonic cables, and each outputting a frequency signal having a frequency which is proportional to a level of said detected pressure; a multiplexer unit for selecting and enabling said plurality of pressure sensors according to a coded address assigned to each of said plurality of pressure sensors, and for transmitting each frequency signal received from each of said plurality of pressure sensors; an address generator for forming and delivering to said multiplexer unit each coded address assigned to each of said plurality of pressure sensors; a clock generator connected to said multiplexer unit through said address generator, for controlling a rate of operation of said multiplexer unit and said address generator; a power supply unit for delivering an operating voltage to said multiplexer unit, said clock generator, and said address generator; and, a single loop for supplying electric power to said power supply unit and for outputting each frequency signal transmitted from said multiplexer unit.

4,872,008

KEY INPUT DEVICE

Akinori Ohtsuka; Hitoshi Kurita, both of Yamatokoriyama, and Yasutetsu Fujii, Gojo, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Oct. 20, 1987, Ser. No. 110,327

Claims priority, application Japan, Oct. 20, 1986, 61-248614; May 28, 1987, 62-132474; May 28, 1987, 62-132475

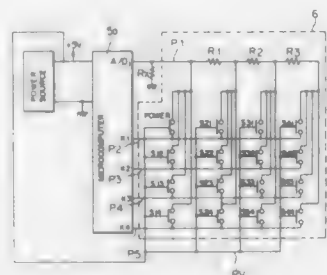
Int. Cl.⁴ H03M 11/00

U.S. Cl. 341—26

7 Claims

1. A key input device comprising: control circuit means including a microcomputer having an analog-digital conversion input terminal and a plurality of

ordinary input terminals and having programming functions; and a keyboard for applying input signals to said microcomputer, said keyboard including a plurality of separate-key-contact circuits, a first portion of said circuits connected through one of a plurality of predetermined resistances to said analog-digital conversion input terminal and a second portion connected to said ordinary input terminals, and



- a plurality of keys, each of said keys corresponding to a selected one of said keycontacts for applying a voltage to said analog-digital conversion input terminal through one of said resistances and to one of said ordinary input terminals so that, said microcomputer discriminates said depressed key through analysis of said input terminals and said analog-digital terminal.

4,872,009

METHOD AND APPARATUS FOR DATA COMPRESSION AND RESTORATION

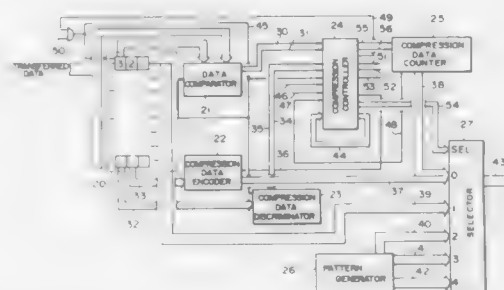
Tokuhiro Tsukiyama; Hiroshi Yashiki, both of Kanagawa, and Osamu Hirose, Odawara, all of Japan, assignors to Hitachi, Ltd. and Hitachi Computer Peripherals Co., both of Tokyo, Japan

Filed Dec. 7, 1987, Ser. No. 129,186

Claims priority, application Japan, Dec. 12, 1986, 61-294826 Int. Cl.⁴ H03M 7/30

U.S. Cl. 341—95

9 Claims



1. A method of transforming an input data string comprising a plurality of data bytes, said plurality including portions of a plurality of consecutive data bytes identical to one another, wherein said data bytes may be of a plurality of types, each type representing different information, said method comprising the steps of: selecting, in advance, a first subset of the plurality of types of data bytes which may occur, said subset including those data byte types which more frequently appear repetitively and consecutively than those data byte types not included in the first subset; detecting a compressible portion of the data string when one of said data bytes types of said first subset appears consecutively in the string a certain minimum number of times up to a certain maximum number of times, compressing the compressible portion according to a first

compression method, said compression method including encoding the data byte of the compressible portion and counting the number of data bytes of the portion to produce a compressed portion representative of the number and kind of data bytes in the compressible portion; appending a compression mark byte, which indicates that compression has been affected, either at the front or rear of said compressed portion to generate a first compression information data; when said input data string contains a third portion consisting of one or more consecutive data bytes the same as a first compression mark byte, said compression step further includes encoding and counting data bytes contained in said third portion to obtain a compressed third portion; and connecting data bytes of said input data string that are not included in said first compressed information data and said compressed third portion, with said first compressed information data and said compressed third portion to produce a compressed output data string.

4,872,010

ANALOG-TO-DIGITAL CONVERTER MADE WITH FOCUSED ION BEAM TECHNOLOGY

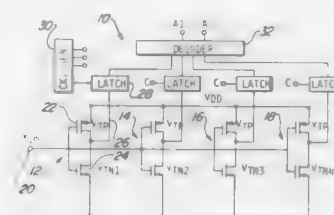
Lawrence E. Larson, Los Angeles; Joseph F. Jensen, Malibu; Robert H. Walden, Westlake Village, and Adele E. Schmitz, Newbury Park, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Feb. 8, 1988, Ser. No. 153,750

Int. Cl.⁴ H03M 1/18

U.S. Cl. 341—134

8 Claims



1. An analog-to-digital (A/D) converter comprising: a plurality of comparators having monotonically increasing transition levels, each comparator including at least one field effect transistor having drain, source and gate regions; the gate region overlying a channel in a semiconductor substrate; input means for providing an analog input signal simultaneously to each comparator; the transistors in each comparator each having a different threshold level due to different concentrations of impurities implanted in the channel regions thereof by focused ion beam implantation techniques thereby defining said transition levels for each of the comparators; and decoder means coupled to outputs of each of the comparators for generating a digital output signal as a function of the comparator outputs; each comparator including a least one complementary metal oxide (CMOS) inverter employing an N-channel and P-channel transistor; each comparator comprising a pair of cross coupled inverters adapted to receive differential analog input signals.

4,872,011

PLURAL STAGE SWITCHED CAPACITOR INTEGRATING DIGITAL-TO-ANALOG CONVERTER

Marcellinus J. M. Pelgrom, and Adrianus C. J. Duinmaijer, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

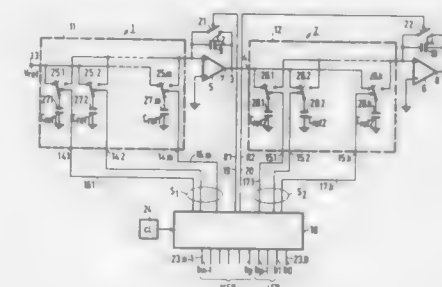
Filed Apr. 5, 1988, Ser. No. 178,051

Claims priority, application Netherlands, Apr. 27, 1987, #700963

Int. Cl.⁴ H03M 1/76, 1/80

U.S. Cl. 341—150

20 Claims



1. A digital-to-analog converter for converting a digital signal having a word length n into an analog signal, comprising a series arrangement of a first and a second integrating circuit each having an input and an output and a control signal input, the output of the first integrating circuit being coupled to the input of the second integrating circuit, the first and second integrating circuits comprising a first and a second amplifier stage, respectively, having an inverting and a non-inverting input and an output and a first and a second capacitor, respectively, coupled between the inverting input and the output of the first and second amplifier stage, respectively, the first and the second integrating circuit each being adapted to perform an integration step under the influence of a control signal applied to its respective control signal input, a control unit having a first and a second output coupled to the control signal input of the first and the second integrating circuit, respectively, said control unit being adapted to supply, in this order, a first control signal at its first output, a second control signal at its second output, a third control signal at its first output and a fourth control signal at its second output, characterized in that the integrating circuits are switched capacitor integrators in which a first capacitor network comprising at least two capacitors is coupled between the input of the first integrator and the inverting input of the first amplifier stage, a second capacitor network comprising at least two capacitors being coupled between the input of the second integrator and the inverting input of the second amplifier stage, the first capacitor network being adapted to be coupled during a given time interval a total capacitance of M1.Cref1 and M3.Cref1 to the inverting input of the first amplifier stage under the influence of the first and the third control signal, respectively, the second capacitor network being adapted to be coupled during a given time interval a total capacitance of M2.Cref2 and M4.Cref2 to the inverting input of the second amplifier stage under the influence of the second and the fourth control signal, respectively, Cref1 and Cref2 being fixed capacitances, and in that for converting arbitrary digital signals having a word length n M2+M4 is equal to a constant (k).

4,872,012

DATA COMPRESSION METHOD AND APPARATUS FOR RADAR IMAGE FORMATION AND LIKE DATA PROCESSING OPERATIONS

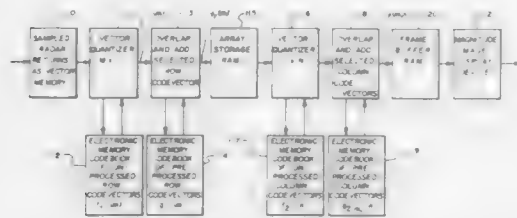
Douglas M. Chabries, Salem, Utah, assignor to Brigham Young University, Provo, Utah

Filed Aug. 19, 1988, Ser. No. 234,274

Int. Cl.⁴ G01S 13/09

U.S. Cl. 342—25

3 Claims



1. A method of forming high resolution visual radar images including the steps of:

storing in memory a finite set of codevectors $f_{1,1}[m]$, $f_{1,2}[m]$, \dots , $f_{1,p}[m]$ with respective indices, where $f_{1,i}[m]$ represents a preselected possible segment of an unprocessed radar return;

storing in memory a finite set of preprocessed segments $g_{1,1}[m]$, $g_{1,2}[m]$, \dots , $g_{1,p}[m]$ with respective indices, where $g_{1,i}[m]$ is the range-correlated version of $f_{1,i}[m]$, equalling $f_{1,i}[m] * h_1[m]$, $h_1[m]$ is the range compression portion of a sampled data response function, and $*$ is a convolution operator;

storing in memory in an array a finite set of codevectors $f_{2,1}[n]$, $f_{2,2}[n]$, \dots , $f_{2,q}[n]$ with respective indices, where $f_{2,i}[n]$ represents a preselected possible segment of a range-correlated unprocessed radar return;

storing in memory a finite set of preprocessed segments $g_{2,1,m}[n]$, $g_{2,2,m}[n]$, \dots , $g_{2,q,m}[n]$ with respective indices, where $g_{2,i,m}[n]$ is the range/azimuth-focused version of $f_{2,i}[n]$ for the m th column of the array of $f_{2,i}[n]$ equalling $f_{2,i}[n] * h_{2,m}[n]$, and $h_{2,m}[n]$ is the azimuth compressed portion of a sampled data response function;

transmitting a sequence of separate radar pulses from an airborne object;

sampling a return signal from the transmitted pulses and ordering the samples in an array;

comparing segments of the sample array with the codevectors $f_{1,i}[m]$ and storing in memory an array of indices of the codevectors which most closely fit the compared sample array segments;

retrieving from memory the range-correlated segments $g_{1,i}[m]$ whose indices match the indices in the array of indices;

forming an intermediate range-compressed image by adding together the retrieved range-correlated segments while maintaining a predetermined offset between them as they are added, and storing the resultant intermediate image vectors;

comparing the resultant intermediate image vectors with the codevectors $f_{2,i}[n]$ and storing in memory a second array of indices of the codevectors which most closely fit the compared intermediate image vectors;

retrieving from memory the range/azimuth-focused segments $g_{2,i,m}[n]$ whose indices match the indices in the second array of indices;

adding together the retrieved range/azimuth-focused segments while maintaining a predetermined offset between them as they are added, and storing the resultant image defining vectors;

producing a visual radar image from the image defining vectors.

4,872,013

METHOD AND DEVICE FOR THE SLANT RANGE CORRECTION OF A SHORT-RANGE RADAR

Jean P. Andrieu, Paris; Dominique Gault, Ville D'Avray, and Jean C. Henri, Boulogne Billancourt, all of France, assignors to Thomson-CSF-S.C.P.I., Paris, France

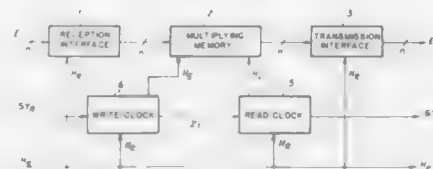
Filed Jun. 5, 1987, Ser. No. 58,570

Claims priority, application France, Jun. 17, 1986, 86 08719

Int. Cl.⁴ G01S 13/08

U.S. Cl. 342—135

10 Claims



7. A device for providing a slant range correction for a radar mounted on a tower comprising

means for providing from said radar a sampled video signal comprising samples which form a radar recurrence, said radar recurrence comprising first, second, and third time zones, said first zone extending from zero to H samples where H corresponds to the height of the tower measured in samples, said second zone extending from H samples to H^2 samples, and said third zone extending from H^2 samples to the end of the recurrence,

memory means for selectively storing said samples of said radar recurrence,

means for generating a first signal having a frequency H_E for writing the samples of said radar recurrence into said memory means, said first signal inhibiting the writing of said samples during the first time zone of said radar recurrence,

means for generating a second signal having a frequency H_L for the reading of said samples from said memory means, said second signal serving to read samples in the second time zone of said radar recurrence with a frequency H_L that differs from the frequency H_E of said first signal by a multiplication factor P_E , said samples read in said second zone being multiplied by said factor P_E , said second signal also serving to read samples in said third zone of said recurrence from said memory means at a frequency which is equal to the frequency H_E of the first signal, and

means for transmitting signals read from said memory means at a sampling frequency H_E .

4,872,014

OBJECT IDENTIFICATION SYSTEM AND METHOD UTILIZING RADIOMETRY

Markus Nowogrodzki, Sussex, N.J., assignor to General Electric Company, Schenectady, N.Y.

Filed Jan. 31, 1985, Ser. No. 696,716

Int. Cl.⁴ G01S 3/02, 13/74

U.S. Cl. 342—351

4 Claims

1. A method for use in distinguishing one class of objects from another class of objects distinguished by differences in their response patterns by use of a radiometer comprises the steps of:

ensuring the existence on said one class of objects of a structure having at least one resonance at a frequency not present in the radiometric signal response from the other class of objects;

receiving at the radiometer a radiation pattern signal emanated from an object of interest;

comparing the received radiation pattern signal against a

stored radiation pattern signal corresponding to the radiation signal pattern from the one class of objects; and



producing a signal indicating a correspondence or lack of correspondence between the signals.

4,872,015

SATELLITE COMMUNICATIONS SYSTEM FOR MOBILE USERS

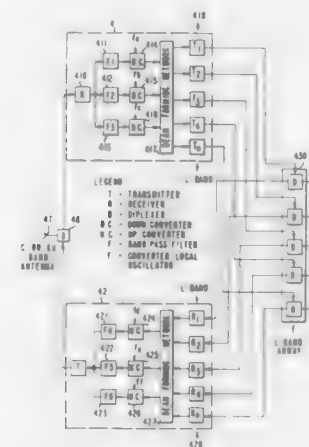
Harold A. Rosen, Santa Monica, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Dec. 1, 1986, Ser. No. 936,301

Int. Cl.⁴ H04B 7/185

U.S. Cl. 342—353

25 Claims



1. A system for communicating via a satellite comprising: a plurality of mobile terminals located within at least two geographical zones;

a satellite positioned in view of the geographical zones for receiving signals from and transmitting signals to the plurality of mobile terminals, the satellite including means for transmitting frequency addressable downlink signals to the mobile terminals, and means for receiving frequency addressable uplink signals from the mobile terminals, said transmitting means and said receiving means each including means for forming a plurality of signal carrying beams of electromagnetic radiation between said satellite and said zones, the positions of the respective beams within each of said zones being a function of the frequency of the beams such that the destination addresses of the respective signals within each zone are determined by the respective frequencies of said beams; and

a base station for transmitting signals to and receiving signals from the satellite.

4,872,016

DATA PROCESSING SYSTEM FOR A PHASED ARRAY ANTENNA

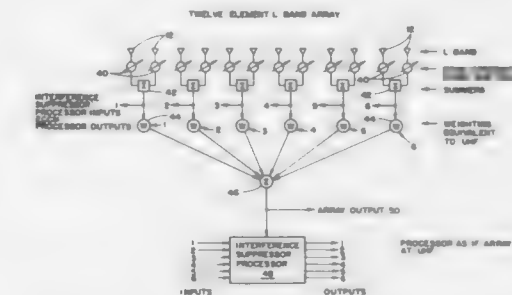
Robert W. Kream, Saugerties, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Sep. 6, 1988, Ser. No. 240,960

Int. Cl.⁴ G01S 3/16, 3/28

U.S. Cl. 342—380

6 Claims



1. A data processing system for an electronically scanned, phased array antenna radar system, comprising:

a. an electronically scanned, phased array antenna comprising an array of n radiating and receiving elements, and a phase control circuit for each element, wherein the phase front of the antenna beam is controlled to steer the antenna beam by individually controlling the gain and phase excitation of each radiating element;

b. a signal receiver, including an interference suppressor processor, for processing signals received by said phased array antenna, wherein the receiver controls the gain and phase shift of the signals received by the elements to match the transmitted beam pattern, and wherein interference suppression is achieved by generating nulls in the received antenna pattern in the direction in which the interference is to be suppressed by adjusting the elements, and wherein the signal processing requirements are reduced by, means for summing the outputs of the phase control circuits for adjacent array elements to produce a number of summed signals less than the number of elements in the array, and each summed signal being directed to a weighted amplifier controlled by said interference suppressor processor to weight the contribution of that particular summed signal to a composite output signal formed by a composite summing means for summing the weighted output signals of the weighted amplifiers.

4,872,017

SIMPLIFIED MOBILE ANTENNA BASE MOUNTING STRUCTURE

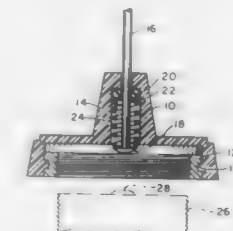
Wayne White, Hillside, Ill., assignor to Whisco Component Engineering, Inc., Glendale Heights, Ill.

Filed Jan. 23, 1989, Ser. No. 300,369

Int. Cl.⁴ H01Q 1/12, 1/32

U.S. Cl. 343—715

2 Claims



1. A mobile antenna base mounting structure comprising an electrically insulative housing having a first cylindrical

recess in the lower surface thereof, a second cylindrical recess relatively small than said first recess extending coaxially upwardly from said first recess, and an aperture extending from said second recess coaxially upwardly through the upper surface of said housing;

an internally threaded metallic insert secured in said first recess and adapted to engage an antenna mount;

an annular groove disposed in the outer surface of said metallic insert, engaging the inner surface of said first recess in said housing, and having a width and depth selected to limit the force required to separate said metallic insert from said housing to a predetermined level;

an antenna whip having an electrical contact at the lower end thereof and extending upwardly through said second recess and aperture to the exterior of said housing; and

a compression spring disposed coaxially about the antenna whip in said second recess such that when said metallic insert is threaded onto an antenna mount said spring is compressed, bears upon the electrical contact on said antenna whip, and exerts downward pressure thereon.

4,872,018

MULTIPLE LOOP ANTENNA

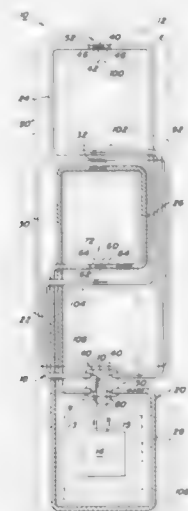
John F. Feltz, Fairborn; Michael F. Hartings, West Carrollton, and Richard D. Heaton, Tipp City, all of Ohio, assignors to Monarch Marking Systems, Inc., Dayton, Ohio

Filed Aug. 31, 1987, Ser. No. 92,052

Int. Cl.⁴ H01Q 7/04; G08B 13/22

U.S. Cl. 343-742

29 Claims



1. An antenna, comprising:

a first shielded twisted loop having first and second spaced apart loop sections lying in a substantially common plane and twisted substantially 180° with respect to each other;

a second shielded twisted loop having third and fourth spaced apart loop sections twisted substantially 180° with respect to each other, said third and fourth loop sections lying in substantially the same plane as said first and second loop sections, said second loop section being interposed between said third and fourth loop sections and said third loop section being interposed between said first and second loop sections along said common plane wherein said first and second loops are fabricated from coaxial cable; and

means electrically coupling said first and second twisted loops.

4,872,019

RADOME-LENS EHF ANTENNA DEVELOPMENT

Yang L. Chow, Waterloo, and Sajeet K. Chaudhuri, Heidelberg, both of Canada, assignors to Her Majesty The Queen in right of Canada as represented by the Minister of National Defence, Ottawa, Canada

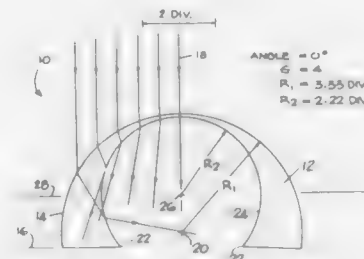
Filed Dec. 7, 1987, Ser. No. 129,626

Claims priority, application Canada, Dec. 9, 1986, 524264

Int. Cl.⁴ H01Q 15/08, 1/42

U.S. Cl. 343-753

3 Claims



1. A radome-lens comprising:

a shell of dielectric material having an outer surface in the form of a small circle defined by a sphere and a plane intersecting said sphere, an opening at one end of said shell for reception of an antenna therein, said surface having a central axis which is normal to said plane and extends through the center of said sphere, and an inner surface having a spherical portion centered at a second center disposed along said axis between said first mentioned center and said outer surface and including a plurality of zones extending toward said opening and concentrically disposed along said axis, each said zone being centered at said second center, adjacent zones being separated by a frustoconical surface which converges at said second center, the radial height, h , of each said frusto-conical surface being given by

$$h = \frac{\lambda_0}{(\epsilon_r)^{1/2} - 1} \quad (1)$$

wherein

λ_0 is the designed wavelength of the incident or transmitted wave, and

ϵ_r is the relative permittivity of the lens.

4,872,020

SLOT ANTENNA IN CIRCULAR WAVEGUIDE

James S. Ajioka, Fullerton, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

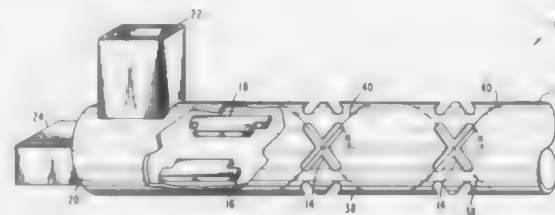
Division of Ser. No. 6,533, Jan. 23, 1987, Pat. No. 4,825,219.

This application Oct. 20, 1988, Ser. No. 260,560

Int. Cl.⁴ H01Q 13/10

U.S. Cl. 343-771

14 Claims



1. A slotted waveguide antenna for providing a beam of energy, the pattern of which may be varied, comprising:

a circular waveguide through which energy of a circumferential mode equal to or greater than may be propagated, said energy having current flow lines which are helical in

relation to said waveguide, said propagated energy including energy of a first circulating mode and energy of a second circulating mode;

a first slot formed in said waveguide and being oriented such that the long dimension of said slot is at an angle of greater than zero degrees with respect to the helical currents of said energy of a first circulating mode and the long dimension of said slot is parallel to the helical currents of said energy of a second circulating mode;

a second slot formed in said waveguide and being oriented such that the long dimension of said slot is at an angle of greater than zero degrees with respect to the helical currents of said energy of a second circulating mode and the long dimension of said slot is parallel to the helical currents of said energy of a first circulating mode;

mode transducer means for feeding the circular waveguide with orthogonally polarized modes of the energy to be propagated;

circular polarizer means for circularly polarizing the energy propagated through the circular waveguide; and

control means for controlling the relative amplitudes and phases of the energy applied to the orthomode transducer so that the pattern of the beam may be varied.

4,872,021

COLLINEAR DIPOLE ARRAY WITH INDUCTIVE AND CAPACITIVE PHASING

Mircho S. Tabakov; Nedyalko K. Nedyalkov, and Stefan T. Stefanov, all of Sofia, Bulgaria, assignors to "MIRTA", Sofia, Bulgaria

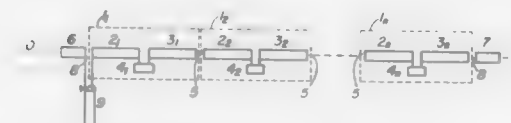
Filed Mar. 14, 1988, Ser. No. 167,668

Claims priority, application Bulgaria, Mar. 12, 1987, 78857

Int. Cl.⁴ H01Q 11/16, 21/10

U.S. Cl. 343-801

4 Claims



1. An antenna comprising

a plurality of pairs of half-wave dipoles disposed end to end on one common axis;

a corresponding plurality of inductive circuits, the half-way dipoles of each pair being connected by a respective one of said inductive circuits;

a free end of a final one of said half-wave dipoles being the active terminal of the antenna;

two quarter-wave dipoles, each quarter-wave dipole being disposed at a respective end of said common axis adjacent a free end of one of said half-wave dipoles;

an end of the respective quarter-wave dipole adjacent to said active terminal being the passive terminal of the antenna;

the pairs being connected to each other and to said quarter-wave dipoles by capacitive connections;

both said inductive circuits and said capacitive connections providing a phase shift within the range of from 60 to 120 electrical degrees.

4,872,022

SUPPORT AND CONNECTION MEANS FOR LOOPED ANTENNA CONDUCTORS

Edward J. Schock, 1000 Conestoga Rd. C-347, Rosemont, Pa. 19010

Continuation-in-part of Ser. No. 708,225, Mar. 5, 1985, abandoned. This application Apr. 9, 1987, Ser. No. 38,425

Int. Cl.⁴ H01Q 11/14

U.S. Cl. 343-806

4 Claims

1. Antenna of wire-like conductors, said conductors includ-

ing a plurality of half loops connected to a balanced transmission line,

each half loop being a section of conductor curved outward from a point of attachment on a central post to an apex removed from said post and then curved back to said post, said antenna including means of supporting said conductors in a feed region and connecting said conductors to said balanced transmission line,

said means comprising:

a non-conductive disk having two substantially flat surfaces that are separated from each other by the thickness of the disk, each of said substantially flat surfaces having a circular perimeter,

one of said substantially flat surfaces having a raised edge perpendicular to it forming a perimeter flange,

the other substantially flat surface of said disk being placed against said post such that said post extends along a diameter of said disk,

said disk being fastened to said post by two notched clamping devices that include means for snap-connecting to said post,

each clamping device having a notched portion that extends over a portion of said disk,

said notched portion of each clamping device having a notch transverse to the length of said post,

said perimeter flange of said disk being held in said transverse flange of each clamping device,

said disk having two apertures through it, one on either side of said post,

an end section of one of said half loops being bent and inserted end-first through one of said apertures of said disk into the throat of an alligator clip that is connected to the end of a lead of said balanced transmission line,

an end section of another of said half loops being bent and inserted end-first through the other of said apertures of said disk into the throat of an alligator clip that is connected to the end of the other lead of said balanced transmission line.

4,872,023

PLOTTER PLATEN MAPPING SYSTEM

Ralph J. Lake, Jr., Yorba Linda; Franklyn L. Wiley, Long Beach; A. Daniel Coby, Brea, and John Pluth, Jr., Hacienda Heights, all of Calif., assignors to Sanders Associates, Inc., Nashua, N.H.

Filed Jan. 7, 1988, Ser. No. 141,652

Int. Cl.⁴ G01D 15/24, 9/00; G06K 15/00

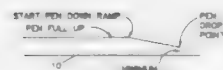
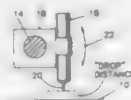
U.S. Cl. 346-1.1

6 Claims

4. In a graphics plotter system having a platen over which

paper is moved longitudinally to create one axis, penholding apparatus moved transversely across the platen and the paper to create the other axis, and a controlled raising and lowering mechanism connected to the penholding apparatus for lowering a pen being held therein into contact with and for raising it from contact with the paper and for providing a relative vertical position value signal, the method of pen height control during pen movement comprising the steps of:

- (a) raising the pen to a full up position;
- (b) moving the pen towards the next pen down location;



- (c) while the pen is moving and prior to reaching the next pen down location beginning to lower the pen at a pre-established horizontal distance from the next pen down location and continuing to lower the pen as it is moving toward its next pen down position such that the pen ramps downward and attains a pre-established minimum clearance distance just as it arrives at the next pen down location; and,
- (d) lowering the pen through the minimum clearance distance to a full down position at the next pen down location.

4,872,024

PRINT INSPECTION METHOD, PRINT INSPECTION APPARATUS AND AUTOMATIC PRINT SORTING SYSTEM

Teiji Nagai, Fujisawa; Ryo Sakazume, Tokyo; Kouichi Hanazawa, Warabi; Hiroshi Nakayama, Kasukabe, and Yoshio Minagawa, Tokyo, all of Japan, assignors to Sapporo Breweries, Ltd., Tokyo and Scan Technology Co., Ltd., Warabi, both of Japan

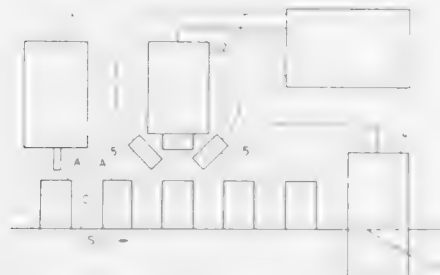
Filed Sep. 30, 1988, Ser. No. 251,393

Claims priority, application Japan, Jan. 29, 1988, 63-17154

Int. Cl.⁴ G06K 9/00; B41J 3/04; G01D 21/00

U.S. Cl. 346-1.1

12 Claims



1. A method of inspecting whether a print pattern composed of plural dots printed on an article meets a predetermined standard, comprising the steps of: recognizing the positions of each of the dots of a print pattern of an acceptable print sample which meets the predetermined standard, and quantizing the dots into binary data;

producing unit areas around the positions of each of the dots

based on said binary data, joining those unit areas which at least partly overlap, into joined area, recognizing the unit areas and joined areas as a reference area, and storing said reference area;

detecting the distribution, or number, or both, of the dots in said reference area, and storing the detected distribution, or number, or both, of the dots as dot information of the print pattern of the acceptable print sample;

calculating the coordinates of the center of the print pattern of said acceptable print sample based on said binary data, and storing the calculated coordinates;

recognizing the positions of each of the dots of a print pattern printed on an object to be inspected, and quantizing the dots into binary data;

calculating the coordinates of the center of the print pattern on the object based on said latter binary data, and storing the calculated coordinates;

referring to the coordinates of the center of the print pattern on said object and the coordinates of the center of the print pattern of said acceptable print sample, superposing said reference area and said print pattern on said object while bringing said centers into alignment with each other, detecting the distribution, or number, or both, of the dots of the print pattern on said object within said reference area, and storing the detected distribution, or number, or both, of the dots as dot information of the print pattern on said object; and

comparing the dot information of the print pattern on said object with the dot information of the print pattern of said acceptable print sample, determining the extent of agreement between the compared dot information, determining whether the print pattern on said object is acceptable, and issuing the result of the determination.

4,872,025

LASER PRINTER CAPABLE OF CHANGING A PIXEL DENSITY

Makoto Sekiya, Mahwah, N.J., and Kanji Wada, Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

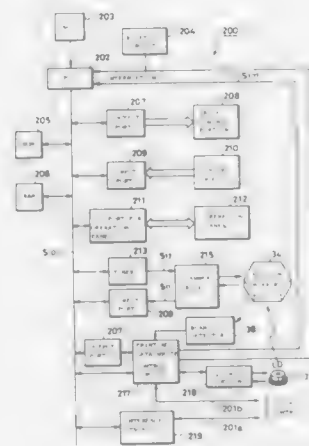
Filed Mar. 28, 1988, Ser. No. 174,120

Claims priority, application Japan, Mar. 30, 1987, 62-80120; Mar. 30, 1987, 62-80121; Mar. 30, 1987, 62-80122; Mar. 30, 1987, 62-80123; Mar. 30, 1987, 62-80124

Int. Cl.⁴ G01D 9/42; H04H 1/40, 1/21

U.S. Cl. 346-108

18 Claims



1. A laser printer for forming an image on a photoreceptor through scanning of a laser beam, that can be modulated based on image data, by scanning means, and capable of changing a pixel density on the photoreceptor, comprising: pixel density change means for changing the pixel density of the image to be formed, by changing a scanning cycle of said scanning means;

scanning detection means for detecting a scanning condition of said laser beam based on a predetermined reference cycle according to said changed pixel density and producing a corresponding signal;

control means responsive to the scanning detection signal for monitoring the laser printer operation, and means for disabling the effect of the scanning detection means while the pixel density is being changed by the pixel density change means to prevent an erroneous response by the control means.

4,872,026

INK-JET PRINTER WITH PRINthead CARRIAGE ALIGNMENT MECHANISM

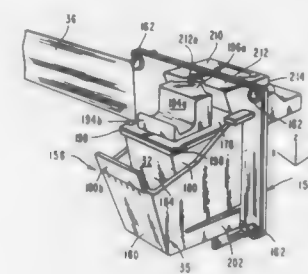
Steve O. Rasmussen; Larry A. Jackson; John D. Rhodes, all of Vancouver; David W. Pinkernell, Pullman; J. Paul Harmon, Vancouver; Kevin L. Moon, Vancouver, and William R. Huseby, Vancouver, all of Wash., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation-in-part of Ser. No. 24,278, Mar. 11, 1987, Pat. No. 4,728,963. This application Jan. 28, 1988, Ser. No. 149,454

Int. Cl.⁴ G01D 15/16; B41J 3/04

U.S. Cl. 346-140 R

13 Claims



1. An ink-jet printer for printing on a print medium, comprising:

- (a) supply means for providing a supply of print medium to be printed;
- (b) collection means for collecting the printed medium;
- (c) means for conveying the print medium from said supply means to said collection through a printing zone (B);
- (d) a cartridge provided with a printhead and mounted on a carriage cooperatively associated with a carriage guide, for printing on the print medium;
- (e) said cartridge being supported on a platen maintained in said printing zone;
- (f) means for directing print medium in a plane generally parallel to said printing zone just prior to entering said printing zone, in order to maintain in substantial flatness of the print medium;
- (g) means for permitting ink to dry on a previously printed sheet of said medium to dry during printing of a next sheet of said medium;
- (h) a printhead carriage lock-in assembly for use with the cartridge having:
 - (i) carriage means;
 - (ii) said carriage means including base support means for receiving the cartridge;
 - (iii) said base support means depending into referencing means, for aligning the cartridge in proper printing position along at least two directions;
 - (iv) said base support means further including retention means for causing the cartridge to be locked in position relative to said carriage means;
 - (v) electrical interconnect means, for supplying control signals to the carriage; and
 - (vi) the carriage including a reference system corresponding to, and generally coordinating with, said referencing system of said base support means, for providing proper alignment to the cartridge during its positioning relative to said carriage means, and for causing

the cartridge to be retained in position during the printing operation.

4,872,027

PRINTER HAVING IDENTIFIABLE INTERCHANGEABLE HEADS

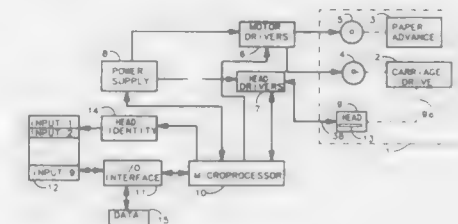
William A. Buskirk, Albany; Carl J. Landsman, Corvallis, both of Oreg., and John D. Rhodes, Vancouver, Wash., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Nov. 3, 1987, Ser. No. 116,093

Int. Cl.⁴ G01D 15/16; B41J 3/04

U.S. Cl. 346-140 R

6 Claims



1. A dot matrix printer, comprising: a movable printhead carriage; a print media; means for advancing said print media in a direction orthogonal to printhead carriage movement; single color and multicolor thermal inkjet printheads; a nozzle plate on each printhead having a plurality of nozzles and means for admitting ink to said nozzles; each multicolor printhead having a nozzle group for each color of ink in the nozzle plate thereat, each nozzle group having the same nozzle format as the nozzles of a single color printhead but of a lesser number of nozzles than the number of nozzles for the single color of ink of the single color printhead; means for mounting single color or multicolor printheads on said printhead carriage; motor means for driving the printhead carriage to move the printhead thereon across said print media; a resistor network on each printhead having a resistor at each nozzle, which resistor when energized heats and expels ink from the nozzle thereat; a print control system for selectively energizing resistors of said resistor network of said printhead for printing on said print media during printhead carriage movement; printhead identification means on each printhead comprising patterns of resistors forming part of said resistor network providing a unique code for each printhead; detection means for energizing said patterns of resistors of said printhead identification means for providing electrical signal identifying a specific printhead; and means in said print control system responsive to said electrical signals for initiating operation of said print control system to selectively energize resistors at the nozzles of said specific printhead.

4,872,028

THERMAL-INK-JET PRINT SYSTEM WITH DROP DETECTOR FOR DRIVE PULSE OPTIMIZATION

William J. Lloyd, Belmont, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Mar. 21, 1988, Ser. No. 170,518

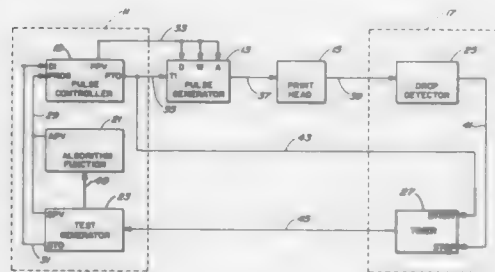
Int. Cl.⁴ G01D 18/00; B41J 3/04

U.S. Cl. 346-1.1

34 Claims

1. A system comprising: a thermal ink jet print head with at least one ink drop generator which generates and propels ink drops in response to

electrical pulses, said ink drop generator having an electrical input for receiving said electrical pulses;
 pulse generator for generating said electrical pulses and transmitting to said electrical input, each of said pulses having a durational width, said pulse generator being electrically coupled to said drop generator;
 a drop detector for providing drop detection signals when said drops reach a predetermined distance from said drop generator;
 monitor means for monitoring a drop velocity parameter, said monitor means being coupled to said pulse generator for determining pulse generation times and to said drop detector for receiving said drop detection signal;



a pulse width controller for determining the duration widths of respective ones of said electrical pulses; and
 program means for setting a program pulse width to be determined by said pulse width controller, said program means including test generator means for commanding said pulse width controller to vary the widths it determines for said electrical pulses so that a threshold width can be determined below which drop detections do not consistently occur in response to electrical pulses, said program means setting said pulse width as a function of said threshold width so that said pulse width is greater than said threshold width.

4,872,029

AUTOMATIC ADJUSTED LIGHT SWITCHING CIRCUIT
 Tadashi Kato, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

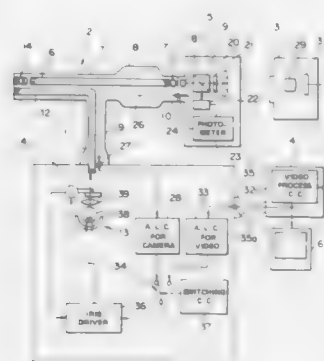
Filed Jul. 5, 1988, Ser. No. 215,128

Claims priority, application Japan, Apr. 8, 1988, 63-87519

Int. Cl.⁴ G03G 7/08

U.S. Cl. 354-413

6 Claims



1. An automatic adjusted light switching circuit comprising:
 a light source emitting an illuminating light to illuminate an object;
 a light amount controlling means capable of controlling the light amount of said light source;
 a first light adjusting means capable of outputting a control signal which can adjust said light amount controlling

means with an information signal relating to the brightness of said object;
 a second light adjusting means capable of outputting a control signal having a light adjusting characteristic different from that of the first light adjusting means from a video signal obtained from a solid state imaging device by imaging said object image with said solid state imaging device; and
 a selecting means capable of selecting the control signals output from said first light adjusting means and second light adjusting means and of inputting into said light amount controlling means the control signal output from either one.

4,872,030

DEVICE FOR PRODUCING PHOTOGRAPHIC EXPOSURE OF IMAGES APPEARING ON THE SCREEN
 Heike Kochmann, Siegsdorf; Georg Lechner, Aying; Jürgen Müller, and Norbert Scholz, both of Munich, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert AG, Leverkusen, Fed. Rep. of Germany

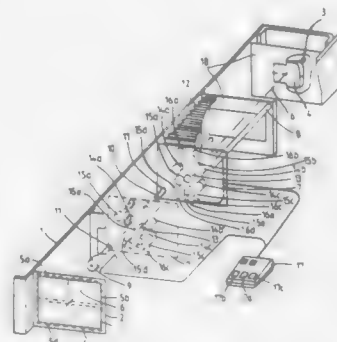
Filed Aug. 8, 1988, Ser. No. 230,188

Claims priority, application Fed. Rep. of Germany, Aug. 29, 1987, 8711745

Int. Cl.⁴ G03B 5/04, 9/08, 29/00

U.S. Cl. 354-76

5 Claims



1. A device for producing photographic exposures of different sizes and arrangements of X-ray, UV or the like images appearing on an image screen, comprising a film platform which is loadable with flat films of given usable film surfaces; a plurality of objectives positionable in different positions, wherein an image field area, in which images being exposed lie, is provided by said image screen, said image screen and said film platform having a constant position relative to each other, said objectives being positioned between said image screen and said film platform; a support for supporting said objectives and displaceable parallel to an axis which extends between a central point formed by central lines of said image field area, a central point of said platform and a central point of a plane film surface on said film platform, said plurality of objectives including a first objective with a magnification by which, with a focus adjustment on said film surface, said image field area is projected into the entire usable film surface, said first objective and an optical axis thereof being fixed in said support, said plurality of objectives further including four additional objectives fixed in said support and having one with another the same magnifying value being dimensioned so that each of said additional objectives projects the image field area of said screen during the focus adjustment only on one fourth of the usable film surface.

4,872,031

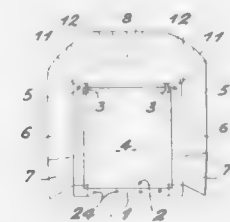
DEVICE FOR SIDE-LIGHTING A SUBJECT PLACED IN FRONT OF BACKGROUND AS WELL AS FOR LIGHTING THE BACKGROUND ITSELF, FOR EXAMPLE WHEN TAKING PICTURES OF THE SUBJECT BY PHOTOGRAPHY, CINEMATOGRAPHY OR THE LIKE
 Mardick Baliozian, 10 E. Ontario St., Chicago, Ill. 60611

Filed Feb. 18, 1988, Ser. No. 157,386

Claims priority, application France, Feb. 24, 1987, 87 02378
Int. Cl.⁴ G03B 15/00

U.S. Cl. 354-291

20 Claims



1. A device for side-lighting a subject placed in front of a background as well as lighting the background itself when taking pictures of the subject by photography, cinematography or the like comprising a plurality of reflecting panels, background means for providing a common central background on a plane for the subject to be photographed, said plurality of reflecting panels being respectively attached to said background means in surrounding relationship to said common central background, said plurality of reflecting panels being disposed in inclined positions with respect to the plane of said background means at angles such that said plurality of panels are capable of reflecting the light emitted by a front light source towards the subject to be photographed as well as towards said central common background, said plurality of reflecting panels and said background means together forming a configuration of a generally concave shape.

4,872,032

IMAGE FIXING DEVICE

Satoshi Watanabe, Nagoya; Hiroto Sugahara, Ichinomiya, and Takeshi Izaki, Nagoya, all of Japan, assignors to Brother Kogyokabushiki Kaisha, Nagoya, Japan

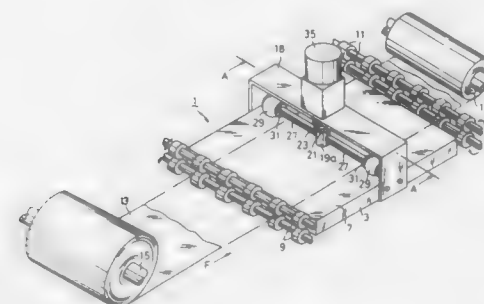
Filed Feb. 17, 1988, Ser. No. 157,478

Claims priority, application Japan, Feb. 18, 1987, 62-36413; Feb. 18, 1987, 62-36414; Feb. 18, 1987, 62-36416; Feb. 18, 1987, 62-36417; Feb. 27, 1987, 62-45688

Int. Cl.⁴ G03B 5/02

U.S. Cl. 354-297

21 Claims



1. In an image fixing device of the type comprising support means for supporting thereon a recording medium on which a provisional image is formed, roller means adapted to roll over the surface of said recording medium in a direction substantially transversely of a feeding direction of said recording

medium, and resilient means for applying a downward force to said roller means to thereby apply pressure to the surface of said recording medium for fixing said provisional image under pressure the improvement comprising a shaft extending vertically with respect to said support means; said roller means comprises one or more rollers connected to an arm swinging about said shaft; and means for varying the swing amplitude of said rollers.

4,872,033

IMAGE FORMING APPARATUS CAPABLE OF PROCESSING VARIOUS KINDS OF PHOTSENSITIVE MATERIAL

Kazuo Watanabe; Toshiharu Nishimura, and Masaki Kakutani, all of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

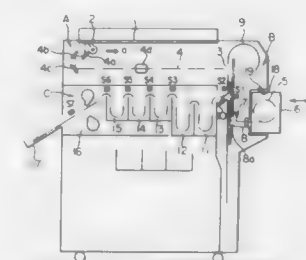
Continuation of Ser. No. 78,838, Jul. 28, 1987, abandoned. This application Feb. 28, 1989, Ser. No. 317,078

Claims priority, application Japan, Jul. 31, 1986, 61-180928

Int. Cl.⁴ G03B 27/32, 27/52

U.S. Cl. 355-27

12 Claims



1. In an image forming apparatus for forming an image on a plurality of different types of photosensitive materials by subjecting said photosensitive materials to an image forming process including image wise exposing, developing, and fixing, wherein processing conditions are determined dependent upon the type of photosensitive material being processed, the improvement comprising:

a kind-discriminating means for discriminating the type of photosensitive material in said apparatus,
 a process-monitoring means for monitoring the progress of the image forming process,
 judging means for changing the processing conditions when a new type of photosensitive material is detected by said kind-discriminating means, and controlling the processing operations in accordance with an output of said processing-monitoring means, and,
 a delay means to delay the change in processing conditions so that, when a new type of photosensitive material, different from a current type of photosensitive material being subjected to a current image process is detected by said kind-discriminating means, said change in processing conditions does not affect the processing of said current type of photosensitive material, said delay being determined by the progress of said current type of photosensitive material monitored by said process-monitoring means, wherein said delay is terminated immediately upon the complete entrance of said current type of photosensitive material into a first constant stage of said image forming process, said first constant stage and all subsequent stages being stages in which processing conditions do not vary.

4,872,034

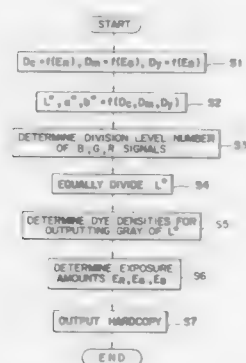
METHOD FOR DIVIDING DENSITY RANGE OF COMPONENT DYES IN COLOR HARD COPY

Noboru Ohta; Koji Takahashi, and Tsuneo Suzuki, all of Minami-Ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation-in-part of Ser. No. 909,954, Sep. 22, 1986, abandoned. This application Dec. 15, 1987, Ser. No. 134,300
Claims priority, application Japan, Sep. 25, 1985, 60-211720
Int. Cl.⁴ G03B 27/32

U.S. Cl. 355—77

4 Claims



1. A method for dividing a density range of component dyes in a color hard copy which comprises the steps of: obtaining first relationships between exposure amounts (E_R , E_G , E_B) of three colors (R,G,B) of an exposing apparatus which outputs said color hard copy and component dye densities (D_C , D_M , D_Y) of a color film to be printed; determining a second relationship between said component dye densities (D_C , D_M , D_Y) and a visual lightness (L^*) so as to produce gray of a certain lightness on said color film; determining a division level number for R, G, B, color image signals; equally dividing a visual lightness (L^*) by said division level number; determining dye densities so as to output gray of the thus equally divided lightness (L^*); determining the exposure amount (E_R , E_G , E_B) in order to output said dye densities; inputting the thus determined exposure amounts of said exposing apparatus to thereby obtain a color hard copy.

4,872,035

IMAGE FORMING APPARATUS

Hiroyuki Miyake, Inagi; Seiji Sagara, Yokohama; Takaji Yonemori, Tokyo; Tsuyoshi Watanabe, Yokohama; Masayoshi Takahashi, Chofu; Koji Suzuki, Yokohama; Yutaka Komiya, Tokyo; Masahiro Tomosada; Hideki Adachi, both of Kawasaki; Masayuki Hirose, Yokohama, and Masanori Miyata, Mitaka, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 808,215, Dec. 11, 1985, abandoned, Continuation of Ser. No. 497,175, May 23, 1983, abandoned.

This application Feb. 2, 1988, Ser. No. 153,577

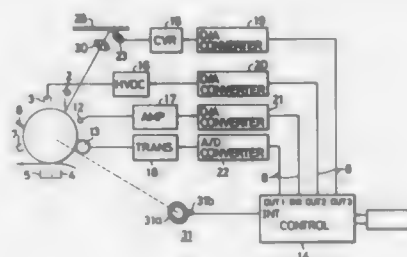
Claims priority, application Japan, May 31, 1982, 57-92505
Int. Cl.⁴ G03G 15/00

U.S. Cl. 355—208

36 Claims

1. An image forming apparatus comprising: image forming means for forming an image on a recording member with any one of a plurality of different image magnifications; and controls means for controlling the image forming conditions of said image forming means, wherein said control means control the image forming conditions in any one of a plurality of different control modes of which each has different parameter in accordance with the image magnifi-

cation such that when the image magnification is anywhere within a first range the image forming conditions are controlled in a first control mode having a first parameter,



eter, and when the desired image magnification is anywhere within a second range the image forming conditions are controlled in a second control means having a second parameter.

4,872,036

DEVELOPING APPARATUS

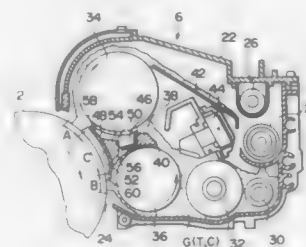
Toru Homma, Sagami-hara, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 22, 1988, Ser. No. 274,907

Claims priority, application Japan, Nov. 30, 1987, 62-302634
Int. Cl.⁴ G03G 15/08

U.S. Cl. 355—253

13 Claims



1. A developing apparatus for developing a latent image on an image carrier, comprising: first means for supplying a developing agent to the latent image on the image carrier, for developing the latent image; second means for supplying a developing agent to the latent image on the image carrier, for developing the latent image; and means, disposed in a region surrounded by the image carrier and the first and second means, for isolating the image carrier from those portions of the first and second means which face said surrounded region.

4,872,037

IMAGE FORMING APPARATUS AND CONTROL SYSTEM THEREFOR

Nobuo Kasahara; Toshi Nakahara; Masayoshi Watanuki, all of Yokohama, and Tadahide Sawamura, Tokyo, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 12,492, Feb. 9, 1987, Pat. No. 4,733,269. This application Mar. 2, 1988, Ser. No. 163,026
Claims priority, application Japan, Mar. 2, 1987, 62-46995

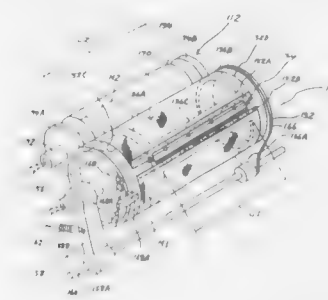
Int. Cl.⁴ G03G 15/16, 15/00

U.S. Cl. 355—271

22 Claims

1. A control system for a color copier having optics for scanning, photoconductive means, and transfer means, comprising:

paper size setting means for setting a size of a paper sheet to be used before a copying operation; scanning sensor means for sensing a start of a scanning performed by said optics; home sensor means for sensing an instantaneous angular position of said transfer means; and control means for determining a transfer start time and a transfer end time in response to a paper size signal output-



ted by said paper size setting means, an output signal of said scanning sensor means, and an output of said home sensor means, and variably controlling a rotation speed of said transfer means during an interval between said transfer start and transfer end times so as to register a leading edge of a paper sheet loaded on said transfer means and a leading edge of each of toner images formed on said photoconductive means and different in color from each other.

4,872,038

LATERAL SURFACE SUPERLATTICE HAVING NEGATIVE DIFFERENTIAL CONDUCTIVITY NOVEL PROCESS FOR PRODUCING SAME

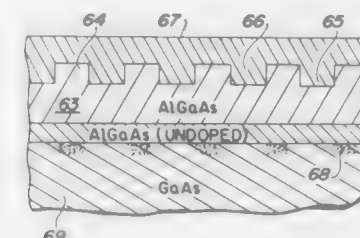
Gary Bernstein, Tempe, and David K. Ferry, Chandler, both of Ariz., assignors to Arizona Board of Regents, Tempe, Ariz.

Filed Feb. 24, 1988, Ser. No. 159,721

Int. Cl.⁴ H01L 27/12

U.S. Cl. 357—4

21 Claims



1. A lateral surface superlattice device which exhibits negative differential conductivity at ambient temperatures, said superlattice device comprising: a first layer, said first layer being a thin, uniform planar layer of a first type of semiconductor material having an upper surface, a lower surface and opposing ends; a second layer of a second type of semiconductor material exhibiting predetermined energy gaps between the conduction and valence bands of said first and second types of semiconductor materials; conducting channel means separating said first and second layers of dissimilar semiconductor materials; a conducting channel formed between said first and second semiconductor layers; gate means received and positioned within a central portion of said upper surface of said first layer and communicating with said channel means, said gate comprising an open Schottky metal grid defining a gate pattern having a plurality of spaced-apart apertures within said pattern, each of said apertures separated on all sides by a Schottky metal wall; a plurality of electronically created,

4,872,039

BURIED LATERAL DIODE AND METHOD FOR MAKING SAME

Paul J. Stabile, Middletown Township, Bucks County, Pa., assignor to General Electric Company, Schenectady, N.Y.

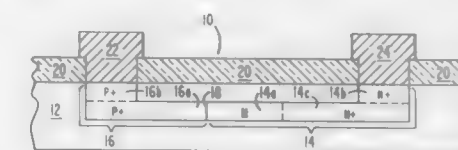
Continuation of Ser. No. 855,602, Apr. 25, 1986, abandoned.

This application Jul. 13, 1987, Ser. No. 73,897

Int. Cl.⁴ H01L 29/90

U.S. Cl. 357—13

13 Claims



1. An oscillating diode comprises a semiconductor body of a resistivity of at least 2000 ohm-cm and having therein: a first region of a first conductivity type; means for coupling said first region to the surface of said body; a second region of a second conductivity type opposite to said first conductivity type having a contact portion extending to a surface of said body, said first and second regions having a lower resistivity than said body; a pair of conducting layers overlying said coupling means and said contact portion, respectively; and a buried junction comprising a buried portion of said first conductivity type and of said first region and a buried portion of said second conductivity type and of said second region laterally adjacent said buried portion of said first region.

4,872,040

SELF-ALIGNED HETEROJUNCTION TRANSISTOR

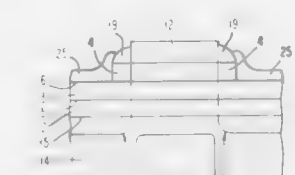
Thomas N. Jackson, Peekskill, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 23, 1987, Ser. No. 41,812

Int. Cl.⁴ H01L 29/72

U.S. Cl. 557—16

11 Claims



1. A semiconductor intermediate manufacturing product structure comprising: a monocrystalline body having first, second and third parallel layers of wider, narrower and wider band gaps, respectively, each of said first, second and third parallel layers including therein a doped region; said doped regions of said first, second and third regions having substantially the same cross-sectional area and being aligned to form a vertically aligned portion through said structure; said first, second and third regions being doped such that

said first and third regions are of a first conductivity type and said second region is of a second, conductivity type; the portion of each said wider band gap layer outside of said aligned region being doped for high resistivity, and the portion of said narrower band gap layer outside said aligned region being doped for high conductivity.

4,872,041

SEMICONDUCTOR DEVICE EQUIPPED WITH A FIELD EFFECT TRANSISTOR HAVING A FLOATING GATE

June Sugiura, Musashino, and Kazuhiro Komori, Kodaira, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Continuation of Ser. No. 701,245, Feb. 13, 1985, abandoned.

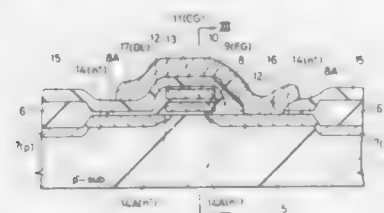
This application Feb. 24, 1988, Ser. No. 161,433

Claims priority, application Japan, Feb. 24, 1984, 59-32355

Int. Cl.⁴ H01L 29/78, 29/04

U.S. Cl. 357—23.5

22 Claims



1. A semiconductor device comprising:

a conductive layer disposed above a surface of a semiconductor substrate and isolated electrically from semiconductor regions formed in said semiconductor substrate by a first insulating layer disposed between said semiconductor substrate and said conductive layer;

another conductive layer disposed on said conductive layer via a third insulating layer, each of said conductive layer and said another conductive layer having a top and a bottom, and sides extending between the top and the bottom;

a second insulating layer disposed sideways of said conductive layer and another conductive layer and covering sides of said conductive layer and another conductive layer and said first insulating layer, said second insulating layer being formed by deposition and being a dense insulating layer sufficiently dense so as to prevent charge leakage from said conductive layer, wherein a portion of said second insulating layer which covers sides of said conductive layer has a film thickness, in a direction parallel to the surface of the semiconductor substrate, greater than the film thickness of another portion of said second insulating layer which covers sides of said another conductive layer;

two semiconductor regions formed respectively in the semiconductor substrate at the sides of the conductive layer, said two semiconductor regions being of one conductivity type, and a portion of the semiconductor substrate beneath the conductive layer being of a conductivity type opposite that of said two semiconductor regions;

said device constituting a field effect transistor, said portion of the semiconductor substrate beneath the conductive layer constituting a channel of said field effect transistor, with the conductive layer being a floating gate and said another conductive layer being a control gate of said field effect transistor, the first insulating layer being the gate oxide layer of the field effect transistor; and

the device including further semiconductor regions having the same conductivity type as that of said two semiconductor regions but a lower impurity concentration than that of the two semiconductor regions, said further semiconductor regions being formed respectively between the region in which the channel of said field effect transistor is formed and said two semiconductor regions, wherein the two semiconductor regions are regions in self-alignment with the second insulating layer and the conductive and

another conductive layers, and the further semiconductor regions are regions in self-alignment with the conductive and another conductive layers.

4,872,042

SEMICONDUCTOR DEVICE

Satoshi Maeda, Yokohama, and Hiroshi Iwai, Takaidonishi, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

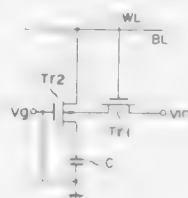
Filed Jul. 13, 1984, Ser. No. 630,830

Claims priority, application Japan, Jul. 20, 1983, 58-132601; Aug. 15, 1983, 58-149058

Int. Cl.⁴ H01L 29/78

U.S. Cl. 357—23.6

3 Claims



1. A semiconductor device comprising:

a semiconductor substrate of a first conductivity type; a semiconductor well of a second conductivity type formed in said semiconductor substrate;

an insulation film formed on said semiconductor well, said insulation film having a predetermined pattern for defining a plurality of element regions in said semiconductor well;

a first high impurity concentration semiconductor region of said first conductivity type formed in each of said element regions;

a second low impurity concentration semiconductor region of said first conductivity type formed in each of said element regions, said second low impurity concentration semiconductor region being separated from said first high impurity concentration semiconductor region by a predetermined distance;

a thin insulation film formed on each of said element regions; an electrode formed on a first portion of said thin insulation film laying above said second low impurity concentration semiconductor region in each of said element regions and formed on a second portion in each of said element regions which is between said first high impurity concentration semiconductor region and said second low impurity concentration semiconductor region, said electrode, said first high impurity concentration semiconductor region, said second low impurity concentration semiconductor region and said thin insulation film forming a MOS transistor in each of said semiconductor regions, one portion of said electrode laying above said second low impurity concentration semiconductor region forming a capacitor electrode of each of said MOS transistors, and another portion of said electrode formed on said second portion forming a gate electrode of each of said MOS transistors; and means for controlling the switching of each of said MOS transistors by changing a potential of said semiconductor well.

4,872,043

CHARGE COUPLED DEVICE WITH REDUCED SURFACE STATE AT SEMICONDUCTOR-INSULATOR INTERFACE

Ichiro Fujii, Miho, Japan, assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 867,842, May 27, 1986, abandoned.

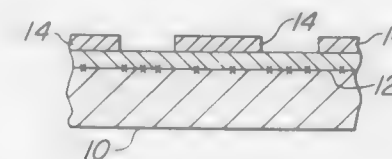
This application Aug. 29, 1988, Ser. No. 240,394

Claims priority, application Japan, Jun. 21, 1985, 60-136509

Int. Cl.⁴ H01L 29/78, 29/167, 27/14; G11C 19/28

U.S. Cl. 357—24

6 Claims



1. A charge coupled device comprising:

a semiconductor body of one conductivity type and having a top surface;

an insulator layer disposed on said semiconductor body along the top surface thereof, said insulator layer cooperating with said semiconductor body to define a semiconductor-insulator interface therebetween;

a plurality of transfer electrodes on said insulator layer and arranged in space relation with respect to each other;

a multiplicity of hydrogen ions selectively incorporated into said semiconductor body at a region adjacent to the top surface thereof and defining a hydrogen-rich portion of said semiconductor body disposed along at least a portion of said semiconductor-insulator interface, said hydrogen ions being available for combining with dangling bonds located along said at least a portion of said semiconductor-insulator interface; and

said at least a portion of said semiconductor-insulator interface having a reduced surface state due to the hydrogen ion-dangling bond combinations, thereby causing a reduction in dark current in the charge coupled device by limiting electron-hole recombination activity along said at least a portion of said semiconductor-insulator interface.

4,872,044

STATIC INDUCTION TYPE THYRISTOR

Jun-ichi Nishizawa, and Tadashi Ohmi, both of Sendai, Japan, assignors to Zaidan Hojin Handotai Kenkyu Shinkokai, Sendai, Japan

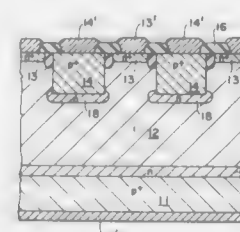
Division of Ser. No. 848,343, Apr. 4, 1986, Pat. No. 4,772,926, which is a continuation of Ser. No. 647,871, Sep. 6, 1984, abandoned, which is a continuation of Ser. No. 115,250, Jan. 20, 1980, abandoned. This application May 6, 1987, Ser. No. 46,314

Claims priority, application Japan, Jan. 26, 1979, 54-8366

Int. Cl.⁴ H01L 29/74

U.S. Cl. 357—38

8 Claims



1. A static induction type thyristor comprising:

an i layer having a substantially uniform low impurity concentration and having opposed major surfaces;

a first main electrode means having a first highly-doped semiconductor region, said part main electrode means being formed adjacent to one of said major surfaces of said i layer;

a thin layer region having an impurity concentration higher than that of said i layer and a thickness much smaller than that of said i layer, said thin layer region being formed on the major surface of said high-resistivity semiconductor region;

a substantially flat second main electrode means comprising a second highly-doped semiconductor region, said second highly-doped semiconductor region being formed on that side of said thin layer region located opposite to the side adjacent to said i layer the impurity concentration of said second highly-doped semiconductor region being much higher than that of said thin layer region, and said second main electrode means further comprising a conductive electrode formed on said second highly-doped semiconductor region and generally coextensive therewith;

a highly-doped gate region in the vicinity of said first highly-doped semiconductor region, at least one current channel for those carriers supplied from said first highly-doped semiconductor region and said second highly-doped semiconductor region being formed of a portion of said i layer and substantially surrounded by said gate region; and a third semiconductor region having an impurity concentration lower than that of said gate region and formed so as to cover that bottom surface of said gate region which faces at least the other of said major surfaces.

4,872,045

INPUT PROTECTION DEVICE FOR C-MOS DEVICE
Isao Baba, Yokohama; Takeo Kondo, Yokosuka; Leichi Yanagisawa, and Kenji Kohguchi, both of Kawasaki, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

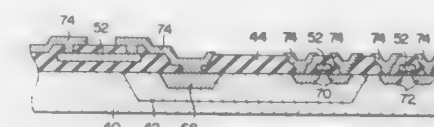
Filed Sep. 2, 1983, Ser. No. 528,888

Claims priority, application Japan, Sep. 7, 1982, 57-155503

Int. Cl.⁴ H01L 29/80, 29/78, 27/02

U.S. Cl. 357—13

9 Claims



1. An input protection device for a C-MOS device comprising:

an n-type semiconductor substrate; a p-type well region formed in a surface region of said n-type semiconductor substrate;

first n-type layers formed in a surface region of said p-type well region, serving as a source and drain of an n-channel MOSFET;

a second n-type layer formed in the surface region of said p-type well region, serving as a cathode of a diode having a single PN junction, the impurity concentration of said second n-type layer being higher than the impurity concentration of said first n-type layer;

p-type layers formed in the surface region of said n-type substrate, serving as a source and drain of a p-channel MOSFET;

a first n⁺-type polysilicon layer formed on said n-type semiconductor substrate; and

a first insulating film isolating said first n⁺-type polysilicon layer from said substrate; said first n⁺-type polysilicon layer having one end con-

nected to said second n-type layer and serving as a protection resistor.

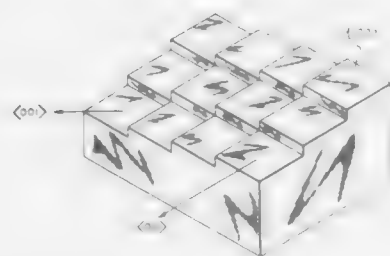
4,872,046

HETEROJUNCTION SEMICONDUCTOR DEVICE WITH <001> TILT

Hadis Morkoc, and Russ Fischer, both of Urbana, Ill., assignors to University of Illinois, Urbana, Ill.
Division of Ser. No. 822,343, Jan. 24, 1986, Pat. No. 4,707,216.
This application Sep. 1, 1987, Ser. No. 91,631
Int. Cl.⁴ H01L 29/04

U.S. Cl. 357—60

12 Claims



1. A semiconductor device, comprising:
a single crystalline substrate selected from the group consisting of silicon and germanium having a {100} crystallographic surface tilted in the <001> direction;
at least one layer of III-V semiconductor material disposed over said surface; and
a transistor device formed in said at least one layer of III-V semiconductor material.

4,872,047

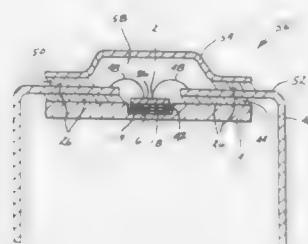
SEMICONDUCTOR DIE ATTACH SYSTEM

Julius C. Fister, Hamden; Satyam C. Cherukuri, West Haven; Deepak Mahulikar, Meriden, and Brian E. O'Donnely, Branford, all of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Nov. 7, 1986, Ser. No. 928,121
Int. Cl.⁴ H01L 23/12, 23/14

U.S. Cl. 357—67

21 Claims



1. A semiconductor die attach system adapted for attaching a semiconductor die to a substrate, comprising:
a substrate;
a semiconductor die;
a buffer component disposed between and bonded to said substrate and said semiconductor die for withstanding thermal stress generated from thermal cycling of said substrate and die, said buffer having a coefficient of thermal expansion of from about 35×10^{-7} to about 100×10^{-7} in/in/°C.;
a layer of solder bonding said buffer component to said substrate, said layer of solder for dissipating thermal stress generated from thermal cycling of said substrate and die, said solder being selected from the group consisting of gold-silicon, gold-tin, copper-indium, silver-antimony-tin,

lead-indium-tin, lead-indium-silver, lead-indium-silver-tin and mixtures thereof; and
a silver-glass adhesive bonding said buffer component to said die.

4,872,048

SEMICONDUCTOR DEVICE HAVING COPPER ALLOY LEADS

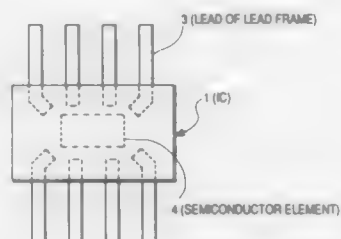
Hidetoshi Akutsu, Kitamoto; Takuro Iwamura, and Masao Kobayashi, both of Omiya, all of Japan, assignors to Mitsubishi Kinzoku Kabushiki Kaisha, Tokyo, Japan
Continuation-in-part of Ser. No. 903,514, Sep. 3, 1986, Pat. No. 4,749,548. This application Mar. 10, 1988, Ser. No. 166,217
Claims priority, application Japan, Sep. 13, 1985, 60-203117; Sep. 13, 1985, 60-203118; Sep. 20, 1985, 60-208097; Sep. 20, 1985, 60-208095; Sep. 20, 1985, 60-208096; United Kingdom, Sep. 11, 1986, 8621958; Fed. Rep. of Germany, Sep. 12, 1986, 3631119

The portion of the term of this patent subsequent to Jun. 7, 2005, has been disclaimed.

Int. Cl.⁴ H01L 23/48; C22C 9/00

U.S. Cl. 357—67

4 Claims



3. A semiconductor device having leads of high strength and elongation and which consist essentially of a copper alloy that contains either 0.05–1% of Cr or 0.005–0.3% of Zr or both, 0.001–0.05% of Li, 0–1% of Ni, 0–1% of Sn, 0–1% of Ti, 0–0.1% of Si and which further contains one or more of 0–2% of a metal selected from the group consisting of Fe, Co and Be, 0–1% of a metal selected from the group consisting of Mg, Al, Zn, Mn, B, P, Y and a rare earth element, and 0–2% of a metal selected from the group consisting of Nb, V, Ta, Hf, Mo and W, the percent being on a weight basis, with the balance being copper and incidental impurities, and which has a structure wherein the average grain size of any eutectic crystal present is no more than 10 μm, the average grain size of any precipitate present is no more than 0.1 μm, and the average size of any crystalline grains present is no more than 50 μm.

4,872,049

ENCAPSULATED LOW-NOISE ULTRA-HIGH FREQUENCY SEMICONDUCTOR DEVICE

Henri Derewonko, Voisins le Bretonneux; Didier Adam, Gif sur Yvette; Daniel Delagebeaudeuf, Saclay, and Patrick Resneau, Boulogne, all of France, assignors to Thomson Hybrides et Microondes, Paris, France

Filed Dec. 15, 1987, Ser. No. 133,421

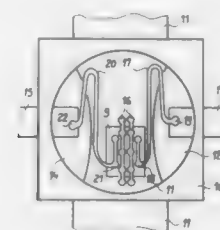
Claims priority, application France, Dec. 16, 1986, 86 17564
Int. Cl.⁴ H01L 23/48

U.S. Cl. 357—68

6 Claims

1. A low-noise, ultra-high frequency semiconductor device, comprising:
a metallic base, said metallic base constituting a ground;
a ceramic frame fixed to said metallic base;
a transistor chip located inside said ceramic frame, said transistor chip having a gate, a drain, and a source, said source connected to said metallic base;
a first external access connection having an end portion located inside said ceramic frame;
a first choke wire serially connected to and located between

said gate and said end portion of said first external access connection, said first choke wire having two strands



which form a hairpin shape, said strands being substantially parallel.

4,872,050

INTERCONNECTION STRUCTURE IN SEMICONDUCTOR DEVICE AND MANUFACTURING METHOD OF THE SAME

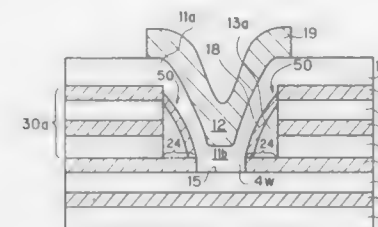
Tatsuo Okamoto; Hideo Kotani; Takio Oono; Kiyoto Watabe; Yasushi Kinoshita, and Yoshikazu Nishikawa, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 15, 1988, Ser. No. 168,386

Int. Cl.⁴ H01L 29/52, 23/48, 29/44, 29/62

U.S. Cl. 357—71

8 Claims



1. A semiconductor device comprising:

- (a) a substrate;
- (b) a first conductive layer provided on an upper surface of said substrate and connected to an internal circuit formed in an arbitrary region on said substrate;
- (c) a first insulating layer formed on an upper surface of said first conductive layer and having a window;
- (d) a multi-layer structure provided on an upper surface of said first insulating layer and having:
(d-1) second conductive layers provided in parallel direction to said upper surface of said substrate and connected respectively to internal circuits formed in an arbitrary region on said substrate;
(d-2) at least one second insulating layer inserted between said second conductive layers for insulating said second conductive layers from each other; and
(d-3) a third insulating layer provided in a top of said multi-layer structure; where said multi-layer structure being provided with a contact hole communicating to said window, and a side surface of said contact hole is defined by a side surface of said multi-layer structure;
- (e) a third conductive layer provided on an upper surface of said multi-layer structure and connected to an internal circuit formed in an arbitrary region on said substrate;
- (f) a side wall provided in said contact hole to cover said side surface of said multi-layer structure while leaving said contact hole open and having a side conductive layer that interconnects at least two of said second conductive layers and an insulating film provided at least on a surface region of said side wall which faces to a center of said contact hole; and
- (g) a connection film provided in said contact hole contacting said first conductive layer through said window and

connected to said third conductive layer on said contact hole thereby to electrically interconnect said first and third conductive layers, said connection film being electrically insulated from said second conductive layers by said side wall.

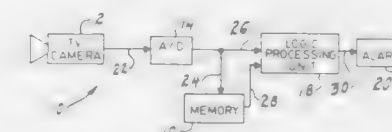
4,872,051

COLLISION AVOIDANCE ALARM SYSTEM

Robert H. Dye, Ann Arbor, Mich., assignor to Environmental Research Institute of Michigan, Ann Arbor, Mich.
Filed Oct. 1, 1987, Ser. No. 103,202
Int. Cl.⁴ H06N 7/18

U.S. Cl. 358—103

14 Claims



1. A collision avoidance alarm system, for rigid mounting on a vehicle, comprising:

- (a) a sensor subsystem, producing electrical signals proportional to the intensity of visible light incident thereon;
- (b) lens means for directing visible light, from a wide field of view substantially centered about a direction of progression of said vehicle, onto said sensor subsystem;
- (c) means for correlatably identifying the electrical signals produced by said sensor subsystem with particular elements within the field of view of said lens system wherein the visible light sensed originates;
- (d) means for comparing the electrical signals resulting from spatially contiguous elements within the field of view, and for establishing an extent parameter, in terms of a measure within the field of view, of said resultant electrical signals having like characteristics and amplitudes;
- (e) means for computing a centroid, in terms of angle with respect to the center of the field of view, of the spatially contiguous elements on which said extent parameter is based;
- (f) means for sequentially, in time, comparing consecutive extent parameters and centroid angle; and
- (g) means for producing an audible signal when, and only when, the centroid angle is consecutively a constant and the extent parameter indicates an apparent growth.

4,872,052

SEMICONDUCTOR DEVICE INSPECTION SYSTEM

Valerie A. Liudzius, Simi Valley; Ralph M. Weisner, Canoga Park, both of Calif.; Takashi Kamiharaka, and Iwami Uramoto, both of Tokyo, Japan, assignors to View Engineering, Inc., Simi Valley, Calif. and Kaijo Denki Co., Ltd., Tokyo, Japan, a part interest

Filed Dec. 3, 1987, Ser. No. 128,329

Claims priority, application Japan, Dec. 3, 1986, 61-286881; Dec. 3, 1986, 61-286882; Dec. 3, 1986, 61-286883

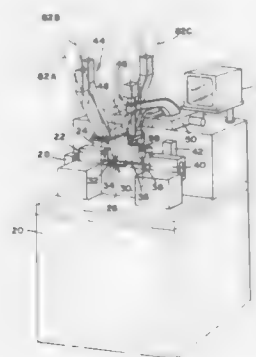
Int. Cl.⁴ H04N 7/18

U.S. Cl. 358—106

18 Claims

1. A semiconductor device inspection system for carrying out visual image inspection of a semiconductor device subjected to wire bonding and supported on a base, comprising:
at least one image pickup mechanism comprising: a plurality of image pickup units each of which carries out image pickup of said semiconductor device to generate an image signal, said image pickup units each including a lens system having at least one lens and a light receptor for receiving thereon an image formed by said lens system;
an optical-electrical signal converter means connected to

said image pickup units for converting each of said image signals into an electrical signal;
 an operation circuit connected to said optical-electrical signal converter to digitize said electrical signal, said operation circuit digitizing electrical signals derived from at least two of said image pickup units and converted by said converter and synthetically operating the digitized of an inspected section of said semiconductor device;
 a memory circuit for storing digitized standard data on an inspection item therein; and
 an image processing unit connected to said operation circuit to compare an input data signal obtained by digitizing said electrical signal with a standard data signal based on said



digitized standard data to judge the normality of said input data signal;
 said image pickup units being arranged in a manner such that central axes of said image pickup units each defined by connecting a center of said light receptor and a center of said lens system together intersect one another on said inspected surface of said semiconductor device, consequently, the central axis of at least one image pickup unit is oblique to said inspected surface of said semiconductor device, and that, said light receptor of each of said image pickup units, including said at least one oblique image pickup unit, is arranged in parallel to an inspected surface of said semiconductor device.

4,872,053

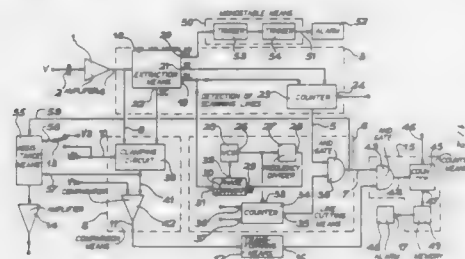
DEVICE TO CONTROL THE PRESENCE OF INFORMATION OF IMAGES IN VIDEO SIGNALS
 Gérard, J. Gay, 5 Parvis du Breuil App.41 92160, Antony, France

Filed Oct. 13, 1988, Ser. No. 257,071

Claims priority, application France, Oct. 14, 1987, 87 14192
Int. Cl.⁴ H04N 7/18

U.S. Cl. 358—108

7 Claims



1. A device for controlling the presence of image information in video signals applicable to a display screen video receiver by scanning of lines with two interlaced frames, wherein it comprises line detection means receiving the video signal on an input in order to mark an instant characteristic of the start of scanning a predetermined row line with respect to

a first line of an image and in order to supply on an output a logical line selection signal characteristic of this predetermined instant, line cutting means connected to the output of the detection means in order to select from the characteristic instant two successive instants separated by a cutting time interval during which a predetermined line portion is scanned, these cutting means supplying on one output a logical cutting signal representative of the cutting time interval of the predetermined row line, comparison means receiving the video signal on one input and receiving on another input a reference voltage of transitions between two image luminance levels in order to compare the amplitude variations of the video signal with the reference voltage and in order to supply on one output a signal characteristic of the transitions between two luminance levels for parts of the video signal which are likely to contain image information, transformation means connected to the output of the comparison means in order to supply on one output a logical signal characteristic of the transitions, and programmable transition counting means connected to the output of the transformation means in order to count the number of transitions in said predetermined row line portion, an output of this counter being connected to alarm means triggered when the number of transitions exceeds a predetermined programmed count.

4,872,054

VIDEO INTERFACE FOR CAPTURING AN INCOMING VIDEO SIGNAL AND REFORMATTING THE VIDEO SIGNAL

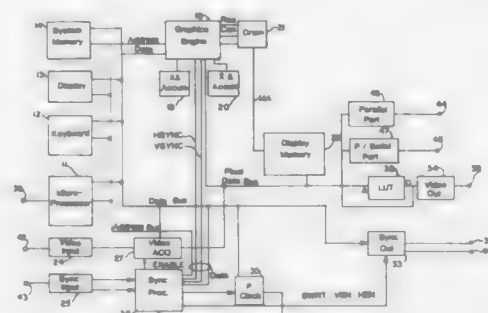
Michael J. Gray, Novato, and Michael J. Franco, San Rafael, both of Calif., assignors to Adaptive Video, Inc., San Rafael, Calif.

Filed Jan. 30, 1988, Ser. No. 213,028

Int. Cl.⁴ H04N 7/01, 5/04

U.S. Cl. 358—140

16 Claims



1. A video interface for receiving a video input signal of one format and deriving an output video signal of another format comprising:

- a microprocessor control system for generating a parameter list identifying the signal parameters of said input video signal including a pixel rate and a video signal line length, and for generating a parameter list identifying the signal parameters of said output signal, including the duration of horizontal and vertical synchronization pulses;
- a pixel clock which is presetable to generate a pixel clock signal in accordance with said input parameter list, said pixel clock including a phase control input for receiving an error signal;
- a synchronization signal processor for receiving synchronization signals related to said input video signal which identify an active line period and for receiving said pixel clock signal, said signal processor regenerating a local active line period signal identified by one of said parameters from said pixel signal, and including means for comparing said regenerated active line period signal with said

horizontal synchronization signals to derive said error signal for said pixel clock;
 an analog-to-digital converter for receiving said input video signal and said pixel clock signal and generating a digital pixel value of said video signal under control of said pixel clock;
 a graphics engine;
 a display memory for storing each of said pixels having pixel values as a frame of pixels under control of said graphics engine;
 an output synchronization generator for generating output horizontal and vertical synchronization pulses from said output parameter list; and,
 a digital-to-analog converter connected to receive said frame of pixels at an output pixel rate determined by said output parameter list in synchronization with said output synchronization generator horizontal and vertical synchronization pulses and converting said pixels to an analog voltage.

4,872,055

LINE SYNCHRONIZING CIRCUIT IN A PICTURE DISPLAY DEVICE

Dirk J. Teuling, and Jozef J. M. Hulshof, both of Eindhoven, Netherlands, assignors to U. S. Philips Corporation, New York, N.Y.

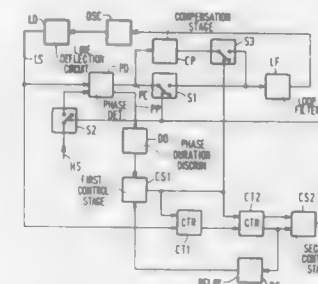
Filed Jan. 20, 1988, Ser. No. 145,855

Claims priority, application Netherlands, Feb. 4, 1987, #700,265

U.S. Cl. 358—148

Int. Cl.⁴ H04N 5/04

20 Claims



1. A circuit for line synchronization in a picture display device, said circuit comprising a phase control loop including an oscillator for generating a local line-frequency signal, a phase comparison stage, means coupled to said oscillator for applying the local line-frequency signal and an incoming signal comprising a line synchronizing signal to said phase comparison stage for comparing the phase between the local line-frequency signal and the line synchronizing signal, and a loop filter for smoothing an output signal of said phase comparison stage and for supplying said smoothed signal as a control signal to said oscillator for controlling a frequency and/or a phase of the local line-frequency signal, characterized in that said phase comparison stage comprises a phase-frequency detector having a trigger action on edges of pulses in input signals applied thereto, and said circuit further comprises means coupled to an output of said phase-frequency detector for determining if a phase difference detected by said phase-frequency detector between the local line-frequency signal and the line synchronizing signal is larger than a predetermined value, and means coupled between said phase-frequency detector and said loop filter for inhibiting the supply of said control signal during a first predetermined period after said determining means has determined that the phase difference between the local line-frequency signal and the line synchronizing signal is larger than said predetermined value.

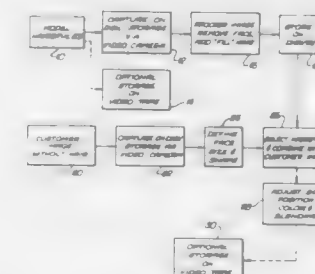
4,872,056

METHOD FOR DISPLAYING SELECTED HAIRSTYLES IN VIDEO FORM

T. Lawrence Hicks, Caldwell; Guy M. Given, Star; Robert J. Brinton, Eagle, and Donald J. Grundhauser, Boise, all of Id., assignors to Video Graphic Styling, Inc., Caldwell, Id.
 Filed Feb. 5, 1987, Ser. No. 10,971
 Int. Cl.⁴ H04N 5/272

U.S. Cl. 358—183

18 Claims



1. A method for displaying hairstyle images on a video image of a customer's face, comprising the steps of: capturing the video image of at least one hairstyle; processing the captured video image of the hairstyle to render it adaptable to a variety of face sizes and shapes; capturing the video image of a customer's face; and combining the video image of the hairstyle with the video image of the customer's face, in such a manner that the hairstyle image fits naturally about the face image; wherein the step of processing the hairstyle image is performed only once for each captured hairstyle, and includes adding "fill" hair to the hairstyle video image in a region covering a range of size and shape adjustability; and wherein the step of combining the hairstyle video image and the customer's face image includes automatically deleting "fill" hair that would otherwise cover the customer's face image, whereby the hairstyle video image is combined with the customer's face image without unnatural gaps between the customer's face image and the hairstyle image, without unnaturally overlaying the hairstyle image over the customer's face image, and without the need of operator intervention.

4,872,057

PULSE MODULATED AUTOMATIC LIGHT CONTROL UTILIZING GATED IMAGE INTENSIFIER

Thomas M. Woolfolk, Gordenville, Va., assignor to Sperry Marine Inc., Charlottesville, Va.

Continuation of Ser. No. 934,068, Nov. 21, 1986, abandoned.

This application Jan. 3, 1989, Ser. No. 293,557

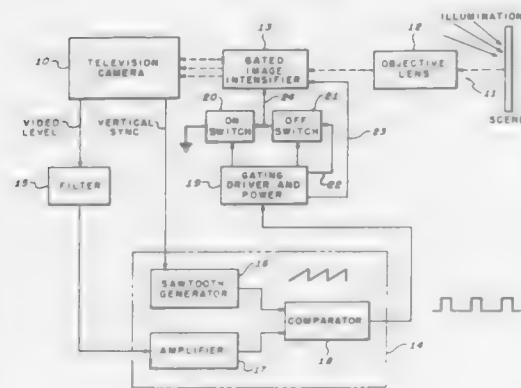
Int. Cl.⁴ H04N 5/14

U.S. Cl. 358—211

3 Claims

1. Light control apparatus for a television camera comprising:
 image intensifier means for amplifying light from a scene incident to said camera;
 means for providing a brightness signal in accordance with brightness levels of said light from said scene;
 pulse modulator means responsive to said brightness signal for generating pulses having durations in accordance with said brightness signal;
 gating means responsive to said pulses for providing first and second gating pulses, said first gating pulses having pulse durations in accordance with said durations of said pulses,

said second gating pulses provided at expirations of said durations of said first gating pulses; and



control means responsive to said first and second gating pulses for providing on and off voltages to respectively turn said image intensifier means on and off.

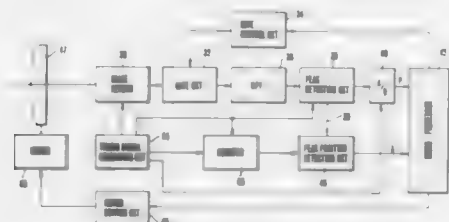
4,872,058

AUTOMATIC FOCUSING DEVICE

Takeshi Baba, Kanagawa, and Yukichi Niwa, Chiba, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Oct. 8, 1987, Ser. No. 106,427
Claims priority, application Japan, Oct. 8, 1986, 61-239786
Int. Cl.⁴ H04N 5/238

U.S. Cl. 358-227

40 Claims



1. A focus detecting device for detecting a focal point by obtaining a focus signal corresponding to a focused degree from a video signal obtained from within a focus detecting area which is set on the image sensing plane of image sensing means, comprising:

- peak detecting means for detecting a substantial peak value of said focus signal corresponding to a focused degree obtained from within said focus detecting area;
- position detecting means for detecting a position at which said peak value is detected within said focus detecting area on said image sensing plane; and
- position control means for controlling the position of said focus detecting area according to the output of said position detecting means.

4,872,059

SYSTEM FOR DRIVING A LIQUID CRYSTAL DISPLAY PANEL

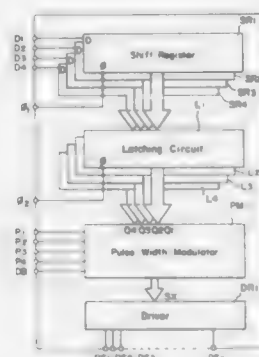
Munehiro Shinabe, Tokorozawa, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan
Continuation-in-part of Ser. No. 12,086, Feb. 6, 1987, abandoned. This application Jul. 19, 1988, Ser. No. 222,397
Claims priority, application Japan, Feb. 7, 1986, 61-025592
Int. Cl.⁴ H04N 5/70

U.S. Cl. 358-241

3 Claims

3. A system for driving a liquid crystal matrix display panel having a plurality of data electrodes and scanning electrodes

arranged in a matrix, picture elements being formed at intersections of said data and scanning electrodes, comprising:
scanning electrode driver means for applying scanning driver pulses to said scanning electrodes;
data electrode driver means for applying data driver pulses to preselected data electrodes, including,
means for applying first data driver pulses during a first field, and
means for applying second data driver pulses during a second field;



said first data driver pulses combining with said scanning driver pulses to form first picture element driver pulses having a high amplitude portion at leading edges thereof and a lower amplitude portion at trailing edges thereof;
said second data driver pulses combining with said scanning driver pulses to form second picture element driver pulses having a high amplitude portion at trailing edges thereof and a lower amplitude portion at leading edges thereof;
the ratio of a high amplitude portion to a lower amplitude portion of a particular picture element driver pulse defining a half tone of a picture element to which said particular pulse is applied.

4,872,060

DIGITAL CIRCUIT SYSTEM FOR TELEVISION RECEIVERS WITH CATHODE RAY PICTURE TUBES
Ljubomir Micic, Freiburg, and Soenke Mehrgardt, March, both of Fed. Rep. of Germany, assignors to Deutsche ITT Industries, GmbH, Freiburg, Fed. Rep. of Germany
Continuation of Ser. No. 48,114, May 11, 1987, abandoned. This application Dec. 5, 1988, Ser. No. 283,031

Claims priority, application European Pat. Off., May 17, 1986, 86106771.8

Int. Cl.⁴ H04N 5/68

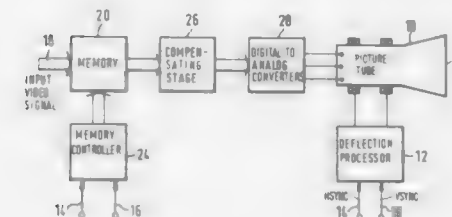
U.S. Cl. 358-242

4 Claims

1. A digital circuit system for a television receiver with a cathode-ray tube for converting a received video signal to images on the picture tube, comprising:

- a deflection processor for generating deflection signals such that the video information of the received signal is displayed on the screen of the picture tube during both the sweep and retrace movements of the cathode-ray beam;
- a random-access memory for storing either at least one line or at least one field of the video signal digitized to form digital signals by means of a clock signal, the random-access memory being under control of a memory controller, the digital signals being read from the random-access memory so that the individual pixels occupy the positions on the screen of the picture which are intended on the transmitter side; and
- a compensating stage coupled to receive the digital signals

from the random-access memory for correcting picture tube errors caused by the non-spherical curvature of the



picture tube screen, the compensating stage driving the picture tube via a digital-to-analog converter.

4,872,061

FACSIMILE

Masahiro Uchiyama, Shizuoka, Japan, assignor to Tokyo Electric Co., Ltd., Tokyo, Japan

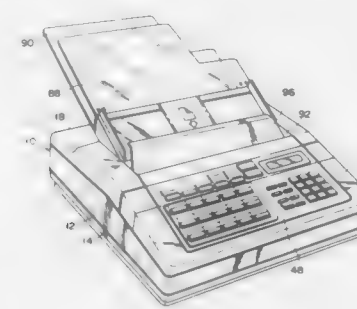
Filed Jul. 8, 1988, Ser. No. 216,855

Claims priority, application Japan, Jul. 13, 1987, 62-174131; Jul. 13, 1987, 62-174132; Jul. 13, 1987, 62-174133; Aug. 28, 1987, 62-214333

Int. Cl.⁴ H04N 1/40

U.S. Cl. 358-400

15 Claims



1. A facsimile comprising:

- a body cover shaped to define a space therein;
- U-turn feed means contained in the space defined by the body cover and having a turnabout roller for changing an original-sheet feed direction;
- a reading sensor in the space defined by the body cover to read an image on an original sheet transported in the U-turn feed means; and
- image recording means in the space defined by the body cover to record an image on a recording sheet, said reading sensor being situated at a position within a space surrounded by a U-turn feed path in the U-turn feed means such that said reading sensor cannot interfere with the turnabout roller.

4,872,062

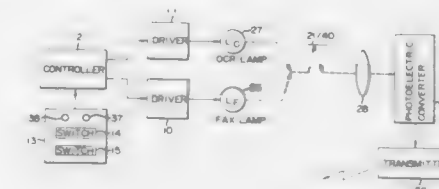
METHOD FOR EFFICIENTLY DROPPING OUT A PATTERN HAVING A DROP-OUT COLOR AND A FACSIMILE APPARATUS FOR REALIZING THE SAME
Hiromi Nanba, Tokorozawa, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 16, 1988, Ser. No. 232,773

Claims priority, application Japan, Aug. 28, 1987, 62-214323
Int. Cl.⁴ H04N 1/40

U.S. Cl. 358-443

16 Claims



whereby the effective width of said aperture in the scanning direction is reduced synthetically due to the signal processing of circuit.

4,872,064

SYSTEM FOR SELECTIVE SCALING OF DIGITAL VIDEO IMAGES

Timothy T. Tutt, Skokie; Mark Westmeyer, Elmhurst, and Khutoryansky, Glenview, all of Ill., assignors to Interand Corporation, Chicago, Ill.

Filed Oct. 19, 1987, Ser. No. 110,001

Int. Cl.⁴ H04N 1/393

U.S. Cl. 358-464

2 Claims



1. A method for scaling an unscaled video image by a predetermined scaling ratio to produce a scaled video image, wherein the scaled and unscaled video images each comprise a plurality of image pels, the method comprising the steps of: generating a lookup table comprising a plurality of scaled image pel values, wherein the particular scaled image pel values are dependent upon the predetermined scaling ratio; establishing a framing matrix of unscaled image pels for each scaled image pel; successively reading out of the lookup table scaled image pel values for each of the scaled image pels, wherein the particular scaled image pel value read out of the lookup table for a particular scaled image pel is dependent upon the framing matrix established for that particular scaled image pel; and generating a scaled video image by assembling the scaled image pel values read out from the lookup table.

4,872,065

METHOD AND APPARATUS FOR JITTER CORRECTION OF A POLYGON MIRROR IN AN IMAGE RECORDING APPARATUS

Koichi Isono, Otsu; Kunio Tomohisa, Kyoto; Junichi Oka, Hikone, and Takashi Sakamoto, Otsu, all of Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan

Filed Oct. 28, 1987, Ser. No. 113,743

Claims priority, application Japan, Oct. 29, 1986, 61-257727; Nov. 21, 1986, 61-279288

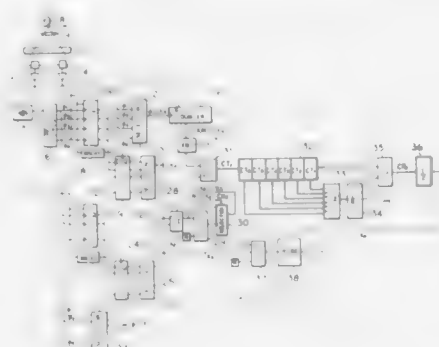
Int. Cl.⁴ H04N 1/10

U.S. Cl. 358-494

8 Claims

1. A method of performing polygon mirror image recording jitter correction by using a polygon mirror to scan a recording beam modulated in synchronization with a dot recording clock signal during recording of an image on a photosensitive material, said method comprising the steps of: detecting said recording beam by a start sensor prior to scanning of one scanning line;

detecting passage of said recording beam after completion of scanning of said one scanning line by an end sensor; generating rotational error times for respective surfaces of said polygon mirror, by obtaining a detection time interval corresponding to detection of said recording beam by said start and end sensors respectively for each surface of said polygon mirror and determining therefor an error time



corresponding to a difference between said detection time interval and a prescribed reference time interval; generating a dot recording clock signal phase-shifted in a direction for reducing a dot misregistration corresponding to said error time by approximately one-half of said error time, for each surface of said polygon mirror; and performing an image recording by said generated dot recording clock signal.

4,872,066

DROP-OUT CORRECTION APPARATUS

Shigeo Yamagata; Masahiro Takei; Tadashi Takayama, all of Kanagawa, and Kazuhiko Ito, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 28, 1988, Ser. No. 173,825

Claims priority, application Japan, Apr. 8, 1987, 62-86147; Apr. 8, 1987, 62-86148

Int. Cl.⁴ H04N 5/76

U.S. Cl. 358-336

15 Claims



1. An information signal transmission system for reproducing from a recording medium an information signal recorded on said recording medium and for outputting the reproduced information signal to a transmission line, comprising:

- reproducing means for reproducing from said recording medium an information signal recorded on said recording medium;
- information drop-out detecting means for detecting occurrence or nonoccurrence of an information drop-out in the information signal reproduced by said reproducing means;
- information signal forming means for dividing the information signal reproduced for a given period of time by said reproducing means into an n number (n : an integer

which is at least 2) of blocks and, for forming an information drop-out number indicating signal indicative of a number of blocks in which the information drop-out has occurred among said n number of blocks when the occurrence of the information drop-out in the information signal of said given period is detected by said drop-out detecting means;

- holding means for holding the information signal reproduced by said reproducing means; and
- control means for controlling said holding means holding the information signal on the basis of the information drop-out number indicating signal formed by said information signal forming means.

4,872,067

METHOD OF REPRODUCING VIDEO INFORMATION IN A DISK PLAYER, INCLUDING COMPENSATION FOR CONDITIONS IN THE DISK AND IN THE PLAYER

Masanao Okatani, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

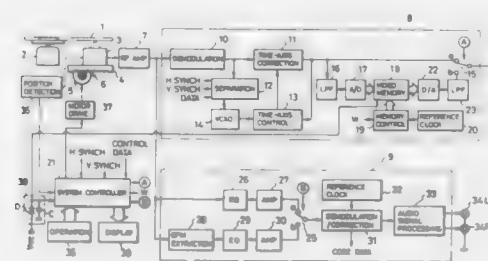
Filed Dec. 16, 1987, Ser. No. 133,836

Claims priority, application Japan, Dec. 16, 1986, 61-300548; Dec. 17, 1986, 61-300504

Int. Cl.⁴ H04N 5/85

U.S. Cl. 358-341

9 Claims



1. In a disk player which reproduces video information stored on an information recording disk, a search method comprising the following steps: during reproduction of said video information from said information recording disk, providing an instruction to initiate a search; when said search has been initiated, determining whether a field of said video information has been stored in a video memory of said disk player; and if said field of said video information has been stored in said video memory, reading out said field of video information repeatedly until said search is complete.

4,872,068

DISK PLAYING METHOD RESULTING IN REDUCED START-UP TIME

Hidehiro Ishii; Junichi Yoshio; Osamu Watanabe; Takeshi Izumo; Noriyoshi Takeya; Kazuhiko Katakami; Masayori Shinohara, and Masao Yoshida, all of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jan. 27, 1988, Ser. No. 149,763

Claims priority, application Japan, Jan. 28, 1987, 62-19350; May 14, 1987, 62-117867; Jun. 19, 1987, 62-152472; Jun. 19, 1987, 62-152475

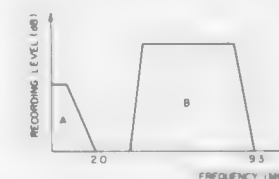
Int. Cl.⁴ G11B 7/00

U.S. Cl. 358-342

6 Claims

1. A method for playing a data recording disk having a first region in which only a digital signal is recorded and a second region in which a multiplex signal containing a frequency modulated video signal and a digital signal is recorded, said second region including a lead-in area, the improvement comprising the steps of: selecting at least one of said first and second regions for playing; determining when only said second

region is selected for playing; and when only said second region is selected for playing, immediately moving a data



detection point of a pickup toward said lead-in area of said second region and starting reading data from said lead-in area.

4,872,069

ELECTRIC POWER SUPPLY CONTROL DEVICE FOR CAMERA

Satoshi Takami, and Yutaka Ohsawa, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

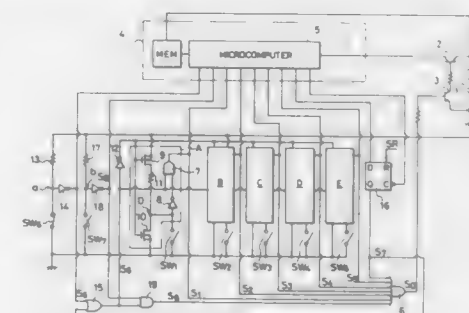
Continuation of Ser. No. 76,506, Jul. 22, 1987. This application Dec. 15, 1988, Ser. No. 284,575

Claims priority, application Japan, Jul. 22, 1986, 61-170919

Int. Cl.⁴ G03B 7/26

U.S. Cl. 354-484

11 Claims



1. An electric power supply control device for a camera, comprising:

- an electric power source;
- a camera control section for performing a selected one of a plurality of distinct functions in a response to a corresponding selected one of a plurality of individual function request signals while being connected to said electric power source;
- power supply switching means rendered conductive by a power supply control signal to electrically connect said camera control section to said electric power source; and
- a plurality of selectively operable electric power supply operation means for individually providing a function request signal when operated, and for simultaneously providing said power supply control signal such that said camera control section is connected to said power source while performing said function.

4,872,070

SYSTEM AND METHOD FOR HIGH SPEED VIDEO TAPE REPRODUCTION

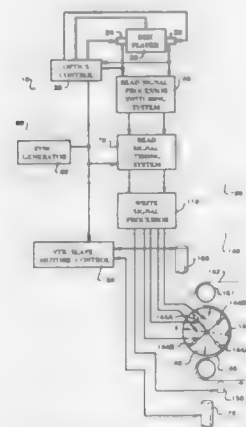
J. Carl Cooper, and John P. Yu, both of Sunnyvale, Calif., assignors to Electro Sound, Inc., Sunnyvale, Calif.

Filed Sep. 11, 1987, Ser. No. 95,978

The portion of the term of this patent subsequent to Sep. 12, 2006, has been disclaimed.

Int. Cl.⁴ G11B 5/86, 27/02

U.S. Cl. 360—15



1. A high speed video tape reproduction system for reproducing a plurality of sequentially occurring frames of data representing video information recorded on a master video storage medium, wherein each frame of data includes a first field of information and a second field of information, comprising:

master storage and read-out means including a master video storage medium for storing video information in an NTSC format and for simultaneously reading out in series each odd frame of data to a first output and each even frame of data to a second output;

processor means coupled to the first and second outputs of said master storage and read-out means and operative to develop an odd stream of information including a serial sequence of the first field of information appearing in each frame of data read out from said master storage and read-out means, and an even stream of information including a serial sequence of the second field of information appearing in each frame of data read out from said master storage and read-out means;

rotary recording head means for engaging magnetic tape media drawn thereacross and having first and second pairs of recording heads orthogonally disposed relative to each other with each head of each pair lying along a diameter of said rotary recording head means; and

means for coupling said odd stream of information to said first pair of heads and said even stream of information to said second pair of heads in timed sequence, such that information corresponding to the first field of each particular frame is applied to at least one of said first pair of heads for recording onto said media, and information corresponding to the second field of a corresponding frame is subsequently applied to at least one of said second pair of heads for recording onto said media.

4,872,071

METHOD AND APPARATUS FOR DETECTING ABNORMAL OPERATION OF MOVING STORAGE APPARATUS

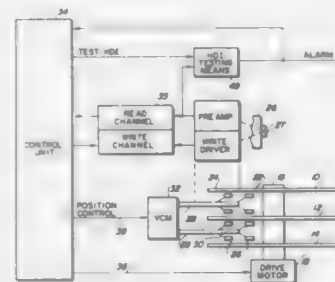
Malcolm C. Easton, San Jose, and Peter B. Phipps, Saratoga, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 14, 1988, Ser. No. 143,798

Int. Cl.⁴ G11B 27/36, 5/02

51 Claims U.S. Cl. 360—31

12 Claims



1. A method for detecting abnormal operation in a magnetic disk storage system comprising the steps of: reading data from a predetermined area of each track on a disk that is normally not rewritten during operation of the system to obtain a readback signal; comparing the amplitude of the readback signal read from one track with the amplitude of the readback signal a read from a plurality of other tracks for each of said tracks on the disk; and setting an alarm condition when the comparison indicates a variation which exceeds a predetermined level whereby some corrective action can be taken in response to said alarm condition prior to an actual failure condition in said magnetic disk storage system.

4,872,072

VIDEO SYSTEM

Masaya Maeda; Hiroyuki Takimoto, and Susumu Kozuki, all of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

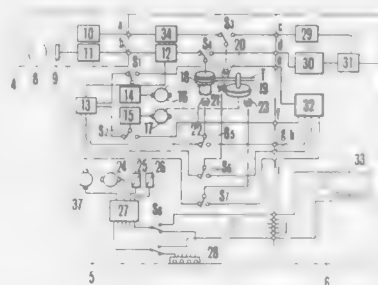
Division of Ser. No. 153,463, Feb. 1, 1988, which is a continuation of Ser. No. 57,714, Jun. 1, 1987, abandoned, which is a continuation of Ser. No. 729,682, May 2, 1985, abandoned, which is a continuation of Ser. No. 351,605, Feb. 23, 1982, Pat. No. 4,531,164. This application May 23, 1988, Ser. No. 197,563

Claims priority, application Japan, Feb. 26, 1981, 56-27140; Mar. 6, 1981, 56-32106; Mar. 6, 1981, 56-32107; Jun. 24, 1981, 56-97913

Int. Cl.⁴ H04N 5/78

U.S. Cl. 360—33.1

8 Claims



8. An information signal recording and reproducing system, comprising:

(A) a first apparatus including:

- (a) a recording and reproducing head;
- (b) a switch which is connected to said head and can take a first state for making said head perform a recording and a second state for making said head perform a reproduction;
- (c) a recording circuit which processes an information signal inputted therein and supplies the information signal as a recording signal to said head through said switch in the first state;
- (d) moving means for relatively moving a recording medium and said head;
- (e) a first operating member for instructing said head to start a recording, said first operating member being unable to instruct said head to start a reproduction; and

(B) a second apparatus which can be electrically and mechanically attached to and detached from said first apparatus, including:

- (a) a reproducing circuit which has a signal reproduced at said head inputted therein through said switch in the second state and processes the reproduced signal then outputs it as a produced information signal; and
- (b) a second operation member for instructing said head to start said reproducing.

4,872,073

APPARATUS FOR PLAYBACK OF MAGNETICALLY RECORDED DATA HAVING A VARIABLE INPUT RATE

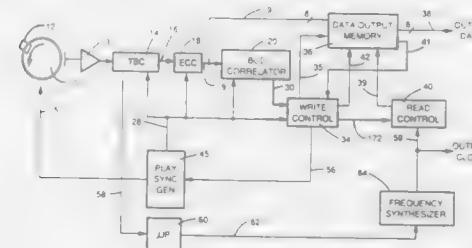
Jeffrey L. Fincher, San Bruno, and Michael R. Stephens, Fremont, both of Calif., assignors to Ampex Corporation, Redwood City, Calif.

Filed Sep. 2, 1988, Ser. No. 240,865

Int. Cl.⁴ G11B 5/09

U.S. Cl. 360—51

9 Claims



1. Apparatus for playback of data received at a variable input rate and recorded on a longitudinal recording medium, utilizing a playback transducer mounted on a rotating scanner drum, said input data rate being maintained constant during a particular recording operation, said data being recorded in the form of fixed length data blocks having variable spacing between said blocks, corresponding to said variable rate, a data block marker being recorded at the beginning of each block, and wherein said input data rate is encoded and recorded on said medium, comprising:

playback synchronizing generator means for providing an internal data transfer clock having a nominal rate, and deriving therefrom synchronously a signal for controlling a rate of rotation of said scanner drum during playback; data output clock generator means for providing an adjustable, stable data output clock;

data output clock rate control means for receiving and decoding said played back input data rate, and providing responsively a first control signal applied to said data output clock generator means to adjust a rate of said data output clock to correspond to said input data rate;

correlator means for receiving said playback data and detecting said data block marker, and providing responsively a second, beginning of data block control signal;

memory means for receiving and storing said playback data at said internal data transfer clock rate, said stored data

being read therefrom sequentially at said data output clock rate, said memory means providing a third, memory status control signal corresponding to a predetermined level of fullness thereof, said third control signal being provided to coincide with said second control signal pertaining to a next sequential data block when an average amount of data being written into said memory is equal to an average amount of data being read from the memory; and

memory write control means receiving said second and third control signals, enabling input of a data block into said memory means in response to said second control signal, and detecting a difference in time between the occurrences of said second and third control signals, and applying responsively an error signal to said playback synchronizing signal generator means to adjust said internal data transfer clock rate to compensate for said time difference.

4,872,074

DATA TRANSDUCER POSITION CONTROL SYSTEM FOR ROTATING DISK DATA STORAGE EQUIPMENT

David A. Brown, Saratoga, Calif.; Donald V. Daniels, Friday Harbor, Wash., and Joel N. Harrison, Monte Sereno, Calif., assignors to Quantum Corporation, Milpitas, Calif.

Continuation of Ser. No. 150,994, Feb. 1, 1988, Pat. No. 4,814,909, which is a continuation of Ser. No. 28,977, Mar. 23, 1987, abandoned, which is a continuation of Ser. No. 496,924, May 23, 1983, Pat. No. 4,660,106, which is a continuation of Ser. No. 190,198, Sep. 24, 1980, Pat. No. 4,396,959. This application

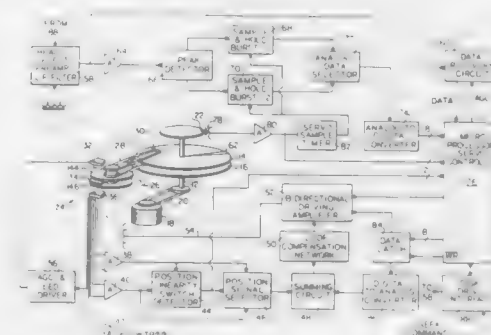
Mar. 20, 1989, Ser. No. 326,166

The portion of the term of this patent subsequent to Jan. 28, 2003, has been disclaimed.

Int. Cl.⁴ G11B 21/08, 21/10

U.S. Cl. 360—77.07

1 Claim



1. In a data storage device including a frame, a data storage disk journaled to the frame and rotatingly driven by motor means at a constant velocity and characterized by a multiplicity of concentric data tracks on the major surfaces thereof, at least one data transducer head in close proximity to a said disk surface, the improvement comprising:

a bidirectionally moveable electromechanical mover including a microstep providing stepping motor supported by said frame adjacent to said disk, said electromechanical mover being moveable between and stabilized at a position related to each said data track,

a head mounting structure securing said data transducer head at one end thereof and secured to said mover at the other end thereof for moving said head across said multiplicity of concentric data tracks,

bidirectional mover driver means connected to said mover and capable of moving said selected structure to any selected one of said concentric data tracks in accordance with externally supplied track position information and of maintaining said structure substantially within said data

track during read and/or write operations by reference to said frame,
data track stabilization means including said stepping motor for stabilizing said structure within a range between the boundaries of each said data track,
a time sampled fine position closed loop servo connected to said driver and including a single, data masked servo sector on a data surface of said disk containing track centerline servo control data therein readable by said head, a sample and hold circuit connected to said head during passes over said sector for holding control data read therefrom, and correction signal generator means connected to said sample and hold circuit for generating an offset signal for application to said driver means to promote and maintain track centerline alignment of said head during read and write operations.

4,872,075

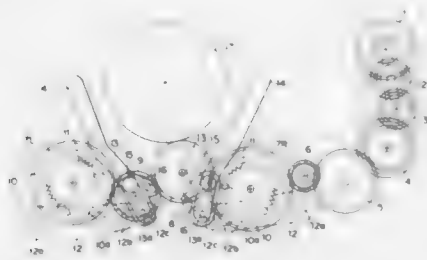
TAPE LOADING MECHANISM IN MAGNETIC RECORDING AND REPRODUCING APPARATUS

Katsumi Yamaguchi; Kikuo Yoshikawa; Shigeo Kinoshita; Takao Kanai, and Syouchiro Yokoi, all of Tokyo, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan
Continuation of Ser. No. 58,458, Jun. 5, 1987, abandoned. This application Mar. 14, 1989, Ser. No. 325,066
Claims priority, application Japan, Jun. 13, 1986, 61-136106; Jun. 13, 1986, 61-136107

Int. Cl.⁴ G11B 5/027

U.S. Cl. 360—85

12 Claims



1. A tape reproducing apparatus, comprising: a rotating head; a loading block and means supporting said loading block in the region of said head for reciprocal movement relative to said head along a path of travel between first and second positions; a loading arm supported for pivotal movement between first and second positions about a stationary first axis which is spaced from said path of travel and which is on a side of said path of travel remote from said head; means coopeable with said loading arm at a location thereon spaced from said first axis for effecting movement of said loading block between its first and second positions, respectively; a gear supported for rotation about a stationary second axis located between said first axis and said path of travel; means for selectively effecting rotation of said gear; and means cooperable with said gear and a portion of said loading arm for effecting movement of said loading arm between said first and second positions thereof in response to rotational movement of said gear.

4,872,076

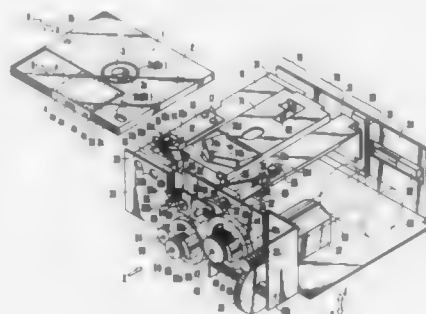
RECORDING AND/OR REPRODUCING APPARATUS

Tsukasa Uehara, Tokyo; Masaya Maeda, and Akimasa Nishimura, both of Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 183,480, Apr. 15, 1988, abandoned, which is a continuation of Ser. No. 777,282, Sep. 18, 1985, abandoned. This application Feb. 9, 1989, Ser. No. 309,947
Claims priority, application Japan, Sep. 19, 1984, 59-196356

Int. Cl.⁴ G11B 5/012

U.S. Cl. 360—99.07

34 Claims



1. A recording and/or reproducing apparatus using a record bearing medium housed in a housing, said housing being provided with at least one window to expose a portion of the medium, and the housing being insertable into the apparatus along a predetermined first direction, said apparatus comprising:

- first holder means for receiving and holding the housing, said first holder means being arranged to receive the housing from said first direction and movable in a predetermined second direction which is different from said first direction to place the housing at a predetermined loading position;
 - second holder means for holding the housing with said first holder means, said second holder means being movably disposed relative to said first holder means in said first direction, said second holder means being movable between a first position where said second holder means is moved relatively to said first holder means to come close to said first holder means and a second position where said second holder means is moved to be separated from said first holder means in said first direction, said second holder means being movable also in said second direction; and
 - head means for recording signals on and/or reproducing second signals from the medium, said head means being located between said first holder means and said second holder means being arranged to confront a surface of the medium through the window of the housing when said housing is positioned at said loading position.
6. A record bearing medium container loading device for a recording and/or reproducing apparatus, comprising:
- first holder means for receiving and holding said container;
 - second holder means for holding the container simultaneously with said first holder means, said second holder means being separated from the first holder means and disposed behind the first holder means along an insertion direction of the container; and
 - pull-in means for pulling the container into said first holder means, said pull-in means being provided on said second holder means.

4,872,077

RECORDING AND/OR REPRODUCING APPARATUS WITH ADJUSTMENTS FOR POSITIONING HEAD AND A MOVING DEVICE USING THE SAME

Nobuo Tezuka, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 4,797, Jan. 5, 1987, abandoned, which is a continuation of Ser. No. 583,765, Feb. 27, 1984, abandoned.

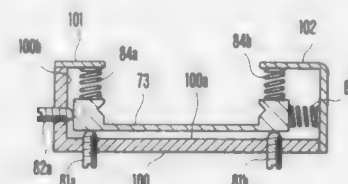
This application Aug. 24, 1988, Ser. No. 236,310

Claims priority, application Japan, Mar. 2, 1983, 58-34099

Int. Cl.⁴ G11B 5/56, 21/24, 5/55, 21/08

U.S. Cl. 360—109

18 Claims



1. A recording and/or reproducing apparatus arranged to use a rotary type record bearing medium, comprising:

- rotating means for rotating said record bearing medium about a rotational axis;
- recording and/or reproducing head means for recording information on and/or reproducing recorded information from said medium;
- carriage means for carrying said head means, said carriage means being movable to shift the head means relative to said medium;
- guide means for movably supporting said carriage means and for guiding the carriage means along a linear axis; and
- an adjusting mechanism for adjusting said guide means, said adjusting mechanism being arranged to effect at least four of the following adjustments.
an adjustment of said guide means to rotate said head means substantially about said linear axis;
an adjustment of said guide means to rotate said head means about an axial line substantially perpendicular to both said rotational axis and said linear axis;
an adjustment of said guide means to move said head means along said axial line substantially perpendicular to both said rotational axis and said linear axis;
an adjustment of said guide means to rotate said head means about an axial line substantially parallel to said rotational axis; and
an adjustment of said guide means to move said head means along said axial line substantially parallel to said rotational axis, and
said adjusting mechanism is arranged to effect one of said at least four adjustments in an independent manner so as not to affect other ones of said adjustments.

4,872,078

METHOD AND APPARATUS FOR ENCODING AND DIRECT OVERWRITING OF MAGNETO-OPTIC DATA

Ulrich G. Gerber, Fremont, and Daniel Rugar, Palo Alto, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.
Continuation-in-part of Ser. No. 855,542, Apr. 24, 1986, abandoned. This application Dec. 9, 1987, Ser. No. 130,813

Int. Cl.⁴ G11B 5/127, 5/02

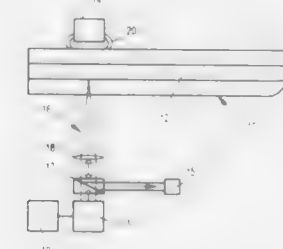
U.S. Cl. 360—114

22 Claims

1. Apparatus for direct overwriting of encoded data along a track in a magneto-optic recording medium, said apparatus comprising:

- first means for producing a magnetic field having a continually alternating magnetic polarity near the track; and
- second means, coupled to the first means, for selectively heating successively overlapping magnetically polarized

domains representing encoded data along the track when the instantaneous polarity of the magnetic field at said



domains corresponds to the polarity of the code for the data to be recorded thereat.

4,872,079

THIN FILM MAGNETIC HEAD WITH A LEVELER LAYER

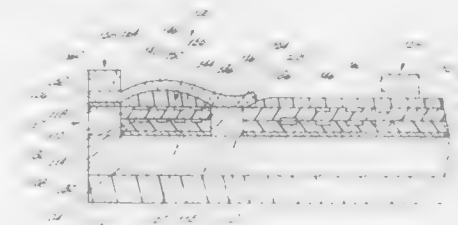
Gary E. Roberts, Santa Barbara, Calif., assignor to Applied Magnetics Corporation, Goleta, Calif.

Filed Jul. 28, 1987, Ser. No. 78,911

Int. Cl.⁴ G11B 5/187, 5/147

U.S. Cl. 360—126

8 Claims



- A thin film magnetic head comprising
a substrate having a depositing surface wherein the substrate is highly resistive to being abraded by a magnetic media being moved thereacross;
a bottom pole piece located on said substrate, said bottom pole piece having a front gap section and a rearwardly extending portion with the front gap section thereof positioned at a predetermined location on said substrate and with the rearwardly extending portion thereof located rearward of and extending in a spaced opposed relationship from said front gap section, a portion of the rearwardly extending portion of the bottom pole piece defining one side of a rear magnetic closure section;
a coil having plurality of coil windings formed on said bottom pole piece and positioned a predetermined distance rearward of the front gap section thereof and having a portion of the coil windings extending therefrom rearward on the rearward section of said bottom pole piece and beyond the rear magnetic closure section;
an insulating structure having a thin gap defining section located on the front gap section of the bottom pole piece and a coil windings enclosing section enclosing and surrounding the coil windings located on said bottom pole piece layer, the thin gap defining portion of said insulating structure being formed of predetermined thickness to establish the thickness of a magnetic transducing gap;
a magnetic top pole piece layer having a front gap section and a contoured top surface having a step formed therein and a rear magnetic closure portion, said top pole piece layer being positioned with the front gap section thereof on said insulating structure and adjacent the front gap section of said bottom pole piece layer to form the other side of the magnetic transducing gap and with the thin gap defining portion of said insulating structure located there-

between establishing the width of the magnetic transducing gap and with the rear magnetic closure portion thereof contiguous the rearwardly extending portion of bottom pole piece layer forming a rear magnetic closure section, said top pole piece layer forming a contoured top enclosure for enclosing the coil windings enclosing portion of said insulating structure enclosing and surrounding that portion of the coil windings located a between the top pole piece and bottom pole piece; and

a leveler layer formed of a material having abrading characteristics substantially the same as that of the magnetic top pole piece layer and having a thickness which is slightly greater than the height of the step of said top pole piece layer and having a forward leveler section located adjacent the front gap section of said top pole piece and a rearward leveler section located a predetermined distance from and rearward of the front wall section of said leveler layer and rearward of the rear magnetic closure section, the front leveler section and the rearward leveler section being adapted to receive and support a superstrate.

4,872,080

PROTECTIVE CIRCUIT FOR A SEMICONDUCTOR LASER

Christian Hentschel, Holzgerlingen, and Wolfgang Schmid, Stuttgart, both of Fed. Rep. of Germany, assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Aug. 6, 1984, Ser. No. 638,095

Claims priority, application Fed. Rep. of Germany, Aug. 30, 1983, 3331132

Int. Cl.⁴ H02H 9/02

U.S. Cl. 361—57

6 Claims



1. A protective circuit which protects a semiconductor laser, said semiconductor laser connected to a current generator circuit providing an excitation current to the semiconductor laser for the generation of laser light, comprising:

- (1) a transducer which detects light power emitted by said semiconductor laser;
- (2) a limit circuit coupled to the transducer and providing a variable control signal in response to the detection of emitted light power exceeding a predetermined maximum value of the detected light power; and
- (3) a shunt circuit connected in parallel with the semiconductor laser, the shunt circuit receiving said control signal from the limit circuit and in response thereto shunting partial excitation current away from the semiconductor laser while limiting the emitted light power to the predetermined maximum value.

4,872,081

DUPLEX ELECTRICAL RECEPTACLE WITH VOLTAGE SURGE SUPPRESSION

Patrick J. Murphy, Camillus; William L. Emeny, Jr., Canastota, and David A. Finlay, Sr., Marietta, all of N.Y., assignors to Pass & Seymour, Inc., Syracuse, N.Y.

Filed Oct. 11, 1988, Ser. No. 255,455

Int. Cl.⁴ H02H 1/04

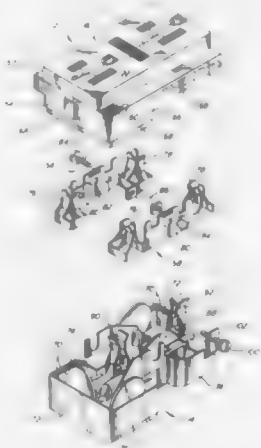
U.S. Cl. 361—117

24 Claims

1. An electrical receptacle having integral means for suppressing high transient voltages in the power provided by the

receptacle to electrical equipment connected thereto, said receptacle comprising:

- (a) a rear casing having:
 - (i) a back wall with substantially flat inner and outer surfaces;
 - (ii) a side wall extending integrally from said back wall about the entire periphery thereof and perpendicular thereto, said side wall having inner and outer surfaces adjoining the respective inner and outer surfaces of said back wall; and
 - (iii) at least one rigid member extending outwardly from said back wall inner surface within the periphery of said wall;
- (b) a substantially flat printed circuit board carrying:
 - (i) a plurality of components including at least one element adapted to clamp high, short-term voltages imposed thereon to a lower, safe level;
 - (ii) at least one female contact for receiving a male blade of a plug connected to said receptacle; and



- (iii) means electrically connecting said components and said contact;
- (iv) said circuit board having a peripheral configuration fitting within said side wall inner surface with said circuit board in a plane superposed and substantially parallel with said back wall inner surface;
- (c) cooperative alignment means on said circuit board and said rear casing for positioning said circuit board, and thereby said components and contact carried thereby, in predetermined relation to said rear casing, said contact being positioned directly over and receiving underlying support from said rigid member when said circuit board and said rear casing are in said predetermined relation; and
- (d) a front casing having:
 - (i) a front wall having openings for receiving the male blades of a plug connected to said receptacle; and
 - (ii) means for cooperatively engaging said rear casing to form therewith an enclosed housing containing said circuit board and elements carried thereby.

4,872,082

DOOR OPERATOR SAFETY FEATURE REQUIRING CONSTANT ACTUATION TO CLOSE DOOR

Brian J. Martel, Walled Lake, Mich., assignor to Stanley Electronics, Novi, Mich.

Continuation-in-part of Ser. No. 92,107, Sep. 2, 1987, abandoned. This application Apr. 5, 1983, Ser. No. 177,703

Int. Cl.⁴ H02P 1/00

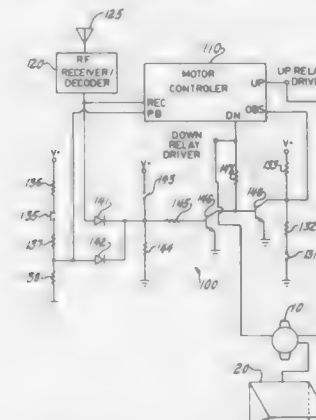
U.S. Cl. 361—179

12 Claims

1. A door operator safety circuit comprising: a motor operable to move a door between an open position and a closed position;

a momentary contact push button switch generating an operator command when activated;

a motor controller connected to said motor and said momentary contact push button switch controlling said motor upon each receipt of said operator command from said momentary contact push button switch to advance to the next state in the circular sequence of states including (1) move the door in the closing direction, (2) stop, (3) move door in the opening direction, and (4) stop, said motor controller further having a safety mode controlling the motor to move the door to a safe position when triggered;



a safety switch coupled to the door and connected to said motor controller triggering said safety mode of said motor controller upon detection of an unsafe condition of the door; and

a safety circuit connected to said momentary contact push button switch and said motor controller triggering said safety mode unless said momentary contact push button switch continuously generates said operator command during movement of the door.

4,872,083

METHOD AND CIRCUIT FOR BALANCE CONTROL OF POSITIVE AND NEGATIVE IONS FROM ELECTRICAL A.C. AIR IONIZERS

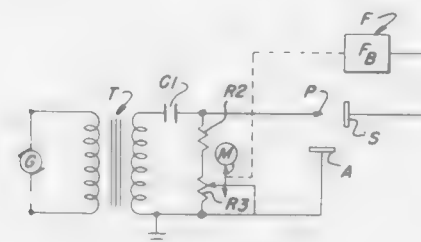
Mark Blitshteyn, Lansdale, Pa., assignor to The Simco Company, Inc., Hatfield, Pa.

Filed Jul. 20, 1988, Ser. No. 221,636

Int. Cl.⁴ H01T 23/00; H05F 3/04

U.S. Cl. 361—213

7 Claims



3. In a balancing system for A.C. air ionizers having at least one discharge electrode adjacently spaced from a proximity ground and being connected to the high side of an A.C. power source;

- (a) a capacitor interposed between each point and the high voltage power source to maintain a bias on each of the discharge electrodes by blocking the D.C. current component across circuit capacitance;
- (b) a variable by-pass resistor across the circuit capacitance for providing a path to ground for bleeding off excess bias

so that equal positive and negative ion densities may be generated during corona flow,

(c) a sensor for monitoring the positive and negative ion densities; and

(d) circuit means to feedback information monitored by the sensor relating to ion densities in a closed loop to control mechanism for modifying the variable by-pass resistor in compensation of the variance from a neutral condition thereof.

4,872,084

ENHANCED ELECTRICAL SHOCKING DEVICE WITH IMPROVED LONG LIFE AND INCREASED POWER CIRCUITRY

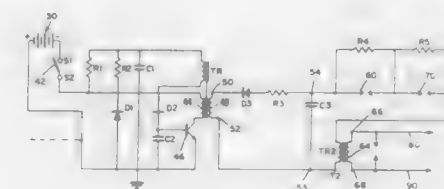
Brian Dunning, Canoga Park, Calif., and A. R. Mansfield, Provo, Utah, assignors to U.S. Protector, Inc., Canoga Park, Calif.

Filed Sep. 6, 1988, Ser. No. 240,740

Int. Cl.⁴ H01T 14/00

U.S. Cl. 361—232

8 Claims



1. A hand held stun-gun which is the energized, operative condition produces a visible external spark and is capable of delivering a powerful but non-fatal electrical shock, comprising:

- a. a non-conductive hollow housing member having a front end, a rear end, a pair of edges and an internal chamber;
- b. a low voltage power source positioned within the internal chamber of said housing member;
- c. an electronic circuit, located within said interior chamber and connected to said low voltage power source, comprising:
 - (i) an on-off switch connected in series to the low voltage power source,
 - (ii) a first resistor connected in series to the on-off switch,
 - (iii) a second resistor,
 - (iv) a first capacitor connected to ground,
 - (v) the second resistor connected in series to a first diode which in turn is connected to ground,
 - (vi) the series combination of the second resistor and first diode connected in parallel to said first capacitor,
 - (vii) the series combination of the second resistor and first diode connected in series to said first resistor,
 - (viii) an inverter transformer connected to the first capacitor, to a second diode and to a transistor,
 - (ix) the second diode connected to a second capacitor which in turn is connected to ground,
 - (x) the transistor connected to the second diode and also connected to ground,
 - (xi) the inverter transformer having a secondary winding including a first and second terminal,
 - (xii) the first terminal of the secondary winding of the inverter transformer connected in series to a third diode which in turn is connected in series to a third resistor,
 - (xiii) a third capacitor connected in parallel with the inverter transformer, with the third diode and third resistor between the first terminal and the third capacitor,
 - (xiv) the third capacitor also connected in parallel to a first medium duty surge arrester which in turn is connected in parallel to a fourth resistor,
 - (xv) the first medium duty surge arrester also connected in series to a second medium duty surge arrester which in turn is connected in parallel to a fifth resistor,

- (xvi) the second medium duty surge arrester connected in series to a high voltage transformer which is also connected in parallel to the third capacitor;
- (xvii) the high voltage transformer having a secondary winding having a first end terminal and a second end terminal;
- d. a first conductive probe connected to the first end terminal of the secondary winding of the high voltage transformer, the probe supported adjacent the front of the housing member;
- e. a second conductive probe connected to the second end terminal of the secondary winding of the high voltage transformer, the probe supported adjacent the front of the housing member; and
- f. the first and second conductive probes separated by a gap at their attachment locations to the housing and protruding forward at an angle from end of the housing such that the two probes are separated by a smaller gap at their tips;
- g. whereby when energized, the low voltage power source and electronic circuitry causes a generally continuous higher non-fatal voltage to be transmitted between the tips of the first and second conductive probes.

4,872,085

THROUGH-TYPE CAPACITOR WITH IMPROVED ANTI-TRACKING PERFORMANCE

Mamoru Tsuzurahara, Mobara, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

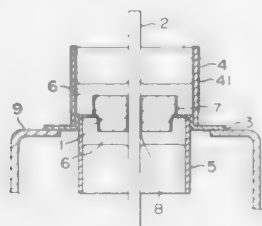
Filed May 27, 1988, Ser. No. 200,065

Claims priority, application Japan, Jun. 5, 1987, 62-139736; Jun. 26, 1987, 62-157637

Int. Cl.⁴ H01G 3/28

U.S. Cl. 361—302

4 Claims



1. A through-type capacitor comprising:
- a central conductor to be applied with a predetermined high potential;
 - a dielectric member with the central conductor passing through the center thereof, the central conductor forming an electrode;
 - another electrode arranged on the outer periphery of the dielectric member, the dielectric member and the electrodes making up a capacitor;
 - a conductor plate connected to the other electrode to apply a predetermined low potential to the other electrode while at the same time coupling the dielectric member with an external member;
 - a housing of an insulating material fitted on the conductor plate in a manner to surround the outer periphery of the dielectric member and having an opening along the axial direction of the central conductor;
 - an insulating resin filled in a space between the housing and the dielectric member; and
 - an anti-tracking resin film of an insulating material coated on the surface of the end of at least an opening of the housing of insulating material and on the inner and outer surfaces of the housing of insulating material adjacent to said end, said anti-tracking resin film having a higher anti-tracking performance than the housing of insulating material.

4,872,086

DIELECTRIC RF DEVICES SUITED FOR USE WITH SUPERCONDUCTORS

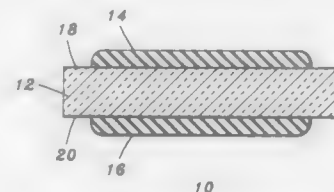
Rong F. Huang, and Wei-Yean Howng, both of Albuquerque, N. Mex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 20, 1988, Ser. No. 260,548

Int. Cl.⁴ H01G 4/10

U.S. Cl. 361—321

19 Claims



1. An electrical device comprising:
- a ceramic dielectric of a first suitable titanate material having a dielectric constant K of at least 100 at radio frequencies over 400 megahertz having thermal expansion coefficient between 10 and 14 parts per million per degree centigrade and having at least first and second sides; and
 - at least one superconducting electrode disposed onto both of said first and second sides of said dielectric said electrode having a thermal expansion coefficient of approximately 14 to 15 parts per million per degrees centigrade and superconducting at at least one temperature above the temperature of liquid nitrogen, said electrode being substantially free of micro-cracks after repetitive temperature cycling between at least the temperature of liquid nitrogen and room temperature.

4,872,087

MECHANICAL ASSEMBLY MEANS FOR GRAND FAULT INTERRUPTER RECEPTACLE

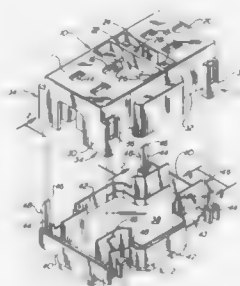
Edward J. Brant, Mattydale, N.Y., assignor to Pass & Seymour, Inc., Syracuse, N.Y.

Filed Jan. 20, 1987, Ser. No. 5,085

Int. Cl.⁴ H02B 1/08

U.S. Cl. 361—356

21 Claims



1. In an electrical plug-receiving duplex receptacle having a housing enclosure, means for mounting metal load terminals on a plastic support member without the use of mechanical fasteners, said means comprising:
- (a) a pair of metal load terminals each including a side portion, first and second end portions extending integrally from opposite ends of said side portion, and a contact arm extending integrally from said side portion at a position between said end portions;
 - (b) each of said end portions including opposed contact portions for receiving therebetween the blades of an electrical plug inserted in said receptacle, and lower, linear edge portions;

- (c) a unitary, plastic, support member having upper and lower surfaces and means for engagement with said housing enclosure to effect predetermined positioning of said support member within said enclosure;
- (d) first and second pairs of ramped portions tapering upwardly from said upper surface and terminating in stepped edges;
- (e) said load terminals and support member being so configured and arranged that said load terminals may be moved toward said support member from opposite sides thereof with said contact arms extending below and contacting said lower surface and said side portions extending above and contacting said upper surface, each of said side portions of each of said load terminals having edge portions resiliently engaged over respective ones of said stepped edges of said ramped portions to define the fully engaged position of said load terminals on said support member, whereby said load terminals are engaged with said support member by a snap fit.

4,872,088

RADIAL MOUNTING FOR STACKED WAFER MODULES WITH COOLING

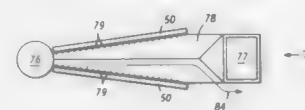
George W. Hawkins, Mesa, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 29, 1988, Ser. No. 237,795

Int. Cl.⁴ H05K 7/20

U.S. Cl. 361—384

17 Claims



1. A modular packaging structure for an electronic system, comprising:
- a central core means having a plurality of contact means around a periphery of the central core means; a plurality of semiconductor modules, each having integrated circuit devices mounted therein, and each semiconductor module being held by the central core means while simultaneously being provided with electrical contact thereto by the contact means; input/output means placed between the plurality of semiconductor modules for providing electrical contact to the central core means through the contact means, and wherein said central core means comprises:
 - an insulated shaft;
 - a plurality of contact rings disposed in a rotatable fashion on said shaft;
 - a plurality of insulator rings disposed on said shaft adjacent said contact rings; and
 - a plurality of contact arms coupled to said contact rings for connecting said semiconductor modules.

4,872,089

HEAT SINK ASSEMBLY FOR DENSELY PACKED TRANSISTORS

Alfred G. Ocken, Franklin Park; Michael L. Charlier, Palatine, and Raymond J. Kowieski, Mt. Prospect, all of Ill., assignors to Motorola Inc., Schaumburg, Ill.

Filed Dec. 19, 1988, Ser. No. 286,001

Int. Cl.⁴ H05K 7/20

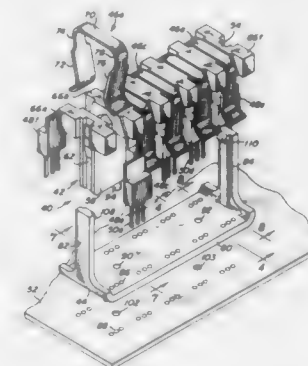
U.S. Cl. 361—388

18 Claims

1. A heat sink assembly for a plurality of transistors, comprising:
- a metal heat sink having a top, a bottom, and side walls, at least one of the side walls being adapted to receive a plurality of transistors, each transistor being situated at a predetermined transistor site on the side wall;
 - a plurality of spaced-apart ramp surfaces carried by the heat

sink and situated near the top thereof, each ramp surface extending downwardly and outwardly from the top of the heat sink, the space between adjacent ramp surfaces defining a clip space, and each clip space being located above a transistor site;

a resilient spring clip for each clip space, each spring clip being substantially U-shaped and comprising a horizontal member joined to a pair of downwardly extending legs, at least one leg of each spring clip having a relatively narrow



portion close to its horizontal member and a relatively wider portion at its opposite end, the dimensions of the legs being selected such that, as a clip is inserted into a clip space, the wider portion of its one leg bears on a pair of adjacent ramp surfaces, and the same leg is spread outwardly by the ramp surfaces as the spring clip is urged downwardly until the relatively wider portion of said leg disengages from the previously engaged ramp surfaces, whereupon the leg snaps back to hold a transistor in place against a side wall.

4,872,090

DOUBLE WALL BAFFLE FOR AIRFLOW AND RFI SHIELDING

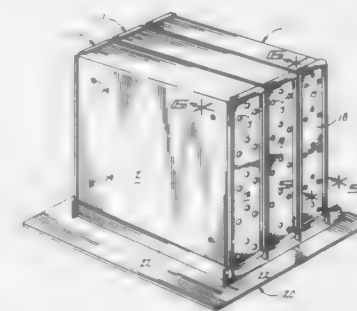
David B. Taylor, Greenacres, Wash., and Steven C. Zemke, Post Falls, Id., assignors to Hewlett Packard Company, Palo Alto, Calif.

Filed Jul. 15, 1988, Ser. No. 219,672

Int. Cl.⁴ H05K 9/00

U.S. Cl. 361—424

7 Claims



6. A double wall baffle for airflow and RFI shielding at one end of a grounded metal box having an opening defined by open-ended box walls that terminate along edges located within a common plane, the baffle comprising:
- first and second spaced parallel baffle walls each having a periphery adapted to be sealingly engaged about the perimeter of a box opening, the double wall baffle adapted to be fixed across the box opening; and

the first and second baffle walls each having apertures formed therethrough.

4,872,091

MEMORY CARTRIDGE

Yoshio Maniwa; Takashi Morita, both of Yokohama; Masaichi Niro, Kawasaki; Daisuke Abe, Misato, and Haruhiko Nagayama, Tokyo, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

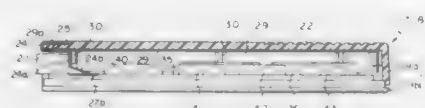
Filed Jul. 15, 1987, Ser. No. 73,714

Claims priority, application Japan, Jul. 21, 1986, 61-172492; Jul. 21, 1986, 61-172493

Int. Cl.⁴ H05K 9/00

U.S. Cl. 361-424

7 Claims



1. A memory cartridge for use with electronic equipment as an external memory, comprising:

- a casing for storing memory devices, said casing comprising an upper casing part and a lower casing part, and said upper casing part having an inner surface;
- a connector provided on said casing and having a plurality of connecting pins at a front end of said connector;
- a grounding plate covering an upper and a rear surface of said connector, said grounding plate having a predetermined area which constitutes a part of an external surface of said casing; and
- a shield plate provided on said inner surface of said upper casing part and comprising a tongue for making contact with said grounding plate.

4,872,092

COUPLER TERMINAL BLOCK

Steven Lush, Epsom, United Kingdom, and Siegfried Kerbstat, Detmold, Fed. Rep. of Germany, assignors to C. A. Weidmüller GmbH & Co., Fed. Rep. of Germany

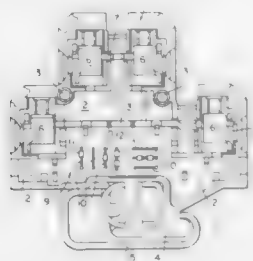
Filed Nov. 7, 1986, Ser. No. 928,846

Claims priority, application European Pat. Off., Nov. 13, 1985, 85114305.8

Int. Cl.⁴ H01R 9/26, 13/66

U.S. Cl. 361-426

6 Claims



1. A serial terminal block, comprising

- (a) a unitary housing formed of an insulating, high-temperature resistant material and defining a chamber, said housing including
 - (1) means for mounting said housing on a carrier rail, whereby a plurality of terminal blocks may be arranged adjacent each other to define a terminal block assembly; and
 - (2) an integral end wall for closing one end of said housing chamber, the other end of said housing chamber being open for being covered by another terminal block or an

end cover, said end wall having an inner surface including at least one imperforate free zone; and

- (b) a plurality of printed strip conductors mounted on the surface of said end wall within said imperforate free zone, thereby to enable electrical components to be mounted on said wall surface and electrically connected with said conductors without penetrating said housing wall.

4,872,093

BRIGHT METER

Takeshige Shimizu, Shimada, Japan, assignor to Yazaki Corporation, Japan

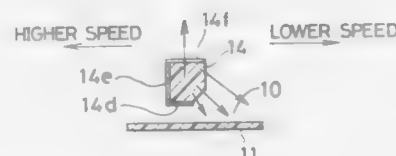
Filed May 27, 1988, Ser. No. 199,709

Claims priority, application Japan, May 29, 1987, 62-081014[U]

Int. Cl.⁴ G01D 11/28

U.S. Cl. 362-26

7 Claims



5. A bright meter comprising:

- (a) a light source;
- (b) a dial; and
- (c) a pointer needle made of a light transmissible material and brightened by said light source, having:
 - (1) a lower light reflecting layer formed on a lower surface of said needle;
 - (2) a first side light reflecting layer formed on a first side surface of said needle; and
 - (3) an upper semitransparent layer for brightening an upper surface of said needle, when said needle is brightened, light being reflected from said first side light reflecting layer and partially reflected from said upper semitransparent layer, and further being emitted obliquely onto said dial through a second side surface opposing said first side surface of said needle.

4,872,094

WORK STATION ENVIRONMENTAL SYSTEM

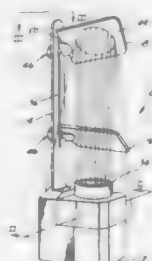
William C. Andrus, Grand Rapids, Mich., assignor to Design Council, Grand Rapids, Mich.

Filed Oct. 11, 1988, Ser. No. 255,660

Int. Cl.⁴ F21Y 33/00

U.S. Cl. 362-96

19 Claims



1. An apparatus for modifying the environment in a work area comprising:

- unidirectional light source means for directing light in a beam along a given axis;

air moving means for moving air in a stream along said axis; and

- adjustable separating means for separating said air stream from said light beam and for directing said air stream and said light beam away from said axis, said adjustable separating means defining selectively adjustable directing means for allowing a user to direct said air stream and said light beam in separate selectable directions away from said axis.

4,872,095

ENTRANCE DOOR NIGHT LIGHT

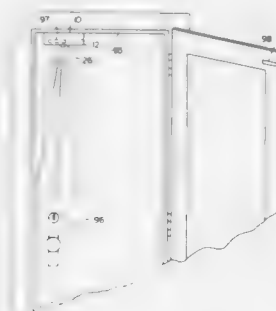
Glenda A. Dubak, and Peter D. Capizzo, both of 76376 Romeo Plank Rd., Romeo, Mich. 48065

Continuation-in-part of Ser. No. 867,206, May 27, 1986, Pat. No. 4,757,430. This application Mar. 7, 1988, Ser. No. 165,125

Int. Cl.⁴ E05B 17/10

U.S. Cl. 362-100

1 Claim



1. A night light for attachment between an entrance door having a lock set and an adjacent screen door, said night light comprising:

- an enclosure for mounting between the entrance door and the adjacent screen door, said enclosure having a plurality of openings formed therein;
- a DC voltage source means mounted within said enclosure;
- a first switch affixed to said enclosure adjacent one of said openings for sensing the proximity of the screen door;
- a light source affixed to said enclosure adjacent one of said openings for directing light upon the lock set;
- a light sensor for detecting ambient light level, said light sensor affixed to said enclosure adjacent one of the openings formed therein;
- a second switch, responsive to said light sensor, being closed at low ambient light levels, and open at high ambient light levels, said second switch connecting said light source to said voltage source means;
- a time delay means comprising a RC timing circuit and a plurality of inverters connected serially with each other, said RC timing circuit being connected to said voltage source means by said first switch, said RC timing circuit and said first switch being coupled with the input of the first inverter for changing the polarity of the output of the last inverter, which is coupled to said second switch, after a predetermined time delay that is initiated by closing said first switch;
- whereby said DC voltage source means, light source, first switch, second switch, light sensor, and time delay means are electrically connected so that when the screen door is open, thereby closing the first switch, and the ambient light level is low enough to thereby cause the second switch to close, the electrical circuit will be completed causing the light source to illuminate the lock set, and when the ambient light level is high enough to cause the second switch to open, the electrical circuit will be broken, thereby preventing the light source from illuminating the lock set, and if the said screen door does not close before the predetermined time delay elapses, then the

timing means will cause the second switch to open, thereby breaking the electrical circuit and extinguishing the light source.

4,872,096

MECHANISM FOR LOCKING AND UNLOCKING A LAMP IN A LAMP HOLDER PARTICULARLY FOR USE IN AN AUTOMOBILE VEHICLE

Maurice Montet, Paris, France, assignor to Valeo Vision, Cedex, France

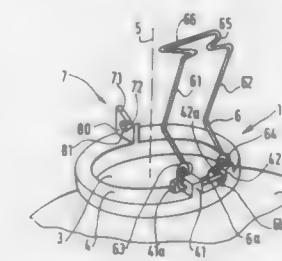
Filed Jan. 12, 1989, Ser. No. 296,667

Claims priority, application France, Jan. 15, 1988, 88 00402

Int. Cl.⁴ H01R 33/00

U.S. Cl. 362-226

10 Claims



1. A mechanism for locking and unlocking a lamp in a lamp holder of the kind comprising a reflector having a circular opening in its rear part for a lamp equipped with a circular flange to pass through, and a lamp holder comprising a bearing surface extending around the opening, said mechanism comprising a spring element, one end of which is articulated on the lamp holder and the other, free, end of which is adapted to hook into at least one attachment disposed substantially diametrically opposite of the opening, the central part of the spring element bearing on the lamp in order to apply its circular flange to the bearing surface of the lamp holder, wherein said attachment comprises means for locking and unlocking the lamp constituted by a guiding ramp and a catch, said guiding ramp being adapted to guide and deform the free end of the spring element when a pressure is exerted, substantially in the same direction as the direction of insertion of the lamp, during the locking operation until the said spring element anchors itself under the catch, regaining its initial shape as it does so; and a concave release ramp facing said catch and adapted to guide and deform the spring element when a second pressure similar to the first is exerted in the same direction during the unlocking operation until the said spring element is freed.

4,872,097

MINIATURE LOW-VOLTAGE LIGHTING FIXTURE

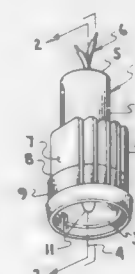
Jack V. Miller, 700 N. Auburn Ave., Sierra Madre, Calif. 91024

Filed Dec. 5, 1988, Ser. No. 279,961

Int. Cl.⁴ H01R 33/49

U.S. Cl. 362-226

7 Claims



1. A lighting fixture comprising:

- a reflector lamp having a bulb, a reflector and a bayonet base;
- a lampholder for holding and connecting the lamp and having a proximal end and a distal end on a central axis;
- a means for connecting the lamp to an external source of electrical power through the proximal end of the lampholder;
- a means for supporting the base of the lamp in the distal end of the lampholder;
- a generally radial flange contiguous with the distal end of the lampholder and supporting a contiguous cylindrical bulb reflector housing coaxially with the lampholder and extending beyond the bulb reflector in the distal direction; and
- a means for rotationally engaging the bulb reflector for installation or removal of the bayonet base of the lamp from the lampholder including one or more notches in the reflector.

4,872,098

VARIABLE BEAM FLOODLIGHT

Perry Romano, Lake Zurich, Ill., assignor to LPI Limited Partnership, Gurnee, Ill.

Filed Mar. 20, 1989, Ser. No. 326,006

Int. Cl.⁴ F21V 7/00

U.S. Cl. 362—283

20 Claims



1. A variable beam floodlight including in combination:
- a housing having first and second opposing ends, with a light exit opening having a predetermined length and a predetermined width located between said ends thereof;
- means for mounting a lamp in said housing to emit light through said light exit opening;
- a fixed reflector section located in the housing behind the lamp and extending substantially across the space between said first and second ends, said fixed reflector section having a width less than the width of said light exit opening for reflecting light outwardly through said opening;
- at least first and second pivoted reflector sections mounted in said housing to pivot between said first and second ends, thereof, with said first pivoted reflector section mounted near said fixed reflector section between said fixed reflector section and said second pivoted reflector section, both of said first and second pivoted reflector sections located on the same side of said fixed reflector section; and
- operating means coupled with said first and second pivoted reflector sections for simultaneously pivoting said first and second pivoted reflector sections through different degrees of rotation with respect to one another to vary the width of a beam of light emitted from said light exit opening in accordance with the pivoted orientation of said first and second pivoted reflector sections.

4,872,099

LIGHT FIXTURE

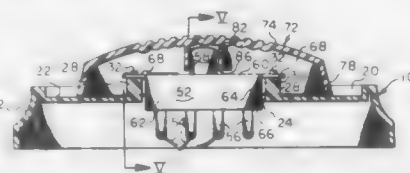
David A. Kelley, Springfield; Dan H. Walters, Marshall, and James G. Stephenson, Kalamazoo, all of Mich., assignors to Progressive Dynamics, Inc., Marshall, Mich.

Filed Apr. 27, 1988, Ser. No. 186,922

Int. Cl.⁴ F21V 23/04; H01H 3/20

U.S. Cl. 362—295

7 Claims



1. A light fixture including a base, a bulb mounted on said base, electric conductors connected to the bulb and connectable to an electric power source, and a drop-in switch connected to the conductors having lateral sides and ends, a bottom, a top, mounting surfaces and a sliding actuator extending from the switch top, the improvement comprising, drop-in switch mounting means defined on the base receiving the switch and restricting the switch against lateral end movement and movement in the direction of the switch bottom, a manually operated slide directly mounted on the base adjacent said switch mounting means, slide mounting means mounting said slide on said base in a superimposed position relative to the switch top for sliding movement between first and second positions, said slide mounting means restraining said slide against movement in a direction away from the switch top, switch restraining means defined on said slide closely spaced from the switch top preventing displacement of the switch from said drop-in switch mounting means, and switch actuator engaging means defined upon said slide engaging the switch actuator whereby displacement of said slide between said first and second positions operates the switch.

4,872,100

HIGH VOLTAGE DC TO AC CONVERTER

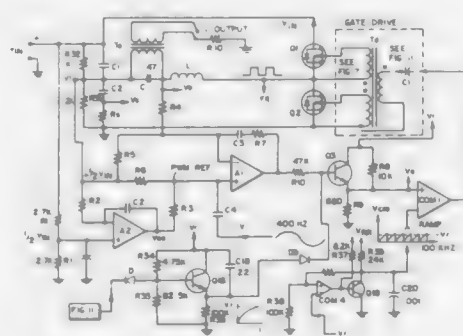
Bonifacio Diaz, El Paso, Tex., assignor to Zenith Electronics Corporation, Glenview, Ill.

Filed Oct. 12, 1988, Ser. No. 256,872

Int. Cl.⁴ H02M 7/538

U.S. Cl. 363—41

53 Claims



1. A high voltage converter, comprising:
- (a) switching and commutation means, adapted to be disposed across the output terminals of a power supply and comprising at least two switch means in series with each other, for switching current therethrough;
- (b) capacitor means comprising two capacitors in series with each other and across said power supply;
- (c) a series capacitor and a series inductor in series with each

other for joining the common node between said two capacitors to the common node between said two switch means;

- (d) transformer means across said series capacitor for providing a high voltage AC output; and
- (e) control means, using as a voltage reference the voltage at said common capacitor node and using a voltage controlled oscillator output signal, for operating said switching and commutation means to maintain the current output generally constant as load changes, said control means including:
- a rectifying and doubling circuit for producing from said AC current a DC voltage whose value is between the average value of the AC waveform and the peak value of the AC waveform, said DC voltage being used to control the output amplitude of said voltage controlled oscillator, whereby the amplitude of the oscillator output is generally representative of the RMS value of said AC current.

4,872,101

INPUT AND OUTPUT RESPONSIVE CONTROLLED RECTIFIER

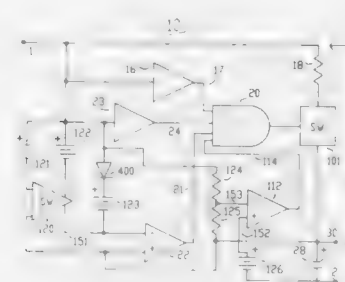
Fred Mirow, 47 Edgewood Rd., Westwood, Mass. 02090

Filed May 6, 1988, Ser. No. 191,010

Int. Cl.⁴ H02M 7/12

U.S. Cl. 363—49

5 Claims



1. A high efficiency converter for obtaining a lower magnitude DC voltage from an AC voltage without magnetics comprising:

- switch means for receiving an input AC voltage and rectifying and applying the switch rectified voltage to an output when the switch means is closed;
- means for comparing the voltage level of the input AC voltage with a voltage level determined by the output voltage and a reference voltage;
- means for closing the switch in response to said determination; and
- means for varying the predetermined voltage level between the input AC voltage and the voltage level at the output terminal at which the switch is closed in accordance with the output voltage.

4,872,102

D.C. TO A.C. INVERTER HAVING IMPROVED STRUCTURE PROVIDING IMPROVED THERMAL DISSIPATION

Dennis L. Getter, Little Canada, Minn., assignor to Dimensions Unlimited, Inc., St. Paul, Minn.

Filed Apr. 28, 1986, Ser. No. 856,506

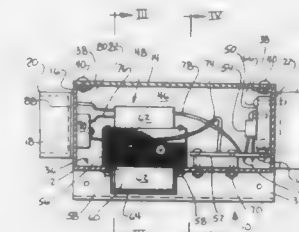
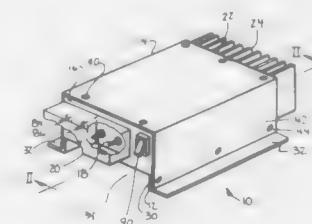
Int. Cl.⁴ H02M 7/537

U.S. Cl. 363—141

25 Claims

19. An electrical DC to AC inverter having improved structure for providing improved thermal dissipation, comprising:
- (a) a thermally conductive and structurally self sufficient frame;

- (b) a cover on said frame, said cover and frame jointly defining an enclosed electrical component compartment;
- (c) converting means within said compartment for converting DC to AC;
- (d) an internal primary heat sink mounted directly upon and in direct thermal exchange relationship with an internal surface of the frame;
- (e) a secondary heat sink mounted directly upon and in direct thermal exchange relationship with an external



surface of the frame, said primary and secondary heat sinks being opposite to each other and substantially overlapping each other;

- (f) said converting means including semi-conductor power switches in the component enclosure, said switches being mounted directly upon and in direct thermal exchange relationship with the primary heat sink; and including
- (g) a printed circuit board mounted to and spaced from said primary heat sink, said power switches having leads extending to and secured to said PCB.

4,872,103

METHOD OF POSITIONING TWO MODULES HAVING ANGLED EDGES

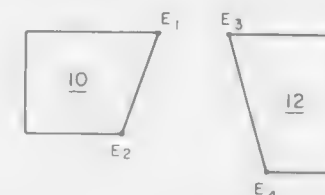
Christopher Kingsley, Valbonne, France, assignor to VLSI Technology, Inc., San Jose, Calif.

Filed Dec. 1, 1987, Ser. No. 127,210

Int. Cl.⁴ G06F 15/60

U.S. Cl. 364—153

10 Claims



1. A method of positioning two modules in a planar field, each of said modules having an edge which is closest to the other module and each edge is characterized by two endpoints, said endpoints lie in a rectilinear coordinate system having the following coordinates $E_1(x_1, y_1)$, $E_2(x_2, y_2)$, $E_3(x_3, y_3)$, $E_4(x_4, y_4)$, where E_1 and E_2 are the end points of one edge and E_3 and E_4 are the endpoints of the other edge, said endpoints characterized by the edge $E_3 - E_4$ being to one side of the edge $E_1 - E_2$, in the increasing x direction, $y_1 > y_2$ and $y_3 > y_4$ and with the two edges positioned, not necessarily parallel to one of the axis of the coordinate system, said method including the

step of moving said modules in the x direction to one another, and further wherein the modules cannot be separated by a distance less than a minimum distance, S, from one another, at their closest points of separation, said method comprising the steps of:

- determining if the edges, if extended, intersect by divergence or by convergence;
- calculating a constraint between one of said endpoints of one edge and one of the endpoints of the other edge, as a function of S; and
- moving said modules in said x direction until the x coordinates of one of said endpoints of one edge and one of the endpoints of the other edge are separated by no less than said calculated constraint.

4,872,104

WINDUP PREVENTION SYSTEM FOR A CONTROL LOOP TO PREVENT OVERSHOOT

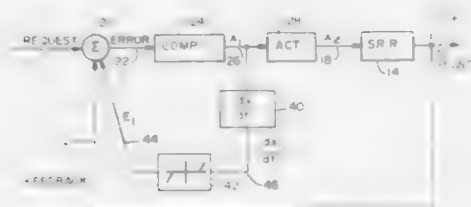
Kevia Holsinger, Menlo Park, Calif., assignor to Spectra Physics, San Jose, Calif.

Filed Apr. 14, 1988, Ser. No. 181,429

Int. Cl.⁴ G05B 11/36

U.S. Cl. 364—166

19 Claims



13. An apparatus for reducing integrator windup in a control system for an apparatus being controlled comprising:

- a feedback input for receiving a feedback signal from said apparatus being controlled indicating the status of said apparatus;
- a command input for receiving an input signal representing the desired status of said apparatus being controlled;
- a compensation error signal input for receiving a compensation error signal;
- a summing junction to which is coupled said feedback input said command input and said compensation error signal input for generating an error signal;
- integrator means for integrating said error signal and for generating a control signal for said apparatus being controlled as a result of said integration;
- differentiator means for determining the rate of change of said control signal; and
- comparison means coupled to said summing means and to said differentiator means for comparing the rate of change of said control signal determined by said differentiator means to predetermined maximum allowable rates of change in the positive going and negative going directions and for generating said compensation error signal in response to said comparison in such a manner to reduce the magnitude of the rate of change of said control signal.

4,872,105

CURVE FOLLOWING APPARATUS

Bahram Mozayeny, Edina, Minn., assignor to VectorVision Corporation, Edina, Minn.

Filed Mar. 9, 1987, Ser. No. 23,160

Int. Cl.⁴ G05B 19/19

U.S. Cl. 364—167.01

18 Claims

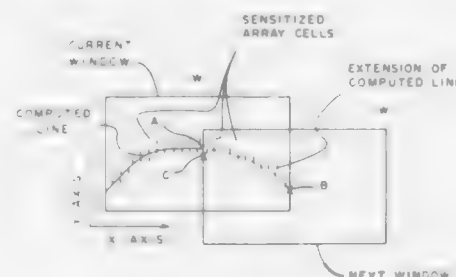
1. An apparatus for following a selected curve and for producing digital output signals indicative of said selected curve, said apparatus comprising:

- a. scanning means for scanning incremental portions of said selected curve, said scanning means having a number of

individual sensors unitarily grouped together into a two dimensional array so as to define a viewing window, said array having (i) a first reference frame of coordinates, and (ii) a substantially planar face, said scanning means further including means (following a contact of said planar face of said array with a first portion of said curve) for generating signals of a first sense for those sensors of said array in register with said curve and for generating signals of a second sense for those sensors of said array which are not in register with said curve and means including output means producing digital output signals of the same sense for all of said sensor signals of said first sense;

- b. a driving mechanism having a holder means and controllable means for incrementally moving said holder means selectively along a first (or "X") axis and also along a second (or "Y") axis perpendicular thereto, said driving mechanism being placeable in proximity to said selected curve;
- c. means attaching said scanning means to said holder means of said driving mechanism for movement therewith along said X and Y axes with said planar face being positioned adjacent to said selected curve; and
- d. processing means connected to receive said digital output signals from said output means of said scanning means, said processing means including the following:

- (1) modeler means for (i) analyzing each digital output signal and assigning a pair of coordinate values relative to said first reference frame of coordinates to each such digital output signal, (ii) computing a curve, the charac-



teristics of which fit all such pairs of coordinate values, and (iii) having output means for providing an output signal indicative of vector components of said computed curve,

- (2) coordinate transformer means (i) connected to receive said modeler output signal and to transform said modeler output signal from said first reference frame of coordinates to a second preselected reference frame of coordinates, and (ii) having output means for supplying an output signal indicative of said modeler output signal after being transformed as aforesaid;
- (3) data stacker means connected to receive said output signal of said coordinate transformer means and adapted to store predetermined reference points of interest, said stacker means having output means for providing an output signal indicative of data stored in said stacker means;
- (4) extrapolative means including mode controller means connected to receive said output signal of said coordinate transformer means and also having a first output connected to control said driving mechanism whereby said scanning means is selectively controlled to move from scanning said first portion of said selected curve incrementally along said X and/or Y axes to a new position (thereby enabling the scanning of a second portion of said selected curve) as a function of said output signal of said coordinate transformer means, and said mode controller means having a second output;
- (5) command generator means connected to said driving

mechanism and adapted to receive a trigger signal and including means, after said driving mechanism has moved said scanning means to said new position, to thence develop a command signal,

- (6) sensor controller means connected to said scanning means and to receive said command signal of said command generator means and adapted, after said scanning means has been moved to a new position, as aforesaid, to selectively initiate (i) the generation of a new set of digital output signals of said same sense for all of said sensor signals of said first sense, and (ii) transfer of said new set of digital signals to said processing means;
- (7) vectorizer means connected to receive the outputs of said coordinate transformer means and said stacker means and adapted to combine contiguous curve segments having the same curvature and said vectorizer means having a first output; and
- (8) storage means connected to receive said first output of said vectorizer means and being adapted to supply stored data.

4,872,106

INDUSTRIAL PROCESS CONTROL SYSTEM WITH BACK-UP DATA PROCESSORS TO TAKE OVER FROM FAILED PRIMARY DATA PROCESSORS

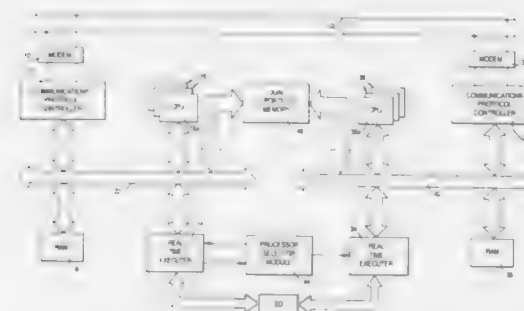
Billy R. Slater, Plano, Texas, assignor to New Forney Corp., Carrollton, Texas.

Continuation of Ser. No. 482,487, Apr. 6, 1983, abandoned. This application Feb. 4, 1987, Ser. No. 14,104

Int. Cl.⁴ G06F 15/00

U.S. Cl. 364—200

8 Claims



- 1. An industrial control system for managing a plurality of input/output devices comprising a primary data processor having a memory and operable to receive signals from said input/output devices, said primary data processor including a central processing unit operable to carry out an applications program and apply signals to said input/output devices in accordance with determinations made in said applications program to control said input/output devices, said primary processor maintaining in said memory of said primary processor a record of status data including a status data component representing a plurality of parameters of the current operation of said applications program, said central processing unit in carrying out said applications program operating on and in response to said status data in said current record maintained in the memory of said primary processor, a back-up data processor having a memory and having an active mode of operation and a back-up mode of operation, said back-up processor being operable in said active mode of operation to receive signals from said input/output devices, carry out said applications program and apply signals to said input/output devices in accordance with the determinations made in the applications program carried out by said back-up processor to control said input/output devices, said back-up processor maintaining a record of status data in the memory of said back-up processor corresponding to the record of status data maintained in the memory of said primary processor, said back-up processor, when carrying out said applications program, operating on and in response to the status data in the record thereof maintained

in the memory of said back-up processor, said primary processor and said back-up processor operating in said back-up mode comprising means to periodically transfer a copy of the status data in the memory of said primary processor to a buffer memory section of the memory of said back-up processor, said means to transfer status data from the memory of said primary processor to a buffer memory section of the memory of said back-up processor including a dual ported memory connected between said primary processor and said back-up processor, said primary processor operating to periodically transfer a copy of the status data from the record of status data maintained by said primary processor in the memory of said primary processor to said dual ported memory, said back-up processor, when operating in said back-up mode, operating to periodically transfer a copy of the status data in said dual ported memory to the buffer memory section of the memory of said back-up processor, said central processing unit generating for each copy of status data transferred to said back-up processor information from which the validity of the status data can be determined, said information being included with the corresponding copy of status data transmitted to said back-up processor, said back-up processor including means operable when said back-up processor is in said back-up mode to determine from the entire content of said status data component and the corresponding information in each periodic copy of status data received in said buffer memory section whether said status data component is valid and, if the copy of said status data component is determined to be valid, to update the record of status data maintained in the memory of said back-up processor in accordance with the copy of the status data in said buffer memory section, means to monitor the condition of said primary processor independently of said status data and to generate a fail over signal when said primary processor fails, and means to switch said back-up processor from said back-up mode of operation to said active mode of operation in response to said fail over signal.

4,872,107

FLOPPY DISK CONTROLLER WITH MEANS TO CHANGE CLOCK RATE AUTOMATICALLY

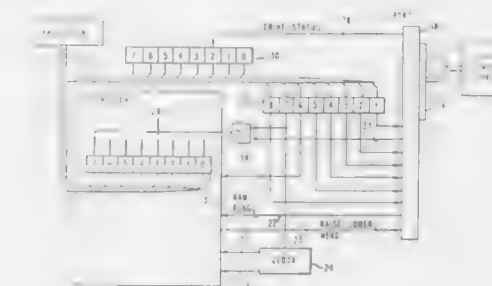
Melvyn J. Marple, Newtown, and Andrew S. Potemski, New Milford, both of Conn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 22, 1983, Ser. No. 487,793

Int. Cl.⁴ G06F 13/12

U.S. Cl. 364—200

4 Claims



- 1. In a data processing system having a processor (12) and an I/O controller (15), said controller having a plurality of ports, each port having a plug (18) for connecting the processor and the controller to operate a peripheral device (14) of a first type (8" diskette) or a second type (5 1/4" diskette), each of said devices having means for signaling a ready condition, said controller having means (bit positions 1-4 in register 27) for selecting one of said ports, wherein the improvement comprises, a first ready signal line (33) connected to each port plug for signaling a ready condition from a device of the first type and a second ready signal line (28) connected to each port

plug for signaling a ready condition from a device of the second type,

first binary storage means (PDBSEL) in the processor for each port for registering information that a port has a device of the first type or of the second type connected and a second binary storage means (PDBFLG) for registering information that the type is undetermined, and means (diskette driver) operable when the processor is initialized for resetting the second storage means to its undetermined signal state and resetting the first storage means to said first one of said types,

a first register (27) for holding the information in the first binary storage means for a selected port, including the device type information,

logic and storage means responsive to the device type information in said first register and to said ready signal lines for signaling whether a device of the selected type is ready,

driver program means (diskette driver) responsive to a signal in said secondary binary storage means that the type is undetermined to access a peripheral device at the selected port according to the type signaled in the first storage means and for testing said signal that a device of the selected type is ready, and means responsive to a signal that a device of said first type is not ready to make a similar test for a device of the second type.

4,872,108

DEVICE HAVING MULTIPLEXER FOR ENABLING PRIORITY AND NON-PRIORITY COMMON CIRCUIT
André Bussaniere, Chatillon, and Yves Courtois, Chilly Mazarin, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

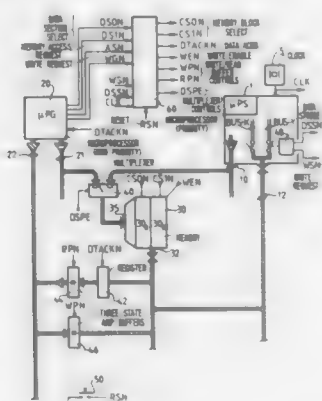
Filed Feb. 24, 1988, Ser. No. 159,817

Claims priority, application France, Feb. 27, 1987, 87 02659

Int. Cl.⁴ G06F 9/46, 13/00, 13/18, 15/16

U.S. Cl. 364—200

16 Claims



1. A data processing system comprising:
 - a common memory having a data connection and an address;
 - a non-priority processor provided with a first address output, a first external data path coupled to the data connection of said memory, and a first control output for a first memory request signal;
 - a priority processor provided with a second address output, a second external data path coupled to the data connection of said memory, and a second output for a preparation signal in conjunction with each intended memory access by said priority processor;
 - a clock means for recurrently outputting a sequence of clock signals;
 - a 2-to-1 multiplexer fed by said first and second address outputs and having a control input and a multiplexer output, feeding the address input of said memory;
 - a control unit fed by said first and second control outputs

and by said clock means for under control of said first memory request signal in isolation generating a first multiplexer control signal coupled to said control input for causing said multiplexer to connect said first address output to said multiplexer output for executing a non-priority memory cycle to exchange data through said first external data path but for under control of said preparation signal irrespective of any said first memory request signal having occurred within a predetermined time interval before occurrence of said preparation signal generating a second multiplexer control signal coupled to said control input for then causing said multiplexer to connect said second address output to said multiplexer output, for executing a priority memory access cycle to exchange data through said second external data path.

4,872,109

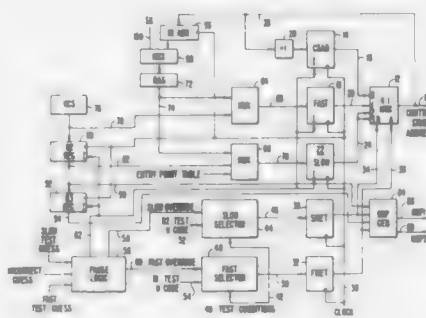
ENHANCED CPU RETURN ADDRESS STACK
Robert W. Horst, Cupertino, and Richard L. Harris, San Jose, both of Calif., assignors to Tandem Computers Incorporated, Cupertino, Calif.

Continuation of Ser. No. 850,535, Apr. 11, 1986, abandoned, which is a division of Ser. No. 774,564, Sep. 10, 1985, Pat. No. 4,636,943, which is a continuation of Ser. No. 537,886, Sep. 29, 1981, Pat. No. 4,571,673. This application Nov. 2, 1987, Ser. No. 117,455

Int. Cl.⁴ G06F 9/38, 9/40, 9/42

U.S. Cl. 364—200

1 Claim



1. In a computer pipeline system using microcode instructions which can generate first and second branch signals at different times, a stack for storing and for selectively rotating stack data to an output of the stack in response to control signals, comprising:

- a plurality of individual sequentially arranged storage elements, including at least first and second storage elements for storing said stack data, said first storage element situated at a beginning end of said plurality of sequentially arranged storage elements, said second storage element situated following said first storage element in said plurality of sequentially arranged storage elements, said output of the stack being coupled to said second storage element;
- a plurality of multiplexing means for interconnecting said plurality of storage elements in series fashion, said plurality of multiplexing means being operable to select a source of stack data input to each of said plurality of individual storage elements;
- input means having an output connected to first and second multiplexing means of said plurality of multiplexing means, and an input for receiving stack data; and
- select logic means connected to each of said multiplexing means for providing control signals to each of said plurality of multiplexing means including,
 - at least one first control signal for causing the rotation of said stack data from each storage element to either an immediately succeeding or preceding storage element, and
 - at least one second control signal provided to said first and

second multiplexing means for selecting said input means to load a new element of stack data to said first storage element in response to said first branch signal and to load said new element of stack data to said second storage element in response to said second branch signal; whereby loading and rotating stack data in said stack are decoupled.

4,872,110

STORAGE OF INPUT/OUTPUT COMMAND TIMEOUT AND ACKNOWLEDGE RESPONSES

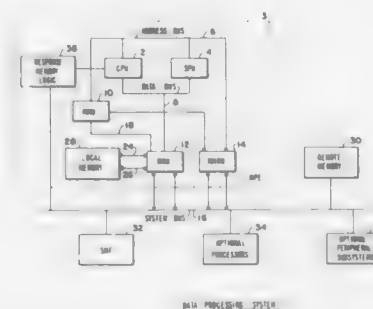
Michael D. Smith, Palo Alto, Calif., and Richard A. Lemay, Carlisle, Mass., assignors to Bull HN Information Systems Inc., Billerica, Mass.

Filed Sep. 3, 1987, Ser. No. 92,863

Int. Cl.⁴ G06F 11/34, 13/42

U.S. Cl. 364—200

21 Claims



1. A data processing system for storing responses to an input/output command comprising:

- A. A system bus;
- B. A processor subsystem coupled to said system bus for generating said input/output command, said command including a channel number;
- C. A plurality of peripheral subsystems coupled to said system bus, one of said plurality of subsystems being responsive to said channel number for accepting said command and generating an acknowledge response when said command is accepted and generating a not acknowledge response when said command is rejected;
- D. said processor subsystem including:
 - central processor means for coupling said processor subsystem to said system bus;
 - storing means coupled to said system bus for receiving said acknowledge and not acknowledge responses for storage at a location specified by said channel number;
 - timeout means coupled to a line of said system bus conducting said not acknowledge response, said timeout means responsive to said input/output commands and to said acknowledge and not acknowledge responses for generating a timeout response on said system bus line in substitution for said not acknowledge response when said acknowledge response is not received within a predetermined time;
 - said processor subsystem being responsive to said timeout response in the same manner as to said not acknowledge response, including storing said timeout response in said location in substitution for said not acknowledge response.

4,872,111
MONOLITHIC SEMI-CUSTOM IC HAVING STANDARD LSI SECTIONS AND COUPLING GATE ARRAY SECTIONS

Kevin L. Daberkow, San Jose; Christopher D. Finan, Santa Clara; Joseph A. Petolino, Palo Alto, all of Calif.; Daniel Carl Sobotka, Chicago, Ill., and Jeffrey A. Thomas, Cupertino, Calif., assignors to Amdahl Corporation, Sunnyvale, Calif.

Continuation of Ser. No. 900,640, Aug. 27, 1986, abandoned.

This application Aug. 18, 1988, Ser. No. 233,953

Int. Cl.⁴ G06F 13/00, 7/00

U.S. Cl. 364—200

12 Claims



1. In a data processing machine having a first unit for execution of instructions and a second unit for storing data supplied from a plurality of ports,

- the first unit executing instructions in a first pipeline including an addressing stage having means for supplying addresses for results to be generated in the first pipeline according to a given instruction and a subsequent result posting stage having means for supplying a result generated in the first pipeline according to the given instruction, the second unit storing data in locations identified by addresses in response to operations in a second pipeline including an address selecting stage, having means for selecting an address for an operation in the second pipeline from one of the plurality of ports or from the means for supplying addresses in the first unit, and a subsequent result posting stage, having means for posting results of operations in the second pipeline; an improvement comprising:

- a plurality of store port means, connected to the first unit and to the second unit, for porting results and addresses received from the first unit to the second unit for storage of the results in the second unit, each of the plurality of store port means including means for storing a result generated in the first pipeline and a corresponding address for the result; and
- control means, in communication with the first unit, the second unit, and the plurality of store port means, and responsive to an address from the means, in the first pipeline, for supplying addresses selected during the address selecting stage of the second pipeline, for allocating one of the plurality of store port means during the result posting stage of the second pipeline to receive the result from the first pipeline during the result posting stage of the first pipeline.

4,872,118

SYSTEM FOR AUTOMATED MONITORING OF TRIM AND STABILITY OF A VESSEL

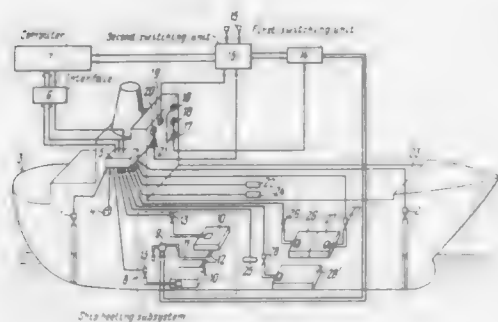
Evgeny V. Naidenov, Naberezhnaya Fontanka, 24, kv. 78, Leningrad; Georgy I. Belozorov, Shestnadtsataya Parkovaya ulitsa, 19, korpus 2, kv. 146, Moscow; Viktor E. Salov, ulitsa Rudnaya, 21 korpus 1, kv. 140, Leningrad, and Ivan V. Zakharov, ulitsa Marata, 8, kv. 2, Leningrad, all of U.S.S.R.

Continuation-in-part of Ser. No. 639,020, Aug. 9, 1984, abandoned. This application Nov. 13, 1987, Ser. No. 120,429

Int. Cl.⁴ G06F 15/20; B63B 43/04

U.S. Cl. 364-463

6 Claims



1. A system for automated monitoring of the trim and stability of a vessel having a hull, a bow defining the fore direction and a stern defining the aft direction, comprising:

at least two draft value sensors monitoring the value of the draft of the vessel, mounted, respectively, fore and aft of said vessel, each of said at least two sensors having an output;

at least one heel angle sensor for monitoring heel angle of the vessel, said at least one sensor of the heel angle of the vessel having an output;

a vessel heeling subsystem adapted to produce a vessel heeling moment, said vessel heeling subsystem having first and second inputs and first and second outputs which provide signals representative of the degree of heeling of the vessel for obtaining information as to when the inclining moment of a ship is determined;

a computer adapted to compute the value of the metacentric height characterizing the stability of the vessel, based on data supplied by said draft value and heel angle sensors and data received from said vessel heeling subsystem, said computer having first and second inputs and a multichannel data input;

a signal conditioner adapted to condition dissimilar output signals of all said sensors into signals susceptible to processing in said computer, said signal conditioner having first, second and third groups of inputs and a multichannel data output, said outputs of said at least two draft value sensors being connected to said first group of inputs of said signal conditioner, said output of said at least one heel angle sensor being connected to said second group of inputs of said signal conditioner, and said first and second outputs of said vessel heeling subsystem being connected to said third group of inputs of said signal conditioner;

an interface, for input and output of data into/from said computer, said interface being adapted to support simultaneous operation of all said sensors with said computer by dividing in time the process of interrogation of all said sensors, said interface having a multichannel data input and a multichannel data output, said multichannel data input of said interface being connected to said multichannel data output of said signal conditioner, and said multichannel data output of said interface being connected to said multichannel data input of said computer;

a unit for presetting the value of a vessel heel angle, operable for presetting in the course of a vessel heeling test a value of the vessel heeling angle required for evaluating the

metacentric height of the vessel, said unit having an output;

a heel angle indicator having an output;

a first comparator, having a first input, a second input and an output, said first input of said first comparator being connected to said output of said heel angle indicator, and said second input of said first comparator being connected to said output of said unit for presetting the value of the vessel heeling angle;

a first switching unit adapted to connect said vessel heeling subsystem to supply voltage and to disconnect said vessel heeling system from supply voltage in response to a signal from said first comparator, said first switching unit having first and second inputs and a control input, and first and second outputs, said control input of said first switching unit being connected to said output of said first comparator, said first and second outputs of said first switching unit being connected to said first and second inputs of said vessel heeling subsystem;

voltage supply terminal means;

a second switching unit adapted to feed supply voltage to said computer under manual control and also to transmit supply voltage from said voltage supply terminal means to said first switching unit, said second switching unit having first and second inputs, first, second, third and fourth outputs, said first and second outputs of said second switching unit being connected to said first and second inputs of said computer, said third and fourth outputs of said second switching unit being connected to said first and second inputs of said first switching unit, and said first and second inputs of said second switching unit being connected to said voltage supply terminal means.

4,872,119

ELECTRONIC POSTAL SCALE FOR COMPUTING A POSTAL CHARGE

Hironobu Kajimoto, Tokyo, Japan, assignor to Ternoka Seiko Co., Ltd., Japan

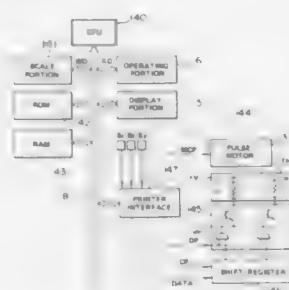
Filed Apr. 20, 1987, Ser. No. 40,349

Claims priority, application Japan, Apr. 28, 1986, 61-98643; Jun. 30, 1986, 61-153318

Int. Cl.⁴ G06F 15/20; G07B 17/02

U.S. Cl. 364-464.03

16 Claims



1. An electronic postal scale for computing a postal charge comprising:

(a) scale means for measuring a weight of a package;

(b) operating means including a plurality of keys including preset keys therein, for inputting a plurality of data concerning said postal charge and for inputting command signals, said preset keys having assigned corresponding look up numbers, said operating means being operatively connected to said scale means;

(c) first memory means for storing data representative of charge information concerning said postal charge, operatively connected to said operating means to provide the data stored therein when requested;

4,872,121

METHOD AND APPARATUS FOR MONITORING ELECTRONIC APPARATUS ACTIVITY

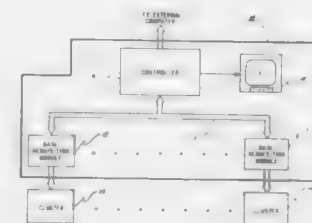
Ellery Y. Chan, Melbourne Beach, and Thomas L. Sterling, Palm Bay, both of Fla., assignors to Harris Corporation, Melbourne, Fla.

Filed Aug. 7, 1987, Ser. No. 82,478

Int. Cl.⁴ G06F 11/00

U.S. Cl. 364-551.01

15 Claims



1. A system activity monitor for monitoring signals of an electronic apparatus, comprising:

a first plurality of registers for storing information;

means for storing a predetermined signal pattern;

first means responsive to a first plurality of signals from the electronic apparatus for producing an event signal when said first plurality of signals match said predetermined pattern;

second means responsive to a second plurality of signals from the electronic apparatus for identifying one register of said first plurality of registers in response to the states of said second plurality of signals; and

third means responsive to said event signals for storing information relative to the operation of the electronic apparatus in said identified storage register when said event signal is present.

4,872,122

INTERACTIVE STATISTICAL SYSTEM AND METHOD FOR PREDICTING EXPERT DECISIONS

Martin D. Altshuler, Wallingford, and Richard Whittington, Media, both of Pa., assignors to University of Pennsylvania, Philadelphia, Pa.

Filed Jun. 19, 1987, Ser. No. 65,304

Int. Cl.⁴ G06F 15/42, 9/00

U.S. Cl. 364-554

18 Claims

1. A method for generating an expert system comprising the steps of:

(a) establishing a set of input parameters having input values which define a case situation and establishing a set of output actions in which the relationship between each input parameter and each output action defines a combinatory situation;

(b) establishing a decision making structure formed of linked nodes with specified nodes defining questions;

(c) generating random values to serve as input values defining a first case situation for a first node;

(d) responding by the expert to the questions posed at the first node;

(e) generating a new set of random values to serve as new input values defining a new case situation for the first node;

(f) repeating steps (d) and (e) until a sufficient number of responses having a predetermined statistical significance is achieved for the first node;

(g) generating in turn for each node subsequent to the first node new random values defining a further new case situation biased by a function of a response from a preceding node;

(d) second memory means for storing data representative of relations between said look up numbers and said charge information, operatively connected to said operating means to provide the data stored therein when requested;

(e) third memory means for storing data representative of relations between said look up numbers and said preset keys, operatively connected to said operating means to provide the data stored therein when requested; and

(f) control means operatively associated with at least said second and third memory means including reloading means therein, said reloading means for reloading contents of data stored in said second and third memory means in accordance with an operation of said operating means, said control means also for reading out desirable charge information assigned to depressed preset keys based on said memory contents of data stored in said second and third memory means, said postal charge of the package being calculated based on said weight of the package and said desirable charge information.

4,872,120

MULTIPLEXED JUNCTION PROBE FOR FUEL GAGING SYSTEM AND SYSTEM CONTAINING SAME

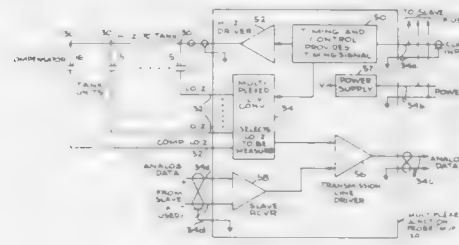
Eugene F. Orloff, Long Beach, Calif.; Martin Horowitz, Lynbrook, and Charles H. Rittner, Great River, both of N.Y., assignors to Gull Inc., Smithtown, N.Y. and McDonnell Douglas Corporation, Long Beach, Calif.

Continuation of Ser. No. 685,396, Dec. 20, 1984. This application Apr. 21, 1988, Ser. No. 184,271

Int. Cl.⁴ G06G 7/57; B64D 37/00; G08B 5/36; G01F 23/00

U.S. Cl. 364-509

52 Claims



1. A multiplexed junction probe fuel gaging system for aircraft having at least one fuel tank with multiple fuel sensing units comprising:

a plurality of individual elements mounted within a tank for sensing fuel and providing signals corresponding to fuel measurement;

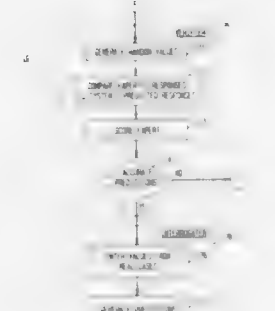
signal processing apparatus on board the aircraft for converting analog data signals to digital values corresponding to measured fuel quantity;

a junction probe installed in a tank and including circuitry separately coupled to the individual tank mounted elements, the junction probe also being coupled to the signal processing apparatus by a common signal path;

first circuit means included in the junction probe for electrically driving said elements; and

second circuit means in the junction probe for individually measuring said plurality of elements in a predetermined sequence and forming a data stream of analog signals corresponding to the sequence of signals from said elements for transmission to the signal processing apparatus over said common signal path, said data stream containing information separately representative of each individual element for processing in said signal processing apparatus to determine the fuel measurement at each individual element which is measured.

- (h) responding by the expert to the questions posed at each subsequent node;
 (i) generating a new set of random values as in step (g);



- (j) repeating steps (h) and (i) until a sufficient of responses having a predetermined statistical significance is achieved for each of the subsequent nodes.

4,872,123

COMMUTATION COMPENSATION DEVICE FOR A DC MACHINE

Noboru Morita, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

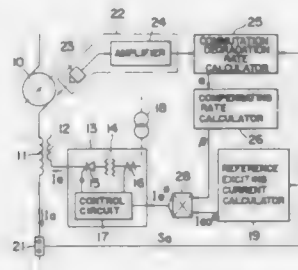
Filed Feb. 16, 1988, Ser. No. 155,960

Claims priority, application Japan, Feb. 17, 1987, 62-33618

Int. Cl.⁴ G06F 15/20; H01R 39/46

U.S. Cl. 364—571.02

16 Claims



1. In a commutation compensation device for a DC machine of a type having an auxiliary interpole coil mounted on an interpole provided with an interpole coil independently

thereof so that, in response to a reference exciting current based on the rate-of-change of an armature current, an exciting current is caused to flow through a controlled DC power source to said auxiliary interpole coil so as to compensate commutation, the improvement comprising:

- commutation degradation detector means for detecting the degradation of commutation of said DC machine;
- commutation degradation rate calculator means for calculating a commutation degradation rate in response to the output from said commutation degradation detector means and at least one parameter associated with the commutation degradation, said parameter being different from said output;
- memory means for storing therein said commutation degradation rate and said parameter sequentially as the newest data;
- compensating rate calculator means for calculating a compensating rate to accomplish the commutation compensation in response to the data stored in said memory means;
- means for correcting said reference exciting current in response to the compensating rate obtained from said compensating rate calculating means.

4,872,124

LENGTH MEASURING DEVICE

Giichiro Shimizu, Toshiharu Okuyama, and Yoshio Wakatsuki, all of Tokyo, Japan, assignors to Man Design Co., Ltd., Tokyo, Japan

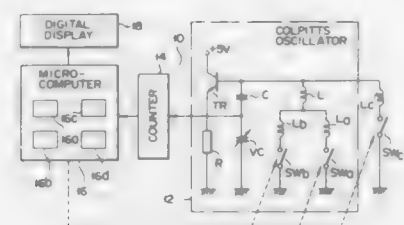
Filed Jul. 25, 1988, Ser. No. 223,408

Claims priority, application Japan, Aug. 5, 1987, 62-195854

Int. Cl.⁴ G01B 7/02; G06F 11/16, 11/22

U.S. Cl. 364—571.03

6 Claims



1. A length measuring device comprising:
 probe means provided extending in one direction and movably in the axial direction thereof;
 oscillating means having core means attached to the distal end of said probe means, first second, and third coil means arranged in that order in the axial direction of said probe means and in the range of movement of said core means due to the movement of said probe means, and means for selectively connecting said second coil means in the middle in series with either of said first and third coil means, for generating and outputting signals of oscillation frequency according to the position of said core means in a first case where said second coil means is connected with said first coil means and in a second case where said second coil means is connected with said third coil means;
 counting means for counting the oscillation frequency in response to oscillation output signals given by said oscillating means;
 calibration coil means which is selectively connected to said oscillating means and whose temperature characteristics are known;
 temperature information generating and storing means for receiving numbers counted from said counting means when said calibration coil means is connected to said oscillating means, obtaining temperature information from the numbers counted, and storing the information; and
 arithmetic means for receiving counted numbers from said

counting means, calculating a difference between the counted number of the first case and the counted number of the second case, temperature-compensating the calculated difference according to the temperature information stored in said temperature information generating and storing means, and finding the distance moved by said probe means from the temperature compensated difference.

4,872,125

MULTIPLE PROCESSOR ACCELERATOR FOR LOGIC SIMULATION

Gary M. Catlin, Cupertino, Calif., assignor to Daisy Systems Corporation, Mountain View, Calif.

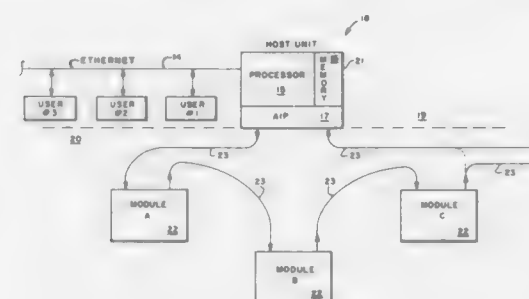
Continuation-in-part of Ser. No. 67,633, Jun. 26, 1987. This

application Jan. 11, 1988, Ser. No. 142,721

Int. Cl.⁴ G06F 15/16

U.S. Cl. 364—578

7 Claims



1. A computer system coupled to a plurality of users for implementing an event driven algorithm of each of the users, comprising:

- (1) a master processor coupled to the users for providing overall control of the computer system and for executing the event driven algorithm of each of the users, wherein the master processor further includes a master memory;
- (2) a unidirectional ring bus coupled to the master processor;
- (3) a plurality of processor modules coupled to the unidirectional ring bus, wherein the unidirectional ring bus transfers data among the processor modules and the master processor, and wherein each processor module includes:
 - (a) a plurality of simulation processors for independently operating on a portion of the event driven algorithm, wherein the plurality of simulation processors function substantially simultaneously to each other, and wherein each simulation processor further includes a simulation memory for storing simulation data for circuit elements being simulated by that respective simulation processor;
 - (b) an interprocessor bus coupled to the plurality of simulation processors for transferring the simulation data among the plurality of simulation processors;
 - (c) an interface means coupled to the unidirectional bus and the interprocessor bus for transferring the simulation data between the unidirectional bus and the interprocessor bus, wherein the interface means further includes:
 - (i) an event memory that stores a history of event changes of the circuit elements being simulated by the simulation processors of that respective processor module;
 - (ii) a first storage means for storing data for the ring bus that is destined for a simulation processor of the simulation processors of that respective processor module;
 - (iii) a second storage means for storing data from a simulation processor of the simulation processors of that respective module, wherein the data is destined for transfer to the ring bus;
 - (iv) a reference table for storing a logical address for each of the simulation processors of that respective processor module, wherein the reference table is

accessed to determine if that respective processor module is a destination of simulation data arriving on the ring bus;
 wherein an intramodule transfer of data on the interprocessor bus occurs independently of a transfer of data on the unidirectional bus.

4,872,126

DIGITAL CIRCUIT DESIGN VERIFICATION

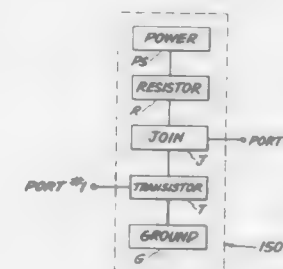
William J. Premerlani, Scotia; David R. Musser, and Paliath Narendran, both of Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jan. 11, 1988, Ser. No. 142,897

Int. Cl.⁴ G06F 15/20, 11/00

U.S. Cl. 364—578

12 Claims



1. A method of verifying the circuit design of an electronic circuit using a computer and a theorem proving system, the method comprising the steps of:

- forming a behavior specification for each preselected circuit portion of an electronic circuit which characterizes that circuit portion in terms of operations which apply to the circuit portion;
- defining a plurality of primitive circuit elements, each corresponding to a different type of physical circuit element and each having at least one port which includes an input wire and an output wire, each wire being characterized by a strength parameter, a value parameter, a capacitance parameter, and a charge parameter;
- said strength parameter being related to resistance and being capable of assuming integer values of 0, 1 or 2 representing, respectively, an open circuit, a moderate resistance, and a low resistance, and being capable of assuming values corresponding to don't care and immaterial;
- the value parameter being related to voltage and being capable of assuming boolean values of true, false, and uncertain;
- the capacitance parameter being capable of assuming an integer value that ranks a total capacitance available for delivering charge on the wire;
- the charge parameter being capable of assuming integer values that represent a sum of charges of capacitors connected to the wire;
- the input wire parameters describing conditions which said electronic circuit would impose on the port of the circuit portion if a connection between the port and the electronic circuit were broken, and the output wire parameters describing another condition which the port would impose upon the electronic circuit if another connection between the port and the circuit were broken;
- modeling selected ones of the circuit portions by defining sets of the primitive circuit elements interconnected to implement such selected circuit portions, a first and second primitive circuit element being interconnected at associated ports thereof by equating the parameters of the input and output wires of a port of the first primitive circuit element with the parameters of the output and input wires, respectively, of the associated port of the second primitive circuit element, each such set of primi-

tive circuit elements representing a structural specification of a corresponding one of the selected circuit portions; verifying the circuit design of each selected circuit portion by using the computer and theorem proving system to determine whether the set of interconnected primitive circuit elements which implement the selected circuit portion satisfies the behavior specification for such portion; and modeling non-selected circuit portions which are identical to selected portions which have been verified using the behavior specification for such non-selected portions, so that circuit portions which are identical need only be verified once.

4,872,127

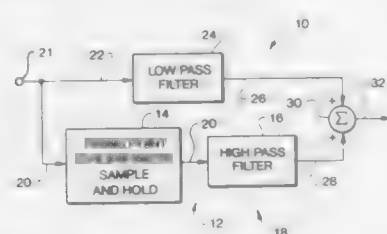
RIPPLE REJECTION FILTER

Dennis C. Nolan, West Allis, Wis., assignor to MagneTek, Inc., Los Angeles, Calif.

Filed Jan. 7, 1988, Ser. No. 142,688
Int. Cl.⁴ G06J 1/00

U.S. Cl. 364-602

39 Claims



1. A ripple rejection filter for filtering ripple from a signal in a phase-control system having an adjustable firing point, the filter comprising:

- first filter means shoving an input for receiving a signal to be filtered and having an output for providing a filtered signal according to a low pass characteristic and a first filter means time constant;
- firing point synchronized sampling means having an input connected to the signal to be filtered and having an output for providing a sampled signal sampled in synchronism with a firing point of a phase control system in which the ripple rejection filter is operating;
- second filter means for receiving the sampled signal and for providing a filtered representation of the sampled signal according to a high pass characteristic with an effective time constant substantially equal to the first filter means time constant; and
- combining means for combining the signals provided by the first and second filter means such that the resulting signal is representative of the signal to be filtered with the ripple substantially rejected.

4,872,128

HIGH SPEED DATA PROCESSING UNIT USING A SHIFT OPERATION

Toru Shimizu, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

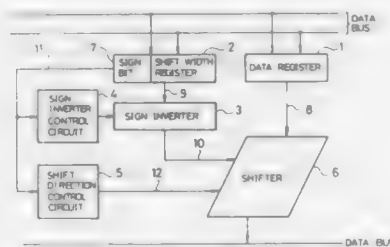
Filed Feb. 17, 1988, Ser. No. 156,766
Claims priority, application Japan, Jan. 30, 1987, 62-164339
Int. Cl.⁴ G06F 7/00, 15/00; G11C 19/00

U.S. Cl. 364-715.08

4 Claims

- A data processing unit comprising: a data register for storing data to be shifted; a shift width register for storing shift width data for specifying that said data to be shifted be moved by a predetermined shift width; an absolute value generator responsive to a sign of said shift width data to compute and store an absolute value of said shift width data;

a shift direction control circuit responsive to said sign of said shift width data to control a shift direction; and



a shifter for moving said data to be shifted by a shift width specified by the absolute value of said shift width data to a direction determined by said shift direction control circuit.

4,872,129

DIGITAL DECIMATION FILTER

Heinrich Pfeifer, Denzlingen; Werner Reich, Emmendingen, and Martin Winterer, Freiburg, all of Fed. Rep. of Germany, assignors to Deutsche ITT Industries, GmbH, Freiburg, Fed. Rep. of Germany

Filed Nov. 18, 1988, Ser. No. 272,968
Claims priority, application European Pat. Off., Dec. 12, 1987, 87118434.7

U.S. Cl. 364-724.1

Int. Cl.⁴ G06F 15/31

7 Claims



1. A digital filter circuit for implementing a decimation filter with the transfer function:

$$H(z) = b(1 - z^{-kn})(1 - z^{-n})^{m-1} / (1 - z^{-1})^m,$$

where z is the complex frequency variable, k is an integral parameter for adjusting the bandwidth of the digital filter circuit, m is a number which specifies how many filter sections are cascaded, n is the integral quotient of the input sampling frequency of the input data and the output sampling frequency of the output data, and b is the nearest power of two (2^{-q}) less than or equal to $1/kn^m$, with terms of the form $(1 - z^{-n})$ and $(1 - z^{-kn})$ representing differentiators, and terms of the form $(1 - z^{-1})$ representing integrators, the digital filter circuit comprising a cascade arrangement of the following sections:

- a multiplier that receives an input signal to be filtered and that multiplies the input signal by the factor 2^{-q} ;
- $m-1$ integrators, each of the integrators having an input and an output and comprising: an adder having first and second inputs and a sum output, the adder in each integrator having its first input and its sum output interposed between the input and the output of the integrator; and a delay element having an input and an output, the input of the delay element connected to the output of the adder in the integrator and the output of the delay element connected to the second input of the adder, the delay element introducing a delay equal to the period of the input sampling frequency;
- an m th integrator having an input and an output, the m th integrator comprising: an adder having first and second inputs and a sum output, the adder having its first input and its sum output

interposed between the input and the output of the integrator; and a delay element having an input and an output, the input of the delay element connected to the output of the adder and the output of the delay element connected to the second input of the adder, the delay element introducing a delay equal to the period of the input sampling frequency, the delay element being reset by the output sampling clock to thereby reset the sum; a sampling device switched at the pulse repetition rate of the output sampling clock; $m-2$ differentiators each containing a delay element which introduces a delay equal to the period of the output sampling clock; and an $(m-1)$ st differentiator containing k delay elements which each introduce a delay equal to the period of the output sampling clock.

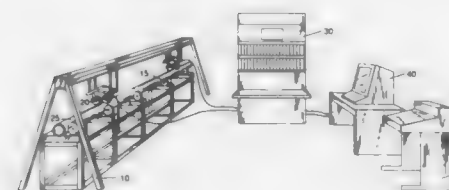
4,872,130

AUTOMATED IN-LINE PIPE INSPECTION SYSTEM

Dominick A. Pagano, 10 Sasqua Trail, Weston, Conn. 06883
Continuation-in-part of Ser. No. 735,334, May 17, 1985, abandoned. This application May 13, 1987, Ser. No. 49,161
Int. Cl.⁴ G01N 29/04

U.S. Cl. 364-507

7 Claims



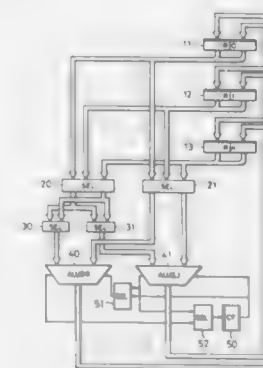
- A real-time ultrasonic pipe inspection system comprising: means for transmitting ultrasonic signals into a pipe presented for inspection and for receiving associated echo signals from within the pipe wall boundaries; first data processing means for selectively enabling the transmission of said ultrasonic signals and for detecting the receipt of said associated echo signals; second data processing means for receiving input data from system input devices and for applying output data to system output devices, said first data processing means being connected to said second data processing means via a communications highway; data storage means, controlled by said second data processing means, for storing predetermined job definition data entered with said system input devices and applied to said first data processing means via said second data processing means and said communications highway; first means, included within said first data processing means for comparing job test data derived from said detected echo signals with said stored job definition data; and second means, included within said second data processing means, and responsive to said comparing means for alerting a system operator to unacceptable variations between said job test data and said job definition data; said transmitting and receiving means comprising a plurality of ultrasonic wheel probes, each of said wheel probes further comprising a rotatably mounted transducer block mounted therein; said transducer block having affixed thereto a yoke with up to nine transducer mounted thereupon; and said transducer block being adjustable so as to align the helical scan angles of each of said transducers as required for inspecting a pipe of a given diameter.

4,872,131
ARITHMETIC-LOGIC OPERATION UNIT HAVING HIGH-ORDER AND LOW-ORDER PROCESSING SECTIONS AND SELECTORS FOR CONTROL OF CARRY FLAG TRANSFER THEREBETWEEN
Kazumi Kubota, Nerima; Kazushi Kobayashi, and Toshihiko Ogura, both of Ebina, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 11, 1988, Ser. No. 192,547
Claims priority, application Japan, May 11, 1987, 62-112353
Int. Cl.⁴ G06F 7/00

U.S. Cl. 364-736

7 Claims



- An arithmetic-logic operation unit for operational processing of two data, comprising: register means including a plurality of registers for storing data, each of said registers being divided at least into two sections, one section for storing a high-order portion of data and the other section for storing a low-order portion of said data; processing means for effecting an operational processing of data supplied from said register means, said processing means including a first processing section for processing a high-order portion of data and a second processing section for processing a low-order portion of said data; and switching means connected between said register means and said processing means for interchanging high-order and low-order portions of data supplied to said processing means.

4,872,132
METHOD AND MEANS FOR BLOCK FLOATING POINT ARITHMETIC

Refael Retter, Haifa, Israel, assignor to Zoran Corporation, Santa Clara, Calif.

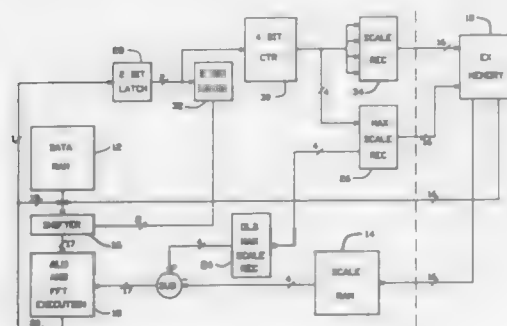
Filed Mar. 13, 1987, Ser. No. 25,329
Int. Cl.⁴ G06F 7/38

U.S. Cl. 364-748

6 Claims

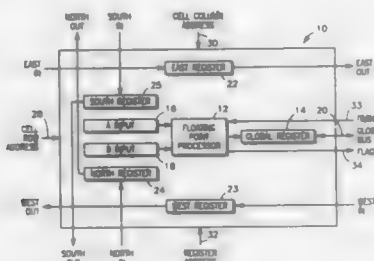
- Circuitry for use with an arithmetic-logic unit operating on block floating-point data where all data have a scale factor associated therewith, said circuitry comprising: a maximum scale register for storing the maximum scale factor of the data in a block stored in memory, first means for receiving the maximum scale factor and data scale factors as data is retrieved from memory for operation by the arithmetic-logic unit and obtaining a difference value between the maximum scale factor and a data scale factor, means responsive to said difference value for adjusting retrieved data by said difference prior to operation

thereon, an overflow register and means responsive to overflow of data from operation by the arithmetic-logic



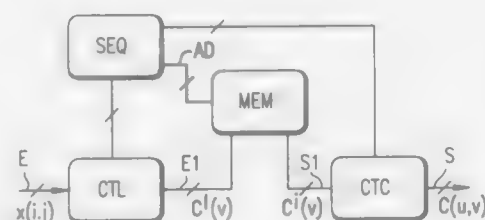
unit for storing scale overflow in said overflow register as a result of data operations.

4,872,133
FLOATING-POINT SYSTOLIC ARRAY INCLUDING SERIAL PROCESSORS
 Steven B. Leeland, Phoenix, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.
 Filed Feb. 18, 1988, Ser. No. 157,682
 Int. Cl.⁴ G06F 7/48
 U.S. Cl. 364-748 11 Claims



1. In a systolic array system utilizing a plurality of semiconductor chips, a semiconductor chip comprising:
 - a plurality of processing elements each including a floating-point serial processor and a plurality of data storage registers;
 - global bus means coupled to the serial processor of each of said plurality of processing elements for inputting and outputting data to and from each chip and for programming each serial processor;
 - a plurality of data buses coupled to each of the plurality of data storage registers of each of said plurality of processing elements; and
 - said global bus means being coupled to said plurality of data storage registers for programming said data storage registers.

4,872,134
SIGNAL PROCESSING INTEGRATED CIRCUIT FOR ROW AND COLUMN ADDITION OF MATRICES OF DIGITAL VALUES
 Joel Cambonie, Fontaine, and Alain Artieri, Meylan, both of France, assignors to SGS Thomson Microelectronics S.A., Paris, France
 Filed Dec. 21, 1987, Ser. No. 135,270
 Claims priority, application France, Dec. 22, 1986, 86 17937
 Int. Cl.⁴ G06F 7/52
 U.S. Cl. 364-768 4 Claims



1. An integrated circuit for the digital processing of signals that transforms input signals, representing a matrix of digital values where i is a row index and j is a column index of the matrix, to produce output signals representing coefficients $C(u,v)$ by a double addition, having the form:

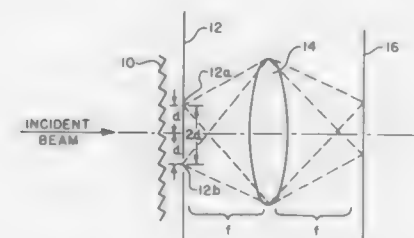
$$C(u,v) = \sum_{i=0}^{n-1} C^i(v)g(i,u)$$

with

$$C^i(v) = \sum_{j=0}^{n-1} x(i,j)f(j,v)$$

- n is an integer value greater than 0 representing $n \times n$ matrix of digital values;
 f is an assignment row coefficient for row i ;
 g is a column assigned coefficient of the column v ; said circuit comprising:
- a first adding circuit, capable of receiving the signals representing the digital values $x(i,j)$ and of producing signals representing the coefficient values $C^i(v)$;
 - a buffer memory capable of recording said produced signals and then restoring them, the addressing of this memory being organized in n rows and n column;
 - a second adding circuit capable of receiving, in succession, the signals representing said values $C^i(v)$ and producing signals representing the values $C(u,v)$;
 - a sequencer to address the memory, to give the memory successive addresses of said value $C^i(v)$ to be recorded, coming from the first adding circuit, or to be restored to the second adding circuit;
- wherein the sequencer alternately gives a sequence of nxn addresses, row by row, then a sequence of nxn addresses, column by column, with a read operation followed by a write operation being performed for each address given by the sequencer.

4,872,135
DOUBLE PINHOLE SPATIAL PHASE CORRELATOR APPARATUS
 Phillip R. Peterson, Albuquerque, and Joseph M. Geary, Edgewood, both of N. Mex., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.
 Filed Dec. 7, 1984, Ser. No. 679,333
 Int. Cl.⁴ H06G 9/00
 U.S. Cl. 364-822 6 Claims



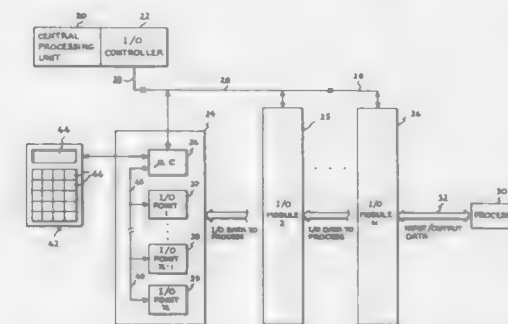
1. A double pinhole spatial phase correlator apparatus comprising in combination:
 - an aperture plate with a first and second pinhole spaced symmetrically about a center line which is perpendicular to said aperture plate, said aperture plate receiving a random wavefront which is incident to said aperture plate, the spacing of said first and second pinhole being variable within a predetermined limit;
 - a Fourier transform lens means positioned symmetrically about said center line of said aperture plate substantially parallel thereto and at a distance therefrom equal to said focal length f , and
 - a detector means formed in a plane substantially parallel to both said aperture plate and said Fourier transform lens means, said detector means symmetrically positioned about said center line of said aperture plate, said detector means positioned at a distance equal to said focal length f from said Fourier transform lens means, said wavefront being applied through said first and second pinhole to said Fourier transform lens means, said Fourier transform lens means forms a Fourier transform of said wavefront which is applied to said detector means to provide the wavefront phase correlation function.

4,872,136
PROGRAMMABLE CONTROLLER INPUT/OUTPUT COMMUNICATIONS SYSTEM
 Joseph J. Cieri, Madison; Mark J. Kocher; Ronald E. Gareis, both of Charlottesville; Kenneth M. Holet, Earlysville, and Michael J. Tusso, Afton, all of Va., assignors to Ge Fanuc Automation North America, Inc., Charlottesville, Va.
 Filed Jun. 4, 1984, Ser. No. 617,179
 Int. Cl.⁴ G06F 11/34, 13/00
 U.S. Cl. 364-900 13 Claims

1. In a programmable controller input/output system of the type having a plurality of input/output modules, each adapted to be located in proximity to a process being controlled, circuitry for use in such modules, comprising:
 - output control means responsive to be activated and deactivated by a command signal;
 - an operations controller generating at least one control signal in the form of sequential pulse frames, each frame of which contains a series of pulses, at least the first two of which define a control status for the output control means, and a time interval without pulses defining the end of the frame whenever said interval reaches a first pre-selected time duration;
 - a communications and control section receiving said control signal and including means responsive to said first two pulses to provide said command signal for activating and deactivating said output control means in accordance with

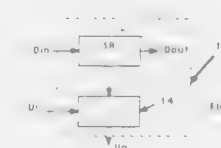
said control status for each frame and first means responsive to said time interval for synchronizing operation of said communications and control section with each frame and second selector mean responsive to said time interval to cause said output control means to assume a pre-selected state whenever the time duration of said interval reaches a second pre-selected value;
 sensing means providing status signals indicative of the operative condition of said output control means; and wherein said communications and control section includes

- (i) coding means receiving said status signals and responsive thereto to produce a diagnostic signal which is updated on each frame of said control signal and first



- selector means for transmitting said diagnostic signal to said operations controller on each frame of said control signal;
- (ii) a hold last state (HLS) latch providing an HLS value, said HLS latch being responsive to a first pre-selected pulse of said series of pulses to be updatable in each frame of the control signal;
 - (iii) a default latch providing a default value, said default latch being responsive to a second pre-selected pulse of said series of pulses to be updated on each frame of the control signal; and
 - (iv) said second selector means includes logic means causing said pre-selected state to be the state from a preceding frame of the control signal or the default value, depending on the HLS value.

4,872,137
REPROGRAMMABLE CONTROL CIRCUIT
 Earle W. Jennings, III, 965 Spadaforte Ct., San Jose, Calif. 95125
 Filed Nov. 21, 1985, Ser. No. 800,509
 Int. Cl.⁴ G06F 1/00; G11C 19/00
 U.S. Cl. 364-900 26 Claims



1. An integrated circuit comprising:
 - a bit shift register for serially receiving and storing a serial bit signal, and having a control output signal; said control signal represents the state of the serial input bit signal stored in said register; and
 - a transmission gate means for receiving an input signal and said control signal and having an output signal, said trans-

mission gate means for transmitting said input signal to said output signal as controlled by said control signal.

4,872,138

TRANSPARENT CACHE MEMORY

Franco Ciacchi, Magenta, Italy, assignor to Bull HN Information Systems Italia S.p.A., Caluso, Italy

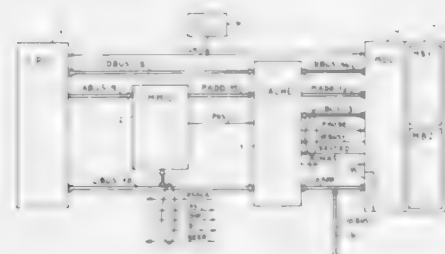
Filed May 16, 1988, Ser. No. 194,365

Claims priority, application Italy, Jun. 3, 1987, 20767 A/87

Int. Cl.⁴ G11C 13/00

U.S. Cl. 365-49

4 Claims



1. Transparent cache memory for a data processing system in which a central processing unit (CPU) requests the information from a working memory, accessible by other system units, comprising:

an input address bus (PADD) for receiving from said CPU a current memory address;

an input control bus for receiving a read/write control signal and a signal identifying the information to be written or read out as an instruction or a data,

characterized by that said cache memory comprises:

a current memory address latching register (20,21) for latching the address received from said input address bus,

an incrementing register (23) for latching a next subsequent memory address, equal to the address received from said input address bus, incremented by one,

a first (26) and a second (27) latching register having inputs connected to the outputs of said incrementing register (23) for latching said next memory address, respectively when said next memory address is an instruction address or a data address,

a first multiplexer (32) having inputs connected to the outputs of said incrementing register (32) and to the outputs of said current memory address latching register (21) for selectively transferring on an address output channel (MADD) said current memory address or said next memory address,

an input bus (DBUS 14) for receiving information read out from said working memory,

a third (28) and a fourth (29) latching register, having inputs connected to said input bus for storing the information read out from said working memory, respectively when said information is an instruction or a data,

a second multiplexer (33) having inputs connected to said input bus (DBUS 14) and to the outputs of said third (28) and fourth (29) register for selectively transferring in output the information present on said input bus, or in output from said third or fourth register,

an output register (30) having inputs connected to the output of said second multiplexer and outputs connected to an output bus (DBUS 8) for storing the information present at the output of said second multiplexer,

a first (24) and a second (25) comparator for comparing the current address present on said input address bus and the address latched in said first (26) and second (27) latching registers, and for a respectively providing an instruction HIT or a data HIT signal, in case of address coincidence,

logical control means (40) operative in response to said HIT signals and to the signals present on said input control bus: in case of instruction or data HIT to transfer through said second multiplexer and to load in said output register, the information presented in said third or fourth register respectively, to transfer through said first multiplexer, to said working memory, the address stored in said incrementing register, to start a memory read operation at said next address and to load said third or fourth register with the information read out from said working memory and said first or second register with the next address in output from said incrementing register;

in case of no HIT, to transfer in a first time phase, through said first multiplexer, to said working memory, the current address stored in said current address latching register, to start a memory read operation at said current address and to load, through said second multiplexer, in said output register (30) the information read out from memory and received through said input bus, and to transfer, in a second time phase, to said working memory and through said first multiplexer, said next address, stored in said incrementing register, to start a second memory read operation at said next address and to load the information read out from memory in said third or fourth register respectively and the address contained in said incrementing register in said first or second register respectively, depending on whether the information previously read out from memory at the current address was an instruction or a data.

4,872,139

MEMORY PROTECTION DEVICE FOR AN ELECTRONIC APPARATUS

Kazuhiko Okamoto, Nara, and Akira Kanayama, Yamatokoriyama, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

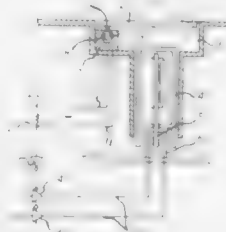
Filed Jan. 12, 1987, Ser. No. 2,194

Claims priority, application Japan, Jan. 21, 1986, 61-7437

Int. Cl.⁴ G11C 5/02; H02B 5/00; H01H 9/20

U.S. Cl. 365-52

10 Claims



1. A memory protection device for an electronic apparatus, the electronic apparatus having a cartridge storage compartment for accommodating a memory cartridge, the memory cartridge storing data for the electronic apparatus, comprising: a lid connected to the cartridge storage compartment; sensor means, responsive to said lid, for detecting an opened condition of said lid; and disconnecting means, responsive to said sensor means, for electrically disconnecting the memory cartridge from a control unit of the electronic apparatus when said lid is in the opened position and the memory cartridge is installed within the cartridge storage compartment.

4,872,140

LASER PROGRAMMABLE MEMORY ARRAY

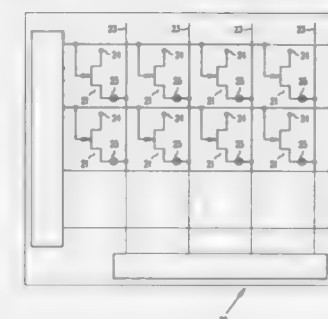
Andrew C. Graham, and David C. MacMillan, both of Sunnyvale, Calif., assignors to Gazelle Microcircuits, Inc., Santa Clara, Calif.

Filed May 19, 1987, Ser. No. 51,971

Int. Cl.⁴ G11C 17/00

U.S. Cl. 365-96

6 Claims



1. A programmable semiconductor memory cell array comprising:

a word line;

first and second bit lines positioned orthogonal to said word line;

first and second field effect transistors positioned between the bit lines, each having respective first and second drain/source regions;

the second drain-source region of the first field effect transistor and the first drain/source region of the second field effect transistor being a common region;

a first laser programmable link connecting the first drain/source region of the first field effect transistor and the first bit line; and

a second laser programmable link connecting the second drain/source region of the second field effect transistor and the second bit line.

4,872,141

RADIATION HARD MEMORY CELL HAVING MONOCRYSTALLINE AND NON-MONOCRYSTALLINE INVERTERS

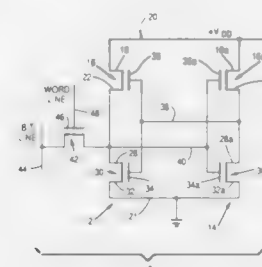
Dora Plus, South Bound Brook, and Alfred C. Iprì, Princeton, both of N.J., assignors to General Electric Company, Schenectady, N.Y.

Filed Sep. 12, 1988, Ser. No. 243,367

Int. Cl.⁴ G11C 11/00, 7/02; H03K 3/26; H01L 27/02

U.S. Cl. 365-154

4 Claims



1. A memory cell comprising:

a first inverter having a low output impedance and comprising a pair of field effect transistors each having source, drain, and channel regions of a monocrystalline semiconductor; and

a second inverter, cross-coupled to said first inverter, said second inverter having a high output impedance and comprising a pair of field effect transistors each having source, drain, and channel regions of a non-monocrystalline semiconductor, wherein the area occupied by the second inverter having a high output impedance is smaller than the area occupied by the first inverter having a low output impedance.

source, drain and channel regions of a non-monocrystalline semiconductor, wherein the area occupied by the second inverter having a high output impedance is smaller than the area occupied by the first inverter having a low output impedance.

4,872,142

SEMICONDUCTOR MEMORY DEVICE WITH IMPROVED BIT LINE ARRANGEMENT

Seiichi Hannai, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

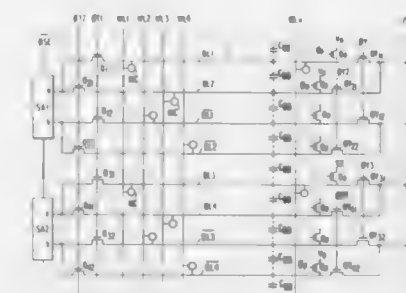
Filed Oct. 21, 1987, Ser. No. 110,825

Claims priority, application Japan, Oct. 21, 1986, 61-251015

Int. Cl.⁴ G11C 7/00

U.S. Cl. 365-189.07

5 Claims



1. A semiconductor memory device comprising:

first to fourth bit lines arranged consecutively in parallel, said second and third bit lines being located between said first and fourth bit lines, said second bit line being located between said first and third bit lines, said third bit line being located between said second and fourth bit lines;

first to fourth memory cells coupled to said first to fourth bit lines, respectively;

first to fourth word lines coupled to said first to fourth memory cells, respectively, enablement of said first word line and said first to fourth bit lines providing read out of only said first memory cell, enablement of said second word line and said first to fourth bit lines providing read out of only said second memory cell, enablement of said third word line and said first to fourth bit lines providing read out of only said third memory cell, enablement of said fourth word line and said first to fourth bit lines providing read out of only said fourth memory cell;

a sense amplifier having a pair of input terminals;

means for selecting one of said word lines;

a first transfer circuit for simultaneously connecting said first and third bit lines to said pair of input terminals of said sense amplifiers;

a second transfer circuit for simultaneously connecting said second and fourth bit lines to said pair of input terminals; and

means for enabling said first transfer circuit to thereby amplify a signal difference between said first and third bit lines by said sense amplifier when one of said first and third word lines is selected by said selecting means, said second and fourth bit lines not being provided with a signal from any one of the memory cells when one of said first and third word lines is selected, said first and third bit lines not being provided a signal from any one of the memory cells when one of said second and fourth word lines is selected.

4,872,143

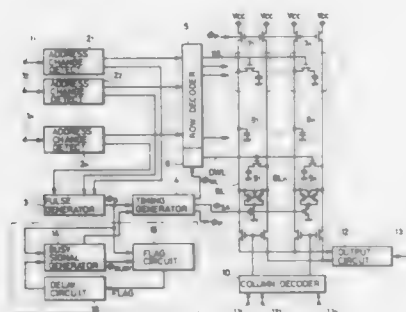
PSEUDO STATIC RANDOM ACCESS MEMORY
EMPLOYING DYNAMIC MEMORY CELLSTadashi Sumi, Hyogo, Japan, assignor to Mitsubishi Denki
Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 13, 1987, Ser. No. 120,425

Claims priority, application Japan, Nov. 14, 1986, 61-272145
Int. Cl.⁴ G11C 8/00

U.S. Cl. 365—233.5

7 Claims



1. A semiconductor memory comprising:
an array formed by a plurality of dynamic memory cells;
peripheral circuit means for executing internal operation for writing/reading data in/from said memory cells within a prescribed period;
means for supplying an address signal for writing/reading said data in/from each of said memory cells;
means for detecting change in said address signal;
means for generating timing signals for controlling said internal operation of said peripheral circuit means in response to said detected address signal change; and
means for temporarily storing a subsequent address signal change until completion of preceding internal operation of said peripheral circuit means responsive to first address signal change when said address signal continuously changes in said prescribed period and for supplying said stored subsequent address signal change to said timing signal generation means upon completion of said preceding internal operation of said peripheral circuit means responsive to said first address signal change.

4,872,144

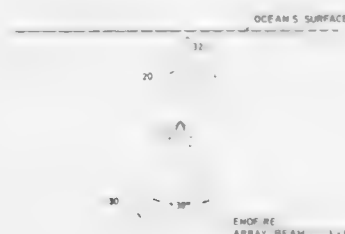
ENDFIRE SEISMIC RECEIVER AND METHOD OF USE
Dewey R. Young, Houston, and Richard E. Duren, Spring, both
of Tex., assignors to Exxon Production Research Company,
Houston, Tex.

Filed Oct. 31, 1988, Ser. No. 265,418

Int. Cl.⁴ G01V 1/00, 1/20

U.S. Cl. 367—20

11 Claims



1. An endfire seismic array, comprising
a marine cable with a plurality of hydrophones spaced along
the length of said cable,
means for orienting said cable in a substantially axial direc-

tion toward a seismic target irradiated by seismic radiation from a seismic source, said plurality of hydrophones receiving respective seismic reflections caused by target irradiation at time intervals dependent of their respective axial distances from the target, said hydrophones converting said respective received acoustic energy to corresponding respective electrical signals, and
means for respectively phasing said respective electrical signals so that the phased electrical signals are additive, thereby producing pencil beams for frequencies across the seismic band.

4,872,145

NOISE TRAP CIRCUIT

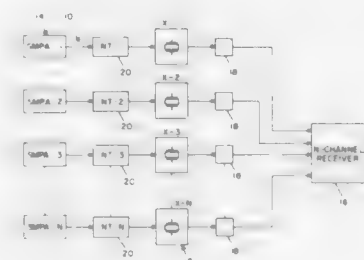
James A. Culbert, Hingham, and Daniel M. Seslar, Weymouth,
both of Mass., assignors to Hazeltine Corporation, Green-
lawn, N.Y.

Filed May 4, 1987, Ser. No. 45,929

Int. Cl.⁴ G01S 9/66

U.S. Cl. 367—87

24 Claims



1. A noise trap circuit, comprising:
input terminal means for connecting with an input signal from a signal source, the input signal including relatively large signals and noise comprised of relatively small signals;
output terminal means;
blocking means connected between said input and said output terminal means, for establishing a high impedance path between said input and said output terminal means to the small signals forming said noise in the input signal, and for establishing a low impedance path between said input and said output terminal means to the large signals in said input signal;
shunt means associated with said output terminal means, for establishing a low impedance shunt to attenuate substantially said small signals at said output terminal means when said shunt means is in an on state, and for allowing said large signals to appear substantially unattenuated at said output terminal means when said shunt means is in an off state; and
feedback means coupled to said shunt means for sensing said large signals in the input signal, and for maintaining said shunt means in said on state in the absence of said large signals and maintaining said shunt means in said off state when said large signals are sensed;
wherein said output terminal means provides said relatively large signals absent said noise.

4,872,146

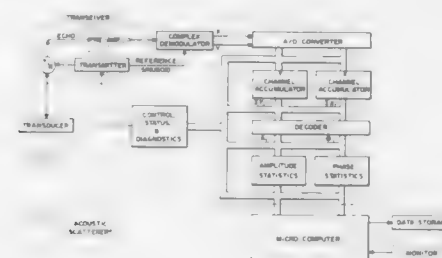
METHOD AND APPARATUS FOR SIMULATING PHASE
COHERENT SIGNAL REFLECTIONS IN MEDIA
CONTAINING RANDOMLY DISTRIBUTED TARGETS
David M. Farmer, Saanichton, and R. Del Huston, Victoria,
both of Canada, assignors to Canadian Patents & Develop-
ment Limited, Ottawa, Canada

Filed May 23, 1988, Ser. No. 197,386

Int. Cl.⁴ H01S 9/66

U.S. Cl. 367—87

11 Claims



1. A method of simulating phase coherent signal reflection in a medium containing a random distribution of targets capable of scattering signals transmitted through said medium, wherein the energy of signals directly scattered by said targets is significantly greater than the energy of signals which are scattered multiple times by said targets, said method comprising the steps of:

- (a) modulating a reference signal having a wave-length " λ " which is small in comparison to the expected mean spacing between said targets;
- (b) transmitting said modulated reference signal through said medium, whereby said targets produce scattered echoes of said modulated reference signal;
- (c) receiving said scattered echo signals;
- (d) for each of said received signals, deriving an in-phase component "I", and a quadrature component "Q";
- (e) summing and normalizing said in-phase components to obtain "I";
- (f) separately summing and normalizing said quadrature components to obtain "Q"; and
- (g) cumulatively repeating steps (a) through (f) "n" times, until the variance of said cumulative, separately summed, normalized in-phase and quadrature components becomes a linear function of 1/n; and,
- (h) calculating the amplitude "A" and the phase " ϕ " of said simulated signal reflection as:

$$A = \sqrt{I^2 + Q^2}$$

and $\phi = \arctan (Q/I)$.

4,872,147

SYSTEM FOR THE CONTROL OF A MEMBER FOR
FOLLOWING A MOVING OBJECT, AN AUTOMATIC
MILKING APPARATUS AND A METHOD FOR
AUTOMATIC MILKINGMaximus A. Hilhorst, Werkhoven, Netherlands, assignor to
Multinorm B.V., Netherlands

Filed Dec. 22, 1986, Ser. No. 944,855

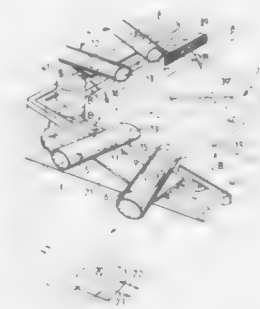
Claims priority, application Netherlands, Dec. 27, 1985,
944,855Int. Cl.⁴ G01S 9/66

U.S. Cl. 367—96

15 Claims

1. A system for the control of a movable member for following a moving object, comprising a following member, means for moving the following member, a sensing system for sensing the position of an object relative to a moving member and including at least two sensor units disposed on the following member in fixed relation to each other in a sensing space, each

sensor unit comprising a transmitter for periodically transmitting ultrasonic waves and a receiver for the reception of reflections of the periodically transmitted ultrasonic waves as reflected by the moving object, said sensing system also including conversion means connected to the transmitter and the receiver for measuring the interval of time which elapses be-



tween the emission of an ultrasonic wave by the transmitter and the reception of the reflected wave from such emission and for converting each envelope of the reflected ultrasonic waves into control signals for steering the means for moving the following member, the means for moving being arranged so that the following member can follow a moving object under the control of the control signals of the conversion means.

4,872,148

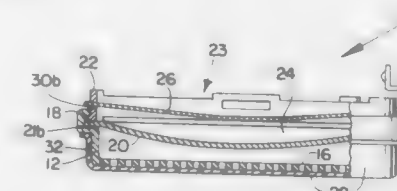
ULTRASONIC TRANSDUCER FOR USE IN A
CORROSIVE/ABRASIVE ENVIRONMENTJohn P. Kirby, Peabody, and Richard Paglia, Carlisle, both of
Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Mar. 8, 1984, Ser. No. 587,706

Int. Cl.⁴ H04R 15/00

U.S. Cl. 367—172

15 Claims



1. An electroacoustical transducer assembly comprising:
a backplate;
a first diaphragm extending across one major surface of said backplate;
means for equalizing the pressure of gases on opposite sides of said first diaphragm;
means for activating said first diaphragm to propagate acoustical energy in a direction away from said backplate; and
means for precluding foreign particles in the gaseous operating environment of said assembly from impinging upon the outwardly disposed face of said first diaphragm, said foreign particle precluding means including a second diaphragm disposed over and spaced from said first diaphragm, said second diaphragm being activated by said acoustical energy to in turn propagate acoustical energy outwardly of said assembly in a direction away from said backplate.

4,872,149

ELECTRONIC ADVERTISING SYSTEM FOR SOLAR POWERED PARKING METER

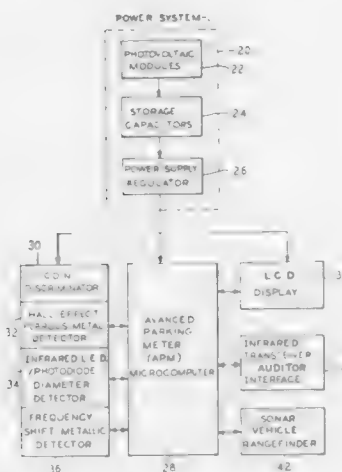
Gary W. Spear, Little Rock, Ark., assignor to POM, Incorporated, Russellville, Ark.

Continuation-in-part of Ser. No. 37,252, Apr. 16, 1987. This application Mar. 25, 1988, Ser. No. 173,743

Int. Cl.⁴ G04F 3/00

U.S. Cl. 368-90

4 Claims



1. An electronic parking meter, comprising: a microprocessor connected to a memory for storing a message having a plurality of characters; electronic display means on said parking meter connected to said microprocessor via at least one driver with serial to parallel interface, said electronic display having at least a plurality of multi-segment sections and symbol sections; means for timing connected to said microprocessor and said display providing at least a first clock pulse signal; said microprocessor causing said display in said multi-segment sections to display at least a selected number of characters from said plurality of characters of said message in said memory during a first time period, said first clock pulse signal determining said first time period, said microprocessor causing said display to display time remaining digits in said multi-segment sections during a second time period, also determined by said first clock pulse signal, said first time period alternating with said second time period, said means for timing providing a second clock pulse signal different from said first clock pulse signal and said microprocessor causing said display to activate at least some of said symbol sections at a time rate determined by said second clock pulse signal.

4,872,150

BINARY SYMBOLS FOR NUMBERS

Murry A. Norman, 164 Arthur Street, Auckland, New Zealand
Continuation of Ser. No. 895,781, Aug. 12, 1986, abandoned.

This application Nov. 30, 1987, Ser. No. 124,858

Claims priority, application New Zealand, Sep. 9, 1985, 111405

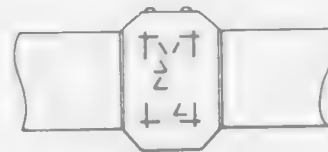
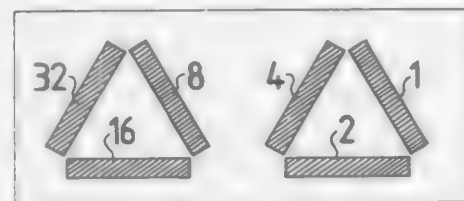
Int. Cl.⁴ G04B 19/08

U.S. Cl. 368-223

2 Claims

1. Apparatus for conveying time and date information by way of at least one array, each array containing at least one pictorial image presented on a plane having no visible fittings, each of said pictorial images having no meaning attached to its shape but by its presence in an array indicating the integer 1 and by one of its absence and its diminishment indicating the integer 0, whereby each of said at least one arrays represents a binary number indicating at least one of seconds, minutes, hours, days of the week, days of the month, months, seasons and years, said at least one image in said at least one array being

positioned relative to a reference not forming part of said at least one array and not forming part of said at least one image



in said at least one array notwithstanding the presence, absence or diminishment of other images in any said array.

4,872,151

COMPACT DISC PLAYER CAPABLE OF PLAYING PLURAL SELECTIONS RECORDED ON A COMPACT DISC IN A PRESELECTED SEQUENCE

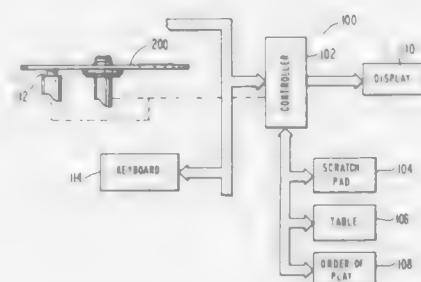
Michael A. Smith, Slidell, La., assignor to Bennie C. Fulkerson, Slidell, La., a part interest

Continuation-in-part of Ser. No. 830,620, Feb. 19, 1986, abandoned. This application Sep. 2, 1986, Ser. No. 903,809

Int. Cl.⁴ G11B 15/06

U.S. Cl. 369-14

23 Claims



1. A compact disc player for reproducing signals from a compact disc loaded therein, the disc having digitally encoded, reproducible data recorded thereon organized in a plurality of spiralling tracks, each of the tracks recording a different selection of reproducible data and having a track width defined by an outermost boundary and an innermost boundary, the number of tracks and the track widths on a disc defining a disc identification code for such disc, said disc player comprising: means for receiving a compact disc upon loading of such disc thereinto; means for scanning a disc loaded into said receiving means to sense the track boundaries of tracks on a disc loaded into said receiving means and for generating a signal upon detecting of each track boundary on the disc; a memory for storing disc identification codes and order or play data corresponding to preselected compact discs; means for generating output signals from the digitally en-

coded data on a compact disc located in said receiving means; and control means connected to said scanning means, said memory, and said output signal generating means and responsive to signals from said scanning means for determining the disc identification code of the loaded disc, comparing the determined disc identification code with disc identification codes already stored in said memory and when a comparison is found reading from said memory the corresponding order of play data, and causing said output signal generating means to generate output signals from the digitally encoded data in the tracks on the loaded compact disc in a track order defined by the read order of play data to reproduce the different selections of reproducible data in such track order sequence.

4,872,152

LIGHT SPOT POSITION CONTROL SYSTEM AND METHOD BY SAMPLED SERVO

Toshiaki Tsuyoshi, Kokubunji; Masatoshi Ohtake, Ome; Wasao Takasugi, Higashiyamato, and Seiji Yonezawa, Kachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

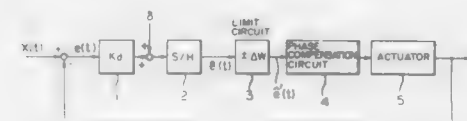
Filed Dec. 11, 1987, Ser. No. 131,643

Claims priority, application Japan, Dec. 19, 1986, 61-301250

Int. Cl.⁴ G11B 7/00

U.S. Cl. 369-44

8 Claims



1. A light spot position control system comprising: error detection means for irradiating with a light spot a recording medium having servo areas and data areas alternately provided along a track and for sampling and detecting error signals from light obtained from the servo areas; limiter means coupled with said error detection means for limiting the amount of change between successive sampled and detected error signals to fall within a predetermined range, thereby outputting a limited error signal; and a position control mechanism for controlling a position of said light spot on the basis of an output of said limiter means.

4,872,153

DETECTING LIGHT SPOT MOVEMENT DIRECTION FOR AN OPTICAL DISK

Hiromi Seo, Odawara, and Osami Kushizaki, Hiratsuka, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

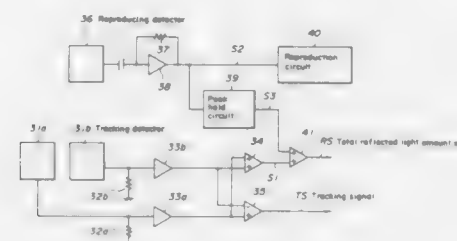
Filed Apr. 8, 1988, Ser. No. 179,389

Claims priority, application Japan, Apr. 10, 1987, 62-87140

Int. Cl.⁴ G11B 7/00

U.S. Cl. 369-44

8 Claims



1. An apparatus for generating and processing a total reflected light amount signal in an optical disk unit, comprising: a pair of detector means, each for detecting the reflected

light from a light spot projected onto and moved relative to an optical disk containing information and respectively producing two electrical signals correlated to the amount of light reflected onto said pair of detector means; first adder means for summing said two electrical signals and producing a summation signal correlated to the sum of said two electrical signals; means for producing a read signal from the reflected light of the light spot so that said read signal is correlated to the formation contained on the optical disk; first means for processing said read signal and producing an electrical information signal correlated to the amplitude of said read signal; second adder means for adding said information signal and said summation signal and thereby producing a total reflected light amount signal correlated to the sum of said summation signal and said information signal; and second means for processing said total reflected light amount signal to thereby produce a signal indicating the direction of relative movement between the light spot and the optical disk.

4,872,154

METHOD FOR RECORDING INDICIA FOR INDICATING PRESENCE OR ABSENCE OF ERROR IN MEDIUM AFTER ERROR CHECKING AND APPARATUS THEREFOR

Wataru Sakagami, and Katsumi Iijima, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

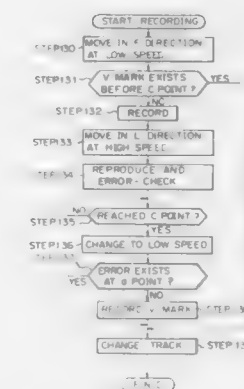
Filed Sep. 17, 1987, Ser. No. 98,066

Claims priority, application Japan, Sep. 22, 1986, 61-222171; Sep. 22, 1986, 61-222172; Feb. 20, 1987, 62-35898; Feb. 20, 1987, 62-35899; Mar. 31, 1987, 62-78014

Int. Cl.⁴ G11B 7/00

U.S. Cl. 369-54

12 Claims



1. A method for recording information comprising the steps of: recording information in a first recording area of an information recording medium, the information recording medium having a plurality of recording areas; reproducing the recorded information and error-checking the reproduced information; and recording an indicia indicating absence of error at a portion of the first recording area in accordance with the result of the error-checking step.

4,872,155

CLOCK GENERATOR CIRCUIT AND A SYNCHRONIZING SIGNAL DETECTION METHOD IN A SAMPLED FORMAT SYSTEM AND A PHASE COMPARATOR CIRCUIT SUITED FOR GENERATION OF THE CLOCK

Fumihiko Yokogawa; Hiroyuki Hirano, and Keiji Kinpara, all of Tokorozawa, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

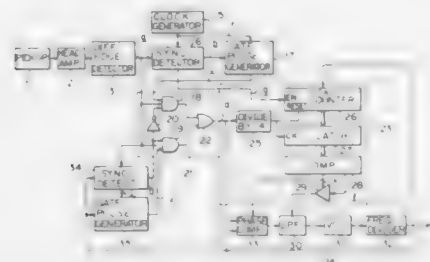
Filed Mar. 1, 1988, Ser. No. 162,625

Claims priority, application Japan, Mar. 13, 1987, 62-59749; Mar. 13, 1987, 62-59746; Sep. 16, 1987, 62-231748; Dec. 17, 1987, 62-319563

Int. Cl.⁴ G11B 5/76

U.S. Cl. 369-59

3 Claims



1. A recording-reproducing clock generator circuit for generating a reproduced clock having a predetermined frequency from a read out signal which includes such pulses that the interval between two successive pulse thereof at a predetermined length is to be used as a synchronizing signal region, said reproduced clock signal synchronized with clock edge pulses located at predetermined positions with reference to said synchronizing signal region, said recording-reproducing clock generator circuit comprising:

- first clock generator means for generating a reference clock at a predetermined frequency;
- first sync detector means for generating a first sync signal detection signal when a value obtained by measuring the distance between two successive pulses in the input signal by means of said reference clock is equal to a predetermined value;
- separating means for separating the clock edge pulses from the input signal according to said first sync signal detection signal and outputting the pulses; and
- second clock generator means for generating a reproduced clock having the predetermined frequency in synchronism with said clock edge pulses outputted from said separating means.

4,872,156

RECORD CARRIER WITH A PREFORMED INFORMATION TRACK FOR RECORDING INFORMATION WITH A RADIATION BEAM

Christiaan Steenbergen, Colorado Springs, Colo., and Dirk J. Gravestelja, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 129,415, Nov. 25, 1987, abandoned, which is a continuation of Ser. No. 906,639, Sep. 10, 1986, abandoned, which is a continuation of Ser. No. 524,730, Aug. 19, 1983, abandoned. This application Feb. 8, 1989, Ser. No. 308,977 Claims priority, application Netherlands, May 9, 1983, 5301631

Int. Cl.⁴ G11B 7/24

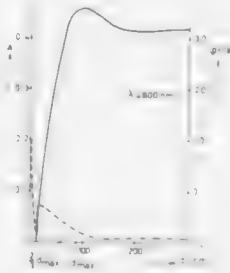
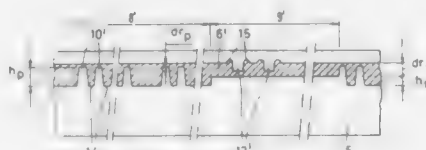
U.S. Cl. 369-275

6 Claims

1. An optical disc record carrier for storing information which is recorded thereon and read therefrom by a beam of radiation which scans the record carrier during rotation thereof; said record carrier comprising a substrate transparent to such radiation and which has a first planar surface defining an entrance surface for such radiation, a second planar surface

opposite said entrance surface, and a plurality of elongated generally parallel ridges projecting from said second surface; each ridge having a top surface spaced from said second surface, said ridges being spaced from each other by lands there-between which are coplanar with said second surface; and a radiation reflective recording layer extending over said top surfaces of said ridges and over said lands; characterized in that:

each ridge constitutes a track for recording and reading information thereon by a scanning beam if radiation directed through the entrance surface of said substrate which passes through said ridge and scans the recording layer on the top surface thereof in the length direction along such ridge, the reflectivity of said recording layer on said top surface being reduced in areas thereof where the scanning beam incident thereon is of a write intensity, whereby the reflectivity of said recording layer on said ridges varies in the length direction along said ridges in accordance with information recorded on such layer by said scanning beam;



the spacing between the top surface of each of said ridges and said second surface produces a phase difference between radiation reflected from such top surface and from the adjoining lands during scanning by said scanning beam, such phase difference constituting a differential tracking signal for guiding said beam to follow said ridges during such scanning;

said recording layer fills the spaces between said ridges and has a flat surface spaced from the top surfaces of said ridges and which is parallel to said second surface of said substrate, whereby said recording layer is of lesser thickness on the top surface of each of said ridges than on the lands there-between; and

the thickness of said recording layer on the top surface of said ridges is at least equal to a reflection neutral thickness at which a further increase in thickness of such layer will not materially increase the reflectivity thereof, whereby the reflectivity of said recording layer is substantially the same on the top surface of said ridges and on said lands except where information has been recorded on said top surfaces by said scanning beam.

4,872,157

ARCHITECTURE AND ORGANIZATION OF A HIGH PERFORMANCE METROPOLITAN AREA TELECOMMUNICATIONS PACKET NETWORK

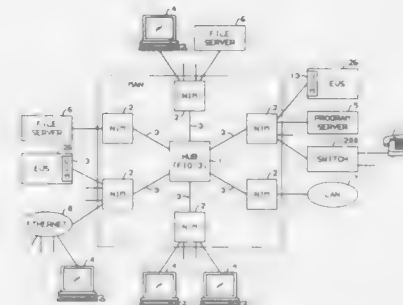
Jayant G. Hemmady; William P. Lidinsky, both of Naperville; Robert K. Nichols, Glen Ellyn; Gaylord W. Richards, Naperville; Gary A. Roediger, Downers Grove; Scott B. Steele, Naperville; Ronald C. Weddige, Western Springs, and Bruce R. Zelle, Naperville, all of Ill., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Mar. 31, 1988, Ser. No. 175,694

Int. Cl.⁴ H04Q 11/04

U.S. Cl. 370-60

14 Claims



1. A data switching network for connecting a plurality of inlets to a plurality of outlets, comprising: circuit switch means for switchably connecting a plurality of inputs and said plurality of outlets; and a plurality of data switch means for assembling and chaining data packets from ones of said plurality of inlets for transmission to one of said outlets and for transmitting said chained data packets to one of said inputs of said circuit switch means for connection to said one outlet.

4,872,158

DISTRIBUTED CONTROL RAPID CONNECTION CIRCUIT SWITCH

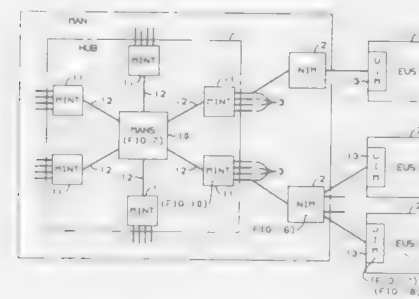
Gaylord W. Richards, Naperville, Ill., assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Mar. 31, 1988, Ser. No. 175,545

Int. Cl.⁴ H04Q 11/04

U.S. Cl. 370-58.1

9 Claims



1. In a circuit switching network for establishing connections between each of a plurality of input terminals on one side and each of a plurality of output terminals on another side, a method of controlling said switching network using a plurality of controllers comprising the steps of: dividing said network into a plurality of disjoint sets of switching and connection elements, wherein each of said disjoint sets is used for establishing a different set of connections from ones of said plurality of terminals on a

first side to all of said plurality of terminals on a second side; assigning to different ones of said plurality of controllers, the control of different ones of said disjoint sets; and responsive to a request to set up a connection, controlling the establishment of a connection using the controller assigned to the disjoint set used for that connection.

4,872,159

PACKET NETWORK ARCHITECTURE FOR PROVIDING RAPID RESPONSE TIME

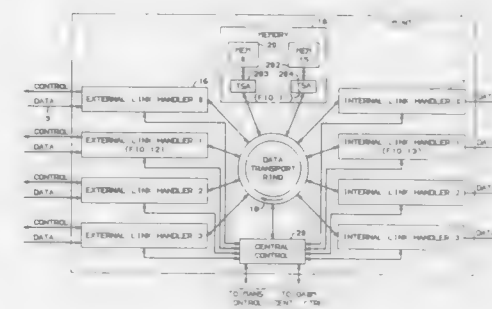
Jayant G. Hemmady; William P. Lidinsky, both of Naperville; Gary A. Roediger, Downers Grove; Scott B. Steele, Naperville; Ronald C. Weddige, Western Springs, and Bruce R. Zelle, Naperville, all of Ill., assignors to American Telephone and Telegraph Company AT&T Bell Laboratories, Murray Hill, N.J.

Filed Mar. 31, 1988, Ser. No. 175,546

Int. Cl.⁴ H04J 3/26

U.S. Cl. 370-60

16 Claims



5. In a data switching system, a method of transmitting data packets each to one of a plurality of outlets, comprising the steps of:

- chaining groups of data packets destined for a common outlet;
- determining for each chained group of data packets whether said group is high priority or low priority;
- transmitting a high priority request for a connection to a circuit switch for each chained group of data packets having high priority; and
- transmitting a low priority request for a connection to said circuit switch for each chained group of data packets having low priority.

4,872,160

INTEGRATED PACKETIZED VOICE AND DATA SWITCHING SYSTEM

Jayant G. Hemmady; William P. Lidinsky; Scott B. Steele, all of Naperville; Werner Ulrich, Glen Ellyn, and Ronald C. Weddige, Western Springs, all of Ill., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Continuation-in-part of Ser. No. 175,547, Mar. 31, 1988. This application Aug. 30, 1988, Ser. No. 238,309

Int. Cl.⁴ H04Q 11/04

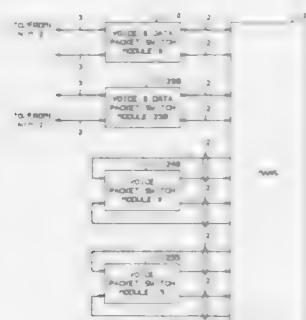
U.S. Cl. 370-60

7 Claims

1. A network for switching first packets, comprising data, and second packets, comprising information representing voice signals, from a plurality of inlets to a plurality of outlets, comprising:

- first and second data switching means; and
- circuit switching means; said first data switching means for switching said first and said second packets received from said inlets to said circuit switching means;

said circuit switching means responsive to said first and said second packets received from said first data switching means for switching said first and said second packets to said outlets and said second data switching means, respectively;



said second data switching means responsive to said second packets received from said circuit switching means for switching said second packets to said circuit switching

means; said circuit switching means further responsive to said second packets received from said second data switching means for switching said second packets to said outlets.

4,872,161

BUS CIRCUIT FOR ELIMINATING UNDESIRABLE VOLTAGE AMPLITUDE

Eisuke Ichinohe, Katano, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

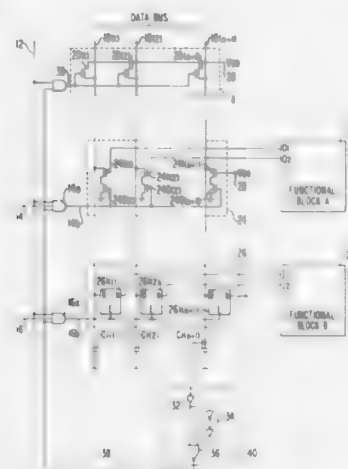
Filed Mar. 21, 1988, Ser. No. 171,469

Claims priority, application Japan, Mar. 19, 1987, 62-64518; Mar. 19, 1987, 62-64523; Mar. 19, 1987, 62-64524

Int. Cl. H04J 3/14

U.S. Cl. 370-85.1

4 Claims



3. A bus circuit comprising:

- a plurality of data bus lines and at least one sensing line;
- a potential initializing means for setting an initial potential of said plurality of data bus lines and said sensing line upon receiving a precharge control signal;
- an output port circuit for supplying data to said plurality of data bus lines upon receiving an output control signal;
- a discharging means for discharging said sensing line upon receiving said output control signal;
- an input port circuit for receiving data from said plurality of data bus lines;
- a data firm judging circuit coupled to said sensing line for

detecting a potential change of said sensing line and for producing a judgement signal;

a control means for deactivating said output port circuit in accordance with judgement signal from said data firm judging circuit, and for activating said potential initializing means to precharge said plurality of data bus lines and said sensing line in accordance with said judgement signal from said data firm judging circuit.

4,872,162

COMMUNICATION SYSTEM

Shotaro Tanaka; Masao Ikezaki, both of Osaka; Yukiko Ono, and Hiroshi Sasanuma, both of Kyoto, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

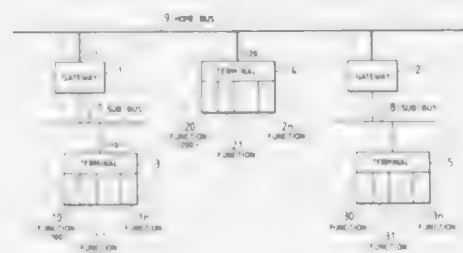
Filed Jul. 18, 1988, Ser. No. 220,725

Claims priority, application Japan, Jul. 20, 1987, 62-180420; Nov. 9, 1987, 62-282474; Nov. 10, 1987, 62-283580

Int. Cl. H04J 3/26

U.S. Cl. 370-85.12

7 Claims



1. A communication system comprising:

- a gateway;
- at least two terminal equipments residing in different communication networks respectively and mutually connected via the gateway, wherein one of the terminal equipments transmits a first communication message to the gateway and the gateway generates a second communication message on the basis of the first communication message and transmits the second communication message to the other of the terminal equipments, wherein each of the terminal equipments includes a plurality of sections, and wherein different addresses are allotted to the gateway, the terminal equipments, and the sections of the terminal equipments respectively;

wherein each of the first and second communication messages comprises a source address, a destination address, a first header information set, at least one data block, and an end code; the source address correspondingly to a first one of the gateway and the terminal equipments from which the related message is transmitted, the destination address correspondingly to a second one of the gateway and the terminal equipments to which the related message is directed, said second one of the gateway and the terminal equipments being different from said first one of the gateway and the terminal equipments, the first header information set following the source address and the destination address, the data block following the first header information set, the end code following the data block, the end code representing an end of the first header information set;

wherein the first header information set comprises a head code, routing information, and presence/absence information; the presence/absence information following the head code and preceding the routing information, the head code representing a head of the first header information set, the routing information relating to addresses of the terminal equipments to and from which the messages are directed and transmitted, the presence/absence information representing that the routing information is present or absent;

wherein the data block comprises a second header information set, a command, and a second end code; the command being given to one of the sections of the terminal equipment to which the message is directed, the second end code representing an end of the data block;

wherein the second header information set comprises a second head code, second routing information, second presence/absence information, and command information; the second presence/absence information and the command information following the second head code and preceding the second routing information, the second head code representing a head of the second header information set, the second routing information relating to addresses of sections of the terminal equipments to and from which the messages are directed and transmitted, the second presence/absence information representing that the second routing information is present or absent, the command information representing a type of the command.

4,872,163

CONTENTION MECHANISM FOR COMMUNICATION NETWORKS

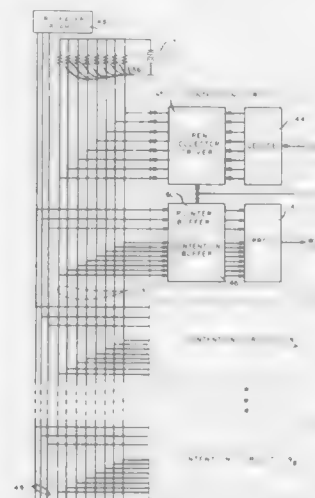
David R. Follett, Succasunna, and Michael P. Levy, Hoboken, both of N.J., assignors to American Telephone and Telegraph Company, New York, N.Y. and AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 22, 1988, Ser. No. 288,649

Int. Cl. H04J 3/24, 3/02

U.S. Cl. 370-94.1

15 Claims



1. A method of providing contention for the sequential transmission of packets of information between a plurality of circuit boards of a communication network, the plurality of circuit boards being formed in at least one cluster of M circuit boards each, the method comprising the steps of:

- (a) selectively assigning one of a plurality of priority levels to each of the M circuit boards in each cluster; and during a selected time period, performing the steps of;
- (b) prior to any circuit board transmitting a packet of information, performing a first cluster contention phase by enabling all circuit boards within each cluster to provide information about both their readiness to transmit a packet of real data and their assigned priority level, and when at least one circuit board in a cluster has a packet of real data to transmit, the one or more circuit boards in each cluster having both (i) a packet of real data to transmit and (ii) a preassigned highest priority level among the circuit boards in the cluster with a packet of real data to transmit are declared as winners of the first cluster priority phase;
- (c) performing a second cluster contention phase by setting a pointer to point at a different one of the M circuit boards

4,872,164

METHOD AND ARRANGEMENT FOR COMPENSATING SHIFTS IN DELAY PRODUCED BY THE DOPPLER EFFECT IN BURSTS IN A TDMA FRAME

Günther Rieger, Auenwald, Fed. Rep. of Germany, assignor to ANT Nachrichtentechnik GmbH, Backnang, Fed. Rep. of Germany

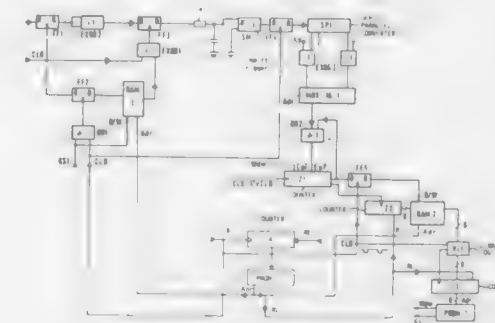
Filed Aug. 30, 1988, Ser. No. 238,150

Claims priority, application Fed. Rep. of Germany, Sep. 4, 1987, 3729586

Int. Cl. H04J 3/16

U.S. Cl. 370-104.1

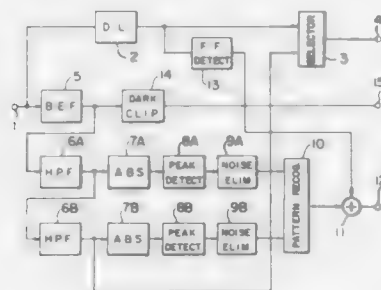
13 Claims



1. A method of compensating for shifts in the delay of bursts caused by the Doppler effect in at least one subscriber station during reception by means of a transponder, with the bursts for the respective stations each including a preamble portion followed by a unique bit pattern agreed upon between the subscriber stations and the transponder, and a following information portion, and with the bursts being combined into TDMA frames, said method comprising the steps of:

- searching the bursts of a first TDMA frame with respect to each subscriber station to locate said unique bit pattern; upon location of said bit pattern in a respective burst, generating a corresponding respective control signal for a phase comparison for each burst;
- utilizing the respective said control signals to perform a respective phase comparison, on each respective subscriber station burst in the next frames, between a clock pulse recovered from the preamble of the burst and the system clock pulse of the transponder; and delaying the bursts of each subscriber station in said next frames by
- (a) a fraction of the period of the system clock pulse if the phase of the respective recovered clock pulse lags behind the system clock pulse by up to 180°, and
- (b) a multiple of said fraction if the phase of the respective recovered clock pulse lags behind the system clock pulse by more than 180° but less than 360°.

components of said digital video signal lying outside said frequency band; and



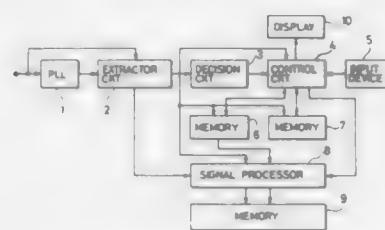
pattern recognition means responsive to said detection means for producing an output indicative of the number and location of said errors.

4,872,171

METHOD FOR RECORDING DIGITAL DATA SO AS TO AVOID OPERATIONAL ERROR ON REPRODUCTION
Shinichi Wakumura, and Tokihiro Takahashi, both of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Dec. 28, 1987, Ser. No. 138,124
Claims priority, application Japan, Dec. 27, 1986, 315225; Dec. 27, 1986, 315226; Dec. 27, 1986, 315227
Int. Cl.⁴ G06F 11/00, 11/10
U.S. Cl. 371-40.1

6 Claims



1. A method for recording digital data comprising the steps of:
evaluating a quality of a flag in input data indicating a status of error correction in said input data;
when the quality of said flag is such that any error in said input data can be corrected upon reproduction, storing the data directly in a first memory;
when the quality of said flag is such that errors in said input data cannot be corrected upon reproduction, storing other data in place of said input data which will cause no erroneous operation upon reproduction; and
recording the stored data on a magnetic tape.

4,872,172

PARITY REGENERATION SELF-CHECKING
Martin W. Sanner, San Jose, Calif., assignor to Tandem Computers Incorporated, Cupertino, Calif.
Filed Nov. 30, 1987, Ser. No. 126,806
Int. Cl.⁴ G06F 11/10

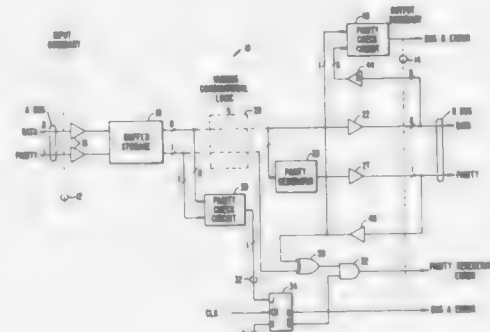
U.S. Cl. 371-49.1

13 Claims

1. In a digital system of the type having storage means for temporarily storing multi-bit data words received by the digital system, output means coupled to an output bus for applying multi-bit data words thereat, and combinatorial logic means for receiving the multi-bit data words from the storage means, the multi-bit data words having N bits of data and M bits of checking code, apparatus for checking the integrity of the

multi-bit data words and to isolate points of data word corruption, the apparatus comprising:

first circuit means coupled to the buffer means for checking the multi-bit data words communicated therefrom, using the M bits of checking code, to produce therefrom a first error signal indicative of data word corruption occurring upstream of the first circuit means;
code generating means for receiving the N bits of data of the multi-bit data words from the combinatorial logic means to produce therefrom M bits of regenerated checking code that is communicated to the output means;



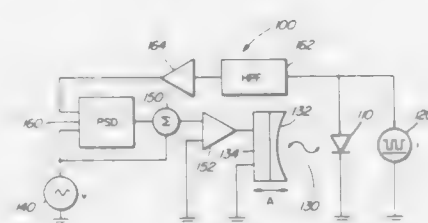
second circuit means coupled to the output bus for checking the multi-bit data words communicated therefrom, using the M bits of regenerated checking code, to produce therefrom a second error signal indicative of data word corruption occurring between the combinatorial logic means and the output bus; and
third circuit means coupled to receive the first error signal, and to receive and compare the M bits of checking code from the combinatorial logic means and the M bits of regenerated checking code from the output bus to produce therefrom, in absence of the first error signal, a third error signal indicative of data word corruption occurring between buffer means and the output means.

4,872,173

METHOD AND APPARATUS FOR STABILIZING THE SPECTRAL CHARACTERISTICS OF A SEMICONDUCTOR LASER DIODE
Bruce A. Richardson, Nepean, Canada, assignor to Northern Telecom Limited, Montreal, Canada
Filed Sep. 2, 1988, Ser. No. 239,880
Int. Cl.⁴ H01S 3/13

U.S. Cl. 372-29

20 Claims



8. Apparatus for stabilizing the emission spectrum of a semiconductor laser diode, the apparatus comprising:
an external optical cavity optically coupled to the laser diode to couple light from an active region of the laser diode to the external cavity and from the external cavity to the active region of the laser diode;
phase control means responsive to a phase control signal for

controlling the phase of light coupled from the external cavity to the active region of the laser diode;
dither means for dithering the phase control signal to dither the phase of light coupled from the external cavity to the active region of the laser diode about a phase operating point at a dither frequency;
feedback means for sensing a component of the forward voltage across the laser at the dither frequency, generating a feedback signal indicative of the amplitude of said component of the forward voltage and the phase of said component of the forward voltage relative to the phase of the dither, and changing the phase operating point in response to the feedback signal to minimize the amplitude of said component of the forward voltage.

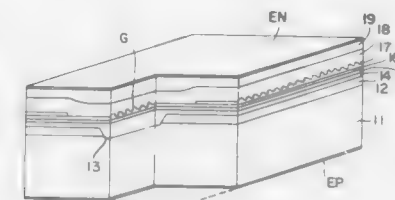
4,872,174

SEMICONDUCTOR LASER DEVICE HAVING A GRATING STRUCTURE

Sadayoshi Matsui, Teari, Mototaka Taneya, Tsukuba; Mituhiko Matsumoto, Nara; Hiroyuki Hosoba, Teari; Haruhisa Takiguchi, Nara, and Hiroaki Kudo, Teari, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Sep. 1, 1988, Ser. No. 239,301
Claims priority, application Japan, Sep. 2, 1987, 62-219719
Int. Cl.⁴ H01S 3/19

U.S. Cl. 372-45

6 Claims



1. In a semiconductor laser device comprising a laminated crystal structure which includes a $Ga_{1-x}Al_xAs$ optical guiding layer and a $Ga_{1-x}Al_xAs$ ($x > y$) cladding layer in this sequence, the improvement exists in that said $Ga_{1-x}Al_xAs$ ($x > y$) cladding layer is formed directly on both a $Ga_{1-x}Al_xAs$ ($0 \leq x \leq 0.1$ and $x < y$) layer and said $Ga_{1-x}Al_xAs$ optical guiding layer.

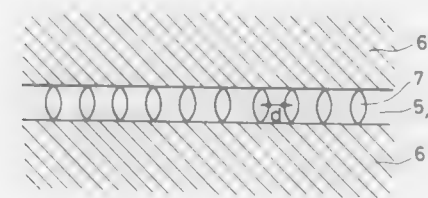
4,872,175

SEMICONDUCTOR LASER DEVICE HAVING A LENS-LIKE REFRACTIVE INDEX DISTRIBUTION WITHIN THE STRIPE

Shinichi Nakatsuka, Kodaira, and Takashi Kajimura, Tokyo, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Mar. 28, 1988, Ser. No. 174,421
Claims priority, application Japan, Mar. 27, 1987, 62-71459
Int. Cl.⁴ H01S 3/19

U.S. Cl. 372-46

19 Claims



1. In a semiconductor laser device wherein a first clad layer made of a semiconductor having a first conductivity type, an active layer, and a second clad layer made of a semiconductor having a second conductivity type opposite to said first conductivity type are disposed on a substrate; the improvement comprising lens-like portions which exhibit a refractive index distribution having a lens effect of magnifying light formed in

a stripe of said laser device and in at least one of said active layer and a part of one or both of said first and second clad layers into which light leaks from said active layer wherein said lens-like portions are shaped to be convex when a refractive index in said lens-like portions is lower than a refractive index of the layer in which the lens-like portions are formed, and said lens-like portions are shaped to be concave when a refractive index in said lens-like portions is higher than a refractive index of the layer in which the lens-like portions are formed.

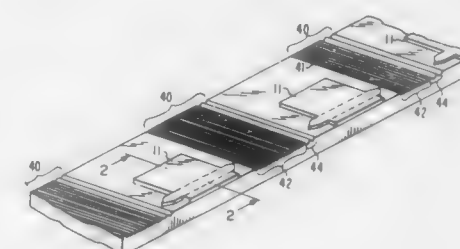
4,872,176

DEVICE AND METHOD FOR MONITORING A LIGHT-EMITTING DEVICE

Jacob M. Hammer, Princeton Borough, N.J., assignor to General Electric Company, Schenectady, N.Y.
Filed Apr. 25, 1988, Ser. No. 184,843
Int. Cl.⁴ H01S 3/05, 3/19

U.S. Cl. 372-50

14 Claims



1. A surface emitting device comprising:
a substrate;
a large optical cavity region overlying the substrate having first and second areas;
an active region overlying said first area of the large optical cavity region;
a capping layer overlying said active region;
means for electrically contacting said substrate and said capping layer;
a grating region overlying said second area of said large optical cavity region having a first grating region having a first periodic length and a second grating region having a periodic length different from said first grating region.

4,872,177

LASER DIODE PUMPED SOLID STATE LASER
Thomas M. Baer, Mountain View, and Mark S. Kierstead, San Jose, both of Calif., assignors to Spectra-Physics, San Jose, Calif.

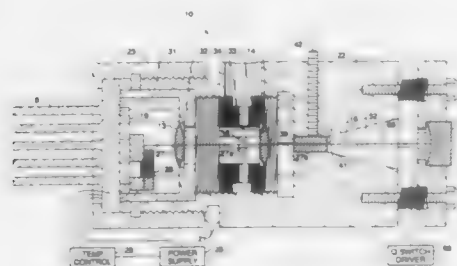
Continuation of Ser. No. 35,530, Apr. 7, 1987, Pat. No. 4,756,003, which is a continuation-in-part of Ser. No. 811,546, Dec. 19, 1985, Pat. No. 4,656,635, which is a continuation-in-part of Ser. No. 730,002, May 1, 1985, Pat. No. 4,653,056. This application Jun. 30, 1988, Ser. No. 214,020. The portion of the term of this patent subsequent to Mar. 24, 2004, has been disclaimed.
Int. Cl.⁴ H01S 3/091

U.S. Cl. 372-75

19 Claims

1. An efficient, laser diode pumped solid state laser comprising:
a doped solid laser rod supported in a housing,
a pumping light source supported in said housing having at least one laser diode, the output of said pumping light source including a frequency which matches an absorption line exciting the rod and having an extended spatial structure limiting the focusability of said output,
means for focussing the spatially extended output onto the rod, and
laser cavity means surrounding the rod, said means including

output coupler means and means for adjusting the volume of the mode in said rod to match the focused output of the width and at least one has a beam discharge area, the improvement wherein the mirror surface of at least one of the beam



pumping means to enhance the absorption of the spatially extended output as focused.

4,872,178

OUTPUT VOLTAGE DETECTING DEVICE IN A LASER OSCILLATOR

Akira Egawa, Minamitsuru, Japan, assignor to Fanuc Ltd, Minamitsuru, Japan

PCT No. PCT/JP88/00182, § 371 Date Oct. 27, 1988, § 102(e) Date Oct. 27, 1988, PCT Pub. No. WO88/06809, PCT Pub. Date Sep. 7, 1988

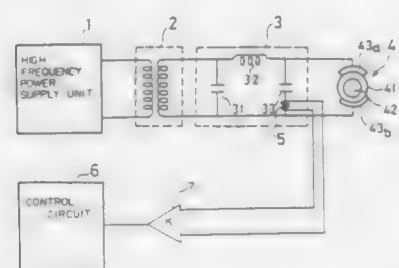
PCT Filed Feb. 19, 1988, Ser. No. 269,745

Claims priority, application Japan, Mar. 3, 1987, 62-48409

Int. Cl.⁴ H01S 3/097

U.S. Cl. 372-82

6 Claims



1. An output voltage detecting device in a laser oscillator, including a matching circuit connected between a high frequency power supply unit and a laser tube, said matching circuit having reactance elements connected in parallel to a load of the matching circuit, said output voltage detecting device comprising:

a current transformer, connected to the matching circuit and the laser tube, for detecting current flowing in a ground terminal of one of the reactance elements connected to an output terminal of the matching circuit, a voltage applied to the laser tube being detected on the basis of current detected by said current transformer.

4,872,179

LASER APPARATUS WITH A MULTIPASS RESONATOR

Rainer Nitsche, Offenbach; Bruno Sebralla, Bruchköbel, and Rolf Malkmus, Hanau, all of Fed. Rep. of Germany, assignors to W. C. Herneus GmbH, Hanau, Fed. Rep. of Germany

Filed Dec. 13, 1988, Ser. No. 283,786

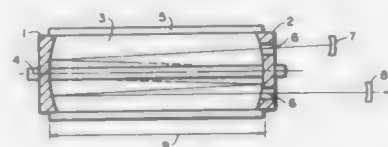
Claims priority, application Fed. Rep. of Germany, Apr. 26, 1988, 3813951

Int. Cl.⁴ H01S 3/081, 3/098

U.S. Cl. 372-93

6 Claims

1. In a laser apparatus with a multipass resonator, which has in the beam path between two resonator end mirrors at least two oppositely lying beam folding mirrors with mirror surfaces facing one another, of which at least one is limited in its



folding mirrors is reduced in its reflectivity in the region outside of desired modes of radiation thereby to mask out undesired modes of radiation.

4,872,180

METHOD FOR REDUCING FACET REFLECTIVITIES OF SEMICONDUCTOR LIGHT SOURCES AND DEVICE THEREOF

William C. Rideout, Townsend, and Elliot Eichen, Arlington, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Jun. 16, 1989, Ser. No. 367,399

Int. Cl.⁴ H01S 3/08

U.S. Cl. 372-99

7 Claims



1. An optoelectronic device, comprising:

a body of semiconductor material having a first and second opposed major facet surfaces, said body including a waveguiding structure through which an input optical signal propagates wherein said waveguiding structure is angled with respect to a longitudinal axis of said body oriented perpendicular to said first and second major facet surfaces; a first regrown end cap region adjacent to said first major facet surface wherein the boundary between said first end cap region and said first major facet surface is an inner end cap facet interface, and wherein said first end cap region has an outer end cap facet opposed to said associated inner end cap facet interface;

a second regrown end cap region adjacent to said second major facet surface wherein the boundary between said second end cap region and said second major facet surface is an inner end cap facet interface, and wherein said second end cap region has an outer end cap facet opposed to said associated inner end cap facet interface;

wherein said first and second regrown end cap regions have an index of refraction which is approximately equal to an effective refractive index of said waveguiding structure, thereby providing a reduced facet reflectivity at both the inner end cap facet interface of said first regrown end cap region and the inner end cap facet interface of said second regrown end cap region;

wherein said first and second regrown end cap regions are fabricated from a non-waveguiding material having a sufficiently higher bandgap energy than that of the wave-

guide to prevent significant absorption of the optical signal in the end cap regions; and wherein said angled waveguide causes that portion of said optical signal which may be reflected from one of said outer end cap facets back into said respective end cap region to be sufficiently misaligned with said waveguide once it strikes the one of said outer end cap facets such that a minimum amount of said reflected signal is coupled back into said waveguiding structure, thereby further reducing the effective facet reflectivity of said optoelectronic device.

4,872,181

LASER RESONATOR WITH LASER MEDIUM EXHIBITING THERMALLY INDUCED BIREFRINGENCE

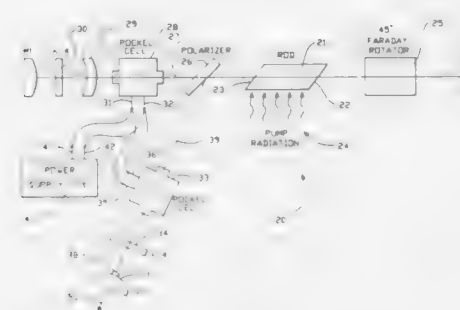
Bertram C. Johnson, Sunnyvale, and Richard L. Herbst, Palo Alto, both of Calif., assignors to Spectra-Physics, San Jose, Calif.

Filed Nov. 21, 1988, Ser. No. 274,405

Int. Cl.⁴ H01S 3/08, 3/11

U.S. Cl. 372-106

19 Claims



1. An apparatus for generating an output beam of coherent radiation comprising:

a laser medium exhibiting thermally induced birefringence having a lasing axis, for transmitting radiation along the lasing axis, and each point in the laser medium characterized by a radial polarization axis having a first index of refraction and a tangential polarization axis having a second index of refraction, the radial polarization axis intersecting the tangential polarization axis at an angle 90 degrees;

means, aligned with the lasing axis on a first side of the laser medium, for rotating polarization of radiation transmitted along the lasing axis from the laser medium by essentially 90 degrees to generate rotated radiation and for guiding the rotated radiation along the lasing axis into the laser medium;

optic means, aligned with the lasing axis on the second side of the laser medium, for guiding radiation having a first polarization along a first path and for guiding radiation having a second polarization along a second path; means, on the first path spaced away from the optic means, for reflecting radiation in the first path back along the first path through the optic means into the laser medium; means, on the second path spaced away from the optic means, for reflecting a first component of the radiation in the second path back along the second path through the optic means into the laser medium, and transmitting a second component of the radiation in the second path as an output beam.

4,872,182

FREQUENCY MANAGEMENT SYSTEM FOR USE IN MULTISTATION H.F. COMMUNICATION NETWORK

Daniel D. McRae, West Melbourne, and William N. Furman, Melbourne, both of Fla., assignors to Harris Corporation, Melbourne, Fla.

Filed Mar. 8, 1988, Ser. No. 165,580

Int. Cl.⁴ H04K 1/00

U.S. Cl. 375-1

38 Claims



1. For use in a multistation communication network containing a plurality of N stations each of which is capable of communicating with any other station of the network over any one of a plurality of K communication frequencies, a method of establishing a communication channel over one of said frequencies between a first station desiring to communicate with a second station of said network comprising the steps of:

at said first station,

(a) transmitting, on plural ones of said K communication frequencies in sequence, a probe waveform containing a first pseudo random code representative of the identity of said second station and a second pseudo random code representative of the identity of said first station; and

at said second station,

(b) sequentially monitoring each of said K communication frequencies for a transmission containing said first pseudo random code; and

(c) in response to detecting, in step (b), a transmission containing said first pseudo random code, transmitting, on plural ones of said K communication frequencies in sequence, a response waveform containing said second pseudo random code and a third pseudo random code representative of a prescribed one of said K communication frequencies to be used as the channel over which said first and second stations are to communicate with one another.

4,872,183

DATA TRANSMISSION APPARATUS WITH REMOTE REPEATER

Noritaka Egami, Nagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 7, 1988, Ser. No. 241,244

Claims priority, application Japan, Sep. 8, 1987, 62-223063; Sep. 11, 1987, 62-226656

Int. Cl.⁴ H04B 7/17

U.S. Cl. 375-3

6 Claims

1. A data transmission apparatus including remote repeaters comprising remote repeater lines formed by first and second remote repeaters connected in series through cables between first and second transmission buses respectively having stations;

said first and second remote repeaters comprising

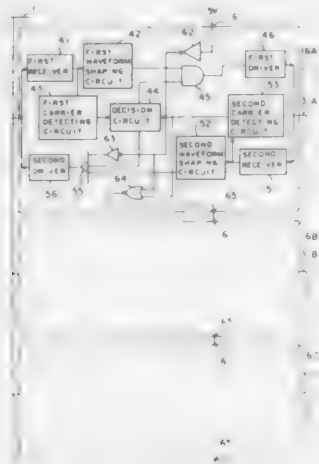
a first receiver and driver which receive signals from the one transmission bus and outputs signals to the other transmission bus,

a second receiver and driver which receives signals from the other transmission bus and outputs signals to one transmission bus,

first and second carrier detecting circuits which detect carrier

ers of signals received from the one and other transmission buses respectively through said first and second receivers, a decision circuit which decides which first or second receiver has operated first by inputting the detected output of the first and second carrier detecting circuits and, first and second AND circuits any one of which is set to the ON state or the OFF state depending on an output of the decision circuit wherein;

a plurality of remote repeater lines from the first to n-th (n is a positive integer equal to or larger than 2) lines are pro-



vided and connected in parallel between said first and second transmission buses, and

a decision control means, which always controls data transmission toward the remote repeater lines having lower priority through sequential exchange by providing the output of significant or insignificant signal upon decision that the remote repeaters having higher priority can no longer operate normally, is provided respectively to the first and second remote repeaters forming said first to nth remote repeater lines.

4,872,184

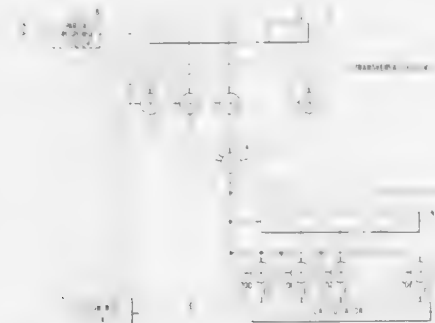
DIGITAL AUTOMATIC LINE EQUALIZER WITH MEANS FOR CONTROLLING TAP GAINS OF TRANSVERSAL FILTER BASED ON MEAN POWER OF OUTPUT FROM THE FILTER

Masaru Yamaguchi, Tokyo, and Takenori Ogata, Miyagi, both of Japan, assignors to NEC Corporation, Tokyo, Japan
Filed Jul. 21, 1988, Ser. No. 222,482

Claims priority, application Japan, Jul. 21, 1987, 62-180105; Jul. 21, 1987, 62-180106; Feb. 29, 1988, 63-46106
Int. Cl.⁴ H04B 3/04

U.S. Cl. 375-14

7 Claims



1. In a digital automatic line equalizer for use in a receiving

side of a digital signal transmitted through a transmission line in a digital communication system, comprising a transversal filter responsive to said digital signal for producing a filter output of sampled pulses, said transversal filter having a plurality of tap gains controlled by tap gain controlling means so as to produce an equalized signal as the filter output, the improvement of which comprises:

first multiplying means coupled to said transversal filter and responsive to the current filter output for squaring said current filter output to produce a first multiplied signal;

means coupled to said transversal filter for temporarily holding said filter output as a held signal;

second multiplying means coupled to said transversal filter output and said holding means and responsive to said current filter output for multiplying said held signal and the current filter output to produce a second multiplied signal;

calculating means coupled to said first and said second multiplying means for calculating from said first and said second multiplied signals a mean power of the sum of said first multiplied signal and said second multiplied signal weighted by weight to produce a mean power signal; and

said tap gain controlling means coupled to said calculating means and responsive to said mean power signal for determining a set of values of said tap gains as a set of determined values on the base of said mean power signal to control the tap gains to be said set of determined values so that said transversal filter produces said equalized signal with the mean power being equal to a predetermined value.

4,872,185

SIGNAL TRANSMISSION METHOD

Walter Braun, Wettingen, and Joachim Habermann, Baden, both of Switzerland, assignors to BBC Brown Boveri AG, Baden, Switzerland

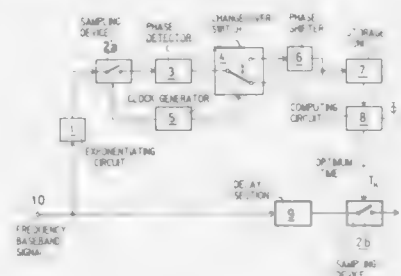
Filed Jun. 24, 1988, Ser. No. 210,993

Claims priority, application Switzerland, Sep. 7, 1987, 2613/87

Int. Cl.⁴ H04B 7/00

U.S. Cl. 375-106

7 Claims



1. Method for determining a sampling time to sample a frequency-baseband signal of a received carrier oscillation modulated according to a CPM-method by a sequence of equally distributed and statistically uncorrelated symbols having a symbol duration T_s , comprising the steps of:

- demodulating the received carrier oscillation into a frequency-baseband signal;
- sampling the frequency-baseband signal in each subinterval in a number of N successive time windows which have in each case the length of one symbol duration T_s and are divided into K corresponding subintervals;
- separating the values of the sampled frequency-baseband signal into two groups, wherein a first of the two groups contains values that have been sampled in time windows displaced by an even-numbered multiple of the symbol duration referred to a reference time t_r and wherein a second of the two groups contains values that have been

sampled in time windows displaced by an odd-numbered multiple of the symbol duration T_s referred to said reference time t_r ;

- determining K dispersions for at least one of the two groups, wherein each of the dispersions is calculated from the values sampled in subintervals which are separated by an even-numbered multiple of the symbol duration T_s and wherein each of the dispersions therefore is related to the relative position of the corresponding subintervals in the time window; and
- comparing the K dispersions with each other and deriving from the position of the smallest of these dispersions the sampling time within each time window at which sampling time the frequency-baseband signal is to be sampled for recovering the data.

4,872,186

APPARATUS AND METHOD FOR IDENTIFICATION OF MESSAGE INITIATION IN A PROCESS CONTROL NETWORK

Paul B. Gerhart, Horsham, Pa., and Yasuo Kumeda, Yokohama, Japan, assignors to Honeywell Inc., Minneapolis, Minn.

Filed Nov. 17, 1987, Ser. No. 121,561

Int. Cl.⁴ H04L 25/48

U.S. Cl. 375-117

15 Claims



15. A process control network comprising:

- a system bus;
- a central control unit for receiving messages from said system bus and for applying messages to said system bus;
- at least one input module for receiving messages from said central control unit, wherein each of said messages includes a plurality of characters, each of said characters having a preselected number of logic signals, wherein a first bit position of said each character has a first logic signal transmitted therein indicating a start of said each character, wherein a last bit position of said each character has a second logic signal transmitted therein indicating an end of said each character, wherein a selected bit position has a predetermined logic signal transmitted therein when said each character is a first character of a message, and wherein said each character has a plurality of preselected positions for transmitting logic signals therein related to data transmitting over the system bus.

4,872,187

X-RAY TOMOGRAPHIC IMAGING SYSTEM AND METHOD

Kozo Nakahata, Chigasaki; Toshimitsu Hamada, Yokohama; Yasuo Nakagawa, Chigasaki, and Mineo Nomoto, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

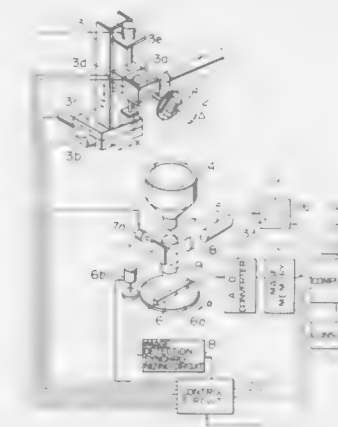
Filed Feb. 16, 1988, Ser. No. 156,179

Claims priority, application Japan, Feb. 27, 1987, 62-42535; Apr. 20, 1987, 62-95147; Jun. 10, 1987, 62-143103

Int. Cl.⁴ G01B 15/06

U.S. Cl. 378-4

14 Claims



13. An X-ray tomographic imaging method comprising the steps of:

- holding an object with a plurality of soldering portions at which an LSI chip is soldered to a multi-layer substrate which has through-holes filled with a metal material and circuit wirings made of a metal material on an object holder;
- irradiating an X-ray from an X-ray source directly to said soldering portions from a peripheral direction of a side face of the chip to obtain an X-ray transmission image thereof;
- converting said transmission image into a detection light image and intensifying the intensity of said detection light image;
- converting said light image into an electrical signal by a photo-electric converter of the soldering portions;
- displaying a visual transmission image of the solder portions adjusting a relative position between said visual image selected by said photo-electric converter and a detected cross-sectional position of the soldering portions;
- rotating the object through a plurality rotation angle positions displaced by $\Delta\theta$;
- obtaining electrical signals from each of the rotation angle positions;
- processing said electrical signals obtained at said rotation angle positions; and
- displaying a cross-sectional image of the soldering portions using said processed electrical signals.

4,872,188

REGISTRATION CORRECTION FOR RADIOGRAPHIC SCANNERS WITH SANDWICH DETECTORS

Karen L. Lauro, Euclid, and Richard A. Sones, Cleveland Hts., both of Ohio, assignors to Picker International, Inc., Highland Hts., Ohio

Filed Nov. 27, 1987, Ser. No. 126,165

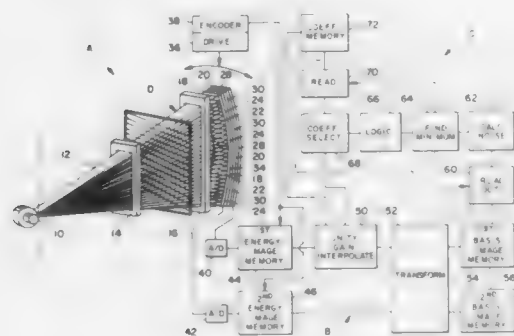
Int. Cl.⁴ G01N 23/04

U.S. Cl. 378-62

23 Claims

1. A radiographic apparatus comprising:
 - a source of radiation for projecting a radiation beam through an examination region which receives a subject to be examined radiographically;

an array of first radiographic detectors for detecting radiation that has traversed the examination region and generating first signals indicative thereof;
an array of second radiographic detectors for detecting radiation that has traversed the examination region and generating second signals indicative thereof;
a transform means for deriving an image representation from the first and second signals, the transform means being



operatively connected with the first and second detector arrays;
a registration correction means for operating on at least one of the first and second signals to correct for spatial misalignment of the first and second detector arrays, the registration correction means being operatively connected between the transform means and at least one of the first and second arrays.

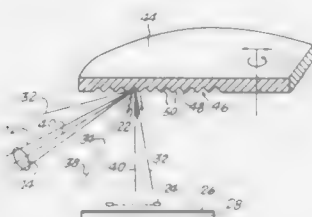
4,872,189 TARGET STRUCTURE FOR X-RAY LITHOGRAPHY SYSTEM

Robert D. Frankel, Rochester, and Jerry Drumbeller, Webster, both of N.Y., assignors to Hampshire Instruments, Inc., Rochester, N.Y.

Filed Aug. 25, 1987, Ser. No. 89,488
Int. Cl.⁴ H05H 1/46

U.S. Cl. 378—119

17 Claims



1. In a system in which X-rays are generated from a pulsed laser beam induced plasma towards an object to be irradiated, said system including movable target means and means for directing a laser beam at a preselected area of said target means, said preselected area being positionable in a plane oblique with respect to the plane in which said target means moves, an improvement to said target means comprising:

a support member having a plurality of selectable target areas thereon, each of which area is positioned on said support member to be coincident with said oblique plane when moved into incidence with said laser beam as said target means is moved.

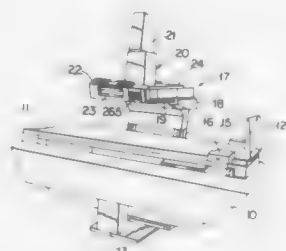
4,872,190 SPOT FILMER CASSETTE TRANSPORT VIBRATION SUPPORT

Mark Stojkov, Parma; Patrick M. Flanagan, Westlake; Victor Hrdlicka, Mayfield Heights; John Geithner, Wickliffe, and Dennis Everett, Garfield Heights, all of Ohio, assignors to Picker International, Inc., Cleveland, Ohio
Continuation of Ser. No. 161,416, Feb. 23, 1988, abandoned, which is a continuation of Ser. No. 879,330, Jun. 27, 1986, abandoned. This application Jan. 13, 1989, Ser. No. 298,339

Int. Cl.⁴ G03B 42/02

U.S. Cl. 378—75

10 Claims



8. A method of controlling motion of a film cassette carriage in a medical diagnostic imaging system, said system including an x-ray source and structure for mounting said film cassette carriage for movement along a path between first and second positions, an electric motor and mechanical drive linkage for providing power for moving said cassette carriage along said path, said method for controlling movement of said carriage comprising the steps of:

(a) generating and applying to an input of said electric motor an input electrical signal defining a predetermined waveform, said waveform including in the time domain a concave up segment, a substantially linear positively sloping segment following said concave up segment, a concave down peak segment following said positively sloping segment, a negatively sloping substantially linear segment following said concave down peak segment and another concave up segment following said substantially linear negatively sloping segment.

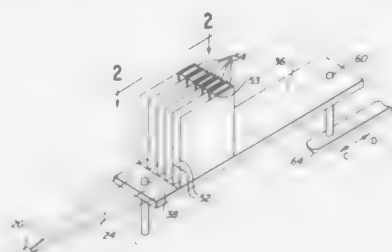
4,872,191 CAM-CONTROLLED AUTOMATIC DYNAMIC FOCUSING FOR COMPUTED TOMOGRAPHY

Richard T. Bernardi, Lincolnshire, Ill., assignor to Bio-Imaging Research, Inc., Lincolnshire, Ill.

Filed Nov. 19, 1987, Ser. No. 122,909
Int. Cl.⁴ H01J 35/16

U.S. Cl. 378—150

10 Claims



1. A dynamic focusing device for an X-ray scanner, said device comprising at least one detector means located in a position to receive, be illuminated by, and respond to X-rays; a source of X-rays; means for moving said source of X-rays toward or away from said detector means; said detector means

comprising a plurality of individual detectors, a plurality of septa for separating said individual detectors, said septa extending beyond said individual detectors far enough to reduce lateral X-ray scatter and to cast shadows upon said individual detectors responsive to illuminations thereof from said X-ray source; said detector means being in the form of at least one elongated module carrying a plurality of said septa and individual detectors, said elongated module having a pivot point at one end and a cam follower at the opposite end, said device further comprising movable focuser means having a cam surface on which said cam follower rides to swing said detector means about said pivot point in response to movement of said focuser means; and means for moving said movable focuser means in order to dynamically change the position of said module as a function of any change in the distance from said detector means to said source of X-rays in order to reduce substantially to a minimum any shadow cast by said septa upon said detectors.

4,872,192 X-RAY EXAMINATION INSTALLATION FOR OPTIONAL TRANSILLUMINATION OR EXPOSURE OF AN EXAMINATION SUBJECT

Alfred Hahn, Erlangen, and Jens-Peter Raup, Uttenreuth, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

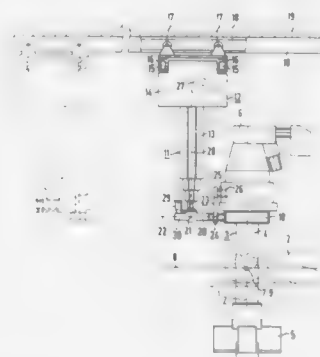
Filed Nov. 22, 1988, Ser. No. 274,870

Claims priority, application Fed. Rep. of Germany, Dec. 18, 1987, 8716725[U]

Int. Cl.⁴ H05G 1/02

U.S. Cl. 378—181

10 Claims



1. An x-ray examination installation for optional transillumination or exposure of an examination subject, said installation comprising:

an x-ray diagnostics device adjustable relative to said examination subject including a moveable C-bend having two free ends, and x-radiators mounted at one free end of said C-bend, and an x-ray image intensifier for transillumination of said examination subject mounted at the other free end of said C-bend;

an exposure device movable opposite said x-radiator for producing an exposure of said examination subject; means for supporting said exposure device independently specially adjustable relative to said x-ray diagnostics device; and

means for releasably mechanically coupling said exposure device to said x-ray diagnostics device and for permitting said exposure device, when coupled to said x-ray diagnostics device, to follow movements of said x-ray diagnostics device without changing the position of said exposure device relative to said x-radiator.

4,872,193 LITHOTRIPSY WORKSTATION

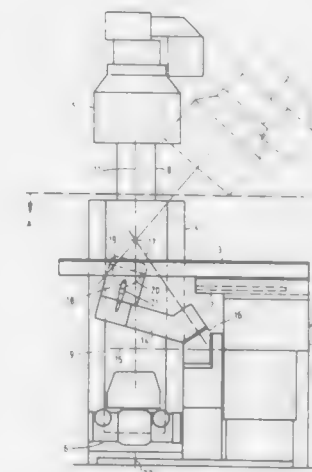
Manfred Elff, Hamburg; Wilfried G. Pfeiffer, Quickborn; Horst-Hartwig Schwieker, Hamburg, and Dieter H. C. Christiansen, Schönberg, all of Fed. Rep. of Germany, assignors to U.S. Phillips Corporation, New York, N.Y.

Filed Mar. 25, 1988, Ser. No. 173,699
Claims priority, application Fed. Rep. of Germany, Apr. 4, 1987, 3711404; Jul. 18, 1987, 3723920

Int. Cl.⁴ A61B 17/22

U.S. Cl. 378—196

6 Claims



1. A lithotripsy workstation, comprising a generally horizontal patient table top (3) with respect to which are arranged a shock wave generator (18), and an X-ray device for localizing of concretions, which X-ray device comprises an X-ray source (6) and an image converter (5) which are spaced apart along an X-ray axis (11) passing through the table top (3), characterized in that a) the X-ray device (5, 6) is pivotable about a generally horizontal first axis (7) which extends perpendicularly to the X-ray axis (11) of the X-ray device, which first axis (7) intersects said X-ray axis (11) in a point, above the table top, which is referred to as the point of intersection, (b) the shock wave generator (18) is carried by a pivot arm (14) which is pivotable about a second, inclined axis (17), said shock wave generator (18) having a focal point through which said inclined axis (17) extends, (c) said means for maintaining said inclined axis (17) oriented with respect to the X-ray device (5, 6) so that the point of intersection coincides with the focal point.

4,872,194 METHOD FOR TRANSMISSION OF ALARM SIGNALS UTILIZING AN ENTRANCE TELEPHONE SYSTEM

Anders E. Trell, Polhemsgatan 20 B, Stockholm, Sweden S-112

Continuation of Ser. No. 5,281, Jan. 16, 1987, abandoned, which is a continuation of Ser. No. 726,896, Apr. 19, 1985, abandoned.

This application Jul. 18, 1988, Ser. No. 220,400

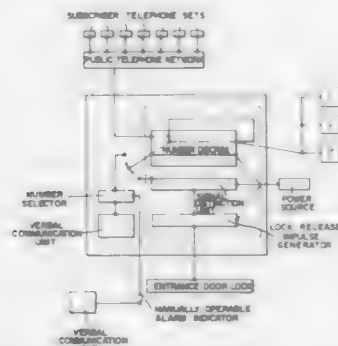
Int. Cl.⁴ H04M 11/04

U.S. Cl. 379—40

4 Claims

1. A method for transmission of alarm signals via a public subscriber telephone network to a central office from an entrance telephone set installation, comprising the steps of: providing an entrance telephone installation including an entrance telephone set connectable to a public subscriber telephone network; providing said entrance telephone installation with a selectively addressable telephone number dialling device for discriminating selected addresses input thereto from said entrance telephone set and for connecting with said public subscriber telephone network and dialling selected pre-

programmed telephone numbers in accordance with said discriminated addresses; and providing at least one alarm indicator connected to said selectively addressable telephone number dialling device which alarm indicator when actuated by an alarm condition causes said selectively addressable telephone number dialling device to



connect with the public subscriber telephone network and to initiate dialling of at least one predetermined telephone number for transmitting an alarm signal via the public subscriber telephone network from said selectively addressable telephone number dialling device when said alarm indicator is actuated.

4,872,195

REMOTE CONTROL UNIT FOR RADIO/TELEVISION TRANSMITTER STATION

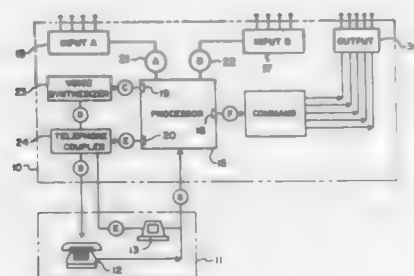
John E. Leonard, San Jose, Calif., assignor to Gentner Electronics Corporation, Salt Lake City, Utah

Filed Nov. 13, 1986, Ser. No. 930,783

Int. Cl.⁴ H04M 11/00

U.S. Cl. 379—40

13 Claims



1. A remote control device for use at a radio or television transmission station location separate from a control studio and being capable of (i) monitoring preset conditions, (ii) activating notification channels for communication of monitored conditions and (iii) responding to commands given remote from the device for initiating remedial and other appropriate actions, said device comprising:

- a microprocessor for locating at the transmitter station and having (i) a plurality of input ports (ii) a plurality of signal output ports, (iii) means for storing a plurality of preset station operating conditions in memory, (iv) means for comparing real-time data received through the input ports with preset operating conditions within the microprocessor and for developing and detecting responsive corresponding triggering signals with respect thereto, (v) means for storing a bank of separate action signals for each responsive triggering signal, (vi) means for generating and sending action signals to output ports in response to detection of responsive triggering signals, and (vii) means for

storing coded voice signals for transmission to a voice synthesizing means;

RF filter means coupled to the input ports for filtering interfering RF ambient energy, said filter means being adapted to attenuate RF frequencies operable with respect to AM, FM or television signals;

voice synthesizing means coupled to the microprocessor and to a telephone coupler and being responsive (i) to generate preset voice sounds in accordance with transmitted coded voice signals received from the microprocessor and (ii) to transmit such voice sounds to the telephone coupler;

telephone calling means coupled to an output of the microprocessor and responsive to at least one of the action signals to generate an automatic dialing sequence for dialing a preset telephone number;

means for transmitting a signal generated at a remote telephone to the microprocessor;

answer detection means coupled to the microprocessor for sensing when a dialed telephone number has been answered at a remote telephone;

means responsive to the answer detection means for transmitting to the answered remote telephone a voice identification of the telephone call as originating with the transmitting station microprocessor;

command response means coupled to the microprocessor and responsive to corrective command signals and start/stop command generated at the remote telephone to activate corresponding action signals for modifying station operating conditions through output signals generated by the microprocessor for transmittance to one of the output ports thereof, thereby enabling a remote party to receive voice notification of occurrence of a preset condition via remote telephone and to immediately respond with selection of a command which corresponds to and is contained within the preset action codes of the microprocessor.

4,872,196

TELEPHONE KEYPAD INPUT TECHNIQUE

Paul Royer, Prospect Heights, and George W. Schaupp, Jr., Schaumburg, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 18, 1988, Ser. No. 220,197

Int. Cl.⁴ H01J 7/04

U.S. Cl. 379—58

11 Claims



10. A method for entering Japanese language kata-kana symbols into a cellular telephone apparatus having a memory and a keypad with a plurality of keys, comprising: providing data in the memory in a form representing a kata-kana symbol matrix having a plurality of representative sound sequences;

designating keys of the telephone keypad with a symbol representing at least one of said representative sound sequences; selecting a designated key in succession a selected number of times to designate a desired representative sound in the matrix; and providing an input signal to the cellular telephone to indicate the selection of the designated representative sound in the matrix.

4,872,197

DYNAMICALLY CONFIGURABLE COMMUNICATIONS NETWORK

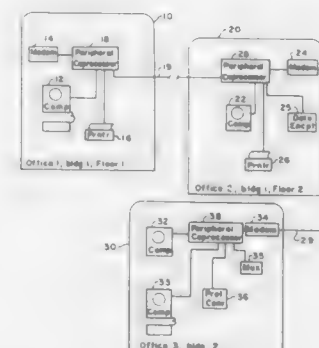
Ramapo V. Pemmaraju, Edison, N.J., assignor to DTI Peripherals, Inc., New York, N.Y.

Filed Oct. 2, 1986, Ser. No. 914,392

Int. Cl.⁴ H04M 11/00

U.S. Cl. 379—93

20 Claims



8. A peripheral coprocessor means for use in a configurable communication network and capable of wide area networking utilizing existing communication lines comprising:

- a central processing means;
 - an input/output controlling means for controlling input and output of data, setting up a subnetwork of at least three nodes and enabling communication among nodes of said subnetwork;
 - a memory means for control and storage of data; and
 - port circuitry coupled to said input/output controlling means for connecting said peripheral coprocessor to a data processing device,
- wherein communication among said subnetwork of nodes takes place by a first node of said subnetwork establishing a data path via the existing communication lines between said first node and a second node of said subnetwork, and said second node establishing a data path via the existing communication lines between said second node and a third node of said subnetwork and wherein data is selectively provided to said nodes according to destination information contained within a header portion of a data string.

18. A dynamically configurable communications network comprising:

- a plurality of nodes;
- a peripheral coprocessor at each of said nodes;
- input/output means at each node for connecting said coprocessor and a data processing device associated with said node;
- means for interconnecting said nodes via a switched network;
- setup mode means for automatically establishing a subnetwork of at least three of said nodes using said interconnecting means, said subnetwork being set up so that the nodes are connected in a serial fashion; and
- data mode means for enabling data transmission among the nodes of said network, said data transmission occurring in a serial fashion from one node to another, said data mode means causing a data string having information indicative

of a mode of operation to be transmitted from a first node to a second node; wherein said mode of operation is one of a group of at least three modes comprising a setup mode, a data mode and a terminate mode.

4,872,198

TRANSIENT SIGNAL ELIMINATION CIRCUIT FOR TELECOMMUNICATIONS APPLICATIONS

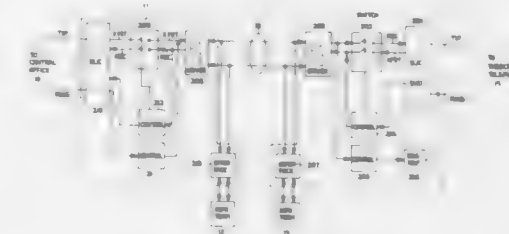
John M. Suen, and Jing H. Sun, both of New York, N.Y., assignors to The Inteleplex Corp., Paramus, N.J.

Filed Aug. 12, 1988, Ser. No. 231,494

Int. Cl.⁴ H04M 11/06

U.S. Cl. 379—377

15 Claims



1. Apparatus for use in a communications loop connecting a subscriber telephone to a telephone central office, said apparatus comprising

- means for receiving different incoming signals and providing an output signal associated with each of said incoming signals, said receiving means also eliminating an undesirable transient present in a predetermined one of said incoming signals so that none of the output signals include the undesirable transients, and
- circuit path control means responsive to a certain one of said incoming signals received by said receiving means for closing a normally-open first circuit path extending between first and second terminals of said apparatus and reopening said circuit path in response to another one of said incoming signals received by said receiving means.

4,872,199

BATTERY-FEED CIRCUIT FOR EXCHANGE

Shigeru Kawami, Kawasaki; Takashi Tabu, Tokyo; Shigeo Sano, and Nobuyuki Masuda, both of Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 813,869, Dec. 27, 1985, abandoned.

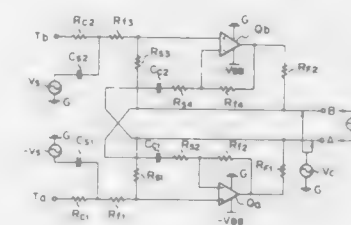
This application Jan. 11, 1989, Ser. No. 296,273

Claims priority, application Japan, Dec. 27, 1984, 59-273830

Int. Cl.⁴ H04M 19/00

U.S. Cl. 379—413

28 Claims



18. A battery feed circuit for an exchange comprising: a first wire; a second wire; a first reference resistance connected to said first wire; a second reference resistance connected to said second wire;

means for providing a DC voltage on said first and second wires;
 means for providing an AC signal on said first and second wires;
 first feedback means for feeding the AC signal provided on said first and second wires back to said first and second wires via said first and second reference resistances; and
 second feedback means for feeding back said DC voltage provided on said first and second wires, said second feedback means operating as a voltage follower circuit, to thereby feed said DC voltage independently, with respect to said first and second wires, back to said first and second wires via said first and second reference resistances.

4,872,200

SYSTEM OF ORTHOGONAL CODE GENERATORS, RADIOS PROVIDED WITH A CODE GENERATOR AND CODE GENERATORS OF SUCH A SYSTEM

Cornelis J. A. Jansen, Best, Netherlands, assignor to Hollandse Signaalapparaten B.V., Hengelo, Netherlands

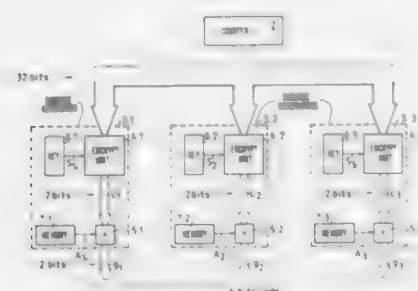
Filed Apr. 13, 1988, Ser. No. 181,879

Claims priority, application Netherlands, Apr. 17, 1987, 179093M

Int. Cl. H04L 9/04

U.S. Cl. 380-34

14 Claims



1. In a system of orthogonal code generators having counting means comprised of a running counter for generating a running count, and code generators for generating respective code sequences in response to the count, the improvement comprising: a plurality of m orthogonal code generators j ($j=1, \dots, m$) each comprised of Q counter-reading directed subcode generators i ($i=1, \dots, Q$) each generating a respective subcode which together represent the code sequence, wherein a subcode generator subsequently generates subcode-representing numbers g_i , where $g_i \leq N_i - 1$ and N_i represents a fixed value and a subcode generator is comprised of a pseudo-random generator and an adder unit, the pseudo-random generator generating from the running counter reading and a key S , a pseudo-random sequence of numbers which are supplied to the adder unit, and the adder unit adding a number A_i modulo N_i to the second-last-mentioned numbers to obtain the numbers g_i .

4,872,201

PATTERN MATCHING APPARATUS EMPLOYING COMPENSATION FOR PATTERN DEFORMATION

Hiroaki Sakoe, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Oct. 3, 1984, Ser. No. 657,428

Claims priority, application Japan, Oct. 4, 1983, 58-185402

Int. Cl. G10L 7/08

U.S. Cl. 381-43

2 Claims

1. A pattern matching apparatus comprising:
 a work memory having a plurality of memory addresses for storing numerical data;
 a reference pattern memory for storing reference patterns having reference feature data time sequences including address data, said address data specifying branching points

in said reference time sequence, said branching points leading to at least two other points within said reference time sequence;
 a control means for generating a first reading address signal indicative of an address of said reference pattern memory, a writing address signal indicative of an address of said work memory and a second reading address signal indicative of an address of said work memory addressed by said address data read out from said reference pattern memory;
 a distance calculating means for calculating a plurality of distances between respective portions of feature data read out from said reference pattern memory addressed by said first reading address signal and feature data of an input pattern, said work memory storing cumulative distances of sum values of the calculated distances as said numerical data accordingly;



a dynamic programming matching means for calculating a new cumulative distance by performing a dynamic programming (DP) recurrence formula based upon the cumulative distances read out from said work memory addressed by said second reading address signal and writing said new cumulative distance in said work memory at the address designated by said writing address signal; and
 a decoder for judging whether the read out signal from said reference pattern memory is the address data or the feature data and supplying the read out signal to said control means and said distance calculating means when it is the address data and the feature data, respectively, wherein, in response to said address data, said distance calculating means calculates said plurality of distances based on each of said other points leading from said branching points.

4,872,202

ASCII LPC-10 CONVERSION

Bruce Fette, Mesa, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 650,592, Sep. 14, 1984, abandoned. This application Oct. 7, 1988, Ser. No. 256,248

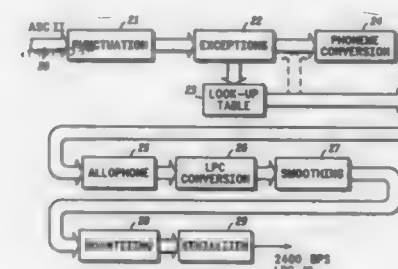
Int. Cl. G10L 5/02

U.S. Cl. 381-52

3 Claims

1. A method of converting a text signal supplied by a computer network into Linear Predictive Coding (LPC) data which is transmittable over a voice network, said method comprising the steps of:
 receiving the text signal at an LPC bridge device including a microprocessor and read-only memory (ROM);
 checking through operation of the microprocessor, if the text signal represents an exception to a set of rules which define relationships between textual spellings and corresponding phonetic representations of the text signal;
 first alternately utilizing the microprocessor to look up in the ROM an alternative phonetic signal for phonetic conversion, said first alternately utilizing step occurring in re-

sponse to an indication of an exception by said checking step;
 second alternately utilizing the microprocessor to look up in the ROM an alternative text spelling signal, said second alternately utilizing step being performed in response to an indication of an exception of said checking step and performed conditionally if said step of first alternately utilizing has not occurred;
 third alternately utilizing the microprocessor to look up in the ROM an alternate set of rules for determining phonemes (as in a different language);
 converting, through operation of the microprocessor, the



text signal or alternate text spelling signal into a phonetic signal composed of a set of phonemes, said converting the text signal or alternate text spelling signal occurring in accordance with the set of rules or said alternate set of rules, the step of converting the text signal into a phonetic signal being performed in response to said steps of checking or second alternately utilizing the microprocessor to look up in the ROM;
 converting, through operation of the microprocessor, the phonetic signal or the alternate phonetic signal into an allophonic signal composed of a set of allophones; and
 converting, through operation of the microprocessor, the allophonic signal into LPC parameters.

4,872,203

IMAGE INPUT DEVICE FOR PROCESSING A FINGERPRINT PRIOR TO IDENTIFICATION

Ko Asai, and Koichiro Morita, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

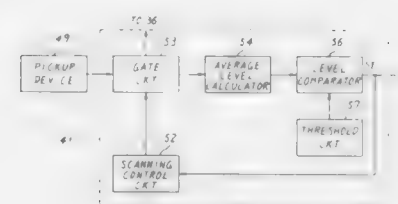
Continuation of Ser. No. 755,810, Jul. 17, 1985, abandoned. This application Mar. 25, 1988, Ser. No. 172,935

Claims priority, application Japan, Jul. 18, 1984, 59-148893; Aug. 8, 1984, 59-166083; Aug. 8, 1984, 59-166084; Aug. 8, 1984, 59-166085; Aug. 30, 1984, 59-181105; Aug. 30, 1984, 59-181107

Int. Cl. G06K 9/00

U.S. Cl. 382-4

11 Claims



1. An image input device for use in pre-processing a fingerprint impressed on an input surface to determine, before said fingerprint is identified by means of an identification unit, whether or not said identification of the fingerprint is to be started, said device comprising:
 signal producing means for producing an optical image signal representative of an optical image of said fingerprint which is impressed on said input surface and which varies in density with time;
 timing control means responsive to said optical image signal

for controlling a time interval of selecting said optical image signal to produce a partial image signal representative of a part of said optical image at a predetermined position of said input surface; and
 detecting means responsive to said partial image signal for detecting density of said partial image so as to determine whether or not an extraction start signal is produced, said extraction start signal allowing supply of said optical image signal to said identification unit.

4,872,204

METHOD OF OPERATING A RADIO TRANSMISSION OR COMMUNICATION SYSTEM INCLUDING A CENTRAL STATION AND A PLURALITY OF INDIVIDUAL REMOTE STATIONS, A RADIO TRANSMISSION OR COMMUNICATION SYSTEM, AND A REMOTE STATION

Ole Hammer, Solrod Strand, Denmark, and Jean-Jacques Gras, Neuilly-sur-Marne, France, assignors to Motorola, Inc., Schaumburg, Ill.

PCT No. PCT/DK87/00024, § 371 Date Nov. 24, 1987, § 102(e) Date Nov. 24, 1987, PCT Pub. No. WO87/05458, PCT Pub. Date Sep. 11, 1987

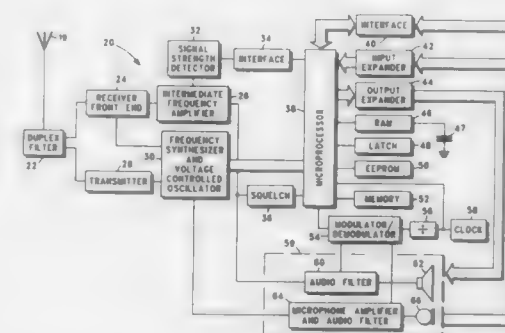
PCT Filed Mar. 3, 1987, Ser. No. 124,210

Claims priority, application Denmark, Mar. 3, 1986, 966/86

Int. Cl. H04B 1/00, 7/00

U.S. Cl. 455-54

6 Claims



1. A method of operating a radio transmission or communication system including a number of central stations, and a plurality of individual remote stations said central stations generating and transmitting control signals in respective transmission channels, each remote station being assigned a specific central station of said number of individual central stations, each of said control signals comprising a first part constituting a first period of time of the control signal and including information identifying one or more intended receiving stations of said plurality of individual remote stations, and a second part constituting a second period of time of the control signal and including control information for said one or more intended receiving stations, each individual remote station being shiftable between a first operational mode in which it is receiving the control signal from the central station to which it is assigned, and a second operational mode in which it is not receiving the control signal from the central station to which it is assigned, the method comprising:

operating each remote station in said first operational mode for a period of time substantially corresponding to said first period of time in order to have it evaluate whether it is identical to one of said one or more intended receiving stations;
 operating each remote station which is not identical to one of said one or more intended receiving stations in said second operational mode for a period of time substantially corresponding to said second period of time for receiving

a control signal from an alternative central station different from the central station to which it is assigned; and operating each remote station which is identical to one of said one or more intended receiving stations in said first operational mode for a period of time substantially corresponding to said second period of time.

4,872,205

RADIO COMMUNICATION SYSTEM HAVING AUTONOMOUSLY SELECTED TRANSMISSION FREQUENCIES

James W. Smith, Middletown, N.J., assignor to American Telephone and Telegraph Company, New York, N.Y. and AT&T Information Systems Inc., Morristown, N.J., a part interest
Filed Aug. 21, 1987, Ser. No. 87,725

Int. Cl.⁴ H04B 1/00, 7/00

U.S. Cl. 455—58

12 Claims



1. A control module for use in a first radio communication system for communicating with each of a plurality of stations and for detecting a presence and absence of radio frequency signals, said control module comprising

first receiver means for receiving a predetermined first radio frequency signal from a source other than said plurality of stations,

second means for receiving a start-up signal, and

first transmitter means jointly responsive to said start-up signal and the absence of reception of said first radio frequency signal in a predefined time interval for transmitting said first radio frequency signal.

4,872,206

MIXER DYNAMIC CONTROL

Rinaldo Graziadei, Monza, and Giorgio Rossi, Nerviano, both of Italy, assignors to SGS-Thomson Microelectronics s.r.l., Italy
Filed Mar. 31, 1988, Ser. No. 175,994

Claims priority, application Italy, Apr. 13, 1987, 83617 A/87
Int. Cl.⁴ H04B 1/26

U.S. Cl. 455—241

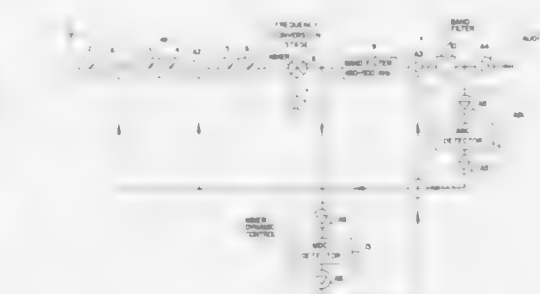
2 Claims

2. A circuit for controlling dynamics of a mixer stage of an AM receiver including at least an RF stage, a local oscillator, a mixer stage having inputs for receiving an output signal of the RF stage and a signal generated by the local oscillator, the output signal of the mixer stage being fed to an input of an IF stage, and a narrow band AGC circuit sensing the amplitude of an IF signal from the IF stage and generating a dc control signal which is applied to a biasing network of at least a signal amplifier of the RF stage for modifying the bias conditions and reducing the gain thereof, said circuit comprising:

at least a level detector for detecting the amplitude of the output signal of the mixer stage; and generating a dc output signal being the function of this amplitude;

an amplifier for amplifying the dc output signal detected by the detector;

a summing node for receiving and combining the amplified dc output signal from the detector and the dc control signal generated by the narrow band AGC circuit, the resulting combined signal being supplied to a biasing network of at least a signal amplifier of the RF stage for modifying the bias condition and reducing the gain



thereof for maintaining the mixer stage operating within the appropriate dynamic range under tuning and out-of-tune conditions of the receiver; and

wherein the combined signal value is defined substantially by the dc control signal generated by the narrow band AGC circuit under tuning conditions, and by the dc output signal from the detector during out of tune conditions of the receiver.

4,872,207

AUTOMATIC IF TANGENT LOCK CONTROL CIRCUIT

Lawrence M. Ecklund, Wheaton, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

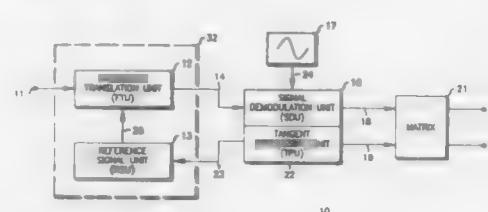
Division of Ser. No. 38,563, Apr. 15, 1987, Pat. No. 4,782,532.

This application Aug. 15, 1988, Ser. No. 231,936

Int. Cl.⁴ H04H 5/00

U.S. Cl. 455—255

5 Claims



1. In a radio receiver having:

input means for receiving an input signal comprised of a first carrier signal having an information signal amplitude modulated thereon;

IF means for receiving said input signal and for converting said input signal into an IF signal comprised of a second carrier signal having a frequency different from said first carrier signal and having said information signal amplitude modulated thereon; and

demodulation means for receiving said IF signal and for demodulating said IF signal to provide a demodulated signal comprising at least a part of said information signal; an improvement wherein:

said IF means further includes: reference signal means for receiving a control signal and for providing a reference signal having a frequency and phase determined at least in part by said control signal; and

frequency translation means for receiving said reference signal and said input signal, and for providing a resultant signal having a frequency and phase related to said first carrier signal as translated by said reference signal, which resultant signal comprises said IF signal; and

said demodulation means further includes tangent processing means for responding, at least in part, to said demodulated signal by providing said control signal to said reference signal means, which control signal varies as a tangent function of at least a part of said demodulated signal.

4,872,208

COMPACT MONOPOLE DIGITAL TACHOMETER GENERATOR FOR USE IN AIRBORNE VEHICLES

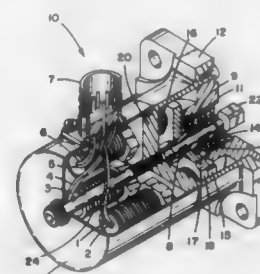
Steven K. Beattie, North Hollywood; Paul C. Richards, Simi Valley, and David A. Smith, Canoga Park, all of Calif., assignors to Ontic Engineering and Manufacturing Inc., North Hollywood, Calif.

Filed Sep. 27, 1988, Ser. No. 249,865

Int. Cl.⁴ G01P 3/48, 3/54; G01B 7/14

U.S. Cl. 324—174

13 Claims



1. A motion detecting device comprising:

a. a rotating member, the rotating member comprising a planar disk, the disk being rotatable about an axis perpendicular to the plane of the disk, the disk being perforated by a least one aperture, the disk being composed of a substantially ferrous material, the rotating member having ferrous regions and nonferrous regions;

b. a magnet, the magnet generating a magnetic field characterized by lines of flux, the lines of flux intercepting the rotating member;

c. a flux density sensor, the flux density sensor detecting rates of change of flux density caused by magnetic field variations as the magnetic field alternately encounters the ferrous and nonferrous regions of the rotating member;

d. a frequency indicator, the frequency indicator detecting periods of rates of change in flux density as sensed by the field density sensor, the periods of the rate of change corresponding to the frequency of rotation of the rotating member;

e. a shaft, the shaft being affixed to the disk so as to be concentric with the axis about which the disk rotates, the shaft being coupled to a parent device, the shaft thereby imparting the motion of the parent device to the plane disk; and

f. a housing, the housing comprising:

i. a mounting flange, the mounting flange being adapted to mate with a compatible fixture on the parent device;

ii. a cylindrical body; and

iii. a partition, the partition being integrally formed within the cylinder, the partition dividing the cylindrical body into a first portion and a second portion, the disk residing within the first portion, the flux density sensor and the magnet residing within the second portion.

4,872,209

INTEGRATABLE AMPLIFIER CIRCUIT HAVING FREQUENCY RESPONSIVE NEGATIVE FEEDBACK

Pieter G. Blanken, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

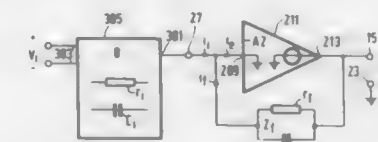
Filed Oct. 27, 1988, Ser. No. 263,680

Claims priority, application Netherlands, Oct. 28, 1987, #702559

Int. Cl.⁴ M03F 1/34

U.S. Cl. 330—294

22 Claims



1. An amplifier arrangement comprising:

a transadmittance circuit having an input coupled to an input of the amplifier arrangement, and

a transimpedance amplifier having an input coupled to an output of the transadmittance circuit and an output coupled to an output of the amplifier arrangement, the transfer function modulus of the transimpedance amplifier having a first-order decrease above a first frequency F1 and a second-order decrease above a second frequency F2, said transimpedance amplifier being negatively fed back by means of a negative current feedback circuit, characterized in that

the negative current feedback circuit is constituted by a negative feedback impedance whose inverse of the transfer function modulus below the second frequency F2 is smaller than the transfer function modulus of the transimpedance amplifier and which transfer function modulus has a first-order increase above a third frequency F3 so that the transfer function modulus of the negatively fed back transimpedance amplifier has a first-order decrease above a fourth frequency F4 which is substantially equal to the third frequency F3, and a second-order decrease above a fifth frequency F5 which is located above the second frequency F2,

the transfer function modulus of the transadmittance circuit has a first-order increase above a sixth frequency F6 which is substantially equal to the fourth frequency F4 so that the transfer function modulus of the amplifier arrangement has a first-order decrease above the fifth frequency F5, and

the transimpedance amplifier has a low-ohmic current input with an input impedance whose modulus, at least for frequencies below the fifth frequency F5, is smaller than the modulus of the negative feedback impedance.

4,872,210

CURBSIDE MAILBOX SIGNAL

Alexander Benages, 1585 Lakeview Dr., Hillsborough, Calif. 94031

Filed Mar. 25, 1988, Ser. No. 173,555

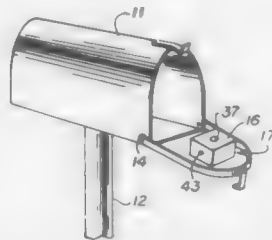
Int. Cl.⁴ G08B 13/08

U.S. Cl. 340—569

6 Claims

1. A curbside mailbox signal for use on a mailbox having a door, comprising a first casing enclosing power means, an r.f. transmitter and a first antenna, a switch operable to be closed upon opening of the door to energize said transmitter from said power means to emit a signal from said first antenna and means for attaching said first casing to the inside of said door, whereby when said door is opened said first antenna is exposed exteriorly of said mailbox; and a second casing adapted to be positioned remote from said first casing comprising an r.f. receiver having a second antenna tuned to said first antenna,

and a power source for said receiver and signal emitting means enabled by said receiver upon receipt of a signal from said



transmitter; said mailbox being characterized by the absence of an external antenna.

4,872,211

DUAL FREQUENCY LAUNCHER FOR CIRCULARLY POLARIZED ANTENNA

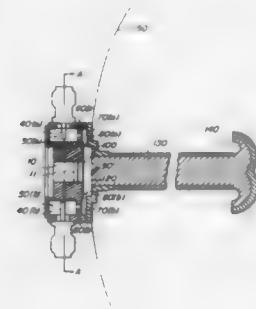
Ming H. Chen, Rancho Palos Verdes, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 10, 1988, Ser. No. 242,001

Int. Cl. H01Q 13/00

U.S. Cl. 343-778

5 Claims



1. A dual frequency antenna feed comprising:
 - a first circular waveguide;
 - a cylindrical first filter cavity located at the end of said waveguide on the same axis as said waveguide, oriented such that an end of the cavity connects to an end of said first circular waveguide;
 - a second circular waveguide connected to the opposite end of the said first filter cavity;
 - a plurality of second filter cavities, formed in the shape of ring segments, suitably connected to said first cavity by means of slots in the walls of said first filter cavity;
 - a plurality of third filter cavities, formed in the shape of ring segments, suitably connected to said second cavities by means of slots in the walls of said second filter cavities; and
- means for the introduction and withdrawal of energy into said plurality of third filter cavities;
- wherein energy of one frequency flows through the said first circular waveguide, and wherein energy of a second frequency flows through said plurality of second and third filter cavities.

4,872,212

MICROWAVE MAIN FRAME

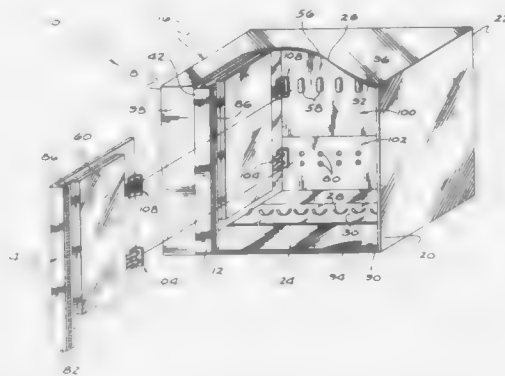
Mark D. Roos, San Carlos, and Walter J. Messner, III, San Jose, both of Calif., assignors to EIP Microwave, Inc., San Jose, Calif.

Filed May 15, 1987, Ser. No. 50,820

Int. Cl. H05K 9/00

U.S. Cl. 361-424

6 Claims



1. A mainframe for a microwave measurement system comprising:
 - (a) a housing constructed of electromagnetic radiation shielding material, said housing including an open front and a distribution back plane;
 - (b) a plurality of first electrical connectors supported on said distribution back plane;
 - (c) a plurality of modular units removably received within said open front of said housing, each said modular unit including:
 1. at least a second electrical connector (104/108) for mating with one of said first electrical connectors on said distribution back plane;
 2. an enclosure (42/60/44/46/48/50/52/54) constructed of electromagnetic radiation shielding material, and
 3. a face plate (82), of all said modular units said face plates, when said modular units are received within said housing, forming a front for said mainframe; and
 - (d) electrically conductive means (86/94/96) in electrical contact with said modular units when said modular units are received within said housing for sealing said front of said housing as to electromagnetic radiation.

4,872,213

VERSATILE INTERFACE MEANS FOR COMPUTER-BASED CONTROL SYSTEMS

Mark D. Sebald, Calendonia, and Richard E. Neumeyer, Rockford, both of Ill., assignors to Barber-Colman Company, Rockford, Ill.

Filed Mar. 31, 1988, Ser. No. 175,865

Int. Cl. G05B 9/00

U.S. Cl. 364-180

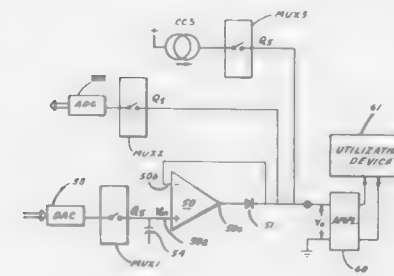
5 Claims

1. In a computer system having
 - (a) a computer which includes a CPU with conventional multibit memory, data bus, address bus and ports,
 - (b) a terminal point through which intelligence is transferred either from the computer to an external device or from an external device into the computer, said system being characterized in that the external device associated with said terminal point may be either one of two categories, namely
- First Category: a device to which a changeable dc. voltage is to be outputted with a magnitude that depends on the changeable contents in a preselected memory location ML₁ in the computer, or
- Second Category: a device which feeds to said terminal

point a changeable dc. voltage whose magnitude is to be represented by setting the numerical contents of a preselected memory location ML₂;

and said system including, in combination

- (c) a DAC adapted to receive multibit input signals and having an analog voltage output terminal,
- (d) means constituting an ADC having an input terminal adapted to receive a voltage signal appearing at said terminal point,
- (e) a sample-and-hold voltage summing amplifier having non-inverting and inverting input terminals and an output terminal,
- (f) means connecting said DAC analog output terminal to said non-inverting input terminal,
- (g) means including a forwardly poled diode connecting said amplifier output terminal to said terminal point,
- (h) means connecting said terminal point to said inverting input terminal to create a negative feedback loop, and



- (i) means formed in part by said computer and a program of sequential instructions loaded therein
 - (1) for iteratively writing out from the computer to said DAC multibit signals which represent the changeable intelligence stored at said preselected memory location ML₁, when said device is of the First Category; or
 - (2) for writing out from the computer to said DAC multibit signal numerically representing substantially zero, and iteratively writing from said ADC into said preselected memory location ML₂ signals which correspond in intelligence to the changeable dc. voltage existing at said terminal point and the ADC input terminal, when said device is of the Second Category; said diode being reverse biased automatically when intelligence is taken from a Second Category external device through said terminal point and into the computer memory.

4,872,214

METHOD AND APPARATUS FOR HIGH PERFORMANCE DIVISION

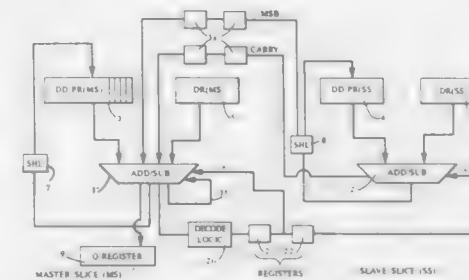
John H. Zurawski, Stow, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed Apr. 1, 1988, Ser. No. 176,787

Int. Cl. G06F 7/52

U.S. Cl. 364-766

5 Claims



1. A bit-slice apparatus for performing division, which apparatus comprises:

- (a) a master divider for dividing a master slice of a dividend by a master slice of divisor through a first series of iterations to obtain a master slice partial remainder after each one iteration of the first series of iterations, said master slice including a preselected number of most significant bits of the dividend;
- (b) said master divider including a first partial remainder register having bit locations to store a cumulative master slice partial remainder;
- (c) a slave divider for dividing a slave slice of the dividend by a slave slice of the divisor through a second series of iterations to obtain a slave slice partial remainder after each one iteration of the second series of iterations, said slave slice including the remaining bits of the dividend;
- (d) said slave divider including a second partial remainder register having bit locations to store a cumulative slave slice partial remainder;
- (e) a first line coupling a most significant bit location of the slave slice partial remainder register to a bit location in a register corresponding to an LSB+2 location of the master slice first partial remainder register;
- (f) a second line coupling a carry-out bit of the slave divider to a bit location in said register corresponding to an LSB+3 location of the master slice first partial remainder register; and
- (g) a monitor for monitoring each one iteration of the first series of iterations of the master divider to detect a preselected condition and for inhibiting a subsequent iteration when said preselected condition is detected.

DESIGNS

OCTOBER 3, 1989

303,727

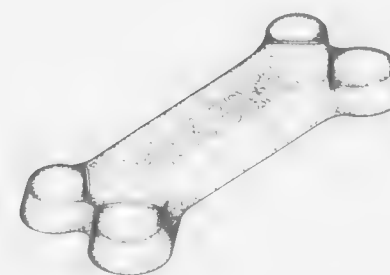
CANINE BISCUIT

Henry C. Spanier, West Milford, N.J., and Albert Spiel, Yonkers, N.Y., assignors to Nabisco Brands, Inc., East Hanover, N.J.

Filed Jan. 5, 1987, Ser. No. 947

Term of patent 14 years

U.S. Cl. D1—106



303,729

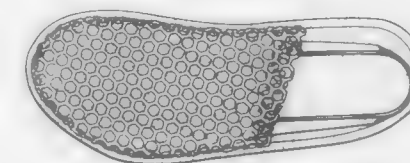
SHOWER SHOE

Rick G. Macasieb, 1160 Bollin Ave., Camarillo, Calif. 93010

Filed Sep. 11, 1986, Ser. No. 907,754

Term of patent 14 years

U.S. Cl. D2—283



303,730

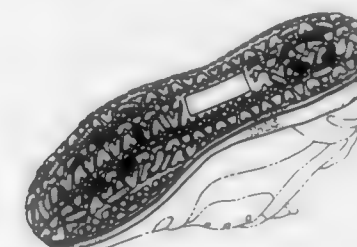
CLEATED SOLE

James C. Astry, Dallas, Tex., and Mark Lin, Taichung, China, assignors to Astry Industries, Inc., Dallas, Tex.

Filed Nov. 3, 1986, Ser. No. 927,000

Term of patent 14 years

U.S. Cl. D2—320



303,728

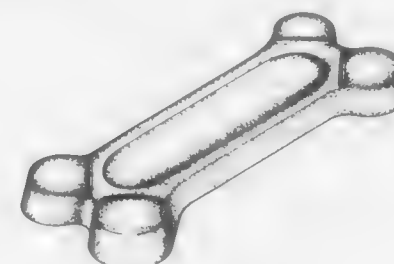
CANINE BISCUIT

Henry C. Spanier, West Milford, N.J., and Albert Spiel, Yonkers, N.Y., assignors to Nabisco Brands, Inc., East Hanover, N.J.

Filed Jan. 5, 1987, Ser. No. 966

Term of patent 14 years

U.S. Cl. D1—106



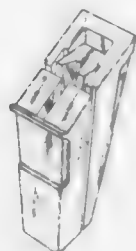
303,731

KNIFE SCABBARD

Alfred Blochlinger, Christopher Collins, both of South Yarra;
Cvetan Petroff, Northcote, and Wallace Trench, South Yarra,
all of Australia, assignors to McPherson's Limited, Australia
Filed May 12, 1986, Ser. No. 862,535

Claims priority, application Australia, Nov. 11, 1985, 3203/85
Term of patent 14 years

U.S. Cl. D3—102



303,733

COMBINED TOOTHBRUSH AND COVER THEREFOR

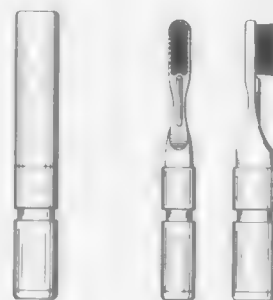
Isaac Benichou, 72 Rue Monceau, Paris, France

Filed Nov. 18, 1987, Ser. No. 122,655

Claims priority, application Int'l Pat. Institute, May 18,
1987, 008658

Term of patent 14 years

U.S. Cl. D4—108



303,734

TEXTILE FABRIC OR SIMILAR ARTICLE

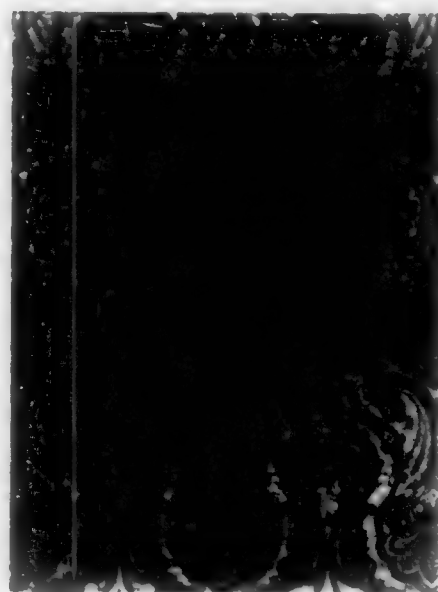
Gerolamo Etro, Milan, Italy, assignor to Etro S.p.A., Milan,
Italy

Filed Dec. 15, 1986, Ser. No. 943,207

Claims priority, application Italy, Jul. 25, 1986, 22655/86[U]

Term of patent 14 years

U.S. Cl. D5—45



303,732

TOOTHBRUSH

Kenneth A. Brown, 181 Farms Village Rd., West Simsbury,
Conn. 06092

Filed Nov. 19, 1987, Ser. No. 122,657

Term of patent 14 years

U.S. Cl. D4—104



303,735

ADJUSTABLE SEAT

Ola Hankvik, Stathelle, and Martin Lande, Stranda, both of
Norway, assignors to J. E. Ekornes A/S, Ikoranes, Norway
Division of Ser. No. 865,082, Apr. 25, 1986. This application

Mar. 21, 1988, Ser. No. 170,980

Claims priority, application Norway, Oct. 25, 1985, 66717

Term of patent 14 years

U.S. Cl. D6—365



303,737

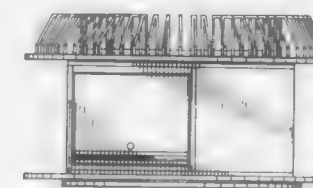
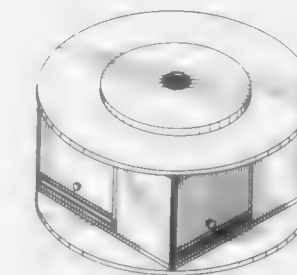
ROTATABLE FILING AND STORAGE CABINET

Gordon F. Kwiecinski, Cincinnati, Ohio, assignor to Hamilton
Sorter Co., Inc., Fairfield, Ohio

Filed Jan. 2, 1986, Ser. No. 869,950

Term of patent 14 years

U.S. Cl. D6—455



303,736

ARMCHAIR

Raymond Grosfillex, Arrent, 01107 Oyonnax, France

Filed Jul. 23, 1986, Ser. No. 888,415

Claims priority, application France, Jan. 24, 1986, 860344

The portion of the term of this patent subsequent to Sep. 23,

2003, has been disclaimed.

Term of patent 14 years

U.S. Cl. D6—379



303,738

ROTATABLE CYLINDER HOLDER

Theodore Ziaylek, Jr., 140 Riverview Dr., Yardley, Pa. 19067

Filed Aug. 8, 1986, Ser. No. 894,428

Term of patent 14 years

U.S. Cl. D6—457



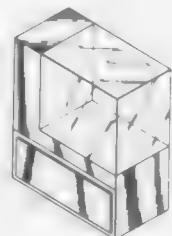
303,739

DISPLAY CASE

Harry Egerton, Jr., 1858 W. 48th St., Los Angeles, Calif. 90062
Filed Mar. 30, 1987, Ser. No. 31,444

Term of patent 14 years

U.S. Cl. D6—470



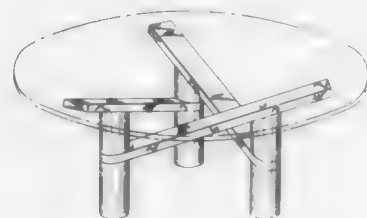
303,740

TABLE BASE

Jay Lefkowitz, 16 Wellesley, Pleasant Ridge, Mich. 48069
Filed Aug. 25, 1986, Ser. No. 900,344

Term of patent 14 years

U.S. Cl. D6—495



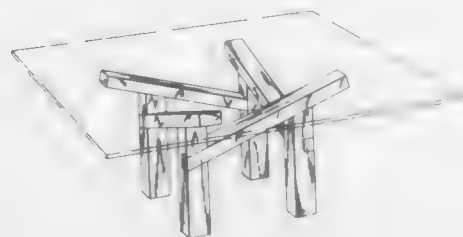
303,741

TABLE BASE

Jay Lefkowitz, 16 Wellesley, Pleasant Ridge, Mich. 48069
Filed Aug. 25, 1986, Ser. No. 900,359

Term of patent 14 years

U.S. Cl. D6—495



303,742

TABLE LEG OR THE LIKE

Mary J. Reid, Sheboygan, Wis., assignor to Kohler Co., Kohler, Wis.
Filed Jan. 12, 1987, Ser. No. 2,253

Term of patent 14 years

U.S. Cl. D6—499



303,743

HEADWALL UNIT FOR HOSPITAL ROOMS

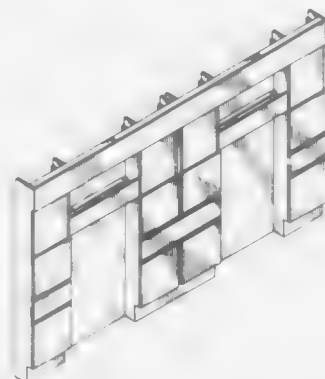
Ira M. Durham, Jr., Houston, Tex., assignor to The Methodist Hospital System, Houston, Tex.

Filed Aug. 7, 1986, Ser. No. 893,969

The portion of the term of this patent subsequent to Oct. 10, 2003, has been disclaimed.

Term of patent 14 years

U.S. Cl. D6—505



303,744

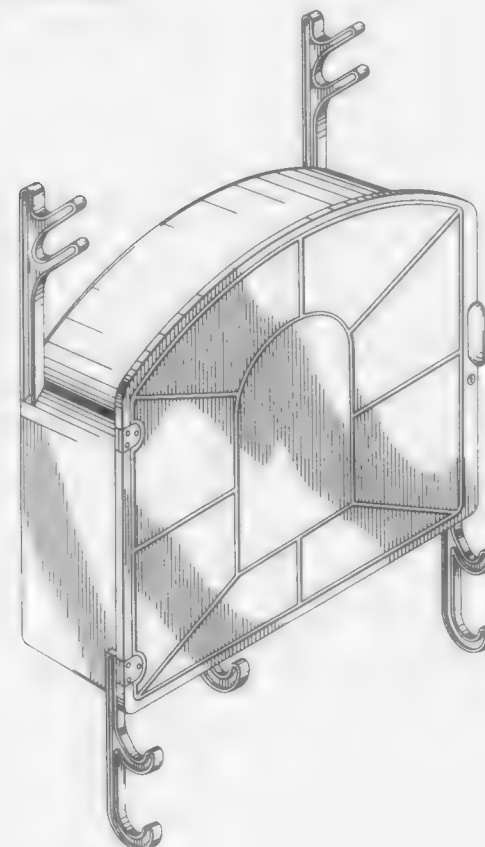
COMBINED STORAGE CABINET AND RACK

Robert A. Turner, 35 E. Roanoke, Phoenix, Ariz. 85004, and Daniel L. Pool, 4414 E. Lincoln Dr., Paradise Valley, Ariz. 85253

Filed Dec. 21, 1987, Ser. No. 135,620

Term of patent 14 years

U.S. Cl. D6—559



303,746

PEPPER MILL

Tom David, Nantucket Island, Mass., assignor to Tom David, Inc., Nantucket Island, Mass.

Filed Oct. 29, 1986, Ser. No. 924,602

Term of patent 14 years

U.S. Cl. D7—53



303,747

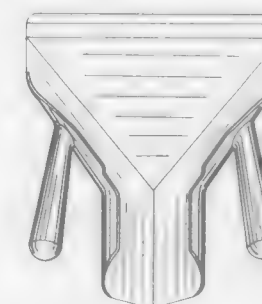
FOOD PACKAGING SCOOP

Gregory J. Wenkman, Middleton, Wis., assignor to Traex Corporation, Dane, Wis.

Filed Sep. 30, 1985, Ser. No. 782,091

Term of patent 14 years

U.S. Cl. D7—104



303,748

HANDLE FOR COOKING KNIFE

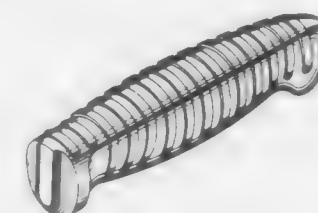
Masami Yamagishi, Tokyo, Japan, assignor to Kai Cutlery Co., Ltd., Tokyo, Japan

Filed Apr. 30, 1987, Ser. No. 44,973

Claims priority, application Japan, Dec. 24, 1986, 61-50787

Term of patent 14 years

U.S. Cl. D7—152



303,745

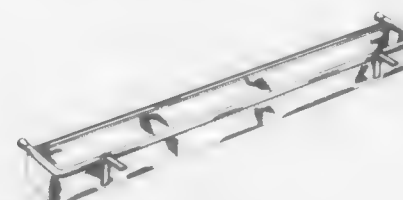
RACK FOR LAUNDRY-TYPE ITEMS OR THE LIKE

Gordon M. Lowe, and Patrice P. Lowe, both of 384 E. Canyon Country Rd., Brea, Calif. 92621

Filed Sep. 8, 1986, Ser. No. 909,419

Term of patent 14 years

U.S. Cl. D6—574



303,749

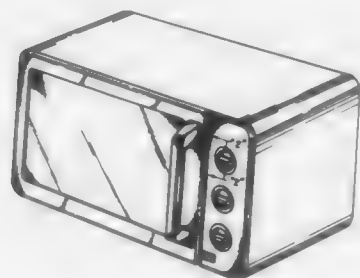
MICROWAVE OVEN

Norman A. Steinkamp, La Grange Park, Ill., assignor to Sunbeam Corporation, Downers Grove, Ill.

Filed Mar. 18, 1987, Ser. No. 28,161

Term of patent 14 years

U.S. Cl. D7—351



303,751

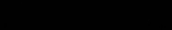
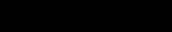
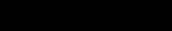
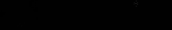
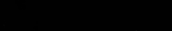
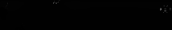
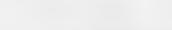
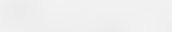
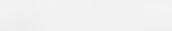
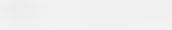
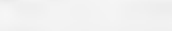
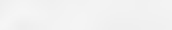
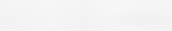
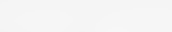
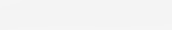
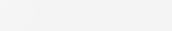
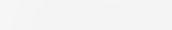
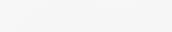
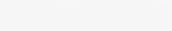
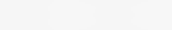
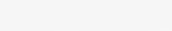
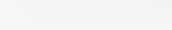
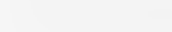
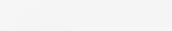
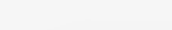
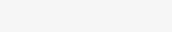
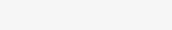
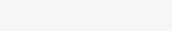
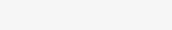
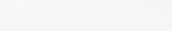
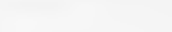
KITCHEN BOX TOP OPENER

Paul E. Kunna, and Sadie A. Kunna, both of 11145 Normandy Cir., #3, Temple Terrace, Fla. 33617

Filed Jan. 27, 1987, Ser. No. 7,417

Term of patent 14 years

U.S. Cl. D8—18



303,750

SEEDLING PROTECTOR

Douglas R. Inglis, 4111 E. Packard Hwy., Charlotte, Mich.

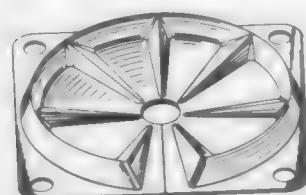
ABSTRACT

Division of Ser. No. 866,105, May 22, 1986. This application

Aug. 24, 1988, Ser. No. 235,642

Term of patent 14 years

U.S. Cl. D8—1



303,752

GUIDE FOR POWER TOOLS

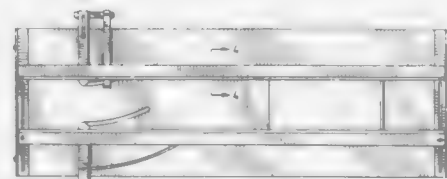
Ramon A. Gleason, and Lemuel Gleason, both of 16 Fullam Road, Blacktown, New South Wales, 2148, Australia

Filed Mar. 25, 1986, Ser. No. 845,805

Claims priority, application Australia, Sep. 25, 1985, 2707/85

Term of patent 14 years

U.S. Cl. D8—71



303,753

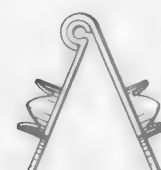
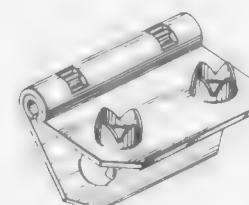
EASEL HINGE

Abraham Friedman, 2205 E. 27 St., Brooklyn, N.Y. 11229

Filed Jun. 8, 1987, Ser. No. 59,276

Term of patent 14 years

U.S. Cl. D8—328



303,755

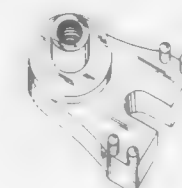
PLASTIC SOLDERABLE-PINNED MOUNT FOR AN ELECTRONIC DEVICE

Alfred F. McCarthy, Belmont, N.H., assignor to Aavid Engineering, Inc., Laconia, N.H.

Filed Jun. 2, 1986, Ser. No. 869,949

Term of patent 14 years

U.S. Cl. D8—349



303,756

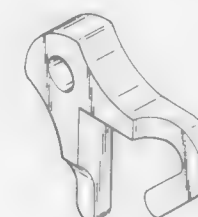
DOOR STOP

Kenneth A. Meyers, Reedsburg, Wis., assignor to Gerber Products Company, Fremont, Mich.

Filed Nov. 10, 1988, Ser. No. 269,946

Term of patent 14 years

U.S. Cl. D8—402



303,757

BATTERY-POWERED SHARPENER FOR FISH HOOKS OR THE LIKE

Lee S. Weinerman, Medina, and Steven A. Mayo, Akron, both of Ohio, assignors to The Eastern Company, Cleveland, Ohio

Filed Jul. 10, 1987, Ser. No. 72,281

Term of patent 14 years

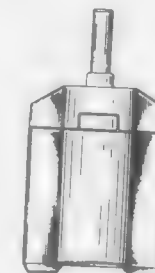
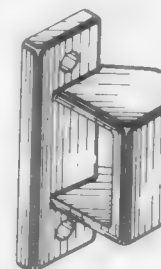
U.S. Cl. D8—344

Bingham A. McClellan, Traverse City, Mich., assignor to McClellan Industries, Inc., Traverse City, Mich.

Filed Jul. 15, 1987, Ser. No. 73,621

Term of patent 14 years

U.S. Cl. D8—91



303,758

AEROSOL CONTAINER

Tomio Nitta, Yokohama, Japan, assignor to Tokai Corporation, Yokohama, Japan

Filed Dec. 11, 1986, Ser. No. 941,959

Term of patent 14 years

U.S. Cl. D9—300



303,761

COMBINED CONTAINER AND BRUSH

Joel Desgrappes, Paris, France, assignor to Institut Jeanne Plaubert, Paris, France

Filed Apr. 25, 1986, Ser. No. 857,777

Claims priority, application Hague, Oct. 31, 1985, DM/006026

Term of patent 14 years

U.S. Cl. D9—337



303,759

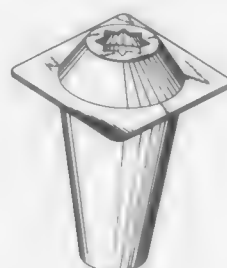
COMBINED PACKAGE AND DISPENSER FOR EXTRUSIBLE COMESTIBLES

George Mileos, Riverdale, N.Y., assignor to General Foods Corporation, White Plains, N.Y.

Filed Sep. 2, 1986, Ser. No. 903,056

Term of patent 14 years

U.S. Cl. D9—306



303,762

JAR

Anthony J. Cardinal, Milford; Robert D. Hanekamp, and Elizabeth T. Olson, both of Cincinnati, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jul. 28, 1986, Ser. No. 891,433

Term of patent 14 years

U.S. Cl. D9—404



303,760

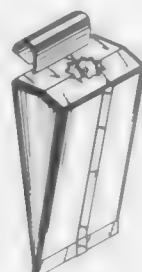
COMBINED PACKAGE AND DISPENSER FOR EXTRUSIBLE COMESTIBLES

Robert H. Brainard, Danbury, Conn., assignor to General Foods Corporation, White Plains, N.Y.

Filed Sep. 2, 1986, Ser. No. 903,057

Term of patent 14 years

U.S. Cl. D9—306



303,763

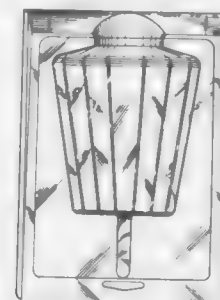
CONTAINER FOR CARAMEL APPLE

Daniel J. DeMarco, 3258 Fullerton Ave., Arlington Heights, Ill. 60647

Filed Feb. 24, 1987, Ser. No. 17,972

Term of patent 14 years

U.S. Cl. D9—415



303,764

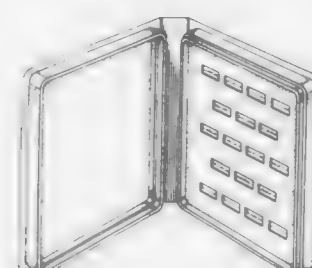
JEWELRY DISPLAY BOX

John D. Kilmartin, III, Providence, R.I., assignor to International Packaging Corporation, Pawtucket, R.I.

Filed Apr. 7, 1986, Ser. No. 849,254

Term of patent 14 years

U.S. Cl. D9—423



303,765

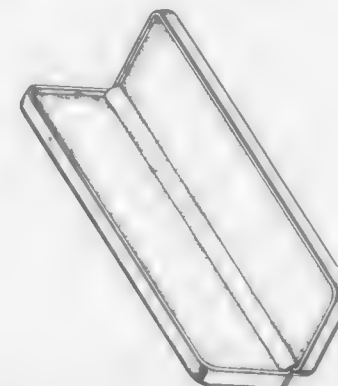
JEWELRY PRESENTATION CASE

Myril Kaplan, 125 E. 144th St., Bronx, N.Y. 10451

Filed Aug. 8, 1986, Ser. No. 894,901

Term of patent 14 years

U.S. Cl. D9—423



303,766

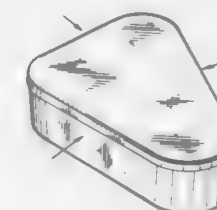
FOOD CONTAINER

Kurt B. Delbanco, New York, N.Y., assignor to Delbanco Arts, New York, N.Y.

Filed Oct. 16, 1986, Ser. No. 919,899

Term of patent 14 years

U.S. Cl. D9—430



303,767

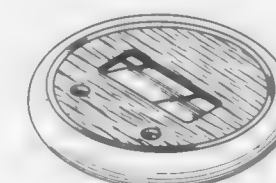
WATCH CASING

Robert E. Baird, and Thomas M. Baird, both of Medford, Oreg., assignors to Momentum Enterprises, Incorporated, Los Angeles, Calif.

Filed May 20, 1986, Ser. No. 867,264

Term of patent 14 years

U.S. Cl. D10—30



303,768

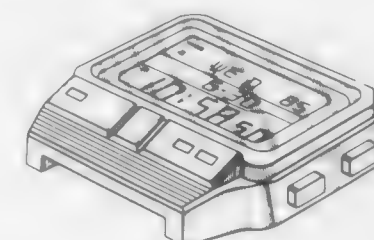
WRIST WATCH

Masamichi Wakamatsu, Akishima, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Sep. 25, 1986, Ser. No. 911,626

Term of patent 14 years

U.S. Cl. D10—38



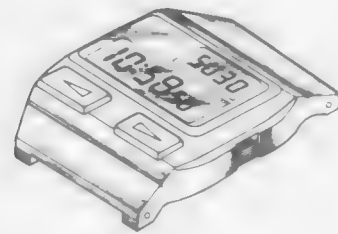
303,769
WRIST WATCH

Toshiya Ando, Murayama, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Dec. 29, 1986, Ser. No. 947,507

Term of patent 14 years

U.S. Cl. D10—38



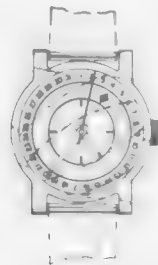
303,770
WRISTWATCH

Benjamin E. Woomer, 1597 E. 30th St., Cleveland, Ohio 44114

Filed Sep. 8, 1986, Ser. No. 905,061

Term of patent 14 years

U.S. Cl. D10—39



303,771
TIMER

Raymond Chan, Hong Kong, Hong Kong, assignor to Integrated Display Technology, Limited, Hong Kong, Hong Kong

Filed Nov. 5, 1986, Ser. No. 927,426

Claims priority, application United Kingdom, Jul. 28, 1986, 1035661

Term of patent 14 years

U.S. Cl. D10—40



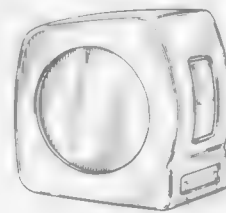
303,772
TAPE MEASURE COVER

Larry R. Maier, Edgewater, and John L. Quinn, Lakewood, both of Colo., assignors to Rocco Enterprises, Grand Lake, Colo.

Filed Dec. 28, 1988, Ser. No. 290,909

Term of patent 14 years

U.S. Cl. D10—74



303,773
WATCH STRAP

Hans Diracherl, Konigheim, Fed. Rep. of Germany, assignor to Textron, Inc., Providence, R.I.

Filed Jul. 20, 1987, Ser. No. 77,402

Term of patent 14 years

U.S. Cl. D11—3



303,774
COMBINED TOOLS AND RACK THEREFOR

Amy M. Motazed, 1016 W. Walnut St., Brownstown, Ind. 47220

Filed Jan. 30, 1986, Ser. No. 880,503

Term of patent 14 years

U.S. Cl. D11—131



303,775
VASE

Donald E. Weder, Highland, Ill., assignor to Highland Supply Corporation, Highland, Ill.

Filed Jan. 22, 1987, Ser. No. 6,578

The portion of the term of this patent subsequent to Jul. 11, 2003, has been disclaimed.

Term of patent 14 years

U.S. Cl. D11—155



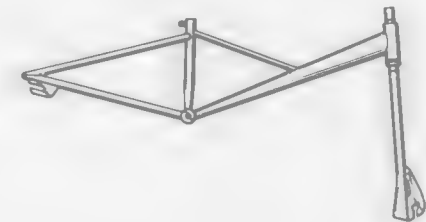
303,777
BICYCLE FRAME

Norman Levine, 2205 NW. 30th Pl., Pompano Beach, Fla. 33060

Filed Jan. 16, 1987, Ser. No. 3,915

Term of patent 14 years

U.S. Cl. D12—111



303,778
STRAP FOR A BICYCLE PEDAL CAGE

Joseph M. Szwczak, 33 Lauriston St., Providence, R.I. 02906

Filed Jan. 15, 1987, Ser. No. 62,468

Term of patent 14 years

U.S. Cl. D12—125



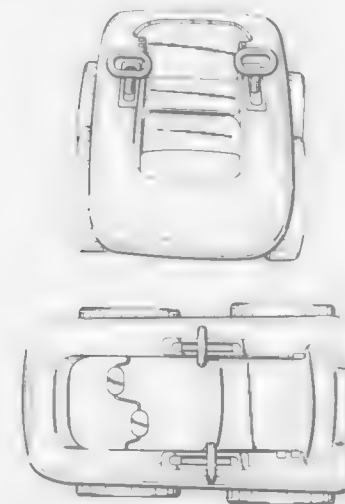
303,776
TOY CAR

Kevin R. Aker, Hudson, Ohio, assignor to The Little Tikes Company, Hudson, Ohio

Filed Mar. 17, 1987, Ser. No. 27,016

Term of patent 14 years

U.S. Cl. D12—108



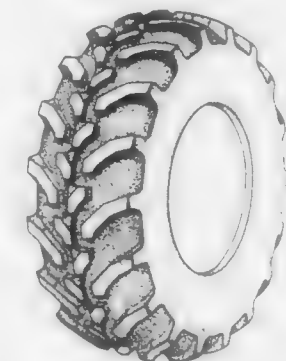
303,779
TIRE

Mark L. Bonko, Hartville, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jan. 30, 1987, Ser. No. 9,396

Term of patent 14 years

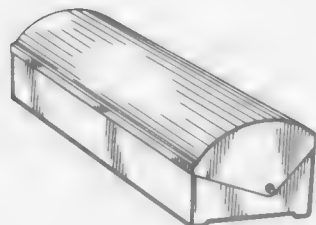
U.S. Cl. D12—151



303,781

UTILITY BOX FOR A PICKUP TRUCK

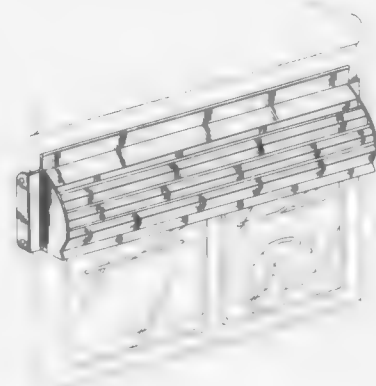
Charles J. Sauber, 10 N. Sauber Rd., Virgil, Ill. 60182
 Filed Feb. 13, 1987, Ser. No. 14,919
 Term of patent 14 years
 U.S. Cl. D12—157



303,782

TRUCK SUN VISOR

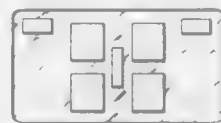
Vabe Karapetian, 4801 Los Feliz Blvd., Los Angeles, Calif.
 86027
 Filed Apr. 20, 1987, Ser. No. 39,964
 Term of patent 14 years
 U.S. Cl. D12—191



303,783

SET OF CAR DASHBOARD COVERS

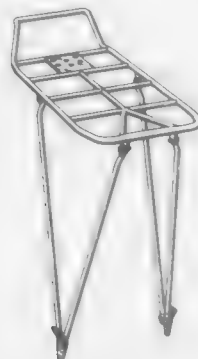
Grady M. Engolia, 11356 Pressburg, New Orleans, La. 70128
 Filed Jul. 18, 1986, Ser. No. 886,747
 Term of patent 14 years
 U.S. Cl. D12—192



303,781

LUGGAGE CARRIER OR SIMILAR ARTICLE FOR TWO-WHEELED VEHICLES

Oskar Pietscher, 8460 Marthalen, Switzerland
 Filed May 14, 1987, Ser. No. 50,135
 Claims priority, application Switzerland, Dec. 12, 1986,
 1051/007 909
 Term of patent 14 years
 U.S. Cl. D12—158



303,784

AIRCRAFT ENGINE COVER

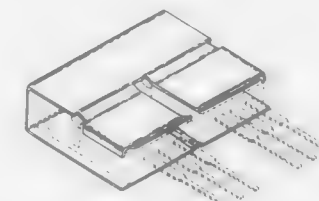
Alfred M. Micallef, Aledo, Tex., assignor to JMK International, Inc., Fort Worth, Tex.
 Filed Sep. 8, 1986, Ser. No. 905,037
 Term of patent 14 years
 U.S. Cl. D12—345



303,786

SPRING-CLIP HEAT SINK FOR A PAIR OF ELECTRONIC DEVICES

Alfred F. McCarthy, Belmont, N.H., assignor to Aavid Engineering, Inc., Laconia, N.H.
 Filed Feb. 26, 1987, Ser. No. 19,549
 Term of patent 14 years
 U.S. Cl. D13—23

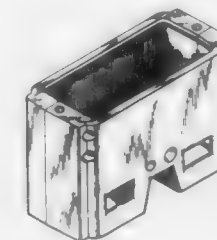


303,787

CONNECTOR STRAIN RELIEVING BACK SHELL

Ronald L. Messenger, 10747 Mt. Vernon Rd., and Kenny R. Messenger, 3573 Sapphire Dr., No. 4, both of Auburn, Calif.
 95603
 Filed Oct. 31, 1986, Ser. No. 926,277
 Term of patent 14 years

U.S. Cl. D13—24



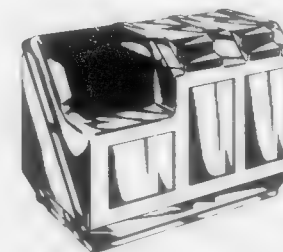
303,785

ENCLOSURE FOR AN ENGINE DRIVEN GENERATOR SET

Richard L. Waltz, Fridley, and Timothy A. Loehlein, Anoka, both of Minn., assignors to Onan Corporation, Minneapolis, Minn.

Filed Aug. 1, 1986, Ser. No. 892,706
 Term of patent 14 years

U.S. Cl. D13—3



303,788

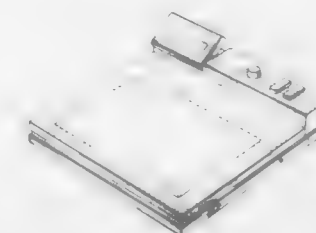
DATA INPUT UNIT FOR A SEWING MACHINE WITH A TOUCH ENTRY PAD

Nobuyuki Kondoh; Yoshinori Abe, both of Kamakura, and Iwao Yamane, Nagoya, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 9, 1986, Ser. No. 883,809

Claims priority, application Japan, Jan. 10, 1986, 401/86; Feb. 4, 1986, 3712/86; Feb. 4, 1986, 3713/86
 Term of patent 14 years

U.S. Cl. D14—100



303,789

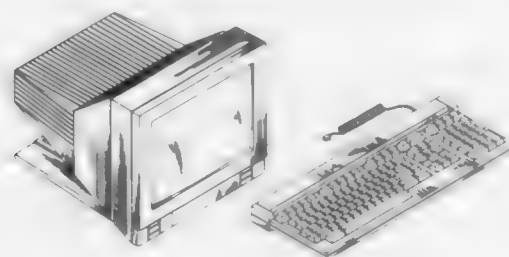
COMPUTER TERMINAL

Robert Brunner, Palo Alto, Calif., assignor to Esprit Systems, Inc., Melville, N.Y.

Filed Oct. 1, 1986, Ser. No. 914,601

Term of patent 14 years

U.S. Cl. D14—100



303,792

ELECTRONIC COPYING MACHINE

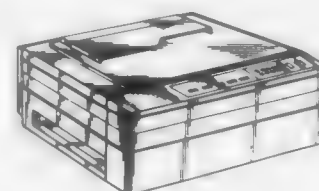
Kunio Hara, Chiba, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 8, 1986, Ser. No. 916,860

Claims priority, application Japan, Apr. 8, 1986, 61-12543

Term of patent 14 years

U.S. Cl. D14—107



303,790

FLAT PANEL DISPLAY WITH KEYBOARD OR SIMILAR ARTICLE

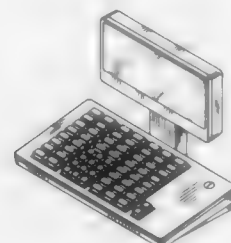
Shuzo Kato; Yasushi Nakamura, both of Hiratsuka, and Junnosuke Takeda, Ninomiya, all of Japan, assignors to NCR Corporation, Dayton, Ohio

Filed Sep. 25, 1987, Ser. No. 101,339

Claims priority, application Japan, Mar. 30, 1987, 11677/87

Term of patent 14 years

U.S. Cl. D14—106



303,793

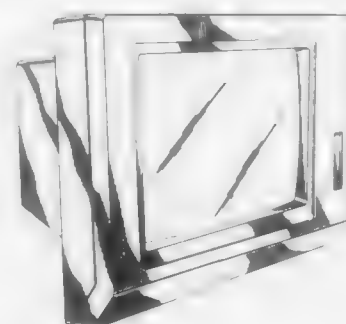
VIDEO DISPLAY

Lawrence M. Kuba, Nashua, N.H., assignor to Wang Laboratories, Inc., Lowell, Mass.

Filed Nov. 10, 1986, Ser. No. 929,137

Term of patent 14 years

U.S. Cl. D14—113



303,791

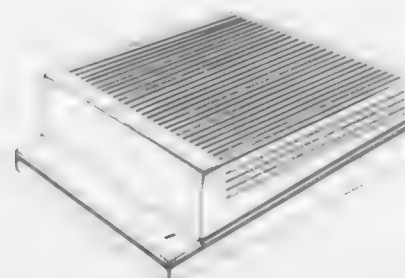
COMPUTER HOUSING

Stephen Peart, Los Gatos, and Anthony Guido, Campbell, both of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

Filed Sep. 12, 1986, Ser. No. 907,529

Term of patent 14 years

U.S. Cl. D14—107



303,794

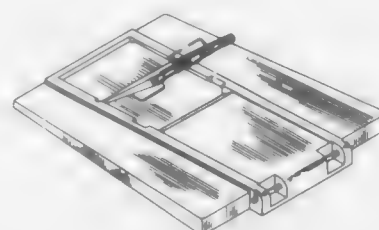
PEDESTAL FOR CRT HOUSING

Robert Brunner, Palo Alto, Calif., assignor to Esprit Systems, Inc., Melville, N.Y.

Filed Oct. 1, 1986, Ser. No. 914,600

Term of patent 14 years

U.S. Cl. D14—114



303,795

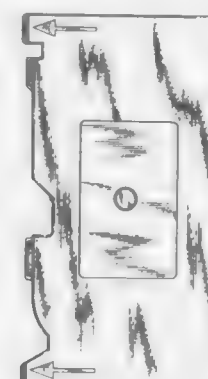
VIDEO ALARM CASSETTE

Peter D. Brown, Otley, Great Britain, assignor to Embassy Safety & Security Limited, Huddersfield, England

Filed Jun. 18, 1987, Ser. No. 63,634

Term of patent 14 years

U.S. Cl. D14—121



303,797

TELEPHONE SET

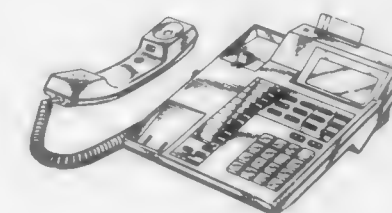
Eiichi Taniguchi, Kawasaki, Japan, assignor to Nitsuko Corporation, Kanagawa, Japan

Filed Feb. 9, 1988, Ser. No. 154,133

Claims priority, application Japan, Oct. 12, 1987, 62-41309

Term of patent 14 years

U.S. Cl. D14—146



303,798

TELEPHONE SET

Kunio Yamakawa, Zama, Japan, assignor to Kanda Tsushin Kogyo Co., Ltd., Tokyo, Japan

Filed Mar. 11, 1988, Ser. No. 166,917

Claims priority, application Japan, Sep. 19, 1987, 62-38187; Sep. 19, 1987, 62-38188

Term of patent 14 years

U.S. Cl. D14—151



303,796

CASSETTE FOR A VIDEO TAPE RECORDER

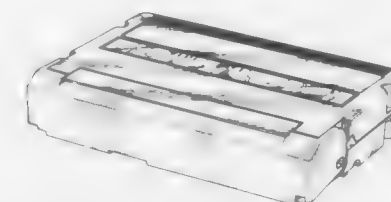
Kenji Nishiyama, Nara; Hanji Takahashi, Hyogo, and Yoshitomo Itakura, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Sep. 5, 1986, Ser. No. 904,313

Claims priority, application Japan, Mar. 5, 1986, 61-7804

Term of patent 14 years

U.S. Cl. D14—121



303,799

RADIO PAGER OR SIMILAR ARTICLE

Robert D. Peanell, Coral Springs; Richard M. Huber, Boca Raton; Robert D. Lloyd, Sunrise, and William J. Scheid, Coral Springs, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 12, 1986, Ser. No. 873,221

Term of patent 14 years

U.S. Cl. D14—191



303,801

DIRECT STATION TELEPHONE SELECTOR

Shigeaki Kido; Sadao Isozaki, and Yasuko Yajima, all of Tokyo, Japan, assignors to Meisei Electric Co., Ltd., Tokyo, Japan

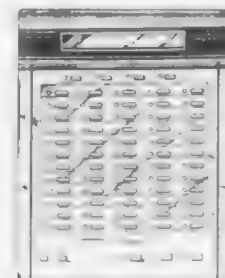
Division of Ser. No. 6,693, Jan. 22, 1987, Pat. No. Des. 300,029.

This application Aug. 22, 1988, Ser. No. 235,032

Claims priority, application Japan, Jun. 25, 1986, 61-29173; Oct. 4, 1986, 61-39346

Term of patent 14 years

U.S. Cl. D14—241



303,802

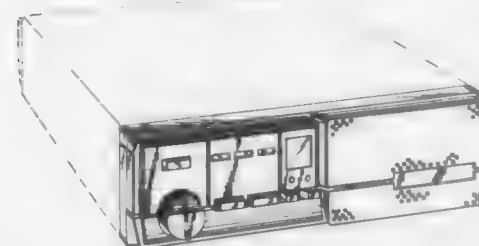
FRONT PANEL FOR A TWO-WAY MOBILE RADIO

Richard Culbertson, Lynchburg, Va., assignor to General Electric Company, Lynchburg, Va.

Filed Oct. 20, 1986, Ser. No. 922,990

Term of patent 14 years

U.S. Cl. D14—258



303,800

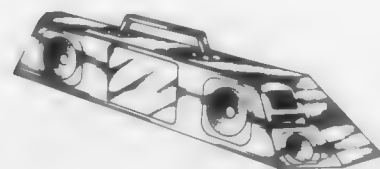
STEREO RADIO

Joel C. Newman, 110 Drury Rd., Shoals, Ala. 35630

Filed Jun. 10, 1987, Ser. No. 61,173

Term of patent 14 years

U.S. Cl. D14—195



303,803

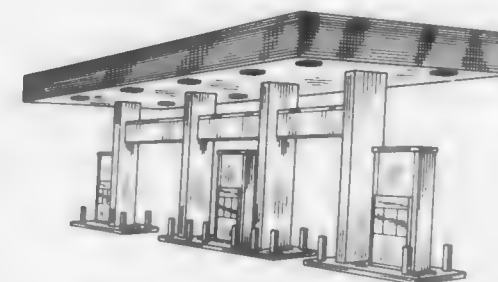
GASOLINE PUMP ISLAND

Wyatt L. Phillips, Tulsa, Okla., assignor to QuikTrip Corporation, Tulsa, Okla.

Filed Jul. 18, 1986, Ser. No. 886,745

Term of patent 14 years

U.S. Cl. D15—9.2



303,805

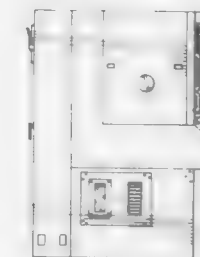
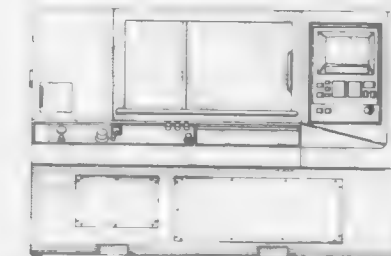
COMBINED CHUCKER AND BAR MACHINE

Terrence M. Sheehan, Elmira; Jeffery W. Thomason, Odessa, both of N.Y.; James S. MacConkey, Winchester, Mass.; Philip M. Reavis, Jr., Arlington, Mass., and Edmund J. Britt, Wakefield, Mass., assignors to Hardinge Brothers, Inc., Elmira, N.Y.

Filed Apr. 1, 1986, Ser. No. 847,621

Term of patent 14 years

U.S. Cl. D15—130



303,804

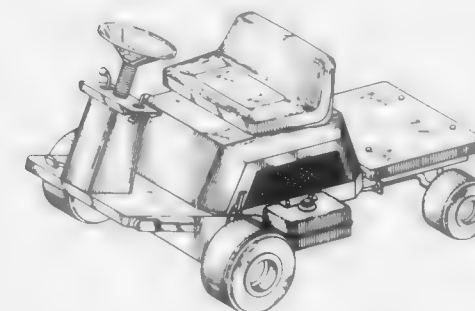
SELF-PROPELLED RIDING TRACTOR

Igor Kamlukin; John F. Brackin, both of Mequon, and Edward Freier, Jr., Port Washington, all of Wis., assignors to Simplicity Manufacturing, Inc., Port Washington, Wis.

Filed May 7, 1987, Ser. No. 47,705

Term of patent 14 years

U.S. Cl. D15—23



303,806

CASH REGISTER OR SIMILAR ARTICLE

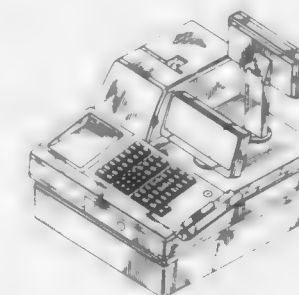
Shunzo Kato; Yasushi Nakamura, both of Hiratsuka, and Masao Kusayanagi, Odawara, all of Japan, assignors to NCR Corporation, Dayton, Ohio

Filed Sep. 25, 1987, Ser. No. 101,340

Claims priority, application Japan, Mar. 30, 1987, 62-11675

Term of patent 14 years

U.S. Cl. D18—4



303,807

ELECTRONIC CALCULATOR WITH MEMO

Takahisa Yabuta; Hiroshi Sakaguchi, and Toshiya Takahashi,
all of Osaka, Japan, assignors to Sharp Kabushiki Kaisha,
Osaka, Japan

Filed Jul. 25, 1986, Ser. No. 890,693

Claims priority, application Japan, Jan. 27, 1986, 61-2625
Term of patent 14 years

U.S. Cl. D18—7



303,809

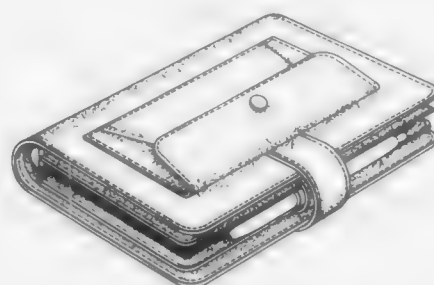
COMBINATION STATIONERY HOLDER AND POCKET SECRETARY

Ludolf Klein, Great Neck, N.Y., assignor to Bond Street, Ltd.,
New York, N.Y.

Filed Mar. 3, 1986, Ser. No. 835,311

Term of patent 14 years

U.S. Cl. D19—27



303,808

HAND-HELD LABELLING GUN

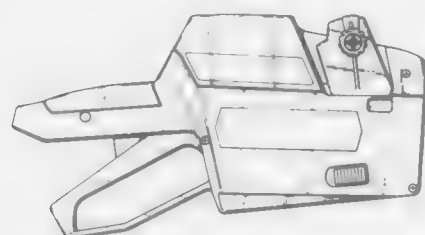
Klaus-Dieter Hermann, Hirschhorn, Fed. Rep. of Germany,
assignor to K-D Hermann Gesellschaft mit beschränkter
Haftung Contact Preisanzzeichnung-Etikettiersysteme,
Hirschhorn, Fed. Rep. of Germany

Filed Dec. 22, 1986, Ser. No. 946,272

Claims priority, application Fed. Rep. of Germany, Jun. 27,
1986, 422

Term of patent 14 years

U.S. Cl. D18—19



303,810

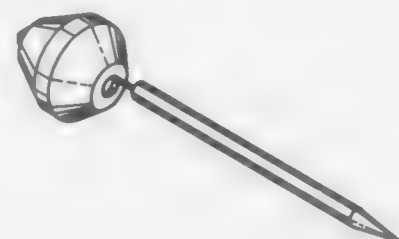
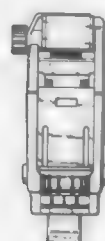
WRITING INSTRUMENT

Thomas Von Den Beuken, 1183 Fuhrman Rd., Cincinnati, Ohio
45215

Filed Apr. 28, 1986, Ser. No. 857,812

Term of patent 14 years

U.S. Cl. D19—46



303,811

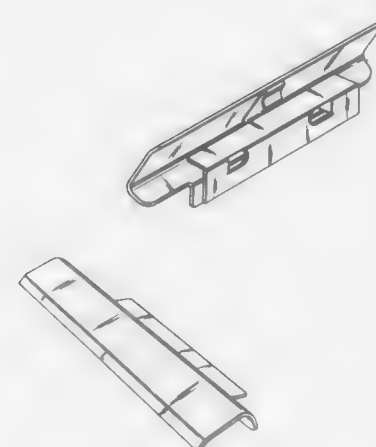
COMBINED DOCUMENT CLIP AND PENCIL GRIP

F. Carlos de Witt, Long Beach, Calif., assignor to Romana
Acosta, Los Angeles, Calif.

Filed Mar. 5, 1986, Ser. No. 841,738

Term of patent 14 years

U.S. Cl. D19—65



303,813

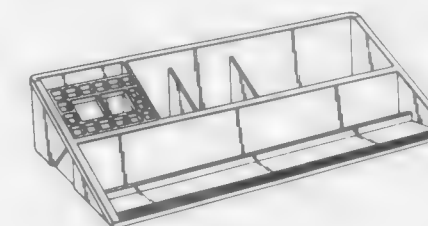
DESK TOP ORGANIZER TRAY

Kenneth C. Foran, Wooster, and Thomas J. David, Worthington,
both of Ohio, assignors to Rubbermaid Incorporated, Woos-
ter, Ohio

Filed Aug. 7, 1986, Ser. No. 894,244

Term of patent 14 years

U.S. Cl. D19—77



303,814

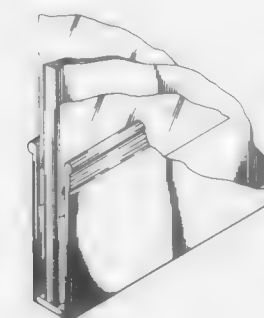
SKIN BOARD

David F. Beck, N. 217 Napa, Spokane, Wash. 99202

Filed Sep. 18, 1987, Ser. No. 98,513

Term of patent 14 years

U.S. Cl. D20—39



303,815

JOYSTICK

Syng N. Kim, Hoffman Estates, Ill., assignor to Wico Distribu-
tion Corp., Niles, Ill.

Filed Sep. 29, 1986, Ser. No. 913,146

Term of patent 14 years

U.S. Cl. D21—48

303,812

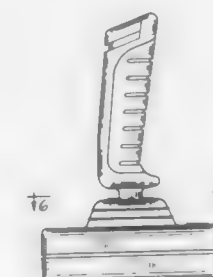
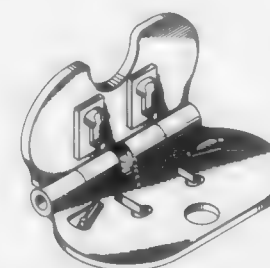
FILE CARD PUNCH

Jam Sun, No. 39, Lane 106, Sec. 7, Yen Ping No. Rd., Taipei,
Taiwan

Filed Oct. 6, 1986, Ser. No. 916,093

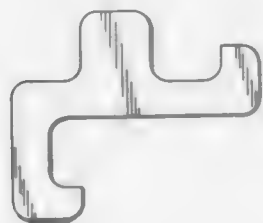
Term of patent 14 years

U.S. Cl. D19—72



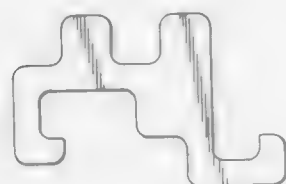
303,816
PUZZLE PIECE

John R. Fitzpatrick, 1044 Willy Way, Concord, Calif. 94518
Division of Ser. No. 930,226, Nov. 13, 1986. This application
Filed Feb. 10, 1989, Ser. No. 310,071
Term of patent 14 years
U.S. Cl. D21—104



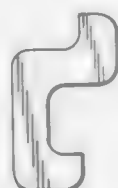
303,817
PUZZLE PIECE

John R. Fitzpatrick, 1044 Willy Way, Concord, Calif. 94518
Division of Ser. No. 930,226, Nov. 13, 1986. This application
Filed Feb. 10, 1989, Ser. No. 310,072
Term of patent 14 years
U.S. Cl. D21—104



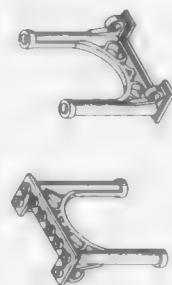
303,818
PUZZLE PIECE

John R. Fitzpatrick, 1044 Willy Way, Concord, Calif. 94518
Division of Ser. No. 930,226, Nov. 13, 1986. This application
Filed Feb. 10, 1989, Ser. No. 310,073
Term of patent 14 years
U.S. Cl. D21—104



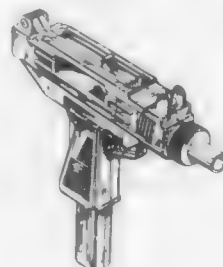
303,819
TOY ARCH

Soren Frederiksen, Copenhagen V, Denmark, assignor to Inter-
lego A.G., Switzerland
Filed Dec. 2, 1987, Ser. No. 127,880
Term of patent 14 years
U.S. Cl. D21—108



303,820
TOY GUN

Yam K. Wong, 1-7 Kin Hong Street, 19th Floor, Flat B, Che
Wah Industrial Building, Kwai Chung, Kowloon, Hong Kong
Filed Dec. 18, 1986, Ser. No. 943,920
Claims priority, application United Kingdom, Sep. 12, 1986,
1,036,688
Term of patent 14 years
U.S. Cl. D21—147



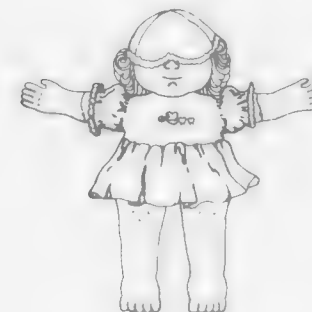
303,821
FINGER PUPPET

Jacqueline B. Dickens, 965 Havensport Dr., Cincinnati, Ohio
45240
Filed Oct. 28, 1986, Ser. No. 924,583
Term of patent 14 years
U.S. Cl. D21—153



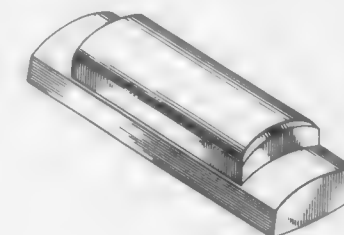
303,822
DOLL FIGURE

Joanne H. Woodson, 112 Live Oak Dr., Enterprise, Ala. 36330
Filed Dec. 3, 1986, Ser. No. 937,516
Term of patent 14 years
U.S. Cl. D21—171



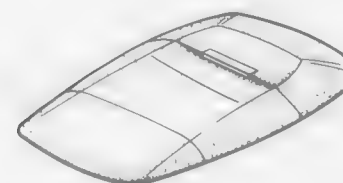
303,825
GOLF PUTTER HEAD

Robert E. Burns, 72 Ocean Vista, Newport Beach, Calif. 92660
Filed Sep. 8, 1986, Ser. No. 905,053
Term of patent 14 years
U.S. Cl. D21—217



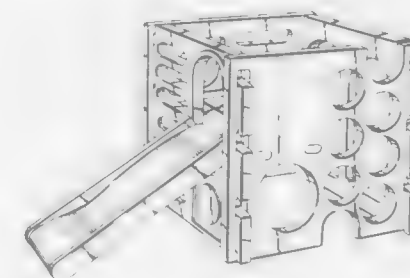
303,823
PORTABLE BASEBALL MOUND

Alan B. Eke, Fairmount, Minn., assignor to Creative Athletic
Products and Services, Inc., Des Moines, Iowa
Filed Jan. 29, 1987, Ser. No. 8,414
Term of patent 14 years
U.S. Cl. D21—199

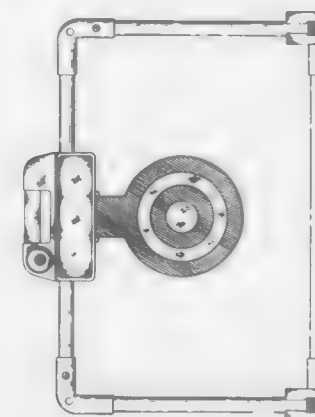


303,826
COMBINED CLIMBER AND SLIDE FOR CHILDREN

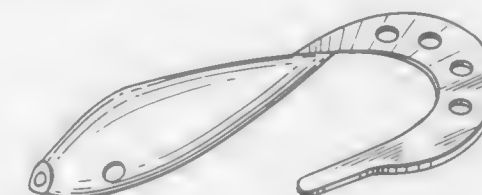
Kevin R. Aker, Hudson, Ohio, assignor to Little Tikes Inc.,
Hudson, Ohio
Filed Oct. 16, 1986, Ser. No. 919,690
Term of patent 14 years
U.S. Cl. D21—244



303,824
SOCCER GOAL
William J. Maloney, II, East Aurora, N.Y., assignor to The
Quaker Oats Company, Chicago, Ill.
Filed Aug. 12, 1986, Ser. No. 895,894
Term of patent 14 years
U.S. Cl. D21—200



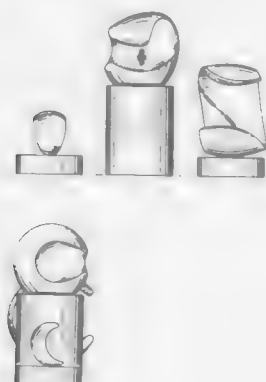
303,827
FISHING LURE
Richard J. Smaling, Virginia Beach, Va., assignor to Tidewater
Lures, Inc., Virginia Beach, Va.
Filed Feb. 19, 1988, Ser. No. 157,999
Term of patent 14 years
U.S. Cl. D22—127



303,828
BIDET SET

Roger H. Ramsey, Copley, and Mitchell L. Wilgus, Akron, both of Ohio, assignors to Stanadyne, Inc., Windsor, Conn.
Filed Jan. 13, 1987, Ser. No. 3,331
Term of patent 14 years

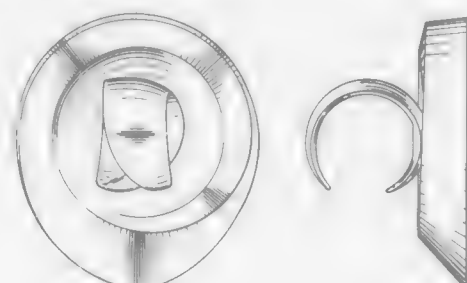
U.S. Cl. D23—242



303,831
COMBINED SHOWER CONTROL HANDLE AND ESCUTCHEON

Roger H. Ramsey, Copley, and Mitchell L. Wilgus, Akron, both of Ohio, assignors to Stanadyne, Inc., Windsor, Conn.
Filed Jan. 13, 1987, Ser. No. 3,308
Term of patent 14 years

U.S. Cl. D23—254



303,829
FAUCET HANDLE OR THE LIKE

Herbert V. Kohler, Jr., Kohler, Wis., and Paul P. Kolada, Bexley, Ohio, assignors to Kohler Co., Kohler, Wis.
Division of Ser. No. 820,201, Jan. 16, 1986, Pat. No. Des. 300,652. This application Mar. 31, 1989, Ser. No. 332,666
Term of patent 14 years

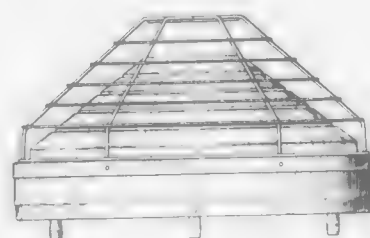
U.S. Cl. D23—250



303,832
THERMAL EXPANSION HEATER FOR BEARINGS

Clyde C. Cone, Arvada, Colo., assignor to Cone Moulder Company, Englewood, Colo.
Filed May 22, 1987, Ser. No. 52,897
Term of patent 14 years

U.S. Cl. D23—336



303,830
COMBINED HAND SHOWER DIVERTER KNOB AND ESCUTCHEON

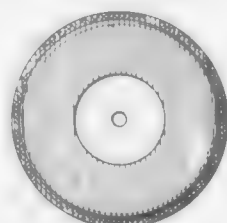
Roger H. Ramsey, Copley, and Mitchell L. Wilgus, Akron, both of Ohio, assignors to Stanadyne Inc., Windsor, Conn.
Filed Jan. 13, 1987, Ser. No. 3,305
Term of patent 14 years

U.S. Cl. D23—254



303,833
AROMA-GENERATING RECORD-TYPE DISC

Donald Spector, 380 Mountain Rd., Union City, N.J. 07087
Filed May 31, 1983, Ser. No. 499,776
Term of patent 14 years

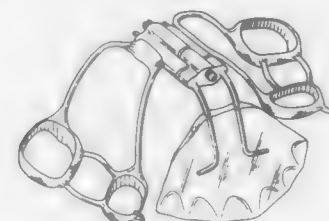


303,834
ORTHODONTIC APPLIANCE

John A. Collins, Jr., 1116 Mishawaka Ave., South Bend, Ind. 46615

Filed Aug. 24, 1987, Ser. No. 88,606
Term of patent 14 years

U.S. Cl. D24—10

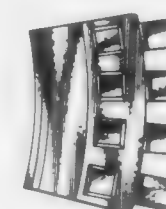


303,837
CUVETTE

Wayne Albert, New Hope, Pa., assignor to Innovative Medical Systems Corp., Ivyland, Pa.

Filed Feb. 20, 1987, Ser. No. 17,433
Term of patent 14 years

U.S. Cl. D24—29

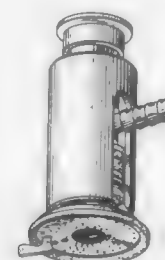


303,835
FAUCET-ATTACHED SUCTION PUMP FOR A DENTAL PLAQUE CLEANER

Paul S. Barclay, Ste. 309, 4801 W. Peterson Ave., Chicago, Ill.

Filed Jan. 5, 1987, Ser. No. 988
Term of patent 14 years

U.S. Cl. D24—15

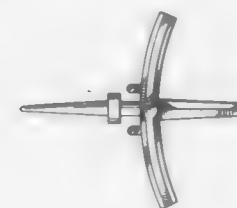


303,836
COMBINED DOWEL PIN AND PARTING GUIDE FOR USE IN THE CONSTRUCTION OF DENTAL PROSTHETICS

Mack L. Roden, 2646 Main St., and Steven D. Adams, 3980 Midway Dr., both of Baker, Oreg. 97814

Filed Jul. 27, 1987, Ser. No. 77,789
Term of patent 14 years

U.S. Cl. D24—16



303,838
COMBINED FACE AND EYES QUARTER MASSAGER

Wu Lien-Fui, No. 5, Lane 550, Sheng-Chan Road, Tainan, Tai-

Filed Jul. 16, 1986, Ser. No. 886,535
Term of patent 14 years

U.S. Cl. D24—41



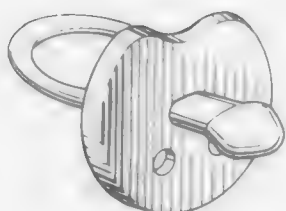
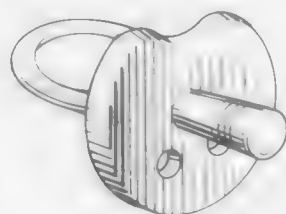
303,838 PACIFIER

William E. Fitzpatrick, Wyckoff; Emanuel P. Morano, Totowa, and William J. Craven, Ridgewood, all of N.J., assignors to Playtex Family Products, Inc., Stamford, Conn.

Filed Jul. 20, 1987, Ser. No. 75,924

Term of patent 14 years

U.S. Cl. D24—46



303,841

URINE LEO BAG

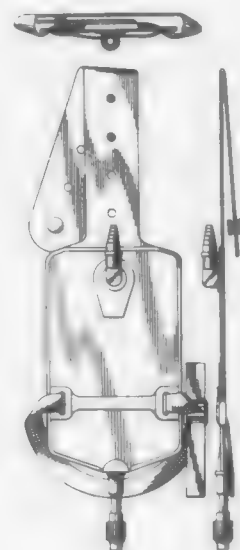
Charles D. Cawood, 11527 N. Low Al Ct., Houston, Tex. 77024, and Gene L. Mrava, 4202 Poplar Grove Ter., Midlothian, Va.

III

Filed Apr. 17, 1987, Ser. No. 39,901

Term of patent 14 years

U.S. Cl. D24—54



303,842

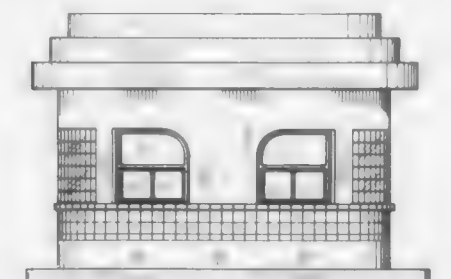
RESTAURANT BUILDING

William S. Bayouth, Jr., 7915 E. 71 St., Tulsa, Okla. 74133

Filed Apr. 16, 1987, Ser. No. 38,916

Term of patent 14 years

U.S. Cl. D25—33



303,840

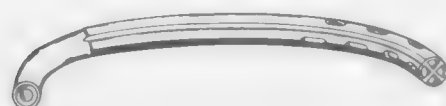
SURGICAL DRAIN TUBE

Eugene E. Weilbacher, New Philadelphia, Ohio, assignor to Snyder Laboratories, Inc., Dover, Ohio

Filed May 22, 1986, Ser. No. 866,101

Term of patent 14 years

U.S. Cl. D24—51



303,843

DECORATIVE GLASS PANEL

B. Jeremiah Shaffer, Worthington, Ohio, assignor to Pease Industries, Inc., Fairfield, Ohio

Filed Jul. 7, 1986, Ser. No. 882,818

Term of patent 14 years

U.S. Cl. D25—109



303,845

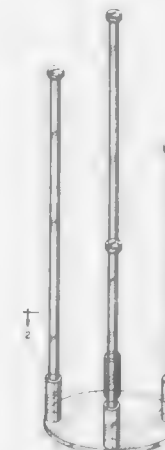
BASE FOR MULTIPLE CANDLE LAMPS

Mary A. Chappellet, Chappellet Vineyard, Pritchard Hill, St. Helena, Calif. 94574

Filed Apr. 16, 1986, Ser. No. 852,888

Term of patent 14 years

U.S. Cl. D26—9



303,846

FLASHLIGHT

David H. Parker, 2255 Jefferson St., Torrance, Calif. 90501

Filed Feb. 2, 1987, Ser. No. 11,278

Term of patent 14 years

U.S. Cl. D26—46



303,847

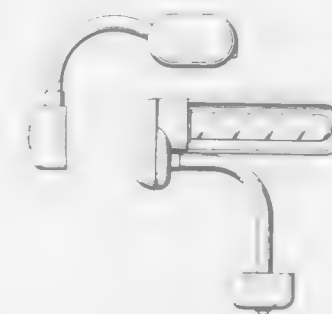
ELECTRIC LAMP

Mel Evenson, San Pedro, Calif., assignor to Eldon Industries, Inc., Inglewood, Calif.

Filed Sep. 15, 1986, Ser. No. 907,632

Term of patent 14 years

U.S. Cl. D26—63



303,844

DOOR LOUVRE BLADE

Robin N. Hodge, 24 Crown Street, Toowoomba, Queensland, 4350, Australia

Filed Oct. 10, 1986, Ser. No. 917,829

Claims priority, application Australia, Oct. 30, 1985, 5044/86

Term of patent 14 years

U.S. Cl. D25—121



303,848
TABLE LAMP

Antonio Bianchi, Via Salomone, 41, 20138 Milan, Italy

Filed Mar. 5, 1987, Ser. No. 22,342

Claims priority, application Italy, Dec. 4, 1986, 23925/86[U]

Term of patent 14 years

U.S. Cl. D26—65



303,850
COMBINED CONTAINER/BOTTLE AND COSMETIC
WAND APPLICATORS OR THE LIKE

Henry J. Cassai, 163-47 85th St., Howard Beach, N.Y. 11414,

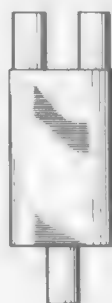
and Gino H. Cassai, 924 E. 96th St., Brooklyn, N.Y. 11236

Division of Ser. No. 765,394, Aug. 14, 1985. This application

Oct. 3, 1988, Ser. No. 252,442

Term of patent 14 years

U.S. Cl. D28—77



303,849
WALL LAMP

Marc Nugent, 155 E. 23rd St., New York, N.Y. 10010

Filed Jun. 8, 1988, Ser. No. 203,871

Term of patent 14 years

U.S. Cl. D26—85



303,851
BICYCLIST'S HELMET

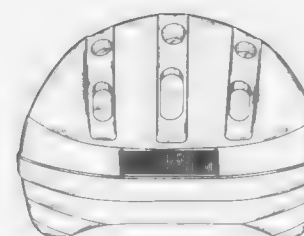
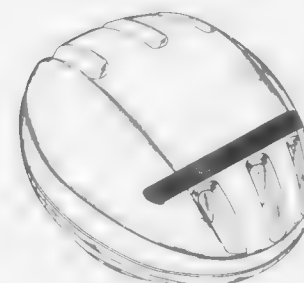
James J. Gentes, San Jose, Calif., assignor to Giro Sport Design, Inc., Santa Cruz, Calif.

Division of Ser. No. 872,766, Jun. 10, 1986, Pat. No. D. 299,180.

This application Aug. 15, 1988, Ser. No. 232,181

Term of patent 14 years

U.S. Cl. D29—12



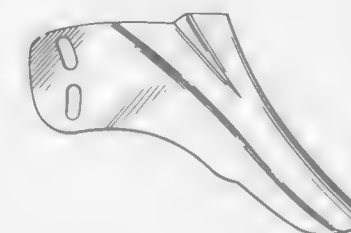
303,852
VISOR

Troy M. Lee, Corona, Calif., assignor to Troy Lee Designs, Calif.

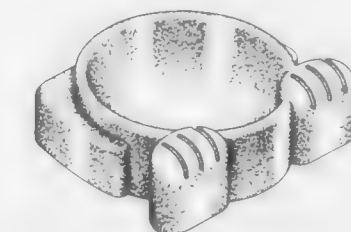
Filed Jun. 25, 1987, Ser. No. 66,397

Term of patent 14 years

U.S. Cl. D29—18



303,853
ANIMAL FEEDING BOWL
Steven F. Keller, 929 N. 77th St., Seattle, Wash. 98103
Filed Aug. 10, 1987, Ser. No. 83,142
Term of patent 14 years
U.S. Cl. D30—129



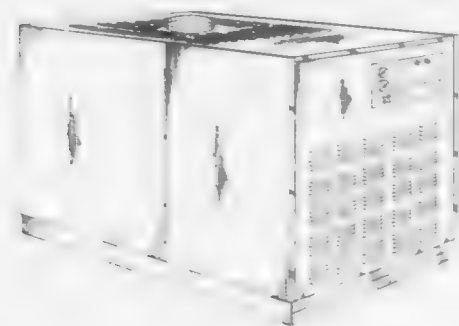
303,854

GAS FIRED HOT WATER PRESSURE CLEANING APPARATUS

Paul W. Linton, 2722 SE. Evans, Troutdale, Oreg. 97060
 Filed Nov. 18, 1986, Ser. No. 931,788

Term of patent 14 years

U.S. Cl. D32-1



303,856

MINI CAR VACUUM CLEANER

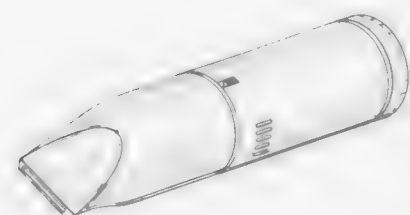
John S. Yuen, Kowloon, Hong Kong, assignor to John Manufacturing Limited, Kowloon, Hong Kong

Filed Oct. 20, 1987, Ser. No. 110,439

Claims priority, application United Kingdom, Jul. 2, 1987, 104,311

Term of patent 14 years

U.S. Cl. D32-18



303,855

PLUMBER'S FLEXIBLE SNAKE

Nicholas W. Moss, Cherry Hill, N.J., assignor to Cobra Products, Inc., Willingboro, N.J.

Filed Dec. 4, 1986, Ser. No. 938,173

Term of patent 14 years

U.S. Cl. D32-14



303,857

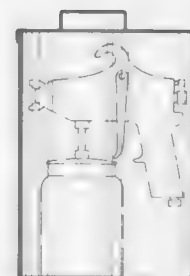
CANISTER FOR SOAKING PAINT SPRAY GUNS

John Hieronymus, 22 Industrial Pl., Island Park, N.Y. 11558

Filed Nov. 10, 1986, Ser. No. 929,160

Term of patent 14 years

U.S. Cl. D32-35



303,858

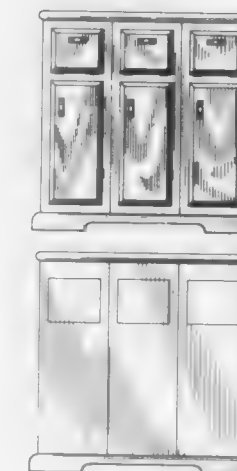
CLOTHES HAMPER

Cheryl R. Coleman, 7400 Buchanan St., Hyattsville, Md. 20784

Filed Jan. 29, 1988, Ser. No. 149,881

Term of patent 14 years

U.S. Cl. D32-37



303,859

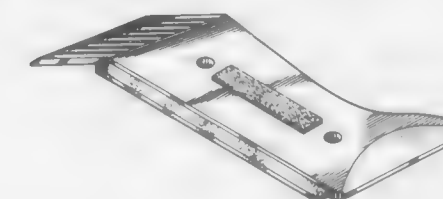
FROST AND ICE SCRAPER

Robert D. Durgin, 13821 Arctic Ave., Rockville, Md. 20853

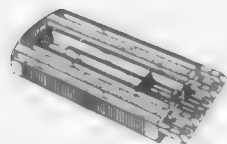
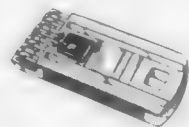
Filed Jun. 18, 1987, Ser. No. 63,902

Term of patent 14 years

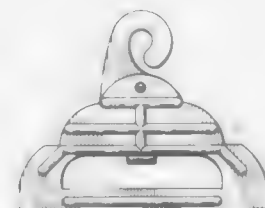
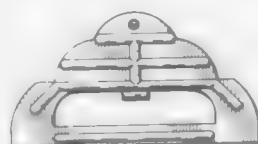
U.S. Cl. D32-46



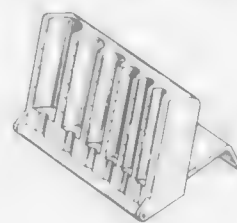
303,860
RAZOR BLADE SCRAPER HOLDER OR SIMILAR ARTICLE
 Clemens A. Iten, Staunton, Va., assignor to American Safety Razor Company, Verona, Va.
 Filed Feb. 28, 1986, Ser. No. 838,052
 Term of patent 14 years
 U.S. Cl. D32—48



303,862
HOSIERY MATCHING CLAMP
 Thurman Henderson, 402 W. 38th St., Indianapolis, Ind. 46208
 Filed Feb. 4, 1987, Ser. No. 10,801
 Term of patent 14 years
 U.S. Cl. D32—64



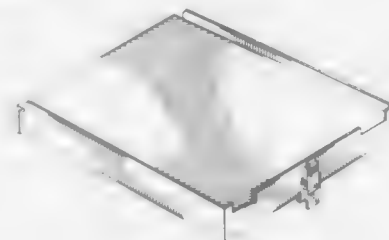
303,863
COIN HOLDER
 Linda Purifoy, 8271 Rosemont, Detroit, Mich. 48228
 Filed Apr. 21, 1986, Ser. No. 857,558
 Term of patent 14 years
 U.S. Cl. D99—34



303,861
PAINT SCRAPER
 Chun-Yong Chen, No. 1, Alley 10, Lane 143, Hsin Ming Rd., Taipei, Taiwan
 Filed Aug. 20, 1986, Ser. No. 898,387
 Term of patent 14 years
 U.S. Cl. D32—48



303,864
VAULT COVER
 Anthony J. Sano, 109B Candace Dr., Maitland, Fla. 32751
 Filed Nov. 10, 1986, Ser. No. 929,162
 Term of patent 14 years
 U.S. Cl. D99—43



LIST OF PATENTEEES

TO WHOM

PATENTS WERE ISSUED ON THE 3RD DAY OF OCTOBER, 1989

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

- A. Ahlstrom Corporation: See—
 Titoff, Juha S., 4,871,459, Cl. 210-519.000.
 A. H. Robins Company, Incorporated: See—
 Taylor, Chandler R., Jr.; and Stauffer, Harold F., Jr., 4,871,737, Cl. 514-236.500.
 A. O. Smith Corporation: See—
 Jones, Robert E., 4,871,317, Cl. 439-68.000.
 Aadsen, Duane R.; Jain, Sunil K.; and Stroud, Charles E., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Integrated circuit with memory self-test. 4,872,168, Cl. 371-21.300.
 Aarts, Mathias L. C., to Product Suppliers AG. Method of, and apparatus for, temporarily removing a product from a series of products being transported. 4,871,057, Cl. 198-346.100.
 Aasen, Steven M.; Ozman, Joel D.; and Ubel, F. Andrew, III, to Minnesota Mining and Manufacturing Company. Organic fluoride sources. 4,871,786, Cl. 523-113.000.
 AB ASEA-ATOM: See—
 Lindner, Johann, 4,871,508, Cl. 376-260.000.
 Abbaticchio, Mark J.: See—
 DeLuca, Joan S.; Holmes, Thomas F.; and Abbaticchio, Mark J., 4,872,005, Cl. 340-825.440.
 Abdo, Suheil F.: See—
 Koepke, Jeffery W.; and Abdo, Suheil F., 4,871,445, Cl. 208-89.000.
 Abe, Daisuke: See—
 Maniwa, Yoshio; Morita, Takashi; Niro, Masaichi; Abe, Daisuke; and Nagayama, Haruhiko, 4,872,091, Cl. 361-424.000.
 Abe, Kumiko: See—
 Sugisawa, Ko; Matsumura, Yasushi; Okamoto, Hidefumi; and Abe, Kumiko, 4,871,565, Cl. 426-407.000.
 Abe, Tsutomu: See—
 Furumura, Kyozauro; Muraoka, Tomoki; Murakami, Yasuo; and Abe, Tsutomu, 4,871,268, Cl. 384-492.000.
 Abitibi-Price Corporation: See—
 Cuddy, Jared G.; and Juntunen, William H., 4,871,588, Cl. 427-264.000.
 Abolins, Andrew, to Strick Corporation. Overhead door construction for providing increased door opening clearance. 4,871,007, Cl. 160-201.000.
 Abramson, Albert. Cathode ray tube. 4,871,949, Cl. 315-382.000.
 ABS Allgemeiner Brandschutz, G.u.M.: See—
 Richter, Klaus, 4,870,909, Cl. 109-59.00T.
 Acker, Lawrence D.: See—
 Russell, Robert H.; and Acker, Lawrence D., 4,870,971, Cl. 128-661.010.
 Actel Corporation: See—
 Galbraith, Douglas C., 4,871,933, Cl. 307-530.000.
 Galbraith, Douglas C., 4,871,978, Cl. 330-253.000.
 Acumeter Laboratories, Inc.: See—
 McIntyre, Frederic S., 4,871,593, Cl. 427-428.000.
 Adachi, Hideki: See—
 Miyake, Hiroyuki; Sagara, Seiji; Yonemori, Takaji; Watanabe, Tsuyoshi; Takahashi, Masayoshi; Suzuki, Koji; Komiya, Yutaka; Tomosada, Masahiro; Adachi, Hideki; Hirose, Masayuki; and Miyata, Masanori, 4,872,035, Cl. 355-208.000.
 Adachi, Kinichi: See—
 Harada, Terumaru; Inoda, Kenichi; Fujita, Tatsuo; and Adachi, Kinichi, 4,870,821, Cl. 60-520.000.
 Adam, Didier: See—
 Derewonko, Henri; Adam, Didier; Delagebeaudeuf, Daniel; and Resneau, Patrick, 4,872,049, Cl. 357-68.000.
 Adam, Peter; Nebelung, Adolf; and Vogt, Michael, to MTU Motoren- und Turbinen-Union Muenchen GmbH; and Benckiser-Knapsack GmbH. Hydroxylapatite coating on metal or ceramic. 4,871,578, Cl. 427-2.000.
 Adam, Valer: See—
 Zikmund, Miroslav; Hybl, Cestmir; Macho, Vendelin; and Adam, Valer, 4,871,519, Cl. 423-169.000.
 Adamache, Ion I., to Canterra Energy Ltd. Recovery of elemental sulphur from products containing contaminated elemental sulphur by froth flotation. 4,871,447, Cl. 209-166.000.
 Adamek-Hetzel, Karl. Massage belt including rotatable blocks. 4,870,955, Cl. 128-58.000.
 Adaptive Video, Inc.: See—
 Gray, Michael J.; and Franco, Michael J., 4,872,054, Cl. 358-140.000.
 ADC Telecommunications, Inc.: See—
 Pfeffer, George B.; and Johnson, Wayne A., 4,870,753, Cl. 29-884.000.
 Aderhold Jr., James L.: See—
 Fahrig, Robert J.; Fitzharris, William D.; and Aderhold Jr., James L., 4,871,699, Cl. 502-34.000.
 Adin, ANthony: See—
 Parton, Richard L.; Gingello, ANthony D.; Collett, David J.; Stegman, David A.; and Adin, ANthony, 4,871,656, Cl. 430-522.000.
 Administrators of the Tulane Educational Fund: See—
 Coy, David H.; and Murphy, William A., 4,871,717, Cl. 514-11.000.
 Adolph Coors Company: See—
 Grims, Conrad M.; and Johansson, Bert, 4,870,852, Cl. 72-347.000.
 Adriaenssens, Luc W.; Bustos, Orlando A.; and Swanson, David, to Tech-Age International Corporation. Proximity sensor apparatus. 4,871,997, Cl. 340-539.000.
 Advanced Micro Devices, Inc.: See—
 Cheung, Robin W., 4,871,962, Cl. 324-65.00R.
 AE PLC: See—
 Purvey, Ronald J., 4,871,458, Cl. 210-360.100.
 Aerospatiale Societe Nationale Industrielle: See—
 Carrel, Claude; and Josse, Alain, 4,870,903, Cl. 102-201.000.
 Picot, Jacques, 4,870,904, Cl. 102-383.000.
 Agency of Industrial Science & Technology: See—
 Imada, Yukio; Yoshikawa, Nobuji; Mizuno, Sumiko; and Mikawa, Takashi, 4,871,667, Cl. 435-142.000.
 Tenjinbayashi, Koji, 4,871,255, Cl. 356-354.000.
 Agfa-Gevaert AG: See—
 Kochmann, Heike; Lechner, Georg; Muller, Jergen; and Scholz, Norbert, 4,872,030, Cl. 354-76.000.
 Agfa-Gevaert Aktiengesellschaft: See—
 Wolff, Erich, 4,871,657, Cl. 430-548.000.
 Agfa-Gevaert, N.V.: See—
 Vanmaele, Luc J.; and Van de Sande, Christian C., 4,871,654, Cl. 430-512.000.
 Ahlers, Klaas: See—
 Scherz, Thomas; Osterloh, Rolf; Schupp, Eberhard; Perner, Thomas; and Ahlers, Klaas, 4,871,808, Cl. 525-113.000.
 Aica Kogyo Co., Ltd.: See—
 Kamiya, Takashi; Suzuki, Masaya; Obata, Yoshinori; Watanabe, Masaaki; and Matsuoka, Isao, 4,871,596, Cl. 428-15.000.
 Air Products and Chemicals, Inc.: See—
 Thorogood, Robert M.; Bennett, Douglas L.; Allam, Rodney J.; Prentice, Alan L.; and Dawson, Bruce K., 4,871,382, Cl. 62-18.000.
 Air Stamping, Inc.: See—
 Robertson, Albert W., 4,870,900, Cl. 101-216.000.
 Airax: See—
 Dony, Dominique; and Jalliet, Andre, 4,871,149, Cl. 267-64.120.
 AirSensors, Inc.: See—
 Smith, David H., 4,870,857, Cl. 73-118.200.
 Aisin Seiki Kabushiki Kaisha: See—
 Hasegawa, Hiromi; and Ishiguro, Toshiaki, 4,870,877, Cl. 74-869.000.
 Kawabata, Yasuhiro; and Hara, Soichi, 4,870,733, Cl. 29-156.50R.
 Aiso, Izumi: See—
 Seki, Kenji; Hashimoto, Junichiro; Kimura, Michio; Yamanami, Hirofumi; Mochizuki, Satomi; and Aiso, Izumi, 4,871,635, Cl. 430-60.000.
 AIT Industries, Inc.: See—
 Ramos, Rolando P.; Loretto, Wilfredo P.; and Vulich, Yordan, 4,870,784, Cl. 51-165.00R.
 Ajinomoto Co., Inc.: See—
 Tackikawa, Toru; and Fuseya, Yoshihiko, 4,871,558, Cl. 426-99.000.
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 Ajmera, Prakash R., to Owens-Illinois Plastic Products Inc. Method for forming hollow partially crystalline biaxially oriented heat set polyethylene terephthalate articles. 4,871,507, Cl. 264-521.000.
 Akae, Yoshifumi; Yamamoto, Takasi; Arima, Koji; and Yagi, Tetsuo, to Mitsubishi Denki Kabushiki Kaisha. Commutator for a starter motor. 4,871,936, Cl. 310-233.000.
 Akamatsu, Hideo: See—
 Sakamoto, Eiichi; Kaneko, Yutaka; Ninomiya, Hidetaka; Kamio, Takashi; Ezaki, Atsuo; Akamatsu, Hideo; and Haraga, Hideaki, 4,871,658, Cl. 430-551.000.
 Akao, Mutsuo, to Fuji Photo Film Co., Ltd. Packaging material. 4,871,613, Cl. 428-328.000.
 Akioka, Takao: See—
 Imai, Shigetoshi; and Akioka, Takao, 4,871,162, Cl. 271-35.000.
 Akiyama, Yoshihisa: See—
 Araki, Hiroshi; Ishii, Hisao; Akiyama, Yoshihisa; Kamada, Hiroshi; and Nagatomi, Takashi, 4,870,744, Cl. 29-568.000.
 Akiyoshi, Mitsuo: See—
 Asahina, Takashi; Akiyoshi, Mitsuo; Mitsumoto, Yoshio; Kodama, Satoru; and Tsujimoto, Masaharu, 4,870,896, Cl. 99-348.000.

Akred, Brian J.; Messenger, Edward T.; and Nicholson, William J., to Albright & Wilson Limited. Non-sedimenting liquid detergent compositions resistant to shear. 4,871,467, Cl. 252-135.000.

Aktiebolaget Leo: See—
Lindskog, Inga M.; Sjogren, Bengt C. H.; and Andersson, Sven-Borje, 4,871,543, Cl. 424-432.000.

Akutsu, Hidetoshi; Iwamura, Takuro; and Kobayashi, Masao, to Mitsubishi Kinzoku Kabushiki Kaisha. Semiconductor device having copper alloy leads. 4,872,048, Cl. 357-67.000.

Akzo N.V.: See—
Buter, Roelof, 4,871,797, Cl. 524-505.000.
Groen, Marinus B.; and de Jongh, Hendrik P., 4,871,724, Cl. 514-173.000.

Albany Medical College of Union University: See—
Mannino, Raphael J.; and Fogerite, Susan G., 4,871,488, Cl. 264-4.600.

Albright & Wilson Limited: See—
Akred, Brian J.; Messenger, Edward T.; and Nicholson, William J., 4,871,467, Cl. 252-135.000.

Alcan International Limited: See—
Strong, David S.; and Dawson, John A., 4,871,627, Cl. 429-27.000.

Alcon Laboratories, Inc.: See—
Gall, Russell A.; Clements, Don A.; and Kent, Michael J., 4,871,094, Cl. 222-386.000.

Aldous, Glenn R. Window washing device. 4,871,275, Cl. 401-23.000.

Alexander, Cynthia R.; and Pollard, Dianne J. Child holder. 4,871,210, Cl. 297-435.000.

Alexander, Frank B., Jr.; Foo, Pang-Dow; and Schutz, Ronald J., to American Telephone and Telegraph Company. AT&T Bell Laboratories. Selective etching process. 4,871,420, Cl. 156-643.000.

Alexander, Lloyd E.: See—
Beaver, Richard N.; Alexander, Lloyd E.; and Byrd, Carl E., 4,871,703, Cl. 502-101.000.

Alf, George M.: See—
Bailey, Paul F., Jr.; Nilsson, Isidro G.; and Alf, George M., 4,870,964, Cl. 128-303.100.

Alfa-Laval Thermal, AB: See—
Nilsson, Bo G.; and Andersson, Torgny, 4,871,013, Cl. 165-75.000.

Alfred Grass Ges.m.b.H. Metallwarenfabrik: See—
Grass, Alfred, 4,870,716, Cl. 16-251.000.

Alfsen & Gunderson A/S: See—
Gunderson, Harald, 4,871,425, Cl. 162-290.000.

Alig, Leo; and Muller, Marcel, to Hoffmann-La Roche Inc. Method for treating diabetes obesity and conditions characterized by increased protein breakdown with novel oxazolidines. 4,871,755, Cl. 514-376.000.

Allam, Rodney J.: See—
Thorogood, Robert M.; Bennett, Douglas L.; Allam, Rodney J.; Prentice, Alan L.; and Dawson, Bruce K., 4,871,382, Cl. 62-18.000.

Allegheny Ludlum Corporation: See—
Toker, Nazmi; and Price, Leroy R., 4,871,402, Cl. 148-113.000.

Allen, Robert H., to Ethyl Corporation. Hydrogen purification process. 4,871,524, Cl. 423-349.000.

Allied Engineering Company S.A.: See—
Ekselt, Erik L.; and Haglund, Artur L., 4,870,726, Cl. 24-636.000.

Allied Products Corporation: See—
Budreau, John D.; and Kirpatrick, John A., 4,870,846, Cl. 72-77.000.

Allied-Signal Inc.: See—
Gu, Alston L., 4,871,267, Cl. 384-105.000.
Hackler, Lewis R., 4,871,604, Cl. 428-96.000.
Laessle, David L.; Carlson, Todd S.; Krochmalny, Andrew J.; and Anderson, Leroy C., 4,871,296, Cl. 415-123.000.
Rabinkin, Anatol, 4,871,622, Cl. 428-576.000.
Zweig, Andrew M.; and Conrad, Jeffrey P., 4,871,831, Cl. 528-205.000.

Allison, Bill W. Catamaran type boat. 4,870,919, Cl. 114-61.000.

Allison, Timothy B.: See—
Graef, Harry T.; Newton, Kevin H.; Allison, Timothy B.; and Eastman, Jeffrey M., 4,871,085, Cl. 221-4.000.

Alloy Surfaces Company, Inc.: See—
Baldi, Alfonso L., 4,871,708, Cl. 502-301.000.

Alonso, Frank, to Lumar Star Kites, Inc. Kite bridle and method. 4,871,133, Cl. 244-153.000.

Alpha Enterprises, Inc.: See—
Hehn, Bruce A.; Weisburn, James T.; Lewellen, Richard R.; and Geis, Mark W., 4,871,064, Cl. 206-387.000.
Hehn, Bruce A.; and Mook, Andrew W., 4,871,065, Cl. 206-387.000.

Alpe Electric Co., Ltd.: See—
Kamada, Soetsu, 4,871,885, Cl. 200-5.000.

Alscher, Arnold: See—
Bencke, Herbert; Alscher, Arnold; Oberkobusch, Rudolf; Peter, Siegfried; and Jaumann, Wolfgang, 4,871,443, Cl. 208-39.000.

Altera Corporation: See—
Wong, Sau-Ching; So, Hock-Chuen; Kopec, Stanley J., Jr.; and Hartmann, Robert F., 4,871,930, Cl. 307-465.000.

Altherr, Russell G.; Glaser, Richard L.; Madura, Francis E.; and Radwill, Robert P., to AMSTED Industries Incorporated. Fifth wheel unlatching and safety latch device. 4,871,182, Cl. 280-434.000.

Altschuler, Martin D.; and Whittington, Richard, to University of Pennsylvania. Interactive statistical system and method for predicting expert decisions. 4,872,122, Cl. 364-554.000.

Aluminum Company of America: See—
Matin, Edward S.; and Wieserman, Larry F., 4,871,711, Cl. 502-415.000.

ALZA Corporation: See—
Eckenhoff, James B., 4,871,544, Cl. 424-438.000.
Edgren, David E.; Magruder, Judy A.; and Bhatti, Gurdish K., 4,871,548, Cl. 424-488.000.
Theeuwes, Felix, 4,871,360, Cl. 604-892.100.

Amada Engineering Service Co., Inc.: See—
Koseki, Ryoji, 4,871,250, Cl. 356-121.000.

Amana Refrigeration, Inc.: See—
Pink, John J., 4,870,836, Cl. 62-382.000.

Amann, John, to Amann, John. Breathable laminate fabric. 4,871,600, Cl. 428-56.000.

Amano, Sho: See—
Yamashita, Toshiharu; Amano, Sho; Tajima, Hidemi; Masuda, Isao; and Izumitani, Tetsuro, 4,871,230, Cl. 350-96.340.

Amdahl Corporation: See—
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Smith, James W., 4,872,205, Cl. 455-58.000.

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Radwill, Robert P., 4,870,914, Cl. 105-206.200.

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Makino, Yuji; Suzuki, Yoshiki; and Aoyagi, Takashi, 4,871,723, Cl. 514-167.000.

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Elbert, Hubert F.; and March-Force, Gary, 4,871,965, Cl. 324-158.000.

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Roberts, Gary E., 4,872,079, Cl. 360-126.000.

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Perkins, David J. B., 4,871,409, Cl. 156-110.100.

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Araki, Akihiko, to Japan Electronic Control Systems Company, Limited. Spark ignition timing control system for internal combustion engine with acceleration responsive spark advance retarding control. 4,870,935, Cl. 123-422.000.

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Shaw, Edward T.; and Kesling, Haven S., Jr., 4,871,871, Cl. 560-344.000.

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Fujimoto, Masami; Inazumi, Tadahiho; Satoh, Katsuhiko; Shimozaawa, Eiichi; Awa, Yasuhiko; Sato, Fumihiko; Nozaki, Kenro; Gushima, Akira; Suemura, Yosinobu; Kusakabe, Nobuo; Imada, Kunihiko; Arichi, Masatoshi; Tanaka, Mitsunori; Umez, Yoshinori; and Ikeda, Tsuneo, 4,871,393, Cl. 75-5.000.

Arima, Koji: See—
Akao, Yoshifumi; Yamamoto, Takasi; Arima, Koji; and Yagi, Tetsuo, 4,871,936, Cl. 310-233.000.

Arizona Board of Regents: See—
Bernstein, Gary; and Ferry, David K., 4,872,038, Cl. 357-4.000.

Arlt, Dieter: See—
Fiege, Helmut; Jautelat, Manfred; and Arlt, Dieter, 4,871,484, Cl. 260-408.000.

Armer, Thomas A.: See—
Kinneberg, Peter A.; and Armer, Thomas A., 4,871,618, Cl. 428-461.000.

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Arnold, Hanfried: See—
Nickisch, Klaus; and Arnold, Hanfried, 4,871,482, Cl. 260-397.300.

Araudeau, Jean-Pierre; Patraud, Jeanne; and Le Gall, Louis, to L'Oreal. Composition based on cationic polymers, anionic polymers and waxes for use in cosmetics. 4,871,536, Cl. 424-59.000.

Artieri, Alain: See—
Cambon, Joel; and Artieri, Alain, 4,872,134, Cl. 364-768.000.

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Matsuo, Hirofumi, 4,871,241, Cl. 350-427.000.
Takami, Satoshi; and Ohsawa, Yutaka, 4,872,069, Cl. 354-484.000.

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Kozawa, Tetsuo; and Asano, Satoru, 4,870,916, Cl. 112-121.110.

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Lechert, Hans; Woeb-Gosch, Volkert; Qun, Song; Kaminsky, Walter; and Sinn, Hansjorg, 4,871,426, Cl. 201-2.500.

Ashcroft, Dale A.: See—
Strosser, Richard P.; and Ashcroft, Dale A., 4,871,044, Cl. 180-273.000.

Asheboro Elastics, Corp.: See—
Odham, Carl J., 4,870,839, Cl. 66-125.00A.

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Hyodo, Masakatsu; Kusumoto, Koji; and Yagi, Isaburo, 4,871,413, Cl. 156-382.000.

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Cimperman, Fred J., 4,871,568, Cl. 426-484.000.

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Dunn, Joseph E.; Clark, R. Wayne; Asmus, John F.; Pearlman, Jay S.; Boyer, Keith; Painchaud, Francois; and Hofmann, Gunter A., 4,871,559, Cl. 426-248.000.

Asmus, Thomas W., to Chrysler Motors Corporation. Fuel injection heating system. 4,870,932, Cl. 123-179.00H.

Assereto, Roberto: See—
Tognella, Sergio; Tedeschi, Michele; Assereto, Roberto; Tofanetti, Odoardo; and Cavalletti, Ennio, 4,871,528, Cl. 424-10.000.

Associated Universities, Inc.: See—
Sugama, Toshifumi, 4,871,395, Cl. 106-88.000.

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Carini, Ed, 4,871,170, Cl. 273-126.00R.

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Follett, David R.; and Levy, Michael P., 4,872,163, Cl. 370-94.100.

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Smith, James W., 4,872,205, Cl. 455-58.000.

Atarashi, Shohgo: See—
Hayakawa, Isao; Atarashi, Shohgo; Yokohama, Shuichi; and Imamura, Masazumi, 4,871,852, Cl. 544-363.000.

Atlantic Richfield Company: See—
Haley, Jerry L.; Barber, Weldon H.; and Morris, Kevin J., 4,871,019, Cl. 166-167.000.

Atlas Copco Aktiebolag: See—
Ekwall, Berndt, 4,871,035, Cl. 173-139.000.
Svensson, Dick L.; and Soderman, Claes-Erik, 4,870,921, Cl. 118-676.000.

Atochem: See—
Moullies, Jean-Claude; and Reignier, Gerard, 4,871,506, Cl. 264-514.000.

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Io, Shinichi, 4,870,864, Cl. 73-517.00R.

Atwell, Sharon L. Method of forming an adjustable tourniquet device. 4,870,978, Cl. 128-898.000.

Audi AG: See—
Bierling, Rudolf; Ruf, Max; and Hannibal, Wilhelm, 4,870,990, Cl. 137-595.000.
Vanetta, Aldo; Burkhart, Helmut; and Weinert, Herbert, 4,870,934, Cl. 123-336.000.

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Irwin, Lawrence F.; and Irwin, Frank, 4,870,992, Cl. 137-846.000.

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Ausimont S.p.A.: See—
Cavattera, Enrico; and Bossi, Alessandro, 4,871,707, Cl. 502-225.000.

Aussel, Christian C. J. L. Method of restoring refractory lining for repeated use using thermal shock and milling procedures. 4,871,211, Cl. 299-10.000.

Autelca AG: See—
Haueter, Ernst, 4,871,125, Cl. 242-67.30R.

Automobiles Citroen: See—
Salver, Le; and Poupard, Dominique, 4,871,150, Cl. 267-140.100.

Automobiles Peugeot: See—
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Autorino, Joseph A.; and Crouch, Jeffrey P. Ball bat. 4,871,168, Cl. 273-26.00B.

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Cavazza, Paolo; and Fiorentini, Giulio, 4,871,773, Cl. 514-626.000.

Aviv, Haim; Gorecki, Marian; Levanon, Avigdor; Oppenheim, Amos; Vogel, Tikva; Zeelon, Pinhas E.; and Zeevi, Menachem, to Bio-Technology General Corp. Analogs of hGH having antagonistic activity, and uses thereof. 4,871,835, Cl. 530-399.000.

- Awa, Yasuhiko: See—
Fujimoto, Masami; Inazumi, Tadahiro; Satoh, Katsuhiko; Shimozawa, Eiichi; Awa, Yasuhiko; Sato, Fumihiro; Nozaki, Kenro; Gushima, Akira; Suemura, Yosinobu; Kusakabe, Nobuo; Imada, Kunihiko; Aichi, Masatoshi; Tanaka, Mitsunori; Umezu, Yoshinori; and Ikeda, Tsuneo, 4,871,393, Cl. 75-5.000.
- Azuma, Makoto: See—
Gemma, Nobuhiro; Miura, Akira; Mizushima, Koichi; Azuma, Makoto; and Mori, Yasushi, 4,871,236, Cl. 350-355.000.
- B. Braun Melsungen AG: See—
Haindl, Hans; and Fuchs, Jürgen, 4,871,356, Cl. 604-247.000.
- B.F. Goodrich Company, The: See—
Percec, Virgil; Nicholas, Paul P.; and Garcia, Dana, 4,871,816, Cl. 525-393.000.
- Sharaby, Zeev, 4,871,780, Cl. 521-56.000.
- Sweet, David B.; and Hindel, James T., 4,871,935, Cl. 310-232.000.
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- Baba, Isao: See—
Komatsu, Masato; Baba, Isao; and Yamamoto, Noboru, 4,871,796, Cl. 524-474.000.
- Baba, Norimasa: See—
Ogawa, Shinji; Kajikawa, Yoshiharu; Kuroyanagi, Isao; Baba, Norimasa; and Ohara, Toshio, 4,870,834, Cl. 62-197.000.
- Baba, Seiichi: See—
Ueno, Toru; Fukuoka, Youichi; Baba, Seiichi; Miyoshi, Kaoru; and Kinoshita, Kazuto, 4,871,910, Cl. 250-560.000.
- Baba, Takeshi; and Niwa, Yukichi, to Canon Kabushiki Kaisha. Automatic focusing device, 4,872,058, Cl. 358-227.000.
- Babayan, Vigen K.: See—
Bistran, Bruce R.; Babayan, Vigen K.; Blackburn, George L.; and Mascioli, Edward A., 4,871,768, Cl. 514-547.000.
- Babcock & Wilcox Company, The: See—
Doyle, John B., 4,871,522, Cl. 423-239.000.
- Skuratovsky, Eugene; and Knudsen, James K., 4,871,908, Cl. 250-227.000.
- Babineau, James W.: See—
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- Babow, David A., to AMP Incorporated. Molded circuit board for ribbon cable connector, 4,871,319, Cl. 439-77.000.
- Bachelard, Roland; and Germain, Patrick, to Comurhex Societe pour la Conversion de l'Uranium en Metal et Hexafluorure. Process for producing sintered mixed oxides which are soluble in nitric acid from solutions of nitrates, 4,871,479, Cl. 252-636.000.
- Bachmann, Peter K.; Hagemann, Hans-Jürgen E.; Warnier, Jacques P. M.; and Wilson, Howard J. C., to U.S. Philips Corp. Method of manufacturing optical fibres, 4,871,383, Cl. 65-3.120.
- Baer, Thomas M.; and Kierstead, Mark S., to Spectra-Physics. Laser diode pumped solid state laser, 4,872,177, Cl. 372-75.000.
- Bagley, Rodney D.; and Wusirika, Raja R., to Corning Incorporated. Method of encasing a structure in metal, 4,871,621, Cl. 428-549.000.
- Bagnall, Arthur F., to Spencer Wright Industries, Inc. Yarn feed system for tufting machines, 4,870,915, Cl. 112-80.410.
- Bahnick, Karl R.; and Groe, David E., to Sun Electric Corporation. Plural source arbitration system, 4,872,004, Cl. 340-825.500.
- Bai, Lan-Qin: See—
Shiue, Chyng-Yann; Wolf, Alfred P.; Bai, Lan-Qin; and Teng, Ren-Tui, 4,871,527, Cl. 424-1.100.
- Bailey, Paul F., Jr.; Nilsson, Isidro G.; and Alf, George M., to Bailey, Paul F., Jr. Ophthalmic surgical device and method with image data reflected off of the eye, 4,870,964, Cl. 128-303.100.
- Bailey, Robert S.: See—
McCune, Robert C., Jr.; Toth, Louis; and Bailey, Robert S., 4,871,651, Cl. 430-315.000.
- Bailey, Timothy J.: See—
Courtney, Daniel P.; and Bailey, Timothy J., 4,871,226, Cl. 350-96.170.
- Baker, Gerald S., to Cameron Iron Works USA, Inc. Gate valve with supplemental actuator, 4,871,143, Cl. 251-58.000.
- Baker Performance Chemicals Inc.: See—
Cizek, Arthur, 4,871,024, Cl. 166-307.000.
- Baker, Ralph; and Foulkes, Stephen N., to Ferodo Limited. Sintered metal friction facing, 4,871,394, Cl. 75-232.000.
- Baldi, Alfonso L., to Alloy Surfaces Company, Inc. Pyrophorically activated iron or nickel foil and method of treating same, 4,871,708, Cl. 502-301.000.
- Baldwin, John J.; Tolman, Richard L.; and Wu, Mu T., to Merck & Co., Inc. Substituted 6H-7,8-dihydrothiapyrano(3,2-D)-pyrimidines as hypoglycemic agents, 4,871,739, Cl. 514-254.000.
- Balozien, Mardick. Device for side-lighting a subject placed in front of background as well as for lighting the background itself, for example when taking pictures of the subject by photography, cinematography or the like, 4,872,031, Cl. 354-291.000.
- Ballato, Arthur, to United States of America, Army. Method of making a crystal oscillator desensitized to acceleration fields, 4,871,986, Cl. 331-158.000.
- Bally Manufacturing Corporation: See—
Pasierb, John J., Jr., 4,871,167, Cl. 273-1.00E.
- Balogh, Maria: See—
Hermecz, Istvan; Kereszturi, Geza; Vasvavi, Lelle; Horvath, Agnes; Balogh, Maria; Kovacs, Gabor; Szuts, Tamas; Ritli, Peter; Sipos, Judit; and Pajor, Aniko, 4,871,849, Cl. 544-229.000.
- Banner, Ralph W., to R. A. Tracer Service Ltd. Method and apparatus for proportionally adding minute quantities of an active ingredient to a flowing stream of material, 4,871,116, Cl. 241-21.000.
- Barber-Colman Company: See—
Sebald, Mark D.; and Neumeyer, Richard E., 4,872,213, Cl. 364-180.000.
- Barber, Weldon H.: See—
Haley, Jerry L.; Barber, Weldon H.; and Morris, Kevin J., 4,871,019, Cl. 166-167.000.
- Barbera, Melvin A.: See—
Hartlaub, Gregory R.; and Barbera, Melvin A., 4,871,531, Cl. 424-48.000.
- Bard, Martin; and Baumgart, Hans G., to Buchtal GmbH. Ceramic wall or floor covering consisting of single tile-shaped elements, 4,870,795, Cl. 52-389.000.
- Bareket, Shlomo: See—
Burshtain, Esther; and Bareket, Shlomo, 4,871,093, Cl. 222-213.000.
- Barnard, Gordon D. Medical ventilator tube and manifold assembly, 4,870,961, Cl. 128-202.270.
- Barnett, Ronald E.; and Yarger, Ronald G., to General Foods Corp. Foodstuffs containing hydrobenzene organic acids as sweetness modifying agents, 4,871,570, Cl. 426-535.000.
- Barraud, Andre; Derost, Gisele; Henrion, Laurence; and Ruau-del-Teixier, Annie, to Commissariat a l'Energie Atomique. Process for the detection of molecular or ionic species, 4,871,680, Cl. 436-103.000.
- Barrella, Joseph N., to Power Conversion Inc. Method and apparatus for cell monitoring and control, 4,871,956, Cl. 320-13.000.
- Barrett, John P.; Schulz, Daniel R.; Kent, David E.; deFasselle, Robert J.; and Zega, Henry E. Dispensing system, 4,870,986, Cl. 137-119.000.
- Barry, John: See—
Ketcham, Kenneth E.; Barry, John; and Hofius, David V., 4,870,706, Cl. 2-2.000.
- Bartha, Johann W.: See—
Wittlinger, Jürgen; Greschner, Johann; Bayer, Thomas; and Bartha, Johann W., 4,871,418, Cl. 156-643.000.
- Barton, Mark R.: See—
Cook, Robert C.; and Barton, Mark R., 4,871,204, Cl. 292-251.500.
- Bartsch, Adalbert: See—
Muschelknautz, Edgar; Becker, Ernst; Bartsch, Adalbert; Kersten, Lars; Gospos, Georg; and Berndt, Gerhard, 4,871,147, Cl. 266-182.000.
- Basel, Rainer: See—
LeBisch, Helmut; Basel, Rainer; Fuchs, Georg; Dietmar, Hermann; Wipfelder, Ernst; and Hekele, Wilhelm, 4,871,502, Cl. 264-222.000.
- BASF Aktiengesellschaft: See—
Danner, Alfred; Mueller, Ulaich; Unger, Klaus; and Hoelderich, Wolfgang, 4,871,701, Cl. 502-62.000.
- Kiener, Volker; Nonn, Guenther; Seid, Bernhard; Schewski, Harald; and Buellmeyer, Karl, 4,871,373, Cl. 23-306.000.
- Miederer, Peter; and Michaelis, Eberhard, 4,871,481, Cl. 552-239.000.
- Pieper, Hartwig; Michels, Reiner; and Werther, Heinz-Ulrich, 4,871,631, Cl. 430-14.000.
- Wallbillich, Guenter; and Van Heuvelen, Jan H., 4,871,650, Cl. 430-300.000.
- BASF Aktiengesellschaft: See—
Martischus, Franz-Dieter; Oppenlaender, Knut; and Vogel, Hans-Henning, 4,871,375, Cl. 44-71.000.
- BASF Lacke + Farben Aktiengesellschaft: See—
Schwerzel, Thomas; Osterloh, Rolf; Schupp, Eberhard; Perner, Thomas; and Ahlers, Klaas, 4,871,808, Cl. 525-113.000.
- BASF Structural Materials Inc.: See—
McMahon, Paul E.; Chung, Tai-Shung; and Ying, Lincoln, 4,871,491, Cl. 264-29.200.
- Bateman, Robert. Coach seat locking mechanism, 4,871,207, Cl. 296-65.100.
- Batori, Sandor; Hajos, Gyorgy; Messmer, Andras; Benko, Pal; Pallos, Laszlo; Petocz, Lujza; Grasser, Katalin; Kosoczky, Ibolya; and Szirt nee Kiszelly, Eniko, to EGIS Gyogyszergyar. Process for the preparation of condensed as-triazine derivatives, 4,871,846, Cl. 544-183.000.
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Huber, Thomas, 4,871,052, Cl. 193-35.0MD.
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Mazza, John C., 4,871,682, Cl. 436-179.000.
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Beck, Gunther, 4,871,851, Cl. 544-279.000.
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Wittlinger, Jürgen; Greschner, Johann; Bayer, Thomas; and Bartha, Johann W., 4,871,418, Cl. 156-643.000.
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Rathgeber, Gerhard, 4,871,954, Cl. 318-466.000.
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Lam, Dominic M-K.; and Kelleher, Peter J., 4,871,350, Cl. 604-49.000.
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Nurmamedov, Narzy N.; Gonchar, Valery I.; Bazarov, Babamurad A.; Nurmukhamedov, Arslan; Skrylnikova, Irina V.; Mustae, Ilyas A.; and Varshavsky, Valery L., 4,871,362, Cl. 623-6.000.
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Braun, Walter; and Habermann, Joachim, 4,872,185, Cl. 375-106.000.
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- Becker, Ernst: See—
Muschelknautz, Edgar; Becker, Ernst; Bartsch, Adalbert; Kersten, Lars; Gospos, Georg; and Berndt, Gerhard, 4,871,147, Cl. 266-182.000.
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Harris, Paul C.; and Stone, Linda J., 4,871,683, Cl. 436-531.000.
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King, Francis D.; and Joiner, Karen A., 4,871,744, Cl. 514-299.000.
- Beiersdorf AG: See—
Cohnen, Erich, 4,871,775, Cl. 514-652.000.
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Gillard, John; Rokach, Joshua; and Belanger, Patrice C., 4,871,756, Cl. 514-381.000.
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Morgan, Leonard J.; and Bell, Mark, 4,871,392, Cl. 71-121.000.
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Naidenov, Evgeny V.; Belozzerov, Georgy I.; Salov, Viktor E.; and Zakharov, Ivan V., 4,872,118, Cl. 364-463.000.
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Adam, Peter; Nebelung, Adolf; and Vogt, Michael, 4,871,578, Cl. 427-2.000.
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- Benson, LeDell E.: See—
Milbauer, Thomas H.; and Benson, LeDell E., 4,871,201, Cl. 292-113.000.
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Tresslar, Marie C.; Kite, Joseph S., III; Piotrowski, Michael J.; and Conaghan, Thomas B., 4,870,887, Cl. 87-9.000.
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O'Farrell, Desmond J.; Schofield, Kenneth; Larson, Mark L.; Hanft, Karl-Heinz; Schierbeek, Kenneth L.; and Bentley, Richard D., 4,871,917, Cl. 250-341.000.
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Torres, Joaquim; Madar, Roland; Bernard, Claude; and Million-Brodaz, Jean-Francois, 4,871,691, Cl. 437-200.000.
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Bernard, Emeric E., 4,871,026, Cl. 172-26.000.
- Bernardi, Richard T., to Bio-Imaging Research, Inc. Cam-controlled automatic dynamic focusing for computed tomography, 4,872,191, Cl. 378-150.000.
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Muschelknautz, Edgar; Becker, Ernst; Bartsch, Adalbert; Kersten, Lars; Gospos, Georg; and Berndt, Gerhard, 4,871,147, Cl. 266-182.000.
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Stoekli, Oscar W.; and Berry, David J., 4,871,564, Cl. 426-388.000.
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- Beschränkter Haftung: See—
Wahl, Hans P.; and Wurzburg, Uwe, 4,871,678, Cl. 436-79.000.
- Bescrankter Haftung: See—
Reiffenrath, Volker; Krause, Joachim; Geelhaar, Thomas; Eiden-schink, Rudolf; Kurmeier, Hans-Adolf; Poetsch, Eike; Scheuble, Bernhard; and Weber, Georg, 4,871,469, Cl. 252-299.610.
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Ferguson, Donald E., 4,870,853, Cl. 72-393.000.
- Bethge, Michael: See—
Hermann, Dietmar; and Bethge, Michael, 4,870,783, Cl. 49-477.000.
- Betz Laboratories, Inc.: See—
Dreisbach, David D.; and Gomes, Gilbert S., 4,871,424, Cl. 162-168.100.
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Edgren, David E.; Magruder, Judy A.; and Bhatti, Gurdish K., 4,871,548, Cl. 424-488.000.
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- Biederstedt, Lutz: See—
Muller, Manfred; and Biederstedt, Lutz, 4,871,330, Cl. 439-709.000.
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Bauerregger, Rolf; Büdi, Erich; and Dietl, Josef, 4,871,117, Cl. 241-23.000.
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- Binary Arts Corporation: See—
Lammertink, Ferdinand, 4,871,173, Cl. 273-153.00S.
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Macier, James E.; Binversie, Gregory J.; Calamia, David C.; and Daniels, John M., 4,870,929, Cl. 123-78.00R.
- Bio-Imaging Research, Inc.: See—
Bernardi, Richard T., 4,872,191, Cl. 378-150.000.
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Kim, Sun H., 4,871,870, Cl. 560-039.000.
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Heliöff, Michael W.; Bires, Carmen D.; and Login, Robert B., 4,871,535, Cl. 424-71.000.
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- Bistran, Bruce R.; Babayan, Vigen K.; Blackburn, George L.; and Mascioli, Edward A., to New England Deaconess Hospital Corporation. Dietary supplement utilizing α -3/medium chain triglyceride mixtures. 4,871,768, Cl. 514-547.000.
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Bunyea, Roderick F., 4,871,629, Cl. 429-97.000.
Miner, Jonathan L., 4,870,714, Cl. 15-327.00C.
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Bistran, Bruce R.; Babayan, Vigen K.; Blackburn, George L.; and Mascioli, Edward A., 4,871,768, Cl. 514-547.000.
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Landa, Benzion; Blake, Christopher J.; Housworth, Gerald R.; and Lior, Shai, 4,871,163, Cl. 271-225.000.
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Hood, Richard D., Jr.; Clemmshaw, John D.; and Blakeman, Jack E., 4,870,988, Cl. 137-343.000.
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- Blanchard, Russell O.: See—
Bredeweg, Robert A.; and Blanchard, Russell O., 4,871,098, Cl. 223-85.000.
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- Blind, Andre; Collas, Gerard; Robin, Jean; and Sagi, Ferenc, to Rhone-Poulenc Chimie. Purification/isolation of isocyanate condensates. 4,871,828, Cl. 528-44.000.
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Robin, Jean; and Blind, Andre, 4,871,460, Cl. 210-634.000.
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- Blumle, Martin, to Winkler & Duenneberg Maschinenfabrik und Eisen-gesellschaft KG. Method and apparatus for packing envelopes in cartons. 4,870,803, Cl. 53-447.000.
- Blytas, George C.: See—
Olson, Donald C.; Miller, John J., deceased; Miller, Wayne R., executor; Blytas, George C.; and Diaz, Zaida, 4,871,520, Cl. 423-221.000.
- Board of Regents, University of Texas System: See—
Weldon, William F.; and Driga, Mircea D., 4,870,888, Cl. 89-8.000.
- Board of Rijks Universiteit Leiden, The: See—
Bos, Johannes L.; and Van der Eb, Alex J., 4,871,838, Cl. 536-27.000.
- BOC, Inc.: See—
Lin, Bor-Sheng; Kudzma, Linas V.; and Spencer, H. Kenneth, 4,871,749, Cl. 514-326.000.
- Bodziuch, Stanislaw: See—
Smith, Robert W.; and Bodziuch, Stanislaw, 4,871,945, Cl. 315-77.000.
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- Boehringer Biochemia Robin SpA: See—
Tognella, Sergio; Tedeschi, Michele; Assereto, Roberto; Tofanetti, Odoardo; and Cavalletti, Ennio, 4,871,528, Cl. 424-10.000.
- Boehringer Ingelheim KG: See—
Arndts, Dietrich; Schingnitz, Gunter; Streller, Ilse; and Walland, Alexander, 4,871,760, Cl. 514-401.000.
- Boehringer Mannheim Corporation: See—
Herpichboehm, Bernd G.; Sierra, George H.; Summers, Robert B.; and Watlington, Thomas M., 4,871,258, Cl. 356-422.000.
- Boehringer Mannheim GmbH: See—
Brown, Nigel L.; and Walsby, Anthony E., 4,871,664, Cl. 435-91.000.
- Boeing Company, The: See—
Bernier, Coral A.; and Swanson, Douglas E., 4,871,131, Cl. 244-122.0AG.
Lubowitz, Hyman R.; and Sheppard, Clyde H., 4,871,475, Cl. 252-500.000.
- Boes, David J.; and Zottola, Gene, to Westinghouse Electric Corp. Reactor coolant pump sealing surfaces with titanium nitride coating. 4,871,297, Cl. 415-170.100.
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Odoni, Walter; and Boesch, Richard, 4,871,033, Cl. 173-12.000.
Bogar, Earl M., Jr. Fishing rod holder. 4,871,099, Cl. 224-42.45R.
- Bohner, Beat; and Meyer, Willy, to Ciba-Geigy Corporation. Aminopyrazinones. 4,871,853, Cl. 544-408.000.
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- Boll, Harry J.: See—
Boll, Gregory G.; and Boll, Harry J., 4,871,964, Cl. 324-158.00F.
- Bomhard, Andreas: See—
Heider, Joachim; Psiorz, Manfred; Bomhard, Andreas; Hael, Norbert; Narr, Berthold; Noll, Klaus; Lillie, Christian; Kobinger, Walter; and Dammgen, Jürgen, 4,871,735, Cl. 514-213.000.
- Bonetti, Cesare: See—
Bonetti, Giulio, 4,870,862, Cl. 73-322.500.
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- Boone, Stephen D., to Instant Product Inc. Greeting card arrangement. 4,870,764, Cl. 40-124.100.
- Boots Company PLC, The: See—
Rees, John A., 4,871,774, Cl. 514-646.000.
- Bos, Johannes L.; and Van der Eb, Alex J., to Board of Rijks Univer-siteit Leiden, The. Probes and methods for detecting activated ras oncogenes. 4,871,838, Cl. 536-27.000.
- Boss, Franz; and Wolz, Udo, to Zahnradfabrik Friedrichshafen AG. Drive-train torque-transmitting disk. 4,871,342, Cl. 464-98.000.
- Bossi, Alessandro: See—
Cavaterra, Enrico; and Bossi, Alessandro, 4,871,707, Cl. 502-225.000.
- Bowden, Robert T. Prewipe device. 4,870,899, Cl. 101-155.000.
- Bowman, Wayne A.; and Harrison, Daniel J., to Eastman Kodak Com-pany. Stripping layers for imaging elements. 4,871,648, Cl. 430-215.000.
- Bowmer, Geoff M.: See—
Kies, Anton M.; van den Nieuwelaar, Harry C.; and Bowmer, Geoff M., 4,870,848, Cl. 72-89.000.
- Boyer, Keith: See—
Dunn, Joseph E.; Clark, R. Wayne; Asmus, John F.; Pearlman, Jay S.; Boyer, Keith; Painchaud, Francois; and Hofmann, Gunter A., 4,871,559, Cl. 426-248.000.
- BP Chemicals Limited: See—
Cloetens, Rudolphe C.; Lidy, Werner A.; Phillips, Brian D.; and Thomas, David B., 4,871,783, Cl. 521-137.000.
Pardy, Richard B. A., 4,871,432, Cl. 204-182.400.
Senez, Alain, 4,871,813, Cl. 525-240.000.
- Bradley, Curtis E. Thermal liquid pump. 4,870,943, Cl. 123-558.000.
- Bradlow, H. Leon: See—
Appelzweig, Norman; and Bradlow, H. Leon, 4,871,726, Cl. 514-177.000.
- Bragdon, Robert W.; and Gaudette, Roger R., to W. R. Grace & Co.-Conn. Hydatonins as animal food supplements. 4,871,552, Cl. 426-2.000.
- Brandes, Wilhelm: See—
Holmwood, Graham; Buchel, Karl H.; Lurssen, Klaus; Frohberger, Paul-Ernst; and Brandes, Wilhelm, 4,871,390, Cl. 71-92.000.
- Brant, Edward J., to Pass & Seymour, Inc. Mechanical assembly means for grand fault interrupter receptacle. 4,872,087, Cl. 361-356.000.
- Braun, Walter; and Habermann, Joachim, to BBC Brown Boveri AG. Signal transmission method. 4,872,185, Cl. 375-106.000.
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- Bray, Charles E. Vehicle finish protection apparatus. 4,871,205, Cl. 293-128.000.
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- Breda Packaging B.V.: See—
Van Oord, Jan J.J., 4,870,809, Cl. 53-531.000.

- Bredeweg, Robert A.; and Blanchard, Russell O., to Batts, Inc. Hook socket for ganging hangers. 4,871,098, Cl. 223-85.000.
- Breitke, Willi, to Henkel Kommanditgesellschaft auf Aktien. Emulsify-ing compositions for suppository bases and suppositories produced therefrom. 4,871,777, Cl. 514-785.000.
- Bridgestone Corporation: See—
Harada, Jumei; and Nishigai, Kazuhisa, 4,871,259, Cl. 366-85.000.
Itoh, Michio; Yamamoto, Hisao; and Okamura, Nobuyuki, 4,871,794, Cl. 524-254.000.
- Brigham Young University: See—
Chabries, Douglas M., 4,872,012, Cl. 342-25.000.
- Brillion Iron Works, Inc.: See—
Kruse, Oliver M., 4,871,030, Cl. 172-397.000.
- Brindopke, Gerhard; Walz, Gerd; Waldmann, Karl; Schon, Manfred; and Kleiner, Hans-Jerg, to Hoechst AG. Reaction product of olefini-cally unsaturated compounds with compounds containing active hydrogen, processes for their preparation and 2-component lacquers based thereon HOE 85/F 036J. 4,871,822, Cl. 526-271.000.
- Brinkmeier, Friedhelm, to Windmoller & Holscher. Apparatus for forming a flexible tubing from a single-ply or multi-ply web. 4,871,347, Cl. 493-302.000.
- Brinton, Robert J.: See—
Hicks, T. Lawrence; Givens, Guy M.; Brinton, Robert J.; and Grundhauser, Donald J., 4,872,056, Cl. 358-183.000.
- Britax Wingard Limited: See—
Anstee, Christopher J., 4,871,953, Cl. 318-466.000.
- British Telecommunications public limited company: See—
Stanley, Ian W., 4,871,244, Cl. 350-486.000.
- Brokens, Alexander. Method of combining fish sawdust with flaked fish. 4,871,560, Cl. 426-272.000.
- Broken Hill Proprietary Company Limited, The: See—
Scott, John C., 4,871,916, Cl. 250-338.500.
- Bromine Compounds Limited: See—
Stollar, Hyman; Khariton, Khaim; Grinberg, Mark; and Ellmann, Eva, 4,871,882, Cl. 568-639.000.
- Brother Kogyo Kabushiki Kaisha: See—
Harada, Yuichi, 4,871,274, Cl. 400-697.100.
Kozawa, Tetsuo; and Asano, Satoru, 4,870,916, Cl. 112-121.110.
Miyabayashi, Takeshi, 4,871,582, Cl. 427-53.100.
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- Burkhart, Helmut: See—
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- Burnham, Robert D.: See—
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- Cain, Wendy J.: See—
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Clark, Albert L. Portable device for storing an endless metallic or fiber-optic cable. 4,871,127, Cl. 242-86.50R.

Clark, Kenneth E.: See—
Long, Richard D.; Long, David L.; Long, Clifford D.; and Clark, Kenneth E., 4,870,946, Cl. 125-13.00R.

Clark, R. Wayne: See—
Dunn, Joseph E.; Clark, R. Wayne; Asmus, John F.; Pearlman, Jay S.; Boyer, Keith; Painchaud, Francois; and Hofmann, Gunter A., 4,871,559, Cl. 426-248.000.

Clark, Steven J.; and Fields, William C. Manufactured building adjustable leveling and support device. 4,870,789, Cl. 52-126.600.

Clements, Don A.: See—
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Cleminshaw, John D.: See—
Hood, Richard D., Jr.; Cleminshaw, John D.; and Blakeman, Jack E., 4,870,988, Cl. 137-343.000.

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von Recum, Andreas F.; and Cooke, Francis W., 4,871,366, Cl. 623-11.000.

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Clouser, Michael T., to Emhart Industries, Inc. Piezoelectric motor. 4,871,939, Cl. 310-332.000.

Coby, A. Daniel: See—
Lake, Ralph J., Jr.; Wiley, Franklyn L.; Coby, A. Daniel; and Pluth, John, Jr., 4,872,023, Cl. 346-1.100.

Coca-Cola Company: See—
Kalala, Rose H.; DeLeon, Joe R.; and Maculan, Thomas P., 4,871,554, Cl. 426-74.000.

Codding, Charles N., III; Rhodes, George F.; and McGrath, Philip I., Jr., to United States Pipe and Foundry Company. Earthquake resistant pipe joints. 4,871,197, Cl. 285-231.000.

Coffee, Louis G.: See—
Smith, Darrell F., Jr.; and Coffee, Louis G., 4,871,511, Cl. 420-96.000.

Cohen, Nathan. Multi-prong surface connector. 4,870,721, Cl. 24-16.0PB.

Cohen, Simon S.: See—
Kim, Manjin J.; Brown, Dale M.; Cohen, Simon S.; Gorowitz, Bernard; and Saia, Richard J., 4,871,617, Cl. 428-450.000.

Cohnen, Erich, to Beiersdorf AG. Substituted phenoxyalkanolamines and phenoxyalkanol-cycloalkylamines in pharmaceutical formulations and use thereof. 4,871,775, Cl. 514-652.000.

Cole, Jack, to Conoco Inc. Telescoping tube omni-directional shear wave vibrator. 4,871,045, Cl. 181-114.000.

Coleman, Patrick L.: See—
Heilmann, Steven M.; Rasmussen, Jerald K.; Krepski, Larry R.; Milbrath, Dean S.; and Coleman, Patrick L., 4,871,824, Cl. 526-304.000.

Colin, Louis. Apparatus for manufacturing bags made of plastic material. 4,871,346, Cl. 493-194.000.

Collas, Gerard: See—
Blind, Andre; Collas, Gerard; Robin, Jean; and Sagi, Ferenc, 4,871,828, Cl. 528-44.000.

Collett, David J.: See—
Parton, Richard L.; Gingello, Anthony D.; Collett, David J.; Stegman, David A.; and Adin, Anthony, 4,871,656, Cl. 430-522.000.

Colli, Luigi, to Savio, S.p.A. Method and device for tube selection. 4,871,072, Cl. 209-656.000.

Combustion Concepts Inc.: See—
Norton, John P.; Schneider, Steven; Wilder, William D.; and Hussell, Stephen J., 4,871,308, Cl. 432-29.000.

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Barraud, Andre; Derost, Gisele; Henrion, Laurence; and Ruadel-Teixier, Annie, 4,871,680, Cl. 436-103.000.

Competitive Athletics Technology, Inc.: See—
Fatool, Wade; and Ferraro, Robert J., 4,870,956, Cl. 128-80.00C.

Completion Tool Company: See—
Bell, William T.; Ellis, Richard C.; and Snyder, Robert E., 4,871,179, Cl. 277-34.600.

Comurhex Societe pour la Conversion de l'Uranium en Metal et Hexafluorure: See—
Bachelard, Roland; and Germanaz, Patrick, 4,871,479, Cl. 252-636.000.

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Coma, Francis E., to General Motors Corporation. Gas turbine engine starting mechanism. 4,870,817, Cl. 60-39.141.

Coma, Kirk O.; Finlay, William, Jr.; Suty, Carol S.; and Maietta, Michael G., to West Company, The. Wet-dry bag with lyphozation vial. 4,871,354, Cl. 604-89.000.

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Zweig, Andrew M.; and Conrad, Jeffrey P., 4,871,831, Cl. 528-205.000.

Consolidated International Automotive, Inc.: See—

Plumer, Mark J., 4,870,842, Cl. 70-232.000.

Constant, Bernard: See—

Bergerieux, Jean-Marcel; Pavie, Claude; Plent, Christian; and Constant, Bernard, 4,870,799, Cl. 53-55.000.

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Hermann, Dietmar; and Bethge, Michael, 4,870,783, Cl. 49-477.000.

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Tran, Loi H., 4,871,352, Cl. 604-82.000.

Cook, Robert C.; and Barton, Mark R., to Securiton-Magnalock Corporation. Touch bar release locking system. 4,871,204, Cl. 292-251.500.

Cooke, Francis W.: See—

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Coomer, Virgil W.: See—

Laursen, Larry J.; Coomer, Virgil W.; and Schrenk, Walter J., 4,871,487, Cl. 264-1.500.

Coom, Paul A., to AMP Incorporated. Electrical harness having one connector intended for circuit board mounting. 4,871,326, Cl. 439-502.000.

Cooper, Erwin E., to Texas Instruments Incorporated. Wide spectral band infrared refractive lens. 4,871,219, Cl. 350-1.400.

Cooper, J. Carl; and Yu, John P., to Electro Sound, Inc. System and method for high speed video tape reproduction. 4,872,070, Cl. 360-15.000.

Cooper Power Systems, Inc.: See—

Roloff, Frederick W., 4,870,742, Cl. 29-335.000.

CooperVision, Inc.: See—

Imonti, Maurice M., 4,870,977, Cl. 128-890.000.

Coquelet, Claude: See—

Bonne, Claude; Coquelet, Claude; and Latour, Elisabeth, 4,871,742, Cl. 514-262.000.

Cornin, Luciano; and Maitan, Gianni, to Nuovopignone-Industrie Meccaniche e Fonderia S.p.A. Improvements in the gripper transportation system of a shuttleless loom. 4,870,996, Cl. 139-1.00R.

Cornell Research Foundation, Inc.: See—

Panda, Prakash C.; Seydel, Edgar R.; and Raj, Rishi, 4,871,496, Cl. 264-65.000.

Corning Incorporated: See—

Bagley, Rodney D.; and Wusirika, Raja R., 4,871,621, Cl. 428-549.000.

Ketcham, Thomas D., 4,871,489, Cl. 264-9.000.

Cory, Robert M., to General Dynamics Land Systems, Inc. Hollow pin assembly for shoe assembly of track laying vehicle. 4,871,216, Cl. 305-58.000.

Cosgrave, Dara; and Roydhouse, John. Fracturable-key activated control system. 4,871,053, Cl. 194-208.000.

Coupek, Jiri; Voza, Stanislav; Strejc, Borivoj; and Tomsova, Zdenka. Storage container of samples for analysis. 4,871,675, Cl. 435-288.000.

Courtney, Daniel P.; and Bailey, Timothy J., to United Technologies Corporation. Mounting of optical fibers to integrated optical chips. 4,871,226, Cl. 350-96.170.

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Bussanmiere, Andre; and Courtois, Yves, 4,872,108, Cl. 364-200.000.

Coutin, Pierre F.: See—

Grosselin, Daniel; and Coutin, Pierre F., 4,870,885, Cl. 89-1.819.

Cowan, Philip L. Automatic reversing valve. 4,870,890, Cl. 91-50.000.

Cowles, Curtis R. Mechanical positioning or transferring system. 4,871,293, Cl. 414-744.300.

Cox, John P. A., to P.C. Cox (Newbury) Limited. Pneumatic dispensers for viscous materials. 4,871,088, Cl. 222-47.000.

Coy, David H.; and Murphy, William A., to Administrators of the Tulane Educational Fund. Peptides. 4,871,717, Cl. 514-11.000.

Cozzi, Lucio, to SGS Microelettronica S.p.A. Method and apparatus for testing EPROM type semiconductor devices during burn-in. 4,871,963, Cl. 324-73.00R.

Craft, Inc.: See—

Roy, Armand E.; and Roy, Leo T., 4,870,749, Cl. 29-798.000.

Crawley, Charles R. Positive ventilation cooling augmentor. 4,870,832, Cl. 62-89.000.

Crocker, Robert L.: See—

Gray, Nigel; Knibbs, Simon; Finlay, Patrick A.; and Crocker, Robert L., 4,870,970, Cl. 128-660.090.

Cronk, Scott; and Thomas, Michelle. Suction canister assembly for the collection of body fluids and tissue specimens. 4,870,975, Cl. 128-749.000.

Crouch, Jeffrey P.: See—

Autorino, Joseph A.; and Crouch, Jeffrey P., 4,871,168, Cl. 273-66.000.

Autorino, Joseph A.; and Crouch, Jeffrey P., 4,871,169, Cl. 273-26.00R.

Cruse, Clint A.: See—

Kesting, Robert E.; Fritzsche, Alfred K.; Murphy, Milton K.; Handermann, Alan C.; Cruse, Clint A.; and Malon, Raymond F., 4,871,494, Cl. 264-41.000.

CSENTIND - Centro Studi Industriali - S.r.l.: See—

Romagnoli, Andrea, 4,870,808, Cl. 53-529.000.

CSX Transportation, Incorporated: See—

McLean, Leonard A., 4,871,047, Cl. 182-90.000.

Cudd, Charles A., to Yale Security Inc. Lock deadbolt protector. 4,870,841, Cl. 70-107.000.

Cuddy, Jared G.; and Juntunen, William H., to Abitibi-Price Corporation. Method and apparatus for accent coating of lap panels. 4,871,588, Cl. 427-264.000.

Culbert, James A.; and Seslar, Daniel M., to Hazeltine Corporation. Noise trap circuit. 4,872,145, Cl. 367-87.000.

Cullen, James H.: See—

Taranto, James; and Cullen, James H., 4,871,957, Cl. 320-26.000.

Curtis, Jeff K., to Stauffer Chemical Company. Certain 3-benzoyl-4-oxolactams. 4,871,856, Cl. 71-94.000.

Curtis, Jeff K., to Stauffer Chemical Company. Certain 3-benzoyl-4-oxolactams. 4,871,857, Cl. 546-220.000.

Curtis, Mark D.; and Heidel, David, to Brunswick Corporation. Cowl-locking mechanism. 4,871,333, Cl. 440-77.000.

CXA Ltd./CXA LTEE: See—

Simon, James R.; True, Donald C.; and Lafond, Jacques, 4,870,902, Cl. 102-201.000.

Cyprien, Guy; Fisch, Alain; Haggiage, Johnny; Porte, Hugues; Pratz, Thierry; and Torres, Ghislaine, to Rhone-Poulenc Chimie. Polyaddition silicone elastomer dosage forms for the controlled release of iodine values. 4,871,547, Cl. 424-81.000.

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Chapman, David J., 4,871,309, Cl. 432-156.000.

Daberkow, Kevin L.; Finan, Christopher D.; Petolino, Joseph A.; Sobottka, Daniel Carl; and Thomas, Jeffrey A., to Amdahl Corporation. Monolithic semi-custom IC having standard LSI sections and coupling gate array sections. 4,872,111, Cl. 364-200.000.

Daguet, Alain P. M.; Glowacki, Pierre A.; and Lassignardie, Herve, to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation (SNECMA). Casing for a turbojet engine combustion chamber. 4,870,826, Cl. 60-751.000.

Dahl, Christian; and Dall, Thoge. Scraping conveyor. 4,871,060, Cl. 198-716.000.

Dai Nippon Insatsu Kabushiki Kaisha: See—

Ishii, Taiji; and Shibata, Masayuki, 4,871,503, Cl. 264-248.000.

Daicel Chemical Industries, Ltd.: See—

Murabayashi, Katuyoshi, 4,871,804, Cl. 525-92.000.

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Takagi, Yoshiaki; Isobe, Susumu; and Matsunaga, Kenkichi, 4,871,512, Cl. 420-448.000.

Daido, Toshihiko; Fujiwara, Mitsugu; and Nishimura, Shigeo, to Koyo Seiko Co., Ltd. Power steering system incorporating electric motor. 4,871,039, Cl. 180-79.100.

Daichi Seiyaku Co., Ltd.: See—

Hayakawa, Isao; Atarashi, Shohgo; Yokohama, Shuichi; and Imamura, Masazumi, 4,871,852, Cl. 544-363.000.

Daiken Industries, Ltd.: See—

Nagata, Yasuhiro; and Fujimura, Hidetaka, 4,871,440, Cl. 204-403.000.

Daikin Industries, Ltd.: See—

Ohmori, Akira; and Yasuhara, Takashi, 4,871,820, Cl. 526-245.000.

Daikuhara, Norio: See—

Yamaguchi, Shuichiro; Daikuhara, Norio; and Shimomura, Takeshi, 4,871,442, Cl. 204-418.000.

Daimler, Wolfgang: See—

Staritzbichler, Werner; Dworak, Gert; and Daimler, Wolfgang, 4,871,807, Cl. 525-113.000.

Dainippon Screen Mfg. Co., Ltd.: See—

Isono, Koichi; Tomohisa, Kunio; Oka, Junichi; and Sakamoto, Takashi, 4,872,065, Cl. 358-494.000.

Nishizawa, Hisao; Morita, Masaru; and Tanaka, Masato, 4,871,417, Cl. 156-640.000.

Sugimoto, Kenji, 4,870,923, Cl. 118-715.000.

Daisy Systems Corporation: See—

Catlin, Gary M., 4,872,125, Cl. 364-578.000.

Daiwa Seiko Inc.: See—

Hashimoto, Hiroshi, 4,871,129, Cl. 242-255.000.

Dall, Thoge: See—

Dahl, Christian; and Dall, Thoge, 4,871,060, Cl. 198-716.000.

Dallas Semiconductor Corporation: See—

Williams, Clark R.; and Jiang, Ching-Lin, 4,871,982, Cl. 331-75.000.

Dallavalle, Carlo, to SGS-Thomson Microelectronics S.p.A. Latch-up prevention in a two-power-supply CMOS integrated circuit by means of a single integrated MOS transistor. 4,871,927, Cl. 307-296.500.

Dammgen, Jurgen: See—

Heider, Joachim; Psiorz, Manfred; Bomhard, Andreas; Haeu, Norbert; Narr, Berthold; Noll, Klaus; Lillie, Christian; Kobinger, Walter; and Dammgen, Jurgen, 4,871,735, Cl. 514-213.000.

Danfoss A/S: See—

Outzen, Svend E., 4,871,300, Cl. 417-363.000.

Thomsen, Flemming; Nissen, Harry S.; Ravn, Kjeld; and Diken, Carl C., 4,870,892, Cl. 91-361.000.

Daniels, Donald V.: See—

Brown, David A.; Daniels, Donald V.; and Harrison, Joel N., 4,872,074, Cl. 360-77.070.

Daniels, John M.: See—

Macier, James E.; Binversie, Gregory J.; Calamia, David C.; and Daniels, John M., 4,870,929, Cl. 123-78.00R.

Danner, Alfred; Mueller, Ulaich; Unger, Klaus; and Hoelderich, Wolfgang, to BASF Aktiengesellschaft. Alkali-free preparation of large pentasil crystals as coated catalysts and fully crystalline catalysts. 4,871,701, Cl. 502-62.000.

Dannoura, Sada-yuki, to Ube Industries, Ltd. Vertical injection apparatus for die casting machine. 4,871,010, Cl. 164-253.000.

Datta, Sudhin; and Ouhadi, Trazollah, to Exxon Chemical Patents Inc. Vanadium tetrachloride stabilization. 4,871,523, Cl. 423-265.000.

Daum, Werner; Hanssler, Gerd; and Ooms, Pieter, to Bayer Aktiengesellschaft. Carbamoyloxythiophene fungicides. 4,871,864, Cl. 549-60.000.

Davies, Alan F. Visible file pockets. 4,870,767, Cl. 40-360.000.

Davies, Robert; and Johndrow, John P., to Sankey Vending Limited. Dispensing apparatus with pivotable article containers. 4,871,086, Cl. 221-4.000.

Davies, Robert B., to Motorola, Inc. Integrated Schottky diode and transistor. 4,871,686, Cl. 437-39.000.

Davis, Gordon T.; and Mandalia, Baiju D., to International Business Machines, Corp. Coherent phase shift keyed demodulator. 4,871,974, Cl. 329-345.000.

Davis, Norman C.: See—

Marschman, Steven C.; and Davis, Norman C., 4,871,437, Cl. 204-291.000.

Marschman, Steven C.; and Davis, Norman C., 4,871,438, Cl. 204-291.000.

Dawson, Bruce K.: See—

Thorogood, Robert M.; Bennett, Douglas L.; Allam, Rodney J.; Prentice, Alan L.; and Dawson, Bruce K., 4,871,382, Cl. 62-18.000.

Dawson, John A.: See—

Strong, David S.; and Dawson, John A., 4,871,627, Cl. 429-27.000.

DeAlmeida, Sergio G.: See—

Farrell, Nicholas; Hacker, Miles P.; McCormack, John J.; and DeAlmeida, Sergio G., 4,871,729, Cl. 514-188.000.

DeCastro, Eugene A.: See—

DonMichael, T. Anthony; Siegel, Robert J.; and DeCastro, Eugene A., 4,870,953, Cl. 128-24.00A.

deFasselle, Robert J.: See—

Barrett, John P.; Schulz, Daniel R.; Kent, David E.; deFasselle, Robert J.; and Zega, Henry E., 4,870,986, Cl. 137-119.000.

Deguchi, Kozi: See—

Uchida, Shin-ichi; Deguchi, Kozi; and Sasaki, Masamitsu, 4,871,700, Cl. 502-51.000.

Degussa Aktiengesellschaft: See—

Bilger, Edgar; and Wolf, Hubert, 4,871,681, Cl. 436-109.000.

de Jongh, Hendrik P.: See—

Groen, Marinus B.; and de Jongh, Hendrik P., 4,871,724, Cl. 514-173.000.

Dekura, Takateru; and Endo, Juro, to Hitachi Metals, Ltd.; and Maruwa Bussan K.K. Synthetic lubricant for lubricating thin film and magnetic recording medium. 4,871,625, Cl. 428-695.000.

Delagebeaudeuf, Daniel: See—

Derewonko, Henri; Adam, Didier; Delagebeaudeuf, Daniel; and Resneau, Patrick, 4,872,049, Cl. 357-68.000.

DeLeon, Joe R.: See—

Kalala, Rose H.; DeLeon, Joe R.; and Maculan, Thomas P., 4,871,554, Cl. 426-74.000.

Dell, Hans-Dieter: See—

Beckermann, Bernhard; Dell, Hans-Dieter; Horstmann, Harald; and Kraus, Reinhold, 4,871,767, Cl. 514-536.000.

Dellon, Arnold L.; and Mackinnon, Susan E., to American Cyanamid Company. Bioabsorbable surgical device for treating nerve defects. 4,870,966, Cl. 128-334.00R.

Delmas, Gilles: See—

Steers, Michel; Hazan, Jean-Pierre; and Delmas, Gilles, 4,871,891, Cl. 219-10.55B.

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Shaffer, J. Howard, 4,870,855, Cl. 73-23.000.

Deltown Chemurgic Corporation: See—

Callahan, Timothy; and Herz, Jack, 4,871,575, Cl. 426-643.000.

DeLuca, Joan S.; Holmes, Thomas F.; and Abbaticchio, Mark J., to Motorola, Inc. Paging receiver capable of reminding a user of an important message event. 4,872,005, Cl. 340-825.440.

deMey, Charles F., II, to Perkin-Elmer Corporation, The. Mounting system for vibration isolation. 4,871,142, Cl. 248-632.000.

de Montmollin, Vincent; and Brun, Yves, to Schlumberger Technology Corporation. Method of processing excitation response of a shaker disposed within a tool to obtain an equalized seismic signal. 4,872,114, Cl. 364-421.000.

Denda, Masahiko, to Director General, Agency of Industrial Science and Technology. Method of bonding a semiconductor to a package with a low and high viscosity bonding agent. 4,871,405, Cl. 156-74.000.

den Hartog, Gerardus H. J. Suspension bar for anode and/or cathode sheets in the electrolytic refining of metals and a method for the manufacture of such a suspension bar. 4,871,436, Cl. 204-286.000.

Dennis, Linda H. Process for forming embellished fabric by core yarn removal. 4,870,999, Cl. 139-383.00R.

Denny, Patrick J.; and Wood, Peter, to Imperial Chemical Industries PLC. Agglomerate absorbents comprising copper and zinc for sulphur compounds removal. 4,871,710, Cl. 502-414.000.

Denny, Thomas A. Intravenous injection shield assembly. 4,870,976, Cl. 128-877.000.

Denofrio, Charles. Electroplating apparatus. 4,871,435, Cl. 204-224.00R.

Derewonko, Henri; Adam, Didier; Delagebeaudeuf, Daniel; and Resneau, Patrick, to Thomson Hybrides et Microondes. Encapsulated low-noise ultra-high frequency semiconductor device. 4,872,049, Cl. 357-68.000.

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Barraud, Andre; Derost, Gisele; Henrion, Laurence; and Ruandel-Teixier, Annie, 4,871,680, Cl. 436-103.000.

Design Council: See—

Andrus, William C., 4,872,094, Cl. 362-96.000.

Desmond, Richard; Mills, Sander G.; Volante, Ralph P.; and Shinkai, Ichiro, to Merck & Company Incorporated. Process for synthesis of arylglyoxal arylamines. 4,871,873, Cl. 564-276.000.

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Deutsche Gesellschaft für Wiederaufarbeitung von Kernbrennstoffen mbH: See—

Ritter, Harald, 4,871,000, Cl. 141-95.000.

Deutsche ITT Industries, GmbH: See—

Micic, Ljubomir; and Mehrgardt, Soenke, 4,872,060, Cl. 358-242.000.

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Schilling, Harald; and Novotny, Bernd, 4,871,977, Cl. 330-255.000.

Devon, Thomas J.: See—

Puckette, Thomas A.; and Devon, Thomas J., 4,871,878, Cl. 568-454.000.

DeWald, Carolyn G., to Minnesota Mining and Manufacturing Company. Resin systems for coated products; and method. 4,871,376, Cl. 51-298.000.

Diafoil Company, Limited: See—

Otonari, Satoshi; Sato, Yoshinori; Masuda, Narihiro; and Kotani, Tomoyuki, 4,871,784, Cl. 521-138.000.

Diamantini, Giuseppe: See—

Fedeli, Gianfranco; Diamantini, Giuseppe; Djaczenko, Wiktor; and Strumillo, Maria, 4,871,769, Cl. 514-550.000.

Diaz, Bonifacio, to Zenith Electronics Corporation. High voltage DC to AC converter. 4,872,100, Cl. 363-41.000.

Diaz, Wilfredo S. Body-supported hoop game and device. 4,871,178, Cl. 273-411.000.

Diaz, Zaida: See—

Olson, Donald C.; Miller, John J., deceased; Miller, Wayne R., executor; Blytas, George C.; and Diaz, Zaida, 4,871,520, Cl. 423-221.000.

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Lindner, Christian; Dickore Karlfried; Suling, Carlhans; Korte, Siegfried; and Podszun, Wolfgang, 4,871,850, Cl. 544-256.000.

Diebold Incorporated: See—

Graef, Harry T.; Newton, Kevin H.; Allison, Timothy B.; and Eastman, Jeffrey M., 4,871,085, Cl. 221-4.000.

Diehl, Donald R.: See—

DoMinh, Thap; and Diehl, Donald R., 4,871,844, Cl. 540-575.000.

Diehl GmbH & Co.: See—

Schubart, Rudolf; and Schwarz, Wolfgang, 4,870,884, Cl. 86-20.120.

Diesel Kiki Co., Ltd.: See—

Ishikawa, Masataka; and Takagi, Nobukazu, 4,870,939, Cl. 123-506.000.

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Takahashi, Tadahiyo; Ooi, Shinichi; and Takemasa, Masami, 4,871,011, Cl. 165-16.000.

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Bauerregger, Rolf; Bildl, Erich; and Dietl, Josef, 4,871,117, Cl. 241-23.000.

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LeBisch, Helmut; Basel, Rainer; Fuchs, Georg; Dietmar, Hermann; Wipfelder, Ernst; and Hecke, Wilhelm, 4,871,502, Cl. 264-222.000.

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Zurawski, John H., 4,872,214, Cl. 364-766.000.

Digital Instruments, Inc.: See—

Elings, Virgil B.; and Gurley, John A., 4,871,938, Cl. 310-328.000.

Dimanshteyn, Felix, to Firestop Chemical Corporation. Fire protected foamed polymeric materials. 4,871,477, Cl. 252-609.000.

Dimensions Unlimited, Inc.: See—

Getter, Dennis L., 4,872,102, Cl. 363-141.000.

DiNardo, John T., to Chrysler Motors Corporation. Gas cylinder locking mechanism. 4,871,083, Cl. 220-23.400.

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Director General, Agency of Industrial Science and Technology: See—

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Director of National Food Research Institute Ministry of Agriculture, Forestry and Fisheries: See—

Kobayashi, Shoichi; and Arahira, Masaomi, 4,871,840, Cl. 536-103.000.

Dixen, Carl C.: See—

Thomsen, Flemming; Nissen, Harry S.; Ravn, Kjeld; and Dixen, Carl C., 4,870,892, Cl. 91-361.000.

Dixon, William C.: See—

Ogden, Stanley D.; and Dixon, William C., 4,871,077, Cl. 215-366.000.

- Djaczenco, Wiktor: See—
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Biller, Scott A., 4,871,721, Cl. 514-102.000.

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Traub, Zeno P., 4,870,849, Cl. 72-149.000.
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Rideout, William C.; and Eichen, Elliot, 4,872,180, Cl. 372-99.000.
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Cooper, J. Carl; and Yu, John P., 4,872,070, Cl. 360-15.000.
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Bess, Coleman, 4,871,480, Cl. 252-645.000.
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Netter, Zvi, 4,872,001, Cl. 340-721.000.
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Murphy, Patrick J.; Emeny, William L., Jr.; and Finlay, David A., Sr., 4,872,081, Cl. 361-117.000.
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Dye, Robert H., 4,872,051, Cl. 358-103.000.
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Allen, Robert H., 4,871,524, Cl. 423-349.000.
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Dethlefsen, Uwe, 4,871,545, Cl. 424-470.000.
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Shew, Jerry D.; and Evans, Stuart A., 4,870,891, Cl. 91-291.000.
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Huhndorff, Harry R., 4,871,553, Cl. 429-61.000.
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Gilmore, James R., 4,870,743, Cl. 29-568.000.
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Datta, Sudhin; and Ouhadi, Trazollah, 4,871,523, Cl. 423-265.000.
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McGlathey, Mark S., 4,871,022, Cl. 166-300.000.
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Young, Dewey R.; and Duren, Richard E., 4,872,144, Cl. 367-20.000.
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Hiltehaus, Karl-Heinz, 4,871,829, Cl. 528-48.000.
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Sandrini, Furio M., 4,870,844, Cl. 70-456.00R.
- Fatool, Wade; and Ferraro, Robert J., to Competitive Athletics Technology, Inc. Knee brace. 4,870,956, Cl. 128-80.00C.
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- Felix, Michael C.; Taylor, Nicola S.; and Hardy, Colin C., to Welding Institute, The. Bonding thermoplastic layers via electrical heating. 4,871,412, Cl. 156-273.900.
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- Ferodo Limited: See—
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- Ferring Service Center, N.V.: See—
Vilhardt, Hans, 4,871,542, Cl. 424-423.000.
- Ferry, David K.: See—
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- Fette, Bruce, to Motorola, Inc. ASCII LPC-10 conversion. 4,872,202, Cl. 381-52.000.
- Fibre Dynamics Limited: See—
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- Fichtel & Sachs AG: See—
Link, Achim; and Weidinger, Reinhold, 4,871,050, Cl. 192-70.290.
- Fiedler, Heidi: See—
Loewenstein, Albert; and Fiedler, Heidi, 4,871,592, Cl. 427-389.900.
- Fiege, Helmut; Jautelat, Manfred; and Arlt, Dieter, to Bayer Aktiengesellschaft. Process for the preparation of 2,2-bis-chloro-methylalkane-carboxylic acid chlorides. 4,871,484, Cl. 260-408.000.
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- Fields, Robert A., to Multiple Marketing Systems, Inc. Adjustable paper handler apparatus. 4,871,273, Cl. 400-613.200.
- Fields, William C.: See—
Clark, Steven J.; and Fields, William C., 4,870,789, Cl. 52-126.600.
- Fife, Breck D.: See—
Higby, Edwin A.; Meier, G. Weston; and Fife, Breck D., 4,870,705, Cl. 2-2.000.
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- Finan, Christopher D.: See—
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- Fincher, Jeffrey L.; and Stephens, Michael R., to Ampex Corporation. Apparatus for playback of magnetically recorded data having a variable input rate. 4,872,073, Cl. 360-51.000.
- Finlay, David A., Sr.: See—
Murphy, Patrick J.; Emeny, William L., Jr.; and Finlay, David A., Sr., 4,872,081, Cl. 361-117.000.
- Finlay, Patrick A.: See—
Gray, Nigel; Knibbs, Simon; Finlay, Patrick A.; and Crocker, Robert L., 4,870,970, Cl. 128-660.090.
- Finlay, William, Jr.: See—
Conn, Kirk O.; Finlay, William, Jr.; Sutyn, Carol S.; and Maietta, Michael G., 4,871,354, Cl. 604-89.000.
- Finn Martinsen A/S: See—
Martinsen, Finn, 4,871,145, Cl. 254-199.000.
- Finsterwalder, Thomas. Aerodynamic structural pipe for hang gliders. 4,871,132, Cl. 244-130.000.
- Fiorentini, Giulio: See—
Cavazza, Paolo; and Fiorentini, Giulio, 4,871,773, Cl. 514-626.000.
- Firestop Chemical Corporation: See—
Dimanshteyn, Felix, 4,871,477, Cl. 252-609.000.
- Fisch, Alain: See—
Cyprien, Guy; Fisch, Alain; Haggiage, Johnny; Porte, Hugues; Prazuck, Thierry; and Torres, Ghislaine, 4,871,547, Cl. 424-81.000.
- Fischel, Richard J.; and Shatzel, Albert V., to Haemonetics Corporation. Enhanced separation of blood components. 4,871,462, Cl. 210-651.000.
- Fischer, Donald R.: See—
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- Fischer, Reiner: See—
Sasse, Klaus; Fischer, Reiner; Hagemann, Hermann; Santel, Hans-Joachim; Schmidt, Robert R.; and Lursen, Kalus, 4,871,387, Cl. 71-92.000.
- Fischer, Russ: See—
Morkoc, Hadis; and Fischer, Russ, 4,872,046, Cl. 357-60.000.
- Fisher, David O.: See—
Kalota, Dennis J.; McConaghy, John S., Jr.; Fisher, David O.; and Zielinski, Ronald E., 4,871,109, Cl. 228-180.100.
- Fisher, John R.; Guth, Leslie A.; and Mahler, James A., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Method and apparatus for applying flux to a substrate. 4,871,105, Cl. 228-33.000.
- Fishers of Men Corp.: See—
Schmucker, Wayne A.; and Rupp, Ronald L., 4,870,773, Cl. 43-12.000.
- Fishler, Mark K.; and Hoggard, Dale B., to Vesuvius Crucible Company. Carbon bonded refractory bodies. 4,871,698, Cl. 501-97.000.
- Fisons Corporation: See—
Georgiev, Vassil S.; and Mullen, George B., 4,871,862, Cl. 548-262.000.
- Griffith, Ronald C., 4,871,872, Cl. 564-157.000.
- Fister, Julius C.; Cherukuri, Satyam C.; Mahuliker, Deepak; and O'Donnelly, Brian E., to Olin Corporation. Semiconductor die attach system. 4,872,047, Cl. 357-67.000.
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- Fitch, Lawrence H.: See—
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Fahrig, Robert J.; Fitzharris, William D.; and Aderhold Jr., James L., 4,871,699, Cl. 502-34.000.
- Fitzpatrick, Mark E.; Gouldsberry, Gary R.; Chan, Yat-Sum; and Pang, Richard F., to Gazelle Microcircuits, Inc. Logic circuit resistant to errors due to supply fluctuations. 4,871,931, Cl. 307-491.000.
- Flanagan, Patrick M.: See—
Stojkov, Mark; Flanagan, Patrick M.; Hrdlicka, Victor; Geither, John; and Everett, Dennis, 4,872,190, Cl. 378-75.000.
- Fletcher-Terry Company, The: See—
Kozyski, Vincent T.; and Peters, Alan R., 4,871,156, Cl. 269-303.000.
- Fogerite, Susan G.: See—
Mannino, Raphael J.; and Fogerite, Susan G., 4,871,488, Cl. 264-4.600.
- Foley, John P.; Millas, Gary P.; and Elliott, Daniel L., to United Technologies. Cooling arrangement. 4,871,015, Cl. 165-76.000.
- Follett, David R.; and Levy, Michael P., to American Telephone and Telegraph Company; and AT&T Bell Laboratories. Contention mechanism for communication networks. 4,872,163, Cl. 370-94.100.
- Fonar Corporation: See—
Smith, Stanton D.; Hertz, David; Wolf, Robert B.; and Olsen, Robert H., 4,871,966, Cl. 324-309.000.
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Alexander, Frank B., Jr.; Foo, Pang-Dow; and Schutz, Ronald J., 4,871,420, Cl. 156-643.000.
- Forbes, Melvin D.; and Malone, William F., Jr., to Ultra Light Arms, Inc. Safety mechanism for firearms. 4,870,770, Cl. 42-70.010.
- Ford Aerospace Corporation: See—
Kuo, Ying-Yan, 4,871,012, Cl. 165-41.000.
- Ford Motor Company: See—
McCune, Robert C., Jr.; Toth, Louis; and Bailey, Robert S., 4,871,651, Cl. 430-315.000.
- Ford New Holland, Inc.: See—
Jennings, Richard E.; Potter, Wilburn H.; and Seymour, Shaun A., 4,870,812, Cl. 56-341.000.
- Strosser, Richard P.; and Ashcroft, Dale A., 4,871,044, Cl. 180-273.000.
- Foster Miller, Inc.: See—
Lusignea, Richard W.; and Stevenson, William A., 4,871,595, Cl. 428-1.000.
- Foulkes, Stephen N.: See—
Baker, Ralph; and Foulkes, Stephen N., 4,871,394, Cl. 75-232.000.
- Fournier, Jean-Paul: See—
Roger, Pierre; Choay, Patrick; and Fournier, Jean-Paul, 4,871,843, Cl. 540-575.000.
- Framatome: See—
Sundheimer, Patrick, 4,870,927, Cl. 122-412.000.
- Francesconi, Lynn C.; and Treher, Elizabeth N., to E. R. Squibb & Sons, Inc. Boronic acid adducts of rhenium and radioactive isotopes of rhenium dioxime complexes. 4,871,836, Cl. 534-10.000.
- Franco, Michael J.: See—
Gray, Michael J.; and Franco, Michael J., 4,872,054, Cl. 358-140.000.
- Frankel, Robert D.; and Drumbheller, Jerry, to Hampshire Instruments, Inc. Target structure for x-ray lithography system. 4,872,189, Cl. 378-119.000.
- Franklin, Jeffrey W., to E-Systems, Inc. Fast hopping microwave frequency synthesizer. 4,871,981, Cl. 331-1.00A.
- Fraunhofer-Gesellschaft zur Förderung der angewandten Forschung e.V.: See—
Reiner, Andreas, 4,871,778, Cl. 521-27.000.
- Fraunhofer Gesellschaft zur Förderung: See—
Mayer, Erhard, 4,870,895, Cl. 98-2.000.
- Friedman, Mark I.: See—
DiNovi, Michael J.; Rafka, Robert J.; Friedman, Mark I.; and Tordoff, Michael G., 4,871,776, Cl. 514-738.000.
- Friedrichs, Bernd; and Hankel, Willi, to HEWI Heinrich Wilke GmbH. Lock for doors or the like. 4,871,202, Cl. 292-169.000.
- Friel, Thomas C., Jr.; and O'Lenick, Anthony J., to GAF Corporation. Novel non-depositing defoaming compositions. 4,871,483, Cl. 260-404.500.
- Fritzche, Alfred K.: See—
Kesting, Robert E.; Fritzche, Alfred K.; Murphy, Milton K.; Handermann, Alan C.; Cruise, Clint A.; and Malon, Raymond F., 4,871,494, Cl. 264-41.000.
- Frohberger, Paul-Ernst: See—
Holmwood, Graham; Buchel, Karl H.; Lursen, Klaus; Frohberger, Paul-Ernst; and Brandes, Wilhelm, 4,871,390, Cl. 71-92.000.
- Froix, Michael. Clouding-resistant contact lens compositions. 4,871,785, Cl. 523-106.000.
- Frost, Cynthia M.: See—
Vigo, Tyrone L.; and Frost, Cynthia M., 4,871,615, Cl. 428-398.000.
- Frushour, Robert H. Composite abrasive compact having high thermal stability and transverse rupture strength. 4,871,377, Cl. 51-309.000.
- Frye, Ricky J., to MIM Industries, Inc. Work holder for sewing machines. 4,870,917, Cl. 112-121.120.
- Fuchigami, Yasuhiro, to Nippon Sheet Glass Co., Ltd. Joint assembly. 4,871,277, Cl. 403-166.000.
- Fuchs, Georg: See—
LeBisch, Helmut; Basel, Rainer; Fuchs, Georg; Dietmar, Hermann; Wipfelder, Ernst; and Hecke, Wilhelm, 4,871,502, Cl. 264-222.000.
- Fuchs, Jürgen: See—
Haindl, Hans; and Fuchs, Jürgen, 4,871,356, Cl. 604-247.000.
- Fuji Electric Co., Ltd.: See—
Hattori, Yoshimasa; and Furusho, Noboru, 4,871,636, Cl. 430-77.000.
- Fuji Jukogyo Kabushiki Kaisha: See—
Kamimaru, Shinji, 4,870,822, Cl. 60-600.000.
Mizuno, Shigeo, 4,870,933, Cl. 123-325.000.
- Fuji Photo Film Co., Ltd.: See—
Akao, Mutsuo, 4,871,613, Cl. 428-328.000.
Inoue, Noriyuki; Heki, Tatsuo; and Kojima, Tetsuro, 4,871,653, Cl. 430-409.000.
Kakimi, Fujio, 4,871,641, Cl. 430-138.000.
Kato, Eiichi; Ishii, Kazuo; and Itakura, Ryosuke, 4,871,638, Cl. 430-96.000.
Kato, Takayuki; Hosoi, Yuichi; and Takahashi, Kenji, 4,871,474, Cl. 252-301.40H.
- Kimura, Tsutomu; Hishinuma, Kazuhiro; and Shiraishi, Misashi, 4,871,913, Cl. 250-327.500.
- Kitatani, Katsugi; and Hoshi, Satoshi, 4,871,637, Cl. 430-77.000.
- Matsuoka, Katsumi; Ikeda, Kensuke; and Iwakura, Ken, 4,871,713, Cl. 503-209.000.
- Naruo, Kyoichi; Ohtani, Sumio; Etoh, Masahiro; and Moriya, Ikuro, 4,871,456, Cl. 210-321.840.
- Ohta, Noboru; Takahashi, Koju; and Suzuki, Tsuneo, 4,872,034, Cl. 355-77.000.
- Tamagawa, Shigehisa; and Kuroishi, Masayuki, 4,871,642, Cl. 430-138.000.
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- Tanaka, Mitsutoshi; Arai, Fuminori; Terashima, Kaoru; and Yaginuma, Nakatsugu, 4,871,679, Cl. 436-79.000.
- Tsunekawa, Yuzo; Tsuruta, Hikaru; and Sato, Takehiko, 4,871,441, Cl. 204-409.000.
- Uenishi, Kazuya; Kokubo, Tadayoshi; and Kawabe, Yasumasa, 4,871,645, Cl. 430-192.000.
- Watanabe, Kazuo; Takahashi, Yutaka; and Takimoto, Masaaki, 4,871,271, Cl. 400-124.000.
- Yoshino, Shigeru, 4,871,160, Cl. 271-9.000.
- Fuji Xerox Co., Ltd.: See—
Aoki, Takayoshi; Nagatsuka, Ikutaro; Takeda, Masayuki; Honjo, Toshio; Itoh, Kazuhiro; and Uchida, Kenji, 4,871,639, Cl. 430-108.000.
- Fujieda, Gentaro: See—
Takata, Shigeru; Aono, Takeki; and Fujieda, Gentaro, 4,871,610, Cl. 428-246.000.
- Fujii, Etsuo; Sato, Makoto; and Hirai, Seiichi, to Honda Giken Kogyo Kabushiki Kaisha. Four wheel-drive anti-locking braking. 4,871,043, Cl. 180-248.000.
- Fujii, Ichiro, to Texas Instruments Incorporated. Charge coupled device with reduced surface state at semiconductor-insulator interface. 4,872,043, Cl. 357-24.000.
- Fujii, Susumu; and Ting, Sai-Pei, to General Electric Company. Thermoplastic composition of polyphenylene ether, ethylene-methacrylic acid copolymer, and styrene-glycidyl methacrylate copolymer. 4,871,800, Cl. 525-68.000.
- Fujii, Yasutetsu: See—
Ohtsuka, Akinori; Kurita, Hitoshi; and Fujii, Yasutetsu, 4,872,008, Cl. 341-26.000.
- Fujiki, Norio: See—
Hayashi, Takatoshi; Fujiki, Norio; Tanaka, Yoichi; Nishimoto, Takashi; and Kobayashi, Masakazu, 4,871,993, Cl. 340-439.000.
- Fujikiko Kabushiki Kaisha: See—
Ikegaya, Iso, 4,871,137, Cl. 248-396.000.
- Fujimoto, Masami; Inazumi, Tadahi; Sato, Katsuhiko; Shimozawa, Eiichi; Awa, Yasuhiko; Sato, Fumihiko; Nozaki, Kenro; Gushima, Akira; Suemura, Yosinobu; Kusakabe, Nobuo; Imada, Kunihiko; Arichi, Masatoshi; Tanaka, Mitsunori; Umez, Yoshinori; and Ikeda, Tsuneo, to Nippon Steel Corporation. Apparatus and method for feeding sintering raw mix. 4,871,393, Cl. 75-5.000.
- Fujimura, Hidetaka: See—
Nagata, Yasuhiro; and Fujimura, Hidetaka, 4,871,440, Cl. 204-403.000.
- Fujino, Toshihiro: See—
Nishijima, Tamotsu; and Fujino, Toshihiro, 4,870,851, Cl. 72-261.000.
- Fujisaki, Yoshinori; and Ida, Kazuo, to Yoshida Kogyo K. K. Separable slide fastener. 4,870,724, Cl. 24-433.000.
- Fujisawa Pharmaceutical Co., Ltd.: See—
Takaya, Takao; Tozuka, Zenzaburo; Yasuda, Nobuyoshi; and Kawabata, Kohji, 4,871,730, Cl. 514-206.000.
Takaya, Takao; Masugi, Takashi; Takasugi, Hisashi; and Kochi, Hiromu, 4,871,860, Cl. 548-195.000.
Ueda, Yoshio; Hata, Takehisa; Yamaguchi, Hisami; Ueda, Satoshi; and Kodani, Masateru, 4,871,549, Cl. 424-494.000.
- Fujita, Tadao, to Sony Corporation. Error detection circuit. 4,872,170, Cl. 371-30.000.
- Fujita, Tatsuo: See—
Harada, Terumaru; Inoda, Kenichi; Fujita, Tatsuo; and Adachi, Kinichi, 4,870,821, Cl. 60-520.000.
- Fujitsu Limited: See—
Kawami, Shigeru; Tabu, Takashi; Sano, Shigeo; and Masuda, Nobuyuki, 4,872,199, Cl. 379-413.000.
Kodaka, Kazuyuki; Kitamura, Mitsuo; and Motegi, Mitsuhiro, 4,871,121, Cl. 242-54.00R.

Fujiwara, Akihiro: See—
Ueda, Kouichi; Fujiwara, Akihiro; Suda, Hirofumi; Toyama, Masamichi; and Yamada, Kunihiko, 4,871,906, Cl. 250-201.000.
Fujiwara Chemical Co., Ltd.: See—
Takata, Shigeru; Aono, Takeki; and Fujieda, Gentaro, 4,871,610, Cl. 428-246.000.
Fujiwara, Hiroshi: See—
Ishikawa, Tomonori; Fukaya, Takashi; Tsunoda, Toshiyuki; and Fujiwara, Hiroshi, 4,871,245, Cl. 350-502.000.
Fujiwara, Mitsugu: See—
Daido, Toshihiko; Fujiwara, Mitsugu; and Nishimura, Shigeo, 4,871,039, Cl. 180-79.100.
Fujiwara, Takayoshi: See—
Iida, Toshikatsu; and Fujiwara, Takayoshi, 4,871,304, Cl. 418-220.000.
Fujiwara, Mitsuo; Uchida, Takashi; and Kimura, Toshihiko, to Konica Corporation. Light-sensitive silver halide color photographic material containing multi-functional dye, 4,871,655, Cl. 430-519.000.
Fukasawa, Hideyuki; Kobayashi, Mamoru; and Wanami, Masahiro, to Hitachi, Ltd. Method and apparatus for aligning solder balls, 4,871,110, Cl. 228-245.000.
Fukaya, Takashi: See—
Ishikawa, Tomonori; Fukaya, Takashi; Tsunoda, Toshiyuki; and Fujiwara, Hiroshi, 4,871,245, Cl. 350-502.000.
Fukuda, Hisashi, to Oki Electric Industry Co., Ltd. Method and device for cleaning substrates, 4,871,416, Cl. 350-635.000.
Fukui, Kunihiko: See—
Kawashima, Hisakazu; Morita, Yoshiyasu; Nishihara, Minoru, Arai, Tetsuzo; and Fukui, Kunihiko, 4,871,194, Cl. 285-55.000.
Fukuoka, Youichi: See—
Ueno, Toru; Fukuoka, Youichi; Baba, Seichi; Miyoshi, Kaoru; and Kinoshita, Kazuto, 4,871,910, Cl. 250-560.000.
Fukushima, Akira: See—
Masumoto, Hisayuki; and Fukushima, Akira, 4,871,239, Cl. 350-427.000.
Fulkerson, Bennie C.: See—
Smith, Michael A., 4,872,151, Cl. 369-14.000.
Fuller, H. B.: See—
Zimmet, John M.; Klinkenberg, Pamela M.; Bunnelle, William L.; and Knutson, Keith C., 4,871,803, Cl. 525-89.000.
Fulmer Limited: See—
Gray, Nigel; Knibbs, Simon; Finlay, Patrick A.; and Crocker, Robert L., 4,870,970, Cl. 128-660.090.
Funahashi, Yoshiki, to Takai Rubber Industries, Ltd. Fluid-filled resilient bushing structure with radial vanes, 4,871,152, Cl. 267-140.100.
Funahashi, Yoshiko; Kamino, Yoshikazu; Matsumura, Yasuharu; and Harimaya, Senichi, to Kawasaki Steel Corporation. Test medium and method for detecting phosphorus segregates in metallic material, 4,871,513, Cl. 422-56.000.
Furman, William N.: See—
McRae, Daniel D.; and Furman, William N., 4,872,182, Cl. 375-1.000.
Furukawa Electric Co., Ltd., The: See—
Hattori, Kenichi; and Imamatsu, Kazuya, 4,871,198, Cl. 285-373.000.
Furumura, Kyozauro; Muraoka, Tomoki; Murakami, Yasuo; and Abe, Tsutomu, to Nippon Seiko Kabushiki Kaisha. Rolling bearing, 4,871,266, Cl. 384-492.000.
Furusho, Noboru: See—
Hattori, Yoshimasa; and Furusho, Noboru, 4,871,636, Cl. 430-77.000.
Fuseya, Yoshihiko: See—
Tackikawa, Toru; and Fuseya, Yoshihiko, 4,871,558, Cl. 426-99.000.
Fushiya, Fusao, to Makita Electric Works, Ltd. Portable circular saw, 4,870,758, Cl. 30-388.000.
G. B. Industries, Inc.: See—
Boll, Gregory G.; and Boll, Harry J., 4,871,964, Cl. 324-158.00F.
Gadebusch, Hans H.; and Valiant, Mary E., to Merck & Co., Inc. Method of controlling mycotic infections and compositions therefor, 4,871,741, Cl. 514-255.000.
Gadow, Andre, to Henning Berlin GmbH. Luminescence immuno-test kits, method for stabilizing same and quality control thereof, 4,871,660, Cl. 435-7.000.
GAF Corporation: See—
Friel, Thomas C., Jr.; and O'Lenick, Anthony J., 4,871,483, Cl. 260-404.500.
Helioff, Michael W.; Bires, Carmen D.; and Login, Robert B., 4,871,535, Cl. 424-71.000.
Gaku, Morio; and Kinbara, Hidenori, to Mitsubishi Gas Chemical Company, Inc. Hot melt adhesive composition, 4,871,811, Cl. 525-148.000.
Galbraith, Douglas C., to Actel Corporation. High-speed static differential sense amplifier, 4,871,933, Cl. 307-530.000.
Galbraith, Douglas C., to Actel Corporation. High-speed static differential sense amplifier, 4,871,978, Cl. 330-253.000.
Gali, Carl E. Solar trickle charger for lead acid batteries, 4,871,959, Cl. 320-61.000.
Galigani, Tiziano, to Cima Impianti S.p.A. Machine for vulcanizing tires, with devices for collecting and unloading the tire being treated, 4,871,305, Cl. 425-35.000.
Gall, Russell A.; Clements, Don A.; and Kent, Michael J., to Alcon Laboratories, Inc. Means and method for dispensing substances, 4,871,094, Cl. 222-386.000.

Gallaher Limited: See—
Browning, Shane C.; Carlisle, Robert; and Wright, Alexander H., 4,870,979, Cl. 131-196.000.
Garcia, Dana: See—
Percec, Virgil; Nicholas, Paul P.; and Garcia, Dana, 4,871,816, Cl. 525-393.000.
Garcia, Felix, Jr., to Texas Instruments Incorporated. Three dimensional color display and system, 4,871,231, Cl. 350-144.000.
Gareis, Ronald E.: See—
Cieri, Joseph J.; Kocher, Mark J.; Gareis, Ronald E.; Holet, Kenneth M.; and Tuso, Michael J., 4,872,136, Cl. 364-900.000.
Gastgeb, Raymond F.; and Tom, Edward, to Pennwalt Corporation. Vibration sensing apparatus, 4,870,868, Cl. 73-649.000.
Gaudette, Roger R.: See—
Bragdon, Robert W.; and Gaudette, Roger R., 4,871,552, Cl. 426-2.000.
Gauger, Gary L. Tuning device for rimless drums, 4,870,883, Cl. 84-413.000.
Gault, Dominique: See—
Andrieu, Jean P.; Gault, Dominique; and Henri, Jean C., 4,872,013, Cl. 342-135.000.
Gavaletz, Eugene J.: See—
Usher, Peter F.; Gavaletz, Eugene J.; and Slonksnes, John, 4,871,181, Cl. 277-229.000.
Gay, Gerard, J. Device to control the presence of information of images in video signals, 4,872,053, Cl. 358-108.000.
Gazelle Microcircuits, Inc.: See—
Fitzpatrick, Mark E.; Gouldsberry, Gary R.; Chan, Yat-Sum; and Pang, Richard F., 4,871,931, Cl. 307-491.000.
Graham, Andrew C.; and MacMillan, David C., 4,872,140, Cl. 365-96.000.
Gazzarrini, Vinicio, to SOLIS S.R.L. Device for holding textile articles, 4,871,206, Cl. 294-99.100.
Ge Fanuc Automation North America, Inc.: See—
Cieri, Joseph J.; Kocher, Mark J.; Gareis, Ronald E.; Holet, Kenneth M.; and Tuso, Michael J., 4,872,136, Cl. 364-900.000.
Geary, Joseph M.: See—
Peterson, Phillip R.; and Geary, Joseph M., 4,872,135, Cl. 364-822.000.
Geelhaar, Thomas: See—
Krause, Joachim; Reiffenrath, Volker; and Geelhaar, Thomas, 4,871,472, Cl. 252-299.650.
Reiffenrath, Volker; Krause, Joachim; Geelhaar, Thomas; Eiden-schink, Rudolf; Kurmeier, Hans-Adolf; Poetsch, Eike; Scheuble, Bernhard; and Weber, Georg, 4,871,469, Cl. 252-299.610.
Geilhaupt, Manfred: See—
Bievert, Klaus; Bruder, Wolfgang; Geilhaupt, Manfred; Kupper, Gerd; and Zabinski, Siegfried, 4,871,155, Cl. 269-289.00R.
Geis, Mark W.: See—
Hehn, Bruce A.; Weisburn, James T.; Lewellen, Richard R.; and Geis, Mark W., 4,871,064, Cl. 206-387.000.
Geither, John: See—
Stojkov, Mark; Flanagan, Patrick M.; Hrdlicka, Victor; Geither, John; and Everett, Dennis, 4,872,190, Cl. 378-75.000.
Gelly, Jean F.: See—
Maerfeld, Charles; and Gelly, Jean F., 4,870,972, Cl. 128-662.030.
Gemma, Nobuhiro; Miura, Akira; Mizushima, Koichi; Azuma, Makoto; and Mori, Yasushi, to Kabushiki Kaisha Toshiba. Organic thin film display element, 4,871,236, Cl. 350-355.000.
General Director of the Agency of Industrial Science and Technology, The: See—
Karakane, Hiroki; Maeda, Yasushi; and Tsuyumoto, Michio, 4,871,461, Cl. 210-638.000.
General Dynamics, Electronics Division: See—
Lux, Paul A.; and Mathis, Ronald F., 4,871,907, Cl. 250-227.000.
General Dynamics Land Systems, Inc.: See—
Cory, Robert M., 4,871,216, Cl. 305-58.00R.
General Electric Company: See—
Carrell, Ross M., 4,871,903, Cl. 235-375.000.
Fuji, Susumu; and Ting, Sai-Pei, 4,871,800, Cl. 525-68.000.
Hammer, Jacob M., 4,872,176, Cl. 372-50.000.
Johansson, Eric B., 4,871,509, Cl. 376-412.000.
Kim, Manjin J.; Brown, Dale M.; Cohen, Simon S.; Gorowitz, Bernard; and Saia, Richard J., 4,871,617, Cl. 428-450.000.
Modic, Frank J.; and Striker, Richard A., 4,871,782, Cl. 521-88.000.
Nowogrodzki, Markus, 4,872,014, Cl. 342-351.000.
Plus, Dora; and Ipr, Alfred C., 4,872,141, Cl. 365-154.000.
Premerlani, William J.; Musser, David R.; and Narendran, Paliath, 4,872,126, Cl. 364-578.000.
Rock, John A., 4,871,817, Cl. 525-425.000.
Roemer, Peter B.; and Edelstein, William A., 4,871,969, Cl. 324-318.000.
Stabile, Paul J.; Rosen, Arye; and Sterzer, Fred, 4,871,920, Cl. 250-551.000.
Stabile, Paul J., 4,872,039, Cl. 357-13.000.
Stewart, Roger G.; and Plus, Dora, 4,872,002, Cl. 340-811.000.
Witting, Harald L., 4,871,946, Cl. 315-248.000.
General Foods Corp.: See—
Barnett, Ronald E.; and Yarger, Ronald G., 4,871,570, Cl. 426-535.000.
Katcher, Jay H.; Mabon, John T.; Matherly, Jennifer W.; McCarty, Lawrence T.; and Schara, Robert E., 4,871,398, Cl. 127-71.000.
Stoeckli, Oscar W.; and Berry, David J., 4,871,564, Cl. 426-388.000.
General Housewares Corporation: See—
Samford, Dean A., 4,871,892, Cl. 219-10.55E.

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Conn, Francis E., 4,870,817, Cl. 60-39.141.
Sadegh, Ali M., 4,871,339, Cl. 445-7.000.
Zuraski, Jeffery A.; Pawlak, Andrzej M.; Graber, David W.; and Babineau, James W., 4,871,040, Cl. 180-142.000.
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Pagen, Charles A.; Stepien, George, Jr.; and Morris, Paul A., 4,871,605, Cl. 428-141.000.
Gentner Electronics Corporation: See—
Leonard, John E., 4,872,195, Cl. 379-40.000.
Georgiev, Vassil S.; and Mullen, George B., to Fisons Corporation. α -Substituted ketonitrone derivatives, 4,871,862, Cl. 548-262.000.
Gerber, Ulrich G.; and Rugar, Daniel, to International Business Machines Corporation. Method and apparatus for encoding and direct overwriting of magneto-optic data, 4,872,078, Cl. 360-114.000.
Gerhart, Paul B.; and Kumeda, Yasuo, to Honeywell Inc. Apparatus and method for identification of message initiation in a process control network, 4,872,186, Cl. 375-117.000.
Gerin, Umberto: See—
Marchiori, Mirko; Lant, Danny; Lancerotto, Fabio; and Gerin, Umberto, 4,870,815, Cl. 57-299.000.
Gerlach, Wolfgang; and Malczok, Reimund, to Uhde GmbH. Bolt-operated clamping device, 4,871,278, Cl. 403-338.000.
Germanaz, Patrick: See—
Bachelard, Roland; and Germanaz, Patrick, 4,871,479, Cl. 252-636.000.
Getter, Dennis L., to Dimensions Unlimited, Inc. D.C. to A.C. inverter having improved structure providing improved thermal dissipation, 4,872,102, Cl. 363-141.000.
Giammarco, Nicholas J.; Gimpelson, Alexander; Kaplita, George A.; Lopata, Alexander D.; Scaduto, Anthony F.; and Shepard, Joseph F., to International Business Machines Corporation. Mask using lithographic image size reduction, 4,871,630, Cl. 430-14.000.
Gibbs & Hill, Inc.: See—
Nakhmanin, Michael, 4,870,816, Cl. 60-39.020.
Gibson, Walter T., to Lever Brothers Company. Skin treatment composition, 4,871,839, Cl. 536-55.100.
Giles, Randy K.: See—
Lucas, Gordon H.; and Giles, Randy K., 4,871,003, Cl. 144-369.000.
Gillard, John; Rokach, Joshua; and Belanger, Patrice C., to Merck Frost Canada, Inc. Leukotriene antagonists, 4,871,756, Cl. 514-381.000.
Gilmore, James R., to Extrude Hone Corporation. Quick change tool assembly for ultrasonic machine tool, 4,870,743, Cl. 29-568.000.
Gimpelson, Alexander: See—
Giammarco, Nicholas J.; Gimpelson, Alexander; Kaplita, George A.; Lopata, Alexander D.; Scaduto, Anthony F.; and Shepard, Joseph F., 4,871,630, Cl. 430-14.000.
Gingello, Anthony D.: See—
Parton, Richard L.; Gingello, Anthony D.; Collett, David J.; Stegman, David A.; and Adin, Anthony, 4,871,656, Cl. 430-522.000.
Giovanniello, Rocco; and Howe, Stephen M., to Westwood Chemical Corporation. Antiperspirant composition and method of preparation, 4,871,525, Cl. 423-463.000.
Givens, Guy M.: See—
Hicks, T. Lawrence; Givens, Guy M.; Brinton, Robert J.; and Grundhauser, Donald J., 4,872,056, Cl. 358-183.000.
GKN Hayward Baker, Inc.: See—
Wright, Paul J., 4,871,283, Cl. 405-263.000.
Glaser, Linda C.: See—
Brazdil, James F., Jr.; Glaser, Linda C.; and Toft, Mark A., 4,871,706, Cl. 502-209.000.
Glang, Reinhard; and Ku, San-Mei, to International Business Machines Corporation. Self-aligned polysilicon emitter and contact structure for high performance bipolar transistors, 4,871,684, Cl. 437-31.000.
Glaser, Richard L.: See—
Altherr, Russell G.; Glaser, Richard L.; Madura, Francis E.; and Radwill, Robert P., 4,871,182, Cl. 280-434.000.
Glass, George E.: See—
Duncan, William M.; Glass, George E.; Johnson, Jeffrey L.; McMillan, Edward A.; Maney, Frank S.; McConnell, James R., Jr.; Roberts, Kenneth P.; and Sanders, Timothy R., 4,870,863, Cl. 73-431.000.
Glauser, Paul: See—
Kempter, Meinrad; and Glauser, Paul, 4,871,896, Cl. 219-121.600.
Gleason, John G.; Hoffstein, Sylvia T.; Kinzig, Charles M.; Mong, Seymour; and Sarau, Henry M., to SmithKline Beckman Corporation. Leukotriene antagonists, 4,871,771, Cl. 514-570.000.
Gligora, Mario: See—
Ilg, Laszlo; and Gligora, Mario, 4,871,752, Cl. 514-355.000.
Glinka, Jerome: See—
Dolfini, Joseph E.; and Glinka, Jerome, 4,871,881, Cl. 568-491.000.
Glowacki, Pierre A.: See—
Daguette, Alain P. M.; Glowacki, Pierre A.; and Lassignardie, Herve, 4,870,826, Cl. 60-751.000.
Gobets, Roy A.; and Tengler, John N., to Minnesota Mining & Manufacturing Company. Tapered strain relief electrical interconnection system, 4,871,318, Cl. 439-76.000.
Goble, E. Marlowe; and Somers, W. Karl. Ligament anchor system, 4,870,957, Cl. 128-92.00F.
Goettsche, Reimer; and Marx, Hans-Norbert, to Dr. Wolman GmbH. Wood preservative, 4,871,473, Cl. 252-400.520.
Gold, Steven K. Externally-based inversionary tube, 4,871,358, Cl. 604-271.000.

Goldberg, Eugene P.: See—
Longo, William E.; McCluskey, Richard A.; and Goldberg, Eugene P., 4,871,716, Cl. 514-2.000.
Gomes, Gilbert S.: See—
Dreisbach, David D.; and Gomes, Gilbert S., 4,871,424, Cl. 162-168.100.
Gonchar, Valery I.: See—
Nurmamedov, Narzy N.; Gonchar, Valery I.; Bazarov, Babamurad A.; Nurmukhamedov, Arslan; Skrynikova, Irina V.; Mustaev, Ilyas A.; and Varshavsky, Valery L., 4,871,362, Cl. 623-6.000.
Goodrich, James A.; and Medlar, Steven J., to Camp Dresser & McKee, Inc., a part interest. Water/wastewater treatment apparatus, 4,871,450, Cl. 210-151.000.
Goodyear Tire & Rubber Company, The: See—
Brown, Robert J.; and Scriver, Richard M., 4,871,004, Cl. 152-209.00R.
Gorbachev, Alexandr S.: See—
Dobryakov, Valentin I.; Zhevzhik, Galina V.; Seballo, Valery A.; Zhukov, Evgeny V.; Ententeev, Altar Z.; Struzhkov, Vyacheslav N.; and Gorbachev, Alexandr S., 4,871,448, Cl. 209-167.000.
Gordon, Herbert L., Jr., to InterCon Systems, Inc. Pin carrier, 4,871,062, Cl. 206-328.000.
Gordy, Donald G. Lawn mower assembly, 4,870,810, Cl. 56-6.000.
Gorecki, Marian: See—
Aviv, Haim; Gorecki, Marian; Levanon, Avigdor; Oppenheim, Amos; Vogel, Tikva; Zeelon, Pinhas E.; and Zeevi, Menachem, 4,871,835, Cl. 530-399.000.
Gorgenyi, Frigyes: See—
Sebestyen, Gyula; Simonyi, Istvan; Miholics, Gizelle; Kovacs, Marta; Gorgenyi, Frigyes; Fekete, Marton; Vago, Pal; Seres, Istvan; Egri, Janos; and Szeli, Maria, 4,871,728, Cl. 514-187.000.
Gorler, Klaus: See—
Madaus, Rolf; Gorler, Klaus; and Soicke, Hartwig, 4,871,763, Cl. 514-45.200.
Gorno-Altaysky Gosudarstvennyy Pedagogichesky Institut: See—
Lebedev, Jury A., 4,871,212, Cl. 299-21.000.
Gorowitz, Bernard: See—
Kim, Manjin J.; Brown, Dale M.; Cohen, Simon S.; Gorowitz, Bernard; and Saia, Richard J., 4,871,617, Cl. 428-450.000.
Gorza, Roberto: See—
Pozzobon, Alessandro; and Gorza, Roberto, 4,870,723, Cl. 24-68.0SK.
Gospos, Georg: See—
Muschelknautz, Edgar; Becker, Ernst; Bartsch, Adalbert; Kersten, Lars; Gospos, Georg; and Berndt, Gerhard, 4,871,147, Cl. 266-182.000.
Gosudarstvennyy Proektno-Konstruktorsky I Eksperimentalnyy Institut Po Obogatitelnomu Oborudovaniyu: See—
Dobryakov, Valentin I.; Zhevzhik, Galina V.; Seballo, Valery A.; Zhukov, Evgeny V.; Ententeev, Altar Z.; Struzhkov, Vyacheslav N.; and Gorbachev, Alexandr S., 4,871,448, Cl. 209-169.000.
Goto, Hiroshi: See—
Okina, Toyohiko; Goto, Hiroshi; Kousaka, Fumio; Teranishi, Akinori; Kawabata, Satoshi; Ohya, Tetsuo; Ohya, Makoto; and Kozaki, Norio, 4,871,612, Cl. 428-269.000.
Goto, Sumio, to Showa Denko Kabushiki Kaisha. Process and apparatus for extrusion of thermoplastic resin films, 4,871,493, Cl. 264-40.600.
Gouldsberry, Gary R.: See—
Fitzpatrick, Mark E.; Gouldsberry, Gary R.; Chan, Yat-Sum; and Pang, Richard F., 4,871,931, Cl. 307-491.000.
Goyal, Raj K.: See—
Schulman, Jerome M.; and Goyal, Raj K., 4,871,758, Cl. 514-397.000.
Graber, David W.: See—
Zuraski, Jeffery A.; Pawlak, Andrzej M.; Graber, David W.; and Babineau, James W., 4,871,040, Cl. 180-142.000.
Grabmaier, Josef: See—
Falckenberg, Richard; Hoyler, Gerhard; and Grabmaier, Josef, 4,871,517, Cl. 422-248.000.
Graef, Harry T.; Newton, Kevin H.; Allison, Timothy B.; and Eastman, Jeffrey M., to Diebold Incorporated. Apparatus for identifying and indicating the content of document canisters, 4,871,085, Cl. 221-4.000.
Graf, Roderich W. Method and an apparatus for drying bulk material, preferably of plastic granules, 4,870,760, Cl. 34-32.000.
Graham, Andrew C.; and MacMillan, David C., to Gazelle Microcircuits, Inc. Laser programmable memory array, 4,872,140, Cl. 365-96.000.
Grams, Charles E. Water-ski locator device, 4,871,335, Cl. 441-68.000.
Grange, John A.: See—
Hohenwarter, Gert K. G.; and Grange, John A., 4,870,830, Cl. 62-50.700.
Granville, Andre: See—
Lecourt, Jean; Legros, Desire; and Granville, Andre, 4,871,385, Cl. 65-115.000.
Gras, Jean-Jacques: See—
Hammer, Ole; and Gras, Jean-Jacques, 4,872,204, Cl. 455-54.000.
Grass, Alfred, to Alfred Grass Ges.m.b.H. Metallwarenfabrik. Covering element for furniture hinges, 4,870,716, Cl. 16-251.000.
Grasser, Katalin: See—
Batori, Sandor; Hajos, Gyorgy; Messmer, Andras; Benko, Pal; Pallós, Laszlo; Petocz, Lujza; Grasser, Katalin; Kosoczky, Ibolya; and Szirt nee Kiszelly, Eniko, 4,871,846, Cl. 544-183.000.
Gravesteijn, Dirk J.: See—
Steenbergen, Christiaan; and Gravesteijn, Dirk J., 4,872,156, Cl. 369-275.000.

Gray, Michael J.; and Franco, Michael J., to Adaptive Video, Inc. Video interface for capturing an incoming video signal and reformatting the video signal. 4,872,054, Cl. 358-140.000.

Gray, Nigel; Knibbs, Simon; Finlay, Patrick A.; and Crocker, Robert L., to Fulmer Limited. Ultrasonic investigation apparatus. 4,870,970, Cl. 128-660.000.

Graycar, Joseph M., to Litton Systems, Inc. Electronically tuned dielectric resonator stabilized oscillator. 4,871,983, Cl. 331-96.000.

Graziadei, Rinaldo; and Rossi, Giorgio, to SGS-Thomson Microelectronics s.r.l. Mixer dynamic control. 4,872,206, Cl. 455-241.000.

Greene, Benjamin I.; Tai, Kuochou; and Thakur, Mrinal, to American Telephone and Telegraph Company, AT&T Bell Laboratories. Optical system including etalon for optically processing electromagnetic radiation at a repetition rate greater than about 1.25×10^4 Hz. 4,871,235, Cl. 350-354.000.

Greschner, Johann: See—

Wittlinger, Jürgen; Greschner, Johann; Bayer, Thomas; and Bartha, Johann W., 4,871,418, Cl. 156-643.000.

Griffin, David A.: See—

Elliott, Raymond; Sunley, Raymond; and Griffin, David A., 4,871,389, Cl. 71-92.000.

Griffin, Raymond T.: See—

Slovak, Michael J.; Griffin, Raymond T.; and Carson, Steven R., 4,871,893, Cl. 200-16.000.

Griffith, Edwin D., to Nekosa Packaging Corporation. Process for on-line lamination of plastic. 4,871,406, Cl. 156-82.000.

Griffith, Ronald C., to Fisons Corporation. 2-[(2-aminoacetyl)amino]acetamide derivatives. 4,871,872, Cl. 564-157.000.

Grimley, S. Allen; Robinson, James C.; and Schroeder, Mark A., to Hoechst Celanese Corporation. Enhanced dithionite bleaching. 4,871,423, Cl. 162-72.000.

Grinberg, Jan; Marom, Emanuel; Soffer, Bernard H.; O'Meara, Thomas R.; and Pops, Adrian E., to Hughes Aircraft Company. Method and apparatus for ultra high frequency spectrum analysis. 4,871,232, Cl. 350-162.110.

Grinberg, Mark: See—

Stollar, Hyman; Kharim, Khaim; Grinberg, Mark; and Ellmann, Eva, 4,871,882, Cl. 568-639.000.

Grindon, John R., to LBP Partnership. Means for projecting patterns of light. 4,871,256, Cl. 356-376.000.

Groe, David E.: See—

Bahnick, Karl R.; and Groe, David E., 4,872,004, Cl. 340-825.500.

Groen, Marinus B.; and de Jongh, Hendrik P., to Akzo N.v. Novel 11-aryloestrane and 11-arylpregnane derivatives. 4,871,724, Cl. 514-173.000.

Grollier, Jean F.; Dubief, Claude; and Cauwet, Daniele, to L'Oreal. Aqueous delayed-foaming cosmetic composition for hair and skin treatment. 4,871,530, Cl. 424-47.000.

Gross, David M., to Synchro-Start Products, Inc. Solenoid with manual actuation mechanism. 4,871,989, Cl. 335-164.000.

Grosselin, Daniel; and Coutin, Pierre F., to R. Alkan & Cie. Device for carrying and releasing a load such as a missile. 4,870,885, Cl. 89-1.819.

Grumman Aerospace Corporation: See—

Kress, Robert W., 4,872,016, Cl. 342-380.000.

Grundhauser, Donald J.: See—

Hicks, T. Lawrence; Givens, Guy M.; Brinton, Robert J.; and Grundhauser, Donald J., 4,872,056, Cl. 358-183.000.

GTE Laboratories Incorporated: See—

Rideout, William C.; and Eichen, Elliot, 4,872,180, Cl. 372-99.000.

GTE Valenite Corporation: See—

Hunt, Carl E., 4,871,286, Cl. 408-144.000.

Gu, Alston L., to Allied-Signal Inc. Foil thrust bearing. 4,871,267, Cl. 384-105.000.

Guenther, Jacob. Apparatus for suspending or securing objects. 4,870,718, Cl. 17-44.100.

Guimont, Patricia A. Cushioned container. 4,871,069, Cl. 206-545.000.

Guiol, Eric, to W. L. Gore & Associates, Inc. Electro-magnetic shielding. 4,871,883, Cl. 174-36.000.

Gulczynski, Zdzislaw. High efficiency power amplifier comprising multilevel power supply. 4,871,980, Cl. 330-295.000.

Gull Inc.: See—

Orloff, Eugene F.; Horowitz, Martin; and Rittner, Charles H., 4,872,120, Cl. 364-509.000.

Gunderson, Harald, to Alfson & Gunderson A/S. Fixation device. 4,871,425, Cl. 162-290.000.

Gunesin, Binnur Z.; Pindris, Paul A.; and Schwab, Frederick C., to Mobil Oil Corporation. High impact, highly transparent linear styrene-diene block copolymers with five or more blocks and their preparations by anionic dispersion polymerization. 4,871,814, Cl. 525-314.000.

Gupta, Omkarnath R.: See—

Herrell, Dennis J.; and Gupta, Omkarnath R., 4,871,316, Cl. 439-66.000.

Gupton, B. Franklin; Rea, James H.; and Mueller, Werner H., to Hoechst Celanese Corporation. Process for preparing pyridine carboxylic acid esters. 4,871,859, Cl. 546-250.000.

Gurley, John A.: See—

Elings, Virgil B.; and Gurley, John A., 4,871,938, Cl. 310-328.000.

Gurnee, Mark N., to Honeywell Inc. Detector array assembly having bonding means joining first and second surfaces except where detectors are disposed. 4,871,921, Cl. 250-578.000.

Gushima, Akira: See—

Fujimoto, Masami; Inazumi, Tadahiho; Satoh, Katsuhiko; Shimozawa, Eiichi; Awa, Yasuhiko; Sato, Fumihiro; Nozaki, Kenro; Gushima, Akira; Suemura, Yosinobu; Kusakabe, Nobuo;

Imada, Kunihiro; Arichi, Masatoshi; Tanaka, Mitsunori; Umezu, Yoshinori; and Ikeda, Tsuneo, 4,871,393, Cl. 75-5.000.

Guss, Patricia, executrix: See—

Chuman, Tatsuji; Guss, Paul L., deceased; Doolittle, Robert E.; McLaughlin, John R.; and Tumlinson, James H., III, 4,871,537, Cl. 424-84.000.

Guss, Paul L., deceased: See—

Chuman, Tatsuji; Guss, Paul L., deceased; Doolittle, Robert E.; McLaughlin, John R.; and Tumlinson, James H., III, 4,871,537, Cl. 424-84.000.

Guth, Leslie A.: See—

Fisher, John R.; Guth, Leslie A.; and Mahler, James A., 4,871,105, Cl. 228-33.000.

Guttinger, Peter: See—

Langen, Marinus J. M.; and Guttinger, Peter, 4,871,070, Cl. 206-591.000.

H. J. Langen & Sons Limited: See—

Langen, Marinus J. M.; and Guttinger, Peter, 4,871,070, Cl. 206-591.000.

H.P. Incorporated: See—

Ridgway, Paul A.; and Butterfield, William P., 4,871,327, Cl. 439-543.000.

Habermann, Joachim: See—

Braun, Walter; and Habermann, Joachim, 4,872,185, Cl. 375-106.000.

Hacker, Miles P.: See—

Farrell, Nicholas; Hacker, Miles P.; McCormack, John J.; and DeAlmeida, Sergio G., 4,871,729, Cl. 514-188.000.

Hackler, Lewis R., to Allied-Signal Inc. Binder powder carpet fiber. 4,871,604, Cl. 428-96.000.

Haemonetics Corporation: See—

Fischel, Richard J.; and Shatzel, Albert V., 4,871,462, Cl. 210-651.000.

Hagans, Patrick L.: See—

Smentkowski, Vincent S.; Hagans, Patrick L.; and Yates, John T., Jr., 4,871,526, Cl. 423-659.000.

Hagemann, Hans-Jürgen E.: See—

Bachmann, Peter K.; Hagemann, Hans-Jürgen E.; Warnier, Jacques P. M.; and Wilson, Howard J. C., 4,871,383, Cl. 65-3.120.

Hagemann, Hermann: See—

Sasse, Klaus; Fischer, Reiner; Hagemann, Hermann; Santel, Hans-Joachim; Schmidt, Robert R.; and Lurssen, Kalus, 4,871,387, Cl. 71-92.000.

Hagemeyer, Bruce A., to Rolscreen Company. Panel joint. 4,870,797, Cl. 52-455.000.

Haggiage, Johnny: See—

Cyprien, Guy; Fisch, Alain; Haggiage, Johnny; Porte, Hugues; Prazuck, Thierry; and Torres, Ghislaine, 4,871,547, Cl. 424-81.000.

Haglund, Artur L.: See—

Eksell, Erik L.; and Haglund, Artur L., 4,870,726, Cl. 24-636.000.

Hagne, Leif. Improvements in a method of and a retraction cord for uncovering and draining the preparation limit line of teeth. 4,871,311, Cl. 433-136.000.

Hahn, Alfred; and Raup, Jens-Peter, to Siemens Aktiengesellschaft. X-ray examination installation for optional transillumination or exposure of an examination subject. 4,872,192, Cl. 378-181.000.

Hailey, Laurence N.: See—

Boecker, Wolfgang D. G.; and Hailey, Laurence N., 4,871,108, Cl. 228-122.000.

Haindl, Hans; and Fuchs, Jürgen, to B. Braun Melsungen AG. Catheter device. 4,871,356, Cl. 604-247.000.

Hajos, Gyorgy: See—

Batori, Sandor; Hajos, Gyorgy; Messner, Andras; Benko, Pal; Pallos, Laszlo; Petocz, Lujza; Grasser, Katalin; Kosoczky, Ibolya; and Szirt nee Kiszelly, Eniko, 4,871,846, Cl. 544-183.000.

Haley, Jerry L.; Barber, Weldon H.; and Morris, Kevin J., to Atlantic Richfield Company. Wellbore fluid sampling apparatus. 4,871,019, Cl. 166-167.000.

Hall, James R.: See—

Wright, James R.; Hall, James R.; and Theobald, Keith D., 4,871,328, Cl. 439-589.000.

Halliburton Company: See—

Caskey, Kenneth D.; and MacLaughlin, Scott, 4,871,018, Cl. 166-142.000.

Hamada, Akihiko: See—

Kitaoh, Katsutoshi; and Hamada, Akihiko, 4,871,589, Cl. 427-322.000.

Hamada, Toshimitsu: See—

Nakahata, Kozo; Hamada, Toshimitsu; Nakagawa, Yasuo; and Nomoto, Mineo, 4,872,187, Cl. 378-4.000.

Hamby, James M.: See—

Taylor, Edward C.; Hamby, James M.; and Shih, Chuan, 4,871,746, Cl. 514-303.000.

Hamilton, Peter W.: See—

Wosaba, Charles L., II; Hamilton, Peter W.; and Kissner, Robert J., 4,871,345, Cl. 493-59.000.

Hamman, Reed K.: See—

Moore, Vernon S.; and Hamman, Reed K., 4,871,291, Cl. 414-563.000.

Hammer, Jacob M., to General Electric Company. Device and method for monitoring a light-emitting device. 4,872,176, Cl. 372-50.000.

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Handelman, Robert I., to K R Industries, Inc. Folding stadium seat. 4,871,209, Cl. 297-378.000.

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Honma, Shigeo; and Hara, Kazuyoshi, 4,871,407, Cl. 156-83.000.

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Hardcastle, Robert E. Connector. 4,871,322, Cl. 439-169.000.

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Felix, Michael C.; Taylor, Nicola S.; and Hardy, Colin C., 4,871,412, Cl. 156-273.900.

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Funahashi, Yoshiko; Kamino, Yoshikazu; Matsumura, Yasuharu; and Harimaya, Senichi, 4,871,513, Cl. 422-56.000.

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Rasmussen, Steve O.; Jackson, Larry A.; Rhodes, John D.; Pinkernell, David W.; Harmon, J. Paul; Moon, Kevin L.; and Huseby, William R., 4,872,026, Cl. 346-140.00R.

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Harrington, Philip M.: See—

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Chan, Ellery Y.; and Sterling, Thomas L., 4,872,121, Cl. 364-551.010.

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Becker, John H., 4,870,732, Cl. 29-121.500.

Harris, James. Oyster shell separator. 4,870,719, Cl. 17-74.000.

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Harris, Richard L.: See—

Horst, Robert W.; and Harris, Richard L., 4,872,109, Cl. 364-200.000.

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Hart, Eric R.; and Hepler, Ernest M. Weatherproof roofing membrane and method for constructing the same. 4,870,796, Cl. 52-409.000.

Hartings, Michael F.: See—

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Hartlaub, Gregory R.; and Barbera, Melvin A. Oral compositions. 4,871,531, Cl. 424-48.000.

Hartmann, Richard. Body-liquid collecting and mattress protecting apparatus. 4,870,710, Cl. 5-90.000.

Hartmann, Robert F.: See—

Wong, Sau-Ching; So, Hock-Chuen; Kopeck, Stanley J., Jr.; and Hartmann, Robert F., 4,871,930, Cl. 307-465.000.

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Hashiba, Kazuhiko: See—

Hirai, Shiro; Hirano, Hiroshi; Arai, Hiroto; Shibata, Hisanari; Kusayanagi, Yoshikazu; and Hashiba, Kazuhiko, 4,871,765, Cl. 514-471.000.

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Hashimoto, Junichiro: See—

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Hata, Kosei; and Maruoka, Toshiyuki, to Seikenai Foundational Juridical Person. Biodeodorizer and process for preparing same. 4,871,539, Cl. 424-93.000.

Hata, Takehisa: See—

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Hayakawa, Isao; Atarashi, Shohgo; Yokohama, Shuichi; and Imamura, Masazumi, to Daiichi Seiyaku Co., Ltd. Quinoline-carboxylic acid derivatives. 4,871,852, Cl. 544-363.000.

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Hayase, Shizu; Horiguchi, Rumiko; Onishi, Yasunobu; and Ushirogouchi, Toru, to Kabushiki Kaisha Toshiba. Polysilane compound and photosensitive composition. 4,871,646, Cl. 430-192.000.

Hayashi, Hideharu, to Yazaki Corporation. Electrical connecting box. 4,871,884, Cl. 174-52.100.

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Haynes, John B. Cornea-borne image and light display device. 4,871,247, Cl. 351-219.000.

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Steers, Michel; Hazan, Jean-Pierre; and Delmas, Gilles, 4,871,891, Cl. 219-10.55B.

Hazeltine Corporation: See—
Culbert, James A.; and Sessler, Daniel M., 4,872,145, Cl. 367-87.000.

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Lucas, Gordon H.; and Giles, Randy K., 4,871,003, Cl. 144-369.000.

Heath, Derek E., to Quality Dental Products, Inc. Dental compactor instrument. 4,871,312, Cl. 433-164.000.

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Vaughan, John E.; Smale, David R.; Patry, Bernard; and Heaton, John C., 4,871,886, Cl. 200-43.050.

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Heidel, David: See—
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Chacko, Tharayil; Soucie, Wayne; Tauer, Elroy J.; and Heimann, Robert, 4,870,814, Cl. 57-217.000.

Hein, Lehmann AG: See—
Schmidt, Gerhard; and Hoppe, Kurt, 4,871,288, Cl. 411-45.000.

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Baugh, Robert F.; and Taylor, Cynthia A., 4,871,677, Cl. 436-69.000.

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Breitzke, Willi, 4,871,777, Cl. 514-785.000.

Loewenstein, Albert; and Fiedler, Heidi, 4,871,592, Cl. 427-389.900.

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Gadow, Andre, 4,871,660, Cl. 435-7.000.

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Dormish, Jeffrey; and Henning, Wolfgang, 4,871,798, Cl. 524-591.000.

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Escaravage, Gerard; and Henriot, Michel, 4,871,192, Cl. 280-808.000.

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Friedrichs, Bernd; and Hinkel, Willi, 4,871,202, Cl. 292-169.000.

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Hoffmann, Armin, 4,871,090, Cl. 222-81.000.

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Matsui, Shigeaki; Hirai, Eiichi; and Nakamura, Junji, 4,871,674, Cl. 435-284.000.

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Bister, Erhard; Huth, Hans-Ulrich; and Stelzel, Werner, 4,871,594, Cl. 427-430.100.

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Hammer, Klaus-Dieter; Siebrecht, Manfred; and Winter, Hermann, 4,871,791, Cl. 524-35.000.

Hupfer, Bernd, 4,871,833, Cl. 528-353.000.

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Grimsley, S. Allen; Robinson, James C.; and Schroeder, Mark A., 4,871,423, Cl. 162-72.000.

Gupton, B. Franklin; Rea, James H.; and Mueller, Werner H., 4,871,859, Cl. 546-250.000.

Laird, Keith A., 4,871,879, Cl. 568-454.000.

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Shutske, Gregory M., 4,871,764, Cl. 514-455.000.

Hoel, Elvin L., to Exxon Chemical Patents Inc. Process for production of a high molecular weight ethylene- α -olefin elastomer with a metal-locene alumoxane catalyst. 4,871,705, Cl. 502-117.000.

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Hrabal, Hans, 4,871,299, Cl. 417-319.000.

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 Luthy, Christoph; and Zurluh, Rene, 4,871,757, Cl. 514-383.000.
- Hoffstein, Sylvia T.: See—
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- Hofius, David V.: See—
 Ketcham, Kenneth E.; Barry, John; and Hofius, David V., 4,870,706, Cl. 2-2.000.
- Hofmann, Gunter A.: See—
 Dunn, Joseph E.; Clark, R. Wayne; Asmus, John F.; Pearlman, Jay S.; Boyer, Keith; Painchaud, Francois; and Hofmann, Gunter A., 4,871,559, Cl. 426-248.000.
- Hogan, Michael J.: See—
 Bessinger, Walter L.; and Hogan, Michael J., 4,871,136, Cl. 248-250.000.
- Hoggard, Dale B.: See—
 Fishler, Mark K.; and Hoggard, Dale B., 4,871,698, Cl. 501-97.000.
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- Hohn, Fritz J.: See—
 Donohue, Thomas P.; Hohn, Fritz J.; and Sai-Halas, George A., 4,871,919, Cl. 250-491.100.
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- Holonyak, Nick, Jr.; and Burnham, Robert D., to Xerox Corporation. Semiconductor structures utilizing semiconductor support means selectively pretreated with migratory defects. 4,871,690, Cl. 437-105.000.
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 Jahr, Richard T., Jr.; and Holt, Marcus N., 4,870,735, Cl. 29-157.30C.
- Homma, Toru, to Kabushiki Kaisha Toshiba. Developing apparatus. 4,872,036, Cl. 355-253.000.
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 Fujii, Etsuo; Sato, Makoto; and Hirai, Seiichi, 4,871,043, Cl. 180-248.000.
- Hattori, Torao, 4,871,343, Cl. 474-28.000.
- Ito, Toshifumi, 4,870,874, Cl. 74-665.00T.
- Saito, Hiroshi; and Hikichi, Koichi, 4,871,041, Cl. 180-219.000.
- Yagi, Toru, 4,870,930, Cl. 123-90.110.
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 Caudland, Calvin T., 4,870,886, Cl. 89-7.000.
- Gerhart, Paul B.; and Kumeda, Yasuo, 4,872,186, Cl. 375-117.000.
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- Nelson, Larry A., 4,871,948, Cl. 315-368.000.
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- Hoopman, Timothy L.; Johnson, Dee L.; and Krinke, Harlan L., to Minnesota Mining and Manufacturing Company. Sheet-member containing a plurality of elongated enclosed electrodeposited channels and method. 4,871,623, Cl. 428-586.000.
- Hoppe, Kurt: See—
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- Horst, Robert W.; and Harris, Richard L., to Tandem Computers Incorporated. Enhanced CPU return address stack. 4,872,109, Cl. 364-200.000.
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 Beckermann, Bernhard; Dell, Hans-Dieter; Horstmann, Harald; and Kraus, Reinhold, 4,871,767, Cl. 514-536.000.
- Horvath, Agnes: See—
 Hermecz, Istvan; Kereszturi, Geza; Vasvavi, Lelle; Horvath, Agnes; Balogh, Maria; Kovacs, Gabor; Szuts, Tamas; Ritli, Peter; Sipos, Judit; and Pajor, Aniko, 4,871,849, Cl. 544-229.000.
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- Hoshi, Satoshi: See—
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 Giovanniello, Rocco; and Howe, Stephen M., 4,871,525, Cl. 423-463.000.
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 Kasuga, Toshihiro, 4,871,384, Cl. 65-30.100.
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 Wagner, Israel; and Hurwitz, Steven D., 4,871,433, Cl. 204-192.120.
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 Rasmussen, Steve O.; Jackson, Larry A.; Rhodes, John D.; Pinkernell, David W.; Harmon, J. Paul; Moon, Kevin L.; and Huseby, William R., 4,872,026, Cl. 346-140.00R.
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 Norton, John P.; Schneider, Steven; Wilder, William D.; and Hussell, Stephen J., 4,871,308, Cl. 432-29.000.
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 Farmer, David M.; and Huston, R. Del., 4,872,146, Cl. 367-87.000.
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- Hutchison, Roy. Spring piston air weapon. 4,870,945, Cl. 124-68.000.
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 Bister, Erhard; Huth, Hans-Ulrich; and Stelzel, Werner, 4,871,594, Cl. 427-430.100.
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 Ohta, Minoru; Miura, Kazuhiko; Huzino, Seizi; Kanehara, Kenji; and Hattori, Tadashi, 4,870,860, Cl. 73-204.260.
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 Nigrini, Andrew; and Hwang, Rong J., 4,871,023, Cl. 166-252.000.
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 Zikmund, Miroslav; Hybl, Cestmir; Macho, Vendelin; and Adam, Valer, 4,871,519, Cl. 423-169.000.
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 Kraus, Andre; Martin, Harry; and Pazenny, Richard, 4,871,262, Cl. 366-160.000.
- Hydromatik GmbH: See—
 Walzer, Winfried, 4,870,819, Cl. 60-422.000.
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 Hohenwarter, Gert K. G.; and Grange, John A., 4,870,830, Cl. 62-50.700.
- I.C.P., S.A.: See—
 Dreyfus, Roger, 4,871,068, Cl. 206-428.000.
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 Wee, Siok H. H.; and Prisbylla, Michael P., 4,871,391, Cl. 71-92.000.
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 Fujisaki, Yoshinori; and Ida, Kazuo, 4,870,724, Cl. 24-433.000.
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 Miwa, Kohtaro; Igusa, Kazuo; and Ogasawara, Toshichika, 4,871,772, Cl. 514-573.000.
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 Yonekura, Norihisa; Yumita, Takashi; Nezu, Yukio; Kojima, Yoshiyuki; Maeno, Shin-ichiro; and Yaguchi, Shigeharu, 4,871,751, Cl. 514-345.000.
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 Kitt, Martin P., 4,870,847, Cl. 72-84.000.
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 Sakagami, Wataru; and Iijima, Katsumi, 4,872,154, Cl. 369-54.000.
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 Yoshioka, Takao; Kitazawa, Eiichi; Yamazaki, Mitsuo; and Iizuka, Yoshio, 4,871,762, Cl. 514-439.000.
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- Ikeda, Shinichi: See—
 Kurono, Masayasu; Unno, Ryoichi; Kimura, Hiromoto; Oka, Mitsuru; Hasegawa, Keiko; Ikeda, Shinichi; Kuboyama, Noboru; Ito, Takashi; Sawai, Kiichi; and Ito, Shunshuke, 4,871,740, Cl. 514-255.000.
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- Ikeda, Tsuneo: See—
 Fujimoto, Masami; Inazumi, Tadahiyo; Satoh, Katsuhiko; Shimozawa, Eiichi; Awa, Yasuhiko; Sato, Fumihiko; Nozaki, Kenro; Gushima, Akira; Suemura, Yoshinobu; Kusakabe, Nobuo; Imada, Kunihiro; Arichi, Masatoshi; Tanaka, Mitsunori; Umezu, Yoshinori; and Ikeda, Tsuneo, 4,871,393, Cl. 75-5.000.
- Ikegaya, Isao, to Fujikiko Kabushiki Kaisha. Seat lifting apparatus. 4,871,137, Cl. 248-396.000.
- Ikeuchi, Satoru: See—
 Komamura, Tawara; Ikeuchi, Satoru; Iwagaki, Masaru; Sasaki, Takashi; and Ishikawa, Wataru, 4,871,647, Cl. 430-201.000.
- Ikezaki, Masao: See—
 Tanaka, Shotaro; Ikezaki, Masao; Ono, Yukiko; and Sasanuma, Hiroshi, 4,872,162, Cl. 370-85.120.
- Ilg, Laszlo; and Gilgona, Mario. Use of aryloxy-carboxylic acid derivatives against dermatological diseases. 4,871,752, Cl. 514-355.000.
- Imada, Kunihiro: See—
 Fujimoto, Masami; Inazumi, Tadahiyo; Satoh, Katsuhiko; Shimozawa, Eiichi; Awa, Yasuhiko; Sato, Fumihiko; Nozaki, Kenro; Gushima, Akira; Suemura, Yoshinobu; Kusakabe, Nobuo; Imada, Kunihiro; Arichi, Masatoshi; Tanaka, Mitsunori; Umezu, Yoshinori; and Ikeda, Tsuneo, 4,871,393, Cl. 75-5.000.
- Imada, Yukio; Yoshikawa, Nobuji; Mizuno, Sumiko; and Mikawa, Takashi, to Agency of Industrial Science & Technology; and Ministry of International Trade and Industry of Japan. Process for preparing muconic acid. 4,871,667, Cl. 435-142.000.
- Imai, Shigetoshi; and Akioka, Takao. Sheet take-out apparatus. 4,871,162, Cl. 271-35.000.
- Imamatsu, Kazuya: See—
 Hattori, Kenichi; and Imamatsu, Kazuya, 4,871,198, Cl. 285-373.000.
- Imamura, Masazumi: See—
 Hayakawa, Isao; Atarashi, Shohgo; Yokohama, Shuichi; and Imamura, Masazumi, 4,871,852, Cl. 544-363.000.
- Imataki, Hiroyuki; Hiraoka, Mizuho; Ichikawa, Sachiko; Ogawa, Yoshihiro; and Yoshino, Hitoshi, to Canon Kabushiki Kaisha. Optical recording medium and optical recording method using the same. 4,871,649, Cl. 430-270.000.
- Imonti, Maurice M., to CooperVision, Inc. Surgical protector for raised wounds. 4,870,977, Cl. 128-890.000.
- Imoto, Katsuyuki, to Hitachi, Ltd. Optical waveguide device. 4,871,221, Cl. 350-96.120.
- Imperi, Giovanni, to Cesare Fiorucci S.p.A. Automatic mould unloader for hams and the like. 4,871,306, Cl. 425-437.000.
- Imperial Chemical Industries PLC: See—
 Denny, Patrick J.; and Wood, Peter, 4,871,710, Cl. 502-414.000.
- Elliott, Raymond; Sunley, Raymond; and Griffin, David A., 4,871,389, Cl. 71-92.000.
- In-Pak S.p.A.: See—
 Valenti, Dante, 4,871,067, Cl. 206-427.000.
- Inaba, Shigemitsu: See—
 Maejima, Toshiro; and Inaba, Shigemitsu, 4,871,325, Cl. 439-353.000.
- Inagaki, Sanji: See—
 Honma, Shigeo; Inagaki, Sanji; and Hara, Kazuyoshi, 4,871,408, Cl. 156-83.000.
- Inazumi, Tadahiyo: See—
 Fujimoto, Masami; Inazumi, Tadahiyo; Satoh, Katsuhiko; Shimozawa, Eiichi; Awa, Yasuhiko; Sato, Fumihiko; Nozaki, Kenro; Gushima, Akira; Suemura, Yoshinobu; Kusakabe, Nobuo; Imada, Kunihiro; Arichi, Masatoshi; Tanaka, Mitsunori; Umezu, Yoshinori; and Ikeda, Tsuneo, 4,871,393, Cl. 75-5.000.
- Inco Alloys International, Inc.: See—
 Smith, Darrell F., Jr.; and Coffee, Louis G., 4,871,511, Cl. 420-96.000.
- Ing. Erich Pfeiffer GmbH & Co. KG: See—
 Maerte, Leo, 4,871,092, Cl. 222-153.000.
- Ingersoll-Rand Company: See—
 Buse, Frederic W., 4,871,301, Cl. 417-420.000.
- Inland Steel Company: See—
 Ludkovsky, Gregory, 4,871,403, Cl. 148-121.000.
- Inoda, Kenichi: See—
 Harada, Terumaru; Inoda, Kenichi; Fujita, Tatsuo; and Adachi, Kinichi, 4,870,821, Cl. 60-520.000.
- Inoue, Akihiro: See—
 Dobashi, Yoshitomi; and Inoue, Akihiro, 4,871,941, Cl. 313-485.000.
- Inoue MTP Kabushiki Kaisha: See—
 Okina, Toyohiko; Goto, Hiroshi; Kousaka, Fumio; Teranishi, Akinori; Kawabata, Satoshi; Ohya, Tetsuo; Ohya, Makoto; and Kozaki, Norio, 4,871,612, Cl. 428-269.000.

Inoue, Noriyuki; Heki, Tatsuo; and Kojima, Tetsuro, to Fuji Photo Film Co., Ltd. Process for forming direct-positive image. 4,871,653, Cl. 430-409.000.

Inoue, Seiji: See—
Tsunamoto, Kanichi; and Inoue, Seiji, 4,871,996, Cl. 340-521.000.

Inoue, Senya; Ono, Akira; Kobayashi, Mikio; and Yokoo, Hiroshi, to Kanto Kagaku Kabushiki Kaisha. Porous cordierite ceramics. 4,871,693, Cl. 501-9.000.

Inovan GmbH & Co. KG. Metalle und Bauelemente: See—
Tilse, Wilhelm, 4,871,227, Cl. 350-96.210.

Instant Product Inc.: See—
Boone, Stephen D., 4,870,764, Cl. 40-124.100.

Institut Pasteur: See—
Pillot, Jacques, 4,871,659, Cl. 435-5.000.

Institute for Atomic Physics, The: See—
Miljevic, Vujo I., 4,871,918, Cl. 250-423.00R.

Institutet for Produktudvikling: See—
Nielsen, Steen E., 4,871,897, Cl. 219-121.670.

Interad Corporation: See—
Tutt, Timothy T.; Westmeyer, Mark; and Khutoryansky, 4,872,064, Cl. 358-464.000.

InterCon Systems, Inc.: See—
Gordon, Herbert L., Jr., 4,871,062, Cl. 206-328.000.

International Business Machines Corporation: See—
Araps, Constance J.; Kandetzke, Steven M.; and Takacs, Mark A., 4,871,619, Cl. 428-473.500.

Davis, Gordon T.; and Mandalia, Baiju D., 4,871,974, Cl. 329-345.000.

Donohue, Thomas P.; Hohn, Fritz J.; and Sai-Halasz, George A., 4,871,919, Cl. 250-491.100.

Easton, Malcolm C.; and Phipps, Peter B. P., 4,872,071, Cl. 360-31.000.

Gerber, Ulrich G.; and Rugar, Daniel, 4,872,078, Cl. 360-114.000.

Giammarco, Nicholas J.; Gimpelson, Alexander; Kaplita, George A.; Lopata, Alexander D.; Scaduto, Anthony F.; and Shepard, Joseph F., 4,871,630, Cl. 430-14.000.

Glang, Reinhard; and Ku, Sen-Mei, 4,871,684, Cl. 437-31.000.

Jackson, Thomas N., 4,872,040, Cl. 557-16.000.

Marple, Melvyn J.; and Potemski, Andrew S., 4,872,107, Cl. 364-200.000.

Wittlinger, Jürgen; Greschner, Johann; Bayer, Thomas; and Bartha, Johann W., 4,871,418, Cl. 156-643.000.

Intevp, S.A.: See—
Rivas, Olegario; and Newski, Alejandro, 4,871,020, Cl. 166-241.000.

Inteleplex Corp., The: See—
Sues, John M.; and Sun, Jing H., 4,872,198, Cl. 379-377.000.

Io, Shinichi, to Atsugi Motor Parts Company Limited. Accelerometer. 4,870,864, Cl. 73-517.00R.

Ionics, Incorporated: See—
Parsi, Edgardo J., 4,871,431, Cl. 204-182.400.

Ipri, Alfred C.: See—
Plus, Dora; and Ipri, Alfred C., 4,872,141, Cl. 365-154.000.

Irick, Virgil, Jr.: See—
Dwivedi, Ratnesh K.; and Irick, Virgil, Jr., 4,871,008, Cl. 164-6.000.

Irwin, Frank: See—
Irwin, Lawrence F.; and Irwin, Frank, 4,870,992, Cl. 137-846.000.

Irwin, Lawrence F.; and Irwin, Frank, to Augerscope, Inc. Backflow prevention device. 4,870,992, Cl. 137-846.000.

Isao KAI: See—
Ueno, Satoshi, 4,870,973, Cl. 128-080.000.

Isenmann Drahtzeugnisse GmbH: See—
Schmidt, Gerhard; and Hoppe, Kurt, 4,871,288, Cl. 411-45.000.

Isherwood, Jonathan M.; and Tansley, Robert W., to Driver Southall Limited. Combinational weighing systems. 4,871,038, Cl. 177-25.180.

Ishibashi, Masayuki; and Yoshioka, Hiroshi, to Hitachi, Ltd. Color display tube with field controller. 4,871,940, Cl. 313-412.000.

Ishiguro, Toshiaki: See—
Hasegawa, Hiromi; and Ishiguro, Toshiaki, 4,870,877, Cl. 74-869.000.

Ishii, Hidehiro; Yoshio, Junichi; Watanabe, Osamu; Izumo, Takeshi; Takeya, Noriyoshi; Katakami, Kazuhiko; Shinohara, Masayori; and Yoshida, Masao, to Pioneer Electronic Corporation. Disk playing method resulting in reduced start-up time. 4,872,068, Cl. 358-342.000.

Ishii, Hiromitsu; and Ono, Takashi, to Hochiki Kabushiki Kaisha. Fire alarm system, sensor and method. 4,871,999, Cl. 340-587.000.

Ishii, Hisao: See—
Araki, Hiroshi; Ishii, Hisao; Akiyama, Yoshihisa, Kamada, Hiroshi; and Nagatomi, Takashi, 4,870,744, Cl. 29-568.000.

Ishii, Kazuo: See—
Kato, Eiichi; Ishii, Kazuo; and Itakura, Ryosuke, 4,871,638, Cl. 430-96.000.

Ishii, Taiji; and Shibata, Masayuki, to Dai Nippon Insatsu Kabushiki Kaisha. Method for producing molded products having unevenness tuned with ink patterns. 4,871,503, Cl. 264-248.000.

Ishii, Tetsuo: See—
Yoshimura, Narihiko; Tokashiki, Michihide; and Ishii, Tetsuo, 4,871,476, Cl. 252-565.000.

Ishikawa, Fumiya: See—
Kaneko, Tsugio; Ishikawa, Fumiya; Nishiyama, Yoshinobu; and Shibata, Toshiharu, 4,871,464, Cl. 210-682.000.

Ishikawa, Hiroichi; and Nagasawa, Yasuo, to Toko, Inc. Charging circuit. 4,871,958, Cl. 320-32.000.

Ishikawa, Masataka; and Takagi, Nobukazu, to Diesel Kiki Co., Ltd. Distribution-type fuel injection system controlled by electromagnetic valve. 4,870,939, Cl. 123-506.000.

Ishikawa, Tomonori; Fukaya, Takashi; Tsunoda, Toshiyuki; and Fujiwara, Hiroshi, to Olympus Optical Co., Ltd. Surgical microscope. 4,871,245, Cl. 350-502.000.

Ishikawa, Wataru: See—
Komamura, Tawara; Ikeuchi, Satoru; Iwagaki, Masaru; Sasaki, Takashi; and Ishikawa, Wataru, 4,871,647, Cl. 430-201.000.

Ishino, Iwao: See—
Onishi, Akiyoshi; Ishino, Iwao; Shimada, Takeo; and Ozeki, Yuji, 4,871,819, Cl. 526-245.000.

Ishino, Yoshio: See—
Takata, Masakazu; Ueda, Takamasa; Ito, Kimiyuki; Hirashima, Suneaki; Yamamoto, Souichi; Ishino, Yoshio; and Ohno, Toshinobu, 4,871,633, Cl. 430-58.000.

Ishizaka, Kouichi; and Ebina, Akimitsu, to Jidosha Kiki Co., Ltd. Motor speed control apparatus. 4,871,952, Cl. 388-829.000.

Isobe, Susumu: See—
Takagi, Yoshiaki; Isobe, Susumu; and Matsunaga, Kenkichi, 4,871,512, Cl. 420-448.000.

Isono, Koichi; Tomohisa, Kunio; Oka, Junichi; and Sakamoto, Takashi, to Dainippon Screen Mfg. Co., Ltd. Method and apparatus for jitter correction of a polygon mirror in an image recording apparatus. 4,872,065, Cl. 358-494.000.

Isuzu Motors Limited: See—
Kawamura, Hideo, 4,871,113, Cl. 237-2.00A.

Itakura, Ryosuke: See—
Kato, Eiichi; Ishii, Kazuo; and Itakura, Ryosuke, 4,871,638, Cl. 430-96.000.

Ito, Katsumi: See—
Sugihara, Hirosada; Nishikawa, Kohei; and Ito, Katsumi, 4,871,842, Cl. 5-0-523.000.

Ito, Kazuhiko: See—
Yamagata, Shigeo; Takei, Masahiro; Takayama, Tadashi; and Ito, Kazuhiko, 4,872,066, Cl. 358-336.000.

Ito, Ken; and Kawabe, Taketoshi, to Nissan Motor Company, Limited. Vehicle motion estimating system of hybrid type. 4,872,116, Cl. 364-424.050.

Ito, Kimiyuki: See—
Takata, Masakazu; Ueda, Takamasa; Ito, Kimiyuki; Hirashima, Suneaki; Yamamoto, Souichi; Ishino, Yoshio; and Ohno, Toshinobu, 4,871,633, Cl. 430-58.000.

Ito, Shunshuke: See—
Kuroko, Masayasu; Unno, Ryoichi; Kimura, Hiromoto; Oka, Mitsuru; Hasegawa, Keiko; Ikeda, Shinichi; Kuboyama, Noboru; Ito, Takashi; Sawai, Kiichi; and Ito, Shunshuke, 4,871,740, Cl. 514-255.000.

Ito, Takashi: See—
Kuroko, Masayasu; Unno, Ryoichi; Kimura, Hiromoto; Oka, Mitsuru; Hasegawa, Keiko; Ikeda, Shinichi; Kuboyama, Noboru; Ito, Takashi; Sawai, Kiichi; and Ito, Shunshuke, 4,871,740, Cl. 514-255.000.

Ito, Toshifumi, to Honda Giken Kogyo Kabushiki Kaisha. Starting and reverse transmission apparatus. 4,870,874, Cl. 74-665.00T.

Itoh, Hiroshi; and Takada, Mitsuru, to Toyota Jidosha Kabushiki Kaisha. Apparatus for controlling continuously variable transmission. 4,872,115, Cl. 364-424.100.

Itoh, Kazuhiro: See—
Aoki, Takayoshi; Nagatsuka, Ikutaro; Takeda, Masayuki; Honjo, Toshio; Itoh, Kazuhiro; and Uchida, Kenji, 4,871,639, Cl. 430-108.000.

Itoh, Michio; Yamamoto, Hisao; and Okamura, Nobuyuki, to Bridge-stone Corporation. Pneumatic tires. 4,871,794, Cl. 524-254.000.

Iuchi, Tetsuya: See—
Nobuta, Masao; and Iuchi, Tetsuya, 4,871,001, Cl. 141-279.000.

Ivan, Steve D., to Wickes Manufacturing Company. Adjustable accelerator and brake pedal mechanism. 4,870,871, Cl. 74-513.000.

Ivanov, Sergei K.; Dudkin, Viktor E.; Peredery, Valery P.; and Molchanov, Viktor N. Axial-flow fan. 4,871,294, Cl. 415-58.700.

Iwagaki, Masaru: See—
Komamura, Tawara; Ikeuchi, Satoru; Iwagaki, Masaru; Sasaki, Takashi; and Ishikawa, Wataru, 4,871,647, Cl. 430-201.000.

Iwai, Hiroshi: See—
Maeda, Satoshi; and Iwai, Hiroshi, 4,872,042, Cl. 357-23.600.

Iwakura, Ken: See—
Matsuoka, Katsumi; Ikeda, Kensuke; and Iwakura, Ken, 4,871,713, Cl. 503-209.000.

Iwamura, Takuro: See—
Akutsu, Hidetoshi; Iwamura, Takuro; and Kobayashi, Masao, 4,872,048, Cl. 357-67.000.

Iwasaki, Tsutomu: See—
Takeda, Yoshimitsu; Mochida, Haruo; Iwasaki, Tsutomu; and Kanai, Toshio, 4,871,994, Cl. 340-457.000.

Iwata, Hiroshi: See—
Kondo, Kazuo; Morikawa, Asao; Iwata, Hiroshi; and Shibata, Yoshimasa, 4,871,608, Cl. 428-209.000.

Izaki, Takesi: See—
Watanabe, Satoshi; Sugahara, Hiroto; and Izaki, Takesi, 4,872,032, Cl. 354-297.000.

Izumitani, Tetsuro: See—
Yamashita, Toshiharu; Amano, Sho; Tajima, Hidemi; Masuda, Isao; and Izumitani, Tetsuro, 4,871,230, Cl. 350-96.340.

Izumo, Takeshi: See—
Ishii, Hidehiro; Yoshio, Junichi; Watanabe, Osamu; Izumo, Takeshi; Takeya, Noriyoshi; Katakami, Kazuhiko; Shinohara, Masayori; and Yoshida, Masao, 4,872,068, Cl. 358-342.000.

J. I. Case Company: See—
Lindstrom, Edgar K.; and Morris, Marvin L., 4,871,027, Cl. 172-40.000.

J & J Hardware, Inc.: See—
Rogers, Gerald H., 4,871,203, Cl. 292-238.000.

Jackson, Larry A.: See—
Rasmussen, Steve O.; Jackson, Larry A.; Rhodes, John D.; Pinkernell, David W.; Harmon, J. Paul; Moon, Kevin L.; and Huseby, William R., 4,872,026, Cl. 346-140.00R.

Jackson, Thomas N., to International Business Machines Corporation. Self-aligned heterojunction transistor. 4,872,040, Cl. 557-16.000.

Jaeggi, Knut A., to Ciba-Geigy Corporation. Aromatically substituted azacycloalkyl-alkanediphosphonic acids useful for the treatment of illnesses that can be attributed to calcium metabolism disorders. 4,871,720, Cl. 514-79.000.

Jaguar Cars Limited: See—
Parsons, Bryan N. V., 4,870,872, Cl. 74-568.00R.

Jahanger, Mohammed S. Umbilical cord cutting and clamping device. 4,870,965, Cl. 128-318.000.

Jahns, Juergen: See—
Burghardt, Hartmut; Jahns, Juergen; and Kindt, Stefan, 4,871,222, Cl. 350-96.140.

Jahr, Richard T., Jr.; and Holt, Marcus N., to White Consolidated Industries, Inc. Refrigeration cabinet construction. 4,870,735, Cl. 29-157.30C.

Jaillet, Andre: See—
Dony, Dominique; and Jaillet, Andre, 4,871,149, Cl. 267-64.120.

Jain, Sunil K.: See—
Aadsen, Duane R.; Jain, Sunil K.; and Stroud, Charles E., 4,872,168, Cl. 371-21.300.

Jansen, Cornelis J. A., to Hollandse Signaalapparaten B.V. System of orthogonal code generators, radios provided with a code generator and code generators of such a system. 4,872,200, Cl. 380-34.000.

Jansson, Karl: See—
Magnusson, Hans G.; and Jansson, Karl, 4,871,837, Cl. 536-4.100.

Japan Electronic Control Systems Company, Limited: See—
Araki, Akihiko, 4,870,935, Cl. 123-422.000.

Nakaniwa, Shinpei, 4,870,938, Cl. 123-489.000.

Japan Exlan Company, Ltd.: See—
Sugimoto, Hiroaki; Hayatsu, Kazuo; Kobashi, Toshiyuki; and Takao, Seiji, 4,871,501, Cl. 264-211.220.

Japan Liquid Crystal Co., Ltd.: See—
Shibanai, Ichiro, 4,871,541, Cl. 424-411.000.

Japan Oxygen Co., Ltd.: See—
Seki, Koji; Morishita, Hiroshi; Ohno, Kiyoshi; and Yokota, Hiroshi, 4,871,695, Cl. 501-54.000.

Japan Tobacco Inc.: See—
Matsushita, Hajime; Shibagaki, Makoto; and Takahashi, Kyoko, 4,871,858, Cl. 546-244.000.

Jarosky, John R. Serving ensemble for holding hot cooked meat. 4,871,082, Cl. 220-22.000.

Jaumann, Wolfgang: See—
Bencke, Herbert; Alschner, Arnold; Oberkobusch, Rudolf; Peter, Siegfried; and Jaumann, Wolfgang, 4,871,443, Cl. 208-39.000.

Jautelet, Manfred: See—
Fiege, Helmut; Jautelet, Manfred; and Arlt, Dieter, 4,871,484, Cl. 260-408.000.

JBS Associates, Inc.: See—
Dinerstein, Sidney F., 4,872,113, Cl. 364-401.000.

Jeerings, Donald I.; and Linders, John R. High impedance fault analyzer in electric power distribution networks. 4,871,971, Cl. 324-509.000.

Jeffers, Robert E.: See—
Wolters, Richard H.; Thoeming, Gerald A.; and Jeffers, Robert E., 4,870,908, Cl. 108-60.000.

Jeffrey, Gaines C., to Dow Chemical Company, The. Method and composition for the removal of hydrogen sulfide and carbon dioxide from gaseous streams. 4,871,468, Cl. 252-190.000.

Jennings, Charles E., to Vetco Gray Inc. Tension leg platform tendon top connector. 4,871,282, Cl. 405-224.000.

Jennings, Chris W.: See—
Doucette, Kenneth E.; and Jennings, Chris W., 4,871,079, Cl. 220-1.00R.

Jennings, Earle W., III. Reprogrammable control circuit. 4,872,137, Cl. 364-900.000.

Jennings, Richard E.; Potter, Wilburn H.; and Seymour, Shaun A., to Ford New Holland, Inc. Round baler with variable bale chamber. 4,870,812, Cl. 56-341.000.

Jensen, Joseph F.: See—
Larson, Lawrence E.; Jensen, Joseph F.; Walden, Robert H.; and Schmitz, Adele E., 4,872,010, Cl. 341-134.000.

Jensen, Villy J.; Pedersen, Sven; and Olsen, Hans A. S., to Novo Industri A/S. Dietetic foodstuff containing low calorie bulking agent. 4,871,571, Cl. 426-548.000.

JEOL Ltd.: See—
Kokubo, Yasushi; Suzuki, Keisuke; and Mori, Seiichi, 4,871,912, Cl. 250-311.000.

Jiang, Ching-Lin: See—
Williams, Clark R.; and Jiang, Ching-Lin, 4,871,982, Cl. 331-75.000.

Jidosha Kiki Co., Ltd.: See—
Ishizaka, Kouichi; and Ebina, Akimitsu, 4,871,952, Cl. 388-829.000.

Jippo, Akira, to NEC Corporation. Information processing system capable of reducing invalid memory operations by detecting an error in a main memory. 4,872,166, Cl. 371-11.100.

Johansson, Eric B., to General Electric Company. Fuel column retainer using radially compressed spring. 4,871,509, Cl. 376-412.000.

John Zink Company: See—
Wright, Kenneth C.; and Stuck, Jerry L., 4,870,910, Cl. 110-190.000.

Johndrow, John P.: See—
Davies, Robert; and Johndrow, John P., 4,871,086, Cl. 221-4.000.

Johns, Robert R. Fly tying tool. 4,870,772, Cl. 43-1.000.

Johnson, Bertram C.; and Herbst, Richard L., to Spectra-Physics. Laser resonator with laser medium exhibiting thermally induced birefringence. 4,872,181, Cl. 372-106.000.

Johnson, David S. Reusable container dispenser for ultra high purity chemicals and method of storage. 4,871,087, Cl. 222-1.000.

Johnson, Dee L.: See—
Hoopman, Timothy L.; Johnson, Dee L.; and Krinke, Harlan L., 4,871,623, Cl. 428-586.000.

Johnson, Jeffrey L.: See—
Duncan, William M.; Glass, George E.; Johnson, Jeffrey L.; McMillan, Edward A.; Maney, Frank S.; McConnell, James R., Jr.; Roberts, Kenneth P.; and Sanders, Timothy R., 4,870,863, Cl. 73-431.000.

Johnson, Keith A.: See—
Butler, John D.; and Johnson, Keith A., 4,870,878, Cl. 81-9.510.

Johnson, Lennart B., to Teradyne, Inc. Electrical connector. 4,871,321, Cl. 439-79.000.

Johnson, Neale E.; and Markham, Carmen F., to Markham, Carmen F. Magnetic rodent control method. 4,870,779, Cl. 43-124.000.

Johnson, Roy C. Guide assembly for a trailer hitch structure. 4,871,184, Cl. 280-477.000.

Johnson, Wayne A.: See—
Pfeffer, George B.; and Johnson, Wayne A., 4,870,753, Cl. 29-884.000.

Joiner, Karen A.: See—
King, Francis D.; and Joiner, Karen A., 4,871,744, Cl. 514-299.000.

Jones, John D.: See—
Yamazaki, Hiroshi; Modler, Howard W.; Jones, John D.; and Elliot, James L., 4,871,574, Cl. 426-622.000.

Jones, Robert E., to A. O. Smith Corporation. Surface mounted component adaptor for interconnecting of surface mounted circuit components. 4,871,317, Cl. 439-68.000.

Jones, Timothy D. Combination tree support and feeder stake. 4,870,781, Cl. 47-43.000.

Joseph, Michael F.: See—
Chang, Robert C. W.; Vorndran, Steven C.; and Joseph, Michael F., 4,870,911, Cl. 110-246.000.

Josse, Alain: See—
Carrel, Claude; and Josse, Alain, 4,870,903, Cl. 102-201.000.

Juntunen, William H.: See—
Cuddy, Jared G.; and Juntunen, William H., 4,871,588, Cl. 427-264.000.

Jupiter Technologies, Inc.: See—
Panda, Prakash C.; Seydel, Edgar R.; and Raj, Rishi, 4,871,496, Cl. 264-65.000.

Justice, Donald R. Trenching tool for installing perforated pipe. 4,871,281, Cl. 405-181.000.

K R Industries, Inc.: See—
Handelman, Robert L., 4,871,209, Cl. 297-378.000.

Kabushiki Kaisha Hirano Seisakusho: See—
Hirano, Tsugutoshi, 4,870,717, Cl. 17-31.000.

Kabushiki Kaisha Kenwood: See—
Kawase, Seiji, 4,871,987, Cl. 332-100.000.

Kabushiki Kaisha Kobe Seiko Sho: See—
Murata, Hiroyuki; Tanaka, Takeshi; Hino, Chouji; Kiuchi, Harunaga; and Chiji, Masahiro, 4,871,119, Cl. 241-189.00R.

Kabushiki Kaisha Sato: See—
Murata, Shinsuke, 4,871,269, Cl. 400-88.000.

Kabushiki Kaisha Seibu Giken: See—
Kuma, Tosimi; and Okano, Hiroshi, 4,871,607, Cl. 428-186.000.

Kabushiki Kaisha Tokai Rika Denki Seisakusho: See—
Kokubu, Sadao, 4,871,909, Cl. 250-229.000.

Kabushiki Kaisha Toshiba: See—
Dobashi, Yoshitomi; and Inoue, Akihiro, 4,871,941, Cl. 313-485.000.

Gemma, Nobuhiro; Miura, Akira; Mizushima, Koichi; Azuma, Makoto; and Mori, Yasushi, 4,871,236, Cl. 350-355.000.

Hayase, Shizu; Horiguchi, Rumiko; Onishi, Yasunobu; and Ushirogouchi, Toru, 4,871,646, Cl. 430-192.000.

Homma, Toru, 4,872,036, Cl. 355-253.000.

Iida, Toshikatsu; and Fujiwara, Takayoshi, 4,871,304, Cl. 418-220.000.

Kanayama, Shoichi, 4,871,968, Cl. 324-318.000.

Kitamoto, Manabu, 4,870,831, Cl. 62-84.000.

Maeda, Satoshi; and Iwai, Hiroshi, 4,872,042, Cl. 357-23.600.

Morita, Noboru, 4,872,123, Cl. 364-571.020.

Nanba, Hiromi, 4,872,062, Cl. 358-443.000.

Satoh, Tomohiro, 4,870,954, Cl. 128-24.00A.

Taka, Shin-ichi; and Ohshima, Jiro, 4,871,685, Cl. 437-33.000.

Kabushiki Kaisha Toyota Chuo Kenkyusho: See—
Arai, Tohru; Endo, Junji; and Takeda, Hiromasa, 4,871,401, Cl. 148-14.000.

Kacaleff, Christ D., to Chris Kaye Plastics Corp. Method of assembling a molded hub and tire. 4,870,736, Cl. 29-159.100.

Kaczynski, Ulrich; Schmidt, Peter; and Paul, Hans-Helmut, to Ernst Leitz Wetzlar GmbH. Automatic handling apparatus for plate-shaped objects. 4,871,290, Cl. 414-331.000.

- Kageyama, Takashi; and Yoshida, Makoto, to Konishiroku Photo Industry Co., Ltd. Process of smoothing a coated-layer and the apparatus for use in such method. 4,870,920, Cl. 118-103.000.
- Kaijo Denki Co., Ltd.: See—
Liudzius, Valerie A.; Weisner, Ralph M.; Kamiharaka, Takashi; and Uramoto, Iwami, 4,872,052, Cl. 358-106.000.
- Kajikawa, Yoshiharu: See—
Ogawa, Shinji; Kajikawa, Yoshiharu; Kuroyanagi, Isao; Baba, Norimasa; and Ohara, Toshio, 4,870,834, Cl. 62-197.000.
- Kajimoto, Hironobu, to Teraoka Seiko Co., Ltd. Electronic postal scale for computing a postal charge. 4,872,119, Cl. 364-464.030.
- Kajimoto, Nobuyuki: See—
Nagata, Teruyuki; Tamaki, Akihiro; Kajimoto, Nobuyuki; and Wada, Masaru, 4,871,875, Cl. 564-402.000.
- Kajimura, Takashi: See—
Nakatsuka, Shinichi; and Kajimura, Takashi, 4,872,175, Cl. 372-46.000.
- Kakimi, Fujio, to Fuji Photo Film Co., Ltd. Light-sensitive material containing silver halide reducing agent and polymerizable compound and process for preparation thereof. 4,871,641, Cl. 430-138.000.
- Kakutani, Masaki: See—
Watanabe, Kazuo; Nishimura, Toshiharu; and Kakutani, Masaki, 4,872,033, Cl. 355-27.000.
- Kalala, Rose H.; DeLeon, Joe R.; and Maculan, Thomas P., to Coca-Cola Company. Calcium fortified food product. 4,871,554, Cl. 426-74.000.
- Kalota, Dennis J.; McConaghy, John S., Jr.; Fisher, David O.; and Zielinski, Ronald E., to Monsanto Company. Vapor phase soldering using certain perfluorinated polyethers. 4,871,109, Cl. 228-180.100.
- Kamada, Hiroshi: See—
Araki, Hiroshi; Ishii, Hisao; Akiyama, Yoshihisa; Kamada, Hiroshi; and Nagatomi, Takashi, 4,870,744, Cl. 29-568.000.
- Kamada, Soetsu, to Alps Electric Co., Ltd. Combined push and slide switch assembly. 4,871,885, Cl. 200-5.00R.
- Kamiharaka, Takashi: See—
Liudzius, Valerie A.; Weisner, Ralph M.; Kamiharaka, Takashi; and Uramoto, Iwami, 4,872,052, Cl. 358-106.000.
- Kamimaru, Shinji, to Fuji Jukogyo Kabushiki Kaisha. Intake air control system for an automotive engine having a turbocharger. 4,870,822, Cl. 60-600.000.
- Kamino, Yoshikazu: See—
Funahashi, Yoshiko; Kamino, Yoshikazu; Matsumura, Yasuharu; and Harimaya, Senichi, 4,871,513, Cl. 422-56.000.
- Kaminsky, Walter: See—
Lechert, Hans; Woebos-Gosch, Volkert; Qun, Song; Kaminsky, Walter; and Sinn, Hansjorg, 4,871,426, Cl. 201-2.500.
- Kamio, Kunimasa: See—
Saito, Yasuhisa; Kanagawa, Shuichi; Watanabe, Katsuya; and Kamio, Kunimasa, 4,871,832, Cl. 528-353.000.
- Kamio, Takashi: See—
Sakamoto, Eiichi; Kaneko, Yutaka; Ninomiya, Hidetaka; Kamio, Takashi; Ezaki, Atsuo; Akamatsu, Hideo; and Haraga, Hideaki, 4,871,658, Cl. 430-551.000.
- Kamiya, Takashi; Suzuki, Masaya; Obata, Yoshinori; Watanabe, Masaaki; and Matsuo, Isao, to Aica Kogyo Co., Ltd. Artificial marble. 4,871,596, Cl. 428-15.000.
- Kamohara, Tatsuyoshi: See—
Shibata, Norio; Mizuno, Hideaki; Satoya, Kouichi; Uchitani, Nobuki; Kamohara, Tatsuyoshi; Harada, Kenichi; Yoshioka, Mamoru; Kato, Takashi; and Ohnaka, Hidemi, 4,870,942, Cl. 123-571.000.
- Kanagawa, Shuichi: See—
Saito, Yasuhisa; Kanagawa, Shuichi; Watanabe, Katsuya; and Kamio, Kunimasa, 4,871,832, Cl. 528-353.000.
- Kanahara, Naoyuki: See—
Sagawa, Akira; and Kanahara, Naoyuki, 4,871,399, Cl. 148-11.50C.
- Kanai, Hachiro: See—
Souza, Toshio; Wakamiya, Koichi; Wakabayashi, Hiroshi; Kanai, Hachiro; and Miyamoto, Hidenori, 4,871,242, Cl. 350-431.000.
- Kanai, Makoto: See—
Noda, Kazushi; and Kanai, Makoto, 4,871,991, Cl. 340-384.00E.
- Kanai, Takao: See—
Yamaguchi, Katsumi; Yoshikawa, Kikuo; Kinoshita, Shigeo; Kanai, Takao; and Yokoi, Syouchiro, 4,872,075, Cl. 360-85.000.
- Kanai, Toshio: See—
Takeda, Yoshimitsu; Mochida, Haruo; Iwasaki, Tsutomu; and Kanai, Toshio, 4,871,994, Cl. 340-457.000.
- Kanayama, Akira: See—
Okamoto, Kazuhiko; and Kanayama, Akira, 4,872,139, Cl. 365-52.000.
- Kanayama, Shoichi, to Kabushiki Kaisha Toshiba. Magnetic resonance apparatus. 4,871,968, Cl. 324-318.000.
- Kanbara, Kouji; Kikuchi, Kenichi; Shimizu, Yoshihito; Hattori, Shinichiro; Tojo, Yoshikazu; Hasegawa, Akira; Yamaguchi, Tatsuya; Tsukaya, Takashi; Kobayashi, Kazunari; Murata, Masanao; Yamamoto, Tsutomu; and Nakamura, Takeaki. Endoscope system. 4,870,950, Cl. 128-6.000.
- Kanda, Ryuuji, to Tokai Rubber Industries, Ltd. Fluid-filled resilient bushing. 4,871,151, Cl. 267-140.100.
- Kandetzke, Steven M.: See—
Arapa, Constance J.; Kandetzke, Steven M.; and Takacs, Mark A., 4,871,619, Cl. 428-473.500.
- Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: See—
Kira, Kazuaki, 4,871,361, Cl. 623-1.000.
- Kanehara, Kenji: See—
Ohta, Minoru; Miura, Kazuhiko; Huzino, Seizi; Kanehara, Kenji; and Hattori, Tadashi, 4,870,860, Cl. 73-204.260.
- Kaneko, Tsugio; Ishikawa, Fumiya; Nishiyama, Yoshinobu; and Shibata, Toshiharu, to Mitsubishi Chemical Industries Limited. Method for extracting metal ions. 4,871,464, Cl. 210-682.000.
- Kaneko, Yutaka: See—
Sakamoto, Eiichi; Kaneko, Yutaka; Ninomiya, Hidetaka; Kamio, Takashi; Ezaki, Atsuo; Akamatsu, Hideo; and Haraga, Hideaki, 4,871,658, Cl. 430-551.000.
- Kanaris, John. Regulator key. 4,871,144, Cl. 251-291.000.
- Kano, Mitsunari; Konishi, Yoshiharu; and Matsuda, Toshihiko, to Hitachi, Ltd. Coordinate input apparatus. 4,872,000, Cl. 340-706.000.
- Kano, Osamu; Takano, Yoshihiko; and Senda, Atsuo, to Murata Manufacturing Co., Ltd. Method of plating treatment. 4,871,585, Cl. 427-98.000.
- Kansai Paint Company, Limited: See—
Sugimura, You; Watanabe, Tadashi; Sugiyama, Yutaka; Ohira, Kazuhiko; Numa, Nobushige; Yamaguchi, Sachio; and Kasari, Akira, 4,871,591, Cl. 427-388.500.
- Kantner, Steven S.: See—
Lucast, Donald H.; Battles, Donald R.; and Kantner, Steven S., 4,871,812, Cl. 525-186.000.
- Kanto Kagaku Kabushiki Kaisha: See—
Inoue, Senya; Ono, Akira; Kobayashi, Mikio; and Yokoo, Hiroshi, 4,871,693, Cl. 501-9.000.
- Kanto Seiki Co., Ltd.: See—
Hayashi, Takatoshi; Fujiki, Norio; Tanaka, Yoichiro; Nishimoto, Takashi; and Kobayashi, Masakazu, 4,871,993, Cl. 340-439.000.
- Kanzaki Kokyokai Mfg. Co. Ltd.: See—
Nemoto, Shusuke, 4,870,820, Cl. 60-487.000.
- Kao Corporation: See—
Mano, Tsutomu; Kawase, Jiro; Misu, Daisuke; and Obayashi, Michio, 4,871,372, Cl. 8-410.000.
- Tsujita, Satoshi; Maeda, Koji; and Eguchi, Yasuteru, 4,871,396, Cl. 106-286.800.
- Kao, Jamee; and Hsu, Joseph. Dual fluted shade. 4,871,006, Cl. 160-84.100.
- Kaplan, Uri, to Ormat Turbines (1965) Ltd. Modular rankine cycle vapor turbine. 4,871,295, Cl. 415-94.000.
- Kaprita, George A.: See—
Giammarco, Nicholas J.; Gimpelson, Alexander; Kaprita, George A.; Lopata, Alexander D.; Scaduto, Anthony F.; and Shepard, Joseph F., 4,871,630, Cl. 430-14.000.
- Karakane, Hiroki; Maeda, Yasushi; and Tsuyumoto, Michio, to General Director of the Agency of Industrial Science and Technology, The Polymer composite membrane. 4,871,461, Cl. 210-638.000.
- Karius, Klaus D.: See—
Sippel, Achim; Kruse, Heinz-Josef; and Karius, Klaus D., 4,870,905, Cl. 102-524.000.
- Karstensen, Holger; and Klement, Ekkehard, to Siemens Aktiengesellschaft. Device for optical connections of one or more optical emitters with one or more optical detectors of one or more integrated circuits. 4,871,224, Cl. 350-96.150.
- Kasahara, Nobuo; Nakahara, Tosio; Watanuki, Masayoshi; and Sawamura, Tadahide, to Ricoh Company, Ltd. Image forming apparatus and control system therefor. 4,872,037, Cl. 355-271.000.
- Kasai, Ryusuke, to Nikka Co., Ltd. Inert gas-filling and sealing device, heat sealing device and packaging apparatus using these devices. 4,870,800, Cl. 53-88.000.
- Kasari, Akira: See—
Sugimura, You; Watanabe, Tadashi; Sugiyama, Yutaka; Ohira, Kazuhiko; Numa, Nobushige; Yamaguchi, Sachio; and Kasari, Akira, 4,871,591, Cl. 427-388.500.
- Kasuga, Toshihiro, to Hoya Corporation. Process for surface modification of inorganic biomaterial. 4,871,384, Cl. 65-30.100.
- Katakami, Kazuhiko: See—
Ishii, Hidehiro; Yoshio, Junichi; Watanabe, Osamu; Izumo, Take-shi; Takeya, Noriyoshi; Katakami, Kazuhiko; Shinohara, Masayori; and Yoshida, Masao, 4,872,068, Cl. 358-342.000.
- Katcher, Jay H.; Mabon, John T.; Matherly, Jennifer W.; McCarty, Lawrence T.; and Schara, Robert E., to General Foods Corporation. Method for pregelatinized, spray-dried starch agglomerates. 4,871,398, Cl. 127-71.000.
- Kato, Eiichi; Ishii, Kazuo; and Itakura, Ryosuke, to Fuji Photo Film Co., Ltd. Electrophotographic photosensitive material with binder combination. 4,871,638, Cl. 430-96.000.
- Kato, Tadashi, to Olympus Optical Co., Ltd. Automatic adjusted light switching circuit. 4,872,029, Cl. 354-413.000.
- Kato, Takashi: See—
Shibata, Norio; Mizuno, Hideaki; Satoya, Kouichi; Uchitani, Nobuki; Kamohara, Tatsuyoshi; Harada, Kenichi; Yoshioka, Mamoru; Kato, Takashi; and Ohnaka, Hidemi, 4,870,942, Cl. 123-571.000.
- Katoh, Takayuki; Hosoi, Yuichi; and Takahashi, Kenji, to Fuji Photo Film Co., Ltd. Phosphor. 4,871,474, Cl. 252-301.40H.
- Katsumata, Hidetosi: See—
Maezawa, Hiruyuki; Katsumata, Hidetosi; and Tomioka, Mikio, 4,872,167, Cl. 371-19.000.
- Kawabata, Kohji: See—
Takaya, Takao; Tozuka, Zenzaburo; Yasuda, Nobuyoshi; and Kawabata, Kohji, 4,871,730, Cl. 514-206.000.
- Kawabata, Satoshi: See—
Okina, Toyohiko; Goto, Hiroshi; Kousaka, Fumio; Teranishi, Akinori; Kawabata, Satoshi; Ohya, Tetsuo; Ohya, Makoto; and Kozaki, Norio, 4,871,612, Cl. 428-269.000.

- Kawabata, Yasuhiro; and Hara, Soichi, to Aisin Seiki Kabushiki Kaisha. Manufacturing method of a piston for an internal combustion engine. 4,870,733, Cl. 29-156.50R.
- Kawabe, Takatoshi: See—
Ito, Ken; and Kawabe, Takatoshi, 4,872,116, Cl. 364-424.050.
- Kawabe, Yasumasa: See—
Uemishi, Kazuya; Kokubo, Tadayoshi; and Kawabe, Yasumasa, 4,871,645, Cl. 430-192.000.
- Kawai, Sumio, to Olympus Optical Co., Ltd. Vibration wave motor. 4,871,937, Cl. 310-323.000.
- Kawami, Shigeru; Tabu, Takashi; Sano, Shigeo; and Masuda, Nobuyuki, to Fujitsu Limited. Battery-feed circuit for exchange. 4,872,199, Cl. 379-413.000.
- Kawamoto, Masao, to Nippon Furnace Kogyo Kaisha, Ltd. Radiant tube burner. 4,870,947, Cl. 126-91.00A.
- Kawamura, Hideo, to Isuzu Motors Limited. Vehicle heating container apparatus. 4,871,113, Cl. 237-2.00A.
- Kawamura, Osamu: See—
Nakamura, Yoshikatsu; Kawamura, Osamu; and Shimomura, Souichi, 4,870,931, Cl. 123-90.390.
- Kawasaki Jukogyo Kabushiki Kaisha: See—
Miyake, Hitomi; and Nishimura, Shigeru, 4,870,928, Cl. 123-52.0MV.
- Kawasaki Steel: See—
Yamaguchi, Yasuhiro; Shimoyama, Yuji; Ohnishi, Tateo; Ohno, Hironobu; Shioda, Isamu; and Nakazono, Yoji, 4,870,850, Cl. 72-164.000.
- Kawasaki Steel Corporation: See—
Funahashi, Yoshiko; Kamino, Yoshikazu; Matsumura, Yasuharu; and Harimaya, Senichi, 4,871,513, Cl. 422-56.000.
- Kawase, Jiro: See—
Mano, Tsutomu; Kawase, Jiro; Misu, Daisuke; and Obayashi, Michio, 4,871,372, Cl. 8-410.000.
- Kawase, Seiji, to Kabushiki Kaisha Kenwood. FSK or am modulator with digital waveform shaping. 4,871,987, Cl. 332-100.000.
- Kawashima, Hisakazu; Morita, Yoshiyasu; Nishihara, Minoru; Arai, Tetsuzo; and Fukui, Kunihiro, to Sumitomo Metal Industries, Ltd. Oil well pipe joint and manufacturing method therefor. 4,871,194, Cl. 285-55.000.
- Kaye, Gordon E.: See—
Marshall, Howard B.; Kaye, Gordon E.; and Prohaska, Raymond J., 4,871,165, Cl. 272-132.000.
- Kelleher, Peter J.: See—
Lam, Dominic M-K.; and Kelleher, Peter J., 4,871,350, Cl. 604-49.000.
- Kelley, David A.; Walters, Dan H.; and Stephenson, James G., to Progressive Dynamics, Inc. Light fixture. 4,872,099, Cl. 362-295.000.
- Kelman, Charles D. Corrective intraocular lens. 4,871,363, Cl. 623-6.000.
- Kempler, Meinrad; and Glauser, Paul, to Lasarray Holding AG. Process and device to enhance system performance accuracy in a laser writing process. 4,871,896, Cl. 219-121.600.
- Kenderi, Tibor. Apparatus for power spraying operating with flame jet. 4,871,114, Cl. 239-79.000.
- Kent, David E.: See—
Barrett, John P.; Schulz, Daniel R.; Kent, David E.; deFasselle, Robert J.; and Zega, Henry E., 4,870,986, Cl. 137-119.000.
- Kent, Michael J.: See—
Gall, Russell A.; Clements, Don A.; and Kent, Michael J., 4,871,094, Cl. 222-386.000.
- Kerb, Ulrich; Nishino, Yukishige; and Henderson, David, to Schering Aktiengesellschaft. 1-methyl-15a-(1-oxalkyl)androsta-1,4-diene-3,17-diones, processes for their production, and pharmaceutical preparations containing them. 4,871,725, Cl. 514-177.000.
- Kerbstat, Siegfried: See—
Lush, Steven; and Kerbstat, Siegfried, 4,872,092, Cl. 361-426.000.
- Kereszturi, Geza: See—
Hermecz, Istvan; Kereszturi, Geza; Vasvavi, Lelle; Horvath, Agnes; Balogh, Maria; Kovacs, Gabor; Szuts, Tamas; Ritli, Peter; Sipos, Judit; and Pajor, Aniko, 4,871,849, Cl. 544-229.000.
- Kernforschungsanlage Julich GmbH: See—
Prince, Kevin C., 4,871,915, Cl. 250-372.000.
- Kernforschungszentrum Karlsruhe GmbH: See—
Petrich, Georg; and Schmieder, Helmut, 4,871,478, Cl. 252-627.000.
- Kersten, Lars: See—
Muschelknaute, Edgar; Becker, Ernst; Bartsch, Adalbert; Kersten, Lars; Gospos, Georg; and Berndt, Gerhard, 4,871,147, Cl. 266-182.000.
- Kersten, Reinhard; Kuhlmoegen, Karl J.; and Kuhl, Egbert, to U.S. Philips Corporation. Method of controlling the supply of power to electrical loads with a minimum of switching surges. 4,871,961, Cl. 323-267.000.
- Kesling, Haven S., Jr.: See—
Shaw, Edward T.; and Kesling, Haven S., Jr., 4,871,871, Cl. 560-344.000.
- Kestel, Frederick J. Rotary hoe tool. 4,871,031, Cl. 172-544.000.
- Kesting, Robert E.; Fritzsche, Alfred K.; Murphy, Milton K.; Handermann, Alan C.; Cruse, Clint A.; and Malon, Raymond F., to Permea, Inc. Process for forming asymmetric gas separation membranes having graded density skins. 4,871,494, Cl. 264-41.000.
- Ketcham, Kenneth E.; Barry, John; and Hofius, David V., to Ketcham, Kenneth E.; and Barry, John. Sports protection garment. 4,870,706, Cl. 2-2.000.
- Ketcham, Thomas D., to Corning Incorporated. Spherical particles having narrow size distribution made by ultrasonic vibration. 4,871,489, Cl. 264-9.000.
- Ketkar, Anil B.: See—
Chen, Nai Y.; Hub, Billy K.; Ketkar, Anil B.; and Venkat, Chaya, 4,871,444, Cl. 208-46.000.
- Keystone International, Inc.: See—
Bickford, Cleo M.; Powell, Walter W.; and Sample, Larry A., 4,870,989, Cl. 137-489.000.
- Khariton, Khaim: See—
Stollar, Hyman; Khariton, Khaim; Grinberg, Mark; and Ellmann, Eva, 4,871,882, Cl. 568-639.000.
- Khuddus, Mo A., to Ethyl Corporation. Halogenated bis-imide flame retardants. 4,871,863, Cl. 548-462.000.
- Khutoryansky: See—
Tutt, Timothy T.; Westmeyer, Mark; and Khutoryansky, 4,872,064, Cl. 358-464.000.
- Kicherer, Robert, to E.G.O. Elektro-Gerate Blanc u. Fischer. Electric hotplate and apparatus for the connection thereof. 4,871,902, Cl. 219-458.000.
- Kiel, Johnathan L., to United States of America, Air Force. Method of inhibiting the activity of peroxidases and stimulating tumor growth. 4,871,770, Cl. 514-567.000.
- Kiener, Volker; Nonn, Guenther; Seid, Bernhard; Schewski, Harald; and Buellmeyer, Karl, to BASF Aktiengesellschaft. Continuous preparation of solutions of low viscosity solvents and high viscosity, pasty products. 4,871,373, Cl. 23-306.000.
- Kierstead, Mark S.: See—
Baer, Thomas M.; and Kierstead, Mark S., 4,872,177, Cl. 372-75.000.
- Kies, Anton M.; van den Nieuwelaar, Harry C.; and Bowmer, Geoff M., to Erico International Corporation. Tapered rolled thread bar joint. 4,870,848, Cl. 72-89.000.
- Kikkawa, Steven. Injury resistant needle and blood collection tube holder. 4,871,355, Cl. 604-198.000.
- Kikuchi, Kenichi: See—
Kanbara, Kouji; Kikuchi, Kenichi; Shimizu, Yoshihito; Hattori, Shinichiro; Tojo, Yoshikazu; Hasegawa, Akira; Yamaguchi, Tatsuya; Tsukaya, Takashi; Kobayashi, Kazunari; Murata, Masanao; Yamamoto, Tsutomu; and Nakamura, Takeaki, 4,870,950, Cl. 128-6.000.
- Killat, George R.; and Tomalia, Donald A., to Dow Chemical Company. The ion exchange/chelation resins containing dense star polymers having ion exchange or chelate capabilities. 4,871,779, Cl. 521-28.000.
- Killpatrick, Joseph E.; and Sanders, Glen A. Readout apparatus for a laser angular rate sensor. 4,871,253, Cl. 356-350.000.
- Kim, Manjin J.; Brown, Dale M.; Cohen, Simon S.; Gorowitz, Bernard; and Saia, Richard J., to General Electric Company. Ohmic contacts and interconnects to silicon and method of making same. 4,871,617, Cl. 428-450.000.
- Kim, Sun H., to Biomeasure, Inc. Immunomodulators and method of making same. 4,871,870, Cl. 560-039.000.
- Kimball International, Inc.: See—
Schneider, Stanley A.; and Knust, John G., 4,871,061, Cl. 206-326.000.
- Kimura, Hiromoto: See—
Kuroko, Masayasu; Unno, Ryoichi; Kimura, Hiromoto; Oka, Mitsuru; Hasegawa, Keiko; Ikeda, Shinichi; Kuboyama, Noboru; Ito, Takashi; Sawai, Kiuchi; and Ito, Shunshuke, 4,871,740, Cl. 514-255.000.
- Kimura, Hiroshi; and Takagi, Akira, to Toshiba Silicone Co., Ltd. Surface-treated poly methyl silsequoxane powder. 4,871,616, Cl. 428-407.000.
- Kimura, Michio: See—
Seki, Kenji; Hashimoto, Junichiro; Kimura, Michio; Yamanami, Hirofumi; Mochizuki, Satomi; and Aiso, Izumi, 4,871,635, Cl. 430-60.000.
- Kimura, Toshihiko: See—
Fujiwhara, Mitsuo; Uchida, Takashi; and Kimura, Toshihiko, 4,871,655, Cl. 430-519.000.
- Kimura, Tsutomu; Hishinuma, Kazuhiro; and Shiraishi, Misashi, to Fuji Photo Film Co., Ltd. Signal processing method in autoradiography. 4,871,913, Cl. 250-327.500.
- Kinast, Gunther; Schuller, Matthias; and Schroder, Theo, to Bayer Aktiengesellschaft. 3-Amino-4,5-dihydroxypiperidines, process for their preparation and their use. 4,871,747, Cl. 514-315.000.
- Kinbara, Hidenori: See—
Gaku, Morio; and Kinbara, Hidenori, 4,871,811, Cl. 525-148.000.
- Kindt, Stefan: See—
Burghardt, Hartmut; Jahns, Juergen; and Kindt, Stefan, 4,871,222, Cl. 350-96.140.
- King, Francis D.; and Joiner, Karen A., to Beecham Group p.l.c. Certain 2,3-dihydro-indole-1-carboxamido-N-[8-azabicyclo(3.2.1)octan-3-yl]derivatives having 5-HT-antagonist activity. 4,871,744, Cl. 514-299.000.
- Kingsford, Kenji A., to Mace Corporation. Double shield fitting. 4,871,196, Cl. 285-138.000.
- Kingsley, Christopher, to VLSI Technology, Inc. Method of positioning two modules having angled edges. 4,872,103, Cl. 364-153.000.
- Kinneberg, Peter A.; and Armer, Thomas A., to Shell Oil Company. Laminar structures prepared with polyketone structural adhesives. 4,871,618, Cl. 428-461.000.
- Kinoshita, Kazuo: See—
Ueno, Toru; Fukuoaka, Youichi; Baba, Seiichi; Miyoshi, Kaoru; and Kinoshita, Kazuo, 4,871,910, Cl. 250-560.000.
- Kinoshita, Shigeo: See—
Yamaguchi, Katsumi; Yoshikawa, Kikuo; Kinoshita, Shigeo; Kanai, Takao; and Yokoi, Syouchiro, 4,872,075, Cl. 360-85.000.

- Kinoshita, Yasushi: See—
Okamoto, Tatsuo; Kotani, Hideo; Oono, Takio; Watabe, Kiyoto; Kinoshita, Yasushi; and Nishikawa, Yoshikazu, 4,872,050, Cl. 357-71.000.
- Kinpara, Keiji: See—
Yokogawa, Fumihiko; Hirano, Hiroyuki; and Kinpara, Keiji, 4,872,155, Cl. 369-59.000.
- Kinzig, Charles M.: See—
Gleason, John G.; Hoffstein, Sylvia T.; Kinzig, Charles M.; Mong, Seymour; and Sarau, Henry M., 4,871,771, Cl. 514-570.000.
- Kira, Kazuaki, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Artificial vessel, 4,871,361, Cl. 623-1.000.
- Kirby, John P.; and Paglia, Richard, to Polaroid Corporation. Ultrasonic transducer for use in a corrosive/abrasive environment, 4,872,148, Cl. 367-172.000.
- Kirchner, Kurt: See—
Rehm, Hans J.; and Kirchner, Kurt, 4,871,673, Cl. 435-262.000.
- Kirkpatrick, Hugh J.; Lee, Thomas J.; and Lee, James M. Drywall cutting tool, 4,870,757, Cl. 30-344.000.
- Kirkpatrick, John A.: See—
Budean, John D.; and Kirkpatrick, John A., 4,870,846, Cl. 72-77.000.
- Kissner, Robert J.: See—
Wosaba, Charles L., II; Hamilton, Peter W.; and Kissner, Robert J., 4,871,345, Cl. 493-59.000.
- Kitamoto, Manabu, to Kabushiki Kaisha Toshiba. Multi-type air conditioner system with oil level control for parallel operated compressor therein, 4,870,831, Cl. 62-84.000.
- Kitamura, Mitsuo: See—
Kodaka, Kazuyuki; Kitamura, Mitsuo; and Motegi, Mitsuhiro, 4,871,121, Cl. 242-54.00R.
- Kitao, Katsutoshi; and Hamada, Akihiko, to Sumitomo Rubber Industries, Ltd. Method of coating a golf ball, 4,871,589, Cl. 427-322.000.
- Kitani, Katsugi; and Hoshi, Satoshi, to Fuji Photo Film Co., Ltd. Electroconductive composition and electrophotographic photoreceptor using the same comprising bisazo compounds, 4,871,637, Cl. 430-77.000.
- Kitazawa, Eiichi: See—
Yoshioka, Takao; Kitazawa, Eiichi; Yamazaki, Mitsuo; and Iizuka, Yoshio, 4,871,762, Cl. 514-439.000.
- Kite, Joseph S., III: See—
Tresslar, Marie C.; Kite, Joseph S., III; Piotrowski, Michael J.; and Conaghan, Thomas B., 4,870,887, Cl. 87-9.000.
- Kitt, Martin P., to Ithy Industries, Inc. Method and apparatus for forming outwardly projecting beads on cylindrical objects, 4,870,847, Cl. 72-84.000.
- Kiuchi, Harunaga: See—
Murata, Hiroyuki; Tanaka, Takeshi; Hino, Chouji; Kiuchi, Harunaga; and Chiji, Masahiro, 4,871,119, Cl. 241-189.00R.
- Klann, Horst. Device for pressing in and pulling off bearings or sleeves, in particular for axle bearings and/or wheel flange hubs on motor vehicles, 4,870,740, Cl. 29-263.000.
- Klaser, John J., to Litton Systems, Inc. Method of making a multilayer printed circuit board having screened-on resistors, 4,870,746, Cl. 29-620.000.
- Klein, Edward. Modular communications jack lock, 4,870,840, Cl. 70-57.000.
- Kleiner, Hans-Jerg: See—
Brindopke, Gerhard; Walz, Gerd; Waldmann, Karl; Schon, Manfred; and Kleiner, Hans-Jerg, 4,871,822, Cl. 526-271.000.
- Klement, Ekkehard: See—
Karstensen, Holger; and Klement, Ekkehard, 4,871,224, Cl. 350-96.150.
- Klinkenberg, Pamela M.: See—
Zimmel, John M.; Klinkenberg, Pamela M.; Bunnelle, William L.; and Knutson, Keith C., 4,871,803, Cl. 525-89.000.
- Klockner-Humboldt Deutz Aktiengesellschaft: See—
Schneider, Richard, 4,870,913, Cl. 110-299.000.
- Klosowski, Jerome M.; and Meddaugh, Michael D., to Dow Corning Corporation. Method of improving shelf life of silicone elastomeric sealant, 4,871,827, Cl. 528-17.000.
- Klosterman, James E. Simplified adjustable ski binding structure, 4,871,186, Cl. 280-611.000.
- Knape & Vogt Manufacturing Co.: See—
Bessinger, Walter L.; and Hogan, Michael J., 4,871,136, Cl. 248-250.000.
- Knetzger, Robert C., to NeoToy Partnership. Gaming method and apparatus, 4,871,176, Cl. 273-237.000.
- Knibbs, Simon: See—
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- Knipscheer, Hermann: See—
Hindrich, Emilia; and Knipscheer, Hermann, 4,870,897, Cl. 99-404.000.
- Knorr, Winfried, to Minnesota Mining and Manufacturing Company. Support helix for a radially expanded resilient sleeve, 4,871,599, Cl. 428-36.900.
- Knotek, Otto: See—
Munz, Wolf-Dieter; Hensel, Bernd; Scherer, Michael; and Knotek, Otto, 4,871,434, Cl. 204-192.160.
- Knudsen, James K.: See—
Skuratovsky, Eugene; and Knudsen, James K., 4,871,908, Cl. 250-227.000.
- Knust, John G.: See—
Schneider, Stanley A.; and Knust, John G., 4,871,061, Cl. 206-326.000.
- Knutson, Keith C.: See—
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- Kobashi, Toshiyuki: See—
Sugimoto, Hiroaki; Hayatsu, Kazuo; Kobashi, Toshiyuki; and Takao, Seiji, 4,871,501, Cl. 264-211.220.
- Kobayashi, Kazunari: See—
Kanbara, Kouji; Kikuchi, Kenichi; Shimizu, Yoshihito; Hattori, Shinichiro; Tojo, Yoshikazu; Hasegawa, Akira; Yamaguchi, Tatsuya; Tsukaya, Takashi; Kobayashi, Kazunari; Murata, Masanao; Yamamoto, Tsutomu; and Nakamura, Takeaki, 4,870,950, Cl. 128-6.000.
- Kobayashi, Kazushi: See—
Kubota, Kazumi; Kobayashi, Kazushi; and Ogura, Toshihiko, 4,872,131, Cl. 364-736.000.
- Kobayashi, Mamoru: See—
Fukasawa, Hideyuki; Kobayashi, Mamoru; and Wanami, Masahiro, 4,871,110, Cl. 228-245.000.
- Kobayashi, Masakazu: See—
Hayashi, Takatoshi; Fujiki, Norio; Tanaka, Yoichiro; Nishimoto, Takashi; and Kobayashi, Masakazu, 4,871,993, Cl. 340-439.000.
- Kobayashi, Masao: See—
Akutsu, Hidetoshi; Iwamura, Takuro; and Kobayashi, Masao, 4,872,048, Cl. 357-67.000.
- Kobayashi, Masashi, to Maruman Golf Co., Ltd. Golf club, 4,871,174, Cl. 273-164.000.
- Kobayashi, Mikio: See—
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- Kobayashi, Tadashi, to Canon Kabushiki Kaisha. Opto-magnetic recording medium having three exchange-coupled magnetic layers, 4,871,614, Cl. 428-336.000.
- Kobinger, Walter: See—
Heider, Joachim; Psorz, Manfred; Bomhard, Andreas; Huel, Norbert; Narr, Berthold; Noll, Klaus; Lillie, Christian; Kobinger, Walter; and Dammgen, Jurgen, 4,871,735, Cl. 514-213.000.
- Kocher, Mark J.: See—
Cieri, Joseph J.; Kocher, Mark J.; Gareis, Ronald E.; Holet, Kenneth M.; and Tuso, Michael J., 4,872,136, Cl. 364-900.000.
- Kochi, Hiromu: See—
Takaya, Takao; Masugi, Takashi; Takasugi, Hisashi; and Kochi, Hiromu, 4,871,860, Cl. 548-195.000.
- Kochmann, Heike; Lechner, Georg; Muller, Jurgen; and Scholz, Norbert, to Agfa-Gevaert AG. Device for producing photographic exposure of images appearing on the screen, 4,872,030, Cl. 354-76.000.
- Kodaka, Kazuyuki; Kitamura, Mitsuo; and Motegi, Mitsuhiro, to Fujitsu Limited. Method and tank for storing a submarine optical cable, 4,871,121, Cl. 242-54.00R.
- Kodama, Satoru: See—
Asahina, Takashi; Akiyoshi, Mitsuo; Mitsumoto, Yoshio; Kodama, Satoru; and Tsujimoto, Masaharu, 4,870,896, Cl. 99-348.000.
- Kodani, Masateru: See—
Ueda, Yoshio; Hata, Takehisa; Yamaguchi, Hisami; Ueda, Satoshi; and Kodani, Masateru, 4,871,549, Cl. 424-494.000.
- Koenig, Peter: See—
Stenzenberger, Horst; and Koenig, Peter, 4,871,821, Cl. 526-262.000.
- Koeppke, Jeffery W.; and Abdo, Suheil F., to Union Oil Company of California. Hydrocarbon conversion, 4,871,445, Cl. 208-89.000.
- Koffron, Robert J., to Tetron, Inc. Vortex inhibitor for molten metal discharge, 4,871,148, Cl. 266-230.000.
- Kohara, Tadanao; and Ueki, Satoshi, to Toa Nenryo Kogyo K.K. Catalyst for olefin polymerization, 4,871,704, Cl. 502-114.000.
- Kohguchi, Kenji: See—
Baba, Isao; Kondo, Takeo; Yanagisawa, Leichi; and Kohguchi, Kenji, 4,872,045, Cl. 357-13.000.
- Kohin, Margaret, to Litton Systems, Inc. Short wavelength pass filter having a metal mesh on a semiconducting substrate, 4,871,220, Cl. 350-1.700.
- Kohler Co.: See—
Heinrich, Martin W.; and Fischer, Donald R., 4,871,922, Cl. 290-1.00B.
- Kohler, Karl; and Reith, Dirk V., to Messerschmitt-Boelkow-Blohm GmbH. On-board water supply, 4,871,452, Cl. 210-167.000.
- Kohno, Akiomi: See—
Yamada, Toshihiro; and Kohno, Akiomi, 4,871,107, Cl. 228-121.000.
- Kohno, Michio: See—
Suzuki, Akiyoshi; and Kohno, Michio, 4,871,257, Cl. 356-400.000.
- Koito Manufacturing Co., Ltd.: See—
Kondo, Hiroyuki; Harada, Tadashi; and Uchida, Kihachiro, 4,871,331, Cl. 439-736.000.
- Koizumi, Hiroyasu: See—
Suzuki, Masaomi; and Koizumi, Hiroyasu, 4,871,894, Cl. 219-93.000.
- Kojima, Osamu: See—
Shimomura, Yozo; Mori, Kinya; and Kojima, Osamu, 4,871,805, Cl. 525-98.000.

- Kojima, Tetsuro: See—
Inoue, Noriyuki; Heki, Tatsuo; and Kojima, Tetsuro, 4,871,653, Cl. 430-409.000.
- Kojima, Yasuhiko; and Tamamura, Sadao, to Kojima, Yasuhiko. Process for producing a biologically active substance and compositions containing the same, 4,871,540, Cl. 424-195.100.
- Kojima, Yoshiyuki: See—
Yonekura, Norihisa; Yumita, Takashi; Nezu, Yukio; Kojima, Yoshiyuki; Maeno, Shin-ichiro; and Yaguchi, Shigeharu, 4,871,751, Cl. 514-345.000.
- Kokubo, Tadayoshi: See—
Uenishi, Kazuya; Kokubo, Tadayoshi; and Kawabe, Yasumasa, 4,871,645, Cl. 430-192.000.
- Kokubo, Yasushi; Suzuki, Keisuke; and Mori, Seichiro, to JEOL Ltd. Control system using external computer for electron microscope, 4,871,912, Cl. 250-311.000.
- Kokubu, Sadao, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Optical switch device employing fluorescent substance in combination with a radioactive element as a light source, 4,871,909, Cl. 250-229.000.
- Kolesar, Edward S., Jr., to United States of America, Air Force. Ion detection using a differential resistance measurement of an ion exchange membrane, 4,871,427, Cl. 204-1.00T.
- Komamura, Tawara; Ikeuchi, Satoru; Iwagaki, Masaru; Sasaki, Takashi; and Ishikawa, Wataru, to Konishiroku Photo Industry Co., Ltd. Method of forming color diffusion transfer image by heat development, 4,871,647, Cl. 430-201.000.
- Komatsu, Masato; Baba, Isao; and Yamamoto, Noboru. Method of production of thermoplastic elastomer compounds, 4,871,796, Cl. 524-474.000.
- Komiya, Yutaka: See—
Miyake, Hiroyuki; Sagara, Seiji; Yonemori, Takaji; Watanabe, Tsuyoshi; Takahashi, Masayoshi; Suzuki, Koji; Komiya, Yutaka; Tomosada, Masahiro; Adachi, Hideki; Hirose, Masayuki; and Miyata, Masanori, 4,872,035, Cl. 355-208.000.
- Komori, Kazuhiko: See—
Sugiura, Jun; and Komori, Kazuhiko, 4,872,041, Cl. 357-23.500.
- Konaka, Yukio, to Shibuya Kogyo Co. Ltd. Carton erecting apparatus, 4,871,348, Cl. 493-315.000.
- Kondo, Hiroyuki; Harada, Tadashi; and Uchida, Kihachiro, to Yazaki Corporation; and Koito Manufacturing Co., Ltd. Bulb socket for wedge-base bulb, 4,871,331, Cl. 439-736.000.
- Kondo, Kazuo; Morikawa, Asao; Iwata, Hiroshi; and Shibata, Yoshimasa, to NGK Spark Plug Co., Ltd. High-density wiring multilayered substrate, 4,871,608, Cl. 428-209.000.
- Kondo, Takeo: See—
Baba, Isao; Kondo, Takeo; Yanagisawa, Leichi; and Kohguchi, Kenji, 4,872,045, Cl. 357-13.000.
- Kone Oy: See—
Rantanen, Raimo; Huhta, Pentti; and Winqvist, Hans-Erik, 4,871,059, Cl. 198-532.000.
- Konica Corporation: See—
Fujiwhara, Mitsuo; Uchida, Takashi; and Kimura, Toshihiko, 4,871,655, Cl. 430-519.000.
- Konishi, Yoshiharu: See—
Kano, Mitsunari; Konishi, Yoshiharu; and Matsuda, Toshihiko, 4,872,000, Cl. 340-706.000.
- Konishiroku Photo Industry Co., Ltd.: See—
Kageyama, Takashi; and Yoshida, Makoto, 4,870,920, Cl. 118-103.000.
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- Sakamoto, Eiichi; Kaneko, Yutaka; Ninomiya, Hidetaka; Kamio, Takashi; Ezaki, Atsuo; Akamatsu, Hideo; and Haraga, Hideaki, 4,871,658, Cl. 430-551.000.
- Watanabe, Kazuo; Nishimura, Toshiharu; and Kakutani, Masaki, 4,872,033, Cl. 355-27.000.
- Kopec, Stanley J., Jr.: See—
Wong, Sau-Ching; So, Hock-Chuen; Kopec, Stanley J., Jr.; and Hartmann, Robert F., 4,871,930, Cl. 307-465.000.
- Korea Advanced Energy Research Institute: See—
Yoon, Myoungwhan; Whang, Seongtae; Chang, Insoon; and Han, Pilsoon, 4,871,518, Cl. 423-11.000.
- Kornblum, Saul S.: See—
Feltz, Dennis R.; Kornblum, Saul S.; and Stoopak, Samuel B., 4,871,546, Cl. 424-482.000.
- Korte, Siegfried: See—
Lindner, Christian; Dickore Karlfried; Suling, Carlhans; Korte, Siegfried; and Podszun, Wolfgang, 4,871,850, Cl. 544-256.000.
- Koseki, Ryoji, to Amada Engineering Service Co., Inc. Beam monitor for a high-output laser, 4,871,250, Cl. 356-121.000.
- Kosoczky, Ibolya: See—
Batori, Sandor; Hajos, Gyorgy; Messmer, Andras; Benko, Pal; Pallos, Laszlo; Petocz, Lujza; Grasser, Katalin; Kosoczky, Ibolya; and Szirt nee Kiszely, Eniko, 4,871,846, Cl. 544-183.000.
- Kotani, Hideo: See—
Okamoto, Tatsuo; Kotani, Hideo; Oono, Takio; Watabe, Kiyoto; Kinoshita, Yasushi; and Nishikawa, Yoshikazu, 4,872,050, Cl. 357-71.000.
- Kotani, Tomoyuki: See—
Otonari, Satoshi; Sato, Yoshinori; Masuda, Narihiro; and Kotani, Tomoyuki, 4,871,784, Cl. 521-138.000.
- Kotting, Fritz, to Wernicke & Co. GmbH. Lens holder for an apparatus for grinding the edges of a lens, 4,870,785, Cl. 51-217.00L.
- Kousaka, Fumio: See—
Okina, Toyohiko; Goto, Hiroshi; Kousaka, Fumio; Teranishi, Akinori; Kawabata, Satoshi; Ohya, Tetsuo; Ohya, Makoto; and Kozaki, Norio, 4,871,612, Cl. 428-269.000.
- Kovacs, Gabor: See—
Hermecz, Istvan; Kereszturi, Geza; Vasvavi, Lelle; Horvath, Agnes; Balogh, Maria; Kovacs, Gabor; Szuts, Tamas; Ritli, Peter; Sipos, Judit; and Pajor, Aniko, 4,871,849, Cl. 544-229.000.
- Kovacs, Marta: See—
Sebestyen, Gyula; Simonyi, Istvan; Miholics, Gizelle; Kovacs, Marta; Gorgenyi, Frigyes; Fekete, Marton; Vago, Pal; Seres, Istvan; Egri, Janos; and Szeli, Maria, 4,871,728, Cl. 514-187.000.
- Kowieski, Raymond J.: See—
Ocken, Alfred G.; Charlier, Michael L.; and Kowieski, Raymond J., 4,872,089, Cl. 361-388.000.
- Koyo Seiko Co., Ltd.: See—
Daido, Toshihiko; Fujiwara, Mitsugu; and Nishimura, Shigeo, 4,871,039, Cl. 180-79.100.
- Kozaki, Norio: See—
Okina, Toyohiko; Goto, Hiroshi; Kousaka, Fumio; Teranishi, Akinori; Kawabata, Satoshi; Ohya, Tetsuo; Ohya, Makoto; and Kozaki, Norio, 4,871,612, Cl. 428-269.000.
- Kozawa, Tetsuo; and Asano, Satoru, to Brother Kogyo Kabushiki Kaisha. Sewing machine capable of being equipped with one of a plurality of operating panels, 4,870,916, Cl. 112-121.110.
- Kozuki, Susumu: See—
Maeda, Masaya; Takimoto, Hiroyuki; and Kozuki, Susumu, 4,872,072, Cl. 360-33.100.
- Kozyski, Vincent T.; and Peters, Alan R., to Fletcher-Terry Company, The. Mat bevel cutting machine, 4,871,156, Cl. 269-303.000.
- Kraus, Reinhold: See—
Beckermann, Bernhard; Dell, Hans-Dieter; Horstmann, Harald; and Kraus, Reinhold, 4,871,767, Cl. 514-536.000.
- Krause, Joachim; Reiffenrath, Volker; and Geelhaar, Thomas, to Merck Patent Gesellschaft mit Beschränkter Haftung. Esters in ferroelectric mixtures, 4,871,472, Cl. 252-299.650.
- Krause, Joachim: See—
Reiffenrath, Volker; Krause, Joachim; Geelhaar, Thomas; Eiden-schink, Rudolf; Kurmeier, Hans-Adolf; Poetsch, Eike; Scheuble, Bernhard; and Weber, Georg, 4,871,469, Cl. 252-299.610.
- Wachtler, Andreas; Krause, Joachim; Eidschink, Rudolf; and Weber, Georg, 4,871,470, Cl. 252-299.630.
- Krauss, Andre; Martin, Harry; and Pszenny, Richard, to Hydrocosmetics, Inc. Cosmetic dispensing system, 4,871,262, Cl. 366-160.000.
- Krauss-Maffei A.G.: See—
Spöetzl, Markus, 4,871,492, Cl. 264-39.000.
- Krepski, Larry R.: See—
Heilmann, Steven M.; Rasmussen, Jerald K.; Krepski, Larry R.; Milbrath, Dean S.; and Coleman, Patrick L., 4,871,824, Cl. 526-304.000.
- Kress, Robert W., to Grumman Aerospace Corporation. Data processing system for a phased array antenna, 4,872,016, Cl. 342-380.000.
- Krichever, Mark J.: See—
Metlitsky, Boris; and Krichever, Mark J., 4,871,904, Cl. 235-467.000.
- Krinke, Harlan L.: See—
Hoopman, Timothy L.; Johnson, Dee L.; and Krinke, Harlan L., 4,871,623, Cl. 428-586.000.
- Krochmalny, Andrew J.: See—
Laessle, David L.; Carlson, Todd S.; Krochmalny, Andrew J.; and Anderson, Leroy C., 4,871,296, Cl. 415-123.000.
- Kroesen, Gerardus M. W.: See—
Schram, Daniel C.; and Kroesen, Gerardus M. W., 4,871,580, Cl. 427-38.000.
- Krone Aktiengesellschaft: See—
Muller, Manfred; and Biederstedt, Lutz, 4,871,330, Cl. 439-709.000.
- Kruse, Heinz-Josef: See—
Sippel, Achim; Kruse, Heinz-Josef; and Karius, Klaus D., 4,870,905, Cl. 102-524.000.
- Kruse, Oliver M., to Brillion Iron Works, Inc. Farm implement having transport wheels and soil working rollers on rotating frame, 4,871,030, Cl. 172-397.000.
- Ku, San-Mei: See—
Glang, Reinhard; and Ku, San-Mei, 4,871,684, Cl. 437-31.000.
- Kubota, Kazumi; Kobayashi, Kazushi; and Ogura, Toshihiko, to Hitachi, Ltd. Arithmetic-logic operation unit having high-order and low-order processing sections and selectors for control of carry flag transfer therebetween, 4,872,131, Cl. 364-736.000.
- Kuboyama, Noboru: See—
Kuronos, Masayasu; Unno, Ryoichi; Kimura, Hiromoto; Oka, Mitsuru; Hasegawa, Keiko; Ikeda, Shinichi; Kuboyama, Noboru; Ito, Takashi; Sawai, Kiichi; and Ito, Shunshuke, 4,871,740, Cl. 514-255.000.
- Kudo, Hiroaki: See—
Matsui, Sadayoshi; Taneya, Mototaka; Matsumoto, Mitsuhiro; Hosoba, Hiroyuki; Takiguchi, Haruhisa; and Kudo, Hiroaki, 4,872,174, Cl. 372-45.000.
- Kudoh, Toshiharu: See—
Ikeda, Tomohiro; Hatagishi, Yuji; Totsuka, Mitsuhiro; and Kudoh, Toshiharu, 4,871,990, Cl. 337-238.000.
- Kudzman, Linas V.: See—
Lin, Bor-Sheng; Kudzman, Linas V.; and Spencer, H. Kenneth, 4,871,749, Cl. 514-326.000.
- Kuhl, Egbert: See—
Kersten, Reinhard; Kuhlmoegen, Karl J.; and Kuhl, Egbert, 4,871,961, Cl. 323-267.000.

- Kuhlmoegen, Karl J.: See—
Kersten, Reinhard; Kuhlmoegen, Karl J.; and Kuhl, Egbert, 4,871,961, Cl. 323-267.000.
- Kuma, Tosimi; and Okano, Hiroshi, to Kabushiki Kaisha Seibu Giken; and Kuma, Tosimi, part interest to each. Humidity exchanger element, 4,871,607, Cl. 428-186.000.
- Kumagai, Shuzo: See—
Takahashi, Hareo; Hatakeyama, Hideharu; and Kumagai, Shuzo, 4,870,893, Cl. 92-71.000.
- Toyoda, Hiroshi; Shimizu, Shigemi; Hatakeyama, Hideharu; Kumagai, Shuzo; and Takahashi, Hareo, 4,870,894, Cl. 92-71.000.
- Kumai Chemical Industry Co., Ltd.: See—
Yonekura, Norihisa; Yumita, Takashi; Nezu, Yukio; Kojima, Yoshiyuki; Maeno, Shin-ichiro; and Yaguchi, Shigeharu, 4,871,751, Cl. 514-345.000.
- Kumar, M. Lalith, to Suprex Corporation. Chromatographic separation method and associated apparatus, 4,871,433, Cl. 210-198.200.
- Kumbier, John F. Pallet cover, 4,871,063, Cl. 206-386.000.
- Kumeda, Yasuo: See—
Gerhart, Paul B.; and Kumeda, Yasuo, 4,872,186, Cl. 375-117.000.
- Kunkel, Ernst; and Rutz, Wolfhard, to Pelikan Aktiengesellschaft. Typewriter ribbon having a thin support and a transferable mass, for typing on varied surfaces, 4,871,620, Cl. 428-484.000.
- Kuntzmann, Jean C.; and Santonja, Noel, to Thomson-CSF. Wide band device for coupling between the delay line of a travelling wave tube and the external circuit transmitting the energy of the tube, 4,871,950, Cl. 315-393.000.
- Kuo, Ying-Yan, to Ford Aerospace Corporation. Variable conductance thermal insulation blanket, 4,871,012, Cl. 165-41.000.
- Kupper, Gerd: See—
Bievert, Klaus; Bruder, Wolfgang; Geilhaupt, Manfred; Kupper, Gerd; and Zabinski, Siegfried, 4,871,155, Cl. 269-289.00R.
- Kuraray Co., Ltd.: See—
Omatsu, Toshihiro; Tokitoh, Yasuo; and Yoshimura, Noriaki, 4,871,880, Cl. 568-454.000.
- Kurashiki Boseki Kabushiki Kaisha: See—
Matsui, Shigeaki; Hirai, Eiichi; and Nakamura, Junji, 4,871,674, Cl. 435-284.000.
- Kurita, Hitoshi: See—
Ohtsuka, Akinori; Kurita, Hitoshi; and Fujii, Yasutetsu, 4,872,008, Cl. 341-26.000.
- Kurmeier, Hans-Adolf: See—
Reifenrath, Volker; Krause, Joachim; Geelhaar, Thomas; Eiden-schinn, Rudolf; Kurmeier, Hans-Adolf; Poetsch, Eike; Scheuble, Bernhard; and Weber, Georg, 4,871,469, Cl. 252-299.610.
- Kuroishi, Masayuki: See—
Tamagawa, Shigehisa; and Kuroishi, Masayuki, 4,871,642, Cl. 430-138.000.
- Tamagawa, Shigehisa; and Kuroishi, Masayuki, 4,871,643, Cl. 430-138.000.
- Kuroki, Masahide: See—
Matsuoka, Yuji; and Kuroki, Masahide, 4,871,834, Cl. 530-387.000.
- Kurono, Masayasu; Unno, Ryoichi; Kimura, Hiromoto; Oka, Mitsuru; Hasegawa, Keiko; Ikeda, Shinichi; Kuboyama, Noboru; Ito, Takashi; Sawai, Kiichi; and Ito, Shunshuke, to Sanwa Kagaku Kenkyusho Co., Ltd. Glycyrrhetic acid derivatives and use thereof, 4,871,740, Cl. 514-255.000.
- Kuroyanagi, Isao: See—
Ogawa, Shinji; Kajikawa, Yoshiharu; Kuroyanagi, Isao; Baba, Norimasa; and Ohara, Toshio, 4,870,834, Cl. 62-197.000.
- Kusakabe, Nobuo: See—
Fujimoto, Masami; Inazumi, Tadashi; Satoh, Katsuhiko; Shimozawa, Eiichi; Awa, Yasuhiko; Sato, Fumihiko; Nozaki, Kenro; Gushima, Akira; Suemura, Yoshinobu; Kusakabe, Nobuo; Imada, Kunihiko; Arichi, Masatoshi; Tanaka, Mitsunori; Umez, Yoshinori; and Ikeda, Tsuneo, 4,871,393, Cl. 75-5.000.
- Kusayanagi, Yoshikazu: See—
Hirai, Shiro; Hirano, Hiroshi; Arai, Hiroto; Shibata, Hisanari; Kusayanagi, Yoshikazu; and Hashiba, Kazuhiko, 4,871,765, Cl. 514-471.000.
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- Kushizaki, Osami: See—
Seo, Hiromi; and Kushizaki, Osami, 4,872,153, Cl. 369-44.000.
- Kusumoto, Koji: See—
Hyodo, Masakatsu; Kusumoto, Koji; and Yagi, Isaburo, 4,871,413, Cl. 156-382.000.
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Kushibiki, Nobuo; Yoshinaga, Yoko; Taniguchi, Naosato; and Kuwayama, Tetsuro, 4,871,411, Cl. 156-249.000.
- Kuypers, Theo W.: See—
Bohren, Hans-Ueli; Kuypers, Theo W.; and Meister, Niklaus, 4,871,573, Cl. 426-588.000.
- KVT Kunststoffverfahrenstechnik GmbH & Co.: See—
Hiltehaus, Karl-Heinz, 4,871,829, Cl. 528-48.000.
- Kyte, Albert David: See—
Faxon, Robert L., Sr., 4,870,882, Cl. 83-471.300.
- Laboratoires Chauvin: See—
Bonne, Claude; Coquelet, Claude; and Latour, Elisabeth, 4,871,742, Cl. 514-262.000.
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Simon, James R.; Truc, Donald C.; and Lafond, Jacques, 4,870,902, Cl. 102-201.000.
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Mizandjian, Jean-Luc; Pean, Jean-Louis; and Amen, Jean, 4,870,801, Cl. 53-432.000.
- Laird, Keith A., to Hoechst Celanese Corporation. Rhodium recovery from hydroformylation reaction product, 4,871,879, Cl. 568-454.000.
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Lapeyre, James M., 4,871,505, Cl. 264-328.100.
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Ogle, John; and Yin, Gerald Z., 4,871,421, Cl. 156-643.000.
- Lamanna, William M.; McCormick, Fred B.; and Wright, Robin E., to Minnesota Mining and Manufacturing Company. Colloidal metals in monomers or polymers, 4,871,790, Cl. 523-333.000.
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- Landry, C. John: See—
Beni, Gerardo; Mar, Alan; and Landry, C. John, 4,871,252, Cl. 356-347.000.
- Landsness, Carl J.: See—
Buskirk, William A.; Landsness, Carl J.; and Rhodes, John D., 4,872,027, Cl. 346-140.00R.
- Lang, Hans-Jochen; Rosner, Manfred; Weidmann, Klaus; Rippel, Robert; and Herling, Andreas W., to Hoechst Aktiengesellschaft. Substituted thienoimidazole-toluidine derivatives as inhibitors of gastric acid secretion, 4,871,734, Cl. 514-212.000.
- Lang, Raymond W.: See—
Webb, Thomas E.; Schumm, Dorothy E.; Hanausek-Walaszek, Margaret; Walaszek, Zbigniew; and Lang, Raymond W., 4,871,661, Cl. 435-7.000.
- Langen, Marinus J. M.; and Guttinger, Peter, to H. J. Langen & Sons Limited. Carton end closure, 4,871,070, Cl. 206-591.000.
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Marchiori, Mirko; Lant, Danny; Lancerotto, Fabio; and Gerin, Umberto, 4,870,815, Cl. 57-299.000.
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Murray, William D.; Duff, Sheldon J. B.; and Lanthier, Patricia H., 4,871,669, Cl. 435-147.000.
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Dwivedi, Ratish K.; and Irick, Virgil, Jr., 4,871,008, Cl. 164-6.000.
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O'Farrell, Desmond J.; Schofield, Kenneth; Larson, Mark L.; Hanft, Karl-Heinz; Schierbeck, Kenneth L.; and Bentley, Richard D., 4,871,917, Cl. 250-341.000.
- Lasarray Holding AG: See—
Kempster, Meinrad; and Glauser, Paul, 4,871,896, Cl. 219-121.600.
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Sunshine, Abraham; Laska, Eugene M.; and Siegel, Carole E., 4,871,733, Cl. 514-212.000.
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Daguet, Alain P. M.; Glowacki, Pierre A.; and Lassignardie, Herve, 4,870,826, Cl. 60-751.000.
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- Latour, Elisabeth: See—
Bonne, Claude; Coquelet, Claude; and Latour, Elisabeth, 4,871,742, Cl. 514-262.000.
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Nickolay, Helmut; and Lattner, Manfred, 4,870,720, Cl. 19-288.000.
- Latussek, Hans-Peter: See—
Brune, Johannes; and Latussek, Hans-Peter, 4,871,324, Cl. 439-189.000.
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- LaWall, David, to Eckhart, David, a part interest. Telescoping file folders, 4,871,066, Cl. 206-425.000.
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Grindon, John R., 4,871,256, Cl. 356-376.000.

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Nobel, Fred I.; Ostrow, Barnet D.; and Schram, David N., 4,871,429, Cl. 204-44.400.
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Kochmann, Heike; Lechner, Georg; Muller, Jurgen; and Scholz, Norbert, 4,872,030, Cl. 354-76.000.
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Chang, Clarence D.; Chu, Cynthia T.-W.; Lee, Carol S.; and Partridge, Randall D., 4,871,702, Cl. 502-86.000.
- Lee, Hong H.; and Lee, Sang H. Passivation of group III-V surfaces, 4,871,692, Cl. 437-235.000.
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Kirkpatrick, Hugh J.; Lee, Thomas J.; and Lee, James M., 4,870,757, Cl. 30-344.000.
- Lee, Ki W., to Siemens-Bendix Automotive Electronics L.P. Methods of making silicon-based sensors, 4,870,745, Cl. 29-610.100.
- Lee, Martin. Safety shoe structure, 4,870,762, Cl. 36-77.00R.
- Lee, Raymond N. Paper roll holding device, 4,871,123, Cl. 242-55.200.
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- Lee, Suh Y., to Westinghouse Electric Corp. Automatic combustion control method for a rotary combustor, 4,870,912, Cl. 110-246.000.
- Lee, Thomas J.: See—
Kirkpatrick, Hugh J.; Lee, Thomas J.; and Lee, James M., 4,870,757, Cl. 30-344.000.
- Leeland, Steven B., to Motorola, Inc. Floating-point systolic array including serial processors, 4,872,133, Cl. 364-748.000.
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- Le Gall, Louis: See—
Arraudeau, Jean-Pierre; Patraud, Jeanne; and Le Gall, Louis, 4,871,536, Cl. 424-59.000.
- Legare, David J. Cellular ceramic material and method of production thereof, 4,871,694, Cl. 501-39.000.
- Leglertex S.r.l.: See—
Ribolla, G. Carlo; Taroni, Federico; Peiretti, Domenico; and Pe-pino, Antonio, 4,870,727, Cl. 26-10.00C.
- Legris SA: See—
Belaisaie, Daniel, 4,870,792, Cl. 52-220.000.
- Legros, Desire: See—
Lecourt, Jean; Legros, Desire; and Granville, Andre, 4,871,385, Cl. 65-115.000.
- Leighton, Harry J.: See—
Lever, O. William, Jr.; and Leighton, Harry J., 4,871,865, Cl. 549-354.000.
- Lemay, Richard A.: See—
Smith, Michael D.; and Lemay, Richard A., 4,872,110, Cl. 364-200.000.
- Lenzing Aktiengesellschaft: See—
Harms, Hajo; Schobesberger, Manfred; Sollradl, Herbert; and Weinrotter, Klaus, 4,871,500, Cl. 264-178.00R.
- Leonard, John E., to Gentner Electronics Corporation. Remote control unit for radio/television transmitter station, 4,872,195, Cl. 379-40.000.
- Leone, David A.; and Buxton, Clifford A., to Siemens Energy & Automation, Inc. Arcing contact assembly for a circuit breaker, 4,871,889, Cl. 200-146.00R.
- Les Fils d'Auguste Maillefer, Societe Anonyme a Ballaigues: See—
Maillefer, Pierre-Luc, 4,871,313, Cl. 433-225.000.
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Aviv, Haim; Gorecki, Marian; Levanon, Avigdor; Oppenheim, Amos; Vogel, Tikva; Zeelon, Pinhas E.; and Zeevi, Menachem, 4,871,835, Cl. 530-399.000.
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Gibson, Walter T., 4,871,839, Cl. 536-55.100.
- Lever, O. William, Jr.; and Leighton, Harry J., to Burroughs Wellcome Co. Tricyclic aromatic compounds, 4,871,865, Cl. 549-354.000.
- Levi, M. James: See—
Chu, Alexander H. T.; and Levi, M. James, 4,871,866, Cl. 549-414.000.
- Levi Strauss & Co.: See—
Blessing, Hubert; and Harrington, Richard L., 4,871,161, Cl. 271-10.000.
- Levin, Harry. Process for coating an object with silicon carbide, 4,871,587, Cl. 427-249.000.
- Levin, Steven D.; and Swenson, William A. Alignment training device for golfers, 4,871,175, Cl. 273-187.00R.
- Levy, Michael P.: See—
Follett, David R.; and Levy, Michael P., 4,872,163, Cl. 370-94.100.
- Lewellen, Richard R.: See—
Hehn, Bruce A.; Weisburn, James T.; Lewellen, Richard R.; and Geis, Mark W., 4,871,064, Cl. 206-387.000.
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Munz, Wolf-Dieter; Hensel, Bernd; Scherer, Michael; and Knotek, Otto, 4,871,434, Cl. 204-192.160.
- Leyens, Gerd: See—
Bravet, Jean-Louis; Toyot, Francois; Leyens, Gerd; Pikhardt, Siegfried; and Bayer, Herbert, 4,871,579, Cl. 427-31.000.
- Lidinsky, William P.: See—
Hemmady, Jayant G.; Lidinsky, William P.; Nichols, Robert K.; Richards, Gaylord W.; Roediger, Gary A.; Steele, Scott B.; Weddige, Ronald C.; and Zelle, Bruce R., 4,872,157, Cl. 370-60.000.
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Cloetens, Rudolphe C.; Lidy, Werner A.; Phillips, Brian D.; and Thomas, David B., 4,871,783, Cl. 521-137.000.
- Liebergessell, Bodo. Test circuit for setting the synchronization of a dual ignition system, 4,871,970, Cl. 324-389.000.
- Liesch, Jerrold M.: See—
Burg, Richard W.; Dulaney, Eugene L.; Hensens, Otto D.; Liesch, Jerrold M.; Ondeyka, John G.; and Wichmann, Carol F., 4,871,727, Cl. 514-179.000.
- Liess, Hans D.: See—
Heinze, Roland; and Liess, Hans D., 4,870,967, Cl. 128-419.0PG.
- Lightolier, Inc.: See—
Slovak, Michael J.; Griffin, Raymond T.; and Carson, Steven R., 4,871,893, Cl. 200-16.00R.
- Lillie, Christian: See—
Heider, Joachim; Psior, Manfred; Bomhard, Andreas; Hael, Norbert; Narr, Berthold; Noll, Klaus; Lillie, Christian; Kobinger, Walter; and Dammgen, Jurgen, 4,871,735, Cl. 514-213.000.
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- Lin, Bor-Sheng; Kudzma, Linas V.; and Spencer, H. Kenneth, to BOC, Inc. 4-heteropentacyclic-4-(N-phenyl)amido piperidine derivatives and pharmaceutical compositions and method employing such compounds, 4,871,749, Cl. 514-326.000.
- Lin, Stephen Y., to Reed Lignin Inc. Binder composed of a graft copolymer of high molecular weight lignin material and an acrylic monomer, 4,871,825, Cl. 527-400.000.
- Linden, Unto, to Neste OY. Vehicle tire intended to be fitted with spikes, 4,871,005, Cl. 152-210.000.
- Linders, John R.: See—
Jeerings, Donald I.; and Linders, John R., 4,871,971, Cl. 324-509.000.
- Lindner, Christian; Dickore Karlfried; Suling, Carlhans; Korte, Siegfried; and Podszun, Wolfgang, to Bayer Aktiengesellschaft. New triazolopyrimidines and their use as initiators, 4,871,850, Cl. 544-256.000.
- Lindner, Johann, to AB ASEA-ATOM. Method for operation of a light water boiling reactor, 4,871,508, Cl. 376-260.000.
- Lindskog, Inga M.; Sjogren, Bengt C. H.; and Andersson, Sven-Borje, to Aktiebolaget Leo. Intravaginal devices, 4,871,543, Cl. 424-432.000.
- Lindstrom, Edgar K.; and Morris, Marvin L., to J. I. Case Company. Multiple-edge sod cutter for vibratory plow, 4,871,027, Cl. 172-40.000.
- Link, Achim; and Weidinger, Reinhold, to Fichtel & Sachs AG. Clutch arrangement, 4,871,050, Cl. 192-70.290.
- Linscott, Susan E., to Amway Corporation. Granola bar with supplemental dietary fiber and method, 4,871,557, Cl. 426-93.000.
- Lior, Shai: See—
Landa, Benzion; Blake, Christopher J.; Housworth, Gerald R.; and Lior, Shai, 4,871,163, Cl. 271-225.000.
- Litton Systems, Inc.: See—
Graycar, Joseph M., 4,871,983, Cl. 331-96.000.
- Hradek, Richard W., 4,870,960, Cl. 128-202.220.
- Klaser, John J., 4,870,746, Cl. 29-620.000.
- Kohin, Margaret, 4,871,220, Cl. 350-1.700.
- Liu, Chung-Chi, to Tatung Company of America, Inc. Ultrasonic cleaning apparatus for household use, 4,870,982, Cl. 134-135.000.
- Liudzius, Valerie A.; Weisner, Ralph M.; Kamiharaka, Takashi; and Uramoto, Iwami, to View Engineering, Inc.; and Kaijo Denki Co., Ltd., a part interest. Semiconductor device inspection system, 4,872,052, Cl. 358-106.000.
- Lloyd, William J., to Hewlett-Packard Company. Thermal-ink-jet print system with drop detector for drive pulse optimization, 4,872,028, Cl. 346-1.100.
- Llumar Star Kites, Inc.: See—
Alonso, Frank, 4,871,133, Cl. 244-153.00R.
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- Loewenstein, Albert; and Fiedler, Heidi, to Henkel Kommanditgesellschaft auf Aktien. Spinning preparations for melt spinning synthetic fibers, 4,871,592, Cl. 427-389.900.
- Loewke, Daniel D.: See—
Loewke, Eunice R.; and Loewke, Daniel D., 4,871,139, Cl. 248-460.000.

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Lofgren, Karl M.: See—
Shearer, Gerald; Lofgren, Karl M.; and Ouyang, Kenneth W., 4,871,979, Cl. 330-253.000.

Login, Robert B.: See—
Helioff, Michael W.; Bires, Carmen D.; and Login, Robert B., 4,871,535, Cl. 424-71.000.

Long, Clifford D.: See—
Long, Richard D.; Long, David L.; Long, Clifford D.; and Clark, Kenneth E., 4,870,946, Cl. 125-13.00R.

Long, David L.: See—
Long, Richard D.; Long, David L.; Long, Clifford D.; and Clark, Kenneth E., 4,870,946, Cl. 125-13.00R.

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Long, Richard D.; Long, David L.; Long, Clifford D.; and Clark, Kenneth E., 4,870,946, Cl. 125-13.00R.

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Lopata, Alexander D.: See—
Giammarco, Nicholas J.; Gimpelson, Alexander; Kaplita, George A.; Lopata, Alexander D.; Scaduto, Anthony F.; and Shepard, Joseph F., 4,871,630, Cl. 430-14.000.

L'Oreal: See—
Arraudeau, Jean-Pierre; Patraud, Jeanne; and Le Gall, Louis, 4,871,536, Cl. 424-59.000.

Grolier, Jean F.; Dubief, Claude; and Cauwet, Daniele, 4,871,530, Cl. 424-47.000.

Morane, Bruno, 4,870,805, Cl. 53-470.000.

Loreto, Wilfredo P.: See—
Ramos, Rolando P.; Loreto, Wilfredo P.; and Vulich, Yordan, 4,870,784, Cl. 51-165.00R.

Lorincz, Eugene M.: See—
Hoskinson, Marlin J.; Lorincz, Eugene M.; and Samson, George W., 4,871,140, Cl. 248-496.000.

Lott, W. Gerald. Clarifier and screw compactor liquid-solid separator. 4,871,449, Cl. 210-110.000.

Lott, W. Gerald. Portable dumpster slurry separating system. 4,871,454, Cl. 210-205.000.

Lowrey, Tyler A., to Micron Technology, Inc. Sequence of etching polysilicon in semiconductor memory devices. 4,871,688, Cl. 437-47.000.

Lowry, Gerald R., to R. J. Reynolds Tobacco Company. Tobacco expansion process and apparatus. 4,870,980, Cl. 131-296.000.

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Romano, Perry, 4,872,098, Cl. 362-283.000.

Lubowitz, Hyman R.; and Sheppard, Clyde H., to Boeing Company, The. Polysulfone and polyethersulfone oligomers. 4,871,475, Cl. 252-500.000.

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Lucas Industries Public Limited Company: See—
Wall, Robin C., 4,870,889, Cl. 91-49.000.

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Lucke, Heinz, to Teroson GmbH. Single component polyurethane-modified bitumen compositions. 4,871,792, Cl. 524-59.000.

Ludkovsky, Gregory, to Inland Steel Company. Method for producing electrical steel core laminations. 4,871,403, Cl. 148-121.000.

Luker, Ken. Floor mat with band of higher density tufting. 4,871,602, Cl. 428-88.000.

Lum, Kin K.: See—
Harrison, Daniel J.; and Lum, Kin K., 4,871,715, Cl. 503-227.000.

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Lurssen, Kaius: See—
Sasse, Klaus; Fischer, Reiner; Hagemann, Hermann; Santel, Hans-Joachim; Schmidt, Robert R.; and Lurssen, Kaius, 4,871,387, Cl. 71-92.000.

Lurssen, Klaus: See—
Holmwood, Graham; Buchel, Karl H.; Lurssen, Klaus; Frohberger, Paul-Ernst; and Brandes, Wilhelm, 4,871,390, Cl. 71-92.000.

Lush, Steven; and Kerbstat, Siegfried, to C. A. Weidmuller GmbH & Co. Coupler terminal block. 4,872,092, Cl. 361-426.000.

Lusigne, Richard W.; and Stevenson, William A., to Foster Miller, Inc. Lyotropic liquid crystalline oriented polymer substrate for printed wire board. 4,871,595, Cl. 428-1.000.

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Lyttle, Kevin A.: See—
Cherne, Lawrence W.; and Lyttle, Kevin A., 4,871,898, Cl. 219-137.00R.

Maack, Werner; and Zender, Richard, to AMP Incorporated. Wire insertion tooling assembly. 4,870,747, Cl. 29-753.000.

Mabon, John T.: See—
Katcher, Jay H.; Mabon, John T.; Matherly, Jennifer W.; McCarty, Lawrence T.; and Schars, Robert E., 4,871,398, Cl. 127-71.000.

Macabrey, Louis: See—
Bonnebat, Claude; Macabrey, Louis; and Rouillet, Gilbert, 4,871,410, Cl. 156-244.140.

Mace Corporation: See—
Kingsford, Kenji A., 4,871,196, Cl. 285-138.000.

Machida, Yutaka: See—
Mita, Katsuya; Machida, Yutaka; and Morishita, Muneki, 4,871,905, Cl. 235-475.000.

Macho, Vendelin: See—
Zikmund, Miroslav; Hybl, Cestmir; Macho, Vendelin; and Adam, Valer, 4,871,519, Cl. 423-169.000.

Macier, James E.; Binversie, Gregory J.; Calamia, David C.; and Daniels, John M., to Outboard Marine Corporation. Multi-cylinder engine with uniform cylinder sensitivity to knocking. 4,870,929, Cl. 123-78.00R.

Mackinnon, Susan E.: See—
Dellon, Arnold L.; and Mackinnon, Susan E., 4,870,966, Cl. 128-334.00R.

MacLaughlin, Scott: See—
Caskey, Kenneth D.; and MacLaughlin, Scott, 4,871,018, Cl. 166-142.000.

MacMillan, David C.: See—
Graham, Andrew C.; and MacMillan, David C., 4,872,140, Cl. 365-96.000.

Maculan, Thomas P.: See—
Kalala, Rose H.; DeLeon, Joe R.; and Maculan, Thomas P., 4,871,554, Cl. 426-74.000.

Madar, Roland: See—
Torres, Joaquim; Madar, Roland; Bernard, Claude; and Million-Brodaz, Jean-Francois, 4,871,691, Cl. 437-200.000.

Madaus, Rolf; Gorler, Klaus; and Soicke, Hartwig, to Dr. Madaus GmbH & Co. Method of treating liver diseases using pure silibinin. 4,871,763, Cl. 514-45.200.

Madura, Francis E.: See—
Altherr, Russell G.; Glaser, Richard L.; Madura, Francis E.; and Radwill, Robert P., 4,871,182, Cl. 280-434.000.

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Maejima, Toshiro; and Inaba, Shigemitsu, to Yazaki Corporation. Connector. 4,871,325, Cl. 439-353.000.

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Magnan, Germain R.: See—
Roy, Jacques T.; and Magnan, Germain R., 4,871,972, Cl. 324-551.000.

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Edgren, David E.; Magruder, Judy A.; and Bhatti, Gurdish K., 4,871,548, Cl. 424-488.000.

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Maiefisch, Peter, to Ciba-Geigy Corporation. Composition for controlling parasites in productive livestock. 4,871,719, Cl. 514-63.000.

Maietta, Michael G.: See—
Conn, Kirk O.; Finlay, William, Jr.; Sutyn, Carol S.; and Maietta, Michael G., 4,871,354, Cl. 604-89.000.

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Makita Electric Works, Ltd.: See—
Fushiya, Fusao, 4,870,758, Cl. 30-388.000.

Malczok, Reimund: See—
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Nitsche, Rainer; Sebralla, Bruno; and Malkmus, Rolf, 4,872,179, Cl. 372-93.000.

Mallinckrodt, Inc.: See—
Dolfini, Joseph E.; and Glinka, Jerome, 4,871,881, Cl. 568-491.000.

Malon, Raymond F.: See—
Kesting, Robert E.; Fritzsche, Alfred K.; Murphy, Milton K.; Handermann, Alan C.; Cruse, Clint A.; and Malon, Raymond F., 4,871,494, Cl. 264-41.000.

Malone, Thomas J. Carpet tile with cushioned backing. 4,871,603, Cl. 428-95.000.

Malone, William F., Jr.: See—
Forbes, Melvin D.; and Malone, William F., Jr., 4,870,770, Cl. 42-70.010.

Maloney, Daniel T., to Simplicity Engineering, Inc. Machine for densifying plastic containers and the like. 4,871,118, Cl. 241-99.000.

Man Design Co., Ltd.: See—
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Man Roland Druckmaschinen AG: See—
Petersen, Godber, 4,871,159, Cl. 270-55.000.

MAN Technologie GmbH: See—
Reichle, Ernst-Michael; and Seel, Matthias, 4,871,515, Cl. 422-174.000.

Manabe, Yukio: See—
Tsuda, Shigenori; Manabe, Yukio; and Tsuji, Kozo, 4,871,766, Cl. 514-521.000.

Mandalia, Baiju D.: See—
Davis, Gordon T.; and Mandalia, Baiju D., 4,871,974, Cl. 329-345.000.

Manenti, Luciano: See—
Monterosso, Gianpaolo; Marazzi, Riccardo; Nicotra, Mario; and Manenti, Luciano, 4,872,007, Cl. 340-870.010.

Maney, Frank S.: See—
Duncan, William M.; Glass, George E.; Johnson, Jeffrey L.; McMillan, Edward A.; Maney, Frank S.; McConnell, James R., Jr.; Roberts, Kenneth P.; and Sanders, Timothy R., 4,870,863, Cl. 73-431.000.

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Manke, Steven A.: See—
Rothgery, Eugene F.; and Manke, Steven A., 4,871,861, Cl. 548-251.000.

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Werbach, Johannes, 4,871,270, Cl. 400-121.000.

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Mansfield, A. R.: See—
Dunning, Brian; and Mansfield, A. R., 4,872,084, Cl. 361-232.000.

Manzoni, Bernard, to Societe Manzoni Bouchot. Device for transmitting, without vibrations, movements from an electric control to a mirror-holder plate of a rearview mirror. 4,871,246, Cl. 350-633.000.

Mar, Alan: See—
Beni, Gerardo; Mar, Alan; and Landry, C. John, 4,871,252, Cl. 356-347.000.

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Elbert, Hubert F.; and March-Force, Gary, 4,871,965, Cl. 324-158.00F.

Marchand, Sam R.: See—
Bays, F. Barry; and Marchand, Sam R., 4,871,364, Cl. 623-10.000.

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Milbauer, Thomas H.; and Benson, LeDell E., 4,871,201, Cl. 292-113.000.

Marion Laboratories, Inc.: See—
Walker, Steven D., 4,871,731, Cl. 514-211.000.

Mariotti, Rene, to Ore-Ida Vended Products, Inc. Flow control valve. 4,870,985, Cl. 137-102.000.

Mark, Carol M., representative: See—
Mark, Victor, deceased; Mark, Carol M., representative; Mark, Ester H., representative; and Peters, Edward N., 4,871,830, Cl. 528-192.000.

Mark, Ester H., representative: See—
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Mark, Victor, deceased; by Mark, Carol M., representative; by Mark, Ester H., representative; and Peters, Edward N. Polystyrene carbonate containing divalent residue of polymerized alkadiene monomer. 4,871,830, Cl. 528-192.000.

Markham, Carmen F.: See—
Johnson, Neale E.; and Markham, Carmen F., 4,870,779, Cl. 43-124.000.

Marko, Istvan E.; and Sharpless, K. Barry, to Massachusetts Institute of Technology. Ligand-accelerated catalytic asymmetric dihydroxylation using dihydroquinidine and dihydroquinidine esters as ligands. 4,871,855, Cl. 546-134.000.

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Grinberg, Jan; Marom, Emanuel; Soffer, Bernard H.; O'Meara, Thomas R.; and Pope, Adrian E., 4,871,232, Cl. 350-162.110.

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Shalati, Mohamad D.; and Marquart, James A., 4,871,806, Cl. 525-108.000.

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Martin, Harry: See—
Krauss, Andre; Martin, Harry; and Pzeny, Richard, 4,871,262, Cl. 366-160.000.

Martinez, Eloy C., to Dow Chemical Company. The Reinforced polymer compositions having excellent distinctness of image. 4,871,789, Cl. 523-220.000.

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Treybig, Duane S.; and Martinez, Robert G., 4,871,848, Cl. 544-224.000.

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Martinsson, Lars M. R. Supporting arrangement for a mast on a vehicle. 4,871,103, Cl. 224-310.000.

Martischius, Franz-Dieter; Oppenlaender, Knut; and Vogel, Hans-Henning, to BASF Aktiengesellschaft. Fuels for Otto engines. 4,871,375, Cl. 44-71.000.

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Kobayashi, Masashi, 4,871,174, Cl. 273-164.000.

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Dekura, Takateru; and Endo, Juro, 4,871,625, Cl. 428-695.000.

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Goettsche, Reimer; and Marx, Hans-Norbert, 4,871,473, Cl. 252-400.520.

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Hermann, Thomas; Herd, Josef; and Pfuhl, Reiner, 4,871,157, Cl. 270-39.000.

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Bunz, Rosa; Dzionara, Christine; and Tempe, Karl, 4,871,101, Cl. 224-153.000.

Mascioli, Edward A.: See—
Bistrian, Bruce R.; Babayan, Vigen K.; Blackburn, George L.; and Mascioli, Edward A., 4,871,768, Cl. 514-547.000.

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Preziosi, Robert, 4,871,091, Cl. 222-92.000.

Massachusetts Institute of Technology: See—
Marko, Istvan E.; and Sharpless, K. Barry, 4,871,855, Cl. 546-134.000.

Seyferth, Dietmar; and Rees, William S., Jr., 4,871,826, Cl. 528-4.000.

Masuda, Isao: See—
Yamashita, Toshiharu; Amano, Sho; Tajima, Hidemi; Masuda, Isao; and Izumitani, Tetsuro, 4,871,230, Cl. 350-96.340.

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Otonari, Satoshi; Sato, Yoshinori; Masuda, Narihiro; and Kotani, Tomoyuki, 4,871,784, Cl. 521-138.000.

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Kawami, Shigeru; Tabu, Takashi; Sano, Shigeo; and Masuda, Nobuyuki, 4,872,199, Cl. 379-413.000.

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Wagner, Israel; and Hurwitz, Steven D., 4,871,433, Cl. 204-192.120.
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Katcher, Jay H.; Mabon, John T.; Matherly, Jennifer W.; McCarty, Lawrence T.; and Schara, Robert E., 4,871,398, Cl. 127-71.000.
- Mathis, Ronald F.: See—
Lux, Paul A.; and Mathis, Ronald F., 4,871,907, Cl. 250-227.000.
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- Matsuda, Toshiharu; and Okumoto, Yoshino, to Hitachi, Ltd.: Car air conditioning apparatus and controlling method therefor. 4,870,833, Cl. 62-134.000.
- Matsuda, Toshihiro: See—
Kano, Mitsunari; Konishi, Yoshiharu; and Matsuda, Toshihiro, 4,872,000, Cl. 340-706.000.
- Matsui, Fumio: See—
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- Matsui, Sadaoyoshi; Taneya, Mototaka; Matsumoto, Mitsuhiro; Hosoba, Hiroyuki; Takiguchi, Haruhisa; and Kudo, Hiroaki, to Sharp Kabushiki Kaisha: Semiconductor laser device having a grating structure. 4,872,174, Cl. 372-45.000.
- Matsui, Shigeaki; Hirai, Eiichi; and Nakamura, Junji, to Kurashiki Boseki Kabushiki Kaisha: Culture cell. 4,871,674, Cl. 435-284.000.
- Matsukura, Shigekazu: See—
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- Matsumoto, Osamu; and Maehara, Hirokazu, to Mitsubishi Denki Kabushiki Kaisha: Auxiliary air control valve for engine. 4,870,944, Cl. 123-585.000.
- Matsumura, Yasuharu: See—
Funahashi, Yoshiko; Kamino, Yoshikazu; Matsumura, Yasuharu; and Harimaya, Senichi, 4,871,513, Cl. 422-56.000.
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Sugisawa, Ko; Matsumura, Yasushi; Okamoto, Hidefumi; and Abe, Kumiko, 4,871,565, Cl. 426-407.000.
- Matsunaga, Kenkichi: See—
Takagi, Yoshiaki; Isoke, Susumu; and Matsunaga, Kenkichi, 4,871,512, Cl. 420-448.000.
- Matsuo, Hirofumi, to Asahi Kogyo Kabushiki Kaisha: Compact zoom lens system. 4,871,241, Cl. 350-427.000.
- Matsuoka, Isao: See—
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- Matsuoka, Katsumi; Ikeda, Kensuke; and Iwakura, Ken, to Fuji Photo Film Co., Ltd.: Heat-sensitive recording material. 4,871,713, Cl. 503-209.000.
- Matsuoka, Yuji; and Kuroki, Masahide: Monoclonal antibodies specific to CEA. 4,871,834, Cl. 530-387.000.
- Matsushita Electric Industrial Co., Ltd.: See—
Asahina, Takashi; Akiyoshi, Mitsuo; Mitsumoto, Yoshio; Kodama, Satoru; and Tsujimoto, Masaharu, 4,870,896, Cl. 99-348.000.
- Harada, Terumaru; Inoda, Kenichi; Fujita, Tatsuo; and Adachi, Kinichi, 4,870,821, Cl. 60-520.000.
- Ichinohe, Eisuke, 4,872,161, Cl. 370-85.100.
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- Matsushita, Takashi: See—
Ogawa, Hideki; and Matsushita, Takashi, 4,871,243, Cl. 350-463.000.
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Hatton, Leslie R., 4,871,748, Cl. 514-317.000.
- May, Joseph N.; Rhinehart, Stephen A.; and Zambelli, Robert G., to Xerox Corporation: Very high speed duplicator with finishing function. 4,871,158, Cl. 270-53.000.
- Mayer, Erhard, to Fraunhofer Gesellschaft zur Forderung: System for ventilating the interior of a vehicle. 4,870,895, Cl. 98-2.000.
- Mayfield, Trevor K.; and Radcliffe, Lindsay F.: Levelling machine. 4,871,025, Cl. 172-4.500.
- Mazza, John C., to Baxter Travenol Laboratories, Inc.: Diluent carry-over control. 4,871,682, Cl. 436-179.000.
- McCarty, Lawrence T.: See—
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- McClellan, Gary C.: Revolver holder. 4,870,771, Cl. 42-90.000.
- McCluskey, Richard A.: See—
Longo, William E.; McCluskey, Richard A.; and Goldberg, Eugene P., 4,871,716, Cl. 514-2.000.
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Kalota, Dennis J.; McConaghy, John S., Jr.; Fisher, David O.; and Zielinski, Ronald E., 4,871,109, Cl. 228-180.100.
- McConnell, James R., Jr.: See—
Duncan, William M.; Glass, George E.; Johnson, Jeffrey L.; McMillan, Edward A.; Maney, Frank S.; McConnell, James R., Jr.; Roberts, Kenneth P.; and Sanders, Timothy R., 4,870,863, Cl. 73-431.000.
- McCormack, John J.: See—
Farrell, Nicholas; Hacker, Miles P.; McCormack, John J.; and DeAlmeida, Sergio G., 4,871,729, Cl. 514-188.000.
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- McDonnell Douglas Corporation: See—
Orloff, Eugene F.; Horowitz, Martin; and Rittner, Charles H., 4,872,120, Cl. 364-509.000.
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- McGathery, Mark S., to Exxon Chemicals Patents, Inc.: Method for removing polymer plugging in well boreholes. 4,871,022, Cl. 166-300.000.
- McGrath, Philip I., Jr.: See—
Coddling, Charles N., III; Rhodes, George F.; and McGrath, Philip I., Jr., 4,871,197, Cl. 285-231.000.
- McGuire, William G.; and Young, Hartley F., to Ralph McKay Limited: Deep tillage implement. 4,871,032, Cl. 172-749.000.
- McIntyre, Frederic S., to Acumeter Laboratories, Inc.: Method of streakless application of thin controlled fluid coatings and slot nozzle roller coater applicator apparatus therefor. 4,871,593, Cl. 427-428.000.
- McKee, Roy L.: Towel rack convenience shelf. 4,870,907, Cl. 108-42.000.
- McKeown, Bruce P.: See—
Farnum, Colin E.; Torney, Allan A.; and McKeown, Bruce P., 4,871,566, Cl. 426-632.000.
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- McLean, Leonard A., to CSX Transportation, Incorporated: Adjustable grab iron. 4,871,047, Cl. 182-90.000.
- McLeod, Whitney G.: Picture display case. 4,870,765, Cl. 40-152.000.
- McMahon, Paul E.; Chung, Tai-Shung; and Ying, Lincoln, to BASF Structural Materials Inc.: Process for preparing composite articles from composite fiber blends. 4,871,491, Cl. 264-29.200.
- McMillan, Edward A.: See—
Duncan, William M.; Glass, George E.; Johnson, Jeffrey L.; McMillan, Edward A.; Maney, Frank S.; McConnell, James R., Jr.; Roberts, Kenneth P.; and Sanders, Timothy R., 4,870,863, Cl. 73-431.000.
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- Mead Release Products, Inc.: See—
LeBel, Andrew P., 4,871,611, Cl. 428-266.000.
- Mechtrix Corporation: See—
Butler, John D.; and Johnson, Keith A., 4,870,878, Cl. 81-9.510.
- Meddaugh, Michael D.: See—
Klosowski, Jerome M.; and Meddaugh, Michael D., 4,871,827, Cl. 528-17.000.
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Watson, James V., 4,871,249, Cl. 356-73.000.
- Medlar, Steven J.: See—
Goodrich, James A.; and Medlar, Steven J., 4,871,450, Cl. 210-151.000.
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Micic, Ljubomir; and Mehrgardt, Soenke, 4,872,060, Cl. 358-242.000.
- Meier, G. Weston: See—
Higby, Edwin A.; Meier, G. Weston; and Fife, Breck D., 4,870,705, Cl. 2-2.000.
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Terauchi, Masakazu; and Suzuki, Gentaro, 4,871,562, Cl. 426-330.300.
- Meister, Niklaus: See—
Bohren, Hans-Ueli; Kuypers, Theo W.; and Meister, Niklaus, 4,871,573, Cl. 426-588.000.
- Meizi, Omar, to Dynamic Energy Research S.R.L.: The structure for garaging motor vehicles. 4,870,790, Cl. 52-175.000.
- Membrane Technology & Research, Inc.: See—
Pinnau, Ingo, 4,871,378, Cl. 55-16.000.
- Menchetti, Robert J., to National Gypsum Company: Clip for outwardly opening C-stud. 4,870,794, Cl. 52-281.000.
- Meno, Henry: See—
Clardy, T. J.; and Meno, Henry, 4,871,302, Cl. 417-404.000.
- Mercer, James B.: Method of treatment of mesenteric adenitis. 4,871,759, Cl. 514-398.000.

- Merck & Co., Inc.: See—
Baldwin, John J.; Tolman, Richard L.; and Wu, Mu T., 4,871,739, Cl. 514-254.000.
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- Merck Frost Canada, Inc.: See—
Gillard, John; Rokach, Joshua; and Belanger, Patrice C., 4,871,756, Cl. 514-381.000.
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Krause, Joachim; Reiffenrath, Volker; and Geelhaar, Thomas, 4,871,472, Cl. 252-299.650.
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- Merrell Dow Pharmaceuticals Inc.: See—
Peet, Norton P.; and Sunder, Shyam, 4,871,732, Cl. 514-212.000.
- Merz, Peter W.; and Zabel, Lutz-Dieter, to Sika AG, vorm. Kaspar Winkler & Co.: Reactive, thixotropic hot-melt adhesive on silane basis. 4,871,590, Cl. 427-387.000.
- Messenger, Edward T.: See—
Akred, Brian J.; Messenger, Edward T.; and Nicholson, William J., 4,871,467, Cl. 252-135.000.
- Messerschmitt-Boelkow-Blohm GmbH: See—
Kohler, Karl; and Reith, Dirk V., 4,871,452, Cl. 210-167.000.
- Messmer, Andras: See—
Batori, Sandor; Hajos, Gyorgy; Messmer, Andras; Benko, Pal; Pallos, Laszlo; Petocz, Lujza; Grasser, Katalin; Kosoczky, Ibolya; and Szirt nee Kisszely, Eniko, 4,871,846, Cl. 544-183.000.
- Messmer, Walter J., III: See—
Roos, Mark D.; and Messmer, Walter J., III, 4,872,212, Cl. 361-424.000.
- Metabowerke GmbH & Co.: See—
Schnizler, Albrecht, 4,870,755, Cl. 30-123.300.
- Metex Corporation: See—
Usher, Peter P.; Gavaletz, Eugene J.; and Slonksnes, John, 4,871,181, Cl. 277-229.000.
- Melitsky, Boris; and Krichever, Mark J., to Symbol Technologies, Inc.: Multidirectional optical scanner. 4,871,904, Cl. 235-467.000.
- Meyer, Willy: See—
Bohner, Beat; and Meyer, Willy, 4,871,853, Cl. 544-408.000.
- Meyers, Reuven I., to Nordson Corporation: Cartridge mount for powder collector. 4,871,380, Cl. 55-350.000.
- Michaelis, Eberhard: See—
Miederer, Peter; and Michaelis, Eberhard, 4,871,481, Cl. 552-239.000.
- Michels, Reiner: See—
Pieper, Hartwig; Michels, Reiner; and Werther, Heinz-Ulrich, 4,871,631, Cl. 430-14.000.
- Micic, Ljubomir; and Mehrgardt, Soenke, to Deutsche ITT Industries GmbH: Digital circuit system for television receivers with cathode ray picture tubes. 4,872,060, Cl. 358-242.000.
- Micro-Control: See—
Berger, Laurent, 4,871,955, Cl. 318-640.000.
- Microbio Resources, Inc.: See—
Spencer, Kenneth G., 4,871,551, Cl. 426-2.000.
- Microelectronics and Computer Technology Corporation: See—
Herrell, Dennis J.; and Gupta, Omkarnath R., 4,871,316, Cl. 439-66.000.
- Micron Technology, Inc.: See—
Lowrey, Tyler A., 4,871,688, Cl. 437-47.000.
- Middleton Enterprises, Inc.: See—
Chakroff, Richard O.; and Chakroff, Christopher N., 4,871,185, Cl. 280-477.000.
- Miederer, Peter; and Michaelis, Eberhard, to BASF Aktiengesellschaft: Preparation of 1,4-diamino-2,3-dicyanoanthraquinone. 4,871,461, Cl. 552-239.000.
- Miholics, Gizelle: See—
Sebestyen, Gyula; Simonyi, Istvan; Miholics, Gizelle; Kovacs, Maria; Gorgenyi, Frigyes; Fekete, Marton; Vago, Pal; Seres, Istvan; Egri, Janos; and Szeli, Maria, 4,871,728, Cl. 514-187.000.
- Mikawa, Takashi: See—
Imada, Yukio; Yoshikawa, Nobuji; Mizuno, Sumiko; and Mikawa, Takashi, 4,871,667, Cl. 435-142.000.
- Milam-Clardy, Inc.: See—
Clardy, T. J.; and Meno, Henry, 4,871,302, Cl. 417-404.000.
- Milanowski, Richard: System for attaching and locking material handling tools to a dipper boom. 4,871,292, Cl. 414-723.000.
- Milbauer, Thomas H.; and Benson, LeDell E., to Marion Body Works, Inc.: Recessed latch device. 4,871,201, Cl. 292-113.000.
- Milbrath, Dean S.: See—
Heilmann, Steven M.; Rasmussen, Jerald K.; Krepski, Larry R.; Milbrath, Dean S.; and Coleman, Patrick L., 4,871,824, Cl. 526-304.000.
- Miljevic, Vujo I., to Institute for Atomic Physics, The: Hollow-anode ion-electron source. 4,871,918, Cl. 250-423.000.
- Millas, Gary P.: See—
Foley, John P.; Millas, Gary P.; and Elliott, Daniel L., 4,871,015, Cl. 165-76.000.
- Millay, Lawrence I.; and Burgbacher, Guenther F., to Bryant Grinder Corporation: Workstock. 4,870,786, Cl. 51-281.000.
- Miller, Jack V.: Miniature low-voltage lighting fixture. 4,872,097, Cl. 362-226.000.
- Miller, John J., deceased: See—
Olson, Donald C.; Miller, John J., deceased; Miller, Wayne R., executor; Blytas, George C.; and Diaz, Zaida, 4,871,520, Cl. 423-221.000.
- Miller, Wayne R., executor: See—
Olson, Donald C.; Miller, John J., deceased; Miller, Wayne R., executor; Blytas, George C.; and Diaz, Zaida, 4,871,520, Cl. 423-221.000.
- Milliken Research Corporation: See—
Harris, Jeffery R., 4,871,371, Cl. 8-403.000.
- Yokoyama, Yoshimitsu, 4,870,804, Cl. 53-450.000.
- Million-Brodaz, Jean-Francois: See—
Torres, Joaquim; Madar, Roland; Bernard, Claude; and Million-Brodaz, Jean-Francois, 4,871,691, Cl. 437-200.000.
- Millman, Phillip L.: Nutrient composition for athletes and method of making and using the same. 4,871,550, Cl. 424-601.000.
- Mills, Sander G.: See—
Desmond, Richard; Mills, Sander G.; Volante, Ralph P.; and Shin-kai, Ichiro, 4,871,873, Cl. 564-276.000.
- MIM Industries, Inc.: See—
Frye, Ricky J., 4,870,917, Cl. 112-121.120.
- Minagawa, Yoshio: See—
Nagai, Teiji; Sakazume, Ryo; Hanazawa, Kouichi; Nakayama, Hiroshi; and Minagawa, Yoshio, 4,872,024, Cl. 346-1.100.
- Miner, Johathan L., to Black & Decker Inc.: Portable blower/vacuum system. 4,870,714, Cl. 15-327.000.
- Minford, Eric: See—
McFarlin, David J.; Caruolo, Antonio B.; Minford, Eric; and Prew, Karl M., 4,870,827, Cl. 435-284.000.
- Ministry of International Trade & Industry: See—
Tenjinbayashi, Koji, 4,871,255, Cl. 356-354.000.
- Ministry of International Trade and Industry of Japan: See—
Imada, Yukio; Yoshikawa, Nobuji; Mizuno, Sumiko; and Mikawa, Takashi, 4,871,667, Cl. 435-142.000.
- Minnesota Mining and Manufacturing Company: See—
Aasen, Steven M.; Oxman, Joel D.; and Ubel, F. Andrew, III, 4,871,786, Cl. 523-113.000.
- Buckanin, Richard S., 4,871,845, Cl. 544-87.000.
- DeWald, Carolyn G., 4,871,376, Cl. 51-298.000.
- Errede, Louis A.; and Hunt, George R., 4,871,671, Cl. 435-182.000.
- Gobets, Roy A.; and Tengler, John N., 4,871,318, Cl. 439-76.000.
- Heilmann, Steven M.; Rasmussen, Jerald K.; Krepski, Larry R.; Milbrath, Dean S.; and Coleman, Patrick L., 4,871,824, Cl. 526-304.000.
- Hoopman, Timothy L.; Johnson, Dee L.; and Krinke, Harlan L., 4,871,623, Cl. 428-586.000.
- Knorr, Winfried, 4,871,599, Cl. 428-36.900.
- Lamanna, William M.; McCormick, Fred B.; and Wright, Robin E., 4,871,790, Cl. 523-333.000.
- Lucast, Donald H.; Battles, Donald R.; and Kantner, Steven S., 4,871,812, Cl. 525-186.000.
- Peck, James M., 4,871,265, Cl. 383-89.000.
- Randklev, Ronald M., 4,871,261, Cl. 366-139.000.
- Minolta Camera Kabushiki Kaisha: See—
Honma, Shigeo; and Hara, Kazuyoshi, 4,871,407, Cl. 156-83.000.
- Honma, Shigeo; Inagaki, Sanji; and Hara, Kazuyoshi, 4,871,408, Cl. 156-83.000.
- Iino, Syuji; Osawa, Izumi; and Hotomi, Hideo, 4,871,632, Cl. 430-58.000.
- Masumoto, Hisayuki; and Fukushima, Akira, 4,871,239, Cl. 350-427.000.
- Sekiya, Makoto; and Wada, Kanji, 4,872,025, Cl. 346-108.000.
- Takata, Masakazu; Ueda, Takamasa; Ito, Kimiyuki; Hirashima, Suneaki; Yamamoto, Souichi; Ishino, Yoshio; and Ohno, Toshinobu, 4,871,633, Cl. 430-58.000.
- Tsuge, Shoichi, 4,871,640, Cl. 430-126.000.
- Mirow, Fred: Input and output responsive controlled rectifier. 4,872,101, Cl. 363-49.000.
- "MIRTA": See—
Tabakov, Mirtcho S.; Nedyalkov, Nedyalko K.; and Stefanov, Stefan T., 4,872,021, Cl. 343-801.000.
- Misra, Sudhan S.; and Noveske, Terrence M., to C & D Charter Power Systems, Inc.: Method for in situ forming lead-acid batteries having absorbent separators. 4,871,428, Cl. 204-2.100.
- Misu, Daisuke: See—
Mano, Tsutomu; Kawase, Jiro; Misu, Daisuke; and Obayashi, Michio, 4,871,372, Cl. 8-410.000.
- Mita, Katsuya; Machida, Yutaka; and Morishita, Muneki, to Omron Tateisi Electronics Co.: IC card reader/writer. 4,871,905, Cl. 235-475.000.
- Mitchell, Henry W.: See—
McMillan, Thomas A.; and Mitchell, Henry W., 4,870,991, Cl. 137-624.120.
- Mitsubishi Chemical Industries Limited: See—
Kaneko, Tsugio; Ishikawa, Fumiya; Nishiyama, Yoshinobu, and Shibata, Toshiharu, 4,871,464, Cl. 210-682.000.
- Mitsubishi Denki Kabushiki Kaisha: See—
Akae, Yoshifumi; Yamamoto, Takasi; Arima, Koji; and Yagi, Tetsuo, 4,871,936, Cl. 310-233.000.
- Egami, Noritaka, 4,872,183, Cl. 375-3.000.
- Matsumoto, Osamu; and Maehara, Hirokazu, 4,870,944, Cl. 123-585.000.
- Morishita, Akira, 4,870,875, Cl. 74-785.000.
- Nakano, Hirofumi, 4,871,419, Cl. 156-643.000.

Okamoto, Tatsuo; Kotani, Hideo; Oono, Takio; Watabe, Kiyoto; Kinoshita, Yasushi; and Nishikawa, Yoshikazu, 4,872,050, Cl. 357-71.000.

Okita, Ryosuke, 4,871,049, Cl. 192-21.500.

Okuda, Hiroshi, 4,871,471, Cl. 252-301.40S.

Shimizu, Toru, 4,872,128, Cl. 364-715.080.

Sumi, Tadashi, 4,872,143, Cl. 365-233.500.

Watanabe, Miyochi; and Ueda, Shinobu, 4,871,976, Cl. 330-69.000.

Mitsubishi Gas Chemical Company, Inc.: See—

Gaku, Morio; and Kinbara, Hidenori, 4,871,811, Cl. 525-148.000.

Hidaka, Toshio; and Mizuno, Tetsuo, 4,871,867, Cl. 549-514.000.

Mitsubishi Jidosha Kogyo Kabushiki Kaisha: See—

Nakagawa, Kiyoshi, 4,870,845, Cl. 72-1.000.

Mitsubishi Kinzoku Kabushiki Kaisha: See—

Akutsu, Hidetoshi; Iwamura, Takuro; and Kobayashi, Masao, 4,872,048, Cl. 357-67.000.

Mitsubishi Petrochemical Co., Ltd.: See—

Oonishi, Akiyoshi; Ishino, Iwao; Shimada, Takeo; and Ozeki, Yuji, 4,871,819, Cl. 526-245.000.

Mitsui Toatsu Chemicals, Inc.: See—

Nagata, Teruyuki; Tanaki, Akihiro; Kajimoto, Nobuyuki; and Wada, Masaru, 4,871,875, Cl. 564-402.000.

Mitsumoto, Yoshio: See—

Asahina, Takashi; Akiyoshi, Mitsuo; Mitsumoto, Yoshio; Kodama, Satoru; and Tsujimoto, Masaharu, 4,870,896, Cl. 99-348.000.

Miura, Akira: See—

Gemma, Nobuhiro; Miura, Akira; Mizushima, Koichi; Azuma, Makoto; and Mori, Yasushi, 4,871,236, Cl. 350-355.000.

Miura, Kazuhiko: See—

Ohta, Minoru; Miura, Kazuhiko; Huzino, Seizi; Kanehara, Kenji; and Hattori, Tadashi, 4,870,860, Cl. 73-204.260.

Miura, Kyo; Sugata, Hiroyuki; Oguchi, Yoshihiro; and Yoshino, Hitoshi, to Canon Kabushiki Kaisha. Optical information recording carrier, 4,871,601, Cl. 428-64.000.

Miwa, Kohtarō; Igusa, Kazuo; and Ogasawara, Toshichika, to Chugai Seiyaku Kabushiki Kaisha. Process for making a stable pharmaceutical preparation of prostaglandin E compounds, and/or 15R forms thereof, 4,871,772, Cl. 514-573.000.

Miyabayashi, Takeshi, to Brother Kogyo Kabushiki Kaisha. Method of manufacturing magnetic recording medium, 4,871,582, Cl. 427-53.100.

Miyake, Hiroyuki; Sagara, Seiji; Yonemori, Takaji; Watanabe, Tsuyoshi; Takahashi, Masayoshi; Suzuki, Koji; Komiya, Yutaka; Tomosada, Masahiro; Adachi, Hideki; Hirose, Masayuki; and Miyata, Masanori, to Canon Kabushiki Kaisha. Image forming apparatus, 4,872,035, Cl. 355-208.000.

Miyake, Hitomi; and Nishimura, Shigeru, to Kawasaki Jukogyo Kabushiki Kaisha. Two-cylinder engine, 4,870,928, Cl. 123-52.0MV.

Miyamoto, Hidenori: See—

Sousa, Toshio; Wakamiya, Koichi; Wakabayashi, Hiroshi; Kanai, Hachiro; and Miyamoto, Hidenori, 4,871,242, Cl. 350-431.000.

Miyamoto, Shoji: See—

Mori, Kinji; Miyamoto, Shoji; and Shiraha, Takeshi, 4,872,165, Cl. 371-11.200.

Miyamoto, Yukio: See—

Okamoto, Kiyokazu; Endo, Tetsuo; Miyamoto, Yukio; and Suzuki, Yoshiharu, 4,871,934, Cl. 310-166.000.

Miyashita, Tsune; and Yasuda, Makoto, to Hitachi, Ltd. Apparatus for automatically correcting arc position of high pressure discharge lamp, 4,871,947, Cl. 315-344.000.

Miyata, Masanori: See—

Miyake, Hiroyuki; Sagara, Seiji; Yonemori, Takaji; Watanabe, Tsuyoshi; Takahashi, Masayoshi; Suzuki, Koji; Komiya, Yutaka; Tomosada, Masahiro; Adachi, Hideki; Hirose, Masayuki; and Miyata, Masanori, 4,872,035, Cl. 355-208.000.

Miyoshi, Kaoru: See—

Ueno, Toru; Fukuoka, Youshi; Baba, Seiichi; Miyoshi, Kaoru; and Kinoshita, Kazuo, 4,871,910, Cl. 250-560.000.

Mizandjian, Jean-Luc; Pean, Jean-Louis; and Amen, Jean, to L'Air Liquide. Process and apparatus for making an inert atmosphere in airtight packages, 4,870,801, Cl. 53-432.000.

Mizuno, Hideaki: See—

Shibata, Norio; Mizuno, Hideaki; Satoya, Kouichi; Uchitani, Nobuki; Kamohara, Tatsuyoshi; Harada, Kenichi; Yoshioka, Mamoru; Kato, Takashi; and Ohnaka, Hidemi, 4,870,942, Cl. 123-571.000.

Mizuno, Shigeo, to Fuji Jukogyo Kabushiki Kaisha. Fuel control system for an automotive engine, 4,870,933, Cl. 123-325.000.

Mizuno, Sumiko: See—

Imada, Yukio; Yoshikawa, Nobuji; Mizuno, Sumiko; and Mikawa, Takashi, 4,871,667, Cl. 435-142.000.

Mizuno, Tetsuo: See—

Hidaka, Toshio; and Mizuno, Tetsuo, 4,871,867, Cl. 549-514.000.

Mizusawa Industrial Chemicals, Ltd.: See—

Nakamura, Seiichi; Saito, Mamoru; and Sugawara, Toshiaki, 4,871,444, Cl. 264-115.000.

Mizushima, Koichi: See—

Gemma, Nobuhiro; Miura, Akira; Mizushima, Koichi; Azuma, Makoto; and Mori, Yasushi, 4,871,236, Cl. 350-355.000.

Mobil Oil Corp.: See—

Chang, Clarence D.; Chu, Cynthia T.-W.; Lee, Carol S.; and Partridge, Randall D., 4,871,702, Cl. 502-86.000.

Chen, Nai Y.; Huh, Billy K.; Ketkar, Anil B.; and Venkat, Chaya, 4,871,444, Cl. 208-46.000.

Gunesin, Binnur Z.; Pindris, Paul A.; and Schwab, Frederick C., 4,871,814, Cl. 525-314.000.

Herbst, Joseph A.; Owen, Hartley; and Schipper, Paul H., 4,871,446, Cl. 208-152.000.

Ross, Mark S., 4,871,514, Cl. 422-145.000.

Shu, Paul, 4,871,021, Cl. 166-270.000.

Mochida, Haruo: See—

Takeda, Yoshimitsu; Mochida, Haruo; Iwasaki, Tsutomu; and Kanai, Toshio, 4,871,994, Cl. 340-457.000.

Mochizuki, Nobuo: See—

Suzuki, Akira; Mochizuki, Nobuo; and Morohoshi, Kunichika, 4,871,609, Cl. 428-195.000.

Mochizuki, Satomi: See—

Seki, Kenji; Hashimoto, Junichiro; Kimura, Michio; Yamanami, Hirofumi; Mochizuki, Satomi; and Aiso, Izumi, 4,871,635, Cl. 430-60.000.

Mock, Roger C. Board game, 4,871,177, Cl. 273-256.000.

Mode, Duane R., to Waldorf Corporation. Tapered tray with pre-glued elevating legs, 4,871,111, Cl. 229-104.000.

Modic, Frank J.; and Striker, Richard A., to General Electric Company. Low viscosity silicone foam compositions, 4,871,782, Cl. 521-88.000.

Modler, Howard W.: See—

Yamazaki, Hiroshi; Modler, Howard W.; Jones, John D.; and Elliot, James L., 4,871,574, Cl. 426-622.000.

Modlin, Delbert J. Retractable pavement marker/reflector, 4,871,280, Cl. 404-10.000.

Molchanov, Viktor N.: See—

Ivanov, Sergei K.; Dudkin, Viktor E.; Peredery, Valery P.; and Molchanov, Viktor N., 4,871,294, Cl. 415-58.700.

Monarch Marking Systems, Inc.: See—

Feltz, John F.; Harting, Michael F.; and Heaton, Richard D., 4,872,018, Cl. 343-742.000.

Monell Chemical Senses Center: See—

DiNovi, Michael J.; Rafka, Robert J.; Friedman, Mark I.; and Tordoff, Michael G., 4,871,776, Cl. 514-738.000.

Mong, Seymour: See—

Gleason, John G.; Hoffstein, Sylvia T.; Kinzig, Charles M.; Mong, Seymour; and Sarau, Henry M., 4,871,771, Cl. 514-570.000.

Monnier, Michel J., to U.S. Philips Corporation. Housing for an electronic device, 4,871,583, Cl. 427-96.000.

Monsanto Company: See—

Hoffman, Richard L., 4,871,248, Cl. 356-36.000.

Kalota, Dennis J.; McConaghy, John S., Jr.; Fisher, David O.; and Zielinski, Ronald E., 4,871,109, Cl. 228-180.100.

Monterosso, Gianpaolo; Marazzi, Riccardo; Nicotra, Mario; and Manenti, Luciano, to Nicotra Sistemi S.p.A. Transducer for measuring pressure in gas-filled cables, 4,872,007, Cl. 340-870.010.

Montet, Maurice, to Valeo Vision. Mechanism for locking and unlocking a lamp in a lamp holder particularly for use in an automobile vehicle, 4,872,096, Cl. 362-226.000.

Montgomery, Robert E., to REM Systems, Inc. Odorless artificial fingernail composition and method of using the same, 4,871,534, Cl. 424-61.000.

Montress, Gary K.: See—

Laton, Richard W.; Chase, Charles E., Jr.; and Montress, Gary K., 4,871,984, Cl. 331-107.00A.

Moock, Andrew W.: See—

Hehn, Bruce A.; and Moock, Andrew W., 4,871,065, Cl. 206-387.000.

Moog Automotive, Inc.: See—

Fister, Louis P.; Fitch, Lawrence H.; and Pearson, Herby O., 4,871,276, Cl. 403-162.000.

Moon, Kevin L.: See—

Rasmussen, Steve O.; Jackson, Larry A.; Rhodes, John D.; Pinkernell, David W.; Harmon, J. Paul; Moon, Kevin L.; and Huseby, William R., 4,872,026, Cl. 346-140.00R.

Moore, John W. Cylinder boring apparatus and method, 4,871,285, Cl. 408-80.000.

Moore Push-Pin Company: See—

Hoskinson, Marlin J.; Lorincz, Eugene M.; and Samson, George W., 4,871,140, Cl. 248-496.000.

Moore, Vernon S.; and Hamman, Reed K., to Holmes International Inc. Retainer blade arm locking means for wheel lift apparatus, 4,871,291, Cl. 414-563.000.

Morane, Bruno, to L'Oreal. Method of packaging a fluid under pressure, and packaging container for use with the method, 4,870,805, Cl. 53-470.000.

Morgan, Leonard J.; and Bell, Mark, to American Cyanamid Company. Aqueous suspension concentrate compositions of pendimethalin, 4,871,392, Cl. 71-121.000.

Mori, Kenji; and Tsuji, Masahiro, to Nisshin Flour Milling Co., Ltd. Optically active bicyclo[3.3.0]octane and processes for the preparation thereof, 4,871,869, Cl. 556-436.000.

Mori, Kinji; Miyamoto, Shoji; and Shiraha, Takeshi, to Hitachi, Ltd. Fault diagnostic distributed processing method and system, 4,872,165, Cl. 371-11.200.

Mori, Kinya: See—

Shimomura, Yojo; Mori, Kinya; and Kojima, Osamu, 4,871,805, Cl. 525-98.000.

Mori, Seiichi: See—

Kokubo, Yasushi; Suzuki, Keisuke; and Mori, Seiichi, 4,871,912, Cl. 250-311.000.

Mori, Yasushi: See—

Gemma, Nobuhiro; Miura, Akira; Mizushima, Koichi; Azuma, Makoto; and Mori, Yasushi, 4,871,236, Cl. 350-355.000.

Morikawa, Asao: See—

Kondo, Kazuo; Morikawa, Asao; Iwata, Hiroshi; and Shibata, Yoshimasa, 4,871,608, Cl. 428-209.000.

Morioka, Akira: See—

Matsuura, Takeshi; Morioka, Akira; and Takahira, Yoshiyuki, 4,871,606, Cl. 428-147.000.

Morisawa, Kunio, to Toyota Jidosha Kabushiki Kaisha. Power transmission chain belt, 4,871,344, Cl. 474-206.000.

Morishita, Akira, to Mitsubishi Denki Kabushiki Kaisha. Driving device for auxiliary device, 4,870,875, Cl. 74-785.000.

Morishita, Hiroshi: See—

Seki, Koji; Morishita, Hiroshi; Ohno, Kiyoshi; and Yokota, Hiroshi, 4,871,695, Cl. 501-54.000.

Morishita, Muneki: See—

Mita, Katsuya; Machida, Yutaka; and Morishita, Muneki, 4,871,905, Cl. 235-475.000.

Moriya, Koichiro: See—

Asai, Ko; and Morita, Koichiro, 4,872,203, Cl. 382-4.000.

Moriya, Masaru: See—

Nishizawa, Hisao; Morita, Masaru; and Tanaka, Masato, 4,871,417, Cl. 156-640.000.

Moriya, Noboru, to Kabushiki Kaisha Toshiba. Commutation compensation device for a DC machine, 4,872,123, Cl. 364-571.020.

Moriya, Takashi: See—

Maniwa, Yoshio; Morita, Takashi; Niro, Masaichi; Abe, Daisuke; and Nagayama, Haruhiko, 4,872,091, Cl. 361-424.000.

Moriya, Toshio. Fishing line device, 4,870,777, Cl. 43-42.740.

Moriya, Yoshiyasu: See—

Kawashima, Hisakazu; Morita, Yoshiyasu; Nishihara, Minoru; Arai, Tetsuzo; and Fukui, Kunihiko, 4,871,194, Cl. 285-55.000.

Moriya, Ikuro: See—

Naruo, Kyoichi; Ohtani, Sumio; Etoh, Masahiro; and Moriya, Ikuro, 4,871,456, Cl. 210-321.840.

Morkoc, Hadis; and Fischer, Russ, to University of Illinois. Heterojunction semiconductor device with <001> tilt, 4,872,046, Cl. 357-60.000.

Morohoshi, Kunichika: See—

Suzuki, Akira; Mochizuki, Nobuo; and Morohoshi, Kunichika, 4,871,609, Cl. 428-195.000.

Morris, Kevin J.: See—

Haley, Jerry L.; Barber, Weldon H.; and Morris, Kevin J., 4,871,019, Cl. 166-167.000.

Morris, Marvin L.: See—

Lindstrom, Edgar K.; and Morris, Marvin L., 4,871,027, Cl. 172-40.000.

Morris, Paul A.: See—

Pagen, Charles A.; Stepien, George, Jr.; and Morris, Paul A., 4,871,605, Cl. 428-141.000.

Mortenson, Mark G.: See—

Newkirk, Marc S.; and Mortenson, Mark G., 4,871,696, Cl. 501-94.000.

Moss Metal Fabrications: See—

Moss, Randy L., 4,871,183, Cl. 280-475.000.

Moss, Randy L., to Moss Metal Fabrications. Trailer dolly, 4,871,183, Cl. 280-475.000.

Motegi, Mitsuhiro: See—

Kodaka, Kazuyuki; Kitamura, Mitsuo; and Motegi, Mitsuhiro, 4,871,121, Cl. 242-54.00R.

Motorola Inc.: See—

Bergami, Bridgette A.; and Williams, Phillip H., 4,871,689, Cl. 437-67.000.

Bushey, Thomas P., 4,871,928, Cl. 307-446.000.

Davies, Robert B., 4,871,686, Cl. 437-39.000.

DeLuca, Joan S.; Holmes, Thomas F.; and Abbaticchio, Mark J., 4,872,005, Cl. 340-825.440.

Ecklund, Lawrence M., 4,872,207, Cl. 455-255.000.

Fette, Bruce, 4,872,202, Cl. 381-52.000.

Hammer, Ole; and Gras, Jean-Jacques, 4,872,204, Cl. 455-54.000.

Hawkins, George W., 4,872,088, Cl. 361-384.000.

Hollstein, Roger L.; and Phan, M. Ngheim, 4,871,929, Cl. 307-455.000.

Huang, Rong F.; and Howng, Wei-Yean, 4,872,086, Cl. 361-321.000.

Leeland, Steven B., 4,872,133, Cl. 364-748.000.

Neely, Eric; and Wells, Michael, 4,871,926, Cl. 307-272.300.

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Royer, Paul; and Schaupp, George W., Jr., 4,872,196, Cl. 379-58.000.

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Moulds, Julie M., to Chrysler Motors Corporation. Shipping rack for vehicle air dams, 4,871,075, Cl. 211-13.000.

Moulies, Jean-Claude; and Reigner, Gerard, to Atochem. Process for manufacturing films from semi-crystalline fluid polymers by coextrusion and tubular film blowing, 4,871,506, Cl. 264-514.000.

Mound Steel Corporation: See—

Tomlinson, Martin G., 4,870,793, Cl. 52-241.000.

Moyer, Carl L.: See—

Brown, Christopher K.; Moyer, Carl L.; Shipe, Joanne E.; and Walter, Herman D., 4,870,752, Cl. 29-866.000.

Mozayeny, Bahram, to VectorVision Corporation. Curve following apparatus, 4,872,105, Cl. 364-167.010.

MTU Motoren- und Turbinen-Union Muenchen GmbH: See—

Adam, Peter; Nebelung, Adolf; and Vogt, Michael, 4,871,578, Cl. 427-2.000.

Mueller, Ulaich: See—

Danner, Alfred; Mueller, Ulaich; Unger, Klaus; and Hoelderich, Wolfgang, 4,871,701, Cl. 502-62.000.

Mueller, Werner H.: See—

Gupton, B. Franklin; Rea, James H.; and Mueller, Werner H., 4,871,859, Cl. 546-250.000.

Mullen, George B.: See—

Georgiev, Vassil S.; and Mullen, George B., 4,871,862, Cl. 548-262.000.

Muller, Charles J., to Pfizer Hospital Products Group, Inc. Long stem hip implant, 4,871,369, Cl. 623-23.000.

Muller, Jergen: See—

Kochmann, Heike; Lechner, Georg; Muller, Jergen; and Scholz, Norbert, 4,872,030, Cl. 354-76.000.

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Hilhorst, Maximus A., 4,872,147, Cl. 367-96.000.

Multiple Marketing Systems, Inc.: See—

Fields, Robert A., 4,871,273, Cl. 400-613.200.

Munz, Wolf-Dieter; Hensel, Bernd; Scherer, Michael; and Knotek, Otto, to Leybold-Heraeus GmbH. Process for equipment to coat tools for machining and forming techniques with mechanically resistant layers, 4,871,434, Cl. 204-192.160.

Murabayashi, Katuyoshi, to Daicel Chemical Industries, Ltd. Resin composition of styrene resin and polyamide block copolymer, 4,871,804, Cl. 525-92.000.

Murakami, Yasuo: See—

Furumura, Kyozauro; Muraoka, Tomoki; Murakami, Yasuo; and Abe, Tsutomu, 4,871,268, Cl. 384-492.000.

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Murata, Hiroyuki; Tanaka, Takeshi; Hino, Chouji; Kiuchi, Harunaga; and Chiji, Masahiro, to Kabushiki Kaisha Kobe Seiko Sho. Impact crushing machine, 4,871,119, Cl. 241-189.00R.

Murata Manufacturing Co., Ltd.: See—

Kano, Osamu; Takano, Yoshihiko; and Senda, Atsuo, 4,871,585, Cl. 427-98.000.

Murata, Masanao: See—

Kanbara, Kouji; Kikuchi, Kenichi; Shimizu, Yoshihito; Hattori, Shinichiro; Tojo, Yoshikazu; Hasegawa, Akira; Yamaguchi, Tatsuya; Tsukaya, Takashi; Kobayashi, Kazunari; Murata, Masanao; Yamamoto, Tsutomu; and Nakamura, Takeaki, 4,870,950, Cl. 128-6.000.

Murata, Shinsuke, to Kabushiki Kaisha Sato. Portable label printing applicator apparatus, 4,871,269, Cl. 400-88.000.

Murata, Yasushi; Ogoshi, Kunizoh; and Matsui, Fumio, to Pioneer Electronic Corporation. Method for producing an optical information recording disk, 4,871,404, Cl. 156-73.100.

Murib, Jawad H., to National Distillers and Chemical Corporation. Apparatus and method for conducting chemical reactions, 4,871,516, Cl. 422-189.000.

Murphy, James D.: See—

Terhune, Ralph D.; and Murphy, James D., 4,871,455, Cl. 210-232.000.

Murphy, Milton K.: See—

Kesting, Robert E.; Fritzsche, Alfred K.; Murphy, Milton K.; Handermann, Alan C.; Cruise, Clint A.; and Malon, Raymond F., 4,871,494, Cl. 264-41.000.

Murphy, Patrick J.; Emeny, William L., Jr.; and Finlay, David A., Sr., to Pass & Seymour, Inc. Duplex electrical receptacle with voltage surge suppression, 4,872,081, Cl. 361-117.000.

Murphy, William A.: See—

Coy, David H.; and Murphy, William A., 4,871,717, Cl. 514-11.000.

Murray, David L. Articulated implement frame with swing hitch, 4,871,028, Cl. 172-248.000.

Murray, David R. V., to Sankey Vending Limited. Vending machine, 4,871,054, Cl. 194-212.000.

Murray, William D.; Duff, Sheldon J. B.; and Lanthier, Patricia H., to Canadian Patents & Development Limited. Production of natural flavor aldehydes from natural source primary alcohols C₂-C₇, 4,871,669, Cl. 435-147.000.

Muschelknaute, Edgar; Becker, Ernst; Bartsch, Adalbert; Kersten, Lars; Gospos, Georg; and Berndt, Gerhard, to Norddeutsche Affinerie Aktiengesellschaft. Apparatus for the pyrometallurgical processing of fine-grained solids, 4,871,147, Cl. 266-182.000.

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Premierani, William J.; Musser, David R.; and Narendran, Paliath, 4,872,126, Cl. 364-578.000.

Mustaev, Ilyas A.: See—

Nurmamedov, Narzy N.; Gonchar, Valery I.; Bazarov, Babamurad A.; Nurmukhamedov, Arslan; Skrylnikova, Irina V.; Mustaev, Ilyas A.; and Varshavsky, Valery L., 4,871,362, Cl. 623-6.000.

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Riley, Joe A., 4,871,386, Cl. 71-79.000.

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Taylor, Gerald W.; and Stanek, Lawrence C., 4,871,217, Cl. 312-216.000.

Myojo, Seiji; and Sato, Jun, to Shimano Industrial Company Limited. Fishing reel, 4,871,126, Cl. 242-84.10R.

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nology Co., Ltd. Print inspection method, print inspection apparatus and automatic print sorting system. 4,872,024, Cl. 346-1.100.

Nagaraj, D. R.: See—
Wang, Samuel S.; and Nagaraj, D. R., 4,871,466, Cl. 252-61.000.

Nagasawa, Yasuo: See—
Ishikawa, Hiroshi; and Nagasawa, Yasuo, 4,871,958, Cl. 320-32.000.

Nagata, Teruyuki; Tamaki, Akihiro; Kajimoto, Nobuyuki; and Wada, Masaru, to Mitsui Toatsu Chemicals, Inc. Process for producing diphenylamines or N,N'-diphenylphenylenediamines. 4,871,875, Cl. 514-87.000.

Nagata, Yasuhiro; and Fujimura, Hidetaka, to Daiken Industries, Ltd. Biosensor. 4,871,440, Cl. 204-403.000.

Nagatani, Shigeo. Rotor composite engine. 4,870,869, Cl. 74-52.000.

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Araki, Hiroshi; Ishii, Hisao; Akiyama, Yoshihisa; Kamada, Hiroshi; and Nagatomi, Takashi, 4,870,744, Cl. 29-568.000.

Nagatsuka, Ikutaroh: See—
Aoki, Takayoshi; Nagatsuka, Ikutaroh; Takeda, Masayuki; Honjo, Toshio; Itoh, Kazuhiro; and Uchida, Kenji, 4,871,639, Cl. 430-108.000.

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Maniwa, Yoshio; Morita, Takashi; Niro, Masaichi; Abe, Daisuke; and Nagayama, Haruhiko, 4,872,091, Cl. 361-424.000.

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Hane, Kazuhiro; and Hattori, Shuzo, 4,870,865, Cl. 73-512.000.

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Naito, Hiromitsu: See—
Shindo, Takuji; Naito, Hiromitsu; and Takeuchi, Makoto, 4,871,400, Cl. 148-12.708.

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Sanbuichi, Hiroshi; Terasaka, Katsunori; and Nakagawa, Toyooki, 4,870,937, Cl. 123-488.000.

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Nakahata, Kozo; Hamada, Toshimitsu; Nakagawa, Yasuo; and Nomoto, Mineo, 4,872,187, Cl. 378-4.000.

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Kasahara, Nobuo; Nakahara, Tosio; Watanuki, Masayosi; and Sawamura, Tadahide, 4,872,037, Cl. 355-271.000.

Nakahara, Hiromi, to Toshiba Kikai Kabushiki Kaisha. Magnetic scale and method of manufacturing the same. 4,871,624, Cl. 428-611.000.

Nakamura, Junji: See—
Matsui, Shigeaki; Hirai, Eiichi; and Nakamura, Junji, 4,871,674, Cl. 435-284.000.

Nakamura, Seiichi; Saito, Mamoru; and Sugawara, Toshiaki, to Mizusawa Industrial Chemicals, Ltd. Process for preparation of granular stabilizer for chlorine-containing polymers. 4,871,498, Cl. 264-115.000.

Nakamura, Takeaki: See—
Kanbara, Kouji; Kikuchi, Kenichi; Shimizu, Yoshihito; Hattori, Shinichiro; Tojo, Yoshikazu; Hasegawa, Akira; Yamaguchi, Tatsuya; Tsukaya, Takashi; Kobayashi, Kazunari; Murata, Masanao; Yamamoto, Tsutomu; and Nakamura, Takeaki, 4,870,950, Cl. 128-6.000.

Nakamura, Yoshikatsu; Kawamura, Osamu; and Shimomura, Souichi, to Nippon Piston Ring Co., Ltd. Rocker arm having wear resistant scuffing resistant portion. 4,870,931, Cl. 123-90.390.

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Nakano, Hirofumi, to Mitsubishi Denki Kabushiki Kaisha. Method of forming pattern of a two-layer metal film. 4,871,419, Cl. 156-643.000.

Nakatsuka, Shinichi; and Kajimura, Takashi, to Hitachi, Ltd. Semiconductor laser device having a lens-like refractive index distribution within the stripe. 4,872,175, Cl. 372-46.000.

Nakayama, Hiroki: See—
Sato, Yasuhisa; Yamada, Yasuyuki; Nakayama, Hiroki; and Oizumi, Kouji, 4,871,238, Cl. 350-422.000.

Nakayama, Hiroshi: See—
Nagai, Teiji; Sakazume, Ryo; Hanazawa, Kouichi; Nakayama, Hiroshi; and Minagawa, Yoshio, 4,872,024, Cl. 346-1.100.

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Yamaguchi, Yasuhiro; Shimoyama, Yuji; Ohnishi, Teteo; Ohno, Hironobu; Shioda, Isamu; and Nakazono, Yoji, 4,870,850, Cl. 72-164.000.

Nakhankin, Michael, to Gibbs & Hill, Inc. Advanced recuperator. 4,870,816, Cl. 60-39.020.

Nanba, Hiromi, to Kabushiki Kaisha Toshiba. Method for efficiently dropping out a pattern having a drop-out color and a facsimile apparatus for realizing the same. 4,872,062, Cl. 358-443.000.

Narendran, Paliath: See—
Premierani, William J.; Musser, David R.; and Narendran, Paliath, 4,872,126, Cl. 364-578.000.

Narr, Berthold: See—
Heider, Joachim; Psiorz, Manfred; Bomhard, Andreas; Huel, Norbert; Narr, Berthold; Noll, Klaus; Lillie, Christian; Kobinger, Walter; and Dammen, Jurgen, 4,871,735, Cl. 514-213.000.

Narui, Mamoru: See—
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Naruo, Kyoichi; Ohtani, Sumio; Etoh, Masahiro; and Moriya, Ikuro, to Fuji Photo Film Co., Ltd. Stacked filter cartridge with porous filter support. 4,871,456, Cl. 210-321.840.

National Child Safety Council: See—
Sommers, Valerie D., 4,871,341, Cl. 446-329.000.

National Distillers and Chemical Corporation: See—
Murib, Jawad H., 4,871,516, Cl. 422-189.000.

National Ecology, Inc.: See—
Berry, John R.; and Chon, David N., 4,871,073, Cl. 209-672.000.

National Gypsum Company: See—
Menchetti, Robert J., 4,870,794, Cl. 52-281.000.

National Research Development Corporation: See—
Roberts, Malcolm H. T., 4,871,750, Cl. 514-328.000.

National Starch and Chemical Corporation: See—
Chiu, Chung-Wai; and Chua, Hunter, 4,871,572, Cl. 426-557.000.

Natori, Tatsuo; Shimaguchi, Takashi; Watanabe, Akihide; and Yamada, Toshihiro, to Hitachi, Ltd. Slip casting method. 4,871,497, Cl. 264-86.000.

Nautical Propulsion Research Limited: See—
Rodriguez, Riccardo, 4,871,332, Cl. 440-5.000.

Navarro, Roger. Brake spring removal tool. 4,870,737, Cl. 29-227.000.

Nawata, Hizuru; and Otani, Susumu, to NEC Corporation. Carrier recovery circuit for offset QPSK demodulators. 4,871,975, Cl. 329-124.000.

Nebelung, Adolf: See—
Adam, Peter; Nebelung, Adolf; and Vogt, Michael, 4,871,578, Cl. 427-2.000.

NEC Corporation: See—
Asai, Ko; and Morita, Koichiro, 4,872,203, Cl. 382-4.000.

Hannai, Seiichi, 4,872,142, Cl. 365-189.070.

Jippo, Akira, 4,872,166, Cl. 371-11.100.

Nawata, Hizuru; and Otani, Susumu, 4,871,975, Cl. 329-124.000.

Okamoto, Kiyokazu; Endo, Tetsuo; Miyamoto, Yukio; and Suzuki, Yoshiharu, 4,871,934, Cl. 310-166.000.

Sakoe, Hiroaki, 4,872,201, Cl. 381-43.000.

Yamaguchi, Masaru; and Ogata, Takenori, 4,872,184, Cl. 375-14.000.

Yoshida, Ikio, 4,872,003, Cl. 340-825.080.

Yoshihara, Masashi, 4,871,973, Cl. 329-308.000.

Nedyalkov, Nedyalko K.: See—
Tabakov, Mirtcho S.; Nedyalkov, Nedyalko K.; and Stefanov, Stefan T., 4,872,021, Cl. 343-801.000.

Neely, Eric; and Wells, Michael, to Motorola, Inc. Low power, three state power up circuit. 4,871,926, Cl. 307-272.300.

Negishi, Yoshie: See—
Endo, Shigeru; Negishi, Yoshie; and Shiiba, Kiwamu, 4,871,577, Cl. 426-653.000.

Nekoosa Packaging Corporation: See—
Griffith, Edwin D., 4,871,406, Cl. 156-82.000.

Nelson, Dwight C., to Season-all Industries, Inc. Alignment clip member for windows and associated method. 4,870,791, Cl. 52-217.000.

Nelson, Larry A., to Honeywell Inc. Memory mapped deflection correction system. 4,871,948, Cl. 315-368.000.

Nelson, Thomas L., to Du Pont de Nemours & E. I. and Company. Apparatus for creating air turbulence. 4,870,728, Cl. 28-271.000.

Nelson, Thomas L., to Du Pont de Nemours & E. I. and Company. Ply-twist heat set carpet yarns. 4,870,813, Cl. 57-204.000.

Nemoto, Shusuke, to Kanzaki Kokyukoki Mfg. Co. Ltd. HST (hydrostatic-transmission) system driving speed changing apparatus. 4,870,820, Cl. 60-487.000.

NeoToy Partnership: See—
Knetzger, Robert C., 4,871,176, Cl. 273-237.000.

Neste OY: See—
Linden, Unto, 4,871,005, Cl. 152-210.000.

Nestec S. A.: See—
Bohren, Hans-Ueli; Kuypers, Theo W.; and Meister, Niklaus, 4,871,573, Cl. 426-588.000.

Netter, Zvi, to Elscint Ltd. Split screen imaging. 4,872,001, Cl. 340-721.000.

Neumann, Peter: See—
Schaefer, Gerhard; and Neumann, Peter, 4,871,876, Cl. 568-34.000.

Neumeyer, Richard E.: See—
Seibald, Mark D.; and Neumeyer, Richard E., 4,872,213, Cl. 364-180.000.

New England Deaconess Hospital Corporation: See—
Bistran, Bruce R.; Babayan, Vigen K.; Blackburn, George L.; and Mascioli, Edward A., 4,871,768, Cl. 514-547.000.

New Forney Corp.: See—
Slater, Billy R., 4,872,106, Cl. 364-200.000.

Newkirk, Marc S.; and Mortenson, Mark G., to Lanxide Technology Company, L.P. Method for producing substantially pure materials. 4,871,696, Cl. 501-94.000.

Newski, Alejandro: See—
Rivas, Olegario; and Newski, Alejandro, 4,871,020, Cl. 166-241.000.

Newton, Kevin H.: See—
Graef, Harry T.; Newton, Kevin H.; Allison, Timothy B.; and Eastman, Jeffrey M., 4,871,085, Cl. 221-4.000.

Nezu, Yukio: See—
Yonekura, Norihisa; Yumita, Takashi; Nezu, Yukio; Kojima, Yoshiyuki; Maeno, Shin-ichiro; and Yaguchi, Shigeharu, 4,871,751, Cl. 514-345.000.

NGK Insulators, LTD.: See—
Hayakawa, Issei; and Ukai, Noriyuki, 4,871,697, Cl. 501-97.000.

Oda, Isao, 4,871,266, Cl. 384-42.000.

NGK Spark Plug Co., Ltd.: See—
Kondo, Kazuo; Morikawa, Asao; Iwata, Hiroshi; and Shibata, Yoshimasa, 4,871,608, Cl. 428-209.000.

Niagara Lockport Industries Inc.: See—
Brown, Charles M.; and Doughty, Robert B., Jr., 4,870,997, Cl. 139-172.000.

Niall, Hugh D.: See—
Hudson, Peter J.; Shine, John; Niall, Hugh D.; and Tregear, Geoffrey W., 4,871,670, Cl. 435-172.300.

Nicholas, Paul P.: See—
Percec, Virgil; Nicholas, Paul P.; and Garcia, Dana, 4,871,816, Cl. 525-393.000.

Nichols, Robert K.: See—
Hemmad, Jayant G.; Lidinsky, William P.; Nichols, Robert K.; Richards, Gaylord W.; Roediger, Gary A.; Steele, Scott B.; Weddige, Ronald C.; and Zelle, Bruce R., 4,872,157, Cl. 370-60.000.

Nicholson, William J.: See—
Akred, Brian J.; Messenger, Edward T.; and Nicholson, William J., 4,871,467, Cl. 252-135.000.

Nickisch, Klaus; and Arnold, Hanfried, to Schering Aktiengesellschaft. Process for the preparation of 1-methylandrosta-1,4-diene-3,17-dione, and the novel intermediates for this process. 4,871,482, Cl. 260-397.300.

Nickolay, Helmut; and Lattner, Manfred, to Zinser Textilmaschinen GmbH. Roving guide apparatus. 4,870,720, Cl. 19-288.000.

Nicotra, Mario: See—
Monterosso, Gianpaolo; Marazzi, Riccardo; Nicotra, Mario; and Manenti, Luciano, 4,872,007, Cl. 340-870.010.

Nicotra Sistemi S.p.A.: See—
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Niedrig, Franklin F., to Straper AG. Apparatus for connecting overlapping ends of thermoplastic band material. 4,871,414, Cl. 156-494.000.

Nielsen, Steen E., to Institutet for Produktudvikling. Nozzle for laser processing. 4,871,897, Cl. 219-121.670.

Nigrini, Andrew; and Hwang, Rong J., to Chevron Research Company. Method for controlling the pH of steam fluids. 4,871,023, Cl. 166-252.000.

Nihon Radiator Co., Ltd.: See—
Hidaka, Yoshiaki, 4,870,828, Cl. 62-7.000.

Suzuki, Masao; and Koizumi, Hiroyasu, 4,871,894, Cl. 219-93.000.

Nikka Co., Ltd.: See—
Kasai, Ryusuke, 4,870,800, Cl. 53-88.000.

Nikki-Universal Co., Ltd.: See—
Tatsushima, Masaru; and Sakura, Makoto, 4,871,709, Cl. 502-324.000.

Nikon Corporation: See—
Anzai, Satoru; and Ohno, Koichi, 4,871,237, Cl. 350-419.000.

Sousa, Toshio; Wakamiya, Koichi; Wakabayashi, Hiroshi; Kanai, Hachiro; and Miyamoto, Hidenori, 4,871,242, Cl. 350-431.000.

Nilsson, Bo G.; and Andersson, Torgny, to Alfa-Laval Thermal, AB. Device to prevent through-flow of a port in a plate heat exchanger. 4,871,013, Cl. 165-75.000.

Nilsson, Isidro G.: See—
Bailey, Paul F., Jr.; Nilsson, Isidro G.; and Alf, George M., 4,870,964, Cl. 128-303.100.

Ninomiya, Hidetaka: See—
Sakamoto, Eiichi; Kaneko, Yutaka; Ninomiya, Hidetaka; Kamio, Takashi; Ezaki, Atsuo; Akamatsu, Hideo; and Haraga, Hideaki, 4,871,658, Cl. 430-551.000.

Nippon Furnace Kogyo Kaisha, Ltd.: See—
Kawamoto, Masao, 4,870,947, Cl. 126-91.00A.

Nippon Iron Powder Co., Ltd.: See—
Aoki, Takayoshi; Nagatsuka, Ikutaroh; Takeda, Masayuki; Honjo, Toshio; Itoh, Kazuhiro; and Uchida, Kenji, 4,871,639, Cl. 430-108.000.

Nippon Piston Ring Co., Ltd.: See—
Nakamura, Yoshikatsu; Kawamura, Osamu; and Shimomura, Souichi, 4,870,931, Cl. 123-90.390.

Nippon Seiko Kabushiki Kaisha: See—
Furumura, Kyozauro; Muraoka, Tomoki; Murakami, Yasuo; and Abe, Tsutomu, 4,871,268, Cl. 384-492.000.

Ono, Katsuyasu, 4,871,191, Cl. 280-804.000.

Nippon Sheet Glass Co., Ltd.: See—
Fuchigami, Yasuhiro, 4,871,277, Cl. 403-166.000.

Nippon Shokubai Kagaku Kogyo Co., Ltd.: See—
Uchida, Shin-ichi; Deguchi, Kozi; and Sasaki, Masamitsu, 4,871,700, Cl. 502-51.000.

Nippon Soken, Inc.: See—
Ohta, Minoru; Miura, Kazuhiko; Huzino, Seizi; Kanehara, Kenji; and Hattori, Tadashi, 4,870,860, Cl. 73-204.260.

Nippon Steel Corporation: See—
Fujimoto, Masami; Inazumi, Tadashi; Satoh, Katsuhiko; Shimozawa, Eiichi; Awa, Yasuhiro; Sato, Fumihiko; Nozaki, Kenro; Gushima, Akira; Suemura, Yoshinobu; Kusakabe, Nobuo; Imada, Kunihiko; Arichi, Masatoshi; Tanaka, Mitsunori; Umez, Yoshinori; and Ikeda, Tsuneo, 4,871,393, Cl. 75-5.000.

Shindo, Takuji; Naito, Hiromitsu; and Takeuchi, Makoto, 4,871,400, Cl. 148-12.708.

Nippondenso Co., Ltd.: See—
Ogawa, Shinji; Kajikawa, Yoshiharu; Kuroyanagi, Isao; Baba, Norimasa; and Ohara, Toshio, 4,870,834, Cl. 62-197.000.

Niro, Masaichi: See—
Maniwa, Yoshio; Morita, Takashi; Niro, Masaichi; Abe, Daisuke; and Nagayama, Haruhiko, 4,872,091, Cl. 361-424.000.

Nishida, Takashi: See—
Kobayashi, Shigeo; and Nishida, Takashi, 4,871,799, Cl. 525-64.000.

Nishigai, Kazuhisa: See—
Harada, Jumei; and Nishigai, Kazuhisa, 4,871,259, Cl. 366-85.000.

Nishihara, Minoru: See—
Kawashima, Hisakazu; Morita, Yoshiyasu; Nishihara, Minoru; Arai, Tetsuzo; and Fukui, Kunihiko, 4,871,194, Cl. 285-55.000.

Nishijima, Tamotsu; and Fujino, Toshihiro, to Yazaki Corporation. Apparatus for producing stranded cable. 4,870,851, Cl. 72-261.000.

Nishikawa, Kohei: See—
Sugihara, Hirotsada; Nishikawa, Kohei; and Ito, Katsumi, 4,871,842, Cl. 540-523.000.

Nishikawa, Yoshikazu: See—
Okamoto, Tatsuo; Kotani, Hideo; Oono, Takio; Watabe, Kiyoto; Kinoshita, Yasushi; and Nishikawa, Yoshikazu, 4,872,050, Cl. 357-71.000.

Nishimoto, Takashi: See—
Hayashi, Takatoshi; Fujiki, Norio; Tanaka, Yoichiro; Nishimoto, Takashi; and Kobayashi, Masakazu, 4,871,993, Cl. 340-439.000.

Nishimura, Akimasa: See—
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Nishimura, Atsushi: See—
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Nishimura, Shigeo: See—
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Nishimura, Shigeru: See—
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Watanabe, Kazuo; Nishimura, Toshiharu; and Kakutani, Masaki, 4,872,033, Cl. 355-27.000.

Nishino, Yukishige: See—
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Hisatomi, Masahiro, 4,870,941, Cl. 123-571.000.

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Sanbuichi, Hiroshi; Terasaka, Katsunori; and Nakagawa, Toyooki, 4,870,937, Cl. 123-488.000.

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Nissen, Harry S.: See—
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Nisshin Flour Milling Co., Ltd.: See—
Endo, Shigeru; Negishi, Yoshie; and Shiiba, Kiwamu, 4,871,577, Cl. 426-653.000.

Mori, Kenji; and Tsuji, Masahiro, 4,871,869, Cl. 556-436.000.

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Seto, Akira, 4,871,066, Cl. 435-134.000.

Nitsche, Rainer; Sebralla, Bruno; and Malkmus, Rolf, to W. C. Heraeus GmbH. Laser apparatus with a multipass resonator. 4,872,179, Cl. 372-93.000.

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Noding, Stephen A., to Dow Chemical Company, The. Novel multi-functional compounds and electrolytic oxidative coupling process. 4,871,430, Cl. 204-72.000.

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Nolan, Dennis C., to MagneTek, Inc. Ripple rejection filter. 4,872,127, Cl. 364-602.000.

Noll, Bernd: See—
Auracher, Franz; and Noll, Bernd, 4,871,223, Cl. 350-96.140.

Noll, Klaus: See—
Heider, Joachim; Psiorz, Manfred; Bomhard, Andreas; Haul, Norbert; Narr, Berthold; Noll, Klaus; Lillie, Christian; Kobinger, Walter; and Damngen, Jergen, 4,871,735, Cl. 514-213.000.

Nomoto, Mineo: See—
Nakahata, Kozo; Hamada, Toshimitsu; Nakagawa, Yasuo; and Nomoto, Mineo, 4,872,187, Cl. 378-4.000.

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Norddeutsche Affinerie Aktiengesellschaft: See—
Muschelkautz, Edgar; Becker, Ernst; Bartsch, Adalbert; Kersten, Lars; Gossop, Georg; and Berndt, Gerhard, 4,871,147, Cl. 266-182.000.

Nordica S.p.A.: See—
Pozzobon, Alessandro; and Gorza, Roberto, 4,870,723, Cl. 24-68.0SK.

Nordson Corporation: See—
Meyers, Reuven I., 4,871,380, Cl. 55-350.000.

Norkus, Christopher P., to W. R. Grace & Co.-Conn. Apparatus for attaching a printing blanket to a printing cylinder. 4,870,901, Cl. 101-415.100.

Norman, Murry A. Binary symbols for numbers. 4,872,150, Cl. 368-223.000.

Normandin, Sharon E., to Eastman Kodak Company. Photographic silver halide material and process. 4,871,652, Cl. 430-387.000.

North American Philips Corporation: See—
Russell, Robert H.; and Acker, Lawrence D., 4,870,971, Cl. 128-661.010.

Shaulov, Avner, 4,870,867, Cl. 73-625.000.

Skwirut, Henry; and Young, Robert C., 4,871,944, Cl. 315-56.000.

Northern Telecom Limited: See—
Richardson, Bruce A., 4,872,173, Cl. 372-29.000.

Northrop Corporation: See—
Shell, Forney L., Jr., 4,870,722, Cl. 24-16.00R.

Norton, John P.; Schneider, Steven; Wilder, William D.; and Hussell, Stephen J., to Combustion Concepts Inc.; and Williamson Company, Method and apparatus for heating a fluid stream. 4,871,308, Cl. 432-29.000.

Noeschke, Rocco, to Burndy Corporation. Ribbon cable connector. 4,871,315, Cl. 439-67.000.

Noveske, Terrence M.: See—
Misra, Sudhan S.; and Noveske, Terrence M., 4,871,428, Cl. 204-100.

Novo Industri A/S: See—
Jensen, Villy J.; Pedersen, Sven; and Olsen, Hans A. S., 4,871,571, Cl. 426-548.000.

Novotny, Bernd: See—
Schilling, Harald; and Novotny, Bernd, 4,871,977, Cl. 330-255.000.

Nowogrodzki, Markus, to General Electric Company. Object identification system and method utilizing radiometry. 4,872,014, Cl. 342-351.000.

Nozaki, Kenro: See—
Fujimoto, Masami; Inazumi, Tadahi; Satoh, Katsuhiko; Shimozawa, Eiichi; Awa, Yasuhiko; Sato, Fumihiro; Nozaki, Kenro; Gushima, Akira; Suemura, Yosinobu; Kusakabe, Nobuo; Imada, Kunihiro; Arichi, Masatoshi; Tanaka, Mitsunori; Umezu, Yoshinori; and Ikeda, Tsuneo, 4,871,393, Cl. 75-5.000.

Numa, Nobushige: See—
Sugimura, You; Watanabe, Tadashi; Sugiyama, Yutaka; Ohira, Kazuhiko; Numa, Nobushige; Yamaguchi, Sachio; and Kasari, Akira, 4,871,591, Cl. 427-388.500.

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Corain, Luciano; and Mattan, Gianni, 4,870,996, Cl. 139-1.00R.

Nurmamedov, Narzy N.; Gonchar, Valery I.; Bazarov, Babamurad A.; Nurmukhamedov, Arslan; Skrylnikova, Irina V.; Mustae, Ilyas A.; and Varshavsky, Valery L., to Otdelenie Vsesojuznogo Nauchno-Issledovatel'skogo i Proektiro-Konstrukorskogo Tekhnologicheskogo. Intraocular lens. 4,871,362, Cl. 623-6.000.

Nurmukhamedov, Arslan: See—
Nurmamedov, Narzy N.; Gonchar, Valery I.; Bazarov, Babamurad A.; Nurmukhamedov, Arslan; Skrylnikova, Irina V.; Mustae, Ilyas A.; and Varshavsky, Valery L., 4,871,362, Cl. 623-6.000.

Obata, Yoshinori: See—
Kamiya, Takashi; Suzuki, Masaya; Obata, Yoshinori; Watanabe, Masaki; and Matsuoka, Isao, 4,871,596, Cl. 428-15.000.

Obayashi, Michio: See—
Mano, Tsutomu; Kawase, Jiro; Misu, Daisuke; and Obayashi, Michio, 4,871,372, Cl. 8-410.000.

Oberkobusch, Rudolf: See—
Bencke, Herbert; Alscher, Arnold; Oberkobusch, Rudolf; Peter, Siegfried; and Jaumann, Wolfgang, 4,871,443, Cl. 208-39.000.

Oberth, Adolf E.; and Rothenstein, Julius, to United States of America, Air Force. Cure catalyst for polyurethanes. 4,871,854, Cl. 546-7.000.

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Oda, Isao, to NGK Insulators, Ltd. Slide assemblies. 4,871,266, Cl. 384-42.000.

Odham, Carl J., to Asheboro Elastics, Corp. Apparatus for deknitting elastic yarns. 4,870,839, Cl. 66-125.00A.

Odoni, Walter; and Boesch, Richard, to Hilti Aktiengesellschaft. Motor-driven hand tool with braking torque device. 4,871,033, Cl. 173-12.000.

O'Donnelly, Brian E.: See—
Fister, Julius C.; Cherukuri, Satyam C.; Mahulikar, Deepak; and O'Donnelly, Brian E., 4,872,047, Cl. 357-67.000.

Oesterling, Erwin: See—
Hensgen, Gerhard; Steiniger, Wolfgang; Hinz, Werner; Oesterling, Erwin; and Schlisio, Siegfried, 4,870,748, Cl. 29-773.000.

O'Farrell, Desmond J.; Schofield, Kenneth; Larson, Mark L.; Hanft, Karl-Heinz; Schierbeck, Kenneth L.; and Bentley, Richard D., to Donnelly Corporation. Vehicular moisture sensor and mounting apparatus therefor. 4,871,917, Cl. 250-341.000.

Ogasawara, Toshichika: See—
Miwa, Kohtaro; Igusa, Kazuo; and Ogasawara, Toshichika, 4,871,772, Cl. 514-573.000.

Ogata, Takenori: See—
Yamaguchi, Masaru; and Ogata, Takenori, 4,872,184, Cl. 375-14.000.

Ogawa, Hideki; and Matsushita, Takashi, to Canon Kabushiki Kaisha. Photographic lens of improved near distance performance. 4,871,243, Cl. 350-463.000.

Ogawa, Shinji; Kajikawa, Yoshiharu; Kuroyanagi, Isao; Baba, Norimasa; and Ohara, Toshio, to Nippondenso Co., Ltd. Vapor pressure-adjusting valve and refrigeration system using same. 4,870,834, Cl. 62-197.000.

Ogawa, Yoshihiro: See—
Imataki, Hiroyuki; Hiraoka, Mizuho; Ichikawa, Sachiko; Ogawa, Yoshihiro; and Yoshino, Hitoshi, 4,871,649, Cl. 430-270.000.

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Ogilvie, David P., to Signaid Limited. Sign. 4,870,769, Cl. 40-564.000.

Ogle, John; and Yin, Gerald Z., to Lam Research Corporation. Split-phase driver for plasma etch system. 4,871,421, Cl. 156-643.000.

Ogoshi, Kunizoh: See—
Murata, Yasushi; Ogoshi, Kunizoh; and Matsui, Fumio, 4,871,404, Cl. 156-73.100.

Oguchi, Yoshihiro: See—
Miura, Kyo; Sugata, Hiroyuki; Oguchi, Yoshihiro; and Yoshino, Hitoshi, 4,871,601, Cl. 428-64.000.

Ogura, Toshihiko: See—
Kubota, Kazumi; Kobayashi, Kazushi; and Ogura, Toshihiko, 4,872,131, Cl. 364-736.000.

Ohara, Toshio: See—
Ogawa, Shinji; Kajikawa, Yoshiharu; Kuroyanagi, Isao; Baba, Norimasa; and Ohara, Toshio, 4,870,834, Cl. 62-197.000.

Ohio State University, The: See—
Nair, Raghunathan V.; and Witaki, Donald T., 4,871,736, Cl. 514-232.500.

Ohio State University Research Foundation, The: See—
Webb, Thomas E.; Schumm, Dorothy E.; Hanausek-Walaszek, Margaret; Walaszek, Zbigniew; and Lang, Raymond W., 4,871,661, Cl. 435-7.000.

Ohira, Kazuhiko: See—
Sugimura, You; Watanabe, Tadashi; Sugiyama, Yutaka; Ohira, Kazuhiko; Numa, Nobushige; Yamaguchi, Sachio; and Kasari, Akira, 4,871,591, Cl. 427-388.500.

Ohmi, Tadahi: See—
Nishizawa, Jun-ichi; and Ohmi, Tadahi, 4,872,044, Cl. 357-38.000.

Ohmori, Akira; and Yasuhara, Takashi, to Daikin Industries, Ltd. Alpha-fluoroacrylic acid polymer and its use. 4,871,820, Cl. 526-245.000.

Ohnaka, Hidemi: See—
Shibata, Norio; Mizuno, Hideaki; Satoya, Kouichi; Uchitani, Nobuki; Kamohara, Tatsuyoshi; Harada, Kenichi; Yoshioka, Mamoru; Kato, Takashi; and Ohnaka, Hidemi, 4,870,942, Cl. 123-571.000.

Ohnishi, Tateo: See—
Yamaguchi, Yasuhiro; Shimoyama, Yuji; Ohnishi, Tateo; Ohno, Hironobu; Shioda, Isamu; and Nakazono, Yoji, 4,870,850, Cl. 72-164.000.

Ohno, Hironobu: See—
Yamaguchi, Yasuhiro; Shimoyama, Yuji; Ohnishi, Tateo; Ohno, Hironobu; Shioda, Isamu; and Nakazono, Yoji, 4,870,850, Cl. 72-164.000.

Ohno, Kiyoshi: See—
Seki, Koji; Morishita, Hiroshi; Ohno, Kiyoshi; and Yokota, Hiroshi, 4,871,695, Cl. 501-54.000.

Ohno, Koichi: See—
Anzai, Satoru; and Ohno, Koichi, 4,871,237, Cl. 350-419.000.

Ohno, Toshinobu: See—
Takata, Masakazu; Ueda, Takamasa; Ito, Kimiyuki; Hirashima, sunaki; Yamamoto, Souichi; Ishino, Yoshio; and Ohno, Toshinobu, 4,871,633, Cl. 430-58.000.

Ohsawa, Yutaka: See—
Takami, Satoshi; and Ohsawa, Yutaka, 4,872,069, Cl. 354-484.000.

Ohshima, Jiro: See—
Taka, Shin-ichi; and Ohshima, Jiro, 4,871,685, Cl. 437-33.000.

Ohsumi, Hideki, to Yazaki Corporation. Connector with connection check device. 4,871,323, Cl. 439-188.000.

Ohta, Minoru; Miura, Kazuhiko; Huzino, Seizi; Kanehara, Kenji; and Hattori, Tadashi, to Nippon Soken, Inc. Direct-heated flow measuring apparatus having improved response characteristics. 4,870,860, Cl. 73-204.260.

Ohta, Noboru; Takahashi, Koji; and Suzuki, Tsuneo, to Fuji Photo Film Co., Ltd. Method for dividing density range of component dyes in color hard copy. 4,872,034, Cl. 355-77.000.

Ohtake, Masatoshi: See—
Tsuyoshi, Tohichi; Ohtake, Masatoshi; Takasugi, Wasao; and Yonezawa, Seiji, 4,872,152, Cl. 369-44.000.

Ohtani, Sumio: See—
Naruo, Kyoichi; Ohtani, Sumio; Etoh, Masahiro; and Moriya, Ikuro, 4,871,456, Cl. 210-321.840.

Ohtani, Yukio; and Sato, Yoshitake, to Yazaki Corporation. Liquid level indicator. 4,870,861, Cl. 73-317.000.

Ohtsuka, Akinori; Kurita, Hitoshi; and Fujii, Yasutetsu, to Matsushita Electric Industrial Co., Ltd. Key input device. 4,872,008, Cl. 341-26.000.

Ohya, Makoto: See—
Okina, Toyohiko; Goto, Hiroshi; Kousaka, Fumio; Teranishi, Akinori; Kawabata, Satoshi; Ohya, Makoto; Ohya, Makoto; and Kozaki, Norio, 4,871,612, Cl. 428-269.000.

Ohya, Tetsuo: See—
Okina, Toyohiko; Goto, Hiroshi; Kousaka, Fumio; Teranishi, Akinori; Kawabata, Satoshi; Ohya, Tetsuo; Ohya, Makoto; and Kozaki, Norio, 4,871,612, Cl. 428-269.000.

Oikawa, Ryutsu, to Yazaki Corporation. Clip for securing a wiring harness. 4,871,134, Cl. 248-65.000.

Oizumi, Kouji: See—
Sato, Yasuhisa; Yamada, Yasuyuki; Nakayama, Hiroki; and Oizumi, Kouji, 4,871,238, Cl. 350-422.000.

Ojima, Kunio: See—
Yamada, Katsuhiko; Ojima, Kunio; Asakura, Takashi; Yamamori, Yusuke; and Nakamura, Yukihiro, 4,871,146, Cl. 266-106.000.

Oka, Junichi: See—
Isono, Koichi; Tomohisa, Kunio; Oka, Junichi; and Sakamoto, Takashi, 4,872,065, Cl. 358-494.000.

Oka, Mitsuru: See—
Kuroko, Masayasu; Unno, Ryoichi; Kimura, Hiromoto; Oka, Mitsuru; Hasegawa, Keiko; Ikeda, Shinichi; Kuboyama, Noboru; Ito, Takashi; Sawai, Kiichi; and Ito, Shunshuke, 4,871,740, Cl. 514-255.000.

Okamoto, Hidefumi: See—
Sugisawa, Ko; Matsumura, Yasushi; Okamoto, Hidefumi; and Abe, Kumiko, 4,871,565, Cl. 426-407.000.

Okamoto, Kazuhiko; and Kanayama, Akira, to Sharp Kabushiki Kaisha. Memory protection device for an electronic apparatus. 4,872,139, Cl. 365-52.000.

Okamoto, Kiyokazu; Endo, Tetsuo; Miyamoto, Yukio; and Suzuki, Yoshiharu, to NEC Corporation. Induction motor. 4,871,934, Cl. 310-166.000.

Okamoto, Tatsuo; Kotani, Hideo; Oono, Takio; Watabe, Kiyoto; Kinoshita, Yasushi; and Nishikawa, Yoshikazu, to Mitsubishi Denki Kabushiki Kaisha. Interconnection structure in semiconductor device and manufacturing method of the same. 4,872,050, Cl. 357-71.000.

Okamura, Nobuyuki: See—
Itoh, Michio; Yamamoto, Hisao; and Okamura, Nobuyuki, 4,871,794, Cl. 524-254.000.

Okano, Hiroshi: See—
Kuma, Tosimi; and Okano, Hiroshi, 4,871,607, Cl. 428-186.000.

Okatani, Masanao, to Pioneer Electronic Corporation. Method of reproducing video information in a disk player, including compensation for conditions in the disk and in the player. 4,872,067, Cl. 358-341.000.

Oki Electric Industry Co., Ltd.: See—
Fukuda, Hisashi, 4,871,416, Cl. 156-635.000.

Okina, Toyohiko; Goto, Hiroshi; Kousaka, Fumio; Teranishi, Akinori; Kawabata, Satoshi; Ohya, Tetsuo; Ohya, Makoto; and Kozaki, Norio, to Inoue MTP Kabushiki Kaisha. Interior member for vehicles and method for its manufacture. 4,871,612, Cl. 428-269.000.

Okita, Ryosuke, to Mitsubishi Denki Kabushiki Kaisha. Coupling device of magnetic particle type. 4,871,049, Cl. 192-21.500.

Okuda, Hiroshi, to Mitsubishi Denki Kabushiki Kaisha. Phosphor for cathode ray tube. 4,871,471, Cl. 252-301.405.

Okumoto, Yoshinao: See—
Matsuda, Toshiharu; and Okumoto, Yoshinao, 4,870,833, Cl. 62-134.000.

Okuyama, Toshiharu: See—
Shimizu, Giichiro; Okuyama, Toshiharu; and Wakatsuki, Yoshio, 4,872,124, Cl. 364-571.030.

O'Lenick, Anthony J.: See—
Friel, Thomas C., Jr.; and O'Lenick, Anthony J., 4,871,483, Cl. 260-404.500.

Olin Corporation: See—
Fister, Julius C.; Cherukuri, Satyam C.; Mahulikar, Deepak; and O'Donnelly, Brian E., 4,872,047, Cl. 357-67.000.

Rothgery, Eugene F.; and Manke, Steven A., 4,871,861, Cl. 548-251.000.

Scardera, Michael; and Roche, Thomas S., 4,871,422, Cl. 156-662.000.

Wojtowicz, John A., 4,871,486, Cl. 562-818.000.

Olsen, Hans A. S.: See—
Jensen, Villy J.; Pedersen, Sven; and Olsen, Hans A. S., 4,871,571, Cl. 426-548.000.

Olsen, Robert H.: See—
Smith, Stanton D.; Hertz, David; Wolf, Robert B.; and Olsen, Robert H., 4,871,966, Cl. 324-309.000.

Olson, Donald C.; Miller, John J., deceased; Miller, Wayne R., executor; Blytas, George C.; and Diaz, Zaida, to Shell Oil Company. Process and composition for H₂S removal. 4,871,520, Cl. 423-221.000.

Olympic Manufacturing Group, Inc.: See—
Choiniere, Stanley W., 4,871,289, Cl. 411-48.000.

Olympus Optical Co., Ltd.: See—
Ishikawa, Tomonori; Fukaya, Takashi; Tsunoda, Toshiyuki; and Fujiwara, Hiroshi, 4,871,245, Cl. 350-502.000.

Kato, Tadashi, 4,872,029, Cl. 354-413.000.

Kawai, Sumio, 4,871,937, Cl. 310-323.000.

Suzuki, Akira, 4,870,951, Cl. 128-6.000.

Tashiro, Yoshio, 4,871,229, Cl. 350-96.260.

Omatsu, Toshihiro; Tokitoh, Yasuo; and Yoshimura, Noriaki, to Kuraray Co., Ltd. Hydroformylation process. 4,871,880, Cl. 568-454.000.

O'Meara, Thomas R.: See—
Grinberg, Jan; Marom, Emanuel; Soffer, Bernard H.; O'Meara, Thomas R.; and Pops, Adrian E., 4,871,232, Cl. 350-162.110.

Omron Tateisi Electronics Co.: See—
Mita, Katsuya; Machida, Yutaka; and Morishita, Muneki, 4,871,905, Cl. 235-475.000.

Ueno, Satoshi, 4,870,973, Cl. 128-680.000.

Ondeyka, John G.: See—
Burg, Richard W.; Dulaney, Eugene L.; Hensens, Otto D.; Liesch, Jerrold M.; Ondeyka, John G.; and Wichmann, Carol F., 4,871,727, Cl. 514-179.000.

Ong, Beng S.: See—
Limburg, William W.; Yanus, John F.; Renfer, Dale S.; Schank, Richard L.; and Ong, Beng S., 4,871,634, Cl. 430-54.000.

Onishi, Yasunobu: See—
Hayase, Shizu; Horiguchi, Rumiko; Onishi, Yasunobu; and Ushirogouchi, Toru, 4,871,646, Cl. 430-192.000.

Ono, Akira: See—
Inoue, Senya; Ono, Akira; Kobayashi, Mikio; and Yokoo, Hiroshi, 4,871,693, Cl. 501-9.000.

Ono, Katsuyasu, to Nippon Seiko Kabushiki Kaisha. Webbing guiding structure for automobile seat belt system. 4,871,191, Cl. 280-804.000.

Ono, Takashi: See—
Ishii, Hiromitsu; and Ono, Takashi, 4,871,999, Cl. 340-587.000.

Ono, Yukiko: See—
Tanaka, Shotaro; Ikezaki, Masao; Ono, Yukiko; and Sasanuma, Hiroshi, 4,872,162, Cl. 370-85.120.

Onocki, Theodore J.: See—
Robbins, Edward S., III; and Onocki, Theodore J., 4,871,264, Cl. 383-68.000.

Ontic Engineering and Manufacturing Inc.: See—
Beattie, Steven K.; Richards, Paul C.; and Smith, David A., 4,872,208, Cl. 324-174.000.

Ooi, Shinichi: See—
Takahashi, Tadahi; Ooi, Shinichi; and Takemasa, Masami, 4,871,011, Cl. 165-16.000.

Ooms, Pieter: See—
Daum, Werner; Hansler, Gerd; and Ooms, Pieter, 4,871,864, Cl. 549-60.000.

Onishi, Akiyoshi; Ishino, Iwao; Shimada, Takeo; and Ozeki, Yuji, to Mitsubishi Petrochemical Co., Ltd. Ethylene copolymer and process for the production thereof. 4,871,819, Cl. 526-245.000.

Oono, Takio: See—
Okamoto, Tatsuo; Kotani, Hideo; Oono, Takio; Watabe, Kiyoto; Kinoshita, Yasushi; and Nishikawa, Yoshikazu, 4,872,050, Cl. 357-71.000.

Opitz, Klaus; Weischer, Maria-Luise; and Traber, Jorg, to Troponwerke GmbH & Co. KG. Use of 2-pyrimidinyl-1-piperazine derivatives in the treatment of dependence on nicotine. 4,871,738, Cl. 514-252.000.

Oppenheim, Amos: See—
Aviv, Haim; Gorecki, Marian; Levanon, Avigdor; Oppenheim, Amos; Vogel, Tikva; Zeelon, Pinhas E.; and Zeevi, Menachem, 4,871,835, Cl. 530-399.000.

Oppenlaender, Knut: See—
Martischius, Franz-Dieter; Oppenlaender, Knut; and Vogel, Hans-Henning, 4,871,375, Cl. 44-71.000.

Optum Corporation: See—
Filo, Andrew, 4,872,063, Cl. 358-474.000.

Ore-Ida Vended Products, Inc.: See—
Mariotti, Rene, 4,870,985, Cl. 137-102.000.

Orloff, Eugene F.; Horowitz, Martin; and Rittner, Charles H., to Gull Inc.; and McDonnell Douglas Corporation. Multiplexed junction probe for fuel gaging system and system containing same. 4,872,120, Cl. 364-509.000.

Ormat Turbines (1965) Ltd.: See—
Kaplan, Uri, 4,871,295, Cl. 415-94.000.

Orscheln Co.: See—
Chacko, Tharayil; Soucie, Wayne; Tauer, Elroy J.; and Heimann, Robert, 4,870,814, Cl. 57-217.000.

Ortho Pharmaceutical Corporation: See—
Pena, Jeffery B., 4,871,745, Cl. 514-300.000.
Osada, Akira: See—
Suzuki, Fujiyuki; and Osada, Akira, 4,872,117, Cl. 364-431.050.
Osaka Municipal Government: See—
Takata, Masakazu; Ueda, Takamasa; Ito, Kimiyuki; Hirashima, Sumaki; Yamamoto, Souichi; Ishino, Yoshio; and Ohno, Toshinobu, 4,871,633, Cl. 430-58.000.
Osawa, Izumi: See—
Iino, Syuji; Osawa, Izumi; and Hotomi, Nideo, 4,871,632, Cl. 430-58.000.
Oshima, Takehiro; Tanaka, Shoji; and Matsukura, Shigekazu, to Sun-
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Osterloh, Rolf: See—
Schwerzel, Thomas; Osterloh, Rolf; Schupp, Eberhard; Perner, Thomas; and Ahlers, Klaas, 4,871,808, Cl. 525-113.000.
Ostrow, Barnet D.: See—
Nobel, Fred I.; Ostrow, Barnet D.; and Schram, David N., 4,871,429, Cl. 204-44.000.
Otani, Susumu: See—
Nawata, Hizuru; and Otani, Susumu, 4,871,975, Cl. 329-124.000.
Otdelenie Vsesojuznogo Nauchno-Issledovatel'skogo i Proektirov-
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Nurmamedov, Narzy N.; Gonchar, Valery I.; Bazarov, Babamurad A.; Nurmukhamedov, Arslan; Skrylnikova, Irina V.; Mustae, Ilyas A.; and Varshavsky, Valery L., 4,871,362, Cl. 623-6.000.
Otonari, Satoshi; Sato, Yoshinori; Masuda, Narihiro; and Kotani, Tomoyuki, to Diafoil Company, Limited. Minute-cellular polyester film, 4,871,784, Cl. 521-138.000.
Ouhadi, Trazollah: See—
Datta, Sudhin; and Ouhadi, Trazollah, 4,871,523, Cl. 423-265.000.
Oullette, Lucille A.; and Scott, Stephen C. Biological freezing apparatus, 4,870,829, Cl. 62-51.100.
Outboard Marine Corporation: See—
Macier, James E.; Binversie, Gregory J.; Calamia, David C.; and Daniels, John M., 4,870,929, Cl. 123-78.00R.
Outzen, Svend E., to Danfoxa A/S. Compressor spring mounting, 4,871,300, Cl. 417-363.000.
Ouyang, Kenneth W.: See—
Shearer, Gerald; Lofgren, Karl M.; and Ouyang, Kenneth W., 4,871,979, Cl. 330-253.000.
Owen, Hartley: See—
Herbst, Joseph A.; Owen, Hartley; and Schipper, Paul H., 4,871,446, Cl. 208-152.000.
Owens-Illinois Plastic Products Inc.: See—
Ajmera, Prakash R., 4,871,507, Cl. 264-521.000.
Oxman, Joel D.: See—
Aasen, Steven M.; Oxman, Joel D.; and Ubel, F. Andrew, III, 4,871,786, Cl. 523-113.000.
Ozawa, Osamu: See—
Igarashi, Shigeru; and Ozawa, Osamu, 4,870,995, Cl. 138-126.000.
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Oonishi, Akiyoshi; Ishino, Iwao; Shimada, Takeo; and Ozeki, Yuji, 4,871,819, Cl. 526-245.000.
P.C. Cox (Newbury) Limited: See—
Cox, John P. A., 4,871,088, Cl. 222-47.000.
Paccar Inc.: See—
Whitmer, Randal, 4,871,051, Cl. 192-85.00C.
Pacific Bell: See—
Schembri, John J., 4,871,225, Cl. 350-96.760.
Pagano, Dominick A. Automated in-line pipe inspection system, 4,872,130, Cl. 364-507.000.
Pagen, Charles A.; Stepien, George, Jr.; and Morris, Paul A., to Genstar Building Materials Company. Inorganic fiber mat based bituminous sheet materials, 4,871,605, Cl. 428-141.000.
Paglia, Richard: See—
Kirby, John P.; and Paglia, Richard, 4,872,148, Cl. 367-172.000.
Painchaud, Francois: See—
Dunn, Joseph E.; Clark, R. Wayne; Asmus, John F.; Pearlman, Jay S.; Boyer, Keith; Painchaud, Francois; and Hofmann, Gunter A., 4,871,559, Cl. 426-248.000.
Pajor, Aniko: See—
Hermecz, Istvan; Kereszturi, Geza; Vasvavi, Lelle; Horvath, Agnes; Balogh, Maria; Kovacs, Gabor; Szuts, Tamas; Ritli, Peter; Sipos, Judith; and Pajor, Aniko, 4,871,849, Cl. 544-229.000.
Palamides, Aldo: See—
Palamides, Sesto; Palamides, Aldo; and Palamides, Stefano, 4,870,807, Cl. 53-528.000.
Palamides GmbH: See—
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Pallos, Laszlo: See—
Batori, Sandor; Hajos, Gyorgy; Messmer, Andras; Benko, Pal; Pallos, Laszlo; Petocz, Lujza; Grasser, Katalin; Kosoczky, Ibolya; and Szirt nee Kiszely, Eniko, 4,871,846, Cl. 544-183.000.
Panda, Prakash C.; Seydel, Edgar R.; and Raj, Rishi, to Jupiter Technologies, Inc.; and Cornell Research Foundation, Inc. Composites comprising silicon carbide fibers dispersed in magnesia-aluminate

matrix and fabrication thereof and of other composites by sinter forging, 4,871,496, Cl. 264-65.000.
Pang, Richard F.: See—
Fitzpatrick, Mark E.; Gouldsberry, Gary R.; Chan, Yat-Sum; and Pang, Richard F., 4,871,931, Cl. 307-491.000.
Paperboard Industries Corporation: See—
Zimmermann, John, 4,871,071, Cl. 206-628.000.
Pardy, Richard B. A., to BP Chemicals Limited. Recovery process, 4,871,432, Cl. 204-182.400.
Park, Yong S.; and Remec, Thomas M., to Zenith Electronics Corporation. Apparatus and method for curing a defect in a grille formed on a panel of a color cathode ray tube, 4,871,415, Cl. 156-626.000.
Parker, David H. Battery terminal post protector, 4,871,628, Cl. 429-96.000.
Parker, Raymond G., to W. R. Grace & Co.-Conn. Method for salting meat, 4,871,561, Cl. 426-281.000.
Parrish, James R., to Central Machine and Tool Company. Safe locking quick disconnect coupling, 4,871,195, Cl. 285-91.000.
Parrott, Gary A. Compliant rotary powered tool, 4,871,036, Cl. 173-163.000.
Parsi, Edgardo J., to Ionics, Incorporated. Apparatus for the removal of dissolved solids from liquids using bipolar membranes, 4,871,431, Cl. 204-182.400.
Parsons, Bryan N. V., to Jaguar Cars Limited. Cam mechanisms, 4,870,872, Cl. 74-568.00R.
Parton, Richard L.; Gingello, Anthony D.; Collett, David J.; Stegman, David A.; and Adin, Anthony, to Eastman Kodak Company. Photographic silver halide elements containing infrared filter dyes, 4,871,656, Cl. 430-522.000.
Partridge, Randall D.: See—
Chang, Clarence D.; Chu, Cynthia T.-W.; Lee, Carol S.; and Partridge, Randall D., 4,871,702, Cl. 502-86.000.
Pasarela, Nunzio R.; and Steller, William S., to American Cyanamid Company. Herbicidal liquid concentrate compositions, 4,871,388, Cl. 71-92.000.
Pasierb, John J., Jr., to Bally Manufacturing Corporation. General purpose display controller for electronic games, 4,871,167, Cl. 273-100E.
Pass & Seymour, Inc.: See—
Brant, Edward J., 4,872,087, Cl. 361-356.000.
Murphy, Patrick J.; Emeny, William L., Jr.; and Finlay, David A., Sr., 4,872,081, Cl. 361-117.000.
Patraud, Jeanne: See—
Arraudeau, Jean-Pierre; Patraud, Jeanne; and Le Gall, Louis, 4,871,536, Cl. 424-59.000.
Patry, Bernard: See—
Vaughan, John E.; Smale, David R.; Patry, Bernard; and Heaton, John C., 4,871,886, Cl. 200-43.050.
Paul, Hans-Helmut: See—
Kaczynski, Ulrich; Schmidt, Peter; and Paul, Hans-Helmut, 4,871,290, Cl. 414-331.000.
Pavie, Claude: See—
Bergerious, Jean-Marcel; Pavie, Claude; Plent, Christian; and Constant, Bernard, 4,870,799, Cl. 53-55.000.
Pawar, Prakash K. Flame retardant additive for thermoplastics, 4,871,795, Cl. 524-267.000.
Pawlak, Andrzej M.: See—
Zuraski, Jeffery A.; Pawlak, Andrzej M.; Graber, David W.; and Babineau, James W., 4,871,040, Cl. 180-142.000.
Pean, Jean-Louis: See—
Mizandjian, Jean-Luc; Pean, Jean-Louis; and Amen, Jean, 4,870,801, Cl. 53-432.000.
Pearlman, Jay S.: See—
Dunn, Joseph E.; Clark, R. Wayne; Asmus, John F.; Pearlman, Jay S.; Boyer, Keith; Painchaud, Francois; and Hofmann, Gunter A., 4,871,559, Cl. 426-248.000.
Pearson, Herby O.: See—
Fister, Louis P.; Fitch, Lawrence H.; and Pearson, Herby O., 4,871,276, Cl. 403-162.000.
Peck, James M., to Minnesota Mining & Manufacturing Company. Rescalable bag, 4,871,265, Cl. 383-89.000.
Pedersen, Sven: See—
Jensen, Villy J.; Pedersen, Sven; and Olsen, Hans A. S., 4,871,571, Cl. 426-548.000.
Peet, Norton P.; and Sunder, Shyam, to Merrell Dow Pharmaceuticals Inc. Substituted imidazo(2,1-b)quinazolin-5(3H)-ones and related tricyclic compounds and use as bronchodilators, 4,871,732, Cl. 514-212.000.
Peiretti, Domenico: See—
Ribolla, G. Carlo; Taroni, Federico; Peiretti, Domenico; and Pepino, Antonio, 4,870,727, Cl. 26-10.00C.
Pekala, Wladyslaw: See—
Rosiak, Janusz; Rucinska-Rybus, Anna; and Pekala, Wladyslaw, 4,871,490, Cl. 264-22.000.
Pelgrom, Marcellinus J. M.; and Duinmaier, Adrianus C. J., to U.S. Philips Corporation. Plural stage switched capacitor integrating digital-to-analog converter, 4,872,011, Cl. 341-150.000.
Pelikan Aktiengesellschaft: See—
Kunkel, Ernst; and Rutz, Wolfhard, 4,871,620, Cl. 428-484.000.
Pemmaraju, Ramarao V., to DTI Peripherals, Inc. Dynamically configurable communications network, 4,872,197, Cl. 379-93.000.
Pendergraft, Paul T., to Amoco Corporation. Sulfur recovery process using metal oxide absorbent with improved purge, 4,871,521, Cl. 423-230.000.

Pennwalt Corporation: See—
Gastgeb, Raymond F.; and Tom, Edward, 4,870,868, Cl. 73-649.000.
Pepino, Antonio: See—
Ribolla, G. Carlo; Taroni, Federico; Peiretti, Domenico; and Pepino, Antonio, 4,870,727, Cl. 26-10.00C.
Percec, Virgil; Nicholas, Paul P.; and Garcia, Dana, to B.F. Goodrich Company, The. Triblock polyarylene polyether with polysiloxane segment and impact-improved blends thereof, 4,871,816, Cl. 525-393.000.
Peredery, Valery P.: See—
Ivanov, Sergei K.; Dudkin, Viktor E.; Peredery, Valery P.; and Molchanov, Viktor N., 4,871,294, Cl. 415-58.700.
Perkin-Elmer Corporation, The: See—
deMey, Charles F., II, 4,871,142, Cl. 248-632.000.
Perkins, David J. B., to Apsley Metals Limited. Apparatus for laying a continuous strip of elastomeric material onto a surface, 4,871,409, Cl. 156-110.100.
Permea, Inc.: See—
Kesting, Robert E.; Fritzsche, Alfred K.; Murphy, Milton K.; Handermann, Alan C.; Cruse, Clint A.; and Malon, Raymond F., 4,871,494, Cl. 264-41.000.
Perner, Thomas: See—
Schwerzel, Thomas; Osterloh, Rolf; Schupp, Eberhard; Perner, Thomas; and Ahlers, Klaas, 4,871,808, Cl. 525-113.000.
Peter, Siegfried: See—
Bencke, Herbert; Alschner, Arnold; Oberkubusch, Rudolf; Peter, Siegfried; and Jaumann, Wolfgang, 4,871,443, Cl. 208-39.000.
Peters, Alan R.: See—
Kozyski, Vincent T.; and Peters, Alan R., 4,871,156, Cl. 269-303.000.
Peters, Edward N.: See—
Mark, Victor, deceased; Mark, Carol M., representative; Mark, Ester H., representative; and Peters, Edward N., 4,871,830, Cl. 528-192.000.
Petersen, Godber, to Man Roland Druckmaschinen AG. Sheet insertion apparatus, 4,871,159, Cl. 270-55.000.
Petersen, Robert C. Tactile display apparatus, 4,871,992, Cl. 340-407.000.
Peterson, Phillip R.; and Geary, Joseph M., to United States of America, Air Force. Double pinhole spatial phase correlator apparatus, 4,872,135, Cl. 364-822.000.
Petocz, Lujza: See—
Batori, Sandor; Hajos, Gyorgy; Messmer, Andras; Benko, Pal; Pallos, Laszlo; Petocz, Lujza; Grasser, Katalin; Kosoczky, Ibolya; and Szirt nee Kiszely, Eniko, 4,871,846, Cl. 544-183.000.
Petolino, Joseph A.: See—
Daberkow, Kevin L.; Finan, Christopher D.; Petolino, Joseph A.; Sobottka, Daniel Carl; and Thomas, Jeffrey A., 4,872,111, Cl. 364-200.000.
Petrich, Georg; and Schmieder, Helmut, to Kernforschungszentrum Karlsruhe GmbH. Method of improving the criticality safety in a liquid-liquid extraction process for spent nuclear fuel or breeder reactor materials, 4,871,478, Cl. 252-627.000.
Petrolite Corporation: See—
Weers, Jerry J., 4,871,374, Cl. 44-63.000.
Pfeffer, George B.; and Johnson, Wayne A., to ADC Telecommunications, Inc. Method of manufacturing a light socket, 4,870,753, Cl. 29-884.000.
Pfeifer, Heinrich; Reich, Werner; and Winterer, Martin, to Deutsche ITT Industries, GmbH. Digital decimation filter, 4,872,129, Cl. 364-724.100.
Pfeiffer, Wilfried G.: See—
Eliff, Manfred; Pfeiffer, Wilfried G.; Schwieker, Horst-Hartwig; and Christiansen, Dieter H. C., 4,872,193, Cl. 378-196.000.
Pfizer Hospital Products Group, Inc.: See—
Muller, Charles J., 4,871,369, Cl. 623-23.000.
PFP-Anstalt fur Produktentwicklung und -Verwertung: See—
Schramm, Werner, 4,871,076, Cl. 211-189.000.
Pfuhl, Reiner: See—
Hermann, Thomas; Herd, Josef; and Pfuhl, Reiner, 4,871,157, Cl. 270-39.000.
Phan, M. Nghiem: See—
Hollstein, Roger L.; and Phan, M. Nghiem, 4,871,929, Cl. 307-455.000.
Phillips, Brian D.: See—
Cloetens, Rudolphe C.; Lidy, Werner A.; Phillips, Brian D.; and Thomas, David B., 4,871,783, Cl. 521-137.000.
Phillips Petroleum Company: See—
Hunt, Harold H., 4,871,016, Cl. 165-109.100.
Phipps, Peter B. P.: See—
Easton, Malcolm C.; and Phipps, Peter B. P., 4,872,071, Cl. 360-31.000.
Picker International, Inc.: See—
Lauro, Karen L.; and Sones, Richard A., 4,872,188, Cl. 378-62.000.
Stojkov, Mark; Flanagan, Patrick M.; Hrdlicka, Victor; Geither, John; and Everett, Dennis, 4,872,190, Cl. 378-75.000.
Picot, Jacques, to Aerospatiale Societe Nationale Industrielle. Releasable body provided with aerodynamic braking means, 4,870,904, Cl. 102-383.000.
Pieper, Hartwig; Michels, Reiner; and Werther, Heinz-Ulrich, to BASF Aktiengesellschaft. Adhesively securable multilayer relief plate for flexographic printing, 4,871,631, Cl. 430-14.000.
Pikhardt, Siegfried: See—
Bravet, Jean-Louis; Toyot, Francois; Leyens, Gerd; Pikhardt, Siegfried; and Bayer, Herbert, 4,871,579, Cl. 427-31.000.

Pillot, Jacques, to Institut Pasteur. Reagent for detecting non-A, non-B viral hepatitis (NANBH) and an immunoenzymatic method for detecting NANBH antigens in fecal extracts, 4,871,659, Cl. 435-5.000.
Pindris, Paul A.: See—
Gunesin, Binur Z.; Pindris, Paul A.; and Schwab, Frederick C., 4,871,814, Cl. 525-314.000.
Pink, John J., to Amana Refrigeration, Inc. Air flow control for glass top refrigerator container, 4,870,836, Cl. 62-382.000.
Pinkernell, David W.: See—
Rasmussen, Steve O.; Jackson, Larry A.; Rhodes, John D.; Pinkernell, David W.; Harmon, J. Paul; Moon, Kevin L.; and Huseby, William R., 4,872,026, Cl. 346-140.00R.
Pinnau, Ingo, to Membrane Technology & Research, Inc. Ultrathin ethylcellulose/poly(4-methylpentene-1) permselective membranes, 4,871,378, Cl. 55-16.000.
Pioneer Electronic Corporation: See—
Ishii, Hidehiro; Yoshio, Junichi; Watanabe, Osamu; Izumo, Takeshi; Takeya, Noriyoshi; Katakami, Kazuhiko; Shinohara, Masayori; and Yoshida, Masao, 4,872,068, Cl. 358-342.000.
Murata, Yasushi; Ogoshi, Kunizoh; and Matsui, Fumio, 4,871,404, Cl. 156-73.100.
Okatani, Masanao, 4,872,067, Cl. 358-341.000.
Wakumura, Shinichi; and Takahashi, Tokihiro, 4,872,171, Cl. 371-40.100.
Yokogawa, Fumihiko; Hirano, Hiroyuki; and Kinpara, Keiji, 4,872,155, Cl. 369-59.000.
Piotrowski, Michael J.: See—
Tresslar, Marie C.; Kite, Joseph S., III; Piotrowski, Michael J.; and Conaghan, Thomas B., 4,870,887, Cl. 87-9.000.
Piskula, James. Floor drain plate assembly, 4,871,451, Cl. 210-164.000.
Pitman-Moore, Inc.: See—
Chu, Alexander H. T.; and Levi, M. James, 4,871,866, Cl. 549-414.000.
Hilton, Matthew D.; and Cain, Wendy J., 4,871,668, Cl. 435-147.000.
Plent, Christian: See—
Bergerious, Jean-Marcel; Pavie, Claude; Plent, Christian; and Constant, Bernard, 4,870,799, Cl. 53-55.000.
Plueddemann, Edwin P., to Dow Corning Corporation. Inomeric coupling agents based on amic acid-functional silanes, 4,871,788, Cl. 523-213.000.
Plumer, Mark J., to Consolidated International Automotive, Inc. Security locking system for vehicle wheel nuts, 4,870,842, Cl. 70-232.000.
Plus, Dora; and Ipri, Alfred C., to General Electric Company. Radiation hard memory cell having monocrystalline and non-monocrystalline inverters, 4,872,141, Cl. 365-154.000.
Plus, Dora: See—
Stewart, Roger G.; and Plus, Dora, 4,872,002, Cl. 340-811.000.
Pluth, John, Jr.: See—
Lake, Ralph J., Jr.; Wiley, Franklyn L.; Coby, A. Daniel; and Pluth, John, Jr., 4,872,023, Cl. 346-1.100.
Podszun, Wolfgang: See—
Lindner, Christian; Dickore Karlfried; Suling, Carlhans; Korte, Siegfried; and Podszun, Wolfgang, 4,871,850, Cl. 544-256.000.
Poetsch, Eike: See—
Reiffenrath, Volker; Krause, Joachim; Geelhaar, Thomas; Eiden-schink, Rudolf; Kurmeier, Hans-Adolf; Poetsch, Eike; Scheuble, Bernhard; and Weber, Georg, 4,871,469, Cl. 252-299.610.
Polaroid Corporation: See—
Kirby, John P.; and Paglia, Richard, 4,872,148, Cl. 367-172.000.
Politechnika Lodzka, Lodz, Ul. Zwirki: See—
Rosiak, Janusz; Rucinska-Rybus, Anna; and Pekala, Wladyslaw, 4,871,490, Cl. 264-22.000.
Pollard, Dianne J.: See—
Alexander, Cynthia R.; and Pollard, Dianne J., 4,871,210, Cl. 297-435.000.
Polycerf, Inc.: See—
Cerf, Alain A., 4,870,802, Cl. 53-442.000.
POM, Incorporated: See—
Speas, Gary W., 4,872,149, Cl. 368-90.000.
Popa, Adrian E.: See—
Grinberg, Jan; Marom, Emanuel; Soffer, Bernard H.; O'Meara, Thomas R.; and Popa, Adrian E., 4,871,232, Cl. 350-162.110.
Porte, Hugues: See—
Cyprien, Guy; Fisch, Alain; Haggiage, Johnny; Porte, Hugues; Prazuck, Thierry; and Torres, Ghislaine, 4,871,547, Cl. 424-81.000.
Posner, Brian. Shopping bag, 4,871,100, Cl. 224-42.46R.
Potemski, Andrew S.: See—
Marple, Melvyn J.; and Potemski, Andrew S., 4,872,107, Cl. 364-200.000.
Potente, Eugen; and Scheller, Herbert, to Uniroyal Engelbert Reifen GmbH. Container with flexible walls, 4,871,598, Cl. 428-36.100.
Potter, Wilburn H.: See—
Jennings, Richard E.; Potter, Wilburn H.; and Seymour, Shaun A., 4,870,812, Cl. 56-341.000.
Poupard, Dominique: See—
Salver, Le; and Poupard, Dominique, 4,871,150, Cl. 267-140.100.
Powell, Walter W.: See—
Bickford, Cleo M.; Powell, Walter W.; and Sample, Larry A., 4,870,989, Cl. 137-489.000.
Power Conversion Inc.: See—
Barrella, Joseph N., 4,871,956, Cl. 320-13.000.
Powers, Thomas L.: See—
Simon, William E.; Powers, Thomas L.; and Ernsberger, Glenn W., 4,871,914, Cl. 250-370.020.

Poythress, Cecil A.; and Wharton, Ronald. Amusement device for collecting coins. 4,871,055, Cl. 194-344.000.

Pozzobon, Alessandro; and Gorza, Roberto, to Nordica S.p.A. Multiple-function operating device particularly for ski boots. 4,870,723, Cl. 24-68.0SK.

Pradelle, Bernard, to Sories. Cheeking device, particularly for the hanging roof in mines, underground working points, or heading and similar. 4,871,214, Cl. 29-69.000.

Prazuck, Thierry: See—
Cyprien, Guy; Fisch, Alain; Haggiage, Johnny; Porte, Hugues; Prazuck, Thierry; and Torres, Ghislaine, 4,871,547, Cl. 424-81.000.

Preikschat, Ekhard: See—
Preikschat, Fritz K.; and Preikschat, Ekhard, 4,871,251, Cl. 356-336.000.

Preikschat, Fritz K.; and Preikschat, Ekhard. Apparatus and method for particle analysis. 4,871,251, Cl. 356-336.000.

Preisendorfer, Gerhard H. Seal construction in bell and spigot type concrete pipe connection. 4,871,180, Cl. 277-207.00A.

Premierani, William J.; Musser, David R.; and Narendran, Palith, to General Electric Company. Digital circuit design verification. 4,872,126, Cl. 364-578.000.

Prentice, Alan L.: See—
Thorogood, Robert M.; Bennett, Douglas L.; Allam, Rodney J.; Prentice, Alan L.; and Dawson, Bruce K., 4,871,382, Cl. 62-18.000.

Presidentia Medical AB: See—
Sjonnell, Goran, 4,871,359, Cl. 604-411.000.

Press, Jeffery B., to Ortho Pharmaceutical Corporation. 2- or 3-aryl substituted imidazo(1,2-A)pyridines and their use as antiseptory agents. 4,871,745, Cl. 514-300.000.

Preston, Gary N. Method and apparatus for welding a new stud on to the end of a broken off stud and new stud. 4,871,895, Cl. 219-99.000.

Prewo, Karl M.: See—
McFarlin, David J.; Caruolo, Antonio B.; Minford, Eric; and Prewo, Karl M., 4,870,827, Cl. 62-6.000.

Preziosi, Robert, to Mason-Keller Corporation. Disposable package for liquids. 4,871,091, Cl. 222-92.000.

Price, Leroy R.: See—
Toker, Nazmi; and Price, Leroy R., 4,871,402, Cl. 148-113.000.

Prince, Kevin C., to Kernforschungsanlage Julich GmbH. Detector for bremsstrahlung-isochromatic-spectroscopy (BIS). 4,871,915, Cl. 250-372.000.

Princeton University, The Trustees of: See—
Taylor, Edward C.; Harrington, Philip M.; and Shih, Chuan, 4,871,743, Cl. 514-272.000.

Taylor, Edward C.; Hamby, James M.; and Shih, Chuan, 4,871,746, Cl. 514-303.000.

Prisbylla, Michael P.: See—
Wee, Siok H. H.; and Prisbylla, Michael P., 4,871,391, Cl. 71-92.000.

Procter & Gamble Company, The: See—
Anderson, Barry J.; and Arand, Dale S., 4,871,569, Cl. 426-489.000.

Wosaba, Charles L., II; Hamilton, Peter W.; and Kissner, Robert J., 4,871,345, Cl. 493-59.000.

Product Suppliers AG: See—
Aarts, Mathias L. C., 4,871,057, Cl. 198-346.100.

Proeve, Heinz-Konrad: See—
Scholz, Hans-Ulrich; and Proeve, Heinz-Konrad, 4,871,923, Cl. 290-55.000.

Progenics, Inc.: See—
Appelzweig, Norman; and Bradlow, H. Leon, 4,871,726, Cl. 514-177.000.

Progressive Dynamics, Inc.: See—
Kelley, David A.; Walters, Dan H.; and Stephenson, James G., 4,872,099, Cl. 362-295.000.

Prohaska, Raymond J.: See—
Marshall, Howard B.; Kaye, Gordon E.; and Prohaska, Raymond J., 4,871,165, Cl. 272-132.000.

Protek AG: See—
Wagner, Heinz, 4,871,368, Cl. 623-22.000.

Psiorz, Manfred: See—
Heider, Joachim; Psiorz, Manfred; Bomhard, Andreas; Haeu, Norbert; Narr, Berthold; Noll, Klaus; Lillie, Christian; Kobinger, Walter; and Dammgen, Jürgen, 4,871,735, Cl. 514-213.000.

Pszenny, Richard: See—
Krauss, Andre; Martin, Harry; and Pszenny, Richard, 4,871,262, Cl. 366-160.000.

Puckette, Thomas A.; and Devon, Thomas J., to Eastman Kodak Company. Low pressure rhodium catalyzed hydroformylation of olefins. 4,871,878, Cl. 568-454.000.

Purves, Murray. Automatic gate opening and closing device. 4,870,782, Cl. 49-364.000.

Purvey, Ronald J., to AE PLC. Centrifugal filters. 4,871,458, Cl. 210-360.100.

Pyromation, Inc.: See—
Wilson, Richard F., 4,871,263, Cl. 374-139.000.

Quality Dental Products, Inc.: See—
Heath, Derek E., 4,871,312, Cl. 433-164.000.

Quantum Corporation: See—
Brown, David A.; Daniels, Donald V.; and Harrison, Joel N., 4,872,074, Cl. 360-77.070.

Quirk, Michael J.; and Drake, Timothy E., to Renold, Inc. Shaker. 4,870,870, Cl. 74-61.000.

Qun, Song: See—
Lechert, Hans; Woeb-Gosch, Volkert; Qun, Song; Kaminsky, Walter; and Sinn, Hansjorg, 4,871,426, Cl. 201-2.500.

R. A. Hanson Company, Inc.: See—
Hanson, Raymond A., 4,871,213, Cl. 299-64.000.

R. A. Tracer Service Ltd.: See—
Banner, Ralph W., 4,871,116, Cl. 241-21.000.

R. Alkan & Cie: See—
Grosselin, Daniel; and Coutin, Pierre F., 4,870,885, Cl. 89-1.819.

R. J. Reynolds Tobacco Co.: See—
Hensgen, Gerhard; Steiniger, Wolfgang; Hinz, Werner; Oesterling, Erwin; and Schlisio, Siegfried, 4,870,748, Cl. 29-773.000.

Lowry, Gerald R., 4,870,980, Cl. 131-296.000.

Rabinkin, Anatol, to Allied Signal Inc. Flexible multilayered brazing materials. 4,871,622, Cl. 428-576.000.

Radcliffe, Lindsay F.: See—
Mayfield, Trevor K.; and Radcliffe, Lindsay F., 4,871,025, Cl. 172-4.500.

Rader, Edward F.; and Rader, Eileen. Hot water dispenser. 4,871,089, Cl. 222-54.000.

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Rader, Edward F.; and Rader, Eileen, 4,871,089, Cl. 222-54.000.

Radwill, Robert P., to AMSTED Industries Incorporated. Diagonally braced railway truck. 4,870,914, Cl. 105-206.200.

Radwill, Robert P.: See—
Altherr, Russell G.; Glaser, Richard L.; Madura, Francis E.; and Radwill, Robert P., 4,871,182, Cl. 280-434.000.

Rafka, Robert J.: See—
DiNovi, Michael J.; Rafka, Robert J.; Friedman, Mark I.; and Tordoff, Michael G., 4,871,776, Cl. 514-738.000.

Raj, Rishi: See—
Panda, Prakash C.; Seydel, Edgar R.; and Raj, Rishi, 4,871,496, Cl. 264-65.000.

Ralph McKay Limited: See—
McGuire, William G.; and Young, Hartley F., 4,871,032, Cl. 172-749.000.

Ramos, Rolando P.; Loreto, Wilfredo P.; and Vulich, Yordan, to AIT Industries, Inc. Lens edging machine and method. 4,870,784, Cl. 51-165.00R.

Randklev, Ronald M., to Minnesota Mining and Manufacturing Company. Vacuum mixing apparatus for dental materials. 4,871,261, Cl. 366-139.000.

Rantanen, Raimo; Huhta, Pentti; and Winqvist, Hans-Erik, to Kone Oy. Means for forming wood portions from a wood flow. 4,871,059, Cl. 198-532.000.

Rasmussen, Jerald K.: See—
Heilmann, Steven M.; Rasmussen, Jerald K.; Krepski, Larry R.; Milbrath, Dean S.; and Coleman, Patrick L., 4,871,824, Cl. 526-304.000.

Rasmussen, Steve O.; Jackson, Larry A.; Rhodes, John D.; Pinkernell, David W.; Harmon, J. Paul; Moon, Kevin L.; and Huseby, William R., to Hewlett-Packard Company. Ink-jet printer with printhead carriage alignment mechanism. 4,872,026, Cl. 346-140.00R.

Rassieur, Charles L., to Central Mine Equipment Company. Vehicle mounted drill rod holding device. 4,870,738, Cl. 29-240.000.

Rathgeber, Gerhard, to Bayerische Motoren Werke A.G. Actuating means for a flap in motor vehicles. 4,871,954, Cl. 318-466.000.

Raup, Jens-Peter: See—
Hahn, Alfred; and Raup, Jens-Peter, 4,872,192, Cl. 378-181.000.

Ravn, Kjeld: See—
Thomsen, Flemming; Nissen, Harry S.; Ravn, Kjeld; and Dixon, Carl C., 4,870,892, Cl. 91-361.000.

Raymond, James H. Air accumulator. 4,870,994, Cl. 137-899.400.

Raynor, George L. Self cleaning truck mirror. 4,870,713, Cl. 15-250.010.

Raytheon Company: See—
Laton, Richard W.; Chase, Charles E., Jr.; and Montress, Gary K., 4,871,984, Cl. 331-107.00A.

Rea, James H.: See—
Gupton, B. Franklin; Rea, James H.; and Mueller, Werner H., 4,871,859, Cl. 546-250.000.

Recreativus Franco, S.A.: See—
Rivero, Francisco B., 4,871,171, Cl. 273-138.00A.

Reed Lignin Inc.: See—
Lin, Stephen Y., 4,871,825, Cl. 527-400.000.

Reel 4926, Frames 491 & 492: See—
Baxter, Bobby G., 4,871,188, Cl. 280-680.000.

Rees, John A., to Boots Company PLC, The. Medical treatment. 4,871,774, Cl. 514-646.000.

Rees, William S., Jr.: See—
Seyferth, Dietmar; and Rees, William S., Jr., 4,871,826, Cl. 528-4.000.

Rehm, Hans J.; and Kirchner, Kurt. Process for the decontamination of soil by means of microorganisms. 4,871,673, Cl. 435-262.000.

Reich, Werner: See—
Pfeifer, Heinrich; Reich, Werner; and Winterer, Martin, 4,872,129, Cl. 364-724.100.

Reichle, Ernst-Michael; and Seel, Matthias, to MAN Technologie GmbH. Electrostatic filter. 4,871,515, Cl. 422-174.000.

Reiffenrath, Volker; Krause, Joachim; Geelhaar, Thomas; Eidenschink, Rudolf; Kurmeier, Hans-Adolf; Poetsch, Eike; Scheuble, Bernhard; and Weber, Georg, to Bescrankter Haftung. Nematic liquid-crystal-line phases. 4,871,469, Cl. 252-299.610.

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Krause, Joachim; Reiffenrath, Volker; and Geelhaar, Thomas, 4,871,472, Cl. 252-299.650.

Reignier, Gerard: See—
Moulies, Jean-Claude; and Reignier, Gerard, 4,871,506, Cl. 264-514.000.

Reiner, Andreas, to Fraunhofer-Gesellschaft zur Förderung der angewandten Forschung e.V. Process for the production of a permselective and flexible anion exchange membrane. 4,871,778, Cl. 521-27.000.

Reinhardt, Bruce A.; and Unroe, Marilyn R., to United States of America, Air Force. Decyloxy-substituted terephthalic acid compounds and method of synthesis. 4,871,712, Cl. 562-473.000.

Reisman, Ron; and Amit, Uri. Protective breathing mask. 4,870,959, Cl. 128-201.250.

Reith, Dirk V.: See—
Kohler, Karl; and Reith, Dirk V., 4,871,452, Cl. 210-167.000.

REM Systems, Inc.: See—
Montgomery, Robert E., 4,871,534, Cl. 424-61.000.

Remec, Thomas M.: See—
Park, Yong S.; and Remec, Thomas M., 4,871,415, Cl. 156-626.000.

Renfer, Dale S.: See—
Limburg, William W.; Yanus, John F.; Renfer, Dale S.; Schank, Richard L.; and Ong, Beng S., 4,871,634, Cl. 430-54.000.

Renold, Inc.: See—
Quirk, Michael J.; and Drake, Timothy E., 4,870,870, Cl. 74-61.000.

Resneau, Patrick: See—
Derewonko, Henri; Adam, Didier; Delagebeaudeuf, Daniel; and Resneau, Patrick, 4,872,049, Cl. 357-68.000.

Retter, Rafael, to Zoran Corporation. Method and means for block floating point arithmetic. 4,872,132, Cl. 364-748.000.

Rheinmetall GmbH: See—
Sippel, Achim; Kruse, Heinz-Josef; and Karius, Klaus D., 4,870,905, Cl. 102-524.000.

Rhinehart, Stephen A.: See—
May, Joseph N.; Rhinehart, Stephen A.; and Zambelli, Robert G., 4,871,158, Cl. 270-53.000.

Rhodes, George F.: See—
Coddington, Charles N., III; Rhodes, George F.; and McGrath, Philip L., Jr., 4,871,197, Cl. 285-231.000.

Rhodes, John D.: See—
Buskirk, William A.; Landsness, Carl J.; and Rhodes, John D., 4,872,027, Cl. 346-140.00R.

Rasmussen, Steve O.; Jackson, Larry A.; Rhodes, John D.; Pinkernell, David W.; Harmon, J. Paul; Moon, Kevin L.; and Huseby, William R., 4,872,026, Cl. 346-140.00R.

Rhone-Poulenc Chimie: See—
Blind, Andre; Collas, Gerard; Robin, Jean; and Sagi, Ferenc, 4,871,828, Cl. 528-44.000.

Cyprien, Guy; Fisch, Alain; Haggiage, Johnny; Porte, Hugues; Prazuck, Thierry; and Torres, Ghislaine, 4,871,547, Cl. 424-81.000.

Robin, Jean; and Blind, Andre, 4,871,460, Cl. 210-634.000.

Rhone-Poulenc, S.A.: See—
Bonnetat, Claude; Macabrey, Louis; and Rouillet, Gilbert, 4,871,410, Cl. 156-244.140.

Ribolla, G. Carlo; Taroni, Federico; Peiretti, Domenico; and Pepino, Antonio, to Legitex S.r.l. Method for detecting anomalies in corduroy preparation. 4,870,727, Cl. 26-10.00C.

Ricco, Mario: See—
Filippi, Renato; and Ricco, Mario, 4,870,940, Cl. 123-506.000.

Richards, Gaylord W., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Distributed control rapid connection circuit switch. 4,872,158, Cl. 370-58.100.

Richards, Gaylord W.: See—
Hemmady, Jayant G.; Lidinsky, William P.; Nichols, Robert K.; Richards, Gaylord W.; Roediger, Gary A.; Steele, Scott B.; Weddige, Ronald C.; and Zelle, Bruce R., 4,872,157, Cl. 370-60.000.

Richards Medical Company: See—
Bays, F. Barry; and Marchand, Sam R., 4,871,364, Cl. 623-10.000.

Richards, Paul C.: See—
Beattie, Steven K.; Richards, Paul C.; and Smith, David A., 4,872,208, Cl. 324-174.000.

Richards, Raymon E. Apparatus for removing pins from connecting link boat hardware. 4,870,739, Cl. 29-252.000.

Richardson, Bruce A., to Northern Telecom Limited. Method and apparatus for stabilizing the spectral characteristics of a semiconductor laser diode. 4,872,173, Cl. 372-29.000.

Richter, Allen R., to Walcon Corp. Double lock standing seam roof sheet. 4,870,798, Cl. 52-528.000.

Richter, Klaus, to ABS Allgemeiner Brandschutz, G.u.M. Sealing device for sealing openings in shelters. 4,870,909, Cl. 109-59.00T.

Ricoh Company, Ltd.: See—
Kasahara, Nobuo; Nakahara, Tosio; Watanuki, Masayoshi; and Sawamura, Tadahide, 4,872,037, Cl. 355-271.000.

Maniwa, Yoshio; Morita, Takashi; Niro, Masaichi; Abe, Daisuke; and Nagayama, Haruhiko, 4,872,091, Cl. 361-424.000.

Seki, Kenji; Hashimoto, Junichiro; Kimura, Michio; Yamanami, Hirofumi; Mochizuki, Satomi; and Aiso, Izumi, 4,871,635, Cl. 430-60.000.

Suzuki, Akira; Mochizuki, Nobuo; and Morohoshi, Kunichika, 4,871,609, Cl. 428-195.000.

Ridenour, Ralph G.; and Stanton, Thomas. Double bead tube fitting. 4,871,199, Cl. 285-382.500.

Rideout, William C.; and Eichen, Elliot, to GTE Laboratories Incorporated. Method for reducing facet reflectivities of semiconductor light sources and device thereof. 4,872,180, Cl. 372-99.000.

Ridgway, Paul A.; and Butterfield, William P., to H.P. Incorporated. Combined electrical grounding and mechanical locking means for ceiling mounted device. 4,871,327, Cl. 439-543.000.

Rieger, Gunther, to ANT Nachrichtentechnik GmbH. Method and arrangement for compensating shifts in delay produced by the doppler effect in bursts in a TDMA frame. 4,872,164, Cl. 370-104.100.

Riley, Joe A., to Mycogen Corporation. Biological control of wild poinsettia and other weedy spurge with a fungal pathogen. 4,871,386, Cl. 71-79.000.

Rippel, Robert: See—
Lang, Hans-Jochen; Rosner, Manfred; Weidmann, Klaus; Rippel, Robert; and Herling, Andreas W., 4,871,734, Cl. 514-212.000.

Ritli, Peter: See—
Hermecz, Istvan; Kereszturi, Geza; Vasvavi, Lelle; Horvath, Agnes; Balogh, Maria; Kovacs, Gabor; Szuts, Tamas; Ritli, Peter; Sipos, Judit; and Pajor, Aniko, 4,871,849, Cl. 544-229.000.

Ritter, Harald, to Deutsche Gesellschaft für Wiederaufarbeitung von Kernbrennstoffen mbH. Method and apparatus for the continuous measurement of the depth of a radioactive glass melt flowing into a container. 4,871,000, Cl. 141-95.000.

Rittner, Charles H.: See—
Orloff, Eugene F.; Horowitz, Martin; and Rittner, Charles H., 4,872,120, Cl. 364-509.000.

Rivas, Edouard: See—
Audoux, Christian; Rivas, Edouard; and Rossignol, Georges, 4,871,499, Cl. 264-173.000.

Rivas, Olegario; and Newski, Alejandro, to Intevap, S.A. Sucker rod centralizer. 4,871,020, Cl. 166-241.000.

Rivero, Francisco B., to Recreativos Franco, S.A. Game device including means simulating release of a ball. 4,871,171, Cl. 273-138.00A.

Rivers, Jacob B., Jr. Continuous hydrogenation of unsaturated oils. 4,871,485, Cl. 260-409.000.

Riviere, Luc; and Carenco, Alain. Microwave transmission line of the symmetrical type and with two coplanar conductors. 4,871,988, Cl. 333-238.000.

Robbins, Edward S., III; and Onocki, Theodore J., to Edward S. Robbins, III. Bag closure device and methods of fabricating the same. 4,871,264, Cl. 383-68.000.

Robbins, Howard J. Tank secondary containment system. 4,871,084, Cl. 220-85.00F.

Robert Bosch GmbH: See—
Eheim, Franz, deceased; and Straubel, Max, 4,870,936, Cl. 123-449.000.

Roberts, Gary E., to Applied Magnetics Corporation. Thin film magnetic head with a leveler layer. 4,872,079, Cl. 360-126.000.

Roberts, Kenneth P.: See—
Duncan, William M.; Glass, George E.; Johnson, Jeffrey L.; McMillan, Edward A.; Maney, Frank S.; McConnell, James R., Jr.; Roberts, Kenneth P.; and Sanders, Timothy R., 4,870,863, Cl. 73-431.000.

Roberts, Malcolm H. T., to National Research Development Corporation. Use of dioxopiperidine derivatives as analgesics. 4,871,750, Cl. 514-328.000.

Robertson, Albert W., to Air Stamping, Inc. Combined bearer wiper assembly and finger guard for printing apparatus. 4,870,900, Cl. 101-216.000.

Robertson, John A., to Telesis Controls Corporation. Apparatus for marking fragile surfaces. 4,870,922, Cl. 118-702.000.

Robin, Jean; and Blind, Andre, to Rhone-Poulenc Chimie. Isolation/purification of isocyanate condensates by extraction with liquid or supercritical gas. 4,871,460, Cl. 210-634.000.

Robin, Jean: See—
Blind, Andre; Collas, Gerard; Robin, Jean; and Sagi, Ferenc, 4,871,828, Cl. 528-44.000.

Robinson, James C.: See—
Grimsley, S. Allen; Robinson, James C.; and Schroeder, Mark A., 4,871,423, Cl. 162-72.000.

Roche, Thomas S.: See—
Scardera, Michael; and Roche, Thomas S., 4,871,422, Cl. 156-662.000.

Rock, John A., to General Electric Company. Polyetherimide-liquid crystal polymer blends. 4,871,817, Cl. 525-425.000.

Rodriguez, Ernesto. Pliers for inserting bushings. 4,870,876, Cl. 81-426.500.

Rodriguez, Riccardo, to Nautical Propulsion Research Limited. Naval propulsion plant with hydraulic transmission. 4,871,332, Cl. 440-5.000.

Roediger, Gary A.: See—
Hemmady, Jayant G.; Lidinsky, William P.; Nichols, Robert K.; Richards, Gaylord W.; Roediger, Gary A.; Steele, Scott B.; Weddige, Ronald C.; and Zelle, Bruce R., 4,872,157, Cl. 370-60.000.

Hemmady, Jayant G.; Lidinsky, William P.; Roediger, Gary A.; Steele, Scott B.; Weddige, Ronald C.; and Zelle, Bruce R., 4,872,159, Cl. 370-60.000.

Roemer, Peter B.; and Edelstein, William A., to General Electric Company. RF shield for RF coil contained within gradient coils of NMR imaging device. 4,871,969, Cl. 324-318.000.

Roesler, Carl A., to Sundstrand Corporation. Fuel drain safety system for fuel pumps and the like. 4,871,303, Cl. 417-434.000.

Roger, Pierre; Choay, Patrick; and Fournier, Jean-Paul, to DROPIE-Societe Civile de gestion de droits de Propriete Industrielle. Cyclic benzenesulfonamides, process for their preparation and their use as active substance of pharmaceutical compositions. 4,871,843, Cl. 540-575.000.

Rogers, Fred A.: See—
Burton, John F.; and Rogers, Fred A., 4,870,759, Cl. 33-563.000.
Rogers, Gerald H., to J & J Hardware, Inc. Reversible mount gate latch with manual latch locking. 4,871,203, Cl. 292-238.000.
Rogier-Brown, Timothy: See—
Taylor, Michael A.; and Rogier-Brown, Timothy, 4,871,463, Cl. 210-161.000.
Rohr, Otto, to Ciba-Geigy Corporation. 3-Phenyl-5-trifluoromethyl-1,2,4-oxadiazole compounds which are useful pesticides. 4,871,753, Cl. 514-364.000.
Rokach, Joshua: See—
Gillard, John; Rokach, Joshua; and Belanger, Patrice C., 4,871,756, Cl. 514-381.000.
Rolly, Didier: See—
Lefevre, Herve; and Rolly, Didier, 4,871,254, Cl. 356-350.000.
Rolloff, Frederick W., to Cooper Power Systems, Inc. Coil winding machine. 4,870,742, Cl. 29-335.000.
Rolscreen Company: See—
Hagemeyer, Bruce A., 4,870,797, Cl. 52-455.000.
Romagnoli, Andrea, to CSENTIND - Centro Studi Industriali - S.r.l. Volumetric dosing unit with adjustable-volume doser cells for continuously operating machines producing dual-use filter sachets. 4,870,808, Cl. 53-529.000.
Romano, Perry, to LPI Limited Partnership. Variable beam floodlight. 4,872,098, Cl. 362-283.000.
Romvary, Attila: See—
Magyar, Karoly; Varga, Janos; Simon, Ferenc; Szauder nee Lauko, Hedvig; Fekete, Pal; Romvary, Attila; Egri, Janos; and Zukovics nee Someg, Katalin, 4,871,722, Cl. 514-157.000.
Roncari, Raymond A.: See—
Carniglia, Francis J., 4,871,718, Cl. 514-23.000.
Roos, Jan, to U.S. Philips Corporation. Image transfer apparatus utilizing optical fibers. 4,871,228, Cl. 350-96.250.
Roos, Mark D., and Messmer, Walter J., III, to EIP Microwave, Inc. Microwave main frame. 4,872,212, Cl. 361-424.000.
Rosen, Arye: See—
Stable, Paul J.; Rosen, Arye; and Sterzer, Fred, 4,871,920, Cl. 250-551.000.
Rosen, Harold A., to Hughes Aircraft Company. Satellite communications system for mobile users. 4,872,015, Cl. 342-353.000.
Rosiak, Janusz; Rucinska-Rybus, Anna; and Pekala, Wladyslaw, to Politechnika Lodzka, Lodz, Ul. Zwirki. Method of manufacturing hydrogel dressings. 4,871,490, Cl. 264-22.000.
Rosin, Stanley A. Rake head attachment for a golf club. 4,871,029, Cl. 172-378.000.
Rosner, Manfred: See—
Lang, Hans-Jochen; Rosner, Manfred; Weidmann, Klaus; Rippel, Robert; and Herling, Andreas W., 4,871,734, Cl. 514-212.000.
Rosov, Eugene, to WaterTest Corporation. Device for shipping microbiology test samples. 4,871,662, Cl. 435-30.000.
Ross, Bruce. Magnetic action toy. 4,871,340, Cl. 446-132.000.
Ross, Mark S., to Mobil Oil Corporation. Flapper valve. 4,871,514, Cl. 422-145.000.
Rossi, Giorgio: See—
Graziadei, Rinaldo; and Rossi, Giorgio, 4,872,206, Cl. 455-241.000.
Rossignol, Georges: See—
Audoux, Christian; Rivaa, Edouard; and Rossignol, Georges, 4,871,499, Cl. 264-173.000.
Rotem, Haim; and Shimoni, Yair, to Elscint Ltd. Spectral component separation in mr imaging. 4,871,967, Cl. 324-309.000.
Roth, Leo E. Portable shelter with wind break. 4,870,984, Cl. 135-109.000.
Rothenstein, Julius: See—
Oberth, Adolf E.; and Rothenstein, Julius, 4,871,854, Cl. 546-7.000.
Rothgery, Eugene F.; and Manke, Steven A., to Olin Corporation. Substituted 5-amidotetrazoles. 4,871,861, Cl. 548-251.000.
Roullet, Gilbert: See—
Bonnebat, Claude; Macabrey, Louis; and Roullet, Gilbert, 4,871,410, Cl. 156-244.140.
Roy, Armand E.; and Roy, Leo T., to Craft, Inc. Jaw and feeder assembly for advancing hinge to a work station. 4,870,749, Cl. 29-798.000.
Roy, Jacques T.; and Magnan, Germain R. Apparatus for detecting faulty power line insulator. 4,871,972, Cl. 324-551.000.
Roy, Leo T.: See—
Roy, Armand E.; and Roy, Leo T., 4,870,749, Cl. 29-798.000.
Roydhouse, John: See—
Cosgrave, Dara; and Roydhouse, John, 4,871,053, Cl. 194-208.000.
Royer, Paul; and Schupp, George W., Jr., to Motorola, Inc. Telephone keypad input technique. 4,872,196, Cl. 379-58.000.
Ruadell-Teixier, Annie: See—
Barraud, Andre; Derost, Gisele; Henrien, Laurence; and Ruadell-Teixier, Annie, 4,871,680, Cl. 436-103.000.
Rucinska-Rybus, Anna: See—
Rosiak, Janusz; Rucinska-Rybus, Anna; and Pekala, Wladyslaw, 4,871,490, Cl. 264-22.000.
Ruf, Max: See—
Bierling, Rudolf; Ruf, Max; and Hannibal, Wilhelm, 4,870,990, Cl. 137-595.000.
Rugar, Daniel: See—
Gerber, Ulrich G.; and Rugar, Daniel, 4,872,078, Cl. 360-114.000.
Rupp, Ronald L.: See—
Schmucker, Wayne A.; and Rupp, Ronald L., 4,870,773, Cl. 43-12.000.

Russell, Robert H.; and Acker, Lawrence D., to North American Philips Corporation. Transmit focus generator for ultrasound imaging. 4,870,971, Cl. 128-661.010.
Rutgerswerke AG: See—
Bencke, Herbert; Alscher, Arnold; Oberkobusch, Rudolf; Peter, Siegfried; and Jaumann, Wolfgang, 4,871,443, Cl. 208-39.000.
Rutz, Wolfhard: See—
Kunkel, Ernst; and Rutz, Wolfhard, 4,871,620, Cl. 428-484.000.
Ryder, Francis E.; and Williams, Fred E., Jr., to Ryder International Corporation. Fixture for tying fishing knots. 4,871,200, Cl. 289-17.000.
Ryder International Corporation: See—
Ryder, Francis E.; and Williams, Fred E., Jr., 4,871,200, Cl. 289-17.000.
S. C. Johnson & Son, Inc.: See—
Billman, Fred L.; Shih, Lih-Bin; and Verbrugge, Calvin J., 4,871,823, Cl. 526-272.000.
Sramek, John A., 4,871,529, Cl. 424-47.000.
Sadegh, Ali M., to General Motors Corporation. Spark plug crimping die and process. 4,871,339, Cl. 445-7.000.
Sagara, Seiji: See—
Miyake, Hiroyuki; Sagara, Seiji; Yonemori, Takaji; Watanabe, Tsuyoshi; Takahashi, Masayoshi; Suzuki, Koji; Komiya, Yutaka; Tomosada, Masahiro; Adachi, Hideki; Hirose, Masayuki; and Miyata, Masanori, 4,872,035, Cl. 355-208.000.
Sagi, Ferenc: See—
Blind, Andre; Collas, Gerard; Robin, Jean; and Sagi, Ferenc, 4,871,828, Cl. 528-44.000.
Sai-Halasz, George A.: See—
Donohue, Thomas P.; Hohn, Fritz J.; and Sai-Halasz, George A., 4,871,919, Cl. 250-491.100.
Saia, Richard J.: See—
Kim, Manjin J.; Brown, Dale M.; Cohen, Simon S.; Gorowitz, Bernard; and Saia, Richard J., 4,871,617, Cl. 428-450.000.
St. Angelo, Allen J.; and Vercellotti, John R., to United States of America, Agriculture. Inhibition of warmed-over flavor and preserving of uncured meat containing materials. 4,871,556, Cl. 426-92.000.
Saint-Gobain Vitrage: See—
Bravet, Jean-Louis; Toytot, Francois; Leyens, Gerd; Pikhart, Siegfried; and Bayer, Herbert, 4,871,579, Cl. 427-31.000.
Lecourt, Jean; Legros, Desire; and Granville, Andre, 4,871,385, Cl. 65-115.000.
Saito, Chuichi, to Hitachi, Ltd. Balustrade for passenger conveyer. 4,871,056, Cl. 198-335.000.
Saito, Hiroshi; and Hikichi, Koichi, to Honda Giken Kogyo Kabushiki Kaisha. Motorcycle fuel tank and fuel pump apparatus. 4,871,041, Cl. 180-219.000.
Saito, Mamoru: See—
Nakamura, Seichi; Saito, Mamoru; and Sugawara, Toshiaki, 4,871,498, Cl. 264-115.000.
Saito, Yasuhisa; Kanagawa, Shuichi; Watanabe, Katsuya; and Kamio, Kunimasa, to Sumitomo Chemical Company, Ltd. Thermosettable imide compound and epoxy resin composition containing the same. 4,871,832, Cl. 528-353.000.
Saito, Yuzuru; and Yoshida, Kokichi, to Takeda Chemical Industries, Ltd. Production of substituted acetylenic compounds. 4,871,868, Cl. 549-416.000.
Sakagami, Wataru; and Iijima, Katsumi, to Canon Kabushiki Kaisha. Method for recording indicia for indicating presence or absence of error in medium after error checking and apparatus therefor. 4,872,154, Cl. 369-54.000.
Sakamoto, Eiichi; Kaneko, Yutaka; Ninomiya, Hidetaka; Kamio, Takashi; Ezaki, Atsuo; Akamatsu, Hideo; and Haraga, Hideaki, to Konishiroku Photo Industry Co., Ltd. Silver halide photographic material that is resistant to fogging during storage. 4,871,658, Cl. 430-551.000.
Sakamoto, Takashi: See—
Isono, Koichi; Tomohisa, Kunio; Oka, Junichi; and Sakamoto, Takashi, 4,872,065, Cl. 358-494.000.
Sakanaka, Yasuhiro: See—
Nakagawa, Tatsushi; Narui, Mamoru; and Sakanaka, Yasuhiro, 4,871,815, Cl. 525-344.000.
Sakazume, Ryo: See—
Nagai, Teiji; Sakazume, Ryo; Hanazawa, Kouichi; Nakayama, Hiroshi; and Minagawa, Yoshio, 4,872,024, Cl. 346-1.100.
Sakoe, Hiroaki, to NEC Corporation. Pattern matching apparatus employing compensation for pattern deformation. 4,872,201, Cl. 381-43.000.
Sakura, Makoto: See—
Tatsushima, Masaru; and Sakura, Makoto, 4,871,709, Cl. 502-324.000.
Salov, Viktor E.: See—
Naidenov, Evgeny V.; Belozorov, Georgy I.; Salov, Viktor E.; and Zakharov, Ivan V., 4,872,118, Cl. 364-463.000.
Saltman, Robert P., to Du Pont de Nemours, E. I., and Company. Composition comprising melt blended product of thermoplastic resin and two ethylene copolymers containing coreactive groups. 4,871,810, Cl. 525-133.000.
Salver, Le; and Poupard, Dominique, to Automobiles Peugeot; and Automobiles Citroen. Elastically yieldable support in particular for the suspension of a vehicle engine. 4,871,150, Cl. 267-140.100.
Samford, Dean A., to General Housewares Corporation. Cooking utensil useful for assuring destruction of harmful bacteria during microwave cooking of poultry and other foods. 4,871,892, Cl. 219-10.55E.

Sample, Larry A.: See—
Bickford, Cleo M.; Powell, Walter W.; and Sample, Larry A., 4,870,989, Cl. 137-489.000.
Samson, George W.: See—
Hoskinson, Martin J.; Lorincz, Eugene M.; and Samson, George W., 4,871,140, Cl. 248-496.000.
Sanbuichi, Hiroshi; Terasaka, Katsunori; and Nakagawa, Toyooki, to Nissan Motor Company, Limited. Air fuel mixture A/F control system. 4,870,937, Cl. 123-488.000.
Sanden Corporation: See—
Igusa, Masaru; and Chiba, Takashi, 4,871,901, Cl. 219-400.000.
Takahashi, Hareo; Hatakeyama, Hideharu; and Kumagai, Shuzo, 4,870,893, Cl. 92-71.000.
Toyota, Hiroshi; Shimizu, Shigemi; Hatakeyama, Hideharu; Kumagai, Shuzo; and Takahashi, Hareo, 4,870,894, Cl. 92-71.000.
Sanders Associates, Inc.: See—
Lake, Ralph J., Jr.; Wiley, Franklin L.; Coby, A. Daniel; and Pluth, John, Jr., 4,872,023, Cl. 346-1.100.
Sanders, Glen A.: See—
Killpatrick, Joseph E.; and Sanders, Glen A., 4,871,253, Cl. 356-350.000.
Sanders, Timothy R.: See—
Duncan, William M.; Glass, George E.; Johnson, Jeffrey L.; McMillan, Edward A.; Maney, Frank S.; McConnell, James R., Jr.; Roberts, Kenneth P.; and Sanders, Timothy R., 4,870,863, Cl. 73-431.000.
Sandoz Pharm. Corp.: See—
Feltz, Dennis R.; Kornblum, Saul S.; and Stoopak, Samuel B., 4,871,546, Cl. 424-482.000.
Sandrini, Furio M., to Fashion Design Studio S.r.l. Object separator supported and hooked to a single ring-like component. 4,870,844, Cl. 70-456.000.
Sankey Vending Limited: See—
Davies, Robert; and Johndrow, John P., 4,871,086, Cl. 221-4.000.
Murray, David R. V., 4,871,054, Cl. 194-212.000.
Sankyo Company, Limited: See—
Yoshioka, Takao; Kitazawa, Eiichi; Yamazaki, Mitsuo; and Iizuka, Yoshio, 4,871,762, Cl. 514-439.000.
Santer, Martin W., to Tandem Computers Incorporated. Parity regeneration self-checking. 4,872,172, Cl. 371-49.100.
Sano, Shigeo: See—
Kawami, Shigeru; Tabu, Takashi; Sano, Shigeo; and Masuda, Nobuyuki, 4,872,199, Cl. 379-413.000.
Sanshin Kogyo Kabushiki Kaisha: See—
Tsunamoto, Kanichi; and Inoue, Seiji, 4,871,996, Cl. 340-521.000.
Santel, Hans-Joachim: See—
Sasse, Klaus; Fischer, Reiner; Hagemann, Hermann; Santel, Hans-Joachim; Schmidt, Robert R.; and Lurssen, Kalus, 4,871,387, Cl. 71-92.000.
Santonja, Noel: See—
Kuntzmann, Jean C.; and Santonja, Noel, 4,871,950, Cl. 315-393.000.
Sanwa Kagaku Kenkyusho Co., Ltd.: See—
Kuroono, Masayasu; Unno, Ryoichi; Kimura, Hiromoto; Oka, Mitsuru; Hasegawa, Keiko; Ikeda, Shinichi; Kuboyama, Noboru; Ito, Takashi; Sawai, Kiichi; and Ito, Shunshuke, 4,871,740, Cl. 514-255.000.
Sapporo Breweries, Ltd.: See—
Nagai, Teiji; Sakazume, Ryo; Hanazawa, Kouichi; Nakayama, Hiroshi; and Minagawa, Yoshio, 4,872,024, Cl. 346-1.100.
Sarau, Henry M.: See—
Gleason, John G.; Hoffstein, Sylvia T.; Kinzig, Charles M.; Mong, Seymour; and Sarau, Henry M., 4,871,771, Cl. 514-570.000.
Sasaki, Masamitsu: See—
Uchida, Shin-ichi; Deguchi, Kozi; and Sasaki, Masamitsu, 4,871,700, Cl. 502-51.000.
Sasaki, Takashi: See—
Komamura, Tawara; Ikeuchi, Satoru; Iwagaki, Masaru; Sasaki, Takashi; and Ishikawa, Wataru, 4,871,647, Cl. 430-201.000.
Sasanuma, Hiroshi: See—
Tanaka, Shotaro; Ikezaki, Masao; Ono, Yukiko; and Sasanuma, Hiroshi, 4,872,162, Cl. 370-85.120.
Sasse, Klaus; Fischer, Reiner; Hagemann, Hermann; Santel, Hans-Joachim; Schmidt, Robert R.; and Lurssen, Kalus, to Bayer Aktiengesellschaft. Pyrimidyl-ox- and -thio-benzoic acid derivatives useful as herbicides and plant growth regulants. 4,871,387, Cl. 71-92.000.
Sato, Fumihiko: See—
Fujimoto, Masami; Inazumi, Tadahiyo; Satoh, Katsuhiko; Shimozawa, Eiichi; Awa, Yasuhiko; Sato, Fumihiko; Nozaki, Kenro; Gushima, Akira; Suemura, Yosinobu; Kusakabe, Nobuo; Imada, Kunihiko; Arichi, Masatoshi; Tanaka, Mitsunori; Umezu, Yoshinori; and Ikeda, Tsuneo, 4,871,393, Cl. 75-5.000.
Sato, Jun: See—
Myono, Seiji; and Sato, Jun, 4,871,126, Cl. 242-84.10R.
Sato, Makoto: See—
Fujii, Eisuo; Sato, Makoto; and Hirai, Seiichi, 4,871,043, Cl. 180-248.000.
Sato, Takehiko: See—
Tsunekawa, Yuzo; Tsuruta, Hikaru; and Sato, Takehiko, 4,871,441, Cl. 204-409.000.
Sato, Yasuhisa; Yamada, Yasuyuki; Nakayama, Hiroki; and Oizumi, Kouji, to Canon Kabushiki Kaisha. Photographic optical device with variable magnification. 4,871,238, Cl. 350-422.000.
Sato, Yoshinori: See—
Otonari, Satoshi; Sato, Yoshinori; Masuda, Narihiro; and Kotani, Tomoyuki, 4,871,784, Cl. 521-138.000.

Sato, Yoshitake: See—
Ohtani, Yukio; and Sato, Yoshitake, 4,870,861, Cl. 73-317.000.
Satoh, Katsuhiko: See—
Fujimoto, Masami; Inazumi, Tadahiyo; Satoh, Katsuhiko; Shimozawa, Eiichi; Awa, Yasuhiko; Sato, Fumihiko; Nozaki, Kenro; Gushima, Akira; Suemura, Yosinobu; Kusakabe, Nobuo; Imada, Kunihiko; Arichi, Masatoshi; Tanaka, Mitsunori; Umezu, Yoshinori; and Ikeda, Tsuneo, 4,871,393, Cl. 75-5.000.
Satoh, Takateru: See—
Tanaka, Kimio; Satoh, Takateru; and Shiba, Haruo, 4,871,153, Cl. 267-155.000.
Satoh, Tomohiro, to Kabushiki Kaisha Toshiba. Ultrasonic diagnostic apparatus having pivotable and slidable operational table. 4,870,954, Cl. 128-24.00A.
Satoya, Kouichi: See—
Shibata, Norio; Mizuno, Hideaki; Satoya, Kouichi; Uchitani, Nobuki; Kamohara, Tatsuyoshi; Harada, Kenichi; Yoshioka, Mamoru; Kato, Takashi; and Ohnaka, Hidemi, 4,870,942, Cl. 123-571.000.
Sauter, Josef, to Dornier GmbH. Telescopic device with unambiguous sequence of deployment and retraction. 4,871,138, Cl. 24-8-408.000.
Savin Corporation: See—
Landa, Benzion; Blake, Christopher J.; Housworth, Gerald R.; and Lior, Shai, 4,871,163, Cl. 271-225.000.
Savio, S.p.A.: See—
Colli, Luigi, 4,871,072, Cl. 209-656.000.
Sawai, Kiichi: See—
Kuroono, Masayasu; Unno, Ryoichi; Kimura, Hiromoto; Oka, Mitsuru; Hasegawa, Keiko; Ikeda, Shinichi; Kuboyama, Noboru; Ito, Takashi; Sawai, Kiichi; and Ito, Shunshuke, 4,871,740, Cl. 514-255.000.
Sawamura, Tadahiyo: See—
Kasahara, Nobuo; Nakahara, Tosio; Watanuki, Masayosi; and Sawamura, Tadahiyo, 4,872,037, Cl. 355-271.000.
Scaduto, Anthony F.: See—
Giammarco, Nicholas J.; Gimpelson, Alexander; Kaplita, George A.; Lopata, Alexander D.; Scaduto, Anthony F.; and Shepard, Joseph F., 4,871,630, Cl. 430-14.000.
Scan Technology Co., Ltd.: See—
Nagai, Teiji; Sakazume, Ryo; Hanazawa, Kouichi; Nakayama, Hiroshi; and Minagawa, Yoshio, 4,872,024, Cl. 346-1.100.
SCAPA, Inc.: See—
Westhead, William T., 4,870,998, Cl. 139-383.00A.
Scardera, Michael; and Roche, Thomas S., to Olin Corporation. Etching solutions containing ammonium fluoride and anionic sulfate esters of alkylphenol polyglycidol ethers and method of etching. 4,871,422, Cl. 156-662.000.
Schaefer, Gerhard; and Neumann, Peter, to Dresser Industries, Inc. Preparation of 4,4' dichlorodiphenyl sulfone. 4,871,876, Cl. 568-34.000.
Schaffer, Gottfried; and Schwindt, Gert, to Thyssen Industrie AG. Dual switch system for common use by track guided rail vehicles and magnetic vehicles. 4,870,906, Cl. 104-130.100.
Schaeble, Walter, to Dr. Ing. H.C.F. Porsche Aktiengesellschaft. Wheel suspension for a motor vehicle. 4,871,187, Cl. 280-667.000.
Schank, Richard L.: See—
Limburg, William W.; Yanus, John F.; Renfer, Dale S.; Schank, Richard L.; and Ong, Beng S., 4,871,634, Cl. 430-54.000.
Schara, Robert E.: See—
Katcher, Jay H.; Mabon, John T.; Matherly, Jennifer W.; McCarty, Lawrence T.; and Schara, Robert E., 4,871,398, Cl. 127-71.000.
Schaupp, George W., Jr.: See—
Royer, Paul; and Schaupp, George W., Jr., 4,872,196, Cl. 379-58.000.
Scheller, Herbert: See—
Potente, Eugen; and Scheller, Herbert, 4,871,598, Cl. 428-36.100.
Schembri, John J., to Pacific Bell. Fiber optic distribution network. 4,871,225, Cl. 350-96.760.
Schenck, Robert C.: See—
Helferich, Richard L.; and Schenck, Robert C., 4,871,495, Cl. 264-43.000.
Scherer, Michael: See—
Munz, Wolf-Dieter; Hensel, Bernd; Scherer, Michael; and Knotek, Otto, 4,871,434, Cl. 204-192.160.
Schering Aktiengesellschaft: See—
Kerb, Ulrich; Nishino, Yukishige; and Henderson, David, 4,871,725, Cl. 514-177.000.
Nickisch, Klaus; and Arnold, Hanfried, 4,871,482, Cl. 260-397.300.
Schering Corporation: See—
Yim, Zachary; Zupun, Martin; and Chaudry, Imtiaz, 4,871,538, Cl. 424-85.700.
Scheuble, Bernhard: See—
Reiffenrath, Volker; Krause, Joachim; Geelhaar, Thomas; Eiden-schink, Rudolf; Kurmeier, Hans-Adolf; Poetsch, Eike; Scheuble, Bernhard; and Weber, Georg, 4,871,469, Cl. 252-299.610.
Scheurer, Robert S. Adjustable toe water ski binder. 4,871,336, Cl. 441-70.000.
Schewski, Harald: See—
Kiener, Volker; Nonn, Guenther; Seid, Bernhard; Schewski, Harald; and Buellmeyer, Karl, 4,871,373, Cl. 23-306.000.
Schierbeck, Kenneth L.: See—
O'Farrell, Desmond J.; Schofield, Kenneth; Larson, Mark L.; Hanft, Karl-Heinz; Schierbeck, Kenneth L.; and Bentley, Richard D., 4,871,917, Cl. 250-341.000.

- Schilling, Harald; and Novotny, Bernd, to Deutsche ITT Industries GmbH. Monolithic integrated wideband power amplifier. 4,871,977, Cl. 330-255.000.
- Schlingnitz, Gunter: See—
Arndt, Dietrich; Schlingnitz, Gunter; Steller, Ilse; and Walland, Alexander, 4,871,760, Cl. 514-401.000.
- Schipper, Paul H.: See—
Herbst, Joseph A.; Owen, Hartley; and Schipper, Paul H., 4,871,446, Cl. 208-152.000.
- Schlisio, Siegfried: See—
Hengen, Gerhard; Steiniger, Wolfgang; Hinz, Werner; Oesterling, Erwin; and Schlisio, Siegfried, 4,870,748, Cl. 29-773.000.
- Schlumberger Industries Limited: See—
Vaughan, John E.; Smale, David R.; Patry, Bernard; and Heaton, John C., 4,871,886, Cl. 200-43.050.
- Schlumberger Technology Corporation: See—
de Montmollin, Vincent; and Brun, Yves, 4,872,114, Cl. 364-421.000.
- Schmid, Wolfgang: See—
Hentschel, Christian; and Schmid, Wolfgang, 4,872,080, Cl. 361-57.000.
- Schmidt, Gerhard; and Hoppe, Kurt, to Hein, Lehmann AG; and Isenmann Drahterzeugnisse GmbH. Screen lining. 4,871,288, Cl. 411-45.000.
- Schmidt, Paul. Rammer. 4,871,034, Cl. 173-90.000.
- Schmidt, Peter: See—
Kaczynski, Ulrich; Schmidt, Peter; and Paul, Hans-Helmut, 4,871,290, Cl. 414-331.000.
- Schmidt, Robert R.: See—
Sasse, Klaus; Fischer, Reiner; Hagemann, Hermann; Santel, Hans-Joschim; Schmidt, Robert R.; and Lurssen, Kalus, 4,871,387, Cl. 71-92.000.
- Schmieder, Helmut: See—
Petrich, Georg; and Schmieder, Helmut, 4,871,478, Cl. 252-627.000.
- Schmitz, Adele E.: See—
Larson, Lawrence E.; Jensen, Joseph F.; Walden, Robert H.; and Schmitz, Adele E., 4,872,010, Cl. 341-134.000.
- Schmucker, Wayne A.; and Rupp, Ronald L., to Fishers of Men Corp. Collapsible and telescoping fishing net. 4,870,773, Cl. 43-12.000.
- Schneider, Richard, to Klockner-Humboldt Deutz Aktiengesellschaft. Grate cooler for cooling hot bulk material. 4,870,913, Cl. 110-299.000.
- Schneider, Stanley A.; and Knust, John G., to Kimball International, Inc. Furniture container. 4,871,061, Cl. 206-323.000.
- Schneider, Steven: See—
Norton, John P.; Schneider, Steven; Wilder, William D.; and Hussell, Stephen J., 4,871,308, Cl. 432-29.000.
- Schnitzler, Albrecht, to Metabowerke GmbH & Co. Jigsaw with pneumatic dust blower. 4,870,755, Cl. 30-123.300.
- Schnuelli, Henry A. Caster including spring operated brake. 4,870,715, Cl. 16-35.000.
- Schobesberger, Manfred: See—
Harms, Haio; Schobesberger, Manfred; Sollradl, Herbert; and Weinrotter, Klaus, 4,871,500, Cl. 264-178.000.
- Schock, Edward J. Support and connection means for looped antenna conductors. 4,872,022, Cl. 343-806.000.
- Schock, Herold. Weight, action, and color adjustable fishing lure. 4,870,776, Cl. 43-42.330.
- Schofield, Kenneth: See—
O'Farrell, Desmond J.; Schofield, Kenneth; Larson, Mark L.; Hanft, Karl-Heinz; Schierbeck, Kenneth L.; and Bentley, Richard D., 4,871,917, Cl. 250-341.000.
- Scholz, Hans-Ulrich; and Proeve, Heinz-Konrad. Wind power device. 4,871,923, Cl. 290-55.000.
- Scholz, Norbert: See—
Kochmann, Heike; Lechner, Georg; Muller, Jurgen; and Scholz, Norbert, 4,872,030, Cl. 354-76.000.
- Schon, Manfred: See—
Brindopke, Gerhard; Walz, Gerd; Waldmann, Karl; Schon, Manfred; and Kleiner, Hans-Jerg, 4,871,822, Cl. 526-271.000.
- Schrader, Henry. Directional reversing lure. 4,870,775, Cl. 43-42.020.
- Schram, Daniel C.; and Kroesen, Gerardus M. W., to Faculty of Physics Eindhoven University of Technology. Method of treating surfaces of substrates with the aid of a plasma. 4,871,580, Cl. 427-38.000.
- Schram, David N.: See—
Nobel, Fred L.; Ostrow, Barnet D.; and Schram, David N., 4,871,429, Cl. 204-44.400.
- Schramm, Werner, to PFP-Anstalt fur Produktentwicklung und -Verwertung. Modular system for the erection of display apparatus. 4,871,076, Cl. 211-189.000.
- Schrenk, Walter J.: See—
Laursen, Larry J.; Coomer, Virgil W.; and Schrenk, Walter J., 4,871,487, Cl. 264-1.500.
- Schroder, Theo: See—
Kinast, Gunther; Schuller, Matthias; and Schroder, Theo, 4,871,747, Cl. 514-315.000.
- Schroeder, Mark A.: See—
Grimsley, S. Allen; Robinson, James C.; and Schroeder, Mark A., 4,871,423, Cl. 162-72.000.
- Schubart, Rudolf; and Schwarz, Wolfgang, to Diehl GmbH & Co. Incendiary projectile, method of introducing the incendiary composition into the projectile and arrangement for implementing the method. 4,870,884, Cl. 86-20.120.
- Schuller, Matthias: See—
Kinast, Gunther; Schuller, Matthias; and Schroder, Theo, 4,871,747, Cl. 514-315.000.
- Schulman, Jerome M.; and Goyal, Raj K. Pharmacologically active cholinergic compositions, and methods for making same and use thereof in treating disease. 4,871,758, Cl. 514-397.000.
- Schulz, Daniel R.: See—
Barrett, John P.; Schulz, Daniel R.; Kent, David E.; deFasselle, Robert J.; and Zega, Henry E., 4,870,986, Cl. 137-119.000.
- Schulze, Walter. Propulsion apparatus for an aircraft. 4,871,130, Cl. 244-55.000.
- Schumm, Dorothy E.: See—
Webb, Thomas E.; Schumm, Dorothy E.; Hanausek-Walaszek, Margaret; Walaszek, Zbigniew; and Lang, Raymond W., 4,871,661, Cl. 435-7.000.
- Schupp, Eberhard: See—
Schwerzel, Thomas; Osterloh, Rolf; Schupp, Eberhard; Perner, Thomas; and Ahlers, Klaas, 4,871,808, Cl. 525-113.000.
- Schutz, Ronald J.: See—
Alexander, Frank B., Jr.; Foo, Pang-Dow; and Schutz, Ronald J., 4,871,420, Cl. 156-643.000.
- Schwab, Frederick C.: See—
Gunesin, Binnur Z.; Pindris, Paul A.; and Schwab, Frederick C., 4,871,814, Cl. 525-314.000.
- Schwartz, Erez; and Schwartz, Zvi. Infusion, stirring and hanging device for preparing beverage. 4,871,555, Cl. 426-82.000.
- Schwartz, Zvi: See—
Schwartz, Erez; and Schwartz, Zvi, 4,871,555, Cl. 426-82.000.
- Schwarz, Wolfgang: See—
Schubart, Rudolf; and Schwarz, Wolfgang, 4,870,884, Cl. 86-20.120.
- Schwerzel, Thomas; Osterloh, Rolf; Schupp, Eberhard; Perner, Thomas; and Ahlers, Klaas, to BASF Lacke + Farben Aktiengesellschaft. Binders water-dilutable by protonation with acid. 4,871,808, Cl. 525-113.000.
- Schwicker, Horst-Hartwig: See—
Elff, Manfred; Pfeiffer, Wilfried G.; Schwicker, Horst-Hartwig; and Christiansen, Dieter H. C., 4,872,193, Cl. 378-196.000.
- Schwindt, Gert: See—
Schaffer, Gottfried; and Schwindt, Gert, 4,870,906, Cl. 104-130.100.
- Scott, John C., to Broken Hill Proprietary Company Limited, The. Sensing of methane. 4,871,916, Cl. 250-338.500.
- Scott, Stephen C.: See—
Oullette, Lucille A.; and Scott, Stephen C., 4,870,829, Cl. 62-51.100.
- Scriven, Richard M.: See—
Brown, Robert J.; and Scriven, Richard M., 4,871,004, Cl. 152-209.000.
- Season-all Industries, Inc.: See—
Nelson, Dwight C., 4,870,791, Cl. 52-217.000.
- Sebald, Mark D.; and Neumeyer, Richard E., to Barber-Colman Company. Versatile interface means for computer-based control systems. 4,872,213, Cl. 364-180.000.
- Seballo, Valery A.: See—
Dobryakov, Valentin I.; Zhevzhik, Galina V.; Seballo, Valery A.; Zhukov, Evgeny V.; Ententev, Altar Z.; Struzhkov, Vyacheslav N.; and Gorbachev, Alexander S., 4,871,448, Cl. 209-169.000.
- Sebestyen, Gyula; Simonyi, Istvan; Miholics, Gizelle; Kovacs, Marta; Gorgenyi, Frigyes; Fekete, Marton; Vago, Pal; Seres, Istvan; Egri, Janos; and Szeli, Maria, to EGIS Cyogyszervar. Pharmaceutical composition comprising an organic zinc complex and a process for preparing the active substance. 4,871,728, Cl. 514-187.000.
- Sebralla, Bruno: See—
Nitsche, Rainer; Sebralla, Bruno; and Malkmus, Rolf, 4,872,179, Cl. 372-93.000.
- Securiton-Magnalock Corporation: See—
Cook, Robert C.; and Barton, Mark R., 4,871,204, Cl. 292-251.500.
- Seel, Matthias: See—
Reichle, Ernst-Michael; and Seel, Matthias, 4,871,515, Cl. 422-174.000.
- Seid, Bernhard: See—
Kiener, Volker; Nonn, Guenther; Seid, Bernhard; Schewski, Harald; and Buellmeyer, Karl, 4,871,373, Cl. 23-306.000.
- Seikenkai Foundational Juridical Person: See—
Hata, Kosei; and Maruoka, Toshiyuki, 4,871,539, Cl. 424-93.000.
- Seiko Instruments Inc.: See—
Suzuki, Mitsuya, 4,871,234, Cl. 350-333.000.
- Seitz Enzinger Noll Maschinenbau Aktiengesellschaft: See—
Sprenger, Helmut, 4,870,806, Cl. 53-485.000.
- Seki, Kenji; Hashimoto, Junichiro; Kimura, Michio; Yamanami, Hirofumi; Mochizuki, Satomi; and Aiso, Izumi, to Ricoh Company, Ltd. Electrophotographic photoconductor layered element comprising salt material undercoat layer on conductive support. 4,871,635, Cl. 430-60.000.
- Seki, Koji; Morishita, Hiroshi; Ohno, Kiyoshi; and Yokota, Hiroshi, to Japan Oxygen Co., Ltd. Process for the production of glass. 4,871,695, Cl. 501-54.000.
- Sekiya, Makoto; and Wada, Kanji, to Minolta Camera Kabushiki Kaisha. Laser printer capable of changing a pixel density. 4,872,025, Cl. 346-108.000.
- Sellati, Christopher G. Safety power receptacle with hot wire switch-through. 4,871,924, Cl. 307-86.000.
- Semiconductor Energy Laboratory Co., Ltd.: See—
Yamazaki, Shumpei, 4,871,581, Cl. 427-39.000.
- Sempel, Adrianus, to U.S. Philips Corporation. Low noise relaxation oscillator. 4,871,985, Cl. 331-111.000.
- Senda, Atsuo: See—
Kano, Osamu; Takano, Yoshitiko; and Senda, Atsuo, 4,871,585, Cl. 427-98.000.

- Seney, John S. Work holding device for handicapped persons. 4,871,154, Cl. 269-97.000.
- Senez, Alain, to BP Chemicals Limited. Polymer compositions based on linear low density polyethylene and propylene copolymers. 4,871,813, Cl. 525-240.000.
- Seo, Hiromi; and Kushizaki, Osami, to Hitachi, Ltd. Detecting light spot movement direction for an optical disk. 4,872,153, Cl. 369-44.000.
- Sepratech: See—
Taylor, Michael A.; and Rogier-Brown, Timothy, 4,871,463, Cl. 210-161.000.
- Seres, Istvan: See—
Sebestyen, Gyula; Simonyi, Istvan; Miholics, Gizelle; Kovacs, Marta; Gorgenyi, Frigyes; Fekete, Marton; Vago, Pal; Seres, Istvan; Egri, Janos; and Szeli, Maria, 4,871,728, Cl. 514-187.000.
- Serrano, Alberto B. Setting chambers for concrete parts. 4,870,981, Cl. 134-56.000.
- Seslar, Daniel M.: See—
Culbert, James A.; and Seslar, Daniel M., 4,872,145, Cl. 367-87.000.
- Seto, Akira, to Nissin Oil Mills, Ltd. Process for preparing a lipid composition having upon saponification a high gamma-linolenic acid content. 4,871,666, Cl. 435-134.000.
- Seydel, Edgar R.: See—
Panda, Prakash C.; Seydel, Edgar R.; and Raj, Rishi, 4,871,496, Cl. 264-65.000.
- Seyferth, Dietmar; and Rees, William S., Jr., to Massachusetts Institute of Technology. Lewis base adducts of decaborane for forming new preceramic polymers, using as binders, forming shaped bodies and forming fibers. 4,871,826, Cl. 528-4.000.
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- Okamoto, Kazuhiko; and Kanayama, Akira, 4,872,139, Cl. 365-52.000.
- Sharpless, K. Barry: See—
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- Shearer, Gerald; Lofgren, Karl M.; and Ouyang, Kenneth W., to Western Digital Corporation. Variable frequency system having linear combination of charge pump and voltage controlled oscillator. 4,871,979, Cl. 330-253.000.
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- Sherman, Daniel A. Agriculturally used rodent bait station with signal wand. 4,870,780, Cl. 43-131.000.
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- Shibata, Masayuki: See—
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- Shields, Winston E. Machine control apparatus using wire capacitance sensor. 4,871,058, Cl. 198-444.000.
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- Shimano Industrial Company Limited: See—
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- Yamato, Yoshiro, 4,870,774, Cl. 43-23.000.
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Rotem, Haim; and Simoni, Yair, 4,871,967, Cl. 324-309.000.
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- Imada, Kunihiro; Arichi, Masatoshi; Tanaka, Mitsunori; Umezu, Yoshinori; and Ikeda, Tsuneo, 4,871,393, Cl. 75-5.000.
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- Shipe, Joanne E.: See—
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- Mori, Kinji; Miyamoto, Shoji; and Shiraha, Takeshi, 4,872,165, Cl. 371-11.200.
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- Siegel, Arthur D.: See—
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- Siegel, Carole E.: See—
- Sunshine, Abraham; Laska, Eugene M.; and Siegel, Carole E., 4,871,733, Cl. 514-212.000.
- Siegel, Robert J.: See—
- DonMichael, T. Anthony; Siegel, Robert J.; and DeCastro, Eugene A., 4,870,953, Cl. 128-24.00A.
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- Antoon, Mattelin, 4,870,751, Cl. 29-846.000.
- Auracher, Franz; and Noll, Bernd, 4,871,223, Cl. 350-96.140.
- Bruno, Johannes; and Latussek, Hans-Peter, 4,871,324, Cl. 439-189.000.
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- Hahn, Alfred; and Raup, Jens-Peter, 4,872,192, Cl. 378-181.000.
- Heinze, Roland; and Liess, Hans D., 4,870,967, Cl. 128-419.0PG.
- Karstensen, Holger; and Klement, Ekkehard, 4,871,224, Cl. 350-96.150.
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- Siemens Energy & Automation, Inc.: See—
- Leone, David A.; and Buxton, Clifford A., 4,871,889, Cl. 200-146.00R.
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- Ogilvie, David P., 4,870,769, Cl. 40-564.000.
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- Merz, Peter W.; and Zabel, Lutz-Dieter, 4,871,590, Cl. 427-387.000.
- Silvestri, George J., Jr., to Westinghouse Electric Corp. Low load operation of steam turbines. 4,870,823, Cl. 60-652.000.
- Simco Company, Inc.: See—
- Blitshteyn, Mark, 4,872,083, Cl. 361-213.000.
- Simmonds Precision Products, Inc.: See—
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- Simon, Ferenc: See—
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- Simplicity Engineering, Inc.: See—
- Maloney, Daniel T., 4,871,118, Cl. 241-99.000.
- Sinn, Hansjorg: See—
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- Hermecz, Istvan; Kereszturi, Geza; Vasvavi, Lelle; Horvath, Agnes; Balogh, Maria; Kovacs, Gabor; Szuts, Tamas; Rittli, Peter; Sipos, Judit; and Pajor, Aniko, 4,871,849, Cl. 544-229.000.
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- Sjogren, Bengt C. H.: See—
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- Sjonell, Goran, to Presidentia Medical AB. Adapter for drop unit. 4,871,359, Cl. 604-411.000.
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- Slack, Maurice W., to Centre for Frontier Engineering Research. Ultrasonic method for measuring internal contact pressure between mating solid parts separated by a liquid film. 4,870,866, Cl. 73-599.000.
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- Sterba, Richard F.; and Slade, James R., Jr., 4,871,166, Cl. 272-144.000.
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- Smith, George C. Air filter housing assembly for gasoline engine power tools. 4,871,381, Cl. 55-385.300.
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- Smith, Michael A., to Fulkerson, Bennie C., a part interest. Compact disc player capable of playing plural selections recorded on a compact disc in a preselected sequence. 4,872,151, Cl. 369-14.000.
- Smith, Michael D.; and Lemay, Richard A., to Bull HN Information Systems Inc. Storage of input/output command timeout and acknowledgment responses. 4,872,110, Cl. 364-200.000.
- Smith, Patrick A.; and Thompson, Glen, to Eagle-Picher Industries, Inc. Tire testing machine. 4,870,858, Cl. 73-146.000.
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- Sobotka, Daniel Carl: See—
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- Audoux, Christian; Rivas, Edouard; and Rossignol, Georges, 4,871,499, Cl. 264-173.000.
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- Bergerious, Jean-Marcel; Pavie, Claude; Plent, Christian; and Constant, Bernard, 4,870,799, Cl. 53-55.000.
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- Societe Manzoni Bouchot: See—
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- Daguet, Alain P. M.; Glowacki, Pierre A.; and Lassignardie, Herve, 4,870,826, Cl. 60-751.000.
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- Grinberg, Jan; Marom, Emanuel; Soffer, Bernard H.; O'Meara, Thomas R.; and Pops, Adrian E., 4,871,232, Cl. 350-162.110.
- Soicke, Hartwig: See—
- Madaus, Rolf; Gorler, Klaus; and Soicke, Hartwig, 4,871,763, Cl. 514-45.200.
- SOLIS S.R.L.: See—
- Gazzarrini, Vinicio, 4,871,206, Cl. 294-99.100.
- Sollradl, Herbert: See—
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- Somatics, Inc.: See—
- Swartz, Conrad M., 4,870,969, Cl. 128-419.00S.
- Somers, W. Karl: See—
- Goble, E. Marlowe; and Somers, W. Karl, 4,870,957, Cl. 128-92.0YF.
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- Sones, Richard A.: See—
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- Song, Won I. Container for dispensing a measured amount of a granulated solid. 4,871,095, Cl. 222-437.000.
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- Fujita, Tadao, 4,872,170, Cl. 371-30.000.
- Sories: See—
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- Speas, Gary W., to POM, Incorporated. Electronic advertising system for solar powered parking meter. 4,872,149, Cl. 368-90.000.
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- Spectra-Physics: See—
- Baer, Thomas M.; and Kierstead, Mark S., 4,872,177, Cl. 372-75.000.
- Holsinger, Kevin, 4,872,104, Cl. 364-166.000.
- Johnson, Bertram C.; and Herbst, Richard L., 4,872,181, Cl. 372-106.000.
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- Lin, Bor-Sheng; Kudzma, Linas V.; and Spencer, H. Kenneth, 4,871,749, Cl. 514-326.000.
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- Spencer, William D. Trash compactor with pivoting platen portion. 4,870,898, Cl. 100-53.000.
- Spencer Wright Industries, Inc.: See—
- Bagnall, Arthur F., 4,870,915, Cl. 112-80.410.
- Sperry Marine Inc.: See—
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Wright, Kenneth C.; and Stuck, Jerry L., 4,870,910, Cl. 110-190.000.
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Herpichboehm, Bernd G.; Sierra, George H.; Summers, Robert B.; and Watlington, Thomas M., 4,871,258, Cl. 356-422.000.
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Sues, John M.; and Sun, Jing H., 4,872,198, Cl. 379-377.000.
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Campbell, James D., 4,870,763, Cl. 38-77.700.
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Roesler, Carl A., 4,871,303, Cl. 417-434.000.
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Elliott, Raymond; Sunley, Raymond; and Griffin, David A., 4,871,389, Cl. 71-92.000.
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Kumar, M. Lalith, 4,871,453, Cl. 210-198.200.
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Christensen, James M.; and Westerfield, David A., 4,871,367, Cl. 623-21.000.
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Conn, Kirk O.; Finlay, William, Jr.; Sutyn, Carol S.; and Maietta, Michael G., 4,871,354, Cl. 604-89.000.
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Terauchi, Masakazu; and Suzuki, Gentarou, 4,871,562, Cl. 426-330.300.
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Kokubo, Yasushi; Suzuki, Keisuke; and Mori, Seichiro, 4,871,912, Cl. 250-311.000.
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Adrienssens, Luc W.; Bustos, Orlando A.; and Swanson, David, 4,871,997, Cl. 340-539.000.
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Magnusson, Hans G.; and Jansson, Karl, 4,871,837, Cl. 536-4.100.
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Metlitsky, Boris; and Krichever, Mark J., 4,871,904, Cl. 235-467.000.
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Gross, David M., 4,871,989, Cl. 335-164.000.
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Szarka, Paul J., 4,871,809, Cl. 525-131.000.
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Batori, Sandor; Hajos, Gyorgy; Messmer, Andras; Benko, Pal; Pallos, Laszlo; Petocz, Lujza; Grasser, Katalin; Kosoczky, Ibolya; and Szirt nee Kiszelly, Eniko, 4,871,846, Cl. 544-183.000.
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Hermez, Istvan; Kereszturi, Geza; Vasvavi, Lelle; Horvath, Agnes; Balogh, Maria; Kovacs, Gabor; Szuts, Tamas; Ritli, Peter; Sipos, Judit; and Pajor, Aniko, 4,871,849, Cl. 544-229.000.
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Stein, Hans P.; Weise, Armin; and Will, Reinhold, 4,871,272, Cl. 400-583.000.
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Kawami, Shigeru; Tabu, Takashi; Sano, Shigeo; and Masuda, Nobuyuki, 4,872,199, Cl. 379-413.000.
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Greene, Benjamin I.; Tai, Kuochou; and Thakur, Mrinal, 4,871,235, Cl. 350-354.000.
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Arapa, Constance J.; Kandetzke, Steven M.; and Takacs, Mark A., 4,871,619, Cl. 428-473.500.
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Itoh, Hiroshi; and Takada, Mitsuru, 4,872,115, Cl. 364-424.100.
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Kimura, Hiroshi; and Takagi, Akira, 4,871,616, Cl. 428-407.000.
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Ishikawa, Masataka; and Takagi, Nobukazu, 4,870,939, Cl. 123-506.000.
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Katoh, Takayuki; Hosoi, Yuichi; and Takahashi, Kenji, 4,871,474, Cl. 252-301.40H.
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Ohta, Noboru; Takahashi, Koji; and Suzuki, Tsuneo, 4,872,034, Cl. 355-77.000.
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Matsushita, Hajime; Shibagaki, Makoto; and Takahashi, Kyoko, 4,871,858, Cl. 546-244.000.
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Miyake, Hiroyuki; Sagara, Seiji; Yonemori, Takaji; Watanabe, Tsuyoshi; Takahashi, Masayoshi; Suzuki, Koji; Komiya, Yutaka; Tomosada, Masahiro; Adachi, Hideki; Hirose, Masayuki; and Miyata, Masanori, 4,872,035, Cl. 355-208.000.
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Wakumura, Shinichi; and Takahashi, Tokihiro, 4,872,171, Cl. 371-40.100.
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Watanabe, Kazuo; Takahashi, Yutaka; and Takimoto, Masaaki, 4,871,271, Cl. 400-124.000.
- Takahira, Yoshiyuki: See—
Matsuura, Takeshi; Morioka, Akira; and Takahira, Yoshiyuki, 4,871,606, Cl. 428-147.000.
- Takai Rubber Industries, Ltd.: See—
Funahashi, Yoshiaki, 4,871,152, Cl. 267-140.100.
- Takami, Satoshi; and Ohsawa, Yutaka, to Asahi Kogaku Kogyo Kabushiki Kaisha. Electric power supply control device for camera. 4,872,069, Cl. 354-484.000.
- Takano, Yoshihiko: See—
Kano, Osamu; Takano, Yoshihiko; and Senda, Atsuo, 4,871,585, Cl. 427-98.000.
- Takao, Mitsuji, to Canon Kabushiki Kaisha. Data transmission system. 4,872,006, Cl. 340-825.520.
- Takao, Seiji: See—
Sugimoto, Hiroaki; Hayatsu, Kazuo; Kobashi, Toshiyuki; and Takao, Seiji, 4,871,501, Cl. 264-211.220.
- Takasugi, Hisashi: See—
Takaya, Takao; Masugi, Takashi; Takasugi, Hisashi; and Kochi, Hiromu, 4,871,860, Cl. 548-195.000.
- Takasugi, Wasao: See—
Tsuyoshi, Toshiaki; Ohtake, Masatoshi; Takasugi, Wasao; and Yonezawa, Seiji, 4,872,152, Cl. 369-44.000.
- Takata, Masakazu; Ueda, Takamasa; Ito, Kimiyuki; Hirashima, Suneaki; Yamamoto, Souichi; Ishino, Yoshio; and Ohno, Toshinobu, to Minolta Camera Kabushiki Kaisha; and Osaka Municipal Government. Photosensitive member comprising azo compound having pyridine-n-oxide or pyridazine-n-oxide. 4,871,633, Cl. 430-58.000.
- Takata, Shigeru; Aono, Takeki; and Fujiwara, Gentaro, to Fujiwara Chemical Co., Ltd. Exterior water-proof ornamental sheet and method of constructing it. 4,871,610, Cl. 428-246.000.
- Takaya, Takao; Tozuka, Zenzaburo; Yasuda, Nobuyoshi; and Kawabata, Kohji, to Fujisawa Pharmaceutical Co., Ltd. Cephem compounds. 4,871,730, Cl. 514-206.000.
- Takaya, Takao; Masugi, Takashi; Takasugi, Hisashi; and Kochi, Hiromu, to Fujisawa Pharmaceutical Co., Ltd. Syn-isomer of 3,7-disubstituted-3-cephem-4-carboxylic acid compounds and processes for the preparation thereof. 4,871,860, Cl. 548-195.000.
- Takayama, Tadashi: See—
Yamagata, Shigeo; Takei, Masahiro; Takayama, Tadashi; and Ito, Kazuhiko, 4,872,066, Cl. 358-336.000.

- Takayama, Toshio, to Tokio Ltd. Vehicle braking system. 4,871,215, Cl. 303-100.000.
- Takeda Chemical Industries, Ltd.: See—
Saito, Yuzuru; and Yoshida, Kokichi, 4,871,868, Cl. 549-416.000.
Sugihara, Hirotsada; Nishikawa, Kohei; and Ito, Katsumi, 4,871,842, Cl. 540-523.000.
- Takeda, Hiromasa: See—
Arai, Tohru; Endo, Junji; and Takeda, Hiromasa, 4,871,401, Cl. 148-14.000.
- Takeda, Masayuki: See—
Aoki, Takayoshi; Nagatsuka, Ikutaro; Takeda, Masayuki; Honjo, Toshio; Itoh, Kazuhiro; and Uchida, Kenji, 4,871,639, Cl. 430-108.000.
- Takeda, Renzo: See—
Aoyama, Motoo; and Takeda, Renzo, 4,871,510, Cl. 376-444.000.
- Takeda, Yoshimitsu; Mochida, Haruo; Iwasaki, Tsutomu; and Kanai, Toshio, to Nissan Motor Co., Ltd. Alarm apparatus for automatic transmission vehicle. 4,871,994, Cl. 340-457.000.
- Takei, Masahiro: See—
Yamagata, Shigeo; Takei, Masahiro; Takayama, Tadashi; and Ito, Kazuhiko, 4,872,066, Cl. 358-336.000.
- Takemasa, Masami: See—
Takahashi, Tadashi; Ooi, Shinichi; and Takemasa, Masami, 4,871,011, Cl. 165-16.000.
- Takeuchi, Makoto: See—
Shindo, Takuji; Naito, Hiromitsu; and Takeuchi, Makoto, 4,871,400, Cl. 148-12.70B.
- Takeya, Noriyoshi: See—
Ishii, Hidehiro; Yoshio, Junichi; Watanabe, Osamu; Izumo, Takeshi; Takeya, Noriyoshi; Katakami, Kazuhiko; Shinohara, Masayori; and Yoshida, Masao, 4,872,068, Cl. 358-342.000.
- Takiguchi, Haruhisa: See—
Matsui, Sadayoshi; Taneya, Mototaka; Matsumoto, Mitsuhiro; Hosoba, Hiroyuki; Takiguchi, Haruhisa; and Kudo, Hiroaki, 4,872,174, Cl. 372-45.000.
- Takimoto, Hiroyuki: See—
Maeda, Masaya; Takimoto, Hiroyuki; and Kozuki, Susumu, 4,872,072, Cl. 360-33.100.
- Takimoto, Masaaki: See—
Watanabe, Kazuo; Takahashi, Yutaka; and Takimoto, Masaaki, 4,871,271, Cl. 400-124.000.
- Tamagawa Seiki Kabushiki Kaisha: See—
Yoden, Sadamitsu, 4,871,960, Cl. 322-24.000.
- Tamagawa, Shigehisa; and Kuroishi, Masayuki, to Fuji Photo Film Co., Ltd. Light-sensitive material comprising light-sensitive layer provided on a support comprising a water resistant coating layer. 4,871,642, Cl. 430-138.000.
- Tamagawa, Shigehisa; and Kuroishi, Masayuki, to Fuji Photo Film Co., Ltd. Image-forming method employing light-sensitive material and image-receiving material comprising microcapsules and specified paper support. 4,871,643, Cl. 430-138.000.
- Tamaki, Akihiro: See—
Nagata, Teruyuki; Tamaki, Akihiro; Kajimoto, Nobuyuki; and Wada, Masaru, 4,871,875, Cl. 564-402.000.
- Tamamura, Sadao: See—
Kojima, Yasuhiko; and Tamamura, Sadao, 4,871,540, Cl. 424-195.100.
- Tanaka, Joji: See—
Tanaka, Taro; and Tanaka, Joji, 4,871,128, Cl. 242-201.000.
- Tanaka, Kimio; Satoh, Takateru; and Shiba, Haruo, to TDK Corporation. Spring for biasing a braking member of a tape cassette. 4,871,153, Cl. 267-155.000.
- Tanaka, Masato: See—
Nishizawa, Hisao; Morita, Masaru; and Tanaka, Masato, 4,871,417, Cl. 156-640.000.
- Tanaka, Mitsunori: See—
Fujimoto, Masami; Inazumi, Tadashi; Satoh, Katsuhiko; Shimozaawa, Eiichi; Awa, Yasuhiko; Sato, Fumihiko; Nozaki, Kenro; Gushima, Akira; Suemura, Yosinobu; Kusakabe, Nobuo; Imada, Kunihiko; Arichi, Masatoshi; Tanaka, Mitsunori; Umez, Yoshinori; and Ikeda, Tsuneo, 4,871,393, Cl. 75-5.000.
- Tanaka, Mitsutoshi; Arai, Fuminori; Terashima, Kaoru; and Yaginuma, Nakatsugu, to Fuji Photo Film Co., Ltd. Integral multilayer analytical element for determining calcium and its use. 4,871,679, Cl. 436-79.000.
- Tanaka, Shoji: See—
Oshima, Takehiro; Tanaka, Shoji; and Matsukura, Shigekazu, 4,871,663, Cl. 435-68.000.
- Tanaka, Shotaro; Ikezaki, Masao; Ono, Yukiko; and Sasanuma, Hiroshi, to Matsushita Electric Industrial Co., Ltd. Communication system. 4,872,162, Cl. 370-85.120.
- Tanaka, Takeshi: See—
Murata, Hiroyuki; Tanaka, Takeshi; Hino, Chouji; Kiuchi, Harunaga; and Chiji, Masahiro, 4,871,119, Cl. 241-189.00R.
- Tanaka, Taro; and Tanaka, Joji, to Wako Kabushiki Kaisha. Auto reverse mechanism for tape recorder/playback devices. 4,871,128, Cl. 242-201.000.
- Tanaka, Yoichi: See—
Hayashi, Takatoshi; Fujiki, Norio; Tanaka, Yoichi; Nishimoto, Takashi; and Kobayashi, Masakazu, 4,871,993, Cl. 340-439.000.
- Tandem Computers Incorporated: See—
Horst, Robert W.; and Harris, Richard L., 4,872,109, Cl. 364-200.000.
- Sanner, Martin W., 4,872,172, Cl. 371-49.100.
- Taneya, Mototaka: See—
Matsui, Sadayoshi; Taneya, Mototaka; Matsumoto, Mitsuhiro; Hosoba, Hiroyuki; Takiguchi, Haruhisa; and Kudo, Hiroaki, 4,872,174, Cl. 372-45.000.
- Taniguchi, Naosato: See—
Kushibiki, Nobuo; Yoshinaga, Yoko; Taniguchi, Naosato; and Kuwayama, Tetsuro, 4,871,411, Cl. 156-249.000.
- Tansley, Robert W.: See—
Isherwood, Jonathan M.; and Tansley, Robert W., 4,871,038, Cl. 177-25.180.
- Taranto, James; and Cullen, James H. Method and apparatus for the automatic connection of battery cables. 4,871,957, Cl. 320-26.000.
- Taroni, Federico: See—
Ribolla, G. Carlo; Taroni, Federico; Peiretti, Domenico; and Peppino, Antonio, 4,870,727, Cl. 26-10.00C.
- Tashiro, Yoshio, to Olympus Optical Co., Ltd. Method for assembling optical fiber bundles in an endoscope. 4,871,229, Cl. 350-96.260.
- Tatini, Sita R., to University of Minnesota, Regents of the. Process for control of food pathogens. 4,871,563, Cl. 426-334.000.
- Tatsushima, Masaru; and Sakura, Makoto, to Nikki-Universal Co., Ltd. Ozone cracking catalyst. 4,871,709, Cl. 502-324.000.
- Tatung Company of America, Inc.: See—
Liu, Chung-Chi, 4,870,982, Cl. 134-135.000.
- Tauer, Elroy J.: See—
Chacko, Tharayil; Soucie, Wayne; Tauer, Elroy J.; and Heimann, Robert, 4,870,814, Cl. 57-217.000.
- Taylor, Chandler R., Jr.; and Stauffer, Harold F., Jr., to A. H. Robins Company, Incorporated. 3-Amino-5-methyl-1H-pyrazole-4-carboxylic acids and esters thereof as anticonvulsants muscle relaxants and anxiolytics. 4,871,737, Cl. 514-236.500.
- Taylor, Cynthia A.: See—
Baugh, Robert F.; and Taylor, Cynthia A., 4,871,677, Cl. 436-69.000.
- Taylor, David B.; and Zemke, Steven C., to Hewlett Packard Company. Double wall baffle for airflow and RFI shielding. 4,872,090, Cl. 361-424.000.
- Taylor, Edward C.; Harrington, Philip M.; and Shih, Chuan, to Princeton University, The Trustees of; and Eli Lilly and Company. L-glutamic acid derivatives. 4,871,743, Cl. 514-272.000.
- Taylor, Edward C.; Hamby, James M.; and Shih, Chuan, to Princeton University, The Trustees of; and Eli Lilly and Company. N-[N-(tetrahydropyridyl(2,3-D)pyrimidinylmethyl)-aminomethylbenzoyl]-glutamic acid derivatives as neoplastic growth inhibitors. 4,871,746, Cl. 514-303.000.
- Taylor, Gerald W.; and Stanek, Lawrence C., to Myers Industries. Plastic carrier box. 4,871,217, Cl. 312-216.000.
- Taylor, Michael A.; and Rogler-Brown, Timothy, to Sepratech. Vertical reaction vessel. 4,871,463, Cl. 210-161.000.
- Taylor, Nicola S.: See—
Felix, Michael C.; Taylor, Nicola S.; and Hardy, Colin C., 4,871,412, Cl. 156-273.900.
- TDK Corporation: See—
Tanaka, Kimio; Satoh, Takateru; and Shiba, Haruo, 4,871,153, Cl. 267-155.000.
- Tech-Age International Corporation: See—
Adriaenssens, Luc W.; Bustos, Orlando A.; and Swanson, David, 4,871,997, Cl. 340-539.000.
- Technochemie GmbH: See—
Stenzenberger, Horst; and Koenig, Peter, 4,871,821, Cl. 526-262.000.
- Tedeschi, Michele: See—
Tognella, Sergio; Tedeschi, Michele; Assereto, Roberto; Tofanetti, Odoardo; and Cavalletti, Ennio, 4,871,528, Cl. 424-10.000.
- Teijin, Limited: See—
Makino, Yui; Suzuki, Yoshiki; and Aoyagi, Takashi, 4,871,723, Cl. 514-167.000.
- Telesis Controls Corporation: See—
Robertson, John A., 4,870,922, Cl. 118-702.000.
- Telettra Telefonica Elettronica e Radio S.p.A.: See—
Donzelli, Giampiero, 4,871,687, Cl. 437-40.000.
- Teng, Ren-Tui: See—
Shiue, Chyng-Yann; Wolf, Alfred P.; Bai, Lan-Qin; and Teng, Ren-Tui, 4,871,527, Cl. 424-1.100.
- Tengler, John N.: See—
Gobets, Roy A.; and Tengler, John N., 4,871,318, Cl. 439-76.000.
- Tenjinbayashi, Koji, to Agency of Industrial Science & Technology; and Ministry of International Trade & Industry. Optical nondestructive testing method of composite materials. 4,871,255, Cl. 356-354.000.
- Tenthoff, Aloys, to Westfalia Separator AG. Centrifuge for separating mixtures of liquids. 4,871,349, Cl. 494-56.000.
- Teradyne, Inc.: See—
Johnson, Lennart B., 4,871,321, Cl. 439-79.000.
- Teranishi, Akinori: See—
Okina, Toyohiko; Goto, Hiroshi; Kousaka, Fumio; Teranishi, Akinori; Kawabata, Satoshi; Ohyama, Tetsuo; Ohya, Makoto; and Kozaki, Norio, 4,871,612, Cl. 428-269.000.
- Teraoka Seiko Co., Ltd.: See—
Kajimoto, Hironobu, 4,872,119, Cl. 364-464.030.
- Terasaka, Katsunori: See—
Sanbuichi, Hiroshi; Terasaka, Katsunori; and Nakagawa, Toyooki, 4,870,937, Cl. 123-488.000.
- Terashima, Kaoru: See—
Tanaka, Mitsutoshi; Arai, Fuminori; Terashima, Kaoru; and Yaginuma, Nakatsugu, 4,871,679, Cl. 436-79.000.

- Terauchi, Masakazu; and Suzuki, Gentarou, to Meiji Seika Kaisha, Ltd. Process for the processing of cacao beans. 4,871,562, Cl. 426-330.300.
- Terhune, Ralph D.; and Murphy, James D., to Facet Enterprises, Inc. Filter assembly with lockable lug means. 4,871,455, Cl. 210-232.000.
- Teroson GmbH: See—
Lucke, Heinz, 4,871,792, Cl. 524-59.000.
- Terumo Corporation: See—
Yamaguchi, Shuichi; Daikuhara, Norio; and Shimomura, Takeshi, 4,871,442, Cl. 204-418.000.
- Tetron, Inc.: See—
Koffron, Robert J., 4,871,148, Cl. 266-230.000.
- Teuling, Dirk J.; and Hulshof, Jozef J. M., to U. S. Philips Corporation. Line synchronizing circuit in a picture display device. 4,872,055, Cl. 358-148.000.
- Teuling, Dirk J. A., to U. S. Philips Corporation. Picture display device including a line synchronizing circuit and a line deflection circuit. 4,871,951, Cl. 315-408.000.
- Texas Instruments Incorporated: See—
Cooper, Erwin E., 4,871,219, Cl. 350-1.400.
Fujii, Ichiro, 4,872,043, Cl. 357-24.000.
Garcia, Felix, Jr., 4,871,231, Cl. 350-144.000.
Whetsel, Lee D., Jr., 4,872,169, Cl. 371-22.300.
- Tezuka, Nobuo, to Canon Kabushiki Kaisha. Recording and/or reproducing apparatus with adjustments for positioning head and a moving device using the same. 4,872,077, Cl. 360-109.000.
- Thakur, Mrinal: See—
Greene, Benjamin I.; Tai, Kuochou; and Thakur, Mrinal, 4,871,235, Cl. 350-354.000.
- Thalenfeld, David R., to Trion Industries Inc. Two-part shelf hook. 4,871,135, Cl. 248-221.400.
- Theeuwes, Felix, to Alza Corporation. System for intravenous delivery of a beneficial drug at a regulated rates. 4,871,360, Cl. 604-892.100.
- Theobald, Keith D.: See—
Wright, James R.; Hall, James R.; and Theobald, Keith D., 4,871,328, Cl. 439-589.000.
- Thoenning, Gerald A.: See—
Wolters, Richard H.; Thoenning, Gerald A.; and Jeffers, Robert E., 4,870,908, Cl. 108-60.000.
- Thomas, David B.: See—
Cloetens, Rudolphe C.; Lidy, Werner A.; Phillips, Brian D.; and Thomas, David B., 4,871,783, Cl. 521-137.000.
- Thomas, Jeffrey A.: See—
Daberkow, Kevin L.; Finan, Christopher D.; Petolino, Joseph A.; Sobottka, Daniel Carl; and Thomas, Jeffrey A., 4,872,111, Cl. 364-200.000.
- Thomas, Michelle: See—
Cronk, Scott; and Thomas, Michelle, 4,870,975, Cl. 128-749.000.
- Thompson, Glen: See—
Smith, Patrick A.; and Thompson, Glen, 4,870,858, Cl. 73-146.000.
- Thomsen, Flemming; Nissen, Harry S.; Ravn, Kjeld; and Diken, Carl C., to Danfoss A/S. Control means for a hydraulic servomotor. 4,870,892, Cl. 91-361.000.
- Thomsen, John. Method and apparatus for injecting fluids into IV line. 4,871,353, Cl. 604-83.000.
- Thomson-CSF: See—
Kuntzmann, Jean C.; and Santonja, Noel, 4,871,950, Cl. 315-393.000.
Lefevre, Herve; and Rolly, Didier, 4,871,254, Cl. 356-350.000.
Maerfeld, Charles; and Gelly, Jean F., 4,870,972, Cl. 128-662.030.
- Thomson-CSF S.C.P.I.: See—
Andrieu, Jean P.; Gault, Dominique; and Henri, Jean C., 4,872,013, Cl. 342-135.000.
- Thomson Hybrides et Microondes: See—
Derewonko, Henri; Adam, Didier; Delagebeaudeuf, Daniel; and Resneau, Patrick, 4,872,049, Cl. 357-68.000.
- Thornton, William E., Jr.; and Whitmore, Henry B., to United States of America, National Aeronautics and Space Administration. Apparatus for waste collection and storage. 4,870,709, Cl. 4-482.000.
- Thorogood, Robert M.; Bennett, Douglas L.; Allam, Rodney J.; Prentice, Alan L.; and Dawson, Bruce K., to Air Products and Chemicals, Inc. Air separation process using packed columns for oxygen and argon recovery. 4,871,382, Cl. 62-18.000.
- Thyssen Industrie AG: See—
Schaffer, Gottfried; and Schwindt, Gert, 4,870,906, Cl. 104-130.100.
- Tilse, Wilhelm, to Inovon GmbH & Co. KG. Metalle und Bauelemente. Optical fiber connector. 4,871,227, Cl. 350-96.210.
- Ting, Sai-Pei: See—
Fujii, Susumu; and Ting, Sai-Pei, 4,871,800, Cl. 525-68.000.
- Titoff, Juha S., to A. Ahlstrom Corporation. Filter bed clarifier. 4,871,459, Cl. 210-519.000.
- Toa Nenryo Kogyo K.K.: See—
Kohara, Tadanao; and Ueki, Satoshi, 4,871,704, Cl. 502-114.000.
Yoshimura, Narihiko; Tokashiki, Michihide; and Ishii, Tetsuo, 4,871,476, Cl. 252-565.000.
- tobita, Shigeru: See—
Hiramatsu, Tooru; and tobita, Shigeru, 4,870,918, Cl. 112-265.200.
- Tofanetti, Odoardo: See—
Tognella, Sergio; Tedeschi, Michele; Assereto, Roberto; Tofanetti, Odoardo; and Cavalletti, Ennio, 4,871,528, Cl. 424-10.000.
- Toft, Mark A.: See—
Brazdil, James F., Jr.; Glaeser, Linda C.; and Toft, Mark A., 4,871,706, Cl. 502-209.000.
- Tognella, Sergio; Tedeschi, Michele; Assereto, Roberto; Tofanetti, Odoardo; and Cavalletti, Ennio, to Boehringer Biochemia Robin SpA. Pharmaceutical compositions having antineoplastic activity. 4,871,528, Cl. 424-10.000.
- Tojo, Yoshikazu: See—
Kanbara, Kouji; Kikuchi, Kenichi; Shimizu, Yoshihito; Hattori, Shinichiro; Tojo, Yoshikazu; Hasegawa, Akira; Yamaguchi, Tatsuya; Tsukaya, Takashi; Kobayashi, Kazunari; Murata, Masanao; Yamamoto, Tsutomu; and Nakamura, Takeaki, 4,870,950, Cl. 128-6.000.
- Tokai Rubber Industries, Ltd.: See—
Kanda, Ryouji, 4,871,151, Cl. 267-140.100.
- Tokashiki, Michihide: See—
Yoshimura, Narihiko; Tokashiki, Michihide; and Ishii, Tetsuo, 4,871,476, Cl. 252-565.000.
- Toker, Nazmi; and Price, Leroy R., to Allegheny Ludlum Corporation. Separating-agent composition and method using same. 4,871,402, Cl. 148-113.000.
- Tokico Ltd.: See—
Takayama, Toshio, 4,871,215, Cl. 303-100.000.
- Tokitoh, Yasuo: See—
Omatsu, Toshihiro; Tokitoh, Yasuo; and Yoshimura, Noriaki, 4,871,880, Cl. 568-454.000.
- Toko, Inc.: See—
Ishikawa, Hiroichi; and Nagasawa, Yasuo, 4,871,958, Cl. 320-32.000.
- Tokyo Electric Co., Ltd.: See—
Uchiyama, Masahiro, 4,872,061, Cl. 358-400.000.
- Tokyo Juki Industrial Co., Ltd.: See—
Hiramatsu, Tooru; and tobita, Shigeru, 4,870,918, Cl. 112-265.200.
- Tokyo Shibaura Denki Kabushiki Kaisha: See—
Baba, Isao; Kondo, Takeo; Yanagisawa, Eiichi; and Kohguchi, Kenji, 4,872,045, Cl. 357-13.000.
- Tolman, Richard L.: See—
Baldwin, John J.; Tolman, Richard L.; and Wu, Mu T., 4,871,739, Cl. 514-254.000.
- Tolner, Harm: See—
Van Gorkom, Gerardus G. P.; Hoebrechts, Arthur M. E.; Van Der Mast, Karel D.; and Tolner, Harm, 4,871,911, Cl. 250-310.000.
- Tom, Edward: See—
Gastgeb, Raymond F.; and Tom, Edward, 4,870,868, Cl. 73-649.000.
- Tomalia, Donald A.: See—
Killat, George R.; and Tomalia, Donald A., 4,871,779, Cl. 521-28.000.
- Tomioka, Mikio: See—
Maezawa, Hiruyuki; Katumata, Hidetosi; and Tomioka, Mikio, 4,872,167, Cl. 371-19.000.
- Tomlinson, Martin G., to Mound Steel Corporation. Support base system for architectural panels. 4,870,793, Cl. 52-241.000.
- Tomohisa, Kunio: See—
Isono, Koichi; Tomohisa, Kunio; Oka, Junichi; and Sakamoto, Takashi, 4,872,065, Cl. 358-494.000.
- Tomosada, Masahiro: See—
Miyake, Hiroyuki; Sagara, Seiji; Yonemori, Takaji; Watanabe, Tsuyoshi; Takahashi, Masayoshi; Suzuki, Koji; Komiya, Yutaka; Tomosada, Masahiro; Adachi, Hideki; Hirose, Masayuki; and Miyata, Masanori, 4,872,035, Cl. 355-208.000.
- Tome, Karl: See—
Bunz, Rosa; Dzionara, Christine; and Tome, Karl, 4,871,101, Cl. 224-153.000.
- Tomsova, Zdenka: See—
Coupek, Jiri; Voza, Stanislav; Strejc, Borivoj; and Tomsova, Zdenka, 4,871,675, Cl. 435-288.000.
- Toncelli, Marcello. Process for the preparation of an iron armature for use with slabs or reinforced articles from an agglomerate of siliceous sand, marble, granite or, in general, stone. 4,871,586, Cl. 427-204.000.
- Tong, Sun D.: See—
Hsu, Li-Chien; and Tong, Sun D., 4,871,357, Cl. 604-266.000.
- Topping, Irene M. Picture support. 4,870,766, Cl. 40-154.000.
- Tordoff, Michael G.: See—
DiNovi, Michael J.; Rafka, Robert J.; Friedman, Mark L.; and Tordoff, Michael G., 4,871,776, Cl. 514-738.000.
- Torney, Allan A.: See—
Farnum, Colin E.; Torney, Allan A.; and McKeown, Bruce P., 4,871,566, Cl. 426-632.000.
- Torres, Ghislaine: See—
Cyprien, Guy; Fisch, Alain; Haggiage, Johnny; Porte, Hugues; Prazuck, Thierry; and Torres, Ghislaine, 4,871,547, Cl. 424-81.000.
- Torres, Joaquim; Madar, Roland; Bernard, Claude; and Million-Brodaz, Jean-Francois, to Etat Francais Centre National de la Recherche Scientifique. Selective deposition process of a refractory metal silicide onto silicon areas. 4,871,691, Cl. 437-200.000.
- Toshiba Kikai Kabushiki Kaisha: See—
Nakamura, Hiromi, 4,871,624, Cl. 428-611.000.
- Toshiba Silicone Co., Ltd.: See—
Kimura, Hiroshi; and Takagi, Akira, 4,871,616, Cl. 428-407.000.
- Toth, Louis: See—
McCune, Robert C., Jr.; Toth, Louis; and Bailey, Robert S., 4,871,651, Cl. 430-315.000.
- Totsuka, Mitsuhiro: See—
Ikeda, Tomohiro; Hatagishi, Yuji; Totsuka, Mitsuhiro; and Kudoh, Toshiharu, 4,871,990, Cl. 337-238.000.

Toyama Chemical Co., Ltd.: See—
Hirai, Shiro; Hirano, Hiroshi; Arai, Hiroshi; Shibata, Hisanari; Kusayanagi, Yoshikazu; and Hashiba, Kazuhiko, 4,871,765, Cl. 514-471.000.

Toyama, Masamichi: See—
Ueda, Kouichi; Fujiwara, Akihiro; Suda, Hirofumi; Toyama, Masamichi; and Yamada, Kunihiko, 4,871,906, Cl. 250-201.000.

Toyo Boseki Kabushiki Kaisha: See—
Kobayashi, Shigeo; and Nishida, Takashi, 4,871,799, Cl. 525-64.000.

Toyo Soda Manufacturing Co., Ltd.: See—
Nakagawa, Tatsushi; Narui, Mamoru; and Sakanaka, Yasuhiro, 4,871,815, Cl. 525-344.000.

Toyoda Gosei Co., Ltd.: See—
Noda, Kazuaki; and Kanai, Makoto, 4,871,991, Cl. 340-384.00E.

Toyoda, Hiroshi; Shimizu, Shigemi; Hatakeyama, Hideharu; Kumagai, Shuzo; and Takahashi, Hareo; to Sanden Corporation. Wobble plate type compressor with a drive shaft attached to a cam rotor at an inclination angle, 4,870,894, Cl. 92-71.000.

Toyota Jidosha Kabushiki Kaisha: See—
Itoh, Hiroshi; and Takada, Mitsuru, 4,872,115, Cl. 364-424.100.

Morisawa, Kunio, 4,871,344, Cl. 474-206.000.

Shibata, Norio; Mizuno, Hideaki; Satoya, Kouichi; Uchitani, Nobuki; Kamohara, Tatsuyoshi; Harada, Kenichi; Yoshioka, Mamoru; Kato, Takashi; and Ohnaka, Hidemi, 4,870,942, Cl. 123-571.000.

Toyot, Francois: See—
Bravet, Jean-Louis; Toyot, Francois; Leyens, Gerd; Pikhardt, Siegfried; and Bayer, Herbert, 4,871,579, Cl. 427-31.000.

Tozuka, Zenzaburo: See—
Takaya, Takao; Tozuka, Zenzaburo; Yasuda, Nobuyoshi; and Kawabata, Kohji, 4,871,730, Cl. 514-206.000.

Traber, Jorg: See—
Opitz, Klaus; Weischer, Maria-Luise; and Traber, Jorg, 4,871,738, Cl. 514-252.000.

Tracy, Richard J. Shoe construction and closure components thereof, 4,870,761, Cl. 36-51.000.

Tran, Loi H., to Controlled Release Technologies, Inc. Self-regulated therapeutic agent delivery system and method, 4,871,352, Cl. 514-211.000.

Traub, Zeno P., to Eaton Leonard Technologies, Inc. Method for tube bending with controlled clamp die arrangement, 4,870,849, Cl. 72-149.000.

Tregear, Geoffrey W.: See—
Hudson, Peter J.; Shine, John; Niall, Hugh D.; and Tregear, Geoffrey W., 4,871,670, Cl. 435-172.300.

Treher, Elizabeth N.: See—
Francesconi, Lynn C.; and Treher, Elizabeth N., 4,871,836, Cl. 534-10.000.

Trell, Anders E. Method for transmission of alarm signals utilizing an entrance telephone system, 4,872,194, Cl. 379-40.000.

Treon Corporation: See—
Harris, Troy L., 4,871,337, Cl. 441-74.000.

Treslar, Marie C.; Kite, Joseph S., III; Piotrowski, Michael J.; and Conaghan, Thomas B., to Bentley-Harris Manufacturing Company, The. Braided sleeve, 4,870,887, Cl. 87-9.000.

Treybig, Duane S.; and Martinez, Robert G., to Dow Chemical Company, The. Compositions prepared from hydrocarbyl substituted nitrogen-containing aromatic heterocyclic compounds, an aldehyde and/or ketone and an amine, 4,871,848, Cl. 544-224.000.

Trion Industries Inc.: See—
Thalenfeld, David R., 4,871,135, Cl. 248-221.400.

Tropenwerke GmbH & Co. KG: See—
Beckermann, Bernhard; Dell, Hans-Dieter; Horstmann, Harald; and Kraus, Reinhold, 4,871,767, Cl. 514-536.000.

Opitz, Klaus; Weischer, Maria-Luise; and Traber, Jorg, 4,871,738, Cl. 514-252.000.

Troutman, Charles E. Apparatus for containing a pet in a vehicle trunk, 4,870,925, Cl. 119-15.000.

True, Donald C.: See—
Simon, James R.; True, Donald C.; and Lafond, Jacques, 4,870,902, Cl. 102-201.000.

Trutzschler GmbH & Co. KG: See—
Hosel, Fritz, 4,870,854, Cl. 73-1.00H.

TRW Vehicle Safety Systems Inc.: See—
Willey, Ronald A., 4,871,190, Cl. 280-801.000.

Tseng, D. H. Cycle exerciser, 4,871,164, Cl. 272-73.000.

Tsuda, Shigenori; Manabe, Yukio; and Tsuji, Kozo, to Sumitomo Chemical Company, Limited. Oil-in-water pesticidal emulsion, 4,871,766, Cl. 514-521.000.

Tsuge, Shoichi, to Minolta Camera Kabushiki Kaisha. Method for producing an original for use in an overhead projector, 4,871,640, Cl. 430-126.000.

Tsuji, Kozo: See—
Tsuda, Shigenori; Manabe, Yukio; and Tsuji, Kozo, 4,871,766, Cl. 514-521.000.

Tsuji, Masahiro: See—
Mori, Kenji; and Tsuji, Masahiro, 4,871,869, Cl. 556-436.000.

Tsujimoto, Masaharu: See—
Asahina, Takashi; Akiyoshi, Mitsuo; Mitsumoto, Yoshio; Kodama, Satoru; and Tsujimoto, Masaharu, 4,870,896, Cl. 99-348.000.

Tsujita, Satoshi; Maeda, Koji; and Eguchi, Yasuteru, to Kao Corporation. Granular composition and dentifrice containing the same, 4,871,396, Cl. 106-286.800.

Tsukada, Hiroaki: See—
Yamamoto, Yasuaki; Tsukada, Hiroaki; Sorimachi, Masami; and Hori, Akihiro, 4,871,787, Cl. 523-122.000.

Tsukaya, Takashi: See—
Kanbara, Kouji; Kikuchi, Kenichi; Shimizu, Yoshihito; Hattori, Shinichiro; Tojo, Yoshikazu; Hasegawa, Akira; Yamaguchi, Tatsuya; Tsukaya, Takashi; Kobayashi, Kazunari; Murata, Masanao; Yamamoto, Tsutomu; and Nakamura, Takeaki, 4,870,950, Cl. 128-6.000.

Tsukiyama, Tokuhiko; Yashiki, Hiroshi; and Hirose, Osamu, to Hitachi, Ltd.; and Hitachi Computer Peripherals Co. Method and apparatus for data compression and restoration, 4,872,009, Cl. 341-95.000.

Tsunamoto, Kanichi; and Inoue, Seiji, to Sanshin Kogyo Kabushiki Kaisha. Warning system for watercraft, 4,871,996, Cl. 340-521.000.

Tsunekawa, Yuzo; Tsuruta, Hikaru; and Sato, Takehiko, to Fuji Photo Film Co., Ltd. Ion activity measuring device, 4,871,441, Cl. 204-409.000.

Tsunoda, Toshiyuki: See—
Ishikawa, Tomonori; Fukaya, Takashi; Tsunoda, Toshiyuki; and Fujiwara, Hiroshi, 4,871,245, Cl. 350-502.000.

Tsuruta, Hikaru: See—
Tsunekawa, Yuzo; Tsuruta, Hikaru; and Sato, Takehiko, 4,871,441, Cl. 204-409.000.

Tsuyoshi, Toshiaki; Ohtake, Masatoshi; Takasugi, Wasao; and Yonezawa, Seiji, to Hitachi, Ltd. Light spot position control system and method by sampled servo, 4,872,152, Cl. 369-44.000.

Tsuyumoto, Michio: See—
Karakane, Hiroki; Maeda, Yasushi; and Tsuyumoto, Michio, 4,871,461, Cl. 210-638.000.

Tsuzurahara, Mamoru, to Hitachi, Ltd. Through-type capacitor with improved anti-tracking performance, 4,872,085, Cl. 361-302.000.

TUI Industries: See—
Sulzberger, Kevin J., 4,870,734, Cl. 29-157.30R.

Sulzberger, Kevin J., 4,871,014, Cl. 165-76.000.

Tumlinson, James H., III: See—
Chuman, Tatsuji; Guss, Paul L., deceased; Doolittle, Robert E.; McLaughlin, John R.; and Tumlinson, James H., III, 4,871,537, Cl. 424-84.000.

Turner, Kenneth R. Disposable stethoscope head shield, 4,871,046, Cl. 181-131.000.

Turner, Michael T. Router fixture, 4,871,002, Cl. 144-144.00R.

Tuso, Michael J.: See—
Cieri, Joseph J.; Kocher, Mark J.; Garcis, Ronald E.; Holet, Kenneth M.; and Tuso, Michael J., 4,872,136, Cl. 364-900.000.

Tutt, Timothy T.; Westmeyer, Mark; and Khutoryansky, to Interand Corporation. System for selective scaling of digital video images, 4,872,064, Cl. 358-464.000.

Twerdochlib, Michael, to Westinghouse Electric Corp. Flowmeter controller for an air leakage monitoring system, 4,870,859, Cl. 73-203.000.

Ube Industries, Ltd.: See—
Dannoura, Sedayuki, 4,871,010, Cl. 164-253.000.

Ubel, F. Andrew, III: See—
Aasen, Steven M.; Oxman, Joel D.; and Ubel, F. Andrew, III, 4,871,786, Cl. 523-113.000.

Uchida, Kenji: See—
Aoki, Takayoshi; Nagatsuka, Ikutaro; Takeda, Masayuki; Honjo, Toshio; Itoh, Kazuhiro; and Uchida, Kenji, 4,871,639, Cl. 430-108.000.

Uchida, Kihachiro: See—
Kondo, Hiroyuki; Harada, Tadaaki; and Uchida, Kihachiro, 4,871,331, Cl. 439-736.000.

Uchida, Shin-ichi; Deguchi, Kozi; and Sasaki, Masamitsu, to Nippon Shokubai Kagaku Kogyo Co., Ltd. Reactivating Mo-Bi-Fe catalyst used in production of unsaturated aldehydes, 4,871,700, Cl. 502-51.000.

Uchida, Takashi: See—
Fujiwara, Mitsuo; Uchida, Takashi; and Kimura, Toshihiko, 4,871,655, Cl. 430-519.000.

Uchitani, Nobuki: See—
Shibata, Norio; Mizuno, Hideaki; Satoya, Kouichi; Uchitani, Nobuki; Kamohara, Tatsuyoshi; Harada, Kenichi; Yoshioka, Mamoru; Kato, Takashi; and Ohnaka, Hidemi, 4,870,942, Cl. 123-571.000.

Uchiyama, Masahiro, to Tokyo Electric Co., Ltd. Facsimile, 4,872,061, Cl. 358-400.000.

Ueda, Kouichi; Fujiwara, Akihiro; Suda, Hirofumi; Toyama, Masamichi; and Yamada, Kunihiko, to Canon Kabushiki Kaisha. Focus detecting device using correlation, 4,871,906, Cl. 250-201.000.

Ueda, Satoshi: See—
Ueda, Yoshio; Hata, Takehisa; Yamaguchi, Hisami; Ueda, Satoshi; and Kodani, Masateru, 4,871,549, Cl. 424-494.000.

Ueda, Shinobu: See—
Watanabe, Miyoichi; and Ueda, Shinobu, 4,871,976, Cl. 330-69.000.

Ueda, Takamasa: See—
Takata, Masakazu; Ueda, Takamasa; Ito, Kimiyuki; Hirashima, Suneaki; Yamamoto, Souichi; Ishino, Yoshio; and Ohno, Toshinobu, 4,871,633, Cl. 430-52.000.

Ueda, Yoshio; Hata, Takehisa; Yamaguchi, Hisami; Ueda, Satoshi; and Kodani, Masateru, to Fujisawa Pharmaceutical Co., Ltd. Time-controlled explosion systems and processes for preparing the same, 4,871,549, Cl. 424-494.000.

Uehara, Tsukasa; Maeda, Masaya; and Nishimura, Akimasa, to Canon Kabushiki Kaisha. Recording and/or reproducing apparatus, 4,872,076, Cl. 360-99.070.

Ueki, Satoshi: See—
Kohara, Tadanao; and Ueki, Satoshi, 4,871,704, Cl. 502-114.000.

Uenishi, Kazuya; Kokubo, Tadayoshi; and Kawabe, Yasumasa, to Fuji Photo Film Co., Ltd. Positive-working photoresist composition, 4,871,645, Cl. 430-192.000.

Ueno, Satoshi, to Omron Tateisi Electronics Co.; and Isao KAI. Electronic blood pressure meter having means for detecting artifacts, 4,870,973, Cl. 128-680.000.

Ueno, Toru; Fukuoka, Youichi; Baba, Seiichi; Miyoshi, Kaoru; and Kinoshita, Kazuto, to Hitachi, Ltd. Method and apparatus for measuring the size of wire rod with laser beam and reference rod, 4,871,910, Cl. 250-560.000.

Uhde GmbH: See—
Gerlach, Wolfgang; and Malczok, Reimund, 4,871,278, Cl. 403-338.000.

Ukai, Noriyuki: See—
Hayakawa, Issei; and Ukai, Noriyuki, 4,871,697, Cl. 501-97.000.

Ulrich, Werner: See—
Hemmady, Jayant G.; Lidinsky, William P.; Steele, Scott B.; Ulrich, Werner; and Weddige, Ronald C., 4,872,160, Cl. 370-60.000.

Ultra Light Arms, Inc.: See—
Forbes, Melvin D.; and Malone, William F., Jr., 4,870,770, Cl. 42-70.010.

Umez, Yoshinori: See—
Fujimoto, Masami; Inazumi, Tadahiyo; Satoh, Katsuhiko; Shimozawa, Eiichi; Awa, Yasuhiko; Sato, Fumihiro; Nozaki, Kenro; Gushima, Akira; Suemura, Yosinobu; Kusakabe, Nobuo; Imada, Kunihiko; Arichi, Masatoshi; Tanaka, Mitsunori; Umez, Yoshinori; and Ikeda, Tsuneo, 4,871,393, Cl. 75-5.000.

Unger, Klaus: See—
Danner, Alfred; Mueller, Ulaich; Unger, Klaus; and Hoelderich, Wolfgang, 4,871,701, Cl. 502-62.000.

Union Carbide Corporation: See—
Cherne, Lawrence; W.; and Lytle, Kevin A., 4,871,898, Cl. 219-137.00R.

Union Oil Company of California: See—
Koepe, Jeffery W.; and Abdo, Suheil F., 4,871,445, Cl. 208-89.000.

Uniroyal Engelbert Reifen GmbH: See—
Potente, Eugen; and Scheller, Herbert, 4,871,598, Cl. 428-36.100.

United States of America
Agriculture: See—
Chuman, Tatsuji; Guss, Paul L., deceased; Doolittle, Robert E.; McLaughlin, John R.; and Tumlinson, James H., III, 4,871,537, Cl. 424-84.000.

St. Angelo, Allen J.; and Vercellotti, John R., 4,871,556, Cl. 426-92.000.

Vigo, Tyrone L.; and Frost, Cynthia M., 4,871,615, Cl. 428-398.000.

Yatsu, Lawrence Y.; Calamari, Timothy A., Jr.; and Benenito, Ruth R., 4,871,370, Cl. 8-116.100.

Air Force: See—
Kiel, Johnathan L., 4,871,770, Cl. 514-567.000.

Kolesar, Edward S., Jr., 4,871,427, Cl. 204-1.00T.

Oberth, Adolf E.; and Rothenstein, Julius, 4,871,854, Cl. 546-7.000.

Peterson, Phillip R.; and Geary, Joseph M., 4,872,135, Cl. 364-822.000.

Reinhardt, Bruce A.; and Unroe, Marilyn R., 4,871,712, Cl. 562-473.000.

Army: See—
Ballato, Arthur, 4,871,986, Cl. 331-158.000.

Energy: See—
Shue, Chyng-Yann; Wolf, Alfred P.; Bai, Lan-Qin; and Teng, Ren-Tui, 4,871,527, Cl. 424-1.100.

National Aeronautics and Space Administration: See—
Thornton, William E., Jr.; and Whitmore, Henry B., 4,870,709, Cl. 4-482.000.

Navy: See—
Chen, Ming H., 4,872,211, Cl. 343-778.000.

U.S. Philips Corp.: See—
Bachmann, Peter K.; Hagemann, Hans-Jurgen E.; Warner, Jacques P. M.; and Wilson, Howard J. C., 4,871,383, Cl. 65-3.120.

Blanken, Pieter G., 4,872,209, Cl. 330-294.000.

Burgmans, Adrianus L. J.; and Van Ijzendoorn, Petrus R., 4,871,942, Cl. 313-493.000.

Bussonniere, Andre; and Courtois, Yves, 4,872,108, Cl. 364-200.000.

Elff, Manfred; Pfeiffer, Wilfried G.; Schwieker, Horst-Hartwig; and Christiansen, Dieter H. C., 4,872,193, Cl. 378-196.000.

Eschard, Gilbert, 4,871,943, Cl. 313-526.000.

Kersten, Reinhard; Kuhlmoegen, Karl J.; and Kuhl, Egbert, 4,871,961, Cl. 323-267.000.

Monnier, Michel J., 4,871,583, Cl. 427-96.000.

Pelgrom, Marcellinus J. M.; and Duinmaier, Adrianus C. J., 4,872,011, Cl. 341-150.000.

Roos, Jan, 4,871,228, Cl. 350-96.250.

Sempel, Adrianus, 4,871,985, Cl. 331-111.000.

Steenbergen, Christiaan; and Gravesteijn, Dirk J., 4,872,156, Cl. 369-275.000.

Steers, Michel; Hazan, Jean-Pierre; and Delmas, Gilles, 4,871,891, Cl. 219-10.55B.

Teuling, Dirk J.; and Hulshof, Jozef J. M., 4,872,055, Cl. 358-148.000.

Teuling, Dirk J. A., 4,871,951, Cl. 315-408.000.

Van Der Meer, Johannes A., 4,871,329, Cl. 439-594.000.

Van Gorkom, Gerardus G. P.; Hoeberechts, Arthur M. E.; Van Der Mast, Karel D.; and Tolner, Harm, 4,871,911, Cl. 250-310.000.

United States Pipe and Foundry Company: See—
Coddling, Charles N., III; Rhodes, George F.; and McGrath, Philip I., Jr., 4,871,197, Cl. 285-231.000.

U.S. Protectors, Inc.: See—
Dunning, Brian; and Mansfield, A. R., 4,872,084, Cl. 361-232.000.

United Technologies: See—
Foley, John P.; Millas, Gary P.; and Elliott, Daniel L., 4,871,015, Cl. 165-76.000.

McFarlin, David J.; Caruolo, Antonio B.; Minford, Eric; and Prewer, Karl M., 4,870,827, Cl. 62-6.000.

United Technologies Corporation: See—
Courtney, Daniel P.; and Bailey, Timothy J., 4,871,226, Cl. 350-96.170.

Suliga, William G., 4,870,818, Cl. 60-740.000.

Unitex Corporation: See—
DuFrenne, Gerald, 4,871,899, Cl. 219-233.000.

University of California, The Regents of the: See—
Beni, Gerardo; Mar, Alan; and Landry, C. John, 4,871,252, Cl. 356-347.000.

University of Florida: See—
Longo, William E.; McCluskey, Richard A.; and Goldberg, Eugene P., 4,871,716, Cl. 514-2.000.

University of Illinois: See—
Morkoc, Hadis; and Fischer, Russ, 4,872,046, Cl. 357-60.000.

University of Minnesota, Regents of the: See—
Tatini, Sita R., 4,871,563, Cl. 426-334.000.

University of Pennsylvania: See—
Altschuler, Martin D.; and Whittington, Richard, 4,872,122, Cl. 364-554.000.

University of Pittsburgh of the Commonwealth System of Higher Education: See—
Smentkowski, Vincent S.; Hagans, Patrick L.; and Yates, John T., Jr., 4,871,526, Cl. 423-659.000.

University of Vermont and State Agricultural College: See—
Farrell, Nicholas; Hacker, Miles P.; McCormack, John J.; and DeAlmeida, Sergio G., 4,871,729, Cl. 514-188.000.

Unno, Ryoichi: See—
Kuroko, Masayasu; Unno, Ryoichi; Kimura, Hiromoto; Oka, Mitsuru; Hasegawa, Keiko; Ikeda, Shinichi; Kuboyama, Noboru; Ito, Takashi; Sawai, Kiichi; and Ito, Shunshuke, 4,871,740, Cl. 514-255.000.

Unroe, Marilyn R.: See—
Reinhardt, Bruce A.; and Unroe, Marilyn R., 4,871,712, Cl. 562-473.000.

Uramoto, Iwami: See—
Liudzius, Valerie A.; Weisner, Ralph M.; Kamiharaka, Takashi; and Uramoto, Iwami, 4,872,052, Cl. 358-106.000.

Usher, Peter P.; Gavalet, Eugene J.; and Slonksnes, John, to Metex Corporation. Reinforced squeak free seal for exhaust couplings, 4,871,181, Cl. 277-229.000.

Ushirogouchi, Toru: See—
Hayase, Shizu; Horiguchi, Rumiko; Onishi, Yasunobu; and Ushirogouchi, Toru, 4,871,646, Cl. 430-192.000.

Vago, Pal: See—
Sebestyen, Gyula; Simonyi, Istvan; Miholics, Gizelle; Kovacs, Marta; Gorgenyi, Frigyes; Fekete, Marton; Vago, Pal; Sera, Istvan; Egri, Janos; and Szeli, Maria, 4,871,728, Cl. 514-187.000.

Valenti, Dante, to In-Pak S.p.A. Perfected case for packaging products of different kinds in cases, 4,871,067, Cl. 206-427.000.

Valeo Vision: See—
Montet, Maurice, 4,872,096, Cl. 362-226.000.

Valiant, Mary E.: See—
Gadebusch, Hans H.; and Valiant, Mary E., 4,871,741, Cl. 514-255.000.

Van Breemen, Charles A. Truck cab suspension system, 4,871,189, Cl. 280-711.000.

van den Nieuwelaar, Harry C.: See—
Kies, Anton M.; van den Nieuwelaar, Harry C.; and Bowmer, Geoff M., 4,870,848, Cl. 72-89.000.

Van der Eb, Alex J.: See—
Bos, Johannes L.; and Van der Eb, Alex J., 4,871,838, Cl. 536-27.000.

Van Der Mast, Karel D.: See—
Van Gorkom, Gerardus G. P.; Hoeberechts, Arthur M. E.; Van Der Mast, Karel D.; and Tolner, Harm, 4,871,911, Cl. 250-310.000.

Van Der Meer, Johannes A., to U.S. Philips Corporation. Snap-lock connection, 4,871,329, Cl. 439-594.000.

Van de Sande, Christian C.: See—
Vanmaele, Luc J.; and Van de Sande, Christian C., 4,871,654, Cl. 430-512.000.

Vanetta, Aldo; Burkhardt, Helmut; and Weinert, Herbert, to Audi AG. Apparatus for controlling engine speed, 4,870,934, Cl. 123-336.000.

Van Gorkom, Gerardus G. P.; Hoeberechts, Arthur M. E.; Van Der Mast, Karel D.; and Tolner, Harm, to U.S. Philips Corporation. Electron beam apparatus comprising a semiconductor electron emitter, 4,871,911, Cl. 250-310.000.

Van Heuvelen, Jan H.: See—
Wallbillich, Guenter; and Van Heuvelen, Jan H., 4,871,650, Cl. 430-300.000.

Van Ijzendoorn, Petrus R.: See—
Burgmans, Adrianus L. J.; and Van Ijzendoorn, Petrus R., 4,871,942, Cl. 313-493.000.

Van Lumig, Lambert: See—
Duyzings, Wilhelmus G.; and Van Lumig, Lambert, 4,871,802, Cl. 525-84.000.

Vanmaele, Luc J.; and Van de Sande, Christian C., to Agfa-Gevaert, N.V. Photographic element incorporating redox compounds for use in a dye diffusion transfer process. 4,871,654, Cl. 430-512.000.

Van Oord, Jan J.J., to Breda Packaging B.V. Packaging device with improved supply station. 4,870,809, Cl. 53-531.000.

Vardimon, Alexander D. Functional orthopedic magnetic appliances (fomas). 4,871,310, Cl. 433-19.000.

Varga, Janos: See—
Magyar, Karoly; Varga, Janos; Simon, Ferenc; Szauder nee Lauko, Hedvig; Fekete, Pal; Romvary, Attila; Egri, Janos; and Zukovics nee Someg, Katalin, 4,871,722, Cl. 514-157.000.

Varshavsky, Valery L.: See—
Nurmamedov, Narzy N.; Gonchar, Valery I.; Bazarov, Babamurad A.; Nurmukhamedov, Arslan; Skryninkova, Irina V.; Mustaev, Ilyas A.; and Varshavsky, Valery L., 4,871,362, Cl. 623-6.000.

Vasvavi, Lelle: See—
Hermecz, Istvan; Kereszturi, Geza; Vasvavi, Lelle; Horvath, Agnes; Balogh, Maria; Kovacs, Gabor; Szuts, Tamas; Ritli, Peter; Sipos, Judit; and Pajor, Aniko, 4,871,849, Cl. 544-229.000.

Vaughan, John E.; Smale, David R.; Patry, Bernard; and Heaton, John C., to Schlumberger Industries Limited. Electronic key and receptacle therefor. 4,871,886, Cl. 200-43.050.

VectorVision Corporation: See—
Mozayeny, Bahram, 4,872,105, Cl. 364-167.010.

Veith, Gunter: See—
Hugo, Schilling; and Veith, Gunter, 4,871,124, Cl. 242-56.00R.

Velcro Industries B.V.: See—
Dubowik, John M., 4,870,725, Cl. 24-442.000.

Venkat, Chaya: See—
Chen, Nai Y.; Huh, Billy K.; Ketkar, Anil B.; and Venkat, Chaya, 4,871,444, Cl. 208-46.000.

Vera, Jean C., to ECIA - Equipments Et Composants Pour L'Industrie Automobile. Falciform blade for a propeller and its application in particular in motorized fans for automobiles. 4,871,298, Cl. 416-189.000.

Verbrugge, Calvin J.: See—
Billman, Fred L.; Shih, Lih-Bin; and Verbrugge, Calvin J., 4,871,823, Cl. 526-272.000.

Vercellotti, John R.: See—
St. Angelo, Allen J.; and Vercellotti, John R., 4,871,556, Cl. 426-92.000.

Vesuvius Crucible Company: See—
Fishler, Mark K.; and Hoggard, Dale B., 4,871,698, Cl. 501-97.000.

Vetco Gray Inc.: See—
Jennings, Charles E., 4,871,282, Cl. 405-224.000.

Vianova Kunstharz, A.G.: See—
Staritzbichler, Werner; Dworak, Gert; and Daimer, Wolfgang, 4,871,807, Cl. 525-113.000.

Video Graphic Styling, Inc.: See—
Hicks, T. Lawrence; Givens, Guy M.; Brinton, Robert J.; and Grundhauser, Donald J., 4,872,056, Cl. 358-183.000.

Viehweg, Holger, to Henkel Kommanditgesellschaft auf Aktien. Process for the preparation of exocellular biopolymers. 4,871,665, Cl. 435-104.000.

View Engineering, Inc.: See—
Liudzius, Valerie A.; Weisner, Ralph M.; Kamiharako, Takashi; and Uramoto, Iwami, 4,872,052, Cl. 358-106.000.

Vigo, Tyrone L.; and Frost, Cynthia M., to United States of America, Agriculture. Temperature-adaptable textile fibers and method of preparing same. 4,871,615, Cl. 428-398.000.

Vilhardt, Hans, to Ferring Service Center, N.V. Method and apparatus useful for delivering medicinal compositions into the bladder and urinary tract. 4,871,542, Cl. 424-423.000.

VLSI Technology, Inc.: See—
Kingsley, Christopher, 4,872,103, Cl. 364-153.000.

Vogel, Hans-Henning: See—
Martischius, Franz-Dieter; Oppenlaender, Knut; and Vogel, Hans-Henning, 4,871,375, Cl. 44-71.000.

Vogel, Tikva: See—
Aviv, Haim; Gorecki, Marian; Levanon, Avigdor; Oppenheim, Amos; Vogel, Tikva; Zeelon, Pinhas E.; and Zeevi, Menachem, 4,871,835, Cl. 530-399.000.

Vogt, Michael: See—
Adam, Peter; Nebelung, Adolf; and Vogt, Michael, 4,871,578, Cl. 427-2.000.

Volante, Ralph P.: See—
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Tanaka, Taro; and Tanaka, Joji, 4,871,128, Cl. 242-201.000.

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Richter, Allen R., 4,870,798, Cl. 52-528.000.

Walden, Robert H.: See—
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Brown, Nigel L.; and Walsby, Anthony E., 4,871,664, Cl. 435-91.000.

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Miyake, Hiroyuki; Sagara, Seiji; Yonemori, Takaji; Watanabe, Tsuyoshi; Takahashi, Masayoshi; Suzuki, Koji; Komiya, Yutaka; Tomosada, Masahiro; Adachi, Hideki; Hirose, Masayuki; and Miyata, Masanori, 4,872,035, Cl. 355-208.000.

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Kasahara, Nobuo; Nakahara, Tosio; Watanuki, Masayosi; and Sawamura, Tadahide, 4,872,037, Cl. 355-271.000.

WaterTest Corporation: See—
Rosov, Eugene, 4,871,662, Cl. 435-30.000.

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Herpichboehm, Bernd G.; Sierra, George H.; Summers, Robert B.; and Watlington, Thomas M., 4,871,258, Cl. 356-422.000.

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Weber, Erich. Process of coating and drying both sides of printed circuit boards. 4,871,584, Cl. 427-96.000.

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Reiffenrath, Volker; Krause, Joachim; Geelhaar, Thomas; Eidenschink, Rudolf; Kurmeier, Hans-Adolf; Poetsch, Eike; Scheuble, Bernhard; and Weber, Georg, 4,871,469, Cl. 252-299.610.

Wachtler, Andreas; Krause, Joachim; Eidenschink, Rudolf; and Weber, Georg, 4,871,470, Cl. 252-299.630.

Weber S.r.l.: See—
Filippi, Renato; and Ricco, Mario, 4,870,940, Cl. 123-506.000.

Webster, Maynard A. Underwear with partitioning liner. 4,870,958, Cl. 128-159.000.

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Hemmady, Jayant G.; Lidinsky, William P.; Nichols, Robert K.; Richards, Gaylord W.; Roediger, Gary A.; Steele, Scott B.; Weddige, Ronald C.; and Zelle, Bruce R., 4,872,157, Cl. 370-60.000.

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Weers, Jerry J., to Petrolite Corporation. Fuel oils stabilized with imine-enamine condensates and method thereof. 4,871,374, Cl. 44-63.000.

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Link, Achim; and Weidinger, Reinhold, 4,871,050, Cl. 192-70.290.

Weidmann, Klaus: See—
Lang, Hans-Jochen; Rosner, Manfred; Weidmann, Klaus; Rippel, Robert; and Herling, Andreas W., 4,871,734, Cl. 514-212.000.

Weinert, Herbert: See—
Vanetta, Aldo; Burkhardt, Helmut; and Weinert, Herbert, 4,870,934, Cl. 123-336.000.

Weinrotter, Klaus: See—
Harms, Haio; Schobesberger, Manfred; Sollradl, Herbert; and Weinrotter, Klaus, 4,871,500, Cl. 264-178.00R.

Weins, Janine J. Device for maintaining the chill on a bottle of wine. 4,870,837, Cl. 62-457.400.

Weisburn, James T.: See—
Hehn, Bruce A.; Weisburn, James T.; Lewellen, Richard R.; and Geis, Mark W., 4,871,064, Cl. 206-387.000.

Weischer, Maria-Luise: See—
Opitz, Klaus; Weischer, Maria-Luise; and Traber, Jorg, 4,871,738, Cl. 514-252.000.

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Stein, Hans P.; Weise, Armin; and Will, Reinhold, 4,871,272, Cl. 400-583.000.

Weise, Carlos, to Wacker-Chemie GmbH. Polydiorganosiloxanes which can be cured to form elastomeric foams. 4,871,781, Cl. 521-88.000.

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Liudzius, Valerie A.; Weisner, Ralph M.; Kamiharako, Takashi; and Uramoto, Iwami, 4,872,052, Cl. 358-106.000.

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Felix, Michael C.; Taylor, Nicola S.; and Hardy, Colin C., 4,871,412, Cl. 156-273.900.

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Wells, Michael: See—
Neely, Eric; and Wells, Michael, 4,871,926, Cl. 307-272.300.

Werbach, Johannes, to Mannesmann AG. Method of printing modified characters by means of a matrix printer. 4,871,270, Cl. 400-121.000.

Wernicke & Co. GmbH: See—
Kotting, Fritz, 4,870,785, Cl. 51-217.00L.

Werther, Heinz-Ulrich: See—
Pieper, Hartwig; Michels, Reiner; and Werther, Heinz-Ulrich, 4,871,631, Cl. 430-14.000.

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Conn, Kirk O.; Finlay, William, Jr.; Sutyn, Carol S.; and Maietta, Michael G., 4,871,354, Cl. 604-89.000.

Westerfield, David A.: See—
Christensen, James M.; and Westerfield, David A., 4,871,367, Cl. 623-21.000.

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Shearer, Gerald; Lofgren, Karl M.; and Ouyang, Kenneth W., 4,871,979, Cl. 330-253.000.

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Tenthoff, Aloys, 4,871,349, Cl. 494-56.000.

Westhead, William T., to SCAPA, Inc. Low stretch papermaking fabric. 4,870,998, Cl. 139-383.00A.

Westinghouse Electric Corp.: See—
Boes, David J.; and Zottola, Gene, 4,871,297, Cl. 415-170.100.

Chang, Robert C. W.; Vorndran, Steven C.; and Joseph, Michael F., 4,870,911, Cl. 110-246.000.

Lee, Suh Y., 4,870,912, Cl. 110-246.000.

Silvestri, George J., Jr., 4,870,823, Cl. 60-652.000.

Twerdochlib, Michael, 4,870,859, Cl. 73-203.000.

Wolters, Richard H.; Thoeming, Gerald A.; and Jeffers, Robert E., 4,870,908, Cl. 108-60.000.

Young, William E.; and Carl, Dan E., 4,870,824, Cl. 60-723.000.

Westmeyer, Mark: See—
Tutt, Timothy T.; Westmeyer, Mark; and Khutoryansky, 4,872,064, Cl. 358-464.000.

Westwood Chemical Corporation: See—
Giovanniello, Rocco; and Howe, Stephen M., 4,871,525, Cl. 423-463.000.

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Yoon, Myongwhan; Whang, Seongtae; Chang, Insoon; and Han, Pilsoon, 4,871,518, Cl. 423-11.000.

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Wharton, Ronald: See—
Poythress, Cecil A.; and Wharton, Ronald, 4,871,055, Cl. 194-344.000.

Whetsel, Lee D., Jr., to Texas Instruments Incorporated. Hierarchical scan selection. 4,872,169, Cl. 371-22.300.

Whirlpool Corporation: See—
Hood, Richard D., Jr.; Clemishaw, John D.; and Blakeman, Jack E., 4,870,988, Cl. 137-343.000.

Whisco Component Engineering, Inc.: See—
White, Wayne, 4,872,017, Cl. 343-715.000.

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Jahr, Richard T., Jr.; and Holt, Marcus N., 4,870,735, Cl. 29-157.30C.

White, Wayne, to Whisco Component Engineering, Inc. Simplified mobile antenna base mounting structure. 4,872,017, Cl. 343-715.000.

Whitmer, Randal, to Paccar Inc. Clutch booster control valve system. 4,871,051, Cl. 192-85.00C.

Whitmore, Henry B.: See—
Thornton, William E., Jr.; and Whitmore, Henry B., 4,870,709, Cl. 4-482.000.

- Whittington, Richard: See—
Altschuler, Martin D.; and Whittington, Richard, 4,872,122, Cl. 364-554.000.
- Wichmann, Carol F.: See—
Burg, Richard W.; Dulaney, Eugene L.; Hensens, Otto D.; Liesch, Jerrold M.; Ondeyka, John G.; and Wichmann, Carol F., 4,871,727, Cl. 514-179.000.
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Ivan, Steve D., 4,870,871, Cl. 74-513.000.
- Wiertfeld, Alexander; and Heinze, Roland, to Siemens Aktiengesellschaft. System and method for controlling the stimulation frequency of heart pacemakers, 4,870,968, Cl. 128-419.0PG.
- Wieserman, Larry F.: See—
Matin, Edward S.; and Wieserman, Larry F., 4,871,711, Cl. 502-415.000.
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Norton, John P.; Schneider, Steven; Wilder, William D.; and Hussell, Stephen J., 4,871,308, Cl. 432-29.000.
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Lake, Ralph J., Jr.; Wiley, Franklin L.; Coby, A. Daniel; and Pluth, John, Jr., 4,872,023, Cl. 346-1.100.
- Will, Reinhold: See—
Stein, Hans P.; Weise, Armin; and Will, Reinhold, 4,871,272, Cl. 400-583.000.
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- Williams, Clark R.; and Jiang, Ching-Lin, to Dallas Semiconductor Corporation. Low-voltage oscillator with separate startup mode, 4,871,982, Cl. 331-75.000.
- Williams, Fred E., Jr.: See—
Ryder, Francis E.; and Williams, Fred E., Jr., 4,871,200, Cl. 289-17.000.
- Williams International Corporation: See—
Chapman, William I., 4,870,825, Cl. 60-745.000.
- Williams, Phillip H.: See—
Bergami, Bridgette A.; and Williams, Phillip H., 4,871,689, Cl. 437-67.000.
- Williams, Roger M., to California Institute of Technology. Current collector for AMTEC, 4,871,626, Cl. 429-11.000.
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Norton, John P.; Schneider, Steven; Wilder, William D.; and Hussell, Stephen J., 4,871,308, Cl. 432-29.000.
- Wilson, Howard J. C.: See—
Bachmann, Peter K.; Hagemann, Hans-Jurgen E.; Warnier, Jacques P. M.; and Wilson, Howard J. C., 4,871,383, Cl. 65-3.120.
- Wilson, Richard F., to Pyromation, Inc. Protective tube for a temperature sensor, 4,871,263, Cl. 374-139.000.
- Windmoller & Holscher: See—
Brinkmeier, Friedhelm, 4,871,347, Cl. 493-302.000.
- Winkler & Duennbeier Maschinenfabrik und Eisengieserei KG: See—
Blumie, Martin, 4,870,803, Cl. 53-447.000.
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Rantanen, Raimo; Huhta, Pentti; and Winqvist, Hans-Erik, 4,871,059, Cl. 198-532.000.
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Hammer, Klaus-Dieter; Siebrecht, Manfred; and Winter, Hermann, 4,871,791, Cl. 524-35.000.
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Pfeifer, Heinrich; Reich, Werner; and Winterer, Martin, 4,872,129, Cl. 364-724.100.
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Warren, Tommy M.; and Winters, Warren J., 4,871,037, Cl. 175-67.000.
- Wipfelder, Ernst: See—
LeBisch, Helmut; Basel, Rainer; Fuchs, Georg; Dietmar, Hermann; Wipfelder, Ernst; and Hekele, Wilhelm, 4,871,502, Cl. 264-222.000.
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Nair, Raghunathan V.; and Witiak, Donald T., 4,871,736, Cl. 514-232.500.
- Witting, Harald L., to General Electric Company. Electrodeless high intensity discharge lamp, 4,871,946, Cl. 315-248.000.
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- Woeb-Gosch, Volkert: See—
Lechter, Hans; Woeb-Gosch, Volkert; Qun, Song; Kaminsky, Walter; and Sinn, Hansjorg, 4,871,426, Cl. 201-2.500.
- Wojtowicz, John A., to Olin Corporation. Process for making methylphosphonic dichloride, 4,871,486, Cl. 562-818.000.
- Wolf, Alfred P.: See—
Shive, Chyng-Yann; Wolf, Alfred P.; Bai, Lan-Qin; and Teng, Ren-Tui, 4,871,527, Cl. 424-1.100.
- Wolf, Hubert: See—
Bilger, Edgar; and Wolf, Hubert, 4,871,681, Cl. 436-109.000.
- Wolf, Robert B.: See—
Smith, Stanton D.; Hertz, David; Wolf, Robert B.; and Olsen, Robert H., 4,871,966, Cl. 324-309.000.
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- Wolfe, John J.: See—
Wolfe, George R.; and Wolfe, John J., 4,870,835, Cl. 62-246.000.
- Wolfe, Steven M. Disposable litter box system, 4,870,924, Cl. 119-1.000.
- Wolff, Erich, to Agfa-Gevaert Aktiengesellschaft. Color photographic recording material with easily dispersible color couplers, 4,871,657, Cl. 430-548.000.
- Wolfram, Joachim W., to Ethyl Corporation. Process for producing dienes, 4,871,874, Cl. 564-288.000.
- Wollweber, Detlef; and Dutzmann, Stefan, to Bayer Aktiengesellschaft. Substituted propylamine pesticides, 4,871,761, Cl. 514-438.000.
- Wolters, Richard H.; Thoeming, Gerald A.; and Jeffers, Robert E., to Westinghouse Electric Corp. Office space dividing system, 4,870,908, Cl. 108-60.000.
- Wolz, Udo: See—
Boss, Franz; and Wolz, Udo, 4,871,342, Cl. 464-98.000.
- Wong, Sau-Ching; So, Hock-Chuen; Kopec, Stanley J., Jr.; and Hartmann, Robert F., to Altera Corporation. Programmable logic device with array blocks connected via programmable interconnect, 4,871,930, Cl. 307-465.000.
- Wood, Peter: See—
Denny, Patrick J.; and Wood, Peter, 4,871,710, Cl. 502-414.000.
- Woolfolk, Thomas M., to Sperry Marine Inc. Pulse modulated automatic light control utilizing gated image intensifier, 4,872,057, Cl. 358-211.000.
- Worndli, Gerhard A. Process for irreversible recording, recording carrier, as well as use of the process or of the recording carrier, 4,871,193, Cl. 283-72.000.
- Wosaba, Charles L., II; Hamilton, Peter W.; and Kissner, Robert J., to Procter & Gamble Company. The Method of making tear strip openable shipping/display container and blanks therefor, 4,871,345, Cl. 493-59.000.
- Wright, Alexander H.: See—
Browning, Shane C.; Carlisle, Robert; and Wright, Alexander H., 4,870,979, Cl. 131-196.000.
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- Wright, Paul J., to GKN Hayward Baker, Inc. Continuous mixing and injection of lime-fly ash slurry, 4,871,283, Cl. 405-263.000.
- Wright, Robin E.: See—
Lamanna, William M.; McCormick, Fred B.; and Wright, Robin E., 4,871,790, Cl. 523-333.000.
- Wu, Mu T.: See—
Baldwin, John J.; Tolman, Richard L.; and Wu, Mu T., 4,871,739, Cl. 514-254.000.
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Wahl, Hans P.; and Wurzberg, Uwe, 4,871,678, Cl. 436-79.000.
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Bagley, Rodney D.; and Wusirika, Raja R., 4,871,621, Cl. 428-549.000.
- Wyman, Jack S.: See—
Enzer, Steven; Burgess, Bruce M.; Wyman, Jack S.; and Hender-shot, Ricky, 4,871,439, Cl. 204-401.000.
- Xerox Corporation: See—
Holonyak, Nick, Jr.; and Burnham, Robert D., 4,871,690, Cl. 437-105.000.
- Limburg, William W.; Yanus, John F.; Renfer, Dale S.; Schank, Richard L.; and Ong, Beng S., 4,871,634, Cl. 430-54.000.
- May, Joseph N.; Rhinehart, Stephen A.; and Zambelli, Robert G., 4,871,158, Cl. 270-53.000.
- Yagi, Isaburo: See—
Hyodo, Masakatsu; Kusumoto, Koji; and Yagi, Isaburo, 4,871,413, Cl. 156-382.000.
- Yagi, Tetsuo: See—
Akao, Yoshifumi; Yamamoto, Takasi; Arima, Koji; and Yagi, Tetsuo, 4,871,936, Cl. 310-233.000.
- Yagi, Toru, to Honda Giken Kogyo Kaisha. Engine valve control apparatus, 4,870,930, Cl. 123-90.110.
- Yaginuma, Nakatsugu: See—
Tanaka, Mitsutoshi; Arai, Fuminori; Terashima, Kaoru; and Yaginuma, Nakatsugu, 4,871,679, Cl. 436-79.000.
- Yaguchi, Shigeharu: See—
Yonekura, Norihisa; Yumita, Takashi; Nezu, Yukio; Kojima, Yoshiyuki; Maeno, Shin-ichiro; and Yaguchi, Shigeharu, 4,871,751, Cl. 514-345.000.
- Yale Security Inc.: See—
Cudd, Charles A., 4,870,841, Cl. 70-107.000.
- Yamada, Katsuhiko; Ojima, Kunio; Asakura, Takashi; Yamamori, Yusuke; and Nakamura, Yukihiko, to Sumitomo Electric Industries, Ltd. Apparatus for heat treatment of steel rods, 4,871,146, Cl. 266-106.000.
- Yamada, Koji, to Sumitomo Electric Industries, Ltd. Cell culture incubator, 4,871,676, Cl. 435-290.000.
- Yamada, Kunihiko: See—
Ueda, Kouichi; Fujiwara, Akihiro; Suda, Hirofumi; Toyama, Masamichi; and Yamada, Kunihiko, 4,871,906, Cl. 250-201.000.
- Yamada, Toshihiro; and Kohno, Akiomi, to Hitachi, Ltd. Method for bonding ceramics to each other or a ceramic to a metal, 4,871,107, Cl. 228-121.000.
- Yamada, Toshihiro: See—
Natori, Tatsuo; Shimaguchi, Takashi; Watanabe, Akihiko; and Yamada, Toshihiro, 4,871,497, Cl. 264-86.000.
- Yamada, Yasuyuki: See—
Sato, Yasuhisa; Yamada, Yasuyuki; Nakayama, Hiroki; and Oizumi, Kouji, 4,871,238, Cl. 350-422.000.

- Yamagata, Shigeo; Takei, Masahiro; Takayama, Tadashi; and Ito, Kazuhiko, to Canon Kabushiki Kaisha. Drop-out correction apparatus, 4,872,066, Cl. 358-336.000.
- Yamaguchi, Hisami: See—
Ueda, Yoshio; Hata, Takehisa; Yamaguchi, Hisami; Ueda, Satoshi; and Kodani, Masateru, 4,871,549, Cl. 424-494.000.
- Yamaguchi, Katsumi; Yoshikawa, Kikuo; Kinoshita, Shigeo; Kanai, Takao; and Yokoi, Syouchiro, to Clarion Co., Ltd. Tape loading mechanism in magnetic recording and reproducing apparatus, 4,872,075, Cl. 360-85.000.
- Yamaguchi, Masaru; and Ogata, Takenori, to NEC Corporation. Digital automatic line equalizer with means for controlling tap gains of transversal filter based on mean power of output from the filter, 4,872,184, Cl. 375-14.000.
- Yamaguchi, Sachio: See—
Sugimura, You; Watanabe, Tadashi; Sugiyama, Yutaka; Ohira, Kazuhiko; Numa, Nobushige; Yamaguchi, Sachio; and Kasari, Akira, 4,871,591, Cl. 427-388.500.
- Yamaguchi, Shuichi; Daikuhara, Norio; and Shimomura, Takeshi, to Terumo Corporation. Ion sensor, 4,871,442, Cl. 204-418.000.
- Yamaguchi, Tatsuya: See—
Kanbara, Kouji; Kikuchi, Kenichi; Shimizu, Yoshihito; Hattori, Shinichiro; Tojo, Yoshikazu; Hasegawa, Akira; Yamaguchi, Tatsuya; Tsukaya, Takashi; Kobayashi, Kazunari; Murata, Masanao; Yamamoto, Tsutomu; and Nakamura, Takeaki, 4,870,950, Cl. 128-6.000.
- Yamaguchi, Yasuhiro; Shimoyama, Yuji; Ohnishi, Tateo; Ohno, Hironobu; Shioda, Isamu; and Nakazono, Yoji, to Kawasaki Steel. Method and device for leveling metal strip to be fed into continuous annealing furnace, 4,870,850, Cl. 72-164.000.
- Yamamori, Yusuke: See—
Yamada, Katsuhiko; Ojima, Kunio; Asakura, Takashi; Yamamori, Yusuke; and Nakamura, Yukihiko, 4,871,146, Cl. 266-106.000.
- Yamamoto, Hisao: See—
Itoh, Michio; Yamamoto, Hisao; and Okamura, Nobuyuki, 4,871,794, Cl. 524-254.000.
- Yamamoto, Noboru: See—
Komatsu, Masato; Baba, Isao; and Yamamoto, Noboru, 4,871,796, Cl. 524-474.000.
- Yamamoto, Souichi: See—
Takata, Masakazu; Ueda, Takamasa; Ito, Kimiyuki; Hirashima, Suneaki; Yamamoto, Souichi; Ishino, Yoshio; and Ohno, Toshiro, 4,871,633, Cl. 430-58.000.
- Yamamoto, Takasi: See—
Akao, Yoshifumi; Yamamoto, Takasi; Arima, Koji; and Yagi, Tetsuo, 4,871,936, Cl. 310-233.000.
- Yamamoto, Tsutomu: See—
Kanbara, Kouji; Kikuchi, Kenichi; Shimizu, Yoshihito; Hattori, Shinichiro; Tojo, Yoshikazu; Hasegawa, Akira; Yamaguchi, Tatsuya; Tsukaya, Takashi; Kobayashi, Kazunari; Murata, Masanao; Yamamoto, Tsutomu; and Nakamura, Takeaki, 4,870,950, Cl. 128-6.000.
- Yamamoto, Yasuaki; Tsukada, Hiroaki; Sorimachi, Masami; and Hori, Akihiro, to Hitachi Cable Ltd. Flame retardant electrical insulating composition having antifungal action, 4,871,787, Cl. 523-122.000.
- Yamanami, Hirofumi: See—
Seki, Kenji; Hashimoto, Junichiro; Kimura, Michio; Yamanami, Hirofumi; Mochizuki, Satomi; and Aiso, Izumi, 4,871,635, Cl. 430-60.000.
- Yamashita, Toshiharu; Amano, Sho; Tajima, Hidemi; Matsuda, Isao; and Izumitani, Tetsuro, to Hoya Corporation. Single mode phosphate laser glass fiber, 4,871,230, Cl. 350-96.340.
- Yamato, Yoshiro, to Shimano Industrial Company Limited. Fishing rod, 4,870,774, Cl. 43-23.000.
- Yamauchi, Kiyotaka; Yoshizawa, Yoshihito; and Nakajima, Shin, to Hitachi Metals, Ltd. High-voltage pulse generating apparatus, 4,871,925, Cl. 307-106.000.
- Yamazaki, Hiroshi; Modler, Howard W.; Jones, John D.; and Elliot, James L., to Canadian Patents And Development Limited/Societe Canadienne Des Brevets Et d'Exploitation Limitee. Process for preparing flour from Jerusalem artichoke tubers, 4,871,574, Cl. 426-622.000.
- Yamazaki, Mitsuo: See—
Yoshioka, Takao; Kitazawa, Eiichi; Yamazaki, Mitsuo; and Iizuka, Yoshio, 4,871,762, Cl. 514-439.000.
- Yamazaki, Shumpei, to Semiconductor Energy Laboratory Co., Ltd. Carbon deposition by ECR CVD using a catalytic gas, 4,871,581, Cl. 427-39.000.
- Yanagisawa, Leichi: See—
Baba, Isao; Kondo, Takeo; Yanagisawa, Leichi; and Kohguchi, Kenji, 4,872,045, Cl. 357-13.000.
- Yang, Jan-Chin: See—
Tadmor, Zehev; Siegel, Arthur D.; and Yang, Jan-Chin, 4,871,260, Cl. 366-99.000.
- Yano, Akechi, to Yano, Akechi. Roller for removing or imparting shrinkages on a metal or cloth sheeting, 4,870,731, Cl. 29-116.100.
- Yanus, John F.: See—
Limburg, William W.; Yanus, John F.; Renfer, Dale S.; Schank, Richard L.; and Ong, Beng S., 4,871,634, Cl. 430-54.000.
- Yarger, Ronald G.: See—
Barnett, Ronald E.; and Yarger, Ronald G., 4,871,570, Cl. 426-535.000.
- Yashiki, Hiroshi: See—
Tsukiyama, Tokuhiko; Yashiki, Hiroshi; and Hirose, Osamu, 4,872,009, Cl. 341-95.000.
- Yasuda, Makoto: See—
Miyashita, Tsune; and Yasuda, Makoto, 4,871,947, Cl. 315-344.000.
- Yasuda, Nobuyoshi: See—
Takaya, Takao; Tozuka, Zenzaburo; Yasuda, Nobuyoshi; and Kawabata, Kohji, 4,871,730, Cl. 514-206.000.
- Yasuhara, Takashi: See—
Ohmori, Akira; and Yasuhara, Takashi, 4,871,820, Cl. 526-245.000.
- Yates, John T., Jr.: See—
Smentkowski, Vincent S.; Hagans, Patrick L.; and Yates, John T., Jr., 4,871,526, Cl. 423-659.000.
- Yatsu, Lawrence Y.; Calamari, Timothy A., Jr.; and Benerito, Ruth R., to United States of America, Agriculture. Stable crystalline cellulose III polymorphs, 4,871,370, Cl. 8-116.100.
- Yazaki Corporation: See—
Hayashi, Hideharu, 4,871,884, Cl. 174-52.100.
- Ikeda, Tomohiro; Hatagishi, Yuji; Totsuka, Mitsuhiro; and Kudoh, Toshiharu, 4,871,990, Cl. 337-238.000.
- Kondo, Hiroyuki; Harada, Tadashi; and Uchida, Kihachiro, 4,871,331, Cl. 439-736.000.
- Nishijima, Tamotsu; and Fujino, Toshihiro, 4,870,851, Cl. 72-261.000.
- Ohsumi, Hideki, 4,871,323, Cl. 439-188.000.
- Ohtani, Yukio; and Sato, Yoshitake, 4,870,861, Cl. 73-317.000.
- Oikawa, Ryetsu, 4,871,134, Cl. 248-65.000.
- Shimizu, Takeshige, 4,872,093, Cl. 362-26.000.
- Sugawara, Akira; and Kanahara, Naoyuki, 4,871,399, Cl. 148-11.50C.
- Yazaki Corporation: See—
Maejima, Toshiro; and Inaba, Shigemitsu, 4,871,325, Cl. 439-353.000.
- Yim, Zachary; Zupon, Martin; and Chaudry, Imtiaz, to Schering Corporation. Insoluble copper-alpha interferon complex, 4,871,538, Cl. 424-85.700.
- Yin, Gerald Z.: See—
Ogle, John; and Yin, Gerald Z., 4,871,421, Cl. 156-643.000.
- Ying, Lincoln: See—
McMahon, Paul E.; Chung, Tai-Shung; and Ying, Lincoln, 4,871,491, Cl. 264-29.200.
- Yoden, Sadamitsu, to Tamagawa Seiki Kabushiki Kaisha. Output voltage control system for an electric generator, 4,871,960, Cl. 322-24.000.
- Yokogawa, Fumihiko; Hirano, Hiroyuki; and Kinpara, Keiji, to Pioneer Electronic Corporation. Clock generator circuit and a synchronizing signal detection method in a sampled format system and a phase comparator circuit suited for generation of the clock, 4,872,155, Cl. 369-59.000.
- Yokohama Rubber Co., Ltd., The: See—
Igarashi, Shigeru; and Ozawa, Osamu, 4,870,995, Cl. 138-126.000.
- Yokohama, Shuichi: See—
Hayakawa, Isao; Atarashi, Shohgo; Yokohama, Shuichi; and Imamura, Masazumi, 4,871,852, Cl. 544-363.000.
- Yokoi, Syouchiro: See—
Yamaguchi, Katsumi; Yoshikawa, Kikuo; Kinoshita, Shigeo; Kanai, Takao; and Yokoi, Syouchiro, 4,872,075, Cl. 360-85.000.
- Yokoo, Hiroshi: See—
Inoue, Senya; Ono, Akira; Kobayashi, Mikio; and Yokoo, Hiroshi, 4,871,693, Cl. 501-9.000.
- Yokota, Hiroshi: See—
Seki, Koji; Morishita, Hiroshi; Ohno, Kiyoshi; and Yokota, Hiroshi, 4,871,695, Cl. 501-54.000.
- Yokoyama, Yoshimitsu, to Milliken Research Corporation. Method of forming a parallelepiped container made of machine-glazed paper to be filled with liquid, 4,870,804, Cl. 53-450.000.
- Yonekura, Norihisa; Yumita, Takashi; Nezu, Yukio; Kojima, Yoshiyuki; Maeno, Shin-ichiro; and Yaguchi, Shigeharu, to Kumai Chemical Industry Co., Ltd.; and Ihara Chemical Industry Co., Ltd. 1,2,6-Triphenyl-4(1H)-pyridinone derivatives, and their use as fungicides, 4,871,751, Cl. 514-345.000.
- Yonemori, Takaji: See—
Miyake, Hiroyuki; Sagara, Seiji; Yonemori, Takaji; Watanabe, Tsuyoshi; Takahashi, Masayoshi; Suzuki, Koji; Komiya, Yutaka; Tomosada, Masahiro; Adachi, Hideki; Hirose, Masayuki; and Miyata, Masanori, 4,872,035, Cl. 355-208.000.
- Yonezawa, Seiji: See—
Tsuyoshi, Toshiaki; Ohtake, Masatoshi; Takasugi, Wasao; and Yonezawa, Seiji, 4,872,152, Cl. 369-44.000.
- Yoon, Myongwhan; Whang, Seongtae; Chang, Insoon; and Han, Pilsoon, to Korea Advanced Energy Research Institute. Recovery or removal of uranium by the utilization of acorns, 4,871,518, Cl. 423-11.000.
- Yoshida, Ikio, to NEC Corporation. Serial interface system flexibly applicable to a one-to-plurality connection, 4,872,003, Cl. 340-825.080.
- Yoshida Kogyo K. K.: See—
Fujisaki, Yoshinori; and Ida, Kazuo, 4,870,724, Cl. 24-433.000.
- Yoshida, Kokichi: See—
Saito, Yuzuru; and Yoshida, Kokichi, 4,871,868, Cl. 549-416.000.
- Yoshida, Makoto: See—
Kageyama, Takashi; and Yoshida, Makoto, 4,870,920, Cl. 118-103.000.
- Yoshida, Masao: See—
Ishii, Hidehiro; Yoshio, Junichi; Watanabe, Osamu; Izumo, Take-shi; Takeya, Noriyoshi; Katakami, Kazuhiko; Shinohara, Masayori; and Yoshida, Masao, 4,872,068, Cl. 358-342.000.

Yoshihara, Masashi, to NEC Corporation. Demodulator including sweep controller for controlling synchronization capture range. 4,871,973, Cl. 329-308.000.

Yoshikawa, Kikuo: See—
Yamaguchi, Katsumi; Yoshikawa, Kikuo; Kinoshita, Shigeo; Kanai, Takao; and Yokoi, Syouchiro, 4,872,075, Cl. 360-85.000.

Yoshikawa, Nobuji: See—
Imada, Yukio; Yoshikawa, Nobuji; Mizuno, Sumiko; and Mikawa, Takashi, 4,871,667, Cl. 435-142.000.

Yoshimura, Narihiko; Tokashiki, Michihide; and Ishii, Tetsuo, to Toa Nenryo Kogyo K.K. Synthetic lubricating fluid. 4,871,476, Cl. 252-565.000.

Yoshimura, Noriaki: See—
Omatsu, Toshihiro; Tokitoh, Yasuo; and Yoshimura, Noriaki, 4,871,880, Cl. 568-454.000.

Yoshinaga, Yoko: See—
Kushibiki, Nobuo; Yoshinaga, Yoko; Taniguchi, Naosato; and Kuwayama, Tetsuro, 4,871,411, Cl. 156-249.000.

Yoshino, Hitoshi: See—
Imataki, Hiroyuki; Hiraoka, Mizuho; Ichikawa, Sachiko; Ogawa, Yoshihiro; and Yoshino, Hitoshi, 4,871,649, Cl. 430-270.000.

Miura, Kyo; Sugata, Hiroyuki; Oguchi, Yoshihiro; and Yoshino, Hitoshi, 4,871,601, Cl. 428-64.000.

Yoshino, Shigeru, to Fuji Photo Film Co., Ltd. Sheet feeding apparatus. 4,871,160, Cl. 271-9.000.

Yoshio, Junichi: See—
Ishii, Hidehiro; Yoshio, Junichi; Watanabe, Osamu; Izumo, Takeshi; Takeya, Noriyoshi; Katakami, Kazuhiko; Shinohara, Masayori; and Yoshida, Masao, 4,872,068, Cl. 358-342.000.

Yoshioka, Hiroshi: See—
Ishibashi, Masayuki; and Yoshioka, Hiroshi, 4,871,940, Cl. 313-412.000.

Yoshioka, Mamoru: See—
Shibata, Norio; Mizuno, Hideaki; Satoya, Kouichi; Uchitani, Nobuki; Kamohara, Tatsuyoshi; Harada, Kenichi; Yoshioka, Mamoru; Kato, Takashi; and Ohnaka, Hidemi, 4,870,942, Cl. 123-571.000.

Yoshioka, Takao; Kitazawa, Eiichi; Yamazaki, Mitsuo; and Iizuka, Yoshio, to Sankyo Company, Limited. Lipid peroxide lowering 1,3-benzoxathiole derivative compositions and method of use therefor. 4,871,762, Cl. 514-439.000.

Yoshizawa, Yoshihito: See—
Yamauchi, Kiyotaka; Yoshizawa, Yoshihito; and Nakajima, Shin, 4,871,925, Cl. 307-106.000.

Young, Dewey R.; and Duren, Richard E., to Exxon Production Research Company. Endfire seismic receiver and method of use. 4,872,144, Cl. 367-20.000.

Young, Hartley F.: See—
McGuire, William G.; and Young, Hartley F., 4,871,032, Cl. 172-749.000.

Young, Robert C.: See—
Skwirut, Henry; and Young, Robert C., 4,871,944, Cl. 315-56.000.

Young, William E.; and Carl, Dan E., to Westinghouse Electric Corp. Passively cooled catalytic combustor for a stationary combustion turbine. 4,870,824, Cl. 60-723.000.

Yu, Chin-ching: See—
Hsu, Chi-chu; Yu, Chin-ching; Chao, Suyueh; and Huang, Miguel C. J., 4,871,042, Cl. 180-220.000.

Yu, John P.: See—
Cooper, J. Carl; and Yu, John P., 4,872,070, Cl. 360-15.000.

Yumita, Takashi: See—
Yonekura, Norihisa; Yumita, Takashi; Nezu, Yukio; Kojima, Yoshiyuki; Maeno, Shin-ichiro; and Yaguchi, Shigeharu, 4,871,751, Cl. 514-345.000.

Zabel, Lutz-Dieter: See—
Merz, Peter W.; and Zabel, Lutz-Dieter, 4,871,590, Cl. 427-387.000.

Zabinski, Siegfried: See—
Bievert, Klaus; Bruder, Wolfgang; Geilhaupt, Manfred; Kupper, Gerd; and Zabinski, Siegfried, 4,871,155, Cl. 269-289.000.

Zahn, Harold. Device for machine-fastening roofing materials to roofs. 4,870,750, Cl. 29-809.000.

Zahnradfabrik Friedrichshafen AG: See—
Boss, Franz; and Wolz, Udo, 4,871,342, Cl. 464-98.000.

Zaidan Hojin Handotai Kenkyu Shinkokai: See—
Nishizawa, Jun-ichi; and Ohmi, Tadashi, 4,872,044, Cl. 357-38.000.

Zakharov, Ivan V.: See—
Naidenov, Evgeny V.; Belozorov, Georgy I.; Salov, Viktor E.; and Zakharov, Ivan V., 4,872,118, Cl. 364-463.000.

Zambelli, Robert G.: See—
May, Joseph N.; Rhinehart, Stephen A.; and Zambelli, Robert G., 4,871,158, Cl. 270-53.000.

Zane, Ronald S. O.: See—
Sterner, Mark H.; Sterner, Mark M.; and Zane, Ronald S. O., 4,871,567, Cl. 426-461.000.

Zeamer, Geoffrey H. Cryostat. 4,870,838, Cl. 62-51.100.

Zeelon, Pinhas E.: See—
Aviv, Haim; Gorecki, Marian; Levanon, Avigdor; Oppenheim, Amos; Vogel, Tikva; Zeelon, Pinhas E.; and Zeevi, Menachem, 4,871,835, Cl. 530-399.000.

Zeevi, Menachem: See—
Aviv, Haim; Gorecki, Marian; Levanon, Avigdor; Oppenheim, Amos; Vogel, Tikva; Zeelon, Pinhas E.; and Zeevi, Menachem, 4,871,835, Cl. 530-399.000.

Zega, Henry E.: See—
Barrett, John P.; Schulz, Daniel R.; Kent, David E.; deFasselle, Robert J.; and Zega, Henry E., 4,870,986, Cl. 137-119.000.

Zelle, Bruce R.: See—
Hemmady, Jayant G.; Lidinsky, William P.; Nichols, Robert K.; Richards, Gaylord W.; Roediger, Gary A.; Steele, Scott B.; Weddige, Ronald C.; and Zelle, Bruce R., 4,872,157, Cl. 370-60.000.

Hemmady, Jayant G.; Lidinsky, William P.; Roediger, Gary A.; Steele, Scott B.; Weddige, Ronald C.; and Zelle, Bruce R., 4,872,159, Cl. 370-60.000.

Zemke, Steven C.: See—
Taylor, David B.; and Zemke, Steven C., 4,872,090, Cl. 361-424.000.

Zendler, Richard: See—
Maack, Werner; and Zendler, Richard, 4,870,747, Cl. 29-753.000.

Zenith Electronics Corporation: See—
Diaz, Bonifacio, 4,872,100, Cl. 363-41.000.

Park, Yong S.; and Remec, Thomas M., 4,871,415, Cl. 156-626.000.

Zhevzhik, Galina V.: See—
Dobryakov, Valentin I.; Zhevzhik, Galina V.; Seballo, Valery A.; Zhukov, Evgeny V.; Ententev, Altar Z.; Struzhkov, Vyacheslav N.; and Gorbachev, Alexandr S., 4,871,448, Cl. 209-169.000.

Zhukov, Evgeny V.: See—
Dobryakov, Valentin I.; Zhevzhik, Galina V.; Seballo, Valery A.; Zhukov, Evgeny V.; Ententev, Altar Z.; Struzhkov, Vyacheslav N.; and Gorbachev, Alexandr S., 4,871,448, Cl. 209-169.000.

Zielinski, Ronald E.: See—
Kalota, Dennis J.; McConaghy, John S., Jr.; Fisher, David O.; and Zielinski, Ronald E., 4,871,109, Cl. 228-180.100.

Zikmund, Miroslav; Hybl, Cestmir; Macho, Vendelin; and Adam, Valer, to Vyskumny ustav pre petrochemiu Prievdza. Method of making magnesium oxide and hydrates thereof. 4,871,519, Cl. 423-169.000.

Zimmel, John M.; Klinkenberg, Pamela M.; Bunnelle, William L.; and Knutson, Keith C., to Fuller, H. B. Hot melt adhesives containing an additive derived from epoxy reactive hydrogen containing polymers and compounds and a polyepoxy compound. 4,871,803, Cl. 525-89.000.

Zimmermann, John, to Paperboard Industries Corporation. Vent opening scoring in container lid. 4,871,071, Cl. 206-628.000.

Zinser Textilmaschinen GmbH: See—
Nickolay, Helmut; and Lattner, Manfred, 4,870,720, Cl. 19-288.000.

Zoran Corporation: See—
Retter, Rafael, 4,872,132, Cl. 364-748.000.

Zottola, Gene: See—
Boes, David J.; and Zottola, Gene, 4,871,297, Cl. 415-170.100.

Zukovics nae Someg, Katalin: See—
Magyar, Karoly; Varga, Janos; Simon, Ferenc; Szauder nae Lauko, Hedvig; Fekete, Pal; Romvary, Attila; Egri, Janos; and Zukovics nae Someg, Katalin, 4,871,722, Cl. 514-157.000.

Zupon, Martin: See—
Yim, Zachary; Zupon, Martin; and Chaudry, Imtiaz, 4,871,538, Cl. 424-85.700.

Zuraski, Jeffery A.; Pawlak, Andrzej M.; Graber, David W.; and Babiniau, James W., to General Motors Corporation. Electromagnetic control apparatus for varying the driver steering effort of a hydraulic power steering system. 4,871,040, Cl. 180-142.000.

Zurawski, John H., to Digital Equipment Corporation. Method and apparatus for high performance division. 4,872,214, Cl. 364-766.000.

Zurfluh, Rene: See—
Luthy, Christoph; and Zurfluh, Rene, 4,871,757, Cl. 514-383.000.

Zweig, Andrew M.; and Conrad, Jeffrey P., to Allied-Signal Inc. Complete ether capping of oligomeric polyphenols. 4,871,831, Cl. 528-205.000.

LIST OF REISSUE PATENTEEES

TO WHOM

PATENTS WERE ISSUED ON THE 3RD DAY OF OCTOBER, 1989

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Bilow, Norman; Landis, Abraham L.; and Miller, Leroy J., to Hughes Aircraft Company. Homopolymerization of acetylene substituted polyimide polymers. Re. 33,079, Cl. 528-125.000.

CIC Int'l Corp.: See—
Levine, Morris M., Re. 33,074, Cl. 15-344.000.

Corning Glass Works: See—
Van Dewoestine, Robert V., Re. 33,077, Cl. 110-203.000.

Exxon Research and Engineering Company: See—
Kramer, George M., Re. 33,080, Cl. 585-740.000.

Hanma, Kentaro: See—
Murakami, Toshio; and Hanma, Kentaro, Re. 33,081, Cl. 358-227.000.

Hitachi, Ltd.: See—
Murakami, Toshio; and Hanma, Kentaro, Re. 33,081, Cl. 358-227.000.

Sugiura, Noboru, Re. 33,076, Cl. 73-204.150.

Holm, Albert E.; and Holm, Grant A., to Testrite, Inc. Method and apparatus for detecting leaks. Re. 33,075, Cl. 73-40.000.

Holm, Grant A.: See—
Holm, Albert E.; and Holm, Grant A., Re. 33,075, Cl. 73-40.000.

Hughes Aircraft Company: See—
Bilow, Norman; Landis, Abraham L.; and Miller, Leroy J., Re. 33,079, Cl. 528-125.000.

Hull-Allen, Gregory, to Mechanical Technology Incorporated. Optical configuration of fiber optic sensor for symmetric dynamic response about the optical null. Re. 33,078, Cl. 356-373.000.

Kramer, George M., to Exxon Research and Engineering Company. Adamantane catalyzed paraffin isomerization. Re. 33,080, Cl. 585-740.000.

Landis, Abraham L.: See—
Bilow, Norman; Landis, Abraham L.; and Miller, Leroy J., Re. 33,079, Cl. 528-125.000.

Levine, Morris M., to CIC Int'l Corp. Wet-dry vacuum cleaner. Re. 33,074, Cl. 15-344.000.

Mechanical Technology Incorporated: See—
Hull-Allen, Gregory, Re. 33,078, Cl. 356-373.000.

Miller, Leroy J.: See—
Bilow, Norman; Landis, Abraham L.; and Miller, Leroy J., Re. 33,079, Cl. 528-125.000.

Murakami, Toshio; and Hanma, Kentaro, to Hitachi, Ltd. Automatic focusing system for video cameras. Re. 33,081, Cl. 358-227.000.

Sugiura, Noboru, to Hitachi, Ltd. Air flow meter circuit with temperature compensation circuit. Re. 33,076, Cl. 73-204.150.

Testrite, Inc.: See—
Holm, Albert E.; and Holm, Grant A., Re. 33,075, Cl. 73-40.000.

Van Dewoestine, Robert V., to Corning Glass Works. Wood burning stove. Re. 33,077, Cl. 110-203.000.

LIST OF DESIGN PATENTEEES

Aavid Engineering, Inc.: See—
McCarthy, Alfred F., 303,755, Cl. D8-349.000.

McCarthy, Alfred F., 303,786, Cl. D13-23.000.

Abe, Yoshinori: See—
Kondoh, Nobuyuki; Abe, Yoshinori; and Yamane, Iwao, 303,788, Cl. D14-100.000.

Adams, Steven D.: See—
Roden, Mack L.; and Adams, Steven D., 303,836, Cl. D24-16.000.

Aker, Kevin R., to Little Tikes Company, The. Toy car. 303,776, 10-3-89, Cl. D12-108.000.

Aker, Kevin R., to Little Tikes Inc. Combined climber and slide for children. 303,826, 10-3-89, Cl. D21-244.000.

Albert, Wayne, to Innovative Medical Systems Corp. Cuvette. 303,837, 10-3-89, Cl. D24-29.000.

American Safety Razor Company: See—
Iten, Clemens A., 303,860, Cl. D32-48.000.

Ando, Toshiya, to Casio Computer Co., Ltd. Wrist watch. 303,769, 10-3-89, Cl. D10-38.000.

Apple Computer, Inc.: See—
Pearl, Stephen; and Guido, Anthony, 303,791, Cl. D14-107.000.

Autry Industries, Inc.: See—
Antry, James C.; and Lin, Mark, 303,730, Cl. D2-320.000.

Autry, James C.; and Lin, Mark, to Autry Industries, Inc. Cleated sole. 303,730, 10-3-89, Cl. D2-320.000.

Baird, Robert E.; and Baird, Thomas M., to Momentum Enterprises, Incorporated. Watch casing. 303,767, 10-3-89, Cl. D10-30.000.

Baird, Thomas M.: See—
Baird, Robert E.; and Baird, Thomas M., 303,767, Cl. D10-30.000.

Barclay, Paul S. Faucet-attached suction pump for a dental plaque cleaner. 303,835, 10-3-89, Cl. D24-15.000.

Bayouth, William S., Jr. Restaurant building. 303,842, 10-3-89, Cl. D25-33.000.

Beck, David F. Sign board. 303,814, 10-3-89, Cl. D20-39.000.

Benichou, Isaac. Combined toothbrush and cover therefor. 303,733, 10-3-89, Cl. D4-108.000.

Bianchi, Antonio. Table lamp. 303,848, 10-3-89, Cl. D26-65.000.

Blochlinger, Alfred; Collins, Christopher; Petroff, Cvetan; and Tench, Wallace, to McPherson's Limited. Knife scabbard. 303,731, 10-3-89, Cl. D3-102.000.

Bond Street, Ltd.: See—
Klein, Rudolf, 303,809, Cl. D19-27.000.

Bonko, Mark L., to Goodyear Tire & Rubber Company, The. Tire. 303,779, 10-3-89, Cl. D12-151.000.

Brackin, John F.: See—
Kamlukin, Igor; Brackin, John F.; and Freier, Edward, Jr., 303,804, Cl. D15-23.000.

Brainard, Robert H., to General Foods Corporation. Combined package and dispenser for extrusible comestibles. 303,760, 10-3-89, Cl. D9-306.000.

Britt, Edmund J.: See—
Sheehan, Terrence M.; Thomason, Jeffery W.; MacConkey, James S.; Reavis, Philip M., Jr.; and Britt, Edmund J., 303,805, Cl. D15-130.000.

Brown, Kenneth A. Toothbrush. 303,732, 10-3-89, Cl. D4-104.000.

Brown, Peter D., to Embassy Safety & Security Limited. Video alarm cassette. 303,795, 10-3-89, Cl. D14-121.000.

Brunner, Robert, to Esprit Systems, Inc. Computer terminal. 303,789, 10-3-89, Cl. D14-100.000.

Brunner, Robert, to Esprit Systems, Inc. Pedestal for CRT housing. 303,794, 10-3-89, Cl. D14-114.000.

Burns, Robert E. Golf putter head. 303,825, 10-3-89, Cl. D21-217.000.

Cardinal, Anthony J.; Hanekamp, Robert D.; and Olson, Elizabeth T., to Procter & Gamble Company, The. Jar. 303,762, 10-3-89, Cl. D9-404.000.

Casio Computer Co., Ltd.: See—
Ando, Toshiya, 303,769, Cl. D10-38.000.

Wakamatsu, Masamichi, 303,768, Cl. D10-38.000.

Cassai, Gino H.: See—
Cassai, Henry J.; and Cassai, Gino H., 303,850, Cl. D28-77.000.

Cassai, Henry J.; and Cassai, Gino H. Combined container/bottle and cosmetic wand applicators or the like. 303,850, 10-3-89, Cl. D28-77.000.

Cawood, Charles D.; and Mrava, Gene L. Urine leg bag. 303,841, 10-3-89, Cl. D24-54.000.

Chan, Raymond, to Integrated Display Technology, Limited. Timer. 303,771, 10-3-89, Cl. D10-40.000.

Chappellet, Mary A. Base for multiple candle lamps. 303,845, 10-3-89, Cl. D26-9.000.

Chen, Chun-Yong. Paint scraper. 303,861, 10-3-89, Cl. D32-48.000.

Cobra Products, Inc.: See—
Moss, Nicholas W., 303,855, Cl. D32-14.000.

Coleman, Cheryl R. Clothes hamper. 303,858, 10-3-89, Cl. D32-37.000.

Collins, Christopher: See—
Blochlinger, Alfred; Collins, Christopher; Petroff, Cvetan; and Tench, Wallace, 303,731, Cl. D3-102.000.

Collins, John A., Jr. Orthodontic appliance. 303,834, 10-3-89, Cl. D24-10.000.

Cone, Clyde C., to Cone Mounter Company. Thermal expansion heater for bearings. 303,832, 10-3-89, Cl. D23-336.000.

Cone Mounter Company: See—
Cone, Clyde C., 303,832, Cl. D23-336.000.

Craven, William J.: See—
Fitzpatrick, William E.; Morano, Emanuel P.; and Craven, William J., 303,839, Cl. D24-46.000.

Creative Athletic Products and Services, Inc.: See—
Eke, Alan B., 303,823, Cl. D21-199.000.

Culbertson, Richard, to General Electric Company. Front panel for a two-way mobile radio. 303,802, 10-3-89, Cl. D14-258.000.

David, Thomas J.: See—
 Foran, Kenneth C.; and David, Thomas J., 303,813, Cl. D19-77.000.
 David, Tom, to Tom David, Inc. Pepper mill. 303,746, 10-3-89, Cl. D7-53.000.
 Delbanco Arts: See—
 Delbanco, Kurt B., 303,766, Cl. D9-430.000.
 Delbanco, Kurt B., to Delbanco Arts. Food container. 303,766, 10-3-89, Cl. D9-430.000.
 DeMarco, Daniel J. Container for caramel apple. 303,763, 10-3-89, Cl. D9-415.000.
 Desgrappes, Joel, to Institut Jeanne Piaubert. Combined container and brush. 303,761, 10-3-89, Cl. D9-337.000.
 de Witt, F. Carlos, to Romana Acosta. Combined document clip and pencil grip. 303,811, 10-3-89, Cl. D19-65.000.
 Dickens, Jacqueline B. Finger puppet. 303,821, 10-3-89, Cl. D21-153.000.
 Dirscherl, Hans, to Textron, Inc. Watch strap. 303,773, 10-3-89, Cl. D11-3.000.
 Durgin, Robert D. Frost and ice scraper. 303,859, 10-3-89, Cl. D32-46.000.
 Durham, Ira M., Jr., to Methodist Hospital System, The. Headwall unit for hospital rooms. 303,743, 10-3-89, Cl. D6-505.000.
 Eastern Company, The: See—
 Weinerman, Lee S.; and Mayo, Steven A., 303,754, Cl. D8-344.000.
 Egerton, Harry, Jr. Display case. 303,739, 10-3-89, Cl. D6-470.000.
 Eke, Alan B., to Creative Athletic Products and Services, Inc. Portable baseball mound. 303,823, 10-3-89, Cl. D21-199.000.
 Eldon Industries, Inc.: See—
 Evenson, Mel, 303,847, Cl. D26-63.000.
 Embassy Safety & Security Limited: See—
 Brown, Peter D., 303,795, Cl. D14-121.000.
 Engolia, Grady M. Set of car dashboard covers. 303,783, 10-3-89, Cl. D12-192.000.
 Esprit Systems, Inc.: See—
 Brunner, Robert, 303,789, Cl. D14-100.000.
 Brunner, Robert, 303,794, Cl. D14-114.000.
 Etro, Gerolamo, to Etro S.p.A. Textile fabric or similar article. 303,734, 10-3-89, Cl. D5-45.000.
 Etro S.p.A.: See—
 Etro, Gerolamo, 303,734, Cl. D5-45.000.
 Evenson, Mel, to Eldon Industries, Inc. Electric lamp. 303,847, 10-3-89, Cl. D26-63.000.
 Fennell, Robert D.; Huber, Richard M.; Lloyd, Robert D.; and Scheid, William J., to Motorola, Inc. Radio pager or similar article. 303,799, 10-3-89, Cl. D14-191.000.
 Fitzpatrick, John R. Puzzle piece. 303,816, 10-3-89, Cl. D21-104.000.
 Fitzpatrick, John R. Puzzle piece. 303,817, 10-3-89, Cl. D21-104.000.
 Fitzpatrick, John R. Puzzle piece. 303,818, 10-3-89, Cl. D21-104.000.
 Fitzpatrick, William E.; Morano, Emanuel P.; and Craven, William J., to Playtex Family Products, Inc. Pacifier. 303,839, 10-3-89, Cl. D24-46.000.
 Foran, Kenneth C.; and David, Thomas J., to Rubbermaid Incorporated. Desk top organizer tray. 303,813, 10-3-89, Cl. D19-77.000.
 Frederiksen, Soren, to Interlego A.G. Toy arch. 303,819, 10-3-89, Cl. D21-108.000.
 Freier, Edward, Jr.: See—
 Kamlukin, Igor; Brackin, John F.; and Freier, Edward, Jr., 303,804, Cl. D15-23.000.
 Friedman, Abraham, to Starlight Industries. Easel hinge. 303,753, 10-3-89, Cl. D8-328.000.
 General Electric Company: See—
 Culbertson, Richard, 303,802, Cl. D14-258.000.
 General Foods Corporation: See—
 Brainard, Robert H., 303,760, Cl. D9-306.000.
 Mileos, George, 303,759, Cl. D9-306.000.
 Gentes, James J., to Giro Sport Design, Inc. Bicyclist's helmet. 303,851, 10-3-89, Cl. D29-12.000.
 Gerber Products Company: See—
 Meyers, Kenneth A., 303,756, Cl. D8-402.000.
 Giro Sport Design, Inc.: See—
 Gentes, James J., 303,851, Cl. D29-12.000.
 Gleeson, Lemuel: See—
 Gleeson, Ramon A.; and Gleeson, Lemuel, 303,752, Cl. D8-71.000.
 Gleeson, Ramon A.; and Gleeson, Lemuel. Guide for power tools. 303,752, 10-3-89, Cl. D8-71.000.
 Goodyear Tire & Rubber Company, The: See—
 Bonko, Mark L., 303,779, Cl. D12-151.000.
 Grosfillex, Raymond. Armchair. 303,736, 10-3-89, Cl. D6-379.000.
 Guido, Anthony: See—
 Pearl, Stephen; and Guido, Anthony, 303,791, Cl. D14-107.000.
 Hamilton Sorter Co., Inc.: See—
 Kwiecinski, Gordon F., 303,737, Cl. D6-455.000.
 Hanekamp, Robert D.: See—
 Cardinal, Anthony J.; Hanekamp, Robert D.; and Olson, Elizabeth T., 303,762, Cl. D9-404.000.
 Hara, Kunio, to Kabushiki Kaisha Toshiba. Electronic copying machine. 303,792, 10-3-89, Cl. D14-107.000.
 Hardinge Brothers, Inc.: See—
 Sheehan, Terrence M.; Thomason, Jeffery W.; MacConkey, James S.; Reavis, Philip M., Jr.; and Britt, Edmund J., 303,805, Cl. D15-130.000.
 Haukvik, Ola; and Lunde, Martin, to J. E. Ekornes A/S. Adjustable seat. 303,735, 10-3-89, Cl. D6-365.000.
 Henderson, Thurman. Hosiery matching clamp. 303,862, 10-3-89, Cl. D32-64.000.
 Hermann, Klaus-Dieter, to K-D Hermann Gesellschaft mit beschränkter Haftung. Contact Preisauszeichnung-Etikettensysteme. Hand-held labelling gun. 303,808, 10-3-89, Cl. D18-19.000.
 Hieronymus, John. Canister for soaking paint spray guns. 303,857, 10-3-89, Cl. D32-35.000.
 Highland Supply Corporation: See—
 Weder, Donald E., 303,775, Cl. D11-155.000.
 Hodge, Robin N. Door louvre blade. 303,844, 10-3-89, Cl. D25-121.000.
 Huber, Richard M.: See—
 Fennell, Robert D.; Huber, Richard M.; Lloyd, Robert D.; and Scheid, William J., 303,799, Cl. D14-191.000.
 Inglis, Douglas R. Seedling protector. 303,750, 10-3-89, Cl. D8-1.000.
 Innovative Medical Systems Corp.: See—
 Albert, Wayne, 303,837, Cl. D24-29.000.
 Institut Jeanne Piaubert: See—
 Desgrappes, Joel, 303,761, Cl. D9-337.000.
 Integrated Display Technology, Limited: See—
 Chan, Raymond, 303,771, Cl. D10-40.000.
 Interlego A.G.: See—
 Frederiksen, Soren, 303,819, Cl. D21-108.000.
 International Packaging Corporation: See—
 Kilmartin, John D., III, 303,764, Cl. D9-423.000.
 Isozaki, Sadao: See—
 Kido, Shigeaki; Isozaki, Sadao; and Yajima, Yasuko, 303,801, Cl. D14-241.000.
 Itakura, Yoshitomo: See—
 Nishiyama, Kenji; Takahashi, Hanji; and Itakura, Yoshitomo, 303,796, Cl. D14-121.000.
 Iten, Clemens A., to American Safety Razor Company. Razor blade scraper holder or similar article. 303,860, 10-3-89, Cl. D32-48.000.
 J. E. Ekornes A/S: See—
 Haukvik, Ola; and Lunde, Martin, 303,735, Cl. D6-365.000.
 JMK International, Inc.: See—
 Micallef, Alfred M., 303,784, Cl. D12-345.000.
 John Manufacturing Limited: See—
 Yuen, John S., 303,856, Cl. D32-18.000.
 K-D Hermann Gesellschaft mit beschränkter Haftung. Contact Preisauszeichnung-Etikettensysteme: See—
 Hermann, Klaus-Dieter, 303,808, Cl. D18-19.000.
 Kabushiki Kaisha Toshiba: See—
 Hara, Kunio, 303,792, Cl. D14-107.000.
 Kai Cutlery Co., Ltd.: See—
 Yamagishi, Masami, 303,748, Cl. D7-152.000.
 Kamlukin, Igor; Brackin, John F.; and Freier, Edward, Jr., to Simplicity Manufacturing, Inc. Self-propelled riding tractor. 303,804, 10-3-89, Cl. D15-23.000.
 Kanda Tsushin Kogyo Co., Ltd.: See—
 Yamakawa, Kunio, 303,798, Cl. D14-151.000.
 Kaplan, Myril. Jewelry presentation case. 303,765, 10-3-89, Cl. D9-423.000.
 Karapetian, Vahe. Truck sun visor. 303,782, 10-3-89, Cl. D12-191.000.
 Kato, Shuzo; Nakamura, Yasushi; and Takeda, Junnosuke, to NCR Corporation. Flat panel display with keyboard or similar article. 303,790, 10-3-89, Cl. D14-106.000.
 Kato, Shuzo; Nakamura, Yasushi; and Kusayanagi, Masao, to NCR Corporation. Cash register or similar article. 303,806, 10-3-89, Cl. D18-4.000.
 Keller, Steven F. Animal feeding bowl. 303,853, 10-3-89, Cl. D30-129.000.
 Kido, Shigeaki; Isozaki, Sadao; and Yajima, Yasuko, to Meisei Electric Co., Ltd. Direct station telephone selector. 303,801, 10-3-89, Cl. D14-241.000.
 Kilmartin, John D., III, to International Packaging Corporation. Jewelry display box. 303,764, 10-3-89, Cl. D9-423.000.
 Kim, Syng N., to Wico Distribution Corp. Joystick. 303,815, 10-3-89, Cl. D21-48.000.
 Klein, Rudolf, to Bond Street, Ltd. Combination stationery holder and pocket secretary. 303,809, 10-3-89, Cl. D19-27.000.
 Kohler Co.: See—
 Kohler, Herbert V., Jr.; and Kolada, Paul P., 303,829, Cl. D23-250.000.
 Reid, Mary J., 303,742, Cl. D6-499.000.
 Kohler, Herbert V., Jr.; and Kolada, Paul P., to Kohler Co. Faucet handle or the like. 303,829, 10-3-89, Cl. D23-250.000.
 Kolada, Paul P.: See—
 Kohler, Herbert V., Jr.; and Kolada, Paul P., 303,829, Cl. D23-250.000.
 Kondoh, Nobuyuki; Abe, Yoshinori; and Yamane, Iwao, to Mitsubishi Denki Kabushiki Kaisha. Data input unit for a sewing machine with a touch entry pad. 303,788, 10-3-89, Cl. D14-100.000.
 Kuba, Lawrence M., to Wang Laboratories, Inc. Video display. 303,793, 10-3-89, Cl. D14-113.000.
 Kunna, Paul E.; and Kunna, Sadie A. Kitchen box top opener. 303,751, 10-3-89, Cl. D8-18.000.
 Kunna, Sadie A.: See—
 Kunna, Paul E.; and Kunna, Sadie A., 303,751, Cl. D8-18.000.
 Kusayanagi, Masao: See—
 Kato, Shuzo; Nakamura, Yasushi; and Kusayanagi, Masao, 303,806, Cl. D18-4.000.
 Kwiecinski, Gordon F., to Hamilton Sorter Co., Inc. Rotatable filing and storage cabinet. 303,737, 10-3-89, Cl. D6-455.000.
 Lee, Troy M., to Troy Lee Designs. Visor. 303,852, 10-3-89, Cl. D29-18.000.
 Lefkowitz, Jay. Table base. 303,740, 10-3-89, Cl. D6-495.000.
 Lefkowitz, Jay. Table base. 303,741, 10-3-89, Cl. D6-495.000.
 Levine, Norman. Bicycle frame. 303,777, 10-3-89, Cl. D12-111.000.

Lien-Fui, Wu. Combined face and eyes quarter massager. 303,838, 10-3-89, Cl. D24-41.000.
 Lin, Mark: See—
 Autry, James C.; and Lin, Mark, 303,730, Cl. D2-320.000.
 Linton, Paul W. Gas fired hot water pressure cleaning apparatus. 303,854, 10-3-89, Cl. D32-1.000.
 Little Tikes Company, The: See—
 Aker, Kevin R., 303,776, Cl. D12-108.000.
 Little Tikes Inc.: See—
 Aker, Kevin R., 303,826, Cl. D21-244.000.
 Lloyd, Robert D.: See—
 Fennell, Robert D.; Huber, Richard M.; Lloyd, Robert D.; and Scheid, William J., 303,799, Cl. D14-191.000.
 Loehlein, Timothy A.: See—
 Waltz, Richard L.; and Loehlein, Timothy A., 303,785, Cl. D13-3.000.
 Lowe, Gordon M.; and Lowe, Patrice P. Rack for laundry-type items or the like. 303,745, 10-3-89, Cl. D6-574.000.
 Lowe, Patrice P.: See—
 Lowe, Gordon M.; and Lowe, Patrice P., 303,745, Cl. D6-574.000.
 Lunde, Martin: See—
 Haukvik, Ola; and Lunde, Martin, 303,735, Cl. D6-365.000.
 Macasieb, Rick G. Shower shoe. 303,729, 10-3-89, Cl. D2-283.000.
 MacConkey, James S.: See—
 Sheehan, Terrence M.; Thomason, Jeffery W.; MacConkey, James S.; Reavis, Philip M., Jr.; and Britt, Edmund J., 303,805, Cl. D15-130.000.
 Maier, Larry R.; and Quinn, John L., to Rocco Enterprises. Tape measure cover. 303,772, 10-3-89, Cl. D10-74.000.
 Maloney, William J., II, to Quaker Oats Company, The. Soccer goal. 303,824, 10-3-89, Cl. D21-200.000.
 Matsushita Electric Industrial Co., Ltd.: See—
 Nishiyama, Kenji; Takahashi, Hanji; and Itakura, Yoshitomo, 303,796, Cl. D14-121.000.
 Mayo, Steven A.: See—
 Weinerman, Lee S.; and Mayo, Steven A., 303,754, Cl. D8-344.000.
 McCarthy, Alfred F., to Aavid Engineering, Inc. Plastic solderable-pinned mount for an electronic device. 303,755, 10-3-89, Cl. D8-349.000.
 McCarthy, Alfred F., to Aavid Engineering, Inc. Spring-clip heat sink for a pair of electronic devices. 303,786, 10-3-89, Cl. D13-23.000.
 McClellan, Bingham A., to McClellan Industries, Inc. Battery-powered sharpener for fish hooks or the like. 303,757, 10-3-89, Cl. D8-91.000.
 McClellan Industries, Inc.: See—
 McClellan, Bingham A., 303,757, Cl. D8-91.000.
 McPherson's Limited: See—
 Blochinger, Alfred; Collins, Christopher; Petroff, Cvetan; and Tench, Wallace, 303,731, Cl. D3-102.000.
 Meisei Electric Co., Ltd.: See—
 Kido, Shigeaki; Isozaki, Sadao; and Yajima, Yasuko, 303,801, Cl. D14-241.000.
 Messenger, Kenny R.: See—
 Messenger, Ronald L.; and Messenger, Kenny R., 303,787, Cl. D13-24.000.
 Messenger, Ronald L.; and Messenger, Kenny R. Connector strain relieving back shell. 303,787, 10-3-89, Cl. D13-24.000.
 Methodist Hospital System, The: See—
 Durham, Ira M., Jr., 303,743, Cl. D6-505.000.
 Meyers, Kenneth A., to Gerber Products Company. Door stop. 303,756, 10-3-89, Cl. D8-402.000.
 Micallef, Alfred M., to JMK International, Inc. Aircraft engine cover. 303,784, 10-3-89, Cl. D12-345.000.
 Mileos, George, to General Foods Corporation. Combined package and dispenser for extrudible comestibles. 303,759, 10-3-89, Cl. D9-306.000.
 Mitsubishi Denki Kabushiki Kaisha: See—
 Kondoh, Nobuyuki; Abe, Yoshinori; and Yamane, Iwao, 303,788, Cl. D14-100.000.
 Momentum Enterprises, Incorporated: See—
 Baird, Robert E.; and Baird, Thomas M., 303,767, Cl. D10-30.000.
 Morano, Emanuel P.: See—
 Fitzpatrick, William E.; Morano, Emanuel P.; and Craven, William J., 303,839, Cl. D24-46.000.
 Moss, Nicholas W., to Cobra Products, Inc. Plumber's flexible snake. 303,855, 10-3-89, Cl. D32-14.000.
 Motazed, Amy M. Combined tools and rack therefor. 303,774, 10-3-89, Cl. D11-131.000.
 Motorola, Inc.: See—
 Fennell, Robert D.; Huber, Richard M.; Lloyd, Robert D.; and Scheid, William J., 303,799, Cl. D14-191.000.
 Mrava, Gene L.: See—
 Cawood, Charles D.; and Mrava, Gene L., 303,841, Cl. D24-54.000.
 Nabisco Brands, Inc.: See—
 Spanier, Henry C.; and Spiel, Albert, 303,727, Cl. D1-106.000.
 Spanier, Henry C.; and Spiel, Albert, 303,728, Cl. D1-106.000.
 Nakamura, Yasushi: See—
 Kato, Shuzo; Nakamura, Yasushi; and Takeda, Junnosuke, 303,790, Cl. D14-106.000.
 Kato, Shuzo; Nakamura, Yasushi; and Kusayanagi, Masao, 303,806, Cl. D18-4.000.
 NCR Corporation: See—
 Kato, Shuzo; Nakamura, Yasushi; and Takeda, Junnosuke, 303,790, Cl. D14-106.000.
 Kato, Shuzo; Nakamura, Yasushi; and Kusayanagi, Masao, 303,806, Cl. D18-4.000.
 Newman, Joel C. Stereo radio. 303,800, 10-3-89, Cl. D14-195.000.
 Nishiyama, Kenji; Takahashi, Hanji; and Itakura, Yoshitomo, to Matsushita Electric Industrial Co., Ltd. Cassette for a video tape recorder. 303,796, 10-3-89, Cl. D14-121.000.
 Nitsuko Corporation: See—
 Taniguchi, Eiichi, 303,797, Cl. D14-146.000.
 Nitta, Tomio, to Tokai Corporation. Aerosol container. 303,758, 10-3-89, Cl. D9-300.000.
 Nugent, Marc. Wall lamp. 303,849, 10-3-89, Cl. D26-85.000.
 Olson, Elizabeth T.: See—
 Cardinal, Anthony J.; Hanekamp, Robert D.; and Olson, Elizabeth T., 303,762, Cl. D9-404.000.
 Onan Corporation: See—
 Waltz, Richard L.; and Loehlein, Timothy A., 303,785, Cl. D13-3.000.
 Parker, David H. Flashlight. 303,846, 10-3-89, Cl. D26-46.000.
 Pearl, Stephen; and Guido, Anthony, to Apple Computer, Inc. Computer housing. 303,791, 10-3-89, Cl. D14-107.000.
 Pease Industries, Inc.: See—
 Shaffer, B. Jeremiah, 303,843, Cl. D25-109.000.
 Petroff, Cvetan: See—
 Blochinger, Alfred; Collins, Christopher; Petroff, Cvetan; and Tench, Wallace, 303,731, Cl. D3-102.000.
 Phillips, Wyatt L., to QuikTrip Corporation. Gasoline pump island. 303,803, 10-3-89, Cl. D15-9.200.
 Playtex Family Products, Inc.: See—
 Fitzpatrick, William E.; Morano, Emanuel P.; and Craven, William J., 303,839, Cl. D24-46.000.
 Pletscher, Oskar. Luggage carrier or similar article for two-wheeled vehicles. 303,781, 10-3-89, Cl. D12-158.000.
 Pool, Daniel L.: See—
 Turner, Robert A.; and Pool, Daniel L., 303,744, Cl. D6-559.000.
 Procter & Gamble Company, The: See—
 Cardinal, Anthony J.; Hanekamp, Robert D.; and Olson, Elizabeth T., 303,762, Cl. D9-404.000.
 Puritoy, Linda. Coin holder. 303,863, 10-3-89, Cl. D99-34.000.
 Quaker Oats Company, The: See—
 Maloney, William J., II, 303,824, Cl. D21-200.000.
 QuikTrip Corporation: See—
 Phillips, Wyatt L., 303,803, Cl. D15-9.200.
 Quinn, John L.: See—
 Maier, Larry R.; and Quinn, John L., 303,772, Cl. D10-74.000.
 Ramsey, Roger H.; and Wilgus, Mitchell L., to Stanadyne, Inc. Bidet set. 303,828, 10-3-89, Cl. D23-242.000.
 Ramsey, Roger H.; and Wilgus, Mitchell L., to Stanadyne Inc. Combined hand shower diverter knob and escutcheon. 303,830, 10-3-89, Cl. D23-254.000.
 Ramsey, Roger H.; and Wilgus, Mitchell L., to Stanadyne, Inc. Combined shower control handle and escutcheon. 303,831, 10-3-89, Cl. D23-254.000.
 Reavis, Philip M., Jr.: See—
 Sheehan, Terrence M.; Thomason, Jeffery W.; MacConkey, James S.; Reavis, Philip M., Jr.; and Britt, Edmund J., 303,805, Cl. D15-130.000.
 Reid, Mary J., to Kohler Co. Table leg or the like. 303,742, 10-3-89, Cl. D6-499.000.
 Rocco Enterprises: See—
 Maier, Larry R.; and Quinn, John L., 303,772, Cl. D10-74.000.
 Roden, Mack L.; and Adams, Steven D. Combined dowel pin and parting guide for use in the construction of dental prosthetics. 303,836, 10-3-89, Cl. D24-16.000.
 Romana Acosta: See—
 de Witt, F. Carlos, 303,811, Cl. D19-65.000.
 Rubbermaid Incorporated: See—
 Foran, Kenneth C.; and David, Thomas J., 303,813, Cl. D19-77.000.
 Sakaguchi, Hiroshi: See—
 Yubisui, Takahisa; Sakaguchi, Hiroshi; and Takahashi, Toshiya, 303,807, Cl. D18-7.000.
 Sano, Anthony J. Vault cover. 303,864, 10-3-89, Cl. D99-43.000.
 Sauber, Charles J. Utility box for a pickup truck. 303,780, 10-3-89, Cl. D12-157.000.
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 Fennell, Robert D.; Huber, Richard M.; Lloyd, Robert D.; and Scheid, William J., 303,799, Cl. D14-191.000.
 Shaffer, B. Jeremiah, to Pease Industries, Inc. Decorative glass panel. 303,843, 10-3-89, Cl. D25-109.000.
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 Simplicity Manufacturing, Inc.: See—
 Kamlukin, Igor; Brackin, John F.; and Freier, Edward, Jr., 303,804, Cl. D15-23.000.
 Smaling, Richard J., to Tidewater Lures, Inc. Fishing lure. 303,827, 10-3-89, Cl. D22-127.000.
 Snyder Laboratories, Inc.: See—
 Weibacher, Eugene E., 303,840, Cl. D24-51.000.
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- Spiel, Albert: See—
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Spanier, Henry C.; and Spiel, Albert, 303,728, Cl. D1-106.000.
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Ramsey, Roger H.; and Wilgus, Mitchell L., 303,828, Cl. D23-242.000.
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Szewczak, Joseph M. Strap for a bicycle pedal cage. 303,778, 10-3-89, Cl. D12-125.000.
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Kato, Shuzo; Nakamura, Yasushi; and Takeda, Junnosuke, 303,790, Cl. D14-106.000.
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Tench, Wallace: See—
Blochinger, Alfred; Collins, Christopher; Petroff, Cvetan; and Tench, Wallace, 303,731, Cl. D3-102.000.
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Nitta, Tomio, 303,758, Cl. D9-300.000.
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David, Tom, 303,746, Cl. D7-53.000.
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Weder, Donald E., to Highland Supply Corporation. Vase. 303,775, 10-3-89, Cl. D11-155.000.
Weilbacher, Eugene E., to Snyder Laboratories, Inc. Surgical drain tube. 303,840, 10-3-89, Cl. D24-51.000.
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Kim, Syng N., 303,815, Cl. D21-48.000.
Wilgus, Mitchell L.: See—
Ramsey, Roger H.; and Wilgus, Mitchell L., 303,828, Cl. D23-242.000.
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Kondoh, Nobuyuki; Abe, Yoshinori; and Yamane, Iwao, 303,788, Cl. D14-100.000.
Yubisui, Takahisa; Sakaguchi, Hiroshi; and Takahashi, Toshiya, to Sharp Kabushiki Kaisha. Electronic calculator with memo. 303,807, 10-3-89, Cl. D18-7.000.
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Ziaylek, Theodore, Jr. Rotatable cylinder holder. 303,738, 10-3-89, Cl. D6-457.000.

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- Hayashi, Calvin K. Anthurium plant named Starlight. 7,044, 10-3-89, Cl. 88.000.
Man, Jan, to Oglevee Ltd. Distinct variety of Begonia plant named Sonata. 7,043, 10-3-89, Cl. 68.000.
Oglevee Ltd.: See—
Man, Jan, 7,043, Cl. 68.000.

LIST OF
STATUTORY INVENTION REGISTRATIONS

APPLICANTS TO WHOM

STATUTORY INVENTION REGISTRATIONS WERE ISSUED ON THE
3RD DAY OF OCTOBER, 1989

- Advanced Nuclear Fuels Corporation: See—
Martenson, Alfred J., H690, Cl. 376-445.000.
Arszman, Jerrold H.; Maykut, Albert R.; and Tate, John M., to United States of America, Army. Vented in-tube burning rocket. H684, 10-3-89, Cl. 102-377.000.
Baker, Ronald B.: See—
Christiansen, David W.; Karnesky, Richard A.; Leggett, Robert D.; and Baker, Ronald B., H689, Cl. 376-361.000.
Betts, Robert E., to United States of America, Army. Erosion rate determinator: rocket nozzle. H682, 10-3-89, Cl. 73-86.000.
Blackman, Gerald G.: See—
Matthewson, Michael D.; and Blackman, Gerald G., H692, Cl. 514-52.000.
Bovino, Lawrence J.: See—
Weiner, Maurice; Bovino, Lawrence J.; Burke, Terence; and Kim, Anderson H., H695, Cl. 357-30.000.
Brubaker, James E., to United States of America, Navy. Method for reloading a vertical launching system with missiles from a supply ship. H683, 10-3-89, Cl. 89-1.802.
Burke, Terence: See—
Weiner, Maurice; Bovino, Lawrence J.; Burke, Terence; and Kim, Anderson H., H695, Cl. 357-30.000.
Burroughs Wellcome Co.: See—
Matthewson, Michael D.; and Blackman, Gerald G., H692, Cl. 514-52.000.
Christiansen, David W.; Karnesky, Richard A.; Leggett, Robert D.; and Baker, Ronald B., to United States of America, Energy. Fuel pin. H689, 10-3-89, Cl. 376-361.000.
CPT Corporation: See—
Davidson, Willard S., H696, Cl. 364-900.000.
Czajkowski, Edward H., Jr., to United States of America, Army. Movable thermal and radar vehicular decoy. H694, 10-3-89, Cl. 342-13.000.
Davidson, Willard S., to CPT Corporation. System for accessing shared resource device by intelligent user devices. H696, 10-3-89, Cl. 364-900.000.
Du Pont de Nemours, E. I., and Company: See—
Sobataka, Warren S.; and Wolfe, William R., Jr., H688, Cl. 204-165.000.
Fuji Photo Film Co., Ltd.: See—
Kitaguchi, Hiroshi; and Kato, Masatoshi, H691, Cl. 430-203.000.
Karnesky, Richard A.: See—
Christiansen, David W.; Karnesky, Richard A.; Leggett, Robert D.; and Baker, Ronald B., H689, Cl. 376-361.000.
Kato, Masatoshi: See—
Kitaguchi, Hiroshi; and Kato, Masatoshi, H691, Cl. 430-203.000.
Kim, Anderson H.: See—
Weiner, Maurice; Bovino, Lawrence J.; Burke, Terence; and Kim, Anderson H., H695, Cl. 357-30.000.
Kitaguchi, Hiroshi; and Kato, Masatoshi, to Fuji Photo Film Co., Ltd. Heat developable photographic element. H691, 10-3-89, Cl. 430-203.000.
Leggett, Robert D.: See—
Christiansen, David W.; Karnesky, Richard A.; Leggett, Robert D.; and Baker, Ronald B., H689, Cl. 376-361.000.
Leupold, Herbert A., to United States of America, Army. PYX twister with superconducting confinement. H693, 10-3-89, Cl. 335-216.000.
Marra, C. Denton, to United States of America, Navy. Video microimaging system. H687, 10-3-89, Cl. 356-237.000.
Martenson, Alfred J., to Advanced Nuclear Fuels Corporation. Device to allow for expansion of nuclear fuel assemblies. H690, 10-3-89, Cl. 376-445.000.
Matthewson, Michael D.; and Blackman, Gerald G., to Burroughs Wellcome Co. Pest control. H692, 10-3-89, Cl. 514-52.000.
Maykut, Albert R.: See—
Arszman, Jerrold H.; Maykut, Albert R.; and Tate, John M., H684, Cl. 102-377.000.
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Tate, John M.: See—
Arszman, Jerrold H.; Maykut, Albert R.; and Tate, John M., H684, Cl. 102-377.000.
United States of America
Army: See—
Arszman, Jerrold H.; Maykut, Albert R.; and Tate, John M., H684, Cl. 102-377.000.
Betts, Robert E., H682, Cl. 73-86.000.
Czajkowski, Edward H., Jr., H694, Cl. 342-13.000.
Leupold, Herbert A., H693, Cl. 335-216.000.
Mullins, William D., H686, Cl. 350-352.000.
Olson, Donald N.; and Miller, Miles C., H685, Cl. 244-3.290.
Weiner, Maurice; Bovino, Lawrence J.; Burke, Terence; and Kim, Anderson H., H695, Cl. 357-30.000.
Energy: See—
Christiansen, David W.; Karnesky, Richard A.; Leggett, Robert D.; and Baker, Ronald B., H689, Cl. 376-361.000.
Navy: See—
Brubaker, James E., H683, Cl. 89-1.802.
Marra, C. Denton, H687, Cl. 356-237.000.
Weiner, Maurice; Bovino, Lawrence J.; Burke, Terence; and Kim, Anderson H., to United States of America, Army. High energy optically controlled kilovolt semiconductor switch. H695, 10-3-89, Cl. 357-30.000.
Wolfe, William R., Jr.: See—
Sobataka, Warren S.; and Wolfe, William R., Jr., H688, Cl. 204-165.000.

CLASSIFICATION OF PATENTS

ISSUED OCTOBER 3, 1989

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2	77 R	4,870,762	CLASS 38	77.7	4,870,763	CLASS 40	124.1	4,870,764	CLASS 62	652	4,870,822	483	4,870,879	157	4,870,926	CLASS 138	126	4,870,995	
2		4,870,765					152	4,870,765		723	4,870,823	CLASS 82	124	4,870,880	412	4,870,927	CLASS 139	126	4,870,995
207		4,870,766					154	4,870,766		740	4,870,824	CLASS 84	102.1	4,870,881	52 MV	4,870,928	1 R	4,870,996	
404		4,870,767					360	4,870,767		745	4,870,825	CLASS 86	471.3	4,870,882	78 R	4,870,929	383 A	4,870,998	
		4,870,768					430	4,870,768		751	4,870,826	CLASS 88	102.1	4,870,883	90.11	4,870,930	383 R	4,870,999	
482		4,870,769					564	4,870,769				CLASS 90	471.3	4,870,884	179 H	4,870,931			
												CLASS 92	413	4,870,885	325	4,870,932			
90		4,870,710										CLASS 94	20.12	4,870,886	336	4,870,933			
200 R		4,870,711										CLASS 96	9	4,870,887	422	4,870,935			
												CLASS 98	1.819	4,870,888	449	4,870,936			
116.1		4,871,370										CLASS 100	7	4,870,889	488	4,870,937			
403		4,871,371										CLASS 102	8	4,870,890	489	4,870,938			
410		4,871,372										CLASS 104	1.819	4,870,891	506	4,870,939			
												CLASS 106	7	4,870,892	558	4,870,940			
227		4,870,712										CLASS 108	8	4,870,893	571	4,870,941			
250.01		4,870,713										CLASS 110	1.819	4,870,894	585	4,870,942			
327 C		4,870,714										CLASS 112	2	4,870,895	11.5 C	4,870,943			
344		Re.33,074										CLASS 114	348	4,870,896	12.7 B	4,870,944			
												CLASS 116	361	4,870,897	14	4,870,945			
35 R		4,870,715										CLASS 118	53	4,870,898	113	4,870,946			
251		4,870,716										CLASS 120	155	4,870,899	121	4,870,947			
												CLASS 122	216	4,870,900	209 R	4,871,004			
31		4,870,717										CLASS 124	415.1	4,870,901	210	4,871,005			
44.1		4,870,718										CLASS 126	201	4,870,902	211	4,871,006			
74		4,870,719										CLASS 128	130.1	4,870,903	212	4,871,007			
												CLASS 130	206.2	4,870,904	213	4,871,008			
288		4,870,720										CLASS 132	130.1	4,870,905	214	4,871,009			
												CLASS 134	206.2	4,870,906	215	4,871,010			
306		4,871,373										CLASS 136	130.1	4,870,907	216	4,871,011			
												CLASS 138	206.2	4,870,908	217	4,871,012			
16 PB		4,870,721										CLASS 140	130.1	4,870,909	218	4,871,013			
16 R		4,870,722										CLASS 142	206.2	4,870,910	219	4,871,014			
68 SK		4,870,723										CLASS 144	130.1	4,870,911	220	4,871,015			
433		4,870,724										CLASS 146	206.2	4,870,912	221	4,871,016			
442		4,870,725										CLASS 148	130.1	4,870,913	222	4,871,017			
636		4,870,726										CLASS 150	206.2	4,870,914	223	4,871,018			
												CLASS 152	130.1	4,870,915	224	4,871,019			
10 C		4,870,727										CLASS 154	206.2	4,870,916	225	4,871,020			
												CLASS 156	130.1	4,870,917	226	4,871,021			
271		4,870,728										CLASS 158	206.2	4,870,918	227	4,871,022			
												CLASS 160	130.1	4,870,919	228	4,871,023			
25.42		4,870,729										CLASS 162	206.2	4,870,920	229	4,871,024			
26 A		4,870,730										CLASS 164	130.1	4,870,921	230	4,871,025			
116.1		4,870,731										CLASS 166	206.2	4,870,922	231	4,871,026			
121.5		4,870,732										CLASS 168	130.1	4,870,923	232	4,871,027			
156.5 R		4,870,733										CLASS 170	206.2	4,870,924	233	4,871,028			
157.3 C		4,870,734										CLASS 172	130.1	4,870,925	234	4,871,029			
159.1		4,870,735										CLASS 174	206.2	4,870,926	235	4,871,030			
227		4,870,736										CLASS 176	130.1	4,870,927	236	4,871,031			
240		4,870,737										CLASS 178	206.2	4,870,928	237	4,871,032			
252		4,870,738										CLASS 180	130.1	4,870,929	238	4,871,033			
263		4,870,739										CLASS 182	206.2	4,870,930	239	4,871,034			
271		4,870,740										CLASS 184	130.1	4,870,931	240	4,871,035			
335		4,870,741										CLASS 186	206.2	4,870,932	241	4,871,036			
568		4,870,742										CLASS 188	130.1	4,870,933	242	4,871,037			
		4,870,743										CLASS 190	206.2	4,870,934	243	4,871,038			
610.1		4,870,744										CLASS 192	130.1	4,870,935	244	4,871,039			
620		4,870,745										CLASS 194	206.2	4,870,936	245	4,871,040			
753		4,870,746										CLASS 196	130.1	4,870,937	246	4,871,041			
773		4,870,747										CLASS 198	206.2	4,870,938	247	4,871,042			
798		4,870,748										CLASS 200	130.1	4,870,939	248	4,871,043			
809		4,870,749										CLASS 202	206.2	4,870,940	249	4,871,044			
846		4,870,750										CLASS 204	130.1	4,870,941	250	4,871,045			
866		4,870,751										CLASS 206	206.2	4,870,942	251	4,871,046			
884		4,870,752										CLASS 208	130.1	4,870,943	252	4,871,047			
		4,870,753										CLASS 210	206.2	4,870,944	253	4,871,048			
												CLASS 212	130.1	4,870,945	254	4,871,049			
123		4,870,754										CLASS 214	206.2	4,870,946	255	4,871,050			
123.3		4,870,755										CLASS 216	130.1	4,870,947	256	4,871,051			
304		4,870,756										CLASS 218	206.2	4,870,948	257	4,871,052			
344		4,870,757										CLASS 220	130.1	4,870,949	258	4,871,053			
388		4,870,758										CLASS 222	206.2	4,870,950	259	4,871,054			
												CLASS 224	130.1	4,870,951	260	4,871,055			
563		4,870,759										CLASS 226	206.2	4,870,952	261	4,871,056			
												CLASS 228	130.1	4,870,953	262	4,871,057			
32		4,870,760										CLASS 230	206.2	4,870,954	263	4,871,058			
												CLASS 232	130.1	4,870,955	264	4,871,059			
												CLASS 234	206.2	4,870,956	265	4,871,060			
												CLASS 236	130.1	4,870,957	266	4,871,061			
51		4,870,761										CLASS 238	206.2	4,870,958	267	4,871,062			
												CLASS 240	130.1	4,870,959	268	4,871,063			
												CLASS 242	206.2	4,870,960	269	4,871,064			
												CLASS 244	130.1	4,870,961	270	4,871,065			
												CLASS 246	206.2	4,870,962	271	4,871,066			
												CLASS 248	130.1	4,870,963	272	4,871,067			
												CLASS 250	206.2	4,870,964	273	4,871,068			
												CLASS 252	130.1	4,870,965	274	4,871,069			
												CLASS 254	206.2	4,870,966	275	4,871,070			
												CLASS 256	130.1	4,870,967	276	4,871,071			
												CLASS 258	206.2	4,870,968	277	4,871,072			
												CLASS 260	130.1	4,870,969	278	4,871,073			
												CLASS 262	206.2	4,870,970	279	4,871,074			
												CLASS 264	130.1	4,870,971	280	4,871,075			
												CLASS 266	206.2	4,870,972	281	4,871,076			

139	4,871,035	167	4,871,452	56 R	4,871,123	455	4,871,929	721	4,872,001
163	4,871,036	198.2	4,871,453	67.3 R	4,871,124	465	4,871,930	811	4,872,002
CLASS 174		205	4,871,454	84.1 R	4,871,125	491	4,871,931	825.08	4,872,003
36	4,871,883	232	4,871,455	86.5 R	4,871,126	530	4,871,933	825.440	4,872,005
52.1	4,871,884	321.84	4,871,456	201	4,871,127	CLASS 310		825.500	4,872,004
CLASS 175		333.1	4,871,457	255	4,871,128	166	4,871,934	870.01	4,872,007
67	4,871,037	360.1	4,871,458	CLASS 270		232	4,871,935	CLASS 341	
CLASS 177		519	4,871,459	39	4,871,157	233	4,871,936	26	4,872,008
25.18	4,871,038	634	4,871,460	53	4,871,158	323	4,871,937	95	4,872,009
CLASS 178		638	4,871,461	55	4,871,159	328	4,871,938	134	4,872,010
CLASS 179		651	4,871,462	122 AG	4,871,130	332	4,871,939	150	4,872,011
CLASS 180		682	4,871,463	130	4,871,131	CLASS 312		CLASS 342	
CLASS 181		CLASS 211		153 R	4,871,133	216	4,871,217	25	4,872,012
79.1	4,871,039	13	4,871,074	225	4,871,163	312	4,871,218	135	4,872,013
142	4,871,040	189	4,871,075	CLASS 272		412	4,871,940	351	4,872,014
219	4,871,041	366	4,871,076	73	4,871,164	485	4,871,941	353	4,872,015
220	4,871,042	CLASS 215		132	4,871,165	493	4,871,942	380	4,872,016
248	4,871,043	1055 B	4,871,891	144	4,871,166	526	4,871,943	CLASS 343	
273	4,871,044	1055 E	4,871,892	CLASS 273		CLASS 315		715	4,872,017
CLASS 182		99	4,871,893	1 E	4,871,167	56	4,871,944	742	4,872,018
114	4,871,045	121.6	4,871,894	26 B	4,871,168	77	4,871,945	753	4,872,019
131	4,871,046	121.67	4,871,895	126 R	4,871,169	248	4,871,946	771	4,872,020
CLASS 183		137 R	4,871,896	138 A	4,871,170	344	4,871,947	778	4,872,021
CLASS 184		233	4,871,897	138 S	4,871,171	382	4,871,948	801	4,872,022
3.58	4,871,048	233	4,871,898	153 S	4,871,172	393	4,871,949	806	4,872,022
21.5	4,871,049	366	4,871,899	164	4,871,173	CLASS 318		CLASS 344	
70.29	4,871,050	400	4,871,900	187 R	4,871,174	466	4,871,950	1.1	4,872,023
85 C	4,871,051	458	4,871,901	237	4,871,175	640	4,871,951	108	4,872,024
CLASS 193		CLASS 219		256	4,871,176	140 R	4,872,025	140 R	4,872,026
35 MD	4,871,052	1055 B	4,871,891	411	4,871,177	CLASS 320		CLASS 350	
CLASS 194		1 B	4,871,078	CLASS 277		13	4,871,956	1.4	4,871,219
CLASS 195		1 R	4,871,079	34.6	4,871,179	26	4,871,957	1.7	4,871,220
208	4,871,053	5 A	4,871,080	207 A	4,871,180	32	4,871,958	96.12	4,871,221
212	4,871,054	22	4,871,081	229	4,871,181	61	4,871,959	96.14	4,871,222
344	4,871,055	23.4	4,871,082	CLASS 328		24	4,871,960	96.15	4,871,223
CLASS 196		85 F	4,871,083	434	4,871,182	267	4,871,961	96.16	4,871,224
335	4,871,056	4	4,871,084	475	4,871,183	65 R	4,871,962	96.17	4,871,225
346.1	4,871,057	CLASS 221		477	4,871,184	73 R	4,871,963	96.25	4,871,226
444	4,871,058	1 B	4,871,085	CLASS 251		158 F	4,871,964	96.26	4,871,227
532	4,871,059	1 R	4,871,086	611	4,871,185	309	4,871,965	96.34	4,871,228
716	4,871,060	CLASS 222		667	4,871,186	318	4,871,966	96.76	4,871,229
CLASS 197		1	4,871,087	680	4,871,187	318	4,871,967	144	4,871,231
5 R	4,871,885	47	4,871,088	711	4,871,188	389	4,871,970	162.11	4,871,232
16 R	4,871,893	54	4,871,089	801	4,871,189	509	4,871,971	286	4,871,233
43.05	4,871,886	81	4,871,090	804	4,871,190	551	4,871,972	333	4,871,234
83 R	4,871,887	92	4,871,091	808	4,871,191	CLASS 283		354	4,871,235
144 B	4,871,888	153	4,871,092	72	4,871,193	174	4,871,208	355	4,871,236
146 R	4,871,889	213	4,871,093	611	4,871,194	309	4,871,209	419	4,871,237
314	4,871,890	386	4,871,094	667	4,871,195	318	4,871,210	422	4,871,238
CLASS 201		437	4,871,095	680	4,871,196	389	4,871,211	427	4,871,239
CLASS 202		487	4,871,096	711	4,871,197	509	4,871,212	484	4,872,069
CLASS 203		2.5	4,871,426	72	4,871,198	551	4,871,213	CLASS 355	
CLASS 204		1 T	4,871,427	73	4,871,199	124	4,871,975	27	4,872,033
2.1	4,871,428	44.4	4,871,429	74	4,871,200	308	4,871,976	62	4,872,034
72	4,871,430	182.4	4,871,431	75	4,871,201	345	4,871,977	75	4,872,035
192.12	4,871,432	153	4,871,432	76	4,871,202	69	4,871,978	208	4,872,036
192.16	4,871,433	191	4,871,433	77	4,871,203	253	4,871,979	253	4,872,037
224 R	4,871,434	310	4,871,434	78	4,871,204	255	4,871,980	CLASS 356	
286	4,871,435	CLASS 225		79	4,871,205	297	4,871,981	36	4,871,248
291	4,871,436	96	4,871,436	80	4,871,206	299	4,871,982	73	4,871,249
401	4,871,437	408	4,871,437	81	4,871,207	338	4,871,983	121	4,871,250
403	4,871,438	409	4,871,438	82	4,871,208	345	4,871,984	136	4,871,251
409	4,871,439	CLASS 228		83	4,871,209	354	4,871,985	147	4,871,252
418	4,871,440	33	4,871,440	84	4,871,210	378	4,871,986	158	4,871,253
427	4,871,441	47	4,871,441	85	4,871,211	389	4,871,987	208	4,871,254
428	4,871,442	121	4,871,442	86	4,871,212	397	4,871,988	253	4,871,255
CLASS 205		122	4,871,443	87	4,871,213	400	4,871,989	271	4,871,256
CLASS 206		180.1	4,871,444	88	4,871,214	407	4,871,990	373	4,871,257
326	4,871,061	245	4,871,445	89	4,871,215	439	4,871,991	400	4,871,258
328	4,871,062	CLASS 229		90	4,871,216	457	4,871,992	422	4,871,259
386	4,871,063	104	4,871,446	91	4,871,217	487	4,871,993	CLASS 357	
387	4,871,064	CLASS 232		92	4,871,218	521	4,871,994	4	4,872,038
425	4,871,065	4 R	4,871,447	93	4,871,219	539	4,871,995	13	4,872,039
427	4,871,066	65	4,871,448	94	4,871,220	569	4,871,996	23.5	4,872,041
428	4,871,067	86	4,871,449	95	4,871,221	587	4,871,997	23.6	4,872,042
545	4,871,068	115	4,871,450	96	4,871,222	706	4,872,000	24	4,872,043
591	4,871,069	173	4,871,451	97	4,871,223	CLASS 303		CLASS 358	
628	4,871,070	211.22	4,871,452	98	4,871,224	384 E	4,871,991	CLASS 359	
CLASS 208		222	4,871,453	99	4,871,225	407	4,871,992	CLASS 360	
39	4,871,443	248	4,871,454	100	4,871,226	439	4,871,993	CLASS 361	
46	4,871,444	328.1	4,871,455	101	4,871,227	457	4,871,994	CLASS 362	
89	4,871,445	514	4,871,456	102	4,871,228	487	4,871,995	CLASS 363	
152	4,871,446	521	4,871,457	103	4,871,229	521	4,871,996	CLASS 364	
CLASS 210		521	4,871,458	104	4,871,230	539	4,871,997	CLASS 365	
166	4,871,447	CLASS 241		105	4,871,231	569	4,871,998	CLASS 366	
169	4,871,448	106	4,871,459	106	4,871,232	587	4,871,999	CLASS 367	
656	4,871,072	182	4,871,460	107	4,871,233	706	4,872,000	CLASS 368	
672	4,871,073	230	4,871,461	108	4,871,234	CLASS 305		CLASS 369	
CLASS 211		CLASS 267		109	4,871,235	384 E	4,871,991	CLASS 370	
110	4,871,449	64.12	4,871,462	110	4,871,236	407	4,871,992	CLASS 371	
151	4,871,450	140.1	4,871,463	111	4,871,237	439	4,871,993	CLASS 372	
161	4,871,463	140.1	4,871,464	112	4,871,238	457	4,871,994	CLASS 373	
164	4,871,451	55.2	4,871,465	113	4,871,239	487	4,871,995	CLASS 374	

38	4,872,044	4,872,137	89	4,871,265	4,871,537	54	4,871,634	CLASS 441
60	4,872,046	4,872,138	85.7	4,871,266	4,871,538	55	4,871,635	4,871,335
67	4,872,047	4,872,139	93	4,871,267	4,871,539	60	4,871,636	4,871,336
68	4,872,049	4,872,140	195.1	4,871,268	4,871,540	77	4,871,637	4,871,337
71	4,872,050	4,872,141	411	4,871,269	4,871,541	116	4,871,638	4,871,338
CLASS 375		4,872,142	432	4,871,270	4,871,542	CLASS 445		4,871,339
103	4,872,051	4,872,143	438	4,871,271	4,871,543	7	4,871,340	4,871,340
106	4,872,052	4,872,144	470	4,871,272	4,871,544	CLASS 446		4,871,341

[illegible]

CLASSIFICATION OF DESIGNS

D1—	106	303,727	D8—	1	303,750	D11—	3	303,773		303,796		108	303,819	D25—	33	303,842	
		303,728		18	303,751		131	303,774		303,797		147	303,820		109	303,843	
D2—	283	303,729		71	303,752		155	303,775		151	303,798		153	303,821		121	303,844
	320	303,730		91	303,757	D12—	108	303,776		191	303,799		171	303,822	D26—	9	303,845
D3—	103	303,731		328	303,753		111	303,777		195	303,800		199	303,823		46	303,846
D4—	104	303,732		344	303,754		125	303,778		241	303,801		200	303,824		63	303,847
	108	303,733		349	303,755		151	303,779		258	303,802		217	303,825		65	303,848
D5—	45	303,734		402	303,756		157	303,780	D15—	2	303,803		244	303,826		85	303,849
D6—	365	303,735	D9—	300	303,758		158	303,781		23	303,804	D22—	127	303,827	D28—	77	303,850
	379	303,736		306	303,759		191	303,782		130	303,805	D23—	142	303,828	D29—	12	303,851
	455	303,737		307	303,760		192	303,783	D18—	4	303,806		250	303,829		18	303,852
	457	303,738		337	303,761		345	303,784		7	303,807		254	303,830	D30—	129	303,853
	470	303,739		404	303,762	D13—	3	303,785		19	303,808		303,831	D32—	1	303,854	
	495	303,740		415	303,763		23	303,786	D19—	27	303,809		336	303,832		14	303,855
		303,741		423	303,764		24	303,787		46	303,810		386	303,833		18	303,856
499		303,742			303,765	D14—	100	303,788		65	303,811	D24—	10	303,834		35	303,857
505		303,743		430	303,766		106	303,789		72	303,812		15	303,835		37	303,858
559		303,744	D10—	30	303,767		107	303,790		77	303,813		16	303,836		46	303,859
574		303,745		38	303,768			303,791	D20—	39	303,814		29	303,837		48	303,860
D7—	53	303,746			303,769		113	303,792	D21—	48	303,815		31	303,838		64	303,861
	104	303,747		39	303,770		114	303,793		104	303,816		46	303,839	D99—	34	303,862
	152	303,748		40	303,771		121	303,794			303,817		51	303,840		43	303,863
	351	303,749		74	303,772			303,795			303,818		54	303,841		34	303,864

CLASSIFICATION OF PLANTS

P -	68	7,043	88	7,044				
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STATUTORY INVENTION REGISTRATIONS

73—	86	H682	204—	165	H688	342—	13	H694									
89—	1 802	H683	244—	3.29	H685	350—	352	H686	357—	30	H695	376—	361	H689	430—	203	H691
102—	377	H684	335—	216	H693	356—	237	H687	364—	900	H696		445	H690	514—	52	H692

GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

01 :	4,871,197	4,871,094	4,871,938	4,871,365	4,871,483	4,872,213
	4,871,200	4,871,095	4,871,949	4,871,422	4,871,889	18 : 4,870,817
	4,871,264	4,871,106	4,871,962	4,871,466	4,870,759	4,870,846
04 :	4,871,900	4,871,133	4,871,978	4,871,477	4,870,925	4,870,963
	4,870,943	4,871,139	4,871,979	4,871,486	4,871,275	4,870,975
	4,871,069	4,871,189	4,871,983	4,871,718	4,871,688	4,871,061
	4,871,273	4,871,196	4,871,997	4,871,861	4,872,056	4,871,192
	4,871,296	4,871,204	4,871,998	4,871,992	4,872,112	4,871,218
	4,871,319	4,871,210	4,872,010	4,872,047	4,870,761	4,871,258
	4,871,686	4,871,225	4,872,015	4,872,107	4,870,763	4,871,263
	4,871,689	4,871,232	4,872,020	4,872,130	4,870,784	4,871,403
	4,871,926	4,871,233	4,872,023	4,870,728	4,870,891	4,871,668
	4,871,928	4,871,247	4,872,028	4,870,813	4,870,900	4,871,830
	4,871,929	4,871,250	4,872,052	4,871,008	4,870,914	4,871,866
	4,871,965	4,871,252	4,872,054	4,871,379	4,870,929	4,871,939
	4,872,038	4,871,267	4,872,063	4,871,696	4,870,948	19 : 4,870,797
	4,872,088	4,871,280	4,872,070	4,871,810	4,870,969	4,870,836
	4,872,133	4,871,318	4,872,071	4,871,847	4,871,006	4,870,880
05 :	4,872,202	4,871,327	4,872,073	Re.33,074	4,871,031	4,870,960
	4,870,735	4,871,355	4,872,074	4,870,708	4,871,048	4,870,926
	4,872,149	4,871,357	4,872,078	4,870,802	4,871,058	4,871,027
06 :	Re.33,079	4,871,360	4,872,079	4,870,823	4,871,082	4,871,759
	4,870,711	4,871,367	4,872,084	4,870,859	4,871,089	21 : 4,870,764
	4,870,719	4,871,381	4,872,097	4,870,882	4,871,118	4,870,796
	4,870,722	4,871,391	4,872,104	4,870,986	4,871,167	22 : 4,871,370
	4,870,734	4,871,421	4,872,109	4,870,991	4,871,209	4,871,386
	4,870,765	4,871,445	4,872,110	4,871,047	4,871,303	4,871,430
	4,870,772	4,871,450	4,872,111	4,871,055	4,871,310	4,871,505
	4,870,779	4,871,463	4,872,120	4,871,096	4,871,352	4,871,524
	4,870,780	4,871,475	4,872,125	4,871,102	4,871,415	4,871,556
	4,870,787	4,871,509	4,872,137	4,871,154	4,871,435	4,871,717
	4,870,789	4,871,534	4,872,140	4,871,184	4,871,465	4,871,863
	4,870,842	4,871,544	4,872,172	4,871,281	4,871,611	4,871,877
	4,870,849	4,871,548	4,872,177	4,871,338	4,871,690	4,872,151
	4,870,855	4,871,550	4,872,181	4,871,353	4,871,699	23 : 4,870,958
	4,870,873	4,871,551	4,872,195	4,871,364	4,871,806	24 : 4,870,714
	4,870,876	4,871,559	4,872,208	4,871,388	4,871,831	4,870,829
	4,870,924	4,871,567	4,872,210	4,871,424	4,871,892	4,870,840
	4,870,946	4,871,568	4,872,211	4,871,554	4,871,989	4,870,966
	4,870,949	4,871,587	4,872,212	4,871,692	4,872,004	4,871,073
	4,870,952	4,871,602	08 : 4,870,847	4,871,716	4,872,017	4,871,166
	4,870,953	4,871,626	4,871,335	4,871,914	4,872,031	4,871,360
	4,870,971	4,871,628	4,871,677	4,871,924	4,872,046	4,871,560
	4,870,977	4,871,682	4,872,156	4,871,971	4,872,064	4,871,629
	4,870,982	4,871,785	4,870,818	4,871,974	4,872,089	25 : 4,870,749
	4,870,992	4,871,854	4,870,826	4,871,981	4,872,098	4,870,838
	4,871,012	4,871,856	4,871,015	4,872,005	4,872,157	4,870,901
	4,871,014	4,871,857	4,871,142	4,872,121	4,872,158	4,870,994
	4,871,022	4,871,899	4,871,156	4,872,182	4,872,159	4,871,208
	4,871,023	4,871,907	4,871,168	13 : 4,870,756	4,872,160	4,871,220
	4,871,029	4,871,930	4,871,169	4,870,841	4,872,191	4,871,226
	4,871,077	4,871,931	4,871,315	4,870,998	4,872,196	4,871,248
	4,871,084	4,871,933	4,871,315	4,871,291	4,872,207	4,871,289

GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

4,871,431	4,871,845	4,872,176	39 :	4,871,183	4,871,062	4,871,350
4,871,480	4,872,102	4,872,197		4,870,706	4,871,066	4,871,378
4,871,593	4,872,105	4,872,205		4,870,773	4,871,074	4,871,449
4,871,595	4,870,739	4,870,976	28 :	4,870,793	4,871,087	4,871,454
4,871,768	4,870,775	4,871,948		4,870,853	4,871,105	4,871,468
4,871,817	4,870,810	4,872,086		4,870,856	4,871,135	4,871,520
4,871,826	4,870,832	4,872,135		4,870,858	4,871,140	4,871,605
4,871,855	4,870,997	Re 33,074	35 :	4,870,917	4,871,175	4,871,618
4,871,870	4,870,713	Re 33,077		4,870,922	4,871,207	4,871,703
4,871,921	4,870,736	4,870,710	29 :	4,871,004	4,871,297	4,871,770
4,871,957	4,870,738	4,870,721		4,871,046	4,871,301	4,871,789
4,871,980	4,870,746	4,870,730		4,871,064	4,871,326	4,871,848
4,871,984	4,870,814	4,870,794		4,871,065	4,871,354	4,871,874
4,872,101	4,871,028	4,870,867		4,871,078	4,871,358	4,871,878
4,872,145	4,871,109	4,870,870		4,871,085	4,871,382	4,871,879
4,872,148	4,871,188	4,870,897		4,871,120	4,871,402	4,871,893
4,872,180	4,871,256	4,871,002		4,871,144	4,871,428	4,871,959
4,872,214	4,871,276	4,871,080		4,871,185	4,871,453	4,871,982
Re 33,075	4,871,317	4,871,108		4,871,186	4,871,526	4,871,995
4,870,798	4,871,374	4,871,158		4,871,199	4,871,698	4,872,100
4,870,825	4,871,731	4,871,165		4,871,217	4,871,708	4,872,106
4,870,871	4,870,741	4,871,170		4,871,308	4,871,711	4,872,144
4,870,908	4,871,115	4,871,262		4,871,345	4,871,739	4,872,169
4,870,932	4,871,205	4,871,293		4,871,406	4,871,741	4,870,705
4,870,984	4,870,707	4,871,328		4,871,427	4,871,771	4,870,957
4,870,988	4,870,725	4,871,363		4,871,495	4,871,776	4,872,012
4,871,040	4,870,732	4,871,395		4,871,507	4,871,871	4,870,786
4,871,075	4,870,837	4,871,429		4,871,516	4,871,920	4,870,898
4,871,083	4,871,321	4,871,433		4,871,522	4,871,945	4,871,729
4,871,097	4,871,552	4,871,488		4,871,531	4,872,022	4,870,745
4,871,098	4,871,662	4,871,489		4,871,553	4,872,039	4,871,123
4,871,136	Re 33,080	4,871,496		4,871,569	4,872,083	4,871,285
4,871,148	4,870,816	4,871,525		4,871,661	4,872,122	4,871,423
4,871,177	4,870,843	4,871,527		4,871,706	4,872,168	4,871,604
4,871,190	4,870,965	4,871,564		4,871,712	4,872,186	4,871,684
4,871,216	4,871,021	4,871,570		4,871,732	4,871,178	4,871,737
4,871,286	4,871,091	4,871,575	43 :	4,871,736	4,871,833	4,871,818
4,871,287	4,871,181	4,871,597	44 :	4,871,780	4,870,811	4,871,859
4,871,341	4,871,235	4,871,600	45 :	4,871,801	4,870,962	4,872,057
4,871,377	4,871,260	4,871,617		4,871,816	4,870,999	4,872,136
4,871,397	4,871,339	4,871,619		4,871,881	4,871,366	4,870,857
4,871,439	4,871,369	4,871,621		4,871,908	4,871,371	4,871,036
4,871,487	4,871,398	4,871,630		4,871,935	4,871,533	4,871,051
4,871,557	4,871,420	4,871,634		4,872,018	4,871,603	4,871,081
4,871,588	4,871,444	4,871,648		4,872,188	4,870,757	4,871,131
4,871,651	4,871,446	4,871,652	47 :	4,872,190	4,870,835	4,871,176
4,871,779	4,871,491	4,871,656		4,870,778	4,870,881	4,871,213
4,871,788	4,871,514	4,871,694	40 :	4,870,910	4,871,003	4,871,251
4,871,809	4,871,523	4,871,714		4,870,961	4,871,312	4,871,437
4,871,827	4,871,535	4,871,715		4,871,016	4,870,709	4,871,683
4,871,887	4,871,538	4,871,726		4,871,018	4,870,737	4,872,026
4,871,917	4,871,546	4,871,733	48 :	4,871,037	4,870,888	4,872,090
4,872,051	4,871,572	4,871,758		4,871,045	4,871,195	4,870,770
4,872,082	4,871,622	4,871,782		4,871,195	4,870,907	4,871,511
4,872,094	4,871,702	4,871,795		4,871,337	4,870,919	4,870,715
4,872,095	4,871,705	4,871,814		4,871,455	4,870,978	4,870,742
4,872,099	4,871,721	4,871,844		4,871,485	4,870,989	4,870,830
4,870,753	4,871,727	4,871,862		4,871,521	4,871,019	4,870,878
4,870,883	4,871,743	4,871,872		4,871,895	4,871,024	4,871,030
4,870,886	4,871,745	4,871,904	41 :	4,870,771	4,871,079	4,871,063
4,871,026	4,871,746	4,871,919		4,870,964	4,871,099	4,871,127
4,871,111	4,871,749	4,871,946		4,871,009	4,872,027	4,871,201
4,871,253	4,871,764	4,871,956	42 :	4,870,743	4,871,161	4,871,292
4,871,261	4,871,836	4,871,966		4,870,752	4,871,179	4,871,333
4,871,265	4,871,865	4,871,969		4,870,791	4,871,203	4,871,334
4,871,376	4,871,873	4,872,016		4,872,081	4,871,219	4,871,451
4,871,380	4,871,903	4,872,040		4,870,812	4,871,231	4,871,529
4,871,462	4,871,944	4,872,087		4,870,824	4,871,282	4,871,623
4,871,563	4,871,964	4,872,087		4,870,868	4,871,283	4,871,823
4,871,599	4,871,986	4,872,126		4,870,887	4,871,302	4,871,825
4,871,671	4,872,002	4,872,189		4,870,911	4,871,307	4,871,888
4,871,786	4,872,014	4,872,198		4,870,912	4,871,316	4,871,898
4,871,790	4,872,025	4,870,781		4,870,956	4,871,322	4,871,922
4,871,803	4,872,113	4,870,839		4,871,007	4,871,336	4,872,127
4,871,812	4,872,141	4,870,863		4,871,044		
4,871,824	4,872,163	4,870,980				

DESIGN PATENTS

01 :	303,800	303,847	303,834	303,839	303,779	44 :	303,764
04 :	303,822	303,851	303,862	303,855	303,810		303,778
06 :	303,744	303,852	303,783	303,753	303,813	48 :	303,730
	303,729	303,772	303,858	303,759	303,821		303,743
	303,739	303,832	303,859	303,765	303,826		303,784
	303,745	303,732	303,746	303,766	303,828		303,841
	303,782	303,760	303,740	303,805	303,830	51 :	303,802
	303,787	303,751	303,741	303,809	303,831		303,827
	303,789	303,777	303,750	303,824	303,840	53 :	303,755
	303,791	303,799	303,757	303,849	303,843		303,860
	303,794	303,864	303,863	303,850	303,803		303,814
	303,811	303,749	303,785	303,857	303,842		303,853
	303,816	303,763	303,823	303,737	303,836	55 :	303,742
	303,817	303,775	303,786	303,754	303,854		303,747
	303,818	303,780	303,793	303,762	303,770		303,756
	303,825	303,815	303,727	303,770	303,738		303,804
	303,845	303,835	303,728	303,776	303,837		303,829
	303,846	303,774	303,833				

PLANT PATENTS

15	7,044				
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STATUTORY INVENTION REGISTRATIONS

01	H682	06	H687		H694	34	H693	39	H688	53	H689
	H684		H685	27	H696		H695	42	H683		H690

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Robert A. Mosbacher, *Secretary*
PATENT AND TRADEMARK OFFICE
Donald J. Quigg, *Commissioner*

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Vol. 1107 Number 2

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October 10, 1989

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

OFFICIAL GAZETTE of the
UNITED STATES PATENT AND TRADEMARK OFFICE
October 10, 1989 Volume 1107 Number 2

CONTENTS

	Page
Patent and Trademark Office Notices	
Patent Cooperation Treaty (PCT) Information	1107 OG 46
Status of Appeal Cases	1107 OG 46
Notice of Maintenance Fees Payable	1107 OG 46
Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees	1107 OG 47
Reissue Applications Filed	1107 OG 48
Requests for Reexaminations Filed	1107 OG 49
Service by Publication	1107 OG 49
Patents Available for License or Sale	1107 OG 49
Patent Terms Extended Under 35 USC 156	1107 OG 50
Patent Certificates of Correction	1107 OG 51
Special Boxes for Mail	1107 OG 52
Reference Collections of U.S. Patents Available for Public Use in	
Patent Depository Libraries	1107 OG 53
Condition of Patent Applications	1107 OG 55
Reexamination	535
Reissue Patents Granted (33,082)	539
Plant Patents Granted (7,045)	543
Patents Granted	
General and Mechanical (4,872,215)	545
Chemical (4,872,880)	777
Electrical (4,873,393)	925
Design Patents Granted (303,865)	1041
Index of Patentees	PI 1
Indices of Reissue, Reexamination and Design Plant Patentees	PI 64
Classification of	
Patents (Including Reissues and Reexaminations)	PI 69
Designs, and Plants Applications	PI 72
Geographical Index of Residence of Inventors	
Patents (Including Reissues and Reexaminations)	PI 73
Designs and Plant Applications	PI 74
Change of Address Form and Subscription Order Form	Back Page

The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed.
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Printing authorized by Section 11(a)3 of Title 35, U.S. P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1107 O.G. 5 on Oct. 3, 1989.

For use of the European Patent Office as a Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 5 on Sept. 28, 1982.

For use of the European Patent Office as an international Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2 on July 7, 1987 and at 1091 O.G. 2 on June 7, 1988.

The Search fee of the European Patent Office was changed due to a difference in the exchange rate of the U.S. dollar in relation to the German Mark as of Sept. 1, 1989, and was announced in the *Official Gazette* at 1105 O.G. 36 on Aug. 15, 1989.

International PCT fees were changed on June 1, 1989 due to a difference in the exchange rate of the U.S. dollar in relation to the Swiss Franc and were announced in the *Official Gazette* at 1102 O.G. 90 on May 30, 1989.

Certain domestic PCT fees and charges for International Search and Preliminary Examination have been changed effective Apr. 17, 1989 and were announced in the *Official Gazette* at 1100 O.G. 24 on Mar. 7, 1989.

The current schedule of PCT fees is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office as Searching Authority (ISA)	
—No corresponding prior U.S. national application filed:	550.00
—Corresponding prior U.S. national application filed:	380.00
—Supplemental search fee, per additional invention:	150.00
European Patent Office as Searching Authority:	1040.00
Preliminary examination fee	
U.S. Patent and Trademark Office as Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as Searching Authority:	400.00
—Additional examination fee, per additional invention:	130.00
—Searching Authority not the USPTO:	600.00
—Additional examination fee, per additional invention:	200.00
International fees	
Basic fee:	436.00
Basic Supplemental fee (for each page over 30):	9.00
Designation fee per country or region for the first 10 national or regional offices:	106.00
Designation fee for 11th and subsequent designations:	No Charge
Handling fee:	134.00

U.S. National Stage fees

	Small Entity	Non-small Entity
U.S. Patent and Trademark Office was Preliminary Examining Authority (IPEA)	165.00	330.00
USPTO was ISA but not		

IPEA	185.00	370.00
USPTO was neither ISA nor IPEA	250.00	500.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(2) to (4)	25.00	50.00
—For each independent claim in excess of 3	18.00	36.00
—For each claim in excess of 20	6.00	12.00
—For each application containing a multiple dependent claim	60.00	120.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39.1	60.00	120.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39.1	30.00	30.00

September 12, 1989. DONALD J. QUIGG,
Assistant Secretary and Commissioner
of Patents and Trademarks.

Status of Appeal Cases

The Date of Examiner's Answer of Oldest Ex Parte Appeals Awaiting Assignment to Panel For A Decision Without a Hearing as of August 31, 1989.	
Chemical Discipline -	February 1, 1988
Mechanical Discipline -	May 2, 1988
Electrical Discipline -	April 13, 1988

The Date of Examiner's Answer of Oldest Ex Parte Appeals Awaiting Hearing as of August 31, 1989.

Chemical -	October 1, 1987
Electrical -	December 1, 1987
Mechanical -	August 4, 1987

Board of Patent Appeals and Interferences Decisions Rendered in Ex Parte Appeals During the Month of August 1989.

Affirmed	262
Affirmed-in-Part	56
Reversed	208
Total Decided	526

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on application filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Apr. 17, 1989. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the patent.

OCTOBER 10, 1989

U. S. PATENT AND TRADEMARK OFFICE

1107 OG 47

Attention is drawn to the patents which were issued on October 7, 1986, for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,615,046 through 4,616,364
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on October 5, 1982 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,352,211 through 4,353,132
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months and seven years and six months are set forth in 37 CFR 1.20(e), (f), (h) and (i), as amended effective Apr. 17, 1989, which are reproduced below:

37 CFR § 1.20 Post-issuance fees	
"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant....."	\$245.00"
"(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant....."	\$495.00"
"(h) For maintaining an original or reissue patent except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:	
By a small entity (§1.9(f)).....	\$245.00
By other than a small entity.....	\$490.00"
"(i) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant:	
By a small entity (§1.9(f)).....	\$495.00
By other than a small entity.....	\$990.00"

The amounts of the surcharges as amended effective Apr. 17, 1989, are set forth in 37 CFR 1.20 (k), (l) and (m) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982....."	\$120.00"
"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:	
By a small entity (§1.9(f)).....	\$60.00
By other than a small entity.....	\$120.00"
"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been unavoidable....."	\$550.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED JULY 23, 1989 DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,530,111	06/527,167	07/23/85
4,530,112	06/488,480	07/23/85
4,530,119	06/518,828	07/23/85
4,530,122	06/385,971	07/23/85
4,530,129	06/421,469	07/23/85
4,530,136	06/422,738	07/23/85
4,530,137	06/606,987	07/23/85
4,530,142	06/543,410	07/23/85
4,530,148	06/576,797	07/23/85
4,530,152	06/481,523	07/23/85
4,530,154	06/583,885	07/23/85
4,530,158	06/502,094	07/23/85
4,530,163	06/555,531	07/23/85
4,530,171	06/562,201	07/23/85
4,530,173	06/510,767	07/23/85
4,530,175	06/519,020	07/23/85
4,530,191	06/344,756	07/23/85
4,530,196	06/467,035	07/23/85
4,530,200	06/502,335	07/23/85
4,530,202	06/457,063	07/23/85
4,530,204	06/644,477	07/23/85
4,530,205	06/530,487	07/23/85
4,530,206	06/528,958	07/23/85
4,530,208	06/473,284	07/23/85
4,530,211	06/635,670	07/23/85
4,530,219	06/575,005	07/23/85
4,530,221	06/530,706	07/23/85
4,530,224	06/533,609	07/23/85
4,530,239	06/599,235	07/23/85
4,530,240	06/551,892	07/23/85
4,530,255	06/585,633	07/23/85
4,530,257	06/502,453	07/23/85
4,530,260	06/594,220	07/23/85
4,530,261	06/565,590	07/23/85
4,530,262	06/501,063	07/23/85
4,530,266	06/560,227	07/23/85
4,530,274	06/371,412	07/23/85
4,530,277	06/620,200	07/23/85
4,530,280	06/570,492	07/23/85
4,530,291	06/535,177	07/23/85
4,530,293	06/387,466	07/23/85
4,530,299	06/629,568	07/23/85
4,530,306	06/568,920	07/23/85
4,530,310	06/567,420	07/23/85
4,530,331	06/593,990	07/23/85
4,530,346	06/619,731	07/23/85
4,530,348	06/478,668	07/23/85
4,530,349	06/558,621	07/23/85
4,530,350	06/592,216	07/23/85
4,530,361	06/634,340	07/23/85
4,530,362	06/512,251	07/23/85
4,530,377	06/521,486	07/23/85
4,530,384	06/543,587	07/23/85
4,530,386	06/545,336	07/23/85
4,530,388	06/509,353	07/23/85
4,530,390	06/514,659	07/23/85
4,530,392	06/496,750	07/23/85
4,530,397	06/480,763	07/23/85
4,530,399	06/546,937	07/23/85
4,530,408	06/479,716	07/23/85

Patent Number	Serial Number	Issue Date	4,530,954	06/571,710	07/23/85
4,530,411	06/514,984	07/23/85	4,530,978	06/531,657	07/23/85
4,530,426	06/446,919	07/23/85	4,530,980	06/579,052	07/23/85
4,530,431	06/447,295	07/23/85	4,530,995	06/509,481	07/23/85
4,530,433	06/492,594	07/23/85	4,531,002	06/641,618	07/23/85
4,530,439	06/653,895	07/23/85	4,531,006	06/265,735	07/23/85
4,530,440	06/482,339	07/23/85	4,531,014	06/577,842	07/23/85
4,530,445	06/425,228	07/23/85	4,531,018	06/561,646	07/23/85
4,530,448	06/493,625	07/23/85	4,531,023	06/408,024	07/23/85
4,530,467	06/465,684	07/23/85	4,531,026	06/476,228	07/23/85
4,530,472	06/623,093	07/23/85	4,531,032	06/558,325	07/23/85
4,530,479	06/539,812	07/23/85	4,531,041	06/464,000	07/23/85
4,530,482	06/262,518	07/23/85	4,531,045	06/624,888	07/23/85
4,530,488	06/510,638	07/23/85	4,531,050	06/313,271	07/23/85
4,530,493	06/635,564	07/23/85	4,531,063	06/404,387	07/23/85
4,530,496	06/461,535	07/23/85	4,531,076	06/446,091	07/23/85
4,530,499	06/430,558	07/23/85	4,531,082	06/523,753	07/23/85
4,530,500	06/622,959	07/23/85	4,531,086	06/446,334	07/23/85
4,530,504	06/496,144	07/23/85	4,531,091	06/363,219	07/23/85
4,530,508	06/398,106	07/23/85	4,531,095	06/585,926	07/23/85
4,530,514	06/485,022	07/23/85	4,531,105	06/452,774	07/23/85
4,530,537	06/529,294	07/23/85	4,531,108	06/581,322	07/23/85
4,530,549	06/557,480	07/23/85	4,531,109	06/479,448	07/23/85
4,530,561	06/394,221	07/23/85	4,531,115	06/402,154	07/23/85
4,530,563	06/431,850	07/23/85	4,531,121	06/437,602	07/23/85
4,530,567	06/377,816	07/23/85	4,531,125	06/392,749	07/23/85
4,530,570	06/482,959	07/23/85	4,531,127	06/598,442	07/23/85
4,530,577	06/520,956	07/23/85	4,531,168	06/416,330	07/23/85
4,530,584	06/462,808	07/23/85	4,531,169	06/353,690	07/23/85
4,530,591	06/484,540	07/23/85	4,531,180	06/217,545	07/23/85
4,530,607	06/639,505	07/23/85	4,531,187	06/435,776	07/23/85
4,530,619	06/422,538	07/23/85	4,531,208	06/351,999	07/23/85
4,530,629	06/424,061	07/23/85	4,531,219	06/519,045	07/23/85
4,530,638	06/558,002	07/23/85	4,531,230	06/388,439	07/23/85
4,530,639	06/577,359	07/23/85	4,531,237	06/554,170	07/23/85
4,530,641	06/485,540	07/23/85			
4,530,644	06/666,136	07/23/85			
4,530,646	06/484,235	07/23/85			
4,530,647	06/578,370	07/23/85			
4,530,659	06/566,521	07/23/85			
4,530,660	06/584,637	07/23/85			
4,530,661	06/650,658	07/23/85			
4,530,685	06/467,342	07/23/85			
4,530,715	06/438,448	07/23/85			
4,530,717	06/459,011	07/23/85			
4,530,728	06/669,146	07/23/85			
4,530,732	06/476,220	07/23/85			
4,530,733	06/559,885	07/23/85			
4,530,734	06/458,460	07/23/85			
4,530,735	06/425,573	07/23/85			
4,530,738	06/430,625	07/23/85			
4,530,740	06/604,838	07/23/85			
4,530,748	06/611,112	07/23/85			
4,530,755	06/547,086	07/23/85			
4,530,760	06/452,976	07/23/85			
4,530,769	06/479,965	07/23/85			
4,530,782	06/576,157	07/23/85			
4,530,785	06/601,697	07/23/85			
4,530,802	06/415,110	07/23/85			
4,530,803	06/660,570	07/23/85			
4,530,805	06/607,163	07/23/85			
4,530,806	06/386,337	07/23/85			
4,530,814	06/377,721	07/23/85			
4,530,827	06/545,427	07/23/85			
4,530,836	06/611,538	07/23/85			
4,530,843	06/545,159	07/23/85			
4,530,845	06/511,268	07/23/85			
4,530,849	06/583,792	07/23/85			
4,530,852	06/570,743	07/23/85			
4,530,853	06/617,932	07/23/85			
4,530,867	06/543,015	07/23/85			
4,530,884	06/471,897	07/23/85			
4,530,918	06/545,521	07/23/85			
4,530,930	06/562,735	07/23/85			
4,530,936	06/512,193	07/23/85			
4,530,947	06/603,396	07/23/85			
4,530,949	06/632,523	07/23/85			

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

4,567,738, Re. S. N. 152,407, Filed Feb. 4, 1988, Cl. 66/85.A, STRUCTURAL FABRIC AND METHOD FOR MAKING SAME, Harold K. Hutson et al., Owner of Record: *Knytex Inc. Minneapolis, Minn.*, Attorney or Agent: Norman F. Oblon, Ex. Gp.: 247

4,656,166, Re. S. N. 338,166, Filed Apr. 14, 1989, Cl. 123/643, CRANK ANGLE DETECTING SYSTEM FOR ENGINES, Haruo Yuzawa et al., Owner of Record: *Nissan Motor Company, Ltd., Kanagawa-Ken, Japan*, Attorney or Agent: John J. Feldhaus, Ex. Gp.: 342

4,681,483, Re. S. N. 381,900, Filed Aug. 22, 1989, Cl. 405/267, CASTING OF STRUCTURAL WALLS, Paul Camilleri, Owner of Record: *Foundation Technology (Aust) Pty Ltd.*, Attorney or Agent: Charles M. Marmelstein, Ex. Gp.: 351

4,689,932, Re. S. N. 400,677, Filed Aug. 30, 1989, Cl. 52/648, PORTABLE SHELTER ASSEMBLIES, Theodore R. Zeigler, Owner of Record: *World Shelters Inc., Springfield, Virginia*, Attorney or Agent: Mark D. Schuman, Ex. Gp.: 354

4,690,287, Re. S. N. 400,149, Filed Aug. 29, 1989, Cl. 211/49.1, GRAVITY FEED DISPLAY DEVICE, Jane S. Ferishko et al., Owner of Record: *Mead Corp., Dayton, Ohio*, Attorney or Agent: Walter M. Rodgers, Ex. Gp.: 355

4,690,405, Re. S. N. 398,263, Filed Aug. 24, 1989, Cl. 273/73C, TENNIS RACKET, Jack L. Frolov, Owner of Record: *Inventor*, Attorney or Agent: None, Ex. Gp.: 334

4,691,375, Re. S. N. 399,583, Filed Aug. 28, 1989, Cl. 455/071, DATA TRANSMISSION USING A TRANSPARENT

TONE-IN BAND SYSTEM, Joseph P. McGeehan et al., Owner of Record: *National Research Development Corp., London, England*, Attorney or Agent: Scott C. Harris, Ex. Gp.: 263

4,748,163, Re. S. N. 400,200, Filed Aug. 29, 1989, Cl. 514/194, NOVEL B-LACTAM ANTIBIOTICS, Gunter Schmidt et al., Owner of Record: *Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany*, Attorney or Agent: Leonard Horn, Ex. Gp.: 125

4,750,118, Re. S. N. 398,379, Filed Aug. 24, 1989, Cl. 364/400, CODING SYSTEM FOR MULTIPLE TRANSMITTERS AND SINGLE RECEIVER FOR A GARAGE DOOR OPENER, Carl Heitschel et al., Owner of Record: *The Chamberlain Group Inc., Elmhurst, Ill.*, Attorney or Agent: Richard B. Wakely, Ex. Gp.: 236

4,755,911, Re. S. N. 380,106, Filed July 14, 1989, Cl. 361/414, MULTILAYER PRINTED CIRCUIT BOARD, Hirotsuke Suzuki, Owner of Record: *Junkosha Company Ltd., Tokyo, Japan*, Attorney or Agent: E. Alan Uebler, Ex. Gp.: 215

4,830,203, Re. S. N. 399,903, Filed Aug. 29, 1989, Cl. 211/105.2, SUPPORT FOR DISPLAY ITEMS OR THE LIKE, Jan S. Ennis, Owner of Record: *Enaco Optical Incorporated, Kirkland, Va.*, Attorney or Agent: Robert A. Jensen, Ex. Gp.: 355

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

4,392,580, Reexam. No. 90/001,836, Requested Aug. 31, 1989, Cl. 215/332, CLOSURE CAP, Charles S. Ochs, Owner of Record: *Anchor Hocking Corp. Lancaster, Ohio*, Attorney or Agent: Richard H. Evans, Ex. Gp.: 240, Requester: Owner

4,449,345, Reexam. No. 90/001,835, Requested Aug. 31, 1989, Cl. 52/506, INSULATION MODULE HARDWARE, Mack A. Haunsel, et al. Owner of Record: *Manville Sales Corp. Denver, Colo.*, Attorney or Agent: Robert F. Hess, Ex. Gp.: 350, Requester: Owner

4,577,958, Reexam. No. 90/001,833, Requested Aug. 28, 1989, Cl. 428/36, NON-FRAYING BREATHABLE FABRIC SUITABLE FOR USE AS A COTTON BALE COVER AND BAG FABRIC APPARATUS AND METHOD FOR MAKING THE SAME, Edward D. Barkis, et al., Owner of Record: *Standard Oil Inc. Chicago, Ill.*, Attorney or Agent: Stephen L. Hensley, Ex. Gp.: 150, Requester: Synthetic Industries Inc. Chickamauga, Ga.

4,764,604, Reexam. No. 90/001,834, Requested Aug. 31, 1989, Cl. 536/103, DERIVATIVES OF GAMMA-CY-CLODEXTRIN, Bernd W. W. Muller, Owner of Record: *Janssen Pharmaceutica N.V. Beerse, Belgium*, Attorney or Agent: Thomas A. Paintin Ex. Gp.: 180, Requester: Owner

4,797,170, Reexam. No. 90/001,837, Requested Sept. 6, 1989, Cl. 156/71, SYSTEM FOR HOLDING CARPET IN PLACE WITHOUT STRETCHING, Merle R. Hoopengardner, Owner of Record: *Jactac Inc., Lafayette, Calif.*, Attorney or Agent: Donald C. Feix, Ex. Gp.: 130, Requester: Orcon Corp., Union City, Calif.

Service by Publication

A petition to cancel each of the registrations identified below having been filed, and the notice of such proceedings sent by

certified mail to registrant at the last known address having been returned by the Postal Service as undeliverable, notice is given that unless the registrants listed herein, their assigns or legal representatives shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

On-Guard Corporation of America, Carlstadt, N.J., Reg. No. 888,974, for the mark "ON-GUARD", Canc. No. 17,835.
International Fragrance Corporation, Philadelphia, Pa., Reg. No. 902,774 for the mark "EARTH", Canc. No. 17,856.

Betsy A. Kofoid and James P. Kofoid dba The Fun Company, Freeport, Ill., Reg. No. 1,317,242, for the mark "THE FUN COMPANY" and design, Canc. No. 17,895.

LFW Corporation, dba Traveling Light, San Francisco, Calif., Reg. No. 1,364,406 for the mark "TRAVELING LIGHT", Canc. No. 17,914.

Nandy Knits, Inc., New York, N.Y., Reg. No. 926,222 for the mark "BANANAS", Canc. No. 17,940.

Gourmet Food Products, Inc., Pasco, Wash., Reg. No. 957,930 for the mark "PETTITE-OS, etc." and design, Canc. No. 17,969.

Kurt S. Mundahl and Sara D. Langworthy, Minneapolis, Minn., Reg. No. 1,359,307 for the mark "GRUNTS G" and design, Canc. No. 17,984.

Mite-T-Mart Corporation, Washington, D.C., Reg. No. 886,888 for the mark "MITE-T-MART", Canc. NO. 18,110.

Joel Rosenman, John Roberts and William Roberts dba The Three R's, New York, N.Y., Reg. Nos. 1,256,958 and 1,269,278 for the mark "A LITTLE SOMETHING" and design, Canc. No. 18,020.

Southern Seating & R.V. Products, Inc., St. Petersburg, Fla., Reg. No. 1,351,593, for the mark "SOUTHERN" and design, Canc. No. 17,685.

Letot, Incorporated, Stratford, Conn., Reg. No. 1,006,025, for the mark "VERSATEL" and design, Canc. No. 17,733.

National Pet Products Corp., San Rafael, Calif., Reg. No. 1,391,279, for the mark "PETPRO NATIONAL PET PRODUCTS CORP." and design, Canc. No. 17,844.

Terson Company, Inc., Chicago, Ill., Reg. No. 575,987, for the mark "SIMPLE SIMON" and design, Canc. No. 17,889.

Kendall Technology Corp., Miami, Fl, Reg. No. 995,211, for the mark "ACCU-DIGIT", Canc. No. 17,896.

Taiho Industries Co., Ltd., New York, N.Y., Reg. No. 968,453, for the mark "KLIN VIEW", Canc. No. 17,677.

Identronix, Inc., Santa Cruz, Calif., Reg. No. 1,283,125, for the mark "IDX", Canc. No. 17,763.

Montrex Corporation, New York, N.Y., Reg. No. 336,639, for the mark "CIRCLE", Canc. No. 18,029.

Jetsoft, Inc., East Falmouth, Mass., Reg. No. 1,328,209, for the mark "BIZWIZ", Canc. No. 18,031.

Smokehouse Products, Inc., Landover, Md., Reg. No. 940,653, for the mark "HOFBERG'S", Canc. No. 18,040.

One On One Sports Training Center, Inc., Philadelphia, Pa., Reg. No. 1,427,857, for the mark "ONE ON ONE", Canc. No. 18,071.

ERMA S. BROWN
Administrator of the Trademark Trial
and Appeal Board
For JEFFREY M. SAMUELS
Assistant Commissioner for Trademarks

Patents Available for License or Sale

Inquiries about the patents listed below should be directed to Shirk, Reist, Wyagenseller and Shirk, K.S. Shirk, Jr. Esquire at P.O. Box 1552, Lancaster, Pa., 17603

3,758,097
3,792,851
3,845,565

AUTOMATIC VISE JAW
AUTOMATIC VISE JAW
ANGLE MEASURING
DEVICE
PIN ORIENTING,
ALIGNING AND
TAPING MACHINE

3,860,110

4,184,347

AIR HEATING AND
CIRCULATING FIRE-
PLACE GRATE

Patent Terms Extended Under 35 USC 156

A certificate extending the terms of the following patents were issued on September 18, 1989.

- 4,266,112-WEB-CUTTING PROCESS, William P. Niedermeyer, 1024 Mount Mary Drive, Green Bay, Wis. 54301
4,576,178-AUDIO SIGNAL GENERATOR, David Johnson, Box 68, 436 East 69th Street, New York, N.Y. 10021
4,702,704- TETRAHEDRAL CONDON STEREO-TABLE, Birch, Stewart, Kolash & Birch, Leonard R. Svensson, 301 N. Washington Street, P. O. Box 747, Falls Church, Va. 22046
4,763,932-HOSE COUPLING, Edward I. Matz, Esq., P.O. Box 5337, Daytona Beach, Fla. 32118
4,807,880-BALL SUPPORT DEVICE, Douglas E. White, Attorney at Law, 101 California Street, Suite 980, San Francisco, Calif. 94111
07/325,289-COMPUTER PROGRAM FOR PREVENTING THE FORMATTING OF A HARD DISK, Boyd W. Ghering, 551 Maple Ave., Doylestown, Pa. 18901

Patent No. 3,652,762, granted Mar. 28, 1972 to Alfred Sallmann, et al., Owner of Record: Ciba-Geigy Corp., Title: PHARMACEUTICAL COMPOSITIONS AND METHODS EMPLOYING SUBSTITUTED DERIVATIVES OF 2-ANILINOPHENYLACETIC ACIDS AND ESTERS, Classification: 524/60, Product Trade Name: Voltaren, Term Extended: 2 years

Patent No. 4,387,089, granted June 7, 1983 to Karl-Fred De Polo, Owner of Record: Givaudan Corp., Title: 4-(1,1-DIMETHYLETHYL)-4'-METHOXDIBENZOYLMETHANE, Classification: 424/59, Product Trade Name: Photoplex, Term Extended: 2 years

PATENT NOTICES

Certificates of Correction For Week of October 10, 1989

B1. 3,826,379	4,791,676	4,805,017	4,818,261
4,434,154	4,792,262	4,806,719	4,818,491
4,569,863	4,792,325	4,806,769	4,818,803
4,615,883	4,793,524	4,807,514	4,819,252
4,672,402	4,793,541	4,807,843	4,819,410
4,684,456	4,793,745	4,808,012	4,819,500
4,689,437	4,793,776	4,808,756	4,820,812
4,696,442	4,793,979	4,808,988	4,822,295
4,701,464	4,794,443	4,809,019	4,823,129
4,717,358	4,794,696	4,809,518	4,823,669
4,725,848	4,795,231	4,809,638	4,823,738
4,728,661	4,795,536	4,809,640	4,824,191
4,738,505	4,795,823	4,809,765	4,824,486
4,752,603	4,795,831	4,809,791	4,824,971
4,753,830	4,795,959	4,810,386	4,825,024
4,754,987	4,798,686	4,810,404	4,825,107
4,757,865	4,798,905	4,810,519	4,826,750
4,758,091	4,798,930	4,810,771	4,827,407
4,759,103	4,799,177	4,811,018	4,827,534
4,759,916	4,799,284	4,811,079	4,827,783
4,760,556	4,800,024	4,811,232	4,827,901
4,764,550	4,800,274	4,811,712	4,828,055
4,770,886	4,800,337	4,811,850	4,828,567
4,771,313	4,800,385	4,811,937	4,828,620
4,772,687	4,800,755	4,812,343	4,828,640
4,774,064	4,800,866	4,812,961	4,828,760
4,776,738	4,801,581	4,813,013	4,828,964
4,777,599	4,801,987	4,813,807	4,829,145
4,778,570	4,802,413	4,814,299	4,829,198
4,779,762	4,802,532	4,815,313	4,829,210
4,779,845	4,802,718	4,815,838	4,829,264
4,780,802	4,802,747	4,816,333	4,829,946
4,784,061	4,802,926	4,816,492	4,831,029
4,784,169	4,802,992	4,817,349	4,831,090
4,784,840	4,803,140	4,817,589	4,832,374
4,785,051	4,804,387	4,817,678	4,833,158
4,785,137	4,804,484	4,817,800	4,837,798
4,785,319	4,804,719	4,817,866	
4,768,188	4,804,749	4,818,218	

SPECIAL BOXES FOR MAIL

Special PTO mail box numbers should be used to allow forwarding of particular types of mail to the appropriate areas as quickly as possible. Such mail is forwarded directly to the appropriate area without being opened. Only the specified type of document should be placed in an envelope addressed to one of these boxes. If any documents other than the specified type identified for each box are addressed to that box, they will be delayed in reaching the appropriate area for which they are intended.

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Box Pat. Ext.	Applications for patent term extension.
Box PCT	Mail related to applications filed under the Patent Cooperation Treaty.
Box Reexam	Mail related to Reexamination.
Box SN	For fee and petitions under 37 CFR 1.182 to obtain date received and/or serial number for patent application prior to the Office's standard notification (return post card or the official "Filing Receipt," "Notice to File Missing Parts," or "Notice of Incomplete Application").
PATENT APPLICATION	New patent application and associated papers and fees.
TRADEMARK APPLICATION	New trademark application and associated papers and fees.
Box Assignments	All assignment documents except those filed in new patent applications.

Reference Collection of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries (PDLs), receive current issues of U.S. Patents and maintain collections of earlier-issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections, which are organized in patent number sequence, are available for use by the public free of charge. Each of the PDLs, in addition, offers supplemental reference publications of the U.S. Patent Classification System, including the *Manual of Classification*, *Index to the U.S. Patent Classification*, *Classification Definitions*, and provides technical staff assistance in their use to aid the public, in gaining effective access to information contained in patents. CASSIS (Classification And Search Support Information System); which provides direct, on-line access to Patent and Trademark Office data, is available at all PDLs. Facilities for making paper copies of patents from either microfilm or paper collections are generally provided for a fee.

Since there are variations in the scope of patent collections among the PDLs and in their hours of service to the public, anyone contemplating use of the patents at a particular library is urged to contact that library, in advance, about its collection and hours in order to avert possible inconvenience.

State	Name of Library	Telephone Contact
Alabama	Auburn University Libraries	(205) 844-1747
	Birmingham Public Library	(205) 226-3680
Alaska	Anchorage: Z. J. Loussac Public Library	(907) 261-2916
Arizona	Tempe: Noble Library, Arizona State University	(602) 965-7607
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	Sunnyvale Patent Clearinghouse	(408) 730-7290
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Connecticut	New Haven: Science Park Library	(203) 786-5447
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Illinois	Chicago Public Library	(312) 269-2865
	Springfield: Illinois State Library	(217) 782-5430
Indiana	Indianapolis-Marion County Public Library	(317) 269-1741
Iowa	Des Moines: State Library of Iowa	(515) 281-4118
Kentucky	Louisville Free Public Library	(502) 561-8617
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library and Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 376
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4281
Nebraska	Lincoln: Engineering Library, University of Nebraska-Lincoln	(402) 472-3411
Nevada	Reno: University of Nevada-Reno Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7782
	Piscataway: Library of Science and Medicine, Rutgers University	(201) 932-2895
New Mexico	Albuquerque: University of New Mexico General Library	(505) 277-4412
New York	Albany: New York State Library	(518) 473-4636
	Buffalo and Erie County Public Library	(716) 858-7101
	New York Public Library (The Research Libraries)	(212) 714-8529
North Carolina	Raleigh: D.H. Hill Library, North Carolina State University	(919) 737-3280
Ohio	Cincinnati and Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 292-6175
	Toledo/Lucas County Public Library	(419) 259-5212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 744-7086
Oregon	Salem: Oregon State University	(503) 378-4239
Pennsylvania	Philadelphia, The Free Library of	(215) 686-5331
	Pittsburgh, Carnegie Library of	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 455-8027
South Carolina	Charleston: Medical University of South Carolina Library	(803) 792-2371
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
	Nashville: Stevenson Science Library, Vanderbilt University	(615) 322-2775

Reference Collection of U. S. Patents Available for Public Use in Patent Depository Libraries—(continued)

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	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
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	Houston: The Fondren Library, Rice University	(713) 572-8101 Ext.2587
	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Utah	Richmond: Virginia Commonwealth University Library	(804) 367-1104
Virginia	Seattle: Engineering Library, University of Washington	(206) 543-0740
Washington	Madison: Kurt F. Wendt Library, University of Wisconsin	(608) 262-6845
Wisconsin	Milwaukee Public Library	(414) 278-3247

PATENT EXAMINING CORPS

JAMES E. DENNY, Acting Assistant Commissioner
STEPHEN G. KUNIN, Acting Deputy Assistant Commissioner
CONDITION OF PATENT APPLICATIONS AS OF September 9, 1989

PATENT EXAMINING GROUPS

Actual Filing Date of Oldest
New Case Awaiting Action

CHEMICAL EXAMINING GROUPS

GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	5-26-87
ORGANIC CHEMISTRY GROUP 120—S. N. ZAHARNA, Director	6-16-87
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	4-15-87
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	5-14-87
BIOTECHNOLOGY, GROUP 180—J. E. KITTLE, Director	7-30-86

ELECTRICAL EXAMINING GROUPS

INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—D. G. Kelly, Director	5-4-87
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	12-23-86
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—G. GOLDBERG, Director	5-28-87
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M. BLIX, Director	5-27-88
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director	8-18-87
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. LEVY, Acting Director	7-2-87
DESIGN, GROUP 290—K. L. CAGE, Director	2-6-86

MECHANICAL EXAMINING GROUPS

HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	1-12-88
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—N. GODICI, Acting Director	4-13-88
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—J. J. LOVE, Director	4-20-87
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—C. CROYLE, Acting Director	2-26-88
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	10-3-88

Expiration of patents: The patents within the range of numbers indicated below expire during September 1989, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

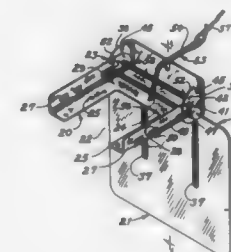
Patents	Numbers 3,688,314 to 3,694,813 inclusive
Plant Patents	None

REEXAMINATIONS

OCTOBER 10, 1989

Matter enclosed in heavy brackets [] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 3,965,838 (1137th)
BACKWASH BAFFLE AND STABILIZING DEVICE FOR PROPELLER DRIVEN WATERCRAFT
 Frank O. Uht, Bellevue, Wash., assignor to R. Wayne Uht, Bellevue, Wash.
 Reexamination Request No. 90/001,434, Feb. 1, 1988.
 Reexamination Certificate for Patent No. 3,965,838, issued Jun. 29, 1976, Ser. No. 581,160, May 27, 1975.
 Int. Cl.⁴ B63H 25/48
 U.S. Cl. 114—145 A



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

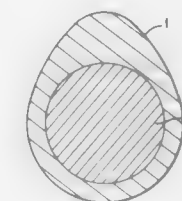
Claims 1-4, 7 and 9-11 are determined to be patentable as amended.

Claims 5, 6, 8, 12 and 13, dependent on an amended claim, are determined to be patentable.

7. A combination trolling backwash baffle and cruise stabilizing device mountable to the anticavitation plate of a drive unit for operation below the operative water line of a watercraft, comprising:

- a mounting member adapted to be anchored to the anticavitation plate;
- a plate member pivotally mounted to the mounting member for movement about an axis between (a) a [first] trolling position intersecting backwash produced by the drive unit to slow the watercraft for trolling at low speeds; and (b) a [second] cruise position angularly displaced from the [first] trolling position and in a plane parallel to the anticavitation plate to guide the backwash to increase maneuverability at cruise speeds by reducing porpoising and skidding in turns;
- releasable locking means mounted on one of the members directly interconnecting the members below the water line for operatively locking and unlocking the plate member relative to the mounting member in either of the positions thereof.

B1 4,236,923 (1138th)
METHOD OF METALLURGICALLY JOINING A FITTING TO A SHAFT
 Akio Takahashi, Toyota; Chiaki Tsumuki, Aichi, and Hitoshi Nakamura, Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan
 Reexamination Request No. 90/000,572, Jun. 6, 1984.
 Reexamination Certificate for Patent No. 4,236,923, issued Dec. 2, 1980, Ser. No. 960,622, Nov. 14, 1978.
 Claims priority, application Japan, Jan. 31, 1978, 53-9527
 Int. Cl.⁴ B22F 7/00
 U.S. Cl. 419—6

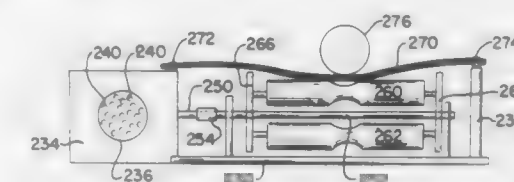


AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1-14 are cancelled.

[1. A method of joining a shaft to a fitting member comprising, molding a fitting member from wear-resistant iron base sinterable alloy powder which yields a liquid phase and shrinks during sintering; assembling said fitting member to a separately produced shaft; and then sintering the assembly of fitting member and shaft at a temperature to cause the fitting member to shrink and to yield a liquid phase of the fitting member to metallurgically bond the fitting member to the shaft.]

B1 4,506,660 (1139th)
MASSAGING DEVICE
 William F. Curran, 85 Dobson Rd., Mars, Pa. 16046
 Reexamination Request No. 90/001,523, Jun. 13, 1988.
 Reexamination Certificate for Patent No. 4,506,660, issued Mar. 26, 1985, Ser. No. 360,791, Mar. 22, 1982.
 and a continuation-in-part of Ser. No. 264,432, May 18, 1981,
 Int. Cl.⁴ A61H 15/00
 U.S. Cl. 128—57



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

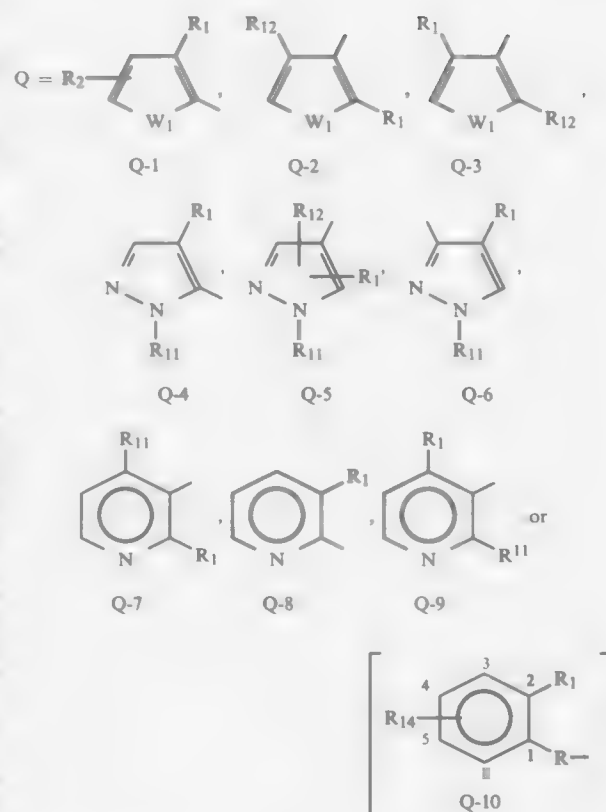
Claim 14 is cancelled.

Claims 1, 13, 15 and 16 are determined to be patentable as amended.

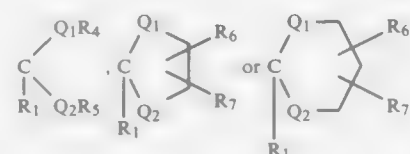
Claims 2-12, dependent on an amended claim, are determined to be patentable.

13. A cervical spine [Massaging] massaging device comprising

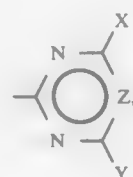
- a base portion,
- a cervical spine [body] support portion for supporting only that portion of an [individual] individual's cervical spine area [body] which will receive massaging action,
- a main drive shaft,
- a motor means for rotating said main drive shaft,
- said main drive shaft being rotatably mounted a fixed distance from said base portion,
- a plurality of roller members operatively associated with said main drive shaft for orbital movement therearound in a fixed path with respect to said base portion responsive to rotation of said main drive shaft, whereby a stationary individual supported by said [body] cervical spine support portion with his or her cervical spine area [region] in overlying contacting supported relationship with respect to said roller members will receive continuous massaging action applied to said area [region] of the body, said [body] cervical spine support portion having a flexible web in overlying position with respect to said roller members,
- said flexible web being secured in fixed position with respect to said base portion, and
- said flexible web being of such size and shape as to provide effective support to said cervical spine area, whereby said stationary individual will have said flexible web interposed between [the] said cervical spine area [region] and said roller members.



R is H or CH₃;
R₁ is



[E is CH₂ or a single bond;]
R₂ is H, C₁-C₂ alkyl or Cl;
R₃ is H, C₁-C₃ alkyl [or C₁-C₃ alkoxy];
R₄ and R₅ are independently C₁-C₂ alkyl;
R₆ and R₇ are independently H or C₁-C₂ alkyl;
W is O or S;
W₁ is O or S;
Q₁ and Q₂ are independently O, S or NCH₃;
A is



X is H, C₁-C₄ alkyl, C₁-C₄ alkoxy, C₁-C₄ haloalkoxy, C₁-C₄ haloalkylthio, C₁-C₄ alkylthio, halogen, C₂-C₅ alkoxyalkoxy, amino, C₁-C₃ alkylamino or di(C₁-C₃)alkylamino;
Y is H, C₁-C₄ alkyl, C₁-C₄ alkoxy, C₁-C₄ haloalkoxy, C₁-C₄ haloalkylthio, C₁-C₄ alkylthio, halogen, C₂-C₅ alkoxyalkyl, C₂-C₅ alkoxyalkoxy, amino, C₁-C₃ alkylamino, di(C₁-C₃)alkylamino, C₃-C₄ alkenyloxy, C₃-C₄ alkynyloxy, C₂-C₅ alkylsulfinylalkyl, C₁-C₄ haloalkyl, C₂-C₅ alkylsulfonylalkyl,

B1 4,659,369 (1140th)

HERBICIDAL ACETALS AND KETALS

George Levitt, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Reexamination Request No. 90/001,626, Oct. 27, 1988.

Reexamination Certificate for Patent No. 4,659,369, issued Apr. 21, 1987, Ser. No. 754,709, Jul. 16, 1985.

Continuation-in-part of Ser. No. 644,259, Aug. 27, 1984, abandoned.

Int. Cl.⁴ C07D 239/69, 407/04; A01N 43/54

U.S. Cl. 71-92

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 2, 3, 18-30, 33, 34, 38-40, 42, 43, and 47-49 are cancelled.

Claims 1, 4 and 6 are determined to be patentable as amended.

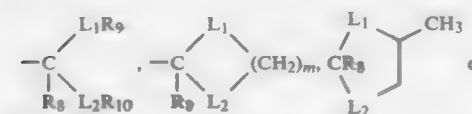
Claims 5, 7-17, 31, 32, 35-37, 41, and 44-46, dependent on an amended claim, are determined to be patentable.

1. A compound of the formula



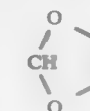
wherein

yl, C₃-C₅ cycloalkyl, C₂-C₄ alkynyl, C₂-C₅ alkylthioalkyl, C(O)R₈.



N(OCH₃)CH₃;
m is 2 or 3;
L₁ and L₂ are independently O or S;
R₈ is H or CH₃;
R₉ and R₁₀ are independently C₁-C₂ alkyl;
R₁₁ is C₁-C₃ alkyl;
R₁₂ is H, F, Cl, NO₂, C₁-C₂ alkyl, C₁-C₂ alkoxy, C₁-C₂ alkylthio, C₁-C₂ alkylsulfinyl, C₁-C₂ alkylsulfonyl, di(C₁-C₂)alkylsulfonyl or CO₂(C₁-C₂alkyl);
R₁₃ is H, C₁-C₂ alkyl, C₁-C₂ alkoxy, Cl, F or NO₂;
[R₁₄ is H, C₁-C₃ alkyl, C₁-C₃ alkoxy, C₁-C₃ haloalkyl, C₁-C₃ haloalkoxy, Cl, Br, F, NO₂, di(C₁-C₃)alkylsulfonyl, C₁-C₃ alkylthio, C₁-C₃ alkylsulfinyl, C₁-C₃ alkylsulfonyl, amino, C₁-C₃ alkylamino, di(C₁-C₃)alkylamino, CH₂OCH₃, CH₂SCH₃ or CH₂CN;]
Z is CH;
and their agriculturally suitable salts, provided that

- (a) when X is Cl, F, Br or I, then Y is OCH₃, OC₂H₅, N(OCH₃)CH₃, NHCH₃, N(CH₃)₂ or OCF₂H;
- (b) when Y is cyclopropyl, X is other than Cl, F, Br or I;
- (c) when R₃ is C₁-C₃ alkoxy, then Q₁ and Q₂ are oxygen;
- (d) when R₃ is H or C₁-C₃ alkyl, then Q is Q-1 through Q-9;
- (e) when the total number of carbon atoms of X and Y is greater than four, then the combined number of carbons of the substituents on Q is less than or equal to ten;
- (f) when W is S, then [A is A-1;] R is H, and Y is CH₃, OCH₃, OC₂H₅, CH₂OCH₃, C₂H₅, CF₃, SCH₃, OCH₂CH=CH₂, OCH₂C=CH₂, OCH₂CH₂OCH₃, CH(OCH₃)₂ or



[(g) when E is CH₂, then R₁₄ is H, CH₃, OCH₃, Cl or NO₂ and is not in the 4-position.]

32. A composition suitable for controlling the growth of undesired vegetation which comprises an effective amount of a compound of claim 1 and at least one of the following: surfactant; solid or liquid inert diluent.

REISSUES

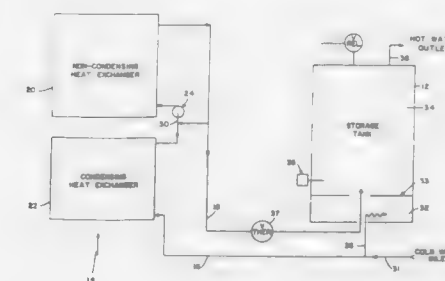
OCTOBER 10, 1989

Matter enclosed in heavy brackets [] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 33,082 COMBUSTION PRODUCT CONDENSING WATER HEATER

Joseph Gerstmann, Framingham, and Andrew D. Vasilakis, Bedford, both of Mass., assignors to Advanced Mechanical Technology, Inc., Newton, Mass.
Original No. 4,403,572, dated Sep. 13, 1983, Ser. No. 150,289, May 16, 1980. Application for reissue Sep. 13, 1985, Ser. No. 775,661

Int. Cl.⁴ F22B 33/00
U.S. Cl. 122—20 B 50 Claims



1. A method of heating water and storing the hot water in an insulated storage vessel comprising:
permitting natural stratification of the water within the vessel such that cooler water collects at the bottom of the vessel;
withdrawing cooler water from the bottom of the vessel and passing that water in heat exchange relationship with combustion gases from a burner assembly to cool those gases below their dew point temperature so as to extract some of the latent heat of vaporization from the gases and to heat the water;
returning the thus heated water to the storage vessel at a location in the storage vessel above the cooler water and in a manner as to avoid mixing with the cooler water, the volume of the cooler water below the location at which hot water is returned to the vessel being sufficiently large to provide for condensation of the combustion gases through substantially the entire heating cycle of the burner.

Re. 33,083
CONTROLLED DISPENSING APPARATUS
Raymond W. Pellegrino, 1650 Cardinal Dr., Coatesville, Pa. 19320
Original No. 4,569,463, dated Feb. 11, 1986, Ser. No. 578,811, Feb. 10, 1984. Application for reissue Feb. 9, 1988, Ser. No. 154,402

Int. Cl.⁴ B67D 5/06; G01F 11/26
U.S. Cl. 222—181 10 Claims

1. A measuring and dispensing apparatus for dispensing granular or liquid materials from a removable container, comprising:
a funnel-shaped member having a first end adapted sealingly and releasably to engage a container and a second end of smaller diameter than said first end having a dispensing head unitarily connected thereto;
said dispensing head comprising two rings extending in a direction opposite from said funnel-shaped member, a first of said rings being open at the center thereof and a second of said rings being closed at the center thereof;
a hollow cylindrical dispensing barrel having a closed end and an open end, said barrel being rotatably and removably supported within said rings such that said closed

center of said second ring forms a closed end for said open end of said barrel;
a volumetric reduction means comprising a solid partially cylindrical member having an exterior surface corresponding in shape to an interior surface of said dispensing barrel and an interior surface which cooperates with said interior surface of said dispensing barrel to define therebetween a dispensing volume, said volumetric reduction means being removably secured within said dispensing barrel and removable through said open end of said dispensing barrel such that said dispensing volume can be



varied by placing within said dispensing barrel volumetric reduction means having differing interior surfaces; and
an opening on a longitudinal side of said barrel adjacent to said dispensing volume, such that when said opening is turned upwardly toward said container, some of said material within said container will fill said dispensing volume, and when said opening subsequently is turned downwardly, said material within said dispensing volume will be dispensed from said dispensing volume; and
a yoke for releasably supporting said funnel-shaped member, said yoke in turn being supported by a longitudinally extending neck].

Re. 33,084
INTERMITTENTLY OPERATING PNEUMATIC DEVICE
FOR PUMPING SOLID-CARRYING LIQUIDS AND
SLURRIES

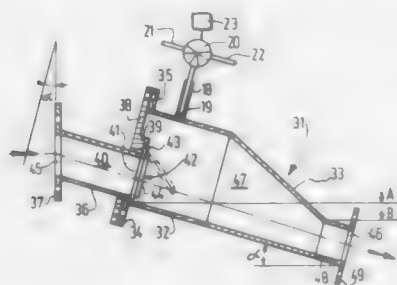
Jean-Francois Ranson, 23 cite Leferrer, 62970 Courcelles-les-Lens, France
Original No. 46,842,95, dated Aug. 4, 1987, Ser. No. 797,644, Nov. 13, 1985. Application for reissue Sep. 21, 1988, Ser. No. 247,171

Int. Cl.⁴ B65G 53/30
U.S. Cl. 406—50 7 Claims

1. Intermittently operating pneumatic pumping device for a solid-carrying liquid or slurry and intended to be under a continuous load, and comprising:
a tubular body (1,31) defining an inner chamber with an entry port (15,45) and a delivery port (16,46) opening into the upstream and downstream ends, respectively, thereof;
at least one injection line for a compressed gas (18) opening into the inner chamber via at least one pressurization port (19);

a supply valve (20) connected to each injection line (18) and intended to be connected to a source of compressed gas (21) to provide a selective supply of compressed gas to each injection line (18); and

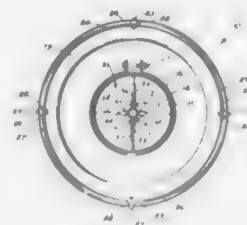
a means of controlling (23) the supply valve (20); characterized in that the pumping device additionally comprises a single flap valve (12,42) mounted on a support (8,39) fixed inside the inner chamber, between the entry port and the pressurization port, and cooperating with a seat internal to the body, surrounding a passage port (11,41), for the solid-carrying liquid or slurry and defining, between it and the delivery port, a part of the inner chamber which constitutes a pumping chamber (17,47), the flap valve (12,42) pivoting, on [.] the one hand, towards the delivery port (16,46), in a position in which the pumping chamber is filling, in the absence of injection of compressed gas via the pressurization port (19) and under the pressure of the solid-carrying liquid or slurry which tends to enter the pumping chamber (17,47) through the passage port (11,41), and, on the other hand, in the opposite direction, towards the seat against which the valve (12,42) is applied in a leakproof manner in a position in which the pumping chamber (17,47) is closed upstream and is emptied downstream under the effect of an injection, via the pressurization port, of compressed gas which expels the volume of solid-carrying liquid held in the pumping chamber, out of



the latter, via the delivery port, the lowest point of the pumping chamber in the region of the flap valve seat being at a level which is at least as high as the level of the highest point of the pumping chamber in the region of the delivery port, the pumping chamber (47) is defined in the tubular body (31) which consists of an upstream part in the shape of a cylindrical shell (32), into which a single injection line (18) opens via a single pressurization port (19), and which is extended in the downstream direction by a funnel (33), having substantially the shape of the frustum of a cone offset downwards, the upstream end of the cylindrical shell (32) of the body (31) has a flange (34) for coupling to a flange (38) at the downstream end of a filling pipeline (36) which opens into the cylindrical shell (32) defining the entry port (41) into the body (31), the flap valve (42) being supported by the downstream flange (38) of the filling pipeline (36), [and the downstream end of the funnel (33) being extended in the downstream direction by a delivery pipeline (48) incorporating means for coupling (49) to a delivery line,] the tubular body having an upstream section (36) forming a filling chamber (40) and a downstream section (31) forming the pumping chamber (47) and with the flap valve opening in [the lowest part of] the upstream portion (32) of this downstream section (31) whereas the compressed gas injection line (18) opens in the upper part of said upstream portion (32) through port (19) in a direction substantially transverse to the direction of travel of the solid-carrying liquid or slurry.

Re. 33,085
FRICTIONER
Ross K. Petersen, 449 Wildwood La., Burleson, Tex. 76028
Original No. 4,201,987, dated May 6, 1980, Ser. No. 934,226, Oct. 24, 1978. Continuation of Ser. No. 22,217, Mar. 5, 1987, abandoned, which is a continuation of Ser. No. 749,731, Dec. 13, 1976, abandoned, which is a continuation-in-part of Ser. No. 648,531, Jan. 12, 1976, abandoned. Application for reissue May 11, 1988, Ser. No. 193,238

Int. Cl. 4 B01D 50/00
U.S. Cl. 55—327 49 Claims



14. An apparatus for separating particles from gas carrying the particles comprising: a housing having a separation chamber, said housing having a side wall surrounding said chamber and an adjacent gas and particle inlet opening, and a member disposed centrally of said chamber, vane means extending between [said] and connected to said side wall and said member, said vane means having a plurality of vanes, said vanes being generally similarly inclined and circumferentially spaced from each other forming passages so as to induce swirling motion of gas and particles in a circular direction passing therethrough whereby the particles move outwardly by centrifugal force, annular skirt means having a substantially right cylindrical configuration, said skirt means being attached to said side wall adjacent said separation chamber and spaced radially outwardly therefrom to define therein a discharge chamber radially outwardly of said separation chamber, an annular opening connecting the separation chamber and the discharge chamber, said housing including a wall attached to said skirt means extending inwardly therefrom in spaced relation thereto thereby to define discharge openings for gas and particles from said discharge chamber, a gas outlet sleeve disposed centrally of said wall extending inwardly from said skirt means and extending therethrough communicating with said separation chamber and defining a gas outlet passage therefrom, spinner means, means mounting said spinner means on the housing for free rotation in said separation chamber, said spinner means including propeller means adjacent said gas outlet passage whereby swirling gas in said separation chamber contacts said propeller means and solely effects rotation thereof, said spinner means further including outwardly extending arm means connected to said propeller means terminating in impeller paddles located in said discharge chamber, whereby rotation of said propeller means causes said paddles to rotate through said discharge chamber and force particles and [air] gas therefrom and through said discharge openings.

Re. 33,086
PROCESS FOR MANUFACTURING EFFERVESCENT GRANULES AND TABLETS AND HIGH EFFICIENCY GRANULATION TOWER FOR SUCH PROCESS
Jean Bru, 24 Rue Raphael, Paris 75016, France
Original No. 4,614,648, dated Sep. 30, 1986, Ser. No. 643,980, Dec. 20, 1983. Application for reissue Jul. 10, 1987, Ser. No. 71,991
Claims priority, application France, Dec. 21, 1982, 82-21476; Nov. 30, 1983, 83-19143
Int. Cl. 4 A61L 9/04; B01F 3/12; C06D 5/10; F26B 17/12
U.S. Cl. 424—44 25 Claims

10. A process for the manufacture of effervescent tablets from a plurality of powdered raw materials, with the avoidance of external contamination, said process comprising the steps of:

- storing said powdered raw materials in storage hoppers;
 - transferring said raw materials downwardly by gravity to a granulator-vacuum-dryer device, introducing into said granulator-vacuum-dryer device a granulation agent in an amount effective to wet form wet granules and drying under vacuum said wet granules therein to obtain dried granules;
 - evacuating the dried granules by gravity from said granulator-vacuum-dryer, transferring them downwardly by gravity to a cooler and cooling said dried granules to a temperature at which destabilization is impeded; and
 - transferring said dried and cooled granules downwardly by gravity to a storage container;
- said process being carried out in an enclosed vertically arranged apparatus array.

28. A vertically disposed apparatus array for the manufacture of effervescent tablets, said apparatus array constituting a tower and comprising in vertically descending order:

- storage hopper means positioned near the top of said tower for the storage of raw materials;
 - granulation and vacuum drying means including means for introducing a granulation agent to wet form wet granules and means for eliminating humidity from said wet granules to obtain dried granules;
 - cooling means for lowering the temperature of said dried granules, and
 - at least one storage container for dried and cooled granules;
- said apparatus comprising also means for feeding material by gravity from said storage hopper means to said granulation-vacuum drying means, means for evacuating said dried granules by gravity from said granulation-vacuum-drying means and feeding them by gravity to said cooling means, and means for transferring granules by gravity from said cooling means to said storage container or containers.

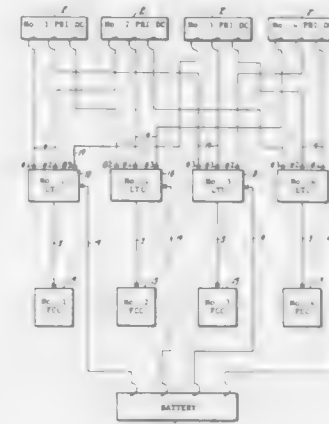
Re. 33,087
ELECTRIC POWER DISTRIBUTION AND LOAD TRANSFER SYSTEM
Michael P. Bradford, Orange; Gerald W. Parkinson, and Ross M. Grant, both of Shelton, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.
Original No. 4,638,175, dated Jan. 20, 1987, Ser. No. 627,706, Jul. 3, 1984. Application for reissue Jan. 20, 1988, Ser. No. 146,057

Int. Cl. 4 H02J 7/00
U.S. Cl. 307—64 20 Claims

- A power distribution system, comprising: at least two switch means for controlling the application of power from a plurality of power sources [.] to a power output; [at least two current means for preventing reverse power flow through respective ones of said plurality of switch means;] and processing means for providing control signals to operate said switch means, effective to switch respective ones of said power sources between on and off states with respect to said power output;
- characterized by:
- first voltage [detection] deriving means for [detecting] deriving first voltage signals dependent on the levels of first

voltages at a first side of corresponding ones of said switch means;

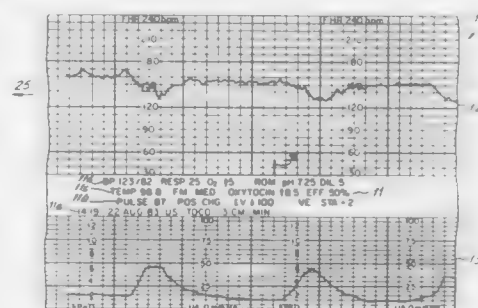
first comparator means for comparing the [voltages detected] first voltage signals derived by said first voltage [detection] deriving means to selected upper and lower voltage thresholds and for providing a signal indication of an abnormal voltage condition to said processing means



when any of said first [detected voltages are] voltage signals is at a level not within the bounds of said upper and lower voltage thresholds, said processing means responding to said abnormal signal [indicator] indication such that the power sources are selectively switched off with respect to said power output in view of any abnormal voltage conditions.

Re. 33,088
METHOD AND APPARATUS FOR RECORDING MEDICAL INFORMATION ON A STRIP CHART
Flave L. Jones, Guilford, and Mark L. Kelly, Middletown, both of Conn., assignors to American Home Products Corporation, New York, N.Y.
Original No. 4,513,295, dated Apr. 23, 1985, Ser. No. 544,325, Oct. 21, 1983. Application for reissue Jul. 23, 1986, Ser. No. 599,319

Int. Cl. 4 G01D 9/00; A61B 5/04
U.S. Cl. 346—1.1 33 Claims



- [For] In a fetal monitoring device including printing by a strip chart recorder and displaying by a display device medical information, a method comprising: communicating said medical information to switching membrane means in a remote control device while held in the hand of a user located remote from said recorder and display device; scanning said switching membrane means; generating one of a plurality of membrane signals in response to each communication and scan; identifying said one of said plurality of membrane signals;

displaying by said display device said medical information in response to said identification; and
either printing by said recorder said medical information in response to said identification or cancelling said medical information in favor of communicating either corrective or new medical information to said switching membrane means, after said medical information has been displayed.

Re. 33,089

POSITION SENSING AND INDICATING DEVICE

Robert B. Pepper, 55140 Calhoun St., Thermal, Calif. 92274, and James A. Maples, 762 Allen Ct., Palo Alto, Calif. 94303
Original No. 4,514,817, dated Apr. 30, 1985, Ser. No. 233,000, Feb. 10, 1981. Continuation-in-part of Ser. No. 18,411, Mar. 7, 1979, Pat. No. 4,270,171. Application for reissue Apr. 24, 1987, Ser. No. 42,351

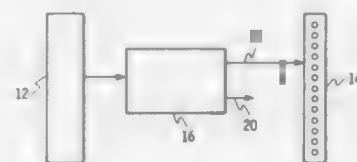
Int. Cl.⁴ G06F 15/20; H05B 39/04

U.S. Cl. 364-480

27 Claims

1. A [level] controlling device comprising:
position sensing transducer means having an elongated transducing surface for detecting the presence and position of an actuating device that is arbitrarily positionable

by a user on the transducing surface independent of any previous position of the actuating device on the transducing surface, said detection being independent of the electrical properties of the human body; and



circuit means connected to the transducer means for producing a first signal representative of the fact that an actuating device is present at the transducing surface and a second signal representative of the position of the actuating device at the transducing surface for controlling [the level of] a utilization device.

PLANT PATENTS

GRANTED OCTOBER 10, 1989

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

7,045

APRICOT TREE PA 7201-1

Thomas K. Toyama, Prosser, Wash., assignor to Washington State University Research Foundation, Pullman, Wash.
Filed Jul. 21, 1988, Ser. No. 222,576

Int. Cl.⁴ A01H 5/02

U.S. Cl. Plt.—39

1 Claim

1. A new and distinct variety of apricot tree obtained as a seedling from a seed parent entitled Goldrich (unpatented) and a pollen parent entitled Blenril (unpatented) is characterized by its large to very large firm attractive fruits of excellent quality and flavor which are especially well adapted for shipment to fresh markets because of its firmness, long shelf life and excellent dessert quality, substantially as shown and described.

7,046

HOSTA PLANT SOLAR FLARE

Heary A. Roas, 16711 Pearl Rd., Strongsville, Ohio 44136
Filed Nov. 25, 1988, Ser. No. 276,423

Int. Cl.⁴ A01H 5/00

U.S. Cl. Plt.—68

1 Claim

1. A new and distinct variety of Hosta, substantially as described and illustrated; named Hosta 'Solar Flare'; particularly distinguished by its extreme large size and size of foliage in which the color ranges from golden-green to golden-yellow with bright green midrib and veins developing on the upper surface toward the end of the growing season.

PATENTS

GRANTED OCT. 10, 1989

ERRATA

For CLASS	See PATENT NO.
165-167	4,872,578
128-205	4,872,579
211-045	4,872,580
212-180	4,872,581
374-005	4,872,762
136-244	4,872,925
428-209	4,873,022
562-091	4,873,025
562-072	4,873,026
562-083	4,873,027
428-036	4,873,116
436-176	4,873,193
427-365	4,873,303
528-487	4,873,314
570-130	4,873,315
514-303	4,873,334
548-157	4,873,346
568-319	4,873,363
568-344	4,873,364
568-345	4,873,365
388-814	4,873,473
346-140	4,873,622
065-374	4,873,674
370-058	4,873,694
371-021	4,873,705
328-062	4,873,708

PATENTS

GRANTED OCTOBER 10, 1989

GENERAL AND MECHANICAL

4,872,215
CHEST PROTECTOR
Williamena Sliger, P.O. Box 52, Idamay, W. Va. 26576
Filed Feb. 22, 1988, Ser. No. 158,857
Int. Cl.⁴ A41D 13/00

U.S. Cl. 2-2

7 Claims

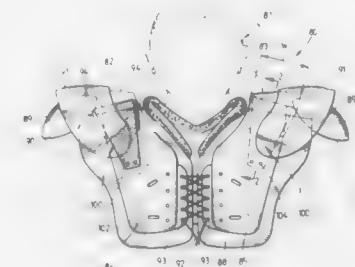


1. A protector for use in sporting activities sized to cover the chest and abdomen of a user comprising a first protective member, said first protective member comprising an outer layer formed of one of leather or light-weight leather-like material and an inner layer formed of batting, at least two laterally spaced apart pieces of a closed-cell foam provided intermediate said outer layer and said inner layer, each of said pieces of foam sized and positioned to cover a selected different vulnerable portion of the chest and abdomen regions to provide additional protection to those selected different vulnerable portions, and means to secure the protector around the chest and abdomen.

4,872,216
CANTILEVER STRAP FOR FOOTBALL SHOULDER PADS
James C. Wingo, Jr., Houston, Tex., assignor to Riddell, Inc., Chicago, Ill.
Filed May 13, 1988, Ser. No. 193,840
Int. Cl.⁴ A41D 13/00

U.S. Cl. 2-2

7 Claims



1. In a shoulder pad for a football player, the shoulder pad having body arch members, which include depending chest and back portions; a pad body disposed beneath the body arch members; and cantilever straps secured to the body arch members to support the body arch members in a spaced relationship from the pad body, the cantilever straps each including a central portion thereof which overlies the acromioclavicular area of the football player's shoulder, the improvement comprising:

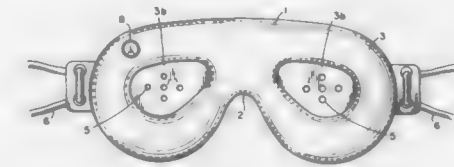
the central portion of each cantilever strap which overlies the acromioclavicular area of the football player's shoulder, is substantially greater in width than two inches, whereby the force from an impact upon a body arch member is transmitted to the acromioclavicular area of the football player's shoulder by the cantilever strap, and the force is dispersed over the area of the central portion of

the cantilever strap which overlies the acromioclavicular area of the football player's shoulder.

4,872,217
EYE MASK
Hidehiro Kitayama, 2-22-11, Yanagibashi, Tokyo, Japan
Filed Mar. 11, 1988, Ser. No. 167,161
Claims priority, application Japan, Mar. 20, 1987, 62-39928
Int. Cl.⁴ A61F 9/04

U.S. Cl. 2-15

1 Claim



1. An eye mask for placement on the human face for sleeping purposes comprising the combination of:
first and second air impermeable sheet members sealed along the periphery thereof and adapted to form an air chamber therebetween; valve means communicating said chamber to the exterior of said eye mask, whereby air may be introduced into said chamber, said air impermeable sheet members having a mask configuration and spaced non-air inflated chamber portions corresponding in size and location to the eyes on a human face and having a plurality of apertures in each of said portions; and means on either side of said mask for attachment to the human face of a wearer of said eye mask.

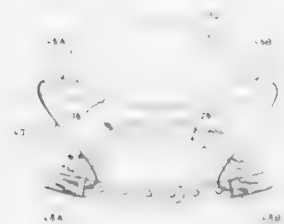
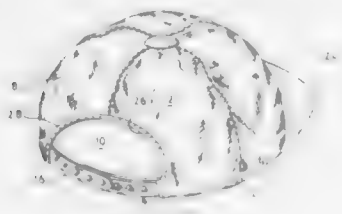
4,872,218
CAP ATTACHMENT TO PREVENT PROTRUDING HAIR
George G. Holt, P.O. Box 3244, Morristown, Tenn. 37814
Filed Feb. 29, 1988, Ser. No. 161,747
Int. Cl.⁴ A42B 1/22, 1/24

U.S. Cl. 2-171.5

7 Claims

1. An attachment for a conventional baseball-type cap having a size adjustment strap secured at its opposite ends to the lower border of the head cover proximate a head band, and having an opening in the back of the headcover between the head cover and the size adjustment strap, comprising:
an attachment member dimensioned for covering said opening; and

securing means for releasably mounting said attachment member on said cap such that said attachment member



covers said opening and prevents hair from protruding through said opening when said cap is worn.

4,872,219

SELF-SUPPORTING EAR PROTECTOR

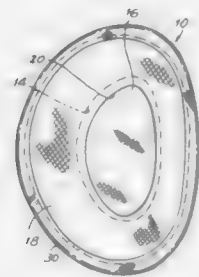
Karen Duncan, 15 Palmer St., Cos Cob, Conn. 06870
Filed May 2, 1988, Ser. No. 189,384

The portion of the term of this patent subsequent to Dec. 22, 2004, has been disclaimed.

Int. Cl.⁴ A61F 11/00; A42B 1/06

U.S. Cl. 2-209

7 Claims



configuration of an ear to be protected, said continuous loop defining a first central opening therein; an outer protective exposed layer of material secured to one side of said sheet of plastic material in covering relation to said first central opening; and an inner layer secured to an opposite side of said sheet of plastic material and having a second central opening in substantial alignment with said first central opening.

4,872,220

PROTECTIVE COMPOSITE MATERIALS, THEIR PRODUCTION AND ARTICLES OF PROTECTIVE CLOTHING MADE THEREFROM

Yair Haruvy, Rehovot; Moshe Katz, Rishon Le-Zion, and Abraham A. Horowitz, Rehovot, all of Israel, assignors to The State of Israel, Atomic Energy Commission, Soreq Nuclear Research Center, Yavne, Israel

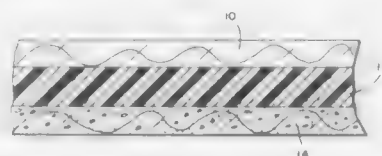
Filed Aug. 26, 1987, Ser. No. 89,953

Claims priority, application Israel, Sep. 5, 1986, 79955

Int. Cl.⁴ A41D 3/04

U.S. Cl. 2-243 A

20 Claims



17. A flexible protective composite material, comprising an air and water permeable outer fabric ply, a substantially continuous and essentially non-porous and non-foamed synthetic polymeric film having a water permeation rate of less than 300 g/m²/h as an intermediary ply, and an air and water permeable fabric inner ply bearing an adsorbent substance capable of interaction with noxious materials by either of adsorption and chemical reaction.

4,872,221

REINFORCED PANT STRUCTURE

Eugene E. Stone, III, 1500 Poinsett Highway, Greenville, S.C.

Continuation of Ser. No. 06,857,648, Apr. 29, 1986, abandoned.
This application Nov. 23, 1987, Ser. No. 125,803

Int. Cl.⁴ A41B 9/02; A41D 27/24

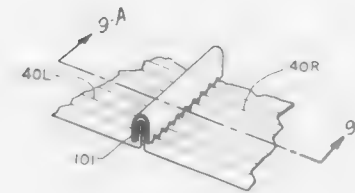
U.S. Cl. 2-404

2 Claims

1. An ear protector comprising:
a flexible core member having a ring shape and formed of a unitary resilient, flexible plastic material substantially impervious to cold weather conditions and having substantially constant thickness, said core having a general

1. In a pant undergarment including leg portions having two front panels connected to each other to form a fly and crotch and connected to a back panel to form inseams along said leg portions, the improvement comprising forming said crotch by doubly folding over to the same side intersecting and aligned edge portions of said front panels together beneath the inside of the fly, said edge portions co-terminating to form a four ply fold extending from said fly to said inseams, a reinforcing strip

of fabric folded over and surrounding both sides of said fold for the full length of said fold, and zigzag stitching extending



through said reinforcing fabric and said fold for the full length of said fold.

4,872,222

TOILET-TANK LEAK DETECTOR, CHEMICAL ECONOMIZER

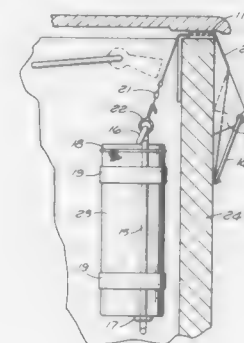
Jonn P. Pavlik, 20411 Lassen St., Chatsworth, Calif. 91311

Filed Jul. 27, 1988, Ser. No. 225,461

Int. Cl.⁴ E03D 9/02

U.S. Cl. 4-228

9 Claims



1. A device for colorimetric detection of a leak past a toilet-tank flush valve and overflow pipe within a toilet flush tank having a lid and an upper rim above a water level and for economizing the dispensing of toilet-bowl cleansing chemicals comprising:

a flexible line having first and second ends
means for attaching a source of water coloring toilet bowl cleanser to the first end of said line;
means for slidably mounting said line across said rim of a toilet flush tank such that said first end is disposed within said tank and said second end is disposed exterior to said tank and means associated with said second end for holding said line stationary at a first level whereby said source of water coloring toilet bowl cleanser is above the water level in the tank, and a second level whereby said source of water coloring toilet bowl cleanser is below the water level in the tank without lifting the tank lid.

4,872,223

ORTHOPEDIC CHAIR

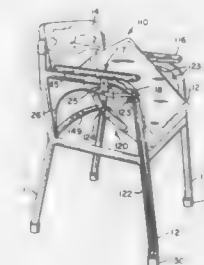
Lincoln F. Baird, 3482 Moore St., Los Angeles, Calif. 90066

Filed Sep. 26, 1985, Ser. No. 781,134

Int. Cl.⁴ A47K 3/10

U.S. Cl. 4-480

2 Claims



1. An orthopedic chair comprising:

a. a frame;
b. a seat which is pivotally coupled to said frame at the front thereof;
c. a back which is mechanically coupled to said frame;
d. a pair arm-rests which are mechanically coupled to said frame;
e. a pair of rubber tubes each of which has a first end which is mechanically coupled to the base of said frame;
f. a pair of pulley systems, each of which includes two pulleys which are disposed in series and mechanically coupled to said frame above said seat and through each of which the second end of one of said rubber tubes is threaded and wherein the second end of said rubber tube is securably coupled to said seat whereby said rubber tubes resiliently bias said seat, when it is in its first position, towards its second position so that said seat may be used to assist an invalid to easily sit therein or to rise therefrom; and
h. releasing means for releasing said seat so that said rubber tubes moves said seat from its first position to its second position.

4,872,224

BATHTUB APPARATUS

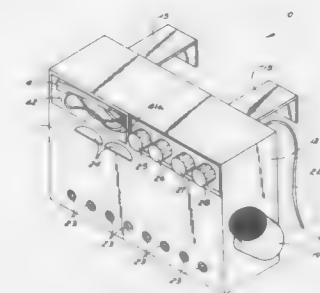
Fred D. Grimes, and Linda D. Grimes, both of 885 Fairview Ave., SE., Salem, Oreg. 97302

Filed Feb. 16, 1988, Ser. No. 156,414

Int. Cl.⁴ A61H 33/00

U.S. Cl. 4-544

6 Claims



1. A bathtub apparatus for use in combination with a bathtub container including top and bottom walls, right and left end walls, a rear wall, and a forward wall to define a module, said apparatus comprises,

a securement means adjustably extending outwardly from said rear wall for securement of said module to an encircling wall of said bathtub;

a fluid inlet conduit means secured to said right wall directed inwardly of said module to an inlet pipe;
 said inlet pipe in contiguous position proximate a selectively operative heating means for heating fluid directed through said inlet pipe;
 a selectively operative pump means positioned to accept water from said inlet pipe for directing water under pressure to an outlet pipe within said module;
 a discharge conduit operatably connected to said outlet pipe to direct fluid outwardly of said module into said bathtub container;
 said securement means includes a plurality of "L" shaped brackets telescopically directed from said rear wall and formed with teeth cooperative with housing teeth formed within said module to adjustably position said bracket relative to said module;
 said inlet conduit means is directed to said inlet pipe by a reducer to reduce the cross-sectional area of flow from said inlet conduit means to said inlet pipe;
 said inlet pipe includes a serpentine coil operatably associated with said heating means to effectively heat fluid within said serpentine pipe, and
 including a first valve means positioned between said pump means and said discharge conduit selectively operative to direct water to said discharge conduit or to a plurality of adjustably orientable water jets operatably associated with said first valve through an elongate water manifold wherein said water jets are positioned proximate a lower edge of said forward wall.

4,872,225

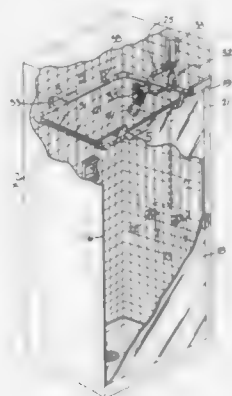
CLEANING APPARATUS AND METHOD FOR BATH ENCLOSURES

Johanna C. Wagner, 4505 S. Yosemite, #379, Denver, Colo. 80237
 Filed Sep. 6, 1988, Ser. No. 240,209

Int. Cl.⁴ A47K 4/00

U.S. Cl. 4-662

20 Claims



1. A cleaning device for a bath enclosure that is usable in combination with a shower head and a water supply pipe comprising:

spray means for mounting in an upper portion of a bath enclosure, said spray means including a spray pipe shaped to extend along the inside surface of a bath enclosure, said spray pipe having a plurality of discharge opening selectively located at spaced intervals along an outer side of the pipe, each said discharge opening being substantially the same distance from the inside surface of the bath enclosure and arranged for directing and spraying a liquid stream at a downward angle in an overlapping pattern against substantially the entire inside surface of at least one wall of said bath enclosure,
 water flow control and support means arranged for supporting and supplying water to a shower head to spray inside

the bath enclosure and supporting and in the alternative supplying water to said spray means, and
 fluid injection means for introducing a cleaning fluid into the water flowing from a water supply pipe to said spray means to provide a cleaning liquid that is sprayed by said spray means against said inside surface and flows down along an inside surface area of said wall to clean substantially all of said inside surface area.

4,872,226

MEANS FOR POSITIONING BEDFAST PATIENTS

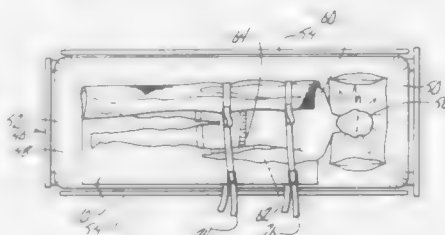
Robert Leonardo, 680 Capri Blvd., Treasure Island, Fla. 33706,
 assignor to Robert Leonardo, Treasure Island, Fla.

Filed Jan. 6, 1988, Ser. No. 202,532

Int. Cl.⁴ A61G 7/10

U.S. Cl. 5-61

1 Claim



1. A bedfast patient positioning device, comprising,
 a substantially rectangular pad means adapted to extend over a patient's bed underneath a bedfast patient, said pad means having opposite parallel sides, and upper and lower surfaces,
 a pair of separate continuous straps secured to the bottom surface of said pad means and extending transversely across the width of said pad means and extending outwardly from said opposite parallel side thereof, and terminating in straight elongated portions,
 said pair of continuous straps being spaced apart and one each thereof being adapted to be substantially aligned with a patient's shoulder and hip areas, respectively, and
 a pair of gripping loops secured to said pair of straps substantially adjacent the opposite parallel sides of said pad means inwardly from the ends thereof;
 the device further including buckle elements that are slidably mounted on said strap elements to selectively adjust the effective lengths thereof, and open hook elements being secured to said buckle elements and being adapted for securement to a side rail of a patient's bed to maintain the straps in a predetermined position with respect to the patient.

4,872,227

STIFFENING MODULE FOR A MATTRESS BOX SPRING AND A BOX SPRING INCORPORATING SAME

Michael H. Galumbeck, 5577 Vantage Point Rd., Columbia, Md. 21044

Filed Jan. 5, 1988, Ser. No. 141,081

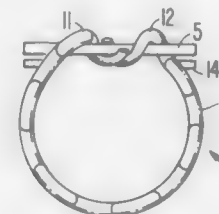
Int. Cl.⁴ A47C 23/057

U.S. Cl. 5-246

19 Claims

1. A stiffening spring module for a spring unit having a wire frame which includes a plurality of spaced wire grid members comprising stiffening means having a spring formed by a sinusoidally-shaped length of spring wire terminating at opposite ends in first and second substantially "S" shaped end sections respectively, each said end section including a terminal leg having a free end, an intermediate leg spaced from said terminal leg and an inner leg spaced from said intermediate leg, said intermediate leg being joined to said terminal and inner legs to form undulations having two adjacent loops with a first loop between said intermediate and terminal legs and a second loop

between said intermediate and inner legs, and attachment means for attaching the stiffening means to said wire frame and being locked into engagement with said stiffening means by a spring action of the spring thereof, said attachment means including an elongate member having first and second ends which is dimensioned to extend through at least the first loops



of said first and second end sections, said elongate member having engagement means formed intermediate the first and second ends thereof to engage the terminal legs of said first and second end sections to form a loop from said length of spring wire, the spring action of said stiffening means operating to hold said terminal legs in engagement with said engagement means.

4,872,228

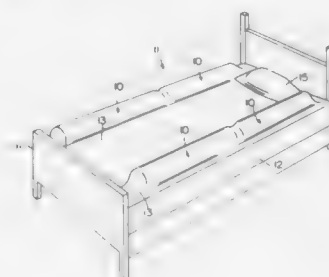
BED GUARD

Carolyn B. Bishop, 1960 Dembrigh La., Charlotte, N.C. 28213
 Filed Jun. 27, 1988, Ser. No. 212,605

Int. Cl.⁴ A47C 21/08

U.S. Cl. 5-425

4 Claims



1. In a bed having a mattress with a continuous and uninterrupted planar upper surface and a bedsheet with a continuous and uninterrupted planar upper surface covering the mattress and tucked under the mattress, the improvement which comprises the combination of means for reducing the risk of a person falling out of bed without

interrupting the continuous and uninterrupted planar upper surface of the mattress or the bedsheet, said means comprising at least one separate bolster unconnected to the mattress or the bedsheet and operatively positioned on top of the mattress and extending at least partially along one side of the mattress and under the bedsheet which covers the mattress and is tucked under the mattress, whereby the bolster is frictionally held in operative position between the mattress and the bedsheet.

4,872,229

WATERPROOF INFLATABLE MASSAGE AIR MATTRESS

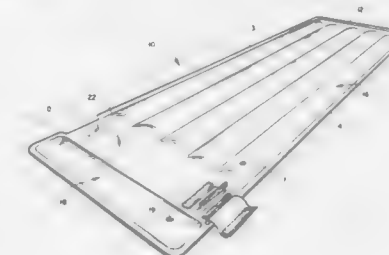
Antonio Brady, 2401 Beta St., San Diego, Calif. 92112
 Continuation-in-part of Ser. No. 38,997, Feb. 13, 1987, which is

a continuation-in-part of Ser. No. 887,533, Jul. 21, 1986, abandoned, which is a continuation-in-part of Ser. No. 887,730, Jul. 21, 1986, abandoned, which is a continuation-in-part of Ser. No. 788,825, Oct. 18, 1985, abandoned. This application Apr. 4, 1988, Ser. No. 177,314

Int. Cl.⁴ A47C 27/10; A61G 7/04

U.S. Cl. 5-455

6 Claims



1. A waterproof inflatable massage air mattress comprising:
 an elongated air mattress having a longitudinal axis, said air mattress having a top surface, a front end, a rear end and spaced lateral edges;
 a transversely extending inflatable head cushion portion located adjacent the front end of said air mattress;
 a longitudinally extending inflatable body cushion portion whose one end is located adjacent the rear end of said air mattress and whose other end is spaced a predetermined distance from said head cushion portion;
 a vibrator assembly chamber formed in said air mattress intermediate said inflatable body cushion portion and said inflatable head cushion portion, said chamber having a closed rear end and a front end that is open and has means for opening and closing it that are water impermeable; and
 a vibrator assembly that may be inserted into or removed from said vibrator assembly chamber.

4,872,230

ELECTRICALLY POWERED AUTOMOBILE JACK AND NUT REMOVER

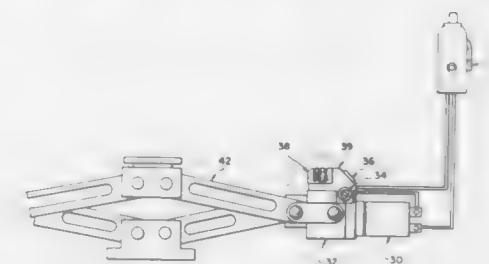
Anthony Levine, 5000 Brewster Dr., Tarzana, Calif. 91356

Filed Apr. 25, 1988, Ser. No. 185,892

Int. Cl.⁴ B25F 3/00

U.S. Cl. 7-100

15 Claims



1. An electrically powered automobile tire-changing apparatus, comprising:
 a first D.C. electric motor, and means for providing power to said motor including a cigarette-lighter type plug for plugging into an automobile cigarette lighter outlet;
 a jack for lifting the wheel of an automobile off the ground to enable the changing of a tire;

a nut remover for removing nuts from a wheel to permit removal of a wheel from an automobile and for reapplying and tightening nuts for replacement of a wheel to the automobile;

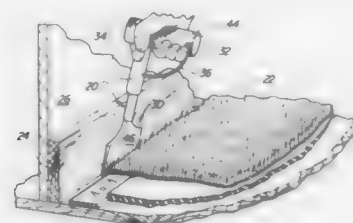
(d) pumping means for pumping liquid from the reservoir onto the brush; and

4,872,231 IMPACT BLADE TOOL

Willard Gustavsen, P.O. Box 37, Berrien Springs, Mich. 49103
Filed Jul. 19, 1988, Ser. No. 222,688
Int. Cl.⁴ B25F 1/00

U.S. Cl. 7-103

15 Claims



(e) manually operable means for simultaneously pumping the pumping means to pump liquid onto the brush and for moving the brush to clean a golf club head at said location.

4,872,233 STREET SWEEPER WITH COIL SPRINGS SUPPORTED DRAG SHOE

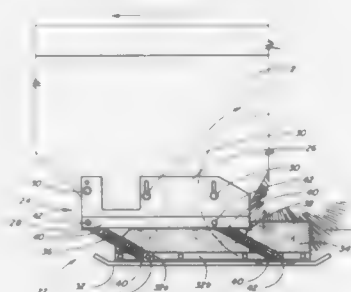
Stanley M. Brown, Wake Forest, N.C., assignor to Athey Products Corp., Raleigh, N.C.

Filed Nov. 28, 1988, Ser. No. 276,653

Int. Cl.⁴ E01H 1/04

U.S. Cl. 15-83

8 Claims



1. In a street sweeper having a drag shoe assembly disposed outwardly of and adjacent to each side of a rotating brush for generally confining dirt debris, etc., inwardly of the drag shoe assembly as the brush is rotated and wherein each drag shoe assembly includes an upper frame member secured to the street sweeper and a drag shoe moveably mounted to the upper frame member, the improvement comprising a linkage arrangement for interconnecting the drag shoe with the upper frame member such that the drag shoe may (1) move vertically up and down with respect to the upper frame member as the street sweeper moves over uneven surfaces and (2) move laterally back and forth in response to the drag shoe engaging obstructions when the street sweeper is turning or otherwise moving laterally, the improved drag shoe linkage comprising a pair of coil springs interconnected between the upper frame member and the drag shoe; the coil springs being disposed in parallel relationship and having opposite ends pivotally mounted to the upper frame member and drag shoe; and wherein the coil springs may flex laterally back and forth in response to the drag shoe engaging a lateral obstruction and wherein the coil springs act to return the drag shoe to a normal vertical orientation once the drag shoe has cleared the lateral obstruction.

4,872,232 PORTABLE GOLF CLUB HEAD CLEANER

Janos G. Stiasny, Vancouver, Canada, assignor to Club Mate Products Inc., Vancouver, Canada

Filed Oct. 14, 1988, Ser. No. 257,934

Int. Cl.⁴ A63B 57/00; A46B 13/08

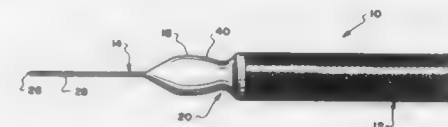
U.S. Cl. 15-21 E

16 Claims

1. A portable golf club head cleaner, comprising:
(a) a body having a location for receiving a golf club head and a reservoir for holding a liquid;
(b) a brush for cleaning a golf club head when adjacent the brush;
(c) means for moveably mounting the brush within the body, adjacent said location;

4,872,234
WATER SPRINKLER HEAD CLEANING TOOL
Gary C. Wonnacott, 6237 Bonsall Dr., Malibu, Calif. 90265
Filed Jul. 5, 1988, Ser. No. 215,368
Int. Cl.⁴ B05C 15/02; B08B 9/02
U.S. Cl. 15-104.16

30 Claims



1. A water sprinkler head cleaning tool, comprising:
(a) an elongated handle having a forward end; and
(b) an elongated thin metallic needle-like debris-unclogging shaft having forward and rearward end portions;
(c) said handle including a mounting tip disposed at said handle forward end, said mounting tip having a diameter smaller than that of the remainder of said handle and a tapered low profile, said shaft being embedded at its rearward end portion in said mounting tip and projecting forwardly therefrom;
(d) said mounting tip having rearward and forward oppositely-tapered axial sections and a middle section located between and interconnecting said rearward and forward sections and defining the maximum diameter of said mounting tip, said rearward and forward sections extending in opposite rearward and forward directions from said middle section, said forward tapered section providing a low profile configuration for allowing said mounting tip to be placed close to an orifice of the water sprinkler head and said rearward tapered section being connected to said handle forward end and providing an axial region on said tip for secure attachment of a water spray deflecting shroud thereto rearwardly of said maximum diameter middle section of said mounting tip.

4,872,235
APPARATUS FOR CLEANING MEDICAL HAND INSTRUMENTS AND IMPLEMENTS FOR TREATMENT OF THE HAIR, SKIN AND/OR BODY
Ernst P. F. Nielsen, Berliner Str. 24, D-6090, Rueselsheim, Fed. Rep. of Germany

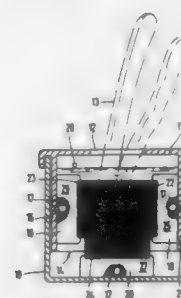
Filed Feb. 4, 1988, Ser. No. 152,106

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1987, 8702105; Apr. 25, 1987, 8706008

Int. Cl.⁴ A46B 17/06

U.S. Cl. 15-104.92

17 Claims



1. An apparatus for cleaning medical hand instruments and implements for treating hair, skin and/or body comprising:
(a) a container having opposed parallel side wall means and bottom wall means orthogonal to said side wall means;
(b) a plurality of cleaning means including at least a first cleaning means detachably affixed to said bottom wall means and a second cleaning means detachably affixed to and extending along one of said side wall means adjacent

and parallel to said first cleaning means such that cleaning surface portions of said first and second cleaning means contact each other and at least partially overlap; and
(c) a solution in said container totally immersing said cleaning means.

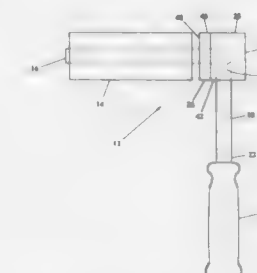
4,872,236
CORNER PAINTING ATTACHMENT FOR PAINT ROLLERS
Marshall A. Thompson, 1253 N. Modesto, Camarillo, Calif. 93010

Filed Jun. 24, 1988, Ser. No. 210,246

Int. Cl.⁴ B05C 17/00

U.S. Cl. 15-118

7 Claims



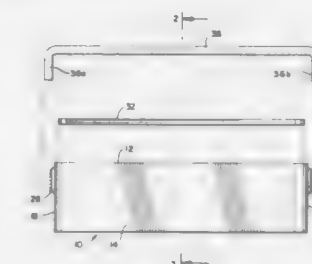
1. A corner painting attachment for use with a paint roller having a generally cylindrical roller and a generally L-shaped handle with said roller rotatably mounted on one leg of said handle and the other leg of said handle extending substantially perpendicular to the axis of said roller, said attachment comprising:

a base portion formed to releasably mount on the handle of said paint roller adjacent the bend of said handle and formed with a tapered upper portion having sides inclining toward each other and joining in a line extending parallel to said other leg of said handle.

4,872,237
CHALK DUST REMOVER
Lloyd J. Smith, 1601 E. Jackson, Lot #30, Macomb, Ill. 61455
Filed Nov. 25, 1985, Ser. No. 802,319
Int. Cl.⁴ A47L 25/00

U.S. Cl. 15-210 R

5 Claims



1. A device for removing accumulated chalk dust from a cleaning surface of a chalkboard cleaner comprising:

(a) a housing having an exterior surface and defining a receiving chamber having an open side for receiving chalk dust from the chalkboard cleaner;
(b) a support member releasably mounted on the housing so as to extend across the open side of the receiving chamber, the support member defining a plurality of holes extending therethrough in communication with the receiving chamber to allow passage of chalk dust through the support member into the receiving chamber;

- (c) means for removing chalk dust from the chalkboard cleaner comprising a sheet of porous, open cell foam material having downwardly turned end portions, the sheet extending over the support member and defining an exposed, rough surface adapted to contact the cleaning surface of the chalkboard cleaner such that relative sliding contact between the exposed rough surface of the sheet and the cleaning surface of the chalkboard cleaner removes accumulated chalk dust therefrom whereby the open cells of the foam material allow the removed chalk dust to pass therethrough into the openings of the support member; and
- (d) attachment means located on the exterior surface of the housing so as to removably attach said opposite end portions of the sheet of foam material to the housing.

4,872,238

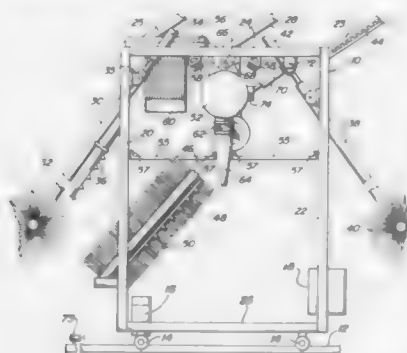
VEHICLE TREATMENT APPARATUS

Lonnie Crotts, Summerfield, and Thomas W. Meadows, Providence, both of N.C., assignors to Bivens Winchester Corporation, Danville, Va.

Filed Sep. 21, 1987, Ser. No. 98,952
Int. Cl.⁴ B60S 3/04

U.S. Cl. 15—302

25 Claims



1. Apparatus for drying a washed vehicle in a vehicle drying location comprising:
an elongate air plenum;
support means disposing said plenum transversely across and over said vehicle drying location;
a plurality of conical, fabric-like, flexible air outlet nozzles connected to and receiving air from said plenum and emitting said air downwardly against the surface of a wet vehicle in said location, said nozzles extending said vehicle; and
means carried by said support means for supplying air to said plenum.

4,872,239

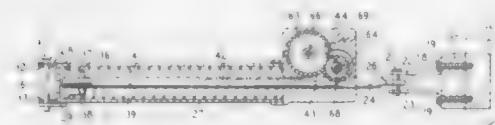
DOOR CLOSURE WITH MECHANICAL BRAKING MEANS

Edward H. Ferguson, Arlington Heights, and Kiyoshi Iba, Elk Grove Village, both of Ill., assignors to The Chamberlain Group, Inc., Elmhurst, Ill.

Filed Aug. 10, 1988, Ser. No. 230,433
Int. Cl.⁴ E05F 1/10, 5/02

U.S. Cl. 16—64

6 Claims



1. A door closure mechanism for a pivoted door which

pivots about a pivot point comprising, a longitudinal rack member with one end pivotally attached to a door jam adjacent the said pivot point of said door and formed with a rack, a housing into which said rack member extends, said housing pivotally attached to said door at a point remote from said pivot point of said door, first spring means mounted in said housing and urging said rack member into said housing to bias said door toward the closed position, a pinion gear rotatably mounted in said housing and engageable with said rack, brake means coupled to said pinion gear, wherein said brake means includes a second gear rotatably supported by said housing and in mesh with said pinion gear, and wherein said pinion gear is loosely mounted in said housing for movement into and out of engagement with said rack and a second spring which engages said pinion gear so as to bias it into engagement with said rack.

4,872,240

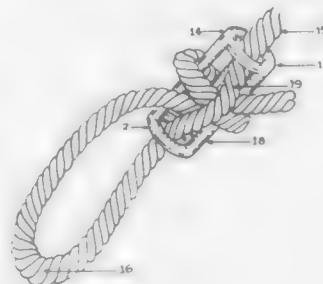
STEEL KNOT FOR ROPES

Raphael F. Spinner, Hillsboro, Ill.; Clement F. Marley, R.R. 2 Box 165, Nokomis, Ill. 62075; Mary Brown (executrix of said Raphael F. Spinner, deceased), and Cathy Grant (executrix of said Raphael F. Spinner, deceased), assignors to Clement F. Marley, Noromis, Ill.

Filed Oct. 26, 1987, Ser. No. 113,468
Int. Cl.⁴ F15G 11/00

U.S. Cl. 16—114 B

1 Claim



1. A device for tying a rope or a cable to a load comprising: two round end rings of equal diameter and two or more rounded and unevenly spaced parallel bars of equal length, one end of each bar is connected to the first ring and the other end of each bar is connected to the second ring, the rings are approximately parallel to each other, the lengths of said bars being equal and from three to six times the diameter of said rings.

4,872,241

PATTY MOLDING MECHANISM FOR FIBROUS FOOD PRODUCT

Scott A. Lindee, New Lenox, Ill., assignor to Formax, Inc., Mokena, Ill.

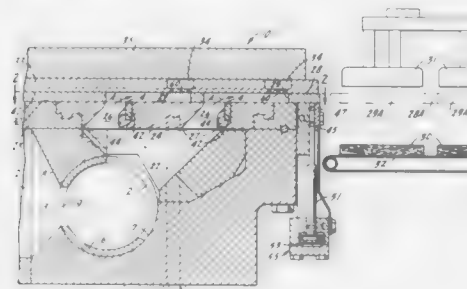
Filed Oct. 31, 1988, Ser. No. 264,870
Int. Cl.⁴ A22C 7/00

U.S. Cl. 17—32

15 Claims

1. In a molding mechanism for molding food patties from a fibrous food product, which molding mechanism comprises:
fill directing means including a fill member having a first planar surface with at least one fill port extending through the fill member and the first planar surface;
cover means including a cover member having a second planar surface in parallel spaced relation to the first planar surface;
a mold plate having opposed planar surfaces, positioned in close fitting relation between the first and second planar surfaces, the mold plate having at least one mold cavity of predetermined configuration and area therethrough, the

area of the mold cavity being substantially larger than the area of the fill port at the first planar surface;
mold plate drive means for driving the mold plate, cyclically, in a given direction from a fill position in which the mold cavity is aligned with the fill port to a discharge position in which the mold cavity is displaced beyond the fill member, and for subsequently driving the mold plate to its fill position;
food pump means for pumping a fibrous food product, under pressure, through the fill port to fill the mold cavity and form a food patty in the mold cavity; and
knockout means for pushing a molded food patty from the mold cavity at the discharge position of the mold plate; the improvement in which:



- the fill directing means includes a transitional rim for the fill port, adjacent the first planar surface, past which the food product flows into the mold cavity with an appreciable change of direction, the transitional rim having a rounded curvature that precludes appreciable damage to fibers in the food product; and
the fill directing means further includes a cutting rim for the fill port, at the first planar surface, past which at least a part of the mold cavity moves when the mold plate is driven toward its discharge position, the cutting rim having a sharp edge for shearing food product from the food patty along a plane coincident with the first planar surface.

4,872,242

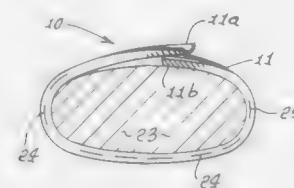
FLEXIBLE C-SHAPED STRAP-LIKE CONNECTOR

Robert M. Allan, 1731 Colgate Cir., La Jolla, Calif. 92037

Filed Apr. 7, 1988, Ser. No. 178,909
Int. Cl.⁴ B65D 63/00

U.S. Cl. 24—16 PB

25 Claims



1. An elongated connector comprising:
(a) a flexible, lengthwise elongated, strap-like body consisting of synthetic resin and having generally C-shaped cross-section in planes crosswise of and normal to the length dimension of the body,
(b) the body having opposite C-shaped end portions which are interfitted so that one C-shaped cross-section end portion nests in and is gripped by the other C-shaped cross-section end portion each C-shaped cross section end portion having opposite walls that terminate at free edges, the walls of said one end portion yieldably deflected toward one another and gripped by the walls of said other

end portion which are yieldably expanded away from one another.

4,872,243

MULTI-HOOK FASTENER MEMBER

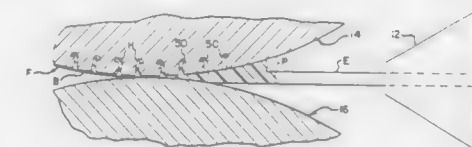
James R. Fischer, Sheboygan, Wis., assignor to Velcro Industries B.V., Amsterdam, Netherlands

Division of Ser. No. 865,575, May 15, 1986, Pat. No. 4,794,028, which is a continuation of Ser. No. 600,990, Apr. 16, 1984, abandoned. This application Sep. 9, 1988, Ser. No. 243,083

Int. Cl.⁴ A44B 18/00

U.S. Cl. 24—442

3 Claims



1. An elongate member, comprising: a base portion; and a great multiplicity of resiliently flexible hook-like projections extending from one surface of said base portion, said hook-like projections including free end portions extending generally toward said base portion, with at least some adjacent ones of said projections, in a direction along the length of said member, extending in generally opposite directions; said base portion and integral projections being formed from an extrusion of molten plastic material by providing a first, cooled forming roller having a plurality of hook-forming cavities defined about the periphery thereof wherein each said cavity includes a throat portion adjacent the periphery of said forming roller having an inwardly tapering configuration, and each said cavity includes an inner end portion communicating with the throat portion thereof and extending in a direction back toward the periphery of said forming roller; providing a second pressure roller in position for coaction with said first forming roller; concurrently rotating said first and second rollers in opposite directions about respective parallel axes; directing said extrusion in between said first and second rollers at an interface thereof so that said plastic material fills said hook-forming cavities to form said base portion of said strip-like fastener member and with said hook-like projections extending integrally from one surface of the base portion, each said hook-like projection having a free end portion; cooling said fastener member to a desired temperature by carrying it on the periphery of said rotating cooled forming roller through a substantial portion of a revolution of said forming roller; and removing said strip-like fastener member from said first forming roller at a position spaced from the interface of said first and second rollers by maintaining tension on the elongated fastener member thus-formed so that said hook-like projections are withdrawn from said hook-forming cavities, after being sufficiently cooled so that unacceptable deformation of the hook-like projections is avoided, without opening said cavities by drawing the free end portion of each said hook-like projection through the throat portion of the respective one of said cavities, the free end portion of each said hook-like projection extending generally toward the base portion of said fastener member.

4,872,244

TURRET WITH SEVERAL DRIVABLE TOOL SPINDLES FOR A MACHINE TOOL

Günter Schleich, Hochdorf, Fed. Rep. of Germany, assignor to Index-Werke Comm.-Ges. Hahn & Tesky, Esslingen, Fed. Rep. of Germany

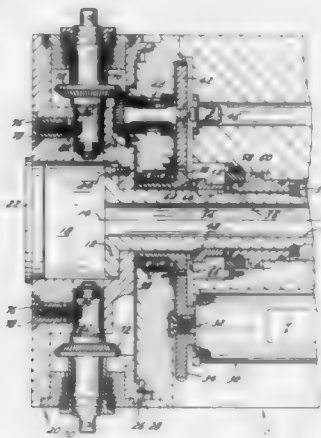
Filed Aug. 30, 1988, Ser. No. 238,310

Claims priority, application Fed. Rep. of Germany, Sep. 11, 1987, 3730561

Int. Cl.⁴ B23B 29/32

U.S. Cl. 29—40

15 Claims



1. Turret comprising a turret body and a turret head rotatable about an indexing axis relative to said turret body, said turret head being displaceable along said indexing axis from a working position in which it is non-rotatably held on said turret body into an indexing position in which it is rotatable about said indexing axis, several spindles being rotatably mounted in said turret head, each of said spindles being in rotary drive connection with a spindle gear and being able to be brought into a working position by rotation of said turret head, further comprising a drive element rotatably mounted in said turret body and being in drive connection with a rotary encoder for driving a switchable coupling for indexing said turret head and for driving a drive shaft rotatably mounted in radially spaced relation to said indexing axis in said turret body, and also comprising a drive gear engageable with the spindle gear of a spindle which is in the working position, characterized in that said spindle gear of a spindle which is in the working position is engageable with and disengageable from said drive gear of said drive shaft by displacement of said turret head between its indexing position and its working position, in that a switchable locking mechanism is provided for each spindle, and in that a releasing mechanism activatable by displacement of said turret head into its working position is provided on said turret body to release said locking mechanism of said spindle in the working position.

4,872,245

METHOD AND APPARATUS FOR MANUFACTURING COLD-ROLLED STEEL STRIP

Yoshiki Kawasaki; Yoshihiro Hioki; Yuichi Ohno, all of Himeji; Kozaburo Ichida; Susumu Yamaguchi, both of Kitakyushu; Michitaka Sudo, Tokyo, and Bunichiro Chikazawa, Kitakyushu, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Continuation of Ser. No. 838,563, Mar. 11, 1986, abandoned.

This application Jan. 11, 1988, Ser. No. 143,311

Claims priority, application Japan, Mar. 15, 1985, 60-50344; Nov. 22, 1985, 60-261294; Nov. 22, 1985, 60-261295

Int. Cl.⁴ B21C 43/00

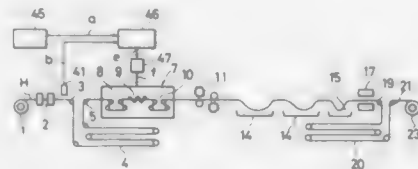
U.S. Cl. 29—81 A

27 Claims

1. A method of removing mill scale from the surface of hot-rolled strip coil in the manufacture of cold-rolled steel strip

using an apparatus comprising an uncoiler linked to a scale removing unit by a first looper, a tandem cold-reduction mill linked to the scale removing unit by a second looper and a continuous annealing unit linked to the tandem cold-reduction mill by a third looper, comprising the steps of:

breaking the mill scale on the surface of the hot-rolled strip coil by elongating the running hot-rolled strip coil to a predetermined percent elongation, controlling the prede-



termined percent elongation during the elongating of the hot-rolled strip coil as a function of at least one of the manufacturing conditions of the hot-rolled strip coil and the properties and quantity of the mill scale on the hot-rolled strip coil so that the top, bottom and middle thereof of the hot-rolled strip coil will be pickled at substantially the same speed; and removing the broken scale from the surface of the elongated hot-rolled strip coil.

4,872,246

ROLL WITH AN ARCHED SHAFT

Akechi Yano, 2, Kikusuidori 4-chome, Moriguchishi, Osaka-fu, Japan

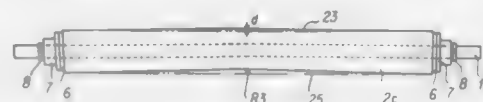
Continuation of Ser. No. 14,887, Feb. 13, 1987, abandoned. This application Jan. 11, 1989, Ser. No. 296,289

Claims priority, application Japan, Jul. 3, 1986, 61-51090; Jul. 3, 1986, 61-51091

Int. Cl.⁴ B21B 13/02

U.S. Cl. 29—116.1

7 Claims



1. A roll for feeding articles comprising: a curved support shaft in a fixed position under a no-load condition; and a roller mounted to rotate around said curved support shaft without any rotation of said support shaft, said roller having a surface layer and a circumference which increases progressively from a central portion of the roller to the ends thereof, said surface layer deforming with cyclical expansion and contraction in a direction of a width of said roller or deforming with cyclical amplitude alteration in a radial direction while being rotated about said curved support shaft such that at least one axial straight line is defined along an external periphery of said surface.

4,872,247

COMBINATION ROLL

Hironori Nakamura, Fujimi; Toshiaki Yotsui, Kawasaki; Youichi Sato, Ichihara; Toshiaki Umetsubo, Fuji, and Hideo Okawa, Higashimatsuyama, all of Japan, assignors to CALP Kogyo Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP87/00183, § 371 Date Jun. 22, 1988, § 102(e) Date Jun. 22, 1988, PCT Pub. No. WO88/01977, PCT Pub. Date Mar. 24, 1988

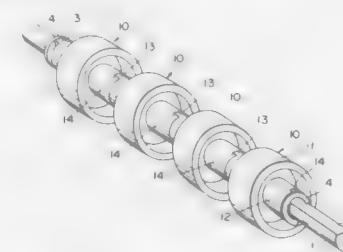
PCT Filed Mar. 26, 1987, Ser. No. 209,490

Claims priority, application Japan, Sep. 9, 1986, 61-138406[U]; Sep. 9, 1986, 61-138407[U]

Int. Cl.⁴ B21B 31/00

U.S. Cl. 29—125

2 Claims



1. A combination roll including: (a) a roll shaft having locking end portion; and (b) a plurality of roll units, including an end roll unit, mounted on said roll shaft, each of said roll units comprising a roll portion of a first diameter and a shaft inserting portion of a second diameter, said second diameter being less than said first diameter, said roll portion being formed with a contact portion and said shaft inserting portion being concentric with said roll portion and having opposite ends and, at each of said opposite ends, engaging means engageable with a corresponding shaft inserting portion of an adjacent roll unit, said end roll unit having a locking means for locking itself to said locking end portion of said roll shaft so that once said end roll unit is locked to said roll shaft all of the remaining roll units are indirectly locked to said roll shaft by means of said engaging means and all of said roll units are rotatable conjointly with said roll shaft.

4,872,248

METHOD OF MAKING A PLAIN BEARING SHELL
Erich Roemer, Wiesbaden; Matthias Kühn, Östlich-Winkel, and Leonhard Maurer, Walluf, all of Fed. Rep. of Germany, assignors to Glyco-Metall-Werke, Daelen & Loos GmbH, Wiesbaden, Fed. Rep. of Germany

Division of Ser. No. 514,311, Jul. 15, 1983, Pat. No. 4,775,249.

This application Jun. 9, 1988, Ser. No. 204,372

Claims priority, application Fed. Rep. of Germany, Aug. 18, 1982, 3230700

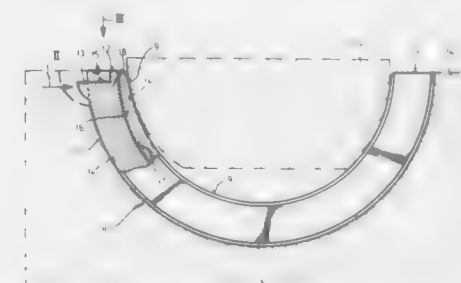
Int. Cl.⁴ B21D 53/10

U.S. Cl. 29—149.5 DP

4 Claims

1. A method of making a plain bearing shell which comprises the steps of: forming a generally cylindrical bearing shell body having an inner functional surface and a joint face lying in a plane substantially parallel to an axis of said generally cylindrical bearing shell body; supporting said functional surface and the exterior of said generally cylindrical bearing shell body at least in a region of said joint face; and depressing material of said generally cylindrical bearing shell body only at a region outwardly of said functional surface in said region of said joint face in a direction perpendicular to said joint face to form a lug radially projecting from the exterior of said generally cylindrical bearing shell body and forming a recess directly above said lug, said lug facilitating positioning of said generally cylindrical bearing shell body while leaving a layer of

material of said generally cylindrical bearing shell body between said recess formed by the depression of said



material of said generally cylindrical bearing shell body and said functional surface.

4,872,249

TOOL SUPPORT AND GUIDE SYSTEM FOR REPAIR OF BOILER TUBE PANELS AND PROCESS FOR CARRYING OUT REPAIR USING SAME

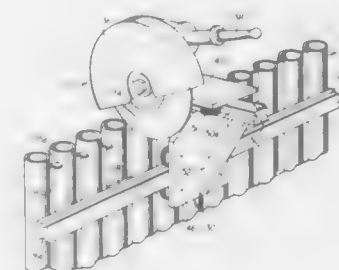
Jerald VanderPol, Eldorado Hills; Cory J. Silber, Sacramento, and William H. Astle, Rancho Cordova, all of Calif., assignors to Tri Tool Inc., Rancho Cordova, Calif.

Filed Jul. 28, 1988, Ser. No. 225,174

Int. Cl.⁴ B23P 15/26

U.S. Cl. 29—157.4

9 Claims



1. A tool support and guide system for end preparation of cut ends of tubes extending along a straight line and connected together by membranes to form a tube panel, said panel having secured thereto a first guide rail means extending parallel to and adjacent the line of cut tube ends to be prepared, said first guide rail means including a guide roller receiving profile for receiving guide rollers in cooperating relationship comprising: a first support carriage means including a first guide roller assembly mounted for movement along the first guide rail means with the first guide roller assembly engaging the guide roller receiving profile of the first guide rail in cooperating relationship; a second guide rail means carried by said first support carriage means and extending normal to said first guide rail means in a direction towards and generally perpendicular to the cut panel tubes; said second guide rail means including a guide roller receiving profile conforming in configuration with the guide roller receiving profile of said first guide rail means.

4,872,250

METHOD FOR FABRICATING A DISHED HOLLOW BODY POSSESSING A LINEAR OR HELICAL INNER TOOTHING

Franco De Marco, Jona, Switzerland, assignor to Ernst Grob AG, Männedorf, Switzerland

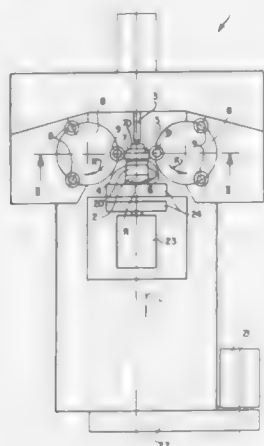
Filed Sep. 17, 1987, Ser. No. 97,749

Claims priority, application Switzerland, Sep. 18, 1986, 83747/86

Int. Cl.⁴ B21D 19/00

U.S. Cl. 29—159.2

11 Claims



1. A method for fabricating a substantially dished hollow body possessing straight or helical internal teeth, having at least a partial web portion and a substantially tubular rim portion connected to said web portion, comprising the steps of: providing a workpiece blank which, in longitudinal section, possesses a rounded portion in a transition region between a rim portion, having a predetermined wall thickness, and a web portion thereof; forming said rounded portion with a mean radius of curvature which is at least as large as the predetermined wall thickness of said rim portion of said workpiece blank; providing a mandrel which possesses external teeth corresponding to said internal teeth which are to be fabricated on the workpiece blank; and cold working said rim portion of the workpiece blank on the mandrel according to the Grob method to form the substantially dished hollow body with internal teeth up to the proximity of said web portion of said workpiece blank.

4,872,251

FENDER FAST CLIP REMOVER

Harold A. Sheppard, 1432 Foxcroft Dr., Muskogee, Okla. 74403

Filed Aug. 24, 1988, Ser. No. 235,571

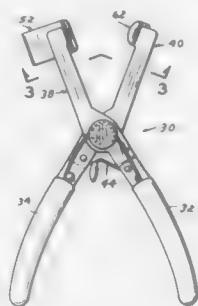
Int. Cl.⁴ B25B 7/02

U.S. Cl. 29—243.56

4 Claims

1. A fast clip removal tool, comprising: a pair of handles pivotally connected intermediate their ends for movement of their respective end portions toward and away from each other; an anvil jaw one end of one said handle; and, a striker jaw cooperatively disposed on one end portion of the other said handle for movement of said jaws toward and away from each other, said striker jaw being generally strap-like and U-shaped having one leg of the U-shape fixed to the said other handle end portion and having the other leg of the U-shape projecting toward said anvil jaw, both said jaws cooperatively projecting laterally normal to the longitudinal axis of the respective said handle, said anvil jaw being substantially right angular in trans-

verse section with one flange of the right angle secured to the one said handle and the other flange of the right



angle projecting toward and inclined downwardly with respect to the plane of the striker jaw said other leg.

4,872,252

METHOD OF REMOVING HAZARDOUS MATERIAL

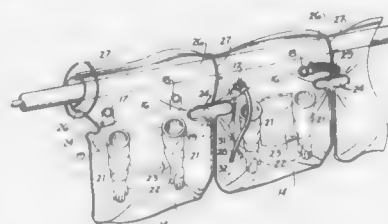
Kurt D. Hittler, Atlanta, Ga., assignor to Grayling Industries, Inc., Alpharetta, Ga.

Division of Ser. No. 278,732, Dec. 2, 1988. This application May 15, 1989, Ser. No. 351,530

Int. Cl.⁴ B23P 19/02, 6/00

U.S. Cl. 29—426.4

5 Claims



1. A method of removing hazardous material from an elongated pipe comprising the steps of: (a) mounting to the pipe a bag of the type that has a series of debris collection pouches joined to a manifold at a series of necks and with the bag being mounted with the manifold secured about the pipe and the pouches depending downwardly therefrom with internal communication established between the pouches and manifold; (b) stripping material from the pipe whereupon the stripped material falls as debris into at least one of the pouches; (c) isolating the one pouch from the manifold by twisting and tying off the neck that joins the one pouch with the manifold; and (d) severing the pouch from the manifold whereby the isolated one pouch containing debris is separated from the manifold without interruption in internal communication of the manifold with the remaining pouches and without exposure of its debris to ambient air.

4,872,253

APPARATUS AND METHOD FOR IMPROVING THE INTEGRITY OF COUPLING SECTIONS IN HIGH PERFORMANCE TUBING AND CASING

Kenneth J. Carstensen, 4540 No. 44th St., No. 70, Phoenix, Ariz. 85018

Filed Oct. 7, 1987, Ser. No. 105,339

Int. Cl.⁴ B21D 39/00

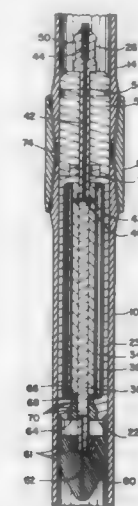
U.S. Cl. 29—507

6 Claims

1. A system for operation during makeup of successive tubing or casing sections where a first tubing or casing section has a coupling collar threaded onto an open end and a second

tubing or casing section is added to the first tubing or casing section through the coupling collar to form an anticipated gap area that will exist between opposed nose ends of the tubing or casing sections within the collar when makeup has been completed, comprising:

a cylindrical member insertable within the tubing or casing sections and including means for releasably engaging the inner wall of the first tubing or casing section in sealing relation on one side of the anticipated gap area opposite the collar, and including further a rigid member having an



outer diameter slightly less than the inner diameter of the tubing or casing section and spanning the anticipated gap area between opposed nose ends: means for filling the area about the rigid surface within the anticipated gap area with a catalyzed resin in liquid form; and means for removing the inserted member from the open end of the added, second tubing or casing section on the opposite side of the gap area from the first tubing or casing section and past the gap area after solidification of the resin.

4,872,254

WHEEL STUD INSTALLER AND METHOD

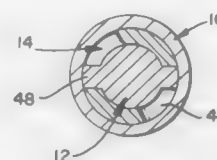
James C. Chancellor, 300 NE. 12th St., Big Spring, Tex. 79720

Filed Mar. 7, 1989, Ser. No. 319,986

Int. Cl.⁴ B23P 19/02, 19/04

U.S. Cl. 29—525

8 Claims



1. Apparatus for installing threaded wheel studs in a vehicular hub, said apparatus comprising a hydraulic actuator means, a stud coupling, a cylinder coupling, and a spacer sleeve; said stud coupling further comprising means for threadedly engaging said wheel stud and means for releasably engaging said cylinder coupling; said cylinder coupling comprising means for releasably engaging said stud coupling and means for releasably engaging actuator means adapted to exert a pulling force on said wheel stud through said cylinder coupling and said stud coupling; and said spacer sleeve further comprising a longitudinal bore

adapted to receive said stud coupling and said cylinder coupling when said stud coupling and said cylinder coupling are engaged, and said spacer sleeve being further adapted to maintain said actuator means a fixed distance from said hub as said pulling force is exerted on said wheel stud.

7. A method for installing a wheel stud in a vehicular hub, said method comprising the steps of: a. inserting a wheel stud outwardly through said vehicular hub; b. providing an apparatus comprising a stud coupling a cylinder coupling, and a spacer sleeve for use in seating said wheel stud in said vehicular hub; c. threadedly engaging said stud coupling to said wheel stud, and releasably engaging said stud coupling to said cylinder coupling; d. providing a longitudinally extendable, hydraulically actuated means adapted to exert a pulling force on said wheel stud through stud coupling and said cylinder coupling; e. said spacer sleeve over said stud coupling and said cylinder coupling; f. releasably engaging said hydraulically actuated means to said cylinder coupling; and g. thereafter operating said hydraulically actuated means to exert a pulling force on said wheel stud through said stud coupling and said cylinder coupling.

4,872,255

METHOD OF MANUFACTURING COMMUTATORS

Boris Kogej, and Jozse Potocnik, both of Idrija, Yugoslavia, assignors to Kolektor P.O., Idrija, Yugoslavia

Continuation of Ser. No. 871,141, Jun. 3, 1986, abandoned, which is a continuation of Ser. No. 651,870, Sep. 18, 1984, abandoned, which is a continuation of Ser. No. 543,230, Oct. 21, 1983, Pat. No. 4,484,389, which is a continuation of Ser. No. 335,350, Dec. 21, 1981, abandoned. This application Dec. 10, 1987, Ser. No. 132,654

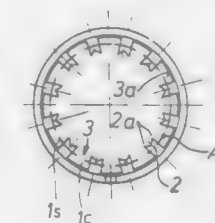
Claims priority, application Yugoslavia, Sep. 29, 1981, 2346/81

The portion of the term of this patent subsequent to Nov. 27, 2001, has been disclaimed.

Int. Cl.⁴ H01R 43/08

U.S. Cl. 29—597

11 Claims



1. A method of manufacturing commutators of the type comprising mutually separated commutator lamellas having an exposed commutator side and an opposite side shaped with integral protruding portions forming anchoring elements which are initially part of a commutator body, whereby the commutator lamellas are produced from an elongated blank, said method comprising: providing an elongated blank having at least one longitudinal margin of reduced thickness and a longitudinal thicker portion; deforming without cutting areas of said thicker portion to displace material from said portion upwardly to form a plurality of spaced apart longitudinal ribs with a longitudinal groove formed between adjacent longitudinal ribs, each said rib having two upwardly and outwardly extending longitudinal ridges to form anchoring elements; forming the blank into a cylinder before the deforming without cutting, with the thicker portion facing inwardly; molding said

deformed cylindrical blank with an insulating plastic material to encapsulate the anchoring elements; and cutting through said blank along said grooves to define a plurality of separated lamellas peripherally spaced about the cylinder with each lamella having its associated anchoring element encapsulated in the insulating plastic material.

4,872,256

PROCESS FOR PRODUCING A SQUIRREL-CAGE ROTOR

Louis Plummer, Cluses, France, assignor to Somfy, Cluses, France

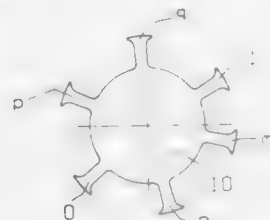
Filed Sep. 19, 1988, Ser. No. 246,256

Claims priority, application France, Oct. 2, 1987, 87 13655

Int. Cl.⁴ H02K 15/02

U.S. Cl. 29—598

2 Claims



1. A process for producing a squirrel-cage rotor for an induction motor, whereby packets of laminations are made by the method consisting in automatically cutting out and assembling rotor laminations of magnetic material by means of a follow-on machine in which the laminations are cut from a strip by means of selectable punches, rotated through a determined angle and provided with half-cutouts, and thereupon assembled in packets by means of the half-cutouts, the angle of rotation having the effect of forming helicoidal slots on the packet of laminations, and the packets of laminations are filled with a nonmagnetic conductive material, in which process in order to obtain an intermediate short-circuiting ring, removing teeth in an ordered manner from the laminations whose position in the packet corresponds to the desired situation of the intermediate short-circuiting ring, and the laminations cut out are turned through an angle corresponding to a whole number of teeth plus the angle of the desired helix, this whole number being different from the number of teeth of a lamination having a complete tooth and from a multiple thereof, and said removal being such that step-by-step rotations will result in a clear flow path around a short circuiting section for the non-magnetic material filler, and in such a manner that when filling is effected a continuous annular zone of nonmagnetic material is obtained.

4,872,257

APPARATUS FOR INSTALLING BEARINGS ON ENGINE COMPONENTS

Takehisa Wakamori, Hidaka; Takashi Ogawa, Higashi Kurume; Ryoji Ito, Kawagoe, and Chikafumi Shimanaka, Sayama, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 3, 1986, Ser. No. 915,275

Claims priority, application Japan, Oct. 4, 1985, 60-222568; Oct. 7, 1985, 60-224204; Oct. 7, 1985, 60-224205; Oct. 9, 1985, 60-225831; Oct. 16, 1985, 60-158134[U]; Dec. 2, 1985, 60-271152; Dec. 2, 1985, 60-271153; Dec. 27, 1985, 60-295778

Int. Cl.⁴ B23P 21/00

U.S. Cl. 29—701

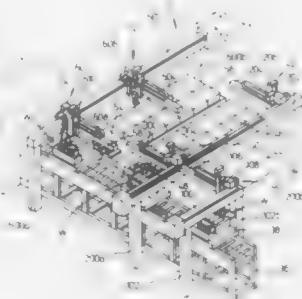
6 Claims

1. An apparatus for installing a bearing of semicylindrical shape on a variable engine component of an internal combustion engine, comprising:

data readout means for determining a specific one of a plurality of different engine bearing by reading data marked on the variable engine component;

bearing selecting means for selecting the bearing determined

by the data read by said data readout means, and changing the attitude of said bearing; positioning means for receiving the bearing from said bearing selecting means; and bearing installing means for installing the bearing received by said positioning means on the variable engine component;



wherein said positioning means comprises a first positioning means for positioning the bearing with its convex side down, and the second positioning means for positioning the bearing with its convex side up; and wherein said bearing installing means comprises a first installing mechanism having a curved surface for engaging an interior peripheral surface of the bearing, and a second installing mechanism comprising means for gripping the engine component.

4,872,258

PICK AND PLACE METHOD AND APPARATUS

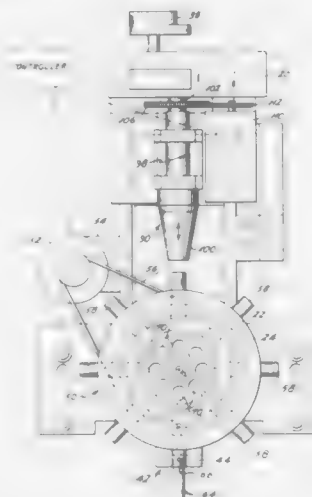
Phillip A. Ragard, Binghamton, N.Y., assignor to Universal Instruments Corporation, Binghamton, N.Y.

Filed Sep. 22, 1988, Ser. No. 247,512

Int. Cl.⁴ B23P 19/04

U.S. Cl. 29—740

14 Claims



1. In an apparatus for selectively performing the operations of picking components from one point and placing them at another point by means of a turret assembly having a rotatable turret with plural component holding spindles protruding therefrom and angularly spaced about a hub thereof, said picking and placing operations being performed by transferring components respectively to and from said spindles at a component transfer station of said turret assembly wherein said

component transfer station is situated at a particular circumferential angular location about the hub of said turret, the improvement comprising:

displacer means for extending and retracting at least one of said spindles relative to said hub in order to perform said transferring;

said displacer means comprising a pin protruding laterally from said at least one spindle and into an annular groove of a guide ring generally centered on said hub, such that said pin rides in said groove during rotation of said turret to retain said spindle in a retracted condition;

said displacer means further comprising a section of said guide ring which is displaceable generally radially of said hub relative to the remainder of said guiding, said section comprising an arcuate portion of said annular groove; means for moving said section, so that when pin extends into the annular groove of said section, radial displacement of said section results in radial displacement of said spindle into an extended condition.

4,872,259

ADJUSTABLE FOOTPRINT COMPONENT REMOVAL TOOL

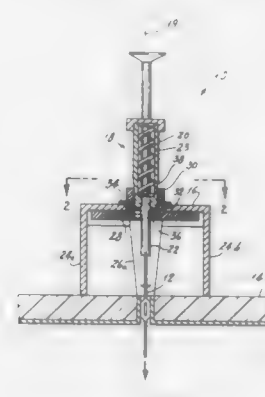
Gerald M. Jones, Titusville, and Rhonda L. Nemcovsky, Warren, both of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Mar. 3, 1989, Ser. No. 319,388

Int. Cl.⁴ H05K 13/04

U.S. Cl. 29—764

3 Claims



1. An apparatus for removing a friction-fitted, axially aligned electrical component from a printed circuit board, said apparatus comprising:

a base;

a component removal tool mounted on said base, said tool having a longitudinal axis substantially normal to said base and being mounted for reciprocal movement along said longitudinal axis;

a first pair or legs mounted on said base and extending therefrom, said first pair of legs being fixed relative to said base; and

a second pair of legs mounted with said base and extending therefrom, said second pair of legs being rotatably adjustable relative to said first pair of legs, both said first and second pair of legs engaging said board during the removing of an electrical component therefrom.

4,872,260

METHOD OF MAKING PRE-FORMED LEAD-INS FOR AN IC PACKAGE

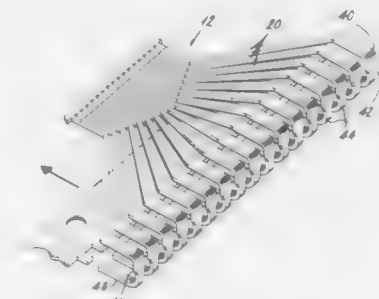
Robert R. Johnson, Ludlow, and Robert S. Orbanic, Warren, both of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Jan. 19, 1988, Ser. No. 145,337

Int. Cl.⁴ H01R 43/00

U.S. Cl. 29—827

1 Claim



1. The method of making pre-formed lead-ins for an IC package comprising, in sequence, the steps of:

(a) preparing a longitudinal strip containing a plurality of substantially identical lead frame segments, each lead frame segment having a multiplicity of lead-ins connected to opposing, first and second continuous rails, said lead-ins having spaces therebetween with the spaces being wider adjacent said second rail than adjacent said first rail;

(b) removing from between segments a section of said second rail;

(c) forming a first right angled bend in said lead-ins of said lead-frame segment, adjacent said second rail to provide a normal portion of said lead-ins;

(d) forming a second right angled bend in said normal portion of said lead-ins of said lead-frame segment to form a bight and a parallel portion of said lead-ins;

(e) removing said second rail; and

(f) forming a re-entrant portion in said parallel portion of said leads of said lead-frame segment to substantially complete said pre-formed lead-ins;

(g) separating said lead-frame segment from said strip;

(h) affixing said lead-frame segment to a lead frame support; and

(i) removing said first rail.

4,872,261

METHOD OF AND APPARATUS FOR SURFACE MOUNTING ELECTRONIC COMPONENTS ONTO A PRINTED WIRING BOARD

Amalendu Sanyal, Andover, Mass.; Peter Moy, Atkinson, N.H., and Frank Cosentino, Wakefield, Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Dec. 11, 1987, Ser. No. 131,652

Int. Cl.⁴ H05K 3/34

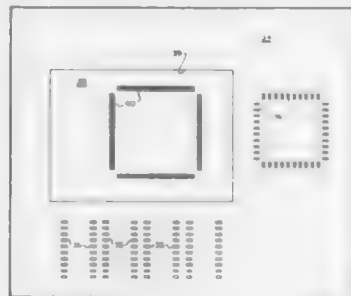
U.S. Cl. 29—840

22 Claims

1. A method of surface mounting electrical components, with leads extending therefrom, to a printed wiring board with surface contact pads by bonding the component leads to the printed wiring board surface contact pads, the printed wiring board including surface contact pads adapted for bonding standard pitch electronic component leads thereto and surface contact pads adapted for bonding fine pitch electronic components leads thereto, the method including the steps of:

(A) placing a stepped solder stencil over said printed wiring board, said stencil having a common flat surface disposed against the printing wiring board and an exposed surface opposite said flat surface, said stencil including at least two sections of different thickness, such that there is at least one thin section of a selected thickness and at least

- one thick section having a thickness greater than that of said thin section, and openings formed in said stencil sections, said openings positioned so that when said stencil is aligned over the printed wiring board, said openings formed in said thick section are in registration over the surface contact pads for the standard pitch leads and said openings formed in said thin section are in registration over the surface contact pads for the fine pitch leads;
- (B) applying solder paste over the exposed surface of said stencil;



- (C) pressing said solder paste on said stencil exposed surfaces through said stencil openings whereby thick mounds of solder paste are deposited on the surface contacts for the standard pitch leads and thin mounds of solder paste are deposited on the surface contact pads for the fine pitch leads; and
- (D) removing said stencil so that said mounds of solder paste are left on the printed wiring board surface contact pads.

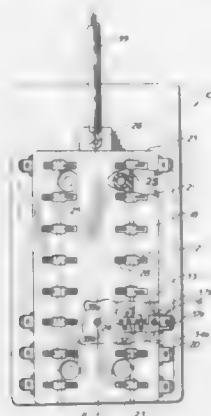
4,872,262

HOLDER FOR A BLADE-TYPE CIRCUIT ELEMENT
David R. Marach, Marengo, Ill., assignor to Cooper Industries, Inc., Houston, Tex.

Filed Aug. 15, 1988, Ser. No. 232,322
Int. Cl.⁴ H01R 43/00

U.S. Cl. 29—884

22 Claims



1. A method of making a holder for a plurality of plug-in electrical circuit protective devices for interrupting the flow of current flowing therethrough, comprising the steps of:

- (a) forming, from a blank of electrically conductive material, at least two branches which are separated from each other by a spaced distance and which are joined to a common trunk member, each of said branches having a free end and two edges which join said free end to said trunk member;
- (b) forming, along at least one edge of each branch of said blank, a pair of spaced apart terminals which are adapted to removably receive the ends of a common plug-in electrical circuit protective device;

- (c) mounting said branches and said trunk of said blank on a generally flat insulated base; and
- (d) splitting each branch at a position intermediate its terminals to form a plurality of severed branch portions and attached branch portions which are carried by said insulated base, whereby those terminals of each attached branch portion are joined to said trunk member and are connected to each other to form a common electrical supply bus
- (e) positioning an insulated member, on said base, to cover all but said free end of each severed branch portion and at least part of said severed branch portions and said trunk member of said blank, said insulated member having at least one aperture therein of sufficient size to receive one plug-in electrical circuit protective device; and
- (f) aligning said insulated member to have said at least one aperture over one pair of said spaced apart terminals.

4,872,263

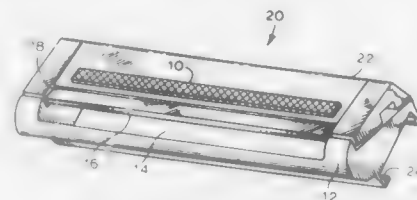
LUBRICATING DEVICE

Robert W. Etheredge, III, Natick, Mass., assignor to The Kendall Company, Boston, Mass.

Filed Sep. 30, 1988, Ser. No. 252,822
Int. Cl.⁴ B26B 19/44

U.S. Cl. 30—41

29 Claims



1. A lubricating device comprising: (1) a porous matrix impregnated with a lubricating composition consisting essentially of an acid soap of at least one unsaturated higher fatty acid having at least 16 carbon atoms; and (2) a water-insoluble perforated sheet material adhered to one surface of said impregnated porous matrix and through which said lubricating composition can diffuse when moistened.

4,872,264

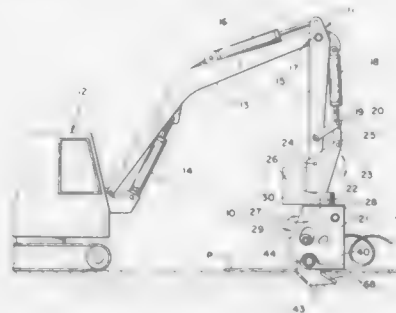
HEAVY DUTY PLATE SHEAR

Roy E. LaBounty, HC2 Box 105E, Two Harbors, Minn. 55616

Filed Jan. 11, 1988, Ser. No. 142,654
Int. Cl.⁴ B23P 19/00

U.S. Cl. 30—210

27 Claims



1. A heavy-duty plate cutting shear to be carried on an elevated lifting device, comprising frame means with mounting means for attaching to such a device, a slidable foot affixed on the frame means and having an

- unobstructed base face for engaging and sliding along the plate being sheared, the slidable foot having an elongate slot opening through the base face and also having metal shearing edges at both sides of the slot and adjoining the face,
- a swingably oscillatable blade having pivot means mounted on the foot, the blade being in the slot and extending from the pivot means and across the base face, the blade having metal cutting edges confronting and traversing the shearing edges on the foot,
- and a hydraulic cylinder on the frame means and connected with the blade in the slot and oscillating the blade across the shearing edges of the foot.

4,872,265

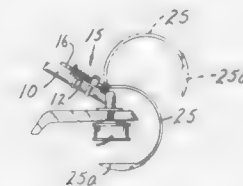
TRIMMER ATTACHMENT

David W. Powell, 11020 Upper Mount Vernon Rd., Mount Vernon, Ind. 47620

Filed May 2, 1988, Ser. No. 188,856
Int. Cl.⁴ B26B 7/00

U.S. Cl. 30—296 A

8 Claims



1. An attachment for an implement including a support shaft and a cutter in the form of a rotatable mono-filament used for lawn trimming mounted at the free end thereof comprising a base secured to said support shaft, a spacer pivotally mounted on said base and selectively engaging and movable on a lawn area, said spacer serving to maintain said cutter vertically distant from said lawn area at an operative position so as to avoid lawn scalping while trimming, and means mounted on said base and cooperable with said spacer selectively locking said spacer at said operative position.

4,872,266

PLASTIC FRAME WITH EMBEDDED SHEARING FOIL

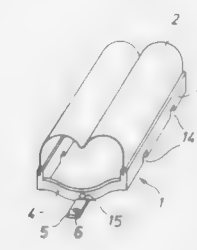
Albert Greutert, Sachseln, and Ruedi Gasser, Luzern, both of Switzerland, assignors to Maxx AG, Sachseln, Switzerland

Filed Jan. 21, 1988, Ser. No. 146,314
Claims priority, application Fed. Rep. of Germany, Jan. 28, 1987, 3702526

Int. Cl.⁴ B26B 11/04

U.S. Cl. 30—346.51

5 Claims



1. In combination a plastic frame and a vaulted shearing foil, said frame including a pair of opposing longitudinal strut portions to which said foil is attached and a pair of transverse strut portions interconnecting the longitudinal strut portions, the longitudinal strut portions being provided with fastening means to hold the plastic frame in a casing member of a dry shaver, characterized in that said transverse strut portions are

- resilient to allow movement of the longitudinal strut portions toward and away from each other, said transverse strut portions having an untensioned state which in their longitudinal direction deviates from a straight line, said transverse strut portions each including a center section reduced in cross-section to accommodate buckling of the transverse strut portions.

4,872,267

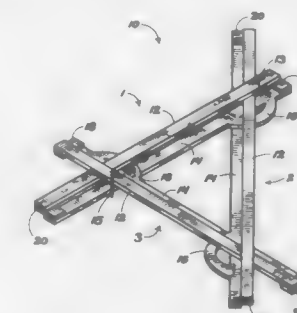
MEASURING DEVICE

Randy Anderton, Route 1 Box 46, Alcester, S. Dak. 57001

Filed Jun. 27, 1988, Ser. No. 212,253
Int. Cl.⁴ G01B 5/24

U.S. Cl. 33—463

6 Claims



1. A measuring device, comprising: three straight leg portions interconnected in a triangular configuration; each of said leg portions mounted for linear sliding movement on each two adjacent leg portions; each of said leg portions including a pair of elongated strips connected in spaced parallel relation forming a slot therebetween; and one strip of each of two adjacent leg portions slidably received in said slot.

4,872,268

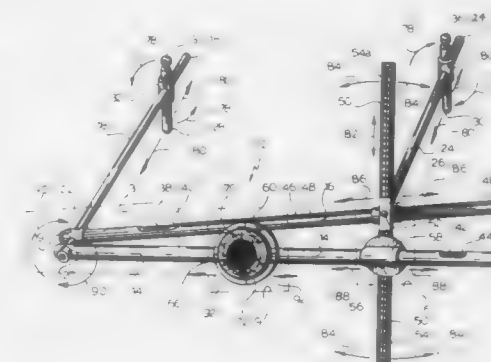
SKELETON DEVICE

Ronald Perrault, 3 avenue des Sapins, Notre-Dame-des-Prairies, Canada J6E 1C3

Filed Apr. 20, 1988, Ser. No. 186,094
Int. Cl.⁴ G01B 3/02

U.S. Cl. 33—512

9 Claims



1. A skeleton-measuring device comprising one and another main arms, said arms being elongated, rigid, and cylindrical; first mounting means interconnecting said arms for pivotal movement of said another arm relative to said one arm about a first plate; support means for supporting said another arm over

joint portions of a human body; level means for monitoring horizontal levelling of both of said arms; a scale member connected to said one arm by second mounting means and to said another arm by third mounting means, for both pivotal movement about a second plane parallel to said first plate and lengthwise displacement relative to either of said arms; and scale means for measuring the lengthwise displacement of the scale member relative to said another arm; wherein said support means includes one and another rod member, said one rod member fixedly connected to said another arm, said another rod member connected to said another arm by said third mounting means and adapted for lengthwise displacement relative to said another arm, said rod members orthogonal to said first plane of pivotal movement of said another arm.

4,872,269

AUTOMATIC CYLINDER PROFILING GAGE

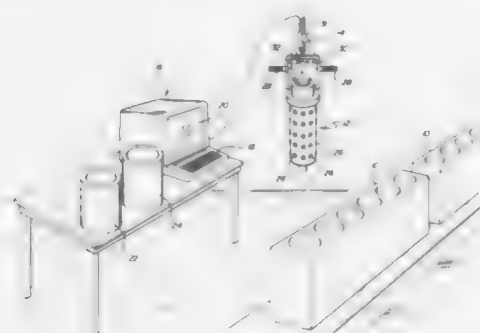
Karl Sattmann, 941 Viewland, Rochester Hills, Mich. 48064

Filed Apr. 8, 1988, Ser. No. 179,261

Int. Cl.⁴ G01B 7/12

U.S. Cl. 33—552

19 Claims



1. An automatic cylinder profiling gage comprising:
 - I. a generally cylindrical measuring head adapted to fit into a cylinder being profiled and including:
 - a centering means for maintaining the head in an approximately centered relationship within the interior of the cylinder;
 - a plurality of transducers associated with the head, each transducer including a measuring probe extensible from the surface of the head and adapted to generate a positional signal corresponding to the distance from the head to the interior wall of the cylinder without deforming the interior wall of the cylinder, said transducers disposed in spaced apart relationship so as to substantially simultaneously contact a plurality of points along the length and circumference of said interior wall and substantially simultaneously generate a plurality of positional signals;
 - II. a signal processor disposed so as to receive the positional signals from the plurality of transducers, compare said signals with stored values corresponding to positional signals obtained from an ideal cylinder and generate a profile signal indicative of the deviation of the measured cylinder from the ideal cylinder; and
 - III. display means in operative communication with the signal processor and adapted to receive the profile signal and provide a visual display corresponding thereto.

4,872,270

DRYING PROCESS

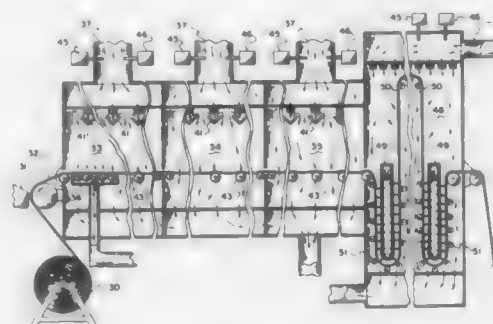
Dennis R. Fronheiser, Rochester; Jack Hayward, Hilton; Gerald G. Reafter, Rochester, and James R. Schuler, Brockport, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 9, 1988, Ser. No. 166,083

Int. Cl.⁴ F26B 3/02, 13/00

U.S. Cl. 34—23

15 Claims



1. A process for drying a coating of wet latex paint on a heat-deformable plastic film, the paint containing water, one or more higher boiling organic solvents and a colloiddally dispersed, coalescable, hardenable, elastomeric film-forming polymer to obtain a smooth, stretchable dried paint layer substantially free of bubble defects, which comprises:
 - passing continuously through a series of drying stages a heat-deformable plastic carrier film having an upper and an under surface and having on its upper surface a coating of the wet latex paint,
 - introducing a flow of heated, moderately humid air to each stage to supply heat and cause evaporation of water and organic solvent, the air flow in at least the first three stages being so directed that more than half of the heat required for evaporation is supplied to the film through its under surface,
 - in a first stage of at least 30 seconds duration, controlling the evaporation conditions, including the flow rate, humidity and temperature of the air to maintain the temperature of the paint layer within about 10 degrees C below and 5 degrees C above its initial temperature,
 - in a second stage of at least 30 seconds duration maintaining conditions which heat the paint layer to a temperature higher than in said first stage but no higher than 10 degrees C above its initial temperature,
 - in a third stage of at least 30 seconds duration maintaining conditions which heat the paint layer to a temperature higher than in said second stage but no higher than 25 degrees C above its initial temperature;
 - thereafter in a final stage maintaining conditions which heat the paint layer to a maximum temperature at least 30 degrees C higher than the highest temperature in the third stage and at least 50 degrees C higher than its initial temperature for sufficient time to evaporate remaining water and organic solvent and harden the paint layer, the temperature being below the heat deformation temperature of the carrier film.

4,872,271

SHOE HEEL SCUFF PROTECTOR

Dorothy E. Allen, 18710 Fenelon, Detroit, Mich. 48234

Filed Oct. 11, 1988, Ser. No. 255,849

Int. Cl.⁴ A43B 13/22

U.S. Cl. 36—72 B

16 Claims

1. A protective device for a shoe having a heel, a shank and a counter comprising:
 - an upper elastic endless band;
 - a lower elastic endless band being smaller in circumference than the upper band;

said upper and lower bands being effective to grip the shoe adjacent the heel and counter, the upper band being disposed around the shoe counter and shank, the lower band being disposed around the shoe heel adjacent the counter; an endless elastic wall interconnecting the upper and lower bands respectively and being gathered at its upper and lower edges for shielding the shoe heel and counter; and



a flexible loop extending across and upwardly from the upper band's inner surface, said loop being reversely bent and continuing downward across the upper band's outer surface wherein said loop serves as a pull for the installation of the device over the shoe heel and counter.

4,872,272

DETACHABLE BINDING DEVICE FOR A SKI BOOT

Heinz Wittmann, Vienna; Roland Erdei, Pottendorf, and Tibor Szasz, Vienna, all of Austria, assignors to TMC Corporation, Switzerland

PCT No. PCT/EP87/00211, § 371 Date Jan. 5, 1988, § 102(e) Date Jan. 5, 1988, PCT Pub. No. WO87/06802, PCT Pub. Date Nov. 19, 1987

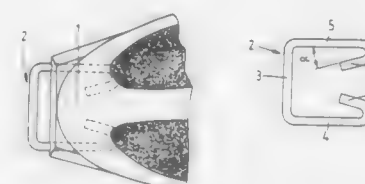
PCT Filed Apr. 18, 1987, Ser. No. 174,993

Claims priority, application Austria, May 7, 1986, 1220/86

Int. Cl.⁴ A43B 5/04; A63C 9/00

U.S. Cl. 36—117

8 Claims



1. A device for detachably fastening a ski boot to a ski binding, comprising:
 - a hook element (2) extending in a longitudinal direction of said ski boot and being rigidly connected to a travel sole (9) of said ski boot, said hook element including a plurality of bent portions, a cross rod fixed into a predetermined distance away from the front end of said ski boot and extending transverse to said longitudinal direction, and first and second legs (4, 5) extending in said longitudinal direction, each of said legs including at least one segment (6, 7) bent in the plane of said hook element by a first predetermined angle (alpha) toward said cross rod.

4,872,273

SPIKE SHOE SLIP

Clifford G. Smeed, 3625 Keating, 190 1, San Diego, Calif. 92110

Continuation-in-part of Ser. No. 132,335, Dec. 14, 1987, abandoned. This application Jul. 29, 1988, Ser. No. 226,142

Int. Cl.⁴ A43B 5/00, 3/10; A43C 13/12

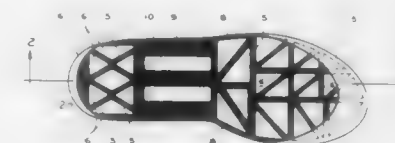
U.S. Cl. 36—135

11 Claims

1. A slip, for use with a sports enthusiast shoe having a heel, sole, and toe portions, and having anti-skid protrusions on a

bottom surface of said shoe's sole and heel portions, said slip comprising:

- a semi-rigid sole membrane capable of being placed proximate to said sole and generally covering a portion of said bottom surface of said sole;
- first means for removably attaching said sole membrane to said shoe;
- a stretchable midsection membrane attached to said sole membrane distal from said first means for attaching;
- a semi-rigid heel membrane attached to said midsection distal from said sole membrane, said heel membrane capable of being placed proximate to said heel generally covering a portion of said heel bottom;
- second means for removably attaching said heel membrane to said shoe;



- a generally rigid heel segment attached to said heel membrane, said heel segment having a plurality of rigid brace within a heel-shaped ring, said braces and heel-shaped ring dimensioned and shaped to allow said spikes to protrude into cavities bounded by said braces and heel membrane;
- a generally rigid sole segment attached to said sole membrane, said sole segment having a plurality of rigid braces within a sole-shaped ring, said braces and sole-shaped ring dimensioned and shaped to allow said spikes to protrude into cavities bounded by said braces and sole membrane; and
- said braces forming a combination of longitudinal, transversal and diagonal septi delineating said cavities.

4,872,274

REMOVABLE TOOTH WITH ADAPTER FOR DIGGING EXCAVATORS

Dieter Giersch, Glückstadt; Hans-Werner Rickmann, Witten, and Ulrich Wibbeling, Dortmund, all of Fed. Rep. of Germany, assignors to Hoesch Aktiengesellschaft, Dortmund, Fed. Rep. of Germany

Filed Sep. 15, 1988, Ser. No. 244,707

Claims priority, application Fed. Rep. of Germany, Sep. 18, 1987, 3731459

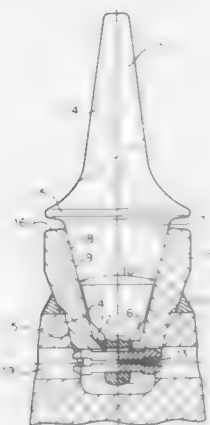
Int. Cl.⁴ E02F 3/88, 9/28

U.S. Cl. 37—64

7 Claims

7. A removable tooth with an adapter for a cutting wheel on suction dredges or power shovels, comprising: a cutting wheel; an adapter attached to the cutting wheel and having similarly shaped surfaces for supporting the tooth; said cutting wheel having a recess with a circumference and length of receiving said adapter; said adapter having a lateral outer surface in contact with said recess over the entire circumference of said recess and along at least part of the length of said recess; said adapter being fixed in said recess; said tooth having a base; said adapter having an opening for supporting said tooth on said base; said tooth extending with said base into said opening of said adapter and said adapter extending into said recess of said cutting wheel; and base of said tooth being shaped at least partly as a truncated cone, said adapter having a conical bore matching substantially said truncated cone, said

truncated cone resting in said matching conical bore, said bore comprising said opening in said adapter; said lateral surface of said adapter being shaped at least partly as a truncated cone, said recess in said cutting wheel having a conical shape matching substantially said truncated cone of said lateral surface, said lateral surface resting in said recess of said cutting wheel; said base having a bottom with a polygonal cross-section, said adapter having a rectangular recess engaging said polygonal



cross-section; a security element at said bottom of said base and extending through said base and through said adapter, said security element being accessible from outside through said cutting wheel; a collar on said tooth between said base and a predetermined point on said recess, said collar having an outside diameter, said adapter having an outside diameter equal substantially to said outside diameter of said collar, said collar being positioned substantially above an upper edge of said adapter.

4,872,275

DITCH CLEANING MACHINE

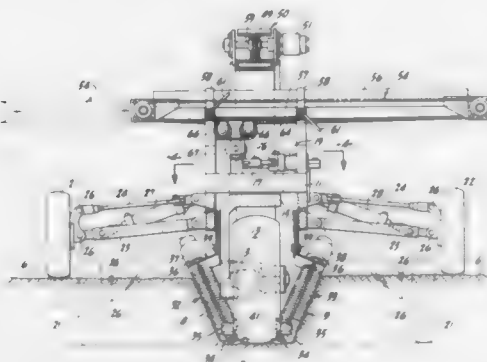
Orval D. Beckett, deceased, late of Placerville, and by Berta M. Beckett, legal representative, 4125 McHenry Ave. - Space 121, Modesto, both of Calif. 95350

Filed May 20, 1988, Ser. No. 196,648

Int. Cl.⁴ E02F 5/02

U.S. Cl. 37-91

5 Claims



1. A ditch cleaning machine comprising a main frame extending longitudinally along an axis, a front ground-engaging wheel connected to the front of said main frame for pivoting about a first vertical axis, a rear ground-engaging wheel connected to the rear of said main frame for pivoting about a second vertical axis, a first outrigger wheel disposed on one side of said axis, a second outrigger wheel disposed on the other side of said axis, means for mounting said outrigger

wheels on said main frame in transverse alignment and for vertical swinging movement relative to said main frame, a support roller, means for mounting said support roller on said frame for rotation about a transverse axis, an elevator frame extending longitudinally and resting on said roller, a pair of cleaning drum carriers, means for mounting both of said carriers at the top thereof for pivotal movement on said frame, cleaning drums rotatably mounted on said carriers, means for connecting both of said cleaning drum carriers at the bottom thereof to the lower end of said elevator frame for pivotal movement about a transverse axis, a jack pivoted to said frame and to said elevator frame for jacking both of said cleaning drum carriers with respect to said elevator frame, an elevator mounted on said elevator frame, a discharge conveyor frame, means for mounting said discharge conveyor frame for transverse shifting movement on said main frame, and a transverse conveyor mounted on said discharge conveyor frame.

4,872,276

CALENDERING PROCESS FOR POLYESTER FABRIC

Thomas E. Godfrey, Moore, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Filed May 13, 1988, Ser. No. 194,674

Int. Cl.⁴ D06F 67/02; B30B 3/04

U.S. Cl. 38-101

3 Claims



1. A method for treating a woven textile fabric comprised of polyester-containing yarns to decrease the bending recovery of said fabric, comprising passing said polyester-containing fabric between a pair of opposed calendar rolls while maintaining the pressure exerted on said fabric by said rolls at a substantially uniform value, said valve being within the range of about 1,000 p.s.i. and 3,500 p.s.i., and maintaining said fabric at a temperature below about 150° F. while passing said fabric between said opposed rolls.

4,872,277

CALENDAR ASSEMBLY

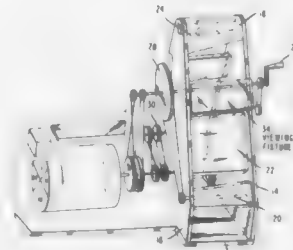
Rao V. Angara, 156 Mineral Springs Ave., Passaic, N.J. 07055

Filed Aug. 18, 1987, Ser. No. 86,686

Int. Cl.⁴ G01D 3/10

U.S. Cl. 40-117

9 Claims



1. A hand held or self-supported calendar assembly comprised of:

a rotatable calendar year member consisting of fourteen different calendar year systems mounted coaxially or in

tandem with a rotating calendar indexing member furnishing an indexing system; and synchronized drive means for indexing a predetermined calendar year format to permit ascertaining the day of the week of any day of the month of said predetermined calendar year.

4,872,278

MOTION SENSITIVE ANIMATED FIGURE DISPLAY

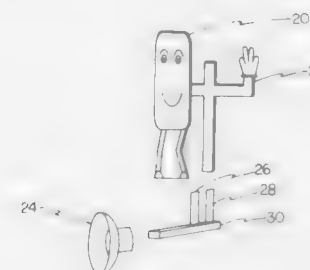
Bruce E. Ross, and Gail C. Ross, both of 8 Kiska Ct., Randallstown, Md. 21133

Filed Apr. 26, 1988, Ser. No. 186,222

Int. Cl.⁴ G09F 19/08

U.S. Cl. 40-424

2 Claims



1. A motion sensitive animated figure display, comprising: display means, comprised of separate display panels, for supporting different portions of said figure display, attachment means, interconnecting the display panels to a support such that the display panels are in closely spaced vertical planes and whereby all portions of said figure display are animated, wherein said attachment means are resilient and oscillating motion of the display panels is achieved, means, for controlling and coordinating the oscillatory movement of each of said display panels with respect to each other, whereby the animation effect is enhanced, mounting means for vertically supporting said figure display.

4,872,279

RELOADING DEVICE FOR CARTRIDGE MAGAZINE

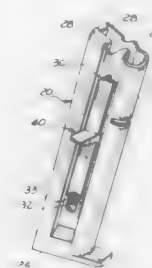
John L. Boat, Phoenix, Ariz., assignor to John A. Norton, Phoenix, Ariz.

Filed Sep. 12, 1988, Ser. No. 242,883

Int. Cl.⁴ F41C 27/00

U.S. Cl. 42-90

9 Claims



1. A reloading device for use in combination with a magazine, which magazine includes an elongate tubular body having an open end for receiving and discharging cartridges therethrough, an elongate slot extending longitudinally of said body, said slot having a first end proximate the open end of said body and a second end opposite said first end,

a follower reciprocally disposed within said body and having a retracting button projecting through said slot, and biasing means normally urging said follower toward the open end of said body, and for retaining said follower in a retracted position to facilitate insertion of cartridges into said magazine, said reloading device comprising:

- (a) an elongate member including
 - (i) first means engageable with the first end of said slot, and
 - (ii) second means engageable with said follower, wherein said elongate member resides in compression against said biasing means when said first means and said second means are engaged with said end of said slot and with said follower, respectively; and
- (b) grip means carried by said member for manual manipulation of said device.

4,872,280

AUTOMATIC FISHHOOK SETTING DEVICE

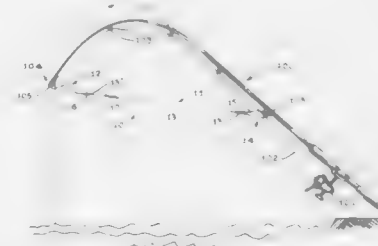
Benjamin L. Smith, 9950 Pine Park Ter., Colorado Springs, Colo. 80909

Filed Sep. 28, 1988, Ser. No. 250,051

Int. Cl.⁴ A01K 91/06, 97/00

U.S. Cl. 43-15

3 Claims



1. An automatic fishhook setting device for use in conjunction with a conventional fishing rod having a plurality of spaced eyelets and a rod tip having a tip eyelet wherein the device consists of:

- a tether unit connected on one end to one of the spaced eyelets on the fishing rod; wherein, the tether unit comprises an elongated tether member having releasable attachment means for releasably securing said one end of the tether unit to one of the spaced eyelets on said fishing rod; and,
- a spring release unit comprising a contoured leaf spring member which is releasably connected on one end to the rod tip eyelet and operatively attached on the other end to the tether unit wherein the contoured leaf spring member comprises: a shallow leaf spring hook segment formed on one end of said leaf spring member; a curved intermediate leaf spring segment formed as an extension of said shallow leaf spring segment; and, a generally flat leaf spring segment formed as an extension of the curved leaf spring segment; wherein, the shallow leaf spring segment and the curved intermediate leaf spring segment combine to form a generally S-shaped configuration on the forward portion of the contoured leaf spring member and the generally flat leaf spring segment is operatively connected to the other end of the tether unit whereby the only operative connection between the conventional fishing rod and the automatic fishhook setting device occurs between the releasable attachment means on one end of the tether unit with a selected one of said plurality of spaced eyelets on the fishing rod, and the free end of the shallow leaf spring hook segment with the tip eyelet of the conventional fishing rod.

4,872,281

DOWNRIGGER FISHING LINE HOLDER

Billie J. Burgess, P.O. Box 492, Grand Haven, Mich. 49417
 Filed Aug. 15, 1988, Ser. No. 231,899
 Int. Cl.⁴ A01K 97/00

U.S. Cl. 43—43.12

10 Claims



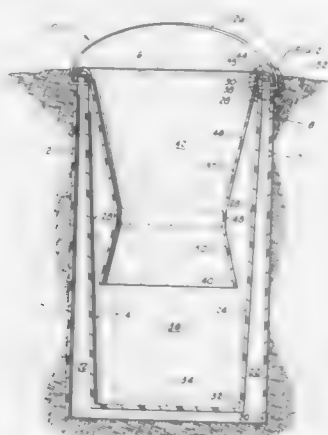
1. A line holder for a downrigger fishing system, comprising:
 an elongated body having a slot along one side adapted to receive a downrigger cable;
 releasable means forming a barrier across said slot, said barrier being spring-loaded plunger normally traversing, and withdrawable from, said slot; and
 releasable clamping means on said body adjacent said slot, and operative to hold a fish line with a predetermined degree of resistance against pull-out.

4,872,282
ANT TRAP

Glen D. Caldwell, Rt. 1, Box 37, and Kenneth D. Craven, Rt. 1, Box 43, both of Byers, Okla. 74831
 Filed Apr. 3, 1989, Ser. No. 331,911
 Int. Cl.⁴ A01M 1/10

U.S. Cl. 43—121

5 Claims



1. An insect trap comprising:
 an outer housing having an upper end and a lower end and an opening extending between the upper end and the lower end;
 a container having an open upper end, a continuous side wall and a closed lower end, wherein the container is sized for insertion into the opening of the outer housing; and
 a frusto-conical entrant lid having a smooth surface continuous side wall, wherein the smooth surface continuous side wall extends into the container, and wherein the smooth surface continuous side wall has an open upper end and an open lower end and an opening extending between the upper end and the lower end, and wherein a portion of the frusto-conical entrant lid adjacent the open upper end of

the smooth surface continuous side wall is secured to and overlies the upper end of the container.

4,872,283

PLANT SUPPORT

William W. Yinger, 4200 Tartan Way, Roswell, Ga. 30075
 Filed May 9, 1988, Ser. No. 191,540
 Int. Cl.⁴ A01G 9/12

U.S. Cl. 47—70

4 Claims



1. A support mechanism for the main stem area of a plant growing in a container; said mechanism comprising a ring structure adapted to encircle the plant stem area above the container rim; and means for detachably clamping the mechanism to the container rim;
 said ring structure being defined by four horizontal bars arranged in a rectangular grip pattern; first and second ones of said bars being parallel to each other above the container rim, and third and fourth ones of said bars extending parallel to each other crosswise of the first and second bars so that sections of said first and second bars are in overlapping engagement with sections of the third and fourth bars; each bar having at least one elongated slot extending therealong;
 a threaded connector means extending through each of the overlapped bar sections to connect the first and second bars to the third and fourth bars; each threaded connector means comprising a threaded element having a non-circular head and a threaded shank extended through the slots in the bars, and a clamping nut threaded onto the shank to releasably clamp the associated overlapped bar sections together;
 the slots in the bars slidably receiving the threaded connector elements, whereby individual bars are capable of selective adjustments in directions normal to their length dimensions, to thereby permit variations in the size and location of the ring structure.

4,872,284

CELL BLOCK SECURITY SYSTEMS

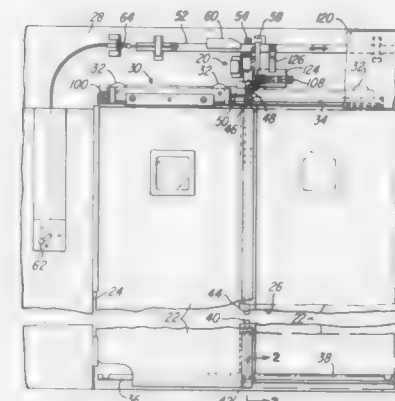
Leroy Bentley, Covington, Ky., assignor to Stewart Decatur Security Systems, Inc., Erlanger, Ky.
 Filed Nov. 17, 1988, Ser. No. 272,468
 Int. Cl.⁴ E05B 47/00

U.S. Cl. 49—16

10 Claims

1. In a security system for a cell block wherein each cell door is locked by a drop bar when it is disposed in a lower position and unlocked when the drop bar is in an elevated, release position, and the system comprises a master control bar having means, effective in a lock position thereof, to lock all of the drop bars in their lower positions, and means, effective in an unlock position of the master control bar, to displace all of the drop bars to their release positions, and selectively actuable, door unlocking means for raising each drop bar, said selectively actuable means being operable when the master control bar is in other than its lock or open positions, and comprising, in association with each cell,

means for latching the drop bar in its lower, locking position, and position in which said door leaves are in contact with said side walls.



4,872,285

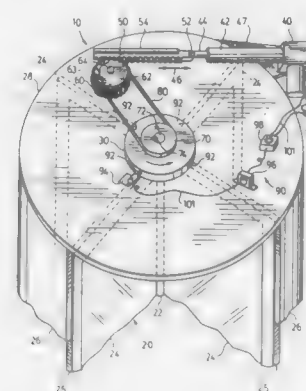
QUARTER POINT RETURN MECHANISM FOR MANUALLY OPERATED REVOLVING DOORS

Horst Appelmann, Pickering, Canada, assignor to C. J. Rush Inc., Agincourt, Canada
 Continuation-in-part of Ser. No. 60,196, Jun. 10, 1987, Pat. No. 4,800,679. This application Jun. 2, 1988, Ser. No. 201,226
 The portion of the term of this patent subsequent to Jan. 31, 2006, has been disclaimed.

Int. Cl.⁴ E05D 15/02

U.S. Cl. 49—42

9 Claims



1. A quarter point return mechanism for a manually driven revolving door having revolving door leaves extending outwardly from a central shaft and being partially enclosed between opposed curved side walls, said return mechanism comprising:
 an actuator;
 transmission means connecting said actuator to said central shaft, said transmission means transmitting rotation to said shaft when said actuator is actuated in a first direction and not transmitting rotation to said shaft when said actuator is actuated in a second direction; and
 sensing means for sensing circumferential displacement of outer-ends of said door leaves from said side walls, said actuator being actuated in said first direction when said sensing means senses said outer ends of said door leaves are in a position circumferentially displaced from said side walls,
 said return mechanism returning said door leaves to a rest

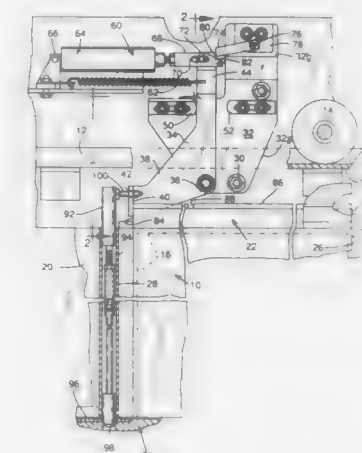
4,872,286

EXTERNAL LATCH STRUCTURE FOR LOCKING A DOOR IN DIFFERENT POSITIONS

Alfred J. Peirish, McMinnville; Theodore E. Schmidt, Carlton, and William C. Thomas, Beaverton, all of Oreg., assignors to Pacific Security Systems of America, Inc., Portland, Oreg.
 Filed May 20, 1988, Ser. No. 196,249
 Int. Cl.⁴ E05D 13/04

U.S. Cl. 49—449

8 Claims



1. In combination with a doorframe defining a door opening and a movable door mounted for movement between positions opening and closing said door opening, lock mechanism comprising:
 a frame-carried locking member movably mounted on the doorframe for movement between a locking position and a release position where the door is located and released, respectively,
 power-operated means operatively connected to and for moving the locking member between said locking and release positions,
 a movable dead latch member mounted on the doorframe movable between a latching position latching the locking member in its locking position and an unlatching position where the locking member is free to move to its release position,
 means for moving the dead latch member to its unlatching position,
 a door-carried locking member shiftable between locking and release positions where the door is locked and released, respectively, said door-carried locking member being mounted on the door to be carried by the door, said doorframe including a receptor for receiving the door-carried locking member with the door closed and the door-carried locking member in its locking position, said frame-carried locking member including means engageable with the door-carried locking member with the door closed producing shifting of the door-carried locking member to a release position with movement of the frame-carried locking member to a release position.

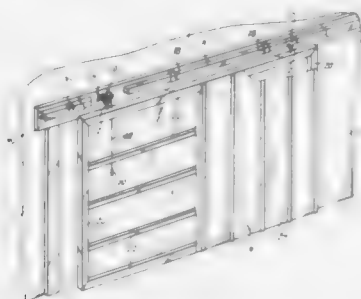
4,872,287

LATCHING MECHANISM FOR TROLLEY-HUNG DOORS

Gordon S. Block, Roscoe, Ill., assignor to C. Hager & Sons Hinge Manufacturing Company, St. Louis, Mo.
Filed May 13, 1988, Ser. No. 193,536
Int. Cl.⁴ E05D 13/04

U.S. Cl. 49—449

26 Claims



1. In combination with a track having a hollow interior, horizontal ways presented toward the hollow interior, and a downwardly presented slot between the ways; a trolley which rolls along the ways; and a hanger which is coupled to the trolley and extends through the downwardly presented slot along the ways for suspending a door or other device from the trolley and the track within which the trolley moves; an improved apparatus for holding the trolley in a predetermined position along the track, said apparatus comprising: a latch mechanism carried by the trolley substantially entirely within the hollow interior of the track and being movable on the trolley between first and second positions without projecting out of the track; and a keeper located within the hollow interior of the track and being attached to the track, the keeper being configured and positioned to be engaged by the latch mechanism when the latch mechanism is in its first position and the trolley is in the predetermined position along the track, but not when the latch mechanism is in its second position.

4,872,288

SEALING STRUCTURE FOR AUTOMOBILE

Masahiro Nozaki, Ama, Japan, assignor to Toyota Gosei Co., Ltd., Nishikasugai, Japan

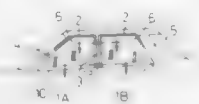
Filed May 26, 1988, Ser. No. 199,153

Claims priority, application Japan, Sep. 22, 1987, 62-144907[U]

Int. Cl.⁴ E06B 7/76

U.S. Cl. 49—485

3 Claims



1. A sealing structure for sealing a gap between a door opening of an automobile body and a door frame by means of a weather strip, comprising:
said weather strip installed on one of a pillar defining said door opening, and said door frame opposed to said pillar for sealing a gap between said pillar and said door frame,

has a quantity of flection, which is gradually increased upwards from a belt line of a door of said automobile body.

4,872,289

CUTTER

Isao Yukawa, Odawara, and Yasuji Tada, Yamato, both of Japan, assignors to Disco Abrasive Systems, Ltd., Tokyo, Japan
Filed Jun. 1, 1987, Ser. No. 55,978

Claims priority, application Japan, Jun. 10, 1986, 61-132655; Jan. 14, 1987, 62-5050

Int. Cl.⁴ B24B 7/00

U.S. Cl. 51—5 R

33 Claims



1. A cutter for cutting plate-like material along concentric circular inside and outside cutting lines, said cutter comprising: a movably mounted supporting base stand, at least two material-holding chuck means disposed on the supporting base stand, each chuck means including a chuck plate having a surface for holding material to be cut thereon, the chuck plate surface having two concentric annular grooves therein, intermittently moving means for intermittently moving the support base stand, and sequentially positioning each chuck means in a cutting zone, material carry-in means for carrying material to be cut to a chuck means located at a position in advance of the cutting zone, a cutting blade device for cutting material held on a chuck means moved into the cutting zone, said blade device comprising rotatably-mounted, concentric inside and outside blades each of the blades having front end portions formed to be received within the concentric, annular grooves of the chuck plate surface, blade rotating means for rotating the inside and outside blades, and blade moving means for moving the inside and outside blades toward and away from the supporting base stand, and material carry-out means for carrying cut material from a chuck means which has passed through the cutting zone.

4,872,290

GLASSWARE GRINDING AND/OR POLISHING APPARATUS

Margaret Jenkinson, Blackpool, England, and John Dunne, Dublin, Ireland, assignors to 501 Abbeybench Limited, Lancashire, England

Filed Dec. 24, 1986, Ser. No. 946,450

Claims priority, application United Kingdom, Dec. 24, 1985, 8531727

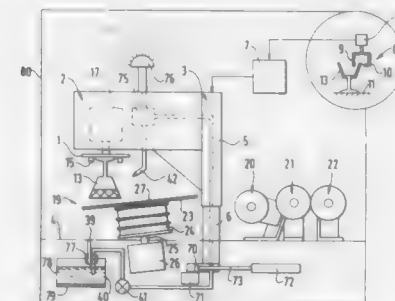
Int. Cl.⁴ B24B 7/00

U.S. Cl. 51—109 R

16 Claims

1. Apparatus for grinding and/or polishing glasses, comprising:
gripping means arranged to grip a glass;
at least one grinding means and at least one polishing means arranged to grind and polish the rim of a glass gripped in the gripping means; and
transport means arranged to cause relative movement between the gripping means and the grinding and polishing means;

wherein the grinding and polishing means each comprises an abrasive member having a resilient and substantially planar working surface disposed at such an angle that, during movement of the gripping means relative to the grinding and polish-



ing means, the rim of a glass gripped in the gripping means travels over each said working surface from a first to a second region thereof, the second region being closer than the first region to the base of the glass.

4,872,291

MOUNTING DEVICE

Kevin Lindsey, Sunbury-on-Thames, England, assignor to National Research Development Corporation, London, United Kingdom

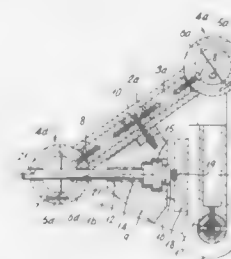
Continuation of Ser. No. 84,851, Aug. 13, 1987, abandoned. This application Dec. 22, 1988, Ser. No. 289,433

Claims priority, application United Kingdom, Aug. 13, 1986, 8619609

Int. Cl.⁴ B24B 41/02

U.S. Cl. 51—166 R

18 Claims



1. A mounting device comprising six rod-like members the ends of which are rigidly coupled together to form a substantially tetrahedral structure and mounting means comprising a rigid member fixedly coupled to three of said rod-like members, said three rod-like members not being co-planar.

4,872,292

FLAP WHEEL

Aleck Block, 800 Warner Ave., Los Angeles, Calif. 90024

Filed Jun. 22, 1988, Ser. No. 210,006

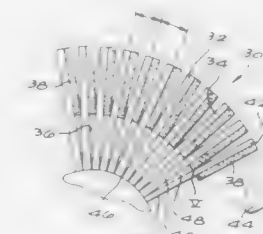
Int. Cl.⁴ B24B 9/02

U.S. Cl. 51—334

52 Claims

3. In combination for use in an array for engaging a work-piece,
a plurality of abrasive flaps each having first and second parallel surfaces and including a backing member and abrasive particles on the first surface of the backing member,
each of the abrasive flaps having a working portion and a support portion,
the abrasive particles being removed from the flaps in the packs at the support portions of the flaps,

the abrasive flaps being compressed against one another at the support portions of the flaps, and
an adhesive material disposed between the flaps at the support portions of the flaps,
wherein the abrasive particles on each abrasive flap have been attached by an adherent material to the support



portion of the flap and wherein at least a portion of the adherent material remains on the support portion of the flap after removal of the abrasive particles from the flap and wherein additional adherent material is provided between the flaps in the support portions of the flaps and is adhered to the adherent material remaining on the flaps after the removal of the abrasive particles from the flaps.

4,872,293

ABRASIVE WATER JET CUTTING APPARATUS

Wataru Yasukawa, deceased, late of Kobe (by Shigeo Yasukawa, sole heir); Masanori Kiyoshige, Akashi; Takeshi Horikawa; Tomonobu Okada, both of Kobe; Tadafumi Ochi, Amagasaki; Yoshiaki Aoki, Osaka; Masahiko Higashida; Takashi Kawashima, both of Akashi; Shigeki Koe, Kobe; Hideo Ono, Takasago; Kanta Nihei, Kobe; Syunji Takasugi, Kobe, and Koji Take, Kobe, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Hyogo, Japan

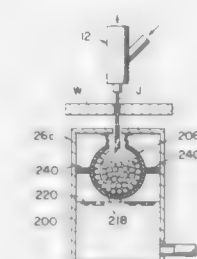
Filed Feb. 20, 1987, Ser. No. 17,345

Claims priority, application Japan, Feb. 20, 1986, 61-36072; Apr. 18, 1986, 61-90398; Jul. 8, 1986, 61-161268; Jul. 8, 1986, 61-161269; Sep. 18, 1986, 61-143415[U]; Sep. 18, 1986, 61-143416[U]; Nov. 5, 1986, 61-264778

Int. Cl.⁴ B24C 9/00

U.S. Cl. 51—410

3 Claims



1. An apparatus for cutting work by means of an abrasive water jet containing abrasive particles, comprising:
(a) a source of water under pressure;
(b) abrasive suspension supply means for supplying an abrasive suspension such that abrasive particles with an average size of up to about 100 microns are held in suspension in water;
(c) an abrasive water jet nozzle assembly held opposite the work to be cut and communicating with both the pressurized water source and the abrasive suspension supply means, the nozzle assembly mixing the pressurized water and the abrasive suspension for directing the resulting mixture against the work as an abrasive water jet; and

(d) recovery vessel means for recovering, for transfer back to the abrasive suspension supply means, the abrasive water jet which has been discharged from the abrasive water jet nozzle assembly and which has cut the work, the recovery vessel means comprising:

- (1) a recovery vessel positioned opposite the abrasive water jet nozzle assembly and having an inlet opening for admitting the abrasive water jet and at least one outlet opening for the discharge of the admitted water and abrasive particles;
- (2) a multiplicity of damper balls of rigid material within the recovery vessel for damping the energy of the abrasive water jet;
- (3) the recovery vessel having an inside surface which is at least partly rounded to allow the damper balls to be recirculated therein by the energy of the abrasive water jet;
- (4) resilient means for resiliently supporting the recovery vessel;
- (5) a watertight enclosure having mounted therein the recovery vessel and resilient means and having defined therein an inlet opening through which the abrasive water jet is admitted into the recovery vessel and an outlet opening in communication with the abrasive suspension supply means; and
- (6) a bellows extending between the inlet opening in the watertight enclosure and the inlet opening in the recovery vessel.

4,872,294

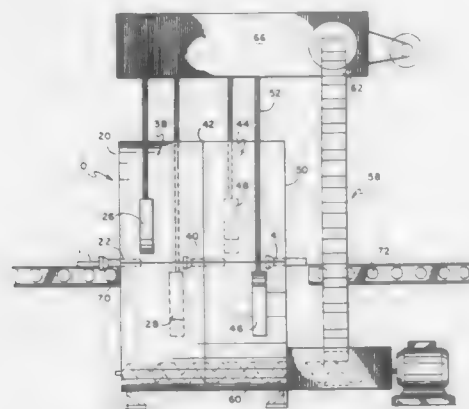
BAR AND COIL DESCALERS

W. David Watts, 4965 Hwy. 19 N., Alpharetta, Ga. 30201
Continuation-in-part of Ser. No. 824,460, Jan. 31, 1986,
abandoned. This application Apr. 24, 1987, Ser. No. 42,464

Int. Cl.⁴ B24C 3/14

U.S. Cl. 51—420

1 Claim



1. An elongated bar-shaped workpiece cleaning device where workpieces are moved lengthwise on a path through said device from front to rear with a front conveyor carrying said workpieces to said device and a rear conveyor carrying said workpieces away from the rear of said device, comprising:

- a casing having a front wall, a rear wall and four sides disposed at 45 degree angles to said path of said workpieces, two of said sides being upper sides and two of said sides being lower sides
- a divider wall in said casing;
- a first chamber, being approximately two feet in length, on one side of said divider wall between said divider wall and said front wall;
- a second chamber, being approximately two feet in length, on the other side of said divider wall from said first chamber between said divider wall and said rear wall;
- a first blast wheel to propel particles positioned on one of

said upper side walls of said first chamber, said blast wheel having approximately a four-inch wide blast pattern;

a second blast wheel to propel particles positioned on an opposite lower side wall of said first chamber from said first blast wheel having approximately a four-inch wide blast pattern separated from said first blast wheel by an approximately four-inch wide air space defined therebetween, said first and second blast wheels mounted perpendicular to the direction of movement of said workpieces;

a third blast wheel to propel particles positioned on one of said upper side walls of said second chamber opposite from said wall in said first chamber having said first blast wheel said third blast wheel having approximately a four-inch wide blast pattern;

a fourth blast wheel to propel particles positioned on one of said lower side walls opposite said third blast wheel and on the opposite side wall of said second chamber from said side wall in said first chamber having said second blast wheel, said fourth blast wheel having approximately a four-inch wide blast pattern separated from said third blast wheel by an approximately four-inch wide air space defined therebetween and each of said third and fourth wheels mounted perpendicular to the direction of movement of said workpieces, the blast patterns of said first, second, third and fourth blast machines oriented perpendicular to the direction of movement of said workpieces;

a plurality of first bar guide tubes disposed in a horizontal parallel array in the front wall of said device, said bar guide tubes protruding approximately six inches into said first chamber, each of said bar guide tubes adapted to receive a workpiece to be cleaned therethrough, said first bar guide tubes adapted for said workpieces to be entered therein and pushed therethrough by said front conveyor, said particles to be propelled within said first chamber against said workpieces by said first and second blast wheels;

a plurality of second bar guide tubes each approximately twelve inches long disposed in a horizontal parallel array in said divider wall aligned with said first bar guide tubes, said second bar guide tubes extending from said divider wall approximately six inches into said first chamber and said second bar guide tubes extending from said divider wall approximately six inches into said second chamber through which said second bar guide tubes, said workpieces are passed into said second chamber where said workpieces have particles propelled thereagainst by said third and fourth blast wheels; and

a plurality of third bar guide tubes disposed in a horizontal parallel array in the rear wall of said casing aligned with said second bar guide tubes, said third bar guide tubes extending approximately six inches into said second chamber, said first, second and third bar guide tubes all being positioned beyond the blast patterns of said first, second, third and fourth blast wheels in said first and second chambers, said workpieces adapted to be lifted by the force of said particles from said fourth blast wheel to assist in aligning it with and to pass through said third bar guide tubes and exit said casing onto said rear conveyor which pulls said workpieces out of said casing.

4,872,295

ELECTRICALLY-OPERATED FOLDING STAGE SYSTEM

Kazuo Fujita, 1-1, Hagiymadai, Seto-shi, Aichi-ken, Japan

Filed Jun. 27, 1988, Ser. No. 212,230

Claims priority, application Japan, Mar. 25, 1988, 63-72712

Int. Cl.⁴ E04H 3/28

U.S. Cl. 52—7

8 Claims

1. An electrically-operated folding stage system comprising
 - (a) at least a pair of stage components each including a platform,
 - (b) a means for pivotally connecting the stage components to each other,
 - (c) means for moving the stage components on a floor,

- (d) a pair of opposed first and second geared motors mounted on the bottom of the platform of at least a first of the stage components for folding the stage components from horizontal positions to opposed vertical positions or unfolding the stage components from the vertical positions to the horizontal positions,
- (e) each said geared motor being rotatable in either of two opposed directions,
- (f) each said geared motor having a rotatable output shaft,
- (g) a pair of opposed first and second link mechanisms,
- (h) said first link mechanisms comprising a first link and a second link and said second link mechanism comprising a third link and a fourth link,
- (i) said first link having one end fixed to said output shaft of said first geared motor,
- (j) a first pivot means for pivotally connecting an opposed end of said first link and one end of said second link,
- (k) a second pivot means for pivotally connecting an opposed end of said second link to the bottom of the platform of a second of the stage components,
- (l) said third link having one end fixed to said output shaft of said second gear,
- (m) a third pivot means for pivotally connecting an opposed end of said third link to one end of said fourth link,



- (n) a fourth pivot means for pivotally connecting an opposed end of said fourth link to the bottom of the platform of the second stage component,
- (o) said links of each said link mechanism being in substantially horizontal positions when the stage components are in horizontal positions, but making upward articulating movements, about said first and third pivot means, to substantially vertical opposed positions when the associated geared motor is rotated in one of said two opposed directions, thereby moving or folding the stage components from said horizontal positions to opposed vertical positions,
- (p) said links of each said link mechanism making downward articulating movements, about said first and third pivot means, from said substantially vertical opposed positions to said substantially horizontal positions when the associated geared motor is rotated in the other of said two opposed directions, thereby moving or unfolding the stage components from said opposed vertical positions to said horizontal positions, and
- (q) said first and second geared motors and all of said links becoming included inside the stage components when the stage components are folded to said opposed vertical positions.

4,872,296
CORNER PIECES FOR SINGLE-PLY
POLYMER-COATED FABRIC CORE ROOF
MEMBRANES AND THE PRODUCT THEREBY
FORMED

Albert S. Jaani, Saginaw, Mich., assignor to Duro-Last Roofing, Inc., Saginaw, Mich.

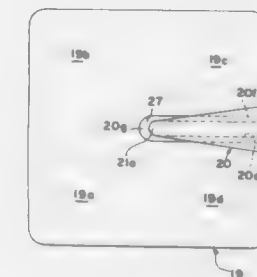
Division of Ser. No. 79,586, Jul. 30, 1987, Pat. No. 4,799,086.

This application Dec. 19, 1988, Ser. No. 286,081

Int. Cl.⁴ E04B 1/36

U.S. Cl. 52—58

2 Claims



1. A corner piece for the integrated enclosure provided on a single-ply, thermoplastic, polymer-coated, fabric for roof membranes to cover large vertical structures projecting vertically from the roof which have vertical walls forming corners; the corner piece comprising a first generally rectangular membrane segment, a side being part-way split interjacent its ends and a second membrane segment with a triangularly-shaped corner portion conformed to loop shape and having its marginal edges overlying portions of the first segment contiguous to the split and being welded thereto in a continuous weld seam, the said triangularly-shaped corner portion having edges extending relative to one another from a radius corner portion at an angle slightly less than 90°.

4,872,297

HEADER ASSEMBLY

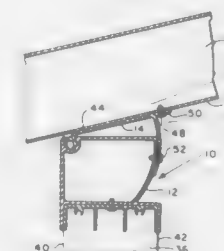
Joseph R. Hetzel, Macedonia, and Kenneth L. Virgins, Hudson, both of Ohio, assignors to Patio Enclosures, Inc., Macedonia, Ohio

Filed Sep. 30, 1988, Ser. No. 251,515

Int. Cl.⁴ E04B 7/06

U.S. Cl. 52—92

4 Claims



1. Apparatus for attaching a roof panel to a side wall of an enclosure comprising a first elongated member having a base portion and a longitudinally extending portion having a longitudinally extending pocket formed therein, said base portion of said first elongated member having a configuration that conforms to the top of the side wall permitting the top of the side wall to be received therein for attachment thereto, said longitudinally extending portion of said first elongated member having a first portion substantially parallel to said base portion, a second portion substantially perpendicular to said first por-

tion and joining one end of said first portion to one end of said base portion, and an arcuate portion oppositely disposed from said second portion and joining the other end of said first portion to said base member, said longitudinally extending pocket being positioned at the junction of said second portion with said one end of said first portion of said first elongated member, and a second elongated member for attachment to the roof panel, said second elongated member having a longitudinally extending yoke portion formed therein, said longitudinally extending yoke portion of said second elongated member being slidably receivable and rotatable within said longitudinally extending pocket within said first elongated member.

4,872,298

CONCRETE ANCHOR BOLT SETTING DEVICE

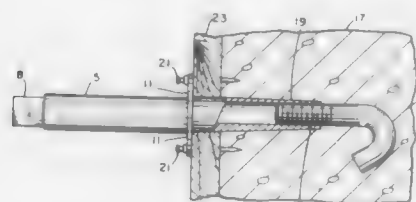
Frank Klemic, Jr., 11225 Hannum Ave., Culver City, Calif. 90230

Filed Feb. 12, 1988, Ser. No. 155,586

Int. Cl.⁴ E04B 1/20, 1/41

U.S. Cl. 52—127.1

2 Claims



1. A device for setting an anchor in place in concrete having a surface comprising:

an anchor which is substantially J-shaped, one end of which is threaded on its exterior surface, and a setting bolt comprising a durable and tapered metal bar having a hollow end with internal threads which mate with the threads on the anchor, wherein said anchor is set entirely below the surface of the concrete and wherein said metal bar is partially set below the surface of the concrete where said bar engages said anchor, and

means for securing said setting bolt to a first surface on one side of a frame having a second surface on an opposite side of the frame defining a form for pouring concrete, said setting bolt is partially inserted in a hole formed in said frame and mated with the anchor, wherein said means is defined by an annular plate fixedly coupled to said metal bar at a predetermined distance from said hollow end of said metal bar, said annular plate having a plurality of through openings formed therein for receiving fasteners to provide releasable coupling to said first surface of said frame, whereby said metal bar is removed to expose said threaded exterior surface of said anchor subsequent to solidification of said poured concrete.

4,872,299

KEY CLIP SUPPORT MEMBER

Arthur L. Troutner, and Kevin B. O'Sullivan, both of Boise, Id., assignors to Trus Joist Corporation

Filed Dec. 27, 1988, Ser. No. 290,686

Int. Cl.⁴ F04C 3/12

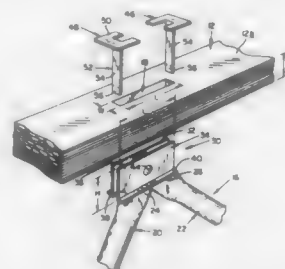
U.S. Cl. 52—693

16 Claims

1. A support member for use with a truss having upper and lower chords, wherein the chords have staggered recesses therein, each recess having a predetermined length and width and extending completely through the height of the chord, the truss further having diagonally extending web members with flattened ends overlapped within the support member, the web members extending between the chords to provide support thereto, wherein the support member comprises:

plural web cases located one in each said recess, each web case including a pair of opposed case elements one of

which is positioned to each side of the adjacent flattened web member ends wherein each case element includes a planar side portion having an interior edge facing the opposing chord and a flange portion extending normally outwardly from said interior edge; joining means for joining each of said web cases to adjacent web member ends; and



at least one case-retaining clip, having a substantially planar flange and a tab extending normal to said planar flange, said tab being sized in width to be clearance receivable in the width of one of the recesses and having a first portion of sufficient length to extend through the chord and having a second portion of sufficient length to secure said web case to the chord by bending of said second portion over said flange portion.

4,872,300

CAP DETECTOR FOR BOTTLING SYSTEM WITH HIGH SPEED GATE MECHANISM

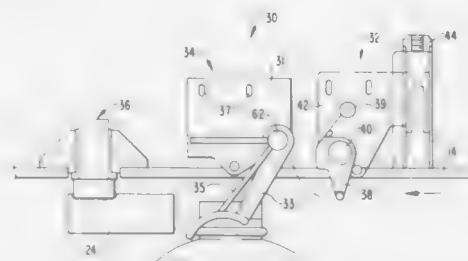
James J. Luke, Bloomsburg, Pa., assignor to Frankandale Corporation, Berwyn, Ill.

Filed Aug. 26, 1988, Ser. No. 237,300

Int. Cl.⁴ B65B 7/28; B67B 3/26

U.S. Cl. 53—53

8 Claims



1. A cap detection device for detecting a missing or cocked cap of a container in a production line, said device comprising:

a frame;

a conveyor coupled to said frame for transporting the containers through said device;

first detection means disposed above said conveyor for determining if one of the containers on said conveyor has a cocked cap;

second detection means disposed above said conveyor for determining if one of the containers on said conveyor has no cap; and

gate means for redirecting a container with a cocked cap or no cap off of the production line.

4,872,301

PACKAGING MACHINERY AND A METHOD OF MAKING A WRAP-AROUND SHIPPER PACKAGE

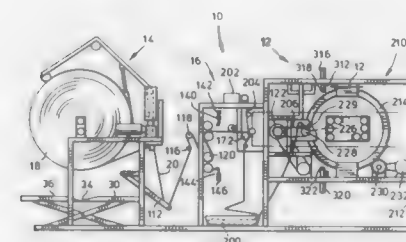
Marius J. M. Langen, Toronto; Peter Guttlinger, Rexdale, and Mihai M. Borza, North York, all of Canada, assignors to H. J. Langen & Sons Limited, Mississauga, Canada

Filed Jun. 13, 1988, Ser. No. 206,039

Int. Cl.⁴ B65B 9/10, 61/18

U.S. Cl. 53—133

25 Claims



1. A packaging machine for wrapping a flexible web around an assembled load comprising:

(a) a wrapping station having an elongated web wrapping path extending therein along which a web is pulled from a web cutting station,

(b) a web dispenser means for dispensing a longitudinally elongated flexible web, in the direction of its longitudinal extent, along a web feeding path which extends to the web cutting station,

(c) a wrapping mandrel mounted in said wrapping station, said mandrel having a wrapping support face which has a longitudinal extent which extends transversely of said web wrapping path and a peripheral extent which extends in the direction of the wrapping path, said wrapping path extending around said wrapping support face, said mandrel having a load transfer passage opening therethrough, said load transfer passage extending transversely of said web wrapping path and having a discharge end opening toward a first side of said wrapping path, wrapper means mounted in said wrapping station for movement along said wrapping path,

(d) said wrapper means being operable to grasp a leading end of a first length of an elongated flexible web and to pull said leading end along the web wrapping path to locate said first length of web in a position extending around said support face of said wrapping mandrel with a marginal edge portion of the web projecting from the discharge end of the mandrel,

(e) web cutting means in said wrapping station for cutting the first length of web along a trailing edge thereof to separate the first length from the remainder of the web after it has been wrapped around the mandrel,

(f) folding means in the wrapping station for folding the leading and trailing ends of the web into an overlapping position on the mandrel to form a sleeve around the mandrel,

(g) discharge means for simultaneously discharging an accumulated load through the discharge end of the wrapping mandrel and stripping the sleeve from the mandrel such that the accumulated load is discharged into the sleeve and is transported laterally out of the wrapping path to an end closure mechanism.

4,872,302

METHOD OF, AND APPARATUS FOR, WRAPPING ARTICLES IN A PLASTIC FILM

Cornelis van Eljaden, Apeldoorn, and Jan C. Merzeman, Rhenen, both of Netherlands, assignors to Borden BV, Apeldoorn, Netherlands

Filed Aug. 2, 1988, Ser. No. 227,340

Int. Cl.⁴ B65B 11/12, 9/06, 53/00

U.S. Cl. 53—441

21 Claims



1. In a method of wrapping articles in a plastic film which is applied in tubular form around a unit of articles and thereafter subjected to a stretching and spring-back treatment to cause said film to contract tautly on to the unit being wrapped, the improvement comprising folding and connecting a stretch wrapping film supplied from at least one supply roll into the form of a tube with a cross-section sufficiently large to introduce a unit to be wrapped into such tube and transport it therein without the unit to be wrapped making contact with the tube wall, stretching the tube thus made in its longitudinal direction to such an extent as to cause said tube to constrict and contract tautly on to the unit being wrapped, closing the stretched and constructed tube in front of and behind the unit being wrapped and separating the stretched and constricted tube behind the unit being wrapped whereby the unit being wrapped is enveloped with tautly stretched film.

4,872,303

BAG TOP FORMING METHOD AND APPARATUS

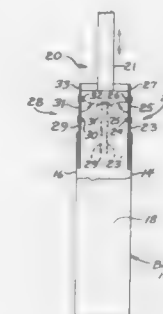
Harold K. Johnson, Junction City, Kans., assignor to Mid America Machine Corp., Junction City, Kans.

Filed Feb. 25, 1988, Ser. No. 159,276

Int. Cl.⁴ B65B 51/00, 7/06

U.S. Cl. 53—481

16 Claims



1. An apparatus for forming a top of a bag filled with a material, comprising:

means for conveying the filled bag to a forming location; means for sensing when the filled bag is present at the forming location;

means for stopping the conveying means, the stopping means being responsive to the sensing means and being releasable;

means for forming the top of the filled bag into a substantially fin-like shape while the bag is stopped at the forming locations; and

means for releasing the stopping means when the top has been formed into the substantially fin-like shape; wherein the means for forming the top of the filled bag

includes front and back flexible plates for flattening a front layer and a back layer of the bag.

4,872,304

CLOSURE CAP WITH A SEAL AND METHOD OF AND APPARATUS FOR FORMING SUCH CLOSURE AND SEAL

Mortimer S. Thompson, Maumee, Ohio, assignor to Tri-Tech Systems International Inc., Maumee, Ohio
Continuation-in-part of Ser. No. 809,057, Dec. 12, 1985, Pat. No. 4,709,824, and a continuation-in-part of Ser. No. 809,058, Dec. 12, 1985, Pat. No. 4,708,255. This application Jun. 10, 1987, Ser. No. 61,304

Int. Cl. B65D 53/00

U.S. Cl. 53—487

23 Claims



19. A method of forming a cap including a linerless seal for a container having a neck comprising:
molding a cap from plastic having a top wall, and a depending wall within the cap comprising plastic and having an upper end extending from said top wall to a lower free end, and
engaging said lower free end with a substantially concave surface in the rim of the container neck as the cap is placed and closed on the container neck to progressively curl said free end as it moves along said substantially concave surface away from said inner depending wall and from said substantially concave surface while stretching and softening the curled portion of said free end in contact with said substantially concave surface of the neck of the container, to thereby form a stretched softened curled free end, and
continuing to close the cap on the container neck whereupon the stretched softened curled free end of the curl is compressed and placed in sealing engagement with said substantially concave surface of the neck of the container.

4,872,305

PROCESS FOR THE AUTOMATIC PRODUCTION OF ORNAMENTAL LINK CHAINS AND RELATIVE APPARATUS

Corrado Lapini, Civitella Val di Chiana, and Franco Esposito, Arezzo, both of Italy, assignors to Costruzione Macchine Speciali C.M.S. srl, Arezzo, Italy

Continuation of Ser. No. 16,357, Feb. 19, 1987, abandoned. This application Sep. 12, 1988, Ser. No. 244,629

Claims priority, application Italy, Feb. 28, 1986, 9343 A/86
Int. Cl. B21L 3/00

U.S. Cl. 59—13

8 Claims

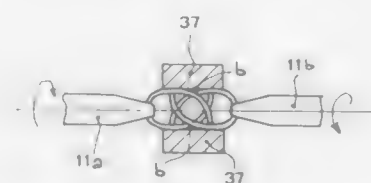
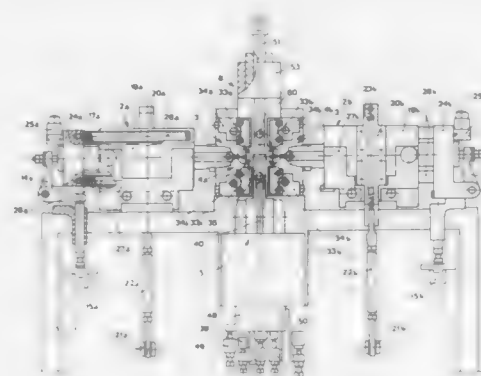
1. An apparatus for the production of ornamental chains from links, each said link being formed of a pair of link elements, each said link element having the shape of a turn of a spiral with free ends, said apparatus comprising:

two pairs of vices suitable for grasping and holding two of said link elements, respectively, one of said link elements being already engaged in the last link of the chain already formed by means of one of said free ends, said pair of vices defining a respective axial direction;

motion means connected to said pairs of vices for providing said pairs of vices with a relative translation motion along said respective axial direction in order to bring into en-

gagement one with the other said two link elements grasped by said two pairs of vices, until said free ends of a first of said two link elements are brought up to about the center of the other of said two link elements, and for providing a simultaneous angular motion about an axis parallel to said axial direction to arrange said two link elements into two planes each containing said axis and offset from each other by an angle not greater than 90° before said engagement, with a relative angularly-opposed motion to contact respective opposing edges of said two link elements, to thereby link said two link elements to form a link of said chain, said motion means adapted to move said pairs of vices between a first working position and a second working position;

shaping means for being positioned around the link constituted by the union of said two link elements and between said two pairs of vices transverse to said axial direction and adjacent the second working position, and for shaping the link by compressing said two link elements both in a transversal and orthogonal direction with respect to a plane of the link, for sliding said free ends of the link elements one on the other, crossing them over until said



free ends of each one are brought against respective internal contours of the other, said vice pairs being provided with a further rotational motion to twist said two link elements relatively in opposite directions one to the other about an axis parallel to said axial direction, while said link is still held in said shaping means, as part of the shaping of each said link; and

means for making further ones of said link elements available two-by-two to said pair of vices, respectively, and for providing the coupling of one of them to the last link formed, said means for making being disposed adjacent to the first working position;

wherein said two pairs of vices are further integrally provided by said motion means with a translatory motion, so as to move between the first working position in which said grasping of each respective pair of said link elements occurs and said coupling of the last-formed link with a respective link element of the link to be subsequently formed is performed and the second working position in which the linking of said link elements and the shaping of the link is carried out; and

wherein said shaping means includes a pair of clamps which

operate to shape the respective link when said pair of vices is in said second working position.

4,872,306

METHOD OF FABRICATING CHAIN MESH AND CHAIN MESH FABRICATED THEREBY

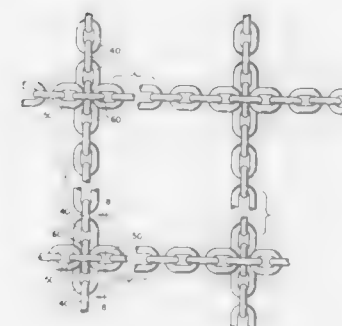
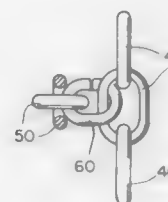
Gerald H. Ensminger, Dallastown, and Andrzej Kalazny, Wyomissing, both of Pa., assignors to Cooper Industries, Inc., Houston, Tex.

Division of Ser. No. 77,623, Jul. 24, 1987. This application Feb. 23, 1988, Ser. No. 159,385

Int. Cl. F16G 13/12

U.S. Cl. 59—78

2 Claims



1. A chain mesh, comprising:
a plurality of running lengths of chain, the running lengths being so positioned that at least a first running length crosses and is adjacent to a second running length at a crossing site, said running lengths being disposed in different planes in overlapping relationship with one another at least at the crossing site; and
separate connecting means between and connected to both the first and second running lengths at the crossing site so as to flexibly maintain the first and second running lengths in close but spatially separate relationship to one another at the crossing site, said connecting means comprising a short length of chain having a link at each end engaged in a respective link of the first and second running lengths.

4,872,307

RETROFIT OF SIMPLE CYCLE GAS TURBINES FOR COMPRESSED AIR ENERGY STORAGE APPLICATION

Michael Nakhamkin, Mountainside, N.J., assignor to Gibbs & Hill, Inc., New York, N.Y.

Filed May 13, 1987, Ser. No. 49,650

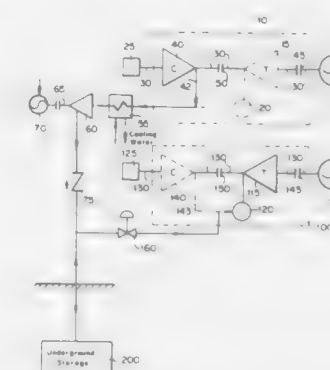
Int. Cl. F02C 6/16

U.S. Cl. 60—39.02

22 Claims

1. In a gas turbine power plant of the type in which first and second gas turbine engines are each used to produce power, each of said engines comprising an air compressor, a turbine element and a combustor, the improvement comprising the steps of:

deblading said turbine element of said first gas turbine engine;
coupling an additional compressor to said first gas turbine engine, said additional compressor having a compressed air input connected to a compressed air output of said compressor of said first gas turbine engine and a compressed air output connected to an air storage device;



coupling to said additional compressor and said compressor of said first gas turbine engine means for driving them; deblading said compressor of said second gas turbine engine; and
providing compressed air from said air storage device to said turbine element of said second gas turbine engine instead of said compressor of said second gas turbine engine.

4,872,308

EXHAUST DEVICE FOR WORKING MACHINE

Noboru Nagai, Hachioji; Yoshisato Hashimoto; Yoshihiko Tsuboike, both of Tokyo, and Noboru Kaito, Koganei, all of Japan, assignors to Kioritz Corporation, Tokyo, Japan

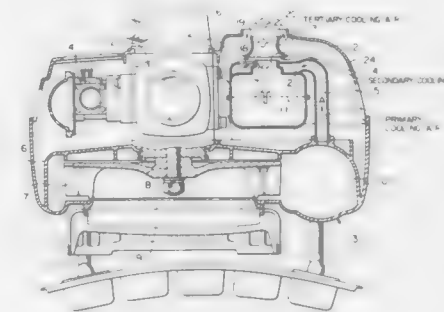
Filed Jun. 8, 1988, Ser. No. 204,124

Claims priority, application Japan, Jun. 18, 1987, 62-93630[U]

Int. Cl. F02B 35/00; F01N 3/02

U.S. Cl. 60—316

2 Claims



1. An exhaust device for a working machine comprising:
an internal combustion engine mounted as a power source;
a muffler connected to said internal combustion engine for discharging exhaust gas delivered from the internal combustion engine while damping its sound, said muffler having an outlet opening;
a blower driven by said internal combustion engine;
a mixing tubular member disposed opposite to the outlet opening of the muffler through a space interposed between the tubular member and the muffler; and
an air-flow passage for introducing a portion of pressurized air from said blower into the inside of an annular air guide wall on the outer periphery of said outlet opening in a tangential direction.

4,872,309

PHASE CONTROL MECHANISM FOR WAVE ENERGY CONVERSION

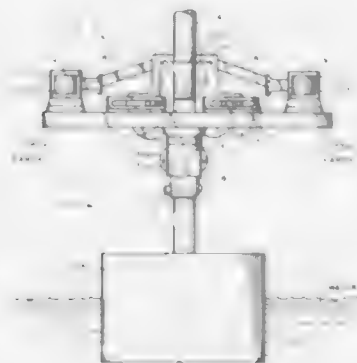
Paul N. Jaenichen, Sr., Newport News, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 7, 1988, Ser. No. 280,869

Int. Cl. F03B 13/14

U.S. Cl. 60—497

7 Claims



1. In a wave energy conversion apparatus of the type having a drive shaft reciprocable by means of a buoyant body, a cam brake locking mechanism, comprising:

- (a) a supporting bracket affixedly mounted on said sea wave conversion apparatus said bracket adjacent said reciprocable drive shaft;
- (b) a locking cam having a shaft engaging surface suitable for frictionally contacting said reciprocable drive shaft, said locking cam pivotally mounted on said supporting bracket and oriented to contact said reciprocable drive shaft with said shaft engaging surface;
- (c) a spring adapted to urge said shaft engaging surface into frictional contact with said reciprocable drive shaft preventing relative motion of said reciprocable drive shaft in a singular direction within said sea wave energy conversion apparatus; and,
- (d) an electrical solenoid pivotally linked with said locking cam; whereby, when said electrical solenoid is energized, said locking cam is disengaged from frictional contact with said reciprocable drive shaft allowing said drive shaft to freely move within said sea wave energy conversion apparatus.

4,872,310

ELECTRO-HYDRAULIC ACTUATOR ASSEMBLY

Arthur Kaye, Freckleton, United Kingdom, assignor to British Aerospace, PLC, London, England

Filed Dec. 14, 1987, Ser. No. 132,339

Claims priority, application United Kingdom, Dec. 12, 1986, 8629158

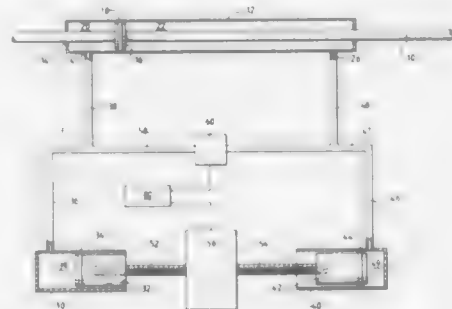
Int. Cl. B60T 7/00

U.S. Cl. 60—567

9 Claims

1. An electro-hydraulic actuator assembly, comprising a rotary actuator, master piston-and-cylinder means connected to said rotary actuator and having two hydraulic fluid delivery ports, a slave piston-and-cylinder having inlets disposed on opposite sides of the piston thereof and being hydraulically connected to said ports by way of respective fluid flow paths, the slave piston being mechanically coupled to an output member, the position of which it is desired to control, and override means for overriding automatic control of the slave piston-and-cylinder, said override means including a by-pass duct connected between said flow paths, and an electrically operable valve means connected in said by-pass duct such that when said valve means is opened hydraulic pressure on two sides of the slave piston is equalized, whereby control of the position of

said output member is decoupled from said rotary actuator, said valve means having a control input connected to an output of controller means which has input means for connection to first and second position signalling means for respectively providing signals from said output member and said actuator,



the controller means being responsive to any difference between said signals so as to de-energize said valve means and thereby to effect decoupling until said difference is eliminated, whereupon the controller means is effective to cause said valve means to be energized.

4,872,311

EXHAUST GAS TURBINE CONNECTED TO ENGINE OUTPUT

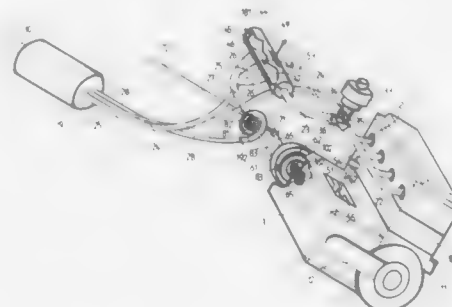
Michael Sturm, Klappengasse 55, 6707 Schifferstadt, Fed. Rep. of Germany

Filed May 19, 1988, Ser. No. 196,160

Int. Cl. F02B 41/10

U.S. Cl. 60—615

1 Claim



1. Motor combustion engine having a turbo compound system for improving the performance of the engine, comprising: casing means for receiving engine exhaust gases and having a plurality of outlets for discharging the exhaust gases, an exhaust-gas-driven turbine means having an inlet connected to certain of the casing means outlets, said turbine means having a driving shaft, an output shaft, variable-speed transmission means connecting the output shaft to be driven by the engine and including a control, a hydraulic clutch having a first part idling on the output shaft and a second part fixed to the output shaft, gear means drivingly connecting the turbine means driving shaft to the first part of the hydraulic clutch, by-pass means connected to other of the casing means outlets, and control means for selectively opening and closing the casing outlets to vary the transmission of exhaust gases to the turbine means, said control means for the casing means being connected to the control for the transmission means.

4,872,312

GAS TURBINE COMBUSTION APPARATUS

Nobuyuki Iizuka, Hitachi, Kazuhiko Kumata, Katsuta, and Michio Kuroda, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

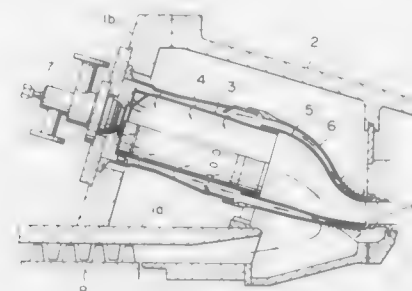
Filed Mar. 19, 1987, Ser. No. 27,730

Claims priority, application Japan, Mar. 20, 1986, 61-60575

Int. Cl. F23R 3/54, 3/06

U.S. Cl. 60—760

1 Claim



- 1. A gas turbine combustor apparatus comprising: a cylindrical combustor liner having an outer wall in which cooling air holes are formed; a fuel nozzle provided at a head of said combustor liner; a tail pipe connected to an end of said combustor liner for introducing combustion gas, produced within said combustor liner, into a turbine portion; a flow sleeve having a length substantially equal to said connected combustor liner and tail pipe and surrounding substantially over the full length of said connected combustor liner and tail pipe, with a radial gap between said flow sleeve and said connected combustor liner and tail pipe; and means for introducing cooling air into the gap between said flow sleeve and said tail pipe, said cooling air introducing means having a group of small holes formed in a first region of said flow sleeve close to said turbine portion, wherein said flow sleeve has a second region closer to said combustor liner than said first region of the small holes, through holes being formed in said second region for introducing the cooling air.

4,872,313

GAS CYCLE MACHINE

Yoshio Kazumoto; Takuya Suganami; Yoshiro Furuishi, and Kazuo Kashiwamura, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

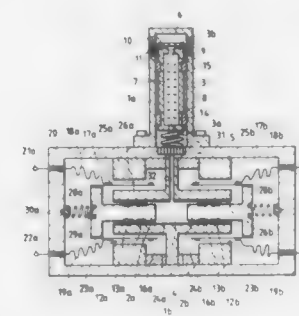
Filed Sep. 2, 1988, Ser. No. 239,822

Claims priority, application Japan, Sep. 4, 1987, 221342/1987

Int. Cl. F25B 9/00

U.S. Cl. 62—6

4 Claims



1. A gas cycle machine, comprising: permanent magnet means (24), a first moving coil (17a) disposed in a first gap (23a)

through which magnetic flux from said permanent magnet means passes in a first direction, a second moving coil (17b) disposed in a second gap (23b) through which magnetic flux from said permanent magnet means passes in

a second direction opposite to said first direction, a first piston (2a) connected to said first moving coil, a second piston (2b) connected to said second moving coil, a compression space (4) defined between said first and said second pistons, a working gas disposed in said compression space such that when an alternating current is supplied to said first and second moving coils, alternating compression and expansion of said working gas is produced in said compression space, and means defining a working gas ingress and egress passage (32) between said compression space and a utilization device.

4,872,314

SUPERCONDUCTING COIL REFRIGERATING METHOD AND SUPERCONDUCTING APPARATUS

Katuhiko Asano, Hitachi, and Takao Suzuki, Mito, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

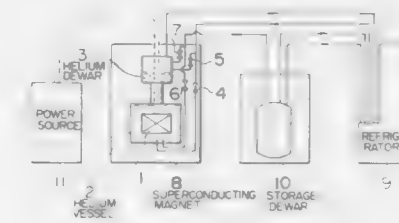
Filed Dec. 7, 1988, Ser. No. 280,966

Claims priority, application Japan, Dec. 7, 1987, 62-307559

Int. Cl. F17C 13/02

U.S. Cl. 62—49.1

7 Claims



1. A superconducting coil refrigerating method in which a superconducting coil immersed in liquid helium in a helium vessel is refrigerated by producing a flow of liquid helium in said helium vessel at at least one of a specified time upon change of a current of said superconducting coil, a specified time before the current change and a specified time after the current change.

4,872,315

HEAT EXCHANGER AND SYSTEMS AND METHODS FOR USING THE SAME

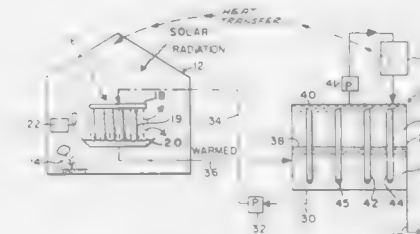
Gad Assaf, Rehovot, Israel, assignor to Geophysical Engineering Company, Seattle, Wash.

Division of Ser. No. 798,841, Nov. 18, 1985, Pat. No. 4,745,963, which is a division of Ser. No. 558,436, Dec. 6, 1983, Pat. No. 4,583,370. This application Jan. 26, 1988, Ser. No. 148,709

Int. Cl. F25B 17/10; F24J 2/30

U.S. Cl. 62—94

7 Claims



1. A method for conditioning air in an enclosure comprising the steps of:

- (a) contacting the air in the enclosure during the day with concentrated brine to cool and dry the air as the brine is heated by absorption of sensible heat from the air and the absorption of latent heat of condensation as vapor in the air condenses on the brine;
- (b) transferring heat absorbed by the contacted brine to another fluid whereby the transferred heat is temporarily stored in the other fluid; and
- (c) returning to the air in the enclosure at night, the heat stored in said other fluid.

4,872,316

SYSTEM FOR MONITORING A LIQUID ENTRAINED IN A FLUID

Fredrick D. Browne, Somerville, and Jacob H. Martin, Wellesley, both of Mass., assignors to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Filed Feb. 1, 1988, Ser. No. 151,071

Int. Cl.⁴ F25B 49/00, 43/02

U.S. Cl. 62—129

18 Claims



14. A monitoring system, for use within a closed refrigeration system including a compressor, a condenser and evaporator, for detecting contamination of a lubricant entrained in a refrigerant circulating through the refrigeration system, said monitoring system comprising:

a housing having an inlet for receiving the refrigerant, a reservoir for containing extracted lubricant, and an outlet portion disposed in predetermined relationship with said reservoir for venting the refrigerant to the remainder of the refrigeration system;

a conduit extending through said inlet and into said housing, below said outlet portion, for directing the circulating refrigerant in a curved path past said reservoir to create a centrifugal force which separates the lubricant from the refrigerant and directs the lubricant into said reservoir;

and

probe means, disposed in said reservoir, for measuring an electrical parameter representative of the electrical resistance of the lubricant to detect a change in resistivity indicative of contamination of the lubricant.

4,872,317

UNITARY ICE MAKER WITH FRESH FOOD COMPARTMENT AND CONTROL SYSTEM THEREFOR

William A. Reed, Cedarburg, Wis., assignor to U-Line Corporation, Milwaukee, Wis.

Filed Oct. 24, 1988, Ser. No. 261,801

Int. Cl.⁴ F25C 1/00

U.S. Cl. 62—135

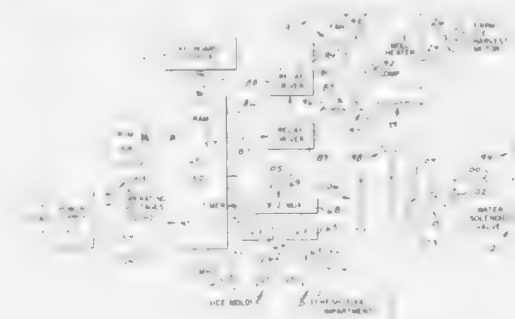
8 Claims

1. In a unitary ice maker with fresh food compartment of the type including a fresh food compartment, a freezer compartment containing an automatic ice making unit, the automatic ice making unit including an ice mold, a first temperature sensing means in thermal contact with the ice mold for producing a first signal indicative of the temperature of the ice mold, and means for harvesting ice from the ice mold, and refrigeration means for producing ice in the automatic ice making unit,

the improvement wherein the unitary ice maker with fresh food compartment further comprises:

second temperature sensing means exposed to the fresh food compartment for producing a second temperature signal indicative of the temperature of the interior of the fresh food compartment;

ice maker control means connected to the refrigeration means and to the first and second temperature signals for initiating an ice harvest in the automatic ice making unit by monitoring the first temperature signal to determine



the time at which ice in the automatic ice making unit is ready to be harvested, and at that time, then monitoring the second temperature signal to determine if the temperature of the fresh food compartment is below a predetermined setpoint temperature, whereby if at the time that the ice in the automatic ice making unit is ready to be harvested, the temperature of the fresh food compartment is above the setpoint temperature, then the ice harvest is delayed to allow additional cooling of the fresh food compartment.

4,872,318

SHUT-OFF MECHANISM FOR ICE MAKER

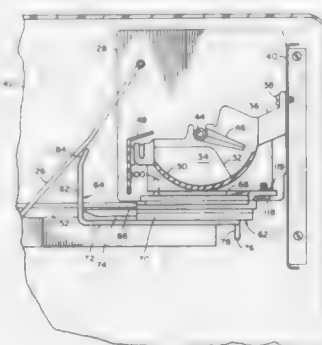
Ramon L. Klemmensen, Cedar Rapids, Iowa, assignor to Amana Refrigeration, Inc., Amana, Iowa

Filed Nov. 18, 1988, Ser. No. 272,843

Int. Cl.⁴ F25C 5/18

U.S. Cl. 62—137

6 Claims



3. In a freezer compartment of a household refrigerator, the combination comprising:

a removable ice container;

an automatic ice maker positioned for periodically dumping a load of ice into said ice container, said ice maker having a feeler arm for sensing the level of ice in said container and shutting off said ice maker in response to ice being above a predetermined level; and

means for urging said feeler arm to a position shutting off said automatic ice maker when said ice container is absent wherein said urging means comprises a case secured to said ice maker and a plunger member, said case having a

longitudinal bore receiving said plunger member and a spring resiliently pushing said plunger member, said plunger member having a plate adapted for engaging said ice storage bin wherein, when said ice storage bin is present in said freezer compartment, said plunger member is held in a first position within said bore and, when said ice storage bin is absent from said freezer compartment, said spring pushes said plunger member outwardly against said feeler arm so that said feeler arm is urged to said position shutting off said ice maker.

4,872,319

AIR-COOLED ABSORPTION TYPE COOLING/HEATING WATER GENERATING APPARATUS

Shinji Tongu, Shizuoka, Japan, assignor to Yazaki Corporation, Tokyo, Japan

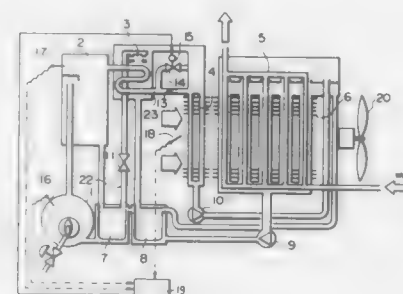
Filed Jun. 28, 1988, Ser. No. 212,617

Claims priority, application Japan, Nov. 19, 1987, 62-292660

Int. Cl.⁴ F25B 15/00

U.S. Cl. 62—141

4 Claims



1. An air-cooled absorption type cooling/heating water generating apparatus comprising:

means for evaporating a refrigerant and absorbing the evaporated refrigerant in a solution and removing heat from the refrigerant-absorbed solution by cooling with ambient air;

high-temperature regenerating means for heating said refrigerant-absorbed solution;

means for separating said heated refrigerant-absorbed solution into the refrigerant and the solution;

low-temperature regenerating means for subjecting said refrigerant separated in vapor form to heat exchange;

a condenser for condensing said refrigerant vapor;

pump means for circulating said refrigerant-absorbed solution and said condensed refrigerant;

a heat exchanger for subjecting said heat-removed refrigerant-absorbed solution to heat exchange before said refrigerant-absorbed solution is fed into said high-temperature regenerating means and said separating means and also subjecting said separated solution to heat exchange before said separated solution is returned to said refrigerant absorbing and heat removing means;

flow rate regulating means disposed in a solution conduit extending between said heat exchanger and said low-temperature regenerating means, said flow rate regulating means being a constant flow rate control valve which controls the flow rate of said solution on the basis of the result of detection of an internal pressure difference between said separating means and said low-temperature regenerating means to provide for solution flow through said solution conduit at a predetermined flow rate; and

pressure regulating means disposed in an evaporated refrigerant conduit extending between said separating means and said condenser, said pressure regulating means being a primary pressure regulating valve whose valve opening is increased when internal pressure of said separating means exceeds a predetermined pressure value.

4,872,320

REFRIGERATION SHOWCASE

Yoshiro Ishizaka, Ora; Hiroshi Naganuma, Oizumi; Kenji Sato; Yuji Kishi, both of Ohta; Yoshihisa Ishida, and Kiyokazu Goto, both of Oizumi, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

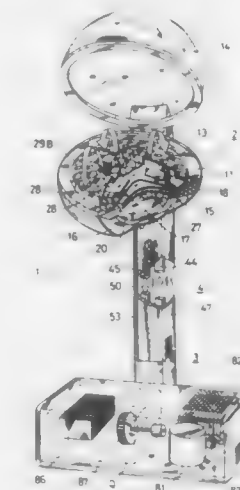
Filed Dec. 7, 1988, Ser. No. 281,268

Claims priority, application Japan, Dec. 11, 1987, 62-314982; Feb. 3, 1988, 63-24585; Apr. 7, 1988, 63-86821; Apr. 20, 1988, 63-97310; May 26, 1988, 63-129060; Jun. 7, 1988, 63-140183

Int. Cl.⁴ A47F 3/04

U.S. Cl. 62—255

24 Claims



1. A refrigeration showcase comprising a display case for displaying commodities while refrigerating the commodities, a machine case disposed at a position away from the display case, and an air duct connecting the display case to the machine case in communication therewith.

the display case comprising a display table for displaying the commodities as placed thereon, a cover member openably covering the display table from above to define a commodity chamber above the display table and permitting the commodity chamber to be seen therethrough from outside, and an air passage member disposed under the display table and providing a cold air supply portion for supplying cold air therethrough to the commodity chamber and a cold air discharge portion independent of the supply portion for discharging cold air from the commodity chamber therethrough,

the machine case comprising a case body, a refrigerator housed in the case body and providing a refrigeration cycle comprising a compressor, condenser, pressure reducing means and evaporator, and a cold air circulating blower housed in the case body for supplying air cooled by the evaporator in circulation,

the air duct having a forward air channel for transporting the cold air cooled by the evaporator therethrough to the cold air supply portion, and a return air channel independent of the forward air channel for transporting cold air from the cold air discharge portion to the evaporator therethrough.

4,872,321

NONIMMERSIVE CRYOGENIC COOLER

Scott Buchanan, San Diego, Calif., assignor to Biomagnetic Technologies, Inc., San Diego, Calif.

Filed Apr. 27, 1988, Ser. No. 187,016

Int. Cl.⁴ F25B 19/00

U.S. Cl. 62—51.1

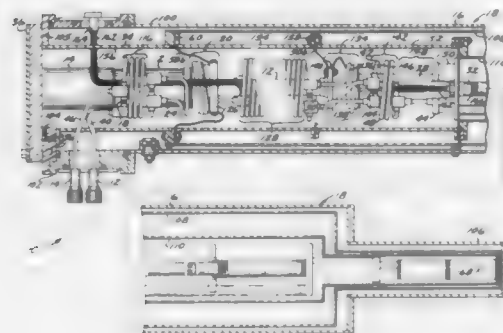
18 Claims

1. Apparatus for attaining cryogenic temperatures within its interior, comprising:

an elongated container having insulated walls, one closed end, and an endplate covering the open end of the container;

a mechanical precooler supported within the container by a first support joined to the endplate;

a gas expansion nozzle supported within the container by a second support joined to the endplate;



a gas supply line extending to the gas expansion nozzle from the endplate, the supply line including a first length of supply line contacting and precooled by the mechanical precooler and a second length of supply line connected to the nozzle; and

a flexible supply coupling between the first length of supply line and the second length of supply line.

4,872,322

POWER OPERATED CONTACT APPARATUS FOR SUPERCONDUCTIVE CIRCUIT

Daniel C. Woods, Florence, S.C., and Kenneth R. Efferson, Oak Ridge, Tenn., assignors to General Electric Company, Milwaukee, Wis.

Filed Sep. 2, 1988, Ser. No. 239,811
Int. Cl. F25B 19/00

U.S. Cl. 62—51.1

9 Claims



1. A power operated contact apparatus for extending and retracting one or more electrical leads into and out of a cryostat for making and breaking, at a cryogenic temperature, electrical contact with a superconductive circuit, comprising: at least one rigid elongated lead for extending into a cold space of the cryostat which is at or near a cryogenic

temperature, said lead having an inner end and an outer end;

a connector fixed at the inner end of the lead for making electrical contact in the cold space with a connector of the superconductive circuit;

guide means journaling said lead for allowing said lead to move axially relative to the guide means and sealing against said lead;

a foundation for sealed attachment to the cryostat and to the guide means so that the connector on the inner end of the lead is extendable into making electrical contact with the connector of the superconductive circuit in the cold space;

power operated means mounted on the foundation and fixed to the outer end of the lead for extending and retracting the lead to and from making electrical contact with the superconductive circuit in the cold space; and

means for de-icing the exterior of the leads and guide means when the leads are connected to the superconducting circuit.

4,872,323

APPARATUS FOR LAYING TRANSVERSE WEFT THREADS FOR A WARP KNITTING MACHINE

Roland Wunner, Schwarzenbach/Wald, Fed. Rep. of Germany, assignor to LIBA Maschinenfabrik GmbH, Fed. Rep. of Germany

Continuation of Ser. No. 860,699, May 5, 1980, Pat. No. 4,677,831, which is a continuation of Ser. No. 674,648, Nov. 26, 1984, abandoned. This application Jul. 6, 1987, Ser. No. 70,013

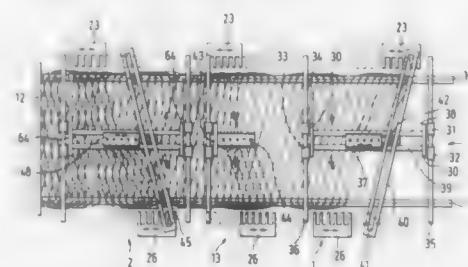
Claims priority, application Fed. Rep. of Germany, Nov. 28, 1983, 3343048

The portion of the term of this patent subsequent to Jul. 7, 2006, has been disclaimed.

Int. Cl. D04B 23/06

U.S. Cl. 66—84 A

8 Claims



1. A weft thread laying apparatus for warp knitting machines having a needle bed and two spaced apart longitudinal conveyors for continuously conveying weft threads in a given direction to the needle bed, the apparatus comprising:

first and second carriages reciprocally movable between said two longitudinal conveyors in a substantially transverse direction to the movement of said conveyors, with said second carriage spaced from said first carriage and located intermediate said needle bed and said first carriage;

first and second thread laying guides carried on said first and second carriages, respectively, and adapted for movement in a direction relative to the direction of movement of said conveyors to lay a first and a second plurality of parallel weft threads between said conveyors;

first and second runway rails cooperating with said first and second thread laying guides, respectively, to guide the same in a given reciprocal path between said opposed conveyors; and

first and second guide rails being movable relative to the direction of movement of said conveyors to cause said thread laying guides to lay said plurality of first and second weft threads at an angle of 20° or greater as viewed transversely to the direction of travel of said conveyors;

a pair of displacement combs for each of said first and second thread laying guides, with each comb of said pair located outwardly adjacent each of the opposed conveyors and adapted to pick the plurality of weft threads from said thread laying guide substantially at the location where said thread guide carried by said thread carriage passes over one conveyor, reverse direction, and moves in that angular reciprocal path determined by said rail toward said other conveyor;

each comb of said pair movable in a reciprocable path parallel to said conveyors that distance necessary for said thread guide to lay successive widths of a given plurality of weft threads in parallel onto its respective conveyor; wherein each of said combs receives a given plurality of parallel weft threads from said thread guide, locates the same on the respective adjacent conveyor and then moves in a direction opposite to that of the conveyor that distance necessary for said thread guide to place a successive width of the given plurality of parallel weft threads onto the conveyor so that all the weft threads of each of said first and second thread guides extend in parallel between said opposed conveyors, said plurality of weft threads from said first second thread guides retained in position thereon until knitted together at the needle bed; and

roller guide means carried above said conveyors for laying stationary threads in the direction of travel of the longitudinal conveyors and being introduced over one layer of weft threads.

4,872,324

ELASTICIZED KNITTED BAND

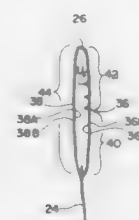
Earle W. Rearwin, and Gayle L. Rearwin, both of Archdale, N.C., assignors to It's A Peach, Inc., High Point, N.C.

Continuation-in-part of Ser. No. 109,094, Oct. 15, 1987, abandoned. This application Dec. 6, 1988, Ser. No. 280,691

Int. Cl. D04B 9/46

U.S. Cl. 66—172 E

16 Claims



1. An elasticized knitted band for use as a waistband or the like in pantyhose and other garments, said band having a knitted fabric body having a fabric face for facing contact with a wearer's body or undergarment and a fabric back for facing outwardly from the wearer, said fabric body comprising yarn formed in stitches extending in perpendicular courses and wales including an uncovered elastomer yarn knitted in selected courses in alternating knit and float stitches with the float stitches appearing at said fabric back of said fabric body for intermittent frictional contact with the wearer's body or undergarment through stitch interstices between said yarn of other courses, said float stitches of said uncovered elastomer yarn having a sufficient excess extent between said knit stitches of said uncovered elastomer yarn to be generally relaxed when said fabric body is stretched during wearing.

4,872,325

METHOD AND DEVICE FOR IMPRINTING WEBS

Manfred Moser, Krefeld-Flacheln; Dieter Itgenshorst, Krefeld, and Johannes Kutz, Tönisvorst, all of Fed. Rep. of Germany, assignors to Eduard Küsters Maschinenfabrik GmbH & Co KG, Krefeld, Fed. Rep. of Germany

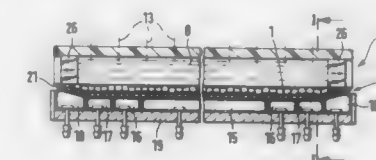
Filed Jun. 19, 1987, Ser. No. 64,214

Claims priority, application Fed. Rep. of Germany, Jun. 21, 1986, 3620864

Int. Cl. D06B 1/08

U.S. Cl. 68—200

6 Claims



1. Apparatus for applying a treatment medium onto a continuously advancing web comprising:

(a) an applicator device containing a gap to which treatment medium is conducted for application of treatment medium onto the web as it passes through the gap, said gap having first and second mutually opposing faces extending transverse to the web through which the web passes, said first and second mutually opposing faces being provided on opposite sides of the web and being stationary in the direction parallel to the web;

(b) a pressurizable oblong cushion extending across the width of the web supported in a stationary abutment, said cushion being subdivided into a plurality of cushion sections defining said second mutually opposing face, which is resilient in the direction perpendicular to the web; and

(c) means for separately controlling the pressure in at least one of the cushion sections whereby the second mutually opposing face presses the web against the first mutually opposing face with non-uniform pressure that varies over the width of the web such that the amount of treatment medium applied to the web varies over the width of the web.

4,872,326

THREE STAGE COMBINATION REPLACEMENT LOCK

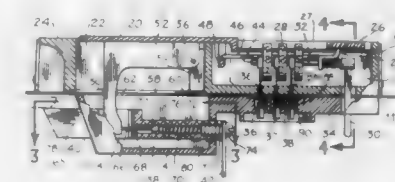
Harold O. Aurness, and Thomas G. Mahler, both of 5808 Knox Ave. N., Brooklyn Center, Minn. 55430

Filed Dec. 10, 1987, Ser. No. 130,894

Int. Cl. E05B 65/06

U.S. Cl. 70—133

9 Claims



1. In a lock unit comprising a three-stage system for use on a small hinged door utilizing an old access hole, the three stages being: (1) dialing a combination lock which releases; (2) a sliding latch lock to be pushed which releases; (3) a push button which activates a door latch; an outer housing comprising in combination a patented combination lock comprising dials, inwardly extending reset buttons and reset arm, a latch lock button added to the sliding latch lock for easier use in opening the system after the lock is correctly dialed, a swivally attached push button tandem to the combination lock with a catch held in locked contact by the sliding latch of the combi-

nation lock, with an arm of the push button extending inwardly from the outer housing through a small rectangular door plate hole previously used for another type of lock, to a door latch chamber in an inside housing to contact the end of a spring controlled sliding push pin horizontally placed within a slot in the door latch; wherein the improvement is in the utilization of the small door plate hole, which is too small for a combination lock installation, for access to the door latch and push pin by the push button arm with the addition of two screw holes in the door plate to hold the housings to the door; with further improvement comprised of the said inside housing comprising of a housing plate opposite the combination lock with additional holes made in the door plate for the reset arm and the combination lock reset buttons which extend inwardly through the door plate and are used to neutralize the combination lock and change the combination respectively; a door latch chamber opposite the push button, containing the door latch which extends laterally through both ends of the chamber, with a slot through the outer half of the latch to accommodate the push button arm which contacts the sliding push pin and the inside face of the latch slot to push back the door latch which is constrained from sliding open from the normal lock position by spring means on either side of the door latch and blocked by the end wall of the latch chamber; with further improvement combining a handle means for opening the door latch from the inside with a screw means for adjusting the pressure of the spring activated sliding push pin in the inner half of the door latch, which automatically returns the push button to a desired flush position, latched and locked, in the outside housing; with further improvement provided by the addition of spring biased push buttons at each dial of the patented combination lock for easier resetting; a cover hinged on the outside of the unit for protection from the weather.

4,872,327

LOCKING DEVICE FOR A VALVE

Thomas Wagner, Route 8 Box 289, Clarksville, Tenn. 37043

Filed Dec. 16, 1987, Ser. No. 133,636

The portion of the term of this patent subsequent to Jul. 4, 2006,

has been disclaimed.

Int. Cl.⁴ G05G 5/00

U.S. Cl. 70—175

7 Claims



1. A locking device for a valve to be used in conjunction with a lock having a hasp comprising:

- a pair of detachably connected corresponding plates each having a shoulder that when in the connected condition substantially prevents the movement of the flow valve, one of said plates including an arm passing through a corresponding aperture in the other one of said plates so as to restrict the relative twisting of said members, each of said plates having an ear containing an aperture through which the hasp of a lock passes whereby the entire hasp is sandwiched between said plates, each one of said plates includes an upper member joined to a lower member in an overlapping fashion to form the shoulder, and each one of said upper members includes a top edge having an interior corner containing a bevel, said bevel accommodating

the body of the lock so that the entire hasp is sandwiched between said upper members.

4,872,328

DOOR LOCK FOR A MOTOR VEHICLE

Lambertus J. Van Oijen, Budel, and Fokke Willems, Heeze,

both of Netherlands, assignors to Volvo Car B.V., Netherlands

Filed Oct. 9, 1986, Ser. No. 916,911

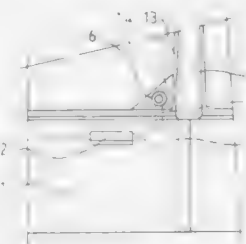
Claims priority, application Netherlands, Oct. 10, 1985,

902761

Int. Cl.⁴ E05B 65/20

U.S. Cl. 70—237

1 Claim



1. A door lock and door construction for a motor vehicle provided with a body having one or more doors, said door comprising a lower part and an upper part, said upper part further comprising a window pillar, such that said window pillar and said lower part partially define a window opening, said lower part further comprising a door lock being operable by inner and outer handles disposed in said lower part for opening and closing the door, said upper part further comprising a substantially right-triangularly shaped member formed of sheet metal wherein the right-angled sides of said sheet metal member are fixed to said window pillar and to said lower part such that the hypotenuse of said sheet metal member further defines said window opening, and wherein said sheet metal member has mounted therein a locking cylinder, said locking cylinder being operatively connected by a locking lever to said door lock for locking and unlocking said door lock.

4,872,329

KEY DEVICE AND A DETECTOR DEVICE FOR USE THEREWITH

James J. Byrne, Edenderry, Ireland

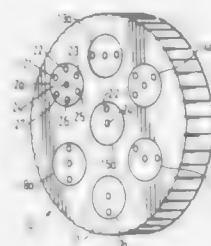
Filed Aug. 6, 1987, Ser. No. 82,845

Claims priority, application Ireland, Aug. 8, 1986, 2129/86; Aug. 8, 1986, 2130/86; Oct. 10, 1986, 2681/86; May 22, 1987, 1352/87; May 22, 1987, 1353/87; Jul. 17, 1987, 1939/87

Int. Cl.⁴ E05B 19/00

U.S. Cl. 70—395

24 Claims



1. A key device which comprises a base notionally subdivided into a plurality of zones arranged in a predetermined pattern; each of said zones comprising an aperture for releasably receiving a respective element, the or each element having one or more sites associated therewith in a predetermined pattern; and wherein a measurable or detectable characteristic of the or each site may be selectively altered; the arrangement being such that the key device may be used in conjunction with

a detector device having means for analyzing the characteristic of the or each site.

4,872,330

PLANT FOR STRAIGHTENING AND CUTTING TO LENGTH ROLLED SECTIONS OR BARS

Geremia Noinai, Buttrio, Italy, assignor to Danieli & C. Officine

Meccaniche SpA, Buttrio, Italy

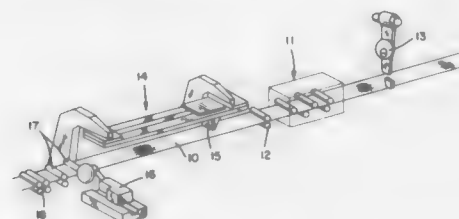
Filed Feb. 17, 1988, Ser. No. 156,824

Claims priority, application Italy, Feb. 24, 1987, 83321 A/87

Int. Cl.⁴ B21B 15/00

U.S. Cl. 72—131

3 Claims



1. A plant for cutting to size rolled sections including angle irons, channel sections, T-bars, window profiles and trackways for lifts or elevators, and rolled bars including round bars and flat bars, comprising: a cooling plate; a feed line for receiving the rolled sections or bars from the cooling plate; a disk saw for cutting to size the rolled sections on the feed line; located upstream of the disk saw along said feed line for drawing and measuring the rolled sections in cooperation with the disk saw; means located downstream of the disk saw along the feed line, for butting and measuring different lengths of the rolled sections in cooperation with the disk saw; a straightening machine located downstream of the butting and measuring means, for straightening the rolled sections or bars on the feed line; and, a shears located downstream of the straightening machine, for cutting the rolled bars to size on the feed line while they are moving.

4,872,331

METHOD AND APPARATUS FOR ROOFING

Lawrence Skelton, 101 Harris La., Springdale, Ark. 72764

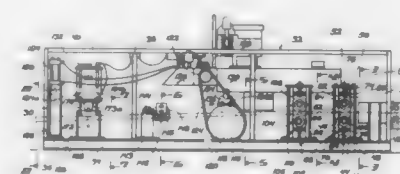
Division of Ser. No. 669,471, Nov. 8, 1984, Pat. No. 4,686,809.

This application Oct. 14, 1986, Ser. No. 918,476

Int. Cl.⁴ B21D 5/08

U.S. Cl. 72—181

1 Claim



1. An apparatus for forming elongated roofing members having opposed male and female flanges joined by a flat central portion from an elongated strip of sheet material, said apparatus comprising:

- a frame having an inlet side and a downstream outlet side;
- a pair of parallel horizontally extending guide rollers rotatably mounted at said inlet side of said frame;
- a first pair of parallel horizontally extending forming rollers rotatably mounted for independent vertical adjustment on said frame, downstream from said guide rollers;
- said first pair of forming rollers having mutually engageable forming surfaces configured for forming a first flange extending angularly upwardly and then angularly downwardly

wardly along a first side edge of the sheet metal strip and a second flange extending angularly upwardly and then horizontally outwardly and then angularly downwardly along a second opposite side edge of the sheet metal strip; a second pair of parallel horizontally extending forming rollers rotatably mounted for independent vertical adjustment on said frame, downstream from said first pair of forming rollers;

said second pair of forming rollers having mutually engageable forming surfaces configured for forming the first and second flanges of the sheet metal strip to a more acute angular configuration;

a horizontally extending driving roller mounted for rotation on said frame, downstream from said second pair of forming rollers;

means on said frame for rotating said driving roller;

a pair of coaxial idler rollers rotatably mounted on said frame extending parallel with said driving roller;

said idler rollers and said driving roller having mutually engageable forming surfaces configured for forming a third flange extending angularly upwardly and outwardly from the flat central portion of the sheet metal strip and terminating at the first flange, and a fourth flange extending angularly upwardly and outwardly from the flat central portion of the sheet metal strip and terminating at the second flange;

a first pair of pinch rollers rotatably mounted on said frame, downstream from said driving roller;

said first pair of pinch rollers having mutually engageable forming surfaces configured for forming the second and fourth flanges into a female flange having a first portion extending angularly upwardly from the flat central portion of the sheet metal strip, and offset second portion extending perpendicular to the first portion, a third portion extending angularly outward from the second portion in a direction away from the first portion, and a fourth portion extending angularly downwardly from the third portion in a direction away from the flat central portion;

a second pair of pinch rollers rotatably mounted on said frame, downstream from said driving roller;

said second pair of pinch rollers having mutually engageable forming surfaces configured for forming the first and third flanges into a male flange having a first portion extending angularly upwardly from the flat central portion of the sheet metal strip, a second portion extending angularly upwardly from the first portion towards the female flange, and a third portion doubled over the second portion;

a third pair of parallel horizontally extending forming rollers rotatably mounted on said frame, downstream from said first and second pairs of pinch rollers;

said third pair of forming rollers having mutually engageable forming surfaces configured for forming a pair of elongated rectangular ribs in the flat central portion of the sheet metal strip;

an enclosure mounted adjacent said outlet side of said frame; a passageway for receiving the sheet metal strip formed through said enclosure, said passageway having a straight central portion and oppositely directed angularly upwardly extending side portions; and

a sheet metal cutter reciprocally mounted in said enclosure for severing the sheet metal strip.

4,872,332

METHOD AND DEVICE FOR SETTING BLIND RIVETS

Peter Potzas, AM Rinnerborn 58, D6305 Alten-Buseck Bunde-

republik Deutschland, Fed. Rep. of Germany

Continuation of Ser. No. 40,771, Mar. 24, 1987, abandoned. This

application Jul. 18, 1988, Ser. No. 220,398

Claims priority, application Fed. Rep. of Germany, Sep. 4, 1985, 3531532

Int. Cl.⁴ B21D 41/02

U.S. Cl. 72—393

22 Claims

1. A device for setting blind rivets provided with cylindrical,

continuous hollow spaces and rivet heads, for connecting inner and outer structural parts which are accessible only on one side and are provided with bores in alignment with one another comprising:

- a riveting mandrel having a thickened end, the diameter of which, at least in one dimension, is larger than the diameter of the cylindrical rivet hollow space,
- a holding-down part having a central bore in which the riveting mandrel is guided in an axially displaceable manner,
- a pulling device for displacing the riveting mandrel in the direction out of the rivet hollow space,
- said riveting mandrel comprising:
 - two flexible tongues which extend in the mandrel longitudinal direction, said tongues each including a free end on their sides pointing radially outwards and projections at the free ends thereof, said projections forming the thickened end,
 - a supporting element extending in the mandrel longitudinal direction provided between the tongues, said supporting element being displaceable in the longitudinal direction of the riveting mandrel relative to the tongues, said supporting element being movable between a forward position for opening out the rivet end and a pulled-back position for



pulling the mandrel out of the rivet hollow space after the rivet end is opened out, wherein when said supporting element is in the forward position, the supporting element is located in a position which is pushed forwards relative to the tongues and between the free ends of the tongues which are provided with the projections, and when said supporting element is in the pulled-back position, the tongue ends provided with the projections can be tilted towards one another.

wherein said drive mechanism comprises:

- a drive piston guided in an axial direction of the riveting mandrel and mounted in a guide channel made in a tong housing,
- a tongue piston bearing said tongues and arranged on a side of said drive piston pointing towards the working end of the riveting tool,
- a slave piston provided on a side of said drive piston remote from the working end,
- wherein said supporting element extends through central bores provided in all three pistons, projects through the slave piston and bears with a head against the side of the slave piston remote from the working end, and all three pistons are adapted to be coupled to one another selectively, dependent on the rivet setting operation.

4,872,333

WIRE DRAWING DIE

Richard P. Burnand, 39 Constantia Avenue, Alan Manor, Johannesburg, Transvaal, South Africa

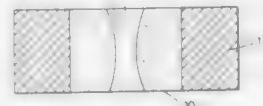
Filed Apr. 8, 1986, Ser. No. 849,549

Claims priority, application South Africa, Apr. 9, 1985, 85/2607

Int. Cl.⁴ B21C 3/02

U.S. Cl. 72-467

4 Claims



1. A wire drawing die comprising a thermally stable diamond compact held in a supporting surround and having a hole through it capable of receiving wire to be drawn there-through, the compact being resistant to significant graphitization resulting from integration with the supporting surround at ambient pressure conditions, the compact comprising a mass of diamond particles present in an amount of 80 to 90 percent by volume of the compact and the remainder as a second phase present in an amount of 10 to 20 percent by volume of the compact, the mass of diamond particles containing substantial diamond-to-diamond bonding to form a coherent, skeletal mass and a second phase consisting essentially of silicon, silicon carbide or a combination thereof.

4,872,334

VARIABLE FLOW CAPILLARY GAS CHROMATOGRAPHY METHOD

Chuichi Watanabe, Niihashi, Japan, assignor to The Dow Chemical Company, Midland, Mich.

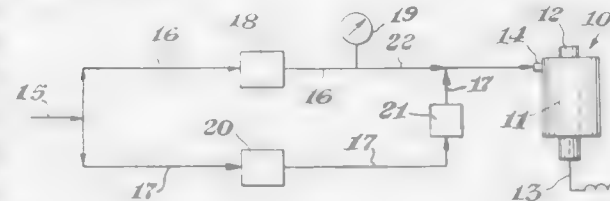
Continuation of Ser. No. 47,801, May 8, 1987, abandoned. This application Dec. 20, 1988, Ser. No. 287,692

Claims priority, application Japan, Sep. 5, 1986, 61-104761

Int. Cl.⁴ G01N 31/08

U.S. Cl. 73-23.1

7 Claims



1. A method for temperature programmed capillary column gas chromatography, comprising the steps of: flowing a carrier gas through a gas chromatography injection port with essentially all of the carrier gas subsequently flowing into a gas chromatography capillary column at a first flow rate and a first pressure; heating the column to a first temperature; introducing a sample through the injection port, the sample comprising a solvent and a component of interest; reducing the flow rate of the carrier gas to a second flow rate at a time longer than immediately after beginning the step of introducing the sample, the second flow rate being a normal flow rate for the column; and increasing the temperature of the column so that the component of interest emerges from the column.

4,872,335

VIBRATING TYPE TRANSDUCER

Michihiko Tsuruoka; Wataru Nakagawa; Noriomi Miyoshi; Naohiro Konosu, and Tadao Hashimoto, all of Kanagawa, Japan, assignors to Fuji Electric Co., Ltd., Kanagawa, Japan

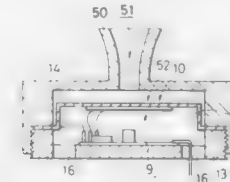
Filed Oct. 24, 1986, Ser. No. 922,694

Claims priority, application Japan, Oct. 25, 1985, 60-239228; Nov. 11, 1985, 60-252424; Nov. 18, 1985, 60-258130; Feb. 24, 1986, 61-38906; Jun. 16, 1986, 61-139786

Int. Cl.⁴ G01L 9/08; H04R 17/00

U.S. Cl. 73-30

3 Claims



1. A device to aid in detecting the resonant frequency of a diaphragm to measure properties of a fluid in contact therewith, said device comprising:

- a container defining a cavity therein;
- a diaphragm within said cavity, said diaphragm dividing said cavity into two chambers on opposite sides of said diaphragm, said diaphragm preventing flow communication between said chambers;
- first fluid inlet means in flow communication with a first of said chambers for introducing said fluid to said first chamber, said first chamber having an acoustic compliance less than the mechanical compliance of said diaphragm, said first fluid inlet means including a conduit having a convergent bore; and
- second fluid inlet means in flow communication with a second of said chambers for introducing fluid to said second chamber.

4,872,336

APPARATUS FOR PRESSURE TESTING PIPELINES

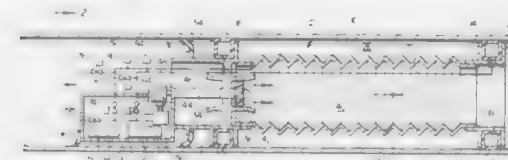
Lloyd A. Baillie, Plano, Tex., assignor to Atlantic Richfield Co., Los Angeles, Calif.

Filed Oct. 5, 1988, Ser. No. 253,781

Int. Cl.⁴ G01M 3/04

U.S. Cl. 73-40.5 R

12 Claims



1. Apparatus for pressure testing a section of pipe of a fluid transmission pipeline without shutoff of fluid flow through said pipeline during said pressure test, said apparatus comprising: spaced apart seal means for engaging a wall of said pipe to form a substantially fluid pressure tight seal therewith; generally flexible tubular means interconnecting said seal means and defining with said seal means a generally annular space between said seal means for pressure fluid testing said section of pipe between said seal means; pump means for pumping pressure fluid to flow into said seal means and said annular space for pressurizing said seal means to form a fluid tight seal to prevent leakage of fluid from said annular space and to increase the pressure of

fluid in said annular space for said pressure testing said section of pipe; and conduit means connected to said pump means for receiving pressure fluid from within said section of pipe for pressurizing said seal means and said annular space.

4,872,337

NONDESTRUCTIVE TESTING OF GEARS

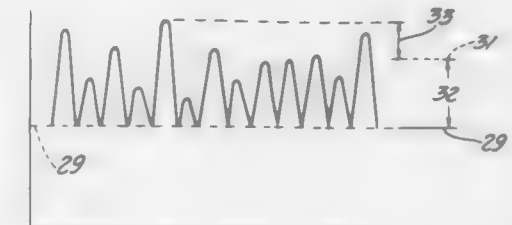
Robert J. Watts, 22430 St. Clair Dr., St. Clair Shores, Macomb, Mich. 48061; David A. Rice, 25 Village View Bluff, Ballston Lake, Saratoga, N.Y. 12019, and John A. Neun, 80 St. Andrews Dr., Clifton Park, Saratoga, N.Y. 12065

Filed Jan. 29, 1988, Ser. No. 150,114

Int. Cl.⁴ G01M 13/02; G06F 07/02

U.S. Cl. 73-162

4 Claims



1. A method of determining the acceptability of a first gear in a set of rotatable gears within a case of a given automotive transmission, the first gear being meshed with a second gear in the set, the method comprising:

- (a) producing a synchronizer signal once per a period corresponding to one or more complete revolutions of the first gear;
- (b) using a vibration sensor to output an analog electrical signal corresponding to vibrations of the gear case, the sensor generating an analog signal for a plurality of said periods;
- (c) averaging together the analog signals from the periods to form a composite signal whose duration is a single period and whose form is that of a wave having peaks and valleys;
- (d) selecting points within the single period and then determining absolute values of the amplitude of the composite signal at the selected points, and then calculating the root mean square of the selected absolute values;
- (e) repeating steps a) through d) for each gear in the set of rotatable gears, and then averaging the root mean squares found for each repetition of these steps, thereby deriving a normalization factor for the given transmission;
- (f) band pass filtering the composite signal to obtain a plurality of component signals corresponding to the first, second and one or more subsequent harmonics of the composite signal, the components signals having a wave form with evenly spaced peaks and valleys disposed along a reference line;
- (g) for each component signal, determining the individual absolute values of the amplitude of peaks or valleys and then ascertaining the average value for the absolute values so determined;
- (h) for each component signal, determining the the statistical standard deviation for the amount by which the absolute values deviate from the average value;
- (i) for each component signal, deriving a first and second weighting factor, each weighting factor based upon the harmonic of the component signal, the gear ratio between the first and second gears, the rotational speed of a gear shaft upon which the first gear is mounted, the gear type of the first gear, and the position of the first gear relative to others gears in the gear train;
- (j) using the average values for the absolute values derived in step g, the statistical standard deviations from step h, the

normalization factor from step e, and the weighting factors from step i to calculate a first fault characterization parameter;

- (k) comparing the first fault characterization parameter to a selected fault characterization parameter for gears similar to the first gear in transmission similar to the given transmission.

4,872,338

EXPANSION MECHANISM FOR METER BOX OR METER YOKE

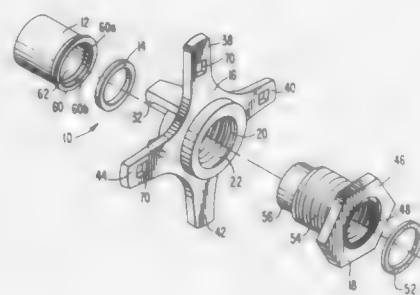
José M. Rivero-Olmedo, Santurce, P.R.

Continuation of Ser. No. 170,644, Mar. 16, 1988, abandoned, which is a continuation of Ser. No. 816,903, Jan. 8, 1986, abandoned. This application Sep. 29, 1988, Ser. No. 251,987

Int. Cl.⁴ G01F 15/18

U.S. Cl. 73—201

16 Claims



1. An expansion mechanism for connecting a meter within a meter box or yoke, comprising:

- a hand wheel having a partially threaded axial opening therethrough with an annular rim extending inwardly into said axial opening, and positioning prongs at one end of said axial opening, said annular rim having an annular surface with a diameter less than a diameter of said axial opening through said hand wheel;
- a bushing having an outer threaded portion cooperating with said partially threaded axial opening in said hand wheel, a sleeve cooperating with and providing a close fit with said annular surface of said annular rim, and means for operatively connecting said bushing to a conduit;
- a cup comprising a sleeve having a flaring rim at one end and an opening at an opposite end thereof, said cup being retained by said prongs of said hand wheel; and
- an annular gasket positioned about said sleeve of said bushing, and located between said flaring rim and said annular rim, whereby threaded movement between said hand wheel and said bushing may place sealing pressure on said annular gasket.

4,872,339

MASS FLOW METER

Bruce Gerhard, Canton, and Bruce Schulman, Newton, both of Mass., assignors to NEC Electronics Inc., Mountain View, Calif.

Filed Aug. 3, 1988, Ser. No. 227,934

Int. Cl.⁴ G01F 1/68

U.S. Cl. 73—204.14

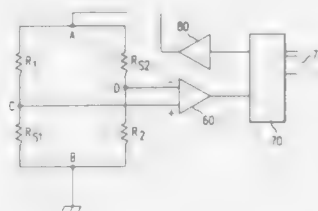
8 Claims

1. A mass air flow meter comprising:

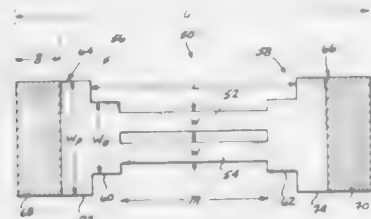
- a bridge circuit having first and second input terminals and having first and second output terminals, said bridge circuit having incorporated in one or more arms a resistive sensing means, said sensing means having a resistance which varies proportionally to a change in its temperature, wherein said sensing means has heat removed from it by an air flow;
- a comparator means with first and second input terminals coupled to said first and second output terminals of said bridge circuit, respectively, wherein said comparator

means produces an output in response to a voltage difference between voltages at said first and second output terminals of said bridge circuit;

a microcomputer with an input terminal coupled to receive said output of said comparator, said microcomputer producing a pulsewidth modulated signal at a first output of said microcomputer whose duty cycle is controlled solely by said output of said comparator in conjunction with an update algorithm, wherein said algorithm uses a control loop which makes repeated evaluations of said output of said comparator and makes repeated changes in said duty cycle of said pulsewidth modulated signal until said output of said comparator has changed in response to a change in said duty cycle, said microcomputer generating digital



creases, the first transducer comprising a pair of first beams and the second transducer comprising a pair of second beams, the improvement wherein the beam dimensions are selected



such that the Euler buckling constants of the first and second transducers are substantially equal to one another, and such that in the absence of acceleration along the sensing axis, the first and second frequencies are different from one another.

4,872,344

METHOD OF NONDESTRUCTIVE QUALITY CONTROL OF CARBON ARTICLES

Anatoly F. Grebenkin; Boris A. Glagovsky; Igor B. Moskovenko, and Ijudmila P. Lasukova, all of Leningrad, U.S.S.R., assignors to Vsesojuzny Nauchno-Issledovatel'skiy I Proektny Institut Aljuminiaevol, Magnievol I Elektrodoel, Leningrad, U.S.S.R.

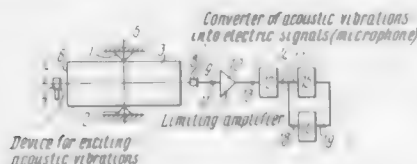
PCT No. PCT/SU86/00117, § 371 Date Nov. 4, 1987, § 102(e) Date Nov. 4, 1987, PCT Pub. No. WO87/05392, PCT Pub. Date Sep. 11, 1987

PCT Filed Nov. 20, 1986, Ser. No. 153,270

Claims priority, application U.S.S.R., Mar. 6, 1986, 4052258 Int. Cl.⁴ G01N 29/00

U.S. Cl. 73-579

1 Claim



1. A method of nondestructive quality control of carbon articles, comprising the steps of exciting acoustic vibrations in each carbon article taken from a group of carbon articles and in a specimen cut out from at least one carbon article, converting the acoustic vibrations in each carbon article and in the specimen into an electric signal having a frequency corresponding to the frequency of the acoustic vibrations, measuring the frequency of the electric signal to determine the frequency of the acoustic vibrations in each carbon article and in the specimen, determining the rate of propagation of the acoustic vibrations in the specimen and in the corresponding carbon article, determining the rate of propagation of the acoustic vibrations in each carbon article, measuring the specific electric resistance of selected carbon articles, establishing the relationship of the rate of propagation of the acoustic vibrations in a carbon article to its specific electric resistance, determining the range of the rate of propagation of the acoustic vibrations from the range of predetermined values of the specific electric resistance, and selecting carbon articles falling within the range of the rate of propagation of acoustic vibrations, held representative of the quality of a carbon article, wherein after the determination of the rate of propagation of the acoustic vibrations in each carbon article (3), there are selected from the group of carbon articles at least one carbon article (3) with the lowest determined rate of propagation of the acoustic vibrations therein and at least one carbon article (3) with the highest determined rate of propagation of the acoustic vibrations therein, followed by cutting out from each thus selected carbon article (3) "n" specimens longitudinally thereof and "m" specimens across the longitudinal axis thereof, exciting acoustic vibrations in each of said "n" and "m" specimens, converting acoustic vibrations in each one of said "n"

and "m" specimens into an electric signal having a frequency corresponding to the frequency of the acoustic vibrations, measuring the frequency of the electric signal to determine the frequency of the acoustic vibrations in each one of said "n" and "m" specimens, determining successively the rate of propagation of acoustic vibrations in and the specific electric resistance of each one of said "n" and "m" specimens, determining the rate of propagation of acoustic vibrations in said selected carbon articles (3) by finding its averaged value therein from an expression:

$$C_e = \frac{1}{n+m} \sum_{i=1}^{n+m} C_i$$

where C_e is the rate of propagation of acoustic vibrations, the specific electric resistance of carbon articles in the group, of which the quantity is defined by the number of said selected carbon articles (3), is determined by finding its averaged value from an expression:

$$\rho = \frac{1}{n+m} \sum_{i=1}^{n+m} \rho_i$$

where ρ is the specific electric resistance, and the establishment of the relationship of the rate of propagation of the acoustic vibrations in a carbon article (3) to its specific electric resistance is effected by finding the linear correlated relationship of the averaged value of the rate of propagation of the acoustic vibrations in said selected carbon articles (3) to the averaged value of their specific electric resistance.

4,872,345

MEASURING WALL EROSION

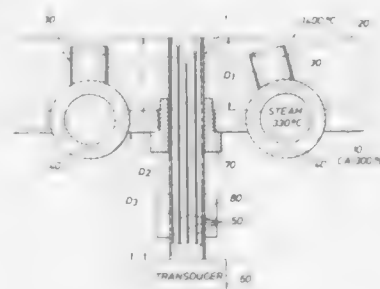
Lynton W. R. Dicks, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Mar. 30, 1988, Ser. No. 175,028

Int. Cl.⁴ G01B 17/02; G01N 17/00

U.S. Cl. 73-597

8 Claims



1. A method for measuring decreasing thickness of the refractory lining of a high pressure, high temperature, water cooled reactor wall during operation of the reactor comprising:

- inserting a pulse-echo ultrasonic probe, which will erode at substantially the same rate as the refractory lining, into an opening in the wall of the reactor to the internal face of the refractory lining;
- measuring the pulse-echo signal of the probe over time so that there is an initial measure of the pulse-echo signal for the initial thickness of the lining and a current measure of the pulse-echo signal for the current thickness of the lining;
- calculating the thickness of the lining of the wall from the thickness measured at the initial time and the thickness measured at the current time;
- measuring at least one of (1) a temperature gradient which occurs in the probe over the time of operation; and (2) a sound velocity change as a function of the temperature;

- adjusting the calculated thickness of the lining of the wall using at least one of (1) the temperature gradient to compensate for the thermal expansion and (2) the sound velocity change of step (d); and
- providing an adjusted calculated thickness of the lining of the wall.

4,872,346

MULTIPLE FREQUENCIES FROM SINGLE CRYSTAL

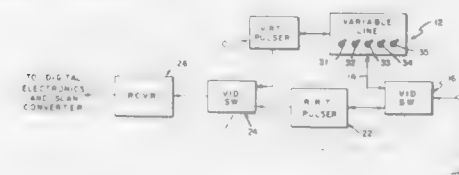
Elizabeth Kelly-Fry, and Steven T. Morris, both of Indianapolis, Ind., assignors to Indianapolis Center for Advanced Research, Indianapolis, Ind.

Continuation of Ser. No. 888,023, Jul. 18, 1986, abandoned. This application Jun. 30, 1988, Ser. No. 214,847

Int. Cl.⁴ G01N 29/00

U.S. Cl. 73-627

15 Claims



1. A method of ultrasound imaging of a material, the method comprising the steps of selectively generating an electrical pulse having a first rate of rise in absolute magnitude or an electrical pulse having a second, relatively longer rate of rise in absolute magnitude, coupling the electrical pulse through a modifying network to an acoustical transducer for conversion into an acoustical pulse, receiving echoes of the acoustical pulse, and coupling echo-related signals to signal processing circuitry.

4,872,347

AUTOMATED ULTRASONIC EXAMINATION SYSTEM FOR HEAT TRANSFER TUBES IN A BOILER

Yoshimi Okabe, Tokyo; Keiichi Iwamoto, Nagasaki; Masaaki Torichigai, Nagasaki; Shozo Kaneko, Nagasaki; Joji Ichinari, Nagasaki, and Kiyoshi Koizumi, Tokyo, all of Japan, assignors to Tokyo Electric Power Co. and Mitsubishi Jukogyo Kabushiki Kaisha, both of Tokyo, Japan

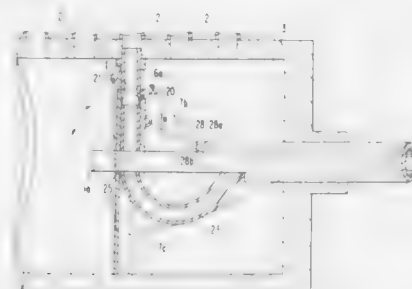
Filed Feb. 1, 1988, Ser. No. 151,093

Claims priority, application Japan, Jan. 30, 1987, 62-19904

Int. Cl.⁴ G01N 29/00

U.S. Cl. 73-634

6 Claims



1. An automated ultrasonic examination system for examining heat transfer tubes open to a cylindrical body in a boiler, said system comprising:

- an insert tube having a longitudinal axis;
- an insert tube moving device for moving said insert tube axially and for rotating said insert tube about the longitudinal axis thereof;
- a pressurized water ejection nozzle rotatably mounted to said insert tube about a pivot axis extending orthogonally to the axis of said insert tube;
- a drive mechanism extending through said insert tube and operatively connected to said pressurized water ejection nozzle for rotating said nozzle about said pivot axis;

a pressurized water feed pump operatively connectable in the system to said pressurized water ejection nozzle for feeding pressurized water to said nozzle;

a cable insertable through said insert tube and said pressurized water ejection nozzle and payable from said nozzle under pressurized water fed to said nozzle;

a cable accommodation tank for accommodating said cable;

a revolvable and submergible ultrasonic probe mounted to an end of said cable for performing ultrasonic testing and for issuing signals indicative of the ultrasonic testing; and

an ultrasonic examination unit operatively connectable in the system to said probe for processing the signals issued by said probe.

4,872,348

SIGNAL ADDED VIBRATION TRANSDUCER

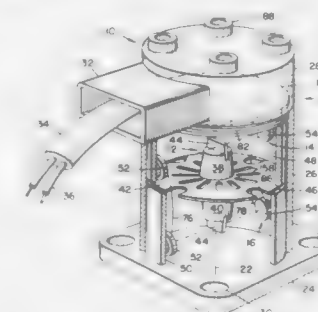
Stephen J. Curry, Bridgeport, Conn., assignor to Avco Corporation, Providence, R.I.

Filed Jan. 28, 1988, Ser. No. 149,376

Int. Cl.⁴ G01P 15/03

U.S. Cl. 73-653

10 Claims



1. A vibration measurement transducer comprising:

an elongated vibratory element having predetermined mass;

a case enclosing said element;

suspension means for mechanically coupling the element to said case, the suspension means permitting displacement of said element relative to said case in response to a vibration applied to said case;

restraining means operatively connected to said suspension means for restraining displacement of said element to one direction of motion parallel to an axis of said case, said restraining means maintaining a longitudinal axis of said vibratory element parallel to said case axis; and

displacement sensor means disposed within said case for sensing displacement of said element relative to said case, the sensor means comprising two sensors located relative to said element for sensing displacement of opposite ends of said element, the sensor means further comprising means for algebraically combining signals of the two sensors for improved signal-to-noise ratio; and wherein

said two sensors are disposed on said case axis at opposite ends of a path of displacement of said vibratory element each of said sensors including means for illuminating an end portion of said vibratory element with light rays directed in a direction normal to said one direction of motion of said vibratory element, an intrusion of said vibratory element into the light rays of a sensor providing an indication of displacement of said vibratory element.

4,872,349

MICROCOMPUTERIZED FORCE TRANSDUCER

Eugenio Espiritu-Santo, Fairfield, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Oct. 31, 1986, Ser. No. 925,339

Int. Cl.⁴ G01L 7/08, 9/06

U.S. Cl. 73-727

14 Claims

1. A transducer apparatus, comprising:

a means for producing an electrical output signal related to force;
 a means for supplying electrical power to the producing means;
 a switching means for modulating the power supplied to the producing means by the supplying means by repetitively



connecting and disconnecting the supplying means to and from the producing means; and
 a means synchronized with the modulating means for sampling the electrical output signal related to force at a predetermined time during the time the modulating means connects the supplying means to the producing means.

4,872,350

MECHANICAL QUANTITY SENSOR ELEMENT

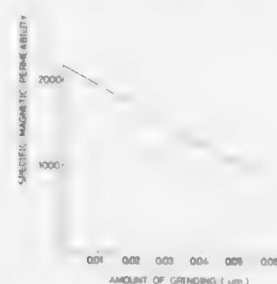
Naomasa Kimura, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 26, 1988, Ser. No. 160,742

Claims priority, application Japan, Feb. 27, 1987, 62-43164
 Int. Cl.⁴ H01F 1/00

U.S. Cl. 73-779

5 Claims



1. A mechanical quantity sensor element making use of a stress-magneto effect of noncrystalline magnetic alloy having positive magnetostriction, wherein treatment is effected such that an external force is applied onto a surface of a thin belt made of noncrystalline magnetic alloy, and thereby compression strain is preliminarily given to and retained by at least a part of the thin belt.

4,872,351

NET OIL COMPUTER

James R. Ruesch, Boulder, Colo., assignor to Micro Motion Incorporated, Boulder, Colo.

Continuation of Ser. No. 235,234, Aug. 23, 1988, abandoned, which is a continuation of Ser. No. 916,780, Oct. 9, 1986, abandoned. This application Apr. 14, 1989, Ser. No. 339,128
 Int. Cl.⁴ G01F 1/74

U.S. Cl. 73-861.04

36 Claims

1. Apparatus for a flow metering system using a Coriolis meter having at least one flow tube which is driven to resonantly oscillate in a substantially sinusoidal manner about a bending axis while an emulsion formed of at least two substantially immiscible components flows through said flow tube, said apparatus comprising:

a flow rate measuring circuit comprising:
 means for sensing a time interval occurring between a first point in time at which one side leg of said flow tube

reaches a pre-defined point in its travel and a second point in time at which a second side leg of said flow tube and counterpart to said first side leg reaches a corresponding pre-defined point in its travel, whereby the duration of this interval is proportional to both Coriolis forces induced by movement of a given fluid flowing through said flow tube and to flow rate of said given fluid flowing through said flow tube; and
 means, responsive to said sensed time interval, for producing a stream of flow rate pulses having a frequency proportional to the flow rate of said given fluid; and

a first circuit comprising:

means for measuring a value of a period at which said flow tube resonantly vibrates while the given fluid flows therethrough and for generating a first interrupt at the conclusion of each period value measurement;

means for measuring a temperature of said flow tube;

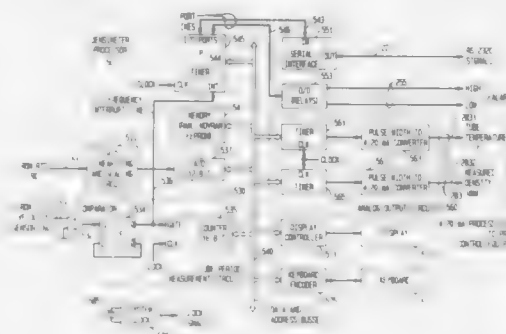
first means for displaying a value of density of said given fluid; and

a first processing circuit comprising:

means, responsive to an occurrence of said first interrupt, for filtering said period value measurement to yield a filtered period measurement;

means for generating a second interrupt at a first pre-defined periodic interval of time;

means, operative in response to an occurrence of said second interrupt and to said temperature measuring means, for providing a measured temperature value of said flow tube coincidentally occurring while said given fluid flows therethrough;



means for determining, in response to the measured temperature value, a temperature coefficient value for said given fluid;

means, responsive to said temperature coefficient determining means and to said filtered period measurement, for determining a first factor as being a product of said temperature coefficient value and a square of said period value;

means, responsive to said first factor and to second and third factors associated with first and second known calibration fluids, for producing a current density value of said given fluid;

means, responsive to said current density value, for updating the displayed density value appearing on said first displaying means with said current density value at a second pre-defined periodic interval of time, wherein said second pre-defined interval is longer than said first pre-defined interval;

means for compensating corresponding first and second reference density values for first and second immiscible components present in said emulsion to the measured temperature value in order to yield corresponding first and second temperature compensated density values;

means, responsive to said current density value, and to said first and second temperature compensated density values, for generating corresponding first and second density ratios of the first and second immiscible components that are present within said given emulsion; and

means for applying said first and second density ratios to a second circuit; and
 a second circuit, operative in response to said first and second density ratios and said flow rate pulses, comprising:
 means for totalizing the flow rate pulses to produce a totalized flow value;
 means for receiving said first and second density ratios from said first circuit to generate corresponding first and second received density ratios and, in response thereto, for generating a third interrupt;
 second means for displaying either a corresponding flow rate of said emulsion, said first or said second immiscible components or corresponding totalized values of the flow of said emulsion or said first or second immiscible components;
 a second processing circuit comprising:
 means, operative in response to said receiving and generating means, for storing the first and second received density ratios, at an occurrence of said third interrupt, in appropriate memory locations in order to provide corresponding stored first and second density ratios;
 means for generating a fourth interrupt at a third pre-defined periodic interval of time;
 means, responsive to the occurrence of said fourth interrupt, for converting the totalized flow value that occurs over a fourth periodic interval of time into a current flow rate value; wherein said fourth interval is longer than said third interval;
 means, responsive to the stored first and second density ratios and to said totalized flow rate value occurring over said fourth interval, for generating corresponding current values of totalized flow for said emulsion and of said first and second components;
 means, responsive to the corresponding current values of flow rate and totalized flow for said emulsion and said first and second components, for selectively updating a corresponding displayed value appearing on said second display means;

wherein said apparatus further comprises means for corresponding setting each of the second and third factors substantially equal to the first factor that occurs when the first and second known calibration fluids are correspondingly and selectively passed through the flow tube in order to calibrate the meter.

4,872,352

FLOW METER PULSE TRANSMITTER

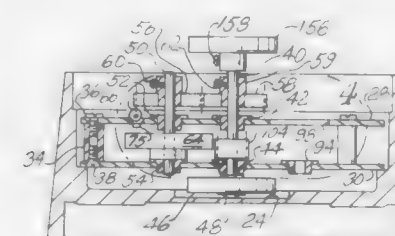
Kevin Alden, 23983 Enriquez Dr., Diamond Bar, Calif. 91765, and Charles Alden, Escondido, Calif., assignors to Kevin Alden, Diamond Bar, Calif.

Filed May 12, 1986, Ser. No. 862,311

Int. Cl.⁴ G01F 1/075, 1/115

U.S. Cl. 73-861.77

19 Claims



1. Apparatus for generating pulses corresponding to the rotation of a rotating member, the apparatus comprising:
 (a) a rotatably mounted input shaft;
 (b) means on the input shaft for coupling the input shaft to the rotating member;
 (c) an output shaft;

(d) means for repetitively interrupting an electrical current in response to rotation of the output shaft;
 (e) sleeve means on and concentric with the input shaft;
 (f) calibration gear means for rotating the output shaft in response to rotation of the sleeve means; and
 (g) range means for rotating the sleeve means at a predetermined turns ratio relative to the input shaft, comprising:
 (i) auxiliary support means for rotatably mounting a compound shaft and gearing the compound shaft to the input shaft and to the sleeve means;
 (ii) a first range member operatively connected between the input shaft and the sleeve means, whereby the turns ratio is a first turns ratio; and
 (iii) means for disconnecting the first range member and receiving and connecting a second range member between the input shaft and the sleeve means at a second turns ratio without disturbing the mounting of the input shaft during the disconnecting of the first range member and the receiving and connecting of the second range member.

4,872,353

AUTOMATIC SAMPLE FEEDER FOR SUSPENDED SAMPLES

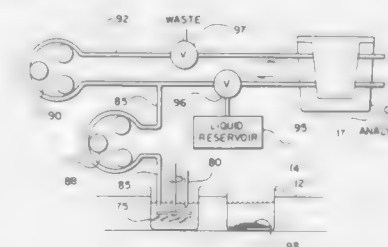
Clyde Orr, Jr., Dunwoody, and Ronnie Camp, Duluth, both of Ga., assignors to Micromeritics Instrument Corp., Norcross, Ga.

Continuation-in-part of Ser. No. 125,395, Nov. 25, 1987. This application Feb. 19, 1988, Ser. No. 157,705

Int. Cl.⁴ G01N 35/00

U.S. Cl. 73-864.85

16 Claims



1. An apparatus for feeding particulate samples to an analyzer, comprising:

a plurality of sample containers for storing particulate samples and liquid in which said particulate is to be suspended; and

sample preparation and delivery means responsive to a first signal from said analyzer for suspending a first sample in a first one of said containers in said liquid and for removing a volume of said first sample from said first container and delivering said volume of said first sample to said analyzer while said first sample is being maintained in suspension in said first sample container, and responsive to a second signal from said analyzer for suspending a second sample in a second one of said containers in said liquid and for removing a volume of said second sample from said second container and delivering said volume of said second sample to said analyzer while said second sample is being maintained in suspension in said second sample container.

4,872,354

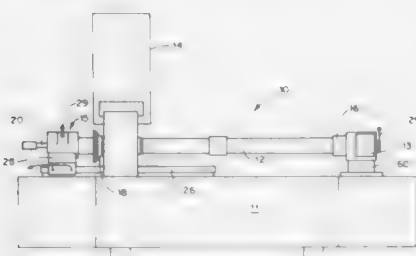
HOLLOW SHAFT MEASUREMENT DEVICE

Marian Barasch, Albany, and Charles H. Mirella, Clifton Park, both of N.Y., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jul. 30, 1987, Ser. No. 79,366
Int. Cl.⁴ G01R 27/26

U.S. Cl. 73-865.8

2 Claims



1. A hollow shaft measurement machine, said machine comprising:

- a measurement table, said measurement table having a flat upper measurement surface;
- means for measuring external dimensions of a hollow shaft, said means for measuring movably mounted upon said measurement table;
- a rotatable chuck, said rotatable chuck mounted to said measurement table, said rotatable chuck having means for holding and centering a first end of said hollow shaft;
- a rotatable centering device, said rotatable centering device having means for holding a second end of said hollow shaft, said rotatable centering device having a cylindrical bearing hole therethrough, said rotatable centering device movably mounted to said measurement table;
- a gauge head, said gauge head rotatably mounted in said bearing hole of said centering device, said gauge head having internal measurement means for insertion into the second end of said hollow shaft for measuring internal dimensions of said hollow shaft; and
- signal processing means, said signal processing means connected to said means for measuring external dimensions and to said gauge head for measuring internal dimensions of said hollow shaft, said signal processing means including a computer for controlling actuators that move said means for measuring.

4,872,355

MICROCUBE INTERCONNECTION HARDWARE

Roderick G. Rohrberg, 2742 W. 234th St., Torrance, Calif. 90505; Timothy K. Rohrberg, 2800 Plz. Del Amo #406, Torrance, Calif. 90505, and Kevin D. McGushion, 2450 Oak St. #E, Santa Monica, Calif. 90405

Filed May 20, 1988, Ser. No. 196,993

Int. Cl.⁴ G01D 11/30; G01F 15/18; G01L 19/00; G01K 1/14
U.S. Cl. 73-866.5 13 Claims

6. A MicroControl Module comprising in combination:
- a gas filter and an inlet fitting connected to an inlet;
 - a first valve connected to said inlet fitting and to a first MicroCube Precision Fitting;
 - said first MicroCube being further connected to a pressure regulator and a second valve;
 - said second MicroCube Precision Fitting being connected to an inert gas fitting;
 - said inert gas fitting being connected to an inert gas supply line, said second MicroCube being further connected to a third valve;
 - said third valve being connected to a MicroVac Vacuum Generator including a first MicroSensor having a Microcube and a gas sensor;

said MicroVac Vacuum Generator being further connected to a vent line and a fourth valve;

said fourth valve being connected to a second MicroSensor;

said second MicroSensor being connected to said pressure regulator, to said fourth valve, to a fifth valve, and to an excess pressure valve;

said fifth valve being further connected to a process gas fitting;

each of said MicroCube Precision Fittings having a unitary substantially cubical body and having a central chamber;

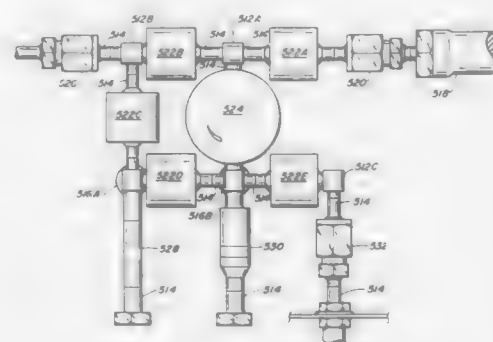
said body having at least one external port in communication with said central chamber;

said port further including an annular counterbored step; and

said MicroVac Vacuum Generator including:

a MicroCube Precision Fitting having a unitary substantially cubical body and having a central chamber;

said body having at least one external port in communication with said central chamber;



said port further including an annular counterbored step;

an inlet coupled to said MicroCube Precision Fitting having an aperture for receiving a high pressure flow of gas;

a first stage disposed within said inlet and in communication with said inlet for successively compressing and expanding said flow of gas;

a contaminant port coupled to said MicroCube Precision Fitting for connection to a contaminated volume;

said contaminant port being disposed generally perpendicular to said first stage;

an outlet coupled to said MicroCube Precision Fitting having an aperture for exhausting said high pressure flow of gas;

a second stage disposed within said MicroCube Precision Fitting for successively compressing and expanding said flow of gas; and

said second stage being oriented substantially coaxially with said first stage.

4,872,356

RESISTIVITY PROBE FIXTURE

Jay D. Barnett, Mountain Home; Bryan J. Ludwig, Meridian; Ernest E. Marks, and Scott E. Moore, both of Boise, all of Id., assignors to Micron Technology Inc., Boise, Id.

Filed Dec. 27, 1988, Ser. No. 290,458

Int. Cl.⁴ B08B 3/00

U.S. Cl. 73-866.5

9 Claims

1. Resistivity probe mounting apparatus for use with a wafer washing machine having fluid discharge means, said apparatus comprising:

- (a) a fitting, having a probe submersion chamber, having an inlet in fluid communication with the fluid discharge means, and having a primary outlet, the chamber lower than said inlet and outlet so that it will retain discharge fluid;
- (b) means for positioning a probe within said chamber so that the chamber when full will submerge said probe; and

4,872,358

DRIVING MECHANISM HAVING A PRESSURE MEMBER

Edwin J. Buis, Veldhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

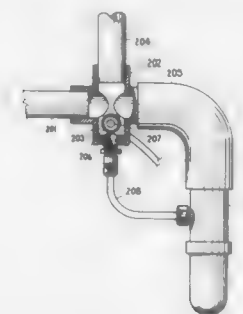
Filed Feb. 29, 1988, Ser. No. 161,527

Claims priority, application Netherlands, Jun. 11, 1987, 1701344

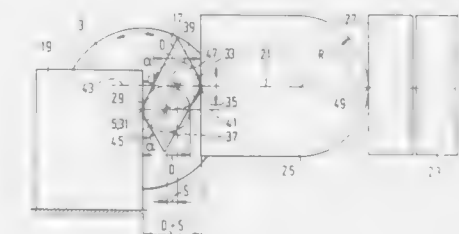
Int. Cl.⁴ F16H 25/18

U.S. Cl. 74-99 R

30 Claims



typical discharge the chamber will be filled, yet will drain empty after discharge.



1. A driving mechanism, comprising:

- an elongate shaft defining a shaft axis, said shaft being rotatable through a predetermined angle about said shaft axis;
- a portion of said shaft defining a cam, said cam portion having first and second opposing surfaces;
- a cam follower displaceable along a second axis generally at right angles to said shaft axis and positioned for engaging said cam portion of said shaft, said cam follower having a surface in contact with said second surface of said cam portion; and
- support means positioned against said cam portion of said shaft on the side of said shaft opposite said cam follower for preventing displacement of said cam portion in a direction parallel to said second axis and in the direction away from said cam follower, said support means having a surface against which said first cam surface bears;
- said first cam surface and said surface of said support means being shaped for providing rolling contact with each other and defining a first roller segment, said first cam surface having a point which coincides with said shaft axis, and
- said second cam surface and said cam follower surface being shaped for providing rolling contact with each other and defining a second roller segment,
- upon rotation of said shaft and said cam portion, said cam portion in the area of said first roller segment being in rolling contact with said support means, and said cam portion in the area of said second roller segment being in rolling contact with said cam follower, and
- said rotation of said cam portion advancing said cam follower along said second axis a distance dependent on the angle of rotation of said shaft and said cam portion, the amount of translation being equal to the distance between a first point of contact between said first cam surface and said support means surface and a second point of contact between said second cam surface and said cam follower surface when projected onto said second axis.

4,872,359

PIVOTATION DEVICE FOR A CENTRIFUGAL CHAIN ASSEMBLY IN A MOTOR VEHICLE

Gerd Schulz, Besselstrasse 9, and Hans-Peter Hertleif, Rotbergskamp 20c, both of 2100 Hamburg 90, Fed. Rep. of Germany

Filed Jul. 21, 1986, Ser. No. 888,458

Claims priority, application Fed. Rep. of Germany, Jul. 20, 1985, 3525981

Int. Cl.⁴ F16H 21/44

U.S. Cl. 74-109

17 Claims

1. A pivotation device for adjustably pivoting an arm of a centrifugal chain assembly, said pivotation device comprising:

4,872,357

DEVICE FOR TEMPORARILY LOCKING A ROTOR ONTO A STATOR

Hubert Vaillant De Guelis, Aubergenville, and Jean-Louis Joly, Bazemont, both of France, assignors to Aerospatiale Societe Nationale Industrielle, Paris, France

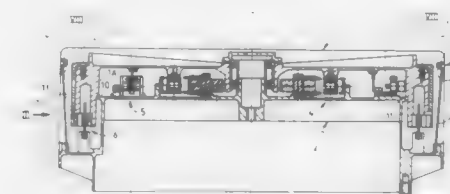
Filed Aug. 3, 1988, Ser. No. 227,932

Claims priority, application France, Aug. 5, 1987, 87 11136

Int. Cl.⁴ G01C 19/26

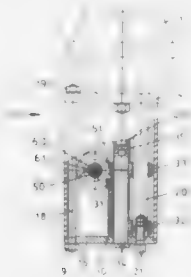
U.S. Cl. 74-5.1

16 Claims



1. Device for temporarily locking onto a stator a rotor that normally rotates on said stator on magnetic bearings, said device comprising a frustoconical bearing surface near the periphery of said rotor, a complementary frustoconical bearing surface on said stator, a plurality of radially mobile elementary bearing surfaces coupled to said stator, a second bearing surface at the periphery of said rotor, spring means radially urging said plurality of radially mobile elementary bearing surfaces away from said second bearing surface; a cable under tension shaped as an annular loop in a transverse plane radially urging said plurality of radially mobile elementary bearing surfaces in axial engagement with said second bearing surface on said rotor in a direction opposite that in which said frustoconical bearing surface on said stator applies an axial engagement force to said frustoconical bearing surface on said rotor, and a releasing device for releasing tension in said cable whereby said plurality of radially mobile elementary bearing surfaces are radially moved away from said second bearing surface by said spring means.

a drive;
a rack;
means interconnecting said rack and said drive, said rack being longitudinally driveable by means of said drive;
a gear wheel in engagement with said rack;
an output drive shaft driven by a said gear wheel;
the axis of rotation of said output drive shaft coinciding with that of said gear wheel;



a coupling means adapted to interconnect said output drive and said pivotation arm
a guide rod of circular cross section extending parallel to said rack; and
means interengaging said rack and said guide rod, said rack being guided in a flying manner by said guide rod, said rack having teeth facing away from said guide rod, teeth of said gear wheel cooperating with teeth of said rack to prevent rotation of said rack about said guide rod.

4,872,360

MOVING CYLINDER ACTUATOR

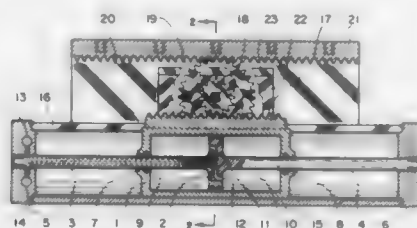
Hyok S. Lew, and Hyon S. Lew, both of 7890 Oak St., Arvada, Colo. 80005

Filed May 12, 1988, Ser. No. 192,835

Int. Cl.⁴ F16H 21/44, 27/02; F01B 15/02

U.S. Cl. 74—110

2 Claims



1. An actuator cylinder comprising in combination:
 - (a) a cylinder including a cylindrical cavity of a constant cross section;
 - (b) a partitioning member engaging said cylindrical cavity in a sliding relationship and dividing said cylindrical cavity into a first and second compartment in a leak-proof manner;
 - (c) at least one rod extending from one end face of said partitioning member in a direction parallel to a central axis of said cylindrical cavity and extending through one end wall of said cylindrical cavity in a leak-proof manner, wherein said rod is anchored to a supporting structure at the extremity thereof;
 - (d) a first port connected to a first flow passage included in said rod and open to said first compartment in the cylinder;
 - (e) a second port connected to a second flow passage included in said rod and open to said second compartment in the cylinder;
 - (f) a first rack disposed parallel to the central axis of said

cylindrical cavity and affixed to an outer cylindrical surface of said cylinder;

- (g) a pinion gear rotatably supported by the support structure and engaged by said first rack, wherein said pinion gear rotates at least another gear having a pitch diameter different from a pitch diameter of said pinion gear; and
- (h) a sliding member with fastening means guided and supported by the support structure in a sliding relationship in directions parallel to the central axis of said cylindrical cavity, said sliding member including a second rack engaged by said another gear.

4,872,361

SHIFT ROD FOR A MANUAL TRANSMISSION

Robert Müller, Mönshelm, Fed. Rep. of Germany, assignor to Dr. Ing. h.c.F. Porsche AG, Weissach, Fed. Rep. of Germany

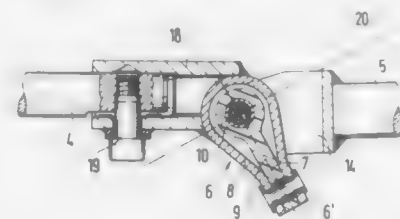
Filed Apr. 5, 1988, Ser. No. 177,927

Claims priority, application Fed. Rep. of Germany, Apr. 2, 1987, 3703290

Int. Cl.⁴ G05G 9/18, 7/16

U.S. Cl. 74—473 R

11 Claims



1. A shift rod for a gear shift transmission of a motor vehicle of the type that is flanged to an engine unit with the desired transmission gears being manually preselectable and shiftable by means of twisting and longitudinal movements of said shift rod, said shift rod being constructed in two rod segments connected with one another by means of a vibration-damping coupling joint, wherein the coupling joint is housed in a damping body that, in a longitudinal direction of the shift rod, is developed to be softly resilient over a short distance, but that, with a subsequent strong spring progression, is developed to be very stiff with respect to torsion in twisting direction of the shift rod, wherein the damping body comprises a rectangular damping plate and a metal plate that shrouds the damping plate.

4,872,362

DRIVING MECHANISM AND MANIPULATOR COMPRISING SUCH A DRIVING MECHANISM

Nicolaas R. Kemper; Henricus J. J. Bouwens; Marinus P. Koster, all of Eindhoven, and Willem L. G. De Peuter, Oegstgeest, all of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 136,582, Dec. 22, 1987, abandoned.

This application Mar. 22, 1989, Ser. No. 327,412

Claims priority, application Netherlands, May 18, 1987, 8701183

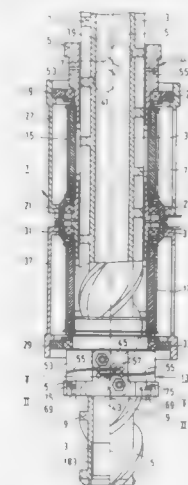
Int. Cl.⁴ F16H 25/24, 55/24; B25J 17/00

U.S. Cl. 74—479

38 Claims

1. A driving mechanism, comprising:
 - a spindle defining a spindle axis, said spindle comprising a first threaded portion having multiple helical threads with a lefthand sense and a second threaded portion having multiple helical threads with a righthand sense, said first and second threaded portions occupying separate axial lengths of said spindle, the threads of said first threaded portion having a first thread pitch and the threads of said second threaded portion having a second thread pitch,

and each thread of said multiple threaded portions having opposing sidewalls;
first and second spindle guides for guiding said spindle for rotation about said spindle axis and translation along said spindle axis, each spindle guide comprising
a sleeve sized for receiving a respective threaded portion with a clearance fit, and
three pairs of rollers arranged on said sleeve for centering and supporting a respective spindle threaded portion within said sleeve, the rollers of each roller pair being spaced from each other and oriented with respect to the spindle axis for guiding a corresponding thread between the rollers of the roller pair and along a helical path relative to said sleeve as defined by the thread pitch of said corresponding thread, and said rollers being rotatably mounted in said sleeve for providing rolling contact with the respective thread sidewalls,
said spindle being inserted into said guides with said first threaded portion engaging said first spindle guide and said



second threaded portion engaging said second spindle guide; and
means for rotatably supporting said spindle guides at a fixed axial distance relative to each other such that each spindle guide guides a respective threaded portion, whereby for rotation of said spindle guides in the same direction as each other, with the rate of rotation of said first spindle guide relative to said second spindle guide equal to the ratio of said first thread pitch to said second thread pitch, said spindle being rotated without axial translation of said spindle,
for rotation of said spindle guides in the opposite direction of each other, with the rate of rotation of said first spindle guide relative to second spindle guide equal to the ratio of said first thread pitch to said second thread pitch, said spindle being translated along said spindle axis without rotation, and
for other combinations of rotation of said spindle guides, said spindle being translated along said spindle axis and being rotated about said spindle axis.

4,872,363

ELECTRIC POSITIONING APPARATUS

Doy Rosenthal, Rishon Le Zion St. 23, Netanya, Israel 42275

Filed Jan. 16, 1987, Ser. No. 4,098

Claims priority, application Israel, Jan. 20, 1986, 77654

Int. Cl.⁴ G05G 11/00; B25J 17/00

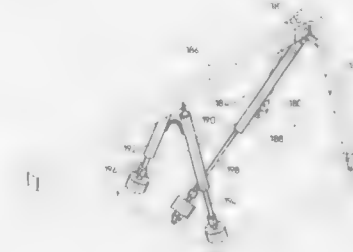
U.S. Cl. 74—479

2 Claims

1. Positioning apparatus comprising:

a base,
a non-elongatable first element pivotably mounted onto said

base for pivotable positioning relative thereto about a first pivot axis only;
a second element pivotably mounted onto said first element for pivotable positioning relative thereto about two pivot axes one substantially parallel to and one substantially perpendicular to said first pivot axis;
first axially elongatable means mounted pivotably onto said base and pivotably connected to one of said first and second pivotable elements for selectable positioning of said first element about said first pivot axis said first axially elongatable means lying at an angle to a first plane extending through said first element and through said first pivot axis; and



second axially elongatable means mounted pivotably onto said base and said second element at a distance from its pivoting connection with said first element for selectable positioning of said second element with respect to said pivot axis substantially perpendicular to said first pivot axis said second axially elongatable means comprising two axially elongatable elements arranged in a plane generally parallel to said first plane and having elongation axes which are angled with respect to each other and converging towards each other from said base to said second element.

4,872,364

STEERING WHEEL

Koichi Kaga; Akio Hosoi, both of Aichi, and Takao Yamaguchi, Nagoya, all of Japan, assignors to Toyota Gosei Co., Ltd., Nishikasugai, Japan

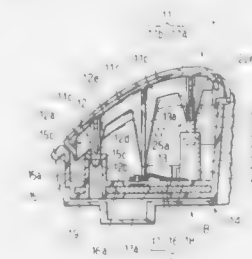
Filed Sep. 20, 1988, Ser. No. 246,640

Claims priority, application Japan, Oct. 27, 1987, 62-164326[U]; Oct. 31, 1987, 62-167169[U]; Oct. 31, 1987, 62-167170[U]

Int. Cl.⁴ B62D 1/04; H01H 9/02

U.S. Cl. 74—484 H

4 Claims



1. A steering wheel comprising
 - a steering wheel body,
 - a horn pad disposed and held above a boss section of said steering wheel body,
 - a plurality of hook legs provided on the back side of said horn pad,
 - a plurality of latch portions provided on said steering wheel body correspondingly to said hook legs,

an urging means disposed between said horn pad and said steering wheel body for urging said horn pad upward, a horn switch unit disposed between said horn pad and said steering wheel body for actuating a horn when said horn pad is depressed, a control portion arranged in a rear section of said horn pad when said horn pad depressed, and a center-of-pivot portion laterally provided in a front section of said horn pad which acts as the center of pivot when said horn pad is depressed.

4,872,365

REMOTE ACTUATOR FOR TRIP VALVE

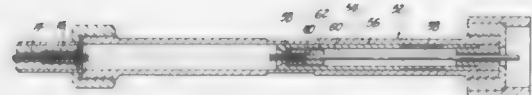
Jeffrey Wolf, Hatboro, Pa., assignor to Teleflex Incorporated, Limerick, Pa.

Filed Jun. 7, 1988, Ser. No. 203,268

Int. Cl.⁴ F16K 31/46; F16L 1/10

U.S. Cl. 74—501.6

15 Claims



1. A motion transmitting remote control assembly (10) of the type for transmitting forces in a curved path by a flexible motion transmitting core element (14), said assembly (10) comprising:

- a conduit (12);
- a first flexible motion transmitting core element (14) moveably supported by said conduit (12), said first core element (14) having a first slug (58) disposed on the end thereof; actuator means (18) adapted for attachment to said first core element (14) and for imparting movement thereto;
- valve trip means remote from said actuator means (18) for actuating a valve (36) and including a second core element (38) having a second slug (62) disposed on the end (40) thereof;
- said assembly (10) characterized by lost motion connection means (52) including a housing (54) secured to said conduit (12) and a sleeve (56) slideably disposed in said housing (54), said first (58) and said second (62) slugs slideably engaging and supported by said sleeve (56) for establishing a first lost motion connection between said first core element (14) and said sleeve (56) and for establishing a second lost motion connection between said second core element (38) and said sleeve (56) said sleeve (56) having front and back walls for retaining said first (58) and second

(62) slugs within said sleeve (56) so that said first slug (58) is moveable relative to said sleeve (56) and abuts said front wall of said sleeve (56) to move said sleeve (56) through a predetermined length in response to a force from said actuator means (18) without imparting movement to said second slug (62) and said second slug (62) is moveable relative to said sleeve (56) and abuts said back wall of said sleeve (56) to move after said sleeve (56) has moved through said predetermined length.

4,872,366

HOOD RELEASE ASSEMBLY WITH INTEGRAL SNAP IN RETENTION AT INSTRUMENT PANEL

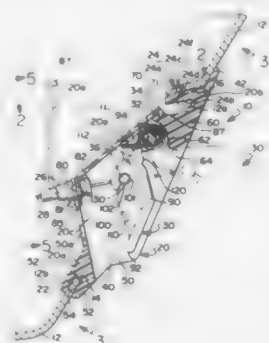
John M. Appleby, Warren; James Bolsworth, Sterling Heights, and Charles M. Wilson, Westland, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 29, 1988, Ser. No. 237,480

Int. Cl.⁴ F16C 1/10; E05B 3/00

U.S. Cl. 74—501.6

5 Claims



1. In combination, a passenger compartment panel for an automotive vehicle, such as an instrument panel, having an opening therethrough whose periphery is defined by upper, lower and side edge portions of said panel, a hood release cable which is adapted to be connected with a hood release latch assembly and a hood release assembly disposed within said opening and attached to said panel, said hood release assembly comprising a one piece housing having upper and lower end portions, side wall portions and a rear wall portion which together define a recess open toward the passenger compartment, said upper end portion including a flange for engaging said panel when attached thereto, a manually manipulatable hood release lever disposed within said recess of said housing and operatively connected with one end of said cable at its end remote from the hood latch assembly, pivot means for pivotally supporting said release lever in said housing for movement about an axis between a first position in which the release member is disposed within said recess and the cable is relaxed and a second position in which the cable is pulled inwardly toward the passenger compartment, and spring means for biasing said hood release lever toward its first position, the improvement being that said lower end portion of said housing has a slot therein for slidably receiving said lower edge portion of said panel and that said upper end portion of said housing has an integrally formed, cantilever snap fastener which extends in a rearward direction away from the passenger compartment and which snap fittingly engages said upper edge portion of said panel when attached thereto, said fastener having a deflectable shank integral with said upper end portion of said housing and a barb integral with said shank at its end remote from said upper end portion of said housing, said hood release assembly being attachable to said panel by sliding said lower end portion of said housing over said lower edge portion of said panel and then moving said upper end portion of said housing toward said panel and with said barb engaging said upper edge portion of said panel to cause said fastener to be

deflected away from its normal free state position until said bar clears said upper edge portion whereupon said fastener returns toward its normal free state position to lock behind said upper edge portion and with the flange on said upper end portion of said housing engaging said panel at its side facing the passenger compartment whereby said hood release assembly is attached to said panel without any need for separate fasteners, said pivot means comprising aligned integral pivot pin ends extending laterally from opposite sides of said release lever, said side wall portions of said housing having aligned openings therein, said pivot pin ends being snap fittingly connected to said side wall portions by being forced into said housing until the pivot pin ends are received without said openings in said side wall portions, and said rear wall portion of said housing comprises a cover integrally hinged to said bottom portion of said housing via a living hinge means, said living hinge means biasing said cover to an open position to permit access from the rear of said housing to said recess, said cover being movable to a closed position in opposition to the biasing force of said living hinge means in which it overlies said side portions of said housing and cooperable detent means on said cover and said upper portion of said housing for snap fittingly retaining said cover in its closed position, said cover being movable to its open position in response to undetenting said detent means.

4,872,367

LOST MOTION END FITTING

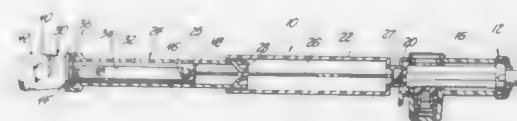
Arthur L. Spease, Bloomfield Hills, Mich., assignor to Teleflex Incorporated, Limerick, Pa.

Filed Jun. 17, 1988, Ser. No. 208,147

Int. Cl.⁴ F16C 1/10

U.S. Cl. 74—502.6

12 Claims



1. A motion transmitting remote control assembly (10,110) of the type for transmitting forces along a curved path by a motion transmitting core element (26,126), said assembly (10,110) comprising: conduit means (12,112); a tubular member (22,122) extending from said conduit means; telescoping means (24,124) comprising a tubular telescoping member (25,125) and a coupling member (25,125) slideably supported by said tubular member (22,122) and extending longitudinally outwardly therefrom in the direction of said coupling member (30,130) for relative telescoping movement between said telescoping means (24,124) and said tubular member (22,122) along predetermined overlapping length therebetween; a moveable core element (26,126) slideably disposed in said conduit means (12,112) and extending through said tubular member (22,122) and into said telescoping means (24,124); said assembly (10,110) characterized by lost motion connection means disposed within said telescoping means (24,124) and connecting said core element (26,126) with said telescoping means (24,124) for allowing relative longitudinal movement between said core element (26,126) and said telescoping means (24,124) along said predetermined overlapping length while simultaneously allowing for telescoping movement of said telescoping means (24,124) into and out of said tubular member (22,122) along said predetermined length.

4,872,368

PUSH-TO-RELEASE CABLE OPERATING APPARATUS

Curtis H. Porter, Moberly, Mo., assignor to Orscheln Co., Moberly, Mo.

Filed Jul. 28, 1988, Ser. No. 225,287

Int. Cl.⁴ G05G 5/06

U.S. Cl. 74—542

11 Claims



1. Cable operating means, comprising:
 - (a) a mounting bracket member (2);
 - (b) an operating lever member (4) adapted for connection with one end of a cable, said operating lever being pivotally connected with said mounting bracket for pivotal movement between cable-released and cable-tensioning positions relative thereto;
 - (c) pawl and ratchet means for maintaining said operating lever in said cable-tensioning position, including:
 - (1) a ratchet (12) connected with said operating lever member, said ratchet including a plurality of ratchet teeth;
 - (2) a bifurcated pawl (22) having a pair of pawl tips (22a, 22b);
 - (3) means including a pivot pin (24) mounted on said mounting bracket member connecting said pawl for pivotal movement relative to said bracket member between first (FIG. 2) and second (FIG. 6) enmeshed positions in which said pawl tips are in enmeshing engagement with said ratchet teeth, respectively; and
 - (4) means connecting said pawl for lateral displacement between first (FIG. 2) and second (FIG. 5) end positions relative to said pivot pin, said connecting means including a slot (26) contained in said pawl for receiving said pivot pin;
 - (d) overcenter spring means including a toggle spring (36) connected between said mounting bracket member and said pawl, said overcenter spring means being alternately operable when said pawl is in said end positions for pivotally biasing said pawl in opposite directions relative to said pivot pin toward said first and second enmeshed positions, respectively, said spring means normally having a first (FIG. 2) overcenter condition pivotally biasing said pawl in said first direction when said operating lever is in the cable-released position and the pawl is in said first end position, thereby to effect enmeshing engagement between said first pawl tip and said ratchet; and
 - (e) cam means (22d, 38) operable solely when said pawl is in said first end and first enmeshed positions and when said operating lever is initially pivoted in the cable-tensioning direction for releasing said first pawl tip from said ratchet and for laterally displacing said pawl toward its second end position (FIG. 5), whereby said overcenter spring means is operated to a second overcenter condition (FIG. 4) to pivotally bias the pawl in the other direction toward its second enmeshed position;
 - (f) said pawl, upon release of said operating lever in the cable-tensioning position and with said pawl in said sec-

ond end and second enmeshed positions being laterally displaced (FIG. 6) toward said first end position, thereby returning said spring means to said first overcenter condition;

(g) said pawl, when in said first end position and in said second enmeshing position (FIG. 6) upon the application of torque to said pawl in said first direction, being pivoted by said spring means directly to said first enmeshing position completely independent of said cam means.

4,872,369

TORSIONAL VIBRATION DAMPER HAVING A ROLL SPUN HOUSING AND OTHER IMPROVEMENTS

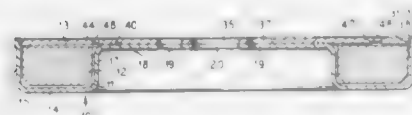
Thomas J. Critton, East Amherst, N.Y.; Donald S. Johnson, Fort Erie, Canada; Walter P. Pukalo, Bissell, N.Y., and Ralph Yorlo, Easton, Pa., assignors to Vibratex, Inc., Buffalo, N.Y.

Filed Aug. 3, 1987, Ser. No. 81,003

Int. Cl.⁴ F16F 15/10

U.S. Cl. 74—574

12 Claims



5. In a viscous torsional vibration damper of the kind operating on the shear film principle and having an annular channel shaped housing providing an annular working chamber within which is mounted an annular complementary inertia mass ring and a viscous damping fluid substantially filling shear film spaces between working surfaces of the inertia ring and confronting working surfaces of the housing within said chamber; said housing comprising a roll spun generally channel shaped annular shell having an axially facing base wall and spaced axially extending radially inner and radially outer walls and which walls provide said housing working surfaces; annular radius corners joining said walls; and said housing working surfaces having a spinning roll work hardened burnished finish.

4,872,370

PISTON ROD ASSEMBLY INCLUDING PRELOADED PISTON HEAD AND COMPOSITE ROD

Terry L. Benton, and John H. Matthews, both of Portage, Mich., assignors to Pneumo Abex Corporation, Boston, Mass.

Filed Apr. 6, 1987, Ser. No. 34,841

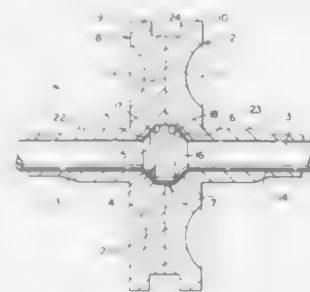
Int. Cl.⁴ G05G 1/00; F16J 1/00

U.S. Cl. 74—579 E

14 Claims

1. A piston rod assembly comprising a piston rod made of fibrous composite material and a metallic piston head, said

piston rod having an entrapment ridge intermediate the length thereof, said piston head including two separate sections, and



means for maintaining said piston head sections in preloaded engagement against opposite sides of said entrapment ridge.

4,872,371

AUTOMOTIVE TRANSMISSIONS

Thomas G. Fellows, 1 Greenbrook Avenue, Hadley Wood, Barnet, Hertfordshire EN4 OLS, England

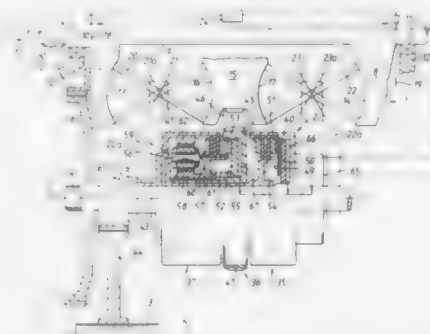
Filed Dec. 9, 1987, Ser. No. 130,530

Claims priority, application United Kingdom, Dec. 11, 1986, 8624673

Int. Cl.⁴ F16H 15/00, 37/06

U.S. Cl. 74—690

10 Claims



1. A transmission of continuously-variable-ratio type including a variator, presenting an axis of operation and having an input and an output;

a gearing unit, having components including not more than a single epicyclic combination comprising a sun member a planet carrier and an annulus, said gearing unit also presenting an axis of operation and having first and second inputs and output all coaxial with said axis of operation; a final drive shaft, presenting an axis of operation and connected to said output of said gearing unit; said variator output and input being connectable with said first and second inputs of said gearing unit respectively; said variator also presenting first and second radial planes, relative to said axis of operation of said variator and marking the axial extremities of said variator; in which said gearing unit is capable of alternative settings whereby said transmission may operate in two different regimes in at least one of which a geared neutral condition is achieved in which said final drive shaft is at rest but said components of said gearing unit are under drive, in which said axes of operation of said variator and said gearing unit are displaced from but parallel to each other, and in which the entire said gearing unit lies between said first and second radial planes.

4,872,372

CONTROLLER FOR LOCKABLE DIFFERENTIAL TRANSMISSION

Manfred Bantle, Vaihingen/Enz; Volker Munz, Ludwigsburg; Bernd Zackl, Frielzheim; Matthias Dietz, Bietigheim-Bissingen, and Eberhard Armbrust, Renningen, all of Fed. Rep. of Germany, assignors to Dr. Ing. H.C.F. Porsche AG, Weissach, Fed. Rep. of Germany

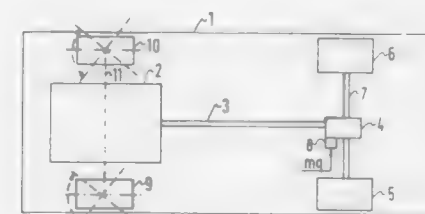
Filed Apr. 29, 1988, Ser. No. 188,214

Claims priority, application Fed. Rep. of Germany, Apr. 29, 1987, 3714332

Int. Cl.⁴ F16H 1/44

U.S. Cl. 74—710.5

17 Claims



1. An arrangement for the control of the power transmission onto at least one axle of a motor vehicle provided with a lockable differential means, comprising adjusting means for adjusting the locking acting of the lockable differential means, control means for activating by way of the adjusting means the differential means continuously controllable in its locking action in dependence on operating or driving parameters, a power output of an internal combustion engine serving as controlling operating parameter, and the control means acting upon the adjusting means with a first value of a first control magnitude corresponding to a higher locking value up to a power output value lying in a middle range of a power output band available from the internal combustion engine and above this power output value with a second value of a control magnitude corresponding to a lower locking value.

4,872,373

DIFFERENTIAL CONTROL DEVICE

Mitsuyuki Ouchi, and Koichi Aono, both of Susono, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Oct. 22, 1987, Ser. No. 111,264

Claims priority, application Japan, Oct. 24, 1986, 61-252060

Int. Cl.⁴ F16H 1/44

U.S. Cl. 74—711

14 Claims



1. A differential control device for controlling the differen-

tial of a differential gear having a limited slip differential, comprising:

detecting means for detecting drive torque; a controller for receiving the detected torque from said detecting means and comparing the size of the detected torque with a predetermined value; and operating means controlled by said controller to operate said limited slip differential for limiting the differential when the detected torque exceeds the predetermined value, wherein said controller determines running conditions of a vehicle, compares the size of the detected torque with the predetermined value when certain running conditions have been determined, and then controls the operating means to limit the differential when the detected torque exceeds the predetermined value.

4,872,374

PLANETARY TRANSMISSION APPARATUS HAVING A FOUR ELEMENT TORQUE CONVERTER

Edward G. Trachman, Birmingham; Shan Shih, Troy, and John Arzoian, Dearborn, all of Mich., assignors to Rockwell International Corporation, Pittsburgh, Pa.

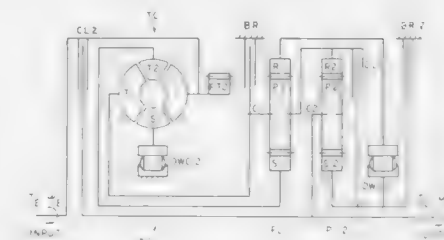
Filed Jul. 3, 1985, Ser. No. 751,401

The portion of the term of this patent subsequent to Oct. 10, 2006, has been disclaimed.

Int. Cl.⁴ F16H 47/06

U.S. Cl. 74—731

11 Claims



1. An automatic transmission apparatus comprising an input shaft, an output shaft, a four element torque converter having an impeller connected to the input shaft, a primary turbine, a secondary turbine, and a stator arranged in fluid flow sequence in which the impeller delivers fluid to the secondary turbine and to the primary turbine and in which the fluid returns from the turbines via the stator to the impeller, first and second planetary gear sets, the first gear set having a first planet gear carrier connected to the primary turbine for turning with the primary turbine and having a first sun gear connected to the secondary turbine for turning with the secondary turbine and having a first ring gear, a one-way clutch connected to the first ring gear, the second planetary gear set having a second ring gear connected to the first planet carrier, a second planet carrier connected to the output shaft, a second sun gear connected to the one-way clutch, a first clutch connected to the second sun gear and to the second ring gear, a first brake connected to the primary turbine, a second brake connected to the one-way clutch and to the second sun gear, and a second clutch connected to the input shaft and to the output shaft.

4,872,375
CONTROL METHOD FOR PLANETARY
TRANSMISSION HAVING FOUR ELEMENT TORQUE
CONVERTER

Edward G. Trachman, Birmingham; Shan Shih, Troy, and John Arzican, Dearborn, all of Mich., assignors to Rockwell International Corporation, Pittsburgh, Pa.

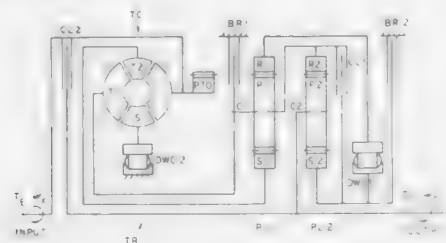
Filed Jul. 3, 1985, Ser. No. 751,402

The portion of the term of this patent subsequent to Oct. 10, 2006, has been disclaimed.

Int. Cl.⁴ F16H 47/06

U.S. Cl. 74-731

15 Claims



1. The method of controlling a transmission apparatus having an input shaft connected to an impeller which directs fluid against primary and secondary turbines and which receives return fluid from the stator and which has a first planetary gear set connected to the primary and secondary turbines and a second planetary gear set connected to the first planetary gear set and to an output shaft, comprising braking a one-way clutch connected to a gear in the first planetary gear set and braking a gear in the second planetary gear set and adding power from the primary and secondary turbines in the first planetary gear set to provide a low forward condition.

4,872,376
TRANSMISSION FOR A VEHICLE HAVING IMPROVED
PERFORMANCE FOR SHIFTING BETWEEN SPEED
STAGES

Toshiyuki Asada, Susono; Fumihiro Ushijima, Okazaki, and Yasuhiko Higashiyama, Susono, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

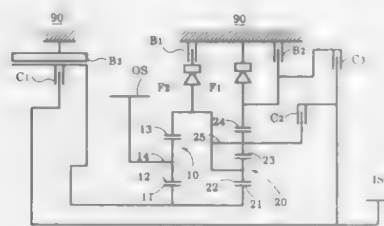
Filed Jun. 2, 1988, Ser. No. 201,454

Claims priority, application Japan, Jun. 4, 1987, 62-140660; Jul. 23, 1987, 62-184425; Aug. 3, 1987, 62-194148; Aug. 3, 1987, 62-194149

Int. Cl.⁴ F16H 57/10, 3/70

U.S. Cl. 74-765

4 Claims



1. A transmission for a vehicle, comprising:
 a housing;
 a rotational input member;
 a rotational output member;
 a single pinion type planetary gear mechanism including a sun gear, a ring gear, a set of planetary pinions and a carrier;
 a double pinion type planetary gear mechanism including a sun gear, a ring gear, an inner set of planetary pinions, an outer set of planetary pinions and a carrier, and arranged

in a coaxial relation with said single pinion type planetary gear mechanism;

a first, a second and a third clutch;

a first, a second and a third brake; and

a first and a second one way clutch adapted to be engaged only when normally rotationally loaded in normal rotational direction;

said first clutch selectively connecting said input member with said sun gear of said single pinion type planetary gear mechanism and said sun gear of said double pinion type planetary gear mechanism to rotate together around a common central axis thereof, wherein said sun gear of said single pinion type planetary gear mechanism and said sun gear of said double pinion type planetary gear mechanism are connected with one another to rotate together around said common central axis thereof;

said second clutch selectively connecting said input member with said ring gear of said single pinion type planetary gear mechanism and said carrier of said double pinion type planetary gear mechanism to rotate together around a common central axis thereof, wherein said ring gear of said single pinion type planetary gear mechanism and said carrier of said double pinion type planetary gear mechanism are connected with one another to rotate together around said common central axis thereof;

said third clutch selectively connecting said input member with said ring gear of said double pinion type planetary gear mechanism to rotate together around a common central axis thereof;

said first brake and said second one way clutch, when normally rotationally loaded, in series, selectively braking said ring gear of said single pinion type planetary gear mechanism and said carrier of said double pinion type planetary gear mechanism relative to said housing;

said second brake and said first one way clutch, when normally rotationally loaded, in parallel, selectively braking said ring gear of said double pinion type planetary gear mechanism relative to said housing;

said third brake selectively braking said sun gear of said single pinion type planetary gear mechanism and said sun gear of said double pinion type planetary gear mechanism relative to said housing;

said output member being connected with said carrier of said single pinion type planetary gear mechanism to rotate together around a common central axis thereof.

4,872,377
TRANSMISSION RATIO CONTROL SYSTEM FOR A
CONTINUOUSLY VARIABLE TRANSMISSION

Susumu Nakamura, Tokyo, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

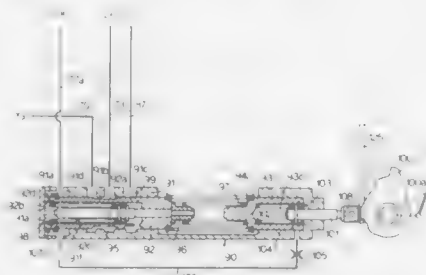
Filed Apr. 25, 1988, Ser. No. 185,431

Claims priority, application Japan, Apr. 30, 1987, 62-107267

Int. Cl.⁴ B60K 41/12

U.S. Cl. 74-867

3 Claims



1. An improved control system for a continuously variable transmission for transmitting the power of an automotive engine to driving wheels of a vehicle, the system comprising a drive pulley having a hydraulically shiftable disc and a hydrau-

lic cylinder for operating the disc, a driven pulley having a hydraulically shiftable disc and a hydraulic cylinder for operating the disc, a belt engaged with both pulleys, a hydraulic circuit having a pump for supplying oil to both the hydraulic cylinders and a drain passage for draining oil in the hydraulic cylinder of the drive pulley, a transmission ratio control valve having a plunger slidably mounted in a valve body, a spool for controlling the oil supplied to the cylinder of the drive pulley and the oil drained from the cylinder to change the transmission ratio, at least one spring provided between the plunger, and the spool, a cam operatively connected with an accelerator pedal of the vehicle, for shifting the plunger of the transmission ratio control valve in accordance with depression of the accelerator pedal, pitot pressure apply means for applying pitot pressure dependent on engine speed to the spool to compress the spring,

wherein the improvement comprises:

stopping means for stopping the cam at a predetermined angular position thereof;

yieldable means provided in a connecting member disposed between the cam and the accelerator pedal for allowing further depression of the accelerator pedal after the stop of the cam;

said stopping means including means for progressively displacing the stopping means as the transmission is upshifted so that the cam is further rotated to compress the spring.

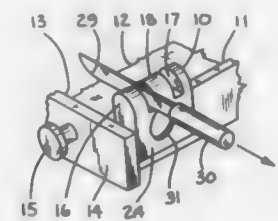
4,872,378
HOLDER FOR KNIFE SHARPENER OR THE LIKE
 Robert A. Wrench, 8542 72nd Ave., N.W., Seattle, Wash. 98117

Filed Mar. 22, 1988, Ser. No. 173,561

Int. Cl.⁴ A01D 3/00; B24B 3/36

U.S. Cl. 76-86

2 Claims



1. Apparatus holder for use on a drawer having a side and a front, said front having an inside surface, said holder comprising a body having a top, bottom and a first side, said bottom of said body being slotted to fit over said side of said drawer with said first side of said body against said inside surface, whereby said top is accessible and include means for holding sharpening apparatus.

4,872,379
ROCKBIT ARM MACHINING FIXTURE AND METHOD
 Eddie L. Eiland, Red Oak, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Jan. 5, 1987, Ser. No. 485

Int. Cl.⁴ B23B 33/00

U.S. Cl. 82-165

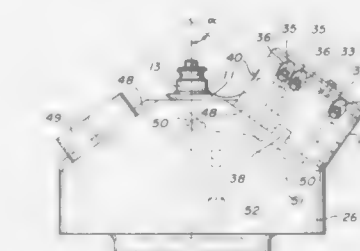
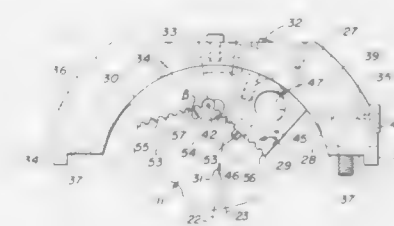
14 Claims

1. A fixture for holding a rockbit arm forging during the machining operations which result in pin angle, ball race height twist angle, offset and pin turn radius, the fixture comprising:

a cap having an interior arcuate surface adapted to rotatably receive a removable vee block;

a removable vee block, having an exterior arcuate surface, first and second interior surfaces, an apex axis correspond-

ing to a predetermined pin angle, the vee block adapted to removably receive a locator; and



a removable locator having a pin, the pin defining a pin turn radius.

4,872,380
WORKPIECE POSITIONER FOR CHUCK AND CENTER
MACHINING

Franz Holy, Stockerau, and Walter List, Enns, both of Austria, assignors to Maschininfabrik Heid Aktiengesellschaft, Stockerau, Austria

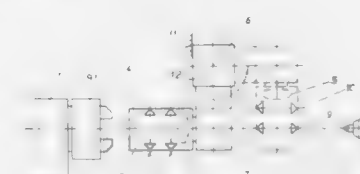
Filed Feb. 18, 1988, Ser. No. 157,849

Claims priority, application Austria, Feb. 18, 1987, 352/87

Int. Cl.⁴ B23B 13/00

U.S. Cl. 82-124

6 Claims



a base adjacent the lathe and defining an upright base axis offset from the lathe axis;
 a gripper support pivotal on the base about the base axis and defining a horizontal support axis;
 a positioner head pivotal on the support about the support axis;
 a pair of grippers each including a respective pair of gripper chuck jaws displaceable on the head transversely of the support axis; and
 control means connected to the base, support, head, and grippers for:
 during chuck machining, holding the support axis generally perpendicular to the lathe axis and pivoting the gripper about the support axis for loading a workpiece into and taking a workpiece out of the chuck jaws; and
 during center machining, holding the support axis generally parallel to the lathe axis and pivoting the gripper about the support axis for loading a workpiece into and taking a workpiece out of the lathe, each gripper including
 a pair of jaws movable parallel to each other in a plane; respective double-acting cylinders adjacent the jaws; link means coupling each jaw to the respective cylinder for joint movement therewith; and
 a synchronizing gear meshing with both cylinders for joint and opposite movement of same, said head including a cylinder plate provided with the cylinders, a jaw plate provided with guides for the jaws, and means releasably linking the plates together.

4,872,381

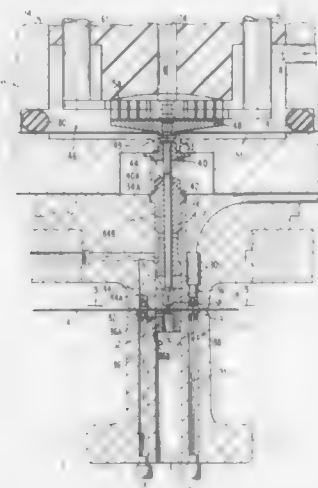
PROGRAMMABLE MAGNETIC REPULSION PUNCHING APPARATUS

Karl F. Stroms, Wappingers Falls, N.Y., assignor to International Business Machines Corp., Armonk, N.Y.
 Filed Jul. 13, 1988, Ser. No. 218,186

Int. Cl. B26D 7/18

U.S. Cl. 83—76.1

14 Claims



1. A punch apparatus for punching hole patterns in thin sheet material comprising:
 a housing having a liquid-cooled cavity therein, said cavity containing a liquid cooling medium;
 a coil mounted in said liquid-cooled cavity and immersed in said liquid medium;
 a driver disk made of a highly conductive material mounted in said liquid-cooled cavity and immersed in said liquid medium, said driver disk mounted adjacent to said coil;
 a driver button located outside of said liquid-cooled cavity but in communication with said driver disk;
 a punch element for perforating thin sheet material, said punch element aligned with said driver button;
 a means for energizing said coil with a pulse of electrical

energy for generating flux linking said driver disk and said coil to repel said driver disk from said coil, thereby translating said driver button and said punch element, causing said punch element to perforate a thin sheet of material.

4,872,382

APPARATUS FOR ADJUSTING KNIVES FOR A POUCH FORM, FILL, SEAL MACHINE

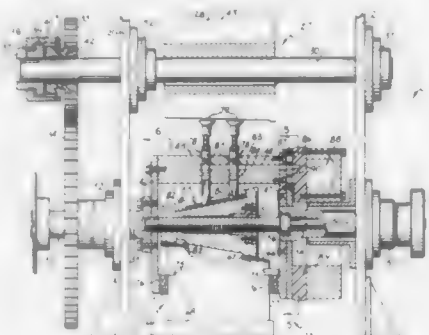
Harold T. Benner, Jr., Wyoming, Ohio, and Paul E. Dieterlen, Covington, Ky., assignors to R. A. Jones & Co. Inc., Covington, Ky.

Filed Apr. 18, 1988, Ser. No. 182,516

Int. Cl. B26D 7/06, 1/62; B65H 61/08

U.S. Cl. 83—152

6 Claims



4. An adjustable knife assembly for a web of filled pouches comprising,
 a cage having an axis of rotation,
 a screw mounted within said cage on said axis of rotation,
 a cone disposed within said cage and mounted on said screw for axial movement upon rotation of said screw, said cone having a conical surface,
 a plurality of axially-extending grooves uniformly spaced about the conical surface of said cone,
 a radially-extending knife blade slidably mounted in each of said grooves,
 means on said cage for supporting each said knife blade in a radial position and blocking axial movement while permitting radial movement,
 a plurality of radially-extending suction cup mounts each terminating in a suction cup, said suction cup mounts being uniformly spaced around the circumference of said cage between said knife blades,
 said cone having a plurality of axially-extending cup grooves on the conical surface of said cone, said cup mounts each having an inner end slidably-mounted in a respective cup groove,
 means on said cage for supporting each said cup mount for radial movement while blocking axial movement, whereby rotation of said screw causes said cone to move axially with respect to said cage, the axial movement of said cone causing radial movement of said knife blade and said suction cups.

4,872,383

APPARATUS FOR CUTTING TUBULAR KNITTED FABRIC

Katuhiko Niwa; Nobuyasu Abe; Katuji Kajikiyo; Tsutomu Suzuoki; Katumi Tabuti, and Yoshifumi Arai, all of Kyoto, Japan, assignors to Gunze Limited, Kyoto, Japan

Filed Jan. 5, 1989, Ser. No. 293,526

Claims priority, application Japan, Feb. 1, 1988, 63-22229

Int. Cl. B26D 7/14

U.S. Cl. 83—175

3 Claims

1. An apparatus for cutting a tubular knitted fabric wherein

the fabric is transported longitudinally thereof and then cut to the shape of a product by a press cutter, the apparatus being characterized in that the apparatus comprises:

- a movable frame reciprocatingly movable longitudinally of the tubular knitted fabric,
- a fixed press bed member spaced apart from the movable frame in the direction of transport of the fabric in series with the frame and provided for the press cutter,
- at least one pair of upper and lower fabric feed rollers mounted on the movable frame and stoppably drivable in the direction of transport of the fabric,
- a tenter core member reciprocatingly movable with the movable frame for tenting the fabric as fitted therearound, the tenter core member having at its one end a portion held by the feed rollers and the other end extending toward the press bed member, and



a fabric holding member for releasably pressing the fabric as tented by the tenter core member against the press bed member, the fabric holding member being provided on the fabric facing side thereof with a cutter blade for the press cutter and elastic pieces having a greater height than the cutter blade and elastically deformable for pressing the fabric against the press bed member before the cutter blade comes into contact with the fabric, the tenter core member being retractable with the fabric pressed against the press bed member by the elastic pieces, the cutter blade being movable in a cutting direction with the fabric pressed against the press bed member by the elastic pieces after the retraction of the tenter core member to cut the fabric by the cooperation of the cutter blade and the press bed member.

4,872,384

TUBE CUTTING APPARATUS

John J. Borzym, 4820 School Bell La., Birmingham, Mich.

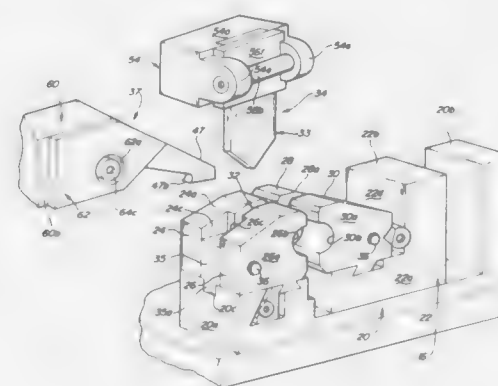
MUM

Filed Jan. 29, 1988, Ser. No. 149,837

Int. Cl. B23D 21/00

U.S. Cl. 83—454

17 Claims



1. A tube cutting apparatus comprising:
 clamping means operative to clamp tubular stock;
 a blade holder;
 a blade;
 a wedge member movable between a locked position in which said blade is locked to said blade holder and a

released position in which said blade is released from said blade holder; and
 a clamping plate carried by said blade holder and positioned at one side face thereof against said blade;
 said wedge member cammingly engaging the other side face of said clamping plate in response to movement of said wedge member to its locked position to clamp said blade upper portion between said blade holder and said clamping plate;
 said one side face of said clamping plate and said blade having complimentary inter-engaging teeth which augment the locking action of said wedge member and provide selective vertical adjustment of said blade in said blade holder.

4,872,385

AUTOMATIC RHYTHM PERFORMING APPARATUS WITH MODIFIABLE CORRESPONDENCE BETWEEN STORED RHYTHM PATTERNS AND PRODUCED INSTRUMENT TONES

Shigenori Oguri, and Kosei Terada, both of Hamamatsu, Japan, assignors to Yamaha Corporation, Hamamatsu, Japan

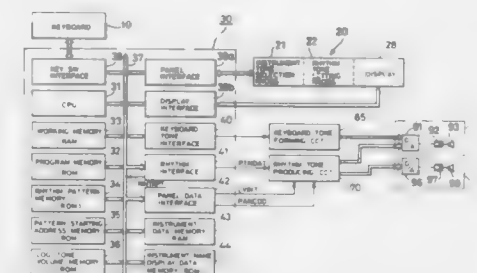
Filed Feb. 13, 1987, Ser. No. 14,706

Claims priority, application Japan, Feb. 14, 1986, 61-28919

Int. Cl. G10H 1/40

U.S. Cl. 84—635

4 Claims



1. An automatic rhythm performing apparatus, comprising:
 pattern memory means simultaneously storing a plurality of rhythm pattern data each of which indicates rhythm timings for tones of a corresponding rhythm instrument, each of said rhythm pattern data including a channel designation datum for a corresponding tone generation channel;
 rewritable data memory means storing channel alteration data for altering at least one of said channel designation data in said rhythm pattern data;
 pattern reading-out means for reading out rhythm pattern data from said pattern memory means;
 instrument tone producing means for producing rhythm instrument tones for respective tone generation channels which have been designated by said rhythm pattern data and said channel alteration data; and
 data inputting means for rewriting the channel alteration data stored in said rewritable data memory means to alter at least one of said channel designation data in said rhythm pattern data.

4,872,386

INTERCHANGEABLE PICK-UP FOR ELECTRIC GUITAR

Olivier Betticare, 82 Boulevard Davout, Paris, France (75020)

Filed Jun. 6, 1988, Ser. No. 202,935

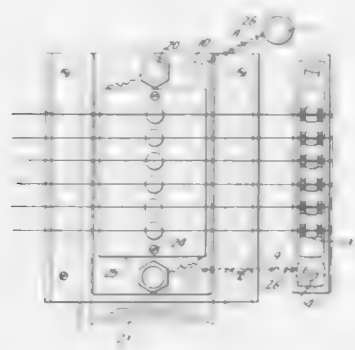
Int. Cl. G10H 3/18

U.S. Cl. 84—726

4 Claims

1. In a combination electric guitar body and interchangeable pick-up element therefor in which the pick-up element is placed in electrical communication with the string bridge of the guitar body upon engagement with said body, the improvement comprising: said guitar body defining a recess, pick-up

mounting means disposed in said recess, said mounting means defining a pair of opposed transversely extending grooves, said pick-up element having a plate having opposed longitudinal edges slidably engaged with said grooves; said pick-up mount-



ing means including conductive terminals, said pick-up element having corresponding terminals selectively engaging said conductive terminals upon engaging said pick-up element in predetermined position relative to said pick-up mounting means.

4,872,387

WIND-ACTUATED MUSICAL DEVICE

John Melia, P.O. Box 471, Woodstock, N.Y. 12498

Filed Apr. 25, 1988, Ser. No. 185,879

Int. Cl.⁴ G10F 1/06

U.S. Cl. 84—95.2

5 Claims



1. A wind-actuated musical device to be suspended between a suspension means, said musical device comprising:

- a mounting means;
- a rotatable member having a surface and being rotatably mounted on the mounting means, the rotatable member having an outer surface, pins being affixed in predetermined positions on the outer surface of the rotatable member;
- a sounding plate mounted on the mounting means and including a series of tines mounted adjacent to the rotatable member so as to be struck by the pins as the rotatable member rotates, the tines being adapted to make musical sounds when struck by the pins;
- a drive shaft rotatably mounted on the mounting means;
- means for connecting the drive shaft to the rotatable member to rotate the rotatable member;
- a wind-actuated impeller rigidly affixed to the drive shaft to rotate the drive shaft; and
- a support means, including a rod rotatably affixed to the mounting means with a ring at each end for connection to the suspension means.

4,872,388

STRING ANCHORING AND TRIMMING DEVICE

Dennis R. Gunn, Tashiro-so, 2-9-2, Kamiochiai Shinjuku-ku, Tokyo, Japan (161)

Filed Aug. 26, 1987, Ser. No. 89,505

Claims priority, application Japan, Feb. 12, 1986, 61-185115

Int. Cl.⁴ G10D 3/00

U.S. Cl. 84—297 R

26 Claims



1. A device for securing a filament onto a support member and trimming said filament which comprises:

- a stationary member which is non-movable relative to said support member;
- a movable member selectively movable, relative to said stationary member, to a filament securing position from which said movable member cannot be moved relative to said support member, by tension in said filament, in a direction which would cause said filament to become released therefrom;
- an actuator operable to selectively move said movable member relative to said stationary and support members; and
- a blade provided on one of said stationary and movable members for cutting said filament when said movable member is actuated toward said filament securing position.

4,872,389

DETACHABLE MOUTHPIECE ASSEMBLY

Lawrence Ramirez, Elkhorn, and Walter Whiteside, Kenosha, both of Wis., assignors to G. LeBlanc Corporation, Kenosha, Wis.

Filed Jan. 9, 1989, Ser. No. 294,871

Int. Cl.⁴ G10D 7/10

U.S. Cl. 84—387 R

9 Claims



1. A detachable mouthpiece assembly for releasably attaching a mouthpiece to a musical instrument comprising a mouthpiece having a reduced end portion, a receiving aperture for releasably receiving said reduced end portion, said detachable mouthpiece assembly comprising a substantially U-shaped saddle member connected to a predetermined portion of said musical instrument and a swivel screw having a head portion and a shaft, said head portion being pivotally attached to said saddle member, and a slotted arm member attached to a predetermined portion of said mouthpiece and engagable with said swivel screw and said saddle member when said reduced end

portion is releasably secured to said receiving aperture of said musical instrument, and a knob releasably engaging said shaft of said swivel screw and slotted arm member for securing said mouthpiece to said musical instrument.

4,872,390

INSERT BARREL WITH ADJUSTING DEVICE

Roland Bertiller, Schramberg; Roland Maier, Dunningen, and Harald Weisser, Oberndorf-Beffendorf, all of Fed. Rep. of Germany, assignors to Mauser-Werke Oberndorf GmbH, Fed. Rep. of Germany

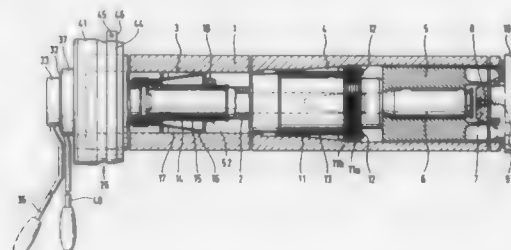
Filed Sep. 2, 1988, Ser. No. 241,021

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1987, 3729412

Int. Cl.⁴ F41F 17/06

U.S. Cl. 89—29

5 Claims



1. An insert barrel construction for a main gun barrel, comprising an insert barrel, bearing means rotatably supporting said insert barrel within the main gun barrel, said bearing means including inner and outer eccentric bushings, said inner eccentric bushing arranged within said outer eccentric bushing and being arranged around said insert barrel and supported in the main gun barrel, said inner bushing being rotatable relative to said outer bushing shifting said insert barrel within the main gun barrel, means for supporting said inner and outer eccentric bushings within the main gun barrel including a radially applied clamping bush positioned to engage an interior of the main gun barrel and an expansion bush arranged over said clamping bush and bearing against said clamping bush, said insert barrel having an external shoulder forming a collar, a pressure disk engaged over said insert barrel, a compensating bushing engaged over said insert barrel between said clamping bush and said collar and pin means engageable with said pressure disk for holding said pressure disk against rotation with respect to said insert barrel.

4,872,391

GUN FOR FIRING TELESCOPED AMMUNITION, PLUS SEARING MEANS

Eugene M. Stoner, Palm City, Fla., assignor to Area, Inc., Port Clinton, Ohio

Division of Ser. No. 58,627, Jun. 2, 1987, abandoned, which is a continuation of Ser. No. 773,585, Sep. 9, 1985, abandoned. This application Dec. 11, 1987, Ser. No. 131,832

Int. Cl.⁴ F41D 10/08

U.S. Cl. 89—155

15 Claims

1. A gun for firing cylindrically-shaped, telescoped ammunition, the gun comprising:

- (a) a receiver;
- (b) a gun barrel and means detachably connecting rearward end regions of the barrel to forward regions of the receiver;
- (c) a shell chamber having formed longitudinally there-through a cylindrical, shell-holding aperture sized to receive a cylindrical, telescoped shell and means mounting the shell chamber in the receiver rearwardly of the barrel for linear sliding movement in a direction orthogonal to a bore axis of the barrel between a shell-loading position in which the shell-holding aperture is out of axial

alignment with the bore through the barrel and a shell firing position in which the shell-holding aperture is axially aligned with the barrel bore;

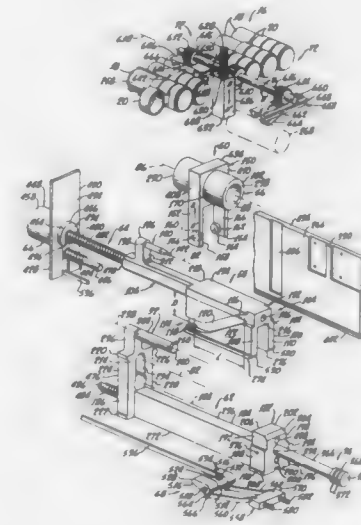
(d) a shell chamber carrier and means mounting the carrier in the receiver for axial sliding movement between a forwardmost, battery position and a rearwardmost position;

(e) means for interconnecting the chamber with the shell chamber carrier so as to cause the shell chamber to be in the shell loading position when the shell chamber carrier is in the rearwardmost position and to be in the shell firing position when the shell carrier is in the forwardmost, battery position;

said interconnecting means including means defining a cam track on the shell chamber carrier and including an interconnecting link, the interconnecting link being connected to the shell chamber and having a cam track follower engaging said cam track; and

said cam track being a generally "S"-shaped recess formed along the shell chamber carrier, and said cam track follower comprising a roller sized to roll along said cam track;

(f) means for causing movement of the shell chamber carrier between the forwardmost, battery position and the rearwardmost position;



(g) means for loading a shell into the shell-holding aperture when the shell chamber is in the shell loading position; said loading means including shell feeding means for moving a shell into a pickup position rearwardly of said shell loading position and further including shell rammer means for ramming shells forwardly from the pickup position into the shell-holding aperture when the shell chamber is in the shell loading position;

said shell rammer means including a rammer body having a forwardly extending shell rammer fixed thereto and including means mounting the shell rammer means in the receiver for axial sliding movement between a rearwardmost position in which the shell rammer is rearward of a shell in a said pickup position and a forwardmost, battery position in which the shell rammer is rearwardly adjacent the shell chamber when the shell chamber is in the shell loading position and further including means for causing movement of the shell rammer means between the rearwardmost and forwardmost, battery positions;

(h) means for causing firing of a shell held in the shell-holding aperture when the chamber is in the shell-firing position; and,

(i) sear means for searing up the shell chamber carrier and the rammer means when the shell chamber carrier and the

shell rammer means are in their rearwardmost positions and including means for releasing said searing means so as to release the shell rammer means and shell chamber carrier for forward movement thereof.

4,872,392

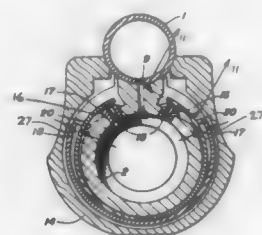
FIREARM GAS RELIEF MECHANISM

Thomas P. Powers, Herkimer, N.Y.; Earl E. Seppala, Hockessin, and James C. Young, Newark, both of Del., assignors to Remington Arms Company, Wilmington, Del.

Continuation-in-part of Ser. No. 106,659, Oct. 13, 1987, abandoned, which is a continuation-in-part of Ser. No. 833,591, Feb. 27, 1986, abandoned. This application Jan. 11, 1988, Ser. No. 142,574

Int. Cl.⁴ F41D 5/08
U.S. Cl. 89—193

6 Claims



1. In an automatic firearm having a barrel, a gas cylinder with an initial volume at one end, a piston at one end of the initial volume within the gas cylinder to actuate mechanism for replacing spent ammunition and cocking the firearm, and a bleed orifice connecting the barrel with the initial volume of the gas cylinder, the improvement which comprises at least one gas aperture connecting the initial volume of the gas cylinder with the atmosphere, a leaf spring positioned over the atmospheric side of the aperture to control the flow of gas therefrom, and a shaped geometric body interposed between the aperture and the leaf spring, the shaped geometric body being a body of revolution about a centerline aligned with the aperture, the body interacting with the spring and aperture to form a seal which is a circular line or ring, and wherein the spring is oriented to move in a direction perpendicular to the direction of recoil during the operation to control the flow of gas.

4,872,393

STEERING GEAR WITH RECIRCULATION CHECK VALVE

William T. Rabe, Lafayette, Ind., and Wendell L. Gilbert, Lebanon, Tenn., assignors to TRW Inc., Lyndhurst, Ohio
Filed Jul. 15, 1987, Ser. No. 73,711

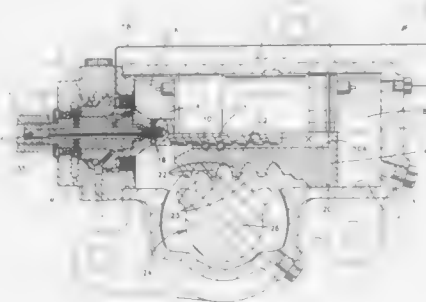
Int. Cl.⁴ F15B 9/10

U.S. Cl. 91—375 A

2 Claims

1. An apparatus comprising:
a fluid motor including a housing defining a chamber and a movable piston located in said chamber dividing said chamber into first and second chamber portions;
a rotatable input member;
a rotatable follow-up member associated with said piston, said follow-up member being rotatable in response to movement of said piston in said chamber;
valve means including a cylindrical valve core and a tubular valve sleeve, said valve core being located within said valve sleeve and rotatable relative to said valve sleeve, said valve core being connected with one of said input member and follow-up member and said valve sleeve being connected with the other of said follow-up member and input member, said valve means for controlling pressurized fluid flow to said first and second chamber portions

in response to relative rotation between said valve core and said valve sleeve;
conduit means providing fluid communication between said first and second chamber portions, said conduit means including a passage formed in said valve core and said valve sleeve; and



a recirculation check valve located in said passage and having a position in which fluid communication is blocked between said first and second chamber portions and a position in which fluid communication is permitted between said first and second chamber portions upon a loss of fluid pressure and upon rotation of said valve core relative to said valve sleeve.

4,872,394

BENT AXIS TYPE AXIAL PISTON PUMP OR MOTOR

Kazushige Nakagawa; Makoto Koh; Kyoji Sera; Tadashi Ozeki, all of Kyoto, and Masahiro Iwasaki, Shiga, all of Japan, assignors to Shimadzu Corporation, Japan

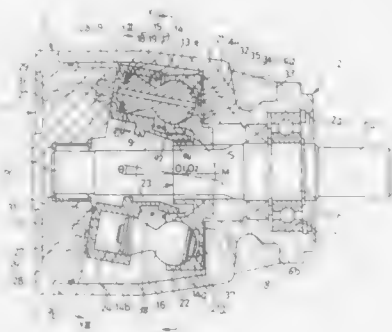
Continuation of Ser. No. 36,203, Apr. 7, 1987, abandoned, which is a continuation of Ser. No. 704,953, Feb. 25, 1985, abandoned.

This application Jan. 28, 1988, Ser. No. 149,896
Claims priority, application Japan, Feb. 29, 1984, 59-38960; Feb. 29, 1984, 59-38961; Mar. 30, 1984, 59-64691; Nov. 12, 1984, 59-234799

Int. Cl.⁴ F01B 13/04

U.S. Cl. 91—506

11 Claims



1. A bent axis type axial piston pump or motor comprising:
a casing having at least a pair of inlet-outlet ports;
a shaft rotatable about a first axis and having a portion thereof extending within said casing;
a torque plate mounted on said shaft portion for simultaneous rotation therewith about said first axis;
a cylinder block rotatable about a second axis and provided with a plurality of cylinder bores circumferentially arranged about said second axis, each of said cylinder bores having an axis parallel with said second axis and an opening facing an axial end surface of said torque plate;

passage means for communicating said inlet-outlet ports with said cylinder bores for transport of working fluid;
means for supporting said cylinder block so that said second axis intersects said first axis;
said shaft passing through said cylinder block without mutual mechanical interference therebetween;
means for rotatably supporting said shaft at the opposite sides of said cylinder block and said torque plate;
a plurality of pistons each slidably inserted into one of said cylinder bores so as to define a chamber therein and having an outer end projecting therefrom;
means for connecting the outer ends of said pistons to said torque plate so as to enable conversion of torque into hydraulic pressure, or vice versa; and
means for synchronizing the rotation of said torque plate and that of said cylinder block, said synchronizing means comprising:

a hollow cylindrical member disposed radially closer to said second axis than said cylinder bores and projecting from said cylinder block toward said torque plate and ending in a plug portion coaxial with said second axis, with said shaft passing through said cylindrical member;
and a socket portion of said torque plate, coaxial with said first axis and receptive of said plug portion, with said plug and socket portions being complementary in shape to enable connection so that they are simultaneously rotatable about said first and second axes and slidable relative to each other about an intersection of said first and second axes.

4,872,396

HYDRAULIC CYLINDER WITH LINER AND A RETAINER

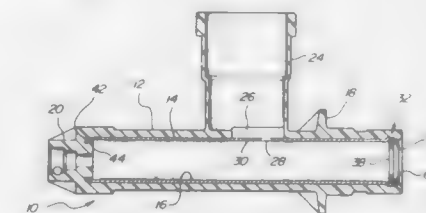
Maurice J. Wimbush, Whitnash, England, assignor to Automotive Products, plc, Warwickshire, United Kingdom
Filed Apr. 11, 1988, Ser. No. 180,248

Claims priority, application United Kingdom, Apr. 16, 1987, 8709190

Int. Cl.⁴ F01B 11/02

U.S. Cl. 92—169.1

25 Claims



1. A hydraulic cylinder comprising a housing in which a piston is slidably mounted and retention means molded into the housing to provide a surface engageable with a piston retainer member at a position radially inboard of an outer periphery of the retainer member, said surface being provided by shearing a portion of the retention means to provide at least one radially inward projection engageable with the retainer member, the housing and retention means being formed from dissimilar materials.

4,872,397

PERSONAL ENVIRONMENTAL MODULE

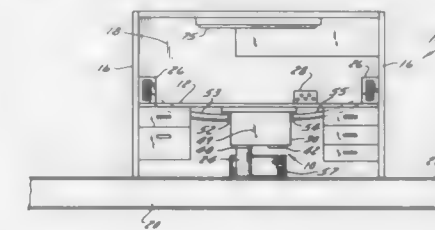
Michael G. Demeter, St. Francis; Paul E. Wichman, Brookfield; Linda S. Endres, and Charles E. Rohrer, both of Milwaukee, Wis., assignors to Johnson Service Company, Milwaukee, Wis.

Filed Nov. 28, 1988, Ser. No. 276,698

Int. Cl.⁴ F24F 7/06

U.S. Cl. 98—31.6

20 Claims



1. A personal environmental module for a work space, said module comprising:

a housing having a pair of air inlets and one or more air outlets positioned to discharge air into the work space, a controlled damper mounted in each of said air inlets, one of said air inlets being connected to a preconditioned air source and the other of said air inlets being connected to room air, means mounted in said housing for drawing air through each of said air inlets for discharge through said air outlet, and baffle means in said housing for mixing the preconditioned air and room air prior to discharge through said air outlet.

4,872,395

CROSSHEAD PER SE, AND IN COMBINATION WITH A CONNECTING ROD ASSEMBLY AND A PISTON ROD

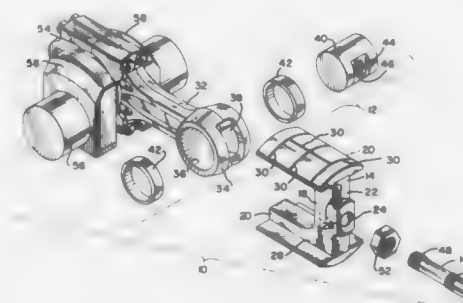
Robert A. Bennett, and Alan C. Anderson, both of Painted Post, N.Y., assignors to Dresser-Rand Company, Painted Post, N.Y.

Filed Nov. 23, 1987, Ser. No. 124,266

Int. Cl.⁴ F01B 9/00; F16J 15/18; F16H 21/22

U.S. Cl. 92—139

8 Claims



8. In combination, a connecting rod assembly, a crosshead, and a piston rod, comprising:

a crosshead body having only a single borehole formed therein and therethrough;
a connecting rod assembly; and
a piston rod in slidable penetration of said borehole and having an end fastened directly to said connecting rod assembly.

4,872,398

**AIR VENT THROAT OF INDOOR VENTILATING
DEVICE CAPABLE OF PREVENTING NOISE**
Hsin-Der Shen, 208, Min Shen West Rd., Taipei, Taiwan
Filed Sep. 14, 1988, Ser. No. 244,034
Int. Cl.⁴ F24F 11/02

U.S. Cl. 98—42.08

2 Claims



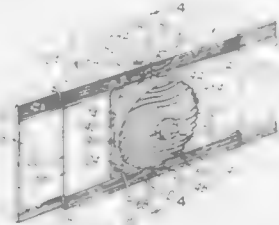
1. In an improved air vent throat of an indoor ventilating device capable of preventing noise comprising:
an outlet throat coupled between an air exhaust port of said device and a bent windpipe which comprises:
said outlet throat having an inclined hole corresponding to the position of said air exhaust port of indoor ventilating device;
a concave check valve pivotally installed on said outlet throat at the top of said inclined hole capable of making the air easily flow out of the device but impossible flow into the device when the indoor ventilating device stops running;
said check valve tightly closes said inclined hole as a whole via its own gravity;
said bent windpipe inwardly extended and gradually enlarged from an air inlet end connected to said outlet throat and then outwardly extended and gradually marging with an air outlet end through a bent portion of said bent windpipe so as to be an air flow connecting and shifting device to exhaust the air flow as a Laminar to avoid the noise derived from the air vibration;
said concave check valve inside said outlet throat includes a concave arched surface outwardly projected in the air flowing out of said bent windpipe and inwardly recessed in the direction of said indoor ventilating device.

4,872,399

CONVERTIBLE FAN ASSEMBLY
David B. Chaney, Powell, Ohio, assignor to The W. B. Marvin Manufacturing Company, Urbana, Ohio
Filed Aug. 15, 1988, Ser. No. 232,340
Int. Cl.⁴ F24F 7/013

U.S. Cl. 98—94.1

19 Claims



1. A fan assembly convertible between use in a window and use on a desk or floor comprising:
a one-piece support member having a top edge, a bottom edge spaced from said top edge, and two mutually-spaced outer side edges,
said support member comprising a first support panel, a

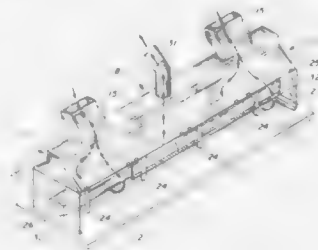
second support panel, and a pair of living hinges connecting said first and second panels to one another along a pivot axis extending perpendicularly to said top and bottom edges and parallel to and intermediate said outer side edges of said support member; and
a fan stationarily mounted on said first support panel;
one of said living hinges extending from said fan to said upper edge of said support member and the other of said living hinges extending along said pivot axis from said fan to said lower edge of said support member, said living hinges being constructed so that said first and second support panels of said support member may be pivoted about said pivot axis to a substantially flat orientation with respect to each other for use in a window or may optionally be pivoted about said pivot axis to a folded orientation with respect to each other for use on a desk or floor with both said outer side edges adapted to rest on a desk top or floor.

4,872,400

**LABORATORY WORK STATION WITH
CONTROLLABLE ENVIRONMENT**
Carlton E. Brown, and Pierre C. de Pagter, both of Tucson, Ariz., assignors to Air Concepts, Inc., Tucson, Ariz.
Filed Dec. 12, 1988, Ser. No. 282,620
Int. Cl.⁴ B08B 15/02

U.S. Cl. 98—115.3

6 Claims



1. A laboratory work station having a controllable environment and adapted for installation in combination with a laboratory work bench, said work station comprising: a hood assembly having a housing; a plurality of air supply ducts, an ingress air channel for receiving air from said supply ducts and having a baffle plate in a lower portion and a perforated differential plate for directing air therefrom toward said work bench, said housing having a first and second sloped canopy depending from said air supply ducts in a diverging relationship to each other; lighting means secured to said hood assembly and depending therefrom in nonobstructive relationship to said air flow; support means operatively interposed between said work bench and said hood assembly to maintain said hood assembly in fixed spatial relationship to said work bench; an egress air channel disposed adjacent said work bench and adapted to receive and divert the air flow passing from said hood assembly through said work station into said egress air channel.

4,872,401

**DEVICE FOR IMPROVING THE FLAVOR OR
REMOVING THE PIQUANTE FLAVOR OF FERMENTED
PRODUCTS**
Wen-bin Lee, No. 164, Cheng-Kung Rd., Feng-Yuan City Tai-chung Hsien, Taiwan
Filed Jul. 5, 1988, Ser. No. 215,335
Int. Cl.⁴ A23L 3/32

U.S. Cl. 99—275

4 Claims

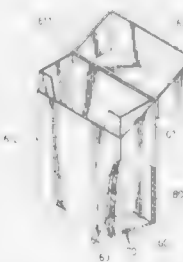
1. An apparatus for improving the flavor of and removing the piquante flavor of a fermented substance such as wine, soy sauce, tobacco or the like comprising:
a container including a surrounding side wall; and

4,872,403

AUTOMATIC COFFEE MAKER
Michael F. LaGesse, and Sally LaGesse, both of #10 Shireford La., Ferguson, Mo. 63135
Filed Feb. 9, 1989, Ser. No. 308,203
Int. Cl.⁴ A47J 31/00

U.S. Cl. 99—280

5 Claims



said magnetic members, said second pole of each of said magnetic members being placed adjacent to said second pole of at least one of other adjacent said magnetic members, said magnetic members inducing a magnetic field inside said container.

4,872,402

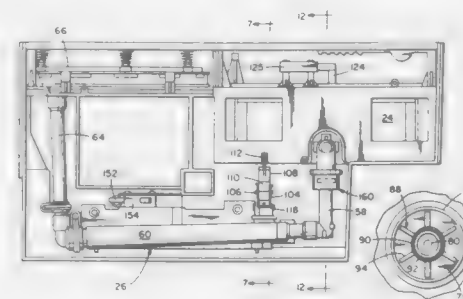
CARAFE-OPERATED COFFEE BREWING SYSTEM
Paul D. Johnson, Hamden; Robert E. Kubicko; Louis C. Martone, both of Shelton, and Gregory E. Moores, Oxford, all of Conn., assignors to Black & Decker Corporation, Towson, Md.

Filed Jul. 6, 1988, Ser. No. 216,410

Int. Cl.⁴ A47J 31/00

U.S. Cl. 99—280

25 Claims



1. Automatic coffee brewing apparatus comprising:
a self-contained water reservoir;
a brewing station;
a water supply conduit in communication with and extending between said brewing station and said water reservoir to enable the flow of water from said reservoir to said brewing station in the course of a brew cycle;
an electrically energizable hot water generator intermediate said brewing station and said operative water reservoir for heating water in said supply conduit to a sufficient extent as it flows from said reservoir to said brewing station to enable coffee to be brewed at said brewing station;
a brewed coffee receiving vessel movable between a withdrawn position and an operative position to receive brewed coffee from said brewing station; and
a carafe switch responsive to the position of said coffee receiving vessel and movable to a closed position for electrically energizing said hot water generator when said vessel is in said operative position and movable to an open position for electrically de-energizing said hot water generator and interrupting the brew cycle when said vessel is in said withdrawn position.

1. An automatic coffee maker comprising:
a vertically oriented housing;
a horizontally oriented base mounted under said housing and having a decanter support portion that extends laterally from said housing and said base having a top surface electric warmer plate mounted thereon;
a water reservoir assembly having a bottom wall, a front wall, a rear wall and laterally spaced side walls extending upwardly from the parameter of said bottom wall;
a removable cover for the top of said water reservoir assembly;
a hot water outlet port in the bottom of said water reservoir assembly at a position vertically above said warming plate, a tubular collar surrounding said hot water outlet port and extending upwardly from said bottom wall;
a cold water outlet port in the bottom wall of said water reservoir assembly at a position vertically above said housing;
a hot water heating chamber mounted in said housing;
a drain tube having its upper end connected to the cold water outlet port of the bottom wall of said water reservoir assembly and its bottom end connected to said hot water heating chamber;
means connected to said hot water heating chamber for delivering a predetermined number of cups of hot water to the hot water outlet port of said water reservoir assembly;
a cup-shaped brewing unit removably mounted to the bottom of said water reservoir assembly below said hot water outlet port;
an elongated cold water tube having its top end in said water reservoir assembly and its bottom end connected to an electric solenoid flow valve;
a water supply tube having a first end and a second end, said second end being connected to said electric solenoid flow valve; and
means connected to said electric solenoid flow valve for measuring a predetermined number of cups of hot water that are delivered to said brewing unit.

4,872,404

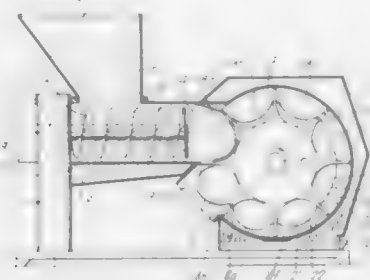
PRESS FOR EXPRESSING LIQUIDS FROM SUBSTANCES CONTAINING THEM, ESPECIALLY MUSTS

Karl-Heinz Quetsch, Mühlenstr., and Hennig Vetter, Trottstr.,
both of Fed. Rep. of Germany, assignors to Vetter Maschinen-
fabrik GmbH, Fed. Rep. of Germany
Filed Nov. 12, 1987, Ser. No. 120,492
Claims priority, application Fed. Rep. of Germany, Nov. 13,
1986, 3638839

Int. Cl.⁴ B30B 9/02, 9/22, 9/26

U.S. Cl. 100—125

16 Claims



1. A press for pressing out material in the form of liquid-con-
taining substances, especially musts comprising:

- (a) a frame;
- (b) carrier means having an axis, being rotatably mounted on
said frame and having dividers extending radially to said
axis, said dividers forming a plurality of press chambers,
said press chambers being sealed against each other and
being circumferentially spaced around said axis;
- (c) a stationary, at least partially cylindrical sieve wall cir-
cumferentially surrounding said carrier means and having
at least a plurality of sieve segments and two openings,
said sieve segments and said openings being circumferen-
tially spaced around said axis;
- (d) radially movably press means disposed in said press
chambers and dividing said press chambers into pressure
chamber portions disposed radially inwardly, and into
press chamber portions disposed radially outwardly and
being open radially outwardly;
- (e) a charging station coupled to one of said openings of said
sieve wall for filling the material into said press chamber
portions;
- (f) a discharging station coupled to the other one of said
openings of said sieve wall for emptying said press cham-
ber portions of the material;
- (g) drive means for rotating said carrier means and for plac-
ing thereby said press chambers at said charging station or
said discharging station, respectively; and
- (h) moving means for moving said press means at least radi-
ally outwardly and for pressing the material filled into said
press chamber portions against said sieve wall.

4,872,405

SYSTEM FOR TINTING CONTACT LENSES

Saul C. Sterman, Jerusalem, Israel, assignor to Med Optics
Corp., Panama, Panama
Continuation of Ser. No. 95,206, Sep. 11, 1987, Pat. No.
4,811,662. This application Dec. 27, 1988, Ser. No. 289,939
Claims priority, application Israel, Sep. 16, 1986, 80039
The portion of the term of this patent subsequent to Mar. 14,
2006, has been disclaimed.

Int. Cl.⁴ B41F 17/00

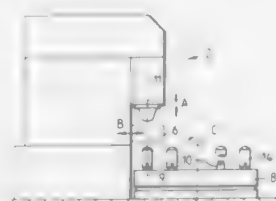
U.S. Cl. 101—44

6 Claims

1. A system for tinting contact lenses, comprising:
a transfer-pad printer adapted to pick up a pattern from an
inked printing block and transfer said pattern to a contact
lens;

at least one lens mount adapted to fixedly hold a soaked

contact lens in a defined position, the top surface of said
lens mount being convexly curved;
reference means provided on said top surface to facilitate
accurate placing of said soaked lens in said defined posi-
tion; and
means to produce alignment between said lens mount and
said transfer pad prior to said pattern transfer from said
pad to said soaked lens;



the radius of curvature of said convexly curved top surface
of said lens mount being slightly smaller than the radius of
curvature of the base curve in a soaked lens placed on said
top surface of said lens mount to facilitate shrinking-on of
the back surface of said soaked lens onto said top surface
of said lens mount.

4,872,406

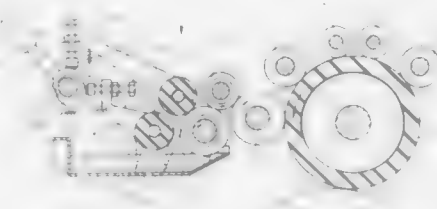
DAMPENING MECHANISM FOR OFFSET ROTARY PRINTING PRESSES

Hans-Jürgen Kusch, Neckargemünd, Fed. Rep. of Germany,
assignor to Heidelberger Druckmaschinen Aktiengesellschaft,
Heidelberg, Fed. Rep. of Germany
Filed Sep. 22, 1988, Ser. No. 247,953
Claims priority, application Fed. Rep. of Germany, Sep. 22,
1987, 3731768

Int. Cl.⁴ B41F 7/26, 7/40

U.S. Cl. 101—148

18 Claims



1. A dampening mechanism for a rotary printing press in-
cluding a printing plate comprising:
a rotatable supply roller having a cylindrical surface;
said supply roller rotatable at a speed relative to a printing
speed of said printing press;
means for applying dampening fluid to said cylindrical sur-
face during rotation of said supply roller;
means for transferring at least some of said dampening fluid
on said cylindrical surface to said printing plate;
a first metering roller having an outer surface with a prede-
termined first surface characteristic;
a second metering roller having an outer surface with a
predetermined second surface characteristic;
means for selectively and alternately causing at least one of
said outer surface of said first metering roller and said
outer surface of said second metering roller to be in
contact with said cylindrical surface downstream of said
means for applying said dampening fluid and upstream of
said means for transferring;

said means for causing allowing only one of said metering
rollers to be in contact with said cylindrical surface at a
time.

said outer surface of said first metering roller being in
contact with said cylindrical surface for causing a first
range of quantities of said dampening fluid to be on said
cylindrical surface for transfer to said printing plate by
said means for transferring during a first set of operating
conditions of said printing press; and
said outer surface of said second metering roller being in
contact with said cylindrical surface for causing a second
range of quantities of said dampening fluid to be on said
cylindrical surface for transfer to said printing plate by
said means for transferring during a second set of operat-
ing conditions of said printing press.

4,872,407

METHOD FOR THE MOUNTING OF A FLEXIBLE PRINTING PLATE ON A CYLINDER, AND APPARATUS FOR THE EXECUTION OF THE METHOD

Allan Banke, c/o Neoplex A/S, Lyvej 6, DK-5800 Nyborg,
Denmark

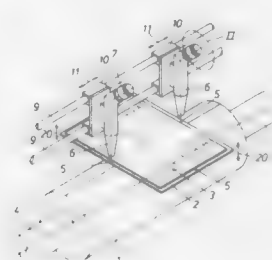
PCT No. PCT/DK88/00034, § 371 Date Oct. 24, 1988, § 102(e)
Date Oct. 24, 1988, PCT Pub. No. WO88/06522, PCT Pub.
Date Sep. 7, 1988

PCT Filed Feb. 24, 1988, Ser. No. 263,794

Claims priority, application Denmark, Feb. 27, 1987, 1057/87
Int. Cl.⁴ B41F 27/00

U.S. Cl. 101—389.1

5 Claims



1. Apparatus for mounting a flexible printing plate on a plate
cylinder for a printing machine comprising holding devices for
at least one plate cylinder arranged to carry a printing plate
with at least one pair of register marks, where the surface of
the cylinder or the back of the printing plate is provided with
an adhesive coating, wherein parallel with the axis of the
cylinder, holding devices are provided with means for secur-
ing the printing plate parallel with and without touching the
cylinder, and further comprising a number of optical spotting
devices at the holding devices, and means for feeding the
printing plate towards the cylinder or vice versa, and wherein
the holding devices are a two-part table, the two parts of
which are provided with vacuum channels with openings
towards the table surface, which is plane.

4,872,408

POLYMERIC FILM-ENVELOPED EXPLOSIVE CARTRIDGES AND THEIR MANUFACTURE AND USE

Horst F. Marz, Otterburn Park, Canada, assignor to C-I-L Inc.,
North York, Canada

Filed Feb. 1, 1988, Ser. No. 150,979

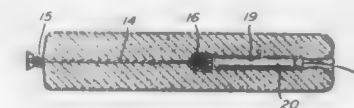
Claims priority, application Canada, Mar. 25, 1987, 532930
Int. Cl.⁴ F42B 3/00

U.S. Cl. 102—324

5 Claims

1. An improved, unyielding, tightly-packed explosive car-
tridge comprising a tubular, flexible, polymeric film envelope
having a first sealed end and a second sealed end and contain-
ing a non-rigid explosive composition, the improvement com-
prising the first sealed end being everted into the body of the
cartridge towards the second sealed end so as to provide a

central, internal recess, the recess being maintained within the
said cartridge body by means of an internal, separate, cord-like
tensioner connected between the said second sealed end and



the said everted first sealed end, the length of the said recess
being sufficient to accommodate an explosion initiating device
so that the said initiating device is substantially surrounded by
the said non-rigid explosive.

4,872,409

KINETIC-ENERGY PROJECTILE HAVING A LARGE LENGTH TO DIAMETER RATIO

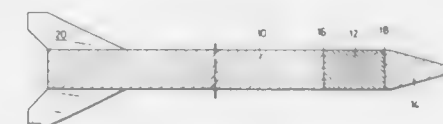
Wilfried Becker, Duesseldorf, and Bernhard Bisping, Ratingen,
both of Fed. Rep. of Germany, assignors to Rheinmetall
GmbH, Duesseldorf, Fed. Rep. of Germany
Continuation of Ser. No. 826,554, Feb. 6, 1986, abandoned,
which is a continuation-in-part of Ser. No. 552,271, Nov. 16,
1983, abandoned. This application Aug. 17, 1987, Ser. No.
185,240

Claims priority, application Fed. Rep. of Germany, Nov. 18,
1982, 3242591

Int. Cl.⁴ F42B 13/16

U.S. Cl. 102—517

5 Claims



1. A fin stabilized arrow-shaped subcaliber penetrator hav-
ing a large length to diameter ratio of uniform cross section
substantially over its entire length and having a high initial
muzzle exit velocity and high kinetic energy to be fired with a
sabot out of a large caliber weapon, comprising in combina-
tion,

a main body, an intermediate body and a front conically
shaped nose body in coaxial alignment with each other;
the length of said intermediate body is about 1.5 times as
large as its maximum diameter;
said main body comprising between 50% and 70% of the
total length of said penetrator;
said main body and said nose penetrator consisting of a
tough metal alloy made from the metals of tungsten or
depleted uranium and nickel and iron;
said intermediate body consisting of high density brittle
sintered alloy which has a high content of tungsten or
depleted uranium and a low content of a binding medium;
said main body, intermediate body and nose body having
abutting butt end faces by means of which they are joined
to each other; whereby in use, on impact of the penetrator
against a target only the intermediate body fractures into
a plurality of relatively small sized particles that widen the
hole formed by the nose body impacting against the target
beyond the caliber size of the penetrator, thereby to make
possible relatively unimpacted travel of the main body
through the hole.

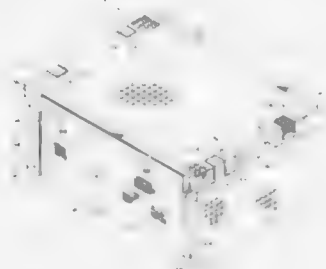
4,872,410

FOLDABLE PLAYTRAY

Carol Lilly, 5354 Highland Dr., Bellevue, Wash. 98006
 Filed Dec. 21, 1987, Ser. No. 136,117
 Int. Cl.⁴ A47B 85/00

U.S. Cl. 108—26

10 Claims



1. A playtray comprising:

- a table having a play surface which at least substantially comprises a play surface with regularly spaced protruding coupling elements;
- a pair of legs, at least one of said legs having a first surface which at least substantially comprises a play surface with regularly spaced protruding coupling elements; and
- hinges pivotally connecting said legs to said table in at least first and second configurations;
- latches operable to selectively lock said legs in said first and second configurations, wherein in said first configuration said leg support said table with said table play surface uppermost, and wherein in said second configuration said legs are outstretched generally coplanar with respect to said table and said first leg surface and table play surface provide the playtray with an extended, substantially unbroken play surface with regularly spaced protruding coupling elements.

4,872,411

APPLICATOR DEVICE

Ernest J. Nagy, 1508-41st Street, SE, Calgary, Alberta, Canada T2A 1K8

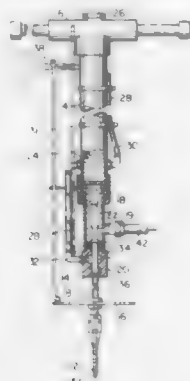
Filed Oct. 25, 1988, Ser. No. 262,491

Claims priority, application Canada, Mar. 23, 1988, 562275

Int. Cl.⁴ A01C 23/02; F16K 11/02

U.S. Cl. 111—7.1

8 Claims



1. An applicator device for injecting liquid additives into the soil comprising:

- (a) an elongated housing having a handle means connected at one end thereof;
- (b) an elongated injector bar, one end of which is slidably secured within means at the other end of the housing to permit the bar to move longitudinally with respect to the

housing between open and closed positions and an additive feed position, the other end of the bar having means to permit insertion thereof into the soil, the bar being provided with an exit aperture at said other end and an entrance aperture on the bar between its ends, the bar including a channel extending within the bar between the two apertures;

- (c) a carrier liquid chamber in the housing and a carrier liquid supply means in the housing, means communicating the carrier chamber with the carrier supply means said carrier chamber enabling liquid to be passed from the carrier chamber to the channel of the bar;
- (d) an additive chamber in the housing beside the carrier liquid chamber in the longitudinal direction; and
- (e) an additive supply means in the housing, means communicating the additive supply means with the additive chamber, the injector bar being longitudinally moveable with respect to the housing allowing the entrance aperture to be in three different positions such that: (a) when the injector bar is in closed position the entrance aperture is sealed off from both the carrier liquid chamber and the additive chamber so that no carrier fluid or additive can flow through the channel, (b) when the injector bar is in open position the entrance aperture communicates with the carrier liquid chamber enabling liquid in that chamber to communicate with the channel, and (c) when the injector bar is in additive supply position, the entrance aperture communicates with the additive supply chamber enabling additive in that chamber to flow to the channel.

4,872,412

FERTILIZER INJECTING IMPLEMENT AND METHOD

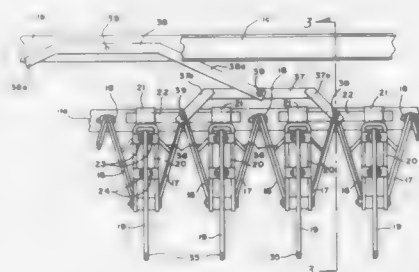
Ezra J. Zollinger, 230 E. 3rd South, Logan, Utah 84321

Filed Apr. 18, 1988, Ser. No. 182,435

Int. Cl.⁴ A01C 23/02

U.S. Cl. 111—121

4 Claims



1. Agricultural apparatus for the injection of fertilizer into agricultural land comprising a frame adapted for travel across said agricultural land; a series of fertilizer injecting implements mounted in side-by-side ganged relationship on said frame transversely of the direction of travel, each of said implements providing a coulter blade of thin, flat disk formation made of a strong and durable material having smooth surfaces that are substantially of soil non-adherent character, a rigid fertilizer injector tube secured directly behind but in spaced relationship with said blade so as to penetrate to substantially the bottom of cuts in the soil of said agricultural land made by said blade, and structural reinforcement secured to and along the length of said tube for stiffening said tube, both said tube and said reinforcement having smooth surfaces that are substantially of soil non-adherent character; structural means mounting said implements on said frame for blade rotation and ground penetration, said structural means including for each implement a pair of mutually spaced, rearwardly convergent arms that are pivotally fastened to the frame at their forward ends and at whose rearward ends rotatably mount the coulter blade of the implement, and an inverted U fork member for said coulter blade extending upwardly from said rearward ends of said arms; sets

of hanger bars pivotally suspending the forks of the coulter blades of the several implements from the frame, one set of the hanger bars comprising individual hanger bars pivotally secured at corresponding ends to respective yoke bars that are slidably fitted in receiving means of the forks of mutually adjacent coulter blades; means whereby said apparatus may be pulled across said agricultural land; means for carrying a supply of fertilizer to be injected into the soil of said agricultural land as the apparatus travels; and means interconnecting a carried supply of fertilizer with the respective injecting tubes of said implements.

4,872,413

CRAYFISH HARVESTER BOAT APPARATUS

Roland J. Hebert, Rte. 3, Box 1492, Abbeville, La. 70510

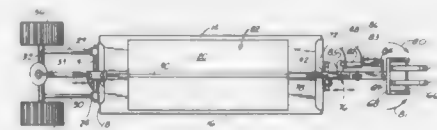
Continuation of Ser. No. 850,704, Apr. 11, 1986, abandoned.

This application May 19, 1988, Ser. No. 196,723

Int. Cl.⁴ B63B 35/14

U.S. Cl. 114—270

4 Claims



1. An apparatus, movable upon land and in water, for harvesting crayfish, comprising:

- a. a container portion having side walls and a floor for remaining buoyant on the surface of a body of water;
- b. steering means, mounted on the front of the container portion, movable across substantially a 180 degree arc, including a wheel member which makes contact with the bottom of the body of water so that the container portion is steered substantially in the direction of the steering means, the wheel member having a substantially smooth surface for engaging the bottom of the body of water with a minimum amount of friction;
- c. power means, including a drive wheel for moving the apparatus at a plurality of speeds, the drive wheel having a plurality of transverse tread plates adhered to its surface for obtaining maximum traction while contacting the bottom of the body of water, mounted substantially on the rear of the container portion for forcibly moving the container portion along the water as the drive wheel makes contact with the water bottom; and
- d. means interconnecting the steering means with the container portion and the power means with the container portion for moving the container portion from a first position, substantially at the level of the power means and the steering means, so that the wheels do not make contact with the bottom of the body of water and the container portion floats in the water, to a second position resting above the level of the power means and the steering means.

4,872,414

EMERGENCY SIGNAL BALLOON APPARATUS

Janet L. Asquith, 1247 W. San Marcos Blvd., San Marcos, Calif. 92069, and Bonnie G. Connor, 745 E. Bradley, No. 53, El Cajon, Calif. 92021

Filed Jun. 8, 1988, Ser. No. 203,902

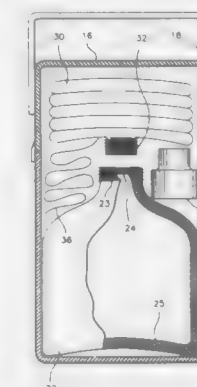
Int. Cl.⁴ B64B 1/50

U.S. Cl. 116—210

1 Claim

1. An emergency signal balloon apparatus comprising: a canister housing having a balloon receptacle portion and an upper receptacle lid portion, a carrying handle attached to said upper receptacle lid portion; a helium canister having an externally threaded neck having an external diameter D2, said helium canister being removably received in the balloon receptacle portion of said

canister housing, said helium canister having a Teflon coating on its inner walls to prevent leakage of helium, a puncture seal closes the neck of the helium canister; an emergency signal balloon capable of being folded in its deflated state and removably packed in the upper receptacle lid portion of said canister housing, said signal balloon having an externally threaded neck adapter unit connected to its gas inflation port, said externally threaded neck adapter unit having an external diameter D1; said signal balloon having means thereon for providing a visual signal for help; valve assembly means for detachably engaging the threaded neck adapter of said emergency signal balloon and the externally threaded neck of said helium canisters to thereby form a fluid passage between said emergency



signal balloon and said helium canister, said valve assembly means consisting entirely of an interiorly threaded tubular upper female coupling unit having an internal diameter D1 and an interiorly threaded tubular lower female coupling unit having an internal diameter D2, said units being connected by horizontal wall structure and a needle valve centrally mounted in a passage through said wall structure for piercing the puncture seal of said helium canister, said valve assembly means having no moving parts; and a predetermined length of tether line having one end connected to attachment means on said emergency signal balloon, said tether line being removably stored in said canister housing prior to inflation of said emergency signal balloon.

4,872,415

METER FOR A VEHICLE

Hiroshi Nakadozono, and Yusuke Mori, both of Kanagawa, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

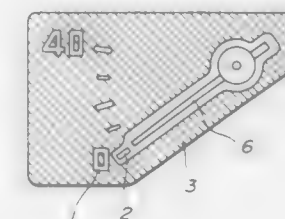
Filed Jan. 22, 1988, Ser. No. 146,863

Claims priority, application Japan, Jan. 23, 1987, 62-14922

Int. Cl.⁴ G01D 11/28

U.S. Cl. 116—288

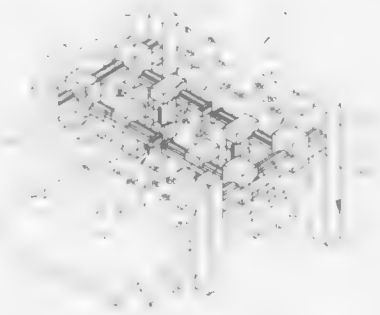
8 Claims



1. A meter for a vehicle comprising:

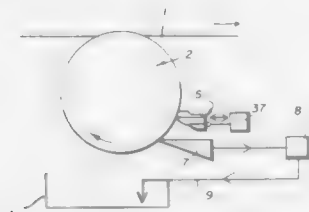
an opaque face;
light means;
a needle for selectively pointing toward a portion of said face, said needle being made of light transmitting material, associated with said light means, and having a shaft which movably supports said needle; and
a reflecting section, provided on said needle, for reflecting light emitted from said light means onto said face so as to illuminate a predetermined area around said portion of the face.

4,872,417
METHOD OF AND APPARATUS FOR
AUTOMATICALLY COATING A WORKPIECE
Takasi Kuwabara; Takeo Yoshiji, both of Sakado, and Masao Tegawa, Ohmiya, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Jul. 3, 1986, Ser. No. 881,783
Claims priority, application Japan, Jul. 5, 1985, 60-148049
Int. Cl.⁴ B05C 3/00
U.S. Cl. 118—411 10 Claims



4,872,416
ELASTOMERIC CLEANER FOR GROOVED ROTATING
HOLLS

Vernon T. Daniel, Oak Ridge; Jessie Gettiffe, Greensboro, and Tina V. Lorenzo, Jamestown, all of N.C., assignors to Burlington Industries, Inc., Greensboro, N.C.
Filed Jan. 14, 1986, Ser. No. 818,769
Int. Cl.⁴ B05C 1/08
U.S. Cl. 118—203 4 Claims



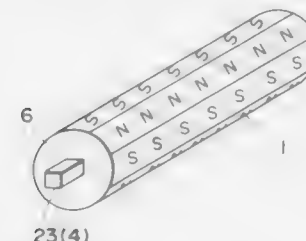
1. Apparatus for applying sizing material to a plurality of textile strands, comprising:
an applicator cylinder having a grooved exterior circumferential surface and mounted for rotation about a first axis;
means for applying melted sizing material to said cylinder so that size lodges in said grooves thereof;
means for rotating said cylinder about said first axis so that size in said grooves is applied to the textile strands each moving past said cylinder and traveling for at least a short distance in a groove; and
means for cleaning the grooves in said grooved cylinder by wiping material that collects in said grooves from said grooves, said cleaning means comprising: a cord of elastomeric material elongated in a first dimension; and means for holding said cord into contact with said cylinder so that the cord is forced into the grooves of said cylinder with the cord elongated in a dimension generally parallel to said first axis, the cord deforming into the grooves so as to effect cleaning of sizing material from the grooves, said holding means comprising: a plurality of holding blocks each having a first end thereof and means defining a channel in said first end for receiving said cord, and means for individually adjusting the positions of said blocks with respect to a housing; each of said holding blocks being linearly reciprocally mounted for sliding movement with respect to the housing, and said means for adjusting the position of each of said holding blocks comprising, for each holding block, a cam slide engaging said holding block at a surface thereof opposite said quadrate channel, and including a slanted surface portion, and an adjustment screw operatively engaging said slanted portion.

1. An apparatus for automatically coating a workpiece, comprising:
at least one first track;
at least one Y-axis mobile body movable on and along said first track;
at least one second track mounted on said Y-axis mobile body and extending substantially perpendicularly to said first track;
at least one X-axis mobile body movable on and along said second track;
at least one third track mounted on said X-axis mobile body and extending substantially perpendicularly to said first and second tracks;
at least one Z-axis mobile body movable on and along said third track;
a plurality of nozzle devices mounted on said Z-axis mobile body and displaceable so as to be directed toward the workpiece;
actuating means for displacing said nozzle devices with respect to each other on each Z-axis mobile bodies wherein each of said nozzle devices is selectively, automatically displaceable with respect to the other nozzle device on each A-axis mobile body, said nozzle devices having respective nozzles for ejecting different coating materials;
means for selectively and independently operating one of said nozzles for first dispensing a coating material from said nozzle for a predetermined time; and
means for selectively and independently operating the other nozzle device for dispensing a different coating material after termination of the first dispensing.

4,872,418
MAGNET ROLL DEVELOPING APPARATUS
Masao Yoshikawa, Tokyo, and Kimio Nakahata, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Oct. 2, 1986, Ser. No. 914,291
Claims priority, application Japan, Oct. 4, 1985, 60-221495; Oct. 4, 1985, 60-221496
Int. Cl.⁴ G03G 15/09
U.S. Cl. 118—657 31 Claims

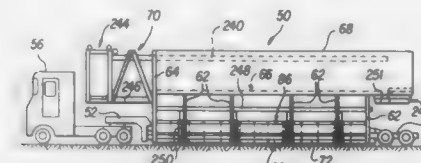
12. A magnet roll usable for carrying a magnetic developer, comprising:
a main body portion which is solid to the center thereof and which is formed from a rubber in which magnetic material

is dispersed, said main body portion having an outer diameter of not more than 20 mm; and



supporting portions projecting out of opposite longitudinal ends of said main body portion, respectively, and made from the same material as the main body portion.

4,872,419
TRANSPORTABLE COATING APPARATUS
Robert L. Blankemeyer, Fort Jennings, and James C. Blankemeyer, Columbus Grove, both of Ohio, assignors to Metokote Corporation, Lima, Ohio
Filed Oct. 29, 1986, Ser. No. 924,515
Int. Cl.⁴ B05C 11/00
U.S. Cl. 118—713 6 Claims



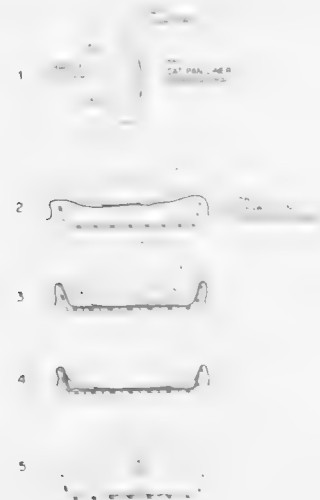
1. A transportable coating apparatus comprising
an elongated support structure having lower and upper horizontal rectangular frames, vertical members interconnecting the horizontal frames, and a side longitudinal member mounted on and extending on one longitudinal side of the support structure, each frame including longitudinal members and transverse members interconnecting the respective longitudinal members;
an elongated unitary multi-compartment tank mounted on the lower horizontal frame, said tank including a series of contiguous tank compartments arranged in a straight line longitudinally in the support structure for containing selected treatment and coating fluids;
a first vertically movable horizontal track section extending longitudinally over the series of tank compartments;
means mounted on the support structure for raising and lowering the first vertically movable horizontal track section between raised and lowered positions;
an oven mounted on the upper horizontal frame and extending longitudinally above the series of tank compartments; said oven including a stationary track section extending longitudinally through the oven;
a front elevator mountable on the support structure at the front end of the series of tank compartments and having a second vertically movable track section and means for raising and lowering the second vertically movable track section between a first position aligned with the stationary track section through the oven and a second position aligned with the first movable track section when the first movable track section is in the raised position;
a rear elevator mounted on the support structure at the rear end of the series of tank compartments and having a third vertically movable track section and means for raising and lowering the third vertically movable track section between an upper position aligned with the stationary track section through the oven and a lower position aligned

with the first movable track section when the first movable track section is in the raised position;
a plurality of article carriers with roller means for movably mounting the carriers for horizontal movement on the first, second and third movable track sections and the stationary oven track section;
lower carrier advancing means for incrementally advancing the article carriers from the second movable track section in its second position, along the first movable track section in its raised position, and onto the third movable track section in its lower position;
upper carrier advancing means for incrementally advancing the article carriers from the third movable track section in its upper position, along the stationary track section through the oven, and then onto the second movable track section in its first position;
tank circulation and fluid handling means mounted on the side longitudinal member and connected with at least one of the tank compartments;
said support means including floor engaging means at front and rear ends thereof;
ground engaging wheels means attachable to one end of the support structure for carrying the one end of the support structure with the respective floor engaging means in a raised position;
coupling means attachable to the other end of the support structure and adapted to be connected to a tractor for carrying the other end of the support with the respective floor engaging means in a raised position so that the support structure, the multi-compartment tank, the oven, and the tank fluid handling and circulation means can be transported in an assembled condition over roadways from one location to another location; and
door means separating a front opening of the oven from the front elevator, said door means including a flexible sheet material, and means for unrolling and rolling the flexible sheet material in order to close and open the front opening of the oven;
said unrolling and rolling means including a shaft rotatably mounted at the bottom of the front opening of the oven, a tube rotatably mounted on the shaft, spring means connected between the shaft and the tube and normally biasing the tube in a rotative position to roll-up the flexible sheet, a pair of first sprockets mounted on the shaft at respective opposite ends of the tube, a pair of second sprockets mounted on respective sides at the top of the front opening of the oven, a pair of chains extending on opposite sides of the front opening of the oven and passing over corresponding first and second sprockets of said pairs of first and second sprockets, means attaching one end of the flexible sheet at respective opposite sides to the chains, and reversible motor means for rotating one of the first and second pair of sprockets so that movement of the chains raises and lowers the sheet while rotation of the pipe unrolls and rolls the sheet.

4,872,420
DISPOSABLE CAT LITTER SYSTEM
Daniel R. Shepard, 400 E. 77th St., Apt. 14 J, New York, N.Y. 10021
Filed Aug. 1, 1988, Ser. No. 226,613
Int. Cl.⁴ A01K 29/00
U.S. Cl. 119—1 3 Claims

1. A disposable cat litter system comprising:
a litter bag containing cat litter and having at least one generally flat side;
a disposal bag attached to said litter bag side, said disposal bag having an opening large enough to encircle the litter bag and a drawstring means around said opening, whereby said litter bag can be placed in a cat litter pan with the one bag side downward with the disposal bag opening arranged around the edges of the pan and whereby the

litter bag may be opened to expose said cat litter for use by a cat and after use the drawstring can be used to fully



enclose the litter bag and used cat litter for easy disposal thereof.

4,872,421

METHOD OF ENHANCING MATING IN POULTRY
Sebastian M. Laurent, Greenwall Springs, and Robert N. Sanders, Baton Rouge, both of La., assignors to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 846,188, Mar. 31, 1986, abandoned, which is a continuation of Ser. No. 741,572, Jun. 5, 1985, abandoned, which is a division of Ser. No. 475,370, Mar. 14, 1983, Pat. No. 4,556,564. This application Nov. 24, 1986, Ser. No. 934,458

The portion of the term of this patent subsequent to Sep. 9, 2003, has been disclaimed.
Int. Cl.⁴ A23K 1/00

U.S. Cl. 119-1

22 Claims

19. A feed composition for male poultry characterized by having the property of increasing the mating aggressiveness of male poultry when used as the diet for such male poultry, said feed composition containing an amount of zeolite A sufficient to increase the mating aggressiveness of said male poultry when fed thereto on a substantially continuous basis, said amount being from about 0.25 to about 4.00 weight percent of said feed composition, said mating aggressiveness being manifested when said so-fed male poultry is/are exposed to one or more populations of female poultry of the same species.

4,872,422

SCRATCHING AND PETTING DEVICE FOR HOUSEHOLD PETS

Rita A. Della Vecchia, 61909 Dobbin Ct., Bend, Oreg. 97702
Filed Mar. 4, 1988, Ser. No. 164,188

Int. Cl.⁴ A01K 13/00

U.S. Cl. 119-83

8 Claims

1. A mechanism for scratching and petting household pets comprising in combination:

- an elongate base having means for mounting in a vertical position on a structural member;
- an elongate "T" shaped petting arm leg extending a spaced distance from the base;
- a compound petting arm carried by a petting arm bracket slidably disposed on the petting arm leg of the base and having means for adjustable vertical motion on the petting arm leg of the base, said petting arm being hingeably carried by said petting arm bracket and having an outer arm portion pivotally communicating with an inner arm portion with means to reciprocally move said outer arm

portion through a predetermined arcuate course relative to the inner arm portion; and



a petting element carried by the outermost part of the outer arm portion of the petting arm, said petting element biased to a horizontal position but pivotally movable in a vertical plane against such bias.

4,872,423

METHOD FOR IMPROVING UTILIZATION OF SULPHUR-ABSORBENT WHEN BURNING FUEL IN A FLUIDIZED BED AND A POWER PLANT IN WHICH FUEL IS BURNED IN A FLUIDIZED BED

Krishna K. Pillai, Finspong, Sweden, assignor to ABB Stal AB, Finspong, Sweden

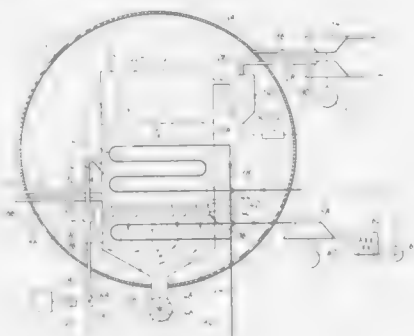
Filed Mar. 22, 1988, Ser. No. 171,598

Claims priority, application Sweden, Mar. 25, 1987, 8701229

Int. Cl.⁴ F22B 1/00

U.S. Cl. 122-4 D

4 Claims



1. A power plant burning a fuel, primarily sulphur-containing coal, in a fluidized bed of particular material comprising: a bed vessel;
- an air distributor with nozzles for blowing air into the bed vessel to effect fluidization of the bed material and combustion of a fuel supplied to the bed, said air distributor dividing the bed vessel into a combustion chamber and an ash chamber;
- openings in the air distributor for permitting the bed material to flow from the combustion chamber to the ash chamber;
- means in the combustion chamber for cooling the bed material and generating steam;
- means for cooling bed material in the ash chamber;
- means for withdrawing partly evolved bed material from said ash chamber;
- a pneumatic transport means for transporting said withdrawn bed material to said combustion chamber; and
- means for supplying said pneumatic transport means with

steam constituting both transport gas and a reactant to effect disintegration of absorbent particles.

4,872,424

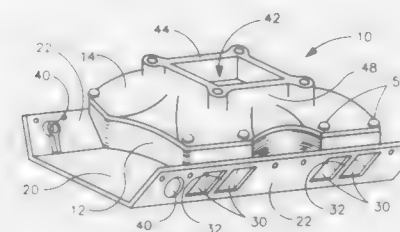
INTAKE MANIFOLD WITH REMOVABLE BAFFLES
Larry N. Carnes, 1228 Wynkoop, Colorado Springs, Colo. 80909

Filed Apr. 13, 1988, Ser. No. 180,903

Int. Cl.⁴ F02B 17/18; F02M 35/10

U.S. Cl. 123-52 MV

31 Claims



1. A manifold apparatus adapted for use with a combustion engine in order to distribute a combustible fuel mixture to a plurality of combustion cylinders in a cylinder block each cylinder having a cylinder intake port located on an intake face of said cylinder block, comprising:

- a lower manifold unit mountable on said engine and having lower runner portions and a lower plenum portion;
- an upper manifold unit having an intake manifold opening surrounded by a carburetor mounting flange, said upper manifold section having upper runner portions and an upper plenum portion;
- said upper and lower manifold units mountable together in an assembled unit whereby said upper and lower plenum portions form a plenum chamber in fluid communication with said intake opening and whereby said upper and lower runner portions form a plurality of intake runners defining fluid flow passageways between said plenum chamber and respective ones of the combustion cylinders, each flow passageway having an outlet port and a surrounding passageway side wall, said assembled unit constructed so that each outlet port is aligned in fluid communication with a respective cylinder intake port; and
- baffle means removably mountable as part of the assembled unit for directing flow of the fuel mixture, said baffle means forming a relatively uninterrupted extension of each respective flow passageway.

4,872,425

AIR POWERED VALVE ACTUATOR

William E. Richeson, and Frederick L. Erickson, both of Fort Wayne, Ind., assignors to Magnavox Government and Industrial Electronics Company, Fort Wayne, Ind.

Filed Jan. 6, 1989, Ser. No. 294,730

Int. Cl.⁴ F01L 9/02

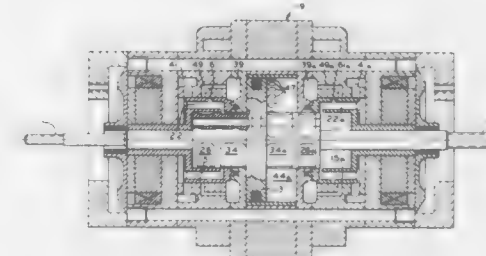
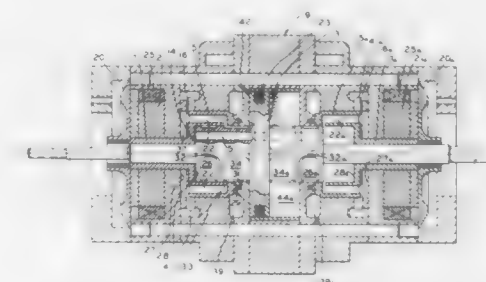
U.S. Cl. 123-90.13

24 Claims

1. An electronically controlled fluid powered power valve actuator for use in an internal combustion engine of the type having engine intake and exhaust valves with elongated valve stems;

- said actuator having a power piston having a piston driven side reciprocative along an axis between first and second positions in a housing corresponding to engine valve open and closed positions;
- a control valve reciprocative along said axis between open and closed positions for controlling the pneumatic pressure from a pneumatic pressure source to said power piston to move said power piston and said member to said first and second positions;
- latching means for closing and holding said control valve in its closed position;
- pneumatic pressure control means comprising said source

for providing pneumatic pressure to said valve to move said valve towards its open valve position against the holding force of said latching means;



said pressure control means for providing a net pneumatic pressure closing force to said valve after said piston has moved a predetermined distance towards its first position from its second position.

4,872,426

VARIABLE CAMSHAFT TIMING SYSTEM

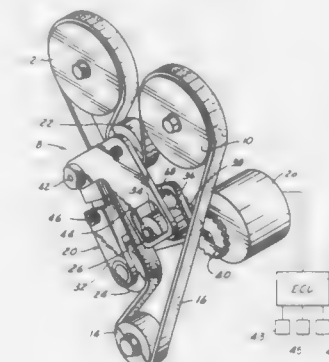
Samuel J. Sapienza, IV, Hampton, Va., assignor to Siemens-Bendix Automotive Electronics L.P., Troy, Mich.

Continuation of Ser. No. 17,670, Feb. 24, 1987, Pat. No. 4,744,338. This application Apr. 15, 1988, Ser. No. 181,867

Int. Cl.⁴ F01L 1/34

U.S. Cl. 123-90.15

13 Claims



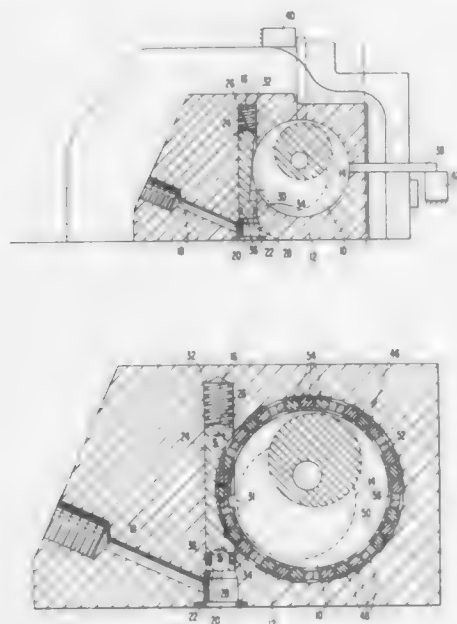
1. A variable camshaft timing system in combination with an internal combustion engine having a rotatable member such as a crankshaft, an intake camshaft and an exhaust camshaft, the system comprising:
 - at least one pulley wheel means fixedly attached to each of the intake camshaft, the exhaust camshaft and the crankshaft;

at least one belt means for interconnecting various ones of said pulley wheel means;
first and second idler arm means independently pivotally attached to the engine, each of said idler arm means having a pivoting arm, a cam follower means and an idler wheel in operative contact with said at least one belt means; and
positioning means operatively coupled to said cam follower means for pivoting said first and second idler arm means and in turn relatively rotating one of said pulley wheel means attached to the intake camshaft with respect to another of said pulley wheel means attached to the exhaust camshaft and for maintaining a predetermined tension in said at least one belt means as said first and second idler arm means are being pivoted.

4,872,427

POSITION CONTROLLER FOR A ROTATABLE SHAFT
Richard J. Gustafson, Columbus, Ind., assignor to Cummins Engine Company, Inc., Columbus, Ind.
Filed Nov. 29, 1988, Ser. No. 277,644
Int. Cl.⁴ F01L 1/34; F02M 37/04
U.S. Cl. 123—90.16

47 Claims



1. A controller for controlling the rotation and angular position of an internal combustion engine shaft wherein the shaft controls the operation of the intake and exhaust valves of the internal combustion engine to vary the timing of the valving events to optimize engine performance, and wherein the shaft is subject to alternating, opposing, oscillating torques having a non-zero mean value, said controller comprising:

engaging means for engaging the shaft and inhibiting rotation of the shaft in a first direction while permitting rotation in a second direction; and
release means for releasing said engaging means from engagement with the shaft to thereby permit the shaft to rotate in the first direction.

6. A controller for controlling the rotation and angular position of a shaft wherein the shaft is subject to alternating, opposing, oscillating torques, said controller comprising:
engaging means for engaging the shaft and inhibiting rotation of the shaft in a first direction while permitting rotation in a second direction wherein said engaging means comprises a locking surface selectively engageable with the shaft and said locking surface is movable between a

disengaged position in which said locking surface does not inhibit rotation of the shaft in the first direction and an engaged position in which said locking surface engages the shaft; and
release means for releasing said engaging means from engagement with the shaft to thereby permit the shaft to rotate in the first direction.

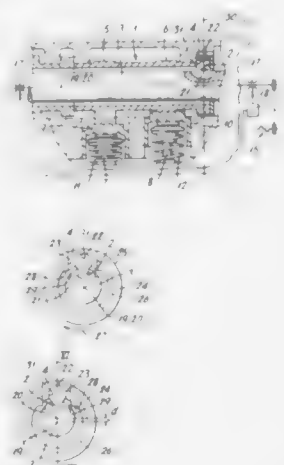
4,872,428

IMPROVEMENTS IN OR RELATING TO DRIVING CONNECTIONS BETWEEN TWO ROTATABLE BODIES
Stephen W. Mitchell, Bury, England, assignor to National Research Development Corporation, London, England
PCT No. PCT/GB88/00376, § 371 Date Jan. 4, 1989, § 102(e) Date Jan. 4, 1989, PCT Pub. No. WO88/08919, PCT Pub. Date Nov. 17, 1988
PCT Filed May 13, 1988, Ser. No. 297,199
Claims priority, application United Kingdom, May 14, 1987, 8711366

Int. Cl.⁴ F01L 1/04, 1/34

U.S. Cl. 123—90.17

13 Claims



1. A driving connection between rotatable first and second bodies (1, 3) having parallel but laterally-displaceable axes of rotation (19, 20), the first body being hollow and the second body being located within it, in which one of the bodies (3) carries a radial arm (2), in which a radial slideway (23) is formed on one of the bodies (1), in which a block (4) is mounted to slide within that slideway, and in which there is a rotary joint between the block and the outer end (22, 36) of the radial arm, characterised in that a common plane (30, FIG. 1) lying at right angles to the two axes of rotation (19, 20) coincides with all three of the radial arm (2), the block (4) and the radial slideway (23).

4,872,429

METHOD OF MAKING LOW FRICTION FINGER FOLLOWER ROCKER ARMS

Anthony T. Anderson, Romulus, and Nathaniel L. Field, Northville, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.
Division of Ser. No. 132,740, Dec. 14, 1987, Pat. No. 4,829,647.
This application Jul. 18, 1988, Ser. No. 220,714
The portion of the term of this patent subsequent to May 16, 2006, has been disclaimed.

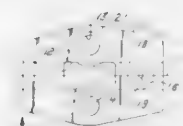
Int. Cl.⁴ F01L 1/18

U.S. Cl. 123—90.44

2 Claims

1. A finger-follower rocker arm construction, comprising:
(a) a metal channel of medium carbon sheet gauge steel stock, said channel having a web and side walls depending from said web to define a U-shaped cross-section, said side

walls being hinged to said web by embossed grooves in said stock, said side walls having surfaces defining transversely aligned openings, said web having internal wear



surfaces at opposite ends, the edges of said openings and wear surfaces being enhanced in hardness and the remainder of said channel not enhanced in hardness; and
(b) low friction roller assembly journaled in said openings.

4,872,430

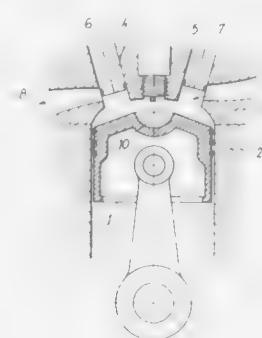
VALVE SYSTEM FOR RECIPROCATING ENGINES
Livio Biagini, Bologna, Italy, assignor to B-ART S.r.l., Bologna, Italy

Filed Mar. 29, 1988, Ser. No. 174,716

Claims priority, application Italy, Apr. 6, 1987, 47813 A/87
Int. Cl.⁴ F01L 3/00

U.S. Cl. 123—188 A

21 Claims



1. A valve system for reciprocating engines, characterized in that it comprises at least two cylindrical guides obtained in the cylinder head; a valve for each guide, which is slidable inside the guide itself without projecting into the inside part of the cylinder; channels or ducts obtained in said cylinder head which put one of said guides and the cylinder itself in communication with the intake or exhaust system following to the motion of the corresponding valve; and sealing means between each one of said valves and the corresponding guide; said valves being provided with a motion that opens the passage of the corresponding channel towards the outside of the cylinder.

4,872,431

INTERNAL COMBUSTION ENGINE WITH CERAMICS VALVES

Shigeaki Akao, Noboru Ishida, and Mitsuyoshi Kawamura, all of Aichi, Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya, Japan

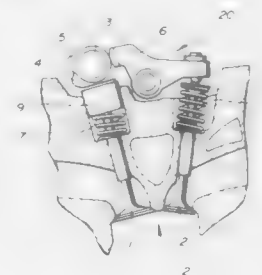
Filed Apr. 27, 1988, Ser. No. 186,841

Claims priority, application Japan, Apr. 28, 1987, 62-65071[U]

Int. Cl.⁴ F01L 3/00

U.S. Cl. 123—188 AA

2 Claims



1. An internal combustion engine comprising:
at least one exhaust valve made of ceramics per each cylinder; and
a plurality of intake valves made of metal per each cylinder; wherein the relation in number and valve head diameter between said intake and exhaust valves are designed so as to give $Pe < Pi$ and $De > Di$ where Pe is the number of said exhaust valves per each cylinder, Pi is the number of said intake valve per each cylinder, De is the valve head diameter of said exhaust valves and Di is the valve head diameter of said intake valve.

4,872,432

OILLESS INTERNAL COMBUSTION ENGINE HAVING GAS PHASE LUBRICATION

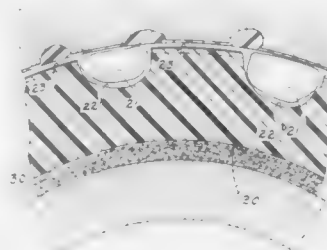
Vemulapalli Durga N. Rao, Bloomfield Township, Oakland County, and Wallace R. Wade, Farmington Hills, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Feb. 23, 1988, Ser. No. 159,615

Int. Cl.⁴ F02F 23/00

U.S. Cl. 123—193 CP

17 Claims



1. In an oilless engine having a piston reciprocal within a cylinder and along an axis of such cylinder while providing an annular gap therebetween to receive combustion gases, a gas phase blow-by control system comprising:

(a) an annular receptacle in at least one of said piston and cylinder;
(b) an annular body of graphite carrying high temperature solid lubricant disposed in said annular receptacle, said body presenting a face projecting out of said receptacle;
(c) an elastomer material retentive of elasticity at the maximum operating temperature to be experienced by said body, interposed between said body and receptacle to

urge said body to close said gap under all operating conditions of said engine; and

- (d) axially directed grooves in said body face sized to substantially trap cylinders of combustion gases therein by viscosity under low pressure gradients and to limit the passage of a combustion gases through said grooves under high pressure gradients to one percent or less of the cylinder gas flow charge volume, the gas cylinders functioning as bearings to ride the piston during reciprocation and provide predominantly gas-phase lubrication.

4,872,433

COMBUSTION CHAMBER CONFIGURATIONS FOR TWO CYCLE ENGINES

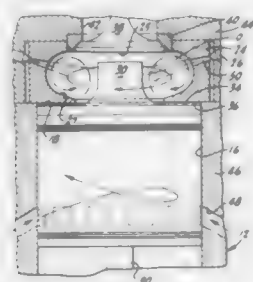
Marino A. Paul, and Ann Paul, both of 1100 Orangethorpe Ave., Ste. 140, Anaheim, Calif. 92801

Filed Dec. 7, 1987, Ser. No. 129,453

Int. Cl.⁴ F02B 23/02

U.S. Cl. 123—257

7 Claims



1. A combustion chamber assembly in a two-cycle, internal combustion engine for improving combustion of injected fuel, the engine having a cylinder and at least one piston reciprocable in the cylinder with the piston and cylinder defining in part a toroidal combustion chamber, the assembly including a plurality of fuel injector nozzles spaced around the cylinder with fuel passages directed tangentially toward the chamber in an arrangement that enhances the toroidal, swirling, compressed air flow during fuel injection, the injector having means for selectively controlling the fuel delivery and fuel timing to each injector nozzle.

4,872,434

ENGINE BRAKE DEVICE

Shigeo Sekiyama, Kawasaki, Japan, assignor to Isuzu Motors Limited, Tokyo, Japan

Filed May 23, 1988, Ser. No. 197,780

Claims priority, application Japan, May 30, 1987, 62-136478

Int. Cl.⁴ F02D 35/00, 9/06

U.S. Cl. 123—320

9 Claims



1. An engine brake device for use on an engine having an inlet line and an exhaust line, said brake device comprising: a bypass line interconnecting said inlet line and said exhaust line permitting intake air to flow from said inlet line to said exhaust line; a compressor having an output shaft, said compressor rotat-

ably disposed in said bypass line with said output shaft connected to said engine; and

- opening and closing means operatively mounted within said bypass line for controlling the flow of air through said bypass line upon braking said engine such that said compressor discharges air induced through said bypass line imposing large negative work on said engine.

4,872,435

THROTTLE VALVE CONTROLLING APPARATUS INCLUDING RELATIVE POSITION LIMITING MEANS FOR THROTTLE VALVES

Yoshiji Ueyama, and Yoshiaki Asayama, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

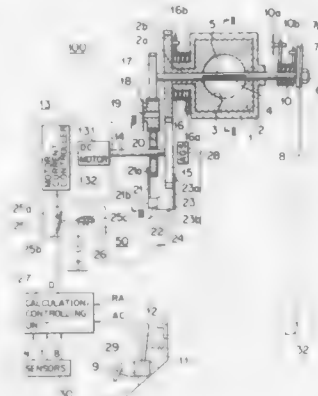
Filed Aug. 26, 1988, Ser. No. 236,823

Claims priority, application Japan, Aug. 26, 1987, 62-212531

Int. Cl.⁴ F02M 11/04

U.S. Cl. 123—336

9 Claims



1. A throttle valve controlling apparatus for an automobile comprising:

- throttle valve means including a first throttle valve and a second throttle valve relatively rotatable to said first throttle valve, for controlling a flow of an air/fuel mixture to an engine of the automobile;

rotating means mechanically coupled to an accelerator pedal, for relatively rotating said first throttle valve with respect to said second throttle valve;

first return spring means for biasing said first throttle valve so as to set the same to a first closed position of said first throttle valve when said accelerator pedal is released;

rotation angle sensor means for sensing an actual rotation angle of said second throttle valve to output a rotation angle signal;

calculation/controlling means for producing a rotation command signal representative of a target rotation angle for said second throttle valves, determined by operation of said accelerator pedal;

electrically controlled actuator means for relatively rotating said second throttle valve with respect to said first throttle valve in response to said rotation command signal derived from said calculation/controlling means in such a manner that deviation between said target rotation angle and actual rotation angle becomes zero;

second return spring means for biasing said closed position of said second throttle valve; and,

relative position limiting means interposed between said electrically controlled actuator means and said calculation/controlling means, for limiting a relative position between said first and second throttle valves within a predetermined rotation range in such a manner that when malfunction of said calculation/controlling means is detected by checking said relative position in said relative position limiting means, supply of said rotation command

signal from said calculation/controlling means via said being similarly cooperable with said valve closure member, relative position limiting means to said electrically controlled actuator means is interrupted.

4,872,436

ARRANGEMENT FOR STABILIZING THE IDLING SPEED OF AN INTERNAL COMBUSTION ENGINE

Helmuth Schultes, Gruenthal, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

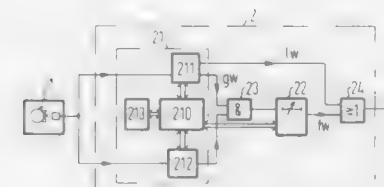
Filed Sep. 21, 1988, Ser. No. 247,408

Claims priority, application Fed. Rep. of Germany, Dec. 16, 1987, 3742668

Int. Cl.⁴ F02D 41/16

U.S. Cl. 123—339

7 Claims



1. An arrangement for stabilizing the idling speed of an internal combustion engine by early adjustment of an ignition angle, the arrangement having a rotating encoder device that supplies encoder signals proportional to the speed of the internal combustion engine, and having a motor control device that contains a microcomputer to which the encoder signals are supplied and that provided a premature angle therefrom as the ignition angle for a defined idling speed of the internal combustion engine, comprising:

- the motor control device having an adjustable timer, whose run-down time (t) is set to a rated time that a reference point (BZ) on a crankshaft of the engine requires for a defined rated idling speed in order to turn from a basic angle (GW) to a defined idling angle (LW) that is the ignition angle at the rated idling speed; the timer beginning to run down when the reference point (BZ) has reached the basic angle (GW); and the motor control device containing a logic circuit that, during idling of the internal combustion engine, uses a premature angle (FW), which is the angular position of the reference point (BZ) after the run-down time (t), as the ignition angle when this premature angle (FW) is chronologically reached before the idling angle (LW) and otherwise using the idling angle (LW) as the ignition angle.

4,872,437

FUEL PRESSURE REGULATOR FOR INTERNAL COMBUSTION ENGINE

Yoshiaki Asayama, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 28, 1988, Ser. No. 212,622

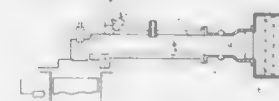
Claims priority, application Japan, Jun. 29, 1987, 62-161667

Int. Cl.⁴ F02M 39/00

U.S. Cl. 123—463

2 Claims

1. A fuel pressure regulator (14) for an internal combustion engine for regulating fuel pressure to be supplied to a fuel injection valve (7), comprising: a rigid valve closure member (18) supported by a flexible diaphragm (16) providing a pressure sensitive surface for fuel supplied by a fuel pump (11), a first cylindrical valve seat (15a) cooperable with said valve closure member for on-off controlling a fuel recirculating passage (29) to a fuel tank (10), a second cylindrical valve seat (22) slidably supported by and coaxially disposed within said first cylindrical valve seat, said second cylindrical valve seat



direction towards said diaphragm in accordance with a sensed operating condition of said engine.

4,872,438

FUEL INJECTION SYSTEM WITH CONTROLLED INJECTORS FOR DIESEL ENGINES

Francesco P. Ausiello, Turin; Mario Ricco, Bari, and Sisto Luigi De Matthaeis, Mogugno, all of Italy, assignors to Weber S.r.l., Italy

Filed Aug. 25, 1988, Ser. No. 236,539

Claims priority, application Italy, Aug. 25, 1987, 67735 A/87

Int. Cl.⁴ F02M 31/20, 31/16

U.S. Cl. 123—514

4 Claims



1. A fuel injection system with controlled injectors for diesel engines, comprising a fuel tank, a supply circuit including a pump for conveying the fuel under pressure from the tank to the controlled injectors, and a circuit for recycling the fuel to the tank, including a return line from the pump in which a solenoid pressure regulating valve is inserted, and a return line from the injectors which is joined by the return line from the pump, including a system for regulating the temperature of the fuel, including:

- preheating means including a branch line (12) which connects the return line (9) from the pump (4) downstream of the solenoid pressure-regulating valve (10, ii) with the supply circuit (5a) upstream of the pump and a cut-off valve (13) having a thermostatic control (14) and arranged to allow the fuel to flow through the branch line (12) when the temperature of the fuel upstream of the pump (4) is below a predetermined threshold value and to stop this flow when the temperature exceeds the threshold value, and cooling means including means (24) for sensing the temperature of the fuel in the supply circuit (5b) downstream of the pump (4) and upstream of the return line (9) from the pump (4), electrically-controlled cooling means (17, 18;

20, 21, 22, 23) associated with the return line (15) from the injectors (2) downstream of the return line (9) of the pump (4), and an electronic unit (S) for controlling the cooling means in response to signals provided by the temperature sensor means (24).

4,872,439

DEVICE FOR PREVENTING OUTFLOW OF A FUEL VAPOR FROM A FUEL TANK

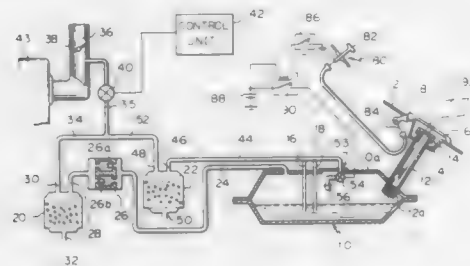
Hidefumi Sonoda, Elji Mori, Mitsuo Kawase, Kazuhiro Yone-shige, all of Aichi; Akira Takahashi, Saitama; Hirokazu Komiya, Tokyo, and Akira Tanaka, Saitama, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha; Aisan Industry Co., Ltd., both of Aichi and Jeco Co., Ltd., Saitama, all of Japan
Filed Feb. 1, 1988, Ser. No. 151,182

Claims priority, application Japan, Feb. 2, 1987, 62-20514; Feb. 2, 1987, 62-12750; Feb. 2, 1987, 62-20513; Feb. 2, 1987, 62-12751; Feb. 2, 1987, 62-12755

Int. Cl.⁴ F02M 59/00

U.S. Cl. 123—518

20 Claims



1. A device for preventing fuel vapor from escaping into the outside air from a fuel tank, said device comprising:
a fuel vapor purifying apparatus;
a float-valve assembly mounted on an upper wall of the fuel tank and having therein a breather passage which is open to an upper interior of the fuel tank at one end and is connected to an upper interior of the fuel tank at one end and is connected to said fuel vapor purifying apparatus at the other end, said float-valve assembly having a normally closed solenoid valve which is arranged in said breather passage and having a float which operates with said one end of said breather passage and closes said one end of said breather passage when the level of a surface of fuel in the fuel tank exceeds a predetermined level; and
control means for determining whether said solenoid valve is to be opened and opening said solenoid valve when said solenoid valve is to be opened, said control means comprising an ignition switch and a control switch, said control switch being operated when replenishment of the fuel tank is to be carried out, and said solenoid valve being opened when said ignition switch is off and when said control switch is operated.

4,872,440

AIR AND FUEL MIXING DEVICES FOR INTERNAL COMBUSTION ENGINES

Kenneth L. Green, 1070 NE. 1st St., Miami, Fla. 33138
Filed Oct. 18, 1988, Ser. No. 259,315

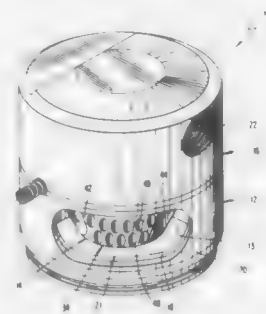
Int. Cl.⁴ F02M 29/00

U.S. Cl. 123—590

13 Claims

1. A fuel and air mixing device for use with an internal combustion engine, comprising:
ring means positionable adjacent an air/fuel intake of an engine and defining an interior volume for the mixing of fuel and air, said ring means including air inlet passage means arranged in a cylindrical periphery of said ring means, and
a mixer body comprising a plurality of fuel passages each having an inlet and outlet, said inlets communicating with

a fuel source, said outlets communicating with said interior volume such that a flow of air into said interior volume and across said fuel passage outlets draws fuel through said fuel passages and into said interior volume to be mixed with the air,



said ring means including a stationary part and a movable part for adjusting the size of said air inlet passage means for regulating the amount of incoming air.

4,872,441

IGNITION CIRCUIT FOR INTERNAL COMBUSTION ENGINE

Masayuki Ozawa, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

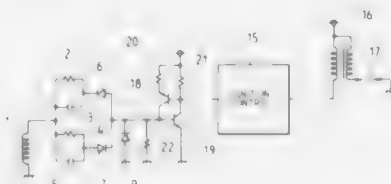
Filed Jun. 10, 1988, Ser. No. 205,244

Claims priority, application Japan, Jun. 10, 1987, 62-89823[U]; Jun. 10, 1987, 62-89824[U]; Jun. 10, 1987, 62-89825[U]

Int. Cl.⁴ F02P 3/12

U.S. Cl. 123—651

4 Claims



1. An ignition circuit for an internal combustion engine, comprising: a signal coil (1) for producing an alternating angle signal in synchronism with the engine rotation, a bistable circuit responsive to said angle signal for providing an output having a first level and a second level corresponding to positive and negative portions of said angle signal, respectively, and an ignition control circuit (15) responsive to said output of said bistable circuit for calculating a desired ignition timing and controlling a current supply to an ignition coil (16), said bistable circuit including, exclusively, a semiconductor transistor (19) having a base electrode input connected to directly receive said angle signal and a collector electrode connected to a power supply through a resistor (21), an output connected to said ignition control circuit, and a positive feedback circuit, comprising an active circuit element (18; 29; 31) and a resistor (20; 30), connected in series between said collector electrode and said base electrode.

4,872,442

ACTIVATOR FOR INITIATING REACTION IN A HEAT PACK AND METHOD FOR MAKING SAME

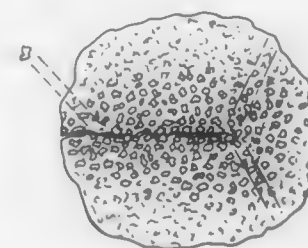
Charles F. Manker, Chicago, Ill., assignor to Prism Technologies, Inc., Chicago, Ill.

Filed Sep. 6, 1988, Ser. No. 241,886

Int. Cl.⁴ F24J 1/00

U.S. Cl. 126—263

6 Claims



1. An activator for reliably initiating crystallization of a super-cooled aqueous salt solution, said activator being formed of a flexible, relatively thin metal, having at least one slit extending therethrough and with the opposing sides of said slit being in contact along at least a part of the length of said slit, and said activator having a number of minute metal nodules attached to and protruding from the surface thereof and adjacent to said slit, said nodules being adapted to be detached from said surface upon flexing of said activator.

4,872,444

WIND DEFLECTOR SHIELD FOR WATER HEATER COMPARTMENT

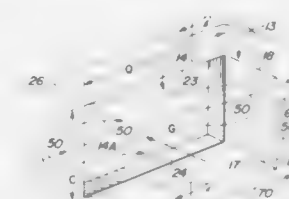
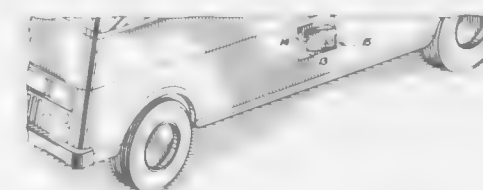
Richard T. Dervin, 1302 West Anderson Dr., Phoenix, Ariz. 85021

Filed Dec. 16, 1988, Ser. No. 285,130

Int. Cl.⁴ F24H 1/00

U.S. Cl. 126—361

3 Claims



1. In combination with a ventilation opening formed through an exterior access door to a closet in a vehicle housing a gas heated water container, the ventilation opening including spaced apart elongate opposed top and bottom boundary edges, including a pair of spaced apart elongate side boundary edges each interconnecting said top and bottom boundary edges, being circumscribed by an outer surface exposed to the ambient air and by an inner surface adjacent said water container,

a deflector shield folded from a blank including
(a) a body panel including first and second spaced apart opposing side edges;
(b) first and second triangular side panels each having a pair of diverging edges intersecting a third common edge, one of said diverging edges of each of said side panels being attached to said body panel along an opposite one of the pair consisting of said first and second edges; and,
(c) first and second elongate feet each having a longitudinal axis and connected to the other of said diverging pair of edges of an opposite one of said side panels;
said blank being folded along said first and second side edges and along the other of said diverging pair of edges of each of said first and second side panels to form said deflector shield, said shield including

(d) said triangular side panels extending outwardly from said body panel in spaced apart, opposed relationship, and
(e) said elongate feet each extending outwardly from one of said side panels and from the area bounded by said opposed, spaced apart side panels, said feet extending outwardly from said opening and contacting said inner wall to prevent said shield from being outwardly pulled through said opening,
said side panels extending outwardly through said opening to said body panel,
said body panel and said one of said diverging pair of edges of each of said side panels of said shield sloping outwardly away from said opening to form a channel which permits air to flow through said opening outwardly from said vehicle in a selected direction of travel, said sloped body panel deflecting away from said opening air flowing adjacent said outer surface and against said body panel in said selected direction of travel.

4,872,443

WATER HEATER WITH POWER VENT ACCESS DOOR

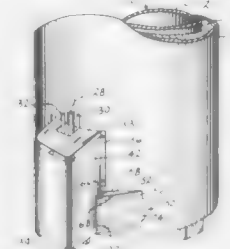
Darryl L. Ruark, Lugoff, S.C., assignor to A. O. Smith Corporation, Milwaukee, Wis.

Filed Mar. 13, 1989, Ser. No. 322,686

Int. Cl.⁴ F24H 1/00

U.S. Cl. 126—361

22 Claims



1. A water heater comprising an inner storage tank, an outer cylindrical jacket spaced outwardly of said tank, an access opening through a lower portion of said jacket, a power vent enclosure extending outwardly and forwardly from said jacket and covering a portion of said access opening, said power vent enclosure having a sidewall extending radially outwardly and forwardly from said jacket, said sidewall having an opening therethrough extending radially outwardly and forwardly from said jacket at said access opening, an access door mounted to said water heater and covering both said sidewall opening and the remainder of said access opening not covered by said power vent enclosure.

4,872,445

COOKING UTENSIL

Hiroshi Kobayashi; Masae Kobayashi, both of Kodaira, and Haruhiko Machida, Tokyo, all of Japan, assignors to Techno-Frontier Ltd., Kodaira, Japan

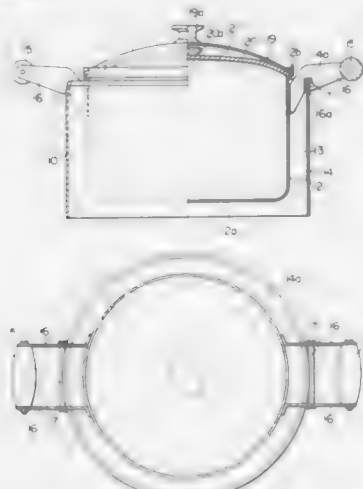
Filed Jun. 29, 1988, Ser. No. 212,781

Claims priority, application Japan, Jun. 29, 1987, 62-99964[U]; Dec. 17, 1987, 62-191617[U]

Int. Cl.⁴ A47J 27/10

U.S. Cl. 126—376

8 Claims



1. A cooking utensil which comprises an inner vessel portion; an outer shell portion having an inside diameter larger than that of the inner vessel portion and a height as same as or longer than that of the inner vessel portion, said outer shell portion having a cylindrical shape and a lid which closes an opening of the inner vessel portion, and a space portion being defined by said inner vessel portion and said outer shell portion, said inner vessel portion and said outer shell portion being combined or connected by a pair of hand grips, wherein each of said hand grips is secured to the outer peripheral surface of the inner vessel portion adjacent to the upper and thereof in diametrically opposite relation, each of said hand grips having plate-like plate arm portions, said plate-like plate arm portions including a recess portion at a mean portion thereof and an engaging shaft provided on an outer side of the recess portion of the plate-like arm portion which engages a reinforced flange of the outer shell portion.

4,872,446

ENDOSCOPE WITH COLOR CORRECTING MECHANISM

Moriyoshi Murata, Tochigi, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 16, 1988, Ser. No. 245,240

Claims priority, application Japan, Sep. 25, 1987, 62-238829

Int. Cl.⁴ A61B 1/06

U.S. Cl. 128—6

11 Claims



1. An endoscope, comprising:

a scope including a bendable viewing head portion, the top of which can be deflected to view a side wall of the scope; imaging device means at the top of the bendable head portion for imaging an object of interest in terms of electric signals; white sheets on the side wall which can be viewed by the imaging device means and which are wide enough to fill most of a single view of the imaging device means; camera control units means for converting electric signals from the imaging device means to image signals; color correction unit means for performing color correction on the image signals; and display means for displaying images of the object of interest.

4,872,447

METHOD FOR TREATMENT OF SEXUAL IMPOTENCE IN MEN

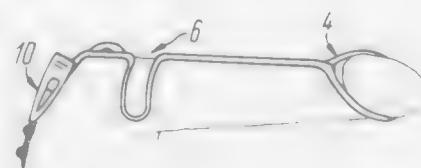
Moisei V. Tsirjulnikov, and Zinoviy A. Zusmanovsky, both of Leningrad, U.S.S.R., assignors to Vsesojunznyi Nauchno-Issledovatel'skiy 1 Ispytatel'nyy Institut Meditsinskoi Tekhniki

Filed Mar. 11, 1988, Ser. No. 166,678

Int. Cl.⁴ A61F 5/41

U.S. Cl. 128—79

2 Claims



1. A method for treatment of sexual impotence in men, comprising an external fixing of the penis with the aid of mechanical means followed by rehabilitation of the sexual potency which is carried out by a stage-by-stage displacement of the points of fixing towards the root of the penis, thus increasing the length of the penis portion free from fixing and accompanied by regulation of the regional blood flow through the penis by way of mechanical action exerted thereon at the points of fixing.

4,872,448

KNEE BRACE HAVING ADJUSTABLE INFLATABLE U-SHAPED AIR CELL

Glenn W. Johnson, Jr., 10 Friar Tuck Cir., Summit, N.J. 07901

Continuation-in-part of Ser. No. 921,858, Oct. 22, 1986, abandoned, which is a continuation of Ser. No. 483,448, Apr. 11, 1983, abandoned. This application May 19, 1987, Ser. No. 51,360

Int. Cl.⁴ A61F 5/04

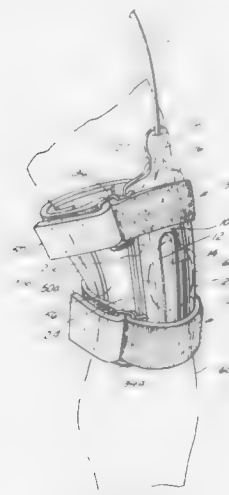
U.S. Cl. 128—80 C

18 Claims

1. A knee brace comprising first adjustable means for engaging the knee and providing support to the patella without hindering normal tracking movement thereof, second adjustable means for fastening said first means in engagement with the knee, third adjustable means for providing support to the infra patella region of the knee,

wherein said first adjustable means comprises a flexible, semi-compressible support member, said flexible, semi-compressible support member comprising a base portion and a pair of depending arm portions thereby generally forming a U-shaped configuration, said support member being adapted for engagement with said knee such that the base portion engages the knee proximally above the patella and each of said arm portions engages the knee on opposed sides of the patella, respectively, and wherein said third adjustable means comprises a second

flexible, semi-compressible support member at least a portion of which is adapted to be disposed between at



least one of said arm portions and the infra patella region of the knee.

4,872,449

QUICK-RELEASE DEVICE FOR JAW STABILIZATION

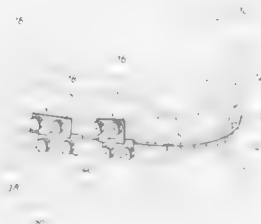
Reinier Beeuwkes, III, Ardmore, Pa., assignor to Medical Products & Research, Houston, Tex.

Filed Sep. 16, 1987, Ser. No. 97,523

Int. Cl.⁴ A61F 5/04

U.S. Cl. 128—87 R

9 Claims



1. A quick-release maxillo-mandibular splint appliance for jaw stabilization, comprising:

- separate upper and lower means capable of being interconnected in immovable relation with selected upper and lower teeth of the patient;
- tab means extending from said upper and lower means to a permit registered and aligned assembly position to be formed between said upper and lower means to define a set of interleaved tab means along the jaw of the patient;
- removable and releasable lock means for engaging said interleaved tab means to form an interlocked relation, between said separate upper and lower means, said lock means being easily removable to enable patient jaw movement;
- wherein said separate upper and lower means each comprises:
 - an anchor member at least partially encircling a selected tooth of the patient,
 - a connector plate supported by said anchor member, and
 - retainer means received by said anchor member and

securing said connector plate in immovable assembly with said selected tooth, and

- wherein said connector plate defines an elongate planar member having a pair of spaced tab means formed into eyelets with aligned openings through said tab means;
- wherein said lock means comprises an elongate wire threadable through said eyelets;
- wherein said connector plate tab means comprise a pair of tabs spaced apart to enable interengaging relation with similar tabs on a mating connector plate; and
- wherein said releasable lock means releasably engages said interengaged tabs to establish releasable interlocking relation between said interengaging opposed tabs.

4,872,450

WOUND DRESSING AND METHOD OF FORMING SAME

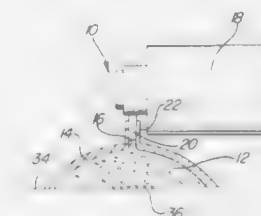
Eric D. Austad, 309 Riverview Dr., Ann Arbor Township, Washington County, Mich. 48105

Continuation-in-part of Ser. No. 641,813, Aug. 17, 1984, abandoned. This application Jul. 26, 1985, Ser. No. 759,628

Int. Cl.⁴ A61F 5/04

U.S. Cl. 128—90

2 Claims



1. A dressing for a skin wound of the type having blood and drainage associated therewith, said dressing being of a size slightly larger than said wound and having a surface substantially covering said wound and engaging a continuous area of the skin around the wound and generally in the plane of the skin around the wound, to thereby form an enclosure for the wound, said enclosure having an opening in said surface forming a conduit through which foam can be injected so as to directly engage the wound, and a layer of medical grade foam directed through said conduit into engagement with said skin and contained thereagainst by said surface of said dressing in a covering relation with said wound at a position disposed between said wound and said enclosure, whereby the foam not only provides a protective cushion for the wound but also a volume for absorbing blood and drainage from the wound, and a medium into which antibiotics can be introduced.

4,872,451

GLENOHUMERAL LIGAMENT REPAIR

Robert R. Moore, 1897 National Ave., Hayward, Calif. 94545; Steve Lamb, 6724 Corte Del Vista, Pleasanton, Calif. 94566, and Eugene M. Wolf, 3400 California St., 2nd Floor, San Francisco, Calif. 94118

Filed Feb. 2, 1987, Ser. No. 9,667

Int. Cl.⁴ A61F 5/04

U.S. Cl. 128—92 YF

7 Claims

1. A ligament repair kit for installing a ligament fastener comprising:

- a drill cannula having a slender tubular barrel with a distal end having an opening;
- at least one slender obturator having a pointed end sized and constructed to removably insert into the barrel of the drill cannula with the pointed end projecting through the opening at the distal end of the barrel, the drill cannula and inserted pointed obturator being constructed and

adapted to spear ligamentous structures and advance them to an anchoring site;

- a cannulated drill bit having a central bore hole sized to fit over a conventional k-wire, the drill bit being sized to fit within the drill cannula and project through the distal end opening when the slender obturator is removed, the drill bit being connectable to a bone drill for drilling a bone hole while the drill cannula retains ligamentous structures over the anchoring site;
- a drive cannula having a tubular barrel with a distal end having an opening;
- a cannulated obturator constructed to removably insert in the tubular barrel of the drive cannula the cannulated



obturator having a pointed tip and a narrow central bore hole sized to fit over a conventional k-wire installed through the cannulated drill bit to retain ligamentous structures at the anchoring site when the drill bit is removed; and

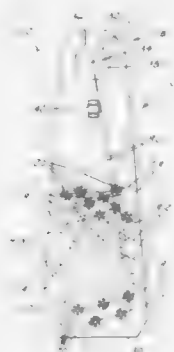
- a cannulated fastener driver having a shank with a bore hole sized to fit over a conventional k-wire, the shank having a driver tip with means for engaging a cannulated bone fastener wherein the shank and tip of the driver and the fastener are sized to fit within the barrel of the drive cannula over a conventional k-wire when the cannulated obturator is removed for installing the fastener into a hole drilled into an anchoring bone for retaining ligamentous structures at the anchoring site by the fastener.

4,872,452 BONE RASP

Charles E. Alexson, Amery, Wis., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Jan. 9, 1989, Ser. No. 295,254
Int. Cl.⁴ A61F 5/04

U.S. Cl. 128—92 VJ

17 Claims



1. A rasp adapted for rasping generally hard tissue, such as bone, cartilage and associated tissue, the rasp comprising a

generally plate-like body having opposite generally parallel major surface portions, an attaching means having a center for detachably attaching the rasp to a powered device for driving the rasp, and a plurality of rasp portions arranged along the rasp for substantially evenly rasping hard tissue, each rasp portion having a center, and a plurality of slots through the body extending generally radially outwardly from the center of the portion to define a plurality of cantilever cutting members extending generally radially inwardly of the rasp portion generally toward the center of the rasp portion and separated from one another by the slots, the cutting members being bent to project outwardly from the major surface portions of the body with alternating members of each rasp portion being bent to project outwardly from opposite surface portions of the body.

11. A method of manufacturing a rasp adapted for rasping generally hard tissue, such as bone, cartilage and associated tissue, the method comprising the following steps:

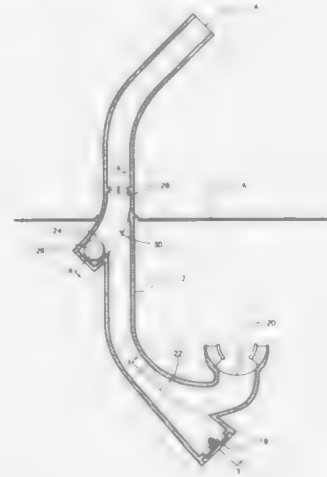
- providing a hardened stainless steel plate having opposite generally parallel major surfaces;
- forming an attaching means having a center on the plate for detachably attaching the rasp to a powered device for driving the rasp; and
- forming a plurality of rasp portions arranged along the rasp for substantially evenly rasping hard tissue, including the steps of forming each rasp portion by:
 - laser cutting a plurality of slots through the body to extend generally radially outwardly from a center to a perimeter to define a plurality of cantilever cutting members extending radially inwardly of the rasp portion; and
 - bending the cutting members to project outwardly from the major surfaces of the body with alternating members of the rasp portion being bent outwardly from alternating respective major surfaces of the body.

4,872,453 SNOORKEL

Tony Christianson, 277 Grulla Ct., Norco, Calif. 91760
Filed Dec. 30, 1988, Ser. No. 292,224
Int. Cl.⁴ B63C 11/16

U.S. Cl. 128—201.11

17 Claims



1. A snorkel device comprising:
 - a conduit having first and second ends thereof;
 - said first end of said conduit being open whereby it is unobstructed and freely admits ambient fluid into said conduit;
 - mouthpiece means joined to said second end of said conduit and communicating fluid flow with said conduit;
 - a chamber intersecting said conduit intermediate said first and second ends of said conduit, said chamber intersection communicating fluid flow with said conduit;
 - a mobile member situated in said chamber, said mobile mem-

ber substantially blocking outward fluid flow in said conduit when water is flooding said chamber; and

purge valve means disposed below said chamber, said purge valve means arranged to selectively provide unidirectional flow from said conduit to ambient.

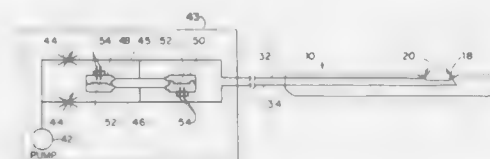
4,872,454

FLUID CONTROL ELECTROSURGICAL DEVICE

Egidio L. DeOliveira, Fairport, and John R. Scoville, Henrietta, both of N.Y., assignors to Lucas DeOliveira, Fairport, N.Y.
Continuation-in-part of Ser. No. 47,502, May 7, 1987, abandoned, which is a continuation of Ser. No. 787,685, Oct. 15, 1985, abandoned. This application Feb. 7, 1989, Ser. No. 307,050
Int. Cl.⁴ A16B 17/36

U.S. Cl. 128—303.14

10 Claims



1. A control device for use with an electrosurgical generator having two different electrical output modes comprising:

- (a) a handpiece having at least two exhaust ports;
- (b) a pressure source for providing a continuous flow of a fluid to each of said at least two exhaust ports;
- (c) a transmission tube having at least two passageways for connecting said pressure source to each of said at least two exhaust ports of said handpiece;
- (d) a fluid pressure responsive switch means connected by said passageways to said exhaust ports and a pressure source for activating one of said output modes in response to the blockage of at least one of said exhaust ports; and
- (e) a blade at one end of said handpiece, said blade being electrically connected to the output of said electrosurgical generator.

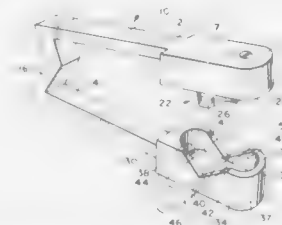
4,872,455

ANASTOMOSIS TRIMMING DEVICE AND METHOD OF USING THE SAME

Leonard Pinchuk, and Martin, Jr. John B., both of Miami, Fla., assignors to Corvita Corporation, Miami, Fla.
Continuation of Ser. No. 125,810, Nov. 25, 1987, abandoned, which is a continuation of Ser. No. 869,299, Jun. 2, 1986, abandoned. This application Dec. 30, 1988, Ser. No. 292,643
Int. Cl.⁴ A61B 17/32

U.S. Cl. 128—305

25 Claims



1. A reusable/disposable device for trimming an end section of a tubular structure, such as a vascular graft or a blood vessel which is to be sutured to another tubular structure, to provide the trimmed end with a smooth, reproducible shape, the end being trimmed in such a manner as to mate with the second tubular structure, to form an end-to-end anastomosis, or to mate with an incision on the side of a structure to form an end-to-side anastomosis, said device comprising first and second element mounting structures coupled to each other in a manner allowing at least one of said structures to move relative to the other structure and each having an elongate axis and an opposing surface; said opposing surface of said first element mounting structure including means for mounting a replace-

able cutting element parallel to said elongate axis thereof; said cutting element including a blade carrier and a single-edged, cutting blade of predetermined length mounted approximately centrally of said carrier; said cutting blade having a curvilinear shape along the length thereof and said cutting blade extending a predetermined distance outwardly from said carrier, which distance is equal along the length of the blade, and facing toward said opposing surface of said second element mounting structure; said opposing surface of said second element mounting structure including means for mounting a replaceable mating element parallel to said elongate axis thereof; said mating element having a cutting board-like surface which faces said cutting element and which, upon movement of one of said first and second element mounting structures toward the other structure, bears against said blade of said cutting element along the length of said blade; said mounting structure for said mating element including alignment means adapted to receive an end section of a tubular structure therein, said tubular structure adapted to extend across said mating element and be maintained in alignment relative to said cutting element by said alignment means to provide means by which an end section of said tubular structure can be reproducibly trimmed.

4,872,456

TEMPLATE INCISION DEVICE

Harrieth M. Hasson, P.O. Box 14898, Chicago, Ill. 60614
Filed Nov. 12, 1987, Ser. No. 119,488
Int. Cl.⁴ A61B 17/28

U.S. Cl. 128—321

21 Claims



1. A device for use in laser surgery, comprising:
 - a first jaw having serrations on one surface;
 - a second jaw pivotable to engage a facing surface with the first jaw one surface, said second jaw facing surface having opposite serrations for clamping tissue between said jaws, and said second jaw having a slot therethrough open to said first jaw to provide a guide for laser cutting; and
 - means for pivoting said first and second jaws together for clamping,
 - said first jaw having a solid surface to block passage of a laser beam directed through said slot in the second jaw with the first and second jaws together for clamping to thereby prevent damage to tissue behind said first jaw.

4,872,457

APPARATUS FOR ASSISTED PARTURITION OF LIVESTOCK AND METHOD OF MAKING SAME
Howard D. Thompson, Rte. 4, Box 186, Brenham, Tex. 77833
Filed Apr. 21, 1988, Ser. No. 184,138
Int. Cl.⁴ A61B 17/42

U.S. Cl. 128—352

11 Claims



1. An apparatus for assisted delivery of livestock comprising

rope having a first segment, a second segment, a third segment, and a fourth segment:

said first segment being hollow woven and having a first axially oriented, central channel with a first aperture and a second aperture, said second aperture being displaced longitudinally on said rope from said first aperture;

said second segment being hollow woven and having a second axially oriented, central channel with a third aperture and a fourth aperture, said fourth aperture being displaced longitudinally on said rope from said third aperture, said second segment being displaced longitudinally on said rope from said first segment by said third segment which extends between said first segment at said second aperture and said second segment at said third aperture; said fourth segment extending as a continuation of said first segment, forming a first loop and turning to enter said first channel at said first aperture, extending through said first channel, exiting said first channel at said second aperture, spanning between said first segment and said second segment, entering said second channel at said third aperture, extending through said second channel, exiting said second channel at said fourth aperture, extending past said fourth aperture forming a second loop and merging with the remainder of said rope as an extension of said second segment;

said first segment acting as a first adjustment arrester for arresting movement of said fourth segment inside said first channel when a traction force is applied to said first segment so said first loop is adjustable in size so long as no traction force is applied to said first segment, and is substantially fixed in size when a traction force is applied to said first segment;

said second segment acting as a second adjustment arrester for arresting movement of said fourth segment inside said second channel when a traction force is applied to said second segment so said second loop is adjustable in size so long as no traction force is applied to said second segment, and is substantially fixed in size when a traction force is applied to said second segment;

said first and second loops for placement about a livestock fetus' forelimbs for applying a traction force to said fetus, said loops when adjustable facilitating ease of engagement with said fetus and when fixed for safely applying said traction force without danger of crushing said forelimbs.

4,872,458

THERMOTHERAPY APPARATUS

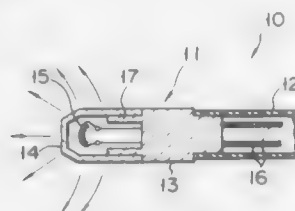
Katsuyuki Kanehira, Syuichi Takayama, Atsushi Amano; Hiroki Hibino; Naoki Uchiyama, and Akio Nakada, all of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan
Filed Sep. 8, 1987, Ser. No. 94,377

Claims priority, application Japan, Sep. 16, 1986, 61-217517; Sep. 16, 1986, 61-217518

Int. Cl.⁴ A61F 7/12

U.S. Cl. 128—401

20 Claims



1. A thermotherapy apparatus which is inserted in a body cavity through a medical tool in order to perform thermotherapy of a diseased part of a tumor in a living body, comprising:
a probe sized for insertion in a body cavity through an endoscope, said probe having a distal end portion adapted to project into the body cavity through an endoscope;
a heating portion provided in said distal end portion, and having a far-infrared radiation ceramic member and a heater for heating said far-infrared radiation ceramic member;

wherein said probe has an elongated guide tube adapted to be inserted in an endoscope, and a mounting member, one end of which is fixed to a body cavity side of said guide tube, said far-infrared radiation ceramic member of said heating portion being mounted on the other end of said mounting member;

wherein said far-infrared radiation ceramic member is formed to have a cap-like shape having a closed end portion at the side of a body cavity, said heater being arranged therein.

4,872,459

PACEMAKER FOR DETECTING AND TERMINATING A TACHYCARDIA

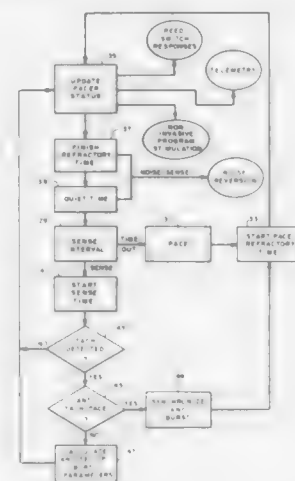
Benjamin D. Pless, Palo Alto, and Michael B. Sweeney, Mountain View, both of Calif., assignors to Intermedics, Inc., Angleton, Tex.

Division of Ser. No. 765,047, Aug. 12, 1985, abandoned. This application May 27, 1988, Ser. No. 199,998

Int. Cl.⁴ A61N 1/36

U.S. Cl. 128—419 PG

10 Claims



1. A method for detecting a pace-terminable tachycardia condition, comprising the steps of:

- detecting consecutive electrical cardiac events which each define a time interval with respect to an immediately preceding event;
- detecting at least three consecutive high rate cardiac events and associated time intervals which are each less than a predefined tachycardia time interval;
- defining an average rate stability interval as the average of the longest and the shortest of the time intervals of said at least three consecutive high rate events;
- counting each detected consecutive rate stable event which has an associated interval which is less than said tachycardia interval and which does not vary by more than a predefined amount of interval change from said defined average rate stability interval;
- setting the count to zero and returning to step b. if an event is detected with an interval greater than the tachycardia time interval;
- setting the count to zero, defining a new average rate stability interval based upon the most recently detected three events and associated intervals and returning to step d. if an event is detected with an interval that varies by more than said predefined amount of interval change from the then defined average rate stability interval, and
- detecting a pace-terminable tachycardia condition when a predefined number of rate stable events is counted.

4,872,460

NONCONTACT TYPE TONOMETER

Kouji Nishio, and Yoshihiko Hanamura, both of Tokyo, Japan, assignors to Tokyo Kogaku Kikai Kabushiki Kaisha, Tokyo, Japan

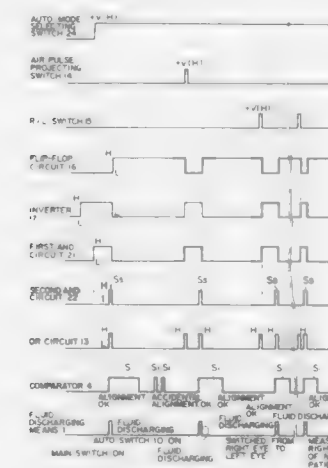
Filed Aug. 19, 1987, Ser. No. 87,039

Claims priority, application Japan, Aug. 21, 1986, 61-195832; Aug. 21, 1986, 61-195833

Int. Cl.⁴ A61B 3/16

U.S. Cl. 128—648

7 Claims



1. A noncontact type tonometer comprising:
fluid discharging means for discharging a fluid towards the cornea of an eye to be tested along an axis thereof;
alignment detecting means for detecting an alignment between the axis of said fluid discharging means and the vertex of said cornea, and for outputting an alignment signal when the alignment occurs;
alignment completion determining means for determining whether or not the alignment had been completed upon receipt of the alignment signal from said alignment detecting means and outputting an alignment completion signal when the alignment has been completed; and
controlling means for outputting an action command signal for automatically performing the fluid discharge of said fluid discharging means based on the alignment completion signal, said controlling means being provided with a delaying means for delaying an outputting time point of an action command signal for a next following fluid discharge with respect to an outputting time point of the action command signal for a preceding fluid discharge, so that the next following fluid discharge will be prohibited for a predetermined time from the preceding fluid discharge.

4,872,461

ELECTRONIC BLOOD PRESSURE METER HAVING IMPROVED CUFF REPRESSURIZATION MEANS

Yoshinori Miyawaki, Yawata, Japan, assignor to Omron Tateisi Electronics Co. and Isao KAI, both of Kyoto, Japan

Filed May 31, 1988, Ser. No. 200,551

Claims priority, application Japan, Oct. 15, 1987, 62-260329

Int. Cl.⁴ A61B 5/02

U.S. Cl. 128—681

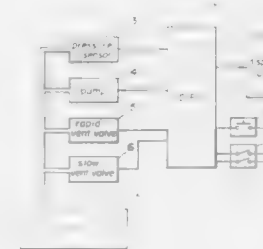
16 Claims

1. An electronic blood pressure meter, comprising:
a cuff which can be pressurized into applying pressure to a part of a human patient;
pressurization means for pressurizing the cuff, wherein said pressurization means initially pressurizes the cuff to an initial cuff pressure which may or may not be above the systolic pressure of said patient;
depressurization means for depressurizing the cuff;
pressure sensing means for detecting a pressure of the cuff

while said depressurization means is depressurizing said cuff and for providing an output thereof;
blood vessel information detecting means for detecting blood vessel information of the part of the human patient and for providing an output thereof;

detecting means for detecting, based on said blood vessel information, whether the initial cuff pressure was below the systolic pressure of the patient;

predicting mean, responsive to detection of a sub-systolic initial cuff pressure, for computing a predicted systolic pressure value from the outputs of the pressure sensing means and from the blood vessel information detecting means;



repressurization level determining means for determining a repressurization level based on the predicted systolic pressure value computed by said predicting means if said detecting means detects a sub-systolic initial cuff pressure; repressurization means for instructing said pressurization means to pressurize said cuff to said repressurization level if said detecting means detects a sub-systolic initial cuff pressure; and
blood pressure value determining means for determining systolic and diastolic pressure values according to said outputs from the blood vessel information detecting means and the pressure sensing means.

4,872,462

PROPHYLACTIC APRON

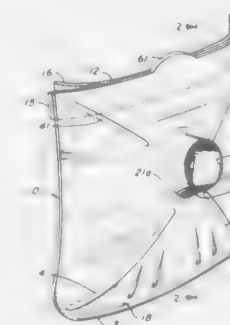
Gilbert Salz, 22702 Via Rodrigo, Mission Viejo, Calif. 92692, and Mark Sullivan, 24953 Paseo de Valencia, #8C, Laguna Hills, Calif. 92653

Filed May 18, 1988, Ser. No. 195,258

Int. Cl.⁴ A01G 5/42

U.S. Cl. 128—842

2 Claims



1. A flexible shield conformed for attachment to the person of a male user, comprising:
a resilient, thin, pliable membrane of substantially rectangular planform defined by an upper edge, and lateral edges extending therebetween;
an adhesive strip formed on the surface of said membrane in adjacent proximity with said upper edge;
a peelable cover releasably adhered to said strip;

- a frustoconical, tubular segment extending from said membrane proximate the center thereof defined by a peripheral wall of axially decreasing thickness towards the end opening thereof;
- a sectionally enlarged edge bead formed in said membrane at the lower edge thereof; and
- a plurality of elongate sectionally enlarged ribs formed in said membrane and aligned radially from said tubular segment toward said edges of said membrane, whereby said ribs and said edge bead cooperate to expand said membrane.

4,872,463

CONDOM APPLICATOR

Taiji Nishizono, Kuki, Japan, assignor to K.K. Chibakou Shoji, Chiba, Japan

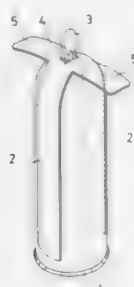
Filed Jul. 13, 1987, Ser. No. 72,332

Claims priority, application Japan, Sep. 12, 1986, 61-141212

Int. Cl.⁴ A61F 5/44

U.S. Cl. 128—844

3 Claims



3. A condom applicator for use with a condom having a hem ring at one end, a sheath, and a pocket at the end remote from the hem ring, the condom applicator comprising a single and continuous strip for being placed on opposing sides of the sheath and to be rolled therewith, the strip in use extending over the pocket and including a slot through which the pocket is adapted to pass, and be held in a substantially airtight manner, and at least one pull tab attached to the strip along the length thereof near the slot, wherein pulling upon the tab causes the condom to unroll.

4,872,464

PUBIC PROPHYLACTIC WITH SNAP-OVER SHIELD

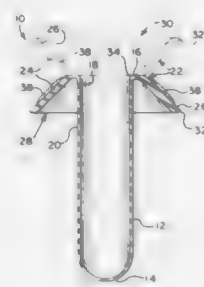
Marvin P. Loeb, Huntington Beach, Calif., and John F. Perry, Vernon Hills, Ill., assignors to Xtramedica, Inc., Deerfield, Ill.

Filed Aug. 4, 1987, Ser. No. 81,360

Int. Cl.⁴ A61F 5/44

U.S. Cl. 128—844

14 Claims



1. An improved condom having a two-position public pubic area shield comprising:
an elastic, elongated tubular penis enclosing member having

a longitudinal axis, an inner surface, an outer surface, an open proximal end, and a closed distal end;

a generally frusto-conically configured, self-supporting, resilient pubic area shield member having opposed first and second side surfaces and a central aperture defined therein whose diameter approximates the diameter of said proximal end, and having a peripheral rim in radially and diagonally outwardly spaced relationship to said aperture; annular flexible joining means interconnecting said proximal end with said shield member circumferentially about said aperture whereby said first surface is generally coextensive with said outer surface, and said second surface is generally coextensive with said inner surface;

said shield member being longitudinally invertable about said annular joining means from a first stable configuration to a second stable configuration;

said first configuration corresponding to a storage configuration wherein said tubular member, when longitudinally collapsed, is generally nestably receivable with said shield means;

said second configuration corresponding to a use configuration wherein said tubular member, when extended, projects away from said shield member; and

said second surface being provided with a bioadhesive.

4,872,465

LIGHT-WEIGHT DISPOSABLE PROTECTIVE FACE SHIELD

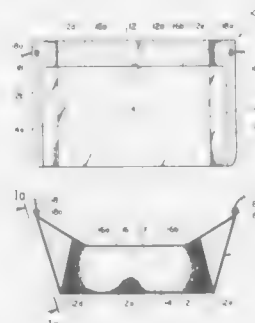
David H. Kuntz, 11810 Bel Ter., Los Angeles, Calif. 90049, and Louis F. Muller, 919 Main St., El Segundo, Calif. 90245

Continuation-in-part of Ser. No. 138,070, Dec. 28, 1987, Pat. No. 4,825,878. This application Dec. 9, 1988, Ser. No. 281,743

Int. Cl.⁴ A61F 9/04

U.S. Cl. 128—857

10 Claims



1. A light-weight, disposable face shield assembly for the protection of the eyes and face of a wearer from accidental exposure to infectious, hazardous or undesirable substances, said face shield assembly comprising:

- (a) an elongated, generally rectangular, semi-flexible, transparent face protection panel including a central panel section and like side panel sections foldable rearwardly along vertical fold lines with respect to the central panel section;
- (b) an elongated, semi-flexible head support strip for said face protection panel in alignment with the upper portion of said panel and having a length that is less than the length of said face protection panel, said head support strip including a central strip portion and like side strip portions foldable rearwardly along vertical fold lines with respect to the central strip portion with the fold lines of said head support strip lying within the fold lines of said face protection panel;
- (c) means for attaching the ends of said head support strip to the ends of said face protection panel in its upper portion whereby said panel is supported in spaced orientation from said head support strip; and
- (d) means attached to said head support strip at the ends

thereof for maintaining said strip in position about the forehead of a wearer of said face shield assembly whereby said face protection panel is formed up into rigidly-supported arcuate spaced protection orientation about the face of a wearer.

4,872,466

LOW ENERGY, LOW WATER CONSUMPTION WAREWASHER

Tore H. Noren, Petaluma, Calif., assignor to Hobart Corporation, Troy, Ohio

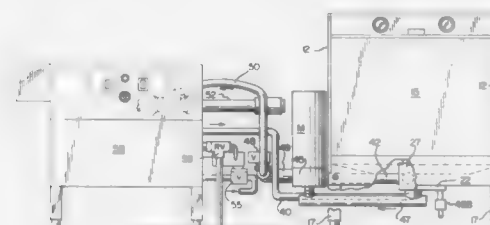
Division of Ser. No. 833,946, Feb. 26, 1986, Pat. No. 4,810,306.

This application Dec. 12, 1988, Ser. No. 282,664

Int. Cl.⁴ A47L 15/16

U.S. Cl. 134—57 D

9 Claims



1. In a warewasher for use in commercial establishments using a single batch of water for washing and rinsing a rack of ware and operating on a cycle time in the order of three minutes or less,

- a wash chamber,
- a door for opening and closing said chamber for introduction of a rack of soiled ware into the chamber and removal therefrom upon completion of washing and rinsing,
- a sump at the bottom of the chamber for holding water for use as a supply in washing the ware,
- at least one wash arm within said chamber and having a plurality of wash nozzles,
- recirculating pump means having an inlet connected to said sump and an outlet connected to said wash arm whereby during operation of said pump means said wash arm provides pressurized spraying of recirculated wash water from said sump onto the ware on the rack,
- a supply of fresh water under pressure located outside said chamber,
- rinse nozzles in said chamber located to spray rinse water over a rack of ware and being in fluid communication with said fresh water supply,
- valve means intermediate said water supply and said rinse nozzles for enabling rinsing of washed ware in response of opening of said valve means,
- drain means for draining a first portion of the wash water from said sump upon completion of washing a rack of ware,
- means for retaining a second portion of said wash water for use as wash water for a second rack of ware, and
- control means for operating said recirculating pump means to recirculate wash water onto the ware for washing the ware and then operating said drain means to remove the first portion of wash water from the sump and to retain the second portion, thereafter opening the valve means to rinse ware with fresh water through said rinse nozzles, and then closing said valve means upon rinsing the ware to complete the cycle for a given rack of ware and to add the fresh rinse water to the retained portion of the wash water.

4,872,467

DEVICE FOR RINSING CONTAINERS

Patrick Ballu, Reims, France, assignor to Tecnomat, Epernay, France

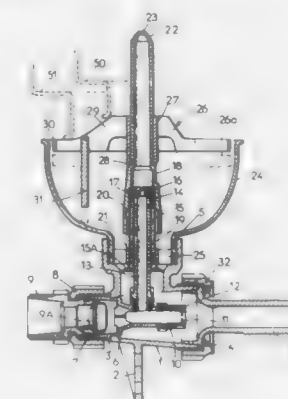
Filed Nov. 18, 1988, Ser. No. 272,927

Claims priority, application France, Nov. 30, 1987, 87 16561

Int. Cl.⁴ B08B 3/02, 9/08

U.S. Cl. 134—104.2

8 Claims



1. A device for rinsing containers in which a onepiece assembly comprising:

- inlet means for a pressurized rinsing liquid,
- a channel connected to said inlet means and provided with a nozzle located at the end of a conduit capable of penetrating in said container via an orifice of said container and capable of spraying rinsing liquid towards the inner walls of the container,
- a funnel capable of collecting the polluted liquid escaping from the container via said orifice, and
- a polluted liquid ejector fed via a branch from the rinsing liquid supply, having an inlet connected to said funnel and an outlet for the polluted liquid mixed with the fraction of rinsing liquid which supplies said ejector.

4,872,468

SAFETY UMBRELLA

Ronald S. Cole, 209 Bache Ave., Staten Island, N.Y. 10306

Filed Oct. 14, 1988, Ser. No. 258,004

Int. Cl.⁴ F21V 33/00

U.S. Cl. 135—16

2 Claims



1. A safety umbrella which comprises a pole, a flashlight handle secured to said pole, for providing better visibility to passing motorists, and a canopy secured to said pole having a glowing and reflective strip, for adding visibility to said passing motorists, said flashlight handle being formed in one piece of plastic material in an L-shaped configuration having a base portion extending horizontally from a vertical, gripping portion with the umbrella opened in an upright, protective condition, a bore extending into the base portion from the free end thereof and a battery, a bulb, a reflector and a coil spring

received in said bore, a threaded lens cap threadedly received on the free end of said base portion, a transparent lens fixedly secured to said lens cap closing the bore, with the lens and reflector having their optical axes extending along the handle base portion so as to direct light from the bulb through the free end of the bore in a horizontal direction, an on-off switch being mounted at an upper end of said gripping portion of said handle and circuit means extending between said on-off switch, said battery and said bulb, the vertical, gripping portion of the handle being formed with a bore extending axially inwardly from an uppermost end thereof providing a socket receiving said pole whereby said handle is secured to said pole, said flashlight handle further comprises lighting means that includes an optical fiber having one end fixedly secured in an opening provided through said reflector, and another end of said optical fiber engages with an upwardly domed lens fixedly secured to a top of the gripping portion of said flashlight handle of said umbrella.

4,872,469

CRUTCH WITH STAIR DEFLECTOR

Jim Schultz, Simi Valley, Calif., assignor to Guardian Products, Inc., Calif.

Filed Nov. 22, 1985, Ser. No. 800,697

Int. Cl.⁴ A61H 3/02

U.S. Cl. 135—69

6 Claims



1. In a crutch of the type including two bow members having upper ends attached to an arm support and parallel lower ends, a footpiece mounting tube affixed lower end, a footpiece telescopically slidable within said mounting tube for adjusting the overall length of the crutch, and a manually releasable fastener means for locking the footpiece to said mounting tube at a first location upwardly removed from said open lower end against said sliding movement, the improvement comprising:

a unitary end cap having three sockets defined in its upper side for receiving and interconnecting the lower ends of said mounting tube and said bow members, the lower end of one of said sockets defining a bushing at the lower end of said mounting tube, said bushing closely fitting the cross-section of said footpiece and cooperating with said fastener means to support the footpiece at a second location axially spaced from said first location thereby to prevent wobbling of the footpiece within said mounting tube, the bottom of said end cap defining stair deflecting lower edges comprising surfaces tapering inwardly from the lower ends of the bow members to said bushing.

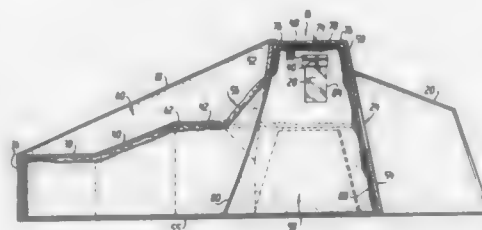
4,872,470
PORTABLE EMERGENCY SHELTER
John P. Hayashida, and Roger P. Bowman, both of Waterloo, Canada, assignors to Her Majesty the Queen in right of Canada, Canada

Filed Mar. 11, 1988, Ser. No. 166,899

Int. Cl.⁴ E04H 15/36

U.S. Cl. 135—97

14 Claims



1. An emergency shelter of the type comprising a thermally insulating shell and a canopy over the shell, wherein the thermally insulating shell is of elongate form, tapered from a head end to a foot end and includes:

- a foot section adjacent the foot end, dimensioned to accommodate the feet of a user;
- a head section adjacent the head end, with a height greater than that of the foot section and dimensioned to accommodate the head and torso of a user in an upright orientation;
- a knee section between the head and foot sections adjacent the foot section, with a height between those of the foot and head sections and dimensioned to accommodate the flexed, upright legs of a user;
- a transition section joining the head and knee sections and a canopy of flaccid material enclosing and spaced from the foot, knee and transition sections of the thermally insulating shell to define a heat transfer chamber between those sections and the canopy.

4,872,471

SEPARABLE AND BREAKAWAY VALVE INTERCONNECTING A FLUID LINE

Peter J. Schneider, 2480 Calle Narciso, Thousand Oaks, Calif.

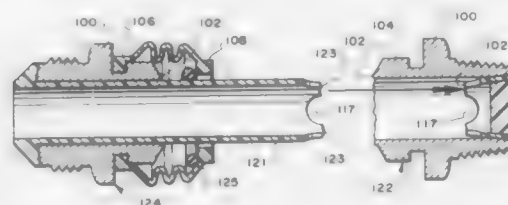
Int. Cl.⁴ F16L 29/00

Filed Sep. 21, 1988, Ser. No. 247,205

Int. Cl.⁴ F16L 29/00

U.S. Cl. 137—68.1

24 Claims



1. A separable valve interconnecting a fluid line to another fluid line or tank for holding fluids comprising:

- a generally cylindrically shaped coupler having a stationary section and a breakaway section axially aligned with each other;
- said breakaway section and said stationary section defined by a frangible groove circumferentially positioned between said breakaway and stationary sections of said coupler;
- a generally axially positioned bore extending through said coupler and having a first and second opening at opposite ends of said coupler;

a plastic seal tube having a first end and a second end and having a length in excess of the length of said axial bore of said coupler and slideably positioned in said bore;

said plastic seal tube having a hollow tube means for allowing fluid passage;

said plastic seal tube having a sealing means toward said first end;

said plastic seal tube having a cap means inserted at said first end, said cap means and said sealing means forming a plug means for sealing off said bore of said coupler in the event of separation of said breakaway and said stationary sections of said coupler;

said hollow tube of said plastic seal tube having at least one flow through port means towards said first end for allowing fluid to pass through;

said plastic seal tube having stop means at its said second end for maintaining said hollow tube in said axial bore, and for maintaining said first end of said tube and said flow through port extending from said first opening of said axial bore when said valve is in its normal operating position;

said frangible groove positioned between said sections of said coupler will fracture upon sufficient force applied to the separable valve causing said sections of said coupler to pull apart;

said stop means at said second end of said plastic seal tube moving with said separating breakaway section of said coupler thereby pulling said first end of said seal tube into said axial bore at said first opening and sealing off said bore by preventing fluid escape through said bore;

the continued pulling away of said stop means of said plastic seal tube and said breakaway section of said coupling resulting in strain on said hollow tube resulting in separation of said hollow tube from said first end near said flow through port thereby allowing complete separation of said breakaway and said stationary sections of said coupler.

4,872,472

FLUID PRESSURE REGULATING VALVE

Jean-Claude A. Lefevre, Cote-la-Forêt, and Antoine T. Mauboussin, Montfermeil, both of France, assignors to Case Po-plain, Le Plessis Belleville, France

Filed Jul. 10, 1981, Ser. No. 282,131

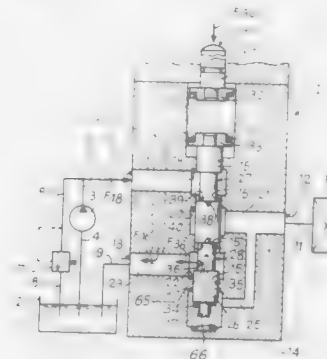
Claims priority, application France, Jul. 21, 1980, 80 16040;

Jun. 2, 1981, 80 10921

Int. Cl.⁴ G05B 9/00

U.S. Cl. 137—116.3

2 Claims



1. A fluid pressure regulating valve comprising:

- (a) a valve body comprising an admission chamber for receiving fluid of a first pressure level from a source of pressurized fluid, a discharge chamber for discharging the fluid having a second pressure level to a regulated pressurized fluid using device, said second pressure level being less than said first pressure level, a fluid return chamber for receiving the fluid of a third pressure level and for returning the fluid to a non-pressurized reservoir, said third pressure level being not greater than said second

pressure level, a cavity, and a bore in communication with each of said admission chamber, said return chamber and said cavity;

(b) a regulating slide valve movably mounted within said bore to one of the following three positions:

- (1) a first position in which said slide valve establishes a first fluid path through said bore between said discharge chamber and said admission chamber, and isolates said discharge chamber from said return chamber, said slide valve and said bore defining in said first position an adjustable space therebetween as said slide valve is moved;
 - (2) a second position in which said slide valve establishes a second fluid path through said bore between said discharge chamber and said return chamber, said slide valve and said bore defining in said second position an adjustable space therebetween as said slide valve is moved, and
 - (3) an intermediate position in which said slide valve substantially isolates said discharge chamber from said admission chamber except for a leaking flow from said admission chamber towards said discharge chamber;
- (c) an actuatable member for disposing said slide valve towards its first position;
- (d) spring means being disposed between said actuatable member and said slide valve;
- (e) first means for defining a first communication conduit between said discharge chamber and said cavity, whereby the fluid pressure within said cavity tends to displace said slide valve in a direction from its intermediate position towards its second position; and
- (f) second means for defining a second communication conduit, in said intermediate position of said slide valve, between said cavity and said return chamber, said second communication means comprises means for forming a calibrated restriction having dimensions selected so that the flow rate of the fluid flow passing through said second communication conduit is not greater than the flow rate of said leaking flow, said second defining means unblocks, in said intermediate position of said slide valve, said second communication conduit and blocks said second communication conduit in said first position of said slide valve.

4,872,473

DUAL FLOAT VALVE CONTROL FOR REGULAR AND DOUGLAS TYPE VALVE

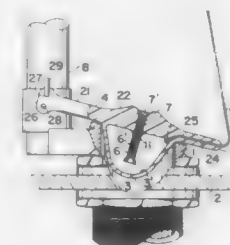
Michael Agostino, 101-A Spring St., St. Augustine, Fla. 32084

Filed Mar. 30, 1988, Ser. No. 175,308

Int. Cl.⁴ E03D 1/34, 1/35

U.S. Cl. 137—270

19 Claims



1. A unitary and reversible buoyant and non-buoyant flush tank valve adapted for use in various types of flush tanks each having a different selective valve operating means for moving said valve, a water inlet, an inlet valve, a water outlet with a valve seat thereat selectively closable by said valve and an upstanding overflow pipe adjacent the water outlet, said valve comprising an elongated base with opposite end portions, said base having at one of its said end portions first attachment means for selectively connecting the valve operating means

thereto for moving said valve to a first position in which said valve is open and a second position in which said valve is closed on the valve seat, said base having at another of said end portions first mounting means for selectively attaching said valve onto the upstanding overflow pipe for movement between said first and second positions, said elongated base having opposite generally planar sides and a generally vertical extending hollow frusto-conical cup member on one of said sides defining an interior surface, said base and said cup member being reversible between a buoyant and non-buoyant position, said cup member being selectively disposed downwardly when said flush valve is mounted in the buoyant position and located within the water outlet when said flush valve is in said second position, said cup member being selectively disposed upwardly when said flush valve is mounted in the non-buoyant position, said base having second attachment means for selectively connecting the valve operating means thereto, said second attachment means including first and second oppositely disposed bores having interior threads, said bores being affixed to said base, said first bore being adapted to be selectively engaged by a substantially vertical rod having exterior threads at the lower end portion thereof for disposing said cup member downwardly, or said second bore for disposing said cup member upwardly, said second attachment means being selectively connected to the valve operating means via the substantially vertical rod for movement in the vertical direction to move said valve between said first and second positions, wherein only one of said mounting means being selective depending on which different valve operating means is to be utilized with said flush valve in the various types of flush tanks.

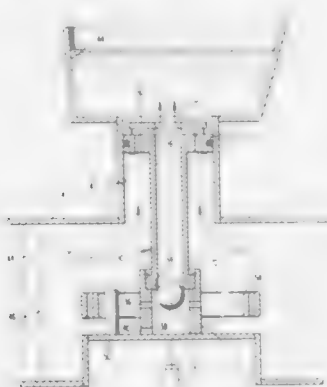
4,872,474 DIVERTER VALVE

Philip N. Middleton, Chantilly, Va.; Glen R. Green, Boise, Id., and Harry Girlock, Mountaintop, Pa., assignors to Ore-Ida Vended Products, Inc., Boise, Id.

Filed Oct. 14, 1988, Ser. No. 257,924
Int. Cl.⁴ F16K 17/18

U.S. Cl. 137—493.8

9 Claims



1. A diverter valve for controlling fluid flow through a generally cylindrical passage between an expansible chamber and a second chamber comprising:

- a valve body having a first end connected to the expansible chamber and a second end disposed in the generally cylindrical passage, defining a generally longitudinal fluid channel, having a radial enlargement in the fluid channel at the first end, and having at least one lateral opening through the valve body between the radial enlargement and the first end;
- a valve flange attached to the second end of the valve body, having an outside diameter sized to provide a running fit with the generally cylindrical passage, and having a plurality of axially-extending openings therethrough;
- an annular valve ring mounted to the valve body, axially movable relative to the valve flange, and having a position

where the valve ring covers the axially-extending openings of the valve flange; and
a valve ball in the fluid channel between the radial enlargement and the first end, having a position engaging the radial enlargement which blocks fluid communication between the radial enlargement and the lateral opening.

4,872,475

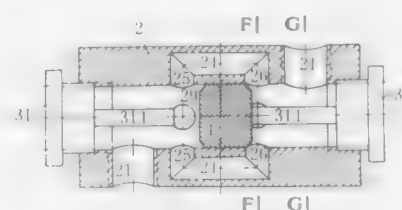
ADJUSTABLE DIFFERENTIAL FLOW SHUTTLE VALVE Zeng Xiang-Wei, 11 4th Block South Renmin Road, Chengdu, Sichuan Province, China

Filed Apr. 22, 1988, Ser. No. 184,741

Claims priority, application China, Apr. 28, 1987, 87103004-2
Int. Cl.⁴ F16K 15/02, 17/26

U.S. Cl. 137—493

11 Claims



1. Adjustable differential flow shuttle valve comprising a shell having fluid openings for connection with pipe-lines, and a shuttle chamber connected with the fluid openings, and a plunger slidably enclosed in the shuttle chamber, wherein only two fluid openings are provided respectively at the two ends of the shell and connected with the two ends of the shuttle chamber, at least one by-pass connects the two ends of the shuttle chamber around the shuttle chamber for entire fluid flow through said valve, and two throttling control elements are placed at the two junctions of the by-pass and the shuttle chamber controlling the stroke of the plunger.

4,872,476

CHECK VALVE FOR ENGINE COOLING SYSTEM

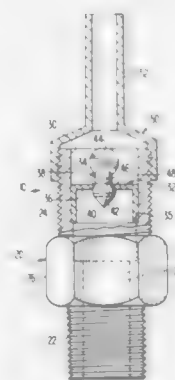
Robert P. Pflum, Indianapolis, Ind., assignor to Caltherm Corporation, Columbus, Ind.

Filed May 24, 1988, Ser. No. 197,955

Int. Cl.⁴ F16K 15/06

U.S. Cl. 137—513.5

11 Claims



1. A check valve for use in a cooling system for an engine, comprising:

- a valve body having a first port and a second port;
- a venting plug positioned in one of said ports, said venting plug having an opening permitting fluid communication

between said first and second ports and a valve seat surrounding said opening;
a valve element for closing said opening in response to fluid pressure on said valve element, said valve element including a head having a sealing surface for engaging said valve seat, an anchor positioned on an opposite side of said venting plug from said head, and a neck extending through said opening and connecting said head to said anchor, said anchor extending across said opening to prevent separation of said valve element from said venting plug; and
a bleed port extending through said venting plug, wherein said venting plug is secured in its port in a press fit.

4,872,477

SWING CHECK VALVE

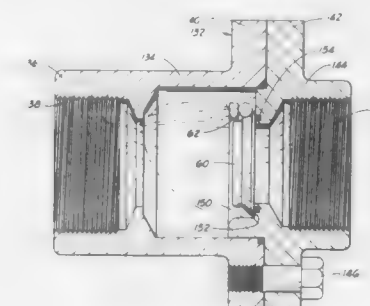
John P. Scaramucci, 10724 Woodridden, Oklahoma City, Okla. 73170

Division of Ser. No. 49,383, May 13, 1987, Pat. No. 4,809,738, which is a continuation-in-part of Ser. No. 23,786, Mar. 9, 1987, abandoned. This application Sep. 27, 1988, Ser. No. 249,942

Int. Cl.⁴ F16K 15/03

U.S. Cl. 137—515.5

3 Claims



1. A swing check valve, comprising:
a tubular valve body internally threaded at one end;
a substantially round valve disc in the valve body having a seating face and having a hinge pin thereon extending parallel with the seating face thereof; and
a tubular fitting secured to the opposite end of the valve body having one end portion thereof extending into the valve body and the opposite end portion thereof internally threaded; said one end portion forming a cage surrounding a portion of the disc when the disc is in a closed position and a valve seat adjacent the cage sized to receive the seating face of the disc; and the opposite end portions of said cage being grooved to form bearing areas to support the opposite end portions of said hinge pin, whereby the disc may swing in the valve body between open and closed positions.

4,872,478

SWING CHECK VALVE

John P. Scaramucci, 10724 Woodridden, Oklahoma City, Okla. 73170

Division of Ser. No. 49,383, May 13, 1987, Pat. No. 4,809,738, which is a continuation-in-part of Ser. No. 23,786, Mar. 9, 1987, abandoned. This application Sep. 27, 1988, Ser. No. 249,707

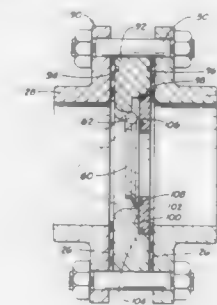
Int. Cl.⁴ F16K 15/03

U.S. Cl. 137—515.7

7 Claims

1. A swing check valve, comprising:
a tubular valve body having an annular shoulder formed therein facing one end of the valve body, said shoulder having a pair of hinge pin recesses therein facing in the same direction as the shoulder;
a substantially round disc in the body having a seating face thereon and a hinge pin thereon extending parallel with the seating face thereof, the opposite end portions of the

hinge pin journaled in said hinge pin recesses to pivotally support the disc in the valve body; and



a replaceable valve seat in the valve body abutting said shoulder and overlapping said hinge pin recesses, said valve seat having a seating face sized to mate with the seating face of the disc.

4,872,479

SWING CHECK VALVE

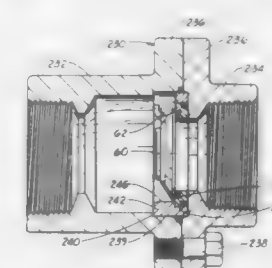
John P. Scaramucci, 10724 Woodridden, Oklahoma City, Okla. 73170

Division of Ser. No. 49,383, May 13, 1987, Pat. No. 4,809,738, which is a continuation-in-part of Ser. No. 23,786, Mar. 9, 1987, abandoned. This application Sep. 27, 1988, Ser. No. 249,868

Int. Cl.⁴ F16K 15/03

U.S. Cl. 137—515.7

1 Claim



1. A swing check valve, comprising:
a tubular valve body;
a first ring in the valve body forming a valve seat having an annular seating face thereon;
an elastomeric sealing ring in the seating face of the valve seat;
a substantially round valve disc in the valve body having a seating face sized to engage the seating face of the seat and having a hinge pin thereon extending parallel with the seating face thereof; and
a second ring in the valve body having a counter bore in one end thereof receiving the first ring and having a portion thereof forming a cage abutting the first ring and surrounding a portion of a disc when the disc is closed, the opposite end portions of said cage being grooved to form hinge pin bearing areas supporting the opposite end portions of the hinge pin thereon; each of said grooves having a width extending at a right angle to the seating face of the valve seat greater than the diameter of the hinge pin, whereby the disc can float a limited distance toward and away from the valve seat.

4,872,480 SWING CHECK VALVE

John P. Scaramacci, 10724 Woodridden, Oklahoma City, Okla. 73170

Division of Ser. No. 49,383, May 13, 1987, Pat. No. 4,809,738, which is a continuation-in-part of Ser. No. 23,786, Mar. 9, 1987, abandoned. This application Sep. 27, 1988, Ser. No. 249,998

Int. Cl.⁴ F16K 15/03

U.S. Cl. 137—527.8

5 Claims



1. A swing check valve, comprising:
 - a tubular valve body having first and second ends;
 - a first ring in the valve body having one end thereof substantially coterminous with the first end of the body and the second end thereof forming a valve seat having a seating face extending normal to the axis of the valve body;
 - a substantially round valve disc in the valve body having a seating face sized to engage the seating face of the seat and having a hanger pin thereon extending parallel with the seating face thereof; and
 - a second ring in the valve body abutting the first ring and forming a cage surrounding the disc when the seating face of the disc engages the seating face of the valve seat; the end face of said second ring facing the valve seat having a pair of grooves therein receiving the opposite end portion of the hinge pin for pivotally supporting the valve disc in the valve body, and the opposite end face of said second ring being substantially coterminous with the second end of the valve body.

4,872,481

POPPET VALVE FLOW SEAT

Richard E. Shaw, Inman, and Steven R. Wolverton, Simpsonville, both of S.C., assignors to Cooper Industries, Inc., Houston, Tex.

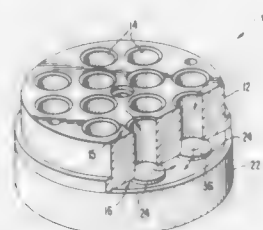
Continuation of Ser. No. 710,715, Mar. 12, 1985, abandoned.

This application Jun. 12, 1986, Ser. No. 873,862

Int. Cl.⁴ F16K 15/00

U.S. Cl. 137—543.17

12 Claims



1. In a poppet valve seat assembly including a seat member having a surface with at least one port, the port having an exit forming an edge with the adjacent portion of the surface, the seat assembly for use with a poppet movable into, and out of, engagement with the seat member for sealing, and unsealing, the port exit, respectively, the improvement comprising:
 - (i) a chamfer formed at the edge of the port exit; and
 - (ii) a counter-bore formed in the port exit edge immediately

upstream of said chamfer with respect to the flow direction through the port.

4,872,482

REMOTELY CONTROLLED OPERATOR FOR GAS CYLINDER VALVE

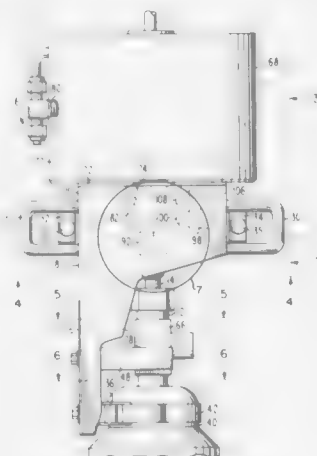
Jawrence P. Jarrett, Wind Gap, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Jun. 24, 1988, Ser. No. 211,487

Int. Cl.⁴ F16K 27/08

U.S. Cl. 137—554

20 Claims



1. An operator for the valve of a gas cylinder adapted to be mounted on the cylinder and to be remotely activated for rotating the valve stem of the valve between an open and closed position comprising:
 - a frame adapted to be mounted on the gas cylinder;
 - means for clamping the frame to a non-cylindrical portion of the valve;
 - pneumatic activating means having a housing mounted on the frame, a rotary shaft projecting from the housing in alignment with the valve stem when the frame is mounted on the cylinder and pneumatic means in said housing for selectively rotating said shaft in either direction;
 - means connected to the end of the shaft and adapted to receive the end of the valve stem; and
 - means for remotely operating the pneumatic means to selectively rotate the shaft in either direction.

4,872,483

CONVENIENTLY HAND HELD SELF-CONTAINED ELECTRONIC MANOMETER AND PRESSURE MODULATING DEVICE

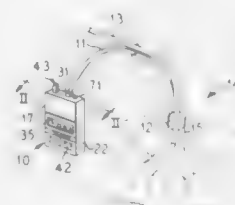
Nyan S. Shah, Mentor, Ohio, assignor to International Medical Products, Inc., Mentor, Ohio

Filed Dec. 31, 1987, Ser. No. 140,121

Int. Cl.⁴ A61M 16/04

U.S. Cl. 137—557

7 Claims



1. An electronic manometer assembly for use in monitoring pressure at a site in the body of a patient comprising:

a numerical read-out unit having a size adapted to be conveniently held in the palm of the hand of a user, said numerical read-out unit having an output passage therein; manually digitally operable pump means contained in said numerical read-out unit in fluid communication with said output passage for generating a pressure head; delivery means in fluid communication with said output passage and adapted for insertion in a patient for delivering said pressure head from said output passage to said site in said patient said delivery means terminating in an enclosed, inflatable cuff; electronic pressure transducer means in said numerical read-out unit in fluid communication with said output passage for generating an electrical signal corresponding to the pressure in said cuff of said delivery means; electronic display means in said numerical read-out unit electrically connected to said transducer means for visually displaying a number corresponding to said electrical signal and thus to said pressure in said cuff of said delivery means; and power supply means contained within said numerical read-out unit and electronically connected to said electronic pressure transducer means and to said electronic display means for supplying electrical power thereto.

4,872,484

SYSTEM FOR CONTROLLING THE FLOW OF A FLUID MEDIUM RELATIVE TO AN OBJECT

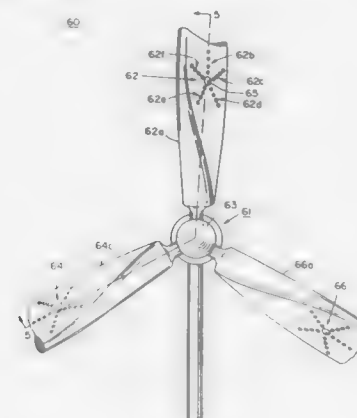
John Hickey, Apt. 4A, 27 Bowdoin St., Boston, Mass. 02114

Filed Dec. 12, 1988, Ser. No. 283,507

Int. Cl.⁴ F15B 1/00

U.S. Cl. 137—561 R

25 Claims



1. A system for controlling the flow of air relative to an object comprising:
 - an object having at least one surface in contact with the air flow;
 - a plurality of deviations on each said surface and arranged in predetermined pattern, said pattern including at least one deviation set; and
 - said pattern covering only a portion of said at least one surface and having a common central deviation with radially extending deviation sets.

4,872,485

SENSOR OPERATED WATER FLOW CONTROL

Martin J. Laverty, Jr., Earlysville, Va., assignor to Coyne & Delany Co., Charlottesville, Va.

Filed Dec. 23, 1987, Ser. No. 137,065

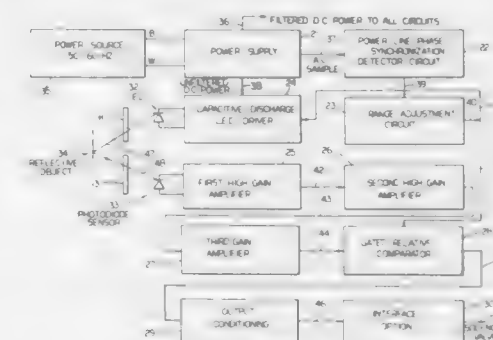
Int. Cl.⁴ F16K 31/02

U.S. Cl. 137—624.11

14 Claims

1. A system for controlling the flow of water through water supply means, including:

a sensor operatively associated with said water supply means to cause water to be supplied by said water supply means; a first control circuit coupled with said sensor for sensing and determining the continued external activation characteristic of the presence of a user or external activation proximate to said sensor and within the range of energization of said sensor and the absence of the characteristic of external activation or presence of a user; a second control circuit including water flow time commencement means responsive to said characteristic for determining the time of commencement of the flow of



water through said water supply means in response to an external activation of said sensor after the elapse of a predetermined period of time; and

- a third control circuit responsive to said second control circuit including water flow shut-off means for permitting water to flow solely for a predetermined period of time after commencement of water flow by said second control circuit, said third control circuit causing the water flow to be shut off after a predetermined period of time of water flow and overriding said second control circuit to prevent said second control circuit from commencing water flow.

4,872,486

ACCUMULATOR HAVING INCLINED COMMUNICATION HOLES

Nobuyuki Sugimura, and Kazuo Sugimura, both of 308, Mabase, Shimizu-shi, Shizuoka-ken, Japan

Filed Mar. 28, 1988, Ser. No. 174,361

Claims priority, application Japan, Apr. 7, 1987, 62-052551; Sep. 16, 1987, 62-141450

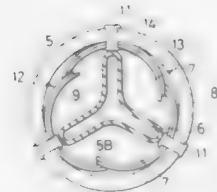
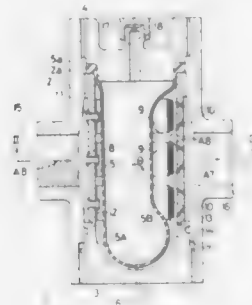
Int. Cl.⁴ F16L 55/04

U.S. Cl. 138—30

10 Claims

1. An accumulator having a vessel main body provided with a feed/discharge port or ports, a bladder for partitioning the interior of said vessel into a gas chamber and a liquid chamber, said bladder including a plurality of longitudinal thin wall portions directed in an axial direction for inducing deformation of the bladder into a regular star shape, an inner tube coaxial with the vessel main body and the bladder having communication holes disposed between said feed/discharge port or ports and said bladder, and a plurality of arcuate spring plates for opening and closing said communication holes disposed on the

inside of said inner tube; characterized in that said communication holes are inclined with respect to an axis of said vessel



main body so that streams of liquid passing through said communication holes may collide obliquely against said plates.

4,872,487

PROJECTILE-CATCHING BRAKE FOR A LOOM

Peter Riesen, Elgg, Switzerland, assignor to Sulzer Brother Limited, Winterthur, Switzerland

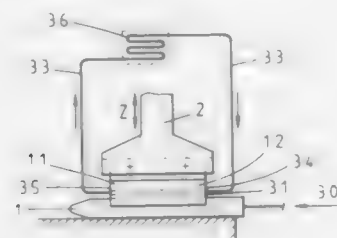
Filed Feb. 18, 1988, Ser. No. 157,382

Claims priority, application Switzerland, Mar. 5, 1987, 00826/87

Int. Cl.⁴ D03D 49/54

U.S. Cl. 139—185

15 Claims



1. In combination, a projectile-catching brake having a pair of brake shoes defining braking surfaces for catching a projectile therebetween; and cooling means for directing a continuous flow of coolant at least into the vicinity of said braking surfaces.

4,872,488

DEVICE FOR DETERMINING THE POSITION OF A WARP THREAD BREAK

Dirk Gryson, Dikkebus-Ieper, and Henry Shaw, Vieteren, both of Belgium, assignors to Picanol N.V., Ieper, Belgium

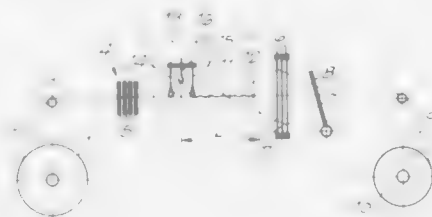
Filed Aug. 30, 1988, Ser. No. 238,124

Claims priority, application Belgium, Sep. 2, 1987, 8700983

Int. Cl.⁴ D03D 51/30

U.S. Cl. 139—353

14 Claims



1. A measuring and detecting device for determining the position of a break in a warp thread on a weaving machine, comprising:

flexible thread guides disposed a predetermined distance from each other generally in line with the warp thread; means including a hook for gripping a broken warp thread and drawing said broken thread between the thread guides, said gripping means and guides being arranged such that said broken thread contacts and flexes at least one of the guides as it is brought between them; means for measuring flexure of said at least one thread guide when the broken warp thread is drawn between the guides and for generating measurement data based on flexure of the thread guides; means for processing said measurement data to produce information indicative of the position of said break.

4,872,489

PROCESS OF PROVIDING IN A LIQUID-CONTAINING LIQUID FRICTION COUPLING AN AIR-FILLED SPACE HAVING A PREDETERMINED VOLUME

Erich Erhart, Graz St. Peter, Austria, assignor to Steyr-Daimler-Puch AG, Vienna, Austria

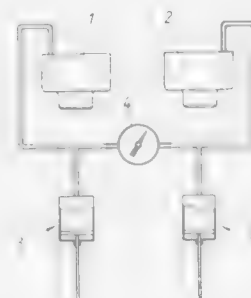
Filed Apr. 28, 1988, Ser. No. 187,487

Claims priority, application Austria, Apr. 29, 1987, 1070/87

Int. Cl.⁴ B67C 3/00; G01F 17/00

U.S. Cl. 141—5

1 Claim



1. A process of providing in a liquid-containing liquid friction coupling an air-filled space having a predetermined volume, comprising the steps of providing an air-tight reference vessel containing an air-filled space having said predetermined volume, forcing equal quantities of air into said reference vessel and into said liquid-containing liquid friction coupling, comparing the pressures in said reference vessel and in said

liquid friction coupling by means of a differential pressure indicator connected between said reference vessel and said liquid friction coupling, and adding or removing liquid in said liquid friction coupling if there is a difference between said pressures until said differential pressure indicator shows that said difference is reduced to zero.

4,872,490

GAS EVACUATION APPARATUS FOR UNDERGROUND LIQUID STORAGE TANKS AND METHOD

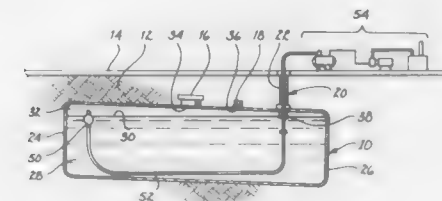
Penrod C. Geisinger, Dewey, Ariz., assignor to Vaporless Manufacturing, Inc., Prescott Valley, Ariz.

Filed Jun. 16, 1988, Ser. No. 207,395

Int. Cl.⁴ B65B 31/04

U.S. Cl. 141—7

27 Claims



1. A method for evacuating vapor pockets in liquid filled storage tanks, said method comprising the steps of:

- a. introducing a wand into the tank, which wand includes a trailing hose;
- b. propelling the wand to a vapor pocket, said step of propelling including the step of discharging a fluid from the wand to create a propulsion force;
- c. drawing the gaseous content of the vapor pocket through the wand and the trailing hose; and
- d. withdrawing the wand and the hose from the tank on completion of said step of drawing.

4,872,491

RECOVERY OF PROPELLANT FROM AEROSOL CAN FILLING OPERATION

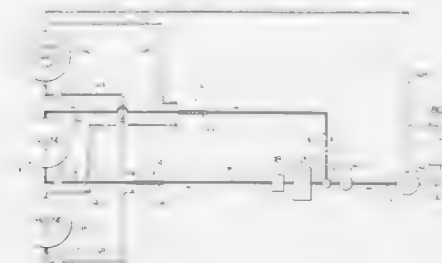
Barry E. Nickason, Scarborough, and Orazio DiGirolamo, Weston, both of Canada, assignors to CCL Industries Inc., Willowdale, Canada

Filed May 3, 1988, Ser. No. 189,946

Int. Cl.⁴ B65B 3/04, 31/00

U.S. Cl. 141—20

4 Claims



1. A system for charging aerosol spray cans with propellant, comprising:

- a first supply tank for housing a first blend of propellant,
- a second supply tank for housing a second blend of propellant,
- a scrap salvage tank for receiving propellant,
- a multiple head aerosol can propellant charging device,
- a propellant supply manifold,
- a propellant feed line connected between said propellant

supply manifold and said multiple head aerosol can propellant charging device, said supply manifold being selectively connected to one of said supply tanks, whereby liquid propellant may be fed from a selected one of said supply tanks through said supply manifold and said propellant feed line to said charging device.

pump means in said propellant feed line for pumping liquid propellant from said selected one of said supply tanks to said charging device,

a return manifold, a first propellant return line connected between said propellant feed line and said return manifold,

said return manifold selectively connecting said first propellant return line to a selected one of said supply tanks or to said scrap salvage tank, whereby liquid propellant in said propellant feed line not passing to said charging device is recycled by said first propellant feed or to said scrap salvage tank, and

a second propellant return line connected between said charging device and said scrap salvage tank for discharging propellant from said charging device to said scrap salvage tank.

4,872,492

PNEUMATIC TIRE INFLATOR

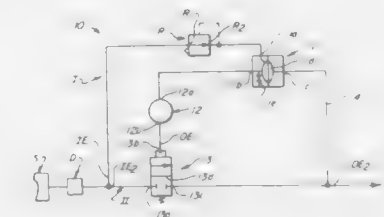
Marcus E. McAnally, Nashville, and Robert E. Gwaltney, Brentwood, both of Tenn., assignors to Hennessy Industries, Inc., LaVergne, Tenn.

Filed Apr. 11, 1988, Ser. No. 180,086

Int. Cl.⁴ B65B 31/04

U.S. Cl. 141—38

4 Claims



1. A pneumatic tire inflator requiring only a source of pressurized air and a device for controlling the air flow from the source, the air pressure of the source being greater than the desired air pressure of the inflated tire; said inflator comprising first and second air flow circuits, each having an inlet end for communicating with a discharge side of the device and an outlet end, the outlet end of said second flow circuit being adapted to communicate with an inlet valve on the pneumatic tire; the first circuit includes a manually adjustable regulator means having an inlet communicating with the first circuit inlet end and an outlet, said regulator means being preset whereby the air pressure at the outlet thereof substantially corresponds to the desired tire air pressure, a pressure sensitive first valve means biased to normally assume an open position and provided with a first inlet communicating with the outlet of said regulator means, an outlet adapted to normally communicate with said first inlet, a second inlet segregated from said first inlet and said outlet, and pressure responsive means for effecting interruption of the communication between said first inlet and said outlet when there is a predetermined pressure at said second inlet overcoming the opening bias, and air accumulator means communicating with the outlet of said first valve means and being charged with air flowing from the outlet of said first valve means, said accumulator means having an outlet communicating with the first circuit outlet end; said second circuit including a pressure sensitive second valve means biased to normally assume a close position and provide with a first inlet communicating with the second circuit inlet end, a second inlet communicating with the first circuit outlet end, an outlet com-

municating with the second circuit outlet end, and a pressure responsive means for effecting opening of said second valve means and communication between the first inlet and outlet thereof when the air pressure at the second inlet overcomes the closing bias, and the second inlet of said first valve means and the outlet end of said second circuit being in continuous communication with one another whereby the pressure responsive means of said first valve means is responsive directly to air pressure within the inflated pneumatic tire.

4,872,493

APPARATUS FOR FILLING A LINED CONTAINER

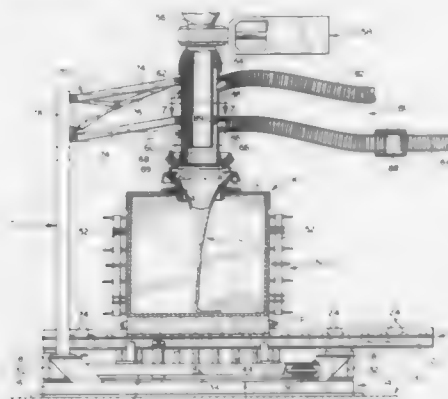
Wayne F. Everman, Cedar Falls, Iowa, assignor to Container Corporation of America, Clayton, Mo.

Filed May 10, 1988, Ser. No. 192,411

Int. Cl.⁴ B65B 31/06

U.S. Cl. 141—59

1 Claim



1. In an apparatus for transferring particulate material from a material containing hopper having a discharge conduit extending downwardly therefrom toward a rigid bulk container having a top wall with a filling opening extending therethrough to fill a flexible liner bag disposed within in the container and having an open upper end extending upwardly through a filling funnel removably and loosely positioned in said opening, said apparatus further comprising:

- a filling spout assembly including a pair of generally cylindrical, concentric, inner and outer spout members defining a passageway therebetween;
- said inner spout member having an upper end fixedly secured to a lower end of said hopper discharge;
- said outer spout member also having an upper end connected to the lower end of the hopper conduit by a tubular, flexible, bellows member that allows axial movement of said outer spout member relative to said inner spout member;
- said outer spout member having at a lower end thereof a filling flange adapted for sealing engagement with said liner bag within said filling funnel;
- moving means attached to said outer spout member and being operable to move said outer spout member axially, relative to said inner spout member, toward and away from said container between filling and non-filling positions;
- air transfer means for effecting the flow of air into said container liner bag and out of said container liner bag through said passageway, as the liner bag is being filled, to:
- inflate the liner bag and force it against inner surfaces of the container;
- force air in the container between the outer surface of the liner bag and the inner surfaces of the container out of the container through the container hatch hole outwardly adjacent said filling funnel;

- compact material entering the liner bag;
- exhaust dust from the liner bag;
- said transfer means including a pair of flexible air intake and air exhaust ducts connected to said outer spout member and a baffle positioned in said passageway between said ducts for deflecting incoming air from said exhaust duct.

4,872,494

APPARATUS WITH SAFETY LOCKING MEMBERS, FOR CONNECTING A SYRINGE TO A BOTTLE CONTAINING A MEDICAMENT

Mario Coccia, Cesano Boscone, Italy, assignor to Farmitalia Carlo Erba S.r.l., Milan, Italy

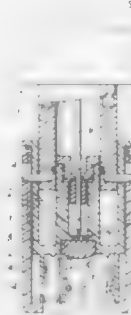
Filed Oct. 12, 1988, Ser. No. 256,575

Claims priority, application Italy, Oct. 14, 1987, 22283 A/87

Int. Cl.⁴ B65B 3/04; A61H 5/00

U.S. Cl. 141—383

8 Claims



1. Apparatus for connecting a syringe to a bottle having a lip surrounding a mouth, said apparatus comprising:

- a radially inner hollow part having a first end containing a first seat for a syringe and a second end;
- an intermediate hollow part slidably received in said radially inner hollow part and having a first open end and a second open end;
- a radially outer part slidably received on said intermediate hollow part and having a first end and a second end;
- a perforable plug received in said second open end of said intermediate hollow part;
- a plurality of flexible retention elements projecting axially from said second open end of said intermediate hollow part radially outwardly of said perforable plug;
- at least one flexible appendix projecting axially from said second open end of said intermediate hollow part radially outwardly of said perforable plug;
- at least one stop tooth projecting axially from said second open end of said radially outer part towards said at least one flexible appendix; and
- means for limiting the axial movement of said parts relative to each other so as to define a first position, in which the overall length of said apparatus is at a maximum, and a second position, in which the overall length of said apparatus is at a minimum, wherein
- i) said radially inner hollow part and said first open end of said intermediate part together define a chamber which, in the first position of said apparatus, has an axial length such that, in use, it entirely contains a needle in fluid communication with a syringe received in said first seat and which, in the second position of said apparatus, has an axial length such that, in use, the same needle projects through said perforable plug;
- ii) said plurality of flexible retention elements and said second open end of said intermediate hollow part together

- define a second seat sized, shaped, and positioned to receive and to grip the lip of a bottle; and
- said at least one flexible appendix is sized, shaped, and positioned so that:
 - i) it is cammed radially outwardly when the lip of a bottle is received in said second seat, permitting said apparatus to assume its second position, and
 - ii) when it is not cammed radially outwardly, it abuts against said at least one stop tooth at a point during the axial movement of said parts relative to each other that prevent said apparatus from assuming its second position.

4,872,496

READILY INSTALLED TIRE CLEATS WITH IMPROVED FASTENING MEANS

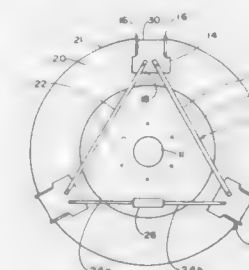
Benjamin A. Fortner, 402 Budleigh Salterton Close, Longwood, Fla. 32779

Continuation-in-part of Ser. No. 860,065, May 6, 1985, abandoned, which is a continuation-in-part of Ser. No. 739,921, May 31, 1985, abandoned. This application Jun. 17, 1987, Ser. No. 63,578

Int. Cl.⁴ B60C 27/20

U.S. Cl. 152—228

39 Claims



1. An anti-skid device for ready application to the tire of a driven vehicle wheel in order to improve its traction, said device being entirely installable from the outer or hub side of the wheel, with access to the backside of the tire or the underside of the vehicle being unnecessary, either during installation or removal, said device comprising a rigid framework adapted to be placed parallel to the plane of the tire and located against the outer sidewall of the tire, said framework being constituted by a plurality of rigid components having outer portions located radially inwardly of the tread portion of the tire, at least three curved cleats each having an inner surface, an outer road contacting surface, and a bent integral attachment flange, with the integral attachment flanges of said cleats being attached at approximately evenly spaced locations around the periphery of said framework, with the inner surface of each of said cleats being designed to a curve in a cantilever manner around the tread of the tire, the relationship of each integral attachment flange to the inner surface of the respective cleat being such that the each inner surface normally bends toward the axis of rotation of the vehicle wheel and has less than a 90° angle with respect to the plane of said framework, the bend in said integral attachment flanges being overcome at the time said device is tightly installed on the tire, thus to create a form of spring serving to overcome any trend toward the development of slack due to deformation of the portion of the tire in contact with the ground at a given cleat location.

4,872,495

TOOL FOR ROTATION RING TYPE BARKING MACHINES

Lennart Magnusson, Iggesund, Sweden, assignor to Mecan AB, Hudiksvall, Sweden

Filed Oct. 27, 1988, Ser. No. 263,524

Claims priority, application Sweden, Jun. 8, 1988, 8802141

Int. Cl.⁴ B27L 1/00

U.S. Cl. 144—208 E

8 Claims



1. A tool for a rotation ring type barking machine, comprising
- a curved arm having a free end adapted to mount a cutting edge; and
 - detachable mounting means at the other end of said curved arm for mounting said arm to a holder;
- said detachable mounting means comprising a first pair of cooperating means associated with said curved arm and a second pair of cooperating means associated with said holder;
- one of said pairs of cooperating means comprising a pair of elongated grooves spaced apart by an intermediate ridge, the other of said pair of cooperating means comprising a pair of elongated beads spaced apart by an intermediate recess with said beads being adapted to engage in said grooves;
- said grooves each having converging side surfaces inclined upwardly and outwardly from a base of the groove;
- said beads each having converging side surfaces inclined outwardly from a base of said bead;
- the convergence of said side surfaces of said grooves forms an angle which is slightly less than an angle formed by the convergence of said side surfaces of said beads; and
- fastening means for releasably fastening said arm to said holder;
- whereby tightening of said fastening means forces said beads into said grooves to thereby reduce the difference between said angles to a 0 angle upon said tightening.

4,872,497

PNEUMATIC RADIAL TIRE AND RIM COMBINATION FOR PASSENGER CAR

Ryoji Hanada, Hiratsuka; Tuneso Morikawa, Hadano, and Kazuyuki Kabe, Hiratsuka, all of Japan, assignors to The Yokohama Rubber Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 864,360, May 19, 1986, abandoned. This application Dec. 22, 1987, Ser. No. 137,214

Claims priority, application Japan, Nov. 26, 1984, 59-248142

Int. Cl.⁴ B60C 15/06

U.S. Cl. 152—541

3 Claims

1. A pneumatic radial tire for a passenger car and rim combination, said tire being mounted on said rim, said rim having a ring flange, said tire having a carcass layer formed of aromatic polyamide fiber cords in which an end portion is turned up around an annular bead wire and a lower bead filler from the inside to the outside of the tire to form a turnout portion which is extended along the main body of said carcass layer, wherein an upper bead filler having a JIS hardness of from 75 to 95 is disposed axially outside said turnout portion, and wherein the height b (mm) of said lower bead filler relative to the height a

(mm) of said rim flange upon which said tire is mounted satisfies the formula:

$$(a-5) < b < (a+10).$$



wherein a is measured radially outward from the diameter of the rim seat to the upper end of the rim flange and is designated as the G dimension specified by JIS-D-4218-1981.

4,872,498

VENTING DOOR LIGHT WITH INSULATED GLASS
David A. DeBlock, and Kert E. Artwick, both of Holland, Mich., assignors to ODL, Incorporated, Zeeland, Mich.

Filed Oct. 1, 1987, Ser. No. 103,393
Int. Cl.⁴ E06B 3/32

U.S. Cl. 160—90

12 Claims



1. A window comprising:
 - a frame including a sill;
 - a sash slidably supported by said frame and movable between a closed position adjacent said sill and an open position away from said sill;
 - a screen supported by said frame and having a lower edge adjacent said sill; and
 - a plurality of bracket assemblies secured to said sill and spaced at discrete locations, each said bracket assembly including a first spacer spacing said sash a first distance above said sill, each said bracket assembly further including a second spacer spacing said screen a second distance above said sill, said first and second distances being sufficient to prevent capillary action from retaining water between said sill and said sash and said sill and said screen, respectively, each said bracket assembly further including

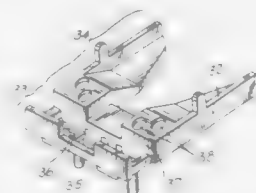
registration means for registering said lower edge of said screen in a desired plane with respect to said sill.

4,872,499

VERTICAL LOUVRE BLIND TRAVELLER BRIDLE
Richard N. Anderson, Owensboro, Ky., assignor to Hunter Douglas Inc., Upper Saddle River, N.J.
Continuation-in-part of Ser. No. 853,818, Apr. 18, 1986, Pat. No. 4,732,202. This application Feb. 11, 1988, Ser. No. 154,728
Int. Cl.⁴ E06B 9/36

U.S. Cl. 160—168.1

11 Claims



1. A vertical louvre blind, comprising:
 - a horizontal headrail;
 - a pull cord, extending within said headrail;
 - a number of travelers;
 - a lead traveler; and
 - a bridle for the lead traveller;
 said travelers, said lead traveler and said bridle all sliding along said headrail, and said bridle comprising:
 - (a) a body having a bottom surface and means adapted to receive and retain the lead traveller;
 - (b) at least two openings defined by said bottom surface of said body for receiving the pull cord; and
 - (c) a post extending downwardly from said bottom surface for being received in a loop of said pull cord which is passed through one of said at least two openings, over said post, and through a second one of said at least two openings, so that said pull cord extends down through one of said openings, around said post, and returns upwardly through one of said openings to fictionally attach said bridle and said pull cord to prevent relative movement therebetween, whereby movement of said pull cord causes the bridle to move along said headrail.

4,872,500

METHOD OF MANUFACTURING A TOOL

Donald Duffey, 504 Edgehill Rd., New Bern, N.C. 28560; Sellers Hardee, 345 Piney Grove Rd., Pollocksville, N.C. 28573; Wayne Smith, 5304 Rossie Rd.; James Elliott, 4924 Morton Rd., both of New Bern, N.C. 28560; Robert Gardner, 401 Hamlet Rd., Summerville, S.C. 29483, and Claus Sues, Eichenstr. 27, D-7133, Maulbronn, Fed. Rep. of Germany
Filed Oct. 14, 1986, Ser. No. 919,752

Claims priority, application Fed. Rep. of Germany, Oct. 12, 1985, 3536496

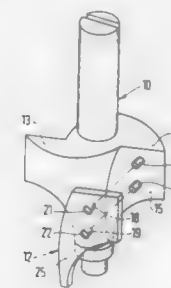
Int. Cl.⁴ B22D 19/06

U.S. Cl. 164—34

8 Claims

1. A method of manufacturing a composite chip-removing tool, such as a spiral drill or a milling tool, which includes a tool body of a material which is in its molten state above a predetermined melting temperature, and at least one tipping element secured to said tool body, comprising the steps of positioning the tipping element on a model of the tool body which consists of a material that melts at a temperature considerably lower than said predetermined melting temperature, in a position relative to the model which the tipping element is to assume relative to the tool body; simultaneously forming the tool body and a durable mechanical connection of the tipping

element to the tool body in a casting operation involving replacement of the material of the model with the material of the



tool body in its molten state; and providing the tipping element prior to said positioning step with at least one aperture.

4,872,501

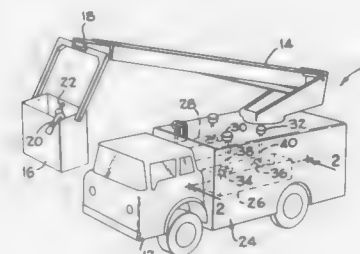
HEAT EXCHANGER FOR MOBILE AIRCRAFT DEICING MACHINE AND METHOD OF USE

Edwin C. Hightower, Orlando, Fla., assignor to FMC Corporation, Chicago, Ill.

Filed Mar. 17, 1986, Ser. No. 840,356
Int. Cl.⁴ B64D 15/00

U.S. Cl. 165—1

7 Claims



5. A method of heating deicing fluid in a tank on a deicer having a coil element submerged in said tank; comprising the steps of:

- a. circulating a hot fluid through said coil element;
- b. heating the bulk of said deicing fluid to a predetermined holding temperature by:
 1. stirring the deicing fluid to cause free flow thereof past said coil element; and
 2. mixing the deicing fluid flowing past said coil element with the bulk of said deicing fluid;
- c. raising the temperature of said deicing fluid above said holding temperature just prior to deicing an aircraft by:
 1. isolating the last portion of said deicing fluid to flow past said coil element; and
 2. pumping only said isolated portion from said tank.
7. In an aircraft deicer having a tank, a spray gun for directing heated deicer fluid onto an aircraft, and a deicer fluid pump connected to supply deicer fluid under pressure to said spray gun; the improvement comprising:
 - a heat exchanger having a coil element through which a hot fluid may be circulated;
 - means mounting said heat exchanger adjacent the bottom of said tank;
 - a suction line connected to said pump and arranged so that substantially all of the fluid flowing into said suction line when said pump is operated must flow past said coil element whereby last pass heating of the deicer fluid before being pumped to the spray gun is provided.

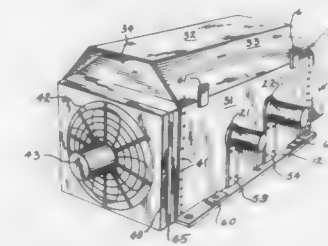
4,872,502

AIR COOLING OF ENCLOSED GEAR DRIVES
Richard W. Holzman, Waukesha, Wis., assignor to The Falk Company, Milwaukee, Wis.

Filed Sep. 25, 1987, Ser. No. 100,895
Int. Cl.⁴ F01M 5/00; F16H 57/02

U.S. Cl. 165—39

12 Claims



1. An air cooling enclosure for a gear drive having a closed housing and shafts projecting from the housing, comprising:
 - a plurality of sides joined together to surround all exposed surfaces of the gear drive housing except for a bottom of the housing, said sides being spaced from the surfaces of the housing and having openings through which the shafts project, one of the sides having an air inlet and an opposite side having an air outlet;
 - a plurality of spaced baffles extending inwardly from the sides of the enclosure toward the housing; and
 - a source of air under pressure connected to the air inlet.

4,872,503

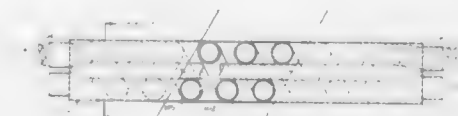
AIR HEAT EXCHANGER

Raymond E. Marriner, Box 7, Site 16, R.R. 7, Calgary, Alta., Canada (T2P 2G7)

Filed Mar. 13, 1986, Ser. No. 839,207
Int. Cl.⁴ F24H 3/02

U.S. Cl. 165—54

4 Claims



1. An air-to-air heat exchanger to transfer heat from air which is being exhausted from an enclosed space, to incoming fresh air comprising: a rigid, circular in cross section outer tube, a central core around which a continuous flexible inner tube is spiralled longitudinally, inlets and outlets for each of the inner and outer tubes connected to the fresh and exhaust air flows respectively so as to effect a counter-current flow through the heat exchanger.

4,872,504

MODULAR HEAT EXCHANGER HOUSING

Fritz Huebner, Zeeland, Mich., assignor to Plascore, Inc., Zeeland, Mich.

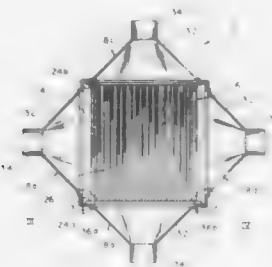
Division of Ser. No. 800,662, Nov. 22, 1985, Pat. No. 4,735,261, which is a division of Ser. No. 417,639, Sep. 13, 1982, Pat. No. 4,588,543. This application Dec. 21, 1987, Ser. No. 135,921
Int. Cl.⁴ F28F 21/06, 9/18; F24H 3/02

U.S. Cl. 165—54

4 Claims

1. A heat exchanger housing comprising four duct units grouped into first and second sets, each said set including an inlet duct unit and an outlet duct unit through which a quantity of fluid flows into and out of said heat exchanger housing, all said duct units being substantially identical to one another and

of a single piece unitary construction, each of said duct units having opposite sides, each said side being directly connected to a side of an adjacent duct unit of the other set so that said duct units collectively define a core-receiving chamber, said inlet duct unit and said outlet duct unit of each set being further arranged to define a path through which the quantity of fluid flows as it passes through said heat exchanger housing, each



said duct unit further including a first structure defining an inner opening and a second structure defining an outer opening, said inner and outer openings cooperating to form a path through which said quantity of fluid flows as it passes through said duct unit, and said first and second structures of each duct unit defining openings which are oriented substantially parallel to each other.

4,872,505

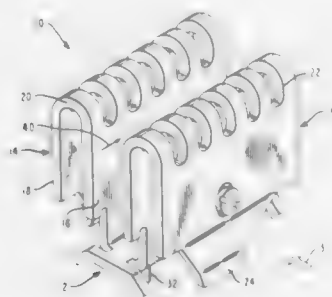
HEAT SINK FOR AN ELECTRONIC DEVICE

Jack E. Jones, Casselberry, and David J. Bulmahn, Winter Springs, both of Fla., assignors to NCR Corporation, Dayton, Ohio

Filed Aug. 16, 1988, Ser. No. 232,821
Int. Cl.⁴ H02L 23/40

U.S. Cl. 165—80.3

17 Claims



1. A heat sink for conducting heat from an electronic device comprising:

a base for mounting said heat sink to a board; and means for retaining an electronic device; said means including a U-shaped member having first and second walls connected by a top ridge, said first wall being integral with said base and extending outwardly therefrom and said second wall having a terminus portion proximate said first wall;

wherein an electronic device is retainable between said first wall and terminus portion for heat conduction from said device directly into said first and second walls.

4,872,506

GASKET FOR PLATE HEAT EXCHANGER

Mats Nilsson; Bernt Tagesson, and Ladislav Novak, all of Lund, Sweden, assignors to Alfa-Laval Thermal AB, Tumba, Sweden
PCT No. PCT/SE86/00497, § 371 Date Mar. 21, 1988, § 102(e)
Date Mar. 21, 1988, PCT Pub. No. WO87/03673, PCT Pub. Date Jun. 18, 1987

PCT Filed Oct. 30, 1986, Ser. No. 170,999

Claims priority, application Sweden, Dec. 11, 1985, 8505849
Int. Cl.⁴ F28F 3/00; F16J 15/00

U.S. Cl. 165—166

9 Claims



1. In combination with a plate heat exchanger having a plurality of heat exchange plates, there being spaces between adjacent plates in the heat exchanger defining flow passages for heat exchange media, a gasket applied between two adjacent plates characterized in that the gasket (4) comprises a strip (5) of metal, fastened to one of the plates (1, 2) and bridging at least 50% of but not the whole distance between the plates, and a layer (7) made of a material with a lesser hardness than the metal and applied onto a surface of the metal strip directed towards the other of said two plates (1, 2), said layer (7) bridging the remaining part of said distance between the plates.

4,872,507

WELL BORE APPARATUS ARRANGED FOR OPERATING IN HIGH-TEMPERATURE WELLS AS WELL AS IN LOW-TEMPERATURE WELLS

Robert L. Ronco, Sr., Destrehan, La., and Piero Wolk, Houston, Tex., assignors to Schlumberger Technology Corporation, Houston, Tex.

Filed Jul. 5, 1988, Ser. No. 215,185
Int. Cl.⁴ E21B 36/00

U.S. Cl. 166—57

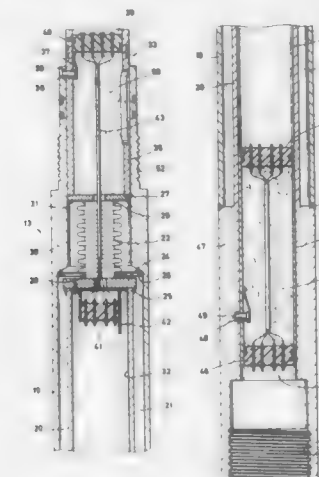
45 Claims

18. A set of alternative tool outer housings respectively arranged for receiving and protecting, over a wide range of subterranean temperatures including a lower range and a higher range, a single group of temperature-sensitive electrical well bore devices, said set comprising:

a first tubular housing for providing thermal protection over said higher temperature range, said first housing having a predetermined external diameter and a longitudinal bore of a predetermined internal diameter and including means for defining a hollow exterior wall having an internal evacuated annular chamber surrounding said longitudinal bore for thermally insulating its said longitudinal bore;

a second tubular housing for providing thermal protection over said lower temperature range, said second housing having a solid exterior wall with an outer diameter substantially equal to said predetermined outer diameter of said first housing and a longitudinal bore having an inner diameter that is substantially equal to said predetermined

inner diameter of said longitudinal bore in said first housing; closure means for sealingly enclosing said longitudinal bore in each of said housings and including thermal insulation means cooperatively arranged for thermally insulating at



least one end of said longitudinal bore in said first housing; and electrical connector means cooperatively arranged on said closure means for providing electrical connections to said electrical devices disposed within said longitudinal bore in either of said housings.

4,872,508

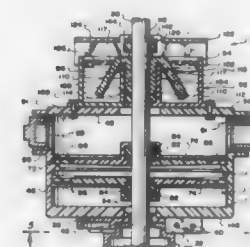
OIL WELL PUMP LEAKAGE ACCUMULATOR

Richard W. Gordon, 224 "B" St., Taft, Calif. 93268
Filed Oct. 31, 1988, Ser. No. 264,793

Int. Cl.⁴ E21B 33/08

U.S. Cl. 166—84

2 Claims



1. In combination with an oil well sump pump which has a reciprocating polish rod, said polish rod being mounted within a stuffing box, said polish rod extending exteriorly of said stuffing box, the improvement comprising:

an accumulator mountable about said polish rod, said accumulator being connected in a liquid-tight manner to said stuffing box preventing leakage of liquid from said stuffing box into the ambient, said accumulator having an internal chamber;

a liquid passage located between said polish rod and said accumulator adjacent said stuffing box, said liquid passage connecting with said internal chamber, any liquid leakage

from said stuffing box along said polish rod is caused to flow through said passage into said internal chamber and collect in said internal chamber; and said accumulator being formed of a two part housing, said two part housing being clamped together about said polish rod, each said part of said housing including a pair of protuberances, each said protuberance of one part of said housing abutting against a said protuberance of the other part of said housing forming a pair of rails, a tongue member being slidably engageable with each said rail thereby tightly holding together said two parts of said housing.

4,872,509

OIL WELL PRODUCTION SYSTEM USING A HOLLOW TUBE LINER

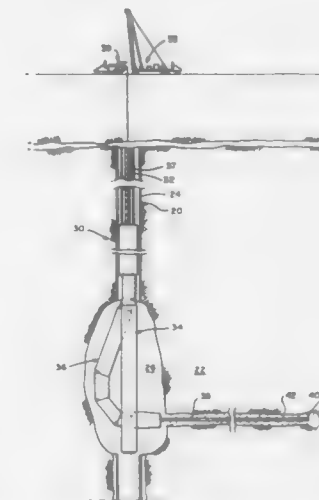
Ben W. O. Dickinson, San Francisco County; Robert W. Dickinson, Marin County; Randall R. Anderson, Solano; Eric W. Dickinson, Marin County, and Robert D. Wilkes, Alameda County, all of Calif., assignors to Petrolphysics Operators, San Francisco, Calif.

Continuation-in-part of Ser. No. 811,572, Dec. 23, 1985, Pat. No. 4,750,561. This application Feb. 12, 1988, Ser. No. 155,361

Int. Cl.⁴ E21B 43/10

U.S. Cl. 166—278

29 Claims



1. In a method of forming a production apparatus for withdrawing oil from an oil bearing underground formation through a well casing in the formation, the steps of

(a) passing a hollow radial tube through a housing in a well casing to the formation and drilling the radial tube to project into the formation, said radial tube and formation defining an annulus therebetween which is relatively permeable or free of formation,

(b) passing a flexible, elongated, hollow tube liner through the casing and radial tube and out into the formation, and (c) withdrawing the radial tube from the formation through the casing, leaving the liner in the formation, said liner including openings of a size and character to pass oil from said formation into said liner but substantially block passage of formation particles.

4,872,510

SUBTERRANEAN WELL CASING FLOAT TOOL

Douglas J. Lehr, Houston; Merle L. Bell, New Waverly; Richard P. Rubbo, The Woodlands, all of Tex., and Richard L. Forehand, Ardmore Park, Singapore, assignors to Baker Hughes Incorporated, Houston, Tex.

Filed Sep. 30, 1988, Ser. No. 252,043
Int. Cl.⁴ E21B 34/08; F16K 15/00

U.S. Cl. 166—327

11 Claims



1. A subterranean well casing float tool, comprising:
 - (a) a tubular metal housing securable to a well casing conduit;
 - (b) valving means implaced within said housing, said valving means comprising:
 - (1) a thermosetting frame;
 - (2) valve head and valve seat means operatively carried relative to said frame and selectively movable relative to one another from an open position to a closed position;
 - (3) biasing means for relatively urging said valve head toward said valve seat means;
 - (4) a compartment including said valve head for enclosure around the biasing means when the valve head is moved fully away from the valve seat means; and
 - (c) means for directly securing said valving means to said housing.

4,872,511

FIRE EXTINGUISHING APPLIANCE AND APPENDED SUPPLEMENTARY APPLIANCES

Charles B. Davis, Hochstrasse 24, D4400 Münster, Fed. Rep. of Germany

Filed Apr. 13, 1987, Ser. No. 40,393

Claims priority, application Fed. Rep. of Germany, Jan. 26, 1987, 3711774

Int. Cl.⁴ A62C 1/00, 35/00, 35/52

U.S. Cl. 169—12

5 Claims



1. A stationary fire extinguishing appliance to extinguish fire

in enclosed spaces and areas by continually controlling and injecting heated air products of combustion through an open-ended passage within said area or space, by drawing in and returning said heated air and products of combustion to the base of a fire; identified by a hollow venturi tube having a longitudinal axis and by an adjustable orifice-ring on the end of said tube which allows discharge and suction fire extinguishing flows at sonic speeds; identified by said tube (1), which is axially shiftable along said axis, with a fire extinguishing agent conveying injector opening (11) having a cross-sectional area that is adjustable by said axial shifts of said tube (1), by suction spaces for the products of combustion which conduct burnt gas mixtures to the base of a fire under application of a secondary chemical extinguishing agent in powder blocks (43), through sub-burn-out spaces (39), in a burn-out space (38) along a shield (44) into the open passage of said tube (1) which is coaxially mounted in slide-action within an annular body (4) by steel springs (50) with a threaded adjustment ring (23) which regulate and offset the cross-sectional area of the injector opening (11), which is circular-formed, with a fire extinguishing agent which is driven and conducted through pressure lines (8) and a pressure chamber (13) and which controls with pressure the cross-sectional area of the circular-formed injector opening (11) with said opening (11) shut off at a lower, outer end of the tube (1) when the tube (1) is shifted axially, said outer end having a first, outer conical surface (16) which describes a first acute angle (α), intersecting at a lower conical end of the annular body (4) which has a second inner conical surface (15) that describes a second acute angle (β), with the first acute angle (α) is greater than the second acute angle (β) and with the second conical surface (15) and the first conical surface (16) in juxtaposition and the injector opening (11) is formed and is identified by the orifice ring, a diverging circular-formed discharge orifice (20) which has conical discharge surfaces that expand, said discharge surfaces are adjoining and are integrated in the adjustment shifts of the injector opening (11), which has conical discharge surfaces (17 and 18) that form an apex-adjustable, cleavable ring opening (2) which regulates the pressure and density of a driving fire extinguishing agent, so that a venturi driving fire extinguishing agent in contact with the products of combustion drawn through the tube (1) reacts in pressure and density to incite sonic and super-sonic speeds into venturi-activating as well as into suction-intake flows, so that the products of combustion are forcefully drawn out of the burn-out spaces (38 and 39) under the shield (44) through the tube (1) and so that the heat of the fire is transmitted into the driving fire extinguishing agent, onto the fire extinguishing stream of the venturi driving fire extinguishing agent, into all the fire inhibiting streams streaming through and out of the tube (1) in order to generate additional energy to fight fire.

4,872,512

SUPPORT & ANCHOR ESCUTCHEON FOR SPRINKLER HEADS INSTALLED ON PIPE

Thomas L. Multer, Lilburn, Ga., assignor to Lifeprotech, Inc., Stone Mountain, Ga.

Filed May 31, 1988, Ser. No. 200,664

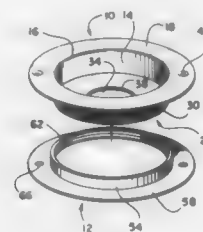
Int. Cl.⁴ A62C 37/08

U.S. Cl. 169—51

2 Claims

2. A sprinkler support system, comprising
 - a sprinkler head;
 - a means for delivering fluid to said sprinkler head comprising a pipe couplable to said sprinkler head;
 - a material to which said sprinkler head is to be anchored; and
 - a support and anchor escutcheon assembly, comprising:
 - a first cylinder containing one open end, a set of threads on its outer wall and having a radial flange extending radially outward from said open end of said cylinder and the other end of said cylinder being partially closed, wherein a hole is bored longitudinally in said partially closed end and the inner wall of said hole is threaded; and

an open ended second cylinder having a set of matable threads on the inner wall of said cylinder capable of operatively connecting with said first cylinder, said cylinder being sized to matably receive said first cylinder, and having a flange extending radially outward from one end



of said second cylinder, the other end of said second cylinder being open, wherein when said first cylinder and said second cylinder are threaded to each other said flanges exert a sandwich pressure on a material placed between said flanges.

4,872,513

CHIMNEY FIRE EXTINGUISHER

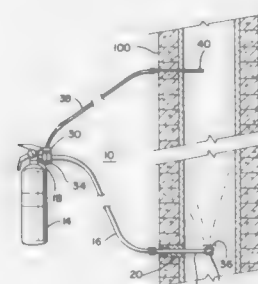
Stanley D. Gardner, Vernon, Canada, and Wilfred J. Finnigan, R.R. #Site 4, Comp. 4, Vernon, British Columbia, Canada V1T 7Z3, assignors to Wilfred J. Finnigan, Vernon, Canada Continuation of Ser. No. 852,997, Apr. 17, 1986, abandoned, which is a continuation-in-part of Ser. No. 683,574, Dec. 19, 1984, abandoned. This application Jan. 18, 1989, Ser. No. 729,154

Claims priority, application European Pat. Off., Feb. 19, 1986, 871117.0

Int. Cl.⁴ A62C 37/12

U.S. Cl. 169—57

13 Claims



1. A chimney fire extinguisher, comprising:
 - (a) a narrow conduit removably insertable through a small aperture in a chimney wall;
 - (b) a source of fire extinguishate coupled to one end of said conduit for delivery of extinguishate therethrough;
 - (c) a sprinkler head fixed to the opposite end of said conduit for insertion through said aperture, said sprinkler head comprising:
 - (i) an enclosed chamber;
 - (ii) a restrictor for restricting the flow of extinguishate from said conduit into said chamber;
 - (iii) a small orifice for spraying extinguishate from said chamber into the chimney;
 - (iv) fusible sealing means fused over said orifice for normally sealing said orifice; and
 - (d) a sleeve rigidly mountable within said aperture to receive and guide said conduit into said chimney; said sleeve including at least a first mating slot for receiving at least a first projecting lug on said conduit to releasably latch said conduit in place in a set orientation within said sleeve.

4,872,514

DRIVE UNIT FOR DRIVING RAMMING PARTS UNDER WATER

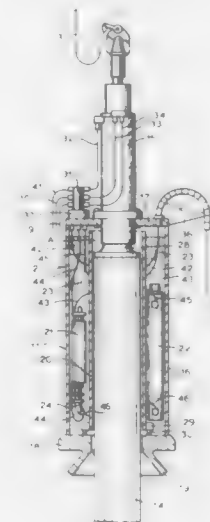
Hans Kuehn, Hamburg, Fed. Rep. of Germany, assignor to Bomag-Menck GmbH, Boppard, Fed. Rep. of Germany Division of Ser. No. 133,901, Dec. 15, 1987. This application Nov. 14, 1988, Ser. No. 275,592

Claims priority, application European Pat. Off., Jul. 28, 1987, 871108890

Int. Cl.⁴ E02D 7/10

U.S. Cl. 173—132

12 Claims



1. A submergible electrohydraulic drive unit for underwater ramming devices comprising a housing having a throughgoing central receiving space for receiving at least a part of a ramming device, upper and lower supporting plates releasably mounted on the ramming device, an outer wall connecting said supporting plates with one another, and an inner wall which surrounds said receiving space; a plurality of pump units arranged between said inner wall and said outer wall at circumferential distances from one another and each including a hydraulic pump and an associated electric motor; and switching means for subdividing supply of a pressure medium produced by said hydraulic pumps to at least one of two ramming devices.

4,872,515

DRILL ROD FOR PERCUSSION DRILLING

Lars-Gunnar Lundell, Sandviken, Sweden, assignor to Sandvik AB, Sandviken, Sweden

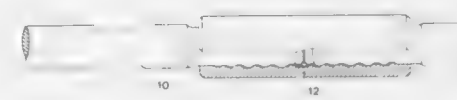
Filed Oct. 14, 1987, Ser. No. 108,089

Claims priority, application Sweden, Oct. 15, 1986, 8604373

Int. Cl.⁴ B23B 45/16

U.S. Cl. 173—132

5 Claims



1. A force-transmitting element in percussion drill rod assemblies, comprising a cylindrical metal body including an integral thread, and a lining disposed on said thread, said lining comprising a metallic material softer than said thread, said lining being metallurgically bonded to said thread, said lining extending substantially the entirety of said thread and being of greater thickness along one of the thread flanks than along a remaining thread flank.

4,872,516

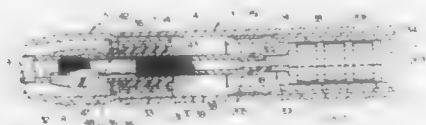
AIR DRIVEN IMPACT OPERATED GROUND PIERCING TOOL

Ronald L. MacFarlane, Buffalo Grove, Ill., and Dirk A. Wilson, Milwaukee, Wis., assignors to Oklahoma Airrow, Inc., Perry, Okla.

Continuation of Ser. No. 802,600, Nov. 27, 1985, abandoned.
This application Apr. 29, 1988, Ser. No. 188,354
Int. Cl.⁴ B23B 45/16

U.S. Cl. 173—134

9 Claims



1. An impact-operated boring tool, comprising:
 - an elongated, generally cylindrical housing having a tubular inner wall;
 - an elongated striker lengthwise reciprocable in said housing for forward driving impacting engagement against an interior impact surface of said housing proximate the front end of said housing, said striker having a rear portion of enlarged diameter, said rear portion having an annular, outwardly opening groove therein, said striker further having a plurality of curved guiding zones proximate the front end of said striker and a flat air passage surface between, each of said guide zones have a central, outwardly opening recess therein, said striker further having a tubular wall defining a rearwardly opening tubular recess in said striker, and a radial port disposed forwardly of said enlarged rear end portion of said striker extending through said tubular wall of said striker;
 - a plurality of resilient, rounded spot bearings set into said central recesses in said guide zones for sliding engagement with said tubular inner wall of said housing;
 - a split bearing ring fitted under compression to said tubular inner wall disposed in said annular groove in said enlarged diameter rear end portion of said striker for resilient, slidable, sealing engagement with said tubular inner wall of said housing;
 - a tubular inlet connectable at a rear end thereof to a pressure fluid source, said inlet having an enlarged diameter front portion closely slidably received in said tubular, rearwardly-opening recess in said striker;
 - passage means for reciprocating said striker in response to pressure fluid supplied through said inlet into said recess of said striker; and
 - a support assembly for maintaining said inlet substantially concentric to said housing.

4,872,517

ROTATABLE FLUID CONDUCTOR FOR WELL APPARATUS

Daniel G. Shaw, 50 Cane River La., Conroe, Tex. 77302, and Billy MacCline, 6923 Shavelson, Houston, Tex. 77055

Filed Feb. 8, 1988, Ser. No. 153,136

Int. Cl.⁴ E21B 3/00

U.S. Cl. 173—163

13 Claims

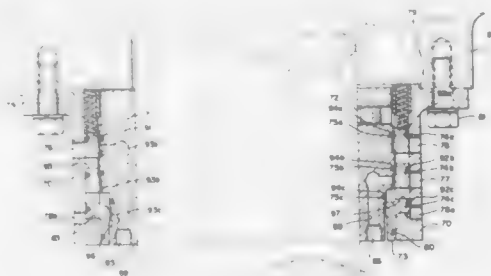
1. A fluid conductor for conducting fluid under pressure to a second well apparatus, the fluid conductor connectable to a first well apparatus, the fluid to be conducted flowable through the fluid conductor, the conductor comprising
 - an inner gland member securable to a shaft passing therethrough,
 - a central gland member non-contactingly disposed about the inner gland member,
 - an outer gland member securable to the first well apparatus and disposed about the central and inner gland members,

the inner gland member having inner hollow channel means, extending therethrough,

the central gland member having central hollow channel means extending therethrough,

the outer gland member having outer hollow channel means extending therethrough,

the hollow channel means of the three members being non-aligned when the conductor is in a non-energized mode so that fluid cannot pass through all of them, and



the central gland member movable to contact the inner gland member in response to pressurized fluid contacting the central gland member so that its hollow channel means aligns with the hollow channel means of the inner and outer gland members permitting the flow of the pressurized fluid into the hollow channel means of the outer gland member, through the hollow channel means of the central gland member, through and out of the hollow channel means of the inner gland member and thereby through and out from the fluid conductor for communication to the second well apparatus.

4,872,518

POWER CHAINSAW-ICE AUGER CONVERSION APPARATUS

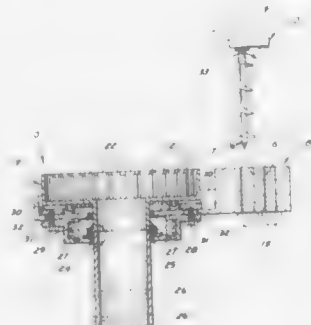
Albert B. Crippin, Rte. #1 Percy Rd., Shingleton, Mich. 49884

Filed Aug. 10, 1988, Ser. No. 230,523

Int. Cl.⁴ B25F 3/00; F25C 5/04

U.S. Cl. 175—18

2 Claims



1. An ice auger conversion apparatus for use in combination with a chain saw, said chain saw including, a drive sprocket and a plurality of spaced mounting bosses, said apparatus comprising,
 - a unitary housing member including a first and second housing portion,
 - said first housing portion rotatably mounting a drive means with said second housing portion including a plurality of through extending apertures for accepting said mounting bosses therethrough and mounting said housing member to said chain saw, and

said drive means including a forward auger mount and an elongate auger mountable on said auger mount, and said drive means further includes a sprocket mounting means integrally formed to said drive means for operatively engaging said drive sprocket of said chain saw, and wherein said drive means further includes a cylindrical sprocket drum formed with an interior cavity wherein the inner surface of said drum is formed with a series of sprocket teeth and recesses in complementary configuration to the drive sprocket of said chain saw, and wherein said cylindrical sprocket drum includes a reduced diameter extension extending through said housing with an outer bearing positioned on one side of said housing and an inner bearing positioned on interior surface of said housing between said housing and said cylindrical sprocket drum, and wherein a cylindrical auger mount is removably mounted to said reduced diameter extension by a plurality of mounting pins securing said auger mount to said reduced diameter extension, and wherein said drive means further includes a plurality of bearing mount fasteners extending through said exterior bearing and said interior bearing to secure the bearings together and wherein the bearing mount fasteners are mounted within slots orthogonally adjustable relative to the axis of said drive means to vary the distance between the axis of said drive means and the through extending apertures formed within said second housing portion.

4,872,519

DRILL STRING DRILL COLLARS

Denis S. Kopecki, Salt Lake City, Utah, assignor to Eastman Christensen Company, Salt Lake City, Utah

Filed Jan. 25, 1988, Ser. No. 148,024

Int. Cl.⁴ E21B 17/16

U.S. Cl. 175—320

9 Claims



1. A non-magnetic drill collar, comprising:
 - a drill collar body member formed of a first non-magnetic material; and
 - a generally rigid corrosion resistant liner, said liner conformingly retained within said body member.

4,872,520

FLAT BOTTOM DRILLING BIT WITH POLYCRYSTALLINE CUTTERS

Jack R. Nelson, Houston, Tex., assignor to Triton Engineering Services Company, Houston, Tex.

Continuation of Ser. No. 004,380, Jan. 16, 1987, abandoned. This application Oct. 13, 1988, Ser. No. 256,934

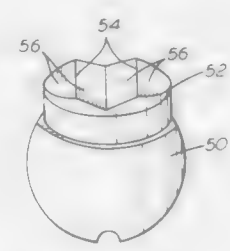
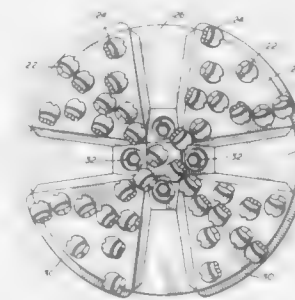
Int. Cl.⁴ E21B 10/46

U.S. Cl. 175—329

4 Claims

1. An earth drilling bit comprising,
 - a body, said body having a flat bottom, a plurality of cutting elements positioned on the flat bottom, said elements

including a stud carrying a polycrystalline diamond cutter, said cutters including an elongate straight, sharp chisel edged apex with a face on both sides of the apex extending backwardly from the apex, said apex extending generally



vertically with a slight back rake for providing a chisel surface for acting on the earth even when the cutter becomes worn, wherein the cutters include multiple apices with a face extending backwardly on both sides of each apex.

4,872,521

PLATEN MODULE FOR A MODULAR MAILING MACHINE

Jovito N. Abellana, Trumbull, and Donald T. Dolan, Ridgefield, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Division of Ser. No. 135,186, Dec. 18, 1987. This application Aug. 24, 1988, Ser. No. 235,769

Int. Cl.⁴ G01G 23/22; B41J 3/28

U.S. Cl. 177—25.15

2 Claims

1. A mailing machine comprised of a plurality of modules, each of said modules mounted in said mailing machine to perform a single process station, said mailing machine having a base and a plurality of support walls, wherein said modules include:
 - a scale module having means for weighing an envelope including,

- a weighing plate having a plurality of slots formed in said weighing plate and a recess,
- support means for supporting said weighing plate in vertically spaced relationship to the base of said mailing machine;
- a transport module having means for positioning said envelope in said process station and ejecting said envelope from said process station including,
- a frame,
- a plurality of rollers rotatably mounted to said frame,
- frame support means for supporting said frame below said weighing plate and selectively placing said frame in a first position such that a portion of said rollers extend through said slots of said weighing plate or a second position such that said rollers are repositioned generally below said weighing plate,
- said frame and said frame support means be located gener-

ally between said mailing machine base and said weighing plate;

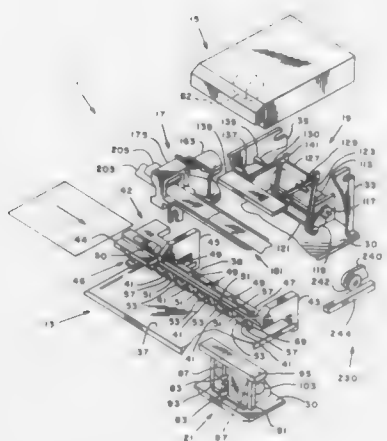
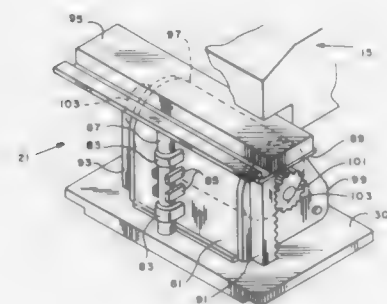
a meter module having a registration area and a printing means located in said registration area for imprinting an indicia on said envelope, said registration area being vertically aligned to and spaced above said recess in said weighing plate;

a platen module including,

a platen plate,

elastomeric member fixably mounted to a first surface of said platen plate,

platen support means for supporting said platen plate such that said elastomeric member is opposite said registration area of said meter module and such that said platen plate can be selectively positioned in a first position wherein said elastomeric member is in close proximity



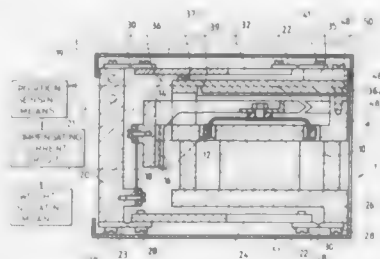
to said printing means of said meter module and a second position wherein said elastomeric member is positioned generally below said weigh plate of said scale module, including,

a support wall, a rack post fixably mounted to said platen plate at one end, means for guiding and confining the displacement of said platen plate to a defined vertical path and, a drive motor having a gear fixably mounted to the output shaft of said motor and in constant mesh with said rack post.

wherein said modules operate in a manner generally functionally independent of any other module, does not interfere with the operation of any other module and said modules can perform their respective function to said envelope while said envelope resides at said process station.

4,872,522
ELECTRONIC WEIGHING APPARATUS INCLUDING GUIDE ADJUSTING MEANS
 Peter Kunz, Gossau, Switzerland, assignor to Mettler Instrumente AG, Greifensee, Switzerland
 Filed Dec. 12, 1988, Ser. No. 283,828
 Claims priority, application Switzerland, Feb. 19, 1988, 271,101

Int. Cl.⁴ G01G 3/08, 23/14
 U.S. Cl. 177-229 7 Claims



1. In an electronic weighing apparatus of the type including parallelogram guide means for guiding a load receiver (20) for vertical movement relative to a frame (1), said guide means including horizontal parallel spaced upper and lower guide members (32, 24), and first (22) and second (23) resilient bending bearing means connecting said guide members with said frame and with said load receiver, respectively, the invention which comprises: means for vertically adjusting the position of at least one of said first bending bearing means relative to said frame, said adjusting means including:

(a) a generally rectangular resilient cantilevered auxiliary guide plate (36) arranged adjacent and parallel with one of said guide members, said guide plate having a relatively low distortion characteristic and carrying at one end said at least one first bending bearing;

(b) means (37) connecting the other end of said guide plate with said frame, said auxiliary guide plate containing a continuous single horizontal groove (39) that extends transversely the entire width of said guide plate for defining therein an axis of bending extending normal to the direction between said one and other ends of said guide plate;

(c) means (41) connecting said one bending bearing with said one guide plate end; and

(d) means (48) for vertically adjusting said one guide plate end relative to said frame.

4,872,523
TORQUE SUSPENSION WEIGHING SCALE
 Robert E. Skibinski, Tompkinsville, Ky., assignor to Mid-America Scale, Inc., Tompkinsville, Ky.
 Continuation of Ser. No. 200,523, May 23, 1988. This application Jan. 19, 1989, Ser. No. 298,915
 Int. Cl.⁴ G01G 21/24

U.S. Cl. 177-255 4 Claims

1. An apparatus for securely fastening a torque suspension member to a subframe and a weighing platform in a torque suspension weighing scale comprising:

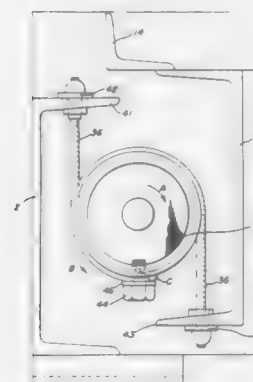
weigh cable means separately surrounding said torque suspension member at a predetermined location thereof, said weigh cable means including:

a ball member fixed to each exposed end of said weigh cable means;

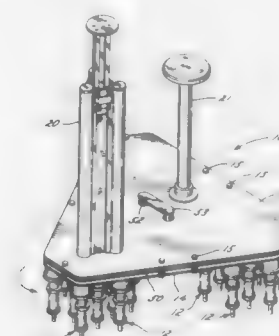
a plurality of seat retention members axially movable along said weigh cable means and corresponding to each said ball member; and

means for supporting said ball and seat members in said predetermined locations of said weigh cable means; wherein said ball member fits within said seat retention

member with respect to each said subframe and weighing platform on said means for supporting when torque is

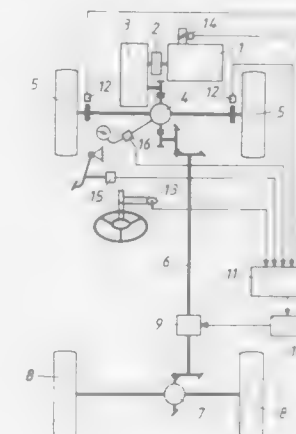


4,872,524
WHEEL-LESS WALKING DOLLY
 Chadwell O'Connor, 2024 Galaxy Dr., Newport Beach, Calif. 92660
 Filed Apr. 13, 1988, Ser. No. 181,037
 Int. Cl.⁴ B62D 57/02
 U.S. Cl. 180-8.6 8 Claims



1. A movable platform comprising, in combination, a base plate, a plurality of extendable fingers mounted on said base plate for engagement with the underlying surface and for tilting movement relative to said base plate, means for driving said fingers cyclically between extended and retracted positions with one portion of the fingers being extended while the other portion are retracted, and means for controllably angling said tiltable fingers relative to said base plate so that the portion of fingers being extended exert an upward and angled force on the base plate with the horizontal component of that force moving the base plate in the direction the fingers tilt, said means for controllably angling said tiltable fingers being capable of tilting the fingers in a range of directions from the vertical so that the horizontal force will move the base plate in any horizontal direction within said range.

4,872,525
DRIVE SYSTEM FOR A MOTOR VEHICLE COMPRISING MEANS FOR PERMANENTLY DRIVING A FIRST PAIR OF WHEELS AND AUTOMATICALLY OPERABLE MEANS FOR SELECTIVELY DRIVING A SECOND PAIR OF WHEELS
 Hans D. Sommer, Graz, Austria, assignor to Steyr-Daimler-Puch AG, Vienna, Austria
 Filed Nov. 14, 1988, Ser. No. 271,101
 Claims priority, application Austria, Nov. 23, 1987, A3073/87
 Int. Cl.⁴ B60K 17/344
 U.S. Cl. 180-197 6 Claims



1. In a drive system for a motor vehicle comprising means for permanently driving a first pair of wheels and automatically operable means for selectively driving a second pair of wheels in a four-wheel drive mode in dependence on the slip of the first pair of wheels,

the improvement residing in that

two speed sensors are operatively associated with respective ones of said permanently driven wheels and arranged to deliver actual speed signals representing the speeds of said permanently driven wheels,

a computer is provided, which is connected to said speed sensors and arranged to derive from said actual speed signals an actual speed difference and in which a first characteristic speed difference associated with a two-wheel drive mode and a second characteristic speed difference associated with a four-wheel drive mode are stored, said characteristic speed differences being specific to a vehicle for which the drive system is intended,

a final control element is provided for effecting in said drive system under the control of said computer a change between said four-wheel drive mode and a two-wheel drive mode in which only said first pair of wheels are driven, said computer is operable to make a comparison between said actual speed difference and a current reference speed difference which depends on that of said stored characteristic speed differences which is associated with the currently used one of said modes and to control said final control element for a change from the two-wheel drive mode to the four-wheel drive mode when said comparison indicates that said actual speed difference exceeds said current reference speed difference, and for a change from the four-wheel drive mode to the two-wheel drive mode when said comparison indicates that said actual speed difference is smaller than said current reference speed difference.

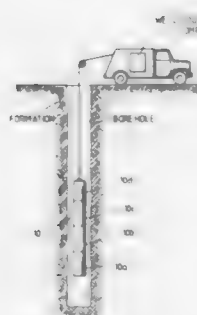
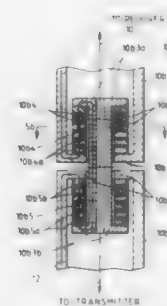
4,872,526 SONIC WELL LOGGING TOOL LONGITUDINAL WAVE ATTENUATION

Albert H. Wignall, Friendswood, and David C. Hoyle, Houston, both of Tex., assignors to Schlumberger Technology Corporation, Houston, Tex.

Filed Jul. 18, 1988, Ser. No. 220,777
Int. Cl.⁴ G01V 1/40

U.S. Cl. 181-102

9 Claims



1. An attenuator for use with a well logging tool in attenuating a wave propagating longitudinally along said tool when said tool is disposed in a borehole of an oil well, comprising: a plurality of layers of a first material, said first material including metal washers; a plurality of layers of a second material interleaved with the plurality of layers of the first material, the second material including rubber-like washers; and an inner member, the interleaved rubber-like washers and metal washers being wrapped around said inner member, said inner member including an outwardly directed flange on which one end of the interleaved rubber-like washers and metal washers rest.

4,872,527 SPEAKER SYSTEM

Bong H. Han, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed May 27, 1988, Ser. No. 198,876

Claims priority, application Rep. of Korea, May 30, 1987, 1987-20000

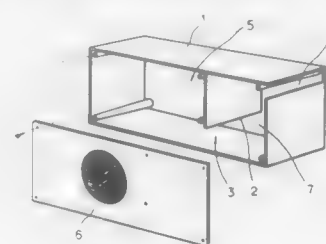
Int. Cl.⁴ H05K 5/00

U.S. Cl. 181-160

6 Claims

1. A speaker system comprising: a partition of predetermined size dividing an interior of a cabinet into a speaker chamber, and a resonance chamber of a predetermined volume; said speaker chamber including at least one speaker; said partition including a first radiation port of predetermined area for passing reproduced sound waves; and a second radiation port of predetermined area formed in a

wall of the resonance chamber which does not face said first radiation port; wherein the size of said partition and the area of said second radiation port are set in accordance with an upper limit



frequency of said reproduced sound waves, and the volume of said resonance chamber and the area of said second radiation port are set in accordance with a lower limit frequency of said reproduced sound waves.

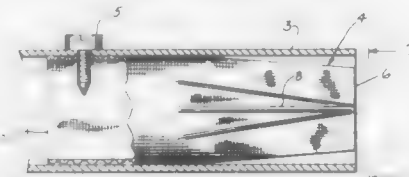
4,872,528 MUFFLER CONSTRUCTION

Gary D. Goplen, Stoughton, and Lawrence F. Iles, Madison, both of Wis., assignors to Nelson Industries Inc., Stoughton, Wis.

Filed Aug. 1, 1988, Ser. No. 226,458
Int. Cl.⁴ F01N 1/10

U.S. Cl. 181-228

18 Claims



1. An improved muffler construction, comprising a muffler having an inlet to receive a gas and having an outlet conduit to discharge the gas, a generally conical metal screen disposed longitudinally within the conduit, said screen having a closed end and having a large diameter open opposite end disposed in engagement with the inner surface of said conduit, the interior of said conical screen being free of obstructions to gas flow.

4,872,529 LADDER STABILIZER ASSEMBLY

Michael I. Vieta, 1647 N. Allen, Pasadena, Calif. 91104

Filed Jan. 11, 1989, Ser. No. 296,579

Int. Cl.⁴ E06C 5/36

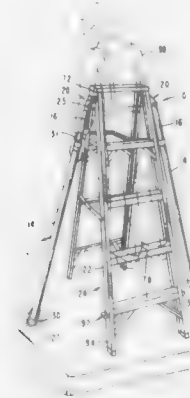
U.S. Cl. 182-172

22 Claims

1. A ladder stabilizer assembly for stabilizing a ladder, the ladder having at least one side frame disposed in a vertical side frame plane, the side frame having an upper side frame end and a lower side frame end, the stabilizer assembly comprising:

- (a) a stabilizer pole having an upper end and a lower end and comprising:
 - (i) a cylindrical, hollow outer pole member having an internal surface and an internal diameter; and
 - (ii) a cylindrical inner pole member having a first end, a second end, and an external diameter: the external diameter of the inner pole member being substantially the same as the internal diameter of the outer pole member, the first end of the inner pole member being longitudinally slidable within the outer pole member;
- (b) cam means for alternatively locking and unlocking the first end of the inner pole member within the outer pole member, comprising:

- (i) a first flexible cylindrical plug having a first end, a second end disposed opposite the first end, a diameter, a first plug longitudinal axis, and a radial surface parallel to the first plug longitudinal axis; the diameter of the first plug being substantially the same as the external diameter of the first end of the inner pole member; and the second end of the first plug being attached to the first end of the inner pole member such that the longitudinal axis of the inner pole member is coincident with the longitudinal axis of the first plug;
- (ii) a second flexible cylindrical plug having a first end, a second end disposed opposite the first end, a diameter, a longitudinal axis, and a radial external surface parallel to the second plug longitudinal axis; the diameter of the second plug being substantially the same as the diameter of the first plug; and
- (iii) plug attachment means for attaching the first plug to the second plug so that the radial surface of the first plug is parallel to the radial surface of the second plug



and so that the first end of the first plug and the first end of the second plug are alternatively rotatable about a common axis between an unlocked position, wherein the first plug longitudinal axis is coincident with the second plug longitudinal axis, and a locked position, wherein the first plug longitudinal axis is not coincident with the second plug longitudinal axis and wherein the radial external surface of the second plug impinges upon the inner surface of the outer pole member; and

- (c) attachment means for attaching the upper end of the stabilizer pole to the upper end of the ladder side frame, comprising:
 - (i) hinge means for pivoting the lower end of the stabilizer pole away from the plane of the ladder side frame to an angle of at least about 30°; and
 - (ii) swivel means for pivoting the lower end of the stabilizer pole away from either side of a vertical plane running through the upper end of the ladder side frame and disposed perpendicular to the plane of the ladder side frame to angles of at least about $\pm 45^\circ$.

4,872,530 SELF-LUBRICATING CENTRIFUGAL DRILLING MUD DEGASSER

Harry L. Burgess, Houston, Tex., assignor to Burgess and Associates Manufacturing, Inc., Houston, Tex.

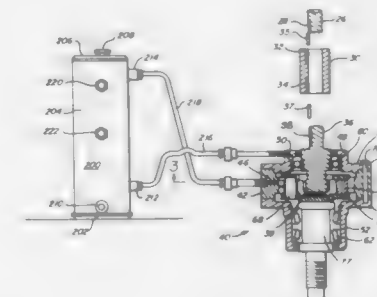
Filed Aug. 15, 1988, Ser. No. 232,318

Int. Cl.⁴ F01M 5/00; F16N 3/00; F16H 57/04; B01D 47/00
U.S. Cl. 184-6.12

16 Claims

1. In the combination of a motor with a drive shaft and a gear box containing a reduction gear arrangement wherein a motor is provided with a drive shaft to which a gear box is journaled, and wherein a lubricant in the gear box is heated during operation of the gear box, the improvement which comprises:

- a. a gear box casing having a lubricant inlet port formed therein adjacent the top of the gear box,
- b. a stationary interiorly-toothed ring gear fixed to said gear box casing below said inlet port, said ring gear having a lubricant outlet port formed between two adjacent teeth,
- c. a system of reduction gears in said gear box operatively interconnected with said drive shaft and said ring gear,
- d. a lubricant reservoir containing cool lubricant adjacent said gear box,
- e. a lubricant inlet line interconnecting the lower portion of said lubricant reservoir with said gear box inlet port, and



- f. a lubricant outlet line interconnecting the top portion of said lubricant reservoir with said gear box outlet port, whereby, when said reduction gears are driven by said drive shaft on operation of said motor, rotation of said reduction gears about said ring gear will force a pulse of hot lubricant from said gear box through said outlet port and said outlet line to said lubricant reservoir and, whereby, a corresponding pulse of cool lubricant will flow from said lubricant reservoir through said inlet line to said inlet port for said gear box.

4,872,531 MARINE STERN DRIVE WITH THROUGH-HOUSINGS LUBRICATION SYSTEM

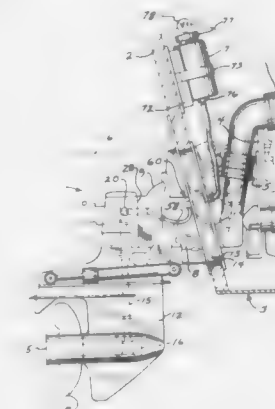
Gary L. Meisenburg, Fond du Lac; Francis E. Bertram, Malone, and Jack L. Golz, Oshkosh, all of Wis., assignors to Brunswick Corporation, Skokie, Ill.

Filed Feb. 26, 1988, Ser. No. 160,587

Int. Cl.⁴ F01M 1/18

U.S. Cl. 184-6.4

13 Claims



- 1. In a marine stern drive for mounting to an opening (14) disposed in the transom (2) of a boat (3) and with said stern drive being adapted for connection to an inboard mounted engine (4), the combination comprising:
 - (a) a stern drive assembly including a bell housing (9) and a drive shaft housing (10), and with said housings being removably assemblable together,

- (b) interconnected lubricant fluid passage means (21,23,26) disposed in said housings,
- (c) fluid flow control valve means (30,31) disposed in said passage means, said valve means being open when said bell housing and said drive shaft housing are assembled, and said valve means being automatically closed when said housings are disassembled,
- (d) said passage means including a first passage (21) disposed in one of said housings (10) and a second passage (23) disposed in the other of said housings (9),
- (e) said first and second passages having outer end portions disposed in registry when said housing are assembled,
- (f) said fluid flow control valve means including opposed first (30) and second (31) valves disposed in said respective first and second passages,
- (g) said first and second valves having cooperatively engaging means (35,52,43) for opening both said valves when said housings are assembled,
- (h) said first and second valves each having means (33,35,36, 47,54,55) for automatically closing the respective valve upon disengagement of said cooperatively engaging means when said housing are disassembled,
- (i) said first and second valves (30,31), when closed, forming means to disconnect said fluid passage means and isolate lubricating fluid inwardly of the outer end portions of said first and second passages (21,23), respectively,
- (j) said first valve (30) comprising:
- (1) a first valve seat (33) and first seat engaging element (35) disposed in said first passage (21),
 - (2) and a first spring (36) disposed in said first passage, said spring biasing said first seat engaging element against said first seat when said housings are disassembled,
- (k) said second valve (31) comprising:
- (1) a generally cylindrical valve housing (38) disposed in said second passage (23) and having a portion (51) abutting an inner end (25) of said second passage,
 - (2) said valve housing forming an inwardly facing second valve seat (47) and an outwardly extending nose (43),
 - (3) an elongated plunger (52) disposed within said valve housing, and with said plunger having an outer tip portion (52a),
 - (4) a second seat engaging element (54) disposed on said plunger,
 - (5) and a second spring (55) weaker than said first spring (36), said second spring biasing said second seat engaging element against said second seat when said bell housing and drive shaft housing are disassembled so that said plunger tip portion extends outwardly beyond said nose.

4,872,532

SIGNAL TRANSMISSION METHOD AND SYSTEM IN ELEVATOR EQUIPMENT

Toohimitsu Tobita; Hiromi Inaba; Masachika Yamazaki, all of Katsuta; Masato Suzuki, Ibaraki; Yuzo Morita, Hitachi; Toshiki Kajiyama, Katsuta; Kiyoshi Nakamura, Katsuta, and Kenji Yoneda, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 4, 1988, Ser. No. 228,229

Claims priority, application Japan, Aug. 12, 1987, 62-199780; Jan. 25, 1988, 63-13795

Int. Cl.⁴ B66B 3/00

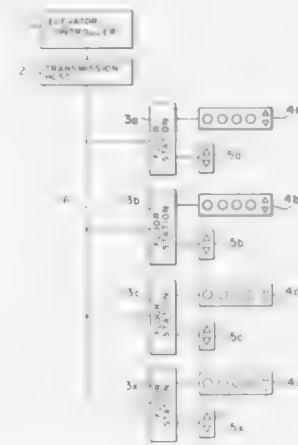
U.S. Cl. 187—121

20 Claims

1. A signal transmission method in elevator equipment wherein an elevator controller is connected to a plurality of apparatus installed at elevator stops on respective floors through a main station, remote stations and a common transmission line, and serial transmission of signal is effected between said controller and the respective apparatus at elevator stops on respective floors, said method comprising:

effecting transmission/reception of a signal unique to each of

said plurality of apparatus on respective floors during a first period; and



effecting transmission/reception of a signal common to said plurality of apparatus on respective floors during a second period.

4,872,533

BRAKE APPARATUS WITH BLIND CABLE INSTALLING MEANS

Billy G. Boyer, Moberly; Lloyd M. Nelson, Blackwater; Wayne L. Soucie, Columbia, and William K. Hayes, Fayette, all of Mo., assignors to Orscheln Co., Moberly, Mo.

Filed Nov. 23, 1988, Ser. No. 275,396

Int. Cl.⁴ F16D 51/00

U.S. Cl. 188—2 D

9 Claims



1. A blind-connection type parking brake assembly for operating brake shoe means relative to a brake surface associated with a wheel of a vehicle, comprising:

- (a) a backing plate (102, 202);
- (b) a flat parking brake lever (114, 214) pivotally connected at one end with said backing plate for pivotal movement parallel with and spaced from said backing plate;
- (c) a helical guide spring (120, 220) extending at one end through a first opening contained in said backing plate, said parking brake lever being provided at its other end with a transversely arranged spring support portion (114a, 214a) for supporting the other end of said guide spring;
- (d) a co-axial parking brake cable assembly including a flexible resilient inner cable member (116, 216) extending through said guide spring and terminating at one end in an enlarged extremity (116a, 216a); and
- (e) means connecting said cable member one end with said lever one end, including an integral ramp portion (114b, 214b) opposite and spaced from said spring support por-

tion, said ramp portion having a ramp surface (114c, 214c) facing and inclined at an acute angle (α) relative to the axis of said spring support portion, said ramp surface being contained in a plane that is generally parallel with the longitudinal axis of said lever, said ramp portion containing a cable mounting opening (140, 240) so arranged and of such a size and configuration that said enlarged inner cable member extremity is operable for successive introduction through said backing plate opening, through said spring, and through said spring support portion into sliding engagement with said ramp portion, whereby during the blind connection of said inner cable member with said lever, the enlarged end extremity of said inner cable member initially rides up said ramp portion and subsequently extends through the ramp opening for return in the opposite direction toward a connected position in which the inner cable member is retained in said mounting opening by the engagement of said enlarged extremity with the rear surface of said ramp portion.

4,872,534

WHEELED CHAIR RESTRAINT

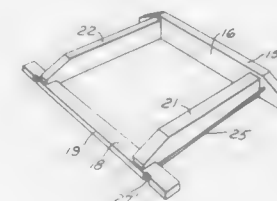
Vincent R. Corsi, 161 Princeton Ave., Coventry, R.I. 02816, and Gaetano W. Citrone, 9 Gordon St., Johnston, R.I. 02919

Filed Oct. 21, 1988, Ser. No. 260,577

Int. Cl.⁴ B60T 3/00

U.S. Cl. 188—32

5 Claims



1. A restraint apparatus for a wheeled patient chair having front and rear pairs of wheels comprising a first bumper bar adapted to engage one pair of wheels of a chair; a second bumper bar of a height substantially half the height of the first bar spaced from and substantially parallel to the first bar and adapted to engage the other pair of wheels; means maintaining the first and second bars in a spaced relation whereby the wheeled chair may with external assistance be forced over the second bar to move the patient.

4,872,535

BRAKE

Leonid Dayen, Plymouth, and Charles D. Raines, Blaine, both of Minn., assignors to Horton Manufacturing Co., Inc., Minneapolis, Minn.

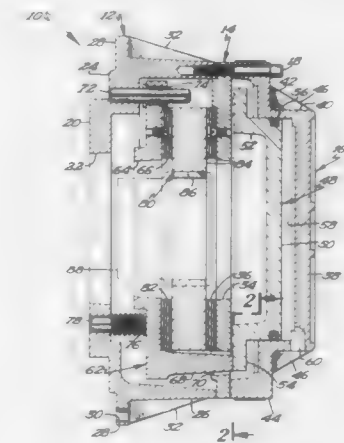
Filed Sep. 30, 1988, Ser. No. 252,183

Int. Cl.⁴ F16D 65/24

U.S. Cl. 188—170

20 Claims

1. Brake for the end of a shaft such as the shaft of an electric motor comprising, in combination: a generally bowl-shaped housing including a radially extending annular flange terminating in an axially extending annular flange; a torque plate; means extending between the radially extending annular flange and the torque plate for reciprocally mounting and rotatably relating the torque plate relative to the housing; a drive disc rotatably related to the shaft; means located on the opposite side of the drive disc than the torque plate and secured to the axially extending annular flange of the housing for moving the torque plate away from the drive disc including an axially



movable piston, and lugs integrally formed on the torque plate for abutting with the piston, with the lugs extending from the torque plate located radially outwardly of the drive disc; and means for moving the torque plate towards the drive disc.

4,872,536

HYDRAULIC PUMPS OR MOTORS AND HYDROSTATIC TRANSMITTING SYSTEMS

Zheng Yue, Room 105, Building 15, (Old) Beicun, Nankai University, Tianjin, China

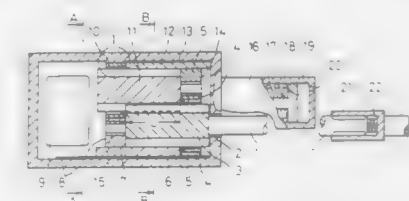
Filed Sep. 23, 1987, Ser. No. 100,103

Claims priority, application Switzerland, Sep. 24, 1986, 86106471

Int. Cl.⁴ F16D 57/00; F04C 2/18, 15/04

U.S. Cl. 188—290

7 Claims



1. An axial variable capacity gear pump comprising: a casing with an inlet and an outlet; an axially movable gear and an axially fixed gear mounted in said casing in a meshing relationship for rotation about their respective axes, said axially movable gear being movable along an axial direction relative to the axially fixed gear; radial sealing means arranged between an inner surface of said casing and teeth of said gears for providing radial seals therebetween; and axial sealing means for providing seals at either axial side of said gears, said radial sealing means and said axial sealing means each having an axially fixed member and also having an axially movable member which are movable together with said axially movable gear along said axial direction so as to change a length of a sealed working chamber defined between said gears and thereby change a delivery capacity per revolution of the pump, said axially movable member of said axial sealing means having a slidable end plate and slidably sleeved on said axially fixed gear so as to move axially together with said sliding end plate, and a ring gear-shaped elastic gasket arranged between said axially fixed gear and said ring gear for providing a seal therebetween, said axially fixed member of said

axial sealing means having a fixed end plate, and an axially fixed ring gear rotatably supported in said fixed end plate and sleeved on said axially movable gear, and a ring gear-shaped elastic gasket arranged between said axially movable gear and said axially fixed ring gear for providing a seal therebetween.

4,872,537

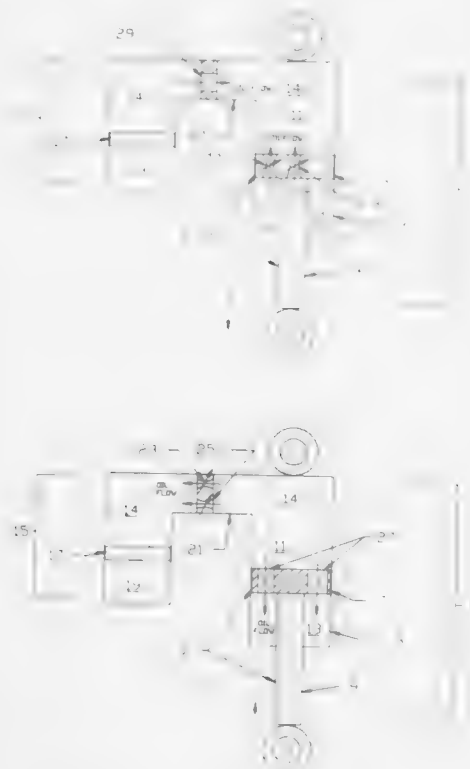
ADJUSTABLE DAMPER MEANS FOR SHOCK ABSORBER

Brian Warner, 84 Eastbourne, Beaconsfield, Quebec, Canada H9W 5G9

Filed Jun. 6, 1988, Ser. No. 203,315
Int. Cl.⁴ F16F 5/00, 9/34, 9/44, 15/16

U.S. Cl. 188—319

7 Claims



1. A shock absorber, comprising:

- a piston and cylinder arrangement comprising a cylinder, and a piston and piston rod assembly slidably mounted in said cylinder and dividing said cylinder into a first chamber and a second chamber, said cylinder being filled with a damper-fluid;
- an auxiliary tank;
- a flow channel permitting flow of said damper-fluid between said cylinder and said auxiliary tank;
- wherein, during each compression stroke of said piston and piston rod assembly, the volume of said first chamber is decreased and the volume of said second chamber is increased; and
- during each extension stroke of said piston and piston cylinder arrangement, the volume of said first chamber is increased and the volume of said second chamber is decreased;
- and including:
- a first restriction means associated with said piston and piston rod assembly and substantially controlling the low velocity flow of said damper-fluid during each said extension stroke, and a second restriction means associated with said piston and piston rod assembly substantially controlling

ling high velocity flow of said damper-fluid during each said extension stroke; and

- a third restriction means in said flow channel substantially controlling the low velocity flow of said damper-fluid during each said compression stroke and a fourth restriction means in said flow channel substantially controlling the high velocity flow of said damper-fluid during each said compression stroke;

and further including first means permitting substantially unrestricted flow of said damper-fluid through said piston and piston rod assembly during each said compression stroke, and a second means permitting substantially unrestricted flow of said damper-fluid through said flow channel during each said extension stroke;

said piston and piston rod assembly comprising a truncated cylindrical piston head having a top surface and a bottom surface, a central opening extending through said piston head, said piston rod comprising a hollow piston rod, an inner cylinder slidably mounted in said hollow piston rod, said inner cylinder being concentric with said piston head, an opening in the side wall of said hollow piston rod; wherein, said first restriction means comprises said opening in said side wall, said first restriction being variable by the inner cylinder linearly sliding up and down in said hollow piston rod to thereby adjust the size of said opening in said side wall;

said second restriction means comprising a blow off valve; said second restriction means further comprising two openings extending through said piston head from the top surface to the bottom surface thereof;

a plate member comprising said blow off valve and including a central opening and two protrusions, each protrusion being mounted to be aligned with and to extend into a respective opening;

said plate member being mounted over the top surface of said piston head;

an adjustment rod extending through said central opening and said inner cylinder, and being concentric to said inner cylinder, and including a cap at the top end thereof;

a spring between said cap and said plate member, the tension of said spring being adjustable by said adjustment rod whereby said second restriction means is also variable.

4,872,538

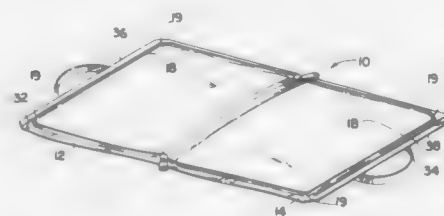
ARTICLE OF LUGGAGE OR THE LIKE AND METHOD OF MAKING SAME

James L. Fournier, N. Bennington, Vt., assignor to JLF Designs, Inc., North Bennington, Vt.

Filed Feb. 26, 1988, Ser. No. 161,006
Int. Cl.⁴ A45C 3/02, 13/10

U.S. Cl. 190—111

24 Claims



- 1. A stitched case comprising
- a first generally rectangular side wall element,
- a second generally rectangular side wall element, the first side wall element being spaced from the second side wall element, and
- at least a joining wall element disposed between and joining said first and second side wall elements, said joining wall element having opposite first and second surfaces, and being joined to an inner surface of a first side wall element by the steps of:

disposing said joining wall element upon said first side wall element, generally along a first edge of said first side wall element, with the first surface of said joining wall element in opposition to the inner surface of said first side wall element, said joining wall element having an outer edge, joining said joining wall element to said first side wall element along a first joining region adjacent and generally parallel to the first edge of said first side wall element, said first joining region spaced on said joining wall element from the outer edge of said joining wall element extending toward said second side wall element, at a region adjacent a second edge of said first side wall element, folding said joining wall element in a manner to dispose the second surface of said joining wall element in opposition to the inner surface of said first side wall element, joining said joining wall element to said first side wall element along a second joining region adjacent and generally parallel to the second edge of said first side wall element, said second joining region spaced on said joining wall element from said outer edge of said joining wall element, whereby said joining wall element is adapted to extend from connection with said first side wall element adjacent and generally parallel to said first and second edges.

4,872,539

CLUTCH RELEASE BEARING FOR AN AUTOMOBILE VEHICLE AND MEANS FOR THE INSTALLATION THEREOF

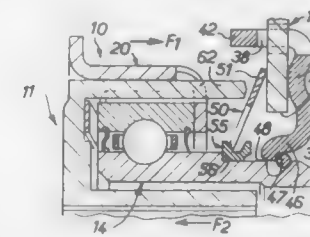
Christian Gay, Paris, and Philippe Lassiez, Boulogne, both of France, assignors to Valeo, Paris, France

Filed Jul. 14, 1988, Ser. No. 218,996

Claims priority, application France, Jul. 22, 1987, 87 10362
Int. Cl.⁴ F16D 23/14

U.S. Cl. 192—98

15 Claims



- 1. A clutch release bearing suitable for an automobile vehicle, of the kind comprising an operating element adapted to be acted on by a control element such as a clutch release fork, and a driving element connected axially to said operating element to act in traction and thus adapted to enable the assembly to exercise a pulling effect on the declutching device of the clutch to be controlled, said driving element being provided for this purpose with a coupling device disposed annularly around the axis of the assembly and being at least partly engaged with an annular groove, and being elastically deformable radially; and elastic bearing means operable to bear axially on said declutching device whilst bearing axially on said driving element, wherein said elastic bearing means comprise a bistable resilient washer capable of adopting either one of two axially inverse configurations, namely a first, storage configuration in which the washer ensures that the coupling device is kept in a relatively contracted position, and a second, operating configuration in which, having freed said coupling device, the washer is adapted to bear axially on the declutching device of the clutch.

4,872,540

CLUTCH CONTROL METHOD FOR FLUID TORQUE CONVERTER OF VEHICULAR TRANSMISSION

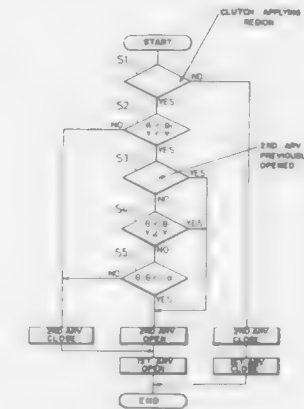
Noboru Sekine, Takashi Aoki, and Satoshi Terayama, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 9, 1987, Ser. No. 36,567

Claims priority, application Japan, Apr. 10, 1986, 61-81198
Int. Cl.⁴ F16H 45/02; B60K 41/02

U.S. Cl. 192—076

6 Claims



- 1. A method for controlling a clutch in a fluid torque converter for a vehicular transmission of a vehicle, said torque converter connected on an input side to an engine having a throttle valve for controlling a throttle opening, and connected on an output side to an auxiliary transmission, said converter being provided with a clutch to which a high force is applied for positively connecting the input and output sides of said converter when the vehicle is operated above a predetermined speed range and to which a relatively low force is applied to allow slippage when the vehicle is operated within said predetermined speed range with the slippage varying inversely relative to the vehicle speed, the method comprising the steps of, determining the throttle opening and the rate of change of the throttle opening, and increasing the force applied to the clutch to a value higher than the relatively low force applied for a given throttle opening for reducing slippage at that given throttle opening when the throttle opening is lower than a predetermined reference throttle opening and the throttle opening is decreasing at a rate higher than a predetermined rate value.

4,872,541

VENDING MACHINE HAVING SLAVE DISPENSING UNITS

Yukichi Hayashi, Sakada, Japan, assignor to Kabushiki Kaisha Nippon Coinco, Tokyo, Japan

Continuation of Ser. No. 734,661, May 15, 1985, abandoned.

This application Mar. 10, 1989, Ser. No. 323,041

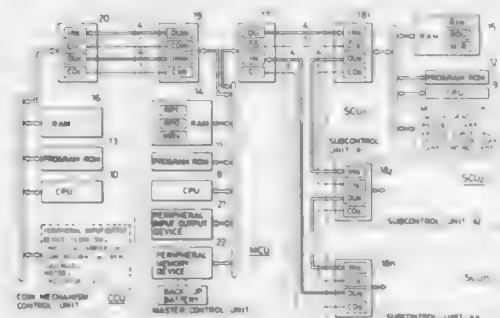
Claims priority, application Japan, May 27, 1984, 59-106730
Int. Cl.⁴ G07F 5/22

U.S. Cl. 194—217

13 Claims

- 10. A vending machine system comprising:
- a single master vendor including a coin mechanism and a vend possible judgment circuit, and
- a plurality of slave vendors controlled by said master vendor, each having a plurality of article dispensers, said master vendor having a master control unit for controlling the operation of all of the respective slave vendors, each of said slave vendors having a respective subcontrol unit which performs transmission and receiving of information to and from the master control unit and which controls the article vending operation of the respective

slave vendor in response to the information provided from the master control unit, and wherein; the output of said master control unit is applied to the first subcontrol unit, outputs and inputs of the first and nth subcontrol units are sequentially connected in series, and the output of the nth subcontrol unit is connected to the input of said master control unit, whereby the respective



subcontrol units are serially connected to said master control unit; and wherein each of said units comprises means for prohibiting receipt of input data and for outputting the input data instantly for transfer to the sequentially adjacent subcontrol unit, when said number data does not indicate the number of said subcontrol unit.

4,872,542

STEEP ANGLE CONVEYOR

Gregor Enneking, Neuenkirchen, Fed. Rep. of Germany, assignor to Fried. Krupp Gesellschaft mit beschränkter Haftung, Essen, Fed. Rep. of Germany

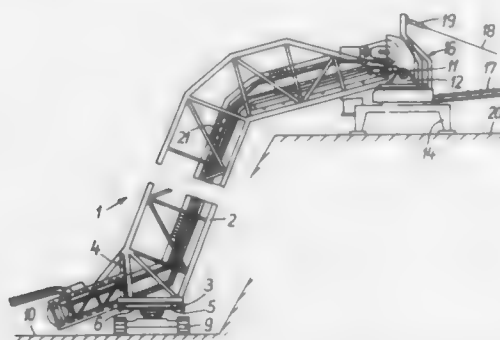
Filed Dec. 14, 1987, Ser. No. 132,446

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1986, 3642718

Int. Cl.⁴ B65G 41/00

U.S. Cl. 198—312

7 Claims



1. A steep angle conveyor for conveying bulk materials from a lower level to an upper level, said conveyor comprising: a one-piece bridge structure having two opposed ends each arranged to be disposed at a respective one of the levels; an endless conveyor extending along said bridge structure; a first intermediate frame to which is articulated that one of said ends which is arranged to be disposed at the lower level; a second intermediate frame to which is articulated that one of said ends which is arranged to be disposed at the upper level; first and second supporting devices each arranged to support a respective one of said intermediate frames while permitting each of said intermediate frames to be rotatable relative to its associated supporting device; and means supporting said first intermediate frame on said first supporting device for angularly adjusting said intermediate frame into a horizontal orientation

relative to said first support device and said bridge structure so as to permit said first intermediate frame to be displaceable relative to said first supporting device in a horizontal direction

4,872,543

CONVEYOR SYSTEM FOR ROD-LIKE ARTICLES

Dennis Hinchcliffe, Orpington, England, assignor to Molins PLC, Milton Keynes, England

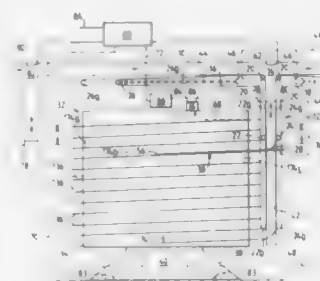
Filed Apr. 22, 1987, Ser. No. 41,197

Claims priority, application United Kingdom, Apr. 23, 1986, 8609814

Int. Cl.⁴ B65G 37/00

U.S. Cl. 198—347

29 Claims



1. A conveyor system for rod-like articles, comprising means defining a path for rod-like articles in multi-layer stack formation, said path having at least one movable end, said movable end including means for transferring articles in a first direction between said movable end of said path and receiving means at different locations, said transferring means and said receiving means being arranged so that articles may be reversibly transferred in multi-layer stack formation between said movable end and said receiving means without substantial change in said multi-layer stack formation, conveyor means for moving articles on said path, and means for moving said movable end in a second direction, different from said first direction, between said different locations to allow transfer of articles between the path and the receiving means at said different locations.

4,872,544

APPARATUS FOR ORIENTED STRAND LAY-UP

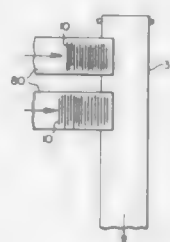
Mark T. Churchland, Vancouver, and Walter W. Schilling, Delta, both of Canada, assignors to MacMillan Bloedel Limited, Canada

Continuation of Ser. No. 882,372, Jul. 7, 1986, abandoned, which is a continuation of Ser. No. 738,542, May 28, 1985, Pat. No. 4,706,799, which is a division of Ser. No. 547,578, Nov. 1, 1983, Pat. No. 4,563,237. This application Feb. 9, 1988, Ser. No. 154,440

Int. Cl.⁴ B65G 47/26

U.S. Cl. 198—382

8 Claims



1. An apparatus for continuously laying elongated members at least about one foot long in a lay-up mat with each member oriented substantially in the longitudinal direction of the lay-up

mat, the mat being formed into an oriented, compressed and bonded composite product in which the average vertical angle of elongated members therein is not more than about 2 degrees, comprising:

a lay-up trough having sides and a moving belt base; and at least two transverse conveyors for advancing the elongated members in a direction substantially normal to their length, each of the transverse conveyors having guide means which are oscillatingly movable with respect to the belt base to distribute the members laterally across the belt base, the transverse conveyors and guide means being positioned to deposit the elongated members onto said moving belt base with the length of the members being substantially parallel to a direction of advancement of the moving belt base and over a length of said belt base that is at least as long as the greater of (i) one and one-half times the length of the elongated members and (ii) 30 times the final thickness of the composite product.

4,872,545

APPARATUS FOR HANDLING BODIES OF GENERALLY CYLINDRICAL CONFIGURATION

Stephen C. N. Brown, Preston, and Andrew W. Ashley, Plymouth, both of United Kingdom, assignors to British Nuclear Fuels plc, Warrington, United Kingdom

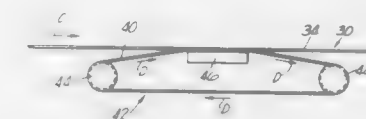
Filed May 16, 1988, Ser. No. 194,214

Claims priority, application United Kingdom, Jun. 5, 1987, 8713213

Int. Cl.⁴ B65G 47/24

U.S. Cl. 198—394

21 Claims



1. Apparatus for handling bodies of generally cylindrical configuration comprising:

(a) means for conveying the bodies in serial fashion along a predetermined path, the conveying means being arranged to support the bodies in one or other of two stable modes, a first mode in which the body is contacted by the conveying means at different points around its generally cylindrical surface such that the body axis extends generally parallel to the direction of conveyance and a second mode in which the body is contacted by the conveying means at both its cylindrical surface and one of its end faces such that the body is supported in tilted fashion with its axis extending laterally of the direction of conveyance, and (b) reorientating means disposed at at least one position along the path of conveyance for contacting those bodies (if any) in said second mode of support and exerting a progressive lifting action on the bodies during the contact phase between the bodies and the reorientating means so as to cause a reorientating of said second mode bodies into the first mode of support while allowing those bodies in said first mode of support to remain in said first mode.

4,872,546

SCREW CONVEYOR DEVICE

Erich A. Hindermann, Sagirain, CH-6403 Küssnacht a.R., Switzerland

Continuation of Ser. No. 30,278, Mar. 23, 1987, abandoned, which is a continuation of Ser. No. 729,565, May 2, 1985, abandoned. This application Dec. 22, 1987, Ser. No. 136,535

Claims priority, application Fed. Rep. of Germany, Jan. 16, 1985, 3501259

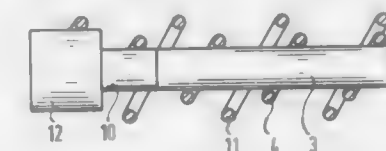
Int. Cl.⁴ B65G 33/26

U.S. Cl. 198—659

10 Claims

1. A screw conveyor device for pourable material compris-

ing a tubular housing which has an inlet opening for material to be conveyed and has an outlet opening for conveyed material spaced from said inlet, a rotatable flexible central shaft extending through the housing, at least one drivable feed coil surrounding the rotatable shaft, a retaining member, consisting of an elastic material, supporting said at least one feed coil at both



ends of the flexible core, means rotatable mounting the shaft at both ends of the housing, and a drive motor at one end of the housing connected to drive the shaft and said at least one feed coil to rotate; wherein said at least one feed coil is connected at at least one end to the flexible shaft in a manner precluding relative rotation and wherein said at least one feed coil is supported without clearance on the flexible shaft.

4,872,547

CLAMPING MEANS FOR ATTACHING THE ENDS OF A CONVEYOR COIL SPRING TO A JOURNAL PIN

Ingolv Helland, N-4330, Algard, Norway

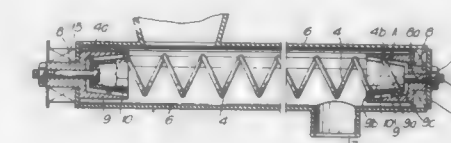
Filed May 17, 1988, Ser. No. 195,003

Claims priority, application Norway, May 21, 1987, 872136

Int. Cl.⁴ B65G 33/26

U.S. Cl. 198—659

4 Claims



1. A clamping apparatus for attaching at least one end of a conveyor coil spring to a journal pin in a conveyor tube, characterized in a clamping sleeve with inner walls converging from an opening at one end of the sleeve towards another end of the clamping sleeve and being secured to the journal pin, and a wedge shaped clamping member for insertion into the clamping sleeve, a screw bolt which is secured to the narrow end of the clamping member and extends through, and projects from an axial bore in the journal pin, and a nut on a free end of the screw bolt, said clamping sleeve and the clamping member together forming an annular space for receiving and fixing the end of the conveyor coil spring when the nut is tightened.

4,872,548

INTERMITTENTLY-DRIVEN BELT CONVEYOR

Satoru Masuda, Yokohama, and Hiroyuki Ishigami, Tokyo, both of Japan, assignors to Otsuka Koki Kabushiki Kaisha, Japan

Continuation of Ser. No. 37,635, Apr. 13, 1987, abandoned. This application Sep. 6, 1988, Ser. No. 247,438

Claims priority, application Japan, Jun. 5, 1986, 61-131020

Int. Cl.⁴ B65G 23/38

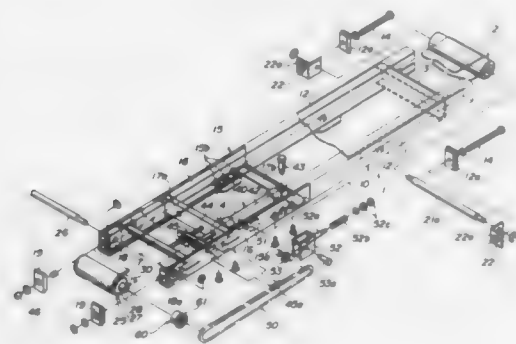
U.S. Cl. 198—859

6 Claims

1. A belt conveyor comprising a support frame established by side body members, two rollers supported on one side body members at opposite ends of the support frame, a belt stretched between the rollers and means for feeding the belt intermittently, said feeding means including:

a cylinder having an opening rod reciprocable in a moving direction of the belt, said cylinder mounted within said support frame between said side body members and between upper and lower runs of the belt; a drum including a one way clutch mechanism therein and having a sprocket wheel mounted therearound fitted

around a transmission shaft integral with one of the rollers;
 a chain trained over said sprocket wheel mounted around the drum including the one way clutch mechanism therein;
 said chain connected to the operating rod of the cylinder to



transmit movement to the transmission shaft through the drum and one way clutch mechanism via the sprocket wheel, wherein said cylinder has a longitudinal axis extending substantially parallel to the body members and is formed with a diameter approximately less than the height of said body members, said cylinder being further located between opposite ends of said body members.

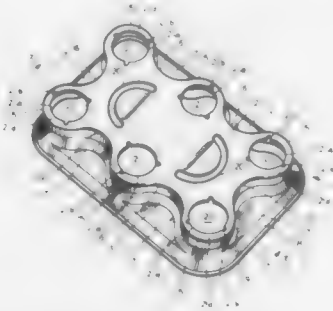
4,872,549

CARRIER FOR BOTTLES

Aldo Panzolo, Perrysburg, Ohio, assignor to Owens-Illinois Plastic Products Inc., Toledo, Ohio
 Continuation of Ser. No. 663,651, Oct. 22, 1984. This application
 Feb. 24, 1986, Ser. No. 834,133
 Int. Cl.⁴ B65D 75/00

U.S. Cl. 206-158

3 Claims

**1. A package comprising, in combination:**

- a plurality of filled and capped bottles, each of said bottles being capped with a molded thermoplastic closure that is provided with a tamper-indicating band on the underside thereof, said tamper-indicating band being of the heat-shrinkable type; and
- a unitary carrier supportably receiving the upper portions of said bottles to permit the carrying of said bottles from said upper portions said carrier being formed from a sheet of a semi-rigid thermoplastic material by thermoforming and further comprising:
 - a top panel, said top panel being disposed adjacent said underside of said molded thermoplastic closure of each of said filled and capped bottles;
 - wall means extending downwardly from said top panel to surround said upper portions of said bottles; and
 - a plurality of generally circular apertures located in said top panel, each of said generally circular apertures

receiving the neck of a bottle and comprising a maximum of three tabs extending radially inwardly from the periphery of said aperture, said tabs extending in a generally circular array around said aperture to support the bottle received in said aperture from the underside of said closure, said tabs being spaced apart from one another, the arcuate extent of each of said tabs being substantially greater than the arcuate extent of the space between adjacent tabs, said arcuate extent of each of said tabs being sufficient to prevent said tab from deflecting upwardly under said tamper-indicating band of said closure prior to any attempt to remove said bottle from said aperture of said unitary carrier.

4,872,550

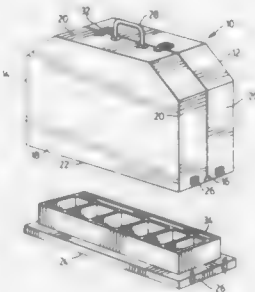
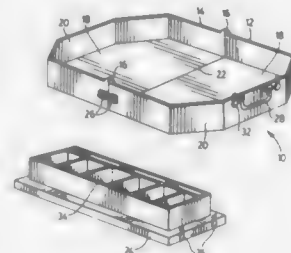
DUAL PURPOSE CARRYING CONTAINER

Frank Stranges, 7296 Woodgate St., Niagara Falls, Ontario, Canada L2J 3Z5

Filed Feb. 26, 1988, Ser. No. 160,957
 Int. Cl.⁴ B65D 85/20; A63F 3/00

U.S. Cl. 206-315.1

3 Claims

**1. A carrying container comprising:**

- a first section having a first substantially planar surface and a wall surrounding the first substantially planar surface on all but one open side;
- a second section having a second substantially planar surface and a wall surrounding the second substantially planar surface on all but one open side;
- the first and second sections being hinged together at points on the walls on each section adjacent the open sides;
- the first and second sections being operable from a first position in which the walls of the first and second sections lie adjacent each other to define an interior cavity to a second position in which the first substantially planar surface is coplanar with and contiguous to the second substantially planar surface; and
- a base detachably securable to the first and second sections when the first and second sections are in the first position.

4,872,551

WORKING CLAMSHELL BLISTER PACKAGE FOR PLIERS OR SIMILAR HAND TOOLS

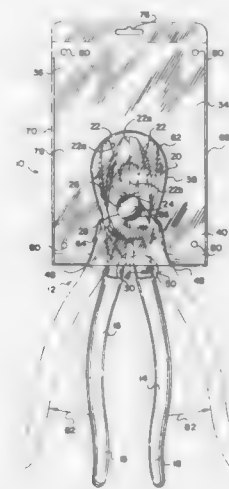
Brian S. Theros, Lemont, Ill., assignor to Klein Tools Corporation, Chicago, Ill.

Filed Mar. 8, 1989, Ser. No. 320,501

Int. Cl.⁴ B65D 73/00

U.S. Cl. 206-349

16 Claims



1. A working clamshell blister package for holding and displaying a pliers or similar hand tool having two pivoting members secured at a pivot junction, each such member having a handle at one end and a working portion at the other end, said package comprising:

- a first panel having an upper end, a lower end and a recess formation;
- a second panel having an upper end, a lower end and a recess formation, said second panel being a mirror image of said first panel;
- said lower ends of said panel having portions being joined to form a hinged base portion, said base portion having a pair of openings with a bridge formation disposed therebetween, said openings being dimensioned to accommodate the handles of the tool therethrough and to allow for pivoting action thereof, said bridge formation being configured to support the pivot junction of the pliers;
- said panels being configured so that when placed in contact in relation to each other, a compartment is formed therebetween by said recesses for accommodating the working portion of the pliers and allowing at least restricted pivoting action thereof.

4,872,552

SAFETY PACKAGING FOR HYPODERMIC SYRINGES WITH NEEDLES AND THE LIKE

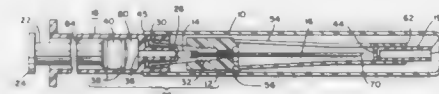
Larry E. Unger, Gadsden, Ala., assignor to Mid-South Products Engineering, Inc., Gadsden, Ala.

Filed Nov. 16, 1988, Ser. No. 271,873

Int. Cl.⁴ A61M 5/00, 5/32

U.S. Cl. 206-365

17 Claims



1. A needle guard package for protecting persons from accidental pricking by a hypodermic type needle having a first end secured within a needle hub and comprising:
 a first generally tubular section of said needle guard package

securable to and surrounding at least a portion of said needle hub;
 a second generally tubular section of said needle guard package having an elongated slot formed therein;
 a hinge connecting together said first and second sections of said needle guard package;
 said second section of said needle guard package positioned in a first position around said needle so that when said second section is pivoted away from said needle on said hinge said needle passes through said longitudinal slot to expose the point of said needle for use;
 said second section having the end thereof opposite its hinged end extending beyond the needle point; and
 a plastic insert frictionally held within the extended end of said second section a predetermined distance from the needle point and movable into the said needle point to lock said needle permanently therein after use of said needle and after said second section has been moved into its first position surrounding said needle.

4,872,553

MEDICAL FLUID-FILLED PLASTIC CONTAINER AND METHODS OF MAKING SAME

Tatsuo Suzuki, Machida, and Keinosuke Isono, Kawaguchi, both of Japan, assignors to Material Engineering Technology Laboratory, Incorporated, Tokyo, Japan

Filed Dec. 29, 1987, Ser. No. 139,312

Int. Cl.⁴ B65D 85/00

U.S. Cl. 206-524.4

10 Claims



1. A fluid-filled plastic container comprising (a) a sealed inner envelope of plastic material filled with a fluid containing a component subject to deterioration by oxygen, said inner envelope including outlet means for changing said fluid into said inner envelope, (b) a deoxidizer, and (c) a sealed outer envelope of plastic material enclosing both said fluid-filled inner envelope and said deoxidizer wherein said deoxidizer comprises a solid deoxidizer which is enclosed in said outer envelope so that a space is left around said solid deoxidizer.

4,872,554

REINFORCED CARRIER WITH EMBEDDED RIGID INSERT

Daniel R. Quernemoen, Chaska, Minn., assignor to Fluoroware, Inc., Chaska, Minn.

Continuation of Ser. No. 69,699, Jul. 2, 1987, abandoned. This application Aug. 23, 1988, Ser. No. 238,989

Int. Cl.⁴ B65D 85/48; B05C 13/02; F27D 5/00

U.S. Cl. 206-454

16 Claims

1. A rigid carrier for retaining a multiplicity of thin wafers in closely spaced but continuously separated confronting relation to each other and in a stack-like arrangement to accommodate liquid and gaseous spray processing and the many high and

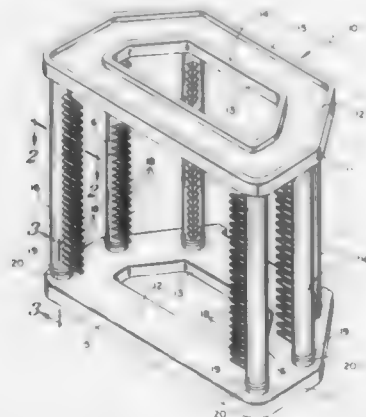
low temperature processing steps of the wafers in the production of circuit chips from the wafers, comprising

a plurality of plastic structural components adjacent each other and affixed together and arranged to define an integral one-piece rigid container to embrace and confine the wafers, said structural components being widely spaced from each other to permit more open space for access by liquid and gaseous sprays to the wafers confined, certain of said structural components having a multiplicity of teeth formed integrally therewith and projecting inwardly of the certain components to support and space the wafers, adjacent teeth of a said structural component being spaced the width of one of said wafers,

and a rigid insert completely embedded in one of said structural components and stiffening the component, said insert being formed of a material which is highly resistant to the influences of temperature in maintaining its shape and rigidity to minimize flexing or deformation of the structural components and the carrier.

15. A rigid carrier for retaining a multiplicity of thin wafers in closely spaced but continuously separated confronting relation to each other and in a stack-like arrangement to accommodate liquid and gaseous spray processing and the many high and low temperature processing steps of the wafers in the production of circuit chips from the wafers, comprising

a plurality of plastic structural components adjacent each other and affixed together and arranged to define an inte-



gral one-piece rigid container to embrace and confine the wafers, said structural components being widely spaced from each other to permit more open space for access by liquid and gaseous sprays to the wafers confined, wherein said structural components include end components and elongate side components affixed to each other, the side components traversing the edges of the wafers in the stack-like arrangement, said side components having a multiplicity of teeth formed integrally therewith and projecting inwardly of the side components to support and space the wafers, adjacent teeth of a said side component being spaced the width of one of said wafers, and the end components confronting the faces of the wafers, and a rigid insert completely embedded in one of said structural components and stiffening the component, said insert being formed of a material which is highly resistant to the influences of temperature in maintaining its shape and rigidity to minimize flexing or deformation of the structural components and the carrier.

16. A rigid carrier for retaining a multiplicity of thin wafers in closely spaced but continuously separated confronting relation to each other and in a stack-like arrangement to accommodate liquid and gaseous spray processing and the many high and low temperature processing steps of the wafers in the production of circuit chips from the wafers, comprising

a plurality of plastic structural components adjacent each other and affixed together and arranged to define an integral one-piece rigid container to embrace and confine the

wafers, said structural components being widely spaced from each other to permit more open space for access by liquid and gaseous sprays to the wafers confined, wherein said structural components include end components and elongate side components affixed to each other, the side components traversing the edges of the wafers in the stack-like arrangement, said side components each being substantially tubular and having a multiplicity of teeth formed integrally therewith projecting inwardly of the side components to support and space the wafers, adjacent teeth of a said side component being spaced the width of one of said wafers, and the end components each being generally panel shaped and including an interior chamber and the end components confronting the faces of the wafers and being affixed to the side components,

and a rigid insert completely embedded in one of said structural components and stiffening the component, said insert being formed of a material which is highly resistant to the influences of temperature in maintaining its shape and rigidity to minimize flexing or deformation of the structural components and the carrier.

4,872,555

CARTON INCLUDING DETACHABLE COUPON

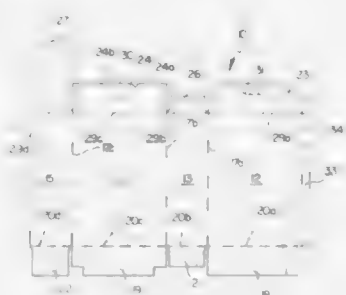
William S. Shadrach III, Atlantic Highland; Michael Mandler, Woodcliffe Lake; Ihor D. Moch, Lebanon; Bernard Zitomer, East Brunswick, and John L. Stewart II, Manalapan, all of N.J., assignors to Sunshine Biscuits, Inc., New York, N.Y. Continuation of Ser. No. 948,171, Dec. 31, 1986, abandoned.

This application Oct. 15, 1987, Ser. No. 109,386

Int. Cl.⁴ B65D 5/42

U.S. Cl. 206-459

3 Claims



1. A carton assembled from a carton blank having a front panel, a back panel, and side panels, which blank as assembled has an opening closable by an end closure unit comprising:

- a major first flap hingedly connected to the front panel along a first hinge line;
- a second major flap hingedly connected to the back panel along a second hinge line;
- a minor third flap hingedly connected to one side panel along a third hinge line and extending into the top opening from said one side panel;
- a redeemable commercial information panel underlying the major flaps when closed and removably attaching to and extending from the other side panel into said opening a substantial distance; and
- means for allowing re-closing of the major flaps;

wherein said commercial information panel is removable in absence of tearing any of said first, second, and third flaps along said first, second and third hinge lines; wherein removal of said commercial information panel is accomplished without destroying the assembled carton so as to permit subsequent re-closing of said end opening; and wherein said commercial information panel can be removed and presented for redemption while said carton is being used.

4,872,556

PACKAGING DEVICE WITH BURST-OPEN SEAL

Bert Farmer, 99 N. Main St., Farmington, Me. 04938

Filed Nov. 2, 1987, Ser. No. 115,352

Int. Cl.⁴ B65D 47/36, 83/00

U.S. Cl. 206-484

6 Claims



1. A package for containing and discharging fluid materials, comprising two sheets of materials sealed together about a perimeter of said sheets so as to form a container in which a fluid material may be contained, wherein a portion of a seal so formed is not capable of bursting under manual pressure and the remaining portion of said seal is capable of bursting under manual pressure applied to said container, and wherein said seal which is capable of bursting under manual pressure is formed by applying pressure to said sheets by a heated, corrugated forming means.

2. A package for containing and discharging fluid materials, comprising:

- a first chamber which will burst under manual pressure applied to said first chamber and a fluid material contained within said first chamber so as to discharge said fluid material; and
- a second chamber contiguous to said first chamber which will receive said fluid material as it is discharged from said first chamber and which will burst under lesser pressure applied to said second chamber, and said fluid so as to discharge said fluid from said package.

4,872,557

NESTABLE, STACKABLE CONTAINERS

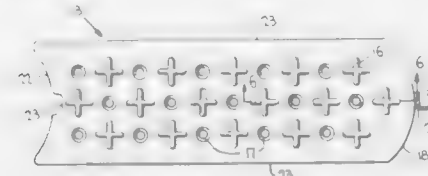
Douglas A. Ames, Huntington Beach, Calif., assignor to Trans-phase Systems, Inc., Huntington Beach, Calif.

Filed Jan. 30, 1985, Ser. No. 696,529

Int. Cl.⁴ B65D 21/02

U.S. Cl. 206-504

11 Claims



1. A nestable, stackable container comprising a continuous container body capable of being rapidly filled with and retaining a viscous liquid therein and having top and bottom walls joined by continuous side walls extending around the periphery of the container body, said container body having a forward portion terminating in a forwardly extending mouth part to provide access to the interior of the container, and a rearward portion thereof, and comprising

- male or female die parts located on said top wall and adapted to cooperate with mating die parts on the bottom wall of another container;
- male or female die parts located on said bottom wall adapted to cooperate with mating die parts on the top wall of another container;
- said forward portion of said container having a substantially convex curvilinear surface sloping continuously from said side walls to said mouth portion without inter-

mediate shapes that upon rapid filling with said viscous liquid, will trap air within said container body;

(d) said rearward portion of said container being formed with a substantially concave curvilinear surface sloping continuously from said side walls and conforming generally to the slope of the convex surface of said forward portion, so that a plurality of containers are stackable by mating male and female die parts on said top and bottom walls of said container, and nestable by juxtaposition of said convex and concave surfaces of a plurality of said containers, said surfaces being capable of contiguous relationship over major portions thereof whereby said convex and concave surfaces are in abutting and touching relationship so that a stack of containers will be better able to support itself.

4,872,558

BAG-IN-BAG PACKAGING SYSTEM

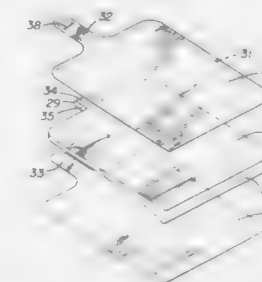
Daniel A. Pharo, 1901 Avenue of the Stars, Ste. 450, Los Angeles, Calif. 90067

Filed Aug. 25, 1987, Ser. No. 89,228

Int. Cl.⁴ B65D 81/02

U.S. Cl. 206-522

20 Claims



1. A packaging system comprising an outer bag defining a sealed chamber therein, an inner bag defining a pocket adapted to retain an article therein disposed within said chamber to split said chamber into first and second chamber portions on opposite sides of said inner bag, said inner and outer bags having peripheral edges thereof secured together on all sides of said inner and outer bags to suspend said inner bag within said chamber, except for a filling stem extending outwardly from one of said sides,

means at least substantially filling said chamber with a filler medium to substantially encapsulate and support said inner bag and article within said outer bag,

passage means for openly communicating the first and second chamber portions of said chamber with each other, and

inflating means communicating with said filling stem for filling said chamber with said filler medium from an external pressurized fluid source and through said passage means,

said outer bag comprising a pair of overlying first panels having outer peripheral edges thereof sealed together to define said chamber and said inner bag comprising a pair of overlying second panels, defining peripheral edges thereof which are sealed between the outer peripheral edges of said first panels on all sides of said first and second panels, except at said filling stem, and wherein said filling stem comprises overlying stem portions secured to said first panels to define an inlet passage therebetween communicating with said chamber through said passage means, said passage means defined by overlying and folded panel portions of said second panels forming a fold line dividing said inlet passage into separate passages communicating with the first and second chamber portions of said split chamber positioned on opposite sides of said inner bag.

4,872,559

DISPENSER FOR MEDICAL PREPARATIONS

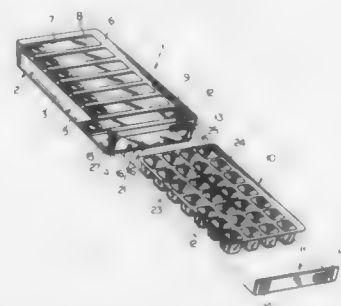
Hilrich Schoon, Tollarp, Sweden, assignor to Preci-Plast AB, Tollarp, Sweden

Continuation-in-part of Ser. No. 68,628, Jun. 30, 1987. This application May 24, 1988, Ser. No. 198,119

Claims priority, application Sweden, Dec. 29, 1987, 8705178 Int. Cl.⁴ A65D 83/04

U.S. Cl. 206—538

9 Claims



1. A dispenser for medical preparations, such as in tablet form, of the type that shall be taken at certain times of the day and over some days, such as a week, said dispenser comprising a rectangular body having two longitudinal sides, two transverse sides, a bottom and an upper surface, said upper surface having several recesses each covered by a cover which is slidable in grooves in the upper surface to be extractable in one direction, an insert having several rows of compartments, each row being positionable below a corresponding recess in the body, each compartment housing said medical preparations, and a cap closing an opening in one of the sides of the body, said cap being removable for allowing insertion and removal of said insert through said opening in said side of the body, wherein the cap at each end thereof comprises a shoulder and wherein said one side of the body comprises two edges adapted for retaining the cap in a closed position and the cap being elastic for being pressed inward at one side so that the corresponding shoulder can pass inside the edge and the cap can be pushed in the transverse direction for bending the cap and making the other shoulder at the other end of the cap free from the corresponding other edge of the body for removal of the cap.

4,872,560

TRAY FOR STORING AND TRANSPORTING BEVERAGE CONTAINERS AND THE LIKE

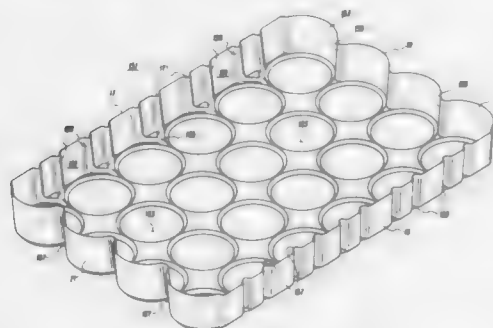
Keith A. Langenbeck, 4005 University Blvd., Dallas, Tex. 75205

Continuation-in-part of Ser. No. 30,899, Mar. 26, 1987. This application Jul. 22, 1987, Ser. No. 76,295

Int. Cl.⁴ B65D 1/34

U.S. Cl. 206—557

10 Claims



1. A tray for storing and transporting a plurality of cylindrical

cally-shaped articles in a substantially upright position, said tray comprising:

a bottom member, a pair of oppositely positioned first and second side walls extending longitudinally along said tray and a pair of oppositely positioned first and second end walls extending transversely across said tray, said bottom member and said walls being interconnected to define an enclosure for receiving said articles;

each of said first and second end walls being comprised of a first plurality of recessed regions separated by corresponding ones of a plurality of inwardly extending surfaces to provide a substantially scalloped appearance on said end walls, the end wall surface within each region being curved to conform to the curved surface of the corresponding article so that substantially the entire curved surface of the portion of the article which is disposed within the recessed region is in contact with the end wall surface within each region;

said first and second side walls having respective first and second sets of rib members extending vertically along substantially the entire height of the respective side walls and partially inwardly across said bottom member on respective inner surfaces thereof, selected ones of said first and second sets of rib members being arranged in cooperating pairs to define a second plurality of recessed regions therebetween;

the respective outer surfaces of said first and second side walls and said bottom member being substantially smooth to enhance the structural integrity of the tray;

said bottom member having a plurality of receptacles disposed therein for receiving predetermined lower portions of corresponding ones of said articles when said articles are disposed within said tray in a substantially upright position, each of said receptacles having a substantially circular shape to conform to the cylindrical shape of said articles, a portion of said bottom member surrounding each of said receptacles being beveled to substantially conform to the chine portion of the corresponding article received within the receptacle.

4,872,561

CARBOXY, CARBOALKOXY AND CARBAMILE SUBSTITUTED ISONITRILE RADIONUCLIDE COMPLEXES

Alan G. Jones, Newton Centre; Alan Davison, Needham; James Kronauge, Cambridge, and Michael J. Abrams, Allston, all of Mass., assignors to Massachusetts Institute of Technology and President and Fellows of Harvard College, both of Cambridge, Mass.

Division of Ser. No. 771,284, Aug. 30, 1985, Pat. No. 4,735,793.

This application Dec. 29, 1987, Ser. No. 139,289

Int. Cl.⁴ B65D 69/00; C07C 119/02; C07F 13/00; A61K 49/02 U.S. Cl. 206—569

10 Claims

7. A kit for converting a supply of a radionuclide to a coordination complex of a lower alkyl isonitrile ligand of the formula:



where X is a lower alkyl group having 1 to 4 carbon atoms, wherein R is selected from the group consisting of COOR^1 and CONR^2R^3 where R^1 can be H, a pharmaceutically acceptable cation, or a substituted or unsubstituted alkyl group having 1 to 4 carbon atoms, R^2 , and R^3 can be H, or a substituted or unsubstituted alkyl group having 1 to 4 carbon atoms, and R^2 and R^3 can be the same or different, and a radioactive metal selected from the class consisting of radioactive isotopes of Tc, Ru, Co, Pt and Re, said kit comprising a predetermined amount of said lower isonitrile ligand and a supply of a reducing agent capable of reducing the radionuclide, wherein said isonitrile ligand and said reducing agent are sterile and non-pyrogenic.

4,872,562

GABLE-TOP CONTAINER

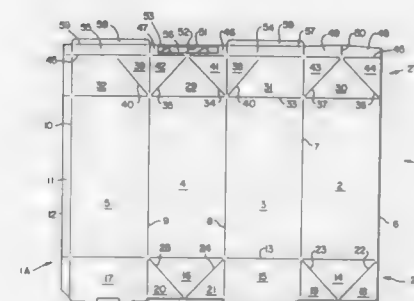
Gregory R. Wyberg, Minneapolis, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 36,908, Apr. 10, 1987, Pat. No. 4,762,234. This application Mar. 9, 1988, Ser. No. 160,403

Int. Cl.⁴ B65D 5/06

U.S. Cl. 206—631.3

9 Claims U.S. Cl. 206—634



1. A sheet material blank for constructing a sealed gable-top container having inner and outer surfaces responsible to a container sealing process, said blank comprising:

- (a) a container body having sides, a bottom, and a top;
- (b) an extensible pouring spout including first and second substantially triangular end panels connected to said container body top, first and second foldback panels, said first foldback panel connected to one lateral edge of said first triangular end panel, and said second foldback panel connected to another lateral edge of said first triangular end panel, a first roof wing panel adjoining said first foldback panel and connected thereto, a second roof wing panel adjoining said second foldback panel and connected thereto, third and fourth foldback panels, said third foldback panel connected to a first roof panel and to one lateral edge of said second triangular end panel, and said fourth foldback panel connected to another lateral edge of said second triangular end panel and adapted to be connected to a second roof panel, first and second gable rib panels connected to upper edges of said first and second foldback panels, respectively, to extend upwardly therefrom, having upper edges and lateral edges, and connected to each other at a common line, third and fourth gable rib panels connected to upper edges of said third and fourth foldback panels, respectively, and to each other, first and second roof rib panels connected to the upper edges of said first and second roof panels, respectively, each of said roof rib panel connected at one side thereof to one of said first and second gable rib panels, first and second upper rib panels connected to upper edges of said first and second roof rib panels, respectively, and
- (c) at least one stiffening fillet overlying a portion of, and bonded to an outer surface of at least one of said pouring spout panels, for stiffening said at least one said panel to transfer applied opening forces along said at least one said panel to open said container, said fillet comprising (x) a strip of material constructed of unoriented polypropylene resistant to the container sealing process and having a modulus of elasticity of at least 0.1×10^6 psi, and (xx) a layer of adhesive attached to one side of said strip and to said outer surface of said at least one side panel for bonding said strip thereto.

4,872,563

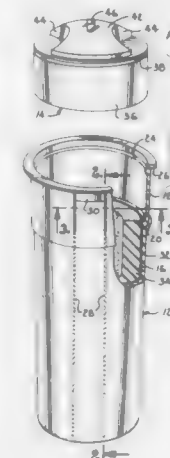
PROTECTIVE ENCLOSURE FOR HAZARDOUS MATERIAL PRIMARY CONTAINERS

William G. Warder, Weston, Mo., and David R. Frye, Longview, Tex., assignors to Pro-Tech-Tube, Inc., Weston, Mo.

Filed May 31, 1988, Ser. No. 200,568

Int. Cl.⁴ B65D 17/00

9 Claims



7. A protective device for packaging a container holding hazardous materials such as those containing viable microorganisms, said device comprising:

- an enclosure having a bottom and a side wall which presents a top section of the enclosure having a size to receive and hold said container therein;
- a top for said enclosure, said top being separate from the enclosure and having a size and shape to be inserted into said top section to close the enclosure and enclose the container therein;
- means for locking said top in said top section to impede removal of the top therefrom;
- a line of weakness on said side wall; and
- means for providing a tab on the side wall in proximity of said line of weakness, said tab being accessible for pulling to break the side wall along said line of weakness in a manner to effect release of said locking means and allow removal of the top to provide access to the container.

4,872,564

METHOD OF, AND APPARATUS FOR, AUTOMATICALLY CHECKING EGGS FOR FLAWS AND BLEMISHES, SUCH AS CRACKS, BLOOD, DIRT, A LEAK, ABERRANT FORM AND THE LIKE

Jelle van der Schoot, Aalten, Netherlands, assignor to Staalkat B.V., Netherlands

Filed Jun. 7, 1988, Ser. No. 203,102

Claims priority, application Netherlands, Jun. 30, 1987, 8701511

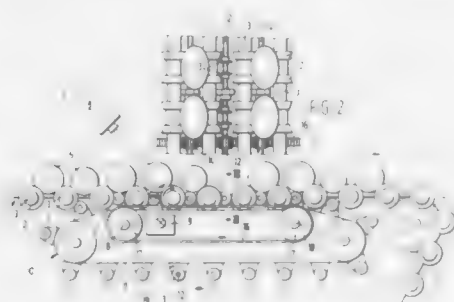
Int. Cl.⁴ A01K 43/00; B07C 5/02, 5/342

U.S. Cl. 209—511

4 Claims

3. In an apparatus for inspecting eggs for flaws or blemishes having a conveyor roller track for conveying eggs with adjacent conveyor rollers thereof adapted to receive a single egg, a light source disposed adjacent the conveyor roller track, a light detector for generating information as to which eggs have flaws or blemishes and storage means for storing said information in a tracking memory for subsequently discarding flawed or blemished eggs, the improvement comprising an auxiliary roller track having a plurality of auxiliary rollers, means for temporarily interposing an auxiliary roller between said adjacent conveyor rollers such that the egg supported thereby is temporarily supported by a first of said conveyor rollers and

the interdisposed auxiliary roller and lifted off of the second of the adjacent conveyor rollers, means for causing the interdisposed auxiliary roller to rotate at a greater peripheral speed



than that of the first of said conveyor rollers to impart such rotation to the egg so as to increase the speed of inspection thereof by said detector as the said rotating egg passes thereby.

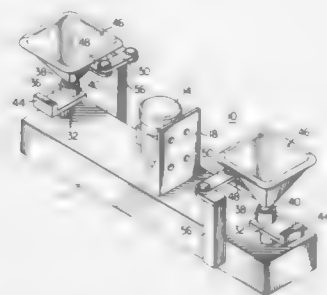
4,872,565

APPARATUS AND METHOD FOR CLEARING DEBRIS FROM CUT TREES

Don J. McAlpine, R.R. 2, Mediapolis, Iowa 52637
Filed Feb. 12, 1988, Ser. No. 155,547
Int. Cl.⁴ B07C 9/00

U.S. Cl. 209—699

13 Claims



1. A tree shaker comprising:

- (a) a base;
- (b) a vertical shaft journaled for rotation with respect to the base;
- (c) horizontal turntable means carried by the shaft;
- (d) means for rotating the shaft; and
- (e) a receptacle shaped for receiving the cut end of a tree trunk, mounted on the turntable for relative rotation with respect to the turntable, and horizontally offset from the shaft.

4,872,566

TACO SHELL HOLDER

Richard E. Alsop, 2104 Loma Vista Pl., Los Angeles, Calif.
Filed May 20, 1988, Ser. No. 196,445
Int. Cl.⁴ A47F 7/00

U.S. Cl. 211—13

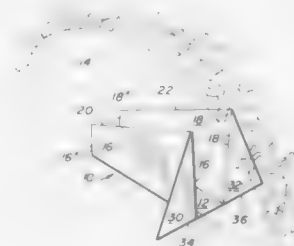
3 Claims

1. In a taco shell holder for holding a taco shell during the filling thereof and during consumption, said taco shell holder comprising:

- a bottom horizontal support surface upon which rests a lower surface of a taco shell, said bottom support surface comprising a first and a second parallel longitudinal edge, a forward edge and a rearward edge;
- a first and second upstanding side wall, said first side wall having a lower edge integral with said first longitudinal edge of said bottom support surface and projecting up-

wardly therefrom, and said second side wall also having a lower edge integral with said second longitudinal edge of said bottom support surface and projecting upwardly therefrom;

each of said first and second side walls having an upstanding forward edge surface substantially adjacent said forward edge of said bottom support surface, each said side wall further comprising an upper edge surface sloping downwardly from said forward edge rearwardly, whereby the vertical distance of each said upper edge above said bottom support surface continuously diminishes from front toward rear; a first and a second triangular brace wall, said first brace wall having an upstanding edge integral with the entire height of the forward edge surface of said first side wall, and said second brace wall having an upstanding edge integral with the entire height of the forward edge surface of said second side wall, said first brace wall lying in a plane extending at an angle with respect to a plane containing therein said first side wall, and said second brace wall lying in a plane extending at an angle with respect to a plane containing therein said second side wall,



whereby said brace walls serve to hold the holder erect in self-supporting manner, so that a taco shell is held therein during the filling process without the need of support by a hand;

each said side wall extending along the entire length of said bottom support surface and being trapezoidal in shape and also comprising a rear edge surface parallel to said forward edge surface, said rear edge surface having a height less than said forward edge surface, said rear and forward edge surfaces defining the bases of said trapezoidal shape, each said first and second side wall extending upwardly from the respective said longitudinal edge of said bottom support surface and diverging away from each other, each said side wall lying in a plane forming an acute angle with respect to a vertical plane containing therein a respective said longitudinal edge of said bottom support surface, said acute angle being between ten and thirty degrees; each said upper edge surface of each said side wall sloping downwardly at an angle of between fifteen and forty degrees; each said brace wall extending from said upstanding forward edge of a respective said side wall.

4,872,567

SHELF CONVERSION UNIT FOR GONDOLA DISPLAY

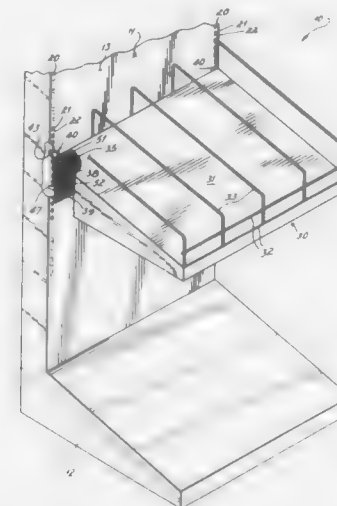
Rafael T. Bustos, Alpharetta, Ga., assignor to Leggett & Platt, Incorporated, Carthage, Mo.
Continuation of Ser. No. 866,776, May 23, 1986, abandoned.
This application Oct. 20, 1987, Ser. No. 110,380
Int. Cl.⁴ A47F 7/00

U.S. Cl. 211—59.2

9 Claims

1. The method of converting the shelf of any one of a plurality of differing gondola displays to a fixed size and configuration replacement shelf of a different type and wherein each of the gondola displays has a base and at least two horizontally spaced vertical uprights fixed to and extending upwardly from said base, each of said uprights of each of said plurality of gondola displays having a plurality of vertically spaced verti-

cal slots therein, the corresponding slots of different ones of said uprights being horizontally aligned for supporting a shelf, and said differing gondola displays being characterized by a different combination of spacing of said uprights, of the dimensions of said slots, of the shape of said slots, and of the spacing of said slots in said uprights, each of said gondola displays being further characterized by having at least one shelf supported from said at least two vertical uprights and cantilevered over said base from said at least two vertical uprights, which method comprises



removing said one shelf from said at least two vertical uprights, mounting a supporting bracket on each upright of said one gondola display by engaging a rearwardly facing hook of each bracket with one of the corresponding slots of said uprights, and mounting said fixed size and configuration of replacement shelf on said brackets by engaging a hook of one of said brackets or said replacement shelf with a slotted opening in the other of said brackets or said replacement shelf.

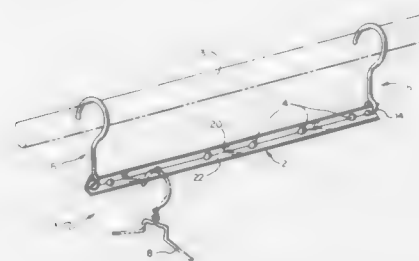
4,872,568

COAT HANGER SUSPENDING DEVICE

Ernest Lehmann, P.O. Box 1, Bellport, N.Y. 11713
Continuation-in-part of Ser. No. 33,019, Mar. 31, 1987, abandoned. This application Aug. 8, 1988, Ser. No. 231,589
Int. Cl.⁴ A47G 25/02

U.S. Cl. 211—113

4 Claims



1. A coat hanger supporting device comprising: an elongated unitary rod member having a uniform, generally channel-shaped cross section consisting of two sides forming an angle therebetween and further having a first end and a second end, said rod member defining a plurality of oblong openings therethrough in the area where the

two sides come together to form the angle, said openings being spaced along the length thereof;

a first rigid open hook member freely and flexibly connected to said first end of said rod member, such that a universal swivel between said first hook and said rod member is formed;

a second rigid open hook member freely and flexibly connected to said rod member, such that a universal swivel is formed therebetween, and first and second hook member being sized and shaped to facilitate attachment and removal of the device from supporting means of various shapes and sizes to which at least one of said first or second hook members may be so engaged, said universal swivel providing a free and flexible connection such that said hook members may form a full range of angles relative to said rod member in any direction when said hook is attached to said supporting means.

4,872,569

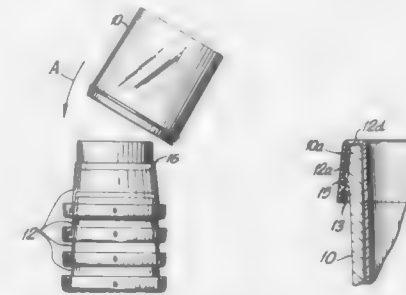
DRINKING VESSELS

Brown Bolte, 630 N. Federal Hwy., North Palm Beach, Fla. 33408

Continuation of Ser. No. 655,063, Sep. 26, 1984, abandoned, which is a continuation-in-part of Ser. No. 575,546, Jan. 31, 1984, abandoned, which is a continuation-in-part of Ser. No. 470,844, Feb. 28, 1983, abandoned. This application May 12, 1987, Ser. No. 52,167
Int. Cl.⁴ B65D 23/06

U.S. Cl. 215—12.1

50 Claims



1. A drinking vessel adapted to provide an exterior surface portion substantially free of condensation, comprising:

a first vessel member having an open top and being adapted to receive and contain any desired substance such as a liquid to be consumed;

a second vessel member associated with but generally separated from said first vessel member to form a thermal air space therebetween,

said first vessel member comprising a removable insert member proportioned to conform generally to the configuration of said second vessel member, said insert member being receivable within said second vessel member to form a generally double-walled drinking vessel having said thermal air space between said insert member and said second vessel member, said insert member also including a lip along its open top, said lip extending towards the bottom of said insert member and being proportioned to substantially prevent a person's lip from contacting said second vessel member during use, and said insert member being tapered to a greater degree from its open top to its bottom than said second vessel member and further including grasping means associated between said insert member and said second vessel member for permitting releasable engagement between said insert member and said second vessel member,

said second vessel member being adapted to provide a barrier against formation of condensation on its exterior holding surface and to form a thermal air space between said insert and second vessel members to provide a ther-

mally insulative gap to help maintain the temperature of any substance contained within said insert member, said second vessel member including vent means for communicating said thermal air space with the ambient surroundings of said drinking vessel to permit thermal expansion and contraction of air within said thermal air space due to the presence of hot or cold substance within said insert member, and said second vessel member further including drip means associated with said vent means for substantially preventing moisture within said thermal air space from spilling through said vent means when said drinking vessel is tilted during use, such that a person can hold said drinking vessel along the exterior holding surface of said second vessel member substantially without contacting any condensation and without any condensation leaking out of said drinking vessel, any condensation forming on said insert member tending to collect within said thermal air space while the exterior surface of said second vessel member remains substantially free of condensation, and, further such that when said second vessel member is thrust down onto a stack of said insert members and thereafter lifted, one said insert member is grasped by said second vessel member yet can be removed therefrom when desired with relative ease for replacement by another said insert member.

4,872,570

TAMPER INDICATOR

Claude J. Harding, 3520 E. Cannon Dr., Phoenix, Ariz. 85028
Continuation-in-part of Ser. No. 119,389, Oct. 10, 1987, Pat. No. 4,804,096. This application Nov. 16, 1988, Ser. No. 271,647
Int. Cl.⁴ B65D 55/02

U.S. Cl. 215—230

17 Claims



1. A tamper indicator comprising:
 - a. a first cylindrical element having an upper wall and a first cylindrical chamber with a side wall oriented generally parallel to a first plane;
 - b. a second cylindrical element with a side wall oriented generally parallel to the first plane and telescopically interconnected with the first cylindrical element and including an upper surface, the second cylindrical element being rotationally displaceable between first, second and third angular positions within a second plane orthogonal to the first plane and telescopically displaceable between a compressed position and an expanded position;
 - c. indicator means including
 - i. a first indicator element coupled to the upper wall of the first cylindrical element;
 - ii. a second indicator element coupled to the upper surface of the second cylindrical element and being rotationally displaceable with the second cylindrical element, the indicator means displaying a first status when the second cylindrical element is positioned in the second angular position and displaying a second status when the second cylindrical element is positioned in the third angular position;
 - d. means for biasing the first and second cylindrical elements into the expanded position and for rotationally biasing the first and second cylindrical elements toward the third angular position; and
 - e. locking means for maintaining the first and second cylindrical elements in the first angular position when the first and second cylindrical elements are placed in the expanded position, for enabling the biasing means to displace

the first and second cylindrical elements into the second angular position when the first and second cylindrical elements are displaced from the expanded position into the compressed position, and for enabling the biasing means to displace the first and second cylindrical elements into the third angular position when the first and second cylindrical elements are displaced from the compressed position into the expanded position, whereby the indicator means display changes from the first status into the second status when the first and second cylindrical elements are displaced from the second angular position into the third angular position.

4,872,571

CONTAINER POUR SPOUT WITH PEELABLE TAMPER-PROOF SEAL

Ross E. Crecelius, 7201 Christopher Dr., St. Louis, Mo. 63129;
Patrick E. O'Neal, 1124 Klondike Rd., and David B. Crecelius, 1615 York St., both of Quincy, Ill. 62301
Filed Jan. 23, 1989, Ser. No. 299,780
Int. Cl.⁴ B65D 41/62

U.S. Cl. 215—232

2 Claims



1. In a container comprising a pour spout through which flowable contents may be poured, said spout having exterior threads, an internally threaded cap screwed onto said spout, and a membrane-like closure secured by a seal over the circumferential lip of said spout, the improvement which comprises, said membrane-like closure having an elongated pull tab by means which said membrane-like closure can be peeled off said lip, and said external threads on said spout being interrupted in a direction parallel to the axis of said spout so as to provide in said external threads a groove in which said tab may reside when said cap is screwed on said spout.

4,872,572

LYOPHILIZATION STOPPER (CASE II)

Rik Schrooten, Kleine Brogel, Belgium, assignor to Helvoet Pharma N.V., Alken, Belgium

Filed Dec. 23, 1988, Ser. No. 288,972
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1987, 3744174

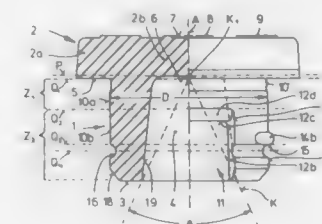
Int. Cl.⁴ B65D 51/16

U.S. Cl. 215—307

7 Claims

1. Lyophilization stopper made of a rubber elastic material and composed of a shank intended for insertion into the container neck to be sealed and of an essentially circular disc shaped flange which is made in one piece with the shank and projects radially beyond it, with the longitudinal axis of the flange being congruent with the longitudinal axis of the shank; the shank includes a cavity which surrounds the longitudinal axis of the shank, is open toward the free end face of the shank and extends up to a centrally closed wall portion of the flange; over its axial length, the shank includes a first section which extends between a first transverse plane defined by the boundary face of the flange projecting radially outwardly from the

shank and a second transverse plane perpendicular to the longitudinal axis of the shank; this first section has a closed outer circumferential face whose maximum diameter is slightly larger than the inner diameter of the container neck; following the first section, the shank has a second section having an outer enveloping face which has essentially the same diameter as the first section and includes at least one passage communicating with a cavity extending from the end face of the shank to a radial opening disposed in the second section adjacent the second transverse plane; a plurality of blocking elements, which can be pushed back by elastic deformation, project outwardly from the second section beyond the enveloping face, with their axially outer boundaries lying on a common



third transverse plane perpendicular to the longitudinal axis of the shank and disposed between the second transverse plane and the free end face of the shank perpendicularly to the longitudinal axis of the shank, characterized in that

the inner wall face (19) laterally defining the cavity (4) lies entirely outside a cone (K) whose axis is the longitudinal axis (A) of the shank, whose tip (K₁) lies in the first transverse plane (Q₁) and whose tip angle (β), in degrees, is larger than a value calculated according to the formula

$$-39 + 75 \times \lg(D),$$

where "lg" in the formula represents the decimal logarithm and "D" the maximum diameter (D), measured in millimeters, of the first section (Z₁) of the shank (1).

4,872,573

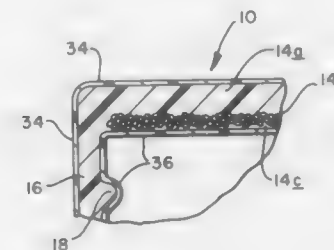
PLASTIC CLOSURE WITH BARRIER COATING

Marion Johnson, Baytown, and Granville J. Hahn, Big Spring, both of Tex., assignors to Permian Research Corporation, Big Spring, Tex.

Continuation-in-part of Ser. No. 922,127, Oct. 23, 1986, Pat. No. 4,744,478. This application May 17, 1988, Ser. No. 195,095
Int. Cl.⁴ B65D 53/00

U.S. Cl. 215—347

11 Claims



1. A polymeric container closure molded from a single moldable polymeric composition, said closure comprising integrally molded polymeric end and side walls, said end wall further comprising a first layer having a density substantially the same as the density of said side wall and a second relatively less dense foamed layer that is formed in situ, said molded closure being further adapted to retard the migration of oxygen-containing gases through said closure by the addition of at least one dissimilar polymeric barrier layer.

4,872,574

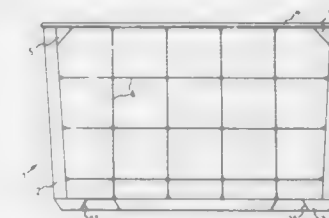
CONTAINER

David C. S. Lam, 23 Hong San Walk, Singapore, Singapore 2368

Filed Nov. 17, 1987, Ser. No. 121,717
Int. Cl.⁴ B65D 7/00

U.S. Cl. 220—1.5

12 Claims



1. A container having a square or rectangular frusto-pyramid shape and a base, whereby empty containers can be stacked one inside another, wherein said container comprises uprights at each corner thereof, a rim connecting the upper ends of said uprights, a base linked to the lower ends of said uprights, open sides which are traversed by a mesh, gussets positioned between said uprights, said base, and/or said rim for strengthening said container, and means in said base for receiving forks of a forklift truck.

4,872,575

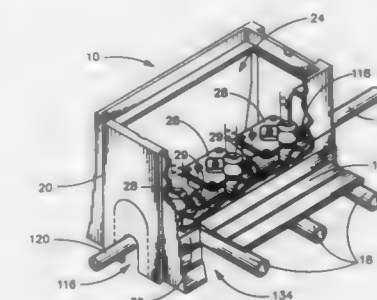
PROTECTIVE HOUSING STRUCTURE FOR UNDERGROUND DEVICES

Errol D. Kobilar, 13030 Meridian Rd., Elbert, Colo. 80106
Filed Jun. 30, 1987, Ser. No. 68,115

Int. Cl.⁴ H02G 3/08

U.S. Cl. 220—3.3

22 Claims



1. A protective housing structure adapted to house and protect devices mounted beneath ground level and connectable to underground interconnect elements such as conduit and the like, comprising a base assembly constructed as an upstanding wall forming an enclosure with an interior adapted to house at least one of said devices, said base assembly having a bottom edge defining an open bottom and a top edge defining an open top and having first and second end wall portions oppositely disposed with respect to one another, and cooperative interlocking means associated with each of said first and second end wall portions for securing two protective housings together in end-to-end relation with an end wall portion of one of said housings facing an end wall portion of the other of said housings each of said first and second end wall portions including a portion of reduced wall thickness contiguous with said bottom edge to provide areas each of which may be cut in a selected shape and the cut portion removed to form a slot through which an interconnect element may longitudinally extend to be connected to said device therein.

4,872,576

SOFT-METAL MADE CAN BODY WITH SQUASHING GUIDES

Tadashi Nakamura, 346, Futago, Takatsu-ku, Kawasaki-shi, Kanagawa-ken, Japan

Filed Mar. 2, 1988, Ser. No. 163,244

Claims priority, application Japan, Jul. 17, 1987, 62-109027

Int. Cl.⁴ B65D 1/40

U.S. Cl. 220—83

1 Claim



1. A beverage can formed of soft-metal having a smooth, cylindrically shaped outer peripheral surface, a top surface and a bottom surface and spiral pressure-squashing guides printed on said smooth outer peripheral surface of said can body in such a way as not to distort said smooth outer peripheral surface, and extending between said top and bottom surface, said outer peripheral surface of said can-body being adapted to be manually pressed by fingers along said spiral pressure-squashing guides thereby deforming said can body and said can body being further adapted to be crushed by squeezing said top and bottom surfaces together while simultaneously twisting said deformed can body.

4,872,577

HINGED CLOSURE ATTACHMENT FOR INSULATED BEVERAGE CAN CONTAINER

Jimmy L. Smith, R.R. 3, Geneseo, Ill. 61254

Filed Dec. 23, 1988, Ser. No. 289,135

Int. Cl.⁴ B65D 43/14

U.S. Cl. 220—85 CH

1 Claim



1. A closure attachment for an insulated container having an annular wall terminating in an upper marginal edge providing an open top for receiving a beverage can wherein the height of the wall is less than that of the can whereby an upper cylindrical portion of the received can is exposed above the aforesaid marginal edge, said attachment comprising annular band means configured to tightly encircle the insulated container wall below the aforesaid marginal edge and independently of the beverage can, an imperforate lid dimensioned to fit over the open top of the insulated container, said lid being in the form of an insulated inverted cup configured to overlie the top of the insulated container wherein closed position and additionally to snugly fit over the exposed upper portion of the beverage can.

tion of the beverage can, and hinge means connecting the lid to the band means.

4,872,578

PLATE TYPE HEAT EXCHANGER

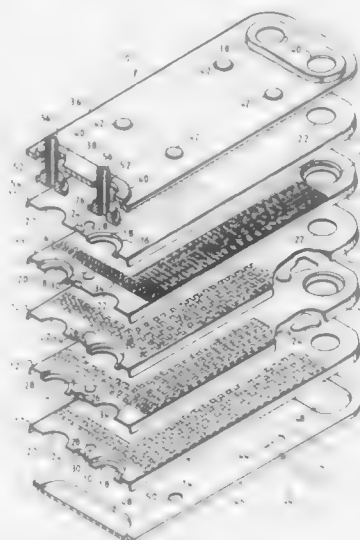
Raymond F. Fuerschbach, Tonawanda; Timothy P. Creighton, Buffalo, and David F. Fijas, Depew, all of N.Y., assignors to ITT Standard of ITT Corporation, Buffalo, N.Y.

Filed Jun. 20, 1988, Ser. No. 209,228

Int. Cl.⁴ F28F 3/08

U.S. Cl. 165—167

23 Claims



1. A plate type heat exchanger comprising:
a plurality of first heat exchange plates arranged in stacked relation, each of said first heat exchange plates including a first heat transfer section, a peripheral flange extending downwardly from said first heat transfer section, a first depression extending downwardly from said first heat transfer section and including a first flow opening extending therethrough, a second flow opening defined within said first heat transfer section, a first projection extending upwardly from said first heat transfer section, and a second depression extending downwardly from said first heat transfer section;
a plurality of second heat exchange plates arranged in alternating, stacked relation with said first heat exchange plates, each of said second heat exchange plates including a second heat transfer section, a peripheral flange extending downwardly from said second heat transfer section and including a first flow opening extending therethrough, a second flow opening defined within said second heat transfer section, a first projection extending upwardly from said second heat transfer section, and a second depression extending downwardly from said second heat transfer section;
said first flow opening of at least one of said first heat exchange plates adjoining said second flow opening of at least one of said second heat exchange plates;
said second depression of said at least one of said first heat exchange plates adjoining said first projection of said at least one of said second heat exchange plates;
a bottom plate mounted in stacked relation to one of said first or second heat exchange plates, said bottom plate including a plurality of downwardly extending depressions; and support feet mounted to said bottom plate, said support feet including a plurality of openings therein, said depressions from said bottom plate extending within said support feet openings.

4,872,579

ASPIRATING/VENTILATING APPARATUS AND METHOD

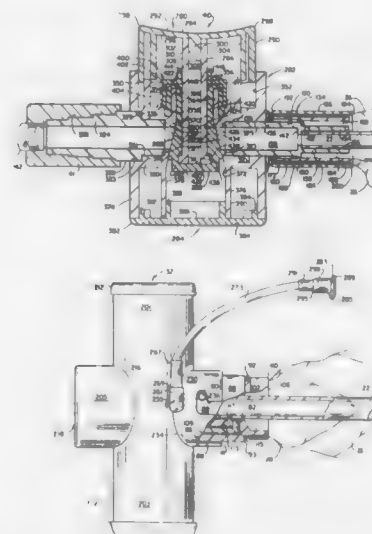
Darrel Palmer, Sandy, Utah, assignor to Ballard Medical Products, Midvale, Utah

Division of Ser. No. 49,376, May 14, 1987, Pat. No. 4,836,199, which is a division of Ser. No. 916,341, Oct. 7, 1986, Pat. No. 4,696,296, which is a division of Ser. No. 767,400, Aug. 20, 1985, Pat. No. 4,638,539, which is a division of Ser. No. 633,570, Jul. 23, 1984, Pat. No. 4,569,344. This application Apr. 11, 1988, Ser. No. 179,800

Int. Cl.⁴ A62B 9/02

U.S. Cl. 128—205.19

7 Claims



1. A non-contaminating normally closed valve assembly for use in selectively delivering vacuum to a desired site, the valve assembly comprising valve means and valve body means in which the valve means may be manually displaced, the valve body means comprising bore means and means for isolating the vacuum pressure from the atmosphere, the valve means comprising a single structural element normally simultaneously self-biasing and sealing the valve means to the valve body means in a closed position at the bore means, but accommodating on-going manual displacement of the single structural element counter to the self-bias into an open position for opening said bore means across the valve assembly to the vacuum pressure.

4,872,580

CARPET SAMPLE HOLDER

Robert T. Fuller, 1351 Empire St., Anaheim, Calif. 92804, and Robert J. Sanders, 2200 E. Oshkosh Cir., Anaheim, Calif. 92806

Continuation of Ser. No. 74,583, Jul. 17, 1987, abandoned. This application Feb. 1, 1989, Ser. No. 304,916

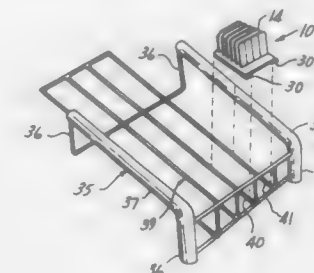
Int. Cl.⁴ A47F 7/16

U.S. Cl. 211—45

2 Claims

1. A carpet sample display device comprising:
a stand including a grid which has a pair of parallel rods; and a rack having a base with a generally flat upper surface and a lower surface, said surfaces having a substantial dimension of width, a plurality of parallel, spaced apart blades attached to and extending away from said upper surface at an oblique angle relative thereto, each of said blades having a substantial dimension of width and of length, each pair of adjacent blades forming a clear slot between them which is open at the sides and free ends of said blades, the face of each blade which is intended to bear against the pile of a carpet sample placed in the respective slot being smooth so as not to form a pattern on that carpet sample,

and a plurality of hook-like members on and projecting below said lower surface adapted releasably to engage to



a respective said rod, there being at least one said hook-like member for each rod of said pair of rods.

4,872,581

KNOCK-DOWN BOOM FOR PICK-UP TRUCK

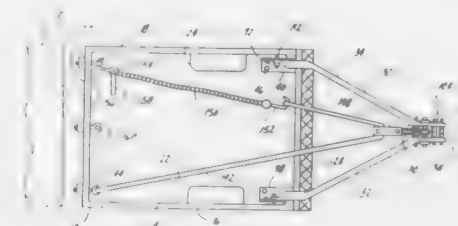
Norman G. Wedhorn, 44112 Yost, Canton, Mich. 48188

Filed Nov. 20, 1987, Ser. No. 123,334

Int. Cl.⁴ B66C 23/44

U.S. Cl. 212—180

5 Claims



1. In association with a truck having a longitudinal centerline; said truck including a cargo box defined by a bed, a forward wall, two side walls, and a tailgate; the improvement comprising a V-shaped boom structure; means pivotally mounting said boom structure for vertical swinging movement around an axis that is transverse to the cargo box side walls in close adjacency to the rear end of the bed and lower edge of the tailgate; said boom structure having a length that is less than the distance between the pivot means and forward wall of the cargo box, whereby the boom structure can be swung forward to a storage position totally disposed within the cargo box; said boom structure comprising two convergent bars having two closely-spaced ends in near proximity to the vehicle centerline and two widely-spaced ends in near proximity to the cargo box side walls; means rigidly connecting the closely-spaced ends of said bars; said rigid connecting means comprising a plate (104 or 106) welded to an end of each bar in parallelism to the vehicle centerline, at least two transverse tubular spacers (110, 114) extending from one plate to the other plate, and threaded fastener means (116, 120) extending through the tubular spacers to rigidly but detachably connect the convergent bars; said pivot means comprising two widely-spaced foot structures detachably fastened to the bed in near adjacency to the cargo box side walls for connection to the widely-spaced ends of the convergent bars; the space between the convergent bars being unobstructed, whereby cargo can be placed therein when the boom is in its storage position.

4,872,582

WEIGHTED REFUSE CONTAINER

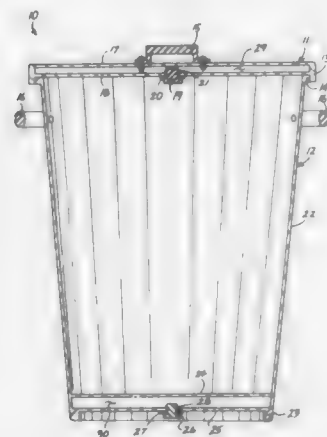
Gene L. Sipple, 3207 N. Rankin St., Appleton, Wis. 54911

Filed May 19, 1988, Ser. No. 196,053

Int. Cl.⁴ B65D 90/00

U.S. Cl. 220-1 T

1 Claim



1. A refuse container comprising a receptacle means and a lid means for overlying securement to said receptacle means: said receptacle means including a tapered continuous wall and floor with said wall terminating at a lower edge with a flange positioned below said floor, said floor defining a continuous web orthogonally and integrally joined to said wall, and

a first floor disposed above said floor defining a second continuous web orthogonally and integrally joined to said wall, and

said floor and said first floor defining a sealed water-tight receptacle chamber therebetween, and

a removable plug means replaceably and sealingly securable to an opening in said floor for receiving fluid in said receptacle chamber, and

said lid means includes a roof portion defining a lid roof web continuously and integrally joined to a downwardly depending flange wherein said flange is of a length and orientation terminating in a continuous downwardly depending edge for securement to an upper terminal end of said wall of said receptacle, and

wherein said lid further includes a lid floor defining a lid floor web spaced below said lid roof web and above the lower continuous edge of said flange to define a lid chamber between said lid roof web and said lid floor web, and said lid floor web formed with a centrally positioned opening and a further plug removably and sealingly securable to said opening, and

wherein said lid chamber is of a volume to receive a predetermined quantity of fluid, and said receptacle chamber is of a volume to receive a further quantity of fluid to exceed said predetermined quantity of fluid, and

said continuous wall of said receptacle is downwardly tapering from an upper radially outwardly projecting rim for cooperation with said flange of said lid to said flange positioned below said floor, and

wherein said plug in said floor and said further plug in said lid are threadably securable within complementary threaded openings respectively in said receptacle and said lid, and said openings are axially aligned.

4,872,583

HANDLE STRUCTURE FOR PAINT CONTAINER

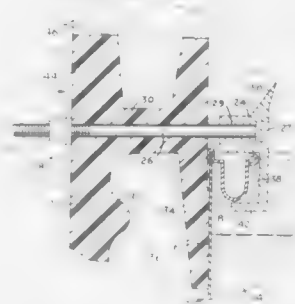
Zdenek Zelenka, and Lyn Zelenka, both of #66-9633-180 St., Edmonton, Alberta, Canada T5T 4G4

Filed May 26, 1988, Ser. No. 199,051

Int. Cl.⁴ B65D 25/28

U.S. Cl. 220-94 R

1 Claim



1. In association with an open-topped container for liquid coating material, said container having an annular side wall that terminates in an inwardly radiating rim structure circumscribing a central opening for withdrawal of the contained liquid material;

the improvement comprising a handle structure to facilitate manipulation of the container during brush application of the coating material onto an uncoated surface; said handle structure comprising a handle component, a separate clamping component, and a threaded connector means operable to draw the clamping component toward the handle component;

said handle component being a one piece molded plastic member that includes a horizontal bridge section (30), a downwardly depending pistol hand grip section (22) at one end of said bridge section, and a downwardly depending container-engagement section (34) at the other end of said bridge section; said container-engagement section being horizontally spaced from the hand grip section so that an intervening space is formed for the user's fingers that extend around the hand grip section, said horizontal bridge section having a horizontal circular hole extending completely therethrough in the zone above the hand grip section and container-engagement section;

said clamping component comprising a three dimensional body (24) having a C-cross section when viewed in a vertical plane coincident with the horizontal hole in the handle component; said C-cross sectioned body including a vertically thickened upper section having an undersurface adapted to seat on the upper surface of the container rim structure, a downwardly-extending web section depending from said vertically thickened section for disposition within the container, and a horizontal flange (40) extending from the lower end of said web section so that it can underlie the container rim structure;

said threaded connector means comprising an elongated horizontal bolt (29) fixedly and permanently attached to said clamping component; said bolt having a non-circular head (27) located in a non-circular socket in the upper section of the clamping component body, and a threaded shank extending horizontally through the upper section of the clamping component body so that said shank is spaced above the undersurface of said upper section when the clamping is operatively seated on the container rim structure; said elongated bolt being adapted to have its shank extend completely through the horizontal hole in the bridge section of the handle component body; and a wing nut (28) threadable onto a threaded end of said bolt, to thereby draw the bolt and attached clamping component

toward the bridge section of the handle component; said clamping component being horizontally spaced from the handle component whereby coating material adhering to the clamping component will have difficulty in reaching the interface between the bolt and handle component.

4,872,584

SAFETY DEVICE FOR A RADIATOR CAP

Takashi Sakai, Saitama, Japan, assignor to Akebono Brake Industry Co., Ltd., Tokyo, Japan and Akebono Research and Development Centre Ltd., Saitama, Japan

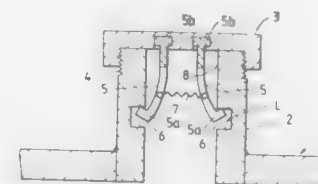
Filed Jul. 27, 1988, Ser. No. 226,337

Claims priority, application Japan, Aug. 28, 1987, 62-130177[U]

Int. Cl.⁴ B65D 55/00

U.S. Cl. 220-201

6 Claims



1. A safety device for a radiator cap detachably mounted on a fluid supply opening having an inner surface of a radiator for sealing the fluid supply opening, comprising:

a lock means for preventing the radiator cap from being detached from the fluid supply opening when the temperature of coolant located in said radiator is higher than a predetermined temperature value, said lock means being provided between said radiator cap and said inner surface of said fluid supply opening, said lock means being provided in pairs formed of two individual lock means and each of said individual lock means of said pair being spaced a distance from one another;

said lock means including a lock portion provided on said inner surface of the fluid supply opening and a lock member having two ends, one of said two ends of said lock member fixedly secured to the radiator cap and the other of said two ends of said lock member extending downwardly from the radiator cap into the fluid supply opening, said lock member being formed of a shape memory alloy.

4,872,585

TRASH CONTAINER TO BE CHEMICALLY SPRAYED

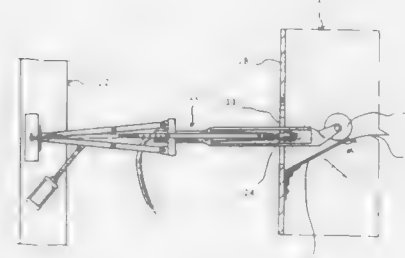
Il Yoo Kim, 7953 Audubon Ave., B-7, Alexandria, Va. 22306

Filed Oct. 14, 1988, Ser. No. 257,882

Int. Cl.⁴ B65D 43/14

U.S. Cl. 220-334

2 Claims



1. A trash container adapted to be chemically sprayed internally which comprises:

a trash container having a top which can be opened, an aperture disposed in one of the side walls of said trash container,

a door mounted by a hinge to close said aperture, said door biasing mounted to the interior of said side wall to open into said trash container, said door containing:

a bent lip end portion disposed opposite from said hinge, said bent lip end portion being inclined toward the inside of said trash container at a slope of 15°-20° for providing a smooth rolling surface for guiding a guide roller which supports an extensible chemical spray apparatus, said extensible chemical spray apparatus being slidably inserted against the bias of the door through the aperture and slidably removed from the trash container through said door, and

handle means disposed on opposite sides of the trash container, whereby the door is provided to accommodate the extensible chemical spray apparatus and the handle means are provided to accommodate a pair of lifting arms mounted to the dump truck so that the trash container can be simultaneously emptied and disinfected in a single operation.

4,872,586

CONTAINER CLOSURE AND ASSEMBLY

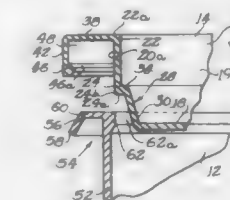
H. Richard Landis, Oak Lawn, Ill., assignor to Landis Plastics, Inc., Chicago, Ill.

Filed Sep. 25, 1987, Ser. No. 101,039

Int. Cl.⁴ B65D 39/00

U.S. Cl. 220-307

11 Claims



1. An injection molded plastic closure having non-uniform wall thickness for application to a container having a container sidewall and a container rim, said closure comprising:

a top central circular panel for covering an open container, a plug-like portion extending upwardly from the central circular panel and for insertion into the open mouth of the container for sealing engagement with the container side wall,

an encircling rim on the closure extending radially outwardly from the plug-like portion and having an outer depending skirt,

an enlarged bead of a cross-sectional thickness substantially greater than the cross-sectional thickness of said skirt and said top central panel for locking engagement with the container rim,

said plug-like portion having a substantially vertical upper wall portion and a lower wall portion offset radially inwardly from the vertical upper wall portion,

a lateral offset portion interconnecting the upper vertical wall portion and the offset lower wall portion,

a lower nesting surface on the bottom side of the lateral offset portion,

and an upper nesting surface on the top of the vertical upper wall portion for engagement,

said lower nesting surface engaging the upper nesting surface of another closure stacked therebelow and the upper surface on said closure engaging a lower nesting surface of a closure thereabove to stack the vertical upper wall portions in a vertical column.

4,872,587

CLOSURE FOR A FUEL TANK

Günther Zimmermann; Reinhard Friedrich, both of Waiblingen; Wolfgang Nantt, Steinheim, and Wolfgang Weissert, Leutenbach, all of Fed. Rep. of Germany, assignors to Andreas Stihl, Waiblingen, Fed. Rep. of Germany

Filed Jul. 7, 1988, Ser. No. 216,203

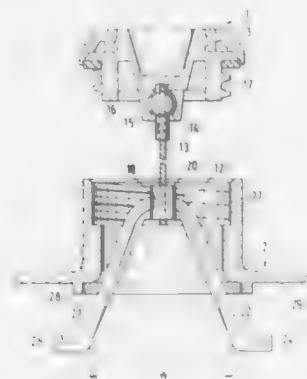
Claims priority, application Fed. Rep. of Germany, Jul. 24, 1987, 8710127[U]

Int. Cl.⁴ B65D 55/16

U.S. Cl. 220—375

18 Claims

U.S. Cl. 220—403



1. A closure for a tank such as the fuel tank of a handheld portable tool such as a motor-driven chain saw, the closure comprising:

- a filling stub defining a longitudinal axis and being formed on the tank and defining an opening having a sealing surface about the periphery thereof;
- a cap for coacting with said sealing surface to close the tank in a seal-tight manner, said cap including an upper grip portion for manually gripping and rotating the cap to remove the same from said filling stub, the cap also having a lower portion extending downwardly from said grip portion for projecting into said filling stub when said cap is placed on said opening;
- a completely limp non-metal connecting member for connecting said cap with the tank, said connecting member defining an axis and having first and second ends;
- holding means for preventing said connecting member and said cap from being separated from the tank after the cap has been removed from said opening;
- said connecting member being made of fuel resistant plastic so as not to scratch said sealing surface during the time that said cap is removed from said opening thereby protecting said sealing surface from damage which could affect the integrity thereof;
- attachment means for loosely attaching said connecting member at said second end thereof to said lower portion of said cap;
- said attachment means including a spherically shaped recess formed in said lower portion; a ball attached to said first end of said connecting member and being journaled in said recess with play so as to permit free movement of said ball in said recess in the manner of a socket joint while at the same time being fixed with respect to movement along said axis;
- said tank having a tank wall defining an inner wall surface in the vicinity of said filling stub; and,
- said holding means including a V-shaped resilient hook attached to said second end of said connecting member, said resilient hook having two legs defining the V-shape thereof, each of said legs having an offset end segment which comes into contact arresting engagement with said inner wall when the cap is removed from the opening of said inlet stub thereby preventing said cap and said connecting member from becoming completely detached

from the tank when the cap is removed from said inlet stub.

4,872,588

LINED CARTON

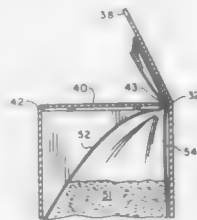
Teodoro A. Texidor, 6720 N. Navajo, Lincolnwood, Ill. 60646

Continuation of Ser. No. 876,688, Jun. 20, 1986. This application

Dec. 18, 1987, Ser. No. 135,499

Int. Cl.⁴ B65D 5/36

10 Claims



1. In a reclosable lined carton having first and second side walls, first and second end walls, a closed bottom and an open top defined by the upper marginal edges of said walls, and a liner including opposed sheets forming a receptacle having a closed bottom and an open top for storing a commodity within the carton, the improvement comprising:

- an inner closure flap hingedly secured to said first side wall along the upper marginal edge thereof and movable between open and closed positions,
- an outer closure flap hingedly secured to said second side wall along the upper marginal edge thereof and flap overlying a portion of said inner closure flap when said closure flaps are in their closed positions,
- the length of the liner from top to bottom being greater than the length of said side walls from top to bottom, defining a liner upper portion which extends between said closure flaps when said closure flaps are in the open position,
- and means bonding said liner upper portion to a portion of the inner surface of said outer closure flap whereby, as said outer closure flap is moved between its open and closed positions, said liner upper portion is moved with said outer closure flap, said inner closure flap conforming in length and width to the length and width of the cross-section of the carton whereby when said inner closure flap is moved to its closed position, its outer marginal edge is located at the junction of said second side wall and said outer closure flap with said outer marginal edge fitting tightly into the dihedral angle formed by said second side and said outer closure flap, and upon subsequent movement of said outer closure flap to its closed position, said liner upper portion of the liner is located between the outer surface of said inner closure flap and the inner surface of said outer closure flap, providing a substantially air-tight seal for the liner.

4,872,589

LINER/INSERT FOR REFRIGERATED CONTAINER

John D. Englehart, 44 S. State St., Vineland, N.J. 08360, and William H. Seaburn, 5417 Duncanwood Dr., Sarasota, Fla. 34232

Filed Apr. 18, 1988, Ser. No. 182,338

Int. Cl.⁴ B65D 90/04

U.S. Cl. 220—410

8 Claims

1. An improved device for the refrigerated storage of materials, which comprises:
- a top-opening refrigerated container having a bottom and side walls that define an interior volume;
 - a liner having a base and walls dimensioned to be releasably

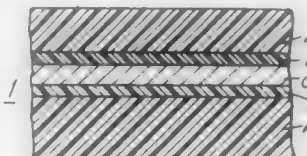
received within said interior volume of said container, said walls being contiguous with said side walls of said container, said base and walls of said liner defining an interior volume of said liner and an opening into said liner;

partition means for dividing said liner into at least two compartments, said partition means being a thin wall extending between opposite walls of said liner and perpendicularly from said base of said liner toward said opening of said liner and having a top edge proximate said opening, said partition means segregating said interior volume of said liner into a plurality of compartments having watertight integrity with respect to each other; and

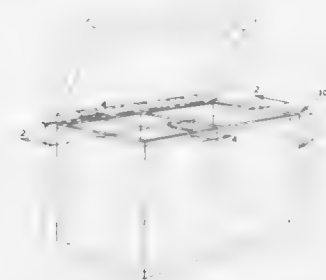
handle means defined by said partition means for selectively removing and inserting said liner from and into said container.

8. A combination liner/insert for segregating a preselected top-opening ice chest into two watertight compartments and for protecting the interior of said ice chest against damage caused by substances or articles placed therein comprising:

thereunder, simultaneously superimposing the other side edge of the laminate film on the folded part and bonding them together such that air bubbles are not entrapped between them, said resin layer having sufficient thickness and strength such that said resin layer alone rigidifies the body to be self support-



ing, said resin layer being formed by melt extrusion onto the outside of said cylindrical body, with said cylindrical body cooled with water passing through the gap between the cylindrical body being formed and the mandrel, said resin layer being surface-finished by a smoothing means after melt extrusion and thereby lacking seams or bends.



a liner, said liner having a base and walls comprised of relatively thin molded plastic dimensioned to substantially define the interior dimensions of said ice chest for being closely received therein, said walls further defining an opening substantially conforming to the opening of said ice chest;

partition means integrally molded within said container, said partition means comprising a wall of approximately the same thickness as said liner walls and being substantially vertically disposed extending from the base of said liner toward said opening of said liner, perpendicular to said base and said opening of said container, thereby segregating said container into two watertight compartments, said partition means having a top edge portion proximate said opening of said liner; and

handle means comprising said partition means having a hole located proximate its said top edge portion, said hole being dimensioned to receive the fingers of a human hand.

4,872,590

RESIN COATED CAN WITH FOLDED SEAM

Hitoshi Sasaki, and Shoji Igota, both of Kawasaki, Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Continuation of Ser. No. 736,969, May 22, 1985, abandoned, which is a continuation-in-part of Ser. No. 531,994, Sep. 14, 1983, abandoned. This application Aug. 5, 1986, Ser. No. 892,465

Claims priority, application Japan, Dec. 3, 1982, 57-212519; Dec. 3, 1982, 57-212520; Dec. 3, 1982, 57-212521; May 22, 1983, 55-19861

The portion of the term of this patent subsequent to Feb. 10, 2004, has been disclaimed.

Int. Cl.⁴ B65D 25/14, 8/08

U.S. Cl. 220—457

3 Claims

1. A retortable structure comprising a cylindrical body and a resin layer formed on the outside thereof, said cylindrical body serving as a content protecting layer which is formed by spirally wrapping a laminate film composed of a polyolefin layer, a gas barrier layer, and a plastic layer around a mandrel, with one side edge thereof folded back and outward and the folded part bonded such that air bubbles are not entrapped

4,872,591

MEDICATION DISPENSER

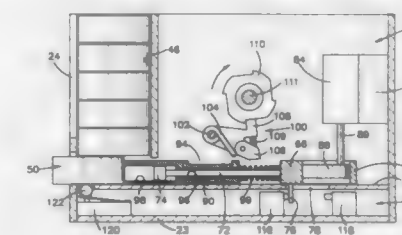
Richard O. Konopka, 5695 Janet Blvd., Solon, Ohio 44139

Filed Nov. 19, 1987, Ser. No. 122,794

Int. Cl.⁴ B65D 83/04

U.S. Cl. 221—3

19 Claims



1. A medication dispenser, comprising:

- a plurality of cannisters within which medicine to be dispensed can be placed;
- a portable housing having a top wall and a front wall;
- a plurality of vertically oriented magazines disposed within the housing, the magazines adapted to receive cannisters stacked atop each other, the magazines having upper and lower ends, each magazine having an entrance opening adjacent its upper end through which cannisters can be inserted into the magazine and a discharge opening adjacent its lower end through which the lowermost cannister can be ejected from the magazine;
- discharge means disposed within the housing for pushing individual cannisters through the discharge openings of selected magazines, the discharge means being movable between a cannister-ejecting position and a retracted position, the discharge means including a horizontally movable block disposed adjacent each magazine, the block being engageable with the lowermost cannister in the magazine, a horizontally movable feed slide disposed adjacent the blocks, a drive motor for moving the feed slide, a lost motion connection between the feed slide and the blocks, and means for preventing the blocks from moving except at predetermined times; and
- control means disposed within the housing for activating the discharge means at selected times.

4,872,592

ARTICLE STORAGE AND DISPENSING DEVICE WITH SOLD OUT INDICATING MECHANISM

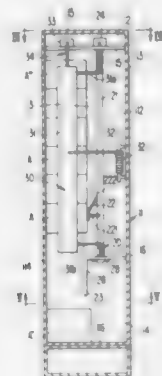
Anazawa Osamu, Macheshi, Japan, assignor to Sanden Corporation, Guama, Japan

Continuation of Ser. No. 11,256, Feb. 5, 1987, abandoned. This application Aug. 3, 1988, Ser. No. 228,837

Claims priority, application Japan, Feb. 5, 1986, 61-14450[U] Int. Cl.⁴ G07F 11/00

U.S. Cl. 221-6

2 Claims



1. An article storage and dispensing device comprising: a cabinet; article supporting and dispensing means for contiguously supporting said articles in a vertical stack and for individually dispensing said articles; article aligning and detecting means for aligning said articles and for detecting when all of said articles have been dispensed, said article aligning and detecting means comprising a detecting plate substantially spanning the entire height of said stack of articles and an arm extending from said detecting plate, said detecting plate engaging said articles to align said articles in said stack; mounting means for pivotably mounting said article aligning and detecting means in said cabinet, said aligning and detecting means pivotable about a vertical pivot axis offset relative thereto to allow pivotal movement of said aligning and detecting means in a direction toward and from said stack of articles; biasing means for biasing said aligning and detecting means toward said stack of articles; and sold-out indicator switch means for indicating a sold-out condition of said device, said arm disposed adjacent said indicator switch means, said detecting plate pivoting about said pivot axis when all of said articles from said stack have been dispensed, said sold-out indicator switch means engaged and actuated by said arm upon pivotal movement of said detecting plate to indicate a sold-out condition of said device.

4,872,593

DISPENSER FOR PACKAGED BANDAGES AND THE LIKE

John W. Behringer, 143 Main St., North Kingstown, R.I. 02852

Filed Jan. 11, 1988, Ser. No. 142,832

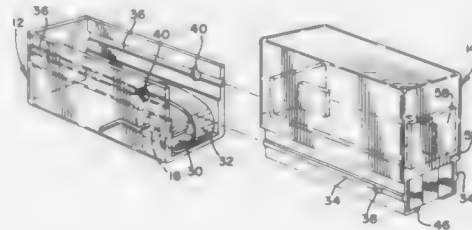
Int. Cl.⁴ B65H 1/08

U.S. Cl. 221-231

11 Claims

1. An apparatus for storage and dispensing of flat package units comprising: a base; engagement means rotatably mounted within said base; said engagement means comprising a substantially cylindrical roller truncated parallel to its axis, said roller having a follower extending from said roller; a cartridge slideably mounted to said base, said cartridge

defining a chamber therewithin for the storage of flat package units; said cartridge having a horizontal track slideably engageable with a horizontal channel in said base and said track having a lug which engages a socket in said channel when said cartridge is in proper horizontal relationship with said base allowing for the proper dispensing of said flat package units; said chamber having a floor with a longitudinally disposed elongated slot defined therein alignable with said engagement means;



- means for biasing toward said floor a plurality of flat package units stacked on said floor; means associated with said base for rotatably driving said engagement means; and an exit portal defined in said cartridge adjacent to one end of said chamber floor, whereby rotation of said engagement means causes said engagement means to frictionally engage a lowermost package unit from said plurality in said chamber through said slot only when the cylindrical portion of said roller is in direct contact with the follower and to urge said package unit toward and through said portal.

4,872,594

HAIR COLORING APPLICATOR BOTTLE

Robert Bloom, 425 Ascot Ln., Streamwood, Ill. 60103

Filed Sep. 12, 1988, Ser. No. 243,592

Int. Cl.⁴ B67D 5/06

U.S. Cl. 222-173

9 Claims



1. A hair coloring applicator bottle comprising: liquid receptacle means for receiving and containing hair coloring liquids therein; an applicator spout removably secured to a discharge end of said receptacle means; a base rotatably arranged at an opposite end of said receptacle means for normally maintaining said receptacle means in a vertical orientation; a timer mechanism operably interconnecting said liquid receptacle means and said base;

4,872,596

VISCOUS PRODUCT DISPENSER

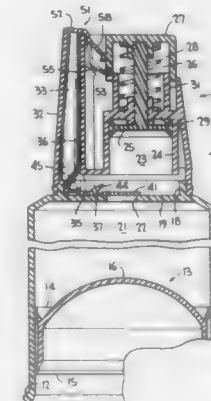
Douglas F. Corsette, Los Angeles, Calif., assignor to Calmar Inc., Watchung, N.J.

Filed Mar. 15, 1988, Ser. No. 168,248

Int. Cl.⁴ B67D 5/42

U.S. Cl. 222-380

5 Claims



4,872,595

MECHANICALLY PRESSURIZED AEROSOL DISPENSER

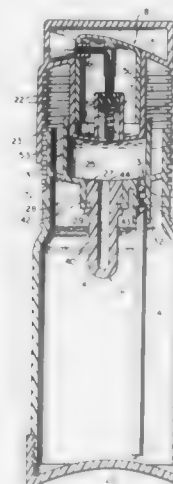
Roy Hammett, 16103 Carden Dr., Odessa, Fla. 33556; Jerry D. Hutcheson, 8188 S. Harrison Way, Littleton, Colo. 80122, and Raymond B. Avedon, 2821 N. Lakeridge Trail, Boulder, Colo. 80302

Filed Sep. 27, 1988, Ser. No. 249,956

Int. Cl.⁴ B65D 37/00, 88/54; B67D 5/42

U.S. Cl. 222-209

10 Claims



1. A mechanically pressurized dispensing device comprising: a container having an open, top end and a closed, bottom end; rotatable actuator means engaged with one end of the container and connected with a first expansible chamber means to enlarge the volume of the chamber to draw product to be dispensed from the container and into the chamber when the actuator means is rotated in a first direction and then to reduce the volume of the chamber to pressurize the product when the actuator means is rotated in a second direction; a second expansible chamber means connected to receive pressurized product from the first expansible chamber means when the actuator means is rotated in said second direction and to store the product under pressure for dispensing; and a discharge valve connected with the second expansible chamber means to release the pressurized product therefrom for dispensing the product; said first expansible chamber means including a piston and cylinder, one of the piston and cylinder being formed integrally with said container and the other of said piston and cylinder being formed integrally with said actuator.

4,872,597

BEVERAGE CONTAINER WITH DUAL DISPENSING TABS

Hisao Hanafusa, 20 Confucius Plaza - #34-F, New York, N.Y. 10011

Filed Oct. 13, 1988, Ser. No. 257,484

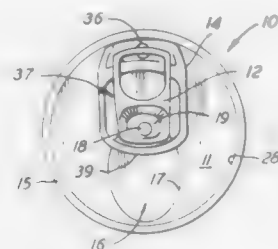
Int. Cl.⁴ B65D 47/10

U.S. Cl. 222-541

15 Claims

1. A beverage container for soda or beer beverage, comprising a tubular member for storing and dispensing said beverage, said tubular member having a removable sealed lid, a first pull tab for unsealing and tearing said lid from said tubular member,

means defining a sealed aperture upon said lid, and a second pull tab secured to said lid for unsealing said aperture, and



wherein said first and second pull tabs are interleaved with respect to one another.

4,872,598

DUSTING APPARATUS

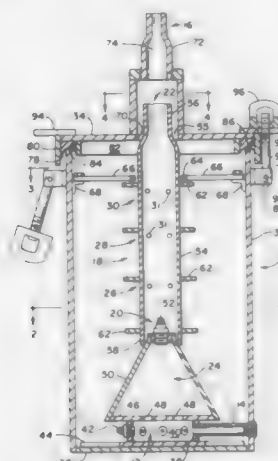
Tonny D. Travis, 113 1/2 Laurel Ter., Beckley, W. Va. 25801

Filed May 10, 1988, Ser. No. 192,769

Int. Cl. B05B 7/00

U.S. Cl. 222-630

13 Claims



1. Apparatus for dispersing dust material into the atmosphere at low concentration levels and substantially uniform rates, comprising tank means adapted for holding substantial quantities of solid, particulate dust material, fluidizer means positioned in a lower portion of said tank means, air feed means communicating with said fluidizer means, discharge port means in an upper portion of said tank means communicating with the ambient atmosphere, tubular densifier means mounted substantially vertically in said tank means and extending from a lower portion thereof to adjacent said discharge port means, said densifier means having air inlet means adjacent its lower end and outlet means adjacent its upper end in direct and immediate communication with said discharge port means, air feed means communicating with said inlet means, said densifier means having a series of longitudinally spaced apertures in the wall thereof providing for the substantially non-pressurized transfer of solid dust material from said tank means into said densifier means for transportation to said discharge port means and into the ambient atmosphere.

4,872,599
TELEMETRY POUCH WITH EXPANSIBLE CHEST STRAP

Vance M. Hubbard, Bedford, and Welton K. Brunson, Tarrant County, both of Tex., assignors to Tecnol, Inc., Fort Worth, Tex.

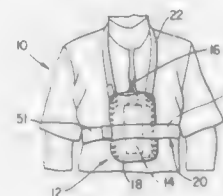
Continuation-in-part of Ser. No. 576,961, Feb. 3, 1984, which is a continuation of Ser. No. 354,632, Mar. 4, 1982, abandoned.

This application Apr. 12, 1985, Ser. No. 722,323

Int. Cl. A45F 3/14

U.S. Cl. 224-208

1 Claim



1. A pouch for maintaining hospital telemetry apparatus adjacent a patient while being sufficiently low cost in construction and materials as to be economically disposable after use, comprising:

an open-topped bag formed from opposed sidewalls fabricated from 1.2 ounce non-apertured polyester material joined at the side and bottom edges thereof by heat sealing with ultrasound such that a flexible moisture proof exterior is formed that is dimensioned to receive the telemetry apparatus and allow the telemetry apparatus to protrude therefrom and which prevents perspiration or liquid damage to the apparatus during use;

an inner layer disposed adjacent the innermost side of at least one of the said opposed sidewalls and ultrasonically bonded thereto, and fabricated from 0.035 inch polyester foam material to provide a high friction causing layer, said inner layer preventing substantial movement of the telemetry apparatus within said bag such that forces on the telemetry apparatus directed outward from the opening in said bag do not result in separation of said bag and the telemetry apparatus, the flexibility of said bag enhancing the friction applied by said inner layer;

said opposing sides joined together in such a manner that the interior of said bag opens outwardly from the open top thereof to the bottom thereof in such a manner that objects within the pouch are restricted from removal;

a first strap having first and second ends and being dimensioned to fit around the body of the patient, said first strap being heat sealed with ultrasound at said first end to one of said side edges of said bag, said first strap having an inner side and an outer side, substantially the entire inner side is fabricated from non-apertured polyester material and said outer side manufactured from a knitted fabric having the surface thereof brushed to raise individual fibers into a pile thereby forming a multiplicity of uninterrupted arches of unbroken individual filaments, and a section of elastic material spliced by heat sealing with ultrasound into said first strap;

hooking material attached to the side edge of said bag opposite said first end of said strap for hooking with said outer side first strap such that said bag is secured to the body of said patient when said first strap is disposed about the body of said patient and attached to the hooking member;

a second strap having first and second ends dimensioned to fit around an upper portion of the body of the patient, said second strap being heat sealed with ultrasound at said first end to an upper corner of said bag, said second strap having an inner side and outer side, said inner side fabricated from non-apertured polyester material and the entire said outer side fabricated from knitted fabric having the surface thereof brushed to raise individual fibers into a

pile composed of a multiplicity of uninterrupted arches of unbroken individual filaments;

a hooking layer attached to the upper corner of said bag opposite said first end of said second strap for mating with the outer side of said second strap such that said bag is maintained at a desired height relative to the body of the patient; and

said first and second straps adjustably securing said bag to body of said patient and said foam inner layer in said bag preventing dislodging of the telemetry apparatus contained therein for all directions of motion of said patient, whereby said pouch is completely constructed with ultrasound techniques to increase the speed and reduce the cost of manufacture thereof.

4,872,600

SPEED SQUARE INTERLOCKING HOLDER

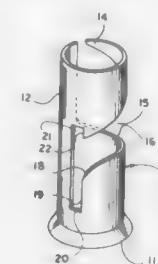
Douglas L. Corbin, P.O. Box 40, Seabrook, S.C. 29940

Filed May 4, 1988, Ser. No. 190,253

Int. Cl. A45F 5/00

U.S. Cl. 224-245

4 Claims



1. A tool holder, for carrying a tool having an aperture therein on a person's belt or the like, said tool holder comprising a generally cylindrical body having a top and bottom edge, a tool holding slot defined in said cylindrical body for receiving the tool to be held, said tool holding slot extending parallel to the centerline of said cylindrical body and defining a locking shoulder on at least one side of said slot for preventing lateral movement of said tool to be held, and a means for selectively receiving a belt of a user for carrying said tool holder on a person, such that said cylindrical body would be oriented in a generally vertical direction with respect to the user so that said tool holding slot would extend generally, said cylindrical body further defining a cam slot extending from said tool holding slot at an intermediate portion thereof to the top edge of said body, the intersection of said cam slot with said tool holding slot defining said locking shoulder, a tang formed from the wall of said body between said cam slot and top edge and extending circumferentially thereof, the lower edge of said tang comprising the upper edge of to said cam slot, the lower edge of said cam slot comprising a cam surface extending downwardly and circumferentially of said cylindrical body, the arrangement being such that said tang is receivable through said aperture of said tool to be held and said tool rests on said cam surface, said cam surface being downwardly sloped such that said tool to be held is movable by gravity along said cam surface towards said tool holding slot.

4,872,601

TWO LARGE ROLL TOILET TISSUE DISPENSER

Jerry A. Sigmund, Bala Cynwyd, Pa., assignor to Scott Paper Company, Philadelphia, Pa.

Filed Sep. 4, 1987, Ser. No. 93,344

Int. Cl. B65H 35/10

U.S. Cl. 225-38

11 Claims

1. A two roll toilet tissue dispenser comprising:
(a) means in the dispenser for rotatably supporting the two

rolls with the axis of each roll perpendicular to a mounting wall of the dispenser;

(b) a dispensing opening centrally located at the bottom of the dispenser and at least in part formed by two walls extending down from the bottom of the dispenser, each wall being located nearer to the center axis of one roll and its respective tail fixing surface than the other downwardly extending wall, and, the wall terminating in a tensioning edge parallel to the axes of the rolls, and



(c) means mounted in the dispenser having a surface for fixing the location in the dispensing opening of the tail of at least one of said roll of tissue when the radius of the roll is less than the perpendicular distance from the vertical plane passing through the centerline of said roll to its respective tail fixing surface and wherein the perpendicular distance from the vertical plane passing through the centerline of a roll to the nearest tensioning edge is less than the perpendicular distance from said plane to the nearest roll tail fixing surface.

4,872,602

GUIDE DEVICE FOR THE DRIVE TAPE OF AN AUTOMATIC SEAT BELT SYSTEM

Takada Juichiro, 12-1 Shinmachi 3-chome, Setagaya-ku, Tokyo, Japan

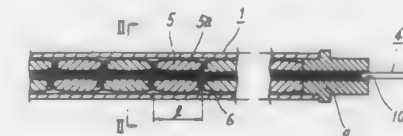
Filed Feb. 23, 1988, Ser. No. 159,313

Claims priority, application Japan, Feb. 23, 1987, 62-039675

Int. Cl. B65H 23/04

U.S. Cl. 226-196

4 Claims



1. In a drive device for a vehicle automatic seat belt system in which a drive tape is slidably received within a cylindrical casing, the improvement wherein buckling-prevention members are received freely between the tape and the wall of the casing, said members being a multiplicity of unitary barrel-shaped bodies disposed in end-to-end engagement along the length of the tape and on opposite sides of the tape, said bodies having holes that are disposed lengthwise of the tape and shaped to constrain the tape to move along the axis of the casing and that slidably receive the tape, and said bodies being axially coextensive with the tape and casing and being displaceable about the axis of the casing to facilitate tape twisting and being engageable at least at intervals with the tape and the casing so as to maintain the axis of the tape substantially aligned with the axis of the casing so that the tape does not buckle.

4,872,603
INSERT INSTALLATION MACHINE

Ralph A. Stearns, Bozrah, Conn., assignor to Spirol International Corporation, Killingly, Conn.

Filed Sep. 16, 1988, Ser. No. 245,753
Int. Cl.⁴ H05K 13/04

U.S. Cl. 227-97

20 Claims



1. A machine for installing an insert into a workpiece and comprising a frame, a quill for applying an insert driving force to drive the insert into the workpiece, the quill being mounted on the frame for reciprocation toward and away from the workpiece between a retracted starting position and a fully extended position, an insert guide tube supported on the frame in coaxial alignment with the quill for reciprocating movement between a retracted ready position and an extended operating position, and a shuttle having an aperture, the shuttle being supported on the frame for movement between an insert loading position, wherein the aperture is displaced in offset relation to the quill for receiving the insert, and an insert installing position, wherein the aperture is coaxially aligned with both the quill and the insert guide tube, the quill being engageable in positive driving relation to the shuttle upon movement of the quill toward the workpiece to move the shuttle from its insert loading position to its insert installing position and simultaneously therewith to move the insert guide tube from its retracted ready position to its extended operating position.

4,872,604
HEATED TOOL WITH STOP MECHANISM

Gero Zimmer, Munich, Fed. Rep. of Germany, assignor to Productech Reflow Solder Equipment Inc., Rolling Hills Estate, Calif.

Filed Jul. 6, 1988, Ser. No. 215,626

Claims priority, application Fed. Rep. of Germany, Jul. 9, 1987, 3722726

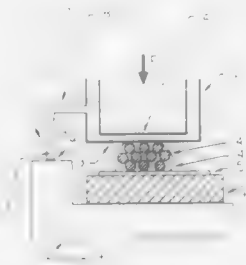
Int. Cl.⁴ B23K 3/00

U.S. Cl. 228-9

13 Claims

1. An apparatus for connecting one part to another by heating the parts, comprising:
a heated tool having a heating bar with a heating surface for contacting one of the parts;
means for moving the tool into contact with the one part and in a direction toward the other part;
stop means for stopping the movement of the tool at a selected spacing from the other part;
said stop means comprising a mechanical stop connected to said tool and having a lower end for engagement with the other part or with a support for supporting the other part;
said heated tool comprising at least one holder bar con-

nected to one end of said heating bar for applying pressure and current to said heating bar, said mechanical stop



extending in substantial alignment with said holder bar and beyond said heating surface.

4,872,605
ROLL-OFF SOLDER TIP

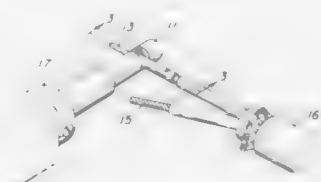
Kenneth S. Rinko, 518 Crown St., Morrisville, Pa. 19067

Filed Nov. 16, 1987, Ser. No. 121,419

Int. Cl.⁴ H01R 43/02; B23K 3/02

U.S. Cl. 228-51

4 Claims



1. A soldering iron tip, comprising:
a. a substantially cylindrical elongate main body,
b. a slot located within said main body, said slot being oriented transverse and perpendicular to the axis of said cylindrical main body, and
c. a reduced width at one end of said slot creating a step and a shoulder within said slot parallel to said axis of said main body.

4,872,606
SEALED STRUCTURE AND PRODUCTION METHOD THEREOF

Motohiro Satoh; Toshihiro Yamada; Akiomi Kohono; Akihiko Yamamoto; Keiji Taguchi, all of Ibaraki; Takahiro Daikoku, Ushiku, and Fumiaki Kobayashi, Sagami, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 10, 1986, Ser. No. 940,490

Claims priority, application Japan, Dec. 11, 1985, 60-276784

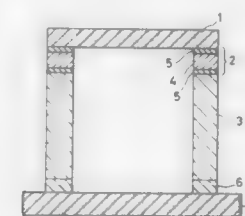
Int. Cl.⁴ B23K 1/03

U.S. Cl. 228-121

16 Claims

1. In a method of producing a sealed structure consisting of ceramic members opposing each other and a frame bonded with said ceramic members and forming an He-tight chamber with said ceramic members, the improvement comprising the steps of: inserting a high melting point insert member consisting of a core member made of pure aluminum or an aluminum alloy and skin members made of an aluminum alloy having a lower melting point than that of said core member, between one of said ceramic members and one side of said frame; heating said one ceramic member, said insert member and said frame in a vacuum to melt only said skin members to effect

diffusion bonding; and solder-bonding the other of said ceramic members and the other side of said frame by a soldering



material having a lower melting point than said high melting point insert member.

4,872,607
METHOD OF BONDING SEMICONDUCTOR MATERIAL TO AN ALUMINUM FOIL

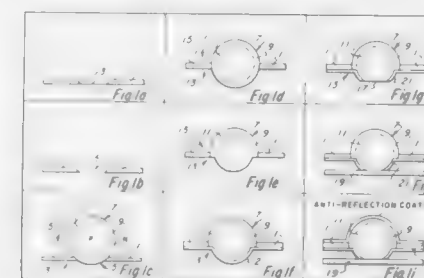
Millard J. Jensen, Balch Springs, and Jules D. Levine, Dallas, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 154,503, Feb. 4, 1988, abandoned, which is a continuation of Ser. No. 647,601, Sep. 4, 1984, abandoned. This application Sep. 26, 1988, Ser. No. 250,982

Int. Cl.⁴ H01L 31/18

U.S. Cl. 228-180.1

20 Claims



1. A method of bonding a semiconductor material to an aluminum foil, comprising the steps of:
(a) providing an aluminum foil having discrete spaced apertures therein,
(b) placing spherically shaped semiconductor material adjacent said apertures,
(c) heating said foil and said material in the range of from about 500° C. to about 577° C., and
(d) moving said material into said apertures under force shearingly to move said material whereby native oxides on the surface of said foil are sheared to expose the underlying aluminum for bonding.

4,872,608
18 CELL EGG CARTON WITH ANGLED LATCH FLAP

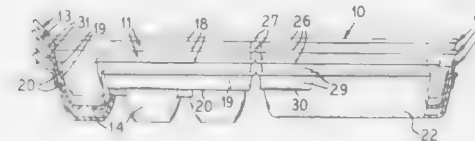
Connie Lake, Tinley Park, Ill., assignor to S. Eisenberg & Co., Division of Creative Industries, Inc., Bridgeview, Ill.

Filed Apr. 7, 1988, Ser. No. 178,653

Int. Cl.⁴ B65D 85/32

U.S. Cl. 229-2.5 EC

16 Claims



1. A molded one-piece cellular carton adapted to be manu-

factured in an opened position from thermoplastic sheet material and used on standard packaging machinery which comprises an open top tray with a planar peripheral rim providing front, back and end walls and having a plurality of open top individual cells within the confines of said rim, a dish cover for closing said tray integrally hinged to the tray rim along the backwall thereof, said cover having peripheral sidewalls bottoming on the rim of the tray in the closed position of the carton, said front planar rim wall of the tray having an upwardly and outwardly inclined latching flap along the length thereof terminating inwardly from the rim end walls and joined to the tray through an integral hinge line accommodating inward swinging of the flap against spring bias from its free state outwardly inclined position to an inwardly inclined position behind the front peripheral wall of the cover, the free state outwardly inclined position of the latching flap defining an obtuse angle with the tray rim of about 120 to 140 degrees.

4,872,609
CARTON AND BLANK FOR PACKAGING ICE CREAM OR THE LIKE

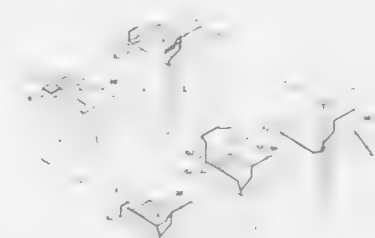
Richard E. DePaul, West Chester, Pa., assignor to Somerville Packaging Corporation, Newport News, Va.

Division of Ser. No. 177,319, Apr. 4, 1988, Pat. No. 4,826,074, which is a division of Ser. No. 21,649, Mar. 4, 1987, Pat. No. 4,756,470. This application Oct. 26, 1988, Ser. No. 262,948

Int. Cl.⁴ B65D 5/02

U.S. Cl. 229-134

65 Claims



1. A carton for packaging ice cream or the like, comprising:
(a) a receptacle, including hinged front, bottom and rear panels;
(b) said front panel and said rear panel each having top, bottom, left and right edges;
(c) said bottom panel having front, rear, left and right edges;
(d) said front panel being hinged to the bottom panel at its bottom edge to said front edge of said bottom panel;
(e) said bottom panel being hinged to the rear panel at its rear edge to said bottom edge of said rear panel;
(f) a cover including a cover panel having front, rear, left and right edges;
(g) said cover panel being hinged to the top edge of said rear panel of said receptacle;
(h) said cover further including a closure flap hinged to said front edge of said cover panel;
(i) means for securing said closure flap to said front panel;
(j) said panels of said receptacle and said cover each having left and right end flaps connected to said left and right edges respectively forming hinge lines therebetween;
(k) said left end flaps of said receptacle and said cover being dimensioned to form a substantially sealed left end of said carton;
(l) said right end flaps of said receptacle and said cover being dimensioned to form a substantially sealed right end of said carton;

- (m) said front panel having a membrane flap extending from the top edge of said front panel;
- (n) said left and right front panel end flaps each having a membrane flap extending from said top edges;
- (o) said left and right front panel end flap membranes and said front panel membrane forming a substantially continuous lip extending inwardly and along at least a portion of the outer periphery of said receptacle;
- (p) pocket means for receiving a portion of said cover panel end flaps adjacent said rear panel for reforming said carton subsequent to initial removal of said closure flap from said front panel;
- (q) said pocket means including rear panel end flaps forming an exterior portion of said pocket means operably associated with at least one of said front panel and bottom panel flaps of said receptacle forming an interior portion of said pocket means;
- (r) said bottom panel end flaps include first and second portions;
- (s) said front panel end flaps each include a cut-out formed adjacent said hinge line formed intermediate said bottom panel and the corresponding bottom panel end flap; and
- (t) said second portion of said bottom panel end flap is offset from said first portion and operably associated with said corresponding front panel end flaps adjacent said cut-out for providing said second portion substantially planar with at least a portion of said corresponding front panel end flap.

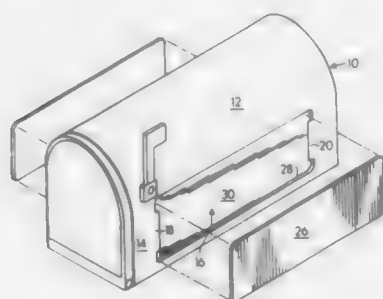
4,872,610

DISPLAY MAILBOX WITH INTERCHANGEABLE INSERTS

Robert J. Grabowiecki, Hamden, Conn., assignor to G & H Corporation of Connecticut, Inc., New Haven, Conn.
Filed May 16, 1988, Ser. No. 194,498
Int. Cl.⁴ B65D 91/00

U.S. Cl. 232-17

16 Claims



1. A display mailbox comprising:
- a mailbox enclosure having at least one exterior surface;
- a recess positioned on the exterior surface of the mailbox bounded by a perimeter wall and a backing wall;
- at least two flanges located on the sides of the recess, each flange having an inwardly facing surface projecting over the recess; and
- an insert constructed of sheet material of appropriate size to fit into the recess inside the perimeter wall and behind the inwardly facing surfaces of the flanges whereby it is securely held in the recess, the insert being of suitable size and material for the presentation of a design thereon, and including a pair of opposed tabs which are held under the inwardly facing surfaces of the flanges.

4,872,611

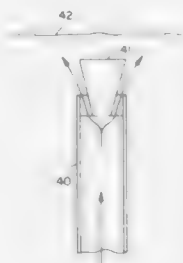
VENTURI-LESS WATER NOZZLE

Alan S. Robinson, El Monte, and Mark W. Fuller, Studio City, both of Calif., assignors to Wet Enterprises, Inc., Universal City, Calif.

Continuation of Ser. No. 48,563, May 11, 1987, abandoned. This application Oct. 11, 1988, Ser. No. 256,121
Int. Cl.⁴ F21P 7/00; B05B 1/14

U.S. Cl. 239-18

16 Claims



1. A submergible nozzle for use in a water fountain, such water fountain comprising a pool of water having a water surface, said nozzle comprising:
- a pipe means having a longitudinal axis, inside and outside surfaces, and first and second open ends, said first open end being attached to a water supply source;
- a dispersion means disposed adjacent to said second open end of said pipe means, a first portion comprising a first length of said dispersion means being disposed within said second open end of said pipe means, and a second portion, comprising a second length of said dispersion means being disposed adjacent to said second open end of said pipe means, said pipe means and dispersion means being entirely located at a predetermined depth under said water surface during the operation of said nozzle;
- said first portion of said dispersion means being shaped such that an annular space is formed between said first portion of said dispersion means and the inside surface of said pipe, said annular space decreasing in cross sectional area along a first direction running parallel to said longitudinal axis of said pipe from said first end of said pipe to said second end of said pipe, such that a flow of water from said water supply source, being split as it flows through said annular space, is accelerated by said decrease in annular cross-sectional area prior to emerging from said second end of said pipe;
- said second portion of said dispersion element shaped such that said split flow of water emerging from said second end of said pipe is diverted radially outward away from said longitudinal axis of said pipe, said split flow forming an aeriated mound of flowing water that extends above said water surface, said aeriated mound of flowing water being produced by entrainment, in part, of water located in a portion of said pool of water directly above said dispersion means, said mound having a height and a width, the ratio of said height to said width being approximately between 0.4 and 3.0, said mound being characterized by its attractiveness when illuminated with light from below and the elimination of any unsightly adjacent apparatus.

4,872,612

ROCKET MOTOR EXTENDIBLE NOZZLE EXIT CONE

Victor Singer, Newark, Del., assignor to Morton Thiokol, Inc., Chicago, Ill.
Division of Ser. No. 876,570, Jun. 20, 1986, Pat. No. 4,766,657, which is a continuation-in-part of Ser. No. 762,472, Aug. 5, 1985, abandoned. This application Jul. 23, 1987, Ser. No. 76,953
Int. Cl.⁴ B63H 11/10

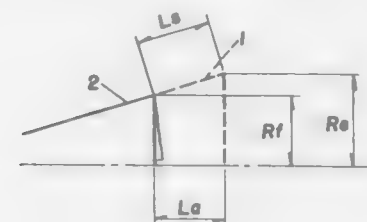
U.S. Cl. 239-265.19

11 Claims

1. A rocket motor extendible nozzle for attachment to a

rocket motor nozzle having a throat area for increasing the ratio of the effective rocket motor nozzle/extendible nozzle exit cone effective area to the rocket motor nozzle throat area comprising:

an arcuate-shaped membrane (16) of ductile heat resistant material, said membrane (16) having opposed arcuate edges (51, 52) one (51) of which is longer than the other (52) having ends (46, 48) that are adapted to be brought into edge-to-edge relationship to form a frustum of a cone, (10), the membrane portion forming that aft end of said frustum of a cone being deformed by a plurality of cooperating crease lines of first and second sets, each of the crease lines of said first and second sets having an apex, with the apex of each of the crease lines of the first set (28, 54, 62, 64, 68, 72, 74, 78, 80, 82, 84, 86, 88) pointing at the viewer from the exterior of the membrane when formed into a frustum of a cone (10) and the apex of each of the



crease lines of the second set (90, 92, 94, 96, 98, 100, 102, 104, 106) pointing away from the viewer, the crease lines of said first set running both circumferentially and longitudinally of said frustum of a cone (10) and the crease lines of said second set running longitudinally only thereof, with the crease lines that run circumferentially forming a plurality of fold lines (28, 34, 54) that are approximately equidistant from each other, the fold line (28) closest the larger diameter end (51) of the cone being substantially the same distance therefrom as from the fold line (34) adjacent thereto, whereby said frustum of a cone (10) may be folded inwardly, axi-symmetrically thereof, in multiple layers from the aft end for compact stowage relative to said rocket motor, and whereby said extendible nozzle may be unfolded to the extended position thereof by a forward-to-aft flow of rocket motor gas therethrough upon firing of said rocket motor.

4,872,613

MASTIC ADHESIVE FIXTURE

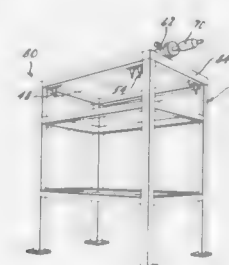
Daniel E. Hueul, c/o Auto/Con Corp., 35380 Union Lk Rd., Mt. Clemens, Mich. 48043, and Ronald R. Matheson, 53340 Beechwood Dr., Utica, Mich. 48087

Filed May 18, 1987, Ser. No. 51,279

Int. Cl.⁴ B05B 15/06; F01B 15/06

U.S. Cl. 239-280

11 Claims



11. An assembly for applying a fluid from a fluid storage supply, said assembly comprising:

means for supplying a fluid from a fluid supply;

means for supplying compressed air from a remote air supply source;

an air cylinder having a first piston slideably disposed therein for receiving air from said air supply means;

a fluid cylinder connected to said air cylinder and having a second piston slideably disposed therein and connected to said first piston for receiving fluid from said fluid supply means and injecting the fluid to the workpiece in response to actuation of said first piston having air supplied thereto;

a solenoid having a first position to allow air to flow from said air supply means to said air cylinder and a second position to vent air from said air cylinder to atmosphere; and

a support frame including a plurality of elongated members and accumulator means disposed substantially within at least one of said elongated members for receiving air from said air cylinder in response to the actuation of said first piston within said air cylinder and for transmitting air from said accumulator means after the actuation of said first piston to return said first piston to said first position and venting the air from said air cylinder to atmosphere upon return of said first piston.

4,872,614

FUEL INJECTION NOZZLE

Godfrey Greeves, Hatch End, and Robert J. Fry, Greenford, both of England, assignors to Lucas Industries Public Limited Company, Birmingham, England

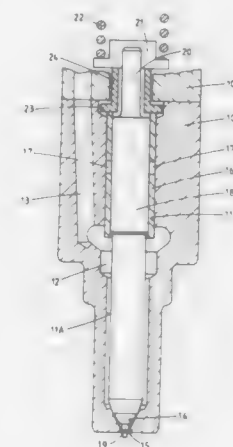
Filed Feb. 1, 1988, Ser. No. 150,883

Claims priority, application United Kingdom, Feb. 6, 1987, 8702712

Int. Cl.⁴ F02M 47/00

U.S. Cl. 239-533.9

1 Claim



1. A fuel injection nozzle for supplying fuel to an internal combustion engine comprising a valve member of varying diameters, with an abrupt change in diameter defining a step near one end of the valve member, said valve member being slidable axially within a sleeve which is axially slidable in a bore formed in a nozzle body, resilient means engaging a spring abutment mounted on said one end of the valve member, the resilient means being located within a chamber defined in a nozzle holder to which the nozzle body is secured, the resilient means acting to bias the valve member into contact with a seating to prevent flow of fuel from an inlet through an outlet, the valve member and the sleeve being subject to the pressure of fuel at the inlet, a tubular push piece surrounding said reduced portion of the valve member, said push piece at one end being engageable with said spring abutment, a flange at the other end of the push piece, the flange being engageable by said sleeve so that the force developed by the fuel pressure acting on the sleeve will be applied to the spring abutment, the

movement of the sleeve being limited by the abutment of a first surface of the flange with an end surface of the nozzle holder and the movement of the valve member being limited by the abutment of the step on said valve member and with a second surface of the flange of the push piece.

4,872,615

FLUID-JET-CUTTING NOZZLE ASSEMBLY

Terrance L. Myers, Columbus, Kans., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

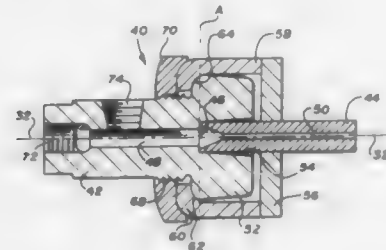
Continuation of Ser. No. 161,631, Feb. 29, 1988, abandoned.

This application Mar. 6, 1989, Ser. No. 319,039

Int. Cl. B05B 15/08

U.S. Cl. 239-587

4 Claims



2. Apparatus for achieving optimum alignment of a nozzle in a nozzle body, comprising:

an enlarged shoulder at a discharge end of the nozzle body, the nozzle body having a central bore formed therein and a conical opening formed in the discharge end, a wider end of the conical opening being downstream of a narrower end of the conical opening, the central bore and the conical opening interfacing at a plane passing through an arcuate surface formed on the shoulder;

the nozzle also having a central bore including an enlarged portion at one end thereof, the nozzle being mounted in the conical opening of the shoulder such that the enlarged portion interfaces at the plane, the central bores of the nozzle body and the nozzle being in substantial alignment and an external transverse dimension of the nozzle being smaller than a transverse dimension of the conical bore at corresponding locations;

a collar having a portion closely encircling the nozzle and said collar interconnecting the nozzle and the nozzle body, the collar having an arcuate rim in mating engagement with the arcuate surface of the shoulder; and means for locking the collar in a selected position, the locking means having an arcuate surface in engagement with the arcuate rim of the collar.

4,872,616

APPARATUS FOR ELECTROSTATIC COATING OF OBJECTS

Hans Behr, Stuttgart; Kurt Vetter, Remseck; Rolf Schneider, Burgstetten, and Fred Luderer, Leutenbach, all of Fed. Rep. of Germany, assignors to Behr Industrieanlagen GmbH & Co., Bietigheim-Bissingen, Fed. Rep. of Germany

Division of Ser. No. 207,022, Jun. 14, 1988, which is a continuation of Ser. No. 12,082, Feb. 6, 1987, abandoned. This application Dec. 19, 1988, Ser. No. 286,363

Claims priority, application Fed. Rep. of Germany, Mar. 19, 1986, 3609240

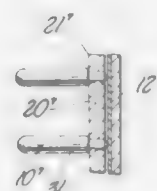
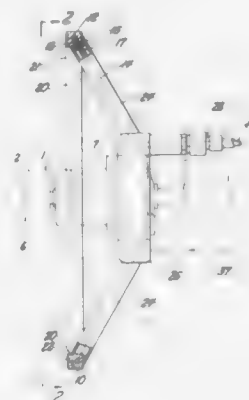
Int. Cl. B05B 5/04

U.S. Cl. 239-703

3 Claims

1. An apparatus for electrostatically coating of objects with an electrically conductive coating material comprising; an internal housing (7), and an atomizer (1) mounted on said housing (7) and including a spraying head (2) for atomizing the material and projecting the atomized material radially therefrom, and electrode mounting means (20') disposed annularly

and radially about said atomizer (1) and having an end face (21'), a plurality of electrodes (10') spaced annularly about said mounting means (20') for creating an electrical field between said electrodes (10') and the object to be coated, an electrical conductor (12) disposed within said electrode mounting means (20') for establishing an electrical connection between said



plurality of electrodes (10') and a high voltage source, said assembly characterized by said electrodes (10') being insulated with an insulating material (31) disposed about said electrodes (10') for increasing the surface path between said electrodes (10'), said insulated electrodes (10') disposed on said end face (21') of said electrode mounting means (20') and projecting from said end face (21') toward the object to be coated.

4,872,617

CANTED, SPRING-LOADED FEED SCREW SUPPORT

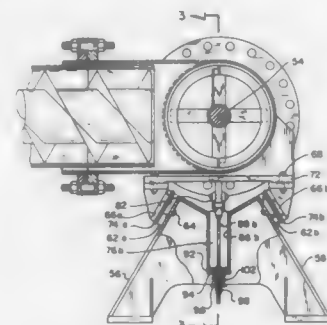
James D. Foreman, Hughesville, Pa., assignor to Sprout-Bauer, Inc., Muncy, Pa.

Filed Jan. 2, 1988, Ser. No. 201,530

Int. Cl. B02C 7/14

U.S. Cl. 241-247

18 Claims



1. In a disc-type refiner system having a refiner casing, a disc mounted for rotation within the casing, an elongated feed housing rigidly attached to one side of the casing, a rotor supported along an axis within the feed housing for supplying feed material to the disc, a pedestal situated under the housing

for supporting the housing, and a base for supporting the casing, the improvement comprising:

a pair of pedestal bearing blocks attached to the pedestal and having a respective first pair of planar surfaces oriented obliquely upward at equal angles to the vertical such that the axis of the rotor lies on the intersection of the first planar surfaces, if extended;

a pair of housing bearing blocks attached to the housing and having a respective second pair of planar surfaces oriented obliquely downward in contact with the first pair of planar surfaces for transferring the weight of the housing to the bearing blocks, said first and second pairs of planar surfaces being adapted to permit coplanar relative motion; and

means for biasing the second planar surfaces into contact with the first planar surfaces.

4,872,618

APPARATUS FOR WINDING COIL ON TOROIDAL CORE

Hiroshi Sato, Yokohama; Toshihiro Ohashi, Chigasaki; Toyohide Hamada, Yokohama; Yukimori Umakoshi, Odawara; Takamichi Suzuki; Yuuji Wada, both of Yokohama; Shigeo Hara, Minamishigara, and Yousuke Fukumoto, Odawara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 888,430, Jul. 23, 1986, Pat. No. 4,771,956.

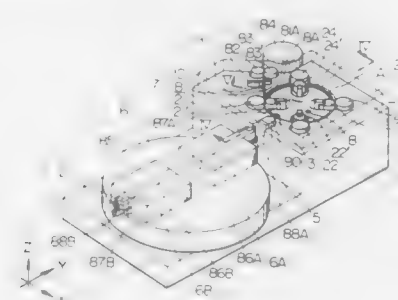
This application May 3, 1988, Ser. No. 189,644

Claims priority, application Japan, Aug. 2, 1985, 60-169832; Nov. 22, 1985, 60-261433; May 21, 1986, 61-114556; May 29, 1986, 61-122343; Jul. 4, 1986, 61-156034

Int. Cl. H01F 41/08

U.S. Cl. 242-4 R

19 Claims



1. An apparatus for winding a length of wire on a toroidal core to form a coil thereon, the apparatus comprising:

means providing first and second substantially circular and parallel surfaces defining a substantially circular slit therebetween;

an annular wire guide means formed with a cutout, said wire guide means including means defining a substantially annular groove extending along an outer periphery of said circular slit and having, as viewed in an axial section, first and second wire-guiding surfaces spaced radially of the annulus and extending circumferentially thereof, and a substantially annular third wire guiding surface forming a bottom of said annular groove, said second wire-guiding surface being radially inward of said first wire-guiding surface and having an axial dimension shorter than an axial dimension of said first-wire guiding surface, said wire guide means further including means providing a fourth wire-guiding surface extending over said annular groove to cooperate therewith to define an annular wire guide channel with a radially inward faced gap left between said second and fourth wire-guiding surfaces such that said annular wire guide channel is communicated with said circular slit through said radially inwardly faced gap;

feed roller means including a plurality of pairs of feed rollers, each pair of feed rollers comprising inner and outer rollers, the inner roller being disposed radially inwardly of said first wire-guiding surface, the rollers of each pair

engaging each other inside the annular groove and having axes of rotation located perpendicular to a plane in which the annular wire guide means is located;

at least one core holding means for holding the toroidal core in a position in which the wire winding portion of the toroidal core is disposed in said cutout of the annular wire guide means;

means for drivingly rotating said feed roller means whereby the wire is fed through the annular groove to form a loop in which the wire winding portion of the toroidal core is included; and

means for bringing the inner rollers of the plurality of pairs of rollers out of engagement with their respective associated rollers and moving the inner rollers way from said circular slit; whereby the wire of the loop can be moved through said circular slit to reduce the size of the loop until the wire is wound around the wire winding portion of the core.

4,872,619

SERCO DRIVEN REDIRECT ROLLER APPARATUS FOR FIBER PLACEMENT MACHINE

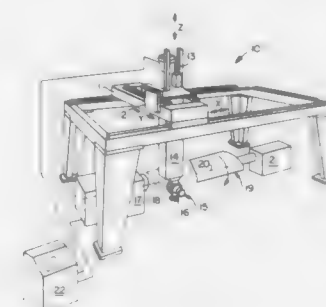
Mario M. Vaniglia, Southgate, Ky., assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Nov. 2, 1988, Ser. No. 265,970

Int. Cl. B21F 17/00; B32B 31/00

U.S. Cl. 242-7.21

2 Claims



1. In a fiber placement machine, having a band of fibers oriented with its length running along a path with respect to a relatively stationary machine member, the band of fibers being ultimately paid-out to a fiber application surface, an improved fiber guidance system comprising:

a fiber supply creel including plural spools of fiber mounted to said relatively stationary machine member, said fiber supply creel also including means for maintaining tension on said fibers;

a manipulator wrist affixed to said relatively stationary machine member;

a fiber placement head affixed to said manipulator wrist, and having a fiber payout zone, said head capable of being manipulated through a variety of spatial orientations by said manipulator wrist, especially at least two-dimensional spatial orientations with respect to said relatively stationary machine member;

a plurality of fiber redirect rollers, having roller elements rotatable about a roller axis with respect to a roller base, each said roller base including a bearing member for providing rotary movement of said base about a swivel axis transverse to the roller axis as said fiber placement head is manipulated;

power means for driving at least one of said roller bases about its respective swivel axis; and

means for controlling manipulator movements, wherein at least a first redirect roller is affixed to said relatively stationary machine member and at least a second redirect roller is affixed to said fiber placement head, and

wherein a band of fibers is trained around said first and second redirect rollers under tension, and said redirect rollers are swivelled about their bases by said power means, in accordance with spatial orientation of the placement head, to thereby maintain control of the fibers.

4,872,620

BOBBIN BLOW OUT PLUG

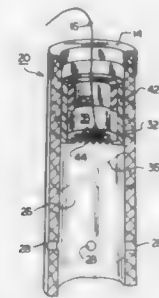
Don Brown, St. Pauls, N.C., assignor to Burlington Industries, Inc., Greensboro, N.C.

Filed Jan. 18, 1988, Ser. No. 145,528

Int. Cl.⁴ B65H 75/10, 75/18

U.S. Cl. 242—118.3

10 Claims



1. An improved yarn package holder comprising:

(a) a tube onto which a length of yarn can be wound; and

(b) an end plug located within one end of said tube, said end plug including an elongated tubular member configured to fit within the tube and a base integrally formed with one end of said member, said base having perforations to permit the passage of air through said member, said end plug being operable to prevent snagging of the yarn end on the inner surface of said tubes wherein the axial dimension of said end plug member is greater than the inside diameter of the tube, thereby providing for self-alignment of said end plug within the tube.

4,872,621

SPRING DYE TUBE

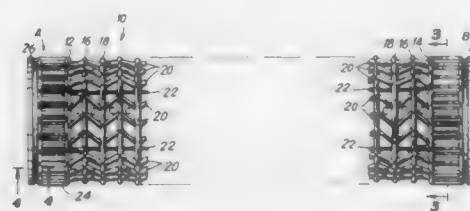
Alvin D. Thomas, Valatie, N.Y., assignor to Crellin, Inc., Chatham, N.Y.

Continuation-in-part of Ser. No. 117,677, Nov. 5, 1987, abandoned. This application Oct. 25, 1988, Ser. No. 261,272

Int. Cl.⁴ B65H 75/20

U.S. Cl. 242—118.11

13 Claims



1. A spring dye tube, comprising:

a pair of end rings, at least one intermediate ring; said at least one intermediate ring being concentrically arranged relative to said end rings;

a plurality of wavyform elements disposed between the end rings and forming with said end rings and said at least one intermediate ring the periphery of said tube, said elements being grouped about said periphery; said groups being separated by elongated axial stiffening members extending

from one of said end rings to the other and rigidly secured thereto;

and integral with each of said end rings a stiffening, anti-buckling section including an outwardly extending end rim and a plurality of spaced parallel ribs securing said rim to an end ring.

4,872,622

EXTENSION CORD WINDING AND STORAGE APPARATUS

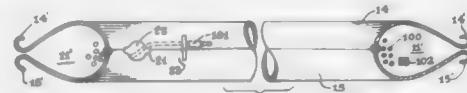
Ronald N. Mansfield, 12851 SW. 22nd St., Miami, Fla. 33175

Filed Oct. 12, 1988, Ser. No. 256,516

Int. Cl.⁴ B65H 75/36, 75/40

U.S. Cl. 242—85.1

5 Claims



1. A cord winding and storage apparatus for use with diverse elongated cords wherein some of the diverse cords are provided with male and female plug elements wherein the cord winding and storage apparatus comprises:

a storage unit including a receptacle member having an enlarged central opening wherein the receptacle member comprises two receptacle segments each having a generally S-shaped cross-sectional configuration wherein the receptacle segments are joined along one common edge to form an enlarged storage unit receptacle and the free ends of the receptacle segments are provided with outwardly curved lip elements which define an elongated relatively narrow fluted peripheral slit which extends completely around the receptacle member and wherein the free ends of the receptacle segments are capable of flexure relative to one another to enlarge the said peripheral slit to accommodate cords having different diameters.

4,872,623

FILM ROLL HOLDER WITH DRUM BRAKE

Daniel J. Parry, and John C. Parry, both of Severna Park, Md., assignors to J. C. Parry & Sons, Inc., Baltimore, Md.

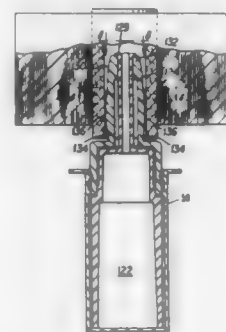
Continuation-in-part of Ser. No. 924,442, Oct. 29, 1986, Pat. No. 4,722,493. This application Feb. 1, 1988, Ser. No. 150,964

The portion of the term of this patent subsequent to Feb. 2, 2005, has been disclaimed.

Int. Cl.⁴ B65H 75/02

U.S. Cl. 242—96

12 Claims



1. A holder for a roll of stretch film, comprising

a handle including a substantially cylindrical body and a shaft extending from one end of said body, an arbor rotatably mounted upon said shaft, means on said arbor for engaging said film roll, thereby

constraining the roll and the arbor to rotate together upon said shaft, and

a collar on said arbor adjacent said handle body, whereby one holding said handle body may create a braking torque on said roll by applying radial pressure to said collar, wherein said arbor has an axial bore and said shaft has an enlarged tip having a major diameter greater than that of said bore, said tip being sufficiently elastically deformable to permit said arbor to be installed upon the shaft, and to retain the arbor thereafter, and further comprising a flexible hand grip around both said handle body and said collar to protect one's hand from discomfort and injury while transmitting said radial pressure to said collar.

4,872,624

DRIVE ARRANGEMENT FOR A VEHICLE HAVING A PROPELLER

Juergen Hawener, Moeglingen; Kim Havemann, Weissach, and Rolf V. Sivers, Rutesheim, all of Fed. Rep. of Germany, assignors to Dr. Ing. h.c.f. Porsche AG, Stuttgart, Fed. Rep. of Germany

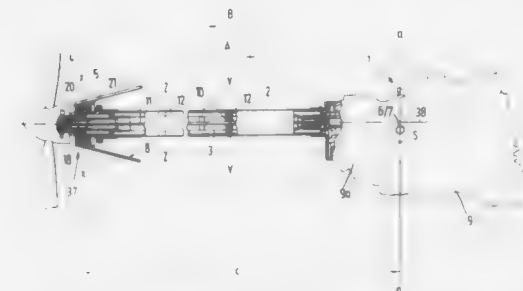
Filed May 25, 1988, Ser. No. 198,446

Claims priority, application Fed. Rep. of Germany, May 26, 1987, 3717632

Int. Cl.⁴ B64D 27/00, 35/00

U.S. Cl. 244—54

24 Claims



1. A drive arrangement for an aircraft of the type having a fuselage housing a drive unit which is operatively connected to drive a propeller, comprising:

a longitudinally installed tubular support means connected at one end with the drive unit,

a central propeller driving shaft supported in the tubular support means and drivingly interconnecting the drive unit with the propeller,

and at least three bearing support means for supporting the drive unit and tubular support means at the fuselage, a first of the bearing support means being provided adjacent the propeller end of the tubular support means for supporting the tubular support means, the other bearing support means being provided in the area of the drive unit for supporting the drive unit,

wherein the tubular support means consists of a glass fiber-reinforced plastic material and wherein the central shaft made of carbon-fiber-reinforced plastic material is supported in the tubular support means.

4,872,625

UNIVERSAL MODULE ASSEMBLY FOR SPACE STRUCTURES

Charles C. Filley, 1207 Saxony, Houston, Tex. 77058

Continuation-in-part of Ser. No. 635,635, Jul. 30, 1984, abandoned. This application Jan. 6, 1987, Ser. No. 717

Int. Cl.⁴ B64G 1/10

U.S. Cl. 244—159

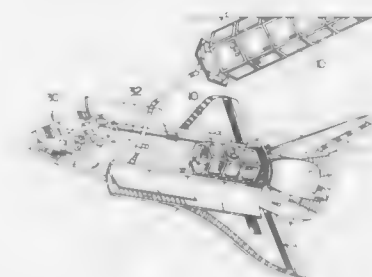
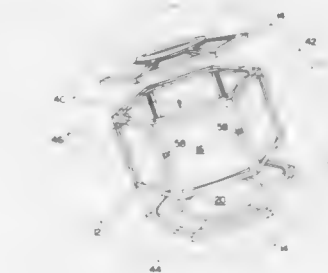
21 Claims

1. A universal module assembly, comprising:

a pressure vessel having cylindrical side walls and curved end surfaces; and

framework means integrally attached to and contiguous

with the exterior of and surrounding the pressure vessel for providing the primary structural rigidity to the module assembly and the primary structural support from the pressure vessel, and for facilitating the interconnection of said framework means of said module assembly with the framework means of another like module assembly, said framework means including a body portion disposed



around said cylindrical side walls and end portions covering said curved end surface of said pressure vessel, said body portion of said framework means being in the general configuration of a right hexagonal prism having six rectangular faces and two hexagonal faces, and said end portions of said framework means are generally frustoconical in configuration.

4,872,626

INSULATED ANCHORING CLAMP FOR INSULATED ELECTRIC CONDUCTOR EQUIPPED WITH A CARRYING CABLE

Jean-Pierre Liénart, Isere, France, assignor to Malico S.A., Isere, France

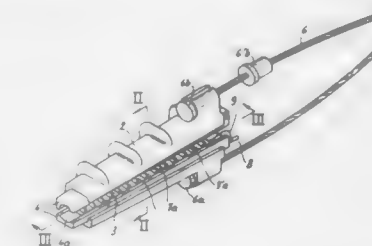
Filed Nov. 5, 1987, Ser. No. 116,837

Claims priority, application France, Nov. 6, 1986, 86 16027

Int. Cl.⁴ H02G 7/05

U.S. Cl. 248—63

12 Claims



1. An anchoring clamp for an insulated electric conductor equipped with an insulated carrying cable comprising:

a split sleeve formed of a material more yieldable than hard

metal and provided with a mooring element and a conical recess with a slight slope;
 a compressible core formed of a material more yieldable than hard metal and mounted in said recess, said core including a cavity for housing the electric conductor or its carrying cable, said core having an outside shape complementary to the shape of said conical recess;
 said core capable of being wedged into said recess by sliding force;
 said cavity comprising a wall;
 said wall comprising at least one longitudinal wall portion comprising a bar formed of hard metal and inserted in said wall, the metal bar having a free face, said free face being equipped with teeth.

4,872,627

LOCKING TRIPOD LEG

Chadwell O'Connor, 2024 Galaxy Dr., Newport Beach, Calif. 92660

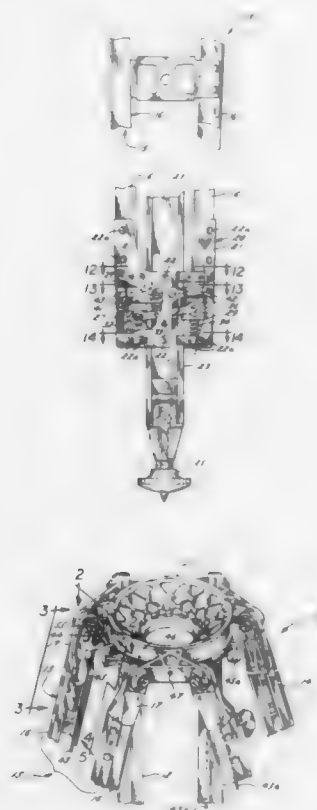
Continuation-in-part of Ser. No. 101,504, Sep. 28, 1987. This application Aug. 5, 1988, Ser. No. 229,081

The portion of the term of this patent subsequent to Jun. 20, 2006, has been disclaimed.

Int. Cl.⁴ F16M 11/32

U.S. Cl. 248—168

7 Claims



4. A leg for a tripod comprising, in combination, an elongated upper leg portion adapted to be secured to a tripod head at its upper end, a housing guide rigidly secured to the lower end of said upper leg portion, a lower leg portion having a uniform cross section through a leg adjustment range, said housing guide having a guide passage closely receiving said uniform cross section in sliding relationship so that said upper and lower leg portions can slide longitudinally and adjust the total leg length without there being bending movement between the leg portions, a set of guide elements in said housing guide for holding said lower leg portion, said guide elements

being substantially in the plane of said elongated upper leg portion and having spaced contact on one side of said lower leg portion and contact intermediate said spaced contact on the other side of said lower leg portion, and means for selectively firmly clamping said guide elements against said lower leg portion so that said guide elements apply spaced forces along one side of the lower leg portion and an intermediate force along the other side of the lower leg portion, said means automatically increasing the clamping force as the load on the tripod increases.

4,872,628

MECHANICALLY COUNTERBALANCING PLATFORM

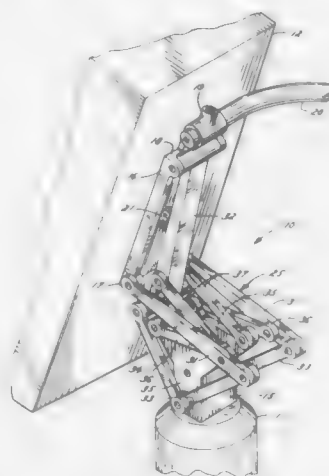
Chadwell O'Connor, 2024 Galaxy Dr., Newport Beach, Calif. 92660

Filed Dec. 7, 1987, Ser. No. 129,469

Int. Cl.⁴ F16M 11/04

U.S. Cl. 248—178

2 Claims



1. An instrument supporting platform system comprising, in combination, a base, an elongated platform having front and rear portions, and linkage means connecting the platforms and said base for defining a predetermined tilting movement of the platform both up from the horizontal, causing the front portion of the platform to rise, and down from the horizontal, causing the rear portion of the platform to rise, said linkage means further including means for defining predetermined paths of travel whether the platform is tilted up or down from the horizontal to cause the center of the platform to rise sufficiently far to cause a point at a fixed perpendicular distance from the top of the platform to maintain a substantially absolute vertical height and to raise slightly as the platform is increasingly tilted, said point corresponding substantially to the center of gravity of an instrument supported on said platform, whereby the instrument supported on said platform is automatically substantially counterbalanced by gravity at any position of the platform relative to the horizontal when the platform is tilted up from the horizontal and when the platform is tilted down from the horizontal.

4,872,629

ADJUSTABLE ANCHOR BRACKET FOR NON-INVASIVE ATTACHMENT TO MASONRY WALL

Michael W. Cothran, 1880 Wronel Way, Reno, Nev. 89502, and Nelson, III: Alvin T., 2249 Old Creek Cir., Pittsburg, Calif. 94565

Filed Sep. 12, 1988, Ser. No. 242,557

Int. Cl.⁴ A47B 96/00

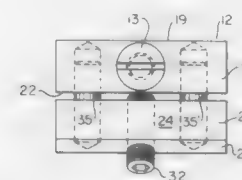
U.S. Cl. 248—231.2

8 Claims

1. An adjustable anchor bracket adapted for non-invasive

detachable attachment in the mortar joint of a masonry wall, comprising:

- a first monolithic body member;
- a second monolithic body member parallel to said first monolithic body member and selectively movable toward or away from said first monolithic body member between a first dimension in which said first and second monolithic bodies are contiguous and project a combined thickness less than the width of a mortar joint to a second dimension in which said first and second monolithic bodies press tightly against the masonry units on opposite sides of the mortar joint when applied thereto; and



- means adjustable disposed between said first and second monolithic bodies selectively manipulable to move said first and second monolithic bodies from said first dimension to said second dimension;
- said first and second monolithic bodies being each provided with corresponding front and rear faces and top and bottom faces connecting said front and rear faces, said rear faces lying recessed in said mortar joint when said bracket is applied to said masonry wall and the top face of said first monolithic body and the bottom face of said second monolithic body detachably engaging the associated surfaces of the masonry units on opposite sides of said mortar joint when said bracket is attached to said masonry wall.

4,872,630

UNIVERSALLY ADJUSTABLE MOUNTING DEVICE

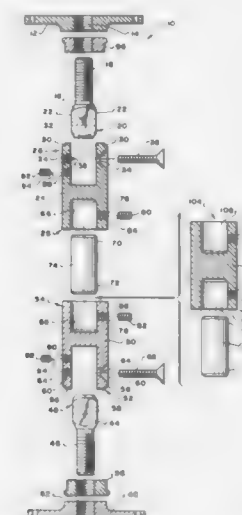
Gershon Cooper, Encino, Calif., assignor to Alliance Research Corporation, Chatsworth, Calif.

Division of Ser. No. 168,582, Mar. 3, 1988, Pat. No. 4,836,485, which is a continuation of Ser. No. 4,736, Jan. 30, 1987, abandoned. This application Jun. 24, 1988, Ser. No. 211,052

Int. Cl.⁴ F16M 13/00

U.S. Cl. 248—278

6 Claims



3. In an adjustable mounting bracket of the type which includes a plate adapted to be removably attached to a body that is to be positioned at a selected position relative to a supporting base, and a shaft having a threaded shank portion engaged in a threaded opening extending perpendicularly through the plate, the subcombination of:

- said shaft having a head end with flattened sides opposite said shank portion;
 a joint member having a fork-shaped end and a base end opposite thereof, said fork-shaped end having a pair of tines receiving said flattened sides of said head end of said shaft therebetween and a first threaded hole extending transversely through one of said tines, said base end having a cylindrical counterbore extending axially thereto and a second threaded hole extending transversely there-through into said counterbore;
 bolt means extending transversely through said tines and said head end of said shaft, and spaced longitudinally apart from said first threaded hole, for frictionally and compressively retaining said shaft in a selected pivotal position relative to said joint member;
 a first set screw extending through said first threaded hole and having an end in compressive and frictional engagement with said head end of said shaft for locking said shaft in said selected pivotal position against shock and vibration;
 a connecting rod having a first end adapted for attachment to said surface and a second end received in said counterbore for positioning said member in a rotationally and axially adjustable position thereon; and
 a second set screw extending through said second threaded hole and having an end in compressive and frictional engagement with said rod for retaining said member on said rod in said position.

4,872,631

DRIP-CAN HOLDER

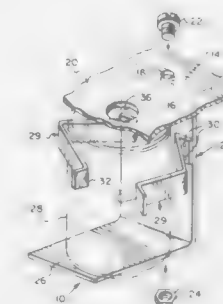
Frank Rutigliano, 16 Poplar St., Centereach, N.Y. 11720

Filed Oct. 14, 1988, Ser. No. 258,005

Int. Cl.⁴ A47K 1/08

U.S. Cl. 248—313

1 Claim



1. A grease collecting receptacle holder for a barbecue cooker, said cooker having a port in the bottom thereof through which grease and other residual materials which collect in said cooker may pass, and an opening proximate to said port in the bottom of said cooker for attaching thereto a holder for a grease collecting can or the like comprising:

- a plate formed from a solid material and having a top portion, a bottom portion, and first and second side portions;
- a mounting lip extending from the top portion of said plate and substantially perpendicular thereto, said mounting lip having an opening therein adapted for alignment with the opening in the bottom of said cooker whereby said mounting lip may be removably secured to said cooker;
- a support lip extending from the bottom portion of said plate and substantially perpendicular thereto in a direction opposite to that of said mounting lip, said support lip being adapted to align with said port and to support thereon a receptacle for receiving and collecting the grease and other materials passing through said port;

(d) first and second substantially V-shaped spring clips fixedly secured respectively to the first and second side portions of said plate and extending horizontally therefrom in the direction of said support lip whereby said spring clips are spaced apart with the open portion of the V of each of said spring clips facing the open portion of the V of the other said clip, each of said spring clips having a short wing portion extending angularly outwardly from each end thereof forming two additional angular extensions in each of said spring clips, the said wing portions at the inside end of each said spring clip being adapted to be secured to said plate, and the wing portions at the outside end of said spring clip being adapted to provide at their junctions with the body of each spring clip a cam means for spreading said first and second spring clips apart when a receptacle is inserted between said spring clips, the open portion of the V of each of said spring clips being adapted to securely hold said receptacle.

4,872,632

ADJUSTABLE OVERHEAD HANGER WITH LOCK PULLEY

Van P. Johnson, 7722 12th NW., Seattle, Wash. 98117
Filed Sep. 27, 1988, Ser. No. 250,773
Int. Cl.⁴ A47B 96/06

U.S. Cl. 248—332

16 Claims



1. An apparatus for suspending articles from an overhead member, comprising:
an elongated support member attachable to said overhead member;
a first pulley having an axis and being supported by said support member;
an abutment radially spaced from said first pulley and having a use position fixed relative to said support member;
a second pulley supported by said support member and spaced from said first pulley, said first and second pulleys being substantially co-tangential;
a cord having two ends and passing over said first pulley radially inwardly of said abutment and further over said second pulley, the end of said cord proximal to said second pulley being attachable to an article to support said article at a height determinable by movement of said cord over said pulleys;
a pivoting lock member which pivots coaxial with and operably independent from said first pulley;
wherein said cord is normally freely movable over said pulleys, but may be restricted from movement in one direction by clamping engagement of the cord between said lock member and said abutment.

4,872,633

AIR RATCHET HOLDER

Michael C. Sullivan, 7772 Darwin Ave., Midway City, Calif. 94665

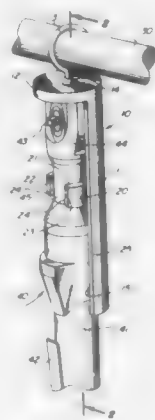
Filed Apr. 4, 1988, Ser. No. 177,330
Int. Cl.⁴ B42F 13/00

U.S. Cl. 248—340

16 Claims

1. For use in receiving and holding an air ratchet having a head, a shaft and a handle, a holder comprising:
a concave body having a cradle portion defining a cradle interior and an end cap;

a hook secured to and extending from said end cap; and
clasp means, supported within said cradle interior, for grasping said shaft of said air ratchet and supporting said air



ratchet solely by said shaft in an attachment in which said ratchet may be withdrawn from said holder by movement away from said concave body.

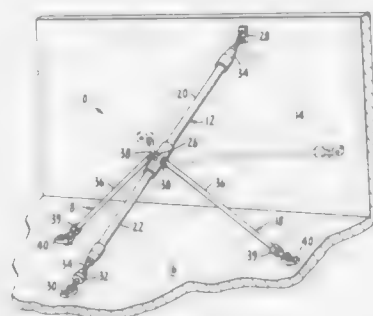
4,872,634

BRACING FOR TILT-UP WALL PANEL

Kenton P. Gillsdpy, and David L. Kelly, both of Sacramento, Calif., assignors to The Burke Company, Sacramento, Calif.
Filed Aug. 29, 1988, Ser. No. 238,333
Int. Cl.⁴ F16M 13/00

U.S. Cl. 248—354.3

6 Claims



1. A wall bracing apparatus for bracing a wall panel with respect to a floor, said apparatus comprising:
an elongated main brace including wall mounting means disposed at one end thereof for securing that end of the main brace to a wall panel, and including floor mounting

means disposed at the other end thereof for securing that end of the main brace to a floor; and
two elongated lateral bracing legs of equal length, each coupled by a two-axis pivot at one end of the lateral bracing leg to the main brace at a location between the two ends of the main brace, and each including mounting means separate from the wall and floor mounting means disposed at the other end of the lateral bracing leg for securing that end of the lateral bracing leg to the floor or wall panel at a position spaced laterally apart from the vertical plane of the main brace.

4,872,635

SLIP CONNECTOR FOR WEIGHT ACTUATED HEIGHT ADJUSTORS

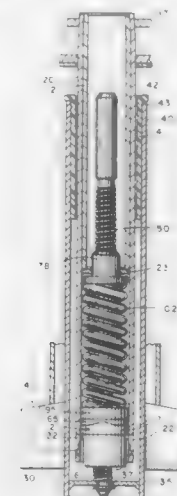
Glenn A. Knoblock, Kentwood, and Brian L. Scolten, Jenison, both of Mich., assignors to Steelcase Inc., Grand Rapids, Mich.

Division of Ser. No. 850,510, Apr. 10, 1986, Pat. No. 4,709,894.
This application Aug. 31, 1987, Ser. No. 91,585

Int. Cl.⁴ A47C 3/24

U.S. Cl. 248—406.2

11 Claims



1. In combination, a chair having a base, a seat supported thereon, and a height adjuster, comprising:
a threaded spindle supported on said base;
a threaded nut threadably engaging said spindle and being adjustably supported thereon;
a bearing surface supported on said nut;
a sleeve slidably mounted on said spindle for vertical movement therealong, and including a stop surface which abuts and is supported on said bearing surface when a preselected overload weight is applied to said chair;
a column having an upper end thereof connected with said seat, and a lower end thereof connected with said sleeve;
a spring positioned between said bearing surface and said sleeve, and biasing said seat away from said base when said chair is occupied;
said sleeve and said spring being mutually positioned such that when said chair is occupied by an average user, the stop surface of said sleeve is spaced apart from said bearing surface, and when said preselected overload weight is applied to said chair, said seat moves downwardly to compress said spring and positively support said seat on said base.

4,872,636

EXTERIOR MIRROR FOR A VEHICLE

Bernhard Mittelhäuser, Am Krähenberg, D-3002 Wedemark 2, and Bernd Winkler, Burgwedel, both of Fed. Rep. of Germany, assignors to Bernhard Mittelhäuser, Wedemark, Fed. Rep. of Germany

Filed Apr. 22, 1988, Ser. No. 185,166

Claims priority, application Fed. Rep. of Germany, Apr. 24, 1987, 3713689

Int. Cl.⁴ A47G 1/16

U.S. Cl. 248—475.1

8 Claims

1. In an exterior mirror for a vehicle, including a support that is adapted to be mounted on the vehicle, and a housing that accommodates a mirror body and is mounted on said support in such a way that it is pivotable to the front and to the rear relative to the forward direction of travel of said vehicle, with said housing being pivotable against a spring force in such a

way that after a pivoting movement, said housing returns to a normal position, the improvement wherein:

said support is provided with an approximately V-shaped recess that is delimited by a base and two side surfaces; rod means and a slide member are substantially vertically disposed as to each other and mounted relative to said housing and in a normal position, said slide member rests against said base of said channel under spring force; during pivoting of said housing in a given direction, said slide member, against said spring force, moves along one



of said side surfaces of said recess, while during pivoting of said housing in the opposite direction, said slide member moves along the other of said side surfaces of said recess; and wherein
spring means is connected to said mirror support for providing said spring force against said slide member to thereby provide said spring force to return said housing to a normal position,
said side surface of said recess of said mirror support having a convex configuration.

4,872,637

DIE MEMBER FOR FORMING A LOST FOAM PATTERN

Russell J. VanRens, Milwaukee, Wis., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Jun. 3, 1988, Ser. No. 202,876

Int. Cl.⁴ B22C 7/02

U.S. Cl. 249—59

9 Claims

9. A die member for forming a foam pattern for casting a cylinder block in a lost foam casting process, the pattern having a cylindrical bore with an axis, a helical transfer passage including a first portion permitting die member separation in the direction along the axis of the cylindrical bore, a first undercut portion preventing one-piece die member separation in the direction along the axis of the cylindrical bore, a second portion permitting movable core separation along a line in a plane substantially perpendicular to the axis of the cylindrical bore, and a second undercut portion preventing one-piece core separation along said line, and the pattern also having a helical finger passage adjacent the transfer passage, said die member comprising a main portion forming the cylinder bore and including a projection forming the second undercut portion of the transfer passage, a first part of the second portion of the transfer passage, and a first part of the first portion of the

transfer passage, and a core carried by said main portion and movable relative to said main portion along said line, said core being movable between an extended position in which said core forms a second part of the first portion, a second part of the second portion, the first undercut portion, and the finger passage, and a retracted position in which said core is withdrawn from the first undercut portion, is partially withdrawn from the second portion and is withdrawn from the finger passage and affords removal of said die member from the pattern in the direction along the axis of the cylindrical bore.

4,872,638

SLOW ACTING FLUID VALVE

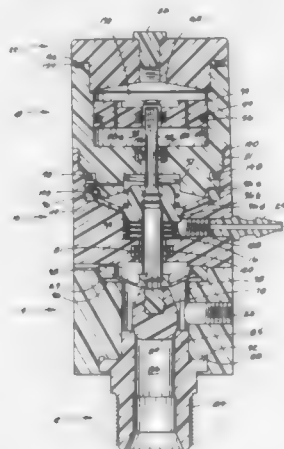
Raymon F. Thompson, and Larry Funk, both of Kalispell, Mont., assignors to Semitool, Inc., Kalispell, Mont.

Filed Jan. 29, 1988, Ser. No. 150,383

Int. Cl.⁴ F16K 31/126, 31/122

U.S. Cl. 251—54

7 Claims



4. A slow-acting pneumatically operated fluid valve for semiconductor fabrication equipment, the valve being designed to minimize fluid supply system shocks that can dislodge particles within the supply system and contaminate components of the semiconductor fabrication equipment when the valve is opened or closed, comprising:

a sealed axially aligned multi-part valve enclosure including a valve seat housing, an actuator housing a cylinder housing, and a cylinder end cap;

an elongated valve stem movably mounted in the actuator housing of the valve enclosure for axial movement relative to it;

a first sealed chamber formed within the actuator housing of the valve enclosure, the first sealed chamber being axially bounded by first and second diaphragms each having a rim sealed to the valve enclosure and a central section sealed and fixed to the valve stem at axially spaced positions along its length, the rim of the first diaphragm being sealingly disposed between the valve seat housing and the actuator housing and the rim of the second diaphragm being sealingly disposed between the actuator housing and the cylinder housing;

fluid inlet means formed through the actuator housing of the valve enclosure in communication with the first sealed chamber for selectively directing fluid under pressure into the first sealed chamber to move the valve stem in a first axial direction relative to the valve enclosure;

at least one biasing means within the actuator housing of the valve enclosure, the biasing means being operably connected between the valve enclosure and valve stem for urging the valve stem in an axial direction opposite to the first axial direction;

a poppet at one axial end of the valve stem;

a valve seat formed within the valve seat housing of the valve enclosure and axially facing the poppet, the valve seat being in fluid communication between first and sec-

ond ports extending through the valve seat housing of the valve enclosure;

a second sealed chamber formed in the cylinder housing of the valve enclosure, the second sealed chamber being bounded at one axial end by one of the first and second diaphragms; and

the cylinder cap being fixed to the cylinder housing to close off the second sealed chamber;

damping piston means fixed to the valve stem within the second sealed chamber in the cylinder housing for restricting and controlling axial movement of the valve stem relative to the valve enclosure;

whereby the actuation speed of the valve stem, in response to pressure of fluid directed into the first sealed chamber overcoming the biasing means, is slow and uniform throughout the entire movement of the valve stem.

4,872,639

PILOT-CONTROL SAFETY VALVE

Andre Gemignani, Saint Mitre Les Remparts, France, assignor to Societe d'Exploitation de Brevets Pour l'Industrie et la Marine Sebim, Chateaufort, France

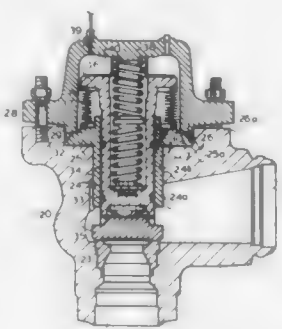
Filed Aug. 19, 1988, Ser. No. 234,967

Claims priority, application France, Aug. 25, 1987, 87 12172

Int. Cl.⁴ F16K 31/126

U.S. Cl. 251—61.4

15 Claims



1. A pilot-controlled safety valve, comprising:

a valve body formed with a first passage connected to a pressurizable space to be protected against a pressure excess, a second communicating with the exterior of said valve body, and means forming an annular generally horizontal valve seat around said first passage;

a guide sleeve axially aligned with said valve seat and spaced therefrom, said guide sleeve having a tubular portion extending toward said seat and a peripheral collar at an upper end of said tubular portion bearing against an annular surface of said valve body and supported thereby;

a cap affixed to said valve body over said guide sleeve and having an annular surface bearing against said collar for clamping said collar between said surfaces;

a shaft guided in said sleeve and formed at an upper end thereof with a peripheral collar overlying the peripheral collar of said guide sleeve, said upper end of said shaft being exposed to a fluid pressure in said cap urging said shaft toward said seat with a pilot pressure for holding said valve closed and which, upon reduction, permits opening of said valve by pressure in said space;

a valve member on a lower end of said shaft positioned to engage upon said seat for closing the valve upon application of said pilot pressure in said cap; and

a variable-length metal jacket having an upper end sealingly connected to said peripheral collar of said shaft, and a lower end sealingly connected to the peripheral collar of said guide sleeve and contracted in a closed position of said valve, an outer surface of said jacket, said cap and said upper end of said shaft delimiting a chamber receiving said pilot pressure.

4,872,640

VALVE APPARATUS

John E. Schwartz, 1642 Buckhorn Ln., Billings, Mont. 59105

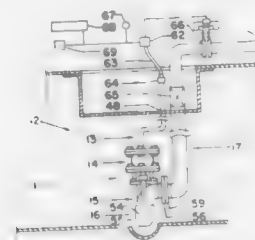
Continuation-in-part of Ser. No. 865,806, May 22, 1986,

abandoned. This application Apr. 25, 1988, Ser. No. 71,850

Int. Cl.⁴ F16K 31/126

U.S. Cl. 251—147

4 Claims



1. A normally-closed valve apparatus for mounting within a vessel containing a fluid, gas, or liquid product, said valve apparatus comprising an actuator assembly; a valve body assembly having a product passage, said product passage having continuous walls that are free of openings; and a valve assembly having a valve seat; said actuator assembly including at least one draw bar straddling said valve body assembly; and said actuator assembly further comprising a sealing member, said sealing member being attached by said draw bar to a cylindrical block, and said sealing member being actuated by said product from within said vessel to thereby move said cylindrical block into engagement with said valve seat to shut the flow of product through said valve apparatus, and said cylindrical block being movable by said draw bar away from its engagement with said valve seat to open said valve apparatus and allow passage of said product through said valve apparatus.

4,872,641

GAS PRESSURE REGULATOR MOUNTING YOKE

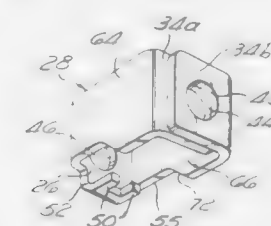
Thomas F. Fangrow, Jr., Corona, Calif., assignor to Life Support Products, Inc., Irvine, Calif.

Filed Jul. 22, 1988, Ser. No. 223,161

Int. Cl.⁴ F16K 51/00; F16L 5/00

U.S. Cl. 251—148

12 Claims



1. A yoke assembly for mounting a pressure regulator on a gas cylinder outlet valve structure, comprising:

a yoke with a closed loop configuration having a pair of spaced, generally flat, parallel side walls defining open sides to enable the yoke to fit on said structure;

a regulator base integrally joined to said walls; a hole in said base for attachment of said yoke to said regulator;

one or more indexing pins formed integral with said base, said pins being bent from the base to extend generally perpendicular to said base and being adapted to fit within indexing holes formed in said valve structure on said cylinder; and

a handle end wall spaced from and extending generally parallel to said base, and joined to said side wall, said handle end wall being adapted to receive a stem of a

handle for attaching said yoke to said cylinder structure, wherein said side walls, said base, said handle end wall, and said pins are of a one-piece construction.

4,872,642

SEAL MECHANISM FOR BUTTERFLY VALVE WITH PRESS CONTACTING SEAL EFFECTIVE IN BOTH INFLOW AND OUTFLOW DIRECTIONS

Akira Oshima, No. 136, Idogayanakamachi, Minami-ku, Yokohama-City, Japan

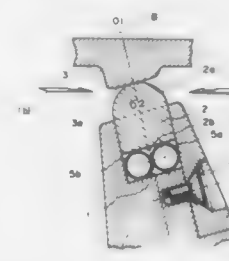
Filed Sep. 2, 1988, Ser. No. 240,831

Claims priority, application Japan, Jan. 21, 1988, 63-12195

Int. Cl.⁴ F16K 25/00

U.S. Cl. 251—173

3 Claims



1. A seal mechanism for butterfly valve of concentric opening with press contacting seal, comprising a ring-formed seal metal arranged surrounding the valve body under insertion in a radially displaceable manner in a circumferential groove formed around the circumference of the valve body, said seal metal having a rounded outer peripheral face; a seat metal disposed surrounding the inner wall of the valve casing and formed integrally therewith, with its seat face inclining relative to the conduit direction of the valve casing; and two tubular buffer rings inserted in said groove of the valve body in between the bottom of the groove and the inner circumference of the seat metal, each of said tubular buffer rings being split along its entire looping length on the upper or lower side of the ring so as to leave a C-shaped cross section to thereby provide a resilient radial support force for said seal metal on said groove bottom at the neutral position on the seat face between the thrust force components in the inflow and the outflow directions of the valve whereby, if the thrust force components imparted to either one side of the valve body increases, the supporting force by the buffer ring will be increased for the corresponding buffer ring on said one side by the intrusion of fluid passing through the valve thereto from the split thereof, resulting in the building up of a balance between the thrust force components and the supporting force for maintaining a seal between said seal metal and said seat metal.

4,872,643

VALVE

Yi C. Lo, 8 Fl., No. 312, Sec. 4, Chung Hsiao E. Rd., Taipei, Taiwan, assignor to Robert C. Lin and Yi C. Lo, both of Taipei, Taiwan

Filed Mar. 17, 1989, Ser. No. 324,899

Int. Cl.⁴ F16K 31/528

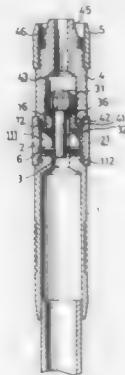
U.S. Cl. 251—252

12 Claims

1. A valve, comprising:

a primary tube having two successive reduced diameter portions formed on one end thereof, a first reduced diameter portion having a larger diameter being formed on one end of the primary tube and a second reduced diameter portion with a smaller diameter being formed on an outer free end of the first reduced diameter portion, two slots being formed on the opposite sides of the first reduced diameter portion, and a first sealing ring being fitted at an

abutment of the primary tube and the first reduced diameter portion;
 a secondary tube, one end of the second reduced diameter portion being connected to said secondary tube, said secondary tube having a reduced diameter annular flange formed on one end thereof, and a sealing ring being fitted on an outer surface of the flange;
 a piston-like element having a head portion being slidable in a bore of the secondary tube, and a rod portion being



slidable in a bore of the primary tube, a transverse hole being formed on the rod portion, and a second sealing ring being fitted at an abutment of the head portion and the rod portion;
 a pin being slidable in the transverse hole; and
 a rotatable control ferrule being rotatably disposed between the primary tube and the secondary tube, two guide slots being formed on the opposite sides of an inner surface of the control ferrule for receiving and guiding opposite ends of the pin.

4,872,644

MOTOR VEHICLE SERVICING TOOL

Peter A. Papapetros, 41-49 Victoria Street, Alexandria New South Wales 2015, Australia

PCT No. PCT/AU86/00038, § 371 Date Aug. 18, 1987, § 102(e) Date Aug. 18, 1987, PCT Pub. No. WO87/03837, PCT Pub. Date Jul. 2, 1987

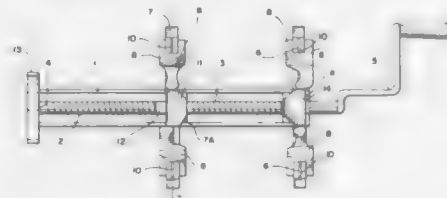
PCT Filed Feb. 14, 1986, Ser. No. 110,746

Claims priority, application Australia, Dec. 23, 1985, 04001

Int. Cl. B23P 19/04

U.S. Cl. 254—10.5

6 Claims



1. A tool for compressing a motor vehicle suspension strut coil spring, comprising a rack,
 two pairs of upwardly curved arms, one pair being rigidly secured to one end of the rack, and the other pair being adapted to slide along the rack,
 two pairs of cleats, each cleat being mounted on a respective one of said arms, and adapted to engage said coil spring intermediate its ends, whereby said coil spring may be compressed,
 each of said cleats being movable relative to and along its respective arm so as to adjust for different diameters of coil spring, a cradle affixed to one of said rack to assist in

supporting part of said motor vehicle suspension strut as the coil spring is compressed.

4,872,645

COIL SPRING COMPRESSOR

Michel Dossier, Paris, France, assignor to Facom, Morangis, France

Filed Aug. 2, 1988, Ser. No. 227,251

Claims priority, application France, Aug. 7, 1987, 87 11325

Int. Cl. B60P 1/48

U.S. Cl. 254—10.5

8 Claims



1. A coil spring compressor comprising:
 a longitudinal guide tube having a longitudinal axis, an axially extending slot in said guide tube;
 two jaws provided for the insertion therebetween of respective spaced-apart coils of a compressible coil spring which is to be compressed, said jaws being mounted on said guide tube in confronting relation to each other in a radial plane containing said axis, one said jaw being axially fixed relative to said tube and the other said jaw being axially slidable on said tube, each said jaw comprising in a single piece two arms forming claws or clamps and a tubular body defining a bore having such section relative to a substantially complementary section of said guide tube as to provide a slidable mounting of the respective said jaw on said guide tube;
 a slide axially slidably mounted in said guide tube and having a radially extending projecting portion extending through said slot and out of said guide tube;
 an actuating screw rotatively mounted in said guide tube on said axis thereof and engaged with said slide for adjusting the axial position of said slide relative to said guide tube by rotation of said screw; and
 means for rigidly and detachably securing said axially slidable jaw to said slide and comprising a screw-threaded skirt coaxial with said bore of said slidable jaw and defining an extension of said bore of said slidable jaw and axially extending from a first side of said slidable jaw directed toward said fixed jaw, a groove provided in said bore of said slidable jaw and in said skirt and axially extending in said radial plane and having a tapering shape in said radial plane with a radial depth which progressively increases from a second side of said slidable jaw remote from said fixed jaw to said first side directed toward said fixed jaw, said groove being continued into said skirt, said radially extending projecting portion of said slide extending into said groove, said groove and said projecting portion each having a substantially rectangular section in a plane perpendicular to said axis, a tapped ring screw-threadedly engageable on said screw-threaded skirt and in axially abutting relation to said projecting portion, said

projecting portion having a shape substantially complementary to said tapering shape of said groove, whereby said slidable jaw is rigidly secured to said projecting portion and said slide when said ring is in abutting relation to said projecting portion.

4,872,646

RAILROAD TIE REPLACEMENT APPARATUS

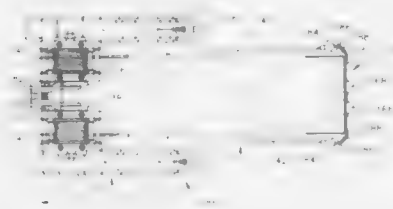
James C. Stano, P.O. Box 2061, Media, Pa. 19063

Continuation of Ser. No. 74,443, Jul. 16, 1987, abandoned, which is a continuation-in-part of Ser. No. 893,660, Aug. 6, 1986, abandoned, which is a continuation of Ser. No. 796,885, Nov. 18, 1985, abandoned. This application Sep. 22, 1988, Ser. No. 252,033

Int. Cl. E01B 29/22

U.S. Cl. 254—43

41 Claims



1. Apparatus for replacing railroad ties by removing a first railroad tie from position under conventional railroad tracks by moving said first tie transversely to said track and inserting a second, replacement tie into the vacant tie position by moving said second replacement tie in a direction opposite to the direction to removal of said first tie, while permitting train passage over said track while said apparatus is in place for said first tie removal and said second tie insertion, comprising:

- a pair of longitudinally elongated spaced apart support members adapted to be inserted between a conventional railroad track rail and ballast beneath said rail, transversely with respect to said rail, on either side of said first tie to be removed from under said rail and on either side of space vacated by said first tie into which said second tie is to be inserted beneath said rail, portions of upper surfaces of said support members being substantially flat and adapted to be positioned coplanar with the lower surface of the base of said rail for flush facing contact therewith;
- a bridging member secured to said support members, fixedly positioning said support members spaced apart with respect to each other sufficiently to permit said support members to be inserted beneath said rail on either side of said tie to be removed;
- transversely positioned shaft means rotatably mounted on and spaced above said bridging member;
- reel means fixedly connected to and rotatable with said shaft, for selectably collecting and dispensing flexible line means in either longitudinal direction with respect to said tie upon shaft rotation in a single direction;
- said flexible line means residing on said reel means, having a first end secured to said reel means and having a remaining end loose and providing means for converting rotation of said reel means in said single direction to tensile force applied along said longitudinal direction of said line means;
- means mounted on said support members, for releasably engaging said rail below the operating surface thereof and preventing relative movement of said apparatus with respect to said rail;
- lever means extending radially outwardly from said shaft, for rotating said shaft in response to angular movement of

said lever with respect to said shaft upon said lever being connected with said shaft;
 h. first ratchet means for selectably connecting said lever with said shaft for rotation of said shaft in a first rotational direction upon lever angular movement in a first angular direction with respect to said shaft and for lever angular movement in a second angular direction, opposite said first angular direction, without shaft rotation resulting;
 i. second ratchet means, selectably engaging said shaft, for precluding shaft rotation in other than said first rotational direction;
 j. means for selectably engaging said first ratchet means with said shaft;
 k. means for selectably engaging said second ratchet means with said shaft; said shaft being freewheeling when said respective selectable ratchet engagement means are disengaged; and
 l. means for transferring tensile force in said line means to an end of either said first or said second tie in the direction of longitudinal travel thereof during respective removal from or insertion into position under said railroad track, including means for adjustably facilitating clamping of said force transferring means about ties of different sizes.

4,872,647

DECORATIVE ATTACHMENT FOR A CHAIN LINK FENCE

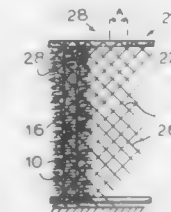
Francis M. Paradise, and James R. Paradise, both of 134-11 Hillside Ave., Jamaica, N.Y. 11418

Filed Sep. 29, 1987, Ser. No. 102,036

Int. Cl. E04H 17/00

U.S. Cl. 256—1

5 Claims



1. An artificial hedge and/or shrubbery assembly comprising a chain link fence having a plurality of interlocking wires twisted together at spaced intervals to form a plurality of diamond shaped openings arranged in parallel rows, and a plurality of camouflage assemblies supported on said fence said camouflage assemblies comprising a central elongated axial support element and relatively stiff densely packed filament means fixedly carried by said support element and extending laterally of the axis thereof, said filament means forming a bush-like planar array that extends along the entire length of said support element, at least one of said camouflage assemblies being inserted in a selected plurality of rows of openings in said fence such that said support element passes through the openings in said selected rows so that when a plurality of such elements are thus inserted the fence assumes a hedge-like appearance.

4,872,648

REACTION VESSEL FOR PROCESSING STEEL

Heinz Holtermann, Meerbusch, and Arno Laven, Krefeld, both of Fed. Rep. of Germany, assignors to Technometal Gesellschaft für Metalltechnologie mbH, Duisburg, Fed. Rep. of Germany

Filed Aug. 11, 1988, Ser. No. 231,186

Claims priority, application Fed. Rep. of Germany, Aug. 11, 1987, 3726646

Int. Cl. C21C 7/10

U.S. Cl. 266—275

8 Claims



1. In an airtight reaction vessel having a lining of refractory material for immersion in steel-processing ladles, with said reaction vessel including an upper vessel part, a lower vessel part, and immersion pipes, with these components being interconnected via respective flange means that include, for each component, an upper main flange and a lower main flange, whereby the upper main flange of one of said components is interconnected to the lower main flange of another of said components via clamping mechanisms, the improvement wherein:

a compensator ring is disposed between the main flanges of each two associated vessel components, with said compensator ring having a first end that rests on said upper main flange of said associated components, and a second resilient free end; and

said upper main flanges are each provided, as part of said flange means, with a separate upper flange ring that is disposed on said second resilient free end of said compensator ring between said compensator ring and the lower main flange of said associated components, whereby in an unstressed state of said flange means, said flange ring extends slightly beyond a projection of an upper rim of that vessel component of said associated components that carries said upper main flange.

4,872,649

LIQUID TYPE MASS DAMPER WITH ELONGATED DISCHARGE TUBE

Shigeo Kawamata, Shibei, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 23, 1988, Ser. No. 159,062

Claims priority, application Japan, Feb. 25, 1987, 62-041793
Int. Cl. F16F 9/04, 7/10; F16M 13/00; E02D 27/34

U.S. Cl. 267—136

2 Claims

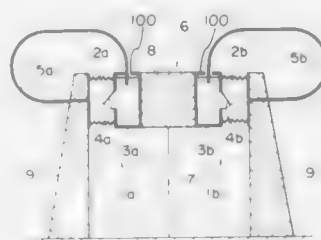
1. A liquid type mass damper comprising:

a sealed cylindrical liquid container having an axial dimension and a radial dimension, said liquid container being expandable in an axial direction with minimum changes in its sectional area for different internal pressures;

a liquid reservoir positioned adjacent said cylindrical liquid container, said liquid reservoir and said cylindrical liquid container defining an opening providing communication between said cylindrical liquid container and said liquid reservoir; a liquid disposed in said liquid container and said liquid reservoir; check valve means positioned within

said opening for preventing said liquid from flowing from said cylindrical liquid container to said liquid reservoir and allowing liquid to flow substantially unrestricted from said reservoir to said container;

a long and narrow liquid discharge tube having a length which is significantly longer than the axial dimension of said cylindrical liquid container and having a tube cross section which is significantly smaller than said opening,



said liquid discharge tube extending out of said container and into said reservoir, said liquid reservoir having an opening to atmosphere, said cylindrical liquid container and said adjacent liquid reservoir being disposed between structural elements such that said liquid container expands and contracts in an axial direction of said cylindrical liquid container according to the vibrations of said structural elements.

4,872,650

VIBRATION INSULATING DEVICE

Toohiyuki Tabata, Sagami, Japan; Tatsuro Ishiyama, Yokohama; Takao Ushijima, Chigasaki, and Takuya Dan, Yokohama, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama and Bridgestone Corporation, Tokyo, both of Japan

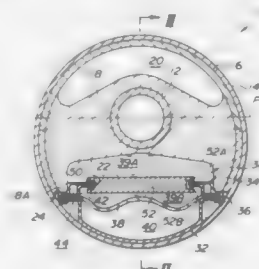
Filed Jun. 15, 1988, Ser. No. 206,718

Claims priority, application Japan, Jun. 19, 1987, 62-152609

Int. Cl. F16F 5/00

U.S. Cl. 267—140.1

17 Claims



1. A vibration insulating device comprising:

an inner cylinder;

an outer cylinder disposed surrounding said inner cylinder;

an elastic support member tightly interposed between said inner and outer cylinders;

means defining a hollow in said elastic support member, at least major part of said hollow being located on one side of a plane containing axis of said inner cylinder;

means defining first and second liquid chambers between a part of said elastic support member on the other side of said plane and inner periphery of said outer cylinder;

means defining a restriction passage through which said first and second liquid chambers are in communication with each other to be restricted in flow of liquid; and

means defining an air chamber filled with air, said air chamber being adjacent to one of said first and second chambers through a flexible partition wall.

4,872,651

FLUID FILLED RESILIENT BUSHING

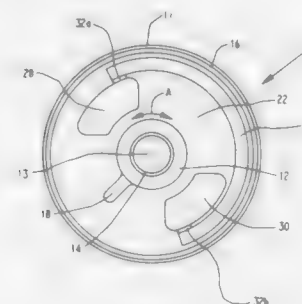
Richard P. Thorn, Erie, Pa., assignor to Lord Corporation, Erie, Pa.

Filed Mar. 14, 1988, Ser. No. 167,943

Int. Cl. F16F 5/00

U.S. Cl. 267—140.1

31 Claims



1. A fluid filled resilient bushing assembly for transmitting motion including rotary oscillatory motions between a motion inducing member and a base member while substantially damping rotary oscillatory motions between said members comprising:

an elongate outer rigid sleeve member;

an elongate inner rigid member disposed within and radially inwardly spaced from said outer sleeve member to define a space therebetween;

a resilient means disposed about said inner rigid member between said inner rigid member and said outer rigid sleeve member for sealingly connecting said inner rigid member to said outer rigid sleeve member to permit the inner rigid member to rotatably oscillate with respect to said outer rigid sleeve member while undergoing elastic stress during rotation,

said resilient means defining at least two spaced chambers interconnected by an elongated restricted passageway; said spaced chambers including radial walls extending in the radial direction of the bushing assembly and circumferential walls extending in the circumferential direction of the bushing assembly; said restricted passageway interconnecting said spaced chambers only through said circumferential walls;

an incompressible fluid filling said spaced chambers and said restricted passageway,

a pressure differential inducing means creating a differential in the fluid pressure of said at least two spaced chambers, resulting from said rotary movement of the inner rigid member with respect to the outer rigid sleeve member permitting contraction of one chamber, and expansion of the other chamber by fluid flow therebetween via said restricted passageway.

4,872,652

TWO CHAMBER ENGINE MOUNT

Gerhard Rohner, Hemsbach; Werner Idigkeit, Weinheim, and Klaus Kurr, Weinheim-Hohensachsen, all of Fed. Rep. of Germany, assignors to Firma Carl Freudenberg, Weinheim-Bergstr., Fed. Rep. of Germany

Continuation of Ser. No. 49,587, May 12, 1987, abandoned. This application Oct. 12, 1988, Ser. No. 257,140

Claims priority, application Fed. Rep. of Germany, Jun. 11, 1986, 3619685

Int. Cl. F16M 1/00; B60K 5/12; F16F 13/00, 15/04

U.S. Cl. 267—140.1

7 Claims

1. A two-chamber engine mount comprising:

(a) means defining a working space;

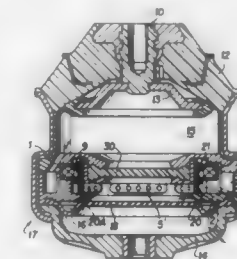
(b) means defining a compensation space;

(c) a liquid filling said working space and said compensation space;

(d) a choke canal having an inlet at one end communicating with the working space and an outlet at another end communicating with said compensation space;

(e) said choke canal having at least one transverse passage disposed between said inlet and said outlet and being parallel to said outlet;

(f) a valve means for selectively opening and closing said at least one transverse passage said at least one transverse passage to permit fluid communication between said compensation space and said choke canal in response to a



signal whereby the amount of liquid resonating in the choke canal when the engine mount is subject to vibration is dependent upon selective operation of the valve means; and

wherein said choke canal is annular and further including an inner annular chamber communicating with said at least one transverse passage, said valve means comprising an annular member having a plurality of openings communicating with said compensation space, and a cylindrical member slidably disposed with respect to said annular member to selectively cover and uncover said openings to selectively permit fluid communication between said at least one transverse passage and said compensation space.

4,872,653

SHACKLE FOR USE IN LIMITING THE MOVEMENT OF AN END OF A LEAF SPRING IN A WHEELED VEHICLE

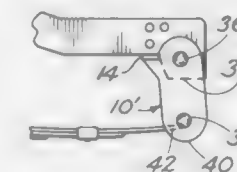
Brian N. Chuchua, 920 S. Mohler Dr., Anaheim, Calif. 92807

Filed Apr. 11, 1988, Ser. No. 180,159

Int. Cl. B60G 11/12; F16F 11/28

U.S. Cl. 267—271

4 Claims



1. A shackle for use in limiting the rotation of an end of a leaf spring which comprises:

a body having a top end and a bottom end, top and bottom bearing means located on said body adjacent to said top and said bottom ends, respectively, for use in pivotally mounting said shackle, and stop means located on said body for limiting the rotation of said body when it is rotated about the axis of said top bearing by physically engaging a member located adjacent to said shackle wherein

said spring is of such a length that when it is bent as a result of rotation of said shackle said stop means will limit the rotation of said shackle by engaging said frame so as to preclude rotation of said shackle to such an extent that said spring will not be deformed to the extent of being

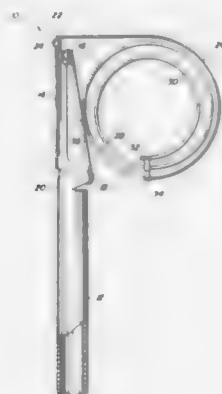
damaged as a result of being bent to accommodate such shackle rotation;
 said body comprises two parallel, spaced side plates and a connecting plate located transverse to said side plates and extending between said side plates, said edge being capable of engaging the frame of a vehicle upon which said shackle is used in order to limit rotation of said shackle, said
 said stop means is an edge on said connecting plate which is spaced from said bearing means.

4,872,654

WORK-HOLDING IMPLEMENT AND BENCH-MOUNTED LOADING FIXTURE THEREFOR
 Harold A. Seele, 6636 Sherbourne Dr., Los Angeles, Calif. 90056
 Filed Feb. 18, 1988, Ser. No. 156,991
 Int. Cl.⁴ B25B 13/52

U.S. Cl. 269—3

9 Claims



1. A work-holding implement comprising:
 a handle; and
 multi-turn torsion spring means for holding a circular workpiece including an inwardly facing gripping surface along a first portion and slidable bearing surfaces along a second portion thereof, said means being attached at one end to said handle, the other end being biased radially inwardly to frictionally engage a circular workpiece positioned therein;
 said spring means comprising:
 a spirally wound spring band coil having an innermost turn and at least one outer turn, with most of an inner circumference of said innermost turn having a gripping surface; and
 first and second band control guides extending radially outward from said innermost turn to adjacent an outermost turn of said coil.

4,872,655

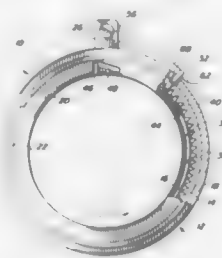
WORK-HOLDING APPARATUS AND METHOD
 Harold A. Seele, 6636 Sherbourne Dr., Los Angeles, Calif. 90056
 Filed Feb. 16, 1988, Ser. No. 156,415
 Int. Cl.⁴ B25B 1/04, 1/20

U.S. Cl. 269—130

10 Claims

1. A work-holding apparatus comprising:
 an annular housing having an outer circumferential surface and an inner circumferential surface;
 an annular member inside said housing and rotatable with respect thereto;
 a biasing spring mounted in said housing, connected at one end to said housing and at another end to said rotatable annular member;
 a spirally wound spring band coil having an innermost turn and at least one outer turn, said coil being attached at one end to said housing and at another end to said rotatable annular member, said band coil fitting inside said housing

with an outermost turn adjacent said inner circumferential surface and having an exposed gripping surface over most of said innermost turn; and
 position fixing means attached to said rotatable annular member and fixable to said housing;



wherein said position fixing means can be unfixed from said housing to tighten said spring band coil with a force of said biasing spring so that said innermost turn decreases in circumference and an object placed inside said innermost turn can be held thereby.

4,872,656

ORTHOPEDIC TABLE WITH MOVABLE UPPER BODY AND SACRUM SUPPORTS

Thomas Brendgord, Ward L. Sanders, and Dennis C. Coon, all of Erie, Pa., assignors to American Sterilizer Company, Erie, Pa.
 Continuation of Ser. No. 587,926, Mar. 9, 1984, abandoned, which is a continuation of Ser. No. 332,656, Dec. 21, 1981, abandoned. This application Nov. 9, 1987, Ser. No. 119,311

Int. Cl.⁴ A61G 13/00

U.S. Cl. 269—322

2 Claims



1. An orthopedic table having a longitudinal axis, said table used for supporting a patient during the performance of orthopedic procedures, said table comprising:
 a base bisected by a vertical plane within which the longitudinal axis of the table lies;
 first table top means mounted on said base for supporting a patient's upper body, said first table top means having a first position wherein a longitudinal axis of said first table top means is colinear with the longitudinal axis of the table;
 second table top means mounted adjacent to said first table top means for supporting a patient's sacrum, said second table top means having a first position wherein a longitudinal axis of said second table top means is colinear with the longitudinal axis of the table;
 means for moving said first and second table top means in unitary fashion in a direction transverse to the longitudinal axis of said table to selected second positions to enable imaging equipment to be located thereunder; and
 a traction mounting assembly including abductor bar means for engaging and supporting the patient's lower extremities, said abductor bar means being pivotally mounted to

and extending substantially perpendicularly from said base such that upon movement of said first and second table top means to said selected second position said abductor bar means pivot to accommodate the patient's lower extremities.

4,872,657

OPERATING TABLE WITH A PATIENT SUPPORT SURFACE TILTABLE AROUND THE LONGITUDINAL AND TRANSVERSE AXES

André Lüsi, Wabern, Switzerland, assignor to M. Schärer AG, Wabern, Switzerland

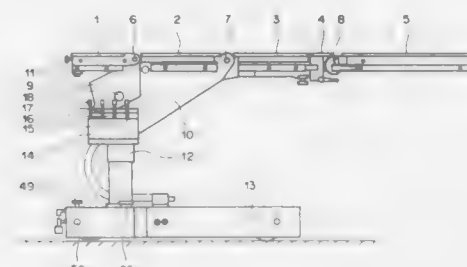
Filed Oct. 13, 1987, Ser. No. 107,337

Claims priority, application Switzerland, Oct. 17, 1986, 4151/86

Int. Cl.⁴ A61G 13/00

U.S. Cl. 269—325

8 Claims



1. An operating table having a patient support surface, said support surface being tilttable about a longitudinal axis and about a transverse axis, said support surface being comprised of a plurality of segments, pivot means pivotally connecting each segment to at least one other segment, individual drive means for tilting the patient support surface about its longitudinal axis and about its transverse axis for pivoting each segment about its pivot means and relative to at least one other segment, a control panel fixed to said table with a plurality of manually operable control levers for manually operating said individual drive means, actuator means for operating said individual drive means, and a remote control device having a sender and a receiver, said receiver having a driver stage with outputs for energizing said actuator means from a location remote from said table, characterized in that the actuating means are electromagnetic devices (43, 44, 48) and that each of the electromagnetic devices is functionally connected with one of the control levers (15-18) to operate that lever from a remote location and is connected electrically with an output of the driver stage (47).

4,872,658

FOLDER FOR BUSINESS FORMS PRESS

Ross A. Hoge, Westmount, Canada, assignor to M-A-N Ashton Inc., Montreal, Canada

Filed May 23, 1988, Ser. No. 197,203

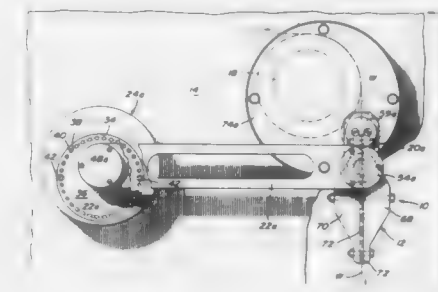
Int. Cl.⁴ B41L 1/32

U.S. Cl. 270—39

7 Claims

1. A web folding structure comprising a frame, the frame including a pair of parallel side walls, one on either side of the web to be folded, a chute extending transversely between the side walls across the web, the chute including spindle means on either end thereof journaled in bearings in the respective side walls allowing the chute to pivot about a pivot axis extending through the spindles, the chute further including a pair of closely spaced wall surfaces defining an elongated slot adapted to pass the web therethrough, the slot defined by the wall surfaces including a plane passing through the pivot axis with the chute extending below the pivot axis to provide a pendulum motion; at least a crank arm connected to one of the spindles and a link arm connected at one end to the crank arm at a point spaced from the pivot axis, the other end of the link arm

being connected to a drive wheel eccentrically thereof for providing a pendulum motion to the crank and thus the chute, characterized in that the drive wheel includes a first disc mounted to a shaft, drive means for rotating the first disc about an axis of rotation passing through the geometric center of the first disc, the first disc defining a circular recess in the outer surface thereof with the geometric center of the circular recess being offset from the axis of rotation of the first disc but the circular recess containing the geometric center of the first disc, a second disc rotatable in the circular recess, the second disc



having a geometric center coincident with the geometric center of the circular recess, the linking arm being eccentrically connected to the second disc such that the axis of the linking arm connection to the second disc is parallel to the axis of rotation of the first disc, and means are provided for detachably locking the second disc to the first disc within the circular recess such that the degree of eccentricity of the linking arm connection to the second disc can be adjusted relative to the rotation of the axis of the first disc to thereby adjust the stroke of the pendulum motion of the chute.

4,872,659

CASSETTE WITH TURN COVER AND FEED ROLLER CONTROL

Toshio Kato, Okazaki; Kunihiro Uotani, Seto, and Mitsuhiro Ito, Toyooka, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

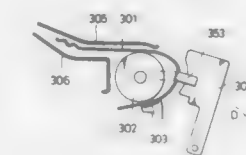
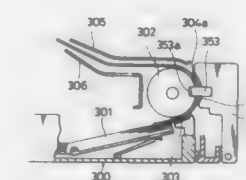
Filed Apr. 29, 1988, Ser. No. 188,307

Claims priority, application Japan, Apr. 30, 1987, 62-107079

Int. Cl.⁴ B65H 3/44, 5/26

U.S. Cl. 271—9

5 Claims



1. An apparatus for forming an image on a sheet of paper, comprising:
 a main body;
 a storing means for storing sheets of paper therein;
 a feeding means for feeding said sheets of paper in said storing means into said main body in a predetermined direction and having a feed roller feeding an uppermost

sheet of paper among said sheets of paper in said storing means by a rotation thereof to a predetermined position corresponding to a conveyor roller;
 a turn cover disposed on said storing means; and
 a member fixed at a turn cover at one end thereof such that one sheet of paper present on said feed roller is positioned between said turn cover and the other end of said member for drawing out said one sheet of paper when said turn cover is opened.

4,872,660

SHEET FEED DEVICE FOR RECORDING APPARATUS

Toshiaki Kameyama, Tokyo, and Yuichi Kobayashi, Yokohama, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 124,410, Nov. 20, 1987, abandoned, which is a continuation of Ser. No. 826,816, Feb. 6, 1986, abandoned. This application Nov. 21, 1988, Ser. No. 274,747
 Claims priority, application Japan, Feb. 12, 1985, 60-24670; Jun. 22, 1985, 60-93810

Int. Cl.⁴ B65H 3/44, 1/08, 3/06

U.S. Cl. 271-9

6 Claims



1. A sheet feed device for a recording apparatus which selectively performs automatic sheet feed and manual sheet feed, comprising:

- sheet load means to be loaded with a stack of sheets to be fed for fully supporting said stack of sheets;
- cylindrical sheet feed means for sequentially picking up and feeding the sheets from a top of the stack which is loaded on said sheet load means;
- electric drive means for driving the sheet load means such that the sheet load means is moved from a standby position to a sheet feed position so as to place the top sheet in said stack of sheets in contact with said cylindrical sheet feed means for maintaining the contact of said top sheet with said cylindrical sheet feed means and for moving said sheet load means from the sheet feed position to the standby position in a non-sheet feed condition;
- manual sheet insert means movable angularly between the sheet feed position and a retracted position which is remote from the sheet feed position, said manual insert means comprising a main tray which is movable as far as the sheet feed position at one end thereof and an auxiliary tray which is rotatably connected at one end thereof to the other end of said main tray, said manual sheet feed means having a pair of tray guide plates extending each from one of opposite sides of said main tray, each of which are received in a slot formed in a side wall of said recording apparatus, said manual sheet insert means being moved to the sheet feed position when said main tray and auxiliary trays become substantially flush with each other;
- sensor means for sensing a movement of said manual insert means from the retracted position to the sheet feed position in a manual insertion condition;
- biasing means for biasing said manual sheet insert means toward the sheet feed position; and
- control means for controlling the drive means such that when said sensor means has sensed a movement of the manual insert means while the sheet load means is in the

sheet feed position, the sheet load means is moved to the standby position away from the sheet feed position.

4,872,661

ROLL RELEASE MECHANISM

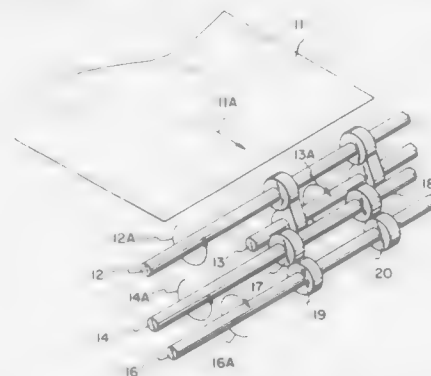
James A. Knepper, Longmont, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 21, 1984, Ser. No. 612,158

Int. Cl.⁴ B65H 5/02, 5/04

U.S. Cl. 271-273

17 Claims



1. A roll release mechanism for easy jam clearance including:

- first and second parallel shafts with drive rolls mounted on said first one of said parallel shafts and mating driven rolls mounted on said second one of said parallel shafts so as to engage said drive rolls with said driven rolls,
- said second shaft having at least two areas of reduced radius and at least two areas of unreduced radius,
- said unreduced radius areas of said second shaft fitted within at least two bearings,
- said reduced radius areas of said second shaft fitted within said bearings to disengage said driven rolls axially and radially from said drive rolls upon axial movement of said second shaft in the disengaging direction.

4,872,662

SORTING APPARATUS HAVING SORTER CONNECTABLE TO ANOTHER SORTER

Takuma Ishikawa; Tadashi Maruyama; Akiyoshi Johdai; Kuniaki Ishiguro, and Toshio Matsui, all of Toyokawa, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

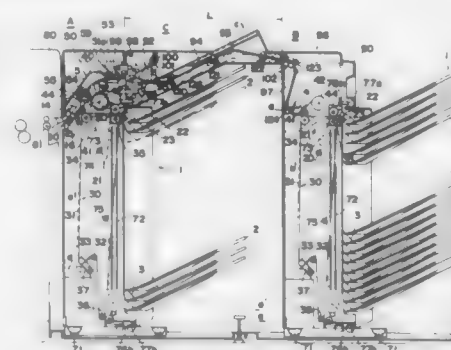
Filed Jul. 8, 1986, Ser. No. 883,157

Claims priority, application Japan, Jul. 9, 1985, 60-104969[U]; Jun. 9, 1986, 61-134519

Int. Cl.⁴ B65H 39/11, 39/115

U.S. Cl. 271-290

4 Claims



1. A sorting apparatus comprising:

- a first sorter module having a first accommodating means for accommodating and sorting sheets of paper, a delivery means including a pair of delivery rollers for discharging sheets of paper without sorting, an inlet means for accepting sheets, a first path of transport of paper for guiding the

accepted sheets from said inlet means to said first accommodating means, a second path of transport of paper for guiding the accepted sheets from said inlet means to said delivery means, wherein substantially all of said second path is distinct from said first path, and a first directing means at the inlet means for directing the accepted sheet to either said first path or said second path;

- a second sorter module which is separated from said first sorter module and having a second accommodating means for accommodating and sorting sheets of paper; and
- a bridge module detachably connected between said first sorter module and second and second sorter module for accommodating the discharged sheet without sorting and transporting the discharged sheet to said second sorter module;

said bridge module having a third accommodating means for accommodating sheets of paper without sorting, a third path of transport of paper for guiding the sheet discharged from said delivery means to said third accommodating means, a fourth path of transport of paper for guiding the sheet discharged from said delivery means to said second accommodating means, and a second directing means for directing the discharged sheet to either said third path or said fourth path.

4,872,663

SHEET SORTER APPARATUS

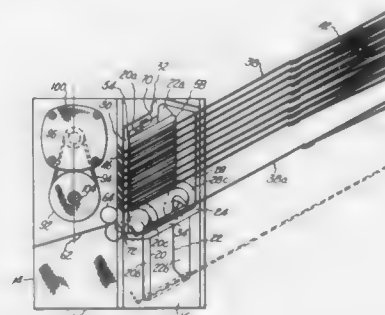
Salvatore Latone, Rochester, N.Y., assignor to M.T.S.L. Associates, Rochester, N.Y.

Filed Mar. 21, 1988, Ser. No. 171,492

Int. Cl.⁴ B65H 39/10

U.S. Cl. 271-294

15 Claims



1. Apparatus for sorting sheets as they arrive, one at a time, from the outlet of a copying machine or the like which apparatus comprises a plurality of stacked trays having a pair of pin means extending outwardly from a side thereof, the pins being spaced from each other along said edge, a frame having an upright support plate disposed along said edge, said plate having a pair of slots generally paralleling each other into which said pin means extend, each of said pair of slots having a slot wall which is opposed to a slot wall of the other of said pair of slots and which define opposed bearing surfaces upon which said pins bear and said trays are supported, the distance between said pin means as measured along a line through their centers to their outer peripheries, being greater than the distance between said bearing surfaces and canted with respect to said slots, and a tray shifting mechanism engagable with said pins for movement of said trays one at a time along tracks defined by said slots through a region adjacent said outlet where adjacent ones of said trays are separated to receive said sheets.

4,872,664
TREADMILL HAVING IMPROVED DECK
 Robert Parker, 12061 Tavel Cir., Dallas, Tex. 75230
 Filed Dec. 3, 1987, Ser. No. 128,223
 Int. Cl.⁴ A63B 23/06; B05D 1/36

U.S. Cl. 272-69

12 Claims



1. An improved treadmill of the type wherein an endless belt is mounted upon an underlying support surface for rotation thereover, said underlying support surface being adapted for receiving the weight of a person using the treadmill and running thereupon, the improvement comprises a curable coating composition disposed on said underlying support surface such that upon curing of the coating the underlying support surface exhibits enhanced lubricity for low resistance to belt movement thereacross and high durability to abrasion, said curable coating composition consisting essentially of from about 30 to about 60 volume percent of a polymeric resin, from about 30 to about 60 volume percent of a wax compatible with the polymeric resin, and from about 2 to about 12 volume percent of a particulate constituent selected from the group consisting of metal particles and melamine particles.

4,872,665

MECHANICAL LEG-PROPULSION ASSISTANCE DEVICE

Jean-Louis Chaire, 66, rue Artistide Briand, 92300 Levallois Perret, France

Filed Oct. 16, 1986, Ser. No. 920,072

Claims priority, application France, Oct. 30, 1985, 85 16097

Int. Cl.⁴ A63B 29/00

U.S. Cl. 272-70

10 Claims



1. A mechanical leg-propulsion assistance device comprising a saddle having means for fastening the saddle to the hips, shoulders or hands of a user, said saddle having a center plane and having attached to said center plane a first joint, said joint having an axis which is about perpendicular to the center plane of the saddle, and to which first joint are connected two telescopic rods with one end of each rod attached to said first joint, one of the rods situated on each of the sides of said center plane, the other end of each of the telescopic rods comprising a second joint whose axis is about perpendicular to the longitudinal axis of each of the telescopic rods, said second joint having an automatic blocking and unblocking device and being connected about perpendicular to the longitudinal axis of a link arm whose other end comprises a third joint having an axis which is about parallel to the axis of said second joint, which third joint connects the link arm to means for securing the link arm to the front of a user's shoes so that the axis the third joint is spaced from and about parallel to the plane of the sole of the

shoe, the shape of the link arm enabling it to rotate freely around the third joint without impeding the shoe, the two telescopic rods being fitted with associated motor means which, when the second joint is blocked, can assist the leg propulsion muscular force of a user.

4,872,666

SKIPPING ROPE ASSEMBLY

Kristin S. Smith, 509 Poppy Hill Rd., Watsonville, Calif. 95076
Continuation-in-part of Ser. No. 902,611, Sep. 2, 1986,
abandoned. This application Mar. 14, 1988, Ser. No. 167,539
Int. Cl.⁴ A63B 5/20

U.S. Cl. 272-75

2 Claims



2. In a skipping rope assembly of a type including an elongate skipping element, a hollow tubular body portion disposed at the ends of said element, openings leading axially inwardly of each said body portion, handles carried at the ends of said element in a manner permitting said element to rotate within and with respect to said body portions, studs carried by said tubular bodies and formed to have a sequence of tapered conical steps disposed therealong and oriented to more easily enter the open end of said tubular body portion than to withdraw from said tubular body portion, said studs having a broad head portion for retaining said element in an associated one of said handles, said handles including a pair of elongate shell portions, said shell portions of each said handle being formed to include a pair of axially spaced pockets for receiving the head of one of said studs selectively within one or the other of said pair of pockets so as to adjust the length of said skipping element.

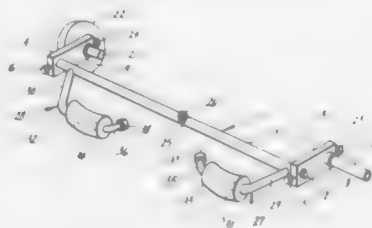
4,872,667

WEIGHT LIFTING APPARATUS

Dino A. Favot, 3000 Amazon, Dearborn, Mich. 48120
Filed Dec. 2, 1988, Ser. No. 278,850
Int. Cl.⁴ A63B 13/00

U.S. Cl. 272-123

16 Claims



1. Weight lifting apparatus comprising:

a bar having an axis;
hand grip means rotatably mounted on the bar coaxially with it to be grasped by a user;
bracket means nonrotatably held relative to the bar;
weight support means on the bracket means and radially offset from the axis of the bar;
brace means connected to the hand grip means for rotating

with the hand grip means relative to the bar and for engaging the back of the user's forearm; and
means for controlling the angle of rotation of the hand grip means relative to the bar for keeping the brace means within a predetermined range of angular positions relative to the weight support means.

4,872,668

MULTIDIRECTIONAL EXERCISER

Joseph P. McGillis, 827 Rosemont Rd. #10, Deer Lodge, Mont. 59722, and Howard G. Fly, Ovando, Mont., assignors to Joseph Patrick McGillis, Deer Lodge, Mont.
Filed Sep. 16, 1987, Ser. No. 98,021
Int. Cl.⁴ A63B 21/24

U.S. Cl. 272-130

63 Claims



1. An exerciser for resisting movement in any direction as applied by contacting parts of a user's body, comprising:

a base;
an elongated first member having a distal end adapted for engagement by the user, and a proximate end longitudinally spaced from said distal end;
an elongated second member which is operably connected for pivotal movement relative to the first member about a first pivot axis;
a third member which is operably connected for pivotal movement relative to the second member about a second pivot axis; said third member further being operably connected for pivotal movement relative to said base about a third pivot axis;
said first, second and third members and said base being pivotally connected to allow the first member to move in any desired direction throughout at least a portion of the first member's range of motion;
first resistance means operably connected between the first and second members for resisting pivotal movement about said first pivot axis;
second resistance means operably connected between the second and third members for resisting pivotal movement about said second pivot axis; and
third resistance means operably connected between the third member and base for resisting pivotal movement about said third pivot axis.

4,872,669

ADJUSTABLE RESISTANCE EXERCISER

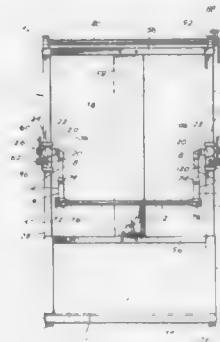
Harry M. Henry, P.O. Box 533, Paradise, Calif. 95967
Filed Jan. 12, 1989, Ser. No. 296,017
Int. Cl.⁴ A63B 21/00

U.S. Cl. 272-132

8 Claims

1. An exercise device comprising:
a frame including a pair of elongated, vertically oriented track members and a base for maintaining the vertical orientation of said track members;
a handlebar means including an elongated tubular handlebar being horizontally lengthwise oriented, and a pair of han-

dlebar side arms, each handlebar side arm being affixed to an end of said tubular handlebar at a right angle;
a carriage mounted on each vertically oriented track member, each handlebar side arm being pivotally attached to a carriage;
adjustment means for adjusting the position of each carriage along said track member including a pair of sprockets each pivotally mounted at the upper end of each track member, a pair of chains each connected at one end to a carriage and trained about a sprocket, a turnable axle con-



necting said sprockets, a crank connected to said turnable axle for manually turning said sprockets and thereby adjusting the position of said carriages along said track members, and means for locking said carriages in a selected position along said track members;
a braking means mounted on each carriage for providing resistance to pivotal movement of said handlebar means, each braking means being individually adjustable; and,
a back rest mounted on said base between and said track members.

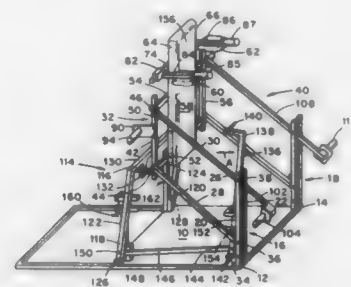
4,872,670

APPARATUS FOR SQUAT EXERCISE

Raymond L. Nichols, P.O. Box 412, Cleveland, Tenn. 37311
Filed Apr. 27, 1988, Ser. No. 186,615
Int. Cl.⁴ A63B 21/00

U.S. Cl. 272-134

12 Claims



1. Apparatus for exercising the muscles of the legs and hips of a user comprising:

a substantially horizontal base means;
first and second side members, each such side member defining a parallelogram, including first, second, third and fourth leg means, said first leg being fixedly secured uprightly with respect to said base means, said second and third leg means having one of their respective ends pivotally connected to said first leg means at spaced apart locations along the length of said first leg means and

extending therefrom in substantially parallel relationship to one another, said fourth leg means being pivotally connected to the outboard ends of said second and third leg means at spaced apart locations along the length of said fourth leg means whereby when said second and third leg means are pivoted about their respective points of connection with said first leg, said fourth leg means moves along an arcuate path but is maintained substantially parallel to said first leg means;
said first and second side members being spaced apart from one another;
back support means mounted between said first and second side members and movable therewith;
shoulder contact means associated with said back support means and adapted to receive the shoulders of a user of the apparatus when the back of such user is in contact with said back support means for exerting a lifting force to said back support means.

4,872,671

EXERCISE DEVICE PROVIDING VARIED AND PREDETERMINED RESISTANCE

John R. Brandell, Barrington, Ill., assignor to Ronlund Sports Products, Inc., Northbrook, Ill.
Filed Aug. 3, 1988, Ser. No. 227,804
Int. Cl.⁴ A63B 21/02

U.S. Cl. 272-137

10 Claims



1. An exercising device comprising:

a pair of elongated tubular handles each having an end portion and a gripping portion extending substantially the length of said handle opposite said end portions, with each of said end portions providing a tubular shaft;
each of said end portions including a spinner member adapted for rotation relative to said handle and having a hook portion;
resilient means attached to said hook portions of said spinner members, interconnecting said ends of said handles;
said resilient means applying a variable resistance against the reactive universal movement of the handles with respect to each other;
said resilient means including at least a first member of a resilient material, wound in one direction to impart a twisting torque thereto and at least a second member of a resilient material wound on said first member along substantially the entire length thereof in the opposite direction to equalize the twisting torque.

4,872,672

PROPORTIONAL CONTROL WITH A JOYSTICK DEVICE FOR INPUTTING COMPUTER VARIABLES

Robert S. Hoye, Lovettsville, and Theodore H. Roach, Leesburg, Va., assignors to Microcube Corporation, Leesburg, Va.

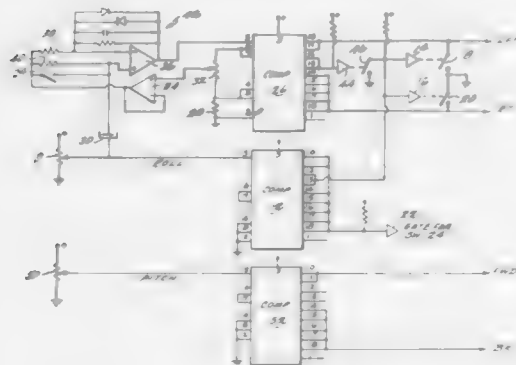
Division of Ser. No. 773,567, Sep. 9, 1985, abandoned. This application Jan. 26, 1988, Ser. No. 149,922
Int. Cl.⁴ A63F 9/22

U.S. Cl. 273-1 E

14 Claims

1. Apparatus for providing a joystick output to a computer comprising:
a joystick including a lever and means for translating a position of said lever into a corresponding signal;
means for sequentially generating a predetermined code a

specific number of times, said specific number being related to a characteristic of said corresponding signal so that said specific number is related to an amount of change



in position of said lever to provide proportional control; and means for applying said code to said computer.

4,872,673

BALANCING BEAM TOY

James L. Hanley, 28 Farmingdale Dr., Parsippany, N.J. 07504
Filed May 27, 1988, Ser. No. 200,077
Int. Cl.⁴ A63F 9/00

U.S. Cl. 273-1 GF

21 Claims



1. A balance toy comprising a base, a balance beam rotatably mounted on the base and a segmented figurine.

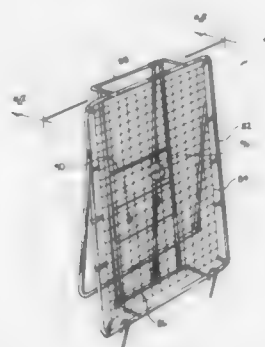
4,872,674

BASEBALL PITCHING PRACTICE DEVICES

Clifton R. Deal, Rte. 1, Box 1321, Blue Ridge, Ga. 30513
Filed Jan. 19, 1988, Ser. No. 145,547
Int. Cl.⁴ A63B 69/40

U.S. Cl. 273-26 A

1 Claim



1. A new and improved baseball pitching practice device comprising, backstop frame,

ball receiving net positioned across said backstop frame means, said ball receiving net defining a first target; a second target adjustable selectively positioned in front of said first target means attaching said second target to said frame; and third target adjustable positioned in front of said second target, said third target being attached to said frame and being movable relative, said second target and wherein said net comprises a rebound net designed to effect a rebound of a ball thrown thereagainst and back to an individual who has thrown said ball, and wherein said second target comprises an adjustable size strike zone, and wherein said strike zone is defined by movable cross-linked members which define a rectangular shape to thus establish said strike zone, and wherein said third target comprises a disk supported on a flexible member.

4,872,675

BASEBALL PITCHING DEVICE

Horace Crowden, Rte. 2, Box 12, Sheffield, Ala. 35661
Filed Feb. 17, 1987, Ser. No. 15,641
Int. Cl.⁴ A63B 69/38

U.S. Cl. 273-26 E

16 Claims



1. An improved baseball pitching device comprising: a base; a hollow shaft supported by said base wherein said shaft is capable of rotating with respect to said base; means for imparting rotation to said shaft; a clamp adjustably engaged along the length of said shaft; means securing a ball to said clamp, wherein said means provides an inward force upon said ball in the direction of said base and said means protruding from within said hollow shaft.

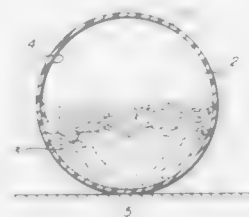
4,872,676

ENERGY ABSORBING BALL

Charles P. Townsend, Claire Road, Kirby Cross, Frinton on Sea, Essex CO13 0LX, United Kingdom
Filed Mar. 22, 1988, Ser. No. 171,845
Int. Cl.⁴ A63B 39/00, 37/08

U.S. Cl. 273-58 H

4 Claims



1. A low-deviation croquet ball comprising a resilient structural outer casing and an energy absorbent core, said core

being formed of a non-resilient deformable material adapted on rolling to move relative to the casing, said deformable material consisting by volume of from 40-70% of the core volume, characterized in that the inner face of the outer casing is smooth and in that the deformable material includes a low viscosity liquid and a small amount of surface active agent, thereby to provide an average deviation on striking of less than 0.21 meters per meter run.

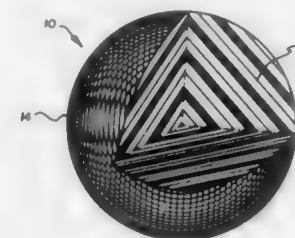
4,872,677

CROQUET BALL

Bryan J. Dawson, 1349 South Road, Bedford Park, and Leonard J. Hill, 1 Mindara Court, Belair, both of Australia
Filed Mar. 28, 1988, Ser. No. 174,406
Claims priority, application Australia, Mar. 26, 1987, PI1085
Int. Cl.⁴ A63B 37/00

U.S. Cl. 273-58 A

2 Claims



1. A croquet ball, comprising:

a one-piece substantially spherical body entirely composed of cold-molded polyurethane including a widely distributed filler which provides said body with a weight of substantially 16 ounces, an external diameter of substantially 3.625 inches and a bounce, when dropped from a height of 60 inches onto a steel plate one inch thick and set rigidly in concrete, when the ambient temperature is 20° C., of:
about 43 inches, when the ball is at 20° C.,
about 43 inches when the ball is at 0° C., and
about 35 inches when the ball is at 100° C.

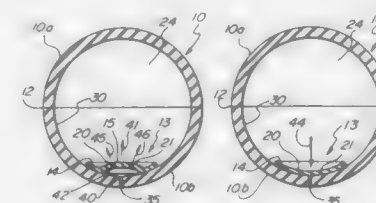
4,872,678

PRESSURIZABLE GAME BALL

Gex B. Coons, 506 Amber Dr., Huntington Beach, Calif. 92648
Filed Oct. 11, 1988, Ser. No. 255,593
Int. Cl.⁴ A63B 39/04, 41/00

U.S. Cl. 273-61 R

7 Claims



1. A pressurizable bladderless game ball comprising: a closed ball surface defining an interior cavity, an interior surface, and a wall aperture therethrough; and a valve member having a flexible raised portion defining a valve aperture and an attachment surface extending therefrom, said attachment surface being conformable to and attachable to said interior surface such that said raised portion overlies said wall aperture.

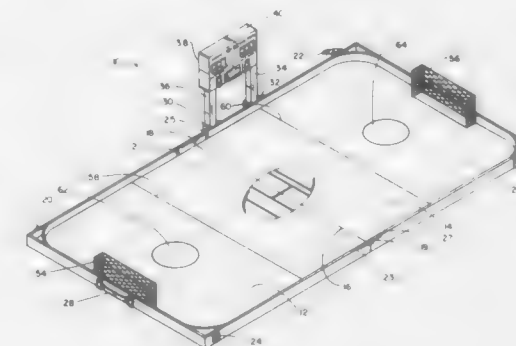
4,872,679

COMBINATION TABLE TOP FOOTBALL AND HOCKEY GAME

Frank L. Bohaski, 34 Penelope St., and Jack L. Horner, Jr., 244 Southern Ave., both of Pittsburgh, Pa. 15211
Filed Dec. 6, 1988, Ser. No. 280,575
Int. Cl.⁴ A63F 7/06

U.S. Cl. 273-85 R

18 Claims



1. A combination table top football and hockey game, comprising:

a rectangular game board having opposite front and back surfaces, opposite parallel end walls connected by base parallel side walls;
said game board formed by two rectangular sections connected by a hinge along a central line for movement between open and closed positions;
indicia designating a football field game area on said front game board surface;
indicia designating a hockey rink game area on said back game board surface;
latch means for retaining said game board in said closed position;
a pair of spaced aligned scoreboard mounting brackets on a side wall of said rectangular board; and
a scoreboard having aligned spaced legs removably received in said mounting brackets, said scoreboard being invertible for usage with said front or said back surface of said game board.

4,872,680

ELECTRIC DRAG STRIP APPARATUS

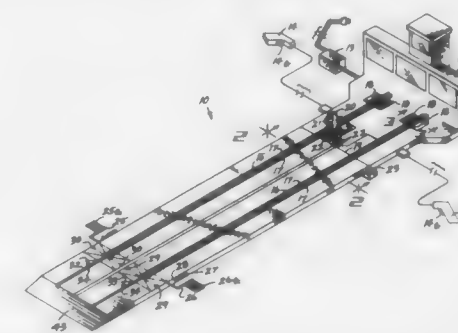
Willard A. Dennis, P.O. Box 807 Country Club Dr., Johnsonville, S.C. 29555

Filed Dec. 5, 1988, Ser. No. 279,513

Int. Cl.⁴ A63F 9/14

U.S. Cl. 273-86 B

8 Claims



1. An electrical drag strip apparatus to provide a contest between two individuals, each racing a miniature vehicle, said apparatus comprising,

an elongate support platform means including first and second tracks each adapted to accept a downwardly depending shoe secured to each of said two vehicles, and at least one electrical conductor coextensive and parallel to each of said elongate tracks, and

a finish line orthogonally oriented to said first and second tracks and each electrical conductor wherein each electrical conductor terminates at said finish line and each of said first and second tracks extends beyond said finish line to a terminal end of said platform means, and

a starting line orthogonally directed and formed across said first and second tracks rearwardly spaced to and parallel of said finish line with a starting indicator medially positioned of said starting line, and

a pair of spaced troughs associated with each of said first and second tracks with each pair of troughs positioned exteriorly of a respective track and a respective electrical conductor wherein said troughs are positioned and spaced rearwardly of said starting line to accept a fluid within said troughs.

4,872,681

GAME APPARATUS

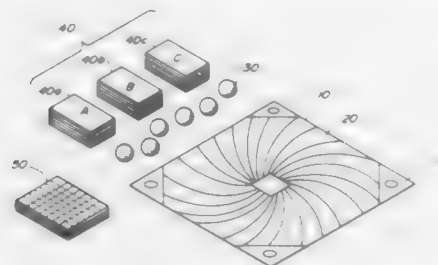
Michael A. Martin, P.O. Box 626, Fairfax, Calif. 94930

Filed Nov. 30, 1988, Ser. No. 277,754

Int. Cl.⁴ A63D 3/00

U.S. Cl. 273-118 R

2 Claims



1. A game apparatus comprising:

a playing surface having a perimeter, a plurality of corners, a plurality of playing sections, a center area, a boundary extending generally around said perimeter but interior of said corners, a plurality of section dividing lines, each defining a diminishing-radius curve extending from said boundary towards said center area, said section dividing lines dividing said playing surface into a plurality of playing sections, each of said playing sections bearing indicia indicative of a particular play result;

a plurality of question cards each bearing indicia indicative of only one of more than one level of question; and

at least one game piece conditioned for rolling on said playing surface and coming to rest on only one of said playing sections, thus generating a result indicia for that roll.

4,872,682

CUBE PUZZLE WITH MOVING FACES

Ravi Kuchimanchi, Dept. of Physics, Univ. of Maryland, College Park, Md. 20742, and Madhukar N. Thakur, Board of Studies in Computer and Information Sciences, Univ. of California, Santa Cruz, Calif. 95064

Filed Nov. 17, 1987, Ser. No. 108,163

Int. Cl.⁴ A63F 9/08

U.S. Cl. 273-153 S

20 Claims

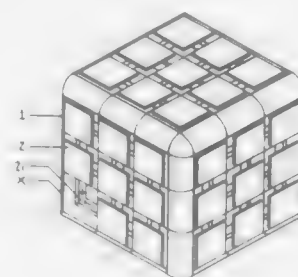
1. A puzzle cube, comprising

an array of cubelets extending in three dimensions to define a base cube with plural faces by respective facelets of said cubelet facelet wherein respective ones of said cubelets define respective sets of planes, the planes of any one of said sets of planes being orthogonal to the planes of each other one of said sets, each said facelet comprising a pair

of orthogonal continuous channel segments defined by respective parts of the facelet which extend continuously from respective edges of each facelet to a central area of the facelet, the respective channel segments intersecting in a limited area at the center of each said facelet, said channel segments of all the respective facelets thereby defining a substantially continuous channel network for each said face of said base cube,

internal support means for supporting said cubelets in the form of said base cube, and for allowing the respective cubelets associated with any one of said planes to be rotated as a unit about a respective axis perpendicular to the respective set of planes,

sliders associated with at most all but one of said facelets of said cubelets of said base cube, said sliders having respective engaging parts on the backs thereof for being secured in said channels of the respective facelet and for holding the respective facelet from only its back in said channel segments so that the entire front of the slider is exposed to an operator and constrained to move substantially



smoothly therein and for moving between adjacent facelets via said channel network, each said facelet not having one of said sliders associated therewith being exposed in the respective face of said base cube,

wherein each occurrence of an exposed facelet can be effectively moved around the respective face of said base cube by sliding any one of the next respective sliders along any respective one of said channel segments of said channel network on the same face of the base cube, each said occurrence of an exposed facelet can be effectively rotated onto a different one of said faces of said base cube by rotation of at least one respective one of said planes of one of said orthogonal sets thereof with respect to each other of said planes of the same set, and said cubelets with said channel segments of said channel networks, said sliders with said engaging parts, and the number of said sliders are provided so that each said slider is capable of non-rotational, linear motion along each of two directions in each said face, said two directions of linear motion across each said facelet being defined by respective ones of said channel segments.

4,872,683

GOLF CLUB PUTTER

Brian A. Doran, Solvang, Calif., and Robert H. Redkey, 1630 Maple, Solvang, Calif. 93463, assignors to Robert H. Redkey, Solvang, Calif.

Division of Ser. No. 66,726, Jun. 25, 1987, Pat. No. 4,809,977. This application Nov. 22, 1988, Ser. No. 274,913

Int. Cl.⁴ A63B 53/04

U.S. Cl. 273-164

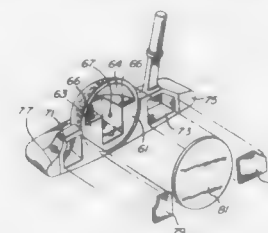
8 Claims

1. A golf putter comprising:

a putter blade;

an alignment means for aligning said putter with a golf ball, said alignment means comprising a substantial section of a

sphere the size of a golf ball centrally located on said putter blade, said section being hollow in part; and



weighting means comprising a first heel weight and a first toe weight disposed within said section and on opposite sides of a space therebetween.

4,872,684

GOLF PUTTER

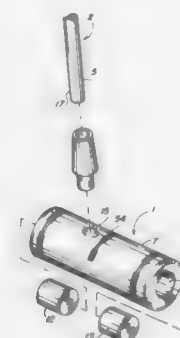
Stephanie A. Dippel, 8787 E. Mountain View #2010, Scottsdale, Ariz. 85218

Continuation-in-part of Ser. No. 115,413, Nov. 2, 1987. This application Dec. 23, 1988, Ser. No. 289,610

Int. Cl.⁴ A63B 53/04

U.S. Cl. 273-164

20 Claims



1. A golf putter comprising:

(A) a generally cylindrical club head, said club head including:

1. a main body portion fabricated from acetal resin, said main body portion having:
 - a. a heel end and a toe end;
 - b. a first weight-receiving receptacle recessed in said heel end;
 - c. a second weight-receiving receptacle recessed in said toe end; and
 - d. a shaft-end-receiving aperture extending from an outer periphery surface of said main body portion and terminating at a position within said main body portion;
2. a first weight insert residing in said first weight-receiving receptacle, said first weight insert being characterized as having a higher weight-per-volume ratio than said plastic material; and
3. a second weight insert residing in said second weight-receiving receptacle, said second weight insert being characterized as having a higher weight-per-volume ratio than said plastic material;

(B) a shaft including:

1. a grip end;
2. an elongated intermediate section; and
3. a club head end, said club head end having a terminal portion dimensioned and configured to be closely received within said shaft-end-receiving aperture; and

(C) joining means for securely fixing said terminal portion of said club head end of said shaft in said shaft-end-receiving aperture.

4,872,685

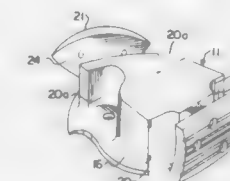
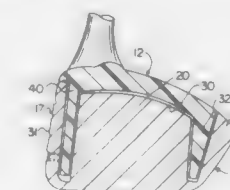
GOLF CLUB HEAD WITH IMPACT INSERT MEMBER
Donald J. C. Sun, 4521 Ocean Valley Ln., San Diego, Calif. 92110

Filed Nov. 14, 1988, Ser. No. 270,508

Int. Cl.⁴ A63B 53/04

U.S. Cl. 273-169

6 Claims



1. A golf club head comprising:

a male unit which includes a sole plate for said head, a face plate for said head extending normally from the sole plate, a back weight element extending normally from said sole plate and a central weight element having outer walls extending normally from said sole plate and located between the face plate and back weight element, there being a first slot formed between the central weight element and said back weight element and a second slot formed between the central weight element and said face plate;

a female unit forming the outer body of said club head and including a central hollow portion for receiving the central weight element of the male unit, said hollow portion being formed by a pair of opposing front and rear walls and a pair of opposing side walls, said front wall having an outer surface with an undercut portion for receiving the face plate;

said male and female units being joined together in mating relationship to form an integral assembly with the central weight element of said male unit in mating engagement within the hollow portion of the female unit, the face plate being fitted within the undercut portion of the female unit and abutting against said front wall and the back weight element abutting against the rear wall of said female unit.

4,872,686

GOLF COURSE AND METHOD OF PLAYING A GOLF GAME

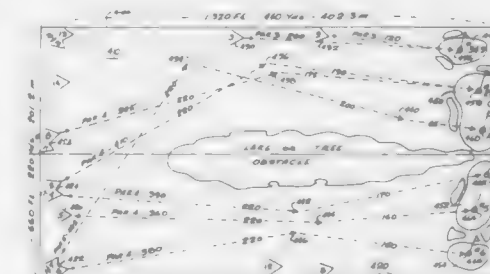
Theodore W. Trasko, 15370 Transit Ct., Unit 106, North Fort Myers, Fla. 33903

Continuation of Ser. No. 742,092, Jun. 6, 1985, abandoned. This application Sep. 23, 1987, Ser. No. 102,783

Int. Cl.⁴ A63B 67/02

U.S. Cl. 273-176 AB

9 Claims



1. A substantially rectangular golf course for playing three holes simultaneously and comprising:

a pair of opposite ends and a pair of sides extending between said opposite ends;
 a first plurality of greens comprising three holes;
 each of said greens in said first plurality comprising at least one hole;
 a first plurality of tee areas each comprising means for playing a respective one of said holes in the first plurality of greens;
 said three holes in said first plurality of greens being arranged relatively close to one another so that the longest distance between adjacent holes is relatively small compared to the shortest distance between any of said three holes and its corresponding tee area;
 a second plurality of greens comprising three holes;
 each green in said second plurality of greens comprising at least one hole;
 a second plurality of tee areas each comprising means for playing a respective one of said holes in the second plurality of greens;
 said three holes in the second plurality of greens being arranged relatively close to one another so that the longest distance between adjacent holes is relatively small compared to the shortest distance between any of said three holes and its corresponding tee area;
 at least one of said holes in each plurality of greens being located relatively close to one of said opposite ends;
 all of said holes in each plurality of greens being located relatively remote from the other opposite end;
 at least one tee area in each plurality of tee areas being located relatively close to the other opposite end;
 all of said tee areas in each plurality of tee areas being located between said ends and relatively remote from said one end;
 each green in said first plurality of greens being outside the area between any other green in said first plurality of greens and any of said first plurality of tee areas;
 all of the tee areas in said first and second plurality of tee areas being outside of the area between any two greens in said first plurality of greens;
 each green in said second plurality of greens being outside the area between any other green in said second plurality of greens and any of said second plurality of tee areas;
 all of the tee areas in said first and second plurality of tee areas being outside of the area between any two greens in said second plurality of greens;
 a first plurality of fairways located between said first plurality of tee areas and said first plurality of greens;
 and a second plurality of fairways located between said second plurality of tee areas and said second plurality of greens;
 said first and second pluralities of greens, tees and fairways being located on a pair of substantially rectangular cores disposed in adjacent, substantially side-by-side, non-diverging relation;
 all of the relatively closely arranged plurality of holes in said golf course being located, as a group, other than along a side of said golf course;
 all of the tee areas, for playing any plurality of relatively closely arranged holes, being located, as a group, other than both (1) along a side of the golf course and (2) at a location across from holes on the opposite side.

4,872,687

PUTTING TUTOR

Daniel J. Dooley, 112 Carriage Way - A110, Burr Ridge, Ill.
 Filed Jul. 23, 1987, Ser. No. 76,877

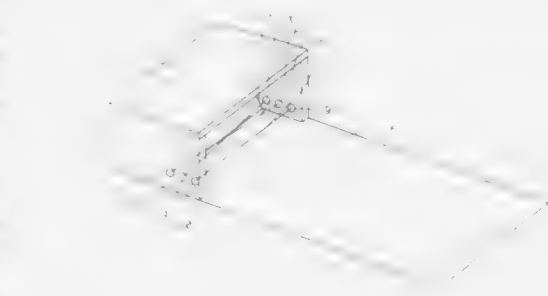
Int. Cl.⁴ A63B 69/36; G01P 3/36

U.S. Cl. 273—185 R

22 Claims

1. A device for diagnosing movement of a ball which is struck in a starting region to roll over a support surface and to cross first, second and third reference lines adjacent said surface, said first and second reference lines being sequentially crossed by the ball and being parallel to each other and perpendicular to a reference path and said third reference being at an

acute angle relative to said reference path, said device comprising: first detector means for generating a first electrical signal as the ball crosses said first detection line; second detector means for generating a second electrical signal as the projectile crosses said second detection line; third detector means for



generating a third electrical signal as the projectile crosses said third detection line; circuit means for processing said first, second and third electrical signals for developing indicating signals which indicate the speed and path of rolling movement of the ball over said support surface, and indicating means responsive to said indicating signals.

4,872,688

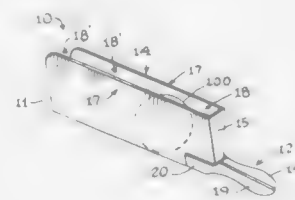
DISC LAUNCHING AND CATCHING APPARATUS
 Irving H. Galvin, 18895 SW. 84 Rd. Pl., Bldg. 12-#14, Miami, Fla. 33157

Filed Feb. 27, 1989, Ser. No. 315,644

Int. Cl.⁴ A63B 65/10

U.S. Cl. 273—326

5 Claims



1. A disc catching and launching apparatus for use in combination with an aerodynamic disc wherein the apparatus comprises:

- a catching and release unit including a generally elongated narrow scoop member having opposed generally flexible side wall portions which define the scoop mouth opening;
- a handle unit comprising a pair of spaced handle members wherein each handle member is provided with an inboard end which is operatively attached to one of the said side wall portions of the said scoop member.

4,872,689

MECHANICAL SEAL WITH HEAT EXCHANGER
 Kevin R. Drumm, Markham, Canada, assignor to Nuraseal Co. Ltd., Canada

Filed Apr. 22, 1987, Ser. No. 41,144

Claims priority, application Canada, Dec. 12, 1986, 525130

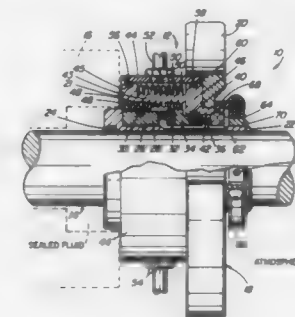
Int. Cl.⁴ F16J 15/34, 15/54; F28F 1/42

U.S. Cl. 277—9.5

13 Claims

8. A heat exchanger for a seal assembly comprising:
 a hollow annular body adapted to be mounted to the seal assembly in surrounding, radially spaced relation to a pair of annular sealing members of the seal assembly to transmit heat energy toward or away from them, fluid inlet and outlet means on said body for passage of heat transfer

medium therethrough; said annular body having inner and outer radially spaced cylindrical walls joined by end walls, said radially inner wall having a radially innermost major surface and a radially outermost major surface with ribs extending on at least the radially innermost major



surface to provide enhanced heat transfer while assisting in inhibiting the flow of fluid into and out of an annular zone which exists, in use, between said radially inner wall of the heat exchanger and the radially outer surfaces of the annular sealing members.

4,872,690

SEAL CAVITY PROTECTOR

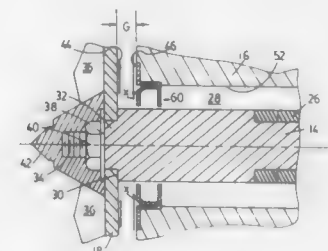
Joseph R. Dunford, Waverley, Canada, assignor to Enviroseal Engineering Products Ltd., Waverley, Canada

Filed Sep. 9, 1988, Ser. No. 242,174

Int. Cl.⁴ F16J 15/00

U.S. Cl. 277—24

21 Claims



1. A seal cavity protector for use with rotary fluid equipment a seal cavity of which is defined by a rotary shaft, a shaft housing and seal means engaging the shaft, said protector comprising an annular generally cup-shaped element adapted to pass the shaft therethrough and to be secured to the housing at the entrance to the seal cavity, said element including a plurality of circumferentially spaced apart, generally tangentially directed, first vent passages extending through the wall thereof whereby, with the protector in place and as the equipment rotates, a low pressure area is created adjacent said element outside the seal cavity and fluid within the seal cavity is drawn therefrom through the vent passages.

4,872,691

LATHE CHUCK

Günter H. Röhm, Heinrich-Röhm-Strasse 50, D-7927 Southeim, Fed. Rep. of Germany

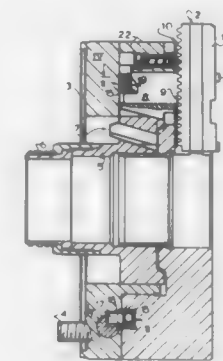
Filed Jul. 29, 1988, Ser. No. 226,325

Claims priority, application Fed. Rep. of Germany, Aug. 12, 1987, 3726773

Int. Cl.⁴ B23B 31/16

U.S. Cl. 279—123

11 Claims



1. A lathe chuck which comprises:

- a chuck body;
- a multiplicity of chuck jaws located radially to the axis of said chuck body, two jaw segments making up each of said chuck jaws, said jaw segments lying one behind the other in relation to said axis, said jaw segments being displaceable with respect to one another to change the clamping span of said chuck, said displacements being always less than the maximum possible stroke of the chuck jaws;
- a coupling member arranged to enable coupling and decoupling of said two jaw segments;
- a actuating member axial to said chuck and displaceable to the maximum possible stroke of the chuck jaws, said actuating member being operatively linked to each of the rearward members of said jaw segments;
- a positioning assembly for positioning said coupling member between two limiting positions corresponding to the coupled and decoupled condition of said jaw segments; and
- a latching assembly for fixing the forward of said jaw segments in respect to said chuck, said latching assembly, said actuating member for said jaws, and said positioning assembly being controllable cooperatively so that said actuating member executes a back-and-forth motion with a stroke the distance of which corresponds to the distance that said rearward jaw segment must move to make possible the coupling of the two said jaw segments, so that thereby said coupling member is, in one of the directions of said stroke, coupled and, in the other direction of said stroke, uncoupled, and during said stroke while the coupling member is uncoupled, said forward jaw segment is fixed to said chuck body.

4,872,692

CONVERTIBLE CARRIAGE WITH BIASED WHEEL RETRACTION

Kip V. Steenburg, Sudbury, Mass., assignor to Prodigy Corp., Concord, Mass.

Filed Jun. 3, 1988, Ser. No. 202,720

Int. Cl.⁴ B62B 11/00

U.S. Cl. 280—30

4 Claims

1. A convertible carriage with biased wheel retraction, comprising:
 a superstructure including seat means for carrying a person to be transported;

- a plurality of wheel means;
- a plurality of leg members pivotably interconnected with said superstructure for rollably supporting said wheel means to transport said superstructure when said leg members are in an extended position;
- drive means for relocating said leg members between a retracted position and said extended position, including first drive means for moving at least one of said leg members to said extended position, and second drive means for interconnecting the remaining leg members and said first drive means to drive the remaining leg members to said extended position, said first and second drive means respectively including first and second pulley means, each



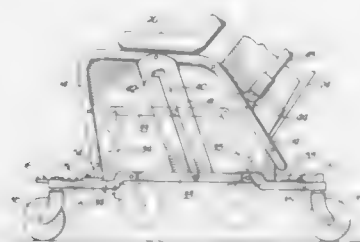
- said pulley means being operatively connected to at least one leg member, and said second drive means further including cable means interconnecting said first and second pulley means to drive said pulley means and their corresponding leg members concurrently;
- biasing means, connected to said drive means, for driving said leg members to said retracted position, said drive means loading said biasing means when said leg members are driven to said extended position, including spring means connected between said cable means and said superstructure; and
- means for locking said leg members in said extended position to inhibit retraction by said biasing means.

4,872,693

COMBINATION INFANT SEAT AND STROLLER
Gordon Kennel, P.O. Box 1110, Havre, Mont. 59501
Continuation of Ser. No. 6,491, Jan. 23, 1987, abandoned. This application Sep. 7, 1988, Ser. No. 241,764
Int. Cl.⁴ B62B 7/10

U.S. Cl. 280—30

8 Claims



1. A combination infant seat-stroller apparatus comprising:
 - (a) a frame assembly having opposing upstanding hollow side panels and at least one supporting cross member;
 - (b) an infant body support shell having back and seat portions secured to the frame assembly between the opposing upstanding side panels;
 - (c) a pair of articulated wheel assemblies, each wheel assembly being retractable within one of said opposing upstanding side panels of the frame assembly and having a central element, a pair of elongated extension elements each pivotally mounted on one end thereof to opposing ends of the

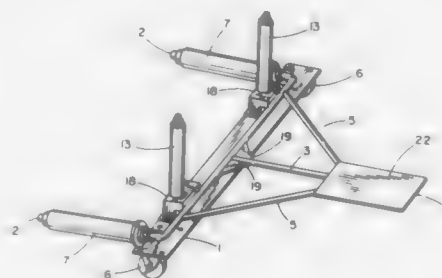
- central element and a wheel mounted on the free end of each of such extension element; and
- (d) separate means to vertically move each articulated wheel assembly to a first upper position within one of the opposing upstanding side panels wherein the extension elements are pivoted inwardly toward one another in a vertical orientation with the wheels positioned out of the way above the lower edge of the frame assembly so the apparatus may be used as an infant seat and to a second lower position wherein the extension elements may be pivoted outwardly away from one another to extend laterally from the central element with the wheels in an operative position below the lower edge of the frame assembly and fore and aft of the opposing side panels so the apparatus may be used as a stroller.

4,872,694

TRUCK TIRE MOUNTING DEVICE
William B. Griesinger, Rte. 1, Box 76, Monee, Ill. 60449, assignor to William B. Griesinger, Monee, Ill.
Filed Aug. 17, 1988, Ser. No. 195,656
Int. Cl.⁴ B62B 1/14

U.S. Cl. 280—79.4

1 Claim



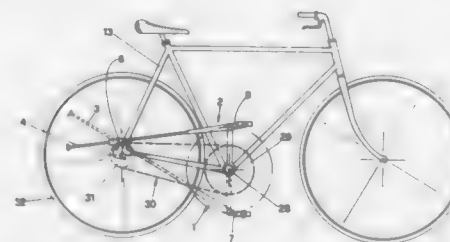
1. A truck wheel mounting device comprising:
 - a laterally extending main-frame plate supported by each end by a caster assembly;
 - two horizontally protruding parallel roller assemblies, each one of which extends forwardly from each end of said main-frame plate;
 - two vertical parallel roller assemblies extending normal to said main-frame plate;
 - a horizontal foot activated lever extending rearwardly from the main-frame plate;
 - a first reinforcing bar having one end connected to a first end of said main-frame plate and the other end connected to said foot activated lever to define an apex;
 - a second reinforcing bar having one end connected to a second end of said main-frame plate and the other end connected to said foot activated lever at said apex;
 - a foot plate mounted at said apex;
 - and the length of said foot activated lever is relatively longer than the height of said caster assemblies thereby forming a lever action by pushing the foot plate down and raising the horizontal roller assemblies with the caster assemblies comprising a fulcrum point.

4,872,695

TORQUE-MULTIPLYING KINEMATIC DEVICE PARTICULARLY FOR BICYCLES AND BICYCLES EMPLOYING SAID KINEMATIC DEVICE
Tommaso Silvano, and Giuseppe Tomba, both of Montecchio Magliore, Italy, assignors to Brai Systems SRL, Vicenza, Italy
Filed Mar. 29, 1988, Ser. No. 174,968
Claims priority, application Italy, Apr. 3, 1987, 85527 A/87
Int. Cl.⁴ 262M 1/02, 1/04

U.S. Cl. 280—257

7 Claims



1. A torque-multiplying kinematic device, particularly adapted for use on bicycles, comprising:
 - a pair of rods, each of said rods having an intermediate angled junction dividing said rod into a foremost portion and a rearmost portion, said foremost portion being inclined at one angle upwardly relative to said rearmost portion, each said junction of each said rod having at least one junction aperture in the vicinity of said junction of said foremost and rearmost portions, and each said foremost portion having an end aperture near the end opposite said junction, said end aperture being adapted to mount a pedal of a bicycle;
 - a pair of pivot means, one of said pivot means being adapted to be inserted into one of said junction apertures of each of said rods for fastening each of said rods to a crank of a bicycle; and
 - a pair of guiding supports, each of said guiding supports corresponding in slideable relationship with one of said rods via said rearmost portion of said rod, and each of said guiding supports being adapted to be fastened to a back fork of a bicycle so that each of said guiding supports rotates about an axis substantially parallel to the rotational axis of a wheel mounted between the back fork of a bicycle;
- wherein where the foremost of one of said rods is in a substantially horizontal position at a bottom dead center of said crank, a maximum additive torque is produced and a minimum clearance above ground surface sufficient to avoid ground surface engagement is obtained.

4,872,696

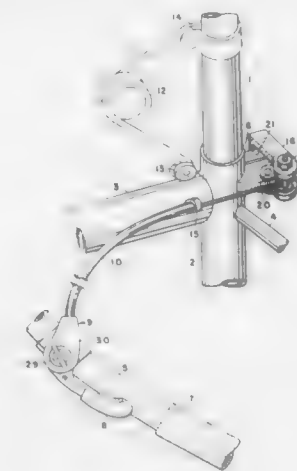
REMOTE RELEASE SADDLE POST CLAMP
G. Herbert Gill, 206 Russell St., Winters, Yolo Co., Calif. 95654
Filed May 27, 1988, Ser. No. 199,422
Int. Cl.⁴ B62K 3/14

U.S. Cl. 280—281.1

6 Claims

1. A remotely operable clamp for a bicycle saddle post where the said saddle post is inserted into the top of an essentially vertical down tube comprising a portion of the frame of said bicycle,
 - (a) said top of said down tube having a slot therein, parallel to the axis of said down tube;
 - (b) a first and a second essentially rectangular block attached rigidly to the opposite sides of said slot near the top of said down tube;
 - (c) said blocks being perpendicular to said slot, and coplanar to each other;
 - (d) two short levers having one end of each pivoted coaxially on the first of said blocks with the ends opposite to the pivots extending beyond the edge of said first block;
 - (e) a long lever having one end pivoted on said second block,

- having two projections on the opposite end overlapping both of said extending ends of said short levers,
- (f) a pivot bolt passing through said extending ends of both of said short levers, and through both of said projections of said long lever, whereby all said levers are rotatably connected together,
- (g) said pivot bolt having an operating means attached thereto approximately centered between the said two



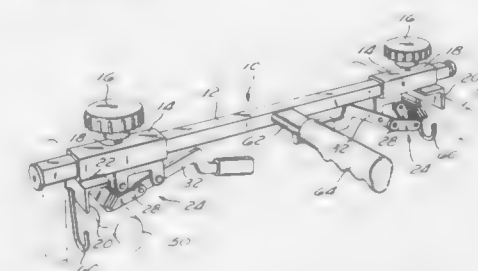
- short levers, whereby movement of said operating means moves said pivot bolt rotationally in an arc about the said pivots of said short and said long levers,
- (h) a first stop to limit the rotational movement of said levers in one direction,
- (i) a second stop to limit the rotational movement of said levers in another direction,
- (j) said operating means being operatively connected to a hand lever located on said bicycle frame.

4,872,697

ADAPTOR HANDLE
Gerard Berkowitz, 33 Highbury Street, Prospect, Australia
Filed Nov. 1, 1988, Ser. No. 265,484
Int. Cl.⁴ B62B 3/00

U.S. Cl. 280—304.5

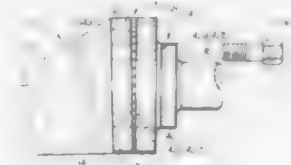
9 Claims



1. An adaptor handle for wheeled vehicles and the like having a pair of rearwardly extending spaced-apart handles for application of propulsion forces and steering comprising:
 - an elongate arm member sized to extend across the pair of spaced-apart handles of the vehicle;
 - an over-center latch mounted adjacent opposite ends of said arm member for releasably clamping said arm member to said pair of handles of the vehicle;
 - a hand grip centrally mounted to said arm member and extending rearwardly therefrom adapted to be grasped in the hand of a user; and
 - means carried on said over-center latch for allowing said

over-center latch to accommodate differing sized handles of the vehicles, said allowing means comprising:
a first plate member affixed to said over-center latch;
a second plate member removably mounted to said first plate member; and
plural spacers removably mounted between said first and second plate members.

coupled to the periphery of said shim hub, said tabs varying radially in thickness around said periphery in accor-



4,872,698

SKI BRAKE ASSOCIATED WITH A SKI BINDING
Pierre Szafranski, Annecy Le Vieux, France, assignor to Salomon, S.A., Annecy Cedex, France

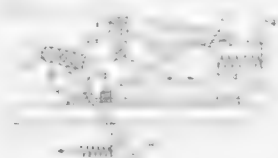
Filed Feb. 1, 1988, Ser. No. 151,277

Claims priority, application France, Feb. 3, 1987, 87 01278

Int. Cl.⁴ A63C 7/10

U.S. Cl. 280—605

24 Claims



1. An associated heel binding-ski brake assembly which comprises:

- (a) a binding body which is longitudinally slidable on a track to be affixed to a ski, said binding body being forwardly biased by a retraction spring; and
- (b) a ski brake comprising at least one projection pivotable around a substantially horizontal transverse axis between an active position and an inactive position, means for elastically biasing said at least one projection to said active position to activate said brake, and means for reducing the biasing force exerted by said elastically biasing means on said at least one projection of said ski brake in response to rearward movement of said binding body.

4,872,699

APPARATUS AND METHOD FOR ADJUSTING CAMBER AND TOE

Clinton E. Grove, and Robert D. Grove, both of R.R. 2, Elbow Lake, Minn. 56531

Filed Apr. 29, 1988, Ser. No. 188,280

Int. Cl.⁴ B62D 17/00

U.S. Cl. 280—661

20 Claims

1. A shim for use in adjusting the camber and toe of a wheel comprising:

- a tapered shim hub having a periphery; and
- a plurality of outwardly extending tabs operably, removably

coupled to the periphery of said shim hub, said tabs varying radially in thickness around said periphery in accordance with the taper of said shim hub such that said tabs and shim hub together define a shim angle.

4,872,700

SELF-PROPELLED VEHICLE HAVING BOGIE-TYPE RUNNING GEAR

Per-Gustaf Mellgren, Kirkland, Canada, assignor to Forest Engineering Research Institute of Canada, Pointe Claire, Canada

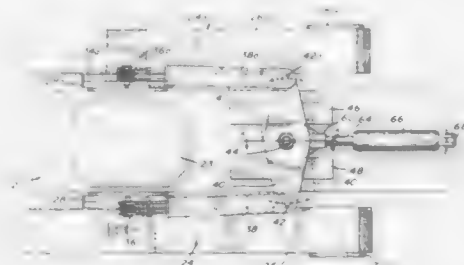
Filed Aug. 22, 1988, Ser. No. 234,747

Claims priority, application Canada, Jan. 26, 1988, 557369

Int. Cl.⁴ B60G 19/02

U.S. Cl. 280—677

6 Claims



1. A self-propelled vehicle having a single chassis, bogie means mounted on each side of the chassis including a pair of parallel walking beams, one on either side of the chassis and each pivotally mounted to shaft means on the chassis having a common transverse axis, wheel means rotatably mounted at each end of the walking beams, a first arm fixedly mounted to each walking beam and extending upwardly from the walking beam, a rocking beam pivotally mounted about a vertical axis to the chassis, link means connecting each first arm to a respective end of the rocking beam such that vertical displacement of a wheel means results in an opposite displacement of a corresponding wheel means on the other walking beam.

4,872,701

ACTIVELY CONTROLLED AUTOMOTIVE SUSPENSION SYSTEM WITH ADJUSTABLE RESPONSE CHARACTERISTICS IN PITCHING-SUPPRESSIVE CONTROL

Yohsuke Akatsu; Naoto Fukushima; Yukio Fukunaga; Sunao Hano, and Masaharu Satoh, all of Kanagawa, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

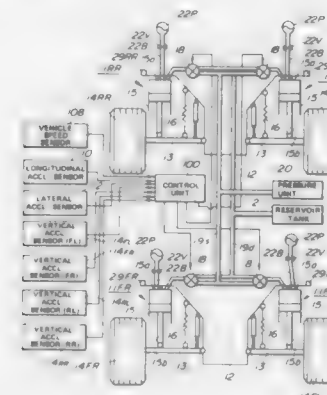
Filed Mar. 24, 1988, Ser. No. 172,419

Claims priority, application Japan, Mar. 24, 1987, 62-69898

Int. Cl.⁴ B603 3/00

U.S. Cl. 280—703

14 Claims



1. A pitching-suppressive suspension control system for an automotive vehicle comprising:

- a suspension system disposed between a vehicle body and a suspension member which rotatably supports a vehicular wheel, said suspension system having a variable pressure chamber filled with a working fluid of controlled pressure;
- a pressure adjusting means, associated with said variable pressure chamber, for adjusting the pressure of said working fluid in said pressure chamber;
- a sensor means for monitoring a magnitude of energy of vehicular pitching direction exerted on the vehicle to produce a pitching magnitude indicative signal; and
- a control unit receiving said pitching magnitude indicative signal, and producing a pitching-suppressive suspension control signal based on said pitching magnitude indicative signal and a variable pitching-suppressive suspension control coefficient to control said pressure adjusting means for adjusting suspension characteristics to suppress vehicular pitching, said control unit adjusting said pitching-suppressive suspension control coefficient depending on said pitching magnitude indicative signal value for adjusting response characteristics relative to pitching magnitude.

4,872,702

SUSPENSION SYSTEM FOR VEHICLES

Jackson C. Medley, Brimfield, Ill., assignor to Kress Corporation, Brimfield, Ill.

Filed Aug. 23, 1988, Ser. No. 235,109

Int. Cl.⁴ B60G 11/26

U.S. Cl. 280—708

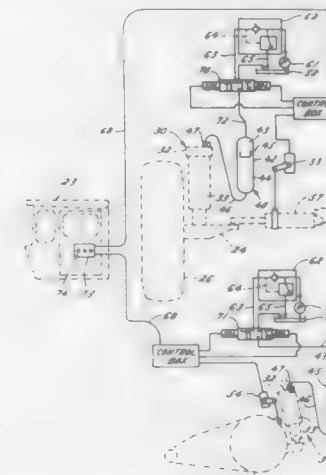
8 Claims

1. A suspension assembly for a vehicle having a chassis and at least one wheel axle comprising, in combination:

- a strut having a first cylinder section and second piston section, said first and second sections being fitted for telescoping movement in relation to each other to form first and second chambers therein, said first strut chamber being filled with a gas, said second strut chamber being filled with a liquid, and a means for separating said chambers;
- a cylinder having a first cylinder chamber filled with a liquid, a second cylinder chamber filled with a gas, and a

movable means for separating the chambers within the cylinder;

- a source of liquid under pressure, a first connection from the source of liquid to the first cylinder chamber, and a valve means for controlling the supply of liquid from the source of liquid to the first cylinder chamber to permit adjustment of the volume of liquid in the cylinder;
- a second connection from the second cylinder chamber to the first strut chamber, said second connection including



4,872,703

PASSIVE SEAT BELT SYSTEM

Hiroyuki Saito, Chigasaki, Japan, assignor to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

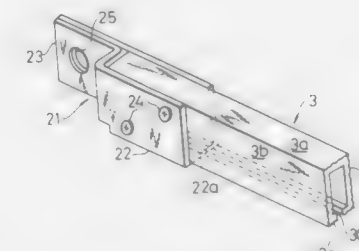
Filed Oct. 22, 1987, Ser. No. 111,262

Claims priority, application Japan, Oct. 25, 1986, 61-162922

Int. Cl.⁴ B60R 21/02

U.S. Cl. 280—804

22 Claims



1. A passive seat belt system comprising:

- a guide rail having an elongated top wall, an elongated bottom wall and two elongated side walls extending spacedly between the top and bottom walls and defining a slot longitudinally in the bottom wall;
- a movable member extending through the slot formed in the guide rail and connected to an associated occupant restraining webbing; and

a bracket provided at one end portion of the guide rail and adapted to mount the guide rail on a stationary base, said bracket being formed of a plate-like material and including a rail-holding portion, which encloses externally said one end portion of the guide rail so as to maintain said rail-holding portion in contact with a portion of at least three of the top wall, side walls and bottom wall of the guide rail, and an extension extending out further longitudinally from the rail-holding portion and defining a mounting bore only at the extension for mounting the bracket on the stationary base.

4,872,704

DEVICE FOR HEIGHT ADJUSTMENT OF A SAFETY BELT FITTING

Dieter Biller, Mutlangen, and Joachim Biller, Leinzell, both of Fed. Rep. of Germany, assignors to TRW Repa GmbH, Alfdorf, Fed. Rep. of Germany

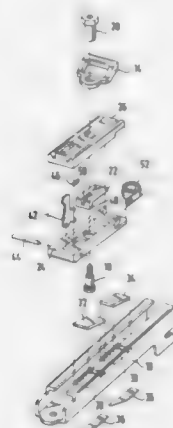
Filed Jul. 29, 1988, Ser. No. 226,051

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1987, 3733026

Int. Cl.⁴ B60R 22/20

U.S. Cl. 280—908

9 Claims



1. A device for the height adjustment of a safety belt fitting in motor vehicles, comprising a load-receiving guide rail adapted to be mounted in a vehicle, an anchoring element which is displaceably accommodated in said guide rail and to which said safety belt fitting is secured, a detent means comprising a plurality of pawl members spaced apart in the longitudinal direction of said guide rail which pawl members are movable against spring force out of a normal locking position into a release position, a latch element on said anchoring element cooperating with said pawl members for locking engagement therewith, and a release element for releasing the locking between said latch element and said pawl members in an actuated state thereof, said release element being mounted on said anchoring element and having a blocking extension which in the actuated state of said release element and upon downward displacement of said anchoring element engages the first pawl member encountered on said downward movement to stop downward displacement of said anchoring element, said pawl members when in said release position being located out of the path of movement of said blocking extension.

4,872,705

CONFIDENTIAL POST CARD

Goenther Hartzell, Dayton, Ohio, assignor to Charles Jones, Dayton, Ohio, a part interest

Filed Aug. 8, 1988, Ser. No. 229,687

Int. Cl.⁴ B42D 15/00; 15/04; 15/02; G09F 3/00

U.S. Cl. 283—67

12 Claims

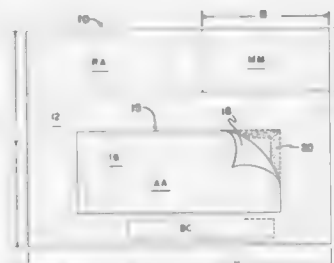
1. A post card for sending confidential data in the form of decipherable indicia from a sender to a recipient who may

legitimately share information conveyed by the indicia, comprising

a stiff rectangular card body measuring no less than 3.5 inches by 5 inches,

said body having a face onto which postage and at least a recipient's address are to be applied and a sender's return address may be applied,

said face of said body having a predetermined area within which area confidential indicia may be located;



an opaque label having an exposed surface and a reverse surface securable to said card body and covering said predetermined area;

said label functioning to conceal confidential indicia placed at the interface of said body and said reverse surface of said label; and

means securing said label to said card body in such manner that tampering with said label will be detectable by the recipient,

said label having on its said exposed surface at least one address.

4,872,706

POSTAGE AD LABELS

Ronnie M. Brewen, Houston, and David A. Lloyd, Conroe, both of Tex., assignors to American Stamp, Inc., Houston, Tex.

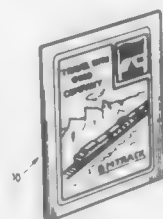
Continuation of Ser. No. 862,757, May 13, 1986, abandoned.

This application Mar. 2, 1988, Ser. No. 166,754

Int. Cl.⁴ B42D 15/00; B42F 5/02; B65D 27/00

U.S. Cl. 283—81

14 Claims



1. A label assembly comprising:

a label having a print side and an adhesive side;

postage affixed on said print side of said label;

a backing member having a first side for releasably engaging said adhesive side of said label.

4,872,707

LABEL OR TICKET

Frank G. deBruin, Grand Rapids, Mich., assignor to Grand Rapids Label Company, Grand Rapids, Mich.

Continuation of Ser. No. 588,047, Mar. 9, 1984, Pat. No.

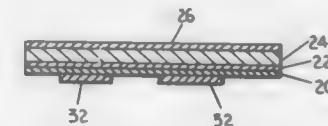
4,724,166. This application Nov. 17, 1987, Ser. No. 121,606

The portion of the term of this patent subsequent to Feb. 9, 2005, has been disclaimed.

Int. Cl.⁴ B42D 15/00; B32B 31/00; B05D 1/32; D06N 7/04

U.S. Cl. 283—102

8 Claims



1. A coupon or ticket comprising:

a sheet of stock material having a first dry substantially continuous coating layer of a material selected from the group consisting of polyamide varnishes, acrylic ester varnishes and wax composition covering a surface of said sheet and a second coating layer of a dry substantially continuous varnish covering at least a portion of said first coating layer;

said first dry coating layer and said second dry coating layer being substantially incompatible with each other so that the first and second coating layers separate from each other by rubbing or pulling apart, and said second coating layer being free from any sheet material covering the same;

a layer of printing on said surface of said sheet beneath said first dry coating;

at least portions of said second coating layer being opaque pigmented and covering at least portions of said first coating layer, said pigmented second coating layer being removable from said at least portions of said first coating by rubbing to expose said printed layer therebeneath.

4,872,708

PRODUCTION TIEBACK CONNECTOR

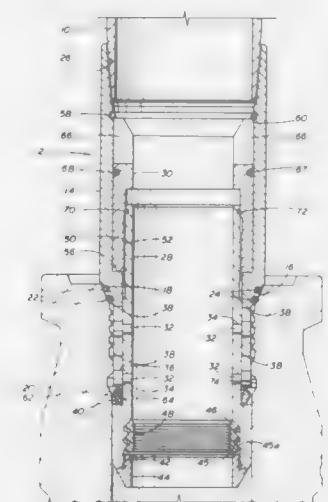
William A. Abreo, Jr., Houston, Tex., assignor to Cameron Iron Works USA, Inc., Houston, Tex.

Filed May 18, 1987, Ser. No. 51,842

Int. Cl.⁴ F16L 37/08

U.S. Cl. 285—39

6 Claims



1. A subsea wellhead comprising

a wellhead housing having an upper tapered seat and internal groove below such seat,

a tie back connector having an annular body with an external downwardly facing shoulder sized to be landed on said housing seat and an internal upwardly facing shoulder, a sleeve positioned within said annular body and having an external upwardly facing shoulder, upper external threads and means preventing rotation of said sleeve within said annular body,

a locking ring carried by said external sleeve shoulder, said annular body having a lower end with a lower outer tapered surface which tapers upwardly and outwardly, an actuator ring threaded onto said sleeve external threads and engaging said annular body internal shoulder whereby rotation of said actuator ring raises said sleeve to raise said locking ring into surrounding relationship to said lower annular body end and thus wedge said locking ring outward to set said locking ring into said housing internal groove and continued rotation of said actuator ring tensions said sleeve to preload the engagement between said wellhead housing seat and said body shoulder.

4,872,709

PIPE ALIGNING APPARATUS

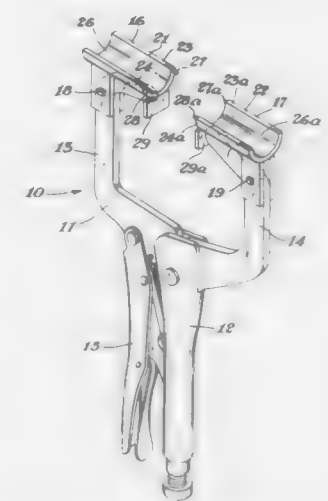
Eugene V. Stack, Bay City, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed May 2, 1983, Ser. No. 490,939

Int. Cl.⁴ F16L 55/00

U.S. Cl. 285—39

3 Claims



1. A pipe clamp and pipe aligning means comprising a clamp operated with toggle action having first and second opposed jaws at least one of which is pivotally attached to the clamp, the opposed jaws each being bifurcated to provide first and second jaw portions defining therebetween a pipe receiving recess, the jaw portions defining pipe receiving recesses each having an opposed end face with at least two flange or ring engaging portions extending from such end face and substantially normal to the end face, and further, extending towards the opposed end face of the other jaw portion, the projections being positioned to engage a ring or flange on closing of the clamp at generally diametrically opposed locations, on closing of the clamp the recesses being coaxially disposed, said locations lying in the plane normal to a plane formed by the arc made on closing the pivotally attached jaw of the clamp.

4,872,710

RELEASABLE QUICK CONNECT FITTING

James W. Konecny, Fort Worth; Rodney L. Huston, Springtown, and Gerrard N. Vyse, Bedford, all of Tex., assignors to Stratoflex, Inc., Fort Worth, Tex.

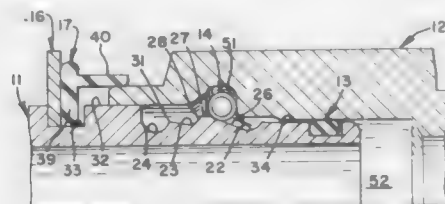
Continuation of Ser. No. 932,515, Nov. 20, 1986, abandoned.

This application Oct. 7, 1988, Ser. No. 256,156

Int. Cl.⁴ F16L 37/22

U.S. Cl. 285—81

17 Claims



1. A releasable quick-connect fitting, comprising
 - (a) a tubular insert having an axis, and having an annular lock groove and an annular release groove in the outer periphery thereof, said lock groove having a forward side which is slanted outwardly and forwardly relative to said axis, and said release groove having a smaller diameter than said lock groove,
 - (b) a cylindrical receptacle coaxial with said insert and having a bore for receiving said insert and having an annular bore groove in said bore, said bore groove having a rearward side which is slanted inwardly and rearwardly relative to the axis of said receptacle,
 - (c) an annular retainer mounted in one of said lock and release grooves and movable to the other of said lock and release grooves, said retainer comprising a garter spring formed by substantially circular radially extending closely adjacent coils,
 - (d) said insert being movable to a lock position in said receptacle wherein said lock and bore grooves are substantially in radial alignment and said retainer extends into said lock and bore grooves, and is wedged between said slanted forward and rearward sides of said grooves and prevents separation of said insert and said receptacle, and said retainer being movable to a release position in said receptacle wherein said release and bore grooves are substantially in radial alignment and said retainer extends into said release groove and is out of engagement with said receptacle, and
 - (e) a stop removably connected to one of said insert and receptacle and engageable with the other, said stop preventing movement of said insert to said release position but enabling movement to said release position when removed.

4,872,711

DEVICE FOR CONNECTING A HOSE END TO A CONNECTING SPIGOT

Karl Weinhold, Im Jagdfeld 43,, D-4040 Neuss 1, Fed. Rep. of Germany

Filed Jul. 14, 1988, Ser. No. 219,471

Claims priority, application Fed. Rep. of Germany, Jul. 28, 1987, 3724886

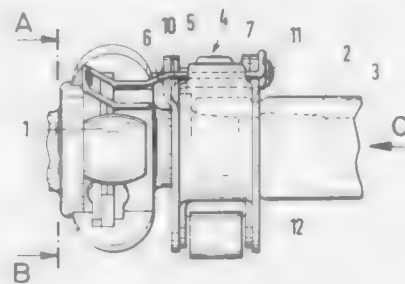
Int. Cl.⁴ F16L 33/12

U.S. Cl. 285—88

3 Claims

1. In an apparatus for connecting a hose end to a connecting spigot in the form of one half of a dog clutch on which a hose socket is formed, on to which the hose end is slipped and clamped, and which is enclosed by a clamp formed by at least two part shells and has a tension lever closure whose tension lever is hinged to a part shell and whose spring connects the tension lever releasably to the other part shell, the device having formed on the connecting spigot an annular collar engaged over by retaining flanges on one side of the part shells, while the clamping flanges forcing those hose against the socket are provided on the other side of the part shells, the

retaining flanges being of dimensions such that the clamp is prevented from being pulled off axially of the socket even when the tension lever closure is opened, the clamp having a pivot pin with a shank, the dog clutch having clutch halves provides with cams, the improvement comprising:



- a U-shaped bent wire member (6) which non-rotatably connects the clamp (4) to the connecting spigot (1), the U-shaped bent wire member (6) having a web (6a) bent to form an eyelet (6b) which positively engages around the shank of the pivot pin (8) of the clamp (4), the U-shaped bent wire member having arms (6c) which enclose one of said said cams of said dog clutch half.

4,872,712

FLANGE CONNECTION

Hans P. Maier, Schweningen, Fed. Rep. of Germany, assignor to Agintec AG, Pfaffikon, Switzerland

Division of Ser. No. 896,646, Aug. 15, 1986, Pat. No. 4,735,445.

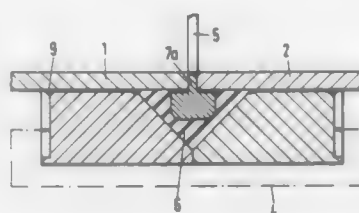
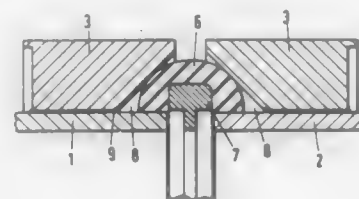
This application Mar. 31, 1988, Ser. No. 176,343

Claims priority, application Fed. Rep. of Germany, Aug. 31, 1985, 3531191; Feb. 13, 1986, 3604467

Int. Cl.⁴ F16L 19/08, 21/06

U.S. Cl. 285—341

10 Claims



1. A flange connection for two components having a connection joint such as containers, pipes and the like, comprising:
 - (a) flange means comprising a pair of flanges positioned over said components, for holding said components axially together at the connecting joint, said flange means having a pair of end faces each defining an annular recess which widens conically in the direction of said connecting joint to thereby form, together with the outside circumference of said components, an annular sealing chamber generally triangular in cross-section,
 - (b) a resilient sealing body positioned within said annular sealing chamber and adapted to surround the connecting joint between said components, said resilient sealing body having a substantially semi-circular radial cross-section in an undeformed condition and comprising an elastomeric ring which has an inwardly open annular groove and an inner ring which sits loosely in said annular groove, and

- (c) means for fastening said flanges so that a portion of their end faces are contiguous to each other, said flanges when in such fastened position defining said annular sealing chamber, said resilient sealing body being deformed by said fastening to substantially completely fill said sealing chamber thereby sealing the connecting joint wherein said flange means comprises a pair of flanges each of which is pushed loosely onto the associated component and, in its end face facing away from the sealing chamber, has a clamping chamber, said fastening means comprising at least one annular clamping element positioned in said clamping chamber, said clamping element being supported on the component by means of a radially inwardly located clamping edge which engages said component during fastening, and by a radially outwardly clamping edge which engages a clamping surface of the clamping chamber, said clamping element projecting out of the clamping chamber in the axial direction in such a way that a compressive force applied by the fastening means and acting axially on the clamping element leads to an increase in the outside diameter and a decrease in the inside diameter of the clamping element, said inner ring sitting loosely in a manner to permit working pressure in a medium inside said components to intensify sealing of said elastomeric ring in said sealing chamber.

4,872,713

COUPLING DEVICE

Michael Kappan, Foster City, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

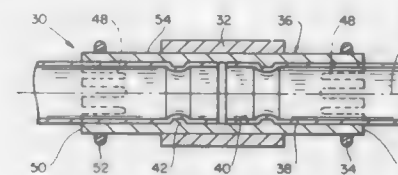
Continuation-in-part of Ser. No. 12,260, Feb. 19, 1987,

abandoned. This application Jan. 25, 1988, Ser. No. 148,732

Int. Cl.⁴ F16L 19/08

U.S. Cl. 285—381

10 Claims



1. A device for coupling to an object, comprising:
 - (a) a tubular sleeve of which an end portion has a wall that is weakened to facilitate radial deformation thereof, and another portion whose wall is not so weakened;
 - (b) a shape memory alloy driver having a portion of the sleeve, other than that portion whose wall is weakened, positioned in the direction of its recovery; and
 - (c) a collar of a dimensionally heat-recoverable polymeric material having at least part of that portion of the sleeve whose wall is weakened positioned in the direction of its recovery.

4,872,714

ELECTRICALLY-POWERED VEHICLE LOCK

Enzo Brusasco, Turin, Italy, assignor to Roltra S.p.A., Turin, Italy

Filed Oct. 13, 1987, Ser. No. 107,968

Claims priority, application Italy, Oct. 17, 1986, 67788 A/86

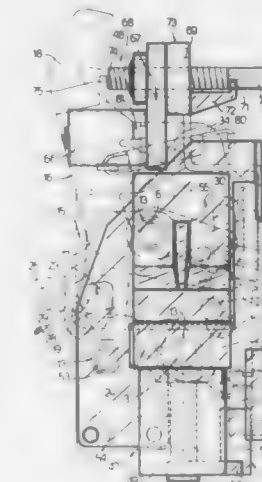
Int. Cl.⁴ E05C 3/26; E05B 47/00

U.S. Cl. 292—201

7 Claims

1. An electrically-powered vehicle lock comprising:
 - a rotary fork having a cavity for engagement with a striker integral attached to a fixed portion of a vehicle, said fork designed to turn between a first partially-closed position and a second fully-closed position;
 - a retaining element for retaining said fork in one of said first or second positions;
 - means for releasing said fork and comprising a first electrical actuating means to move said fork from said partially-

closed position to said fully-closed position; and second electrical actuating means to move said fork from said fully-closed position to said partially closed position; and; control means for automatically restoring said first and



second electrical actuating means to respective idle positions, subsequent to each fork rotation operation, wherein said actuating means act in the reverse direction of the initial actuation to reach respective idle positions.

4,872,715

SLIDING DOOR AND LOCK COMBINATION

Frank Correnti, 1740 SW. 10th St., Boca Raton, Fla. 33486

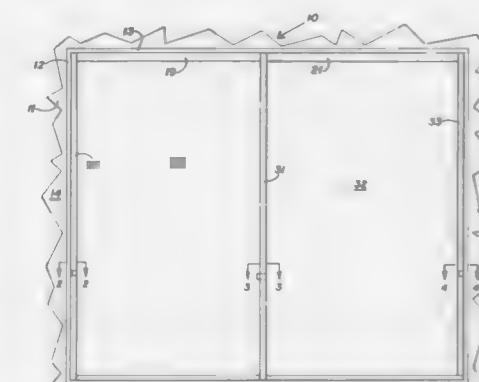
Continuation-in-part of Ser. No. 142,648, Jan. 11, 1988,

abandoned. This application Sep. 22, 1988, Ser. No. 247,491

Int. Cl.⁴ E05C 1/04

U.S. Cl. 292—302

5 Claims



1. A sliding-door and lock combination comprising:
 - (A) a building wall defining a rectangular opening, a frame fitting said opening, said frame comprising left and right vertical frame members each comprising vertical strips projecting inwardly therefrom to define a panel receiving recess and said frame also comprising parallel inner and outer track means,
 - (B) inner and outer sliding-door panels each comprising mid-door and edge-door end posts, said panels being mounted on said tracks to slide one behind the other,
 - (C) a first pair of angles and locking pin locking the outer of said panels to one of said vertical frame members, one leg of each of said angles terminating in a tubular portion and the other leg comprising walls defining screw attachment holes, one of said angles being attached to an edge-door end post of said outer panel and the other of said angles being attached to one of said vertical frame members between two of said strips, said tubular portions of said

angles aligning to accept said pin, said outer panel being closed.

- (D) a second pair of angles and locking pin locking the inner of said panels at the other of said vertical frame members, one leg of each of said angles of said second pair of angles terminating in a tubular portion and the other leg defining screw attachment holes, one of said second pair of angles being attached to an edge-door end post of said inner panel and the other of said second pair of angles being attached to said wall at a point inside the innermost of said strips, said tubular portions of the angles of said second pair of angles aligning to accept said second pin, said inner panel being closed.

4,872,716

CASEMENT LOCK, NOTABLY OF THE TYPE COMPRISING A PLURALITY OF OPERATING RODS WITH RESILIENT RETURN MEANS

Legrand Jean-Claude, Reding, and Prevot G  fard, Willervald, both of France, assignors to Ferco International, Sarrebourg, France

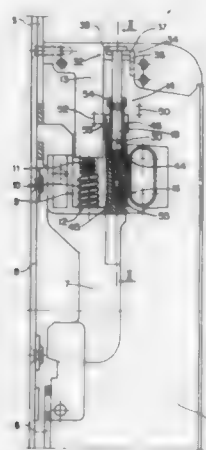
Filed Jun. 3, 1988, Ser. No. 201,875

Claims priority, application France, Jun. 11, 1987, 87.06316

Int. Cl.⁴ E05C 9/02

U.S. Cl. 292—336.3

8 Claims



1. A casement lock comprising:

- a plurality of operating rods adapted to be positioned in a locking position;
- means for actuating at least one of said plurality of operating rods to move with a velocity into a locking position operably associated with said plurality of operating rods;
- resilient means for urging at least one of said operating rods to the locking position;
- a casing housing said means for actuating;
- damping means for reducing said velocity of said at least one of said plurality of operating rods during movement to the locking position, said damping means comprises a double-acting shock absorber having a fixed piston slidable in a central bore of a movable piston, the movable piston being slidable in a bore of a cylindrical body, the cylindrical body being rigidly connected to said casing, and said movable piston being coupled to said operating rods.

4,872,717

STRIKE PLATE REINFORCING DEVICE

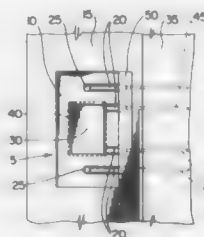
Richard J. McEvoy, Box 383, Manotick, Canada K0A 2N0, and Robert A. Close, 61 McEwen Ave., #702, Ottawa, Canada K1H 1L3

Filed Mar. 28, 1988, Ser. No. 174,303

Int. Cl.⁴ E05B 15/02

U.S. Cl. 292—340

6 Claims



1. A reinforcing device for reinforcing a doorjamb strike plate, said reinforcing device comprising a rigid body whereby said body is configured for cooperating with said strike plate, said body including a plate and means integral to said body for fastening a fastener thereto to secure said reinforcing device to a doorjamb, whereby said plate is configured for installation between said strike plate and said doorjamb and said fastening means is configured for receiving a fastener and for permitting passage of said fastener into said doorjamb in a direction which is at an angle of less than 25 degrees to a plane defined by said strike plate, wherein said fastening means comprises at least one passageway in said plate for receiving and guiding said fastener and said body further comprises a raised border edge along an inner length thereof adjacent said plate, said passageway being formed in and at an intersection of said plate and border edge.

4,872,718

SUPPORT FOR A GRIPPER FOR AN INDUSTRIAL ROBOT

Klaus K. Nerger, Witten, Fed. Rep. of Germany, assignor to Mannesmann Aktiengesellschaft, D  sseldorf, Fed. Rep. of Germany

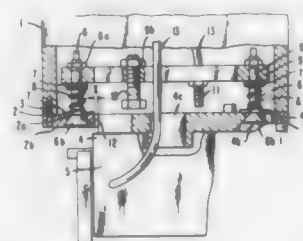
Filed Nov. 19, 1987, Ser. No. 122,914

Claims priority, application Fed. Rep. of Germany, Dec. 1, 1986, 3640973

Int. Cl.⁴ B25J 17/02, 19/06

U.S. Cl. 294—86.4

20 Claims



1. A support for a gripper of an industrial robot comprising a fixed plate; a connection plate; a spring-supported plate; means for maintaining an approximate relative position of the spring-supported plate relative to the fixed plate; means for supporting and maintaining an approximate relative position of the connection plate relative to the spring-supported plate; a fixed-plate stop providing a rest position between the fixed plate and spring-supported plate; fixed-plate springs disposed between the fixed plate and spring-supported plate for maintaining a relative position

between the fixed plate and spring-supported plate with reference to the fixed-plate stop; a connection-plate stop providing a rest position between the connection plate and spring-supported plate; connection-plate springs maintaining a relative position between the spring-supported plate and connection plate with reference to the connection-plate stop.

4,872,719

TRUCK RAIL ARRANGEMENT

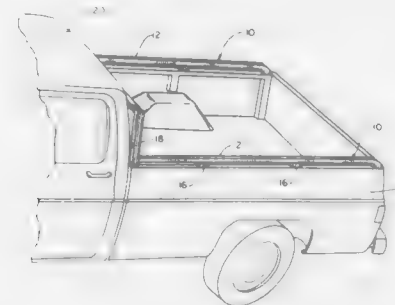
Billy L. Cardwell, 2209 Post Oak, Belton, Tex. 76513

Filed Jul. 21, 1988, Ser. No. 222,034

Int. Cl.⁴ B62D 33/02

U.S. Cl. 296—34

1 Claim



1. A new and improved truck rail assembly comprising: rail means for attachment to a top surface of a truck bed in a cargo supporting position; and first connector means for connecting said rail means to said truck bed, said first connector means including a first threaded connector threadably extensible relative to said first connector means and a second threaded connector threadably extensible relative to said first connector means and being oppositely disposed from said first threaded connector, said first threaded connector being engageable with said rail means and said second threaded connector being engageable with said truck bed, and wherein said first threaded connector is reversibly threaded relative to said second threaded connector, whereby a rotation of a body portion of said first connector means results in said first and second threaded connectors moving concurrently into or out of said body portion depending upon a direction of rotation thereof, and wherein said first and second threaded connectors are provided with engagement means to prevent relative rotation thereof respectively with said rail means and said truck bed, and wherein said engagement means includes, a first pair of pointed members each orthogonally formed on said first connector, and a second pair of pointed members orthogonally formed on said second connector wherein said first and second pair of pointed members engage surface portions of said rail means and said truck bed.

4,872,720

TRUCK BED LINERS

Neil F. Nagy, 1310 Park Western Dr., #159, San Pedro, Calif. 90731

Filed Nov. 17, 1987, Ser. No. 121,518

Int. Cl.⁴ B62D 33/00

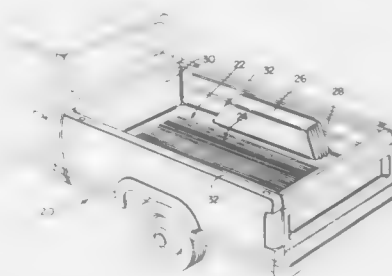
U.S. Cl. 296—39.1

10 Claims

1. A liner for a truck bed of the type having a substantially horizontal bottom wall interrupted by first and second wheel wells, a substantially upright front wall and first and second side walls, the side walls each having an upper rail-like portion substantially parallel to the other rail-like portion and spaced a first predetermined distance therefrom, the side walls also each having a lower portion spaced from the lower portion of the

other side wall by a distance exceeding said first predetermined distance, the liner comprising:

a unitary structure comprising a bottom panel having first and second side edges and front and rear edges, a front panel having an upper edge, a lower edge and first and second side edges, and first and second side panels each having an upper edge, a lower edge and front and rear edges, said bottom panel being formed to lie against the bottom wall of a truck bed and over the wheel wells thereon, said bottom panel being integrally joined at said first and second side edges to said lower edges of said first and second side panels, said bottom panel also being integrally joined at said front edge to said lower edge of said front panel, said first and second side panels being integrally joined to said first and second side edges, respec-



tively, of said front panel, said first and second side panels being spaced from each other by a distance approximately equal to said first predetermined distance such that said side panels are substantially flush with the upper rail-like portions of the truck bed, the region of said first and second side panels adjacent the top edge thereof being formed outward at an elevation slightly below the upper rail-like portions of the truck bed to fit thereunder and including means for maintaining the top edge of said first and second side panels spaced apart by approximately said first predetermined distance; whereby said liner together with the side rails of the truck bed define an approximately rectangular truck bed, as interrupted by the provision in the bottom panel for the wheel wells of the truck.

4,872,721

AUTOMOTIVE SUNSCREEN

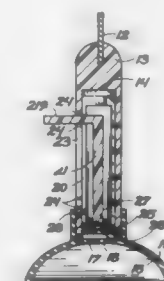
James R. Sniadach, 1871 Page #3, San Francisco, Calif. 94117

Filed Aug. 10, 1988, Ser. No. 230,601

Int. Cl.⁴ B60J 3/00

U.S. Cl. 296—97.2

6 Claims



1. An automotive sunscreen apparatus for attachment to an automotive interior comprising, a planar sunscreen member for limiting passage there-through, and

an elongate support defined by a central axis integrally secured to and axially aligned with said sunscreen member, and
said support including a plurality of securement means for securing said support to a plurality of various surfaces, and
wherein said planar screen member is opaque, and
wherein said planar sunscreen member is formed of photochromic material to progressively darken when exposed to progressively brighter light conditions, and
wherein said securement means includes a resilient suction cup integrally secured to a distal end of said elongate support, and
wherein said support means further includes a hollow tubular member reciprocally slidable from interiorly of said support to a position exteriorly thereof with a magnet secured at an end thereof for attachment to a surface.

4,872,722

SUN ROOF FOR VEHICLES HAVING PROTECTIVE SCREENS

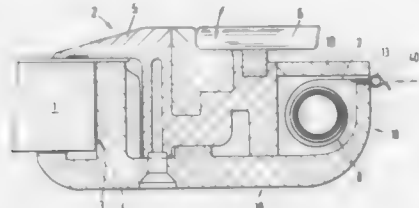
Rolf Farmont, Düsseldorf, Fed. Rep. of Germany, assignor to Farmont Produktion GmbH & Co. KG., Düsseldorf, Fed. Rep. of Germany

Continuation of Ser. No. 13,352, Feb. 11, 1987, abandoned, which is a continuation-in-part of Ser. No. 733,138, May 10, 1983, abandoned. This application Sep. 1, 1988, Ser. No. 239,611
Claims priority, application Fed. Rep. of Germany, May 15, 1984, 3417983

Int. Cl.⁴ B60J 7/08

U.S. Cl. 296—214

4 Claims



4. A sun roof for a vehicle having an opening in the roof thereof, said sun roof comprising a single cover for the opening, frame means for supporting said cover for the opening, and sun protective screen means enclosed and supported by said frame means and located beneath said cover, said sun protective screen means comprising two sun protective screens and two independently operated roller devices for rolling and unrolling said two sun protective screens, said frame means comprising upper and lower frame members clamping therebetween an edge portion of the roof defining the opening, one of said upper and lower frame members supporting said roller devices, and one of said upper and lower members having a first portion for engaging an edge portion of the roof and extending from said edge portion inwardly relative to the opening to a location beyond said roller devices and a second portion projecting from said first portion at said location into the roof opening for partially enclosing said roller devices between upper and lower frame members.

4,872,723

SAFETY TRAY

Thomas W. Kopf, Littleton, Colo., assignor to Master Products Inc., Des Moines, Iowa

Filed Mar. 3, 1988, Ser. No. 163,787

Int. Cl.⁴ B60R 21/00

U.S. Cl. 297—216

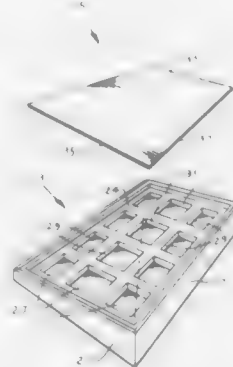
10 Claims

1. Safety tray comprising:

(a) Support frame having a generally rectangular configuration in plan form, a flat bottom, and a front wall, a rear wall and opposing side walls, a sunken planar shelf in the

upper surface of said frame bounded by upwardly extending portions of said front, rear and side walls, said planar shelf having an array of a plurality of regularly shaped cavities therein, said cavities bounded by a grid of longitudinally and transversely extending ribs, said frame composed of a low-density, highly resilient polymeric material in molded configuration;

(b) generally rectangular corrugated top board comprising a flat top sheet and a flat bottom sheet of plastic material with a corrugated plastic layer affixed between said



sheets, said corrugated board covering said sunken planar shelf with its lower surface supported in non binding engagement by said ribs, wherein said upwardly extending wall portions provide lateral and longitudinal support to said board, said corrugated board having ridges and furrows lying in a direction parallel to said front and rear frame walls; and

(c) flexible, resilient plastic outer coating, enveloping the entire outer surface of said combined support frame and corrugated board, and said outer coating holding said board in engagement with said frame.

4,872,724

FIXING DEVICE FOR A COVERING, ESPECIALLY A COVERING OF A SEAT

Serge Deley, Seloncourt, and Francois Fourrey, Monthellard, both of France, assignors to ECIA-Equipements Et Composants Pour L'Industrie Automobile, Audincourt, France

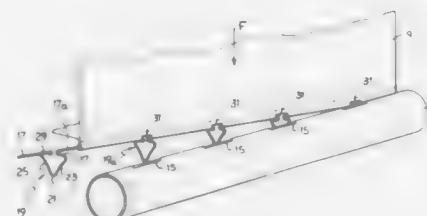
Filed Nov. 10, 1988, Ser. No. 269,331

Claims priority, application France, Nov. 24, 1987, 87 16287

Int. Cl.⁴ A47C 27/00

U.S. Cl. 297—218

10 Claims



1. Device for fixing a covering, comprising a profiled section (1), having a series of longitudinal slots (15), and an edging wire (13) bent at at least two places to form fasteners (19, 19a) intended to cooperate with the slots, characterized in that each fastener (19, 19a) lies generally in a plane inclined to the axis of the edging wire (13), and is deformable by twisting for the purpose of its insertion into a slot (15) in the profiled section, but resiliently recovers after this insertion its initial shape and a position inclined to the wire and to the slot.

4,872,725

CHILD SEAT

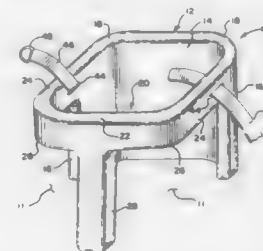
Terri A. Hakeem, 2007 N. Shiawassee, S.E., Grand Rapids, Mich. 49506

Filed Aug. 17, 1987, Ser. No. 85,401

Int. Cl.⁴ A47C 1/08

U.S. Cl. 297—250

7 Claims



1. A vehicle comprising a child's wagon, said vehicle having a body defining a bed upon which the child sits, and a restraint resting on said bed, said restraint comprising:

a back support comprising a transverse back panel and longitudinal side panels joined by curved intermediate panels, said transverse back, longitudinal side and curved panels defining a wrap-around back support, said curved intermediate panels having a curvature received within the wagon body having complementary curved rear portions, a pair of side portions forming extensions of said back support, and a transverse front portion, and opening means provided in one of said front and pair of side portions and adapted to receive a child's limbs, the back support, side portions and front portion defining open top and bottom portions for the restraint for receiving the child's body and enabling the child to sit directly on the vehicle bed, a portion of at least one of said side and front portions having a vertical dimension less than that of said back support and being spaced above said bed, said one of said side and front portions cooperating with said bed to define said opening means, at least one of said back support and front and pair of side portions having lower surfaces engaging said bed to support said restraint thereon, said back support and front and side portions forming a partial enclosure adapted to restrain the child, and including means securing said restraint in position on said bed, said restraint further comprising at least one front support depending downwardly from one of said side and front portions, said front and back supports having lower surfaces adapted to engage the bed to support said restraint thereon, and said opening means being partially defined by said front support.

4,872,726

RATCHET SEAT RECLINER WITH REMOTE RELEASE

Harry H. White, Battle Creek, Mich., and Karl Ligensa, Oberseithelm, Fed. Rep. of Germany, assignors to Keiper Recaro Incorporated, Battle Creek, Mich.

Continuation-in-part of Ser. No. 651,911, Sep. 19, 1984, abandoned. This application Aug. 27, 1987, Ser. No. 91,299

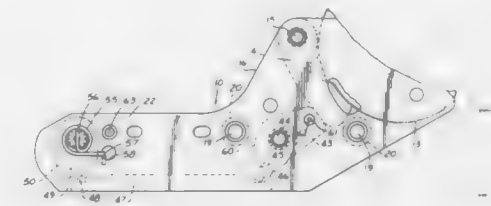
Int. Cl.⁴ A47C 1/025

U.S. Cl. 297—367

16 Claims

1. Ratchet recliner seat hinge assembly having a pair of sandwich seat bracket plates pivotally connected to a toothed sector of a seat back bracket retained in adjusted position by a toothed pawl pivotally mounted between said plates and locked in retaining position by a cam pivotally mounted between said plates, said cam having flat bellcrank extension means, said seat bracket plates having integral remote release lever mounting extension means, intermediate flat release lever means pivotally mounted between the ends of said lever mounting extension means, said pivotal mounting including lever drive connection and external stem, manually actuated

lever means having drive connection to said external stem, and linkage connecting means between said bellcrank extension means and intermediate release lever means for transmitting release actuation from said manual lever means to said cam bellcrank extension means, said linkage connecting means being characterized by a flat unitary link formed from substantially flat stock having substantial thickness capable of transmitting push-pull actuating forces extending between said



4,872,727

ADJUSTABLE ARMED CHAIR

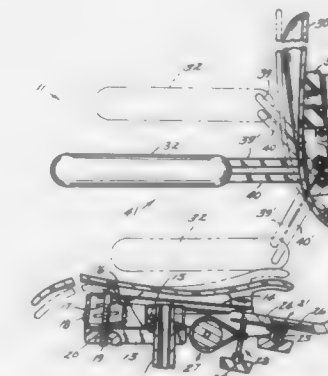
Ralph K. Rye, 1559 College St. SE., Grand Rapids, Mich. 49507

Filed Oct. 5, 1988, Ser. No. 253,601

Int. Cl.⁴ A47C 7/54

U.S. Cl. 297—411

6 Claims



1. In a chair the arm height adjustment combination comprising:

a chair back;
a pair of arms extending from said back of said chair;
arm rests at the ends of said pair of arms;
operable means including a remotely controlled source of stored energy secured to said back and selectively and eccentrically connected to at least one of said arms and unlocking said arms of said extending arm rests for pantographic height adjustment thereof.

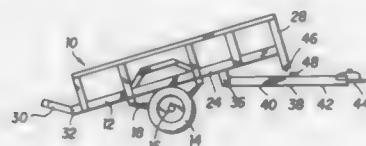
4,872,728

TILT-BED TRAILER

Kevin T. Adams, 13840 Willow Branch Rd., Darlington, Wis.
 Filed Apr. 7, 1988, Ser. No. 178,501
 Int. Cl.⁴ B60D 1/14

U.S. Cl. 298-5

14 Claims



9. In a tilt-bed trailer comprising at least one pair of wheels, a trailer frame mounted on the pair of wheels, the trailer frame comprising a front member in substantial parallel relationship with a rear member, two substantially parallel side members, and a draw bar pivotally connected to the trailer frame, the draw bar having a forward end and at least one rearward end, the improvement comprising:

- a forward stabilizer cross bar and a rearward stabilizer cross bar, wherein the forward and rearward stabilizer cross bars are distinct from and located in substantially parallel relationship between the front and rear members of the trailer frame, and
- a hinge member for pivotally connecting the rearward end of the draw bar to the trailer frame, the hinge member comprising two substantially parallel stabilizer plates mounted orthogonally to the forward and rearward stabilizer cross bars, and a hinge pin, wherein the two stabilizer plates are spaced apart a sufficient distance to receive the rearward end of the draw bar therebetween, wherein each stabilizer plate and the rearward portion of the draw bar have apertures which are in matching alignment to receive the hinge pin therethrough and wherein the forward and rearward stabilizer cross bars are positioned to substantially eliminate any deformation of the stabilizer plates.

4,872,729

ANTI-SKID CONTROL APPARATUS FOR A VEHICLE BRAKING SYSTEM

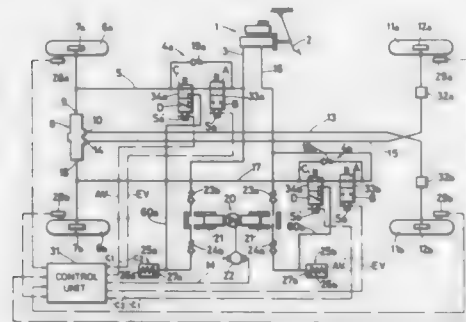
Tetsuro Arikawa, Kanagawa, Japan, assignor to Nippon ABS, Ltd., Japan

Filed Sep. 17, 1987, Ser. No. 97,879

Claims priority, application Japan, Sep. 19, 1986, 61-221033
 Int. Cl.⁴ B60J 8/82, 8/64

U.S. Cl. 303-92

14 Claims



1. In an anti-skid control apparatus for a vehicle braking system including:

- a pair of front wheels, and a pair of rear wheels in which wheel cylinders are diagonally connected in conduits;
- a first fluid pressure control valve device for controlling

the brake fluid pressure of the wheel cylinder of one of said front wheels, arranged between a first fluid pressure generating chamber of a tandem master cylinder and said wheel cylinder of the one front wheel;

- a second fluid pressure control valve device for controlling the brake fluid pressure of the wheel cylinder of another of said front wheels, arranged between a second fluid pressure generating chamber of said tandem master cylinder and said wheel cylinder of the other front wheel;
- a control unit for judging the said conditions of said front and rear wheels and for generating control signals for controlling said first and second fluid pressure control valve devices; and
- a valve apparatus for generating a fluid pressure in accordance with the lower of the brake fluid pressures of said front wheels controlled with said first and second fluid pressure control valve devices, being arranged between said wheel cylinders of the front wheels and those of the rear wheels; the improvements in which, when a brake-relieving output signal for decreasing the brake fluid pressure is obtained from only one of said rear wheels, it is neglected, and when the brake-relieving output signals are obtained from both of said rear wheels, the brake-relieving output signal of the one of said rear wheels which is obtained later than that of the other is logically combined with the brake-relieving output signal of the one of said front wheels running on the same side as said one of the rear wheels, to form a brake-relieving control signal for controlling said first or second fluid pressure control valve device connected to the wheel cylinder of said one front wheel, and a brake-increasing control signal for increasing the brake fluid pressure by said first or second fluid pressure control valve device after said brake-relieving control signal disappears, is formed on the basis of the brake-increasing output signal of the one of said one front and rear wheels on said same side which has a stronger locking tendency than the other.

4,872,730

BRAKING CONTROL APPARATUS FOR USE IN MOTOR VEHICLE

Kozi Takagi, Takahama; Noriyuki Ido, Aichi; Sadayuki Ohno; Hideaki Suzuki, both of Kariya; Yoshiaki Inoue, and Yoshihisa Nomura, both of Toyota, all of Japan, assignors to Nippondenso Co., Ltd., Kariya and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Filed Oct. 18, 1988, Ser. No. 259,583

Claims priority, application Japan, Oct. 19, 1987, 62-263536
 Int. Cl.⁴ B60T 8/88

U.S. Cl. 303-92

5 Claims

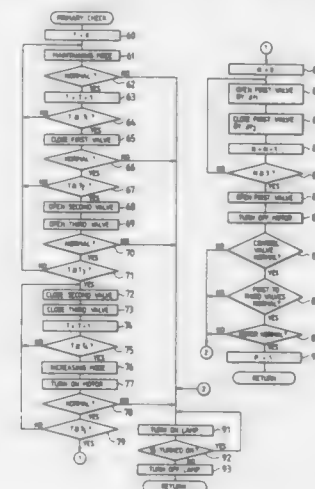
1. A braking control apparatus for use in a motor vehicle having at least one wheel, comprising:
 master cylinder means for generating a hydraulic pressure in response to a braking operation by a driver of said motor vehicle;
 accumulator means for accumulating a hydraulic pressure;
 wheel braking cylinder means for braking said wheel in accordance with a hydraulic pressure supplied thereto;
 passage means disposed in common between said wheel braking cylinder means and said master cylinder means or said accumulator means so that said wheel braking cylinder means is communicated through said passage means with said master cylinder means or said accumulator means;

cut-off valve means including first means provided between said master cylinder means and said passage means for controlling communication between said master cylinder means and said passage means and further including second means provided between said accumulator means and said passage means for controlling the communication between said accumulator means and said passage means, thereby allowing said first and second means to cut off the communication between said master cylinder means and

said passage means in between said accumulator means and said passage means;

control valve means provided in said passage means for cutting off and establishing the communication between said passage means and said wheel braking cylinder means; and

control means for checking the normality of operation of said cut-off valve means and said control valve means, said control means operating said control valve means so as to cut off the communication between said wheel braking cylinder means and said passage means, operating said cut-off valve means so as to cut off the communication



between said master cylinder and said passage means and to establish the communication between said accumulator means and said passage means, operating said cut-off valve means so as to cut off the communication between said accumulator and said passage means and further between said master cylinder means and said passage means, operating said control valve means so as to establish the communication between said wheel braking cylinder and said passage means so as to reduce the pressure in said passage means after checking the normality of the valve means operation, and operating said cut-off valve means so as to establish the communication between said master cylinder and said passage means.

4,872,731

VEHICULAR BRAKE CONTROL SYSTEM

Masatoshi Nakamura, Atsugi, Japan, assignor to Nissan Motor Company, Japan

Filed Oct. 17, 1986, Ser. No. 920,268

Claims priority, application Japan, Oct. 18, 1985, 60-232380
 Int. Cl.⁴ B60T 8/86, 13/16, 8/58

U.S. Cl. 303-93

11 Claims

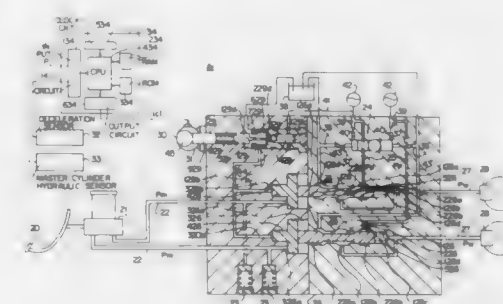
1. A vehicular brake control system comprising:

- a brake pedal;
- a master cylinder operatively connected to said brake pedal to generate hydraulic pressure in fluid in the system in accordance with a depression force imposed on said brake pedal;
- at least one fluid passage connected to said master cylinder;
- first means incorporated in said fluid passage for maintaining a fixed relationship between a stroke of said brake pedal and the depression force imposed on said brake pedal;
- second means for producing an input hydraulic pressure when said brake pedal is depressed;
- third means responsive to the hydraulic pressure of said master cylinder in said at least one fluid passage and to a control hydraulic pressure for converting the input hy-

draulic pressure derived from said second means to an output hydraulic pressure for application to a wheel cylinder incorporated in a brake apparatus on a vehicle tire wheel;

(g) fourth means for generating the control hydraulic pressure in accordance with a control signal;

(h) fifth means for detecting a braking deceleration rate;



(i) sixth means for detecting the depression force applied to said brake pedal; and

(j) seventh means for producing said control signal according to the braking deceleration rate detected by said fifth means so that the braking deceleration rate has a fixed relationship to the depression force applied to said brake pedal.

4,872,732

HYDRAULIC VEHICLE BRAKE SYSTEM

Alwin Steigmaier, Schwiebingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

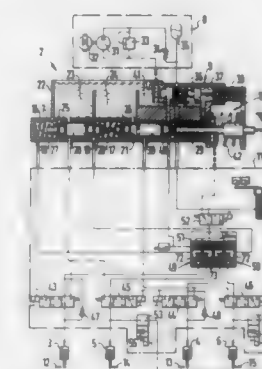
Filed Oct. 7, 1988, Ser. No. 254,765

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1987, 3743346

Int. Cl.⁴ B60T 8/62

U.S. Cl. 303-110

4 Claims



1. A hydraulic brake system for vehicles having wheels with wheel brakes, comprising a master brake cylinder, a brake booster which boosts fluid pressure in said master brake cylinder, an auxiliary pressure source combined with said brake booster for actuating said brake booster for application of brake pressure to the brakes via said master brake cylinder and fluid flow blockable valve assemblies disposed in a brake fluid pressure line between said master brake cylinder and said wheel brakes, and for controlling wheel drive slip via control valves connected to a fluid pressure line between at least one of said blockable valve assemblies and said brakes for a driven wheel, signal control means for controlling said blockable valve assemblies for preventing skidding of a wheel and for

controlling said blockable valves and said control valves for limiting drive slip at driven wheels, said control valves being operative for limiting drive slip by means of pressure from said auxiliary pressure source, said control valves permit brake pressures to be introduced into wheel brakes (5, 6) of the driven wheels for limiting drive slip, with the aid of pressure from said auxiliary pressure source (8, 81).

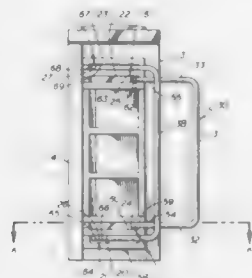
4,872,733

MULTI-POSITION BASE FOR SUPPORTING A CABINET
Thomas A. Tedham, Salem, and See C. Leung, Tewksbury, both of Mass., assignors to Wang Laboratories, Inc., Lowell, Mass.
Filed Dec. 29, 1988, Ser. No. 291,802

Int. Cl.⁴ A47B 91/00

U.S. Cl. 312—255

5 Claims



1. A cabinet base for supporting a cabinet with a horizontal bottom surface, said horizontal bottom surface being bounded in part by a first edge and a second edge parallel thereto, said first and second edges having at least twice the length of that distance which separates them, said cabinet base comprising:

four cabinet support areas affixed to said cabinet and positioned below said cabinet bottom surface in a plane with each of said cabinet support areas near an end of said edges,

a first pair of pivot pins affixed to said cabinet with a common first axis parallel to said first and second edges and spaced below said bottom, said first axis being substantially closer to said first edge than to said second edge,

a second pair of pivot pins affixed to said cabinet with a common second axis parallel to said second and first edges and spaced below said bottom, said second axis being substantially closer to said second edge than to said first edge,

pivot pins of said first pair of pivot pins being positioned such that they project onto said second axis between the pivot pins of the second pair of pivot pins,

a first stabilizing leg formed into a U-shape, with a center section and two end sections, distal ends of said two end sections being pierced with pivot holes which engage the pivot pins of said first pair of pivot pins, permitting pivoting of said said first stabilizing leg about said first axis,

a second stabilizing leg formed into a U-shape, with a center section and two end sections, distal ends of said two end sections being pierced with pivot holes which engage the pivot pins of said second pair of pivot pins, permitting pivoting of said said second stabilizing leg about said second axis, the center section of said second leg being longer than the center section of said first leg,

two first outboard support bearings affixed to and spaced from said cabinet horizontal bottom surface, said first outboard support bearings being positioned respectively between the pivot pins of said first pair of pivot pins and said first edge,

two first inboard support bearings affixed to and spaced from said cabinet horizontal bottom surface, said first inboard support bearings being positioned respectively between the pivot pins of said first pair of pivot pins and said second edge,

the end sections of said first stabilizing leg being so shaped and dimensioned, and said first outboard support bearings

being so spaced above said plane that said first stabilizing leg is pivotable between

an outboard position in which it bears upon said first outboard support bearings and its center section lies above and touching said plane and extended outboard from said first edge and

an inboard position in which it bears upon said first inboard support bearings and its center section lies above and touching said plane and adjacent to said second edge,

two second outboard support bearings affixed to and spaced from said cabinet horizontal bottom surface, said second outboard support bearings being positioned respectively between the pivot pins of said second pair of pivot pins and said second edge,

two second inboard support bearings affixed to and spaced from said cabinet horizontal bottom surface, said second inboard support bearings being positioned respectively between the pivot pins of said second pair of pivot pins and said first edge,

the end sections of said second stabilizing leg being so shaped and dimensioned, and said second outboard support bearings being so spaced above said plane that said second stabilizing leg is pivotable between

an outboard position in which it bears upon said second outboard support bearings and its center section lies above and touching said plane and extended outboard from said second edge and

an inboard position in which it bears upon said second inboard support bearings and its center section lies above and touching said plane and adjacent to said first edge,

the two end sections of said first stabilizing leg having offset bends positioning the end sections of the first stabilizing leg above the center section of the second stabilizing leg when said first stabilizing leg is in its outboard position and the second stabilizing leg is in its inboard position,

whereby

with said first stabilizing leg in its said outboard position and said second stabilizing leg is in its said outboard position, said cabinet base provides stable support for said cabinet with said bottom surface horizontal, when said cabinet is removed from any wall,

with said first stabilizing leg in its said inboard position and said second stabilizing leg is in its said inboard position, said cabinet base provides stable support for said cabinet with said bottom surface horizontal, when said cabinet is positioned with its first edge against a wall,

with said second stabilizing leg in its said inboard position and said first stabilizing leg in its said outboard position, said cabinet base provides stable support for said cabinet with said bottom surface horizontal, when said cabinet is positioned with its second edge against a wall, and

with said first stabilizing leg in its said inboard position and with said second stabilizing leg in its said inboard position said cabinet base provides a compact envelope for shipping.

4,872,734

DRAWER SLIDES WITH SELF-ACTUATING LATCHING SYSTEMS

Robert Rechberg, 3800 E. Miraloma Ave., Anaheim, Calif. 92606

Continuation-in-part of Ser. No. 64,407, Jun. 22, 1987, Pat. No. 4,749,242. This application Jun. 6, 1988, Ser. No. 203,233

Int. Cl.⁴ A47B 88/10; F16C 21/00

U.S. Cl. 312—333

29 Claims

1. A drawer slide assembly comprising:

at least first, second, and third slide members having proximal and distal longitudinal ends, said second and third slide members having internally formed elongated channels extending between said proximal and distal ends;

said second slide member being longitudinally slidably disposed within the elongated channel of the third slide

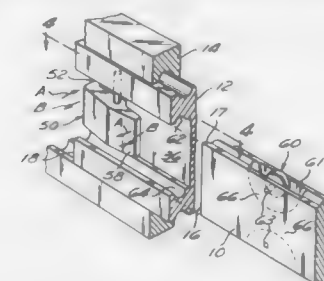
member so as to be movable between an "unextended" position wherein the second slide member is fully disposed within the elongated channel of the third slide member and an "extended" position wherein a portion of the second slide member extends beyond the distal end of the third slide member;

said first slide member being longitudinally slidably disposed within the elongated channel of the second slide member so as to be movable between an "unextended" position wherein said first slide member is fully disposed within the elongated channel of the second slide member and an "extended" position wherein a portion of the first slide member extends beyond the distal end of the second slide member;

a first latching mechanism operative to releasably lock said second slide member in fixed longitudinal position relative to said third slide member, said first latching mechanism comprising:

a first latching member positioned on said second slide member;

a first aperture extending through said third slide member and alignable with at least a portion of said first latching member upon slidable movement of said second slide member relative to said first slide member;



said first latching member being spring biased to cause a portion of said first latching member to extend into said first aperture upon said slidable alignment thereof and to thereby hold said second slide member in fixed longitudinal position relative to said third slide member; and

a second latching mechanism operative to releasably lock said first slide member in fixed longitudinal position relative to said second slide member, said second latching mechanism comprising:

a second latching member positioned on said first slide member;

a second aperture extending through said second slide member and alignable with at least a portion of said second latching member upon slidable movement of said first slide member within the elongated channel of said second slide member;

said second latching member being biased to urge at least said portion of said first latching member into said second aperture when said aperture becomes slidably aligned therewith and to thereby hold said first slide member in fixed longitudinal position relative to said second slide member.

4,872,735

DRAWER INCLUDING ROLLER CARRIER CONNECTING SIDE WALLS TO REAR MEMBER

Erich Röck, and Josef Brunner, both of Höchst, Austria, assignors to Julius Blum Gesellschaft M.B.H., Höchst, Austria

Filed Jul. 1, 1987, Ser. No. 68,335

Claims priority, application Austria, Jul. 14, 1986, 1898/86

Int. Cl.⁴ A47B 88/00

U.S. Cl. 312—342

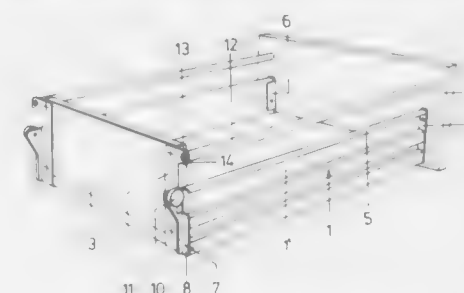
12 Claims

1. In a drawer including two side walls, a front member, a rear member, and a bottom member, the improvement comprising:

each said side wall including a longitudinally extending projection directed inwardly of the drawer;

a separate roller carrier connected to the rear end of each said side wall, each said roller carrier having mounted thereon a respective roller; and

each said roller carrier including a forwardly extending flange positioned between the respective side edge of said



rear member and the respective said side wall, said flange having a dimension in a direction parallel to the longitudinal dimension of said side wall at least equal to the thickness of said rear member, said flange having a height extending to the top of said side wall, and said flange having a laterally outward configuration adapted to the contour of said side wall.

4,872,736

CONNECTOR ASSEMBLY HAVING A LATCHING MECHANISM

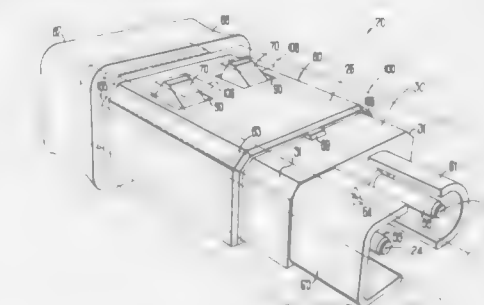
Clyde J. Myers, Stone Mountain; Daniel L. Stephenson, Norcross, and Ruben Travieso, Duluth, all of Ga., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Apr. 19, 1988, Ser. No. 183,194

Int. Cl.⁴ G02B 6/36

U.S. Cl. 350—96.20

17 Claims



1. A connector assembly, which includes:

a connector body which includes a first end and a second end and at least one connective device disposed adjacent to said first end and adapted to terminate a communications path, said connector body including latching means;

a cover which is disposed about said connector body and which is adapted to be moved slidably along said connector body; and

a coupling for receiving at least a portion of said connector body and of said cover and for aligning said connective device of said connector body with another communication path, said latching means being effective when said cover is in a first position to secure said connector body to said coupling and cooperating with said cover as said cover is moved to a second position to cause said latching means to become disengaged from said coupling and allow withdrawal of said connector body from said cou-

pling said latching means also cooperating with said cover to become disengaged from said coupling when said connector body is subjected to a force having a predetermined magnitude and being in a direction from said first end to said second end.

6. An optical fiber connector assembly, which comprises:
- a connector body which includes a connection end and a cable input end and two connective devices which are disposed adjacent to said connection end and each of which is adapted to terminate an optical fiber, said connector body including two latching nubs projecting and being biased normally outwardly therefrom, each said latching nub including a latching surface and a camming surface and being attached to a cantilevered arm which is formed integrally with said connector body;
 - a release cover which is disposed slidably about said connector body and which includes at least two windows in one portion thereof for allowing a portion of each said latching nub to project outwardly therefrom, said release cover being adapted to be moved slidably by a user grasping said cover adjacent to said cable input end and moving it toward said cable input end thereby causing a wall which defines each said window to cam along one of the camming surfaces to urge said latching nubs inwardly and withdraw said nubs into said windows, said latching nubs normally extending beyond said windows; and
 - a coupling for causing said connective devices of said connector body to become connected to other optical fibers, said coupling including a housing adapted to receive at least a portion of said connector body and of said cover and including at least two openings therein so that when said connector body is received in said housing, said latching nubs which extend beyond said windows project into said openings with said latching surfaces thereof being engaged by walls which define said openings to secure said release cover to said coupling, and such that when a force of at least a predetermined magnitude is applied to said release cover in a direction toward its cable end, said release cover is moved slidably to depress said latching nubs and to withdraw them from said openings in said housing to permit withdrawal of said connector body from said coupling.

4,872,737

MULTI-PORT FIBEROPTIC ROTARY JOINT

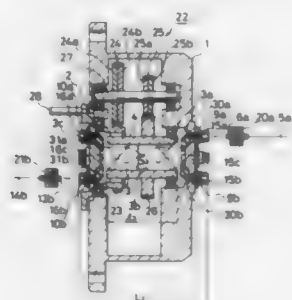
Toshio Fukahori; Hideyuki Takashima, both of Hitachi, and Hitoshi Morinaga, Takahagi, all of Japan, assignors to Hitachi Cable Limited, Tokyo, Japan

Filed Sep. 7, 1988, Ser. No. 241,536

Int. Cl.⁴ G02B 6/36

U.S. Cl. 350—96.2

50 Claims



1. A multi-port fiberoptic rotary joint of the type having a fixed member and a rotative member, comprising:
- a trapezoid prism having an aperture, an entrance side, an exit side and an optical axis, said prism being disposed between the rotative member and the fixed member of the rotary joint so as to be rotatable relative to said rotative member and coaxial with said rotative member;
 - a speed change gear mechanism for transmitting the rotation

of said rotative member to the trapezoid prism to rotate the trapezoid prism at an angular velocity half the angular velocity of said rotative member;

reflector means provided on the entrance side of the trapezoid prism so as to optically guide the light coming from a region outside the aperture of said trapezoid prism to the trapezoid prism such that the light is parallel to the axis of the trapezoid prism within the aperture thereof, and reflector means provided on the exit side of the trapezoid prism so as to optically guide the light emanating from the trapezoid prism to a region outside the aperture of said trapezoid prism;

a plurality of pairs of convergent lenses respectively provided on the rotative member and the fixed member, the convergent lenses of each pair optically facing the entrance and exit surfaces of the trapezoid prism via the reflector means and optically facing each other, the convergent lenses in each pair thereof being spaced apart a distance greater than the width of the aperture of said trapezoid prism; and

entrance and exit side optical fibers respectively connected to the entrance and exit surface side convergent lenses.

4,872,738

ACOUSTO-OPTIC FIBER-OPTIC FREQUENCY SHIFTER USING PERIODIC CONTACT WITH A SURFACE ACOUSTIC WAVE

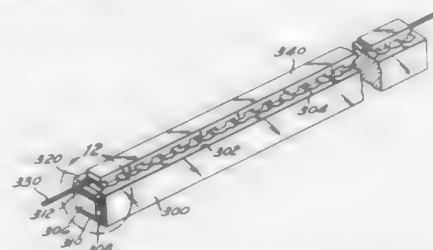
William P. Risk, Palo Alto, and Gordon S. Kino, Stanford, both of Calif., assignors to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Filed Feb. 18, 1986, Ser. No. 830,461

Int. Cl.⁴ G02F 2/02

U.S. Cl. 350—96.29

32 Claims



1. An apparatus for shifting the optical frequency of an optical signal from a first optical frequency to a second optical frequency, comprising:

an optical fiber having first and second propagation paths for propagation of said optical signal therein, said first propagation path having a first optical propagation constant k_1 at said first optical frequency, said second propagation path having a second optical propagation constant k_2 at said second optical frequency;

means for generating an acoustic wave having an acoustic frequency equal to the difference between said first optical frequency and said second optical frequency;

acoustic propagation means for propagating said acoustic wave in proximity to said optical fiber, said acoustic propagation means having an acoustic propagation constant k_a ;

means for positioning said optical fiber in acoustic contact with said acoustic propagation means at periodic locations

along said fiber so that said acoustic wave stresses said optical fiber at said periodic locations to cause optical energy to be coupled from said first optical propagation path to said second optical propagation path and to be shifted in frequency by an amount equal to the acoustic frequency, said periodic locations spaced apart from each other by a distance Λ_a and having an effective propagation constant k_a equal to $2\pi/\Lambda_a$, said effective propagation constant k_a having a value such that the difference be-

tween said acoustic propagation constant k_a and said effective propagation constant k_a is substantially equal to the difference between said first optical propagation constant k_1 and said second optical propagation constant k_2 .

4,872,739

OPTICAL BUSHING

Kahn: David A., Nepean; Grant K. Pacey, Stittsville; Jaroslav M. Hvezda, Nepean, and Jack F. Dalglish, Ottawa, all of Canada, assignors to Northern Telecom Ltd., Montreal, Canada

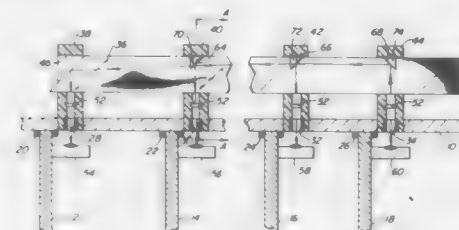
Continuation of Ser. No. 840,262, Mar. 17, 1986, abandoned.

This application May 5, 1988, Ser. No. 193,162

Int. Cl.⁴ G02B 6/28

U.S. Cl. 350—96.16

21 Claims



1. Apparatus comprising a backplane, a plurality of circuit cards each associated with an optical element, and an optical busbar, said circuit cards being mounted upon said backplane substantially parallel with each other and substantially perpendicular to the backplane, said backplane having seating means for said optical busbar, said optical busbar comprising a rod of optically transmissive material having a planar surface along one side thereof, said optical busbar being mounted to said backplane with said planar surface positively located by said seating means, said rod of optically transmissive material having a row of diverter means along its length, the diverter means being spaced apart so as to correspond to the aforesaid optical element associated with said circuit cards, said diverter means being so disposed relative to said planar surface as to divert light travelling along said rod to emerge laterally through said planar surface at intervals corresponding to the spacing of said diverter means and impinge upon said optical element.

4,872,740

ENDOSCOPE

Hiromu Terada, Otake; Naoyuki Fukahori, Ayase, and Kenichi Sakunaga, Otake, all of Japan, assignors to Mitsubishi Rayon Company, Ltd., Tokyo, Japan

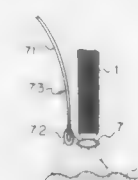
Filed Feb. 5, 1988, Ser. No. 152,492

Claims priority, application Japan, Feb. 12, 1987, 62-28092; Jun. 24, 1987, 62-155297

Int. Cl.⁴ G02B 6/06

U.S. Cl. 350—96.26

7 Claims



1. An endoscope comprising:
- an image-transmitting member made of a multifilament type plastic optical fiber having a substantial rectangular cross-section,
 - an object lens arranged on one end of the optical fiber and

means for guiding an image of an object transmitted to the other end of the multifilament type optical fiber to an image-receiving portion, wherein said multifilament type plastic optical fiber has an islands-in-sea structure in which 50 to 10,000 light-transmitting core-sheath structure islands having a substantially circular cross-section with a diameter of 5 to 200 μ , arranged in the sea such that the same positional relationship of the islands is maintained on both ends of the multifilament type optical fiber, and the core occupancy ratio in the total cross-section of the multifilament type optical fiber is at least 50%.

4,872,741

ELECTRODELESS PANEL DISCHARGE LAMP LIQUID CRYSTAL DISPLAY

James T. Dakin, and Sayed A. El-Hamamsy, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jul. 22, 1988, Ser. No. 222,980

Int. Cl.⁴ G02F 1/13

U.S. Cl. 350—345

20 Claims



1. An illuminatable liquid crystal display including:
- (a.) a light transmissive liquid crystal display panel; and
 - (b.) a flat source of uniformly distributed light positioned to illuminate said panel by directing visible light from a front surface of said source through said panel, said source comprising:
 - (1.) a flat, electrodeless lamp containing a fill gas therein capable of emitting radiation of a predetermined wavelength when undergoing excitation, said lamp including a first phosphor-coated transparent light-emitting surface and a second phosphor-coated light-emitting surface in parallel therewith; and
 - (2.) coil means for coupling an electromagnetic field into the interior of said lamp to establish a plasma arc discharge therein, whereby ultraviolet radiation from said arc discharge excites the first and second phosphor-coated light-emitting surfaces to produce said visible light.

4,872,742

IMAGING SYSTEMS FOR MAINTAINING CONSTANT THE INTENSITY OF AN OUTPUT IMAGE

Henry J. White, and Christopher Stace, both of Bristol, England, assignors to British Aerospace Public Limited Company, London, England

Filed Jul. 24, 1987, Ser. No. 77,245

Claims priority, application United Kingdom, Jul. 25, 1986, 8610719

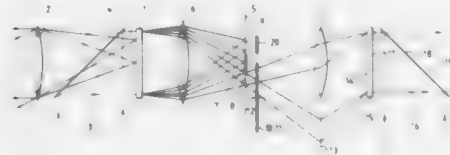
Int. Cl.⁴ G02F 1/13

U.S. Cl. 350—348

6 Claims

1. An imaging system for maintaining constant the intensity of an output image corresponding to a viewed scene, the system comprising:
- variable grating modulation means;
 - focusing means, disposed with an optical path to said variable grating modulation means, for forming an input image of the viewed scene on the variable grating modulation means;
 - imaging means, coupled to said focusing means, for reading

the input image from said focusing means and for forming a scene intensity distribution pattern corresponding to the input image, wherein the scene intensity distribution pattern comprises two histograms each corresponding to the input image of the viewed scene; and



output means, coupled to said imaging means, for processing the scene intensity distribution pattern from said imaging means to produce an output image of the viewed scene, the output image having a constant range of intensity levels which is not dependent on any change in intensity of the viewed scene.

4,872,743

VARIFOCAL OPTICAL ELEMENT

Takeshi Baba; Kazuhiko Matsuoka; Masayuki Usui; Kazuo Minoura, all of Yokohama; Atsushi Someya, Machida, and Masayuki Suzuki, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Division of Ser. No. 943,837, Dec. 18, 1986, abandoned, which is a continuation of Ser. No. 600,959, Apr. 16, 1984, abandoned.

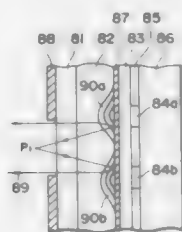
This application Jan. 11, 1988, Ser. No. 144,643

Claims priority, application Japan, Apr. 18, 1983, 58-67026; Apr. 19, 1983, 58-67713; Oct. 7, 1983, 58-187859; Oct. 7, 1983, 58-187860; Mar. 26, 1984, 59-58011

Int. Cl.⁴ G02F 1/29; G02B 3/14

U.S. Cl. 350—353

9 Claims



1. An optical element having a variable focal length, comprising:

- a medium the refractive index of which varies with temperature, said medium passing an incident light beam there-through;
- a plurality of independently controllable heating means for imparting heat to said medium to create a single continuous index gradient due to a temperature distribution resulting in said medium as a consequence of heat being imparted thereto, wherein said plurality of independently controllable heating means comprise an annular heater and a central heater provided at the center of said annular heater, wherein the heating of said annular heater and said central heater is capable of being selectively controlled by control means to thereby produce concave and convex lens functions of the index gradient formed in said medium, and wherein said plurality of independently controllable heating means is disposed in a plane crossing the light beam; and

control means for independently controlling the amount of heat being imparted to said medium by each of said plurality of heating means to vary the shape of the index gradient formed in said medium.

4,872,744

SINGLE QUANTUM WELL OPTICAL MODULATOR

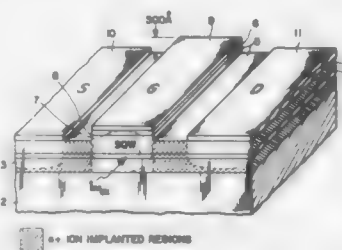
Joseph H. Abeles, Highland Park; Alexander Kastalsky, Way-side, and Robert F. Leheny, Little Silver, all of N.J., assignors to Bell Communications Research, Inc., Livingston, N.J.

Filed Jan. 15, 1988, Ser. No. 144,817

Int. Cl.⁴ G02F 1/015

U.S. Cl. 350—356

19 Claims



1. An optical modulator comprising a single quantum well (SQW) and a planar waveguide configuration coextensive with and overlapping said SQW for laterally confining light propagation through the modulator, said waveguide supporting light of a wavelength near or within the absorption wavelength band of excitons formed in said quantum well and monolithic field effect transistor means for altering the density of free carriers in said SQW.

4,872,745

COVER FOR CAR LAMPS

Norio Fujisawa; Toshishige Sakamoto; Toshiyasu Ito, and Jun-ichi Shimada, all of Aichi, Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

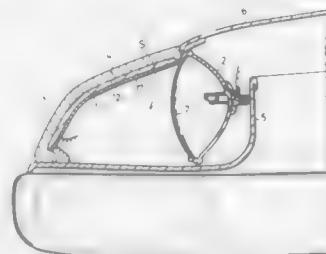
Filed Feb. 17, 1988, Ser. No. 156,839

Claims priority, application Japan, Feb. 18, 1987, 62-022989

Int. Cl.⁴ G02F 1/17, 1/13

U.S. Cl. 350—357

6 Claims



1. A cover for car lamps comprising:

- a transparent base, and
- a transparent element with variable coloring intensity, the color being controlled by electric conduction, disposed on at least a part of said base, said transparent element being substantially nontransparent and colored when said lamps are turned off and substantially transparent and colorless or disclosed when said lamps are turned on.

4,872,746

LIGHT BEAM DEFLECTOR

Koji Kobayashi, Hino, Japan, assignor to Kowa Company Ltd., Japan

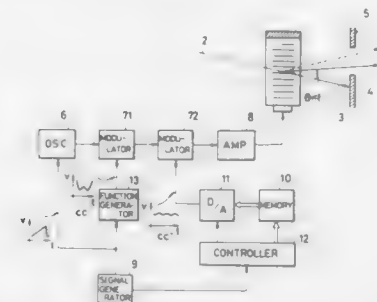
Filed Jan. 19, 1988, Ser. No. 145,032

Claims priority, application Japan, Jan. 16, 1987, 62-6027

Int. Cl.⁴ G02F 1/11

U.S. Cl. 350—358

12 Claims



1. A light beam reflector adapted to deflect a light beam from a light source, comprising:

- an acousto-optical element for deflecting said light beam at an angle of deflection which is dependent on the frequency of a drive signal applied thereto, said acousto-optical element having a deflection efficiency which is also dependent on the frequency of said drive signal;
- means for generating said drive signal;
- a first modulator for modulating the amplitude of said drive signal with first frequency dependent predetermined modulating data to produce a modulated drive signal;
- a second modulator for modulating the amplitude of said modulated drive signal with second frequency dependent predetermined modulating data; and
- a memory for storing said second modulating data, the modulation of the amplitude of said drive signal being such that said deflection efficiency of said acousto-optical element is substantially independent of the frequency of said drive signal.

4,872,747

USE OF PRISMS TO OBTAIN ANAMORPHIC MAGNIFICATION

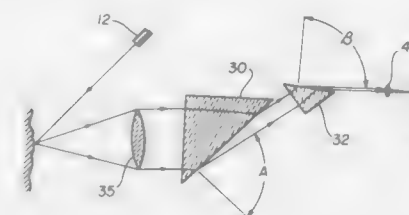
Jeffrey A. Jalkio, St. Paul, and Steven K. Case, St. Louis Park, both of Minn., assignors to CyberOptics Corporation, Minneapolis, Minn.

Filed Apr. 15, 1987, Ser. No. 38,846

Int. Cl.⁴ G02B 13/10, 17/00

U.S. Cl. 350—421

14 Claims



1. An anamorphic optical system for detecting light from a light source directed along a light source axis onto an object surface, comprising:

- a collimating lens for detecting reflected light from said light source reflected off the object surface and forming said reflected light into a collimated beam, said collimating lens being spaced apart from the object surface to present

a stand off distance and having a lens axis offset from said light source axis;

- a prism having a first prism surface oriented generally perpendicular to said lens axis for receiving said collimated light beam, whereby the light beam is anamorphically refracted as it passes through said prism so that variations in said stand off distance present large angular shifts of the refracted light beam;
- a second prism oriented to receive the refracted light from the first prism and to further anamorphically refract the light beam, said refracted light beam experiencing total internal reflection in said second prism;
- a focusing lens for receiving the refracted light beam; and
- a detector positioned to receive the focused light beam from the focusing lens.

4,872,748

PROJECTION-LENS SYSTEM

Josephus J. M. Braat, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

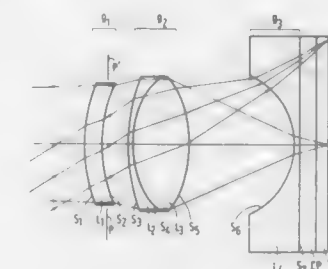
Filed May 13, 1985, Ser. No. 733,567

Claims priority, application Netherlands, Feb. 18, 1985, 850454

Int. Cl.⁴ G02B 13/18

U.S. Cl. 350—432

4 Claims



1. A projection-lens system for projecting a magnified image of a scene reproduced by means of a reproduction element onto a projection screen, which lens system comprises, in this order and viewed from the image side, a first group having one aspheric surface, a positive second or main group having two spherical convex outer surface, and a third group comprising a planoconcave lens element whose concave surface which faces the image side is aspheric, the elements of the first group and of the third group being made of transparent plastic, characterized in that the main group provides substantially the entire power of the lens system and comprises a cemented doublet of a convex-concave element and a biconvex lens element, which elements have substantially equal refractive indices and different dispersions.

4,872,749

LENS FOR VIDEO TERMINAL SCREEN

David J. Lummis, Hertfordshire, England, and Jon D. Masao, Whitinsville, Mass., assignors to American Optical Corporation, Southbridge, Mass.

Filed Sep. 14, 1984, Ser. No. 650,922

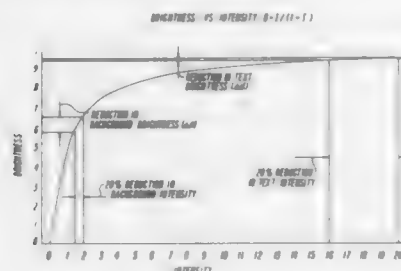
Int. Cl.⁴ G02C 7/10

U.S. Cl. 351—44

11 Claims

1. A method for improving the visual comfort and perceived vision of a person viewing a monochromatic phosphor image on a video display terminal screen, the monochromatic phosphor image being formed by radiation at a primary phosphor emission which comprises causing said person to view said image through a spectacle lens which has been tinted a color

which is approximately the complement to the color of said monochromatic phosphor image wherein said spectacle lens



blocks said radiation at the primary phosphor emission and transmits light at other wavelengths.

4,872,750

IMAGE PROJECTION APPARATUS

Masanobu Morishita, Osaka, Japan, assignor to NEC Home Electronics Ltd., Osaka, Japan

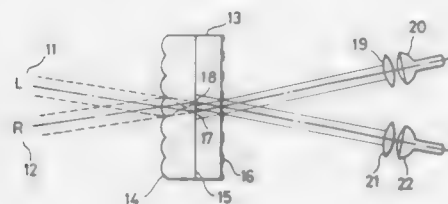
Continuation of Ser. No. 517,279, Jan. 16, 1984, abandoned. This application Aug. 19, 1987, Ser. No. 88,481

Claims priority, application Japan, Jul. 14, 1982, 57-122717; Jul. 31, 1983, 58-139589; Jul. 31, 1983, 58-139591

Int. Cl.⁴ H04N 13/04

U.S. Cl. 353-7

8 Claims



1. A projected image displaying apparatus including image source means and image displaying means spaced from said image source means, said image source means optically projecting two-dimensional images onto said image displaying means, said image displaying means comprising a transmissive diffusion element onto which said images produced by said image source means are projected, a striped shield plate with alternating light blocking stripes and light transmitting stripes disposed on a surface of said transmissive diffusion element adjacent to said image source means for projecting said images onto said transmissive diffusion element in the form of partially overlapping, interleaved stripes, and a lenticular lens plate disposed on a surface of said transmissive diffusion element opposite from said image source means for displaying the images from the diffusion element as a three-dimensional image.

4,872,751

NON-CONTACT LATERAL DISPLACEMENT SENSOR AND EXTENSOMETER SYSTEM

Michael Hercher, 216 Pleasant St., Marblehead, Mass. 01945

Continuation-in-part of Ser. No. 870,107, Jun. 3, 1986, abandoned. This application Jan. 14, 1988, Ser. No. 144,495

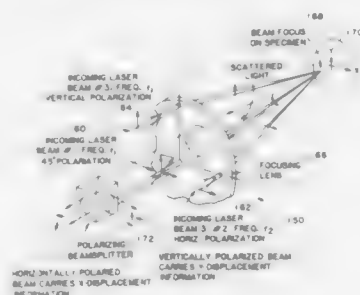
Int. Cl.⁴ G01B 9/02

U.S. Cl. 356-35.5

2 Claims

1. A bilateral displacement sensor system comprising: means for superimposing a first laser beam at a first frequency and having vertical and horizontal polarization components, a second laser beam at a second frequency and having horizontal polarization components and a third laser beam at the second frequency and having verti-

cal polarization components at a point on a surface of a bilaterally movable body so that each of the first laser beam and the second laser beam and the first laser beam and the third laser beam are incident at a point on the surface of the bilaterally moveable body;



means for detecting the modulation frequency of light scattered by the surface; and means for processing said detected modulation frequency to determine the horizontal and vertical lateral displacement of the bilaterally moveable body.

4,872,752

DIAGNOSIS OF FREE FATTY ACID TOXICITY BY MONITORING RED BLOOD CELLS MORPHOLOGIC CHANGES

Israel Siegel, 5313 Collins Ave. Apr. 412, Miami Beach, Fla. 33140

Continuation-in-part of Ser. No. 713,861, Mar. 20, 1985, abandoned. This application Sep. 23, 1987, Ser. No. 100,287

Int. Cl.⁴ G01N 33/48

U.S. Cl. 356-39

6 Claims

1. A monitoring method for detecting free fatty acid toxicity, in a patient receiving parenteral fat emulsions, said method consisting of microscopically observing a drop of fresh blood of the patient, and comparing the morphology of the red cells in said blood, in their natural wet condition, to the morphology of red cells in serum containing known free fatty acid concentration.

4,872,753

PROCESS CELL WITH TEMPERATURE COMPENSATION

Harald Danigel, and Hans-Rudolf Schatzmann, both of Basel, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jul. 13, 1988, Ser. No. 218,193

Claims priority, application Switzerland, Jul. 22, 1987, 2774/87

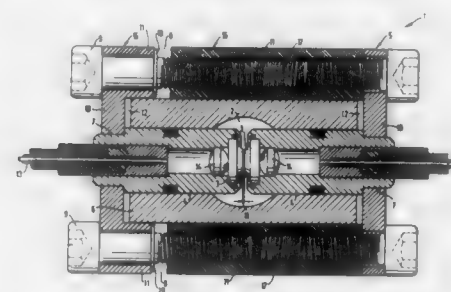
Int. Cl.⁴ G01N 21/05

U.S. Cl. 356-246

12 Claims

1. Process cell (1) with a measuring chamber (2) through which flows particularly a cloudy or dyed or similar liquid with high light absorption upon its processing or further conveyance, which chamber has two windows (3) which upon the measurement lie opposite each other at a short distance, light being introduced into the measuring (2) chamber at one window and being received at the opposite window for further conveyance to a preferably spectroscopic investigation in a photometer or the like, characterised in that the two windows (3) are held in holding devices (4), which are supported by a common frame (5) or the like, which frame (5) is movable relative to the cell housing (6), and that the materials of the holding devices (4) and the frame (5) are matched with regard

to their coefficients of thermal expansion so that the change in length of the frame (5) which is determined by changes in



temperature compensates for the change in length of the holding devices (4) which is determined by changes in temperature.

4,872,754

CONSTANT FREQUENCY DIGITAL CLOSED-LOOP OPTICAL FIBER GYRO

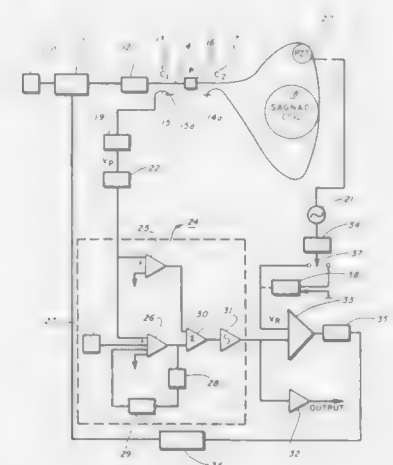
Donald L. Enaley, 303 Tom Jones Ct., Bodega Bay, Calif. 94923

Filed Oct. 7, 1987, Ser. No. 105,880

Int. Cl.⁴ G01C 19/64

U.S. Cl. 356-350

16 Claims



1. A fiber-optic inertial sensor comprising a sensing coil of optical fiber,

a source of optical energy, operating at a known frequency, for supplying an optical signal to said sensing coil, means for digitally modulating the intensity of said optical energy source so that said optical signal comprises a series of optical pulses, each at said known source frequency, for which the optical energy is alternately turned on and off for a finite time period at a known sample rate, a directional coupler connected between said source and both ends of said coil for dividing each pulse of said optical signal between the two ends of said coil so that each pulse of said optical signal is split into two components and propagated in opposite directions through the fiber of the coil, an optical phase modulator operating at a known modulation frequency and connected to said sensing coil for producing a relative phase difference between the two counter-propagating components of the pulses of said optical signal, and time synchronized with the pulses of said optical signal, means for digitally sampling the optical phase modulator waveform at a sample rate determined by the optical phase modulator modulation frequency, said relative

4,872,755

INTERFEROMETER FOR MEASURING OPTICAL PHASE DIFFERENCES

Michael Küchel, Oberkochen, Fed. Rep. of Germany, assignor to Carl-Zeiss-Stiftung, Heidenheim/Brenz, Fed. Rep. of Germany

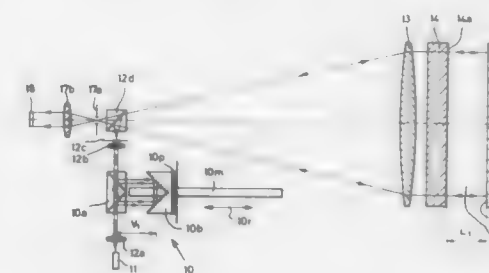
Filed Mar. 7, 1988, Ser. No. 164,790

Claims priority, application Fed. Rep. of Germany, Mar. 7, 1987, 3707331

Int. Cl.⁴ G01B 9/02

U.S. Cl. 356-360

16 Claims



1. An interferometer for measuring optical phase differences which occur between two partial beams reflected from a reference surface and from the surface of the part to be measured, respectively, the interferometer comprising: light source means for providing a coherent beam directed along a beam path; optical delay means for splitting said beam into first and second component beams and for generating a first optical path difference between said first and second component beams and for then congruently recombining said component beams; optical directing means for directing said first and second component beams toward the reference surface and the measurement surface of the part to be measured whereat said partial beams occur and a second optical path difference is generated between said partial beams; said optical delay means including adjusting means for adjusting said first optical path difference to be approximately equal to said second optical path difference; said light source means having a coherence length that is less than said second optical path difference; spatially-resolving receiver means; and, optical means for transmitting said partial beams reflected from said reference surface and said measurement surface, respectively, so as to image said reference surface and said measurement surface on said receiver means.

4,872,756

DUAL PATH INTERFEROMETER WITH VARYING DIFFERENCE IN PATH LENGTH

Barry R. Hill, St. Helens, England, assignor to Pilkington Brothers plc, United Kingdom

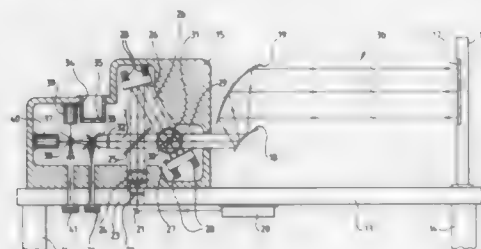
Filed Oct. 16, 1986, Ser. No. 919,860

Claims priority, application United Kingdom, Oct. 17, 1985, 852554

Int. Cl.⁴ G01B 9/02

U.S. Cl. 356—361

12 Claims



1. An interferometer for producing an interference pattern from substantially monochromatic light travelling along respective first and second optical paths, each path having reflection means for returning light components to a common optical path, means to vary the difference between the first and second optical paths to thereby produce an interference pattern in the common optical path, first detector means for detecting a reference part of the interference pattern produced to derive therefrom a reference signal, second detector means for receiving the interference pattern thereby to derive signals indicative of successive parts of said interference pattern, and means for comparing said reference and successive signals to derive therefrom signals indicative of the optical phase difference corresponding to the interference pattern.

4,872,757

OPTICAL CONVEX SURFACE PROFILING AND GAUGING APPARATUS AND METHOD THEREFOR

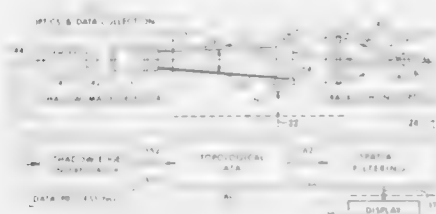
Robert H. Cormack, Boulder, and Carey S. Brown, Denver, both of Colo., assignors to Ball Corporation, Muncie, Ind.

Filed Apr. 20, 1988, Ser. No. 183,763

Int. Cl.⁴ G01B 11/24

U.S. Cl. 356—376

12 Claims



1. An apparatus for displaying the surface profile of a convex object, said apparatus comprising:
means (40) for uniformly producing converging white light over an area larger than the area of an edge of said convex object being profiled,
means (50) opposite said producing means for detecting the shadow image (800) of said edge of said convex object as illuminated by said producing means, said converging white light being focused in said detecting means, said detecting means generating a plurality of pixel outputs for

each of a plurality of vertical locations for said shadow image of said edge,
means (60) for providing movement between said object and said producing and detecting means to provide a plurality of shadow images onto said detecting means corresponding to different edges of said convex object,
means (20) connected to said detecting means and receptive of said plurality of pixel outputs for determining a sub-pixel distance measurement for each of said plurality of vertical locations, said determining means further being capable of arranging said sub-pixel distance measurements into rows of said surface profile corresponding to individual vertical measurements of said shadow image for one of said edges and into columns of said surface profile corresponding to said plurality of edges, and
means (30) connected to said determining means and receptive of said row and column measurements for displaying said surface profile.

4,872,758

FILM THICKNESS-MEASURING APPARATUS

Takao Miyazaki; Yoshiro Yamada, and Isamu Komine, all of Tokyo, Japan, assignors to NKK Corporation, Tokyo, Japan

Filed Jul. 22, 1988, Ser. No. 223,275

Claims priority, application Japan, Jul. 23, 1987, 62-184250

Int. Cl.⁴ G01B 11/06

U.S. Cl. 356—381

10 Claims



1. A film thickness-measuring apparatus comprising:
circularly polarized light forming means for forming circularly polarized light which can be incident on an incidence plane of an object to be measured at a predetermined angle;
beam splitter means for converting the light reflected by the object into a plurality of light beams;
a plurality of analyzers for allowing the plurality of light beams obtained by said beam splitter means to pass at different transmission polarization azimuths, respectively;
electrical signal output means for outputting electrical signals corresponding to light amounts/intensities of the plurality of light beams from said analyzers; and
an arithmetic processing section for receiving the respective electrical signals from said electrical signal output means and performing predetermined arithmetic processing for the electrical signals to obtain an amplitude ratio and a phase of two ellipsometric parameters.

4,872,759

SENSOR FOR GASES OR IONS

Eva-M. Stich-Baumeister, Erlangen; Karl-Otto Dohnke, Forchheim-Kersbach, and Albrecht Winnacker, Erlangen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jul. 7, 1988, Ser. No. 216,134

Claims priority, application Fed. Rep. of Germany, Jul. 8, 1987, 3722449

Int. Cl.⁴ G01N 21/00

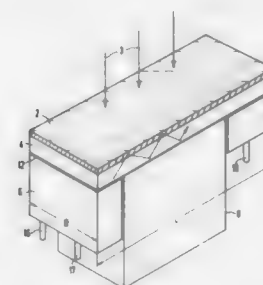
U.S. Cl. 356—432

28 Claims

1. A sensor for detecting gases and ions comprising:
carrier means with at least one flat surface;
light source means with a light emitting surface for generat-

ing light and attached to the carrier means so that the light emitting surface of the source is in the same plane as the flat surface of the carrier;

light detector means with a flat detecting surface for detecting and quantifying light falling thereon, attached to the carrier means on the side of the carrier means opposite that to which the source means is attached, the detector being mounted so that its flat detecting surface is in the same plane as the flat surface of the carrier;



light wave guide means with at least one flat side mounted on the flat surface of the carrier, covering the light means, the detector means, and the flat surface with the waveguide's flat side, conveying light of various intensities from said source means to said detector means; and
thin sensor layer means attached to the waveguide means on the side of the waveguide opposite to the side attached to the carrier for analyzing the gases and ions by changing its absorptivity, and thereby altering light flow through the light waveguide means.

4,872,760

METHOD AND APPARATUS FOR PROCESSING A MIX, PREFERABLY CONCRETE MIX

Alexandr S. Arbeniev; Alexandr A. Ignatiev, both of Vladimir; Vitaly A. Zhilin, Moscow; Alexandr S. Melnikov, and Sergei F. Tomskikh, both of Vladimir, all of U.S.S.R., assignors to Vladimirovskiy Politekhicheskyy Institut Glavnoe Territorialnoye Upravleniye Po Stroitelstvu Vn, Vladimir, U.S.S.R.

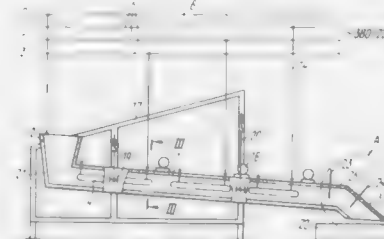
Continuation of Ser. No. 19,598, Feb. 26, 1987, abandoned. This

application Jan. 18, 1989, Ser. No. 298,831

Int. Cl.⁴ B28C 5/46; B01F 11/00, 15/02, 15/06

U.S. Cl. 366—7

12 Claims



1. A method for processing a mix, comprising:
causing the mix to move continuously within an elongated vessel having an inlet end and an outlet end so that said vessel is completely filled;
subjecting said mix to the action of oscillations during said movement;
defining a sealed zone within the vessel during said movement of said mix by sealing said inlet end and said outlet end;
heating at least a portion of said mix to at least 100° C. by causing electric current to flow in the mix during said movement of said mix within said sealed zone, whereby

vapour is formed which penetrates the whole body of said mix to carry out rapid heating of all components of said mix.

4,872,761

EXTRUSION APPARATUS

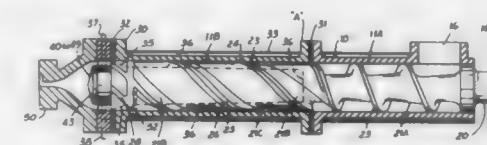
Paul Geyer, 15660 Tacoma, Detroit, Mich. 48025

Filed May 12, 1988, Ser. No. 194,070

Int. Cl.⁴ B29B 1/06

U.S. Cl. 366—79

16 Claims



1. An extrusion apparatus for the mixing and refining of rubber-like materials, either hot or cold feed, and some thermoplastic materials which comprises: an elongated cylindrical barrel member, an elongated rotor member, disposed coaxially in the interior of said barrel member and having an upstream and a downstream end, said rotor member provided with a concentric bore, at said downstream end in which a stationary screw-like member is coaxially disposed; means for relative rotational movement of said rotor member with respect to said barrel member and to said stationary screw-like member, for treating and axially advancing a process material; said barrel, rotor and screw-like members defining a feed end, a forcing zone, a mixing and refining zone, and a discharge end, interposed between said barrel ends; said rotor member being proven in said forcing zone with one or more extrusion grooves, capable of warming, pressurizing and transporting the process material to said mixing and refining zone, said rotor groove being a continuation of said forcing zone and being provided with a two part groove design, the leading portion of which consists of a deep, high lead, or longitudinal extrusion groove, which starts deep, at full extrusion capacity, and progressively decreases in capacity to essentially zero, at the trailing portion of said mixing and refining zone the trailing portion of said two part groove design connects with the downstream edge of said leading portion, by means of the shallow opening formed by the leading end of the groove the process material being directed in a circumferential direction, along the groove, which progressively diminishes in depth to a minimum depth restrictive opening or openings which retard the flow of oversize and less fluent process material, and direct the fine and fluent process material to ports leading radially inwardly to said concentric bore of said rotor member; said stationary screw-like member receives the process material from said ports and by means of an extruder groove configuration, reacting to the rotation of the rotor core bore, extrudes the process material out of said discharge end of the extruder.

4,872,762

METHOD AND APPARATUS FOR DETECTING DEFECTIVE PORTION ON INNER SURFACE OF PIPE

Toshio Koshihara; Rokuro Misawa; Yuzo Sagawa; Kimio Takehara; Yuji Matoba, and Koji Ishihara, all of Tokyo, Japan, assignors to NKK Corporation, Tokyo, Japan

Filed Aug. 2, 1988, Ser. No. 227,366

Claims priority, application Japan, Aug. 25, 1987, 62-209309;

Aug. 25, 1987, 62-209310; Nov. 6, 1987, 62-279321; Dec. 3, 1987,

62-304418; Dec. 16, 1987, 62-190034; Jan. 13, 1988, 63-5397

Int. Cl.⁴ G01N 25/72

U.S. Cl. 374—5

10 Claims

1. A method of detecting a defective portion, including either an accumulation of foreign matter or a thinned out

region on the inner surface of a pipe, the outer surface of which is exposed, comprising:

selectivity heating or cooling a pipe, the outer surface of which is exposed, from the side of the outer surface of the pipe so that a difference in temperature is produced between a portion of the outer surface of said pipe corresponding to a defective portion, including either an accumulation of foreign matter or a thinned out region on the inner surface of the pipe, and a portion of the outer surface of said pipe corresponding to a normal portion of the inner surface thereof;

then shooting the outer surface of said pipe by means of a thermal imaging system while said difference in temperature still remains on the outer surface of said pipe to obtain a thermal image of said difference in temperature; and detecting said defective portion on the inner surface of said pipe by means of the thus obtained thermal image.

7. An apparatus for detecting a defective portion, including either an accumulation of foreign matter or a thinned out region on the inner surface of a pipe, the outer surface of which is exposed, comprising:

a guide prop (11), having a square cross section and a prescribed length, fitted releasably to the outside of a pipe, the outer surface of which is exposed, in parallel with the axis of the pipe;



a first pedestal (12) movable along one surface (11a) of said guide prop (11) in parallel with the axis of said pipe;

a heating mechanism (13), mounted on said first pedestal (12), for heating said pipe from the side of the outer surface of the pipe, said heating mechanism (13) comprising

a reflecting plate (21), having a concavely curved surface concentric with said pipe, and directed toward said pipe;

a plurality of heaters (22) provided on said concavely curved surface of said reflecting plate (21), and

a reflecting plate driving mechanism (23) for return-moving said reflecting plate (21) along the direction of curvature thereof;

a first driving mechanism (14) for moving said first pedestal (12), together with said heating mechanism (13), along said one surface (11a) of said guide prop (11) in parallel with the axis of said pipe;

a second pedestal (15) movable along another surface (11b) of said guide prop (11) in parallel with the axis of said pipe;

a thermal imaging system (b 4), mounted on said second pedestal (15) toward said pipe, for shooting the outer surface of said pipe heated by said heating mechanism (13) to obtain a thermal image of said outer surface; and

a second driving mechanism (16) for moving said second pedestal (15), together with said thermal imaging system (b 4), along said another surface (11b) of said guide prop (11) in parallel with the axis of said pipe.

4,872,763 METHOD OF AND APPARATUS FOR MEASURING LIQUID

Noboru Higuchi; Keizo Matsui; Chuzo Kobayashi, and Shigeru Yamaguchi, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 2, 1988, Ser. No. 188,987

Claims priority, application Japan, May 1, 1987, 62-106412; May 12, 1987, 62-113430; May 14, 1987, 62-115891

Int. Cl.⁴ B01F 15/04

U.S. Cl. 366—160

35 Claims



13. An apparatus for measuring liquid and for mixing at least first and second liquids, the apparatus comprising:

(a) first means for containing the first liquids;

(b) second means for containing the second liquids;

(c) means for receiving respective amounts of the first and second liquids;

(d) first means for defining a flow path between said first containing means and said receiving means;

(e) second means for defining a flow path between said second containing means and said receiving means;

(f) first means for regulating flow-rate of the first liquid along said first flow path means to said means for receiving said first means for regulating having a degree of opening corresponding to the flow-rate;

(g) second means for regulating flow-rate of the second liquid along said second flow path means to said means for receiving said second means for regulating having a degree of opening corresponding to the flow-rate;

(h) means for obtaining an actual measured value corresponding to an amount of liquid received by said means for receiving; and

(i) a control mechanism including:

(1) means for determining the degree of opening of the first and second means for regulating the degree of opening of said first means for regulating being based on the actual measured amount of liquid received by said means for receiving and a first set value and a degree of opening of said second means for receiving being based on the actual measured amount of liquid received by said means for receiving and a second set value and

(2) means for controlling the respective amounts of opening of the first and second means for regulating in response to the determinations of the respective amounts of opening.

4,872,764 COCKTAIL SHAKER

John W. McClean, Lakemba, Australia, assignor to Breville R & D Pty. Ltd., Pyrmont, Australia

Filed Jun. 27, 1988, Ser. No. 212,198

Claims priority, application Australia, Jun. 30, 1987, P12790

Int. Cl.⁴ B01F 7/22

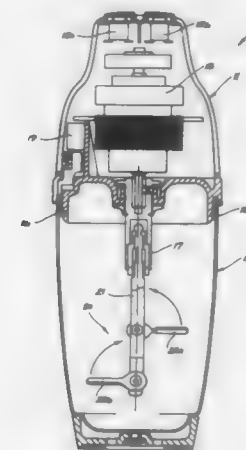
U.S. Cl. 366—251

5 Claims

1. A beverage processing apparatus comprising: an outer housing including an upper portion removably attached to a lower portion to form a closed processing vessel for containing a beverage mixture;

the upper portion including drive means to rotate a processing assembly which extends into the lower portion; the processing assembly including a shaft adapted to be driven by said drive means;

at least one processing blade hingedly attached to the shaft so that the blade can upwardly fold against the shaft to a neutral position in which the blade lies alongside the shaft, on introduction of the shaft to a beverage mixture containing ice or other solid materials;



the blade including a portion lying in a plane tilted upwardly in relation to the axis and rotation of the shaft and operative to promote deflection of the blade towards the neutral position on the blade striking an obstacle during processing; and

the blade being operative in use to extend substantially at right angles to the shaft under the influence of centrifugal force and to deflect into the neutral position in which the blade lies close alongside the shaft upon an adverse collision with solids in the beverage mixture.

4,872,765 DUAL MODE QUARTZ THERMOMETRIC SENSING DEVICE

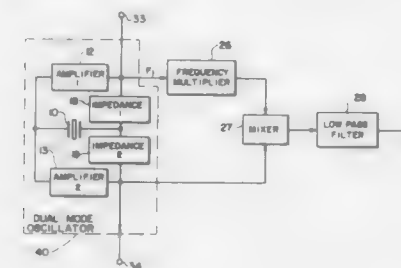
Stanley S. Schodowski, Wayside, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 20, 1983, Ser. No. 487,560

Int. Cl.⁴ H01L 41/10

U.S. Cl. 374—117

14 Claims



1. Apparatus for sensing temperature comprising, in combination:

a single resonator means connected for generating at least two different C-mode harmonic frequency single as defined as F_A and F_B , wherein F_B has a higher harmonic number relative to F_A , the ratio of the higher harmonic number to the lower harmonic number being defined as N ; means for generating a third signal whose frequency is N times the frequency of F_A ; and means for generating a fourth signal which is the resultant of

the subtraction of F_B from said third signal, wherein said fourth signal is used in the sensing of temperature.

4,872,766 TWO-COMPARTMENT PLASTIC BAG

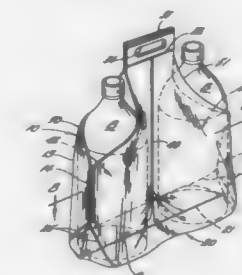
Hugh G. Deacy, Hartsville, S.C., assignor to Sonoco Products Company, Hartsville, S.C.

Filed Nov. 18, 1988, Ser. No. 273,954

Int. Cl.⁴ B65D 30/22, 33/08

U.S. Cl. 383—10

6 Claims



1. A two-compartment plastic bag particularly adapted for carrying two large beverage bottles or like products and being characterized by a construction providing easy insertion and removal of such products into and out of said bag; said bag being fabricated from tubular flexible thermoplastic film and comprising in the flat condition thereof:

generally coextensive overlying front and rear wall portions integrally joined at longitudinally-extending side edges thereof;

a bottom portion including a heat seal extending transversely across and securing together bottom edges of said front and rear wall portions for closing said bottom portion;

a top handle portion including spaced-apart heat seals extending transversely across and securing said front and rear wall portions at a top area thereof, and a hand-receiving cutout formed through said front and rear wall portions between said spaced-apart heat seals and positioned generally medially of the side edges of said front and rear wall portions to form a medial grippable handle in said bag;

a heat seal extending generally longitudinally of and connecting said front and rear wall portions from said top handle portion toward said bottom portion and positioned generally medially between the side edges of said front and rear wall portions to define side-by-side compartments within said bag; and

an open mouth portion at the top of each of said compartments on each side of said top handle portion and being formed by respective oppositely curved cutouts of said front and rear wall portions and each extending downwardly from the top of said top handle portion and outwardly to the said respective side edges of said front and rear wall portions to form easy insert mouths for each said compartment of said bag.

4,872,767 BEARING SUPPORT

Malcolm H. Knapp, Lynnfield, Mass., assignor to General Electric Company, Lynn, Mass.

Filed Apr. 3, 1985, Ser. No. 719,606

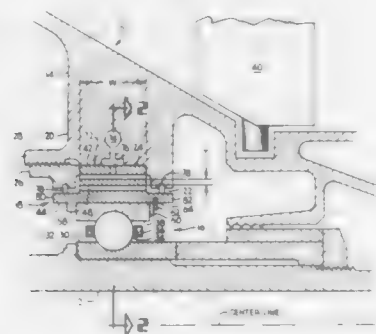
Int. Cl.⁴ F16C 27/00

U.S. Cl. 384—99

24 Claims

1. A bearing support comprising: an annular first shell; an annular second shell being coaxial with and spaced from said first shell for defining an annular space therebetween; at least one elongated, arcuate circling disposed in said

annular space and being substantially concentric with said first and second shells, said circling having first and second opposing ends fixedly attached to said first and second shells, respectively; and



damping means including means effective for channeling a damping fluid into said annular space for cooperating with said circling for damping vibration.

4,872,768

SWIVEL BEARING FOR BRAKING DEVICES

Manfred Brandenstein, Eussenheim; Roland Haas, Hofheim; Wolfgang Friedrich, and Gerhard Herrmann, both of Schweinfurt, all of Fed. Rep. of Germany, assignors to SKF GmbH, Schweinfurt, Fed. Rep. of Germany

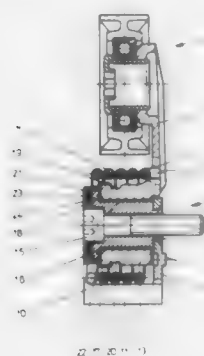
Filed Nov. 22, 1988, Ser. No. 275,204

Claims priority, application Fed. Rep. of Germany, Dec. 11, 1987, 3742030

Int. Cl.⁴ F16C 27/00

U.S. Cl. 384—223

6 Claims



1. A swivel bearing for a braking device comprising a fixed internal machine part, a sleeve section rotatably mounted to said fixed internal machine part, a spring coupled between said machine part and said sleeve section for generating a relative swivel motion between said machine part and said sleeve section, and a damping element installed, a portion of said sleeve section and said machine part having radial friction surfaces, said internal machine part comprising a flange directed radially outward and having radial friction surfaces, a flange sleeve surrounding said flange axially and radially, means for securing said machine part axially and against torsion at said sleeve section, and said damping element adjoining at least one of the friction surfaces of the flange.

4,872,769

FRICTION BEARING SYSTEM FOR A RAPIDLY ROTATING SHAFT

Hans Krause, Bad Nauheim; Rudi Rös, and Helmut Koch, both of Bruchköbel, all of Fed. Rep. of Germany, assignors to Leybold Aktiengesellschaft, Hanau, Fed. Rep. of Germany

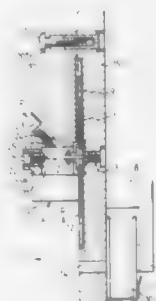
Filed Nov. 4, 1988, Ser. No. 267,245

Claims priority, application Fed. Rep. of Germany, Sep. 6, 1988, 3830181

Int. Cl.⁴ F16C 35/10; G02B 26/04

U.S. Cl. 384—226

5 Claims



1. In an apparatus for measuring the optical absorption ability of a sample under analysis with an optical radiation source for projecting a beam against the sample, a chopper system for the periodical interruption of the measuring beam, a speed-regulated drive system, and a radiation detector for the measuring light affected by the sample, a friction bearing system for a rapidly rotating shaft comprising a chopper disk provided with light passage openings, a shaft affixed to the chopper disk and having pivots at two ends thereof, two bushes, a spider holding one bush and being affixed to a housing part holding the other bush, the spider being provided with a bore running at an angle to the shaft, the longitudinal axis of the bore intersecting the axis of rotation of the shaft, a longitudinally displaceable part and a magnet held in the bore on the longitudinally displaceable part, a ring of magnetic material which is disposed on the shaft, the magnet having a magnetic field acting on the ring of magnetic material.

4,872,770

ANTIFRICTION BEARING WITH SEAL ARRANGEMENT

Thorn W. Dickinson, Berlin, Conn., assignor to The Torrington Company, Torrington, Conn.

Filed Apr. 20, 1989, Ser. No. 340,739

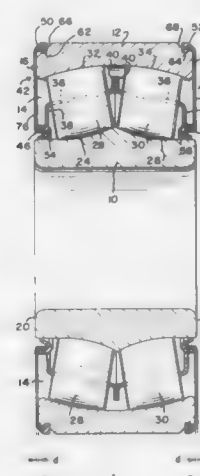
Int. Cl.⁴ F16C 33/72

U.S. Cl. 384—484

1 Claim

1. A bearing comprising: an annular inner race; an annular outer race having an inside diameter greater than the outside diameter of the annular inner race thereby providing an inner race-outer race annulus, both end surfaces of each race extending radially to the axis of the bearing, each end surface of the outer race being spaced axially inwardly from its corresponding inner race end surface, the axial end portions of the outer race having a smaller outside diameter than the outside diameter of the remainder of the outer race, each smaller outside diameter of the outer race having an annular groove; and a pair of axially spaced annular sealing members sealing the inner race-outer race annulus, each sealing member having a metal part consisting of an axially inwardly extending radially inside portion radially spaced from the outside periphery of the inner race, and an axially extending radially outside portion extending over the corresponding smaller outside diameter of the outer race interconnected by a portion having its axially outside surface extending along the same radial plane as the corresponding inner race end surface; a rubber seal lip molded on the metal part inside portion and in contact with the outside periphery of the inner race; and a rubber insert molded on the

metal part outside portion, the rubber insert having an outside diameter substantially the same as the diameter of the remainder of the outer race, the rubber insert also having an annular



portion fitting into said groove whereby the rubber insert is locked in the annular groove when the bearing is inserted into the bore of a housing.

4,872,771

BEARING

Hiroshi Ueno; Tomoaki Satomi, and Terno Yoshida, all of Osaka, Japan, assignors to Koyo Seiko Co., Ltd., Osaka, Japan

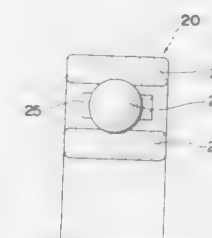
Division of Ser. No. 78,120, Jul. 27, 1987, abandoned. This application Dec. 16, 1988, Ser. No. 285,427

Claims priority, application Japan, Jul. 29, 1986, 62-117399[U]; Jun. 24, 1987, 62-156784

Int. Cl.⁴ F16C 33/32, 33/62

U.S. Cl. 384—492

8 Claims



1. A bearing, comprising: at least two rings formed of a metal of a first hardness; and a plurality of rolling elements in between said at least two rings as bearing members, said rolling elements formed of calcined carbon and provided with a second hardness higher than said first hardness.

4,872,772

THERMAL RECORDER FOR PRINTING DOT PATTERNS HAVING HIGHER DENSITY AT ENDS OF PATTERN

Takahiro Tsukamoto, Mitaka, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

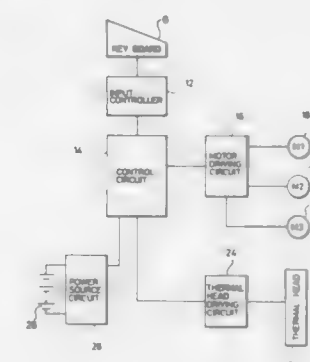
Continuation of Ser. No. 9,570, Jan. 30, 1987, abandoned, which is a continuation of Ser. No. 861,123, May 7, 1986, abandoned, which is a continuation of Ser. No. 704,936, Feb. 25, 1985, abandoned. This application Dec. 5, 1988, Ser. No. 283,058

Claims priority, application Japan, Mar. 1, 1984, 59-37337; Jun. 22, 1984, 59-127395

Int. Cl.⁴ B41J 3/02

U.S. Cl. 400—120

10 Claims



1. A printer comprising: a thermal head having a plurality of heat generating elements for providing dots on a recording medium; generating means for generating dot patterns to be recorded on the recording medium by said plurality of heat generating elements; control means for changing the relative position of the recording medium and said thermal head by an amount smaller than the size of said plurality of heat generating elements; and driving means for selectively driving said plurality of heat generating elements so as to record dots at the ends of the dot patterns with a higher print density than other dots of the dot patterns.

4,872,773

PRINTING WHEEL DISCRIMINATING APPARATUS

Hiroyuki Ueda, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 113,433, Oct. 28, 1987, abandoned, and Ser. No. 804,896, Dec. 5, 1985, abandoned. This application

Mar. 8, 1989, Ser. No. 320,906

Claims priority, application Japan, Dec. 10, 1984, 59-259192

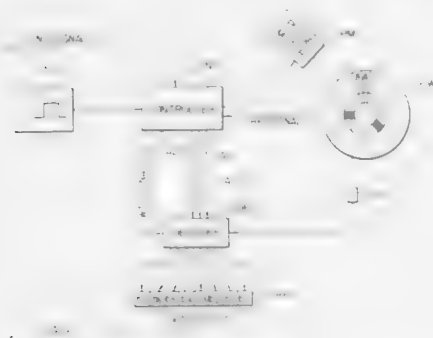
Int. Cl.⁴ B41J 1/30

U.S. Cl. 400—144.2

5 Claims

1. A printing wheel discriminating apparatus for discriminating a printing wheel having a plurality of areas for identifying data, a plurality of type faces around a rotating outer area thereof at specific angles and a reference position, comprising: driving means for rotating said printing wheel, said driving means rotating said printing wheel stepwisely during the wheel discriminating process, with the angle of each stepwise rotation being larger than said specific angles and the entire periphery of said printing wheel being equally divided into predetermined angles which correspond to the angle of each stepwise rotation; detecting means for detecting said area provided on said printing wheel; a first transferring line for transferring a result of detection by said detecting means;

a second transferring line, independent from said first transferring line, for transferring a reference signal representing the reference position of said printing wheel; memory means for storing the result of detection by said detecting means at each predetermined angular position, said memory means containing a number of memory areas corresponding to a number of said areas, and storing said identifying data, if present;



control means for rotating said printing wheel in units of predetermined angles on the basis of the reference signal transferred through said second transferring line, and outputting the contents of said memory as identifying data; and means for defining a printing position of said printing wheel, based on the identifying data output from said control means.

4,872,774

INSTRUMENT FOR WRITING AND DRAWING

Walter Rosso, Turin, Italy, assignor to R.P.R. Righella di W. Rosso & C. S.a.s., Turin, Italy

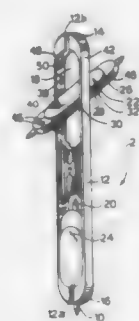
Filed May 4, 1988, Ser. No. 190,181

Claims priority, application Italy, Jan. 13, 1988, 52821/88[U]

Int. Cl.⁴ B43K 27/00, 27/12

U.S. Cl. 401—29

2 Claims



1. A writing and drawing instrument comprising a main body of elongate shape having an elongate axis and a first and a second writing end, first and second auxiliary bodies each having an elongate shape and being provided at its respective ends with a writing element, each of said auxiliary bodies being mounted to rotate about an axis transverse to said elongate axis in order to allow the alternative positioning of one of the two writing elements at one of the writing ends of the main body, each of the auxiliary bodies being able to slide longitudinally with respect to the main body between a first position in which the writing element positioned at the writing end is covered by the main body and a second position in which the writing element projects externally from the main body thereby allowing writing, the main body having two slots in which the respective auxiliary body is slidably and rotatably mounted,

each auxiliary body being provided with grooved lateral surfaces cooperating with stop means designed to prevent the undesired rotation of the auxiliary body with respect to the main body, and each auxiliary body having hinge means cooperating with the main body and ramp means able to cooperate with the stop means for causing resilient lateral deformation of the main body thereby disengaging the hinge means to allow and guide the axial translation of the auxiliary body following the disengagement of the hinge means.

4,872,775

NOTE PAPER-HOLDING PEN

Shi-Lung Chang, P.O. Box 10160, Taipei, Taiwan

Continuation-in-part of Ser. No. 66,221, Jun. 24, 1987,

abandoned. This application Jan. 6, 1988, Ser. No. 141,513

Int. Cl.⁴ B43K 29/12

U.S. Cl. 401—52

4 Claims



1. A slip-holding pen comprising:

a penholder formed as a generally longitudinal cylinder having an inner hollow bore portion and having a male-threaded portion formed on a top end of said penholder, a longitudinal slit formed in an upper portion of said penholder and a lower cap fixed on a lower end of said penholder limiting a lower end of a central stick selected from a pencil lead and an inner ink reservoir of a ball pen;

an upper cap having an upper round cover formed with a central hole therein, a female-threaded portion formed in a lower perimeter of the cap engageable with the male-threaded portion of said penholder, and a plurality of ratchet teeth circumferentially formed on a cylindrical wall inside said cap; a rotating knob having a stem portion rotatably mounted in said central hole of said cap, a round disk secured to said stem portion having a recess inserted with a spring pawl therein, and a male-threaded rod portion protruding downwardly from said round disk, said round disk with said spring pawl clickingly rotatably engageable with said ratchet teeth of said cap to allow a single-direction rotation of said knob;

a slip reel including a central axle rotatably mounted on an upper stick portion of said central stick, two round flanges disposed on an upper end and a lower end of said axle rotatably mounted in the bore portion of said penholder, and a female-threaded hole formed on the upper flange engaged with said male-threaded rod portion of said knob;

a slip roll having a rolled paper strip wound on said axle of said reel, and operatively unrolled to be released through said slit in said penholder, the improvement which comprises: said longitudinal slit includes:

a pair of longitudinal edges generally tangential to a circumferential surface of said bore portion of said pen holder, a pair of wedge portions respectively formed on two opposite ends on a first longitudinal edge of said longitudinal slit approximate and corresponding to two opposite ends of said slip roll; and

said slip roll having two opposite ends of said roll coated and bonded by an adhesive, whereby upon an unwinding rotation of said knob, a slip paper may be torn from said slip roll and released through said slit.

4,872,776

LEAD CHUCK OF MECHANICAL PENCIL

Hidehei Kageyama; Yoshihide Mitsuya, and Yoichi Nakazato, all of Kawagoe, Japan, assignors to Kotobuki & Co., Ltd., Kyoto, Japan

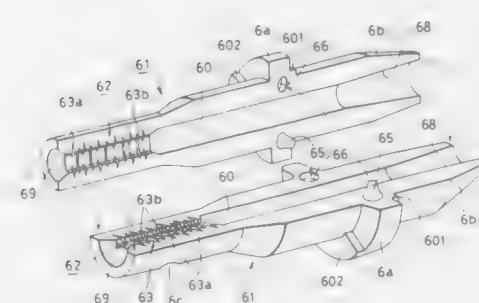
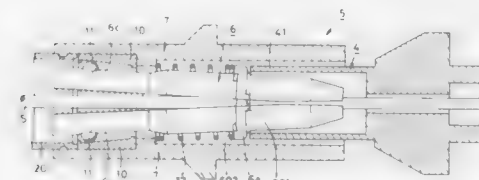
Filed Oct. 30, 1987, Ser. No. 114,745

Claims priority, application Japan, Oct. 30, 1986, 61-167356[U]; Jun. 30, 1987, 62-100526[U]; Sep. 17, 1987, 62-140862[U]

Int. Cl.⁴ B43K 21/22

U.S. Cl. 401—65

9 Claims



1. A lead chuck of a mechanical pencil in which said chuck is completely divided along a lead insertion hole into two chuck members with mutually adjacent substantially planar inner surfaces and mutually oppositely facing semi-circumferential outer surfaces, such that lead can be held therebetween by a lead holding part, disposed at a forward end of said chuck members, by which the lead is fed out by way of expansion of a rearward extremity end of said chuck upon performance of a knocking operation, the improvement comprising:

a flange projected semi-circumferentially about a rear portion of said semi-circumferential outer surface of each of said chuck members, said flange having a forward face and a rearward face;

a first stepped portion projected forwardly from said forward face of each of said semi-circumferential flanges and extending outwardly from a central portion of said semi-circumferential outer surface of each of said chuck members the same radial distance as does each said flange, for receiving a rear end of a resilient member against a front face of each of said first stepped portions of said semi-circumferential flanges;

second stepped portions, each being projected rearwardly from and formed integral with said rear face of each said semi-circumferential flange and projecting outwardly from said semi-circumferential outer surface of each said

chuck member, for receiving an extremity end of a receiving element;

such that when said receiving element is pressed against said second stepped portions, said first stepped portions are pressed against a biasing force of said resilient member and cause a radially outward motion of said extremity end of each said chuck member to thereby result in expansion of said lead chuck and release of said lead.

8. A lead chuck of a mechanical pencil in which a chuck member is completely divided along a lead insertion hole into two chuck segments with mutually adjacent inner surfaces and diametrically opposite semi-circumferential outer surfaces, and forms part of a lead feeding mechanism, said chuck member including a lead holding part formed at an extremity end thereof, and means for expanding said lead holding part during advancing movement of said chuck member when an extremity end of a receiving member presses said chuck member forwardly against a biasing force of a resilient member installed between said chuck member and a sleeve of said lead feeding mechanism, to perform a feeding of said lead, wherein;

said lead holding part is constructed such that corners of raised portions positioned oppositely against both sides of a shallow groove are provided with several first lead holding teeth projected such that, when the sliding surfaces of each chuck segment are facing each other, said first teeth of one chuck segment face said first teeth of the other chuck segment as well as face corresponding first teeth on opposite corners of the same chuck segment, the first teeth are abutted against the outer periphery of the lead along four longitudinal lines thereon when said lead is gripped and the lead is held under a condition in which each lead abutment portion of the first teeth is point contacted; and

second teeth raised from a bottom surface of said shallow groove and having a lower tooth height than that of said first teeth are projected and formed alternately between each of the several first teeth arranged along an axial direction of the mechanical pencil in order to hold the lead with said first teeth and to contact the outer periphery of the lead with said second teeth when said first teeth cut into the outer periphery of said lead and produce a lead thinning phenomenon during prolonged use of the same lead;

such that a new surface of the outer periphery of said lead which has not been cut by said first teeth is held by said second teeth and provides a holding force in addition to that provided by said first teeth when said lead thinning phenomenon occurs.

4,872,777

MEANS AND METHOD OF ERADICATING IMAGES FROM ELECTROSTATIC MEDIA

Gary R. Dalbke, Wooddale, Ill., assignor to Teledyne Industries, Inc., Los Angeles, Calif.

Filed Dec. 3, 1987, Ser. No. 128,348

Int. Cl.⁴ B41J 27/12; C09D 9/00; B43L 19/00; B08B 7/00

U.S. Cl. 401—199

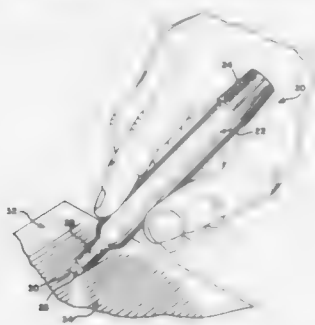
8 Claims

1. A device for removing electrostatic images affixed to various mediums in an electrostatic copier, comprising:

a container;

a felt-like tip member secured to said container and communicating internally with the contents thereof; and,

an image eradicator solution of acetone in water contained within said container to be dispensed therefrom through



said tip member, said eradicator solution containing at least about 85% by weight of acetone.

4,872,778

COATING DISPENSING CARTRIDGE AND SPOUT THEREFROM

William J. Longo, 35865 Timber Ridge La., Willoughby, Ohio
Filed Nov. 16, 1987, Ser. No. 120,992
Int. Cl.⁴ B05C 5/02

U.S. Cl. 401-266

11 Claims



1. A spout for dispensing flowable materials from a container to coat a surface, comprising:

a nozzle connected at one of its ends in fluid communication with the container and having means defining an orifice at its opposite end inclined at an angle relative to the axis of the nozzle, said nozzle being substantially tubular, a single guide means extending transversely from one side of said nozzle;

the entire surface contacting end of said guide means being generally flat with a guide surface inclined at an angle relative to the axis of the nozzle end disposed adjacent to and substantially co-planar with said angled orifice, whereby said guide means is the primary support of said container with nozzle during a dispensing operation of said container.

4,872,779

JOINT DEVICE OF STRUCTURE MEMBER

Katsuhiko Imai, Ashiya, Japan, assignor to Kawatetsu Kenzai Kogyo Kabushiki Kaisha, Hyogo, Japan
PCT No. PCT/JP87/00137, § 371 Date Mar. 29, 1988, § 102(e) Date Mar. 29, 1988, PCT Pub. No. WO88/01323, PCT Pub. Date Feb. 25, 1988

PCT Filed Mar. 4, 1987, Ser. No. 187,662

Claims priority, application Japan, Aug. 19, 1986, 61-193059
Int. Cl.⁴ F16D 1/00

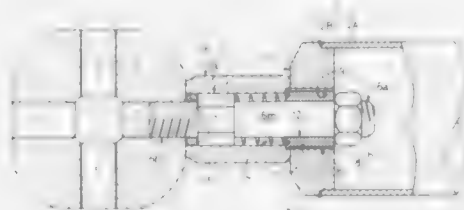
U.S. Cl. 403-171

21 Claims

1. A device for connecting an end of an elongate pipe-like structure member having an internally threaded end, ending at a first contact surface, to a connector node having an internally threaded aperture ending at a second contact surface, comprising:

a bolt having first and second end portions, formed to have

oppositely spiralled threads, the threads of said second end portion being adapted to engage with said threaded node aperture, and intermediate therebetween a cylindrical portion and a torque-transmitting portion; an annular cylindrical bolt-support member, having an internal bore adapted to slidably receive therethrough said first threaded portion and said cylindrical portion of said bolt, provided along a portion of its length with an external thread adapted for engagement with the internal threads of said structure member end; a nut means for engaging said first threaded end portion of the bolt, selected to be diametrically larger than said



internal bore of the bolt-support member but smaller than a diameter of the internal threads of the structure member end; and

a sleeve member having a first end with a first end surface for contacting the first contact surface and a second end with a second end surface for contacting the second contact surface, of the structure member and the node respectively, an internal bore of a cross-section shaped to slidably receive said torque-transmitting portion of the bolt in torque-transmitting engagement therewith, and an external surface formed to be engaged thereat by a suitable sleeve-engaging tool means for applying torque.

4,872,780

MANHOLE COVER SUPPORT WITH BOX FLANGING THEREFROM

Harold M. Bowman, 18867 N. Valley Dr., Fairview Park, Ohio
Continuation-in-part of Ser. No. 76,668, Jul. 23, 1987, and Ser. No. 20,573, Jun. 1, 1988. This application Jan. 15, 1988, Ser. No. 207,185

Int. Cl.⁴ E02D 29/14

U.S. Cl. 404-26

32 Claims



1. A manhole cover support for emplacing into and raising the effective grade of an existing manhole cover receiving structure that has an upwardly-extending shoulder surface, the cover support comprising a base portion with a seat portion, and a lateral keeper portion that is integral with the base portion, the transverse wall thickness of the keeper portion being substantially less than the corresponding transverse thickness of the base, the outer wall of the base portion facing said shoulder surface, the keeper portion projecting upwardly from the seat, the cover support including a hollow stiffening wale that is integral with and substantially coextensive with the top of the keeper portion.

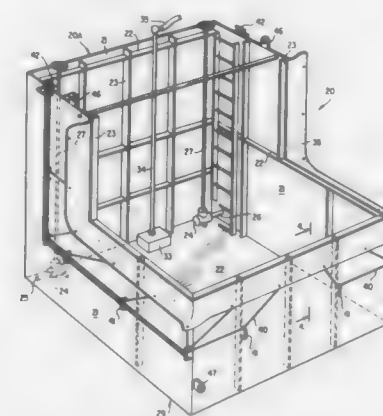
4,872,781

OPEN TOP FLOATABLE BARGE REPAIR BOX WITH BARGE TO BOX SEALING SYSTEM

Joseph B. Childress, 6630 River Pl., Gulf Shores, Ala. 36542
Filed Nov. 18, 1988, Ser. No. 273,451
Int. Cl.⁴ E02D 23/02; B63C 11/00

U.S. Cl. 405-12

6 Claims



1. A watertight floodable barge repair box comprising an L-shaped athwartship construction having a vertical leg and horizontal foot, the top of said vertical leg being open, an open front wall on said leg and an open top wall on said foot, a flexible waterproof unitary contiguous flexible membrane strip one edge of which is secured to said box about the open front wall on said leg and the open top wall of said foot and said strip being of a width to overlap the connection between the barge hull and barge repair box when said barge is in place in a body of water between said leg and said foot, cable attaching means connected between said barge and said barge repair box to maintain said barge in place against said repair box, and tethering means connected between the free edge of said contiguous flexible waterproof membrane and said work box to keep the free edge of said membrane from being engaged between said barge and work box during securing of the barge to the work box which is releasable to permit the waterproof membrane to form a watertight seal between the barge and work box when the work box is secured tightly against the barge prior to pumping the water from the work box.

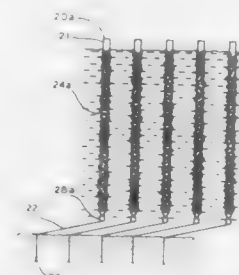
4,872,782

ARTIFICIAL SUBSTRATES FOR MARINE BIOMASS ENHANCEMENT AND WAVE ENERGY ABSORPTION

Rodolphe Streichenberger, 101 Dahlia Ave., Corona Del Mar, Calif. 92628
Filed Apr. 7, 1987, Ser. No. 35,449
Int. Cl.⁴ E02B 3/00; A01K 61/00

U.S. Cl. 405-24

21 Claims



1. An artificial substrate for increasing biomass in a body of water comprising:
a plurality of substrate units, each of said substrate units comprising a buoyant tube connected by a flexible line to

a bottom mooring and separated from adjacent substrate units so as to achieve a predetermined implantation density; and sessile organisms attached to each of said substrate units.

4,872,783

BALANCED BUOYANCY CONTROL DIVING GEAR

Alden T. Greenwood, R.F.D. Box 213, Greenville Rd., Mason, N.H. 03048
Filed Jan. 16, 1988, Ser. No. 207,236
Int. Cl.⁴ B63C 11/08

U.S. Cl. 405-186

7 Claims



1. A buoyancy control system for diver's gear comprising at least an inflatable outer cell having a flexible wall mounted in said gear, means for inflating said outer cell to increase the volume thereof, a deflatable inner cell also having a flexible wall disposed within said outer cell, means for deflating said inner cell and means connecting said flexible wall of said inner cell to said flexible wall of said outer cell at spaced points for common movement thereof whereby deflating of said inner cell reduces the volume of said outer cell and the buoyancy of said diver's gear.

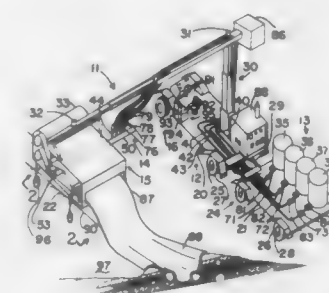
4,872,784

DITCH LINING APPARATUS AND METHOD AND PRODUCT THEREFROM

Le Roy Payne, 3300 Nicholas La., Molt, Mont. 59057
Filed Aug. 23, 1988, Ser. No. 235,205
Int. Cl.⁴ E02B 3/12; E01C 23/03

U.S. Cl. 405-270

18 Claims



1. Mobile continuous ditch lining apparatus including a supporting portion, a raw material supplying portion, a mixing portion, a matrix forming portion and a control portion; said supporting portion including at least one base section, carriage means depending from said supporting portion including at least one transverse axle assembly with wheels mounted on free ends thereof; said raw material supplying portion including a plurality of reservoirs disposed on said supporting portion, said reservoirs being connected independently with said

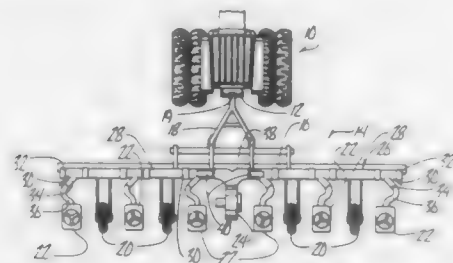
mixing portion through flexible conduit means, blanket support means extending from said supporting portion; said mixing portion including an elongated chamber mounted on said supporting portion adjacent said blanket support means, a plurality of deflector sections within said mixing chamber spaced along the length thereof; said matrix forming portion including elongated mixture delivery means disposed closely adjacent to said mixing chamber and substantially parallel to said blanket support means, pressure applying means disposed subsequent to said mixture delivery means; said control portion including pump means, valve means and flow monitoring means disposed along the length of each of said conduit means, drive means advancing a continuous porous blanket through said matrix forming portion, programmable memory means and actuating means responsive thereto respectively controlling and activating said pump means, valve means and drive means; whereby a solidifiable liquid mixture is applied to said porous blanket as it passes through said matrix forming portion and the combination immediately laid into a ditch continuously while the liner is deformable and conforming it to the ditch so it will be set in the configuration thereof.

4,872,785

SHUT-OFF MEANS FOR AIR-ACTUATED PLANTER
Timothy L. Schrage, Jay T. Schrage, and Lester Schrage, all of 420 Locust St., P.O. Box 565, Allison, Iowa 50602
Filed Jan. 22, 1988, Ser. No. 146,860
Int. Cl.⁴ B65G 53/40

U.S. Cl. 406-155

9 Claims



1. A seed planter, comprising:

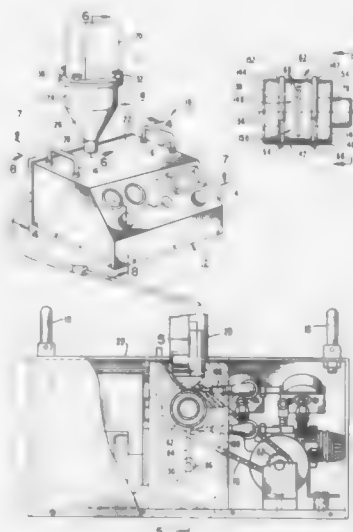
a frame device including an elongated frame member; means for securing said elongated frame member to the rearward end of a tractor;
a plurality of air-actuated row planter units secured to said elongated frame member in spaced relation;
an elongated air conduit secured to and extending in parallel relationship to said elongated frame member;
an air fan means on said frame device and in communication at a juncture with said air conduit for moving air through said air conduit;
means connecting said row planter units to said air conduit so that air moving in said air conduit can operate said row planter units;
a plurality of air valve means in said air conduit and adapted to open and close different segments of said air conduit to the flow of air;
and control means operatively connected to said air valve means whereby some of said row planter units can be selectively closed to air flow while other of said row planter units can be open to air flow to permit seed planting by some of said planter units while rendering inoperative other of said seed planter units.

4,872,786

SOLID PARTICULATE AEROSOL GENERATOR
Thomas M. Braden, 5737-G Arrow Hwy., Montclair, Calif.
Filed Apr. 6, 1987, Ser. No. 34,914
Int. Cl.⁴ B65G 53/46, 53/08

U.S. Cl. 406-68

11 Claims



1. A solid particulate aerosol generator for accurately dispersing a predetermined quantity of a solid particulate material having a mean diameter less than about 0.2 microns so as to provide a highly precise aerosol concentration of the particulate material which is useful in the testing of HEPA filters, the solid particulate aerosol generator comprising:

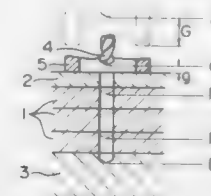
- (a) a reservoir for storing the solid particulate material;
- (b) a wheel rotatable about a horizontal axis of rotation, the wheel being disposed below and in fluid communication with the reservoir, the wheel being a right circular cylinder having a first end surface, a second end surface and a continuous radial surface, the radial surface abutting the first end surface along a first radial edge and the radial surface abutting the second end surface along a second radial edge, the radial surface having an upper radial surface moiety above the axis of rotation and a lower radial surface moiety below the axis of rotation;
- (c) a first o-ring groove disposed radially around the radial surface proximate to the first radial edge and a second o-ring groove disposed radially around the radial surface proximate to the second radial edge, the first o-ring groove and the second o-ring groove being disposed in parallel planes which are perpendicular to the axis of rotation;
- (d) a first o-ring disposed within the first o-ring groove and a second o-ring disposed within the second o-ring groove;
- (e) at least four pockets disposed evenly around the radial surface between the o-ring grooves, each pocket having a predetermined volume and a single open side;
- (f) scraping means disposed proximate to the radial surface upper moiety for scraping excess solid particulate material from above the single open side of each pocket;
- (g) a conveying conduit disposed below and in fluid communication with the radial surface lower moiety; and
- (h) a venturi mixer having a throat in fluid communication with the conveying conduit and having an inlet side and a delivery port.

4,872,787

METHOD OF DRILLING PRINTED CIRCUIT BOARD
Kunio Arai, Atsugi; Hiroshi Nishiyama, Ebina; Hiroshi Aoyama, Tokyo, and Yasuhiko Kanaya, Machida, all of Japan, assignors to Hitachi Seiko Ltd., Tokyo, Japan
Filed Oct. 9, 1987, Ser. No. 106,439
Claims priority, application Japan, Dec. 19, 1986, 61-301285
Int. Cl.⁴ B23B 35/00, 4/00, 47/00

U.S. Cl. 408-1 R

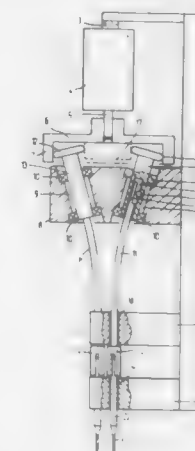
20 Claims



1. A method of drilling a hole in a printed circuit board in which stacked printed circuit boards are fixed by a pressure foot for the drilling, comprising the steps of:

- setting a drill start position at which said pressure foot is not in contact with said printed circuit boards, a pulled-out position at which the pressure of said pressure foot acts on said printed circuit boards and at which a drill bit is located just above said stacked printed circuit boards, a plurality of intermediate positions successively located at certain points in a depthwise direction of said hole, and a hole bottom position at which the drilling of said hole is completed;
- setting and entry feed rate at which said drill bit initially drills said printed circuit boards, a drilling feed rate which ensures satisfactory drilling, and a rapid feed rate which is faster than said drilling feed rate;
- repeating, after said drill has been fed from said drill start position to a first intermediate position at said entry feed rate, a cycle which includes a step of feeding said drill from said first intermediate position to said pulled-out position at said rapid feed rate and a step of feeding said drill from said pulled out position to a next intermediate position at said drilling feed rate; and
- returning said drill to said drill start position at said rapid feed rate after said drill has reached said hole bottom position.

holes to be drilled, coupling means being provided in the space between the drill guide block and the spindle guide block for



connecting the shanks of drill bits placed in the bores of the drill guide block to the spindles.

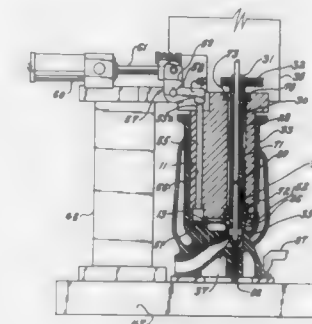
4,872,789

METHOD AND APPARATUS FOR MACHINING VALVE SEATS AND VALVE STEM GUIDES IN A DEEP-WALLED ENGINE MONOBLOCK WORKPIECE

Nathaniel L. Field, Northville, Mich., assignor to Ford Motor Company, Dearborn, Mich.
Division of Ser. No. 137,994, Dec. 28, 1987, Pat. No. 4,836,719.
This application Apr. 3, 1989, Ser. No. 331,722
Int. Cl.⁴ B23B 41/12

U.S. Cl. 408-79

8 Claims



1. An apparatus for machining valve seats at the end of an axially deep cavity of a workpiece having an axially clampable surface adjacent one or more of said valve seats, the apparatus comprising:

- (a) a rotary spindle support having a nonrotatable housing effective to fit closely to the interior of the cavity within a tolerance of 0.01 inches and effective to move along the axis of the cavity, a first rotary spindle carried within a central bore of said housing and movable axially with the housing;
- (b) a cutting tool carried by the lower extremity of said spindle for machining said valve seats at the end of said workpiece cavity; and
- (c) clamping means for securing said housing against radial movement when the extremity of the spindle of said housing is located proximate to said valve seat but allowing limited axial movement of the housing and spindle to

4,872,788

MULTI-SPINDEL DRILLING MACHINE
Gerrit C. Koese, Steljastraat 6, 953 RE Baflo, Netherlands
Continuation of Ser. No. 137,598, Dec. 24, 1987, abandoned.
This application Feb. 1, 1989, Ser. No. 304,650
Int. Cl.⁴ B23B 39/16

U.S. Cl. 408-46

18 Claims

1. A multi-spindle drilling machine for simultaneously drilling a plurality of holes, in particular suitable for drilling a plurality of tiny, closely-spaced holes, characterized by a cup-shaped drivable drive wheel, the inner wall of the drive wheel coating with a plurality of friction wheels, each connected to a flexible spindle, whose ends away from the friction wheels extend through bores in a spaced apart spindle guide block, which bores correspond with opposite bores in a drill guide block and are disposed in accordance with the pattern of the

permit machining contact between the cutting tool and workpiece.

4,872,790 SEGMENTED DIE

Wade Sibole, 15704 Livingston Rd., Accokeek, Md. 20607
Filed Dec. 18, 1987, Ser. No. 134,905
Int. Cl.⁴ B23G 5/00

U.S. Cl. 408—221

3 Claims



1. A die comprising at least two completely separable complementary members interfitting each other, each of said members having an inner surface defining at least one lobe with recesses positioned on either side thereof, said lobes having thread cutting surfaces thereon whereby the lobes and recesses define an annular inner surface and a substantially contiguous outer surface when the members are mated together, said outer surface being formed of a plurality of flat contiguous wrench-engaging surfaces, a recess formed and extending about the entire wrench-engaging surfaces, an expansible coiled spring of annular configuration seated in said recess maintaining said members in mating engagement allowing the members to separate out of contact with one another to permit their passing over an element to be threaded and thereafter to be re-engaged therewith, whereafter the wrench-engaging surfaces can be engaged for turning the same.

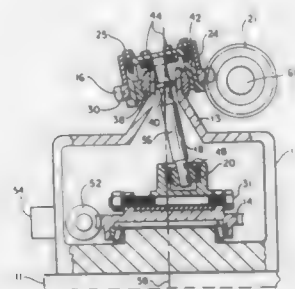
4,872,791

METHOD OF FORMING CROWNED GEAR TEETH
John H. Crankshaw, Erie, Pa., assignor to Dynetics, Inc., Erie, Pa.

Filed Jun. 27, 1988, Ser. No. 211,865
Int. Cl.⁴ B23F 9/00

U.S. Cl. 409—12

9 Claims



1. A method for making a gear coupling designed to connect a first rotary member to a second rotary member to operate at misalignment at a predetermined angle comprising:
providing a first gear having teeth,
providing a gear cutting machine having cutting means thereon that is adapted to simulate the teeth of said first gear,
providing gear support means on said gear cutting machine, supporting a gear blank to be shaped into a second gear on said gear support means,
engaging said blank with said cutting means and simulta-

neously moving said gear blank and said cutting means relative to one another substantially in the same manner that said first gear and said second gear are intended to move when operated as a misalignment coupling at said predetermined angle of misalignment,
whereby said blank is formed into a crowned tooth gear having the same number of teeth as said first gear,
installing said first gear with said second gear thereby forming a coupling for operation at said predetermined angle of misalignment with substantially no interference between said teeth on said first gear and the teeth cut in said second gear.

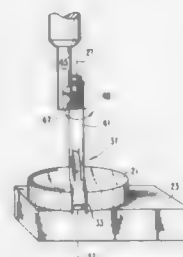
4,872,792 PISTOL GRIP CHECKERING

Kim M. McCubbin, Longrove, Iowa, assignor to Springfield Armory, Inc., Geneseo, Ill.

Filed Dec. 8, 1988, Ser. No. 281,806
Int. Cl.⁴ B23C 9/00

U.S. Cl. 409—131

18 Claims



1. A method for checkering the convex face of a pistol grip frame, comprising the steps of:
mounting a metal pistol grip frame to a rotatable holder with the convex face of said pistol grip exposed;
mill cutting a successive series of parallel, generally lateral cuts around the convex face of said pistol grip frame by rotating said rotatable holder about a holder pivot axis, wherein said pistol grip frame is rotated with respect to a mill cutter; and
mill cutting a successive series of parallel, generally longitudinal cuts along the convex face of said pistol grip frame by moving said pistol grip frame and a mill cutter longitudinally with respect to each other, wherein a pattern of cut checkering is formed in the convex face of said pistol grip frame.

4,872,793

METHOD OF AND APPARATUS FOR SERRATING A STEERING WHEEL

Takehiro Minagawa; Toshio Stou; Masao Miyata, all of Fuji; Kenji Nemoto, and Kuninobu Uchida, both of Sayama, all of Japan, assignors to Nihon Plast Co., Ltd., Shizuoka and Honda Giken Kogyo Kabushiki Kaisha, Tokyo, both of, Japan

Filed Oct. 4, 1988, Ser. No. 252,998

Claims priority, application Japan, Oct. 7, 1987, 62-252661

Int. Cl.⁴ B23D 37/10

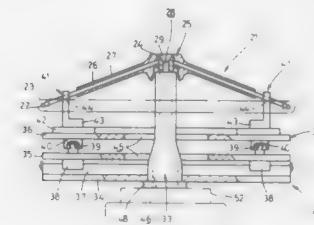
U.S. Cl. 409—244

7 Claims

1. A method serrating a steering wheel by setting the steering wheel on a serrating broaching machine, inserting a serrating broach into a through hole defined in a boss of the steering wheel, and then pulling the serrating broach with a broach chuck gripping the serrating broach to cut serrations on an inner surface of the through hole in the boss, said method comprising the steps of:

positioning said steering wheel horizontally movably and nonrotatably in a prescribed angular orientation on said broaching machine while placing said boss on a holder of said broaching machine;

inserting the serrating broach through said through hole in said boss into said holder of the broaching machine while holding said serrating broach in a prescribed angular orientation around the axis thereof with respect to said broach chuck; and



pulling the serrating broach from said boss with said broach chuck gripping said serrating broach to cut serrations on the inner surface of said boss.

4,872,794

TANK MOUNTING APPARATUS

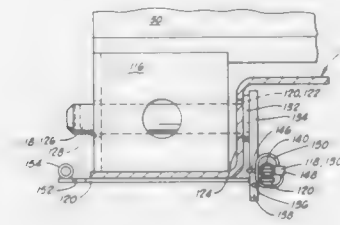
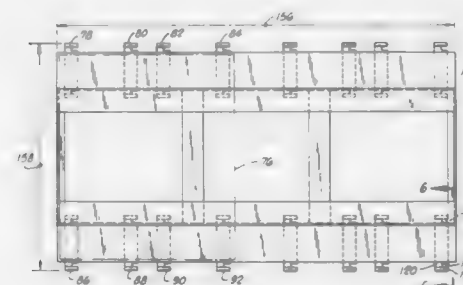
Gail F. Davis, and Robert L. Baker, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed May 27, 1988, Ser. No. 199,970

Int. Cl.⁴ B61D 45/00

U.S. Cl. 410—54

10 Claims



1. A tank mounting assembly, comprising:
a tank having a plurality of tank legs extending downward therefrom;
a mounting rack having a plurality of mounting positions defined thereon for receiving said tank legs, said mounting rack including at least one first pin receiving hole disposed through a substantially vertical wall of said rack and aligned with at least one second pin receiving hole disposed through each of said tank legs, said mounting rack further having at least one notch defined therein and associated with said first pin receiving hole;
a connecting pin received through said aligned first and second pin receiving holes, said connecting pin having a locking bar fixedly attached to one end thereof and ex-

tending radially therefrom and received in said notch of said mounting rack; and
pin retainer means, connected to said rack, for retaining said locking bar in said notch and thereby retaining said connecting pin in said first and second pin receiving holes.

4,872,795

NUT ASSEMBLY WITH ROTATABLE SLEEVE FOR TAKING UP BACKLASH

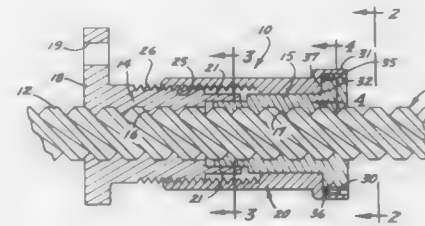
Evy P. Davis, Crystal Lake, Ill., assignor to Dana Corporation, Toledo, Ohio

Filed Sep. 9, 1988, Ser. No. 243,332

Int. Cl.⁴ F16B 37/00; F16H 55/18

U.S. Cl. 411—433

9 Claims



1. A nut assembly adapted to be threadably connected with a screw and movable axially relative to the screw as an incident to relative rotation between the nut assembly and the screw, said nut assembly comprising first and second nuts disposed end-to-end with one another and having threads adapted to mate with the thread of the screw, connecting means coupling said nuts against relative rotation while permitting the nuts to move axially relative to one another, a sleeve telescoped with said nuts and having one end portion threadably connected to said first nut whereby said sleeve moves axially relative to said nuts when said sleeve is rotated relative to said nuts, coaxing means on said second nut and on the other end portion of said sleeve and engaging one another in such a manner as to tend to force said second nut axially away from said first nut when said sleeve is rotated in one direction relative to said nuts, a plurality of first detent means spaced angularly from one another around one of said second nut and said sleeve, second detent means carried by the other of said second nut and said sleeve, said second detent means normally being axially slidably engaged with certain ones of said first detent means and normally coupling said sleeve and said second nut against relative rotation, and said second detent means releasing said certain ones of first detent means and then engaging different ones of said first detent means when said sleeve is rotated relative to said nuts with torque of sufficient magnitude to overcome the rotational coupling effect of said certain ones of said detent means.

4,872,796

COMPOUND DEVICE FOR PUNCHING AND BINDING
Kun-Chih Hsieh; Jien-Hung Chow, and Hsin-Chien Chen, all of P.O. Box 10780, Taipei 10099, Taiwan

Filed Jun. 17, 1988, Ser. No. 208,162

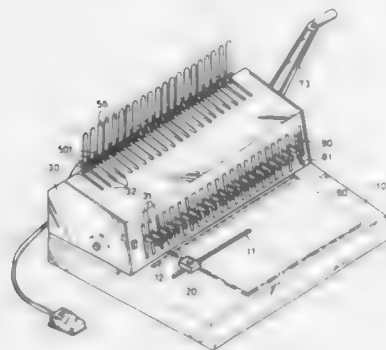
Int. Cl.⁴ B42L 19/12

U.S. Cl. 412—16

5 Claims

1. A compound device for punching and binding includes:
a base having a transverse slot and a transverse scale;
a power member fixed upon the rear portion of the said base;
a cover with several vertical slots on its front plate and several horizontal L-shaped slots on its top plane;
a coaxial dual shaft means composed of a main shaft and a manual shaft;
a couple of pinions fixed on the said main shaft;
a couple of racks engaged with the said pinions being fixed on the punch bar;

a comb plate providing comb and guide slots for slide plate to slide along;
 a hook plate to open the bindings;
 a slide plate driven by the shifting arm to push the said hook plate to and fro;
 a swing arm fixed on the said manual shaft has a rod at its swing end;
 a couple of shifting arms having an indent on their middles respectively to hold the said rod of swing arm and having



a rod around their upper ends respectively to drive the said slide plate; and
 the said coaxial dual shaft means is composed of two individual shafts, which can be either joined together as a connected shaft or divided into two individual shafts—one manual shaft and one mainshaft, which can rotate separately/synchronously by removing/inserting a pin, and therefore, the device can be driven by either electric motor or by manpower while the binding operation is always operated by manpower.

4,872,797

BOOK OPENING APPARATUS

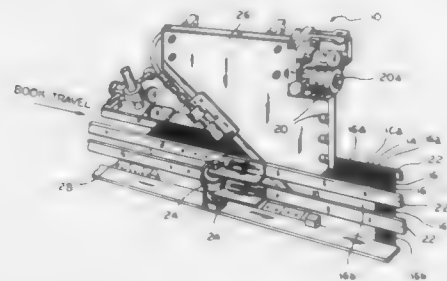
Jorg Schnitter, Glenview, Ill., assignor to R.R. Donnelley & Sons Company, Chicago, Ill.

Filed Dec. 1, 1988, Ser. No. 278,498

Int. Cl.⁴ B42C 5/00

U.S. Cl. 412—25

20 Claims



1. An apparatus for opening a book at a preselected location in the book, the book having a plurality of pages held in assembled relation with adjacent foreedges substantially in contact with one another, the apparatus comprising:
 means for delivering the book to an opening station, said delivering means being adapted to move the book from a supply station to the opening station and thereafter away from said opening station;
 means at said opening station for holding the pages of the book in assembled relation as the book is moved by said delivering means; and
 rotatable means at said opening station for initiating separation of the pages of the book by contacting and entering

the book at one end of the adjacent foreedges of the pages, said rotatable means causing one of the pages to be separated from the next adjacent page at said preselected location in the book.

4,872,798

VESSEL TO DOCK CARGO TRANSFER APPARATUS

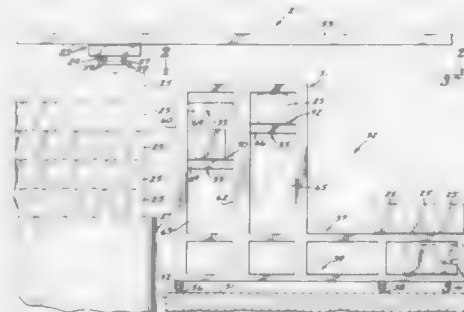
Allan R. Ide, 4020 Elm St., Apt. A, Long Beach, Calif. 90807

Filed Jun. 5, 1987, Ser. No. 59,263

Int. Cl.⁴ B65G 63/00, 67/60

U.S. Cl. 414—141.3

7 Claims



1. Cargo handling apparatus for transferring containers of cargo between a dock and a vessel and comprising:

a transfer frame mounted on said dock and formed with an upstanding open top elevator tower defining an elevator shaft, said tower being formed in its side facing said ship with a vertically elongated topless doorway for passage therethrough of such containers, said frame being further formed adjacent the bottom of said tower with a laterally projecting accumulator frame;

elevator means mounted in said tower and formed with at least one upwardly facing container support means for receiving such containers and operative to be raised between an elevated container transfer level and a lower accumulator level;

accumulator conveyor means mounted on said accumulator frame at said accumulator level for receipt of multiple ones of said containers for accumulation thereof;

an overhead boom mounted on said dock and projecting horizontally over said tower and said vessel to define therebelow a pathway leading from said vessel through said topless doorway and over said container support

a trolley mounted on said boom for travel thereon between said tower and said vessel;

hoist means on said trolley, including deployable cable means suspending container grabbing means for grabbing said containers, said hoist means being operable to raise and lower said container grabber means concurrent with travel of said trolley along said pathway to pass through said topless doorway to transfer such containers from various levels on said ship directly onto said upwardly facing support means; and

drive means for driving said trolley along said boom, raising and lowering said hoist and raising and lowering said container support means in said tower and for driving said conveyor means whereby said drive means may be actuated to drive said trolley means along said boom to be positioned over containers loaded on said vessel, said hoist actuated to lower said grabber means onto a container, said grabbing means actuated to grab said container and, said hoist means actuated to raise said container as said trolley is driven along said boom carrying said container along said pathway and through said topless doorway for deposit directly on said container support means which is lowered by said drive means to said accumulator level for transfer to said accumulator conveyor means.

4,872,799

BOAT TRANSFER AND QUEUING FURNACE ELEVATOR AND METHOD

Daniel J. Fisher, Jr., Chelmsford, Mass., assignor to BTU Engineering Corporation, North Billerica, Mass.

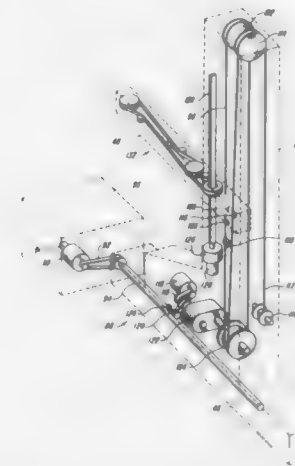
Continuation of Ser. No. 734,919, May 16, 1985, abandoned.

This application Jun. 16, 1987, Ser. No. 65,182

Int. Cl.⁴ B65G 25/00; F27D 3/00

U.S. Cl. 414—180

5 Claims



1. A high-output, multiple-processing semiconductor processing system providing transfer and queuing of selected ones of whole furnace loads of boat-loaded wafers all at once to and from any selected one of a plurality of boat-loading mechanisms that are each operatively associated with a corresponding one of plural semiconductor processing furnace tubes of a semiconductor processing furnace in such a way that the several mechanisms and tubes respectively are axially aligned, comprising:

a work station at which a furnace load of semiconductor wafers as a whole are temporarily deposited for subsequent transfer to boat-loading mechanisms for processing in a selected furnace tube, at which a furnace load of already processed semiconductor wafers as a whole are temporarily deposited from said boat-loading mechanisms after processing in a selected furnace tube, and at which each of one or more furnace loads of semiconductor wafers as a whole are temporarily queued while being transferred between several furnace tubes during multiple-processing;

said work station including one or more intermediate transfer shelves upon which said wafers are queued during transfer, a loading shelf upon which said wafers are deposited for transfer to a selected furnace tube, and an unloading shelf upon which said wafers are deposited after processing in selected ones of the furnace tubes;

said work station being stationed at a work station position selected in relation to said boat-loading mechanisms of the several furnace tubes so as to provide unobstructed operative transfer pathways therebetween;

means for transferring as a whole any one of said furnace loads of wafers between any one of said boat-loading mechanisms and any one of said shelves of said work station along said pathways, said transferring means including

a body having a tower upstanding along a Z axis, an arm extending from the tower along an X axis and a frame attached to the arm, said frame having fingers extending along a Y axis for engaging a furnace load of wafers to be moved as a whole between said work station and said boat loading mechanisms, wherein said X axis is parallel to said axial alignment of said boat loading mechanism, said Y

axis is horizontally perpendicular to said X axis and said Z axis is mutually orthogonal to said X and Y axis;

means coupled to said body for controllably providing access of said fingers to a plurality of stopping positions along a first range of said X axis, said first range defined at least between the X coordinates of said boat-loading mechanisms and the X coordinate of said position of said work station; said means coupled to said body further for controllably providing access of said fingers to a plurality of stopping positions along a second range of said Y axis, said second range of at least defined between the Y coordinates of said boat-loading mechanisms, the Y coordinates of said work station position, and the Y coordinates of the X axis, said means coupled to said body further for controllably providing access of said fingers to a plurality of stopping positions along a third range of said Z axis, said third range at least defined by the Z coordinates of said boat-loading mechanisms and by the Z coordinates of said shelves of said work station;

said controllably providing access means including an X drive sub-assembly;

said X-drive sub-assembly including an X-drive motor mounted at a Z coordinate below said third range of said Z axis to keep X-drive motor generated pollution below said operative transfer pathways; and

an X-linkage coupled between said X-drive motor and said body for providing access of said fingers to any selected X coordinate of said first range of said X axis;

said controllably providing access means further including: a Z-drive sub-assembly;

said Z-drive sub-assembly including a Z drive motor mounted at a Z coordinate below said third range of said Z axis to keep Z-drive motor generated pollution below said operative transfer pathways; and

a Z-linkage coupled between said body and said Z-drive motor for providing access of said fingers to any selected Z coordinate of said third range of said Z axis; and said controllably providing access means further including a Y-drive sub-assembly;

said Y-drive sub-assembly including a Y-drive motor mounted at a Z coordinate below said third range of said Z axis to keep Y-drive motor generated pollution below said operative transfer pathways; and

a Y-linkage coupled between said Y-drive motor and said body for providing access of said fingers to any selected Y-coordinate of said second range of said Y axis, said Y-linkage including a flat bar journaled in said arm and coupled to said Y drive motor, and means for moving said fingers along said Y axis coupled between said flat bar and said frame having fingers.

4,872,800

UNIT GOODS STORAGE

Sergei K. Gutov, ulitsa Ramenka, 7 korpus 1, kv. 76; Dmitry A. Plesser, ulitsa Seleznevskaia, 30, korpus 3, kv. 14, and Grigory A. Radutsky, ulitsa Pervomaiskaya, 66, kv. 45, all of Moscow, U.S.S.R.

PCT No. PCT/SU87/00030, § 371 Date Nov. 12, 1987, § 102(e) Date Nov. 12, 1987, PCT Pub. No. WO87/05584, PCT Pub. Date Sep. 24, 1987

PCT Filed Mar. 13, 1987, Ser. No. 156,915

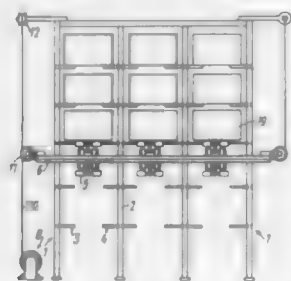
Claims priority, application U.S.S.R., Mar. 14, 1986, 4033006 Int. Cl.⁴ B65G 1/04

U.S. Cl. 414—278

1 Claim

1. A unit goods storage comprising: racks; a framework of each of said racks made up of vertical masts; shelves cantilevered at one end to said vertical masts, said shelves having other ends facing each other to form vertical passages; horizontal conveyors having frames and having ends extending beyond said framework and arranged one in each of the passages; a rope and sheave system serving as a drive to cause vertical movement of said conveyors over an entire height of said framework between said other ends of the shelves; stiff tubular

members interconnecting ends of said frames of the conveyors at both ends of each of the conveyors; ropes of said rope and sheave system extending through said stiff tubular members, said stiff tubular members and said frames of the conveyors



defining a permanent stiff gridwork means for supporting said conveyors and said gridwork means being always located in said passages between said shelves of said racks and moved within said passages by said rope and sheave system.

4,872,801

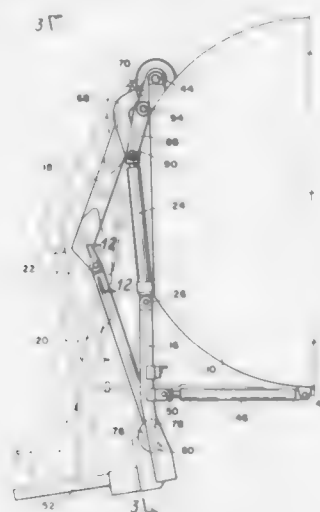
SIDE REFUSE LOADER FOR VEHICLES

Kenneth L. Yeazel, Tulsa, and Robert J. Forester, Broken Arrow, both of Okla., assignors to Crane Carrier Company, Tulsa, Okla.

Filed Sep. 10, 1987, Ser. No. 95,409
Int. Cl.⁴ B65F 3/02

U.S. Cl. 414-409

4 Claims



1. An apparatus for use in lifting a trash can off the ground to above the bin of a refuse collection vehicle so that the trash can is emptied through a hole in the top of said bin which comprises:

- two guide rails each with a guide channel having a long straight section and a curved section at the top end;
- an upper torsion bar rotatably supported from said bin at a fixed location with respect thereto near the top of said guide rails;
- means rotatably attaching the top ends of said guide rails to said upper torsion bar in a non-sliding relationship;
- push means pivotally connected to a lower end of the guide rails and said bin to rotate the guide rails about the upper torsion bar;
- grabber means for grabbing said trash can;
- a pair of lift arms, each said arm having an upper arm segment and a lower arm segment;

means rigidly attaching the upper end of said upper arm segments to said upper torsion bar;

means pivotally connecting the lower end of said lower arm segments to said grabber means including roller means to guide the grabber means along said guide channel;

means to rotate said upper torsion bar.

4,872,802

APPARATUS AND METHOD FOR REMOVING THE CONTENTS OF A CAN

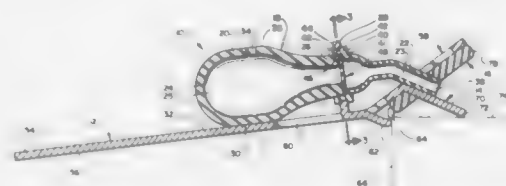
Ross E. Abbe, 2721 Victor St., Bellingham, Wash. 98225

Filed Jan. 29, 1987, Ser. No. 67,931

Int. Cl.⁴ B65B 69/00

U.S. Cl. 414-417

12 Claims



1. An apparatus to remove contents from a container having a first open portion, a peripheral wall portion and an end wall portion at least partially enclosing the contents, the apparatus comprising:

- (a) a handle having a rear end and a front operating end, the handle being arranged to be grasped and rotated manually, said handle having a locating member adapted to engage the can at a pivot location adjacent to said end wall portion;
- (b) an opening means located at the front end of the handle spaced from said locating member and arranged to be located adjacent to the end wall portion in a first operating position preparatory to forming an opening in the wall portion, and further arranged to be moved by rotation of the handle along a handle operating path to a second operating position where the opening is formed in the end wall portion;
- (c) an opening air sealing means mounted at the front end of the handle and arranged to be moved into sealing engagement with the end wall portion at a sealing position by rotation of the handle along the handle operating path to enclose the opening; and
- (d) a manually operable air pressurizing means mounted on said apparatus to inject air through the air sealing means and through the opening formed in the end wall portion to pressurize the interior area of the can.

4,872,803

FORCE CONTROLLING SYSTEM

Kazuo Asakawa, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 675,867, Nov. 28, 1984, abandoned.

This application Mar. 29, 1988, Ser. No. 175,616

Claims priority, application Japan, Nov. 30, 1983, 58-226301; Nov. 30, 1983, 58-226302

Int. Cl.⁴ B25J 15/08

U.S. Cl. 414-730

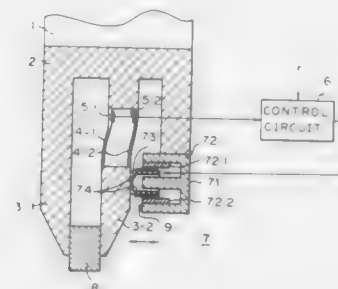
92 Claims

1. A force generating apparatus for applying a force to an object by receiving a force information signal, comprising:

- a base member;
- an elastic member fixed to said base member and producing a reactive force when it is displaced;
- a movable member, fixed to said elastic member, for applying said force corresponding to said force information signal to said object;

detecting means, provided on said elastic member, for detecting the displacement thereof, so that said detecting means generates a displacement signal corresponding to the displacement;

driving means for driving said movable member, comprising a linear motor having a stator side fixed to said base member and a movable side fixed to said movable member; and control means, connected to said detecting means and to said driving means for controlling said driving means by said



force information signal to move said movable member along a displacement direction, thereby applying a force to said object, and for controlling said driving means by said displacement signal to move said movable member along said displacement direction, thereby counteracting said reactive force of said elastic member, wherein said reactive force is counteracted and said movable member applies only a force corresponding to said force information signal to said object.

4,872,804

WIND TURBINE HAVING COMBINATION WIND DEFLECTING AND FRAME ORIENTING MEANS AS WELL AS DUAL RUDDERS

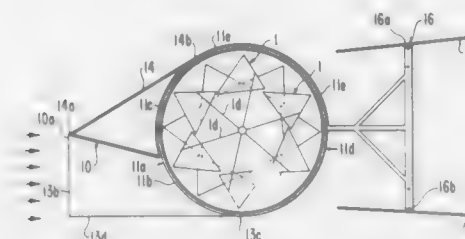
Antonio Teles De Menezes, Junior, Fremunde, Quita da Vista Alegre, Portugal

Continuation-in-part of Ser. No. 905,329, Sep. 9, 1986, abandoned. This application Aug. 26, 1987, Ser. No. 89,561
Claims priority, application Portugal, Sep. 17, 1983, 81146

Int. Cl.⁴ F03D 1/04

U.S. Cl. 415-2.1

19 Claims



1. A device for generating power from wind comprising: a shaft having a central axis extending vertically in an axial direction;

propelling elements mounted on said shaft; a frame mounted for rotation about said shaft, said frame supporting said shaft for rotation about said central axis due to a force of the wind acting on said propelling elements;

wind deflecting means associated with said frame in combination with rudder means for orienting said frame to have a portion thereof facing the direction of travel of the wind and the wind deflecting means deflecting wind into said propelling elements, said portion of said frame comprising an open first part and a closed second part of said frame, said wind deflecting means deflecting the wind to strike said propelling elements at a position radially outwardly

of said central axis of said shaft and radially inwardly of said first part of said frame and said wind deflecting means preventing the wind from striking said propelling elements at a position radially inwardly of said second part of said frame, said wind deflecting means having a pair of sidewalls forming a vertically extending edge which faces into the wind and which lies in a plane which contains said central axis of said shaft and which is parallel to the wind direction;

said rudder means being disposed on a side of said frame opposite to said portion thereof facing the wind, said rudder means being reflected by the wind for providing forces which counteract wind faces acting on said pair of sidewalls for orienting of said portion of said frame in an angular position facing the direction of the wind, said rudder means comprising a pair of spaced-apart rudders separated from each other in a direction perpendicular to said central axis, each of said rudders being pivotable about a rudder axis parallel to said central axis and being fixable in any one of a plurality of desired angular positions with respect to said rudder axis.

4,872,805

WATER POWERED DEVICE

Kotaro Horiuchi, Hamamatsu, and Masato Suzuki, Iwata, both of Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

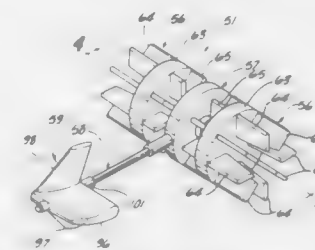
Division of Ser. No. 792,970, Oct. 30, 1985, Pat. No. 4,737,070. This application Nov. 2, 1987, Ser. No. 115,339

Claims priority, application Japan, Jul. 31, 1985, 60-167638; Jul. 31, 1985, 60-167639

Int. Cl.⁴ F03B 7/00

U.S. Cl. 415-7

20 Claims



1. A water powered device adapted to be positioned in a stream of water to be powered by the water movement, said device comprising first, second and third axially spaced components, at least one of said components comprising a water wheel having a plurality of vanes and being rotatable about an axis, and at least another of said components comprising a water driven device comprising an outer housing, a driven element contained within said outer housing and having an input shaft driven by said water wheel for driving said driven element, at least two of said components having a cylindrical outer peripheral surface of greater diameter than the remainder of said two components and the remaining component for rolling of said device along the ground on said two component outer peripheral surfaces.

4,872,806

CENTRIFUGAL PUMP OF VORTEX-FLOW TYPE

Yutaka Yamada, 42, 2-chome, Komemoto-cho, Tsushima-shi, Aichi-ken; Tadashi Kozawa; Naohiro Natsume, and Hirofumi Komatsubara, all of Oobu, Japan, assignors to Aisan Kogyo Kabushiki Kaisha, Oobu and Yutaka Yamada, Aichi, both of, Japan

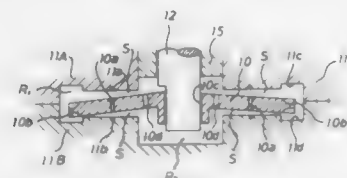
Filed May 16, 1988, Ser. No. 194,517

Claims priority, application Japan, May 15, 1987, 62-119887; Jan. 31, 1987, 62-192813; Sep. 8, 1987, 62-224983

Int. Cl.⁴ F04D 5/00

U.S. Cl. 415—55.5

5 Claims



1. A centrifugal pump of the vortex-flow type comprising a pump housing defining therein an arcuate pump chamber in surrounding relationship with a central sealed chamber, and a disc-like impeller rotatably and axially movably assembled within said pump housing and having opposite end faces each forming a close clearance with a corresponding internal end wall of the pump housing between the sealed and pump chambers, said impeller having on either end face of the rim portion thereof a plurality of circumferentially spaced vane grooves which cooperate with the pump chamber to produce a discharge pressure therein and being formed with at least one pressure balancing hole extending axially therethrough in the interior of the sealed chamber,

wherein the opposite end faces of said impeller are each formed at an intermediate annular portion thereof with a plurality of circumferentially spaced arcuate recesses which are arranged in surrounding relationship with the sealed chamber and tapered toward an axial hole formed in said impeller at each center of said arcuate recesses.

4,872,807

STATIC PRESSURE SYSTEM FOR GAS TURBINE ENGINES

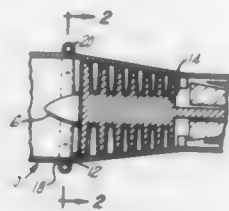
Frank B. Thompson, North Palm Beach, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 5, 1988, Ser. No. 279,633

Int. Cl.⁴ F01D 17/08

U.S. Cl. 415—118

3 Claims



1. For a gas turbine engine having a casing defining an inlet for leading air to said engine, a plane transverse to said inlet defining the upstream end of said engine, means for measuring the static pressure for obtaining a value of the total pressure of the airstream in said inlet that exhibits a value within a tolerance that is acceptable to be used in an engine control, said means including a plurality of ports circumferentially spaced in said casing located in proximity to said face for leading static pressure into a common manifold, and means for measuring the pneumatic pressure in said manifold for obtaining an average

value of the static pressure of the air being admitted into said engine.

4,872,808

CENTRIFUGAL PUMP MODULAR BEARING SUPPORT FOR PUMPING FLUIDS CONTAINING ABRASIVE PARTICLES

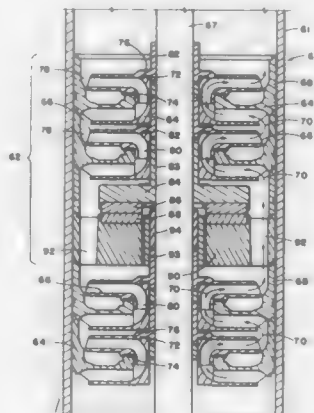
Brown L. Wilson, Tulsa, Okla., assignor to Oil Dynamics, Inc., Tulsa, Okla.

Filed Jun. 22, 1987, Ser. No. 64,685

Int. Cl.⁴ F04D 29/02

U.S. Cl. 415—170.1

16 Claims



1. A submersible pump for pumping fluids which may contain abrasives which comprises:

- a plurality of vertically oriented diffusers which form an outer casing;
- a longitudinal shaft rotatably mounted through the center of said diffusers;
- an impeller for each said diffuser, each impeller having a hub supported by said shaft and axially moveable thereon, the bottom of each hub of each impeller capable of abutment with the top of the next lower impeller hub to transfer down thrust to said next impeller hub;
- a thrust bearing assembly positioned about said shaft, said assembly having a thrust plate rotatably supported to said shaft for receiving said down thrust from the bottommost of said hubs; and
- a stationary thrust bearing in contact with said thrust plate, said thrust bearing supported to said outer casing of said diffuser whereby said down thrust is transferred to said outer casing.

4,872,809

SLURRY PUMP HAVING INCREASED EFFICIENCY AND WEAR CHARACTERISTICS

Graeme R. Addie, and Robert J. Visintainer, both of Augusta, Ga., assignors to GIW Industries, Inc., Grovetown, Ga.

Filed Mar. 6, 1987, Ser. No. 22,787

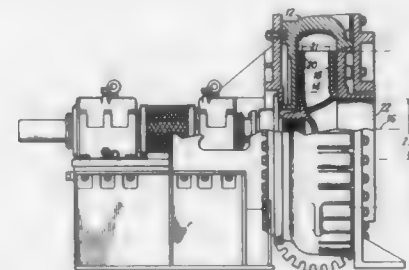
Int. Cl.⁴ F04D 29/44

U.S. Cl. 415—206

3 Claims

- 1. A centrifugal pump for pumping a slurry, comprising:
 - (a) a shell defining a pump housing, said shell having a longitudinal axis and a radius and further including:
 - (1) a throat having an actual throat area;
 - (2) a tongue positioned along a peripheral portion of said shell; and
 - (3) an outlet branch; and
 - (b) an impeller rotatably disposed within said housing for rotation about said axis, said impeller including:
 - (1) an outlet area;
 - (2) a plurality of vanes;

- (3) an inside and outside shroud secured to said vanes and defining a shroud width;
 - (4) an outside diameter; and
 - (5) an eye having a diameter;
- wherein the ratio of the impeller outlet area to the shell actual throat area is from about 5.0 to about 9.0, wherein the ratio of the radius of the shell at said tongue to the radius of the shell



at right angles to a branch centerline is from about 0.8 to about 0.9, wherein the ratio of said impeller outside diameter to said shroud width is from about 5.0 to about 78.0, wherein the ratio of said impeller outside diameter to said impeller eye diameter is from about 1.5 to about 3.5, and wherein the ratio of said impeller outside diameter to said shell radius at said tongue is from about 1.5 to about 1.8.

4,872,810

TURBINE ROTOR RETENTION SYSTEM

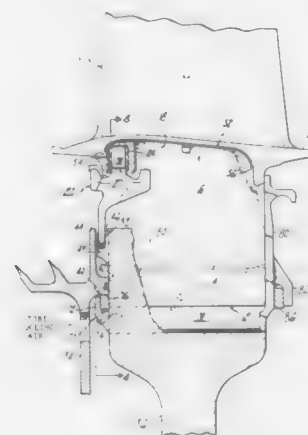
Wesley D. Brown, Jupiter; Edward C. Hill, Tequesta, and Peter T. Vercellone, Lake Worth, all of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 14, 1988, Ser. No. 284,269

Int. Cl.⁴ F01D 5/26

U.S. Cl. 416—145

10 Claims



6. In combination, a damper and interplatform seal for a gas turbine engine having a turbine comprising a disk and a plurality of blades extending radially from and being circumferentially supported in the rim of the disk, means for absorbing excessive vibratory motions occasioned by the rotation of the turbine, said means including a damper formed from a weighted element having an inner diameter and outer diameter in its assembled position and opposing side walls, opposing pockets formed in the neck of each of said blades being dimensioned to accept the side walls of said element at its outer diameter, a TOBI rotor seal adjacent said disk and extending radially adjacent the necks of said blades and defining a cavity, the inner diameter of said element being trapped in said cavity, a lug on said blade extending axially toward said TOBI rotor seal and overlying a portion of said inner diameter of said element, whereby said element is trapped in the assembled position and movable between adjacent blades to absorb the

energy induced by vibratory motion experienced by said turbine and each of said blades having a platform extending over the rim surface of said disk, said interplatform seal comprising a relatively flat rectangular plate member curved at either end fitting underneath adjacent platforms to seal the lateral extending gap between adjacent platforms, nubs formed on the forward and rearward underside surface of said platform for receiving and retaining said plate member, and a shelf defined by the top wall of said pockets defining a gap for permitting said plate member from sliding over the top surface of said damper.

4,872,811

INBOARD SERVO FOR MARINE CONTROLLABLE PITCH PROPELLERS

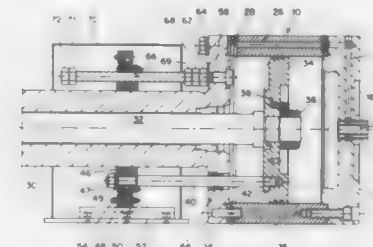
Joseph L. Cavallaro, Canton, and Patrick J. Kelly, Jr., Shrewsbury, both of Mass., assignors to Bird-Johnson Company, Walpole, Mass.

Filed Aug. 3, 1987, Ser. No. 80,785

Int. Cl.⁴ B63H 3/08

U.S. Cl. 416—162

4 Claims



1. In an inboard servo for controlling the pitch of a marine controllable pitch propeller of the type in which the pitch is controlled by a force rod received in and movable axially of a propeller drive shaft, the servo having a hydraulic cylinder adapted to be affixed to the shaft coaxially with and for rotation with the shaft, a piston in the cylinder coupled to the force rod, means for supplying hydraulic fluid under pressure selectively to the cylinder on either side of the piston to move the piston and force rod forward or aftward for propeller pitch control, a feedback device for detecting the position of the force rod as an indication of the actual pitch of the propeller, and an emergency lock device for preventing movement of the force rod relative to the shaft the improvement wherein the feedback device includes a feedback ring located externally of and proximate to an end wall of the cylinder and concentric with the cylinder axis and at least two connecting rods located symmetrically with respect to the axis of the force rod and coupling the feedback ring to the piston for conjoint movement therewith, the connecting rods passing through openings in said end wall of the cylinder in sealed relation, and, wherein the emergency lock device includes at least two threaded locking rods affixed to the cylinder and received freely through holes in the feedback ring in symmetrical relation with respect to the axis of the force rod such that the feedback ring can move freely relative to the threaded rods, over the entire working stroke of the piston, and at least one locking nut received by each locking rod, each locking nut normally being positioned on the respective threaded rod in a location where it is not engageable by the feedback ring at any point during the working stroke of the piston in controlling propeller pitch but being adapted to be threaded along the respective locking rod and into engagement with the feedback ring at a selected point along the working stroke of the piston to establish and hold a selected propeller pitch by preventing movement of the feedback ring relative to said end wall and consequently preventing the piston from moving relative to the feedback ring.

because of the fixed connection between the feedback ring and the piston afforded by the connecting rods.

4,872,812

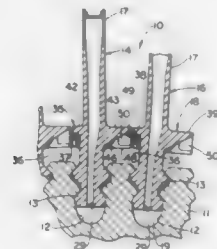
TURBINE BLADE PLATFORM SEALING AND VIBRATION DAMPING APPARATUS

David G. Headley, Wyoming, and William A. Litzinger, Cincinnati, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Aug. 5, 1987, Ser. No. 81,773
Int. Cl.⁴ F01D 5/22

U.S. Cl. 416—190

18 Claims



1. An insert element to be loosely received between first and second opposing and converging edge surfaces of adjacent blade platforms of a rotor of a gas turbine engine and, in response to centrifugal forces acting thereon due to high rotor rotation speed, to seal a gap between the edge surfaces and to dampen vibration of the blades, said element comprising:

an elongated body having a longitudinal axis and at least three element surfaces configured and arranged symmetrically about said longitudinal axis so that, irrespective of the orientation with which said element is received between the platform edges, the centrifugal forces will drive one of said element surfaces into sealing engagement against the first edge surface and will drive another of said element surfaces into sealing engagement against the second edge surface.

4,872,813

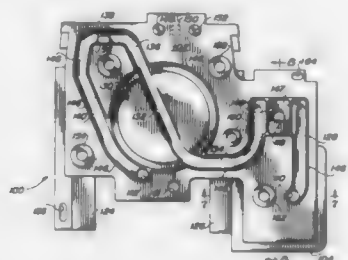
DISPOSABLE CASSETTE FOR A MEDICATION INFUSION SYSTEM

Lanny A. Gorton, Sunland, and John P. Pelmulder, Chatsworth, both of Calif., assignors to Pacemaker Infusion, Ltd., Sylmar, Calif.

Filed Dec. 1, 1987, Ser. No. 127,333
Int. Cl.⁴ E04B 21/00, 39/14

U.S. Cl. 417—63

19 Claims



1. A disposable cassette for use with a medication infusion system, comprising:

a cassette body having an upper surface, said cassette body including a cylinder disposed below the upper surface of said cassette, one end of said cylinder being sealingly attached to the bottom of said upper surface, the other end of said cylinder being open, said upper surface of said

cassette body having disposed therein first, second, and third apertures extending therethrough, said second aperture being in communication with the interior of said cylinder at said one end thereof;

piston means located in said cylinder for varying the fluid volume contained in said cylinder by alternately drawing fluid into said cylinder through said second aperture and forcing fluid out of said cylinder through said second aperture;

an inlet passageway recessed into said upper surface of said cassette body, said inlet passageway being open on the top side of said upper surface, one end of said inlet passageway being in fluid communication with said first aperture through which fluid is supplied to said inlet passageway, the other end of said inlet passageway being located near to said second aperture;

an outlet passageway recessed into said upper surface of said cassette body, said outlet passageway being open on the top side of said upper surface, one end of said outlet passageway being located near to said second aperture, the other end of said outlet passageway being in fluid communication with said third aperture through which fluid is removed from said outlet passageway;

diaphragm means for sealing the open top sides of said inlet and outlet passageways; and

flexible, resilient domed valve means for forming a cavity over a portion of said upper surface of said cassette body including said other end of said inlet passageway, said second aperture, and said one end of said outlet passageway, said cavity being in fluid communication with said inlet passageway, said second aperture leading to said cylinder, and said outlet passageway, said valve means being selectively deformable to prevent the flow of fluids between said inlet passageway and said second aperture, said valve means also being selectively deformable to prevent the flow of fluids between said second aperture and said outlet passageway.

4,872,814

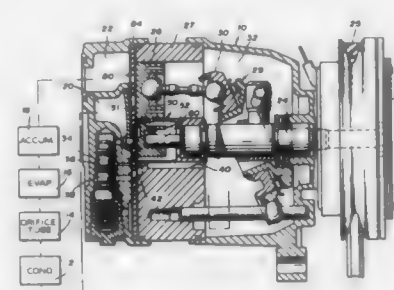
VARIABLE DISPLACEMENT COMPRESSOR PASSIVE DESTROYER

Timothy J. Skinner, E. Amherst; Joseph L. Spurney, Tonawanda, and Weiming Ma, Williamsville, all of N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed Jun. 9, 1988, Ser. No. 204,338
Int. Cl.⁴ F04B 1/26

U.S. Cl. 417—222

2 Claims



1. A variable stroke axial piston wobble plate compressor comprising a suction cavity, a discharge cavity, a sealed crankcase, a drive shaft extending through said crankcase, a tiltable wobble plate mechanism in said crankcase mounted on and driven by said drive shaft, stroke increase control valve means for connecting said discharge cavity to said crankcase thereby to affect pressure increase therein tending to tilt said wobble plate mechanism toward a zero piston stroke position, stroke decrease control valve means for connecting said suction cavity to said crankcase thereby to affect a pressure decrease therein tending to tilt said wobble plate mechanism toward a

maximum piston stroke position, said compressor being characterized by a valve member having a counterweight portion and a flat valve face, said valve member receiving an end portion of said shaft with substantial radial clearance therebetween, drive means operatively drivingly connecting said valve member to said end portion for rotation therewith and guiding radial movement of said valve member relative to said shaft, a spring arranged so as to normally urge contact of said end portion and valve member thereby to normally establish said valve member in a closed valve position and yieldable in response to centrifugal force generated by said counterweight portion at a predetermined shaft speed to permit centrifugally forced movement of said valve member to an open valve position, a compressor part having a flat surface facing said valve face, a regulating passage permanently open to said discharge cavity and extending through said flat surface at a port in central axial alignment with said shaft, a delivery passage permanently open to said crankcase and extending through said flat surface at a port radially outward of said regulating passage port, a spring arranged between said shaft end portion and said valve member continuously forcing sealing contact of said valve face with said flat surface of said compressor part, said valve face having channel means therein positioned to be closed to said regulating passage port by contact of said valve face with said flat surface in said closed valve position and to be continuously open thereto during rotation of said valve member with said shaft when said valve member is in said open valve position, said channel means further positioned to be closed to said delivery passage port by contact of said valve face with said flat surface in said closed valve position and to be continuously open thereto during rotation of said valve member with said shaft when said valve member is in said open valve position whereby said channel means effects communication between said discharge cavity and said crankcase only when said valve member is urged by centrifugal force to said open valve position at said predetermined shaft speed.

4,872,815

SLANT PLATE TYPE COMPRESSOR WITH VARIABLE DISPLACEMENT MECHANISM

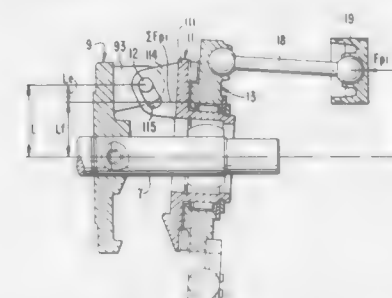
Kazuhiko Takai, Maebashi, Japan, assignor to Sanden Corporation, Gunma, Japan

Filed Feb. 19, 1988, Ser. No. 157,783

Claims priority, application Japan, Feb. 19, 1987, 62-36445
Int. Cl.⁴ F04B 1/26, 27/08

U.S. Cl. 417—222

8 Claims



1. In a wobble plate type compressor with a variable displacement mechanism, the compressor comprising a compressor housing having a cylinder block provided with a plurality of cylinders which in turn are associated with a suction chamber, said compressor also having a crank chamber adjacent the cylinder block, a drive shaft rotatably supported in the housing, a cam rotor fixed on the drive shaft and further connected to an inclined plate wherein the connection comprises a hinge means for providing variable inclination of the inclined plate with respect to the drive shaft, a wobble plate adjacent the inclined plate, rotational motion of the inclined plate being converted into nutating motion of the wobble plate, and a plurality of pistons coupled with the wobble plate each of which is reciprocally fitted within a respective one of the cylinders and of which the stroke volume is changed in accor-

dance with variation of the angle of the inclined plate, the improvement comprising:

said hinge means comprising return means for permitting the inclined plate to rapidly return to its maximum angular orientation, which maximizes said stroke volume, solely in response to the difference between crank chamber pressure and suction chamber pressure, said return means including a first arm portion extending from the cam rotor, said first arm portion having a guide pin fixedly secured thereto, wherein the distance between the center of said guide pin and the central axis of said drive shaft is selected from within the range and inclusive of 78–90 percent of the distance between the central axis of at least one of said cylinders and the central axis of said drive shaft and the distance between the guide pin and the central axis of the shaft substantially remaining constant during variation of the angle of the inclined plate.

4,872,816

EVACUATION PUMP ASSEMBLY

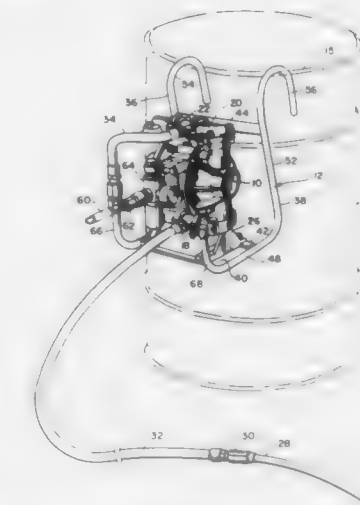
Michael Fetcko, Habron, Ind., assignor to The Aro Corporation, Bryan, Ohio

Filed Oct. 28, 1988, Ser. No. 263,688

Int. Cl.⁴ F04B 55/00

U.S. Cl. 417—360

4 Claims



1. An improved portable pump assembly for evacuation of fluid from a reservoir for discharge into a container, said assembly comprising, in combination:

a pump having an inlet manifold with an inlet and a outlet manifold with an outlet; and
a bracket for supporting the assembly on a container, said bracket including:
a support platform for the pump; and
a first hollow tube attached to the platform, said tube defining at one end thereof a support hook for supporting the platform on the container and including a fluid inlet connector at the opposite end, said outlet of the pump being attached to the inlet connector to thereby direct pumped fluid through the tube for discharge from the support hook end into the container, the inlet to the inlet manifold being attached to a fluid inlet conduit.

4,872,817

INTEGRAL DEFLECTION WASHER COMPRESSOR WHEEL

Jack De Kruij, Carson, Calif., assignor to Allied-Signal Inc., Morristown, N.J.

Filed Jul. 19, 1984, Ser. No. 632,761

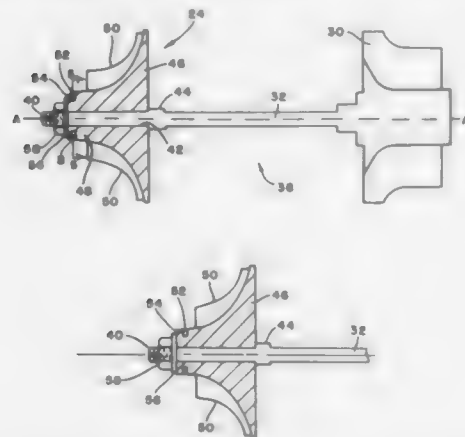
Int. Cl.⁴ F04B 17/00

U.S. Cl. 417—407

3 Claims

1. A rotor-shaft assembly comprising:

a shaft having a mounting face thereon defined by a shoulder;
 a rotor having two mounting faces and a nose portion;
 means, having a mounting face, for securing said rotor to said shaft adjacent said shoulder in a rotatable relationship;
 means, integral with said rotor, for preventing the rotation of imbalance of said rotor-shaft assembly during attachment



ment of said rotor to said shaft, said means comprises an annular slot extending radially inward from the outer surface of said nose portion.

4,872,818

ROTARY PUMP HAVING ALTERNATING PISTONS CONTROLLED BY NON-CIRCULAR GEARS

Akira Takami, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
 PCT No. PCT/JP87/00537, § 371 Date Mar. 21, 1988, § 102(e) Date Mar. 21, 1988

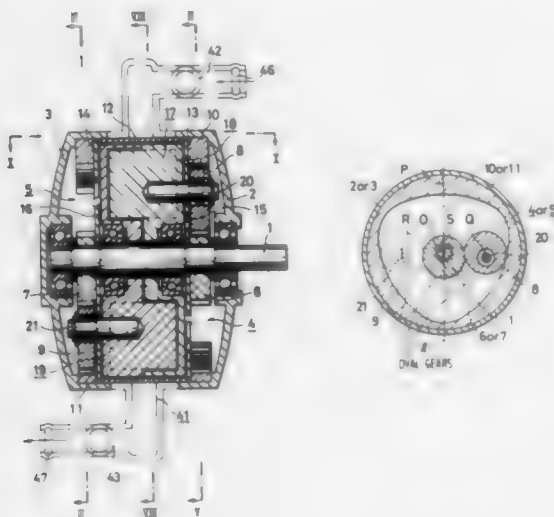
PCT Filed Jul. 23, 1987, Ser. No. 184,553

Claims priority, application Japan, Jul. 26, 1986, 61-176288

Int. Cl.⁴ F04C 2/077

U.S. Cl. 418—36

1 Claim



1. A rotary pump apparatus, comprising:
 (a) means (12-16) defining a cylindrical chamber (17),

- (b) suction port means and discharge port means individually defined by the chamber,
- (c) a pair of generally cylindrical rotary pistons (18, 19) disposed within the chamber, each piston defining a plurality of sector shaped, axially directed projections (32) individually separated by an equal plurality of sector shaped recesses (31) spanning greater arcs than the projections, said pistons being disposed facing each other such that the projections of each are accommodated within the recesses of the other,
- (d) a drive shaft (1) extending centrally and axially through the chamber and pistons,
- (e) bearing means rotatably supporting the pistons on said drive shaft,
- (f) a pair of sun and planet gear systems (4, 5) disposed axially flanking the chamber and pistons and individually associated with said pistons, each system comprising:
 - (1) a non-circular sun gear (6, 7) eccentrically mounted to the shaft for rotation therewith,
 - (2) a non-circular planet gear (8, 9) eccentrically mounted to an associated piston and disposed in engagement with an associated sun gear, and
 - (3) a stationary ring gear (10, 11) surrounding and engaging an associated planet gear, and having a non-circular inner configuration,
- (g) wherein the planet gears undergo orbital rotation which impart cyclical speed, continuous rotation to the respective pistons, which in turn continuously expands and contracts sector shaped spaces between adjacent projections of the pistons to implement pumping.

4,872,819

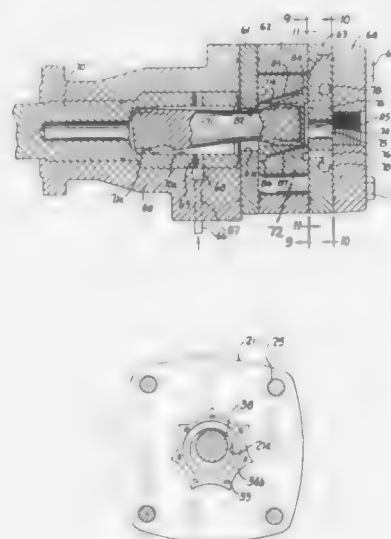
ROTARY GEROTOR HYDRAULIC DEVICE WITH FLUID CONTROL PASSAGEWAYS THROUGH THE ROTOR

Hollis N. White, Jr., 243 Pyle La., Hopkinsville, Ky. 42240
 Division of Ser. No. 840,993, Mar. 14, 1986, Pat. No. 4,697,997, which is a continuation-in-part of Ser. No. 360,832, Mar. 23, 1982, Pat. No. 4,474,544, which is a continuation-in-part of Ser. No. 113,400, Jan. 18, 1980, Pat. No. 4,357,133, which is a continuation of Ser. No. 910,075, May 26, 1978, abandoned. This application Mar. 2, 1987, Ser. No. 942,836

Int. Cl.⁴ F03C 2/08; F04C 2/10

U.S. Cl. 418—61.3

22 Claims



1. In a gerotor hydraulic pressure device having a housing, a rotor with a certain eccentric rotary motion, full revolution constant commutation between a fluid passage in the housing and a single ring shaped fluid passage in the rotor, and a val-

ing manifold on one side of the rotor selectively connecting valving passages in the rotor to the expanding and contracting gerotor cells of the device, the improvement of one of the fluid passage in the housing or the fluid passage in the rotor being laid out in a pattern substantially following the certain eccentric rotary motion of the rotor, said pattern facilitating the fluid commutation between the passages.

9. In a gerotor hydraulic pressure device having a housing, a rotor with two flat axial end surfaces rotatively engaging the housing at planes, gerotor cells and two fluid connections, a improved fluid control comprising a pair of travel passageways, 100% of the fluid traveling through said pair of travel passageways, said pair of travel passageways being in the rotor, means at one plane to connect one of said pair of travel passageways to one of the two fluid connections, means at the other plane to connect the other of said pair of travel passageways to the other of the two fluid connections and valving means within the housing at said one plane to connect said pair of travel passageways to the gerotor cells selectively as the device is operated such that the commutation of one of said pair of travel passageways occurs on the opposite side of the rotor from the commutation of the other of said pair of travel passageways and the valving means to connect said pair of travel passageways to the gerotor cells.

4,872,820

AXIAL FLOW FLUID COMPRESSOR WITH ANGLED BLADE

Toshikatsu Iida, Yokohama; Takayoshi Fujiwara, Kawasaki, and Yoshinori Sone, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

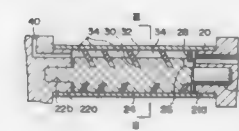
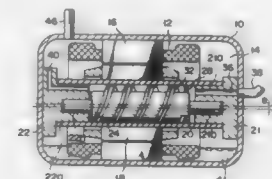
Filed Dec. 7, 1988, Ser. No. 280,880

Claims priority, application Japan, Jan. 5, 1988, 63-493

Int. Cl.⁴ F04B 39/00

U.S. Cl. 418—220

12 Claims



- 1. A compressor comprising:
 a cylinder having a suction-side end and a discharge-side end;
 a columnar rotary member arranged in the cylinder to extend in the axial direction thereof and be eccentric thereto, and rotatable relative to the cylinder while part of the rotary member is in contact with the inner peripheral surface of the cylinder, said rotary member having a spiral groove on the outer periphery thereof, said groove having pitches narrowed gradually with distance from the suction-side end of the cylinder, and said groove being formed such that a depth direction thereof extending from the bottom of the groove to an opening thereof is inclined at a predetermined angle toward the discharge-side end of the cylinder with respect to a direction perpendicular to the axis of the rotary member;
 a spiral blade fitted in the spiral groove to be slidable in the depth direction, having an outer peripheral surface intimately in contact with the inner peripheral surface of the cylinder, and dividing a space between the inner periph-

eral surface of the cylinder and the outer periphery of the rotary member into a plurality of working chambers; and driving means for relatively rotating the cylinder and the rotary member, thereby introducing a fluid from the suction-side end of the cylinder into the cylinder, and transporting this fluid toward the discharge-side end of the cylinder through the plurality of working chambers.

4,872,821

COTTON CANDY MACHINE

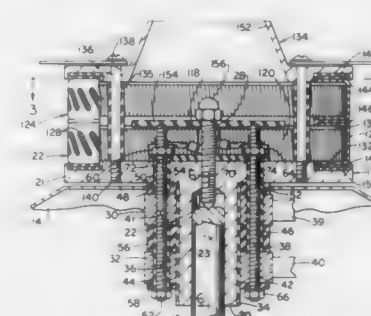
Ronald R. Weiss, Colerain Township, Hamilton County, Ohio, assignor to Gold Medal Products Co., Cincinnati, Ohio

Filed Mar. 23, 1987, Ser. No. 29,278

Int. Cl.⁴ A23G 3/00; B28B 17/00

U.S. Cl. 425—9

3 Claims



1. A spinner assembly for a cotton candy machine which comprises a tubular wall member having an upright wall provided with a plurality of slots, a tubular heater element supported by the wall members in close proximity with the slots, the wall member being of aluminum material, and a dielectric anodized coating on the wall member to insulate the wall member from the heater element.

4,872,822

TIRE CURING PRESS MECHANISM

Augusto Pizzorno, Milan, Italy, assignor to Pirelli Coordinamento Pneumatici S.p.A., Milan, Italy

Filed Nov. 24, 1987, Ser. No. 124,980

Claims priority, application Italy, Dec. 1, 1986, 22514 A/86

Int. Cl.⁴ B29D 30/06

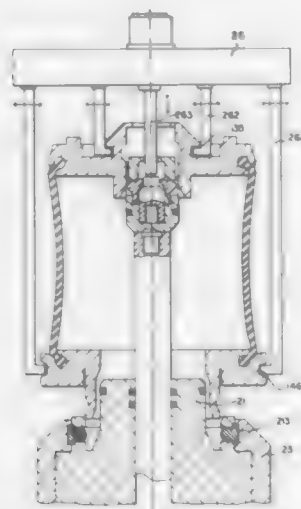
U.S. Cl. 425—48

21 Claims

1. A bladder assembly comprising a substantially cylindrical, flexible and elastically deformable sleeve (10) provided with first and second beads on first and second ends of said sleeve, a movable clamp (13) to block said first end of said sleeve and a fixed clamp (14) to block said second end of said sleeve, said movable clamp comprising a disc (131) provided with a coaxial hub (132) and a first fastening ring (133) secured to said disc, said disc and said first fastening ring each having a peripheral portion which can be associated with said first bead of said sleeve, and connecting means to block said first bead on said movable clamp between said disc and said first fastening ring, said fixed clamp comprising a tube portion (141) having a flanged end and a pair of distinct coaxial elements including a second fastening ring (142) integrally associated with a flange edge (143), each element having an annular portion of its surface which can be associated with said second bead of said sleeve, and connecting means to block said second bead on said fixed clamp, and means for the automatic engagement and disengagement of said movable and fixed clamps with respect to a corresponding support and operating mechanism, said means comprising at least one coaxial annular groove provided on said coaxial hub of said movable clamp and at least one coaxial annular groove provided on said tube body.

8. An operating mechanism which provides for fast, easy and automatic changing of a bladder assembly on a curing

press comprising an annular support body (21) with a support axis associated with said curing press, a stem (22) coaxial with said annular support body, axially slidable therein, an annular ring nut coaxially rotatable around said annular support body, means to axially displace said stem with respect to said annular support body, and means for the automatic engagement and disengagement of said operating mechanism with said bladder assembly, said engaging and disengaging means comprising a head integrally associated with a free end of said stem, said head comprising at least one peg housed in a corresponding hole provided in said head, which can be radially moved with respect to an axis of said stem, between an expanded position in which said at least one peg protrudes from a radial surface of



a lateral wall of said head and a collapsed position in which said at least one peg is completely contained within said lateral wall of said head, and a coaxial cam means to move said at least one peg from said collapsed position to said expanded position, and at least one peg housed in a corresponding hole provided in said support body which is radially displaceable with respect to an axis of said support body, between a work position in which said at least one peg protrudes from said corresponding hole housing said respective peg and a rest position in which said at least one peg does not protrude from said corresponding hole housing said respective peg, said annular ring nut being provided to move said at least one peg from said rest position to said work position.

4,872,823

APPARATUS FOR FORMING A COLUMNAR REINFORCEMENT IN A CONCRETE WALL PANEL

Albert Howard, San Jose, Calif., assignor to Clay Shanrock, Hollister, Calif., a part interest

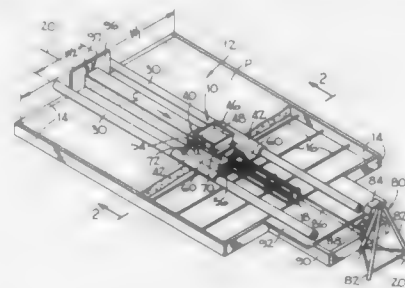
Filed Mar. 23, 1984, Ser. No. 593,028
Int. Cl.⁴ E04G 11/20

U.S. Cl. 425—64

3 Claims

1. A concrete forming apparatus for forming a columnar reinforcement in a concrete wall panel comprising: concrete shaping means with a cavity for receiving concrete and with walls adjacent the cavity for shaping the concrete to form a columnar reinforcement along a concrete wall panel, said concrete shaping means including spaced flanges projecting laterally outward within a common plane for engaging concrete in the forming of a columnar reinforcement; support means supporting said concrete shaping means for movement above a casting space in which a concrete wall panel is formed, said support means having a narrower width than that of the casting space, said support means including a plurality of rails disposed above the casting space, said rails extending along the casting space within

the width of the casting space on opposite sides of the location in which a columnar reinforcement is to be formed, said support means further including a runner on each side of said concrete shaping means advancing along one of said rails, said runners being affixed to said flanges, respectively, whereby said concrete shaping means is supported above the casting space by said rails and guided



along a path along the casting space by said rails and guided along a width of the casting space to form the columnar reinforcement within the width of the casting space of the concrete wall panel; and means for advancing said concrete shaping means along the casting space for forming a columnar reinforcement along a concrete wall panel.

4,872,824

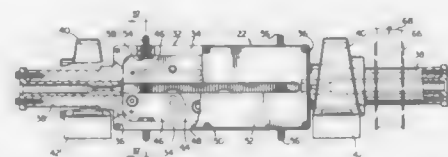
APPARATUS FOR PRODUCING GROOVED SUPPORT MEMBER FOR OPTIC FIBERS

Robert J. Williams, and Randall J. Smith, both of Saskatoon, Canada, assignors to Northern Telecom Limited, Montreal, Canada

Division of Ser. No. 26,230, Mar. 16, 1987, abandoned. This application Mar. 11, 1988, Ser. No. 167,227
Int. Cl.⁴ B29C 47/02; G02B 6/44

U.S. Cl. 425—113

5 Claims



1. Apparatus for making a grooved support member for carrying optical fibers comprising an extrusion die defining a die aperture having circumferentially spaced and fixed projections defining grooves in plastics material to be extruded there-through, the extrusion die disposed upon a passline for passage of a strength member for the grooved support member through the extrusion die and die aperture to extrude a plastic sheath onto the strength member, a twisting means located upstream from the die along the passline for gripping the strength member as said member is fed through the twisting means and along the passline, the twisting means comprising a plurality of gripping wheels rotatably mounted on opposite sides of the passline with their peripheral surfaces facing towards the passline, the wheels on each side of the passline spaced apart along the passline with the wheels staggered in position along the passline from one side of the passline to the other and a means for rotating the gripping wheels alternately in one direction and then in the other direction around the passline.

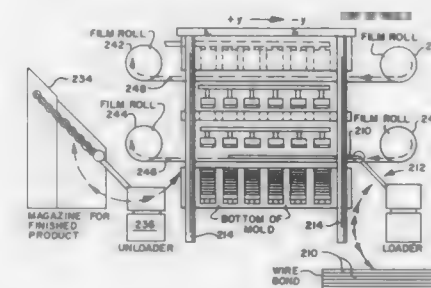
4,872,825

METHOD AND APPARATUS FOR MAKING ENCAPSULATED ELECTRONIC CIRCUIT DEVICES

Milton I. Ross, 400 College Ave., Haverford, Pa. 19041
Continuation-in-part of Ser. No. 613,172, May 23, 1984, Pat. No. 4,680,617. This application Jul. 13, 1987, Ser. No. 72,510
Int. Cl.⁴ B29C 43/18, 43/20, 43/34

U.S. Cl. 425—117

14 Claims



1. A molding apparatus for producing an encapsulated electronic circuit device, said mold comprising: an upper press member disposed above a lower press member, said upper and lower press members being relatively movable toward each other; heated molding means disposed between said upper and lower press members and having at a parting plane thereof ledge means for holding at least one planar conductive lead frame therein and having upper and lower mold cavity means, and means for placing plural sheets of prepreg, a planar conductive lead frame, and plural sheets of prepreg, in that order, between said upper and lower mold cavity means.

4,872,826

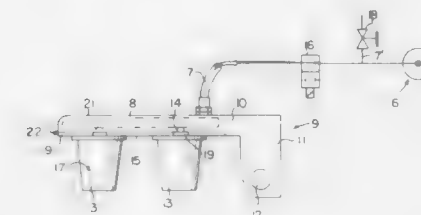
APPARATUS FOR OBTAINING A NEGATIVE PRESSURE IN CHAMBERS FORMED BY A FLAT EXTRACTOR PLATE SUPPORTING HOLLOW THERMOFORMED OBJECTS

Pietro Padovani, Todeschini, Italy, assignor to O.M.V. S.p.A. (Officine Meccaniche Veronesi), Parona, Italy

Filed Jun. 1, 1988, Ser. No. 201,556
Claims priority, application Italy, Jun. 5, 1987, 84940 A/87
Int. Cl.⁴ B29C 51/44

U.S. Cl. 425—388

13 Claims



1. Apparatus for holding thermoformed objects via a negative pressure, said apparatus comprising: a flat extractor plate for holding hollow frustoconical or truncated pyramidal objects, said objects having rims, the plate having a connecting cavity and a lower face, the objects when resting their rims on the lower face of the extractor plate forming chambers; a pipe; a suction unit connected to said chambers by said pipe and said connecting cavity, the suction unit producing a suc-

tion to adhere the objects to the lower face of the flat extractor plate; a shut off valve disposed on the pipe for connecting or shutting off the chambers from the suction unit; an air intake adjustment valve between the suction unit and the shut-off valve; and atmospheric air intakes disposed on the flat extractor plate for permitting aerial communication with said chambers, the atmospheric air intakes having a cross-section that is variable and adjustable.

4,872,827

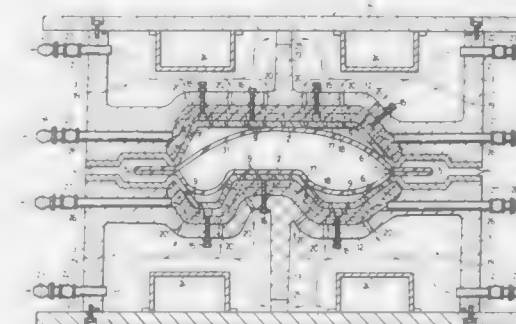
POROUS DIE

Yasuyoshi Noda, Konan, Japan, assignor to KTX Co., Ltd., Aichi, Japan

Filed Dec. 22, 1987, Ser. No. 136,914
Claims priority, application Japan, Jul. 2, 1987, 62-166469
Int. Cl.⁴ B29C 39/38, 45/34

U.S. Cl. 425—526

8 Claims



1. A porous die comprising: a porous die body including a back side and further including a molding surface having a plurality of pores opening therethrough; a cooling chamber adjacent said back side of said porous die body opposite said molding surface and communicating with said molding surface through said pores; at least one inlet communicating with said cooling chamber for supplying a coolant to said cooling chamber so as to cool said porous die body; a suction hole communicating with said cooling chamber; and suction means coupled to said suction hole for drawing coolant from said cooling chamber at a rate sufficient to cause air to be drawn into said cooling chamber through said pores so that the coolant and air are drawn simultaneously from said cooling chamber through said suction hole.

4,872,828

INTEGRATED FURNACE CONTROL AND CONTROL SELF TEST

Eugene P. Mierzwinski; Michael T. Grunden, and Stephen E. Youtz, all of Ft. Wayne, Ind., assignors to Hamilton Standard Controls, Inc., Farmington, Conn.

Filed Sep. 10, 1987, Ser. No. 95,508
Int. Cl.⁴ F23N 5/24

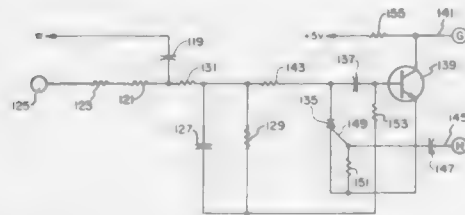
U.S. Cl. 431—16

13 Claims

1. An integrated control for a gas-fired furnace system of the type having at least a relay controlled pilot gas valve, a relay controlled main gas valve, an inlet gas pressure sensor, an inducer fan for forcing air through a combustion chamber in the furnace, means for sensing inducer fan forced air flow through the combustion chamber, a blower fan for circulating air through the furnace, a thermostat for providing a comfort setting signal to the control, a hot air temperature sensor for

controlling the blower fan, and means operable in response to inputs from said sensors and sensing means and said thermostat to control said valves so as to operate said furnace in a safe manner, the integrated control comprising: first means for sequentially testing a plurality of the above recited furnace components prior to an attempt to ignite the furnace, second means for sequentially testing said plurality of furnace components during furnace operation, and manually operable means for sequentially testing said plurality of furnace components at times other than prior to an attempt to ignite the furnace and during furnace operation.

11. An integrated burner control system for a furnace system of the type having at least a relay controlled main gas valve, an inducer fan for forming air through a combustion chamber in the furnace, means for sensing inducer fan forced air flow through the combustion chamber, a blower fan for circulating air through the furnace, a thermostat for providing a comfort



setting signal to the control, means for controlling the blower fan, and means operable in response to inputs from said sensing means and said thermostat to control said valve so as to operate said furnace in a safe manner, the integrated control comprising:

first, second and third means, respectively operable in three different modes to test a plurality of the above recited furnace components, respectively, prior to an attempt to ignite the furnace, during furnace operation and at times other than prior to an attempt to ignite the furnace and other than during furnace operation, and means responsive to any one of the said first, second and third means for selectively providing a visible indication if all tested components are operating in a satisfactory manner and any one of a plurality of faulty component indicative indications in the event a tested component failed the test.

4,872,829

FIRE-EXTINGUISHING DEVICE FOR OIL BURNER

Kazuharu Nakamura, Nagoya; Yoshio Mito, Gifu; Yutaka Nakanishi, Kounan; Toshihiko Yamada, Anjou; Kenji Nakamura, and Kiyonobu Itoh, both of Aichi, all of Japan, assigns to Toyotomi Kogyo Co., Ltd., Aichi, Japan

Division of Ser. No. 834,597, Feb. 28, 1986, Pat. No. 4,810,185.

This application Feb. 6, 1989, Ser. No. 306,183

Claims priority, application Japan, Mar. 1, 1985, 60-41612

Int. Cl.⁴ F23N 5/24

U.S. Cl. 431-33

16 Claims

1. A fire-extinguishing device for an open-type oil burner which is adapted to discharge combustion gas generated in a combustion cylinder construction from an opening provided at a part of an outer wall of the combustion cylinder construction to the interior of a room, comprising:

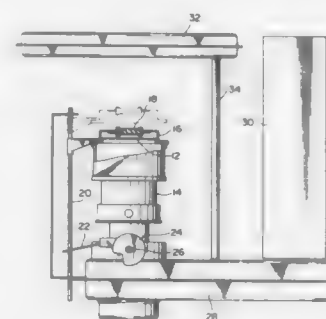
a combustion cylinder construction having an opening provided at an upper portion thereof to discharge combustion gas therethrough to the interior of a room, said wick supplying fuel oil burned in said combustion cylinder construction to generate said combustion gas, and movement of said wick operating mechanism to a fire-extinguishing position causing said wick to be lowered into said wick receiving chamber such that a bad odor is generated in said combustion cylinder construction, said combustion cylinder construction defining a combustion gas chamber

having an internal volume substantially larger than said wick receiving chamber;

a damper means vertically movable in relation to said opening to substantially close said opening at the fire-extinguishing;

a suction system for sucking up therein at least a part of combustion gas containing unburned fuel oil gas remaining in said combustion cylinder construction at the fire-extinguishing, said suction system comprising an air-tightly sealed tank arranged to be exposed to combustion heat from said combustion cylinder construction and communicated with said combustion cylinder construction, and said lowering of the wick causing cooling of said air-tightly sealed tank; and

connecting means for connecting said damper means to said wick operating mechanism of said oil burner such that movement of said wick operating mechanism to said fire-extinguishing position causes said damper means to be actuated through said connecting means to substantially close said opening, said substantial closure of said opening and said cooling of said air-tightly sealed tank substantially preventing said bad odor from being discharged from said oil burner to the



a wick operating mechanism for raising and lowering a wick which supplies fuel oil being burned in said combustion cylinder construction, movement of said wick operating mechanism to a fire-extinguishing position causing said wick to be lowered into a wick receiving chamber such that a bad odor is generated in said combustion cylinder construction, and said combustion cylinder construction defining a combustion gas chamber having an internal volume substantially larger than said wick receiving chamber;

damper means arranged with respect to said opening of said combustion cylinder construction to substantially close said opening at the fire-extinguishing of said oil burner;

connecting means for connecting said damper means to said wick operating mechanism of said oil burner such that movement of said wick operating mechanism to said fire-extinguishing position causes said damper means to be actuated through said connecting means to substantially close said opening of said combustion cylinder construction such that said bad odor is substantially prevented from being discharged from said oil burner to the interior of said room at the fire-extinguishing of said oil burner.

4,872,830

BURNER CONTROL DEVICE, SYSTEM AND METHOD OF MAKING THE SAME

Jay R. Katchka, Cypress; George A. Yeaman, and Richard W. McKinney, both of Lakewood, all of Calif., assigns to Robertshaw Controls Company, Richmond, Va.

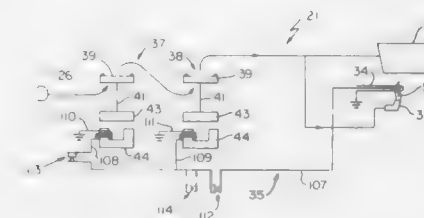
Division of Ser. No. 918,525, Oct. 14, 1986, Pat. No. 4,728,283, which is a division of Ser. No. 767,721, Aug. 20, 1985, Pat. No. 4,640,676. This application Dec. 14, 1987, Ser. No. 132,561

The portion of the term of this patent subsequent to Feb. 3, 2004,

has been disclaimed.
Int. Cl.⁴ F23Q 9/08

U.S. Cl. 431-54

10 Claims



1. In a control device for supplying fuel to a main burner means, said device comprising a housing means having an inlet means for being interconnected to a source of fuel and having a first outlet means for being interconnected to said main burner means and a second outlet means for being interconnected to a pilot burner means for said main burner means, and first and second control valve means carried by said housing means and being in series to connect said inlet means to said first outlet means through both of said control valve means only when both of said control valve means are in an open condition thereof, each said control valve means comprising a movable valve member resiliently biased closed and an independent electromagnetic valve member latching means energizable to hold its respective said valve member open and deenergizable to allow its respective said valve member to close, each said control valve means having movable means to open its respective said valve member to a latching position so as to be held open by its respective said latching means when its respective said latching means is energized, the improvement wherein said control valve means are adapted to interconnect said inlet means to said second outlet means through both of said control valve means only when both of said control valve means are in an open condition thereof.

4,872,831

KEROSENE HEATER PROVIDING AUTOMATIC WICK REPOSITIONING AFTER IGNITION

Masayuki Fujimoto, Nara; Muneco Tao, Yamatokoriyama, and Kuniaki Uchida, Kashihara, all of Japan, assigns to Matsushita Electric Industrial Co., Ltd., Japan

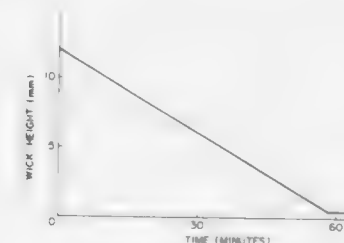
Filed Feb. 16, 1988, Ser. No. 156,436

Claims priority, application Japan, Feb. 16, 1987, 62-33059

Int. Cl.⁴ F23N 5/00

U.S. Cl. 431-73

12 Claims



1. A kerosene heater comprising:
a wick which is movable upward and downward and which

can be ignited when raised to an upper position and is extinguished when moved to a lowered position;
a wick raising and lowering apparatus for executing upward and downward movement of said wick; and,
fuel consumption saving means for driving said wick raising and lowering apparatus to automatically lower said wick from said upper position to a predetermined position which is within a range of combustion positions of said wick after said wick has remained at said upper position for a predetermined time interval.

4,872,832

AIR CONTROLLER FOR BURNERS

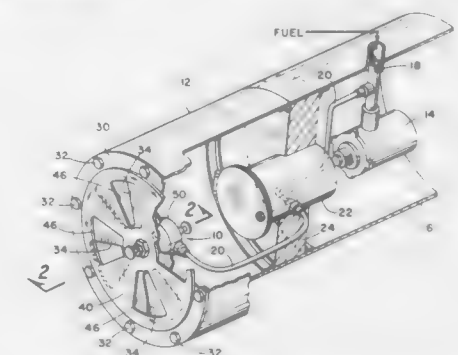
Jack L. Alexander, 260 E. 28th St., Tulsa, Okla. 74114

Filed Dec. 11, 1987, Ser. No. 131,855

Int. Cl.⁴ F23N 3/00

U.S. Cl. 431-90

7 Claims



1. An adjustable air control register for a fuel burner comprising:

a fixed member having multiple apertures for the flow of air therethrough;

a second apertured member coaxially contiguous thereto on one side of said fixed member and rotatable relative thereto to change the amount of air flow through said aperture of said fixed member;

a housing coaxially attached to the other side of said fixed member, a coaxial cavity internally of said housing, said cavity divided by a flexible diaphragm into inner and outer chambers, a coaxial cylinder in said inner chamber, a piston reciprocable in said cylinder having one end attached to said diaphragm and the other end within said cylinder, cam or follower means formed as a part of said other end of said piston;

means within said inner chamber to normally bias said piston toward said outer chamber;

a rotor, said rotor having one end coaxially attached to said second member, the other end of said rotor having follower or cam means in contact with said respective cam or follower means, said cam and follower designed such that reciprocation of said piston will rotate said rotor and second member;

a first adjustable stop member in said outer chamber to limit the movement toward said outer chamber and a second adjustable stop member in said inner chamber to limit movement of said piston in direction toward said inner chamber to establish minimum and maximum amounts of air flow through said fixed member apertures, respectively; and

means to communicate the quantity, pressure or flow of that is going through the burner to fuel to said outer chamber, said diaphragm being responsive thereto to automatically vary the amount of air flow through said fixed member apertures.

4,872,833

GAS BURNER CONSTRUCTION

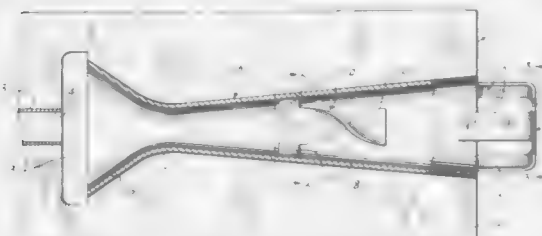
David W. Kramer, Milwaukee, Wis., assignor to A. O. Smith Corporation, Milwaukee, Wis.

Filed May 16, 1988, Ser. No. 194,976

Int. Cl.⁴ F23D 14/62

U.S. Cl. 431-354

10 Claims



1. A gas burner, comprising a conduit connected to a source of fuel gas and having an outlet, a venturi having a generally circular cross section and disposed downstream of said outlet and having a converging section spaced radially outward of said outlet to provide an annular air intake passage, said venturi also including an intermediate throat section disposed downstream of said converging section and a diverging section disposed downstream of said throat section, a baffle disposed in said venturi and having an upstream end secured to the inner surface of said diverging section at a location spaced downstream of said throat section, said baffle having a helical configuration and the portion of said baffle located downstream of said upstream end being spaced out of contact with the diverging section of said venturi, and target means spaced outwardly from the downstream end of said diverging section to spread the combustible mixture of gas and air and provide a relatively short flame pattern.

4,872,834

RECOVERY BOILER PORT CLEANER

John W. Williams, Jr., 5501 Outley Dr., Mobile, Ala. 36693

Filed Nov. 9, 1988, Ser. No. 268,775

Int. Cl.⁴ F27D 23/00

U.S. Cl. 432-75

17 Claims



1. Apparatus for cleaning an air opening in a furnace, comprising:

- an elongated push rod;
- an actuator coupled to said push rod for providing a reciprocatory linear motion of the push rod to and from said air opening;
- a cleaning blade orthogonally attached to one end of said push rod and being operable to clean debris from the edges of said air opening when said push rod is actuated by said actuator to translate said blade to said air opening;
- means for mounting said apparatus on a wall of said furnace;
- means for attaching said actuator in stand off relationship with said mounting means to position said actuator at a predetermined distance away from the wall of said furnace

nace to provide heat protection for said actuator from the extreme heat radiated from the furnace; and
an elongated protective sleeve for said push rod extending from said attaching means to a position adjacent said cleaning blade when said blade is positioned away from said air opening.

4,872,835

HOT CHUCK ASSEMBLY FOR INTEGRATED CIRCUIT WAFERS

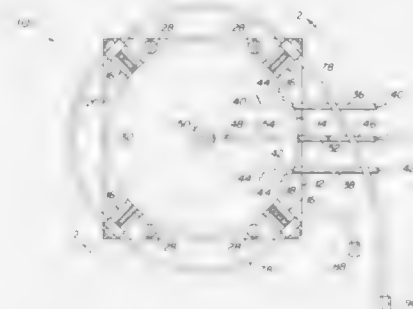
Barclay J. Tullis, Palo Alto, and Richard G. Baer, Los Altos Hills, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jul. 24, 1986, Ser. No. 889,548

Int. Cl.⁴ F24J 3/00

U.S. Cl. 432-225

22 Claims



2. A hot chuck assembly comprising:

base means;

chuck means including:

- a platen having a top, substantially horizontal, planar, wafer support surface and an opposing bottom surface; and

heater means for heating said platen; and

support means coupled to said platen proximate to said support surface and distal from said bottom surface, said support means being adapted to support said chuck means over said base means such that said wafer support surface remains in a substantially constant horizontal plane regardless of the temperature of said platen.

4,872,836

RELEASABLE EXTRAORAL ORTHODONTIC APPLIANCE

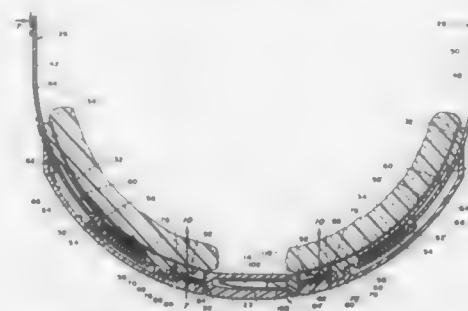
James E. Grove, 6514 Graves Ave., Van Nuys, Calif. 91406

Filed Apr. 8, 1985, Ser. No. 721,240

Int. Cl.⁴ A61C 7/00

U.S. Cl. 433-5

6 Claims



1. An orthodontic appliance adapted to be located about the head of an individual for applying force to the teeth of the individual through teeth mounted braces for the purpose of

achieving proper occlusion, said orthodontic appliance comprising:

- an encircling assembly adapted to be located about the head of the individual, said encircling assembly being generally composed of a front section and a rear section which are connected together by side sections;
- said front section including connecting means for facilitating connection to the teeth mounted braces;
- said rear section to be located at the back of the head of the individual, said rear section including a single disconnection means which disconnects upon applying of a predetermined amount of force to said front section in a direction away from said rear section;
- each said side section being extendible in length from a retracted position to an extended position upon application of said predetermined amount of force, each said side section including resilient means, said resilient means applying a force to said front section tending to locate said side sections in said retracted position;
- said disconnection means comprises a separable coupling device composed of a male member and a female member, said male member including release means which is activated upon said predetermined amount of force being reached;
- said release means comprising a cam assembly, said cam assembly being capable of causing deflection of said male member to effect separation of said male member from said female member; and
- said coupling device further including deflection means for a second way to separate said male and female members, said deflection means comprising a pair of arms formed on said male member, each said arm connecting with a cutout opening formed in said female member, said cutout openings permitting direct manual contact with said arms to cause deflection of said arms toward each other to also result in separation of said male member from said female member.

4,872,837

SURGICAL OR DENTAL INSTRUMENT AND CANNULAE FOR ASPIRATING, CLEANING, DRYING AND ILLUMINATING

Robert Issaleuc, 7, rue Ampère, 83100 Toulon, and Jean-François Lantreaux, "La Campagne" Lot. les Grés Macany, 83400 Hyeres, both of France

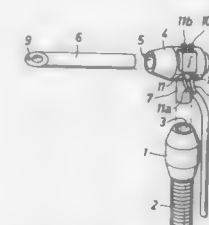
Filed Feb. 3, 1988, Ser. No. 151,537

Claims priority, application France, Feb. 6, 1987, 87 01569

Int. Cl.⁴ A61C 3/00, 17/02, 17/04

U.S. Cl. 433-29

5 Claims



1. A surgical or dental instrument comprising a hollow body incorporating means for connecting it to a suction pipe, means for fitting thereon a removable cannula, means for supplying fluid which will be conveyed to the end of said cannula, and a supply of electrical current for illuminating a bulb, wherein said hollow body contains a sleeve, made of a transparent material having a refraction coefficient greater than that of air, traversed by an axial bore whose diameter is equal to the inner diameter of said cannula, said sleeve comprising, on its periphery, a housing in which is placed said bulb which emits light in the direction of said cannula, said cannula being removably connected to said hollow body; said cannula is made of a transparent material having a

refraction coefficient greater than that of air, the rear end of said cannulae is, when said cannula is fitted in said hollow body, in contact with the front end of said sleeve, so that the light generated by said bulb is conveyed in said sleeve then in said cannula of which the wall performs the role of light conductor; said cannula further comprising in its wall longitudinal conduits for transporting said fluids, said conduits opening out, on the one hand, at the outer end of said cannula and, on the other hand, in the vicinity of the other end of the cannula on the outer wall of said cannula at two points which are offset longitudinally and which communicates with spaces disposed between spaced O-rings arranged in the inner face of said hollow body, into which the ends of the means for supplying said fluids also open out;

said cannula and said hollow body being at the level of those parts of these pieces corresponding to the fit, of cylindrical section, so that said cannula may pivot on itself in said hollow body.

4,872,838

ORAL INSPECTION DEVICE

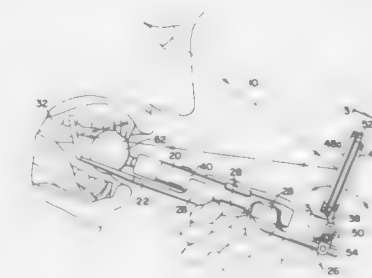
Wade Canter, Kimberly Canter, both of 23675 Park Andorra, Calabasas Park, Calif. 91302; Shawn Canter, and Chip Canter, both of 19274 Berclair La., Tarzana, Calif. 91356

Filed Jun. 29, 1987, Ser. No. 67,306

Int. Cl.⁴ A61C 3/00

U.S. Cl. 433-31

16 Claims



1. An oral inspection device for allowing self-inspection of a person's oral cavity, comprising:

- an elongated body having a longitudinal axis suited for gripping by said person's hand and containing illuminating means at a first end thereof;
- at least three elongated support means each having a first end detachably mounted on a said elongated body and a second end for supporting oral inspection and cleaning means wherein each of said support means are free to slideably move along said elongated body substantially parallel to said longitudinal axis and rotate about said longitudinal axis;
- a first of said elongated support means extending laterally and longitudinally away from said first end of said elongated body, said first elongated support supporting first oral inspection and cleaning means comprising means for biasing a person's cheek and tongue away from said longitudinal axis of said elongated body such that said illuminating means can provide unobstructed illumination of said person's oral cavity;
- a second of said elongated support means extending longitudinally away from said first end of said elongated body for supporting a second oral inspection and cleaning means within said person's oral cavity while a portion of said elongated body remains without said oral cavity, said second oral inspection and cleaning means including a primary mirror for receiving an image of a portion of the

person's oral cavity which is being observed, and reflecting said image; and,
a third of said elongated support means extending from a second end of said elongated body, said third elongated support means supporting a secondary mirror means for receiving said reflected image from said primary mirror and re-directing that image to the person's eye for viewing of said portion of the person's oral cavity during the operation of said device.

4,872,839

SPACER FOR DENTAL IMPLANTS

Izidor Brajnovic, Gothenburg, Sweden, assignor to Nobelpharma AB, Gothenburg, Sweden

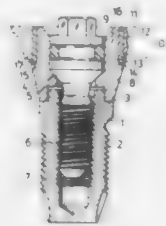
Filed May 18, 1988, Ser. No. 195,334

Claims priority, application Sweden, Jun. 12, 1987, 8702445

Int. Cl.⁴ A61C 8/00

U.S. Cl. 433—173

6 Claims



1. A spacer for dental implants constituting a connection element in a removable screw connection between an anchorage element implanted in the maxillary beneath the gingiva, and a dental prosthesis construction whose joint surface is disposed above the gingiva, said spacer comprising:

- a tubular spacer member made of a bio-compatible material such as titanium for absorbing the loadings of the screw connection;
- said tubular spacer element having a lower, substantially conically tapered portion for gingival penetration and an upper cylindrical portion projecting above the gingival edge and extending from said conically tapered portion up to the joint surface of the prosthesis construction;
- the outer diameter of the lower end part of said conically tapered portion substantially corresponding to the outer diameter of the upper portion of the anchorage element;
- a covering sleeve of a tooth-like material provided substantially around said cylindrical portion of the spacer element; and
- wherein said covering sleeve is not subjected to any loadings of the screw connection.

4,872,840

DENTAL IMPLANT AND METHOD

Jacques E. F. Bori, Watertown, Mass., assignor to Team Incorporated, Newton, Mass.

Filed Jul. 15, 1987, Ser. No. 73,489

Int. Cl.⁴ A61C 8/00

U.S. Cl. 433—173

33 Claims



1. A dental implant having a shaft and a bulbous end at-

tached thereto, with the bulbous end having a diameter greater than the remainder of the shaft to which it is attached, said implant having tightly captured bone channelled substantially through the implant, a portion of said bone being exposed at a surface of said implant for stimulating osteointegration through the guiding of new bone growth into said implant so as to provide more than surface attachment to said implant, said implant providing a mechanical anchoring via bone growth through said implant.

4,872,841

DEMONSTRATION DEVICE FOR ILLUSTRATING SPINAL MISALIGNMENT

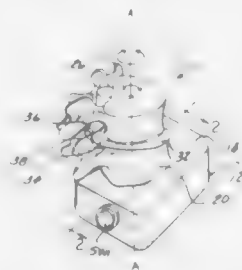
Kenneth L. Hamilton, 22706 Gordon Switch, St. Clair Shores, Mich. 48081, and Timothy C. Butler, 2929 Acorn Ln., Howell, Mich. 48843

Filed Jun. 20, 1988, Ser. No. 208,680

Int. Cl.⁴ G09B 23/32

U.S. Cl. 434—274

8 Claims



1. An education display device, representing a portion of a spine, useful for illustrating the effect of a misaligned spine vertebrae on the operation of a nerve trunk disposed within the spine, said device comprising:

- a first lower member configured to resemble a vertebrae;
- a second upper member configured to resemble a vertebrae, movably mounted above said first lower member;
- means for movably mounting said second upper member above said first lower member;
- a flexible member configured to resemble a nerve trunk, mounted in side-lying anatomically appropriate relationship with said vertebrae;
- a power source;
- a wiring harness, having first and second ends, mounted with said flexible member, extending from said power source through said flexible member to at least one end of said flexible member;
- at least one light emitting diode fixed to said first end of said wiring harness remote from said power source, and protruding from said flexible member proximate to the first lower member and second upper member;
- circuit means, mounted within a unitary hollow display base, for operating said light emitting diode in an ON/OFF configuration at a frequency which varies depending on the position of said first and second members in relation to each other, and connected to said second end of said wiring harness;
- a first switching means attached to said first and second members operating to switch said circuit means from one frequency of ON/OFF operation to a second frequency of ON/OFF operation dependent upon the position of said first and second members in relation to each other;
- second switching means attached to an exterior surface of said base for activating said circuit means;
- wherein movement of the first and second members with relation to one another will change the frequency of ON/OFF flashing of the light emitting diode visually indicating the interruption of nerve signal flow which occurs

upon dislocation of spinal bones with relation to one another.

4,872,842

ELECTRIC CONNECTING DEVICE

Tsutomu Ishima, Utsunomiya, and Kunihiro Sasaki, Miyagi, both of Japan, assignors to Alps Electric Co., Ltd. and Honda Motor Co., Ltd., both of Japan

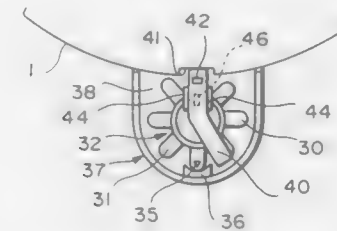
Filed Oct. 31, 1988, Ser. No. 265,119

Claims priority, application Japan, Nov. 4, 1987, 62-167859

Int. Cl.⁴ H01R 35/00

U.S. Cl. 439—15

3 Claims



1. An electric connecting device, comprising a fixed member, a movable member mounted for rotation on said fixed member, a cable for electrically connecting said fixed member and said movable member to each other, a rotational position detector provided between said fixed member and said movable member and including a gear which is rotated by a predetermined angle each time said rotatable member is rotated for one full rotation, said rotational position detector detecting a rotational position of said movable member in accordance with a position of a tooth of said gear, and a resilient member removably mounted on said rotational position detector for engaging with said movable member to facilitate precise positioning of said movable member relative to said fixed member.

4,872,843

INTERCONNECTION SYSTEMS FOR ELECTRICAL CIRCUITS

Michael J. Anstey, Wokingham, United Kingdom, assignor to Dowty Electronic Components Limited, Buckinghamshire, United Kingdom

PCT No. PCT/GB87/00203, § 371 Date Nov. 23, 1987, § 102(e)

Date Nov. 23, 1987, PCT Pub. No. WO87/06092, PCT Pub. Date Oct. 8, 1987

PCT Filed Mar. 24, 1987, Ser. No. 123,160

Claims priority, application United Kingdom, Mar. 25, 1986, 8607299; Apr. 5, 1986, 8608360; Japan, Aug. 20, 1986, 8620211; United Kingdom, Oct. 23, 1986, 8625352

Int. Cl.⁴ H01R 9/09

U.S. Cl. 439—69

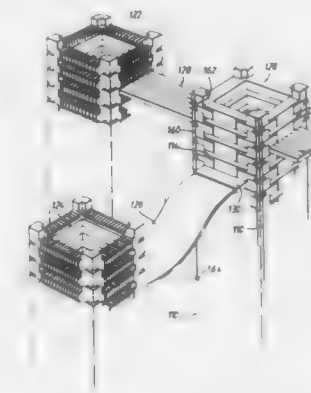
16 Claims

1. An interconnection unit for interconnecting two-sided chip carriers comprising:
a plurality of mechanically interlocking spacer elements arranged in a stack, each of at least some of said spacer elements including at least one elongate support member having an upper surface, for supporting a chip carrier, a lower surface and side surfaces,

- a plurality of electrically conductive contact clips distributed along the support member in spaced relationship with one another, each contact clip comprising a first part, a second part, and a third part uniting the first and second parts,
- location means on the support member for locating each said contact clip at a respective position on the support member, the contact clip embracing the support member so that the first and second parts thereof are disposed adjacent the said upper and lower surfaces respectively of the support member, wherein the said upper and lower surfaces of immediately adjacent support members in the

stack define a respective aperture in the stack enabling an external electrical connection to be made to one or more of the contact clips disposed adjacent to said upper and lower surfaces, and

said first part of each contact clip is capable of establishing an electrical connection with a respective contact pad on the lower surface of a chip carrier supported by said



support member, and said second part of each contact clip is capable of establishing an electrical connection with a respective contact pad on the upper surface of a chip carrier supported by a support member of an immediately underlying spacer element in the stack so that said contact pads are connected together electrically via said first, second and third parts of the contact clip.

4,872,844

COMPONENT-CARRYING ADAPTER FOR CHIP CARRIER SOCKET

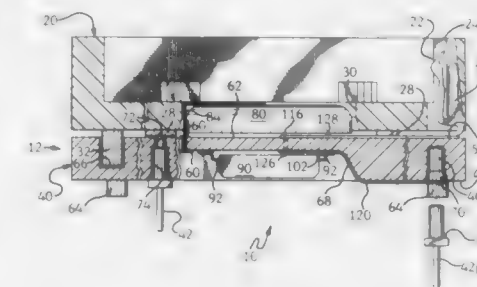
Robert K. Grebe, Scottsdale; John E. Lucius, Glendale, and David S. Szczesny, Glendale, all of Ariz., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jul. 8, 1988, Ser. No. 216,927

Int. Cl.⁴ H01R 23/72

U.S. Cl. 439—69

20 Claims



1. A substrate for being secured to an electronically active chip carrier socket for interconnecting an integrated circuit chip with a circuit panel, the socket having a plurality of contact means engaged with a like plurality of contact means of the carrier for the integrated circuit chip and required to be electrically connected to a like plurality of contact means of the circuit panel, to define with the socket an assembly desired to include at least one electrical interconnecting circuit between the circuit panel and the integrated circuit chip, the substrate comprising:

- a directional member molded of plastic material and having a generally planar shape, said dielectric member having a panel-mounting face and a socket-mounting face;

a plurality of first contact means being disposed along said panel-mounting face and associated with a respective plurality of contact means of a circuit panel and adapted to be electrically connected therewith upon mounting of said panel-mounting face of said dielectric member to said circuit panel;

a plurality of second contact means being disposed along said socket-mounting face and associated with a respective plurality of contact means of a chip carrier-receiving socket and adapted to be electrically connected therewith upon mounting of said socket to said socket-mounting face;

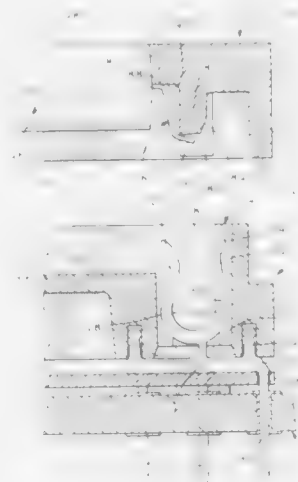
at least a selected one of associated said first and second contact means being electrically isolated on said dielectric member, and continuous conductive paths electrically connecting remaining ones of said first contact means and said second contact means desired to remain unaffected by an at least one electrical component disposed between said circuit panel and said socket;

said dielectric member including at least one component-receiving region on one of said panel-mounting face and said socket-mounting face for receiving a corresponding said at least one electrical component securable thereonto;

said dielectric member including at least one third and at least one fourth contact means, said at least one third contact means disposed in said at least one component-receiving region and adapted to be electrically connected to corresponding panel-side contact means of said at least one electrical component, said at least one third contact means being electrically connected to said selected at least one first contact means by first conductive path segments, said at least one fourth contact means disposed in said at least one component-receiving region and adapted to be electrically connected to corresponding socket-side contact means of said at least one electrical component, and said at least one fourth contact means being electrically connected to said selected at least one second contact means by second conductive path segments;

said continuous conductive path means, said first and second conductive path segments, and at least portions of said first, second, third and fourth contact means being plated onto respective selected surface regions of said dielectric member after molding of said member, whereby said selected at least one first contact means and associated said selected at least one second contact means become electrically connected upon the mounting of said at least one electrical component to said dielectric member.

resilient securing portion to resiliently deform, and after the chip carrier receiving member is positioned in place on



the housing member, the resilient means is allowed to moved to an unstressed position, thereby securing the chip carrier receiving member to the housing member.

4,872,846

SOLDER CONTAINING ELECTRICAL CONNECTOR AND METHOD FOR MAKING SAME

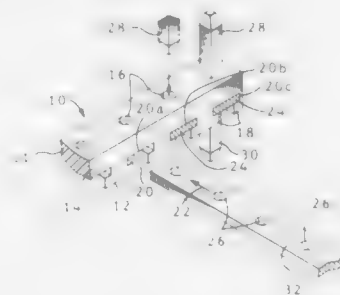
Thomas C. Clark, 301 N. 17th St., Camp Hill, Pa. 17011

Filed Jul. 21, 1988, Ser. No. 222,655

Int. Cl.⁴ H01R 9/09

U.S. Cl. 439—83

16 Claims



1. An electrical connector comprising:
a housing which defines a receiving channel;
a reflowable element disposed within the channel;
a conductive pin mounted in the housing and passing through the channel;
said channel defining a loading axis angled with respect to the pin such that the loading axis is non-parallel to the pin;
said channel shaped to receive the reflowable element along the loading axis and positively to retain the reflowable element from movement along the pin;
said pin preventing the reflowable element from moving along the loading axis out of the channel.

4,872,845
RETENTION MEANS FOR CHIP CARRIER SOCKETS
Iosif Korsunsky; Kevin E. Walker, and Robert W. Brown, all of Harrisburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 116,770, Nov. 30, 1987. This application May 6, 1988, Ser. No. 191,635

Int. Cl.⁴ H01R 23/72

U.S. Cl. 439—70

19 Claims

1. A chip carrier socket comprising:
a chip carrier receiving member having a chip carrier receiving opening extending therethrough, the chip carrier receiving opening having apertures provided proximate thereto for receiving resilient means therein;
a housing member having a first major surface and a second major surface, resilient securing portions provided on the first major surface, resilient means extend from, and are integral with the resilient securing portions, the resilient members extend beyond the second major surface, each of the resilient securing portions being integral with the first major surface of the housing member on a plurality of sides thereof, the resilient securing portion being spaced from the first major surface on a plurality of sides thereof, whereby as the chip carrier receiving member is moved into engagement with the housing member, the resilient means is caused to resiliently deform, which in turn causes the

4,872,847

PILFER PROOFING SYSTEM FOR ELECTRIC UTILITY METER BOX

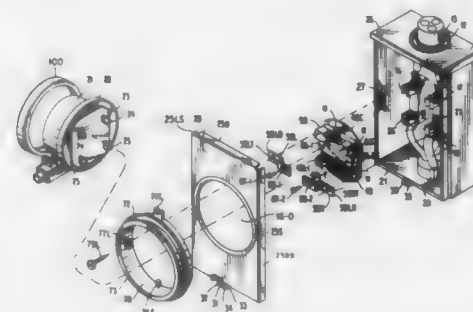
Robert B. Fennell, 241 Deerfield Rd., Bloomington, Ga. 31302; David H. Fritta, 142 Jefferson St., Savannah, Ga. 31412, and David S. LeGasse, P.O. Box 99, Walpole, N.H. 03606

Continuation-in-part of Ser. No. 98,699, Sep. 18, 1987, abandoned, which is a continuation-in-part of Ser. No. 694,368, Jan. 24, 1985, Pat. No. 4,615,113, which is a division of Ser. No. 526,236, Aug. 25, 1983, Pat. No. 4,505,530, which is a division of Ser. No. 170,205, Aug. 18, 1980, Pat. No. 4,404,521. This application Mar. 1, 1988, Ser. No. 162,517

Int. Cl.⁴ H01R 13/52

U.S. Cl. 439—133

11 Claims



1. In a pilfer proofing apparatus for a plug-in utility meter and base box of the type having a meter base box, a pair of meter stops fastened to said base box at diametrically opposite sides of said opening through which said glass meter cover normally projects, a plug-in electric meter having a glass meter cover, rearwardly projecting male connectors and an annular flange, a plug-in terminal block set and a meter box cover having an opening therein through which said glass meter cover of said electric meter passes to plug and engage said rearwardly projecting male connectors in said terminal block set to pilfer proof same without electrically disconnecting the meter base box and terminal block set from the electrical power line, said pilfer proofing apparatus including,

- rigid insulated carrier means, a plurality of male conductor plug elements projecting on one side of said insulated carrier means, and
- a like numbered plurality of female conductor socket elements, each integrally formed with a respective one of said male conductor plug elements and projecting from the opposite side of said carrier member,
- a locking ring member constituted by a meter box cover engaging member and in integral annular locking ring projection projecting outwardly from the plane of said meter box cover engaging member and through said opening in said meter box cover,
- anchor means adapted to be secured to said meter base box, said anchor means including a pair of insulated anchor bars having means for adjustably securing first ends of said anchor bars to said insulated carrier means, and second ends of said anchor bars having bifurcated ends with bifurcations spacedly projecting under said meter stops at said diametrically opposite sides of said opening to accommodate a wider variety of meter boxes and form a plurality of bearing points for engagement with said meter stops and better distribute the load on said meter box cover and make it more difficult to defeat by a would-be pilferer,
- screw means fully passing through said locking ring member to threadably engage with threaded bores in said anchor bars to clamp said locking ring and said meter box cover to said meter stops with each spaced bifurcation providing a of bearing point on said meter stops for each anchor bar,
- removable insulated blade members releasably retained in

at least electrically energized ones of said female conductor socket elements during the installation of elements (b), (c) and (d), and

- an annular locking ring means engaging said annular flange on the base of said meter and said locking ring projection for securing said meter to said locking ring member and meter base box whereby said projecting male connectors are prevented from being unplugged from said contact terminal block set and said meter base box without removing said annular locking ring.

4,872,848

COVER FOR A MULTIPPOINT CONNECTOR

Bob Mounie, Berlicum, Netherlands, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

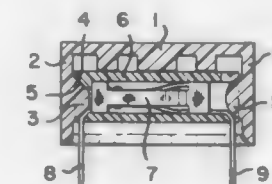
Filed Nov. 3, 1988, Ser. No. 266,892

Claims priority, application Fed. Rep. of Germany, Nov. 9, 1987, 8714913[U]

Int. Cl.⁴ H01R 13/44

U.S. Cl. 439—135

8 Claims



1. A cover for a multipoint connector having a block-shaped multipoint connector body with lateral surfaces, said connector having electrical contacts with connecting pins disposed within spaces of the body, said contacts being accessible from the outside through apertures provided in said lateral surfaces of the connector body, said cover comprising an upper part and four lateral parts extending substantially perpendicularly to said upper part to define an open end for the cover into which the connector is received, at least two of said lateral parts having inner surfaces which face the apertures in said lateral surfaces of the multipoint connector body when said cover is inserted over the connector, said inner surfaces being provided with knobs aligned so as to lie opposite each aperture and rest against the edge of each respective aperture when the cover is placed on the connector.

4,872,849

CHANNEL OUTLET

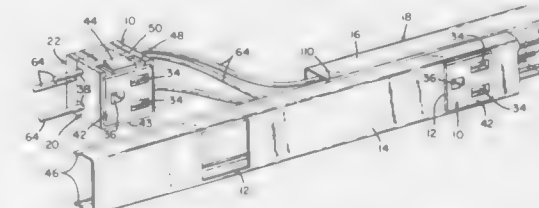
William B. Long, Camp Hill, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 396,222, Jul. 8, 1982, abandoned. This application Dec. 5, 1984, Ser. No. 678,369

Int. Cl.⁴ H01R 13/60, 4/24

U.S. Cl. 439—209

8 Claims



1. A channel outlet electrical connector assembly, comprising:
channel-housing means including cover means and base means, said cover means having spaced openings therealong, means maintaining said cover means and said base means together;

channel outlet means disposed in said channel-housing means at each of said openings and including terminal-housing means and cover member means of rigid insulative material, said terminal-housing means having power terminal-receiving cavities and a ground terminal-receiving cavity therein, a front section of each of the terminal-housing means disposed in respective spaced openings of said cover means of said channel-housing means and having apertures therethrough leading to the respective terminal-receiving cavities, means provided by said channel outlet means and said channel-housing means securing said channel outlet means in the respective spaced openings of said cover means;

power terminal means respectively disposed in said power terminal-receiving cavities and ground terminal means disposed in said ground terminal-receiving cavity, said power terminal means and said ground terminal means have conductor-terminating means including slots therein positioned adjacent an inner end of said terminal-housing means, wherein insulated electrical conductors are respectively terminated in said conductor-terminating means upon said conductors being pushed into the respective slots so that the slotted conductor-terminating means cut through the insulation and electrically connect with the electrical conductor, said power terminal means having receptacle section means in alignment with respective apertures, said ground terminal means having spring contact means extending along said ground terminal-receiving cavity toward the aperture in alignment therewith and ground contact means extending substantially parallel with respect to said conductor-terminating means of said ground terminal means, said apertures in alignment with said receptacle section means and said spring contact means being offset from the respective conductor-terminating means of said power terminal means and said ground terminal means so that the electrical conductors terminated in the respective conductor-terminating means are positioned to the side of the respective apertures;

means provided by said terminal means and said terminal-housing means securing said power terminal means in said power terminal-receiving cavities and said ground terminal means in said ground terminal-receiving cavity opposite outer surfaces of said terminal-housing means being formed with depressed open channels therein, a strap member extending across the mouth of each of the channels intermediate its ends, said cover member having a plurality of spaced leg members extending from the rim thereof to respectively slide along the channels when the cover is moved to close the housing, said legs having protruding wedge-shaped portions engageable with the strap members to latch the cover in place, said cover member means having an opening through which said ground contact means extends and electrically connects with said base means.

4,872,850

IC TESTER SOCKET

Hiroyuki Mogi, and Kazuhisa Ozawa, both of Kawaguchi, Japan, assignors to Dai-ichi Seiko Kabushiki Kaisha, Kawaguchi, Japan

Continuation of Ser. No. 946,584, Dec. 23, 1986. This application Jun. 8, 1988, Ser. No. 207,101

Claims priority, application Japan, Dec. 30, 1985, 60-204384; Sep. 1, 1986, 61-133941

Int. Cl.⁴ H01R 9/09, 13/631

U.S. Cl. 439-264

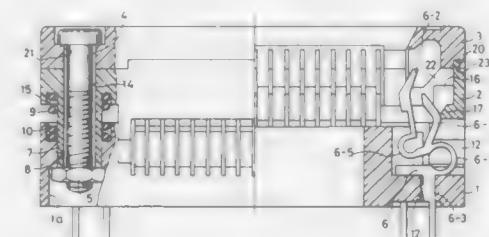
1 Claim

1. An IC testing socket having a chip accommodating space defined therein for accommodating an insertable IC chip having a plurality of terminals, comprising:

- a socket body;
- a contacting pin extending from the socket body and including:
 - (a) a base portion secured to the socket body,
 - (b) a contact portion disposed to move toward and away

from the chip accommodating space to respectively mate and unmate with a corresponding terminal of the IC chip,

- (c) a first arcuate spring portion coupling the contact portion to the base portion in a manner such that the contact portion is located out of the chip accommodating space when the first arcuate spring is not under spring load thereby facilitating insertion of an IC chip into the chip accommodating space, and



- (d) an actuator arm extending from the arcuate spring portion; and
- actuating means, engageable with the actuator arm of the contacting pin, for imparting a force to overcome the resiliency of the first arcuate spring portion and move the contact portion of the contacting pin toward the chip accommodating space to contact a terminal of an IC chip therein.

4,872,851

ELECTRICAL CONNECTOR WITH TORSIONAL CONTACTS

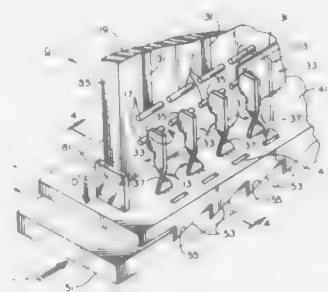
Robert Babuka, Vestal, and James R. Petrozello, Endicott, both of N.Y., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Feb. 27, 1989, Ser. No. 316,041

Int. Cl.⁴ H01R 11/22

U.S. Cl. 439-267

18 Claims



- 1. An electrical connector for providing electrical connection to at least one contact element located on a substrate, said connector comprising:

- a base member;
- at least one torsional contact for contacting said contact element located on said substrate to provide said electrical connection, said torsional contact adapted for occupying a first, twisted orientation relative to said substrate and a second, substantially non-twisted orientation relative to said substrate; and
- means for engaging said torsional contact to cause said contact to move from said first, twisted orientation to said second, substantially non-twisted orientation.

4,872,852

CHILD RESISTANT ELECTRICAL SOCKET OR SOCKET ATTACHMENT

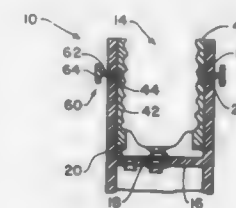
Bernard G. Palitz, Jr., R.F.D. 4, 431 Haines Rd., Mount Kisco, N.Y. 10549

Filed Dec. 23, 1988, Ser. No. 290,482

Int. Cl.⁴ H01R 17/04, 33/97

U.S. Cl. 439-307

6 Claims



- 1. A child resistant electrical light socket for resisting removal of a threaded base of a standard light bulb therefrom comprising in combination:

- (a) an outer cylindrical portion having an open upper end to receive said base of said bulb and a base with a pair of electrical contact elements;
- (b) an inner cylindrical sleeve rotatably mounted within said outer portion having standard internal screw threads for receiving the threaded base of said bulb, at least one recess in its outer wall and a slidable electrical connection to one of said base contact elements;
- (c) moveable means mounted in the outer cylindrical portion for securing said inner sleeve and preventing rotation thereof by mating with said inner sleeve recess comprising a member projecting inwardly through the sidewall of said outer portion; and
- (d) means for retracting said inwardly projecting member whereby said inner sleeve rotates freely within said outer portion unless said member engages said recess.

4,872,853

CIRCUIT CARD RETAINING DEVICE

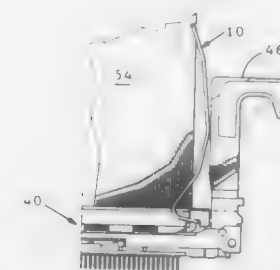
Van K. Webster, Camp Hill, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 8, 1988, Ser. No. 281,579

Int. Cl.⁴ H01R 13/629, 13/635

U.S. Cl. 439-327

4 Claims



- 1. A retaining device for card edge connectors which receive circuit cards having a slot in one side thereof and which are inserted into the connector with the slot being at a predetermined distance therefrom, said retaining device comprising an elongated, U-shaped member formed from spring wire and having parallel legs joined at one end by a bight and having free ends pivotally attached to the connector at one end thereof, said legs including parallel concavo-convex shaped portions between said bight and said free ends whereby the length of said member may be resiliently elongated to a predetermined length to enable said bight to be placed in the slot in

the circuit card which may be placed in the connector and thereby exert a retaining force on the circuit card to hold it in the connector.

4,872,854

SIMULATED BALL USED IN SPORTS INCORPORATING AN ELECTRONIC COMPONENT

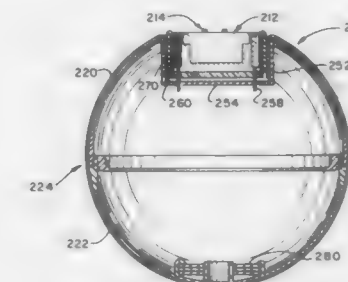
Victor C. Hess, St. Louis, Mo., assignor to Hyman Products, Inc., Maryland Heights, Mo.

Filed Mar. 23, 1988, Ser. No. 172,016

Int. Cl.⁴ H01R 3/00

U.S. Cl. 439-577

36 Claims



- 1. A simulated ball used in sports having an electronic component mounted therein with exposed controls for operation by a user, said ball including a hollow body over which a complementary shaped flexible ball cover is mounted, said body receiving said electronic component in a recess provided in an outer wall of said hollow body, said body including means associated therewith to position and hold said electronic component within said hollow body, said complementary shaped flexible ball cover having a corresponding opening there through to allow exposure of the controls of the electronic component, said ball cover being drawn in generally close-fitting and conforming relationship to the outer wall of said hollow body including at least partially within the recess thereof; and said body being formed from two generally curvilinearly shaped thin-walled plastic half sections which terminate in complementary interfitting free end portions, a thin-walled plastic disc-shaped element extending substantially across the hollow body and structurally inter-engaging the complementary interfitting free end portions to provide laterally outwardly directed and circumferentially extending support therefor.

4,872,855

ADJUSTABLE TERMINAL BLOCK EQUIPMENT

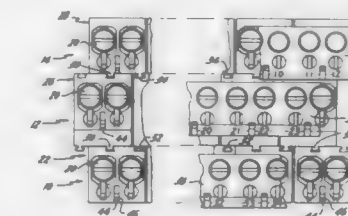
Alexander R. Norden, New York, N.Y., assignor to Connectron, Inc., Laurence Harbor, N.J.

Filed Jun. 3, 1988, Ser. No. 202,801

Int. Cl.⁴ H01R 9/22

U.S. Cl. 439-717

26 Claims



- 11. Apparatus for making electrical connections to electrical equipment having at least one row of many equipment terminals whose distribution is alternatively at inch-based or metric-based modular intervals along the row, said apparatus includ-

ing at least one group of terminal blocks having electrical terminals which are distributed along a row and which are distributed for cooperation with said equipment terminals, respectively, said terminal blocks having wire fastening terminals connected to said electrical terminals, respectively, said terminal blocks being movable relative to one another along their row, the electrical terminals of each of said terminal blocks being so limited in number and each electrical terminal being so located on its respective terminal block that the terminals of said terminal blocks are cooperable with respective equipment terminals regardless of whether the distribution of the equipment terminals is at inch-based or metric-based modular intervals, and an elongated locating member assembled to said one row of terminal blocks for fixing the distribution of the terminals thereof, said member having terminal-block locating formations distributed at one of said modular intervals.

4,872,856

ELECTRICAL CONNECTOR

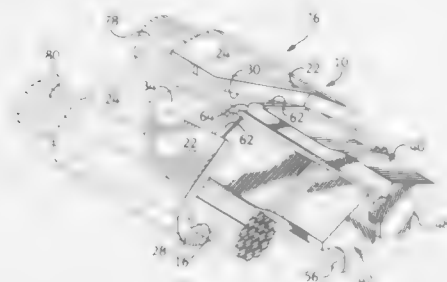
Denis M. Pooley, Oshawa, and Douglas K. MacKenzie, deceased, late of Markham, both of Canada (by Russell U. MacKenzie, administrator), assignors to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 15, 1989, Ser. No. 323,638

Int. Cl.⁴ H01R 11/01

U.S. Cl. 439—783

3 Claims



1. An electrical connector for electrically commoning a pair of conductors, said connector comprising:

a C-member having a pair of spaced apart, conductor-receiving channels and at least one ramp converging towards a space between conductors which may be disposed in said channels; and

a pair of toggle blocks pivotally engaging each other along one side and having a combined width when in a parallel relation to each other which is greater than said space, said blocks adapted for insertion into said space initially at an angle relative to each other to provide a smaller combined width until said blocks engage and slide along said ramp whereupon said blocks are forced into a parallel relation and thereby compress the conductors which may be in said channels.

4,872,857

OPERATION OPTIMIZING SYSTEM FOR A MARINE DRIVE UNIT

Neil A. Newman, Omro; Herbert A. Bankstahl; John M. Griffiths, both of Fond du Lac; Lyle M. Forsgren, Oshkosh, and Wayne T. Beck, Fond du Lac, all of Wis., assignors to Brunswick Corporation, Skokie, Ill.

Filed Aug. 23, 1988, Ser. No. 235,288

Int. Cl.⁴ B63H 5/12

U.S. Cl. 440—1

18 Claims

1. A system for optimizing the operation of an engine-driven marine drive unit for a boat comprising:

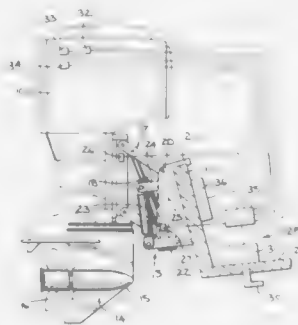
means for trimming the drive unit relative to the boat;

means for moving the drive unit vertically relative to the boat;

means for sensing the trim position of the drive unit with

respect to the boat and for generating an output signal representative of the drive unit trim position;

means for sensing the vertical position of the drive unit with respect to the boat and for generating an output signal representative of the drive unit vertical position; and



control means operative to receive and store said output signals, said control means being responsive to a selected input signal to cause the trimming means and the moving means to move the drive unit to a position based on stored output signals.

4,872,858

OUTBOARD JET PROPULSION DEVICE

Junichi Hasegawa, and Hideharu Takahashi, both of Hamamatsu, Japan, assignors to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

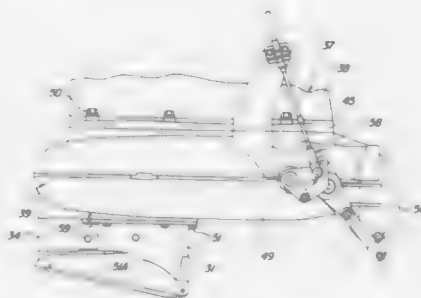
Filed Mar. 4, 1988, Ser. No. 164,242

Claims priority, application Japan, Mar. 5, 1987, 62-48717

Int. Cl.⁴ B63H 11/08

U.S. Cl. 440—38

3 Claims



1. A jet propulsion unit for an outboard drive comprising a lower unit housing having a cylindrical portion journaling an impeller shaft for rotation about a vertically extending axis, an impeller contained within a generally cylindrical cavity in said cylindrical portion of said lower unit housing and affixed for rotation with said impeller shaft, an inlet portion depending from said cylindrical portion and defined in part by a foot portion extending forwardly therefrom and terminating in a forward end with said inlet portion extending forwardly of said cylindrical portion, a volute chamber formed above said cylindrical cavity and forming a rearwardly directed water outlet, and means forming a forwardly extending flow diverting member extending upwardly from said foot portion and forwardly from the sides of said cylindrical portion and terminating in proximity to the forward end of said foot portion.

4,872,859

LIFT AND LATCH APPARATUS FOR AN OUTBOARD MOTOR

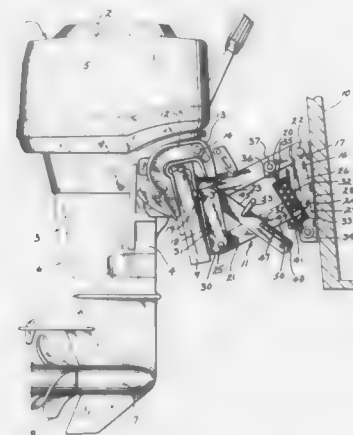
John M. Griffiths, Fond du Lac; Lyle M. Forsgren, Oshkosh; Neil A. Newman, Omro, and Wayne T. Beck, Fond du Lac, all of Wis., assignors to Brunswick Corporation, Skokie, Ill.

Filed May 11, 1988, Ser. No. 193,114

Int. Cl.⁴ B63H 21/26

U.S. Cl. 440—53

11 Claims



8. In a transom extension assembly for mounting an outboard motor to a boat to provide vertical movement of the motor relative to the transom between raised and lowered positions, said assembly having a collapsible four-leg linkage including a transom bracket leg attached to the transom and a motor bracket leg adapted to support the motor, an upper leg pivotally connected at its ends to the upper ends of the transom and motor bracket legs, and a lower leg pivotally connected at its ends to the lower ends of the transom and motor bracket legs, an apparatus for releasably holding the motor in its raised position and supporting the motor in its lower position comprising:

means for applying a lifting force to the linkage to raise the motor in a generally vertical direction;

a latch bar pivotally attached at one end to one of said legs for rotation in opposite directions;

a slot in said latch bar including first and second abutment surfaces at opposite ends of said slot;

stop means on another of said legs, said stop means extending into said slot and movable therein in response to vertical movement of the motor;

said stop means adapted to engage said first abutment surface to hold the motor in its raised position in response to lifting movement of the motor to its raised position, manual rotation of said latch bar in one direction and release of the lifting force;

said stop means adapted to disengage said first abutment surface in response to application of the lifting force and rotation by gravity of said latch bar in the other direction; and,

said stop means adapted to engage said second abutment surface to support the motor in its lowered position in response to release of the lifting force.

4,872,860

SACRIFICIAL ANODE FOR MARINE PROPULSION UNITS

Gary L. Meisenburg, Fond du Lac, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed May 23, 1988, Ser. No. 197,710

Int. Cl.⁴ C23F 13/00

U.S. Cl. 440—113

16 Claims

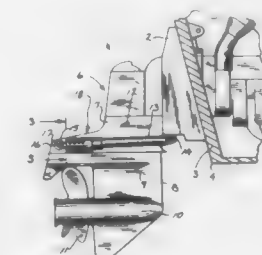
1. In a marine propulsion unit (1) for a boat (4), the combination comprising:

(a) a generally vertical propeller carrying drive housing (6),

(b) a generally horizontal longitudinal fore-to-aft extending trim cylinder unit (12) disposed adjacent said housing for pivotally raising and lowering the latter relative to the water,

(c) a sacrificial anode (19, 47, 55, 61) mounted to said trim cylinder unit,

(d) said trim cylinder unit (12) including:



(1) a trim cylinder (13),

(2) and a piston rod (15) extending from an end of said trim cylinder, said piston rod having an outer end,

(c) and mounting means (16) for attaching said outer end of said piston rod for pivoting said trim cylinder unit relative to said boat,

(f) said sacrificial anode being disposed between said trim cylinder end and said mounting means.

4,872,861

GLIDE BOARD WITH RUDDER

Serge Gaudin, 15 Avenue de la République, F-40600 Biscarosse, France, assignor to Serge Gaudin, Biscarosse; Henry Clauzet, Paris and Jean-Pierre Daures, Mont de Marsan, all of France

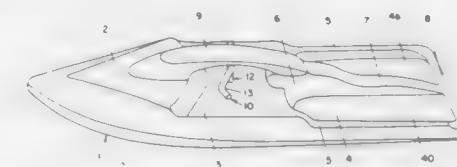
Filed Jun. 8, 1988, Ser. No. 203,816

Claims priority, application France, Jun. 10, 1987, 87 08162

Int. Cl.⁴ B63H 25/16

U.S. Cl. 441—79

7 Claims



1. A board with a rudder, said board comprising: at least one rudder on a lower face of the board mounted for swivelling in the body of the board, means for actuating said rudder accessible on an upper face of the board,

said means for actuating being disposed substantially in a central zone of the board and comprising two manual members covered by a profiled portion formed so as to allow a user to lie on the board with his chest along said profiled portion,

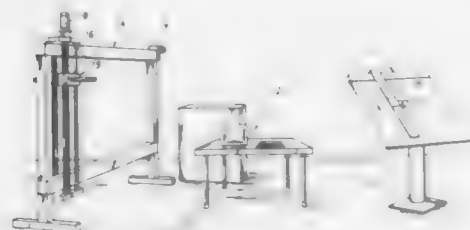
two substantially parallel elongate housings provided on a rearward, upper-face portion of the board, said housings being formed in the mass of the board for receiving the leg portions of the user below his knees, when kneeling on the board.

4,872,862

METHOD AND APPARATUS FOR MANUFACTURING DISPLAY COMPRISING LIGHT-EMITTING DIODES

Rolf V. T. Ewald, Chokelvaag 55, S-310 31 Eldsberga, Sweden
Continuation-in-part of Ser. No. 895,460, Aug. 11, 1986, abandoned, which is a division of Ser. No. 613,091, May 22, 1984, Pat. No. 4,628,422, which is a continuation-in-part of Ser. No. 463,540, Feb. 3, 1983, abandoned. This application Mar. 24, 1988, Ser. No. 173,177

Claims priority, application Sweden, Feb. 16, 1982, 8200913
Int. Cl.⁴ B23P 15/00; B21D 28/32
U.S. Cl. 445—22 2 Claims



1. An improved method of manufacturing displays incorporating light-emitting diodes, wherein said light-emitting diodes form a selected pattern and their power are enhanced by reflectors surrounding the individual light-emitting diodes, said method comprising:
mapping the selected pattern on a substratum,
determining a series of coordinate points on the substratum relating to the positions of the light-emitting diodes to form the selected pattern,
automatically recording the series of coordinates thus determined in computer memory means;
supplying said recorded series of coordinates from said computer memory means to control means and directly utilizing said series of recorded coordinates to successively position backing means and means for forming impressions and openings in said impressions in aligned relationship on opposite sides of a plate;
successively actuating said means for forming impressions and openings as positioned so as to thereby form said impressions and said openings in said plate substantially at each of said series of coordinates;
inserting said diodes in each of said openings; and
interconnecting said diodes in a desired manner.

4,872,863

METHOD OF FIXING A CATHODE-RAY TUBE CONE AND DISPLAY WINDOW PRIOR TO SEALING AND A CATHODE-RAY TUBE MANUFACTURED BY SUCH A METHOD

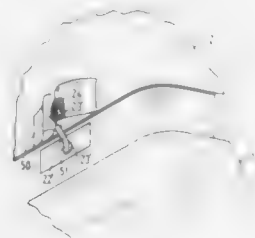
Henricus J. M. Van Der Avoort, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Jun. 6, 1988, Ser. No. 202,616

Claims priority, application Netherlands, Jun. 11, 1987, 8801354

Int. Cl.⁴ H01J 9/30, 9/26

U.S. Cl. 445—45

4 Claims



1. A method of manufacturing a cathode-ray tube, including

the steps of positioning relative to each other and subsequently sealing to each other a cone part having a substantially rectangular cone edge and a display window part having a substantially rectangular sealing edge at the location of the sealing edge and the cone edge, characterized in that after both parts have been positioned relative to each other this positioning is fixed temporarily prior to sealing by securing locating pins to faces which are provided on the peripheral edge of one of the parts, each locating pin being secured in a slot which is provided on a stud present on the peripheral edge of the other part, each locating pin being secured to a face and in a slot by means of an acrylate adhesive, and also secured to a face and in a slot by means of a temperature resistant cement.

4,872,864

METHOD OF MAKING A CATHODE FROM TUNGSTEN AND ALUMINUM POWDERS

Louis E. Branovich, Howell; Bernard Smith, Ocean; Gerard L. Freeman, Freehold, and Donald W. Eckart, Wall, all of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 23, 1989, Ser. No. 313,837

Int. Cl.⁴ H01J 9/04

U.S. Cl. 445—50

8 Claims

1. Method of making a cathode for operation in microwave devices from tungsten and aluminum powders, said method including the steps of:

- (A) mixing the tungsten and aluminum powders,
- (B) adding about 2 percent by weight of an activator to the mixture,
- (C) ball milling the mixture for about 8 hours,
- (D) pressing the ball milled mixture into a billet at about 48,000 p.s.i. in a die,
- (E) sintering the billet at about 700° to 1325° C. for about thirty minutes in dry hydrogen of less than -100 dew-point,
- (F) backfilling the billet with methyl methacrylate,
- (G) machining the billet to the desired geometry,
- (H) removing the methyl methacrylate by dissolution in acetone,
- (I) thoroughly rinsing in deionized water, methanol and then drying,
- (J) firing the billet in dry hydrogen at about 700° to 1325° C. for about 15 minutes,
- (K) impregnating the billet with an impregnant having a melting point less than or equal to 1000° C. by firing the billet in a dry hydrogen furnace at a temperature at which the impregnant melts for about two minutes,
- (L) removing the billet from the furnace after the furnace is cooled, and
- (M) removing any loose pieces of impregnant from the billet.

4,872,865

HYPERTONIC SOLUTION FOR ARTHROSCOPIC SURGERY

Roy D. Bloebaum, Salt Lake City, Utah, and Frank P. Magee, Phoenix, Ariz., assignors to Harrington Arthritis Research Center, Phoenix, Ariz.

Continuation of Ser. No. 785,767, Oct. 9, 1985, abandoned. This application Nov. 30, 1987, Ser. No. 125,731

Int. Cl.⁴ A61M 1/00

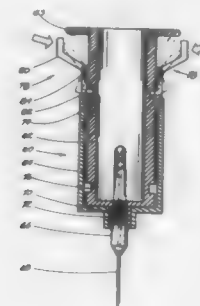
U.S. Cl. 604—28

9 Claims

1. A composition for use in invasive medical procedures, comprising:

a solution containing ions selected from the group consisting of Na⁺, K⁺, Cl⁻ and Ca⁺⁺ having a hypertonic osmolality between about 350 mmol to about 450 mmol relative to the osmolality of normal mammalian blood

serum and conforming to the ionic composition of normal mammalian synovial fluid so as to be physiologically



compatible with joints and tissues during said medical procedures.

4,872,866

MEDICAL LAVAGE APPARATUS

Richard C. Davis, 14802 Dunstan Place, Tampa, Fla. 33618

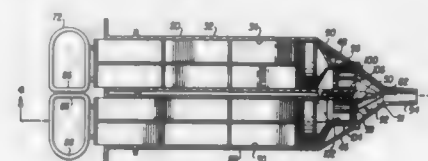
Continuation of Ser. No. 95,077, Sep. 11, 1987. This application

Dec. 30, 1988, Ser. No. 292,163

Int. Cl.⁴ A61M 5/315

U.S. Cl. 604—227

1 Claim



1. A medical lavage syringe device for irrigating and aspirating a body cavity, said device comprising:

- a rigid housing defining an irrigation cylinder with an elongated irrigation bore and an aspiration cylinder with an elongated aspiration bore, said bores being substantially parallel and side-by-side, said irrigation and aspiration cylinder bores each being open and unconnected at first ends thereof, said rigid housing further defining respectively an inlet port and an outlet port in said respective irrigation and aspiration cylinders intermediate first and second ends thereof;
- a common tube configuration coupling second ends of said irrigation and aspiration cylinders to a common nozzle;
- an irrigation plunger and an aspiration plunger having first ends for respectively fitting into said first open ends of said irrigation and aspiration cylinders and having seals at said first ends thereof for making sealing, sliding contact with internal cylinder surfaces of said respective bores and including hand-engaging portions at second ends outside the cylinders for engaging a hand and thereby being moved into and out of their respective bores by said hand;
- a system of check-valves comprising an inlet check-valve located at said inlet port for allowing the flow of fresh irrigation fluid into said inlet port but hindering the flow of fluid from said inlet port, an outlet check-valve located at said outlet port for allowing the flow of aspiration fluid from said outlet port but hindering the flow of fluid into said outlet port, an irrigation check-valve located at said irrigation bore between said inlet port and said common exchange tube for allowing flow of irrigation fluid from said irrigation bore into said common exchange tube but for hindering the flow of fluid from said common exchange tube into said irrigation bore and an aspiration check-valve located at said aspiration bore between said outlet port and said common exchange tube for allowing flow of irrigation fluid from said common exchange tube

into said aspiration bore but hindering flow in the opposite direction;

said hand-engaging portions of said irrigation and aspiration plungers having closed, side-by-side, loop configurations, said closed loops being in a common plane and said loops having adjacent sides when are relatively-straight, parallel-to-axes-of-elongation-of-said-bores, said sides positioned close to each other to allow a user to grip both hand engaging portions with fingers of one hand while simultaneously moving the irrigation and aspiration plungers into and out of the irrigation and aspiration cylinders while maintaining these fingers close together.

4,872,867

COMPOSITIONS HAVING ANTITHROMBOGENIC PROPERTIES AND BLOOD CONTACT MEDICAL DEVICES USING THE SAME

Yasushi Joh, Yokohama, Japan, assignor to UBE Industries, Ltd., Ube, Japan

Continuation of Ser. No. 33,157, Jan. 30, 1987, abandoned. This application Feb. 28, 1989, Ser. No. 317,108

Claims priority, application Japan, Jun. 19, 1985, 60-133194; Jun. 19, 1985, 60-133195

Int. Cl.⁴ A61M 5/005

U.S. Cl. 604—269

14 Claims

1. An antithrombogenic material having an interpenetrating polymer network which comprises

- (1) a polyether type polyurethane or polyurethane urea containing in its main chain a segment comprising polytetramethylene oxide;
- (2) a water soluble polymer, a water swellable polymer or a combination thereof; and
- (3) a room temperature cross-linking type silane coupling agent capable of being activated by water and induced condensation polymerization with crosslinking which is crosslinked to form a hydrophobic highly crosslinked polysiloxane network in which network the polyether type polyurethane or polyurethane urea, and the water soluble polymer, the water swellable polymer or combination thereof, are entangled.

4,872,868

COLLECTING BAG FOR MAKING QUICK MEDICAL ANALYSES

Francois Chevallier, 10 boulevard Périer, 13008 Marseille, France

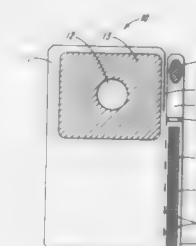
Continuation of Ser. No. 140, Jan. 2, 1987, abandoned. This application Sep. 28, 1988, Ser. No. 252,036

Claims priority, application France, Jan. 3, 1986, 86 00033

Int. Cl.⁴ A61M 1/00

U.S. Cl. 604—327

10 Claims



1. A collection bag for performing quick medical analysis allowing the making of a diagnosis or the monitoring of the evolution of the state of health of a patient comprising:
a collection chamber defined by a closed, flexible envelope, a first orifice for allowing for passage into the collection chamber of matter such as stools, urine, secretions or other material originating from the patient,

a second chamber defined by a weld point of the walls of the bag along at least one edge of the bag, the second chamber in fluid communication with the collection chamber, and a second orifice constructed and arranged both to allow insertion of a product or an instrument into the second chamber and to allow for sampling the contents of the bag, the second orifice comprising a slit for access inside the bag, the slit constituting the inlet of the second chamber.

4,872,869

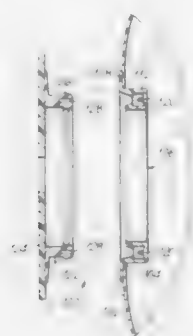
LOW PROFILE OSTOMY DEVICE

Owen L. Johns, Madeira Beach, Fla., assignor to Smith & Nephew (Latin America), Inc., Largo, Fla.
Continuation of Ser. No. 872,305, Jun. 9, 1982, abandoned. This application Jun. 24, 1988, Ser. No. 210,910

Int. Cl.⁴ A61F 5/44

U.S. Cl. 604—342

9 Claims



1. A low profile ostomy device which comprises:
 - (a) an ostomy bag provided with a stoma-encircling opening through the side thereof;
 - (b) a first coupling member comprising a flat ring portion attached to the ostomy bag through the opening and having an aperture substantially of the same size as and coincident with the ostomy bag opening, said ring having a first engaging element in the form of an annular channel having two sides and a bottom, the bottom of the channel having a rib extending upward within the channel; said first engaging means extending into the ostomy bag; and
 - (c) a second coupling member comprising means for attachment to a user's body, said second member having a second engaging element for engagement with the first engaging element, said second member having an aperture of substantially the same size as the ostomy bag opening, said second engaging element comprising an annular flange having a central groove therein which mates with said rib to provide a seal between the first and second engaging means.

4,872,870

FUSED LAMINATED FABRIC AND PANTY LINER INCLUDING SAME

Lauren Jackson, Yardley, Pa., assignor to Chicopee, New Brunswick, N.J.

Continuation of Ser. No. 72,837, Jul. 13, 1987, abandoned, which is a division of Ser. No. 644,159, Aug. 16, 1984, Pat. No. 4,737,404. This application Oct. 19, 1988, Ser. No. 262,111

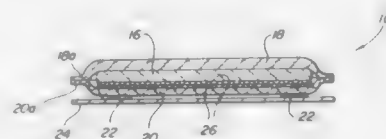
Int. Cl.⁴ A61F 13/00

U.S. Cl. 604—366

11 Claims

1. A panty liner to be worn in the crotch portion of an undergarment comprising: a first fibrous layer having first and second oppositely facing major surfaces, said first major surface of said first fibrous layer being adapted to be disposed against the body; an absorbent core smaller in external dimensions than said first fibrous layer and positioned in juxtaposed relationship with respect to the second major surface thereof;

liquid repellent means generally coextensive in external dimension with the external dimensions of said absorbent core and positioned in juxtaposed relationship with respect thereto; and a second fibrous layer of base fibers and fusible fibers, said layer having substantially the same size and shape as said first fibrous layer, said second fibrous layer having first and second oppositely facing major surfaces, the first major surface of said second fibrous layer being positioned in face-to-face juxtaposition with said liquid repellent means and with the peripheral portion of the second major surface of said first fibrous layer outwardly of said liquid repellent means, the fibers in said



second fibrous layer being arranged in a regular repeating pattern of entangled region of higher density than the average density of the layer and interconnected fibers extending between the entangled fiber regions, said interconnecting fibers being randomly entangled with each other in said entangled regions, said heat fusible fibers being present at least at the first major surface of said second fibrous layer, at least some of said heat fusible fibers in the peripheral portion of said second fibrous layer being fused to fibers in the peripheral portion of said first fibrous layer, whereby said first and second fibrous layers are secured to one another and said absorbent core and said liquid repellent means are retained therebetween.

4,872,871

DISPOSABLE ABSORBENT GARMENT HAVING ELASTIC OUTER COVER AND INTEGRATED ABSORBENT INSERT STRUCTURE

Deborah L. Proxmire, Larsen; Dan D. Endres, Appleton; John C. Wilson, Neenah; Lynn A. Johnson, DePere; Georgia L. Zehner, Larsen; Leona G. Boland, Neenah, and Robert A. Stevens, Appleton, all of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Continuation of Ser. No. 947,941, Dec. 31, 1986, abandoned.

This application Jul. 14, 1988, Ser. No. 220,356

The portion of the term of this patent subsequent to Oct. 20, 2004, has been disclaimed.

Int. Cl.⁴ A61F 13/16

U.S. Cl. 604—394

52 Claims



1. An anatomically form-fitting, generally self-adjusting disposable absorbent garment comprising:
 - a breathable elastomeric nonwoven outer cover, including a pair of leg openings, front and rear waist sections together defining a waist opening, a crotch section situated between said leg openings and opposed front and rear panels separated by said crotch section;
 - an absorbent insert structure having opposed longitudinal

ends and substantially superposable on said front and rear panels and said crotch section, including a liquid impermeable barrier and a liquid permeable bodyside liner with an absorbent composite disposed therebetween; attachment means for attaching and integrating said longitudinal ends of said insert to said outer cover, at selected front and rear waist attachment zones, defining one or more free-span zones underlying said insert wherein the functional stretchability of said outer cover in said free-span zone is substantially unrestricted.

4,872,872

MEDICAMENT CONTAINER/DISPENSER ASSEMBLY

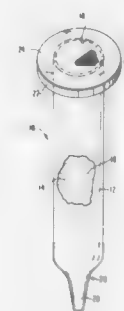
Robert B. Polak, 160 Kimberly Ave., Asheville, N.C. 28804

Filed Sep. 22, 1986, Ser. No. 910,407

Int. Cl.⁴ A61M 5/14

U.S. Cl. 604—405

13 Claims



1. A disposable container/dispenser assembly for the extended storage and direct intravenous administration of a medicament comprising:

a substantially non-collapsible main body defining a chamber for containing said medicament in liquid form, said main body being prepared from a medical grade polypropylene-containing molding resin and having an upper portion and a lower portion; pressure equalizing means consisting essentially of a liquid impervious, gas permeable membrane prepared from a material selected from the group consisting of polypropylene, nylon, and polysulfone, said membrane permanently attached to the upper portion of said main body; and an exit port consisting of a tube extending from the lower portion of said main body and having a rupturable closed end.

4,872,873

CONTROLLED RELEASE BOLUS DEVICE

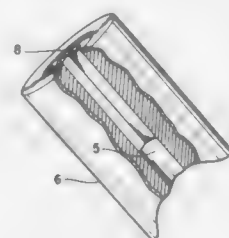
Joel R. Zingerman, Westfield, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Dec. 14, 1987, Ser. No. 133,586

Int. Cl.⁴ A61K 9/22

U.S. Cl. 604—892.1

3 Claims



1. An improved controlled release bolus comprising a semi-permeable membrane defining a compartment, the compartment being divided into first and second portions by a move-

able interface, the first compartment portion containing a swellable agent, the second compartment portion containing a medicament to be dispensed, a densifier within the second compartment adjacent said membrane and a passageway through the membrane and densifier connecting said second compartment portion with the exterior of the bolus, having a central axis and a diameter such that when the bolus is in contact with water, the semipermeable membrane allow water to pass therethrough which is imbibed by the swellable agent which forces the interface to move the medicament to be dispensed through the passageway, wherein the improvement comprises an insert of rigid film having a central axis which is placed coaxially within the passageway, said insert comprising from 2 to 6 arm members connected together at and extending radially from said central axis of said insert a distance of approximately one-half of the diameter of the passageway.

4,872,874

METHOD AND APPARATUS FOR TRANSARTERIAL AORTIC GRAFT INSERTION AND IMPLANTATION

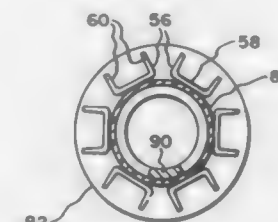
Syde A. Taheri, 268 Dan Troy, Williamsville, N.Y. 14221

Filed May 29, 1987, Ser. No. 56,131

Int. Cl.⁴ A61F 2/06; A61B 17/04

U.S. Cl. 623—1

4 Claims



1. The method of attaching an implantable tubular graft to the wall of a blood vessel, comprising the steps of: forming an incision in said blood vessel; inserting said tubular graft into said blood vessel through said incision; moving said graft along said blood vessel to a desired location relative to said blood vessel; moving an inflatable bulb in a deflated condition within said graft so as to be in a desired position with respect to said graft and blood vessel, said bulb releasably carrying a plurality of clips having outwardly-facing ends; quickly inflating said bulb so as to drive said clips outwardly to penetrate said graft and blood vessel; releasing said clips after said clips have penetrated said graft and blood vessel; deflating said bulb; withdrawing such deflated bulb from said blood vessel; and closing said incision, thereby to leave said graft attached to said blood vessel by said clips.

4,872,875

PROSTHETIC HEART VALVE

Ned H. C. Hwang, Houston, Tex., assignor to Carbon Implants, Inc., Austin, Tex.

Filed Jan. 28, 1989, Ser. No. 296,428

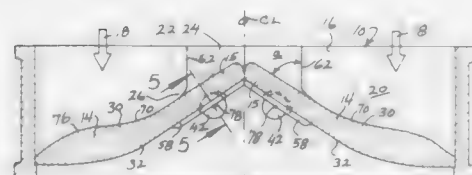
Int. Cl.⁴ A61F 2/24

U.S. Cl. 623—2

14 Claims

1. A prosthetic heart valve for allowing blood flow there-through in a downstream direction, which valve comprises a generally annular valve body having an interior surface defining a central passageway through which blood flows, a pair of occluders proportioned to be pivotally received within said valve body and to move between an open position wherein downstream flow of blood is permitted

and a closed position wherein the reverse flow of blood in an inflow direction is blocked, said occluders each having a pair of opposite lateral edges respectively extending between a minor mating edge and a major arcuate edge and having major inflow and outflow surfaces, cooperative pivotal mounting means incorporated in said occluders in the regions of each lateral edge and in said valve body in its interior surface region which cooperate to establish generally pivotal movement of said occluders about a pair of parallel pivot axes, said occluders each having an inflow surface formed with a concave region of two-dimensional curvature and with a generally convex region of two-dimensional curvature,



said concave surface region being spaced downstream from said pivot axis in said open position and being curved about a straight line which is generally parallel to said pivot axis, said convex region being spaced further from said pivot axis than said concave region, and said occluders being installed in said annular valve body and constructed so that said occluders have an angle of opening of about 70° to about 85° in said fully open position with said outflow surface regions lying generally adjacent the centerline through said central passageway, and so that, in the closed position, said mating edges of said occluders generally abut each other and said arcuate edges of said occluders abut said valve body interior surface.

4,872,876

UNIVERSAL FIT INTRAOCULAR LENS

John M. Smith, Santa Barbara, Calif., assignor to Nestle S.A., Vevey, Switzerland

Filed May 11, 1988, Ser. No. 192,824

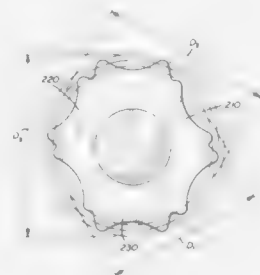
Int. Cl.⁴ A61F 2/16

U.S. Cl. 623—6

9 Claims

1. An intraocular lens for use in eyes of different sizes, comprising:
an optic;
a haptic which is connected to and projects outwardly from at least a portion of the optic; the haptic including an outer periphery with a plurality of support portions adapted to maintain and support the optic within an eye, the support portions being located on one of a plurality of different

diameters of different length relative to the optic, so that the support portions along one diameter can be selected



and the other support portions removed for adapting the lens to fit in an eye of a predetermined size.

4,872,877

INTRAOCULAR LENS WITH ULTRAVIOLET SCREENING AGENT

John Tiffany, Ventura, Calif., assignor to Dennis T. Grendahl, Shorewood, Minn.

Filed Mar. 17, 1987, Ser. No. 26,631

Int. Cl.⁴ A61F 2/16

U.S. Cl. 623—6

6 Claims

1. A method for incorporating an ultraviolet screening agent into a preformed flexible silicone rubber intraocular lens, the method comprising:
a. preparing a solution of an ultraviolet screening agent in an organic liquid, the concentration of agent in the solution being such that the solution has a higher concentration of agent than the lens material;
b. bringing the lens and the solution into contact with each other until the lens and solution reach osmotic equilibrium;
c. separating the lens and the solution; and,
d. drying the lens.

4,872,878

OPTICAL BRIGHTENER IN AN INTRAOCULAR LENS

John S. Tiffany, Ventura, Calif., assignor to Dennis T. Grendahl, Shorewood, Minn.

Continuation-in-part of Ser. No. 26,631, Mar. 17, 1987. This application May 26, 1987, Ser. No. 53,840

Int. Cl.⁴ A61F 2/16

U.S. Cl. 623—6

3 Claims

1. A method for incorporating an ultraviolet screening agent and an optical brightener into a preformed silicone rubber intraocular lens, the method comprising:
a. preparing a solution of an ultraviolet screening agent and an optical brightener in an organic liquid, the concentration of each in the solution being such that the solution has a higher osmotic pressure than the lens material;
b. bringing the lens and the solution into contact with each other until the lens and solution reach osmotic equilibrium;
c. separating the lens and the solution; and,
d. drying the lens.

4,872,879

PROSTHETIC DEVICE FOR ABOVE-KNEE AMPUTATION

Daniel L. Shamp, Akron, Ohio, assignor to Prosthetic Consultants Inc., Akron, Ohio

Filed Sep. 22, 1987, Ser. No. 99,778

Int. Cl.⁴ A61F 2/80

U.S. Cl. 623—36

9 Claims

1. A prosthetic socket for above-knee amputations comprising:
an interface having proximal and distal ends, said proximal and distal ends both being open;
a single peripheral discontinuity;
said peripheral discontinuity extending along the entire longitudinal extent of said interface between said proximal and distal ends to permit adjustment of the peripheral dimension of said interface along the full longitudinal extent thereof;
means selectively to secure the selectively adjusted peripheral dimension of said interface so that it will properly circumscribe a residual limb received within said interface;

a frame positioned at the distal end of said interface; wherein said frame incorporates a cup-like portion to receive the distal end of said interface;



mounting tangs extend upwardly from said cup-like portion; said means selectively to secure said frame to the distal end of said interface are connected through said tangs.

4,872,881
PROCESS FOR THE DYEING OF POLYMERS OF PROPYLENE, BUTENE-1 AND 4-METHYL-PENTENE-1 USING BASIC DYE IN AN AQUEOUS DYE BATH
 John R. B. Boocock, Kingston, Canada, assignor to DuPont Canada Inc., Mississauga, Canada
 Continuation-in-part of Ser. No. 126,796, Dec. 1, 1987, abandoned. This application Oct. 6, 1988, Ser. No. 253,632
 Claims priority, application United Kingdom, Dec. 1, 1986, 8628658

Int. Cl.⁴ C08L 23/02; D06P 1/41, 3/79
 U.S. Cl. 8—513 7 Claims
 1. A process for dyeing a polyolefin article, comprising the steps of:

(A) contacting the polyolefin article with an aqueous dye-bath, said polyolefin being a blend comprising (i) 50–99 parts by weight of at least one polymer selected from the group consisting of homopolymers of propylene, butene-1 or 4-methyl-pentene-1 and copolymers of propylene, butene-1 or 4-methyl-pentene-1 with a minor amount of a hydrocarbon alpha-olefin, and mixtures thereof, and (ii) 1–50 parts by weight of a copolymer selected from the group consisting of direct copolymers or graft copolymers wherein (a) said direct copolymer is a zinc ionomer of a copolymer of an alpha-olefin having the formula $R-CH=CH_2$, where R is a radical selected from the class consisting of hydrogen and alkyl radicals having from 1 to 8 carbon atoms, with at least one alpha-beta-ethylenically unsaturated carboxylic acid having from 3 to 8 carbon atoms, the acid moieties being randomly or non-randomly distributed in the polymer chain, the carboxylic acid content being 0.5–50% by weight of the direct copolymer, any other copolymerized monomer being monoethylenically unsaturated, and (b) said graft copolymer is obtained by grafting 0.1 to 20 percent by weight of at least one alpha,beta-unsaturated carboxylic acid having 3 to 8 carbon atoms or unsaturated carboxylic acid anhydride onto a preformed polyolefin backbone derived from at least one of homopolymers of C_2 to C_8 hydrocarbon alpha-olefins, copolymers of ethylene and at least one C_3 to C_8 hydrocarbon alpha-olefin and copolymers of ethylene and unsaturated carboxylic acids, in which polyolefin backbone any other optionally copolymerized monomer component is monoethylenically unsaturated, said aqueous dyebath containing basic dye in a concentration of at least 0.4 g/l and at a pH of at least 5.0, the temperature of the aqueous dyebath being at least 90° C.,

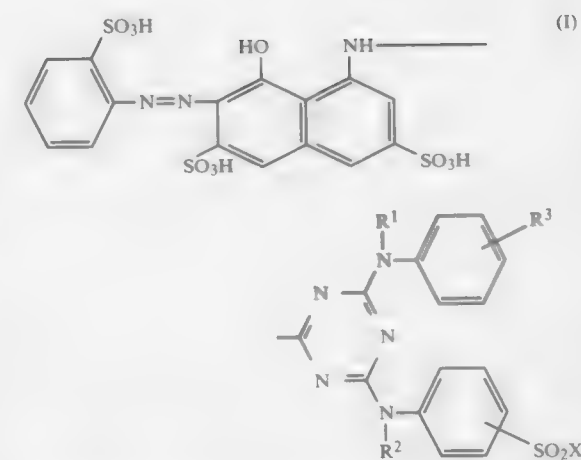
(B) maintaining said polyolefin article in contact with the aqueous dyebath for a period of at least 10 minutes, and
 (C) removing the polyolefin article so dyed from the aqueous dyebath.

4,872,881
MIXTURES OF WATER-SOLUBLE RED AND YELLOW OR BLUE REACTIVE DYES AND A METHOD OF DYEING CELLULOSIC FIBERS USING SUCH DYE MIXTURES

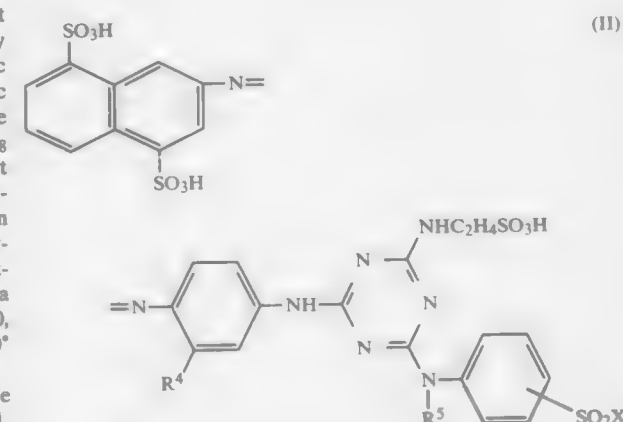
Takashi Fujita; Toshio Hihara, both of Kitakyushu; Yoshio Kogure, Takarazuka; Kiyonichi Sekioka, and Noboru Nakamura, both of Kitakyushu, all of Japan, assignors to Mitsubishi Kasei Corporation, Tokyo, Japan
 PCT No. PCT/JP88/00226, § 371 Date Oct. 31, 1988, § 102(e) Date Oct. 31, 1988, PCT Pub. No. WO89/00184, PCT Pub. Date Jan. 12, 1989

PCT Filed Mar. 1, 1988, Ser. No. 269,146
 Claims priority, application Japan, Jun. 30, 1987, 62-163166
 Int. Cl.⁴ C09B 62/00, 67/22; D06P 1/38

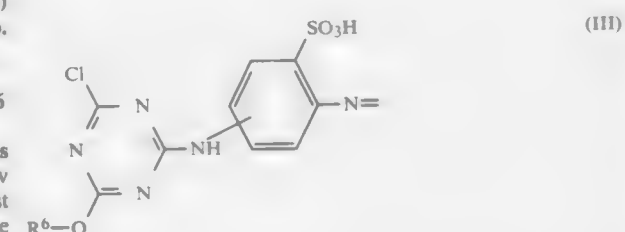
U.S. Cl. 8—549 38 Claims
 1. A water-soluble reactive dye mixture, wherein a yellow and/or blue water-soluble reactive dye is blended with at least one kind of red water-soluble reactive dyes represented by the following general formula (I) in the form of free acid:

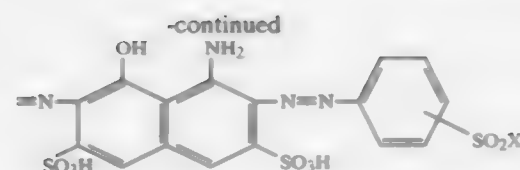


(where: each of R^1 and R^2 denotes a hydrogen atom or a lower alkyl group which may contain therein a substituent; R^3 indicates a hydrogen atom, a lower alkyl group or a halogen atom and X represents $-CH=CH_2$ or $-C_2H_4OSO_3H$),
 said water-soluble reactive dye mixture being characterized in that the yellow component is a water-soluble reactive dye represented by the following general formula (II) in the form of free acid:

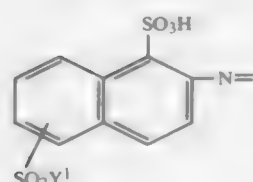


(where: R^4 represents a $-NHCOCH_3$ group, a $-NH-COC_2H_5$ group, a $-NHCONH_2$ group or a $-NH-COSO_2CH_3$ group; R^5 denotes a hydrogen atom or a lower alkyl group which may contain therein a substituent; and X has the same definition as in the preceding general formula (I)), and the blue component is at least one water-soluble reactive dye represented by the following general formulas (III) to (VI) in the form of free acid:

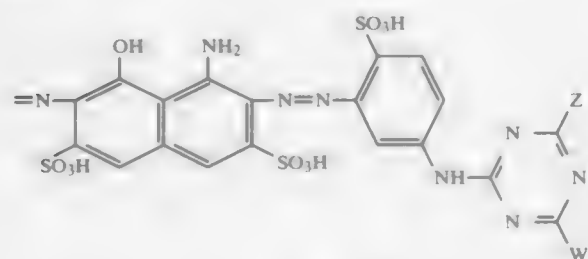




(where: R^6 indicates a lower alkyl group; and X has the same definition in the preceding general formula (I));

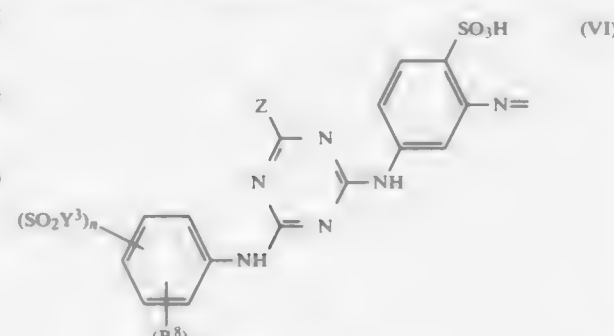


(IV)

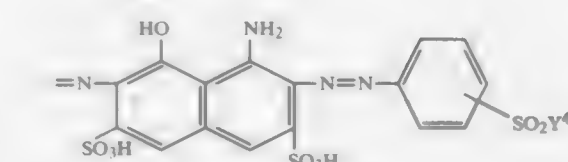


(where: Y^1 denotes a $-\text{CH}=\text{CH}_2$ group, a $-\text{C}_2\text{H}_4\text{OSO}_3\text{H}$ group or a $-\text{OH}$ group; Z represents a chlorine atom or a fluorine atom; W designates a lower alkoxy group or a

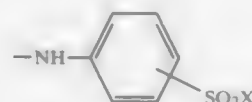
stituent; and Y^2 indicates a $-\text{CH}=\text{CH}_2$ group, a $-\text{C}_2\text{H}_4\text{OSO}_3\text{H}$ group or a $-\text{OH}$ group, provided that when V is a $-\text{NHC}_2\text{H}_4\text{SO}_3\text{H}$ group, Y^2 is either a $-\text{CH}=\text{CH}_2$ group or a $-\text{C}_2\text{H}_4\text{OSO}_3\text{H}$ group; and



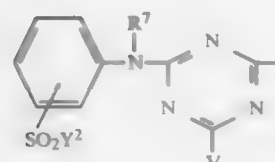
(VI)



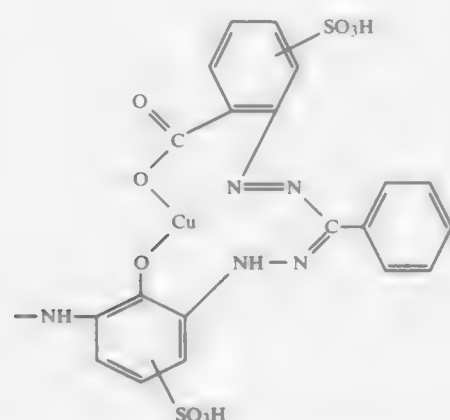
(where: R^8 denotes a chlorine atom, a $-\text{COOH}$ group or a $-\text{OH}$ group; each of Y^3 and Y^4 represents a $-\text{CH}=\text{CH}_2$ group, a $-\text{C}_2\text{H}_4\text{OSO}_3$ group or a $-\text{OH}$ group; m and n are numbers of 0 or 1, but cannot be 0 at the same time; and Z has the same definition as in the preceding general formula (IV)).



and X has the same definition as in the preceding general formula (I);



(V)



(where: V denotes a chlorine atom, a fluorine atom or a $-\text{NHC}_2\text{H}_4\text{SO}_3\text{H}$ group; R^7 represents a hydrogen atom or a lower alkyl group which may contain therein a sub-

4,872,882 DYEING FORMULATIONS OF MIXTURES OF RED DISPERSE DYES FOR THE WASHFAST DYEING OF POLYESTER FIBERS OR MIXTURES THEREOF WITH CELLULOSE FIBERS: BENZO-DI-FURANONE AND AZO DYE

Manfred Hähnke, Kelkheim, and Reinhard Kühn, Frankfurt am Main, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 1, 1988, Ser. No. 239,520

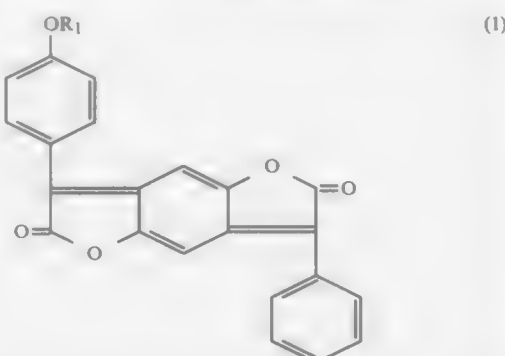
Claims priority, application Fed. Rep. of Germany, Sep. 2, 1987, 3729323; Oct. 3, 1987, 3733505

Int. Cl. 4 C09B 23/08, 67/22; D06P 3/54

U.S. Cl. 8—638

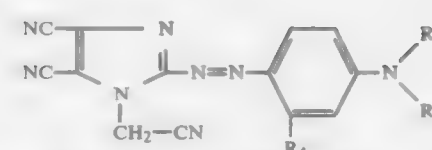
5 Claims

1. Dyeing formulations in solid or liquid form, containing one or more red disperse dyes of the general formula (1)



(1)

where R_1 denotes an alkyl group of 1 to 4 carbon atoms, and one or more red disperse dyes of the general formula (2)



(2)

(b) remaining amounts of a material selected from the group consisting of elastomer solvent, emulsifiers, plasticizers, fillers and mixtures thereof.

4,872,885

DISPERSANT FOR AQUEOUS SLURRY OF CARBONACEOUS SOLID AND AQUEOUS CARBONACEOUS SOLID SLURRY COMPOSITION INCORPORATING SAID DISPERSANT THEREIN

Tsunao Tsunakimoto, Toyonaka; Hayami Ito, Himeji; Shuhei Tatsumi, Akashi; Yoshihiro Kajibata, Hyogo; Shoichi Takao, Akashi; Takakiyo Goto, Yokohama; Akio Nakaishi, Yokosuka; Kenji Rakutani, Yokohama; Toshio Tamura, Yokohama, and Hiroya Kobayashi, Minoo, all of Japan, assignors to Kawasaki Jukogyo Kagushiki Kaisha, Hyogo and Nippon Shokubai Kabaku Kogyo Co., Ltd., Osaka, both of Japan

PCT No. PCT/JP87/00109, § 371 Date Feb. 23, 1988, § 102(e) Date Feb. 23, 1988

PCT Filed Feb. 20, 1987, Ser. No. 171,866

Claims priority, application Japan, Feb. 27, 1986, 61-150939; Aug. 19, 1986, 61-192055; Aug. 27, 1986, 61-199069; Aug. 27, 1986, 61-199070; Dec. 19, 1986, 61-305031; Dec. 19, 1986, 61-305032; Dec. 19, 1986, 61-305033; Dec. 19, 1986, 61-305034

Int. Cl. 4 C10L 1/32

U.S. Cl. 44—51

26 Claims

4,872,883 MIXTURES OF MONOAZO DYESTUFFS

Ulrich Bühler, Alzenau; Klaus Hofmann, Frankfurt am Main, and Manfred Hähnke, Kelkheim, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Bayerwerk, Fed. Rep. of Germany

Filed Jan. 27, 1988, Ser. No. 149,010

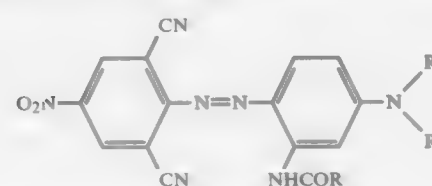
Claims priority, application Fed. Rep. of Germany, Feb. 2, 1987, 3702967

Int. Cl. 4 C09B 67/22, 29/08; D06P 1/18

U.S. Cl. 8—639

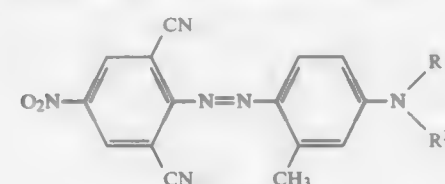
20 Claims

1. A mixture of monoazo dyestuffs which comprises one or more dyestuffs of the formula I



(I)

and one or more dyestuffs of the formula II



(II)

wherein R^1 and R^2 independently of one another each denote linear or branched alkyl with 1 to 6 carbon atoms and R denotes linear or branched alkyl with 1 to 3 carbon atoms.

4,872,884

REDUCED CALORIE CHEWING GUM BASE AND COMPOSITIONS CONTAINING THE SAME

Subraman R. Cherukuri, Towaco, N.J., and Gul Mansukhani, Staten Island, N.Y., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Dec. 10, 1986, Ser. No. 939,918

Int. Cl. 4 A23G 3/30

U.S. Cl. 426—3

34 Claims

1. A chewing gum base composition consisting essentially of, in weight percent:

(a) about 0.5 to about 20% elastomer; about 10% to about 25% of a polyvinyl acetate having a medium molecular weight of about 35,000 to about 55,000; about 4.5% to about 10.0% acetylated monoglyceride; and about 6% to about 10% of a wax having a melting point below about 60° C.; and



1. A dispersant for an aqueous carbonaceous solid slurry, comprising a water-soluble copolymer having an average molecular weight of 1,000 to 500,000 and obtained by polymerizing the following monomer components (A), (B), (C), and (D) and/or a water-soluble copolymer obtained by neutralizing said copolymer with a basic substance:

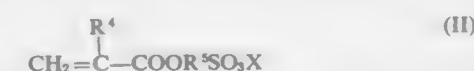
(A) 0.1 to 7 mol % of a polyalkylene glycol mono(meth)acrylate type monomer represented by the general formula I:



(I)

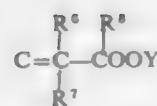
wherein R^1 stands for hydrogen atom or methyl group, R^2 for alkylene group having 2 to 4 carbon atoms, n for a numeral in the range of 1 to 100 on the average, and R^3 for an alkyl, alkenyl, or aryl group having 1 to 30 carbon atoms, an alkyl, cyclic alkyl, or cyclic alkenyl group possessing an aryl group as a substituent, or a monovalent organic group derived from a heterocyclic compound,

(B) 5 to 94.9 mol % of a sulfoalkyl (meth)acrylate type monomer represented by the general formula II:



(II)

wherein R^4 stands for hydrogen atom or methyl group, R^5 for an alkylene group having 1 to 4 carbon atoms and X for hydrogen atom, an alkali metal atom, an alkaline earth metal atom, an ammonium group, or an amine base, (C) 5 to 94.9 mol % of an unsaturated carboxylic acid type monomer represented by the general formula III:



(III)

wherein R^6 and R^7 independently stand for hydrogen atom, methyl group, or $-COOY$, providing that R^6 and R^7 do not simultaneously stand for $-COOY$, R^8 stands for hydrogen atom, methyl group, $-COOY$, or $-CH_2COOY$, providing that R^6 and R^7 independently stand for hydrogen atom or methyl group where R^8 stands for $-COOY$ or $-CH_2COOY$, and Y stands for hydrogen atom, alkali, metal atom, alkaline earth metal atom, ammonium group, or amine base, and

(D) 0 to 20 mol % of other monomer providing that the total amount of said monomer component (A), (B), (C), and (D) is 100 mol %.

ARTICLE

TWO-STAGE COAL GASIFICATION PROCESS

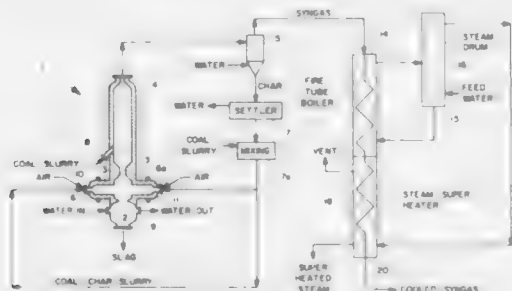
John P. Henley; Stanley R. Pearson, both of Baton Rouge, La.; Bruce C. Peters, Midland, Mich., and Larry L. LaFitte, Baton Rouge, La., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 803,031, Nov. 29, 1985, abandoned. This application Apr. 5, 1988, Ser. No. 178,035
Int. Cl. C10J 3/46

U.S. Cl. 48—197 R 10 Claims

1. A non-catalytic two-stage upflow process for gasification of a carbonaceous material, which process comprises the steps of

- combusting in a fired horizontal slagging reactor a stream comprising an oxygen-containing gas and a first increment of a slurry of particulate carbonaceous material in a liquid carrier at a temperature of between 2400° F. (1316° C.) and 3000° F. (1649° C.) and at a pressure of from 50 psig (345 kPa gage) to 600 psig (4137 kPa gage) by means of opposed horizontal burner nozzles, thereby evolving heat and forming a liquid, molten slag and a gaseous products stream and entrained byproduct sticky, molten slag particles;
- separating said liquid, molten slag;
- contacting, in an unfired vertical second stage, said gaseous products stream and said entrained byproduct sticky, molten slag particles from the fired horizontal reactor with a second increment of a slurry of particulate carbonaceous material in a liquid carrier at a temperature of between 1600° F. (871° C.) and 2000° F. (1093° C.), whereby a substantial portion of the heat evolved in the said step (a) is recovered by converting the second increment of carbonaceous material and carrier liquid into steam, vapor from



the carrier liquid, synthesis gas and char, whereby at least a portion of the entrained byproduct sticky, molten slag particles are cooled below the temperature of adherence to heat transfer surfaces and at least a portion of said entrained sticky, molten slag particles are absorbed onto said char preventing the fouling of the downstream heat recovery equipment; and

- recovering another portion of the heat values from said gaseous combustion products in a high temperature heat

recovery system, including a fire-tube boiler, whereby the gaseous combustion products are cooled to a temperature of about 450° to about 550° F. (232° to 288.7° C.).

4,872,887

METHOD FOR FLUE GAS CONDITIONING WITH THE DECOMPOSITION PRODUCTS OF AMMONIUM SULFATE OR AMMONIUM BISULFATE

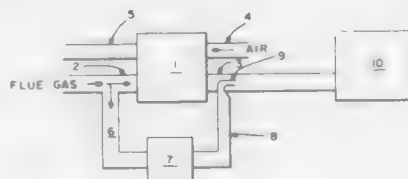
Ralph F. Altman, Chattanooga, Tenn.; John P. Gooch; Edward B. Dismukes, both of Birmingham, Ala., and Edward C. Landham, Jr., Pinson, Ala., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Sep. 12, 1988, Ser. No. 243,435

Int. Cl. B03C 1/00

U.S. Cl. 55—5

12 Claims



1. A method for conditioning flue gas containing suspended fly ash, comprising the steps of:

- diverting a slipstream of flue gas from a main flue gas stream at a point upstream from an air preheater located directly upstream of an electrostatic precipitator where the temperature of said main flue gas stream is in the range of about 700° F. to 900° F., said diverted stream thereby having a temperature in the range of from about 700° F. to 900° F.;
- introducing an aqueous solution of ammonium sulfate or ammonium bisulfate into said diverted flue gas slipstream thereby effecting thermal decomposition of said ammonium sulfate or bisulfate into its gaseous thermal decomposition products which include sulfur trioxide and ammonia;
- flowing said gaseous thermal decomposition products through a catalyst capable of oxidizing NH_3 with O_2 to produce N_2 and H_2O and suppressing the reaction whereby NH_3 and SO_3 interact by an oxidation-reduction process to produce N_2 , SO_2 and H_2O ;
- then returning said diverted flue gas slipstream to said main flue gas stream at a point between said air preheater and said electrostatic precipitator thereby distributing said gaseous thermal decomposition products into said main flue gas stream flowing between said air preheater and said electrostatic precipitator.

4,872,888

MICROPOROUS MEMBRANE FILTER AND METHOD OF PRODUCING SAME

Wolfgang Ehrfeld, Karlsruhe; Peter Hagmann, Eggenstein-Leopoldshagen; Jürgen Mohr, Sulzfeld, and Dietrich Münchmeyer, Stutensee, all of Fed. Rep. of Germany, assignors to Kernforschungszentrum Karlsruhe GmbH, Karlsruhe, Fed. Rep. of Germany

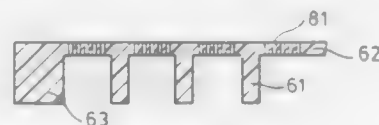
Filed Feb. 11, 1988, Ser. No. 154,298

Claims priority, application Fed. Rep. of Germany, Feb. 13, 1987, 3704546

Int. Cl. B01D 39/16, 59/14; C08J 9/26; B29C 67/20

U.S. Cl. 55—16

9 Claims



1. A microporous membrane filter comprising: an integrally molded body of a material whose solubility can be changed by

high energy radiation and including a first flat membrane portion and a plurality of supporting elements for said membrane portion extending from one surface of said membrane portion; and a plurality of micropores provided in selected regions of said membrane portion and formed by high energy irradiation of the membrane and removal of the regions of increased solubility.

4,872,889

FILTER SYSTEM FOR THE REMOVAL OF ENGINE EMISSION PARTICULATES

Gerhard Lepperhoff, Eschweiler, and Georg Hühthwohl, Aachen, both of Fed. Rep. of Germany, assignors to FEV Motorentechnik GmbH & Co., KG, Aachen, Fed. Rep. of Germany
Filed Apr. 8, 1988, Ser. No. 179,647

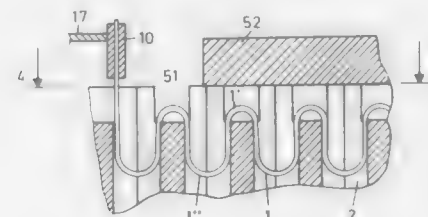
Claims priority, application Fed. Rep. of Germany, Apr. 11, 1987, 3712333

Int. Cl. B01D 46/00

U.S. Cl. 55—267

14 Claims

1. A filter system for removing particulates from exhaust gases of an internal combustion engine, in particular a diesel engine, comprising at least one filter member in the configuration of a honeycomb of a porous filter material having generally parallel inlet and outlet passages for the gases, particulates for the gases being trapped on some of the surfaces of said inlet passages, said outlet passages being plugged closed at the gas intake side of said filter member, said inlet passages having inlet openings facing said gas intake side and being plugged closed at a side opposite said gas intake side, electric resistance heating means comprising a plurality of spaced apart heating elements each having loop-shaped wire portions extending into several of said inlet openings at said gas intake side for heating and igniting the trapped particulates, said filter member having a plurality of spaced apart grooves in said gas intake side wall



thereof receiving connecting portions of said looped shaped wire portions said heating elements for firmly positioning said heating elements directly in said filter member.

4,872,890

MULTI-STAGE GAS-ENTRAINED LIQUID SEPARATOR

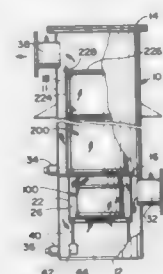
Ned L. Lamprecht, Rocky River, Ohio, and Clyde W. Hawley, Chester, Va., assignors to Dollinger Corporation, Richmond, Va.

Filed Nov. 14, 1988, Ser. No. 270,022

Int. Cl. B01D 46/02

U.S. Cl. 55—323

1 Claim



1. A multi-stage gas-entrained liquid separator comprising: housing means having a first chamber and a second chamber separated by a partition and communicable with one another through a first aperture in said partition, said first

chamber having an annular passage provided with a tangential gas inlet for admitting an inlet gas-liquid stream in a tangential path thereinto and for imparting centrifugal action upon large liquid droplets entrained in said admitted gas-liquid stream to cause impingement of said entrained large liquid droplets against said housing means, said annular passage opening into said first chamber, said first chamber further being provided with an inner chamber separated from said annular passage and communicable therewith by a second aperture so positioned relative said gas inlet and said annular passage as to impart a change of direction to said admitted gas-liquid stream, said inner chamber also communicating with said first aperture, said second chamber having a gas outlet for discharging a gas stream therefrom, said first chamber, second chamber and inner chambers each having a respective liquid sump at a lower portion thereof;

drain means for draining the respective liquid sumps of the first and second chambers;

means for draining the liquid sump of the inner chamber into the liquid sump of the first chamber;

preseparator means provided in said inner chamber for separating by impingement thereon liquid droplets from said gas-liquid stream and for coalescing and draining said separated liquid into said inner sump, and for conducting said gas-liquid stream through said first aperture into said second chamber; and

two-stage principal separator means provided in said second housing for separating by impingement and coalescence thereon liquid microdroplets entrained in said gas-liquid stream admitted thereto from said preseparator means and for preventing by impingement re-entrainment of coalesced liquid droplets therefrom into a gas stream discharged therefrom.

4,872,891

DESICCANT SYSTEM

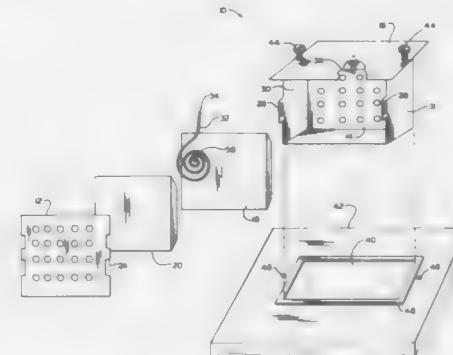
John Susameier, Danbury, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Sep. 6, 1988, Ser. No. 240,972

Int. Cl. B01D 53/04

U.S. Cl. 55—387

3 Claims



1. A desiccant system for an enclosure, comprising desiccant material contained in two gas permeable packets each having a flattened side, a perforated box having a cover plate and being adapted for retaining the two packets with the respective flattened sides juxtaposed, and an open tube having a length to internal diameter ratio of at least about ten and further having an outer end open to atmosphere through the cover plate and an inner end positioned centrally between the flattened sides of the packets, the box being insertable into a port in an enclosure with the cover plate adapted to seal the port, whereby the enclosure is maintained at atmospheric pressure and in a gas controlled condition.

4,872,892

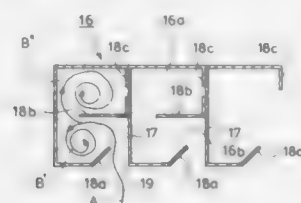
AIR PURIFIER

Seppo Vartiainen, Kouvola, and Erkki Aalto, Kausala, both of Finland, assignors to Halton Oy, Finland
Continuation-in-part of Ser. No. 46,243, May 5, 1987, abandoned, which is a continuation of Ser. No. 803,066, Nov. 5, 1985, abandoned. This application Sep. 16, 1988, Ser. No. 245,795

Claims priority, application Finland, Mar. 9, 1984, 840978
Int. Cl.⁴ B01D 45/12

U.S. Cl. 55—345

1 Claim



1. An air purifier (10) comprising a purifier part (11) having at least two air purifier modules (16) being placed substantially in parallel to each other and operating on the centrifugal separation principle, each of said modules having at least one vortex chamber (16a, 16b), a partition (17) separating said air purifier modules (16) from each other, an inflow aperture (19) and an outlet, wherein

each vortex chamber (16a, 16b) extends along an entire length of a longitudinal dimension of said air purifier module (16),

said inflow aperture (19) is positioned to co-operate with said partition (17) and with a guide member (18a) to direct each air flow (A) entering said purifier part (11) through one of said inflow apertures (19) to proceed in a constant helical motion (B', B'') to said outlet of said air purifier module (16), such that said air flow (A) through said vortex chamber (16a, 16b) is only in a direction substantially perpendicular to the direction in which said air flow (A) enters through said inflow aperture (19).

4,872,893

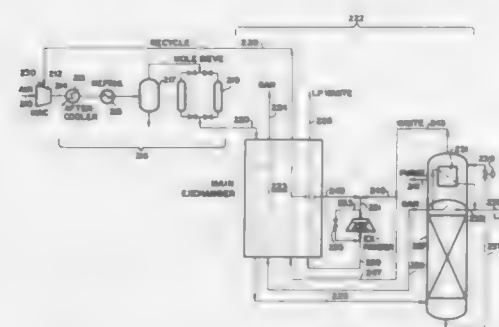
PROCESS FOR THE PRODUCTION OF HIGH PRESSURE NITROGEN

Rakesh Agrawal, Allentown, and Steven R. Anvil, Macungie, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Oct. 6, 1988, Ser. No. 254,528
Int. Cl.⁴ F25J 3/00

U.S. Cl. 62—11

19 Claims



1. A process for the recovery of nitrogen from a feed gas stream containing nitrogen and oxygen whereby a pressurized condition is retained in an oxygen-enriched recycle process stream comprising the steps of:

(a) compressing a feed gas stream containing nitrogen and oxygen to an elevated pressure;

(b) introducing the elevated pressure feed gas stream into a cryogenic separation zone to recover a high purity nitrogen product and an oxygen-enriched waste stream from said zone, and

(c) removing an elevated pressure recycle stream, having an oxygen content above that of the feed gas stream of step (a), from said cryogenic separation zone and at least maintaining the oxygen content of said recycle stream, recycling said stream at elevated pressure to the feed gas stream for introduction into the cryogenic separation zone.

4,872,894

METHOD FOR RAPID PREPARATION OF HALIDE GLASSES

Joseph J. Hutta, Groton, Mass., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

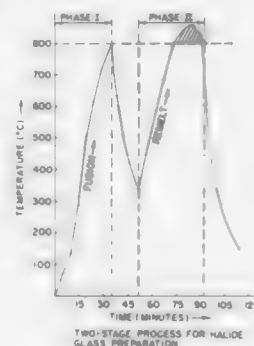
Filed May 26, 1988, Ser. No. 202,659
Int. Cl.⁴ C03B 37/018

U.S. Cl. 65—3.11

9 Claims

1. A method of rapidly forming fluorozirconate and fluoro-hafnate glasses, the glasses having multiple components in a starting mixture, one or more of the components being volatile at an elevated temperature, said starting mixture being placed in a crucible, the crucible being near a source of controllable heat from a furnace, the crucible being in a sealed chamber having a controlled inert, reactive or slightly oxidizing atmosphere, the method comprising the steps of:

a. heating the mixture to a temperature such that substantially all of the mixture melts to form a first melt, said heating occurring in about one half hour to a temperature in the range of about 750 to 890 degrees centigrade;



b. cooling the first melt by removing the source of heat to at least the temperature where the first melt becomes a non-liquid mixture;

c. heating said non-liquid mixture in a short period of time to a temperature where the mixture completely melts to form a second melt;

d. allowing the homogenization of said second melt for a short period of time; and

e. cooling the second melt by removing the source of heat therefrom.

4,872,895

METHOD FOR FABRICATING ARTICLES WHICH INCLUDE HIGH SILICA GLASS BODIES

James W. Fleming, Westfield; David W. Johnson, Jr., Pluckemin; John B. MacChesney, Lebanon, and Sandra A. Pardeneck, Westfield, all of N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 11, 1986, Ser. No. 940,392
Int. Cl.⁴ C01B 33/18

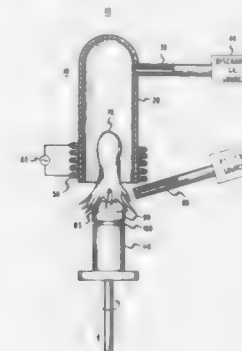
U.S. Cl. 65—18.1

9 Claims

1. A method for fabricating an article comprising silica-containing glass, the method comprising the steps of:

forming silica-containing gel particles, said forming step including the step of mechanically subdividing (1) an ungelled or partially gelled sol capable of yielding a substantially cohesive gel body and/or (2) a gel body which is substantially cohesive and substantially elastic, such that

essentially all of said gel particles are wet and are of substantially uniform size;



fusing said gel particles into a silica-containing glass body; and
completing the fabrication of said article.

4,872,896

PROCESS FOR STRENGTHENING GLASS

William C. LaCourse, Alfred, and Maysood Akhtar, Wellsville, both of N.Y., assignors to Alfred University, Alfred, N.Y.

Filed May 27, 1988, Ser. No. 199,954
Int. Cl.⁴ C03C 21/00

U.S. Cl. 65—30.14

20 Claims

1. A process for strengthening a glass article, comprising the steps of:

(a) providing a glass article comprised of from about 1 to about 30 weight percent of at least one compound of a first monovalent exchangeable cation wherein said cation is selected from the group consisting of sodium, potassium, lithium, silver, copper, and mixtures thereof;

(b) coating the surface of said glass article with a source of a second cation, wherein:
said second cation has an ionic radius larger than that of said first cation, and

2. said second cation is selected from the group consisting of sodium, potassium, silver, copper, and mixtures thereof; and, thereafter

(c) subjecting said coated glass article to a source of microwave radiation at a frequency of from about 0.9 to about 22.1 Gigahertz, whereby said second cation is caused to penetrate the surface of said glass article to a depth of from about 10 to about 100 microns.

4,872,897

BOTTOM TAP OF A GLASS MELTING FURNACE AND METHOD OF OPERATING THE SAME

Heinrich Krejci, Marktheidenfeld, and Rudi Kessel, Lohr/Main, both of Fed. Rep. of Germany, assignors to Sorg GmbH & Co. KG, Lohr/Main, Fed. Rep. of Germany

Filed Feb. 8, 1989, Ser. No. 308,126

Claims priority, application Fed. Rep. of Germany, Feb. 8, 1988, 3803730

Int. Cl.⁴ C03B 5/26

U.S. Cl. 65—128

8 Claims

1. A discontinuously operable bottom tap of a glass melting furnace, comprising:

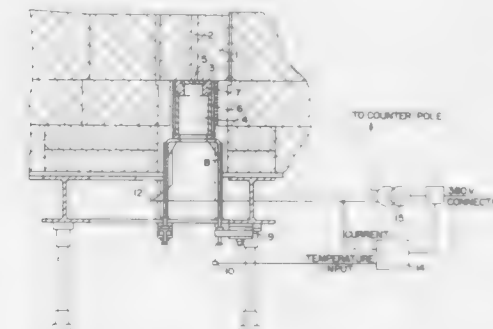
a tap brick with a tap hole in which glass is frozen when the tap is not in operation and seals the tap, a tap gate of refractory and non-oxidizing metal urged against the tap brick underneath the tap hole which is connected as an electrode to a counter-electrode situated in a glass bath, a tap chamber situated underneath the tap gate, and a removable insulation for the tap chamber.

7. A method of operating a bottom tap of a glass melting furnace comprising a tap brick with a tap hole in which glass is frozen when the tap is not in operation and seals the tap, a tap gate of refractory and non-oxidizing metal urged against the tap brick underneath the tap hole which is connected as an electrode to a counter-electrode situated in a glass bath, a tap

chamber situated underneath the tap gate, and a removable insulation for the tap chamber, the method comprising:

to put the tap into operation, performing an insulating of the tap chamber;

after a sufficient temperature is reached at the gate, producing a flow of current between the gate and the counter-electrode;



removing the insulation, the flow of glass beginning upon continued heating; and
interrupting the input of electrical energy, to end the withdrawal of glass, after which the glass again solidifies in the tap brick.

4,872,898

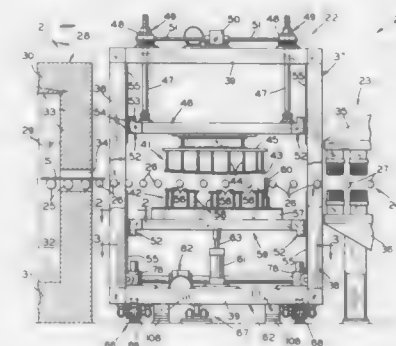
CENTERING AND LEVELING OF MOBILE PRESS BENDING APPARATUS

Allan T. Enk, Toledo, Ohio, and Jeffrey R. Flaugh, Carlton, Mich., assignors to Libbey-Owens-Ford Co., Toledo, Ohio

Filed Feb. 17, 1989, Ser. No. 312,120
Int. Cl.⁴ C03B 23/03

U.S. Cl. 65—287

17 Claims



1. In glass sheet bending apparatus of the type including, in aligned sequence, heating, press bending, and tempering sections, said press bending section comprising upper and lower bending members and associated conveyor rolls operatively mounted upon a mobile carriage for movement as a unit transversely into and out of operative position in said aligned sequence, the improvement wherein said mobile carriage includes a base framework, wheels affixed to said base adapted for movement along spaced carriage rails, means vertically moving said base and carriage between a raised transport position whereat said wheels are extended for supporting said carriage upon said rails and a lowered operating position whereat said wheels are retracted, means for supporting said carriage at a predetermined elevation in said operating position with said wheels retracted, and means carried by said base for locating said carriage in a predetermined position of transverse alignment relative to said heating and tempering sections and securing said carriage in said predetermined position.

4,872,888

TREATMENT OF PLANT CHLOROSIS WITH RHODOTORULIC ACID

Gene W. Miller, Providence, Utah, assignor to Utah State University Foundation, Logan, Utah
Continuation of Ser. No. 718,858, Apr. 2, 1985. This application May 22, 1987, Ser. No. 54,088
Int. Cl.⁴ C05F 11/00

U.S. Cl. 71-11

21 Claims

1. A method of treating iron chlorosis in plants comprising the step of administering to said plants a sufficient quantity of rhodotorulic acid to provide said plants with increased capacity to absorb iron in usable form.

4,872,900

4,872,900

BIOREGULATOR BASED ON PLANT RAW MATERIALS AND METHOD FOR PRODUCING SAME

Branco R. Gajic, Bulevar Lenjina 105/7, Novi Beograd, 11070, Yugoslavia, assignor to Patentverwertungsgesellschaft bürgerlichen Rechts; Götz Dorndorf, both of Frankfurt am Main, Fed. Rep. of Germany and Branco Gajic, Yugoslavia
Filed Feb. 24, 1988, Ser. No. 159,991

Claims priority, application Yugoslavia, Feb. 27, 1987, 309/87
Int. Cl.⁴ C05F 11/10

U.S. Cl. 71-23

8 Claims

1. Bioregulator based on plant raw materials which comprises the following main components belonging to the family Caryophyllaceae:

- (a) 20 to 30 weight % Herniaria
- (b) 8 to 14 weight % Buffonia
- (c) 10 to 16 weight % Spergula
- (d) 30 to 40 weight % Ortega
- (e) 5 to 7 weight % Arenaria
- (f) 6 to 8 weight % Sagina, and
- (g) 4 to 6 weight % Holsteum

4,872,901

4,872,901

HERBICIDAL PYRAZOLE SULFONYL IMINO-2H-1,2,4-THIAZOLO[2,3-A9]PYRIMIDINES

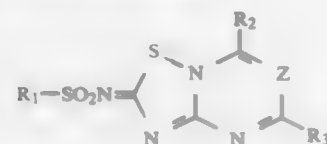
Isao Aoki, Kawanishi; Takashi Karagano, Takarazuka; Nobuyuki Okajima, Osaka, and Yoshiyuki Okada, Suita, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan
Filed Oct. 22, 1986, Ser. No. 921,420

Claims priority, application Japan, Oct. 25, 1985, 60-240258
Int. Cl.⁴ A01N 43/90; C07D 497/22

U.S. Cl. 71-90

9 Claims

1. A compound of the formula



wherein R₁ is a pyrazolyl group which is unsubstituted or mono- to tri-substituted by a lower alkyl group, a lower alkenyl group, a lower alkynyl group, a lower alkoxy group, a lower alkenyloxy group, an aryl group of 6 to 12 carbon atoms, an aryloxy group of 6 to 12 carbon atoms, an aralkyl group of 7 to 10 carbon atoms, an aralkyloxy group of 7 to 10 carbon atoms, an acyl group derived from an organic carboxylic acid but excluding carbamoyl, an acyloxy group in which the acyl group is derived from an organic carboxylic acid but excluding carbamoyloxy, a carbamoyl group, a carbamoyloxy group, sulfamoyl, halogen, a carboxy group which may be esterified, or cyano or said pyrazolyl group is mono-substituted by nitro or a group of the formula:



in which R₄ is an organic residue and n is an integer of 0, 1 or 2;
R₂ and R₃ respectively are a lower alkyl group or a lower alkoxy group; and Z is CH.

4,872,902

4,872,902

CYCLOHEXANEDIONES AND THEIR USE AS PLANT GROWTH REGULATORS

Hans-Georg Brunner, Lausen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

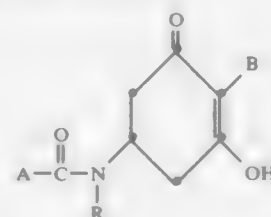
Filed Feb. 8, 1988, Ser. No. 153,376

Claims priority, application Switzerland, Feb. 9, 1987, 469/87
Int. Cl.⁴ A01N 33/02, 33/08; C07C 149/40, 101/44

U.S. Cl. 71-105

14 Claims

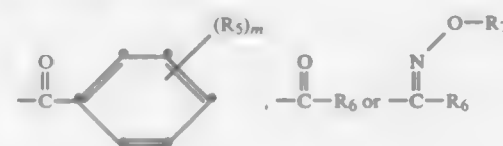
1. Compounds of formula I



(I)

in which

R is hydrogen or C₁-C₆-alkyl,
A is R₂, OR₃ or NR₃R₄,
R₂ is C₁-C₆-alkyl that is unsubstituted or is mono-substituted by C₁-C₄-alkoxy or mono- or poly-substituted by halogen, or is C₃-C₆-cycloalkyl,
R₃ is C₁-C₆-alkyl or C₃-C₆-cycloalkyl, or is phenyl or benzyl each of which is unsubstituted or is mono-, di- or tri-substituted by R₅,
R₄ is hydrogen, C₁-C₆-alkyl, C₁-C₄-alkoxy or C₃-C₆-cycloalkyl,
B is one of the radicals



m is 0, 1, 2 or 3,
R₅ is halogen, nitro, cyano, C₁-C₄-alkyl, C₁-C₄-alkoxy, C₁-C₄-alkylthio, C₁-C₄-haloalkyl, C₁-C₄-alkylsulphonyl or C₁-C₄-alkylsulphonyl,
R₆ is C₁-C₆-alkyl or C₃-C₆-cycloalkyl, and
R₇ is hydrogen, C₁-C₆-alkyl, C₁-C₆-haloalkyl, C₃-C₆-alkenyl, C₃-C₆-haloalkenyl or C₃-C₆-alkynyl,
and salts of the compounds of formula I with acids, bases or complexformers.

12. A herbicidal or growth-regulating composition which contains as active ingredient an effective amount of a compound of formula I according to claim 1, together with carriers and/or other adjuvants.

4,872,903

4,872,903

SCREW JACK SAFE AGAINST OVERLOAD FOR A MOVABLE ELEMENT SUCH AS A SEAT STRUCTURE

Pierre Perleu, Cergy Pontoise, France, assignor to Rockwell-CIM, France
Filed Oct. 3, 1988, Ser. No. 252,216

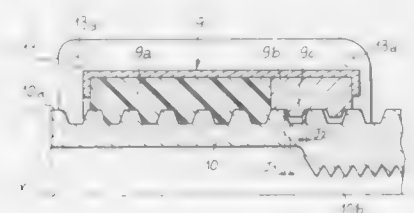
Claims priority, application France, Oct. 8, 1987, 87 13917
Int. Cl.⁴ F16H 25/24

U.S. Cl. 74-89.15

4 Claims

1. A screw jack safe against overload for a movable element such as a seat structure, said screw jack comprising a support, a tubular primary screw movable in rotation and in translation and provided with an outer screw thread and an inner screw thread which screw threads have opposite screw thread hands, a fixed secondary screw fixed relative to the support and en-

gaged in the inner screw thread of the primary screw, nut means for connection to said movable element, said nut means being engaged with the outer screw thread of the primary screw, the nut means being composite and comprising a first



nut composed of a plastics material which has a good coefficient of friction, and a second nut which is composed of a mechanically strong material.

4,872,904

4,872,904

TUNGSTEN CARBIDE POWDER AND METHOD OF MAKING FOR FLAME SPRAYING

Mitchell R. Dorfman, Smithtown, N.Y., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Jun. 2, 1988, Ser. No. 201,507

Int. Cl.⁴ B22F 9/00

U.S. Cl. 75-0.5 BA

7 Claims

1. A method of making a cobalt bonded tungsten carbide powder useful for flame spraying, comprising:

preparing a mixture consisting essentially of a first tungsten carbide powder having a particle size of -5 microns, a second tungsten carbide powder having a particle size of -44+10 microns, a cobalt powder having a particle size of -5 microns and a carbon powder having a particle size of -1 micron, the mixture having proportions, by weight totaling 100%, of about 10% to 30% first tungsten carbide, 40% to 80% second tungsten carbide, 8% to 25% cobalt and 0.5 to 3% carbon; and
processing the mixture by compacting the mixture to produce a compacted product, sintering the compacted product to produce a sintered product, crushing the sintered product to produce a crushed product, and classifying the crushed product to produce the cobalt bonded tungsten powder.

4,872,905

4,872,905

METHOD OF PRODUCING NON-AGGLOMERATING SUBMICRON SIZE PARTICLES

Roy S. Bourne, Clearwater; Clarence C. Eichman, Indian Rocks Beach, and William W. Welton, Bellair, all of Fla., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.
Filed May 11, 1988, Ser. No. 192,555

Int. Cl.⁴ C23C 15/00

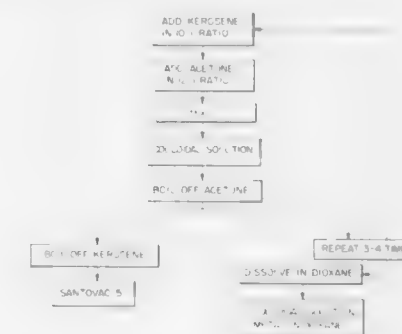
U.S. Cl. 75-0.5 C

24 Claims

1. A process for forming non-agglomerating metallic particles having a size of less than one micron in diameter, comprising:

providing particles by a sputtering technique;

capturing said particles in a high molecular weight low vapor pressure oil; and



recovering the captured particles from the oil, said particles being covered with a molecular layer of oil that prevents agglomeration.

4,872,906

4,872,906

PROCESS AND PLANT FOR PRODUCING BINDER-FREE HOT BRIQUETTES

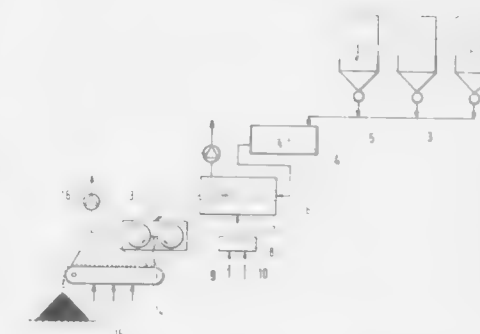
Rudolf Auth, Dorsten; Lothar Seidelmann, Duisburg, and Heinz Maas, Dinslaken, all of Fed. Rep. of Germany, assignors to Thyssen Stahl AG, Duisburg, Fed. Rep. of Germany
Filed Mar. 16, 1988, Ser. No. 168,708

Claims priority, application Fed. Rep. of Germany, Apr. 2, 1987, 3711130

Int. Cl.⁴ C22B 1/24

U.S. Cl. 75-5

13 Claims



1. A process for the production of binder-free hot briquets of finely particulate non-pyrophoric residual substances accumulating in the production and processing of iron and steel and containing substantially no combustible components, for use in smelting, wherein:

- a) fuel in a finely particulate form is admixed to the residual substances,
- b) a quantity of external heat is fed from outside to the mixture of residual substances and fuel, until the fuel ignites, the quantity of fuel added being such that the temperature of the residual substances reaches the range of 600° to 900° C., and
- c) the residual substances are then immediately hot-briquetted without intermediate cooling at a temperature in the aforementioned range.

4,872,907

METAL CHIP FURNACE CHARGE APPARATUS AND METHOD

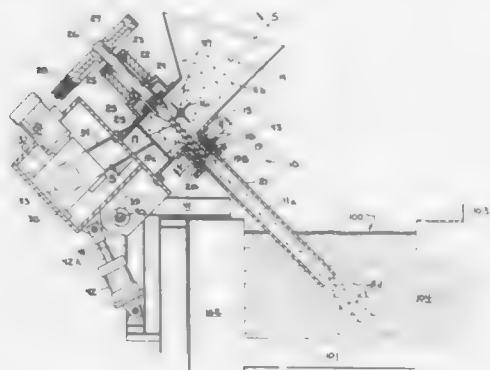
Larry D. Areaux, Nathrop, Colo., assignor to Pre-Melt Systems, Inc., Kalamazoo, Mich.

Filed Jan. 30, 1988, Ser. No. 213,365

Int. Cl.⁴ C21B 9/16; F27B 14/16

U.S. Cl. 75—65 R

49 Claims



1. A method for the industrial utilization of metal chips which involves the introduction of said metal chips into a mass of molten metal of which said chips are formed, comprising the steps of:

- providing a delivery conduit of a material which is resistant to the mass of molten metal, under the temperature and other conditions present therein,
- compacting and extruding said metal chips into said delivery conduit in the form of a densified mass,
- creating a pressure upon the densified mass of chips in the delivery conduit,
- causing the densified mass of chips in the delivery conduit to substantially fill said delivery conduit and to move along said delivery conduit,
- causing said delivery conduit to dip into said mass of molten metal so as to provide a point of introduction below the surface thereof,
- causing the densified mass of chips within the delivery conduit to exit from said delivery conduit directly into said mass of molten metal at said point of introduction below the surface thereof, and
- maintaining a pressure upon the densified mass of chips within the delivery conduit sufficient to prevent substantial entry of the mass of molten metal into said delivery conduit.

4,872,908

METAL TREATMENT

Philip G. Enright, Hook Norton; Andrew J. Hobbs, and Ronald E. Tapping, both of Banbury, all of England, assignors to Alcan International Limited, Quebec, Canada

Filed Dec. 31, 1987, Ser. No. 140,268

Claims priority, application United Kingdom, Dec. 31, 1986, 2,310,665

Int. Cl.⁴ C22B 21/00; C22C 24/00

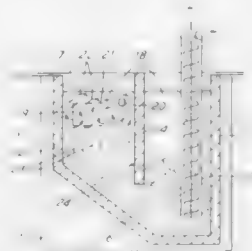
U.S. Cl. 75—68 R

29 Claims

1. A method of forming a filter cake for filtering liquid metal comprising the steps of:

- (a) disposing a liquid metal permeable substrate in a flow path of the liquid metal to be filtered and
- (b) disposing particles that are stable with respect to the

liquid metal into said flow path, upstream of the substrate, so that said particles are carried at least partially, as well



as wetted, by the metal flow and dispersed as a pre-wetted and pre-primed filter cake on the substrate.

4,872,909

PROCESS FOR ACID LEACHING OF MANGANESE OXIDE ORES AIDED BY HYDROGEN PEROXIDE

James P. Allen, and Richard R. Corwin, both of Salt Lake City, assignors to The United States of America, as Represented by the Secretary of the Interior, Washington, D.C.

Filed Aug. 8, 1988, Ser. No. 229,408

Int. Cl.⁴ C22B 3/00

U.S. Cl. 75—101 R

7 Claims

1. A method of processing manganese ore, containing manganese, nickel, and cobalt metals comprising the steps of:
- adding the manganese ore to an aqueous solution of acid and H_2O_2 to form a leach pulp wherein said leach pulp contains up to about 40 weight percent solids, about 20 weight percent acid, and about 10 weight percent H_2O_2 ;
 - agitating said leach pulp for up to about 1 hour period at a temperature of about 0° C. to 100° C.;
 - separating the leach pulp into a solid fraction and a liquid fraction containing manganese, nickel, and cobalt solubilized metals; and
 - recovering the solubilized manganese, nickel, and cobalt metals from the liquid fraction.

4,872,910

ANTISTATIC FLOOR POLISH

James M. Eahleman, Manheim, and Kenneth K. Ko, West Grove, both of Pa., assignors to Armstrong World Industries, Inc., Lancaster, Pa.

Filed Aug. 12, 1988, Ser. No. 231,457

Int. Cl.⁴ C09G 1/10

U.S. Cl. 106—3

18 Claims

1. A conductive composition comprising at least one metal crosslinking latex binder and a metal salt/polymer matrix where the polymer is polyethylene or polypropylene oxide.

4,872,911

STOP LEAK COMPOSITION

David H. Walley, 3621 Club Estates Dr. #2, Muskogee, Okla. 74403, and Marvin R. DeVries, 3823 S. 99th East Ave., Tulsa, Okla. 74146

Continuation-in-part of Ser. No. 947,881, Dec. 30, 1986, abandoned. This application Apr. 21, 1988, Ser. No. 184,199

Int. Cl.⁴ C09K 3/10; E21B 33/00

U.S. Cl. 106—33

2 Claims

1. A stop leak composition for a cooling system of a vehicle which comprises a tridimensional cross-linked superabsorbent hydrogel particulate polymer having a non-uniform particle geometry such as acicular and/or cuboidal with an aspect ratio of from about 1 to about 10,
- a first particle fraction having an average size less than the average leak size,
 - a second particle fraction having particles of an average size

about one order of magnitude greater than the average size of the leak, said particles having a specific gravity which is from about 1.25 g/cc to about 1.40 g/cc with a blown density which has a neutral buoyancy condition in an ethylene glycol antifreeze.

4,872,912

WET AND DRY LAID PHOSPHATE REACTIVE SHEETS AND PHOSPHATE CERAMIC STRUCTURES MADE THEREFROM

Jeffery L. Barrall, and Robert C. Garman, both of Lancaster, Pa., assignors to Armstrong World Industries, Inc., Lancaster, Pa.

Filed Nov. 13, 1987, Ser. No. 119,863

The portion of the term of this patent subsequent to Dec. 20, 2005, has been disclaimed.

Int. Cl.⁴ C04B 9/06, 28/34

U.S. Cl. 106—85

42 Claims

1. A phosphate reactive composition consisting essentially of a wet-laid substrate which is a mixture that includes calcium silicate as a phosphate reactant, wherein the calcium silicate is in the substrate in an amount effective to produce a phosphate ceramic material, a non-reactive matrix in an amount effective to hold the wet-laid substrate together, said matrix being either (i) fiber or (ii) fiber and a binder, and a metal oxide as a phosphate reactant, said metal oxide being selected from the group consisting of zinc oxide, aluminum oxide, calcium oxide and magnesium oxide.

4,872,913

APPARATUS AND METHOD TO PRODUCE FOAM, AND FOAMED CONCRETE

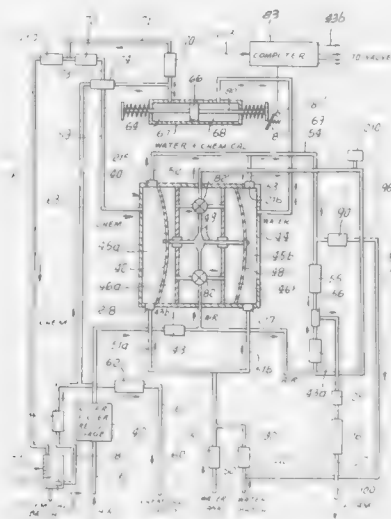
Harvey R. Dunton, Victorville, and Donald H. Rez, Newport Beach, both of Calif., assignors to Standard Concrete Products, Inc., Santa Ana, Calif.

Continuation of Ser. No. 3,028, Jan. 12, 1987, abandoned. This application Jun. 20, 1988, Ser. No. 208,579

Int. Cl.⁴ C04B 24/14, 38/10

U.S. Cl. 106—88

8 Claims



1. The method of producing an improved concrete that includes:

- (a) providing a synthetic resinous foaming agent, in liquid form, to a reciprocating pump and repeatedly drawing said agent and water into the pump for combining the foaming agent with water in the pump to continuously form a liquid mix, and repeatedly discharging quantities of the liquid mix from the pump,
- (b) adding pressurized air to the mix discharged from the

pump, sub-dividing the mix into droplets, in a confined flowing stream, and reducing the stress confinement, whereby the droplets expand to form a foam,

- (c) forming an aqueous calcareous concrete mix, said concrete mix containing said particles, calcareous cement particles, aggregate pieces and water, adding said foam to the concrete mix, and sizing the foam before adding it to the concrete mix, to pass only bubbles of about 5 to 25 micron sphere size to the concrete mix, and mixing together the concrete mix and added foam bubbles of said micron sphere size,
- (d) the ratio by volume of foam added to the concrete mix being between $\frac{1}{4}$ and 5 cubic feet of foam per cubic yard of concrete mix,
- (e) the bubbles passed to the concrete mix having substantially the same sizes as the cement particles,
- (f) the mix and foam being added to a rotary drum on a delivery truck, and mixing the concrete mix and foam by rotating said drum as the truck travels to a job site.

4,872,914

HIGH PURITY, HIGH TEMPERATURE PIPE THREAD SEALANT PASTE

Ronald A. Howard, Brook Park, Ohio, assignor to Union Carbide Corporation, Danbury, Conn.

Filed Apr. 29, 1988, Ser. No. 187,846

Int. Cl.⁴ C09D 3/00

U.S. Cl. 106—285

7 Claims

1. A pipe thread sealant paste composition comprising from about 30 to about 80 percent by weight of natural flake graphite particles of a size sufficient to pass through a 100 Tyler mesh sieve and a liquid carrier comprising a mixture of mineral oil and from 5 to 60 percent by weight petrolatum.

4,872,915

ORTHORHOMBIC LEAD CHROMATE PIGMENTS OF GREENISH HUE

Leonardus J. H. Erkens; Gerben P. Algra; Jacobus M. H. Snijders, all of Maastricht; Herman J. J. M. Geurts, Kerkrade, all of Netherlands, and André Pugin, Pont-la-Ville, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

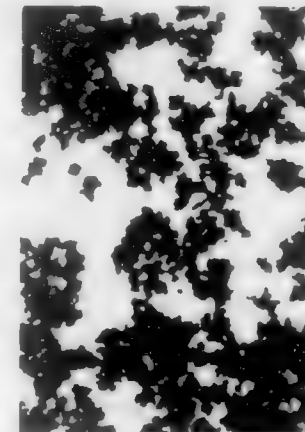
Continuation of Ser. No. 755,886, Jul. 17, 1985, abandoned. This application Mar. 3, 1987, Ser. No. 22,617

Claims priority, application Switzerland, Jul. 25, 1984, 3600/84; Jan. 30, 1985, 398/85

Int. Cl.⁴ C09C 1/20

U.S. Cl. 106—433

14 Claims



1. An orthorhombic lead chromate pigment of greenish hue, which contain lead chromate and lead sulfate in the weight ratio of 60:40 to 100:0, and which is characterized by a tinctorial strength of 0.067 to 0.103 at a standard depth of shade of 1/25 in accordance with DIN 53 235 and by an opacity factor Y_{black}/Y_{white} of 0.78 to 0.87, which pigment is obtainable by

4,872,924

METHOD OF PRODUCING SHADOW MASK OF COLOR CATHODE RAY TUBE

Masaharu Kumada, and Akira Misumi, both of Mobara, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

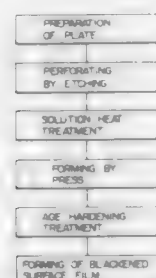
Filed Aug. 17, 1987, Ser. No. 85,763

Claims priority, application Japan, Sep. 12, 1986, 61-213834; Sep. 12, 1986, 61-213835

Int. Cl.⁴ C21D 7/14

U.S. Cl. 148—12.1

12 Claims



1. A method of producing a shadow mask for use in a color cathode ray tube, comprising the steps of: preparing an alloy sheet having a composition consisting of 30 to 50 wt % of Ni, to 5 wt % of Ti, up to 2 wt % Cr and the balance substantially Fe and incidental impurities; perforating said alloy sheet by etching; subjecting the etched alloy sheet to a solution treatment at a temperature ranging between 850° and 1000° C.; forming the alloy sheet after the solution treatment into a predetermined form; subjecting the formed alloy sheet to an age-hardening treatment by holding said alloy sheet at a temperature ranging between 650° and 750° C.; and subjecting the formed alloy sheet to a surface blackening treatment so as to oxidize titanium of the composition of the alloy sheet, thereby forming a black film on the surface of said alloy sheet.

4,872,925

PHOTOVOLTAIC CELL FABRICATION METHOD AND PANEL MADE THEREBY

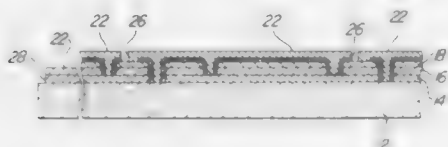
Harold A. McMaster, Woodville, Ohio, assignor to Glasstech, Inc., Perryburg, Ohio

Filed Oct. 29, 1987, Ser. No. 114,683

Int. Cl.⁴ H01L 27/14, 31/18

U.S. Cl. 136—244

19 Claims



1. A photovoltaic panel including at least two serially connected photovoltaic cells comprising:
a glass substrate;
at least a first transparent electrically conductive sheet electrode disposed on said substrate;
at least a second transparent electrically conductive sheet electrode disposed on said substrate spaced from and electrically isolated from said first transparent sheet electrode;
at least one layer of photovoltaic semiconductor material disposed on each of said first and second transparent sheet electrodes and in continuous electrical contact therewith, each said layer of semiconductor material having at least one opening therethrough to expose a portion of the respective said first and second transparent sheet electrodes therethrough;
a pair of electrically conductive sheet-like back electrodes, one disposed on each of said layers of semiconductor material to form two adjacent photovoltaic cells, each of

said back electrodes having at least one opening therethrough mating said at least one opening through the respective layer of semiconductor material;
a dielectric layer disposed on each of said back electrodes including the internal surface of said at least one opening therethrough, said dielectric layer disposed on a first of said two photovoltaic cells having an opening exposing its back electrode therethrough along the length of its edge adjacent to the second of said two photovoltaic cells;
a vacuum deposited third electrically conductive sheet electrode disposed on said dielectric layer of said second photovoltaic cell and extending onto a portion of said first photovoltaic cell, said third sheet electrode electrically isolated from said back electrode of said second photovoltaic cell and electrically contacting said transparent sheet electrode thereof through said at least one opening through said layer of semiconductor material and said back electrode and electrically contacting said back electrode of said first photovoltaic cell through said opening through said dielectric layer; and
means permitting electrical contact to said transparent sheet electrode of said first photovoltaic cell and said back electrode of said second photovoltaic cell.

4,872,926

PROCESS FOR HEAT TREATING METALS OR METAL ALLOYS IN A THERMAL PLASMA

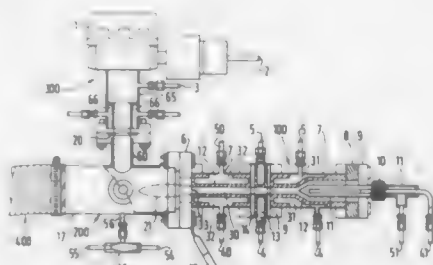
Frederick Giacobbe, Naperville, Ill., assignor to American Air Liquide, New York, N.Y.

Filed Dec. 30, 1987, Ser. No. 139,405

Int. Cl.⁴ C21D 1/52

U.S. Cl. 148—13.1

14 Claims



1. A method for localized heat treating of a workpiece of metal to a predetermined depth in a plasma flame generated by plasma generating means, comprising the steps of:
directing inert gas through the plasma generating means;
igniting the inert gas in the plasma generating means to produce a plasma flame having a temperature exceeding 10,000° C.;
moving the workpiece into the plasma flame path;
rotating the workpiece at a speed fast enough so that significant cooling does not occur between the position where said workpiece is heated in said plasma flame and the position in which the surface temperature of the workpiece is monitored;
monitoring the surface temperature of said workpiece by noncontact surface temperature measurement means;
varying the inert gas flow rate through the plasma generating means, in response to the monitored surface temperature, to thereby control the temperature of the plasma flame and thus the workpiece surface temperature in order to maintain a predetermined heating rate and to rapidly reach the desired soaking temperature for the workpiece;
extinguishing the plasma flame; and
quenching the workpiece.

4,872,927

METHOD FOR IMPROVING THE MICROSTRUCTURE OF TITANIUM ALLOY WROUGHT PRODUCTS

Daniel Eylon, Dayton; Francis H. Froes, Xenia, both of Ohio, and Charles F. Yoltan, Coraopolis, Pa., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 4, 1987, Ser. No. 128,841

The portion of the term of this patent subsequent to Feb. 28, 2006, has been disclaimed.

Int. Cl.⁴ C21D 1/00

U.S. Cl. 148—20.3

6 Claims

1. A method for improving the microstructure of wrought titanium alloy material which comprises the steps of hydrogenating the material at a temperature near or greater than the titanium-hydrogen eutectoid temperature of 815° C., said temperature of hydrogenation being in the range of about 780° to 1020° C. to a hydrogen level of about 0.50 to 1.50 weight percent, cooling the thus-hydrogenated material to room temperature at a controlled rate, heating the thus-cooled, hydrogenated material to a temperature of about 650° to 750° C., applying a vacuum to dehydrogenate the material and cooling said material to room temperature at a controlled rate.

4,872,930

METHOD FOR MANUFACTURING CARPET TILES HAVING EXCELLENT DIMENSIONAL STABILITY

Teruo Kajikawa, Yokosuka, and Toshio Yoshino, Zama, both of Japan, assignors to Nippon Oil Co., Ltd., Japan

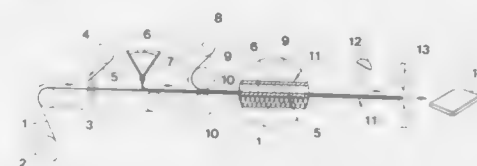
Continuation of Ser. No. 752,891, Jul. 8, 1985, abandoned. This application Jan. 19, 1988, Ser. No. 147,034

Claims priority, application Japan, Jul. 9, 1984, 59-142035

Int. Cl.⁴ B32B 31/08, 31/12, 31/30

U.S. Cl. 156—72

5 Claims



1. A method for manufacturing carpet tiles having excellent dimensional stability comprising the steps of:

- allowing a reticulated glass fiber base having a small thermal coefficient of linear expansion and an opening ratio of 33 to 95% and a unit weight of 73 to 225 g/m² to contact with the whole surface of the back of a tufted or needle-punched carpet base material in order to form a composite material, and,
- thermally melting a backing material prepared from a composition containing as the major component, a thermoplastic material selected from the group consisting of asphalt, polyolefin and olefin-polar monomer copolymer, and applying the melted material to the composite material on the side of the reticulated fabric base thereof by T-die extrusion.

4,872,931

HEAT SHRINK LABELING MACHINE WITH EXTENDED CHUCK

Monte C. Mitchell, Modesto, Calif., assignor to B & H Manufacturing Company, Inc., Ceres, Calif.

Filed May 18, 1988, Ser. No. 195,694

Int. Cl.⁴ B29C 53/04

U.S. Cl. 156—86

2 Claims



1. A machine for applying a label or other sheet or film material to the cylinder surface of a cylindrical article having a body portion and two end portions, at least one of said end portions sloping inwardly from the cylinder surface of the body portion, said machine including a pair of chucks arranged in axial alignment whereby they can clamp such article between them with the ends of the article in contact with the chucks, said chucks being mounted for orbital movement about the central axis of the machine and for spinning about their individual axes, and means for imparting such orbital and spinning motion to the chucks with such an article clamped between them, at least one of said chucks being formed with an extension which is an integral part of the chuck and which overlies the respective end portion of the article and provides a smooth 360° continuation of the cylinder surface of the article.

4,872,929

COMPOSITE EXPLOSIVE UTILIZING WATER-SOLUBLE FUELS

John J. Mullay, Hazelton, Pa., assignor to Atlas Powder Company, Dallas, Tex.

Filed Aug. 29, 1988, Ser. No. 237,773

Int. Cl.⁴ C06G 31/28

U.S. Cl. 149—46

9 Claims

1. An explosive composition comprising:
- 60 to 90% of a solid oxidizer; and
 - 10 to 40% emulsion consisting essentially of
 - 10 to 80% water
 - 0.5 to 5.0% of an emulsifier effective to form a water-in-oil emulsion
 - 2 to 25% of a water immiscible carbonaceous fuel
 - 20 to 90% of a water miscible fuel.

cle, whereby when a heat shrinkable label or sheet is wrapped around the article with at least one edge thereof detached from the article, such chuck extension provides an unyielding surface bearing against the detached edge or edges.

4,872,932

METHOD FOR MAKING RUBBERY COMPOSITE MATERIALS BY PLATING A METAL SUBSTRATE WITH A COBALT ALLOY

Masato Yoshikawa, Tokyo; Yukio Fukuura, Kawagoe; Setsuo Akiyama, Kodaira; Makoto Nakamura, Fujimi; Kazuo Naito, Kawasaki, and Toshio Honda, Akigawa, all of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 919,012, Oct. 15, 1986, abandoned. This application Apr. 15, 1988, Ser. No. 182,083. Claims priority, application Japan, Oct. 15, 1985, 60-229638; Oct. 15, 1985, 60-229639; Oct. 15, 1985, 60-229640

Int. Cl.⁴ C25D 5/24

U.S. Cl. 156—151

8 Claims

1. A method for preparing a rubbery composite material comprising a metal substrate and a rubber composition bonded thereto, comprising the steps of:

depositing a cobalt or cobalt alloy thin film having a thickness of from about 10 Å to 100 μm on the surface of a metal substrate by a dry plating process selected from the group consisting of ion plating, DC and RF magnetron sputtering, bipolar sputtering and RF sputtering processes, said cobalt alloy having more than 80% by weight of cobalt and

holding a rubber composition in intimate contact with said cobalt or cobalt alloy thin film under heat and pressure to achieve vulcanization bonding, said rubber composition being free of an organic cobalt salt.

4,872,933

METHOD OF FORMING RAPIDLY DISINTEGRATING PAPER TUBE

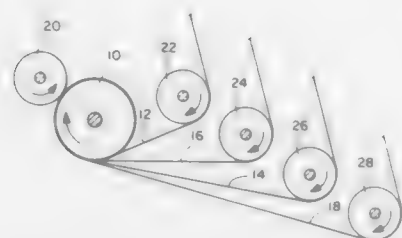
Richard R. Tews, Appleton, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Division of Ser. No. 032,833, Mar. 30, 1987, Pat. No. 4,792,326. This application Aug. 5, 1988, Ser. No. 229,065

Int. Cl.⁴ B32B 1/00

U.S. Cl. 156—184

20 Claims



12. A method of forming a cube comprising providing at least one web of paper, at least one web comprising an adhesive film and at least one layer comprising a superabsorbent material, wrapping the webs on a mandrel, and heating to seal said webs together to form a tube.

4,872,934

METHOD OF PRODUCING HYBRID MULTI-LAYERED CIRCUIT SUBSTRATE

Elitichi Kameda, Ushiku, Japan, assignor to Nippon Mektron, Ltd., Tokyo, Japan

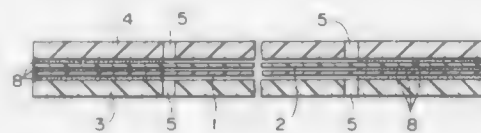
Filed Jan. 23, 1988, Ser. No. 210,637

Claims priority, application Japan, Jan. 30, 1987, 62-162570

Int. Cl.⁴ B32B 31/18

U.S. Cl. 156—250

20 Claims



1. A method of producing a hybrid multi-layered circuit substrate comprising the steps of:

disposing first and second sheets having a layer of copper on at least a first side thereof on respective opposite surfaces of a flexible circuit substrate means in registration with one another, the flexible circuit substrate means having formed thereon a predetermined conductive circuit pattern, said first and second sheets having integral separation means which at least in part define a boundary between a flexible portion and a rigidized hybrid portion of a multi-layer hybrid circuit substrate to be produced;

adhesively bonding said first and second sheets to said flexible circuit substrate means only in a region of the flexible circuit substrate means which is to become part of a hybrid circuit in the multi-layered circuit substrate;

forming through-hole conductors between said first and second sheets and said flexible circuit substrate means at said hybrid portion;

producing a pre-determined circuit pattern on both of said first and second sheets within the bounds of said hybrid portion; and

severing said first and second sheets along the desired outer profile of said hybrid circuit portion and along the desired outer profile line of the flexible circuit portion to produce a hybrid multi-layered circuit substrate having a flexible portion and a rigid hybrid portion, the profile line of the flexible circuit portion encompassing said separation means.

4,872,935

APPARATUS AND METHOD FOR BONDING A PLASTIC CONTAINER AND SPOUT

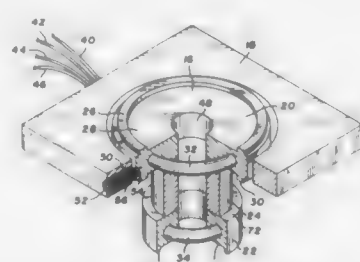
Raymond K. Newkirk, and Richard L. Batzlaff, both of Plymouth, Minn., assignors to Forward Technology Industries, Inc., Minneapolis, Minn.

Filed Nov. 28, 1988, Ser. No. 276,888

Int. Cl.⁴ B29C 65/20; B30B 15/34

U.S. Cl. 156—250

11 Claims



1. An apparatus for forming a fusion bond between a container and a tubular spout constructed of a plastic, said apparatus comprising:

a first fixture for supporting a plastic tubular spout in a longitudinal orientation and in spaced apart relation to a plastic container, said first fixture reciprocable to move said spout longitudinally toward and away from a generally transverse wall section of the container;

a heating tool including an inner end segment and an outer end segment spaced apart from and axially aligned with the inner end segment, said inner and outer end segments having selected first and second transverse profiles, respectively;

a first element for heating said inner end segment, and a second element for heating said outer end segment; and

a second fixture for supporting said heating tool in a longitudinal orientation, axially aligned with said tubular spout and disposed between said spout and container, said second fixture reciprocable to move the tool longitudinally toward and away from said container wall section to permit the advancing of said inner end segment when heated against and through said container wall section to form a bore having said first selected profile, and allowing further longitudinal advancement of the tool to form an engagement of said outer end section of the tool against a rim area of said container surrounding said bore;

wherein said second fixture further is movable transversely to remove said tool from between the spout and container, thereby permitting longitudinal travel of said first fixture a sufficient amount to move an inner edge portion of said spout into surface engagement with said rim area.

9. A process for bonding a tubular plastic spout to a molded plastic container, including the steps of:

supporting a tubular spout in a longitudinal orientation and in spaced apart relation to a generally transverse wall section of a plastic container;

supporting a bore forming means between said tubular spout and said container wall section and in an axial alignment with the spout;

heating said bore forming means to a temperature sufficient to rapidly melt the plastic, and advancing the bore forming means longitudinally inward toward the container wall section until the bore forming means travels through the container wall section, thus to form a bore there-through;

positioning a heating means against a rim area of the container wall section surrounding said bore, and longitudinally advancing said spout to position a lead end of said spout against said heating means;

heating the heating means above the fusion temperature of the plastic to simultaneously fuse said rim area and said lead end; and

withdrawing said heating means and longitudinally advancing said spout until said lead end and rim area engage, and allowing said lead end and rim area to cool, thereby to form a bond to said spout and container.

4,872,936

POLYMERIZABLE CEMENT MIXTURES

Jürgen Engelbrecht, Hamburg, Fed. Rep. of Germany, assignor to Ernst Muhlauer KG, Hamburg, Fed. Rep. of Germany. Continuation of Ser. No. 916,589, Oct. 8, 1986, abandoned. This application May 9, 1988, Ser. No. 191,650

Claims priority, application Fed. Rep. of Germany, Oct. 9, 1985, 3536076

Int. Cl.⁴ C09J 5/02

U.S. Cl. 156—307.3

36 Claims

1. A polymerizable cement mixture comprising (a) at least one polymerizable unsaturated monomer, oligomer or prepolymer containing an acid group or a reactive acid derivative thereof,

(b) at least one finely divided reactive filler that can react ionically with the acids or acid derivative of (a), and (c) a curing agent.

34. A method for adhering (a) an oxidic, mineral, vitreous, ceramic, metallic or biological substrate to (b) an oxidic, vitreous, ceramic, metallic, biological or acrylic substrate, comprising the steps of

(c) applying to said substrate (a) a mixture according to claim 1;

(d) bringing said substrate (b) in good contact with said mixture on said substrate (a) and

(e) causing that mixture to harden.

4,872,937

ELECTRICAL COMPONENT AND METHOD OF MOUNTING SAME

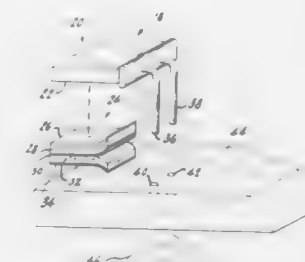
Thomas E. Gouldy, South Williamsport, Pa., assignor to GTE Products Corporation, Stamford, Conn.

Filed Jul. 14, 1988, Ser. No. 220,857

Int. Cl.⁴ C09J 7/00

U.S. Cl. 156—313

7 Claims



1. The method of mounting an electrical component, comprising of a body having a major surface and having two lead-in wires extending from said body orthogonal to said major surface; and a mounting entity therefor, said mounting entity comprising, in layered order: a pressure sensitive adhesive affixed to said major surface; a flexible spacer attached to said pressure sensitive adhesive; and a heat sensitive adhesive attached to said spacer, upon a printed circuit board comprising the steps of: positioning said component upon a surface of said board with said lead-in wires penetrating said board, and said heat sensitive adhesive in contact with said surface of said board; and raising the temperature of said surface to a sufficient degree to activate said heat sensitive adhesive and fix said component to said board.

4,872,938

PROCESSING APPARATUS

Cecil J. Davis, Greenville; Joseph V. Abernathy, Wylie; Robert T. Matthews, Plano; Randall C. Hildenbrand, Richardson; Bruce Simpson, Dallas; John I. Jones; Lee M. Loewenstein, both of Plano, and James G. Bohlman, Forney, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 73,939, Jul. 16, 1987, abandoned. This application Apr. 25, 1988, Ser. No. 188,128

Int. Cl.⁴ B44C 1/22; B05D 3/06; C03C 15/00

U.S. Cl. 156—345

4 Claims

1. An apparatus for processing of wafers, comprising: (a) a vacuum processing chamber;

(b) a wafer support within said process chamber, said wafer support being capable of supporting a wafer in a substantially face down position with substantially no damage to structures on the face of said wafer;

(c) a wafer transfer mechanism positioned to controllably transfer wafers through an openable port into said process

chamber, said wafer transfer mechanism being capable of operation under high vacuum;



(d) said wafer support being movable to rotate said wafer from said substantially face down position into a more nearly vertical position.

4,872,939

APPARATUS FOR ASSEMBLING LINED PACKAGING TRAY

David R. McVay; Lawrence D. Carter, both of Hazlehurst, Ga.; John D. Jonasky, Fresno, Calif., and Chris A. Jefferson, Hazlehurst, Ga., assignors to Amoco Corporation, Chicago, Ill.

Filed Apr. 23, 1987, Ser. No. 41,390
Int. Cl.⁴ B65H 3/08; B65G 59/10

U.S. Cl. 156—354

6 Claims



1. In an apparatus for preparing a pad-lined packaging tray, having means for denesting flanged trays that are horizontally oriented in a vertical stack in a magazine, a novel and improved denester comprising:

- A. at least two opposed, vertically arranged rotary denester members;
- B. means to synchronously rotate said members;
- C. each denester member comprising a vertical member having mounted thereon:
 - (1) a horizontally oriented lower plate member which extends laterally to underlie and support the bottom of the lowermost of said stacked trays during rotation of said denester member about its vertical axis
 - (2) a horizontally oriented upper plate member that is vertically spaced from said lower plate, having a radius smaller than that of the lower plate, wherein said upper plate member extends laterally to underlie and support flanges of a next succeeding tray to a tray in the process of being denested during rotation of said denester member; and
 - (3) an inclined, planar cam plate that extends laterally outwards from the vertical member of said denester below the upper plate, extends downwardly to below and is free of the lower plate member, and extends sufficiently laterally outwards of said body whereby to contact a flange of a tray being denested; whereby
- D. on rotation of said at least two denester members the lower plates will first underlie and support a said lowermost tray, then pass out of supporting position while generally coincident therewith the upper plates will commence to support at its flanges the next tray to be subse-

quently denested and still coincident therewith the inclined cam plates contact the flanges of the tray in the process of being denested, and upon continued rotation of said rotary denester means said inclined cam plates continue to move said flanges whereby the tray is forcefully ejected to a receiving means disposed below said magazine.

4,872,940

APPARATUS FOR THE CONTINUOUS WELDING OF STRIPS AND/OR SHEETS

Josep Strum, Duisburg, and Wilfried Prange, Dinslaken, both of Fed. Rep. of Germany, assignors to Thyssen Stahl Aktiengesellschaft, Duisburg, Fed. Rep. of Germany

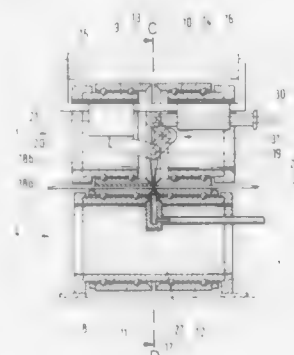
Filed Jul. 13, 1988, Ser. No. 218,711

Claims priority, application Fed. Rep. of Germany, Jul. 17, 1987, 3723611

Int. Cl.⁴ B23K 26/02, 26/08, 26/14

U.S. Cl. 156—379.8

10 Claims



1. An apparatus for the continuous welding of abutting strips or sheets comprising one or more welding heads for one or more fixed laser beams and tension rollers disposed in pairs on opposite of the strips or sheets to be welded, the axes of said tension rollers extending perpendicularly with respect to the direction of travel of the strips or sheets with the respective rollers of said pairs of rollers disposed on opposite lateral sides of an abutting line of said strips or sheets, the tension rollers comprising hollow shafts and roller shells mounted thereon and spaced out at an axial distance from one another, each welding head of the laser beam being disposed inside the hollow shaft of at least one tension roller, the laser beam passing through a gap between the roller shells and an opening in the hollow shaft.

4,872,941

AUTOMATIC WELDING APPARATUS FOR WELDING THERMOPLASTIC MATERIALS IN SHEET FORM

Glenn W. Lippman, 169 S. Buchanan Ave., Louisville, Colo. 80027-9505, and Gerald Lippman, 3403 2nd St., Oceanside, N.Y. 11572

Filed Nov. 9, 1987, Ser. No. 118,601

Int. Cl.⁴ B44C 7/00

U.S. Cl. 156—497

20 Claims

1. An apparatus for welding a pair of overlapping thermoplastic materials in sheet form along the overlapping portions thereof, said apparatus comprising:

- a chassis of elongate configurations having a length and a width respectively forming a pair of sides, a front end and a rear end, said chassis being operable to be positioned lengthwise over the overlapping portions with said front and rear ends straddling the overlapping portions of the materials;
- means, connected to said front end of said chassis in an overlying relationship with respect to the overlapping

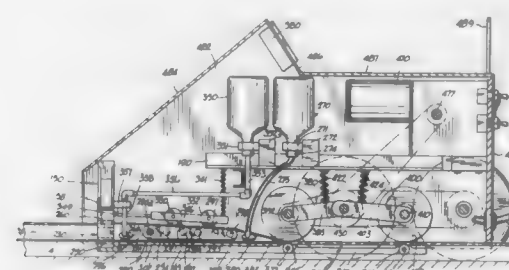
portions, for maintaining a separation between the materials at the overlapping portions thereof, said means including a pair of horizontally overlapping channels, vertically spaced from one another and vertically spaced from the materials with each of said channels being sized and oriented to receive one of the overlapping portions of the materials;

means, located within the separation and connected to said chassis, for heating the overlapping portions of said materials to plasticity;

means, connected to said chassis and situated between said rear end of said chassis and said plasticity heating means in an overlapping relationship with respect to the materials, for urging the materials together into the overlapping position and against one another, said urging means including:

a pair of pressure rollers located in tandem relationship with respect to one another and between said front and said rear ends of said chassis;

means for pivotally attaching said rollers to said chassis;



a guide plate for rectangular planar, elongate configuration, sized to extend from said separation maintaining means to at least said rollers, said guide plate being connected to said separation maintaining means beneath said channels and being located between said sides of said chassis, above the thermoplastic materials, said guide plate serving to maintain the overlapping portions of the materials in alignment with each other and to prevent the overlapping portions from contacting any obstacles on the terrain underlying the overlapping portions; and

means, connected to said pivotal roller attachment means, for biasing said pressure rollers against the materials and said guide plate; and

means, connected to said chassis, for providing a rolling engagement between said chassis and the thermoplastic materials and for supporting said chassis and said separation maintaining means above said thermoplastic materials, whereby as said chassis is propelled along the overlapping portions, the overlapping portions of the materials are heated to plasticity and welded to one another along the overlap within said urging means.

4,872,942

SEAL BAR INCLUDING CLAMPED SEAL ELEMENT

Gordon V. Sharps, Jr., and Eric A. St. Phillips, both of Fairport, N.Y., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 22, 1987, Ser. No. 99,809

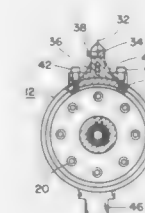
Int. Cl.⁴ B32B 31/18, 31/20; B65B 61/10

U.S. Cl. 156—515

7 Claims

1. A device for heat sealing superimposed layers of a layflat web of a thermoplastic film material comprising: a hollow-cylindrical rotatable drum means for a rotary side seal apparatus, a seal bar structure intermittently movable into surface contact with said film layers for imparting an elongated heat seal thereto, said seal bar structure being mounted on the cylindrical surface of said drum means so as to extend in parallel relationship with the longitudinal central axis of said drum means; the improvement comprising: said seal bar structure comprising a first elongated bar member; a second elongated

bar member detachably fastened to said first bar member so as to provide flat facing clamping surfaces therebetween; a thin flat elongated ribbon-like seal element constituted of a high temperature-resistant metallic material being clamped along substantially the full length thereof by said first and second bar members between said flat facing clamping surfaces so as to



have a longitudinal edge projecting therefrom for contacting said film material and constituting a heat seal element; and means for imparting a pulsed electrical current to said seal element prior to said seal element contacting said film material so as to rapidly heat said seal element to a predetermined temperature for sealing and concurrently cutting through said layers of the thermoplastic film material.

4,872,943

PROCESS FOR MAKING MONOCRYSTALLINE HGCDE LAYERS

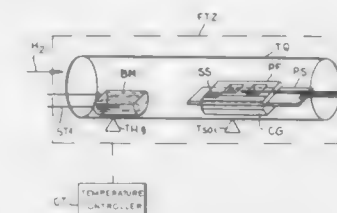
Sergio Bernardi, Turin, Italy, assignor to Selenia Industrie Elettrotecniche Associate S.p.A., Bacoli, Italy

Filed Jun. 15, 1988, Ser. No. 207,259

Claims priority, application Italy, Jun. 16, 1987, 67519 A/87
Int. Cl.⁴ C30B 19/04, 19/06, 19/10

U.S. Cl. 156—621

1 Claim



1. A process for fabricating single-crystal mercury cadmium telluride layers by epitaxial growth on a cadmium telluride substrate, performed inside a reactor with two communicating zones maintained at different and controlled temperatures, said method comprising the steps of:

- (a) placing weighed quantities of cadmium and tellurium in a well inside the reactor in a higher-temperature zone, melting the cadmium and tellurium and homogenizing same, so as to produce a solution of cadmium in tellurium;
- (b) disposing a mercury bath inside the reactor in a lower-temperature zone and heating said bath so as to obtain a mercury vapor atmosphere through said reactor;
- (c) by the absorption of vapor state mercury, converting the solution of step (a) into a solution of cadmium and mercury in tellurium and homogenizing the converted solution by thermal agitation at the higher temperature;
- (d) cooling the solution formed in step (c) and the mercury bath slowly so as to produce supersaturation of the solution of cadmium and mercury in tellurium and keeping its composition constant;
- (e) contacting a cadmium telluride substrate with the super-saturated solution of step (d) and effecting epitaxial growth of single-crystal mercury cadmium telluride on said substrate from said supersaturated solution; and
- (f) controlling the composition of said solution of cadmium

and mercury in tellurium by regulating the lower temperature of the mercury bath, the composition of said supersaturated solution being maintained constant all during epitaxial growth by contemporarily reducing the solution and mercury bath temperatures, but maintaining the reaction between time derivatives of said temperatures equal to the ratio between respective partial derivatives of the partial pressures with temperature.

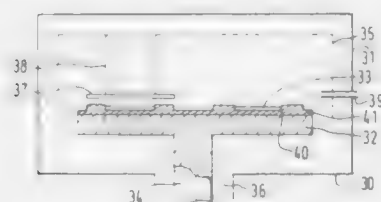
4,872,944

PROCESS FOR THE CONTROL IN REAL TIME OF THE SELECTIVITY OF THE ETCHING BY ANALYSIS OF THE PLASMA GASES IN A PROCESS OF REACTIVE IONIC ETCHING AND A REACTOR THEREFORE

Denis Ruffin, Hinsdale, Ill., and Ikuro Hirase, Ibaraki, Japan, assignors to L'Air Liquide, Societe Anonyme Pour l'Etude et l'Exploitation des Procédés Georges Claude, Paris, France

Filed Aug. 17, 1988, Ser. No. 233,045

Claims priority, application France, Aug. 20, 1987, 87 11754
Int. Cl.⁴ H01L 21/306; B44C 1/22; C03C 15/00, 25/06
U.S. Cl. 156—626 9 Claims



1. Process for the control in real time of etching in a process of manufacturing electronic components obtained by reactive ionic etching of silicon wafers utilizing a plasma produced between two electrodes, wherein the gaseous species of the plasma are analyzed during the etching, at least one of the silicon wafers being withdrawable in situ from the influence of the plasma.

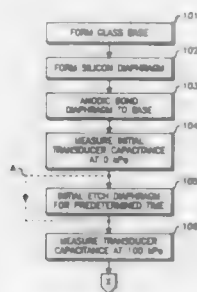
4,872,945

POST SEAL ETCHING OF TRANSDUCER DIAPHRAGM

Donald O. Myers, Carpentersville, and Ruta J. Venclovas, Western Springs, both of Ill., assignors to Motorola Inc., Schaumburg, Ill.

Continuation of Ser. No. 878,453, Jun. 25, 1986, abandoned.
This application Aug. 24, 1987, Ser. No. 90,433
Int. Cl.⁴ H04R 31/00

U.S. Cl. 156—627 20 Claims



1. A process for manufacturing a sensor comprising the steps of:
providing a transducer by bonding a flexible diaphragm to a base to form said transducer with a cavity being between said diaphragm and base, at least one electrical property of said transducer being varied in accordance with deflection

of said diaphragm with respect to said base in response to sensed force applied to said diaphragm;
applying at least one predetermined force to said transducer; measuring said at least one electrical property of said transducer provided in response to said predetermined force resulting in a deflection of said diaphragm with respect to said base;

calculating, based upon at least said measured at least one electrical property, a quantity corresponding to an amount of thickness reduction of said diaphragm needed to obtain a desired transducer characteristic by altering the flex characteristic of said diaphragm with respect to said base; and then

thinning said transducer diaphragm by removing a portion of said diaphragm from a diaphragm surface external and nonadjacent to said cavity, while said diaphragm is bonded to said base substrate, to reduce the thickness of said diaphragm and thereby alter the flex characteristic of said diaphragm to achieve said desired transducer characteristic, wherein parameters of this thinning step are determined in accordance with said calculated quantity which in turn is determined in accordance with said measured at least one electrical property of said transducer.

4,872,946

METHOD OF MANUFACTURING SUPPORTS FOR LITHOGRAPHIC PRINTING PLATE

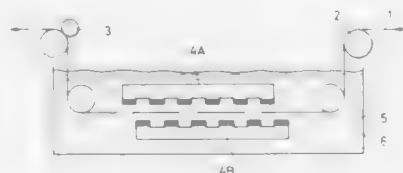
Akio Uesugi, Tsutomu Kakei, and Shinichiro Minato, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 23, 1988, Ser. No. 159,086

Claims priority, application Japan, Feb. 23, 1987, 62-37798; Mar. 25, 1987, 62-69135

Int. Cl.⁴ C23F 1/00; B44C 1/22

U.S. Cl. 156—637 24 Claims



1. A method of manufacturing supports for a lithographic printing plate comprising;
chemically treating a metal sheet or web in a treatment solution, and
heating said sheet or web by an induction heating method while said sheet or web is in said treating solution.

4,872,947

CVD OF SILICON OXIDE USING TEOS DECOMPOSITION AND IN-SITU PLANARIZATION PROCESS

David N. Wang, Cupertino; John M. White, Hayward; Kam S. Law; Casey Leung, both of Union City; Salvador P. Umotoy, Pittsburg; Kenneth S. Collins, San Jose; John A. Adamik, San Ramon; Ilya Perlov, Mountain View, and Dan Maydan, Los Altos Hills, all of Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.

Division of Ser. No. 944,492, Dec. 19, 1986. This application Oct. 26, 1988, Ser. No. 262,992

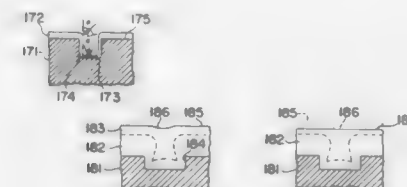
Int. Cl.⁴ B44C 1/22; C03C 15/00, 25/06

U.S. Cl. 156—643 14 Claims

9. A process for planarizing a dielectric layer formed on a substrate in-situ in a chamber, comprising:
first, depositing a first, conformal, relatively thick layer of silicon oxide by exposing the substrate to a reactive

plasma by positioning the substrate on a support within a chamber and adjacent a gas inlet manifold which is an RF electrode and includes a multiplicity of closely-spaced gas outlet holes closely adjacent the substrate; and communicating a gas mixture containing tetraethylorthosilicate into the manifold while applying RF energy between the manifold and the substrate support, with the pressure in the chamber being within the range of about 1 to 50 torr and heating the substrate to within the range of about 200° C. to 500° C.;

second, depositing a second, relatively thin silicon oxide layer on the first silicon oxide layer by applying a mixture comprising ozone, oxygen and tetraethylorthosilicate to



the gas inlet manifold for communicating reactive nitrogen and oxygen species into the vacuum chamber via the outlet holes, while heating the substrate to within the approximate range 200° C. to 500° C. with the chamber pressure within the approximate range 10 to 200 torr; and third, isotropically etching the resulting composite film by exposing the composite to a plasma formed within said chamber, by communicating a reactive gas selected from fluorinated gases such as NF₃, CF₄ and C₂F₆ into the gas inlet manifold, and applying RF energy between the gas inlet manifold and the substrate support and heating the substrate to within the approximate range 200° C. to 500° C. while maintaining the chamber pressure within the approximate range 200 mt to 20 torr.

4,872,948

METHOD AND APPARATUS FOR CONTROLLING CENTRIFUGAL THIN FILM DRYER

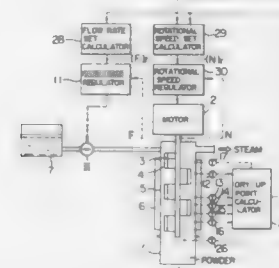
Mitsuo Kinoshita; Tetsuo Ito, both of Hitachi; Hiroji Mikawa, Ibaraki, and Koichi Chino, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 3, 1983, Ser. No. 471,861

Claims priority, application Japan, Mar. 5, 1982, 57-33927

Int. Cl.⁴ B01D 1/22

U.S. Cl. 159—62 5 Claims



1. A method of controlling a centrifugal thin film dryer wherein said dryer has a dryer vessel including a tubular heating surface and having a delivery port, comprising the steps of reducing the pressure in said dryer vessel to lower than atmospheric pressure, feeding slurry containing solid matter at a variable flow rate to said tubular heating surface, heating said slurry with a heating medium while rotating blades inside of said heating surface so that said slurry travels along said heat-

ing surface as a thin film and turns into dry powder, measuring temperatures at a plurality of locations spaced apart along the axial direction of said heating surface upstream from the delivery port of the dryer and controlling the position along said axial direction of said heating surface where a rise in the distribution of said temperatures measured begins to saturate at the vicinity of the heating medium temperature by adjusting at least one of said flow rate, the pressure within said dryer vessel, and the degree of heating by said heating surface on the basis of the temperatures measured to maintain said position upstream from the delivery port of the dryer; and

measuring the moisture content of the dry powder, and controlling the moisture content of the dry powder by adjusting the rotational speed of the rotating blades in dependence upon the moisture content measured and the position along said axial direction of said heating surface where a rise in the distribution of said temperatures measured approaches the saturation temperature of the heating medium.

4,872,949

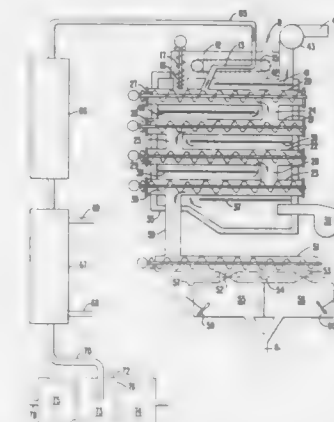
PROCESS FOR TREATMENT OF DRILLING MUD

Carl M. Wilwerding, P.O. Box 561, Klamath Falls, Oreg. 97601
Continuation of Ser. No. 165,324, Mar. 8, 1988, abandoned. This

application Jan. 18, 1989, Ser. No. 298,380

Int. Cl.⁴ B01D 1/04; E21B 21/06; F26B 11/00

U.S. Cl. 159—47.3 9 Claims



1. A process for the removal of organic liquid and water-soluble solids from a drilling mud contaminated therewith, said process comprising:

- (a) feeding said drilling mud into a vertical array of a plurality of horizontal tubes through an entry port in the uppermost tube thereof, said horizontal tubes arranged in series in a shell-and-tube heat exchanger;
- (b) conveying said drilling mud through said horizontal tubes by screw conveyors to cause said drilling mud to flow from the top of said vertical array downward, while passing combustion gases from a burner upward around the exteriors of said horizontal tubes, thereby heating said drilling mud to evaporate substantially all liquid therefrom, leaving a first solid residue;
- (c) removing vapors generated in said horizontal tubes through an exit port adjacent to said entry port thereby effecting counter-current flow of said vapors with respect to said drilling mud;
- (d) combining said first solid residue with water to form a slurry consisting of (i) an aqueous solution of substantially all water-soluble materials contained in said first solid residue, and (ii) a second solid residue comprising said first solid residue substantially devoid of said water-soluble materials; and
- (e) recovering said second solid residue from said slurry.

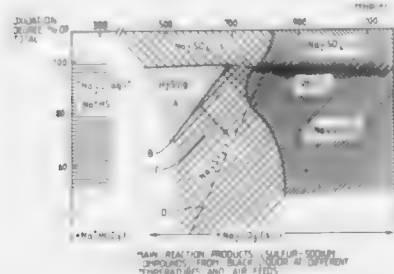
7. A process for the removal of organic liquid and water-soluble solids from a drilling mud contaminated therewith, said process comprising:

- feeding said drilling mud into a plurality of horizontal tubes arranged in series in a vertical array in a shell-and-tube heat exchanger through an entry port, and conveying said drilling mud through said horizontal tubes by screw conveyors turning at a rate sufficient to substantially prevent said drilling mud from settling, said drilling mud flowing from the top of said vertical array downward, while passing combustion gases from a burner upward over said horizontal tubes to evaporate substantially all liquid from said drilling mud to form a vapor stream and a first solid residue, and removing said vapor stream from said horizontal tubes at a location adjacent to said entry port, thereby effecting counter-current flow of said vapor stream with respect to said drilling mud;
- preheating said drilling mud with said vapor stream upstream of said entry port;
- condensing said vapor stream to form a condensate containing at least partially immiscible organic and aqueous phases, separating said organic and aqueous phases, and vacuum distilling said aqueous phase prior to disposal to remove therefrom substantially all organic species dissolved therein;
- combining said first solid residue with water to form a slurry consisting of (i) an aqueous solution of substantially all water-soluble materials contained in said first solid residue, and (ii) a second solid residue comprising said first solid residue substantially devoid of said water-soluble materials; and
- decanting said aqueous solution from said slurry and vacuum filtering said second solid residue from the portion of said slurry remaining after said decantation to recover said second solid residue from said slurry.

4,872,950

PROCESS FOR RECOVERING ENERGY AND CHEMICALS FROM SPENT LIQUOR IN PULP PREPARATION

Alf O. Andersson, Kofallsvägen 38, S-710 40 Frövi, and Björn S. Warnqvist, Tingsvögen 44, S-183 40 Täby, both of Sweden
Filed Nov. 17, 1987, Ser. No. 121,795
Claims priority, application Sweden, Nov. 28, 1986, 8605116
Int. Cl.⁴ D21C 11/04, 11/06, 11/10, 11/12
U.S. Cl. 162—15 9 Claims



1. A process for recovering energy and chemicals from spent liquor containing organic materials in pulp preparation, said liquor being thermally decomposed after concentration, forming gaseous and solid products and energy being recovered from the gases, the process comprising: concentrating said spent liquor containing organic materials; and thermally decomposing said concentrated spent liquor, wherein said thermal decomposition is carried out in a single step at a supply of oxygen in an amount corresponding to from 5 to 75% of the stoichiometric amount required for a complete oxidation, at a pressure of from 10 to 50 bar and at a temperature of from 700° to 850° C. such that no melt is formed, wherein the formation of carbon from included organic materials is suppressed and

wherein the thermal decomposition forms sulfur-containing gases which are recovered by being absorbed in an alkaline solution.

4,872,951

STARCH BLENDS USEFUL AS EXTERNAL PAPER SIZES

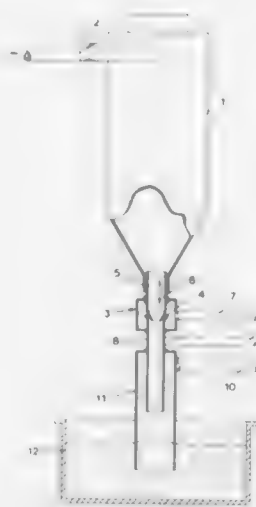
Walter Maliczyszyn, Somerville, and Henry R. Hernandez, Flemington, both of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.
Filed Jul. 13, 1988, Ser. No. 218,380
Int. Cl.⁴ D21H 1/38
U.S. Cl. 162—135 24 Claims

11. In a process of external sizing of paper or paperboard the improvement which comprises the step of applying to the surface thereof an effective amount of a starch blend which comprises an admixture of 10–70% (by wt) of a cationic starch and 30–90% by wt and 30–90% (by wt) of an ASA-treated starch, said ASA-treated starch being a monoester of an alkenyl succinate, such that the pore size of said paper or paperboard is reduced while the water resistance remains unchanged or is enhanced.

4,872,952

METHOD FOR MANUFACTURING A BOARD- OR SHEET-SHAPED MATERIAL WITH A HIGH PROPORTION OF GLASS OR MINERAL WOOL FIBRES

Lars Alsterhäll, Svanskog, Sweden, assignor to Swanboard Masonite AB, Svanskog, Sweden
Filed May 18, 1987, Ser. No. 50,424
Claims priority, application Sweden, May 16, 1986, 8602231
Int. Cl.⁴ D21H 5/18
U.S. Cl. 162—152 5 Claims



1. A method for manufacturing sheet material containing a high proportion of glass wool or mineral wool fibers, comprising:

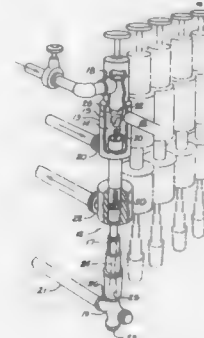
- providing a cyclone having an upper inlet and a lower outlet;
- injecting fibers of glass wool or mineral wool into the cyclone through the inlet, in an air stream, whereby, in passing through the cyclone in said air stream, the fibers are separated into fiber tufts, which are ejected through said outlet;
- forcing a stream of fluid selected from the group consisting of steam and water into said fiber tufts as said fiber tufts emerge from said cyclone through said outlet, thereby accelerating the fibers, replacing air within and around

said fiber tufts, with said fluid and wetting the fibers in said fiber tufts;
separating the resulting wetted fibers from air which has emerged from the cyclone with the fiber tufts, to provide a wetted fiber-containing aqueous phase;
mixing the wetted fiber-containing aqueous phase with paper pulp and a binding agent to provide a mixture thereof; and
supplying the mixture to an operative sheet manufacturing machine as input thereto.

4,872,953

APPARATUS FOR IMPROVING THE QUALITY OF PAPER MANUFACTURED FROM RECYCLED PAPER WITH A HYDROKINETIC AMPLIFIER

William E. Smith, Greenville, S.C., assignor to EZE Products, Inc., Greenville, S.C.
Continuation-in-part of Ser. No. 943,615, Dec. 18, 1986, Pat. No. 4,726,880. This application Feb. 16, 1988, Ser. No. 157,052
The portion of the term of this patent subsequent to Feb. 23, 2005, has been disclaimed.
Int. Cl.⁴ D21C 5/02
U.S. Cl. 162—261 6 Claims



1. An apparatus for improving the quality of paper manufactured from a contaminated fibrous stock including secondary fiber, contaminants smaller than a predetermined size, and contaminants with a specific gravity approximately that of the specific gravity of whitewater used in the production of recycled paper stock, the apparatus comprising:

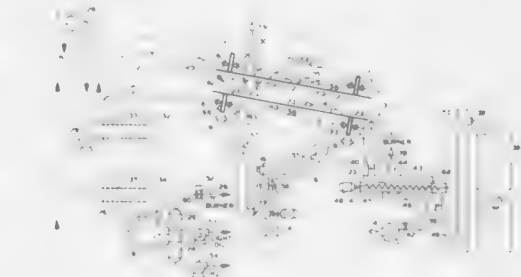
- a source of steam;
- a source of contaminated fibrous stock;
- a hydrokinetic amplifier means having a mixing chamber connected to each of steam inlet, a stock inlet and a venturi, said amplifier means having an outlet connected to said venturi, said mixing chamber having an interior wall, said steam inlet connected to said source of steam for allowing steam to enter said mixing chamber, said stock inlet connected to said source of contaminated fibrous stock for receiving said contaminated fibrous stock and structured for supplying same to said mixing chamber in the form of a vertical liquid column which is substantially out of contact with said interior wall, said amplifier means for mixing in said mixing chamber said contaminated fibrous stock with steam entering through said steam inlet and thereby condensing said steam to transfer the energy of said steam to said contaminated fibrous stock to increase the temperature of said contaminated fibrous stock from said stock inlet to said outlet, said amplifier means for subjecting said contaminants in said contaminated fibrous stock to increased pressure in said venturi to produce dispersed contaminants in said contaminated fibrous stock, said outlet for supplying contaminated fibrous stock having dispersed contaminants therein and at a pressure and temperature substantially greater than the pressure and temperature of said contaminated fibrous stock received by said stock inlet, a treatment device coupled to

said outlet of said hydrokinetic amplifier for further emulsifying and dispersing contaminants contained in said fibrous stock exiting from said outlet of said hydrokinetic amplifier, said treatment device including means for mechanically manipulating said fibrous stock as it passes through said treatment device.

4,872,954

APPARATUS FOR THE TREATMENT OF WASTE

Jim S. Hogan, 1742 Country Club Dr., Sugar Land, Tex. 77478
Filed Nov. 24, 1987, Ser. No. 124,976
Int. Cl.⁴ B01J 8/10
U.S. Cl. 202—105 42 Claims



1. A retort for treating waste, comprising:

- a sloped rotating drum having a front end and a back end, the front end being in a higher position with respect to the back end;
- rotating means being mounted to the drum for rotating the drum;
- burners being affixed to the exterior surface of the drum; scrapers being mounted in the drum for scraping material from the surface of the drum;
- baffles mounted in the interior surface of the drum;
- a drum enclosure for enclosing the drum and forming a chamber therebetween, the chamber being isolated from the interior of the drum;
- a burner being mounted apart from the drum and having a fire tube, the burner generating hot exhaust gases;
- a first conduit for conveying the hot exhaust gases to the chamber where the exhaust gases release heat to the drum whereby the exhaust gases are cooled;
- a second conduit for returning cooled exhaust gases from the chamber to the burner, flowing the returned cooled exhaust gases over the fire tube to cool the fire tube, and mixing the returned cooled exhaust gases with hot exhaust gases generated by the burner;
- a fan being mounted in the second conduit for providing the driving force for conveying the exhaust gases from the burner to the chamber and for returning the cooled exhaust gases to the burner;
- a damper being mounted in the second conduit for regulating the amount of cooled exhaust gases being returned to the burner from the chamber;
- an exhaust line for exhausting exhaust gases to the atmosphere;
- a seal for sealing the chamber from the atmosphere whereby fluid communication between the chamber and the atmosphere is provided through the exhaust line only;
- a screw conveyor being connected to the back end of the drum by a collection chamber, the screw conveyor having an inlet and an outlet;
- a conveyor enclosure enclosing a portion of the conveyor and forming a flow passage therebetween, the flow passage having an inlet and an outlet;
- an air compressor being connected to the inlet of the flow passage;
- an air conduit for connecting the outlet of the flow passage to the air inlet of the burner;

a collector being connected to the outlet of the screw conveyor;
 a bucket elevator being connected to the collector and having a bucket elevator discharge;
 a storage tank being connected to the bucket elevator discharge;
 a vapor conduit being in fluid communication with the front end of the drum;
 an accumulator being connected to the outlet of the vapor conduit;
 an overhead line connecting the overhead of the accumulator with the fuel burning side of the burner;
 a compressor for providing a driving force for vapors slowing in the overhead line;
 a first liquid line for removing liquid from one section of the accumulator;
 a second liquid line for removing liquid from another section of the accumulator;
 a first pump being connected to the first liquid line;
 a second pump being connected to the second liquid line;
 a pressure equalizing line connecting the second exchanger and the accumulator;
 a feed conduit being connected to the front end of the drum;
 a first heat exchanger for providing heat exchange between the feed conduit and the vapor conduit;
 a second heat exchanger for providing heat exchange between the feed conduit and the vapor conduit;
 a centrifuge being connected to the feed conduit; and
 a feed pump being connected to the feed conduit.

4,872,955

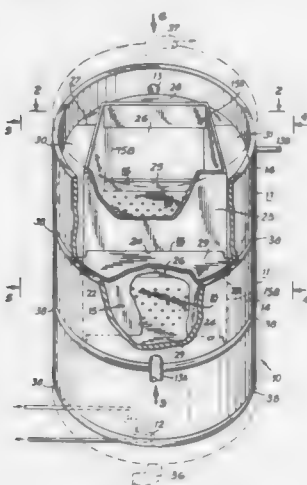
VAPOR/LIQUID CONTACT COLUMN STRUCTURE

Trent J. Parker, and Byron M. Parker, both of Salt Lake City, Utah, assignors to Uni-Frac Inc., Salt Lake City, Utah
 Continuation-in-part of Ser. No. 840,134, Mar. 17, 1986, Pat. No. 4,750,975. This application Apr. 18, 1988, Ser. No. 182,887
 The portion of the term of this patent subsequent to Jun. 14, 2005, has been disclaimed.

Int. Cl.⁴ B01D 3/16, 47/00

U.S. Cl. 202—154

17 Claims



1. A column section arranged in a vertical stack of other column sections, said section comprising:
 a vertical conduit having upper and lower ends,
 a vapor and liquid horizontal contact device secured to and extending transversely across said conduit;
 an inlet means and an exit means disposed in said contact device disposed in opposite to one another;
 a reflux liquid admittance throat means in said conduit and connected with said inlet means and a gas admittance and liquid discharge means proximate said contact device exit means;

a weir disposed at said exit means of said contact device beneath said gas admittance and liquid discharge means;
 a downcomer structure secured to and outside of said conduit and having a lower end connected with said throat means, an upper end disposed above said discharge means, and means for connecting said lower and upper ends of said downcomer structure; and
 a wall enclosure disposed about said conduit and configured to form with said downcomer structure, said conduit and said contact device, a counter current reflux liquid and gas, 360° progressively redirected flow path;
 said upper end of said downcomer structure is arranged to receive a liquid discharge from an exit means of a contact device of one of said other column sections next above said section in said vertical stack for 360° progressively redirected flow of said liquid discharge to the inlet means of said contact device;
 said contact device of said one of said other column sections having an inlet means vertically aligned with the inlet means of said section;
 so that the liquid flow from said inlet means to said exit means of said contact device is unidirectional relative to liquid flow across said contact device of said one of said other column sections next above said section in said vertical stack.
 7. A vertical column for ascending vapors and countercurrent descending reflux liquid and froth, which comprises:
 plural, mutually-spaced, vertically aligned, horizontal vapor and liquid contact devices, each provided with an outlet means;
 conduit means connected to the outer periphery of and mounting said plural, vertically aligned contact devices for conducting vapor flow from one contact device to and through a next upper contact device;
 a plurality of vertically aligned reflux liquid admittance throat means, each connected with an inlet means of one of said contact devices opposite said outlet means and;
 each inlet means is vertically aligned with the inlet means of a next lower contact device in said vertical column; and
 downcomer means, laterally disposed exterior of and secured to said conduit means, for conducting reflux liquid from the outlet means of each said contact devices to the admittance throat means connected with an inlet means of a next lower contact device to provide a 360° progressively redirected flow path from each admittance throat means to a vertically aligned admittance throat means of said next lower contact device so that the liquid flow across each of said contact devices is unidirectional relative to the liquid flow across the plural devices.

4,872,956

METHODS OF MEASURING ION-CONCENTRATION AND THE LIKE AND A CALIBRATING SHEET AS WELL AS A CALIBRATING METHOD OF MEASURING DEVICES USED THEREIN

Harno Kotani, and Katsuhiko Tomita, both of Miyahohigashi, Japan, assignors to Horiba, Ltd., Kyoto, Japan
 Continuation of Ser. No. 124,629, Nov. 24, 1987, abandoned.

This application Dec. 29, 1988, Ser. No. 291,628

Claims priority, application Japan, Dec. 11, 1986, 61-296369; Mar. 16, 1987, 62-61634

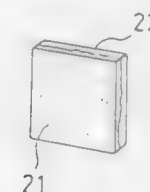
Int. Cl.⁴ A61B 10/00; G01N 27/46

U.S. Cl. 204—1 T

14 Claims

1. A method of measuring characteristics of a sample based on the electrical properties of the sample, comprising the steps of:
 impregnating an easily absorbing solution material with the sample, said sample being obtained from an object to be measured and said solution material being chemically stabilized, flexible, and said solution material emanating no interferential ingredient against the object to be measured; and
 bringing said solution material into physical contact with a

measuring portion of a sheet-type ion-concentration device for measuring said characteristics, said sheet-type measuring device having an electrode which is formed in part by an ion-response membrane and further having a



reference electrode where both electrodes substantially lie in the same plane for placement of said solution material therebetween, the step of bringing following the step of impregnating.

4,872,957

ELECTROCHEMICAL CELL HAVING DUAL PURPOSE ELECTRODE

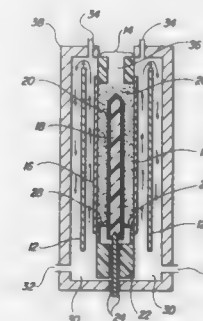
Dennis F. Dong; Edward B. Noonan; Derek J. Rogers, all of Kingston; Arthur L. Clifford, Markham; Katharina Benesch, Kingston, all of Canada, and Richard E. Loftfield, Jacksonville, Fla., assignors to H-D Tech Inc., Woodbridge

Filed Jul. 20, 1988, Ser. No. 221,854

Int. Cl.⁴ C25B 1/30, 11/03

U.S. Cl. 204—84

18 Claims



17. A process for reacting a liquid with a gas in an electrochemical cell comprising at least one electrode assembly comprising an electrode characterized as porous and self-draining and at least two electrodes of opposite charge to said porous and self-draining electrode, each electrode of opposite charge contained in an electrolyte compartment and separated by said electrode assembly and further comprising: an electrode frame defining an opening, said opening filled with said porous, self-draining electrode and containing an internally positioned current distributor and a liquid permeable, microporous diaphragm contacting the external faces of said electrode, said process comprising

(A) flowing a liquid electrolyte into said electrolyte compartment and recovering spent electrolyte from said electrolyte compartment and
 (B) providing internal electrolyte flow within said electrolyte compartment.

4,872,958

ION EXCHANGE MEMBRANE FOR ELECTROLYSIS
 Koji Suzuki, Yokohama; Tetsuro Tsukada, Machida; Yoshihiko Saito; Kiyotaka Arai, both of Yokohama, and Hiroshi Mori, Yokohama, all of Japan, assignors to Asahi Glass Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 59,770, Jun. 8, 1987, abandoned. This application Jun. 15, 1988, Ser. No. 206,914

Claims priority, application Japan, Jun. 13, 1986, 61-136217; Jun. 26, 1986, 61-148176; Jun. 27, 1986, 61-149682

Int. Cl.⁴ C25B 1/16, 1/26, 13/08

U.S. Cl. 204—96

28 Claims

1. An ion exchange membrane for electrolysis comprising a first layer having a thickness of from 5 to 50 μm of a fluoropolymer having carboxylic acid groups as the first layer's ion exchange groups and facing a cathode, a second layer having a thickness of from 50 to 200 μm of a fluoropolymer having ion exchange groups, a specific resistance lower than that of the first layer by at least 10 $\Omega\cdot\text{cm}$ and a thickness of at least 50% of the total thickness of the membrane, and a third layer having a thickness of from 10 to 50 μm of a fluoropolymer having ion exchange groups, a swelling degree higher by at least 5% than that of the second layer and a specific resistance lower by at least 30 $\Omega\cdot\text{cm}$ than that of the second layer, the first, second and third layers being laminated in this order.

15. An ion exchange membrane for electrolysis comprising a first layer having a thickness of from 5 to 50 μm of a fluoropolymer having carboxylic acid groups as the first layer's ion exchange groups and facing a cathode, a second layer having a thickness of from 50 to 200 μm of a fluoropolymer having ion exchange groups, a specific resistance lower by at least 10 $\Omega\cdot\text{cm}$ than that of the first layer and a thickness of at least 50% of the total thickness of the membrane, a third layer having a thickness of from 5 to 50 μm of a fluoropolymer having ion exchange groups, a swelling degree higher by at least 5% than that of the second layer and a specific resistance lower by at least 30 $\Omega\cdot\text{cm}$ than that of the second layer, and a fourth layer having a thickness of from 5 to 50 μm of a fluoropolymer having ion exchange groups and a specific resistance higher by from 5 to 150 $\Omega\cdot\text{cm}$ than that of the third layer, the first, second, third and fourth layers being laminated in this order.

4,872,959

ELECTROLYTIC TREATMENT OF LIQUIDS

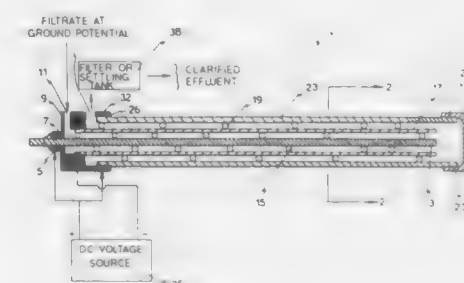
Robert J. Herbst, Parker, Colo., and Russell R. Renk, Laramie, Wyo., assignors to Cleanup & Recovery Corp. (CURE), Denver, Colo.

Continuation-in-part of Ser. No. 74,680, Jul. 17, 1982, abandoned, which is a continuation-in-part of Ser. No. 59,998, Jun. 9, 1987, abandoned. This application Sep. 30, 1987, Ser. No. 102,681

Int. Cl.⁴ C25C 1/20; C25F 5/00; C25B 9/00

U.S. Cl. 204—109

48 Claims



46. A method for removing gold from an aqueous material, which comprises said aqueous material containing said gold through an electrolytic treatment apparatus for liquids, comprising:

a centrally located elongated member for allowing said aqueous material to pass therealong;
 an inner insulator means for wrapping around said centrally located elongated member and for allowing said aqueous material to pass along the external surface thereof;
 an inner tube for enclosing said inner insulator means and for allowing said aqueous material to pass along the internal and external surfaces thereof;
 an outer insulator means for wrapping around said inner tube and for allowing said aqueous material to pass along the external surface thereof;
 an outer tube for enclosing said outer insulator means and for allowing said aqueous material to pass along the internal surface thereof;
 a housing means having an inlet and outlet portions, whereby gold is recovered from said aqueous material.

4,872,960

PROTECTIVE COATINGS OF A CURED HYDROXYSTYRENE MANNICH BASE AND BLOCKED POLYISOCYANATES

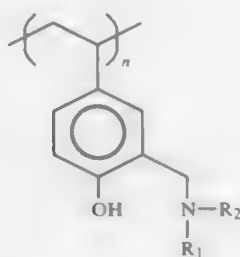
Donna L. Keene, Carrollton, Va., and Darrell D. Hicks, Jeffersonville, Ky., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Filed Jul. 18, 1988, Ser. No. 219,695
 Int. Cl.⁴ C08L 29/00

U.S. Cl. 204—181.7

21 Claims

1. A coating composition which comprises a uniformly dispersed admixture of
 A. a fluid carrier; and
 B. a homopolymer or copolymer containing monomer units of the formula



wherein R₁ and R₂ are independently C₁ to C₁₂ alkyl, or hydroxyalkyl, or aryl, wherein the comonomer is a substituted or unsubstituted component selected from the group consisting of styrene, acrylates, methacrylates and maleimides; said homopolymer or copolymer having a value of n which corresponds to an average molecular weight in the range of from about 360 to about 200,000; and

C. a polyisocyanate compound having terminal NCO units blocked with a blocking component, said blocking component selected to prevent unblocking from the NCO units prior to the application of conditions suitable to cause the reaction of NCO groups from said polyisocyanate compound with said homopolymer or copolymer.

21. A method of protecting a metallic surface which comprises cationically electrodepositing the composition of claim 1 onto said surface and curing the composition by heating wherein the fluid carrier is water or a water/co-solvent mixture.

4,872,961
CORROSION RESISTANT, LOW TEMPERATURE CURED CATHODIC ELECTRODEPOSITION COATING
 John M. McIntyre; Kenneth W. Anderson; Nancy A. Rao, and Richard A. Hickner, all of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.
 Filed Aug. 28, 1987, Ser. No. 90,498
 Int. Cl.⁴ C05D 13/00

U.S. Cl. 204—181.7

48 Claims

1. In a cathodic electrodeposition coating composition comprising an aqueous dispersion of (1) at least one cationic epoxy-based resin, (2) at least one blocked isocyanate crosslinker, and (3) a solvent system containing one or more organic solvents:

the improvement which comprises (a) employing a blocked isocyanate crosslinker which deblocks at a temperature of less than about 160° C., and (b) employing as the solvent system, one which is substantially free of any organic solvent which will react with isocyanate groups at the temperature employed to cure said coating.

4,872,962

PRINTING PRESS

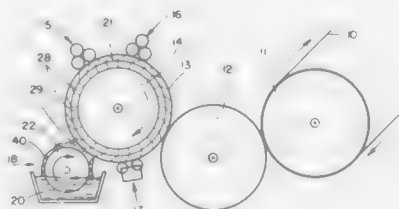
Wolfgang Scheer, Holzkirchen; Hartmut Fuhrmann, Karlsfeld; Gerhard Kossmehl, Berlin; Matthias Niemitz, Berlin, and Detlef Kabbeck-Kupijai, Berlin, all of Fed. Rep. of Germany, assignors to MAN Technologie GmbH, Munich, Fed. Rep. of Germany

Filed Dec. 18, 1987, Ser. No. 134,924
 Claims priority, application Fed. Rep. of Germany, Feb. 20, 1987, 3705439

Int. Cl.⁴ C25D 17/00

U.S. Cl. 204—224 R

15 Claims



1. A printing press for surface printing comprising a printed image carrier having hydrophobic and hydrophilic areas corresponding to matter to be printed, means for changing over areas of such printed image carrier between hydrophobic and hydrophilic states in dots, said printed image carrier comprising a material able to be changed between over between said states by electrical operation, and means adapted to produce electrical operating signals for influencing selected areas of said printed image carrier to effect such change in state thereat.

4,872,963
METHOD AND APPARATUS FOR IMPROVED ELECTROPLATING AND PAINTING RACKS
 Samuel L. Van Horn, 2270 S. High St., Columbus, Ohio 43207
 Continuation-in-part of Ser. No. 656,253, Oct. 1, 1984, Pat. No. 4,591,420, Continuation-in-part of Ser. No. 828,030, Feb. 10, 1986, abandoned. This application May 13, 1988, Ser. No. 193,560

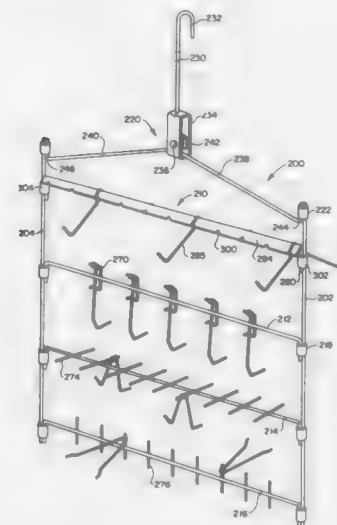
Int. Cl.⁴ C25D 17/08; B05C 13/00

U.S. Cl. 204—297 W

9 Claims

1. A support rack for use in holding objects comprising:
 a first primary support rod having a length and two ends;
 a second primary support rod having a length substantially equal to the length of said first primary support rod, spaced apart and parallel to said first primary support rod;
 at least one cross support rod having a length, two ends and a diameter, having means for releasable connection to said

first and second primary support rods at the ends of said cross support rod;
 a plurality of tip holding members each fixedly attached to said cross support rod, each tip holding member having a diameter and being configured to hold at least one releasably attached retaining tip, said objects being retained by said retaining tip;



wherein said means for releasable connection between said cross support rod and said first and second primary support rods comprises:

a cross support rod socket fixedly attached to and parallel to the length of said primary support rod, said socket being configured to the diameter of said cross support rod;
 a 90 degree bend in an end of said cross support rod.

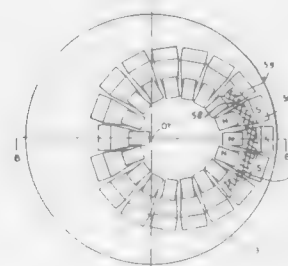
4,872,964

PLANAR MAGNETRON SPUTTERING APPARATUS AND ITS MAGNETIC SOURCE

Masafumi Suzuki, Kawasaki, and Hidenobu Shirai, Seto, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan
 Continuation of Ser. No. 85,295, Aug. 13, 1987, abandoned, which is a continuation of Ser. No. 890,238, Jul. 29, 1986, abandoned. This application Aug. 26, 1988, Ser. No. 237,689
 Claims priority, application Japan, Aug. 2, 1985, 60-171327
 Int. Cl.⁴ C25C 14/34

U.S. Cl. 204—298

9 Claims



1. A planar magnetron sputtering apparatus utilizing a plasma formed by an electromagnetic field, said apparatus comprising:
 an evacuable chamber having a means for introducing an inert gas and a means for holding a substrate for deposit;
 a planar target within said chamber, a front face of said target faces in parallel with said substrate;

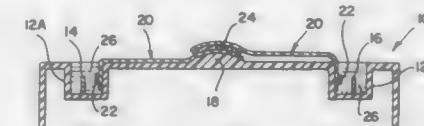
means for applying an electric field over the front surface of said target;
 a mounting base; and
 magnetic source means for generating a magnetic field over the surface of said target, said magnetic source means being positioned behind said target and being rotated around a center axis of said target, a plane of rotation being maintained in parallel with said target, said magnetic source means being composed of a plurality of permanent magnets arranged on said mounting base, each permanent magnet being arranged in a way that similar poles are toward said center axis, each permanent magnet being aligned in a direction of said rotation to form a closed contour having a distance from the center axis which gradually decreases and then increases, said closed contour forming a heart-shaped-like contour on said mounting base, each permanent magnet having a lateral width measured in a direction of said rotation, each lateral width, along the entire closed contour, being substantially proportional to a radius of rotation about said center axis, so that a plasma region is formed over the surface of said target, an instantaneous length of said plasma region, measured along an arc of said rotation, being proportional to a radius of rotation, wherein substantially all of the said surface of said target is exposed during the rotation of the magnetic source means to the plasma generated by said magnetic field for substantially the same period of time.

4,872,965

CONTACT LENS CLEANING APPARATUS
 Mark L. Pankow, 2106 N. Seminary, Chicago, Ill. 60614
 Filed Feb. 10, 1988, Ser. No. 154,790
 Int. Cl.⁴ B08B 3/12, 6/00, 7/00

U.S. Cl. 204—299 R

17 Claims



1. A lens cleaning apparatus comprising:
 means for containing a fluid capable of transmitting an electrical charge;
 means for supplying an electrical current to said fluid;
 means for transmitting said electrical current from said fluid to a location remote from said fluid, said electrical transmitting means including an immersion end within said electrical charge transmitting fluid, said electrical transmitting means further being for transmitting the electrical current from said fluid to said remote location; and
 at least said fluid containing means, said electrical current supplying means, and electrical current solely transmitting means cooperate to clean a lens positioned at said remote and exterior location.

4,872,966

SHEET TYPE ELECTRODE FOR USE IN THE MEASUREMENT OF ION CONCENTRATIONS
 Haruo Kotani, and Katsuhiko Tomita, both of Kyoto, Japan, assignors to Horiba, Ltd., Kyoto, Japan
 Filed Nov. 24, 1987, Ser. No. 124,970
 Claims priority, application Japan, Dec. 11, 1986, 61-191497[U]

Int. Cl.⁴ G01N 27/46

U.S. Cl. 204—414

13 Claims

1. In a sheet-configured electrode for use in the measurement of ion concentrations, the improvement comprising:
 a substrate of a non-conducting material defining a through-hole;
 an electrode assembly having a glass electrode disposed side

by side to a reference electrode, each electrode having a different internal construction from the other, the glass electrode being provided with an internal electrode portion directly aligned with said throughhole and a lead portion, said portions being adhered to a lower surface of



the substrate, the lower surface being opposite a side of the substrate from which a sample is received by the sheet-configured electrode, and
a support layer of non-conducting material formed over a portion of the electrode assembly while exposing the lead portion.

4,872,967

MULTISTAGE REFORMING WITH INTERSTAGE AROMATICS REMOVAL

Kenneth R. Clem, Baton Rouge, La.; Kenneth J. Heider, Oak Ridge; James E. Kegerreis, Montville, both of N.J., and Ehsan I. Shoukry, Baton Rouge, La., assignors to Exxon Research and Engineering Company, Florham Park, N.J.
Filed May 23, 1988, Ser. No. 197,233
Int. Cl.⁴ C10G 35/06

U.S. Cl. 208—65

34 Claims



1. A process for catalytically reforming a gasoline boiling range hydrocarbonaceous feedstock in the presence of hydrogen in a reforming process unit comprised of a plurality of serially connected reactors wherein each of the reactors contains a supported noble metal-containing reforming catalyst composition, the process comprising:

- conducting the reforming in two or more stages comprised of one or more reactors;
- separating aromatics from at least a portion of the reaction stream between each stage thereby resulting in an aromatics-rich stream and an aromatics-lean stream;
- passing at least a portion of the aromatics-lean stream to

the next downstream stage, in the substantial absence of non-reformed feed; and

- conducting the reforming of one or more of the downstream stages wherein at least one of the reactors contains a reforming catalyst selected from (i) a supported multi-metallic catalyst wherein at least one of the metals is a noble metal, and the support is alumina, and (ii) a noble metal-containing catalyst wherein the support material is a crystalline aluminosilicate material, and wherein at least one downstream reactor is operated in the substantial absence of steam, and at a pressure which is at least 25 psig lower than that of the first stage.

4,872,968

CATALYTIC DEWAXING PROCESS USING BINDER-FREE CATALYST

Emmerson Bowes, East Amwell, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 20, 1987, Ser. No. 87,197

Int. Cl.⁴ C10G 47/20

U.S. Cl. 208—111

5 Claims

1. A process for catalytic dewaxing of a waxy feed having a pour point of at least 100° F., containing at least 25 wt % paraffin hydrocarbons and having a basic nitrogen content of at least 100 ppm by contacting the feed with a dewaxing catalyst comprising a binder-free extrudate of an intermediate pore zeolite at a temperature of 500° to 700° F. and at a space velocity, LHSV of 0.25 to 1.5 hr⁻¹ and wherein said binder free extrudate zeolite catalyst displays an aging rate which is at least 65% lower than the aging rate of a comparable, alumina bound zeolite dewaxing catalyst of the prior art used at identical process conditions and recovering a dewaxed feed as a product of the process.

4,872,969

METHOD FOR VALVELESS CONTROL OF PARTICLE TRANSPORT

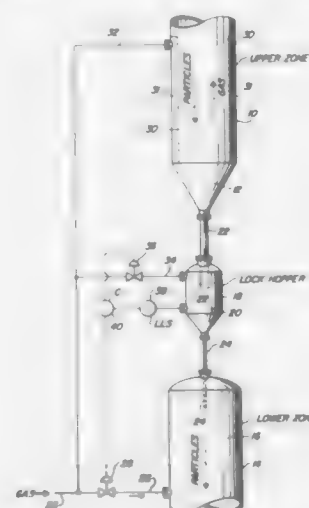
Paul A. Sechrist, Arlington Heights, Ill., assignor to UOP, Des Plaines, Ill.

Filed Mar. 28, 1988, Ser. No. 173,831

Int. Cl.⁴ C10G 35/00

U.S. Cl. 208—173

5 Claims



1. A method for semi-continuously transferring solid particles through an upper collection zone, an intermediate collection zone and a lower collection zone, said method comprising:

- passing particles from said upper zone to said intermediate zone through an upper transfer conduit, passing first gas stream into said lower zone, passing said first gas stream from said lower zone upwardly through a lower

transfer conduit into said intermediate zone, and passing said first gas stream from said intermediate zone upwardly through said upper transfer conduit into said upper zone, said upper conduit having a flow larger than the flow area of said lower conduit and said gas stream having a flux rate that will prevent particle movement down said lower transfer conduit and permit particle movement down said upper transfer conduit;

- passing a second gas stream into said intermediate zone to provide a gas flux rate up said upper transfer conduit that will prevent particle movement down said upper transfer conduit; and
- reducing the flow of said first gas stream into said lower zone and passing particles from said intermediate zone to said lower zone through said lower transfer conduit.

4,872,970

REACTIVATION OF IRIIDIUM-CONTAINING CATALYSTS

Joseph P. Boyle, Sarnia, Canada, assignor to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Sep. 23, 1988, Ser. No. 248,512

Int. Cl.⁴ C10G 35/09, 35/085; B01J 23/96, 38/44

U.S. Cl. 208—140

32 Claims

1. In a process for the catalytic conversion of hydrocarbons wherein a hydrocarbon feedstock is contacted with a catalyst containing an iridium component composited with a porous refractory inorganic oxide support at hydrocarbon conversion conditions, the catalyst having been at least partially deactivated during contact with the feedstock by coke deposition thereon, the catalyst having been regenerated after discontinuing contact of said catalyst with the feedstock in a series of steps which include

- providing a bed of the catalyst in a reaction zone wherein the catalyst has a chloride level of at least about 0.9 wt. %;
- burning a major portion of the coke from the catalyst while adding a gas containing a chlorinated compound in an amount sufficient to maintain at least 0.9 wt. % chloride on the catalyst and oxygen in a concentration ranging up to about 5000 vppm to provide a flame front temperature not exceeding about 425° C.,
- increasing the chloride level of the catalyst to at least about 1.6 wt. %,
- burning a major portion of the remaining coke from the catalyst while adding a gas containing from about 100 to about 5000 vppm of a chlorinated compound and up to about 5000 vppm oxygen to provide a flame front temperature of at least about 460° C.,

the improvement comprising

- contacting the substantially coke-depleted catalyst with a gas containing from about 300 to about 10,000 vppm of a chlorinated compound and from about 0.3 to about 5 vol. % of oxygen at a temperature of at least about 460° C. under essentially stagnant gas conditions for at least about 1 hour, the concentrations of the chlorinated compound and oxygen during this contacting being greater than the concentrations used in (iv), and
- repeating (a) at least two additional times to redisperse the agglomerated iridium, thereby obtaining a substantially coke-depleted and reactivated iridium-containing catalyst.

4,872,971

PROGRESSIVE FLOW CRACKING OF COAL/OIL MIXTURES WITH HIGH METALS CONTENT CATALYST

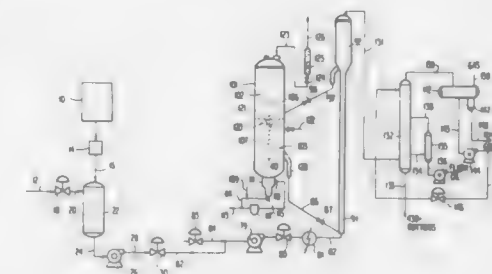
Oliver J. Zandona, Ashland, Ky., assignor to Ashland Oil, Inc., Ashland, Ky.

Continuation of Ser. No. 292,096, Jan. 30, 1981, abandoned. This application Sep. 4, 1984, Ser. No. 646,404

Int. Cl.⁴ C10G 1/06

U.S. Cl. 208—419

21 Claims



1. A process for economically producing liquid fuel products at least partly from coal, comprising the steps of:

- introducing to a progressive flow catalytic cracking zone a charge stock comprising a pumpable mixture of solid, particulate coal and carbo-metallic oil, at least about 70% of said oil boiling above about 650° F., the weight ratio of oil to coal being at least 1:1, said carbo-metallic oil being characterized by a carbon residue on pyrolysis as defined by a Conradson carbon content in the range of 2 to about 12 wt. % carbon by ASTM D189-76 and by containing at least about 4 ppm nickel equivalents of heavy metal(s), said metals including nickel, and forming within said zone a stream having a linear velocity of at least about 25 feet per second, said stream comprising said charge stock and a hydrocarbon zeolite cracking catalyst, said zeolite catalyst being characterized as bearing a deposit of heavy metal(s) of at least about 1500 ppm nickel equivalents, for promoting dehydrogenation of said charge stock;
- forming mobile hydrogen within said zone by said dehydrogenation under a combination of vapor residence time in the range of up to about 10 seconds, a temperature in the range of about 900°–1400° F. and a total pressure in the range of about 10 to about 50 pounds per square inch absolute;
- introducing said mobile hydrogen into said stream by dehydrogenation of said charge stock in the absence of added molecular hydrogen, through contacting said charge stock with said hydrocarbon zeolite cracking catalyst, thereby producing liquid products from said charge stock while laying down coke on said hydrocarbon cracking catalyst in the range of about 0.3% to about 3%, and thereby producing spent catalyst;
- separating from said spent catalyst said liquid products.

4,872,972

APPARATUS FOR CLASSIFYING PARTICLES

Minoru Wakabayashi, Hyogo; Hiroyuki Murata; Yasuo Sugino, both of Kobe; Masanobu Yamao, Hyogo, and Takao Nishikawa, Kobe, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Nov. 5, 1987, Ser. No. 116,964

Claims priority, application Japan, Nov. 6, 1986, 61-264790; Nov. 6, 1986, 61-264791

Int. Cl.⁴ B07B 7/04

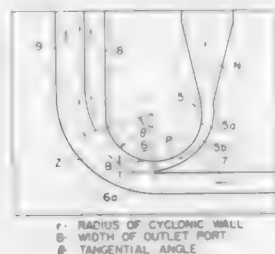
U.S. Cl. 209—143

8 Claims

1. An apparatus for classifying particles, said apparatus comprising:

- a feed nozzle having an outlet port defined by a first side wall and a second side wall spaced from and at least ap-

- proximately equidistant from said first side wall for producing a first jet stream of particles entrained in a gas;
- (b) a cyclonic block disposed downstream of and continuous to said first side wall of said feed nozzle, said cyclonic block having a first inner arcuate surface sized, shaped, and positioned such that, in use, the first jet stream flows therealong;
- (c) a control port sized, shaped, the positioned to produced a second jet stream of a gas that merges tangentially with the first jet stream adjacent said cyclonic block but on the side thereof remote from said cyclonic block to accelerate the first jet stream, said control port being defined by a first straight, imperforate side wall the merges tangentially



- with said second side wall and a second straight, imperforate side wall that is spaced from and at least approximately parallel to said first straight, imperforate side wall; and
- (d) at least two collecting ports disposed downstream of said cyclonic block in position to receive portions of the merged first and second jet streams, wherein:
- (e) said cyclonic block has a second inner arcuate surface sized, shaped, and positioned such that, in use, the first jet stream flows therealong and
- (f) said second inner arcuate surface is located upstream of said first inner arcuate surface and upstream of said control port.

4,872,973

CYCLONE CLASSIFIER

Iwao Ikebuchi, Hirakata; Mamoru Nakano, Kadoma; Kazuo Fuse, Nara, and Akira Ganze, Tokyo, all of Japan, assignors to Kubota Ltd., Osaka, Japan

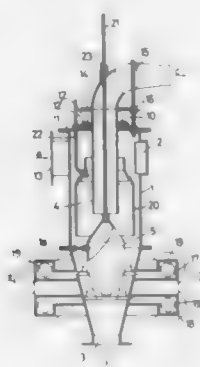
Continuation of Ser. No. 51,373, May 19, 1987, abandoned. This application Feb. 23, 1989, Ser. No. 315,237

Claims priority, application Japan, Apr. 6, 1987, 62-51883[U]

Int. Cl. B04C 3/00

U.S. Cl. 209-144

10 Claims



1. A cyclone classifier comprising:
- a tubular casing having upper, middle, and lower parts, said tubular casing including a peripheral wall defining an

- inside and an outside, and said lower part of said tubular casing including a substantially conical portion;
- an inlet pipe means at said upper part of said tubular casing for supplying gas and material to be processed into the inside of said casing, said inlet pipe means having an inlet port means for directing the material to be processed into said casing and in a direction tangential to said peripheral wall of said casing;
- a discharge pipe means for discharging solid particles and being at said lower part of said tubular casing;
- an outlet pipe means for discharging gas and classified material from the inside or said tubular casing, said outlet pipe means extending from inside said casing, through said upper part of said casing, and outside said casing, said outlet pipe means having a first opening inside said casing and a second opening outside said casing;
- a tubular body having upper, middle, and lower parts, said tubular body including a peripheral wall defining an inside and an outside, said lower part of said tubular body being open and surrounding and extending past said first opening of said outlet pipe means, and said peripheral wall of said tubular body being spaced from said peripheral wall of said tubular casing for defining a space for further directing the material to be processed directed by said inlet port means of said inlet pipe means in a direction tangential to said peripheral wall of said casing;
- a conic being attached to said casing, located inside said casing, being spaced from said peripheral wall of said casing, being spaced from said tubular body, and being spaced from said first opening of said outlet pipe means, said conic having substantially conical upper and lower ends, and being located between said first opening of said outlet pipe means and said discharge pipe means; and
- an annular gas inlet pipe means substantially surrounding said peripheral wall of said lower part of said tubular casing, said annular gas inlet means having an inner and an outer annular peripheral wall, a gas inlet port in said outer peripheral wall for introducing gas into said annular gas inlet pipe means in a direction tangential to said annular peripheral walls thereof for causing a smooth swirling tangential gas current therein, a gas outlet port in said inner peripheral wall of said annular gas inlet pipe means, said gas outlet port extending around substantially the entire inner peripheral wall for fluidly communicating with said lower part of said tubular casing substantially around the entire circumference thereof for causing a smooth swirling tangential gas current in said tubular casing.

4,872,974

APPARATUS FOR TESTING MEMBRANE FILTERS, AND FOR STERILIZING LIQUIDS WITH USE OF MEMBRANE FILTER

Shigemitsu Hirayama, Yao; Takamichi Akashi, Ikeda; Akio Ikuta, Osaka; Isao Sasaki, Minoo, and Hiroshi Fukuda, Tokyo, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Continuation of Ser. No. 45,159, May 4, 1987, abandoned, which is a continuation of Ser. No. 647,886, Sep. 6, 1984, abandoned. This application Dec. 27, 1988, Ser. No. 291,395

Claims priority, application Japan, Sep. 9, 1983, 58-167343; Mar. 19, 1984, 59-53259

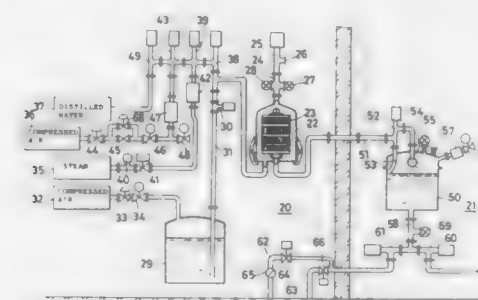
Int. Cl. G01N 15/08; B01D 13/00

U.S. Cl. 210-90

2 Claims

1. A liquid sterilizing filtration apparatus comprising a filter housing fixedly accommodating a membrane filter therein, a primary container for containing a prefill, a primary pipe connecting the primary side of the filter housing to the primary container, means defining a gas source connected to the primary pipe, a secondary container for containing a filtrate, and a secondary pipe connecting the secondary side of the filter housing to the secondary container, the apparatus further including means defining a steam source and a distilled water

source which are connected to the primary pipe via a changeover valve, a valve which sets pressure increase rate being provided between the gas source and the changeover valve for maintaining the rate of increase of the pressure at the primary side of the membrane filter by the gas at a predetermined value, a gas outlet being provided at an upper portion of the filter housing and openable by a valve, a pressure sensor being provided at the primary side of the filter housing, and a control unit comprising a microcomputer structured to achieve auto-



4,872,975

SYSTEM FOR SEPARATING ABRASIVE MATERIAL FROM A FLUID USED IN FLUID JET CUTTING

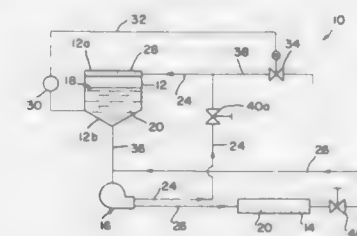
Dan T. Benson, Joplin, Mo., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Jan. 31, 1989, Ser. No. 304,084

Int. Cl. B01D 21/26, 21/34; B24C 9/00

U.S. Cl. 210-99

11 Claims



9. A system for separating abrasive material from a fluid used in fluid jet cutting, comprising:
- a catcher tank;
- means for pumping fluid, having an abrasive material suspended therein, from the catcher tank and centrifugally separating an abrasive slurry from the fluid;
- first conduit means for returning the fluid separated from the slurry to the catcher tank;
- a settling tank;
- second conduit means for directing the slurry to the settling tank wherein a portion of the abrasive material substantially settles from the slurry and, after settling has occurred, the slurry from which some of the abrasive material has settled is returned to the means for pumping;
- fluid level control means for limiting fluid in the catcher tank to a desired level; and
- means for regulating fluid flow rate in the system.

4,872,976

OIL FILTER WITH MULTIPLE FUNCTION VALVE

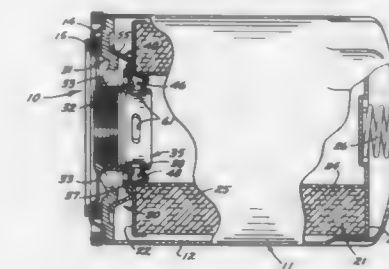
Roger L. Cudaback, Gibbon, Nebr., assignor to Baldwin Filters, Inc., Kearney, Nebr.

Filed Jul. 25, 1988, Ser. No. 223,395

Int. Cl. B01D 27/10

U.S. Cl. 210-130

11 Claims

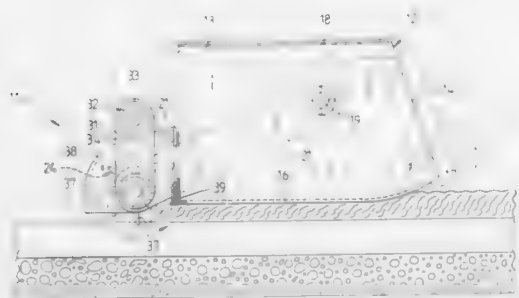


1. An oil filter comprising a housing, a filter element located in said housing and operable to separate contaminants from oil passing through said element, a plate joined to one end of said housing, a series of angularly spaced inlet openings formed through said plate for admitting oil into said housing, a sleeve joined to said plate near the center thereof and defining an outlet for discharging oil from said housing, oil normally flowing from said inlet openings, through said filter element and out of said outlet when said inlet is pressurized, and valve means for controlling the flow of oil between said inlet openings and said outlet, said valve means comprising a flange projecting radially outwardly from said sleeve and having angularly spaced passages which are operable when open to allow oil to flow directly from said inlet openings to said outlet without passing through said filter element, a valve member comprising a ring made of resiliently yieldable material and telescoped over said sleeve, said valve member having an inner peripheral portion defining a first resiliently yieldable valve portion normally biased fact-to-face against said flange and normally closing said passages to prevent oil from flowing directly from said inlet openings to said outlet, said valve member having a second resiliently yieldable valve portion biased to a closed position against said plate and operable when in said closed position to prevent oil from flowing between said inlet openings and said filter element, said valve member further including an intermediate section disposed in a generally radial plane, said first valve portion normally lying in said plane and being hinged to said intermediate section to yield and swing out of said plane to open said passages, and said second valve portion comprising a skirt extending around and projecting generally axially from the outer periphery of said intermediate section and hinged to yield and swing toward said plane, said second valve portion normally yielding when said inlet openings are pressurized and permitting oil to flow from said inlet openings to said outlet by way of said filter element, and said first valve portion yielding and opening said passages when said inlet openings are pressurized and the pressure differential between said inlet openings and the downstream side of said filter element exceeds a predetermined value whereby oil bypasses said filter element and flows directly from said inlet openings to said outlet by way of said passages, there being a series of angularly spaced and generally radially extending ports formed through said sleeve and communicating with said passages when said first portion of said valve member yields and opens said passages.

4,872,977

SOLID WASTE RETRIEVER

Davis G. Jackson, 3927 Lorna Rd., Birmingham, Ala. 35244
Filed Sep. 26, 1988, Ser. No. 249,412
Int. Cl.⁴ B07B 1/00; E02F 3/40
U.S. Cl. 210—173 14 Claims



8. Apparatus for removing dried sludge from an underlying sand bed when urged thereacross by an associated propelling device comprising:

- (a) a sludge receiving bin having a smooth imperforate bottom surface adapted to slide over said sludge with minimal resistance such that dried sludge forward of said bin is not disrupted as said receiving bin is urged thereacross, said sludge a closed forward end with a rolled radius curved section and
- (b) a rotor assembly mounted for selective positioning adjacent said open rear end for lifting dried sludge emerging from below said bin thereinto; and
- (c) a propelling device operatively connected to said bin.

4,872,978

DEVICE FOR THE REMOVAL OF CRYOGLOBULINS
Storker Jorstad, Trondhjem, Norway, and Leif Smedby, Land, Sweden, assignors to Fabio Fasting Biotech A/S, Trondhjem, Norway

Filed Nov. 25, 1987, Ser. No. 125,419
Claims priority, application Norway, Nov. 26, 1986, 864728
Int. Cl.⁴ B01D 35/18, 36/02, 36/04
U.S. Cl. 210—181 14 Claims



1. A device for the cryoprecipitation of blood plasma, said device comprising:

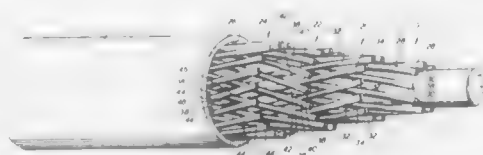
- a plasma separator for the separation of blood cells from blood plasma in blood from a mammal,
- a sedimentation container,
- a first tube connecting said plasma separator and said sedimentation container,
- a plasma filter,
- a second tube connecting said plasma filter and said sedimentation container, for the supply of blood plasma from said plasma separator to said plasma filter,
- an outlet tube from said plasma filter for flow of filtrate from said plasma filter for return to a host,
- a heating device for the filtrate flowing through said outlet tube,
- a recirculation tube connected to said plasma filter and said sedimentation container for recirculating plasma from said

plasma filter back to said plasma filter through said sedimentation container and said second tube,
a cooling device for said recirculation tube for cooling the recirculating plasma between said plasma filter and said sedimentation container.

4,872,979

CHROMATOGRAPHY COLUMN

Marcel Golay, La Conversion, Switzerland, assignor to The Perkin-Elmer Corporation, Norwalk, Conn.
Filed Apr. 22, 1987, Ser. No. 41,554
Int. Cl.⁴ B01D 15/08
U.S. Cl. 210—198.2 28 Claims



1. A chromatographic column comprising an elongated column housing having first and second end portions, an elongated central core element within said housing extending between said first and second end portions, a configuration of fiber layers disposed about said central element forming a plurality of fluid passageways extending between said first and second end portions, said configuration comprising, an innermost layer having a plurality of fibers helically wound about said central element with the fibers being in predetermined spaced disposition for forming uniform fluid passageways between adjacent fibers extending between said first and second end portions, and a plurality of outwardly successive layers of fibers disposed about said innermost layer with an outermost layer being disposed adjacent said housing, each said successive layer having a plurality of fibers helically wound in reverse hand relative to the next adjacent layer and in predetermined spaced disposition for forming uniform fluid passageways between adjacent fibers extending between said first and second end portions with a plurality of lateral openings fluidly interconnecting overlapping fluid passageways longitudinally along said passageways, and a chromatographic coating of stationary phase material on said passageways.

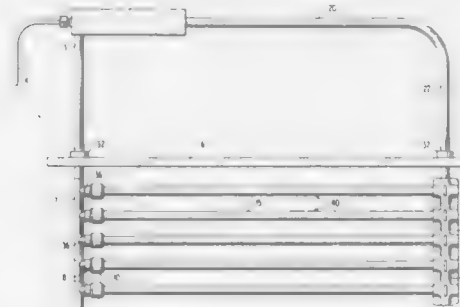
4,872,980

FLUID PURIFICATION DEVICE

Jan Maarschalkerweerd, Lambeth, Canada, assignor to Trojan Technologies, Inc., Canada
Filed Sep. 13, 1988, Ser. No. 243,845
Int. Cl.⁴ G01N 21/01
U.S. Cl. 210—243 35 Claims

1. A fluid purification device comprising in combination a frame including a pair of opposed legs laterally spaced from each other, one of said legs having a longitudinally extending passage therein, a plurality of water purification lamp assemblies extending between and supported by said legs, each lamp assembly having one end thereof located towards said one leg and an opposite end located towards the other leg, a plurality of electrical lead wires located in said passage in said one leg and respectively connected to said lamp assemblies at said one end thereof, said one leg having a plurality of openings spaced along said one leg, a plurality of first seals surrounding said lead wires and respectively sealing said openings from the

fluid, electrical connector means connecting said lead wires to said lamp assemblies respectively while being sealed to prevent

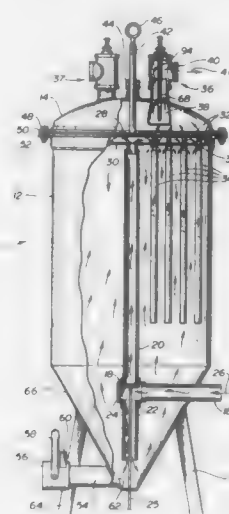


contact with fluid surrounding said lamp assemblies when in use, and wherein said other leg is free of any lead wires.

4,872,981

SPLIT INLET FOR FILTER

Russell Hobson, Jr., Rte. 1, Box 30, Old Fort, N.C. 28762
Filed Jan. 7, 1988, Ser. No. 141,651
Int. Cl.⁴ B01D 29/24
U.S. Cl. 210—323.2 18 Claims

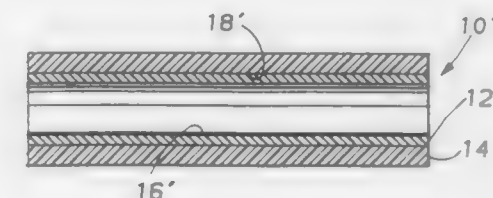


1. A fluid filter, comprising: a casing; a tube sheet dividing said casing into a filtered and an unfiltered chamber, said tube sheet having openings there-through; a filter unit in each of said openings in said tube sheet; a filtered fluid outlet in said filtered chamber; fluid inlet means in said unfiltered chamber for directing the flow of fluid, toward said filtered chamber, and away from said filtered chamber and, wherein said fluid inlet means is comprised of a valve means for directing the flow of fluid towards said filtered and said unfiltered chamber.

4,872,982

COMPOSITE SEMIPERMEABLE MEMBRANES AND METHOD OF MAKING SAME

John A. Taylor, Pinckney, Mich., assignor to Separation Dynamics, Inc., Southfield, Mich.
Filed Sep. 6, 1988, Ser. No. 240,632
Int. Cl.⁴ B01D 13/00
U.S. Cl. 210—490 14 Claims



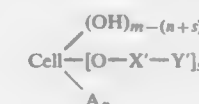
10. A semipermeable hollow fiber membrane consisting of: a first layer including water and water soluble substance permeating means for selectively permeating only water and water soluble substances therethrough and excluding the permeation of hydrocarbon fluids; a second layer (14) covalently bonded to said first layer (12) and including water soluble substance permeating means for selectively permeating only water soluble substances therethrough and excluding water permeation therethrough.

4,872,983

BIOCOMPATIBLE CELLULOSE DIALYSIS MEMBRANE WITH INCREASED ADSORPTION OF BETA-2-MICROGLOBULIN

Michael Dimantoglou, Erlenbach/Main, and Helmut Kuhne, Kreuzau, both of Fed. Rep. of Germany, assignors to Akzo N.V., Netherlands
Filed Dec. 9, 1988, Ser. No. 281,762
Claims priority, application Fed. Rep. of Germany, Dec. 11, 1987, 3742072
Int. Cl.⁴ B01D 13/00
U.S. Cl. 210—500.29 11 Claims

1. A dialysis membrane for hemodialysis in the form of flat films, tubular films or hollow filaments, composed of substitution-modified cellulose, wherein the modified cellulose has a molecular structure which substantially adsorbs beta-2-microglobulin present in blood plasma and is effective to reduce carpal tunnel syndrome and is represented by the formula



wherein:

- Cell is a framework of an unmodified cellulose molecule or of a chitin molecule, in each case without hydroxyl groups;
- A is selected from the group consisting of and Z-B;
- Z is an atom of group V or VI or the Periodic System other than oxygen;
- In the case where Z is an atom of group V, A is and T is a hydrogen atom or (X-Y); in the case where Z is an atom of group VI, A is
- (n+s) is the mean degree of substitution; $0 < n < m$ and $0 \leq s < m$ and $n+s < m$;
- m=3 in the case of the unmodified cellulose molecule and m=2 in the case of the chitin molecule;
- B is selected from the group consisting of Y and X-Y; —X— and —X'— are each at least one member selected

from the group consisting of a substituted or unsubstituted, straight or branched chain alkylene, alkenylene or alkynylene radical in which the carbon chain may be interrupted by hetero atoms or be CO—, CONR— or COO— groups, a substituted or unsubstituted cycloalkylene which may contain hetero atoms, a substituted or unsubstituted arylene, arylalkylene, arylalkenylene or arylalkynylene radical which may contain hetero atoms, a substituted or unsubstituted bisarylalkylene or bisarylene radical, a substituted bisarylalkylene or bisarylene radical of a condensed aromatic compound, and a substituted or unsubstituted readical of a heterocyclic compound;

—Y and —Y' are each at least one member selected from the group consisting of —H, —NR₂—N⁺R₃, —COOH or a salt thereof, —COOR, —CONR₂, —CO—R, —CS—R, —CSOH or a salt thereof, —CSOR, —CSNR₂, —SO₃H or a salt thereof, —SO₃R, —SO₂R, —SO₂NR₂, —SR, —SOR, —SON R₂, —PO₃H₂ or a salt thereof, —PO—(OR)₂, —PO₂H(NR₂), —PO(NR₂)₂, —PO₂H₂, —PO—H(OR), —CN, —NO₂, —OR, halogen and Si(OR)₃;

R is at least one member selected from the group consisting of a hydrogen atom, a straight or branched chain alkyl, alkenyl or alkynyl group having 1 to 36 atoms in which the carbon chain may be interrupted by hetero atoms or by CO—, CONR— or COO— groups, a substituted or unsubstituted cycloalkyl group which may contain hetero atoms, a substituted or unsubstituted aryl, arylalkyl, arylalkenyl or arylalkynyl radical which may contain hetero atoms, a substituted or unsubstituted bisarylalkyl or bisaryl radical, a substituted or unsubstituted radical or a condensed aromatic compound, and a substituted or unsubstituted radical of a heterocyclic compound;

X is identical to or different from X' and Y is identical to or different from Y'.

4,872,984

INTERFACIALLY SYNTHESIZED REVERSE OSMOSIS MEMBRANE CONTAINING AN AMINE SALT AND PROCESSES FOR PREPARING THE SAME

John E. Tomaschke, San Diego, Calif., assignor to Hydranautics Corporation, San Diego, Calif.

Filed Sep. 28, 1988, Ser. No. 250,190

Int. Cl.⁴ B01D 13/00

U.S. Cl. 210—500.38

58 Claims

1. A water permeable membrane prepared by interfacially polymerizing, on a microporous support, (1) an essentially monomeric, aromatic polyamine reactant having at least two amine functional groups, and (2) an essentially monomeric, aromatic, amine-reactive reactant comprising a polyfunctional acyl halide or mixture thereof, wherein the amine-reactive reactant has, on the average, at least about 2.2 acyl halide groups per reactant molecule, in the presence of (3) a monomeric amine salt.

30. A process for producing a water permeable membrane comprising interfacially polymerizing, on a microporous support, (1) an essentially monomeric, aromatic polyamine reactant having at least two amine functional groups, and (2) an essentially monomeric, aromatic, amine-reactive reactant comprising a polyfunctional acyl halide or mixture thereof, wherein the amine-reactive reactant has, on the average, at least about 2.2 acyl halide groups per reactant molecule, in the presence of (3) a monomeric amine salt.

4,872,985

METHOD FOR APPLICATION OF WASTEWATER TO PLANTS FOR IMPROVED WASTEWATER TREATMENT

Ray Dinges, 3404 Buckrace, Austin, Tex. 78748

Filed Nov. 10, 1986, Ser. No. 928,996

Int. Cl.⁴ C02F 3/32

U.S. Cl. 210—602

4 Claims

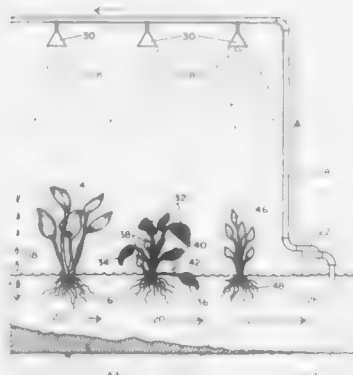
1. A method of wastewater treatment comprising the steps of:

(a) constructing a wastewater treatment basin for temporar-

ily holding wastewater introduced at one end and released at another end of said basin;

(b) growing floating aquatic plants in said basin;

(c) locating a pump means near the end of said basin where said wastewater is released; and



(d) providing an attaching means, interconnecting said pump, with a plurality of clog-free distribution means, and introducing said wastewater at variable rates and for variable time periods to said plants from above thereby engaging said wastewater with microbial biofilm covering leaves and stems, as well as the root mass, of said plants in purification of said wastewater.

4,872,986

USE OF BACTERIA FOR CONTROL OF ALGAL BLOOM IN WASTEWATER, LAGOONS, OR PONDS

William T. Stringfellow, Atlanta, Ga.; Charles D. Goldsmith, Christiansburg, and Lois T. Davis, Salem, both of Va., assignors to Sybron Chemicals, Inc., Birmingham, N.J.

Filed May 6, 1988, Ser. No. 191,073

Int. Cl.⁴ C02F 1/50

U.S. Cl. 210—611

4 Claims

1. A process for controlling algal growth in waste water, lagoons and ponds which comprises treating the algae containing water with a high concentration of a selected actively growing species of pseudomonas product which produces an exudate which exhibits antialgal characteristics.

4,872,987

PROCESS FOR SEPARATING AND PRODUCING CHLOROGENIC ACID

Reiner Kopsch, Schenefeld; Claus F. Gösswein, Buchholz; Henning Lutz; Michael Ball, both of Halstenbek, and Peter Hubert, Buxtehude, all of Fed. Rep. of Germany, assignors to Ergo Forschungsgesellschaft mbH, Hamburg, Fed. Rep. of Germany

Continuation of Ser. No. 131,191, Oct. 1, 1987, abandoned. This application Mar. 20, 1989, Ser. No. 326,488

Claims priority, application Fed. Rep. of Germany, Feb. 6, 1986, 3603574

Int. Cl.⁴ B01D 15/08

U.S. Cl. 210—635

8 Claims

1. A process for separation and production of 3-, 4-, and 5-chlorogenic acid by extraction of plant raw materials in water comprising passing a water extract from plant raw material containing chlorogenic acid through a chromatography column containing crosslinked dextran whereby the chlorogenic acid is separated from accompanying substances by gel permeation chromatography on said cross-linked dextran and eluting said chlorogenic acid with water as elution medium to obtain a purity of greater than 70.7% in commercial scale amounts.

4,872,988

METHOD AND DEVICE FOR SEPARATION OF COLLOIDAL SUSPENSIONS

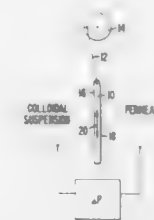
Joseph B. Calkin, 2810 Clay St., Alameda, Calif. 94501

Filed Feb. 2, 1988, Ser. No. 151,359

Int. Cl.⁴ B01D 13/00

U.S. Cl. 210—636

34 Claims

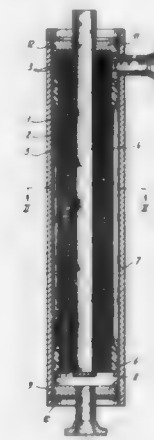


1. A method for separating particulates from a colloidal suspension in which plugging of a filter membrane is inhibited said method comprising:

inhibiting plugging of a membrane from a sample blood suspension, by passing the suspension through the filter membrane, the filter membrane selected to substantially block passage of the particulates; and

simultaneously inducing a relative oscillation between the filter membrane and the suspension with a frequency and displacement selected to provide a Reynold's number of at least about 1.

width dimension of said rods measured perpendicular to said membrane layers being about 0.5 to 2.5 mm and the distance



between said rods being about four to about twelve times said width dimension.

4,872,991

TREATMENT OF WATER

Craig R. Bartels; Tansukhlal G. Dorawala, both of Wappingers Falls, N.Y.; Michael T. Stephenson, Katy, Tex.; Mordechai Pasternak, Spring Valley, and John Reale, Jr., Wappingers Falls, both of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Jul. 5, 1988, Ser. No. 214,981

Int. Cl.⁴ B01D 13/00; C02F 1/40

U.S. Cl. 210—651

17 Claims

16. The method of treating an aqueous charge containing immiscible crude oil which comprises nanofiltering said aqueous charge containing immiscible crude oil thereby forming (i) aqueous filtrate containing a diminished amount of immiscible crude oil and (ii) aqueous retentate containing immiscible crude oil; recovering said aqueous filtrate containing a diminished amount of immiscible crude oil; and recovering said aqueous retentate containing immiscible crude oil.

4,872,992

METHOD AND APPARATUS FOR ANALYZING DILUTED AND UNDILUTED FLUID SAMPLES

Javier N. Oquendo, Denton, and Joseph A. Leone, Plano, both of Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 9, 1987, Ser. No. 130,831

Int. Cl.⁴ B01D 15/08

U.S. Cl. 210—659

5 Claims

1. A method for the simultaneous analysis of diluted and undiluted fluid samples to determine the concentration of one or more ions in said fluid samples, respectively, comprising the steps of:

providing analysis means including an ion detection unit, ion separation means adapted to be in communication with said detection unit, first pump means for supplying an eluent for displacing a fluid sample to be measured through said separation means and said detection unit, second pump means for supplying an undiluted sample of fluid to be analyzed to said separation means and said detection unit, first reservoir means for holding a predetermined quantity of an undiluted sample of said fluid, second reservoir means for holding a predetermined quantity of a diluted sample of said fluid and valve means for selectively placing said reservoir means, respectively, in

4,872,990

MEMBRANE MODULE FOR HYPERFILTRATION OR ULTRAFILTRATION OF CONTAINING LIQUID FLOWS

Hendrik F. Van Wijk, Ce Zeist, Netherlands, assignor to Nederlandse Organisatie voor Toegepast-Natuurwetenschappelijk Onderzoek TNO, The Hague, Netherlands

Filed Sep. 9, 1988, Ser. No. 242,721

Claims priority, application Netherlands, Sep. 9, 1987, 8702149

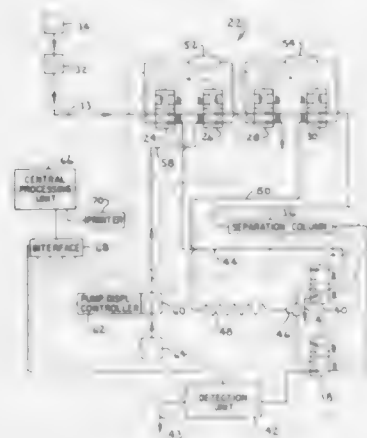
Int. Cl.⁴ B01D 13/00

U.S. Cl. 210—644

18 Claims

1. Membrane module comprising: means for hyperfiltration or ultrafiltration of particulate-containing liquid flows including an envelope of membrane layers spirally wound around a tube provided with openings, said membrane layers being alternately separated by retentate spacers and permeate spacers, said retentate spacers comprising relatively rigid rods or wires extending parallel to the center line of said module, the

flow communication with said separation means and said first pump means;
filling said first reservoir means with an undiluted fluid sample;
mixing a quantity of undiluted fluid with a diluent to form a diluted sample of fluid and filling said second reservoir means with said diluted sample of fluid;
selectively operating said valve means to displace one of said



samples of fluid through said separation means and said detection unit and followed by the other sample of fluid to be displaced through said separation means and said detection unit in timed relationship such that the concentration of the most concentrated component of said fluid sample and said least concentrated component of said fluid sample may be detected within a predetermined time period to provide an analysis of the components of said fluid sample by said detection unit.

4,872,993

WASTE TREATMENT

George C. Harrison, 32 Mid Oaks La., Roseville, Minn. 55113
Filed Feb. 24, 1988, Ser. No. 159,688
Int. Cl.⁴ C02F 1/28

U.S. Cl. 210—666

12 Claims

1. A process for treatment of waste water comprising the steps of:

- (a) mixing with said waste water a finely-divided clay to form a blend, wherein said waste water includes organic matter and heavy metals;
- (b) adding a flocculant to said blend in a manner such that said clay bonds to said flocculant to form a sludge;
- (c) separating said sludge from said water;
- (d) reducing water content of said sludge to less than about 60% by weight;
- (e) shaping said sludge to form particles of desired size and shape;
- (f) firing said sludge particles at a temperature of about 2,000 ° F. for a time sufficient to convert said sludge particles to expanded ceramic particles.

4,872,994

METHOD AND APPARATUS FOR REMOVING ORGANIC LIQUIDS FROM WATER

Paul G. Jakob, 7201 Venetian Way, West Palm Beach, Fla. 33411

Filed Mar. 28, 1988, Ser. No. 174,459

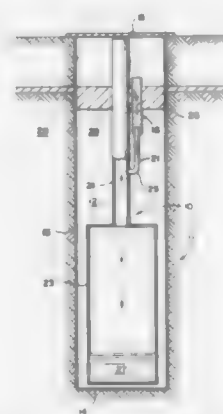
Int. Cl.⁴ B01D 17/022

U.S. Cl. 210—691

6 Claims

1. A process for separating gasoline from water in a water well wherein an interface separates the gasoline from the water, comprising the steps of:

disposing a containment vessel in a water well below an interface of gasoline and water;
placing a floating wick vertically through the interface, said wick being hydrophobic, and absorbing said gasoline with said wick;
connecting said wick in open communication with the water well above the containment vessel;



permitting the absorbed gasoline to flow by gravity from said wick to said containment vessel for collection therein;
removing the collected gasoline from said containment vessel; and
venting said containment vessel to the atmosphere to displace gases in said containment vessel to the atmosphere.

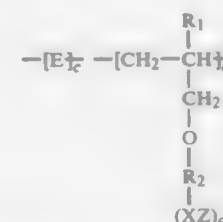
4,872,995

METHOD FOR CALCIUM OXALATE SCALE CONTROL
Fu Chen, Newtown, Pa., and Daniel L. Michalopoulos, Jacksonville, Fla., assignors to Betz Laboratories, Inc., Trevose, Pa.
Continuation-in-part of Ser. No. 37,484, Apr. 13, 1987, Pat. No. 4,759,851, which is a continuation of Ser. No. 864,049, May 16, 1986, Pat. No. 4,659,481, which is a continuation of Ser. No. 545,563, Oct. 26, 1983, abandoned. This application Jun. 6, 1988, Ser. No. 203,035
Int. Cl.⁴ C02F 5/14

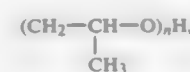
U.S. Cl. 210—699

12 Claims

1. A method of inhibiting the formation of calcium oxalate scale formation in an aqueous medium having a pH of at least about 7, comprising adding to said aqueous medium an effective amount to inhibit said formation of a water soluble or water dispersible polymer having repeat units represented by the formula

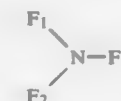


wherein E is the repeat unit remaining after polymerization of an α,β , ethylenically unsaturated compound, R₁ is H or lower (C₁-C₄) alkyl, R₂ is (CH₂-C(=O)-O)_nH,



monohydroxylated C₁-C₈ alkyl, monohydroxylated C₁-C₈ alkylene, di- or polyhydroxy C₁-C₈ alkyl, dihydroxy or polyhy-

droxy C₁-C₈ alkylene, C₁-C₈ alkyl, or C₁-C₈ alkylene, n is an integer of from 1 to about 20, a is 0 or 1, X, is an anionic radical selected from the group consisting of SO₃, PO₃, PO₄, and COO, Z, is H or hydrogens or a water soluble cation or cations, Z being chosen to counterbalance the valence of X, XZ combined also comprises an amine functionality of the formula



wherein F₁, F₂, and F₃ are independently selected from H and C₁-C₅ alkyl, C₁C₃ hydroxy-substituted or carboxy-substituted alkyl, the molar ratios of repeat units c:d being from about 30:1 to about 1:20.

4,872,996

USE OF AMINOPHOSPHONIC ACIDS TO INHIBIT SCALE FORMATION AND CORROSION CAUSED BY MANGANESE IN WATER SYSTEMS

Jeffrey G. Grierson, Angleton; David A. Wilson, Richwood, and Druce K. Crump, Lake Jackson, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

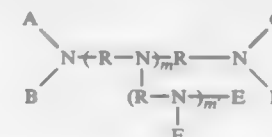
Continuation-in-part of Ser. No. 25,420, Mar. 13, 1987, abandoned. This application Jan. 27, 1988, Ser. No. 148,809

The portion of the term of this patent subsequent to Feb. 3, 2004, has been disclaimed.
Int. Cl.⁴ C02F 5/14

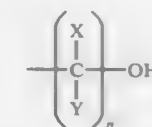
U.S. Cl. 210—700

12 Claims

1. A process of inhibiting undesirable manganese deposition in water conducting systems which contain manganese at concentrations and under conditions such that the manganese will tend to precipitate as an insoluble compound and cause corrosion, the improvement which comprises adding to said water an organic aminophosphonic acid, wherein the nitrogen and phosphorus are interconnected by an alkylene or substituted alkylene radical, and having the formula



wherein substituents A, B, C, D, E and F are independently selected from hydrogen, —CH₂PO₃H₂,



and salts of the phosphonic acid radical, wherein X and Y are independently hydrogen, methyl or ethyl radicals, n is 2 or 3 and m and m' each is 0-10, with the proviso that more than 50 percent of the amine hydrogens have been substituted by the phosphorus-containing group as previously defined herein, and wherein R is a hydrocarbon residue which can be a linear, branched, cyclic, heterocyclic or a substituted heterocyclic structure; with the further proviso that when m or m' ≥ 1 the E and F substituents may be the same as or different from any other substituent of any other nitrogen atom and each R can be the same as or different from any other R.

4,872,997

COOLANT RECYCLING SYSTEM AND METHOD

Roger T. Becker, Kalamazoo, Mich., assignor to Monlan, Incorporated, Kalamazoo, Mich.

Filed Aug. 12, 1988, Ser. No. 231,824

Int. Cl.⁴ B01D 17/035

U.S. Cl. 210—703

18 Claims

1. An apparatus for recycling and cleaning a coolant utilized in conjunction with a machine tool to effect removal of tramp oil from the coolant, said apparatus comprising:

a frame;
a tank means stationarily supported on said frame and defining there a recycling chamber adapted for holding a batch of dirty coolant, said chamber having substantially vertical height and substantially uniform horizontal cross section throughout this height,

means communicating with the lower portion of said chamber to effect removal of coolant therefrom;

first nozzle means stationarily mounted adjacent the bottom of said chamber for discharging directly into the dirty coolant a first airstream which creates a first upwardly directed stream of air bubbles;

second nozzle means stationarily disposed adjacent the bottom of said tank in sidewardly disposed relationship from said first nozzle means for discharging therefrom directly into said dirty coolant a second airstream which creates a second upwardly directed stream of air bubbles of a larger size than said air bubbles of said first stream;

wherein said first and second nozzle means are constructed and arranged such that the first and second bubble streams agitate the dirty coolant and cause upward movement of oil particles so that said tramp oil tends to collect on the surface of the dirty coolant within a collection area disposed over said first stream of air bubbles;

said collection area being of a smaller cross sectional area than said chamber horizontal cross section.

4,872,998

APPARATUS AND PROCESS FOR FORMING UNIFORM, PELLETIZABLE SLUDGE PRODUCT

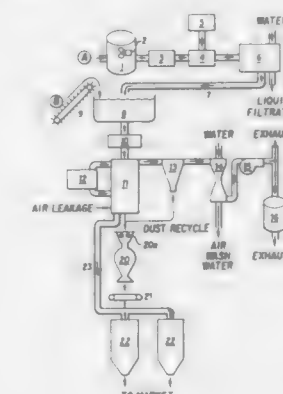
Jerome Dausman, Arlington, Va., and Raymond J. Avedt, Annapolis, Md., assignors to Bio Gro Systems, Inc., Annapolis, Md.

Filed Jun. 10, 1988, Ser. No. 205,345

Int. Cl.⁴ C02F 11/14

U.S. Cl. 210—710

18 Claims



1. An automated, non-polluting process for mechanically dewatering and heat drying liquid sewage sludge of widely varying solids content within an apparatus having a predetermined capacity to form a pelletizable, dried sludge of predetermined uniform solids content without requiring recycling of previously heat processed sludge, comprising the steps of
a. limiting and modulating the flow of liquid sewage sludge

into the apparatus in a manner to prevent the capacity of the apparatus from being exceeded;

- b. mixing with the liquid sewage sludge entering the apparatus a chemical substance which is capable of promoting flocculation and coagulation;
- c. dewatering the chemically treated sludge by mechanically pressing the sludge to separate a substantial portion of liquid to form a cake sludge of at least approximately 10 percent solids; and
- d. heat drying the cake sludge within an enclosed drying means without addition of recycled, previously heat processed sludge to form a pelletizable sludge having a predetermined uniform moisture content, said heat drying step including steps of
 - (i) bring the cake sludge into sliding contact with a heated surface,
 - (ii) agitating the cake sludge while in sliding contact the heated surface,
 - (iii) capturing in the enclosure and drawing away from said drying means substantially all gases and gas entrained particles expended from said sludge by said heat drying step for further processing,
 - (iv) continuing steps (i) and (ii) until the moisture content of the heat processed sludge is reduced to the desired predetermined level, and
 - (v) delivering said heat processed sludge to an accumulation means for storing said processed sludge.

4,872,999

MIXTURE OF HALIDES SUCH AS NaOCl AND A BROMIDE SALT FOR REMOVAL OF MUSSELS AND BARNACLES FROM SALT OR BRACKISH WATER

Ronald H. Schild; Sandra Koeplin-Gall, both of Naperville, Ill., and Gregory C. Broxterman, Midlothian, Va., assignors to Nalco Chemical Company, Naperville, Ill.

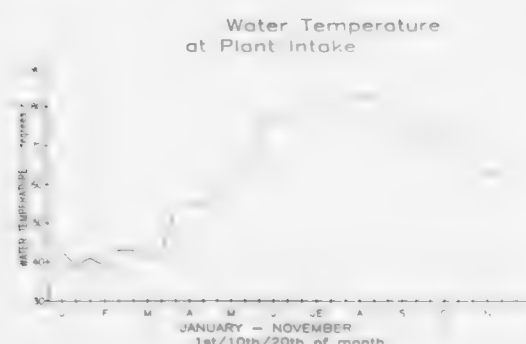
Filed Jul. 17, 1987, Ser. No. 74,966

The portion of the term of this patent subsequent to Feb. 17, 2004, has been disclaimed.

Int. Cl.⁴ C02F 1/50

U.S. Cl. 210-754

6 Claims



1. A method for controlling barnacles and a slime layer of a slime-forming organism selected from the group consisting of capsulated bacteria, diatoms and protozoa in salt water and brackish water, and bryozoans from sea water fouling, and selected from one member of the group consisting of barnacles, mussels, cyprides, Polydora, Hydroids, Molgula, and Taxa in tidal brackish water which comprises treating said water with a composition comprising the combination of chlorine solution and a bromide salt capable of releasing bromide ions to the chlorine solution, and from about 1 up to about 10 percent by weight of a water-soluble biodegradable chosen from the group consisting of ethylene oxide condensates with propylene oxide adducts or propylene glycol having an HLB between 4-10 and a molecular weight between 1,000-5,000, nonionic polyethoxylated straight chain alcohols, tris cyanoethylated cocodiamines, polyoxethylene sorbitan ester/acids, nonionic

N,N, dimethyl stearamides, nonionic amine polyglycol condensates, and nonionic ethoxylated alcohols, and mixtures thereof.

4,873,000

CARPET FRESHENING AND DEODORIZING COMPOSITION

Jeanne M. Weller, Glen Rock, N.J., assignor to Sterling Drug Inc., New York, N.Y.

Filed Jan. 3, 1988, Ser. No. 202,776

Int. Cl.⁴ D06M 11/04; C11D 3/12

U.S. Cl. 252-8.6

9 Claims

1. A powdered carpet deodorizer and freshener composition consisting essentially of:

- (a) from about 57 to about 73 weight-percent of an inorganic salt selected from the group consisting of alkali metal and alkaline earth metal sulfates, bicarbonates and chlorides;
- (b) from about 25 to about 40 weight-percent of an aluminum silicate clay derived from pyrophyllite and having a particle size distribution of from about 10 to about 60, microns;
- (c) from about 1 to about 2 weight-percent of a liquid agglomerating agent; and
- (d) from about 1 to about 2 weight-percent of a fragrance.

4,873,001

FABRIC SOFTENING AND ANTISTATIC LIQUID DETERGENT COMPOSITIONS

Pallassana N. Ramachandran, Robbinsville; Paul S. Grand, Highland Park, and Robert A. Bauman, New Brunswick, all of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 53,979, May 22, 1987. This application Jun. 17, 1988, Ser. No. 207,843

Int. Cl.⁴ C11D 3/32

U.S. Cl. 252-8.8

12 Claims

1. A fabric softening and antistatic liquid laundry detergent composition which comprises a detergent proportion a synthetic anionic organic detergent, a fabric softening proportion of bentonite and an antistatic proportion of N-higher aliphatic isosteamamide antistat, in an aqueous medium.

4,873,002

LIQUID DETERGENT FABRIC CONDITIONING COMPOSITIONS

Nader Ibrahim, Flanders, N.J., assignor to Beecham Inc., Clifton, N.J.

Filed Nov. 23, 1982, Ser. No. 443,896

Int. Cl.⁴ D06M 11/00

U.S. Cl. 252-8.8

14 Claims

1. A detergent fabric conditioning composition capable of imparting detergency, softness and anti-static properties to fabrics treated therewith during the wash cycle of a laundering process which consists of 8% methyl-1-oleyl-amidoethyl-2-oleyl-imidazolium methyl sulfate (75% active), 40% ethoxylated/propoxylated adduct of a C₁₂-C₁₅ fatty alcohol, 5% coconut oil diethanolamide, 3% benzalkonium chloride, 10% ethyl alcohol and water qs.

4,873,003

CATIONIC SOIL RELEASE POLYMERS

Anthony J. O'Lenick, Jr., Lilburn, and Joseph J. Fanelli, Alpharetta, both of Ga., assignors to GAF Corporation, Wayne, N.J.

Division of Ser. No. 144,482, Jan. 13, 1988, Pat. No. 4,804,483, which is a continuation of Ser. No. 54,028, May 26, 1987, Pat. No. 4,738,787. This application Oct. 26, 1988, Ser. No. 262,650

Int. Cl.⁴ C11D 1/62

U.S. Cl. 252-8.75

4 Claims

1. A composition prepared by the reaction of an aromatic hydroxy containing polyester soil release agent with monochloroacetic acid to produce an intermediate which is reacted

with an amine to make a quaternary compound useful in both a soil release and softening.

4,873,004

LUBRICATING COMPOSITION

Christiaan D. M. Beverwijk; Feike De Jong, both of Amsterdam, Netherlands, and Peter Sant, Wirral, United Kingdom, assignors to Shell Oil Company, Houston, Tex.

Filed Nov. 16, 1987, Ser. No. 121,193

Claims priority, application United Kingdom, Nov. 28, 1986, 8628523

Int. Cl.⁴ C10M 133/44, 137/04

U.S. Cl. 252-32.5

11 Claims

1. A lubricating composition comprising a major portion of a lubricating oil and a minor portion of an alkyl or alkenyl-substituted succinimide, wherein said succinimide is formed from the reaction product of:

- (1) a polyamine possessing 3 to 25 carbon atoms, said polyamines being selected from linear alkylene polyamines, branched alkylene polyamines, cycloaliphatic polyamines and heterocyclic polyamines, and
- (2) an alkyl or alkenyl-substituted succinic anhydride, wherein the alkyl or alkenyl moiety of said anhydride has a number average molecular weight from 600 to 1300 and where the average number of succinic groups per alkyl or alkenyl groups is between 1.4 and 4.0.

4,873,005

EXTRUSION LUBRICANT COMPRISING A HYDROCARBON WAX, FATTY ACID SALT AND AN ORGANIC MERCAPTAN

Jeffrey R. Hyde, West Chester, Ohio, assignor to Morton Thiokol, Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 101,658, Feb. 4, 1987, abandoned. This application May 14, 1987, Ser. No. 50,602

Int. Cl.⁴ C10M 135/20

U.S. Cl. 252-35

36 Claims

1. An extrusion lubricant composition comprising a mixture of:

- (a) hydrocarbon wax; and
- (b) Group II metal or lead salt of a fatty acid in relative amounts sufficient to produce a composition having a viscosity in excess of about 10,000 cps at 125° C.; and
- (c) an organic mercaptan capable of reducing the viscosity of said mixture in an amount at least sufficient to reduce the viscosity of said mixture composition below about 10,000 cps at 125° C.

4,873,006

COMPOSITIONS CONTAINING ACTIVE SULFUR

James N. Vinci, Mayfield Heights, and Curtis R. Scharf, Wickliffe, both of Ohio, assignors to The Lubrizol Corporation, Wickliffe, Ohio

Filed Sep. 1, 1988, Ser. No. 239,586

Int. Cl.⁴ C10M 135/02, 133/58

U.S. Cl. 252-38

4 Claims

1. A method for reducing the presence of free hydrogen sulfide from an active sulfur containing compound including the steps of contacting (C) the active sulfur containing compound with (B) a nitrogen-containing carboxylic compound made by the reaction of at least one polycarboxylic acid acylating agent having at least one hydrocarbon-based substituent of about 12 to 500 carbon atoms with at least one of: (i) a N-(hydroxyl-substituted hydrocarbyl) amine; (ii) a hydroxyl-substituted poly(hydrocarbyloxy) analog of said amine; or (iii) mixtures of (i) and (ii), and heating the mixture of (B) and (C) to reduce the amount of free hydrogen sulfide.

4,873,007

METHOD FOR PRODUCING SULFURIZED ALKYLPHENOLS

Yuehsung Chang, Naperville, Ill., assignor to Amoco Corporation, Chicago, Ill.

Filed Sep. 26, 1988, Ser. No. 249,607

Int. Cl.⁴ C10M 135/02, 129/00

U.S. Cl. 252-40.7

4 Claims

1. A process for preparing sulfurized alkyl-substituted phenol which comprises: reacting in a suitable vessel (a) alkyl-substituted phenol wherein the alkyl substituent comprises about 8 to about 50 carbons, (b) sulfur, (c) dihydric alcohol, (d) alkaline earth metal base, and (e) water the amounts of said reactants being as follows: about 1 to about 5 moles sulfur per mole of alkylphenol; about 0.01 to about 0.1 moles dihydric alcohol per mole of alkylphenol; about 0.01 to about 0.1 moles alkaline earth metal base per mole of alkylphenol; and about 0.02 to about 0.4 moles water per mole of alkylphenol, said reaction being conducted such that the water utilized in the reaction is retained in the reaction vessel, and wherein the amount of alkaline earth metal used in the reaction results in a level of alkaline earth metal in the sulfurized alkylphenol product not exceeding about 1.0 wt. % of the product.

4,873,008

JOJOBA OIL AND JOJOBA OIL DERIVATIVE LUBRICANT COMPOSITIONS

Phillip S. Landis, Alexandria, Va., and Frank Erickson, Seattle, Wash., assignors to International Lubricants, Inc., Seattle, Wash.

Continuation of Ser. No. 88,186, Aug. 21, 1987, abandoned. This application Nov. 16, 1988, Ser. No. 273,709

Int. Cl.⁴ C10M 141/10

U.S. Cl. 252-46.6

12 Claims

1. A lubricant base concentrate comprising a base oil and a mixture of about 0.1% to about 20% (w/w) jojoba oil, about 0.1% to about 5% (w/w) of a sulfurized jojoba oil, and about 0.1% to about 5% (w/w) of a phosphite adduct of jojoba oil.

4,873,009

BORATED LUBE OIL ADDITIVE

Ronald L. Anderson, Naperville, Ill., assignor to Amoco Corporation, Chicago, Ill.

Continuation of Ser. No. 90,653, Aug. 28, 1987, abandoned, which is a continuation of Ser. No. 549,237, Nov. 4, 1983, abandoned, which is a continuation-in-part of Ser. No. 362,955, Mar. 29, 1982, abandoned. This application Jun. 28, 1988, Ser. No. 212,512

Int. Cl.⁴ C10M 133/44, 139/00

U.S. Cl. 252-49.6

7 Claims

1. A lube oil dispersant obtained by reacting a C₈-C₅₀₀ polybutene succinic acid or anhydride compound and a hydroxypropylated alkylene diamine, the diamine being the reaction product of propylene oxide and an alkylene diamine having the formula NH₂-(CH₂)_x-NH₂ where X is from 2 to 24, and having an average of at least about 2 N-substituted hydroxypropyl groups, said dispersant also containing boron at a level which improves the compatibility of the dispersant toward fluorocarbon engine seals.

asymmetric carbon atom, m is 1 or 2, n is 0 or 1, and A is a releasable substituent selected from the group consisting of hydroxy, halogen, phenoxy, toluenesulfonyl, acetyloxy, and trifluoroacetyloxy.

4,873,019

CYCLOPENTANE DERIVATIVES

Jochim Krause, Dieburg; Andreas Wüchler, Griesheim, both of Fed. Rep. of Germany; Bernard Scheuble, Yokohama, Japan, and Georg Weber, Erzhansen, Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit Beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Dec. 18, 1987, Ser. No. 135,103

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1986, 3643795

Int. Cl.⁴ G02F 1/13; C09K 19/30; C07C 69/74, 69/773, 43/21 U.S. Cl. 252-299.61 15 Claims

1. A liquid-crystalline phase having at least two liquid-crystalline components, wherein at least one liquid-crystalline compound is of the formula



wherein

R¹ and R², in each case independently of one another, are alkyl of 1-15 carbon atoms, or alkyl of 1-15 carbon atoms in which one or more non-adjacent CH₂ groups are replaced by —O—, —CO—, —O—CO—, —O—CO—O—, —CHhalogen—, —CHCN— and/or —CH=CH—, and one of R¹ and R² can also be F, Cl, CN, or —NCS,

Z¹ and Z² in each case independently of one another, are —CO—O—, —O—CO—, —CH₂CH₂—, —CH₂—O—, —OCH₂—, —N=N—, —NO=N—, —CH=N— or a single bond, and one of Z¹ and Z² can also be —CO—,

A¹, A² and A³ in each case independently of one another, are 1,4-phenylene, 1,4-phenylene in which one or more CH groups are replaced by N, 1,4-cyclohexylene, 1,4-cyclohexylene in which one or two non-adjacent CH₂ groups are replaced by O and/or S, 1,3-cyclopentylene, 1,3-cyclopentylene in which one or two non-adjacent CH₂ groups are replaced by O and/or S, 1,4-bicyclo-(2,2,2)-octylene, piperidine-1,4-diyl, naphthalene-2,6-diyl, decahydronaphthalene-2,6-diyl or 1,2,3,4-tetrahydronaphthalene-2,6-diyl, each of which can also be substituted by halogen, nitrile and/or alkyl, and n is 0, 1 or 2,

with the proviso that at least one of the rings A¹, A² and A³ is 1,3-cyclopentylene or 1,3-cyclopentylene in which one or two non-adjacent CH₂ groups are replaced by O and/or S.

4,873,020

FLUORO-CHEMICAL SURFACTANTS AND PROCESS FOR PREPARING SAME

Imelda A. Muggli, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

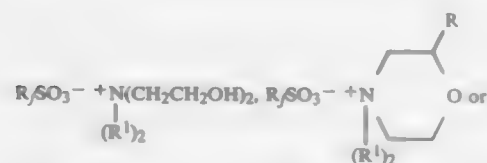
Filed Oct. 4, 1988, Ser. No. 253,136

Int. Cl.⁴ B01F 17/16; C11D 3/26

U.S. Cl. 252-355

8 Claims

1. Fluorochemical surfactant compositions comprising at least one fluorochemical amine salt which can be represented by the formula:



wherein R_f is a perfluoroaliphatic radical containing 3 to 20 carbon atoms, R is H or CH₃, and each R¹ is independently an alkyl radical containing 1 to 4 carbon atoms.

4,873,021

AZEOTROPE OR AZEOTROPE-LIKE COMPOSITION OF TRICHLOROTRIFLUOROETHANE AND DICHLORODIFLUOROETHANE

Robert A. Gorski, Newark; Bernhardt J. Elscman, Jr., late of Wilmington, both of Del. (by Carol E. Aronoff, executrix), and Donovan E. Kvalnes, late of Castine, Mass. (by Atherton Fuller, personal representative), assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 30, 1986, Ser. No. 947,834

Int. Cl.⁴ C11D 7/50; B01F 1/00; C23G 5/028

U.S. Cl. 252-364

2 Claims

1. An azeotrope comprising an admixture of about 50.5 wt. percent 1,1,2-trichloro-1,2,2-trifluoroethane and about 49.5 wt. percent 1,2-dichloro-1,1-difluoroethane.

4,873,022

ELECTRICALLY CONDUCTIVE PASTE, ELECTRONIC CIRCUIT COMPONENT AND METHOD FOR PRODUCING SAME

Tohio Ogawa, Katsuta; Mituru Fujii, Hadano; Tadamiichi Asai, Ibaraki; Akira Ikegami, Hitachi; Hiroshi Ohtsu, Mito, and Kazuhiko Ato, both of Mito, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 30, 1987, Ser. No. 139,792

Claims priority, application Japan, Jan. 9, 1987, 62-1644; Sep. 4, 1987, 62-220174

Int. Cl.⁴ B32B 3/00

U.S. Cl. 428-209

30 Claims



1. An electrically conductive paste which comprises 100 parts by weight of a copper powder of 1 μm or less in average particle size, 0.01-4 parts by weight of at least one of S, Te and Se and a frit glass as a binder.

5. An electronic circuit component comprising an insulating base and a copper film circuit formed thereon by firing, wherein average surface roughness of said insulating base is 1 μm or less and is 1/5 or less of the thickness of film circuit formed thereon and said copper film circuit consists essentially of 100 parts by weight of copper, 0.005-2 parts by weight of at least one of S, Te and Se and 1-10 parts by weight of a glass.

4,873,023

PREPARATION OF MONOOLEFINICALLY UNSATURATED CARBOXYL-CONTAINING VERSATIC ESTERS

Guenther Schulz, Bad Duerkheim; Wolfgang Druschke, Dirmstein, and Helmut Jaeger, Bobenheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Nov. 21, 1988, Ser. No. 273,973

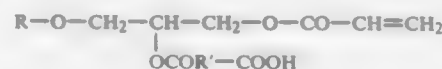
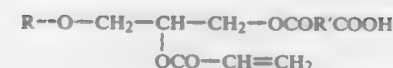
Claims priority, application Fed. Rep. of Germany, Nov. 21, 1987, 3739542

Int. Cl.⁴ C11C 1/00

U.S. Cl. 260-404.8

3 Claims

1. A process for preparing a compound of the general formula

-continued
or

where R is versatyl and R' is unsubstituted or alkyl-substituted straight-chain alkylene of 4 or 5 carbon atoms, which comprises reacting the versatic ester of 1,3-dihydroxy-propyl-2 acrylate or of 2,3-dihydroxy-propyl-1 acrylate with an equimolar amount of a saturated or monoolefinically unsaturated cyclic dicarboxylic anhydride having 4 or 5 carbon atoms and an oxygen atom in the ring at from 50° to 150° C. in the presence of an esterification catalyst.

4,873,024

METHOD OF SYNTHESIZING LEUKOTRIENE B₄ AND DERIVATIVES THEREOF

Yoshihiro Abe, Tokyo, Japan, and Kyriacos C. Nicolau, Havertown, Pa., assignors to University of Pennsylvania, Philadelphia, Pa.

Filed Mar. 8, 1988, Ser. No. 165,521

Int. Cl.⁴ C07C 51/09

U.S. Cl. 260-405.5

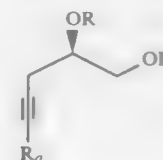
11 Claims

1. A process for preparing a compound of the formula



where R₀ is selected from the group consisting of hydrocarbon groups, and C₁-C₆ linear alkyl groups substituted at their termini with a C₁-C₂ haloalkyl group; comprising

(a) hydrogenating a compound of the formula

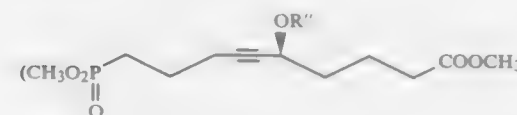


where R and R' are different from one another and are protecting groups, to reduce the acetylene bond;

(b) removing the protecting group R' at position 1 from the product of step (a);

(c) oxidizing the product of step (b) to convert the alcohol group at position 1 to an aldehyde;

(d) coupling the product of step (c) with a compound of the formula



where R'' is a protecting group;

(e) hydrogenating the product of step (d) to reduce the acetylene bond; and

(f) removing the protecting groups R and R'' and the methyl group from the ester from the product of step (e) to yield the desired compound.

4,873,025

ALKYLXYLENE SULFONATE COMPOSITIONS

Theodoros A. B. M. Bolsman, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Dec. 12, 1983, Ser. No. 560,468

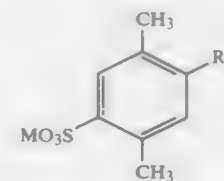
Claims priority, application United Kingdom, Dec. 13, 1982, 52354/82

Int. Cl.⁴ C07C 143/24

U.S. Cl. 562-91

2 Claims

1. A surface active composition consisting essentially of alkylxylene sulfonate compounds of the formula



wherein M represents a hydrogen, a metal, an ammonium or an amine ion and R' represents a C₈ to C₁₀ alkyl group in about 35 percent by weight of the compounds, R' represents a C₁₁ or C₁₂ alkyl group in about 40 percent by weight of the compounds, and R' represents a C₁₃ or C₁₄ alkyl group in about 25 percent by weight of the compounds.

4,873,026

PROCESS FOR THE PREPARATION OF 1-AMINONAPHTHALENE-2,4,7-TRISULPHONIC ACID AND 1-AMINONAPHTHALENE-7-SULPHONIC ACID

Horst Behre; Heinz U. Blank, both of Odenthal; Gerhard Marzolph, and Willi Streicher, both of Koeln, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 900,215, Aug. 26, 1986, abandoned.

This application Oct. 4, 1988, Ser. No. 253,280

Claims priority, application Fed. Rep. of Germany, Sep. 7, 1985, 3531923

Int. Cl.⁴ C07C 143/60

U.S. Cl. 562-72

7 Claims

1. A process for the preparation of 1-aminonaphthalene-2,4,7-trisulphonic acid which comprises the steps

(a) reacting 1-nitronaphthalene by the Piria method with bisulphites,

(b) sulphonating the sulphamate mixture obtained in this Piria reaction with sulphur trioxide in sulphuric acid and

(c) isolating the 1-amino-naphthalene-2,4,7-trisulphonic acid from the sulphonation mixture.

4,873,027

FLUOROALKYLARYLIODONIUM COMPOUNDS

Teruo Umamoto, and Yoshihiko Gotoh, both of Kanagawa, Japan, assignors to Sagami Chemical Research Center, Tokyo, Japan

Division of Ser. No. 148,181, Jan. 27, 1988, abandoned, which is a continuation of Ser. No. 913,591, Oct. 1, 1986, abandoned,

which is a continuation of Ser. No. 753,835, Jul. 11, 1985, abandoned. This application Sep. 19, 1988, Ser. No. 245,940

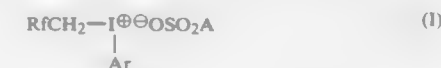
Claims priority, application Japan, Jul. 11, 1984, 59-142449

Int. Cl.⁴ C07C 143/02, 19/08

U.S. Cl. 562-83

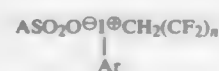
2 Claims

1. A fluoroalkyliodonium compounds represented by the formula (I):



wherein Ar represents a substituted or unsubstituted phenyl group wherein the substituent is an alkyl group having 1 to 5

carbon atoms or a halogen atom, A represents a trifluoromethyl group or a fluorine atom, and Rf represents a polyfluoroalkyl group having 1 to 20 carbon atoms or a group of the formula



wherein A and Ar are as defined above, and n is an integer of 1 to 20.

4,873,028

LOW SILHOUETTE COOLING TOWER WITH TRAPEZOIDAL FILL AND METHOD OF AIR FLOW THERETHROUGH

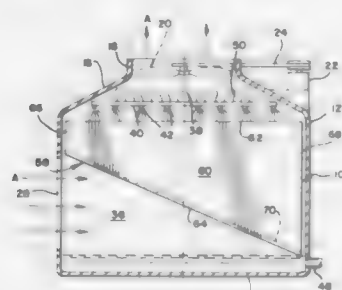
Bryan F. Garrick, Ellicott City, Md., assignor to Baltimore Aircoil Company, Inc., Jessup, Md.

Filed Feb. 22, 1988, Ser. No. 158,603

Int. Cl.⁴ B01F 3/04; F28C 1/02

U.S. Cl. 261-109

10 Claims



1. An improved counterflow cooling water tower comprising:

an enclosure having vertical walls including one wall with an air inlet in a lower portion thereof and a second wall opposite said one wall;

a plurality of heat transfer media extending across said enclosure from about said one wall to about said second wall so as to form a plurality of parallel air passageways, said passageways being aligned with said air inlet and perpendicular to said one wall, each of said media having an upper extremity extending in a horizontal substantially straight line above said air inlet from about said one wall to said second wall, each of said media also having a lower extremity sloping downwardly in one direction from said one wall above said air inlet along a substantially continuous line to about said second wall whereby to define a plenum space inward of said air inlet, said plenum space having an interface with the lower extremity of said media which slopes continuously downwardly in one direction from said one wall to said second wall.

2. An improved method for moving air through a counterflow cooling tower, said method comprising:

forming an enclosure having vertical walls including one wall with an air inlet in a lower portion thereof and a second wall opposite said one wall;

placing heat transfer media within said enclosure to define a plenum space between said air inlet and said second wall, said media extending across said enclosure between said one wall and said second wall so as to form a plurality of parallel air passageways aligned with said air inlet and perpendicular to said one wall;

maintaining each of said media in a vertical altitude with an upper extremity extending in a horizontal substantially straight line between said one wall and said other wall and a lower extremity extending from said one wall above said air inlet along a substantially continuous downwardly sloped line to said second wall whereby said plenum space

interface with said media slopes continuously downwardly in one direction from a top of said air inlet; and moving air horizontally into said plenum space through said air inlet toward said second wall and causing portions of the horizontally moving air to move upwardly through said passageways from points where said horizontally moving air reaches said interface whereby the vertical path and resistance to flow of air in said air passageways is increased as the horizontal distance from said one side is increased and thereby causing a relatively greater rate of vertical air flow near said one side.

4,873,029

METHOD FOR MANUFACTURING LENSES

Ronald D. Blum, 2040 Herabberger Dr., Roanoke, Va. 24017

Filed Oct. 30, 1987, Ser. No. 114,962

Int. Cl.⁴ B29D 11/00

U.S. Cl. 264-1.3

22 Claims



1. A method for tinting plastic lens comprising:

(a) arrange a first mold form for receiving molding material;

(b) delivering plastic molding material to said first mold form;

(c) inserting a tinted wafer of solidified plastic material capable of intermolecular bonding with said plastic molding material into said first mold form in contiguous relationship with said plastic molding material;

(d) fixing a second mold form in sealed relationship with said first mold form to form a mold having a cavity between said wafer and said second mold form;

(e) inserting additional plastic molding material into said mold cavity;

(f) said mold forms configured to form a lens of preselected shape;

(g) subjecting said mold to oven curing process to solidify the plastic molding material and to cause intermolecular bonding between the molding material and the wafer; and

(h) removing said molded material from said mold with said wafer in the form of a lens.

4,873,030

METHOD OF MOLDING A RESINOUS OPTICAL TRANSMITTING ELEMENT

Noriaki Taketani, Katsuta; Hideki Asano; Akira Endo, both of Mito; Tomiya Abe, Hitachi; Masahiko Ibemoto, Katsuta; Junji Mukai, Hitachi; Seikichi Tanno, Hitachi; Shuji Eguchi, Hitachi, and Masato Shimura, Hitachi, all of Japan, assignors to Hitachi, Ltd. and Hitachi Cable, Ltd., both of Tokyo, Japan

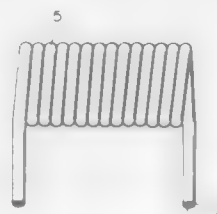
Filed Jul. 1, 1988, Ser. No. 214,463

Claims priority, application Japan, Jul. 6, 1987, 62-166797

Int. Cl.⁴ B29D 11/00; G02B 6/16

U.S. Cl. 264-1.5

11 Claims



1. A method of manufacturing a resinous optical transmitting element comprising a core through which light is transmitted,

and a cladding which is lower in refractive index than said core, said method comprising the steps of polymerizing polymeric material forming said core, within a mold having a predetermined non-linear cavity, subsequently removing said mold, and forming said cladding about said core.

4,873,031

METHOD OF CONTROLLING THE CRYSTAL GRAIN SIZE OF URANIUM DIOXIDE PELLET

Tadao Yato, Mito; Sadaaki Hagino, Urawa, and Hiroshi Tanaka, Omiya, all of Japan, assignors to Mitsubishi Kinzoku Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 30, 1987, Ser. No. 139,447

Int. Cl.⁴ G21C 21/00; C09K 11/04; G21G 4/00; C04B 35/05

U.S. Cl. 264-0.5

4 Claims

1. A method of controlling the crystal grain size of UO₂ pellets, comprising

(1) providing an aqueous uranyl solution which is free of hydrofluoric acid and nitric acid and which contains uranyl fluoride (UO₂F₂) and/or uranyl nitrate (UO₂(NO₃)₂) as a uranium component,

(2) reacting with ammonia said aqueous uranyl solution to precipitate ammonium diuranate (ADU), while adjusting the ratio of said uranium components to a predetermined value within the range varying from the ratio 100% of uranyl fluoride and 0% of uranyl nitrate to the ratio 0% of uranyl fluoride and 100% of uranyl nitrate, adjusting the concentration of uranium of the reaction mixture to 50 to 1,000 gU/liter and also adjusting the rate of contact between said uranium component in said aqueous uranyl solution with ammonia to at least 2 moles NH₃/min/mole U,

(3) calcining and reducing said ADU precipitate to form UO₂ powder, and

(4) molding and sintering said UO₂ powder, thus producing UO₂ pellet having a predetermined crystal grain size in the range varying from 5 to 100 micrometers.

4,873,032

POUR HOLE CLOSER, STRAIGHT IN TYPE, FOR USE WITH INJECTION FOAM MOLDING SYSTEM

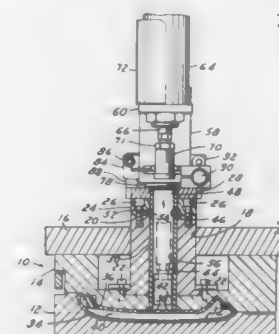
Webster Kohlbase, Portsmouth, N.H., assignor to Davidson Textron Inc., Dover, N.H.

Filed Apr. 18, 1988, Ser. No. 182,839

Int. Cl.⁴ B29C 67/22; B29B 17/00

U.S. Cl. 264-39

10 Claims



1. In conjunction with filling a cavity in a mold by injecting a foam material through a pour opening therein leading to said cavity, a method plugging the pour opening during the reaction period of said foam material curing in said cavity, said method comprising the steps of:

(a) moving a vertically oriented power cylinder including a cylinder rod having a plug of flexible plastic material formed on the lower end thereof laterally into position above and in axial alignment with the pour opening;

(b) activating said cylinder so as to project said plug vertically downwardly into said pour opening to effect flexure of said plug so that said plug has sliding and sealing interference fit with said pour opening during the foam reaction period; and

(c) retracting the cylinder rod and plug from said pour opening subsequent to said reaction period to clear said pour opening.

4,873,033

PROCESS FOR THE PRODUCTION OF HYPERFILTRATION MEMBRANES

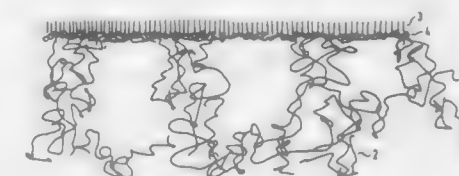
Klaus Heckmann, Regensburg; Georg Manecke, Berlin; Beate Pfannenmüller, Frieberg; Klaus Ring, Frankfurt, and Helmut Ringsdorf, Mainz, all of Fed. Rep. of Germany, assignors to Klaus Heckmann, Regensburg, Fed. Rep. of Germany Division of Ser. No. 598,083, Apr. 9, 1984, Pat. No. 4,758,342, which is a continuation of Ser. No. 351,286, Feb. 22, 1982, abandoned. This application Jun. 22, 1988, Ser. No. 209,839

Claims priority, application Fed. Rep. of Germany, Feb. 27, 1981, 3107527

Int. Cl.⁴ B29C 41/24

U.S. Cl. 264-41

10 Claims



1. A method for producing a filtration membrane comprising a separation layer comprising at least one crosslinked monomolecular film formed from a surfactant each molecule of which contains at least one hydrophobic chain and at least one hydrophilic group, said separation layer being supported by a porous, mechanically stable supporting layer, which comprises: spreading said surfactant dissolved in a volatile or water soluble solvent upon the surface of an aqueous medium, or at the interface of an aqueous medium and a liquid immiscible therewith, to form a film the molecules of which have a predetermined average distance between each other obtained either by compressing said film to a predetermined pressure or by spreading a predetermined quantity of said surfactant within a predetermined area; crosslinking molecules of said surfactant through polymerizable or condensable groups in at least one of their hydrophobic chains or at least one of their hydrophilic groups to form a crosslinked film; and applying said crosslinked film constituting said separation layer to a mechanically stable supporting layer to form said filtration membrane.

4,873,034

PROCESS FOR PRODUCING MICROPOROUS ULTRA-HIGH-MOLECULAR-WEIGHT POLYOLEFIN MEMBRANE

Koichi Kono, Asaka; Kenkichi Okamoto; Rumi Iwasaki, both of Yokohama, and Shuichi Sawada, Ooi, all of Japan, assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 22, 1988, Ser. No. 223,123

Int. Cl.⁴ B29C 47/78, 55/04, 55/12; C08J 9/28

U.S. Cl. 264-41

9 Claims

1. A process for producing a microporous ultra-high-molecular-weight polyolefin membrane, comprising the steps of:

(a) preparing a solution of an ultra-high-molecular-weight polyolefin having a weight-average molecular weight of 5×10^5 or more;

(b) extruding said solution from a die, said solution being

- rapidly cooled to its gelation temperature or below before extrusion, thereby forming a gel-like sheet;
- (c) removing at least 10 wt % of said solvent from said gel-like sheet so that said gel-like sheet contains 10 to 90 wt % of said ultra-high-molecular-weight polyolefin;
- (d) stretching said gel-like sheet at a temperature equal to or lower than that which is 10° C. above the melting point of said ultra-high-molecular-weight polyolefin; and
- (e) removing the residual solvent from the stretched product.

4,873,035

PREPARATION OF SIZED POPULATIONS OF LIPOSOMES

Martin Wong, Graylake, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Filed Nov. 25, 1987, Ser. No. 125,505
Int. Cl.⁴ A61K 9/50; B01J 13/02

U.S. Cl. 264—4.6

15 Claims

1. A method for the preparation of a substantially homogeneous population of aqueous liquid encapsulating multilamellar lipid vesicles having mean diameters within the range of from about 50 to about 3,000 nanometers, said method comprising the steps of:

- (1) adding to a vessel one or more lipids in an organic solvent, said organic solvent being in an amount which allows said lipids to be dried as a film on the walls of said vessel;
- (2) drying said lipids to a thin film onto the walls of said vessel;
- (3) adding to said vessel an aqueous liquid and a collection of contact masses having mean diameters within the range of from 50 to 3000 microns, said aqueous liquid being in an amount sufficient to result in a concentration of lipid which is less than about 1 mole per liter, and said contact masses being in an amount which is not: (a) so numerous that agitation of said masses in said vessel cannot be performed; and (b) so small that collisions between said contact masses and collisions between said contact masses and said walls do not occur; and
- (4) agitating said vessel to form said multilamellar vesicles.

4,873,036

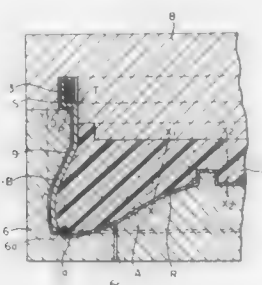
METHOD OF MAKING INTEGRALLY FOAM-MOLDED SEATS

Muneharu Urai, Tokyo, Japan, assignor to Tachi-S Co. Ltd., Tokyo, Japan

Filed Feb. 23, 1988, Ser. No. 159,323
Int. Cl.⁴ B29C 67/22

U.S. Cl. 264—46.6

15 Claims



1. A method of making an integrally foam-molded seat by disposing a surface cover along an inner wall surface of a molding cavity of a lower mold used for molding a polyurethane foam and having a seat surface pattern embossed on said inner wall surface, injecting a polyurethane resin solution into the molding cavity of said lower mold and foaming polyurethane resin to mold the polyurethane foam integrally combined with the surface cover, said method comprising the steps of:

defining, adjacent to an upper peripheral edge of the molding cavity of said lower mold, a mold portion having a shape conforming to the shape of the combination of an upper end of the surface cover and surface-cover end retaining member;

providing a surface cover having a surface cover end retaining member along its marginal edge;

carrying out mold-releasing treatment to an inner surface of a side part of the surface cover and/or that of the portion of a seat base part of the surface cover adjacent to said side part, so that the portion of said surface cover so treated will not adhere to the molded polyurethane foam;

attaching said surface cover to an outer surface of a surface cover mounting plate having the same shape as that of a side part of said surface cover;

placing said surface cover along the inner wall surface of the molding cavity of said lower mold with said surface cover end retaining member received in said mold portion having a shape conforming to the shape of the combination of the upper end of the surface cover and the surface cover end retaining member;

injecting the polyurethane resin solution into the molding cavity of said lower mold; and

foaming the polyurethane resin to mold the polyurethane foam integrally combined with those portions of said surface cover which did not receive said mold-releasing treatment.

4,873,037

METHOD FOR PREPARING AN ASYMMETRIC SEMI-PERMEABLE MEMBRANE

C. C. Chan; Jang-hi Im; Otto C. Raspor, and Lu H. Tung, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Oct. 5, 1988, Ser. No. 253,458
Int. Cl.⁴ B05D 3/00; B29C 43/30, 47/06; B32B 31/00

U.S. Cl. 264—49

34 Claims



1. A method for preparing an asymmetric membrane comprising a separation layer and a microporous support layer comprising providing a membrane support structure by:

forming a lamellar polymeric composition by dividing and reorienting a plurality of adjacent layers of polymeric materials, each layer comprising at least two different polymeric materials and having a thickness of from 0.03 to 5 microns to form discrete domains of said polymeric materials of random orientation, at least one of said different polymeric materials having a preferential solubility in a selected solvent with respect to at least one other of said different polymeric materials;

forming a melt composition of said lamellar polymeric composition into a thin solid support structure; and

converting said thin solid support structure to an asymmetric membrane by:

(A) providing a separation layer on one major surface of said support structure and treating said separation layer-coated support structure with an extraction medium which is substantially inert with respect to said separation layer to remove said preferentially soluble polymeric material to provide an asymmetric membrane

structure comprising at least one separation layer and at least one porous support layer; or

(B) contacting said solid support structure with an extraction medium which has a preferential solubility for at least one of said at least two different polymeric materials, whereby said preferentially soluble polymeric material is removed from said solid support structure to form a porous structure and providing a separation layer on one major surface of said porous structure.

4,873,039

METHOD FOR PRODUCING SHAPED ARTICLES OF CERAMICS

Tamio Serita, Chibashi, and Hiroyuki Takeuchi, Minamitashi, both of Japan, assignors to Chisso Corporation, Osaka, Japan

Continuation of Ser. No. 868,038, May 29, 1986, abandoned.
This application Feb. 16, 1988, Ser. No. 155,703
Claims priority, application Japan, Jun. 24, 1985, 60-137289
Int. Cl.⁴ C04B 33/32

U.S. Cl. 264—65

3 Claims

1. The method which comprises

(a) forming a shaped article of polysilazene,

(b) contacting the shaped article of step (a) with dry ammonia while the shaped article is maintained at a temperature within the range of 20°–200° C. to effect infusibilization, and

(c) subjecting the ammonia-treated product resulting from step (b) to further heat treatment at a higher temperature in a nitrogen atmosphere to thereby produce a shaped ceramic article.

4,873,038

METHOD FOR PRODUCING CERAMIC/METAL HEAT STORAGE MEDIA, AND TO THE PRODUCT THEREOF

Robert A. Rapp, Columbus, Ohio, and E. Allen LaRoche, Jr., Middletown, Del., assignors to Lanxide Technology Company, LP, Newark, Del.

Filed Jul. 6, 1987, Ser. No. 69,732
Int. Cl.⁴ C04B 35/71, 35/02

U.S. Cl. 264—60

24 Claims



1. A method for producing a direct contact heat storage medium comprising a body of parent metal and intrinsically cohesive ceramic layer formed integrally with the metal body and encapsulating said parent metal body, which method comprises:

- (a) heating a body of parent metal in the presence of an oxidant to a temperature above the melting point of said parent metal but below the melting point of its oxidation reaction product formed in step (b), to form molten parent metal, and
- (b) at said temperature,
 - (i) reacting said molten parent metal with said oxidant outwardly from the surface of said parent metal body to form integrally with the body of parent metal a layer of oxidation reaction product,
 - (ii) transporting said molten parent metal through said oxidation reaction product into contact with said oxidant so that fresh oxidation reaction product continues to form at the interface between said oxidant and previously formed oxidation reaction product thereby continuously forming a progressively thicker layer of oxidation reaction product outwardly from said surface and concurrently depleting molten metal from said body,
 - (iii) continuing said reaction for a time sufficient to develop said progressively thicker layer to sufficient thickness to substantially completely encapsulate unreacted parent metal and to have a cavity resulting from said depletion, and
- (c) recovering the resulting heat storage medium.

4,873,040

METHOD FOR PRODUCTION OF PILED MATS WITH A RUBBER BACKING ON A VULCANIZING PRESS

Aage Lang, Kolding, Denmark, assignor to Milliken Research Corporation, Spartanburg, S.C.

Filed Oct. 13, 1988, Ser. No. 256,965

Claims priority, application Denmark, Jun. 30, 1988, 3643/88
Int. Cl.⁴ B29C 39/12

U.S. Cl. 264—102

1 Claim

1. Method to produce a rubber-backed pile mat article on a vulcanizing press with a stationary heater plate using an intermittently operated heat conducting conveyor belt comprising the steps of: placing a first article on the conveyor belt at a first mold station for feeding and removing articles, then indexing the conveyor belt to move the article into the vulcanizing press, then vulcanizing the first article in the vulcanizing press and placing a second article on the conveyor belt at the first work station, then indexing the conveyor belt in the same direction as with the first article to move the second article into the vulcanizing press and the first article into a first cooling and degassing station, then vulcanizing the second article in the vulcanizing press, cooling and degassing the first article, and placing a third article on the conveyor belt at a second work station for feeding and removing articles downstream of the first cooling and degassing zone, then reversing the conveyor belt to move the second article to a second cooling and degassing station upstream of the first work station and to place the first article in the first work station and the third article in the vulcanizing press, then vulcanizing the third article while removing the first article from the first work station, cooling and degassing the second article, and placing a fourth unvulcanized article on the conveyor belt at the first work station, then reversing the conveyor belt to move the second article into the first work station, the fourth article into the vulcanizing press and the third article into the first cooling and degassing station, then vulcanizing the fourth article while cooling and degassing the third article and removing the second article from the first work station, then placing a fifth article on the conveyor belt in the first work station, then

indexing the conveyor belt in the same direction as the preceding step to place the fifth article into the vulcanizing press, the third article into the second work station, then vulcanizing the fifth article while cooling and degassing the fourth article and removing the third article from the second work station, then placing a fifth article on the conveyor belt in the first work station, then indexing the conveyor belt in the same direction as the preceding step to place the fifth article into the vulcanizing press, the fourth article into the first cooling and degassing station and the third article into the second work station, then vulcanizing the fifth article while cooling and degassing the fourth article and removing the third article from the second work station, then placing a sixth unvulcanized article on the conveyor belt in the second work station and repeating sequentially the enumerated steps to produce further vulcanized articles.

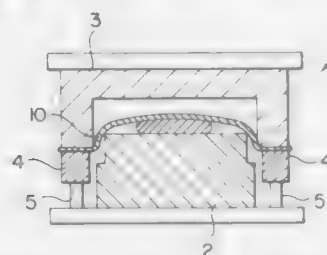
4,873,041

PROCESS FOR PRODUCING A MULTILAYER MOLDED ARTICLE

Syobei Masui, Kyoto; Masahito Matsumoto, Ibaraki, and Nobuhiro Usui, Takatsuki, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan
Filed Aug. 31, 1988, Ser. No. 238,857

Claims priority, application Japan, Aug. 31, 1987, 62-218457; Aug. 31, 1987, 62-218458

Int. Cl.⁴ B29C 43/04, 43/18, 43/20; B32C 27/00
U.S. Cl. 264—135 6 Claims



1. A process for producing a multilayer molded article which comprises:

- wetting a skin material comprising a fabric or a thermoplastic resin sheet as an outermost layer with at least one liquid material,
- which is a volatile material and which is a liquid at room temperature and atmospheric pressure, state and a solution having a surfactant contained therein comprising a volatile material which is liquid in an ordinary state as a medium,
- supplying the wet skin material between male and female molds,
- supplying a thermoplastic resin melt between the molds and closing the molds to shape the thermoplastic resin melt against the wet skin material and thereby form the multilayer molded article comprising the integrally adhered skin material and the thermoplastic resin, wetting, of the skin material including wetting of the outermost layer to the extent that increase of the temperature of the skin material and excess penetration of the skin material are prevented during shaping of the thermoplastic melt, thereby preventing deterioration of the feeling and warping of the molded article.

4,873,042

PROCESS FOR EXTRUDING A THERMOPLASTIC COPOLYMER

Barry Topcik, Bridgewater, N.J., assignor to Union Carbide Chemicals and Plastics Company Inc., Danbury, Conn.

Filed Mar. 25, 1988, Ser. No. 173,148

Int. Cl.⁴ B29C 35/02, 47/78, 71/00

U.S. Cl. 264—211.24

7 Claims

1. A process for extruding a hydrolyzable particulate thermoplastic copolymer, comprising (i) coating the copolymer with an organic peroxide, which, will provide essentially no crosslinking per se, but will decompose to provide a silanol condensation catalyst; (ii) passing the coated polymer through an extruder having a die at its downstream end; (iii) maintaining the temperature of the extruder upstream of the die at a level sufficient to extrude the copolymer, but below the decomposition temperature of the organic peroxide; (iv) maintaining the temperature at the die or downstream of the die at or above the decomposition temperature of the organic peroxide; and (v) providing sufficient moisture at the die or downstream of the die to crosslink the copolymer in the presence of a silanol condensation catalyst.

4,873,043

METHOD INJECTION MOLDED A PLASTIC PART WITH A ROUND TUBULAR PORTION

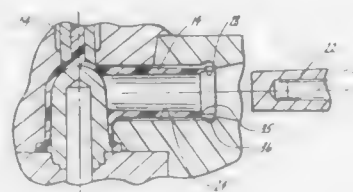
Marvin L. Meyers, Erie, Pa., assignor to Hoover Universal, Inc., Ann Arbor, Mich.

Filed Mar. 25, 1988, Ser. No. 173,145

Int. Cl.⁴ B29C 45/40

U.S. Cl. 264—237

1 Claim



1. The method of forming a plastic part having a tubular portion with an internal surface at a terminal end thereof having alternating ridges and grooves so as to eliminate a continuous inner surface at the terminal end of the tubular portion and thereby form a substantially symmetrical saw tooth shape to insure roundness of the tubular portion at the terminal end:

- (a) providing an injection mold having a cavity formed with a cylindrical surface portion having an outer end section and a core member removably inserted in said cylindrical portion and configured to be in a spaced relation with said cylindrical surface portion, said core member having an annular outer surface portion formed of alternating ridges and grooves when said core member is inserted in said cylindrical portion to assemble said mold,
- (b) injecting a molten plastic material into said cavity so that the material extends into said cylindrical portion and around said core member,
- (c) withdrawing said core member from said cylindrical portion along a line extending axially of said cylindrical portion after the plastic material in said cylindrical portion has solidified enough to retain its tubular shape and before it has completely cooled to thereby enable said plastic material to shrink radially inwardly away from said cylindrical surface;
- (d) thereafter withdrawing said tubular shape form said cylindrical portion in a direction axially of said tubular shape; and
- (e) cooling the part to room temperature, the symmetrical discontinuous inner surface of said tubular portion at the

terminal end of the part insuring an even shrinking of said tubular portion at said terminal end to thereby insure the roundness of said tubular portion at said terminal end.

4,873,044

METHOD AND APPARATUS FOR REDUCTION OF MOLD CYCLE TIME

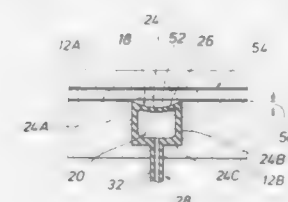
Joseph N. Epel, Southfield, Mich., assignor to Shell Oil Company, Houston, Tex.

Filed Dec. 21, 1987, Ser. No. 136,061

Int. Cl.⁴ B29C 45/56, 39/40

U.S. Cl. 264—257

2 Claims



2. A method for reducing the fabrication time of a molded article of manufacture wherein a portion of said molded article is formed by a hardenable liquid, said method including the steps of:

- providing a mold having two mold section surfaces with at least one hardenable liquid injection port defined there-through in at least one of said surfaces, said mold surface having at least one opening defined downwardly therein extending outwardly away from said hardenable liquid injection port,
- locating a deflatable member within said opening, said deflatable member having at least one fluid chamber containing fluid defined in the interior thereof, said deflatable member having a thickened wall contacting the sides of said opening and a moveable wall positionable flush with one of said mold section surfaces,
- placing fluid movement means in fluid communication with said at least one fluid chamber,
- placing a filament matrix in the mold and positioning a majority of both surfaces of said filament matrix adjacent said mold section surfaces,
- removing said fluid from said fluid chamber so as to move said moveable wall inward a selected distance relative to one of said mold section surfaces, thereby defining a channel to accelerate flow of portions of said hardenable liquid beneath said filament matrix means,
- flowing hardenable liquid into said mold,
- adding fluid to said fluid chamber to move said moveable wall surface flush with said mold section surface,
- retaining said hardenable liquid in said mold for a sufficient period for said liquid to wet said filament matrix and to harden sufficiently to dimensionally stabilize said article of manufacture, and
- removing said article of manufacture from said mold.

4,873,045

METHOD FOR MANUFACTURING AUTOMOTIVE INTERIOR COMPONENTS

Zenzo Fujita, Fujisawa; Hirokiyo Morita, Atsugi, and Sadao Morishita, Ebina, all of Japan, assignors to Kasai Kogyo Co., Ltd., Tokyo, Japan

Filed Mar. 24, 1988, Ser. No. 172,407

Claims priority, application Japan, Jul. 14, 1987, 62-175460

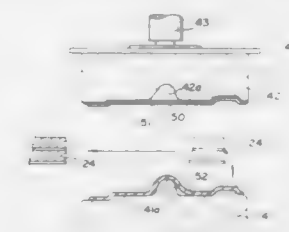
Int. Cl.⁴ B29C 43/20

U.S. Cl. 264—259

4 Claims

1. Method for cold press manufacturing automotive interior component parts, comprising the steps of: positioning a skin layer, having a back liner consisting of a foamed cushioning layer, on a mold surface of an upper

cold press mold with the cushioning layer facing downward; extruding a sheet of semi-molten thermoplastic resin material serving as a core layer directly onto a mold surface of a lower cold press mold; and



cold pressing by clamping together the upper mold and the lower mold in such a manner that the core layer and the skin layer are bonded together with the cushioning layer interposed therebetween, wherein the upper mold and the lower mold are at temperatures of from room temperature to 60° C. and the press pressure is from 30 to 50 kg/cm².

4,873,046

PRODUCTION OF STRETCHED ION-EXCHANGE MEMBRANE

Janusz J. H. Krause; Peter J. Smith, both of Northwich, and Robin A. Woolhouse, Bunbury, Nr Taporley, all of England, assignors to Imperial Chemical Industries PLC, London, England

Continuation of Ser. No. 466,145, Feb. 14, 1983, abandoned.

This application Aug. 17, 1987, Ser. No. 85,786

Claims priority, application United Kingdom, Feb. 17, 1982, 8204575

The portion of the term of this patent subsequent to Oct. 14, 2003, has been disclaimed.

Int. Cl.⁴ B29C 55/00; B29B 17/00

U.S. Cl. 264—288.4

14 Claims

1. A method of producing an ion-exchange membrane of an organic polymer containing ion-exchange groups or groups convertible to ion-exchange groups in which method the membrane is expanded to increase the surface area per unit weight of the membrane, characterized in that a film of the membrane is heated at an elevated temperature and the membrane is stretched at the elevated temperature in order to effect an increase of at least 100% in the surface area per unit weight of the membrane.

4,873,047

SHAPING ANODIC ALUMINUM OXIDE SHEET

Dianne M. Jenkins, Leamington Spa, and Christopher Pargeter, Banbury, both of England, assignors to Alcan International Limited, Montreal, Canada

Filed Nov. 9, 1987, Ser. No. 118,724

Claims priority, application United Kingdom, Nov. 11, 1986, 8626853

Int. Cl.⁴ C04B 35/10

U.S. Cl. 264—322

18 Claims

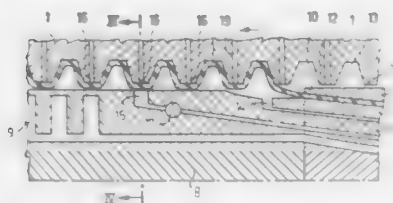
1. A method of forming into a desired shape an anodic aluminum oxide sheet, which method comprises wetting the sheet, forming the wetted sheet into the desired shape, and drying the sheet in that shape.

4,873,048

METHOD FOR THE FORMATION OF A HOLE IN A PLASTIC PIPE

Jyri Järvenkylä, Salpausselkä, Finland, assignor to Oy Uposor AB, Nastola, Finland
Continuation of Ser. No. 889,325, Jul. 23, 1986, abandoned. This application Jul. 7, 1988, Ser. No. 217,083
Claims priority, application Finland, Jul. 24, 1985, 852886
Int. Cl. B29C 49/04, 49/38
U.S. Cl. 264—504

5 Claims



1. A method of forming a hole in a corrugated plastic pipe, comprising the steps of:

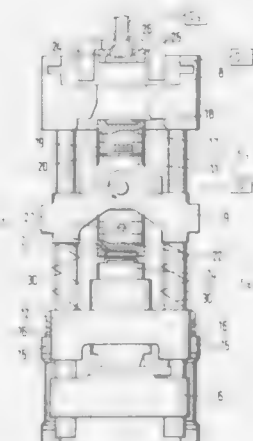
providing a mandrel;
feeding a plastic layer for forming said corrugated plastic pipe from a nozzle located at one end of the mandrel into an elongated mould cavity between an outermost surface of the mandrel and inner surfaces of chill molds which are displaced along the mandrel and which define a corrugated pattern; pressing all of the plastic layer into the chill mould with a pressure medium between the outermost surface of the mandrel and an inner surface of the plastic layer, thereby forming corrugations in said plastic layer, said corrugations having adjacent regions of crests and troughs; displacing the corrugated plastic layer with the chill moulds along the mandrel to an opening in the outermost surface of the mandrel; covering said opening in said mandrel and sealing around the edges of the opening in said mandrel with the plastic layer forming one of said troughs, said sealing arising from having the distance between the corresponding trough forming portion of said chill mound and the outermost surface of said mandrel surrounding said opening correspond to the thickness of the portion of the plastic layer forming said one of said troughs, said sealing being effective to prevent pressure from a pressure medium emanating from said opening from reaching areas of the plastic layer adjacent said one of said troughs; and, then subjecting only the portion of the plastic layer covering said opening in the mandrel to a local pressure difference exceeding a breaking limit of the plastic layer, said pressure difference being applied between the inner surface and opposite outer surface of the plastic layer at the location of said one of said troughs, said pressure difference at least in part arising from a pressure medium emanating from the opening in the mandrel, said pressure difference forming a hole through the plastic layer at the location of said one of said troughs thereby allowing said pressure medium to be released through said hole formed in said plastic layer and then through an opening in said trough forming portion of said chill mould, said pressure medium being selected from the group consisting of gas and liquid.

4,873,049

MOLDING OUTER AND INNER SOLES ONTO SHOE UPPERS

Reinhard Landwehr, Achim, and Günter Rebers, Achim-Baden, both of Fed. Rep. of Germany, assignors to Klöckner Permatik Desma GmbH, Malterdingen, Fed. Rep. of Germany
Division of Ser. No. 116,361, Nov. 4, 1987, Pat. No. 4,801,256.
This application Jul. 12, 1988, Ser. No. 217,965
Claims priority, application Fed. Rep. of Germany, Nov. 5, 1986, 3637697; Dec. 20, 1986, 3643821
Int. Cl. B29C 39/04
U.S. Cl. 264—513

3 Claims



1. A process for molding outer and inner soles on to shoe uppers, comprising the steps of forming a molded outer sole by injecting molding an elastomer into a mold cavity defined by a heatable first mold part at one end of a pivotable and axially movable mold carrier and an axially movable confronting mold plate, the injection molding being carried out while pressing said carrier against a stationary support by moving said mold plate into a mold closing position against said mold part, releasing the molded outer sole on to said mold plate by shifting said carrier away from said support and separating said mold part into a mold opening position, pivoting said mold carrier such that a cooled second mold part at an opposite end thereof overlies the molded outer sole, transferring the molded outer sole to said second mold part, pivoting said mold carrier to confront the molded outer sole to a last supported shoe upper located adjacent said support, forming an inner sole mold cavity with the molded outer sole by disposing said last supported shoe upper adjacent the molded outer sole and by closing an opposed pair of lateral mold elements about the shoe upper, forming a molded inner sole by injection molding a mixture of isocyanate and a polyol reacting into polyurethane into said inner sole mold cavity, and thereby bonding the molded inner sole to the shoe upper, the elastomer containing additives of reactive end groups of substances to effect chemical bonding with the isocyanate.

4,873,050

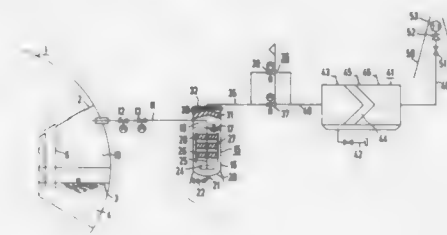
METHOD AND APPARATUS FOR PRESSURE RELIEF OF A NUCLEAR POWER PLANT

Bernd Eckardt, Bruchköbel, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany
Filed Mar. 22, 1988, Ser. No. 171,656
Claims priority, application Fed. Rep. of Germany, Mar. 23, 1987, 3709471; Sep. 3, 1987, 3729501
Int. Cl. G21C 9/00; G21F 9/02
U.S. Cl. 376—283

19 Claims

1. Method for pressure relief of a nuclear power plant, which comprises feeding fluid from an outlet opening of a containment through a filter to a stack, exposing the filter to pressure in the containment, filtering moisture and collecting mist at the

filter, passively decreasing pressure downstream of the filter at a throttle device with a critical relaxation for a uniform



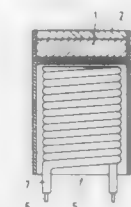
throughput, and providing a pressure drop upstream of the filter which is at most half as great as a pressure drop downstream of the filter.

4,873,052

METHOD OF MANUFACTURING A SCANDATE DISPENSER CATHODE AND SCANDATE DISPENSER CATHODE MANUFACTURED ACCORDING TO THE METHOD

Jan Haaker, Johannes Van Esdonk, both of Eindhoven, and Wim Kwestroo, Lelystad, all of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.
Continuation of Ser. No. 689,542, Jan. 7, 1985, abandoned. This application Aug. 22, 1986, Ser. No. 899,788
Claims priority, application Netherlands, Oct. 5, 1984, 8403071
Int. Cl. C22C 29/12
U.S. Cl. 419—2

4 Claims



1. A method of manufacturing a scandate dispenser cathode having a matrix at least the top layer of which consists substantially of a mixture of tungsten (W) with scandium oxide (Sc₂O₃) or with a mixed oxide comprising scandium oxide, characterized in that the matrix is sintered at a temperature between 1300° and approximately 1500° C. in hydrogen.

4,873,051

NUCLEAR FUEL GRID OUTER STRAP

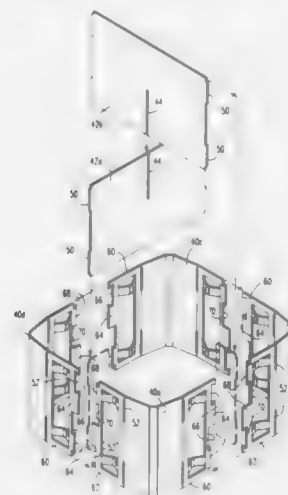
Robert Duncan, Fork, and James E. Craver, Lexington, both of S.C., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 6, 1988, Ser. No. 178,723

Int. Cl. G21C 3/34

U.S. Cl. 376—438

23 Claims



1. A nuclear reactor fuel assembly grid comprising:

- a first outer grid strap segment end, said first end having a first tab arranged in substantially the same plane as the plane defined by said first end;
- a second outer grid strap end, said second end having a second slot arranged in substantially the same plane as the plane defined by said second end, with said tab being substantially disposed in said slot, defining a socket therebetween; and
- a fork tine interposed substantially perpendicularly in said socket.

4,873,053

METHOD FOR MANUFACTURING A METAL BORIDE CERAMIC MATERIAL

Junichi Matsushita, Hajime Saito, both of Nagoya, and Hideo Nagashima, Tokyo, all of Japan, assignors to STK Ceramics Laboratory Corp. and Toshiba Ceramics Co., Ltd., both of, Japan

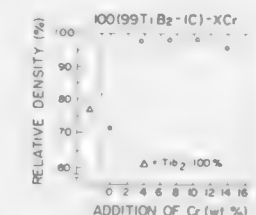
Filed Feb. 12, 1988, Ser. No. 155,604

Claims priority, application Japan, Feb. 20, 1987, 62-35475; Feb. 20, 1987, 62-35476

Int. Cl. G22F 1/00

U.S. Cl. 419—11

20 Claims



1. A method for manufacturing a metal boride ceramic material, comprising mixing metal boride powder with 1-20 wt. % metal powder and 0.1-10 wt. % carbon powder to thereby make a mixture, shaping the mixture and firing it.

4,873,054

THIRD ELEMENT ADDITIONS TO ALUMINUM-TITANIUM MASTER ALLOYS

Geoffrey K. Sigworth, Reading, Pa., assignor to KB Alloys, Inc., Sinking Spring, Pa.
Continuation-in-part of Ser. No. 904,511, Sep. 8, 1986, Pat. No. 4,812,290. This application Mar. 7, 1988, Ser. No. 165,036
Int. Cl. C22C 1/00, 21/00
U.S. Cl. 420—552

22 Claims

1. An aluminum-titanium master alloy consisting essentially

of, in weight percent, any two or more elements selected from the group consisting of carbon about 0.003 up to 0.1, sulfur about 0.03 up to 2, phosphorus about 0.03 up to 2, nitrogen about 0.03 up to 2, and boron about 0.01 up to 0.4, titanium 2 to 15, and the balance aluminum plus impurities normally found in master alloys, wherein said master alloy is substantially free of carbides, sulfides, phosphides, nitrides, and borides greater than about 5 microns in diameter.

4. A method of making an aluminum-titanium master alloy comprising the steps of:

preparing an alloy consisting essentially of, in weight percent, any two or more elements selected from the group consisting of carbon about 0.003 up to 0.1, sulfur about 0.03 up to 2, phosphorus about 0.03 up to 2, nitrogen about 0.03 up to 2, and boron about 0.01 up to 0.4, titanium 2 to 15, and the balance aluminum plus impurities normally found in master alloys;

superheating the alloy to a temperature and for a time sufficient to place said any two or more elements into solution in the alloy; and

casting the alloy to produce a master alloy consisting essentially of, in weight percent, any two or more elements selected from the group consisting of carbon about 0.003 up to 0.1, sulfur about 0.03 up to 2, phosphorus about 0.03 up to 2, nitrogen about 0.03 up to 2, and boron about 0.01 up to 0.4, titanium 2 to 15, and the balance aluminum plus impurities normally found in master alloys, wherein the alloy is substantially free of carbides, sulfides, phosphides, nitrides, and borides greater than about 5 microns in diameter.

4,873,055

CORROSION RESISTANT FE-NI-CR ALLOY

John H. Callig, St. Louis, Mo., assignor to Carondelet Foundry Company, St. Louis, Mo.

Filed Dec. 20, 1988, Ser. No. 287,839

The portion of the term of this patent subsequent to Jan. 3, 2006, has been disclaimed.

Int. Cl.⁴ C22C 30/00

U.S. Cl. 420—582

14 Claims

1. An alloy consisting essentially of

Nickel	19-30% by weight
Chromium	19-27%
Molybdenum	0.3-1%
Copper	2.7-4.5%
Manganese	2.7-4.7%
Silicon	2.7-5.5%
Carbon	up to about 0.08%
Columbium	up to about 0.7%
Tantalum	up to about 1% substituted for part of Cb at the rate of 1% Ta = 0.5% Cb
Nitrogen	up to about 0.12%
Tungsten	up to about 0.6%
Cobalt	up to about 0.8%
Iron	essentially balance

4,873,056

CHEMICAL TEST KIT FOR DETECTING IMPURITIES IN AN OIL SAMPLE

David J. Fisher, North Adams, Mass., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Continuation of Ser. No. 529,154, Sep. 2, 1983, Pat. No. 4,686,192. This application May 15, 1987, Ser. No. 50,924

Int. Cl.⁴ G01N 31/22

U.S. Cl. 422—61

19 Claims

1. A kit for detecting the presence of chloride ions and polychlorinated biphenyls at above a predetermined total threshold concentration in an oil sample comprising:

(a) a first container for receiving an oil sample and for receiving an aqueous liquid phase and further including at least one breakable capsule mounted within said first

container, said breakable capsule containing a predetermined amount of an alkali metal and said first container including means for withdrawing said liquid phase from said first container; and

(b) a second container comprising at least two breakable capsules mounted within said second container, and further including an aqueous liquid phase surrounding said capsules, one of said capsules containing a predetermined



amount of mercury titrant which reacts with chloride ions and the other of said capsules containing a predetermined amount of dye indicator which reacts with mercuric ions; wherein said respective predetermined amounts of alkali metal, mercury titrant and dye indicator are sufficient to allow visual detection in the presence of said chloride ions and polychlorinated biphenyls above said predetermined threshold concentration in said oil sample.

4,873,057

APPARATUS FOR CARRYING OUT A TITRATION PROCEDURE FOR THE CHEMICAL ANALYSIS OF A SAMPLE

Peter M. Robertson, Winkel b. Buelach, and Erwin Suter, Zurich, both of Switzerland, assignors to Zellweger Uster Ltd, Uster, Switzerland

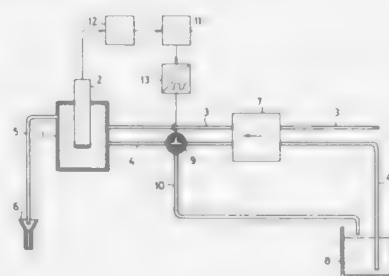
Filed Mar. 10, 1987, Ser. No. 27,001

Claims priority, application Switzerland, Mar. 11, 1986, 864,95

Int. Cl.⁴ G01N 31/16

U.S. Cl. 422—75

16 Claims



1. Apparatus for chemically analyzing a sample by fluid titration comprising:

- (a) a titration vessel;
- (b) means for sensing the titration equivalence point of the contents of the titration vessel;
- (c) a first supply line connected to a source of sample fluid and the titration vessel for supplying sample fluid to the titration vessel;
- (d) a second supply line connected to a reservoir of a reagent fluid and the titration vessel for supplying reagent fluid to the titration vessel;
- (e) means for supplying one of said sample and reagent fluids substantially continuously to said titration vessel through

one of said first and second supply lines and means for supplying the other of said fluids intermittently to the titration vessel through the other of said supply lines; (f) said means for supplying the other of said fluids intermittently including valve means located in the supply line for said other fluid; and

(g) control means connected to the valve means for controlling opening and closing of the valve means to obtain a pulse flow with the frequency and duration of the pulses providing a ratio of average sample fluid flow rate to average reagent fluid flow rate sufficient to achieve the ratio of sample fluid to reagent fluid at the equivalence point.

4,873,058

FLOW DIVIDER FOR GAS CHROMATOGRAPHY

Kraft-Ulrich Arnold, Karlsruhe, Fed. Rep. of Germany, and Fernand Claus, Beinheim, France, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

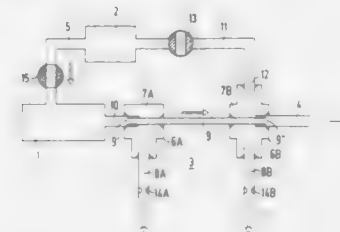
Filed Mar. 1, 1988, Ser. No. 162,538

Claims priority, application Fed. Rep. of Germany, Mar. 16, 1987, 3708504

Int. Cl.⁴ G01N 30/02

U.S. Cl. 422—89

1 Claim



1. A flow divider system for use in gas chromatographs and adapted to be connected to a sample dispenser, a separation column and a source of carrier gas, comprising:

upstream and downstream flow dividers, each having a split chamber, an inlet, an outlet, and a choked port, the inlet of the upstream flow divider being connected to the sample dispenser, the outlet of the upstream flow divider adapted to be connected to the inlet of the downstream flow divider, and the outlet of the downstream flow divider being connected to the separation column; means for connecting and disconnecting the source of carrier gas with the split chamber of the downstream flow divider.

4,873,059

PIPETTE DEVICE

Keishiro Kido, and Yoshio Saito, both of Saitama, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 17, 1986, Ser. No. 942,750

Claims priority, application Japan, Dec. 20, 1985, 60-286995

Int. Cl.⁴ B01L 3/02

U.S. Cl. 422—100

6 Claims

1. A pipette device comprising:

- (i) a vertical housing,
- (ii) a cylinder member having a pipette tip fitting section at the lower end thereof to which a removable pipette tip is fitted, for receiving and issuing liquid, disposed at least at a lower section of said housing so as to be vertically slidable in said housing and extending vertically past a lower end of said housing;
- (iii) means for upwardly biasing said cylinder member,
- (iv) a piston member having a lower end portion vertically slidable in said cylinder member,
- (v) means for upwardly biasing said piston member, and
- (vi) an engagement member for engaging said piston member with said cylinder member, wherein said engagement member engages said piston

member with said cylinder member when said piston member moves down to an engagement position, lower by a predetermined distance than a top position within the movement range of said piston member in said cylinder member, and wherein thereafter said cylinder member is moved vertically together with said piston

member against a combined upward bias of said means for biasing said cylinder member and said means for biasing said piston member, in said housing while said piston member is moved vertically between said engagement position and a position lower than said engagement position.

4,873,060

PROCESS FOR THE PREPARATION OF AROMATIC POLYESTERS AND APPARATUS FOR CARRYING OUT THIS PROCESS

Werner Rieder, Vienna, Austria, assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 342,007, Jan. 18, 1982, Pat. No. 4,401,803.

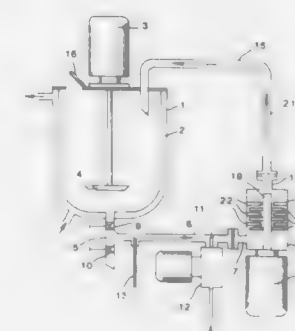
This application Jun. 28, 1983, Ser. No. 508,723

Claims priority, application Austria, Jun. 26, 1980, 3344/80

Int. Cl.⁴ B01F 7/22; B01J 19/18; C08F 2/00

U.S. Cl. 422—135

1 Claim



1. An apparatus for polycondensation of diphenols and aromatic dicarboxylic acid halides comprising a reactor provided with a stirring means and connected to a dispersing means by a feed means and a recycle means, said dispersing means comprising means defining a plurality of mixing stages in series to be passed by a liquid reaction mixture fed to the dispersing means via the recycle means, whereby in each mixing stage there are means for dividing the reaction mixture into

several streams, the flow boundaries of the streams thereby carrying out motions transversely to the main direction of the reaction-mixture-flow at mean velocities greater than 5 m/sec and mixing chamber means with at least one outlet channel, the apparatus further comprising means for introducing a solution of aromatic dicarboxylic acid halide in an organic solvent into the recycle means before entry into the dispersing means.

4,873,061

FIXATION OF NITROGEN BY SOLAR ENERGY

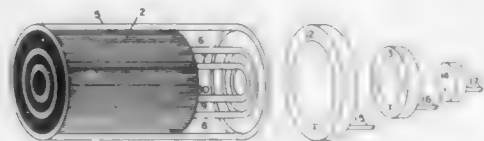
Louis R. O'Hare, 1066 A County Rd. 335, Pagosa Springs, Colo. 81147

Filed Jan. 13, 1988, Ser. No. 143,371

Int. Cl.⁴ C01B 21/24, 21/30; F24J 2/26

U.S. Cl. 422-188

15 Claims



1. A solar powered chemical reactor for reacting nitrogen and other reactants to provide products of combined compounds comprising:

- (1) a primary solar energy gas heater in the form of porous material in physical contact with a flow of gases being heated and flowing through the pores of the material, said porous material being capable of absorbing intense concentrated solar radiation and of converting said radiation to thermal energy, and
- (2) rapidly acting, double heat transfer means each of which means being capable of contacting said gas flow immediately after leaving said pores and of immediately absorbing heat energy from the gas flow in order to fix the equilibrium percentage of combined compound products formed at the temperatures of the absorber in a first time period, said heat transfer means in a second, alternate time period each being also capable of transferring said heat absorbed from solar heated gases to reactant gases about to be heated by said primary gas heater, each one of said double heat transfer means being capable of acting alternately in time with the other heat transfer means, and each of said heat transfer means being in the form of a set of metal tubes with open ends immediately adjacent to but not contacting said porous absorber, said tubes being capable of providing fluid flow communication between the solar absorber and
- (3) a gas flow direction reversal means in the form of electric valving and a valve current interrupter capable of intermittently energizing said valving thereby to repeatedly alternate said valving between two conditions, one condition being the provision of series fluid flow communication from a source of gas reactants through a first set of heat transfer tubes and a solar absorber to a second set of heat transfer tubes and to a product output duct, the second valve condition being the provision of series fluid flow communication from the source of reactant gases through the second set of heat transfer tubes and then through the solar absorber and through the first set of heat transfer tubes and then to the product output duct, and
- (4) a multiple chamber, heat resistant housing having seals with conduit ports on one end, said housing being capable of supporting the sets of heat transfer tubes in separate cavities and of directing gas flow through said sets of tubes and through said solar radiation absorber in such a manner that said housing provides series fluid flow communication through one set of heat transfer tubes then the absorber and the other set of tubes,
- (5) reactant and product gas circulation means in the form of a vacuum/pressure pump capable of moving gas from a

source, through said valving for repeatedly reversing flow direction, through the heat transfer tubes and absorber and into an output duct.

4,873,062

APPARATUS FOR THE GROWTH OF SINGLE CRYSTALS

Toshihiro Kotani, and Kohji Tada, both of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jun. 28, 1984, Ser. No. 625,537

Claims priority, application Japan, Aug. 6, 1983, 58-144149; Aug. 6, 1983, 58-144150

Int. Cl.⁴ B01D 9/00

U.S. Cl. 422-249

7 Claims



1. In an apparatus for the Czochralsky growth of compound single crystals wherein a single crystal seed held by a pull rod is provided in a sealed vessel which vessel has a closed end and an opened end sealed by immersion of the open end of the vessel in a B₂O₃ melt and which contains therein a crucible containing a raw material melt of the compound and an atmosphere of a volatile element of the compound, the improvement wherein at least the inner surface of the sealed vessel is made of a heat resistance material having a melting point of at least 1400° C., selected from the group consisting of pyrolytic and aluminum nitride, boron nitride,

4,873,063

APPARATUS FOR ZONE REGROWTH OF CRYSTAL RIBBONS

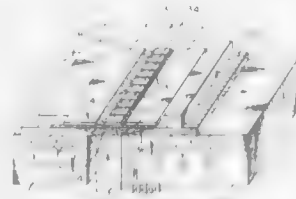
Carl E. Bleil, 132 Chalmers Dr., Rochester, Mich. 48063

Continuation-in-part of Ser. No. 826,596, Feb. 6, 1986, Pat. No. 4,775,443, and a continuation-in-part of Ser. No. 816,424, Jan. 6, 1986, Pat. No. 4,749,438. This application Mar. 28, 1988, Ser. No. 172,760

Int. Cl.⁴ C30B 35/00

U.S. Cl. 422-250

21 Claims



1. An apparatus for forming a crystalline ribbon from a source body of material, comprising: means for supporting a film of material in a plane; heating means comprising generally planar electrodes parallel to the said plane for producing electrical currents in the material causing a planar film of material to melt along a zone in the source body, means for controllably removing heat from the melted planar film of material in a direction substantially perpendicular to the plane to effect ribbon growth, means for causing relative motion in a direction substantially

parallel to the film between the ribbon and the heating means; and means for replenishing the melted film.

4,873,064

POWDER OF COAGULATED SPHERICAL ZIRCONIA PARTICLES AND PROCESS FOR PRODUCING THEM

Etsuro Kato, Aichi, Japan, assignor to Nissan Chemical Industries, Ltd., Tokyo, Japan

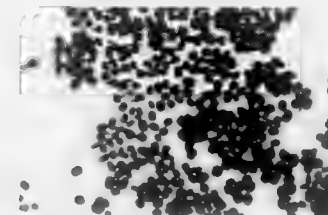
Filed Mar. 4, 1986, Ser. No. 836,143

Claims priority, application Japan, Mar. 4, 1985, 60-42098

Int. Cl.⁴ C04B 35/48

U.S. Cl. 423-85

14 Claims



3. A process for producing calcined powder of coagulated spherical particles having a uniform secondary coagulated particle size of 0.2 μm to 3 μm and composed of primary particles of less than 500 Å in the crystallite size comprising:

- (a) hydrolyzing an aqueous solution of a zirconia salt under heating at a temperature from 90° to 250° C. and separating coagulated zirconia particles of greater than about 1000 Å in coagulated particle size from coagulated zirconia particles composed of ultrafine monoclinic primary particles of less than 100 Å in the crystallite size coagulated with each other prepared by the hydrolysis;
- (b) adding a zirconium salt and water to the thus separated coagulated particles to prepare an aqueous suspension having a pH lower than 1;
- (c) hydrolyzing the aqueous suspension under heating at a temperature from 90° to 250° C. to grow the particles and increase the particle size and thereafter, repeating once or more the procedures of adding the zirconium salt and applying hydrolysis under heating at a temperature from 90° to 250° C., thereby growing the particles into spherical particles of essentially uniform particle size within a range from 0.2 μm to 3 μm and separating the thus grown particles from the aqueous suspension;
- (d) drying the particles separated from the aqueous suspension to obtain a powder of ultrafine zirconia particles; and
- (e) calcining said ultrafine zirconia particles with or without other metal compounds at a temperature of less than 1000° C., and pulverizing the obtained calcined product.

4,873,065

FLUE GAS PURIFICATION PROCESS

Hartmut Braun, and Hubert Vogg, both of Karlsruhe, Fed. Rep. of Germany, assignors to Kernforschungszentrum Karlsruhe GmbH, Karlsruhe, Fed. Rep. of Germany

Filed Apr. 22, 1987, Ser. No. 41,293

Claims priority, application Fed. Rep. of Germany, May 2, 1986, 3614814

Int. Cl.⁴ B01D 47/05, 47/06

U.S. Cl. 423-210

14 Claims

1. In a process for purifying flue gas generated by the combustion of waste materials, the flue gas being comprised of solid particulates, polluting gases including HCl, heavy metal vapors including Hg, and water vapor, the process including the steps of:

- a. separating the majority of solid particulates from the flue gas in a dry solids separation system and collecting the solid particulates as flue ash;
- b. scrubbing from the flue gas the solid particulates remain-

ing in the flue gas leaving the dry solids separation system and condensing polluting gases, heavy metal vapors, and water vapor from the flue gas leaving the dry solids separation system in a condensation/scrubbing system to form a condensate; and

c. extracting soluble heavy metals from the flue ash with the condensate to produce a purified flue ash, the improvement comprising:

subjecting the condensate from the scrubbing step to a first heavy metal separating process which is an ion exchange process and which selectively removes at least Hg from the condensate prior to the extracting step.

4,873,066

LOW TEMPERATURE PROCESS FOR THE REDUCTION OF NITROGEN OXIDES IN AN EFFLUENT

William R. Epperly, New Canaan; James C. Sullivan, Norwalk, and Barry N. Sprague, Bethlehem, all of Conn., assignors to Fuel Tech, Inc., Stamford, Conn.

Continuation-in-part of Ser. No. 207,382, Jan. 15, 1988, which is a continuation-in-part of Ser. No. 50,198, May 14, 1987, Pat. No. 4,780,289, and a continuation-in-part of Ser. No. 90,962, Aug. 28, 1987, abandoned, and a continuation-in-part of Ser. No. 207,292, Jun. 15, 1988, Pat. No. 4,863,704, which is a

continuation-in-part of Ser. No. 22,716, Mar. 6, 1987, Pat. No. 4,777,024, and a continuation-in-part of Ser. No. 90,962, Aug. 28, 1987, abandoned. This application Feb. 8, 1989, Ser. No. 308,255

Int. Cl.⁴ C01B 21/00

U.S. Cl. 423-235

10 Claims

1. A process for the reduction of the concentration of nitrogen oxides in the effluent from the combustion of a carbonaceous fuel, the process comprising introducing a treatment agent which comprises an ammonium salt selected from the group consisting of triammonium citrate and ammonium formate into the effluent at an effluent temperature below 1300° F.

4,873,067

ZEOLITE ZSM-57

Ernest W. Valyocskil; Nancy M. Page, both of Yardley, Pa., and Cynthia T-W. Chu, Princeton Junction, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 944,297, Dec. 19, 1986, abandoned, which is a continuation-in-part of Ser. No. 807,424, Dec. 10, 1985, abandoned, which is a continuation-in-part of Ser. No. 642,964, Aug. 21, 1984, abandoned, which is a

continuation-in-part of Ser. No. 642,965, Aug. 21, 1984, abandoned, which is a continuation-in-part of Ser. No. 642,963, Aug. 21, 1984, abandoned, which is a continuation-in-part of Ser. No. 642,962, Aug. 21, 1984, abandoned, which is a

continuation-in-part of Ser. No. 642,961, Aug. 21, 1984, abandoned, which is a continuation-in-part of Ser. No. 759,377, Jul. 26, 1985, abandoned, said Ser. No. 944,297, is a

continuation-in-part of Ser. No. 759,377, which is a continuation-in-part of Ser. No. 642,964, which is a continuation-in-part of Ser. No. 642,965, which is a continuation-in-part of Ser. No. 642,963, which is a continuation-in-part of Ser. No. 642,962, which is a continuation-in-part of Ser. No. 642,961, which is a continuation-in-part of Ser. No. 642,930, Aug. 21, 1984, abandoned. This application Nov. 17, 1987, Ser. No. 121,544

Int. Cl.⁴ C01B 35/10

U.S. Cl. 423-279

11 Claims

1. A synthetic porous crystalline zeolite having a molar ratio of X₂O₃: Y₂O₃ of at least 4, wherein X represents silicon and/or germanium and Y represents aluminum, boron, chromium, iron and/or gallium, said porous crystalline zeolite having at least the X-ray diffraction lines as set forth in Table 1 of the specification.

and an effective amount of an opiate analgesic prior to the performance of said procedure, followed by the parenteral administration to the patient of from about 1.0 to about 3.0 mg of a long-acting pure narcotic antagonist to counteract an observed drop in mean blood pressure, said antagonist being administered during the time interval commencing immediately after the procedure and continuing until about 3-5 hours after administration of the benzodiazepine and opiate.

4,873,077

LIQUID FIBER WRAP FINGERNAIL REINFORCEMENT COMPOSITION

Steven L. Thompson, 301 N. Pine Island Rd., Plantation, Fla. 33324, and Melvin K. Silverman, 1460 SE. 15th St., Fort Lauderdale, Fla. 33316

Filed Sep. 21, 1987, Ser. No. 99,200

Int. Cl.⁴ A61K 7/04

U.S. Cl. 424-61

5 Claims

1. A fingernail reinforcement composition, comprising: a nitrocellulose-based nail lacquer having plasticizer, resin and solvent, and glass fibers suspended in said nail lacquer, in which the proportion of glass fiber to said nitrocellulose based formula is in the range of 1:3 to 1:8, and said glass fiber possesses dimensions of about 10 microns in diameter and about 800 microns in length.

4,873,078

HIGH-GLOSS, HIGH-SHINE LIPSTICK

Robert J. Edmundson, Germantown, and Terry C. Jacks, Memphis, both of Tenn., assignors to Plough, Inc., Memphis, Tenn. Filed Apr. 22, 1988, Ser. No. 184,995

Int. Cl.⁴ A61K 7/027, 7/025

U.S. Cl. 424-64

7 Claims

1. A lipstick composition comprising from about 0.5 to about 8 weight percent of isohexadecane in a lipstick formulation.

4,873,079

HAIR COLORING COMPOSITION AND ITS METHOD OF USE

Charles R. Hahn, Cornwall-on-Hudson, N.Y., and Warren B. Shapiro, Norwalk, Conn., assignors to Clairol Incorporated, New York, N.Y.

Continuation of Ser. No. 88,163, Aug. 21, 1987, abandoned. This application Dec. 14, 1987, Ser. No. 132,500

Int. Cl.⁴ A61K 7/13

U.S. Cl. 424-70

13 Claims

1. A temporary or semipermanent hair coloring composition comprising an aqueous vehicle having incorporated therein a hair coloring component comprising one or more hair colorants selected from the group consisting of water-soluble temporary and water-soluble semipermanent hair colorants and mixtures thereof, in amount sufficient to color hair, said composition also containing as a cosolvent for said hair colorants from about 2 to about 15% by weight of a diol, said diol being selected from the group consisting of branched chain aliphatic hydrocarbon diols and having from 5 to 8 carbon atoms and bis(hydroxyalkyl) cycloalkanes having from 7 to 14 carbon atoms, said diol being present in said composition in a concentration to effectively function as a cosolvent for said hair colorants.

4,873,080

ORAL ANTI-DIABETIC PHARMACEUTICAL COMPOSITIONS AND THE PREPARATION THEREOF

Rolf Brickl, Warthausen; Gottfried Schepky, Biberach; Eckhard Rupprecht, Aulendorf-Tannhausen, and Andreas Greischel, Biberach, all of Fed. Rep. of Germany, assignors to Dr. Karl Thomae GmbH, Biberach an der Riss, Fed. Rep. of Germany Continuation-in-part of Ser. No. 616,010, May 31, 1984, Pat. No. 4,708,868. This application Sep. 30, 1987, Ser. No. 103,524 Claims priority, application Fed. Rep. of Germany, Jun. 8, 1983, 3320583

Int. Cl.⁴ A61K 31/79, 31/745, 31/445, 31/40

U.S. Cl. 424-80

14 Claims

1. The method of preparing an oral antidiabetic pharmaceutical composition containing an antidiabetic benzoic acid as the active ingredient, which comprises dissolving or emulsifying (a) an acid antidiabetic benzoic acid with a basic excipient, or (b) an amphoteric antidiabetic benzoic acid with a basic or acid excipient, or (c) a basic antidiabetic benzoic acid with an acid excipient in an inert polar solvent in the presence of at least one solubilizing or emulsifying substance, where the molar ratio of benzoic acid to basic or acid excipient is less than 1:1 and the ratio of benzoic acid to the total of solubilizing or emulsifying substance is from about 1:0.5 to 1:10 parts by weight, applying the resulting solution or emulsion to the surface of at least one water-insoluble carrier, where the ratio of benzoic acid to the total of water-insoluble carrier is from 1:1 to 1:12 parts by weight, and drying the thus treated water-insoluble carrier.

4,873,081

PERCUTANEOUS ABSORPTION PREPARATION

Taro Ogiso, Higashiosaka, Japan, assignor to Maraho Co., Ltd., Osaka, Japan

Filed Mar. 26, 1987, Ser. No. 31,241

Claims priority, application Japan, May 7, 1986, 61-105350

Int. Cl.⁴ A61K 31/40, 31/54, 31/78

U.S. Cl. 424-81

10 Claims

1. A percutaneous absorption preparation which comprises: (a) an active ingredient comprising a calcium salt of indomethacin or tolmetin in an amount of 0.3-10% by weight of the preparation; (b) a medium for the active ingredient selected from the group consisting of an ethylene glycol mono-lower alkyl ether, propylene glycol, polyethylene glycol and dimethylsulfoxide, in an amount at least sufficient to dissolve the active ingredient; and (c) an absorption promoter selected from the group consisting of 1-dodecylazacycloheptan-2-one hexamethylenelauramide, N-methyl-2-pyrrolidone, a sucrose aliphatic acid ester, dimethylsulfoxide and a nonionic surfactant, in an amount of 0.5-10% by weight of the preparation.

4,873,082

MULTI-LAYER BIRD REPELLANT COATING COMPOSITION

Paul Cacioli, Reservoir, and Roger Snow, Sandringham, both of Australia, assignors to International Contamination Control Industries Pty Ltd., Victoria, Australia

Continuation-in-part of Ser. No. 885,812, Jul. 15, 1986, which is a continuation of Ser. No. 620,944, Jun. 14, 1984, abandoned.

This application Jan. 28, 1987, Ser. No. 7,723

Claims priority, application Australia, Jan. 29, 1986, PH4368

Int. Cl.⁴ A01N 27/00, 25/04

U.S. Cl. 424-83

9 Claims

1. A multi-layer bird repellent coating composition for a substrate comprising: (i) at least one bird repellent bead or strip formed from a bird repellent gel composition including:

- (a) about 75 to 98% by weight based on the total weight of the gel composition of a high molecular weight polybutene having a molecular weight of 1300 to 1500 and a low molecular weight polybutene having a molecular weight of 900 to 1000;
- (b) about 1 to 7% by weight based on the total weight of the gel composition of a clay-based thickening agent; and
- (c) about 1 to 3% by weight based on the total weight of the gel composition of a polar organic solvent swelling agent; said bird repellent bead or strip having sufficient tackiness to repel birds but not to substantially retard the birds and having sufficient viscosity to minimize the flattening of said bead or strip; and
- (ii) a protective coating layer on said bird repellent bead or strip, said protective coating layer formed by application to the bead or strip of a coating composition comprising: (a) an effective amount of a polymeric component, which polymeric component includes at least one vinyl aromatic polymer or vinyl aromatic copolymer, (b) an effective amount of a solvent or emulsifier for the polymeric component; the protective coating layer being sufficient brittle that the surface thereof is broken, in use, on contact with a bird.

4,873,083

FIBRINOLYTIC COMPOSITION

Robert L. Hunter, Tucker, and Alexander Duncan, Dunwoody, both of Ga., assignors to Emory University, Atlanta, Ga. Division of Ser. No. 45,459, May 7, 1987, which is a continuation of Ser. No. 863,582, May 15, 1986. This application Dec. 21, 1987, Ser. No. 136,034

Int. Cl.⁴ A61K 31/745, 49/00

U.S. Cl. 424-83

5 Claims

1. A method of improving blood flow and oxygenation of a tumor in a human or animal, comprising the step of injecting into the human or animal a solution comprising an effective amount of a surface-active copolymer of the following formula:



wherein a is an integer such that the hydrophobe represented by $(\text{CH}_2\text{CH}_2\text{O})_a$ has a molecular weight of approximately 950 to 4000, and b is an integer such that the hydrophile portion represented by $(\text{C}_2\text{H}_4\text{O})_b$ constitutes from approximately 50% to 90% by weight of the compound.

4,873,084

INSECTICIDAL COMPOSITION

Stephen I. Sallay, 2918 Glencairn Dr., Ft. Wayne, Ind. 46815 Continuation of Ser. No. 719,252, Apr. 2, 1985, abandoned, which is a continuation-in-part of Ser. No. 603,340, Apr. 24, 1984, Pat. No. 4,514,326, which is a continuation-in-part of Ser. No. 489,176, Apr. 27, 1983, abandoned, which is a

continuation-in-part of Ser. No. 429,133, Sep. 30, 1982, Pat. No. 4,504,546, which is a continuation-in-part of Ser. No. 286,042, Jun. 22, 1981, Pat. No. 4,382,025, which is a continuation-in-part of Ser. No. 135,177, Mar. 28, 1980, abandoned, which is a continuation-in-part of Ser. No. 927,340, Jul. 24, 1978, Pat. No. 4,196,177. This application Dec. 18, 1987, Ser. No. 134,704

Int. Cl.⁴ A01N 59/14

U.S. Cl. 424-658

8 Claims

1. An insecticidal composition comprising an aqueous solution containing an insecticidally effective amount of from 0.01-5.0% of ammonium pentaborate and from 0.01-2.0% of a mildewicide.

4,873,085

SPUN FIBROUS COSMETIC AND METHOD OF USE

Richard C. Fuiz, Bethlehem, Pa., assignor to Fuiz Pharmaceutical Ltd., Washington, D.C. Continuation-in-part of Ser. No. 40,371, Apr. 20, 1987, abandoned. This application Mar. 18, 1988, Ser. No. 169,914 The portion of the term of this patent subsequent to Aug. 8, 2006, has been disclaimed.

Int. Cl.⁴ A61K 7/44; A61L 23/00; A23G 3/02

U.S. Cl. 424-400

25 Claims

1. A spun fibrous cosmetic composition comprising a rapidly dissolvable mass of water soluble spun fibers of a material capable of being spun into fibers that are readily water-soluble, and an effective quantity of an active agent distributed on or incorporated in said fibrous mass where said active agent has cosmetologic activity.

4,873,086

HYDROGELS WITH INCREASED ORGANIC SOLVENT SOLUBLE ACTIVE AGENT LOADING CAPACITY, THEIR PREPARATION AND THE USE THEREOF

William R. Good, Suffern, N.Y.; John Mikes, Madison, and Joseph Sikora, Wanaque, both of N.J., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 835,414, Mar. 3, 1986, abandoned. This application Aug. 8, 1988, Ser. No. 229,189

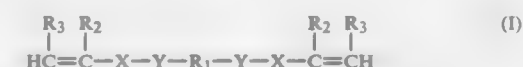
Int. Cl.⁴ A61K 31/78, 31/74

U.S. Cl. 424-409

15 Claims

1. A process for the preparation of a controlled, sustained release composition comprising:

- (a) an organic-solvent soluble active agent in an amount sufficient for the total desired dosage during the release period and distributed within
- (b) a water-insoluble macromer expanded hydrogel comprising the crosslinked copolymerization product of (A') about 30 to about 90% by weight of said hydrogel of (a') a water-soluble monoolefinic monomer, or mixture of said monomers, of (b') a water-soluble monoolefinic monomer, or mixture of said monomers with 1 to 50% by weight of total monomers of a water-insoluble monoolefinic monomer, or mixture of said water-insoluble monomers, with (B) about 70 to about 10% by weight of said hydrogel of a terminal diolefinic hydrophobic macromer having a molecular weight from about 400 to about 8000, said macromer having the formula



wherein R₁ is a polycondensate chain having a molecular weight from about 200 and about 8000, which is the residue of a poly(propylene oxide) or poly(tetramethylene oxide) glycol having ether linkages; R₂ is hydrogen, methyl or —CH₂COOR₄ wherein R₄ is hydrogen or an alkyl group with up to 10 carbon atoms; R₃ is hydrogen or —COOR₄, with the proviso that at least one of R₂ and R₃ is hydrogen; X is oxa, —COO—, or —CONR₅—wherein R₅ is hydrogen or alkyl of up to 5 carbon atoms and Y is a direct bond or the radical —R₆—Z₁—CO—NH—R₇—NH—CO—Z₂—, wherein R₆ is linked to X and represents branched or linear alkylene of up to 7 carbon atoms; Z₁ and Z₂ are oxa or NR₅ and R₇ is the diradical of an aliphatic or aromatic diisocyanate, with the proviso that in case Xi is oxa, Y is different from a direct bond, and R₂ and R₃ are hydrogen; comprising the steps of copolymerizing said monomer (A) and said macromer (B) in the presence of a free radical initiator at the reaction temperature between about 20° to about 150° C., in the presence or absence of a substantially inert diluent, and in the presence of an effective macromer (B) expanding amount of a macromer (B) soluble compound of the formula



(II)

wherein R' is HO—, alkoxy of up to eight carbon atoms or alkanoyloxy of up to eight carbon atoms; R'' is straight or branched chain alkylene of two to six carbon atoms; R''' is hydrogen, alkyl of up to eighteen carbon atoms or alkanoyl of up to eighteen carbon atoms; and n is an integer from 1 to about 100, with the proviso that if n is 1 or R'' is ethylene, R''' is alkyl of two to eighteen carbon atoms or alkanoyl of three to eighteen carbon atoms, or a mixture thereof; to form said hydrogel; and loading said active agent (a) into said hydrogel.

4,873,087

SUPPOSITORY PREPARATION HAVING EXCELLENT ABSORPTION PROPERTY

Masataka Morishita; Renji Aikawa; Shigeo Katsuragi; Yoshiaki Yamamoto, and Kenichi Sugimoto, all of Shizuoka, Japan, assignors to Toyo Jozo Company, Ltd., Shizuoka, Japan
Filed Mar. 8, 1982, Ser. No. 355,887

Claims priority, application Japan, Jan. 14, 1982, 57-4222
The portion of the term of this patent subsequent to Sep. 10, 2002, has been disclaimed.

Int. Cl.⁴ A61K 9/02

U.S. Cl. 424—433

9 Claims

1. A suppository having excellent absorption property, comprising (1) a water-soluble medicine, (2) a water-soluble substance selected from the group consisting of water-soluble salts and water-soluble saccharides at a concentration exhibiting 1.5–6.0 fold of osmotic pressure of isotonic sodium chloride solution, and (3) at least 0.01 W/W % of an absorption promoter which is at least one N-acyl amino acid derivative or N-acyl peptide derivative represented by the formula:



wherein R is an aliphatic hydrocarbon group, a substituted aliphatic hydrocarbon group, an aromatic hydrocarbon group, a substituted aromatic hydrocarbon group, an aryl-substituted lower hydrocarbon group or a substituted aryl-substituted lower hydrocarbon group; wherein said substituted aliphatic hydrocarbon group, said substituted aromatic hydrocarbon group or said substituted aryl-substituted lower hydrocarbon group is substituted with a member selected from the group consisting of a lower alkyl group, a hydroxyl group, a carboxylic acid group, an alkoxy group, a phosphoric acid group, an amino group, an imino group and a halogen; and A is an amino acid residue or a peptide residue.

4,873,088

LIPOSOME DRUG DELIVERY METHOD AND COMPOSITION

Eric Mayhew, South Wales; M. Jane Ehrke, Lancaster; Kenneth Mace, Buffalo, all of N.Y.; Francis Szoka, San Francisco, Calif., and Fred C. Olson, Helena, Mont., assignors to Liposome Technology, Inc., Menlo Park, Calif.

Continuation-in-part of Ser. No. 529,890, Sep. 6, 1983, abandoned, and Ser. No. 915,863, Oct. 6, 1986, abandoned. This application Jul. 13, 1987, Ser. No. 72,828

Int. Cl.⁴ A61K 9/52, 49/00; B01J 13/02

U.S. Cl. 424—450

17 Claims

1. In the treatment of cancerous tumors in a mammal in need of such treatment, a method for enhancing the therapeutic effectiveness of adriamycin and a secondary compound capable of:

- reducing adriamycin toxicity; or
- enhancing the induction of host defenses by adriamycin, when administered in free form, comprising providing a suspension of lipid bilayer vesicles containing co-entrapped adriamycin and the secondary compound, and administering a therapeutically effective amount of the suspension parenterally.

4,873,089

PROTEOLIPOSOMES AS DRUG CARRIERS

Anthony W. Scott, Middle Village, and David Zakim, Armonk, both of N.Y., assignors to Cornell Research Foundation Inc., Cornell University, Ithaca, N.Y.

Continuation of Ser. No. 754,319, Jul. 12, 1985, abandoned. This application Mar. 21, 1988, Ser. No. 171,197

Int. Cl.⁴ A61K 37/22

U.S. Cl. 424—450

10 Claims

1. A process for the preparation of fusogenic proteoliposomes comprising:

- mixing a fusogen with a lipid component used to form unilamellar lipid vesicles to thereby form fusogenic unilamellar lipid vesicles;
- mixing said fusogenic unilamellar lipid vesicles with integral membrane proteins; and
- lowering the temperature of the mixture of fusogenic unilamellar lipid vesicles and integral membrane proteins to at or below the phase transition temperature of the fusogenic unilamellar lipid vesicles to thereby form fusogenic proteoliposomes.

4,873,090

NON-ADJUVENATED VACCINE

Robert L. Clancy, Newcastle, Australia, assignor to Bronco Stat Pty. Limited, Perth, Australia

PCT No. PCT/AU86/00071, § 371 Date Nov. 12, 1986, § 102(e) Date Nov. 12, 1986, PCT Pub. No. WO86/05691, PCT Pub. Date Oct. 9, 1986

PCT Filed Mar. 17, 1986, Ser. No. 2,625

Claims priority, application Australia, Mar. 27, 1985, PG9928

Int. Cl.⁴ A61K 9/48, 39/02

U.S. Cl. 424—451

11 Claims

1. An enteral non-adjuvanted monobacterial vaccine comprising a killed bacteria for immunization against bacterial infection of mucosal sites;

- the killed bacteria being selected from the group consisting of Haemophilus influenzae, Streptococcus pneumoniae, Pseudomonas aeruginosa, and Staphylococcus aureus;
- the vaccine comprising a pharmaceutically acceptable carrier which does not elicit an antigenic response and being in the form of an enteric coated tablet, granule, capsule or dragee for oral administration;
- the monobacterial vaccine comprising a single bacteria and being in the absence of any adjuvant therefor, so as to stimulate only a limited immune response in a patient.

4,873,091

CONTROLLED RELEASE FORMULATING EMPLOYING RESILIENT MICROBEADS

Laura J. Jankower, and Larry W. Shipley, both of Lafayette, La., assignors to Advanced Polymer Systems, Inc., Redwood City, Calif.

Filed May 23, 1988, Ser. No. 197,375

Int. Cl.⁴ A61K 9/14; C08J 9/28

U.S. Cl. 424—489

94 Claims

1. A method for forming solid resilient particles containing a substantially continuous network of pores open to the exterior of said particles, said method comprising:

- combining an ethylene-propylene-diene elastomeric prepolymer with a substantially water-immiscible liquid species which is inert with respect to said prepolymer to form a homogeneous, substantially water-immiscible liquid solution;
- dispersing said liquid solution in an aqueous solution to form a suspension;
- polymerizing said prepolymer in said suspension to form solid resilient particles containing said water-immiscible liquid species;
- recovering said solid resilient particles from said suspension; and
- extracting said water-immiscible liquid species from said solid resilient particles.

4,873,092

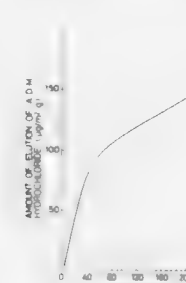
SLOW-RELEASING PREPARATION

Ishiro Amama; Satoshi Tokura, both of Sapporo; Shinichiro Nishimura, Sapporo, and Hiroshi Seo, Saka, all of Japan, assignors to Morita Kikai Kabushiki Kaisha, Kyoto, Japan
Filed May 21, 1987, Ser. No. 53,072

Int. Cl.⁴ A61K 9/50

U.S. Cl. 424—499

11 Claims



1. A slow-releasing preparation consisting essentially of porous granules of deacetylated chitin as a carrier and at least one physiologically active therapeutic substance contained in the granules, wherein said therapeutic substance is selected from the group consisting of an anticancer drug, a hormone drug, an antiepileptic drug, an antiemetic, a psychotropic drug, an antispastic, a cardiotonic, an antiarrhythmic agent, an angiotonic, a vasodilator, and a sulfur drug.

4,873,093

STARCH SNACK FOODS AND PROCESS

Richard D. Fazzolare, Pearl River, N.Y.; Joseph A. Szwer, Mahwah, and Rich McFeters, Hackensack, both of N.J., assignors to Nabisco Brands, Inc., Parsippany, N.J.

Continuation-in-part of Ser. No. 681,647, Dec. 14, 1984, abandoned. This application Sep. 5, 1985, Ser. No. 772,918

Int. Cl.⁴ A21D 8/06; A23P 1/08

U.S. Cl. 426—28

10 Claims

1. A method for making a baked-starch based chip-like snack food comprising:

- mixing at least one ingredient having starch with water to form a non-elastic, starch-based composition, said at least one ingredient having starch comprising a member selected from the group consisting of potato, corn, buckwheat, rice, barley, tapioca, wheat, rye sorghum, and graham ingredients;
- steaming said starch-based composition with continued mixing until a composition temperature of at least 160° F. is obtained for a sufficient amount of time for said composition to form a machinable dough-like consistency;
- machining said dough-like composition whereby pieces are formed, said machining including:
 - laminating a sheet of said dough-like composition to obtain over lapping laminae of said sheet;
 - rolling said dough-like the laminated composition in at least one reduction roller; and
 - cutting said dough-like the rolled composition; and
- baking said pieces to obtain a snack having a flat chip-like appearance or a partially delaminated, blistered chip-like appearance.

4,873,094

METHOD OF MAKING AN ACIDIFIED DAIRY CREAM

LaMonte D. Piechick, and Ralph J. Greene, both of Eau Claire, Wis., assignors to Land O'Lakes, Inc., Arden Hills, Minn.

Continuation of Ser. No. 223,708, Jul. 21, 1980, abandoned, which is a continuation of Ser. No. 939,731, Dec. 9, 1986, abandoned. This application Mar. 29, 1989, Ser. No. 330,978

Int. Cl.⁴ A23C 9/12; A23L 3/00

U.S. Cl. 426—43

20 Claims

1. A method for processing an acidified dairy-derived cream, the method comprising:

- providing an acidified dairy-derived cream having a pH level below approximately 4.6;
- heating the cream to a temperature range of approximately 222° F. to 264° F. while simultaneously subjecting the cream to a pressure of at least approximately 180 psig for a time period sufficient to extend ambient temperature shelf life to at least four weeks; and
- aseptically packaging the cream.

4,873,095

EXTRACTION OF SOLUBLE MATERIALS FROM WHOLE CITRUS FRUIT

Kevin W. Rundle, Box 206, Berri, South Australia, Australia

Continuation-in-part of Ser. No. 784,296, Oct. 7, 1985, abandoned. This application Nov. 4, 1987, Ser. No. 116,319

Claims priority, application Australia, Oct. 5, 1984, PG7515

Int. Cl.⁴ A23L 2/06

U.S. Cl. 426—50

8 Claims

1. A process for the extraction of soluble materials from whole citrus fruit selected from the group consisting of oranges, mandarins and grapefruit having the skin thereon, said process comprising the steps of:

- severing the whole fruit to form fruit slices having the skin thereon;
- extracting juice having an amount of bitter principles from said fruit slices with the skin thereon by extracting said fruit slices with water in a countercurrent extractor to form an extracted juice containing insoluble particulate material, said extraction being conducted such that bitter principles are retained or absorbed by said insoluble particulate material relative to said extracted juice so that the introduction of bitter principles into the extracted juice is reduced by about 50%;
- subjecting said extracted juice obtained from said countercurrent extractor to a pectinase enzyme in an amount and for a time sufficient to reduce the viscosity of said extracted juice to enable removal of at least some insoluble particulate material from said extracted juice;
- deactivating said pectinase enzyme in said extracted juice; and
- removing at least some of said insoluble particulate material present in said extracted juice together with bitter principles, to obtain citrus juice of reduced bitterness.

4,873,096

SIMULATED EGG TREATS FOR PETS

Albert A. Spiel, Yonkers, N.Y.; James Roe, Wayne, and Henry C. Spanier, West Milford, both of N.J., assignors to Nabisco Brands, Inc., East Hanover, N.J.

Continuation of Ser. No. 000,431, Jan. 5, 1987, Pat. No. 4,795,655, which is a continuation-in-part of Ser. No. 578,040, Feb. 2, 1986, Pat. No. 4,634,597, and a continuation-in-part of Ser. No. 898,187, Aug. 20, 1986, Pat. No. 4,711,425. This application Aug. 23, 1988, Ser. No. 235,059

Int. Cl.⁴ A23K 1/00

U.S. Cl. 426—72

15 Claims

15. A dry hard pet egg treat biscuit having a base egg white portion and upper egg yolk portion, said base egg white portion being formed in an oblate ellipsoidal shape from a dough comprising 40 to 50 weight percent of flour, 10 to 20 weight percent of meal and from 10 to 15 weight percent of egg solids

and said egg yolk portion comprising from 15 to 25 weight percent of flour, 4 to 8 weight percent of meal, from 12 to 18 weight percent of a sugar and from 15 to 20 weight percent egg solids, wherein said base portion has a substantially planar lower surface and a substantially planar upper surface having an indentation therein, said indentation having a substantially planar lower surface therein containing a plurality of grooves into which said upper egg yolk portion is deposited so that the base egg white portion and said egg yolk portion adhere and bond together when the biscuit is baked.

4,873,097

ZEOLITES IN POULTRY NUTRITION

Sebastian M. Laurent, Greenwell Springs, and Robert N. Sanders, Baton Rouge, both of La., assignors to Ethyl Corporation, Richmond, Va.

Continuation of Ser. No. 846,188, Mar. 31, 1986, abandoned, which is a continuation of Ser. No. 741,752, Jan. 5, 1985, abandoned, which is a division of Ser. No. 475,370, Mar. 14, 1983, Pat. No. 4,556,564. This application Apr. 27, 1987, Ser. No. 42,987

Int. Cl.⁴ A23K 1/00

U.S. Cl. 426—74

10 Claims

1. A feed formulation for laying poultry for improving egg shell quality of eggs laid by the poultry consisting essentially of a laying poultry feed containing an amount of calcium sufficient to effect an increase in egg shell and mixed therewith about 0.25 up to about 2 percent by weight of synthetic sodium zeolite A, said feed formulation having the property of improving egg shell quality of the eggs laid by the poultry to which it is fed.

4,873,098

METHOD FOR CONTROLLING THE SPREAD OF SOFT COOKIES

Lori Banks, Lincoln Park; Grant C. Busk, Jr., Chester; Bin Chiang, Cedar Knolls, and Robert Thulin, Wyckoff, all of N.J., assignors to Nabisco Brands, Inc., East Hanover, N.J.

Filed Oct. 15, 1987, Ser. No. 108,466

Int. Cl.⁴ A21D 13/00

U.S. Cl. 426—94

21 Claims

1. A method for controlling spread in soft cookies having an extended shelf life comprising:

- forming a dough by admixing unbleached flour, a humectant for imparting softness to the cookies for at least two months when the cookie is packaged in a closed container, water, shortening or fat, and from about 2% by weight to about 20% by weight of a cold-water swelling granular starch material having a cold water solubility of at least 50%;
- forming the dough into pieces, and
- baking the dough pieces to a moisture content of at least 6% by weight and a water activity of less than about 0.7, the weight percent of said granular starch material being based upon the weight of the unbleached flour, said starch material serving to reduce cookie spread.

4,873,099

EDIBLE FOOD PRODUCT AND PACKAGE

Mark R. Ruiz, 5445 Del Amo Blvd., Ste. 204, Lakewood, Calif. 90712

Filed Dec. 9, 1987, Ser. No. 131,919

Int. Cl.⁴ A21D 13/00

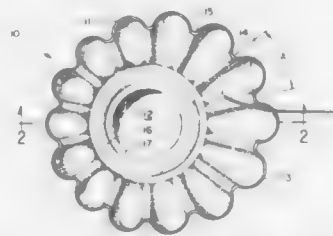
U.S. Cl. 426—104

1 Claim

1. A consumable food product comprising: an edible shell consisting of a circular base integrally supporting an upwardly and outwardly projecting continuous sidewall and being totally composed of a digestible material; said base provided with at least one annular reinforcement bead coaxially disposed with respect to said circular sidewall; said circular sidewall having a plurality of semicircular

convolutions of equal diameter integrally provided about said circular base, each of said semicircular convolutions having a central axis radiating upwardly and outwardly from said circular base;

said semicircular convolutions and said base annular bead cooperating to provide combined reinforcement applied load carrying characteristics; said convolutions of equal diameter are provided in a series in adjacent side-by-side relationship; said continuous sidewall angles outwardly to diverge from said circular base and having a roughened exterior surface contributing to said load carrying characteristics wherein said continuous sidewall and base resists breakage, damage and separation;



said diverging circular sidewall permits a plurality of said shells to be nested together in a stack whereby equal load paths are established conducting applied loads from shell-to-shell throughout said stack;

form means supporting said shells in said nested stack; said form means comprising a pair of conical forms separated by said stack of shells with a portion of each form extending beyond the endmost shells of said stack and the diameter of the widest end of each form being a greater diameter than the diameter of said shells; and a film surrounding said nested shells in said stack engaged with said extended portions of each form in spaced relationship to said stack for holding said shells in a unitary construction.

4,873,100

BISTABLE EXPANDABLE BOTTLE

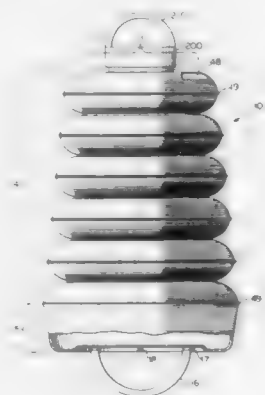
Robert S. Dirksing, Cincinnati; Richard M. Girardot, Wyoming, and Theodore P. Merz, Cincinnati, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Apr. 15, 1987, Ser. No. 38,794

Int. Cl.⁴ B65D 1/40, 1/44

U.S. Cl. 426—111

46 Claims



1. A bistable bottle for storage of a concentrated material to be diluted within said bottle and dispensed in diluted form directly therefrom, said bottle being capable of maintaining either a collapsed condition or an expanded condition until is

acted upon by an external force applied in a direction substantially parallel to the vertical axis of said bottle, said bottle exhibiting improved resistance to both expansion and collapse when said bottle is in its expanded condition, said bottle comprising:

- a lowermost portion;
- an uppermost portion, said uppermost portion including an orifice for introducing concentrated material and diluent into said bottle and for dispensing diluted material from said bottle; and
- a resilient, continuous sidewall portion having its lowermost end sealingly secured to said lowermost portion of said bottle and its uppermost end sealingly secured to said uppermost portion of said bottle, said continuous sidewall portion comprising a multiplicity of bellows, each of said bellows being sealingly interconnected to the adjacent bellows by means of a hinge ring which defines a minor diameter of said bottle sidewall portion, each of said bellows comprising a pair of curvilinear legs joined to one another at an outermost hinge point substantially coinciding with the major diameter of said bellows, said curvilinear legs comprising said bellows gradually tapering from a maximum thickness at their points of joinder to their respective hinge rings to a minimum thickness at said outermost hinge point, each of said hinge rings interconnecting adjacent bellows comprising a discrete wall segment of sufficient height to permit collapse of said bottle without causing interference between the curvilinear legs to which the ends of said hinge ring are sealingly secured, said points of securement between said hinge ring and said curvilinear legs being thinner than the adjacent portion of said hinge ring and the curvilinear leg to which it is sealingly secured, thereby defining a pair of innermost hinge points substantially coinciding with the minor diameter of said bottle sidewall for each of said hinge rings, each of said curvilinear legs exhibiting its maximum horizontal orientation immediately adjacent said hinge rings and its maximum vertical orientation immediately adjacent said outermost hinge points, one of said curvilinear legs being outwardly convex relative to the interior of said bottle in both the collapsed and expanded condition of said bottle and the other of said curvilinear legs being outwardly convex relative to the interior of said bottle in the expanded condition of said bottle, but inwardly convex relative to the interior of said bottle in the collapsed condition of said bottle, said bottle exhibiting improved resistance to both expansion and collapse while in its expanded condition due to the maximum vertical alignment of each pair of said curvilinear legs immediately adjacent the outermost hinge point joining said pair of curvilinear legs to one another.

4,873,101

MICROWAVE FOOD PACKAGE AND GREASE ABSORBENT PAD THEREFOR

Cartis L. Larson, City of Hudson, Wis., and Pierre H. LePere, City of Cottage Grove, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 780,219, Sep. 26, 1985, abandoned. This application Aug. 10, 1987, Ser. No. 82,421

Int. Cl.⁴ B65D 81/34

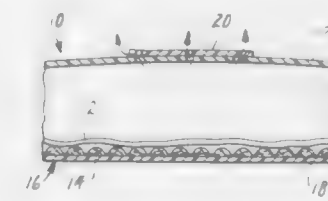
U.S. Cl. 426—113

9 Claims

1. A package for use in a microwave oven, said package comprising:

- food to be cooked by microwave energy containing a substantial amount of water and solidified grease;
- a pad adjacent said food comprising generally microwave radiation transparent and generally hydrophobic grease absorbing microfibers constructed of a composition comprising a blend containing substantially equal parts by weight of polypropylene and poly 4-methylpentene-1,

said pad capable of holding the amount of grease in said food when it is melted by cooking said food; and



(c) a vapor tight microwave radiation transparent enclosure surrounding said pad and said food.

4,873,102

MAGNETIC PARTICLES

Manchium Chang, 4589 Via Marisol, #265, Los Angeles, Calif. 90042, and Michael S. Colvin, 25001 Pacific Coast Hwy., Malibu, Calif. 90265

Filed Mar. 14, 1988, Ser. No. 167,723

Int. Cl.⁴ B05D 5/12

U.S. Cl. 427—130

13 Claims

1. A method of forming a magnetic polymeric material containing particles of magnetic metal oxide distributed throughout the material comprising the steps of:

- immersing a swellable, porous polymer in an aqueous solution of a metal salt which is a precursor of said particles of magnetic metal oxide, said metal salt being a salt of a strong acid and a metal ion selected from iron, cobalt or nickel;
- swelling the polymer in said solution while diffusing said metal containing salt solution into said pores;
- adding a strong base selected from a hydroxide of a Group I metal ion or ammonium to the solution;
- reacting the base with the metal salt within the pores to form finely-divided magnetic metal oxide particles within the pores of the polymeric material.

4,873,103

FLOWABLE MATERIAL DISTRIBUTION SAMPLING METHOD

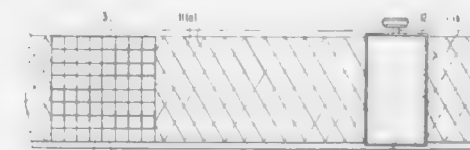
Robert J. Cordera, East Amherst, N.J., assignor to Nabisco Brands, Inc., East Hanover, N.J.

Filed Mar. 3, 1988, Ser. No. 163,539

Int. Cl.⁴ G01N 1/20

U.S. Cl. 426—233

16 Claims



1. A method for determining the distribution of a flowable coating material onto food articles in the process of being baked, and which are disposed on a moving lower surface beneath a dispenser comprising dispensing said flowable material downwardly onto said food articles on said lower surface a multi-sectioned device to collect a representative sample of said flowable material and determining the amount of said flowable material in each section of said multi-sectioned device.

4,873,104

METHOD OF PRODUCING VARIEGATED EXTRUDED PRODUCTS

Ian Butcher, Guildford, and Kevin P. Hillman, Cheltenham, both of Great Britain, assignors to Thomas J. Lipton, Inc., Englewood Cliffs, N.J.

Filed Apr. 20, 1988, Ser. No. 183,850
Claims priority, application United Kingdom, Apr. 22, 1987, 8709478; Apr. 22, 1987, 8709479; Apr. 22, 1987, 8709480
Int. Cl.⁴ A23L 1/27

U.S. Cl. 426—249

2 Claims



1. A method of producing a variegated extruded product comprising feeding a first viscous product through a tube, rotationally introducing a second, different viscous product into said first viscous product, while preventing homogeneous mixing, to form a stream of the two distinct products and conducting this stream along at least one divider in the tube, which divider has one of its main dimensions substantially in the direction of flow of the stream prior to extrusion to form the product.

4,873,105

METHOD FOR THE TREATMENT OF AN ELONGATED AGRICULTURAL PRODUCE

Joseph Coppolani, Meudon La Foret, France, assignor to Femia Industrie, Paris, France

Filed Jan. 23, 1988, Ser. No. 210,319
Claims priority, application France, Jan. 25, 1987, 87 8967
Int. Cl.⁴ A23P 1/00; B23D 19/00

U.S. Cl. 426—481

6 Claims

1. A method for sorting or cutting off the ends of elongated agricultural produce, occurring near a surface of an inner lateral wall of a rotary drum that has a longitudinal axis, wherein said produce is continually brought to a top of the drum due to the rotation thereof, and then falls towards a bottom of the drum, comprising the steps of

stopping the fall of the produce, after a relatively short initial falling distance, at a point intermediate of the top and the bottom of the drum, thus lowering the effective falling distance of the produce to reduce an impact speed thereof; receiving the produce and transporting it along an approximately helicoidal path in order not only to move the produce toward the bottom of the drum to a lower level located at a relatively low height above the bottom of the drum but also to move it in a direction parallel to the longitudinal axis of the drum; and making the produce fall once more down to the bottom of the drum from said lower level.

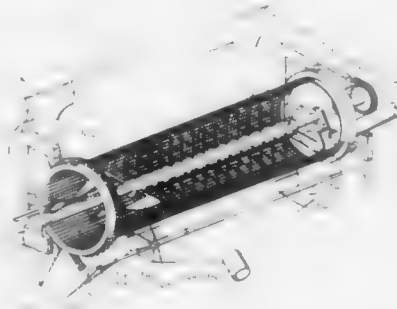
4,873,106

METHOD OF AND APPARATUS FOR SEPARATING JUICE SACS FROM THE SECTIONAL MEMBRANES OF A FRUIT MEAT SECTION

Michael S. Kolodess, Cincinnati; Douglas Toms, St. Bernard, and Bruce A. Pierson, Cincinnati, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio
Filed Jan. 3, 1988, Ser. No. 202,173
Int. Cl.⁴ A23L 1/212; A23N 1/00

U.S. Cl. 426—481

13 Claims



9. A method of separating juice and juice sacs from the sectional membranes of a fruit meat section extracted from a fruit, said method comprising the steps of:

- (a) feeding said extracted fruit meat sections into the interior of a tubular screen, said screen having a rotatable shaft coaxial therewith, said shaft having a plurality of striker bars projecting therefrom;
- (b) tumbling said extracted fruit meat sections by rotating said tubular screen;
- (c) striking said extracted fruit meat sections with said plurality of striker bars, whereby said juice and juice sacs are separated from said sectional membranes; and
- (d) collecting said separated juice and juice sacs.

4,873,107

AIR IMPINGEMENT TUNNEL OVEN APPARATUS

Virgil L. Archer, Dallas, Tex., assignor to Archer Air Industries, Inc., Dallas, Tex.

Filed Dec. 24, 1986, Ser. No. 946,521
Int. Cl.⁴ A23L 1/01; A23B 4/04; F26B 3/00

U.S. Cl. 426—520

47 Claims

36. A method of thermally treating a food item with a gas impingement apparatus comprising:
an elongated housing having a heat treatment passage extending longitudinally therethrough along an axis;
first and second plenum ducts each having a wall portion defined by alternating series of parallel ridges which respectively project toward and away from the interior of the plenum duct with which the wall portion is associated, each of said wall portions having a plurality of rectangular slots in the outer portions of the ridges which project away from the interior of their associated plenum duct; said first and second plenum ducts being positioned within

said heat treatment passage on opposite sides of said axis with said wall portions being laterally spaced apart from and facing said axis;
one of said first and second plenum ducts being supported for selective movement toward or away from said axis, said method comprising the steps of:
flowing a heated gas, at a predetermined temperature suitable for thermally treating the food item, into said first and second plenum ducts and outwardly through said slots in said wall portions thereof toward said axis; and conveying the food item through said passage, generally parallel to said axis and between said first and second plenum ducts, to thermally treat the food item by impingement thereon of heated gas being discharged through said slots in said wall portions of said first and second plenum ducts.

4,873,108

PROCESS FOR PREPARING HYDROGEN CHLORIDE HYDROLYZED PROTEIN

Johannes F. M. De Rooij, Sellindge, Great Britain, and Stephen E. Meakins, Canterbury, United Kingdom, assignors to Unilever Patent Holdings B.V., Rotterdam, Netherlands
Filed May 2, 1986, Ser. No. 858,751

Claims priority, application European Pat. Off., May 6, 1985, 85200704

Int. Cl.⁴ A23L 1/228

U.S. Cl. 426—533

3 Claims

1. A process for preparing hydrogen chloride hydrolysed protein, consisting essentially of dissolving the hydrolysate in water and subjecting this solution to gel filtration over a porous material

which is a crosslinked dextran and which has an average pore diameter between 0.5 and 2.5 nanometers, and eluting a fraction characterized by:

- (a) a content of NaCl between 0 and 35% w/w;
- (b) a content of free amino acids between 25 and 100% w/w; and
- (c) a content of glutamic acid between 8 and 60% w/w calculated as dry matter; and
- (d) that the amount of apolar amino acids relative to total amino acids is reduced by at least 50% of the original value.

4,873,109

CACAO BUTTERN SUBSTITUTE COMPOSITION

Yukitaka Tanaka; Hisao Omura; Yuichi Irinatsu; Takashi Kobayashi, and Aiko Noguchi, all of Ibaraki, Japan, assignors to Kao Corporation, Tokyo, Japan

Continuation of Ser. No. 840,292, Mar. 14, 1986, abandoned.
This application Apr. 28, 1988, Ser. No. 188,196

Claims priority, application Japan, Mar. 25, 1985, 60-60267
Int. Cl.⁴ A23D 5/00; A23G 1/00

U.S. Cl. 426—607

9 Claims

1. A cacao butter substitute composition which consists essentially of:

- (a) at least 80 percent by weight, based on the total weight of the composition, of 1,3-disaturated-2-oleoyl glycerols having a member selected from the group consisting of palmitoyl groups, stearoyl groups and palmitoyl and stearoyl groups contained at the 1 and 3 positions of said glycerols, said 1,3-disaturated-2-oleoyl glycerols consisting of:
(a-1) up to 10 percent by weight of 1,3-dipalmitoyl-2-oleoyl glycerol, based on the total weight of (a),
(a-2) 25 to 45 percent by weight of 1-palmitoyl-2-oleoyl-3-stearoyl glycerol, based on the total weight of (a), and
(a-3) 45 to 70 percent by weight of 1,3-distearoyl-2-oleoyl glycerol, based on the weight of (a), and
- (b) up to 20 percent by weight, based on the total weight of the composition, of glycerides comprising:

- (b-1) up to 10 percent by weight of triglycerides having two unsaturations in the molecule,
- (b-2) up to 6 percent by weight of diglycerides,
- (b-3) up to 5 percent by weight of 1,2-disaturated-3-oleoyl glycerols,
- (b-4) up to 5 percent by weight of trisaturated glycerides and
- (b-5) up to 5 percent by weight of triglycerides having three or more unsaturations in the molecule.

4,873,110

METHOD FOR PRODUCING BREAKFAST CEREAL

Allen T. Short, Barrington, and Raleigh J. Wilkinson, Lockport, both of Ill., assignors to J. R. Short Milling Company, Chicago, Ill.

Continuation-in-part of Ser. No. 177,831, Mar. 22, 1988, which is a continuation of Ser. No. 37,054, Apr. 13, 1987, abandoned, which is a continuation of Ser. No. 836,704, Mar. 6, 1986, abandoned. This application May 20, 1988, Ser. No. 196,589

Claims priority, application Canada, Mar. 30, 1987, 533273

Int. Cl.⁴ A23L 1/164

U.S. Cl. 426—621

10 Claims

1. A method for producing a breakfast cereal comprising the steps of

- extruding a gelatinized starch-containing material to form pellets;
- drying said extruded pellets to a moisture content of from about 9.5 to about 14.0 percent by weight under conditions which inhibit case hardening to form dried half products suitable for extended storage;
- rehydrating said dried pellets to a moisture content of from about 18.0 to about 23.0 percent by weight to form rehydrated half products;
- flaking said rehydrated pellets into flakes; and
- toasting said flakes to a final moisture content of from about 2.0 to about 5.0 percent by weight.

4,873,111

FUR ANIMAL FEED AND A METHOD FOR PREPARING THE SAME

Pirkko K. Aaltonen, and Ilkka T. Siissalo, both of, Helsinki, Finland, assignors to Cultor Oy, Helsinki, Finland

Filed Jan. 22, 1988, Ser. No. 146,832

Claims priority, application Finland, Jan. 23, 1987, 870287

Int. Cl.⁴ A23K 1/10

U.S. Cl. 426—623

4 Claims

1. A method for thickening and toughening fur animal feed, particularly mink feed, comprising the steps of (i) obtaining a raw material selected from the group consisting of fresh fish, conserved fish, fresh offal, conserved offal, fish meal, grain and soy flour; and (ii) adding hydrothermally treated sugar beet slices to the raw material in an amount of about 1–6 % by weight of the total weight of the feed, for binding the free water present in the feed and for providing added nutritional value.

4,873,112

FRUIT CONCENTRATE SWEETNER AND PROCESS OF MANUFACTURE

Cheryl R. Mitchell, and Pat R. Mitchell, both of Manteca, Calif., assignors to FruitSource Associates, Santa Cruz, Calif.

Filed Jul. 26, 1988, Ser. No. 224,298

Int. Cl.⁴ A23L 1/222, 2/00

U.S. Cl. 426—599

59 Claims

1. A fruit concentrate sweetener composition comprising a blend of a hydrolyzed starch having a dextrose equivalent (D.E.) of up to 25 and a fruit juice or fruit syrup concentrate of at least about 40% soluble solids and about 0% insoluble solids thereby forming a liquor having a dry weight composition of about 40 to 65% complex carbohydrates, about 35 to 55% simple sugars from the fruit juice or fruit syrup concentrate

and about 0 to 5% nutritional components occurring naturally in the fruit juice or fruit syrup concentrate.

4,873,113

PROCESS FOR THE PRODUCTION OF EXTENDABLE THERMOGRAPHIC PLATES

Aleide Grein-Wiegand, Wanfriedwerre, Fed. Rep. of Germany, assignor to Varnel Chemical Business S.A., Switzerland
Filed Feb. 2, 1988, Ser. No. 151,564
Claims priority, application Switzerland, Feb. 16, 1987, 90564/87

Int. Cl.⁴ B05D 5/00, 7/02

U.S. Cl. 427—2

5 Claims

1. A process for producing an extendable thermographic plate by applying a capsular ink formulation based on microencapsulated liquid crystals by screen printing an elastomer plate of natural latex, the said formulation being made elastic by means of vehicles and additives which impart stability and elasticity including, as a binder, a solution of polyvinyl alcohol modified by the addition of an inorganic cobalt salt, which confers elasticity, and stability of the color-change temperatures of the liquid crystals.

4,873,114

COATING EXPENDABLE SUBSTRATES WHICH CONTACT MOLTEN METAL

Jeffrey A. Harris, West Bromwich, United Kingdom, assignor to Fosco International Limited, Birmingham, England
Continuation of Ser. No. 201,481, Jul. 9, 1980, abandoned. This application Jul. 12, 1984, Ser. No. 630,238
Claims priority, application United Kingdom, Jan. 21, 1980, 2280/12

Int. Cl.⁴ B05D 1/04

U.S. Cl. 427—27

5 Claims

1. In a method of casting molten metal using a foundry sand mould or core substrate for the cast molten metal, the improvement which comprises:

- preparing a mould or core substrate from sand and binder so that the substrate has a resistivity of less than 10^9 ohm.cm. at 10 kv;
- selecting particles of refractory material coated with organic binder so that the coated particles have an electrical resistivity of at least 10^{10} kv;
- tribo-electrically charging the coated particles;
- grounding the substrate and coating the surface of the substrate to be contacted with molten metal with the charged particles so as to provide the surface of the substrate with a coherent layer of said particles; and
- thereafter casting the molten metal against said coated substrate.

4,873,115

METHOD OF SYNTHESIZING CARBON FILM AND CARBON PARTICLES IN A VAPOR PHASE

Mitsuo Matsumura, and Toshihiko Yoshida, both of Saitama, Japan, assignors to Toa Nenryo Kogyo K.K., Tokyo, Japan
Continuation of Ser. No. 523,249, Aug. 15, 1983, abandoned. This application Aug. 14, 1985, Ser. No. 765,573
Claims priority, application Japan, Aug. 13, 1982, 57-141559

Int. Cl.⁴ B05D 3/06

U.S. Cl. 427—34

12 Claims

1. A method of synthesizing a carbon film consisting essentially of carbon and carbon particles consisting essentially of carbon on a heated substrate in a vapor phase which comprises using a single gas or a mixed gas capable of supplying halogen, hydrogen and carbon atoms as a starting material and carrying out the process by having the gas in a plasma state with the temperature of the substrate being from about 100° to 900° C. and with process being carried out under a pressure of from about 10 mm Torr to several tens of Torr until said carbon film and carbon particles deposit on the substrate while heated to about 100° to 900° C.

4,873,116

METHOD OF PREPARING MIXTURES OF INCOMPATIBLE HYDROCARBON POLYMERS

Fred H. Ancker, Warren, N.J., assignor to Union Carbide Chemicals and Plastics Company Inc., Danbury, Conn.
Filed Sep. 30, 1986, Ser. No. 913,517
Int. Cl.⁴ C08L 23/00

U.S. Cl. 428—36.9

38 Claims

20. A mixture of incompatible thermoplastic hydrocarbon polymers, substantially free of free radical initiators, comprising: (I) a first thermoplastic hydrocarbon polymer and (II) a second thermoplastic hydrocarbon polymer that is incompatible with the first hydrocarbon polymer, and (III) a compatibilizing mixture comprising:

- an inorganic filler; and
- from about 0.1 to 5.0 weight percent, based on the weight of (I), (II), and (III), of a reinforcement additive selected from the group consisting of:
 - a mixture comprising two interfacial agents wherein:
 - said agents are capable of copolymerization with each other;
 - at least one agent contains at least one reactive olefinic double bond capable of mechanochemical grafting to the polymers;
 - one agent is more highly adsorbable onto the filler surface while the other agent is more highly soluble in the filled polymers; and
 - said agents have a synergy index, S, being greater than zero, which is defined by the formula:

$$S = 50(Q_A + Q_S - 0.2)(1 - 10R_f)(0.5 - \Delta^2)$$

wherein:

Q_A and Q_S are the Alfrey-Price resonance parameters of the most reactive olefinic double bonds in the adsorbable and soluble agents, respectively;

R_f is the relative flow ratio of the adsorbable agent measured by thin layer chromatography on a neutral silica gel using xylene as the eluant and di-n-butyl fumarate as the standard; and

Δ is the difference between the Hildebrand solubility parameter of the soluble agent and that of the major polymer component; and

(ii) a reinforcement promoter having at least two reactive olefinic double bonds, said promoter being characterized by having a promoter index, P, being greater than zero, which is defined by the formula:

$$P = n(n-1)Q(e+2)(1-2R_f)-2.5$$

wherein:

n is the number of olefinic double bonds in the promoter, and has a value of at least 2;

Q and e are the Alfrey-Price resonance and polarity parameters, respectively, of at least one of the olefinic double bonds in the compound;

Q is greater than 0;

e is greater than 0; and

R_f has a value less than 0.5 and is the relative flow ratio of the promoter measured by thin layer chromatography on a neutral silica gel using xylene as the eluant and di-n-butyl fumarate as the standard.

4,873,117

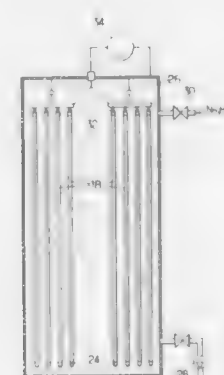
STAINLESS STEEL TUBULAR ELEMENT WITH IMPROVED WEAR RESISTANCE

Dominique Hertz, Tassin, and Jean-Michel Couturier, Villeurbanne, both of France, assignors to Framatome, Courbevoie and Compagnie Generale Des Matieres Nucleaires, Villacoublay, both of, France
Filed Sep. 18, 1987, Ser. No. 97,984

Claims priority, application France, Sep. 18, 1986, 86 13078
Int. Cl.⁴ B05D 3/06; G21C 7/10

U.S. Cl. 427—37

8 Claims



1. A process for manufacturing a control rod sheath for a water-cooled and moderated nuclear reactor, comprising the steps of:

- providing a chromium-nickel stainless steel sleeve;
- closing said sleeve with plugs;
- maintaining said sleeve in a nitrogen-hydrogen atmosphere under a reduced pressure of from 30 to 200 Pascals; and
- striking an electric discharge in said atmosphere for generating nitrogen ions until only a radially outer surface of said sleeve is nitrided over a depth of from 15 to 40 um.

4,873,118

OXYGEN GLOW TREATING OF ZNO ELECTRODE FOR THIN FILM SILICON SOLAR CELL

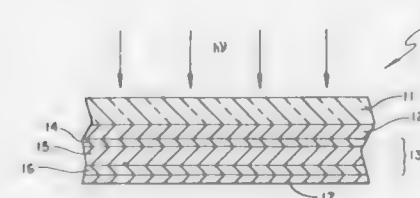
Eric Elias, Los Angeles, and Karl E. Knapp, Tarzana, both of Calif., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Nov. 18, 1988, Ser. No. 273,453

Int. Cl.⁴ B05D 3/06

U.S. Cl. 427—39

13 Claims



1. In a process for production of a photoconductive device wherein a first conductive layer comprising ZnO is applied to a substrate, and a thin film silicon hydrogen alloy is applied to said first conductive layer, the improvement comprising: after applying said first conductive layer comprising ZnO to said substrate, treating said first conductive layer with a glow discharge in a gas containing a source of oxygen.

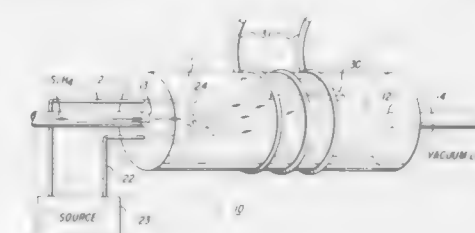
4,873,119

CATALYTIC DEPOSITION OF SEMICONDUCTORS

Masud Akhtar, Lawrenceville, and Herbert A. Weakliem, Pennington, both of N.J., assignors to Chronar Corp., Princeton, N.J.
Filed Jan. 28, 1987, Ser. No. 937,032
Int. Cl.⁴ B05D 3/06

U.S. Cl. 427—39

5 Claims



1. A method of preparing amorphous semiconductors comprising the steps of:

- activating a semiconductane gas, including the hydrides of polyvalent elements, using an activator to produce mononuclear, reactive fragments and gaseous condensation products which serve as precursors for the deposition of an amorphous semiconductor; and
 - controlling the temperature of the activator and the flow rate of the semiconductane gas so that it does not decompose upon the activator;
- wherein the activator is a catalytic member, comprising an electrically heated metal wire coil, which serves to excite a semiconductane gas and bring about the production of precursors without becoming affected thereby.

4,873,120

METHOD OF MANUFACTURING CATHODE-RAY TUBE

Takeo Ito, Fukaya; Hidemi Matsuda, Oomiya; Mamoru Yoshizako, Tokyo, and Osamu Yagi, Kawasaki, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki and Tama Chemicals Co., Ltd., Tokyo, both of, Japan
Filed Dec. 23, 1987, Ser. No. 136,943

Claims priority, application Japan, Dec. 23, 1986, 61-305206

Int. Cl.⁴ B05D 5/06

U.S. Cl. 427—64

1 Claim

1. A method of manufacturing a cathode-ray tube, comprising the steps of:

- condensing and hydrolyzing two or more alkyl silicate monomers in an alcohol solution and in an average range of dimer to hexamer thereby forming, as a condensate a solution containing polyalkyl siloxane;
- coating said solution containing polyalkyl siloxane on a cathode-ray tube faceplate;
- continuing the condensing reaction of said solution containing polyalkyl siloxane to form a polyalkylsiloxane condensate; and
- sintering the polyalkyl siloxane condensate of step (c) to convert same to SiO₂ dehydration and dealcoholation reactions, thereby forming an SiO₂ film on said faceplate.

4,873,121

CATHODE/MEMBRANE ASSEMBLY AND METHOD OF MAKING SAME

Bernad D. Struck, Langerwehe, Herbert Neumeister, and Aristides Naoumidis, both of Jülich, all of Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich GmbH, Jülich, Fed. Rep. of Germany

Division of Ser. No. 34,018, Apr. 1, 1987, abandoned. This application Nov. 6, 1987, Ser. No. 118,416

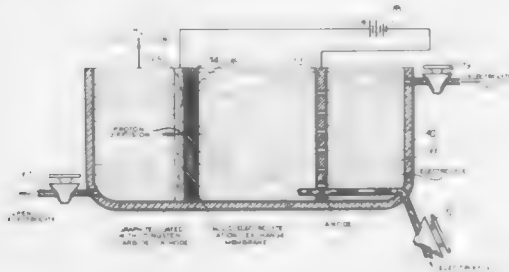
Claims priority, application Fed. Rep. of Germany, Apr. 9, 1986, 3611938

The portion of the term of this patent subsequent to Oct. 27, 2004, has been disclaimed.

Int. Cl.⁴ B05D 5/12; C25B 13/00

U.S. Cl. 427—77

5 Claims



1. A method of making a cathode/membrane assembly for an electrolysis cell capable of producing hydrogen in a cathode compartment thereof, comprising:

a proton-permeable solid-electrolyte ion-exchange membrane; and

on a surface of said membrane turned toward said cathode compartment, a layer of porous graphite in the form of carbonaceous fibers coated with tungsten carbide, said method comprising the steps of:

(a) impregnating a mat of graphite fibers with a solution of para-ammoniumtungstate or tungsten hexachloride;

(b) thermally converting the para-ammonium tungstate or tungstenhexachloride to tungsten oxide on the graphite fibers;

(c) carburizing the tungsten oxide on the graphite fibers to tungsten carbide at a temperature of substantially 620° C. to 950° C. in a carburizing atmosphere, thereby forming a cathode of tungsten-carbide-coated graphite fibers to constitute said layer; and

(d) applying said cathode to a proton-permeable solid-electrolyte ion-exchange membrane by pressing said layer against said membrane to form said assembly.

4,873,122

TREATING LAMINATES WITH A WETTING/REDUCING SOLUTION AFTER DESMEARING WITH PERMANGANATE

Jeffrey Darken, Woking, England, assignor to OMI International Corporation, Warren, Mich.

Filed May 27, 1987, Ser. No. 54,715

Claims priority, application United Kingdom, Jun. 9, 1986, 8611950

Int. Cl.⁴ B05D 5/12, 3/04, 3/10, 1/18

U.S. Cl. 427—97

5 Claims

3. A method of preparing a drilled multi-layer laminate for a printed circuit board for being receptive to the deposition of copper, the method comprising the steps of:

(a) treating the laminate with permanganate to de-smear the drilled holes, thereafter with no intervening treatment,

(b) contacting the laminate with an aqueous composition of a wetting agent having a positively charged quaternary nitrogen atom and a reducing agent compatible with the wetting agent, which reducing agent is selected from:

(i) hydroxylamine and salts thereof; and
(ii) oxalic acid and salts thereof, and mixtures thereof,
(c) when there is an external copper layer on a said laminate, mildly etching said copper layer to render its adhesives qualities suitable for the deposition of electroless copper thereon,

(d) contacting the laminate with an acidic solution, and

(e) contacting the laminate with a composition for depositing catalyst for rendering the laminate's surfaces catalytic to the deposition of copper on them.

4,873,123

FLEXIBLE ELECTRICAL CONNECTION AND METHOD OF MAKING SAME

Michael J. Canestaro, Endicott, and William J. Summa, Endwell, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 915,485, Oct. 6, 1986, Pat. No. 4,728,751.

This application Sep. 29, 1987, Ser. No. 102,447

Int. Cl.⁴ B05D 5/12

U.S. Cl. 427—96

9 Claims



1. A method for making a flexible electrical connection on a substrate made primarily of an organic material for carrying an electronic device, comprising the steps of:

placing a layer of copper on the substrate;

covering all of the copper layer on the substrate with a mask, except for area (s) of the substrate which is to have relatively high adhesion;

removing all of the copper layer not covered by the mask; removing the mask;

treating the surface of the substrate, including the part (s) of the copper layer left on the substrate, with a cationic surfactant whereby the part (s) of the copper layer left on the substrate and treated with the cationic surfactant form a relatively low adhesive area (s); and

forming at least one circuit line on the substrate, with said circuit line having a terminus with a stress relief bend floating on the relatively low adhesive area of the substrate.

4,873,124

HEAT STABLE PREPASTES FOR WALLCOVERINGS

Arshad-Ul-Haq Chaudhry, Wellingborough, England, assignor to Scott Bader Company Limited, Wellingborough, England

Filed Jun. 14, 1988, Ser. No. 206,274

Claims priority, application United Kingdom, Jun. 16, 1987, 8714004

Int. Cl.⁴ B05D 3/02, 5/10

U.S. Cl. 427—207.1

21 Claims

1. A method of producing a prepasted wallcovering, which method comprises applying to a substrate suitable for covering a wall a paste composition comprising a water-in-oil emulsion containing effective amount of a water-soluble polymer, and a surfactant, the water-soluble polymer being essentially wholly anionic but containing a minor amount of crosslinking residues derived from a polyfunctional monomer, and the paste composition having a pH of at least 7.

4,873,125

METHOD FOR FORMING DEPOSITED FILM

Jinsho Matsuyama, Nagahama; Yutaka Hirai, Hikone; Masao Ueki, Urayasu, and Akira Sakai, Nagahama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

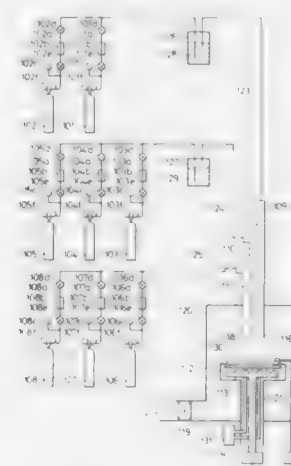
Filed Mar. 26, 1987, Ser. No. 30,115

Claims priority, application Japan, Mar. 31, 1986, 61-073092

Int. Cl.⁴ C23C 16/00

U.S. Cl. 427—248.1

14 Claims



1. A method for forming a deposited film using starting materials (A) and (B), which comprises:

introducing one of the starting materials into a film forming space having a substrate therein; said substrate having a surface with crystal orientability;

allowing said one starting material to adsorb onto said surface of said substrate to thereby form an adsorption layer; and

introducing the other starting material into said film forming space, to thereby cause a surface reaction on said adsorption layer to form a deposited film; said starting material (A) being a gaseous starting material for forming a deposited film; and starting material (B) being a gaseous halogen oxidizing agent capable of having an oxidative action on said starting material (A).

4,873,126

SYSTEM AND PROCESS FOR SPOTTING REAGENTS ON POROUS SUPPORTS

Timothy G. Bloomster, Shrewsbury, Pa.; Hans H. Feindt, Parkton, Md.; Gerald D. Hahn, Lothian, Md., and S. Melissa Maret, Damascus, Md., assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed Aug. 15, 1988, Ser. No. 232,209

Int. Cl.⁴ B05D 3/00; B05C 3/18, 3/20

U.S. Cl. 427—282

18 Claims



1. A method of coating at least one reagent onto a porous support comprising:

providing a cover having an upperside, an underside, and an aperture therethrough; the cover having secured to its underside an upper surface of the porous support so that the porous support covers the aperture on the underside of the cover;

positioning the cover in a coating station with its aperture

between a dispensing assembly above the cover having a dispensing cannula and a fluid collection head below the cover;

decreasing the distance between the dispensing assembly and the fluid collection head until the fluid collection head contacts the lower surface of the porous support and the dispensing cannula is sufficiently close to the porous support that a fluid dispensed through the dispensing cannula will contact the porous support within an area defined by the aperture; and

dispensing reagent from the dispensing cannula while reducing the pressure in the fluid collection head so that fluid in the reagent is pulled through the porous support.

5. A system for coating at least one reagent on a porous support secured to an underside of a cover, the cover having guide means associated therewith and an aperture therethrough which is covered by the porous support comprising:

a slotted guide channel having upper and lower surfaces, the upper surface having a slot along its length which is dimensioned to receive the guide means of the cover and the lower surface having an opening therethrough;

a coating station having a dispensing assembly and a fluid collection head, the coating station being positioned with the dispensing assembly above the slot and the fluid collection head below the opening in the channel,

the dispensing assembly having a dispensing cannula, and the fluid collection head having vacuum means for pulling fluid in a reagent dispensed from the dispensing cannula through a porous support positioned in the guide channel; and

reciprocating means for decreasing the distance between the dispensing assembly and the fluid collection head so that a porous support and its cover positioned in the guide channel between the dispensing assembly and the fluid collection head is contacted by the fluid collection head on its lower surface and is sufficiently close to the dispensing cannula that a reagent dispensed from the dispensing cannula will contact the porous support in the area defined by the aperture in the cover.

4,873,127

METHOD OF MAKING HEAT TRANSFER TUBE

Kagetoshi Onodera, Chiba; Tatsuya Koizumi; Toshiyuki Kato, both of Tokyo; Junji Sotani; Masauki Momo, both of Yokohama, and Shuichi Furuya, Kawasaki, all of Japan, assignors to The Fukura Electric Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 77,073, Jul. 24, 1987, abandoned, which is a continuation of Ser. No. 846,606, Mar. 31, 1986, abandoned.

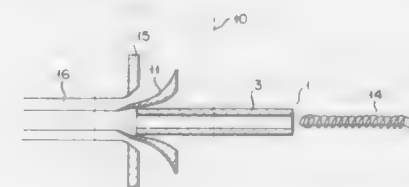
This application Jun. 21, 1988, Ser. No. 211,084

Claims priority, application Japan, Oct. 3, 1983, 58-153468[U]; Aug. 2, 1984, 59-163419; Sep. 28, 1984, 59-147112[U]; Oct. 19, 1984, 59-158019[U]; Feb. 18, 1985, 60-21751[U]; Mar. 18, 1985, 60-38634[U]; Apr. 17, 1985, 60-57095[U]; Oct. 30, 1985, 60-167199[U]

Int. Cl.⁴ B05D 3/02, 7/14

U.S. Cl. 427—376.8

3 Claims



1. A method of manufacturing a heat transfer tube, comprising the steps of:

placing an intermediate metal layer having a low melting point around an inner tube formed of copper or steel; heating the intermediate layer to a temperature above its melting point to metalurgically bond it to the inner tube; and coating the molten intermediate layer with lead or a lead alloy while the intermediate layer is in a molten state to form an outer layer around the inner tube.

4,873,128

PROCESS FOR PULTRUDING FIBER REINFORCED PHENOLIC RESIN PRODUCTS

Chen-chi M. Ma, Bartlesville, Okla., and Wen-cheng Shih, Taichung, Taiwan, assignors to National Science Council, Taiwan

Filed Mar. 7, 1988, Ser. No. 164,548
Int. Cl.⁴ B05D 1/18; B29G 2/00, 7/00

U.S. Cl. 427-434.7

15 Claims

1. A process for pultruding fiber reinforced phenolic resin products which comprises drawing a plurality of continuous filaments through an impregnating bath of liquid phenolic resin to saturate the filaments with said resin and a squeeze orifice for removal of excess resin and air, and continuously pulling the resin filament composite through a pultrusion die to heat and cure said resin, characterized in that the liquid phenolic resin normally has a viscosity ranging from 3,000 to 5,000 cps at 25° C. and is heated to 45°-65° C. to have a viscosity ranging from 800 to 2,000 cps during the impregnating step, wherein the pultrusion die has at least three zones therein and the last zone has a temperature below the temperature of a preceding zone.

4,873,129

MAGNETIC RECORDING MEDIUM

Hajime Fukke, Tama, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 16, 1988, Ser. No. 156,457

Claims priority, application Japan, Feb. 18, 1987, 62-33248
Int. Cl.⁴ G11B 5/70

U.S. Cl. 428-694

8 Claims

1. A coating magnetic recording medium which comprises a non-magnetic substrate and at least two magnetic films different from one another formed on said substrate, each of said films comprising a ferromagnetic powder dispersed in a polymeric binder and being provided on the same side surface of the non-magnetic substrate in different regions; each of said magnetic films being formed separately by a process comprising coating on the non-magnetic substrate a coating material which contains a radiation-curable resin in the polymeric binder, then, by means of photolithography, leaving only a desired part behind and removing another part with an organic solvent and, thereafter, curing the desired part on the non-magnetic substrate.

4,873,130

COATING PROCESS FOR THE PREPARATION OF COHERENT PROTECTIVE LAYER

John W. Nicholson, Hampton, and Alan D. Wilson, Liphook, both of England, assignors to National Research Development Corporation, England

Continuation of Ser. No. 846,904, Apr. 1, 1986, abandoned. This application Aug. 22, 1988, Ser. No. 235,389

Claims priority, application United Kingdom, Apr. 1, 1985, 8500461

Int. Cl.⁴ B27N 5/02; B05D 3/02

U.S. Cl. 428-35.8

14 Claims

1. A process for the preparation of a coherent protective layer on a substrate surface of a body, the substrate surface comprising elemental metal or an alloy thereof, which process comprises reacting (i) a compound of a group IA metal, effective in aqueous media to convert a free carboxylic acid group to a carboxylate group with (ii) an aqueous solution consisting of water and a homopolymer of a mono- or polybasic ethylen-

cally unsaturated acid or a copolymer of a mono- or polybasic ethylenically unsaturated acid comprising at least 40 mol % of polymerized unsaturated carboxylic acid residues, the amount of (i) being sufficient to neutralize from 5 to 20% of the acid groups of said homo- or copolymer (ii); applying to the substrate surface the aqueous solution consisting of water and partially neutralized homo- or copolymer of a mono- or polybasic ethylenically unsaturated acid resulting from said reaction; and heat-curing the layer so formed at a temperature above 180° C.

4,873,131

OPTICAL RECORDING MEDIUM

Toshihiro Kashima, Ootsu, and Minoru Fukuda, Nagaokakyō, both of Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka, Japan

Filed Mar. 23, 1988, Ser. No. 172,142

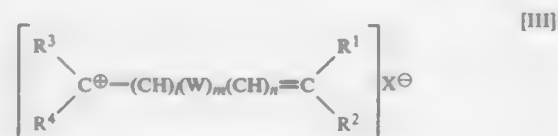
Claims priority, application Japan, Mar. 23, 1987, 62-69736; Mar. 30, 1987, 62-79397; Apr. 8, 1987, 62-85948; Apr. 9, 1987, 62-87673; Jul. 2, 1987, 62-165943; Jul. 7, 1987, 62-170443

Int. Cl.⁴ B32B 3/02; G11B 3/70

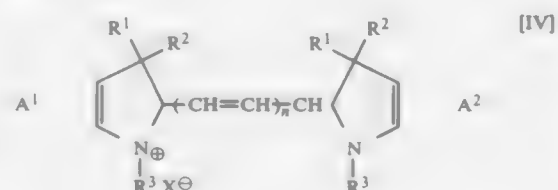
U.S. Cl. 428-64

3 Claims

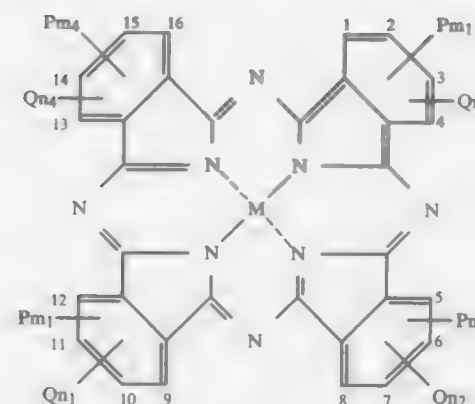
1. An optical recording medium having a thin film layer consisting mainly of an organic dye and formed on a substrate, characterized in that said thin film layer consists mainly of a dye mixture comprising a polymethine dye (A) and an azannulene dye (B), the polymethine dye (A) being selected from those represented by the general formula (III) and (IV):



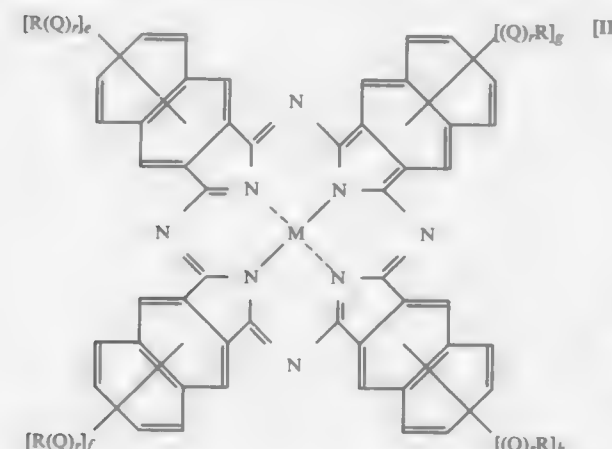
wherein each of R¹, R², R³ and R⁴ represents hydrogen atom, alkyl group, substituted alkyl group, aryl group, substituted aryl group or heterocyclic group W represents a cyclohexene ring or a condensed ring containing at least one cyclohexene ring or at least one substituted cyclohexene ring; of the 1 and n represents 0 or an integer of 1 to 3 and satisfies the relation 0 < n < 5; m is a number of 0 or 1; and X⁻ represents an anion; and,



wherein n is 0 or an integer of from 1 to 3; R¹, R² and R³ may be the same or different and each represents an alkyl group having 1 to 6 carbon atoms; X represents halogen, perhalogenate, boron tetrafluoride, toluenesulfonate or alkyl sulfate; each of A¹ and A² represents benzene ring or naphthyl ring and each of these rings may be substituted by any of alkyl groups, alkoxy groups, hydroxy group, carboxyl group, halogen, aryl groups and alkylcarboxyl groups, and the azannulene dye (B) being selected from those represented by the general formula and:



wherein the numerals 1 to 16 denote the respective carbon atom positions; each of m₁, m₂, m₃ and m₄ represents the number of groups P which may be same or different and the number is an integer of from 0 to 4; each of n₁, n₂, n₃ and n₄ represents the number of groups Q which may be the same or different and the number is an integer of from 0 to 4; two or more of the carbon atoms bearing the numbers 1 to 16 are substituted amino, imino, nitro, cyano, sulfonic acid, sulfonate, sulfonyl, hydroxyl and halogen; 3 to 8 of the carbon atoms bearing the numbers 1 to 16 are substituted by the groups Q; Q is represented by (Z)/R wherein Z represents —CH₂—, —O—, —CONH— or —COO— and R represents a straight or branched alkyl group or aryl group and r represents a number of 0 or 1; and M represents hydrogen, metal, metal oxide, metal hydroxide or metal halide;



wherein —[Q]rR represents substituents which may be same or different, Q is any of —O—, —CONR'—, —NR'CO—, —COO— and —OCO—, wherein R' is hydrogen or alkyl group having 4 or less carbon atoms, R represents a group selected from straight or branched alkyl groups having 4 to 18 carbon atoms, and aryl and cyclohexyl groups having 6 to 18 carbon atoms; e, f, g and h represent the numbers of the respective substituents and each of them is a number of 0 to 4, (e+f+g+h) being > 3; M represents hydrogen, metal, metal oxide, metal hydroxide or metal halide; and r represents a number of 0 or 1; the dyes (A) and (B) being those in which the maximum absorption wavelength λ_{max}A (nm) of the dye (A) and the maximum absorption wavelength λ_{max}B (nm) of the dye (B) satisfy the relation defined by the formula:

$$-80 \leq \lambda_{\max} B - \lambda_{\max} A \leq 300,$$

the ratio of the dye(A)/dye(B) being 95/5 to 10/90.

4,873,132

SURFACE PROTECTOR WITH EXPANSIBLE POCKET

Wallace R. Jones, Waite Hill Village, and Robert A. Isaksen, Chardon, both of Ohio, assignors to The Excello Specialty Company, Cleveland, Ohio

Continuation of Ser. No. 883,826, Jul. 9, 1986, Pat. No.

4,696,848. This application Sep. 21, 1987, Ser. No. 98,805

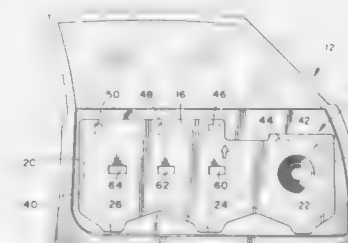
The portion of the term of this patent subsequent to Sep. 29,

2004, has been disclaimed.

Int. Cl.⁴ B32B 3/02

U.S. Cl. 428-80

9 Claims



1. A shield device for use in protecting a surface comprising: (a) a generally flat and relatively thin sheet of flexible plastic material having a peripheral edge shaped to generally conform to the shape of the surface to be protected; and, (b) a predetermined area of said sheet being at least partially enclosed by a series of relatively small and closely spaced deformations formed to extend outwardly of the plane of the sheet a short distance for permitting said predetermined area to be selectively deflected laterally of the plane of the sheet to form a pocket for generally conforming to a discontinuity in said surface, said predetermined area being substantially in the plane of said sheet until an external force is applied to produce lateral deflection.

4,873,133

FIBER REINFORCED STAMPABLE THERMOPLASTIC SHEET

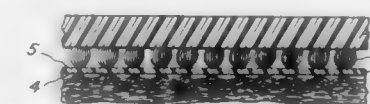
Harold F. Giles, Jr., Cheshire, Mass., assignor to General Electric Company, Pittsfield, Mass.

Filed Sep. 11, 1986, Ser. No. 905,995

Int. Cl.⁴ B32B 5/06, 5/12, 17/04, 27/12, 31/20

U.S. Cl. 428-107

18 Claims



1. A fiber reinforced stampable sheet obtained by laminating (a) a thermoplastic resin surface layer and (b) a reinforcing fiber mat comprising (i) a thermoplastic resin support film having a melting point below the temperature of lamination and (ii) long fibers penetrating the support film and positioned by said support film, a major portion of said long fibers being positioned on one side of said support film, a minor portion of said long fibers being positioned on an opposite side of said support film, said minor portion of fibers being positioned adjacent said surface layer.

4,873,134

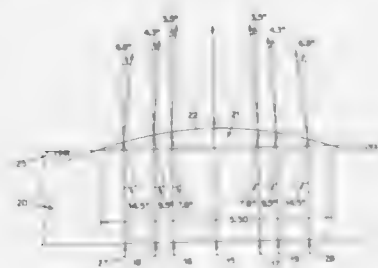
HOT MELT INK PROJECTION TRANSPARENCY

Steven J. Fulton, Hanover, N.H.; Charles W. Spehrley, Jr., Hartford, Vt., and Lawrence R. Young, West Lebanon, N.H., assignors to Spectra, Inc., Hanover, N.H.

Filed Aug. 10, 1988, Ser. No. 230,797
Int. Cl.⁴ B41M 5/00

U.S. Cl. 428—156

7 Claims



1. A transparency comprising a transparent substrate and an ink pattern on the surface of the substrate containing a plurality of three-dimensional ink spots having curved surfaces, wherein the contact angle of the spots with the substrate is no more than about 25°.

4,873,135

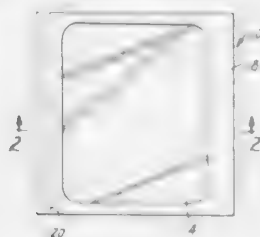
PREFRAMED TRANSPARENCY FILM HAVING IMPROVED FEEDING RELIABILITY

Bruce W. Wittnebel, White Bear Lake; Kerry D. Reimer, Hugo, and Leonard F. Miller, Lakeland, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jan. 29, 1988, Ser. No. 149,856
Int. Cl.⁴ B32B 23/02; G03G 15/04

U.S. Cl. 428—192

9 Claims



1. A sheet material suitable for preparing visual transparencies comprising

- (a) a backing that is transparent to visible light,
- (b) an image receptive layer transparent to visible light adhered to at least one major surface of said backing,
- (c) an anti-blocking layer transparent to visible light adhered to at least one major surface of said backing,

said sheet material having an opaque border extending around the periphery thereof, said sheet material further having an area of increased caliper along one edge thereof, said area extending inward from said edge for a distance not exceeding the width of said opaque border along said edge, said increased caliper being effected by a strip of thin material adhesively applied to one of said anti-blocking layer or said image receptive layer, said increased caliper being of sufficient thickness so as to provide an air gap between the leading edge of an adjacent like sheet material when said sheet materials are disposed in a stack.

9. A sheet material suitable for preparing visual transparencies comprising

- (a) a backing that is transparent to visible light,
- (b) an image receptive layer transparent to visible light adhered to at least one major surface of said backing,

(c) an anti-blocking layer transparent to visible light adhered to at least one major surface of said backing,

said sheet material having an opaque border extending around the periphery thereof, said sheet material further having an area of increased caliper along one edge thereof, said area extending inward from said edge for a distance not exceeding the width of said opaque border along said edge, said increased caliper being effected by a printed coating, said increased caliper being of sufficient thickness so as to provide an air gap between the leading edge of an adjacent like sheet material when said sheet material are disposed in a stack.

4,873,136

METHOD FOR PREPARING POLYMER SURFACES FOR SUBSEQUENT PLATING THEREON, AND IMPROVED METAL-PLATED PLASTIC ARTICLES MADE THEREFROM

Donald F. Foust; Edward J. Lamby, both of Scotia; Bradley R. Karas, Amsterdam; William V. Dumas, Delanson, and Elihu C. Jerabek, Glenmont, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jan. 16, 1988, Ser. No. 207,462

Int. Cl.⁴ B32B 3/00; 7/00; B44C 1/22; H05K 1/00

U.S. Cl. 428—209

32 Claims

27. An article comprising

- (A) a polyimide substrate which has been pretreated by mild etching of the surface, contact of the surface with a basic solution, and contact of the surface with a cationic surfactant which is capable of removing a residual film formed on the surface after the mild etching step, followed by treatment with an adhesion-promoting compound;
- (B) an electrolessly-applied metal layer disposed on the substrate; and
- (C) an electrolytically-applied metal layer free of chemical additives disposed on top of the electrolessly-applied layer.

4,873,137

FOOD TRAY

Edward J. Deyrup, Northeast, Md., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 2, 1988, Ser. No. 201,234

Int. Cl.⁴ B32B 7/02

U.S. Cl. 428—216

21 Claims

1. A rigid composite structure comprising at least one core layer comprising a thermoplastic polymeric material and at least one outer layer on each side of the core layer comprising polyethylene terephthalate and about 10 to about 60 percent glass flake, based on the weight of the outer layers, wherein the core layer comprises about 25% to about 90% of the thickness of the composite structure.

4,873,138

METALLIC THIN FILM TYPE MAGNETIC RECORDING MEDIUM

Tsutomu Okita, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 90,382, Aug. 27, 1987, abandoned, which is a continuation of Ser. No. 757,581, Jul. 22, 1985, abandoned, which is a continuation of Ser. No. 582,666, Feb. 23, 1984, abandoned. This application Oct. 18, 1988, Ser. No. 309,327

Claims priority, application Japan, Feb. 24, 1983, 58-28644

Int. Cl.⁴ G11B 5/64

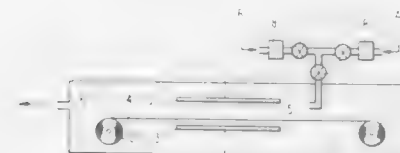
U.S. Cl. 428—336

28 Claims

1. A magnetic recording medium comprising:

- a polymer support base;
- a ferromagnetic metal thin film on the polymer support base;
- a plasma polymerization layer having a thickness of 20 to 270 Å as provided on the ferromagnetic metal thin film by plasma polymerization of a gaseous low molecular com-

ound at a pressure of the gaseous low molecular compound of from 1 to 1×10^{-4} Torr; and
a lubricating layer on the plasma polymerization layer, wherein said lubricating layer is formed from a compound which has a carbon-carbon unsaturated group at a termi-



nal position thereof and contains at least 8 carbon atoms, and being strongly bound onto the plasma polymerization layer after plasma polymerization by reaction of radical active sites generated by the plasma polymerization and the carbon-carbon unsaturated bonds.

4,873,139

CORROSION RESISTANT SILVER AND COPPER SURFACES

David S. Kinosky, Austin, Tex., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 29, 1988, Ser. No. 174,837

Int. Cl.⁴ B32B 27/06

U.S. Cl. 428—341

6 Claims

1. An article comprising a plastic film having a layer of silver supported thereon, wherein said silver layer has been contacted with a compound selected from the group consisting of 2-mercaptobenzoxazole and 1-phenyl-1H-tetrazole-5-thiol; wherein said compound is present on said silver layer in an amount of at least about 0.001 gram per square meter; and further comprising a film-forming coating on said silver layer.

4,873,140

ARTICLES HAVING LOW ADHESION ARTICLES HAVING COATINGS THEREON

Daniel K. McIntyre, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Apr. 27, 1988, Ser. No. 186,955

Int. Cl.⁴ C09J 7/02; B32B 27/08

U.S. Cl. 428—343

16 Claims

12. A pressure-sensitive adhesive tape comprising a flexible substrate having a low surface energy coating on one surface thereof, said coating comprising an in situ polymerized mono-functional poly(perfluoropropyleneoxy) acrylate or methacrylate oligomer, the poly(perfluoropropyleneoxy) segments of which have a number average molecular weight of about 1200 to 10,000, and said substrate having a pressure-sensitive adhesive on the second surface of said substrate opposite said low surface energy coated surface.

4,873,141

HIGH MECHANICAL STRENGTH WATER RESISTANT INSULATING MATERIAL AND A METHOD FOR PREPARING THE SAME

Vida Popovic, Kraljevo, Yugoslavia, assignor to Quill-Quartz GmbH, Munich, Fed. Rep. of Germany

Filed Apr. 2, 1986, Ser. No. 847,200

Claims priority, application Yugoslavia, Apr. 13, 1985, 553185

Int. Cl.⁴ D02G 3/00

U.S. Cl. 428—357

4 Claims

1. A calcium-hydrosilicate based material having thermal and electrical insulating properties, sound and vibration damping properties, high mechanical strength, and permanent water and CO₂ resistance, comprising at least 80% by weight of 11 Å tobermorite having a fibrous structure, said material comprising a bulk density of about 100–280 kg/m³, an apparent thermal conductivity of about 0.06978–0.1 W/mK, a compressive resistance of about 1,500,000–1,900,000 n/m², a maximum

linear shrinkage of 2% after 24 hours at a mean temperature of 1273.15° K., thermal stability at temperatures exceeding 1573° K., and a flexural strength of 980,600–1,000,000 N/m².

4,873,142

ACRYLIC FIBERS HAVING SUPERIOR ABRASION/FATIGUE RESISTANCE

Hartwig C. Bach, Pensacola, Fla., assignor to Monsanto Company, Del.

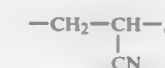
Continuation of Ser. No. 847,991, Apr. 3, 1986, abandoned. This application Sep. 30, 1987, Ser. No. 104,555

Int. Cl.⁴ D02G 3/00

U.S. Cl. 428—359

4 Claims

1. A wet-spun tow consisting of at least 1000 filaments consisting of a copolymer of acrylonitrile and one or more vinyl monomers copolymerizable therewith, wherein from 85% to 98% by weight of its units are acrylonitrile units of the formula



said filaments being characterized in having a mercury density greater than 1.0 grams/cc, an average flex fatigue parameter of at least -0.11 , a tenacity of at least 2.0 gpd, knot strengths of at least 90% of the tenacity and an elongation in the range of 35% to 60% and in containing from 0.001 to 1.0% by weight of dimethylformamide.

4,873,143

WATER-SWELLABLE FIBER

Koji Tanaka, Okayama, Japan, assignor to Japan Exlan Company Limited, Osaka, Japan

Continuation-in-part of Ser. No. 32,720, Apr. 1, 1987, abandoned. This application Sep. 20, 1988, Ser. No. 246,959

Claims priority, application Japan, May 6, 1986, 61-104140

Int. Cl.⁴ D02G 3/00

U.S. Cl. 428—373

2 Claims

1. A water-swellaable fiber exhibiting a degree of water swelling of 3 times or more and satisfying the following requirements (a)–(f):

- (a) it is composed of a hydrophilic crosslinked polymer (I) and another polymer (II),
- (b) it has a cross-sectional structure such that at least a part of the polymer (I) is situated as an outer layer,
- (c) the proportion of the polymer (I) is not larger than 60% based on the total volume of the fiber,
- (d) it contains and links carboxyl groups thereto in a quantity of from 0.3 to 4.0 m mol/g,
- (e) the degree of neutralization of the carboxyl groups is less than 0.1, and
- (f) the degree of water swellability is 10 times or less, by causing to adhere to said fiber such a quantity of carbonate or hydrogen carbonate whose cationic component is an alkali-metal as to make the degree of neutralization of the carboxyl groups from 0.1 to 0.7.

2. A water-swellaable polyacrylonitrile fiber exhibiting a degree of water swelling of 3 times or more and satisfying the following requirements (a)–(f):

- (a) it has a cross-sectional structure having an outer layer of a hydrophilic crosslinked acrylonitrile polymer (I) and a core of an uncrosslinked acrylonitrile fiber (II),
- (b) the proportion of the polymer (I) is not larger than 60% based on the total volume of the fiber,
- (c) it contains and links carboxyl groups thereto in a quantity of from 0.3 to 4.0 m mol/g,
- (d) the degree of neutralization of the carboxyl groups is less than 0.1, and
- (e) the degree of water swellability is 10 times or less, by causing to adhere to said fiber such a quantity of carbonate

or hydrogen carbonate whose cationic component is an alkali-metal as to make the degree of neutralization of the carboxyl groups from 0.1 to 0.7.

4,873,144

FIBER FOR COMPOSITE REINFORCEMENT WITH ANTI-BLOCKING FINISH

Robert M. Marshall, Chester, Va., assignor to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Nov. 4, 1985, Ser. No. 794,366

Int. Cl.⁴ D02G 3/00

U.S. Cl. 428—395

15 Claims

1. A high tenacity reinforcing fiber selected from the group consisting of polyester, aliphatic polyamide, and combinations thereof, for reinforcing plastic composites, said fiber being coated with a composition comprising:

- (a) an aqueous solution of carboxyl-terminated, oil-free alkyd resin consisting essentially of the reaction product of at least one aliphatic glycol containing 2 to 12 carbons with a combination of aromatic di- and trifunctional carboxylic acids, said resin having a degree of esterification below the gel point of the resin to enhance stiffness of the fiber for cutting, and
- (b) an aqueous emulsion of oxidized polyethylene, said oxidized polyethylene being present in an amount sufficient to provide enhanced anti-blocking properties to the coated fiber.

4,873,145

RESIN-COATED AGGREGATES

Takeji Okada, Yokohama; Minoru Sawaide, Narashino; Minoru Imai, Yokohama, and Daisuke Tachibana, Tokyo, all of Japan, assignors to Shimizu Construction Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 738,603, May 28, 1985, abandoned. This application Nov. 26, 1986, Ser. No. 935,182

Claims priority, application Japan, May 31, 1984, 59-111609; May 31, 1984, 59-111610

Int. Cl.⁴ C04B 7/02; B05D 7/00

U.S. Cl. 428—407

12 Claims

1. A substantially water-resistant resin coated aggregate for use in concrete comprising a porous aggregate body and a water-resistant layer having a thickness of from about 20 to about 50 μ m made of a mechanically strong phenol resin coated on said porous aggregate body, said porous aggregate body selected from the group consisting of artificial light weight aggregates and natural light weight aggregates said mechanically strong phenol resin comprising a reaction product of novolak and hexamethylenetetramine.

4,873,146

TRANSPARENT FIRE-SCREENING PANELS

Francois Toussaint, Montignies-le-Tilleul, and Pierre Goeliff, Nalinnes, both of Belgium, assignors to Glaverbel, Brussels, Belgium

Filed Nov. 27, 1987, Ser. No. 125,994

Claims priority, application Luxembourg, Dec. 1, 1986, 86691 Int. Cl.⁴ B32B 9/00; B27N 9/00; C09K 21/00

U.S. Cl. 428—428

19 Claims

18. A process of manufacturing a transparent fire-screening glazing panel comprised of at least one solid layer of intumescent material comprising a hydrated alkali metal silicate held sandwiched between two sheets of glazing material, the process comprising:

- incorporating at least one silicate-stabilizing agent which inhibits loss of transparency by haze formation in the at least one solid intumescent material layer into an aqueous solution of said hydrated alkali metal silicate;
- drying said aqueous solution to form grains; and
- sandwiching said grains between said two sheets of glazing material.

4,873,147

PROCESS FOR WATERPROOFING STARCH BINDERS

Johannes J. Jansen; Bernardus H. F. Mossou, and Hans Poort, all of Veendam, Netherlands, assignors to Coöperatieve Verkoop- en Productievereniging van Aardappelmeel en Derivaten 'AVEBE' B.A., Veendam, Netherlands

Filed Feb. 11, 1988, Ser. No. 155,042

Claims priority, application Netherlands, Feb. 11, 1987, #700320

Int. Cl.⁴ B32B 3/26, 5/16, 23/04

U.S. Cl. 428—533

5 Claims

1. A process for applying waterproof starch layers to substrates, which comprises the steps of applying an aqueous starch dispersion containing a starch-reacting waterproofing agent to the substrate and then drying same, wherein the waterproofing agent or a catalyst which catalyzes the reaction of the waterproofing agent with the starch molecules is distributed through the starch dispersion enclosed in microcapsules, and wherein after applying said starch dispersion to the substrate, the waterproofing agent is reacted with the starch molecules by breaking down the microcapsules, thus releasing said agent or said catalyst.

5. A substrate provided with a waterproof starch layer prepared by the process according to any one of claims 1-4.

4,873,148

COATED METALLIC PARTICLES AND PROCESS FOR PRODUCING SAME

Preston B. Kemp, Jr., Athens, and Robert J. Holland, Sr., Sayre, both of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Continuation of Ser. No. 918,181, Oct. 14, 1986, Pat. No. 4,818,567. This application Sep. 19, 1988, Ser. No. 233,394

Int. Cl.⁴ B22F 1/00; B32B 5/16

U.S. Cl. 428—570

7 Claims

1. Metallic coated particles comprising a core consisting essentially of a material selected from the group consisting of metals, metal alloys, ceramics, and ceramic glasses, and a coating consisting essentially of a relatively ductile and/or malleable metallic material selected from the group consisting of metals and metal alloys, said coated particles being produced by a process comprising the steps of (a) increasing the aspect ratio of relatively ductile and/or malleable metallic powder particles selected from the group consisting of metal powder particles and metal alloy powder particles to greater about 50 to 1 by relatively high speed milling, and (b) mechanically applying the resulting ductile and/or malleable metallic particles having the increased aspect ratio to a powder material selected from the group consisting of metal powder particles, metal alloy powder particles, ceramic powder particles, and ceramic glass powder particles, by relatively low speed milling, said powder material being sufficiently less deformable than said ductile and/or malleable metallic powder to allow said ductile and/or malleable particles to coat said powder material.

4,873,149

VIBRATION-DAMPER METAL SHEETS

Kenichi Shinoda; Tomoyoshi Iwao; Tomoaki Isayama, and Yuchi Higo, all of Hiroshima, Japan, assignors to Nisshin Steel Co., Ltd., Tokyo, Japan

PCT No. PCT/JP87/00402, § 371 Date Mar. 28, 1988, § 102(e) Date Mar. 28, 1988, PCT Pub. No. WO87/07872, PCT Pub. Date Dec. 30, 1987

PCT Filed Jun. 18, 1987, Ser. No. 177,524

Claims priority, application Japan, Jun. 20, 1986, 61-142709; Aug. 1, 1986, 61-180151

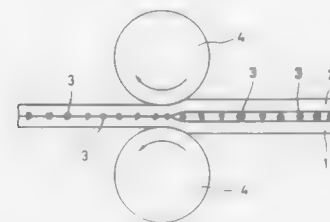
Int. Cl.⁴ B32B 7/00

U.S. Cl. 428—609

10 Claims

1. A vibration-damping metal sheet, comprising: metal plates, and minute inclusions joining said metal plates together, said

minute inclusions being substantially and uniformly present between said metal plates and biting into said metal plates, said metal plates contacting each other but not



being metallurgically joined to each other at portions where said minute inclusions are not present, said minute inclusions biting into a projection area of 0.5 to 50% of the area of said metal plates.

4,873,150

HIGH WATER-RESISTANT MEMBER, AND VALVE GEAR USING THE SAME FOR USE IN INTERNAL COMBUSTION ENGINE

Masayuki Doi, Katsuta; Naotatsu Azahi, Matsudo; Yoshitaka Kojima, Hitachi; Hisanobu Kanamaru, Katsuta, and Susumu Aoyama, Kashiwa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

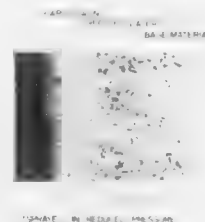
Filed Oct. 26, 1987, Ser. No. 112,493

Claims priority, application Japan, Oct. 27, 1986, 51-255261

Int. Cl.⁴ F01L 1/00

U.S. Cl. 428—627

37 Claims



35. A valve gear for use in an internal combustion engine which is adapted to employ a thrust generated by the rotation of a cam to cause a valve stem to reciprocally move, said valve gear comprising metal members which are maintained in sliding contact with each other, at least one of said metal members having a sliding surface provided with a hardened and tempered sprayed layer consisting essentially of, by weight, 2 to 10% C, 18 to 60% Cr, 0.3 to 20% V, 25% or less Mo, 25% or less W, 10% or less Nb, 10% or less Ti, 10% or less Zr, 10% or less Hf and the balance being Fe in a proportion of 20% or greater, said sprayed layer having a surface hardness of 1000 Hv or greater and having a martensite-phase matrix containing at least carbide particles with a width of 3 μ m or less and an areal ratio of 25 to 90% and said sprayed layer further having a surface provided with a carburized layer, a nitrided layer or a carbonitrided layer.

4,873,151

ALUMINUM NITRIDE CIRCUIT SUBSTRATE

Hideki Sato, and Nobuyuki Mizunoya, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 8, 1987, Ser. No. 71,132

Claims priority, application Japan, Jul. 11, 1986, 61-161784 The portion of the term of this patent subsequent to Aug. 2, 2005, has been disclaimed.

Int. Cl.⁴ B32B 15/04

U.S. Cl. 428—627

17 Claims

1. An aluminum nitride circuit substrate comprising: an aluminum nitride plate comprising a bonding surface; and a conductive material having a thermal expansion coefficient substantially similar to that of AlN bonded to said aluminum nitride plate through a metallized layer formed on the bonding surface of the aluminum nitride plate, said conductive material being of a metallic material which has a thermal expansion coefficient of 2×10^{-6} to 6×10^{-6} /°C.

4,873,152

HEAT TREATED CHEMICALLY VAPOR DEPOSITED PRODUCTS

Diwakar Garg, Macungie, Pa.; Paul N. Dyer, Allentown, Pa., and Duane Dimos, Upper Mount Clair, N.J., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Feb. 17, 1988, Ser. No. 157,550

The portion of the term of this patent subsequent to Aug. 8, 2006, has been disclaimed.

Int. Cl.⁴ B32B 15/04

U.S. Cl. 428—627

5 Claims



1. A coated substrate product which comprises a fine-grained, non-columnar outer coating and a columnar intermediate layer of tungsten between said substrate and said outer coating, said outer coating comprising a chemical vapor deposited mixture of tungsten and tungsten carbide wherein the tungsten carbide phase consists of W_2C or W_3C or a mixture of W_2C and W_3C and wherein the coated substrate has been heat treated at a temperature in the range from about 300° C. to about 500° C. in a non-reactive atmosphere for a period of time sufficient to confer substantially higher erosion and abrasive wear resistance to the outer coating than the coating in its unheat treated condition but which does not result in substantial degradation of the mechanical properties of the substrate and has a substantially layered substantially uniform microstructure substantially free of cracks.

4,873,153

HOT-DIP GALVANIZED COATING FOR STEEL

George T. Miller, Lewiston, N.Y., assignor to Occidental Chemical Corporation, Niagara Falls, N.Y.

Continuation-in-part of Ser. No. 66,366, Jun. 25, 1987. This application Aug. 28, 1987, Ser. No. 93,946

Int. Cl.⁴ B32B 15/18; B05D 1/18

U.S. Cl. 428—659

12 Claims

1. An article having improved resistance welding characteristics consisting essentially of a steel substrate having a hot-dip

coating of zinc metal or a zinc alloy containing discrete particles of at least one metal phosphide selected from the group consisting of phosphides of iron, tin, titanium, manganese, tungsten, vanadium, tantalum, and mixtures thereof, said hot-dip coating being applied to the steel substrate by immersing the substrate in a molten bath of zinc or zinc alloy and spraying the molten zinc or zinc alloy with said discrete particles whereby said discrete particles are deposited on the surface of said zinc or zinc alloy.

4,873,154

MAGNETIC RECORDING MEDIUM CONTAINING FE, CO, N AND O

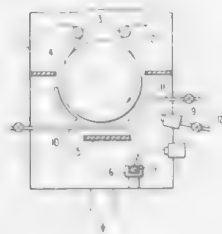
Tadaaki Yasunaga, and Akio Yanai, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Feb. 3, 1988, Ser. No. 151,722

Claims priority, application Japan, Feb. 4, 1987, 62-24378

Int. Cl.⁴ G11B 5/64

U.S. Cl. 428—694

3 Claims



1. A magnetic recording medium, comprising a non-magnetic support having provided thereon a thin ferromagnetic metal film comprising iron of atomic percentage a, cobalt of atomic percentage b, nitrogen of atomic percentage c and oxygen of atomic percentage d, wherein said atomic percentages of said iron, cobalt, nitrogen and oxygen are based on the total number of these atoms and have the following limits:

$$32 \leq a \leq 90;$$

$$5 \leq b \leq 55;$$

$$2 \leq c \leq 28;$$

$$5 \leq d \leq 23; \text{ and}$$

$$c + d \leq 40.$$

4,873,155

FUEL CELL MANIFOLDS

Toshio Hirota, Takashi Ohuchi, and Osamu Yamamoto, all of Kanagawa, Japan, assignors to Fuji Electric Co., Ltd., Kanagawa, Japan

Filed Nov. 9, 1988, Ser. No. 268,921

Claims priority, application Japan, Nov. 10, 1987, 62-283834; Oct. 18, 1988, 63-261796

Int. Cl.⁴ H01M 8/02

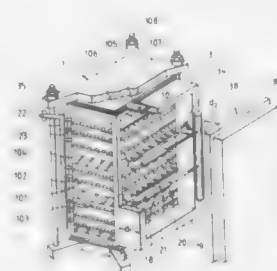
U.S. Cl. 429—26

4 Claims

1. A fuel cell manifold for supplying and removing reaction gases, mountable airtightly on the side walls of a fuel cell stack formed by stacking individual cells in a column, and in which electrolyte and cooling solution are charged and discharged through pipes penetrating the manifold, the manifold comprising:

- a seal layer covering the periphery of one of the walls of the fuel cell stack;
- a frame-shaped seal spacer having one side in airtight contact with the seal layer, the seal spacer including a bore for securing airtightly a penetrating portion of one of the pipes; and,

a manifold cover mounted airtightly on the opposite side of the seal spacer with a packing, the depth of the manifold



cover being large enough to accommodate the pipes protruding from the seal spacer.

4,873,156

SOLID ELECTROLYTIC FUEL CELL AND METHOD FOR MANUFACTURING SAME

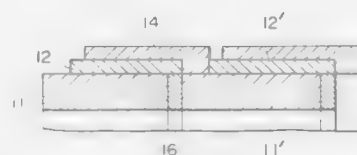
Tokuji Satake, Hiroshi Sakai, Hayami Nakatani, Masaharu Nakamori, and Masaru Ishibashi, all of Hyogo, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan
Filed Sep. 30, 1987, Ser. No. 102,652

Claims priority, application Japan, Sep. 30, 1986, 61-232781; Dec. 17, 1986, 61-300710

Int. Cl.⁴ H01M 8/10

U.S. Cl. 429—31

4 Claims



1. A cylindrical solid electrolytic fuel cell which comprises: at least an oxygen electrode which is a porous cylinder of CaTiO_3 forming an innermost layer of said fuel cell and having a thickness of 1 mm or more; at least a solid electrolyte covering an outer peripheral surface of said oxygen electrode; at least a fuel electrode covering an outer peripheral surface of said solid electrolyte; and an intermediate connector attached to said outer peripheral surface of said oxygen electrode in the axial direction; wherein said solid electrolyte has said intermediate connector interposed therein, and said intermediate connector and said fuel electrode are spaced.

4,873,157

RECOMBINANT ELECTRIC STORAGE BATTERY

Robert P. Flicker, Topton, and Scott Fenstermacher, Kutztown, both of Pa., assignors to East Penn Manufacturing Co., Inc., Lyon Station, Pa.

Filed Jul. 5, 1988, Ser. No. 214,754

Int. Cl.⁴ H01M 10/06

U.S. Cl. 429—57

1 Claim

1. A recombinant storage battery comprising a plurality of positive plates containing about 2 to 4 percent of antimony based upon the total weight of the alloy and positive active material, and essentially antimony free negative plates in a closed case; a fibrous sheet plate separator between adjacent ones of said plates, and a body of an electrolyte to which said sheet separators are inert absorbed by each of said separators and maintained in contact with each of the adjacent ones of said plates, each of said separator sheets comprising first

fibers which impart to the sheet a given absorbency greater than 90 percent relative to said electrolyte and second fibers which impart to the sheet a different absorbency less than 80 percent relative to said electrolyte, the first and second fibers being present in such proportions that each of said sheet separators has an absorbency with respect to said electrolyte of from 75 to 95 percent and the second fibers being present in such proportions that the battery has a recombination rate adequate to compensate for gassing.

4,873,158

OVERDISCHARGE PROTECTION FOR RECHARGEABLE CELLS

On-Kok Chang, John C. Hall, San Jose; Jeffrey Phillips, Saratoga, and Lenard F. Silvester, Scotts Valley, all of Calif., assignors to Altus Corporation, San Jose, Calif.

Filed Sep. 14, 1988, Ser. No. 244,488

Int. Cl.⁴ H01M 2/00, 4/02, 2/14

U.S. Cl. 424—61

5 Claims



1. A rechargeable electrochemical cell comprising a cell casing having side-walls, a top and bottom housing therein a positive terminal, a negative terminal, an anode of alkaline metal connected to the negative terminal, a cathode connected to the positive terminal, a non-aqueous electrolyte, a first microporous membrane separating said anode from said cathode being characterized as allowing the flow of electrolyte through the pores of the first microporous membrane but inhibiting passage of alkaline metal dendrites therethrough, a tab of conductive material extending from the anode to a portion proximate said cell casing and a second microporous membrane located between said tab and cell casing, said second microporous membrane being characterized as being less resistant to passage of alkaline metal dendrites than said first microporous membrane.

4,873,159

BATTERY BLANKET DEVICE

Albert Ciriello, 179 S. Windemer Ave., Thunder Bay, Ontario, Canada P7B-4M7

Filed Jan. 9, 1989, Ser. No. 295,135

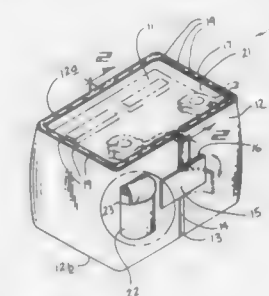
Int. Cl.⁴ H01H 2/02

U.S. Cl. 429—120

7 Claims

1. A battery blanket device for securement about a battery comprising, in combination, a battery, and an elongate flexible exterior layer including a top edge, a bottom edge, a first end, and a parallel second end wherein said first and second end are in a contiguous adjacent relationship in securement of said device about said battery, and securement means for tautly securing said first end relative to said second end, and

a dispensing member laminated to an interior surface of said exterior layer, and



applicator means formed integrally to said top edge for directing an acid neutralizing fluid to said dispenser member.

4,873,160

RECHARGEABLE BATTERY

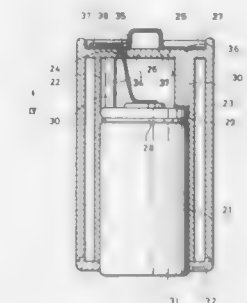
Noriyuki Miyazaki, and Tetsunori Matsuo, both of Hyogo, Japan, assignors to Sanyo Electric Co., Ltd., Japan
Filed Nov. 7, 1988, Ser. No. 268,163

Claims priority, application Japan, Nov. 10, 1987, 62-283613

Int. Cl.⁴ H01M 2/6

U.S. Cl. 429—170

12 Claims



1. A rechargeable battery comprising: an internal cell having a pair of electrodes; an insulated cylindrical case having an internal space for holding said internal cell and end walls provided on both ends thereof, said insulated cylindrical case substantially conforming to a prescribed conventional battery in outside dimension; an insulated cover plate having an opening in its center and being provided on one of said end walls of said case; and a first auxiliary terminal having a flange portion held by said one of said end walls of said case and said cover plate to be supported by the same and a projection protruding from said central opening of said cover plate, said first auxiliary terminal being electrically connected to one of said electrodes of said internal cell.

4,873,161

POSITIVE PASTE WITH LEAD-COATED GLASS FIBERS

Wally E. Rippel, 3308 Alegre La., Altadena, Calif. 91101, and Dean B. Edwards, 852 N. Grant St., Moscow, Id. 83843

Filed Aug. 19, 1988, Ser. No. 234,094

Int. Cl.⁴ H01M 4/14

U.S. Cl. 429—225

16 Claims

1. A positive paste for a lead-acid battery comprising: a layer of positive active material comprising lead dioxide containing a dispersion of 0.1 to 10% by volume of light-

weight, reinforcement fibers containing a lead coating formed of a high modulus core fiber.

4,873,162

X-RAY MASK AND A MANUFACTURE METHOD THEREFOR

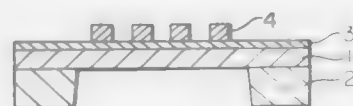
Nobuyuki Yoshioka; Nobuo Fujiwara, and Yaichiro Watakabe, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Aug. 14, 1987, Ser. No. 85,210

Claims priority, application Japan, Aug. 20, 1986, 61-195991; Mar. 20, 1987, 62-66254

Int. Cl.⁴ G03F 1/00

U.S. Cl. 430-5



1. An x-ray mask comprising: a mask substrate that is permeable to x-rays; and an x-ray absorber disposed on said substrate and formed into a pattern, said absorber being made from a Ti-W alloy with a Ti content of approximately 0.5-10 weight % in a sufficient thickness to absorb x-rays.

4,873,163

PHOTOMASK MATERIAL

Yaichiro Watakabe; Hiroaki Morimoto, and Tatsuo Okamoto, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

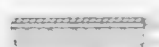
Continuation of Ser. No. 48,989, May 11, 1987, abandoned, which is a continuation of Ser. No. 777,715, Sep. 13, 1985, abandoned. This application Aug. 8, 1988, Ser. No. 229,769

Claims priority, application Japan, Oct. 16, 1984, 59-217838

Int. Cl.⁴ G03F 1/00

U.S. Cl. 430-5

11 Claims



1. A photomask material blank for manufacturing a semiconductor device, said photomask material comprising: a mask blank in the form of a transparent substrate; and a silicide film of a transition metal selected from the group consisting of molybdenum, tantalum and tungsten formed on said transparent substrate and formed by one of sputtering, ionized cluster beam and CVD.

4,873,164

ELECTROPHOTOGRAPHIC PHOTORECEPTOR COMPRISING A CHARGE TRANSPORT MEDIUM AND A BIS-AZO COMPOUND CONTAINING OXYGEN

Hitoshi Ono, Yokohama, and Yoshiaki Kato, Mitaka, both of Japan, assignors to Mitsubishi Kasei Corporation, Tokyo, Japan

Filed May 11, 1988, Ser. No. 192,456

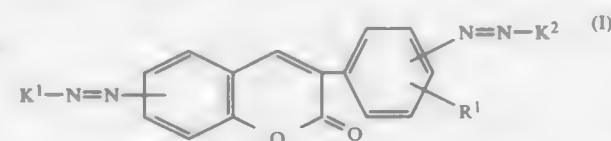
Claims priority, application Japan, May 14, 1987, 62-117933; Jan. 12, 1988, 63-4564

Int. Cl.⁴ G03G 5/06

U.S. Cl. 430-58

14 Claims

1. An electrophotographic photoreceptor having on a conductive base a photosensitive layer comprising a medium for transporting a charge carrier and a bis-azo compound represented by the general formula (I):



wherein K¹ and K² are independently a coupling ingredient residue with a hydroxy group which has a coupling activity; R¹ is a hydrogen atom, a lower alkyl group, a lower alkoxy group or a halogen atom.

4,873,165

ELECTROPHOTOGRAPHIC PHOTORECEPTOR HAVING OVERLAYER COMPRISING CARBON

Ken-ichi Karakida, and Shigeru Yagi, both of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

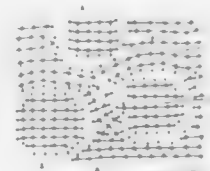
Filed Jan. 15, 1988, Ser. No. 144,006

Claims priority, application Japan, Jan. 16, 1987, 6047

Int. Cl.⁴ G03G 5/082, 5/14

U.S. Cl. 430-66

12 Claims



1. An electrophotographic photoreceptor which comprises (1) a support; (2) a light-sensitive layer comprising an i-type semiconductor layer that is predominantly composed of amorphous silicon and contains a small amount of an element of group IIIB of the periodic table; and (3) a surface layer having a thickness of from 0.01 to 10 μm provided on the i-type semiconductor layer, said surface layer being predominantly composed of carbon and containing an element capable of forming a tetrahedral bond.

4,873,166

LIQUID DEVELOPER FOR ELECTROPHOTOGRAPHY

Takao Senga; Kazuchiyo Takaoka; Hirokazu Yamamoto, and Takimi Hashimoto, all of Nagaokakyo, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed Mar. 31, 1987, Ser. No. 33,002

Claims priority, application Japan, Mar. 31, 1986, 61-74505; Mar. 31, 1986, 61-74507; Apr. 2, 1986, 61-77358; Jan. 19, 1987, 62-11087; Jan. 20, 1987, 62-11743

Int. Cl.⁴ G03G 9/12, 11/00

U.S. Cl. 430-137

14 Claims

1. A process for producing a liquid developer for electrostatic photography which comprises a highly insulating hydrocarbon medium which is a liquid having an electric resistance

of 10⁹ Ω-cm or more and a permittivity of 3.5 or less and resin particles dispersed therein, said process comprising polymerizing a monomer (A) soluble in said medium, but insolubilized upon being polymerized in the presence of a polymer (S) insoluble in said medium and having a carboxyl group, a hydroxyl group or an amide group.

4,873,167

SELF CLEANING SHEET FOR DISSOLVING A PHOTO-SENSITIVE MATERIAL CONTAINING MICROCAPSULES ON BOTH SIDES OF SUBSTRATE

Yuji Asano, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Mar. 8, 1988, Ser. No. 165,465

Claims priority, application Japan, Mar. 11, 1987, 62-55795

Int. Cl.⁴ B41M 5/12; G03C 1/68

U.S. Cl. 430-138

7 Claims



1. A self cleaning sheet comprising: a sheet of substrate; and microcapsules enveloping a solvent of a photo-curable material and being coated on said sheet of substrate, said solvent selected from the group consisting of isopropyl alcohol, butanol, ethyl alcohol, propyl alcohol, methyl alcohol, acetone, ethyl ketone and methyl ketone.

4,873,168

IMAGING SYSTEM UTILIZING HEAT TREATMENT

Donna L. Ruder, Dayton; Lyudmila Feldman, Centerville, and James A. Dowler, Franklin, all of Ohio, assignors to The Mead Corporation, Dayton, Ohio

Filed Mar. 7, 1988, Ser. No. 164,653

Int. Cl.⁴ G03C 5/54, 1/68, 5/00

U.S. Cl. 430-138

14 Claims

1. A method for treating an imaging sheet comprising the steps of: providing an imaging sheet having coated on one of its surfaces a layer of microcapsules, said microcapsules containing a radiation curable composition and having an image-forming agent associated therewith; heating said sheet; and image-wise exposing said layer of microcapsules to actinic radiation; wherein said heating step is performed prior to said image-wise exposing step.

4,873,169

PROCESS FOR THE PREPARATION OF AN O-NAPHTHOQUINONEDIAZIDE SULFONIC ACID ESTER AND PHOTSENSITIVE MIXTURE CONTAINING SAME

Fritz Erdmann, Eltville-Martinsthal; Horst-Dieter Thamm, Eschborn, and Hans-Joachim Staudt, Taunusstein, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Aug. 20, 1987, Ser. No. 87,599

Claims priority, application Fed. Rep. of Germany, Aug. 27, 1986, 3629122

Int. Cl.⁴ G03C 1/54, 1/60; C07C 113/00

U.S. Cl. 430-192

18 Claims

1. A process for the preparation of an o-naphthoquinone diazide sulfonic acid ester comprising the steps of: mixing an o-naphthoquinone diazide sulfonic acid halide with a mono- or polyvalent phenolic compound in a solvent; adding a basic component selected from the group consisting of ammonia, ammonium salts of weak acids and mono-hydroxy aliphatic amine with 1 to 3 carbon atoms or dihydroxy aliphatic amine with 1 to 3 carbon atoms; controlling the pH within the range from about 1.5 to about 8.5 and the temperature within the range from about 15° C. to about 40° C. to carry out an esterification reaction producing an o-naphthoquinone diazide sulfonic acid ester; and precipitating the o-naphthoquinone diazide sulfonic acid ester produced.
2. An o-naphthoquinone diazide sulfonic acid ester having less than about 1 p.p.m. of any metal ion, prepared by the process according to claim 1.
3. A photosensitive mixture comprising a photosensitive o-naphthoquinone diazide sulfonic acid ester prepared by the process according to claim 1 in admixture with from about 50 to 90% of a binder which is insoluble in water and soluble in aqueous-alkaline solutions.

4,873,170

METHOD FOR MAKING LITHOGRAPHIC PRINTING PLATE

Hiroshi Nishinoiri; Masahiko Saikawa; Yoshikazu Takaya, and Eiji Kanada, all of Nagaokakyo, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed Aug. 6, 1987, Ser. No. 82,318

Claims priority, application Japan, Aug. 14, 1986, 61-191475; Apr. 17, 1987, 62-94497

The portion of the term of this patent subsequent to Nov. 15, 2005, has been disclaimed.

Int. Cl.⁴ G03C 5/54; G03F 7/06

U.S. Cl. 430-204

7 Claims

1. A method for making a lithographic printing plate utilizing silver complex diffusion transfer process which comprises subjecting to scanning exposure of highintensity short-time a light sensitive material comprising a support and, provided thereon, at least a silver halide emulsion layer and a physical development nuclei layer as a surface layer and then developing it with a silver complex diffusion transfer developer, the improvement which comprises subjecting the light sensitive material to imagewise exposure with scanning light of at least 700 nm, said emulsion layer containing silver halide grains mainly composed of silver chloride and a sensitizing dye having a sensitivity maximum in the long wavelength region of at least 700 nm in an amount of 3×10⁻⁵-3×10⁻⁴ mol for 1 mol of silver halide and an antihalation means being provided below said emulsion layer to provide a reflectance of 13-40% for the scanning exposure light of at least 700 nm.

4,873,171

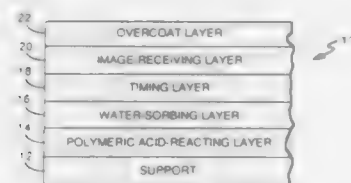
IMAGE-RECEIVING ELEMENT FOR DIFFUSION
TRANSFER PHOTOGRAPHIC PRODUCT

Louis J. George, Somerville, and Lloyd D. Taylor, Lexington,
both of Mass., assignors to Polaroid Corporation, Cambridge,
Mass.

Filed May 2, 1988, Ser. No. 188,897
Int. Cl.⁴ G03C 5/54

U.S. Cl. 430—213

17 Claims



1. An image-receiving element for photographic diffusion transfer processing comprising in order:

- a support layer;
- a polymeric acid-reacting layer;
- a water-permeable and water-absorbing polymeric layer, said layer being effective to absorb water introduced into said image-receiving element during said diffusion transfer processing;
- a water-impermeable polymeric timing layer through which aqueous alkali must pass to said polymeric acid-reacting layer, said polymeric timing layer being deposited from a polymeric latex and being essentially non-absorbing of water and being substantially impermeable for a predetermined time interval to the passage of aqueous alkali there-through, said polymeric timing layer including a polymer comprising polymerized repeating units, which as a function of contact with aqueous alkaline processing composition and after said predetermined time interval, undergo an alkali-initiated chemical reaction effective to convert said timing layer from a condition of substantial impermeability to the passage of aqueous alkali to a condition of substantial permeability thereto; and
- a water-permeable and dyeable image-receiving layer.

14. The image-receiving element of claim 1 wherein said water-permeable and dyeable image-receiving layer comprises a mixture of polyvinyl alcohol and a mordant for dye-image forming material.

4,873,172

PROCESS FOR FORMING A SUPERHIGH CONTRAST
NEGATIVE IMAGE

Shoji Ishiguro; Shigeo Hirano; Tadao Shishido, all of Kanagawa,
and Akio Miyake, Osaka, all of Japan, assignors to Fuji Photo
Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 857,270, Apr. 30, 1986, abandoned.

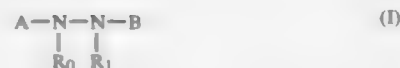
This application Aug. 8, 1988, Ser. No. 229,796

Claims priority, application Japan, Apr. 30, 1985, 60-93324
Int. Cl.⁴ G03C 1/06

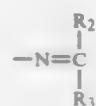
U.S. Cl. 430—264

15 Claims

1. A process for forming a superhigh contrast negative image comprising development processing a photographic light-sensitive material comprising a support having provided thereon at least one silver halide emulsion layer with a developer containing not less than 0.5 mol/liter of a sulfite ion and having a pH of from 10.5 to 12.3, wherein the development processing is carried out in the presence on a compound represented by formula (I)



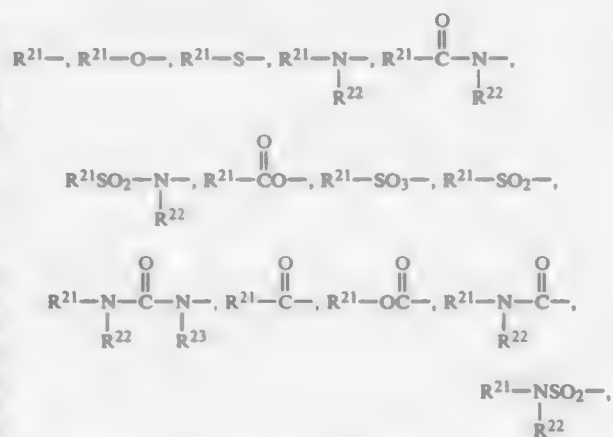
wherein A represents an aliphatic group or an aromatic group; B represents a formyl group, an acyl group, an alkyl sulfonyl group, an arylsulfonyl group, an alkyl sulfinyl group, an arylsulfinyl group, a carbamoyl group, a sulfamoyl group, an alkoxy carbonyl group, an aryloxy carbonyl group, a sulfinamoyl group, an alkoxy sulfonyl group, a thioacyl group, a thio-carbamoyl group, or a heterocyclic group; R_0 and R_1 each represent a substituent selected from the group consisting of a hydrogen atom, a substituted or unsubstituted alkylsulfonyl group and a substituted or unsubstituted acyl group, provided that at least one of R_0 and R_1 is a hydrogen atom; or B, R_1 , and the nitrogen atom to which B and R_1 are bonded jointly form the group



wherein R_2 represents a substituent selected from the group consisting of an alkyl group, an aryl group, and a heterocyclic group, and R_3 represents a substituent selected from the group consisting of a hydrogen atom, an alkyl group, an aryl group, and a heterocyclic group; and a compound represented by formula (II)



wherein Z represents an atomic group comprising atoms selected from carbon atoms and nitrogen atoms forming a 5- to 7-membered unsaturated heterocyclic or condensed heterocyclic ring, wherein said condensed heterocyclic ring is condensed with a monocyclic or dicyclic aryl group and wherein said atomic group is unsubstituted or substituted by a group selected from the group consisting of an alkyl, aryl, alkoxy, aryloxy, alkylthio, arylthio, halogen, acylamino, sulfonamido, ureido, cyano, carboxyl, carbamoyl, sulfamoyl, acyloxy, alkoxy carbonyl, aryloxy carbonyl, acyl, amino, imino, nitroso, alkynyl and sulfonyl groups and wherein said unsaturated condensed heterocyclic ring is condensed with a monocyclic or dicyclic aryl group; and R represents one substituent selected from the group consisting of



$[\text{R}^{21}\text{OO}_3\text{S}-]$ $\text{R}^{21}\text{O}_3\text{S}-$, $-\text{COOH}$, a halogen atom, and

$-\text{CN}$, wherein R^{21} , R^{22} and R^{23} are each selected from the group consisting of a hydrogen atom, an aliphatic group or an aromatic group.

4,873,173

METHOD OF FORMING IMAGE PROVIDING A
CHANGE IN SENSITIVITY BY ALTERING THE PH OF
THE DEVELOPER

Senzo Sasakawa; Tetsuo Yoshida, and Nobuaki Inoue, all of
Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd.,
Kanagawa, Japan

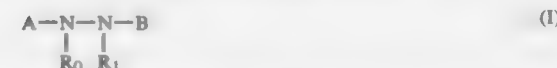
Filed Oct. 21, 1987, Ser. No. 110,981

Claims priority, application Japan, Oct. 21, 1986, 61-249872
Int. Cl.⁴ G03C 5/24, 1/06

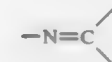
U.S. Cl. 430—964

10 Claims

1. A method of forming an image comprising the steps of:
(a) imagewise exposing a photographic material which comprises a support having provided thereon at least one light-sensitive silver halide emulsion layer and which contains a hydrazine compound represented by the following general formula (I) in said emulsion layer or a hydrophilic colloid layer adjacent thereto:



wherein A represents a substituted or unsubstituted aliphatic group, or a substituted or unsubstituted aromatic group; B represents a formyl group, an acyl group, an alkylsulfonyl group, an arylsulfonyl group, an alkylsulfinyl group, an arylsulfinyl group, a carbamoyl group, an alkoxy carbonyl group, an aryloxy carbonyl group, a sulfinamoyl group, an alkoxy sulfonyl group, a thioacyl group, a thiocarbamoyl group, a sulfamoyl group, or a heterocyclic group; both R_0 and R_1 represent a hydrogen atom, or one of them represents a hydrogen atom and the other represents a substituted or unsubstituted alkylsulfonyl group, a substituted or unsubstituted arylsulfonyl group, or a substituted or unsubstituted acyl group; and B, R_1 and the nitrogen atom attached thereto may form a partial structure of hydrazone,



(b) developing said exposed material with a developer (A) having a sulfite ion concentration of 0.15 mole/l or more, a potassium ion concentration of 0.2 mole/l or more, and a pH value ranging from 10.5 to 12.3; wherein a gamma value of said material developed with developer (A) is at least 10, a gamma value of said material developed with a developer (B) that is the same as the developer (A) except that the pH value is lowered by 1.0 is at least 5, and a difference in sensitivity between said material developed with the developer (A) and that developed with the developer (B) is at most 0.7 wherein the sensitivity is defined as log E corresponding to the density of fog +2.0.

4,873,174

METHOD OF USING DEVELOPER-FINISHER
COMPOSITIONS FOR LITHOGRAPHIC PLATES

Major S. Dhillon, Belle Mead; Shane Haich, Bridgewater, and
Douglas A. Seeley, High Bridge, all of N.J., assignors to
Hoechst Celanese Corporation, Somerville, N.J.

Filed Feb. 3, 1988, Ser. No. 151,652

Int. Cl.⁴ G03C 5/34

U.S. Cl. 430—309

6 Claims

1. A method of treating a photographic element which comprises imagewise exposing a positive working or negative

working photographic element to sufficient actinic radiation to form a latent image thereon, and then removing the non-image portions thereof and finishing said element with a developing and finishing composition comprising in admixture:

- a. from about 0.1% to about 10.0% by weight of the composition consisting of mono-, di-, or trisodium, potassium or lithium phosphate; and
- b. from about 0.1% to about 10.0% by weight of the composition of one or more compounds selected from the group consisting of benzyl alcohol, phenoxyethanol and phenoxypropanol; and
- c. from about 0.1% to about 10.0% by weight of the composition of one or more resins selected from the group consisting of polyvinyl pyrrolidone, dextrin, poly (methyl vinyl ether/maleic acid) and gum arabic; and
- d. from about 0.1% to about 10.0% by weight of the composition of one or more acids selected from the group consisting of citric acid and benzoic acid; and
- e. from about 0.5% to about 15.0% by weight of the composition of one or more compounds selected from the group consisting of sodium or potassium octyl sulfate; and
- f. from about 1.0% to about 15.0% by weight of the composition of one or more compounds selected from the group consisting of sodium, potassium and lithium benzoate; and
- g. from about 0.2% to about 10.0% by weight of the composition of one or more components selected from the group consisting of sodium, potassium and ammonium citrate; and
- h. from about 0.2% to about 15.0% by weight of the composition of one or more components selected from the group consisting of sodium, potassium and ammonium sorbate; and
- i. sufficient water to formulate an effective developer.

4,873,175

METHOD OF FORMING FUNCTIONAL COATING FILM
BETWEEN FINE ELECTRIC CONDUCTIVE CIRCUITS

Tameyuki Suzuki, Kanagawa, and Takuro Kamakura, Chiba,
both of Japan, assignors to Shinto Paint Co., Ltd., Amagasaki,
Japan

Filed Dec. 29, 1986, Ser. No. 947,332

Claims priority, application Japan, Jan. 8, 1986, 61-1534
Int. Cl.⁴ G03C 5/00

U.S. Cl. 430—311

3 Claims

1. (Four Times Amended) A method of forming a functional coating film on spaces of a fine electric conductive circuit pattern of a transparent base board comprising the steps of:
(i) forming a light-shielding precoat film on said electric conductive circuit pattern by electrode position of a coating agent having a light-shielding property and reagent solubility;
(ii) forming a photo-setting coating film by applying a functional material having photo-curability to an entire part of said transparent base board including said precoat film;
(iii) exposing a back surface of said transparent base board to light for curing portions of said photo-setting coating film which are not shielded by said light-shielding precoat film; and
(iv) removing the uncured portions of said photo-setting coating film, which has been un-exposed in the step (iii), and said light-shielding precoat film, formed in the step (i), with the same reagent in a single process.

4,873,176

RETICULATION RESISTANT PHOTORESIST COATING

Thomas A. Fisher, Cambridge, Mass., assignor to Shipley Company Inc., Newton, Mass.

Filed Aug. 28, 1987, Ser. No. 90,753

Int. Cl.⁴ G03F 7/26; H01L 21/312

U.S. Cl. 430—313

7 Claims

1. A process for etching an integrated circuit substrate, said

process comprising the steps of forming an imaged and developed positive working photoresist coating over said integrated circuit substrate, said photoresist prior to imaging and developing comprising a binder selected from the group of novolak resins and polyvinyl phenol resins, a photoactive naphthoguinone diazide sulfonic acid ester and an essentially unreacted acid activated cross-linking agent, and subjecting said coated substrate to an etching plasma in a gaseous stream that contains a Lewis acid during etching whereby a cross-linked surface layer is formed on said photoresist wherein the concentration of the acid activated cross-linking agent is sufficient to form a surface layer of cross-linked photoresist over the imaged photoresist film adequate to prevent significant reticulation of the photoresist image during plasma etching.

4,873,177

METHOD FOR FORMING A RESIST PATTERN ON A SUBSTRATE SURFACE AND A SCUM-REMOVER THEREFOR

Hatsuyuki Tanaka; Yoshiyuki Sato, both of Samukawa; Hidekatsu Kohara, Chigasaki, and Toshimasa Nakayama, Hiratsuka, Japan, assignors to Tokyo Ohka Kogyo Co., Ltd., Japan
Continuation of Ser. No. 15,215, Feb. 17, 1987, abandoned. This application Aug. 5, 1988, Ser. No. 229,762

Claims priority, application Japan, Feb. 24, 1986, 61-38755; Mar. 17, 1986, 61-57162

Int. Cl.⁴ G03C 5/24, 5/34

U.S. Cl. 430—326

3 Claims

1. A method for forming a pattern-wise photoresist layer on the surface of a substrate which comprises the steps of:

- (a) forming a layer of photo-working photoresist composition on the surface of a substrate;
- (b) exposing the layer of the positive-working photoresist pattern-wise to actinic rays to increase the solubility of the photoresist composition on the areas exposed to the actinic rays;
- (c) dissolving away the layer of the photoresist composition on the areas exposed to the actinic rays with a developer solution to leave a pattern-wise photoresist layer on the surface of the substrate; and
- (d) rinsing the substrate with the pattern-wise photoresist layer on the surface thereof with a scum-remover solution which is a mixture of 100 parts by weight of an aqueous solution of from 0.5 to 1.5% by weight of tetramethylammonium hydroxide or trimethyl 2-hydroxymethyl ammonium hydroxide, and from 1 to 30 parts by weight of a water-miscible organic solvent.

4,873,178

OPTICAL RECORDING MEDIUM AND METHOD FOR CONDUCTING RECORDING ON SAID MEDIUM

Masahiro Haruta; Yoko Kuwae, both of Tokyo; Hirohide Munakata; Satoshi Yuasa, both of Yokohama, and Etsuko Sugawa, Machida, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 807,954, Dec. 12, 1985, abandoned.

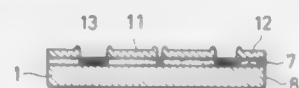
This application Jan. 19, 1988, Ser. No. 147,577

Claims priority, application Japan, Dec. 18, 1984, 59-265457; Dec. 18, 1984, 59-265459

Int. Cl.⁴ G03C 11/00; G01D 15/10

U.S. Cl. 430—327

8 Claims



1. A method for recording on an optical recording medium comprising a non-electroconductive substrate layer, a light-transmissive surface layer and a colored film formed by electrolytic polymerization and interposed between the substrate layer and the surface layer, the method comprising the step of applying light to the recording medium in such a manner that

the colored film of the recording medium generates heat in response to the applied light, to melt the surface layer to form pits therein, wherein the colored film is selected from a polymer film formed from a monomer unit selected from the group consisting of pyrrole, N-methylpyrrole, thiophene, furan, selenophene, tellurophene, indole, azulene, aniline, thienothiophene, pyrrolopyrrole and diacetylene.

4,873,179

METHOD FOR PROCESSING A SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL WHILE REPLENISHING WASHING WATER AND STABILIZING SOLUTION

Akira Abe; Keiji Mihayashi, and Seiji Ichijima, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 20, 1987, Ser. No. 52,086

Claims priority, application Japan, May 20, 1986, 61-115792

Int. Cl.⁴ G03C 7/16, 7/40, 7/32, 11/00

U.S. Cl. 430—382

52 Claims

1. A method for processing a silver halide color photographic material which comprises, after color development of a silver halide color photographic material comprising a support having thereon at least one light-sensitive silver halide emulsion layer and at least one compound capable of releasing, after reaction with an oxidation produce of a developing agent, a development inhibitor upon a reaction with another molecule of an oxidation produce of a developing agent, treating said photographic material with a liquid having a fixing ability, and thereafter washing or stabilizing said photographic material while replenishing the washing water and stabilizing solution, respectively, each in an amount of from 2 to 50 times the amount carried over from the preceding bath per unit area of the silver halide color photographic material, wherein the silver halide color photographic material contains a p-hydroxybenzoic acid ester represented by formula (PHB)



(PHB)

wherein R represents an alkyl group, a substituted alkyl group, an aralkyl group, or a substituted aralkyl group each having from 1 to 18 carbon atoms in total.

4,873,180

DEVELOPER COMPOSITIONS FOR SILVER HALIDE PHOTOGRAPHIC MATERIALS COMPRISING CYCLIC AMINO METHANE DIPHOSPHONIC ACID COMPOUNDS

Carlo Marchesano; Franco Buriano, and Enrico Furlanetto, all of Savona, Italy, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 6, 1988, Ser. No. 178,251

Claims priority, application Italy, Apr. 13, 1987, 20087 A/87

Int. Cl.⁴ G03C 5/30, 7/16

U.S. Cl. 430—491

13 Claims

1. An alkaline aqueous developer composition for silver halide photographic materials which comprises a silver halide developing agent and a cyclicaminomethane diphosphonic acid compound sequestering agent.

4,873,181

SILVER HALIDE PHOTOGRAPHIC MATERIAL

Nobuaki Miyasaka, and Shuzo Suga, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Continuation of Ser. No. 822,496, Jan. 27, 1986, abandoned. This application May 31, 1988, Ser. No. 206,922

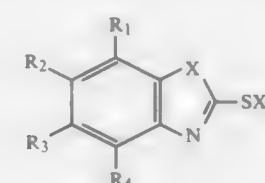
Claims priority, application Japan, Jan. 25, 1985, 60-11066

Int. Cl.⁴ G03C 1/76

U.S. Cl. 430—523

14 Claims

1. A silver halide photographic material comprising a support bearing on at least one side thereof at least one silver halide photographic emulsion layer and at least one auxiliary layer, wherein the silver halide photographic emulsion layer is a layer made of a light-sensitive silver halide emulsion containing silver iodide and an internally fogged silver halide emulsion, or is composed of a layer made of the light-sensitive silver halide emulsion containing silver iodide and a layer made of the internally fogged silver halide emulsion, and the auxiliary layer contains substantially non-light-sensitive silver halide grains having an average grain size of not more than 0.5 μm and is provided outside of and on the same side of the support as a light sensitive emulsion layer which is the outermost light-sensitive emulsion layer from the support, and wherein the amount of the substantially non-light-sensitive silver halide grains coated is from 1 × 10⁻⁴ to 1 × 10⁻² mol/m² and wherein said silver halide photographic material contains no metallic salts coated with a less solubilizing agent, wherein the substantially non-light-sensitive silver halide grains comprise at least 75 mol % silver chloride, and have absorbed on the surface thereof at least one compound represented by formula (I)



(I)

wherein X is —O—, —NH— or —S—; R₁, R₂, R₃ and R₄ each represents a hydrogen atom or a substituted group, at least one of R₁, R₂, R₃ and R₄ being a substituted or unsubstituted alkyl or aryl group having 13 carbon atoms or less which is linked, directly or through a divalent connecting group, to the benzene nucleus of formula (I); and X₁ represents a hydrogen atom or a cation necessary for rendering the molecule neutral.

4,873,182

LIGHT-SENSITIVE SILVER HALIDE PHOTOGRAPHIC MATERIALS AND PROCESS FOR INCORPORATING HYDROPHOBIC PHOTOGRAPHIC ADDITIVES INTO HYDROPHILIC COLLOID COMPOSITIONS

Ivano Delprato, and Agostino Baldassarri, both of Savona, Italy, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 28, 1988, Ser. No. 187,271

Claims priority, application Italy, May 8, 1987, 20435 A/87

Int. Cl.⁴ G03C 1/38, 7/32

U.S. Cl. 430—546

12 Claims

1. A light-sensitive silver halide photographic material comprising a support and a hydrophilic colloid layer coated thereon, said hydrophilic colloid layer containing hydrophobic photographic additives dispersed in fine droplets of one or more water-immiscible high boiling organic solvents, wherein at least one of said solvents is an alkylene glycol aliphatic diester compound corresponding to the general structural formula wherein R₁ and R₂, the same or different, each represents an unsubstituted alkyl group having 1 to 15 carbon atoms, Q represents a linear unsubstituted alkylene group of 1 to 10 carbon atoms or linear halogen substituted alkylene group of 1 to 10 carbon atoms, m represents 0 or 1, and the total number of carbon atoms represented in R₁ + R₂ is at least 6.

3. The light-sensitive silver halide photographic material of

claim 1, wherein said hydrophobic photographic additive is a dye-forming coupler.

4,873,183

SILVER HALIDE COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL CONTAINING PYRAZOLOAZOLE TYPE CYAN COUPLER

Kimie Tachibana, Hino; Yutaka Kaneko, Sagami, and Fumio Ishii, Akishima, all of Japan, assignors to Konica Corporation, Tokyo, Japan

Continuation of Ser. No. 124,987, Nov. 24, 1987, abandoned.

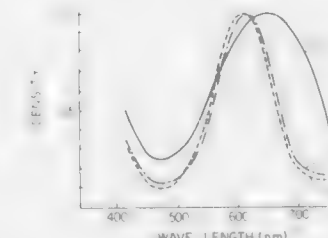
This application Dec. 29, 1988, Ser. No. 291,351

Claims priority, application Japan, Nov. 25, 1986, 61-280164; Dec. 27, 1986, 61-313455; Mar. 2, 1987, 62-47323; Mar. 9, 1987, 62-53417; Mar. 17, 1987, 62-62162; Mar. 17, 1987, 62-62163; Jul. 23, 1987, 62-184552

Int. Cl.⁴ G03C 7/38

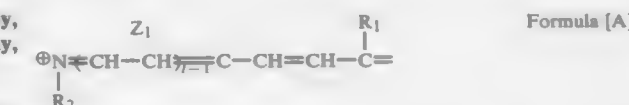
U.S. Cl. 430—550

11 Claims

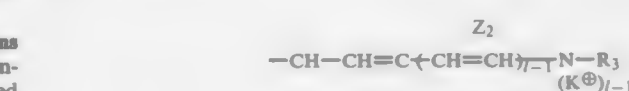


1. A light-sensitive silver halide color photographic material comprising a support and, provided thereon, a red light-sensitive silver halide emulsion layer containing a pyrazoloazole type cyan dye-forming coupler having at least one electron attractive group at a substitutable position except the active site of the coupler for coupling reaction.

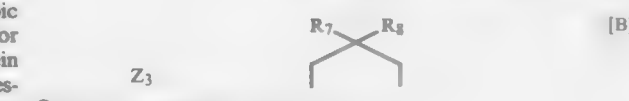
11. The light-sensitive silver halide color photographic material of claim 1, wherein said red light-sensitive emulsion layer contains a spectral sensitizing dye selected from the group consisting of ones represented by formulas [A], [B], [C], [D], [E] and [F]:



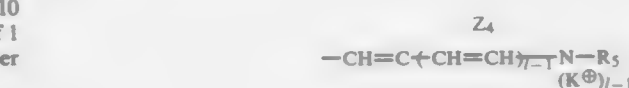
Formula [A]



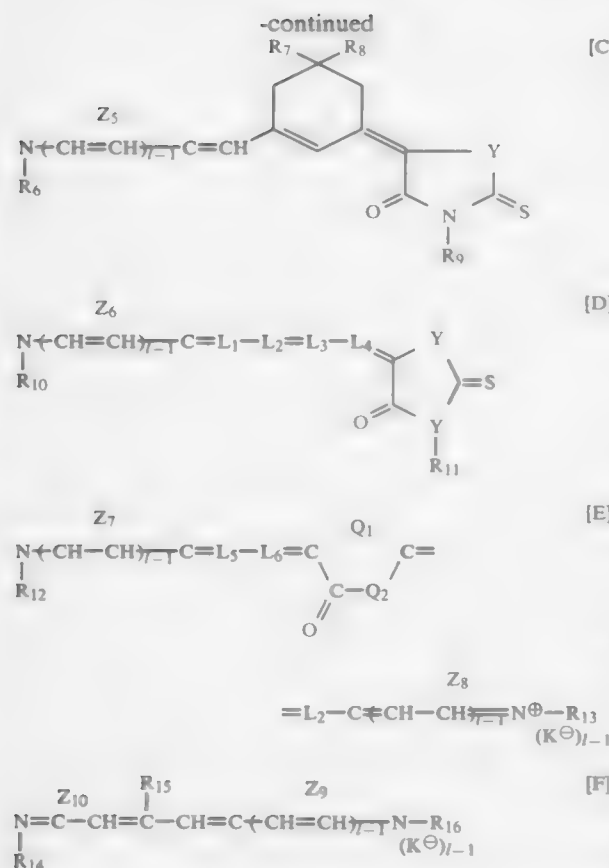
(K[⊕])/-1



[B]



(K[⊕])/-1



wherein Z_1 through Z_9 each represent a group of atoms necessary for completing a benzene ring or a naphthalene ring condensed with a pyridine ring, an imidazole ring, a thiazole ring, a selenazole ring, an oxazole ring or a tetrazole ring; Z_{10} represents a group of atoms necessary for completing a benzothiazole ring, a benzoselenazole ring, a β -naphthothiazole ring or a β -naphthoselenazole ring, a benzimidazole ring or a 2-quinoline ring; Q_1 and Q_2 each represent a group of atoms necessary for associatively completing a nucleus of 4-thiazolidinone, 5-thiazolidinone or 4-imidazolidinone; R_1 and R_{15} each represent a hydrogen atom, an alkyl group or an aryl group; R_7 , R_8 , R'_7 and R_8 , each represent an alkyl group; R_9 and R_{11} each represent an alkyl group, an aryl group or a heterocyclic group; R_2 , R_3 , R_4 , R_5 , R_6 , R_{10} , R_{12} , R_{13} , R_{14} and R_{16} each represent an alkyl group or an aryl group; l is an integer of 1 or 2; Y represents a sulfur atom or selenium atom; L_1 through L_6 each represent a substituted or nonsubstituted methine group; and K represents an acid anion.

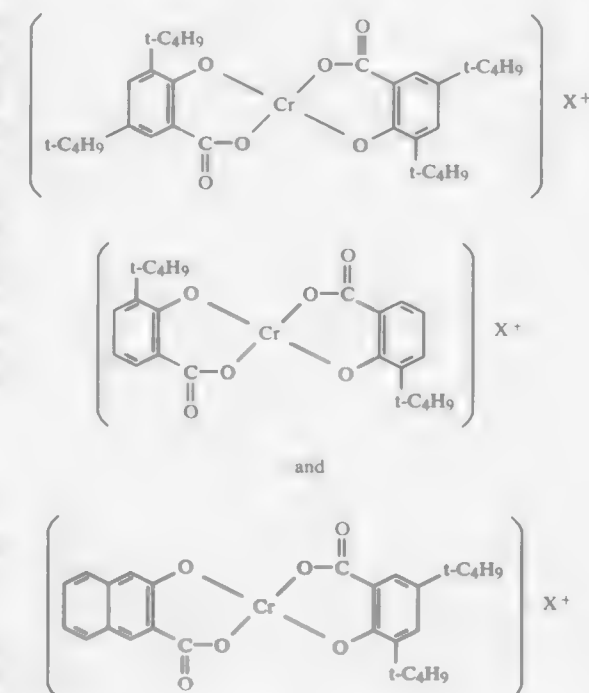
4,873,184
SUPERSENSITIZATION OF SILVER HALIDE
PHOTOTHERMOGRAPHIC EMULSIONS
 Sharon M. Simpson, Lake Elmo, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
 Filed Feb. 5, 1988, Ser. No. 152,755
 Int. Cl. G05C 1/08, 1/12

U.S. Cl. 430-617 **25 Claims**
 1. A spectrally sensitized silver halide photothermographic emulsion layer comprising a reducible silver source material as 20 to 70% by weight of said emulsion layer, photosensitive silver halide, and a reducing agent for silver ion, said silver halide having no latent image therein and being present as 1.5 to 7.0% by weight of said emulsion layer and said emulsion layer having a speed increasing effective amount of a metal

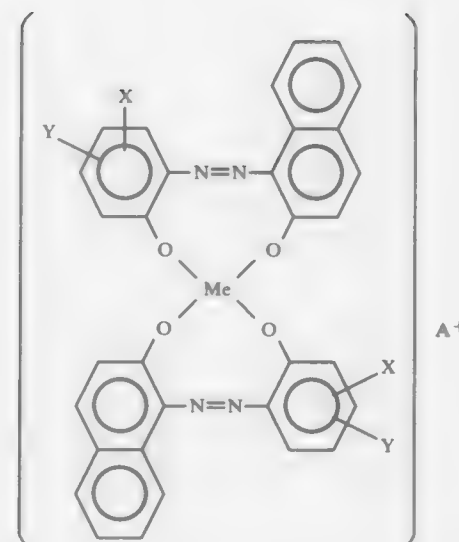
complexing agent therein in an amount equal to 0.4 to 40% by weight of total silver in said emulsion.

4,873,185
ONE-COMPONENT TONER FOR DRY
ELECTROPHOTOGRAPHY CONTAINING METAL
COMPLEX AS CHARGE CONTROL AGENT
 Mitsuru Uchida, Chohfu; Satoshi Yasuda, Matsudo, and Tetsuya Kuribayashi, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
 Filed Jul. 2, 1987, Ser. No. 69,498
 Claims priority, application Japan, Jul. 3, 1986, 61-155145
 Int. Cl. G03G 9/14

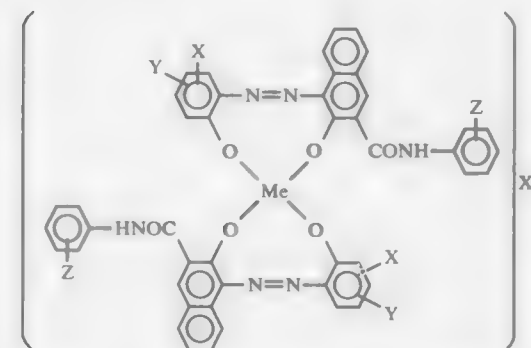
U.S. Cl. 430-903 **15 Claims**
 1. A dry electrophotographic negatively chargeable one-component type magnetic toner, comprising: a binder resin, magnetic powder, negatively chargeable particles of a metal complex compound (A) of an aromatic hydroxy carboxylic acid having a lipophilic group represented by the formula selected from the group consisting of:



wherein X^+ denotes a counter ion, and negatively chargeable particles of a metal complex salt-type monoazo dye (B) having a hydrophilic group represented by the formula selected from the group consisting of



wherein X and Y denotes the same or different groups of hydrogen, halogen, carboxyl, hydroxyl, nitro, sulfo or sulfamide; Me denotes a metal atom; and A^+ denotes a counter ion; provided that at least one of the X and Y denotes a group other than hydrogen; and



wherein X , Y and Z denote the same or different groups of hydrogen, halogen, carboxyl, hydroxyl, nitro, sulfo or sulfamide; Me denotes a metal atom; and A^+ denotes a counter ion; provided that at least one of X , Y and Z denotes a group other than hydrogen; said metal complex compound (A) and monoazo dye (B) being added each in a proportion of 0.1 to 10.0 wt. parts per 100 wt. parts of the binder resin so that they provide a ratio of the compound (A) to the dye (B) in the range of 1/10 to 10.0.

4,873,186
CORNEA STORAGE MEDIUM
 Chung-Ho Chen, and Sumi C. Chen, both of Phoenix, Md., assignors to The Johns Hopkins University, Baltimore, Md.
 Filed Sep. 2, 1987, Ser. No. 92,321
 Int. Cl. A01N 1/02

U.S. Cl. 435-1 **6 Claims**
 1. A method of extending a time a surgical quality isolated cornea can be stored which comprises including in the corneal storage medium containing the stored cornea, an amount of at least one compound selected from the group consisting of short chain fatty acids, ketone bodies and ketogenic amino acids capable of inhibiting lactate production by said isolated cornea sufficient to inhibit said lactate production.

4,873,187
BIFUNCTIONAL DNA-PROTEIN CONJUGATING
AGENT

Floyd Taub, Rockville, Md., assignor to Digene Diagnostics, Incorporated, Silver Spring, Md.

Filed Mar. 13, 1986, Ser. No. 839,074

Int. Cl. C12Q 1/68, 1/70, 1/54; C12N 9/96

U.S. Cl. 435-5 **23 Claims**

1. A method of detecting nucleic acid hybridization which comprises:

A. incubating (i) a sample suspected of containing a nucleic acid molecule (I) whose presence is sought to be detected with (ii) a conjugate of a single-stranded nucleic acid molecule (II) and an enzyme molecule, said conjugate comprising the following components: (a) said single-stranded nucleic acid molecule (II), (b) said enzyme molecule, and (c) a cationic detergent, wherein said cationic detergent has a positively charged group and a hydrophobic group; and wherein said enzyme of said conjugate is enzymatically active and wherein said single-stranded nucleic acid molecule (II) is complementary to said nucleic acid molecule (I); and
 B. detecting said nucleic acid hybridization by detecting any enzyme molecule of said conjugate (ii) wherein the single-stranded nucleic acid molecule (II) of said conjugate has hybridized with said nucleic acid molecule (I).

4,873,188
METHOD, MONOCLONAL ANTIBODY, AND
MONOCLONAL ANTIBODY FRAGMENTS FOR
DETECTING HUMAN NON-SMALL CELL LUNG
CARCINOMAS AND CELL LINE FOR PRODUCING
MUCH ANTIBODIES

Ingegerd Hellström; Joseph P. Brown; Karl E. Hellström; Diane Horn, and Peter Linsley, all of Seattle, Wash., assignors to Oncogen, Seattle, Wash.

Filed May 28, 1985, Ser. No. 738,612

Int. Cl. G01N 33/574, 33/577

U.S. Cl. 435-7 **17 Claims**

1. A method for determining the presence of a malignant condition in the lung of a subject, which comprises examining tissue from said subject, for the presence of a carbohydrate antigen which is Le^a antigen or an antigen having the characteristics of Le^a antigen.

4,873,189
MONOCLONAL ANTIBODIES TO BLUETONGUE VIRUS
ANTIGEN

Michael M. Jochim, Arvada, and Suzanne C. Jones, Lakewood, both of Colo., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Jan. 12, 1984, Ser. No. 570,155

Int. Cl. C12P 21/00; C12N 15/00, 5/00; C12Q 1/00

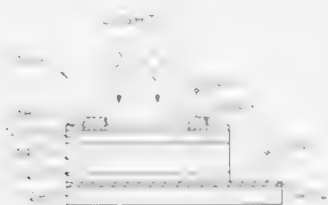
U.S. Cl. 435-68 **12 Claims**

1. A hybridoma which secretes monoclonal antibody which is group-specific to bluetongue virus (BTV) antigen and does not cross react with epizootic hemorrhage disease virus (EHDV) antigen selected from the group consisting of ATCC HB 8219 and ATCC HB 8377.

U.S. Cl. 437-5 37 Claims
1. In a method of making a multi-layer photovoltaic cell

containing a heat-treated layer comprised of CdTe or ternary compounds thereof, the sequential steps of:

- (A) forming the CdTe layer,
(B) applying a chloride solution thereto,



- (C) heat-treating the CdTe layer with the chloride solution thereon, and
(D) etching the heat-treated surface of the CdTe layer and then applying a further layer thereto.

4,873,199 METHOD OF MAKING BIPOLAR INTEGRATED CIRCUITS

Rowland G. Hunt, Ipswich, Great Britain, assignor to STC PLC, London, England

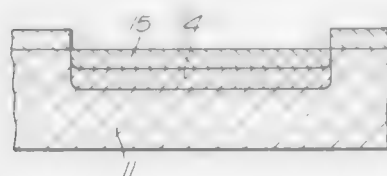
Continuation of Ser. No. 23,223, Mar. 9, 1987, abandoned. This application Sep. 23, 1988, Ser. No. 249,205

Claims priority, application United Kingdom, Mar. 26, 1986, 2,171,991

Int. Cl.⁴ H01L 21/265

U.S. Cl. 437-31

5 Claims



1. A method of fabricating a bipolar polysilicon emitter transistor in a single crystal substrate, the method including defining a doped well in the substrate by implanting phosphorus dopant ions at a dose of about $7.7 \times 10^{12}/\text{cm}^2$ into the well region at an energy of about 100 KeV and heating the substrate to drive in the dopant, implanting boron ions at a dose of about $2.8 \times 10^{12}/\text{cm}^2$ and at an energy of about 160 KeV and further heating the substrate to drive in the boron dopant and to effect compensation between the two dopants whereby the peak net dopant concentration is disposed at a depth of 2 to 5 microns below the substrate surface, implanting boron ions into the well thus forming to define a p-type base layer depositing a body of undoped polysilicon on a selected area of the base layer so as to define a polysilicon emitter, providing an oxide coating on the polysilicon emitter body, implanting boron ions into the base layer to define p+-type base contact regions, and oxide layer on the emitter body providing a mask whereby the base contact regions are aligned with the emitter body and whereby implantation into the emitter body is inhibited, implanting an n-type dopant into the well to provide a collector contact, heating the substrate to drive in the implanted base contact regions and collector contact, and applying metal contacts to the collector contact, the base contact regions and the polysilicon emitter body.

4,873,200 METHOD OF FABRICATING A BIPOLAR TRANSISTOR

Akira Kawakatsu, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan

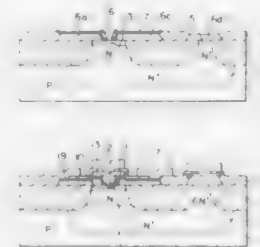
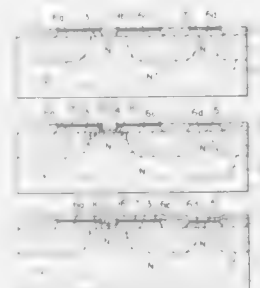
Filed Apr. 20, 1988, Ser. No. 183,893

Claims priority, application Japan, Apr. 20, 1987, 62-95358

Int. Cl.⁴ H01L 21/265

U.S. Cl. 437-31

9 Claims



1. A method of fabricating a bipolar transistor on a semiconductor substrate, comprising steps of:
forming a first polycrystalline silicon layer over a main surface of a silicon substrate having a first conductivity type land region;
forming an antioxidizing film in selected areas over the surface of the first polycrystalline silicon layer;
selectively oxidizing portions of the first polycrystalline silicon layer using the antioxidizing film as a mask;
introducing a second conductivity type impurity through the antioxidizing film into at least some unoxidized portions of the first polycrystalline silicon layer;
forming an opening by selectively removing the oxidized first polycrystalline silicon layer to expose a part of the land region;
forming a thin oxide film over the surface of the exposed land region and a side surface of the opening;
forming a first region of the second conductivity type in the unexposed land region;
forming a second region of the second conductivity type disposed on a side of the first region by introducing a second conductivity type impurity through the thin oxide film into the land region;
forming a first oxide film through a CVD process over an entire surface of the structure obtained by said steps;
forming a second polycrystalline silicon layer over an entire surface of the oxide film;
selectively removing the second polycrystalline silicon layer through an anisotropic etching process so as to be remained the second polycrystalline silicon layer only on the side surface of the opening;
etching the exposed first oxide film and thin oxide film to expose the second region;
selectively forming a third polycrystalline silicon layer doped the first conductivity type impurity at least on the exposed second region;

diffusing the first conductivity type impurity from the third polycrystalline silicon layer into the second region to form a third region of the first conductivity type in the second region; and
forming a metal silicide film at least over the surface of a portion of the first polycrystalline silicon layer.

4,873,201 METHOD FOR FABRICATING AN INTERCONNECTED ARRAY OF SEMICONDUCTOR DEVICES

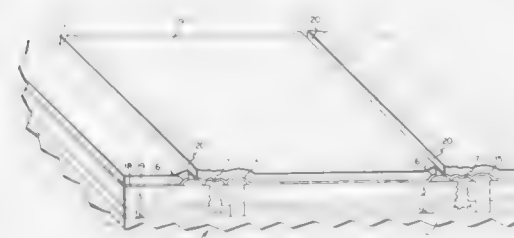
Derrick P. Grimmer, White Bear Lake; Kenneth R. Paulson, North St. Paul, and James R. Gilbert, St. Paul, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 10, 1987, Ser. No. 131,416

Int. Cl.⁴ H01L 31/18

U.S. Cl. 437-51

48 Claims



1. A method for fabricating an interconnected array of semiconductor devices based on an electrical insulating substrate initially having on a surface thereof a conductive support layer which supports a semiconductor material layer thereon having first and second major surfaces with said support layer being in electrical contact with said semiconductor material layer second major surface, said method comprising:

dividing said semiconductor material layer and said support layer into a plurality of semiconductor devices by removing selected commonly located portions of said semiconductor material layer and said support layer to thereby form separating spaces between adjacent said semiconductor devices each of which devices comprises a corresponding portion of said support layer and a corresponding portion of said semiconductor material layer having corresponding portions of said first and second major surfaces;

forming at said semiconductor material layer first major surface portions an electrical insulating intervening material in each said separating space extending through said semiconductor layer and said support layer; and

forming in each said semiconductor device a penetrating terminal extending through said semiconductor material layer portion therein from said first major surface portion thereof to be in electrical contact with its corresponding said support layer portion, each said penetrating terminal being formed from a location spaced apart in said semiconductor material layer first major surface from said separating spaces with said penetrating terminal on each said semiconductor device being electrically interconnected to that said semiconductor material layer first major surface portion provided in an adjacent said semiconductor device.

4,873,202 SOLID STATE RELAY AND METHOD OF MANUFACTURING THE SAME

Sigeo Akiyama, Neyagawa, Japan, assignor to Matsushita Electric Works, Ltd., Osaka, Japan

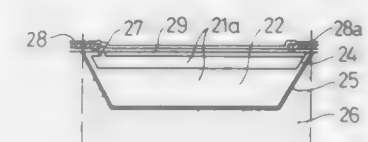
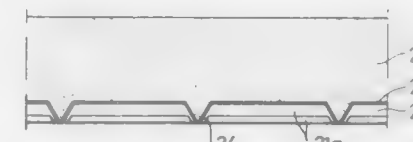
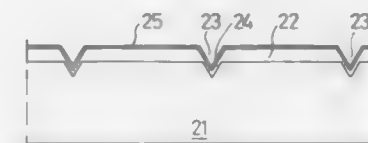
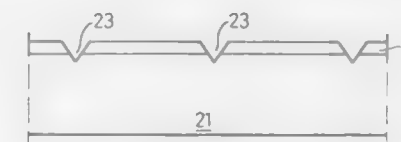
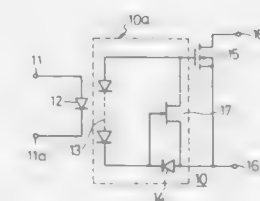
Division of Ser. No. 26,994, Mar. 10, 1987, Pat. No. 4,804,866. This application Nov. 7, 1988, Ser. No. 268,215

Claims priority, application Japan, Mar. 24, 1986, 61-68112; Jun. 16, 1986, 61-139911

Int. Cl.⁴ H01L 29/78

U.S. Cl. 437-62

5 Claims



1. A method of manufacturing a solid state relay, the method comprising the steps of forming a first high impurity concentration layer on one side of a low impurity concentration single crystal substrate layer; forming a plurality of grooves penetrating through said first high impurity concentration layer into said single crystal substrate; forming a second high impurity concentration layer over the entire surface of said first high impurity concentration layer and said grooves; coating said second high impurity concentration layer with an insulating

film over its entire surface; forming a carrier layer on said insulating film; preparing a dielectric-isolated substrate by abrading said low impurity concentration single crystal substrate layer from a reverse side thereof, so that the first and second high impurity concentration layers will appear in the form of a plurality of islands mutually isolated by said carrier layer filling said plurality of grooves and electrically isolated by said insulating film with said single crystal substrate layer appearing between respective said islands; and forming with said first and second high impurity concentration layers of the respective islands a plurality of diodes of a photovoltaic diode array for optical coupling to a light emitting element and for generating a photovoltaic output to be applied across gate and substrate electrodes of an output MOS FET, an impedance element being connected to both end terminals of said photovoltaic diode array and to said gate and substrate electrode of said MOS FET, and a normally ON driving transistor to be biased to be in a high impedance state by a voltage drop across said impedance element due to a current flowing through the impedance element.

4,873,203

METHOD FOR FORMATION OF INSULATION FILM ON SILICON BURIED IN TRENCH

Toru Kaga, Urawa; Shinichiro Kimura, Hachioji; Tokuo Kure, Kokubunji; Yoshifumi Kawamoto, Kanagawa, and Hideo Sunami, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

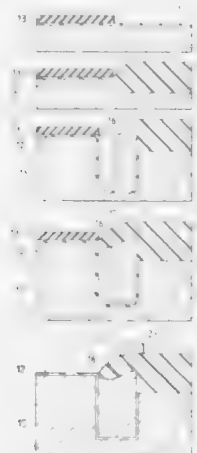
Filed Jul. 19, 1988, Ser. No. 221,351

Claims priority, application Japan, Jul. 27, 1987, 62-185481

Int. Cl.⁴ H01L 21/76

U.S. Cl. 437—67

20 Claims



1. A method for forming an insulation film on silicon buried in a trench, which comprises the steps of (i) forming a first mask composed of a first Si_3N_4 layer on a silicon substrate, (ii) forming a field oxide film by using the first mask composed of the first Si_3N_4 layer, (iii) forming a trench in the silicon substrate, (iv) burying polycrystalline silicon in the trench, and (v) oxidizing the surface of the polycrystalline silicon in the state where no Si_3N_4 , other than the first Si_3N_4 layer of the first mask, is present on the silicon substrate adjacent the trench.

4,873,204

METHOD FOR MAKING SILICIDE INTERCONNECTION STRUCTURES FOR INTEGRATED CIRCUIT DEVICES

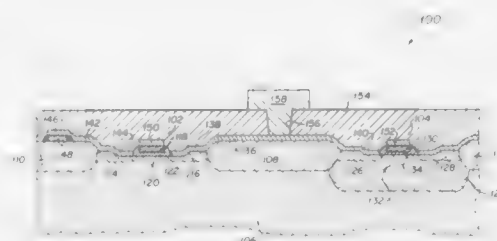
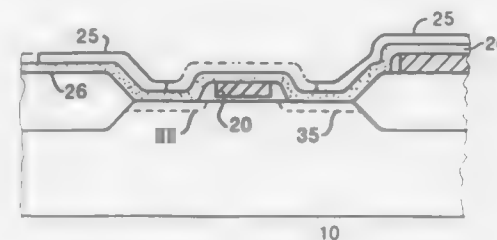
Siu-Weng S. Wong, Ithaca, N.Y.; Devereaux C. Chen, San Jose, and Kuang-Yi Chiu, Los Altos Hills, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 922,608, Oct. 24, 1986, abandoned, which is a continuation-in-part of Ser. No. 621,285, Jun. 15, 1984, abandoned. This application Nov. 8, 1988, Ser. No. 270,415

Int. Cl.⁴ H01L 21/283

U.S. Cl. 437—200

14 Claims



1. A method of forming an electrically conducting path between a contact region and a junction region on an integrated circuit, the method comprising the steps of:

forming a layer of a refractory metal over and between a contact region and a junction region of an integrated circuit;

forming a layer of amorphous silicon over said layer of refractory metal;

patterning said amorphous silicon to form a strip the strip extending over and between the contact region and the junction region but stopping short of a gate region adjacent the junction region;

heating the integrated circuit to cause that portion of the metal which is covered by the strip of amorphous silicon to react therewith and to cause that portion of the metal which overlies the junction region adjacent the gate region to react with a surface part of the junction region to form a strip of electrically conducting silicide which is in electrical contact with the junction region adjacent the gate and which extends between the junction region and the contact region; and

removing the remainder of said refractory metal which was not converted to silicide by said heating step.

4,873,205

METHOD FOR PROVIDING SILICIDE BRIDGE CONTACT BETWEEN SILICON REGIONS SEPARATED BY A THIN DIELECTRIC

Dale L. Critchlow, Burlington; John K. DeBrosse, Essex Junction; Rick L. Mohler, Williston; Wendell P. Noble, Jr., Milton, and Paul C. Parries, Essex Junction, all of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

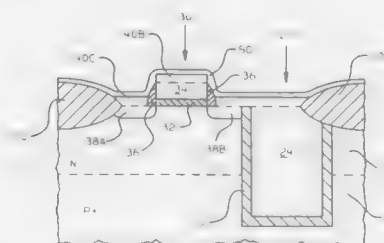
Continuation of Ser. No. 135,953, Dec. 21, 1987, abandoned.

This application Sep. 1, 1988, Ser. No. 240,421

Int. Cl.⁴ H01L 21/205, 21/283, 21/314

U.S. Cl. 437—200

17 Claims



1. A process for forming a bridge contact between first silicon regions separated by a narrow insulator gap without forming a contact between second silicon regions separated by insulator gaps that are wider than the narrow insulator gap, comprising the steps of:

providing a substrate having a plurality of first and second exposed silicon regions on an exposed surface thereof separated by a plurality of insulator regions, said first regions being separated by narrow insulator gaps and said second regions being separated by other insulator gaps appreciably wider than said narrow insulator gaps, at least some of said first and second regions comprising shallow diffusion regions;

growing undoped silicon regions over said plurality of first and second regions by exposure to a deposition gas comprised of a silicon component and an etchant component, said silicon component and said etchant component being present at a ratio sufficient to allow said silicon to grow over said narrow insulator gaps without allowing said silicon to grow over said other insulator gaps, said undoped silicon regions being grown under conditions that do not appreciably vary dopant profiles of said shallow diffusion regions;

depositing a refractory metal on said substrate, said refractory metal being of a thickness commensurate with that of said grown silicon regions;

sintering said substrate to form silicide regions over said first and second regions as well as over said narrow insulator gaps without forming a silicide over said other insulator gaps; and

removing unreacted portions of said refractory metal without appreciably etching said silicide regions.

4,873,206

DARK, NEUTRAL, GRAY, NICKEL-FREE GLASS COMPOSITION

James V. Jones, Cumberland, Md., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jul. 5, 1988, Ser. No. 215,191

Int. Cl.⁴ C03C 3/087

U.S. Cl. 501—71

12 Claims

1. A neutral gray colored glass composition having a base glass composition comprising:

SiO_2

68-75 percent by weight

-continued

Na_2O	10-18
CaO	5-15
MgO	0-5
Al_2O_3	0-5
K_2O	0-5

and traces of melting and refining aids, if any, and colorants consisting essentially of:

Fe_2O_3 (total iron)	0.6-1.0 percent by weight
MnO	0.005-0.02
CoO	0.01-0.02

at least 15 percent of the iron being in the ferrous state, the glass having a luminous transmittance of no more than 20 percent and total solar energy transmittance less than 40 percent at a thickness of 0.219 inch (5.56 millimeters).

4,873,207

CERAMIC AGGREGATE FOR ROADWAY COMPOSITION AND METHOD OF PRODUCING SAME

Fred Keller, Jr., 1410 Winston Cir., Bethlehem, Pa. 18017

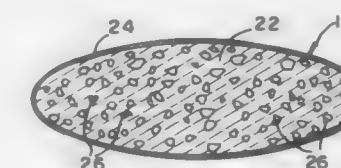
Continuation-in-part of Ser. No. 143,587, Jan. 13, 1988, Pat. No. 4,780,433, which is a continuation-in-part of Ser. No. 924,891, Oct. 30, 1986, Pat. No. 4,740,486. This application May 3, 1988, Ser. No. 189,665

The portion of the term of this patent subsequent to Apr. 26, 2005, has been disclaimed.

Int. Cl.⁴ C04B 20/00, 33/22, 38/06

U.S. Cl. 501—80

9 Claims



1. A ceramic aggregate for concrete constructions comprising a mixture of clay and dried organic garbage in the ratio of about three parts by volume of organic garbage to about one part by volume of clay, said mixture shaped into pellets and fired at a temperature in excess of the vitrification point of said clay.

5. In a cement based composition for building structures with increased hardness, the improvement comprising the addition to about one part by volume dry cement and about two parts granular sand or grog:

about three parts ceramic aggregate pellets, said aggregate pellets being formed from a premix of vitreous clay and processed shredded and dried organic garbage mulch in the ratio of one part clay to three parts organic garbage mulch by volume, the pellets being fired at a temperature higher than the vitrification point of said vitreous clay.

7. A method for producing a ceramic composition to make cement for roadways comprising:

(a) providing a dried organic mulch made from processed shredded organic garbage;

(b) mixing vitreous clay with said organic mulch, said clay having a fixing temperature of from about cone 3 (2000 degrees F.) to about cone 14 (2400 degrees F.);

(c) shaping said mixture of step (b) into pellets, each said pellet being generally elliptical with a rounded top surface, rounded ends, and a generally flat bottom surface, said ends having a height one half as great as the height of said pellet's longitudinal midpoint;

(d) firing said pellets at a temperature at least 100 degrees F.

- above said clay's vitrification point to cause said pellet surface to melt;
- (e) mixing dry cement, grog, and said pellets in the general ratio of one part cement to two parts grog to three parts pellets; and
- (f) mixing the mixture of step (e) with water to form concrete.

4,873,208

HOLDER FOR SEALING MEMBER

Mitsuhiko Nagata, Yokohama; Tadashi Hayashi, Yokosuka; Yoshinobu Hashimoto, Sakai, and Kiyoshi Nakamura, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 849,728, Apr. 9, 1986, abandoned. This application Oct. 19, 1987, Ser. No. 109,399

Claims priority, application Japan, Jun. 10, 1985, 60-124221 Int. Cl.⁴ C04B 35/52, 35/58

U.S. Cl. 501—89

10 Claims



1. A holder for a sealing member, in which at least a portion of said holder which comes into contact with said member comprises a sintered body comprising as a main component a non-oxide ceramic of silicon nitride, aluminum nitride, sialon or silicon carbide finished to a grinding degree of less than 4 S wherein S indicates a surface roughness in accordance with Japanese Industrial Standard B 0601.

4,873,209

INSULATING LIGHTWEIGHT REFRACTORY MATERIALS

Bohdan Gayra, Kingston, Canada, assignor to Alcan International Limited, Montreal, Canada

Filed Jun. 17, 1988, Ser. No. 208,255

Claims priority, application Canada, Jun. 26, 1987, 540710

Int. Cl.⁴ C04B 35/82

U.S. Cl. 501—95

27 Claims

1. A settable composition, which comprises a mixture of: ceramic fibers, natural wollastonite powder, and aqueous colloidal silica having a solids content of about 5–25% by wt.;

wherein the weight ratio of the ceramic fibres to the wollastonite powder is 0.8–1.2:1.5–2.5, respectively, and wherein the amount of said aqueous colloidal silica relative to the amount of said wollastonite powder is about 1–1.4 ml per gram.

4,873,210

SIALON CONTAINING HIGH CONTENT OF ALPHA PRIME PHASE

Martin Y. Hsieh, Palo Alto, Calif., assignor to GTE Products Corporation, Stamford, Conn.

Filed Dec. 2, 1987, Ser. No. 127,846

Int. Cl.⁴ C04B 35/58

U.S. Cl. 501—98

7 Claims

1. A pressureless sintered silicon aluminum oxynitride article

having high density and high hardness and having a composition which contains about 100 weight percent of alpha prime



phase sialon and is located in Triangle XYZ of the quaternary system $\text{Si}_3\text{N}_4\text{—AlN—Y}_2\text{O}_3$ shown in FIG. 1.

4,873,211

CRACKING CATALYST AND PROCESS

Darrell W. Walker, Media, Pa., and A. M. Schaffer, Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 69,337, Jul. 2, 1987, Pat. No. 4,765,884.

This application May 13, 1988, Ser. No. 193,863

Int. Cl.⁴ B01J 27/18, 27/82, 29/06

U.S. Cl. 502—64

11 Claims

1. A composition of matter, effective as a cracking catalyst composition, comprising:

- zeolite and
- a matrix material, in which said zeolite is embedded, consisting essentially of aluminum phosphate.

4,873,212

NITROGEN-CONTAINING BIDENTATE COMPOUND IMMOBILIZED ON A SOLID INORGANIC CARRIER

Johan Stapersma, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Mar. 7, 1988, Ser. No. 165,054

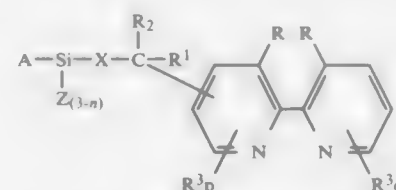
Claims priority, application United Kingdom, Mar. 25, 1987, 11707111

Int. Cl.⁴ B01J 31/02; C07F 7/18, 5/06

U.S. Cl. 502—158

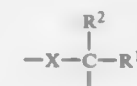
6 Claims

1. A catalyst composition comprising nitrogen-containing bidentate compound immobilized on a solid inorganic carrier having the formula



wherein A forms part of a solid inorganic nucleus of an oxide of silicon or of aluminium, Si is silicon, Z is an alkyl, aryl, alkoxy or aryloxy group of up to 10 carbon atoms; n is an integer 1, 2, or 3; and when n is 2 or 3 the remaining Si-bonds are connected with the nucleus A; R¹ and R² independently are hydrogen, an alkyl or cycloalkyl group of up to 7 carbon atoms or a benzyl group; or both R¹ and R² together form a group $-(\text{CH}_2)_a-$ wherein a is an integer of from 2 to 6; each R is hydrogen or both R's together form the group $-\text{CH}=\text{CH}-$;

each R³ individually is an alkyl of 1 to 6 carbon atoms, phenyl, alkoxy of 1 to 6 carbon atoms, phenoxy, alkylthio of 1 to 6 carbon atoms, or phenylthio group and p and q are integers of from 0 to 2 and of from 0 to 3, respectively; the



group is linked to a carbon atom of the heterocyclic aromatic ring which occupies the ortho- or para-position with respect to the nitrogen atom in said heterocyclic ring; and $-\text{X}-$ is a bivalent organic radical.

4,873,213

LOW PRESSURE RHODIUM CATALYZED HYDROFORMYLATION OF OLEFINS

Thomas A. Puckette, 306 Jamie Ct., and Thomas J. Devon, 109 Katy Dr., both of Longview, Tex. 75601

Filed Aug. 12, 1988, Ser. No. 231,564

Int. Cl.⁴ B01J 31/18

U.S. Cl. 502—161

8 Claims

1. A catalyst composition comprising a mixture of rhodium components having the structure:



wherein

Ar is an aromatic ring having 6–14 carbon atoms; each Z is independently:
 a C₁ up to C₁₂ alkyl radical;
 a C₆ up to C₁₂ aryl radical;
 a C₇ up to C₁₂ alkaryl or aralkyl radical; halogen, excluding Cl, Br or I in the ortho position;
 —OR or —CO₂R, wherein R is a C₁ up to C₁₂ alkyl radical, a C₆ up to C₁₂ aryl radical, or a C₇ up to C₁₂ alkaryl or aralkyl radical;
 wherein x is a whole number which varies in the range of 0 up to 4 when Ar is phenyl, 0 up to 6 when Ar is naphthyl and 0 up to 8 when Ar is phenanthryl or anthracenyl; and wherein z is a whole number selected from 2 and 3.

4,873,214

CARBONACEOUS MATERIAL FOR PRODUCTION OF HYDROGEN FROM LOW HEATING VALUE FUEL GASES

Elias P. Koutsoukos, Los Angeles, Calif., assignor to TRW Inc., Redondo Beach, Calif.

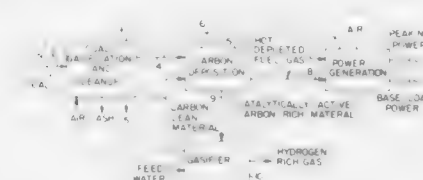
Continuation of Ser. No. 685,882, Dec. 24, 1984, abandoned.

This application Jun. 30, 1987, Ser. No. 70,627

Int. Cl.⁴ B01J 21/18; C01B 31/02, 3/02; C10K 3/04

U.S. Cl. 502—185

4 Claims



1. A fibrous carbon-enriched carbonaceous material for use in a continuous steam gasification process for producing a hydrogen-rich gas stream from a low heating value fuel gas, the fibrous carbon-enriched carbonaceous material having been produced by carbon deposition from a low heating value fuel gas comprising carbon monoxide at a temperature above about 350° C. onto a carbon lean material comprising a metal

component, the fibrous carbon-enriched carbonaceous material comprising:

- about 55 to about 98 percent by weight carbon, about 1 to about 44 percent by weight metal component, and about 0.1 to about 1 percent by weight hydrogen; and including a major phase and a minor phase,
- the major phase comprising from about 95 to about 99.9 percent by weight carbon, about 0.1 to about 1 percent by weight hydrogen, and the balance being the metal component; and
 - the minor phase being nodules which are dispersed throughout the major phase and are intimately associated with, and at least partly bonded to the carbon in the major phase, the minor phase comprising carbon and at least about 50 percent by weight metal component,

wherein the metal component comprises from about 75 to about 95 percent by weight cobalt, and an effective amount of iron in an amount of from about 5 to about 15 percent by weight and an effective amount of chromium in an amount of from about 1 to about 10 percent by weight for suppressing the production of methane and enhancing the production of hydrogen, so that the carbon-enriched carbonaceous material is capable of producing a gas stream that consists primarily of hydrogen and not more than about 5 mole percent methane on a dry basis.

4,873,215

CATALYST FOR AMMOXIDATION OF PARAFFINS

James F. Brazdil, Mayfield Village, and Andrew T. Guttman, Maple Heights, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Division of Ser. No. 919,105, Oct. 15, 1986, abandoned. This application May 13, 1987, Ser. No. 49,252

The portion of the term of this patent subsequent to Oct. 3, 2006, has been disclaimed.

Int. Cl.⁴ B01J 27/182, 27/185, 27/188, 27/198

U.S. Cl. 502—202

14 Claims

1. A complex metal oxide catalyst having ingredients and the proportions which are represented by the following empirical formula:



where

A is one or more of W, Sn, B and Ge;
 D is one or more of Fe, Co, Ni, Cr, Mn, Cu, Zn, Se, Te, Pb and As;
 C is one or more of an alkali metal and T1;
 T is one or more of Ca, Sr and BA;
 and where m is 3–7; n is greater than zero and up to 10; a is 0.2–10; b is 0–3; c is 0–1; t is 0–1; a is equal to or less than m; b is equal to or less than m; n is equal to or less than m; and wherein the antimony has an average valency higher than +3, the vanadium has an average valency lower than +5, wherein A includes at least 0.2 atoms of W and the catalyst is essentially free of Mo and is on an inorganic support material selected from silica-alumina and alumina having 20 to 100 weight percent alumina.

4,873,216

LANTHANA-ALUMINA-ALUMINUM PHOSPHATE
CATALYST COMPOSITION

Robert P. L. Abail, Mantua; Philip J. Angevine, West Deptford; Arthur W. Chester, Cherry Hill, and Garry W. Kirker, Washington Township, Gloucester County, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 50,446, May 18, 1987, Pat. No. 4,810,361. This application Dec. 13, 1988, Ser. No. 283,778

The portion of the term of this patent subsequent to Aug. 30, 2005, has been disclaimed.

Int. Cl.⁴ B01J 21/04, 23/10, 27/18, 32/00

U.S. Cl. 502-211

13 Claims

1. A catalyst composition comprising catalytic component selected from the group consisting of metals of groups IIIB, IVB, VB, VIB, VIIB and VIII of the Periodic Table of Elements, copper, zinc and combinations thereof, and a catalyst support comprising an amorphous combination of lanthana, alumina and aluminum phosphate in the absence of a hydrocarbon-containing feedstream.

4,873,217

CATALYST FOR OXIDATION OF OLEFIN OR
TERTIARY ALCOHOL AND PROCESS FOR
PRODUCTION THEREOF

Tatsuya Kawajiri; Hideo Onodera; Shinichi Uchida, all of Himaji; Yukio Aoki, Taishi, and Masahiro Wada, Nishinomiya, all of Japan, assignors to Nippon Shokubai Kagaku Kogyo Co., Ltd., Osaka, Japan

Filed Feb. 17, 1988, Ser. No. 156,669

Claims priority, application Japan, Feb. 17, 1987, 62-32354; Jun. 18, 1987, 62-150112

Int. Cl.⁴ B01J 23/78, 23/84, 23/88

U.S. Cl. 502-311

15 Claims

1. A catalyst useful for producing, by catalytic gas phase oxidation of a C₃-C₅ olefin or tertiary alcohol, the corresponding unsaturated aldehyde and unsaturated carboxylic acid, said catalyst being obtained by forming particles of an unfired material powder comprising molybdenum, iron and bismuth in a centrifugal flow coating device, and then firing the particles, said catalyst having a specific surface area in the range of from 1 to 20 m²/gr, a pore volume in the range of from 0.1 to 1.0 cc/gr and a pore diameter distribution in which the pore diameters are collectively distributed in the range of each of from 1 to 10 microns and from 0.1 to less than 1 micron.

4,873,218

LOW DENSITY, RESORCINOL-FORMALDEHYDE
AEROGEL

Richard W. Pekala, Pleasant Hill, Calif., assignor to The United States Department of Energy, Wash.

Filed May 26, 1988, Ser. No. 199,404

Int. Cl.⁴ B01J 20/02; C08J 9/28

U.S. Cl. 502-418

15 Claims

1. A process for the synthesis of a low density, organic aerogel of ultra-fine pore size, said process comprising the steps of:

- mixing in a predetermined ratio a polyhydroxy benzene and formaldehyde in the presence of a base catalyst;
- heating the mixture to a predetermined temperature for a sufficiently long period of time to form a stable gel;
- washing the gel in a suitable organic solvent to exchange the aqueous solvent for the organic solvent;
- critical point drying the gel; and
- characterizing the gel.

4,873,219

DESENSITIZABLE SELF-CONTAINED RECORD
MATERIAL USEFUL FOR SECURITY DOCUMENTS
AND THE LIKE

Robert W. Brown, and Donald Churchill, both of Appleton, Wis., assignors to Appleton Papers Inc., Appleton, Wis.

Filed Nov. 15, 1988, Ser. No. 271,472

Int. Cl.⁴ B41M 5/16; G03C 1/72

U.S. Cl. 503-204

9 Claims

1. An improved self-contained pressure-sensitive record material having tamper resistance, said self-contained record material being of the type having a substrate, a coating on said substrate comprising in acidic developer material and a first set of microcapsules containing a first color former capable of expressing a first color, wherein the improvement comprises in addition a second set of microcapsules in combination with the first set of microcapsules, the second set of microcapsules containing a second color former and a photosensitive composition internal thereof which second set of microcapsules undergo a change in viscosity upon exposure to actinic radiation and which second color former is capable of expressing a color different from the color of the first color former in the first set of microcapsules, wherein the first set of microcapsules does not contain any photosensitive composition and said color formers are compounds which are not substantially decomposed by light.

4,873,220

HEAT-SENSITIVE TRANSFER MATERIAL

Seiiti Kubodera, and Takeshi Nakamine, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 25, 1988, Ser. No. 236,473

Claims priority, application Japan, Aug. 25, 1987, 62-211154

Int. Cl.⁴ B41M 5/035, 5/26

U.S. Cl. 503-227

16 Claims

1. A heat-sensitive transfer material comprising a support having provided thereon a coloring material layer containing binder and a dye represented by formula (I):

wherein
Q¹ represents an atomic group containing at least one nitrogen atom required to form a nitrogen-containing heterocyclic ring containing 5 or more members together with the carbon atoms to which Q¹ is bonded;

R¹ represents an acyl group or a sulfonyl group;

R² represents a hydrogen atom or an aliphatic group containing from 1 to 6 carbon atoms;

R³ represents a hydrogen atom, a halogen atom, an alkoxy group or an aliphatic group containing from 1 to 6 carbon atoms, and may be connected to R¹, R² or R⁴ to form a ring;

R⁴ represents a halogen atom, an alkoxy group or an aliphatic group containing from 1 to 6 carbon atoms;

R⁵ and R⁶, which may be the same or different, each represents a hydrogen atom, an aliphatic group containing from 1 to 6 carbon atoms or an aromatic group, and R⁵ and R⁶ may be connected to each other to form a ring, or at least one of R⁵ and R⁶ may be connected to R⁴ to form a ring; and

n represents an integer of from 0 to 4.

4,873,221

DIFLUORO PEPTIDE COMPOUNDS

Diane A. Trainor, Glen Mills, Pa., assignor to ICI Americas Inc., Wilmington, Del.

Filed May 19, 1987, Ser. No. 51,952

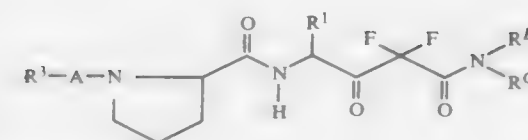
Claims priority, application United Kingdom, Jun. 5, 1986, 2,417,111

Int. Cl.⁴ A61K 37/43; C07K 5/08

U.S. Cl. 514-18

4 Claims

1. A compound of formula Ib



wherein

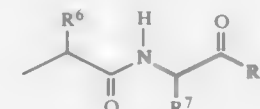
R¹ is an alkyl group containing 3 carbons;

R² is benzyl;

A is —OCO—;

R^C is hydrogen; and

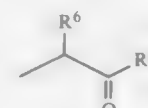
R^B is selected from a group consisting of (a) formula IIa



wherein

R⁶ is hydroxymethyl or phenylmethyl and

R⁷ is hydrogen or phenylmethyl, and (b) formula IIb



wherein

R⁶ is hydrogen, phenylmethyl, 4-[(phenylmethoxy)carbonyl]butyl or 2-[(phenylmethoxy)carbonyl]ethyl; and
R⁸ is methoxy, hydroxy or phenylmethoxy, or a pharmaceutically acceptable salt thereof.

4,873,222

PLACENTA-DERIVED ANTICOAGULATING
SUBSTANCE

Koichi Arai, Urawa, and Hideo Yoshizaki, Sayama, both of Japan, assignors to Kowa Co., Ltd., Nagoya, Japan

Filed Oct. 2, 1987, Ser. No. 103,686

Claims priority, application Japan, Oct. 14, 1986, 61-243778

Int. Cl.⁴ A61K 37/02, 35/50

U.S. Cl. 514-21

1 Claim

1. A human placenta-derived anticoagulating substance having the following properties:

- (1) molecular weight (SDS-polyacrylamide gel electrophoresis, reduced and non-reduced states): 73,000±2,000;
- (2) isoelectric point (isoelectric column electrophoresis using an ampholyte): 6.2-6.6;
- (3) stability:
 - (a) inactivated by a heat treatment at 50° C. for 30 minutes;
 - (b) stable in a pH range of 5.5-8.5 (37° C.);
 - (c) stable in plasma at 37° C. for 15 minutes;
- (4) effects:
 - (a) capable of prolonging the recalcification time;
 - (b) capable of prolonging the prothrombin time;
 - (c) capable of prolonging the activated partial thromboplastin time; and
- (5) amino acid composition as determined by hydrolysis with 5.7 N HCl at 110° C.:

Amino acid	Analysis data (mol %)
Aspartic acid	11.0
Threonine	6.1*
Serine	5.8*
Glutamic acid	12.7
Proline	2.4

-continued

Amino acid	Analysis data (mol %)
Glycine	7.0
Alanine	8.9
† Cystine	0.5
Valine	3.7**
Methionine	2.8
Isoleucine	6.2**
Leucine	10.0
Tyrosine	3.4
Phenylalanine	3.8
Histidine	1.9
Lysine	7.6
Arginine	6.3
Total	100.0

IIa

in which the unasterisked analysis data are those obtained after the 24-hour hydrolysis, the single-asterisked analysis data are those obtained by extrapolation to 0 hour, and the double-asterisked analysis data are those obtained after the 72-hour hydrolysis.

4,873,223

ZINC SALT OF FRUCTOSE-1,6-DIPHOSPHATE
Antonio B. Vinas, Barcelona, Spain, assignor to Laboratorios Vinas, S.A., Barcelona, Spain

Filed Mar. 12, 1986, Ser. No. 838,996

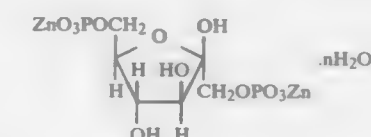
Claims priority, application Spain, Mar. 15, 1985, 541.277

Int. Cl.⁴ A61K 31/70; C07H 13/00

U.S. Cl. 514-23

4 Claims

3. A method of treating a male patient suffering from a condition of low zinc concentration or low fructose concentration in seminal plasma caused by gonadal dysfunction, which comprises administering to such a patient a therapeutically effective amount of a pharmaceutical composition comprising a therapeutically effective amount of the zinc salt of fructose-1,6-diphosphate having the formula



wherein n=0 to 4, in combination with a pharmacologically acceptable carrier.

4,873,224

AVERMECTIN DERIVATIVES

Bruce O. Linn, Bridgewater, and Helmut Mrozik, Matawan, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

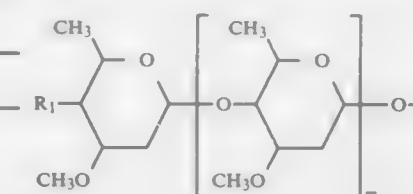
Filed May 23, 1988, Ser. No. 197,731

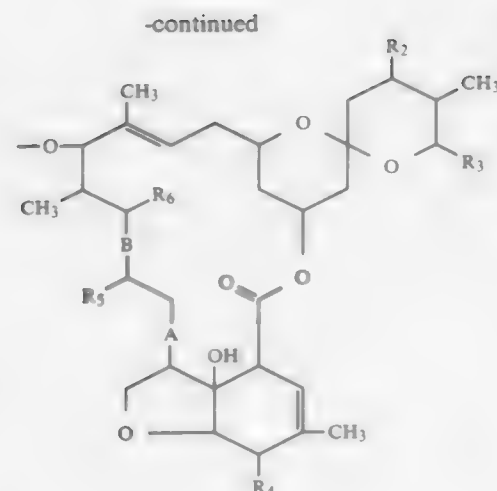
Int. Cl.⁴ A61K 31/70; C07H 17/08

U.S. Cl. 514-30

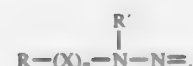
13 Claims

1. A compound having the formula:





wherein
m is 0 or 1;
R₁ is



wherein
n is 0 or 1;

R is hydrogen, amino, loweralkyl, mono- or di-lower alkyl amino, methoxy-loweralkylamino, diloweralkylamino-loweralkyl, diloweralkylaminoloweralkylamino, loweralkylphenyl, loweralkyl phenylamino, loweralkoxyphenyl, loweralkoxyphenylamino, halophenyl, halophenylamino, sulfamylphenyl, sulfamyl-phenylamino, morpholinyl, N-loweralkyl piperazinyl, N-(loweralkoxy phenyl)piperazinyl, N-(halophenyl)piperazinyl, benzimidazolylamino, pyrimidinylamino, thiazolylamino, benzothiazolylamino or N-(loweralkylphenyl)piperazinyl

R' is hydrogen or loweralkyl;
X is carbonyl or sulfonyl;
A is a double bond or an epoxide;
B is a single bond or a double bond;
R₂ is hydrogen or hydroxy,
R₃ is iso-propyl or sec-butyl,
R₄ is hydroxy or methoxy.

R₅ and R₆ are present only when B is a single bond and are independently hydrogen, hydroxy or halogen;
and the broken line indicates a single or a double bond at the 22,23-position, provided that R₂ is hydroxy only when the broken line indicates a single bond.

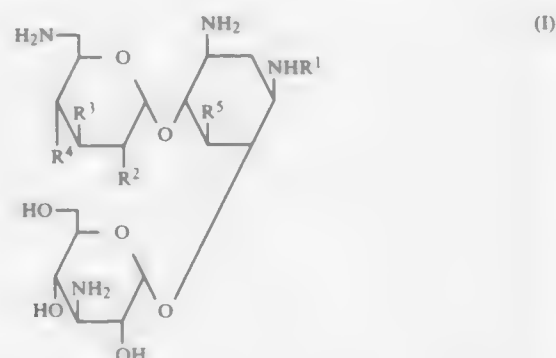
11. A method for the treatment of parasitic infections which comprises administering to an animal infected with parasites an effective amount of a compound of claim 1.

4,873,225 1-N-(4-AMINO-3-FLUORO-2-HYDROXYBUTYRYL)- KANAMYCINS

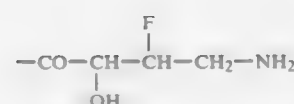
Sumio Umezawa, Tokyo; Tsutomu Tsuchiya, Yokohama; Tomio Takeuchi, Tokyo; Kazuo Umezawa, Tokyo; Yoshiaki Takahashi, Tokyo; Tetsuo Shitara, Tokyo; Yoshihiko Kobayashi, and Yasushi Takagi, both of Yokohama, all of Japan, assignors to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai, Japan
Filed Feb. 22, 1988, Ser. No. 158,628
Claims priority, application Japan, Feb. 24, 1987, 62-39033
Int. Cl.⁴ A61K 31/70; C07H 15/22

U.S. Cl. 514-41 13 Claims

1. A 1-N-((2R,3R)-4-amino-3-fluoro-2-hydroxybutyryl) kanamycin A or B derivative represented by the formula:



wherein R¹ means a (2R,3R)-4-amino-3-fluoro-2-hydroxybutyryl group of the formula:



and (a) R², R³, R⁴ and R⁵ are each a hydroxyl group, or (b) R⁴ and R⁵ are each a hydroxyl group, and R² and R³ are each a hydrogen atom, or (c) R⁴ and R⁵ are each a hydroxyl group, R³ is a hydrogen atom, and R² is a fluorine atom, or (d) R², R³ and R⁴ are each a hydroxyl group, and R⁵ is a fluorine atom, or (e) R² is an amino group, and R³, R⁴ and R⁵ are each a hydroxyl group, or (f) R² is an amino group, R³ is a hydrogen atom, and R⁴ and R⁵ are each a hydroxyl group, or (g) R² is an amino group, R³ and R⁴ are each a hydrogen atom, and R⁵ is a hydroxyl group, or (h) R² is an amino group, R³ and R⁴ are each a hydroxyl group, and R⁵ is a fluorine atom, or (i) R² is an amino group, R³ is a hydrogen atom, R⁴ is a hydroxyl group, and R⁵ is a fluorine atom, or (j) R² is an amino group, R³ and R⁴ are each a hydrogen atom, and R⁵ is a fluorine atom; or a pharmaceutically acceptable acid addition salt thereof.

13. A method of treating bacterial growth in an animal or human, which comprises administering a bacteriologically effective amount of the compound of the formula (I) as defined in claim 1 or a pharmaceutically acceptable acid addition salt thereof to an animal or human infected with or susceptible to bacteria.

4,873,226 METHOD OF INHIBITING HERPETIC LESIONS BY THE USE OF PLATINUM COORDINATION COMPOUNDS

Robert C. Talroy, Oxford; Sarah G. Ward, Utica, and Parbury P. Schmidt, Rochester, all of Mich., assignors to Delta Metals, Inc., Rochester, Mich.

Division of Ser. No. 505,216, Jun. 17, 1983, Pat. No. 4,571,335.

This application Jul. 19, 1985, Ser. No. 757,062

Int. Cl.⁴ A61K 31/70, 31/555, 31/28

U.S. Cl. 514-46

5 Claims

1. A method of inhibiting herpetic lesions in a warm blooded animal comprising:

applying to the surface of the lesions of said warm blooded animal a herpes virus inhibiting amount of platinum coordination compound contained in a pharmaceutical composition in topical dosage form, the platinum coordination compound content being selected from the group of compounds consisting of cisplatin derivatives having the formula



where x is one or two, y and z being one when x is one and being zero and two when x is two, and P is cyclaradine.

4,873,227 3',5'-CAMP DERIVATIVES FOR TREATMENT OF CERTAIN TYPES OF SKIN ULCERS

Junji Ikada, Uji, and Eiko Mano, Tokyo, both of Japan, assignors to Daiichi Seliyaku Co., Ltd., Tokyo, Japan

Filed Jun. 11, 1987, Ser. No. 60,516

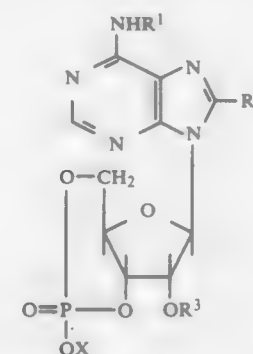
Claims priority, application Japan, Jun. 16, 1986, 61-139749

Int. Cl.⁴ A61K 31/70

U.S. Cl. 514-47

12 Claims

1. A method for the treatment of a skin ulcer selected from the group consisting of a gangrene, a thermal burn, frostbite and radionecrosis, in mammals, which comprises applying to an affected area of a mammal an effective amount of an adenosine-3',5'-cyclic phosphate derivative of the formula (I):



wherein R¹ represents a hydrogen atom, an alkyl group of from 1 to 6 carbon atoms or an aliphatic acyl group of from 2 to 7 carbon atoms; R² represents a hydrogen atom, a mercapto group, an alkylthio group of from 1 to 6 carbon atoms, a benzylthio group, an amino group, a hydroxy group, a chlorine atom or a bromine atom; R³ represents a hydrogen atom or an aliphatic acyl group of from 2 to 7 carbon atoms; with the proviso that not all of R¹, R² and R³ are a hydrogen atom at the same time, and X represents a hydrogen atom or a sodium atom, to the affected portion.

4,873,228 2-OXO-4-CARBOXY-PYRIMIDINES AND THEIR USE AS ANTI-MALARIA AND ANTI-CANCER AGENTS

Karl J. Schmalzi, Victoria; Suresh C. Sharma, Prospect, and Richard I. Christopherson, Paddington, all of Australia, assignors to The University of Melbourne, Melbourne and The University of Sydney, Sydney, both of, Australia

Filed Sep. 1, 1987, Ser. No. 91,761

Claims priority, application Australia, Sep. 2, 1986, PH78111;

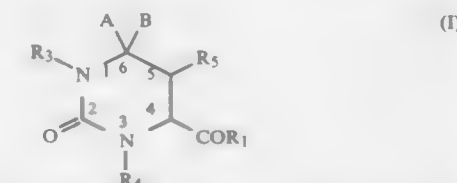
Sep. 22, 1986, PH8161

Int. Cl.⁴ A61K 31/505; C07D 401/06; C08B 37/00

U.S. Cl. 514-49

22 Claims

1. A compound of the formula (I)



wherein either (i) A and B together are =S or (ii) A is —H, and B is COR₂ or —SR₆; and R₁ and R₂ which may be the same or different are —OH; a di-, tri- or polypeptide group, —OR where R is saturated or unsaturated C₁₋₁₆ alkyl, C₁₋₁₆ alkanoyloxymethyl, or 4-alkyl-piperidinyl-alkyl, —NR'R' where each R₁ is independently selected from —H or saturated or unsaturated C₁₋₁₆ alkyl, R₃ is H, R₄ is —H, C₁₋₆ alkyl, hydroxy C₁₋₁₆ alkyl, hydroxy C₁₋₆ ether group, tetrahydrofuranyl, tetrahydropyranyl, a sugar group, hexylcarbonyl, or methylglycine-N-carbonyl, R₅ is —H, halo, or C₁₋₆ alkyl; R₆ is C₁₋₆ alkyl or 1-methyl 1-4-nitroimidazol-5-yl; and the dotted line represents a double bond which may be absent or present in the 4-5 position, provided that A and B shall not be =S when R₁ is OH, R₄ is —H and R₅ is —H.

18. A composition which comprises an anti-malaria effective amount, or an anti-cancer effective amount of a compound according to claim 1 together with a pharmaceutically acceptable carrier.

4,873,229 GALACTO-OLIGOSACCHARIDE CONTAINING FEED

Eiki Deya, Sayama; Shuichi Yanahira, Tsurugashimamachi; Kenkichi Abiko, and Eichi Kikuchi, both of Kodaira, all of Japan, assignors to Snow Brand Milk Products Co., Ltd., Sapporo, Japan

Filed Dec. 8, 1986, Ser. No. 939,141

Claims priority, application Japan, Dec. 12, 1985, 60-277957

Int. Cl.⁴ A61K 31/70, 31/715

U.S. Cl. 514-54

6 Claims

1. A galacto-oligosaccharide containing stock feed which comprises a livestock feed incorporated from about 0.1 to 2% by weight of galacto-oligosaccharides being selected from the group consisting of galactosyl-lactose and digalactosyl-lactose.

4. A method of preventing scours/loose passage in livestock comprising administering thereto a livestock feed comprising 0.1 to 2% by weight of galacto-oligosaccharides relative to the livestock feed.

4,873,230 COMPOSITION FOR THE PRESERVATION OF ORGANS

Folkert O. Belzer, and James H. Southard, both of Madison, Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Division of Ser. No. 784,435, Oct. 3, 1985, Pat. No. 4,798,824.

This application Jul. 27, 1988, Ser. No. 225,102

The portion of the term of this patent subsequent to Jan. 17, 2006, has been disclaimed.

Int. Cl.⁴ A61K 31/715

U.S. Cl. 514-60

2 Claims

1. A composition of matter for the preservation of organs

comprising hydroxyethyl starch having a molecular weight of from about 150,000 to about 350,000 daltons, degree of substitution of from about 0.4 to about 0.7, and being substantially free of ethylene glycol, ethylene chlorohydrin, sodium chloride and acetone.

4,873,231

DECREASING THE TOXICITY OF AN IBUPROFEN SALT

Walton J. Smith, 21 Green St., Grafton, N.H. 03240
Continuation-in-part of Ser. No. 853,542, Apr. 8, 1986, abandoned, which is a continuation-in-part of Ser. No. 469,974, Feb. 25, 1983, abandoned, which is a continuation-in-part of Ser. No. 351,962, Feb. 24, 1982, abandoned, which is a continuation-in-part of Ser. No. 161,386, Jun. 20, 1980, abandoned, which is a continuation-in-part of Ser. No. 79,119, Sep. 26, 1979, abandoned, which is a continuation-in-part of Ser. No. 923,464, Jun. 10, 1978, abandoned, which is a continuation-in-part of Ser. No. 671,939, Mar. 30, 1976, abandoned. This application Jan. 19, 1988, Ser. No. 182,284

Int. Cl.⁴ A61K 31/19

U.S. Cl. 514—557

3 Claims

1. A method of decreasing the toxicity of a salt of ibuprofen by combining the salt with from one to five molar excess of a bicarbonate or carbonate.

4,873,232

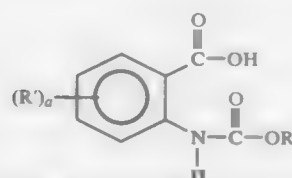
NOVEL USE FOR CARBAMOYL BENZOATES

Alexander Krantz, Toronto, Canada, and John M. Young, Redwood City, Calif., assignors to Syntex, Palo Alto, Calif.
Filed Oct. 29, 1986, Ser. No. 924,246
Int. Cl.⁴ A61K 31/615, 31/635

U.S. Cl. 514—159

30 Claims

1. A method for treating an auto-immune disease, by administering to a subject in need thereof a compound of the formula:



or a pharmaceutically acceptable salt thereof, wherein: a is an integer of 1 or 2 and R' is in the 6— or 4— position of the benzoic acid ring system.

R is alkyl, phenyl, or cycloalkyl having three to six carbon atoms, wherein the phenyl, or cycloalkyl ring is optionally substituted with 1 to 3 substituents independently selected from the group consisting of lower alkyl having one to four carbon atoms, lower alkoxy having one to four carbon atoms, -N(R¹)₂, -NO₂, halo, and lower alkylthio having one to four carbon atoms; and each R' is independently selected from the group consisting of lower alkyl having one to six carbon atoms, lower alkenyl having two to six carbon atoms, halo-lower alkyl or lower alkylthio having one to six carbon atoms, halo, and NO₂, in which

each R¹ is independently hydrogen or lower alkyl having one to four carbon atoms. each R² is independently lower alkyl having one to four carbon atoms.

4,873,233 17-SUBSTITUTED ANDROSTA-1,4-DIEN-3-ONE DERIVATIVES

Vittoria Villa; Enrico di Salle, and Paolo Lombardi, all of Milan, Italy, assignors to Farmitalia Carlo Erba S.p.A., Milan, Italy
Filed Sep. 12, 1988, Ser. No. 242,855

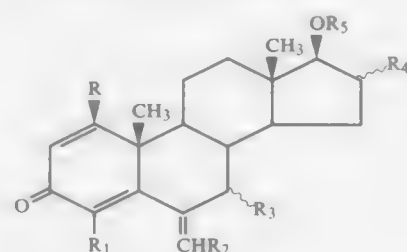
Claims priority, application United Kingdom, Sep. 11, 1987, 8711334

Int. Cl.⁴ A61K 31/56; C07J 1/00

U.S. Cl. 514—179

8 Claims

1. A compound of general formula (I)



wherein

each of R and R₃, independently, is hydrogen or C₁—C₆ alkyl;

R₁ is hydrogen, halogen or C₁—C₆ alkyl;

R₂ is hydrogen or C₁—C₆ alkyl;

R₄ is hydrogen or fluorine;

R₅ is (a) hydrogen or C₁—C₆ alkyl; (b) phenyl unsubstituted or substituted by one or two substituents independently chosen from C₁—C₆ alkyl, halogen and amino; (c) an acyl group; or (d) a hydroxy protecting group; and the pharmaceutically acceptable salts thereof.

4,873,234

ISOXAZOLOBENZOXAZEPINES

Gregory M. Shutske, Somerset, and Kevin J. Kapples, Little York, both of N.J., assignors to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.

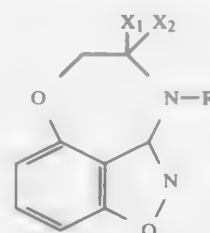
Filed Aug. 1, 1988, Ser. No. 226,930

Int. Cl.⁴ C07D 448/04; A61K 31/55

U.S. Cl. 514—211

108 Claims

1. An isoxazolobenzoxazepine of the formula



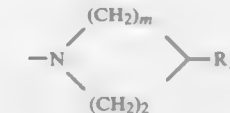
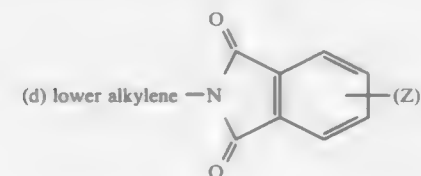
wherein X₁ is H; X₂ is H or OH; or X₁ and X₂ taken together are carbonyl oxygen or



R is (1) H, (2) loweralkyl, (3) arylloweralkyl, (4) loweralkynyl, (5) loweralkenyl,

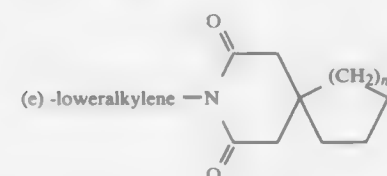


where R₁ and R₂ are independently (a) H, (b) lower alkyl, (c) arylloweralkyl, (d)

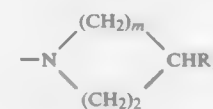


where R₃ and m are as defined above;

where Z is H, halogen, loweralkyl, loweralkoxy, CF₃, nitro or amino and n is an integer of 1 to 3;



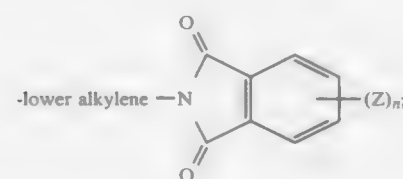
where n' is an integer of 1 to 3; or (f) R₁ and R₂ taken together with the nitrogen atom are substituted or unsubstituted piperidino or pyrrolidino of the formula



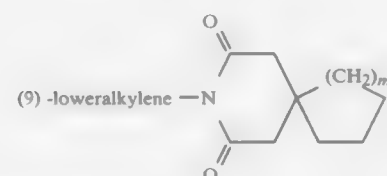
where R₃ is H, loweralkyl or aryl, and m is an integer of 1 or 2;



where R₄ is H or loweralkyl and m' is an integer of 3 or 4;



where Z and n are as previously defined;

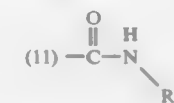


where m''' is an integer of 1, 2 or 3;



where R₅ and R₆ are independently alkyl, aryl lower alkyl or

are taken together with the N atom to form a substituted or unsubstituted piperidino or pyrrolidino group of the formula



where R₇ is loweralkyl, aryl, or aryl loweralkyl;



where [R₁ and R₂]R₅ and R₆ are as previously defined; and the pharmaceutically acceptable acid addition salts thereof and where applicable to the geometric, and stereo isomers thereof.

4,873,235

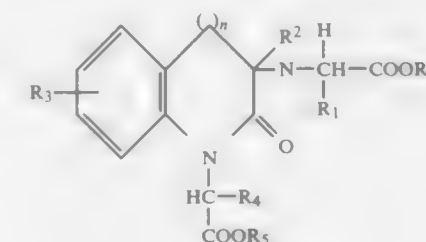
BENZOFUSED LACTAMS AS ANTIHYPERTENSIVES
William H. Parsons, Avenel; Arthur A. Patchett, Westfield, and Eugene D. Thorsett, Fanwood, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 383,435, Jun. 1, 1982, abandoned. This application Mar. 16, 1983, Ser. No. 473,792
Int. Cl.⁴ A61K 31/47; C07D 217/24

U.S. Cl. 514—312

18 Claims

1. A compound having the formula:



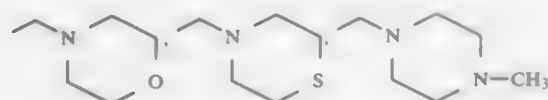
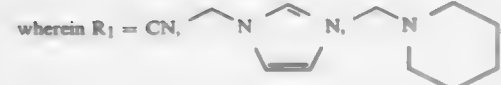
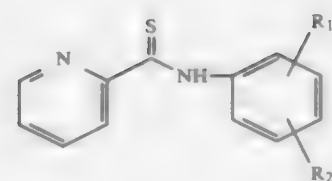
and pharmaceutically acceptable salts thereof wherein n is

R₄ is hydrogen, lower alkyl, phenyl, phenyl lower alkyl, hydroxy phenyl lower alkyl, hydroxy lower alkyl, amino lower alkyl, acylamino lower alkyl, guanidino lower alkyl, imidazolyl lower alkyl, indolyl lower alkyl, mercapto lower alkyl or lower alkyl thio lower alkyl;

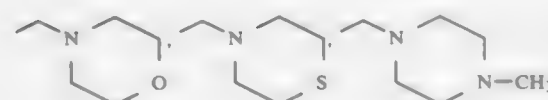
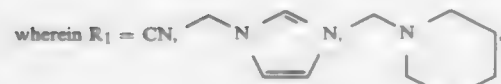
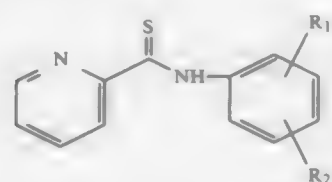
R₂ is hydrogen,

R₃ is H, halo, lower alkyl, cycloalkyl, or loweralkoxy,

R₁ is hydrogen; hydrocarbon of from 1 to 12 carbon atoms which include branched and unsaturated alkyl groups; cycloalkyl; substituted loweralkyl wherein the substituent can be halo, hydroxy, carboxy, carboxamido, loweralkylthio, loweralkoxy, loweralkoxycarbonyl, loweralkoxycarbonyl, amino, loweralkylamino, lowerdialkylamino, acylamino; substituted loweralkylamino wherein the substituent can be halo, hydroxy, alkoxy or cyano; aryloweralkylamino; cyclic amino; oxo, thio or ureido; aryloxy; arylthio; aralkyloxy; aralkylthio; benzofused cycloalkyl or bicyclicalkyl of from 8—12 carbon atoms; aryl or heteroaryl which may be mono-, di- or trisubstituted by loweralkyl, hydroxy, loweralkoxy, halo, amino,



R₂ = H or F, and the pharmaceutically acceptable salts thereof.
13. The method of treating ulcers or inducing cytoprotection in humans by increasing the natural defences of the gastrointestinal mucosa, which comprises administering to a human in need of such therapy an effective amount of a compound of structural formula (I)

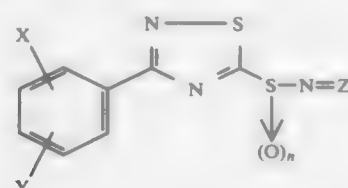


and R₂ = H or F and the pharmaceutically acceptable salts thereof.

4,873,239 ARYLTHIAZOLYLSULFONAMIDES AND DERIVATIVES

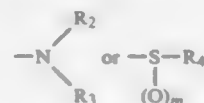
John J. Tegeler, Bridgewater, and Kirk D. Shoger, Piscataway, both of N.J., assignors to Hoechst-Roussel Pharmaceuticals, Inc., Somerville, N.J.
Division of Ser. No. 8,225, Jan. 29, 1987, Pat. No. 4,758,578.
This application May 3, 1988, Ser. No. 189,919
Int. Cl.⁴ C07D 285/08, 417/12; A61K 31/41
U.S. Cl. 514-227.8

1. A compound having the formula

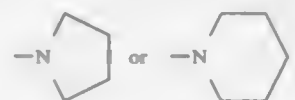


where n is 0, 1 or 2; X and Y are independently hydrogen,

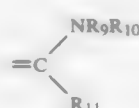
loweralkyl, loweralkoxy, arylloweralkyl, aryloxy, halogen, -CF₃, -NO₂, -OH, -OCOR₁,



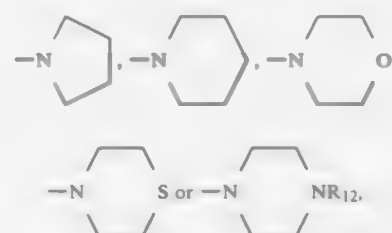
where R₁ is loweralkyl, arylloweralkyl, aryl or loweralkoxy, R₂ is hydrogen, loweralkyl or loweralkylcarbonyl, R₃ is hydrogen or loweralkyl, or the group -NR₂R₃ as a whole is



m is 0, 1 or 2, and R₄ is hydrogen, loweralkyl or aryl; and Z is



(I) where R₉ and R₁₀ are each independently loweralkyl or the group -NR₉R₁₀ as a whole is

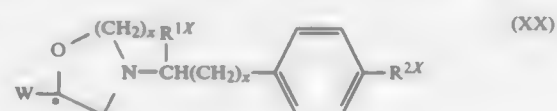


R₁₂ being hydrogen, loweralkyl or aryl, and R₁₁ is hydrogen, loweralkyl or aryl; or a pharmaceutically acceptable salt thereof.

4,873,240 METHOD FOR ADMINISTERING ETILANOLAMINE DERIVATIVES TO LIVESTOCK

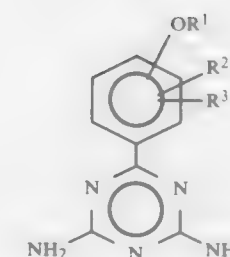
Jonathan R. Arch, Banstead, England, assignor to Beecham Group p.l.c., England
Division of Ser. No. 937,030, Oct. 30, 1986. This application Jul. 8, 1988, Ser. No. 216,872
Claims priority, application United Kingdom, Mar. 1, 1985, 8505284; Aug. 22, 1985, 8521068
Int. Cl.⁴ A61K 31/535, 31/42

U.S. Cl. 514-231.5
1. A method for increasing the weight gain and/or improving the feed utilization efficiency of livestock, which method comprises the oral or non-oral administration to livestock of an effective, non-toxic amount of a compound formula (XX):



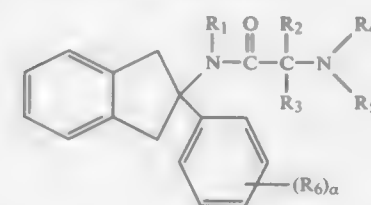
or a salt thereof, in which W is phenyl optionally substituted by halogen or trifluoromethyl, or a benzofuran-2-yl group, R_{1x} is hydrogen or methyl, R_{2x} is carboxyl or a group O-Z⁴-CO₂H or an ester or amide thereof; a group O-E¹-NR^{3x}R^{4x} or a

group O-E¹-OR^{5x}, wherein R^{3x}, R^{4x} and R^{5x} each represents hydrogen or C₁₋₆ alkyl, Z⁴ is a C₁₋₆ straight or branched alkylene chain, x is 1 or 2, y is 2 or 3, and E¹ is C₂₋₇ straight or branched alkylene chain with at least two carbon atoms separating the two heteroatoms in the group R^{2x}.



4,873,241
2-AMINO-N-(2-PHENYLINDAN-2-YL)ACETAMIDES
USEFUL AS ANTI-EPILEPTICS
James J. Napier, Chill, and Ronald C. Griffith, Pittsford, both of N.Y., assignors to Fisons Corporation, Rochester, N.Y.
Filed Oct. 31, 1988, Ser. No. 265,087
Int. Cl.⁴ C07D 295/14; A61K 31/535
U.S. Cl. 514-237.8

1. A compound having the formula:

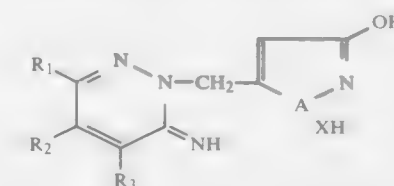


or pharmaceutically acceptable acid addition salts thereof, including such compounds and salts thereof in the form of their enantiomers, or mixtures of their enantiomers,

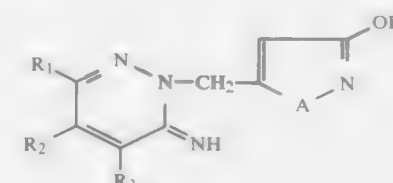
a=0 to 3,
R₁, R₂ and R₃ are independently selected from hydrogen and methyl,
R₄ is hydrogen, or C₁₋₄ alkyl,
R₅ is selected from hydrogen, or C₁₋₄ alkyl, cyclopropyl and (aminomethyl)carbonyl, or
R₄ and R₅ taken together with the nitrogen atom to which they are attached from a heterocyclic ring selected from pyrrolidinyl, piperidinyl and morpholinyl, or
R₃ and R₄ taken together with the carbon atom and nitrogen atom to which they are respectively attached form a heterocyclic ring selected from pyrrolidinyl and piperidinyl, and
R₆ is selected from hydrogen, halogen, C₁₋₄ alkoxy, trifluoromethyl, C₁₋₄ alkyl and combinations thereof.
21. A method of treating a warm-blooded animal for epilepsy comprising administering to such animal an effective amount of a compound according to claim 1.

4,873,242
2,4-DIAMINO-6-SUBSTITUTED-PHENYL-S-TRIAZINES AS NOOTROPIC AGENTS
Kiyoshi Kimura, Osaka; Fusao Ueda, Shiga, and Takashi Ogawara, Uji, all of Japan, assignors to Nippon Shinyaku Co., Ltd., Japan
Filed May 20, 1988, Ser. No. 197,102
Claims priority, application Japan, May 20, 1987, 62-124624
Int. Cl.⁴ A61K 31/53

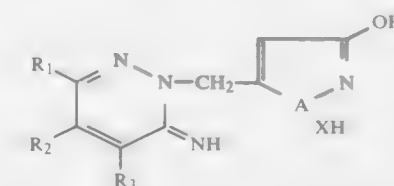
U.S. Cl. 514-242
1. A method of treating dementia in humans and animals which comprises administering to a human or animal in need thereof a therapeutically effective amount of a compound of the formula I:



4,873,243
DERIVATIVES OF 3-IMINO-PYRIDAZINE, PROCESS FOR OBTAINING THEM AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM
Camille G. Wermuth, Strasbourg; Gilbert Schiewer, Ostwald, and Michel Heaulme, Baillargues, all of France, assignors to SANOFI, Paris, France
Filed Oct. 28, 1986, Ser. No. 923,901
Claims priority, application France, Oct. 30, 1985, 85 16157
Int. Cl.⁴ C07D 413/06, 417/06, 413/14; A61K 31/50
U.S. Cl. 514-248
1. Derivatives of 3-imino-2,3-dihydro-pyridazines, having the formula:



in which:
A represents an atom of oxygen or of sulfur;
R₁ represents a C₁₋₄ alkyl group, or an aromatic group selected from:
the phenyl group;
the phenyl group which is mono- or poly-substituted by halogen group, a C₁₋₄ alkyl group, a C₁₋₄ alkoxy group, a nitro group, a hydroxy or methylene-dioxy group;
the naphthyl group;
the furyl group;
the thienyl group or the pyridyl group;
R₂ and R₃ each designate independently hydrogen or a lower alkyl group; a phenyl group, or R₂ and R₃, taken together, constitute, with the 2 atoms of the pyridazine cycle to which they are bonded, a benzene ring; and the addition salts of these compounds, with pharmaceutically acceptable acids, corresponding to formulae I' or I'':



4,873,244

TRICYCLIC HETEROCYCLIC COMPOUNDS AS PSYCHOPHARMACEUTICALS

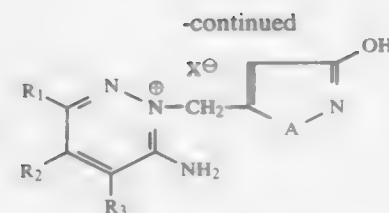
Frank Wäjen, Vaerlose, and Holger C. Hansen, Ballerup, both of Denmark, assignors to A/S Ferrosan, Soborg, Denmark
Filed Feb. 16, 1988, Ser. No. 156,363

Claims priority, application Denmark, Mar. 18, 1987, 1374/87
Int. Cl.⁴ A61K 31/505; C07D 471/14, 487/04

U.S. Cl. 514-250

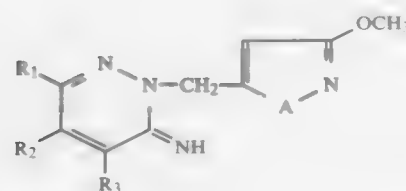
9 Claims

1. A heterocyclic compound having the formula I



in which R₁, R₂, R₃ and A are defined hereinabove and X represents the anion of an acid.

5. Derivatives of 3-imino-2,3-dihydro-pyridazines, which have the formula:



in which:

A represents an atom of oxygen or of sulfur;

R₁ represents a C₁-C₄ alkyl group, or an aromatic group selected from:

the phenyl group;

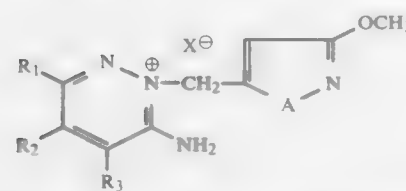
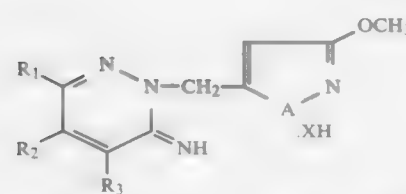
the phenyl group which is mono- or polysubstituted by a halogen group, a C₁-C₄ alkyl group, a C₁-C₄ alkoxy group, a nitro group, a hydroxy or methylene-dioxy group;

the naphthyl group;

the furyl group;

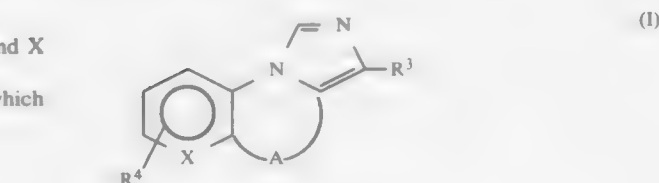
the thienyl group or the pyridyl group;

R₂ and R₃ each designate independently hydrogen or a lower alkyl group; a phenyl group, or R₂ and R₃, taken together, constitute, with the 2 atoms of the pyridazine cycle to which they are bonded, a benzene ring; and the addition salts of these compounds of formulae:



in which R₁, R₂, R₃ and A are as defined hereinabove and X represents the anion of a pharmaceutically acceptable acid.

6. A pharmaceutical composition having anti-depressant action, wherein said composition contains an effective amount of a derivative of 3-imino-2,3-dihydropyridazine according to claim 1 in combination with a carrier.



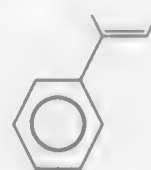
(II)

wherein

R³ is CO₂R' or CONR'R'', wherein

R' and R'' independently are C₁-6-alkyl;

-A- is -C(=O)-NR''', -NR'''-C(=O)-, or



wherein

R''' is C₁-6-alkyl;

X is C or N; and

R⁴ is hydrogen or halogen; provided, however, that A is not -C(=O)-NR''' or -NR'''-C(=O)- when R³ is CO₂R' and X is C and further provided that A is not -NR'''-C(=O)- when R³ is CONR'R'' and X is C.

8. Method of treating a central nervous system ailment associated with the benzodiazepine receptors in a subject in need of such treatment comprising the step of administering to said subject an amount of a compound of claim 1 which is effective for the alleviation of such ailment.

4,873,245

ISOLATION AND STRUCTURAL ELUCIDATION OF CEPHALOSTATINS 1-4

George R. Pettit, Paradise Valley, and Yoshiaki Kamano, Tempe, both of Ariz., assignors to Arizona Board of Regents, Tempe, Ariz.

Filed Mar. 14, 1988, Ser. No. 167,550

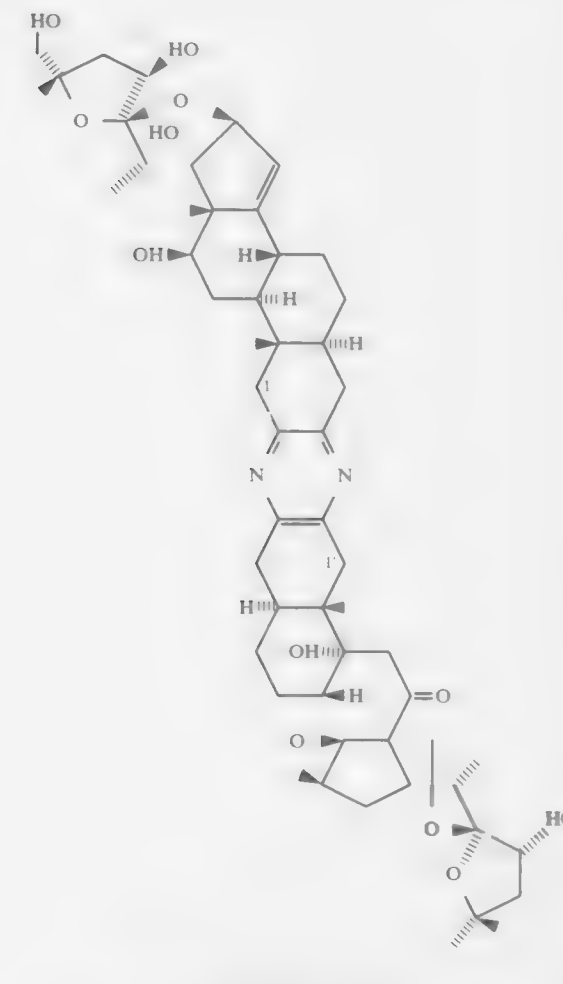
Int. Cl.⁴ C07D 491/22; A61K 31/495

U.S. Cl. 514-250

24 Claims

1. A substance for inhibiting P388 lymphocytic leukemia selected from the group denominated cephalostatin 1, cephalostatin 2, cephalostatin 3, and cephalostatin 4.

2. A substance according to claim 1 having the structure:



4,873,246

6-(ACYLAMINOARYL)-3(2H)-PYRIDAZINONE DERIVATIVES, AND THEIR USE

Philip A. Rossy, Hillsdale, N.J.; Marco Thyes, Ludwigshafen, Fed. Rep. of Germany; Albrecht Franke, Wachenheim; Horst Koenig, Ludwigshafen, Fed. Rep. of Germany; Hans D. Lehmann, Hirschberg, Fed. Rep. of Germany; Josef Gries, Wachenheim, Fed. Rep. of Germany; Ludwig Friedrich, Bruehl, Fed. Rep. of Germany, and Dieter Lenke, Ludwigshafen, Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Division of Ser. No. 571,675, Jan. 17, 1984, Pat. No. 4,636,504.

This application Oct. 8, 1986, Ser. No. 916,843

Claims priority, application Fed. Rep. of Germany, Jan. 22, 1983, 3302021

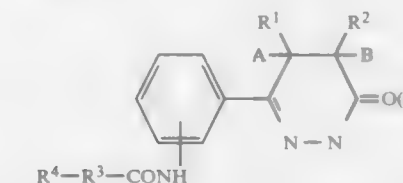
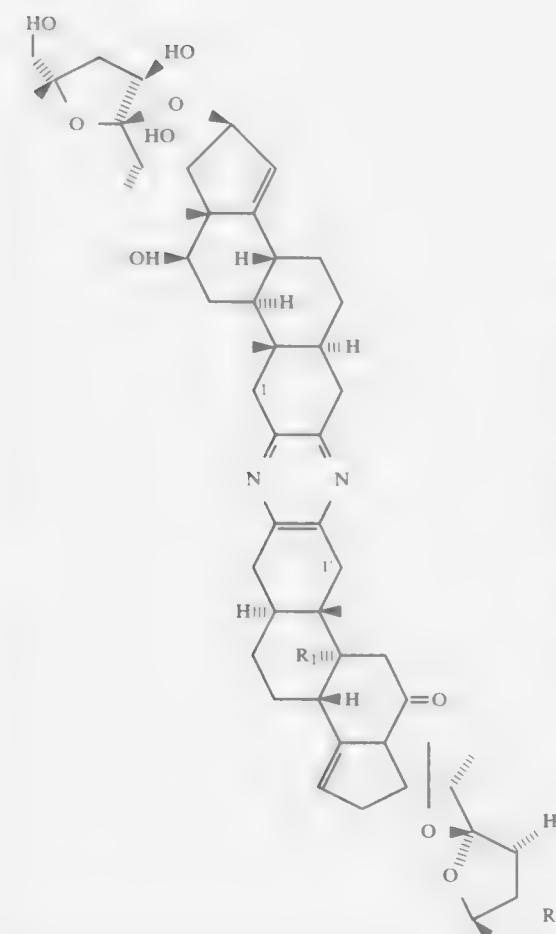
The portion of the term of this patent subsequent to Jan. 13, 2004, has been disclaimed.

Int. Cl.⁴ C07D 237/14; A61K 31/50

U.S. Cl. 514-252

3 Claims

1. A 6-(alkanoylaminoaryl)-3(2H)-pyridazinone derivative of the formula I

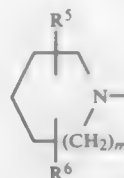


wherein: R₁ is H or OH and R₂ is H or CH₃.

3. A substance according to claim 1 having the structure: where the substituents on the phenylene radical are para to one

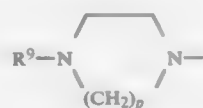
another, A and B are each hydrogen or together form a bond, R¹ is hydrogen or methyl, R² is hydrogen, or, where A and B are each hydrogen, R¹ and R² together form a C₁-C₂-alkylene radical, R³ is a straight-chain C₂-C₄-alkylene group which can be substituted by C₁-C₃-alkyl group or by two methyl groups, and R⁴ is

- (a) imidazol-1-yl, or
(b) a group of the formula (II)



where the broken line can be an additional bond, R⁵ is hydrogen, a C₁-C₄-alkyl radical which is unsubstituted or substituted by phenyl, or cyclohexyl, hydroxyl, or phenyl which is unsubstituted or substituted by one or two halogen atoms, C₁-C₄-alkyl groups and/or, C₁-C₄-alkoxy groups, or is a group of the formula R⁷R⁸N—, where R⁷ is hydrogen or phenyl which can be monosubstituted or disubstituted by halogen, C₁-C₄-alkyl, and/or C₁-C₄-alkoxy, R⁸ is C₁-C₄-alkanoyl or benzoyl, R⁶ is hydrogen, and m is 0, 1 or 2, or

- (c) a group of the formula (III)



wherein R⁹ is a C₁-C₃-hydrocarbon radical which is substituted by a hydroxy group or a C₄-C₁₄-hydrocarbon radical which may be substituted by a hydroxyl group, and p is 2, and their salts with physiological tolerated acids.

4,873,247

DERIVATIVES OF PARAHERQUAMIDE ISOLATED FROM A FERMENTATION BROTH ACTIVE AS ANTIPARASITIC AGENTS

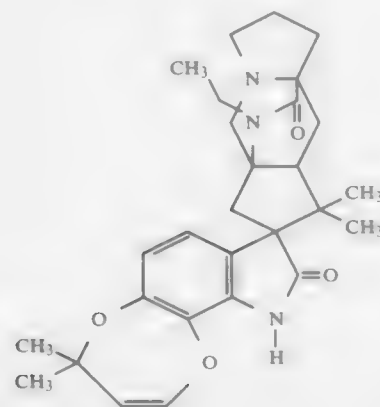
Robert T. Goegelman, 437 Academy Terr., Linden, N.J. 07036, and John G. Ondeyka, 12 Nichols Ct., Fanwood, N.J.

Filed Nov. 27, 1987, Ser. No. 126,061
Int. Cl.⁴ A61K 31/495; C07D 491/22

U.S. Cl. 514—257

14 Claims

1. A compound having the formula:



4,873,248 PYRIDINYL-PYRIMIDINES HAVING FUNGICIDAL ACTIVITY

Tsuguhiko Katoh, Osaka; Kiyoto Maeda; Masao Shiroshita, both of Hyogo; Norihisa Yamashita, Osaka; Yuzuru Sanemitsu, and Satoru Inoue, both of Hyogo, all of Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka, Japan

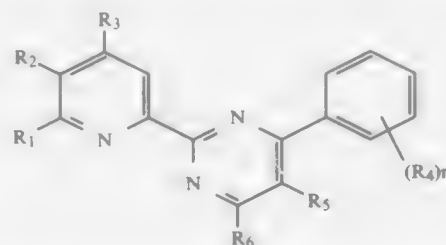
Filed Dec. 3, 1987, Ser. No. 128,654

Claims priority, application Japan, Dec. 3, 1986, 61-288350
Int. Cl.⁴ A61K 31/44, 31/505; A01N 43/54; C07D 239/26, 239/34

U.S. Cl. 514—269

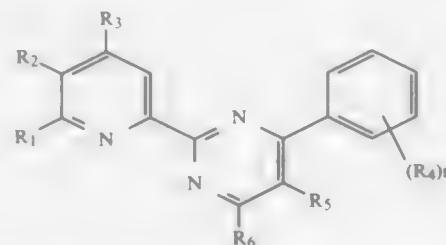
11 Claims

1. A pyridinylpyrimidine compound of the formula:



wherein R₁ is lower alkyl; R₂ and R₃ are, the same or different, each hydrogen or methyl; R₄ is, the same or different, each lower alkyl, lower alkoxy, lower haloalkyl or halogen; n is an integer of 0-3; R₅ is hydrogen or lower alkyl and R₆ is hydrogen, lower alkyl, lower alkoxy, lower alkenyloxy or lower alkylthio, or its salt.

11. A method for controlling fungi which comprises applying a fungicidally effective amount of a pyridinylpyrimidine compound of the formula:



wherein R₁ is lower alkyl; R₂ and R₃ are, the same or different, each hydrogen or methyl; R₄ is, the same or different, each lower alkyl, lower alkoxy, halo(lower)alkyl or halogen; n is an integer of 0 to 3; R₅ is hydrogen or lower alkyl and R₆ is hydrogen, lower alkyl, lower alkoxy, lower alkenyloxy or lower alkylthio, or its salt to fungi.

4,873,249

PHARMACEUTICAL COMPOSITION

Lujza Petöcz; István Simonyi; Iván Beck; Gábor Gigler; Márton Fekete; Enikő Kiszelly; Attila Mándi; Frigyes Görgényi; András Dietz; Katalin Sümeg née Zukovics, and Elemér Jákfalvi, all of Budapest, Hungary, assignors to EGIS Gyógyszergyár, Budapest, Hungary

Filed Feb. 20, 1987, Ser. No. 17,090

Claims priority, application Hungary, Feb. 28, 1986, 842/86
Int. Cl.⁴ A61K 31/505

U.S. Cl. 514—275

7 Claims

1. A method of treating an individual in need of an analgesic or anti-inflammatory agent comprising administering to the individual a pharmaceutical composition containing a pharmaceutically effective amount of 2,4-diamino-5-(3,4-dimethoxybenzyl)-pyrimidine or a pharmaceutically acceptable acid addition salt thereof.

4,873,250

ANTIMICROBIAL COMPOUND AND COMPOSITIONS PARTICULARLY EFFECTIVE AGAINST CANDIDA ALBICANS

Charles D. Hufford, and Alice M. Clark, both of Oxford, Miss., assignors to The University of Mississippi, University, Miss.

Filed Jul. 14, 1988, Ser. No. 218,993

Int. Cl.⁴ C07D 471/00; A61K 31/44

U.S. Cl. 514—290

3 Claims

1. An antimicrobial composition consisting essentially of onychine in a therapeutically-effective concentration and a non-toxic, pharmaceutically-acceptable carrier.

2. A method for preventing pathological conditions in mammals brought about by the presence of *Candida albicans* organism comprising administering to said mammals in a therapeutically-effective concentration, a composition consisting essentially of onychine and a non-toxic, pharmaceutically-acceptable carrier.

4,873,251

METHOD OF TREATING ANIMALS USING FUSED IMIDAZOHETEROCYCLIC COMPOUNDS

Bruce E. Tomczuk, and Deborah S. Sutherland, both of Richmond, Va., assignors to A. H. Robins Company, Incorporated, Richmond, Va.

Division of Ser. No. 871,772, Jun. 9, 1986, Pat. No. 4,772,600.

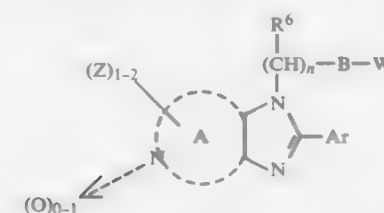
This application Jul. 5, 1988, Ser. No. 215,170

Int. Cl.⁴ A61K 31/435, 31/535

U.S. Cl. 514—303

5 Claims

1. A method for the treatment of a living animal body for muscle tension and spasticity and/or anxiety and/or convulsions which comprises administering a compound selected from the group having the formula:

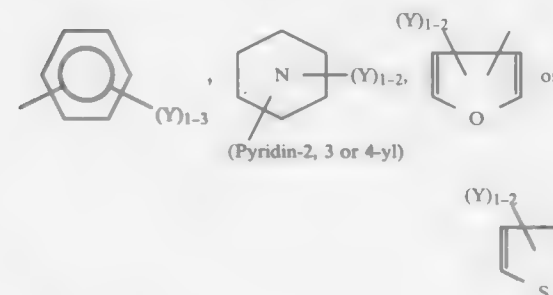


wherein;

A represents a heterocyclic ring having two of its carbon atoms held mutually with the imidazo moiety, selected from the group consisting of pyridine in any of its four positions wherein nitrogen is unshared by the imidazo moiety and substituted by one or two Z radicals on a carbon not shared by the imidazo moiety selected from the group consisting of hydrogen, halogen, loweralkyl, hydroxy, loweralkoxy, diloweralkylamino or nitro; n is 1 to 3;

R⁶ is hydrogen or loweralkyl;

Ar is selected from:



B is carbonyl;

W is selected from:
—NR²(CH₂)_pOR¹

—NR²(CH₂)_pNHC(O)R¹],
—NR²(CH₂)_pAr¹ wherein Ar¹ is selected from the same group as Ar,
—NR³R⁴, or
—NR²(CH₂)_pNR³R⁴,

wherein R¹ and R² are selected from hydrogen, loweralkyl, (Y)₁₋₃-phenyl, or (Y)₁₋₃-phenyl-loweralkyl and R³ and R⁴ are selected from:

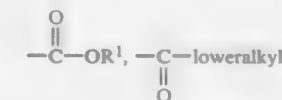
hydrogen,
loweralkyl,
loweralkenyl,
cycloalkyl,
cycloalkyl-loweralkyl,
(Y)₁₋₃-phenyl, (Y)₁₋₃-phenyl-loweralkyl,
(Y)₁₋₂-pyridin-2, 3, or 4-yl, or

R³ and R⁴ when taken together with the adjacent nitrogen atom may form a heterocyclic amino radical selected from:

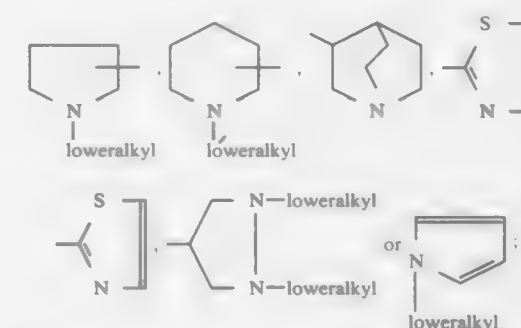
azetidin-1-yl,
pyridin-1-yl,
loweralkyl-piperidin-1-yl,
morpholin-4-yl,
4-R⁵-piperazin-1-yl,
thiazolidin-3-yl,

P is 0-3;

R⁵ is selected from loweralkyl,



or (Y)₁₋₃-phenyl;
Q is selected from:



wherein all of the above Y is hydrogen, halo, loweralkoxy, loweralkyl, trifluoromethyl, cyano, nitro or diloweralkylamino;

the optical isomers, the oxides represented by —O and the pharmaceutically acceptable acid addition salts thereof.

4,873,252

ACYLATED AMINOALCOHOLS FOR REPELLING INSECTS AND MITES

Bernd-Wieland Krüger, Wuppertal; Klaus Sasse, Bergisch-Gladbach; Franz-Peter Hoefer; Günther Nentwig, both of Cologne, and Wolfgang Berhrenz, Overath, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 9, 1988, Ser. No. 165,684

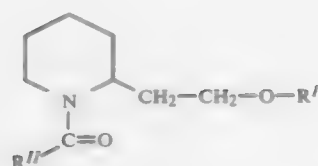
Claims priority, application Fed. Rep. of Germany, Mar. 12, 1987, 3708033

Int. Cl.⁴ A01N 43/40; C07D 211/22

U.S. Cl. 514—315

7 Claims

1. An acrylated α,ω-aminoalcohol derivative of the formula



wherein

R' represents hydrogen, COR¹¹, COOR¹² or R¹³, wherein R¹¹, R¹² and R¹³ are identical or different and represent alkyl containing up to twelve carbon atoms or alkenyl containing up to ten carbon atoms and

R¹¹ represents C₂-C₆-alkyl, or represents C₃-C₆-alkenyl.

6. An insect- and mite-repellent composition comprising an amount effective thereof of a compound according to claim 1 and a diluent.

4,873,253

PHENYLALANINE DERIVATIVE AND PROTEINASE INHIBITOR

Shosuke Okamoto, 15-18, Asahigaoka 3-chome, Tarumi-ku, Kobe-shi, Hyogo; Yoshio Okada, Akashi; Akiko Okunomiya, Kobe; Taketoshi Naito, Ohta; Yoshio Kimura, Ohta; Morihiko Yamada, Ohta; Norio Ohno, Ohta; Yasuhiro Katsura, Ohta; Hiroshi Nojima, Ohta, and Takashi Shishikura, Ohta, all of Japan, assignors to Shosuke Okamoto, Hyogo and Showa Denko Kabushiki Kaisha, Tokyo, both of, Japan

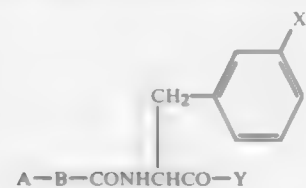
Filed Mar. 30, 1987, Ser. No. 31,738

Int. Cl.⁴ A61K 31/44; C07C 79/46; C07D 401/00, 233/66

U.S. Cl. 514-352

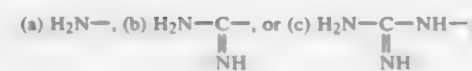
20 Claims

1. A phenylalanine derivative having the formula (I):

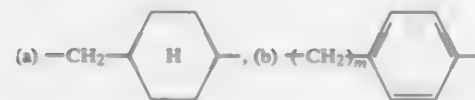


wherein

A represents



B represents

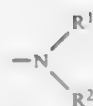


or (c) $-(CH_2)_n-$.

wherein m is 0, 1, 2 and n is 3, 4, or 5;

X represents (a) hydroxy, (b) nitro, (c) amino, (d) phenoxy which may be substituted with (i) halogen or (ii) nitro, (e) C₁-C₄ alkoxy which may be substituted with (i) phenyl or (ii) benzoyl, (f) benzoyl, (g) pyridyloxy which may be substituted with (i) halogen or (ii) nitro, or (h) C₁-C₄ alkyl which may be substituted with halogen;

Y represents



or -OR³ wherein

R¹ and R² are independently (a) hydrogen, (b) phenyl which may be substituted with (i) benzoyl, (ii) C₁-C₄ alkylcarbonyl, (iii) C₁-C₄ alkyl which may be further substituted with C₁-C₄ alkoxy or hydroxycarbonyl, (iv) C₂-C₅ alkenyl which may be further substituted with hydroxycarbonyl or C₁-C₄ alkoxy, (v) C₁-C₄ alkoxy, or (vi) amidino, (c) pyridyl which may be substituted with C₁-C₄ alkyl which may be further substituted with C₁-C₄ alkoxy, (d) imidazolyl, (e) pyrimidyl, (f) tetrazolyl, (g) thiazolyl which may be substituted with C₁-C₄ alkyl which may be further substituted with C₁-C₄ alkoxy, (h) C₁-C₆ alkyl which may be substituted with C₁-C₄ alkoxy, C₁-C₄ alkoxy, phenyl, or benzoyl, (i) C₅-C₇ cycloalkyl which may be substituted with C₁-C₄ alkoxy, C₁-C₄ alkoxy, pyrrolidyl which may be substituted with C₁-C₄ alkoxy, carbonyl, or (iv) morpholyl; and

R³ represents (a) hydrogen, (b) C₁-C₆ alkyl which may be substituted with (i) C₁-C₄ alkoxy, (ii) phenyl, or (iii) pyridyl, or (c) pyridyl; or a pharmaceutically acceptable salt thereof.

3. A proteinase inhibitor composition comprising as an essential component a therapeutically effective amount of the phenylalanine derivative of claim 1 or the pharmaceutically acceptable salt thereof and a pharmaceutically acceptable carrier.

4,873,254

1,4-DIHYDROPYRIDINES SUBSTITUTED BY 3-ARYLOXY-2-HYDROXYPROPYL AMINO MOIETY IN THE 4-PHENYL GROUP

Rodney B. Hargreaves, Poynton; Bernard J. McLoughlin, and Stuart D. Mills, both of Macclesfield, all of England, assignors to Imperial Chemical Industries plc, London, England

Filed Feb. 11, 1986, Ser. No. 828,363

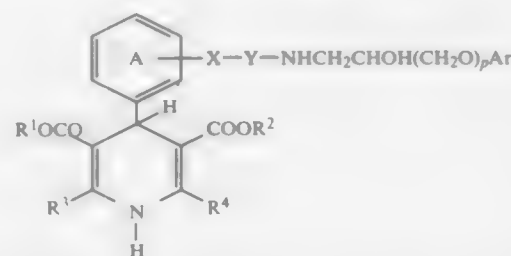
Claims priority, application United Kingdom, Feb. 11, 1985, 828,363

Int. Cl.⁴ C07D 211/86; A61K 31/455

U.S. Cl. 514-356

13 Claims

1. A dihydropyridine of the formula:



wherein R¹ and R², which may be the same or different, each is alkyl or alkoxyalkyl each of up to 6 carbon atoms; wherein R³ and R⁴, which may be the same or different, each is alkyl of up to 6 carbon atoms;

wherein benzene ring A bears one or more additional substituents selected from halogeno, cyano, nitro, trifluoromethyl and alkyl of up to 6 carbon atoms,

wherein Ar is phenyl, naphthyl, tetrahydronaphthyl, inda-

nyl or indenyl which is unsubstituted or which bears one or more substituents selected from halogeno, trifluoromethyl, hydroxy, amino, nitro, carbamoyl and cyano, and alkyl, alkenyl, alkoxy, alkenyloxy, alkoxyalkoxy, alkylthio, alkanoyl, carbamoylalkyl and alkanoylamino each of up to 6 carbon atoms;

wherein p is 0 or 1;

wherein X is -O- or -S-; and

wherein Y is a group of the formula $-(CH_2)_mC(CH_3)_2-$ wherein m is 2, 3, 4 or 5,

or an acid-addition salt thereof.

4,873,255

THIAZOLIDINONE DERIVATIVES, THEIR PREPARATION AND THEIR USE

Takao Yoshioka; Tsutomu Kanai; Yuichi Aizawa; Hiroyoshi Horikoshi, and Kazuo Hasegawa, all of Hiromachi, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

Filed Feb. 3, 1988, Ser. No. 151,807

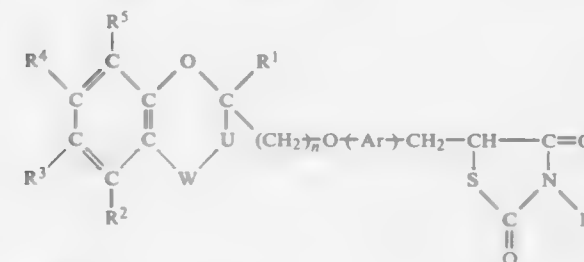
Claims priority, application Japan, Feb. 4, 1987, 62-22508

Int. Cl.⁴ C07D 417/12; A61K 31/425

U.S. Cl. 514-369

22 Claims

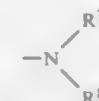
1. A compound of formula (I):



in which:

R¹ represents a hydrogen atom, a C₁-C₂₅ alkyl group, an aralkyl group, a C₃-C₁₀ cycloalkyl group or a substituted C₃-C₁₀ cycloalkyl group having at least one substituent selected from the group consisting of C₁-C₆ alkyl groups;

R², R⁴ and R⁵ are independently selected from the group consisting of: hydrogen atoms; C₁-C₂₅ alkyl groups; substituted C₁-C₂₅ alkyl groups having at least one substituent selected from the group consisting of substituents (a); aralkyl groups; C₃-C₁₀ cycloalkyl groups; substituted C₃-C₁₀ cycloalkyl groups having at least one substituent selected from the group consisting of C₁-C₆ alkyl groups; aryl groups; halogen atoms; hydroxy groups; protected hydroxy groups in which the protecting group is selected from the group consisting of substituents (b); C₁-C₇ alkanoyl groups; substituted C₂-C₇ alkanoyl groups having at least one substituent selected from the group consisting of substituents (c); arylcarbonyl groups; cycloalkylcarbonyl groups in which the cycloalkyl part is C₃-C₁₀; substituted cycloalkylcarbonyl groups in which the cycloalkyl part is C₃-C₁₀ and has at least one substituent selected from the group consisting of C₁-C₆ alkyl groups; carboxy groups; C₂-C₇ alkoxy carbonyl groups; aryloxy carbonyl groups; aralkyloxy carbonyl groups; nitro groups; groups of formula (II):

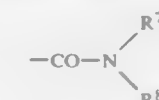


(II)

in which R⁷ and R⁸ are independently selected from the group consisting of hydrogen atoms, C₁-C₆ alkyl groups, aralkyl groups, C₃-C₁₀ cycloalkyl groups, aryl groups, C₁-C₇ alkanoyl groups, aralkanoyl groups, arylcarbonyl groups and C₂-C₇ alkoxy carbonyl groups, or R⁷ and R⁸, together with the nitrogen atom to which they are at-

tached, form a nitrogen-containing heterocyclic group having from 5 to 10 ring atoms, of which one is said nitrogen atom and from 0 to 3 are additional hetero-atoms selected from the group consisting of nitrogen, oxygen and sulfur hetero-atoms,

and groups of formula (III):



(III)

in which R⁷ and R⁸ are independently selected from the group consisting of hydrogen atoms, C₁-C₆ alkyl groups, aralkyl groups, C₃-C₁₀ cycloalkyl groups and aryl groups or R⁷ and R⁸, together with the nitrogen atom to which they are attached, form a nitrogen-containing heterocyclic group having from 5 to 10 ring atoms, of which one is said nitrogen atom and from 0 to 3 are additional hetero-atoms selected from the group consisting of nitrogen, oxygen and sulfur hetero-atoms;

R³ represents a hydrogen atom, a C₁-C₂₅ alkyl group, a substituted C₁-C₂₅ alkyl group having at least one substituent selected from the group consisting of substituents (a), an aralkyl group, a C₃-C₁₀ cycloalkyl group, a substituted C₃-C₁₀ cycloalkyl group having at least one substituent selected from the group consisting of C₁-C₆ alkyl groups, an aryl group, a halogen atom, a C₁-C₇ alkanoyl group, a substituted C₂-C₇ alkanoyl group having at least one substituent selected from the group consisting of substituents (c), an arylcarbonyl group, a cycloalkylcarbonyl group in which the cycloalkyl part is C₃-C₁₀, a substituted cycloalkylcarbonyl group in which the cycloalkyl part is C₃-C₁₀ and has at least one substituent selected from the group consisting of C₁-C₆ alkyl groups, a carboxy group, a C₂-C₇ alkoxy carbonyl group, an aryloxy carbonyl group, an aralkyloxy carbonyl group, a nitro group, a group of formula (II) as defined above or a group of formula (III) as defined above;

Ar represents a divalent aromatic carbocyclic group or a divalent aromatic heterocyclic group;

W represents a methylene group, a carbonyl group, a group of formula $>CH-O-$ in which Y represents a hydrogen atom, a C₁-C₇ alkanoyl group or an arylcarbonyl group, or

a group of formula $>C=N-OV$ in which V represents a hydrogen atom, a C₁-C₆ alkyl group, a substituted C₁-C₆ alkyl group having at least one substituent selected from the group consisting of substituents (c), a C₁-C₇ alkanoyl group or an arylcarbonyl group;

U represents a single bond or a methylene group; or, when W represents a carbonyl group or said group of formula $>C=N-OV$, U, R¹ and the carbon atom to which R¹ is attached may together represent a group of formula $-CH=C<$;

or W-U may represent a carbon-carbon double bond; and n represents an integer from 1 to 10;

said aralkyl groups have an alkyl portion containing from 1 to 6 carbon atoms and an aryl portion as defined below, the alkyl portion being unsubstituted or having at least one substituent selected from the group consisting of substituents (c);

substituents (a):

hydroxy groups; protected hydroxy groups in which the protecting group is selected from the group consisting of substituents (b); C₁-C₇ aliphatic carboxylic acyl groups; C₂-C₇ aliphatic carboxylic acyl groups having at least one substituent selected from the group consisting of substituents (c); arylcarbonyl groups; cycloalkylcarbonyl groups in which the cycloalkyl part is C₃-C₁₀; substituted cycloalkylcarbonyl groups in which the cycloalkyl part is C₃-C₁₀ and having at least one substit-

uent selected from the group consisting of C₁-C₆ alkyl groups; carboxy groups; C₂-C₇ alkoxy carbonyl groups; aryloxy carbonyl groups; aralkoxy carbonyl groups; hydroxyimino groups; protected hydroxyimino groups in which the protecting group is selected from the group consisting of substituents (b); groups of formula (II) as defined above; and groups of formula (III) as defined above;

substituents (b);

C₁-C₆ alkyl groups, substituted C₁-C₆ alkyl groups having at least one substituent selected from the group consisting of substituents (c), C₁-C₇ aliphatic carboxylic acyl groups, substituted C₂-C₇ aliphatic carboxylic acyl groups having at least one substituent selected from the group consisting of substituents (c), aryl carbonyl groups, C₂-C₇ alkoxy carbonyl groups, aryloxy carbonyl groups, groups of formula (III) as defined above and sulfo groups;

substituents (c)

carboxy groups, C₂-C₇ alkoxy carbonyl groups and aryl groups;

said aryl groups and the aryl parts of said aralkyl aryl carbonyl, aryloxy carbonyl, aralkoxy carbonyl and divalent aromatic groups being C₆-C₁₄ carbocyclic aryl groups which are unsubstituted or have at least one substituent selected from the group consisting of substituents (d);

said heterocyclic groups, heterocyclic parts of said heterocyclic acyl and acyloxy groups and said divalent heterocyclic aromatic groups have from 5 to 14 ring atoms, of which from 1 to 5 are hetero-atoms selected from the group consisting of nitrogen, oxygen and sulfur hetero-atoms, said heterocyclic groups being unsubstituted or having at least one substituent selected from the group consisting of substituents (d) and substituents (e);

substituents (d)

C₁-C₆ alkyl groups, C₁-C₆ alkoxy groups, hydroxy groups, sulfoxy groups, halogen atoms, nitro groups, groups of formula (II), as defined above, C₁-C₇ aliphatic carboxylic acyl groups, C₇-C₁₁ aromatic carboxylic acyl groups, C₁-C₇ aliphatic carboxylic acyloxy groups and C₇-C₁₁ aryl carbonyloxy groups in which the aryl part is unsubstituted or has at least one substituent selected from the group consisting of C₁-C₆ alkyl groups, C₁-C₆ alkoxy groups and halogen atoms;

substituents (e)

aryl groups and oxygen atoms; and pharmaceutically acceptable salts thereof.

4,873,256

ANTIANDROGENIC

4-HYDROXYMETHYL-2-IMIDAZOLIDINE-DIONES

Daniel Cousinier, Montfermeil; Giuseppe Gigliotti, and Martine Moguilewsky, both of Paris, all of France, assignors to Roussel Uclaf, Paris, France

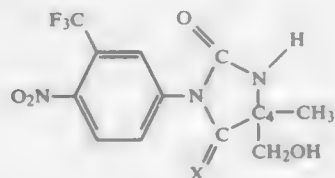
Filed Aug. 10, 1988, Ser. No. 230,587

Claims priority, application France, Aug. 13, 1987, 87 11544
Int. Cl.⁴ A61K 31/415; C07D 233/78, 233/88

U.S. Cl. 514-391

18 Claims

1. A compound in all possible racemic and optically active forms of the formula



wherein $\text{--}x$ is --O-- or --imino-- .

13. A method of inducing antiandrogenic activity in warm-blooded animals comprising administering to warm-blooded

animals an antiandrogenically effective amount of at least one compound of claim 1.

4,873,257

SUBSTITUTED FUSED TETRAHYDROCARBAZOLE ACETIC ACID DERIVATIVES

Dominick Mobilio, Franklin Park, N.J., assignor to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 184,468, Apr. 21, 1988, Pat. No. 4,783,479.

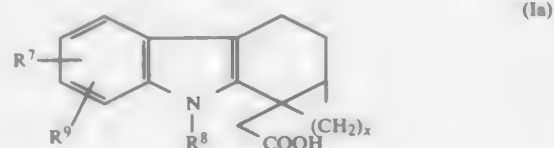
This application Aug. 9, 1988, Ser. No. 230,101

Int. Cl.⁴ C07D 209/82; A61K 31/40

U.S. Cl. 514-410

10 Claims

1. A compound of formula (Ia)



wherein R⁷ is hydrogen, lower alkyl containing 1 to 6 carbon atoms or halogen; R⁸ is hydrogen or lower alkyl containing 1 to 6 carbon atoms; R⁹ is hydrogen, lower alkyl containing 1 to 6 carbon atoms, halogen, or acetyl; x is 1 to 5; and the pharmaceutically acceptable salts thereof.

10. A method for treating inflammatory, painful or allergic conditions in a mammal which comprises the administration to said mammal of an effective amount of a compound selected from those of formula (Ia), or a pharmaceutically acceptable salt thereof, as claimed in claim 1.

4,873,258

BENZO[C] CARBAZOLE PROPANEDIOL CONTAINING ANTI TUMOR COMPOSITIONS AND USE

Kenneth W. Bair, Chapel Hill, N.C., assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

Division of Ser. No. 128,638, Dec. 4, 1987, Pat. No. 4,797,495, which is a continuation of Ser. No. 801,087, Nov. 22, 1985, abandoned, which is a continuation-in-part of Ser. No. 673,356, Nov. 20, 1984, abandoned. This application Aug. 18, 1988, Ser. No. 234,186

Int. Cl.⁴ A61K 31/40

U.S. Cl. 514-411

7 Claims

1. A pharmaceutical composition containing 2-methyl-2-[[[7-methyl-7H-benzo[c]-carbazol-10-yl)methyl]amino]-1,3-propanediol or a pharmaceutically acceptable acid addition salt thereof with a pharmaceutically acceptable carrier thereof.

6. A method of reducing the number of cells of a susceptible tumor which comprises contacting said susceptible tumor cells with 2-methyl-2-[[[7-methyl-7H-benzo[c]-carbazol-10-yl)methyl]amino]-1,3-propanediol or a pharmaceutically acceptable acid addition salt thereof.

4,873,259

INDOLE, BENZOFURAN, BENZOTHIOPHENE CONTAINING LIPOXYGENASE INHIBITING COMPOUNDS

James B. Summers, Jr., Libertyville; Bruce P. Gunn, Island Lake, and Dee W. Brooks, Libertyville, all of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

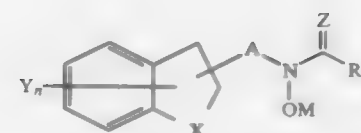
Continuation-in-part of Ser. No. 60,784, Jun. 10, 1987, abandoned, which is a continuation-in-part of Ser. No. 12,970, Feb. 10, 1987, abandoned. This application Jan. 11, 1988, Ser. No. 138,073

Int. Cl.⁴ A61K 31/38, 31/34; C07D 209/04, 333/52

U.S. Cl. 514-443

25 Claims

1. A compound of the formula:



wherein R₁ is (1) hydrogen, (2) C₁ to C₄ alkyl, (3) C₂ to C₄ alkenyl, or (4) NR₂R₃, wherein R₂ and R₃ are independently selected from (1) hydrogen, (2) C₁ to C₄ alkyl and (3) hydroxyl, but R₂ and R₃ are not simultaneously hydroxyl;

wherein X is oxygen, sulfur, SO₂, or NR₄, wherein R₄ is (1) hydrogen, (2) C₁ to C₆ alkyl, (3) C₁ to C₆ alkoyl, (4) aroyl, or (5) alkylsulfonyl;

A is selected from C₁ to C₆ alkylene and C₂ to C₆ alkenylene; n is 1-5;

Y is selected independently at each occurrence from (1) hydrogen, (2) halogen, (3) hydroxy, (4) cyano, (5) halo-substituted alkyl, (6) C₁ to C₁₂ alkyl, (7) C₂ to C₁₂ alkenyl, (8) C₁ to C₁₂ alkoxy, (9) C₃ to C₈ cycloalkyl, (10) C₁-C₈ thioalkyl, (11) aryl, (12) aryloxy, (13) aroyl, (14) C₁ to C₁₂ arylalkyl, (15) C₂ to C₁₂ arylalkenyl, (16) C₁ to C₁₂ arylalkoxy, (17) C₁ to C₁₂ arylthioalkoxy, and substituted derivatives of (18) aryl, (19) aryloxy, (20) aroyl, (21) C₁ to C₁₂ arylalkyl, (22) C₂ to C₁₂ arylalkenyl, (23) C₁ to C₁₂ arylalkoxy, or (24) C₁ to C₁₂ arylthioalkoxy, wherein substituents are selected from halo, nitro, cyano, C₁ to C₁₂ alkyl, alkoxy, and halosubstituted alkyl;

Z is oxygen or sulfur;

and M is hydrogen, a pharmaceutically acceptable cation, aroyl, or C₁ to C₁₂ alkoyl.

4,873,260

TREATMENT OF DIABETIC KETOACIDOSIS

Alfred W. Alberts, Princeton, N.J., and Michael D. Greenspan, New York, N.Y., assignors to Merck & Co., Inc., Rahway, N.J.

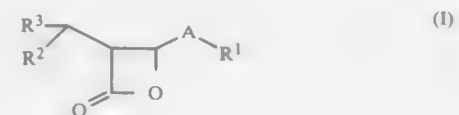
Filed Jun. 27, 1988, Ser. No. 212,769

Int. Cl.⁴ A61K 31/335

U.S. Cl. 514-449

9 Claims

1. A method for the treatment of ketoacidosis which comprises administering to a subject in a ketoacidotic state an effective amount of a compound represented by the following structural formula (I):



wherein:

R¹ is selected from

- (1) hydrogen,
- (2) hydroxy,
- (3) C₁₋₆ alkoxy
- (4) phenyl,
- (5) COR⁴,

R⁴ is

- (1) hydroxy,
- (2) C₁₋₆ alkoxy,
- (3) substituted C₁₋₆ alkoxy in which the substituent is a phenyl group,
- (4) amino,
- (5) C₁₋₆ alkylamino,
- (6) substituted C₁₋₆ alkylamino in which the substituent is a hydroxy group,
- (7) phenylamino,
- (8) substituted phenyl amino in which the substituent is a halogen; and
- (9) 2-thiopyridine;

R² is selected from

- (1) hydrogen,
- (2) halogen,
- (3) cyano,
- (4) azido,
- (5) C₁₋₆ alkylcarbonylthio,
- (6) C₁₋₆ alkyl
- (7) C₁₋₆ alkoxy,
- (8) C₂₋₆ alkenyloxy,
- (9) formyloxy,
- (10) C₁₋₆ alkylcarbonyloxy,
- (11) carboxy C₁₋₆ alkylcarbonyloxy,
- (12) anisylidiphenylmethyloxy,
- (13) C₁₋₆ alkylsulfonyloxy,
- (14) aminocarbonyloxy, and
- (15) C₁₋₆ alkylaminocarbonyloxy;

R³ is selected from

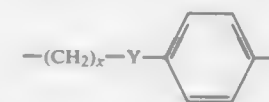
- (1) hydrogen,
- (2) C₁₋₆ alkyl,
- (3) C₁₋₆ alkenyl,
- (4) phenyl, or

R² and R³ when taken together with the carbon atom to which they are attached form C₃₋₆ carbocyclic ring;

A is selected from



- (2) C₆₋₁₇ alkylene,
- (3) substituted C₆₋₁₇ alkylene in which the one or two substituents are
 - (a) oxo,
 - (b) epoxy,
 - (c) geminal dihydroxy,
 - (d) C₁₋₆ alkoxy, and
 - (e) 4-bromophenylhydrazono;
- (4) monounsaturated C₆₋₁₇ alkylene, and
- (5) substituted monounsaturated C₆₋₁₇ alkylene in which the one or two substituents are
 - (a) oxo,
 - (b) epoxy,
 - (c) geminal dihydroxy,
 - (d) C₁₋₆ alkoxy, and
 - (e) 4-bromophenylhydrazono;
- (6) C₇₋₁₆ aralkylene, wherein the alkyl chain is interrupted by a 1,2-, 1,3-, or 1,4-phenylene moiety,
- (7) C₆₋₁₈ alkylene, straight or branched chain, interrupted by an oxygen, sulfur or sulfoxide moiety,
- (8) a group of the structure



where x is 1-4 and Y is O, S, or SO; the broken line indicates a connecting single or double bond; or a pharmaceutically acceptable salt thereof.

4,873,261

PHARMACEUTICAL COMPOSITION FOR TREATING ULCERATIVE LARGE INTESTINAL DISEASE

Wasei Miyazaki, and Yasuhiko Inoue, both of Tokushima, Japan, assignors to Otsuka Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Feb. 10, 1988, Ser. No. 154,205

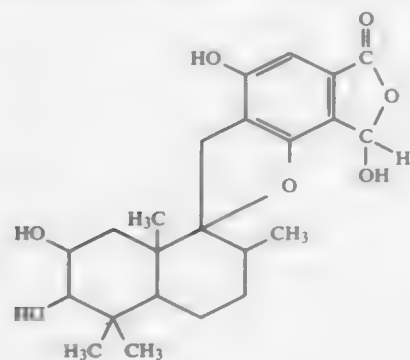
Claims priority, application Japan, Feb. 13, 1987, 62-32129
Int. Cl.⁴ A61K 31/34

U.S. Cl. 514-462

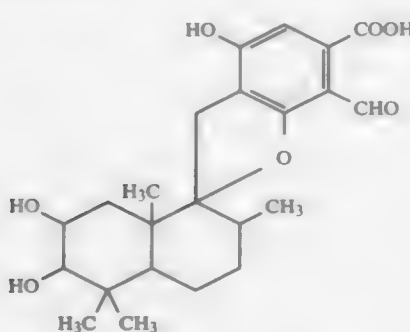
2 Claims

1. A method for treating ulcerative large intestinal diseases, which comprises administering to a patient suffering from an ulcerative large intestinal disease a pharmaceutical composi-

tion containing at least one of the analogous compounds of sesquiterpene or a salt thereof represented by the formula, selected from the group consisting of the formula (1),



and the formula (2),



and a pharmaceutically acceptable carrier in a daily dose of from about 0.1 to 50 mg/kg of body weight/day based on the analogous compounds of sesquiterpene or a salt thereof.

4,873,262

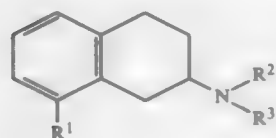
8-SUBSTITUTED 2-AMINOTETRALINS

Bodo Junge, Wuppertal; Bernd Richter, Bergisch Gladbach; Thomas Glaser, Roerath; Jörg Traber, Lohmar, all of Fed. Rep. of Germany, and George S. Allen, Nashville, Tenn., assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 15, 1987, Ser. No. 132,372
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1986, 3643899; Jun. 15, 1987, 3719924

Int. Cl.⁴ A61K 31/24, 31/275; C07C 101/00, 121/00
U.S. Cl. 514—510 7 Claims

1. An 8-substituted 2-aminotetralin of the formula



in which

R¹ represents cyano or —COR⁶,

R⁶ denotes hydrogen, hydroxyl, amino, alkoxy, aryloxy or alkoxy,

R² represents hydrogen or alkyl, and

R³ represents alkyl,

or a salt thereof.

7. A method of treating a disorder of the central nervous system, the cardiovascular system or the intestinal tract comprising administering to a patient suffering therefrom an

(1)

4,873,263

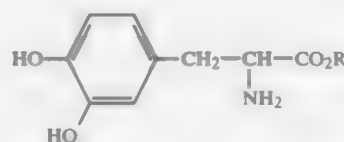
RECTALLY ABSORBABLE FORM OF L-DOPA

A. J. Repta, Lawrence, Kans., assignor to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 39,406, Apr. 17, 1987, Pat. No. 4,771,073, which is a continuation-in-part of Ser. No. 814,861, Dec. 30, 1985, Pat. No. 4,663,349. This application Sep. 9, 1988, Ser. No. 242,246

Int. Cl.⁴ A61K 31/24, 31/195
U.S. Cl. 514—535 28 Claims

1. A pharmaceutical composition for enhancing rectal absorption of L-dopa by administering a formulation comprising a therapeutically effective dosage amount of an ester of L-dopa of the structural formula:



wherein R=alkyl(C₁–C₂₀), aryl(C₆–C₉), substituted and unsubstituted mono, di or polyhydroxyalkyl(C₁–C₂₀); substituted and unsubstituted aralkyl(C₇–C₂₀) and pharmaceutically acceptable organic or inorganic counterion salts.

4,873,264

NOVEL PESTICIDAL

1-(ALKYL-PHENOXY-ARYL)-3-BENZOYL UREAS AND PROCESS FOR PREPARATION

David T. Chou, Raleigh, and Paul A. Cain, Cary, both of N.C., assignors to Rhone-Poulenc Nederlands B.V., Amstelveen, Netherlands

Continuation of Ser. No. 495,331, May 20, 1983, abandoned, which is a continuation-in-part of Ser. No. 393,553, Jun. 30, 1982, abandoned. This application Mar. 7, 1988, Ser. No. 168,625

Int. Cl.⁴ A01N 47/34; C07C 157/12, 127/22
U.S. Cl. 514—594 6 Claims

1. A compound having the formula 1-[4-(2,4-dimethylphenoxy)-3,6-dimethyl-5-chlorophenyl]-3-(2-chlorobenzoyl) urea.

2. A compound having the formula 1-[4-(2,4-dimethylphenoxy)-3,6-dimethyl-5-chlorophenyl]-3-(2,6-difluorobenzoyl) urea.

4,873,265

ANTI-INFECTION METHODS AND COMPOSITIONS

Steven T. Blackman, New York, N.Y., assignor to Thomas Pharmacal Co., Inc., Rokonkoma, N.Y.

Filed Jul. 14, 1988, Ser. No. 218,956

Int. Cl.⁴ A61K 31/135, 31/52
U.S. Cl. 514—651 14 Claims

1. A method of providing local antimicrobial treatment to a human or animal tissue area, in need thereof, comprising applying to said tissue area of an effective amount of a composition containing (a) from about 0.5 to about 5.0% by weight of an antihistaminic agent selected from the group consisting of ethanolamine derivatives and pharmaceutically acceptable salts thereof, and (b) a pharmaceutically acceptable topical vehicle.

4,873,266

MENTHONE ENHANCEMENT OF TRANSDERMAL DRUG DELIVERY

Thomas W. Leonard; Karol Kay Mikula, both of Clinton, N.Y., and Marcia S. Schlesinger, Middlesex, N.J., assignors to American Home Products Corp., New York, N.Y.

Filed Jan. 16, 1987, Ser. No. 3,977

Int. Cl.⁴ A61K 31/12, 31/135
U.S. Cl. 514—653 2 Claims

1. A topical composition for the transdermal delivery of physiologically active agents to mammals by topical administration comprising an effective amount of a systemically active, water soluble or solubilizable drug, a percutaneous transfer enhancing amount of 1-menthone and a pharmaceutically acceptable vehicle comprising at least one pharmaceutically acceptable solvent or solubilizer for said 1-menthone, wherein said water soluble or solubilizable drug is albuterol.

4,873,267

PROCESS FOR THE PRODUCTION OF METHANOL AND A COMPOSITION SUITABLE FOR USE AS A CATALYST IN SAID PROCESS

Swan T. Sie; Eit Drent, and Willem W. Jager, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Apr. 25, 1988, Ser. No. 185,622

Claims priority, application United Kingdom, Apr. 29, 1987, NT10172
Int. Cl.⁴ C07C 27/06, 31/04
U.S. Cl. 518—700 11 Claims

1. A process for the production of methanol which comprises contacting a gaseous mixture comprising carbon monoxide and hydrogen with a catalytic system prepared by combining the following components:

component (a): a nickel salt of a carboxylic acid having a pK_a, measured in aqueous solution at 25° C., of more than 4.76,

component (b): an alcohol; and

component (c): hydride selected from the group consisting of a hydride of an alkali metal, a hydride of an alkaline earth metal, and a mixture thereof.

4,873,268

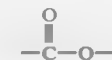
DIGESTION PRODUCTS OF POLYALKYLENE TEREPHTHALATE POLYMERS AND POLYCARBOXYLIC ACID-CONTAINING POLYOLS AND POLYMERIC FOAMS OBTAINED THEREFROM

Richard K. Hallmark, Largo; Michael J. Skowronski, Clearwater, and William D. Stephens, Pinellas Park, all of Fla., assignors to Sloss Industries Corporation, Birmingham, Ala.

Continuation of Ser. No. 713,201, Mar. 18, 1985, which is a continuation of Ser. No. 582,348, Feb. 22, 1984, Pat. No. 4,539,341. This application Oct. 14, 1986, Ser. No. 917,887

Int. Cl.⁴ C08G 18/14
U.S. Cl. 521—48.5 22 Claims

1. A polyester polyol mixture comprising the fluid reaction product obtained by digesting polyalkylene terephthalate in the presence of a transesterification catalyst with a digesting medium comprising a polycarboxylic acid component containing polyol derived from the polycarboxylic acid component and a digesting polyol component, wherein the polycarboxylic acid component has ring units with two



groups on adjacent or alternate ring positions, the content of the digesting polyol component and ring unit content of the polycarboxylic acid component being sufficient for improved storage stability of the digestion product.

4,873,269

RESINOUS COMPOSITIONS FOR DENTURE BASE

Ryoji Nakazato, Tokorozawa, Japan, assignor to G-C Dental Industrial Corp., Tokyo, Japan

Filed Jul. 7, 1987, Ser. No. 70,701

Claims priority, application Japan, Jul. 21, 1986, 61-178958
Int. Cl.⁴ A61K 6/08
U.S. Cl. 523—115 20 Claims

1. A resinous composition for denture base, having improved performance suitable for microwave curing, which comprises in combination a two component composition comprised of:

(i) a powdery component containing as the main constituents a methacrylate ester polymer having a mean particle size of 50 to 120 microns, a barbituric acid derivative and an organic peroxide, and

(ii) a liquid component containing as the main constituents a monomethacrylate ester monomer, a cross-linking agent and a quaternary ammonium chloride.

4,873,270

POLYURETHANE-CARBOHYDRATE-BASED SUBSTANCES WHICH CAN BE CALENDERED TO PRODUCE BIODEGRADABLE MATERIALS

Jean-Marc Aime, Creil; Georges Mention, Compiègne, and André Thouzeau, Paris, all of France, assignors to Charbonnages De France, Paris, France

Filed Feb. 9, 1988, Ser. No. 153,889

Claims priority, application France, Feb. 10, 1987, 87 01623
Int. Cl.⁴ C08J 3/04; C08L 3/04
U.S. Cl. 523—128 19 Claims

1. Polyurethane-based substance which can be calendered to produce a biodegradable material, comprising a homogeneous mixture of a thermoplastic polyurethane resin, a carbohydrate, at least one second thermoplastic polymer which is miscible in the molten state with said polyurethane resin and which gives the mixture the ability to be calendered and which comprises polyvinylchloride, and at least one third biodegradable polymer different from said polyurethane resin and which is a biodegradable aliphatic polyester.

19. A biodegradable homogeneous plastic composition comprising a thermoplastic polyurethane resin, an amount sufficient of a carbohydrate in fine particle form to make such composition in film form biodegradable, and an amount sufficient to make said composition calenderable of at least one second thermoplastic polymer which is miscible in the molten state with said thermoplastic polyurethane resin, said second thermoplastic polymer comprising PVC.

4,873,271

GAMMA RADIATION RESISTANT POLYCARBONATE COMPOSITIONS

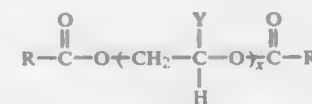
Charles E. Lundy, and Sivaram Krishnan, both of Pittsburgh, Pa., assignors to Mobay Corporation, Pittsburgh, Pa.

Filed Apr. 25, 1989, Ser. No. 342,918

Int. Cl.⁴ C08K 5/10
U.S. Cl. 523—136 7 Claims

1. A thermoplastic molding composition comprising (i) an aromatic polycarbonate resin and about 0.05 to 5.0% of

(ii) a stabilizing agent conforming to



wherein R denotes a C₁–C₂₀ alkyl, aryl or alkylaryl radical, Y denotes a C₁–C₆ alkyl or a hydrogen atom and X is 1 to 40.

4,873,272

POLYETHER END-BLOCKED WITH HYDROLYZABLE SILYL GROUPS, METHOD OF MANUFACTURING AND ROOM TEMPERATURE CURABLE COMPOSITION USING THE POLYETHER

Chiaki Shimizu, and Tamio Yoshida, both of Ohta, Japan, assignors to Toshiba Silicone Co., Ltd., Japan
Filed Nov. 9, 1987, Ser. No. 118,505

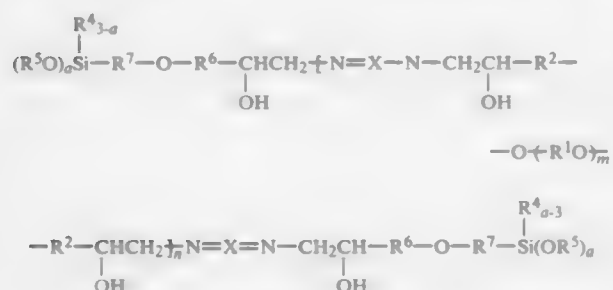
Claims priority, application Japan, Nov. 17, 1986, 61-273519; Nov. 17, 1986, 61-273520

Int. Cl.⁴ C08K 9/06

U.S. Cl. 523—212

9 Claims

1. A polyether having molecular weight from 1000 to 50,000, end-blocked with hydrolyzable silyl groups and represented by the general formula:



where R¹, R², R⁶ and R⁷ individually represent a divalent hydrocarbon group, R⁴ represents a monovalent hydrocarbon group, R⁵ represents an alkyl group with 1 to 6 carbon atoms, a represents a number from 1 to 3, m represents a number from 10 to 500, n represents a number of 1 or greater and —N=X— represents a residue group of a diimino heterocyclic compound selected from piperazine, 2,5-dimethyl piperazine, 1,4-diimino cyclopentane, perhydrophenazine, perhydro-pyrimidine, perhydro-1,3,5-oxadiazine or perhydro-1,3,5-thiadiazine.

4,873,273

EPOXIDE COATING COMPOSITION

John L. Allan; Jeffery J. Boettcher, both of Neenah, Wis.; Norman G. Gaylord, New Providence, N.J., and Leon Katz, Norwalk, Conn., assignors to James River-Norwalk, Inc., Norwalk, Conn.

Continuation-in-part of Ser. No. 93,105, Aug. 31, 1987, abandoned, which is a division of Ser. No. 841,938, Mar. 20, 1986, Pat. No. 4,740,392. This application Jun. 7, 1988, Ser. No. 203,711

Int. Cl.⁴ C08K 3/20, 5/09

U.S. Cl. 523—407

7 Claims

1. A one part self-curing thermosetting resin composition having extended pot life which consists of the following components:

- a polymer or copolymer containing carboxylic acid groupings;
- an epoxy-compound containing on average more than one epoxide grouping;
- a quaternary ammonium or quaternary phosphonium compound; and
- a monomeric acid selected from the group consisting of hydrochloric acid, sulfuric acid, and organic carboxylic acids containing 1 to 3 carboxylic acid groupings per molecule and their anhydrides,

wherein the mole ratio of epoxide groupings in the epoxy component (b) to carboxylic acid groupings in the polymeric component (a) is in the range of 0.5 to 5; the mole ratio of the quaternary ammonium or quaternary phosphonium moiety of the base to carboxylic acid groupings in the polymeric component is in the range of 0.05 to 2, and said monomeric acid component (d) is present in the composition in an amount in

the range of 0.02 to 5 moles for each mole of carboxylic acid grouping contained in component (a).

4,873,274

IN-MOLD COATING POWDERS WITH TWO INITIATORS OR 1,1-DI(T-BUTYLPEROXY)-3,3,5-TRIMETHYLCYCLOHEXANE AS A SINGLE INITIATOR

Frederick L. Cummings, Reading, and Glenn D. Correll, Birdsboro, both of Pa., assignors to Morton Thiokol, Inc., Chicago, Ill.

Filed Sep. 24, 1987, Ser. No. 100,675

Int. Cl.⁴ C08L 67/06

U.S. Cl. 523—500

30 Claims

1. An unsaturated polyester resin coating powder composition consisting essentially of:

- from about 20 to 100 parts by weight of at least one unsaturated polyester resin;
- from 0 to about 80 parts by weight of at least one copolymerizable second resin, wherein the total proportion of resin is 100 parts by weight;
- from about 0.01 to about 2 parts by weight per 100 parts resin by weight of a fast initiator having a ten hour half-life at not more than 82° C.; and
- from about 3 to about 7 parts by weight per 100 parts resin by weight of a slow initiator having a ten hour half-life at about 91° C. or more.

4,873,275

FLOW RESISTANT ASPHALT PAVING BINDER

Lyle E. Moran, Sarnia, Canada, and Lawrence G. Kaufman, Somerville, N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Continuation-in-part of Ser. No. 21,189, Mar. 3, 1987, abandoned. This application Dec. 18, 1987, Ser. No. 134,954

Int. Cl.⁴ C08L 95/00

U.S. Cl. 524—64

11 Claims

1. A storage stable and creep resistant asphalt paving binder which comprises

- an asphalt having about 7 wt. % or less asphaltenes, and
- from about 3.5 to about 10 wt. % of a copolymer consisting essentially of ethylene with at least one compound selected from the group of vinyl acetate, alkyl acrylate or alkyl methacrylate, wherein said copolymer has a melt index of from about 0.3 to about 20 g/10 mins. and contains from about 70 to about 97 wt. % ethylene.

4,873,276

POLYPHENYLENE ETHER/POLYAMIDE BLENDS HAVING IMPROVED PHYSICAL PROPERTIES

Susumi Fujii, Ibaragi; Hiromi Ishida; Masataka Morioka, both of Tochigi; Akihiro Saito, Utsunomiya, all of Japan, and Roelof van der Meer, Halsteren, Netherlands, assignors to General Electric Company, Selkirk, N.Y.

Filed Mar. 6, 1987, Ser. No. 22,836

Claims priority, application Japan, Mar. 7, 1986, 61-48504; Apr. 7, 1986, 61-78383; Apr. 22, 1986, 61-91371

Int. Cl.⁴ C08K 5/51; C08L 71/04, 77/00

U.S. Cl. 524—153

27 Claims

1. A resin composition comprising:

- a polyphenylene ether resin;
- a polyamide resin in which the amount of terminal amino group is greater than the amount of terminal carboxyl group; and
- a compatibilizer compound for (a) and (b).

4,873,277

AROMATIC CARBONATE RESIN EXHIBITING IMPROVED IMPACT PROPERTIES

Omar M. Boutai, Mt. Vernon, Ind., assignor to General Electric Company, Mt. Vernon, Ind.

Filed Oct. 31, 1986, Ser. No. 925,681

Int. Cl.⁴ C08K 5/41

U.S. Cl. 524—166

8 Claims

- A composition comprising
 - an aromatic carbonate resin;
 - about 1 to 10 weight percent of a polyolefin based on the weight of (a) and (b)
 - an amount effective to improve the impact properties of (a) and (b) of an aliphatic sulfonate wherein the amount of aliphatic sulfonate is from about 0.5 to about 2.5 weight percent based upon the total amounts of aliphatic sulfonate and aromatic carbonate.

4,873,278

INHIBITION OF IRRADIATION YELLOWING IN POLYSULFONE COMPOSITIONS

Linda H. Nelson, Evansville, Ind., assignor to General Electric Company, Mt. Vernon, Ind.

Filed Nov. 14, 1986, Ser. No. 930,518

Int. Cl.⁴ C08K 5/05, 5/13, 5/02, 5/03

U.S. Cl. 524—380

9 Claims

- A radiation sterilized polysulfone resin composition exhibiting improved color properties comprised of: (i) at least one polysulfone resin; and (ii) an amount effective to inhibit or diminish yellowing of said polysulfone resin upon exposure to sterilizing radiation of at least one stabilizing alcohol compound of 2 to about 50 carbon atoms.

4,873,279

COPOLYESTER-CARBONATE AND POLYESTER RESIN BLENDS EXHIBITING IMPROVED COLOR PROPERTIES

Linda H. Nelson, Evansville, Ind., assignor to General Electric Company, Mt. Vernon, Ind.

Filed Dec. 22, 1986, Ser. No. 944,036

Int. Cl.⁴ C08K 5/05, 5/15

U.S. Cl. 524—384

24 Claims

- A resinous composition comprising:
 - at least one copolyester-carbonate resin;
 - at least one polyester resin; and
 - a minor amount of a mixture of at least one polyol and at least one epoxide, wherein said polyol is represented by the formula



wherein R⁴ is selected from aliphatic hydrocarbon moieties, substituted aliphatic hydrocarbon moieties, aliphatic aromatic hydrocarbon moieties, or substituted aliphatic aromatic hydrocarbon moieties, with the proviso that if R⁴ is an aliphatic aromatic or substituted aliphatic aromatic hydrocarbon moiety the hydroxyl radicals are present only on the aliphatic portion thereof; and

r is a positive integer having a value of from 2 up to the number of replaceable hydrogen atoms present on R⁴ wherein said amount of (iii) is an anti-yellowing effective amount.

4,873,280

WATER CLARIFICATION PROCESS AND COMPOSITION AND METHOD

Stephan J. Allenson, Richmond, Tex., assignor to Nalco Chemical Company, Naperville, Ill.

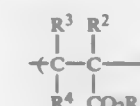
Continuation of Ser. No. 927,568, Jan. 6, 1986, abandoned. This application Mar. 2, 1989, Ser. No. 317,763

Int. Cl.⁴ C08K 3/10

U.S. Cl. 524—437

16 Claims

- A method of preparing an aqueous blend of alkali metal aluminate and anionic vinyl polymer comprising: admixing an aqueous solution of alkali metal aluminate having a pH of at least 10 with a water-external emulsion containing in the dispersed-phase an anionic vinyl polymer, wherein said anionic vinyl polymer is comprised of at least 90 weight percent of units having the Formula I of



wherein R¹ is hydrogen, alkali metal cation, ammonia cation, or alkyl of 1 to 16 carbon atoms, and R², R³, and R⁴ are each independently hydrogen, alkyl of 1 to 16 carbon atoms, or a carboxylic acid moiety or water soluble salt thereof, provided said polymer contains no more than 70 weight percent of units of said Formula I comprised of a carboxylic acid or water soluble salt thereof moiety which contain less than 10 total carbon atoms,

wherein said anionic vinyl polymer has an average molecular weight of at least 500,000, wherein the weight ratio of said alkali metal aluminate and said anionic vinyl polymer is from 5 to 175 alkali metal aluminate per part anionic vinyl polymer, wherein the admixing is conducted under agitation while the pH of the admixture is maintained at at least 10 and the admixture does not gel.

4,873,281

STABLE WATER-SOLUBILIZED POLYESTER/ACRYLIC RESINS MADE UTILIZING HYDROCARBON WAXES AND LOW ACID VALUE POLYESTERS

Rudolf Maska, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Sep. 29, 1987, Ser. No. 102,210

Int. Cl.⁴ C08F 2/16

U.S. Cl. 524—457

17 Claims

- A water-solubilized resin composition prepared by combining a solubilizing agent and water with a composition comprising:

- a saturated polyester polymer having an acid value on solids of from 0 to 30 when the weight average molecular weight of said polyester polymer ranges from 500 to 5,000, and
- a vinyl polymer derived from a vinyl monomer composition comprising 3 to 50 percent by weight of an ethylenically unsaturated carboxylic acid provided that said vinyl monomer composition has been addition polymerized in solution in the presence of from 1.0 to 50 percent by weight of a hydrocarbon wax based on the total weight of said vinyl monomer composition.

4,873,282

POLYACETAL RESIN COMPOSITION

Hiroshi Yui; Michiya Okamura; Masakazu Ikeda, and Norio Matsuo, all of Mie, Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

Filed Apr. 29, 1988, Ser. No. 187,843

Claims priority, application Japan, May 15, 1987, 62-118168; May 15, 1987, 62-118169

Int. Cl.⁴ C08L 59/00; C08K 3/04

U.S. Cl. 524—496

12 Claims

1. A polyacetal resin composition, comprising:
(a) from 60 to 94 parts by weight of a polyacetal, (b) from 4 to 30 parts by weight of an ethylene homopolymer or copolymer having a density of from 0.945 to 0.98 g/cm³ and a melt flow rate of from 2 to 8 g/10 min, and (c) from 2 to 10 parts by weight of a carbon black selected from furnace black, acetylene black, thermal black and channel black, the amount of each component being based on 100 parts by weight of the total amount of components (a), (b), and (c) in the composition, the ratio of the melt flow rate of the polyacetal component (a) to component (b) ranging from 0.5 to 15.

4,873,283

MOLDED OR FORMED POLY(ARYLENE THIOETHER-KETONE) ARTICLES

Yoshikatsu Satake; Yo Iizuka; Toshitaka Kouyama; Takayuki Katto, and Zenya Shiiki, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo K.K., Tokyo, Japan

Filed May 12, 1988, Ser. No. 194,017

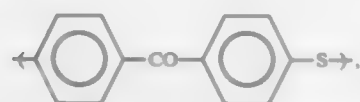
Claims priority, application Japan, May 15, 1987, 62-118620; Jul. 21, 1987, 62-181970; May 7, 1988, 63-109916

Int. Cl.⁴ C08F 82/80

U.S. Cl. 524—520

16 Claims

1. A molded or formed poly(arylene thioether-ketone) article made of a thermoplastic material which comprises:
(A) 100 parts by weight of a melt-stable poly(arylene thioether-ketone) having predominant recurring units of the formula



wherein the —CO— and —S— are in the para position to each other, and having the following physical properties (a)–(c):

- (a) melting point, T_m being 310°–380° C.;
(b) residual melt crystallization enthalpy, ΔH_{mc} 420° C./10 min being at least 10 J/g, and melt crystallization temperature, T_{mc} (420° C./10 min) being at least 210° C., wherein ΔH_{mc} (420° C./10 min) and T_{mc} (420° C./10 min) are determined by a differential scanning calorimeter at a cooling rate of 10° C./min, after the poly(arylene thioether-ketone) is held at 50° C. for 5 minutes in an inert gas atmosphere, heated to 420° C. at a rate of 75° C./min and then held for 10 minutes at 420° C.; and
(c) reduced viscosity being 0.2–2 dl/g as determined by viscosity measurement at 25° C. and a polymer concentration of 0.5g/dl in 98 percent by weight sulfuric acid; and optionally,
(B) at least one component selected from (i) up to 100 parts by weight of at least one thermoplastic resin and (ii) up to 300 parts by weight of at least one filler selected from fibrous fillers and inorganic fillers.

4,873,284

HEAT-CURABLE MOLDING COMPOSITIONS

Peter Ittemann, Ludwigshafen, and Philipp Eisenbarth, Bad Dierkeim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jan. 20, 1988, Ser. No. 146,232

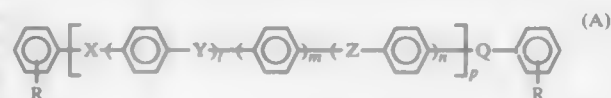
Claims priority, application Fed. Rep. of Germany, Jan. 23, 1987, 3701900

Int. Cl.⁴ C08K 7/06, 7/14; C08L 33/24, 49/00

U.S. Cl. 524—548

5 Claims

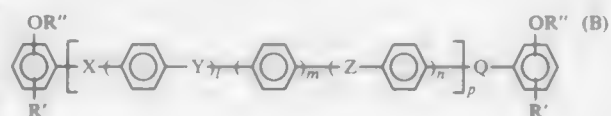
1. A heat-curable resin system, comprising a bismaleimide monomer and a comonomer selected from the group consisting of:



wherein X, Y, Z, and Q are selected from the group consisting of —CO—, —O—, —SO₂—, —CH₂O—, and —C(R')₂— wherein R' is a C₁–C₆ alkyl radical; wherein l and n may be 0 or 1; wherein m may be 1 or 2; wherein p can be a whole number between 1 and 10; wherein



r is an aryl nucleus, which may be substituted with C₁–C₆ alkyl, alkoxy, aryl, halogen, or nitro groups; wherein R is an alkenyl or alkynyl radical containing from 2 to about 6 carbon atoms; and wherein the comonomer A contains at least 5 aryl nuclei; and



wherein the symbols have the same meaning as in (A) and wherein R' and R'' are alkenyl, alkynyl, or H, provided that when R' is alkenyl or alkynyl, R'' is H, and when R'' is alkenyl or alkynyl, R' is H.

5. A fiber reinforced, heat-curable prepreg, comprising
(a) reinforcing fibers selected from the group consisting of glass, carbon, aramid, and polyarylene polymers containing interspersed ether, ketone, sulfone, or isopropylidene groups; and
(b) the heat curable resin of claim 1.

4,873,285

POLYESTER GRAFT COPOLYMERS, FLEXIBLE COATING COMPOSITIONS COMPRISING SAME AND BRANCHED POLYESTER MACROMERS FOR PREPARING SAME (III)

Rose A. Ryntz, Midland, Mich., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 12,131, Feb. 6, 1987, abandoned. This application Aug. 11, 1988, Ser. No. 231,421

Int. Cl.⁴ C08L 67/02, 75/06

U.S. Cl. 525—28

27 Claims

1. A solvent based coating composition useful as an automotive coating on metal and plastic substrates comprising:
(A) hydroxy functional polyester graft copolymer which has a number average molecular weight between about 1,300 and about 15,000, a hydroxyl number between about 30 and about 300, and is the reaction product of carbon-car-

bon double bond-reactive monoethylenically unsaturated monomers with hydroxy functional branched polyester macromer having a terminal carbon-carbon double bond, under free radical polymerization reaction conditions, said monomers bearing substantially no functionality which is substantially reactive with hydroxy functionality of said macromer under said reaction conditions and said monomers being polymerized to form a polymeric chain grafted to the macromer by the carbon-carbon double bond, said macromer being the reaction product of: (i) hydroxy functional polyester reactant formed by reacting polyol with a saturated dicarboxylic acid or corresponding anhydrides thereof and having about 0–10 urethane groups per molecule with (ii) halide compound selected from the group consisting of vinyl alkyl halide compound and vinyl aryl halide compound, wherein the reaction of (i) and (ii) takes place under conditions that promote substantially only the reaction between the halide moiety of compound (ii) and the hydroxyl groups of reactant (i) wherein said hydroxy functional polyester reactant and said halide compound are reacted in about 1:1 molar ratio; and
(B) polyfunctional, hydroxy reactive crosslinking agent.

4,873,287

FLAME RETARDANT TERNARY BLENDS OF POLYETHERIMIDE, POLYPHENYLENE ETHER AND BLOCK COPOLYMER OF A VINYL AROMATIC HYDROCARBON AND AN ALKENE COMPOUND

Fred F. Holub, Schenectady; Virvaldis Abolina, Bethlehem, both of N.Y., and John A. Rock, Becket, Mass., assignors to General Electric Company, Pittsfield, Mass.

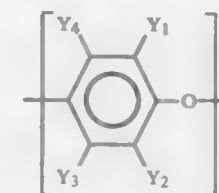
Filed Dec. 30, 1987, Ser. No. 139,575

Int. Cl.⁴ C08L 53/00, 71/04

U.S. Cl. 525—92

8 Claims

1. A ternary polymer blend comprising (a) a polyetherimide; (b) a polyphenylene ether of the structural formula:



wherein the oxygen ether atom of one structural unit is connected to the benzene nucleus of the next adjoining unit, b is a positive integer and is at least 50 and Y₁, Y₂, Y₃ and Y₄, which may be the same or different, are monovalent substituents selected from the group consisting of hydrogen, halogen, hydrocarbon radicals, halo-hydrocarbon radicals having at least two carbon atoms between the halogen atom and the benzene nucleus, hydrocarboxy radicals and halo-hydrocarboxy radicals having at least two carbon atoms between the halogen atom and the benzene nucleus; and (c) a block copolymer of a vinyl aromatic compound (A) and an alkene compound (B), of the A-B-A type, the center block being of higher molecular weight than that of the combined terminal blocks.

4,873,286

MODIFIED POLYPHENYLENE ETHER-POLYAMIDE COMPOSITIONS AND PROCESS

Robert R. Gallucci, Pittsfield, Mass.; Roelof van der Meer, Bergen op Zoom, Netherlands, and Roger W. Avakian, Brasschaat, Belgium, assignors to General Electric Company, Pittsfield, Mass.

Continuation of Ser. No. 736,490, May 20, 1985, abandoned, which is a continuation-in-part of Ser. No. 612,389, May 21, 1984. This application Apr. 14, 1988, Ser. No. 183,494

Int. Cl.⁴ C08L 71/04, 77/00

U.S. Cl. 525—92

24 Claims

1. An improved process for the preparation of polyphenylene ether-polyamide compositions wherein the improvement comprises precompounding from about 0.05 to about 4% by weight, based on the total composition, of one or more aliphatic polycarboxylic acid represented by the formula:



or derivatives thereof wherein R is a linear or branched chain, saturated aliphatic hydrocarbon of from 2 to 20 carbon atoms; R¹ is selected from the group consisting of hydrogen or an alkyl, aryl, acyl or carbonyl dioxy group of from 1 to 10 carbon atoms; each R² is independently selected from the group consisting of hydrogen or an alkyl or aryl group of from 1 to 20 carbon atoms; each R³ and R⁴ is independently selected from the group consisting of hydrogen or an alkyl or aryl group of from 1 to 10 carbon atoms; m is equal to 1 and (n+s) is greater than or equal to 2, and n and s are each greater than or equal to 0; and wherein (OR⁴) is alpha or beta to a carbonyl group and at least 2 carbonyl groups are separated by 2 to 6 carbon atoms, with the polyphenylene ether and a modifier resin prior to compounding with the polyamide in order to enhance the impact strength of the final composition; said modifier resin having been derived from vinyl aromatic monomers, the blending ratio of polyphenylene ether to polyamide being from 5 to 95 percent by weight of the former to 95 to 5 percent by weight of the latter.

4,873,288

METHOD FOR PREPARATION OF THERMOPLASTIC RESIN COMPOSITION

Masato Komatsu; Isao Baba, both of Saitama; Takashi Mikami, Tokyo; Kiyotada Narukawa, Saitama, and Tsuyoshi Kanai, Kanagawa, all of Japan, assignors to Toa Nenryo Kogyo K.K., Tokyo, Japan

Filed Oct. 4, 1988, Ser. No. 253,178

Claims priority, application Japan, Oct. 7, 1987, 62-253308

Int. Cl.⁴ C08L 23/26, 15/02, 23/10

U.S. Cl. 525—194

9 Claims

1. A method for preparation of a thermoplastic resin composition comprising from 80 to 60% by weight of a polyolefin and from 20 to 40% by weight of crosslinked olefin rubber and further comprising halogenated butyl rubber in an amount of from 5 to 30 parts by weight to 100 parts by weight of the total of said polyolefin and said crosslinked olefin rubber, characterized in that:

- (a) a first blend of polyolefin and crosslinkable olefin rubber are dynamically heat-treated in the presence of an organic peroxide to form a dynamically vulcanized composition, and
(b) a polyolefin and halogenated butyl rubber and a crosslinking agent for said halogenated butyl are added to said first blend and dynamically heat-treated so as to crosslink said halogenated butyl rubber.

4,873,289

GRAFT POLYMERS AND BLENDS THEREOF WITH POLYAMIDES

Christian Lindner, Koels, Dieter Wittmann; Ludwig Trabert, both of Krefeld; Carikans Siling; Herbert Bartl, both of Oden-
thal, and Karl-Heinz Ott, Leverkusen, all of Fed. Rep. of
Germany, assignors to Bayer Aktiengesellschaft, Leverkusen,
Fed. Rep. of Germany

Continuation of Ser. No. 878,278, Jun. 25, 1986, abandoned.

This application Sep. 15, 1988, Ser. No. 246,887

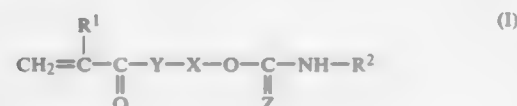
Claims priority, application Fed. Rep. of Germany, Jul. 6,
1985, 3524234

Int. Cl.⁴ C08F 265/04

U.S. Cl. 525—293

19 Claims

1. A graft polymer prepared under free radical conditions from a graft substrate (A) and grafting monomers (B) wherein (A) comprises an elastomer component which is at least one of diene rubbers, ethylene/vinyl acetate copolymers, ethylene/acrylate copolymers, silicone rubbers, or acrylate rubbers which are partly crosslinked to a degree of at least 20% and having an average particle size of 0.05 to 8 μ m determined by ultracentrifuge measurement, and a glass transition temperature less than -20° C., and (B) comprises grafting monomers of the formula



in which

R¹ represents a hydrogen atom or a C₁-C₄-alkyl radical, R² represents a C₁-C₂₀-alkyl or C₆-C₁₈-aryl radical, which is unsubstituted or substituted by alkyl groups or groups containing O or N,

Y represents an —O— or an —NH— group,

X represents a C₂-C₁₀-alkylene radical, and

Z represents O or S; or mixtures thereof with other olefinically unsaturated monomers.

4,873,290

CURE SYSTEM FOR OPEN STEAM CURING OF MINERAL-LOADED CHLOROBUTYL COMPOUNDS

Terry F. Allen, Barberton, and Robert C. Schialer, Akron, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Aug. 11, 1988, Ser. No. 231,288

Int. Cl.⁴ C08C 19/26, 19/22

U.S. Cl. 525—337

11 Claims

1. A method for vulcanizing mineral loaded chlorobutyl rubber which comprises (a) mixing chlorobutyl rubber with (1) 25 to about 200 phr of a filler selected from the group consisting of calcium carbonate, magnesium carbonate, magnesium silicate, calcium silicate, aluminum silicate, whiting, pyrogenic silica, hydrated silica, barium sulfate, calcium sulfate, titanium dioxide and mica and (2) a vulcanization agent comprising from about 0.25 to about 10 phr of an alkyl phenol disulfide and from about 0.25 to about 10 phr of a guanidine compound selected from the group consisting of diphenyl guanidine, di-ortho-tolylguanidine, triphenyl guanidine and di-ortho-tolylguanidine salt of dicatechol borate and (b) vulcanizing the resultant mixture by open-steam curing.

4,873,291

RUBBER VULCANIZATION SYSTEM WITH TRIAZINE COMPOUNDS

Martin P. Cohen, Akron, and Richard M. D'Sidocky, Ravenna, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 23,328, Mar. 9, 1987, Pat. No. 4,755,320.

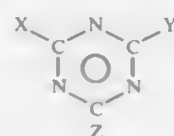
This application Dec. 7, 1987, Ser. No. 129,798

Int. Cl.⁴ C08F 8/34; C08C 19/20

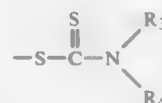
U.S. Cl. 525—348

4 Claims

1. A process for vulcanizing a sulfur vulcanizable rubber selected from the group consisting of styrene/butadiene copolymers, polyisoprene, natural rubber, polybutadiene, ethylene/propylene/diene terpolymers, butadiene/isoprene copolymers, butadiene/isoprene/styrene terpolymers, and blends thereof, said process comprising: (1) admixing an effective amount of a vulcanization system with the vulcanizable rubber, said vulcanization system comprising: (a) a morpholine polysulfide containing from 2 to 5 sulfur atoms and (b) a dithiocarbamyl triazine of the structural formula:



wherein X, Y and Z are the same or different radicals selected from the group consisting of halogen, alkoxy of 1-8 carbon atoms, the radical —S—R wherein R can be from 1-8 carbon atoms, the radical —N—R¹—R² wherein R¹ and R² can be the same or different radicals of 1 to 8 carbon atoms or R¹ and R² taken together complete with the nitrogen atom to which they are attached can form a six membered ring which may contain oxygen as a heteroatom, and a dithiocarbamyl radical of the formula:



wherein R³ and R⁴ are the same or different radicals selected from alkyl of 1 to 8 carbon atoms or R³ and R⁴ taken together with the nitrogen atom to which they are attached form a six membered ring which may contain oxygen as a heteroatom; with the proviso that at least one of X, Y or Z is always a dithiocarbamyl radical and (c) sulfur; wherein the weight percent of component (a) can range from 20 to 98%, the weight percent of component (b) can range from 2 to 40% and the weight percent of component (c) can range from 0 to 70% based on the total weight of the composition with the proviso that the weight percent of (a) is always equal to or greater than the weight percent of (b); (2) heating the admixture to a temperature of from 100°-250° C.

4,873,292

ANTITHROMBOGENIC SYNTHETIC POLYMER AND PROCESS FOR ITS PREPARATION

Naoya Ogata; Kohei Sanui; Nobuhiko Yui; Kazunori Kataoka, all of Tokyo; Teruo Okano, Chiba, and Yasuhisa Sakurai, Tokyo, all of Japan, assignors to Research Development Corporation of Japan, Tokyo, Japan

Continuation-in-part of Ser. No. 814,974, Dec. 31, 1985,

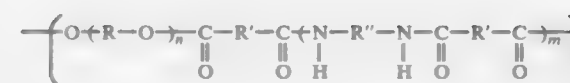
abandoned. This application Feb. 9, 1988, Ser. No. 154,003

Int. Cl.⁴ C08L 71/02, 77/06

U.S. Cl. 525—408

8 Claims

1. An antithrombogenic synthetic polymer having repeat structural units represented by the following structural formula consisting of portions I and II:



I

II

where R is a straight-chain or branched-chain alkylene group containing from 2 to 4 carbon atoms, R' is a straight-chain alkylene group containing from 2 to 10 carbon atoms or an aromatic ring group, R'' is a straight-chain or branched-chain alkylene group containing up to 10 carbon atoms, n is an integer which ranges from 13 to 180, and m is an integer ranging from 1 to 400, said polymer having a microdomain structure composed of crystalline phases and amorphous phases, each phase having an average size of between 5 to 10 nm, and the molecular weight of said polymer being in the range of about 10,000 to about 300,000, the portion I being present in an amount ranging from about 13% to about 27% by weight of the polymer.

4,873,294

MIXTURE OF CATIONIC BENZENE CARBOXYLATE POLYMERS FROM THE REACTION OF HALOACETYL TERMINATED POLY(ETHER-ESTERS) WITH TERMINAL QUATERNIZING AGENTS

Anthony J. O'Lenick, Jr., Lilburn, and Joseph J. Fanelli, Al-
pharetta, both of Ga., assignors to GAF Corporation, Wayne,
N.J.

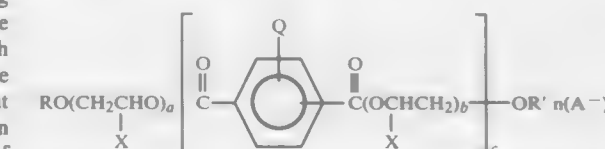
Filed Jun. 16, 1988, Ser. No. 207,419

Int. Cl.⁴ C08G 63/18, 63/46, 63/66, 63/68

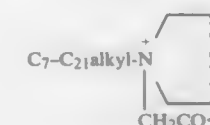
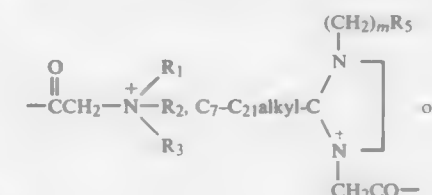
U.S. Cl. 525—419

10 Claims

1. A mixture of cationic benzene carboxylate polymers having the formula



wherein R and R' are selected from the group consisting of alkyl or alkenyl having from 1 to 20 carbon atoms, aryl,



4,873,293

PARTIALLY HYDROLYZED, POLY(N-ACYL ALKYLENIMINES) IN PERSONAL CARE

George L. Brode, II, Bridgewater, N.J., and Frederick M. Mer-
ritt, II, Lockport, Ill., assignors to Union Carbide Chemicals
and Plastics Company Inc., Danbury, Conn.

Division of Ser. No. 913,407, Sep. 30, 1986, Pat. No. 4,837,005.

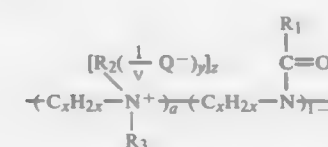
This application Mar. 9, 1989, Ser. No. 321,149

Int. Cl.⁴ C08G 73/00

U.S. Cl. 525—417

10 Claims

1. Nitrogen-substituted, partially hydrolyzed, poly(N-acyl alkyleneimine) containing repeating units represented by the structural formula:



wherein a is from about 1 to about 50 mole percent; and wherein for each repeating unit individually:

Q is an anion;

R₁ is hydrogen, alkyl, aryl, aralkyl or alkaryl;

R₂ is hydrogen or a hydrocarbyl-containing group;

R₃ is hydrogen, oxygen or a hydrocarbyl-containing group;

v is equal to the valence of Q;

x is 2 or 3;

y is 0 or 1; and

z is 0 or 1;

provided that:

(1) when R₃ is oxygen then y is 0, R₂ is a hydrocarbyl-containing group and z is 1; and

(2) when R₃ is not oxygen then y is 1; and with the further provisions that:

(3) when all R₂ and R₃ groups are hydrogen then the average value of z per repeat unit is greater than 0 and Q represents a mixture of anions; and

(4) when all z values are 0 then at least one R₃ group is a hydrocarbyl-containing group.

with the proviso that at least one of R and R' is quaternized; Q is hydrogen, SO₃-alkali metal, SO₃H, COOH or COO-alkali metal, at least 25% of Q in said mixture being hydro-

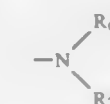
gen; a and b each have a value of from 1 to 200, except that the sum of a+b is at least 25;

X is hydrogen, lower alkyl or mixtures thereof in random or block distribution when a and/or b is greater than 3;

c has a value of from 2 to 10,000;

R₁, R₂ and R₃ each contain from 1 to 22 carbon atoms and are alkyl, hydroxy alkyl or alkylamido lower alkyl;

R₅ is

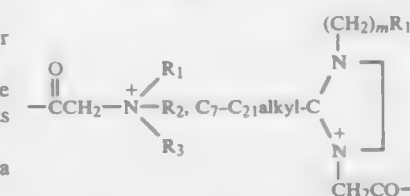


—OH, —OCOR₁ or —OR₁;

R₆ is hydrogen or —COR₁;

R₇ is hydrogen, —(CH₂)_mOCOR₁, —(CH₂)_mOR₁,

—(CH₂)_mNH₂.



4,873,302

STYRENE-TERMINATED POLYETHERS OF POLYPHENOL

Allyson Beuhler, Indian Head Park, and James A. Wrezel, Buffalo Grove, both of Ill., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Continuation of Ser. No. 895,394, Aug. 11, 1986, abandoned.

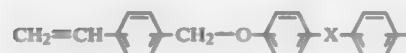
This application Aug. 29, 1988, Ser. No. 238,996

Int. Cl.⁴ C08F 16/12

U.S. Cl. 526-333

7 Claims

1. A poly(vinyl benzyl ether) of a polyphenol which possesses the generic structure:



in which X is selected from the group consisting of S, SO₂, O and straight or branched chain alkyl radicals containing from 1 to about 6 carbon atoms, n is an integer of from 1 to about 8 and m is in a range of from 1 to about 10.

4,873,303

METHOD FOR MAKING A REINFORCED PRODUCT OF BITUMINOUS MATERIAL

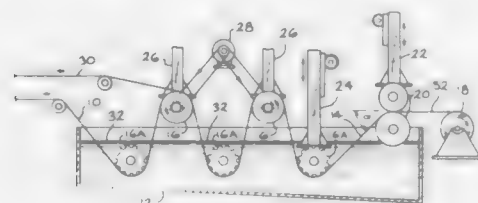
Albert J. Blackwood, Perrysburg, and Thomas R. Brady, Granville, both of Ohio, assignors to Owens-Corning Fiberglass Corporation, Toledo, Ohio

Filed Jun. 3, 1986, Ser. No. 870,054

Int. Cl.⁴ B05D 3/12, 1/18

U.S. Cl. 427-365

5 Claims



1. The method of making a reinforced product of bituminous material comprising drawing a reinforcing mat through a tank of molten bituminous material to impregnate the mat with the bituminous material, pulling the impregnated mat through metering rolls to establish the final thickness of the reinforced product, establishing the angle of incidence of the impregnated mat with respect to the metering rolls by means of a guide member, and controlling the relative position of the mat within the reinforced product by controlling said angle of incidence.

4,873,304

ORGANOMETALLIC POLYMER

Myron Rosenblum, Lexington, Mass., assignor to Brandeis University, Waltham, Mass.

Filed Nov. 10, 1987, Ser. No. 119,024

Int. Cl.⁴ C08G 79/00, 83/00

U.S. Cl. 528-9

18 Claims

1. A polymer represented by



where R¹ represents a ligand selected from the group consist-

ing of cyclopentadienyl, phenyl, and cycloheptatrienyl ligands, R² represents a monovalent radical selected from the group consisting of the cyclopentadienyl, η⁶-arene and cycloheptatrienyl rings, M represents a transition metal, n is an integer of 2 or more, and R represents a divalent radical bound to the individual metallocene units at two positions.

4,873,305

TIN MONOCHELATE CATALYSIS OF ORGANOPOLYSILOXANE COMPOSITIONS

Jacques Cavezzan; Jean-Marc Frances, both of Villeurbanne, and Claude Millet, Saint-Priest, all of France, assignors to Rhone-Poulenc Chimie, Courbevoie, France

Filed Jun. 27, 1988, Ser. No. 212,184

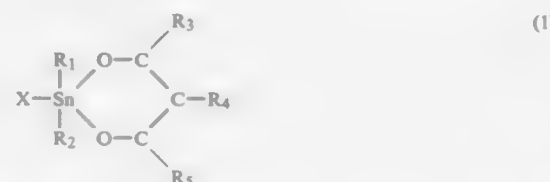
Claims priority, application France, Jun. 25, 1987, 87 09178

Int. Cl.⁴ C08G 77/06

U.S. Cl. 528-18

6 Claims

1. An organopolysiloxane composition of matter curable into elastomeric state, comprising (1) a curable organopolysiloxane base including an organopolysiloxane polymer and a crosslinking agent therefor, and (2) a catalytically effective amount of a monochelate of pentacoordinated tin of valency IV having the formula:



in which:

the symbols R₁ and R₂, which may be identical or different, are each an optionally substituted, monovalent C₁-C₈ hydrocarbon radical;
the symbols R₃ and R₅, which may be identical or different, are each a radical R₁ or R₂, a hydrogen atom, a C₁-C₅ alkoxy radical or a silyl radical Si(R₁)₃;
the symbol R₄ is hydrogen atom, or an optionally halogenated C₁-C₈ hydrocarbon radical, with the proviso that R₄ and R₅ may together form, with the carbon atoms from which they depend, a divalent C₅-Clhd 12 cyclic hydrocarbon radical or a substituted such radical bearing at least one chlorine, nitro and/or cyano substituent; and
the symbol X is a monocarboxylate radical of the formula R₆COO wherein R₆ has the same definition as R₁ above

4,873,306

URETHANES CONTAINING FLUORINE AND POLYSILOXANE, PROCESS FOR THEIR PREPARATION AND THEIR USE

Frank Wehowsky, Burgkirchen, and Martin Liebig, Hofheim am Taunus, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 5, 1988, Ser. No. 215,202

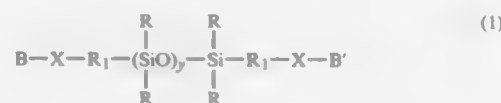
Claims priority, application Fed. Rep. of Germany, Jul. 7, 1987, 3722375

Int. Cl.⁴ C08G 77/04

U.S. Cl. 528-28

3 Claims

1. A urethane containing fluorine and polysiloxane, of the following formula I

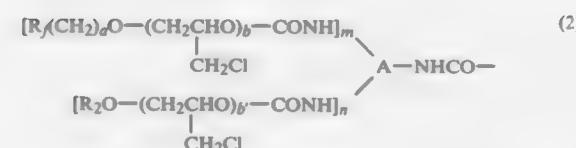


in which

R denotes CH₃ or C₂H₅.

y denotes a number from 5 to 500.

B denotes a radical of the following formula 2



in which

R_f denotes a perfluoroalkyl radical with 4 to 20 carbon atoms, an ω-H-perfluoroalkyl radical with 4 to 20 carbon atoms, or a radical of the formula R/SO₂NR₃ or of the formula R/CH₂CH₂SO₂NR₃, in which R/ is a perfluoroalkyl radical with 4 to 20 carbon atoms and R₃=H or C₁₋₄-alkyl,

R₂ denotes an alkyl radical with 4 to 20 carbon atoms,

a denotes an integer from 1 to 4,

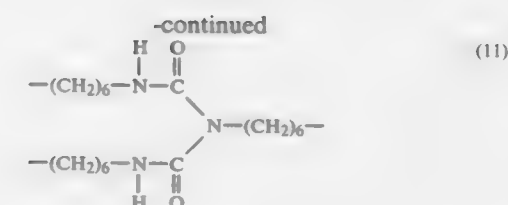
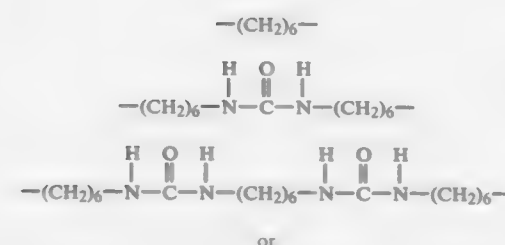
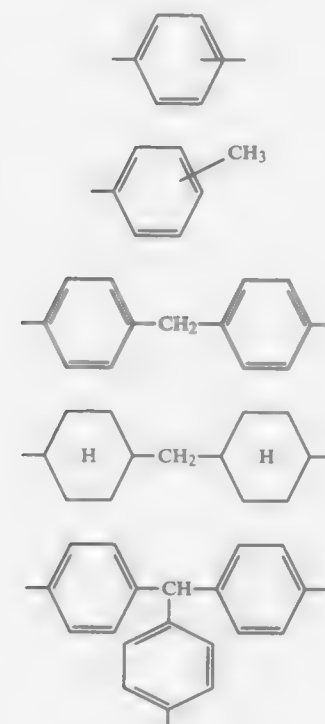
b denotes a number from 0 to 10,

b' denotes a number from 0 to 10,

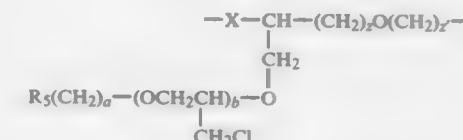
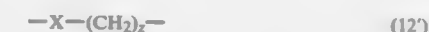
m denotes a number from 1 to 2 and

n denotes a number from 0 to 1, the sum of m+n being not more than 2, and

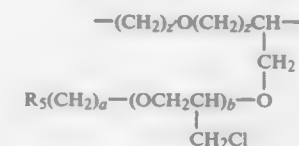
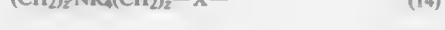
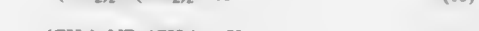
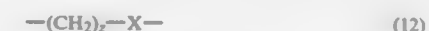
A denotes a radical corresponding to one of the following formulae (3) to (11)



B' denotes H or likewise denotes a radical of the formula 2, X denotes O or NR₄, in which R₄=H or C₁₋₄-alkyl
-X-R₁-denotes a radical corresponding to one of the following formulae (12) to (15')



in which z and z' are each an integer from 1 to 10, R₅ has one of the meanings of R₂ or of R_f, and X, R₄, a, and b have the meanings defined previously, and
R₁-X denotes a radical corresponding to one of the following formulae 12 to 15



in which z, z', R₅, X, R₄, a, and b have the meanings defined previously.

4,873,307

MONOCOMPONENT POLYURETHANE ADHESIVES

Franco Federici, 49, viale Stelvio, 21052 Busto Arsizio Varese; Franco Pallozzi, 18, via Duca degli Abruzzi, 20059 Vimercate, Milan; Eranio Cozzi, 2, via Novara, 20020 Cantalupo, Milan, and Pietro Turco, 13, via Venezia, 21052 Busto Arsizio, Varese, all of Italy

Continuation of Ser. No. 914,155, Oct. 1, 1986, abandoned. This application Sep. 29, 1987, Ser. No. 104,564

Claims priority, application Italy, Oct. 2, 1985, 22336 A/85 Int. Cl.⁴ C08G 18/10, 18/32

U.S. Cl. 528-60

11 Claims

1. A monocomponent polyurethane adhesive having a long "pot life", good "green tack", a high cross-linking rate and good resistance to heat obtained by a process which comprises: causing a polyurethane resin, having a content of free isocyanate groups of from about 1.5 to 8, and a polyamine selected from the class consisting of aliphatic, cycloaliphatic and heterocyclic polyamines having from 2 to 6 amino groups to react in an organic solvent, at room temperature, by adding the polyurethane resin to the polyamine and wherein the ratio between the number of

isocyanate groups of the polyurethane resin and moles of polyamine is between 0.8 and 1; adding an epoxy resin to the thus-obtained polyurethane resin containing amino groups, in order to have the number of active hydrogen atoms of polyamine/number of epoxy groups higher than 1; and heating the mixture at temperature from about 5020 C. to about the boiling point of the solvent, for a time between 30 minutes and 10 hours.

4,873,308

BIOSTABLE, SEGMENTED ALIPHATIC POLYURETHANES AND PROCESS THEREFOR
Arthur J. Coury, St. Paul; Christopher M. Hobot, Mound, and Kurt Carlson, Osseo, all of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Sep. 30, 1988, Ser. No. 251,418
Int. Cl.⁴ C08G 18/75

U.S. Cl. 528—75 17 Claims

1. A segmented polyurethane comprising: alternating softer and harder segments linked by urethane groups; wherein said softer segments comprise a polyurethane having the formula $(-O \text{ or } -OCNH)-(R_1-U-R_2-U)_m-R_1-(O \text{ or } NHCO-)$, wherein one of R_1 and R_2 signifies a dimer backbone, U signifies a urethane group and the other of R_1 and R_2 signifies a hydrocarbon moiety free of ether and ester groups and having a molecular weight less than about 1000, and the average value of m is approximately 1 or greater; and wherein said harder segments comprise a polyurethane having the general formula $(-O \text{ or } -OCNH)-(R_3-U-R_4-U)_n-R_3-(O \text{ or } NHCO-)$, wherein R_3 and R_4 both signify hydrocarbon moieties free of ether and ester groups and having molecular weights less than about 500, U signifies a urethane group and the average value of n is approximately 1 or greater.

4,873,309

STABILIZED FLAME-RETARDANT EPOXY RESIN COMPOSITION FROM A BROMINATED EPOXY RESIN AND A VINYL MONOMER DILUENT
Larry S. Corley, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Jun. 8, 1987, Ser. No. 59,434
Int. Cl.⁴ C08G 59/14

U.S. Cl. 528—102 15 Claims

1. A composition comprising:
(a) a brominated epoxy resin which is the reaction product of a brominated polyhydric phenol and epichlorohydrin, said brominated epoxy resin having a weight per epoxide within the range of about 450 to about 800 and a bromine content of from about 30 to about 70 percent;
(b) an effective amount of a curing agent for the brominated epoxy resin; and
(c) from about 5 to 50 weight percent, based on the weight of the composition, of at least one reactive diluent selected from the group consisting essentially of aliphatic and aromatic monomers having at least one site of vinyl unsaturation.

4,873,310

AROMATIC POLYAMIDES BASED ON PHENOXYTEREPHTHALIC ACID AND PROCESS FOR PREPARING THEM

Martin Bartmann, Recklinghausen, Fed. Rep. of Germany, and Naoki Ikeda, Himeji, Japan, assignors to Huls Aktiengesellschaft, Marl, Fed. Rep. of Germany and Daicel Chemical Industries, Ltd., Tokyo, Japan

Filed Mar. 2, 1988, Ser. No. 162,968

Claims priority, application Fed. Rep. of Germany, Mar. 7, 1987, 3707435

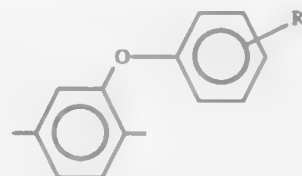
Int. Cl.⁴ C08G 69/32

U.S. Cl. 528—208 3 Claims

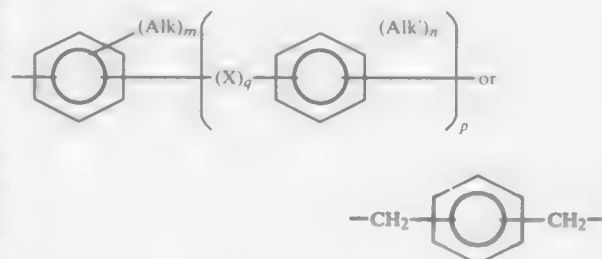
1. A polyamide having structural units of the formula



in which Ar is a divalent group of the formula



in which R is a straight-chain, branched or cyclic alkylene group with 2 to 20 carbon atoms or a divalent aromatic group of the formula



wherein Alk and Alk' are, independently, alkyl groups with up to 6 carbon atoms, X is a divalent group selected from the group consisting of $-O-$, $-S-$, $-CH_2-$, $-C(CH_3)_2-$, $-CO-$, and $-SO_2-$, and p and q are, independently, 0 or 1, and m and n are, independently, 0, 1 or 2, and in which R' is hydrogen, a halogen, an alkyl, aryl, alkoxy, or aryloxy group, each with up to 12 carbon atoms.

4,873,311

WATER DISPERSIBLE POLYAMIDE ESTER

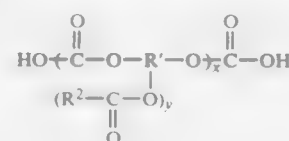
Walter K. Bornack, Jr., Amherst, N.Y., and Keith R. McNally, Bedminster, N.J., assignors to Union Carbide Corporation, Wayne, N.J.

Filed Feb. 5, 1988, Ser. No. 152,640

Int. Cl.⁴ C08G 63/02

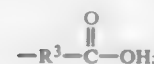
U.S. Cl. 528—272 16 Claims

1. A composition having the formula:



wherein x is an integer of 1-5; R' = a polyamide ester chain of molecular weight 500-2000; where y is an integer of 1-3; R² is independently at each occurrence the residue of a cyclic car-

boxylic anhydride bearing at least one free carboxyl group or



where R³ is independently at each occurrence R' or a polyamide segment of up to 2000 MW.

4,873,312

METHOD FOR PURIFYING INTERFERON AND COMPOSITION OF MATTER PRODUCED THEREBY
Tsutomu Arakawa, Thousand Oaks, Calif., assignor to Amgen, Thousand Oaks, Calif.

Filed Apr. 25, 1985, Ser. No. 727,147

Int. Cl.⁴ C07K 15/26; A61K 45/02

U.S. Cl. 530—351 2 Claims

1. A method for obtaining monomeric gamma interferon substantially free of associated states comprising the steps of: providing purified gamma interferon in an aggregated form which lacks intermolecular covalent bonds and which is excluded from a gel filtration column whose characteristics are such that proteins of molecular weight greater than about 80,000 daltons are excluded; unfolding the gamma interferon in a solution containing a denaturant; diluting the solution to achieve a concentration of less than 0.18 mg of gamma interferon per ml; and concentrating the diluted solution by diafiltration.

4,873,313

SPECIFIC HYBRIDOMA CELL LINE AND MONOCLONAL ANTIBODIES PRODUCED FROM SUCH SPECIFIC HYBRIDOMA CELL LINE AND METHOD OF USING SUCH MONOCLONAL ANTIBODIES TO DETECT CARCINOEMBRYONIC ANTIGENS

Frances G. Crawford, Houston, Tex.; John E. Shively, Arcadia, Calif.; Charles W. Todd, Arcadia, Calif., and Y. H. Joy Yang, Arcadia, Calif., assignors to Beckman Research Institute of City of Hope, Duarte, Calif.

Continuation-in-part of Ser. No. 692,515, Jan. 18, 1985, abandoned. This application Apr. 18, 1985, Ser. No. 725,492

Int. Cl.⁴ A61K 39/395; C07K 15/14; C12N 15/00; G01N 33/574

U.S. Cl. 530—387 6 Claims

1. A hybridoma cell line designated as T84.66-A3.1-H-11 cell line ATCC Accession No. HB8747.

4,873,314

PROCESS FOR THE PRODUCTION OF POLYCARBONATE SOLUTIONS

Klaus Berg, Karsten-Josef Idel, both of Krefeld, and Ulrich Grigo, Kempen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 18, 1988, Ser. No. 157,438

Claims priority, application Fed. Rep. of Germany, Feb. 26, 1987, 3706205

Int. Cl.⁴ C08G 63/74, 63/62

U.S. Cl. 528—487 2 Claims

1. In the process for preparing a thermoplastic aromatic polycarbonate resin by the condensation of diphenols in the two phase interfacial process the improvement comprising adding to the aqueous emulsion of the polycarbonate thus produced 2.5 to 100 ppm of phosphorus acid said adding being before said emulsion is separated, said acid remaining in the aqueous phase of said process and said ppm being relative to the weight of diphenols thus condensed.

4,873,315

PERFLUORINATED PROPYL DERIVATIVE COMPOUND

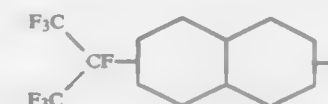
Frank K. Schweighardt, Allentown; Webb I. Bailey, Fogelsville; John T. Lileck, Tamaqua; John K. Graybill, Macungie, and Eugene G. Lutz, Druma, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Aug. 25, 1987, Ser. No. 89,293

Int. Cl.⁴ C07C 19/08, 17/02

U.S. Cl. 570—130 2 Claims

1. The perfluorinated compounds having the formula:



wherein the carbon rings are fully fluorinated.

4,873,316

ISOLATION OF EXOGENOUS RECOMBINANT PROTEINS FROM THE MILK OF TRANSGENIC MAMMALS

Harry Meade, Newton, Mass., and Nils Lonberg, New York, N.Y., assignors to Biogen, Inc., Cambridge, Mass.

Filed Jan. 23, 1987, Ser. No. 65,994

Int. Cl.⁴ C07K 3/02, 3/12, 3/18; C12N 15/00

U.S. Cl. 530—412 3 Claims

1. A process for the production and secretion into mammal's milk of an exogenous recombinant protein comprising the steps of:

- producing milk in a transgenic mammal characterized by an expression system comprising a casein promoter operatively linked to an exogenous DNA sequence coding for the recombinant protein through a DNA sequence coding for a signal peptide effective in secreting and maturing the recombinant protein in mammary tissue;
- collecting the milk; and
- isolating the exogenous recombinant protein from the milk.

4,873,317

METHOD OF SEPARATING OR PURIFYING PROTEINS AND OTHER BIOPOLYMERS

Melvyn Rosenberg, 12 Yeda Am Street, and Ilana Eli, 22 Shazar Street, both of Ramat-Gan, Israel

Filed Mar. 5, 1987, Ser. No. 22,225

Claims priority, application Israel, Mar. 13, 1986, 78130

Int. Cl.⁴ C07K 3/12, 3/20, 3/24; C12P 21/00

U.S. Cl. 530—412 16 Claims



- The method for the separation or purification of biopolymers comprising the steps:
adsorbing the biopolymer on the surface of liquid oil droplets;
and separating the adsorbed biopolymer from the oil droplets.

4,873,318
OXAZINE-UREAS AND THIAZINE UREA
CHROMOPHORE

Spyros Theodoropoulos, 2964 Hickory St., Yorktown Heights, N.Y. 10598

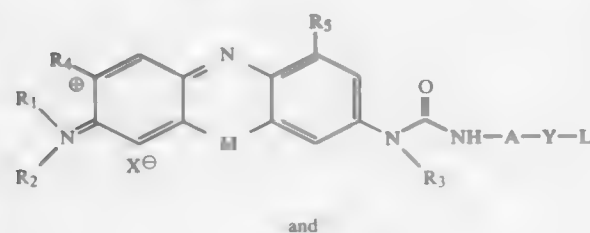
Continuation-in-part of Ser. No. 69,860, Jul. 6, 1967, abandoned, which is a continuation-in-part of Ser. No. 753,937, Jul. 11, 1985, Pat. No. 4,714,763. This application Oct. 20, 1987, Ser. No. 110,415

Int. Cl.⁴ C07D 265/38, 279/36

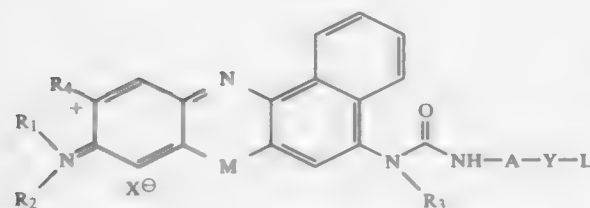
U.S. Cl. 530—387

8 Claims

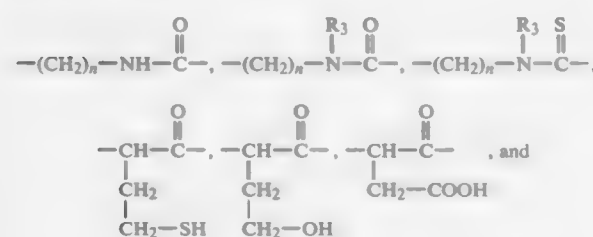
1. An adduct of urea derivatives of oxazine and thiazine chromophores and an antibody, said adduct being selected from the group consisting of:



and



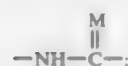
wherein R¹-R³ are hydrogen or alkyl of 1 to 10 carbon atoms; R⁴ and R⁵ are R¹, halogen or amino; M is oxygen or sulfur; X⁻ is an organic or inorganic anion; A is selected from the group consisting of:



wherein T represents



NR³ and



M represents oxygen or sulfur; Y is sulfur or a primary or secondary amine of from 1 to 12 carbon atoms; and L is an antibody.

4,873,319
DISAZO DYES CONTAINING A PYRIMIDINE
COUPLING COMPONENT AND A CATIONIC ALKYL
AMMONIUM GROUP

Willy Stingelin, Reinach, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Sep. 25, 1987, Ser. No. 100,853

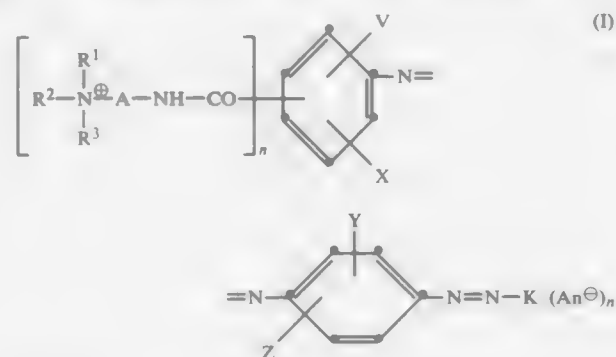
Claims priority, application Switzerland, Oct. 3, 1986, 1986/85

Int. Cl.⁴ C09B 44/02, 44/08; D06P 1/41, 3/58

U.S. Cl. 534—604

15 Claims

1. An unsulfonated cationic disazo dye of formula



wherein

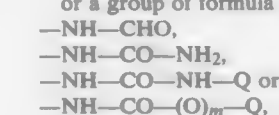
R¹, R² and R³ are each independently an unsubstituted alkyl radical or an alkyl radical which is substituted by hydroxy, phenyl or alkoxy, or R¹ and R², together with the linking nitrogen atom are a pyrrolidine, piperidine, morpholine or piperazine radical, or R¹, R² and R³, together with the linking nitrogen atom, are a pyridinium or triethylenediamine radical,

A is a C₂-C₆alkylene radical,

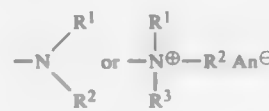
V and X are each independently of the other hydrogen or C₁-C₄alkyl or C₁-C₄alkoxy, each unsubstituted or substituted by hydroxy, halogen, cyano or C₁-C₄alkoxy,

Y is hydrogen, C₁-C₄alkyl or C₁-C₄alkoxy, halogen, or cyano,

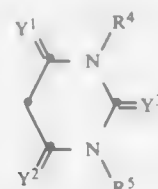
Z is hydrogen, C₁-C₄alkyl or C₁-C₄alkoxy, halogen, cyano, or a group of formula



wherein m is 0 or 1 and Q is C₁-C₄alkyl which is unsubstituted or substituted by halogen or groups of the formulae



or Q is phenyl which is unsubstituted or substituted by C₁-C₄alkyl, C₁-C₄alkoxy, halogen or nitro, K is a coupling component of formula



wherein

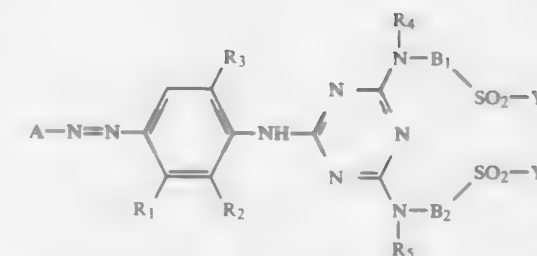
Y¹ and Y² are each independently of the other =O, =NH, or =N-C₁-C₄alkyl,

Y³ is =O, =S, =NR or =N-CN, where R is hydrogen or C₁-C₄alkyl,

R⁴ and R⁵ are each independently of the other hydrogen, alkyl which is unsubstituted or substituted by hydroxy, C₁-C₄alkoxy or C₁-C₄hydroxyalkoxy or they are phenyl which is unsubstituted or substituted by C₁-C₄alkyl, C₁-C₄alkoxy, halogen or nitro,

n is 1 or 2, and

An⁺ is an anion.



4,873,320
WATER-SOLUBLE MONOAZO AND DISAZO DYES
CONTAINING A FIBER-REACTIVE
2-CHLORO-4-(NITROPHENYLAMINO-ALKYLAMINO)-
S-TRIAZIN-6-YLAMINO GROUPING WITH A
FIBER-REACTIVE GROUP OF THE VINYL SULFONE
SERIES AS A SUBSTITUENT IN THE NITROPHENYL
MOIETY

Hartmut Springer, Königstein/Taunus; Manfred Kühn, Frankfurt am Main, and Holger M. Büch, Hofheim am Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 15, 1987, Ser. No. 133,009

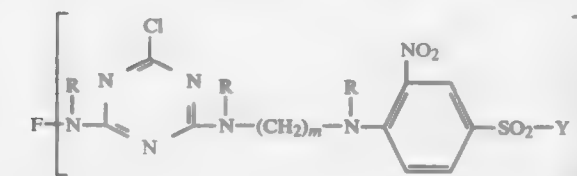
Claims priority, application Fed. Rep. of Germany, Dec. 17, 1986, 3643014

Int. Cl.⁴ C09B 62/085, 62/03, 62/53, 62/533

U.S. Cl. 534—632

16 Claims

1. A compound which corresponds to the formula



in which:

F denotes the radical of a sulfo group-containing monoazo or disazo dye;

m denotes the number 2 or 3;

n denotes the number 1 or 2;

R denotes a hydrogen atom or an alkyl group having 1 to 4 carbon atoms; and

Y denotes the vinyl group or a group of the formula



in which X represents a substituent which can be eliminated as an anion, by means of an alkali.

4,873,321
MONAZO COMPOUNDS HAVING A TRIOZINYL
BRIDGING GROUP AND TWO VINYL SULFONE TYPE
FIBER REACTIVE GROUPS

Takashi Omura, Ashiya; Sadanobu Kikkawa; Toshihiko Morimoto, both of Minoo; Naoki Harada, Suita, and Tetsuya Miyamoto, Takatsuki, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Sep. 29, 1987, Ser. No. 102,497

Claims priority, application Japan, Oct. 17, 1986, 61-248200; Feb. 20, 1987, 62-38301

Int. Cl.⁴ C09B 62/503, 62/51; D06P 1/38, 3/66

U.S. Cl. 534—642

11 Claims

1. A compound of the following formula,

wherein A is phenyl substituted with a water-solubilizing group or naphthyl substituted with a water-solubilizing group, B₁ and B₂ independently of one another are each phenylene unsubstituted or substituted with methyl, ethyl, methoxy, ethoxy, halogeno, sulfo or carboxy, or naphthylene unsubstituted or substituted with sulfo, R₁ is hydrogen, halogeno, C₁-4 alkyl, C₁-4 alkoxy, ureido or acylamino, said acylamino being selected from —NHCOC₁₋₄ alkyl, —NHCOC₂₋₄ alkenyl and benzoylamino, in which the alkyl and alkenyl are unsubstituted or substituted with sulfo, carboxy or halogeno, and the benzoyl is unsubstituted or substituted with sulfo, carboxy, methyl or halogeno, R₂ is hydrogen or taken together with R₁ forms a benzene ring unsubstituted or substituted with sulfo, R₃ is hydrogen, C₁-4 alkyl, C₁-4 alkoxy or sulfo, R₄ and R₅ independently of one another are each hydrogen or alkyl unsubstituted or substituted with hydroxy, cyano, C₁-4 alkoxy, halogeno, carboxy, carbamoyl, C₁-4 alkoxy carbonyl, C₁-4 alkyl carbonyloxy, sulfo or sulfamoyl, and Y₁ and Y₂ independently of one another are each vinyl or —CH₂CH₂L in which L is a group capable of being split by the action of an alkali.

4,873,322
SACCHARIDE DERIVATIVES AND PROCESSES FOR
THEIR MANUFACTURE

Bruno Fechtig, Reinach, and Gerhard Baschang, Bettingen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jan. 16, 1987, Ser. No. 3,986

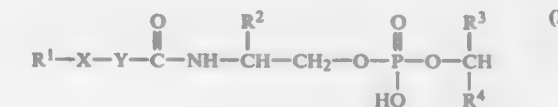
Claims priority, application Switzerland, Jan. 24, 1986, 276/86

Int. Cl.⁴ A61K 37/00

U.S. Cl. 536—4.1

27 Claims

1. A saccharide derivative of the formula I



in which R¹ represents a) aldohexosyl, (b) D-aldohexosyl that is glycosidically linked in the 4- or the 6-position to D-aldohexosyl, (c) aldopentosyl, (d) 6-deoxy-aldohexosyl or (e) 2-acetylamin-2-deoxy-D-aldohexosyl, it being possible for free hydroxy groups present in the radicals mentioned under a) to e) above to be peracetylated, X represents oxygen or sulphur, Y represents alkylene having up to 10 carbon atoms in which from 1 to 3 non-terminal methylene groups may be replaced by oxygen, by carbonylimino or by carbonyloxy, R² represents hydrogen, carboxy, lower alkoxy carbonyl, benzyloxy carbonyl or carbamoyl, R³ represents hydrogen and R⁴ represents a 1,2-dihydroxyethyl, 2-hydroxy-ethyl or hydroxymethyl group in which at least one hydroxy group is esterified by an unsubstituted aliphatic C₁₀₋₂₄-carboxylic acid and in which the other hydroxy group, if present, is free or esterified by an aliphatic C₂₋₂₄-carboxylic acid, or R³ and R⁴ each represents a hydroxymethyl group esterified by an unsubstituted aliphatic C₁₀₋₂₄-carboxylic acid, or a pharmaceutically acceptable salt thereof, or a mixture of said saccharide derivative and its pharmaceutically acceptable salt.

25. A pharmaceutical preparation for the prophylaxis or therapy of a virus infection in or on a warm-blooded animal containing an in vivo antivirally effective amount of a pharmaceutically acceptable salt according to claim 1 together with a pharmaceutical carrier.

4,873,323

ACID/HEAT MODIFIED POLYSACCHARIDE BIOPOLYMERS

Patrick Cros, and Robert Pipon, both of Melle, France, assignors to Rhone-Poulenc Specialites Chimiques, Courbevoise, France

Filed Aug. 14, 1986, Ser. No. 896,282

Claims priority, application France, Aug. 14, 1985, 85 12382 Int. Cl.⁴ C07G 17/001; C08B 37/00; E21B 43/22

U.S. Cl. 536—114

9 Claims

1. A process for the preparation of a modified polysaccharide biopolymer, comprising (i) acidifying an aqueous composition of a polysaccharide with nitric acid to a pH of from about 2 to 0.1, (ii) heat-treating said acidified composition at a temperature of from about 50° to 100° C. for from about 5 to 60 minutes, and (iii) cooling said heat-treated composition and adjusting the pH thereof to a value of from about 5 to 7, said acidifying and heat treating giving rise to a modified polysaccharide having a decreased number of acetyl groups compared to an unmodified polysaccharide.

4,873,324

PROCESS FOR CHIRAL SYNTHESIS OF 1-BETA-METHYL-CARBAPENEM INTERMEDIATES

Burton G. Christensen, Cliffside Park; Lovji D. Cama, Cresskill, and Susan M. Schmitt, Scotch Plains, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

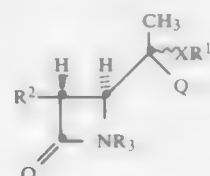
Continuation of Ser. No. 157,165, Feb. 11, 1988, abandoned, which is a continuation of Ser. No. 59,143, Jun. 5, 1987, abandoned, which is a continuation of Ser. No. 8,050, Jan. 15, 1987, abandoned, which is a continuation of Ser. No. 703,052, Feb. 19, 1985, abandoned. This application Feb. 6, 1989, Ser. No. 307,135

Int. Cl.⁴ C07D 205/08; C07F 7/18, 487/04, 35/06

U.S. Cl. 540—200

6 Claims

1. A compound of the structural formula:



wherein R² is independently selected from hydrogen, linear or branched C₁-C₃ alkyl, which can be substituted with fluoro, hydroxy, or protected hydroxy, R³ is hydrogen or a protecting group, X is sulfur or selenium, Q is hydroxymethyl, carboxy or C₁-C₄ alkoxy, and R¹ is C₁-C₄ alkyl, C₆-C₁₀ aryl, and pyridyl which can be substituted with C₁-C₄ alkyl, alkoxy and nitro.

4,873,325

PROCESS FOR THE PRODUCTION OF AMIDES

Kurt D. Olson, Cross Lanes, W. Va., assignor to UOP, Des Plaines, Ill.

Filed Jun. 25, 1986, Ser. No. 878,215

Int. Cl.⁴ C07D 201/04

U.S. Cl. 540—536

74 Claims

1. A process for converting an oxime into a corresponding amide, which process comprises contacting the oxime with a non-zeolitic molecular sieve, the nonzeolitic molecular sieve having, in its calcined form, an adsorption of isobutane of at least about 2 percent by weight of the non-zeolitic molecular sieve at a partial pressure of 500 torr and a temperature of 20°

C., the contacting of the oxime with the non-zeolitic molecular sieve being effected under conditions effective to convert the oxime into the corresponding amide.

4,873,326

PROCESS FOR THE PREPARATION OF N-ALKYLATED CAPROLACTAMS

Wolfgang Jakob, Moers; Wolfgang Alewelt, and Erhard Tresper, both of Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen Bayerwerk, Fed. Rep. of Germany

Filed Aug. 11, 1988, Ser. No. 231,232

Claims priority, application Fed. Rep. of Germany, Aug. 15, 1987, 3727255; Oct. 23, 1987, 3735904

Int. Cl.⁴ C07D 223/10

U.S. Cl. 540—538

3 Claims

1. Process for the preparation of N-alkylcaprolactams by the cyclisation of N-alkylaminocaproic acids or their salts, characterised in that solutions of N-alkylaminocaproic acids or their salts in the corresponding N-alkylaminocaprolactams are adjusted to the isoelectric point of the N-alkylaminocaproic acid, the solutions are briefly heated to the boiling point of the N-alkylaminocaprolactam and after removal of the water of reaction by distillation the N-alkylaminocaprolactam is optionally directly returned to a reaction solution or the lactam is separated by distillation and purified.

4,873,327

PESTICIDAL BENZOYLUREA COMPOUNDS

Martin Anderson, Whitstable, and Anthony G. Brinnand, Faversham, both of England, assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

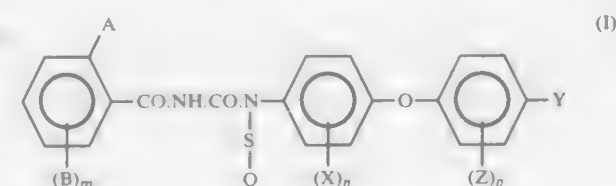
Division of Ser. No. 906,361, Sep. 10, 1986, Pat. No. 4,745,113. This application Mar. 8, 1988, Ser. No. 165,528

Int. Cl.⁴ C07D 295/12, 211/56; C07C 149/40, 145/04

U.S. Cl. 544—59

1 Claim

1. A compound of the general formula



in which each of A and B independently represents a halogen atom or an alkyl group; m is 0 or 1; Q represents a group of general formula

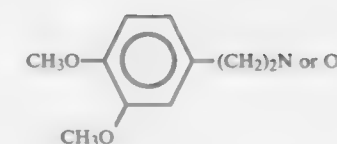


in which R represents an optionally substituted alkylene group in which a —CH₂— group is replaced by an oxygen or sulphur atom or by a sulphone or sulfoxide group, or by a group N—R¹ in which R¹ represents an optionally substituted alkyl, alkylcarbonyl, alkoxy, dialkylaminocarbonyl, alkylsulphonyl or arylsulphonyl group, or in which a —CH₂— group is replaced by a carbonyl or thiocarbonyl group, or Q represents a group of general formula —CR²R³R⁴ in which R² represents a hydrogen atom or an optionally substituted alkyl group, R³ represents a halogen atom or a cyano or nitro group, or an optionally substituted alkylcarbonyl, alkoxy, arylcarbonyl, aryloxy, or dialkylaminocarbonyl group, and R⁴ represents any one of the moieties specified for R²

and/or R³, or R² and R⁴ together represent an optionally substituted alkylene group, or R³ and R⁴ together represent a group of general formula



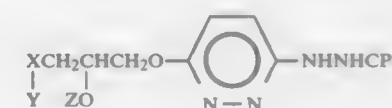
in which T represents a sulphur or oxygen atom, R⁵ represents an optionally substituted alkylene group and R⁶ represents a methylene, carbonyl or thiocarbonyl group; the optical substituents for an alkyl moiety or alkylene group being selected from halogen atoms and cyano, alkoxy, haloalkoxy, alkylcarbonyl, haloalkylcarbonyl, alkoxy, haloalkoxy, haloalkoxy, and haloalkoxy groups and the optional substituents for an aryl group being selected from these substituents and also from alkyl, haloalkyl and nitro groups; X represents a halogen atom or a cyano, nitro, alkyl or haloalkyl group; each of Y and Z independently represents a halogen atom or a cyano, nitro or haloalkyl group; n is 0, 1, 2, 3 or 4; and p is 0, 1 or 2.



Y and Z are both hydrogen or Y and Z together are a protecting group

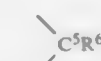


wherein R⁵ is hydrogen or C₁-3alkyl and R⁶ is C₁-3alkyl or phenyl, and Ph is phenyl, to afford a compound of the formula (6):



(6)

wherein Ph, X, Y and z are as hereinbefore defined, and (b) removing by acid catalyzed hydrolysis the triphenylmethyl group, the



PROCESS FOR PREPARING ALKOXYALKYLIDENEHYDRAZINOPYRIDAZINE DERIVATIVES

Carlo Farina, Como; Mario Pinza, Milan; Alberto Cerri, Pavia, and Francesco Parravicini, Milan, all of Italy, assignors to I.S.F. Società Per Azioni, Milan, Italy

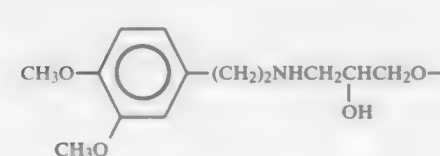
Filed Jan. 5, 1988, Ser. No. 140,850

Claims priority, application Italy, Jan. 8, 1987, 19026 A/87 Int. Cl.⁴ C07D 237/21; A61K 31/50

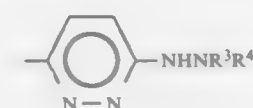
U.S. Cl. 544—239

5 Claims

1. A process for preparing a compound of the formula (4), or a pharmaceutically acceptable salt thereof:



(4)

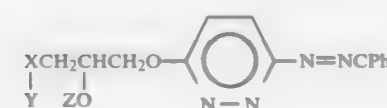


wherein

R³ and R⁴ are both hydrogen or together are =CR¹R² where

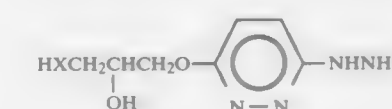
R¹ is hydrogen or C₁-3 alkyl and R² is C₁-3alkyl, carboxy or phenyl, which process comprises:

(a) adding hydrogen to the double bond of a compound of the formula (5):



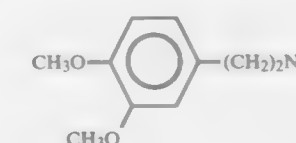
(5)

wherein X is



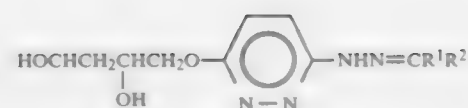
(7)

wherein X is as hereinbefore defined. (c) when X is

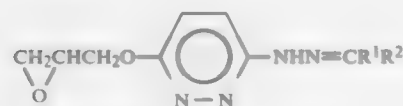


reacting a compound of formula (7) with R¹R²CO wherein R¹ and R² are as hereinbefore defined to yield a compound of the formula (4):

or when X is 0: reacting a compound of formula (7) with R¹R²CO wherein R¹ and R² are as hereinbefore defined to afford a compound of the formula (8):



wherein R^1 and R^2 are as hereinbefore defined which is converted by treatment with hydrogen bromide in acid, followed by treatment with a base to a compound of the formula (9):



wherein R^1 and R^2 are as hereinbefore defined which is reacted with 3,4-dimethoxyphenethylamine, and thereafter removing the CR^1R^2 group by hydrolysis, to yield a compound of formula (4).

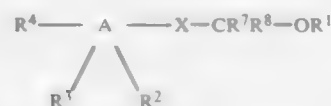
4,873,329 ALKENE, ALKYNE OR CYCLOALKYLENE DERIVATIVES

Leslie R. Hughes, Macclesfield; John Oldfield, Wilmslow, and Howard Tucker, Macclesfield, all of England, assignors to Imperial Chemical Industries PLC, London, England
Filed Feb. 21, 1985, Ser. No. 704,038

Claims priority, application United Kingdom, Mar. 7, 1984, 8400000

Int. Cl. 4 C07D 473/00, 215/16
U.S. Cl. 544—265

1. A compound of the formula



wherein X is trans- $-\text{CH}=\text{CH}-$, wherein ring A is 3,4-dichlorophenyl, 3-chloro-4-cyanophenyl, 3-chloro-4-fluorophenyl, 4-chloro-3-trifluoromethylphenyl, 4-cyanophenyl, 4-cyano-3-fluorophenyl, 4-cyano-3-trifluoromethylphenyl or 4-fluoro-3-trifluoromethylphenyl, wherein R^1 is hydrogen, wherein R^2 is trifluoromethyl and wherein R^8 is ethyl, ethynyl, cyanomethyl, 1-cyanoethyl, acetyl, methylsulphonylmethyl, p-methylsulphonylphenylsulphonylmethyl or pyrid-2-ylsulphonylmethyl or has the formula $-\text{CH}_2\text{SR}^9$ wherein R^9 is m-methylthiophenyl, pyrid-4-yl, pyrimid-2-yl, 4,6-dimethylpyrimid-2-yl, purin-6-yl, 1H-pyrazolo [3,4-d]pyrimidin-4-yl, imidazol-2-yl, 1-methylimidazol-2-yl, 7-chloroquinolin-4-yl or 7-trifluoromethylquinolin-4-yl.

4,873,330 A PROCESS FOR THE PREPARATION OF ANHYDROUS, STABLE, CRYSTALLINE DELTA-FORM OF PRAZOSIN HYDROCHLORIDE

Stig O. E. Lindholm, Helsinki, Finland, assignor to Orion-yhtymä Oy, Helsinki, Finland

Division of Ser. No. 660,871, Oct. 15, 1984, Pat. No. 4,739,055.

This application Feb. 8, 1988, Ser. No. 153,780

Claims priority, application Finland, Jun. 25, 1984, 842544

Int. Cl. 4 C07D 405/14

U.S. Cl. 544—291

9 Claims

1. The process for producing anhydrous stable, crystalline δ -form of prazosin hydrochloride, wherein the water of crystalline of the prazosin hydrochloride hydrate is removed by azeotropic distillation with organic solvents having a boiling

point in the range of 55°–160° C. selected from the group consisting of hexane, heptane and corresponding alkanes with linear and branched chains and cycloalkanes; benzene, xylene and corresponding aromatic hydrocarbons, and chloroform, trichloroethylene, 1,2-dichloroethane, 1,1,1-trichloroethane and corresponding halogenated hydrocarbons.

4,873,331 NORADAMANTYL-CARBOXYLIC ACID PIPERAZINOALKYL ESTERS

Wayne E. Childers, Jr., Yardley, and Magid A. Abou-Gharbia, Glen Mills, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

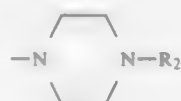
Filed Dec. 9, 1988, Ser. No. 282,711

Int. Cl. 4 C07D 401/04, 403/04, 295/06, 295/08

U.S. Cl. 544—295

6 Claims

1. A compound of formula:



wherein

R^1 is 3-noradamantyl;

n is 0 or 1;

X is $-\text{CO}_2-$, $-\text{O}_2\text{C}-$ or $-\text{OCO}_2-$;

m is 1, 2, 3, 4 or 5;

and R^2 is phenyl, benzyl, pyridinyl, pyrimidinyl, pyrazinyl, a substituted phenyl or benzyl in which the substituent is alkyl of 1 to 6 carbon atoms, alkoxy of 1 to 6 carbon atoms, halo, cyano, nitro or trifluoromethyl; or a pharmaceutically acceptable salt thereof.

4,873,332 METAL-CONTAINING INDOANILINE COMPOUND AND OPTICAL RECORDING MEDIUM EMPLOYING THE COMPOUND

Katsuhira Yoshida, and Yuji Kubo, both of Kochi, Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan
Filed Sep. 23, 1987, Ser. No. 100,264

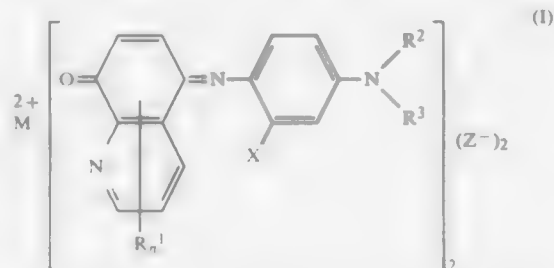
Claims priority, application Japan, Mar. 14, 1987, 62-59777

Int. Cl. 4 C07D 215/30; C07F 15/04, 15/06, 1/08

U.S. Cl. 546—7

8 Claims

1. A metal-containing indoaniline compound having the formula:



wherein M is a metal atom selected from the group consisting of Ni, Cu or Co, R^1 is a hydrogen atom, a halogen atom or a methyl group, n is 1 or 2, X is a hydrogen atom or a lower alkyl group, each of R^2 and R^3 is a lower alkyl group, and Z^- is an anion.

4,873,333 NITROGEN-CONTAINING BIDENTATE COMPOUND IMMOBILIZED ON A SOLID INORGANIC CARRIER

Johan Staperuma, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Division of Ser. No. 165,054, Mar. 7, 1988, This application

Mar. 27, 1989, Ser. No. 328,648

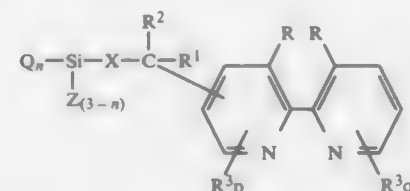
Claims priority, application United Kingdom, Mar. 25, 1987, 8707131

Int. Cl. 4 C07D 471/04; C07F 7/18; B01J 31/02

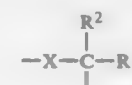
U.S. Cl. 546—14

5 Claims

1. A compound of the formula:



wherein Si is silicon, Q is an alkoxy or aryloxy group of up to 10 carbon atoms; Z is an alkyl, aryl, alkoxy or aryloxy group of up to 10 carbon atoms; n is an integer 1, 2 or 3; R^1 and R^2 independently are hydrogen, an alkyl or cycloalkyl of up to 7 carbon atoms or a benzyl group; or both R^1 and R^2 together form a group $-(\text{CH}_2)_a-$ wherein a is an integer of from 2 to 6; each R is hydrogen, an alkyl or cycloalkyl of up to 7 carbon atoms, phenyl, alkoxy of 1 to 6 carbon atoms, phenoxy, alkylthio of 1 to 6 carbon atoms or phenylthio group and p and q are integers of from 0 to 2 and from 0 to 3, respectively; the



group is linked to a carbon atom of the heterocyclic aromatic ring which occupies the ortho- or para-position with respect to the nitrogen atom in said heterocyclic ring; and X is a bivalent organic radical.

4,873,334 4,7-DIHYDROPYRAZOLO[3,4-b]PYRIDINE DERIVATIVES

Ikuro Adachi, Osaka; Tetsuo Yamamori, Hyogo; Motohiko Ueda, Osaka, and Hatsuo Sato, Nara, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 709,795, Mar. 8, 1985, abandoned, which is a continuation-in-part of Ser. No. 18,815, Feb. 19, 1987, abandoned, which is a continuation of Ser. No. 527,733, Aug. 30, 1983, abandoned. This application Sep. 22, 1987, Ser. No. 99,907

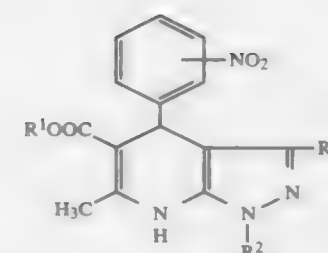
Claims priority, application Japan, Oct. 5, 1982, 57-176763; Mar. 19, 1984, 69-53118

Int. Cl. 4 A61K 31/44; C07D 471/04

U.S. Cl. 514—303

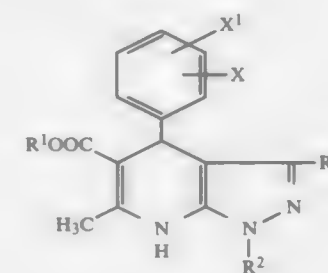
18 Claims

1. A 4,7-dihydropyrazolo[3,4-b]-pyridine derivative represented by the formula:



wherein R^1 is (a) straight or branched chain C_5-C_8 alkyl, (b) C_4-C_6 cycloalkyl which may be substituted by lower alkyl, (c) C_3-C_7 cycloalkyl (C_1-C_4)alkyl, (d) C_1-C_4 alkoxy- (C_1-C_4) alkyl, (e) C_4-C_7 cycloalkyloxy- (C_1-C_4) alkyl, (f) phenoxy- (C_1-C_4) alkyl, (g) C_1-C_4 alkylthio- (C_1-C_4) alkyl, (h) C_4-C_7 cycloalkylthio- (C_1-C_4) alkyl, (i) phenylthio- (C_1-C_4) alkyl, (j) C_1-C_4 monalkylamino or C_2-C_8 dialkylamino-substituted (C_1-C_4) alkyl, (k) tetrahydrofuryl- (C_1-C_4) alkyl, (l) phenyl- (C_1-C_3) alkyl, which may have one or more substituents of halogen or C_1-C_4 alkoxy, (m) N-benzylpyrrolidinyl, or (n) N-benzylpiperidinyl; R^2 is C_1-C_4 alkyl; and R^3 is C_4-C_6 cycloalkyl or C_3-C_7 cycloalkyl- (C_1-C_4) alkyl; and the pharmaceutically acceptable acid addition salts thereof.

8. A 4,7-dihydropyrazolo[3,4-b]pyridine derivative represented by the formula:



wherein X and X^1 each is hydrogen, nitro, or halogen which may be located at the position or positions 2, 3, and/or 6;

R^1 is C_1-C_4 alkyl; R^2 is hydrogen, C_1-C_4 alkyl, C_4-C_6 cycloalkyl, or phenyl;

R^3 is hydrogen, C_1-C_8 straight or branched chain alkyl, C_3-C_7 cycloalkyl which may be substituted by C_1-C_3 alkyl, phenyl which may be substituted by chlorine, trifluoromethyl, cyano, methoxy, methoxycarbonyl or ethoxycarbonyl, C_7-C_9 aralkyl or C_1-C_4 alkoxy-carbonyl; or pharmaceutically acceptable acid addition salts thereof.

4,873,335 3-PHENETHYL-2-BENZENE-AMIDES OR AZA-DERIVATIVES THEREOF

Doris P. Schumacher, Florham Park; Bruce L. Murphy, Elizabeth, and Jon E. Clark, Highland Park, all of N.J., assignors to Schering Corporation, Kenilworth, N.J.

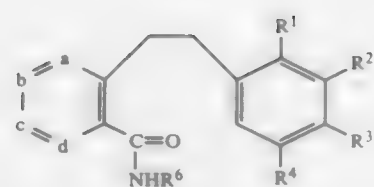
Division of Ser. No. 839,016, Mar. 12, 1986, Pat. No. 4,731,447, which is a continuation-in-part of Ser. No. 733,428, May 13, 1985, abandoned. This application Dec. 2, 1987, Ser. No. 127,743

Int. Cl. 4 C07D 213/56; C07C 103/22, 103/26

U.S. Cl. 546—194

7 Claims

1. A compound of the formula IV



wherein:

- a, b, c and d represent CH or one of a, b, c and d represents N and the others represent CH;
 R¹, R², R³ and R⁴ may be the same or different and each independently represents hydrogen, alkyl having from 1 to 6 carbon atoms, halogen, nitro, alkoxy having from 1 to 6 carbon atoms or trifluoromethyl; and
 R⁶ represents a tertiary butyl group.

4,873,336

PROCESS FOR THE PREPARATION OF N-VINYL LACTAMS

Kou-Chang Liu, Wayne, and Paul D. Taylor, West Milford, both of N.J., assignors to GAF Corporation, Wayne, N.J.

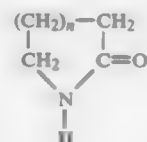
Filed Mar. 28, 1988, Ser. No. 183,559

Int. Cl.⁴ C07D 207/267, 211/74, 223/00

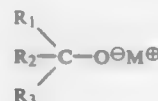
U.S. Cl. 546—243

16 Claims

1. A single stage non-aqueous liquid process for the preparation of an N-vinyl lactam which comprises reacting a lactam having the formula



wherein n is an integer having a value of from 1 to 3 with acetylene under an acetylene partial pressure of from about 25 to about 125 psig. in the presence of a catalyst having the formula



wherein R₁, R₂ and R₃ are each lower alkyl or aryl or wherein one of R₁, R₂ and R₃ is hydrogen and M is an alkali metal.

4,873,337

N-SUBSTITUTED DERIVATIVES OF 2-(PYRIDYLALKENESULFINYL) BENZIMIDAZOLES AS GASTRIC ANTISECRETORY AGENTS

John C. Sih, and Moo J. Cho, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation of Ser. No. 761,239, Jul. 31, 1985, abandoned, which is a continuation-in-part of Ser. No. 653,999, Sep. 24, 1984, abandoned, and a continuation-in-part of Ser. No. 682,980, Dec. 18, 1984, abandoned. This application Aug. 3, 1987, Ser. No. 81,583

Int. Cl.⁴ C07D 401/12

U.S. Cl. 546—271

3 Claims

1. A compound selected from the group consisting of:
 2-[(2-pyridinylmethyl)sulfinyl]-1H-benzimidazole-1-methanol,
 2-[(4-methoxy-3,5-dimethyl-2-pyridinylmethyl)-thio]-1H-benzimidazole-1-methanol,
 2-[(4-ethylthio-3-methyl-2-pyridinylmethyl)-thio]-1H-benzimidazole-1-methanol,

IV

- 2-[(4-chloro-3-methyl-2-pyridinylmethyl)-thio]-1H-benzimidazole-1-methanol,
 2-[(4-methoxy-3,5-dimethyl-2-pyridinylmethyl)-thio]-1H-benzimidazole-1-methanol, acetate (ester),
 2-[(2-pyridinylmethyl)-thio]-1H-benzimidazole-1-methanol, acetate (ester),
 2-[(4-ethylthio-3-methyl-2-pyridinylmethyl)-thio]-1H-benzimidazole-1-methanol, acetate (ester),
 2-[(4-chloro-3-methyl-2-pyridinylmethyl)-thio]-1H-benzimidazole-1-methanol, acetate (ester),
 2-[(2-pyridinylmethyl)-thio]-1H-benzimidazole-1-methanol, methyl succinate (ester),
 2-[(2-pyridinylmethyl)-thio]-1H-benzimidazole-1-methanol, octanoate (ester),
 2-[(2-pyridinylmethyl)-thio]-1H-benzimidazole-1-methanol, isobutyrate (ester), and
 2-[(2-pyridinylmethyl)-thio]-1H-benzimidazole-1-methanol, isopropionate (ester).

4,873,338

PROCESS FOR THE PREPARATION OF 2-AMINO-5-ACYLAMINO PHENOLS AND STARTING COMPOUNDS SUITABLE THEREFOR

Heinz Wiesen, Enskirchen, and Erich Wolff, Solingen, both of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 23, 1987, Ser. No. 123,920

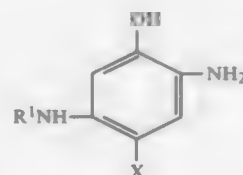
Claims priority, application Fed. Rep. of Germany, Dec. 6, 1986, 3641825

Int. Cl.⁴ C07D 213/64; C07C 102/00, 143/675, 103/30

U.S. Cl. 546—293

3 Claims

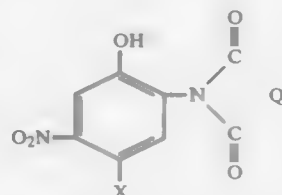
1. Process for the preparation of compounds corresponding to Formula I



wherein

R¹ denotes an acyl group derived from an aliphatic or aromatic carboxylic or sulfonic acid or from a carbamic or sulfamic acid and

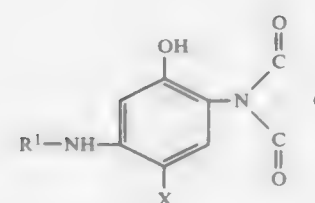
X denotes hydrogen, halogen, alkoxy, aryloxy, SO₃H or a heterocyclic group attached through —O— or —N—, characterised in that a compound corresponding to Formula II



wherein

X has the meaning indicated and
 Q denotes the group required for completing a dicarbonyl ring

is converted by reduction to the amino compound and acylation into a compound corresponding to Formula III



wherein

X, Q and R¹ have the meanings indicated, and in that the compound corresponding to Formula III is converted into the corresponding compound of Formula I by hydrazinolytic decomposition of the dicarbonyl ring.

4,873,339

CHIRAL BIOTIN PRECURSORS

John McGarrity, Leander Tenud, and Thomas Meul, all of Visp, Switzerland, assignors to Lonza Ltd., Gampel, Switzerland

Division of Ser. No. 127,052, Dec. 1, 1987. This application Nov. 30, 1988, Ser. No. 284,021

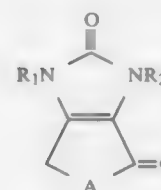
Claims priority, application Switzerland, Dec. 2, 1986, 8790/86

Int. Cl.⁴ C07D 495/04, 491/048

U.S. Cl. 548—110

3 Claims

1. An imidazole derivative of the formula:



wherein R₁ is an (R)- or (S)-1-phenylalkyl group, an (R)- or (S)-1-alkoxycarbonyl-1-phenylmethyl group or an (R)- or (S)-1-aryloxycarbonyl-1-phenylmethyl group, and R₂ is hydrogen, a substituted or unsubstituted alkanoyl group, a substituted or unsubstituted benzoyl group, a substituted or unsubstituted benzyl group, an alkoxy carbonyl group, an aryloxy carbonyl group, an alkoxyalkyl group, a pyranil group, a substituted or unsubstituted benzenesulfonyl group, an alkylsulfonyl group, a diarylphosphinyl group, a dialkylphosphinyl group or a trialkylsilyl group, and A is a sulfur or oxygen atom.

4,873,340

PROCESS FOR PREPARING 5-AROYL-1,2-DIHYDRO-3H-PYRROLO[1,2-a]PYRROLE-1,1-DICARBOXYLATES

Joseph M. Muchowski, Sunnyvale, and Robert Greenhouse, Cupertino, both of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

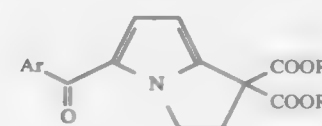
Filed May 29, 1986, Ser. No. 868,835

Int. Cl.⁴ C07D 487/04, 498/04, 513/04

U.S. Cl. 548—453

25 Claims

19. A process for preparing a compound of the formula

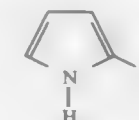


in which

R is lower alkyl; and
 Ar is an aryl group not containing hydrogen bonded to a pyrrole nitrogen,

which comprises

(a) reacting a compound of the formula



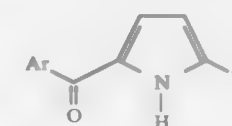
in which

X is bromo or chloro,
 with a compound of the formula

ArC(O)Q

in which

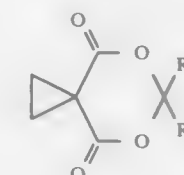
Ar is as defined above; and
 Q is the residue of a dialkylamine or a saturated cyclic amine,
 in the presence of an acid halide to afford a compound of the formula



(III)

IX

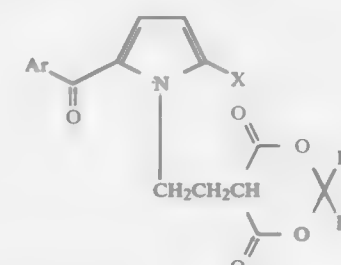
(b) treating the compound of formula (III) with an alkali metal hydride in an aprotic organic solvent, followed by treatment with a compound of the formula



(VI)

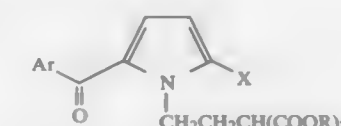
in which

each R' is independently lower alkyl
 to afford a compound of the formula



(IV)

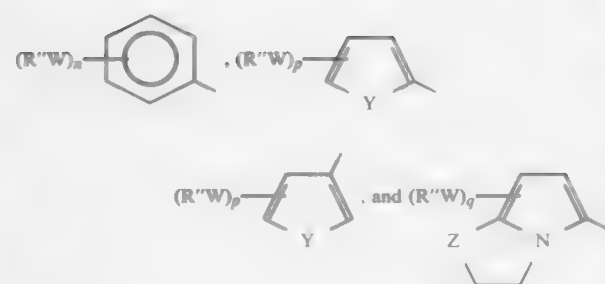
(c) treating the compound of formula (IV) with ROH, R being as defined above, in the presence of acid to afford a compound of the formula



(V)

(d) cyclization of the compound of formula (V).

20. The process of claim 19 wherein Ar is selected from the group consisting of



in which

R'' is H, lower alkyl, lower alkenyl, or lower alkynyl, optionally substituted by halogen;
W is a covalent bond, —O—, —S—, —S(O)—, —S(O)₂—, —NR—, —CHR—, —NO₂, fluoro, chloro, or bromo; except that if W is —NO₂, fluoro, chloro, or bromo, then R'' is absent;
Y is —O—, —S—, or —NR—;
Z is —O—, —S—, —S(O)—, —S(O)₂—, —NR—, or —CHR—;
n is 0 to 5;
p is 0 to 3; and
q is 0 to 2.

25. A process for preparing dimethyl 5-benzoyl-1,2-dihydro-3H-pyrrolo[1,2-a]pyrrole-1,1-dicarboxylate which comprises
(a) treating 2-(bromo or chloro)pyrrole with benzomorpholine in the presence of phosphoryl chloride;
(b) treating the resulting 5-benzoyl-2-(bromo or chloro)pyrrole with an alkali metal hydride in an aprotic organic solvent at a temperature between about 0°–40° C. for about 10 minutes to 10 hours, followed by treatment with a 6,6-di(lower alkyl)-5,7-dioxaspiro[2.5]octane-4,8-dione at a temperature between about 50°–100° C. for about 1–10 hours;
(c) treating the resulting intermediate with methanolic HCl at a temperature between about 0°–30° C. for about 5 minutes to 5 hours; followed by
(d) cyclizing the resulting intermediate with an alkali metal hydride in a polar aprotic organic solvent at a temperature between about 50°–150° C. for about 10 minutes to 10 hours in an inert atmosphere.

4,873,341

WHITE BIS-IMIDE FLAME RETARDANTS

Keith G. Anderson, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Sep. 19, 1988, Ser. No. 246,209
Int. Cl.⁴ C07D 209/48

U.S. Cl. 548—462

14 Claims

1. A method for producing a white or at least nearwhite product which predominantly contains alkylene(C₁–C₅)-bis-(tetrabromophthalimide), which product is produced from the yellow product produced by the reaction of tetrabromophthalic anhydride and diaminoalkane in the presence of water and an alkanic acid, said method comprising:

- forming a solution which contains, as a solvent,
 - SO₃ or fuming sulfuric acid, and
 - a haloalkane of the formula R_nX_n, wherein R is an alkyl group containing up to two carbon atoms, X is a halogen selected independently from Br and Cl, and n is 2 or 3 when R is an alkyl containing 1 carbon atom and is 1, 2 or 3 when R is an alkyl group containing 2 carbon atoms, and,
- as a solute, said yellow product, and
- adding water to said solution to precipitate therefrom said white or at least near-white product.

4,873,342
DIPEPTIDE DERIVATIVE AND SYNTHESIS AND USE THEREOF

Takaharu Tanaka; Masayuki Saitoh; Naoki Higuchi, and Masaki Hashimoto, all of Osaka, Japan, assignors to Suntory Limited, Osaka, Japan

Filed Apr. 16, 1986, Ser. No. 852,710

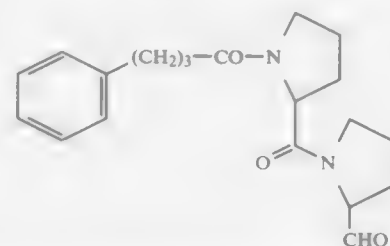
Claims priority, application Japan, Apr. 16, 1985, 60-80871; Dec. 23, 1985, 60-290237

Int. Cl.⁴ C07D 207/00; A61K 31/40

U.S. Cl. 548—518

2 Claims

2. An anti-amnesic agent comprising a pharmaceutically effective amount of a compound of the formula:



together with a pharmaceutically acceptable carrier.

4,873,343

PROCESS FOR THE PREPARATION OF N-(2-CHLOROBENZYL)-2-(2-THIENYL) ETHYLAMINE

Joël Radisson, Toulouse, France, assignor to Sanofi, Paris, France

Filed Nov. 23, 1988, Ser. No. 275,369

Claims priority, application France, Dec. 18, 1987, 87 17755
Int. Cl.⁴ C07D 333/12

U.S. Cl. 549—74

9 Claims

1. A process for the preparation of N-(2-chlorobenzyl)-2-(2-thienyl)ethylamine, wherein 2-thiophene acetonitrile is reacted with 2-chlorobenzylamine and hydrogen in the presence of a hydrogenation catalyst.

4,873,344

CYANO CONTAINING INDENE DERIVATIVES

Klaus P. Bogeso, Molleasparken, and Michael B. Sommer, Markmandsgade, both of Denmark, assignors to H. Lundbeck A/S, Copenhagen-Valby, Denmark

Filed Nov. 24, 1987, Ser. No. 124,820

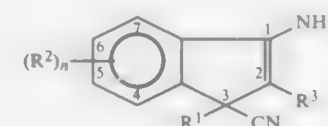
Claims priority, application United Kingdom, Dec. 1, 1986, 8528644

Int. Cl.⁴ C07C 121/64; C07D 333/24

U.S. Cl. 541—77

9 Claims

1. An indene derivative of the formula I:



wherein R¹ is

- phenyl or phenyl substituted with one or two groups selected from halogen, lower alkyl, lower alkoxy, lower alkylthio, lower alkylsulfonyl, dilower alkylamino, or carboxylic acid-derived acylamino, cyano, or trifluoromethyl, trifluoromethoxy,
 - a bicyclic aromatic,
 - a thiophene, or thiophene substituted with a substituent selected from halogen, lower alkyl, lower alkoxy, lower alkylthio, trifluoromethyl or trifluoromethoxy, and
- R² is selected from H, halogen, lower alkyl, benzyl, lower

alkylthio, methoxy, lower alkylsulfonyl, dilower alkylsulfonyl, carboxylic acid-derived acylamino, benzylamino, dilower alkylamino, cyano, trifluoromethyl and trifluoromethoxy,
R³ is CN, COOR⁴, —CON(R⁴)₂ or COR⁴, where R⁴ is a lower alkyl group, and "n" is an integer of 1–3 inclusive.

4,873,345

PROCESS FOR THE PREPARATION OF 5'-OXA, 5'-THIA, 5'-AZA HMG-COA REDUCTASE INHIBITORS

Mark E. Duggan, Wynnewood, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

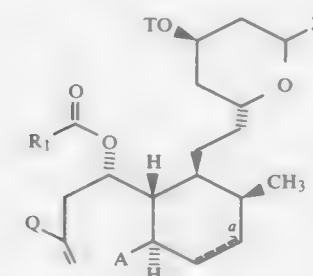
Filed Sep. 29, 1988, Ser. No. 250,525

Int. Cl.⁴ C07D 309/10, 315/00

U.S. Cl. 549—214

14 Claims

1. A compound of structural formula B:



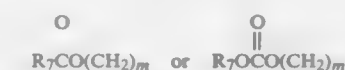
wherein:

- A is HO, SH or HN—R_N;
Q is CH₃, CH₂OT, or H;
T is H, tert-butyldimethylsilyl, tert-butyldiphenylsilyl, trimethylsilyl, triethylsilyl, triisopropylsilyl or tetrahydropyranyl;
Z is OCH₃, or Z together with the carbon to which it is attached represents C=O;
R₁ is selected from:
(1) C₁–10 alkyl;
(2) substituted C₁–10 alkyl in which one or more substituent(s) is selected from
(a) halogen,
(b) hydroxy,
(c) C₁–10 alkoxy,
(d) C₁–5 alkoxycarbonyl,
(e) C₁–5 acyloxy,
(f) C₃–8 cycloalkyl,
(g) phenyl,
(h) substituted phenyl in which the substituents are X and Y,
(i) C₁–10 alkylS(O)_n in which n is 0 to 2,
(j) C₃–8 cycloalkylS(O)_n,
(k) phenylS(O)_n,
(l) substituted phenylS(O)_n in which the substituents are X and Y, and
(m) oxo;
(3) C₁–10 alkoxy;
(4) C₂–10 alkenyl;
(5) C₃–8 cycloalkyl;
(6) substituted C₃–8 cycloalkyl in which one substituent is selected from
(a) C₁–10 alkyl,
(b) substituted C₁–10 alkyl in which the substituent is selected from
(i) halogen,
(ii) hydroxy,
(iii) C₁–10 alkoxy,
(iv) C₁–5 alkoxycarbonyl,
(v) C₁–5 acyloxy,
(vi) phenyl,
(vii) substituted phenyl in which the substituents are X and Y

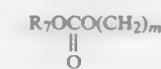
- (viii) C₁–10 alkylS(O)_n,
(ix) C₃–8 cycloalkylS(O)_n,
(x) phenylS(O)_n,
(xi) substituted phenylS(O)_n in which the substituents are X and Y, and
(xii) oxo,
(c) C₁–10 alkylS(O)_n,
(d) C₃–8 cycloalkylS(O)_n,
(e) phenylS(O)_n,
(f) substituted phenylS(O)_n in which the substituents are X and Y,
(g) halogen,
(h) hydroxy,
(i) C₁–10 alkoxy,
(j) C₁–5 alkoxycarbonyl,
(k) C₁–5 acyloxy,
(l) phenyl, and
(m) substituted phenyl in which the substituents are X and Y;
(7) phenyl;
(8) substituted phenyl in which the substituents are X and Y;
(9) amino;
(10) C₁–5 alkylamino;
(11) di(C₁–5 alkyl)amino;
(12) phenylamino;
(13) substituted phenylamino in which the substituents are X and Y;
(14) phenyl C₁–10 alkylamino;
(15) substituted phenyl C₁–10 alkylamino in which the substituents are X and Y;
(16) R₅S in which R₅ is selected from
(a) C₁–10 alkyl,
(b) phenyl, and
(c) substituted phenyl in which the substituents are X and Y;

R_N is selected from:

- C₁–5 alkyl;
 - phenylC₁–5 alkyl;
- X and Y independently are hydrogen, halogen, trifluoromethyl, C₁–3 alkyl, nitro, cyano or group selected from:
(1) R₆O(CH₂)_m in which m is 0 to 3 and R₆ is hydrogen, C₁–3 alkyl or hydroxy-C₂–3 alkyl;
(2) R₇CO(CH₂)_m or



in which R₇ is hydrogen, C₁–3 alkyl, hydroxy-C₂–3 alkyl, phenyl, naphthyl, amino-C₁–3 alkyl, C₁–3 alkylamino-C₁–3 alkyl, di(C₁–3 alkyl)amino-C₁–3 alkyl, hydroxy-C₂–3 alkylamino-C₁–3 alkyl or di(hydroxy-C₂–3 alkyl) amino-C₁–3 alkyl; provided that in



R₇ is not H;
(3)



in which R₈ is hydrogen, C₁–3 alkyl, hydroxy-C₂–3 alkyl, C₁–3 alkoxy-C₁–3 alkyl, phenyl or naphthyl;
(4)



-continued



in which R_9 and R_{10} independently are hydrogen, C_{1-3} alkyl, hydroxy- C_{2-3} alkyl

(5) $R_{11}S(O)_n(CH_2)_m$ in which R_{11} is hydrogen, C_{1-3} alkyl, amino, C_{1-3} alkylamino or di(C_{1-3} alkyl)amino;

a is a single bond or a double bond;

halogen is F or Cl;

n is 0 to 2.

4,873,346

SUBSTITUTED BENZOTHAZOLES, BENZIMIDAZOLES, AND BENZOAZOLES
David J. Anderson, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

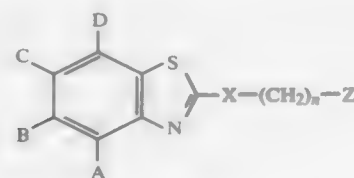
Filed Sep. 20, 1985, Ser. No. 778,340

Int. Cl.⁴ C07D 417/12, 277/74

U.S. Cl. 548—157

5 Claims

1. A compound according to the structural formula



wherein A, B, C and D are independently hydrogen or hydroxy provided that they are all not hydrogen;

X is O, S or NH; and

Z is

- (1) exo or endo 2-norbornyl,
- (2) 1-adamantyl,
- (3) 3-cyclohexenyl,
- (4) 2-cyclohexanolyl,
- (5) 2-cyclohexanone,
- (6) Cl,
- (7) Br,
- (8) CN,
- (9) OCOCH₃,
- (10) COOCH₃,
- (11) C=CH,
- (12) CH=CH₂,
- (13) CH=CH(C₁₋₄)alkyl,
- (14) CH=CH-phenyl,
- (15) CH(Br)CH₃,
- (16) CH(CH₃)phenyl,
- (17) CH(CH₃)_p-tolyl,
- (18) phenyl unsubstituted or substituted at the 4 position with bromine or COOCH₃;
- (19) benzoyl,
- (20) tolyl,
- (21) 2-naphthyl,
- (22) 9-anthracenyl,
- (23) 2-tetrahydrofuran-yl,
- (24) phthalimido,
- (25) 2-benzimidazolyl,
- (26) 2-mercapto-6-hydroxybenzothiazolyl, or
- (27) 7-methoxy-coumarin-4-yl; and pharmaceutically acceptable salts thereof; wherein n is 4–11, except when Z is:
 - (a) exo or endo 2-norbornyl,
 - (b) 1-adamantyl,
 - (c) 3-cyclohexenyl,
 - (d) 2-cyclohexanolyl, or
 - (e) 2-cyclohexanone; then n is 0.

4,873,347
PROCESS FOR THE PREPARATION OF THE DEMALONYL COMPOUND OF MACROLIDE LACTONES

Peter Hammann, Kelkheim; Susanne Grabley, Königstein-Taunus; Wolfgang Raether, Dreieich; Bernd Clommer, Kelkheim; Heinz Kluge, Hofheim am Taunus, and Burkhard Sachse, Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 22, 1987, Ser. No. 136,768

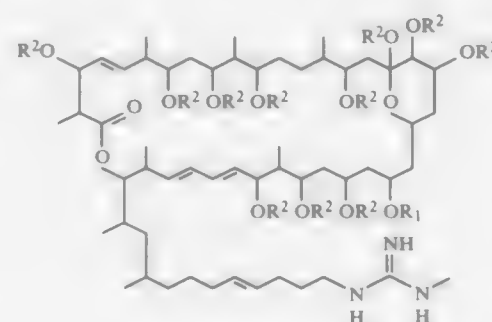
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1986, 3644375; Jan. 8, 1987, 3700331

Int. Cl.⁴ C07D 313/00

U.S. Cl. 549—267

9 Claims

1. A process for the preparation of the demalonyl compound of macrolide lactones, which comprises hydrolysis, in the presence of a base, of the compound of the formula I



in which R^1 and R^2 , independently of one another, are hydrogen or a malonyl group, not more than one R^2 substituent representing a malonyl group, excepting the compound of the formula I in which R^1 and all R^2 are simultaneously hydrogen.

4,873,348

OXYPRICIN, A NEW ANTIBIOTIC

Imre Szilágyi; Gyula Dékány; Judit Frank; Gábor Horváth, and Gábor Kulcsár, all of Budapest, Hungary, assignors to Chinoin Gyógyszer és Vegyszeti Termékek Gyára R.T., Budapest, Hungary

PCT No. PCT/HU85/00034, § 371 Date Mar. 10, 1986, § 102(e) Date Mar. 10, 1986, PCT Pub. No. WO85/05621, PCT Pub. Date Dec. 19, 1985

PCT Filed May 31, 1985, Ser. No. 834,333

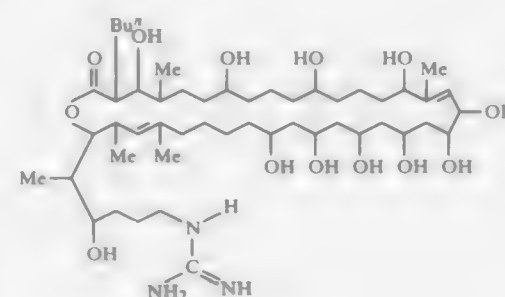
Claims priority, application Hungary, May 31, 1984, 2125/84; Jul. 26, 1984, 2869/84

Int. Cl.⁴ C07D 313/04

U.S. Cl. 549—271

5 Claims

1. Oxypriecin of the formula II



having an R_f value of 0.35 developed on thin-layer chromatoplate with a combined solvent system and having a molar weight of 946 determined by FAB-MS method or a pharmaceutically acceptable salt thereof.

4,873,349
RUTHENIUM CATALYST FOR BIARYLIC COUPLING; NEW STEGANOLIDES

Jean-Pierre Robin, and Yannick Landais, both of Le Mans, France, assignors to Université Du Maine (Le Mans), Le Mans Cedex, France

PCT No. PCT/FR87/00055, § 371 Date Nov. 5, 1987, § 102(e) Date Nov. 5, 1987, PCT Pub. No. WO87/05289, PCT Pub. Date Sep. 11, 1987

PCT Filed Mar. 5, 1987, Ser. No. 127,898

Claims priority, application France, Mar. 6, 1986, 86 03152

Int. Cl.⁴ C07D 307/93

U.S. Cl. 549—298

15 Claims

1. A method for forming bridged biaryl compounds via the intramolecular biaryl coupling of compounds containing two aromatic rings, which may be polycondensed and which may contain one or more hetero atoms selected from oxygen and nitrogen, linked to each other at the ortho position via a straight-chain to branched, saturated or unsaturated hydrocarbon chain which may optionally contain one or more hetero atoms selected from oxygen and nitrogen, wherein the unbridged biaryl precursors are coupled in the presence of ruthenium (IV) tetrakis (trifluoroacetate) produced in situ by reacting trifluoroacetic acid with ruthenium dioxide RuO_2 in the presence of trifluoroacetic anhydride.

4,873,350

DISELENOBIS-BENZOIC ACID AMIDES OF PRIMARY AND SECONDARY AMINES AND PROCESSES FOR THE TREATMENT OF DISEASES IN HUMANS CAUSED BY A CELL INJURY

André Welter, Beyne-Hevsey, Belgium; Harmut Fischer, Cologne, Fed. Rep. of Germany; Léon Christiaens, Nandrin, Belgium; Albrecht Wendel, Tübingen, Fed. Rep. of Germany; Eugen Eschenberg, Cologne, Fed. Rep. of Germany; Norbert Deren, Frechen-Bachem, Fed. Rep. of Germany; Peter Kuhl, Bornheim, Fed. Rep. of Germany, and Eric Graf, Kerpen-Horrem, Fed. Rep. of Germany, assignors to A Nattermann & CIE GmbH, Cologne, Fed. Rep. of Germany

Continuation of Ser. No. 849,468, Apr. 8, 1986, abandoned. This application Oct. 3, 1988, Ser. No. 253,955

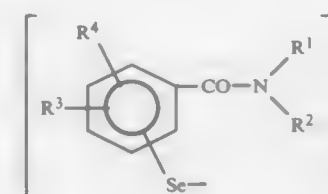
Claims priority, application Fed. Rep. of Germany, Apr. 12, 1985, 3513070; Apr. 12, 1985, 3513071

Int. Cl.⁴ C07C 163/00; A61K 31/165, 31/275, 31/245

U.S. Cl. 549—436

3 Claims

1. Diselenobis-benzoic acid amides of the general formula (I):



wherein:

R^1 and R^2 which are identical or different from each other, represent members selected from the group consisting of hydrogen, straight C_{1-18} -alkyl, branched C_{1-18} -alkyl, C_{3-8} -cycloalkyl, C_{3-8} -cycloalkylmethyl, phenylalkyl, phenyl, phenyl substituted by one to three substituents, identical or different from each other, selected from the group consisting of halogen, C_{1-4} -alkyl, C_{1-4} -alkoxy, hydroxy, trifluoromethyl, nitro, di- $(C_{1-4}$ -alkyl)-amino, cyano, carboxy, alkoxy-carbonyl, alkoxy-carbonylalkyl and methylenedioxy; and together a C_4 - C_6 -alkylene bridge, with the proviso that at least one of R^1 and R^2 is different from hydrogen, and
 R^3 and R^4 which are identical or different from each other, represent members selected from the group consisting of

hydrogen, halogen, C_{1-4} -alkyl, C_{1-4} -alkoxy, trifluoromethyl, nitro and together methylenedioxy, the diseleno bridge in the molecule being positioned in the ortho-, meta- or para-position relative to the carbamido group.

4,873,351

METHOD FOR PREPARATION OF ANTIMONY MERCAPTIDES

Kohtaroh Fujita, Sakai; Toshio Wachi, Nara, and Yoshiaki Ikeda, Sakai, all of Japan, assignors to Sakai Chemical Industry Co., Ltd., Osaka, Japan

Filed Dec. 7, 1988, Ser. No. 280,851

Int. Cl.⁴ C07F 9/90, 9/92

U.S. Cl. 556—76

4 Claims

1. A method for preparation of antimony mercaptides of a general formula:



where R^1 represents an alkyl, alkenyl, aryl, aralkyl, cycloalkyl or heterocyclic group having from 1 to 18 carbon atoms, or an alkyl, alkenyl, aryl, aralkyl, cycloalkyl or heterocyclic group having from 1 to 18 carbon atoms and having sulfide bond or ether bond in the group or having a hydroxyl group or a carboxyl group as a substituent, which comprises reacting antimony trioxide and an organic mercaptan of a general formula:



where R^1 has the same meaning as above, in the presence of a lower aliphatic carboxylic acid.

4,873,352

TRANSPARENT AQUEOUS TIN COMPOUND SOLUTION

Toshiyuki Kobashi, and Hideo Naka, both of Okayama, Japan, assignors to Japan Exlan Company Limited, Osaka, Japan

Filed Feb. 4, 1987, Ser. No. 11,863

Claims priority, application Japan, Feb. 8, 1986, 61-26239; Feb. 8, 1986, 61-26240; Feb. 8, 1986, 61-26241

Int. Cl.⁴ C07F 7/22

U.S. Cl. 556—105

4 Claims

1. A transparent aqueous tin compound solution prepared by adding, under stirring, tin oxalate into an aqueous medium in such an amount that the tin oxalate is present in said aqueous medium in a concentration below 20% by weight and adding hydrogen peroxide in an amount of 1.6 to 2.2 mols per mol of tin oxalate to effect a reaction between the hydrogen peroxide and tin oxalate, said reaction taking place at a temperature below the boiling point of the aqueous reaction medium, and carrying out said reaction for 5 to 20 minutes.

4,873,353

PRECERAMIC COMPOSITIONS AND CERAMIC PRODUCTS

Leonard M. Niebyski, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Feb. 6, 1989, Ser. No. 306,097

Int. Cl.⁴ C07F 7/08

U.S. Cl. 556—402

20 Claims

1. A process which comprises mixing about 0.25–20 parts by weight of a trialkoxy-, triaryloxy-, or tri(arylalkoxy)boroxine with one part by weight of a polycarbosilane in an organic solvent.

4,873,354

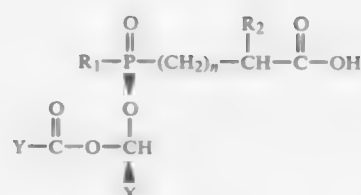
IODOPHOR

Alfred R. Globus, 26-53 210th Street, Bayside, N.Y. 11360
 Filed Apr. 21, 1988, Ser. No. 184,250
 Int. Cl.⁴ C07C 143/68

U.S. Cl. 558—51

6 Claims

1. An iodophor comprising the reaction product formed by reacting polyethylene glycol, an alkylarylsulfonate and iodine in the presence of water and propylene glycol as solvent wherein aryl designates benzene, naphthalene, toluene or xylene.



including salts thereof, and all stereoisomers thereof, wherein R₁ is lower alkyl, aryl, arylalkyl, cycloalkyl or cycloalkylalkyl; R₂ is hydrogen, lower alkyl or arylalkyl; X is hydrogen, lower alkyl or phenyl; Y is hydrogen, lower alkyl, phenyl or alkoxy or together X and Y are $-(\text{CH}_2)_2$, $-(\text{CH}_2)_3$, $-\text{CH}=\text{CH}$ or

4,873,355

PROCESS FOR REGIOSELECTIVELY PREPARING PHOSPHORYLATED INOSITOLS AND OTHER CYCLITOLS

Frank W. Hobbs, and James L. Meek, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

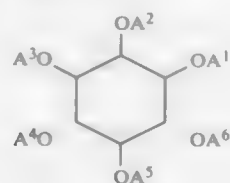
Filed May 29, 1987, Ser. No. 56,181

Int. Cl.⁴ C07F 9/117

U.S. Cl. 558—161

37 Claims

1. A myo-inositol poly(phosphate) of the formula



wherein

A¹ through A⁶ are independently selected from the group consisting of

H,
 a hydroxyl protecting group, and
 $\text{P}(=\text{O})(\text{YR})(\text{ZR}^1)$,

where

R and R¹ are, independently, a phosphorus protecting group.

Y and Z are, independently, selected from the group consisting of O, S, and NR², where R² is aryl or a C₁-C₁₅ straight chain, branched or cyclic alkyl where the alkyl may be internally interrupted by ether oxygen, provided that

three or four of A¹ through A⁶ are $\text{P}(=\text{O})(\text{YR})(\text{ZR}^1)$.

4,873,356

METHOD FOR PREPARING PHOSPHINIC ACIDS USED IN PREPARING ACE INHIBITORS AND INTERMEDIATES PRODUCED THEREBY

Edward W. Petrillo, Jr., Pennington; Donald S. Karanewsky, East Windsor; John K. Thottathil, Lawrenceville; James E. Heikes, East Windsor, and John A. Grosso, Princeton Junction, all of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

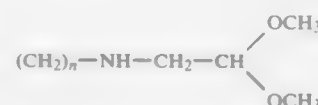
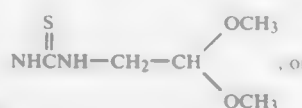
Filed Sep. 30, 1987, Ser. No. 102,694

Int. Cl.⁴ C07F 9/32

U.S. Cl. 558—180

9 Claims

1. A compound having the structure



and
 n is 1-5;
 except compounds in which:
 X is four H's; and
 Y is CN or CHO.



and
 n is 0 or 1.

4,873,357

TRIFLUORO ACETYL-CYANO-ANILINE INTERMEDIATES FOR DOPAMINE-β-HYDROXYLASE INHIBITORS

Carl Kaiser, Haddon Heights; Lawrence I. Kruse, Haddonfield, both of N.J., and Stephen T. Ross, Berwyn, Pa., assignors to SmithKline Beckman Corporation, Philadelphia, Pa.

Division of Ser. No. 793,512, Oct. 31, 1985, Pat. No. 4,719,223.

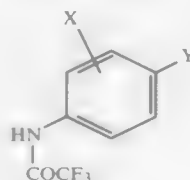
This application Oct. 8, 1987, Ser. No. 105,628

Int. Cl.⁴ C07C 122/00, 157/07, 103/34

U.S. Cl. 558—414

6 Claims

1. A compound having the formula:



in which:

X is H, Br, Cl, F, I or any combination thereof of up to four substituents;
 Y is CN, CHO,

4,873,358

PREPARATION OF NITROESTERS VIA THE REACTION OF NITROPARAFFINS WITH CYANOFORMATES

Jennifer M. Quirk, Highland, and Charles G. Carter, Silver Spring, both of Md., assignors to W. R. Grace & Co.-Conn., New York, N.Y.

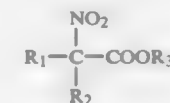
Filed Sep. 20, 1988, Ser. No. 246,609

Int. Cl.⁴ C07C 79/41

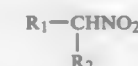
U.S. Cl. 560—22

19 Claims

1. A process for forming an alkyl nitroacetate represented by the formula:



wherein R₁ and R₂ each independently represent a hydrogen atom, an unsubstituted or substituted C₁-C₇ alkyl group or an unsubstituted or substituted phenyl group and R₃ is a C₁-C₄ alkyl group, comprising contacting in a liquid, a strong base, a nitroparaffin of the formula:



wherein R₁ and R₂ are the same as defined above, with a cyanofornate of the formula:



wherein R₃ is the same as defined above, an recovering the formed alkyl nitroacetate.

4,873,359

PROCESS FOR PREPARING AS PARTYL-PHENYLALANINE DIPEPTIDES

Alan B. Chamuray, Frederick; Akiva T. Gross, Rockville; Robert J. Kupper, Mount Airy, and Rowena L. Roberts, Derwood, all of Md., assignors to W. R. Grace & Co. - Conn., New York, N.Y.

Division of Ser. No. 789,595, Oct. 21, 1985, Pat. No. 4,710,583.

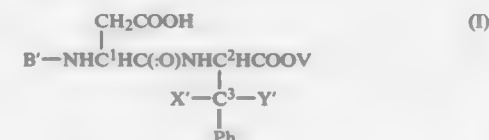
This application Oct. 1, 1987, Ser. No. 103,635

Int. Cl.⁴ C07C 101/08, 101/18, 99/00, 103/30

U.S. Cl. 560—40

4 Claims

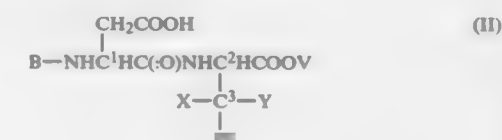
1. A process for the preparation of aspartylphenylalanine dipeptides of the formula (I):



wherein B' is B or B replaced with a hydrogen atom; X' is X or X replaced with a hydrogen atom; Y' is Y or Y replaced with a hydrogen atom, with the proviso that at least one of X' and Y' is X or Y replaced by a hydrogen atom; B is hydrogen or Q; Q is an amino acid protective group; V represents hydrogen or an alkyl group having 1, 2, 3 or 4 carbon atoms; C¹ and C² are chiral carbon atoms having an S optical configuration; and

(a) Y is hydrogen and X is $-\text{OR}'$, $-\text{SR}'$, $-\text{OC}(\text{O})\text{R}'$, $-\text{OC}(\text{O})\text{OR}'$, $-\text{OC}(\text{O})\text{NHR}'$, $-\text{OC}(\text{S})\text{SR}'$, $-\text{Cl}$, $-\text{Br}$, $-\text{N}_3$, $-\text{OS}(\text{O})(\text{O})-\text{R}$, $-\text{S}(\text{O})(\text{O})-\text{R}$, $-\text{NHR}'$, or $-\text{NO}_2$; or
 (b) X and Y are independently $-\text{OR}'$, $-\text{SR}'$, $\text{RS}(\text{O})(\text{O})-$, $-\text{OC}(\text{O})\text{R}'$, $-\text{NHR}'$, or $-\text{Cl}$; or
 (c) X and Y together are $-\text{O}$, $-\text{S}(\text{CH}_2)_n\text{S}-$, $-\text{S}(\text{CH}_2)_n\text{O}-$, $-\text{O}(\text{CH}_2)_n\text{O}-$, $-\text{NNHC}(\text{O})\text{NH}_2$, $-\text{NNHC}(\text{O})\text{R}'$, $\text{RNHN}-$, $\text{TsNHN}-$, or $-\text{NOH}$;
 where R' is H or R; R is alkyl or alkylene having 1, 2, 3, or 4

carbons, or substituted alkyl or substituted alkylene having 1, 2, 3, or 4 carbons; or aryl or substituted aryl; n is 1, 2, 3, or 4 and X and Y are interchangeable, comprising hydrogenating a compound of the formula (II):



wherein B, X, Y and V are as defined above at a temperature of from about 0° to 150° C. at a hydrogen pressure ranging from about atmospheric to 1500 psig in the presence of a catalyst selected from the group consisting of Pt, PtO₂, Pd black or Pd(OH)₂ on carbon, barium sulfate, or alumina, and Raney Ni or Raney Co to reductively cleave at least one of X and Y, and optionally B, from said compound of the formula (II), thereby forming said compound of formula (I).

4,873,360

PROCESS FOR THE PREPARATION OF CYCLOPENTANOLIDS AND NOVEL INTERMEDIATES PRODUCED THEREBY

Carl R. Johnson, and Thomas D. Peanning, both of Detroit, Mich., assignors to Board of Governors of Wayne State University, Detroit, Mich.

Division of Ser. No. 883,993, Jul. 10, 1986, abandoned. This application Jan. 21, 1988, Ser. No. 146,716

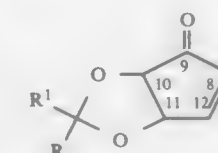
Int. Cl.⁴ C07C 177/00

U.S. Cl. 560—121

10 Claims

1. The process for the preparation of a cyclopentanoid (I) which comprises:

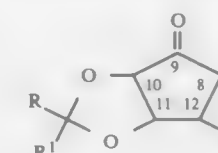
(a) reacting in an organic solvent at a reduced temperature less than ambient temperatures a compound of the formula:



including stereoisomers wherein R and R' CO— provide a protecting group for the C-11 oxygen group and the C-10 methylene group and with a compound of the formula:

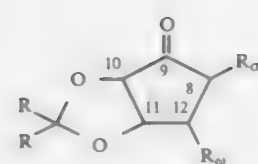


wherein R_ωCu is a copper complex soluble in the organic solvent wherein R_ω is selected from alkyl and alkenyl groups containing 4 to 12 carbon atoms to form an intermediate of the formula:

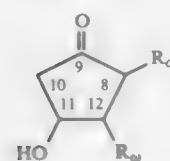


including stereoisomers;

(b) reacting II with R_αX in an organic solvent wherein R_α is selected from alkenyl and alkynyl ester, ketone and amide groups containing 3 to 12 carbon atoms and X is a halogen selected from chloro- and iodo- and bromo-groups to form a compound of the formula:



including stereoisomers;
(c) reacting (III) in an aqueous organic solvent mixture with a metallic reducing agent to produce a compound of the formula:



including stereoisomers as the prostanoid (I).

4,873,362
PREPARATION OF 2-SUBSTITUTED 4-ACYLOXY-2-BUTENALS
Franz Merger, Frankenthal; Rolf Fischer, Heidelberg, and Hans Horler, Darmstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

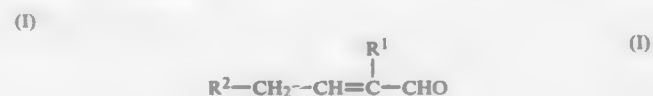
Filed Nov. 2, 1987, Ser. No. 115,891
Claims priority, application Fed. Rep. of Germany, Nov. 20, 1986, 3639562

Int. Cl.⁴ C07C 67/00

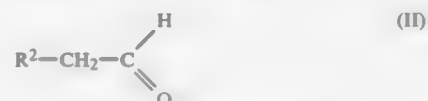
U.S. Cl. 560—238

12 Claims

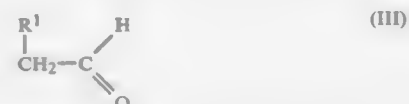
1. A process for preparing a 2-substituted 4-acyloxy-2-butenal of formula I:



where R¹ is alkyl of 1 to 12 carbon atoms which may be substituted by cycloaliphatic, phenyl, anisyl, or heterocyclic radicals, by alkenyl or alkynyl or by hydroxyl, ether, thioether, acetoxy acyl, acetoxy alkylamino, carboxyl or carbalkoxy, and R² is acyloxy of 1 to 12 carbon atoms, which comprises: reacting an acyloxyacetaldehyde of formula II:



where R² has the abovementioned meaning, with an aldehyde of formula III:



where R¹ has the abovementioned meaning, in the presence of a linear or cyclic secondary amine and of a mono- or dicarboxylic acid at from 20° to 100° C.

4,873,363
PROCESS FOR THE PREPARATION OF 3-(4'-BROMOBIPHENYL-4-YL)TETRALIN-1-ONE
In O. Kim, and Sang G. Lee, both of Seoul, Rep. of Korea, assignors to Korea Advanced Institute of Science and Technology, Rep. of Korea

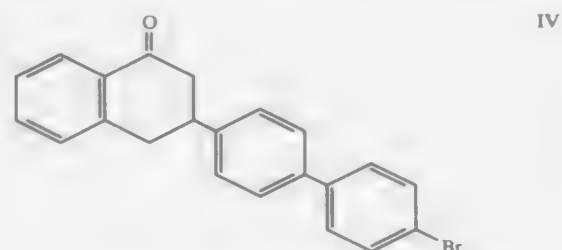
Filed May 11, 1988, Ser. No. 192,776
Claims priority, application Rep. of Korea, Sep. 24, 1987, 10603/1987

Int. Cl.⁴ C07C 45/45

U.S. Cl. 568—319

8 Claims

1. A process for the production 3-(4'-bromobiphenyl)-4-yl)tetralin-1-one of the formula IV, consisting essentially of:



reacting a compound of formula I with ethyl bromoacetate in

4,873,361
PROCESS FOR PRODUCTION OF P-ACETOXYBENZOIC ACID FROM P-ACETOXYACETOPHENONE
Krisati A. Fjare, Naperville, Ill., assignor to Amoco Corporation, Chicago, Ill.

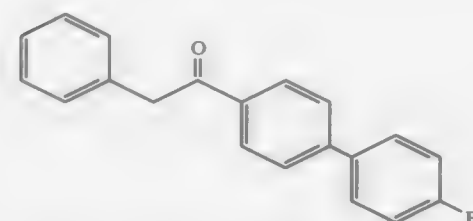
Continuation-in-part of Ser. No. 16,746, Feb. 19, 1987, abandoned. This application Aug. 29, 1988, Ser. No. 237,992
Int. Cl.⁴ C07C 67/08

U.S. Cl. 560—130

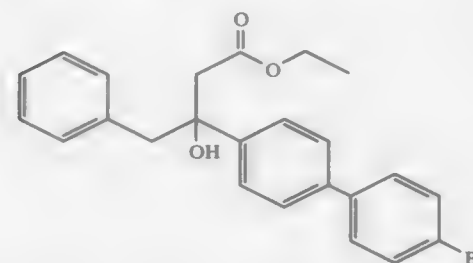
17 Claims

1. A semicontinuous or continuous liquid-phase process for the production of p-acetoxybenzoic acid from p-acetoxyacetophenone in high yield, which process comprises: (a) oxidizing in a reaction zone said p-acetoxyacetophenone with a source of molecular oxygen in the presence of a catalyst comprising cobalt (II), manganese (II), and bromine, in a solvent comprising a lower aliphatic carboxylic acid and in the presence of a promoter consisting essentially of an acid anhydride of said lower aliphatic carboxylic acid, at a temperature within the range of from about 200° F. to about 400° F. and at a pressure of from 1 atmosphere to about 30 atmospheres, said promoter being present as an initial reactor charge in a mole ratio of promoter to said p-acetoxyacetophenone of from 1:1 to 2.4:1; (b) adding said promoter to said reaction zone during said oxidizing in an amount of from 0.25 to 1.5 moles of said promoter per mole of said p-acetoxyacetophenone, the total amount of promoter resulting from the initial charge and subsequent addition of said promoter providing a mole ratio of said promoter to said p-acetoxyacetophenone that is in the range of about 1.6:1 to 3:1 moles of said promoter per mole of said p-acetoxyacetophenone; (c) evaporating the reactor effluent to remove water and said lower aliphatic carboxylic acid therefrom; (d) recovering said lower aliphatic carboxylic acid that has been removed from said effluent; (e) recycling to a make-up vessel the lower aliphatic carboxylic acid that has been recovered from said effluent; (f) filtering the evaporator bottoms to recover reactor product from mother liquor; and (g) recycling said mother liquor to said reaction zone.

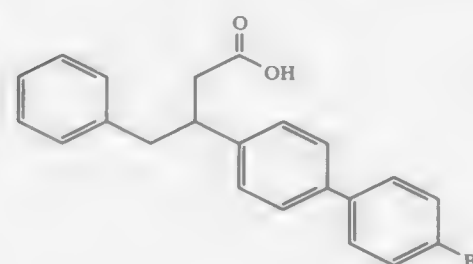
the presence of a mixed solvent, to form a compound of formula II;



reacting the compound of formula II with trialkylsilane and trifluoroacetic acid in the presence of sulfate salt and a catalytic amount of boron trifluoride etherate wherein alkyl is 1-2 carbon atoms, to form a compound of formula III; and,



obtaining the compound of formula IV by the cyclization reaction of the compound of formula III in the presence of polyphosphoric acid in a suitable solvent:



4,873,364
PROCESS FOR THE PREPARATION OF METHYLENE DIPHENYLENE DIISOCYANATES AND POLYMETHYLENE POLYPHENYLENE POLY (DIISOCYANATES)

Edward T. Shawl, Wallingford, and Haven S. Kesling, Jr., Drexel Hill, both of Pa., assignors to Arco Chemical Technology, Inc., Wilmington, Del.

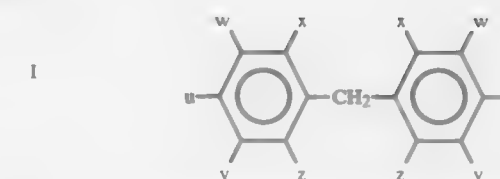
Filed Dec. 9, 1988, Ser. No. 283,430

Int. Cl.⁴ C07C 118/00

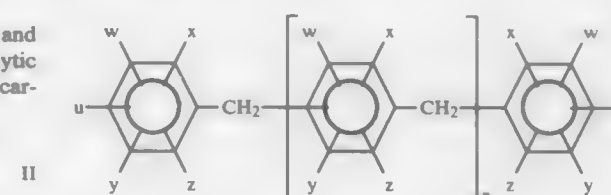
U.S. Cl. 560—344

12 Claims

1. A process for the preparation of a methylene diphenylene diisocyanate or a polymethylene polyphenylene poly (diisocyanate) which comprises heating at a temperature within the range of from about 50° C. to about 220° C. a methylene diphenylene bis (dialkylurea) having the formula



or a polymethylene polyphenylene poly (dialkylurea) having the formula



wherein at least one of the substituents u, w, x, y and z on the ring is a dialkylureido (—NHCONRR') group and the other substituents which may be the same or different on the ring, are hydrogen, an ether group or a nitro group, R and R' of the dialkylureido group which may be the same or different are an alkyl group having independently from 1 to 8 carbon atoms and n is an integer of from 1 to 8, dissolved or slurried in an organic solvent or mixture of solvents, in the presence of a tertiary amine hydrohalide as a promoter to convert the urea to the corresponding diisocyanate, and thereafter separating and recovering the diisocyanate or poly (diisocyanate).

4,873,365
PROCESS FOR THE PREPARATION OF ISOPHORONE DIISOCYANATE FROM ISOPHORONE DICARBAMYL ESTERS USING HIGHLY SELECTIVE SNO₂ OR CUO CATALYSTS

Yuhshi Lah, Orange, and Peter S. Forgione, Stamford, both of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Apr. 4, 1986, Ser. No. 848,417

Int. Cl.⁴ C07C 119/00

U.S. Cl. 560—345

9 Claims

1. In a process for the preparation of isophorone diisocyanate by cleaving a corresponding biscarbamic acid ester at a temperature of 175° C. to 400° C. in the presence of a metal oxide catalyst, the improvement which comprises using SnO₂ or CuO or a mixture thereof as said catalyst to produce said isophorone diisocyanate with high selectivity and high yield.

4,873,366
PROCESS FOR PRODUCING 2,6-NAPHTHALENEDICARBOXYLIC ACID
Toshiharu Matsuda; Atsushi Sasakawa; Shoichiro Hayashi, all of Iwaki, and Yutaka Konai, Machida, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 5, 1988, Ser. No. 177,774

Claims priority, application Japan, Apr. 7, 1987, 62-85198

Int. Cl.⁴ C07C 51/265

U.S. Cl. 562—416

2 Claims

1. A process for producing 2,6-naphthalenedicarboxylic acid which comprises oxidizing 2,6-diisopropyl-naphthalene or its partially oxidized intermediate with molecular oxygen in a solvent containing at least 50% by weight of an aliphatic monocarboxylic acid having not more than three carbon atoms in the presence of a catalyst composed of

- a heavy metal comprising cobalt, manganese or their mixture, and
- bromine, and a salt of an inorganic acid, having an acid dissociation constant K_a smaller than 1.34×10⁻⁵, at 25°

C., and a vapor pressure lower than that of said aliphatic monocarboxylic acid used as the solvent, which is selected from the group consisting of sodium tetraborate, ammonium tetraborate, potassium tetraborate, sodium molybdate, sodium phosphate, and disodium hydrogen phosphate.

4,873,367

METHOD FOR PREPARING

4-HYDROXY-3-PHENYLBENZOIC ACID

Patricia P. Anderson, Worthington, Mass.; Timothy M. Sivavec, Clifton Park, and Tohru Takekoshi, Scotia, both of N.Y., assigns to General Electric Company, Schenectady, N.Y.
Filed Nov. 25, 1988, Ser. No. 275,881
Int. Cl.⁴ C07C 51/15

U.S. Cl. 562—425

17 Claims

1. A method for preparing 4-hydroxy-3-phenylbenzoic acid which comprises contacting a mixture of an anhydrous alkali metal salt of 2-phenylphenol and a liquid N,N-dialkylcarbamate, said mixture containing up to about 50% by weight of said salt, with carbon dioxide at a pressure of at least about one atmosphere and a temperature in the range of about 70°–150° C., and neutralizing the salt thus formed.

4,873,368

PROCESS FOR PRODUCING ACRYLIC ACID

Koju Kadowaki, Kobei Sarumaru, both of Ami, and Takeshi Shibano, Yokkaichi, all of Japan, assigns to Mitsubishi Petrochemical Company Limited, Tokyo, Japan
Continuation of Ser. No. 203,592, Nov. 3, 1980, abandoned. This application Sep. 29, 1982, Ser. No. 426,273

Claims priority, application Japan, Nov. 19, 1979, 54-149871
Int. Cl.⁴ C07C 51/25, 57/05

U.S. Cl. 562—532

7 Claims

1. In a process for producing acrylic acid by a two-stage gas-phase catalytic oxidation comprising subjecting a gas mixture containing propylene, molecular oxygen, and steam to a first-stage catalytic oxidation reaction thereby to convert propylene principally into acrolein and subjecting the gases formed in the first-stage catalytic oxidation reaction to a second-stage catalytic oxidation reaction thereby to convert the acrolein principally into acrylic acid, the improvement wherein said process is carried out under the conditions comprising:

A. carrying out at least the first-stage catalytic oxidation reaction in a reaction zone defined by the conditions

(1) that said reaction zone comprises a plurality of elongated unit reaction zones extending in the direction of flow of the gases and connected in parallel arrangement,

(2) that each of the unit reaction zone comprises a reaction region comprising a bed of oxidation catalyst capable of a one pass yield of at least about 88% for the sum of the quantities of acrolein and acrylic acid at a reaction temperature of about 280° to 350° C. and a cooling region comprising a bed of a solid inactive material disposed contiguously to the reaction on the downstream side thereof, and

(3) that the temperatures of the reaction region and of the cooling region are respectively controlled independently;

B. that the gases to be subjected to the first-stage catalytic oxidation reaction satisfy the conditions:

that the mol ratio of molecular oxygen/propylene is 1.17 to 1.66, that the mol ratio of steam/propylene is equal to or less than 4,

that the propylene concentration is 7 to 15 percent, and that the gas pressure is 0.4 to 1.5 kg./cm.² gage;

C. that the gases formed in the reaction regions of the unit reaction zones by the first-stage catalytic oxidation are quenched to a temperature of 280° C. or lower in the cooling region; and

D. that the gases formed in the first-stage catalytic oxidation reaction to be subjected to the second-stage catalytic

oxidation reaction are conditioned by adding a gas mixture of molecular oxygen and steam to satisfy the conditions:

that the mol ratio of molecular oxygen/propylene is 1.75 to 2.5,

that the mol ratio of steam/propylene is 1 to 5, and that the gas temperature is 280° C. or lower, the mol ratios being based on respective total quantities including those of the gases subjected to the first-stage catalytic oxidation reaction.

4,873,369

PURIFICATION OF CYCLOHEXANONE OXIME CONTAINING AMMONIUM SULFATE

Hugo Fuchs, Ludwigshafen, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Mar. 5, 1987, Ser. No. 22,235

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1986, 3607997

Int. Cl.⁴ C07C 131/00

U.S. Cl. 564—264

3 Claims

1. A process for the purification of cyclohexanone oxime containing from 5 to 8% by weight of water and containing from 10 to 1000 mg of ammonium sulfate per kg of cyclohexanone oxime, wherein the cyclohexanone oxime in the molten state is passed over an acidic ion exchanger and a basic ion exchanger at a temperature from 70° to 95° C.

4,873,370

ALKYLENE DIAMINES FOR USE IN FRICTION AND WEAR REDUCING COMPOSITIONS

I-Ching Chiu, Houston, Tex., assignor to Pennzoil Products Company, Houston, Tex.

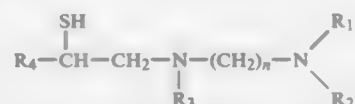
Filed Mar. 3, 1987, Ser. No. 21,316

Int. Cl.⁴ C07C 61/16; C10M 105/08

U.S. Cl. 564—500

10 Claims

1. N,N-dialkyl-N'-(beta substituted) alkyl alkylene diamine of the formula



wherein R₁, R₂ and R₃ are C₁₋₄ hydrocarbon groups or H, but both R₁ and R₂ are not H, R₄ is a saturated or unsaturated C₁₄₋₂₄ hydrocarbon group, and n=1-4.

4,873,371

HYDROXY-TERMINATED ARYLENE ETHERS, AND METHOD FOR MAKING

Gary W. Yeager, Schenectady, and David N. Schissel, Clifton Park, both of N.Y., assigns to General Electric Company, Schenectady, N.Y.

Filed Aug. 1, 1988, Ser. No. 226,594

Int. Cl.⁴ C07C 43/295

U.S. Cl. 568—33

10 Claims

1. A method for making a hydroxy-terminated arylene ether of the formula



comprising,

(1) reacting a dihydroxyaromatic compound of the formula,



and with an arylcarbonyl compound selected from aldehydes and ketones having a leaving group in the para position, selected from fluoro, bromo, and nitro to form an arylene ether dicarbonyl adduct of the formula,



(2) oxidizing the resulting arylene ether dicarbonyl adduct of step (1) to form the corresponding arylene ether diester of the formula,



(3) saponifying the arylene ether diester of step (2) to the corresponding hydroxy-terminated arylene ether, where R is a substituted or unsubstituted arylene radical having from 6–36 carbons, R¹ is the same or different arylene radical having from 6–20 carbons and X is hydrogen or an arylene group having from 6–14 carbons.

4,873,372

ISOLATION OF 4,4'-DICHLORODIPHENYL SULFONE

Gerhard Schaefer, Heidelberg; Heinz Ellingsfeld, Frankenthal; Peter Neumann, Wiesloch, and Michael Stumpp, Ludwigshafen, all of Fed. Rep. of Germany, assigns to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany
Filed Jan. 25, 1988, Ser. No. 148,386

Int. Cl.⁴ C07C 147/06

U.S. Cl. 568—34

6 Claims

1. A process for the isolation of 4,4'-dichlorodiphenyl sulfone from a substantially water-free mixture containing dichlorodiphenyl sulfones in which the ratios of the masses of 2,4'-dichlorodiphenyl sulfone and 3,4'-dichlorodiphenyl sulfone to the mass of 4,4'-dichlorodiphenyl sulfone are respectively from 0.5% to 20% and from 0.5% to 30%, which process comprises: treating the mixture with an alkanol at temperatures of from 20° C. to 250° C. under substantially water-free conditions in such a manner that dissolution in the alkanol is as complete as possible, cooling the resultant substantially water-free mixture to precipitate pure 4,4'-dichlorodiphenyl sulfone, and finally separating the 4,4'-dichlorodiphenyl sulfone.

4,873,373

PROCESS FOR PREPARATION OF 3-PHENOXYBENZYL

2-(4-ALKOXYPHENYL)-2-METHYLPROPYL ETHERS
Mitsumasa Umemoto; Tamotsu Asano; Hironobu Horie; Akinobu Takagi; Nobuyasu Tamura, and Takeshi Nishida, all of Fukuoka, Japan, assigns to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan
PCT No. PCT/JP86/00198, § 371 Date Jul. 16, 1986, § 102(e)
Date Jul. 16, 1986, PCT Pub. No. WO86/06367, PCT Pub. Date Nov. 6, 1986

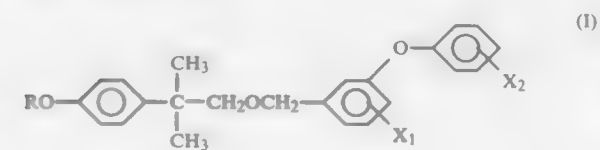
PCT Filed Apr. 18, 1986, Ser. No. 890,143

Claims priority, application Japan, Apr. 19, 1985, 60-82661
Int. Cl.⁴ C07C 41/24

U.S. Cl. 568—637

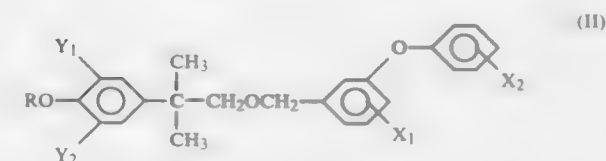
7 Claims

1. A process for the preparation of 3-phenoxybenzyl 2-(4-alkoxyphenyl)-2-methylpropyl ethers represented by the following formula (I):



wherein R represents a lower alkyl group, and X₁ and X₂ represent a hydrogen atom or fluorine atom, which comprises subjecting a 3-phenoxybenzyl 2-(4-alkoxy-3-halogenophenyl)-2-methylpropyl ether or 3-

phenoxybenzyl 2-(4-alkoxy-3,5-dihalogenophenyl)-2-methylpropyl ether represented by the following formula (II):



wherein R stands for a lower alkyl group, X₁ and X₂ represent a hydrogen atom or fluorine atom, and Y₁ and Y₂ represent a hydrogen atom, chlorine atom, bromine atom or iodine atom, with the proviso that at least one of Y₁ and Y₂ is a chlorine atom, bromine atom or iodine atom, to dechlorination, debromination or deiodination by hydrogenation in the presence of a dehydrohalogenating base in an amount of 1 to 10 moles per mole of the compound of formula (II), wherein the dechlorination, debromination or deiodination is carried out in the presence of a hydrogenation catalyst by using as a hydrogenative reducing agent a lower aliphatic alcohol in an amount of at least 0.3 mole of the stoichiometric amount per mole of the compound of formula (II) and an alkali compound selected from alkali metal hydroxides in an amount effective to form three moles of hydrogen for each mole of the lower aliphatic alcohol, said amount being at least 0.6 moles for each mole of the compound of formula (II), without introducing hydrogen from outside of the reaction system.

4,873,374

PREPARATION PROCESS OF 4,4'-BIPHENOL, PRECURSOR OF SAME AND PREPARATION PROCESS OF PRECURSOR

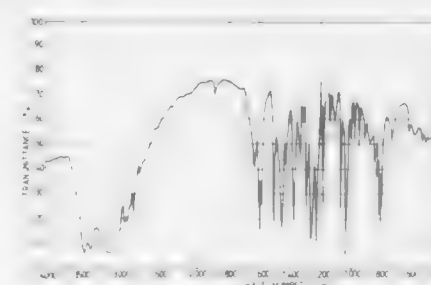
Tohru Miura; Teruyuki Nagata; Koju Okazaki; Masayuki Furuya, and Emiko Nishida, all of Ohmura, Japan, assigns to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan
Filed Apr. 6, 1988, Ser. No. 178,301

Claims priority, application Japan, Apr. 14, 1987, 62-89890;
Dec. 18, 1987, 62-318701

Int. Cl.⁴ C07C 39/17

U.S. Cl. 568—743

1 Claim



1. 4-(4-Hydroxyphenyl)-3-cyclohexene-1-ol having the formula (I):



4,873,375
PROCESS FOR PREPARING FLUORINE-SUBSTITUTED
ALICYCLIC DIOL

Motonobu Kubo, and Yoshiaki Shimizu, both of Osaka, Japan,
assignors to Daikin Industries, Ltd., Osaka, Japan

Filed Apr. 11, 1988, Ser. No. 180,118

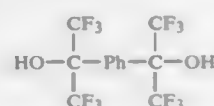
Claims priority, application Japan, Apr. 11, 1987, 62-89283

Int. Cl.⁴ C07C 33/44

U.S. Cl. 568—812

10 Claims

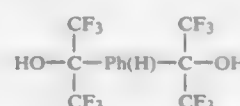
1. A process for preparing a fluorine-substituted alicyclic diol comprising reacting a fluorine-substituted aromatic diol represented by formula (I):



wherein Ph represents a divalent organic group selected from the group consisting of a phenylene group, a biphenylene group, a terphenylene group, a phenyleneoxy-phenylene group, a phenylenethiophenylene group, a phenylenealkylenephenylene group, an anthrylene group, a phenanthrylene group and said divalent organic group or which at least one hydrogen atom of said group is substituted by a methyl group, a hydroxyl group, an amino group or a halogen atom, in which the alkylene group contained in said group represented by Ph has from 1 to 10 carbon atoms with hydrogen in the presence of a rhodium catalyst;

at a temperature in the range of from 10° to 250° C. under a hydrogen pressure in the range of from 1 to 250 kg/cm² G;

to obtain said fluorine-substituted alicyclic diol represented by formula (II):



wherein Ph(H) represents the corresponding fully hydrogenated Ph group.

4,873,376
PROCESS FOR THE PRODUCTION OF MONOMERIC
ALKENYLPHENOLS FROM
DIHYDROXYDIPHENYLALKANES

Ralf Dujardin, and Wolfgang Ebert, both of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen Bayerwerk, Fed. Rep. of Germany

Filed Jun. 20, 1988, Ser. No. 209,200

Claims priority, application Fed. Rep. of Germany, Jul. 2, 1987, 3721853

Int. Cl.⁴ C07C 37/52, 37/50

U.S. Cl. 568—806

6 Claims

1. A process for the production of monomeric alkenylphenols from dihydroxydiphenylalkanes in the presence of basic catalysts which comprise oxides, hydroxides or carbonates of alkali metals or alkaline earth metals, alkali metal salts of phenols or alkali metal salts of mildly acidic fatty acids, wherein a solution of dihydroxydiphenylalkane and a water-miscible organic solvent, which is oligomeric 1,2-(C₂-C₄)-alkylidene glycols, di- and trialkanolamines or N-alkyl lactams, is continuously introduced into an organic reaction medium containing the basic catalyst under reduced pressure and at elevated temperature of from 150° to 250° C. at such a rate that the initial volume of the reaction medium increases by up to 10% by volume and the cleavage products are continuously distilled off together with the solvent from the reaction system into a water-filled receiver from which the monomeric alkenylphenol is then isolated and the phenol formed as second-

ary product and the solvent remain dissolved in the aqueous phase.

4,873,377
PREPARATION OF DIBROMONEOPENTYL GLYCOL
John Y. Lee, and Edgar E. Spielman, Jr., both of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Filed Oct. 3, 1988, Ser. No. 251,787

Int. Cl.⁴ C07C 31/42

U.S. Cl. 568—844

10 Claims

1. A process for preparing dibromoneopentyl glycol, which process comprises:

- (a) brominating pentaerythritol with HBr to yield a reaction mass containing dibromoneopentyl glycol and lesser amounts of monobromopentaerythritol and tribromoneopentyl alcohol, said bromination occurring in the presence of a catalyst selected from the group consisting of mono- or di-carboxylic acids, their anhydrides, their esters, and mixtures thereof, and in the presence of a substantially inert solvent, which solvent has, at the temperature to which the reaction mass is cooled in (d), a solubility for said tribromoneopentyl alcohol greater than that for said dibromoneopentyl glycol;
- (b) maintaining in the reaction mass at least a major portion of the by-product water formed by the bromination in (a);
- (c) neutralizing the reaction mass;
- (d) cooling said reaction mass sufficiently to form a precipitate which is predominant in said dibromoneopentyl glycol; and
- (e) recovering said precipitate from the reaction mass.

4,873,378
PROCESS FOR MAKING 1,3-DIOLS FROM EPOXIDES
Mark A. Murphy, Corpus Christi; Brad L. Smith, Portland; Adolfo Aguilo, and Kwoliang D. Tan, both of Corpus Christi, all of Tex., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Continuation-in-part of Ser. No. 898,072, Aug. 20, 1986, abandoned. This application Dec. 15, 1987, Ser. No. 133,116

Int. Cl.⁴ C07C 29/36, 31/20

U.S. Cl. 568—867

28 Claims

1. A single-step process for manufacturing 1,3-propanediol with CO and H₂ in a ether reaction solvent, said process being characterized by reacting a reaction mixture comprising (1) ethylene oxide at a concentration from about 0.01 to about 30 weight percent; (2) rhodium at a molar concentration from about 0.00001 to about 0.1 molar; (3) a phosphine having the formula



III

wherein R₁, R₂, and R₃ are independently selected, from the group consisting of aliphatic and aromatic hydrocarbon groups, the molar ratio of rhodium to phosphine being from about 10:1 to about 1:10; (4) water in an amount up to about 25 weight percent based on the weight of the reaction mixture; (5) CO; (6) H₂; and (7) an acid, the molar ratio of acid to phosphine being from about 10:1 to about 1:10; wherein the molar ratio of CO to H₂ is from about 10:1 to about 1:10, and wherein the reaction takes place at a temperature from about 50 to about 200° C. under a pressure from about 200 to about 10,000 psig, for a period of time which is sufficient to form.

4,873,379
PROCESS FOR MAKING 1,3-DIOLS FROM EPOXIDES
Mark A. Murphy, Corpus Christi, Tex., assignor to Hoechst Celanese Corporation, Somerville, N.J.

Filed May 25, 1988, Ser. No. 198,364

Int. Cl.⁴ C07C 27/20, 27/22, 29/00

U.S. Cl. 568—867

7 Claims

1. A single-step process for manufacturing 1,3-propanediol from ethylene oxide with CO and H₂ in an ether reaction

solvent, said process being characterized by reacting a reaction mixture comprising (1) ethylene oxide at a concentration from about 0.01 to about 30wt. %; (2) rhodium at a molar concentration from about 0.00001 to about 0.1 molar; (3) an alkali metal compound in a concentration of from about 0.00001 molar to about 0.1 molar; (4) water in an amount up to about 25 wt. % based on the weight of the reaction mixture; (5) CO; and (6) H₂; wherein the molar ratio of CO to H₂ is from about 1:1 to about 1:5, and wherein the reaction takes place at a temperature from about 50° to about 200° C. under a pressure from about 200 to about 10,000 psig, for a period of time which is sufficient to form 1,3-propanediol.

4,873,380
CATALYST FOR REMOVING PEROXIDE
CONTAMINANTS FROM TERTIARY BUTYL ALCOHOL
John R. Sanderson, Leander, and John M. Larkin, Austin, both of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Jan. 20, 1987, Ser. No. 4,508

Int. Cl.⁴ C07C 29/88, 27/26

U.S. Cl. 568—914

7 Claims

1. In a method for enhancing the motor fuel quality of a tertiary butyl alcohol feedstock contaminated with tertiary butyl hydroperoxide, ditertiary butyl hydroperoxide, acetone, methanol and isobutylene, wherein said tertiary butyl hydroperoxide and said ditertiary butyl peroxide are converted to tertiary butyl alcohol by heating the contaminated tertiary butyl alcohol feedstock, the improvement comprising the steps of:

- a. contacting said feedstock in a reaction zone with a catalyst at a temperature to about 80° to about 200° C. for a period of time sufficient to substantially selectively reduce said tertiary butyl hydroperoxide and said ditertiary butyl hydroperoxide to tertiary butyl alcohol, and
- b. recovering from the products of said reaction a tertiary butyl alcohol product containing not more than about 100 ppm of tertiary butyl hydroperoxide, not more than about 100 ppm of ditertiary butyl peroxide, not more than about 1 wt. % of isobutylene and not more than about 3 wt. % each of acetone and methanol,
- c. said catalyst consisting essentially of a catalyst composed of the oxides of nickel, copper, chromium and barium.

4,873,381
HYDRODEHALOGENATION OF CF₃CHClF IN THE
PRESENCE OF SUPPORTED PD
Carl S. Kellner, and V. N. Mallikarjuna Rao, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 20, 1988, Ser. No. 199,811

Int. Cl.⁴ C07C 17/24, 19/02

U.S. Cl. 570—176

6 Claims

1. A process for the preparation of 1,1,1,2-tetrafluoroethane comprising contacting in the gaseous phase at a temperature of 200° C. to 350° C. 1,1,1,2-tetrafluoromonoethane with H₂ in the presence of a catalyst consisting essentially of palladium on an aluminum fluoride or fluorinated alumina support.

4,873,382
PURIFICATION OF TELOMERS PREPARED FROM
CHLOROTRIFLUOROETHYLENE AND
TRICHLOROTRIFLUOROETHANE
Bobby F. Dannels; Deborah J. Olsen, both of Grand Island, and John Forcucci, Niagara Falls, all of N.Y., assignors to Occidental Chemical Corporation, Niagara Falls, N.Y.

Continuation-in-part of Ser. No. 116,843, Nov. 5, 1987. This application Aug. 22, 1988, Ser. No. 234,645

Int. Cl.⁴ C07C 17/24, 17/38, 19/08

U.S. Cl. 570—177

11 Claims

1. A process for purifying a mixture of telomers prepared by reacting chlorotrifluoroethylene with CF₂ClCFCl₂, said te-

lomers having the formula CF₂ClCFCl(CF₂CFCl)_nCl, where n is in the range of 1 to 10, said process comprising the steps of (a) reacting the telomer mixture with an aqueous solution of potassium hydroxide in the presence of a quaternary ammonium compound, (b) separating and removing impurities from the telomer mixture of step (a), (c) reacting the telomer mixture from step (b) with potassium permanganate in a solvent in the presence of a quaternary ammonium compound, and (d) recovering a purified telomer mixture.

4,873,383
METHOD FOR SELECTIVE ISOLATION OF
DICHLOROBENZENE
Toshitaka Kaneshiki; Osamu Narukawa; Tadayoshi Haneda, and Toshiyuki Endo, all of Koriyama, Japan, assignors to Hodogaya Chemical Co., Ltd., Tokyo, Japan

Filed Jan. 29, 1988, Ser. No. 150,400

Claims priority, application Japan, Feb. 10, 1987, 62-27169

Int. Cl.⁴ C07C 17/38

U.S. Cl. 570—211

16 Claims

1. A method for a selective isolation of m-dichlorobenzene comprising the steps of:

- bringing an isomeric mixture containing m-dichlorobenzene and at least one member selected from o- and p-dichlorobenzenes into contact with an absorbing material comprising a TPZ-3 type zeolite consisting essentially of at least one aluminosilicate compound of the formula (I):



wherein M represents a member selected from monovalent and divalent cations, n represents an integer of 1 when M represents a monovalent cation, or of 2 when M represents a divalent cation, x represents an integer of 10 or more, and m represents zero or an integer of 1 or more, to cause the o- and p-dichlorobenzene in the isomeric mixture to be selectively absorbed by the absorbing material; and collecting the selectively non-absorbed fraction of the isomeric mixture.

4,873,384
METHOD FOR PRODUCING DICHLOROETHANE
Shun Wachi; Yuusaku Arikawa, both of Takasago, and Hiroshi Oshima, Kobe, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 105,496, Oct. 2, 1987, abandoned, which is a continuation of Ser. No. 830,801, Feb. 19, 1986, abandoned. This application Apr. 14, 1989, Ser. No. 338,538

Claims priority, application Japan, Feb. 19, 1985, 60-31261; Apr. 9, 1985, 60-76277; May 22, 1985, 60-111047

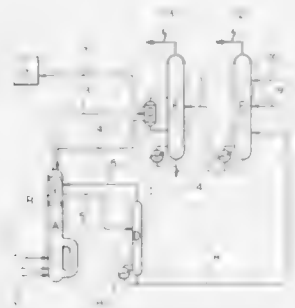
Int. Cl.⁴ C07C 17/02, 19/045, 17/38

U.S. Cl. 570—247

4 Claims

1. A method of producing dichloroethane which comprises feeding ethylene and chlorine into a liquid reaction medium

containing dichloroethane as a main component in a reactor which comprises a reaction zone and a gas-liquid contact device at the top part of the reactor above said reaction zone, reacting the ethylene and chlorine in the reaction zone of the reactor at a temperature which is not lower than the boiling point of dichloroethane at atmospheric pressure, to produce dichloroethane and to generate a vapor of the reaction medium, leading the reaction medium vapor through said gas-liquid contact device at the top of the reactor to a heat giving side of an exchanger whose heat receiving side is utilized as a reboiler for a distillation column, thereby condensing the reaction medium vapor and recovering the latent heat resulting from condensation of the vapor in the heat exchanger, return-



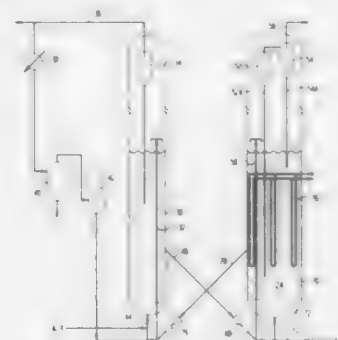
ing the resulting condensate of the reaction medium vapor from the heat exchanger to said gas-liquid contact device of the reactor, thereby said condensate is brought into contact with the reaction medium vapor, removing as a product a part of the condensate subsequently to its contact with the reaction medium vapor, while conducting the remainder of the condensate subsequently to its contact with the reaction medium vapor to the reaction zone of the reactor, and purifying in said distillation column at least one member selected from the group consisting of dichloroethane produced by the reaction of ethylene and chlorine, dichloroethane produced in a separate process of oxychlorination of ethylene, and uncracked dichloroethane recovered in a separate process of thermally cracking dichloroethane.

4,873,385

SINGLE ZONE OLIGOMERIZATION OF LOWER OLEFINS TO DISTILLATE UNDER LOW SEVERITY IN A FLUID BED WITH TAILORED ACTIVITY
Amos A. Avidan, Yardley, and David L. Johnson, Glen Mills, both of Pa., assignors to Mobil Oil Corp., New York, N.Y. Continuation-in-part of Ser. No. 6,407, Jan. 23, 1987, Pat. No. 4,746,762. This application May 23, 1988, Ser. No. 197,543
Int. Cl.⁴ C07C 2/12

U.S. Cl. 585—415

12 Claims



1. A catalytic process for converting an essentially C₃+ ole-

fin feedstream to distillate in a fluid bed of catalyst, said process comprising:

- equilibrating said fluid bed of catalyst which consists essentially of finely divided medium pore zeolite metallosilicate particles having a constraint index in the range from 1 to 12, said bed having an average activity, alpha, in the range from about 2 to 10, said bed consisting essentially of preselected weight fractions of low activity catalyst particles adding up to about 90% by weight having an alpha no greater than 10, the remaining less than 10% by weight having an alpha greater than 10;
- contacting said olefin feedstream with said catalyst maintained as a dense fluid-bed operating in a single zone turbulent regime at superatmospheric pressure but below about 2800 kPa (400 psig) and a temperature above the dewpoint of the hydrocarbon mixture in the bed at operating pressure;
- flowing said olefin feedstream through said bed at a weight hourly space velocity (WHSV) in the range from about 0.05 to about 5 hr⁻¹;
- maintaining a catalyst fines content of from about 10% to about 25% by wt, based on the weight of the catalyst in the bed, said fines having a particle size less than 32 microns, and;
- converting at least 80% by wt of said feedstream to olefins in a product which is essentially free of aromatics, with a yield per pass of about 20 percent by weight of said distillate.

4,873,386

SELECTIVE PRODUCTION OF 2,6-DIETHYLNAPHTHALENE

Gary P. Hagen, Glen Ellyn, and Thomas E. Nemo, Naperville, both of Ill., assignors to Amoco Corporation, Chicago, Ill.
Filed Jun. 28, 1988, Ser. No. 212,518
Int. Cl.⁴ C07C 5/22

U.S. Cl. 585—471

11 Claims

1. A method for producing 2,6-diethylnaphthalene, comprising: reacting in the liquid phase at least one of naphthalene or 2-ethylnaphthalene as the feed with at least one of 1,2,4-triethylbenzene, at least one tetraethylbenzene or pentaethylbenzene as the ethylating agent at a level of from about 1 to about 10 moles of the ethylating agent per mole of the feed by weight, in the presence of a Lewis acid catalyst selected from the group consisting of aluminum chloride, aluminum bromide, boron trichloride, tantalum pentachloride, antimony pentafluoride, and red oil, at a level of from about 0.01 to about 1 mole of the catalyst per mole of the feed by weight and at a temperature in the range of from about -10° C. to about 100° C.

4,873,387

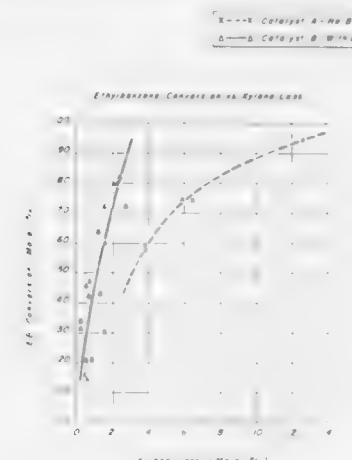
PROCESS FOR THE ISOMERIZATION OF AROMATICS
J. W. Adriaan Sachtler, Des Plaines, and R. Joe Lawson, Palatine, both of Ill., assignors to UOP, Des Plaines, Ill.
Division of Ser. No. 107,604, Oct. 13, 1987. This application Dec. 21, 1988, Ser. No. 287,351
Int. Cl.⁴ C07C 5/22

U.S. Cl. 585—482

9 Claims

1. A process for the isomerization of isomerizable alkylaromatic hydrocarbons and conversion of ethylbenzene which comprises contacting alkylaromatic hydrocarbons in a reaction

zone at isomerization reaction conditions with a hydrocarbon conversion catalyst useful for isomerizing isomerizable alkylar-



omatic hydrocarbons comprising a pentasil zeolite, a Group VIII metal component, and a bismuth component.

4,873,388

OXIDATIVE CONVERSION OF METHANE TO ETHYLENE AND ETHANE

Eric Shutt, Oxon, United Kingdom; Andries G. Altena, Hengelo, Ov., Netherlands, and John W. Jenkins, Berks, United Kingdom, assignors to Johnson Matthey Public Limited Company, London, England

Filed Aug. 13, 1987, Ser. No. 84,809

Claims priority, application United Kingdom, Aug. 13, 1986, 8619717

Int. Cl.⁴ C07C 2/00

U.S. Cl. 585—500

9 Claims

1. A method for the oxidative conversion of methane to ethylene, ethane or mixtures thereof in which a mixture comprising methane and oxygen is heated to an operative temperature of from 500° to 1000° C. and the heated mixture is contacted with a catalyst system which comprises a first support component which is a non-reducible metal compound and which first component is substantially refractory at the operative temperature and a second component which is one or more oxycarbonyls selected from the group consisting of boron and phosphorus supported on the surface of the first component.

4,873,389

CONVERSION OF LIGHT OLEFINS TO GASOLINE USING LOW-TEMPERATURE CATALYST REGENERATION

Amos A. Avidan, Yardley, and David L. Johnson, Glen Mills, both of Pa., assignors to Mobil Oil Corp., New York, N.Y.
Filed Aug. 4, 1988, Ser. No. 228,147

Int. Cl.⁴ C07C 2/02

U.S. Cl. 585—533

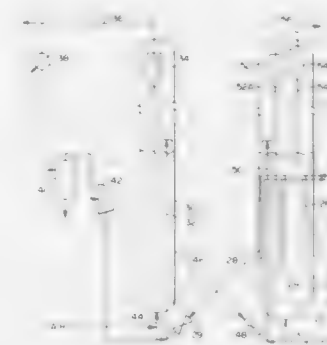
17 Claims

1. A fluidized bed catalytic process for conversion of light olefinic gas feedstock comprising at least 2 mol % ethene and a total C₂-C₃ alkene content about 10 to 75 wt %, comprising the steps of

- maintaining a fluidized bed of zeolite catalyst particles in a turbulent reactor bed at a temperature of about 315° to 510° C., said catalyst having an apparent particle density of about 0.9 to 1.6 g/cm³ and a size range of about 1 to 150 microns, and average catalyst particle size of about 20 to 100 microns containing about 10 to 25 wt. % of fine particles having a particle size less than 32 microns;
- passing hot feedstock vapor upwardly through the fluidized catalyst bed in a single pass under turbulent flow

conditions at reaction severity conditions sufficient to convert at least about 70% of feedstock ethene whereby said catalyst is deactivated;

- maintaining turbulent fluidized bed conditions through the reactor bed between transition velocity and transport velocity at a superficial fluid velocity of about 0.3 to 2 meters per second;
- recovering hydrocarbon product containing a major amount of C₄+ hydrocarbons and containing propane and propene in the ratio of about 0.2:1 to 5:1 in the substantial absence of added feedstock propane;



(e) withdrawing at least a portion of said deactivated catalyst from said reactor bed;

- maintaining a fluidized bed of deactivated catalyst in a turbulent regenerator bed at a temperature between 400° to 482° C.;
- passing oxygen-containing gas upwardly through the fluidized bed or deactivated catalyst at a rate sufficient to maintain the catalyst in a state of turbulent fluidization whereby the deactivated catalyst is regenerated;
- withdrawing regenerated catalyst from the regenerator bed; and
- returning the regenerated catalyst to the reactor bed.

4,873,390

CHEMICAL CONVERSION PROCESS

Jeffrey M. O. Lewis, Charleston, and Joe B. Price, Hamlin, both of W. Va., assignors to UOP, Des Plaines, Ill.
Filed Jul. 7, 1987, Ser. No. 70,575
Int. Cl.⁴ C07C 1/00, 1/24

U.S. Cl. 585—638

16 Claims

1. A process for catalytically converting a feedstock containing one or more compounds selected from the group consisting of alcohols, halides, mercaptans, sulfides, amines, ethers, and carboxyl compounds, said compounds having from 1 to about 4 carbon atoms per molecule, into a product containing light olefins which comprises:

- contacting said feedstock with a crystalline microporous three dimensional solid catalyst comprising a silicoaluminophosphate molecular sieve having pores with diameters of less than 5 Angstroms, said contacting being at conditions effective to convert said feedstock into said product and to form carbonaceous deposit material on said solid catalyst;
- contacting said carbonaceous deposit material-containing solid catalyst with regeneration medium at conditions effective to remove only a portion of said carbonaceous deposit material from said solid catalyst to form a partially regenerated solid catalyst having from about 2% to about 30% by weight of said carbonaceous deposit material and providing improved selectivity to said product relative to said solid catalyst containing less carbonaceous deposit material; and
- repeating step (a) using as said solid catalyst in step (a) at

least a portion of said solid catalyst previously subjected to step (b).

catalyst is diluted with a carrier which has lower activity than the used catalyst.

4,873,391

PROCESS FOR PRODUCING ISOBUTYLENE

Kazutaka Inoue, Tooshiro Sato, and Masao Kobayashi, all of Hiroshima, Japan, assignors to Mitsubishi Rayon Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 80,008, Jul. 31, 1987, abandoned. This application Aug. 17, 1988, Ser. No. 235,694

Claims priority, application Japan, Aug. 6, 1986, 61-184961

Int. Cl.⁴ C07C 1/24

U.S. Cl. 585-639

10 Claims

1. A process for producing isobutylene by dehydration of a feed gas of t-butyl alcohol of at least 90% of purity or its aqueous solution in gaseous phase on a fixed-bed type silica-alumina catalyst at a temperature in the range of 100°-210° C., wherein water vapor is added to feed gas and at an intermediate portion of said fixed bed catalyst and at least the last half of the catalyst located near the outlet end of the fixed-bed of

4,873,392

CATALYTIC CONVERSION OF AQUEOUS ETHANOL TO ETHYLENE

Raymond Le Van Mao, St-Laurent, Canada, assignor to Concordia University, Montreal, Canada

Filed Apr. 25, 1988, Ser. No. 185,911

Int. Cl.⁴ C07C 6/00

U.S. Cl. 585-640

3 Claims

1. A process for converting diluted ethanol to ethylene which comprises:

- heating an ethanol-containing fermentation broth thereby to vaporize a mixture of ethanol and water,
- contacting said vaporized mixture with a ZSM-5 zeolite catalyst having a Si/Al ratio from 5 to 50 and impregnated with 0.5 to 7 wt % of triflic acid, and
- recovering the ethylene thus produced.

ELECTRICAL

4,873,393

LOCAL AREA NETWORK CABLING ARRANGEMENT

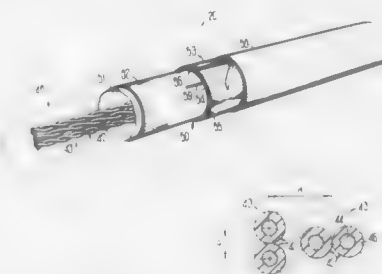
Harold W. Friesen, and Wendell G. Nutt, both of Dunwoody, Ga., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Mar. 21, 1988, Ser. No. 170,500

Int. Cl.⁴ H01B 11/04

U.S. Cl. 174-34

11 Claims



1. A cabling media which is suitable for balanced mode transmission with relatively low crosstalk, said cabling media comprising:

- a first pair of conductors; and
- at least two other pairs of conductors being adjacent to said first pair, each pair including two plastic-insulated metallic conductors which are twisted together in accordance with a twist frequency spacing such that increments of the twist frequency spacing as between adjacent pairs are non-uniform and such that the twist length of each pair does not exceed the product of about forty and the outer diameter of an insulated conductor of said each pair.

4,873,394

RECEPTACLE PANEL FOR ELECTRONIC DEVICE PROVIDING SIMPLE ASSEMBLY AND RFI SUPPRESSION

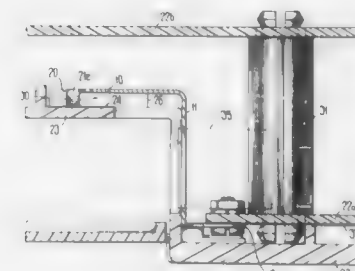
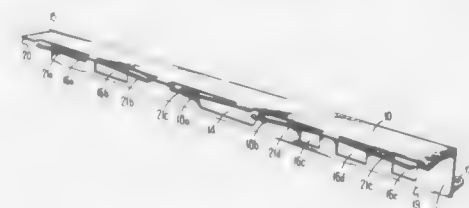
Vikram Bhargava, Alpharetta, and James R. Heberling, Lawrenceville, both of Ga., assignors to Hayes Microcomputer Products, Inc., Norcross, Ga.

Filed Jun. 3, 1988, Ser. No. 202,084

Int. Cl.⁴ H05K 9/00

U.S. Cl. 174-35 R

8 Claims



5. Apparatus for mounting in an enclosure of the type having at least one receptacle opening and means defining a conductive surface of said enclosure proximate said receptacle open-

ing, said enclosure being for housing electronic apparatus which emits radio frequency energy over a spectrum characterized by a predetermined highest frequency of interest, comprising in combination:

- an elongated plate of electrically conductive material having respective first and second edges;
- means for mounting said plate to said electronic apparatus such that, when said electronic apparatus is assembled within said enclosure, said second edge overlaps a conductive surface of said enclosure at said receptacle opening;
- grounding means for providing an electrical ground connection between said strip and said electronic apparatus; and
- at least one elongated finger formed at said second edge to provide a discontinuity in said second edge, said finger being substantially parallel to said second edge and of a length substantially equal to a predetermined fraction of the wavelength of said predetermined highest frequency of interest.

4,873,395

PERSONAL COMPUTER EXPANSION SLOT SEAL AND METHOD

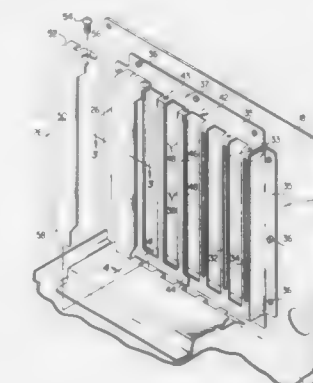
Thomas R. Mast, Austin, Tex., assignor to CompaAdd Corporation, Austin, Tex.

Filed Nov. 14, 1988, Ser. No. 270,266

Int. Cl.⁴ H05K 9/00

U.S. Cl. 174-35 GC

11 Claims



1. An improved personal computer chassis, wherein the improvement comprises:

- at least one expansion slot on a base for receiving electronic circuit cards, said slot having edges;
- at least one expansion slot cover;
- a spring-loaded retainer fixed to said base to bias said slot cover against said expansion slot edges; and
- an expansion slot seal disposed between said expansion slot edges and said slot cover such that said retainer forces said cover into said seal, and said seal into said slot edges, to retard the escape of radio frequency from the chassis.

4,873,396

WALL ELECTRICAL COVER PLATE

Hossein F. Guity-Mehr, Long Beach, Calif., assignor to Texim International, Irvine, Calif.

Filed Apr. 21, 1988, Ser. No. 184,411

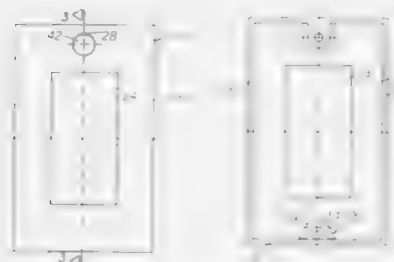
Int. Cl.⁴ H05K 5/03

U.S. Cl. 174-66

2 Claims

- A wall cover plate for covering prior art electrical wiring devices and the like, said cover plate comprising:
 - a front surface farthest from the wall after installation;
 - a back surface opposite the front surface, part of which back surface defines an M-groove near the center bottom of said back surface, said M-groove capable of mating with a

protruding screw coupled to an electrical wiring device installed on the wall;
an interior surface communicating between front and back surfaces and defining only one screw groove oriented such that coupling the M-groove to one of the two screws protruding from a prior art installed electrical wiring device such as a switch permits the second of said two



electrical wiring device screws to pass through the center of the screw groove, which screw groove has a diameter just slightly greater than the diameter of the electrical wiring device screw; and
a screw groove cover removably coupling to said screw groove to cover the head of the screw therethrough after installation.

4,873,397

ELECTRONIC CIRCUIT ELEMENT

Sho Masujima; Hiroshi Yagi; Atsuo Tamashima, and Jun Tamashima, all of Tokyo, Japan, assignors to TDK Corporation, Tokyo, Japan

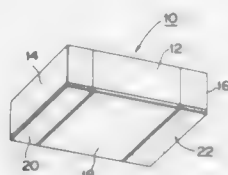
Filed Dec. 28, 1987, Ser. No. 138,237

Claims priority, application Japan, Dec. 25, 1986, 61-200044[U]; Mar. 25, 1987, 62-43693[U]; Mar. 25, 1987, 62-43694[U]

Int. Cl.⁴ H05K 1/18

U.S. Cl. 174-117 A

10 Claims



1. A surface-mounted-type electronic circuit element adapted to be mounted on a printed circuit board, comprising:
an element body having a surface opposed to the printed circuit board when mounted thereon;
two external terminals mounted at two ends of said element body;
adhesive means provided on said surface opposite to the printed circuit board, said adhesive means being formed of a material which exhibits adhesion only when it is heated;
a solder layer provided on a surface of each said external terminal, which is opposite to said printed circuit board, said solder layer being formed of a solder material which effects soldering at a temperature of about 100° C. and is remelted at a temperature of at least about 130° C.

4,873,398
FLAT PANEL DISPLAY WITH INTEGRATED DIGITIZING TABLET

Laurence M. Hubby, Jr., Palo Alto, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jan. 30, 1988, Ser. No. 213,756

Int. Cl.⁴ G08C 21/00; G03B 21/14

U.S. Cl. 178-18

14 Claims



1. A flat panel display comprising:
a screen;
means for projecting an image; and
a substantially thin lens for focusing said image on said screen.

4,873,399

INK-ON-GLASS DIGITIZER TABLET AND METHOD OF CONSTRUCTION

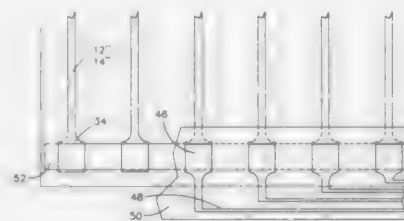
Waldo L. Landmeier, Scottsdale, Ariz., assignor to Calcomp Inc., Anaheim, Calif.

Filed Dec. 20, 1988, Ser. No. 286,700

Int. Cl.⁴ G08C 21/00

U.S. Cl. 178-18

13 Claims



1. A digitizer tablet structure comprising:
(a) a glass substrate having top and bottom surfaces;
(b) a plurality of parallel, spaced conductive ink first conductors disposed on said top surface of said substrate, said first conductors terminating in conductive ink pads adjacent a side edge of said substrate;
(c) a plurality of parallel, spaced conductive ink second conductors disposed on said bottom surface of said substrate perpendicular to said first conductors, said second conductors terminating in conductive ink pads adjacent another side edge of said substrate;
(d) a flexible connector strip containing a plurality of flexible conductors terminating in conductive pad ends disposed with said pad ends over respective ones of said conductive ink pads; and
(e) electrically conductive adhesive means disposed between respective ones of said conductive pad ends and said conductive pad end's associated said conductive ink pad.

4,873,400

MANUALLY ACTIVATED POSITION INDICATOR

Werner Rapp, Geislingen; Walter Link, Rutesheim, and Giovanni Quinzio, Stuttgart, all of Fed. Rep. of Germany, assignors to Enchner & Co., Fed. Rep. of Germany

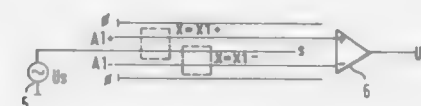
Filed Jul. 8, 1988, Ser. No. 216,294

Claims priority, application Fed. Rep. of Germany, Jul. 10, 1987, 3722890

Int. Cl.⁴ G08C 21/00

U.S. Cl. 178-19

13 Claims



1. A manually activated position indicator with electrical output signals, comprising:
(a) a plurality of adjacent electrodes (S, A1-, A1+, B1-, B1+, Ax-, Ax+, Bx-, Bx+, Ay-, Ay+, By-, By+), which are electrically insulated from one another and are covered on one side by an electrically insulating layer (3) the side of which opposite said electrodes is provided as a support surface for a finger (4) of the user of said position indicator wherein;
(b) said electrodes form at least three groups;
(c) all of the electrodes (S) of a first group are connected to a voltage source (5) that delivers an alternating voltage (Us);
(d) the electrodes of the other groups are connected to a signal evaluating circuit; and
(e) at least one electrode of said other groups is arranged adjacent to an electrode (S) of the first group.

4,873,401

ELECTROMAGNETIC DAMPED INERTIA SENSOR

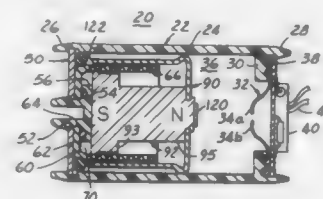
John A. Ireland, Chatham, Canada, assignor to Bendix Electronics Limited, Chatham, Canada

Filed Sep. 19, 1988, Ser. No. 246,588

Int. Cl.⁴ H01H 35/14

U.S. Cl. 200-61.45 M

18 Claims



1. A sensor comprising:
a housing;
an inertial mass that moves within said housing from a first position to a second position in response to an acceleration or deceleration signal of predetermined amplitude and duration in a sense urging said inertial mass toward the second position;
first means for indicating that the inertial mass has moved to the second position; and
second means, comprising a magnet and an electrical conductor, said magnet serving to hold said inertial mass in the first position until occurrence of such a signal, and said magnet and said conductor serving for generating an electro-magnetic force which is in response to motion of said inertial mass toward the second position and acts to dampen the motion of the inertial mass, one of said magnet and said electrical conductor being movable with said

inertial mass and the other of said magnet and said electrical conductor being affixed to said housing.

4,873,402

PUSH-BUTTON SWITCH WITH PLUNGER AND SWITCHING MECHANISM

Sueaki Honda, Kurayoshi; Mitsuji Hayashi, Nagaokakyo; Takashi Niwa, Kyoto; Akihiko Hayakawa, Kyoto, and Hideyuki Bingo, Uji, all of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

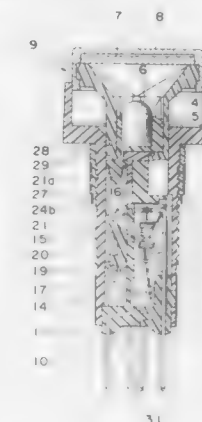
Division of Ser. No. 67,391, Jan. 26, 1987, Pat. No. 4,516,630, which is a continuation of Ser. No. 816,619, Jan. 6, 1986, abandoned. This application Sep. 16, 1988, Ser. No. 245,278

Claims priority, application Japan, Jan. 8, 1985, 60-1337; Jan. 8, 1985, 60-1338; Jan. 9, 1985, 60-1304; Jan. 9, 1985, 60-1305

Int. Cl.⁴ H01H 9/00

U.S. Cl. 200-283

3 Claims



1. A push-button switch, comprising:
a housing;
a base fixed to said housing;
a plunger mechanism movable within said housing;
a switching mechanism disposed within said housing which is movable between an on and an off state;
an operating member which moves in association with said plunger mechanism so as to move said switching mechanism between the on and the off state; and
a fixed terminal fixed to said base and being of an inverted L-shape having a curved corner portion;
wherein said operating member has through-hole located at one end thereof through which an end portion of said fixed terminal extends, and wherein said fixed terminal has a shoulder portion which engages with opposing side edges of said through-hole

4,873,403

ON-OFF SWITCH SYSTEM FOR A PAIR OF CONDUCTORS

Richard Counts, Dallas, and Rob Pritchett, Carrollton, both of Tex., assignors to Prescolite, Inc., San Leandro, Calif.

Continuation of Ser. No. 47,046, May 5, 1987. This application Jul. 28, 1988, Ser. No. 225,533

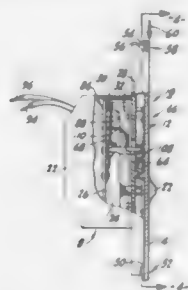
Int. Cl.⁴ H01H 9/12

U.S. Cl. 200-330

8 Claims

1. An ON-OFF switch system comprising:
a first and second electrical conduits mechanically connected to a support element, said support element having an electrical terminal distinct from said first and second electrical conduits;
a first plate, said first plate including a first side and a second side, said second side of said first plate including an appendage;

- c. a second plate including a first side and a second side and further including an opening therethrough;
- d. means for linearly sliding said first plate relative to said second plate with said second side of said first plate being removably maintained in facing relationship with said first side of said second plate;
- e. first and second electrical contact members for electrical linkage to said first and second electrical conduits, said first electrical contact member being mechanically connected to said support element, said support element being mechanically connected to said second plate, said second electrical contact member being movable relative to said first electrical contact member;
- f. an arm contacting said movable second electrical contact member, said arm extending through said opening in said



a peripheral surface in rolling engagement with edges of said opening.

4,873,405

SWITCHING DEVICE

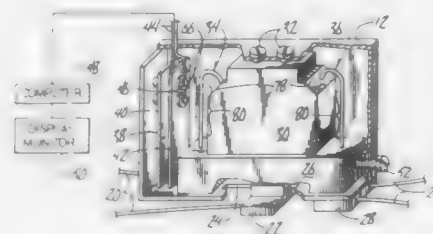
Gerald A. Parks, Ames, Iowa, assignor to Iowa State University Research Foundation, Inc., Ames, Iowa
Division of Ser. No. 882,310, Jul. 7, 1986, Pat. No. 4,755,642.

This application Jan. 11, 1988, Ser. No. 141,824

The portion of the term of this patent subsequent to Jul. 5, 2005, has been disclaimed.
Int. Cl.⁴ H01H 15/12

U.S. Cl. 200—547

7 Claims



1. A switching device for attachment to a human's skin to close and open in response to contraction or expansion of the skin, the switching action producing signals which can be directed to a computer device to produce communications and instructions comprising:

- a block means;
- a carriage means attached to the block means by spring means, said spring means being resilient to bias the carriage means in a first position spaced apart from the block means;
- a first connecting means extending between the carriage means and a first skin attachment means;
- a second connecting means attached between said block means and a second skin attachment means;
- at least one switch means positioned adjacent to the carriage means and being responsive to movement of the carriage means away from the first position;
- so that sufficient movement of the first skin attachment means with respect to the second skin attachment means by contraction or expansion of the skin at or around the first and second skin attachment means causes movement of the carriage means from the first position, in turn causing switching action of the switching means.

4,873,404

LOW-FRICTION DRIVE LINK FOR AUXILIARY HANDLE OPERATION TO MOLDED CASE CIRCUIT BREAKER CONNECTION

Ronald J. Fritsch, Sumner, Wis., assignor to Eaton Corporation, Cleveland, Ohio

Filed Aug. 17, 1988, Ser. No. 233,102

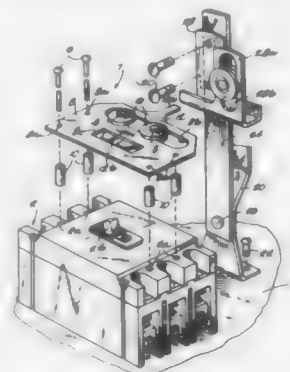
Int. Cl.⁴ H01H 25/00

U.S. Cl. 200—332

6 Claims

1. A low-friction drive link connecting auxiliary handle operator means to a molded case circuit breaker, said circuit breaker having a constituent operating handle and a superstructure supporting a linearly reciprocally movable slide disposed over said operating handle, said slide having a projection disposed transversely to direction of movement of said slide, said handle operator means having a drive lever pivotally supported at one side of said circuit breaker and movable in a plane parallel to a plane of movement of said circuit breaker operator handle, said drive lever including means defining an elongated opening oriented angularly to said direction of movement of said slide at each possible position of said drive

lever, said projection extending within said opening, and roller means disposed over said projection, said roller means having



4,873,406

MICROWAVE POPCORN POPPER

Gary L. Connor, HC 01 P.O. Box 74, Coulee DAM, Wash.

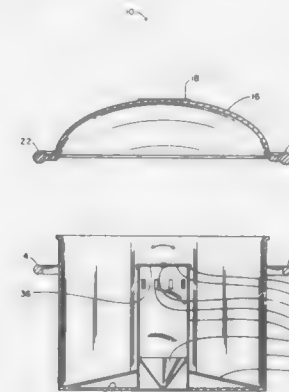
WW116

Filed Dec. 23, 1988, Ser. No. 289,054

Int. Cl.⁴ H05B 6/80; A23L 1/18

U.S. Cl. 219—10.55 E

11 Claims



1. A microwave popcorn popper, comprising:
- a generally cylindrical open topped container having a flat circular floor;
- a domed cover removably received in sealing relation over said open topped container, a plurality of vent apertures provided in said cover;
- a raised frusto conical partition having a radially outwardly and axially downwardly inclined upper surface in said container, above said circular floor;
- an elongated cylindrical tube centrally disposed in said container, said tube received through a central circular aperture in said frusto conical partition with a bottom end of said tube resting on said flat circular floor;
- an upwardly opening cone received in a bottom of said tube for holding a quantity of unpopped corn and popping oil;
- a plurality of vent apertures spaced circumferentially around a top portion of said tube;
- and
- a circular cap over an open top end of said tube, said cap formed by two semi-circular plates connected by a central hinge.

4,873,407

DIELECTRIC CROSS MACHINE MOISTURE CONTROL

Douglas W. P. Smith, Port Coquitlam, Canada, assignor to Devron-Hercules, Inc., North Vancouver, Canada

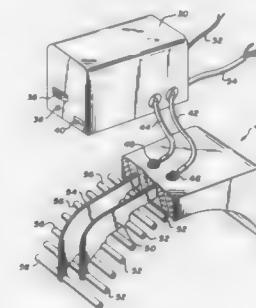
Continuation of Ser. No. 946,421, Dec. 24, 1986, abandoned.

This application Feb. 17, 1989, Ser. No. 312,438

Int. Cl.⁴ H05B 6/54

U.S. Cl. 219—10.43

11 Claims



1. A method of applying heat to a paper web by subjecting

the web to dielectric heating in discrete segments, comprising the steps of:

- providing a plurality of discrete heating modules distributed transverse to the width of the web and all opposite one major surface of the web to control moisture in the web in the cross-machine direction;
- providing in each of said heating modules a plurality of pairs of equally-spaced heating electrodes, with said heating electrodes extending over a respective one of said discrete segments in a spaced-apart array facing said surface of the web and with said heating electrodes being equally spaced from the web;
- connecting one electrode of each of said pairs together to a first current supply conductor and the other electrode of each of said pairs together to a second current supply conductor; and
- energizing said heating modules by supplying an electrical current through said conductors to effect dielectric heating of said web so that the web is heated by current flow between said electrodes in accordance with the moisture profile of said web.

4,873,408

MAGNETRON WITH MICROPROCESSOR BASED FEEDBACK CONTROL

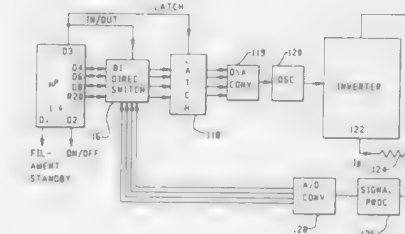
Pamela S. Smith, Anchorage, Ky., and Peter H. Smith, deceased, late of Anchorage, Ky. (by Pamela S. Smith, executor), assignors to General Electric Company, Louisville, Ky.

Filed Dec. 28, 1987, Ser. No. 138,139

Int. Cl.⁴ H05B 6/68

U.S. Cl. 219—10.55 B

17 Claims



1. A microwave energy generating system comprising:
- a magnetron operable to generate microwave energy for cooking;
- a power transformer having a primary and a magnetron powering secondary;
- an inverter having controlled switches and connected to supply power to said primary by selectively switching said controlled switches;
- a control circuit for controlling operation of said inverter, said control circuit having an oscillator and operable to generate gating pulses to switch said controlled switches;
- a first feedback loop having a current sensor and a comparing means, said current sensor providing a sensed signal dependent on a current within a part of the system, said comparing means comparing said sensed signal with a reference signal and generating a shutdown signal when the current sensed by the current sensor exceeds a value corresponding to said reference signal; said comparing means being connected to said control circuit such that the shutdown signal stops the control circuit from supplying gating pulses to said controlled switches; and
- a second feedback loop including a microprocessor, and a magnetron power sensing means, said magnetron power

sensing means providing a signal to said microprocessor dependent upon magnetron power, said microprocessor being connected to said control circuit to adjust inverter operation to stabilize magnetron power at a desired level; and wherein said first feedback loop has a relatively fast response time, and said second feedback loop has a relatively slow response time.

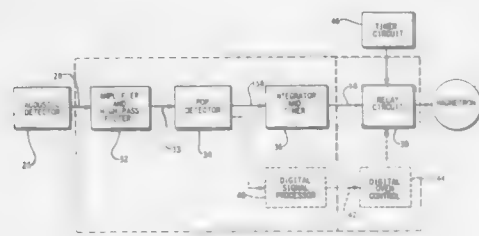
4,873,409

CLOSED-LOOP MICROWAVE POPCORN CONTROL
Fred T. Spruytenburg, 3321 Piedmont Cove, Memphis, Tenn. 38115; Charles McDonald, 4135 Cottonwood, Memphis, Tenn. 38118, and Michael J. Hodgetta, 7991 Elm Leaf Dr., Germantown, Tenn. 38138

Filed Oct. 26, 1987, Ser. No. 113,646
Int. Cl.⁴ H05B 6/68

U.S. Cl. 219—10.55 M

24 Claims



1. A closed-loop automatic control for popping popcorn in a microwave oven comprising:
 - (a) sound transducer means acoustically coupled to a microwave oven cavity having
 - (i) an input for receiving sound generated by the popping of popcorn in the microwave oven cavity, and
 - (ii) an electrical output representative thereof;
 - (b) interface circuit means having
 - (i) an input connected to the electrical output of the sound transducer, and
 - (ii) an output providing a shut-off signal responsive to a decreasing level of popping rate of popcorn in the oven; and
 - (c) a microwave oven control circuit having:
 - (i) an input connected to the interface circuit output, and
 - (ii) an output connected to control a source of microwaves in response to a signal at the input
- wherein the interface circuit means provides the shut-off signal to the oven control circuit when the rate of individual popping of the popcorn falls to an end rate corresponding to the effective completion of popping such that the oven control circuit and source of microwaves are thereafter deactivated.

4,873,410

PARALLEL GAP WELDER

Samuel S. Aidlin; Stephen H. Aidlin; Russell O. Bailey, all of Sarasota, and Ed Myers, Bradenton, all of Fla., assignors to Aidlin Automation Corp., Sarasota, Fla.

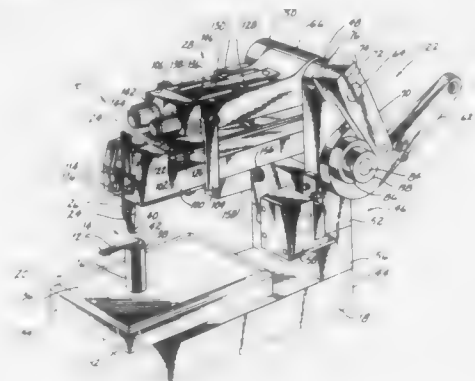
Filed Dec. 28, 1987, Ser. No. 138,352
Int. Cl.⁴ B23K 11/16

U.S. Cl. 219—56.1

5 Claims

1. A welder comprising:
 - a base means having a surface to support a workpiece in a predetermined position;
 - vertical support means extending from the rear end of the base means;
 - a first shaft means journaled for rotation in the vertical support mean;
 - a first support means mounted on the first shaft means be-

tween the vertical support means for movement in an arcuate path of travel;
follower arm means secured to one end of the first shaft means;
second shaft means secured between the vertical support means;
handle means mounted for rotation on the second shaft means, the handle means being provided with rotatable cam means to rotate the follower arm means, first shaft means and first support means in response to movement of the handle means;
second support means secured at their rear ends to the second shaft means for movement in an arcuate path of travel;



electrode means secured to the front ends of the second support means for movement in an arcuate path of travel; bracket arm means secured to the edges of the first support means to provide shoulders for supporting the second support means and limit their downward motion; leaf spring means secured at their rear ends to the first support means;
finger means mounted for longitudinal movement with respect to the first support means with their lower edges adapted to contact predetermined portions of the leaf spring means for varying the tensions to be applied to the workpiece by the electrode means; and
electrical means responsive to motion of the handle means to energize the electrode means after they have contacted the workpiece.

4,873,411

METHOD OF SPOT-WELDING FLAT-TYPE ELECTRICAL WIRES TO METAL TERMINALS

Haruo Saen, and Kougi Kobayashi, both of Tochigi, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

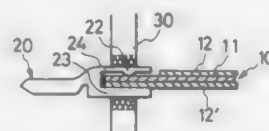
Filed Jan. 11, 1988, Ser. No. 141,749

Claims priority, application Japan, Jan. 9, 1987, 62-2861

Int. Cl.⁴ B23K 11/14

U.S. Cl. 219—93

3 Claims



1. In a method of spot welding a flat-type electrical conductor, consisting of at least one conductor sandwiched between insulators, to a metal terminal, consisting of first and second metal plates at least partially connected to each other, comprising the steps of:
 - removing the insulator from one side of the conductor at an

end portion of the flat-type electrical conductor to expose the conductor on said one side;
providing one of said first and second metal plates with a projection;
placing said first and second metal plates over said end portion of the flat-type electrical conductor such that the one of the first and second metal plates with the projection is disposed over said exposed conductor; and
contacting said projection with said exposed conductor before said conductor is spot-welded to said metal plates.

4,873,413

METHOD AND APPARATUS FOR WRITING A LINE ON A PATTERNED SUBSTRATE

Fumihiko Uesugi, and Yukio Morishige, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

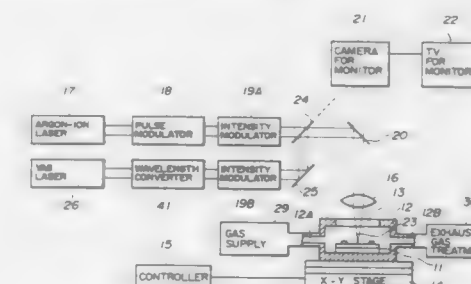
Filed Nov. 20, 1987, Ser. No. 123,460

Claims priority, application Japan, Nov. 20, 1986, 61-75234; Nov. 25, 1986, 61-280995

Int. Cl.⁴ B23K 26/00

U.S. Cl. 219—121.68

5 Claims



4,873,412
AUTOMATIC FEED APPARATUS, FOR FUSION WELDING MACHINE, AND ELECTRODE HOLDER THEREFOR

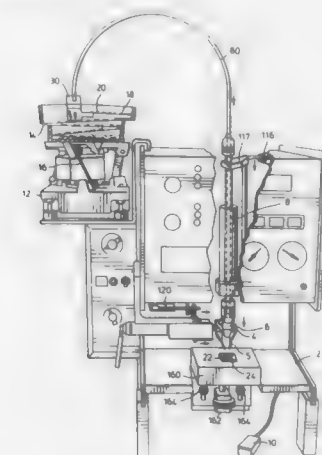
Peter S. Vinczer, 1 Parkington Crescent, Scarborough, Ontario, Canada (M1H 2T6), and Ferenc B. Vinczer, 2 Lynch Rd., Willowdale, Ontario, Canada M2J 2V5

Filed Dec. 18, 1986, Ser. No. 943,114

Int. Cl.⁴ B23K 9/22

U.S. Cl. 219—95

20 Claims



1. An automatic feed apparatus, for a fusion welding machine, the automatic feed apparatus comprising:
 - an electrode holder, adapted for mounting on a driver cylinder of a fusion welding machine for holding a pin for fusion welding to a base piece, the electrode holder including a clamping means for clamping a pin;
 - a holder control unit, which is mounted for opening the clamping means of the electrode holder;
 - a feeding device for feeding pins to the electrode holder; and
 - a feed control unit, which is connected to the feeding device and to the holder control unit, operation of the holder control unit and feed control unit being synchronized, so that the feed control unit only actuates the feeding device to feed a pin to the electrode holder when the holder control unit has opened the electrode holder, and after a predetermined time, the feed control unit terminates actuation of the feeding device and the holder control unit releases the clamping means, thereby clamping a pin.

4,873,414

LASER DRILLING OF COMPONENTS

Kong Ma, Duluth, and John T. Pinder, Marietta, both of Ga., assignors to Rolls Royce Inc., Greenwich, Conn.

Filed Jun. 13, 1988, Ser. No. 206,125

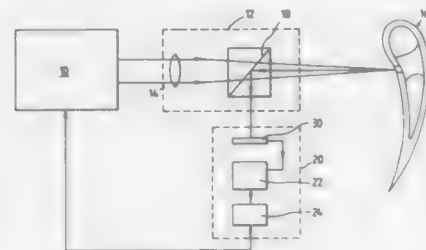
Int. Cl.⁴ B23K 26/00

U.S. Cl. 219—121.7

17 Claims

1. A method of drilling through an outer wall of a hollow component in which a laser beam is directed at an outer surface of the outer wall and emerges from an inner surface of the

component, comprising the step of providing at the inner surface of the component, in the vicinity of where the beam



emerges, a thixotropic medium that comprises material for dispersing the laser light.

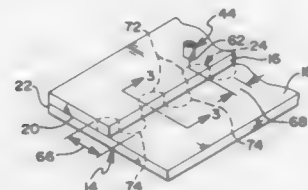
4,873,415

METHOD FOR WELDING GALVANIZED MATERIAL
Trevor A. Johnson, Orland Park, Ill., and Sharon L. Gorscak, Ann Arbor, Mich., assignors to Raycon Corporation, Ann Arbor, Mich.

Filed Feb. 2, 1988, Ser. No. 151,465
Int. Cl.⁴ B23K 26/00

U.S. Cl. 219—121.64

16 Claims



1. Method for welding galvanized steel comprising the steps of:

- electroplating mild steel with a gum coating of zinc;
- spraying the gum coated steel with a zinc rich coating having a thickness in the range of 0.001 to 0.3 millimeters;
- providing a plurality of sheets with the aforesaid first and second coatings and with an edge on each of the sheets;
- juxtaposing the plurality of sheets with one another to form a lapped joint at edges of at least two of said plurality of sheets; and
- laser welding the juxtaposed sheets at the lapped joint along a pattern which will bond the juxtaposed sheets to one another while providing for the escape of vapor generated at the weld pool through a path at the lapped joint.

4,873,416

METHOD FOR THE APPLICATION AND FASTENING OF ROTATING BANDS ON PROJECTILE BODIES
Dieter Böder, Düsseldorf, Fed. Rep. of Germany, assignor to Rheinmetall GmbH, Düsseldorf, Fed. Rep. of Germany

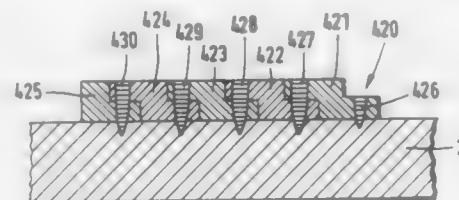
Filed Sep. 28, 1987, Ser. No. 105,954
Int. Cl.⁴ B23K 26/00

U.S. Cl. 219—121.64

12 Claims

1. A method for the application of rotating bands on a projectile body comprising: winding at least one layer of a first ribbon-like material around the projectile body; fastening the

ribbon-like material on the projectile body by applying a laser in a deep-penetration welding process; and giving the beam an



intensity so that only a small zone near the surface of the projectile body is melted to the ribbon-like material.

4,873,417

LASER MACHINING APPARATUS

Masaharu Moriyasu; Takeshi Morita, and Megumi Ohmine, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

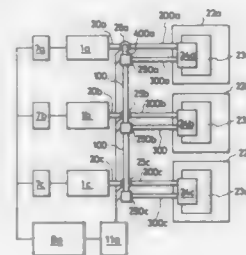
Filed Dec. 24, 1987, Ser. No. 137,690

Claims priority, application Japan, Dec. 26, 1986, 61-308382; Dec. 26, 1986, 61-308384

Int. Cl.⁴ B23K 26/00

U.S. Cl. 219—121.6

9 Claims



1. A laser machining apparatus for machining a workpiece by irradiating the workpiece with laser beams generated by a plurality of laser oscillators, said plurality of laser oscillators including CO₂ laser, a single mode CO₂ pulse laser, and a continuously excited Q switch YAG pulse laser, said apparatus comprising:

- a plurality of laser beam machining portions, each composed of one of said plurality of laser oscillators, a machining station and a first laser beam transmission path;
- a plurality of second laser beam transmission paths connecting adjacent ones of said first laser beam transmission paths; and
- a plurality of laser beam converters each provided in a junction between one of said first laser beam transmission paths and a respective one of said second laser beam transmission paths.

4,873,418

COMPOUND MACHINING APPARATUS

Isao Katayama, Kagamiyama, Japan, assignor to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Continuation-in-part of Ser. No. 239,218, Aug. 31, 1988, Pat. No. 4,833,292. This application Feb. 16, 1989, Ser. No. 310,911

Claims priority, application Japan, Sep. 3, 1987, 62-134893

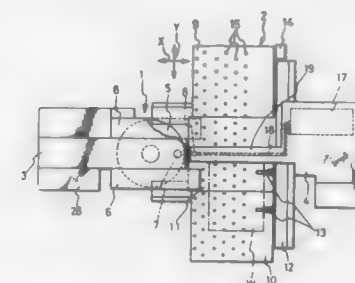
Int. Cl.⁴ B23K 26/00

U.S. Cl. 219—121.6

11 Claims

1. A compound machining apparatus comprising a punch press, a laser oscillator having a long side and a movable table device having a table movable in a first direction, characterized in that the punch press and the movable table device are

provided on separate frames, respectively, and the laser oscillator, a laser beam machining head and a guide tube for guiding a laser beam from the laser oscillator to the laser beam machin-



ing head are collectively placed on the same frame as the frame of said movable table device, wherein the long side of the laser oscillator is arranged substantially perpendicular to the first direction.

4,873,419

AUTOMATIC WELDING APPARATUS FOR WELD BUILD-UP AND METHOD OF ACHIEVING WELD BUILD-UP

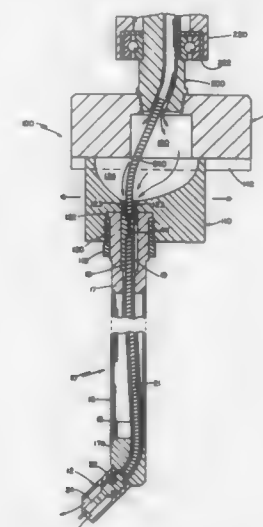
Rees H. Acheson, Hill Rd., Alstead, N.H. 03602

Continuation-in-part of Ser. No. 759,543, Jul. 26, 1985, abandoned, which is a continuation-in-part of Ser. No. 707,341, Mar. 10, 1985, abandoned. This application Jan. 2, 1986, Ser. No. 815,682

Int. Cl.⁴ B23K 11/30

U.S. Cl. 219—125.1

7 Claims



1. Welding apparatus for weld build-up on a surface of revolution, comprising:

- an elongated, rotatable assembly that supports, at one end, an electrical welding torch that terminates in a nozzle, said rotatable assembly being adapted to introduce electrical welding current, inert gas, and welding wire to the torch, characterized in that
- said assembly comprises an electrically conductive, hollow, metal drive spindle,
- means are provided for both applying driving motion and conducting electrical current by said metal drive spindle for transmission to the torch, and
- means are provided for passage of gas and welding wire through said current-carrying spindle to the torch,
- said means for conducting electrical current to said drive

4,873,420

Patent Not Issued For This Number

4,873,421

LIQUID-FILLED ELECTRIC RADIATOR

Roland Brehmer, Fellingsbro, Sweden, and Adolfo Papi, Arras, France, assignors to AB Fellingsbro Verkstader, Sweden

PCT No. PCT/SE86/00053, § 371 Date Oct. 27, 1986, § 102(e) Date Oct. 27, 1986, PCT Pub. No. WO86/04666, PCT Pub. Date Aug. 14, 1986

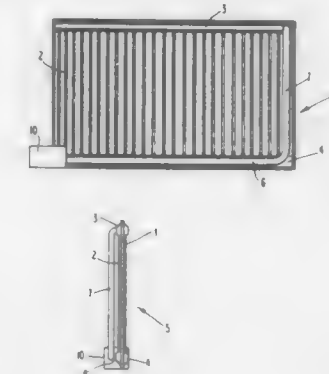
PCT Filed Feb. 7, 1986, Ser. No. 919,810

Claims priority, application Sweden, Feb. 8, 1985, 8500586

Int. Cl.⁴ H05B 1/02; F24H 3/10

U.S. Cl. 219—341

3 Claims



1. A liquid-filled electric radiator comprising a generally rectangular, vertically disposed radiator body having an upper horizontal distribution duct and a lower horizontal collection duct, said ducts being in liquid connection to each other through a plurality of connecting ducts within the radiator body and through a separate vessel in the form of an angularly bent pipe having a mainly uniform cross section and including a first section connected in series with a second section, said bent pipe having its free ends connected respectively to said upper and lower ducts at diagonally opposite positions on said radiator body, said first section of said pipe being arranged parallel to and in level with said lower collection duct and being connected at its free end to said lower duct via a short branch pipe, while said second section of said pipe is arranged parallel to and immediately adjacent the vertical side of the radiator body within the border line of the body and having its free end connected to the distribution duct, an electric immersion heating element housed in said first section for heating a liquid filling said ducts and said vessel, said first section having a hermetically sealed connection at its free end through which pass means for energizing the immersion heating element.

4,873,422

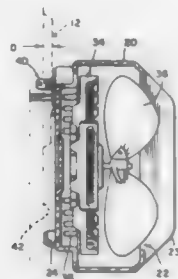
WALL MOUNTED HEATER WITH PLUG MOUNT AND SUPPORT

Herbert K. Streich, Scottsdale; Robert D. Leach, Phoenix; Joel R. Johnson, Peoria; Thomas B. Olson, Paradise Valley, and Donald L. Townsend, Chandler, all of Ariz., assignors to Arvin Industries, Inc., Columbus, Ind.

Filed May 5, 1988, Ser. No. 190,497
Int. Cl.⁴ H05B 3/02

U.S. Cl. 219—370

24 Claims



1. A heater assembly for heating a space contained at least in part by a wall, the heater assembly being adapted to be supported by an electrical receptacle mounted in the wall, the heater assembly comprising,

heater means for generating heat when receiving electrical power,

cover means for supporting and enclosing the heater means, means for forcing air into the cover means to be heated by the heater means and to be discharged out of the cover means to heat the space,

a plug that is mateable directly with the wall-mounted electrical receptacle to provide power to the heater means only when the plug is mated with the receptacle,

mounting means for mounting the plug directly in the cover means such that the plug acts to directly support the cover means only when the plug is mated with the receptacle,

contact means situated below the plug and adapted to contact the wall below the receptacle so that the entire heater assembly is maintained in position solely by the plug and contact means.

4,873,423

HIGH TEMPERATURE HEATING FURNACE

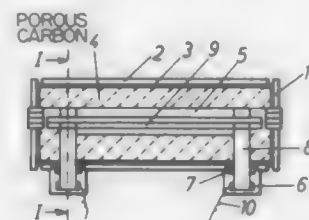
Suzuma Takahashi, Yokohama, Japan, assignor to Kanto Yakin Kogyo Kabushiki Kaisha, Japan

Filed Apr. 21, 1988, Ser. No. 184,224

Claims priority, application Japan, Aug. 21, 1987, 62-207912
Int. Cl.⁴ H05B 3/02

U.S. Cl. 219—390

2 Claims



1. A high temperature heating furnace having therein carbon or graphite heating elements operative to heat the interior of said furnace to a temperature range of approximately 2000° C. to 3000° C., and which comprises a frame, a liner having there-through a space extending longitudinally throughout a longitu-

dinal distance of the furnace for passing therethrough articles to be treated by the furnace, said liner being formed within said frame by thermal insulation blocks having internal surfaces facing upon and defining said space, and being made from porous carbon having an electric resistivity in the range of approximately 1 to 6 $\Omega \cdot \text{cm}$, and at least a pair of said carbon or graphite heating elements having an electric resistivity in the range or approximately 0.001 to 0.0007 $\Omega \cdot \text{cm}$, and being mounted to extend longitudinally of the furnace and along opposite sides, respectively, of said space.

4,873,424

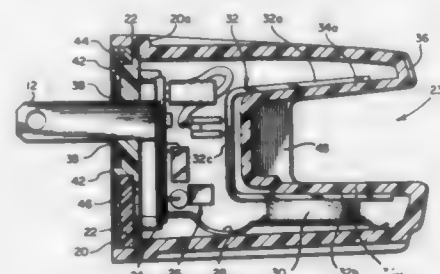
WALL PLUG LENDS DISINFECTOR

Francis E. Ryder, Arab; Rowland W. Kanner, Guntersville, and Fred E. Williams, Arab, all of Ala., assignors to Ryder International Corporation, Arab, Ala.

Filed Jul. 19, 1988, Ser. No. 221,283
Int. Cl.⁴ H05B 3/14

U.S. Cl. 219—521

25 Claims



1. An appliance for electrically heated disinfection of contact lenses or similar objects, by direct electrical connection of the appliance to an electrical wall outlet, comprising:

(A) a housing having a pair of opposite side walls and a receiving cavity for insertion of a storage compartment containing a lens and disinfecting liquid;

(B) said housing including a floor wall below said cavity and a cover portion overlying said cavity for preventing vertical access to said storage compartment when said compartment is installed in said cavity;

(C) said housing further including a pair of horizontally aligned side openings through said respective opposite housing side walls, each of said openings being located and dimensioned to allow sliding passage of said storage compartment therethrough so that the storage compartment will fall by gravitation from said housing cavity through one of said side openings when said housing is rotated 90° to vertically align said side openings; and

(D) heating means for electrically generated heating of said storage compartment installed in said cavity, wherein said heating means comprises heat radiation means located above and separated from said cavity by a section of said cover portion, so that said radiation means generates downwardly directed radiant energy for heating said contact lens compartment without requiring heat conducting contact therewith.

4,873,425

VANDAL RESISTANT READ/WRITE DEVICE FOR ELECTRONIC MEMORY CARDS

Joel Langlais, Verrieres, and Maurice Paumard, Velizy, both of, assignors to Schlumberger Industries, Montrouge, France

Filed Apr. 6, 1988, Ser. No. 178,164

Claims priority, application France, Apr. 9, 1987, 87 04992; Oct. 22, 1987, 87 14601

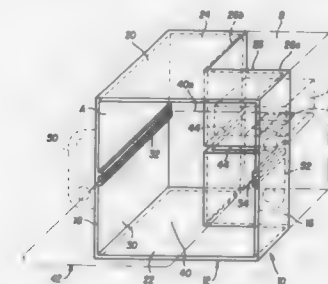
Int. Cl.⁴ G06K 13/00

U.S. Cl. 235—441

17 Claims

1. A read/write device for electronic memory cards com-

prising a card body with electrical contact tabs disposed in one of the main faces of said card body, said device comprising: a housing provided with a front opening for enabling said card to be inserted into said housing; a read/write head including electrical connection components disposed inside said housing; guidance means for guiding said card between said front opening and a processing position in which said contact



tabs are suitably placed for coming into contact with said connection components of said read/write head; and means for maintaining the portion of said card body including said contact tabs in position while said card is in the processing position, whereby said contact tabs are applied against said connection components of the read/write head; at least that region of the housing in which said read/write head is disposed being unobstructed at least at the bottom thereof.

4,873,426

TECHNIQUE FOR READING BAR CODES

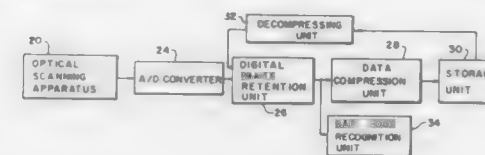
David E. Y. Sarna, Teaneck, N.J., and Daniel Mailick, New Rochelle, N.Y., assignors to Image Business Systems Corporation, New York, N.Y.

Filed Aug. 3, 1988, Ser. No. 227,826

Int. Cl.⁴ G06K 7/10

U.S. Cl. 235—462

52 Claims



1. A bar code apparatus for processing digitized bar code data stored electronically in bit map form and representative of a bar code having parallel bar code components including alternating dark bars and blank spaces carried on a light reflective surface, said bar code data being obtained by scanning said surface in lines along a primary scanning direction substantially perpendicular to the bar code components and at a resolution of a predetermined number of pixels per unit length to generate for a line of said pixels respective bar code signals having values related to the amount of light reflected by said dark bars and blank spaces, respectively, and scanning in a secondary scanning direction substantially perpendicular to said primary scanning direction to traverse a plurality of said scanning lines at a resolution of a predetermined number of lines per unit length, said bit map being produced from said bar code signals and having a plurality of bits arranged in rows, said rows corresponding, respectively, to the scanning lines, and the bits in each row corresponding to the pixels in a corresponding one of said scanning lines, the bit map bits having a bit value related to the bar code signal value of the corresponding pixels; said apparatus comprising:

memory means for storing assigned bar code component data related to a number of bits allotted, respectively, in a row of said bit map to said bar code components;

means for comparing the bit map with the stored bar code

component data to identify said bar code components in said bit map; and conversion means for providing from said identified bar code components a bar code reading result for converting the bar code to the message it represents.

4,873,427

CARD OR PASS IN PLASTIC MATERIAL INCORPORATING AN INTEGRATED MEMORY CIRCUIT

Antonio Virdia, Trento, Italy, assignor to Pentasystem S.p.A., Trento, Italy

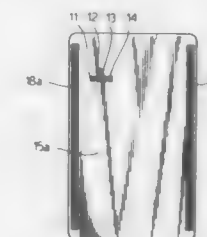
PCT No. PCT/IT86/00050, § 371 Date Jul. 30, 1987, § 102(e)
Date Jul. 30, 1987, PCT Pub. No. WO87/02807, PCT Pub. Date May 7, 1987

PCT Filed Jul. 8, 1986, Ser. No. 76,931

Claims priority, application Italy, Oct. 23, 1985, 22594 A/85
Int. Cl.⁴ G06K 19/06

U.S. Cl. 235—492

7 Claims



1. An identification system, comprising

(a) a card formed of synthetic plastic material which is transparent to infrared rays;

(b) an integrated memory circuit arranged within said card and comprising a plurality of memory cells and voltage conversion circuits for generating the voltages necessary for programming said cells;

(c) an optical code univocally associated with and arranged within said card, said code further being associated with data contained in said memory circuit and being used as a component of an access key for the information stored in said memory circuit via an external reading/writing device; and

(d) four contacts arranged on said card and connected with said memory circuit and including a first contact (VCC) receiving a feed signal, a second contact (VSS) being connected with a feed return line, a third contact (SCL) transmitting a logic signal acting as a clock signal for data and instructions, and a fourth contact (SDA) connected with an open drain two-dimensional line and acting as a support for data and instructions;

(e) the voltage applied to said third and fourth contacts being variable between low and high logic levels;

(f) said external reading/writing device providing the clock signal for transferring data from and to said memory circuit;

(g) the line connected with said fourth contact changing its status only when said third contact is low with said fourth contact status variations occurring when said third contact is high and being used to indicate START and STOP conditions for a transmission;

(h) all controls being preceded by the START condition with no data byte following it and subsequently the selection control is sent with RW=1 and, continuing to generate the clock signal, the desired byte is received from the memory, whereby if the generation of the clock signal continues, the memory continues to send new bytes, increasing the memory address from which they are drawn and if the memory address exceeds the limit of the 256 bytes page, said address is put to zero so that the bits

selected subsequently are taken commencing from the beginning of the same page.

4,873,428

IMAGE PROCESSING APPARATUS USING CONVERSION MEANS

Akihiko Takeuchi, and Yoji Tomoyuki, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan. Continuation of Ser. No. 162,303, Feb. 29, 1988, abandoned.

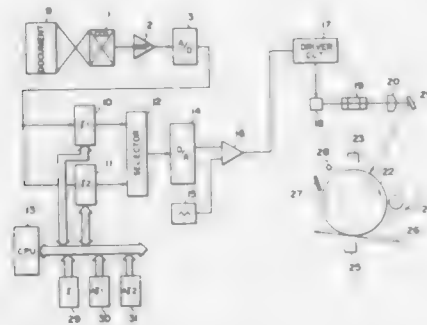
This application Mar. 20, 1989, Ser. No. 325,022

Claims priority, application Japan, Mar. 3, 1987, 62-046780; Mar. 3, 1987, 62-046781; Jun. 30, 1987, 62-164818

Int. Cl.⁴ H04N 1/10

U.S. Cl. 250—214 DC

26 Claims



1. An image processing apparatus comprising: image data generation means; characteristic conversion means for converting a characteristic of image data generated by said image data generation means; said characteristic conversion means including a first conversion table for converting the characteristic of the image data in a first mode, and a second conversion table for converting the characteristic of the image data in a second mode different from the first mode; said first and second conversion tables being selectively used in recording one image; and data formation means for forming data to be stored in said first and second conversion tables; said data formation means having a reference characteristic conversion table to be used as a base in forming the data.

4,873,429

OPTICAL PICK-UP HEAD WITHOUT PICK-UP OF STRAY LIGHT

Hidehiro Kume; Yoshiyuki Matsumoto, and Yoa Yoshitoshi, all of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

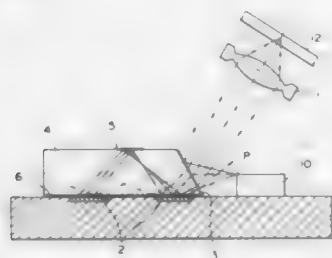
Filed Feb. 3, 1988, Ser. No. 152,007

Claims priority, application Japan, Feb. 6, 1987, 62-25936

Int. Cl.⁴ H01J 3/14

U.S. Cl. 250—216

5 Claims



1. An optical pick-up head which reads information re-

corded on a record medium by irradiating said record medium with light generated from a laser source and receiving return light therefrom by a light sensor, comprising, in combination: a substrate on which the optical sensor is formed; an optical member adhered by adhesive on said optical sensor on said substrate, said adhesive having a refractive index different from that of said optical member; and a semi-transmissive reflective film adapted to reflect light emitted directly from said laser source and to transmit light returned from said record medium, characterized in that light is prevented from directly reaching the optical sensor from the laser source by differentiating the refractive index of said optical member from the refractive index of said adhesive.

4,873,430

METHOD AND APPARATUS FOR OPTICALLY MEASURING CHARACTERISTICS OF A THIN FILM BY DIRECTING A P-POLARIZED BEAM THROUGH AN INTEGRATING SPHERE AT THE BREWSTER'S ANGLE OF THE FILM

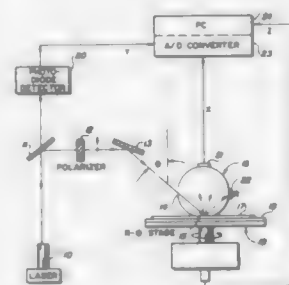
Anthony Juliana; Wai C. Leung, both of San Jose; Victor T. Pan, Fremont; Hal J. Rosen, Los Gatos, and Timothy C. Strand, San Jose, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 25, 1988, Ser. No. 262,558

Int. Cl.⁴ G01V 5/00

U.S. Cl. 250—225

15 Claims



1. A method of optically measuring at least one characteristic of a thin film on a reflecting substrate, comprising the steps of: directing a p-polarized beam of collimated light of known intensity through one aperture in an integrating sphere and via a second aperture therein onto the film at substantially the Brewster's angle of the film; reflecting all the light into the sphere, including (i) all diffusely reflected light and (ii) the light specularly reflected at a region inside the sphere where the specularly reflected light is incident; and sensing the light intensity within the sphere for measuring said at least one characteristic of the film.

4,873,431

RECORDING APPARATUS WITH OPTICAL FIBER CABLE INTERCONNECTING MICROCOMPUTERS

Masazumi Ito, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Aug. 11, 1988, Ser. No. 231,095

Claims priority, application Japan, Aug. 12, 1987, 62-202195; Aug. 17, 1987, 62-204474; Sep. 16, 1987, 62-233233

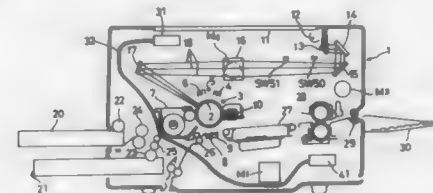
Int. Cl.⁴ H01J 5/16

U.S. Cl. 250—227

11 Claims

9. A control system for controlling a recording apparatus comprising: a reset circuit for generating a reset signal; a light-emitting circuit having a light-emitting device connected to a signal output terminal of said reset circuit; and

optical fiber cable means interconnecting between said light-emitting device and a plurality of microcomputers; each of said microcomputers including, interface means having an electric interface and an optical interface formed integrally with said electric interface, said optical interface including a light-receiving device and adapted for interfacing the reset signal,



an optical fiber cable connector attached to the package of said microcomputer, and an internal light transmission line for connecting said optical fiber cable connector to said optical interface inside said microcomputer package.

4,873,432

COMPOUND APPLICATION DETECTOR

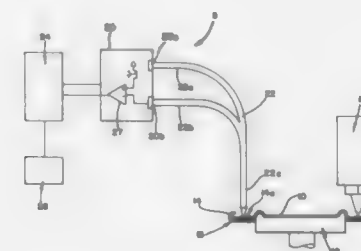
George W. Alderman, Barrington, Ill., assignor to American National Can Company, Chicago, Ill.

Filed Aug. 25, 1988, Ser. No. 236,640

Int. Cl.⁴ H01J 5/16; B65B 7/00

U.S. Cl. 250—227

13 Claims



1. A detector for a can making apparatus applying a compound to a seaming flange of a can end, the detector for detecting the presence of said compound on said seaming flange of said can end comprising: means for generating an infrared signal; means for receiving an infrared signal; a first fiber optic cable having a first end coupled to said infrared signal generating means and a second end directed toward said seaming flange of said can end, said first fiber optic cable for transmitting said generated infrared signal toward said seaming flange of said can end, causing said seaming flange to reflect a portion of said generated signal as a reflected signal, wherein said seaming flange reflects a first proportion of said generated infrared light in the absence of said compound and a second proportion of said generated infrared light in the presence of said compound; a second fiber optic cable having a first end directed toward said seaming flange of said can end and a second end coupled to said infrared signal receiving means, said second fiber optic cable for transmitting said reflected infrared signal from said seaming flange to said infrared signal receiving means; means for comparing said reflected infrared signal received by said infrared signal receiving means to a reference value representing a desired thickness of said compound applied to said seaming flange; and means for generating a reject signal in the event that said

comparing means indicates that less than said desired thickness of said compound has been applied.

4,873,433

ELECTROMAGNETIC RADIATION DETECTING DEVICE WITH HOLLOW SEMICYLINDRICAL CHOPPER

Dieter Lorenz, Hohenpeissenberg, Fed. Rep. of Germany, assignor to Deutsche Forschungs- und Versuchsanstalt für Luft- und Raumfahrt e.V., Fed. Rep. of Germany

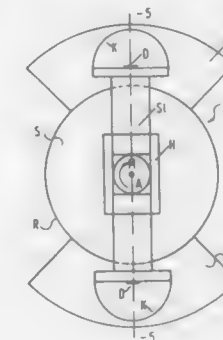
Filed Mar. 9, 1988, Ser. No. 165,837

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1987, 3708043

Int. Cl.⁴ G01D 5/36

U.S. Cl. 250—233

8 Claims



1. An electromagnetic radiation detecting device comprising at least one radiation detector for detection of electromagnetic radiation from a hemisphere corresponding to a solid angle 2π , the or each said detector including a receiving area for exposure to radiation from the respective hemisphere, a respective radiation-transparent hood covering the or each said detector, and a rotating chopper to alternately shield the or each said detector and associated hood from and to expose the or each said detector and associated hood to arriving electro-magnetic radiation, the chopper comprising a carrier member rotatable around an axis parallel to said receiving area of the or each said detector and at least one hollow semicylindrical shielding member which is carried by said carrier member and which is curved in the axial direction of the hollow semicylindrical shape, the or each said shielding member being movable on a circular path by said carrier member to alternately shield and reveal said respective hood covering the or each said detector.

4,873,434

SCANNING OPTICAL MICROSCOPE USING SINGLE LASER BEAM

Chung W. See, London, England, and Mehdi Vaez-iravani, Peekskill, N.Y., assignors to National Research Development Corporation, London, United Kingdom

Filed Jul. 20, 1987, Ser. No. 75,508

Claims priority, application United Kingdom, Jul. 18, 1987, 2417570

Int. Cl.⁴ G02F 1/11

U.S. Cl. 250—235

9 Claims

1. A scanning optical microscope comprising: a source of optical radiation; means for focussing a single beam of radiation from said source into an interrogating spot on a surface under examination; means for scanning said interrogating spot across said surface; deflecting means for providing an oscillatory deflection of said interrogating spot so as to move said interrogating

spot sinusoidally across said surface as said interrogating spot is scanned across said surface; and means for measuring the amplitude variation of the radiation reflected from said surface upon impingement of radiation at said oscillatory deflected scanning interrogating spot.

4,873,435

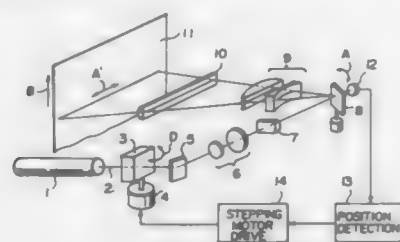
LASER BEAM SCANNING SYSTEM

Shinji Ono, and Masafumi Yamamoto, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Jan. 27, 1988, Ser. No. 148,831

Claims priority, application Japan, Jan. 27, 1987, 62-17044
Int. Cl.⁴ H04N 1/04

U.S. Cl. 250-235

2 Claims



2. A laser beam scanning system comprising a laser source for emanating a laser beam, a light deflector for deflecting the laser beam emanating from the laser source to cause the laser beam to scan a surface-to-be-scanned, a beam position detecting means which detects the incident position of the laser beam on the light deflector, an optical path changing means which changes the optical path of the laser beam upstream of the light deflector, and a control circuit which drives the optical path changing means according to the output of the beam position detecting means so that the laser beam impinges upon the light deflector at a predetermined position, wherein said light deflector comprises a galvanometer mirror formed of a half-silvered mirror and said beam position detecting means is disposed on the optical path of the light beam passing through the galvanometer mirror.

4,873,436

NONDESTRUCTIVE READOUT OF A LATENT ELECTROSTATIC IMAGE FORMED ON AN INSULATING MATERIAL

Emil Kamieniecki; Leszek Reiss, both of Lexington, and William C. Goldfarb, Melrose, all of Mass., assignors to Optical Diagnostic Systems, Inc., Billerica, Mass.

Continuation-in-part of Ser. No. 719,725, Apr. 3, 1985, Pat. No. 4,663,526, which is a continuation-in-part of Ser. No. 696,420, Dec. 26, 1984, abandoned. This application May 4, 1987, Ser. No. 46,562

The portion of the term of this patent subsequent to May 5, 2004, has been disclaimed.

Int. Cl.⁴ G01T 1/24; H01L 31/00

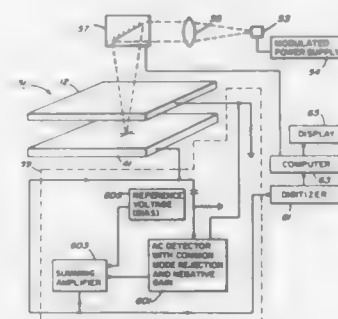
U.S. Cl. 250-315.3

13 Claims

1. A photoreceptor for use in recording and reading out a charge distribution pattern comprising:

a. a reference electrode,

b. a photoconductive insulator, and
c. a semiconductor/pickup electrode combination, and
d. wherein either said reference electrode or said semicon-



ductor pickup electrode combination or both of said reference electrode and said semiconductor/pickup electrode are segmented.

4,873,437

RADIATION IMAGE READ-OUT METHOD AND APPARATUS

Nobuyoshi Nakajima, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

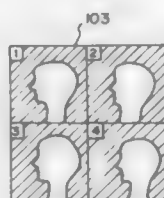
Filed Sep. 4, 1986, Ser. No. 903,802

Claims priority, application Japan, Sep. 4, 1985, 60-195455

Int. Cl.⁴ H04N 5/30; G01N 23/04

U.S. Cl. 250-327.2

8 Claims



1. A radiation image read-out method in which a stimuable phosphor sheet carrying a radiation image of an object stored thereon is exposed to stimulating rays, light emitted by the stimuable phosphor sheet in proportion to the stored radiation energy when the stimuable phosphor sheet is exposed to the stimulating rays is photoelectrically detected by a light detection means to obtain an image signal for use in reproduction of a visible image, image processing conditions are adjusted on the basis of image input information detected from the stimuable phosphor sheet, and an image processing is conducted on the image signal by use of the image processing conditions, wherein the improvement comprises the steps of:

(i) in the case where said radiation image is read out from the stimuable phosphor sheet subjected to subdivision image recording conducted by exposing a plurality of subdivisions on said stimuable phosphor sheet respectively to a radiation in the radiation image recording

step, discriminating the respective regions of said plurality of subdivisions on the basis of information on said subdivision image recording,

(ii) determining said image processing conditions for the respective discriminated regions, and
(iii) adjusting said image processing conditions for the respective regions when said image processing is conducted.

4,873,438

RADIATION IMAGE READ-OUT APPARATUS USING A FLUORESCENT LIGHT GUIDE

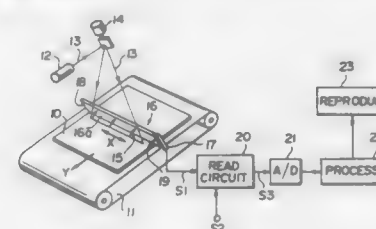
Yuichi Hosoi, and Kenji Takahashi, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Jan. 19, 1988, Ser. No. 144,982

Claims priority, application Japan, Jan. 16, 1987, 62-8570

Int. Cl.⁴ G03B 42/08; G01N 23/04; G01T 1/105

U.S. Cl. 250-327.2

5 Claims



5. A radiation image read-out apparatus comprising:

- a stimulating ray source for producing stimulating rays which excite stimuable phosphor,
- a stimulating-ray main scanning means for scanning said stimulating rays on a stimuable phosphor sheet carrying a radiation image stores thereon,
- a fluorescent light guide member comprising a sheet-shaped material having a length, a width and a thickness which is small relative to said width, and said width being small relative to said length, a main surface of said material being defined by said length and width, and an end surface of said material being defined by said width and thickness, said material containing a phosphor and being disposed in such a direction that said main surface receives the light emitted by said stimuable phosphor sheet when said stimuable phosphor sheet is scanned by said stimulating rays,
- a photodetector closely contacted with said end surface,
- a sub-scanning means for moving said stimuable phosphor sheet with respect to said stimulating rays in a direction approximately normal to the direction of said scanning.

4,873,439

X-RAY DETECTOR

Peter L. Hagelstein, Acton, and Christopher C. Eugster, Cambridge, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Jun. 27, 1988, Ser. No. 211,776

Int. Cl.⁴ G01T 1/00

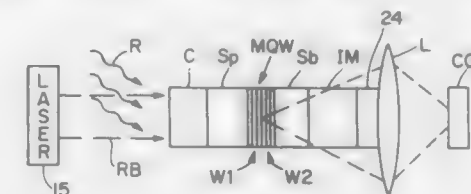
U.S. Cl. 250-327.2

15 Claims

1. Apparatus for detecting x-ray photons comprising:

- a first means responsive to said photons for generating carriers in response to said photons;
- a second means responsive to said generated carriers and having an index of refraction which changes in relation to the number of such carriers incident on said second means;

(c) a light beam incident on said second means, said beam being modulated by said changes; and



(d) imaging means responsive to said light means for displaying the modulations of said light beam.

4,873,440

ELECTRON MICROSCOPE IMAGE OUTPUT METHOD AND APPARATUS

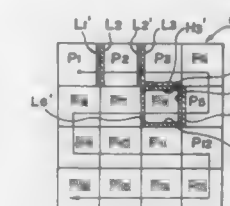
Nobufumi Mori; Takayuki Katoh, both of Kanagawa; Tetsumo Oikawa; Yoshiyasu Harada, both of Tokyo, and Junji Miyahara, Kanagawa, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa and Jeol Ltd., Tokyo, both of, Japan

Filed Dec. 24, 1987, Ser. No. 137,691

Claims priority, application Japan, Dec. 26, 1986, 61-311125
Int. Cl.⁴ G03B 42/00

U.S. Cl. 250-327.2

2 Claims



1. An apparatus for outputting an electron microscope image, which comprises:

- a two-dimensional sensor for storing an electron beam image of a specimen formed by distribution of electron beam energy, said two-dimensional sensor being in the same vacuum system as an image formation plane of said electron microscope,
- a stimulation means for exposing said two-dimensional sensor to light or heat,
- a detection means for photoelectrically detecting light emitted by said two-dimensional upon exposure to light or heating, thereby to obtain image signals, and
- a signal correction means for correcting the image signals detected at a plurality of divisions into which said specimen has been divided and storage of the electron beam image carried out for each of said divisions, so that signal values of the boundary areas of adjacent divisions become approximately equal to each other,

wherein said signal correction means comprises:

- a first memory means for storing image signals of said plurality of divisions;
- density data calculating means for calculating mean values for picture element strings at the boundaries between adjacent divisions of said plurality of divisions read from said first memory means and calculating correction coefficient values from said mean values;
- density data memory means for storing said correction coefficient values;
- density matching data processing means receiving said correction coefficient values for uniformly correcting said image signals of said plurality of divisions;
- control means for selectively supplying said correction

coefficient values to said density matching data processing means when one of said image signals of one of said plurality of divisions is to be uniformly corrected; and
second memory means for storing the output of said density matching data processing means.

4,873,441

METHOD OF AND APPARATUS FOR RECORDING AND READING OUT RADIATION IMAGE INFORMATION

Tetsuya Kimura, and Yukio Watanabe, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

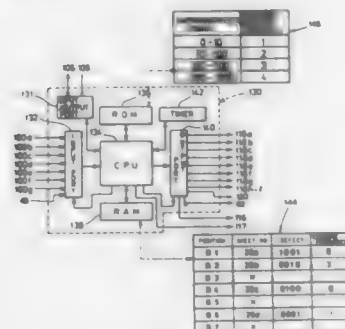
Division of Ser. No. 793,009, Oct. 30, 1985. This application Sep. 30, 1987, Ser. No. 102,999

Claims priority, application Japan, Oct. 30, 1984, 59-228747; Oct. 30, 1984, 59-228748; Oct. 30, 1984, 59-228749

Int. Cl.⁴ G01N 23/04

U.S. Cl. 250—327.2

8 Claims



1. A method of recording and reading out radiation image information, comprising the steps of:

feeding stimulative phosphor sheets each capable of recording radiation image information along a predetermined circulatory feed path;

exposing said stimulative phosphor sheets to a radiation through an object to record the radiation image information of the object on the stimulative phosphor sheets in an image recording unit in said circulatory feed path;

reading out said radiation image information from said stimulative phosphor sheets in an image readout unit in said circulatory feed path;

erasing any remaining image from said stimulative phosphor sheets in an image erase unit in said circulatory feed path; and

exposing said stimulative phosphor sheets to stimulating light to detect any defect thereon before radiation image information is successively recorded on said stimulative phosphor sheets, and feeding those stimulative phosphor sheets which bear defects through said circulatory feed path while skipping said image recording, reading, and erasing steps.

4,873,442

METHOD AND APPARATUS FOR SCANNING THERMAL IMAGES

Robert W. Klett, Rancho Palos Verdes, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Dec. 9, 1985, Ser. No. 896,895

Int. Cl.⁴ H01J 31/50

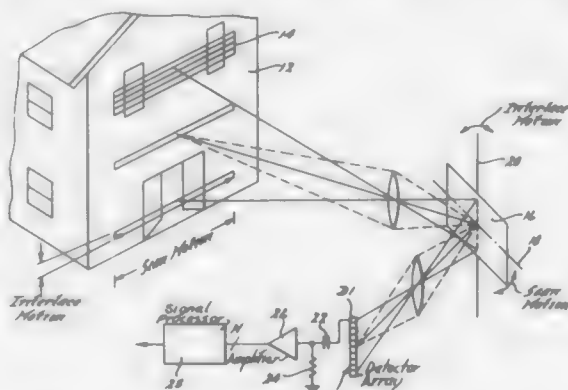
U.S. Cl. 250—334

20 Claims

1. An imaging sensor for scanning an image in an object space during first and second portions of a scanning cycle, said imaging sensor comprising:

a plurality of infrared detector channels each comprising an infrared detector, each of said infrared detectors having

an overlapping field-of-view with another of said infrared detectors; and
means for reflecting said object space onto said infrared detectors, said means for reflecting said object space onto said infrared detectors operable to expose each of said



infrared detectors to the field-of-view of at least one other of said infrared detectors to allow said infrared detectors to be calibrated by sequentially comparing the outputs of each of said elemental detectors with another of said elemental detectors having an overlapping fields-of-view.

4,873,443

MAGNETIC SUPERCONDUCTING DETECTOR

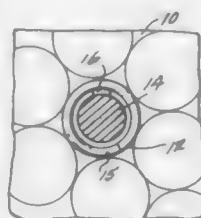
Richard T. Schneider, Alachua, Fla., assignor to Progress Technology Corporation, St. Petersburg, Fla.

Filed Dec. 23, 1987, Ser. No. 137,136

Int. Cl.⁴ H01L 39/00, 27/18

U.S. Cl. 250—336.2

24 Claims



1. A photon detector comprising:

a superconducting material;

means for maintaining said superconducting material in a superconducting state; and

means for sensing induced currents formed in said material when said photons strike said material.

4,873,444

DETECTION OF SURFACE IMPURITY PHASES IN HIGH T_c SUPERCONDUCTORS USING THERMALLY STIMULATED LUMINESCENCE

D. Wayne Cooke, Los Alamos, N. Mex., and Muhammad S. Jahan, Bartlett, Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 23, 1988, Ser. No. 276,188

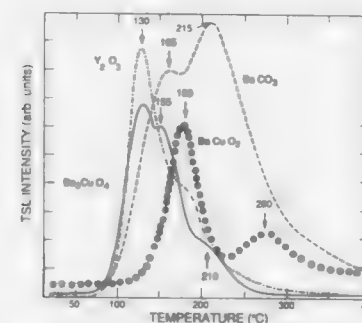
Int. Cl.⁴ G01N 23/00

U.S. Cl. 250—337

11 Claims

1. A method for detecting insulating phases in samples of superconducting materials which comprises the steps of:

irradiating the sample with ionizing radiation in order to induce charge trapping in the insulating phases; and
heating the irradiated sample to yield luminescence; and



detecting the luminescence as a function of sample temperature.

4,873,445

SOURCE OF IONS OF THE TRIODE TYPE WITH A SINGLE HIGH FREQUENCY EXCITATION IONIZATION CHAMBER AND MAGNETIC CONFINEMENT OF THE MULTIPOLE TYPE

Claude Le Jeune, Gif Sur Yvette, France, assignor to Centre National de la Recherche Scientifique, Paris, France

Continuation of Ser. No. 97,268, Sep. 17, 1987, abandoned, which is a continuation-in-part of Ser. No. 856,412, Apr. 28, 1986, abandoned. This application Nov. 15, 1988, Ser. No.

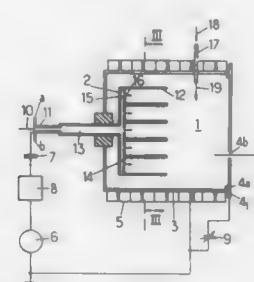
273,179

Claims priority, application France, Apr. 29, 1985, 85 06492

Int. Cl.⁴ H01J 27/00

U.S. Cl. 250—432 R

18 Claims



1. A discharge ion source with a single ionization chamber, comprising in combination with a single ionization chamber: an amagnetic cathode forming a capacitor plate and cooled by a flow of fluid, which cathode is disposed inside the ionization chamber in the vicinity of a first end thereof; an amagnetic anode forming at least a part of a wall of the ionization chamber; means for applying between the cathode and the anode a high frequency AC voltage, said frequency being at least equal to the value of the lower limit frequency from which the plasma of the chamber is permanently ignited in a state of stationary equilibrium independent of time; a third electrode disposed at a second end of the chamber opposite a first end; means for biasing the third electrode independently with respect to an assembly of the cathode and the anode; a system of alternate magnetic poles for creating a multi-mirror magnetic configuration about the anode; means for injecting at least one gas to be ionized into the ionization chamber; at least one orifice for discharging gases from the ionization chamber; and pumping means controlled for exhausting gases from the ionization chamber through said at least one orifice.

4,873,446

DEVICE FOR IRRADIATING DENTURE PARTS

Albert Kreitmair, Forstenrieder Allee 233b, 8000 München 71, and Günther Nath, Delpstrasse 27, 8000 München 80, both of Fed. Rep. of Germany

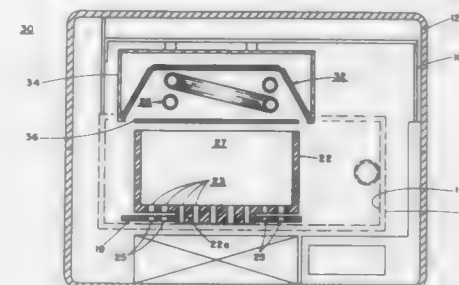
Continuation of Ser. No. 9,613, Jan. 22, 1987, which is a continuation of Ser. No. 487,577, Apr. 22, 1983. This application Jul. 6, 1988, Ser. No. 218,472

Claims priority, application Fed. Rep. of Germany, Apr. 27, 1982, 3215664; Aug. 4, 1982, 3229117; Sep. 15, 1982, 8226016; Oct. 4, 1982, 8227782

Int. Cl.⁴ C08J 7/18

U.S. Cl. 250—492.1

13 Claims



1. Irradiation device for treating a synthetic material in denture parts, said device comprising an electric lamp for emitting useful radiation in a short-wave visible and near ultra-violet spectral ranges and undesired IR radiation; a receptacle defining a cup shaped irradiation chamber for a denture part to be irradiated; said chamber having a radiation entrance opening facing said lamp; and a concave reflector associated with said lamp to reflect the useful radiation from the lamp toward the radiation entrance opening of said irradiation chamber and to allow passage of the undesired radiation out of said irradiation device, wherein said concave reflector has essentially the shape of a truncated pyramid for reflecting the useful radiation of said lamp, and wherein said electric lamp is a xenon flash-lamp, which has a curved bulb extending in two dimensions in a plan view of said radiation entrance opening of said irradiation chamber, said two dimensions being normal to a vertical axis of said irradiation chamber, said concave reflector being comprised of flat thin-film dielectric interference filter panes, said irradiation chamber being defined by walls, at least at the inner surface thereof, made of a material selected from the group comprising PTFE and ceramic and including a support surface for accommodating denture parts of various sizes, and a flat pane thin-film interference filter provided between said lamp and said irradiation chamber, said filter provided between said lamp and said irradiation chamber transmitting useful radiation of shorter wavelength while reflecting said undesirable IR radiation of longer wavelength.

4,873,447

WAFER TRANSPORT APPARATUS FOR ION IMPLANTATION APPARATUS

Issei Imahashi, Tokyo, Japan, assignor to Tokyo Electron Limited, Tokyo, Japan

Continuation of Ser. No. 848,567, Apr. 7, 1986, abandoned. This application Jan. 15, 1988, Ser. No. 145,689

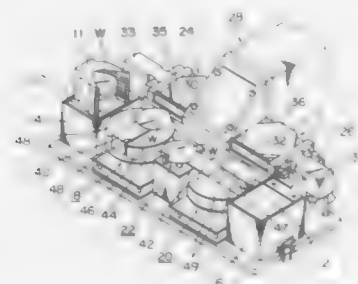
Int. Cl.⁴ H01J 27/00

U.S. Cl. 250—492.2

13 Claims

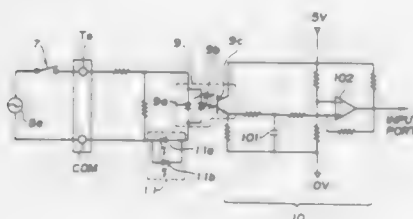
1. An ion implantation apparatus, comprising: a vacuum processing chamber in which a wafer is subjected to ion implantation processing; first and second auxiliary vacuum chambers each of which is hermetically sealable from or connectable to the outer atmosphere and vacuum processing chamber, and each of which is constructed to temporarily store the wafer; first wafer transfer means for transferring a wafer into the

vacuum processing chamber from the first auxiliary vacuum chamber;
 second wafer transfer means for transferring the wafer to the second auxiliary vacuum chamber from the vacuum processing chamber;
 driving means for driving the first and second wafer transfer means in a mutually synchronized manner;
 wafer cassette supporting means for supporting a cassette containing a plurality of wafers; and
 wafer transport means for transporting the wafer into the first auxiliary vacuum chamber from the cassette one by one;



said driving means being connected to the first and second wafer transfer means to move them at the same time so that two wafers are simultaneously transferred to the vacuum processing chamber and second auxiliary vacuum chamber from the first auxiliary vacuum chamber and vacuum processing chamber;
 wherein said first wafer transfer means includes first and second arms, said second wafer transfer means includes third and fourth arms, and said driving means includes a first retaining member connecting the first and third arms together, and a second retaining member connecting the second and fourth arms together.

4,873,448
INPUT CIRCUIT HAVING A PHOTO-COUPLER WITH BI-DIRECTIONAL INDICATOR
 Hironobu Shirai, Takatsuki, Japan, assignor to Omron Tateisi Electronics Co., Kyoto, Japan
 Filed Apr. 27, 1987, Ser. No. 42,736
 Claims priority, application Japan, Apr. 30, 1986, 61-65266
 Int. Cl.⁴ G02B 27/00
 U.S. Cl. 250—551 10 Claims



1. An output circuit for accepting an external input signal by way of a photo-coupler for circuit isolation, comprising:

a photo-coupler having an input end comprising a bi-directional element; and
 an indicator of a bi-directional type which is connected in series with the input end of the photo-coupler and comprises a pair of light emitting diode chips.

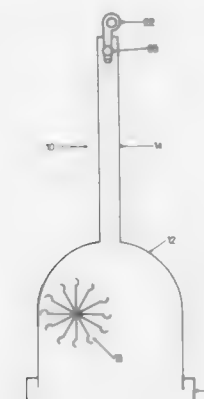
4,873,449
PROCESS AND APPARATUS FOR THREE-DIMENSIONAL SURVEYING
 Michel Paramythioti, 19 Bis, 7eme Avenue Le Lys, 60260 Lamorlaye, and Auguste d'Aligny, 197, rue du Temple, 75003 Paris, both of France
 Filed Feb. 4, 1988, Ser. No. 152,137
 Claims priority, application France, Feb. 4, 1987, 87 01360
 Int. Cl.⁴ G02B 27/42

U.S. Cl. 250—560 12 Claims
 1. A process of three-dimensional surveying in which a scene is scanned by emitting a laser beam in its direction, the image of the laser spot obtained in this way being formed on at least one element of an array of photoresistive receptor elements, the direction of the laser spot relative to the said array being determined from the position of the exited receptor element in said array of elements, and the three spatial coordinates of each point of scanning being calculated by triangulation on the basis of the angular orientation of the beam emitted and the said direction of the reflected spot received, characterized by the fact that
 (a) the scene is scanned by controllably orienting the beam relatively roughly,
 (b) the orientation of the beam emitted being measured more precisely independently of the controllable orientation thereof, and
 (c) that the said spatial coordinates are calculated on the basis of the independently measured orientation of the beam emitted and the said direction of the spot.

4,873,450
ELECTRICAL GENERATING APPARATUS AND METHOD
 James Quaintance, 303 Charlotte Dr., Port Lavaca, Tex. 77979
 Continuation of Ser. No. 637,483, Aug. 3, 1984, abandoned. This application Aug. 28, 1985, Ser. No. 770,253
 Int. Cl.⁴ F03B 1/02
 U.S. Cl. 290—52 7 Claims

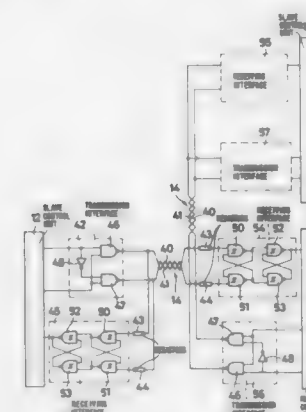
1. An electrical generating apparatus in a working environment of a tank comprising:
 an electrical generating device housed in a container called the gravity-motor which is totally submerged below the surface of the working fluid such as a liquid contained in a tank with a pressurized gaseous atmosphere gravity accelerating fluid chamber called the passage;
 an anchored, water-tight rotor chamber which contains a rotor axle, rotor, and generator;
 a submersible centrifugal pump located in the uppermost part of the passage whose discharge is directed vertically downward onto rotor vanes;
 a valve connected to the discharge side of the pump;
 an external electrical power source to supply the submersible centrifugal pump, air compressor, and generator;

and an opening in the bottom of the gravity-motor to permit transmission of working fluid flowing through the gravi-



ty-motor to disperse into the main body of working fluid in the tank.

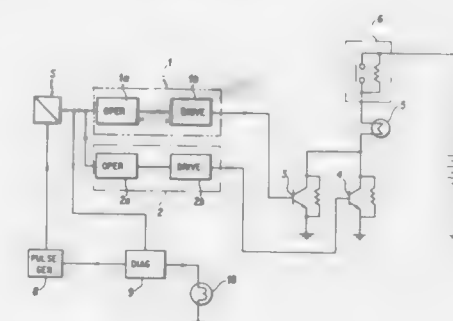
4,873,451
ELECTRICAL SYSTEM FOR A MOTOR VEHICLE
 Raffaele Pristerà, Cormano; Edoardo Rugora, Milan; Silvio Fioravazzi, Milan; Giorgio Gueffi, Milan; Aldo Bassi, Milan, and Alberto Poli, Ossona, all of Italy, assignors to Alfa Lancia Industriale S.p.A., Arese, Italy
 Filed Dec. 22, 1987, Ser. No. 136,276
 Claims priority, application Italy, Dec. 31, 1986, 22903 A/86
 Int. Cl.⁴ B60L 1/00; H02G 3/00
 U.S. Cl. 307—10.1 4 Claims



1. An electrical system for the distribution of electrical power to user devices installed on board a motor vehicle equipped with a dashboard, said electrical system assembly comprising a plurality of electronic microprocessor control units, each of said control units being connected with a source of electrical power and being connected with one another by a multiplex communication bus, one of said control units being a main control unit for controlling the operative functions of the user devices, signaling means being connected to said main control unit for sending signals to said main control unit to indicate user's request for actuation of particular user devices, said control units further including first and second secondary control units, said first and second secondary control units being disposed between said main control unit and selected user devices, said first and second secondary units receiving signals from said main control unit and in turn actuate respective user devices and feed signals to said main control unit indicative of operating conditions of the respective user devices, said multiplex communication bus being a serial interconnection line, said secondary units containing power stages

for the actuation of said respective user devices, and being connected to a source of electrical power suitable for said power stages, said serial interconnection line being formed by two leads, said two leads of said communication bus being connected to said main unit and said first and second secondary control units through transmission interfaces and reception interfaces wherein the transmission interface sends to one of said leads a first signal to be transmitted and sends to the other of said leads a second signal which complements said first signal, the reception interface being provided to compare the first and second signals with one another and if the difference is within a pre-established value, the first signal passes into the control unit to which it is addressed.

4,873,452
COLLISION DETECTOR FOR A VEHICLE
 Makie Morota, and Junichi Fukuda, both of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
 Filed Sep. 22, 1988, Ser. No. 247,559
 Claims priority, application Japan, Dec. 23, 1987, 62-325769
 Int. Cl.⁴ B60R 21/08
 U.S. Cl. 307—10.1 1 Claim

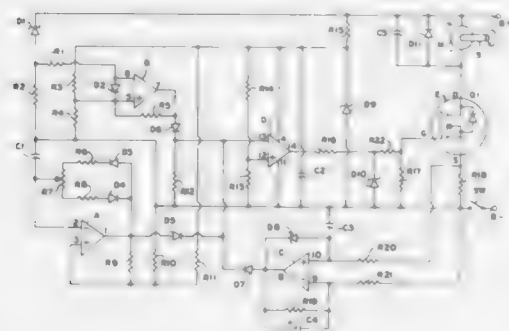


1. A collision detector for a vehicle comprising:
 an acceleration sensor for detecting acceleration of the vehicle;
 signal processing circuit which provides a collision signal when a value, based on an output of the acceleration sensor, exceeds a predetermined reference collision level;
 a diagnostic pulse generator which applies diagnostic pulses to the acceleration sensor to detect a failure of the acceleration sensor; and
 a diagnostic circuit which stops an output of the output diagnostic pulses the diagnostic pulse generator when the output of the acceleration sensor exceeds a malfunction avoidance level which is lower than the predetermined reference collision level.

4,873,453
DC MOTOR SPEED CONTROLLER HAVING PROTECTION
 Richard F. Schmerda, and James E. Hansen, both of Oak Creek, Wis., assignors to Eaton Corporation, Cleveland, Ohio
 Division of Ser. No. 114,348, Oct. 27, 1987. This application Oct. 19, 1988, Ser. No. 238,447
 Int. Cl.⁴ H01H 83/12
 U.S. Cl. 307—130 2 Claims

1. Speed controller for a DC motor connected in series with a switching device that controls the average DC current of the motor by controlling the switching duty cycle, said switching device having an input control terminal, comprising:
 oscillator means for generating an AC signal having controllable duty cycle;
 means for communicating said AC signal to said input control terminal of said switching device;
 undervoltage protection means for producing an under

voltage signal upon occurrence of a low-battery condition below a predetermined threshold voltage level; override circuit means communicating said undervoltage signal to said input control terminal of said switching device, for turning off said switching device irrespective of the AC signal of said oscillator means upon an undervoltage condition; and wherein said undervoltage protection means comprises one operational amplifier circuit having; means for establishing a first battery voltage threshold corresponding to said predetermined threshold voltage level and a second battery voltage threshold which is higher than said first threshold;



means for providing said undervoltage signal when battery voltage is below said first threshold and withholding said undervoltage signal when battery voltage exceeds said second threshold; and, means for providing or withholding said undervoltage signal when the battery voltage is between said first and second thresholds, depending upon whether the battery voltage entered between said thresholds when said undervoltage signal was already being provided on already being withheld, respectively; whereby said operational amplifier circuit performs both (a) a threshold comparator function and (b) a hysteresis function.

4,873,454

POWER SOURCE SWITCHING CIRCUIT

Hisung Kwon, Seoul, Rep. of Korea, assignor to Sam Sung Electronic Co. Ltd., Rep. of Korea
Filed Dec. 23, 1987, Ser. No. 137,149
Claims priority, application Rep. of Korea, Dec. 26, 1986, 86-21233

Int. Cl.⁴ H01H 3/26

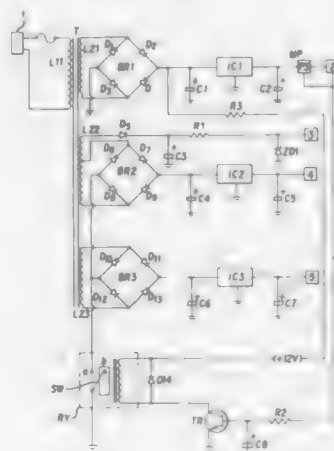
U.S. Cl. 307-140

6 Claims

1. Apparatus for switching a power source to supply power to different loads, comprising:

- a transformer;
- a first bridge-type rectifier, electrically coupled to said transformer;
- a plurality of second bridge-type rectifiers, said second bridge-type rectifiers excluding said first bridge-type rectifier, said second bridge-type rectifiers being electrically coupled to said transformer in a parallel configuration;
- a switching relay having a coil and a switch;
- said second bridge-type rectifiers being electrically connected, in common, to said switch, said switch being

electrically interposed between said second bridge-type rectifiers and a ground point;



said switching relay being operative to control said switch in accordance with electrical current applied to said coil.

4,873,455

PROGRAMMABLE FERROELECTRIC POLYMER NEURAL NETWORK

Emmanuel de Chambost, Molieres; Francois Micheron, Gif Sur Yvette; Francois Vallet, Bagnole, and Jean-Michel Vignolle, Boug la Reine, all of France, assignors to Thomson-CSF, Paris, France

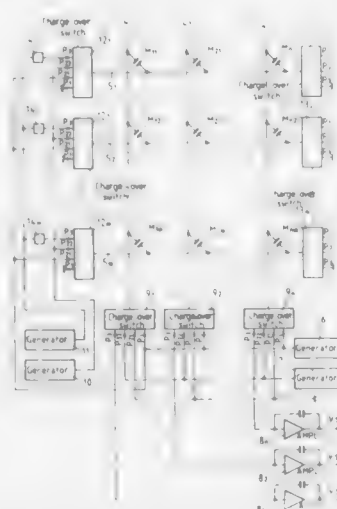
Filed Oct. 17, 1988, Ser. No. 254,805

Claims priority, application France, Oct. 9, 1987, 87 13961

Int. Cl.⁴ G06F 15/42; H04Q 9/00; G11C 11/22

U.S. Cl. 307-201

12 Claims



1. A programmable, ferroelectric polymer neural network wherein each synapse (Mij) of the network comprises a memory element, made of a thin layer material or other ferroelectric materials, to memorize a synaptic coefficient a_{ij} , in the form of an electrical charge q_{ij} , and wherein the memory elements a_{ij} of one and the same column j are connected together by one and the same conductor to enable the flow of all the electrical charges generated by pyroelectrical effect at each memory element of the network, when any part of the entire memory (Mij) of the column j is heated.

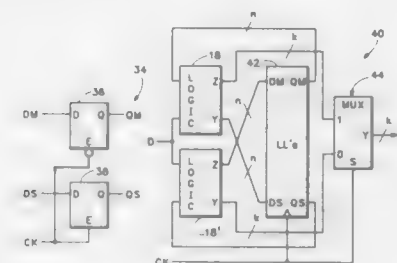
4,873,456

HIGH SPEED STATE MACHINE

Ronald A. Olisar, Portland, and Daniel G. Knierim, Beaverton, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.
Filed Jan. 6, 1988, Ser. No. 203,036
Int. Cl.⁴ H03K 3/284, 3/29

U.S. Cl. 307-272.1

16 Claims



1. A state machine for generating output signals having states which are a function of the current and previous states of the input signals, with the state machine being controlled by a system clock signal, said state machine comprising:

at least one pair of latches, each pair comprising:

a first latch means having a first input port means, a first output port means and a first enabling port means coupled to the system clock signal, the signal level on said first input port means being transferred to said first output port means while the signal on said first enabling port means is at a first state, and the signal level on said first output port means being latched while the signal on said first enabling port means is at a second state; and

a second latch means having a second input port means, a second output port means, and a second enabling port means coupled to the system clock signal, the signal level on said second input port means being transferred to said second output port means while the signal on said second enabling port means is at the second state, and the signal level on said second output port means being latched while the signal on said second enabling port means is at the first state; and

a logic means having a pair of logic input port means and a pair of logic output port means wherein the levels of the signals on said logic output port means are predetermined logic functions of the levels of the signals on said two logic input port means, a first of said logic input port means being coupled to receive the state machine input signals, and the first of said logic output port means forming the state machine output signals;

the second of said logic input port means being coupled to said first and second output port means of each of said pair(s) of latches; and

the second of said logic output port means being coupled to said first and second input port means of each of said pair(s) of latches.

4,873,457

INTEGRATED SAMPLE AND HOLD CIRCUIT

Sergio A. Sanielevici, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Jul. 5, 1988, Ser. No. 214,973

Int. Cl.⁴ G11C 27/02

U.S. Cl. 307-353

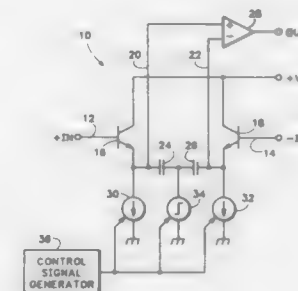
9 Claims

1. A sample and hold circuit comprising:

bipolar transistor means having a base coupled to receive an input signal;

capacitor means coupled to said transistor means for storing a voltage representative of the input signal while said transistor means is turned on, and for storing a voltage representative of the input signal at the time said transistor

means is turned off while said transistor means is turned off; current source means for biasing selectively said transistor means appropriately for turning it on and off; and means for applying selectively relatively higher and lower voltages on said capacitor means, and means for control-



4,873,458

VOLTAGE LEVEL DETECTING CIRCUIT HAVING A LEVEL CONVERTER

Takuji Yoshida, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan

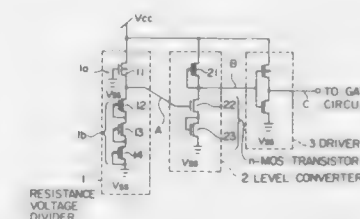
Filed Jul. 12, 1988, Ser. No. 218,302

Claims priority, application Japan, Jul. 17, 1987, 62-177125

Int. Cl.⁴ H03K 17/30

U.S. Cl. 307-362

11 Claims



1. A voltage level detecting circuit comprising:

a resistance voltage divider comprising a first resistive element connected between a power supply voltage and an output node and a second resistive element connected between said output node and a ground potential for producing a divided voltage, said first resistive element having a resistance variation with respect to temperature which is higher than that of said second resistive element; a level converter connected between said power supply voltage and said ground potential for converting said divided voltage of said output node into a binary signal having a high voltage signal level substantially equal to said power supply voltage and having a low voltage signal level substantially equal to said potential.

wherein said level converter comprises serially connected MOS transistors having a predetermined switching threshold voltage, whereby the level converter converts said output node voltage into said high voltage signal level when said output node voltage is lower than said switching threshold voltage and converts said output node voltage into said low voltage signal level when said output node voltage is higher than said switching threshold voltage; and

an MOS driver connected between said power supply voltage and said ground voltage for receiving said binary signal and for producing a control signal in response thereto.

4,873,459

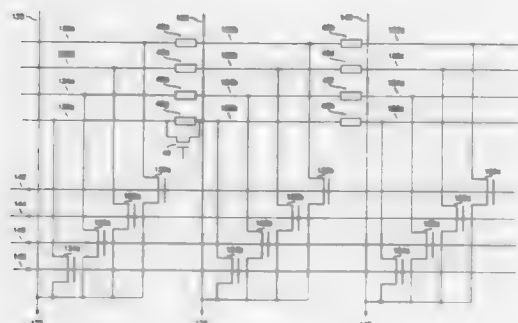
PROGRAMMABLE INTERCONNECT ARCHITECTURE
Abbas A. El Gamal, Palo Alto; Khaled A. El-Ayat, Cupertino; Jonathan W. Greene, Palo Alto; Ta-Pen R. Guo, Cupertino; and Justin M. Reyneri, Los Altos, all of Calif., assignors to Actel Corporation, Sunnyvale, Calif.

Continuation-in-part of Ser. No. 909,261, Sep. 19, 1986, Pat. No. 4,758,745. This application May 18, 1988, Ser. No. 195,728. The portion of the term of this patent subsequent to Jul. 19, 2005, has been disclaimed.

Int. Cl.⁴ H03K 19/094

U.S. Cl. 307—465

12 Claims



1. In an integrated circuit, a programmable interconnect architecture, including:

- a plurality of wiring channels, running in a selected direction each of said wiring channels including a plurality of wiring segments,
- a plurality of electrically programmable elements, each having an unprogrammed non-conductive state and a programmed conductive state, said electrically programmable elements connected between adjacent ones of said wiring segments in said wiring channels,
- a plurality of programming lines, each of said programming lines associated with corresponding ones of said wiring segments in said plurality of wiring channels,
- a plurality of sets of programming transistors, each of said sets including a programming transistor connected between one of said programming lines and one of said corresponding ones of said wiring segments, each of said programming transistors having a control element,
- a plurality of control lines, each of said control lines connected to the control elements of the ones of said programming transistors connected to wiring segments in the same wiring channel.

4,873,460

MONOLITHIC TRANSISTOR GATE ENERGY RECOVERY SYSTEM

Wally E. Rippel, Altadena, Calif., assignor to California Institute of Technology, Pasadena, Calif.

Filed Nov. 16, 1988, Ser. No. 271,644

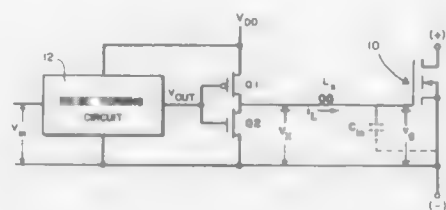
Int. Cl.⁴ H03K 17/04, 17/687

U.S. Cl. 307—571

3 Claims

1. A pulse forming circuit for control of the gate of an insulated gate semiconductor switch having capacitance between its source and gate electrodes, and inductance in series with its gate electrode comprising means for producing a notch in an applied input control voltage after an interval A following the initial application of the input control voltage for an interval B, and a notch for an interval C following termination of the

applied input control voltage followed by a pulse of an interval D, where each interval is a period ΔT given by



$$\Delta T = \frac{\pi}{3} \sqrt{L_s C_{in}}$$

where L_s is said series conductance and C_{in} is said capacitance, comprising means responsive to the initial application of said control input voltage for determining said intervals A and B and means responsive to the termination of said control input voltage for determining said intervals C and D, means responsive to said intervals A and B for producing a notch after initial application of said control input voltage, and means responsive to said intervals C and D for producing a notch after termination of said control input voltage, whereby said notches at the leading and trailing ends of said control input voltage to the gate of said transistor will switch said gate to an off level during said notches of said intervals B and C while switching said gate to an on level during intervals A and D and for the entire period between intervals B and C.

4,873,461

ELECTRIC MOTOR STERILIZABLE SURGICAL POWER TOOL

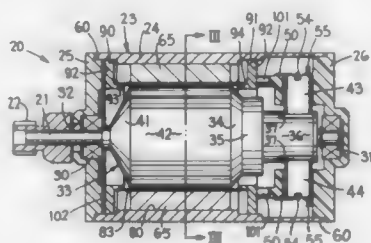
Thomas J. Brennan, Kalamazoo, and James A. Evans, Galesburg, both of Mich., assignors to Stryker Corporation, Kalamazoo, Mich.

Filed May 13, 1988, Ser. No. 193,882

Int. Cl.⁴ H02K 1/18, 5/04, 21/28

U.S. Cl. 310—47

16 Claims



1. An electric motor comprising:
a casing having a peripheral wall;
circumferentially distributed magnets lining the inside of the peripheral wall of the casing;
means on said casing locating said magnets axially and circumferentially with respect to said casing;
an armature and means on said casing rotatably supporting said armature within said casing;
a split sleeve radially interposed between said magnets and said armature;
means bearing on the ends of said split sleeve for expanding said split sleeve radially away from said armature and firmly radially outwardly pressing said sleeve against said magnets and thereby for holding said magnets fixedly against the inner periphery of said casing; and
whereby said magnets are held in place in said casing without need for adhesive bonding to said casing.

4,873,462

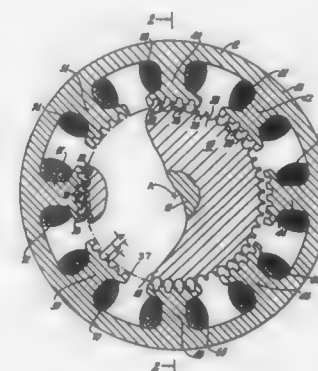
STEPPING MOTOR WITH LOW DETENT TORQUE
Timothy J. Harned, East Kingston, N.H., assignor to Eastern Air Devices, Inc., Dover, N.H.

Filed Sep. 16, 1988, Ser. No. 245,787

Int. Cl.⁴ H02K 37/00

U.S. Cl. 310—49 R

17 Claims



1. A synchronous motor comprising, in combination,
a rotor assembly including a cylindrical portion having an axis, said portion having a plurality of annularly spaced rotor teeth projecting radially to a cylindrical peripheral envelope on said axis,
a stator assembly coaxial with said rotor assembly and having a plurality of radially projecting stator poles, said poles each having a plurality of stator teeth projecting radially toward said envelope, the rotor teeth each projecting radially upon two stator teeth,
means for electrically energizing said stator poles,
permanent magnet means in one of said assemblies for establishing a magnetic field at said rotor teeth, said rotor teeth and stator teeth each extending longitudinally along the stator poles and rotor portion, the plurality of rotor teeth and stator teeth being skewed relative to each other, the annular arc length subtended by the skew as projected on said envelope being substantially equal to the arc length corresponding to the angular pitch of the rotor teeth divided by an integer between two and four.

4,873,463

D.C. ELECTRIC MOTOR

Gareth Jones, 18 The Links, Amlwch, Anglesey, Gwynedd, United Kingdom

PCT No. PCT/GB86/00501, § 371 Date Apr. 16, 1987, § 102(e) Date Apr. 16, 1987, PCT Pub. No. WO87/01247, PCT Pub. Date Feb. 26, 1987

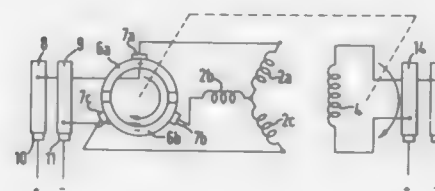
PCT Filed Aug. 22, 1986, Ser. No. 52,045

Claims priority, application United Kingdom, Aug. 22, 1985, 2,111,000

Int. Cl.⁴ H02K 23/16

U.S. Cl. 310—68 B

3 Claims



1. A d.c. motor which is energizable by a d.c. electrical energy source, said motor comprising:

a stator core having a cylindrical shaped inner surface;
a rotor journaled on a shaft for rotation within the cylindrical shaped inner surface of the stator core, said shaft having an axis;
armature windings inserted in slots in the stator core and being divided into similar armature coils mutually spaced about said shaft axis;
said rotor including field generating means providing magnetic rotor poles mutually spaced about the shaft axis and serving to induce an e.m.f. in each armature coil during rotation of the rotor, said rotor adapted such that the associated radial distance between each magnetic rotor pole and the inner surface of the stator core remain substantially constant as the rotor rotates; and
switching means adapted to connect said armature coils to the d.c. source so as to apply an e.m.f. to each armature coil in timed synchronism with rotation of the rotor such that (i) switching of the d.c. to an armature coil occurs when a pole generated by that coil is substantially in alignment with a magnetic rotor pole of opposite polarity, (ii) immediately before switching, the e.m.f. induced in that armature coil is approaching a maximum value and opposes the applied e.m.f., and (iii) immediately after switching, that armature pole and the magnetic rotor pole are of like polarity and the induced e.m.f. assists the applied e.m.f., said armature windings providing a rotating field which is in arrears of and opposes the rotor fields so as to exert a repelling force against the rotor poles, said switching means including a device for sensing rotor position and controlling an electronic means which switches the d.c. source to the armature windings, said electronic control means including power switching devices and means for providing a pulse train to control the power switching devices in which the mark-space ratio of the pulse train is adjustable but, for a given adjustment, is constant over the whole cycle.

4,873,464

TERMINAL IN AN ELECTRIC MOTOR

Patrick S. Wang, Repulse Bay, Hong Kong, assignor to Johnson Electric Industrial Manufactory Limited, Chaiwan, Hong Kong

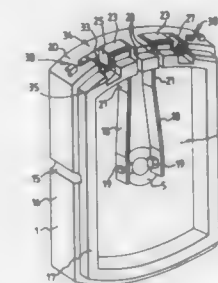
Filed Mar. 23, 1988, Ser. No. 172,174

Claims priority, application United Kingdom, Mar. 23, 1987, 8706841; Jul. 27, 1987, 8717744

Int. Cl.⁴ H02K 5/14, 13/00

U.S. Cl. 310—249

18 Claims



1. A fractional horsepower DC electric motor having a housing, a rotor comprising an armature and a commutator mounted in the housing, and brushgear mounted in the housing for supplying power from a power supply to said commutator wherein a motor terminal is provided on said motor housing for forming each one of a first and second electrical connection between the power supply and a brush of said brushgear, said terminal comprising a conducting metal strip having a first portion which extends across and is supported by an outside surface of said housing and a second portion contiguous with said first portion and housed within a recess in said outside

surface of said housing said first portion providing a surface to form said first connection by means of a touch contact and said second portion being arranged to grip a power supply terminal and/or wire lead of said power supply when the power supply terminal or lead is inserted in said recess, thereby to form said second connection.

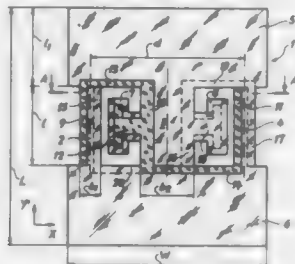
4,873,465

PI-CUT PIEZOELECTRIC RESONATOR USING COUPLED CONTOUR MODES

Claude Bourgeois, Bôle, Switzerland, assignor to Centre Electronique Horloger S.A., Neuchâtel, Switzerland
Filed Nov. 28, 1988, Ser. No. 276,487
Claims priority, application France, Dec. 2, 1987, 87 16733
Int. Cl.⁴ H01L 41/08

U.S. Cl. 310—361

8 Claims



1. A piezoelectric resonator comprising two plates, at least two parallel bars connecting said plates to each other, and means for exciting a vibration of said resonator in a first contour vibration mode, wherein said exciting means are arranged for exciting said vibration in said bars and the cut and dimensions of said resonator are such that at least a second contour vibration mode, different from said first vibration mode, is coupled with said first vibration mode.

4,873,466

IGNITER PLUG

Shunzo Matsumura; Takasori Mizuno; Noboru Aoki, and Takahiro Suzuki, all of Nagoya, Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya, Japan
Filed Sep. 8, 1987, Ser. No. 93,975
Claims priority, application Japan, Sep. 6, 1986, 61-208874
Int. Cl.⁴ H01T 13/20

U.S. Cl. 313—131 R

2 Claims



1. An igniter plug comprising:
a tubular metallic shell having a diameter-reduced seat at one open end, the seat being tapered to progressively decrease its diameter as approaching an outside of said open end;
a tubular insulator concentrically placed at an inner side of

said metallic shell, and having a tapered end face to be in registration with said seat;
a frusto-cone shaped insert ring made of oxidation and heat resistant material, a peripheral end and one entire surface of which are mounted on an upper surface of said seat by means of an electrical resistant welding, said insert ring permitting said tapered end face of said insulator to engage with an upper surface of said insert ring;
a center electrode concentrically disposed in said insulator, one end of said electrode being terminated short of said tapered end face of said insulator to allow a creeping discharge to occur along an inner surface of said insulator when a high voltage is applied across said center electrode and said insert ring.

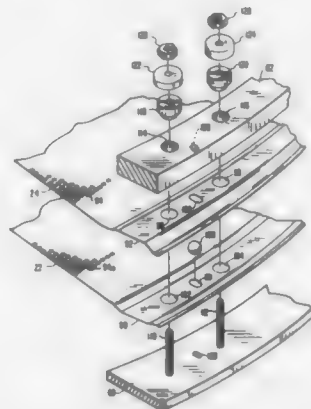
4,873,467

ION SOURCE WITH PARTICULAR GRID ASSEMBLY

Harold R. Kaufman, 5920 Obenchain Rd., La Porte, Colo. 80535, and Raymond S. Robinson, Bradbury Ct., Fort Collins, Colo. 80511
Filed May 23, 1988, Ser. No. 197,525
Int. Cl.⁴ H01J 27/00; F02K 9/00

U.S. Cl. 313—360.1

17 Claims



1. In an ion source having a chamber wherein ions are produced and propelled outwardly through at least a pair of grids having a mutually-aligned respective plurality of apertures, a grid assembly comprising:
first and second grids each of conductive material having an integrally-formed peripheral marginal portion and having, inside said marginal portion, an array of apertures distributed in a predetermined pattern;
a support element having a shape which matches that of and is mounted over the side of the marginal portion of said first grid facing away from said second grid;
a clamp having a shape which matches that of and is mounted over the side of the marginal portion of said second grid facing away from said first grid;
means for securing said clamp to said support element with said marginal portions sandwiched therebetween and respectively positioned to mutually align the respective ones of said apertures in said first and second grids;
means defining a first and second mutually aligned series of seats successively spaced around respective ones of said marginal portions;
and means, including a plurality of insulators each having a circular cross section and individually seated in and between corresponding ones of said first and second series of seats, for enabling radial movement of said marginal portions relative to each other and relative to said support element and said clamp.

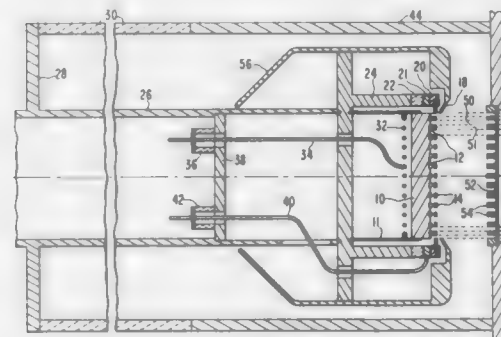
4,873,468

MULTIPLE SHEET BEAM GRIDDED ELECTRON GUN

George V. Miram, Atherton; Michael C. Green, Palo Alto, and George K. Merdianian, Los Altos, all of Calif., assignors to Varian Associates, Inc., Palo Alto, Calif.
Filed May 16, 1988, Ser. No. 194,638
Int. Cl.⁴ H01J 33/04, 29/58, 19/04

U.S. Cl. 313—411

11 Claims



1. A gun for projecting multiple sheet electron beams comprising:
a thermionic cathode with an extended emissive surface;
a set of parallel focusing bars, each focusing bar comprising a base portion held in a slot in said extended surface and a focusing portion projecting as a ridge above said surface; and
a grid of conductive bars uniformly spaced above said ridges and aligned therewith.

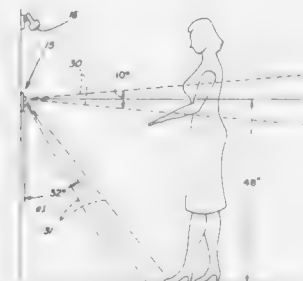
4,873,469

INFRARED ACTUATED CONTROL SWITCH ASSEMBLY

William A. Young, Aurora, Colo.; Wai-Shing Ko, Aurora, Ill.; Curtis R. Davidson, Oswego, Ill., and Thomas Whitehurst, Bensenville, Ill., assignors to Pittway Corporation, Northbrook, Ill.
Continuation-in-part of Ser. No. 52,763, May 21, 1987, Pat. No. 4,823,051. This application Oct. 14, 1987, Ser. No. 107,002
Int. Cl.⁴ G01J 5/08; G08B 13/18

U.S. Cl. 315—155

32 Claims



1. An infrared radiation actuated control switch assembly responsive to infrared radiation within a given space for controlling a functional device in response to variations in infrared radiation, indicative of movement of a source of infrared radiation within the space, comprising
sensing means including a sensing element responsive to infrared radiation; optical means; control circuit means; and housing means for containing said sensing means, said optical means and said control circuit means;
said housing means being constructed and arranged for mounting within the space;
said optical means being supported within said housing means and including first planar reflecting means, second

planar reflecting means and focusing means, said sensing element being mounted in an operative relation with said focusing means, said first planar reflecting means including a first plurality of planar reflecting segments arranged in juxtaposed relation and inclined at a first vertical angle defining a first reflecting surface for reflecting to said focusing means infrared radiation in a first sensing field extending at a first predetermined semivertical angle within the space, said second planar reflecting means including a second plurality of planar reflecting segments arranged in juxtaposed relation and inclined at a second vertical angle defining a second reflecting surface for reflecting to said focusing means infrared radiation in a second sensing field extending at a second predetermined semivertical angle within the space, and said focusing means having first and second curved reflecting surfaces for focusing onto said sensing element infrared radiation from said first and second sensing fields, respectively, reflected thereto by said first and second planar reflecting means,
said circuit means being connected to said sensing element and responsive to said sensing element for providing an output for energizing the functional device in response to variation in infrared radiation focused onto said sensing element, indicative of movement of source of infrared radiation within the space.

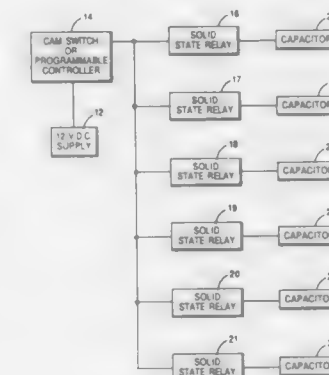
4,873,470

PROGRAMMABLE ULTRAVIOLET LAMP CONTROL SYSTEM

Robert A. Myers, Viroqua, Wis., assignor to NCR Corporation, Dayton, Ohio
Filed May 27, 1988, Ser. No. 199,987
Int. Cl.⁴ H05B 41/14

U.S. Cl. 315—240

6 Claims



1. A variable intensity output arrangement of an ultraviolet lamp system for use in curing printing ink, said arrangement comprising at least one
ultraviolet lamp having a pair of terminals and a lamp ballast transformer operational with alternating current, a plurality of capacitors coupled to the lamp ballast transformer, said capacitors being selected to enable varying capacitance into the system and thereby provide selected intensities of output of said ultraviolet lamp, a plurality of relay contactors operably coupled to said capacitors for switching said capacitors into and out of operation, a
direct current control voltage supply means, a plurality of relay coils operable to actuate the relay contactors, and
control means coupled to said control voltage supply means and to said relay coils for timing operation of the output intensity of the ultraviolet lamp system whereby the lamp ballast is selectively varied from a low intensity output

during one portion of operation to a higher intensity output during another portion of a curing cycle of operation.

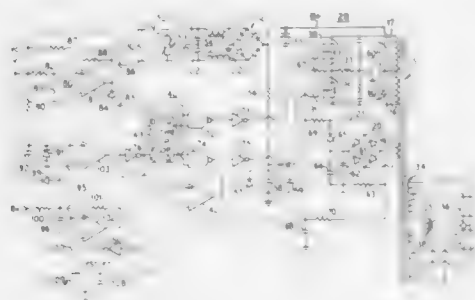
4,873,471

HIGH FREQUENCY BALLAST FOR GASEOUS DISCHARGE LAMPS

Thomas E. Dean, Cookeville; William H. Henrich, Sparta, both of Tenn.; David M. Fischer, Waltham; Lawrence J. Stratton, Lexington, both of Mass., and Herbert E. Pietsch, Cookeville, Tenn., assignors to Thomas Industries Inc., Louisville, Ky.
Continuation-in-part of Ser. No. 845,853, Mar. 23, 1986, abandoned. This application Oct. 8, 1987, Ser. No. 106,180
Int. Cl.⁴ H05B 41/36

U.S. Cl. 315—308

56 Claims



54. An electronic circuit for receiving input electrical power at a lower frequency for energizing a load circuit at higher frequency comprising:

voltage source means receiving said input electrical power for generating a source voltage having a varying magnitude and a predetermined minimum voltage, said voltage source means having rectifier circuit means for generating a full-wave rectified voltage and make-up power means receiving power from said full-wave rectified voltage for storing energy for use during periods when the output voltage of said rectifier circuit means falls below said predetermined minimum voltage;

inverter circuit means including first and second switching means connected in circuit with said voltage source means and said load circuit;

logic circuit means responsive to a sensed signal representing current flowing in said switching means for operating said first and second switching means to conduct alternately by switching a conducting one of said switching means to a non-conducting state when the current flowing therein reaches a predetermined value and immediately thereafter switching the other of said switching means to conduct until the current flowing therein reaches a predetermined value, whereby the frequency of current in said load circuit varies as the magnitude of said source voltage varies, said logic circuit means having a bistable circuit having complementary outputs for determining the states of said first and second switching means respectively, sensing circuit means for generating said sensed current signal representative of the instantaneous current flowing through said switching means, and first comparator circuit means receiving said sensed signal for changing the state of said bistable circuit means when said sensed current reaches a predetermined set point signal representative of a desired current level flowing in said switching means;

reactance circuit means connected in circuit with said load circuit, the operating frequency range of said inverter circuit means and the impedance of said reactance circuit means being such that as the magnitude of said source voltage changes the operating frequency of said inverter circuit means changes and the resulting impedance of said reactance circuit means is such that the peak amplitude of current in said load circuit remains substantially constant; said load circuit having a power transformer coupled in circuit with said voltage source means and said first and

second switching means, whereby said sensed current signal is a ramp signal having a rise time slope which increases when the magnitude of said source voltage increases and which decreases when the magnitude of said source voltage decreases, thereby to change the operating frequency of said inverter circuit means; and first compensating circuit means for adding a first compensating signal to said sensed signal when the amplitude of the voltage of said voltage source means is relatively high, thereby at least partially to compensate for current overshoot in the shutting off of said first and second switching means.

4,873,472

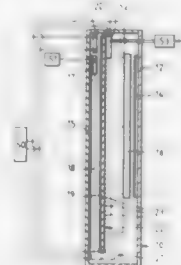
FLAT CATHODE RAY TUBE DISPLAY APPARATUS

Kenneth G. Freeman, Reigate, England, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Oct. 25, 1988, Ser. No. 262,410
Claims priority, application United Kingdom, Dec. 11, 1987, 2729019

Int. Cl.⁴ H01J 29/70, 29/72

U.S. Cl. 315—366

20 Claims



1. A flat cathode ray tube display apparatus comprising a cathode ray tube having an envelope, a luminescent screen extending over a substantially flat faceplate, a deflection electrode array within the envelope extending parallel to the screen and comprising a plurality of individual deflector electrodes, a planar electrode spaced from the deflection electrode array and overlying the screen, means in the envelope for producing and directing a line scanning electron beam substantially parallel to the faceplate between the deflection electrode array and the screen, a drive circuit comprising a plurality of output stages each of which is connected to a respective electrode of the deflection electrode array, the deflection electrode array being operable by the drive circuit for deflecting the line scanning beam in a direction towards said faceplate in field scanning manner whereby the electron beam is scanned over the luminescent screen in a television raster fashion, characterized in that the deflection electrode array comprises one deflector electrode for each conventional standard raster line to be displayed, and in that the drive circuit is operable to switch the voltage applied to each deflector electrode from a first predetermined level to a second predetermined level in sequence so as to step the line-scanning beam in the field direction.

4,873,473

MODULAR MOTOR CONTROLLER

Paul E. Penn, Indianapolis; Roger A. Werckman, Jr., Carmel, and John W. Waymire, Indianapolis, all of Ind., assignors to Dart Controls, Inc., Zionsville, Ind.

Filed Jan. 28, 1988, Ser. No. 149,624

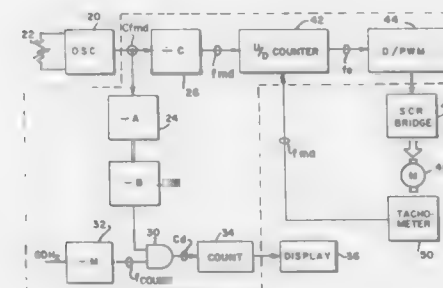
Int. Cl.⁴ G05B 5/00

U.S. Cl. 388—814

32 Claims

1. An apparatus for controlling a motor, the apparatus comprising an oscillator for providing a source of periodic signals;

means for converting the oscillator output into desired motor rotation frequency signals;
means for generating actual motor rotation frequency signals;
means for comparing the actual and desired motor rotation frequency signals and for generating a rotation frequency error signal;
means for controlling motor rotation frequency;
means for coupling the oscillator to the means for converting the oscillator output into desired motor rotation frequency signals;
means for coupling the means for converting the oscillator output into desired motor rotation frequency signals to the means for comparing the actual and desired motor rotation frequency signals and for generating a rotation frequency error signal;



means for coupling the means for comparing the actual and desired motor rotation frequency signals and for generating a rotation frequency error signal to the means for controlling motor rotation frequency;
means for coupling the means for generating actual motor rotation frequency signals to the means for comparing the actual and desired motor rotation frequency signals and for generating a rotation frequency error signal;
means for generating a counting gate during which signals are to be counted;
means for counting signals;
means for displaying the number of signals counted during the counting gate;
means for coupling at least one of the means for generating a counting gate and the oscillator to the means for counting signals; and
means for coupling the signal count display means to the means for counting signals.

4,873,474

WINCH WITH SHUT-OFF LOAD LIMITER

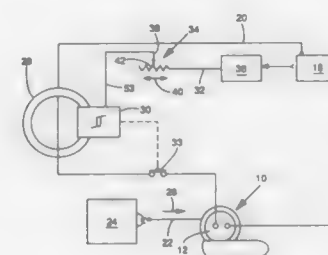
Richard G. Johnson, Portland, Oreg., assignor to Warn Industries, Inc., Milwaukie, Oreg.

Filed Apr. 20, 1989, Ser. No. 341,431

Int. Cl.⁴ H02P 7/00

U.S. Cl. 318—434

2 Claims



1. A winch comprising:
a winching mechanism including a rotatable winch reel, a

cable wound onto the reel adapted for being wound at least in part onto and off of the reel, and an electric motor for rotating the reel and winding the cable onto the reel and in a process pulling a load connected to the cable;
an electrical power source providing electrical power to the motor, a load limit switching means for shutting off the power to the motor, and a hall effect switch responsive to the magnetic field generated by the electrical power source for activating the switching means and automatically shutting off the motor in response to a power demand by the motor indicating a load being pulled that exceeds an established load limit, and the improvement that comprises;

a first conducting line from the electrical power source to the motor and a magnetic field detector means placed in proximity to the first conducting line for detecting the magnetic field generated in the first conducting line as an indicator of the power demand by the motor, said detector means connected to the hall effect switch and conveying the level of magnetic field detected in the first conducting line to the hall effect switch;

a secondary power source providing a determined voltage through a second conducting line to the hall effect switch, and a potentiometer placed in the second conducting line between the secondary power source and hall effect switch, said potentiometer adapted to reduce the voltage from the secondary power source to the hall effect switch, and control means for controlling the amount of voltage reduction by the potentiometer and thereby determining in part the required magnetic field in the first conducting line of the motor required for activating the hall effect switch and the load limit switching means for shutting off the motor.

4,873,475

ELECTRICALLY POWERED POWER STEERING SYSTEM FOR INDUSTRIAL VEHICLE OR THE LIKE

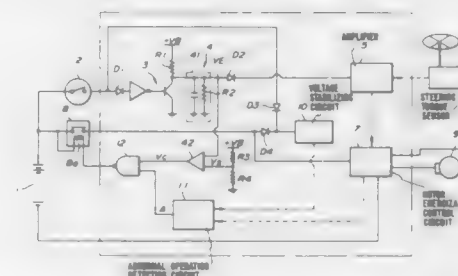
Sigeru Togo, Akigawa; Yoichi Saito, Musashimurayama; Masayuki Tateyama; Genji Okuma, both of Oume, and Hiroya Miyazaki, Maebashi, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jul. 29, 1987, Ser. No. 79,068

Int. Cl.⁴ B62D 5/04

U.S. Cl. 318—489

7 Claims



1. A power steering system, comprising:
a sensor for sensing the direction in which a steering column is being rotated and producing an output signal indicative thereof;
an electric motor;
a motor control circuit for controlling the motor in response to the output signal of the sensor;
a source of electrical power;
a manually operable switch;
a power supply circuit which supplies power from the source to the motor control circuit when the switch is closed; and
means for gradually decreasing the supply of electrical

4,873,482

SUPERCONDUCTING TRANSMISSION LINE PARTICLE DETECTOR

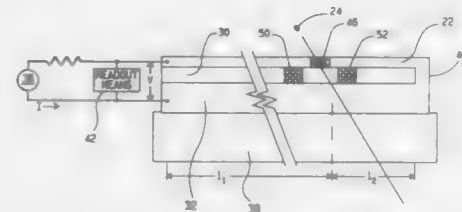
Kenneth E. Gray, Naperville, Ill., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jul. 28, 1988, Ser. No. 225,412

Int. Cl. G01N 27/00

U.S. Cl. 324-71.4

12 Claims



1. A microvertex detector for tracking charged subatomic particles comprising:

- a plurality of superconducting transmission line waveguides positioned to be capable of intercepting the trajectory of a moving subatomic particle, said plurality superconducting transmission line waveguides capable of carrying current supplied by a current source and
- readout means responsive to said plurality superconducting transmission line waveguides whereby the position of a particle passing through any of said plurality of superconducting transmission line waveguides can be determined.

4,873,483

MULTI INPUT LIGHTNING DETECTION SYSTEM

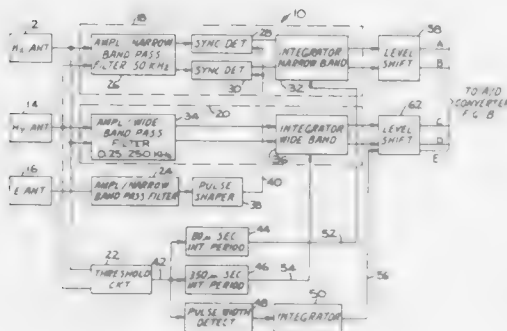
Kenneth A. Ostrander, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn. Division of Ser. No. 145,276, Jan. 19, 1988, Pat. No. 4,803,421.

This application Nov. 18, 1988, Ser. No. 273,081

Int. Cl. G01W 1/16

U.S. Cl. 324-72

4 Claims



1. An apparatus for determining geographic locations of electrical disturbances generated by weather phenomena relative to an observation location, comprising

- means for independently receiving signals associated with the electromagnetic fields generated by said electrical disturbances which are indicative of the direction from the observation location to the location of the disturbances,
- means for isolating from said received signals at least first components of said fields, the intensities of which are inverse functions of the distance between the discharges and the observation location,
- means responsive to said received signals for generating pulse width signals proportional to the time between the

beginning of each of the discharges and the first zero crossing of that discharge, means for simultaneously combining said first components and said pulse width signals and for deriving therefrom a range signal which is indicative of said distance, the inclusion of the pulse width signals in deriving said range signal thereby improving the accuracy of said range signal, and means responsive to said direction indicative received signals for deriving a direction signal, whereby said range and direction signals may be used to control display means to provide a map-like display of the location of said disturbances relative to said observation location.

4,873,484

EXTENDED RANGE COMPOSITE HEAD POWER SENSOR WITH THREE CIRCUIT BRANCHES HAVING A COMMON NODE

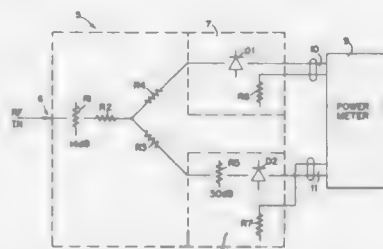
Stephen F. Adam, Los Altos, Calif., assignor to Lucas Weinschel, Inc., Gaithersburg, Md.

Filed Sep. 3, 1987, Ser. No. 92,755

Int. Cl. G01R 15/08, 21/00, 21/10

U.S. Cl. 324-95

14 Claims



1. A power sensor for detecting the power of a signal from a signal source, comprising:

- (a) circuit means for dividing said signal having first, second and third branches having a common node, said first branch comprising first and second resistors, said first branch extending between the node and input means for receiving said signal, said second branch comprising a third resistor connected in series with a first diode for conduction of a signal within a first predetermined power range, said third branch comprising fourth and fifth resistors connected with a second diode for conduction of a signal within a second predetermined power range; and
- (b) said second and third branches extending from said node to output means responsive to the signals on said second and third branches for providing an output signal characteristic of the power level of the signal from the signal source.

4,873,485

ELECTRO-OPTIC SIGNAL MEASUREMENT

Steven L. Williamson, Henrietta, N.Y., assignor to The University of Rochester, Rochester, N.Y.

Filed Jul. 13, 1988, Ser. No. 218,178

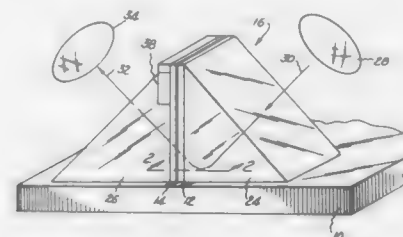
Int. Cl. G01R 19/00, 19/155

U.S. Cl. 324-96

26 Claims

1. The method of measuring an electrical signal on a conductor at a predetermined location spatially of said conductor which comprises the steps of placing a probe of electro-optical material in the electrical fringe field from said conductor at said location; passing a beam of light through said probe; converting said beam after passage through said probe into a

second electrical signal; and generating, with a third electrical signal, a field at said probe, which cancels said fringe field, in



response to said second electrical signal, said third signal providing a measurement of said first named signal.

4,873,486

MAGNETIC RESONANCE SPECTROMETER

Michael H. Kuhn, Hamburg; Thomas Helzel, Kaltenkirchen; Roland Prokss, Hamburg, all of Fed. Rep. of Germany, and Noel J. M. Van Den Berg, Putte, Netherlands, assignors to U.S. Philips Corp., New York, N.Y.

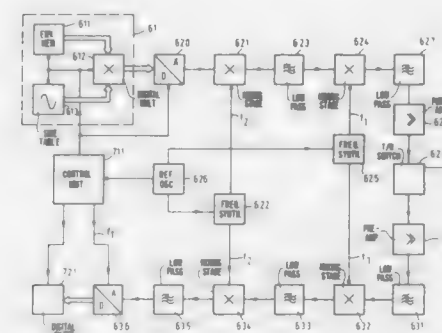
Filed Sep. 8, 1988, Ser. No. 241,635

Claims priority, application Fed. Rep. of Germany, Sep. 10, 1987, 3730293

Int. Cl. G01R 33/20

U.S. Cl. 324-307

16 Claims



1. A magnetic resonance spectrometer comprising a receiving branch in which means, including successive first and second mixing stages is provided for transposing a received spin resonance signal having a first frequency band (B_1) of useful frequencies into a lower third frequency band (B_3) having a lowest useful frequency greater than zero and in which an analog-to-digital converter (636) converts the spin resonance signal thus transposed into the lower frequency range band (B_3) into a series of digital data words, said analog-to-digital converter having a sampling frequency (f_s) at least twice as high as the highest useful frequency in the lower frequency band (B_3) characterized in that in the first mixing stage (632) the spin resonance signal is mixed with a first frequency (f_1) in the vicinity of the Larmor frequency, but lying outside of said first frequency band (B_1) in order to produce an output signal in which said first frequency band (B_1) is transposed to a second frequency band (B_2) substantially lower than said first frequency band (B_1), and in that in the second mixing stage (634) the output signal of the first mixing stage is mixed with a second frequency (f_2) substantially lower than the first frequency (f_1) in the vicinity of but lying outside of said second frequency band (B_2) in order to reduce an output signal in which said second frequency band (B_2) is transposed to a frequency band which is substantially lower than said second frequency band (B_2).

4,873,487

METHOD AND ARRANGEMENT FOR SUPPRESSING COHERENT INTERFERENCES IN MAGNETIC RESONANCE SIGNALS

Peter Van Der Meulen, Eindhoven, Netherlands, assignor to U.S. Philips Corp., NY, N.Y.

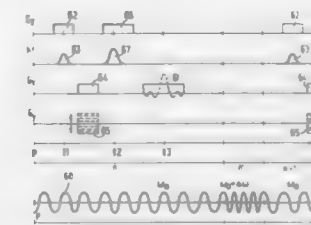
Filed May 27, 1987, Ser. No. 54,476

Claims priority, application Netherlands, Feb. 4, 1987, 1700266

Int. Cl. G01R 33/20

U.S. Cl. 324-314

5 Claims



5. An arrangement for determining a nuclear magnetization spatial distribution in a part of a body, this arrangement comprising means for producing a stationary magnetic field, means for producing magnetic field gradients and means for producing a reference signal, as well as transmitter means for transmitting a high-frequency electromagnetic pulse which is formed in the transmitter means by means of the reference signal, and receiver means for receiving and detecting by means of the reference signal a resonance signal which is excited in the body by at least one high-frequency electromagnetic pulse, and processing means for processing the detected resonance signals by means of a Fourier transformation, characterized in that for smearing out over the determined spatial distribution, artefacts due to coherent interferences, the arrangement comprises means for varying the value of the phase of the reference signal before the transmission of the at least one high-frequency electromagnetic pulse.

4,873,488

INDUCTION LOGGING SONDE WITH METALLIC SUPPORT HAVING A COAXIAL INSULATING SLEEVE MEMBER

Thomas D. Barber; Richard N. Chandler, both of Houston, and John F. Hunka, Kingwood, all of Tex., assignors to Schlumberger Technology Corporation, Houston, Tex.

Division of Ser. No. 718,003, Apr. 3, 1985, Pat. No. 4,651,101, which is a continuation-in-part of Ser. No. 584,059, Feb. 27, 1984, abandoned. This application Nov. 13, 1986, Ser. No. 932,231

The portion of the term of this patent subsequent to Mar. 17, 2004, has been disclaimed.

Int. Cl. G01V 3/28

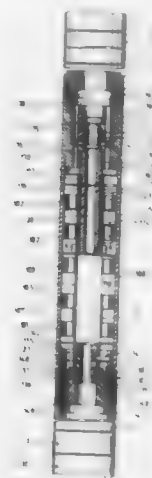
U.S. Cl. 324-339

2 Claims

1. An induction logging sonde adapted to be passed through a borehole for electromagnetically exploring earth formations traversed by the borehole comprising:

- a high strength, electrically conductive, longitudinal support member having a substantially continuous outer surface to favor the flow of eddy currents;
- an insulating sleeve member coaxial with and supported by said support member;
- at least one transmitter solenoid coil coaxial with and supported by said sleeve member said coil transmitting at a frequency between about 10-400 KHz for generating an electromagnetic field substantially free from dielectric effects, which field induces currents in the formation and

induces said eddy currents circularly around the surface of said longitudinal support member;
a first receiver array coaxial with and supported by said sleeve member and having a primary receiver solenoid coil disposed a first longitudinal distance on one side of said transmitter solenoid coil; and



a second receiver array coaxial with and supported by said sleeve member and having a primary receiver solenoid coil disposed a second longitudinal distance on the side of said transmitter solenoid coil which is opposite that on which said first receiver array is mounted and where said second distance is greater than said first distance.

4,873,489

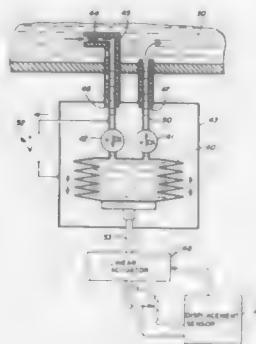
METHOD AND APPARATUS FOR MEASUREMENT OF CHARGE ENTRAINED IN FLUIDS

James R. Melcher, Lexington; Alfred J. Morin, II, Cambridge, and Markus Zahn, Lexington, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Mar. 2, 1988, Ser. No. 163,384

Int. Cl.⁴ G01R 31/12

U.S. Cl. 324-453



3. Apparatus as claimed in claim 2 wherein the probe is recessed inside the conducting shield by a distance that is on the order of the width of an aperture in the shield through which the fluid is received.

4. Apparatus as claimed in claim 1 wherein the container is filled through a port which is recessed inside the conducting shield by a distance that is on the order of the width of an aperture in the shield through which the fluid is received.

4,873,490

CIRCUIT ARRANGEMENT FOR GENERATING AN OUTPUT SIGNAL THAT IS NONLINEARLY DEPENDENT ON THE TEMPERATURE

Hans Hecht, Korntal, and Winfried Kuhn, Stuttgart, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

PCT No. PCT/DE87/00118, § 371 Date Dec. 10, 1987, § 102(e) Date Dec. 10, 1987, PCT Pub. No. WO87/06337, PCT Pub. Date Oct. 22, 1987

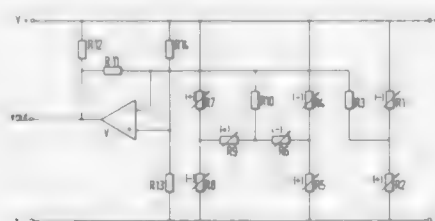
PCT Filed Mar. 19, 1987, Ser. No. 150,661

Claims priority, application Fed. Rep. of Germany, Apr. 16, 1986, 3612809

Int. Cl.⁴ G01K 7/00; G06G 7/12, 7/00; H01L 31/00

U.S. Cl. 328-3

3 Claims



1. A circuit arrangement for generating a signal that is non-linearly dependent on the temperature, comprising two power supply lines; a temperature-dependent resistor bridge circuit having two pairs of series connected resistors of opposite temperature coefficients interconnected at two opposite junction points; each of said junction points corresponding to a connection point of a resistor having a positive temperature coefficient and a resistor having a negative temperature coefficient; said opposite junction points being connected between said power supply lines; a series circuit of a resistor having a negative temperature coefficient and a resistor having a positive temperature coefficient being connected between the connection points of said series connected resistor in said two pairs whereby the non-linearly dependent signal is formed at the connection point of the two resistors of said series circuit.

4,873,491

PHASE SHIFT CIRCUIT UTILIZING A VARIABLE TIME DELAY LINE

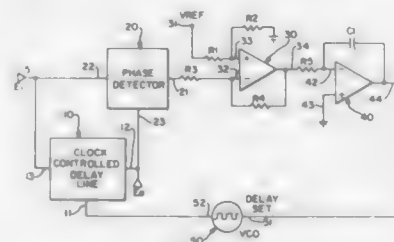
Jeffrey K. Wilkins, P.O. Box 4223, Stanford, Calif. 94305

Filed Oct. 19, 1987, Ser. No. 110,674

Int. Cl.⁴ H03K 5/159, 5/13

U.S. Cl. 328-155

7 Claims



1. A phase modulator comprised of:
an input signal to be phase modulated;
a clock-controlled delay line used to provide a time delay of said input signal;
a phase detector which measures the phase difference between said input and output of said clock-controlled delay line, output of said phase detector being a voltage that is a function of said phase difference;
a differential operational amplifier generating an error voltage by comparing the output of said phase detector and a time-varying reference voltage;

said time-varying reference voltage being a function of a desired amount phase modulation;
said error voltage being applied to the input of an integrator; output of said integrator being a feedback control signal;
said feedback control signal being applied to the input of a voltage-controlled oscillator;
output of said voltage controlled oscillator being a square wave used to set said time delay of said clock-controlled delay line;
output of said clock-controlled delay line being phase modulated from said input signal by the desired amount.

4,873,492

AMPLIFIER WITH MODULATED RESISTOR GAIN CONTROL

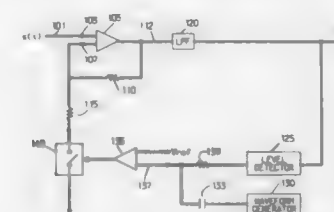
Robert E. Myer, Deenville, N.J., assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 5, 1988, Ser. No. 280,076

Int. Cl.⁴ H03G 3/20

U.S. Cl. 330-86

27 Claims



1. A circuit for controlling the gain of an amplifier operating over a prescribed frequency range having an input and an output comprising:

means coupled to the output of the amplifier for generating a first signal representative of the output level of the amplifier;

means for generating a second signal having predetermined waveform repeated at a rate greater than the reciprocal of twice the upper frequency of the prescribed frequency range;

means connected to the first and second signal generating means for forming a third signal having a level corresponding to the first signal and variations therefrom corresponding to the second signal;

means for generating a reference threshold; and
means connected to the amplifier responsive to the third signal and the reference threshold for determining the gain of the amplifier including

at least one switched impedance element; and
means jointly responsive to the third signal and said reference threshold for altering the value of the switched impedance element at the repetition rate of the second signal.

4,873,493

AUDIO AMPLIFIER

Nobuo Fujiwara, Yokohama, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Feb. 19, 1988, Ser. No. 158,919

Claims priority, application Japan, Feb. 20, 1987, 62-38362; Feb. 20, 1987, 62-38363

Int. Cl.⁴ H03G 3/18

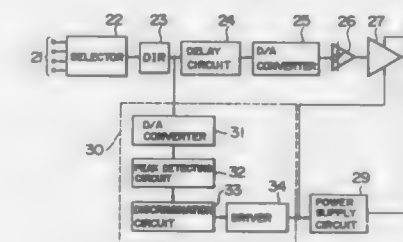
U.S. Cl. 330-285

7 Claims

1. An audio amplifier for amplifying an input signal thereto comprising:

a delay circuit for delaying the input signal;
an amplifier circuit having an amplification device for amplifying an output signal of said delay circuit, said amplifier circuit having a variable operating point;

a power supply circuit capable of changing a supply voltage to said amplifier circuit; and
a control circuit for detecting a level of said input signal to output a control signal corresponding to said level, said



control signal being coupled to said amplifier circuit for changing the operating point of said amplifier circuit and being also coupled to said power supply circuit for changing said supply voltage to said amplifier circuit in response to a level change of said input signal.

4,873,494

INDUCTIVE LOOP PRESENCE DETECTOR WITH CROSS TALK FILTER

Brian C. Jeffers, Hampshire, United Kingdom, assignor to Sarasota Automation Limited, Winchester, United Kingdom

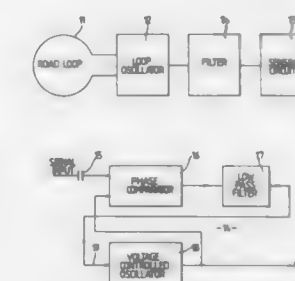
Filed Mar. 13, 1984, Ser. No. 589,250

Claims priority, application United Kingdom, Mar. 16, 1983, 8307290

Int. Cl.⁴ G08G 1/07

U.S. Cl. 331-65

2 Claims



1. A system including a plurality of inductive loop presence detectors, each of said presence detectors comprising an inductive loop to (11) sense the presence of an object to be detected, a loop oscillator (12) having said inductive loop connected thereto as an element determining frequency of oscillation, sensing circuitry (13) to detect changes in the loop oscillator frequency due to the movement of an object to be detected in the vicinity of said loop, and a filter network (14) inserted between the loop oscillator output and the input of said sensing circuitry, said filter network comprising a phase-locked loop including a filter (17) with a pass band sufficiently low to attenuate beat frequency components due to cross talk caused by mutual interference between said plurality of inductive loop detectors.

4,873,495

ULTRAHIGH-FREQUENCY OSCILLATOR HAVING A DIELECTRIC RESONATOR STABLE WITH RESPECT TO MECHANICAL VIBRATIONS

Daniel Doyon, Lise-Brevauges, and Tarcisio Vriz, Montgeron, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

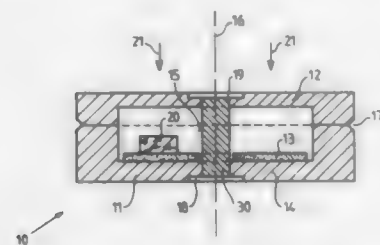
Filed Aug. 30, 1988, Ser. No. 238,689

Claims priority, application France, Sep. 4, 1987, 87 12278

Int. Cl.⁴ H03B 5/18

U.S. Cl. 331-68

2 Claims



1. An ultrahigh-frequency oscillator (10) stabilized by a dielectric resonator (20) comprising a housing (11) closed by a cover (12) and having a circuit (13) including a dielectric resonator (20) fixed in the bottom (14) of the housing (11), characterized in that a column (30) situated in the central part (15) of the housing (11) rigidly connects the bottom (14) of the housing (11) to the cover (12), and in that the dielectric resonator (20) is arranged outside the said central part (15).

4,873,496

TUNED OSCILLATOR

Takahiro Ohgihara, Yoshikazu Murakami, Yasuyuki Mizunuma, all of Kanagawa, and Hiroyuki Nakano, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

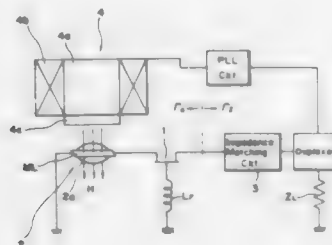
Filed Dec. 8, 1988, Ser. No. 281,289

Claims priority, application Japan, Dec. 14, 1987, 62-315650

Int. Cl.⁴ H03B 5/18

U.S. Cl. 331-96

7 Claims



1. A tuned oscillator comprising:
an active element for oscillation,
a ferromagnetic resonance element formed of a ferrimagnetic thin film and a transmission line connected as a part of feedback for said active element,
a matching circuit connected to said active element, and a bias magnetic field means applying a D.C. bias magnetic field to said ferrimagnetic thin film,
said matching circuit being designed to reflect a fundamental wave generated by said ferromagnetic resonance element and said active element and to pass a second harmonic wave of said fundamental wave.

4,873,497

WIDE BAND VOLTAGE CONTROLLED R-C OSCILLATOR FOR USE WITH MMIC TECHNOLOGY

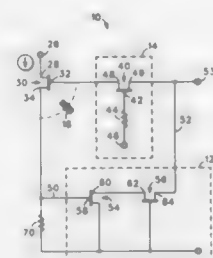
Ronald F. Kleimeyer, Jr., Chandler, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 3, 1988, Ser. No. 252,204

Int. Cl.⁴ H03B 5/24

U.S. Cl. 331-108 B

18 Claims



1. A wide band tunable microwave oscillator for monolithic microwave integrated circuits comprising:
feedback loop means for providing a feedback signal for oscillation, said feedback loop means comprising:
transistor capacitance means for supplying gain and phase shift for oscillation, said transistor capacitance means including an input and an output;
variable resistor means for supplying a voltage variable resistance, said variable resistor means having a first input and an output coupled to said input of said transistor capacitance means; and
amplifier means for providing an amplification to said feedback signal, said amplifier means including an input coupled to said output of said transistor capacitance means, and an output coupled to said first input of said variable resistor means.

4,873,498

REFLECTION OSCILLATORS EMPLOYING SERIES RESONANT CRYSTALS

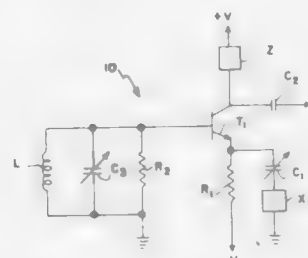
Leonard L. Kleinberg, Annapolis, Md., assignor to The United States of America as represented by the Administrator, National Aeronautics and Space Administration, Washington, D.C.

Filed Dec. 30, 1988, Ser. No. 292,037

Int. Cl.⁴ H03B 5/12

U.S. Cl. 331-116 FE

8 Claims



1. A reflection oscillator including an active device with at least two terminals operated in its roll-off region and further including two tuned circuits, one of which is connected to one terminal of said device and the other of which is connected to another terminal of said device.

4,873,499

FAST RISE PULSE OSCILLATOR

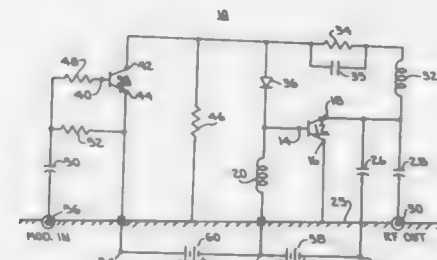
Marshall M. Algor, Conover, N.C., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 26, 1988, Ser. No. 199,824

Int. Cl.⁴ H03B 5/12

U.S. Cl. 331-117 R

9 Claims



1. An oscillator for producing an output having fast rise time oscillations comprising:
an output terminal;
a first power supply terminal;
a second power supply terminal;
an oscillator transistor having a collector connected to said first power supply terminal, an emitter connected to said output terminal, and a base;
a step recovery diode connected to the base of said oscillator transistor;
a tank circuit connected between said second power supply terminal and the base of said oscillator transistor;
first network biasing means connected to said first power supply terminal for effectuating a forward bias current through said step recovery diode;
second network biasing means connected to said step recovery diode for reverse biasing said step recovery diode to produce a momentary reverse current that causes an internal transient in said tank circuit immediately prior to initiation of oscillations.

4,873,500

PHASE ACCUMULATION CONTINUOUS PHASE MODULATOR

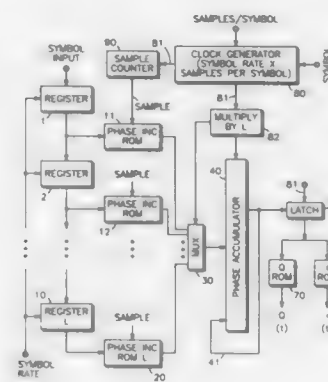
Thad J. Gearich, Scottsdale, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 29, 1988, Ser. No. 188,440

Int. Cl.⁴ H04L 27/12

U.S. Cl. 332-104

27 Claims



1. A phase accumulator continuous phase modulator having a symbol input and a symbol clock input, said phase accumulator continuous phase modulator providing a phase state signal

of said symbol input, said phase accumulator continuous phase modulator comprising:

register means connected to said symbol input and to said symbol clock input, said register means operating to sequentially store a plurality of bits of each symbol;
clock means connected to said symbol clock input and having a second input equal to the number of samples per symbol, said clock means operating to produce first and second clock signals;
phase incrementing means connected to said register means and to said clock means, said phase incrementing means being operated in response to said first clock signal to produce a plurality of phase increment signals proportional to said symbols of said symbol input; and
phase accumulator means connected to said phase incrementing means and to said clock means, said phase accumulator means being operated in response to said second clock signal to sequentially add each of said plurality of phase increment signals to produce said phase state signal.

4,873,501

INTERNAL TRANSMISSION LINE FILTER ELEMENT

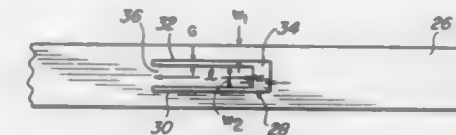
Alfred R. Hislop, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 27, 1986, Ser. No. 881,419

Int. Cl.⁴ H01P 1/203, 1/207, 7/08

U.S. Cl. 333-204

15 Claims



1. A transmission line filter element for inclusion in a transmission line that propagates electromagnetic energy, said transmission line having a longitudinal axis comprising:
a strip of conductive material positioned within said transmission line said strip of conductive material comprising one of the conductors of said transmission line; and
means for rejecting the propagation of a band of frequencies of electromagnetic energy through said transmission line comprising a U-shaped gap positioned within said strip of conductive material, said U-shaped gap having first and second side legs that are gaps in said strip of conductive material and further having a bottom leg, positioned between said first and second side legs, said bottom leg being a gap in said strip of conductive material, said first and second side legs having first and second longitudinal axes, said first and second longitudinal axes being parallel to said longitudinal axis of said transmission line.

4,873,502

NEGATIVE IMMITTANCE CONVERTER

Jacob S. Visser, Hilversum, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 27, 1988, Ser. No. 263,654

Claims priority, application Netherlands, Oct. 29, 1987, 8702571

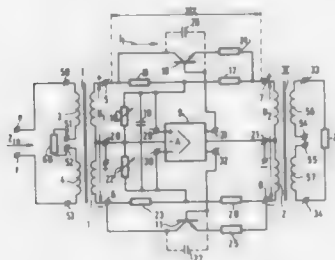
Int. Cl.⁴ H03H 11/44

U.S. Cl. 333-216

12 Claims

1. A negative immittance converter, comprising
a first transformer including a first coil having first and second terminals and a center tap,
a second transformer including a second coil having respective first and second terminals and a center tap,
first and second amplifier elements each having a respective control input, the first amplifier element being connected between the first terminal of the first coil and the first terminal of the second coil, and the second amplifier

element being connected between the second terminal of the first coil and the second terminal of the second coil, respective power supply points connected to the respective center taps of the first and second coils, and a 180° phase shifter connected between the first and second terminals of the second coil and the respective control inputs of said amplifier elements, characterized in that said 180° phase shifter is formed by a voltage differential amplifier having two inputs, and

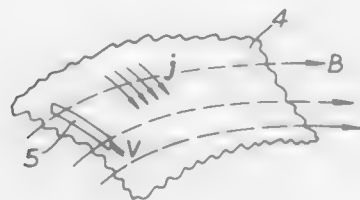


said converter comprises a first voltage divider connected between the respective first terminals of the first and second coils, having a terminal connected to one input of said voltage differential amplifier, and a second voltage divider connected between the respective second terminals of the first and second coils and having a respective voltage divider terminal connected to the other input of said voltage differential amplifier, said control inputs of the first and second amplifier elements being respectively connected to respective outputs of the differential amplifier.

4,873,503 ELECTRICAL COILS

Peter Mansfield, and Barry L. W. Chapman, both of Beeston, England, assignors to National Research Development Corporation, London, England
Filed Jun. 24, 1987, Ser. No. 65,853
Int. Cl.⁴ H01F 7/22
U.S. Cl. 335—216

8 Claims



1. An electrical coil for generating a magnetic field comprises a set of electrical conductors and means for supplying the conductors of the set with electrical currents of magnitude such that the resultant current distribution in the set of conductors approximates to the induced surface current distribution in a conductive former positioned in the place of said set and in the presence of the required magnetic field.

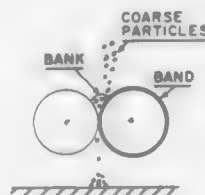
4,873,504 BONDED HIGH ENERGY RARE EARTH PERMANENT MAGNETS

Walter S. Blume, Jr., Cincinnati, and Walter S. Blume, III, Amelia, both of Ohio, assignors to The Electrodyne Company, Inc., Ohio

Filed Feb. 25, 1987, Ser. No. 18,626
Int. Cl.⁴ H01F 7/02

U.S. Cl. 335—303

23 Claims



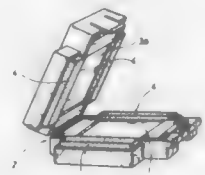
1. A process for making bonded magnets of the rare earth type having unexpectedly high magnetic properties, comprising:

adding particles of rare earth type permanent magnet material to a workable non-magnetic binder until the particles are coated with and cohered in the binder as a workable mass; the average size of the particles of the starting magnet material being substantially larger than single domain size for said magnet material, less than about 15 weight % of the particles of said starting material being smaller than 44 microns in size; thereafter working said mass under shearing forces of such intensity that the average size of the particles is substantially reduced by such working, thereby improving the magnetic properties of the particles, progressively reducing the thickness of said mass during said working while simultaneously increasing its area to form an extended shape therefrom, forming desired magnet shapes from said sheet, and magnetizing said magnet shapes to form permanent magnets therefrom, said magnets having a residual induction which exceeds by at least 5% the maximum value expected for their packing fraction.

4,873,505 ELECTRIC NOISE ABSORBER

Kazuhiro Matsui, Toyoake, Japan, assignor to Kitagawa Industries Co., Ltd., Aichi, Japan
Filed Apr. 11, 1988, Ser. No. 180,462
Claims priority, application Japan, May 29, 1987, 62-84514
Int. Cl.⁴ H01F 17/06, 27/02, 27/26
U.S. Cl. 336—92

13 Claims



1. An electric noise absorber comprising:
a magnetic body abutably divided into two parts, each of said two parts having an abutment surface which has a recess and said magnetic body configured to enclose a portion of an electric conductor;

a retaining case including a pair of cases hingedly connected with each other for holding said magnetic body;
an auxiliary case connected to and adjacent a side of said retaining case, said auxiliary case including at least one cavity; and
an elastic press member sized, shaped, and positioned to fit into a cavity of said auxiliary case and to engage and hold a conductor when said retaining case is in a closed condition about the conductor.

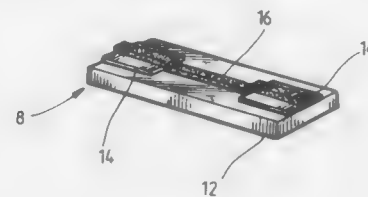
4,873,506 METALLO-ORGANIC FILM FRACTIONAL AMPERE FUSES AND METHOD OF MAKING

Leon Gurevich, St. Louis, Mo., assignor to Cooper Industries, Inc., Houston, Tex.

Filed Mar. 9, 1988, Ser. No. 166,082
Int. Cl.⁴ H01H 35/04, 69/02

U.S. Cl. 337—290

14 Claims



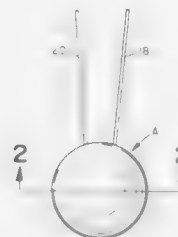
1. A method of making a fuse element subassembly comprising the steps of:
providing a support means of insulating material;
providing said support means with metallized areas so that said support means has a least two separate metallized areas; and
printing a metallo-organic ink on said support means and firing to provide a thin film fusible element on said support means to electrically connect said metallized areas.

4,873,507 ENCAPSULATED THERMAL PROTECTOR

Adamantios Antonas, Fairlawn, Ohio, assignor to Therm-O-Disc, Incorporated, Mansfield, Ohio
Filed Oct. 15, 1987, Ser. No. 108,757
Int. Cl.⁴ H01C 7/10

U.S. Cl. 338—22 R

15 Claims



1. A thermal protector for electric circuits, said protector being characterized by increasing sharply in resistance when a normal operating temperature is exceeded, said protector having a normal operating temperature range and being capable of exploding under extreme overload conditions, said protector being encapsulated in inner and outer layers of substantially different materials having substantially different properties, said inner layer being of an energy-absorbing material that is capable of absorbing and dissipating energy released by explosion of said protector, and said outer layer being of an elastomeric material that is capable of substantial elastic expansion without rupturing when subjected to internal force from energy released by explosion of said protector.

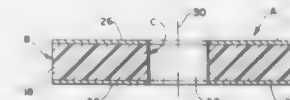
4,873,508 VARIABLE RESISTANCE THERMAL PROTECTOR AND METHOD OF MAKING SAME

Bruce E. Ankenman, and Donald G. Cunitz, both of Mansfield, Ohio, assignors to Therm-O-Disc, Incorporated, Mansfield, Ohio

Filed Jun. 6, 1988, Ser. No. 202,946
Int. Cl.⁴ H01C 3/04

U.S. Cl. 338—25

16 Claims



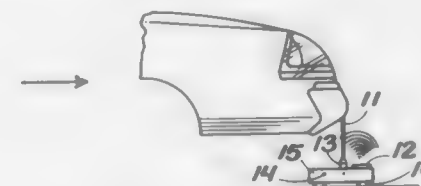
1. A PTC device having inner and outer peripheries and opposite surfaces, both said inner and outer peripheries intersecting both of said opposite surfaces, electrodes on said opposite surfaces for connecting said PTC device in a circuit to carry current therethrough between said electrodes, said PTC device having a conductive area between said inner and outer peripheries that is adjustable by varying the size of said inner periphery while maintaining the size of said outer periphery.

4,873,509 VEHICLE POSITION INDICATOR

David G. Simi, 3585 Waterfall Dr., Sparks, Nev. 89431
Filed Oct. 27, 1987, Ser. No. 113,019
Int. Cl.⁴ B60Q 1/00

U.S. Cl. 340—436

1 Claim



1. A vehicle position indicator apparatus to provide an audible signal upon a predetermined positioning of a vehicle with respect to said apparatus wherein said apparatus comprises, a box-like case means including side walls, a top wall and a bottom wall, and a contact antennae means secured within said case means and projecting vertically upwardly and outwardly of said top wall of said case a predetermined distance for engagement with said vehicle, and a speaker means positioned in said case for emitting an audible sound upon said contact antennae completing an electrical circuit, and switch means positioned proximate said antennae within said case to complete said circuit upon deflection of said antennae by said vehicle, and wherein an on/off switch means positioned through one of said side walls of said case.

means enables selective completion of said circuit upon contact of said antennae with said switch means, and wherein a DC battery is positioned within said case means for providing energy to said electrical circuit, and wherein said switch means comprises a 360 degree encircling ring about said antennae for enabling contact of said antennae with said switch means, and wherein a rubber-like cover boot portion formed about said antennae means externally of said case means and in contact with said case means for containing sparking effected by completion of said circuit within said case means, and wherein friction-like feet are positioned downwardly from said bottom wall and externally of said case means to maintain said positioning of said apparatus on a horizontal support surface.

4,873,510

ICE DETECTOR WITH MOVABLE FEELER

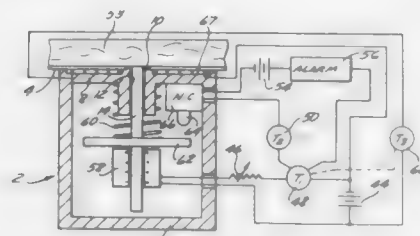
Boris Khurgin, 175 W. 87th St., New York, N.Y. 10024

Filed Apr. 21, 1988, Ser. No. 184,361

Int. Cl.⁴ G08B 19/02

U.S. Cl. 340—580

13 Claims



1. An ice detector comprising a housing adapted to be mounted adjacent a location where the presence or absence of ice is to be detected, said housing having an aperture opening to said location, a feeler within said housing having a part movable through said aperture to a first position extending from said housing but normally in a second position retracted relative to said first position, driving means in said housing operatively connected to said feeler and active when actuated to urge said feeler to its first position, and detector means sensitive to the position of said feeler to indicate the presence or absence of ice at said location pursuant to whether said feeler is in its second or first position respectively after said driving means has been activated.

4,873,511

DEVICE FOR FORECASTING BREAKAGE CABLES IN AN INDUSTRIAL ROBOT

Seizo Tanaka, Aichi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 28, 1988, Ser. No. 187,146

Claims priority, application Japan, Apr. 28, 1987, 62-105022

Int. Cl.⁴ G08B 21/00; B25J 19/00

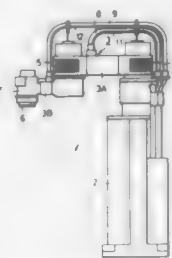
U.S. Cl. 340—677

11 Claims

1. A device for forecasting breakage of cables coupled between a control means provided to a main body of an industrial robot and a driving means for driving arms of said industrial robot, said arms being driven by an instruction signal transmitted through said cables from said control means, the device comprising:

at least one sample wire for forecasting breakage of at least

one of said cables, said at least one sample wire being disposed next to at least one of said cables, and becoming



fatigued and breaking earlier than said cables to forecast the time of breakage of said cables.

4,873,512

ACTIVE SHAFT GROUNDING AND DIAGNOSTIC SYSTEM

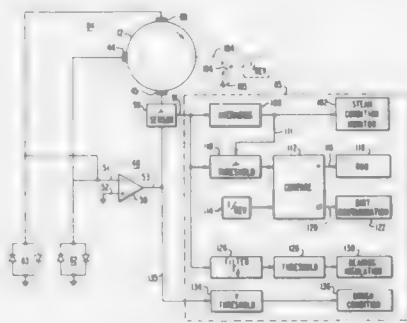
Robert C. Miller, Penn Hills, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 20, 1984, Ser. No. 591,636

Int. Cl.⁴ G08B 21/00

U.S. Cl. 340—679

14 Claims



1. An active shaft grounding system comprising:

- (A) a rotating assembly having a shaft rotatable relative to a stationary assembly and subject to an electrical charge build-up during rotation;
- (B) said shaft being electrically insulated from, and supported by, spaced-apart bearings;
- (C) a first electrically conducting contact device contacting said shaft;
- (D) a second electrically conducting contact device contacting said shaft;
- (E) feedback circuit means connected between said first and second contact devices and operable to provide a neutralizing current to said shaft, through said second contact device to inhibit said electrical charge build-up, as a function of the voltage at said first contact device; and
- (F) protection means connected between said first contact device and ground potential and operable to limit the voltage of said first contact device to some predetermined maximum value.

4,873,513

AUTOMATED MAP DISPLAY SYSTEM

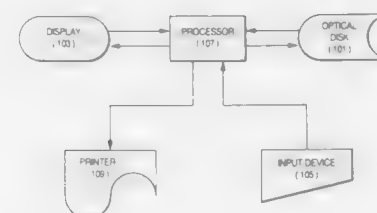
Donald J. Soultz, Vienna, and Neil A. Daniels, Arlington, both of Va., assignors to Geodisplay Technology Limited Partnership, Vienna, Va.

Filed Aug. 26, 1987, Ser. No. 89,450

Int. Cl.⁴ G09G 1/00

U.S. Cl. 340—723

13 Claims



1. A map display system for electronically storing, accessing, and displaying video images generated from physical maps, the system comprising:

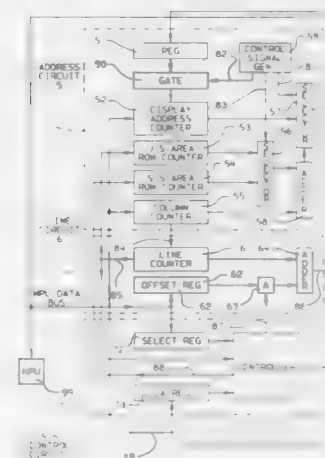
image storing means for storing images of the physical maps, each of said map images having corresponding field of view data representing the geographic coverage in longitude and latitude available as a displayed image derived after generating said map image from the corresponding physical map, a longitude value representing a reference longitude for the map image, and a latitude value representing a reference latitude for the map image;

means for displaying said map images;

means for selecting a latitude, longitude, and field-of-view data of a map image to be displayed, said selecting means including an input device for selectively positioning a locator on said displaying means and means for determining a latitude and longitude location from said position of said locator on said displaying means; and

means for accessing from said storing means and for transferring to said displaying means the unique stored map image including said latitude and longitude location and a field of view closest to said desired field of view data.

signal for selectively modifying said line count signal with said offset data, and



control means for changing said offset data in said third means.

4,873,515

COMPUTER GRAPHICS PIXEL PROCESSING SYSTEM

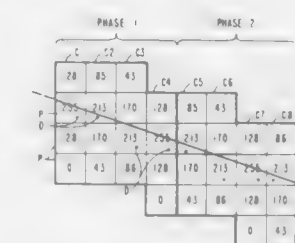
Calvin M. Dickson, Salt Lake City, and Kevin C. Rushforth, West Valley City, both of Utah, assignors to Evans & Sutherland Computer Corporation, Salt Lake City, Utah

Filed Oct. 16, 1987, Ser. No. 108,888

Int. Cl.⁴ G09G 1/16

U.S. Cl. 340—728

13 Claims



1. A computer graphics system for receiving display data, as in a form to specify a line in a display, said system for providing representative pixel data for said display and comprising:

- a plotting unit for providing address data, as to specify a line in said display;
- a plurality of parallel processors coupled to said plotting unit, said parallel processors being individually coupled for processing data for individual pixels of said display in stages, each stage treating an array of pixels in columns of a predetermined number of pixels, said columns being aligned individually substantially to said line to track said line, said processors providing display data for individual pixels in sequence and varying as the proximity of a pixel to a specified line; and
- means for receiving and storing said display data in an arrangement for display.

4,873,514

VIDEO DISPLAY SYSTEM FOR SCROLLING TEXT IN SELECTED PORTIONS OF A DISPLAY

Banri Nakagawa, Yamato, and Katsuyuki Nojima, Yokohama, both of Japan, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 17, 1985, Ser. No. 809,993

Claims priority, application Japan, Dec. 20, 1984, 59-267639

Int. Cl.⁴ G09G 1/16

U.S. Cl. 340—726

6 Claims

4. A video display system for smooth scrolling of a selected partition of a display device comprising, in combination, a character generator operable to generate a horizontal slice of a character pattern on the display screen of a cathode ray tube in response to character and line count signals from a line counter which is synchronized with a raster scan of said cathode ray tube, the improvement characterized by

- first means for storing control information to indicate a partition to be scrolled on said display screen, second means connected to said first means for generating a scroll area signal when said partition is scanned,
- third means for retaining offset data,
- fourth means connected to the output of said line counter, second and third means, and responsive to said scroll area

4,873,516

METHOD AND SYSTEM FOR ELIMINATING CROSS-TALK IN THIN FILM TRANSISTOR MATRIX ADDRESSED LIQUID CRYSTAL DISPLAYS

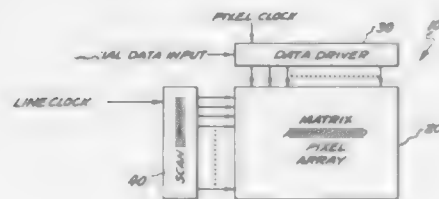
Donald E. Castleberry, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 56,512, Jun. 1, 1987, abandoned. This application Dec. 22, 1988, Ser. No. 287,670

Int. Cl.⁴ G09G 3/36

U.S. Cl. 340—784

9 Claims



1. A display device comprising:

- a plurality of pixel electrodes disposed in a grid pattern on a first insulative substrate;
- a plurality of semiconductor switching devices connected to, so as to be associated with, corresponding pixel electrodes;
- a second substrate having disposed thereon at least one ground plane electrode, said second substrate being disposed adjacent to said first substrate at a predetermined distance therefrom;
- liquid crystal material disposed between said substrates so that said pixel electrodes, said at least one ground plane electrode and said liquid crystal material form electrical devices having capacitive characteristics;
- a plurality of electrically conductive scan lines, each said scan line being connected to a plurality of said semiconductor switching devices associated with a row of said pixel electrode grid;
- a plurality of electrically conductive data lines, each said data line being connected to a plurality of said semiconductor switch devices associated with a column of said pixel electrode grid;
- means for sequentially applying an enabling unipolar signal to said scan lines; and
- means for applying a plurality of unipolar data signals to said data lines, said data signals being operative, in a period of time between initiation of successively activated scan line enabling signals, so that during a first portion of said time period desired voltage levels are impressed on said data

lines and during a second portion of said time period, corrective voltage levels are applied to said data lines so that in said time period, an approximately constant RMS voltage is applied to at least some of said data lines.

4,873,517

METHOD FOR SELECTING LEAST WEIGHT END NODE TO END NODE ROUTE IN A DATA COMMUNICATIONS NETWORK

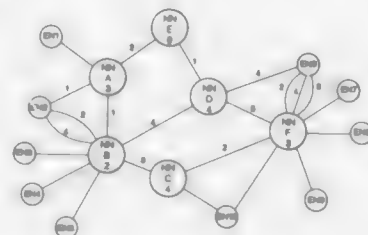
Alan E. Baratz, Chappaqua, N.Y.; Kathryn E. Clarke, Little Silver, N.J.; Melinda R. Pollard, Raleigh, N.C.; Diane P. Pozefsky, Chapel Hill, N.C.; Lee M. Rafalow, Durham, N.C.; William E. Siddall, and James P. Gray, both of Chapel Hill, N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 23, 1988, Ser. No. 210,273

Int. Cl.⁴ H04Q 11/04; H04L 11/20

U.S. Cl. 340—825.030

6 Claims



1. A method of enabling a network node to determine an optimal route through a data communications network including end nodes and network nodes, said end nodes and network nodes being interconnected by transmission groups, said method including the steps of:

- receiving from the end nodes information about the characteristics of transmission groups connecting the end nodes to network nodes;
- calculating optimal routes from the end nodes to network nodes using received information;
- calculating optimal routes between network nodes using information stored in a network topology database; and
- combining the results of the above-defined calculating steps to determine the optimal end node-to-end node route.

4,873,518

PULSE WIDTH DISCRIMINATING CIRCUIT

Walter Mehnert, Ottobrunn, Fed. Rep. of Germany, assignor to MITEC Moderne Industrietechnik GmbH, Fed. Rep. of Germany

Filed Jul. 25, 1986, Ser. No. 890,042

Claims priority, application Fed. Rep. of Germany, Jul. 26, 1985, 3526839; Jul. 14, 1986, 3623705

Int. Cl.⁴ H04Q 9/00

U.S. Cl. 340—825.070

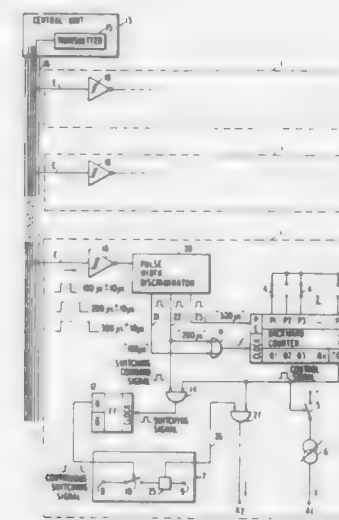
7 Claims

1. An addressable circuit arrangement, in particular for use in measuring and selecting units of a measuring arrangement, which measuring and selecting units are connected by means of a cable with each other and with a central unit comprising a transmitter from which signal pulses having different widths are transmitted to said measuring and selecting units, said addressable circuit arrangement comprising:

- (a) an address memory for storing an address characterizing the addressable circuit arrangement,
- (b) an address recognition circuit for comparing the stored address with addresses transmitted from said central unit in the form of signal pulses having a first width in time, and which, on agreement of a received address with the stored address, delivers a control signal, and
- (c) a pulse width discriminating circuit for generating at least a first indication signal for each received signal pulse having a width greater than a first preselected lower limit

and less than a first preselected upper limit, said pulse width discriminating circuit comprising:

- (1) a time measuring means responsive to said signal pulses and providing for each signal pulse at least a first lower limit signal when the width of said signal pulse exceeds that first lower limit and a first upper limit signal when the width of said signal pulse exceeds said first upper limit;
- (2) a delay member delaying each signal pulse by a preselected period of time,
- (3) at least a first digital latch circuit having a signal output and being set by said first lower limit signal from said time measuring means and being reset by the corresponding first upper limit signal from said time measuring means if said first upper limit signal occurs before



the trailing edge of the respective delayed signal pulse, and being reset by the trailing edge of the respective delayed signal pulse if said trailing edge occurs before said upper limit signal, and

- (4) at least a first logic AND gate means having a first and a second input, said first input being connected to said signal output of said first digital latch circuit and said second input being supplied with a signal preventing said first logic AND gate means from generating an output signal as long as a signal pulse is present at the input of the pulse width discriminator,
- whereby the output of said first logic AND gate means provides said first indication signal if said latch circuit is not reset by said first upper limit signal before the occurrence of the trailing edge of said undelayed signal pulse.

4,873,519

PAGING RECEIVER HAVING INDEPENDENT MEMORY AREAS FOR COMMON AND INDIVIDUAL ADDRESSES

Masahiro Matsui, Takashi Ohyagi, and Toshihiro Mori, all of Tokyo, Japan, assignors to NEC Corporation, Japan Division of Ser. No. 80,227, Jul. 28, 1987, Pat. No. 4,786,901, which is a continuation of Ser. No. 711,069, Mar. 12, 1985, abandoned. This application Mar. 28, 1988, Ser. No. 173,766

Claims priority, application Japan, Mar. 13, 1984, 59-46582

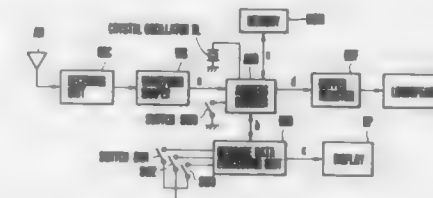
Int. Cl.⁴ G08B 5/22; H04Q 7/00

U.S. Cl. 340—825.44

6 Claims

1. A paging receiver having an individual paging number and at least one common paging number, the common paging number being received more frequently than said individual paging number is received, said receiver comprising: memory means including individual memory areas for storing at least one message signal following said individual paging number, and specific memory areas for storing

message signals following said common paging number, the message signals stored in said individual memory areas



being not erased responsive to the receipt of the message signals following said common paging number.

4,873,520

PAGING RECEIVER FOR STORING DIGITIZED VOICE MESSAGES

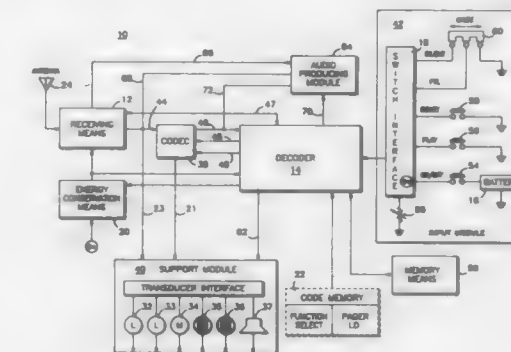
Kenneth D. Fisch, Delray Beach; Alfred R. Lucas, Coral Springs, and David F. Willard, Plantation, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 2, 1987, Ser. No. 115,029

Int. Cl.⁴ H04Q 7/00

U.S. Cl. 340—825.44

7 Claims



1. A paging receiver comprising:

- receiving means for receiving selective call signals intended for said paging receiver, wherein the selective call signals include at least one analog voice message for said paging receiver;
- decoding means responsive to said selective call signals for enabling said paging receiver to recover said analog voice message;
- conversion means responsive to said receiving means and said decoding means for converting said analog voice message to digital signals representative of a replica of the analog voice message;
- memory means including at least one fixed capacity storage area for storing digital signals;
- means for sensing the end of the recovered analog voice message and generating an end of message signal in response thereto;
- signal producing means for generating predetermined digital signals;
- control means for accessing said memory means to store in a portion of a selected fixed capacity storage area thereof the converted digital signals of said analog voice message during the conversion thereof by said conversion means and, governed by said end of message signal, to access said memory means to store in the remaining portion of said selected fixed capacity storage area the predetermined digital signals during the generation thereof; and
- means for inhibiting memory accessing by said control means when the remaining portion of said selected fixed capacity area is filled.

4,873,521

ADDRESS ADMINISTRATION UNIT OF A MULTI-PROCESSOR CENTRAL CONTROL UNIT OF A COMMUNICATIONS SWITCHING SYSTEM

Klaus Dietrich, Senertsch; Hans Haner, Munich, and Klaus Schreier, Penzberg, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

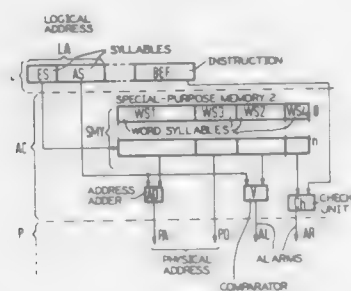
Filed Sep. 25, 1987, Ser. No. 101,184

Claims priority, application Fed. Rep. of Germany, Sep. 25, 1986, 3632608

Int. Cl.⁴ H04Q 3/00

U.S. Cl. 340—825.52

6 Claims



1. An address management unit for the conversion of logical addresses with two address portions contained in a program and composed of a first number of digits into physical address composed of any second, namely said first or another, number of digits comprising:

- a computer-controlled communications switching system including physical objects, namely a multiprocessor central control unit having, a central bulk storage, and a plurality of additional memories as local memories in a plurality of central processors, a central bus system connecting said central processors to said bulk storage for collaboration between said central processors and said bulk storage, and a plurality of peripheral units connected to at least one input/output interface which is connected to said central bus system;
- a special-purpose memory for storing long words containing at least four words address parts stored under a first of said two address portions, the long word length being of a number of digits;
- an address adder and a comparator in at least one central processor, said processor converting logical addresses into physical addresses of memory locations in one of said additional memories and into the physical addresses of said peripheral units;
- said four words address parts each corresponding to a defined control signal in which the first word address part comprises a number of digits and corresponds to a physical starting address of a physical address space in one of said memories, a second word address part comprises a number of digits and corresponds to the respectively highest physical address of the plurality of physically-existing addresses of the physical address space to be selected, a third word address part corresponding to the physical object to be respectively selected, and a fourth word address part which corresponds to information concerning access rights,
- said address adder operable to add a second of said two address portions and said first word address part, said comparator operable to compare said second address portion to said second word address part, and
- a check unit in at least said one central processor for receiving said fourth word address part for monitoring the access to a selected object selected according to said third word address part.

4,873,522

METHOD FOR TRANSMITTING DOWNHOLE DATA IN A REDUCED TIME

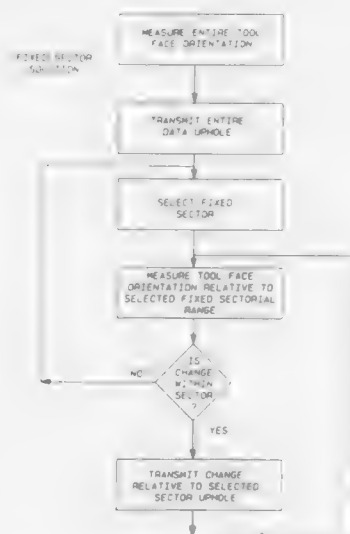
Rainer Jürgens, Celle, Fed. Rep. of Germany, assignor to Eastman Christensen Company, Salt Lake City, Utah

Filed May 4, 1987, Ser. No. 46,136

Int. Cl.⁴ G01V 1/00

U.S. Cl. 340—853

18 Claims



1. A method for reducing transmission time of a parameter value of downhole data from a downhole location to a remote location of a well bore comprising:

- (a) defining a value of said parameter in said well bore a first time;
- (b) representing said value as a range of values and a position within said range;
- (c) transmitting said value representation from said downhole location to said remote location at a fixed rate;
- (d) storing said range representation at both said downhole and remote locations;
- (e) measuring a value of said parameter in said well bore;
- (f) determining if said measured value falls within the stored range; and
- (g) (1) if yes, transmitting only said position within said stored range of said measured value from said downhole location to said remote location at a fixed rate; or (2) if no, selecting a new range and representing said measured value as said new range and a position there-within and transmitting said new range and position within range from said downhole location to said remote location at a fixed rate and thereafter storing said new range at both locations in lieu of the previously-stored range and (i) repeating steps (e), (f) and (g).

4,873,523

SHALLOW WATER INDICATOR FOR A BOAT

Harry E. Jones, 9408 NE. 188th St., Bothell, Wash. 98011

Filed Oct. 8, 1987, Ser. No. 106,723

Int. Cl.⁴ G08B 23/00

U.S. Cl. 340—984

16 Claims

1. A shallow water detector for a boat, comprising:
- a source of electrical energy;
 - a signal device;
 - a main housing positionable on a boat;
 - a normally off snap-action microswitch in said main housing, including a switch housing and a depressible operator projecting outwardly from the switch housing which when depressed turns the switch on;
 - electrical conductor means connecting the source of electrical energy, the signal device and the microswitch together

such that when the microswitch is on the source of electrical energy is connected to the signal device and the signal device is on;

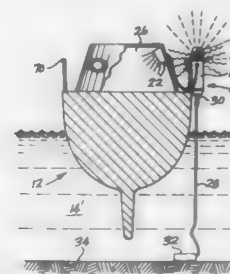
a switch actuator member having an end portion directed towards the depressible operator;

guide means in said main housing for guiding the actuator member for linear reciprocating movement towards and away from said depressible operator;

spring means biasing the actuator member towards and into depressing contact with the depressible operator;

line means for suspending a weight, said line means having a first end connectable to the actuator member and a second end which in use extends from the boat into the water;

a weight connected to the second end of said line means and when suspended exerting a pulling force on the actuator member in opposition to the spring force, and said weight being of sufficient mass when suspended to overcome the



force of the spring means and hold the actuator member away from depressing contact with the depressible operator;

said line means being of a predetermined length indicative of a safe depth condition for the boat so long as the weight is suspended; and

said spring means functioning in response to bottom contact by said weight of a type and amount sufficient to produce slack in the line means, to move the actuator member into contact with the depressible operator of the microswitch, to depress said operator and operate the microswitch to connect the source of electrical energy to the signal device, causing operation of the signal device to signal a shallow water condition;

wherein said guide means is a tubular housing and said end portion of said switch actuator member is sized to slidably reciprocate within said tubular housing towards and away from the depressible operator.

4,873,524

DECODING UNIT FOR CMI-ENCODED SIGNALS

Gerardus P. M. Akkermans, Hilversum, Netherlands, assignor to AT&T and Philips AT&T Philips Telecommunications B.V., Hilversum, Netherlands

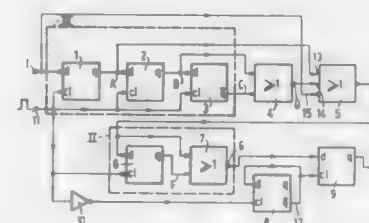
Filed Mar. 18, 1988, Ser. No. 169,679

Claims priority, application Netherlands, Mar. 27, 1987, N7007720

Int. Cl.⁴ H03M 5/14

U.S. Cl. 341—73

5 Claims



1. A decoding unit for CMI-encoded input signals having an

input and an output, the input of the decoding unit being coupled via a time delay stage to a first input of a first gate circuit a second input of which is connected to the input of the decoding unit, the output of the gate circuit being coupled to the output of the decoding unit, characterized in that the time delay stage comprises a series arrangement of first, second and third delay elements, that the first input of the first gate circuit is connected to the output of a second gate circuit an input of which is connected to the output of the third delay element and another input of which is connected to the output of the second delay element, and that a third input of the first gate circuit is connected to the output of the first delay element.

4,873,525

COMPACT R SEGMENT D/A CONVERTER

Tetsuya Iida, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

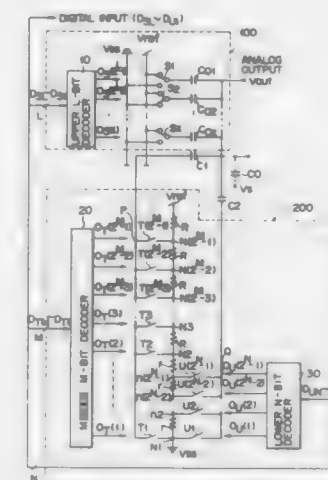
Filed Mar. 8, 1988, Ser. No. 165,702

Claims priority, application Japan, Mar. 13, 1987, 62-58128

Int. Cl.⁴ H03M 1/68

U.S. Cl. 341—145

11 Claims



1. A digital-to-analog converter comprising:

- a group of resistors serially connected between a power source potential supply terminal and a reference potential supply terminal;
- a first group of switches, connected between a first circuit point and a predetermined serial connection node on said resistor group and between the first circuit point and said reference potential supply terminal, and controlled so that one of them is selectively turned on according to upper bits of a digital signal;
- a second group of switches, connected between a second circuit point and a predetermined serial connection node on said resistor group and between the second circuit point and said reference potential supply terminal, and controlled so that one of them is selectively turned on according to lower bits of the digital signal; and
- first and second capacitors connected between an output terminal and said first circuit point, and between the output terminal and said second circuit point, respectively.

4,873,526

MOBILE STATION ANTENNA ATTITUDE CONTROL APPARATUS

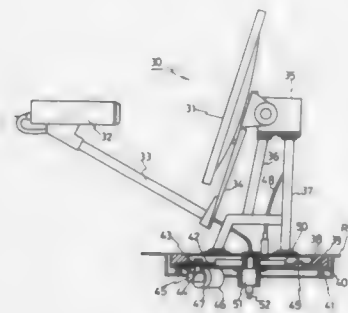
Suzuki Katsumi, Tokyo, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Aichi and Kabushiki Kaisha Shinsangyokaiatsu, Tokyo, both of Japan

Filed Jul. 7, 1988, Ser. No. 217,524

Claims priority, application Japan, Jul. 8, 1987, 62-170623
Int. Cl.⁴ H01Q 3/00

U.S. Cl. 342-359

4 Claims



1. A mobile station antenna attitude control apparatus comprising:

an antenna attitude changeably supported on a mobile station;

a drive mechanism for changing attitude of an antenna at a plurality of different speeds;

a receiving level detecting means for detecting receiving level of an antenna;

a first drive information setting means for renewing and setting first drive information for changing attitude of antenna in a direction resulting in an increase of receiving level by monitoring the receiving level detected by the receiving level detecting means;

an attitude detecting means for detecting attitude information of a mobile station;

a second drive information setting means for renewing and setting second drive information to correct relative change of attitude of an antenna due to attitude change of mobile station based on the attitude information of mobile station detected by said attitude detecting means;

a drive information correcting means for correcting said second drive information depending on change on time of the second drive information set by the second drive information setting means by monitoring such change thereof; and

a control means for controlling said drive mechanism based on the first drive information set by said first drive information setting means and the second drive information corrected by said drive information correcting means; wherein said drive information correcting means corrects said second drive information to that providing a higher speed drive when change of time of the second drive information set by said second drive information setting means is larger than the specified value.

4,873,527

ANTENNA SYSTEM FOR A WRIST CARRIED PAGING RECEIVER

William Tan, Lantana, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 7, 1988, Ser. No. 141,455

Int. Cl.⁴ H01Q 7/08

U.S. Cl. 343-718

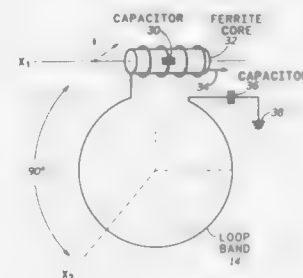
8 Claims

1. An antenna system for a wrist carried paging receiver comprising:

a single magnetic loop antenna having first and second ends, said loop antenna enclosed in a non-conductive housing

surrounding the wrist, said single magnetic loop antenna having the first end grounded;

a ferrite core loop antenna connected in series to the second end of said magnetic loop antenna, said ferrite core loop antenna having an output applied as an input to a receiver



ing means of the paging receiving selective call signals;

further wherein, an axis of the single magnetic loop antenna is perpendicular to and non-coplanar with the ferrite core loop axis.

4,873,528

DEVICE FOR ENERGIZING A NON-ECCENTRIC IN THE WIDE SIDE OF A WAVEGUIDE, AND A SLOTTED ANTENNA COMPRISING SUCH A DEVICE

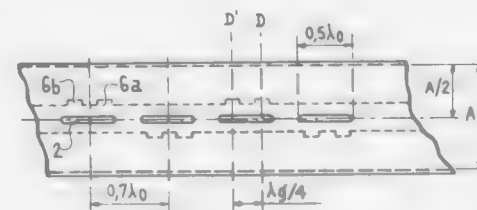
Bernard Girard, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Mar. 2, 1983, Ser. No. 472,259

Claims priority, application France, Mar. 26, 1982, 82 05248
Int. Cl.⁴ H01Q 13/10

U.S. Cl. 343-770

6 Claims



1. A device for energizing an antenna formed by a rectangular waveguide comprising a first wide side pierced by at least one slot extending along a longitudinal axis of symmetry and a second wide side provided with a ridge bearing a metallic ribbon parallel to the wide sides of the guide and extending along the middle of the second wide side, said ribbon providing for each slot first and second thin metallic teeth of identical shape symmetrical with respect to an axis of symmetry of the two teeth to energize a parallel extending slot with the teeth being arranged side by side on the edge of the metallic ribbon.

4,873,529

COPLANAR PATCH ANTENNA

Peter J. Gibson, Crawley, England, assignor to U.S. Phillips Corp., New York, N.Y.

Filed Dec. 16, 1988, Ser. No. 286,572

Claims priority, application United Kingdom, Dec. 22, 1987, 872176

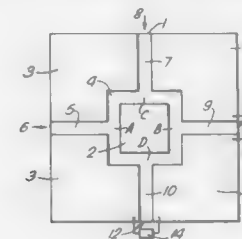
Int. Cl.⁴ H01Q 1/38

U.S. Cl. 343-700 MS

8 Claims

1. A coplanar patch antenna including a continuous layer of a dielectric material, a patch of conductive material supported on a major surface of the layer of dielectric material, a ground plane of conductive material supported on said major surface

of the layer of dielectric material and substantially surrounding and spaced from the patch of conductive material, and means for feeding electrical signals to the antenna, characterised in



that the means for feeding electrical signals to the antenna comprises a slot line formed in said ground plane of conductive material and opening into the space between the ground plane and the patch of conductive material.

4,873,530

ANTENNA DEVICE IN AUTOMOTIVE KEYLESS ENTRY SYSTEM

Mikio Takeuchi; Kinichiro Nakano, both of Zama; Kenichi Mitamura, Fujisawa, and Takahisa Tomoda, Sagami-hara, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

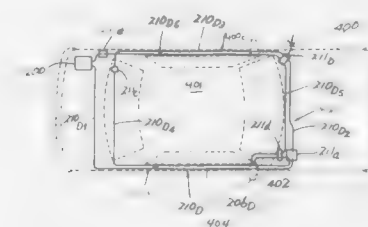
Filed Sep. 29, 1986, Ser. No. 912,518

Claims priority, application Japan, Sep. 30, 1985, 60-214866

Int. Cl.⁴ H01Q 1/32

U.S. Cl. 343-711

15 Claims



1. An antenna device for an automotive keyless entry system comprising:

a lock device mounted on a vehicle and operable between a first locking position and a second unlocking position, and said lock device including an actuator operating said lock device between said first and second positions in response to a control signal;

a pocket-portable transmitter producing a radio signal containing a unique code identifying the transmitter, said transmitter having a first loop antenna;

a controller receiving said radio signal and comparing said unique code contained in said radio signal with a preset code therein, and producing said control signal when said unique code matches said preset code said controller operatively connected to provide said control signal to said actuator;

a second antenna connected to said controller and surrounding a vehicle compartment.

4,873,531

IDENTIFICATION TRANSPONDER FOR USE WHEN A VEHICLE PASSES A GIVEN POINT

Marc Heddebaut, Sainghlin En Melantois; Pierre Mainardi, Douvria; Pierre Degauque, Lambertsart, and Denis Dubot, Paris, all of France, assignors to Societe Anonyme dite: Alstom, Paris, France

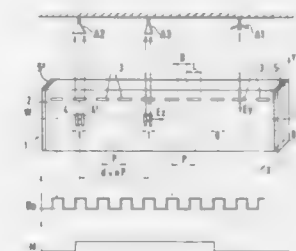
Filed Nov. 16, 1988, Ser. No. 271,814

Claims priority, application France, Nov. 20, 1987, 87 16092

Int. Cl.⁴ H01Q 13/10

U.S. Cl. 343-711

8 Claims



1. An identification transponder for use when a vehicle passes a given point, the transponder being constituted by a rectangular waveguide having a large face along a waveguide axis WW', said large face including regularly spaced-apart longitudinal slots along one of its longitudinal edges and having longitudinal axes extending substantially parallel to said waveguide axis and slot pairs, each slot pair constituted by two slots having axes extending perpendicularly to said waveguide axis and centered on said waveguide axis, each of said pairs being adjacent a longitudinal slot, with the pairs being disposed along said waveguide axis at a pitch of one pair for every n longitudinal slots, and with the presence of a pair corresponding to a bit of value 1 and the absence of the pair corresponding to a bit of value 0, the longitudinal slots successively receiving radiation of polarization Ey perpendicular to said waveguide axis, said radiation including a low frequency F1 and a high frequency F2, the longitudinal slots re-emitting radiation of polarization Ey at said high frequency F2, and said pairs re-emitting radiation of polarization Ez parallel to said waveguide axis at said low frequency F1, said transponder being a passive transponder having no power supply.

4,873,532

ANTENNA APPARATUS FOR A VEHICLE

Kaoru Sakurai, Kanagawa; Harunori Murakami, Tokyo; Hikaru Mizukami, and Kazuhisa Fujita, both of Kanagawa, all of Japan, assignors to Nippon Sheet Glass Co., Ltd., Japan

Filed Sep. 29, 1988, Ser. No. 251,347

Claims priority, application Japan, Oct. 7, 1987, 62-153644[U]

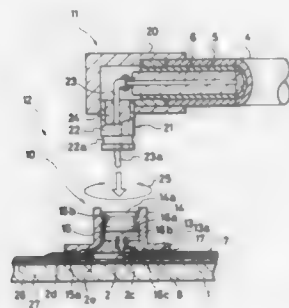
Int. Cl.⁴ H01Q 1/38

U.S. Cl. 343-713

8 Claims

1. An antenna apparatus for a vehicle, comprising: first and second layers of transparent insulating film, said first layer having adhesive applied to its outside surface to attach the film to a vehicle window; an antenna element conductor interposed between said first and second film layer and comprising a feeder terminal conductor and a ground terminal conductor, said second film layer having an opening therein to expose said feeder terminal conductor and said ground terminal conductor; a pair of detachably coupled coaxial connectors comprising a plug member and a receptacle member and engaging means for preventing the connectors from being easily disconnected, said coaxial connectors further comprising an inner contact and an outer contact to which said feeder terminal conductor and ground terminal conductor are respectively connected, one of said connectors being

mounted on said second film layer with its plug-in axis perpendicular to the surface of the film; and a coaxial feeder cable attached to the other of said coaxial connectors so as to extend perpendicularly to the plug-in axis of said coaxial connectors,



said antenna element conductor being subjected to unbalanced power feed with a communication apparatus through said coaxial feeder cable.

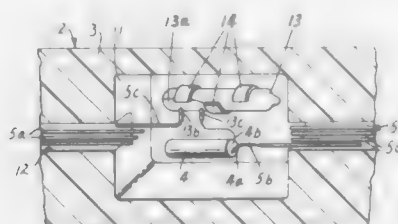
4,873,533

MARKER FOR LOCATING A BURIED OBJECT
Tomoyasu Oike, Sagami, Japan, assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Oct. 9, 1987, Ser. No. 106,343
Claims priority, application Japan, Nov. 18, 1986, 61-176955[U]

Int. Cl.⁴ H01Q 1/04, 1/40

U.S. Cl. 343-744

5 Claims



1. A marker for positioning in proximity to a buried object, the marker being detected to locate the buried object by use of the fact that an antenna of the passive resonance type having a coil and capacitor connected in a closed series circuit for operation, which forms a part of the marker, is resonantly responsive to an electromagnetic wave of a specified frequency transmitted to the marker, the marker including means forming a part of the series circuit for opening the series circuit in response to a change, such as inclination and displacement, of the marker from its initial position of installation thereby preventing the occurrence of any resonant response by the marker to an electromagnetic wave transmitted subsequent to the occurrence of such change, said means including a switch which is position sensitive for presenting an electrical open or closure, said switch presenting an electrical open in response to the inclination of the marker from its initial position of installation.

4,873,534

HYBRID MODE FEED HORN HAVING FUNNEL-SHAPED HORN FLANGE WITH GROOVED CONICAL INNER SURFACE

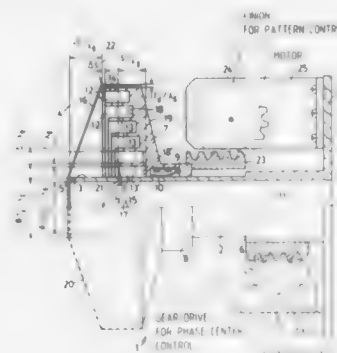
Rudolf Wöhleben, Am Bogen 9, 5300 Bonn 1 (Röttgen), and Johann Mutschlechner, Frankenstr. 31, 5357 Odendorf, both of Fed. Rep. of Germany
PCT No. PCT/EP86/00661, § 371 Date Jul. 20, 1987, § 102(e) Date Jul. 20, 1987, PCT Pub. No. WO87/03143, PCT Pub. Date May 21, 1987

PCT Filed Nov. 17, 1986, Ser. No. 90,586
Claims priority, application Fed. Rep. of Germany, Nov. 18, 1985, 3540900

Int. Cl.⁴ H01Q 13/06

U.S. Cl. 343-786

13 Claims



1. A feed horn for use as a primary focus feed of a reflector antenna, the feed horn having a horn flange located at a free end portion of a tubular TE₁₁-mode feeding waveguide, the horn flange widening in a funnel shape radially outwardly from a horn throat fitted on the feeding waveguide and which horn flange has a conical inner surface which is provided with grooves therein of uniform axial depth extending parallel to and coaxially with a central longitudinal axis of the feeding waveguide, the grooves being radially separated by concentric ring-shaped walls therebetween, the walls extending parallel to said central longitudinal axis, characterized in that a half opening angle θ° of the horn flange (7) defined between the central longitudinal axis (11) of the feeding waveguide (2) and the inner surface of the horn flange lies in the region $70^\circ < \theta^\circ < 80^\circ$ and in that a free end of the feeding waveguide (2) is protrudingly offset axially relative to the intersection between a straight line connecting free axial ends of said walls separating the grooves in the horn flange inner surface and the feeding waveguide, means being provided on the free end portion of the feeding waveguide and on the feed horn for axially shifting the feed horn on the free end portion of the feeding waveguide for adjusting said offset.

4,873,535

METHOD OF DRIVING THERMAL HEAD

Eiichi Sasaki, Sagami, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed May 20, 1988, Ser. No. 196,428

Claims priority, application Japan, May 25, 1987, 62-127438
Int. Cl.⁴ G01D 15/10

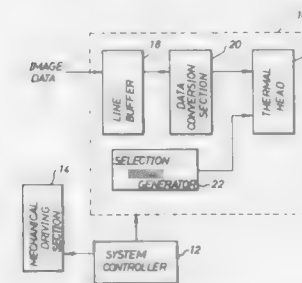
U.S. Cl. 346-1.1

3 Claims

1. A method of driving a thermal head in a printing device, said thermal head having a plurality of thermal resistance elements arranged in one line, each of said thermal resistance elements capable of being energized by heating pulses the number of which is controlled in accordance with the required density of a corresponding picture element, said method comprising the steps of:

electrically and alternately separating said thermal resistance

elements into first blocks and second blocks so that the odd arranged elements and the even arranged elements of said plurality of thermal resistance elements are separated into said first blocks and second blocks, respectively; simultaneously applying a heating pulse to all the necessary thermal resistance elements separated in the first block;



simultaneously applying a heating pulse to all the necessary thermal resistance elements separated in the second block; and alternately repeating said two applying steps in sequence until the respective numbers of the heating pulses are applied to each of the thermal resistance elements so as to obtain the required density.

4,873,536

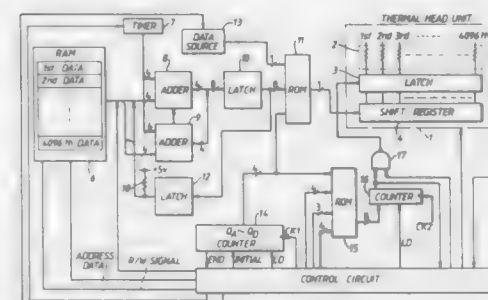
METHOD AND APPARATUS FOR PREVENTING UNEVENNESS IN PRINTING DEPTH IN A THERMAL PRINTER

Takehiko Minowa, and Toshifumi Yamamoto, both of Hino, Japan, assignors to Kabushiki Kaisha Toshiba, Japan
Filed Dec. 22, 1987, Ser. No. 136,395

Claims priority, application Japan, Dec. 26, 1986, 61-313064
Int. Cl.⁴ G01D 9/00, 15/10

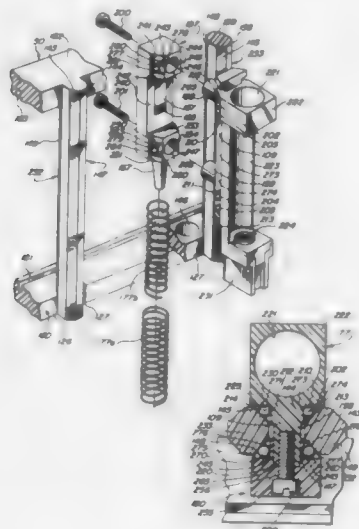
U.S. Cl. 346-76 PH

37 Claims



lengths thereof and having rear pairs of inwardly angled planar rear guide surfaces on said rear side adjacent each of said slots and extending substantially the lengths thereof;

- a plurality of pen shuttles each configured to receive and support a recording pen and defining an elongated member having first bearing means positioned to contact said front guide surfaces when said pen shuttle is received within one of said vertical slots from said front side;
- a plurality of pen shuttle backs each defining an elongated member having second bearing means positioned to



contact said rear guide surfaces when said pen shuttle back is received within one of said vertical slots from said rear side;

- a plurality of attachment means securing each of said pen shuttles to respective ones of said pen shuttle backs to form a plurality of pen assemblies in which each of said pen shuttles is secured to one of said pen shuttle backs and slideably captivated against said front and rear guide surfaces respectively and moveable between a raised position and a lowered position; and
- return spring means biasing said pen assemblies to their uppermost positions within said vertical slots.

4,873,539

PHASE CHANGE INK JET APPARATUS

Thomas W. DeYoung, Stormville, N.Y., assignor to Data-products Corporation, Woodland Hills, Calif.

Continuation of Ser. No. 913,547, Sep. 26, 1986, abandoned, which is a continuation of Ser. No. 661,924, Oct. 16, 1984, abandoned. This application Jul. 26, 1988, Ser. No. 224,260. The portion of the term of this patent subsequent to Aug. 19, 2003, has been disclaimed.

Int. Cl.⁴ G01D 15/16

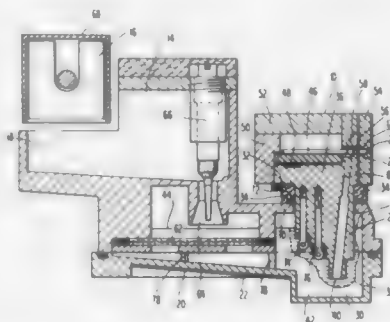
U.S. Cl. 346—140 R

18 Claims

1. Hot-melt ink jet printing apparatus for ejecting droplets of phase change ink comprising:

- an imaging head having at least one ink jet including a chamber, an orifice and an inlet;
- a reservoir containing a supply of the phase change ink, said reservoir coupled to the inlet of said at least one ink jet;
- first heater means for heating ink in said jet so as to undergo a phase change from a solid state to a liquid state without degrading the ink;
- second heater means for heating ink in said reservoir so as to undergo a phase change from a solid state to a liquid state without degrading the ink;
- thermal resistance barrier means between said imaging head and said reservoir, whereby said first heater means is adapted to be controlled independently of said second

heater means, thereby enabling said imaging head to be maintained at a different temperature than said reservoir;



said jet comprising a material having a thermal conductivity of at least 0.03 g cal/sec cm² (°C./cm).

4,873,540

IMAGE RECORDING METHOD

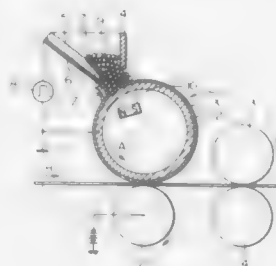
Masumi Asanoe, Kumagaya, and Kimura Fumio, Isezaki, both of Japan, assignors to Hitachi Metals, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 182,116, Apr. 15, 1988, abandoned. This application Jun. 3, 1988, Ser. No. 202,591. Claims priority, application Japan, Apr. 15, 1987, 62-92327

Int. Cl.⁴ G01D 15/00

U.S. Cl. 346—160.1

4 Claims



1. A method of forming an image comprising the steps of:

- (a) arranging a plurality of recording electrodes opposite to a movable recording member having an insulating layer on the surface, thereby forming a recording area between said insulating layer and said recording electrodes;
- (b) supplying to said recording area magnetic toner, said supplying step including the step of selecting magnetic toner consisting of toner particles composed of a binder resin and magnetic powder, said toner particles being coated with particles made of a conductive material and further coated thereon with particles made of an insulating material so that it has a bulk resistivity of 10⁶Ω.cm or less and a resistivity of 10⁵–10¹⁵Ω.cm; and
- (c) applying signal voltage corresponding to said image to said recording electrodes, thereby forming a toner image on the surface of said recording member.

4,873,541

IMAGE FORMING APPARATUS

Yoshihiko Hirose; Tomohiro Aoki, both of Yokohama; Kazuyoshi Chiku; Yasushi Murayama, both of Tokyo; Takashi Uchida, Yokohama; Kunihiko Matsuzawa, Kawasaki, and Kazunori Kanekura, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 198,736, May 25, 1988, abandoned.

This application Feb. 21, 1989, Ser. No. 313,362

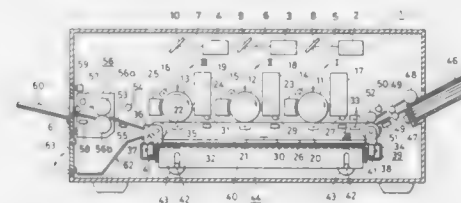
Claims priority, application Japan, May 28, 1987, 62-132915; Aug. 6, 1987, 62-196581; Aug. 6, 1987, 62-196582

Int. Cl.⁴ G01D 15/00

U.S. Cl. 346—160.1

37 Claims U.S. Cl. 354—402

20 Claims



1. An image forming apparatus comprising:

- image forming means including movable image carrying means for forming an image corresponding to image information on said image carrying means;
- transfer means for transferring the image carried by said image carrying means to an image receiving member;
- feeding means defining a closed path for feeding said image receiving member to a position for the transfer of the image from said image carrying means;
- moving means for moving said feeding means between a first position where said feeding means is operable with said image carrying means and a second position where said feeding means is not operable with said image carrying means;
- cleaning means for cleaning said feeding means; and
- control means for operating said feeding means so that said feeding means is cleaned by said cleaning means when said feeding means is in said second position.

4,873,542

AUTO-FOCUS CAMERA

Haruki Nakayama, Hachioji, Japan, assignor to Konica Corporation, Tokyo, Japan

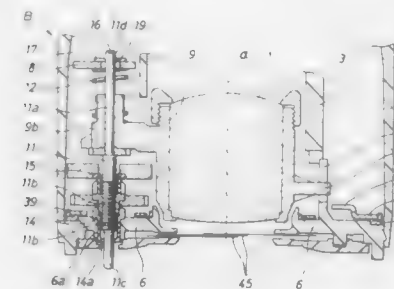
Filed Sep. 1, 1988, Ser. No. 239,369

Claims priority, application Japan, Sep. 4, 1987, 62-221349; Sep. 4, 1987, 62-221350

Int. Cl.⁴ G03B 3/00

U.S. Cl. 354—400

7 Claims



1. An auto-focus camera for moving a focusing lens along a lens optical axis upon rotation of a focus control motor, comprising:

- a focusing lens supporting feed screw rod supported substantially parallel to the lens optical axis and having focusing means at its one end; and
- a spacer nut meshed with a feed screw portion of said feed

screw rod, so that longitudinal movement thereof is prevented, and rotated by said focus control motor.

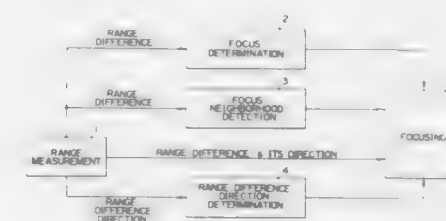
4,873,543

AUTOMATIC FOCUSING CAMERA

Minoru Matsuzaki; Junichi Itoh, both of Hachioji, and Youji Watanabe, Sagami-hara, all of Japan, assignors to Olympus Optical Co., Ltd., Japan

Filed Oct. 8, 1987, Ser. No. 106,574

Claims priority, application Japan, Nov. 1, 1986, 61-261692

Int. Cl.⁴ G03B 3/10

1. An automatic focusing camera including measuring means for detecting an amount and a direction of difference between an image forming position of light from an object being photographed and a film surface to drive a taking lens in response to an output therefrom and focus determining means for determining an in-focus condition when an amount of the difference measured by said measuring means is less than a given value to produce an in-focus signal to complete a focusing operation, comprising:

- means for detecting the neighborhood of focus for comparing said amount of difference with a standard value larger than said given value;
- means for determining a direction of difference for comparing a direction of difference last measured by said measuring means with that presently measured after the taking lens has been driven in response to the last measured output; and
- means for adjusting focusing for driving the taking lens in response to a measured output from said measuring means such that when said focus neighborhood detecting means detects that said amount of difference is less than said standard value and said direction detecting means detects that the last and the presently measured directions are the same, the focusing operation is completed with the next lens driving and when said amount of difference is less than said standard value and both said directions are different from each other, a range measurement resumes after the next lens driving is carried out.

4,873,544

PHOTOGRAPHIC CAMERA HAVING A PIEZO-ELECTRIC ACTUATING ELEMENT

Yoshihiro Tanaka; Sadafusa Tsuji, both of Osaka; Yoshiaki Hata, Nishinomiya; Manabu Inoue, Kobe; Hiroshi Ootsuka, Sakai; Michihiro Iwata, Sakai; Fumiaki Ishito, Sakai, and Koh Hayama, Sakai, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 13,561, Feb. 11, 1987, abandoned. This application Jun. 8, 1988, Ser. No. 203,891

Claims priority, application Japan, Feb. 12, 1986, 61-29399

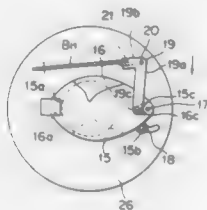
Int. Cl.⁴ G03B 7/08

U.S. Cl. 354—457

4 Claims

1. A camera, comprising:
- a power source;
- boosting means for boosting a voltage of said power source;
- charging means for accumulating therein energy boosted by said boosting means;

piezo-electric means;
driven means including a shutter connected to be actuated by said piezo-electric means;
driving and controlling means for driving and controlling said piezo-electric means by energy accumulated in said charging means; and



exposure controlling means for controlling said driving and controlling means to cause a charged voltage of said charging means to be applied to said piezo-electric means in a first polarity in order to said shutter and in a second polarity opposite to the first polarity in the course of the closing operation of said shutter.

4,873,545 METHOD OF DEVELOPING IMAGE ON ELECTROPHOTOGRAPHIC FILM

Keiichi Yamana; Masaru Imai, and Shuichi Ohtsuka, all of Ashigarakami, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

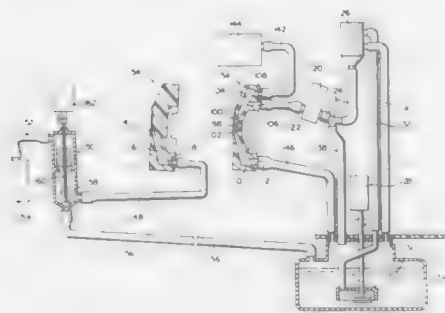
Filed Aug. 9, 1988, Ser. No. 230,288

Claims priority, application Japan, Oct. 24, 1986, 61-253130

Int. Cl.⁴ G03G 15/10

U.S. Cl. 355—256

10 Claims



1. A developing method for developing an image on an electrophotographic film by means of a processing head which has a developing section in which said image is developed under the supply of a developer, said method comprising the steps of:

- pressing said electrophotographic film onto said processing head;
- supplying said developer to said developing section;
- applying, for a first predetermined period, a weak blast of pressurized gas to said developing section when the supply of the developer to said developing section is finished;
- applying, for a second predetermined period, a first strong blast of pressurized gas stronger than said weak blast to said developing section;
- suspending, for a third predetermined period, the applications of both the weak blast and the first strong blast of pressurized gas;
- applying, for a fourth predetermined period, a second strong blast of pressurized gas stronger than said weak blast to said developing section; and
- moving said electrophotographic film from said developing section at the earliest during the application of said

second strong blast of pressurized gas to said developing section.

4,873,546
COLOR PRINTING METHOD AND APPARATUS
Wolfgang Zahn, Munich; Manfred Fürsich, Taufkirchen; Wilhelm Nitsch, Munich; Hans-Jürgen Rauh, Strasslach-Hallafing, and Helmut Tiber, Munich, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

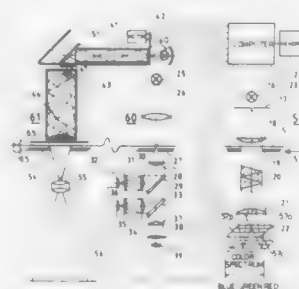
Filed Oct. 28, 1988, Ser. No. 264,399

Claims priority, application Fed. Rep. of Germany, Nov. 6, 1987, 3737775

Int. Cl.⁴ G03B 27/73

U.S. Cl. 355—38

30 Claims



1. A method of copying a colored original onto color copy material, comprising the steps of passing light through said original, said light having blue, green and red components; forming a color spectrum from the light transmitted through said original, said spectrum extending across a first wavelength range corresponding to blue-containing radiation, a second wavelength range corresponding to green-containing radiation and a third wavelength range corresponding to red-containing radiation, and said copy material having respective first, second and third spectral sensitivities in said first, second and third ranges, said first, second and third spectral sensitivities being represented by first, second and third factors, respectively; measuring the intensity of the transmitted light in said first, second and third ranges to obtain respective first, second and third raw intensities; modifying said first, second and third raw intensities by said first, second and third factors, respectively, to obtain first, second and third corrected intensities; and calculating the amounts of blue, green and red copy light which will produce a copy of said original on said copy material in such a manner that said copy has a desired density, the calculating step being performed using said corrected intensities.

4,873,547
SHEET CONVEYING APPARATUS
Nobukazu Sasaki, Tokyo; Toshiro Kasamura, Yokohama; Masashi Ohashi, Tokyo; Naoki Okuda, Kawasaki; Toshihiko Kusumoto, Tokyo; Yasunori Maeda, Inagi; Takashi Ozawa, Ichikawa; Yasuyoshi Yamamoto, Tokyo; Atsushi Kubota, Machida; Akiyoshi Kimura, Tokyo, and Makoto Masuda, Toride, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 97,662, Sep. 16, 1987, abandoned. This application Feb. 16, 1989, Ser. No. 311,380

Claims priority, application Japan, Sep. 18, 1986, 61-220511; Sep. 18, 1986, 61-220512; Dec. 26, 1986, 61-311579; Jan. 8, 1987, 61-000044

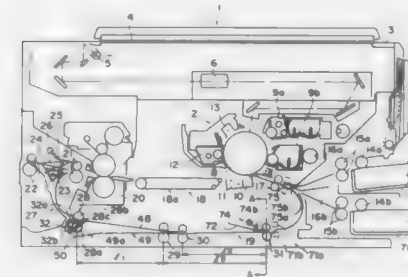
Int. Cl.⁴ G03G 15/00; B65H 3/04

U.S. Cl. 355—316

46 Claims

1. A sheet conveying apparatus, comprising:
conveying means for accommodating a bundle of sheets in a form in which leading edges of the sheets are gradually

deviated in a sheet advancement direction, and for conveying the bundle as a whole;
feeding means, disposed downstream of said conveying means with respect to the sheet advancement direction, for feeding one by one the sheets of the bundle from the sheet closest to said feeding means; and



confining means for confining the sheets of the bundle other than the sheet being fed by said feeding means, said confining means including first and second members for gripping and stopping the bundle of the sheet by contacting respective sides of the bundle.

4,873,548
IMAGE FORMING APPARATUS COMPRISING A MAIN ASSEMBLY HAVING A TOP FRAME ADAPTED TO SWING OPEN AND CLOSED WITH RESPECT TO A BOTTOM FRAME AND HAVING PROCESS CARTRIDGE DETACHABLY MOUNTED IN THE MAIN ASSEMBLY
Hiroo Kobayashi; Hitoshi Fujino, both of Tokyo; Tadashi Yagi, Kawasaki; Nobukazu Adachi, Tokyo; Yasuyoshi Hayakawa, and Takeshi Setoriyama, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

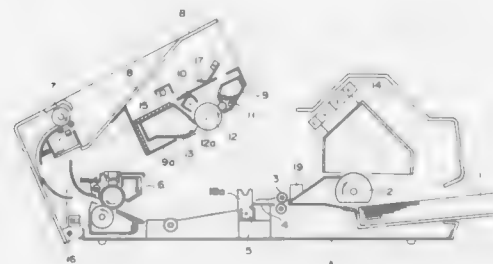
Continuation of Ser. No. 869,872, Jun. 3, 1986, abandoned. This application Mar. 7, 1989, Ser. No. 319,893

Claims priority, application Japan, Jun. 6, 1985, 60-123060

Int. Cl.⁴ G03G 15/00

U.S. Cl. 355—200

18 Claims



1. An image forming apparatus comprising:
a main assembly including a first frame and a second frame which is adapted to assume closing and opening positions with respect to the first frame;
a process cartridge detachably mountable into the main assembly and containing at least a photosensitive member and process means contributable to image formation on the photosensitive member;
optical means provided in said first frame for applying light information to the photosensitive member of said cartridge;
a positioning member provided in said first frame and engageable with said cartridge when said second frame assumes its closing position;
supporting means provided in said second frame to detachably support said cartridge; and
a spring member provided in said second frame to urge said

process cartridge, when loaded, toward said positioning member.

4,873,549
DEVICE FOR DETECTING THE LIFE OF AN IMAGE FORMING PROCESS UNIT, OPENING OF A SEAL OF THE UNIT AND ATTACHMENT OF THE UNIT TO AN IMAGE FORMING APPARATUS

Tomio Tada; Junichi Hirobe, both of Osaka; Junichi Takamatsu, Hannan; Kazuto Hori, Sakai, and Yukihiro Aikawa, Osaka, all of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

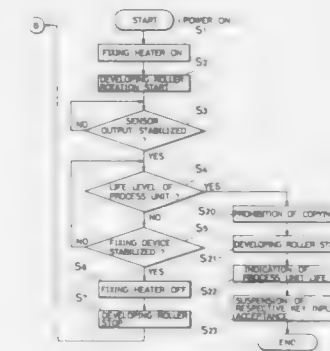
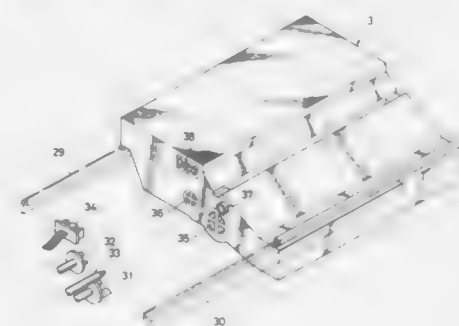
Filed Feb. 29, 1988, Ser. No. 161,571

Claims priority, application Japan, Mar. 3, 1987, 62-49606; Mar. 3, 1987, 62-49607; Mar. 3, 1987, 62-49610; Apr. 17, 1987, 62-95534

Int. Cl.⁴ G03G 21/00

U.S. Cl. 355—206

21 Claims



1. A device for detecting the life of a process unit having a toner and which is detachably mounted in an image forming apparatus comprising:
sensor means for detecting the density of the toner in said process unit;
signal detecting means receiving an output from said sensor means and operable to stabilize said output and to determine whether said stabilized output exceeds or is less than a predetermined value; and
control means connected to said signal detecting means and operable to effect different operating conditions depending on whether said stabilized output exceeds or is below said predetermined value, one of said operating conditions being an indication that the life of said process unit has expired and another of said operating conditions being an indication that the life of said process unit is unexpired.

4,873,550

ELECTROPHOTOGRAPHIC COPIER INCLUDING MEANS FOR SENSING THE SIZE OF AN ORIGINAL DOCUMENT

Toshio Watanabe, Yamato, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

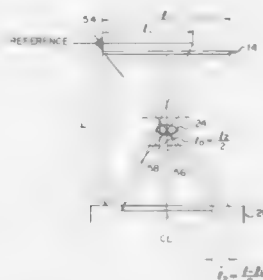
Filed Mar. 15, 1988, Ser. No. 168,397

Claims priority, application Japan, Mar. 26, 1987, 62-44617[U]

Int. Cl.⁴ G03G 15/04

U.S. Cl. 355—232

5 Claims



1. An electrophotographic copier in which an original document laid on a glass platen and optics assembly, which includes a lens, are movable relative to each other to expose a photoconductive element imagewise via the optics assembly, and a resulting latent image produced on said photoconductive element is developed to become a visible image which is then transferred to a paper sheet, said copier comprising:

- document size sensing means for sensing a size of said document which is positioned at one corner portion of said glass platen;
- means for transporting said paper sheet with its center as a reference point; and
- lens displacing means for changing a first position of said lens of said optics assembly to a second position based on said document size sensed by said document size sensing means.

4,873,551

DEVELOPING APPARATUS USING MAGNETIC CARRIER UNDER AC FIELD

Hatsuo Tajima, Matsudo; Atsushi Hosoi, Tokyo; Norihisa Hoshika, Kawasaki; Hiroshi Tajika, and Masahide Kinoshita, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 15, 1988, Ser. No. 168,434

Claims priority, application Japan, Mar. 16, 1987, 62-60454; Mar. 16, 1987, 62-60464

Int. Cl.⁴ G03G 15/09

U.S. Cl. 355—251

14 Claims

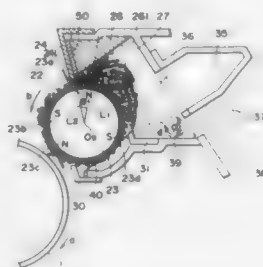
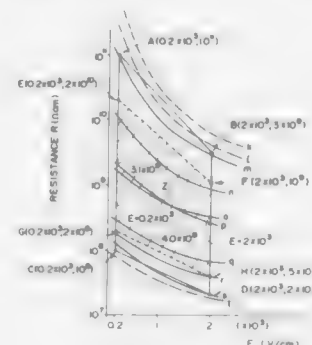
1. A developing apparatus, comprising:

- a developer container for containing a developer containing toner particles and resin coated magnetic particles;
- a developer carrying member opposed to a latent image bearing member to form a developing zone;
- means for forming a layer of the developer on a surface of said developer carrying member;
- means for forming a magnetic field in the developing zone for conveying the magnetic particles into the developing zone;

means for forming an alternating electric field between the latent image bearing member and said developer carrying member in the developing zone;

wherein said magnetic particles are high resistance particles exhibiting an electric field dependence property, wherein an electric resistivity curve of the magnetic particles on a coordinate graph wherein abscissa represents an electric field E (V/cm) applied to the magnetic particles, and ordinate represents an electric resistivity R (ohm-cm) of

the magnetic particles crosses a zone defined by lines AB, BD, DC and CA, where A is a point with coordinates $(0.2 \times 10^3, 10^{11})$; B is a point with coordinates $(2 \times 10^3, 3 \times 10^9)$; C is a point with coordinates $(0.2 \times 10^3, 10^8)$; and D is a point with coordinates $(2 \times 10^3, 2 \times 10^7)$,



wherein the resistivity R is measured by a sandwich type cell having electrodes with a clearance of 0.4 cm and having electrode area of 4 cm², in which 1 kg wt. is applied to one of the electrodes, and a voltage is applied across the electrodes.

4,873,552

READER-PRINTER

Hajime Otsuki, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

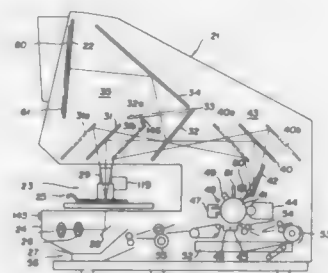
Filed Feb. 2, 1988, Ser. No. 151,520

Claims priority, application Japan, Feb. 2, 1987, 62-23222

Int. Cl.⁴ G03G 15/00, 21/00

U.S. Cl. 355—271

34 Claims



1. A reader-printer of the type which is adapted to project a recorded image of a microfilm on a screen and to print the image on a sheet of paper by projecting the image on a photosensitive medium, said reader-printer comprising:

- a first specifying means for specifying a first area to be

printed on the paper from an image projected on said screen;

- a second specifying means for specifying a second area located in a position different from that of said first area specified by said first specifying means;
- a detection means for detecting the positional relationship between said first and second areas;
- a shift means responsive to said detection means for shifting the projected image of said microfilm in the longitudinal and transverse directions with respect to said paper; and
- an image forming means for forming the image defined within said first area on said paper in a position corresponding to said second area.

4,873,553

VARIABLE PRESSURE CONTROLS OF FIXING DEVICE IN ELECTROPHOTOGRAPHIC COPYING MACHINE

Masakatsu Inaba, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

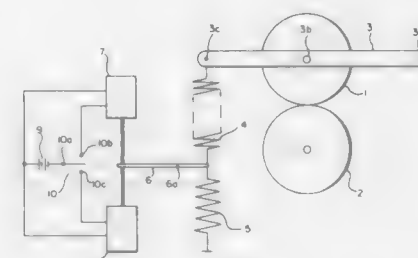
Continuation of Ser. No. 107,848, Oct. 6, 1987, abandoned, which is a continuation of Ser. No. 869,328, Jun. 2, 1986, abandoned. This application Jul. 27, 1988, Ser. No. 225,627

Claims priority, application Japan, Jun. 14, 1985, 60-130509

Int. Cl.⁴ G03G 15/20

U.S. Cl. 355—295

5 Claims



1. A variable pressure control of a fixing device having a fixing roller and a compression roller in contact with each other and serving to fix a toner image on a transfer sheet by passing said sheet between said rollers, said control comprising:

- an elastic means having one end operationally connected to said fixing roller so as to compress said fixing roller against said compression roller,
- adjusting means for adjusting the elastic force of said elastic means such that said rollers press each other selectively at an increased pressure level or at a reduced pressure level, and
- switching means for automatically controlling said adjusting means to select between said increased and reduced pressure levels according to the thickness of paper to be passed between said rollers.

4,873,554

ELECTROSTATOGRAPHIC MACHINE WITH WITHDRAWABLE COPY PAPER MODULE

Robert L. Greco, Jr., Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jun. 29, 1988, Ser. No. 213,077

Claims priority, application United Kingdom, Jul. 1, 1987, 8715481

Int. Cl.⁴ G03G 15/00

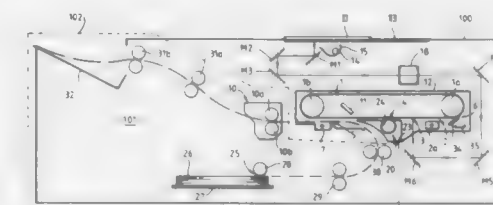
U.S. Cl. 355—309

3 Claims

1. Electrostatographic machine comprising:

- a first portion including means for forming an electrostatic latent image on an imaging member; means for developing the electrostatic latent image with a developer material; and means for transferring, at a transfer station, the developed image to a copy sheet; and
- a second portion comprising a module which is slidably

mounted at one side of the first portion directly adjacent said transfer station, the module being separable from the first portion by being pulled out of the front of the machine;



the module including a copy sheet supply, a fuser for fusing developed images to the copy sheets, a copy sheet output receiver, and a copy sheet transport system for conveying copy sheets from the supply to the transfer station, from the transfer station to the fuser, and from the fuser to the output receiver.

4,873,555

INTRABAND QUANTUM WELL PHOTODETECTOR AND ASSOCIATED METHOD

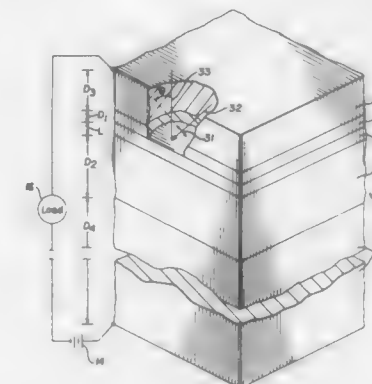
Darryl D. Coon, Pittsburgh, Pa.; Runkiri P. Karunasiri, Sherman Oaks, Calif., and Hui C. Lin, Pittsburgh, Pa., assignors to University of Pittsburgh of the Commonwealth System of Higher Education, Pittsburgh, Pa.

Filed Jun. 8, 1987, Ser. No. 58,972

Int. Cl.⁴ H01L 27/12, 49/02, 29/161, 29/72

U.S. Cl. 357—4

18 Claims



1. A photodetector comprising multiple layers of semiconductor material including:

- an emitter layer;
 - a collector layer;
 - a quantum well layer disposed between said emitter layer and collector layer;
 - a first barrier layer between the emitter layer and the quantum well layer; and
 - a second barrier layer between the collector layer and the quantum well layer;
- said first barrier layer having a band edge height establishing a first energy barrier which is higher than the band edge height of a second energy barrier established by the second barrier layer which in turn is higher than the Fermi level of the quantum well, and the thickness of the first barrier layer and height of the first energy barrier being such that electrons from the quantum well excited by photons flow from the quantum well through the second barrier layer but over the second energy barrier to the collector and are replaced by electrons which tunnel from the emitter layer through the first barrier layer to the

quantum well layer, the thickness of said second barrier layer being such that non substantial proportion of the electrons in the quantum well tunnel through the second energy barrier.

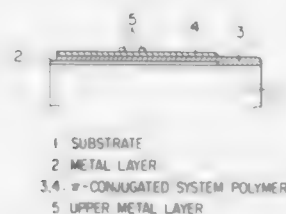
4,873,556

HETERO-JUNCTION DEVICE

Kenji Hyodo, Drexel Hill, Pa.; Hiroshi Koezuka, Nishinomiya, Japan, and Alan G. MacDiarmid, Drexel Hill, Pa., assignors to Mitsubishi Denki Kabushiki Kaisha, Japan
Continuation of Ser. No. 731,282, May 7, 1985, abandoned, which is a continuation of Ser. No. 052,227, May 15, 1987, abandoned. This application Mar. 25, 1988, Ser. No. 178,828
Int. Cl.⁴ H01L 29/28

U.S. Cl. 357—8

12 Claims



1. A hetero-junction device comprising a hetero-junction formed at the interface of a π -conjugated system polymer (A) and a π -conjugated system polymer (B), said π -conjugated system polymer (B) being deposited on said polymer (A) and being a different polymer from said polymer (A) to provide a non-ohmic behavior in a solid state condition.

4,873,557

MIS FET AND PROCESS OF FABRICATING THE SAME

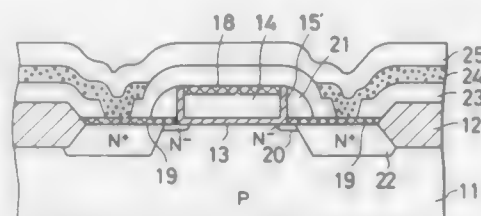
Akio Kita, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan
Filed Jun. 19, 1987, Ser. No. 67,413
Claims priority, application Japan, Jul. 3, 1986, 61-155089
Int. Cl.⁴ H01L 29/78

U.S. Cl. 357—23.1

6 Claims

1. An LDD MIS field effect transistor formed at the surface of a silicon substrate, comprising
a channel region in part of the substrate;
a gate insulating film formed on the channel region;
a gate electrode formed on the gate insulating film;
a lightly-doped region formed in the substrate adjacent to an end of the channel region;
a heavily-doped region formed in the substrate, said heavily-doped region being separated from the channel region by the lightly-doped region;

a metal silicide film formed on part of the lightly-doped region and the heavily doped region; and
a sidewall spacer formed on a side of the gate electrode, said



sidewall spacer being used as a mask during ion implantation for forming said heavily-doped region, such that said metal silicide separates said sidewall spacer from the substrate.

4,873,558

GROUP III-V COMPOUND FIELD EFFECT TRANSISTOR WITH DIFFUSION BARRIER

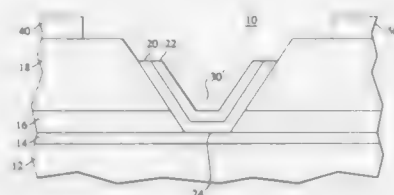
Arsam Antreassyan, Fanwood; Paul A. Garbinaki, New Providence; Vincent D. Mattera, Jr., Flemington, and Henryk Temkin, Berkeley Heights, all of N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Continuation-in-part of Ser. No. 13,328, Feb. 11, 1989. This application Feb. 23, 1988, Ser. No. 159,156

Int. Cl.⁴ H01L 29/78, 29/201, 29/46

U.S. Cl. 357—23.2

14 Claims



1. A field effect transistor comprising
a body having at least a surface layer which is semi-insulating, characterized by
a low-doped Group III-V compound epitaxial channel layer disposed on the semi-insulating surface layer,
a highly-doped Group III-V compound epitaxial contact-facilitating layer,
a low-doped Group III-V compound epitaxial barrier layer disposed between said channel and contact-facilitating layers and being sufficiently thick so as to prevent dopant impurities from diffusing from the latter into the former, said channel layer having a bandgap not less than that of said contact-facilitating layer and said barrier layer, means forming source and drain contacts to said contact-facilitating layer, and
gate electrode means for controlling the flow of current in said channel and between said source and drain contacts.

4,873,559

SEMICONDUCTOR MEMORY DEVICE AND A PROCESS FOR PRODUCING THE SAME

Shinji Shimizu, Hoya; Osamu Tsuchiya, Ohme, and Katsuyuki Sato, Kodaira, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 855,418, Apr. 24, 1986, abandoned.

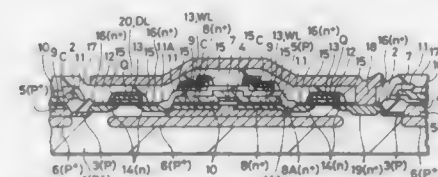
This application Oct. 5, 1988, Ser. No. 253,779

Claims priority, application Japan, Apr. 24, 1985, 60-86393; May 24, 1985, 60-110361; May 24, 1985, 60-110362

Int. Cl.⁴ H01L 29/78

U.S. Cl. 357—23.6

26 Claims



1. A semiconductor integrated circuit device, comprising series circuits including a MISFET and a capacitor, as memory cells, comprising:

- a semiconductor substrate of a first type of conductivity having a main surface;
- a first semiconductor region of a second type of conductivity formed in said semiconductor substrate and extending to said main surface, said first semiconductor region serving as one electrode of said capacitor;
- a second semiconductor region of the first type of conductivity formed under and in contact with said first semiconductor region, said second semiconductor region having an impurity concentration which is higher than the impurity concentration of said semiconductor substrate; and
- a third semiconductor region, of the first type of conductivity, formed under said second semiconductor region said third semiconductor region having an impurity concentration which is higher than the impurity concentration of said second semiconductor region.

4,873,560

DYNAMIC RANDOM ACCESS MEMORY HAVING BURIED WORD LINES

Hideo Sunami, Tokyo; Shinichiro Kimura, Hachioji, and Toru Kaga, Urawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

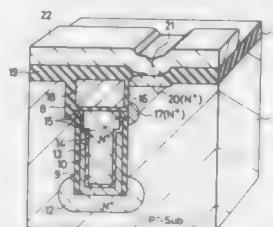
Filed Feb. 16, 1988, Ser. No. 155,698

Claims priority, application Japan, Apr. 1, 1987, 62-77416

Int. Cl.⁴ H01L 29/78, 29/06, 27/02

U.S. Cl. 357—23.6

42 Claims



1. A semiconductor memory comprising, a semiconductor substrate;
a plurality of memory cells, each including a deep hole bored in said semiconductor substrate;
a capacitor formed on a sidewall portion at the lower half of said deep hole, the capacitor comprising a storage node disposed inside said deep hole, a sheath type plate electrode, a capacitance insulating film disposed be-

tween said storage node and said sheath type plate electrode and an insulating film encompassing said sheath type plate electrode; and a switching transistor formed immediately above said capacitor;
word lines for selecting said memory cells, wherein at least half of each word line forms a gate of said switching transistor of each memory cell and is buried in one of a plurality of elongated recesses formed in a surface portion of said semiconductor substrate;
bit lines for transferring data; and
voltage impression means connected to said sheath type plate electrode which impresses a voltage to said sheath type plate electrode which is different from a voltage impressed to said semiconductor substrate.

4,873,561

HIGH DYNAMIC RANGE CHARGE-COUPLED DEVICE

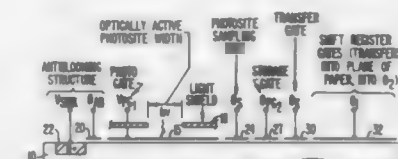
David D. Wen, 248 Delphi Cir., Los Altos, Calif. 94022

Filed Apr. 19, 1988, Ser. No. 183,111

Int. Cl.⁴ H01L 29/78

U.S. Cl. 357—24

17 Claims



1. A semiconductor structure comprising:
a semiconductor substrate;
photogate means disposed in proximity to the substrate for creating a first depletion region in the substrate of first depth for the accumulation of charge in response to ambient electromagnetic radiation, the first depletion region being capable of containing a first quantity of charge;
storage gate means, spaced apart from the photogate means, disposed in proximity to the substrate for creating a second depletion region in the substrate of second depth, the second depth being greater than the first depth and the second depletion region being capable of containing a second quantity of charge less than the first quantity; and
sampling gate means disposed between the photogate means and the storage gate means for controllably isolating the second depletion region from the first depletion region to allow transfer of the second quantity of charge from the second depletion region without the first quantity of charge.

4,873,562

CHARGE-COUPLED DEVICE WITH LOWERING OF TRANSFER POTENTIAL AT OUTPUT AND FABRICATION METHOD THEREOF

Yvon Cazaux; Yves Thenoz, both of Grenoble; Didier Herault, Weyssinet, and Pierre Blanchard, Verrieres le Buisson, all of France, assignors to Thomson-CSF, Paris, France

Filed Dec. 21, 1988, Ser. No. 287,887

Claims priority, application France, Dec. 22, 1987, 87 17880

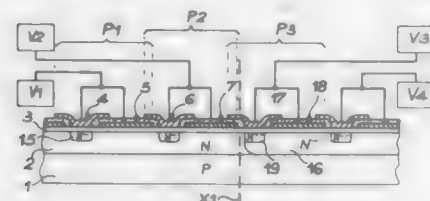
Int. Cl.⁴ H01L 29/78; G11C 19/28

U.S. Cl. 357—24

5 Claims

1. A charge-coupled device comprising:
a semiconductor substrate with first type of doping, a semiconductor layer with a second type of doping covering this substrate,
an insulating layer covering this semiconducting layer, and, along one and the same axis defining a direction of flow of charges between an upstream position and an downstream position,
at least one first pair and one second pair of electrodes, each comprising, in said direction, a transfer electrode and a

storage electrode having surfaces of contact with the insulating layer, with zones of a third type of doping being made so as to face the contact surfaces of the transfer electrodes of the first and second pairs, in the semiconducting layer of the second type, the electrodes of the first and second pairs being respectively connected to a first source and a second source of voltage varying cyclically and in phase opposition, between a first value and a second value, to create potential wells of equal depths, beneath and facing the storage electrodes, and identical and phase shifted potentials beneath and facing the transfer and storage electrodes of the first pair and the second pair, to make the charges flow in said direction;



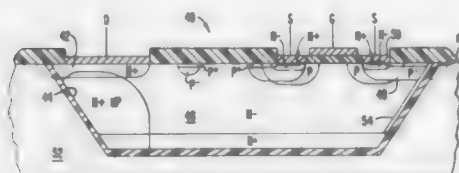
said device comprising, from the downstream position, along said axis, in the direction of flow;
a semiconducting layer with a third type of doping made in the layer with the second type of doping,
at least one third pair of electrodes comprising, in said direction, a transfer electrode and a storage electrode having surfaces of contact with the insulating layer, and comprising means to create transfer potentials, beneath and facing the electrodes of the third pair, with values smaller than those of the transfer potentials beneath and facing the transfer and storage electrodes of the first pair and second pair.

4,873,563

SOLID STATE MONOLITHIC SWITCHING DEVICE
Stephen L. Daleo, Parkville, Mo., and James B. Compton, Los Gatos, Calif., assignors to Synectics, Inc., Kansas City, Mo.
Filed May 2, 1988, Ser. No. 188,809
Int. Cl.⁴ H01L 27/02

U.S. Cl. 357-41

7 Claims



1. In a monolithic integrated double-diffused Metal Oxide Semiconductor circuit constructed on a dielectrically isolated monolithic silicon substrate, wherein individual components are formed within wells, each well formed by a dielectric isolation wall, the improvement comprising:
a source diffusion of said individual component abutted to said wall to form a diffusion/wall interface in silicon for maximizing use of area within said well and for minimizing undesired electric fields at the diffusion/wall interface;
a drain diffusion of said individual component abutted along a majority of its surface periphery to said wall to form a diffusion/wall interface in silicon for maximizing use of area within said well and for minimizing undesired electric fields at the diffusion/wall interface; and
a thin layer of dopant provided on at least a part of the inner surface of a side portion of the wall bridging said source

diffusion and a bottom of said well and bridging said drain and said bottom of said well, said dopant being in sufficient concentration to prevent inversion along an interdiffusion channel of a parasitic MOSFET formable under expected operating conditions.

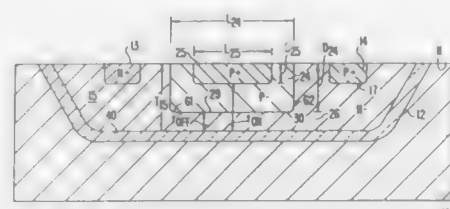
4,873,564

CONDUCTIVITY-MODULATED FET WITH IMPROVED PINCH OFF-ON PERFORMANCE

James D. Beason, Melbourne Village, Fla., assignor to Harris Corporation, Melbourne, Fla.
Continuation-in-part of Ser. No. 790,117, Oct. 22, 1985, abandoned. This application Oct. 21, 1987, Ser. No. 110,775
Int. Cl.⁴ H01L 29/06, 29/80, 27/12

U.S. Cl. 357-49

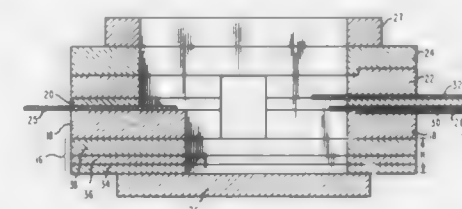
35 Claims



1. A channel conductivity-modulated field effect semiconductor device comprising:
a body of semiconductor material of a first conductivity type having first and second surfaces;
a gate region of semiconductor material of a second conductivity type, opposite to said first conductivity type, extending from a top portion thereof at said first surface of said body to a bottom portion thereof a prescribed depth from said first surface, space apart from said second surface, and forming with the material of said body a PN junction, so that a channel region is defined between said PN junction at the bottom portion of said gate region and said second surface of said body; and
means, coupled to said body, for controllably injecting carriers of said second conductivity type into said body, whereby said carriers are caused to flow through and thereby modulate the conductivity of said channel region; and wherein
that portion of said gate region which is contiguous with and defines said PN junction at the bottom portion thereof is comprised of relatively high resistivity semiconductor material having a first, relatively low impurity concentration the profile of which gradually varies with depth from said first surface, and said gate region includes a portion of relatively low resistivity semiconductor material having a second, relatively high impurity concentration the profile of which changes abruptly with depth from said first surface, overlying said channel region and being contiguous with the relatively high resistivity semiconductor material thereof, such that said channel region lies beneath a portion of said gate region whereat said relatively high resistivity material and relatively low resistivity material portions are contiguous with one another and said relatively low resistivity material portion is spaced apart from said channel region therebeneath by material of said relatively high resistivity portion of said gate region and such that the composite of said first and second impurity concentration profiles has a knee at a bottom interface whereat said relatively high resistivity material and relatively low resistivity material regions are contiguous with one another, such that from said bottom interface to the bottom of said gate region the impurity concentration profile of said gate region varies from said knee in accordance with the profile of said first, relatively low impurity

concentration, and from said bottom interface toward said first surface the impurity concentration profile of said gate region varies abruptly from said knee in accordance with the profile of said second relatively high impurity concentration, whereby, during the on-condition of said device, said channel region is effectively established between said second surface of said body and the bottom interface of said portion of relatively low resistivity material and said portion of relatively high resistivity material whereat the composite of said first and second impurity concentration profiles undergoes an abrupt change at said knee, during turn-off of said device said low resistivity portion provides a low resistance path for removal of carriers of said second conductivity type and, in the off-condition of said device, said channel region is confined between said PN junction at the bottom portion of said gate region and said second surface of said body.

sion fiber and including a multilayer microwave transmission line for providing a connection between a high bit rate input



signal source and said semiconductor optical communication devices.

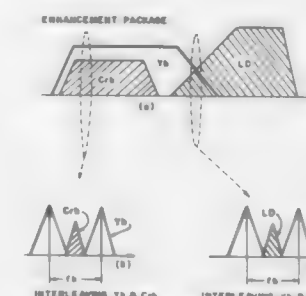
4,873,567

EXTENDED HORIZONTAL RESOLUTION OF LUMINANCE AND CHROMINANCE IN A HIGH DEFINITION TELEVISION SYSTEM

Mikhail Tsineberg, Riverdale, N.Y., assignor to U.S. Philips Corporation, New York, N.Y.
Filed Aug. 13, 1987, Ser. No. 84,968
Int. Cl.⁴ H04N 7/04

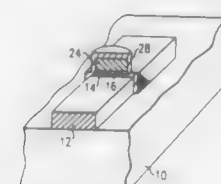
U.S. Cl. 358-12

6 Claims



4,873,565
METHOD AND APPARATUS FOR PROVIDING INTERCONNECTION BETWEEN METALLIZATION LAYERS ON SEMICONDUCTOR DEVICES
Bobby A. Roane, Manvel, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.
Filed Nov. 2, 1987, Ser. No. 115,282
Int. Cl.⁴ H01L 23/48, 45/00, 29/04
U.S. Cl. 357-71

13 Claims



1. A semiconductor device interconnection between first and second metallization levels separated by an insulator, comprising:
a solid stud with vertical sidewalls extending from the first level of metallization through the insulator into contact with the second level of metallization;
said stud clad with a corrosion-preventing material on said vertical sidewalls and a top surface thereof.

4,873,566

MULTILAYER CERAMIC LASER PACKAGE

John L. Hokanson, Upper Milford Township, Lehigh County; Palmer D. Smeltz, Jr., Ruscombmanor Township, Berks County; Katherine A. Yanushefski; Michael J. Yanushefski, both of Hanover Township, Northampton County, and Craig A. Young, Nazareth, all of Pa., assignors to American Telephone and Telegraph Company, Murray Hill and AT&T Bell Laboratories, AT&T Technologies Inc., Berkeley Heights, both of, N.J.
Continuation-in-part of Ser. No. 792,056, Oct. 28, 1985, abandoned. This application Jan. 15, 1987, Ser. No. 8,051
Int. Cl.⁴ H01L 23/02, 23/12

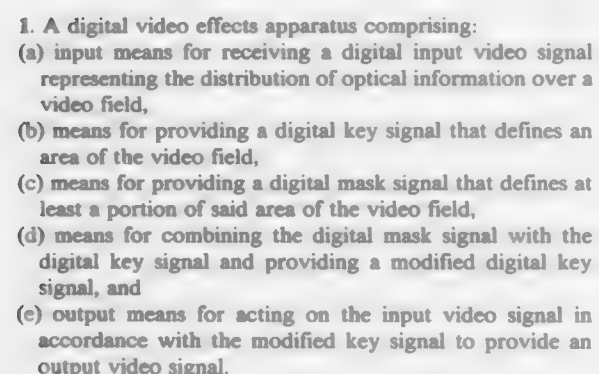
U.S. Cl. 357-74

48 Claims

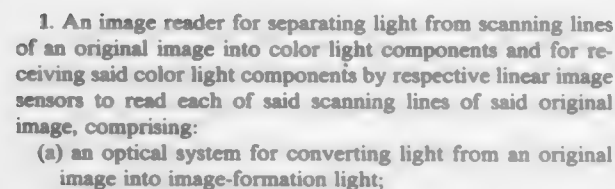
1. A package for semiconductor optical communication devices comprising an electrically nonconductive housing having an opening for allowing insertion of an optical transmis-

1. A system for transmitting a television signal for producing a high definition television image, comprising:
(a) means for separating said television signal into a first signal and a second signal having separate frequency bands, said second signal comprising a line differential signal for providing enhanced vertical detail in said television image, a wide bandwidth luminance signal and a wide bandwidth chrominance enhancement signal;
(b) first filter means for receiving said wide bandwidth luminance signal and for passing a high frequency component thereof;
(c) second filter means for receiving said wide bandwidth chrominance enhancement signal and for passing high frequency components thereof;
(d) a first vertical filter means connected to said first filter means for receiving and vertically filtering said high frequency component of said luminance signal;
(e) second vertical filter means connected to said second filter means for receiving and vertically low pass filtering said high frequency components of said chrominance enhancement signal; and
(f) means connected to said first vertical filter means and said second vertical filter means for frequency interleaving most of the frequency band of said high frequency component of said luminance signal with said high frequency components of said chrominance enhancement signal and further frequency interleaving the upper portion of said frequency band with said line differential signal.

27 Claims



5 Claims



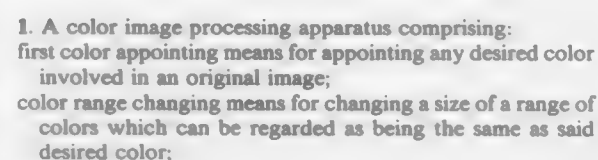
(b) a spectroscope for forming and directing color light components of said image-formation light; and

(c) an image sensing device fixed to said spectroscope, said image sensing device including linear image sensors for receiving said color light components, said linear image sensors including surfaces for receiving said color light components; and

wherein said spectroscope includes:

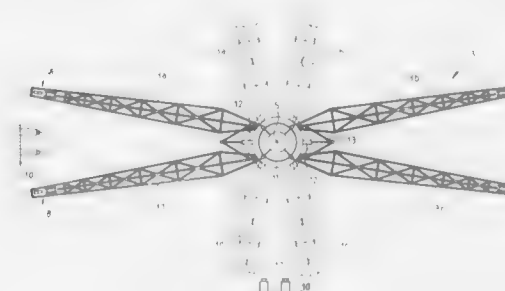
- (1) a plurality of transparent bodies;
- (2) a light incident plane for allowing said image-formation light to enter the interior of said spectroscope, said plane being adapted to be substantially perpendicular to the optical axis of said image-formation light;
- (3) color separation planes for selectively reflecting said image-formation light in said interior of said spectroscope to separate said image-formation light into said color light components;
- (4) optical axis direction changing planes for reflecting said color light components and directing said color light components to form images on said surfaces of said linear image sensors, said optical axis direction changing planes being adapted to direct said color light components such that said images formed on said surfaces of said linear image sensors have a common conjugate position with respect to said spectroscope, said optical axis direction changing planes being adapted to direct each of said color light components onto said surfaces of said linear image sensors in a direction which is perpendicular to said surfaces of said linear image sensors;
- (5) means for totally reflecting said color light components at said optical axis direction changing planes; and
- (6) means for reflecting said color light components either an exclusively even number of times or an exclusively odd number of times.

17 Claims



second color appointing means for appointing a target color to which said desired color is to be converted; and color image forming means for forming a color image with said desired color and colors in said color range converted into said target color.

16 Claims



(a) a top support including four top support end portions which are movable between at least two sets of relative positions in a top plane, said top support being rotatable relative to a second axis substantially perpendicular to said illumination axis, said second axis passing substantially through a middle portion of said top support;

(b) a bottom support including four bottom support end portions which are also movable from at least two relative positions but in a bottom plane below said top plane, said bottom support also being rotatable about said second axis, said second axis also passing substantially through a middle portion of said bottom support;

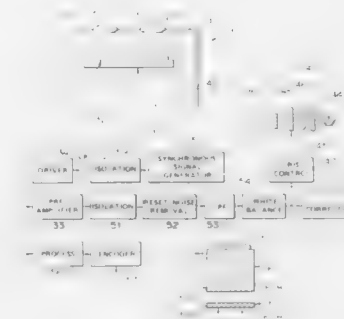
(c) four top wires each having a lower end fixed to a top portion of the mock-up and extending upwardly to a respective one of said top support end portions;

(d) four bottom wires each having an upper end fixed to a bottom portion of the mock-up and extending downwardly to a respective one of said bottom support end portions;

(e) tensioning means operatively coupled to each of the top support end portions and the bottom support end portions for adjusting the respective tensions and effective lengths of said top and bottom wires as a function of a desired attitude and altitude for the mock-up; and

(f) control means for controlling the angular positions of said top and bottom supports, the relative positions of said top support end portions and the relative positions of said bottom support end portions, as a function of a desired attitude for the mock-up relative to said illumination axis.

30 Claims



1. An electronic endoscope apparatus comprising:
an elongate insertable part;
two image forming optical systems provided in the tip part
of said insertable part; and
an imaging means provided in the tip part of said insertable
part, having two imaging regions in which object images
are formed by said two image forming optical systems and
made integral.

25 Claims



1. Receiving or playback apparatus for a reduced bandwidth video signal accompanied by a digital signal carrying motion vector information pertaining individually to a plurality of blocks of pixels, characterized by means for accumulating sub-sample points from the fields of each of a repeating cycle of fields, and means responsive to the motion vector information to shift the sub-sample points in accordance with the

corresponding motion vector information so that the accumulated points provide a high-definition picture both in stationary areas and moving areas which are correlated from field to field.

4,873,574

NOISE MEASUREMENT FOR VIDEO SIGNALS

Ted A. Darby, Knoxville, Tenn., assignor to North American Philips Corporation, New York, N.Y.

Filed Dec. 20, 1988, Ser. No. 288,061
Int. Cl.⁴ H04N 17/00, 17/02

U.S. Cl. 358—139

20 Claims



1. A noise measurement system in a television signal receiver that receives a composite television picture signal having noise, picture information, vertical synchronization pulses indicating television picture frames, horizontal synchronizing pulses indicating television scan lines, and a standard signal that occurs repeatedly in the television signal and that would be the same at each occurrence but for noise, the system comprising:
means for producing at least two samples of the standard signal taken at different times;
means for comparing the at least two standard signal samples and for generating a comparison signal that is representative of the comparison of the at least two standard signal samples; and
means for receiving the comparison signal and for generating a measured noise signal that is representative of the noise in the composite television picture signal as measured by at least one comparison signal.

4,873,575

CIRCUIT ARRANGEMENT FOR ENHANCING THE HORIZONTAL DEFINITION OF A TELEVISION SIGNAL

Gerard De Haan, Eindhoven, Netherlands, assignor to U. S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 145,858, Jan. 20, 1988, abandoned. This application Feb. 16, 1989, Ser. No. 312,320

Claims priority, application Netherlands, Jan. 23, 1987, 1700111

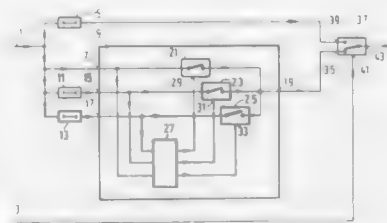
Int. Cl.⁴ H04N 5/14

U.S. Cl. 358—166

7 Claims

1. A circuit arrangement for enhancing the horizontal definition of an interlaced television signal comprising a plurality of pictures, said circuit arrangement having a circuit input coupled to a television signal source for applying thereto a first plurality of horizontal samples having a vertical position, sampled from a first picture of said television signal, and a second plurality of horizontal samples having said vertical position, sampled from a successive picture in anti-phase with respect to said first picture, wherein said circuit arrangement comprises:
a selection circuit having three inputs and an output;
means coupled to said circuit input for applying to each of said three selection circuit inputs respectively, three hori-

zontally successive samples comprising alternate ones of said first and second horizontal samples having the same vertical position; and



means for providing at said output the one of said horizontal samples applied at said selection circuit inputs at any instant which has an amplitude at that instant which is closest in value to the mean value of the amplitudes of said applied horizontal samples.

4,873,576

CAMERA EQUIPPED WITH A TELEVISION SET

Tsuyoshi Hattori, Masanao Tanaka, both of Hino, and Syoji Matsuzaka, Hachioji, all of Japan, assignors to Konica Corporation, Tokyo, Japan

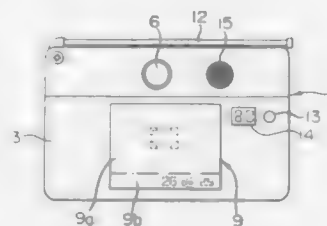
Filed Aug. 2, 1988, Ser. No. 227,390

Claims priority, application Japan, Mar. 8, 1987, 62-192721

Int. Cl.⁴ H04N 5/30, 5/64

U.S. Cl. 358—224

5 Claims



1. A camera for taking photographs comprising:
a unitary casing for housing the camera and a television;
the camera including a mirror positioned interiorly of said unitary casing for receiving the subject image being viewed and projecting said subject image on a CCD area image sensor provided interiorly of said unitary casing;
a liquid crystal display means housed in said unitary casing and visible from the exterior of said unitary casing operable in first and second operational modes for selectively receiving and displaying said subject image from said CCD area image sensor and for displaying a television signal generated from said television, respectively; and
selection means attached to said unitary housing for manual selection of one of said first and second operational modes.

4,873,577

EDGE DECOMPOSITION FOR THE TRANSMISSION OF HIGH RESOLUTION FACSIMILE IMAGES

Christodoulos Chamzas, West Long Branch, N.J., assignor to American Telephone and Telegraph Company, New York, N.Y. and AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jan. 22, 1988, Ser. No. 146,917

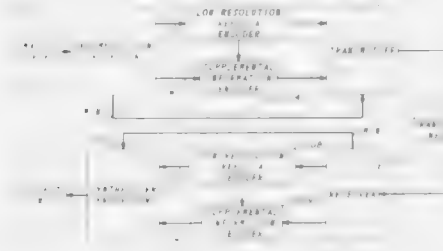
Int. Cl.⁴ H04N 1/415, 1/40

U.S. Cl. 358—426

21 Claims

1. A method for decomposing a high resolution image into a low resolution replica and supplemental information for facsimile storage or transmission, comprising the steps of:
a. obtaining a super pixel, including a plurality of high resolution pixels, from a high resolution image source;

b. determining whether a low resolution pixel being generated from said super pixel is at an edge in a low resolution replica being generated;
if so, generating supplemental information for said low resolution pixel being generated in accordance with first prescribed criteria dependent on said high resolution pixels in said super pixel and generating said low resolution pixel having a tone determined in accordance with second prescribed criteria;
if not, determining whether said low resolution pixel being generated requires supplemental information and, if so, generating supplemental information for said low resolution pixel being generated in accordance with said first prescribed criteria and selecting the tone of said low resolution pixel being generated so that it is at an edge in said low resolution replica and, if not, generating said low resolution pixel having a tone determined in accordance with third prescribed criteria;
c. outputting said supplemental information, if any;
d. outputting a representation of said generated low resolution pixel tone;
e. obtaining a next super pixel from said high resolution image source as in step (a);
f. repeating steps (b) through (e) until the high resolution image has been decomposed to a low resolution replica plus supplemental information, if any.
8. A method for recomposing a high resolution image from received low resolution pixel information from a low resolution replica and received supplemental information, comprising the steps of:



a. obtaining a low resolution pixel from the low resolution replica;
b. determining whether said obtained low resolution pixel is at an edge in the low resolution replica;
if so, obtaining received supplemental information corresponding to said low resolution pixel and substituting said obtained supplemental information for said low resolution pixel to generate a high resolution super pixel in the high resolution image being recomposed, said high resolution super pixel including a plurality of high resolution pixels each having a tone determined from said supplemental information;
if not, generating a high resolution super pixel in the high resolution image being recomposed, said high resolution super pixel including a plurality of high resolution pixels each having a tone the same as said low resolution pixel;
c. outputting said high resolution super pixel;
d. obtaining a next low resolution pixel as in step (a);
e. repeating steps (b) through (d) until the high resolution image has been recomposed.
11. Apparatus for decomposing a high resolution image into a low resolution replica and supplemental information for facsimile storage or transmission comprising:
a source of a high resolution image having a first plurality of high resolution pixels;
means for obtaining super pixels in a predetermined sequence from said image source, each of said super pixels including a second plurality of high resolution pixels;
means for generating low resolution pixels to be substituted for corresponding ones of said super pixels;
means for determining whether each of said low resolution

pixels being generated is at an edge in a low resolution replica being generated;
means for generating supplemental information in accordance with first prescribed criteria for each of said low resolution pixels being generated determined to be at an edge;
said means for generating said low resolution pixels including means for generating a tone for each of said low resolution pixels being generated determined to be at an edge in accordance with second prescribed criteria;
means for determining whether supplemental information is required for individual ones of said low resolution pixels being generated;
means for generating supplemental information for individual ones of said low resolution pixels being generated determined to require it in accordance with said first prescribed criteria;
means for selecting the tone of said individual ones of said low resolution pixels being generated which require said supplemental information so that they are at an edge in said low resolution replica;
means for generating a tone for each of said low resolution pixels being generated determined not to require supplemental information in accordance with third prescribed criteria;
means for outputting representations of the tones of said generated low resolution pixels; and
means for outputting said supplemental information, if any.
18. Apparatus for recomposing a high resolution replica from received low resolution pixel information from a low resolution replica and received supplemental information comprising:

means for obtaining low resolution pixels from the received low resolution replica;
means for determining whether individual ones of said obtained low resolution pixels are at an edge in said low resolution replica;
means for obtaining supplemental information for individual ones of said low resolution pixels determined to be at an edge and for substituting said supplemental information for said low resolution pixel at an edge to generate a high resolution super pixel in the high resolution image being recomposed, said high resolution super pixel having a plurality of high resolution pixels, each having a tone determined from said supplemental information;
means for generating a high resolution super pixel for each low resolution pixel not at an edge, said high resolution super pixel having a plurality of high resolution pixels, each of said high resolution pixels having a tone the same as that of a corresponding low resolution pixel; and
means for outputting said high resolution pixels.

4,873,578

VIDEO CIRCUIT ENCLOSURE FOR ATTACHMENT TO A CATHODE RAY TUBE

Keith I. Tognoni, Winchester; John Fitzgerald, Leominster; Glenn Welch, Lynnfield, and Paul Yonkers, North Chelmsford, all of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Jul. 28, 1987, Ser. No. 78,778

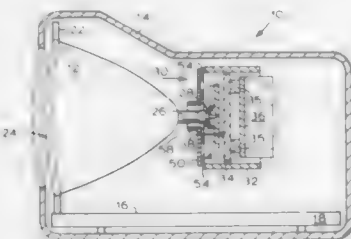
Int. Cl.⁴ H04N 5/645

U.S. Cl. 358—254

18 Claims

1. A video circuit enclosure for attachment to a cathode ray tube, the cathode ray tube having a screen face and a neck extending away from the face, said neck having at least one conductive terminal for the cathode ray tube, the video circuit enclosure comprising:
(a) video box formed of conductive material so as to form a shield, said box disposed over the portion of the cathode ray tube have the conductive terminals, said box forming an open face into which the cathode ray tube neck is inserted;

- (b) a video board secured inside said video box, said video board including at least a video circuit for supplying signals to the cathode ray tube;
- (c) a socket board disposed inside said video box closely spaced from said video board, said socket board having a socket means for coupling to the cathode ray tube so that it is attached thereto and in electrical contact with the cathode ray tube terminal;
- (e) an electrical connection means connected to said socket



means able to maintain a conductive path for signal transfer therebetween when said video board and said socket board move relative to each other; and

- (d) a video cover formed of conductive material disposed over said video box open face and forming an hole the cathode ray tube is positioned in, said video cover attached to said socket board and spaced away therefrom so that when said socket board is disposed in said video box, said video cover is in electrical contact with said video box.

4,873,579

IMAGE INFORMATION READING APPARATUS

Tooru Kubota, and Hiroyuki Mori, both of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

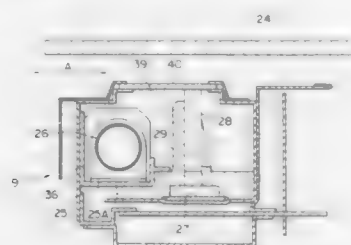
Filed Sep. 6, 1988, Ser. No. 240,654

Claims priority, application Japan, Sep. 7, 1987, 62-223346

Int. Cl.⁴ H04N 1/10

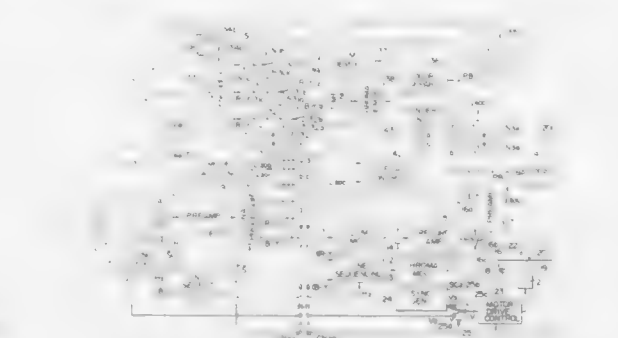
U.S. Cl. 358—471

9 Claims



1. An apparatus for reading an image from an image data-containing sheet, comprising:
 - support means for supporting the sheet mounted thereon;
 - first illuminating means for illuminating the sheet with light, said first illuminating means extending in a first direction which is parallel to a surface of the sheet;
 - first housing means for housing said first illuminating means so as to seal said illuminating means therein, said first housing means including a transparent section through which the light emitted from said first illuminating means and is directed toward the sheet;
 - photoelectric converting means, which extends parallel to said first direction, for converting the light reflected from the sheet into electric signals; and
 - driving means for simultaneously driving said first illuminating means and said photoelectric converting means in a second direction which is parallel to the surface of the sheet and is perpendicular to said first direction.

4,873,580
DETACHABLE UNIT ELECTRONIC CAMERA
Akira Katoh; Masatoshi Ida, both of Hachioji; Yutaka Yunoki, Kunitachi; Hisayuki Harada, Hachioji; Manabu Inoue, Kokubunji, and Yoshio Fukuda, Hino, all of Japan, assignors to Olympus Optical Co., Ltd., Japan
Division of Ser. No. 797,025, Nov. 12, 1985, Pat. No. 4,746,990.
This application Apr. 12, 1988, Ser. No. 180,822
Int. Cl.⁴ H04N 5/76, 5/06
U.S. Cl. 358—335 10 Claims



1. An independent connector means for use in a multi-unit electronic camera system having units capable of performing the functions of photographing an image, recording and playing back an image and monitoring an image being photographed, said system being comprised of a plurality of independent units each having an array of coupling terminals arranged along one side of a housing for each unit; said independent connector means being provided for electrically coupling an array of terminals provided on the housing of one of said units with an associated array of terminals provided on the housing of another one of said units;

said independent connector means comprising a connector means housing containing a sync signal generator for supplying a plurality of different output sync signals; first and second groups of terminals being arranged along said independent connector mean housing; and at least one terminal from each of said first and second groups of terminals being coupled in common for receipt of one of said output sync signals to enable said independent connector means to couple said sync signals to those units of said system which are respectively connected to said first and second groups of terminals.

4,873,581

FIELD/FRAME CONVERSION CIRCUIT

Yoshiki Iwase, and Yasuhito Kobayashi, both of Tokyo, Japan, assignors to Fuji Photo Film Co. Ltd., Kanagawa, Japan
Division of Ser. No. 46,710, May 7, 1987, Pat. No. 4,812,919.
This application Oct. 24, 1988, Ser. No. 261,624

Claims priority, application Japan, May 8, 1986, 61-105749; May 8, 1986, 61-105750; May 8, 1986, 61-105753; May 8, 1986, 61-105754; Aug. 4, 1986, 61-182963

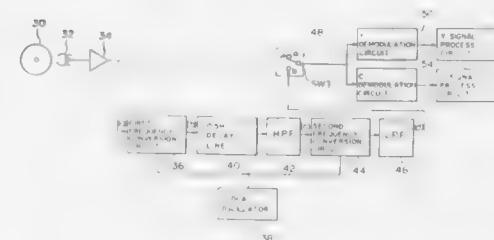
Int. Cl.⁴ H04N 5/76, 9/79

U.S. Cl. 358—310

10 Claims

1. A field/frame conversion circuit comprising:
 - first frequency conversion means adapted to convert the frequency of a repetitively input, frequency modulated field signal on the higher band side than the frequency band of said field signal;
 - signal delay means adapted to delay a frequency modulated field signal output from said first frequency conversion means only by 0.5 horizontal scan period;
 - a filter adapted to extract the upper band component of a frequency modulated field signal output from said signal delay means;

second frequency conversion means adapted to convert the frequency of a signal output from said filter to the same frequency of said repetitively input frequency modulated field signal; and,



signal switching means adapted to select a frequency modulated field signal output from said second frequency conversion means and delayed only 0.5 horizontal scan period and said repetitively input, frequency modulated field signal not delayed alternately at every one vertical scan period to thereby output a frame signal.

4,873,582

VIDEO SIGNAL AND METHOD THEREFOR TIME AXIS ALTERING CIRCUIT USED IN A VIDEO TAPE RECORDER FOR RECORDING A BROADBAND VIDEO SIGNAL

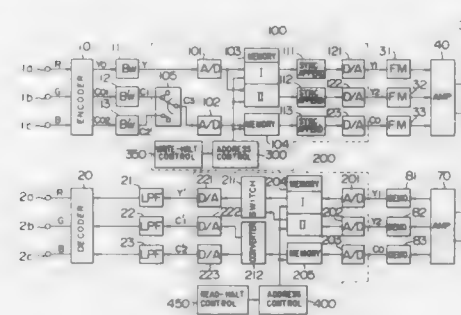
Takashi Furuhashi, Yokohama; Hitoaki Owashi, Katsuta; Takayasu Ito, and Masakazu Hamaguchi, both of Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Continuation of Ser. No. 33,265, Apr. 2, 1987, abandoned. This application Jun. 21, 1988, Ser. No. 210,167

Claims priority, application Japan, Apr. 2, 1986, 61-74217

Int. Cl.⁴ H04N 9/79, 5/76

U.S. Cl. 358—310

18 Claims



1. A video signal time axis altering circuit for transforming a broad-band video signal including a blanking signal with a period τ into narrow-band video signals in a plurality of channels by dividing said broad-band video signal into signals in a plurality (N ; $N \geq 2$) of channels on the time axis and expanding the divided signals on the time axis, said circuit comprising:
 - (a) an analog-to-digital converting circuit which receives said broad-band video signal and quantizes said signal into a digital signal;
 - (b) a memory connected to said analog-to-digital converting circuit and having a plurality of storage areas, said memory receiving a quantized video signal from said analog-to-digital converting circuit and storing said quantized video signal in said storage areas by dividing said quantized video signal into a plurality of signals in a predetermined period;
 - (c) a plurality of digital-to-analog converting circuits each of which receives a quantized video signal retrieved from

each of said storage areas of said memory and converts said signal into an analog signal;

- (d) an address control signal generating circuit which is connected to said memory, produces a writing clock signal for controlling the writing of said quantized video signal to said memory and a reading clock signal for controlling the reading of stored video signal out of said memory, and supplies said writing clock signal and reading clock signal to said memory, said writing clock signal having a frequency f_1 determined in such a relation with a frequency f_2 of said reading clock signal of $f_1 > N \times f_2$; and
- (e) a write-halting control circuit which is connected to said address control signal generating circuit and produces a signal which causes said writing clock signal to halt temporarily the writing of said quantized video signal to said memory in said blanking signal period τ .

4,873,583

MAGNETIC TAPE RECORDING/REPRODUCING APPARATUS

Masaaki Kobayashi, Kawanishi; Kazuhiro Yamanishi, Kashiwara; Akihiro Takeuchi, Ikoma, and Yoshitomi Nagaoka, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

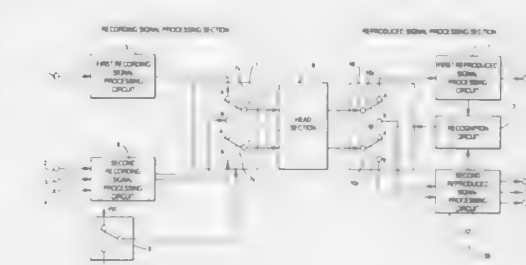
Filed Dec. 18, 1986, Ser. No. 943,200

Claims priority, application Japan, Dec. 18, 1985, 60-284895

Int. Cl.⁴ H04N 9/79, 5/76

U.S. Cl. 358—310

6 Claims



1. A magnetic tape recording/reproducing apparatus comprising:

a recording signal processing section for converting a video signal to one or more recordable signals;

a head section having a plurality of magnetic heads mounted on a signal rotary cylinder for recording said one or more recordable signals on a magnetic tape and for reproducing said one or more recordable signals which have been recorded from said magnetic tape; and

a reproduced signal processing section for converting said one or more reproduced signals from said head section to said video signal,

wherein said recording signal processing section comprises: a first recording signal processing circuit for converting a first kind of video signal to a 1-channel video signal; a second recording signal processing circuit for converting a second kind of video signal to 2-channel component signals; and a first switch circuit for selectively connecting one of said first and second recording signal processing circuits to said head section, and

wherein said reproduced signal processing section comprises: a first reproduced signal processing circuit for converting said 1-channel video signal reproduced from said head section to said first kind of video signal; a second reproduced signal processing circuit for converting said 2-channel component signals reproduced from said head section to said second kind of video signal; a second switch circuit for selectively connecting one of said first and second reproduced signal processing circuits to said head section; and a recognition circuit for recognizing

error detecting means for detecting the presence or absence of any error in the block address data determined by use of the redundancy data and for producing an error detection signal when any error is detected in the block address data;

first write address generating means for generating first write address data;

first memory means for storing at least the main data among the data block according to the first write address data from said first write address generating means;

second write address generating means for generating second write address data;

second memory means for storing the first write address data from said first write address generating means according to the second write address data from said second write address generating means when the address data is determined to have no error by said error detecting means;

second read address generating means for generating second read address data, whereby the first write address data stored in said second memory means is read out according to the second read address data; and

first read address generating means for generating first read address data according to the first write address data read out from said second memory means, whereby the main data stored in said first memory means is read out according to the first read address data.

4,873,589

DATA RECORDER AND METHOD

Yoshizumi Inazawa, Masaki Yamada, Hiroshi Ishibashi, and Shinya Ozaki, all of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

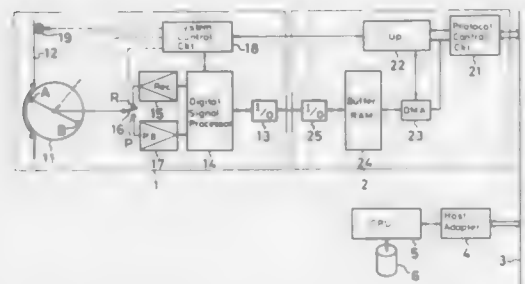
Filed Dec. 15, 1987, Ser. No. 133,010

Claims priority, application Japan, Dec. 19, 1986, 61-303080; Dec. 22, 1986, 61-305881; Dec. 24, 1986, 61-313856; Dec. 24, 1986, 61-313857; Dec. 25, 1986, 61-314922; Jan. 8, 1987, 62-2084; Jan. 12, 1987, 62-4434

Int. Cl.⁴ G11B 5/09, 5/00

U.S. Cl. 360—53

11 Claims



1. A digital data signal recorder comprising a rotary head means for recording the digital data signal on a part of a skewed track on a recording medium, means for transporting the recording medium past the rotary head means, means for detecting invalid data in the digital data signal, means controlled by the detecting means for recording in another part of said skewed track signal indicating that the data is invalid, and wherein the medium transporting means is controllable to have a normal recording speed mode and a high speed mode at which the recording medium is transported past the rotary head means at a rate much faster than the normal recording speed and further comprising means for recording on the recording medium, when a recording is ended, a predetermined end signal for a period having a duration which can be detected during the high speed mode, means for detecting a start position of said end signal at the next recording operation, and means for carrying out overwrite recording on the recording medium at said detected start position.

4,873,590

MAGNETIC RECORDING AND REPRODUCING APPARATUS

Tetsuo Ishiwata, Suita, and Katsuyuki Taguchi, Hirakata, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

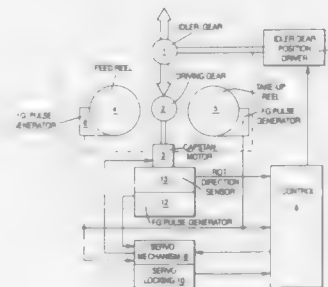
Filed Feb. 29, 1988, Ser. No. 262,102

Claims priority, application Japan, Feb. 27, 1987, 62-45593

Int. Cl.⁴ G11B 15/96

U.S. Cl. 360—73.14

2 Claims



1. A magnetic recording and reproducing apparatus comprising:

a feed reel and a take-up reel which drive a hub of a cassette half;

a capstan motor for generating a driving force;

a driving gear driven by said capstan motor;

an idler gear which is selectively positioned in one of a first state and a second state, said first state being a position wherein said idler gear is in rotational contact with said driving gear, and said second state being a position wherein said idler is disengaged from said driving gear, and a means for selectively coupling said drive gear with said feed reel and take-up reel whereby said feed reel and said take-up reel rotate according to a rotation of said driving gear when said idler gear is in said first state;

a idler gear position driving means for shifting said idler gear between said first and second states;

a capstan FG pulse generating means for generating a capstan FG pulse according to a rotational speed of said capstan motor;

a feed reel FG pulse generating means for generating a feed reel FG pulse according to a rotational speed of side feed reel;

a take-up reel FG pulse generating means for generating a take-up reel FG pulse according to a rotational speed of said take-up reel;

a servomechanism means for controlling rotation of said capstan motor;

a servo locking detection means coupled to said capstan FG pulse generating means for detecting a servo locking of said servomechanism means when said capstan has attained a predetermined speed;

a capstan rotational direction detecting means for detecting a rotational direction of said capstan motor; and

a control means coupled to said idler gear position driving means, said feed reel FG pulse generating means, said take-up reel FG pulse generating means, said servomechanism means, said servo locking detecting means, and said capstan rotational direction detecting means, wherein said control means monitors said feed reel FG pulses and said take-up reel FG pulses to determine if said feed reel and said take-up reel are properly rotating when said idler gear is in said first state, and wherein said control means causes said idler gear position driving means to shift said idler gear from said first state to said second state and then back to said first state when said control means determines that at least one of said feed reel and said take-up reel are not rotating properly when said idler gear is in said first state.

4,873,591

TAPE LOADING DEVICE HAVING PAIR OF TAPE GUIDE POST UNITS ON PAIR OF ROTATABLE MEMBERS

Takashi Kimura, Toshiya Yatomi, and Hiroo Edakubo, all of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

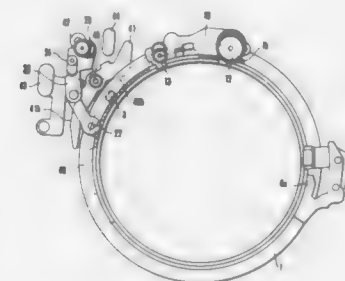
Filed Aug. 25, 1987, Ser. No. 89,136

Claims priority, application Japan, Aug. 28, 1986, 61-20214; Aug. 28, 1986, 61-202020; Aug. 28, 1986, 61-202021; Aug. 28, 1986, 61-202022; Aug. 28, 1986, 61-202023

Int. Cl.⁴ G11B 15/665

U.S. Cl. 360—85

7 Claims



1. A loading device for loading a tape-shaped record bearing medium onto a transducing member to carry out a transducing operation, comprising

- a first guide post unit including a guide post for guiding a tape-shaped recording medium;
- a second guide post unit including a guide post for guiding the tape-shaped medium;
- a first rotary member for moving said first guide post unit between a first unloading position where said first guide post unit is out of contact with said tape-shaped record bearing medium and a first loading position;
- a second rotary member for moving said second guide post unit between a second unloading position where said second guide post unit is out of contact with said tape-shaped recording medium and a second loading position, said tape-shaped recording medium being arranged to be loaded onto said transducing member to carry out said transducing operation when said first guide post unit is in said first loading position and said second guide post unit is in said second loading position;
- drive means for driving said first rotary member; and
- connection controlling means for controlling physical connection of said first rotary member with said second rotary member, said connection controlling means being arranged to physically connect said first rotary member with said second rotary member when said first guide post unit is positioned near said first unloading position and to release physical connection of said first rotary member with said second rotary member at least once during movement of said first guide post unit from said first unloading position to said first loading position.

4,873,592

PINCH ROLLER DRIVE ENGAGEMENT MECHANISM FOR A COMMUNICATIONS MONITOR AND LOGGER

Paul G. Dulaff, Fairfield, and C. Eugene McGraw, Norwalk, both of Conn., assignors to Dictaphone Corporation, Stratford, Conn.

Filed Sep. 17, 1987, Ser. No. 97,905

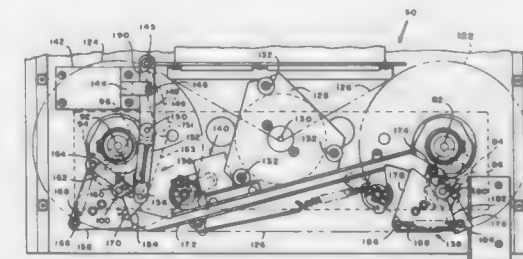
Int. Cl.⁴ G11B 15/00

U.S. Cl. 360—90

5 Claims

1. In a communications-monitoring multi-channel magnetic tape recorder/reproducing device including a drive capstan, multi-channel recording and reproducing heads, means for rotating said drive capstan to move said tape across said heads, a pinch roller to urge said tape against said capstan with a

pre-determined force, a solenoid having a plunger, a drive engagement mechanism comprising displaceable mounting means for mounting said pinch roller and to allow movement of said pinch roller towards and away from said capstan, a linkage connecting said pinch roller mounting means to said plunger so that said solenoid, acting through said linkage, moves said pinch roller from a retracted position to a contact position in which it contacts said capstan and urges said pinch roller against said capstan with said pre-determined force, said linkage including resilient bias means for applying a pre-determined force to said pinch roller in response to movement of



said solenoid plunger in a given direction, and disabling means for disabling said bias means and preventing it from applying force to said pinch roller until said pinch roller is closely adjacent said capstan; and further including a second drive capstan and second pinch roller and second drive engagement mechanism operative to engage said second pinch roller with said second drive capstan in functionally the same manner as the first-named drive engagement mechanism engages the first-named pinch roller and capstan with one another; and further including a coupling member drivably coupling said linkage of said drive engagement mechanisms to enable said solenoid to operate both of said mechanisms simultaneously.

4,873,593

MULTI-CASSETTE INDEXING MECHANISM FOR A TAPE TRANSPORT

Antoni S. Baranski, San Carlos, Calif., assignor to Ampex Corporation, Redwood City, Calif.

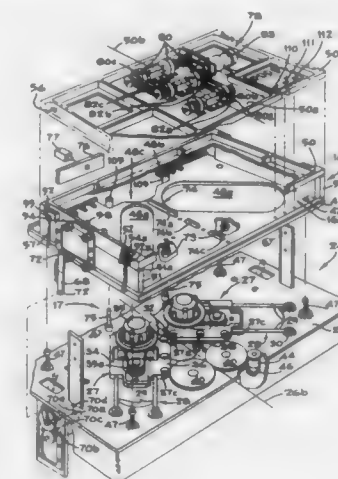
Division of Ser. No. 117,771, Nov. 5, 1987, Pat. No. 4,853,805.

This application May 10, 1989, Ser. No. 350,179

Int. Cl.⁴ G11B 15/675

U.S. Cl. 360—96.5

2 Claims



1. In a magnetic recording and reproducing apparatus, said apparatus having a turntable support assembly, an elevator

movable into engagement with the turntable support assembly, apparatus for aligning the elevator with the turntable support assembly to assure that a cassette inserted into the elevator for play would be delivered to a play position of the cassette support assembly, said apparatus comprising:

- adjustable leveling members mounted on the turntable support assembly and supporting the elevator, said members individually movable to adjust the elevator to a final play position for the apparatus;
- tape guide elements provided on a rear edge of the turntable support assembly;
- alignment caps positioned to overlie the tape guide elements when the elevator is being aligned with respect to the turntable support assembly;
- a cut-out portion of the bottom plate of the elevator engageable with the alignment caps to align the elevator front to rear with respect to the play position of the apparatus; and
- adjusting means provided on the elevator for bringing the cut-out portion of the bottom plate into alignment with the alignment caps to position the elevator for play with respect to the turntable support assembly of the transport.

4,873,594

DISK SPACER RING HAVING AIR PUMPS

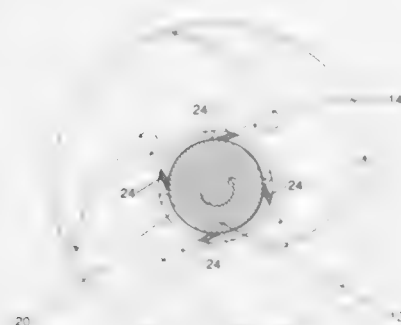
Tsu-Fang Chen, Eden Prairie, Minn., assignor to Magnetic Peripherals Inc., Minnetonka, Minn.

Filed Apr. 18, 1988, Ser. No. 182,675

Int. Cl.⁴ G11B 5/02, 23/00

U.S. Cl. 360—97.03

6 Claims



1. A disk spacer ring comprising:

- a spacer ring having formed thereon at least one pair of intercommunicating fluid communicating channels,
 - a first channel outwardly diverging from one of the ring's radials in a first direction as the channel extends from a radially inner portion of the ring to an outer portion; and
 - a second channel outwardly diverging from said radial in a second direction opposite the first direction as the second channel extends from a radially inner portion of the ring to an outer portion such that the radial approximately bisects the angle between the two directions;
- said first and second channels being in fluid communication with each other.

4,873,595

APPARATUS FOR POSITIONING A MAGNETIC DISK ON A DISK DRIVE

Katsuhiko Taguchi, and Kazuya Mitsumori, both of Chofu, Japan, assignors to JUKI Corporation, Japan

Filed Aug. 19, 1985, Ser. No. 767,090

Claims priority, application Japan, Aug. 23, 1985, 59-175784

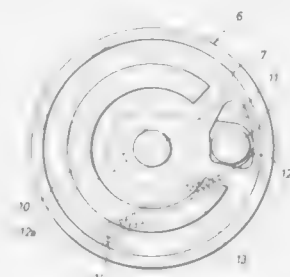
Int. Cl.⁴ G11B 5/012

U.S. Cl. 360—99.05

18 Claims

1. Apparatus for positioning a magnetic disk upon a magnetic disk drive which includes a motor drive spindle and a turntable fixedly mounted upon said spindle, comprising:

- a driving pin;
- means for biasingly mounting said driving pin upon said motor drive spindle so as to be movable in both radial and circumferential directions relative to said spindle and said turntable;
- means defining a first hole within said magnetic disk within which said motor drive spindle is to be disposed;
- means defining a second hole within said magnetic disk within which said driving pin is to be disposed;
- means defining a third hole within said turntable for cooperating with said means defining said second hole within



said magnetic disk so as to confine said driving pin between said means defining said second hole within said magnetic disk and said means defining said third hole within said turntable whereby said magnetic disk will be properly positioned upon said magnetic disk drive; and

said means mounting said driving pin upon said spindle comprises a link plate having one end thereof rotatably disposed around said spindle and a spring having one end thereof connected to said turntable and the other end thereof fixed to said link plate which urges said driving pin to move said spindle.

4,873,596

MAGNETIC DISK DRIVE APPARATUS

Tsutomu Harada, Tamana, and Yasushi Okamura, Yamaga, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

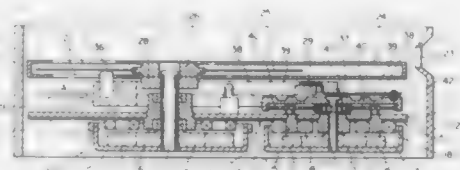
Filed Oct. 26, 1987, Ser. No. 112,163

Claims priority, application Japan, Oct. 27, 1986, 61-255080; Oct. 29, 1986, 61-257263

Int. Cl.⁴ G11B 17/02, 5/016, 5/55, 21/08

U.S. Cl. 360—99.11

3 Claims



1. An apparatus for driving a magnetic disk, comprising:

- (a) a base plate made of magnetic metal;
- (b) first and second motor shafts rotatably supported on the base plate;
- (c) first and second rotors mounted on the first and second motor shafts respectively;
- (d) first and second exciting coils fixed to the base plate and opposing the first and second rotors respectively;
- (e) means for connecting the first motor shaft and the magnetic disk and allowing the magnetic disk to rotate in accordance with rotation of the first motor shaft;
- (f) a carrier having a central opening through which the first motor shaft extends;

- (g) a magnetic head mounted on the carrier and able to contact the magnetic disk;
 - (h) means for slidably supporting opposite sides of the carrier on the base plate;
 - (i) means for coupling the second motor shaft and the carrier and allowing the carrier to move linearly in accordance with rotation of the second motor shaft; and
- printed wiring films extending on a surface of the base plate and provided with terminals, and electronic parts connected to the printed wiring films, the first and second exciting coils being fixed to the surface of the base plate and electrically connected to the terminals.

4,873,597

HEAD PLATE OPERATING MECHANISM FOR CASSETTE TAPE PLAYER

Ryousuke Hatanaka, Sayama, Japan, assignor to Nihon Technical Kabushiki Kaisha, Japan

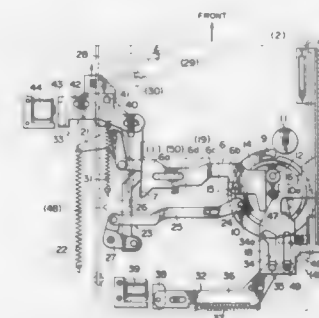
Filed Feb. 9, 1987, Ser. No. 12,359

Claims priority, application Japan, Jun. 23, 1986, 61-144745

Int. Cl.⁴ G11B 5/54

U.S. Cl. 360—105

9 Claims



1. A head plate operating mechanism for a cassette tape player comprising:

- a frame;
- a head plate carrying magnetic head means and movably mounted on the frame for movement between non-play and play positions;
- a transmission gear connected to be rotated when a tape cassette is loaded into the cassette tape player;
- a notched gear engageable with the transmission gear and having gear teeth and a crank pin on a rotation surface thereof;
- a starting mechanism for imparting a starting torque to the notched gear to rotate the notched gear so that a gear tooth adjacent to a notched portion of the notched gear approaches to and engages with the rotating transmission gear to thereby enable continued rotation of the notched gear by the rotating transmission gear, the starting mechanism being actuated when the tape cassette is loaded into the cassette tape player;
- linkage means movably connected with the head plate and including a slide member slidably contactable with the crank pin of the notched gear to undergo displacement outwardly relative to the notched gear while the notched gear is being rotated by the rotating transmission gear, the slide member having means for releasing the head plate to allow movement of the head plate from the non-play position to the play position when the slide member has been moved by the crank pin;
- first spring means for urging the slide member of the linkage means toward the notched gear, the biasing force of the first spring means being increased with displacement of the slide member by the crank pin;
- first locking means for releasably locking the slide member in its position displaced by the crank pin;
- controlling means for controlling the movement of the head

plate between the non-play and play positions, the controlling means comprising a control member slidably contactable with the crank pin of the rotating notched gear so as to be moved outwardly relative to the notched gear by the crank pin after the slide member of the linkage means has been locked by the first locking means, and second spring means for resiliently connecting the control member and the head plate;

third spring means for urging the control member of the controlling means toward the notched gear, the biasing force of the third spring means being selected to allow the forced movement of the control member by the crank pin against the biasing force exerted by the third spring means; and

second locking means for releasably locking the starting mechanism in its actuated state after the starting mechanism has imparted the starting torque to the notched gear and for releasably restraining the notched gear from undergoing rotation after the control member has carried the head plate to the play position and the notched portion of the notched gear has rotated to a position to release the engagement between the notched gear and the transmission gear.

4,873,598

MECHANISM FOR SUPPORTING AND GUIDING A HEAD CARRIAGE

Kenji Negishi, Hidemi Sasaki, and Takeshi Fujishiro, all of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

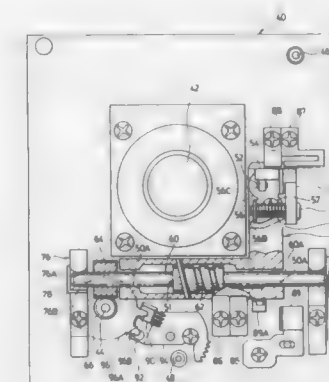
Filed Jan. 27, 1988, Ser. No. 149,237

Claims priority, application Japan, Feb. 5, 1987, 62-25431; Feb. 5, 1987, 62-25432; Feb. 10, 1987, 62-30038; Feb. 10, 1987, 62-30039; Mar. 26, 1987, 62-73676

Int. Cl.⁴ G11B 21/08, 5/55

U.S. Cl. 360—106

11 Claims



1. A head carriage support mechanism comprising:

two bearings, each having two substantially perpendicularly intersecting surfaces in contact with opposite ends of a shaft of a lead screw, said lead screw having a threaded portion substantially in a center portion thereof;

a head carriage comprising: a needle engageable with said threaded portion of said lead screw; and

two substantially perpendicularly intersecting surfaces in contact with said lead screw shaft at two respective portions thereof adjacent opposite ends of said threaded portion, one of said two surfaces of said head carriage facing one of said two surfaces of each of said two bearings and a second one of said two surfaces of said head carriage facing a second one of said two surfaces of each of said two bearings; and,

at least one spring for energizing said head carriage so that said two surfaces of said head carriage as well as said two

surfaces of said bearings, respectively, can be brought into contact with said shaft of said lead screw.

4,873,599

MAGNETIC HEAD ASSEMBLY FOR PERPENDICULAR MAGNETIC RECORDING

Kuniaki Sueoka, Kawasaki, Japan, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 10, 1988, Ser. No. 192,416

Claims priority, application Japan, May 15, 1987, 62-117267
Int. Cl.⁴ G11B 5/147, 5/187, 5/23

U.S. Cl. 360—126

6 Claims



1. In a magnetic head assembly for perpendicular magnetic recording comprising a main magnetic pole, a coil magnetically connected to said main pole and an auxiliary pole placed on the same side of a magnetic medium as said main magnetic pole for forming a return path for a magnetic flux, the improvement wherein said auxiliary magnetic pole is formed of a magnetic material having the property that the permeability varies in the direction of relative movement between said magnetic head assembly and said magnetic medium with the permeability progressively increasing from each edge to the center of said auxiliary magnetic pole.

4,873,600

UTILITY PEDESTAL

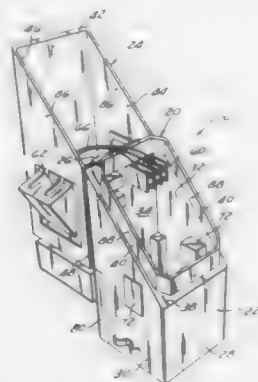
Thomas A. Voegel, Newport Beach, Calif., assignor to Unicorn Electrical Products, Anaheim, Calif.

Filed Oct. 5, 1987, Ser. No. 104,106

Int. Cl.⁴ H01R 9/00

U.S. Cl. 361—426

9 Claims



1. A utility station for mounting on a dock, comprising a generally vertically extending housing formed by a lower portion having an open upper end and an upper portion having an open lower end, said ends having edges which mate with each other to form an interface between said portions, said interface extending across said housing at an angle with respect to horizontal and creating a high side and a low side on the upper edge of said lower portion, structure for movably connecting said portions to permit said upper portion to be moved with respect to said lower portion from a closed position wherein the upper portion is vertically aligned on the lower portion and an open position wherein the upper portion is moved away from said lower portion to provide access to the upper end of the lower portion, an electric terminal block mounted on a wall of said lower portion near said upper end, said terminal block being connected to the high side of said lower portion, and said angle being such that the terminal block is above said low side, thus being readily accessible in a horizontal direction when said upper portion is in its open position, thereby enabling powerlines to be conveniently connected to said terminal block, an electrical outlet on said upper portion, and electrical wiring connecting said outlet to said terminal block, said wiring being sufficiently long not to restrict movement of said upper housing portion between said closed and opened positions.

4,873,601

SPOT NETWORK TYPE POWER RECEIVING AND TRANSFORMING PROTECTIVE APPARATUS

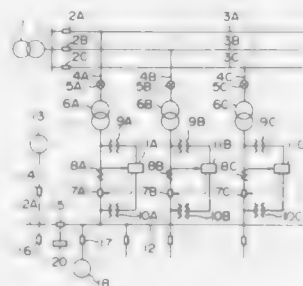
Fumio Wakasa, Kitaibaraki, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 17, 1988, Ser. No. 169,612

Claims priority, application Japan, Mar. 18, 1987, 62-60937
Int. Cl.⁴ H02H 7/26

U.S. Cl. 361—64

14 Claims



1. An apparatus for protecting a spot network type power receiving and transforming system, comprising:

- (i) spot network protector means including:
 - a common bus connected to loads,
 - a plurality of branch buses connected to one end of said common bus and connected also to a plurality of power supply buses respectively,
 - series circuits of network transformers, current transformers and protector circuit breakers connected to said branch buses respectively, and
 - network relays connected in parallel with said series circuits of said current transformers and said protector circuit breakers respectively, said current transformers detecting reverse current flowing toward said power supply buses through said common bus, and said network relays operating in response to the detection of said current to trip said protector circuit breakers;
- (ii) an electric generator connected to the other end of said common bus through a generator circuit breaker and operating in parallel with said spot network protector means; and
- (iii) a link circuit breaker connected to said common bus between said spot network protector means and said electric generator, any one of said protector circuit breakers, said link circuit breaker and said generator circuit breaker being tripped under the condition that all of said circuit breakers and said network relays are in operation, thereby cutting off the path of current from said electric generator.

4,873,602

RIPPLE ATTENUATOR FOR AC POWER TRANSMISSION LINE PROTECTIVE RELAYS

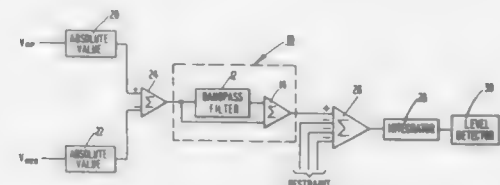
Stanley B. Wilkinson, Havertown, Pa., assignor to General Electric Company, Malvern, Pa.

Filed Nov. 12, 1987, Ser. No. 120,079

Int. Cl.⁴ H02H 3/16

U.S. Cl. 361—78

14 Claims



1. A protective relay for detecting faults in a three phase alternating current electrical power distribution system, said relay comprising:

- (a) means for generating an alternating current operate signal;
- (b) means for rectifying said alternating current operate signal;
- (c) means for removing at least one principal harmonic component from said rectified alternating current operate signal; and
- (d) energy comparison means, connected to receive said rectified alternating current operate signal with said at least one principal harmonic component removed, for generating a relay output signal as a function of the magnitude of the received operate signal.

4,873,603

CIRCUIT BREAKER

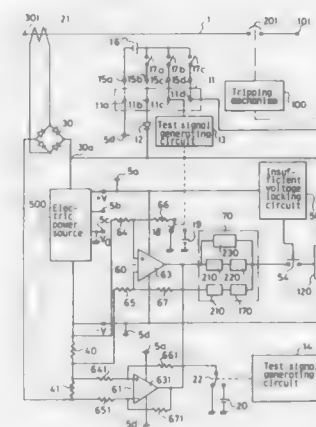
Kazuhiro Ishii, Fukuyama, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 23, 1989, Ser. No. 314,160

Claims priority, application Japan, Feb. 24, 1988, 63-41054
Int. Cl.⁴ H02H 3/093

U.S. Cl. 361—96

1 Claim



1. A circuit breaker comprising:
 - at least one current transformer for detecting current flowing on at least one A.C. power line;
 - at least one rectifying circuit for converting A.C. output of secondary winding of said current transformer to unidirectional current;
 - a series connection of an electric power circuit and at least one resistor connected between output terminals of the rectifying circuit, said resistor being for converting current flowing thereon to a voltage;

at least one differential amplifier for amplifying said voltage across both ends of said resistor;

at least one D.C. power source for outputting quasi input voltage;

at least one switch connected between said D.C. power source and said differential amplifier;

at least one test signal generating circuit for generating an output for controlling said switch on and off, to apply said quasi input voltage to said differential amplifier when the switch is turned on;

at least one connector having plural contacts for supplying D.C. voltage from external power source to said electric power circuit and said test signal generating circuit; and

a reverse current preventing device connected between the electric power circuit and said contacts of said connector.

4,873,604

FUSES HAVING SUPPRESSED VOLTAGE TRANSIENTS

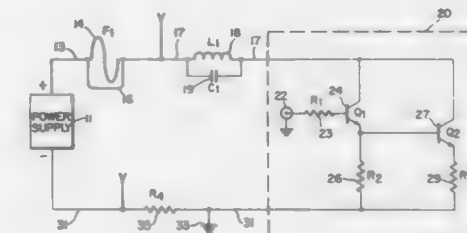
Harris A. Goldberg, Colonia, and Clyde C. Williams, Roselle, both of N.J., assignors to Hoechst Celanese Corp., Somerville, N.J.

Continuation-in-part of Ser. No. 487,401, Apr. 21, 1983, Pat. No. 4,642,664, and a continuation-in-part of Ser. No. 487,378, Apr. 21, 1983, Pat. No. 4,577,979. This application Jul. 1, 1985, Ser. No. 750,216

Int. Cl.⁴ H02H 5/04

U.S. Cl. 361—104

6 Claims



2. A shunt device which is used to protect electrical equipment when a fuse blows at a selected blowing voltage by minimizing the inductive spike which occurs when said fuse blows, said device comprising a by-pass across said fuse for permitting a limited amount of current to begin to flow at a lower voltage than said blowing voltage and before said fuse blows, thereby serving as a transitory relief valve for a portion of said current.

4,873,605

MAGNETIC TREATMENT OF FERROMAGNETIC MATERIALS

Vladimir Drita, Minnetonka, Minn., and Naum Telesin, Atlanta, Ga., assignors to Innovex, Inc., Hopkins, Minn.

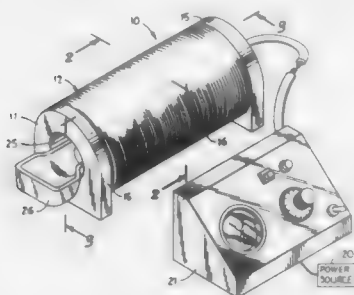
Continuation-in-part of Ser. No. 835,462, Mar. 3, 1986, abandoned. This application Jan. 9, 1987, Ser. No. 1,950
Int. Cl.⁴ H01F 13/00; H01H 47/00

U.S. Cl. 361—143

26 Claims

12. A treatment devise for increasing the effective service life of objects subjected to stress by stress equalization wherein the object is made of a material influenced by a magnetic field, comprising:
 - a coil having an open center core;
 - means for supporting an object to be treated in said open center of the core; and
 - power means for cycling current through said coil to provide a magnetic field in the vicinity of the object to be treated for a selected duration to reduce stresses in such object, said power means including power control means

for providing a sequence of applying current to the coil for periods ranging in time from substantially 15 to 50



seconds, in time related cycles, separated by a time pause of no current between each two cycles of current.

4,873,606

SAFETY CONTROL DEVICE FOR AN ACTUATOR OF THE FLAP SOLENOID VALVE TYPE

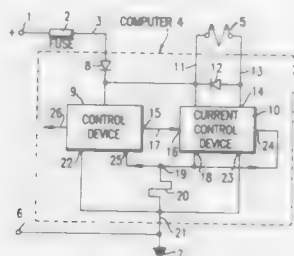
Gerard Pannier, Villiers-Saint-Frederic, France, assignor to Regie Nationale des Usines Renault, Boulogne Billancourt, France

Filed Jun. 22, 1988, Ser. No. 209,968

Claims priority, application France, Jun. 22, 1987, 87 08744 Int. Cl.⁴ H01H 47/00

U.S. Cl. 361-152

7 Claims



1. A safety control device for an actuator having a solenoid valve, comprising:

- a current control device for controlling the current to said solenoid valve;
- a shunt resistor connected to said current control device for measuring the current to said solenoid valve;
- a control package connected to said current control device and said shunt resistor for measuring the time between the start of power to the solenoid valve and the moment when the current reaches a threshold intensity, said control package comparing said time with a time range $T_S \pm \Delta T$ which indicates the proper operation of the solenoid valve so that, if said time falls outside said time range, said control package controls said current control device to cut off power to said solenoid valve.

4,873,607

METHOD OF AND APPARATUS FOR CONTROLLING THE OPERATION OF ELECTROMAGNETIC SWITCHES

Kyohel Yamamoto, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 24, 1988, Ser. No. 159,717

Claims priority, application Japan, Feb. 25, 1987, 62-26984[U]; Feb. 25, 1987, 62-41848[U] Int. Cl.⁴ H01H 47/00

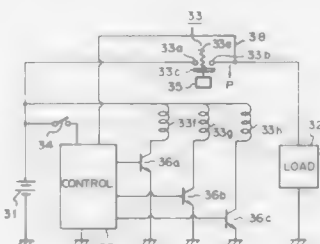
U.S. Cl. 361-210

6 Claims

1. Electromagnetic switch apparatus for connecting a load

device to a power source, said electromagnetic switch apparatus comprising:

- a contact connected electrically in series between said load device and said power source, said contact having an open position in which said load device is not connected to said power source and said contact having a closed position in which said load device is connected to said power source;
- means connected to said contact for moving said contact to said closed position, said moving means including a plural-



ity of exciting coils connected in parallel, said coils, when energized, generating a force to move said contact to said closed position;

energizing apparatus operable to energize each of said plurality of exciting coils sequentially so that the generated force is increased in steps until said contact is moved to said closed position; and

release apparatus responsive to said contact being moved to said closed position to de-energize at least one of said plurality of exciting coils.

4,873,608

ELECTRIC SOLDERING IRON

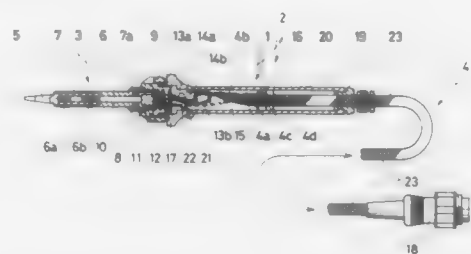
Hiroshi Yoshimura, Osaka, Japan, assignor to Hakko Metal Industries Limited, Osaka, Japan

Filed Feb. 5, 1988, Ser. No. 152,891

Int. Cl.⁴ H02H 5/22

U.S. Cl. 361-220

7 Claims



1. In an electric soldering iron having a main body portion, a tip part to be heated by an electric heating means attached to a front end of the main body portion, the main body portion having a grip part, and a power cord for said electric heating means connected to the rear end of said main body portion, the main body portion including a conductive part disposed at least on the surface portion of said grip, and grounding wire means for this conductive part for electrically grounding the grip part:

the improvement comprising a conductive coating material formed on the surface of said power cord to cover the entire length thereof connected to electric ground for electrically grounding a sufficient portion of the power cord surface to prevent the power cord surface from becoming charged with static electricity.

4,873,609

PORTABLE ELECTRONIC UNIT FOR TREATMENT OF BITES BY POISONOUS SNAKES OR OTHER ANIMALS OR ALLERGIC CONTRAITS

Clifford R. Mackey, 2900 NE. Edgewater Dr., Claremore, Okla. 74017

Filed Jun. 20, 1988, Ser. No. 209,185

Int. Cl.⁴ H05C 1/04; F41B 15/04, 15/02

U.S. Cl. 361-232

4 Claims

1. A portable self-contained medical unit for treatment of bites by poisonous snakes or other animals or allergic contacts which comprises:

- a case;
- an electrical battery within said case;
- an electrical circuit within said case having an output and producing at its output a pulsating D.C. current at a voltage between about 15 KV and about 25 KV and at the rate of approximately twelve times per second;
- a pair of outwardly extending electrodes carried by said case and connected to said output of said circuit;
- a hand operated switch for connecting said battery to said circuit.

4,873,610

DIELECTRIC ARTICLES AND CONDENSERS USING THE SAME

Akira Shimizu, Sagami-hara, and Norio Kaneko, Atsugi, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan Continuation of Ser. No. 27,398, Mar. 18, 1987, abandoned. This application Jan. 31, 1989, Ser. No. 303,999

Claims priority, application Japan, Mar. 20, 1986, 61-63788

Int. Cl.⁴ H01G 3/075, 4/10

U.S. Cl. 361-313

16 Claims



9. A condenser having a pair of electrodes and a dielectric article sandwiched between said electrodes which article comprises a plurality of laminated repeating unit cells, each unit cell comprising at least two thin dielectric material layers, one of said layers having temperature characteristic of permittivity different from the other and wherein the thickness of each layer is 1000 Å or less but not less than of monatomic layer.

4,873,611

ELECTRICALLY INSULATING FLUIDS

William J. Greco, Jr., Forked River, N.J., assignor to Sybron Chemicals, Inc., Birmingham, N.J.

Continuation-in-part of Ser. No. 213,237, Jun. 29, 1988, abandoned. This application May 4, 1989, Ser. No. 347,061

Int. Cl.⁴ H01G 4/22

U.S. Cl. 361-315

4 Claims

1. An electrical capacitor comprising a sealed casing having alternate layers of an electrically conductive material and a dielectric material disposed within the casing, and dielectric fluid impregnated into said dielectric material, said dielectric fluid consisting essentially of ditolylmethane.

4,873,612

TEMPERATURE STABLE MULTILAYER CAPACITOR

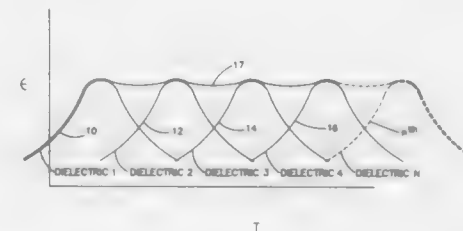
Jorge M. Hernandez, Mesa, Ariz., assignor to Rogers Corporation, Rogers, Conn.

Filed Aug. 1, 1988, Ser. No. 226,601

Int. Cl.⁴ H01G 1/00; C23B 5/50

U.S. Cl. 361-321

24 Claims



1. In a multilayer capacitor including a plurality of layers of dielectric material having interleaved layers of electrodes with alternating electrodes layers being electrically connected to one of a pair of respective common terminations, the improvement comprising:

at least two of said plurality of layers of dielectric material being comprised of dielectric materials having differing Curie points wherein said at least two layers will have mutually distinct Curie points which are staggered over a preselected temperature range and wherein said at least two layers will form an effective temperature characteristic curve which is substantially constant over said preselected temperature range and wherein said at least two layers will have an effective dielectric constant which will be substantially equal to the dielectric constants at said Curie points.

4,873,613

COMPACT HIGH POWER MODULAR RF SEMI-CONDUCTOR SYSTEMS PACKAGING

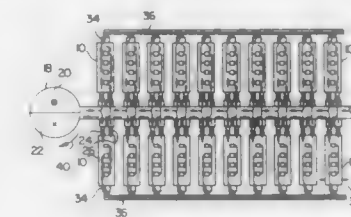
Arthur H. Iversen, 15315 Sobey Rd., Saratoga, Calif. 95070

Filed Nov. 25, 1988, Ser. No. 276,025

Int. Cl.⁴ H05K 7/20

U.S. Cl. 361-385

1 Claim



1. A compact microwave solid state subsystem comprising a liquid coolant conduit incorporating side-by-side input and discharge conduits, said conduit attached at one end to a master coolant conduit; liquid cooled microwave semi-conductor device modules comprising input and output liquid coolant connectors at one end and RF output coupling means at the other end, said modules being mounted on two opposing surfaces of said liquid conduit there being multiple adjacent modules in close proximity to each other on each side, and along the length of said conduit, each module having input and discharge liquid couplers fastened respectively to corresponding input and discharge conduits of said conduit, there being RF coupling means mounted on the opposing ends of said module from said coolant connectors, said RF coupling means joining adjacent modules in such manner that the sum of the RF power output of all modules on each side of said conduit transmitted through successive couplers is additive and is

substantially equal to the power delivered from the last coupler into an output wave guide;

and, there being a number of RF subsystems set side by side, each having a coolant conduit coupled to said master coolant conduit, and, each module mounted on said coolant conduit having RF coupling means mounted on the opposing surface of said module, said RF coupling means additively joining adjacent modules and thence delivering the summed RF power into said output waveguide.

4,873,614

ARRANGEMENT OF A MODULE WITHIN A CASING FRAME

Ernst Lichtensperger, Kleiststrasse 10, 8057, Echting, Fed. Rep. of Germany

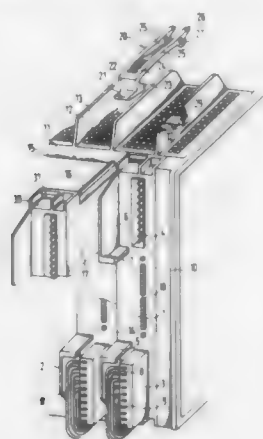
Filed Jun. 6, 1988, Ser. No. 202,455

Claims priority, application Fed. Rep. of Germany, Jun. 12, 1987, 3719689

Int. Cl.⁴ H02B 1/04

U.S. Cl. 361—394

14 Claims



1. In combination, a casing frame having removable modular electronic subassemblies inserted endwise therein in side-by-side relation, each said subassembly comprising a module having upper and lower edges, opposite side walls and a front wall, said front wall including at least one connector socket for receiving a plug of a cable harness and an L-shaped attachment projecting from said front wall adjacent said at least one connector socket, and fastener means for locking each said module within said casing frame, each said fastener means comprising a resilient lever removably and hingedly connected at one end to said casing frame, said lever being formed at its opposite end with a locking nose, and a recess in each said module for lockingly receiving said locking nose.

4,873,615

SEMICONDUCTOR CHIP CARRIER SYSTEM

Dimitry G. Grabbe, Middletown, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 916,974, Oct. 9, 1986,

abandoned. This application Sep. 23, 1987, Ser. No. 100,151

Int. Cl.⁴ H04K 1/14

U.S. Cl. 361—395

6 Claims

1. A semiconductor chip carrier system for use with a multiple chip carrier substrate, the system comprising:

a frame of generally rectangular shape having a first major surface, a second major surface, and walls connecting the surfaces, the first major surface having a substrate receiving area;

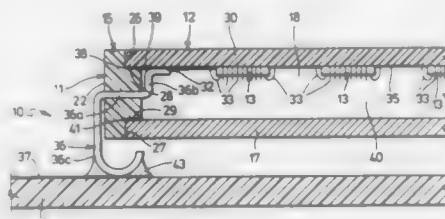
the substrate, having a plurality of semiconductor chips mounted thereon, is positioned in the substrate receiving area and secured therein;

a plurality of electrical terminals extending through one or more walls of the frame, the terminals including a central

portion embedded in the walls or walls, an outer compliant portion extending outside the frame and adapted to be electrically connected to external circuitry, and an inner compliant portion which is adapted to be electrically connected to a contact pad in electrical engagement with a semiconductor chip of the multiple chip carrier substrate;

cover means provided to protect the semiconductor chips from environmental harm;

a flexible interconnection member having conductors, mechanically fastened to the substrate at a plurality of sites to restrict lateral movement of the interconnection member



and associated conductors relative to the substrate while permitting the interconnection member and associated conductors and the substrate to flex and distort substantially independently of one another when subject to temperature variations; and the frame being substantially non-rigid such that as the substrate expands and contracts according to temperature variation, the non-rigid frame allows the terminals to move accordingly, thereby eliminating the harmful stresses that will otherwise occur between the substrate and the terminals.

4,873,616

POWER SUPPLY FOR ARC LAMPS

William Fredrick, Valencia; Robert Brent, Saugus, and Peter Baldwin, Costa Mesa, all of Calif., assignors to Camera Platforms International, Inc., Valencia, Calif.

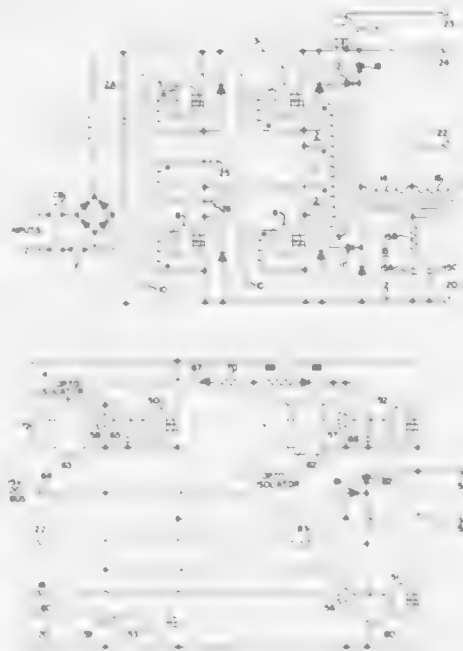
Continuation-in-part of Ser. No. 39,044, Apr. 16, 1987. This

application May 21, 1987, Ser. No. 53,271

Int. Cl.⁴ H02M 3/335

U.S. Cl. 363—17

6 Claims



1. A power supply for an arc lamp, comprising:

(a) a DC converter having an input, an output, four electronic switches arranged in a bridge configuration, a transformer coupled to said electronic switches, a gate drive control circuit for controlling said electronic switches, said gate drive control circuitry alternately turning on opposing pairs of said electronic switches in said bridge configuration so as to reverse the direction of current flow through said transformer, rectifying means connected to said transformer and to said output of said DC converter, another electronic switch coupling the input of said DC converter to the output of said transformer and gate control means for controlling said another electronic switch so as to turn said another electronic switch on when the output voltage of said converter is greater than its input voltage;

(b) an output bridge coupled to the output of the DC converter for generating a square wave in response thereto for supply to said arc lamp at a normal operations voltage;

(c) means for reigniting the arc lamp quickly after the lamp has become de-energized, said reigniting means including a capacitor coupled to said output and means for charging said capacitor to a voltage higher than the normal operating voltage of said arc lamp.

4,873,617

POWER SUPPLY FOR ARC LAMPS

William Fredrick, Valencia; Robert Brent, Saugus, and Peter Baldwin, Costa Mesa, all of Calif., assignors to Camera Platforms International, Inc., Valencia, Calif.

Continuation-in-part of Ser. No. 39,044, Apr. 16, 1987, and a

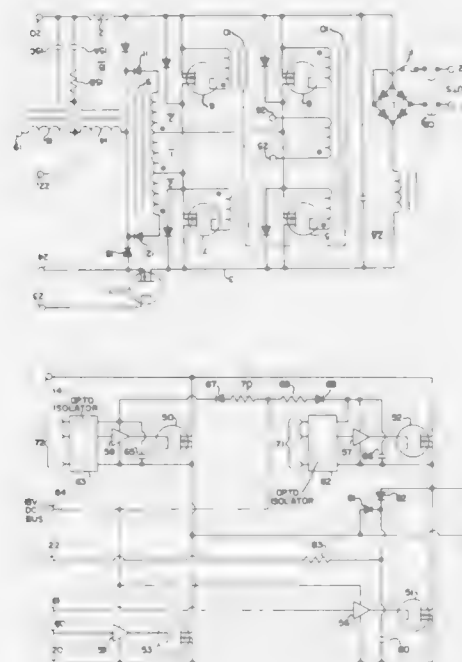
continuation-in-part of Ser. No. 53,271, May 21, 1987. This

application Aug. 10, 1987, Ser. No. 85,015

Int. Cl.⁴ H02M 3/335

U.S. Cl. 363—17

13 Claims



1. A power supply for an arc lamp, comprising:

(a) a DC converter having an input, an output, means for increasing the voltage received at the input and for applying increased voltage to said output, current sensing means for controlling the amount of current delivered to said output, a filter including a capacitor and an inductor, said filter being coupled to said output, the size of the

capacitor being relatively large compared to the size of the inductor, whereby, upon re-ignition of the lamp, the inductor is sized such as not to unduly impede the transfer of charge then stored in the capacitor into the lamp; and (b) an output H bridge coupled to the output of the DC converter for generating a square wave in response thereto, the output H bridge being coupled to said arc lamp.

4,873,618

POWER SUPPLY FOR D.C. ARC LAMPS

William Fredrick, Valencia; Robert Brent, Saugus, and Peter Baldwin, Costa Mesa, all of Calif., assignors to Camera Platforms International, Inc., Valencia, Calif.

Continuation-in-part of Ser. No. 39,044, Apr. 16, 1987, and a

continuation-in-part of Ser. No. 53,271, May 21, 1987, and a

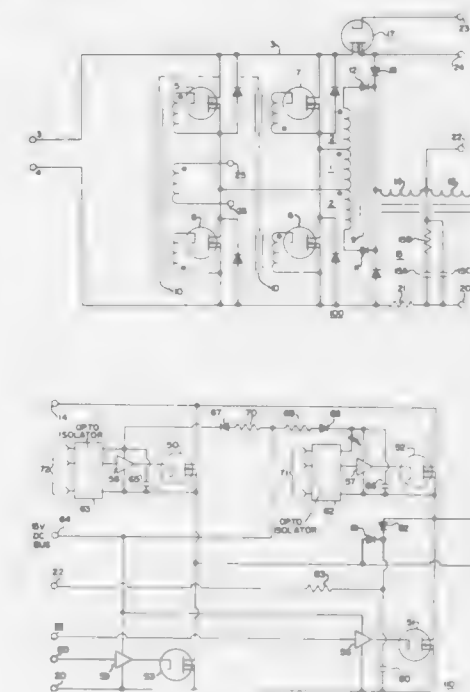
continuation-in-part of Ser. No. 85,015, Aug. 7, 1987. This

application Dec. 3, 1987, Ser. No. 128,149

Int. Cl.⁴ H02M 3/335

U.S. Cl. 363—17

21 Claims



1. A power supply for an arc lamp, comprising:

a DC to DC converter having an input, an output, means for increasing the voltage received at the input and for supplying the increased voltage to said output; current sensing means for controlling the amount of current delivered to said output; an electronic switch coupling said input and said output; and switch control means responsive to the voltage of said input and at said output for controlling the state of said electronic switch depending upon the relative voltage levels of said input and output.

4,873,619

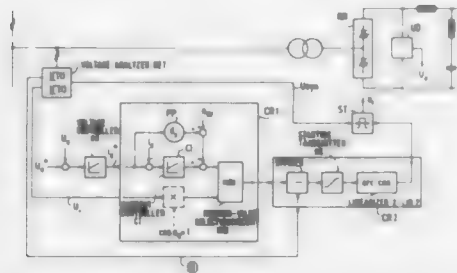
METHOD AND APPARATUS FOR CONTROLLING A STATIC CONVERTER AT AN ASYMMETRICAL NETWORK
 Elfriede Neupauer, Erlangen, Fed. Rep. of Germany, assignor to Siemens A.G., Munich, Fed. Rep. of Germany
 Filed Nov. 9, 1988, Ser. No. 269,247

Claims priority, application Fed. Rep. of Germany, Nov. 12, 1987, 3738470

Int. Cl.⁴ H02M 7/04, 7/68

U.S. Cl. 363—51

12 Claims



1. A method for controlling with a predetermined control angle a converter that is coupled to a three-phase network and to a d-c circuit, comprising the steps of:
 measuring an instantaneous asymmetry of the three-phase network; forming an asymmetry signal from the measured asymmetry; and modulating the control angle with said asymmetry signal.

4,873,620

VOLTAGE SUPPLY WITH RECOVERY PROTECTION FOR A THYRISTOR

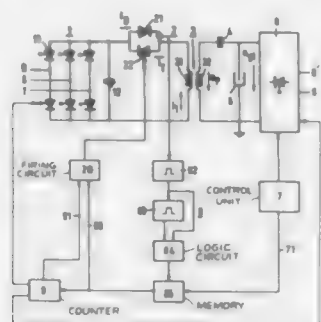
Franz Neulinger, Dietzenbach; Helmut Schummer, Heusenstamm; Gerhard Dönig, Erlangen, and Walter Schmidt, Uttenreuth, all of Fed. Rep. of Germany, assignors to Metallgesellschaft AG, Frankfurt am Main and Siemens AG, Munich, both of, Fed. Rep. of Germany
 Filed Nov. 10, 1983, Ser. No. 550,616

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1982, 3246057

Int. Cl.⁴ H02H 7/122

U.S. Cl. 363—57

9 Claims



1. In a voltage supply for an electric filter in which the electric filter is supplied with a high dc voltage from a first source of dc voltage, the supply including a transformer having a primary winding and a secondary winding, the secondary winding being coupled to the electric filter, a parallel connection of a thyristor and a diode connected in series with the primary winding and a second source of dc voltage, and a circuit coupled to the thyristor to supply periodic pulses thereto to periodically fire the thyristor and thereby trigger a resonant circuit which includes the transformer to produce a one period oscillation in the resonant circuit which is coupled to the filter by the transformer secondary winding, the im-

provement wherein the firing circuit comprises means for generating a firing pulse and supplying it to the thyristor when the duration of the current resulting from the one period oscillation flowing through the diode is shorter than the recovery time of the thyristor and means for preventing delivery of subsequent firing pulses from the firing circuit to the thyristor for a period of time depending on the state of the filter.

4,873,621

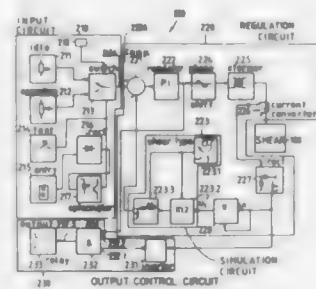
METHOD OF REGULATION AND REGULATING DEVICE FOR AN APPARATUS OR GROUP OF APPARATUSES, AS WELL AS AN APPARATUS HAVING A REGULATING DEVICE

Beat De Col, Sargans, and Hans-Peter Keller, Wagen, both of Switzerland, assignors to Gebrüder Loepfe AG, Wetzikon, Switzerland

Continuation of Ser. No. 624,268, Jun. 25, 1984, Pat. No. 4,700,289. This application Aug. 13, 1987, Ser. No. 84,870
 Claims priority, application Switzerland, Jul. 1, 1983, 3630/83
 Int. Cl.⁴ G05B 13/04

U.S. Cl. 364—150

13 Claims



13. A regulating device for regulating an apparatus or group of apparatuses, comprising:
 an input circuit generating at least one predetermined reference value of an operating characteristic related to at least one predetermined state variable of said apparatus regulated by the regulating device;
 a regulation circuit series connected with said input circuit and receiving therefrom said at least one predetermined reference value;
 said regulation circuit being operatively connected with said apparatus regulated by the regulating device;
 said regulation circuit containing a simulation circuit receiving data related to momentary values of said at least one predetermined state variable of said apparatus regulated by the regulating device;
 said simulation circuit producing, from said received data related to said momentary values of the at least one predetermined state variable, simulated values of said operating characteristic related to said at least one predetermined state variable and varying in accordance either a predetermined high-sloped branch of a preselected course of variation and which predetermined high-sloped branch leads to an operative state of the apparatus to be regulated;
 said regulation circuit further containing a comparator circuit connected to said input circuit and said simulation circuit; and
 said comparator circuit comparing said at least one predetermined reference value and said simulated values of said operating characteristic for regulating said apparatus.

4,873,622

LIQUID JET RECORDING HEAD

Hirokazu Komuro, Hiratsuka, and Masami Ikeda, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
 Continuation of Ser. No. 77,090, Jul. 23, 1987, abandoned, which is a continuation of Ser. No. 740,494, Jun. 3, 1985, abandoned.

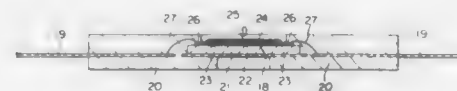
This application Aug. 10, 1988, Ser. No. 230,718

Claims priority, application Japan, Jun. 11, 1984, 59-118333

Int. Cl.⁴ G01D 15/18; H05B 1/00

U.S. Cl. 346—140 R

10 Claims



1. A liquid jet recording head comprising:
 a recording head unit including a support having an energy generator thereon and a cover attached to said support to form therewith a liquid chamber, wherein said cover has an orifice therein opposed to said energy generator for discharging liquid in said liquid chamber as flying droplets from said orifice by operating said energy generator;
 a substrate member comprising a frame having an external wiring unit including at least one connector for supplying an electrical signal to said energy generator; and
 an electrical connection area, electrically connecting said energy generator and said external wiring unit, sealed by an insulative sealing material, wherein said recording head unit and said substrate member are molded into an integral unit by said sealing material and said connector extends externally of said integral unit.

4,873,623

PROCESS CONTROL INTERFACE WITH SIMULTANEOUSLY DISPLAYED THREE LEVEL DYNAMIC MENU

Leslie A. Lane, Santa Clara; Lynn V. Lybeck, Moss Beach; David S. Perloff, Sunnyvale, and Shoji Kumagi, Santa Clara, all of Calif., assignors to Prometrix Corporation, Santa Clara, Calif.

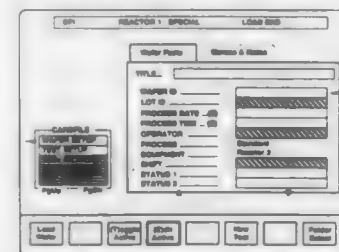
Continuation-in-part of Ser. No. 864,024, May 16, 1986, Pat. No. 4,805,089, which is a continuation-in-part of Ser. No. 729,153, Apr. 30, 1985, Pat. No. 4,679,137. This application May 15, 1987, Ser. No. 50,925

The portion of the term of this patent subsequent to Jul. 7, 2004, has been disclaimed.

Int. Cl.⁴ G06F 15/46

U.S. Cl. 364—188

6 Claims



1. A method of using a programmed digital computer having a display to provide values for a predefined set of parameters for use by a selected process:
 establishing a set of processes which can be run under the control of said computer, each process having a predetermined set of process parameters which control said process;
 selecting a process, from said set of established processes, to be run under the control of said computer, said selected

process having a predefined set of process parameters which control said process;
 concurrently displaying three menus in three distinct areas on the display;
 establishing a pointer for each said menu for selecting an item in the corresponding menu;
 displaying the item in each menu currently selected by the corresponding pointer so that a person viewing the display can identify said selected item;
 listing: (a) in a first one of said menus, a multiplicity of set names, (b) in a second one of said menus, a set of subgroup names corresponding to the selected item in said first menu, and (c) in a third one of said menus, a predefined subset of said process parameters, said subset corresponding to the selected subgroup name in said second menu;
 automatically responding to a position change of said pointer in said first menu by updating said second menu to display the subgroup names corresponding to the set name pointed to by said pointer in said first menu, and updating said third menu to display the subset of said parameters corresponding to the subgroup name pointed to by said pointer in said second menu;
 automatically responding to a position change of said pointer in said second menu by updating said third menu to display the subset of said parameters corresponding to the subgroup name pointed to by said pointer in said second menu; and
 providing interactive parameter entry means for entering parameter values for the parameter pointed to by said pointer in said third menu;
 wherein said second and third menus together have the visual appearance of a set of indexes cards, said second menu forming tabs on the index cards, and said third menu forming the information listed on each index card;
 whereby said process parameters are hierarchically organized into sets and subsets.

4,873,624

OUTPUT COMPARE SYSTEM AND METHOD FOR A DATA PROCESSOR

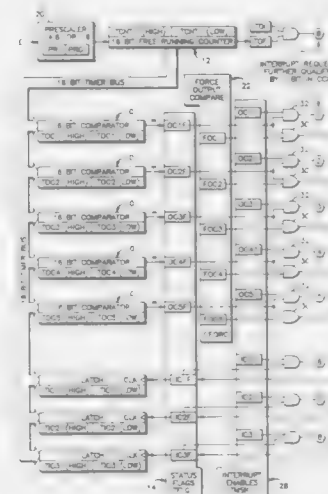
James M. Sibigroth, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 885,800, Jul. 14, 1986, abandoned, which is a continuation of Ser. No. 549,367, Nov. 4, 1983, abandoned. This application Oct. 20, 1988, Ser. No. 262,186

Int. Cl.⁴ G06F 1/04

U.S. Cl. 364—200

2 Claims



1. In a timer system comprising:

a counter for counting pulses of an input signal, and for providing a count value indicative thereof;
 a compare register for storing therein, in response to a first control signal, a compare value provided thereto via a first bus; and
 a comparator, coupled to the counter and to the compare register, for comparing the count value to the compare value, and for asserting a compare signal when said count and compare values are the same;
 the improvement comprising:

a force register for storing therein, in response to a second control signal, a control bit provided thereto via a second bus, and for asserting a force signal when said stored control bit is set; and
 logic means, responsive to the compare signal and to the force signal, for producing an output signal in response to the assertion of either said compare signal or said force signal.

4,873,625

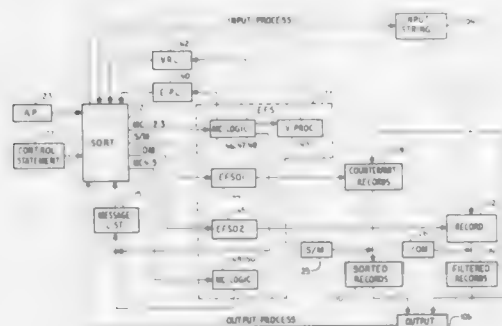
METHOD AND APPARATUS FOR EXTENDING COLLATION FUNCTIONS OF A SORTING PROGRAM
 Gary D. Archer, Campbell, Calif.; Eugene G. Huff, Raleigh, N.C.; Miguel T. Madrid, Jr., San Jose, Calif., and Akio Yoshii, Tokyo, Japan, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 17, 1987, Ser. No. 121,465

Int. Cl.⁴ G06F 7/00

U.S. Cl. 364-200

12 Claims



4. A method for concurrently executing a first (DFSORT) and a second (EFS) cooperating sequential process on a computing system, said first process being adapted to generate commands for forming an output string of records from an input string of first records having first collating characteristics in response to control statements executable by said first process upon said first records, said second process including a modality for altering control statements, said method comprising the steps of:

while said computing system is under control of said first process, inputting a set of control statements and an input string of records including second records with second collating characteristics, said set of control statements including a subset of control statements executable only on records including said second collating characteristics; transferring control of said computing system to said second process; modifying the control statements of said subset to a form executable by said first process upon records with said first collating characteristics; in response to said modified control statements, concurrently executing said first and second processes upon said input file to filter said second records; transferring control of said computing system to said first process; and forming an output file including filtered second records.

4,873,626
PARALLEL PROCESSING SYSTEM WITH PROCESSOR ARRAY HAVING MEMORY SYSTEM INCLUDED IN SYSTEM MEMORY

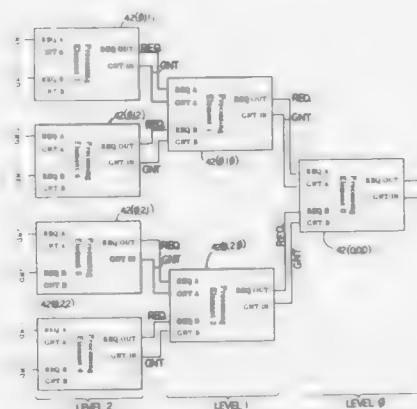
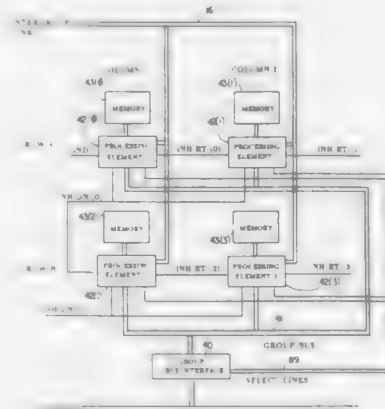
David K. Gifford, Cambridge, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Dec. 17, 1986, Ser. No. 943,314

Int. Cl.⁴ G06F 7/00

U.S. Cl. 364-200

6 Claims



1. A digital data processing system comprising a plurality of processing elements divided into a plurality of processing element groups, all of said processing elements in a processing element group being connected to a group bus interface over a group bus, said group bus interfaces being interconnected by a system bus;

A. each said processing element including:

- transfer request means connected to a transfer request line in said group bus for generating a transfer request signal when said processing element is to engage in a transfer over said group bus;
- arbitration means for engaging in an arbitration operation when said transfer request means generates said transfer request signal for controlling access of said processing element to said group bus;
- information transfer means connected to information lines in said bus for engaging in an information transfer operation; and
- control means connected to said arbitration means, said information transfer means and a grant line in said group bus for enabling said information transfer means to engage in an information transfer when said arbitration means indicates that said processing means has access to the group bus in response to the receipt of a grant signal over said grant line;

B. each said group bus interface including:

- information coupling means for coupling information from said group bus information lines onto corresponding lines in said system bus; and
- system bus arbitration means connected to system bus arbitration lines, said information coupling means, said group bus request line and said group bus grant line for engaging in a system bus arbitration operation in response to the receipt of said request signal for controlling said information coupling means and generating the grant signal in response to the system bus arbitration operation.

4,873,627

METHOD AND MEANS FOR CONDITIONAL STORING OF DATA IN A REDUCED INSTRUCTION SET COMPUTER

Allen J. Baum, Palo Alto; Terrence C. Miller, Menlo Park, and David A. Fotland, San Jose, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Division of Ser. No. 750,809, Jun. 28, 1985, Pat. No. 4,747,046.

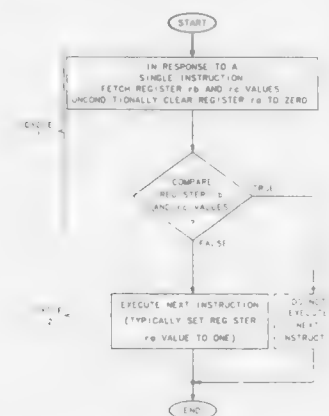
This application Dec. 30, 1987, Ser. No. 139,508

The portion of the term of this patent subsequent to May 24, 2005, has been disclaimed.

Int. Cl.⁴ G06F 9/28

U.S. Cl. 364-200

4 Claims



1. A method for handling data conditionally in a computer device comprising the steps of:
 receiving a single instruction; and
 in response to said single instruction:
 fetching and comparing in accordance with a selected condition two selected values from a first and a second register, respectively; and
 clearing a third register unconditionally.

4,873,628

COMMAND TRANSLATING COMPUTER

Takuro Omori, Yamatokoriyama, and Shigenobu Yanagiuchi, Tenri, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 926,846, Nov. 3, 1986, abandoned, which is a continuation of Ser. No. 525,666, Aug. 23, 1983, abandoned. This application Apr. 18, 1988, Ser. No. 185,283
 Claims priority, application Japan, Aug. 30, 1982, 57-151538

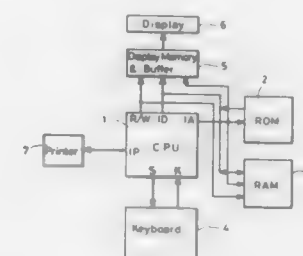
Int. Cl.⁴ G06F 9/00

U.S. Cl. 364-200

5 Claims

1. A computer of a first type, comprising:
 memory means, for storing control instructions, program instructions, commands and interpreter instructions;
 said program instructions representing commands, each particular program instruction being executable by the computer of the first type or by a computer of a second type, a particular program instruction being executable by the computer of the first type to cause a first result, said

particular program instruction being executable by the computer of the second type to cause a second result, said first and second results being different, said interpreter instructions specifying whether said particular program instruction in said memory means is to be interpreted as either a first command for the computer of the first type or a second command for the computer of the second type; and
 program execution means, responsive to said control instructions from said memory means and said interpreter in-



structions, for performing operations under control of said control instructions and said interpreter instructions, including,
 translation means, operatively connected to said memory means and responsive to said interpreter instructions, for translating said particular program instruction into a translated first command for the computer of the first type; said translated first command for the computer of the first type commanding a result in the computer of the first type that is equivalent to said second result commanded by said second command of the computer of the second type.

4,873,629

INSTRUCTION PROCESSING UNIT FOR COMPUTER
 Michael C. Harris, Bedford; David M. Chastain, Plano, and Gary B. Gostin, Coppell, all of Tex., assignors to Convex Computer Corporation, Richardson, Tex.

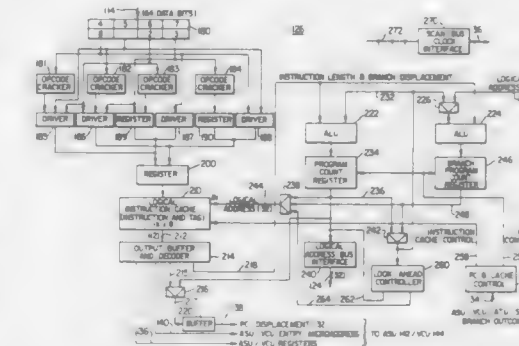
Continuation of Ser. No. 622,728, Jun. 20, 1984, abandoned.

This application Dec. 15, 1987, Ser. No. 133,195

Int. Cl.⁴ G06F 9/26, 13/00

U.S. Cl. 364-200

5 Claims



1. An instruction processing unit for use in a computer which has a main memory and a central processor wherein instructions for execution by the computer include a plurality of fields wherein at least one of the fields is an address field and the instructions are stored in the main memory, the instruction processing unit comprising:
 means for decoding address fields of instructions received from said main memory to produce cracked instructions which have at least one non-decoded field therein, an instruction cache for storing said cracked instructions,

means for decoding at least one of said non-decoded fields of said cracked instructions received from said instruction cache for producing a plurality of instruction execution commands with at least one of said commands supplied to said central processor for directing the execution of the decoded, cracked instruction;

a first logic unit connected to receive one of said commands and functioning to compute an address for a next sequential instruction for execution by said central processor;

means for storing the address for the next sequential instruction which address is produced by said first logic unit;

a second logic unit connected to receive one of said commands and functioning to compute a branch address for the next instruction for execution by said central processor;

means for storing the branch address for the next instruction, which address is produced by said second logic unit, and means responsive to said central processor for selecting either the stored address for the next sequential instruction or the stored branch address for the next instruction and routing the selected one of the addresses to said instruction cache to read the cracked instruction therein having said selected address, said read, cracked instruction transferred to said means for decoding said cracked instruction.

4,873,630

SCIENTIFIC PROCESSOR TO SUPPORT A HOST PROCESSOR REFERENCING COMMON MEMORY

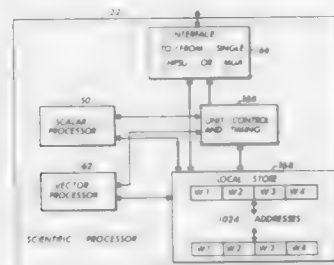
John T. Rusterholz, Roseville; Archie E. Lahti, Fridley; Louis B. Bushard, Anoka; Larry L. Byers, Apple Valley; James R. Hamstra, Plymouth, and Charles J. Homan, St. Paul, all of Minn., assignors to Unisys Corporation, Blue Bell, Pa.

Filed Jul. 31, 1985, Ser. No. 761,201

Int. Cl. G06F 15/347, 15/16

U.S. Cl. 364-200

26 Claims



1. For use in a data processing system having a general purpose host processor and a high performance storage unit coupled thereto for providing a general purpose processing capabilities in said data processing system, an improved scientific processor operable under the control of the general purpose host processor comprising:

- interface means for coupling to the high performance storage unit for receiving data operands and instruction words from the high performance storage unit and for transmitting resultant data operands to the high performance storage unit;
- unit control and timing means coupled to said interface means for providing timing and control signals for synchronizing operation with the operation of the general purpose host processor and the high performance storage unit;
- scalar processor module means coupled to said unit control and timing means for performing scalar instruction data processing, said scalar processor module means including instruction buffer means for providing instruction word buffering between the high performance storage unit and the scientific processor; and
- vector process module means coupled to said unit control and timing means for performing vector data processing instructions, said vector processor module means including a

plurality of pipeline means coupled to said interface means for receiving data transfers of said data operands therefrom and for providing resultant operands thereto, and further including a plurality of vector register means for temporarily storing selected ones of said data operands and said resultant operands;

wherein both scalar operands and vector operands can be efficiently manipulated in various combinations under program control of the general purpose host processor and to make resultant data operands available to the high performance storage unit all without the requirement of dedicated or cached memory.

4,873,631

POINT OF SALE AUTOMATIC BACK-UP SYSTEM AND METHOD

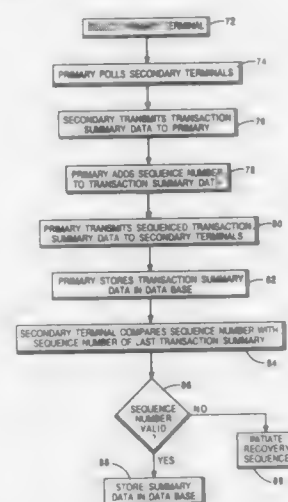
Robert H. Nathan, and Lawrence A. Hislop, both of Atlanta, Ga., assignors to NCR Corporation, Dayton, Ohio

Filed Apr. 25, 1988, Ser. No. 185,590

Int. Cl. G06F 15/21

U.S. Cl. 364-405

7 Claims



1. A method for preventing the loss of data in a data processing system which includes a plurality of data terminal devices and in which each of the terminal devices is coupled to every other terminal device in the system comprising the steps of:

- selecting one of the data terminal devices as a primary terminal device and the remaining terminal devices as secondary terminal devices;
- transmitting a data message generated by one of the secondary terminal devices to the primary terminal device;
- storing the data message generated by the secondary terminal device in a first storage unit in the primary terminal device;
- transmitting the data message stored in the first storage unit to each of the secondary terminal devices in response to the storing of the data message in the first storage unit;
- storing the data message transmitted by the primary terminal device in a second storage unit in each of the secondary terminal devices; and
- transmitting the data stored in the first storage unit to a third storage unit in the primary terminal device after the data message has been transmitted to all of the secondary terminal devices.

4,873,632

APPARATUS AND METHODS FOR SCATTER REDUCTION IN RADIATION IMAGING

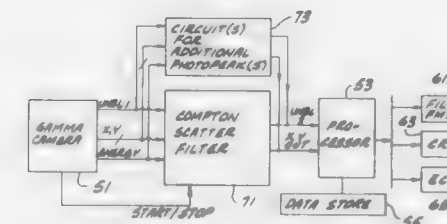
K. William Logan, and William D. McFarland, both of Boone County, Mo., assignors to The Curators of the University of Missouri, Columbia, Mo.

Continuation-in-part of Ser. No. 604,989, Apr. 27, 1984, Pat. No. 4,755,680. This application Jun. 1, 1987, Ser. No. 57,967

Int. Cl. G01T 1/20

U.S. Cl. 364-413.13

82 Claims



1. Apparatus for use in reducing scatter in radiation imaging for use with a detector of ionizing radiation, where the ionizing radiation is partly unscattered and partly Compton scattered, the detector producing an energy signal representing values of energy of the ionizing radiation and producing coordinate position information for the ionizing radiation, and where the apparatus is for use with both data storage means for holding numerical values and with means for displaying an image based on the numerical values in the data storage means, the apparatus comprising:

means responsive to the energy signal from the detector for producing first and second signals which indicate whether each value of energy represented by the energy signal at a given time is in a first energy range or in a second energy range less than half as wide as the first energy range and having at least some energies in common with the first energy range; and

means responsive to the first and second signals and the coordinate position information for generating numerical values for each coordinate position and storing them in the data storage means, the numerical values being a function of the difference of the number of occurrences of ionizing radiation in the first energy range at each coordinate position less a second number proportional to the number of occurrences of ionizing radiation in the second energy range at that coordinate position.

4,873,633

USER CONTROLLED OFF-CENTER LIGHT ABSORBANCE READING ADJUSTER IN A LIQUID HANDLING AND REACTION SYSTEM

Mezel, Louis M., Fremont; Bradley S. Albom, Richmond; Coppock, Stan; Stephen J. Moehle, both of Berkeley; Brent S. Noorda, Pleasant Hill; Joseph T. Widunas, Berkeley, and James A. Zeitlin, Piedmont, all of Calif., assignors to Cetus Corporation, Emeryville, Calif.

Continuation-in-part of Ser. No. 788,998, Oct. 18, 1985, abandoned. This application Sep. 11, 1986, Ser. No. 906,101

Int. Cl. G01N 33/48, 21/01, 33/80, 35/02

U.S. Cl. 364-413.08

7 Claims

1. An apparatus for optimizing the accuracy of light absorbance readings taken by a plate reader regardless of the type of plate and type of well in said plate comprising:

- means for causing the plate reader to take multiple light absorbance readings at different locations across the bottom of each well;
- means for displaying the absorbance readings in graphical form to a user and for displaying the current locations of at least one off center absorbance reading used to discriminate positive reactions from negative reactions;
- means for allowing the user to move the locations of the off

center absorbance reading relative to the rest of the graphic display to optimize the discriminatory powers of the system to distinguish between positive and negative reactions; and

means to record the user's choice for the position of the off center reading for use in further plate reading operations.

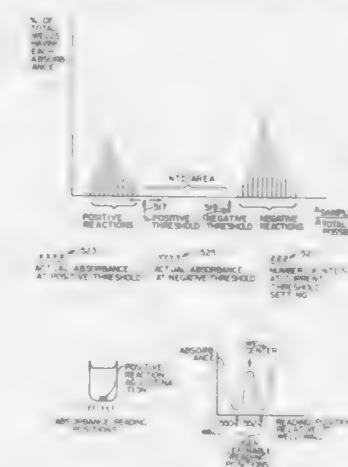
2. The apparatus of claim 1 wherein the means for graphically displaying the absorbance data and for allowing the user to move the position of the off center reading is a host computer and further comprising:

means for allowing the user to perform automated liquid handling on each different plate type using a sequence of liquid handling steps which is customized for that plate type;

means for reading a bar code on each plate type and for sending this data to said host system with tag data for plates which have predetermined liquid handling sequences, said tag data indicating that the plate has a well bottom geometry for which the plate reader system is not currently optimized;

means in said plate reader for reading the bar codes on plates placed therein for reading and for sending the bar code data to said host system;

means in said host system for looking up the bar code data received from the plate reader and determining whether the plate is a type for which the plate reader has not been optimized in position of the off center reading;



means for controlling the plate reader to cause said means for causing multiple absorbance readings to be taken to take said readings.

4. An apparatus for performing automated blood grouping on donor samples comprising:

- a computer directed liquid handler means to perform predetermined automated sequences of operations involving placing aliquots of donor red blood cells and plasma into a plurality of wells in a plurality of assay trays and placing predetermined reagents in predetermined ones of said assay wells;
- a computer directed plate reader to measure light absorbance data for the wells in said trays; and
- a host computer for sending commands to control the operations of said plate reader and said liquid handler and for collecting, analyzing and storing the light absorbance data from said plate reader to determine the blood group and type of each donor's blood, said host computer also having means therein for allowing the user to define graphically the optimum position for shining light through the bottom of one of said assay wells to measure light absorbance so as to maximize the accuracy of the host computer in determining blood group and type including means to cause said plate reader to measure the light absorbance along a plurality of different paths through the bottom of

4,873,638

TRACTION CONTROL SYSTEM FOR CONTROLLING SLIP OF A DRIVING WHEEL OF A VEHICLE
 Shuji Shiraiishi, and Takashi Nishihara, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 11, 1987, Ser. No. 48,424

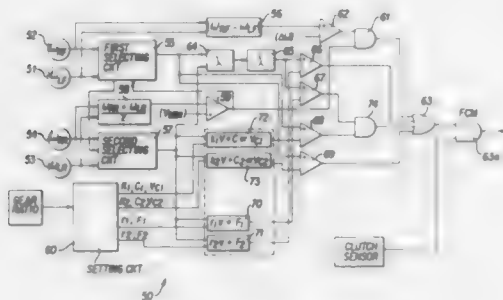
Claims priority, application Japan, May 9, 1986, 61-107240; May 9, 1986, 61-107241; May 9, 1986, 61-107242; May 9, 1986, 61-107243; May 9, 1986, 61-107244

The portion of the term of this patent subsequent to Oct. 10, 2006, has been disclaimed.

Int. Cl.⁴ B60T 8/58

U.S. Cl. 364—426.01

45 Claims



1. A control system for controlling the slip of a driving wheel of a vehicle having at least two driving wheels, said system comprising:

- a driving wheel speed sensor means for sensing the speed of said driving wheels and for generating a driving wheel speed signal as a function thereof;
- a vehicle speed sensor means for sensing the speed of said vehicle and for generating a vehicle speed signal as a function thereof;
- a first selecting circuit means, included within said driving wheel speed sensor means and operatively connected to said vehicle speed sensor means, for selecting the speed of only one of said driving wheels, on opposing sides of the vehicle, as said driving wheel speed signal, such that when the vehicle speed is below a predetermined value, said first selecting means selects the speed of the slower of said driving wheels as said driving wheel speed signal, and control means responsive to said driving wheel speed signal from said first selecting circuit means for controlling the slip of said driving wheel.

4,873,639

TRACTION CONTROL SYSTEM FOR CONTROLLING SLIP OF A DRIVING WHEEL OF A VEHICLE
 Makoto Sato, Shuji Shiraiishi, and Tetsuji Muto, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 4, 1987, Ser. No. 21,892

Claims priority, application Japan, Mar. 4, 1986, 61-46948; Mar. 4, 1986, 61-46949; Mar. 4, 1986, 61-46950

Int. Cl.⁴ B60T 8/58

U.S. Cl. 364—426.02

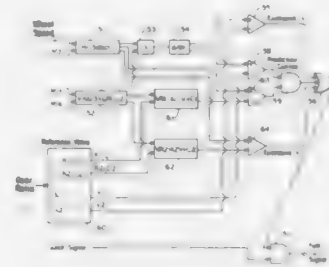
33 Claims

1. A control system for controlling the slip of a driving wheel of a vehicle, said system comprising:

- driving wheel speed sensor means for sensing the speed of a driving wheel and for generating a driving wheel speed signal as a function thereof;
- vehicle speed sensor means for sensing the speed of the vehicle and for generating a vehicle speed signal as a function thereof;
- slip rate calculating means, operatively coupled to said driving wheel speed sensor means and said vehicle speed sensor means, for calculating a slip rate (λ) of said driving wheel with respect to the movement of said vehicle;
- differentiating means, coupled to said slip rate calculating

means, for calculating the differential value (λ) of said slip rate;

means for generating a gear ratio signal;



output means, coupled to said differentiating means and said gear ratio signal generating means, for providing a driving wheel slip control signal in response to said differential value (λ) of said slip rate and said gear ratio signal.

4,873,640

DRIVING-SPEED ADJUSTING ARRANGEMENT
 Peter Bürk, Reichen-Ulm, and Klaus Hahn, Bühlertal, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

PCT No. PCT/DE87/00018, § 371 Date Dec. 21, 1987, § 102(e) Date Dec. 21, 1987, PCT Pub. No. WO87/06200, PCT Pub. Date Oct. 22, 1987

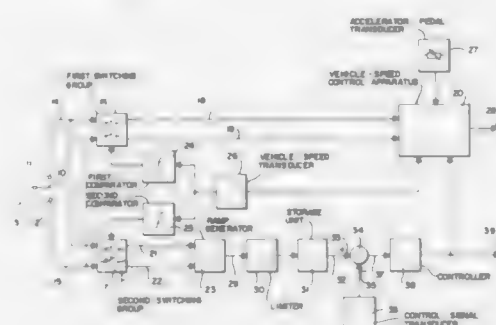
PCT Filed Jan. 15, 1987, Ser. No. 143,130

Claims priority, application Fed. Rep. of Germany, Apr. 19, 1986, 3613322

Int. Cl.⁴ B60K 31/00

U.S. Cl. 364—426.04

12 Claims



1. A vehicle-speed adjusting arrangement comprising:

- a switching unit including: first and second switching contacts for controlling an increase and a decrease in the vehicle-speed desired value, respectively; and, selector switching means movable between two positions for selectively connecting one of said contacts to a neutral position;
- a vehicle-speed control apparatus for controlling the speed of the vehicle in response to the position of said selector switching means;
- transducer means for providing an electrical speed signal indicative of the actual speed of the vehicle;
- first switching means movable between a first condition wherein said switching contacts are disconnected from said control apparatus and a second condition wherein said switching contacts are connected to said control apparatus;
- ancillary function means for performing an ancillary function in the motor vehicle;
- second switching means movable between a first situation

4,873,642

METHOD FOR CONTROLLING AN OXYGEN CONCENTRATION SENSOR FOR USE IN AN AIR/FUEL RATIO CONTROL SYSTEM OF AN INTERNAL COMBUSTION ENGINE

Toshiyuki Miemo, Toyohi Nakajima, Yasushi Okada, and Nobuyuki Oono, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 4, 1987, Ser. No. 21,704

Claims priority, application Japan, Mar. 4, 1986, 61-47547

Int. Cl.⁴ F02M 51/00, 7/00

U.S. Cl. 364—431.06

4 Claims

wherein at least one of said switching contacts is disconnected from said ancillary function means and a second situation wherein said one switching contact is connected to said ancillary function means;

comparator means for setting a threshold vehicle speed and being responsive to said speed signal for actuating said first switching means to move the first switching means from said second condition thereof into said first condition when said vehicle speed drops below said threshold vehicle speed and for actuating said second switching means to move the second switching means from said first situation thereof into said second situation thereof also when said vehicle speed drops below said threshold vehicle speed thereby permitting said one switching contact to serve to control said ancillary function means.

4,873,641

INDUCTION VOLUME SENSING ARRANGEMENT FOR AN INTERNAL COMBUSTION ENGINE OR THE LIKE
 Hattuo Nagaishi, Zushi, Yasuo Seimiya, Fujisawa, Hideyuki Tamura, Yokohama; Hiromichi Miwa, Yokohama; Hiroshi Sanbuchi, Yokohama; Masaaki Uchida, Yokohama, and Toshio Takahata, Yokohama, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

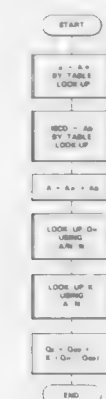
Filed Jul. 1, 1987, Ser. No. 68,942

Claims priority, application Japan, Jul. 3, 1986, 61-156837; Jul. 25, 1986, 61-174997; Jul. 29, 1986, 61-177949

Int. Cl.⁴ F02M 17/00

U.S. Cl. 364—431.04

27 Claims



1. A method of operating an internal combustion engine comprising the steps of:

- sensing a first engine operational parameter which indicates the load on the engine;
- sensing a second engine operational parameter which indicates the rotational speed of the engine;
- recording a first set of data in a memory means, said first set of data defining a first two dimensional map which is recorded in terms of said first engine operational parameter and a first variable which varies with the degree by which air flow to said engine is restricted;
- deriving a value of said first variable by comparing the value of said first engine operational parameter with said first set of recorded data;
- modifying said first variable using the value of said second engine operational parameter to derive a second variable;
- recording a second set of data in said memory means, said second set of data defining a second two dimensional map, said second set of data being recorded in terms of said second variable, said second engine operational parameter and a third variable which is indicative of an amount of air being inducted into said engine; and
- comparing the values of said second variable and said first parameter with said second set of recorded data to obtain a value of said third variable.

1. A method for controlling an oxygen concentration sensor to be used in an internal combustion engine having an ignition switch and an exhaust gas passage, the oxygen concentration sensor having a sensor body forming a gas retaining space which communicates with an inside of the exhaust gas passage through a gas diffusion restriction region and which includes a wall of an oxygen ion conductive solid electrolyte member, the oxygen concentration sensor further having two pairs of electrodes so that each pair is disposed on opposing sides of the wall of the oxygen ion conductive solid electrolyte member and a current source for supplying a current in response to a difference between a voltage developed across one pair of electrodes of the two pairs of electrodes and a reference voltage, the current being supplied to the other pair electrodes of the two pairs of electrodes, the oxygen concentration sensor also having a heater element for generating heat for heating the wall of the oxygen ion conductive solid electrolyte member in accordance with the amount of a heater current supplied thereto, the method comprising the steps of: measuring time lapsed after the ignition switch of the internal combustion engine is turned on; and

light-modulating means for modifying the in-focus and out-of-focus portions of said image by attenuating the amplitudes of the low frequency components of the image and enhancing the high frequency components thereof; and, computer means for sensing and receiving data corresponding to each of said images and for suppressing the out-of-focus portion corresponding thereto whereby an improved three-dimensional image data file of the specimen is obtained.

4,873,654

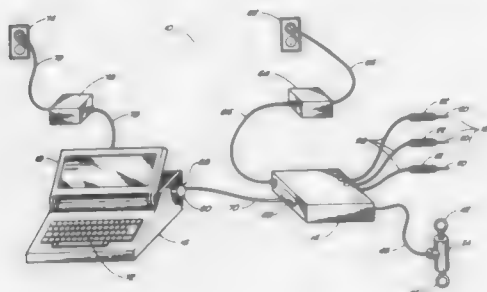
TESTING DEVICE AND METHOD FOR INFLATABLE OBJECTS

William B. Alexander, New Orleans, La., and Paul Frenger, Houston, Tex., assignors to Safe-Test, Inc., New Orleans, La. Continuation-in-part of Ser. No. 619,601, Jun. 11, 1984, Pat. No. 4,642,783. This application Feb. 9, 1987, Ser. No. 12,576. The portion of the term of this patent subsequent to Feb. 10, 2004, has been disclaimed.

Int. Cl. G06F 15/20; G01N 7/00

U.S. Cl. 364-551.01

16 Claims



1. A testing device for evaluating an inflatable object having expandable wall comprising:

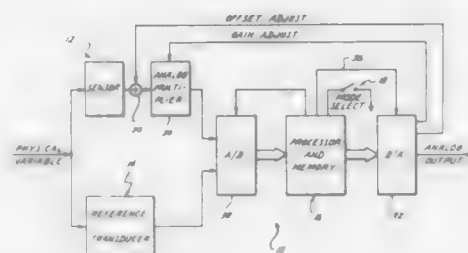
transducer means for converting the physical inputs of temperature and pressure from said inflatable object into electrical impulses, said transducer means comprising: a pressure transducer for evaluating the pressure of a gas within said inflatable object, said pressure transducer having a chamber connected thereto; and a temperature transducer having a nozzle for connection to a valve of said inflatable object, said temperature transducer positioned adjacent said nozzle, said temperature transducer for measuring the temperature of said gas within said chamber of said pressure transducer; connection means fastened to said transducer means for enabling said transducer means to be interactive with said physical inputs from said inflatable object, said connection means comprising a pressure transducer nozzle for connecting a valve of said inflatable object to said pressure transducer, said chamber of said pressure transducer being adjacent to and in air-tight connection with said pressure transducer nozzle, said chamber for allowing differential pressures within said chamber and said inflatable object to equalize upon connection of said pressure transducer nozzle to a valve of said inflatable object;

processing means electrically connected to said transducer means for selectively converting said electrical impulses of said transducer means into signals relative to said physical inputs of temperature and pressure, each of said pressure transducer and said temperature transducer having electrically conductive lines extending therefrom to said processing means, the signals from said transducer means being passed as separate inputs of temperature and pressure to said processing means, said processing means evaluating said inflatable object based on said signals; and output means electrically connected to said processing means for producing a perceivable display of said signals from said processing means.

4,873,655
SENSOR CONDITIONING METHOD AND APPARATUS
George V. Kondraske, Arlington, Tex., assignor to Board of Regents, The University of Texas System, Austin, Tex.
Filed Aug. 21, 1987, Ser. No. 88,087
Int. Cl. G01R 7/10

U.S. Cl. 364-553

21 Claims



1. A method for conditioning the output characteristics of a sensor to conform to a desired transfer function, where the normal output of the sensor in measuring a physical quantity of interest deviates from the desired transfer function, comprising the steps of:

- measuring the physical quantity in a first condition with a reference transducer having the desired transfer function;
- measuring the physical quantity in the first condition with the sensor;
- repeating steps (a) and (b) with the physical quantity in a plurality of different conditions;
- building a changeable look-up table with the plurality of measurements of steps (a)-(c), where for each condition a sensor measurement corresponds to a reference transducer measurement conforming to the desired transfer function;
- measuring the physical quantity in an unknown condition using the sensor;
- conditioning the sensor measurement of step (e) to obtain an output conforming to the desired transfer function by adjusting the sensor output by providing real time feedback signals to obtain an adjusted sensor output and including the substeps: determining a corresponding reference transducer measurement using the adjusted sensor output from the look-up table, and outputting the reference transducer measurement from the look-up table.

4,873,656
MULTIPLE PROCESSOR ACCELERATOR FOR LOGIC SIMULATION
Gary M. Catlin, Cupertino, Calif., assignor to Daisy Systems Corporation, Mountain View, Calif.
Filed Jun. 26, 1987, Ser. No. 67,633
Int. Cl. G06F 13/36

U.S. Cl. 364-578

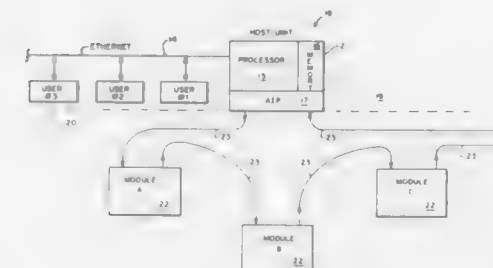
5 Claims

1. A computer system coupled to a plurality of users for implementing an event driven algorithm of each of the users, comprising:

- a master processor coupled to the users for providing overall control of the computer system and executing the event driven algorithm of each of the users, the master processor further including a master memory;
- a unidirectional ring bus coupled to the master processor;
- a plurality of processor modules coupled to the unidirectional ring bus which transfers data among the processor modules and the master processor, each of the processor modules capable of receiving into a plurality of connectors a plurality of selectable simulation processors for independently operating on a portion of the event driven

algorithm and functioning substantially simultaneously to each other, each simulation processor including a simulation memory for storing the simulation data for circuit elements being simulated by that processor, the plurality of selectable processor including (i) a hardwired processor for providing rapid simulation of simpler circuit elements and (ii) a microcodable processor for providing simulation of more complicated circuit elements, each of the processor modules further including:

- an interprocessor bus coupled to the plurality of processors within the module for transferring the simulation data among the processors;



- an interface means coupled to the unidirectional bus and interprocessor bus for transferring the simulation data between the unidirectional bus and the interprocessor bus, the interface means including (i) a first storage means for storing data from the ring bus that is destined for a processor of the plurality of processors of the module; (ii) a second storage means for storing data from the simulation processor that is destined for transfer external to the module; and (iii) a bypass means for bypassing data on the ring bus that is not destined for the module;

wherein intra-module transfer of data on the interprocessor bus occurs independently of transfer of data on the unidirectional bus.

4,873,657
METHOD FOR SIMULATING AN IMAGE BY CORRELATION
Gertrude H. Kornfeld, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Nov. 13, 1987, Ser. No. 120,458
Int. Cl. G06F 15/66

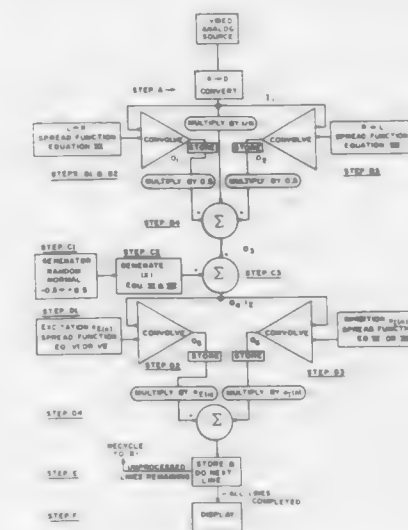
U.S. Cl. 364-578

4 Claims

1. In the method of simulating an image projected by an optical scanning system which, due to the presence of specific lenses, mirrors and other such optical elements has an analog shift spread function, wherein said image is simulated by an idealized image in the form of an x-y array matrix of pixels, line scanned along the x axis, each spaced a distance Δ from adjacent pixels and having an input power $P(I_x, I_y)$ where I_x and I_y are positions in said matrix expressed as integral values of Δ ; a submethod for also simulating said spread function comprising the following steps:

- digitize the image such that each picture element (PIXEL) represents a detector sample of the system to be simulated, thus providing a number of first sets of input pixel values, each said set representing a scan line in the system of image;
- starting with the first image line as the current line simulate the spread function of the optical elements by the substeps:
 - convolve said input values for said current line with a right-to-left asymmetrical spread function $P_{om}(n)$, where $P_{om}(n) = (1 - e_n)P(n) + e_n P_{om}(n-1)$, to obtain a first set of output values;
 - store said first step of output values;
 - repeat steps B1 and B2 with a left-to-right spread

function $P_{op}(n)$, where $P_{op}(n) = (1 - e_n)P(n) + e_n P_{op}(n-1)$, to obtain and store a second set of output values; B4. add half of each corresponding value in said first set of output values to each corresponding value in said second set of output values and subtract a given fraction of the corresponding input value, to obtain a third set of output values;

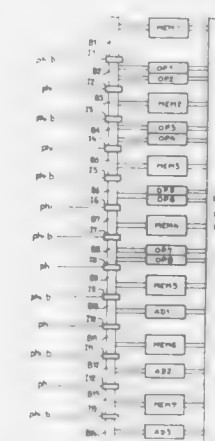


- store the last completed set of output values, if any line remains unprocessed as above, then repeat steps B1 through E with each of the remaining lines in the image in place of said first image line as said current line; and
- display the resulting image as a shade of gray IV type image.

4,873,658
INTEGRATED DIGITAL SIGNAL PROCESSING CIRCUIT FOR PERFORMING COSINE TRANSFORMATION
Joël Cambonie, Fontaine, France, assignor to SGS-Thomson Microelectronics S.A., Paris, France
Filed Dec. 21, 1987, Ser. No. 135,266
Claims priority, application France, Dec. 22, 1986, 86 17936
Int. Cl. G06F 15/332

U.S. Cl. 364-725

2 Claims



- An integrated circuit for the digital processing of signals, performing a specific transformation of input signals representing a digital values x_j so as to produce signals representing n coefficients F_j of the form

$$F_v = \sum_{j=0}^{n-1} x_j f(j, v)$$

wherein $f(j, v)$ is a function of the indexes j and v , comprising:
 a signal transmission bus for unidirectionally transmitting a signal of p bits representing a digital value;
 switches spaced apart along the bus for letting the signals pass along the bus or for interrupting these signals, with any two adjacent switches along the bus being actuated in phase opposition, so as to divide the bus into sections, each bus section communicating alternately with a preceding section and a following section;
 computing operators are connected to certain sections of the bus and may receive successive data of p bits therefrom, for carrying out a computation on this data and sending resulting data over this bus section;
 buffer memories are connected to other bus sections so as to receive several successive data therefrom and send them over a bus in an order different from the order in which they were received;
 microprogrammed sequences for controlling each of said computation operator or said buffer memory.

4,873,659

C-MOS ARITHMETIC - LOGIC UNIT WITH HIGH CARRY PROPAGATION SPEED

Luigi Licciardi, Almese, and Alessandro Torielli, Torino, both of Italy, assignors to Caelt - Centro Studi E Laboratori Telecomunicazioni Spa, Torino, Italy

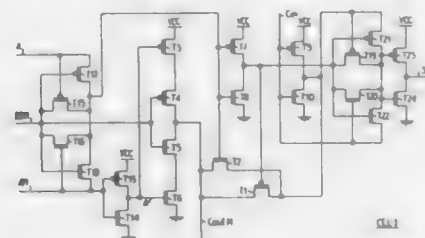
Filed Apr. 27, 1988, Ser. No. 186,897

Claims priority, application Italy, May 27, 1987, 67459 A/87

Int. Cl. G06F 7/50

U.S. Cl. 364-784

6 Claims



1. A C-MOS arithmetic-logic unit for calculating addition and subtraction minima between two operands A and B, and comparison between a datum and a threshold, wherein addition and subtraction operations are carried out by a carry-propagating adder consisting of elementary cells, one cell for each bit of the two operands, said cells being cascade-connected for carry propagation, each elementary cell basically comprising:

- a first EX-OR logic gate (T15, T16, T17, T18) receiving said bits of said operands (A, B);
- a first inverter (T9, T10) which receives an input carry;
- a second inverter (T7, T8) which receives the output of said first EX-OR logic gate;
- a first transfer gate (T1, T2) which receives at the transfer input of said first inverter, and which is controlled by input and output logic levels of said second inverter;
- a second EX-OR logic gate (T19, T20, T21, T22) which receives the input carry and the output of said second inverter, and supplies the addition result (SN);
- a first pair of series-connected P-MOS transistors (T3, T4) and a second pair of series-connected N-MOS transistors (T5, T6), said first and second pair being connected in series between two reference voltages, a bit of the first operand (A) being applied to gates of respective transistors of both pairs, the bit of the second operand (B) being brought to the gate of the other transistor of both pairs, the common node of said two pairs being connected to the

output of said first transfer gate (T1, T2) and supplying an output carry, wherein for minima and comparison operations said elementary cells perform subtraction and individually further comprise:

third and fourth transfer gates (TG1, TG2) which receive at the transfer input the first and second operand respectively, and have a common transfer output (ANBN), and which are controlled by a first and second control signal (SEL, SELN) which in case of a minimum operation transfer to the output the inferior operand on the basis of the carry level outgoing from the last cell, and in case of comparison said first operand;

third (T34) and fourth (T35) P-MOS transistors and fifth (T36) and sixth (T37) N-MOS transistors, all connected in series between the two reference voltages, said third and fifth transistors receiving at the gate said result (SN) from the relevant elementary cell, said fourth and sixth transistors receiving at the gate a third (BEST) and a fourth (INFN) control signal; and

seventh (T38) and eighth (T39) P-MOS transistors and ninth (T40) and tenth (T41) N-MOS transistors, all connected in series between the two reference voltages, the points common to said third and fourth and said seventh and eighth transistors being interconnected, the intermediate points in said series between said eighth and ninth and between said fourth and fifth transistors being interconnected to supply an output (U) of the unit, said eighth and tenth transistors receiving at the gate said common transfer output (ANBN), said seventh and ninth transistors receiving at the gate said fourth (INFN) and third (BEST) control signals respectively, said control signals taking up such logic levels that said output (U) in case of addition or subtraction, if there is no saturation, is said result (SN), otherwise said output is in a state indicative of saturation; in case of minimum said output (U) is said common transfer output; in case of comparison, if there is no saturation, said output (U) is said transfer output, otherwise said output (U) is in said state indicative of saturation.

4,873,660

ARITHMETIC PROCESSOR USING REDUNDANT SIGNED DIGIT ARITHMETIC

Tamotsu Nishiyama, and Shigeo Kuninobu, both of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 25, 1987, Ser. No. 66,817

Claims priority, application Japan, Jun. 27, 1986, 61-152451; Jun. 27, 1986, 61-152452; Jun. 27, 1986, 61-152455

Int. Cl. G06F 7/49

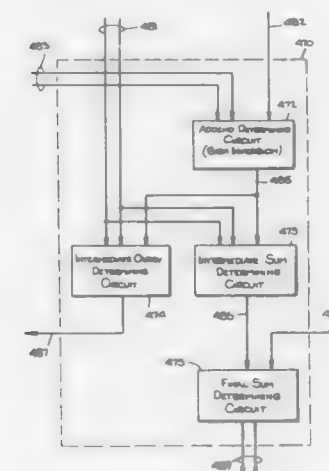
U.S. Cl. 364-768

20 Claims

1. An arithmetic processor which performs addition or subtraction of two redundant signed-digit numbers X and Y of radix r having N digits denoted by single digits x_i and y_i , where i is an index which assumes integer values ranging from 1 to N to denote digits in descending order, said arithmetic processor for each order comprising:

- (a) means for receiving a control signal and a single digit, and in response to the value of said control signal, producing an output operand by either inverting the sign of said single digit, leaving said single digit unchanged, or replacing said single digit operand with 0;
- (b) a first arithmetic means for receiving said output operand and for receiving a second single digit, and determining therefrom, in the case of addition an intermediate sum and an intermediate carry, or, in the case of subtraction, determining therefrom an intermediate difference and an intermediate borrow, said intermediate carry or borrow being output by said first arithmetic means for utilization in the processing of the next higher order digits; and
- (c) a second arithmetic means for determining the final sum by combining an intermediate carry obtained from processing the digits of the next lower order and said intermediate

mediate sum, or in the case of subtraction, determining the final difference by combining an intermediate borrow obtained from processing the digits of the next lower order and said intermediate difference;



whereby said arithmetic processor performs addition or subtraction of said two redundant signed-digit numbers X and Y in a manner which eliminates carry-propagation.

4,873,661

SWITCHED NEURAL NETWORKS

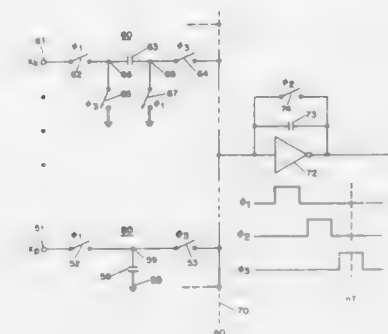
Yannis Tsividis, 601 W. 113th St., New York, N.Y. 10025

Filed Aug. 27, 1987, Ser. No. 90,126

Int. Cl. G06F 15/46; H03K 19/08

U.S. Cl. 364-807

7 Claims



1. A neural network including a plurality of neurons, each comprising non-linear amplifying means including input means and an output terminal, the output terminal of each being connected to the input means of other amplifying means of the plurality for supplying its output as an input to said other amplifying means, each of said neurons being characterized by the inclusion of capacitor means and switching means in said input means for storing an input signal for sampling and for weighting.

4,873,662

INFORMATION HANDLING SYSTEM AND TERMINAL APPARATUS THEREFOR

Desmond J. Sargent, Felixstowe, England, assignor to The Post Office, United Kingdom

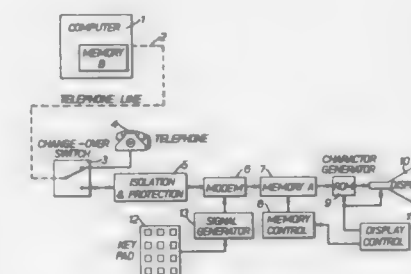
Continuation of Ser. No. 814,922, Jul. 12, 1977, abandoned. This application Aug. 15, 1980, Ser. No. 178,307

Claims priority, application United Kingdom, Jul. 20, 1976, 30137/76

Int. Cl. G06F 13/00

U.S. Cl. 364-900

7 Claims



1. A digital information storage, retrieval and display system comprising:

a central computer means in which plural blocks of information are stored at respectively corresponding locations, each of which locations is designated by a predetermined address therein by means of which a block can be selected, each of said blocks comprising a first portion containing information for display and a second portion containing information not for display but including the complete address for each of plural other blocks of information;

plural remote terminal means, each including (a) modem means for effecting input/output digital data communication with said central computer means via the telephone lines of a telephone network, (b) local memory for locally storing digital data representing at least the first portion of the selected block of information received via said modem means from the central computer, (c) display means for visually displaying such a locally stored first portion of a block of information and (d) key pad means connected to communicate data to at least said modem means for manual entry of keyed digital data; and

further memory means being provided as a part of said central computer means for receiving and storing said second portion of the block of information selected by a particular terminal means in response to the selection of the block and when its respective first portion is transmitted to that terminal means for display, said central computer means utilizing keyed digital data from that particular terminal means of less extent than any one of said complete addresses for another block of information but nevertheless uniquely indicative of one of the complete addresses contained in said portion of the block of information which contains the first portion then being displayed by that particular terminal means for selectively accessing the part of said further memory means associated with that particular terminal means and for supplying the complete address of the next block of information which is to be retrieved for that particular terminal means and utilized for display purposes at that terminal means.

4,873,663

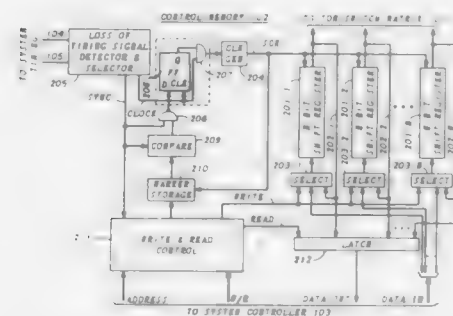
CONTROL MEMORY USING RECIRCULATING SHIFT REGISTERS FOR A TDM SWITCHING APPARATUS
Lawrence Baranyai, Howell, and Dominick Scordo, Middletown, both of N.J., assignors to American Telephone and Telegraph Company, New York, N.Y. and AT&T Bell Laboratories, Murray Hill, N.J.

Filed Apr. 25, 1988, Ser. No. 185,653

Int. Cl.⁴ G11C 21/00, 19/00

U.S. Cl. 365—73

8 Claims



- Control memory apparatus comprising, a plurality of shift registers each connected in a recirculating configuration and arranged to form a matrix of storage cells, a source of a system timing signal and a system synchronization signal, means for storing a timing marker, means responsive to said system timing signal for advancing bits in said plurality of shift registers and said timing marker in said means for storing, means for detecting when said timing marker is out of synchronism with said system synchronization signal, and means for inhibiting advancing of said bits in said plurality of shift registers and said timing marker in said means for storing for a predetermined interval when said timing marker is out of synchronism with said synchronization signal.

4,873,664

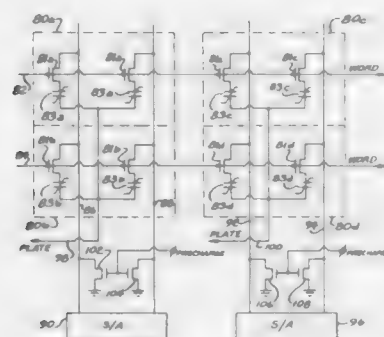
SELF RESTORING FERROELECTRIC MEMORY
S. Sheffield Eaton, Jr., Colorado Springs, Colo., assignor to Ramtron Corporation, Colorado Springs, Colo.

Filed Feb. 12, 1987, Ser. No. 13,746

Int. Cl.⁴ G11C 7/00, 11/22

U.S. Cl. 365—145

29 Claims



- In a nonvolatile ferroelectric memory of the type having a plurality of memory cells arranged in rows and columns, each column comprising a bit line coupled to memory cells along the column, each said memory cell comprising a ferroelectric capacitor having first and second plate electrodes, the

polarization of said capacitors corresponding to the data stored therein, the improvement wherein:

said memory further comprises a plurality of word lines and a plurality of plate lines distinct from said bit lines and word lines, each of the memory cells along a row being coupled to a word line corresponding to the row, each memory cell being coupled also to a corresponding plate line, each plate line being coupled to plate electrodes in a plurality of said cells,

each said memory cell further including a respective switching device located within the memory cell, said first plate electrode of said capacitor in said cell being coupled to its corresponding bit line via said switching device, said switching device being coupled to be controlled by said corresponding word line, said second plate electrode of said capacitor in said cell being coupled to said corresponding plate line.

4,873,665

DUAL STORAGE CELL MEMORY INCLUDING DATA TRANSFER CIRCUITS

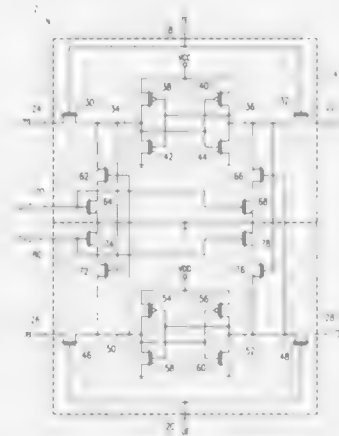
Ching-Lin Jiang, Dallas, and Clark R. Williams, Plano, both of Tex., assignors to Dallas Semiconductor Corporation, Dallas, Tex.

Filed Jun. 7, 1988, Ser. No. 203,424

Int. Cl.⁴ G11C 11/40, 19/00

U.S. Cl. 365—154

12 Claims



- Apparatus for storing data comprising: first and second memory cells, each memory cell having first and second complementary data nodes; first transfer means, coupled to said first and second data nodes of said first memory cell for transferring data into and out of said first memory cell independent of data stored in said second memory cell; second transfer means, coupled to said first and second data nodes of said second memory cell, for transfer data into and out of said second memory cell independent of data stored in said first memory cell; and third transfer means, separate from said first and second transfer means, and coupled to said first and second data nodes of said first and second memory cells, for transferring data between said first and second memory cells; wherein said third transfer means comprises first and second switching means for coupling said first data node of said first memory cell to ground potential when an input terminal coupled to said first switching means and said first data node of said second memory cell, which is coupled to a control input of said second switching means, are both at a first logic state.

4,873,666

MESSAGE FIFO BUFFER CONTROLLER

Martin C. Lefebvre, Ottawa; Carmine A. Ciancibello, and Youssef A. Gendah, both of Nepean, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

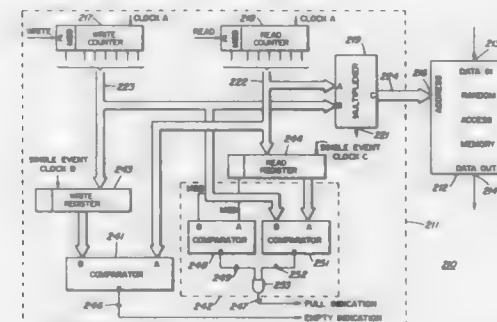
Filed Oct. 15, 1987, Ser. No. 108,655

The portion of the term of this patent subsequent to Oct. 10, 2006, has been disclaimed.

Int. Cl.⁴ G11C 7/00, 8/00

U.S. Cl. 365—189.07

8 Claims



- A control circuit for a FIFO (first in first out) memory circuit for providing address information to a FIFO memory means having an address field of n bits, said control circuit comprising:

- a first means for providing a first binary signal having n+1 bits;
- a second means for providing a second binary signal having n+1 bits;
- a first storage means for selectively receiving and storing the output of said first means;
- second storage means for selectively receiving and storing the output of said second means;
- first comparator means for comparing the output of said first storage means with the output of said second means and producing a first control signal indicative of said comparison; and
- second comparator means for comparing the output of said second storage means with the output of said first means and producing a second control signal indicative of said comparison.

4,873,667

FIFO BUFFER CONTROLLER

Youssef A. Gendah, Nepean, and Martin C. Lefebvre, Ottawa, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Oct. 15, 1987, Ser. No. 108,653

The portion of the term of this patent subsequent to Oct. 10, 2006, has been disclaimed.

Int. Cl.⁴ G11C 7/00, 8/00

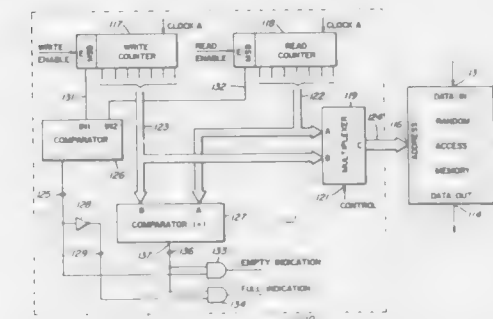
U.S. Cl. 365—189.07

6 Claims

- A control circuit for a FIFO (first in first out) memory circuit for providing address information to FIFO memory means having an address field of n bits, said control circuit comprising:

- a first means for providing a first binary signal having n+1 bits;
- a second means for providing a second binary signal having n+1 bits;
- first comparator means for comparing the most significant bit of said first signal with the most significant bit of said second signal and producing a first control signal indicative of said comparison;
- second comparator means for comparing the n least significant bits of said first signal with the n least significant bits

of said second signal, and producing a second control signal indicative of said comparison;



- logic means, responsive to said first control signal and said second control signal, for producing an indicator signal of said memory circuit being full or not full.

4,873,668

INTEGRATED CIRCUIT IN COMPLEMENTARY CIRCUIT TECHNOLOGY COMPRISING A SUBSTRATE BIAS GENERATOR

Josef Winnerl, Landshut, and Dezső Takacs, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

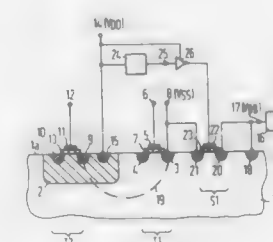
Filed Aug. 17, 1987, Ser. No. 86,295

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1986, 3633301

Int. Cl.⁴ G11C 7/00, 11/40

U.S. Cl. 365—189.09

7 Claims



- In an integrated circuit executed in complementary circuit technology comprising a pair of field effect transistors (T1, T2) of different channel types, said first field effect transistor (T1) being provided in a doped semiconductor substrate (1) of a first conductivity type and at least one second field effect transistor (T2) being arranged in a well-shaped semiconductor zone (2) of a second conductivity type provided in said semiconductor substrate (1), said semiconductor zone adapted to be wired to a supply voltage (VDD), whereby a terminal region (3) of at least one first field effect transistor (T1) is charged with a grounded potential (VSS), the semiconductor substrate adapted to be connected to the output (17) of a substrate bias generator (16) to which the grounded potential and the supply voltage are supplied and which biases the p-n junction between the terminal region (3) of the first field effect transistor lying at ground potential and the semiconductor substrate (1) in non-conducting direction, the combination comprising: an electronic switch for connecting the output (17) of the substrate bias generator (16) to ground potential for a predetermined time after said supply voltage (VDD) is applied; and a time delay circuit connected between said electronic switch and said supply voltage (VDD) for opening said

switch in response to said supply voltage after said predetermined time.

4,873,669

RANDOM ACCESS MEMORY DEVICE OPERABLE IN A NORMAL MODE AND IN A TEST MODE

Kiyohiro Furutani; Koichiro Mashiko; Kazutami Arimoto; Noriaki Matsumoto, and Yoshio Matsuda, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

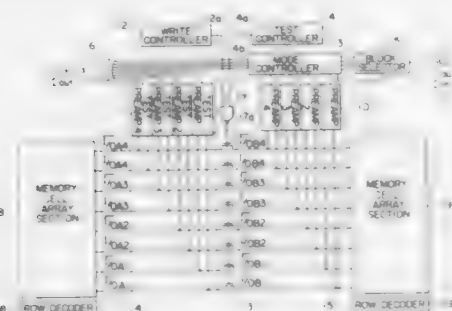
Filed Jul. 24, 1987, Ser. No. 77,306

Claims priority, application Japan, Jul. 30, 1986, 61-179741

Int. Cl. G11C 7/00, 11/40

U.S. Cl. 365—189.01

9 Claims



1. A semiconductor memory device operable for reading and writing in a normal mode and in a test mode comprising, two memory cell sections each having an identical number of blocks in the memory cell sections,

data bus lines connected to respective ones of the blocks, switch means for interconnecting data bus lines connected to blocks of different ones of the memory cell sections comprising switches associated with each of the data bus lines connected to the plurality of memory cell sections, the switches being configured so as to connect each other to the data bus lines connected to each of the memory cell sections,

switch control means for causing the switch means to be conductive during reading and writing in the normal mode and during writing in the test mode, and causing the switch means to be nonconductive during reading in the test mode,

first output means connected to the data bus lines that are connected to the blocks of one of the memory cell sections for applying input data onto the data bus lines for writing in the blocks of the section simultaneously during writing in the normal mode and in the test mode, and for outputting the data read out of the blocks of the sections during reading in the normal mode, and for outputting the data read out of the blocks of said one of the sections during reading in the test mode, and

second output means connected to the data bus lines that are connected to the blocks of at least one of the memory cell sections other than said one of the memory cell sections, for outputting the data read out of the memory cell blocks of the at least one of the memory cell sections during the reading in the test mode.

4,873,670 COMPLEMENTARY SEMICONDUCTOR MEMORY DEVICE WITH PULL-UP AND PULL DOWN

Yasunori Tanaka, Yokohama, and Hideo Hashimoto, Tokyo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki and Tosbac Computer System Co., Ltd., Tokyo, both of, Japan

Filed Jun. 13, 1986, Ser. No. 873,963

Claims priority, application Japan, Jun. 18, 1985, 60-130867

Int. Cl. G11C 7/00, 11/40

U.S. Cl. 365—189.11

4 Claims



1. A master slice type semiconductor memory device, comprising:

a plurality of basic cells, each constituted by p- and n-channel MOS transistors, formed as a gate array on a CMOS master slice chip;

first and second power terminals;

a plurality of word lines;

a plurality of bit lines; and

a memory section including a plurality of said p- and n-channel MOS transistors, each of said MOS transistors having a gate connected to a corresponding one of said word lines, a drain connected to a corresponding one of said bit lines, and a source selectively connected to one of said first and second power terminals to form a memory cell which is driven via the corresponding word line and supplies a potential of said one power terminal to the corresponding bit line as preset data,

in which said plurality of bit lines includes a first bit line dedicated to connection with the n-channel MOS transistors and a second bit line dedicated to connection with the p-channel MOS transistors, the memory device further comprising a pull-up compensation circuit for pulling up an output potential of said first bit line and a pull-down compensation circuit for pulling down an output potential of said second bit line.

4,873,671 SEQUENTIAL READ ACCESS OF SERIAL MEMORIES WITH A USER DEFINED STARTING ADDRESS

Vikram Kowshik, San Jose; Sudhakar Boddur, Sunnyvale, and Elroy M. Lucero, San Jose, all of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Jan. 28, 1988, Ser. No. 149,399

Int. Cl. G11C 7/00, 8/00

U.S. Cl. 365—189.12

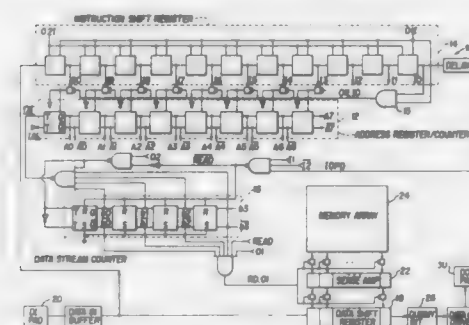
4 Claims

1. Apparatus for reading a sequential series of storage registers within a memory array wherein the memory array includes a plurality of storage registers organized for read access by having sequential binary addresses associated therewith, each storage register having capacity for storing data comprising a plurality of data bits, the apparatus comprising:

(a) address register/counter means for storing a binary address which is used to access a preselected storage register

within the memory array to serially read the data bits from the preselected storage register, the address register/counter means including means for incrementing the stored binary address by 1 upon receipt of an increment signal; and

(b) means for determining that all of the plurality of data bits stored in the preselected storage register have been read



from the preselected storage register and for generating the increment signal in response to said determination such that data is read from storage registers within the memory array having sequential binary addresses, whereby the apparatus automatically initiates a read of a sequence of storage registers in the array, the read sequence comprising a variable number of storage registers.

4,873,672 DYNAMIC RANDOM ACCESS MEMORY CAPABLE OF FAST ERASING OF STORAGE DATA

Jun Etoh, Hachioji; Katsuhiko Shimohigashi, Musashimurayama; Kazuyuki Miyazawa, Iruma; Katsutaka Kimura, Akishima, and Takesada Akiba, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Device Engineering Co., Ltd., Mobera, both of, Japan

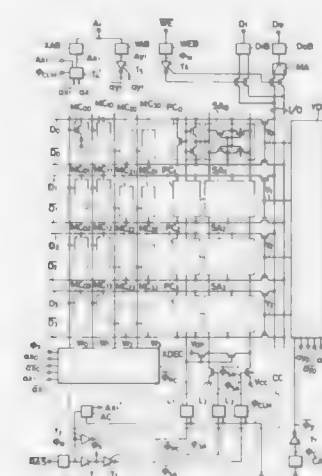
Filed May 20, 1987, Ser. No. 51,715

Claims priority, application Japan, May 21, 1986, 61-114640

Int. Cl. G11C 7/00

U.S. Cl. 365—218

15 Claims



1. A semiconductor dynamic random access memory comprising:

a plurality of word lines;

a plurality of data lines arranged in such a manner as to cross said word lines;

memory cells electrically connected to said word lines and to said data lines;

sense amplification circuits coupled to said data lines, respectively; selection means for selecting one of said word lines; means for selecting one of said data lines; means for writing predetermined data into said memory cells by use of said data lines; means for providing a control signal for controlling an operation of erasing storage data stored in the memory cells; means for precharging said data lines; means for sequentially selecting and driving said word lines responding to the control signal while the storage data is erased; and

control circuit means for holding said sense amplification circuits under an on-state responding to the control signal while said word lines are sequentially selected and driven, while the storage data is erased,

wherein said control circuit means comprises:

a data line precharge signal control circuit for controlling said precharge means to be in an off-state while the storage data is erased, responding to the control signal;

a sense amplifier control circuit for controlling the sense amplification circuits to be in their on-states while the storage data is erased, responding to the control signal.

4,873,673 DRIVER CIRCUIT HAVING A CURRENT MIRROR CIRCUIT

Ryoichi Hori, Tokyo; Kiyoo Itoh, Higashikurume; Goro Kitakawa, Tokyo; Yoshiki Kawajiri, Hachioji; Takao Watanabe, and Takayuki Kawahara, both of Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 30, 1987, Ser. No. 126,485

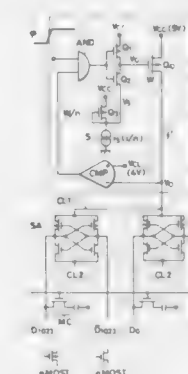
Claims priority, application Japan, Dec. 3, 1986, 61-286610;

Feb. 20, 1987, 62-35519; Jul. 8, 1987, 62-168652

Int. Cl. G11C 8/00, 7/00; H03K 3/01

U.S. Cl. 365—230.06

11 Claims



1. A driver circuit characterized by including at least one current mirror circuit which is controlled by a pulse input signal and an output current of which drives a load, wherein said current mirror circuit includes a first MOS transistor and a second MOS transistor, the sources of said first MOS transistor and said second MOS transistor being supplied with an operating potential, the drain of said first MOS transistor being connected electrically to said load to be driven by said output current, the gate and the drain of said second MOS transistor being electrically connected to a current source, and the gate of said first MOS transistor and the gate of said second MOS transistor being connected electrically to one another through first means which is controlled by said pulse signal.

4,873,674

CORROSION RESISTANT BRONZE ALLOYS AND GLASS MAKING MOLD MADE THEREFROM
 Thomas W. McCausland, Brockway, Pa., assignor to O-I Brockway Glass, Inc., Toledo, Ohio

Filed Feb. 24, 1989, Ser. No. 315,104
 Int. Cl.⁴ C22C 9/06; C03B 11/00

U.S. Cl. 65—374.12

11 Claims

1. An aluminum bronze alloy for glassmaking molds, the alloy having the following ingredients in approximate percent by weight:

	BG-650
Aluminum (%)	8.0-12.0
Nickel (%)	12.0-18.0
Iron (%)	1.0-6.0
Manganese (%)	0.5-6.0
Silicon (%)	0.1-2.0
Copper	balance

and the alloy having the following properties:

Tensile Strength (psi)	75,000-100,000
Yield Strength (psi)	35,000-60,000
Elongation (%)	1.0-6.0
Hardness (BHN)	175-250
Thermal Conductivity	36-40

at 850° F. (BTU/hr/ft²/ft²°F.), the alloy being corrosion resistant and resistant to pitting from contact with hot glass.

10. A method of making a glass making mold member, the method comprising: forming the mold member from a bronze alloy composition consisting essentially of the following ingredients in approximate percent by weight:

Ingredients	Percent by weight
Aluminum	8-12
Nickel	12-18
Iron	1-6
Manganese	0.5-6
Silicon	0.1-2.0
Copper	balance

4,873,675

METHOD AND APPARATUS FOR SEISMIC EXPLORATION OF STRATA SURROUNDING A BOREHOLE

Frederick J. Barr, Jr., Houston; Thomas R. Beasley, Katy, and Richard H. Piggin, Fort Worth, all of Tex., assignors to Halliburton Logging Services, Inc., Houston, Tex.

Filed Jan. 10, 1988, Ser. No. 205,291

Int. Cl.⁴ G01V 1/40, 1/20

U.S. Cl. 367—57

13 Claims

1. An apparatus for seismic exploration of the strata adjacent to a well borehole during drilling of that borehole, the apparatus comprising:

- a drill bit disposed within a borehole at the lower end of a drill string;
- a first geophone disposed supported by said drill string proximate to said drill bit;
- a jar means incorporated along said drill string above said drill bit for selectively applying an impact to said drill bit;
- a shock absorbing joint so incorporated along said drill string above said jar mechanism wherein operation of said jar means creates an impact and said shock absorbing means prevents impact propagation up said drill string;
- geophones operatively disposed on the surface of the earth in the vicinity of said borehole;
- a seismic recording device coupled to said geophones disposed on the surface of the earth and said first geo-

phone for recording the impact and seismic waves resultant therefrom;

- (g) mating separable electrical connectors operable in drilling fluid, one of said connectors being connected to said first geophone located in said drill string for connection with the other of said connectors; and



- (h) a cable supporting the other of said electrical connectors sufficiently long to enable electrical connection through said drill string to provide a signal from said first geophone to said seismic recording device.

4,873,676

SONAR DEPTH SOUNDER APPARATUS

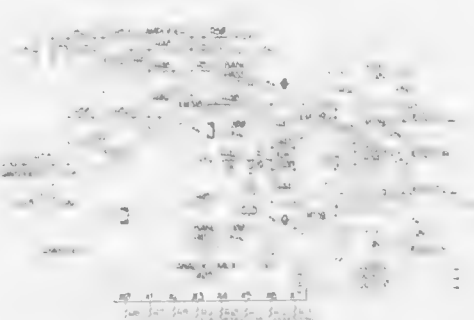
James B. Bailey, Abbeville; Robert R. Gibson, Eufaula; Alvin Nunley, III, Eufaula, and Q. Wayne Utz, Eufaula, all of Ala., assignors to Techsonic Industries, Inc., Lake Eufaula, Ala.

Division of Ser. No. 745,133, Jun. 14, 1985. This application Jul. 28, 1987, Ser. No. 78,871

Int. Cl.⁴ G01S 15/08, 15/96

U.S. Cl. 367—98

25 Claims



1. An improved variable sensitivity sonar receiver for use in an echo ranging depth sounder, comprising:

fixed gain amplifier means responsive to amplify an input signal at a predetermined gain to provide an amplified output signal, said amplifier means comprising a pair of cascaded amplifier stages, each of said amplifier stages operative to amplify an input signal at a predetermined gain, one of said amplifier stages being operative to amplify the output signal provided by the other one of said amplifier stages to provide a high gain output signal and other one of said amplifier stages being operative to amplify said input signal to provide a low gain output signal; comparator means for providing a comparator output signal when said amplified output signal exceeds a threshold signal, said comparator means comprising a first comparator and a second comparator,

said first comparator being operative to receive said high gain output signal and said second comparator being operative to receive said low gain output signal, each of said comparators providing said comparator output signal when the magnitude of its respective amplifier output signal exceeds the magnitude of said threshold signal; means responsive to said comparator output signal for providing a target detection signal; and means responsive to said target detection signal for varying said threshold signal as a function of a number of said target detection signals received.

4,873,677

CHARGING APPARATUS FOR AN ELECTRONIC DEVICE

Kenji Sakamoto; Nobuo Ishikawa, and Motomu Hayakawa, all of Suwa, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

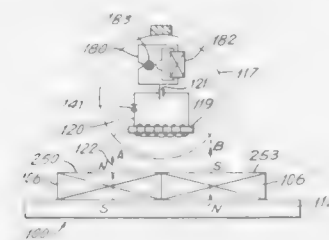
Filed Jul. 7, 1988, Ser. No. 216,914

Claims priority, application Japan, Jul. 10, 1987, 62-106457[U]; Jul. 15, 1987, 62-176399; Jul. 15, 1987, 62-176400; Jul. 15, 1987, 62-176401

Int. Cl.⁴ G04C 10/04; H01M 10/44

U.S. Cl. 368—204

36 Claims



36. A method for charging a power storage device provided within an electronic device which also includes at least one secondary coil, said method comprising:

placing the electronic device at a predetermined position on a surface of a casing of a charging apparatus with the at least one secondary coil near said surface; positioning a pair of primary coils and a coil yoke at a predetermined position within the casing; generating an oscillating signal; and switching the direction of direct current flow through the primary coils in response to the oscillating signal so as to induce an alternating current in the at least one secondary coil for charging the power storage device whereby during charging of the power storage device substantially all of the magnetic flux of the magnetic field produced by the pair of primary coils flows through at least one secondary coil and the coil yoke.

4,873,678

OPTICAL HEAD AND OPTICAL INFORMATION PROCESSOR USING THE SAME

Shigeru Nakamura, Tachikawa; Sadatsugi Machida, Hachioji, and Tsuyoshi Toda, Kodaira, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

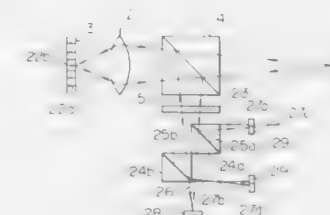
Filed Dec. 9, 1987, Ser. No. 130,637

Claims priority, application Japan, Dec. 10, 1986, 61-292307; Mar. 18, 1987, 62-61022

Int. Cl.⁴ G11B 11/12, 7/09, 7/12

U.S. Cl. 369—13

20 Claims



1. An optical head comprising: a light source; focusing means for focusing a light beam which is emitted from said light source, on an information medium; beam separating means for isolating at least part of a light beam which is reflected from said information medium, from the light beam emitted from said light source; beam splitting means including a first polarized-light separating film, said first polarized-light separating film being illuminated with about a half of a light beam isolated by said beam separating means; and light detecting means including first and second photodetectors, said first photodetector being used to receive a first light beam reflected from said first polarized-light separating film, said second photodetector being used to receive a second light beam passing through said first polarized-light separating film, at least one of said first and second photodetectors being separated into a pair of light detecting elements.

4,873,679

OPTICAL INFORMATION RECORDING DISK AND OPTICAL INFORMATION RECORDING DISK APPARATUS

Katsumi Murai, Kyoto, and Makoto Usui, Suita, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 21, 1987, Ser. No. 135,453

Claims priority, application Japan, Dec. 25, 1986, 61-311358; Dec. 25, 1986, 61-311359; Dec. 25, 1986, 61-311360

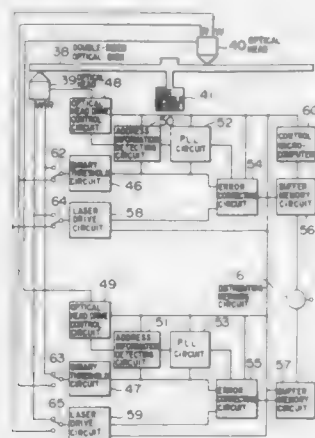
Int. Cl.⁴ G11B 7/007

U.S. Cl. 369—32

6 Claims

5. An optical information recording disk apparatus comprising: an optical information recording disk having address information section on tracks for identifying the location where information is recorded, first information recording sections provided at a constant angular interval on said tracks, and partitioned information sections provided by dividing part or all of said first information recording sections, said partitioned information sections having each a length longer than a predetermined length and having a maximum allowable number of divisions per said first information recording section determined depending on the radius of track; at least one pair of heads for writing or reading information on said optical information recording disk; means for converting information read out of said optical information recording disk into binary information; a buffer memory for storing binary information written or read by said heads; means for rotating said optical information recording disk at a constant angular velocity; means for identifying said address information; and means for

recording a constant quantity of information per said partitioned information section, wherein said pair of heads access to different tracks, with a sum of numbers of divisions of said first information recording sections being a constant value, and, at recording, binary information to be recorded in quantity equivalent to said sum of divisions is written into said buffer memory during each certain angular revolution of said disk and, thereafter the binary information is read out of said buffer memory



and supplied to said partitioned information sections distributively for said head pair depending on said division number, and, at reproduction, information picked up by said pair of heads is converted into binary information and written in said buffer memory and binary information in quantity equivalent to said sum of division numbers is read out of said buffer memory during said angular revolution of said optical information recording disk.

4,873,680

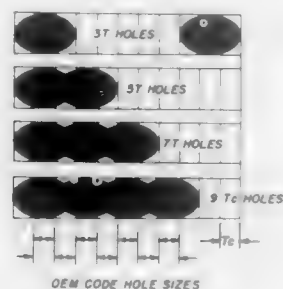
APPARATUS AND METHOD FOR DETECTING AND COMPENSATING FOR PIT EXTENSION IN AN OPTICAL DISK RECORDING SYSTEM

Chi H. Chung, San Jose; Theodore D. Rees, Mountain View, and Ian Turner, Sunnyvale, all of Calif., assignors to Laserdrive Ltd., Santa Clara, Calif.

Filed Mar. 13, 1987, Ser. No. 25,394
Int. Cl.⁴ G11B 7/007

U.S. Cl. 369—59

15 Claims



1. In a system for storing encoded binary data bits in an optical recording medium, including encoding means for converting each of said data bits into a code word comprising one or more code bits, writing means for writing said code bits in the form of a series of pits on said optical recording medium by generating write pulses of laser light energy, and reading means for detecting the edge transitions of pits formed on said optical recording medium, the improvement comprising:
medium certification means for determining the pit extension characteristics of said medium, including means for gener-

ating one or more test write pulses each having a predetermined on time, said write pulses causing corresponding pits to be formed on a selected segregated areas of said medium during a first time session before the recording of data, and comparator means for detecting the time duration difference between the on time of said predetermined test write pulses and the duration of the leading edge transition to trailing edge transition of the corresponding pit formed on said medium as read by said reading means; and

pit extension compensation means for modifying the duration of each subsequent write pulse written on a selected area of said medium other than said selected segregated area during a second time session, as a function of said duration difference detected by said comparator means.

4,873,681

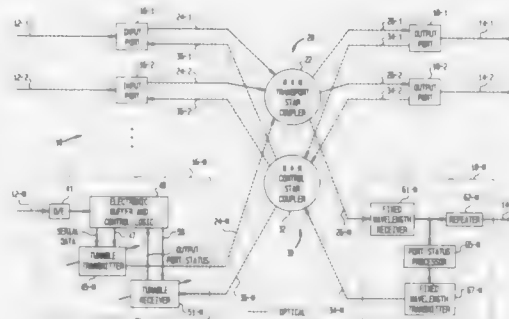
HYBRID OPTICAL AND ELECTRONIC PACKET SWITCH

Edward Arthurs, Summit; Matthew S. Goodman, Belle Mead; Haim Kobrinski, Andover, and Mario P. Vecchi, Morris Plains, all of N.J., assignors to Bell Communications Research, Inc., Livingston, N.J.

Filed Jan. 26, 1988, Ser. No. 147,445
Int. Cl.⁴ H04B 9/00

U.S. Cl. 370—3

12 Claims



6. A hybrid optical and electronic packet switch for routing data packets from specific incoming optical fiber trunks to specific outgoing optical fiber trunks, said packet switch comprising:

- a plurality of output ports connected to said outgoing optical fiber trunks,
 - a plurality of input ports connected to said incoming optical fiber trunks, said input ports including electronic circuit means for storing said packets and for processing status information received from said output ports,
 - a first internally collisionless optical network for simultaneously transmitting a plurality of said packets in optical form from specific ones of said input ports to specific ones of said output ports, and
 - a second optical network for transmitting said status information from said output ports to said input ports so that said input ports can determine when packets may be transmitted to specific output ports without two packets being transmitted to the same output port at the same time, wherein each of said input ports comprises
- an optical-to-electronic converter for converting incoming packets into bit-serial electronic form,
a serial-to-parallel converter for converting said packets from serial to parallel form,
a buffer for storing said packets in parallel form,
decoding means for decoding address information contained in said packets,
a tunable optical transmitter, said optical transmitter being tunable to a specific wavelength based on said address information, and
means for reading said packets from said buffer and for

converting said packets into serial form so that said packets can be modulated onto the specific wavelength to which said transmitter is tuned.

4,873,682

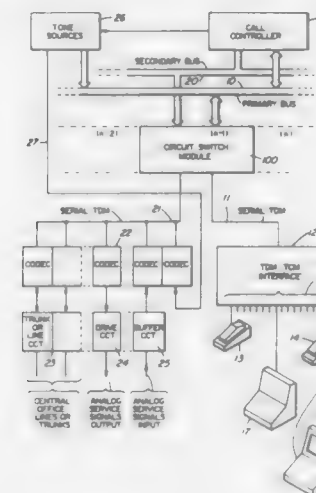
DIGITAL KEY TELEPHONE SYSTEM

George F. Irwin, Kanata; Paul J. Smelters; David J. Robertson, both of Ottawa, and Ronald J. Maginley, Ann Arbor, Mich., assignors to Northern Telecom Limited, Montreal, Canada

Filed Nov. 30, 1987, Ser. No. 126,710
Int. Cl.⁴ H04Q 11/04

U.S. Cl. 370—58.1

11 Claims



1. A digital key telephone system for providing communication paths, as directed by a call controller, between digital signal communications (DSC) terminals via line appearances provided by corresponding digital signal ports, the digital key telephone system comprising:

- a time division multiplex (TDM) serial transmission path, being connected to a predetermined plurality of said digital signal ports, for providing a predetermined plurality of time division multiplex transmit (TDMT) and receive (TDMR) channels in fixed pair relationship with each of the said digital signal ports, the TDMT and TDMR channels residing in respective transmit and receive serial bit streams, and being of a fixed time slot interval for transmission of a fixed plurality of bit occurrences in excess of a predetermined plurality of m information bits;
- a first transmission bus including a plurality of at least m parallel signal paths;
- timing means for defining predetermined TDM frame intervals and channel occurrences, in the TDM serial transmission path, and for defining time slot occurrences being a whole number multiple of said channel occurrences during one of said frame intervals, in relation to the first TDM parallel bus, in response to timing signals from the call controller;
- a circuit switch module being connected between the TDM serial transmission path and the first transmission bus and comprising:
- a module transmission bus including a plurality of m parallel signal paths;
- conversion circuit means for transferring the TDMT serial bit stream states of each channel occurrence to one of the first and module transmission buses and for transferring bit states of the m parallel signal paths of the other of said first and module transmission buses to the TDMR serial bit stream during corresponding channel occurrences;
- time switch means, being connected between the first transmission bus and the module transmission bus, for storing digital bit states, from one of the first bus and the module bus said

bit states being those occurring during time slot intervals having been defined by the call controller, and transferring the stored bit states to the other of said buses in response to the defined channel occurrences from the timing means.

4,873,683

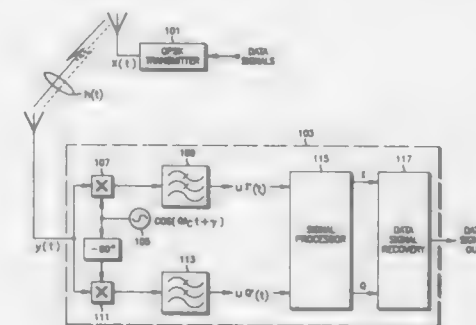
TDMA RADIO SYSTEM EMPLOYING BPSK SYNCHRONIZATION FOR QPSK SIGNALS SUBJECT TO RANDOM PHASE VARIATION AND MULTIPATH FADING

David E. Borth, Palatine; Chih-Fei Wang, Arlington Heights; Duane C. Rabe, Rolling Meadows, and Gerald P. Labedz, Chicago, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 4, 1987, Ser. No. 128,677
Int. Cl.⁴ H04J 3/16; H04B 1/10

U.S. Cl. 370—95.1

13 Claims



1. A quadrature phase shift keying (QPSK) time division multiple access (TDMA) radio system conveying a data signal comprising a synchronizing portion and a message portion in a timeslot over a radio channel which introduces multipath distortion and phase variation in the data signal, the system comprising:

- means for transmitting a synchronizing portion consisting of a plurality of data bits in a predetermined pattern in only one vector of the data signal;
- means for receiving the data signal subjected to multipath distortion and phase variation; and
- means, responsive to said one vector synchronizing portion of a received data signal, for compensating the multipath distortion and phase variation of the message portion of said received data signal for the duration of one TDMA timeslot.

4,873,684

METHOD AND APPARATUS FOR MULTIPLEXING OF INPUT SIGNALS HAVING DIFFERING FREQUENCIES AND DEMULTIPLEXING SAME

Hirokazu Kobayashi, Gyoda; Yukihiko Miyamoto, Tama; Masaaki Takai, Tokyo; Syuichi Fujisawa, Tokyo, and Hiroshi Miyazawa, Tokyo, all of Japan, assignors to Trio Kabushiki Kaisha and Nippon Hoso Kyokai, both of Japan

Continuation of Ser. No. 868,036, May 29, 1986, abandoned.
This application Sep. 19, 1988, Ser. No. 246,923
Claims priority, application Japan, May 29, 1985, 60-114357; May 29, 1985, 60-114358; Sep. 18, 1985, 60-204519

Int. Cl.⁴ H04J 3/07

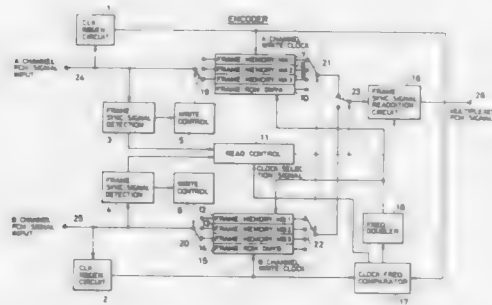
U.S. Cl. 370—102

7 Claims

1. A time division multiplex transmission system for time division multiplexing of a plurality of information signals each having information coded in a predetermined frame format and having either different sampling frequencies or clock signals frequencies, to form a resultant time division multiplexed signal having a predetermined frequency, and transmitting the

resultant time division multiplexed signal by one transmission path, comprising the steps of:

rearranging said plurality of information signals so as to have a time division multiplexed signal format, by selecting a reference signal having a frequency corresponding to a frequency which is at least equal to a product of one of (a) the maximum frequency among said sampling frequencies, or (b) the maximum clock signal frequencies of said plurality of information signal, multiplied by the number of said plurality of information signals;



4,873,685

SELF-CHECKING VOTING LOGIC FOR FAULT TOLERANT COMPUTING APPLICATIONS

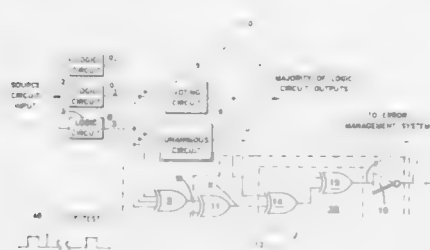
Hugh L. Millis, Jr., Placentia, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed May 4, 1988, Ser. No. 190,311

Int. Cl.⁴ G06F 11/00

U.S. Cl. 371-36

11 Claims



1. An apparatus comprising in combination:

a voting circuit means for producing a voting circuit output signal based upon a majority value of triplicated logic output signals 01, 02, and 03;

a unanimous circuit means for producing a unanimous circuit output signal representing whether or not all of said triplicated logic output signal values are equal or not; and

a self-checking means for monitoring operational validity of said voting and said unanimous circuit means, and said self-checking means, said self-checking, voting, and unanimous circuit means operating independently from triplicated logic circuits producing said triplicated logic output signals, and said self-checking circuit means receiving said output signals 01, 02, and 03, said voting circuit output signal, and said unanimous circuit output signal.

TEST ASSIST CIRCUIT FOR A SEMICONDUCTOR DEVICE PROVIDING FAULT ISOLATION

Tetsuo Tada, and Tsuyoshi Yamada, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

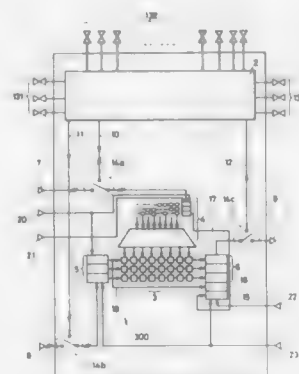
Filed Jan. 11, 1988, Ser. No. 142,557

Claims priority, application Japan, Jan. 14, 1987, 62-6982

Int. Cl.⁴ G06F 11/00

U.S. Cl. 371-22.4

12 Claims



7. In a test assist circuit for a semi-conductor device, said test assist circuit being contained in said semi-conductor device, said semi-conductor device having a memory circuit for storing multi-bit data and a logic circuit for independently testing said memory circuit, disconnecting means for disconnecting said memory circuit from said logic circuit, addressing means for addressing said memory circuit on the basis of a multiple-bit address signal, input data storage means for storing multiple-bit input data and supplying the same to said memory circuit, and output data storage means for storing multiple-bit data outputting from said memory circuit,

the improvement wherein, said output data storage means further includes, means for storing at least one of at least single-bit information within said multiple-bit address signal and at least single-bit information contained within said multiple-bit input data, and means for controlling said output data storage means such that,

said at least one of (a) said at least single-bit information contained within said multiple-bit address signal and (b) said at least single-bit information contained within said multiple-bit input data is outputted with said multiple-bit data outputted from said memory circuit.

4,873,687

FAILING RESOURCE MANAGER IN A MULTIPLEX COMMUNICATION SYSTEM

Wendy W. Brea, Mountain View, Calif., assignor to IBM Corporation, Armonk, N.Y.

Filed Oct. 5, 1987, Ser. No. 105,771

The portion of the term of this patent subsequent to Mar. 28, 2006, has been disclaimed.

Int. Cl.⁴ G06F 11/32; H04B 3/46

U.S. Cl. 371-8.2

11 Claims

1. A method to analyze errors in a system, the system having a plurality of resources with replaceable units, a display, a processor, and memory means for storing decision trees, data structures, failing resource manager tasks and error analysis tasks, the resources including a diagnostics card having a processor and memory means for storing resource analysis tasks, and communication resources, the method comprising the steps of:

(a) testing said resources intermittently by said error analysis tasks invoking a card analysis task on said diagnostics card

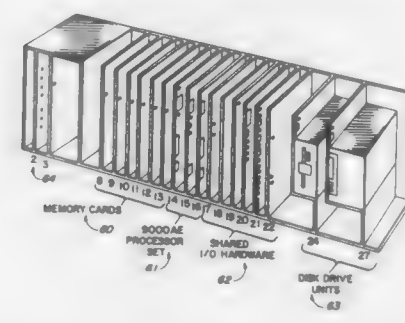
to test for an error in said communication resources in said system;

(b) detecting an error and invoking an appropriate error analysis tasks to further diagnose the cause of said error;

(c) isolating said error to a replaceable unit by automatically traversing said decision trees in said error analysis tasks on said diagnostics card;

(d) writing data to record said error in said data structure in said memory of said system;

(e) retesting said replaceable unit by automatically travers-



ing said decision trees in said error analysis tasks on said diagnostics card;

(f) removing said replaceable unit from service if said retest detects said error;

(g) retesting said replaceable unit by automatically traversing said decision trees in said error analysis tasks on said diagnostics card to detect a return to normal operation;

(h) returning said replaceable unit to service if said error is not detected; and

(i) displaying a message indicative of said error on said display of said system.

4,873,688

HIGH-SPEED REAL-TIME REED-SOLOMON DECODER

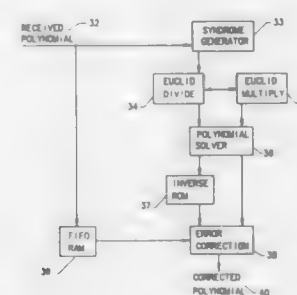
Gary K. Maki; Kelly B. Cameron, and Patrick A. Owsley, all of Moscow, Id., assignors to Idaho Research Foundation, Moscow, Id.

Filed Oct. 5, 1987, Ser. No. 105,401

Int. Cl.⁴ G06F 11/10

U.S. Cl. 371-37.1

13 Claims



1. A Galois Field decoder for correcting an error in a received message comprising:

a. means for calculating a magnitude polynomial representing a portion of a magnitude of said error in said received message;

b. means for calculating a location polynomial representing a location of said error in said received message, said location polynomial having a first derivative polynomial;

c. means for calculating the first derivative polynomial of said location polynomial, said first derivative having a plurality of non-zero values, each of said non-zero values having an inverse;

d. means for calculating said inverse values;

e. means for multiplying each of said inverse values with a value of said magnitude polynomial for forming a correction polynomial; and

f. means for correcting said received message by combining the received polynomial with the correction polynomial.

4,873,689

METHOD AND APPARATUS FOR COLLECTING ERRORS IN THE DIGITAL DATA OF A TELEVISION SIGNAL

Daniel Pellerin, Versailles, France, assignor to U.S. Philips Corporation, New York, N.Y.

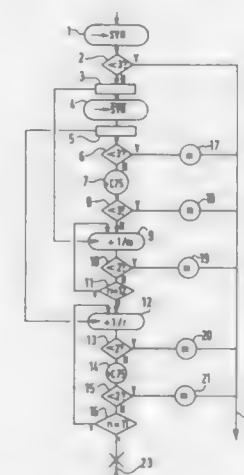
Filed Jun. 6, 1988, Ser. No. 203,405

Claims priority, application France, Jun. 16, 1987, 87 08370

Int. Cl.⁴ G06F 11/00

U.S. Cl. 371-37.1

5 Claims



1. A method of correcting in a television receiver errors in a number less than four in digital data received with the television signal and coded according to a cyclic so-called Golay code comprising a word of 12 bits representing a message and a word of 11 bits which is the residue of the Euclidean division of the message by a word designated as "generating polynomial", and which provides for a redundancy, in which there is started to establish from the code as received a particular word designated as "syndrome", which represents the difference between the redundancy as received and that which would have to correspond to the message received, and permits of affirming that the message does not contain errors if the syndrome comprises at most three "1" bits, that is to say that it differs by at most three bits from that which would be obtained in the absence of errors, characterized in that, if the syndrome comprises more than three bits, a series of operations are carried out, each of which can provide the solution, in which event the following operations are not carried out, and which consists of the following tests:

from the redundancy word received, for which there are two corresponding messages capable of forming with it a correct code, it is determined for each of the two corresponding message words whether it differs by more than three bits from the message word received, in which event this corresponding word is the correct one;

each of the twelve bits of the message word received is modified in turn and each time it is determined whether the syndrome of the complete code received provided with the modified message comprises more than two bits, in which event the modified message word received is the correct one;

each of the bits of the redundancy word received is modified in turn and it is determined each time by each of the two corresponding message words whether it differs by more

than two bits from the message word received, in which event this corresponding message word is the correct one.

4,873,690

OPTICAL SWITCH

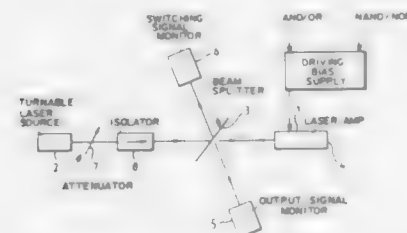
Michael J. Adams, Ipswich, United Kingdom, assignor to British Telecommunications public limited company, Great Britain
PCT No. PCT/GB87/00905, § 371 Date Aug. 10, 1988, § 102(e)
Date Aug. 10, 1988, PCT Pub. No. WO88/04791, PCT Pub.
Date Jun. 30, 1988

PCT Filed Dec. 14, 1987, Ser. No. 230,837

Claims priority, application United Kingdom, Dec. 15, 1986,
860111

Int. Cl.⁴ H01S 3/30

U.S. Cl. 372—8



1. An optical switch comprising:

- a semi-conductor or optical amplifier having optical input and output ports located at a common end of an amplifier cavity,
- means for coupling a detuned optical input switching signal to the amplifier, and
- means for applying a driving electrical current to the amplifier, which driving current is selected to have either one of at least two different values, at a first value of which driving current the optical amplifier is operated as an AND/OR logic gate for input optical signals and at a second value of which driving current the optical amplifier is operated as a NAND/NOR logic gate for input optical signals.

4,873,691

WAVELENGTH-TUNABLE SEMICONDUCTOR LASER

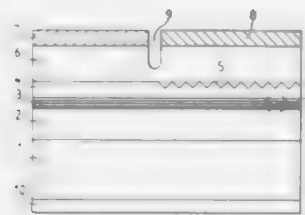
Kazuhisa Uomi, Hachioji, Japan; Shinji Tsuji, Red Bank, N.J.;
Shinji Sakano, Hachioji, Japan; Makoto Okai, Koganei, Japan,
and Naoki Chinone, Chofu, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 27, 1988, Ser. No. 224,726

Claims priority, application Japan, Jul. 31, 1987, 62-190040

Int. Cl.⁴ H01E 3/19

U.S. Cl. 372—20



1. In a wavelength-tunable semiconductor laser comprising an active part having an active layer, and an external waveguide part having a diffraction grating, the improvement comprising wherein the external waveguide part includes a quantum well structure with at least one quantum well layer in addition to said diffraction grating, the quantum well structure being optically coupled to the diffraction grating, the external

waveguide part including means for applying an electric field to the quantum well structure.

4,873,692

PULSED TUNABLE SOLID STATE LASER

Bertram C. Johnson, Sunnyvale; John C. DiFonzo, San Mateo,
and Richard L. Herbst, Palo Alto, all of Calif., assignors to Spectra-Physics, San Jose, Calif.

Filed Aug. 12, 1988, Ser. No. 231,726

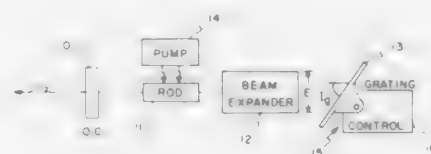
Int. Cl.⁴ H01S 3/10

U.S. Cl. 372—20

9 Claims

U.S. Cl. 372—20

35 Claims



1. An apparatus, comprising:

- a solid state laser medium, coupled with an energy source, for amplifying a beam of coherent radiation along an optical path;
- a beam expander mounted along the optical path, having a first side facing the laser medium and a second side, for expanding the beam incident at the first side and transmitted out the second side in a first direction perpendicular to the optical path and for focusing a beam incident at the second side and transmitted out the first side;
- a grating, mounted along the optical path facing the second side of the beam expander at an adjustable angle of incidence for reflecting the expanded beam incident on the grating, the grooves in the grating being essentially perpendicular to the first direction and to the optical path; and
- means, connected to the grating, for adjusting the adjustable angle of incidence.

4,873,693

APPARATUS AND METHOD FOR SUPPRESSING DIFFRACTION RINGS IN A LASER

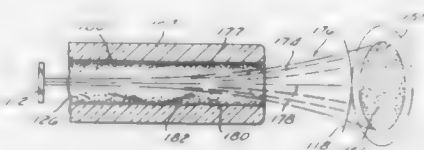
Benjamin H. Cook, Jr., Fallbrook, Calif., assignor to Melles Griot San Marcos Company, Carlsbad, Calif.

Division of Ser. No. 108,550, Oct. 14, 1987, Pat. No. 4,827,484.
This application Nov. 30, 1988, Ser. No. 277,883

Int. Cl.⁴ H01S 3/00

U.S. Cl. 372—33

2 Claims



1. A method of manufacturing a gas laser having an envelope for containing a laser gas and a tube in said envelope which surrounds an optical path, said method comprising flowing a substance through said tube to roughen interior surfaces of said tube such that diffraction rings in light output from said laser are suppressed.

4,873,694

SWITCHING CONFIGURATION FOR PCM TIME DIVISION MULTIPLEX TELEPHONE EXCHANGE HAVING A CENTRAL SWITCHING NETWORK AND INDIVIDUAL SUB-SWITCHING NETWORKS

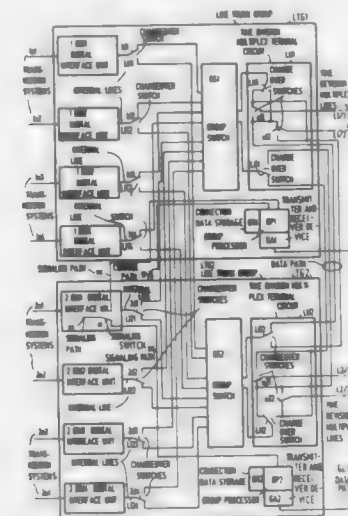
Lothar Schmidt, Fuerstenfeldbruck, and Alfred Jugel, Geretsried, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany
Filed Sep. 22, 1988, Ser. No. 247,998

Claims priority, application Fed. Rep. of Germany, Oct. 6, 1987, 3733765

Int. Cl.⁴ H04Q 11/04

U.S. Cl. 370—58.1

12 Claims



1. A switching system for a centrally controlled PCM time division multiplex telephone exchange, in which a central switching network provides connections and a central processor provides control and switching signal processing, and including a plurality of individual line groups having a sub-switching network for external connection of interexchange trunks or subscriber lines and having an individual control unit for receiving switching signals from said lines, for switching signal preprocessing and for switching signal transfer to the central processor and for switching signal transmission to said lines, and in which said plurality of individual line groups of the sub-switching networks are connected internally via groups of link lines groupwise separated to switching network connections of the central switching network, and in which the line groups are assigned pairwise to each other, and within each of said line groups line units provide external connection of said subscriber lines and/or said interexchange trunks; and wherein a particular line group is connected via internal lines to the sub-switching network of a first of two groups is additionally connectable to the sub-switching network of the other of said two groups, a partner line group, whereupon for connections, via a line unit of the first line group the corresponding switching signal processing and sub-switching network setting is controlled by the individual control unit of the second line group, the improvement comprising:

means for switching over said internal lines within the line group leading from a line system within one of said pairwise assigned line groups to its sub-switching network within a diversion phase individual to the connection to the sub-switching network of the other said line group, such that within said diversion phase, changeover switching is limited to internal lines which are not busy through release of said connection, to said internal lines via which said connections are through-connected to subscribers where a called party has answered internal lines seized by said connections, in which the process of establishing one of said connecting are completed, but wherein the called

party has not yet answered, and such that with the completion of the diversion phase, the connections in the process of being set up are released.

4,873,695

LASER WITH DISCHARGE IN A TURBULENT TRANSVERSE FLOW

Henri Brunet, L'Hay Les Roses; Michel Mabru, Bures Sur Yvette, and Philippe Chauvet, Chateaux Malabry, all of France, assignors to Compagnie Generale D'Electricite, Cedex, France

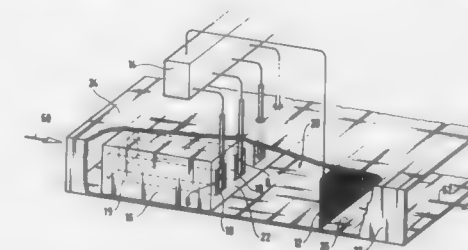
Filed Jul. 27, 1988, Ser. No. 224,626

Claims priority, application France, Jul. 27, 1987, 87 10629

Int. Cl.⁴ H01S 3/02

U.S. Cl. 372—58

10 Claims



1. A laser with electrical discharge in a turbulent transverse flow, the laser comprising:

- optical means (2) for causing light radiation to circulate or oscillate;
- a discharge chamber (20) having a length between an upstream face (10, 22) and a downstream face (12) which extends along a width and a height of said chamber; circulation means (18, 28, 30) for circulating an active gas in said discharge chamber and forming a subsonic turbulent flow from said upstream face to said downstream face; and electrical means (8, 12, 14) for establishing at least one electric discharge in said active gas inside said discharge chamber between at least one upstream electrode (8) and a downstream electrode (12) situated in said upstream and downstream faces (10, 20; 12) respectively, so that said discharge is made uniform and/or stable by said turbulent flow, thereby electrically exciting said gas so as to enable said gas to amplify said light radiation;
- said circulation means comprising:
- a plurality of insertion passages through said upstream face (10, 22) enabling active gas to be inserted into said discharge chamber (20), each of said passages corresponding to a discharge module which is the portion of said discharge chamber in which the gas inserted via said orifice circulates, said module having an upstream surface and a downstream surface which are those portions of said upstream and downstream faces respectively that are occupied by said module;
- evacuation passages (13) in said downstream face to enable said active gas to be evacuated from said chamber; and pressure maintaining means (30) for maintaining a pressure ratio on insertion of more than one, said ratio being the ratio between the pressure of said active gas upstream from said insertion passage relative to the working pressure of said gas in said discharge chamber;
- the improvement wherein each of said insertion passages is an injection orifice (10) occupying a minority fraction of the area of said upstream surface and surrounded by one or more reserved portions occupying the remainder of said upstream face in such a manner that the gas injected via said orifice forms a corresponding diverging jet (40) leaving one or more corner spaces to one side constituting portions of the corresponding said discharge module (16); said injection orifice being provided with one of said up-

stream electrodes (8) to form a discharge (44) in said diverging jet (10) starting at the origin thereof; and at least a portion of at least one of said downstream electrodes (12) being distributed in said downstream surface in order to diffuse said electrical discharge throughout the volume of the jet.

4,873,696

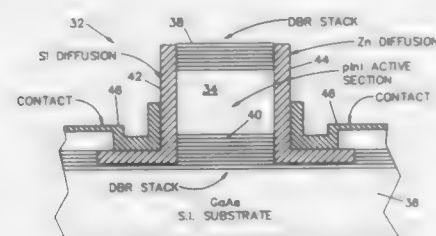
SURFACE-EMITTING LASERS WITH PERIODIC GAIN AND A PARALLEL DRIVEN NIP STRUCTURE

Larry A. Coldren, Santa Barbara; Jeffery W. Scott, Isla Vista, and Raa H. Yan, Goleta, all of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Oct. 31, 1988, Ser. No. 265,146
Int. Cl.⁴ H01S 3/19

U.S. Cl. 372-96

19 Claims



1. A Distributed-Bragg-Reflector semiconductor laser comprising:

- (a) a nipinipi . . . gain-producing active section comprised of a plurality of gain segments disposed at periodic intervals with respect to the wavelength of an intended operating frequency of the laser;
- (b) a pair of Distributed-Bragg-Reflector stacks disposed at the respective ends of said nipinipi . . . active section; and,
- (c) electrode means operably connected to said nipinipi . . . active section in electrical contact therewith for applying a driving current to said nipinipi . . . active section.

4,873,697

NARROWBAND LASER TRANSMITTER HAVING AN EXTERNAL RESONATOR FROM WHICH THE OUTPUT POWER CAN BE TAKEN

Klaus M. Haussler, Munich; Julius Wittmann, Oberhaching; Gisela Gaukel, Munich, and Franz Auracher, Baierbrunn, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

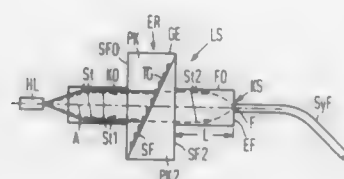
Filed Jul. 23, 1987, Ser. No. 76,839

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1986, 3632998

Int. Cl.⁴ H01S 3/08

U.S. Cl. 372-108

16 Claims



1. In a narrowband laser transmitter comprising a semiconductor laser having a laser emission output and an external optical resonator being coupled to the semiconductor laser wherein an output power of the transmitter can be taken from the resonator, the improvements comprising said resonator being composed of an optical means being arranged in the beam path of the laser emission output of the semiconductor

laser for conducting a first part of the laser emission output back to the semiconductor laser and directing a second part of the laser emission output along a separate beam path having a beam axis, and a focussing optic composed of a gradient lens having a length along a lens axis being selected with a focus point of the lens coinciding with an end face of said gradient lens, said gradient lens being disposed in said beam path with the lens axis coinciding with the beam axis, said focus point on said end face forming a coupling location at which said second part can be taken as the output power of said transmitter, said optical means including grating means.

4,873,698

INDUCTION FURNACE CRUCIBLE

Roger Boen, Pont Saint Esprit, France, assignor to Commissariat à l'Energie Atomique, Paris, France

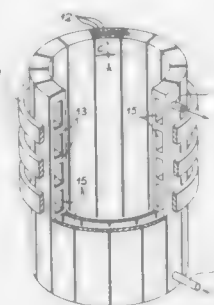
Filed Sep. 26, 1988, Ser. No. 249,122

Claims priority, application France, Oct. 6, 1987, 87 13778

Int. Cl.⁴ H05B 5/00

U.S. Cl. 373-156

6 Claims



1. A crucible for use in an induction furnace comprising a bottom wall means;

a circumferential sidewall composed of a plurality of longitudinally extending sidewall elements (12) made from electrically conductive material, each of said sidewall elements having circumferentially spaced apart transverse faces and duct means traversing therethrough in open fluid communication between said spaced apart transverse faces, said wall elements being arranged relative to each other to place said duct means of each wall in aligned open facing relation with said duct means of those wall elements that are adjacent thereto;

an electrically insulating joint interposed in sealing relation between each of said adjacent wall elements, each of said insulating joints having duct openings therethrough in open registry with said ducts presented by adjacent wall elements to form therewith at least one channel interconnected between said crucible wall elements for carrying a cooling liquid;

a cooling liquid supply means for admitting coolant into said channel; and

a cooling liquid discharge means for discharging fluid from said channels.

4,873,699

METHOD AND DEVICE FOR CODING AND DECODING A BROADBAND TRANSMISSION

Alain Saussier, Argenteuil, and Bruno R. Seiblet, Rueil Malmaison, both of France, assignors to Societe Nationale D'Etude et de Construction de Moteurs D'Aviation, Paris, France

Filed Mar. 18, 1988, Ser. No. 170,232

Claims priority, application France, Mar. 19, 1987, 87 03778

Int. Cl.⁴ H04K 1/00

U.S. Cl. 375-1

5 Claims

3. In a communications system comprising a transmitter and

at least one receiver, means for coding and decoding a spread spectrum transmission comprising:

in the transmitter, a first code generator for generating a transmission code consisting of a pseudo-random binary sequence of period T and composed of two alternating pseudo-random half-sequences of period T/2 and with nil or almost nil cross-correlation, and a modulator controlled by said transmission code to modulate the real signal to be transmitted and thereby generate a coded signal;

and in said at least one receiver, a second code generator for generating a reception code which is identical to said transmission code except that one of the half-sequences of said reception code is shifted in a circular rotational sense relative to the corresponding half-sequence of the trans-



mission code, a demodulator controlled by said reception code to demodulate said coded signal received from said transmitter and to derive said real signal, and a synchronization device for synchronizing said second code generator with said first code generator by correlation of said reception code with said received coded signal to derive sum and difference synchronization control signals, said device comprising

a single correlator which receives said received coded signal and said reception code generated by the second code generator and is operative to deliver said sum synchronization control signal, and

a synchronous detector which receives said sum control signal and an alternation signal and is operative to deliver said difference synchronization control signal.

4,873,700

AUTO-THRESHOLD/ADAPTIVE EQUALIZER

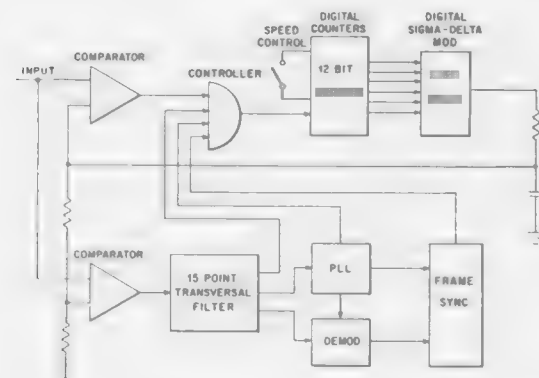
Hee Wong, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Oct. 14, 1987, Ser. No. 108,718

Int. Cl.⁴ H04L 25/06

U.S. Cl. 375-76

10 Claims



1. An auto-threshold circuit that allows a signal receiver to detect an input signal at different amplitude levels, the input signal comprising data and a carrier waveform, the auto-threshold circuit comprising

window comparator means for slicing the input signal at predetermined levels;

an auto-threshold controller which receives the sliced input signal and provides an output voltage representative of the sliced input signal;

a digital loop filter which receives the output voltage of the auto-threshold controller and generates a corresponding binary signal; and

converter means for converting the binary signal to a single-bit, pulse density modulated signal having a predetermined sampling frequency whereby the auto-threshold circuit provides selected data as an output.

4,873,701

MODEM AND METHOD FOR 8 DIMENSIONAL TRELIS CODE MODULATION

Steven A. Tretter, Silver Spring, Md., assignor to Penril Corporation, Rockville, Md.

Filed Sep. 16, 1987, Ser. No. 97,448

Int. Cl.⁴ H04B 14/06

U.S. Cl. 375-27

13 Claims



1. A modem for modulation-demodulation of received analog signals including a demodulator comprising:

receiving means for receiving analog signals comprised of four 2D points;

means for storing a plurality of ideal 2D points comprising a twenty point 2D signal constellation, said twenty point 2D signal constellation comprised of four 2D subsets of points;

slicing means connected to said receiving means including a set of rules for finding the best ideal 2D point in each of said four 2D subsets to each of said received four 2D points by locating the ideal 2D point closest in Euclidean distance;

first combining means connected to said slicing means for combining into pairs each of said ideal 2D points to form 4D points in each of eight 4D subsets and selecting one of said pairs of ideal 2D points in each of said 4D subsets to represent the best 4D point in each of said 4D subsets;

second combining means connected to said first combining means for combining into pairs each of said best eight 4D points to form sixteen 8D points and comparing said pairs of four 4D points with a set of allowed points in each of sixteen 8D subsets and selecting one of said 8D points to represent the best 8D point in each of the sixteen 8D subsets;

decoding means connected to said second combining means for extending a decoder trellis for implementing a Viterbi algorithm and generating as output 20 Z-bits corresponding to the best 8D point;

converting means connected to said decoding means for converting said 20 Z-bits into a stream of 16 data bits; and sending means connected to said converting means for sending said data bits to a data sink.

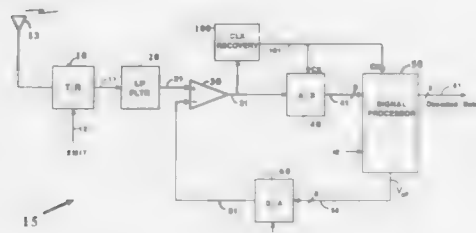
4,873,702

METHOD AND APPARATUS FOR DC RESTORATION IN DIGITAL RECEIVERS

Ran-Pan Chiu, 1295 Montclair Way, Los Altos, Calif. 94022
Filed Oct. 20, 1988, Ser. No. 260,288
Int. Cl.⁴ H04L 25/06

U.S. Cl. 375-76

7 Claims



1. In a digital communication system between a local receiver and between a plurality of remote data sources, each source selectively generating a digitally modulated signal having X predetermined amplitude levels, said remote sources providing a short preamble signal immediately prior to the transmission of one of said digitally modulated signals, said preamble signal characterized by a coding that produces multiple cycles of equal amplitude level excursions in said receiver, apparatus at said receiver for removing any dc offset voltage, V_{off} , from said digitally modulated signal, said apparatus comprising:

analog summing means having first and second inputs, said summing means for receiving one of said digitally modulated signals at said first input;

A/D converting means having a sampling interval T for periodically converting said digitally modulated signals from said summing means into a digitally formatted signal; digital processing means for receiving said digitally formatted signal and for generating a dc offset voltage at time intervals nT, where n is an integer, said dc offset voltage being equal to

$$V_{offn} + 1 = V^n (1/\alpha) V_e n,$$

where;

V^n = the offset voltage at time nT;
 V_e = the offset voltage at time nT as measured by the voltage difference between said digitally formatted signal and the closest normalized coding level; and
 α = a predetermined number,

such that at time $n=1$, V^n , the initial offset voltage, is set equal to the average amplitude level during at least one of said multiple cycles during said preamble period; and means for feeding back said dc offset voltage to said second input, said summing means subtracting said offset voltage from said digital modulated signal.

4,873,703

SYNCHRONIZING SYSTEM

Douglas Crandall, Berkeley; Vicente Cavanna, Loomis; Pradip Shankar, Citrus Heights, all of Calif., and Rasmus Nordby, Horsholm, Denmark, assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation-in-part of Ser. No. 11,352, Jan. 30, 1987, abandoned, which is a continuation-in-part of Ser. No. 781,868, Sep. 27, 1985, abandoned. This application Aug. 19, 1988, Ser. No. 235,746

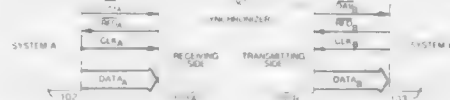
Int. Cl.⁴ H04L 7/00

U.S. Cl. 375-118

24 Claims

1. A synchronizing system comprising:
first system means having data synchronized with a first clock signal;
second system means having the data to be synchronized

with a second clock signal being independent from the first clock signal; and
synchronizer means coupled to the first and second system means for transferring the data from the first system means to the second system means, the synchronizer means having a two port memory which receives the data from the



first system means at a first address whose succeeding addresses are encoded in a unit distance code by determining that the two port memory is not full, and transmits the data to the second system means from the same address to the first address and the succeeding addresses by determining that the two port memory is not empty.

4,873,704

METHOD AND APPARATUS FOR EFFECTIVELY DOUBLING THE OPERATIONAL SPEED OF SELECTED DIGITAL CIRCUITS

Jack E. Randall, Savage, Minn., assignor to CPT Corporation, Minneapolis, Minn.

Filed May 9, 1988, Ser. No. 191,707

Int. Cl.⁴ H03K 3/02

U.S. Cl. 377-47

14 Claims



1. A high speed parallel to serial converter for converting parallel multibit digital words into a plurality of serial data streams, comprising:

a plurality of shift registers, each shift register having applied thereto in parallel, selected parallel bits of said multibit digital words,

a digital clock operating at a first frequency, means for effectively doubling the first frequency of said digital clock by producing a plurality of digital waveforms, each waveform having a frequency equal to said first frequency and each waveform being the inverse of the other waveform with a predetermined phase relationship between said waveforms; and

means for selectively applying each of said waveforms to selected ones of said shift registers to alternately operate said shift registers, whereby said parallel multibit digital words are converted into a plurality of serial data streams at a data rate effectively equal to twice said first frequency.

4,873,705

METHOD OF AND SYSTEM FOR HIGH-SPEED, HIGH-ACCURACY FUNCTIONAL TESTING OF MEMORIES IN MICROPROCESSOR-BASED UNITS

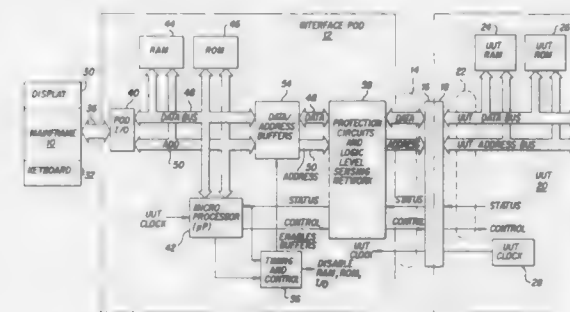
Craig V. Johnson, Everett, Wash., assignor to John Fluke Mfg. Co., Inc., Everett, Wash.

Filed Jan. 27, 1988, Ser. No. 148,901

Int. Cl.⁴ G06F 11/00

U.S. Cl. 371-21.2

24 Claims



1. A method of functionally testing a memory having a plurality of addressable cells, comprising the steps of:

(a) writing a pseudorandom sequence of bits into a predetermined number of consecutively-addressed memory cells to provide a reference block;

(b) replicating said reference block by iteratively reading said pseudorandom sequence of bits and writing said bits into next successive blocks in a first direction until all of the memory cells are written;

(c) complementing the contents of said reference block;

(d) again replicating said reference block by iteratively reading complemented bits of said pseudorandom sequence and writing said complemented bits into next successive blocks in said first direction until all of the memory cells are written;

(e) sequentially reading each cell in a second direction opposite said first direction, complementing the data therein, and writing said complemented data back into said cell;

(f) again reading each cell in said first direction and comparing said complemented data with said pseudorandom sequence of bits to detect differences, and, in response, (g) identifying any memory faults.

4,873,706

ELECTROMECHANICAL PULSE COUNTER

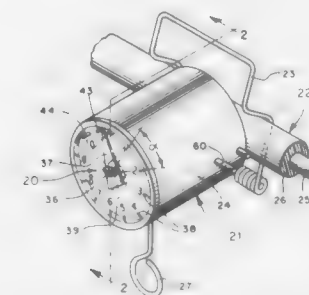
Edmund O. Schweitzer, Jr., 2433 Center St., Northbrook, Ill.

Filed Mar. 9, 1988, Ser. No. 166,048

Int. Cl.⁴ G06M 3/14, 1/10

U.S. Cl. 377-85

9 Claims



1. A bidirectional electromechanical counter for counting up in response to applied up-count current pulses, and down in response to applied down-count current pulses, comprising:
armature means mounted for movement in forward and

reverse directions to successive counting positions and responsive to a momentarily applied magnetic field to develop a pair of magnetic poles aligned with the axis of magnetization of the applied field;

forward magnetizing means responsive to a first one of the up-count current pulses for momentarily applying a magnetic field to said armature to establish a pair of magnetic poles therein;

reverse magnetizing means responsive to a first one of the down-count current pulses for momentarily applying a magnetic field to said armature to establish a pair of magnetic poles therein;

indexing means for applying a magnetic field to said armature which coats with said established magnetic poles to move said armature to a succeeding counting position in the forward direction in response to magnetic poles established by said forward magnetizing means, and to a succeeding counting position in the reverse direction in response to magnetic poles established by said reverse magnetizing means;

each of said magnetizing means being subsequently responsive to a second one of the applied current pulses for momentarily applying a magnetic field to said armature to establish a subsequent pair of magnetic poles therein;

said magnetic field applied by said indexing means subsequently coacting with each said subsequently established magnetic poles to move said counting armature to a succeeding counting position in the respective direction; and indicator means mechanically coupled to said armature for indicating the number of current pulses applied to the counter.

4,873,707

X-RAY TOMOGRAPHY PHANTOMS, METHOD AND SYSTEM

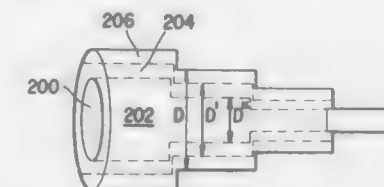
Douglas D. Robertson, Waltham, Mass., assignor to Brigham & Women's Hospital, Boston, Mass.

Filed Sep. 11, 1987, Ser. No. 95,191

Int. Cl.⁴ A61B 6/00

U.S. Cl. 378-18

14 Claims



1. A phantom for simulating an existing structure, comprising:

a hollow body of a solid material, wherein internal and external surfaces of said hollow body comprises a plurality of cylindrical sections of multiple distinct radii in substantially abutting end-to-end relationship; said material having high-energy absorption characteristics substantially similar to those of the existing structure.

4,873,708

DIGITAL RADIOGRAPHIC IMAGING SYSTEM AND METHOD THEREFOR

Dominic A. Cusano, and George E. Pown, both of Schenectady, N.Y., assignors to General Electric Company, Milwaukee, Wis.

Filed May 11, 1987, Ser. No. 48,236

Int. Cl.⁴ G01N 23/04

U.S. Cl. 378-62

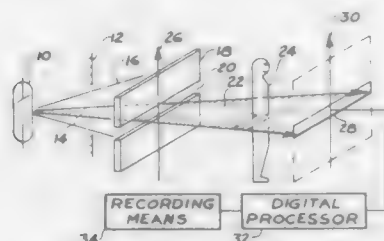
29 Claims

1. A digital radiographic image recording system which comprises:

(a) a movable scintillator body having a dense, self-support-

ing and substantially void-free single flat layer configuration which is substantially transparent to the optical radiation emitted by said medium, said scintillator body comprising a polycrystalline scintillator ceramic with a high X-ray absorption value and a material density of at least 99% so that substantially all X radiation impinging thereon will be converted therein to optical radiation without excessive scattering and loss of the converted optical radiation,

- (b) a stationary X-ray source to expose said scintillator body to an X-ray fan beam moving in a linear non-arcuate travel direction after passage through an object,
- (c) a photodetection member positioned physically contiguous with said moving scintillator body and movable therewith so that both scintillator body and photodetection member move synchronously together with the moving x-ray fan beam in the same linear non-arcuate travel direction for conversion of said moving fan beam to an optical image for simultaneous detection of said optical image in a point-by-point and line-by-line manner,
- (d) said movable photodetection member having a plurality of charge transfer devices arranged in electrically con-



nected columns and rows, said columns being aligned in the same linear non-arcuate travel direction as the moving X-ray fan beam while said rows being aligned substantially transverse thereto in order to also synchronously shift the signals being generated by optical radiation impinging on the individual charge transfer device located in the same column in the opposite travel direction to the travel direction of said moving photodetection member and with said synchronous signal shifting being carried out by a time delay and integration mode of operation to form an electrical analog representation of said optical image without experiencing substantial optical attenuation, the pixel arrangement in said photo-detection member also being unbroken so that all impinging optical radiation will be collected, the synchronous signal shifting further being carried between adjoining charge transfer devices such that signals are shifted from a device having received optical radiation to the next adjoining device at the same velocity rate as the physical movement, and

- (e) digital processing means for immediately converting said electrical analog representation of said optical image to a recorded digital representation thereof with higher quantum detection efficiency, resolution and contrast.

4,873,709

X-RAY GENERATOR WITH GROOVED ROTARY ANODE

Shunzo Hattori, 42-1, Oaza Nagakute Aza Musashizuka, Nagakute-cho, Aichi-gun, Aichi-ken; Takashi Tagawa, Nara, and Motoomu Asano, Nagoya, all of Japan, assignors to Meitec Corporation, Nagoya and Shunzo Hattori, Aichi, both of Japan

Filed Jul. 18, 1988, Ser. No. 220,087

Claims priority, application Japan, Jul. 24, 1987, 62-186115; Jul. 24, 1987, 62-186116

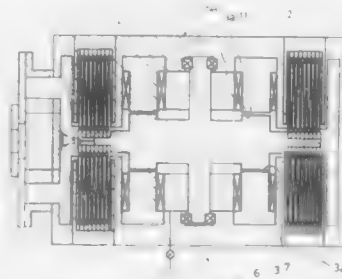
Int. Cl. H01J 35/10

U.S. Cl. 378-142

3 Claims

1. An X-ray generator comprising: a vacuum vessel;

- a cathode disposed in said vacuum vessel for emitting an electron beam;
- a plurality of stators constituting an electric motor and disposed within said vacuum vessel for generating rotating magnetic fields;
- a disk-shaped anode rotatable about a vertical axis upon reception of the rotating magnetic fields generated from said stators and operable to radiate an X-ray upon reception of the electron beam emitted from said cathode, said disk-shaped anode having a groove formed in the underside along the periphery thereof where the electron beam from said cathode is focused;
- a plurality of rotary fins mounted on said disk-shaped anode for dissipating the heat generated in the groove upon radiation of an X-ray;



- a plurality of fixed fins mounted within said vacuum vessel in opposed relation to said rotary fins and operable to receive the heat transferred from said rotary fins and dissipate the heat to the outside of said vacuum vessel;
- first exhaust port means communicating with a first space defined between said cathode and said anode;
- second exhaust port means communicating with a second space defined between said rotary fins and said fixed fins;
- gas inlet port means for introducing gas into said second space at a predetermined flow rate;
- a first vacuum pump mounted on said first exhaust port means for producing a high vacuum in said first space; and
- a second vacuum pump mounted on said second exhaust port means for producing a soft vacuum in said second space in response to the flow rate of gas flown into said second space.

4,873,710

PATIENT SUPPORT

David B. Lotman, 13175 Sand Grouse Ct., Palm Beach Gardens, Fla. 33418

Filed Jan. 15, 1988, Ser. No. 144,469

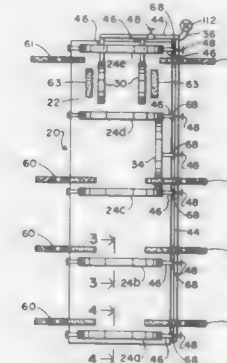
Int. Cl. A61G 7/10; A47C 27/10; A61B 6/04

U.S. Cl. 378-177

32 Claims

1. A support for a patient to be x-rayed, said support having a plurality of spaced apart elongated inflatable runners adapted to lift portions of the patient's body, said support comprising: a generally flat support surface having at least one substantially U-shaped inflatable runner means, said U-shaped runner means comprising substantially parallel portions and at least one substantially perpendicular portion; and, connection means for placing said inflatable runner means in fluid connection with fluid supply means, whereby inflation of said runner means lifts an adjacent portion of the

patient from the support surface so as to permit the insertion of an x-ray cassette beneath said portion of the pa-



tient, above the support surface, in an area bounded by said substantially U-shaped runner means.

4,873,711

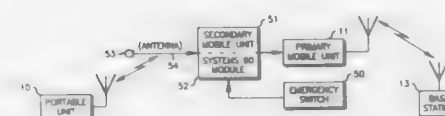
METHOD AND APPARATUS FOR REMOTE TALK/LISTEN COMMUNICATION SYSTEM

Teddy P. Roberts, Fort Wayne, Ind., and Walter J. Rozanski, Jr., Hurst, Tex., assignors to Motorola, Inc., Schaumburg, Ill. Continuation-in-part of Ser. No. 917,923, Oct. 10, 1986, Pat. No. 4,748,685. This application Jan. 5, 1987, Ser. No. 947,155

Int. Cl. H04B 1/40

U.S. Cl. 379-58

9 Claims



9. A method of controlling communications between a portable transceiver and a vehicle mounted transceiver, comprising the steps of:

in the vehicle mounted transceiver

- (a) periodically transmitting a range burst signal;
- (b) monitoring for receipt of an acknowledge signal following transmission by said vehicle mounted transceiver of a message to said portable transceiver;
- (c) transmitting a missed message signal when reception of said acknowledge signal fails to occur within at least a predetermined period of time;

in the portable transceiver

- (d) monitoring for receipt of said range burst
- (e) providing an out-of-range signal when reception of said range burst signal fails to occur within at least a predetermined period of time following said portable transceiver's last reception of a range burst signal;
- (f) monitoring for receipt of said missed message signal;
- (g) providing a missed message alert upon receiving said missed message signal.

4,873,712

TELEPHONE CONTROLLED INTERRUPTER CIRCUIT

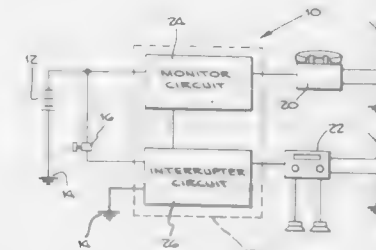
Carmen R. Porco, Canoga Park, Calif., assignor to Alliance Research Corporation, Chatsworth, Calif.

Filed May 19, 1988, Ser. No. 196,954

Int. Cl. H04Q 7/04; H04M 11/00

U.S. Cl. 379-58

4 Claims



1. In a vehicle equipped with a telephone, an audio system and a battery for powering the telephone and audio system, a circuit for interrupting the flow of power to the telephone in response to the activation of the telephone comprising, in combination;

monitor circuit means interposed between the battery and the telephone including first means for creating a first signal in response to a flow of power to the telephone in excess of a predetermined power threshold and a second signal in response to a flow of power below said threshold; and

circuit interrupter means connected to said monitor circuit means and interposed between the battery and the audio system, said circuit interrupter means including switching means responsive to said first signal for disconnecting the audio system from the battery and responsive to said second signal for connecting the audio system to the battery,

whereby the audio system is disabled whenever the telephone operates and draws power in excess of the predetermined power threshold level.

4,873,713

AUTOMATIC TELEPHONE ANSWERING APPARATUS AND METHOD

Kiyoshi Yamanouchi, and Sumio Iwase, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

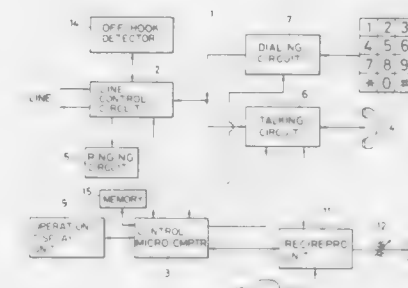
Filed Nov. 6, 1987, Ser. No. 118,402

Claims priority, application Japan, Nov. 10, 1986, 61-267304

Int. Cl. H04M 1/64

U.S. Cl. 379-67

6 Claims



2. A method for automatically answering a telephone and forwarding a notification of a recorded message to a predetermined telephone, comprising the steps of: recording and automatically reproducing an outgoing message from a subscriber and sending it over a telephone line

to a calling party in response to an incoming call over said telephone line from said calling party;
 automatically recording an incoming message from said calling party over a telephone line after the outgoing message is sent;
 selectively recording a specific message from the subscriber to be sent to a predetermined telephone set designated by the subscriber, wherein said specific message comprises a relay message for informing that at least one incoming message has been recorded;
 electronically receiving from the subscriber a telephone number of the predetermined telephone set and storing said telephone number;
 electronically reading out said stored telephone number and automatically dialing said predetermined telephone set a plurality of times within a predetermined period of time upon completion of the recording of the incoming message;
 automatically reproducing and sending said specific message over the telephone line to said automatically dialed, predetermined telephone set;
 detecting an off-hook state of said predetermined telephone set in response to said automatic dialing and sending said specific message upon detecting the offhook state;
 automatically redialing said predetermined telephone a predetermined number of times when a predetermined period of time has elapsed upon completion of a previous automatic dialing and the off-hook state is not detected in response to automatic dialing;
 when the off-hook state is detected, performing said specific message sending step and inhibiting said redialing step to prevent subsequent redialing.

4,873,714

SPEECH RECOGNITION SYSTEM WITH AN ACCURATE RECOGNITION FUNCTION

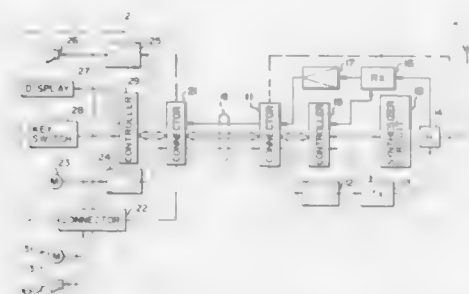
Takasaki Ishii, Sagami-hara, and Toru Kuge, Tokyo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 21, 1986, Ser. No. 933,213

Claims priority, application Japan, Nov. 26, 1985, 60-181654[U]; Nov. 26, 1985, 60-265502; Dec. 20, 1985, 60-287434
 Int. Cl.⁴ H04M 1/26, 1/56

U.S. Cl. 379-88

6 Claims



1. A speech recognition system with an accurate recognition function, said speech recognition system comprising:
 microphone means for producing speech input signals to be registered or recognized of various users;
 speech registration/recognition processing means responsive to a speech input signal from the microphone means, wherein said speech registration/recognition processing means is manually selectable so as to subject this speech input signal to either a registration or a recognition processing, in which upon the registration processing the speech input signal is stored as recognition data and upon recognition processing the speech input signal is compared to the recognition data which has been stored;
 speech record/reproduction processing means responsive to a speech input signal from the microphone means to sub-

ject this speech input signal to a record/reproduction processing, in which upon the record processing this speech input signal is recorded as a record signal and upon the reproduction processing the record signal is delivered as a reproduction signal in a given user voice, which has been pre-registered, in advance;
 speaker means to which the reproduction signal is supplied;
 mode designation means for delivering a registration or a recognition mode designation signal;
 control means, in accordance with the registration or the recognition mode designation signal, for setting the speech registration/recognition processing means to the registration or the recognition processing mode and for setting the speech record/reproduction processing means to the record or the reproduction processing mode corresponding to the registration or the recognition processing mode in which the speech registration/recognition processing means is placed.

4,873,715

AUTOMATIC DATA/VOICE SENDING/RECEIVING MODE SWITCHING DEVICE

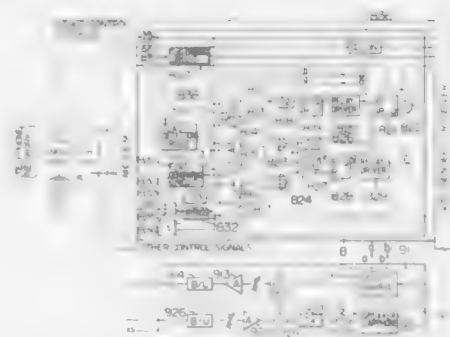
Yoji Shibata, Yokosuka, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 8, 1987, Ser. No. 59,514

Claims priority, application Japan, Jun. 10, 1986, 61-132785
 Int. Cl.⁴ H04M 11/00

U.S. Cl. 379-93

16 Claims



1. A terminal device which sends/receives data and voice signals through a low speed circuit to/from another device, comprising:
 data sending/receiving means which sends/receives digital data;
 modulation/demodulation means which modulates/demodulates digital data from/to said data sending/receiving means in order to make said digital data conform to said low speed circuit;
 voice sending/receiving means which sends/receives voice signals through said low speed circuit; and
 voice/data switching means connected between said data sending/receiving means and said modulation/demodulation means for switching between data and voice modes wherein said data mode sends/receives data to/from said other device and said voice mode sends/receives voice to/from said other device;
 said voice/data switching means including
 detecting means for detecting a received carrier from said other device through said modulation/demodulation means,
 means for interrupting said data mode upon detection of an interruption of said received carrier and starting said voice mode, and for connecting said voice sending/receiving means to said low speed circuit,
 detecting means for detecting special data from said other

terminal device through said modulation/demodulation means,
 means for outputting a logical product of an output from said special data detecting means and an output from said received carrier detecting means, said logical product output being connected to said modulation/demodulation means, and
 means for setting said data mode according to said logical product output from said logical product means and for disconnecting said voice sending/receiving means from said low speed circuit.

4,873,716

PATH ALLOCATION ARRANGEMENT FOR MULTI-TERMINAL GROUPS

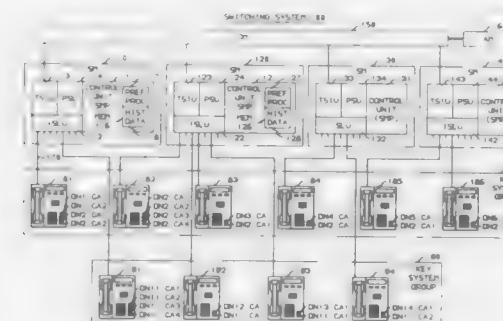
Patrick K. Brady, Wheaton, Ill., assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 27, 1988, Ser. No. 290,608

Int. Cl.⁴ H04M 3/02

U.S. Cl. 379-134

25 Claims



1. In a switching system connectable to a plurality of terminals, a method of processing calls to a directory number shared by a multiple number of said terminals, said method comprising the following steps:

selecting, based on call answering activity, a preferred terminal of said multiple terminals to serve a subsequent call to said directory number;
 before receiving an answer request from any of said multiple terminals for an incoming call to said directory number, establishing at least a partial connection to said preferred terminal, said connection for use in answering said incoming call at said preferred terminal; and
 enabling other of said multiple terminals to answer said incoming call.

4,873,717

CALL COVERAGE ARRANGEMENT

Wayne A. Davidson, Winfield; John P. Ernst, Warrenville; Marybeth Herkes, Aurora; Ram Kuppaswami, Wheaton; Timothy A. Satalich, Warrenville, and John J. Stanaway, Jr., Wheaton, all of Ill., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jan. 14, 1988, Ser. No. 206,467

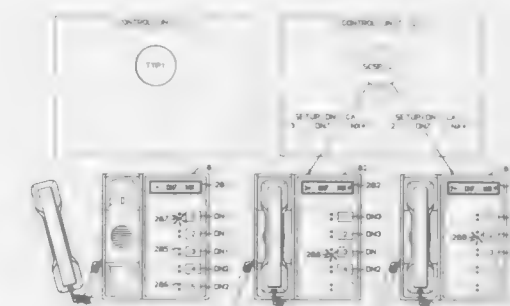
Int. Cl.⁴ H04M 3/42

U.S. Cl. 379-157

30 Claims

1. In an arrangement comprising a switching system inter-

connecting a plurality of terminals, a method for providing call coverage for calls to a directory number shared by a first one of said terminals and a second one of said terminals, said first terminal including a two-part indicator comprising a first part for identifying any one of said terminals and a second part for defining switch-hook status of at most one of said terminals said first terminal also including a first plurality of call appearances with at least one of said first plurality of call appearances assigned said directory number, said second terminal including a second plurality of call appearances, said method comprising in response to an incoming call for said directory number, determining switch-hook status of said second terminal,



transmitting said determined switch-hook status to said first terminal,
 in response to receipt of said determined switch-hook status, said first terminal using said two-part indicator to provide an indication for use in answering said call at said first terminal such that said first part identifies said second terminal and said second part defines said determined switch-hook status of said second terminal as identified by said first part, and
 while performing said step of using said two-part indicator, alerting at said at least one cell appearance at said first terminal in response to said call for said directory number.

4,873,718

FEATURE TELEPHONE INTEGRATION DEVICE

Paul M. Barnett, Sunnyvale; Douglas A. Welch, San Jose, and Duncan J. MacMillan, Jr., Los Altos, all of Calif., assignors to Octel Communications Corp., Milpitas, Calif.

Continuation of Ser. No. 74,532, Jul. 16, 1987, abandoned. This

application Nov. 22, 1988, Ser. No. 275,659

Int. Cl.⁴ H04M 1/64, 11/00

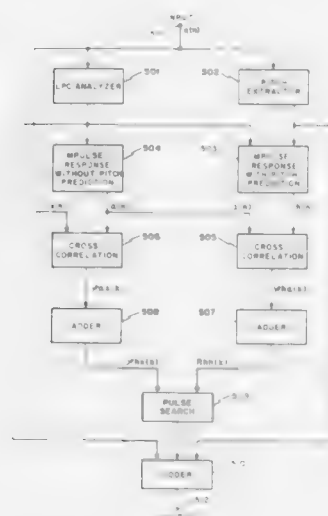
U.S. Cl. 379-156

6 Claims

1. Feature telephone integration apparatus comprising
 a feature telephone set,
 an applications processor,
 a PBX,
 integration means for monitoring telephone communications between said applications processor, said feature telephone set and said PBX in order to determine the nature or type of said telephone communications, and
 means for informing said applications processor of the nature or type of said telephone communications.

between the impulse response of said synthetic filter with pitch prediction output by said first impulse response calculating means and the impulse response of said synthetic filter without pitch prediction output by said second impulse response calculating means;

- a first adding means responsive to said first crosscorrelation calculating means for adding the crosscorrelations as calculated by said first crosscorrelation calculating means to produce autocorrelations of the impulse response of said synthetic filter with pitch prediction;
- a second crosscorrelation calculating means jointly responsive to said second impulse response calculating means and the input speech signal for calculating crosscorrelations between the impulse response of said synthetic filter



without pitch prediction output by said second impulse response calculating means and the input speech signal;

- a second adding means jointly responsive to said second crosscorrelation calculating means and the input signal for adding the crosscorrelations as calculated by said second crosscorrelation calculating means to produce crosscorrelations between the impulse response of said synthetic filter with pitch prediction and the input speech signal;
- a pulse search means jointly responsive to said first and second adding means for searching for a plurality of pulses for exciting a synthetic filter based on the autocorrelations output by said first adding means and the crosscorrelations output by said second adding means.

4,873,724 MULTI-PULSE ENCODER INCLUDING AN INVERSE FILTER

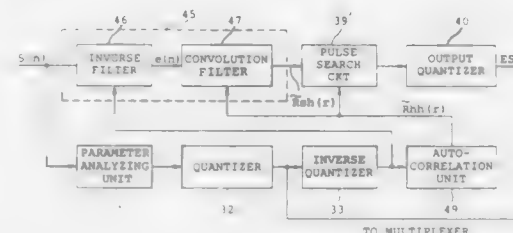
Yayoi Satoh, and Toshihiko Mizukami, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Jul. 16, 1987, Ser. No. 74,193

Claims priority, application Japan, Jul. 17, 1986, 61-168901
Int. Cl. G10L 5/00

U.S. Cl. 381—40

6 Claims



1. An encoder for use in encoding a speech signal, given through a vocal tract, into a plurality of excitation pulses, each pulse having an amplitude and a location determined by said speech signal, said encoder comprising:

parameter calculating means, responsive to said speech signal, for calculating a parameter specific to said speech signal and for producing a parameter signal representative of said parameter;

autocorrelation calculating means, responsive to said parameter signal, for calculating an autocorrelation related to said speech signal and for producing an autocorrelation signal representative of said autocorrelation;

cross-correlation calculating means, coupled to said autocorrelation calculating means and responsive to said speech signal, for calculating a cross-correlation related to said parameter and said speech signal

and for producing a cross-correlation signal representative of said cross-correlation; and

excitation pulse producing means, coupled to said autocorrelation calculating means and said cross-correlation calculating means, for producing said excitation pulses in response to said autocorrelation signal and said cross-correlation signal;

wherein said cross-correlation calculating means comprises: an inverse filter responding to said speech signal and having an inverse filter characteristic relative to said vocal tract, said inverse filter producing a residual signal representative of a residue resulting from passage of said speech signal through said inverse filter;

filtering means, coupled to said inverse filter and said autocorrelation calculating means, for filtering said residual signal and for producing a filtered signal, said filtering means having an impulse response determined by said autocorrelation signal; and

signal supplying means for supplying said filtered signal to said excitation pulse producing means as said cross-correlation signal.

DESIGNS

OCTOBER 10, 1989

303,865

COOKIE HAVING OPENINGS THERETHROUGH

Michael P. Lucas, Ridgewood, N.J.; Robert Tabor, New York, N.Y.; Richard B. Gerstman, Tenafly, N.J., and Juan F. Concepcion, Brooklyn, N.Y., assignors to Nabisco Brands, Inc., Parsippany, N.J.

Division of Ser. No. 731,488, May 7, 1985, Pat. No. Des. 297,280. This application May 10, 1988, Ser. No. 192,123

Term of patent 14 years

U.S. Cl. D1—109



303,866

COOKIE HAVING OPENINGS THERETHROUGH

Michael P. Lucas, Ridgewood, N.J.; Robert Tabor, New York, N.Y.; Richard B. Gerstman, Tenafly, N.J., and Juan F. Concepcion, Brooklyn, N.Y., assignors to Nabisco Brands, Inc., Parsippany, N.J.

Division of Ser. No. 731,488, May 7, 1985, Pat. No. Des. 297,280. This application May 10, 1988, Ser. No. 192,124

Term of patent 14 years

U.S. Cl. D1—109



303,867

HIGH TOP MOCCASIN TOE WALKER

James Argyropoulos, Venice, Calif., assignor to The Cherokee Group, Sunland, Calif.

Filed Mar. 26, 1987, Ser. No. 30,547

Term of patent 14 years

U.S. Cl. D2—268



303,868

LOW TOP MOCCASIN TOE WALKER

James Argyropoulos, Venice, Calif., assignor to The Cherokee Group, Sunland, Calif.

Filed Mar. 26, 1987, Ser. No. 34,561

Term of patent 14 years

U.S. Cl. D2—268



303,869

SPORTS SHOE

Rexy Jacobs, 1182b Market, #632, San Francisco, Calif. 94102

Filed Oct. 3, 1986, Ser. No. 916,037

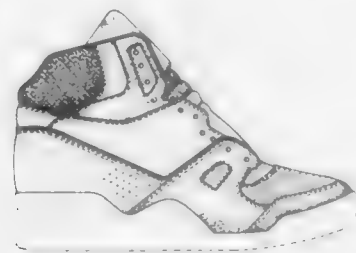
Term of patent 14 years

U.S. Cl. D2—310



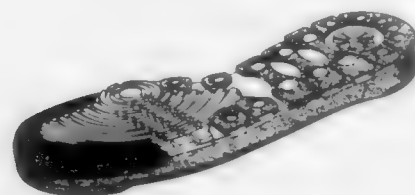
303,870
SHOE UPPER

Lawrence Selbiger, Portland, Oreg., assignor to Avia Group International, Inc., Portland, Oreg.
Filed Feb. 2, 1989, Ser. No. 305,206
Term of patent 14 years
U.S. Cl. D2—314



303,871
SOLE

Dennis Driscoll, Healdsburg, Calif., assignor to Asahi Corporation, Tokyo, Japan
Filed Feb. 27, 1987, Ser. No. 19,608
Claims priority, application Japan, Sep. 27, 1986, 61-38347
Term of patent 14 years
U.S. Cl. D2—320



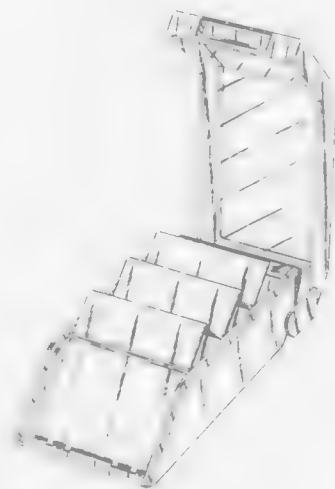
303,872
COMBINED SCISSORS WITH CAP

Hiromi Tamamura, Tokyo, Japan, assignor to Plus Corporation, Japan
Filed Feb. 10, 1986, Ser. No. 827,416
Term of patent 14 years
U.S. Cl. D3—18

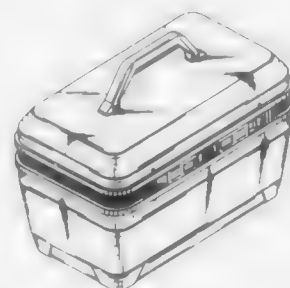


303,873
DISKETTE STORAGE CONTAINER

Bernd Brüßing, Neu-Ulm, Fed. Rep. of Germany, assignor to Hans Friedrich Hefendehl, Kierspe, Fed. Rep. of Germany
Filed Apr. 24, 1986, Ser. No. 857,616
Claims priority, application Fed. Rep. of Germany, Oct. 24, 1985, MR 627
Term of patent 14 years
U.S. Cl. D3—35



303,874
COSMETIC CASE OR SIMILAR ARTICLE
Lai Wei-Mu, No. 31-1, Sec. 1, Wan Ho Road, Nan Tun District, Taichung, Taiwan
Filed Jun. 10, 1986, Ser. No. 872,756
Term of patent 14 years
U.S. Cl. D3—39



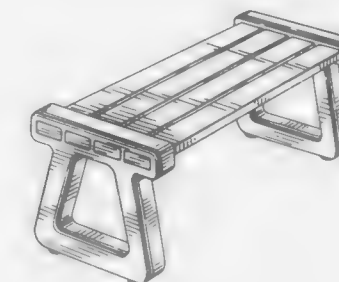
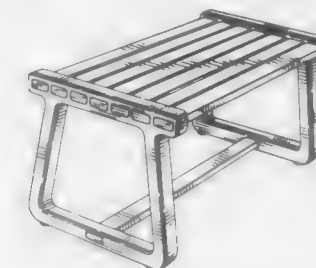
303,875
HOLSTER

Ernest H. Hill, 3128 S. Extension, Mesa, Ariz. 85202
Filed Apr. 16, 1986, Ser. No. 852,934
Term of patent 14 years
U.S. Cl. D3—101

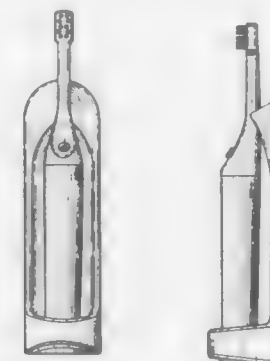


303,877
BENCH

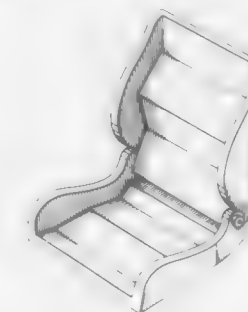
Ian F. Norton, Toronto, Canada, assignor to Union Carbide Canada Limited, Toronto, Canada
Filed May 8, 1986, Ser. No. 862,392
Claims priority, application Canada, Mar. 14, 1986, 14-03-86-5
Term of patent 14 years
U.S. Cl. D6—349



303,876
COMBINED ELECTRIC PERIODONTAL BRUSH AND MOUNTING BRACKET
George S. Clemens, Northfield, Ill., and Spencer L. Mackay, Agoura Hills, Calif., assignors to Dental Research Corporation, Tucker, Ga.
Filed Feb. 6, 1986, Ser. No. 827,275
Term of patent 14 years
U.S. Cl. D4—101



303,878
FOLDABLE SEAT FOR USE PRIMARILY IN A BOAT
Howard G. Goldsmith, Cranston, R.I., assignor to Todd Enterprises, Inc., Cranston, R.I.
Filed Oct. 21, 1986, Ser. No. 921,635
Term of patent 14 years
U.S. Cl. D6—368

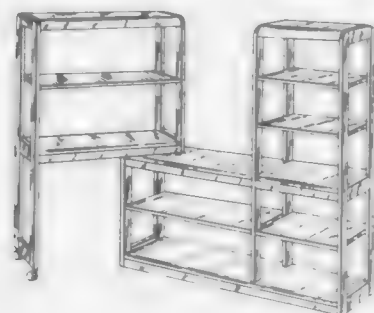


303,879

SWIVEL DESK AND DISPLAY UNIT

David P. G. Williams, Englewood, N.J., assignor to Mohasco Upholstered Furniture Corporation, Fairfax, Va.
Filed May 1, 1987, Ser. No. 44,572
Term of patent 14 years

U.S. Cl. D6—397

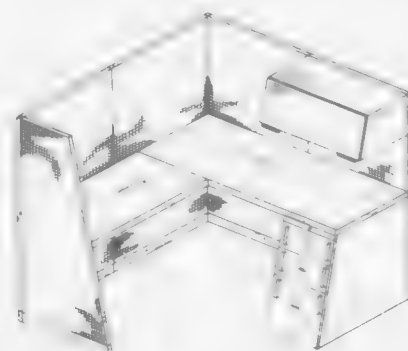


303,881

MODULAR OFFICE WORK STATION

Isidoro N. Markus, 65-36 99th St. (1E), Rego Park, N.Y. 11374
Filed May 30, 1986, Ser. No. 869,118
Term of patent 14 years

U.S. Cl. D6—421

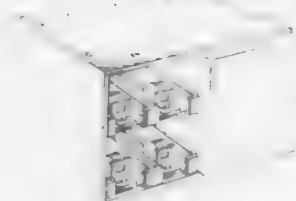
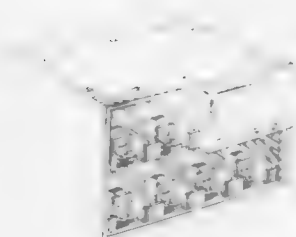
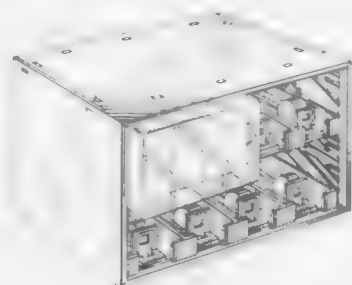


303,880

COMBINED DISPLAY AND DISPENSER RACK

Fred W. Kates, New York, and Karl Yeranossian, Pearl River, both of N.Y., assignors to Revlon, Inc., New York, N.Y.
Division of Ser. No. 847,596, Mar. 31, 1986, Pat. No. Des. 299,597. This application Nov. 9, 1988, Ser. No. 269,947
Term of patent 14 years

U.S. Cl. D6—408

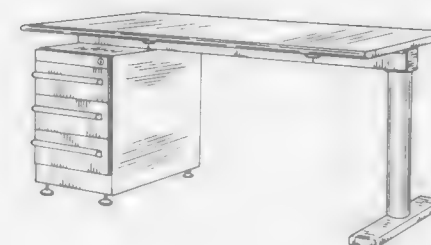
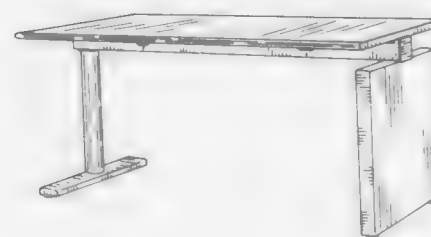
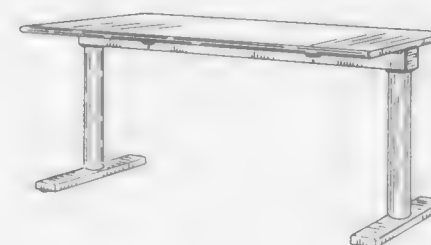


303,882

DESK

Ettore Sottsass, and Michele DeLucchi, both of Milan, Italy, assignors to Olivetti Synthesis, S.p.A., Ivrea, Italy
Division of Ser. No. 845,001, Mar. 18, 1986, Pat. No. Des. 299,798. This application Jul. 27, 1988, Ser. No. 225,726
Claims priority, application Italy, Sep. 18, 1985, 53806/85[U]
Term of patent 14 years

U.S. Cl. D6—422

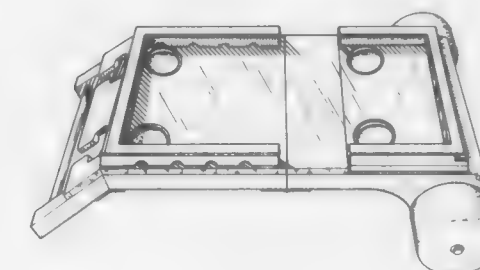
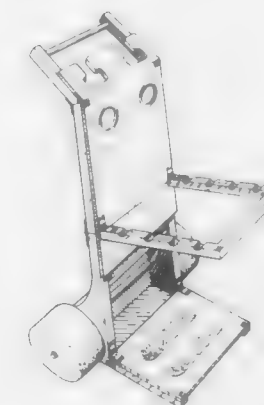


303,883

FOLDABLE BEACH EQUIPMENT CARRIER

Donnie W. Higson, 505 Queen Anne's Rd., Greenville, N.C. 27834, and Michael E. Higson, 108 Eighth Ave., North Myrtle Beach, S.C. 29582
Filed Oct. 6, 1986, Ser. No. 916,095
The portion of the term of this patent subsequent to Aug. 29, 2003, has been disclaimed.
Term of patent 14 years

U.S. Cl. D6—429



303,884

DISPLAY STAND

Karl Yeranossian, Pearl River, N.Y., assignor to Revlon, Inc., New York, N.Y.
Division of Ser. No. 538,408, Oct. 3, 1983, Pat. No. Des. 286,829. This application Jul. 21, 1986, Ser. No. 887,401
Term of patent 14 years

U.S. Cl. D6—455



303,885
TABLE

Charles R. Goetz, Carnegie, Pa., assignor to Alco Industries, Inc., Valley Forge, Pa.

Filed Sep. 3, 1986, Ser. No. 903,439
Term of patent 14 years

U.S. Cl. D6—484

303,887
TABLE LEG OR THE LIKE

Mary J. Reid, Sheboygan, Wis., assignor to Kohler Co., Kohler, Wis.

Filed Jan. 12, 1987, Ser. No. 2,251
Term of patent 14 years

U.S. Cl. D6—499



303,890

TABLE LEG OR THE LIKE

Mary J. Reid, Sheboygan, Wis., assignor to Kohler Co., Kohler, Wis.

Filed Dec. 22, 1986, Ser. No. 944,619
Term of patent 14 years

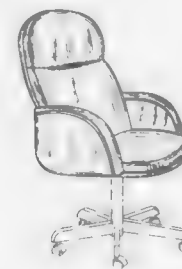
U.S. Cl. D6—499

303,888
SEAT

John R. Stafford, Greensboro, N.C., assignor to Chromcraft Furniture Corporation, Senatobia, Miss.

Filed Jan. 10, 1988, Ser. No. 285,107
Term of patent 14 years

U.S. Cl. D6—502



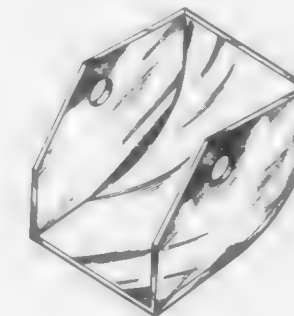
303,890

TOILET PAPER GUARD

Douglas J. Pilot, 28902 Hollow Brook Ave., Agoura Hills, Calif. 91301

Filed Apr. 21, 1986, Ser. No. 856,117
Term of patent 14 years

U.S. Cl. D6—523



303,891

HEADWALL UNIT FOR HOSPITAL ROOMS

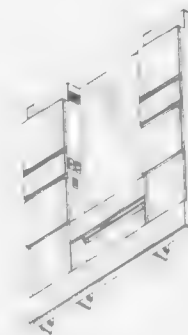
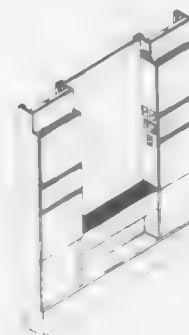
Ira M. Durham, Jr., Houston, Tex., assignor to The Methodist Hospital System, Houston, Tex.

Filed Aug. 7, 1986, Ser. No. 893,966

The portion of the term of this patent subsequent to Apr. 4, 2006, has been disclaimed.

Term of patent 14 years

U.S. Cl. D6—505



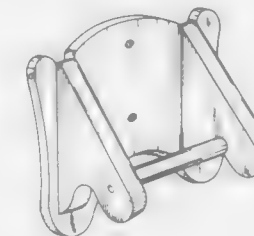
303,891

PAPER ROLL HOLDER

Raymond N. Lee, 9512 Woody Ln., Great Falls, Va. 22066
Filed Feb. 12, 1987, Ser. No. 13,862

Term of patent 14 years

U.S. Cl. D6—523



303,892

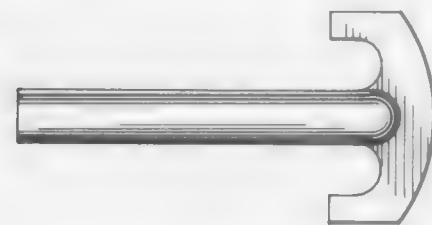
LOCKING TUBE ROLLER

William G. Parker, 1410 Briarwood Dr. R.D. #3, Montoursville, Pa. 17754

Filed Nov. 6, 1987, Ser. No. 117,657

Term of patent 14 years

U.S. Cl. D6—541



303,894

MIRRORED CABINET

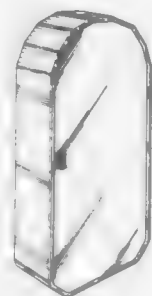
Heinz G. Baus, 35 Wartbodenstrasse, CH-3626 Hünibach-Thun, Switzerland

Filed Aug. 17, 1987, Ser. No. 85,695

Claims priority, application Fed. Rep. of Germany, Feb. 19, 1987, URA198/87

Term of patent 14 years

U.S. Cl. D6—559



303,893

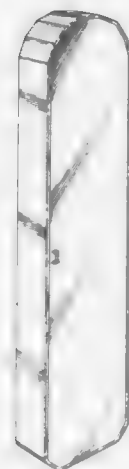
ILLUMINATED MENU DISPLAY PANEL

John M. Brown, 2600 Lockheed Way, Carson City, Nev. 89701

Filed Mar. 13, 1987, Ser. No. 25,786

Term of patent 14 years

U.S. Cl. D6—559



303,895

MIRRORED CABINET

Heinz G. Baus, 35 Wartbodenstrasse, CH-3626 Hünibach-Thun, Switzerland

Filed Aug. 26, 1987, Ser. No. 89,622

Claims priority, application Hague, Aug. 6, 1987, DM/009072

Term of patent 14 years

U.S. Cl. D6—559



303,896

MIRRORED CABINET

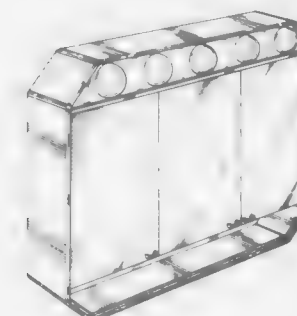
Heinz G. Baus, 35 Wartbodenstrasse, CH-3626 Hünibach-Thun, Switzerland

Filed Aug. 26, 1987, Ser. No. 89,623

Claims priority, application World Int. Prop. O., Aug. 6, 1987, DM/009072

Term of patent 14 years

U.S. Cl. D6—561



303,897

PILLOW

Katherine A. Phillips, 5780 Mifflin Ave., Pensacola, Fla. 32506

Filed Sep. 2, 1986, Ser. No. 903,092

Term of patent 14 years

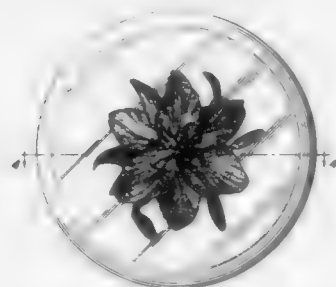
U.S. Cl. D6—601



303,899
PLATTER OR SIMILAR ARTICLE

Jean-Jacques Durand, LaBute, 62510, Arques, France
Filed Sep. 25, 1986, Ser. No. 911,201
Term of patent 14 years

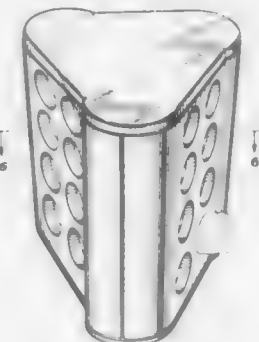
U.S. Cl. D7—28



303,900
PLASTIC SPICE RACK

Jane Ancona, and Bruce Ancona, both of New York, N.Y.,
assignors to M. Kamenstein, Inc., White Plains, N.Y.
Filed May 16, 1989, Ser. No. 355,398
Term of patent 14 years

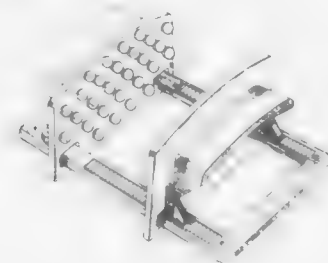
U.S. Cl. D7—71



303,901
CLAMP FOR FILLETING FISH

Joseph M. Franey, 7432 Landau Carve, Bloomington, Minn.
Filed Apr. 30, 1987, Ser. No. 44,280
Term of patent 14 years

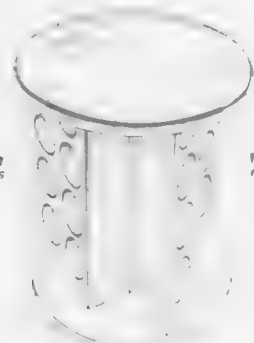
U.S. Cl. D7—99



303,897
WOOD SPICE RACK

Jane Ancona, and Bruce Ancona, both of New York, N.Y.,
assignors to M. Kamenstein, Inc., White Plains, N.Y.
Filed May 16, 1989, Ser. No. 352,455
Term of patent 14 years

U.S. Cl. D7—71



303,902
SERVER FOR CAKES, PIES AND THE LIKE

Bruno Gecchelin, Milan, Italy, assignor to Fratelli Guzzini
S.p.A., Recanati, Italy
Filed Nov. 19, 1986, Ser. No. 932,897
Claims priority, application Italy, May 23, 1986, 21970/86[U]
Term of patent 14 years

U.S. Cl. D7—102

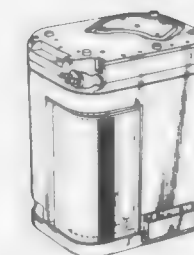
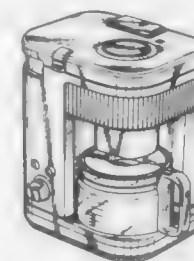


303,903
AUTOMATIC COFFEE MAKER

Ueda Yoshiaki, Osaka, and Mano Kazunori, Hyogo, both of
Japan, assignors to Matsushita Electric Industrial Co., Ltd.,
Osaka, Japan

Filed Oct. 24, 1986, Ser. No. 923,072
Term of patent 14 years

U.S. Cl. D7—309



303,905
VACUUM FLASK

José M. P. Gibert, Reus, Spain, assignor to Industria Auxiliar
Manodomecica, S.A., Tarragona, Spain

Filed Dec. 9, 1986, Ser. No. 939,934
Claims priority, application Spain, Jul. 1, 1986, 110,946
Term of patent 14 years

U.S. Cl. D7—317

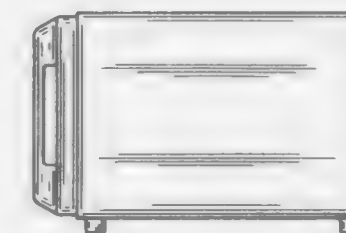
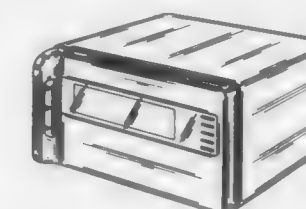


303,906
MICROWAVE OVEN

Hiroshi Nishibori, Osaka, Japan, assignor to Sharp Kabushiki
Kaisha, Osaka, Japan

Filed Jul. 27, 1987, Ser. No. 78,474
Claims priority, application Japan, Feb. 19, 1987, 62-6393
Term of patent 14 years

U.S. Cl. D7—351



303,904
COVERED JUG

Anthony H. Wolfenden, Victoria, Australia, assignor to The
Decor Corporation Proprietary Limited, Scoresby, Australia

Filed Nov. 28, 1986, Ser. No. 936,653
Term of patent 14 years

U.S. Cl. D7—317



303,907

MICROWAVE OVEN

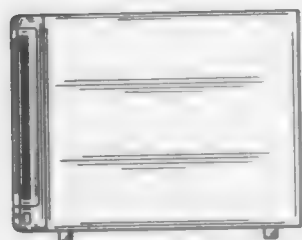
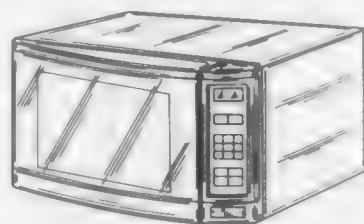
Wetaru Iwahashi, Osaka, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 9, 1987, Ser. No. 130,734

Claims priority, application Japan, Jun. 19, 1987, 62-25199

Term of patent 14 years

U.S. Cl. D7—351



303,909

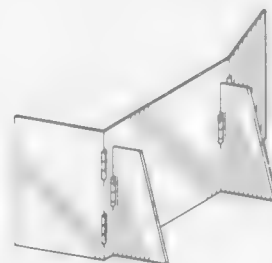
STOVETOP GREASE SPATTER SHIELD

Genevieve K. Stankus, 4126-104 Ave. N.; Robert Stankus, 4176 104th Ave. N., both of Clearwater, Fla. 33520, and Gerald Stankus, 13232 Winsford La., Fort Myers, Fla. 33907

Filed May 11, 1987, Ser. No. 47,994

Term of patent 14 years

U.S. Cl. D7—406



303,908

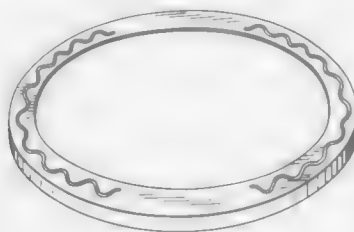
PIE CRUST SHIELD

Georgette M. Anderson, 2616 NE. 57th Ave., Portland, Oreg. 97213

Filed Oct. 29, 1986, Ser. No. 924,601

Term of patent 14 years

U.S. Cl. D7—387



303,910

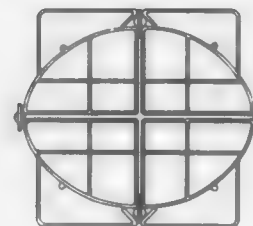
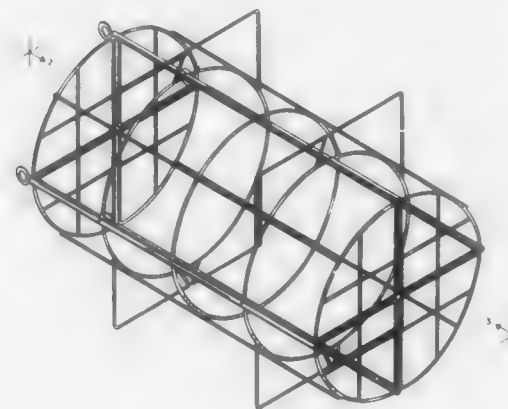
ROASTING BASKET

Robert J. Sjoberg, 6212 Bion Ave., San Gabriel, Calif. 91775

Filed Apr. 22, 1986, Ser. No. 857,567

Term of patent 14 years

U.S. Cl. D7—409



303,911

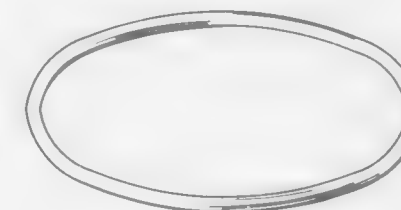
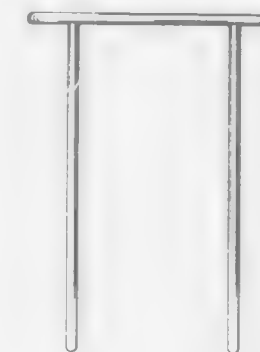
PLANT SUPPORT

Vivian L. Saari, 1 Binninger Rd. Ext., Shushaw, N.Y. 12873

Filed Aug. 10, 1987, Ser. No. 83,299

Term of patent 14 years

U.S. Cl. D8—1



303,912

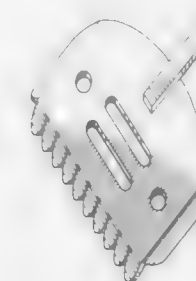
HAND HELD TOOL FOR PACKING AND LOADING OF LEAVES

Mark R. Butler, 4321 Kenston Way, Sacramento, Calif. 95822

Filed Oct. 8, 1987, Ser. No. 106,315

Term of patent 14 years

U.S. Cl. D8—1

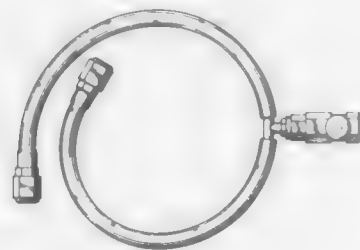


303,913

TREE SOAKER

Earl J. Leap, Rte. 1, Box 232, Oak Grove, Mo. 64075
 Filed Oct. 19, 1987, Ser. No. 110,530
 Term of patent 14 years

U.S. Cl. D8-1



303,916

DOUBLE-ENDED BOX WRENCH

Davis S. Colvin, 23933 Haynes, Farmington Hills, Mich. 48018,
 assignor to Davis S. Colvin, Farmington Hills, Mich.
 Filed Mar. 24, 1987, Ser. No. 29,596
 Term of patent 14 years

U.S. Cl. D8-22

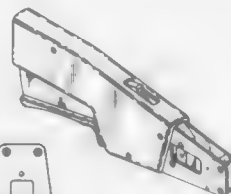


303,917

MULTIPLE STROKE RATCHET TOOL FOR CRIMPING, CUTTING OR THE LIKE

John G. Hatfield, Camp Hill, Pa., assignor to AMP Incorporated, Harrisburg, Pa.
 Filed Jun. 11, 1986, Ser. No. 873,036
 Term of patent 14 years

U.S. Cl. D8-51



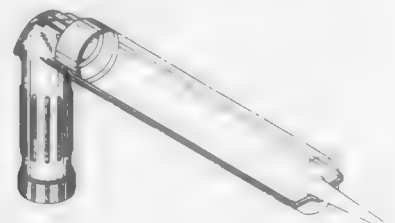
303,914

CAULKING GUN

Milton Hinden, Glen Head, and John Lyons, Levittown, both of
 N.Y., assignors to Duro-Dyne Corporation, Farmingdale,
 N.Y.

Filed Aug. 17, 1987, Ser. No. 86,040
 Term of patent 14 years

U.S. Cl. D8-14.1



303,915

BEVERAGE CAN OPENING RING

Kevin M. Knutson, 3486 E. 8505 S., Salt Lake City, Utah 84121
 Filed Mar. 11, 1986, Ser. No. 844,272
 Term of patent 14 years

U.S. Cl. D8-18



303,918

COMBINED RADIATOR TAB LIFTER AND CRIMPER

Alan E. Gickler, Clinton, Iowa, assignor to Johnson Manufacturing Company, Princeton, Iowa
 Filed Jan. 12, 1987, Ser. No. 2,556
 Term of patent 14 years

U.S. Cl. D8-52



303,919

COMBINED HAIRSTYLING SCISSORS-COMB

Louis Pate, Oak Grove, Ky. 42262
 Filed Mar. 25, 1986, Ser. No. 845,830
 Term of patent 14 years

U.S. Cl. D8-57

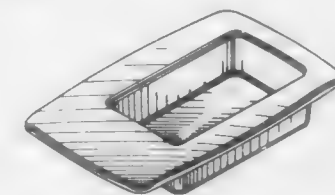


303,922

HOUSINGS FOR LATCHES OR LOCKS

Richard H. Russell, Farmington; David W. Kaiser, North Haven, and Richard M. O'Grady, Southington, all of Conn., assignors to The Eastern Company, Cleveland, Ohio
 Filed Jul. 10, 1987, Ser. No. 72,282
 Term of patent 14 years

U.S. Cl. D8-321

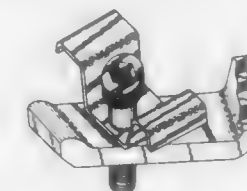


303,923

GRID CLAMP FOR SUPPORT BEAM OR THE LIKE

Neil F. Gill, and Gordon H. Alderton, both of Bradford, United Kingdom, assignors to Lindapter International Limited, West Yorkshire, Great Britain
 Filed Dec. 24, 1986, Ser. No. 946,295
 Term of patent 14 years

U.S. Cl. D8-394

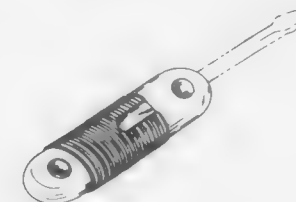


303,920

HANDLE FOR A SCREWDRIVER

Frederick S. Kandel, Columbia, Md., assignor to Majestic Tool Corp., Baltimore, Md.
 Filed Sep. 14, 1987, Ser. No. 95,940
 Term of patent 14 years

U.S. Cl. D8-83

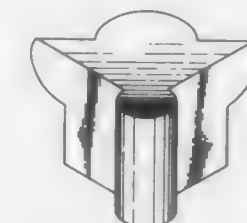


303,924

CORNER PROTECTOR

Otto G. Klein, 10703 College, Kansas City, Mo. 64137
 Filed May 19, 1987, Ser. No. 51,302
 Term of patent 14 years

U.S. Cl. D8-403



303,921

UTILITY KNIFE OR SIMILAR ARTICLE

Alfred Blochinger; Christopher Collins, both of South Yarra; Cvetan Petroff, Northcote, and Wallace Tench, South Yarra, all of Australia, assignors to McPherson's Limited, Australia
 Filed May 12, 1986, Ser. No. 862,534
 Claims priority, application Australia, Nov. 11, 1985, 3205/85
 Term of patent 14 years

U.S. Cl. D8-98

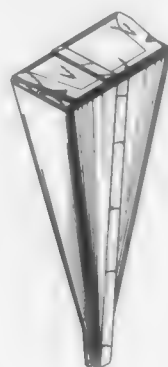


303,925

**COMBINED PACKAGE AND DISPENSER FOR
EXTRUDIBLE COMESTIBLES**
George Mileos, Riverdale, N.Y., assignor to General Foods
Corp., White Plains, N.Y.

Filed Sep. 2, 1986, Ser. No. 903,061
Term of patent 14 years

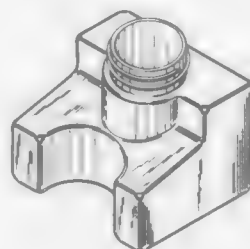
U.S. Cl. D9—306

303,928
BOTTLE

Juris M. Mednis, Howell, N.J., assignor to Universal Symetrics
Corporation, Howell, N.J.

Filed Apr. 3, 1986, Ser. No. 847,837
Term of patent 14 years

U.S. Cl. D9—375



303,926

INK DISPENSING BOTTLE

Clarence J. Venne, and Richard A. Venne, both of Bensalem,
Pa., assignors to Clarence J. Venne, Inc., Bensalem, Pa.

Division of Ser. No. 767,576, Aug. 20, 1985. This application
Oct. 3, 1988, Ser. No. 254,530

Term of patent 14 years

U.S. Cl. D9—349

303,929
BOTTLE

Samuel Roas, Cincinnati, Ohio, assignor to The Procter & Gam-
ble Company, Cincinnati, Ohio

Filed Mar. 31, 1986, Ser. No. 847,591
Term of patent 14 years

U.S. Cl. D9—376



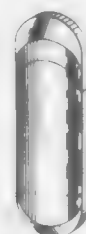
303,927

CONTAINER WITH CAP

Heinz Weber, Apt. 712, 21 Lakeshore Rd., Pointe Claire, Que-
bec, Canada

Filed Jun. 24, 1986, Ser. No. 877,979
Term of patent 14 years

U.S. Cl. D9—371



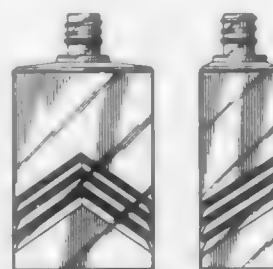
303,930

PERFUME BOTTLE

Jean-Jacques Durand, LaBute, 62510 Arques, France

Filed Jun. 17, 1986, Ser. No. 875,742
Term of patent 14 years

U.S. Cl. D9—403



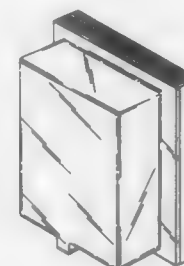
303,931

BOOK BLISTER PACKAGE

Ruth E. Miller, and Jack V. Miller, both of 700 N. Auburn Ave.,
Sierra Madre, Calif. 91024

Filed Apr. 27, 1987, Ser. No. 81,036
Term of patent 14 years

U.S. Cl. D9—415



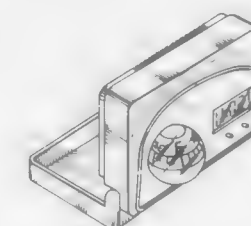
303,933

**COMBINED DIGITAL CLOCK AND COMPASS FOR
VEHICLES**

Marc R. Iacovelli, Miami, Fla., assignor to Rally Manufactur-
ing, Inc., Miami, Fla.

Filed Dec. 5, 1986, Ser. No. 938,748
Term of patent 14 years

U.S. Cl. D10—2



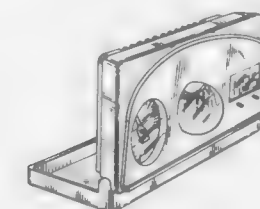
303,934

**COMBINED DIGITAL CLOCK, THERMOMETER AND
COMPASS FOR VEHICLES**

Marc R. Iacovelli, Miami, Fla., assignor to Rally Manufactur-
ing, Inc., Miami, Fla.

Filed Dec. 5, 1986, Ser. No. 938,749
Term of patent 14 years

U.S. Cl. D10—2



303,932

CHEF'S HAT BOTTLE CAP

Norbert Pasillas, 7251 Comstock Ave. #F, Whittier, Calif.
90605

Filed May 13, 1986, Ser. No. 862,895
Term of patent 14 years

U.S. Cl. D9—451



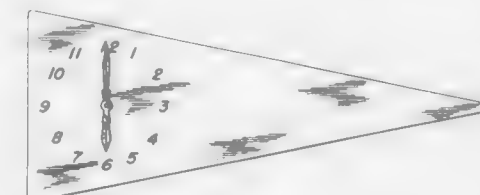
303,935

PENNANT CLOCK

Ronald Coleman, 2700 W. Milbrook Ct., Peoria, Ill. 61615

Filed Apr. 30, 1986, Ser. No. 858,283
Term of patent 14 years

U.S. Cl. D10—6



303,936

WRISTWATCH

Jacqueline Debluc, Gland, Switzerland, assignor to Leonard S.A., Switzerland

Filed Dec. 30, 1986, Ser. No. 947,970

Claims priority, application Switzerland, Jul. 8, 1986, 115356

Term of patent 14 years

U.S. Cl. D10—32



303,937

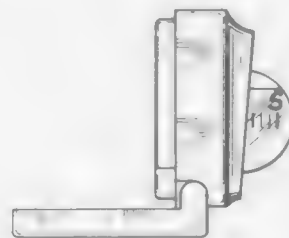
COMBINED THERMOMETER AND COMPASS FOR VEHICLES

Marc R. Iacovelli, Miami, Fla., assignor to Rally Manufacturing, Inc., Miami, Fla.

Filed Dec. 5, 1986, Ser. No. 938,747

Term of patent 14 years

U.S. Cl. D10—53



303,937

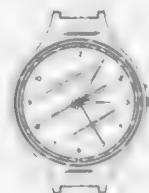
WATCH WITH NEON-LIKE ILLUMINATION RING

M. Frazier King, Jr., 220 Luther Dr., and Elizabeth A. Clarfeo, 1045 Shook, Apartment 131, both of San Antonio, Tex. 78212

Filed May 16, 1986, Ser. No. 864,123

Term of patent 14 years

U.S. Cl. D10—39



303,939

COMPASS HOLDER

Toshikazu Yusa, Tokyo, Japan, assignor to Tokyo Compass Mfg. Co., Ltd., Tokyo, Japan

Filed Sep. 24, 1986, Ser. No. 911,311

Claims priority, application Japan, Aug. 4, 1986, 61-26602

Term of patent 14 years

U.S. Cl. D10—74



303,940

LINK CHAIN FOR BRACELET OR THE LIKE

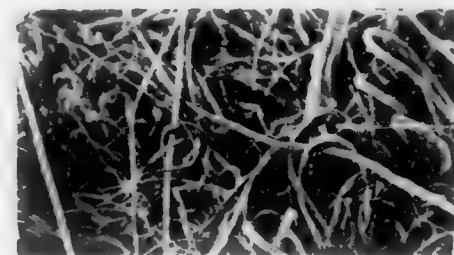
Alain-Dominique Perrin, Rueil-Malmaison, France, assignor to Cartier International B.V., Amsterdam, Netherlands

Filed Oct. 16, 1987, Ser. No. 109,027

Claims priority, application France, Apr. 17, 1987, 87 2309

Term of patent 14 years

U.S. Cl. D11—13



303,943

SLIDER PULL TAB FOR SLIDE FASTENER

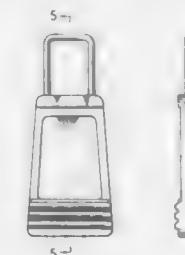
Hiroo Minami, Uozu, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed Aug. 11, 1987, Ser. No. 83,960

Claims priority, application Japan, Apr. 25, 1987, 62-16202

Term of patent 14 years

U.S. Cl. D11—221



303,944

AUTOMOBILE TIRE

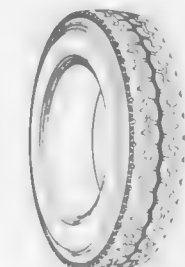
Yasuo Himuro, and Hidenori Masuda, both of Tokyo, Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Mar. 25, 1987, Ser. No. 30,783

Claims priority, application Japan, Sep. 25, 1986, 61-37594

Term of patent 14 years

U.S. Cl. D12—146



303,941

LINK CHAIN FOR BRACELET OR THE LIKE

Alain-Dominique Perrin, Rueil-Malmaison, France, assignor to Cartier International B.V., Amsterdam, Netherlands

Filed Oct. 16, 1987, Ser. No. 109,124

Claims priority, application France, Apr. 17, 1987, 87 2309

Term of patent 14 years

U.S. Cl. D11—21



303,945

AUTOMOBILE TIRE

Toru Tsuda, and Yuji Sakamaki, both of Tokyo, Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed May 6, 1987, Ser. No. 46,494

Claims priority, application Japan, Dec. 16, 1986, 61-49522

Term of patent 14 years

U.S. Cl. D12—147



303,942

CORNER SUPPORT BRACKET FOR PLAQUES OR THE LIKE

Charles E. Bottcher, Redbud Rd., Oneonta, Ala. 35121

Filed May 29, 1986, Ser. No. 867,755

Term of patent 14 years

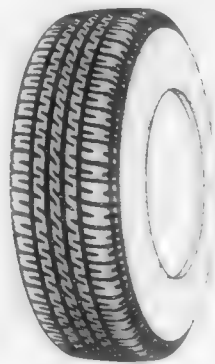
U.S. Cl. D11—164



303,946
TIRE

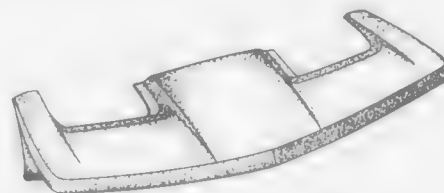
Maurice Grass, Luxembourg City, Luxembourg, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Jan. 15, 1987, Ser. No. 61,992
Claims priority, application Japan, Jan. 8, 1987, 62-000126
Term of patent 14 years

U.S. Cl. D12—147

303,948
SUN VISOR

Douglas L. Bonstead, Ankeny, and Herbert O. Dixon, West Des Moines, both of Iowa, assignors to Deflecta-Shield Corporation, West Des Moines, Iowa
Filed Nov. 13, 1987, Ser. No. 119,991
Term of patent 14 years

U.S. Cl. D12—191

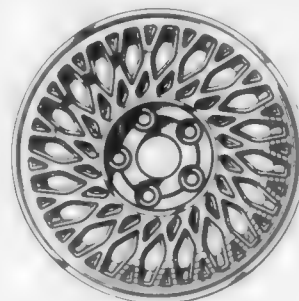


303,949

VEHICLE WHEEL

Toshiki Nakatsuka, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Oct. 22, 1986, Ser. No. 922,097
Term of patent 14 years

U.S. Cl. D12—211

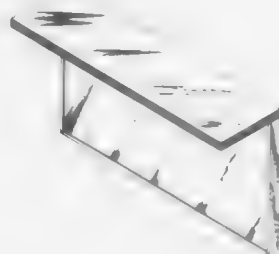


303,947

HEARVIEW MIRROR

Yehuda Yehuda, 25 Messada Street, Ramat HaSharon, Israel
Filed Jan. 27, 1987, Ser. No. 7,382
Claims priority, application Israel, Jul. 27, 1986, 11820
Term of patent 14 years

U.S. Cl. D12—187

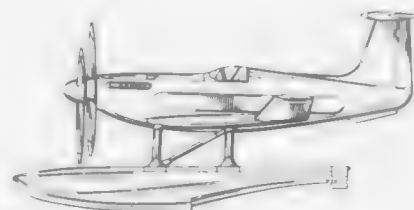


303,950

SEAPLANE WITH PONTOONS

Samuel C. Burgess, P.O. Box 3224, San Antonio, Tex. 78211
Filed Oct. 8, 1986, Ser. No. 916,861
Term of patent 14 years

U.S. Cl. D12—324

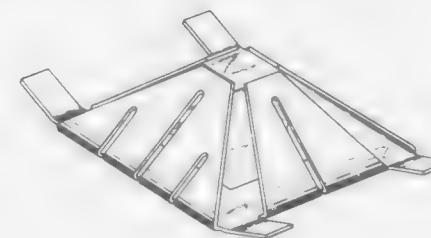


303,951

HEAT-SINK COVER FOR LEADLESS ELECTRONIC CHIP-CARRIER SOCKETS

Alfred F. McCarthy, Belmont, N.H., assignor to Aavid Engineering, Inc., Laconia, N.H.
Filed Mar. 27, 1986, Ser. No. 847,020
Term of patent 14 years

U.S. Cl. D13—23

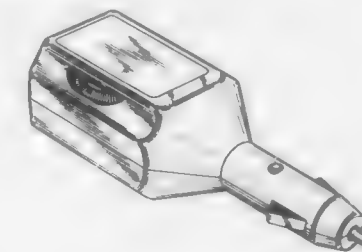


303,954

TAPE PLAYER ADAPTER FOR CAR RADIOS

Dennis Michels, New York, N.Y.; Alan Kaplan, West Orange, and Vincent Fusco, Clifton, both of N.J., assignors to Sound Sender, Inc., East Hanover, N.J.
Filed Nov. 8, 1985, Ser. No. 804,370
Term of patent 14 years

U.S. Cl. D14—155

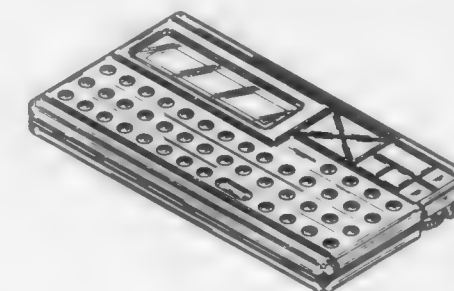


303,955

POCKET COMPUTER

Hajime Shiozawa, and Keiichi Koyama, both of Osaka, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Nov. 12, 1986, Ser. No. 929,669
Claims priority, application Japan, May 12, 1986, 6117915
Term of patent 14 years

U.S. Cl. D14—100

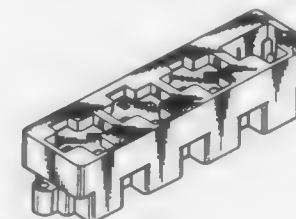


303,952

ELECTRICAL CONNECTOR

Douglas Drew, Toronto, Canada, assignor to Noma Inc., Scarborough, Canada
Filed Dec. 24, 1986, Ser. No. 947,463
Term of patent 14 years

U.S. Cl. D13—30



303,956

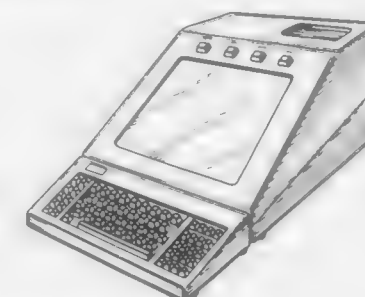
COMPUTER DISPLAY TERMINAL

Richard J. Ditzik, 10929 Clairemont Mesa Blvd., San Diego, Calif. 92124

Filed Jul. 31, 1986, Ser. No. 892,070

Term of patent 14 years

U.S. Cl. D14—106

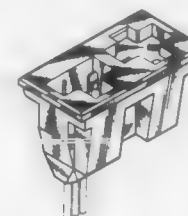


303,953

ELECTRICAL CONNECTOR

Douglas Drew, Toronto, Canada, assignor to Noma Inc., Scarborough, Canada
Filed Dec. 24, 1986, Ser. No. 947,466
Term of patent 14 years

U.S. Cl. D13—30



303,957

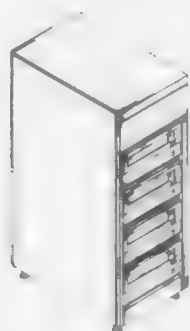
OPTICAL DISK UNIT FOR ELECTRONIC COMPUTERS
Shingo Nakamura, and Norio Shibuya, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Dec. 18, 1986, Ser. No. 943,295

Claims priority, application Japan, Jun. 19, 1986, 61-23876

Term of patent 14 years

U.S. Cl. D14-109



303,959

BASE FOR DISPLAY MONITOR

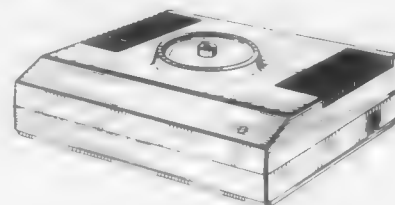
Tsutomu Suyama; Masaharu Wakamatsu, both of Amagasaki; Takahiko Yamamuro, and Kazuyuki Fukushima, both of Nagasaki, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 8, 1986, Ser. No. 938,912

Claims priority, application Japan, Jun. 9, 1986, 61-22187

Term of patent 14 years

U.S. Cl. D14-114

303,960
FACSIMILE

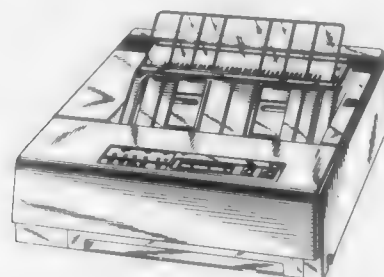
Kawamura Tora, Aichi, and Takagi Katsunori, Hyogo, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Japan

Filed Jan. 12, 1987, Ser. No. 2,344

Claims priority, application Japan, Jul. 14, 1986, 61-27466

Term of patent 14 years

U.S. Cl. D14-118



303,958

CARD SHROUD ENCLOSURE FOR AN INDUSTRIAL COMPUTER

William V. Cranston, III; Randall W. Martin, both of Boca Raton, and Mark A. Young, Lake Worth, all of Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 25, 1986, Ser. No. 910,514

Term of patent 14 years

U.S. Cl. D14-114



303,961

REEL FOR A VIDEO TAPE RECORDER

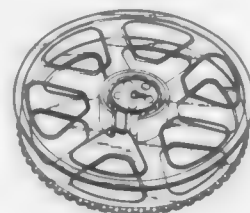
Suk E. Kim, Cheonan, Rep. of Korea, assignor to SKC Limited, Kyongki, Rep. of Korea

Filed Dec. 31, 1986, Ser. No. 948

Claims priority, application Rep. of Korea, Jul. 5, 1986, 86-9569

Term of patent 14 years

U.S. Cl. D14-122



303,962

OUTDOOR VIDEO DISPLAY UNIT

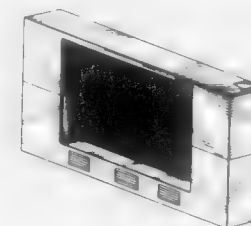
Tohru Ason, Nagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 27, 1986, Ser. No. 822,552

Claims priority, application Japan, Jul. 27, 1985, 60-32171

Term of patent 14 years

U.S. Cl. D14-128



303,964

COMBINATION HANDSET TRANSCIVER AND MESSAGE RECORDER TELEPHONE STAND THEREFOR

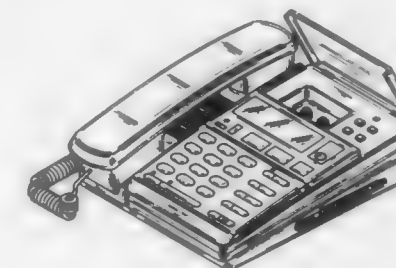
Satoshi Fukutome, Osaka, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Aug. 30, 1988, Ser. No. 238,880

Claims priority, application Japan, Mar. 3, 1988, 63-9009

Term of patent 14 years

U.S. Cl. D14-141



303,963

PORTABLE TELEPHONE

Mitsuharu Kokihara, Tokyo, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Jun. 28, 1988, Ser. No. 212,724

Claims priority, application Japan, Jan. 14, 1988, 63-1323

Term of patent 14 years

U.S. Cl. D14-138



303,965

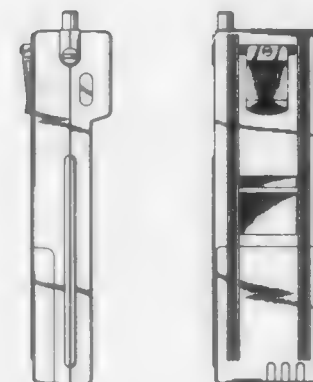
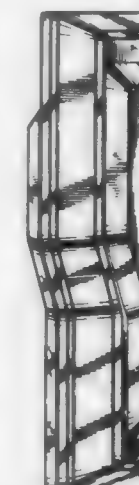
BASE FOR TELEPHONE SET

Edmond J. Helstab, Ottawa, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Mar. 8, 1988, Ser. No. 165,680

Term of patent 14 years

U.S. Cl. D14-142



303,966

TELEPHONE STATION

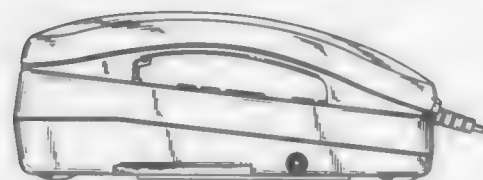
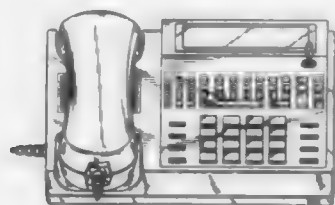
Jochen Fritzsch, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 25, 1988, Ser. No. 223,375

Claims priority, application Fed. Rep. of Germany, Feb. 29, 1988, BD.IORN.17704

Term of patent 14 years

U.S. Cl. D14—151



303,968

CLOCK RADIO

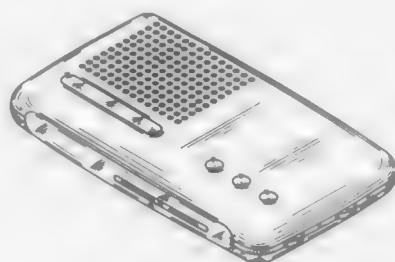
Kazuo Tsujimoto, Osaka, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Nov. 17, 1987, Ser. No. 121,726

Claims priority, application Japan, May 21, 1987, 62-20201

Term of patent 14 years

U.S. Cl. D14—171



303,969

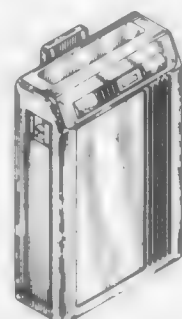
RADIO PAGER OR SIMILAR ARTICLE

William J. Scheid; John M. McKee, both of Coral Springs; Robert Kurchart, Boca Raton; Joseph V. Ranalletta, Coral Springs; John R. Benyo, and Richard J. Toth, both of Boca Raton, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 15, 1986, Ser. No. 919,337

Term of patent 14 years

U.S. Cl. D14—191



303,967

COMBINED CASSETTE PLAYER AND RADIO RECEIVER FOR THE BLIND

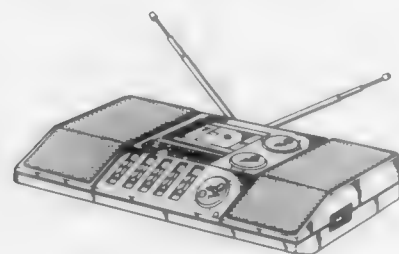
Myung C. Shin, Daegu-shi, Rep. of Korea, assignor to Gold Star Co., Ltd., Seoul, Rep. of Korea

Filed Feb. 28, 1986, Ser. No. 838,029

Claims priority, application Rep. of Korea, Sep. 30, 1985, 1985-17942

Term of patent 14 years

U.S. Cl. D14—162



303,970

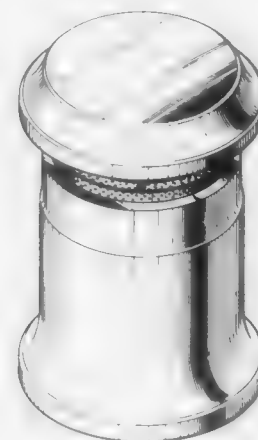
OUTDOOR LOUDSPEAKER

Martin W. Collins, Windermere, Fla., and William B. Smith, San Diego, Calif., assignors to SoundScape Speakers, Inc., Windermere, Fla.

Filed Nov. 21, 1986, Ser. No. 933,694

Term of patent 14 years

U.S. Cl. D14—216



303,971

TWIN FUNCTION GRAPHIC EQUALIZER

Shiro Arai, 1-8-24, Kibogaoka, Chikusa-ku, Nagoya 464, Japan

Filed Mar. 31, 1986, Ser. No. 817,434

Term of patent 14 years

U.S. Cl. D14—217



303,972

ANTENNA FOR A MINI SATELLITE EARTH STATION
Takao Uozumi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jul. 23, 1986, Ser. No. 888,379

Claims priority, application Japan, Feb. 27, 1986, 61-7105

Term of patent 14 years

U.S. Cl. D14—231



303,973

PORTABLE INTERNAL COMBUSTION ENGINE AND TOOLS

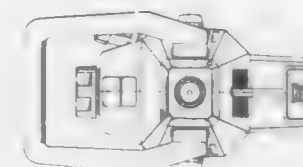
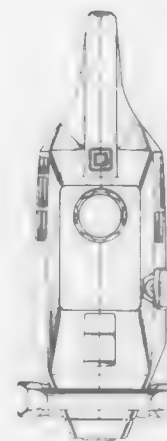
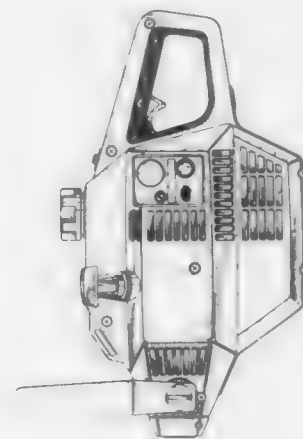
Katsumi Kiyooka, Warabi; Tetsuo Ueno, Higashiyamato; Keiko Iramina, Tachikawa, and Hideko Inomata, Higashiyamato, all of Japan, assignors to Komatsu Zenoah Company, Tokyo, Japan

Filed Jan. 16, 1986, Ser. No. 819,357

Claims priority, application Japan, Jul. 16, 1985, 60-030056; Jul. 29, 1985, 60-32067; Aug. 2, 1985, 60-032807

Term of patent 14 years

U.S. Cl. D15—10



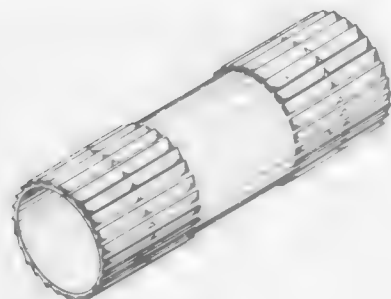
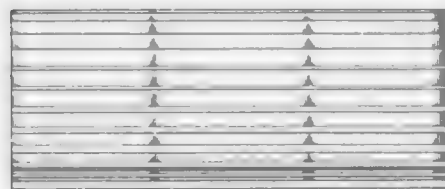
303,974

POWER ROLLER ELEMENT

Craig C. Karr, 1312 San Vicente Blvd., Santa Monica, Calif. 90403

Filed May 1, 1986, Ser. No. 858,515
Term of patent 14 years

U.S. Cl. D15-126

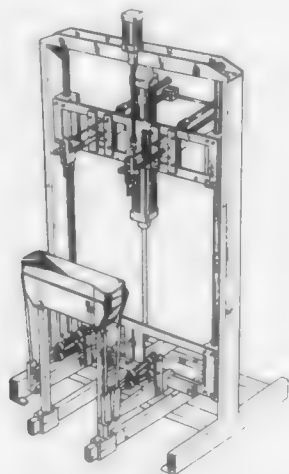


303,975

APPARATUS FOR APPLYING SEAT COVERS TO
AUTOMOBILE BACKRESTS OR THE LIKEConny Hedenberg, Slödvägen 10, S-564 00 Bankeryd, Sweden,
and Alfred Tillner, Richtstättenweg 1a, D-4513 Belm, Fed.
Rep. of GermanyFiled Mar. 20, 1985, Ser. No. 714,197
Claims priority, application Fed. Rep. of Germany, Sep. 20,
1984, 59-1278

Term of patent 14 years

U.S. Cl. D15-199



303,976

LENS FOR CAMERA

Hiroyuki Kimura, Tokyo, and Yoshiaki Hara, Utsunomiya, both
of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 8, 1987, Ser. No. 35,707

Claims priority, application Japan, Oct. 15, 1986, 61-41055
Term of patent 14 years

U.S. Cl. D16-134



303,977

MAGNIFIER

Veronica G. Steel, London, England, and David F. Francis,
Sydney, Australia, assignors to Combined Optical Industries
Limited, United Kingdom

Filed Apr. 9, 1987, Ser. No. 36,284

Claims priority, application United Kingdom, Oct. 14, 1986,
1037361

Term of patent 14 years

U.S. Cl. D16-135



303,978

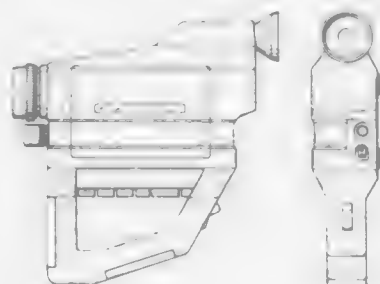
COMBINED VIDEO CAMERA AND RECORDER

Raymond C. Phinney, East Aurora, N.Y., assignor to The
Quaker Oats Company, Chicago, Ill.

Filed Mar. 16, 1987, Ser. No. 25,866

Term of patent 14 years

U.S. Cl. D16-202



303,979

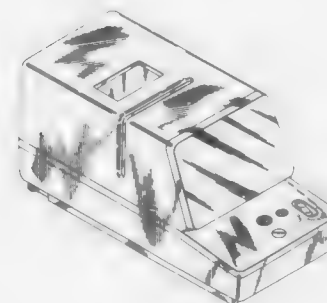
RECEIPT-JOURNAL PRINTER OR SIMILAR ARTICLE

Shuzo Kato, Hiratsuka; Satoru Sakama, Ischawa, and Tamihei
Takahashi, Atsugi, all of Japan, assignors to NCR Corpora-
tion, Dayton, Ohio

Filed Jul. 11, 1986, Ser. No. 884,817

Claims priority, application Japan, Mar. 27, 1986, 61-10934
Term of patent 14 years

U.S. Cl. D18-13



303,981

DESK-TOP ELECTRONIC CALCULATOR

Keiko Takemata, Tokyo, and Eichi Yoshioka, Abiko, both of
Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 9, 1986, Ser. No. 905,256

Claims priority, application Japan, Mar. 14, 1986, 61-9256
Term of patent 14 years

U.S. Cl. D18-7



303,982

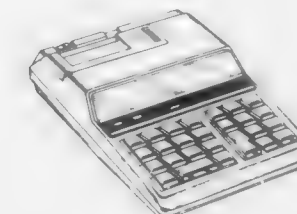
DESK-TOP ELECTRONIC CALCULATOR

Fumiya Matsuoka, Tokyo, and Takeshi Hasegawa, Yokohama,
both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo,
Japan

Filed Sep. 23, 1986, Ser. No. 910,774

Claims priority, application Japan, Mar. 27, 1986, 61-11240
Term of patent 14 years

U.S. Cl. D18-7



303,980

ELECTRONIC CALCULATOR

Takahisa Yubisui; Hiroshi Sakaguchi, and Toshiya Takahashi,
all of Osaka, Japan, assignors to Sharp Kabushiki Kaisha,
Osaka, Japan

Filed Aug. 22, 1986, Ser. No. 899,501

Claims priority, application Japan, Feb. 25, 1986, 61-6910
Term of patent 14 years

U.S. Cl. D18-7



303,983

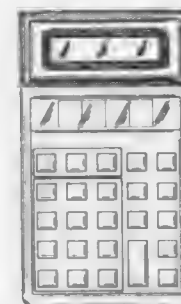
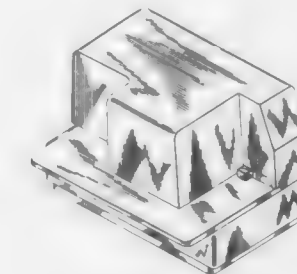
SLIP PRINTER OR SIMILAR ARTICLE

Shuzo Kato, Hiratsuka, and Shingo Watanabe, Fujisawa, both of
Japan, assignors to NCR Corporation, Dayton, Ohio

Filed Jul. 11, 1986, Ser. No. 884,816

Claims priority, application Japan, Mar. 27, 1986, 61-10935
Term of patent 14 years

U.S. Cl. D18-13



303,984

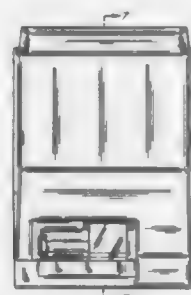
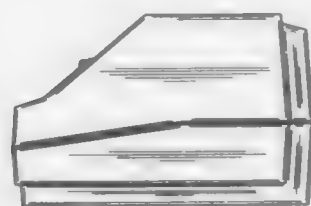
PRINTER FOR CASH REGISTER

Akira Tsukada, Osaka, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Aug. 19, 1986, Ser. No. 898,003

Claims priority, application Japan, Mar. 3, 1986, 61-7648
Term of patent 14 years

U.S. Cl. D18—13



303,986

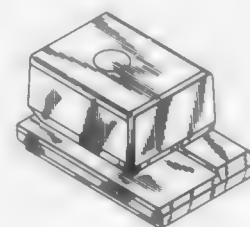
RECEIPT/SLIP PRINTER OR SIMILAR ARTICLE

Shuzo Kato, Hiratsuka, and Tamihai Takahashi, Atsugi, both of Japan, assignors to NCR Corporation, Dayton, Ohio

Filed Sep. 25, 1987, Ser. No. 101,342

Claims priority, application Japan, Apr. 30, 1987, 62-16664
Term of patent 14 years

U.S. Cl. D18—13



303,985

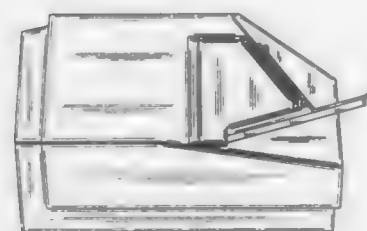
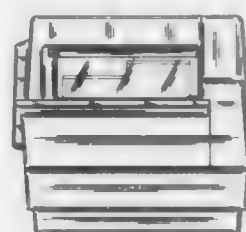
PRINTER FOR CASH REGISTER

Maki Tomoiike, Osaka, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Oct. 20, 1986, Ser. No. 922,109

Claims priority, application Japan, Apr. 22, 1986, 61-15404
Term of patent 14 years

U.S. Cl. D18—13



303,987

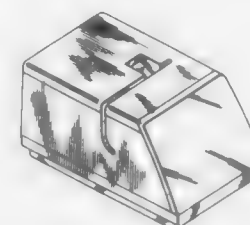
RECEIPT/JOURNAL PRINTER OR SIMILAR ARTICLE

Shuzo Kato; Yasushi Nakamura, both of Hiratsuka, and Masao Kusayanagi, Odawara, all of Japan, assignors to NCR Corporation, Dayton, Ohio

Filed Sep. 25, 1987, Ser. No. 101,345

Claims priority, application Japan, Mar. 30, 1987, 62-11682
Term of patent 14 years

U.S. Cl. D18—13



303,988

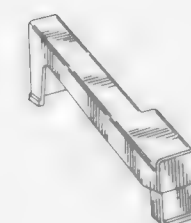
SUPPORT LEG FOR COMPUTER EQUIPMENT

Albert F. Buchweitz, Jr., Wheeling, and Bruce Heggeland, Palatine, both of Ill., assignors to IPD Innovative Plastic Designs Inc., Wheeling, Ill.

Filed Sep. 8, 1986, Ser. No. 905,254

Term of patent 14 years

U.S. Cl. D18—23



303,990

PEN

Tor Petterson, Rancho Palos Verdes, Calif., assignor to Pentel of America, Ltd., Torrance, Calif.

Filed Dec. 11, 1986, Ser. No. 940,642

Term of patent 14 years

U.S. Cl. D19—48



303,989

HOLE

Lucy Körner, Bahnhofstrasse 49, D-7012 Fellbach, Fed. Rep. of Germany

Filed Mar. 11, 1986, Ser. No. 842,433

Claims priority, application Fed. Rep. of Germany, Sep. 25, 1985, 1053; Sep. 27, 1985, 1056; Oct. 7, 1985, 1057; Feb. 3, 1986, 1058

Term of patent 14 years

U.S. Cl. D19—26



303,991

MINIATURE PEN WITH CAP

Kent D. Murphy, 8 Windermere, Gilford Road, Sandymount, Dublin 4, Ireland

Filed Dec. 22, 1986, Ser. No. 944,604

Term of patent 14 years

U.S. Cl. D19—48



303,792

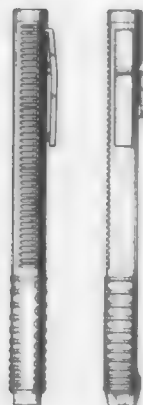
RETRACTABLE HOLDER FOR AN ERASER OR
SIMILAR ARTICLE

Gerald Grötsch, Fuerth, Fed. Rep. of Germany, assignor to J. S. Staedtler GmbH & Co., Nuremberg, Fed. Rep. of Germany
Filed Dec. 5, 1986, Ser. No. 938,741

Claims priority, application Fed. Rep. of Germany, Jun. 11, 1986, MRVII275

Term of patent 14 years

U.S. Cl. D19—53



303,993

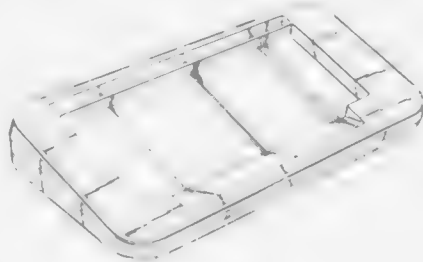
NOTE PAD HOLDER

Michael J. Szablak, Stephens City, and Glen E. Tomblin, Winchester, both of Va., assignors to Rubbermaid Commercial Products, Inc., Winchester, Va.

Filed Oct. 24, 1986, Ser. No. 923,717

Term of patent 14 years

U.S. Cl. D19—78



303,994

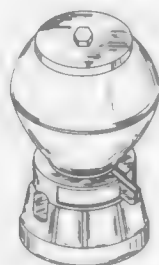
CANDY DISPENSER

George C. Lee, 17879 Santa Valera St., Fountain Valley, Calif. 92708

Filed Aug. 26, 1986, Ser. No. 901,155

Term of patent 14 years

U.S. Cl. D20—7



LIST OF PATENTEEES

TO WHOM

PATENTS WERE ISSUED ON THE 10TH DAY OF OCTOBER, 1989

NOTE.—Arranged in accordance with the first significant character or word of the name
(in accordance with city and telephone directory practice).

- A. H. Robins Company, Incorporated: See—
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- A. Nattermann & CIE GmbH: See—
Welter, Andre.; Fischer, Harmut; Christiaens, Leon; Wendel, Albrecht; Eschenberg, Eugen; Dereu, Norbert; Kuhl, Peter; and Graf, Eric, 4,873,350, Cl. 549-436.000.
- A. O. Smith Corporation: See—
Kramer, David W., 4,872,833, Cl. 431-354.000.
Ruark, Darryl L., 4,872,443, Cl. 126-361.000.
- A/S Ferrosan: See—
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- Aalto, Erkki: See—
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- Abellana, Jovito N.; and Dolan, Donald T., to Pitney Bowes Inc. Platen module for a modular mailing machine. 4,872,521, Cl. 177-25.150.
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Childers, Wayne E., Jr.; and Abou-Gharbia, Magid A., 4,873,331, Cl. 544-295.000.
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Wiesen, Heinz; and Wolff, Erich, 4,873,338, Cl. 546-293.000.
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Murphy, Mark A.; Smith, Brad L.; Aguilo', Adolfo; and Tau, Kwoliang D., 4,873,378, Cl. 568-867.000.
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- Aikawa, Renji: See—
Morishita, Masataka; Aikawa, Renji; Katsuragi, Shigeo; Yamamoto, Yoshiaki; and Sugimoto, Kenichi, 4,873,087, Cl. 424-433.000.
- Aikawa, Yukihiko: See—
Tada, Tomio; Hirobe, Junichi; Takamatsu, Junichi; Hori, Kazuo; and Aikawa, Yukihiko, 4,873,549, Cl. 355-206.000.
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Brown, Carlton E.; and de Pagter, Pierre C., 4,872,400, Cl. 98-115.300.
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- Schweighardt, Frank K.; Bailey, Webb I.; Lileck, John T.; Graybill, John K.; and Lutz, Eugene G., 4,873,315, Cl. 570-130.000.
- Aisan Industry Co., Ltd.: See—
Sonoda, Hidefumi; Mori, Eiji; Kawase, Mitsuo; Yoneshige, Kazuhiro; Takahashi, Akira; Komiya, Hirokazu; and Tanaka, Akira, 4,872,439, Cl. 123-518.000.
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Yamada, Yutaka; Kozawa, Tadashi; Natsume, Naohiro; and Komatsubara, Hirofumi, 4,872,806, Cl. 415-55.500.
- Aisin Seiki Kabushiki Kaisha: See—
Katsuo, Suzuki, 4,873,526, Cl. 342-359.000.

Aizawa, Yuichi: See—
Yoshioka, Takao; Kanai, Tsutomu; Aizawa, Yuichi; Horikoshi, Hiroyoshi; and Hasegawa, Kazuo, 4,873,255, Cl. 514-369.000.

Ajomoto Co., Inc.: See—
Sasaki, Hitoshi; and Igota, Shoji, 4,872,590, Cl. 220-457.000.

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Hirayama, Shigemitsu; Akashi, Takamichi; Ikuta, Akio; Sasaki, Isao; and Fukuda, Hiroshi, 4,872,974, Cl. 210-90.000.

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Sakai, Takashi, 4,872,584, Cl. 220-201.000.

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LaCourse, William C.; and Akhtar, Maysood, 4,872,896, Cl. 65-30.140.

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Etoh, Jun; Shumohigashi, Katsuhiro; Miyazawa, Kazuyuki; Kimura, Katsutaka; and Akiba, Takesada, 4,873,672, Cl. 365-218.000.

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Yoshikawa, Masato; Fukuura, Yukio; Akiyama, Setsuo; Nakamura, Makoto; Naito, Kazuo; and Honda, Toshio, 4,872,932, Cl. 156-151.000.

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Dimantoglou, Michael; and Kuhne, Helmut, 4,872,983, Cl. 210-500.290.

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Mezei, Louis M.; Albom, Bradley S.; Coppock, Stan; Moehle, Stephen J.; Noorda, Brent S.; Widunas, Joseph T.; and Zeitlin, James A., 4,873,633, Cl. 364-413.080.

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Enright, Philip G.; Hobbis, Andrew J.; and Tapping, Ronald E., 4,872,908, Cl. 75-68.00R.

Gnyra, Bohdan, 4,873,209, Cl. 501-95.000.

Jenkins, Dianne M.; and Pargeter, Christopher, 4,873,047, Cl. 264-322.000.

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Alden, Kevin; and Alden, Charles, 4,872,352, Cl. 73-861.770.

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Jakob, Wolfgang; Alewelt, Wolfgang; and Tresper, Erhard, 4,873,326, Cl. 540-538.000.

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Pristera, Raffaele; Rugosa, Edoardo; Fioravazzi, Silvio; Guelfi, Giorgio; Bassi, Aldo; and Poli, Alberto, 4,873,451, Cl. 307-10.100.

Alfa-Laval Thermal AB: See—
Nilsson, Mats; Tagesson, Bernt; and Novak, Ladislav, 4,872,506, Cl. 165-166.000.

Alfred University: See—
LaCourse, William C.; and Akhtar, Maysood, 4,872,896, Cl. 65-30.140.

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Algra, Gerben P.: See—
Erkens, Leonardus J. H.; Algra, Gerben P.; Snijders, Jacobus M. H.; Geurts, Herman J. J. M.; and Pugin, Andre, 4,872,915, Cl. 106-433.000.

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Allen, Dorothy E. Shoe heel scuff protector, 4,872,271, Cl. 36-72.00B.

Allen, George S.: See—
Junge, Bodo; Richter, Bernd; Glaser, Thomas; Traber, Jorg; and Allen, George S., 4,873,262, Cl. 514-510.000.

Allen, James P.; and Corwin, Richard R., to United States of America, Interior. Process for acid leaching of manganese oxide ores aided by hydrogen peroxide, 4,872,909, Cl. 75-101.00R.

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Alliance Research Corporation: See—
Cooper, Gershon, 4,872,630, Cl. 248-278.000.

Porco, Carmen R., 4,873,712, Cl. 379-58.000.

Allied-Signal Inc.: See—
Beuhler, Allyson; and Wrezel, James A., 4,873,302, Cl. 526-333.000.

De Kruij, Jack, 4,872,817, Cl. 417-407.000.

Marshall, Robert M., 4,873,144, Cl. 428-395.000.

Swan, Ellen L.; Basu, Rajat S.; Lund, Earl A. E.; and Wilson, David P., 4,873,015, Cl. 252-171.000.

Alps Electric Co., Ltd.: See—
Ishima, Tsutomu; and Sasaki, Kinshiko, 4,872,842, Cl. 439-15.000.

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Alsop, Richard E. Taco shell holder, 4,872,566, Cl. 211-13.000.

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Shutt, Eric; Altena, Andries G.; and Jenkins, John W., 4,873,388, Cl. 585-500.000.

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Chang, On-Kok; Hall, John C.; Phillips, Jeffrey; and Silvester, Lenard F., 4,873,158, Cl. 424-61.000.

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Niemeyer, Robert H., III, 4,873,538, Cl. 346-139.00R.

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Klemmensen, Ramon L., 4,872,318, Cl. 62-137.000.

Amano, Atsushi: See—
Kanehira, Katsuyuki; Takayama, Syuichi; Amano, Atsushi; Hibino, Hiroki; Uchiyama, Naoki; and Nakada, Akio, 4,872,458, Cl. 128-401.000.

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Giacobbe, Frederick, 4,872,926, Cl. 148-13.100.

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Luh, Yuhshi; and Forgione, Peter S., 4,873,365, Cl. 560-345.000.

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Leonard, Thomas W.; Mikula, Karol Kay; and Schlesinger, Marcia S., 4,873,266, Cl. 514-653.000.

Mobilio, Dominick, 4,873,257, Cl. 514-410.000.

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Weaver, Samuel C.; and Nixdorf, Richard D., 4,873,069, Cl. 423-345.000.

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Alderman, George W., 4,873,432, Cl. 250-227.000.

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Lummis, David J.; and Masso, Jon D., 4,872,749, Cl. 351-44.000.

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Brewen, Ronnie M.; and Lloyd, David A., 4,872,706, Cl. 283-81.000.

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Brendgord, Thomas; Sanders, Ward L.; and Coon, Dennis C., 4,872,656, Cl. 269-322.000.

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Baranay, Lawrence; and Scordo, Dominick, 4,873,663, Cl. 365-73.000.

Chamzas, Christodoulos, 4,873,577, Cl. 358-426.000.

Hokanson, John L.; Smeltz, Palmer D., Jr.; Yanusheski, Katherine A.; Yanusheski, Michael J.; and Young, Craig A., 4,873,566, Cl. 357-74.000.

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Antreasyan, Arsam; Garbinski, Paul A.; Mattera, Vincent D., Jr.; and Temkin, Henryk, 4,873,558, Cl. 357-23.200.

Brady, Patrick K., 4,873,716, Cl. 379-134.000.

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Myer, Robert E., 4,873,492, Cl. 330-86.000.

Myers, Clyde J.; Stephenson, Daniel L.; and Travieso, Ruben, 4,872,736, Cl. 350-96.200.

Ames, Douglas A., to Transphase Systems, Inc. Nestable, stackable containers, 4,872,557, Cl. 206-504.000.

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Meyers, Peter V.; Liu, Chung-Heng; and Frey, Timothy J., 4,873,198, Cl. 437-5.000.

Amgen: See—
Arakawa, Tsutomu, 4,873,312, Cl. 530-351.000.

Amoco Corporation: See—
Anderson, Ronald L., 4,873,009, Cl. 252-49.600.

Chang, Yuehsung, 4,873,007, Cl. 252-40.700.

Fjare, Krisati A., 4,873,361, Cl. 560-130.000.

Hagen, Gary P.; and Nemo, Thomas E., 4,873,386, Cl. 585-471.000.

Hepp, Vincent R., 4,873,636, Cl. 364-422.000.

McVay, David R.; Carter, Lawrence D.; Jonasky, John D.; and Jefferson, Chris A., 4,872,939, Cl. 156-354.000.

AMP Incorporated: See—
Grabbe, Dmitry G., 4,873,615, Cl. 361-395.000.

Grebe, Robert K.; Lucius, John E.; and Szczesny, David S., 4,872,844, Cl. 439-69.000.

Korsunsky, Iosif; Walker, Kevin E.; and Brown, Robert W., 4,872,845, Cl. 439-70.000.

Long, William B., 4,872,849, Cl. 439-209.000.

Pooley, Denis M.; and MacKenzie, Douglas K., deceased, 4,872,856, Cl. 439-783.000.

Webster, Van K., 4,872,853, Cl. 439-327.000.

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Baranski, Antoni S., 4,873,593, Cl. 360-96.500.

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Arch, Jonathan R., to Beecham Group p.l.c. Method for administering ethanalamine derivatives to livestock, 4,873,240, Cl. 514-231.500.

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Areaux, Larry D., to Pre-Melt Systems, Inc. Metal chip furnace charge apparatus and method, 4,872,907, Cl. 75-65.00R.

Ares, Inc.: See—
Stoner, Eugene M., 4,872,391, Cl. 89-155.000.

Arii, Yoshifumi: See—
Niwa, Katsuhiro; Abe, Nobuyasu; Kajikiyo, Katuji; Suzuki, Tsutomu; Tabuti, Katumi; and Arii, Yoshifumi, 4,872,383, Cl. 83-175.000.

Anikawa, Tetsuro, to Nippon ABS, Ltd. Anti-skid control apparatus for a vehicle braking system, 4,872,729, Cl. 303-92.000.

Ariki, Yuusaku: See—
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Pettit, George R.; and Kamano, Yoshiaki, 4,873,245, Cl. 514-250.000.

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Bantle, Manfred; Munz, Volker; Zackl, Bernd; Dietz, Matthias; and Armbrust, Eberhard, 4,872,372, Cl. 74-710.500.

Armstrong World Industries, Inc.: See—
Barrall, Jeffery L.; and Garman, Robert C., 4,872,912, Cl. 106-85.000.

Eshleman, James M.; and Ko, Kenneth K., 4,872,910, Cl. 106-3.000.

Arnold, John: See—
Fishman, Jack; Arnold, John; Sherman, Fred; and Hsiao, Jane, 4,873,076, Cl. 424-10.000.

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Aro Corporation, The: See—
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Artwick, Kert E.: See—
DeBlock, David A.; and Artwick, Kert E., 4,872,498, Cl. 160-90.000.

Arvin Industries, Inc.: See—
Streich, Herbert K.; Leach, Robert D.; Johnson, Joel R.; Olson, Thomas B.; and Townsend, Donald L., 4,873,422, Cl. 219-370.000.

Arzoian, John: See—
Trachman, Edward G.; Shih, Shan; and Arzoian, John, 4,872,374, Cl. 74-731.000.

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Asada, Toshiyuki; Ushijima, Fumihiro; and Higashiyama, Yasuhiko, to Toyota Jidosha Kabushiki Kaisha. Transmission for a vehicle having

- improved performance for shifting between speed stages. 4,872,376, Cl. 74-765.000.
- Asahi, Akihiko: See—
Kubo, Yoshimasa; Honda, Masao; Tanaka, Masashi; and Asahi, Akihiko, 4,873,195, Cl. 435-254.000.
- Asahi Glass Company, Ltd.: See—
Suzuki, Koji; Tsukada, Tetsuro; Saito, Yoshihiko; Arai, Kiyotaka; and Mori, Hiroshi, 4,872,958, Cl. 204-98.000.
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- Asai, Tadamichi: See—
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- Asano, Hideki: See—
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- Asano, Katuhiko; and Suzuki, Takao, to Hitachi, Ltd. Superconducting coil refrigerating method and superconducting apparatus. 4,872,314, Cl. 62-49.100.
- Asano, Motomu: See—
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- Asano, Yuji, to Brother Kogyo Kabushiki Kaisha. Self cleaning sheet for dissolving a photo-sensitive material containing microcapsules on both sides of substrate. 4,873,167, Cl. 430-138.000.
- Asayama, Yoshiaki, to Mitsubishi Denki Kabushiki Kaisha. Fuel pressure regulator for internal combustion engine. 4,872,437, Cl. 123-463.000.
- Asayama, Yoshiaki: See—
Ueyama, Yoshiji; and Asayama, Yoshiaki, 4,872,435, Cl. 123-336.000.
- Ashland Oil, Inc.: See—
Zandona, Oliver J., 4,872,971, Cl. 208-419.000.
- Ashley, Andrew W.: See—
Brown, Stephen C. N.; and Ashley, Andrew W., 4,872,545, Cl. 198-394.000.
- Asquith, Janet L.; and Connor, Bonnie G. Emergency signal balloon apparatus. 4,872,414, Cl. 116-210.000.
- Asaf, Gad, to Geophysical Engineering Company. Heat exchanger and systems and methods for using the same. 4,872,315, Cl. 62-94.000.
- Astle, William H.: See—
VanderPol, Jerald; Silber, Cory J.; and Astle, William H., 4,872,249, Cl. 29-157.400.
- AT&T Bell Laboratories: See—
Baranyai, Lawrence; and Scordo, Dominick, 4,873,663, Cl. 365-73.000.
- Chamzas, Christodoulos, 4,873,577, Cl. 358-426.000.
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Akkermans, Gerardus P. M., 4,873,524, Cl. 341-73.000.
- Athey Products Corp.: See—
Brown, Stanley M., 4,872,233, Cl. 15-83.000.
- Atlantic Richfield Co.: See—
Baillie, Lloyd A., 4,872,336, Cl. 73-40.50R.
- Elias, Eric; and Knapp, Karl E., 4,873,118, Cl. 427-39.000.
- Oquendo, Javier N.; and Leone, Joseph A., 4,872,992, Cl. 210-659.000.
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Mullay, John J., 4,872,929, Cl. 149-46.000.
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Haeussler, Klaus M.; Wittmann, Julius; Gaukel, Gisela; and Auracher, Franz, 4,873,697, Cl. 372-108.000.
- Aurness, Harold O.; and Mahler, Thomas G. Three stage combination replacement lock. 4,872,326, Cl. 70-133.000.
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- Austad, Eric D. Wound dressing and method of forming same. 4,872,450, Cl. 128-90.000.
- Auth, Rudolf; Seidelmann, Lothar; and Maas, Heinz, to Thyssen Stahl AG. Process and plant for producing binder-free hot briquettes. 4,872,906, Cl. 75-5.000.
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- Auvil, Steven R.: See—
Agrawal, Rakesh; and Auvil, Steven R., 4,872,893, Cl. 62-11.000.
- Avakian, Roger W.: See—
Gallucci, Robert R.; van der Meer, Roelof; and Avakian, Roger W., 4,873,286, Cl. 525-92.000.
- Avco Corporation: See—
Curry, Stephen J., 4,872,348, Cl. 73-653.000.
- Avedon, Raymond B.: See—
Hammett, Roy; Hutcheson, Jerry D.; and Avedon, Raymond B., 4,872,595, Cl. 222-209.000.
- Avendt, Raymond J.: See—
Dausman, Jerome; and Avendt, Raymond J., 4,872,998, Cl. 210-710.000.
- Avidan, Amos A.; and Johnson, David L., to Mobil Oil Corp. Single zone oligomerization of lower olefins to distillate under low severity in a fluid bed with tailored activity. 4,873,385, Cl. 585-415.000.
- Avidan, Amos A.; and Johnson, David L., to Mobil Oil Corp. Conversion of light olefins to gasoline using low-temperature catalyst regeneration. 4,873,389, Cl. 585-533.000.
- Azuma, Ichiro; Tokura, Seiichi; Nishimura, Shinichiro; and Seo, Hiroshi, to Murata Kikai Kabushiki Kaisha. Slow-releasing preparation. 4,873,092, Cl. 424-499.000.
- B-ART S.r.l.: See—
Biagini, Livio, 4,872,430, Cl. 123-188.00A.
- B & H Manufacturing Company, Inc.: See—
Mitchell, Monte C., 4,872,931, Cl. 156-86.000.
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- Babuka, Robert; and Petrozello, James R., to International Business Machines Corp. Electrical connector with torsional contacts. 4,872,851, Cl. 439-267.000.
- Bach, Hartwig C., to Monsanto Company. Acrylic fibers having superior abrasion/fatigue resistance. 4,873,142, Cl. 428-359.000.
- Baer, Richard G.: See—
Tullis, Barclay J.; and Baer, Richard G., 4,872,835, Cl. 432-225.000.
- Bailey, James B.; Gibson, Robert R.; Nunley, Alvin, III; and Utz, Q. Wayne, to Techsonic Industries, Inc. Sonar depth sounder apparatus. 4,873,676, Cl. 367-98.000.
- Bailey, Russell O.: See—
Aidlin, Samuel S.; Aidlin, Stephen H.; Bailey, Russell O.; and Myers, Ed, 4,873,410, Cl. 219-56.100.
- Bailey, Webb I.: See—
Schweighardt, Frank K.; Bailey, Webb I.; Lileck, John T.; Graybill, John K.; and Lutz, Eugene G., 4,873,315, Cl. 570-130.000.
- Baillie, Lloyd A., to Atlantic Richfield Co. Apparatus for pressure testing pipelines. 4,872,336, Cl. 73-40.50R.
- Bair, Kenneth W., to Burroughs Wellcome Co. Benzo[c] carbazole propanediol containing anti tumor compositions and use. 4,873,258, Cl. 514-411.000.
- Baird, Lincoln F. Orthopedic chair. 4,872,223, Cl. 4-480.000.
- Baker Cummins Pharmaceuticals, Inc.: See—
Fishman, Jack; Arnold, John; Sherman, Fred; and Hsiao, Jane, 4,873,076, Cl. 424-10.000.
- Baker Hughes Incorporated: See—
Lehr, Douglas J.; Bell, Merle L.; Rubbo, Richard P.; and Forehand, Richard L., 4,872,510, Cl. 166-327.000.
- Baker, Robert L.: See—
Davis, Gail F.; and Baker, Robert L., 4,872,794, Cl. 410-54.000.
- Baldassarri, Agostino: See—
Delprato, Ivano; and Baldassarri, Agostino, 4,873,182, Cl. 430-546.000.
- Baldwin, Peter: See—
Fredrick, William; Brent, Robert; and Baldwin, Peter, 4,873,617, Cl. 363-17.000.
- Baldwin Filters, Inc.: See—
Cudaback, Roger L., 4,872,976, Cl. 210-130.000.
- Baldwin, Peter: See—
Fredrick, William; Brent, Robert; and Baldwin, Peter, 4,873,616, Cl. 363-17.000.
- Fredrick, William; Brent, Robert; and Baldwin, Peter, 4,873,618, Cl. 363-17.000.
- Balet, Daniel; Chiomento, Renzo; Beaulieu, Louis; and Poncel, Yves, to Electronique Serge Dassault. Device for positioning a mock-up in three dimensions, in particular for studying backscattering from said mock-up. 4,873,571, Cl. 358-93.000.
- Ball Corporation: See—
Cormack, Robert H.; and Brown, Carey S., 4,872,757, Cl. 356-376.000.
- Ball, Michael: See—
Kopsch, Reiner; Gosswein, Claus F.; Lutz, Henning; Ball, Michael; and Hubert, Peter, 4,872,987, Cl. 210-635.000.
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Palmer, Darrel, 4,872,579, Cl. 128-205.190.
- Ballu, Patrick, to Tecnoma. Device for rinsing containers. 4,872,467, Cl. 134-104.200.
- Baltimore Aircoil Company, Inc.: See—
Garrish, Bryan F., 4,873,028, Cl. 261-109.000.
- Banke, Allan. Method for the mounting of a flexible printing plate on a cylinder, and apparatus for the execution of the method. 4,872,407, Cl. 101-389.100.
- Banki, Mehrdad; Bush, Kevin M.; and McDermith, William O., to Mine Incorporated. Digital waveform analyzer. 4,873,647, Cl. 364-488.000.
- Banks, Lori; Busk, Grant C., Jr.; Chiang, Bin; and Thulin, Robert, to Nabisco Brands, Inc. Method for controlling the spread of soft cookies. 4,873,098, Cl. 426-94.000.

- Bankstahl, Herbert A.: See—
Newman, Neil A.; Bankstahl, Herbert A.; Griffiths, John M.; Forsgren, Lyle M.; and Beck, Wayne T., 4,872,857, Cl. 440-1.000.
- Bantle, Manfred; Munz, Volker; Zackl, Bernd; Dietz, Matthias; and Armbrust, Eberhard, to Dr. Ing. H.C.F. Porsche AG. Controller for lockable differential transmission. 4,872,372, Cl. 74-710.500.
- Baranski, Antoni S., to Ampex Corporation. Multi-cassette indexing mechanism for a tape transport. 4,873,593, Cl. 360-96.500.
- Baranyai, Lawrence; and Scordo, Dominick, to American Telephone and Telegraph Company; and AT&T Bell Laboratories. Control memory using recirculating shift registers for a TDM switching apparatus. 4,873,663, Cl. 365-73.000.
- Barasch, Marian; and Mirella, Charles H., to United States of America. Air Force. Hollow shaft measurement device. 4,872,354, Cl. 73-865.800.
- Baratz, Alan E.; Clarke, Kathryn E.; Pollard, Melinda R.; Pozefsky Diane P.; Rafalow, Lee M.; Siddall, William E.; and Gray, James P., to International Business Machines Corporation. Method for selecting least weight end node to end node route in a data communications network. 4,873,517, Cl. 340-825.030.
- Barber, Thomas D.; Chandler, Richard N.; and Hunka, John F., to Schlumberger Technology Corporation. Induction logging sonde with metallic support having a coaxial insulating sleeve member. 4,873,488, Cl. 324-339.000.
- Barnett, Jay D.; Ludwig, Bryan J.; Marks, Ernest E.; and Moore, Scott E., to Micron Technology Inc. Resistivity probe fixture. 4,872,356, Cl. 73-866.500.
- Barnett, Paul M.; Welch, Douglas A.; and MacMillan, Duncan J., Jr., to Otel Communications Corp. Feature telephone integration device. 4,873,718, Cl. 379-156.000.
- Barnett, Ronnie D.: See—
Jackson, Richard A.; Abt, John; and Barnett, Ronnie D., 4,873,568, Cl. 358-22.000.
- Barr, Frederick J., Jr.; Beasley, Thomas R.; and Piggan, Richard H., to Halliburton Logging Services, Inc. Method and apparatus for seismic exploration of strata surrounding a borehole. 4,873,675, Cl. 367-57.000.
- Barrall, Jeffery L.; and Garman, Robert C., to Armstrong World Industries, Inc. Wet and dry laid phosphate reactive sheets and phosphate ceramic structures made therefrom. 4,872,912, Cl. 106-85.000.
- Barraud, Claude, to Schlumberger Industries. Device for starting charging in a pay phone. 4,873,721, Cl. 380-9.000.
- Bartels, Craig R.; Dorawala, Tansukhlal G.; Stephenson, Michael T.; Pasternak, Mordechai; and Reale, John, Jr., to Texaco Inc. Treatment of water. 4,872,991, Cl. 210-651.000.
- Bartl, Herbert: See—
Lindner, Christian; Wittmann, Dieter; Trabert, Ludwig; Suling, Carlhans; Bartl, Herbert; and Ott, Karl-Heinz, 4,873,289, Cl. 525-293.000.
- Bartmann, Martin; and Ikeda, Naoki, to Huls Aktiengesellschaft; and Daicel Chemical Industries, Ltd. Aromatic polyamides based on phenoxyphterephthalic acid and process for preparing them. 4,873,310, Cl. 528-208.000.
- Baschang, Gerhard: See—
Fechtig, Bruno; and Baschang, Gerhard, 4,873,322, Cl. 536-4.100.
- BASF Aktiengesellschaft: See—
Fuchs, Hugo, 4,873,369, Cl. 564-264.000.
- Itemann, Peter; and Eisenbarth, Philipp, 4,873,284, Cl. 524-548.000.
- Merger, Franz; Fischer, Rolf; and Horler, Hans, 4,873,362, Cl. 560-238.000.
- Nowakowsky, Bernhard H.; Beck, Juergen; Hartmann, Heinrich; and Vamvakaris, Christos, 4,873,299, Cl. 526-73.000.
- Rossy, Philip A.; Thyves, Marco; Franke, Albrecht; Koenig, Horst; Lehmann, Hans D.; Gries, Josef; Friedrich, Ludwig; and Lenke, Dieter, 4,873,246, Cl. 514-252.000.
- Schaefer, Gerhard; Eilingsfeld, Heinz; Neumann, Peter; and Stumpp, Michael, 4,873,372, Cl. 568-34.000.
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- Bassi, Aldo: See—
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- Bastin, Danielle: See—
Broze, Guy; and Bastin, Danielle, 4,873,012, Cl. 252-99.000.
- Basu, Rajat S.: See—
Swan, Ellen L.; Basu, Rajat S.; Lund, Earl A. E.; and Wilson, David P., 4,873,015, Cl. 252-171.000.
- Batzlaff, Richard L.: See—
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- Bauman, Robert A.: See—
Ramachandran, Pallassana N.; Grand, Paul S.; and Bauman, Robert A., 4,873,001, Cl. 252-8.800.
- Bayer Aktiengesellschaft: See—
Behre, Horst; Blank, Heinz U.; Marzolph, Gerhard; and Streicher, Willi, 4,873,026, Cl. 562-72.000.
- Berg, Klaus; Idel, Karsten-Josef; and Grigo, Ulrich, 4,873,314, Cl. 528-487.000.
- Buhler, Ulrich; Hofmann, Klaus; and Hahnke, Manfred, 4,872,883, Cl. 8-639.000.
- Dujardin, Ralf; and Ebert, Wolfgang, 4,873,376, Cl. 568-806.000.
- Jakob, Wolfgang; Alewelt, Wolfgang; and Tresper, Erhard, 4,873,326, Cl. 540-538.000.
- Junge, Bodo; Richter, Bernd; Glaser, Thomas; Traber, Jorg; and Allen, George S., 4,873,262, Cl. 514-510.000.
- Kruger, Bernd-Wieland; Sasse, Klaus; Hoefer, Franz-Peter; Nentwig, Gunther; and Berhrenz, Wolfgang, 4,873,252, Cl. 514-315.000.
- Lindner, Christian; Wittmann, Dieter; Trabert, Ludwig; Suling, Carlhans; Bartl, Herbert; and Ott, Karl-Heinz, 4,873,289, Cl. 525-293.000.
- Beasley, Thomas R.: See—
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- Beason, James D., to Harris Corporation. Conductivity-modulated FET with improved pinch off-on performance. 4,873,564, Cl. 357-49.000.
- Beaulieu, Louis: See—
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- Beck, Ivan: See—
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- Beck, Juergen: See—
Nowakowsky, Bernhard H.; Beck, Juergen; Hartmann, Heinrich; and Vamvakaris, Christos, 4,873,299, Cl. 526-73.000.
- Beck, Wayne T.: See—
Griffiths, John M.; Forsgren, Lyle M.; Newman, Neil A.; and Beck, Wayne T., 4,872,859, Cl. 440-53.000.
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- Becker, Roger T., to Monlan, Incorporated. Coolant recycling system and method. 4,872,997, Cl. 210-703.000.
- Becker, Wilfried; and Bisping, Bernhard, to Rheinmetall GmbH. Kinetic-energy projectile having a large length to diameter ratio. 4,872,409, Cl. 102-517.000.
- Beckett, Berta M., legal representative: See—
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- Beckman Research Institute of City of Hope: See—
Crawford, Frances G.; Shively, John E.; Todd, Charles W.; and Yang, Y. H. Joy, 4,873,313, Cl. 530-387.000.
- Beeton, Dickinson and Company: See—
Bloomster, Timothy G.; Feindt, Hans H.; Hahn, Gerald D.; and Maret, S. Melissa, 4,873,126, Cl. 427-282.000.
- Beecham Group p.l.c.: See—
Arch, Jonathan R., 4,873,240, Cl. 514-231.500.
- Beecham Inc.: See—
Ibrahim, Nader, 4,873,002, Cl. 252-8.800.
- Beeuwkes, Reinier, III, to Medical Products & Research. Quick-release device for jaw stabilization. 4,872,449, Cl. 128-87.00R.
- Behr, Hans; Vetter, Kurt; Schneider, Rolf; and Luderer, Fred, to Behr Industrieanlagen GmbH & Co. Apparatus for electrostatic coating of objects. 4,872,616, Cl. 239-703.000.
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- Behre, Horst; Blank, Heinz U.; Marzolph, Gerhard; and Streicher, Willi, to Bayer Aktiengesellschaft. Process for the preparation of 1-aminonaphthalene-2,4,7-trisulphonic acid and 1-aminonaphthalene-7-sulphonic acid. 4,873,026, Cl. 562-72.000.
- Behringer, John W. Dispenser for packaged bandages and the like. 4,872,593, Cl. 221-231.000.
- Bell Communications Research, Inc.: See—
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- Arthurs, Edward; Goodman, Matthew S.; Kobrinski, Haim; and Vecchi, Mario P., 4,873,681, Cl. 370-3.000.
- Bell, Merle L.: See—
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- Belzer, Folkert O.; and Southard, James H., to Wisconsin Alumni Research Foundation. Composition for the preservation of organs. 4,873,230, Cl. 514-60.000.
- Bendix Electronics Limited: See—
Ireland, John A., 4,873,401, Cl. 200-61.45M.
- Benesch, Katharina: See—
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- Benner, Harold T., Jr.; and Dieterlen, Paul E., to R. A. Jones & Co. Inc. Apparatus for adjusting knives for a pouch form, fill, seal machine. 4,872,382, Cl. 83-152.000.
- Bennitt, Robert A.; and Anderson, Alan C., to Dresser-Rand Company. Crosshead per se, and in combination with a connecting rod assembly and a piston rod. 4,872,395, Cl. 92-139.000.
- Benson, Dan T., to Ingersoll-Rand Company. System for separating abrasive material from a fluid used in fluid jet cutting. 4,872,975, Cl. 210-99.000.
- Bentley, Leroy, to Stewart Decatur Security Systems, Inc. Cell block security systems. 4,872,284, Cl. 49-16.000.

Benton, Terry L.; and Matthews, John H., to Pneumo Abex Corporation. Piston rod assembly including preloaded piston head and composite rod. 4,872,370, Cl. 74-579.00E.

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Berkowitz, Gerard. Adaptor handle. 4,872,697, Cl. 280-304.500.

Bernardi, Sergio, to Selenia Industrie Elettroniche Associate S.p.A. Process for making monocrystalline HGCDTE layers. 4,872,943, Cl. 156-621.000.

Bertiller, Roland; Maier, Roland; and Weisser, Harald, to Mauser-Werke Oberndorf GmbH. Insert barrel with adjusting device. 4,872,390, Cl. 89-29.000.

Bertram, Francis E.: See—
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Betticare, Olivier. Interchangeable pick-up for electric guitar. 4,872,386, Cl. 84-726.000.

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Biagini, Livio, to B-ART S.r.l. Valve system for reciprocating engines. 4,872,430, Cl. 123-188.00A.

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Honda, Sueaki; Hayashi, Mitsuji; Niwa, Takashi; Hayakawa, Akihiko; and Bingo, Hideyuki, 4,873,402, Cl. 200-283.000.

Bio Gro Systems, Inc.: See—
Dausunan, Jerome; and Avendt, Raymond J., 4,872,998, Cl. 210-710.000.

Biogen, Inc.: See—
Meade, Harry; and Lonberg, Nils, 4,873,316, Cl. 530-412.000.

Biomagnetic Technologies, Inc.: See—
Buchanan, Scott, 4,872,321, Cl. 62-51.100.

Bird-Johnson Company: See—
Cavallaro, Joseph L.; and Kelly, Patrick J., Jr., 4,872,811, Cl. 416-162.000.

Bishop, Carolyn B. Bed guard. 4,872,228, Cl. 5-425.000.

Bisping, Bernhard: See—
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Bivens Winchester Corporation: See—
Crotts, Lonnie; and Meadows, Thomas W., 4,872,238, Cl. 15-302.000.

Black & Decker Corporation: See—
Johnson, Paul D.; Kubicko, Robert E.; Martone, Louis C.; and Moores, Gregory E., 4,872,402, Cl. 99-280.000.

Blackman, Steven T., to Thomas Pharmacal Co., Inc. Anti-infective methods and compositions. 4,873,265, Cl. 514-651.000.

Blackwood, Albert J.; and Brady, Thomas R., to Owens-Corning Fiberglass Corporation. Method for making a reinforced product of bituminous material. 4,873,303, Cl. 427-365.000.

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Cazaux, Yvon; Thenoz, Yves; Herault, Didier; and Blanchard, Pierre, 4,873,562, Cl. 357-24.000.

Blank, Heinz U.: See—
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Blankemeyer, Robert L.; and Blankemeyer, James C., to Metokote Corporation. Transportable coating apparatus. 4,872,419, Cl. 118-713.000.

Blankemeyer, James C.: See—
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Blanton, Keith A.; Finlay, William M.; Sinclair, Michael J.; and Tumbelin, John E., to Ivex Corporation. Method of selectively retrieving video images from a video reproducer for simulating movement. 4,873,585, Cl. 358-335.000.

Bleil, Carl E. Apparatus for zone regrowth of crystal ribbons. 4,873,063, Cl. 422-250.000.

Block, Aleck. Flap wheel. 4,872,292, Cl. 51-334.000.

Block, Gordon S., to C. Hager & Sons Hinge Manufacturing Company. Latching mechanism for trolley-hung doors. 4,872,287, Cl. 49-449.000.

Bloebaum, Roy D.; and Magee, Frank P., to Harrington Arthritis Research Center. Hypertonic solution for arthroscopic surgery. 4,872,865, Cl. 604-28.000.

Bloom, Robert. Hair coloring applicator bottle. 4,872,594, Cl. 222-173.000.

Bloomster, Timothy G.; Feindt, Hans H.; Hahn, Gerald D.; and Maret, S. Melissa, to Becton, Dickinson and Company. System and process for spotting reagents on porous supports. 4,873,126, Cl. 427-282.000.

Blum, Ronald D. Method for manufacturing lenses. 4,873,029, Cl. 264-1.300.

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Board of Governors of Wayne State University: See—
Johnson, Carl R.; and Penning, Thomas D., 4,873,360, Cl. 560-121.000.

Board of Regents, The University of Texas System: See—
Kondraske, George V., 4,873,655, Cl. 364-553.000.

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Boder, Dieter, to Rheinmetall GmbH. Method for the application and fastening of rotating bands on projectile bodies. 4,873,416, Cl. 219-121.640.

Boehmer, Gabrielle: See—
Chia, Han-Lie; Popescu, Horia; and Boehmer, Gabrielle, 4,873,074, Cl. 424-1.100.

Boen, Roger, to Commissariat a l'Energie Atomique. Induction furnace crucible. 4,873,698, Cl. 373-156.000.

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Allan, John L.; Boettcher, Jeffery J.; Gaylord, Norman G.; and Katz, Leon, 4,873,273, Cl. 523-407.000.

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Boland, Leona G.: See—
Proxmire, Deborah L.; Endres, Dan D.; Wilson, John C.; Johnson, Lynn A.; Zehner, Georgia L.; Boland, Leona G.; and Stevens, Robert A., 4,872,871, Cl. 604-394.000.

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Bolte, Brown. Drinking vessels. 4,872,569, Cl. 215-12.100.

Bomag-Menck GmbH: See—
Kuehn, Hans, 4,872,514, Cl. 173-132.000.

Boocock, John R. B., to DuPont Canada Inc. Process for the dyeing of polymers of propylene, butene-1 and 4-methyl-pentene-1 using basic dye in an aqueous dye bath. 4,872,880, Cl. 8-513.000.

Borden BV: See—
van Eijdsen, Cornelis; and Mersman, Jan C., 4,872,302, Cl. 53-441.000.

Borer, Timothy J.: See—
Thomas, Graham A.; and Borer, Timothy J., 4,873,573, Cl. 358-133.000.

Bori, Jacques E. F., to Team Incorporated. Dental implant and method. 4,872,840, Cl. 433-173.000.

Bornack, Walter K., Jr.; and McNally, Keith R., to Union Camp Corporation. Water dispersible polyamide ester. 4,873,311, Cl. 528-272.000.

Borodin, Daniel J., to U.S. Automation Co. Die-less drawing method and apparatus. 4,872,923, Cl. 148-11.50R.

Borth, David E.; Wang, Chih-Fei; Rabe, Duane C.; and Labeledz, Gerald P., to Motorola, Inc. TDMA radio system employing BPSK synchronization for QPSK signals subject to random phase variation and multipath fading. 4,873,683, Cl. 370-95.100.

Borza, Mihai M.: See—
Langen, Marinus J. M.; Guttinger, Peter; and Borza, Mihai M., 4,872,301, Cl. 53-133.000.

Borzyn, John J. Tube cutting apparatus. 4,872,384, Cl. 83-454.000.

Bourgeois, Claude, to Centre Electronique Horloger S.A. 2T-cut piezo-electric resonator using coupled contour modes. 4,873,465, Cl. 310-361.000.

Bourne, Roy S.; Eichman, Clarence C.; and Welbon, William W., to United States of America, Energy. Method of producing non-agglomerating submicron size particles. 4,872,905, Cl. 75-0.50C.

Boutni, Omar M., to General Electric Company. Aromatic carbonate resin exhibiting improved impact properties. 4,873,277, Cl. 524-166.000.

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Kemper, Nicolaas R.; Bouwens, Henricus J. J.; Koster, Marinus P.; and De Peuter, Willem L. G., 4,872,362, Cl. 74-479.000.

Bowes, Emmerson, to Mobil Oil Corporation. Catalytic dewaxing process using binder-free catalyst. 4,872,968, Cl. 208-111.000.

Bowman, Harold M. Manhole cover support with box flanging. 4,872,780, Cl. 404-26.000.

Bowman, Roger P.: See—
Hayashida, John P.; and Bowman, Roger P., 4,872,470, Cl. 135-97.000.

Boyer, Billy G.; Nelson, Lloyd M.; Soucie, Wayne L.; and Hayes, William K., to Orscheln Co. Brake apparatus with blind cable installing means. 4,872,533, Cl. 188-2.00D.

Boyle, Joseph P., to Exxon Research and Engineering Company. Reaction of iridium-containing catalysts. 4,872,970, Cl. 208-140.000.

Braat, Josephus J. M., to U.S. Philips Corporation. Projection-lens system. 4,872,748, Cl. 350-432.000.

Braden, Thomas M. Solid particulate aerosol generator. 4,872,786, Cl. 406-68.000.

Brady, Antonio. Waterproof inflatable massage air mattress. 4,872,229, Cl. 5-455.000.

Brady, Patrick K., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Path allocation arrangement for multi-terminal groups. 4,873,716, Cl. 379-134.000.

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Silvano, Tomba; and Tomba, Giuseppe, 4,872,695, Cl. 280-257.000.

Brainovic, Izidor, to Nobelpharma AB. Spacer for dental implants. 4,872,839, Cl. 433-173.000.

Brandeis University: See—
Rosenblum, Myron, 4,873,304, Cl. 528-9.000.

Brandell, John R., to Ronlund Sports Products, Inc. Exercise device providing varied and predetermined resistance. 4,872,671, Cl. 272-137.000.

Brandenstein, Manfred; Haas, Roland; Friedrich, Wolfgang; and Herrmann, Gerhard, to SKF GmbH. Swivel bearing for braking devices. 4,872,768, Cl. 384-223.000.

Branovich, Louis E.; Smith, Bernard; Freeman, Gerard L.; and Eckart, Donald W., to United States of America, Army. Method of making a cathode from tungsten and aluminum powders. 4,872,864, Cl. 445-50.000.

Braun, Eugene R., to Eaton Corporation. Control for vehicle start from stop operation. 4,873,637, Cl. 364-424.100.

Braun, Hartmut; and Vogg, Hubert, to Kernforschungszentrum Karlsruhe GmbH. Flue gas purification process. 4,873,065, Cl. 423-210.000.

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McClean, John W., 4,872,764, Cl. 366-251.000.

Brewen, Ronnie M.; and Lloyd, David A., to American Stamp, Inc. Postage ad labels. 4,872,706, Cl. 283-81.000.

Brickl, Rolf; Schepky, Gottfried; Rupprecht, Eckhard; and Greischel, Andreas, to Dr. Karl Thomae GmbH. Oral anti-diabetic pharmaceutical compositions and the preparation thereof. 4,873,080, Cl. 424-80.000.

Bridgestone Corporation: See—
Tabata, Toshiyuki; Ishiyama, Tatsuro; Ushijima, Takao; and Dan, Takuya, 4,872,650, Cl. 267-140.100.

Yoshikawa, Masato; Fukura, Yukio; Akiyama, Setsuo; Nakamura, Makoto; Naito, Kazuo; and Honda, Toshio, 4,872,932, Cl. 156-151.000.

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Robertson, Douglas D., 4,873,707, Cl. 378-18.000.

Brinnand, Anthony G.: See—
Anderson, Martin; and Brinnand, Anthony G., 4,873,327, Cl. 544-59.000.

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Kaye, Arthur, 4,872,310, Cl. 60-567.000.

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White, Henry J.; and Stace, Christopher, 4,872,742, Cl. 350-348.000.

British Broadcasting Corporation: See—
Thomas, Graham A.; and Borer, Timothy J., 4,873,573, Cl. 358-133.000.

British Nuclear Fuels plc: See—
Brown, Stephen C. N.; and Ashley, Andrew W., 4,872,545, Cl. 198-394.000.

British Telecommunications public limited company: See—
Adams, Michael J., 4,873,690, Cl. 372-8.000.

Brode, George L., II; and Merritt, Frederick M., II, to Union Carbide Chemicals and Plastics Company Inc. Partially hydrolyzed, poly(N-acyl alkylamines) in personal care. 4,873,293, Cl. 525-417.000.

Broncastat Pty. Limited: See—
Clancy, Robert L., 4,873,090, Cl. 424-451.000.

Brooks, Dee W.: See—
Summers, James B., Jr.; Gunn, Bruce P.; and Brooks, Dee W., 4,873,259, Cl. 514-443.000.

Brother Kogyo Kabushiki Kaisha: See—
Asano, Yuji, 4,873,167, Cl. 430-138.000.

Brown, Carey S.: See—
Cormack, Robert H.; and Brown, Carey S., 4,872,757, Cl. 356-376.000.

Brown, Carlton E.; and de Pagter, Pierre C., to Air Concepts, Inc. Laboratory work station with controllable environment. 4,872,400, Cl. 98-115.300.

Brown, Don, to Burlington Industries, Inc. Bobbin blow out plug. 4,872,620, Cl. 242-118.300.

Brown, Joseph P.: See—
Hellstrom, Ingegerd; Brown, Joseph P.; Hellstrom, Karl E.; Horn, Diane; and Linsley, Peter, 4,873,188, Cl. 435-7.000.

Brown, Mary: See—
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Brown, Robert W.; and Churchill, Donald, to Appleton Papers Inc. Desensitizable self-contained record material useful for security documents and the like. 4,873,219, Cl. 503-204.000.

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Brown, Stanley M., to Athey Products Corp. Street sweeper with cool springs supported drag shoe. 4,872,233, Cl. 15-83.000.

Brown, Stephen C. N.; and Ashley, Andrew W., to British Nuclear Fuels plc. Apparatus for handling bodies of generally cylindrical configuration. 4,872,545, Cl. 198-394.000.

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Broxterman, Gregory C.: See—
Schild, Ronald H.; Koepin-Gall, Sandra; and Broxterman, Gregory C., 4,872,999, Cl. 210-754.000.

Broze, Guy; and Bastin, Danielle, to Colgate-Palmolive Company. Built nonaqueous liquid nonionic laundry detergent composition containing hexylene glycol and method of use. 4,873,012, Cl. 252-99.000.

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Brunner, Hans-Georg, to Ciba-Geigy Corporation. Cyclohexanediones and their use as plant growth regulators. 4,872,902, Cl. 71-105.000.

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Griffiths, John M.; Forsgren, Lyle M.; Newman, Neil A.; and Beck, Wayne T., 4,872,859, Cl. 440-53.000.

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Fisher, Daniel J., Jr., 4,872,799, Cl. 414-180.000.

Buch, Holger M.: See—
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Bucher, Michael S.; Russo, Paul J.; and Schaar, Robert J., to Procter & Gamble Company, The. Method for removing precipitated calcium citrate from juice pasteurization or sterilization equipment. 4,872,919, Cl. 134-3.000.

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Marchesano, Carlo; Buriano, Franco; and Furlanetto, Enrico, 4,873,180, Cl. 430-491.000.

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Brown, Don, 4,872,620, Cl. 242-118.300.
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- Burroughs Wellcome Co.: See—
Bair, Kenneth W., 4,873,258, Cl. 514-411.000.
- Bush, Kevin M.: See—
Banki, Mehrdad; Bush, Kevin M.; and McDermith, William O., 4,873,647, Cl. 364-488.000.
- Bushard, Louis B.: See—
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- Busk, Grant C., Jr.: See—
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Block, Gordon S., 4,872,287, Cl. 49-449.000.
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Marz, Horst F., 4,872,408, Cl. 102-324.000.
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Appelmann, Horst, 4,872,285, Cl. 49-42.000.
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Landmeier, Waldo L., 4,873,399, Cl. 178-18.000.
- Caldwell, Glen D.; and Craven, Kenneth D. Ant trap, 4,872,282, Cl. 43-121.000.
- California Institute of Technology: See—
Rippel, Wally E., 4,873,460, Cl. 307-571.000.
- Calmar Inc.: See—
Corsette, Douglas F., 4,872,596, Cl. 222-380.000.
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Nakanura, Hironori; Yotsui, Toshiaki; Sato, Youichi; Umetsubo, Toshiaki; and Ohikawa, Hideo, 4,872,247, Cl. 29-125.000.
- Caltherm Corporation: See—
Plum, Robert P., 4,872,476, Cl. 137-513.500.
- Cama, Lovji D.: See—
Christensen, Burton G.; Cama, Lovji D.; and Schmitt, Susan M., 4,873,324, Cl. 540-200.000.
- Cambonie, Joel, to SGS-Thomson Microelectronics S.A. Integrated digital signal processing circuit for performing cosine transformation, 4,873,658, Cl. 364-725.000.
- Camera Platforms International, Inc.: See—
Fredrick, William; Brent, Robert; and Baldwin, Peter, 4,873,616, Cl. 363-17.000.
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- Cameron Iron Works USA, Inc.: See—
Abreo, William A., Jr., 4,872,708, Cl. 285-39.000.
- Cameron, Kelly B.: See—
Maki, Gary K.; Cameron, Kelly B.; and Owsley, Patrick A., 4,873,688, Cl. 371-37.100.
- Camp, Ronnie: See—
Orr, Clyde, Jr.; and Camp, Ronnie, 4,872,353, Cl. 73-864.850.
- Canada, Her Majesty the Queen in right of: See—
Hayashida, John P.; and Bowman, Roger P., 4,872,470, Cl. 135-97.000.
- Canestaro, Michael J.; and Summa, William J., to International Business Machines Corporation. Flexible electrical connection and method of making same, 4,873,123, Cl. 427-96.000.
- Canon Kabushiki Kaisha: See—
Baba, Takeshi; Matsuo, Kazuhiko; Usui, Masayuki; Minoura, Kazuo; Someya, Atsushi; and Suzuki, Masayuki, 4,872,743, Cl. 350-353.000.
Haruta, Masahiro; Kuwae, Yoko; Munakata, Hirohide; Yuasa, Satoshi; and Sugawa, Etsuko, 4,873,178, Cl. 430-327.000.
Hirose, Yoshihiko; Aoki, Tomohiro; Chiku, Kazuyoshi; Murayama, Yasushi; Uchida, Takashi; Matsuzawa, Kunihiko; and Kanekura, Kazunori, 4,873,541, Cl. 346-160.100.
Kimura, Takashi; Yatomi, Toshiya; and Edakubo, Hiroo, 4,873,591, Cl. 360-85.000.
Kobayashi, Hiroo; Fujino, Hitoshi; Yagi, Tadashi; Adachi, Nobukazu; Hayakawa, Yasuyoshi; and Setoriyama, Takeshi, 4,873,548, Cl. 355-200.000.
Komuro, Hirokazu; and Ikeda, Masami, 4,873,622, Cl. 346-140.000.
- Matsuyama, Jinsho; Hirai, Yutaka; Ueki, Masao; and Sakai, Akira, 4,873,125, Cl. 427-248.100.
- Nohira, Hiroyuki; Kamei, Masanao; Nakamura, Shinichi; Yoshinaga, Kazuo; Kai, Mariko; and Katagiri, Kazuharu, 4,873,018, Cl. 252-299.010.
- Ohta, Shinichi, 4,873,537, Cl. 346-108.000.
- Sasaki, Nobukazu; Kasamura, Toshiro; Ohashi, Masashi; Okuda, Naoki; Kusumoto, Toshihiko; Maeda, Yasunori; Ozawa, Takashi; Yamamoto, Yasuyoshi; Kubota, Atsushi; Kimura, Akiyoshi; and Masuda, Makoto, 4,873,547, Cl. 355-316.000.
- Shimizu, Akira; and Kaneko, Norio, 4,873,610, Cl. 361-313.000.
- Suzuki, Yasumichi; Ikeda, Yoshinori; Katoh, Koichi; Ohnishi, Tetsuya; Kadowaki, Toshihiro; and Honma, Toshio, 4,873,570, Cl. 358-80.000.
- Tajima, Hatsu; Hosoi, Atsushi; Hoshika, Norihisa; Tajika, Hiroshi; and Kinoshita, Masahide, 4,873,551, Cl. 355-251.000.
- Takeuchi, Akihiko; and Tomoyuki, Yoji, 4,873,428, Cl. 250-214.000.
- Tsakamoto, Takahiro, 4,872,772, Cl. 400-120.000.
- Uchida, Mitsuru; Yasuda, Satoshi; and Kuribayashi, Tetsuya, 4,873,185, Cl. 430-903.000.
- Ueda, Hiroyuki, 4,872,773, Cl. 400-144.200.
- Yoshikawa, Masao; and Nakahata, Kimio, 4,872,418, Cl. 118-657.000.
- Yoshimura, Katsuji; Kozuki, Susumu; Edakubo, Hiroo; and Sato, Chikara, 4,873,587, Cl. 360-9.100.
- Canter, Chip: See—
Canter, Wade; Canter, Kimberly; Canter, Shawn; and Canter, Chip, 4,872,838, Cl. 433-31.000.
- Canter, Kimberly: See—
Canter, Wade; Canter, Kimberly; Canter, Shawn; and Canter, Chip, 4,872,838, Cl. 433-31.000.
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- Canter, Shawn: See—
Canter, Wade; Canter, Kimberly; Canter, Shawn; and Canter, Chip, 4,872,838, Cl. 433-31.000.
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- Cappelli, Alberto: See—
Ciaperoni, Aldemaro; Cappelli, Alberto; D'Andolfo, Francesco; and Salan, Antonio, 4,873,296, Cl. 525-434.000.
- Carbon Implants, Inc.: See—
Hwang, Ned H. C., 4,872,875, Cl. 623-2.000.
- Cardwell, Billy L. Truck rail arrangement, 4,872,719, Cl. 296-34.000.
- Carl Freudenberg, Firma: See—
Rohner, Gerhard; Idigkeit, Werner; and Kurr, Klaus, 4,872,652, Cl. 267-140.100.
- Carl-Zeiss-Stiftung: See—
Grosskopf, Rudolf E., 4,873,653, Cl. 364-525.000.
Kuchel, Michael, 4,872,755, Cl. 356-360.000.
- Carlson, Kurt: See—
Corry, Arthur J.; Hobot, Christopher M.; and Carlson, Kurt, 4,873,308, Cl. 528-75.000.
- Carnes, Larry N. Intake manifold with removable baffles, 4,872,424, Cl. 123-52.000.
- Carondelet Foundry Company: See—
Culling, John H., 4,873,055, Cl. 420-582.000.
- Carstensen, Kenneth J. Apparatus and method for improving the integrity of coupling sections in high performance tubing and casing, 4,872,253, Cl. 29-507.000.
- Carter, Charles G.: See—
Quirk, Jennifer M.; and Carter, Charles G., 4,873,358, Cl. 560-22.000.
- Carter, Lawrence D.: See—
McVay, David R.; Carter, Lawrence D.; Jonasky, John D.; and Jefferson, Chris A., 4,872,939, Cl. 156-354.000.
- Case Poclaim: See—
Lefevre, Jean-Claude A.; and Mauboussin, Antoine T., 4,872,472, Cl. 137-116.300.
- Case, Steven K.: See—
Jalkio, Jeffrey A.; and Case, Steven K., 4,872,747, Cl. 350-421.000.
- Case Western Reserve University: See—
Raviv, Daniel, 4,873,651, Cl. 364-513.000.
- Castleberry, Donald E., to General Electric Company. Method and system for eliminating cross-talk in thin film transistor matrix addressed liquid crystal displays, 4,873,516, Cl. 340-784.000.
- Catlin, Gary M., to Daisy Systems Corporation. Multiple processor accelerator for logic simulation, 4,873,656, Cl. 364-578.000.
- Cavallaro, Joseph L.; and Kelly, Patrick J., Jr., to Bird-Johnson Company. Inboard servo for marine controllable pitch propellers, 4,872,811, Cl. 416-162.000.
- Cavanna, Vicente: See—
Crandall, Douglas; Cavanna, Vicente; Shankar, Pradip; and Nordby, Rasmus, 4,873,703, Cl. 375-118.000.
- Cavezzan, Jacques; Frances, Jean-Marie; and Millet, Claude, to Rhone-Poulenc Chimie. Tin monochelate catalysis of organopolysiloxane compositions, 4,873,305, Cl. 528-18.000.
- Cazaux, Yvon; Thenoz, Yves; Herault, Didier; and Blanchard, Pierre, to Thomson-CSF. Charge-coupled device with lowering of transfer potential at output and fabrication method thereof, 4,873,562, Cl. 357-24.000.
- CCL Industries Inc.: See—
Nickason, Barry E.; and DiGirolamo, Orazio, 4,872,491, Cl. 141-20.000.
- Cegedur Societe de Transformation de l'Aluminium Pechiney: See—
Teirlinck, Didier, 4,872,921, Cl. 148-2.000.

- Centre Electronique Horloger S.A.: See—
Bourgeois, Claude, 4,873,465, Cl. 310-361.000.
- Centre National de la Recherche Scientifique: See—
Le Jeung, Claude, 4,873,445, Cl. 250-432.000.
- Cerri, Alberto: See—
Farina, Carlo; Pinza, Mario; Cerri, Alberto; and Parravicini, Francesco, 4,873,328, Cl. 544-239.000.
- Cetus Corporation: See—
Mezei, Louis M.; Albom, Bradley S.; Coppock, Stan; Moehle, Stephen J.; Noorda, Brent S.; Widunas, Joseph T.; and Zeitlin, James A., 4,873,633, Cl. 364-413.080.
- Chamberlain Group, Inc., The: See—
Ferguson, Edward H.; and Iha, Kiyoshi, 4,872,239, Cl. 16-64.000.
- Chamzas, Christodoulos, to American Telephone and Telegraph Company; and AT&T Bell Laboratories. Edge decomposition for the transmission of high resolution facsimile images, 4,873,577, Cl. 358-426.000.
- Chancellor, James C. Wheel stud installer and method, 4,872,254, Cl. 29-525.000.
- Chandler, Richard N.: See—
Barber, Thomas D.; Chandler, Richard N.; and Hunka, John F., 4,873,488, Cl. 324-339.000.
- Chaney, David B., to W. B. Marvin Manufacturing Company. The Convertible fan assembly, 4,872,399, Cl. 98-94.100.
- Chang, Manchium; and Colvin, Michael S. Magnetic particles, 4,873,102, Cl. 427-130.000.
- Chang, On-Kok; Hall, John C.; Phillips, Jeffrey; and Silvester, Lenard F., to Altus Corporation. Overdischarge protection for rechargeable cells, 4,873,158, Cl. 424-61.000.
- Chang, Shi-Lung. Note paper-holding pen, 4,872,775, Cl. 401-52.000.
- Chang, Yuehsung, to Amoco Corporation. Method for producing sulfurized alkylphenols, 4,873,007, Cl. 252-40.700.
- Chapman, Barry L. W.: See—
Mansfield, Peter; and Chapman, Barry L. W., 4,873,503, Cl. 335-216.000.
- Charbonnages De France: See—
Aime, Jean-Marie; Mention, Georges; and Thouzeau, Andre, 4,873,270, Cl. 523-128.000.
- Chareire, Jean-Louis. Mechanical leg-propulsion assistance device, 4,872,665, Cl. 272-70.000.
- Charles Stark Draper Laboratory, Inc., The: See—
Browne, Fredrick D.; and Martin, Jacob H., 4,872,316, Cl. 62-129.000.
- Chastain, David M.: See—
Harris, Michael C.; Chastain, David M.; and Gostin, Gary B., 4,873,629, Cl. 364-200.000.
- Chau, C. C.; Im, Jang-hi; Raspor, Otto C.; and Tung, Lu H., to Dow Chemical Company. The Method for preparing an asymmetric semi-permeable membrane, 4,873,037, Cl. 264-49.000.
- Chaudhry, Arshad-Ul-Haq, to Scott Bader Company Limited. Meat stable prepartes for wallcoverings, 4,873,124, Cl. 427-207.100.
- Chauvet, Philippe: See—
Brunet, Henri; Mabru, Michel; and Chauvet, Philippe, 4,873,695, Cl. 372-58.000.
- Chen, Chung-Ho; and Chen, Sumi C., to Johns Hopkins University. The Cornea storage medium, 4,873,186, Cl. 435-1.000.
- Chen, Devereaux C.: See—
Wong, Siu-Weng S.; Chen, Devereaux C.; and Chiu, Kuang-Yi, 4,873,204, Cl. 437-200.000.
- Chen, Fu; and Michalopoulos, Daniel L., to Betz Laboratories, Inc. Method for calcium oxalate scale control, 4,872,995, Cl. 210-699.000.
- Chen, Hsin-Chien: See—
Hsieh, Kun-Chih; Chow, Jien-Hung; and Chen, Hsin-Chien, 4,872,796, Cl. 412-16.000.
- Chen, Sumi C.: See—
Chen, Chung-Ho; and Chen, Sumi C., 4,873,186, Cl. 435-1.000.
- Chen, Tsu-Fang, to Magnetic Peripherals Inc. Disk spacer ring having air pumps, 4,873,594, Cl. 360-97.030.
- Cherukuri, Subraman R.; and Mansukhani, Gul, to Warner-Lambert Company. Reduced calorie chewing gum base and compositions containing the same, 4,872,884, Cl. 426-3.000.
- Chester, Arthur W.: See—
Abail, Robert P. L.; Angevine, Philip J.; Chester, Arthur W.; and Kirker, Garry W., 4,873,216, Cl. 502-211.000.
- Chevallier, Francois. Collecting bag for making quick medical analyses, 4,872,868, Cl. 604-327.000.
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- Chiang, Bin: See—
Banks, Lori; Busk, Grant C., Jr.; Chiang, Bin; and Thulin, Robert, 4,873,098, Cl. 426-94.000.
- Chicopee: See—
Jackson, Lauren, 4,872,870, Cl. 604-366.000.
- Chikazawa, Bunichiro: See—
Kawasaki, Yoshiaki; Hioki, Yoshihiro; Ohno, Yuichi; Ichida, Kozaburo; Yamaguchi, Susumu; Sudo, Michitaka; and Chikazawa, Bunichiro, 4,872,245, Cl. 29-81.00A.
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Hirose, Yoshihiko; Aoki, Tomohiro; Chiku, Kazuyoshi; Murayama, Yasushi; Uchida, Takashi; Matsuzawa, Kunihiko; and Kanekura, Kazunori, 4,873,541, Cl. 346-160.100.
- Childers, Wayne E., Jr.; and Abou-Gharbia, Magid A., to American Home Products Corporation. Noradmantyl-carboxylic acid piperazinoalkyl esters, 4,873,331, Cl. 544-295.000.
- Childress, Joseph B. Open top floatable barge repair box with barge to box sealing system, 4,872,781, Cl. 405-12.000.
- Chino, Koichi: See—
Kinoshita, Mitsuo; Ito, Tetsuo; Mikawa, Hiroji; and Chino, Koichi, 4,872,948, Cl. 159-6.200.
- Chino Gygyszer es Vegyeszeti Termekek Gyara R.T.: See—
Szilagyi, Imre; Dekany, Gyula; Frank, Judit; Horvath, Gabor; and Kulcsar, Gabor, 4,873,348, Cl. 549-271.000.
- Chinone, Naoki: See—
Uomi, Kazuhisa; Tsuji, Shinji; Sakano, Shinji; Okai, Makoto; and Chinone, Naoki, 4,873,691, Cl. 372-20.000.
- Chiomento, Renzo: See—
Balet, Daniel; Chiomento, Renzo; Beaulieu, Louis; and Poncel, Yves, 4,873,571, Cl. 358-93.000.
- Chisso Corporation: See—
Serita, Tamio; and Takeuchi, Hiroyuki, 4,873,039, Cl. 264-65.000.
- Chiu, I-Ching, to Pennzoil Products Company. Alkylene diamines for use in friction and wear reducing compositions, 4,873,370, Cl. 564-500.000.
- Chiu, Kuang-Yi: See—
Wong, Siu-Weng S.; Chen, Devereaux C.; and Chiu, Kuang-Yi, 4,873,204, Cl. 437-200.000.
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- Chmurny, Alan B.; Gross, Akiva T.; Kupper, Robert J.; and Roberts, Rowena L., to W. R. Grace & Co. - Conn. Process for preparing as partyl-phenylalanine dipeptides, 4,873,359, Cl. 560-40.000.
- Cho, Moo J.: See—
Sih, John C.; and Cho, Moo J., 4,873,337, Cl. 546-271.000.
- Chou, David T.; and Cain, Paul A., to Rhone-Poulenc Nederland B.V. Novel pesticidal 1-(alkyl-phenoxy-aryl)-3-benzoyl ureas and process for preparation, 4,873,264, Cl. 514-594.000.
- Chow, Jien-Hung: See—
Hsieh, Kun-Chih; Chow, Jien-Hung; and Chen, Hsin-Chien, 4,872,796, Cl. 412-16.000.
- Christensen, Burton G.; Cama, Lovji D.; and Schmitt, Susan M., to Merck & Co., Inc. Process for chiral synthesis of 1-beta-methyl-carbapenem intermediates, 4,873,324, Cl. 540-200.000.
- Christians, Leon: See—
Welter, Andre; Fischer, Harmut; Christians, Leon; Wendel, Albrecht; Etschenberg, Eugen; Dereu, Norbert; Kuhl, Peter; and Graf, Eric, 4,873,350, Cl. 549-436.000.
- Christianson, Tony. Snorkel, 4,872,453, Cl. 128-201.110.
- Christopherson, Richard I.: See—
Schmalzi, Karl J.; Sharma, Suresh C.; and Christopherson, Richard I., 4,873,228, Cl. 514-49.000.
- Chronar Corp.: See—
Akhtar, Masud; and Weakliem, Herbert A., 4,873,119, Cl. 427-39.000.
- Chu, Cynthia T.-W.: See—
Valyocik, Ernest W.; Page, Nancy M.; and Chu, Cynthia T.-W., 4,873,067, Cl. 423-279.000.
- Chuchua, Brian N. Shackle for use in limiting the movement of an end of a leaf spring in a wheeled vehicle, 4,872,653, Cl. 267-271.000.
- Chung, Chi H.; Rees, Theodore D.; and Turner, Ian, to Laserdrive Ltd. Apparatus and method for detecting and compensating for pit extension in an optical disk recording system, 4,873,680, Cl. 369-59.000.
- Churchill, Donald: See—
Brown, Robert W.; and Churchill, Donald, 4,873,219, Cl. 503-204.000.
- Churchland, Mark T.; and Schilling, Walter W., to MacMillan Bloedel Limited. Apparatus for oriented strand lay-up, 4,872,544, Cl. 198-382.000.
- Ciancibello, Carmine A.: See—
Lefebvre, Martin C.; Ciancibello, Carmine A.; and Geadah, Youssef A., 4,873,666, Cl. 365-189.070.
- Ciaperoni, Aldemaro; Cappelli, Alberto; D'Andolfo, Francesco; and Salan, Antonio, to SNIA Fibre S.p.A. Polyamide polyethylene glycolpolyamide block copolymer, 4,873,296, Cl. 525-434.000.
- Ciba-Geigy Corporation: See—
Brunner, Hans-Georg, 4,872,902, Cl. 71-105.000.
Danigel, Harald; and Schatzmann, Hans-Rudolf, 4,872,753, Cl. 356-246.000.
Erkens, Leonardus J. H.; Algra, Gerben P.; Snijders, Jacobus M. H.; Geurts, Herman J. J. M.; and Pugin, Andre, 4,872,915, Cl. 106-433.000.
- Fechtig, Bruno; and Baschang, Gerhard, 4,873,322, Cl. 536-4.100.
- Good, William R.; Mikes, John; and Sikora, Joseph, 4,873,086, Cl. 424-409.000.
- Stingelin, Willy, 4,873,319, Cl. 534-604.000.
- Cincinnati Milacron Inc.: See—
Vaniglia, Mario M., 4,872,619, Cl. 242-7.210.
- Ciommer, Bernd: See—
Hamann, Peter; Grabley, Susanne; Raether, Wolfgang; Ciommer, Bernd; Kluge, Heinz; and Sachse, Burkhard, 4,873,347, Cl. 549-267.000.
- Ciriello, Albert. Battery blanket device, 4,873,159, Cl. 429-120.000.
- Citrone, Gaetano W.: See—
Corsi, Vincent R.; and Citrone, Gaetano W., 4,872,534, Cl. 188-32.000.
- Clairel Incorporated: See—
Hahn, Charles R.; and Shapiro, Warren B., 4,873,079, Cl. 424-70.000.
- Clancy, Robert L., to Bronco Pty. Limited. Non-adjuvanted vaccine, 4,873,090, Cl. 424-451.000.

- Clark, Alice M.: See—
Hufford, Charles D.; and Clark, Alice M., 4,873,250, Cl. 514-290.000.
- Clark, Jon E.: See—
Schumacher, Doris P.; Murphy, Bruce L.; and Clark, Jon E., 4,873,335, Cl. 546-194.000.
- Clark, Thomas C. Solder containing electrical connector and method for making same, 4,872,846, Cl. 439-83.000.
- Clarke, Kathryn E.: See—
Baratz, Alan E.; Clarke, Kathryn E.; Pollard, Melinda R.; Pozefsky, Diane P.; Rafalow, Lee M.; Siddall, William E.; and Gray, James P., 4,873,517, Cl. 340-825.030.
- Clauss, Fernand: See—
Arnold, Kraft-Ulrich; and Clauss, Fernand, 4,873,058, Cl. 422-89.000.
- Claudet, Henry: See—
Gaudin, Serge, 4,872,861, Cl. 441-79.000.
- Cleanup & Recovery Corp. (CURE): See—
Herbst, Robert J.; and Renk, Russell R., 4,872,959, Cl. 204-109.000.
- Clem, Kenneth R.; Heider, Kenneth J.; Kegerreis, James E.; and Shoukry, Ehsan I., to Eason Research and Engineering Company, Multistage reforming with interstage aromatics removal, 4,872,967, Cl. 208-65.000.
- Clifford, Arthur L.: See—
Dong, Dennis F.; Noonan, Edward B.; Rogers, Derek J.; Clifford, Arthur L.; Benesch, Katharina; and Loftfield, Richard E., 4,872,957, Cl. 204-84.000.
- Close, Robert A.: See—
McEvoy, Richard J.; and Close, Robert A., 4,872,717, Cl. 292-340.000.
- Club Mate Products Inc.: See—
Stiansy, Janos G., 4,872,232, Cl. 15-21.00E.
- Coccia, Mario, to Farmitalia Carlo Erba S.r.l. Apparatus with safety locking members, for connecting a syringe to a bottle containing a medicament, 4,872,494, Cl. 141-383.000.
- Cohen, Martin P.; and D'Sidocky, Richard M., to Goodyear Tire & Rubber Company, The Rubber vulcanization system with triazine compounds, 4,873,291, Cl. 525-348.000.
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- Cole, Ronald S. Safety umbrella, 4,872,468, Cl. 135-16.000.
- Colella, Wayne: See—
Pilat, John; Keating, David; and Colella, Wayne, 4,873,652, Cl. 364-518.000.
- Colgate-Palmolive Company: See—
Broze, Guy; and Bastin, Danielle, 4,873,012, Cl. 252-99.000.
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- Collins, Kenneth S.: See—
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Hertz, Dominique; and Couturier, Jean-Michel, 4,873,117, Cl. 427-37.000.
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Norden, Alexander R., 4,872,855, Cl. 439-717.000.
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Everman, Wayne F., 4,872,493, Cl. 141-59.000.
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Ensminger, Gerald H.; and Kalazny, Andrzej, 4,872,306, Cl. 59-78.000.
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- Cornelius, Craig J.: See—
Peters, Rex B.; and Cornelius, Craig J., 4,872,343, Cl. 73-517.0AV.
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Scott, Anthony W.; and Zakim, David, 4,873,089, Cl. 424-450.000.
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Pinchuk, Leonard; and Martin, Jr. John B., 4,872,455, Cl. 128-305.000.
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Allen, James P.; and Corwin, Richard R., 4,872,909, Cl. 75-101.00R.
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Sanyal, Amalendu; Moy, Peter; and Cosentino, Frank, 4,872,261, Cl. 29-840.000.
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Lapini, Corrado; and Esposito, Franco, 4,872,305, Cl. 59-18.000.
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- Couturier, Jean-Michel: See—
Hertz, Dominique; and Couturier, Jean-Michel, 4,873,117, Cl. 427-37.000.
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Howe, Charles R.; Southwick, Everett W.; and Cox, Richard H., 4,872,917, Cl. 131-275.000.
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Laverty, Martin J., Jr., 4,872,485, Cl. 137-624.110.
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- CPT Corporation: See—
Randall, Jack E., 4,873,704, Cl. 377-47.000.
- Crandall, Douglas; Cavanna, Vicente; Shankar, Pradip; and Nordby, Rasmus, to Hewlett-Packard Company, Synchronizing system, 4,873,703, Cl. 375-118.000.
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Yeazel, Kenneth L.; and Forester, Robert J., 4,872,801, Cl. 414-409.000.
- Crankshaw, John H., to Dynetics, Inc. Method of forming crowned gear teeth, 4,872,791, Cl. 409-12.000.
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Caldwell, Glen D.; and Craven, Kenneth D., 4,872,282, Cl. 43-121.000.

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Duncan, Robert; and Craver, James E., 4,873,051, Cl. 376-438.000.
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- Crecelius, David B.: See—
Crecelius, Ross E.; O'Neal, Patrick E.; and Crecelius, David B., 4,872,571, Cl. 215-232.000.
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Fuerschbach, Raymond F.; Creighton, Timothy P.; and Fijas, David F., 4,872,578, Cl. 165-167.000.
- Crellin, Inc.: See—
Thomas, Alvin D., 4,872,621, Cl. 242-118.110.
- Crippin, Albert B. Power chainsaw-ice auger conversion apparatus, 4,872,518, Cl. 175-18.000.
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- Critton, Thomas J.; Johnson, Donald S.; Pukalo, Walter P.; and Yorio, Ralph, to Vibratex, Inc. Torsional vibration damper having a roll spun housing and other improvements, 4,872,369, Cl. 74-574.000.
- Cros, Patrick; and Pipon, Robert, to Rhone-Poulenc Specialites Chimiques, Acid/heat modified polysaccharide biopolymers, 4,873,323, Cl. 536-114.000.
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- Crump, Druce K.: See—
Grierson, Jeffrey G.; Wilson, David A.; and Crump, Druce K., 4,872,996, Cl. 210-700.000.
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Licciardi, Luigi; and Torielli, Alessandro, 4,873,659, Cl. 364-784.000.
- Cudaback, Roger L., to Baldwin Filters, Inc. Oil filter with multiple function valve, 4,872,976, Cl. 210-130.000.
- Culkin, Joseph B. Method and device for separation of colloidal suspensions, 4,872,988, Cl. 210-636.000.
- Culling, John H., to Carondelet Foundry Company, Corrosion resistant Fe-Ni-Cr alloy, 4,873,055, Cl. 420-582.000.
- Cultor Oy: See—
Aaltonen, Pirkko K.; and Siissalo, Ilkka T., 4,873,111, Cl. 426-623.000.
- Cummings, Frederick L.; and Correll, Glenn D., to Morton Thiokol, Inc. In-mold coating powders with two initiators or 1,1-di(t-butylperoxy)-3,3,5-trimethylcyclohexane as a single initiator, 4,873,274, Cl. 523-500.000.
- Cummins Engine Company, Inc.: See—
Gustafson, Richard J., 4,872,427, Cl. 123-90.160.
- Cunitz, Donald G.: See—
Ankenman, Bruce E.; and Cunitz, Donald G., 4,873,508, Cl. 338-25.000.
- Curry, Stephen J., to Avco Corporation, Signal added vibration transducer, 4,872,348, Cl. 73-653.000.
- Cusano, Dominic A.; and Possin, George E., to General Electric Company, Digital radiographic imaging system and method therefor, 4,873,708, Cl. 378-62.000.
- CyberOptics Corporation: See—
Jalkio, Jeffrey A.; and Case, Steven K., 4,872,747, Cl. 350-421.000.
- Dai-ichi Seiko Kabushiki Kaisha: See—
Mogi, Hiroyuki; and Ozawa, Kazuhisa, 4,872,850, Cl. 439-264.000.
- Daicel Chemical Industries, Ltd.: See—
Bartmann, Martin; and Ikeda, Naoki, 4,873,310, Cl. 528-208.000.
- Daiichi Seiyaku Co., Ltd.: See—
Ikeda, Junji; and Mano, Eiko, 4,873,227, Cl. 514-47.000.
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Kubo, Motonobu; and Shimizu, Yoshiki, 4,873,375, Cl. 568-812.000.
- Daikoku, Takahiro: See—
Satoh, Motohiro; Yamada, Toshihiro; Kohono, Akiomi; Yamamoto, Akihiko; Taguchi, Keiji; Daikoku, Takahiro; and Kobayashi, Fumiaki, 4,872,606, Cl. 228-121.000.
- Dainippon Screen Mfg. Co., Ltd.: See—
Hirosawa, Makoto, 4,873,569, Cl. 358-75.000.
- Daisy Systems Corporation: See—
Catlin, Gary M., 4,873,656, Cl. 364-578.000.
- Dakin, James T.; and El-Hamamsy, Sayed A., to General Electric Company, Electrodeless panel discharge lamp liquid crystal display, 4,872,741, Cl. 350-345.000.
- Dalbke, Gary R., to Teledyne Industries, Inc. Means and method of eradicating images from electrostatic media, 4,872,777, Cl. 401-199.000.
- Daleo, Stephen L.; and Compton, James B., to Synectics, Inc. Solid state monolithic switching device, 4,873,563, Cl. 357-41.000.
- Dalglish, Jack F.: See—
Kahn, David A.; Pacey, Grant K.; Hvezda, Jaroslav M.; and Dalglish, Jack F., 4,872,739, Cl. 350-96.160.
- d'Aligny, Auguste: See—
Paramythioti, Michel; and d'Aligny, Auguste, 4,873,449, Cl. 250-560.000.
- Dallas Semiconductor Corporation: See—
Jiang, Ching-Lin; and Williams, Clark R., 4,873,665, Cl. 365-154.000.
- Dan, Takuya: See—
Tabata, Toshiyuki; Ishiyama, Tatsuro; Ushijima, Takao; and Dan, Takuya, 4,872,650, Cl. 267-140.100.
- Dana Corporation: See—
Davis, Evy P., 4,872,795, Cl. 411-433.000.
- Dancy, Hugh G., to Sonoco Products Company, Two-compartment plastic bag, 4,872,766, Cl. 383-10.000.
- D'Andolfo, Francesco: See—
Ciaperoni, Aldemaro; Cappelli, Alberto; D'Andolfo, Francesco; and Salan, Antonio, 4,873,296, Cl. 525-434.000.
- Daniel, Vernon T.; Gettiffe, Jessie; and Lorenzo, Tina V., to Burlington Industries, Inc. Elastomeric cleaner for grooved rotating rolls, 4,872,416, Cl. 118-203.000.
- Danieli & C. Officine Meccaniche SpA: See—
Nonini, Geremia, 4,872,330, Cl. 72-131.000.
- Daniels, Neil A.: See—
Souls, Donald J.; and Daniels, Neil A., 4,873,513, Cl. 340-723.000.
- Danigel, Harald; and Schatzmann, Hans-Rudolf, to Ciba-Geigy Corporation, Process cell with temperature compensation, 4,872,753, Cl. 356-246.000.
- Dannels, Bobby F.; Olsen, Deborah J.; and Forcucci, John, to Occidental Chemical Corporation, Purification of telomers prepared from chlorotrifluoroethylene and trichlorotrifluoroethane, 4,873,382, Cl. 570-177.000.
- Darby, Ted A., to North American Philips Corporation, Noise measurement for video signals, 4,873,574, Cl. 358-139.000.
- Darken, Jeffrey, to OMI International Corporation, Treating laminates with a wetting/reducing solution after desmearing with permanganate, 4,873,122, Cl. 427-97.000.
- Dart Controls, Inc.: See—
Penn, Paul E.; Werckman, Roger A., Jr.; and Waymire, John W., 4,873,473, Cl. 388-814.000.
- Data General Corporation: See—
Pilat, John; Keating, David; and Colella, Wayne, 4,873,652, Cl. 364-518.000.
- Datanet Corp.: See—
Son, Masayoshi, 4,873,720, Cl. 379-356.000.
- Dataproducs Corporation: See—
DeYoung, Thomas W., 4,873,539, Cl. 346-140.00R.
- Daures, Jean-Pierre: See—
Gaudin, Serge, 4,872,861, Cl. 441-79.000.
- Dausman, Jerome; and Avendt, Raymond J., to Bio Gro Systems, Inc. Apparatus and process for forming uniform, pelletizable sludge product, 4,872,998, Cl. 210-710.000.
- Davidson, Curtis R.: See—
Young, William A.; Ko, Wai-Shing; Davidson, Curtis R.; and Whitehurst, Thomas, 4,873,469, Cl. 315-155.000.
- Davidson Texttron Inc.: See—
Kohlhaas, Webster, 4,873,032, Cl. 264-39.000.
- Davidson, Wayne A.; Ernst, John P.; Herkes, Marybeth; Kuppusswami, Ram; Satalich, Timothy A.; and Stanaway, John J., Jr., to American Telephone and Telegraph Company, AT&T Bell Laboratories, Call coverage arrangement, 4,873,717, Cl. 379-157.000.
- Davis, Cecil J.; Abernathy, Joseph V.; Matthews, Robert T.; Hildenbrand, Randall C.; Simpson, Bruce; Jones, John I.; Loewenstein, Lee M.; and Bohman, James G., to Texas Instruments Incorporated, Processing apparatus, 4,872,938, Cl. 156-345.000.
- Davis, Charles B. Fire extinguishing appliance and appended supplementary appliances, 4,872,511, Cl. 169-12.000.
- Davis, Evy P., to Dana Corporation, Nut assembly with rotatable sleeve for taking up backlash, 4,872,795, Cl. 411-433.000.
- Davis, Gail F.; and Baker, Robert L., to Halliburton Company, Tank mounting apparatus, 4,872,794, Cl. 410-54.000.
- Davis, Lois T.: See—
Stringfellow, William T.; Goldsmith, Charles D.; and Davis, Lois T., 4,872,986, Cl. 210-611.000.
- Davis, Richard C. Medical lavage apparatus, 4,872,866, Cl. 604-227.000.
- Davison, Alan: See—
Jones, Alan G.; Davison, Alan; Kronauge, James; and Abrams, Michael J., 4,872,561, Cl. 206-569.000.
- Dawson, Bryan J.; and Hill, Leonard J. Croquet ball, 4,872,677, Cl. 273-58.00A.
- Dayen, Leonid; and Raines, Charles D., to Horton Manufacturing Co., Inc. Brake, 4,872,535, Cl. 188-170.000.
- Deal, Clifton R. Baseball pitching practice device, 4,872,674, Cl. 273-26.00A.
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- DeBlock, David A.; and Artwick, Kert E., to ODL, Incorporated, Venting door light with insulated glass, 4,872,498, Cl. 160-90.000.
- DeBrosse, John K.: See—
Critchlow, Dale L.; DeBrosse, John K.; Mohler, Rick L.; Noble, Wendell P., Jr.; and Parries, Paul C., 4,873,205, Cl. 437-200.000.
- deBruin, Frank G., to Grand Rapids Label Company, Label or ticket, 4,872,707, Cl. 283-102.000.

- de Chambost, Emmanuel; Micheron, Francois; Vallet, Francois; and Vignolle, Jean-Michel, to Thomson-CSF. Programmable ferroelectric polymer neural network. 4,873,455, Cl. 307-201.000.
- De Coi, Beat; and Keller, Hans-Peter, to Gebrueder Loepfe AG. Method of regulation and regulating device for an apparatus or group of apparatuses, as well as an apparatus having a regulating device. 4,873,621, Cl. 364-150.000.
- de Figueiredo, Joe L.: See—
Flynn, Tom S.; and de Figueiredo, Joe L., 4,872,920, Cl. 134-21.000.
- Degauque, Pierre: See—
Heddebaut, Marc; Mainardi, Pierre; Degauque, Pierre; and Duhot, Denis, 4,873,531, Cl. 343-711.000.
- De Haan, Gerard, to U. S. Philips Corporation. Circuit arrangement for enhancing the horizontal definition of a television signal. 4,873,575, Cl. 358-166.000.
- De Jong, Feike: See—
Beverwijk, Christiaan D. M.; De Jong, Feike; and Sant, Peter, 4,873,004, Cl. 252-32.500.
- De Jonge, Adriaan: See—
Engel, Wolfhard; Eberlein, Wolfgang; Mihm, Gerhard; Trummlitz, Gunter; Mayer, Norbert; and De Jonge, Adriaan, 4,873,236, Cl. 514-220.000.
- Dekany, Gyula: See—
Szilagyi, Imre; Dekany, Gyula; Frank, Judit; Horvath, Gabor; and Kulcsar, Gabor, 4,873,348, Cl. 549-271.000.
- De Kruif, Jack, to Allied-Signal Inc. Integral deflection washer compressor wheel. 4,872,817, Cl. 417-407.000.
- Deley, Serge; and Fourrey, Francois, to ECIA-Equipements Et Composants Pour L'Industrie Automobile. Fixing device for a covering, especially a covering of a seat. 4,872,724, Cl. 297-218.000.
- Della Vecchia, Rita A. Scratching and petting device for household pets. 4,872,422, Cl. 119-83.000.
- Delprato, Ivano; and Baldassarri, Agostino, to Minnesota Mining and Manufacturing Company. Light-sensitive silver halide photographic materials and process for incorporating hydrophobic photographic additives into hydrophilic colloid compositions. 4,873,182, Cl. 430-546.000.
- Delta Metals, Inc.: See—
Talroy, Robert C.; Ward, Sarah G.; and Schmidt, Parbury P., 4,873,226, Cl. 514-46.000.
- De Marco, Franco, to Ernst Grob AG. Method for fabricating a dish hollow body possessing a linear or helical inner toothing. 4,872,250, Cl. 29-159.200.
- De Mattheis, Sisto Luigi: See—
Ausiello, Francesco P.; Riccio, Mario; and De Mattheis, Sisto Luigi, 4,872,438, Cl. 123-514.000.
- Demeter, Michael G.; Wichman, Paul E.; Endres, Linda S.; and Rohrer, Charles E., to Johnson Service Company. Personal environmental module. 4,872,397, Cl. 98-31.600.
- Dennis, Willard A. Electric drag strip apparatus. 4,872,680, Cl. 273-86.000.
- De Oliveira, Egidio L.; and Sooville, John R., to De Oliveira, Lucas. Fluid control electro-surgical device. 4,872,454, Cl. 128-303.140.
- De Oliveira, Lucas: See—
De Oliveira, Egidio L.; and Sooville, John R., 4,872,454, Cl. 128-303.140.
- de Pagter, Pierre C.: See—
Brown, Carlton E.; and de Pagter, Pierre C., 4,872,400, Cl. 98-115.300.
- DePaul, Richard E., to Somerville Packaging Corporation. Carton and blank for packaging ice cream or the like. 4,872,609, Cl. 229-134.000.
- De Peuter, Willem L. G.: See—
Kemper, Nicolaas R.; Bouwens, Henricus J. J.; Koster, Marinus P.; and De Peuter, Willem L. G., 4,872,362, Cl. 74-479.000.
- Dereu, Norbert: See—
Welter, Andre; Fischer, Harmut; Christiaens, Leon; Wendel, Albrecht; Etschenberg, Eugen; Dereu, Norbert; Kuhl, Peter; and Graf, Eric, 4,873,350, Cl. 549-436.000.
- De Rooij, Johannes F. M.; and Meakins, Stephen E., to Unilever Patent Holdings B.V. Process for preparing hydrogen chloride hydrolyzed protein. 4,873,108, Cl. 426-533.000.
- Dervin, Richard T. Wind deflector shield for water heater compartment. 4,872,444, Cl. 126-361.000.
- Deutsche Forschungs- und Versuchsanstalt für Luft- und Raumfahrt e.V.: See—
Lorenz, Dieter, 4,873,433, Cl. 250-233.000.
- Devon, Thomas J.: See—
Puckette, Thomas A.; and Devon, Thomas J., 4,873,213, Cl. 502-161.000.
- DeVries, Marvin R.: See—
Walley, David H.; and DeVries, Marvin R., 4,872,911, Cl. 106-33.000.
- Devron-Hercules, Inc.: See—
Smith, Douglas W. P., 4,873,407, Cl. 219-10.430.
- Deya, Eiki; Yanahira, Shuichi; Abiko, Kenichi; and Kikuchi, Eiichi, to Snow Brand Milk Products Co., Ltd. Galacto-oligosaccharide containing feed. 4,873,229, Cl. 514-54.000.
- de Yong, John L., to Commonwealth Scientific and Industrial Research Organization. Psychrometer. 4,872,340, Cl. 73-338.000.
- DeYoung, Thomas W., to Dataproducts Corporation. Phase change ink jet apparatus. 4,873,539, Cl. 346-140.000.
- Deyrup, Edward J., to Du Pont de Nemours, E. I., and Company. Food tray. 4,873,137, Cl. 428-216.000.
- Dhillon, Major S.; Hsieh, Shane; and Seeley, Douglas A., to Hoechst Celanese Corporation. Method of using developer-finisher compositions for lithographic plates. 4,873,174, Cl. 430-309.000.
- Dickinson, Ben W. O.; Dickinson, Robert W.; Anderson, Randall R.; Dickinson, Eric W.; and Wilkes, Robert D., to Petrolphysics Operators. Oil well production system using a hollow tube liner. 4,872,509, Cl. 166-278.000.
- Dickinson, Eric W.: See—
Dickinson, Ben W. O.; Dickinson, Robert W.; Anderson, Randall R.; Dickinson, Eric W.; and Wilkes, Robert D., 4,872,509, Cl. 166-278.000.
- Dickinson, Robert W.: See—
Dickinson, Ben W. O.; Dickinson, Robert W.; Anderson, Randall R.; Dickinson, Eric W.; and Wilkes, Robert D., 4,872,509, Cl. 166-278.000.
- Dickson, Thorn W., to Torrington Company. The. Antifriction bearing with seal arrangement. 4,872,770, Cl. 384-484.000.
- Dieks, Lynton W. R., to Shell Oil Company. Measuring wall erosion. 4,872,345, Cl. 73-597.000.
- Dickson, Calvin M.; and Rushforth, Kevin C., to Evans & Sutherland Computer Corporation. Computer graphics pixel processing system. 4,873,515, Cl. 340-728.000.
- Dictaphone Corporation: See—
Dulaff, Paul G.; and McGraw, C. Eugene, 4,873,592, Cl. 360-90.000.
- Dieterlen, Paul E.: See—
Benner, Harold T., Jr.; and Dieterlen, Paul E., 4,872,382, Cl. 83-152.000.
- Dietrich, Klaus; Hauer, Hans; and Schreier, Klaus, to Siemens Aktiengesellschaft. Address administration unit of a multi-processor central control unit of a communications switching system. 4,873,521, Cl. 340-825.520.
- Dietz, Andras: See—
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- Dietz, Matthias: See—
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Altman, Ralph F.; Gooch, John P.; Dismukes, Edward B.; and Landham, Edward C., Jr., 4,872,887, Cl. 55-5.000.
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Hutchings, Richard S., 4,873,013, Cl. 252-102.000.
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Eiland, Eddie L., 4,872,379, Cl. 82-165.000.
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Schulz, Guenther; Druschke, Wolfgang; and Jaeger, Helmut, 4,873,023, Cl. 260-404.800.
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Cohen, Martin P.; and D'Sidocky, Richard M., 4,873,291, Cl. 525-348.000.
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- Dumas, William V.: See—
Foust, Donald F.; Lamby, Edward J.; Karas, Bradley R.; Dumas, William V.; and Jerabek, Elihu C., 4,873,136, Cl. 428-209.000.
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Hunter, Robert L.; and Duncan, Alexander, 4,873,083, Cl. 424-83.000.
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Jenkinson, Margaret; and Dunne, John, 4,872,290, Cl. 51-109.00R.
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Boocock, John R. B., 4,872,880, Cl. 8-513.000.
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Anderson, Martin; and Brimmand, Anthony G., 4,873,327, Cl. 544-59.000.
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- Mouissie, Bob, 4,872,848, Cl. 439-135.000.
- Ryntz, Rose A., 4,873,285, Cl. 525-28.000.
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Janni, Albert S., 4,872,296, Cl. 52-58.000.
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Hunter, Kevin D.; Durst, Robert T., Jr.; and Pastor, Jose, 4,873,645, Cl. 364-479.000.
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Garg, Diwakar; Dyer, Paul N.; and Dimos, Duane, 4,873,152, Cl. 428-627.000.
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Tomari, Noboru, 4,873,722, Cl. 381-17.000.
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Crankshaw, John H., 4,872,791, Cl. 409-12.000.
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Petrillo, Edward W., Jr.; Karanewsky, Donald S.; Thottathil, John K.; Heikes, James E.; and Grosso, John A., 4,873,356, Cl. 558-180.000.
- East Penn Manufacturing Co., Inc.: See—
Flicker, Robert P.; and Fenstermacher, Scott, 4,873,157, Cl. 429-57.000.
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Hamed, Timothy J., 4,873,462, Cl. 310-49.00R.
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Jurgens, Rainer, 4,873,522, Cl. 340-853.000.
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Fronheiser, Dennis R.; Hayward, Jack; Reafler, Gerald G.; and Schuler, James R., 4,872,270, Cl. 34-23.000.
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Braun, Eugene R., 4,873,637, Cl. 364-424.100.
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Dujardin, Ralf; and Ebert, Wolfgang, 4,873,376, Cl. 568-806.000.
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Deley, Serge; and Fourrey, Francois, 4,872,724, Cl. 297-218.000.
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- Eckart, Donald W.: See—
Branovich, Louis E.; Smith, Bernard; Freeman, Gerard L.; and Eckart, Donald W., 4,872,864, Cl. 445-50.000.
- Edakubo, Hiroo: See—
Kimura, Takashi; Yatomi, Toshiya; and Edakubo, Hiroo, 4,873,591, Cl. 360-85.000.
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- Edmundson, Robert J.; and Jacks, Terry C., to Plough, Inc. High-gloss, high-shine lipstick. 4,873,078, Cl. 424-64.000.
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Moser, Manfred; Itgenshorst, Dieter; and Kutz, Johannes, 4,872,325, Cl. 68-200.000.
- Edwards, Dean B.: See—
Rippel, Wally E.; and Edwards, Dean B., 4,873,161, Cl. 429-225.000.
- Efferson, Kenneth R.: See—
Woods, Daniel C.; and Efferson, Kenneth R., 4,872,322, Cl. 62-51.100.
- EGIS Gyogyszergyar: See—
Petocz, Lujza; Simonyi, Istvan; Beck, Ivan; Gigler, Gabor; Fekete, Marton; Kiszelly, Eniko; Mandi, Attila; Gorgenyi, Frigyes; Dietz, Andras; Sumeg nee Zukovics, Katalin; and Jakfalvi, Elemer, 4,873,249, Cl. 514-275.000.
- Eguchi, Shuji: See—
Taketani, Noriaki; Asano, Hideki; Endo, Akira; Abe, Tomiya; Ibamoto, Masahiko; Mukai, Junji; Tanno, Seikichi; Eguchi, Shuji; and Shimura, Masato, 4,873,030, Cl. 264-1.500.
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- Ehrke, M. Jane: See—
Mayhew, Eric; Ehrke, M. Jane; Mace, Kenneth; Szoka, Francis; and Olson, Fred C., 4,873,088, Cl. 424-450.000.
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Bourne, Roy S.; Eichman, Clarence C.; and Welbon, William W., 4,872,905, Cl. 75-0.50C.
- Eiland, Eddie L., to Dresser Industries, Inc. Rockbit arm machining fixture and method. 4,872,379, Cl. 82-165.000.
- Eilingsfeld, Heinz: See—
Schaefer, Gerhard; Eilingsfeld, Heinz; Neumann, Peter; and Stumpp, Michael, 4,873,372, Cl. 568-34.000.
- Eiseman, Bernhardt J., Jr.: See—
Gorski, Robert A.; Eiseman, Bernhardt J., Jr.; and Kvalnes, Donovan E., 4,873,021, Cl. 252-364.000.
- Eisen, Herman N.: See—
Saito, Haruo; Kranz, David M.; Eisen, Herman N.; and Tonegawa, Susumu, 4,873,190, Cl. 435-172.300.
- Eisenbarth, Philipp: See—
Itemann, Peter; and Eisenbarth, Philipp, 4,873,284, Cl. 524-548.000.
- El-Ayat, Khaled A.: See—
El Gamal, Abbas A.; El-Ayat, Khaled A.; Greene, Jonathan W.; Guo, Ta-Pen R.; and Reynert, Justin M., 4,873,459, Cl. 307-465.000.
- Electric Power Research Institute, Inc.: See—
Altman, Ralph F.; Gooch, John P.; Dismukes, Edward B.; and Landham, Edward C., Jr., 4,872,887, Cl. 55-5.000.
- Fisher, David J., 4,873,056, Cl. 422-61.000.
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Blume, Walter S., Jr.; and Blume, Walter S., III, 4,873,504, Cl. 335-303.000.
- Electronique Serge Dassault: See—
Balet, Daniel; Chiomento, Renzo; Beaulieu, Louis; and Poncel, Yves, 4,873,571, Cl. 358-93.000.
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- El-Hamamsy, Sayed A.: See—
Dakin, James T.; and El-Hamamsy, Sayed A., 4,872,741, Cl. 350-345.000.
- Eli, Ilana: See—
Rosenberg, Melvyn; and Eli, Ilana, 4,873,317, Cl. 530-412.000.
- Elias, Eric; and Knapp, Karl E., to Atlantic Richfield Company. Oxygen glow treating of ZnO electrode for thin film silicon solar cell. 4,873,118, Cl. 427-39.000.
- Elliott, James: See—
Duffey, Donald; Hardee, Sellers; Smith, Wayne; Elliott, James; Gardner, Robert; and Suess, Claus, 4,872,500, Cl. 164-34.000.
- Emory University: See—
Hunter, Robert L.; and Duncan, Alexander, 4,873,083, Cl. 424-83.000.
- Endo, Akira: See—
Taketani, Noriaki; Asano, Hideki; Endo, Akira; Abe, Tomiya; Ibamoto, Masahiko; Mukai, Junji; Tanno, Seikichi; Eguchi, Shuji; and Shimura, Masato, 4,873,030, Cl. 264-1.500.
- Endo, Takeshi: See—
Sotome, Yasushi; Miyazawa, Takeo; and Endo, Takeshi, 4,873,301, Cl. 526-257.000.
- Endo, Toshiyuki: See—
Kanesaki, Toshitaka; Narukawa, Osamu; Haneda, Tadayoshi; and Endo, Toshiyuki, 4,873,383, Cl. 570-211.000.
- Endres, Dan D.: See—
Proxmire, Deborah L.; Endres, Dan D.; Wilson, John C.; Johnson, Lynn A.; Zehner, Georgia L.; Boland, Leona G.; and Stevens, Robert A., 4,872,871, Cl. 604-394.000.
- Endres, Linda S.: See—
Demeter, Michael G.; Wichman, Paul E.; Endres, Linda S.; and Rohrer, Charles E., 4,872,397, Cl. 98-31.600.
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- Enneking, Gregor, to Fried. Krupp Gesellschaft mit beschränkter Haftung. Steep angle conveyor. 4,872,542, Cl. 198-312.000.
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- Ensley, Donald L. Constant frequency digital closed-loop optical fiber gyro. 4,872,754, Cl. 356-350.000.
- Ensminger, Gerald H.; and Kalazny, Andrzej, to Cooper Industries, Inc. Method of fabricating chain mesh and chain mesh fabricated thereby. 4,872,306, Cl. 59-78.000.
- Enviroseal Engineering Products Ltd.: See—
Dunford, Joseph R., 4,872,690, Cl. 277-24.000.
- Epel, Joseph N., to Shell Oil Company. Method and apparatus for reduction of mold cycle time. 4,873,044, Cl. 264-257.000.
- Epperly, William R.; Sullivan, James C.; and Sprague, Barry N., to Fuel Tech, Inc. Low temperature process for the reduction of nitrogen oxides in an effluent. 4,873,066, Cl. 423-235.000.
- Erb, Lee A.: See—
Nelson, Loren D.; Erb, Lee A.; Ware, Randolph H.; and Rottner, Donald, 4,873,481, Cl. 324-58.50R.
- Erdei, Roland: See—
Wittmann, Heinz; Erdei, Roland; and Szasz, Tibor, 4,872,272, Cl. 36-117.000.
- Erdmann, Fritz; Thamm, Horst-Dieter; and Staudt, Hans-Joachim, to Hoechst Aktiengesellschaft. Process for the preparation of an o-naphthoquinonediazide sulfonic acid ester and photosensitive mixture containing same. 4,873,169, Cl. 430-192.000.
- Ergo Forschungsgesellschaft mbH: See—
Kopsch, Reiner; Gosswein, Claus F.; Lutz, Henning; Ball, Michael; and Hubert, Peter, 4,872,987, Cl. 210-635.000.
- Erhart, Erich, to Steyr-Daimler-Puch AG. Process of providing in a liquid-containing liquid friction coupling an air-filled space having a predetermined volume. 4,872,489, Cl. 141-5.000.
- Erickson, Frank: See—
Landis, Phillip S.; and Erickson, Frank, 4,873,008, Cl. 252-46.600.
- Erickson, Frederick L.: See—
Richeson, William E.; and Erickson, Frederick L., 4,872,425, Cl. 123-90.130.
- Erkens, Leonardus J. H.; Algra, Gerben P.; Snijders, Jacobus M. H.; Geurts, Herman J. J. M.; and Pugin, Andre, to Ciba-Geigy Corporation. Orthorhombic lead chromate pigments of greenish hue. 4,872,915, Cl. 106-433.000.
- Ernst Grob AG: See—
De Marco, Franco, 4,872,250, Cl. 29-159.200.
- Ernst, John P.: See—
Davidson, Wayne A.; Ernst, John P.; Herkes, Marybeth; Kuppawami, Ram; Satalich, Timothy A.; and Stanaway, John J., Jr., 4,873,717, Cl. 379-157.000.
- Ernst Muhlbauser KG: See—
Engelbrecht, Jurgen, 4,872,936, Cl. 156-307.300.
- Eshleman, James M.; and Ko, Kenneth K., to Armstrong World Industries, Inc. Antistatic floor polish. 4,872,910, Cl. 106-3.000.
- Espiritu-Santo, Eugenio, to General Electric Company. Microcomputerized force transducer. 4,872,349, Cl. 73-727.000.
- Esposito, Franco: See—
Lapini, Corrado; and Esposito, Franco, 4,872,305, Cl. 59-18.000.
- Etheredge, Robert W., III, to Kendall Company, The. Lubricating device. 4,872,263, Cl. 30-41.000.
- Ethyl Corporation: See—
Anderson, Keith G., 4,873,341, Cl. 548-462.000.
- Laurent, Sebastian M.; and Sanders, Robert N., 4,873,097, Cl. 426-74.000.
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- Lee, John Y.; and Spielman, Edgar E., Jr., 4,873,377, Cl. 568-844.000.
- Niebylski, Leonard M., 4,873,353, Cl. 556-402.000.
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- Etschenberg, Eugen: See—
Welter, Andre; Fischer, Harmut; Christiaens, Leon; Wendel, Albrecht; Etschenberg, Eugen; Dereu, Norbert; Kuhl, Peter; and Graf, Eric, 4,873,350, Cl. 549-436.000.
- Euchner & Co.: See—
Rapp, Werner; Link, Walter; and Quinzio, Giovanni, 4,873,400, Cl. 178-19.000.
- Eugster, Christopher C.: See—
Hagelstein, Peter L.; and Eugster, Christopher C., 4,873,439, Cl. 250-327.200.
- Evans, James A.: See—
Brennan, Thomas J.; and Evans, James A., 4,873,461, Cl. 310-47.000.
- Evans & Sutherland Computer Corporation: See—
Dickson, Calvin M.; and Rushforth, Kevin C., 4,873,515, Cl. 340-728.000.
- Everman, Wayne F., to Container Corporation of America. Apparatus for filling a lined container. 4,872,493, Cl. 141-59.000.
- Ewald, Rolf V. T. Method and apparatus for manufacturing display comprising light-emitting diodes. 4,872,862, Cl. 445-22.000.
- Exello Specialty Company, The: See—
Jones, Wallace R.; and Isaksen, Robert A., 4,873,132, Cl. 428-80.000.
- Exxon Research and Engineering Company: See—
Boyle, Joseph P., 4,872,970, Cl. 208-140.000.
- Clem, Kenneth R.; Heider, Kenneth J.; Kegerreis, James E.; and Shoukry, Ehsan I., 4,872,967, Cl. 208-65.000.
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Smith, William E., 4,872,953, Cl. 162-261.000.
- Fabio Fasting Biotech A/S: See—
Jorstad, Storker; and Smedby, Leif, 4,872,978, Cl. 210-181.000.
- Facom: See—
Dossier, Michel, 4,872,645, Cl. 254-10.500.

- Falk Company, The: See—
Holzman, Richard W., 4,872,502, Cl. 165-39.000.
- Fanelli, Joseph J.: See—
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- Fangrow, Thomas F., Jr., to Life Support Products, Inc. Gas pressure regulator mounting yoke. 4,872,641, Cl. 251-148.000.
- Fanuc Ltd.: See—
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- Farmer, Bert. Packaging device with burst-open seal. 4,872,556, Cl. 206-484.000.
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Farmonat, Rolf, 4,872,722, Cl. 296-214.000.
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- Fazzolare, Richard D.; Szwerc, Joseph A.; and McFeaters, Rich, to Nabisco Brands, Inc. Starch snack foods and process. 4,873,093, Cl. 426-28.000.
- Fechtig, Bruno; and Baschang, Gerhard, to Ciba-Geigy Corporation. Saccharide derivatives and processes for their manufacture. 4,873,322, Cl. 536-4.100.
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Coppolani, Joseph, 4,873,105, Cl. 426-481.000.
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- Ferco International: See—
Jean-Claude, Legrand; and Gefard, Prevot, 4,872,716, Cl. 292-336.300.
- Ferguson, Edward H.; and Iha, Kiyoshi, to Chamberlain Group, Inc., The. Door closure with mechanical braking means. 4,872,239, Cl. 16-64.000.
- Fetcko, Michael, to Aro Corporation, The. Evacuation pump assembly. 4,872,816, Cl. 417-360.000.
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Lepperhoff, Gerhard; and Huthwohl, Georg, 4,872,889, Cl. 55-267.000.
- Field, Nathaniel L., to Ford Motor Company. Method and apparatus for machining valve seats and valve stem guides in a deep-walled engine monoblock workpiece. 4,872,789, Cl. 408-79.000.
- Field, Nathaniel L.: See—
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Blanton, Keith A.; Finlay, William M.; Sinclair, Michael J.; and Tumbliin, John E., 4,873,585, Cl. 358-335.000.
- Finnigan, Wilfred J.: See—
Gardner, Stanley D.; and Finnigan, Wilfred J., 4,872,513, Cl. 169-57.000.
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- Fisch, Kenneth D.; Lucas, Alfred R.; and Willard, David F., to Motorola, Inc. Paging receiver for storing digitized voice messages. 4,873,520, Cl. 340-825.440.
- Fischer, David M.: See—
Dean, Thomas E.; Henrich, William H.; Fischer, David M.; Stratton, Lawrence J.; and Pietsch, Herbert E., 4,873,471, Cl. 315-308.000.
- Fischer, Harmut: See—
Welter, Andre; Fischer, Harmut; Christiaens, Leon; Wendel, Albrecht; Etschenberg, Eugen; Dereu, Norbert; Kuhl, Peter; and Graf, Eric, 4,873,350, Cl. 549-436.000.
- Fischer, James R., to Velcro Industries B.V. Multi-hook fastener member. 4,872,243, Cl. 24-442.000.
- Fischer, Rolf: See—
Merger, Franz; Fischer, Rolf; and Horler, Hans, 4,873,362, Cl. 560-238.000.
- Fisher, Daniel J., Jr., to BTU Engineering Corporation. Boat transfer and queuing furnace elevator and method. 4,872,799, Cl. 414-180.000.
- Fisher, David J., to Electric Power Research Institute, Inc. Chemical test kit for detecting impurities in an oil sample. 4,873,056, Cl. 422-61.000.
- Fisher, Thomas A., to Shipley Company Inc. Reticulation resistant photoresist coating. 4,873,176, Cl. 430-313.000.
- Fishman, Jack; Arnold, John; Sherman, Fred; and Haiso, Jane, to Baker Cummins Pharmaceuticals, Inc. Method of safely providing anesthesia or conscious sedation. 4,873,076, Cl. 424-10.000.
- Fisons Corporation: See—
Napier, James J.; and Griffith, Ronald C., 4,873,241, Cl. 514-237.800.
- Fitzgerald, John: See—
Tognoni, Keith I.; Fitzgerald, John; Welch, Glenn; and Yonkers, Paul, 4,873,578, Cl. 358-254.000.
- Fjare, Kristi A., to Amoco Corporation. Process for production of p-acetoxybenzoic acid from p-acetoxyacetophenone. 4,873,361, Cl. 560-130.000.
- Flaughner, Jeffrey R.: See—
Enk, Allan T.; and Flaughner, Jeffrey R., 4,872,898, Cl. 65-287.000.
- Fleming, James W.; Johnson, David W., Jr.; MacChesney, John B.; and Pardenek, Sandra A., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Method for fabricating articles which include high silica glass bodies. 4,872,895, Cl. 65-18.100.
- Flicker, Robert P.; and Fenstermacher, Scott, to East Penn Manufacturing Co., Inc. Recombinant electric storage battery. 4,873,157, Cl. 429-57.000.
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Quernemoe, Daniel R., 4,872,554, Cl. 206-454.000.
- Fly, Howard G.: See—
McGillis, Joseph P.; and Fly, Howard G., 4,872,668, Cl. 272-130.000.
- Flynn, Tom S.; and de Figueiredo, Joe L. Asbestos removal method and system. 4,872,920, Cl. 134-21.000.
- FMC Corporation: See—
Hensler, Paul L., 4,873,068, Cl. 423-315.000.
- Hightower, Edwin C., 4,872,501, Cl. 165-1.000.
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Dannels, Bobby F.; Olsen, Deborah J.; and Forcucci, John, 4,873,382, Cl. 570-177.000.
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Anderson, Anthony T.; and Field, Nathaniel L., 4,872,429, Cl. 123-90.440.
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- Forehand, Richard L.: See—
Lehr, Douglas J.; Bell, Merle L.; Rubbo, Richard P.; and Forehand, Richard L., 4,872,510, Cl. 166-327.000.
- Forensic Applications Corporation: See—
Jensen, Richard E.; Nichols, Donald H.; and Hemphill, D. Gary, 4,873,193, Cl. 436-176.000.
- Foresman, James D., to Sprout-Bauer, Inc. Canted, spring-loaded feed screw support. 4,872,617, Cl. 241-247.000.
- Forest Engineering Research Institute of Canada: See—
Mellgren, Per-Gustaf, 4,872,700, Cl. 280-677.000.
- Forester, Robert J.: See—
Yeazel, Kenneth L.; and Forester, Robert J., 4,872,801, Cl. 414-409.000.
- Forgione, Peter S.: See—
Luh, Yuhshii; and Forgione, Peter S., 4,873,365, Cl. 560-345.000.
- Formax, Inc.: See—
Lindee, Scott A., 4,872,241, Cl. 17-32.000.
- Forsgren, Lyle M.: See—
Griffiths, John M.; Forsgren, Lyle M.; Newman, Neil A.; and Beck, Wayne T., 4,872,859, Cl. 440-53.000.
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- Forward Technology Industries, Inc.: See—
Newkirk, Raymond K.; and Batzlaff, Richard L., 4,872,935, Cl. 156-250.000.
- Foseco International Limited: See—
Harris, Jeffrey A., 4,873,114, Cl. 427-27.000.
- Fotland, David A.: See—
Baum, Allen J.; Miller, Terrence C.; and Fotland, David A., 4,873,627, Cl. 364-200.000.
- Fournier, James L., to JLF Designs, Inc. Article of luggage or the like and method of making same. 4,872,538, Cl. 190-111.000.
- Fourrey, Francois: See—
Deley, Serge; and Fourrey, Francois, 4,872,724, Cl. 297-218.000.
- Foust, Donald F.; Lamby, Edward J.; Karas, Bradley R.; Dumas, William V.; and Jerabek, Elihu C., to General Electric Company. Method for preparing polymer surfaces for subsequent plating

thereon, and improved metal-plated plastic articles made therefrom. 4,873,136, Cl. 428-209.000.

Framatome, See—
Hertz, Dominique; and Couturier, Jean-Michel, 4,873,117, Cl. 427-37.000.

Frances, Jean-Marc, See—
Cavezzan, Jacques; Frances, Jean-Marc; and Millet, Claude, 4,873,305, Cl. 528-18.000.

Frank, Judit, See—
Szilagyi, Imre; Dekany, Gyula; Frank, Judit; Horvath, Gabor; and Kulcsar, Gabor, 4,873,348, Cl. 549-271.000.

Frankandale Corporation, See—
Luke, James J., 4,872,300, Cl. 53-53.000.

Frank, Albrecht, See—
Rosy, Philip A.; Thyes, Marco; Franke, Albrecht; Koenig, Horst; Lehmann, Hans D.; Gries, Josef; Friedrich, Ludwig; and Lenke, Dieter, 4,873,246, Cl. 514-252.000.

Fredrick, William; Brent, Robert; and Baldwin, Peter, to Camera Platforms International, Inc. Power supply for arc lamps, 4,873,616, Cl. 363-17.000.

Fredrick, William; Brent, Robert; and Baldwin, Peter, to Camera Platforms International, Inc. Power supply for arc lamps, 4,873,617, Cl. 363-17.000.

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Freeman, Gerard L., See—
Branovich, Louis E.; Smith, Bernard; Freeman, Gerard L.; and Eckart, Donald W., 4,872,864, Cl. 445-50.000.

Freeman, Kenneth G., to U.S. Philips Corporation. Flat cathode ray tube display apparatus, 4,873,472, Cl. 315-366.000.

Frenger, Paul, See—
Alexander, William B.; and Frenger, Paul, 4,873,654, Cl. 364-551.010.

Frey, Timothy J., See—
Meyers, Peter V.; Liu, Chung-Heng; and Frey, Timothy J., 4,873,198, Cl. 437-5.000.

Fried. Krupp Gesellschaft mit beschränkter Haftung, See—
Enneking, Gregor, 4,872,542, Cl. 198-312.000.

Friedrich, Ludwig, See—
Rosy, Philip A.; Thyes, Marco; Franke, Albrecht; Koenig, Horst; Lehmann, Hans D.; Gries, Josef; Friedrich, Ludwig; and Lenke, Dieter, 4,873,246, Cl. 514-252.000.

Friedrich, Reinhard, See—
Zimmermann, Günther; Friedrich, Reinhard; Nant, Wolfgang; and Weisert, Wolfgang, 4,872,587, Cl. 220-375.000.

Friedrich, Wolfgang, See—
Brandenstein, Manfred; Haas, Roland; Friedrich, Wolfgang; and Herrmann, Gerhard, 4,872,768, Cl. 384-223.000.

Friesen, Harold W.; and Nutt, Wendell G., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Local area network cabling arrangement, 4,873,393, Cl. 174-34.000.

Frisch, Rudolf A.; and Zamora, Antonio, to International Business Machines Corporation. Spelling assistance method for compound words, 4,873,634, Cl. 364-419.000.

Fritsch, Ronald J., to Eaton Corporation. Low-friction drive link for auxiliary handle operation to molded case circuit breaker connection, 4,873,404, Cl. 200-332.000.

Fritts, David H., See—
Fennell, Robert B.; Fritts, David H.; and LeGasse, David S., 4,872,847, Cl. 439-133.000.

Froes, Francis H., See—
Eylon, Daniel; Froes, Francis H.; and Yoltan, Charles F., 4,872,927, Cl. 148-20.300.

Fronheiser, Dennis R.; Hayward, Jack; Reafler, Gerald G.; and Schuler, James R., to Eastman Kodak Company. Drying process, 4,872,270, Cl. 34-23.000.

FruitSource Associates, See—
Mitchell, Cheryl R.; and Mitchell, Pat R., 4,873,112, Cl. 426-599.000.

Fry, Robert J., See—
Greeves, Godfrey; and Fry, Robert J., 4,872,614, Cl. 239-533.900.

Frye, David R., See—
Warder, William G.; and Frye, David R., 4,872,563, Cl. 206-634.000.

Fuchs, Hugo, to BASF Aktiengesellschaft. Purification of cyclohexanone oxime containing ammonium sulfate, 4,873,369, Cl. 564-264.000.

Fuel Tech, Inc., See—
Epperly, William R.; Sullivan, James C.; and Sprague, Barry N., 4,873,066, Cl. 423-235.000.

Fuentes, Ricardo, Jr.; Meiske, Larry A.; and Marchand, Gary R., to Dow Chemical Company. The Process for polymerizing olefins, 4,873,300, Cl. 526-142.000.

Fuerschbach, Raymond F.; Creighton, Timothy P.; and Fijas, David F., to ITT Standard of ITT Corporation. Plate type heat exchanger, 4,872,578, Cl. 165-167.000.

Fuhrmann, Hartmut, See—
Scheer, Wolfgang; Fuhrmann, Hartmut; Kossmehl, Gerhard; Niemitz, Matthias; and Kabbeck-Kupijai, Detlef, 4,872,962, Cl. 204-224.000.

Fuizs Pharmaceutical Ltd., See—
Fuizs, Richard C., 4,873,085, Cl. 424-400.000.

Fuizs, Richard C., to Fuizs Pharmaceutical Ltd. Spun fibrous cosmetic and method of use, 4,873,085, Cl. 424-400.000.

Fuji Electric Co., Ltd., See—
Hirota, Toshio; Ohuchi, Takashi; and Yamamoto, Osamu, 4,873,155, Cl. 429-26.000.

Tsuruoka, Michihiko; Nakagawa, Wataru; Miyoshi, Noriomi; Konosu, Naohiro; and Hashimoto, Tadao, 4,872,335, Cl. 73-30.000.

Fuji Jukogyo Kabushiki Kaisha, See—
Nakamura, Susumu, 4,872,377, Cl. 74-867.000.

Fuji Oil Company, Limited, See—
Sawamura, Norio; Matsuo, Takaharu; Tsumura, Kazunobu; and Ebihara, Yoshitaka, 4,873,194, Cl. 435-198.000.

Fuji Photo Film Co., Ltd., See—
Abe, Akira; Miyahashi, Keiji; and Ichijima, Seiji, 4,873,179, Cl. 430-382.000.

Higuchi, Noboru; Matsui, Keizo; Kobayashi, Chuzo; and Yamaguchi, Shigeru, 4,872,763, Cl. 366-160.000.

Hosoi, Yuichi; and Takahashi, Kenji, 4,873,438, Cl. 250-327.200.

Ishiguro, Shoji; Hirano, Shigeo; Shishido, Tadao; and Miyake, Akio, 4,873,172, Cl. 430-264.000.

Iwase, Yoshiki; and Kobayashi, Yasuhiro, 4,873,581, Cl. 358-310.000.

Kido, Keishiro; and Saito, Yoshio, 4,873,059, Cl. 422-100.000.

Kimura, Tsutomu; and Watanabe, Yukio, 4,873,441, Cl. 250-327.200.

Kubodera, Seiiti; and Nakamine, Takeshi, 4,873,220, Cl. 503-227.000.

Miyasaka, Nobuaki; and Suga, Shuzo, 4,873,181, Cl. 430-523.000.

Mori, Nobufumi; Katoh, Takayuki; Oikawa, Tetsuo; Harada, Yoshiyasu; and Miyahara, Junji, 4,873,440, Cl. 250-327.200.

Nakajima, Nobuyoshi, 4,873,437, Cl. 250-327.200.

Negishi, Kenji; Sasaki, Hidemi; and Fujishiro, Takeshi, 4,873,598, Cl. 360-106.000.

Okita, Tsutomu, 4,873,138, Cl. 428-336.000.

Ono, Shuji; and Yamamoto, Masafumi, 4,873,435, Cl. 250-235.000.

Sasaoka, Senzo; Yoshida, Tetsuo; and Inoue, Nobuaki, 4,873,173, Cl. 430-964.000.

Uesugi, Akio; Kakei, Tsutomu; and Minato, Shinichiro, 4,872,946, Cl. 156-637.000.

Yamana, Keiichi; Imai, Masaru; and Ohtsuka, Shuichi, 4,873,545, Cl. 355-256.000.

Yasunaga, Tadashi; and Yanai, Akio, 4,873,154, Cl. 428-694.000.

Fuji Xerox Co., Ltd., See—
Karakida, Ken-ichi; and Yagi, Shigeru, 4,873,165, Cl. 430-66.000.

Fujii, Masaki, See—
Yamada, Yasuhiro; Imamura, Takeshi; Honda, Hidemasa; Fujii, Masaki; and Minohata, Masanori, 4,873,071, Cl. 423-448.000.

Fujii, Mituru, See—
Ogawa, Toshio; Fujii, Mituru; Asai, Tadamichi; Ikegami, Akira; Ohtsu, Hiroshi; and Ato, Kazuhiko, 4,873,022, Cl. 428-209.000.

Fujii, Susumi; Ishida, Hiromi; Morioka, Masataka; Saito, Akihiro; and van der Meer, Roelof, to General Electric Company. Polyphenylene ether/polyamide blends having improved physical properties, 4,873,276, Cl. 524-153.000.

Fujii, Yasuo; and Hayashi, Masahiko, to Kubota, Ltd. Guide system for a working machine having a product identifying system, 4,873,644, Cl. 364-478.000.

Fujimoto, Masayuki; Tao, Munco; and Uchida, Kuniaki, to Matsushita Electric Industrial Co., Ltd. Kerosene heater providing automatic wick repositioning after ignition, 4,872,831, Cl. 431-73.000.

Fujino, Hitoshi, See—
Kobayashi, Hiroo; Fujino, Hitoshi; Yagi, Tadashi; Adachi, Nobukazu; Hayakawa, Yasuyoshi; and Setoriyama, Takeshi, 4,873,548, Cl. 355-200.000.

Fujisawa, Norio; Sakamoto, Toshishige; Ito, Toshiyasu; and Shimada, Junichi, to Toyoda Gosei Co., Ltd. Cover for car lamps, 4,872,745, Cl. 350-357.000.

Fujisawa Pharmaceutical Co., Ltd., See—
Hirayama, Shigemitsu; Akashi, Takamichi; Ikuta, Akio; Sasaki, Isao; and Fukuda, Hiroshi, 4,872,974, Cl. 210-90.000.

Fujisawa, Syuichi, See—
Kobayashi, Hirokazu; Miyamoto, Yukihiko; Takai, Masaaki; Fujisawa, Syuichi; and Miyazawa, Hiroshi, 4,873,684, Cl. 370-102.000.

Fujishiro, Takeshi, See—
Negishi, Kenji; Sasaki, Hidemi; and Fujishiro, Takeshi, 4,873,598, Cl. 360-106.000.

Fujita, Kazuhisa, See—
Sakurai, Kaoru; Murakami, Harunori; Mizukami, Hikaru; and Fujita, Kazuhisa, 4,873,532, Cl. 343-713.000.

Fujita, Kazuo. Electrically-operated folding stage system, 4,872,295, Cl. 52-7.000.

Fujita, Kohtaroh; Wachi, Toshio; and Ikeda, Yoshiaki, to Sakai Chemical Industry Co., Ltd. Method for preparation of antimony mercaptides, 4,873,351, Cl. 556-76.000.

Fujita, Takashi; Hihara, Toshio; Kogure, Yoshio; Sekioka, Riyouichi; and Nakamura, Noboru, to Mitsubishi Kasei Corporation. Mixtures of water-soluble red and yellow or blue reactive dyes and a method of dyeing cellulosic fibers using such dye mixtures, 4,872,881, Cl. 8-549.000.

Fujita, Zenzo; Morita, Hirokiyo; and Morishita, Sadao, to Kasai Kogyo Co., Ltd. Method for manufacturing automotive interior components, 4,873,045, Cl. 264-259.000.

Fujitsu Limited, See—
Asakawa, Kazuo, 4,872,803, Cl. 414-730.000.

Suzuki, Masafumi; and Shirai, Hidenobu, 4,872,964, Cl. 204-298.000.

Fujiwara, Nobuo, to Victor Company of Japan, Ltd. Audio amplifier, 4,873,493, Cl. 330-285.000.

Fujiwara, Nobuo, See—
Yoshioka, Nobuyuki; Fujiwara, Nobuo; and Watakabe, Yaichirou, 4,873,162, Cl. 430-5.000.

Fujiwara, Takayoshi, See—
Iida, Toshikatsu; Fujiwara, Takayoshi; and Sone, Yoshinori, 4,872,820, Cl. 418-220.000.

Fukahori, Naoyuki, See—
Terada, Hiromu; Fukahori, Naoyuki; and Sakunaga, Kenichi, 4,872,740, Cl. 350-96.260.

Fukahori, Toshio; Takashima, Hideyuki; and Morinaga, Hitoshi, to Hitachi Cable Limited. Multi-port fiberoptic rotary joint, 4,872,737, Cl. 350-96.200.

Fukke, Hajime, to Hitachi, Ltd. Magnetic recording medium, 4,873,129, Cl. 428-694.000.

Fukuda, Hiroshi, See—
Hirayama, Shigemitsu; Akashi, Takamichi; Ikuta, Akio; Sasaki, Isao; and Fukuda, Hiroshi, 4,872,974, Cl. 210-90.000.

Fukuda, Junichi, See—
Morota, Makie; and Fukuda, Junichi, 4,873,452, Cl. 307-10.100.

Fukuda, Minoru, See—
Kashima, Toshihiro; and Fukuda, Minoru, 4,873,131, Cl. 428-64.000.

Fukuda, Yoshio, See—
Katoh, Akira; Ida, Masatoshi; Yunoki, Yutaka; Harada, Hisayuki; Inoue, Manabu; and Fukuda, Yoshio, 4,873,580, Cl. 358-335.000.

Fukui, Akira, See—
Shibagaki, Kouichi; and Fukui, Akira, 4,873,723, Cl. 381-34.000.

Fukumoto, Yousuke, See—
Sato, Hiroshi; Ohashi, Toshihiro; Hamada, Toyohide; Umakoshi, Yukimori; Suzuki, Takamichi; Wada, Yuuji; Hara, Shigeo; and Fukumoto, Yousuke, 4,872,618, Cl. 242-4.000.

Fukunaga, Yukio, See—
Akatsu, Yohsuke; Fukushima, Naoto; Fukunaga, Yukio; Hano, Sunao; and Satoh, Masaharu, 4,872,701, Cl. 280-703.000.

Fukura Electric Company, Ltd., The, See—
Onodera, Kagetoshi; Koizumi, Tatsuya; Kato, Toshiyuki; Sotani, Junji; Momo, Masauki; and Furuya, Shuichi, 4,873,127, Cl. 427-376.800.

Fukushima, Naoto, See—
Akatsu, Yohsuke; Fukushima, Naoto; Fukunaga, Yukio; Hano, Sunao; and Satoh, Masaharu, 4,872,701, Cl. 280-703.000.

Fukuura, Yukio, See—
Yoshikawa, Masato; Fukuura, Yukio; Akiyama, Setsuo; Nakamura, Makoto; Naito, Kazuo; and Honda, Toshio, 4,872,932, Cl. 156-151.000.

Fuller, Mark W., See—
Robinson, Alan S.; and Fuller, Mark W., 4,872,611, Cl. 239-18.000.

Fuller, Robert T.; and Sanders, Robert J. Carpet sample holder, 4,872,580, Cl. 211-45.000.

Fulton, Steven J.; Spehrley, Charles W., Jr.; and Young, Lawrence R., to Spectra, Inc. Hot melt ink projection transparency, 4,873,134, Cl. 428-156.000.

Fumio, Kimura, See—
Asanae, Masumi; and Fumio, Kimura, 4,873,540, Cl. 346-160.100.

Funk, Larry, See—
Thompson, Raymond F.; and Funk, Larry, 4,872,638, Cl. 251-54.000.

Furlanetto, Enrico, See—
Marchesano, Carlo; Buriano, Franco; and Furlanetto, Enrico, 4,873,180, Cl. 430-491.000.

Fursich, Manfred, See—
Zahn, Wolfgang; Fursich, Manfred; Nitsch, Wilhelm; Rauh, Hans-Jürgen; and Treiber, Helmut, 4,873,546, Cl. 355-38.000.

Furuhata, Takashi; Owashi, Hitoki; Ito, Takayasu; and Hamaguchi, Masakazu, to Hitachi, Ltd. Video signal and method thereof time axis altering circuit used in a video tape recorder for recording a broadband video signal, 4,873,582, Cl. 358-310.000.

Furuishi, Yoshiro, See—
Kazumoto, Yoshio; Suganami, Takuya; Furuishi, Yoshiro; and Kashiwamura, Kazuo, 4,872,313, Cl. 62-6.000.

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Furuya, Masayuki, See—
Miura, Tohru; Nagata, Teruyuki; Okazaki, Koju; Furuya, Masayuki; and Nishida, Emiko, 4,873,374, Cl. 568-743.000.

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Onodera, Kagetoshi; Koizumi, Tatsuya; Kato, Toshiyuki; Sotani, Junji; Momo, Masauki; and Furuya, Shuichi, 4,873,127, Cl. 427-376.800.

Fuse, Kazuo, See—
Ikebuchi, Iwao; Nakano, Mamoru; Fuse, Kazuo; and Ganze, Akira, 4,872,973, Cl. 209-144.000.

G-C Dental Industrial Corp., See—
Nakazato, Ryoji, 4,873,269, Cl. 523-115.000.

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Grabowiecki, Robert J., 4,872,610, Cl. 232-17.000.

G. LeBlanc Corporation, See—
Ramirez, Lawrence; and Whiteside, Walter, 4,872,389, Cl. 84-387.000.

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Gallucci, Robert R.; van der Meer, Roelof; and Avakian, Roger W., to General Electric Company. Modified polyphenylene ether-polyamide compositions and process, 4,873,286, Cl. 525-92.000.

Galumbeck, Michael H. Stiffening module for a mattress box spring and a box spring incorporating same, 4,872,227, Cl. 5-246.000.

Galvin, Irving H. Disc launching and catching apparatus, 4,872,688, Cl. 273-326.000.

Ganze, Akira, See—
Ikebuchi, Iwao; Nakano, Mamoru; Fuse, Kazuo; and Ganze, Akira, 4,872,973, Cl. 209-144.000.

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Gardner, Robert, See—
Duffey, Donald; Hardee, Sellers; Smith, Wayne; Elliott, James; Gardner, Robert; and Sues, Claus, 4,872,500, Cl. 164-34.000.

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Garman, Robert C., See—
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Garrish, Bryan F., to Baltimore Aircoil Company, Inc. Low silhouette cooling tower with trapezoidal fill and method of air flow there-through, 4,873,028, Cl. 261-109.000.

Gasser, Ruedi, See—
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Haeussler, Klaus M.; Wittmann, Julius; Gaukel, Gisela; and Au-racher, Franz, 4,873,697, Cl. 372-108.000.

Gay, Christian; and Lassiaz, Philippe, to Valeo. Clutch release bearing for an automobile vehicle and means for the installation thereof, 4,872,539, Cl. 192-98.000.

Gaylord, Norman G., See—
Allan, John L.; Boettcher, Jeffery J.; Gaylord, Norman G.; and Katz, Leon, 4,873,273, Cl. 523-407.000.

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Lefebvre, Martin C.; Ciambello, Carmine A.; and Geadah, Youssef A., 4,873,666, Cl. 365-189.070.

Gebrueder Loefle AG, See—
De Coi, Beat; and Keller, Hans-Peter, 4,873,621, Cl. 364-150.000.

Gefard, Prevot, See—
Jean-Claude, Legrand; and Gefard, Prevot, 4,872,716, Cl. 292-336.300.

Geisinger, Penrod C., to Vaporless Manufacturing, Inc. Gas evacuation apparatus for underground liquid storage tanks and method, 4,872,490, Cl. 141-7.000.

Gemignani, Andre, to Societe d'Exploitation de Brevets Pour l'Industrie et la Marine Sebim. Pilot-control safety valve, 4,872,639, Cl. 251-61.400.

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Anderson, Patricia P.; Sivavec, Timothy M.; and Takekoshi, Tohru, 4,873,367, Cl. 562-425.000.

Boutni, Omar M., 4,873,277, Cl. 524-166.000.

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Dakin, James T.; and El-Hamamsy, Sayed A., 4,872,741, Cl. 350-345.000.

Espiritu-Santo, Eugenio, 4,872,349, Cl. 73-727.000.

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Giles, Harold F., Jr., 4,873,133, Cl. 428-107.000.

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Holub, Fred F.; Abolins, Visvaldis; and Rock, John A., 4,873,287, Cl. 525-92.000.

Knapp, Malcolm H., 4,872,767, Cl. 384-99.000.

Nelson, Linda H., 4,873,278, Cl. 524-380.000.

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Smith, Pamela S.; and Smith, Peter H., deceased, 4,873,408, Cl. 219-10.55B.

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Wilkinson, Stanley B., 4,873,602, Cl. 361-78.000.

Woods, Daniel C.; and Efferson, Kenneth R., 4,872,322, Cl. 62-51.100.

Yeager, Gary W.; and Schissel, David N., 4,873,371, Cl. 568-33.000.

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Appleby, John M.; Boisworth, James; and Wilson, Charles M., 4,872,366, Cl. 74-501.600.
Skinner, Timothy J.; Spurney, Joseph L.; and Ma, Weining, 4,872,814, Cl. 417-222.000.
- Genrich, Thad J., to Motorola, Inc. Phase accumulation continuous phase modulator. 4,873,500, Cl. 332-104.000.
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- Geophysical Engineering Company: See—
Assaf, Gad, 4,872,315, Cl. 62-94.000.
- George, Louis J.; and Taylor, Lloyd D., to Polaroid Corporation. Image-receiving element for diffusion transfer photographic product. 4,873,171, Cl. 430-213.000.
- Gerhard, Bruce; and Schulman, Bruce, to NEC Electronics Inc. Mass flow meter. 4,872,339, Cl. 73-204.140.
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Daniel, Vernon T.; Gettiffe, Jessie; and Lorenzo, Tina V., 4,872,416, Cl. 118-203.000.
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Erkens, Leonardus J. H.; Algra, Gerben P.; Snijders, Jacobus M. H.; Geurts, Herman J. J. M.; and Pugin, Andre, 4,872,915, Cl. 106-433.000.
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- Giacobbe, Frederick, to American Air Liquide. Process for heat treating metals or metal alloys in a thermal plasma. 4,872,926, Cl. 148-13.100.
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Nakhman, Michael, 4,872,307, Cl. 60-39.020.
- Gibson, Peter J., to U.S. Philips Corp. Coplanar patch antenna. 4,873,529, Cl. 343-700.0MS.
- Gibson, Robert R.: See—
Bailey, James B.; Gibson, Robert R.; Nunley, Alvin, III; and Utz, Q. Wayne, 4,873,676, Cl. 367-98.000.
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- Gifford, David K., to Massachusetts Institute of Technology. Parallel processing system with processor array having memory system included in system memory. 4,873,626, Cl. 364-200.000.
- Gigler, Gabor: See—
Petocz, Lujza; Simonyi, Istvan; Beck, Ivan; Gigler, Gabor; Fekete, Marton; Kiszely, Eniko; Mandi, Attila; Gorgenyi, Frigyes; Dietz, Andras; Sumeg nec Zukovics, Katalin; and Jakfalvi, Elemer, 4,873,249, Cl. 514-275.000.
- Gigliotti, Giuseppe: See—
Cousseidiere, Daniel; Gigliotti, Giuseppe; and Moguilewsky, Martine, 4,873,256, Cl. 514-391.000.
- Gilbert, James R.: See—
Grimmer, Derrick P.; Paulson, Kenneth R.; and Gilbert, James R., 4,873,201, Cl. 437-51.000.
- Gilbert, Wendell L.: See—
Rabe, William T.; and Gilbert, Wendell L., 4,872,393, Cl. 91-375.00A.
- Giles, Harold F., Jr., to General Electric Company. Fiber reinforced stampable thermoplastic sheet. 4,873,133, Cl. 428-107.000.
- Gill, G. Herbert. Remote release saddle post clamp. 4,872,696, Cl. 280-281.100.
- Gillsdy, Kenton P.; and Kelly, David L., to Burke Company, The. Bracing for tilt-up wall panel. 4,872,634, Cl. 248-354.300.
- Girard, Bernard, to Thomson-CSF. Device for energizing a non-eccentric in the wide side of a waveguide, and a slotted antenna comprising such a device. 4,873,528, Cl. 343-770.000.
- Girardot, Richard M.: See—
Dirksing, Robert S.; Girardot, Richard M.; and Merz, Theodore P., 4,873,100, Cl. 426-111.000.
- Girlock, Harry: See—
Middleton, Philip N.; Green, Glen R.; and Girlock, Harry, 4,872,474, Cl. 137-493.800.
- GIW Industries, Inc.: See—
Addie, Graeme R.; and Visintainer, Robert J., 4,872,809, Cl. 415-206.000.
- Glagovsky, Boris A.: See—
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- Glaser, Thomas: See—
Junge, Bodo; Richter, Bernd; Glaser, Thomas; Traber, Jorg; and Allen, George S., 4,873,262, Cl. 514-510.000.
- Glasstech, Inc.: See—
McMaster, Harold A., 4,872,925, Cl. 136-244.000.
- Glaverbel: See—
Toussaint, Francois; and Goelff, Pierre, 4,873,146, Cl. 428-428.000.
- Globus, Alfred R. Iodophor. 4,873,354, Cl. 558-51.000.
- Glyco-Metall-Werke, Daelen & Loos GmbH: See—
Roemer, Erich; Kuhn, Matthias; and Maurer, Leonhard, 4,872,248, Cl. 29-149.5DP.
- Gnyra, Bohdan, to Alcan International Limited. Insulating lightweight refractory materials. 4,873,209, Cl. 501-95.000.
- Godfrey, Thomas E., to Milliken Research Corporation. Calendaring process for polyester fabric. 4,872,276, Cl. 38-101.000.
- Goegelman, Robert T.; and Ondeyka, John G. Derivatives of paraherquamide isolated from a fermentation broth active as antiparasitic agents. 4,873,247, Cl. 514-257.000.
- Goelff, Pierre: See—
Toussaint, Francois; and Goelff, Pierre, 4,873,146, Cl. 428-428.000.
- Golay, Marcel, to Perkin-Elmer Corporation. The. Chromatography column. 4,872,979, Cl. 210-198.200.
- Gold Medal Products Co.: See—
Weiss, Ronald R., 4,872,821, Cl. 425-9.000.
- Goldberg, Harris A.; and Williams, Clyde C., to Hoechst Celanese Corp. Fuses having suppressed voltage transients. 4,873,604, Cl. 361-104.000.
- Goldfarb, William C.: See—
Kamieniecki, Emil; Reiss, Leszek; and Goldfarb, William C., 4,873,436, Cl. 250-315.300.
- Goldsmith, Charles D.: See—
Stringfellow, William T.; Goldsmith, Charles D.; and Davis, Lois T., 4,872,986, Cl. 210-611.000.
- Golz, Jack L.: See—
Meisenburg, Gary L.; Bertram, Francis E.; and Golz, Jack L., 4,872,531, Cl. 184-6.400.
- Gooch, John P.: See—
Altman, Ralph F.; Gooch, John P.; Diamukes, Edward B.; and Landham, Edward C., Jr., 4,872,887, Cl. 55-5.000.
- Good, William R.; Mikes, John; and Sikora, Joseph, to Ciba-Geigy Corporation. Hydrogels with increased organic solvent soluble active agent loading capacity, their preparation and the use thereof. 4,873,086, Cl. 424-409.000.
- Goodman, Matthew S.: See—
Arthurs, Edward; Goodman, Matthew S.; Kobrinski, Haim; and Vecchi, Mario P., 4,873,681, Cl. 370-3.000.
- Goodyear Tire & Rubber Company, The: See—
Allen, Terry F.; and Schisler, Robert C., 4,873,290, Cl. 525-337.000.
- Cohen, Martin P.; and D'Sidocky, Richard M., 4,873,291, Cl. 525-348.000.
- Goplen, Gary D.; and Iles, Lawrence F., to Nelson Industries Inc. Muffler construction. 4,872,528, Cl. 181-228.000.
- Gordon, Richard W. Oil well pump leakage accumulator. 4,872,508, Cl. 166-84.000.
- Gorgenyi, Frigyes: See—
Petocz, Lujza; Simonyi, Istvan; Beck, Ivan; Gigler, Gabor; Fekete, Marton; Kiszely, Eniko; Mandi, Attila; Gorgenyi, Frigyes; Dietz, Andras; Sumeg nec Zukovics, Katalin; and Jakfalvi, Elemer, 4,873,249, Cl. 514-275.000.
- Gorscak, Sharon L.: See—
Johnson, Trevor A.; and Gorscak, Sharon L., 4,873,415, Cl. 219-121.640.
- Gorski, Robert A.; Eiseman, Bernhardt J., Jr.; and Kvalnes, Donovan E., to Du Pont de Nemours, E. I., and Company. Azeotrope or azeotrope-like composition of trichlorotrifluoroethane and dichlorodifluoroethane. 4,873,021, Cl. 252-364.000.
- Gorton, Lanny A.; and Pelmulder, John P., to Pacesetter Infusion, Ltd. Disposable cassette for a medication infusion system. 4,872,813, Cl. 417-63.000.
- Gosswein, Claus F.: See—
Kopsch, Reiner; Gosswein, Claus F.; Lutz, Henning; Ball, Michael; and Hubert, Peter, 4,872,987, Cl. 210-635.000.
- Gostin, Gary B.: See—
Harris, Michael C.; Chastain, David M.; and Gostin, Gary B., 4,873,629, Cl. 364-200.000.
- Goto, Kiyokazu: See—
Ishizaka, Yoshiro; Naganuma, Hiroshi; Sato, Kenji; Kishi, Yuji; Ishida, Yoshihisa; and Goto, Kiyokazu, 4,872,320, Cl. 62-255.000.
- Goto, Takakiyo: See—
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- Gotoh, Yoshihiko: See—
Umemoto, Tetsuo; and Gotoh, Yoshihiko, 4,873,027, Cl. 562-83.000.
- Gould, John H., to United States of America, Health. Quick color test to detect lead release from glazed ceramic and enameled metal ware. 4,873,197, Cl. 436-77.000.
- Gouldy, Thomas E., to GTE Products Corporation. Electrical component and method of mounting same. 4,872,937, Cl. 156-313.000.
- Grabbe, Dimitry G., to AMP Incorporated. Semiconductor chip carrier system. 4,873,615, Cl. 361-395.000.
- Grabley, Susanne: See—
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- Grabowiecki, Robert J., to G & H Corporation of Connecticut, Inc. Display mailbox with interchangeable inserts. 4,872,610, Cl. 232-17.000.
- Graf, Eric: See—
Welter, Andre; Fischer, Harmut; Christiaens, Leon; Wendel, Albrecht; Etschenberg, Eugen; Dereu, Norbert; Kuhl, Peter; and Graf, Eric, 4,873,350, Cl. 549-436.000.
- Grald, Eric W.; and MacArthur, J. Ward, to Honeywell Inc. Method for operating variable speed heat pumps and air conditioners. 4,873,649, Cl. 364-505.000.
- Grand, Paul S.: See—
Ramachandran, Pallassana N.; Grand, Paul S.; and Bauman, Robert A., 4,873,001, Cl. 252-8.800.
- Grand Rapids Label Company: See—
deBruin, Frank G., 4,872,707, Cl. 283-102.000.
- Grant, Cathy: See—
Spinner, Raphael F.; Marley, Clement F.; Brown, Mary; and Grant, Cathy, 4,872,240, Cl. 16-114.00B.

- Grass Valley Group, Inc., The: See—
Jackson, Richard A.; Abt, John; and Barnett, Ronnie D., 4,873,568, Cl. 358-22.000.
- Gray, James P.: See—
Baratz, Alan E.; Clarke, Kathryn E.; Pollard, Melinda R.; Pozefsky, Diane P.; Rafalow, Lee M.; Siddall, William E.; and Gray, James P., 4,873,517, Cl. 340-825.030.
- Gray, Kenneth E., to United States of America, Energy. Superconducting transmission line particle detector. 4,873,482, Cl. 324-71.400.
- Graybill, John K.: See—
Schweighardt, Frank K.; Bailey, Webb I.; Lileck, John T.; Graybill, John K.; and Lutz, Eugene G., 4,873,315, Cl. 570-130.000.
- Grayling Industries, Inc.: See—
Hitler, Kurt D., 4,872,252, Cl. 29-426.400.
- Grebe, Robert K.; Lucius, John E.; and Szczesny, David S., to AMP Incorporated. Component-carrying adapter for chip carrier socket. 4,872,844, Cl. 439-49.000.
- Grebentkin, Anatoly F.; Glagovsky, Boris A.; Moskovenko, Igor B.; and Lasukova, Ijudmila P., to Vsesojuzny Nauchno-Issledovatel'skiy I Proektny Institut Aluminievoy, Magnitovoy I Elektrodoznoi. Method of nondestructive quality control of carbon articles. 4,872,344, Cl. 73-579.000.
- Greco, Robert L., Jr., to Xerox Corporation. Electrostaticographic machine with withdrawable copy paper module. 4,873,554, Cl. 355-309.000.
- Greco, William J., Jr., to Sybron Chemicals, Inc. Electrically insulating fluids. 4,873,611, Cl. 361-315.000.
- Green, Glen R.: See—
Middleton, Philip N.; Green, Glen R.; and Girlock, Harry, 4,872,474, Cl. 137-493.800.
- Green, Kenneth L. Air and fuel mixing devices for internal combustion engines. 4,872,440, Cl. 123-590.000.
- Green, Michael C.: See—
Miram, George V.; Green, Michael C.; and Merdian, George K., 4,873,468, Cl. 313-411.000.
- Greene, Jonathan W.: See—
El Gamal, Abbas A.; El-Ayat, Khaled A.; Greene, Jonathan W.; Guo, Ta-Pen R.; and Reyneri, Justin M., 4,873,459, Cl. 307-465.000.
- Greene, Ralph J.: See—
Pischke, LaMonte D.; and Greene, Ralph J., 4,873,094, Cl. 426-43.000.
- Greenhouse, Robert: See—
Muchowski, Joseph M.; and Greenhouse, Robert, 4,873,340, Cl. 548-453.000.
- Greenspan, Michael D.: See—
Alberts, Alfred W.; and Greenspan, Michael D., 4,873,260, Cl. 514-449.000.
- Greenwood, Alden T. Balanced buoyancy control diving gear. 4,872,783, Cl. 405-186.000.
- Greeves, Godfrey; and Fry, Robert J., to Lucas Industries Public Limited Company. Fuel injection nozzle. 4,872,614, Cl. 239-533.900.
- Grein-Wiegand, Aldeide, to Varnel Chemical Business S.A. Process for the production of extendable thermographic plates. 4,873,113, Cl. 427-2.000.
- Greischel, Andreas: See—
Brickl, Rolf; Schepky, Gottfried; Rupprecht, Eckhard; and Greischel, Andreas, 4,873,080, Cl. 424-80.000.
- Grendahl, Dennis T.: See—
Tiffany, John, 4,872,877, Cl. 623-6.000.
- Tiffany, John S., 4,872,878, Cl. 623-6.000.
- Greuter, Albert; and Gasser, Ruedi, to Max AG. Plastic frame with embedded shearing foil. 4,872,266, Cl. 30-346.510.
- Grierson, Jeffrey G.; Wilson, David A.; and Crump, Druce K., to Dow Chemical Company, The. Use of aminophosphonic acids to inhibit scale formation and corrosion caused by manganese in water systems. 4,872,996, Cl. 210-700.000.
- Gries, Josef: See—
Rossy, Philip A.; Thyes, Marco; Franke, Albrecht; Koenig, Horst; Lehmann, Hans D.; Gries, Josef; Friedrich, Ludwig; and Lenke, Dieter, 4,873,246, Cl. 514-252.000.
- Griesinger, William B., to Griesinger, William B. Truck tire mounting device. 4,872,694, Cl. 280-79.400.
- Griffith, Ronald C.: See—
Napier, James J.; and Griffith, Ronald C., 4,873,241, Cl. 514-237.800.
- Griffiths, John M.; Forsgren, Lyle M.; Newman, Neil A.; and Beck, Wayne T., to Brunswick Corporation. Lift and latch apparatus for an outboard motor. 4,872,859, Cl. 440-53.000.
- Griffiths, John M.: See—
Newman, Neil A.; Bankstahl, Herbert A.; Griffiths, John M.; Forsgren, Lyle M.; and Beck, Wayne T., 4,872,857, Cl. 440-1.000.
- Grigo, Ulrich: See—
Berg, Klaus; Idel, Karsten-Josef; and Grigo, Ulrich, 4,873,314, Cl. 528-487.000.
- Grimes, Fred D.; and Grimes, Linda D. Bathtub apparatus. 4,872,224, Cl. 4-544.000.
- Grimes, Linda D.: See—
Grimes, Fred D.; and Grimes, Linda D., 4,872,224, Cl. 4-544.000.
- Grimmer, Derrick P.; Paulson, Kenneth R.; and Gilbert, James R., to Minnesota Mining and Manufacturing Company. Method for fabricating an interconnected array of semiconductor devices. 4,873,201, Cl. 437-51.000.
- Gross, Akiva T.: See—
Chmurny, Alan B.; Gross, Akiva T.; Kupper, Robert J.; and Roberts, Rowena L., 4,873,359, Cl. 560-40.000.
- Grosskopf, Rudolf E., to Carl-Zeiss-Stiftung. Microscope system for providing three-dimensional resolution. 4,873,653, Cl. 364-525.000.
- Grosso, John A.: See—
Petrillo, Edward W., Jr.; Karanewsky, Donald S.; Thottathil, John K.; Heikes, James E.; and Grosso, John A., 4,873,356, Cl. 558-180.000.
- Grove, Clinton E.; and Grove, Robert D. Apparatus and method for adjusting camber and toe. 4,872,699, Cl. 280-661.000.
- Grove, James E. Releasable extraoral orthodontic appliance. 4,872,836, Cl. 433-5.000.
- Grove, Robert D.: See—
Grove, Clinton E.; and Grove, Robert D., 4,872,699, Cl. 280-661.000.
- Grunden, Michael T.: See—
Mierzwinaki, Eugene P.; Grunden, Michael T.; and Youtz, Stephen E., 4,872,828, Cl. 431-16.000.
- Gryson, Dirk; and Shaw, Henry, to Picanol N.V. Device for determining the position of a warp thread break. 4,872,488, Cl. 139-353.000.
- GTE Products Corporation: See—
Gouldy, Thomas E., 4,872,937, Cl. 156-313.000.
- Hsieh, Martin Y., 4,873,210, Cl. 501-98.000.
- Johnson, Robert R.; and Orbanic, Robert S., 4,872,260, Cl. 29-827.000.
- Jones, Gerald M.; and Nemcovsky, Rhonda L., 4,872,259, Cl. 29-764.000.
- Kemp, Preston B., Jr.; and Holland, Robert J., Sr., 4,873,148, Cl. 428-570.000.
- Guardian Products, Inc.: See—
Schultz, Jim, 4,872,469, Cl. 135-69.000.
- Guelfi, Giorgio: See—
Pristera, Raffaele; Rugora, Edoardo; Fioravazzi, Silvio; Guelfi, Giorgio; Bassi, Aldo; and Poli, Alberto, 4,873,451, Cl. 307-10.100.
- Guity-Mehr, Hossein F., to Texim International. Wall electrical cover plate. 4,873,396, Cl. 174-66.000.
- Gunn, Bruce P.: See—
Summers, James B., Jr.; Gunn, Bruce P.; and Brooks, Dee W., 4,873,259, Cl. 514-443.000.
- Gunn, Dennis R. String anchoring and trimming device. 4,872,388, Cl. 84-297.00R.
- Gunze Limited: See—
Niwa, Katuhiro; Abe, Nobuyasu; Kajikiyo, Katuji; Suzuki, Tsutomu; Tabuti, Katumi; and Arai, Yoshifumi, 4,872,383, Cl. 83-175.000.
- Guo, Ta-Pen R.: See—
El Gamal, Abbas A.; El-Ayat, Khaled A.; Greene, Jonathan W.; Guo, Ta-Pen R.; and Reyneri, Justin M., 4,873,459, Cl. 307-465.000.
- Gurevich, Leon, to Cooper Industries, Inc. Metallo-organic film fractional ampere fuses and method of making. 4,873,506, Cl. 337-290.000.
- Gustafson, Richard J., to Cummins Engine Company, Inc. Position controller for a rotatable shaft. 4,872,427, Cl. 123-90.160.
- Gustavsen, Willard. Impact blade tool. 4,872,231, Cl. 7-103.000.
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- Gwaltney, Robert E.: See—
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- H-D Tech Inc.: See—
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Langen, Marinus J. M.; Guttinger, Peter; and Borza, Mihai M., 4,872,301, Cl. 53-133.000.
- H. Lundbeck A/S: See—
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- Haas, Roland: See—
Brandenstein, Manfred; Haas, Roland; Friedrich, Wolfgang; and Herrmann, Gerhard, 4,872,768, Cl. 384-223.000.
- Habata, Hidetsugu: See—
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- Hagelstein, Peter L.; and Eugster, Christopher C., to Massachusetts Institute of Technology. X-ray detector. 4,873,439, Cl. 250-327.200.
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Ehrfeld, Wolfgang; Hagmann, Peter; Mohr, Jürgen; and Munchmeyer, Dietrich, 4,872,888, Cl. 55-16.000.
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- Hahn, Gerald D.: See—
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- Hahn, Granville J.: See—
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- Hakeem, Terri A. Child seat. 4,872,725, Cl. 297-250.000.
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Yoshimura, Hiroshi, 4,873,608, Cl. 361-220.000.
- Hall, John C.: See—
Chang, On-Kok; Hall, John C.; Phillips, Jeffrey; and Silvester, Lenard F., 4,873,158, Cl. 424-61.000.
- Halliburton Company: See—
Davis, Gail F.; and Baker, Robert L., 4,872,794, Cl. 410-54.000.
- Mouser, Charles L.; and Stewart, Joseph A., 4,873,648, Cl. 364-500.000.
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Barr, Frederick J., Jr.; Beasley, Thomas R.; and Piggins, Richard H., 4,873,675, Cl. 367-57.000.
- Hallmark, Richard K.; Skowronski, Michael J.; and Stephens, William D., to Sicom Industries Corporation. Digestion products of polyalkylene terephthalate polymers and polycarboxylic acid-containing polyols and polymeric foams obtained therefrom. 4,873,268, Cl. 521-48.500.
- Hakko Oy: See—
Vartiainen, Seppo; and Aalto, Erkki, 4,872,892, Cl. 55-345.000.
- Hamada, Toyohide: See—
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- Hamaguchi, Masakazu: See—
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- Hamilton, Kenneth L.; and Butler, Timothy C. Demonstration device for illustrating spinal misalignment. 4,872,841, Cl. 434-274.000.
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Mierzwiński, Eugene P.; Grunden, Michael T.; and Youtz, Stephen E., 4,872,828, Cl. 431-16.000.
- Hamman, Peter; Grabley, Susanne; Raether, Wolfgang; Ciommer, Bernd; Klege, Heinz; and Sachse, Burkhard, to Hoechst Aktiengesellschaft. Process for the preparation of the demakoyl compound of macrolide lactones. 4,873,347, Cl. 549-267.000.
- Hammett, Roy; Hutchison, Jerry D.; and Avedon, Raymond B. Mechanically pressurized aerosol dispenser. 4,872,595, Cl. 222-209.000.
- Hamstra, James R.: See—
Rusterholz, John T.; Lahti, Archie E.; Bushard, Louis B.; Byers, Larry L.; Hamstra, James R.; and Homan, Charles J., 4,873,630, Cl. 364-200.000.
- Han, Bong H., to Samsung Electronics Co., Ltd. Speaker system. 4,872,527, Cl. 181-160.000.
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- Hanafusa, Hisao. Beverage container with dual dispensing tabs. 4,872,597, Cl. 222-541.000.
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Nishio, Kouji; and Hanamura, Yoshihiko, 4,872,460, Cl. 128-447.000.
- Hameda, Tadayoshi: See—
Kaneshiki, Toshitaka; Narukawa, Osamu; Hameda, Tadayoshi; and Eado, Toshiyuki, 4,873,383, Cl. 570-211.000.
- Hanley, James L. Balancing beam toy. 4,872,673, Cl. 273-1.00F.
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Akatsu, Yoshio; Fukushima, Naoto; Fukumaga, Yukio; Hano, Susao; and Satoh, Masaharu, 4,872,701, Cl. 280-703.000.
- Hansen, Holger C.: See—
Watjen, Frank; and Hansen, Holger C., 4,873,244, Cl. 514-250.000.
- Hansen, James E.: See—
Schmerda, Richard F.; and Hansen, James E., 4,873,453, Cl. 107-130.000.
- Hanson, Richard A.; Peters, Rex B.; Norling, Brian L.; and Urbach, Edward A., to Sundstrand Data Control, Inc. Translational accelerometer and accelerometer assembly method. 4,872,342, Cl. 73-517.00R.
- Hara, Shigeo: See—
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- Harada, Hisayuki: See—
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Omura, Takashi; Kikkawa, Sadanobu; Morimitsu, Toshihiko; Harada, Naoki; and Miyamoto, Tetsuya, 4,873,321, Cl. 534-642.000.
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- Hardee, Sellers: See—
Duffey, Donald; Hardee, Sellers; Smith, Wayne; Elliott, James; Gardner, Robert; and Suess, Claus, 4,872,500, Cl. 164-34.000.
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- Harned, Timothy J., to Eastern Air Devices, Inc. Stepping motor with low detent torque. 4,873,462, Cl. 310-49.00R.
- Harrington Arthritis Research Center: See—
Bloebaum, Roy D.; and Magee, Frank P., 4,872,865, Cl. 604-28.000.
- Harris Corporation: See—
Beason, James D., 4,873,564, Cl. 357-49.000.
- Harris, Jeffrey A., to Fosco International Limited. Coating expendable substrates which contact molten metal. 4,873,114, Cl. 427-27.000.
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- Harrison, George C. Waste treatment. 4,872,993, Cl. 210-666.000.
- Hartfeil, Guenther, to Jones, Charles, a part interest. Confidential post card. 4,872,705, Cl. 283-67.000.
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Nowakowski, Bernhard H.; Beck, Juergen; Hartmann, Heinrich; and Vamvakaris, Christos, 4,873,299, Cl. 526-73.000.
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- Hasegawa, Kazuo: See—
Yoshioka, Takao; Kanai, Tsutomu; Aizawa, Yuichi; Horikoshi, Hiroyoshi; and Hasegawa, Kazuo, 4,873,255, Cl. 514-369.000.
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Hashimoto, Kazuo, 4,873,584, Cl. 358-335.000.
- Hashimoto, Hideo: See—
Tanaka, Yasunori; and Hashimoto, Hideo, 4,873,670, Cl. 365-189.110.
- Hashimoto, Kazuo, to Hashimoto Corporation. Computer control for VCR including display of record playback listing and playback order selection. 4,873,584, Cl. 358-335.000.
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Tanaka, Takaharu; Saitoh, Masayuki; Higuchi, Naoki; and Hashimoto, Masaki, 4,873,342, Cl. 548-518.000.
- Hashimoto, Tadao: See—
Tsuruoka, Michihiko; Nakagawa, Wataru; Miyoshi, Noriomi; Konosu, Naohiro; and Hashimoto, Tadao, 4,872,335, Cl. 73-30.000.
- Hashimoto, Takimi: See—
Senga, Takao; Takao, Kazuchiyu; Yamamoto, Hirokazu; and Hashimoto, Takimi, 4,873,166, Cl. 430-137.000.
- Hashimoto, Yoshinobu: See—
Nagata, Mitsuhiro; Hayashi, Tadashi; Hashimoto, Yoshinobu; and Nakamura, Kiyoshi, 4,873,208, Cl. 501-89.000.
- Hashimoto, Yoshisato: See—
Nagai, Noboru; Hashimoto, Yoshisato; Tsuboike, Yoshihiko; and Kaito, Noboru, 4,872,308, Cl. 60-316.000.
- Hasker, Jan; Van Esdonk, Johannes; and Kwestroo, Wim, to U.S. Philips Corporation. Method of manufacturing a scandate dispenser cathode and scandate dispenser cathode manufactured according to the method. 4,873,052, Cl. 419-2.000.
- Hasson, Harrieth M. Template incision device. 4,872,456, Cl. 128-321.000.
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Tanaka, Yoshihiro; Tsuji, Sadafusa; Hata, Yoshiaki; Inoue, Manabu; Ootsuka, Hiroshi; Iwata, Michihiro; Ishito, Fumiaki; and Hayama, Koh, 4,873,544, Cl. 354-457.000.
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Dietrich, Klaus; Hauer, Hans; and Schreier, Klaus, 4,873,521, Cl. 340-825.520.
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Hawener, Juergen; Havemann, Kim; and Sivers, Rolf V., 4,872,624, Cl. 244-54.000.
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Lamprecht, Ned L.; and Hawley, Clyde W., 4,872,890, Cl. 55-323.000.
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Honda, Sueaki; Hayashi, Mitsuji; Niwa, Takashi; Hayakawa, Akihiko; and Bingo, Hideyuki, 4,873,402, Cl. 200-283.000.
- Hayakawa, Motomu: See—
Sakamoto, Kenji; Ishikawa, Nobuo; and Hayakawa, Motomu, 4,873,677, Cl. 368-204.000.
- Hayakawa, Yasuyoshi: See—
Kobayashi, Hiroo; Fujino, Hitoshi; Yagi, Tadashi; Adachi, Nobukazu; Hayakawa, Yasuyoshi; and Setoriyama, Takeshi, 4,873,548, Cl. 355-200.000.
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Tanaka, Yoshihiro; Tsuji, Sadafusa; Hata, Yoshiaki; Inoue, Manabu; Ootsuka, Hiroshi; Iwata, Michihiro; Ishito, Fumiaki; and Hayama, Koh, 4,873,544, Cl. 354-457.000.
- Hayashi, Masahiko: See—
Fuji, Yasuo; and Hayashi, Masahiko, 4,873,644, Cl. 364-478.000.
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Honda, Sueaki; Hayashi, Mitsuji; Niwa, Takashi; Hayakawa, Akihiko; and Bingo, Hideyuki, 4,873,402, Cl. 200-283.000.
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Matsuda, Toshiharu; Sasakawa, Atsushi; Hayashi, Shoichiro; and Konai, Yutaka, 4,873,366, Cl. 562-416.000.
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Nagata, Mitsuhiro; Hayashi, Tadashi; Hashimoto, Yoshinobu; and Nakamura, Kiyoshi, 4,873,208, Cl. 501-89.000.
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- Hayes Microcomputer Products, Inc.: See—
Bhargava, Vikram; and Heberling, James R., 4,873,394, Cl. 174-35.00R.
- Hayes, William K.: See—
Boyer, Billy G.; Nelson, Lloyd M.; Soucie, Wayne L.; and Hayes, William K., 4,872,533, Cl. 188-2.00D.
- Hayward, Jack: See—
Fronheiser, Dennis R.; Hayward, Jack; Reafter, Gerald G.; and Schuler, James R., 4,872,270, Cl. 34-23.000.
- Heaulme, Michel: See—
Wernuth, Camille G.; Schlewer, Gilbert; and Heaulme, Michel, 4,873,243, Cl. 514-248.000.
- Heberling, James R.: See—
Bhargava, Vikram; and Heberling, James R., 4,873,394, Cl. 174-35.00R.
- Hebert, Roland J. Crayfish harvester boat apparatus. 4,872,413, Cl. 114-270.000.
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- Heckmann, Klaus; Manecke, Georg; Pfannenmuller, Beate; Ring, Klaus; and Ringsdorf, Helmut, to Klaus Heckmann. Process for the production of hyperfiltration membranes. 4,873,033, Cl. 264-41.000.
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- Heidelberger Druckmaschinen Aktiengesellschaft: See—
Kusch, Hans-Jürgen, 4,872,406, Cl. 101-148.000.
- Heider, Kenneth J.: See—
Clem, Kenneth R.; Heider, Kenneth J.; Kegerreis, James E.; and Shoukry, Ehsan I., 4,872,967, Cl. 208-65.000.
- Heikes, James E.: See—
Petrillo, Edward W., Jr.; Karanewsky, Donald S.; Thottathil, John K.; Heikes, James E.; and Grosso, John A., 4,873,356, Cl. 558-180.000.
- Helland, Ingolv. Clamping means for attaching the ends of a conveyor coil spring to a journal pin. 4,872,547, Cl. 198-659.000.
- Hellstrom, Ingegerd; Brown, Joseph P.; Hellstrom, Karl E.; Horn, Diane; and Linsley, Peter, to Oncogen. Method, monoclonal antibody, and monoclonal antibody fragments for detecting human non-small cell lung carcinomas and cell line for producing such antibodies. 4,873,188, Cl. 435-7.000.
- Hellstrom, Karl E.: See—
Hellstrom, Ingegerd; Brown, Joseph P.; Hellstrom, Karl E.; Horn, Diane; and Linsley, Peter, 4,873,188, Cl. 435-7.000.
- Helvoet Pharma N.V.: See—
Schrooten, Rik, 4,872,572, Cl. 215-307.000.
- Helzel, Thomas: See—
Kuhn, Michael H.; Helzel, Thomas; Proksa, Roland; and Van Den Berg, Noel J. M., 4,873,486, Cl. 324-307.000.
- Hemphill, D. Gary: See—
Jensen, Richard E.; Nichols, Donald H.; and Hemphill, D. Gary, 4,873,193, Cl. 436-176.000.
- Hendley, David G.; and Litzinger, William A., to General Electric Company. Turbine blade platform sealing and vibration damping apparatus. 4,872,812, Cl. 416-190.000.
- Henley, John P.; Pearson, Stanley R.; Peters, Bruce C.; and LaFitte, Larry L., to Dow Chemical Company. The Two-stage coal gasification process. 4,872,886, Cl. 48-197.00R.
- Hennessy Industries, Inc.: See—
McAnally, Marcus E.; and Gwaltney, Robert E., 4,872,492, Cl. 141-38.000.
- Henrich, William H.: See—
Dean, Thomas E.; Henrich, William H.; Fischer, David M.; Stratton, Lawrence J.; and Pietsch, Herbert E., 4,873,471, Cl. 315-308.000.
- Henry, Harry M. Adjustable resistance exerciser. 4,872,669, Cl. 272-132.000.
- Hensler, Paul L., to FMC Corporation. Process for manufacturing tetrasodium pyrophosphate. 4,873,068, Cl. 423-315.000.
- Hepp, Vincent R., to Amoco Corporation. Interpretation of conical structures from dipmeter surveys. 4,873,636, Cl. 364-422.000.
- Herauld, Didier: See—
Cazaux, Yvon; Thenoz, Yves; Herauld, Didier; and Blanchard, Pierre, 4,873,562, Cl. 357-24.000.
- Herbst, Richard L.: See—
Johnson, Bertram C.; DiFonzo, John C.; and Herbst, Richard L., 4,873,692, Cl. 372-20.000.
- Herbst, Robert J.; and Renk, Russell R., to Cleanup & Recovery Corp. (CURE). Electrolytic treatment of liquids. 4,872,959, Cl. 204-109.000.
- Hercher, Michael. Non-contact lateral displacement sensor and extensometer system. 4,872,751, Cl. 356-35.500.
- Herkes, Marybeth: See—
Davidson, Wayne A.; Ernst, John P.; Herkes, Marybeth; Kuppawami, Ram; Satalich, Timothy A.; and Stanaway, John J., Jr., 4,873,717, Cl. 379-157.000.
- Hernandez, Henry R.: See—
Maliczynski, Walter; and Hernandez, Henry R., 4,872,951, Cl. 162-135.000.
- Hernandez, Jorge M., to Rogers Corporation. Temperature stable multilayer capacitor. 4,873,612, Cl. 361-321.000.
- Herrmann, Gerhard: See—
Brandenstein, Manfred; Haas, Roland; Friedrich, Wolfgang; and Herrmann, Gerhard, 4,872,768, Cl. 384-223.000.
- Hertleif, Hans-Peter: See—
Schulz, Gerd; and Hertleif, Hans-Peter, 4,872,359, Cl. 74-109.000.
- Hertz, Dominique; and Couturier, Jean-Michel, to Framatome; and Compagnie Generale Des Matieres Nucleaires. Stainless steel tubular element with improved wear resistance. 4,873,117, Cl. 427-37.000.
- Hesu, Victor C., to Hyman Products, Inc. Simulated ball used in sports incorporating an electronic component. 4,872,854, Cl. 439-577.000.
- Hetzl, Joseph R.; and Virgina, Kenneth L., to Patio Enclosures, Inc. Header assembly. 4,872,297, Cl. 52-92.000.
- Hewlett-Packard Company: See—
Baum, Allen J.; Miller, Terrence C.; and Fotland, David A., 4,873,627, Cl. 364-200.000.
- Crundall, Douglas; Cavanna, Vicente; Shankar, Pradip; and Nordby, Rasmus, 4,873,703, Cl. 375-118.000.
- Hubby, Laurence M., Jr., 4,873,398, Cl. 178-18.000.
- Tullis, Barclay J.; and Baer, Richard G., 4,872,835, Cl. 432-225.000.
- Wong, Siu-Weng S.; Chen, Devereaux C.; and Chiu, Kuang-Yi, 4,873,204, Cl. 437-200.000.
- Hibino, Hiroki: See—
Kaneshira, Katsuyuki; Takayama, Syuichi; Amano, Atsushi; Hibino, Hiroki; Uchiyama, Naoki; and Nakada, Akio, 4,872,458, Cl. 128-401.000.
- Hickey, John. System for controlling the flow of a fluid medium relative to an object. 4,872,484, Cl. 137-561.00R.
- Hickner, Richard A.: See—
McIntyre, John M.; Anderson, Kenneth W.; Rao, Nancy A.; and Hickner, Richard A., 4,872,961, Cl. 204-181.700.
- Hicks, Darrell D.: See—
Keene, Donna L.; and Hicks, Darrell D., 4,872,960, Cl. 204-181.700.
- Higashida, Masahiko: See—
Yasukawa, Wataru, deceased; Kiyoshige, Masanori; Horikawa, Takeshi; Okada, Tomonobu; Ochi, Tadafumi; Aoki, Yoshiaki; Higashida, Masahiko; Kawashima, Takashi; Koe, Shigeki; Ono, Hideo; Nihel, Kanta; Takasugi, Syunji; and Take, Koji, 4,872,293, Cl. 51-410.000.
- Higashiyama, Yasuhiko: See—
Asada, Toshiyuki; Ushijima, Fumihiro; and Higashiyama, Yasuhiko, 4,872,376, Cl. 74-765.000.
- Hightower, Edwin C., to FMC Corporation. Heat exchanger for mobile aircraft deicing machine and method of use. 4,872,501, Cl. 165-1.000.
- Higo, Yuichi: See—
Shinoda, Kenichi; Iwao, Tomoyoshi; Isayama, Tomoaki; and Higo, Yuichi, 4,873,149, Cl. 428-609.000.
- Higuchi, Naoki: See—
Tanaka, Takaharu; Saitoh, Masayuki; Higuchi, Naoki; and Hashimoto, Masaki, 4,873,342, Cl. 548-518.000.
- Higuchi, Noboru; Matsui, Keizo; Kobayashi, Chuzo; and Yamaguchi, Shigeru, to Fuji Photo Film Co., Ltd. Method of and apparatus for measuring liquid. 4,872,763, Cl. 366-160.000.
- Hihara, Toshio: See—
Fujita, Takashi; Hihara, Toshio; Kogure, Yoshio; Sekioka, Riyouchi; and Nakamura, Noboru, 4,872,881, Cl. 8-549.000.

- Hildenbrand, Randall C.: See—
Davis, Cecil J.; Abernathy, Joseph V.; Matthews, Robert T.; Hildenbrand, Randall C.; Simpson, Bruce; Jones, John I.; Loewenstein, Lee M.; and Bohlman, James G., 4,872,938, Cl. 156-345.000.
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- Hill, Edward C.: See—
Brown, Wesley D.; Hill, Edward C.; and Vercellone, Peter T., 4,872,810, Cl. 416-145.000.
- Hill, Leonard J.: See—
Dawson, Bryan J.; and Hill, Leonard J., 4,872,677, Cl. 273-58.00A.
- Hillman, Kevin P.: See—
Butcher, Ian; and Hillman, Kevin P., 4,873,104, Cl. 426-249.000.
- Hinchcliffe, Dennis, to Molins PLC. Conveyor system for rod-like articles. 4,872,543, Cl. 198-347.000.
- Hindermann, Erich A. Screw conveyor device. 4,872,546, Cl. 198-659.000.
- Hioke, Yoshihiro: See—
Kawasaki, Yoshiaki; Hioke, Yoshihiro; Ohno, Yuichi; Ichida, Kozaburo; Yamaguchi, Susumu; Sudo, Michitaka; and Chikazawa, Bunichiro, 4,872,245, Cl. 29-81.00A.
- Hirai, Yutaka: See—
Matsuyama, Jinsho; Hirai, Yutaka; Ueki, Masao; and Sakai, Akira, 4,873,125, Cl. 427-248.100.
- Hiramatsu, Akihiko, to Sony Corporation. Apparatus for storing digital data. 4,873,588, Cl. 360-47.000.
- Hirano, Shigeo: See—
Ishiguro, Shoji; Hirano, Shigeo; Shishido, Tadao; and Miyake, Akio, 4,873,172, Cl. 430-264.000.
- Hirase, Ikuo: See—
Rufin, Denis; and Hirase, Ikuo, 4,872,944, Cl. 156-626.000.
- Hirayama, Shigemitsu; Akashi, Takamichi; Ikuta, Akio; Sasaki, Isao; and Fukuda, Hiroshi, to Fujisawa Pharmaceutical Co., Ltd. Apparatus for testing membrane filters, and for sterilizing liquids with use of membrane filter. 4,872,974, Cl. 210-90.000.
- Hirobe, Junichi: See—
Tada, Tomio; Hirobe, Junichi; Takamatsu, Junichi; Hori, Kazuto; and Aikawa, Yukihiko, 4,873,549, Cl. 355-206.000.
- Hirosawa, Makoto, to Dainippon Screen Mfg. Co., Ltd. Image reader having spectroscopy for color separation. 4,873,569, Cl. 358-75.000.
- Hirose, Yoshihiko; Aoki, Tomohiro; Chiku, Kazuyoshi; Murayama, Yasushi; Uchida, Takashi; Matsuzawa, Kunihiko; and Kanekura, Kazunori, to Canon Kabushiki Kaisha. Image forming apparatus. 4,873,541, Cl. 346-160.100.
- Hirota, Toshiro; Ohuchi, Takashi; and Yamamoto, Osamu, to Fuji Electric Co., Ltd. Fuel cell manifolds. 4,873,155, Cl. 429-26.000.
- Hirotsu, Jun, to Seiko Instruments Inc. Driving circuit for actuator. 4,873,477, Cl. 318-603.000.
- Hislop, Alfred R., to United States of America, Navy. Internal transmission line filter element. 4,873,501, Cl. 333-204.000.
- Hislop, Lawrence A.: See—
Nathan, Robert H.; and Hislop, Lawrence A., 4,873,631, Cl. 364-405.000.
- Hitachi Cable Limited: See—
Fukahori, Toshiro; Takashima, Hideyuki; and Morinaga, Hitoshi, 4,872,737, Cl. 350-96.200.
- Taketani, Noriaki; Asano, Hideki; Endo, Akira; Abe, Tomiya; Ibamoto, Masahiko; Mukai, Junji; Tanno, Seikichi; Eguchi, Shuji; and Shimura, Masato, 4,873,030, Cl. 264-1.500.
- Hitachi Device Engineering Co., Ltd.: See—
Etoh, Jun; Shimohigashi, Katsuhiro; Miyazawa, Kazuyuki; Kimura, Katsutaka; and Akiba, Takesada, 4,873,672, Cl. 365-218.000.
- Hitachi Koki Company, Ltd.: See—
Iimura, Yoshio; and Nagahara, Kazuyuki, 4,873,479, Cl. 320-2.000.
- Hitachi, Ltd.: See—
Asano, Katuhiko; and Suzuki, Takao, 4,872,314, Cl. 62-49.100.
- Doi, Masayuki; Asahi, Naotatsu; Kojima, Yoshitaka; Kanamaru, Hisanobu; and Aoyama, Susumu, 4,873,150, Cl. 428-627.000.
- Etoh, Jun; Shimohigashi, Katsuhiro; Miyazawa, Kazuyuki; Kimura, Katsutaka; and Akiba, Takesada, 4,873,672, Cl. 365-218.000.
- Fukke, Hajime, 4,873,129, Cl. 428-694.000.
- Furuhata, Takashi; Owashi, Hitoaki; Ito, Takayasu; and Hamaguchi, Masakazu, 4,873,582, Cl. 358-310.000.
- Hori, Ryoichi; Itoh, Kiyoo; Kitsukawa, Goro; Kawajiri, Yoshiaki; Watanabe, Takao; and Kawahara, Takayuki, 4,873,673, Cl. 365-230.060.
- Iizuka, Nobuyuki; Kumata, Kazuhiko; and Kuroda, Michio, 4,872,312, Cl. 60-760.000.
- Kaga, Toru; Kimura, Shinichiro; Kure, Tokuo; Kawamoto, Yoshifumi; and Sunami, Hideo, 4,873,203, Cl. 437-67.000.
- Kinoshita, Mitsuo; Ito, Tetsuo; Mikawa, Hiroji; and Chino, Koichi, 4,872,948, Cl. 159-6.200.
- Kumada, Masaharu; and Misumi, Akira, 4,872,924, Cl. 148-12.100.
- Nakamura, Shigeru; Machida, Sadatsugi; and Toda, Tsuyoshi, 4,873,678, Cl. 369-13.000.
- Ogawa, Toshiro; Fujii, Mituru; Asai, Tadachichi; Ikegami, Akira; Ohtsu, Hiroshi; and Ato, Kazuhiko, 4,873,022, Cl. 428-209.000.
- Sato, Hiroshi; Ohashi, Toshihiro; Hamada, Toyohide; Umakoshi, Yukimori; Suzuki, Takamichi; Wada, Yuuji; Hara, Shigeo; and Fukumoto, Yoshio, 4,872,618, Cl. 242-4.000.
- Satoh, Motohiro; Yamada, Toshihiro; Kohono, Akiomi; Yamamoto, Akihiko; Taguchi, Keiji; Daikoku, Takahiro; and Kobayashi, Fumiaki, 4,872,606, Cl. 228-121.000.
- Shibata, Yoji, 4,873,715, Cl. 379-93.000.
- Shimizu, Shinji; Tsuchiya, Osamu; and Sato, Katsuyuki, 4,873,559, Cl. 357-23.600.
- Sunami, Hideo; Kimura, Shinichiro; and Kaga, Toru, 4,873,560, Cl. 357-23.600.
- Taketani, Noriaki; Asano, Hideki; Endo, Akira; Abe, Tomiya; Ibamoto, Masahiko; Mukai, Junji; Tanno, Seikichi; Eguchi, Shuji; and Shimura, Masato, 4,873,030, Cl. 264-1.500.
- Tobita, Toshimitsu; Inaba, Hiromi; Yamazaki, Masachika; Suzuki, Masato; Morita, Yuzo; Kajiyama, Toshiaki; Nakamura, Kiyoshi; and Yoneda, Kenji, 4,872,532, Cl. 187-121.000.
- Uomi, Kazuhisa; Tsuji, Shinji; Sakano, Shinji; Okai, Makoto; and Chinone, Naoki, 4,873,691, Cl. 372-20.000.
- Wakasa, Fumio, 4,873,601, Cl. 361-64.000.
- Hitachi Metals, Ltd.: See—
Asanac, Masumi; and Fumio, Kimura, 4,873,540, Cl. 346-160.100.
- Hitachi Seiko Ltd.: See—
Arai, Kunio; Nishiyama, Hiromi; Aoyama, Hiroshi; and Kanaya, Yasuhiko, 4,872,787, Cl. 408-1.00R.
- Hittler, Kurt D., to Grayling Industries, Inc. Method of removing hazardous material. 4,872,252, Cl. 29-426.400.
- Hobart Corporation: See—
Noren, Tore H., 4,872,466, Cl. 134-57.00D.
- Hobbs, Andrew J.: See—
Enright, Philip G.; Hobbs, Andrew J.; and Tapping, Ronald E., 4,872,908, Cl. 75-68.00R.
- Hobbs, Frank W.; and Meek, James L., to Du Pont de Nemours & E. I., and Company. Process for regioselectively preparing phosphorylated inositols and other cyclitols. 4,873,355, Cl. 558-161.000.
- Hobot, Christopher M.: See—
Corry, Arthur J.; Hobot, Christopher M.; and Carlson, Kurt, 4,873,308, Cl. 528-75.000.
- Hobson, Russell, Jr. Split inlet for filter. 4,872,981, Cl. 210-323.200.
- Hodgetts, Michael J.: See—
Spruytenburg, Fred T.; McDonald, Charles; and Hodgetts, Michael J., 4,873,409, Cl. 219-10.55M.
- Hodogaya Chemical Co., Ltd.: See—
Kaneshiki, Toshitaka; Narukawa, Osamu; Haneda, Tadayoshi; and Endo, Toshiyuki, 4,873,383, Cl. 570-211.000.
- Hoechst Aktiengesellschaft: See—
Erdmann, Fritz; Thamm, Horst-Dieter; and Staudt, Hans-Joachim, 4,873,169, Cl. 430-192.000.
- Hahnke, Manfred; and Kuhn, Reinhard, 4,872,882, Cl. 8-638.000.
- Hammann, Peter; Grabley, Susanne; Raether, Wolfgang; Ciommer, Bernd; Kluge, Heinz; and Sachse, Burkhard, 4,873,347, Cl. 549-267.000.
- Springer, Hartmut; Kuhn, Manfred; and Buch, Holger M., 4,873,320, Cl. 534-632.000.
- Wehowsky, Frank; and Liebig, Martin, 4,873,306, Cl. 528-28.000.
- Hoechst Celanese Corporation: See—
Dhillon, Major S.; Hsieh, Shane; and Seeley, Douglas A., 4,873,174, Cl. 430-309.000.
- Goldberg, Harris A.; and Williams, Clyde C., 4,873,604, Cl. 361-104.000.
- Keene, Donna L.; and Hicks, Darrell D., 4,872,960, Cl. 204-181.700.
- Murphy, Mark A.; Smith, Brad L.; Aguilo, Adolfo; and Tau, Kwoliang D., 4,873,378, Cl. 568-867.000.
- Murphy, Mark A., 4,873,379, Cl. 568-867.000.
- Hoechst-Roussel Pharmaceuticals Inc.: See—
Shutske, Gregory M.; and Kapples, Kevin J., 4,873,234, Cl. 514-211.000.
- Tegeler, John J.; and Shoger, Kirk D., 4,873,239, Cl. 514-227.800.
- Hoesch Aktiengesellschaft: See—
Giersch, Dieter; Rickmann, Hans-Werner; and Wibbeling, Ulrich, 4,872,274, Cl. 37-64.000.
- Hoefer, Franz-Peter: See—
Kruger, Bernd-Wieland; Sasse, Klaus; Hoefer, Franz-Peter; Nentwig, Gunther; and Berhrens, Wolfgang, 4,873,252, Cl. 514-315.000.
- Hofmann, Klaus: See—
Buhler, Ulrich; Hofmann, Klaus; and Hahnke, Manfred, 4,872,883, Cl. 8-639.000.
- Hogan, Jim S. Apparatus for the treatment of waste. 4,872,954, Cl. 202-105.000.
- Hoge, Ross A., to M-A-N Ashton Inc. Folder for business forms press. 4,872,658, Cl. 270-39.000.
- Hokanson, John L.; Smeltz, Palmer D., Jr.; Yanusheski, Katherine A.; Yanusheski, Michael J.; and Young, Craig A., to American Telephone and Telegraph Company; and AT&T Bell Laboratories, AT&T Technologies Inc. Multilayer ceramic laser package. 4,873,566, Cl. 357-74.000.
- Holland, Robert J., Sr.: See—
Kemp, Preston B., Jr.; and Holland, Robert J., Sr., 4,873,148, Cl. 428-570.000.
- Holt, George G. Cap attachment to prevent protruding hair. 4,872,218, Cl. 2-171.500.
- Holtermann, Heinz; and Luven, Arno, to Technometal Gesellschaft fur Metalltechnologie mbH. Reaction vessel for processing steel. 4,872,648, Cl. 266-275.000.
- Holub, Fred F.; Abolins, Visvaldis; and Rock, John A., to General Electric Company. Flame retardant ternary blends of polyetherimide, polyphenylene ether and block copolymer of a vinyl aromatic hydrocarbon and an alkene compound. 4,873,287, Cl. 525-92.000.

- Holy, Franz; and List, Walter, to Maschininfabrik Heid Aktiengesellschaft. Workpiece positioner for chuck and center machining. 4,872,380, Cl. 82-124.000.
- Holzman, Richard W., to Falk Company, The. Air cooling of enclosed gear drives. 4,872,502, Cl. 165-39.000.
- Homan, Charles J.: See—
Rusterholz, John T.; Lahti, Archie E.; Bushard, Louis B.; Byers, Larry L.; Hamstra, James R.; and Homan, Charles J., 4,873,630, Cl. 364-200.000.
- Honda Giken Kogyo Kabushiki Kaisha: See—
Kimura, Naomasa, 4,872,350, Cl. 73-779.000.
- Kuwabara, Takasi; Yoshiji, Takeo; and Tegawa, Masao, 4,872,417, Cl. 118-411.000.
- Mieno, Toshiyuki; Nakajima, Toyohi; Okada, Yasushi; and Oono, Nobuyuki, 4,873,642, Cl. 364-431.060.
- Minagawa, Takehiro; Stou, Toshio; Miyata, Masao; Nemoto, Kenji; and Uchida, Kuninobu, 4,872,793, Cl. 409-244.000.
- Morota, Makie; and Fukuda, Junichi, 4,873,452, Cl. 307-10.100.
- Sato, Makoto; Shiraiishi, Shuji; and Muto, Tetsuji, 4,873,639, Cl. 364-426.020.
- Sekine, Noboru; Aoki, Takashi; and Terayama, Satoshi, 4,872,540, Cl. 192-0.076.
- Shiraiishi, Shuji; and Nishihara, Takashi, 4,873,638, Cl. 364-426.010.
- Wakamori, Takehisa; Ogawa, Takashi; Ito, Ryoji; and Shimanaka, Chikafumi, 4,872,257, Cl. 29-701.000.
- Honda, Hidemasa: See—
Yamada, Yasuhiro; Imamura, Takeshi; Honda, Hidemasa; Fujii, Masaki; and Minohata, Masanori, 4,873,071, Cl. 423-448.000.
- Honda Motor Co., Ltd.: See—
Ishima, Tsutomu; and Sasaki, Kihiko, 4,872,842, Cl. 439-15.000.
- Honda, Sueaki; Hayashi, Mitsuji; Niwa, Takashi; Hayakawa, Akihiko; and Bingo, Hideyuki, to Omron Tateisi Electronics Co. Push-button switch with plunger and switching mechanism. 4,873,402, Cl. 200-283.000.
- Honda, Toshio: See—
Yoshikawa, Masato; Fukuura, Yukio; Akiyama, Setsuo; Nakamura, Makoto; Naito, Kazuo; and Honda, Toshio, 4,872,932, Cl. 156-151.000.
- Hondo, Masao: See—
Kubo, Yoshimasa; Hondo, Masao; Tanaka, Masashi; and Asahi, Akihiko, 4,873,195, Cl. 435-254.000.
- Honeywell Inc.: See—
Grald, Eric W.; and MacArthur, J. Ward, 4,873,649, Cl. 364-505.000.
- Honma, Toshio: See—
Suzuki, Yasumichi; Ikeda, Yoshinori; Katoh, Koichi; Ohnishi, Tetsuya; Kadowaki, Toshihiro; and Honma, Toshio, 4,873,570, Cl. 358-80.000.
- Hoover Universal, Inc.: See—
Meyers, Marvin L., 4,873,043, Cl. 264-237.000.
- Hoppe, Peter C.: See—
Wagner, Thomas E.; and Hoppe, Peter C., 4,873,191, Cl. 435-172.300.
- Hori, Kazuto: See—
Tada, Tomio; Hirobe, Junichi; Takamatsu, Junichi; Hori, Kazuto; and Aikawa, Yukihiko, 4,873,549, Cl. 355-206.000.
- Hori, Ryoichi; Itoh, Kiyoo; Kitsukawa, Goro; Kawajiri, Yoshiaki; Watanabe, Takao; and Kawahara, Takayuki, to Hitachi, Ltd. Driver circuit having a current mirror circuit. 4,873,673, Cl. 365-230.060.
- Hornba, Ltd.: See—
Kotani, Haruo; and Tomita, Katsuhiko, 4,872,956, Cl. 204-1.00T.
- Kotani, Haruo; and Tomita, Katsuhiko, 4,872,966, Cl. 204-414.000.
- Horie, Hironobu: See—
Umemoto, Mitsumasa; Asano, Tamotsu; Horie, Hironobu; Takagi, Akinobu; Tamura, Nobuyasu; and Nishida, Takeshi, 4,873,373, Cl. 568-637.000.
- Horikawa, Takeshi: See—
Yasukawa, Wataru, deceased; Kiyoshige, Masanori; Horikawa, Takeshi; Okada, Tomonobu; Ochi, Tadafumi; Aoki, Yoshiaki; Higashida, Masahiko; Kawashima, Takashi; Koe, Shigeki; Ono, Hideo; Nihei, Kanta; Takasugi, Syunji; and Take, Koji, 4,872,293, Cl. 51-410.000.
- Horikoshi, Hiroyoshi: See—
Yoshioka, Takao; Kanai, Tsutomu; Aizawa, Yuichi; Horikoshi, Hiroyoshi; and Hasegawa, Kazuo, 4,873,255, Cl. 514-369.000.
- Horiuchi, Kotaro; and Suzuki, Masato, to Yamaha Hatsudoki Kabushiki Kaisha. Water powered device. 4,872,805, Cl. 415-7.000.
- Horler, Hans: See—
Merger, Franz; Fischer, Rolf; and Horler, Hans, 4,873,362, Cl. 560-238.000.
- Horn, Diane: See—
Hellstrom, Ingegerd; Brown, Joseph P.; Hellstrom, Karl E.; Horn, Diane; and Linsley, Peter, 4,873,188, Cl. 435-7.000.
- Horner, Jack L., Jr.: See—
Bohaski, Frank L.; and Horner, Jack L., Jr., 4,872,679, Cl. 273-85.00R.
- Horowitz, Abraham A.: See—
Haruvy, Yair; Katz, Moshe; and Horowitz, Abraham A., 4,872,220, Cl. 2-243.00A.
- Horton Manufacturing Co., Inc.: See—
Dayen, Leonid; and Raines, Charles D., 4,872,535, Cl. 188-170.000.
- Horvath, Gabor: See—
Szilagy, Imre; Dekany, Gyula; Frank, Judit; Horvath, Gabor; and Kulcsar, Gabor, 4,873,348, Cl. 549-271.000.
- Hoshika, Norihisa: See—
Tajima, Hatsu; Hosoi, Atsushi; Hoshika, Norihisa; Tajika, Hiroshi; and Kinoshita, Masahide, 4,873,551, Cl. 355-251.000.
- Hosoi, Akio: See—
Kaga, Koichi; Hosoi, Akio; and Yamaguchi, Takao, 4,872,364, Cl. 74-484.00H.
- Hosoi, Atsushi: See—
Tajima, Hatsu; Hosoi, Atsushi; Hoshika, Norihisa; Tajika, Hiroshi; and Kinoshita, Masahide, 4,873,551, Cl. 355-251.000.
- Hosoi, Yuichi; and Takahashi, Kenji, to Fuji Photo Film Co., Ltd. Radiation image read-out apparatus using a fluorescent light guide. 4,873,438, Cl. 250-327.200.
- Houminer, Yoram: See—
Podraza, Kenneth F.; and Houminer, Yoram, 4,872,918, Cl. 131-277.000.
- Howard, Albert, to Shanrock, Clay, a part interest. Apparatus for forming a columnar reinforcement in a concrete wall panel. 4,872,823, Cl. 425-64.000.
- Howard, Ronald A., to Union Carbide Corporation. High purity, high temperature pipe thread sealant paste. 4,872,914, Cl. 106-285.000.
- Howe, Charles R.; Southwick, Everett W.; and Cox, Richard H., to Philip Morris Incorporated. Sclarai alkyl ethers and smoking compositions containing a sclarai alkyl ether flavorant. 4,872,917, Cl. 131-275.000.
- Hoye, Robert S.; and Roach, Theodore H., to Microcube Corporation. Proportional control with a joystick device for inputting computer variables. 4,872,672, Cl. 273-1.00E.
- Hoyle, David C.: See—
Wignall, Albert H.; and Hoyle, David C., 4,872,526, Cl. 181-102.000.
- Hsiao, Jane: See—
Fishman, Jack; Arnold, John; Sherman, Fred; and Hsiao, Jane, 4,873,076, Cl. 424-10.000.
- Hsieh, Kun-Chih; Chow, Jien-Hung; and Chen, Hsin-Chien. Compound device for punching and binding. 4,872,796, Cl. 412-16.000.
- Hsieh, Martin Y., to GTE Products Corporation. Sialon containing high content of alpha prime phase. 4,873,210, Cl. 501-98.000.
- Hsieh, Shane: See—
Dhillon, Major S.; Hsieh, Shane; and Seeley, Douglas A., 4,873,174, Cl. 430-309.000.
- Hubbard, Vance M.; and Brunson, Welton K., to Tecno, Inc. Telemetry pouch with expansible chest strap. 4,872,599, Cl. 224-208.000.
- Hubby, Laurence M., Jr., to Hewlett-Packard Company. Flat panel display with integrated digitizing tablet. 4,873,398, Cl. 178-18.000.
- Hubert, Peter: See—
Kopsch, Reiner; Gosswein, Claus F.; Lutz, Henning; Ball, Michael; and Hubert, Peter, 4,872,987, Cl. 210-635.000.
- Hucul, Daniel E.; and Matheson, Ronald R. Mastic adhesive fixture. 4,872,613, Cl. 239-280.000.
- Huebner, Fritz, to Plascor, Inc. Modular heat exchanger housing. 4,872,504, Cl. 165-54.000.
- Huff, Eugene G.: See—
Archer, Gary D.; Huff, Eugene G.; Madrid, Miguel T., Jr.; and Yoshii, Akio, 4,873,625, Cl. 364-200.000.
- Hufford, Charles D.; and Clark, Alice M., to University of Mississippi. The antimicrobial compound and compositions particularly effective against candida albicans. 4,873,250, Cl. 514-290.000.
- Hughes Aircraft Company: See—
Klatt, Robert W., 4,873,442, Cl. 250-334.000.
- Hughes, Leslie R.; Oldfield, John; and Tucker, Howard, to Imperial Chemical Industries PLC. Alkene, alkyne or cycloalkylene derivatives. 4,873,329, Cl. 544-265.000.
- Huls Aktiengesellschaft: See—
Bartmann, Martin; and Ikeda, Naoki, 4,873,310, Cl. 528-208.000.
- Hunka, John F.: See—
Barber, Thomas D.; Chandler, Richard N.; and Hunka, John F., 4,873,488, Cl. 324-339.000.
- Hunt, Rowland G., to STC PLC. Method of making bipolar integrated circuits. 4,873,199, Cl. 437-31.000.
- Hunter Douglas Inc.: See—
Anderson, Richard N., 4,872,499, Cl. 160-168.100.
- Hunter, Kevin D.; Durst, Robert T., Jr.; and Pastor, Jose, to Pitney Bowes, Inc. Secure postage dispensing system. 4,873,645, Cl. 364-479.000.
- Hunter, Robert L.; and Duncan, Alexander, to Emory University. Fibrinolytic composition. 4,873,083, Cl. 424-83.000.
- Huston, Rodney L.: See—
Konecny, James W.; Huston, Rodney L.; and Vyse, Gerrard N., 4,872,710, Cl. 285-81.000.
- Hutcheson, Jerry D.: See—
Hammett, Roy; Hutcheson, Jerry D.; and Avedon, Raymond B., 4,872,595, Cl. 222-209.000.
- Hutchings, Richard S., to Drackett Company, The. Aqueous alkali metal halogenite compositions containing a colorant stabilized by ammonium hydroxide. 4,873,013, Cl. 252-102.000.
- Huthwohl, Georg: See—
Lepperhoff, Gerhard; and Huthwohl, Georg, 4,872,889, Cl. 55-267.000.
- Hutta, Joseph J., to United States of America, Air Force. Method for rapid preparation of halide glasses. 4,872,894, Cl. 65-3.110.
- Hvezda, Jaroslav M.: See—
Kahn, David A.; Pacey, Grant K.; Hvezda, Jaroslav M.; and Dalglish, Jack F., 4,872,739, Cl. 350-96.160.
- Hwang, Ned H. C., to Carbon Implants, Inc. Prosthetic heart valve. 4,872,875, Cl. 623-2.000.

- Hwang, Sang Yo: See—
Jung, Il Nam; Hwang, Sang Yo; and Lee, Chung Suk, 4,873,011, Cl. 252-75.000.
- Hyde, Jeffrey R., to Morton Thiokol, Inc. Extrusion lubricant comprising a hydrocarbon wax, fatty acid salt and an organic mercaptan. 4,873,005, Cl. 252-35.000.
- Hydranautics Corporation: See—
Tomaschke, John E., 4,872,984, Cl. 210-500.380.
- Hyman Products, Inc.: See—
Hsu, Victor C., 4,872,854, Cl. 439-577.000.
- Hyodo, Kenji; Kozuka, Hiroshi; and MacDiarmid, Alan G., to Mitsubishi Denki Kabushiki Kaisha. Hetero-junction device. 4,873,556, Cl. 357-8.000.
- I.S.F. Società Per Azioni: See—
Farina, Carlo; Pinza, Mario; Cerri, Alberto; and Parravicini, Francesco, 4,873,328, Cl. 544-239.000.
- Ibamoto, Masahiko: See—
Taketai, Noriaki; Asano, Hideki; Endo, Akira; Abe, Tomiya; Ibamoto, Masahiko; Mukai, Junji; Tanno, Seikichi; Eguchi, Shuji; and Shimura, Isasato, 4,873,030, Cl. 264-1.500.
- Ibrahim, Nader, to Beecham Inc. Liquid detergent fabric conditioning compositions. 4,873,002, Cl. 252-8.800.
- Ichida, Kozaburo: See—
Kawasaki, Yoshiki; Hioka, Yoshihiro; Ohno, Yuichi; Ichida, Kozaburo; Yamaguchi, Susumu; Sudo, Michitaka; and Chikazawa, Bunichiro, 4,872,245, Cl. 29-81.00A.
- Ichijima, Seiji: See—
Abe, Akira; Mihayashi, Keiji; and Ichijima, Seiji, 4,873,179, Cl. 430-382.000.
- Ichinari, Joji: See—
Okabe, Yoshimi; Iwamoto, Keiichi; Torichigai, Masaaki; Kaneko, Shozo; Ichinari, Joji; and Koizumi, Kiyoshi, 4,872,347, Cl. 73-634.000.
- ICI Americas Inc.: See—
Trainor, Diane A., 4,873,221, Cl. 514-18.000.
- Ida, Masatoshi: See—
Katoh, Akira; Ida, Masatoshi; Yunoki, Yutaka; Harada, Hisayuki; Inoue, Manabu; and Fukuda, Yoshio, 4,873,580, Cl. 358-335.000.
- Idaho Research Foundation: See—
Maki, Gary K.; Cameron, Kelly B.; and Owsley, Patrick A., 4,873,688, Cl. 371-37.100.
- Idc, Allan R. Vessel to dock cargo transfer apparatus. 4,872,798, Cl. 414-141.300.
- Idel, Karsten-Josef: See—
Berg, Klaus; Idel, Karsten-Josef; and Grigo, Ulrich, 4,873,314, Cl. 528-487.000.
- Idigkeit, Werner: See—
Rohner, Gerhard; Idigkeit, Werner; and Kurr, Klaus, 4,872,652, Cl. 267-140.100.
- Ido, Noriyuki: See—
Takagi, Kozi; Ido, Noriyuki; Ohno, Sadayuki; Suzuki, Hideaki; Inoue, Yoshiaki; and Nomura, Yoshihisa, 4,872,730, Cl. 303-92.000.
- Ignatiev, Alexandr A.: See—
Arbeniev, Alexandr S.; Ignatiev, Alexandr A.; Zhilin, Vitaly A.; Melnikov, Alexandr S.; and Tomskikh, Sergei F., 4,872,760, Cl. 366-7.000.
- Igota, Shoji: See—
Sasaki, Hitoshi; and Igota, Shoji, 4,872,590, Cl. 220-457.000.
- Iha, Kiyoshi: See—
Ferguson, Edward H.; and Iha, Kiyoshi, 4,872,239, Cl. 16-64.000.
- Iida, Tetsuya, to Kabushiki Kaisha Toshiba. Compact R segment D/A converter. 4,873,525, Cl. 341-145.000.
- Iida, Toshikatsu; Fujiwara, Takayoshi; and Sone, Yoshinori, to Kabushiki Kaisha Toshiba. Axial flow fluid compressor with angled blade. 4,872,820, Cl. 418-220.000.
- Iimura, Yoshio; and Nagahara, Kazuyuki, to Hitachi Koki Company, Ltd. Battery charger. 4,873,479, Cl. 320-2.000.
- Iizuka, Nobuyuki; Kumata, Kazuhiko; and Kuroda, Michio, to Hitachi, Ltd. Gas turbine combustion apparatus. 4,872,312, Cl. 60-760.000.
- Iizuka, Yo: See—
Satake, Yoshikatsu; Iizuka, Yo; Kouyama, Toshitaka; Katto, Takayuki; and Shiiki, Zenya, 4,873,283, Cl. 524-520.000.
- Ikada, Junji; and Mano, Eiko, to Daichi Seiyaku Co., Ltd. 3',5'-Camp derivatives for treatment of certain types of skin ulcers. 4,873,227, Cl. 514-47.000.
- Ikebuchi, Iwao; Nakano, Mamoru; Fuse, Kazuo; and Ganze, Akira, to Kubota Ltd. Cyclone classifier. 4,872,973, Cl. 209-144.000.
- Ikeda, Masakazu: See—
Yui, Hiroshi; Okamura, Michiya; Ikeda, Masakazu; and Matsuo, Norio, 4,873,282, Cl. 524-496.000.
- Ikeda, Masami: See—
Komuro, Hirokazu; and Ikeda, Masami, 4,873,622, Cl. 346-140.00R.
- Ikeda, Naoki: See—
Bartmann, Martin; and Ikeda, Naoki, 4,873,310, Cl. 528-208.000.
- Ikeda, Yoshiaki: See—
Fujita, Koharoh; Wachi, Toshio; and Ikeda, Yoshiaki, 4,873,351, Cl. 556-76.000.
- Ikeda, Yoshinori: See—
Suzuki, Yasumichi; Ikeda, Yoshinori; Katoh, Koichi; Ohnishi, Tetsuya; Kadowaki, Toshihiro; and Honma, Toshio, 4,873,570, Cl. 358-80.000.
- Ikegami, Akira: See—
Ogawa, Toshio; Fujii, Mituru; Asai, Tadamihi; Ikegami, Akira; Ohtsu, Hiroshi; and Ato, Kazuhiko, 4,873,022, Cl. 428-209.000.
- Ikuno, Yuji: See—
Miyazaki, Akihiko; Nonami, Tetsuo; and Ikuno, Yuji, 4,873,572, Cl. 358-98.000.
- Ikuta, Akio: See—
Hirayama, Shigemitsu; Akashi, Takamichi; Ikuta, Akio; Sasaki, Isao; and Fukuda, Hiroshi, 4,872,974, Cl. 210-90.000.
- Iles, Lawrence F.: See—
Goplen, Gary D.; and Iles, Lawrence F., 4,872,528, Cl. 181-228.000.
- Im, Jang-hi: See—
Chau, C. C.; Im, Jang-hi; Raspor, Otto C.; and Tung, Lu H., 4,873,037, Cl. 264-49.000.
- Image Business Systems Corporation: See—
Sarna, David E. Y.; and Mailick, Daniel, 4,873,426, Cl. 235-462.000.
- Imahashi, Issei, to Tokyo Electron Limited. Wafer transport apparatus for ion implantation apparatus. 4,873,447, Cl. 250-492.200.
- Imai, Katsuhiko, to Kawatetsu Kenzai Kogyo Kabushiki Kaisha. Joint device of structure member. 4,872,779, Cl. 403-171.000.
- Imai, Masaru: See—
Yamana, Keiichi; Imai, Masaru; and Ohtsuka, Shuichi, 4,873,545, Cl. 355-256.000.
- Imai, Minoru: See—
Okada, Takeji; Sawade, Minoru; Imai, Minoru; and Tachibana, Daisuke, 4,873,145, Cl. 428-407.000.
- Imamura, Takeshi: See—
Yamada, Yasuhiro; Imamura, Takeshi; Honda, Hidemasa; Fujii, Masaki; and Minohata, Masanori, 4,873,071, Cl. 423-448.000.
- Imperial Chemical Industries plc: See—
Hargreaves, Rodney B.; McLoughlin, Bernard J.; and Mills, Stuart D., 4,873,254, Cl. 514-356.000.
- Hughes, Leslie R.; Oldfield, John; and Tucker, Howard, 4,873,329, Cl. 544-265.000.
- Krause, Janusz J. H.; Smith, Peter J.; and Woolhouse, Robin A., 4,873,046, Cl. 264-288.400.
- Inaba, Hiromi: See—
Tobita, Toshimitsu; Inaba, Hiromi; Yamazaki, Masachika; Suzuki, Masato; Morita, Yuzo; Kajiyama, Toshiki; Nakamura, Kiyoshi; and Yoneda, Kenji, 4,872,532, Cl. 187-121.000.
- Inaba, Masakatsu, to Sharp Kabushiki Kaisha. Variable pressure controls of fixing device in electrophotographic copying machine. 4,873,553, Cl. 355-295.000.
- Inazawa, Yoshizumi; Yamada, Masaki; Ishibashi, Hiroshi; and Ozaki, Shinya, to Sony Corporation. Data recorder and method. 4,873,589, Cl. 360-53.000.
- Index-Werke Comm.-Ges. Hahn & Tessky: See—
Schleich, Gunter, 4,872,244, Cl. 29-40.000.
- Indianapolis Center for Advanced Research: See—
Kelly-Fry, Elizabeth; and Morris, Steven T., 4,872,346, Cl. 73-627.000.
- Ingersoll-Rand Company: See—
Benson, Dan T., 4,872,975, Cl. 210-99.000.
- Myers, Terrance L., 4,872,615, Cl. 239-587.000.
- Innovex, Inc.: See—
Drits, Vladimir; and Tselesin, Naum, 4,873,605, Cl. 361-143.000.
- Inoue, Kazutaka; Sato, Toshihiro; and Kobayashi, Masao, to Mitsubishi Rayon Company, Ltd. Process for producing isobutylene. 4,873,391, Cl. 585-639.000.
- Inoue, Manabu: See—
Katoh, Akira; Ida, Masatoshi; Yunoki, Yutaka; Harada, Hisayuki; Inoue, Manabu; and Fukuda, Yoshio, 4,873,580, Cl. 358-335.000.
- Tanaka, Yoshihiro; Tsuji, Sadafusa; Hata, Yoshiaki; Inoue, Manabu; Ootsuka, Hiroshi; Iwata, Michihiro; Ishito, Fumiaki; and Hayama, Koh, 4,873,544, Cl. 354-457.000.
- Inoue, Nobuaki: See—
Sasaoka, Senzo; Yoshida, Tetsuo; and Inoue, Nobuaki, 4,873,173, Cl. 430-964.000.
- Inoue, Satoru: See—
Katoh, Tsuguhiko; Maeda, Kiyoto; Shiroshita, Masao; Yamashita, Norihisa; Sanemitsu, Yuzuru; and Inoue, Satoru, 4,873,248, Cl. 514-269.000.
- Inoue, Yasuhiko: See—
Miyazaki, Wasei; and Inoue, Yasuhiko, 4,873,261, Cl. 514-462.000.
- Inoue, Yoshiaki: See—
Takagi, Kozi; Ido, Noriyuki; Ohno, Sadayuki; Suzuki, Hideaki; Inoue, Yoshiaki; and Nomura, Yoshihisa, 4,872,730, Cl. 303-92.000.
- Intermedics, Inc.: See—
Pless, Benjamin D.; and Sweeney, Michael B., 4,872,459, Cl. 128-419.0PG.
- International Business Machines Corporation: See—
Archer, Gary D.; Huff, Eugene G.; Madrid, Miguel T., Jr.; and Yoshii, Akio, 4,873,625, Cl. 364-200.000.
- Babuka, Robert; and Petrozello, James R., 4,872,851, Cl. 439-267.000.
- Baratz, Alan E.; Clarke, Kathryn E.; Pollard, Melinda R.; Pozefsky, Diane P.; Rafalow, Lee M.; Siddall, William E.; and Gray, James P., 4,873,517, Cl. 340-825.030.
- Breu, Wendy W., 4,873,687, Cl. 371-8.200.
- Canestaro, Michael J.; and Summa, William J., 4,873,123, Cl. 427-96.000.
- Critchlow, Dale L.; DeBrosse, John K.; Mohler, Rick L.; Noble, Wendell P., Jr.; and Parries, Paul C., 4,873,205, Cl. 437-200.000.
- Frisch, Rudolf A.; and Zamora, Antonio, 4,873,634, Cl. 364-419.000.
- Juliana, Anthony; Leung, Wai C.; Pan, Victor T.; Rosen, Hal J.; and Strand, Timothy C., 4,873,430, Cl. 250-225.000.

- Knepper, James A., 4,872,661, Cl. 271-273.000.
- Nakagawa, Banri; and Nojima, Katsuyuki, 4,873,514, Cl. 340-726.000.
- Stroms, Karl F., 4,872,381, Cl. 83-76.100.
- Sueoka, Kuniaki, 4,873,599, Cl. 360-126.000.
- International Contamination Control Industries Pty Ltd.: See—
Cacioli, Paul; and Snow, Roger, 4,873,082, Cl. 424-83.000.
- International Lubricants, Inc.: See—
Landis, Phillip S.; and Erickson, Frank, 4,873,008, Cl. 252-46.600.
- International Medical Products, Inc.: See—
Shah, Nyan S., 4,872,483, Cl. 137-557.000.
- Iowa State University Research Foundation, Inc.: See—
Parks, Gerald A., 4,873,405, Cl. 200-547.000.
- Ireland, John A., to Bendix Electronics Limited. Electromagnetic damped inertia sensor. 4,873,401, Cl. 200-61.45M.
- Irinatsu, Yuuichi: See—
Tanaka, Yukiaka; Omura, Hisao; Irinatsu, Yuuichi; Kobayashi, Takashi; and Noguchi, Aiko, 4,873,109, Cl. 426-607.000.
- Irwin, George F.; Smelters, Paul J.; Robertson, David J.; and Maginley, Ronald J., to Northern Telecom Limited. Digital key telephone system. 4,873,682, Cl. 370-58.100.
- Isaksen, Robert A.: See—
Jones, Wallace R.; and Isaksen, Robert A., 4,873,132, Cl. 428-80.000.
- Isao KAI: See—
Miyawaki, Yoshinori, 4,872,461, Cl. 128-681.000.
- Isayama, Tomoaki: See—
Shinoda, Kenichi; Iwao, Tomoyoshi; Isayama, Tomoaki; and Higo, Yuichi, 4,873,149, Cl. 428-609.000.
- Ishibashi, Hiroshi: See—
Inazawa, Yoshizumi; Yamada, Masaki; Ishibashi, Hiroshi; and Ozaki, Shinya, 4,873,589, Cl. 360-53.000.
- Ishibashi, Masaru: See—
Satake, Tokuki; Sakai, Hiroshi; Nakatani, Hayami; Nakamori, Masaharu; and Ishibashi, Masaru, 4,873,156, Cl. 429-31.000.
- Ishida, Hiromi: See—
Fujii, Susumi; Ishida, Hiromi; Morioka, Masataka; Saito, Akihiro; and van der Meer, Roelof, 4,873,276, Cl. 524-153.000.
- Ishida, Noboru: See—
Akao, Shigeaki; Ishida, Noboru; and Kawamura, Mitsuyoshi, 4,872,431, Cl. 123-188.0AA.
- Ishida, Yoshihisa: See—
Ishizaka, Yoshiro; Naganuma, Hiroshi; Sato, Kenji; Kishi, Yuji; Ishida, Yoshihisa; and Goto, Kiyokazu, 4,872,320, Cl. 62-255.000.
- Ishigami, Hiroyuki: See—
Masuda, Satoru; and Ishigami, Hiroyuki, 4,872,548, Cl. 198-859.000.
- Ishiguro, Kuniaki: See—
Ishikawa, Takuma; Maruyama, Tadashi; Johdai, Akiyoshi; Ishiguro, Kuniaki; and Matsui, Toshio, 4,872,662, Cl. 271-290.000.
- Ishiguro, Shoji; Hirano, Shigeo; Shishido, Tadao; and Miyake, Akio, to Fuji Photo Film Co., Ltd. Process for forming a superhigh contrast negative image. 4,873,172, Cl. 430-264.000.
- Ishihara, Koji: See—
Koshihara, Toshio; Misawa, Rokuro; Sagawa, Yuzo; Takehara, Kimio; Matoba, Yuji; and Ishihara, Koji, 4,872,762, Cl. 374-5.000.
- Ishii, Fumio: See—
Tachibana, Kimie; Kaneko, Yutaka; and Ishii, Fumio, 4,873,183, Cl. 430-550.000.
- Ishii, Kazuhiro, to Mitsubishi Denki Kabushiki Kaisha. Circuit breaker. 4,873,603, Cl. 361-96.000.
- Ishii, Takaaki; and Kuge, Toru, to Kabushiki Kaisha Toshiba. Speech recognition system with an accurate recognition function. 4,873,714, Cl. 379-88.000.
- Ishikawa, Kazushige; Mochizuki, Kenji; Maehara, Toshihiro; and Hagiri, Masaharu, to Pioneer Electronic Corporation. Method and apparatus for reproducing audio and video data from a disk. 4,873,586, Cl. 358-342.000.
- Ishikawa, Nobuo: See—
Sakamoto, Kenji; Ishikawa, Nobuo; and Hayakawa, Motomu, 4,873,677, Cl. 368-204.000.
- Ishikawa, Takuma; Maruyama, Tadashi; Johdai, Akiyoshi; Ishiguro, Kuniaki; and Matsui, Toshio, to Minolta Camera Kabushiki Kaisha. Sorting apparatus having sorter connectable to another sorter. 4,872,662, Cl. 271-290.000.
- Ishima, Tsutomu; and Sasaki, Kunihiro, to Alps Electric Co., Ltd.; and Honda Motor Co., Ltd. Electric connecting device. 4,872,842, Cl. 439-15.000.
- Ishito, Fumiaki: See—
Tanaka, Yoshihiro; Tsuji, Sadafusa; Hata, Yoshiaki; Inoue, Manabu; Ootsuka, Hiroshi; Iwata, Michihiro; Ishito, Fumiaki; and Hayama, Koh, 4,873,544, Cl. 354-457.000.
- Ishiwata, Tetsuo; and Taguchi, Katsuyuki, to Matsushita Electric Industrial Co., Ltd. Magnetic recording and reproducing apparatus. 4,873,590, Cl. 360-73.140.
- Ishiyama, Tatsuro: See—
Tabata, Toshiyuki; Ishiyama, Tatsuro; Ushijima, Takao; and Dan, Takuya, 4,872,650, Cl. 267-140.100.
- Ishizaka, Yoshiro; Naganuma, Hiroshi; Sato, Kenji; Kishi, Yuji; Ishida, Yoshihisa; and Goto, Kiyokazu, to Sanyo Electric Co., Ltd. Refrigeration showcase. 4,872,320, Cl. 62-255.000.
- Isoai, Masaru: See—
Takedoi, A.; Sushii; Kondo, Hiroyuki; Isoai, Masaru; Yoshinaga, Yoshitaki; Harada, Toshiharu; Okuda, Yosiro; Sumita, Hiroshi; Kawasaki, Hirofumi; and Mori, Kohji, 4,873,010, Cl. 252-62.590.
- Isono, Keinosuke: See—
Suzuki, Tatsuo; and Isono, Keinosuke, 4,872,553, Cl. 206-524.400.
- Issalene, Robert; and Lantrua, Jean-Francois. Surgical or dental instrument and cannulae for aspirating, cleaning, drying and illuminating. 4,872,837, Cl. 433-29.000.
- Isuzu Motors Limited: See—
Sekiyama, Shigeo, 4,872,434, Cl. 123-320.000.
- Igenshorst, Dieter: See—
Moser, Manfred; Igenshorst, Dieter; and Kutz, Johannes, 4,872,325, Cl. 68-200.000.
- Ito, Hayami: See—
Tsubakimoto, Tsuneo; Ito, Hayami; Tsumi, Shuhei; Kajibata, Yoshihiro; Takao, Shoichi; Goto, Takakiyo; Nakaishi, Akio; Rakutani, Kenji; Tamura, Toshio; and Kobayashi, Hiroya, 4,872,885, Cl. 44-51.000.
- Ito, Masazumi, to Minolta Camera Kabushiki Kaisha. Recording apparatus with optical fiber cable interconnecting microcomputers. 4,873,431, Cl. 250-227.000.
- Ito, Mitsuhiro: See—
Kato, Toshio; Uotani, Kunihiro; and Ito, Mitsuhiro, 4,872,659, Cl. 271-9.000.
- Ito, Ryoji: See—
Wakamori, Takehisa; Ogawa, Takashi; Ito, Ryoji; and Shimanaka, Chikafumi, 4,872,257, Cl. 29-701.000.
- Ito, Takayasu: See—
Furuhata, Takashi; Owashi, Hitoaki; Ito, Takayasu; and Hamaguchi, Masakazu, 4,873,582, Cl. 358-310.000.
- Ito, Tetsuo: See—
Kinoshita, Mitsuo; Ito, Tetsuo; Mikawa, Hiroji; and Chino, Koichi, 4,872,948, Cl. 159-6.200.
- Ito, Toshiyasu: See—
Fujisawa, Norio; Sakamoto, Toshishige; Ito, Toshiyasu; and Shimada, Junichi, 4,872,745, Cl. 350-357.000.
- Itoh, Junichi: See—
Matsuzaki, Minoru; Itoh, Junichi; and Watanabe, Youji, 4,873,543, Cl. 354-402.000.
- Itoh, Kiyonobu: See—
Nakamura, Kazuharu; Mito, Yoshio; Nakanishi, Yutaka; Yamada, Toshihiko; Nakamura, Kenji; and Itoh, Kiyonobu, 4,872,829, Cl. 431-33.000.
- Itoh, Kiyoo: See—
Hori, Ryoichi; Itoh, Kiyoo; Kitsukawa, Goro; Kawajiri, Yoshiki; Watanabe, Takao; and Kawahara, Takayuki, 4,873,673, Cl. 365-230.060.
- Ito, Takeo; Matsuda, Hidemi; Yoshizako, Mamoru; and Yagi, Osamu, to Kabushiki Kaisha Toshiba; and Tama Chemicals Co., Ltd. Method of manufacturing cathode-ray tube. 4,873,120, Cl. 427-64.000.
- It's A Peach, Inc.: See—
Rearwin, Earle W.; and Rearwin, Gayle L., 4,872,324, Cl. 66-172.00E.
- ITT Standard of ITT Corporation: See—
Fuerschbach, Raymond F.; Creighton, Timothy P.; and Fijas, David F., 4,872,578, Cl. 165-167.000.
- Itemann, Peter; and Eisenbarth, Philipp, to BASF Aktiengesellschaft. Heat-curable molding compositions. 4,873,284, Cl. 524-548.000.
- Iversen, Arthur H. Compact high power modular RF semi-conductor systems packaging. 4,873,613, Cl. 361-385.000.
- Ivex Corporation: See—
Blanton, Keith A.; Finlay, William M.; Sinclair, Michael J.; and Tumblin, John E., 4,873,585, Cl. 358-335.000.
- Iwamoto, Keiichi: See—
Okabe, Yoshimi; Iwamoto, Keiichi; Torichigai, Masaaki; Kaneko, Shozo; Ichinari, Joji; and Koizumi, Kiyoshi, 4,872,347, Cl. 73-634.000.
- Iwamoto, Takashi: See—
Kurakake, Mitsuo; Sakamoto, Keiji; and Iwamoto, Takashi, 4,873,476, Cl. 318-568.220.
- Iwao, Tomoyoshi: See—
Shinoda, Kenichi; Iwao, Tomoyoshi; Isayama, Tomoaki; and Higo, Yuichi, 4,873,149, Cl. 428-609.000.
- Iwasaki, Masahiro: See—
Nakagawa, Kazushige; Koh, Makoto; Sera, Kyoji; Ozeki, Tadashi; and Iwasaki, Masahiro, 4,872,394, Cl. 91-506.000.
- Iwasaki, Rumi: See—
Kono, Koichi; Okamoto, Kenkichi; Iwasaki, Rumi; and Sawada, Shuichi, 4,873,034, Cl. 264-41.000.
- Iwase, Sumio: See—
Yamanouchi, Kiyoshi; and Iwase, Sumio, 4,873,713, Cl. 379-67.000.
- Iwase, Yoshiki; and Kobayashi, Yasuhito, to Fuji Photo Film Co., Ltd. Field/frame conversion circuit. 4,873,581, Cl. 358-310.000.
- Iwata, Michihiro: See—
Tanaka, Yoshihiro; Tsuji, Sadafusa; Hata, Yoshiaki; Inoue, Manabu; Ootsuka, Hiroshi; Iwata, Michihiro; Ishito, Fumiaki; and Hayama, Koh, 4,873,544, Cl. 354-457.000.
- J. C. Parry & Sons, Inc.: See—
Parry, Daniel J.; and Parry, John C., 4,872,623, Cl. 242-96.000.
- J. R. Short Milling Company: See—
Short, Allen T.; and Wilkinson, Raleigh J., 4,873,110, Cl. 426-621.000.
- Jacks, Terry C.: See—
Edmundson, Robert J.; and Jacks, Terry C., 4,873,078, Cl. 424-64.000.
- Jackson, Davis G. Solid waste retriever. 4,872,977, Cl. 210-173.000.
- Jackson, Lauren, to Chicopee. Fused laminated fabric and panty liner including same. 4,872,870, Cl. 604-366.000.

Jackson, Richard A.; Abt, John; and Barnett, Ronnie D., to Grass Valley Group, Inc., The. Digital video effects apparatus. 4,873,568, Cl. 358-22.000.

Jacobs, Wayne, to Johnson Matthey Inc. Solder paste. 4,872,928, Cl. 148-24.000.

Jaeger, Helmut: See—
Schulz, Guenther; Druschke, Wolfgang; and Jaeger, Helmut, 4,873,023, Cl. 260-404.800.

Jaenichen, Paul N., Sr., to United States of America, Navy. Phase control mechanism for wave energy conversion. 4,872,309, Cl. 60-497.000.

Jager, Willem W.: See—
Sie, Swan T.; Drent, Eit; and Jager, Willem W., 4,873,267, Cl. 518-700.000.

Jahan, Muhammad S.: See—
Cooke, D. Wayne; and Jahan, Muhammad S., 4,873,444, Cl. 250-337.000.

Jakfalvi, Elemer: See—
Petocz, Lujza; Simonyi, Istvan; Beck, Ivan; Gigler, Gabor; Fekete, Marton; Kiszely, Eniko; Mandi, Attila; Gorgenyi, Frigyes; Dietz, Andras; Sumeg, nee Zukovics, Katalin; and Jakfalvi, Elemer, 4,873,249, Cl. 514-275.000.

Jakob, Paul G. Method and apparatus for removing organic liquids from water. 4,872,994, Cl. 210-691.000.

Jakob, Wolfgang; Alewelt, Wolfgang; and Tresper, Erhard, to Bayer Aktiengesellschaft. Process for the preparation of N-alkylated caprolactams. 4,873,326, Cl. 540-538.000.

Jalkio, Jeffrey A.; and Case, Steven K., to CyberOptics Corporation. Use of prisms to obtain anamorphic magnification. 4,872,747, Cl. 350-421.000.

James River-Norwalk, Inc.: See—
Allan, John L.; Boettcher, Jeffery J.; Gaylord, Norman G.; and Katz, Leon, 4,873,273, Cl. 523-407.000.

Jankower, Laura J.; and Shipley, Larry W., to Advanced Polymer Systems, Inc. Controlled release formulating employing resilient microbeads. 4,873,091, Cl. 424-489.000.

Janni, Albert S., to Duro-Last Roofing, Inc. Corner pieces for single-ply polymer-coated fabric core roof membranes and the product thereby formed. 4,872,296, Cl. 52-58.000.

Jansen, Johannes J.; Mossou, Bernardus H. F.; and Poort, Hans, to Coöperatieve Verkoop- en Productievereniging van Aardappelmeele en Derivaten 'AVEBE' B.A. Process for waterproofing starch binders. 4,873,147, Cl. 428-533.000.

Japan Exlan Company Limited: See—
Kobashi, Toshiyuki; and Naka, Hideo, 4,873,352, Cl. 556-105.000.

Tanaka, Koji, 4,873,143, Cl. 428-373.000.

Jarrett, Lawrence P., to Air Products and Chemicals, Inc. Remotely controlled operator for gas cylinder valve. 4,872,482, Cl. 137-554.000.

Jarvenkylä, Jyri, to Oy Uponor AB. Method for the formation of a hole in a plastic pipe. 4,873,048, Cl. 264-504.000.

Jean-Claude, Legrand; and Gefard, Prevot, to Ferco International. Casement lock, notably of the type comprising a plurality of operating rods with resilient return means. 4,872,716, Cl. 292-336.300.

Jeco Co., Ltd.: See—
Sonoda, Hideo; Mori, Eiji; Kawase, Mitsuo; Yoneshige, Kazuhiro; Takahashi, Akira; Komiya, Hirokazu; and Tanaka, Akira, 4,872,439, Cl. 123-518.000.

Jeffers, Brian C., to Sarasota Automation Limited. Inductive loop presence detector with cross talk filter. 4,873,494, Cl. 331-65.000.

Jefferson, Chris A.: See—
McVay, David R.; Carter, Lawrence D.; Jonasky, John D.; and Jefferson, Chris A., 4,872,939, Cl. 156-354.000.

Jenkins, Dianne M.; and Pargeter, Christopher, to Alcan International Limited. Shaping anodic aluminum oxide sheet. 4,873,047, Cl. 264-322.000.

Jenkins, John W.: See—
Shutt, Eric; Altana, Andries G.; and Jenkins, John W., 4,873,388, Cl. 585-500.000.

Jenkinson, Margaret; and Dunne, John, to 501 Abbeybench Limited. Glassware grinding and/or polishing apparatus. 4,872,290, Cl. 51-109.000.

Jensen, Millard J.; and Levine, Jules D., to Texas Instruments Incorporated. Method of bonding semiconductor material to an aluminum foil. 4,872,607, Cl. 228-180.100.

Jensen, Richard E.; Nichols, Donald H.; and Hemphill, D. Gary, to Forensic Applications Corporation. Method and apparatus for the collection and preservation of fluid biological evidence. 4,873,193, Cl. 436-176.000.

Jeol Ltd.: See—
Mori, Nobufumi; Katoh, Takayuki; Oikawa, Tetsuo; Harada, Yoshiyasu; and Miyahara, Junji, 4,873,440, Cl. 250-327.200.

Jerabek, Elihu C.: See—
Foust, Donald F.; Lamby, Edward J.; Karas, Bradley R.; Dumas, William V.; and Jerabek, Elihu C., 4,873,136, Cl. 428-209.000.

Jiang, Ching-Lin; and Williams, Clark R., to Dallas Semiconductor Corporation. Dual storage cell memory including data transfer circuits. 4,873,665, Cl. 365-154.000.

JLF Designs, Inc.: See—
Fournier, James L., 4,872,538, Cl. 190-111.000.

Jochim, Michael M.; and Jones, Suzanne C., to United States of America, Agriculture. Monoclonal antibodies to bluetongue virus antigen. 4,873,189, Cl. 435-68.000.

Joh, Yasushi, to UBE Industries, Ltd. Compositions having antithrombogenic properties and blood contact medical devices using the same. 4,872,867, Cl. 604-269.000.

Johdai, Akiyoshi: See—
Ishikawa, Takuma; Maruyama, Tadashi; Johdai, Akiyoshi; Ishiguro, Kuniaki; and Matsui, Toshio, 4,872,662, Cl. 271-290.000.

John Fluke Mfg. Co., Inc.: See—
Johnson, Craig V., 4,873,705, Cl. 371-21.200.

John Wyeth & Brother Limited: See—
Crossley, Roger, 4,873,237, Cl. 514-222.800.

Johns Hopkins University, The: See—
Chen, Chung-Ho; and Chen, Sumi C., 4,873,186, Cl. 435-1.000.

Johns, Owen L., to Smith & Nephew (Latin America), Inc. Low profile ostomy device. 4,872,869, Cl. 604-342.000.

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Johnson, Craig V., to John Fluke Mfg. Co., Inc. Method of and system for high-speed, high-accuracy functional testing of memories in microprocessor-based units. 4,873,705, Cl. 371-21.200.

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Avidan, Amos A.; and Johnson, David L., 4,873,389, Cl. 585-533.000.

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Johnson, Donald S.: See—
Critton, Thomas J.; Johnson, Donald S.; Pukalo, Walter P.; and Yorio, Ralph, 4,872,369, Cl. 74-574.000.

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Wang, Patrick S., 4,873,464, Cl. 310-249.000.

Johnson, Glenn W., Jr. Knee brace having adjustable inflatable U-shaped air cell. 4,872,448, Cl. 128-80.000.

Johnson, Harold K., to Mid America Machine Corp. Bag top forming method and apparatus. 4,872,303, Cl. 53-481.000.

Johnson, Joel R.: See—
Streich, Herbert K.; Leach, Robert D.; Johnson, Joel R.; Olson, Thomas B.; and Townsend, Donald L., 4,873,422, Cl. 219-370.000.

Johnson, Lynn A.: See—
Proxmire, Deborah L.; Endres, Dan D.; Wilson, John C.; Johnson, Lynn A.; Zehner, Georgia L.; Boland, Leona G.; and Stevens, Robert A., 4,872,871, Cl. 604-394.000.

Johnson, Marion; and Hahn, Granville J., to Permian Research Corporation. Plastic closure with barrier coating. 4,872,573, Cl. 215-347.000.

Johnson Matthey Inc.: See—
Jacobs, Wayne, 4,872,928, Cl. 148-24.000.

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Shutt, Eric; Altana, Andries G.; and Jenkins, John W., 4,873,388, Cl. 585-500.000.

Johnson, Paul D.; Kubicko, Robert E.; Martone, Louis C.; and Moores, Gregory E., to Black & Decker Corporation. Carafe-operated coffee brewing system. 4,872,402, Cl. 99-280.000.

Johnson, Richard G., to Warn Industries, Inc. Winch with shut-off load limiter. 4,873,474, Cl. 318-434.000.

Johnson, Robert R.; and Orbanic, Robert S., to GTE Products Corporation. Method of making pre-formed lead-ins for an IC package. 4,872,260, Cl. 29-827.000.

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Demeter, Michael G.; Wichman, Paul E.; Endres, Linda S.; and Rohrer, Charles E., 4,872,397, Cl. 98-31.600.

Johnson, Trevor A.; and Gorscak, Sharon L., to Raycon Corporation. Method for welding galvanized material. 4,873,415, Cl. 219-121.640.

Johnson, Van P. Adjustable overhead hanger with lock pulley. 4,872,632, Cl. 248-332.000.

Joly, Jean-Louis: See—
Vaillant De Guelis, Hubert; and Joly, Jean-Louis, 4,872,357, Cl. 74-5.100.

Jonasky, John D.: See—
McVay, David R.; Carter, Lawrence D.; Jonasky, John D.; and Jefferson, Chris A., 4,872,939, Cl. 156-354.000.

Jones, Alun G.; Davison, Alan; Kronauge, James; and Abrams, Michael J., to Massachusetts Institute of Technology; and President and Fellows of Harvard College. Carboxy, carboxalkoxy and carbamile substituted isonitrile radionuclide complexes. 4,872,561, Cl. 206-569.000.

Jones, Charles: See—
Hartfeil, Guenther, 4,872,705, Cl. 283-67.000.

Jones, Gareth D.C. electric motor. 4,873,463, Cl. 310-68.000.

Jones, Gerald M.; and Nemcovsky, Rhonda L., to GTE Products Corporation. Adjustable footprint component removal tool. 4,872,259, Cl. 29-764.000.

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Jones, Jack E.; and Bulmahn, David J., to NCR Corporation. Heat sink for an electronic device. 4,872,505, Cl. 165-80.300.

Jones, James V., to PPG Industries, Inc. Dark, neutral, gray, nickel-free glass composition. 4,873,206, Cl. 501-71.000.

Jones, John I.: See—
Davis, Cecil J.; Abernathy, Joseph V.; Matthews, Robert T.; Hildenbrand, Randall C.; Simpson, Bruce; Jones, John I.; Loewen-

stein, Lee M.; and Bohlman, James G., 4,872,938, Cl. 156-345.000.

Jones, Suzanne C.: See—
Jochim, Michael M.; and Jones, Suzanne C., 4,873,189, Cl. 435-68.000.

Jones, Wallace R.; and Isaksen, Robert A., to Excello Specialty Company, The. Surface protector with expandable pocket. 4,873,132, Cl. 428-80.000.

Jorstad, Storker; and Smedby, Leif, to Fabio Fasting Biotech A/S. Device for the removal of cryoglobulins. 4,872,978, Cl. 210-181.000.

Joseph Patrick McGillis: See—
McGillis, Joseph P.; and Fly, Howard G., 4,872,668, Cl. 272-130.000.

Jugel, Alfred: See—
Schmidt, Lothar; and Jugel, Alfred, 4,873,694, Cl. 370-58.100.

Juichiro, Takada. Guide device for the drive tape of an automatic seat belt system. 4,872,602, Cl. 226-196.000.

JUKI Corporation: See—
Taguchi, Katsuhiko; and Mitsumori, Kazuya, 4,873,595, Cl. 360-99.050.

Juliana, Anthony; Leung, Wai C.; Pan, Victor T.; Rosen, Hal J.; and Strand, Timothy C., to International Business Machines Corporation. Method and apparatus for optically measuring characteristics of a thin film by directing a P-polarized beam through an integrating sphere at the brewster's angle of the film. 4,873,430, Cl. 250-225.000.

Julius Blum Gesellschaft M.B.H.: See—
Rock, Erich; and Brunner, Josef, 4,872,735, Cl. 312-342.000.

Jung, Il Nam; Hwang, Sang Yo; and Lee, Chung Suk, to Korea Advanced Institute of Science and Technology. Antifreeze corrosion inhibitor composition for aluminum engines and radiators. 4,873,011, Cl. 252-75.000.

Junge, Bodo; Richter, Bernd; Glaser, Thomas; Traber, Jorg; and Allen, George S., to Bayer Aktiengesellschaft. 8-Substituted 2-aminotetra-
lins. 4,873,262, Cl. 514-510.000.

Jurgens, Rainer, to Eastman Christensen Company. Method for transmitting downhole data in a reduced time. 4,873,522, Cl. 340-853.000.

Kabbeck-Kupijai, Detlef: See—
Scheer, Wolfgang; Fuhrmann, Hartmut; Kossmehl, Gerhard; Niemitz, Matthias; and Kabbeck-Kupijai, Detlef, 4,872,962, Cl. 204-224.000.

Kabe, Kazuyuki: See—
Hanada, Ryoji; Morikawa, Tuneo; and Kabe, Kazuyuki, 4,872,497, Cl. 152-541.000.

K.K. Chibakou Shoji: See—
Nishizono, Taiji, 4,872,463, Cl. 128-844.000.

Kabushiki Kaisha Akita: See—
Kubo, Yoshimasa; Honda, Masao; Tanaka, Masashi; and Asahi, Akihiko, 4,873,195, Cl. 435-254.000.

Kabushiki Kaisha Kobe Seiko Sho: See—
Kaji, Kichiro; Shimasaki, Katsunori; Yamamoto, Masakazu; Saiki, Kozo; Yura, Keita; Habata, Hidetsugu; Kimura, Isao; and Suzuki, Tetsuo, 4,873,070, Cl. 423-345.000.

Wakabayashi, Minoru; Murata, Hiroyuki; Sugino, Yasuo; Yamao, Masanobu; and Nishikawa, Takao, 4,872,972, Cl. 209-143.000.

Kabushiki Kaisha Nippon Coinco: See—
Hayashi, Yukichi, 4,872,541, Cl. 194-217.000.

Kabushiki Kaisha Shinsangyokaihatsu: See—
Katsuo, Suzuki, 4,873,526, Cl. 342-359.000.

Kabushiki Kaisha Toshiba: See—
Iida, Tetsuya, 4,873,525, Cl. 341-145.000.

Iida, Toshiakazu; Fujiwara, Takayoshi; and Sone, Yoshinori, 4,872,820, Cl. 418-220.000.

Ishii, Takaaki; and Kuge, Toru, 4,873,714, Cl. 379-88.000.

Itou, Takeo; Matsuda, Hidemi; Yoshizako, Mamoru; and Yagi, Osamu, 4,873,120, Cl. 427-64.000.

Kubota, Tooru; and Mori, Hiroyuki, 4,873,579, Cl. 358-471.000.

Minowa, Takehiko; and Yamamoto, Toshifumi, 4,873,536, Cl. 346-76.0PH.

Murata, Moriyo, 4,872,446, Cl. 128-6.000.

Nagata, Mitsuhiro; Hayashi, Tadashi; Hashimoto, Yoshinobu; and Nakamura, Kiyoshi, 4,873,208, Cl. 501-89.000.

Sato, Hideki; and Mizunoya, Nobuyuki, 4,873,151, Cl. 428-627.000.

Tanaka, Yasunori; and Hashimoto, Hideo, 4,873,670, Cl. 365-189.110.

Kadowaki, Koju; Sarumaru, Kohei; and Shibano, Takeshi, to Mitsubishi Petrochemical Company Limited. Process for producing acrylic acid. 4,873,368, Cl. 562-532.000.

Kadowaki, Toshihiro: See—
Suzuki, Yasumichi; Ikeda, Yoshinori; Katoh, Koichi; Ohnishi, Tetsuya; Kadowaki, Toshihiro; and Honma, Toshio, 4,873,570, Cl. 358-80.000.

Kaga, Koichi; Hosoi, Akio; and Yamaguchi, Takao, to Toyoda Gosei Co., Ltd. Steering wheel. 4,872,364, Cl. 74-484.00H.

Kaga, Toru; Kimura, Shinichiro; Kure, Tokuo; Kawamoto, Yoshifumi; and Sunami, Hideo, to Hitachi, Ltd. Method for formation of insulation film on silicon buried in trench. 4,873,203, Cl. 437-67.000.

Kaga, Toru: See—
Sunami, Hideo; Kimura, Shinichiro; and Kaga, Toru, 4,873,560, Cl. 357-23.600.

Kageyama, Hidehei; Mitsuya, Yoshihide; and Nakazato, Yoichi, to Kotobuki & Co., Ltd. Lead chuck of mechanical pencil. 4,872,776, Cl. 401-65.000.

Kahn: David A.; Pacey, Grant K.; Hvezda, Jaroslav M.; and Dalgleish, Jack F., to Northern Telecom Ltd. Optical busbar. 4,872,739, Cl. 350-96.160.

Kai, Mariko: See—
Nohira, Hiroyuki; Kamei, Masanao; Nakamura, Shinichi; Yoshinaga, Kazuo; Kai, Mariko; and Katagiri, Kazuharu, 4,873,018, Cl. 252-299.010.

Kaiser, Carl; Kruse, Lawrence I.; and Ross, Stephen T., to SmithKline Beckman Corporation. Trifluoro acetyl-cyano-aniline intermediates for dopamine- β -hydroxylase inhibitors. 4,873,357, Cl. 558-414.000.

Kaito, Noboru: See—
Nagai, Noboru; Hashimoto, Yoshisato; Tsuboike, Yoshihiko; and Kaito, Noboru, 4,872,308, Cl. 60-316.000.

Kaji, Kichiro; Shimasaki, Katsunori; Yamamoto, Masakazu; Saiki, Kozo; Yura, Keita; Habata, Hidetsugu; Kimura, Isao; and Suzuki, Tetsuo, to Kabushiki Kaisha Kobe Seiko Sho. Process for producing silicon carbide whiskers. 4,873,070, Cl. 423-345.000.

Kajibata, Yoshihiro: See—
Tsubakimoto, Tsuneo; Ito, Hayami; Tatsumi, Shuhei; Kajibata, Yoshihiro; Takao, Shoichi; Goto, Takakiyo; Nakaiishi, Akio; Rakutani, Kenji; Tamura, Toshio; and Kobayashi, Hiroya, 4,872,885, Cl. 44-51.000.

Kajikawa, Teruo; and Yoshino, Toshio, to Nippon Oil Co., Ltd. Method for manufacturing carpet tiles having excellent dimensional stability. 4,872,930, Cl. 156-72.000.

Kajikiyo, Katuji: See—
Niwa, Katuhiko; Abe, Nobuyasu; Kajikiyo, Katuji; Suzuoki, Tsutomu; Tabuti, Katumi; and Arai, Yoshifumi, 4,872,383, Cl. 83-175.000.

Kajiyama, Toshiaki: See—
Tobita, Toshimitsu; Inaba, Hiromi; Yamazaki, Masachika; Suzuki, Masato; Morita, Yuzo; Kajiyama, Toshiaki; Nakamura, Kiyoshi; and Yoneda, Kenji, 4,872,532, Cl. 187-121.000.

Kakei, Tsutomu: See—
Uesugi, Akio; Kakei, Tsutomu; and Minato, Shinichiro, 4,872,946, Cl. 156-637.000.

Kalazny, Andrzej: See—
Ensminger, Gerald H.; and Kalazny, Andrzej, 4,872,306, Cl. 59-78.000.

Kamakura, Takuro: See—
Suzuki, Tameyuki; and Kamakura, Takuro, 4,873,175, Cl. 430-311.000.

Kamano, Yoshiaki: See—
Pettit, George R.; and Kamano, Yoshiaki, 4,873,245, Cl. 514-250.000.

Kameda, Eiichi, to Nippon Mektron, Ltd. Method of producing hybrid multi-layered circuit substrate. 4,872,934, Cl. 156-250.000.

Kamei, Masanao: See—
Nohira, Hiroyuki; Kamei, Masanao; Nakamura, Shinichi; Yoshinaga, Kazuo; Kai, Mariko; and Katagiri, Kazuharu, 4,873,018, Cl. 252-299.010.

Kameyama, Toshiaki; and Kobayashi, Yuichi, to Ricoh Company, Ltd. Sheet feed device for recording apparatus. 4,872,660, Cl. 271-9.000.

Kamieniecki, Emil; Reiss, Leszek; and Goldfarb, William C., to Optical Diagnostic Systems, Inc. Nondestructive readout of a latent electrostatic image formed on an insulating material. 4,873,436, Cl. 250-315.300.

Kanada, Eiji: See—
Nishinori, Hiroshi; Saikawa, Masahiko; Takaya, Yoshikazu; and Kanada, Eiji, 4,873,170, Cl. 430-204.000.

Kanai, Tsutomu: See—
Yoshioka, Takao; Kanai, Tsutomu; Aizawa, Yuichi; Horikoshi, Hiroyoshi; and Hasegawa, Kazuo, 4,873,255, Cl. 514-369.000.

Kanai, Tsuyoshi: See—
Komatsu, Masato; Baba, Isao; Mikami, Takashi; Narukawa, Kiyotada; and Kanai, Tsuyoshi, 4,873,288, Cl. 525-194.000.

Kanamaru, Hisanobu: See—
Doi, Masayuki; Asahi, Naotatsu; Kojima, Yoshitaka; Kanamaru, Hisanobu; and Aoyama, Susumu, 4,873,150, Cl. 428-627.000.

Kanaya, Yasuhiko: See—
Arai, Kunio; Nishiyama, Hiromi; Aoyama, Hiroshi; and Kanaya, Yasuhiko, 4,872,787, Cl. 408-1.00R.

Kanagafuchi Kagaku Kogyo Kabushiki Kaisha: See—
Wachi, Shun; Arik, Yuusaku; and Oshima, Hiroshi, 4,873,384, Cl. 570-247.000.

Kanehira, Katsuyuki; Takayama, Syuichi; Amano, Atsushi; Hibino, Hiroki; Uchiyama, Naoki; and Nakada, Akio, to Olympus Optical Co., Ltd. Thermotherapy apparatus. 4,872,458, Cl. 128-401.000.

Kaneko, Norio: See—
Shimizu, Akira; and Kaneko, Norio, 4,873,610, Cl. 361-313.000.

Kaneko, Shozo: See—
Okabe, Yoshimi; Iwamoto, Keiichi; Torichigai, Masaaki; Kaneko, Shozo; Ichinari, Joji; and Koizumi, Kiyoshi, 4,872,347, Cl. 73-634.000.

Kaneko, Yutaka: See—
Tachibana, Kimie; Kaneko, Yutaka; and Ishii, Fumio, 4,873,183, Cl. 430-550.000.

Kanekura, Kazunori: See—
Hirose, Yoshihiko; Aoki, Tomohiro; Chiku, Kazuyoshi; Murayama, Yasushi; Uchida, Takashi; Matsuzawa, Kunihiko; and Kanekura, Kazunori, 4,873,541, Cl. 346-160.100.

Kaneshiki, Toshitaka; Narukawa, Osamu; Haneda, Tadayoshi; and Endo, Toshiyuki, to Hodogaya Chemical Co., Ltd. Method for selective isolation of Dichlorobenzene. 4,873,383, Cl. 570-211.000.

Kanner, Rowland W.: See—
Ryder, Francis E.; Kanner, Rowland W.; and Williams, Fred E., 4,873,424, Cl. 219-521.000.

Kanto Yakin Kogyo Kabushiki Kaisha: See—
Takahashi, Susumu, 4,873,423, Cl. 219-390.000.

- Kao Corporation: See—
Tanaka, Yukitaka; Omura, Hisao; Irinatsu, Yuichi; Kobayashi, Takashi; and Noguchi, Aiko, 4,873,109, Cl. 426-607.000.
- Kaplan, Michael: See—
Raychem Corporation. Coupling device. 4,873,713, Cl. 285-381.000.
- Kapples, Kevin J.: See—
Shutske, Gregory M.; and Kapples, Kevin J., 4,873,234, Cl. 514-211.000.
- Karakida, Ken-ichi; and Yagi, Shigeru, to Fuji Xerox Co., Ltd. Electro-photographic photoreceptor having overlayer comprising carbon. 4,873,165, Cl. 430-66.000.
- Karanewsky, Donald S.: See—
Petrillo, Edward W., Jr.; Karanewsky, Donald S.; Thottathil, John K.; Heikes, James E.; and Grosso, John A., 4,873,356, Cl. 558-180.000.
- Karas, Bradley R.: See—
Foust, Donald F.; Lamby, Edward J.; Karas, Bradley R.; Dumas, William V.; and Jerabek, Elihu C., 4,873,136, Cl. 428-209.000.
- Karunasiri, Runkiri P.: See—
Coon, Darryl D.; Karunasiri, Runkiri P.; and Liu, Hui C., 4,873,555, Cl. 357-4.000.
- Kasai Kogyo Co., Ltd.: See—
Fujita, Zenzo; Morita, Hirokiyo; and Morishita, Sadao, 4,873,045, Cl. 264-259.000.
- Kasamura, Toshiro: See—
Sasaki, Nobukazu; Kasamura, Toshiro; Ohashi, Masashi; Okuda, Naoki; Kusumoto, Toshihiko; Maeda, Yasunori; Ozawa, Takashi; Yamamoto, Yasuyoshi; Kubota, Atsushi; Kimura, Akiyoshi; and Masuda, Makoto, 4,873,547, Cl. 355-316.000.
- Kashima, Toshihiro; and Fukuda, Minoru, to Toyo Boseki Kabushiki Kaisha. Optical recording medium. 4,873,131, Cl. 428-64.000.
- Kashiwamura, Kazuo: See—
Kazumoto, Yoshio; Suganami, Takuya; Furuishi, Yoshiro; and Kashiwamura, Kazuo, 4,872,313, Cl. 62-6.000.
- Kastalsky, Alexander: See—
Abeles, Joseph H.; Kastalsky, Alexander; and Leheny, Robert F., 4,872,744, Cl. 350-356.000.
- Katagiri, Kazuharu: See—
Nohira, Hiroyuki; Kamei, Masanao; Nakamura, Shinichi; Yoshinaga, Kazuo; Kai, Mariko; and Katagiri, Kazuharu, 4,873,018, Cl. 252-299.010.
- Kataoka, Kazunori: See—
Ogata, Naoya; Sanui, Kohei; Yui, Nobuhiko; Kataoka, Kazunori; Okano, Teruo; and Sakurai, Yasuhisa, 4,873,292, Cl. 525-408.000.
- Katayama, Isao, to Murata Kikai Kabushiki Kaisha. Compound machining apparatus. 4,873,418, Cl. 219-121.600.
- Katchka, Jay R.; Yeaman, George A.; and McKinney, Richard W., to Robertshaw Controls Company. Burner control device, system and method of making the same. 4,872,830, Cl. 431-54.000.
- Kato, Etsuro, to Nirsan Chemical Industries, Ltd. Powder of coagulated spherical zirconia particles and process for producing them. 4,873,064, Cl. 423-85.000.
- Kato, Kiyotaka: See—
Matsui, Haruo; Nakagawa, Ipppei; and Kato, Kiyotaka, 4,873,073, Cl. 423-617.000.
- Kato, Toshio; Uotani, Kunihiro; and Ito, Mitsuhiko, to Ricoh Company, Ltd. Cassette with turn cover and feed roller control. 4,872,659, Cl. 271-9.000.
- Kato, Toshiyuki: See—
Onodera, Kageyoshi; Koizumi, Tatsuya; Kato, Toshiyuki; Sotani, Junji; Momo, Masauki; and Furuya, Shuichi, 4,873,127, Cl. 427-376.800.
- Kato, Yoshiaki: See—
Ono, Hitoshi; and Kato, Yoshiaki, 4,873,164, Cl. 430-58.000.
- Katoh, Akira; Ida, Masatoshi; Yonoki, Yutaka; Harada, Hisayuki; Inoue, Manabu; and Fukuda, Yoshio, to Olympus Optical Co., Ltd. Detachable unit electronic camera. 4,873,580, Cl. 358-335.000.
- Katoh, Koichi: See—
Suzuki, Yasumichi; Ikeda, Yoshinori; Katoh, Koichi; Ohnishi, Tetsuya; Kadowaki, Toshihiro; and Honma, Toshio, 4,873,570, Cl. 358-80.000.
- Katoh, Takayuki: See—
Mori, Nobufumi; Katoh, Takayuki; Oikawa, Tetsuo; Harada, Yoshiyasu; and Miyahara, Junji, 4,873,440, Cl. 250-327.200.
- Katoh, Tsuguhiko; Maeda, Kiyoto; Shiroshita, Masao; Yamashita, Norihisa; Sanemitsu, Yuzuru; and Inoue, Satoru, to Sumitomo Chemical Co., Ltd. Pyridinylpyrimidines having fungicidal activity. 4,873,248, Cl. 514-269.000.
- Katsuo, Suzuki, to Aisin Seiki Kabushiki Kaisha; and Kabushiki Kaisha Shinsangyokaihatsu. Mobile station antenna attitude control apparatus. 4,873,526, Cl. 342-359.000.
- Katsuragi, Shigeo: See—
Morishita, Masataka; Aikawa, Renji; Katsuragi, Shigeo; Yamamoto, Yoshiaki; and Sugimoto, Kenichi, 4,873,087, Cl. 424-433.000.
- Katsuura, Yasuhiro: See—
Okamoto, Shosuke; Okada, Yoshio; Okunomiya, Akiko; Naito, Taketoshi; Kimura, Yoshio; Yamada, Morihiko; Ohno, Norio; Katsuura, Yasuhiro; Nojima, Hiroshi; and Shishikura, Takashi, 4,873,253, Cl. 514-352.000.
- Katto, Takayuki: See—
Satake, Yoshikatsu; Iizuka, Yo; Kouyama, Toshitaka; Katto, Takayuki; and Shiiki, Zenya, 4,873,283, Cl. 524-520.000.
- Katz, Leon: See—
Allan, John L.; Boettcher, Jeffery J.; Gaylord, Norman G.; and Katz, Leon, 4,873,273, Cl. 523-407.000.
- Katz, Moshe: See—
Haruvy, Yair; Katz, Moshe; and Horowitz, Abraham A., 4,872,220, Cl. 2-243.03A.
- Kaufman, Harold R.; and Robinson, Raymond S. Ion source with particular grid assembly. 4,873,467, Cl. 313-360.100.
- Kaufman, Lawrence G.: See—
Moran, Lyle E.; and Kaufman, Lawrence G., 4,873,275, Cl. 524-64.000.
- Kawahara, Takayuki: See—
Hori, Ryoichi; Itoh, Kiyoo; Kitsukawa, Goro; Kawajiri, Yoshiki; Watanabe, Takao; and Kawahara, Takayuki, 4,873,673, Cl. 365-230.060.
- Kawajiri, Tatsuya; Onodera, Hideo; Uchida, Shinichi; Aoki, Yukio; and Wada, Masahiro, to Nippon Shokubai Kagaku Kogyo Co., Ltd. Catalyst for oxidation of olefin or tertiary alcohol and process for production thereof. 4,873,217, Cl. 502-311.000.
- Kawajiri, Yoshiki: See—
Hori, Ryoichi; Itoh, Kiyoo; Kitsukawa, Goro; Kawajiri, Yoshiki; Watanabe, Takao; and Kawahara, Takayuki, 4,873,673, Cl. 365-230.060.
- Kawakatsu, Akira, to Oki Electric Industry Co., Ltd. Method of fabricating a bipolar transistor. 4,873,200, Cl. 437-31.000.
- Kawamata, Shigeya, to Mitsubishi Jukogyo Kabushiki Kaisha. Liquid type mass damper with elongated discharge tube. 4,872,649, Cl. 267-136.000.
- Kawamoto, Yoshifumi: See—
Kaga, Toru; Kimura, Shinichiro; Kure, Tokuo; Kawamoto, Yoshifumi; and Sunami, Hideo, 4,873,203, Cl. 437-67.000.
- Kawamura, Mitsuyoshi: See—
Akao, Shigeaki; Ishida, Noboru; and Kawamura, Mitsuyoshi, 4,872,431, Cl. 123-188.0AA.
- Kawasaki, Hirofumi: See—
Takedoi, Atsushi; Kondo, Hiroyuki; Isoai, Masaru; Yoshinaga, Yoshitaka; Harada, Toshiharu; Okuda, Yosiro; Sumita, Hiroshi; Kawasaki, Hirofumi; and Mori, Kohji, 4,873,010, Cl. 252-62.590.
- Kawasaki Jukogyo Kabushiki Kaisha: See—
Yasukawa, Wataru, deceased; Kiyoshige, Masanori; Horikawa, Takeshi; Okada, Tomonobu; Ochi, Tadafumi; Aoki, Yoshiaki; Higashida, Masahiko; Kawashima, Takashi; Koe, Shigeki; Ono, Hideo; Nihei, Kanta; Takasugi, Syunji; and Take, Koji, 4,872,293, Cl. 51-410.000.
- Kawasaki Jukogyo Kagushiki Kaisha: See—
Tsubakimoto, Tsuneo; Ito, Hayami; Tatsumi, Shuhei; Kajibata, Yoshihiro; Takao, Shoichi; Goto, Takakiyo; Nakaishi, Akio; Rakutani, Kenji; Tamura, Toshio; and Kobayashi, Hiroya, 4,872,885, Cl. 44-51.000.
- Kawasaki, Yoshiki; Hioki, Yoshihiro; Ohno, Yuichi; Ichida, Kozaburo; Yamaguchi, Susumu; Sudo, Michitaka; and Chikazawa, Bunichiro, to Nippon Steel Corporation. Method and apparatus for manufacturing cold-rolled steel strip. 4,872,245, Cl. 29-81.00A.
- Kawase, Mitsuo: See—
Sonoda, Hidefumi; Mori, Eiji; Kawase, Mitsuo; Yoneshige, Kazuhiro; Takahashi, Akira; Komiya, Hirokazu; and Tanaka, Akira, 4,872,439, Cl. 123-518.000.
- Kawashima, Takashi: See—
Yasukawa, Wataru, deceased; Kiyoshige, Masanori; Horikawa, Takeshi; Okada, Tomonobu; Ochi, Tadafumi; Aoki, Yoshiaki; Higashida, Masahiko; Kawashima, Takashi; Koe, Shigeki; Ono, Hideo; Nihei, Kanta; Takasugi, Syunji; and Take, Koji, 4,872,293, Cl. 51-410.000.
- Kawatetsu Kenzai Kogyo Kabushiki Kaisha: See—
Imai, Katsuhiko, 4,872,779, Cl. 403-171.000.
- Kaye, Arthur, to British Aerospace. PLC. Electro-hydraulic actuator assembly. 4,872,310, Cl. 60-567.000.
- Kazumoto, Yoshio; Suganami, Takuya; Furuishi, Yoshiro; and Kashiwamura, Kazuo, to Mitsubishi Denki Kabushiki Kaisha. Gas cycle machine. 4,872,313, Cl. 62-6.000.
- KB Alloys, Inc.: See—
Sigworth, Geoffrey K., 4,873,054, Cl. 420-552.000.
- Keating, David: See—
Pilat, John; Keating, David; and Colella, Wayne, 4,873,652, Cl. 364-518.000.
- Keene, Donna L.; and Hicks, Darrell D., to Hoechst Celanese Corporation. Protective coatings of a cured hydroxystyrene mannich base and blocked polyisocyanates. 4,872,960, Cl. 204-181.700.
- Kegerreis, James E.: See—
Clem, Kenneth R.; Heider, Kenneth J.; Kegerreis, James E.; and Shoukry, Ehsan I., 4,872,967, Cl. 208-65.000.
- Keiper Recaro Incorporated: See—
White, Harry H.; and Ligensa, Karl, 4,872,726, Cl. 297-367.000.
- Keller, Fred, Jr. Ceramic aggregate for roadway composition and method of producing same. 4,873,207, Cl. 501-80.000.
- Keller, Hans-Peter: See—
De Cui, Beat; and Keller, Hans-Peter, 4,873,621, Cl. 364-150.000.
- Kellner, Carl S.; and Rao, V. N. Mallikarjuna, to Du Pont de Nemours, E. I., and Company. Hydrodehalogenation of CF₃CHClF in the presence of supported Pd. 4,873,381, Cl. 570-176.000.
- Kelly, David L.: See—
Gillsdpy, Kenton P.; and Kelly, David L., 4,872,634, Cl. 248-354.300.
- Kelly-Fry, Elizabeth; and Morris, Steven T., to Indianapolis Center for Advanced Research. Multiple frequencies from single crystal. 4,872,346, Cl. 73-627.000.
- Kelly, Patrick J., Jr.: See—
Cavallaro, Joseph L.; and Kelly, Patrick J., Jr., 4,872,811, Cl. 416-162.000.

- Kemp, Preston B., Jr.; and Holland, Robert J., Sr., to GTE Products Corporation. Coated metallic particles and process for producing same. 4,873,148, Cl. 428-570.000.
- Kemper, Nicolaas R.; Bouwens, Henricus J. J.; Koster, Marinus P.; and De Peuter, Willem L. G., to U.S. Philips Corporation. Driving mechanism and manipulator comprising such a driving mechanism. 4,872,362, Cl. 74-479.000.
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Etheredge, Robert W., III, 4,872,263, Cl. 30-41.000.
- Kennel, Gordon. Combination infant seat and stroller. 4,872,693, Cl. 280-30.000.
- Kern & Co.: See—
Wahlen, Erika, 4,872,341, Cl. 73-431.000.
- Kernforschungsanstalt Julich GmbH: See—
Struck, Bernd D.; Neumeister, Herbert; and Naoumidis, Aristides, 4,873,121, Cl. 427-77.000.
- Kernforschungsanstalt Karlsruhe GmbH: See—
Braun, Hartmut; and Vogg, Hubert, 4,873,065, Cl. 423-210.000.
- Ehrfeld, Wolfgang; Hagmann, Peter; Mohr, Jürgen; and Munchmeyer, Dietrich, 4,872,888, Cl. 55-16.000.
- Kesling, Haven S., Jr.: See—
Shaw, Edward T.; and Kesling, Haven S., Jr., 4,873,364, Cl. 560-344.000.
- Kessel, Rudi: See—
Krejci, Heinrich; and Kessel, Rudi, 4,872,897, Cl. 65-128.000.
- Khurgin, Boris. Ice detector with movable feeler. 4,873,510, Cl. 340-580.000.
- Kido, Keishiro; and Saito, Yoshio, to Fuji Photo Film Co., Ltd. Pipette device. 4,873,059, Cl. 422-100.000.
- Kielmeyer, Ronald F., Jr., to Motorola, Inc. Wide band voltage controlled R-C oscillator for use with MMIC technology. 4,873,497, Cl. 331-108.00B.
- Kikkawa, Sadanobu: See—
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- Kikuchi, Eiichi: See—
Deya, Eiki; Yanahira, Shuichi; Abiko, Kenkichi; and Kikuchi, Eiichi, 4,873,229, Cl. 514-54.000.
- Kim, Il Yoo. Trash container to be chemical sprayed. 4,872,585, Cl. 220-334.000.
- Kim, In O.; and Lee, Sang G., to Korea Advanced Institute of Science and Technology. Process for the preparation of 3-(4'-bromobiphenyl-4-yl)tetralin-1-one. 4,873,363, Cl. 568-319.000.
- Kimberly-Clark Corporation: See—
Proxmire, Deborah L.; Endres, Dan D.; Wilson, John C.; Johnson, Lynn A.; Zehner, Georgia L.; Boland, Leona G.; and Stevens, Robert A., 4,872,871, Cl. 604-394.000.
- Tews, Richard R., 4,872,933, Cl. 156-184.000.
- Kimura, Akiyoshi: See—
Sasaki, Nobukazu; Kasamura, Toshiro; Ohashi, Masashi; Okuda, Naoki; Kusumoto, Toshihiko; Maeda, Yasunori; Ozawa, Takashi; Yamamoto, Yasuyoshi; Kubota, Atsushi; Kimura, Akiyoshi; and Masuda, Makoto, 4,873,547, Cl. 355-316.000.
- Kimura, Isao: See—
Kaji, Kichiro; Shimasaki, Katsunori; Yamamoto, Masakazu; Saiki, Kozo; Yura, Keita; Habata, Hidetsugu; Kimura, Isao; and Suzuki, Tetsuo, 4,873,070, Cl. 423-345.000.
- Kimura, Katsutaka: See—
Etioh, Jun; Shimohigashi, Katsuhiko; Miyazawa, Kazuyuki; Kimura, Katsutaka; and Akiba, Takesada, 4,873,672, Cl. 365-218.000.
- Kimura, Kiyoshi; Ueda, Fusao; and Ogasawara, Takashi, to Nippon Shinyaku Co., Ltd. 2,4-diamino-6-substituted-phenyl-S-triazines as nootropic agents. 4,873,242, Cl. 514-242.000.
- Kimura, Naomasa, to Honda Giken Kogyo Kabushiki Kaisha. Mechanical quantity sensor element. 4,872,350, Cl. 73-779.000.
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- Sunami, Hideo; Kimura, Shinichiro; and Kaga, Toru, 4,873,560, Cl. 357-23.600.
- Kimura, Takashi; Yatomi, Toshiya; and Edakubo, Hiroo, to Canon Kabushiki Kaisha. Tape loading device having pair of tape guide post units on pair of rotatable members. 4,873,591, Cl. 360-85.000.
- Kimura, Tsutomu; and Watanabe, Yukio, to Fuji Photo Film Co., Ltd. Method of and apparatus for recording and reading out radiation image information. 4,873,441, Cl. 250-327.200.
- Kimura, Yoshio: See—
Okamoto, Shosuke; Okada, Yoshio; Okunomiya, Akiko; Naito, Taketoshi; Kimura, Yoshio; Yamada, Morihiko; Ohno, Norio; Katsuura, Yasuhiro; Nojima, Hiroshi; and Shishikura, Takashi, 4,873,253, Cl. 514-352.000.
- King, Stephen W., to Union Carbide Corporation. Heterogeneous alkoxylation using anion-bound metal oxides. 4,873,017, Cl. 252-183.110.
- Kinney, William A.; and Lee, Nancy E., to American Home Products Corporation. 2-Pyridinecarboxithioamides and pharmaceutical compositions comprising the same. 4,873,238, Cl. 514-227.800.
- Kino, Gordon S.: See—
Risk, William P.; and Kino, Gordon S., 4,872,738, Cl. 350-96.290.
- Kinoshita, Masahide: See—
Tajima, Hatsu; Hosoi, Atsushi; Hoshika, Norihisa; Tajika, Hiroshi; and Kinoshita, Masahide, 4,873,551, Cl. 355-251.000.
- Kinoshita, Mitsuo; Ito, Tetsuo; Mikawa, Hiroji; and Chino, Koichi, to Hitachi, Ltd. Method and apparatus for controlling centrifugal thin film dryer. 4,872,948, Cl. 159-6.200.
- Kinoeky, David S., to Minnesota Mining and Manufacturing Company. Corrosion resistant silver and copper surfaces. 4,873,139, Cl. 428-341.000.
- Kioritz Corporation: See—
Nagai, Noboru; Hashimoto, Yoshisato; Tsuboike, Yoshihiko; and Kaito, Noboru, 4,872,308, Cl. 60-316.000.
- Kirker, Garry W.: See—
Abail, Robert P. L.; Angevine, Philip J.; Chester, Arthur W.; and Kirker, Garry W., 4,873,216, Cl. 502-211.000.
- Kishi, Yuji: See—
Ishizaka, Yoshirou; Naganuma, Hiroshi; Sato, Kenji; Kishi, Yuji; Ishida, Yoshihisa; and Goto, Kiyokazu, 4,872,320, Cl. 62-255.000.
- Kiszely, Eniko: See—
Petocz, Lujza; Simonyi, Istvan; Beck, Ivan; Gigler, Gabor; Fekete, Marton; Kiszely, Eniko; Mandi, Attila; Gorgenyi, Frigyes; Dietz, Andras; Sumeg nee Zukovics, Katalin; and Jakfalvi, Elemer, 4,873,249, Cl. 514-275.000.
- Kita, Akio, to Oki Electric Industry Co., Ltd. MIS FET and process of fabricating the same. 4,873,557, Cl. 357-23.100.
- Kitagawa Industries Co., Ltd.: See—
Matsui, Kazuhiro, 4,873,505, Cl. 336-92.000.
- Kitayama, Hidehiro. Eye mask. 4,872,217, Cl. 2-15.000.
- Kitsukawa, Goro: See—
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- Kiyoshige, Masanori: See—
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- Klatt, Robert W., to Hughes Aircraft Company. Method and apparatus for scanning thermal images. 4,873,442, Cl. 250-334.000.
- Klaus Heckmann: See—
Heckmann, Klaus; Manecke, Georg; Pfannenmuller, Beate; Ring, Klaus; and Ringsdorf, Helmut, 4,873,033, Cl. 264-41.000.
- Klein Tools Corporation: See—
Theros, Brian S., 4,872,551, Cl. 206-349.000.
- Kleinberg, Leonard L., to United States of America, Administrator, National Aeronautics and Space Administration. Reflection oscillators employing series resonant crystals. 4,873,498, Cl. 331-116.00E.
- Klemic, Frank, Jr. Concrete anchor bolt setting device. 4,872,298, Cl. 52-127.100.
- Klemmensen, Ramon L., to Amana Refrigeration, Inc. Shut-off mechanism for ice maker. 4,872,318, Cl. 62-137.000.
- Klockner Ferromatik Desma GmbH: See—
Landwehr, Reinhard; and Rebers, Gunter, 4,873,049, Cl. 264-513.000.
- Kluge, Heinz: See—
Hammann, Peter; Grabley, Susanne; Raether, Wolfgang; Ciommer, Bernd; Kluge, Heinz; and Sachse, Burkhard, 4,873,347, Cl. 549-267.000.
- Knapp, Karl E.: See—
Elias, Eric; and Knapp, Karl E., 4,873,118, Cl. 427-39.000.
- Knapp, Malcolm H., to General Electric Company. Bearing support. 4,872,767, Cl. 384-99.000.
- Knepper, James A., to International Business Machines Corporation. Roll release mechanism. 4,872,661, Cl. 271-273.000.
- Knierim, Daniel G.: See—
Olisar, Ronald A.; and Knierim, Daniel G., 4,873,456, Cl. 307-272.100.
- Knoblock, Glenn A.; and Scolten, Brian L., to Steelcase Inc. Slip connector for weight actuated height adjusters. 4,872,635, Cl. 248-406.200.
- Ko, Kenneth K.: See—
Eshleman, James M.; and Ko, Kenneth K., 4,872,910, Cl. 106-3.000.
- Ko, Wai-Shing: See—
Young, William A.; Ko, Wai-Shing; Davidson, Curtis R.; and Whitehurst, Thomas, 4,873,469, Cl. 315-155.000.
- Koa Oil Company, Limited Director General, Agency of Industrial Science Technology: See—
Yamada, Yasuhiro; Imamura, Takeshi; Honda, Hidemasa; Fujii, Masaki; and Minohata, Masanori, 4,873,071, Cl. 423-448.000.
- Kobashi, Toshiyuki; and Naka, Hideo, to Japan Exlan Company Limited. Transparent aqueous tin compound solution. 4,873,352, Cl. 556-105.000.
- Kobayashi, Chuzo: See—
Higuchi, Noboru; Matsui, Keizo; Kobayashi, Chuzo; and Yamaguchi, Shigeru, 4,872,763, Cl. 366-160.000.
- Kobayashi, Fumiaki: See—
Sato, Motohiro; Yamada, Toshihiro; Kohono, Akiomi; Yamamoto, Akihiko; Taguchi, Keiji; Daikoku, Takahiro; and Kobayashi, Fumiaki, 4,872,606, Cl. 228-121.000.
- Kobayashi, Hirokazu; Miyamoto, Yukihiko; Takai, Masaaki; Fujisawa, Suichi; and Miyazawa, Hiroshi, to Trio Kabushiki Kaisha; and Nippon Hoso Kyokai. Method and apparatus for multiplexing of input signals having differing frequencies and demultiplexing same. 4,873,684, Cl. 370-102.000.
- Kobayashi, Hiroo; Fujino, Hitoshi; Yagi, Tadashi; Adachi, Nobukazu; Hayakawa, Yasuyoshi; and Setoriyama, Takeshi, to Canon Kabushiki Kaisha. Image forming apparatus comprising a main assembly having a top frame adapted to swing open and closed with respect to a

bottom frame and having process cartridge detachably mounted in the main assembly. 4,873,548, Cl. 355-200.000.

Kobayashi, Hiroshi; Kobayashi, Masae; and Machida, Haruhiko, to Techno-Frontier Ltd. Cooking utensil. 4,872,445, Cl. 126-376.000.

Kobayashi, Hiroya: See—

Tsubakimoto, Tsuneo; Ito, Hayami; Tatsumi, Shuhei; Kajibata, Yoshihiro; Takao, Shoichi; Goto, Takakiyo; Nakaishi, Aki; Rakutani, Kenji; Tamura, Toshio; and Kobayashi, Hiroya, 4,872,885, Cl. 44-51.000.

Kobayashi, Koji, to Kowa Company Ltd. Light beam deflector. 4,872,746, Cl. 350-358.000.

Kobayashi, Kougi: See—

Saen, Haruo; and Kobayashi, Kougi, 4,873,411, Cl. 219-93.000.

Kobayashi, Masaaki; Yamanishi, Kazuhiro; Takeuchi, Akihiro; and Nagaoka, Yoshitomi, to Matsushita Electric Industrial Co., Ltd. Magnetic tape recording/reproducing apparatus. 4,873,583, Cl. 358-310.000.

Kobayashi, Masae: See—

Kobayashi, Hiroshi; Kobayashi, Masae; and Machida, Haruhiko, 4,872,445, Cl. 126-376.000.

Kobayashi, Masao: See—

Inoue, Kazutaka; Sato, Toshihiro; and Kobayashi, Masao, 4,873,391, Cl. 585-639.000.

Kobayashi, Takashi: See—

Tanaka, Yukitaka; Omura, Hisao; Irinatsu, Yuuichi; Kobayashi, Takashi; and Noguchi, Aiko, 4,873,109, Cl. 426-607.000.

Kobayashi, Yasuhito: See—

Iwase, Yoshiaki; and Kobayashi, Yasuhito, 4,873,581, Cl. 358-310.000.

Kobayashi, Yoshihiko: See—

Umezawa, Sumio; Tsuchiya, Tsutomu; Takeuchi, Tomio; Umezawa, Kazuo; Takahashi, Yoshiaki; Shitara, Tetsuo; Kobayashi, Yoshihiko; and Takagi, Yasushi, 4,873,225, Cl. 514-41.000.

Kobayashi, Yuichi: See—

Kameyama, Toshiaki; and Kobayashi, Yuichi, 4,872,660, Cl. 271-9.000.

Koblan, Errol D. Protective housing structure for underground devices. 4,872,575, Cl. 220-3.300.

Kobriniski, Haim: See—

Arthurs, Edward; Goodman, Matthew S.; Kobriniski, Haim; and Vecchi, Mario P., 4,873,681, Cl. 370-3.000.

Koch, Helmut: See—

Krause, Hans; Ross, Rudi; and Koch, Helmut, 4,872,769, Cl. 384-226.000.

Koe, Shigeki: See—

Yasukawa, Wataru, deceased; Kiyoshige, Masanori; Horikawa, Takeshi; Okada, Tomonobu; Ochi, Tadafumi; Aoki, Yoshiaki; Higashida, Masahiko; Kawashima, Takashi; Koe, Shigeki; Ono, Hideo; Nihei, Kanta; Takasugi, Syunji; and Take, Koji, 4,872,293, Cl. 51-410.000.

Koenig, Horst: See—

Rossy, Philip A.; Thyes, Marco; Franke, Albrecht; Koenig, Horst; Lehmann, Hans D.; Gries, Josef; Friedrich, Ludwig; and Lenke, Dieter, 4,873,246, Cl. 514-252.000.

Koepf, Gall, Sandra: See—

Schild, Ronald H.; Koepf-Gall, Sandra; and Broxterman, Gregory C., 4,872,999, Cl. 210-754.000.

Koese, Gerrit C. Multi-spindle drilling machine. 4,872,788, Cl. 408-46.000.

Koezuka, Hiroshi: See—

Hyodo, Kenji; Koezuka, Hiroshi; and MacDiarmid, Alan G., 4,873,556, Cl. 573-8.000.

Kogej, Boris; and Potocnik, Joze, to Kolektor P.O. Method of manufacturing commutators. 4,872,255, Cl. 29-597.000.

Kogure, Yoshio: See—

Fujita, Takashi; Hihara, Toshio; Kogure, Yoshio; Sekioka, Riyouchi; and Nakamura, Noboru, 4,872,881, Cl. 8-549.000.

Koh, Makoto: See—

Nakagawa, Kazushige; Koh, Makoto; Sera, Kyoji; Ozeki, Tadashi; and Iwasaki, Masahiro, 4,872,394, Cl. 91-506.000.

Kohara, Hidekatsu: See—

Tanaka, Hatsuyuki; Sato, Yoshiyuki; Kohara, Hidekatsu; and Nakayama, Toshimasa, 4,873,177, Cl. 430-326.000.

Kohlhase, Webster, to Davidson Texton Inc. Pour hole closer, straight in type, for use with injection foam molding system. 4,873,032, Cl. 264-39.000.

Kohono, Akiomi: See—

Satoh, Motohiro; Yamada, Toshihiro; Kohono, Akiomi; Yamamoto, Akihiko; Taguchi, Keiji; Daikoku, Takahiro; and Kobayashi, Fumuki, 4,872,606, Cl. 228-121.000.

Koizumi, Kiyoshi: See—

Okabe, Yoshimi; Iwamoto, Kenchi; Torichigai, Masaaki; Kaneko, Shozo; Ichinari, Joji; and Koizumi, Kiyoshi, 4,872,347, Cl. 73-634.000.

Koizumi, Tatsuya: See—

Onodera, Kagetoshi; Koizumi, Tatsuya; Kato, Toshiyuki; Sotani, Junji; Momo, Masauki; and Furuya, Shuichi, 4,873,127, Cl. 427-376.800.

Kojima, Yoshitaka: See—

Doi, Masayuki; Asahi, Naotatsu; Kojima, Yoshitaka; Kanamaru, Hisanobu; and Aoyama, Susumu, 4,873,150, Cl. 428-627.000.

Kolektor P.O.: See—

Kogej, Boris; and Potocnik, Joze, 4,872,255, Cl. 29-597.000.

Kolodess, Michael S.; Toms, Douglas; and Pierson, Bruce A., to Procter & Gamble Company, The. Method of and apparatus for

separating juice sacs from the sectional membranes of a fruit meat section. 4,873,106, Cl. 426-481.000.

Komatsu, Masato; Baba, Isao; Mikami, Takashi; Narukawa, Kiyotada; and Kanai, Tsuyoshi, to Toa Nenryo Kogyo K.K. Method for preparation of thermoplastic resin composition. 4,873,288, Cl. 525-194.000.

Komatsubara, Hirofumi: See—

Yamada, Yutaka; Kozawa, Tadashi; Natsume, Naohiro; and Komatsubara, Hirofumi, 4,872,806, Cl. 415-55.500.

Komine, Isamu: See—

Miyazaki, Takao; Yamada, Yoshiro; and Komine, Isamu, 4,872,758, Cl. 356-381.000.

Komiya, Hirokazu: See—

Sonoda, Hidefumi; Mori, Eiji; Kawase, Mitsuo; Yoneshige, Kazuhiro; Takahashi, Akira; Komiya, Hirokazu; and Tanaka, Akira, 4,872,439, Cl. 123-518.000.

Komuro, Hirokazu; and Ikeda, Masami, to Canon Kabushiki Kaisha. Liquid jet recording head. 4,873,622, Cl. 346-140.00R.

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Matsuda, Toshiharu; Sasakawa, Atsushi; Hayashi, Shoichiro; and Konai, Yutaka, 4,873,366, Cl. 562-416.000.

Kondo, Hiroyuki: See—

Takedoi, Atsushi; Kondo, Hiroyuki; Isoai, Masaru; Yoshinaga, Yoshitaka; Harada, Toshiharu; Okuda, Yosio; Sumita, Hiroshi; Kawasaki, Hirofumi; and Mori, Kohji, 4,873,010, Cl. 252-62.590.

Kondraske, George V., to Board of Regents, The University of Texas System. Sensor conditioning method and apparatus. 4,873,655, Cl. 364-553.000.

Konecny, James W.; Huston, Rodney L.; and Vyse, Gerrard N., to Stratoflex, Inc. Releasable quick connect fitting. 4,872,710, Cl. 285-81.000.

Konica Corporation: See—

Hattori, Tsuyoshi; Tanaka, Masanao; and Matsuzaka, Syoji, 4,873,576, Cl. 358-224.000.

Nakayama, Haruki, 4,873,542, Cl. 354-400.000.

Tachibana, Kimie; Kaneko, Yutaka; and Ishii, Fumio, 4,873,183, Cl. 430-550.000.

Kono, Koichi; Okamoto, Kenkichi; Iwasaki, Rumi; and Sawada, Shuichi, to Toa Nenryo Kogyo Kabushiki Kaisha. Process for producing microporous ultra-high-molecular-weight polyolefin membrane. 4,873,034, Cl. 264-41.000.

Konopka, Richard O. Medication dispenser. 4,872,591, Cl. 221-3.000.

Konosu, Naohiro: See—

Tsuruoka, Michihiko; Nakagawa, Wataru; Miyoshi, Noriomi; Konosu, Naohiro; and Hashimoto, Tadao, 4,872,335, Cl. 73-30.000.

Kopecki, Denis S., to Eastman Christensen Company. Drill string drill collars. 4,872,519, Cl. 175-320.000.

Kopf, Thomas W., to Master Products Inc. Safety tray. 4,872,723, Cl. 297-216.000.

Kopsch, Reiner; Gosswein, Claus F.; Lutz, Henning; Ball, Michael; and Hubert, Peter, to Ergo Forschungsgesellschaft mbH. Process for separating and producing chlorogenic acid. 4,872,987, Cl. 210-635.000.

Korea Advanced Institute of Science and Technology: See—

Jung, Il Nam; Hwang, Sang Yo; and Lee, Chung Suk, 4,873,011, Cl. 252-75.000.

Kim, In O.; and Lee, Sang G., 4,873,363, Cl. 568-319.000.

Kornfeld, Gertrude H., to United States of America, Army. Method for simulating an image by correlation. 4,873,657, Cl. 364-578.000.

Korsunsky, Iosif; Walker, Kevin E.; and Brown, Robert W., to AMP Incorporated. Retention means for chip carrier sockets. 4,872,845, Cl. 439-70.000.

Koshihara, Toshio; Misawa, Rokuro; Sagawa, Yuzo; Takehara, Kimio; Matoba, Yuji; and Ishihara, Koji, to NKK Corporation. Method and apparatus for detecting defective portion on inner surface of pipe. 4,872,762, Cl. 374-5.000.

Kossmehl, Gerhard: See—

Scheer, Wolfgang; Fuhrmann, Hartmut; Kossmehl, Gerhard; Niemitz, Matthias; and Kabbeck-Kupijaj, Detlef, 4,872,962, Cl. 204-224.00R.

Koster, Mannus P.: See—

Kemper, Nicolaas R.; Bouwens, Henricus J. J.; Koster, Mannus P.; and De Peuter, Willem L. G., 4,872,362, Cl. 74-479.000.

Kotani, Haruo; and Tomita, Katsuhiko, to Horiba, Ltd. Methods of measuring ion-concentration and the like and a calibrating sheet as well as a calibrating method of measuring devices used therein. 4,872,956, Cl. 204-1.00T.

Kotani, Haruo; and Tomita, Katsuhiko, to Horiba, Ltd. Sheet type electrode for use in the measurement of ion concentrations. 4,872,966, Cl. 204-414.000.

Kotani, Toshihiro; and Tada, Kohji, to Sumitomo Electric Industries, Ltd. Apparatus for the growth of single crystals. 4,873,062, Cl. 422-249.000.

Kotobuki & Co., Ltd.: See—

Kageyama, Hidehei; Mitsuya, Yoshihide; and Nakazato, Yoichi, 4,872,776, Cl. 401-65.000.

Koutsoukos, Elias P., to TRW Inc. Carbonaceous material for production of hydrogen from low heating value fuel gases. 4,873,214, Cl. 502-185.000.

Kouyama, Toshitaka: See—

Satake, Yoshikatsu; Iizuka, Yo; Kouyama, Toshitaka; Katto, Takayuki; and Shiiki, Zenya, 4,873,283, Cl. 524-520.000.

Kowa Co. Ltd.: See—

Arai, Koichi; and Yoshizaki, Hideo, 4,873,222, Cl. 514-21.000.

Kobayashi, Koji, 4,872,746, Cl. 350-358.000.

Kowshik, Vikram; Boddu, Sudhakar; and Lucero, Elroy M., to National Semiconductor Corporation. Sequential read access of serial memories with a user defined starting address. 4,873,671, Cl. 365-189.120.

Koyo Seiko Co., Ltd.: See—

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 Henley, John P.; Pearson, Stanley R.; Peters, Bruce C.; and LaFitte, Larry L., 4,872,886, Cl. 48-197.00R.
 LaGesse, Michael F.; and LaGesse, Sally. Automatic coffee maker. 4,872,403, Cl. 99-280.000.
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 LaGesse, Michael F.; and LaGesse, Sally, 4,872,403, Cl. 99-280.000.
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 Rusterholz, John T.; Lahti, Archie E.; Bushard, Louis B.; Byers, Larry L.; Hamstra, James R.; and Homan, Charles J., 4,873,630, Cl. 364-200.000.
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 Rufin, Denis; and Hirase, Ikuo, 4,872,944, Cl. 156-626.000.
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 Lamb, Steve: See—
 Moore, Robert R.; Lamb, Steve; and Wolf, Eugene M., 4,872,451, Cl. 128-92.0YF.
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 Lamprecht, Ned L.; and Hawley, Clyde W., to Dollinger Corporation. Multi-stage gas-entrained liquid separator. 4,872,890, Cl. 55-323.000.
 Land O'Lakes, Inc.: See—
 Pischke, LaMonte D.; and Greene, Ralph J., 4,873,094, Cl. 426-43.000.
 Landais, Yannick: See—
 Robin, Jean-Pierre; and Landais, Yannick, 4,873,349, Cl. 549-298.000.
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 Altman, Ralph F.; Gooch, John P.; Dismukes, Edward B.; and Landham, Edward C., Jr., 4,872,887, Cl. 55-5.000.
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 Landis Plastics, Inc.: See—
 Landis, H. Richard, 4,872,586, Cl. 220-307.000.
 Landmeier, Waldo L., to Calcomp Inc. Ink-on-glass digitizer tablet and method of construction. 4,873,399, Cl. 178-18.000.
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 Lantrua, Jean-Francois: See—
 Issalene, Robert; and Lantrua, Jean-Francois, 4,872,837, Cl. 433-29.000.
 Lanxide Technology Company, LP: See—
 Rapp, Robert A.; and LaRoche, E. Allen, Jr., 4,873,038, Cl. 264-60.000.
 Lapini, Corrado; and Esposito, Franco, to Costruzione Macchine Speciali C.M.S. srl. Process for the automatic production of ornamental link chains and relative apparatus. 4,872,305, Cl. 59-18.000.
 Larkin, John M.: See—
 Sanderson, John R.; and Larkin, John M., 4,873,380, Cl. 568-914.000.
 LaRoche, E. Allen, Jr.: See—
 Rapp, Robert A.; and LaRoche, E. Allen, Jr., 4,873,038, Cl. 264-60.000.
 Larson, Curtis L.; and LePere, Pierre H., to Minnesota Mining and Manufacturing Company. Microwave food package and grease absorbent pad therefor. 4,873,101, Cl. 426-113.000.
 Laserdrive Ltd.: See—
 Chung, Chi H.; Rees, Theodore D.; and Turner, Ian, 4,873,680, Cl. 369-59.000.
 Lassiak, Philippe: See—
 Gay, Christian; and Lassiak, Philippe, 4,872,539, Cl. 192-98.000.
 Lasukova, Ijudmila P.: See—
 Grebenkin, Anatoly F.; Glagovsky, Boris A.; Moskovenko, Igor B.; and Lasukova, Ijudmila P., 4,872,344, Cl. 73-579.000.
 Latone, Salvatore, to M.T.S.L. Associates. Sheet sorter apparatus. 4,872,663, Cl. 271-294.000.
 Latosky, Joseph A., to Sun Chemical Corporation. Phosphate ester pigment dispersant. 4,872,916, Cl. 106-503.000.
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 Laverty, Martin J., Jr., to Coyne & Delany Co. Sensor operated water flow control. 4,872,485, Cl. 137-624.110.
 Law, Kam S.: See—
 Wang, David N.; White, John M.; Law, Kam S.; Leung, Cissy; Umotoy, Salvador P.; Collins, Kenneth S.; Adamik, John A.; Perlov, Ilya; and Maydan, Dan, 4,872,947, Cl. 156-643.000.
 Lawson, R. Joe: See—
 Sachtlar, J. W. Adriaan; and Lawson, R. Joe, 4,873,387, Cl. 585-482.000.
 Leach, Robert D.: See—
 Streich, Herbert K.; Leach, Robert D.; Johnson, Joel R.; Olson, Thomas B.; and Townsend, Donald L., 4,873,422, Cl. 219-370.000.
 Lee, Chung Suk: See—
 Jung, Il Nam; Hwang, Sang Yo; and Lee, Chung Suk, 4,873,011, Cl. 252-75.000.
 Lee, John Y.; and Spielman, Edgar E., Jr., to Ethyl Corporation. Preparation of dibromoneopentyl glycol. 4,873,377, Cl. 568-844.000.
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 Kinney, William A.; and Lee, Nancy E., 4,873,238, Cl. 514-227.800.
 Lee, Sang G.: See—
 Kim, In O.; and Lee, Sang G., 4,873,363, Cl. 568-319.000.
 Lee, Wen-bin. Device for improving the flavor or removing the piquante flavor of fermented products. 4,872,401, Cl. 99-275.000.
 Lefebvre, Martin C.; Ciancibello, Carmine A.; and Geadah, Youssef A., to Northern Telecom Limited. Message FIFO buffer controller. 4,873,666, Cl. 365-189.070.
 Lefebvre, Martin C.: See—
 Geadah, Youssef A.; and Lefebvre, Martin C., 4,873,667, Cl. 365-189.070.
 Lefevre, Jean-Claude A.; and Mauboussin, Antoine T., to Case Poclain. Fluid pressure regulating valve. 4,872,472, Cl. 137-116.300.
 LeGasse, David S.: See—
 Fennell, Robert B.; Fritts, David H.; and LeGasse, David S., 4,872,847, Cl. 439-133.000.
 Leggett & Platt, Incorporated: See—
 Bustos, Rafael T., 4,872,567, Cl. 211-59.200.
 Leheny, Robert F.: See—
 Abeles, Joseph H.; Kastalsky, Alexander; and Leheny, Robert F., 4,872,744, Cl. 350-356.000.
 Lehmann, Ernest. Coat hanger suspending device. 4,872,568, Cl. 211-113.000.
 Lehmann, Hans D.: See—
 Rosy, Philip A.; Thyse, Marco; Franke, Albrecht; Koenig, Horst; Lehmann, Hans D.; Gries, Josef; Friedrich, Ludwig; and Lenke, Dieter, 4,873,246, Cl. 514-252.000.
 Lehr, Douglas J.; Bell, Merle L.; Rubbo, Richard P.; and Forehand, Richard L., to Baker Hughes Incorporated. Subterranean well casing float tool. 4,872,510, Cl. 166-327.000.
 Le Jeung, Claude, to Centre National de la Recherche Scientifique. Source of ions of the triode type with a single high frequency excitation ionization chamber and magnetic confinement of the multipole type. 4,873,445, Cl. 250-432.00R.
 Leland Stanford Junior University, The Board of Trustees of the: See—
 Risk, William P.; and Kino, Gordon S., 4,872,738, Cl. 350-96.290.
 Lenke, Dieter: See—
 Rosy, Philip A.; Thyse, Marco; Franke, Albrecht; Koenig, Horst; Lehmann, Hans D.; Gries, Josef; Friedrich, Ludwig; and Lenke, Dieter, 4,873,246, Cl. 514-252.000.
 Leonard, Thomas W.; Mikula, Karol Kay; and Schlesinger, Marcia S., to American Home Products Corp. Menthone enhancement of transdermal drug delivery. 4,873,266, Cl. 514-653.000.
 Leone, Joseph A.: See—
 Oquendo, Javier N.; and Leone, Joseph A., 4,872,992, Cl. 210-659.000.
 LePere, Pierre H.: See—
 Larson, Curtis L.; and LePere, Pierre H., 4,873,101, Cl. 426-113.000.
 Lepperhoff, Gerhard; and Huthwohl, Georg, to FEV Motorentechnik GmbH & Co., K.G. Filter system for the removal of engine emission particulates. 4,872,889, Cl. 55-267.000.
 Leung, Cissy: See—
 Wang, David N.; White, John M.; Law, Kam S.; Leung, Cissy; Umotoy, Salvador P.; Collins, Kenneth S.; Adamik, John A.; Perlov, Ilya; and Maydan, Dan, 4,872,947, Cl. 156-643.000.
 Leung, See C.: See—
 Tedham, Thomas A.; and Leung, See C., 4,872,733, Cl. 312-255.000.
 Leung, Wai C.: See—
 Juliana, Anthony; Leung, Wai C.; Pan, Victor T.; Rosen, Hal J.; and Strand, Timothy C., 4,873,430, Cl. 250-225.000.
 Le Van Mao, Raymond, to Concordia University. Catalytic conversion of aqueous ethanol to ethylene. 4,873,392, Cl. 585-640.000.
 Lever Brothers Company: See—
 Thom, David; Swarthoff, Ton; and Maat, Jan, 4,873,016, Cl. 252-174.120.
 Levine, Anthony. Electrically powered automobile jack and nut remover. 4,872,230, Cl. 7-100.000.
 Levine, Jules D.: See—
 Jensen, Millard J.; and Levine, Jules D., 4,872,607, Cl. 228-180.100.

Lew, Hyok S.; and Lew, Hyon S. Moving cylinder actuator. 4,872,360, Cl. 74-110.000.
 Lew, Hyon S.: See—
 Lew, Hyok S.; and Lew, Hyon S., 4,872,360, Cl. 74-110.000.
 Lewis, Jeffrey M. O.; and Price, Joe B., to UOP. Chemical conversion process. 4,873,390, Cl. 585-638.000.
 Leybold Aktiengesellschaft: See—
 Krause, Hans; Ross, Rudi; and Koch, Helmut, 4,872,769, Cl. 384-226.000.
 LIBA Maschinenfabrik GmbH: See—
 Wunner, Roland, 4,872,323, Cl. 66-84.00A.
 Libbey-Owens-Ford Co.: See—
 Enk, Allan T.; and Flaughner, Jeffrey R., 4,872,898, Cl. 65-287.000.
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 Lichtensperger, Ernst. Arrangement of a module within a casing frame. 4,873,614, Cl. 361-394.000.
 Liebig, Martin: See—
 Wehowsky, Frank; and Liebig, Martin, 4,873,306, Cl. 528-28.000.
 Lienart, Jean-Pierre, to Malico S.A. Insulated anchoring clamp for insulated electric conductor equipped with a carrying cable. 4,872,626, Cl. 248-63.000.
 Life Support Products, Inc.: See—
 Fangrow, Thomas F., Jr., 4,872,641, Cl. 251-148.000.
 LifeProtech, Inc.: See—
 Multer, Thomas L., 4,872,512, Cl. 169-51.000.
 Ligensa, Karl: See—
 White, Harry H.; and Ligensa, Karl, 4,872,726, Cl. 297-367.000.
 Lileck, John T.: See—
 Schweighardt, Frank K.; Bailey, Webb I.; Lileck, John T.; Graybill, John K.; and Lutz, Eugene G., 4,873,315, Cl. 570-130.000.
 Lilly, Carol. Foldable playtray. 4,872,410, Cl. 108-26.000.
 Lin, Robert C.: See—
 Lo, Yi C., 4,872,643, Cl. 251-252.000.
 Linde, Scott A., to Formax, Inc. Patty molding mechanism for fibrous food product. 4,872,241, Cl. 17-32.000.
 Lindholm, Stig O. E., to Orion-yhtymä Oy. A process for the preparation of anhydrous, stable, crystalline delta-form of prazosin hydrochloride. 4,873,330, Cl. 544-291.000.
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 Lindsey, Kevin, to National Research Development Corporation. Mounting device. 4,872,291, Cl. 51-166.00R.
 Link, Walter: See—
 Rapp, Werner; Link, Walter; and Quinzio, Giovanni, 4,873,400, Cl. 178-19.000.
 Linn, Bruce O.; and Mrozik, Helmut, to Merck & Co., Inc. Avermectin derivatives. 4,873,224, Cl. 514-30.000.
 Linsley, Peter: See—
 Hellstrom, Ingegerd; Brown, Joseph P.; Hellstrom, Karl E.; Horn, Diane; and Linsley, Peter, 4,873,188, Cl. 435-7.000.
 Liposome Technology, Inc.: See—
 Mayhew, Eric; Ehrke, M. Jane; Mace, Kenneth; Szoka, Francis; and Olson, Fred C., 4,873,088, Cl. 424-450.000.
 Lippman, Gerald: See—
 Lippman, Glenn W.; and Lippman, Gerald, 4,872,941, Cl. 156-497.000.
 Lippman, Glenn W.; and Lippman, Gerald. Automatic welding apparatus for welding thermoplastic materials in sheet form. 4,872,941, Cl. 156-497.000.
 List, Walter: See—
 Holy, Franz; and List, Walter, 4,872,380, Cl. 82-124.000.
 Litzinger, William A.: See—
 Hendley, David G.; and Litzinger, William A., 4,872,812, Cl. 416-190.000.
 Liu, Chung-Heng: See—
 Meyers, Peter V.; Liu, Chung-Heng; and Frey, Timothy J., 4,873,198, Cl. 437-5.000.
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 Coon, Darryl D.; Karunasiri, Runkiri P.; and Liu, Hui C., 4,873,555, Cl. 357-4.000.
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 Loftfield, Richard E.: See—
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 Lonardo, Robert, to Lonardo, Robert. Means for positioning bedfast patients. 4,872,226, Cl. 5-61.000.
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 Long, William B., to AMP Incorporated. Channel outlet. 4,872,849, Cl. 439-209.000.
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 Lucas Industries Public Limited Company: See—
 Greeves, Godfrey; and Fry, Robert J., 4,872,614, Cl. 239-533.900.
 Lucas Weinschel, Inc.: See—
 Adam, Stephen F., 4,873,484, Cl. 324-95.000.
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 Lucius, John E.: See—
 Grebe, Robert K.; Lucius, John E.; and Szczesny, David S., 4,872,844, Cl. 439-69.000.
 Luderer, Fred: See—
 Behr, Hans; Vetter, Kurt; Schneider, Rolf; and Luderer, Fred, 4,872,616, Cl. 239-703.000.
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 Luke, James J., to Frankandale Corporation. Cap detector for bottling system with high speed gate mechanism. 4,872,300, Cl. 53-53.000.
 Lummis, David J.; and Masso, Jon D., to American Optical Corporation. Lens for video terminal screen. 4,872,749, Cl. 351-44.000.
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 Swan, Ellen L.; Basu, Rajat S.; Lund, Earl A. E.; and Wilson, David P., 4,873,015, Cl. 252-171.000.
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 Lutz, Henning: See—
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 Luven, Arno: See—
 Holtermann, Heinz; and Luven, Arno, 4,872,648, Cl. 266-275.000.
 Lybeck, Lynn V.: See—
 Lane, Leslie A.; Lybeck, Lynn V.; Perloff, David S.; and Kumagi, Shoji, 4,873,623, Cl. 364-188.000.
 M-A-N Ashton Inc.: See—
 Hoge, Ross A., 4,872,658, Cl. 270-39.000.
 M & D Research Co., Ltd.: See—
 Saotome, Yasushi; Miyazawa, Takeo; and Endo, Takeshi, 4,873,301, Cl. 526-257.000.
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 Lussi, Andre, 4,872,657, Cl. 269-325.000.
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 Latone, Salvatore, 4,872,663, Cl. 271-294.000.
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 Skinner, Timothy J.; Spurney, Joseph L.; and Ma, Weiming, 4,872,814, Cl. 417-222.000.

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Thom, David; Swarthoff, Ton; and Maat, Jan, 4,873,016, Cl. 252-174.120.
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Brunet, Henri; Mabru, Michel; and Chauvet, Philippe, 4,873,695, Cl. 372-58.000.
- MacArthur, J. Ward: See—
Grald, Eric W.; and MacArthur, J. Ward, 4,873,649, Cl. 364-505.000.
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Shaw, Daniel G.; and MacCline, Billy, 4,872,517, Cl. 173-163.000.
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Hyodo, Kenji; Kozuka, Hiroshi; and MacDiarmid, Alan G., 4,873,556, Cl. 357-8.000.
- Mace, Kenneth: See—
Mayhew, Eric; Ehrke, M. Jane; Mace, Kenneth; Szoka, Francis; and Olson, Fred C., 4,873,088, Cl. 424-450.000.
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- Machida, Haruhiko: See—
Kobayashi, Hiroshi; Kobayashi, Masae; and Machida, Haruhiko, 4,872,445, Cl. 126-376.000.
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Pooley, Denis M.; and MacKenzie, Douglas K., deceased, 4,872,856, Cl. 439-783.000.
- MacKenzie, Russell U., administrator: See—
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Churchland, Mark T.; and Schilling, Walter W., 4,872,544, Cl. 198-382.000.
- MacMillan, Duncan J., Jr.: See—
Barnett, Paul M.; Welch, Douglas A.; and MacMillan, Duncan J., Jr., 4,873,718, Cl. 379-156.000.
- Madrid, Miguel T., Jr.: See—
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Katoh, Tsuguhiro; Maeda, Kiyoto; Shiroshita, Masao; Yamashita, Norihisa; Sanemitsu, Yuzuru; and Inoue, Satoru, 4,873,248, Cl. 514-269.000.
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Sasaki, Nobukazu; Kasamura, Toshiro; Ohashi, Masashi; Okuda, Naoki; Kusumoto, Toshihiko; Maeda, Yasunori; Ozawa, Takashi; Yamamoto, Yasuyoshi; Kubota, Atsushi; Kimura, Akiyoshi; and Masuda, Makoto, 4,873,547, Cl. 355-316.000.
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Ishikawa, Kazushige; Mochizuki, Kenji; Machara, Toshihiro; and Hagiri, Masaharu, 4,873,586, Cl. 358-342.000.
- Magee, Frank P.: See—
Bloebaum, Roy D.; and Magee, Frank P., 4,872,865, Cl. 604-28.000.
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Irwin, George F.; Smelters, Paul J.; Robertson, David J.; and Maginley, Ronald J., 4,873,682, Cl. 370-58.100.
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Richeson, William E.; and Erickson, Frederick L., 4,872,425, Cl. 123-90.130.
- Magnetic Peripherals Inc.: See—
Chen, Tsu-Fang, 4,873,594, Cl. 360-97.030.
- Magnusson, Lennart, to Mecanis AB. Tool for rotation ring type barking machines. 4,872,495, Cl. 144-208.00E.
- Mahler, Thomas G.: See—
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- Maier, Roland: See—
Bertiller, Roland; Maier, Roland; and Weisser, Harald, 4,872,390, Cl. 89-29.000.
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Sarna, David E. Y.; and Mailick, Daniel, 4,873,426, Cl. 235-462.000.
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Hedebaut, Marc; Mainardi, Pierre; Degauque, Pierre; and Duhot, Denis, 4,873,531, Cl. 343-711.000.
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Lienart, Jean-Pierre, 4,872,626, Cl. 248-63.000.
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Shadrach III, William S.; Mandler, Michael; Moch, Ihor D.; Ziotner, Bernard; and Stewart II, John L., 4,872,555, Cl. 206-459.000.
- Manecke, Georg: See—
Heckmann, Klaus; Manecke, Georg; Pfannenmuller, Beate; Ring, Klaus; and Ringsdorf, Helmut, 4,873,033, Cl. 264-41.000.
- Manker, Charles F., to Prism Technologies, Inc. Activator for initiating reaction in a heat pack and method for making same. 4,872,442, Cl. 126-263.000.
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Nerger, Klaus K., 4,872,718, Cl. 294-86.400.
- Mano, Eiko: See—
Ikada, Junji; and Mano, Eiko, 4,873,227, Cl. 514-47.000.
- Mansfield, Peter; and Chapman, Barry L. W., to National Research Development Corporation. Electrical coils. 4,873,503, Cl. 335-216.000.
- Mansfield, Ronald N. Extension cord winding and storage apparatus. 4,872,622, Cl. 242-85.100.
- Mansukhani, Gul: See—
Cherukuri, Subraman R.; and Mansukhani, Gul, 4,872,884, Cl. 426-3.000.
- Marach, David R., to Cooper Industries, Inc. Holder for a blade-type circuit element. 4,872,262, Cl. 29-884.000.
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Ogiso, Taro, 4,873,081, Cl. 424-81.000.
- Marchand, Gary R.: See—
Fuentes, Ricardo, Jr.; Meiske, Larry A.; and Marchand, Gary R., 4,873,300, Cl. 526-142.000.
- Marchesano, Carlo; Buriano, Franco; and Furlanetto, Enrico, to Minnesota Mining and Manufacturing Company. Developer compositions for silver halide photographic materials comprising cyclic amino methane diphosphonic acid compounds. 4,873,180, Cl. 430-491.000.
- Maret, S. Melissa: See—
Bloomster, Timothy G.; Feindt, Hans H.; Hahn, Gerald D.; and Maret, S. Melissa, 4,873,126, Cl. 427-282.000.
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Barnett, Jay D.; Ludwig, Bryan J.; Marks, Ernest E.; and Moore, Scott E., 4,872,356, Cl. 73-866.500.
- Marley, Clement F.: See—
Spinner, Raphael F.; Marley, Clement F.; Brown, Mary; and Grant, Cathy, 4,872,240, Cl. 16-114.00B.
- Marriner, Raymond E. Air heat exchanger. 4,872,503, Cl. 165-54.000.
- Marshall, Robert M., to Allied-Signal Inc. Fiber for composite reinforcement with anti-blocking finish. 4,873,144, Cl. 428-395.000.
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Browne, Fredrick D.; and Martin, Jacob H., 4,872,316, Cl. 62-129.000.
- Martin, Jr. John B.: See—
Pinchuk, Leonard; and Martin, Jr. John B., 4,872,455, Cl. 128-305.000.
- Martin, Michael A. Game apparatus. 4,872,681, Cl. 273-118.00R.
- Martone, Louis C.: See—
Johnson, Paul D.; Kubicko, Robert E.; Martone, Louis C.; and Moores, Gregory E., 4,872,402, Cl. 99-280.000.
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- Marzolph, Gerhard: See—
Behre, Horst; Blank, Heinz U.; Marzolph, Gerhard; and Streicher, Willi, 4,873,026, Cl. 562-72.000.
- Maschinenfabrik Heid Aktiengesellschaft: See—
Holy, Franz; and List, Walter, 4,872,380, Cl. 82-124.000.
- Mashiko, Koichiro: See—
Furutani, Kiyohiro; Mashiko, Koichiro; Arimoto, Kazutami; Matsumoto, Noriaki; and Matsuda, Yoshio, 4,873,669, Cl. 365-189.010.
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Gifford, David K., 4,873,626, Cl. 364-200.000.
- Hagelstein, Peter L.; and Eugster, Christopher C., 4,873,439, Cl. 250-327.200.
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- Melcher, James R.; Morin, Alfred J., II; and Zahn, Markus, 4,873,489, Cl. 324-453.000.
- Saito, Haruo; Kranz, David M.; Eisen, Herman N.; and Tonegawa, Susumu, 4,873,190, Cl. 435-172.300.

- Masso, Jon D.: See—
Lummis, David J.; and Masso, Jon D., 4,872,749, Cl. 351-44.000.
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- Master Products Inc.: See—
Kopf, Thomas W., 4,872,723, Cl. 297-216.000.
- Masuda, Makoto: See—
Sasaki, Nobukazu; Kasamura, Toshiro; Ohashi, Masashi; Okuda, Naoki; Kusumoto, Toshihiko; Maeda, Yasunori; Ozawa, Takashi; Yamamoto, Yasuyoshi; Kubota, Atsushi; Kimura, Akiyoshi; and Masuda, Makoto, 4,873,547, Cl. 355-316.000.
- Masuda, Satoru; and Ishigami, Hiroyuki, to Otsuka Koki Kabushiki Kaisha. Intermittently-driven belt conveyor. 4,872,548, Cl. 198-859.000.
- Masui, Syohei; Matsumoto, Masahito; and Usui, Nobuhiro, to Sumitomo Chemical Company, Limited. Process for producing a multilayer molded article. 4,873,041, Cl. 264-135.000.
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- Matai, Masahiro; Ohayagi, Takashi; and Mori, Toshihiro, to NEC Corporation. Paging receiver having independent memory areas for common and individual addresses. 4,873,519, Cl. 340-825.440.
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Suzuki, Tatsuo; and Isono, Keinosuke, 4,872,553, Cl. 206-524.400.
- Matheson, Ronald R.: See—
Hucul, Daniel E.; and Matheson, Ronald R., 4,872,613, Cl. 239-280.000.
- Matoba, Yuji: See—
Koshihara, Toshio; Misawa, Rokuro; Sagawa, Yuzo; Takehara, Kimio; Matoba, Yuji; and Ishihara, Koji, 4,872,762, Cl. 374-5.000.
- Matsuda, Hidemi: See—
Itou, Takeo; Matsuda, Hidemi; Yoshizako, Mamoru; and Yagi, Osamu, 4,873,120, Cl. 427-64.000.
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- Matsuda, Yoshio: See—
Furutani, Kiyohiro; Mashiko, Koichiro; Arimoto, Kazutami; Matsumoto, Noriaki; and Matsuda, Yoshio, 4,873,669, Cl. 365-189.010.
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- Matsui, Kazuhiro, to Kitagawa Industries Co., Ltd. Electric noise absorber. 4,873,505, Cl. 336-92.000.
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Higuchi, Noboru; Matsui, Keizo; Kobayashi, Chuzo; and Yamaguchi, Shigeru, 4,872,763, Cl. 366-160.000.
- Matsui, Toshio: See—
Ishikawa, Takuma; Maruyama, Tadashi; Johdai, Akiyoshi; Ishiguro, Kuniaki; and Matsui, Toshio, 4,872,662, Cl. 271-290.000.
- Matsuki, Kunio: See—
Kurosawa, Shigeru; and Matsuki, Kunio, 4,873,295, Cl. 425-420.000.
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Masui, Syohei; Matsumoto, Masahito; and Usui, Nobuhiro, 4,873,041, Cl. 264-135.000.
- Matsumoto, Noriaki: See—
Furutani, Kiyohiro; Mashiko, Koichiro; Arimoto, Kazutami; Matsumoto, Noriaki; and Matsuda, Yoshio, 4,873,669, Cl. 365-189.010.
- Matsumoto, Yoshiyuki: See—
Kume, Hidehiro; Matsumoto, Yoshiyuki; and Yoshitoshi, You, 4,873,429, Cl. 250-216.000.
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- Matsumura, Shuzo; Mizuno, Takanori; Aoki, Noboru; and Suzuki, Takahiro, to NGK Spark Plug Co., Ltd. Igniter plug. 4,873,466, Cl. 313-131.00R.
- Matsuo, Norio: See—
Yui, Hiroshi; Okamura, Michiya; Ikeda, Masakazu; and Matsuo, Norio, 4,873,282, Cl. 524-496.000.
- Matsuo, Takaharu: See—
Sawamura, Norio; Matsuo, Takaharu; Tsumura, Kazunobu; and Ebihara, Yoshitaka, 4,873,194, Cl. 435-198.000.
- Matsuoka, Kazuhiko: See—
Baba, Takeshi; Matsuoka, Kazuhiko; Usui, Masayuki; Minoura, Kazuo; Someya, Atsushi; and Suzuki, Masayuki, 4,872,743, Cl. 350-353.000.
- Matsuoka, Tetsunori: See—
Miyazaki, Noriyuki; and Matsuoka, Tetsunori, 4,873,160, Cl. 429-170.000.
- Matsushita Electric Industrial Co., Ltd.: See—
Fujimoto, Masayuki; Tao, Munee; and Uchida, Kuniaki, 4,872,831, Cl. 431-73.000.
- Harada, Tsutomu; and Okamura, Yasushi, 4,873,596, Cl. 360-99.110.
- Ishiwata, Tetsuo; and Taguchi, Katsuyuki, 4,873,590, Cl. 360-73.140.
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- Murai, Katsumi; and Usui, Makoto, 4,873,679, Cl. 369-32.000.
- Nishiyama, Tamotsu; and Kuninobu, Shigeo, 4,873,660, Cl. 364-768.000.
- Matsushita Electric Works, Ltd.: See—
Akiyama, Sigeo, 4,873,202, Cl. 437-62.000.
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- Matsuzaka, Syoji: See—
Hattori, Tsuyoshi; Tanaka, Masanao; and Matsuzaka, Syoji, 4,873,576, Cl. 358-224.000.
- Matsuzaki, Minoru; Itoh, Junichi; and Watanabe, Youji, to Olympus Optical Co., Ltd. Automatic focusing camera. 4,873,543, Cl. 354-402.000.
- Matsuzawa, Kunihiko: See—
Hirose, Yoshihiko; Aoki, Tomohiro; Chiku, Kazuyoshi; Murayama, Yasushi; Uchida, Takashi; Matsuzawa, Kunihiko; and Kanekura, Kazunori, 4,873,541, Cl. 346-160.100.
- Mattera, Vincent D., Jr.: See—
Antreasian, Arsam; Garbinski, Paul A.; Mattera, Vincent D., Jr.; and Temkin, Henryk, 4,873,558, Cl. 357-23.200.
- Matthews, John H.: See—
Benton, Terry L.; and Matthews, John H., 4,872,370, Cl. 74-579.00E.
- Matthews, Robert T.: See—
Davis, Cecil J.; Abernathy, Joseph V.; Matthews, Robert T.; Hildenbrand, Randall C.; Simpson, Bruce; Jones, John I.; Loewenstein, Lee M.; and Bohlman, James G., 4,872,938, Cl. 156-345.000.
- Mauboussin, Antoine T.: See—
Lefevre, Jean-Claude A.; and Mauboussin, Antoine T., 4,872,472, Cl. 137-116.300.
- Maurer, Leonhard: See—
Roemer, Erich; Kuhn, Matthias; and Maurer, Leonhard, 4,872,248, Cl. 29-149.5DP.
- Mausier-Werke Oberndorf GmbH: See—
Bertiller, Roland; Maier, Roland; and Weisser, Harald, 4,872,390, Cl. 89-29.000.
- Max AG: See—
Greuter, Albert; and Gasser, Ruedi, 4,872,266, Cl. 30-346.510.
- Maydan, Dan: See—
Wang, David N.; White, John M.; Law, Kam S.; Leung, Cissy; Umotoy, Salvador P.; Collins, Kenneth S.; Adamik, John A.; Perlov, Ilya; and Maydan, Dan, 4,872,947, Cl. 156-643.000.
- Mayer, Norbert: See—
Engel, Wolfhard; Eberlein, Wolfgang; Mihm, Gerhard; Trummlitz, Gunter; Mayer, Norbert; and De Jonge, Adriaan, 4,873,236, Cl. 514-220.000.
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Dulaff, Paul G.; and McGraw, C. Eugene, 4,873,592, Cl. 360-90.000.
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Crotts, Lonnie; and Meadows, Thomas W., 4,872,238, Cl. 15-302.000.
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De Rooij, Johannes F. M.; and Meakins, Stepien E., 4,873,108, Cl. 426-533.000.
- Mecanis AB: See—
Magnusson, Lennart, 4,872,495, Cl. 144-208.00E.
- Med Optics Corp.: See—
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Hobbs, Frank W.; and Meek, James L., 4,873,355, Cl. 558-161.000.
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Fuentes, Ricardo, Jr.; Meiske, Larry A.; and Marchand, Gary R., 4,873,300, Cl. 526-142.000.
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Hattori, Shuzo; Tagawa, Takashi; and Asano, Motomu, 4,873,709, Cl. 378-142.000.
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Cook, Benjamin H., Jr., 4,873,693, Cl. 372-33.000.
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Arbeniev, Alexandr S.; Ignatiev, Alexandr A.; Zhilin, Vitaly A.; Melnikov, Alexandr S.; and Tomsikh, Sergei F., 4,872,760, Cl. 366-7.000.
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Aime, Jean-Marc; Mention, Georges; and Thouzeau, Andre, 4,873,270, Cl. 523-128.000.
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Alberts, Alfred W.; and Greenspan, Michael D., 4,873,260, Cl. 514-449.000.
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Krause, Joachim; Wachtler, Andreas; Scheuble, Bernard; and Weber, Georg, 4,873,019, Cl. 252-299.610.
- Merdinian, George K.: See—
Miram, George V.; Green, Michael C.; and Merdinian, George K., 4,873,468, Cl. 313-411.000.
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Brode, George L., II; and Merritt, Frederick M., II, 4,873,293, Cl. 525-417.000.
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van Eijdsden, Cornelis; and Mersman, Jan C., 4,872,302, Cl. 53-441.000.
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Dirksing, Robert S.; Girardot, Richard M.; and Merz, Theodore P., 4,873,100, Cl. 426-111.000.
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Neulinger, Franz; Schummer, Helmut; Donig, Gerhard; and Schmidt, Walter, 4,873,620, Cl. 363-57.000.
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Blankemeyer, Robert L.; and Blankemeyer, James C., 4,872,419, Cl. 118-713.000.
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Kunz, Peter, 4,872,522, Cl. 177-229.000.
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McGarrity, John; Tenud, Leander; and Meul, Thomas, 4,873,339, Cl. 548-110.000.
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Chen, Fu; and Michalopoulos, Daniel L., 4,872,995, Cl. 210-699.000.
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de Chambost, Emmanuel; Micheron, Francois; Vallet, Francois; and Vignolle, Jean-Michel, 4,873,455, Cl. 307-201.000.
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Ruesch, James R., 4,872,351, Cl. 73-861.040.
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Hoye, Robert S.; and Roach, Theodore H., 4,872,672, Cl. 273-1.00E.
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Orr, Clyde, Jr.; and Camp, Ronnie, 4,872,353, Cl. 73-864.850.
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Barnett, Jay D.; Ludwig, Bryan J.; Marks, Ernest E.; and Moore, Scott E., 4,872,356, Cl. 73-866.500.
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Johnson, Harold K., 4,872,303, Cl. 53-481.000.
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Skibinski, Robert E., 4,872,523, Cl. 177-255.000.
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Unger, Larry E., 4,872,552, Cl. 206-365.000.
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Abe, Akira; Mihayashi, Keiji; and Ichijima, Seiji, 4,873,179, Cl. 430-382.000.
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Engel, Wolfhard; Eberlein, Wolfgang; Mihm, Gerhard; Trummlitz, Gunter; Mayer, Norbert; and De Jonge, Adriaan, 4,873,236, Cl. 514-220.000.
- Mikami, Takashi: See—
Komatsu, Masato; Baba, Isao; Mikami, Takashi; Narukawa, Kiyotada; and Kanai, Tsuyoshi, 4,873,288, Cl. 525-194.000.
- Mikawa, Hiroji: See—
Kinoshita, Mitsuo; Ito, Tetsuo; Mikawa, Hiroji; and Chino, Koichi, 4,872,948, Cl. 159-6.200.
- Mikes, John: See—
Good, William R.; Mikes, John; and Sikora, Joseph, 4,873,086, Cl. 424-409.000.
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Leonard, Thomas W.; Mikula, Karol Kay; and Schlesinger, Marcia S., 4,873,266, Cl. 514-653.000.
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- Miller, Leonard F.: See—
Wittnebel, Bruce W.; Reimer, Kerry D.; and Miller, Leonard F., 4,873,135, Cl. 428-192.000.
- Miller, Robert C., to Westinghouse Electric Corp. Active shaft grounding and diagnostic system, 4,873,512, Cl. 340-679.000.
- Miller, Terrence C.: See—
Baum, Allen J.; Miller, Terrence C.; and Fotland, David A., 4,873,627, Cl. 364-200.000.
- Millet, Claude: See—
Cavezzan, Jacques; Frances, Jean-Marc; and Millet, Claude, 4,873,305, Cl. 528-18.000.
- Milliken Research Corporation: See—
Godfrey, Thomas E., 4,872,276, Cl. 38-101.000.
- Lang, Aage, 4,873,040, Cl. 264-102.000.
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- Mills, Stuart D.: See—
Hargreaves, Rodney B.; McLoughlin, Bernard J.; and Mills, Stuart D., 4,873,254, Cl. 514-356.000.
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- Minato, Shinichiro: See—
Uesugi, Akio; Kakei, Tsutomu; and Minato, Shinichiro, 4,872,946, Cl. 156-637.000.
- Minc Incorporated: See—
Banki, Mehrdad; Bush, Kevin M.; and McDermith, William O., 4,873,647, Cl. 364-488.000.
- Ministry of International Trade and Industry: See—
Matsui, Haruo; Nakagawa, Ippei; and Kato, Kiyotaka, 4,873,073, Cl. 423-617.000.
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Alexson, Charles E., 4,872,452, Cl. 128-92.0VJ.
- Delprato, Ivano; and Baldassarri, Agostino, 4,873,182, Cl. 430-546.000.
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- McIntyre, Daniel K., 4,873,140, Cl. 428-343.000.
- Muggli, Imelda A., 4,873,020, Cl. 252-355.000.
- Oike, Tomoyasu, 4,873,533, Cl. 343-744.000.
- Ostrander, Kenneth A., 4,873,483, Cl. 324-72.000.
- Rieder, Werner, 4,873,060, Cl. 422-135.000.
- Simpson, Sharon M., 4,873,184, Cl. 430-617.000.
- Wittnebel, Bruce W.; Reimer, Kerry D.; and Miller, Leonard F., 4,873,135, Cl. 428-192.000.
- Wyberg, Gregory R., 4,872,562, Cl. 206-631.300.
- Minohata, Masanori: See—
Yamada, Yasuhiro; Imamura, Takeshi; Honda, Hidemasa; Fujii, Masaki; and Minohata, Masanori, 4,873,071, Cl. 423-448.000.
- Minolta Camera Kabushiki Kaisha: See—
Ishikawa, Takuma; Maruyama, Tadashi; Johdai, Akiyoshi; Ishiguro, Kuniaki; and Matsui, Toshio, 4,872,662, Cl. 271-290.000.
- Ito, Masazumi, 4,873,431, Cl. 250-227.000.
- Otsuki, Hajime, 4,873,552, Cl. 355-271.000.
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- Minoura, Kazuo: See—
Baba, Takeshi; Matsuoka, Kazuhiko; Usui, Masayuki; Minoura, Kazuo; Someya, Atsushi; and Suzuki, Masayuki, 4,872,743, Cl. 350-353.000.
- Minowa, Takehiko; and Yamamoto, Toshifumi, to Kabushiki Kaisha Toshiba. Method and apparatus for preventing unevenness in printing depth in a thermal printer, 4,873,536, Cl. 346-76.0PH.
- Miram, George V.; Green, Michael C.; and Merdinian, George K., to Varian Associates, Inc. Multiple sheet beam gridded electron gun, 4,873,468, Cl. 313-411.000.
- Mirella, Charles H.: See—
Barasch, Marian; and Mirella, Charles H., 4,872,354, Cl. 73-865.800.
- Misawa, Rokuro: See—
Koshihara, Toshio; Misawa, Rokuro; Sagawa, Yuzo; Takehara, Kimio; Matoba, Yuji; and Ishihara, Koji, 4,872,762, Cl. 374-5.000.
- Misumi, Akira: See—
Kumada, Masaharu; and Misumi, Akira, 4,872,924, Cl. 148-12.100.
- Mita Industrial Co., Ltd.: See—
Tada, Tomio; Hirobe, Junichi; Takamatsu, Junichi; Hori, Kazuto; and Aikawa, Yukihiro, 4,873,549, Cl. 355-206.000.
- Mitamura, Kenichi: See—
Takeuchi, Mikio; Nakano, Kinichiro; Mitamura, Kenichi; and Tomoda, Takahisa, 4,873,530, Cl. 343-711.000.
- Mitchell, Cheryl R.; and Mitchell, Pat R., to FruitSource Associates. Fruit concentrate sweetener and process of manufacture, 4,873,112, Cl. 426-599.000.
- Mitchell, Monte C., to B & H Manufacturing Company, Inc. Heat shrink labeling machine with extended chuck, 4,872,931, Cl. 156-86.000.
- Mitchell, Pat R.: See—
Mitchell, Cheryl R.; and Mitchell, Pat R., 4,873,112, Cl. 426-599.000.
- Mitchell, Stephen W., to National Research Development Corporation. Improvements in or relating to driving connections between two rotatable bodies, 4,872,428, Cl. 123-90.170.
- MITEC Moderne Industrietechnik GmbH: See—
Mehner, Walter, 4,873,518, Cl. 340-825.070.
- Mito, Yoshio: See—
Nakamura, Kazuharu; Mito, Yoshio; Nakanishi, Yutaka; Yamada, Toshihiko; Nakamura, Kenji; and Itoh, Kiyonobu, 4,872,829, Cl. 431-33.000.
- Mitsubishi Chemical Industries Limited: See—
Yoshida, Katsuhira; and Kubo, Yuji, 4,873,332, Cl. 546-7.000.
- Mitsubishi Denki Kabushiki Kaisha: See—
Asayama, Yoshiaki, 4,872,437, Cl. 123-463.000.
- Furutani, Kiyohiro; Mashiko, Koichiro; Arimoto, Kazutami; Matsumoto, Noriaki; and Matsuda, Yoshio, 4,873,669, Cl. 365-189.010.
- Hyodo, Kenji; Koezuka, Hiroshi; and MacDiarmid, Alan G., 4,873,556, Cl. 357-8.000.
- Ishii, Kazuhiro, 4,873,603, Cl. 361-96.000.
- Kazumoto, Yoshio; Suganami, Takuya; Furuishi, Yoshiro; and Kashiwamura, Kazuo, 4,872,313, Cl. 62-6.000.
- Moriyasu, Masaharu; Morita, Takeshi; and Ohmine, Megumi, 4,873,417, Cl. 219-121.600.
- Ozawa, Masayuki, 4,872,441, Cl. 123-651.000.
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- Takami, Akira, 4,872,818, Cl. 418-36.000.
- Tanaka, Seizo, 4,873,511, Cl. 340-677.000.
- Ueyama, Yoshiji; and Asayama, Yoshiaki, 4,872,435, Cl. 123-336.000.
- Watakabe, Yaichiro; Morimoto, Hiroaki; and Okamoto, Tatsuo, 4,873,163, Cl. 430-5.000.
- Yamamoto, Kyohei, 4,873,607, Cl. 361-210.000.
- Yoshioka, Nobuyuki; Fujiwara, Nobuo; and Watakabe, Yaichiro, 4,873,162, Cl. 430-5.000.
- Mitsubishi Jukogyo Kabushiki Kaisha: See—
Kawamata, Shigeya, 4,872,649, Cl. 267-136.000.
- Okabe, Yoshimi; Iwamoto, Keiichi; Torichigai, Masaaki; Kaneko, Shozo; Ichinari, Joji; and Koizumi, Kiyoshi, 4,872,347, Cl. 73-634.000.
- Satake, Tokuki; Sakai, Hiroshi; Nakatani, Hayami; Nakamori, Masaharu; and Ishibashi, Masaru, 4,873,156, Cl. 429-31.000.
- Mitsubishi Kasei Corporation: See—
Fujita, Takashi; Hihara, Toshio; Kogure, Yoshio; Sekioka, Riyouchi; and Nakamura, Noboru, 4,872,881, Cl. 8-549.000.
- Ono, Hitoshi; and Kato, Yoshiaki, 4,873,164, Cl. 430-58.000.
- Mitsubishi Kinzoku Kabushiki Kaisha: See—
Yato, Tadoku; Hagino, Sadaaki; and Tanaka, Hiroshi, 4,873,031, Cl. 264-0.500.
- Mitsubishi Paper Mills, Ltd.: See—
Nishinori, Hiroshi; Saikawa, Masahiko; Takaya, Yoshikazu; and Kanada, Eiji, 4,873,170, Cl. 430-204.000.
- Senga, Takao; Takaoka, Kazuchio; Yamamoto, Hirokazu; and Hashimoto, Takimi, 4,873,166, Cl. 430-137.000.
- Mitsubishi Petrochemical Company Limited: See—
Kadowaki, Koji; Sarumaru, Kohei; and Shibano, Takeshi, 4,873,368, Cl. 562-532.000.
- Yui, Hiroshi; Okamura, Michiya; Ikeda, Masakazu; and Matsuo, Norio, 4,873,282, Cl. 524-496.000.
- Mitsubishi Rayon Company, Ltd.: See—
Inoue, Kazutaka; Sato, Toshihiro; and Kobayashi, Masao, 4,873,391, Cl. 585-639.000.
- Terada, Hiromu; Fukahori, Naoyuki; and Sakunaga, Kenichi, 4,872,740, Cl. 350-96.260.
- Mitsui Toatsu Chemicals, Incorporated: See—
Miura, Tohru; Nagata, Teruyuki; Okazaki, Koji; Furuya, Masayuki; and Nishida, Emiko, 4,873,374, Cl. 568-743.000.
- Umemoto, Mitsumasa; Asano, Tamotsu; Horie, Hironobu; Takagi, Akinobu; Tamura, Nobuyasu; and Nishida, Takeshi, 4,873,373, Cl. 568-637.000.
- Mitsumori, Kazuya: See—
Taguchi, Katsuhiko; and Mitsumori, Kazuya, 4,873,595, Cl. 360-99.050.
- Mitsuya, Yoshihide: See—
Kageyama, Hidehei; Mitsuya, Yoshihide; and Nakazato, Yoichi, 4,872,776, Cl. 401-65.000.
- Mittelhauser, Bernhard; and Winkler, Bernd, to Mittelhauser, Bernhard. Exterior mirror for a vehicle, 4,872,636, Cl. 248-475.100.
- Miura, Tohru; Nagata, Teruyuki; Okazaki, Koji; Furuya, Masayuki; and Nishida, Emiko, to Mitsui Toatsu Chemicals, Incorporated. Preparation process of 4,4'-biphenol, precursor of same and preparation process of precursor, 4,873,374, Cl. 568-743.000.
- Miwa, Hiromichi: See—
Nagaishi, Hatsu; Seimiya, Yasuo; Tamura, Hideyuki; Miwa, Hiromichi; Sanbuchi, Hiroshi; Uchida, Masaaki; and Takahata, Toshio, 4,873,641, Cl. 364-431.040.
- Miyahara, Junji: See—
Mori, Nobufumi; Katoh, Takayuki; Oikawa, Tetsuo; Harada, Yoshiyasu; and Miyahara, Junji, 4,873,440, Cl. 250-327.200.
- Miyake, Akio: See—
Ishiguro, Shoji; Hirano, Shigeo; Shishido, Tadao; and Miyake, Akio, 4,873,172, Cl. 430-264.000.
- Miyamoto, Tetsuya: See—
Omura, Takashi; Kikkawa, Sadanobu; Morimitsu, Toshihiko; Harada, Naoki; and Miyamoto, Tetsuya, 4,873,321, Cl. 534-642.000.
- Miyamoto, Yukihiro: See—
Kobayashi, Hirokazu; Miyamoto, Yukihiro; Takai, Masaoki; Fujisawa, Syuichi; and Miyazawa, Hiroshi, 4,873,684, Cl. 370-102.000.
- Miyasaka, Nobuaki; and Suga, Shuzo, to Fuji Photo Film Co., Ltd. Silver halide photographic material, 4,873,181, Cl. 430-523.000.
- Miyata, Masao: See—
Minagawa, Takehiro; Stou, Toshio; Miyata, Masao; Nemoto, Kenji; and Uchida, Kuninobu, 4,872,793, Cl. 409-244.000.
- Miyawaki, Yoshinori, to Omron Tateisi Electronics Co.; and Isao KAI. Electronic blood pressure meter having improved cuff repressurization means, 4,872,461, Cl. 128-681.000.

- Miyazaki, Akihiko; Nonami, Tetsuo; and Ikuno, Yuji, to Olympus Optical Co., Ltd. Electronic endoscope apparatus. 4,873,572, Cl. 358-98.000.
- Miyazaki, Hiroya: See—
Togo, Sigeru; Saito, Yoichi; Tateyama, Masayuki; Okuma, Genji; and Miyazaki, Hiroya, 4,873,475, Cl. 318-489.000.
- Miyazaki, Noriyuki; and Matsuo, Tetsunori, to Sanyo Electric Co., Ltd. Rechargeable battery. 4,873,160, Cl. 429-170.000.
- Miyazaki, Takao; Yamada, Yoshiro; and Komine, Isamu, to NKK Corporation. Film thickness-measuring apparatus. 4,872,758, Cl. 356-381.000.
- Miyazaki, Wasei; and Inoue, Yasuhiko, to Otsuka Pharmaceutical Co., Ltd. Pharmaceutical composition for treating ulcerative large intestinal disease. 4,873,261, Cl. 514-462.000.
- Miyazawa, Hiroshi: See—
Kobayashi, Hirokazu; Miyamoto, Yukihiko; Takai, Masaoki; Fujisawa, Syuichi; and Miyazawa, Hiroshi, 4,873,684, Cl. 370-102.000.
- Miyazawa, Kazuyuki: See—
Etoh, Jun; Shimohigashi, Katsuhiko; Miyazawa, Kazuyuki; Kimura, Katsutaka; and Akiba, Takesada, 4,873,672, Cl. 365-218.000.
- Miyazawa, Takeo: See—
Satomme, Yasushi; Miyazawa, Takeo; and Endo, Takeshi, 4,873,301, Cl. 526-257.000.
- Miyoshi, Noriomi: See—
Tsuruoka, Michihiko; Nakagawa, Wataru; Miyoshi, Noriomi; Konosu, Naohiro; and Hashimoto, Tadao, 4,872,335, Cl. 73-30.000.
- Mizukami, Hikaru: See—
Sakurai, Kaoru; Murakami, Harunori; Mizukami, Hikaru; and Fujita, Kazuhisa, 4,873,532, Cl. 343-713.000.
- Mizukami, Toshihiko: See—
Sato, Yuyoi; and Mizukami, Toshihiko, 4,873,724, Cl. 381-40.000.
- Mizuno, Takanori: See—
Matsumura, Shuzo; Mizuno, Takanori; Aoki, Noboru; and Suzuki, Takahiro, 4,873,466, Cl. 313-131.00R.
- Mizunoya, Nobuyuki: See—
Sato, Hideki; and Mizunoya, Nobuyuki, 4,873,151, Cl. 428-627.000.
- Mizunuma, Yasuyuki: See—
Ohgihara, Takahiro; Murakami, Yoshikazu; Mizunuma, Yasuyuki; and Nakano, Hiroyuki, 4,873,496, Cl. 331-96.000.
- Mobay Corporation: See—
Lundy, Charles E.; and Krishnan, Sivaram, 4,873,271, Cl. 523-136.000.
- Mobil Oil Corporation: See—
Abail, Robert P. L.; Angevine, Philip J.; Chester, Arthur W.; and Kirker, Garry W., 4,873,216, Cl. 502-211.000.
- Avidan, Amos A.; and Johnson, David L., 4,873,385, Cl. 585-415.000.
- Avidan, Amos A.; and Johnson, David L., 4,873,389, Cl. 585-533.000.
- Bowes, Emmerson, 4,872,968, Cl. 208-111.000.
- Sharps, Gordon V., Jr.; and St. Phillips, Eric A., 4,872,942, Cl. 156-515.000.
- Valyocak, Ernest W.; Page, Nancy M.; and Chu, Cynthia T.-W., 4,873,067, Cl. 423-279.000.
- Mobilio, Dominick, to American Home Products Corporation. Substituted fused tetrahydrocarbazole acetic acid derivatives. 4,873,257, Cl. 514-410.000.
- Moch, Ihor D.: See—
Shadrach III, William S.; Mandler, Michael; Moch, Ihor D.; Ziotner, Bernard; and Stewart II, John L., 4,872,555, Cl. 206-459.000.
- Mochizuki, Kenji: See—
Ishikawa, Kazushige; Mochizuki, Kenji; Maehara, Toshihiro; and Hagiri, Masaharu, 4,873,586, Cl. 358-342.000.
- Moehe, Stephen J.: See—
Mezei, Louis M.; Albom, Bradley S.; Coppock, Stan; Moehe, Stephen J.; Noorda, Brent S.; Widunas, Joseph T.; and Zeitlin, James A., 4,873,633, Cl. 364-413.080.
- Mogi, Hiroyuki; and Ozawa, Kazuhisa, to Dai-ichi Seiko Kabushiki Kaisha. IC tester socket. 4,872,850, Cl. 439-264.000.
- Moguilevsky, Martine: See—
Cousseidiere, Daniel; Gigliotti, Giuseppe; and Moguilevsky, Martine, 4,873,256, Cl. 514-391.000.
- Mohler, Rick L.: See—
Crichtlow, Dale L.; DeBrosse, John K.; Mohler, Rick L.; Noble, Wendell P., Jr.; and Parries, Paul C., 4,873,205, Cl. 437-200.000.
- Mohr, Jürgen: See—
Ehrfeld, Wolfgang; Hagmann, Peter; Mohr, Jürgen; and Munchmeyer, Dietrich, 4,872,888, Cl. 55-16.000.
- Molins PLC: See—
Hinchcliffe, Dennis, 4,872,543, Cl. 198-347.000.
- Momo, Masauki: See—
Onodera, Kageyoshi; Koizumi, Tatsuya; Kato, Toshiyuki; Sotani, Junji; Momo, Masauki; and Furuya, Shuichi, 4,873,127, Cl. 427-376.800.
- Monlan, Incorporated: See—
Becker, Roger T., 4,872,997, Cl. 210-703.000.
- Monsanto Company: See—
Bach, Hartwig C., 4,873,142, Cl. 428-359.000.
- Moore, Robert R.; Lamb, Steve; and Wolf, Eugene M. Glenohumeral ligament repair. 4,872,451, Cl. 128-92.0YF.
- Moore, Scott E.: See—
Barnett, Jay D.; Ludwig, Bryan J.; Marks, Ernest E.; and Moore, Scott E., 4,872,356, Cl. 73-866.500.
- Moore, Gregory E.: See—
Johnson, Paul D.; Kubicko, Robert E.; Martone, Louis C.; and Moore, Gregory E., 4,872,402, Cl. 99-280.000.
- Moran, Lyle E.; and Kaufman, Lawrence G., to Exxon Research and Engineering Company. Flow resistant asphalt paving binder. 4,873,275, Cl. 524-64.000.
- Mori, Eiji: See—
Sonoda, Hidefumi; Mori, Eiji; Kawase, Mitsuo; Yoneshige, Kazuhiro; Takahashi, Akira; Komiya, Hirokazu; and Tanaka, Akira, 4,872,439, Cl. 123-518.000.
- Mori, Hiroshi: See—
Suzuki, Koji; Tsukada, Tetsuro; Saito, Yoshihiko; Arai, Kiyotaka; and Mori, Hiroshi, 4,872,958, Cl. 204-98.000.
- Mori, Hiroyuki: See—
Kubota, Tooru; and Mori, Hiroyuki, 4,873,579, Cl. 358-471.000.
- Mori, Kohji: See—
Takedoi, Atsushi; Kondo, Hiroyuki; Isoai, Masaru; Yoshinaga, Yoshitaka; Harada, Toshiharu; Okuda, Yosiro; Sumita, Hiroshi; Kawasaki, Hirofumi; and Mori, Kohji, 4,873,010, Cl. 252-62.590.
- Mori, Nobufumi; Katoh, Takayuki; Oikawa, Tetsuo; Harada, Yoshiyasu; and Miyahara, Junji, to Fuji Photo Film Co., Ltd.; and Jeol Ltd. Electron microscope image output method and apparatus. 4,873,440, Cl. 250-327.200.
- Mori, Toshihiro: See—
Matai, Masahiro; Ohya, Takashi; and Mori, Toshihiro, 4,873,519, Cl. 340-825.440.
- Mori, Yusuke: See—
Nakadozono, Hiroshi; and Mori, Yusuke, 4,872,415, Cl. 116-288.000.
- Monikawa, Tuneso: See—
Hanada, Ryoji; Monikawa, Tuneso; and Kabe, Kazuyuki, 4,872,497, Cl. 152-541.000.
- Morimitsu, Toshihiko: See—
Omura, Takashi; Kikkawa, Sadanobu; Morimitsu, Toshihiko; Harada, Naoki; and Miyamoto, Tetsuya, 4,873,321, Cl. 534-642.000.
- Morimoto, Hiroaki: See—
Wakabe, Yaichiro; Morimoto, Hiroaki; and Okamoto, Tatsuo, 4,873,163, Cl. 430-5.000.
- Morin, Alfred J., II: See—
Melcher, James R.; Morin, Alfred J., II; and Zahn, Markus, 4,873,489, Cl. 324-453.000.
- Morinaga, Hitoshi: See—
Fukahori, Toshio; Takashima, Hideyuki; and Morinaga, Hitoshi, 4,872,737, Cl. 350-96.200.
- Morioka, Masataka: See—
Fujii, Susumu; Ishida, Hiromi; Morioka, Masataka; Saito, Akihiro; and van der Meer, Roelof, 4,873,276, Cl. 524-153.000.
- Morishige, Yukio: See—
Uesugi, Fumihiko; and Morishige, Yukio, 4,873,413, Cl. 219-121.680.
- Morishita, Masanobu, to NEC Home Electronics Ltd. Image projection apparatus. 4,872,750, Cl. 353-7.000.
- Morishita, Masataka; Aikawa, Renji; Katsuragi, Shigeo; Yamamoto, Yoshiaki; and Sugimoto, Kenichi, to Toyo Jozo Company, Ltd. Suppository preparation having excellent absorption property. 4,873,087, Cl. 424-433.000.
- Morishita, Sadao: See—
Fujita, Zenzo; Morita, Hirokiyo; and Morishita, Sadao, 4,873,045, Cl. 264-259.000.
- Morita, Hirokiyo: See—
Fujita, Zenzo; Morita, Hirokiyo; and Morishita, Sadao, 4,873,045, Cl. 264-259.000.
- Morita, Takeshi: See—
Moriyasu, Masaharu; Morita, Takeshi; and Ohmine, Megumi, 4,873,417, Cl. 219-121.600.
- Morita, Yuzo: See—
Tobita, Toshimitsu; Inaba, Hiromi; Yamazaki, Masachika; Suzuki, Masato; Morita, Yuzo; Kajiyama, Toshiki; Nakamura, Kiyoshi; and Yoneda, Kenji, 4,872,532, Cl. 187-121.000.
- Moriyasu, Masaharu; Morita, Takeshi; and Ohmine, Megumi, to Mitsubishi Denki Kabushiki Kaisha. Laser machining apparatus. 4,873,417, Cl. 219-121.600.
- Morota, Makie; and Fukuda, Junichi, to Honda Giken Kogyo Kabushiki Kaisha. Collision detector for a vehicle. 4,873,452, Cl. 307-10.100.
- Morris, Steven T.: See—
Kelly-Fry, Elizabeth; and Morris, Steven T., 4,872,346, Cl. 73-627.000.
- Morton Thiokol, Inc.: See—
Cummings, Frederick L.; and Correll, Glenn D., 4,873,274, Cl. 523-500.000.
- Hyde, Jeffrey R., 4,873,005, Cl. 252-35.000.
- Singer, Victor, 4,872,612, Cl. 239-265.190.
- Moser, Manfred; Itgenshorst, Dieter; and Kutz, Johannes, to Eduard Kusters Maschinenfabrik GmbH & Co. KG. Method and device for imprinting webs. 4,872,325, Cl. 68-200.000.
- Moskovenko, Igor B.: See—
Grebennin, Anatoly F.; Glagovsky, Boris A.; Moskovenko, Igor B.; and Lasukova, Ijudmila P., 4,872,344, Cl. 73-579.000.
- Mossou, Bernardus H. F.: See—
Jansen, Johannes J.; Mossou, Bernardus H. F.; and Poort, Hans, 4,873,147, Cl. 428-533.000.

- Motorola, Inc.: See—
Borth, David E.; Wang, Chih-Fei; Rabe, Duane C.; and Labeledz, Gerald P., 4,873,683, Cl. 370-95.100.
- Fisch, Kenneth D.; Lucas, Alfred R.; and Willard, David F., 4,873,520, Cl. 340-825.440.
- Gennich, Thad J., 4,873,500, Cl. 332-104.000.
- Kielmeier, Ronald F., Jr., 4,873,497, Cl. 331-108.00B.
- Myers, Donald O.; and Venclovas, Ruta J., 4,872,945, Cl. 156-627.000.
- Roberts, Teddy P.; and Rozanski, Walter J., Jr., 4,873,711, Cl. 379-58.000.
- Sibigroth, James M., 4,873,624, Cl. 364-200.000.
- Tan, William, 4,873,527, Cl. 343-718.000.
- Mouissie, Bob; to Du Pont de Nemours, E. I., and Company. Cover for a multipoint connector. 4,872,848, Cl. 439-135.000.
- Mouser, Charles L.; and Stewart, Joseph A., to Halliburton Company. Watercut monitor device and method. 4,873,648, Cl. 364-500.000.
- Moy, Peter: See—
Sanyal, Amalendu; Moy, Peter; and Cosentino, Frank, 4,872,261, Cl. 29-840.000.
- Mrozik, Helmut: See—
Linn, Bruce O.; and Mrozik, Helmut, 4,873,224, Cl. 514-30.000.
- Muchowski, Joseph M.; and Greenhouse, Robert, to Syntex (U.S.A.) Inc. Process for preparing 5-aryl-1,2-dihydro-3H-pyrrolo[1,2-A]pyrrole-1,1-dicarboxylates. 4,873,340, Cl. 548-453.000.
- Muggli, Imelda A., to Minnesota Mining and Manufacturing Company. Fluorochemical surfactants and process for preparing same. 4,873,020, Cl. 252-355.000.
- Mukai, Junji: See—
Taketani, Noriaki; Asano, Hideki; Endo, Akira; Abe, Tomiya; Ibamoto, Masahiko; Mukai, Junji; Tanno, Seikichi; Eguchi, Shuji; and Shimura, Masato, 4,873,030, Cl. 264-1.500.
- Mullay, John J., to Atlas Powder Company. Composite explosive utilizing water-soluble fuels. 4,872,929, Cl. 149-46.000.
- Muller, Louis F.: See—
Kuntz, David H.; and Muller, Louis F., 4,872,465, Cl. 128-857.000.
- Muller, Robert, to Dr. Ing. h.c.F. Porsche AG. Shift rod for a manual transmission. 4,872,361, Cl. 74-473.00R.
- Multer, Thomas L., to Lifeprotect, Inc. Support & anchor escutcheon for sprinkler heads installed on pipe. 4,872,512, Cl. 169-51.000.
- Munakata, Hirohide: See—
Haruta, Masahiro; Kuwae, Yoko; Munakata, Hirohide; Yuasa, Satoshi; and Sugawa, Etsuko, 4,873,178, Cl. 430-327.000.
- Munchmeyer, Dietrich: See—
Ehrfeld, Wolfgang; Hagmann, Peter; Mohr, Jürgen; and Munchmeyer, Dietrich, 4,872,888, Cl. 55-16.000.
- Munz, Volker: See—
Bantle, Manfred; Munz, Volker; Zackl, Bernd; Dietz, Matthias; and Armbrust, Eberhard, 4,872,372, Cl. 74-710.500.
- Murai, Katsumi; and Usui, Makoto, to Matsushita Electric Industrial Co., Ltd. Optical information recording disk and optical information recording disk apparatus. 4,873,679, Cl. 369-32.000.
- Murakami, Harunori: See—
Sakurai, Kaoru; Murakami, Harunori; Mizukami, Hikaru; and Fujita, Kazuhisa, 4,873,532, Cl. 343-713.000.
- Murakami, Yoshikazu: See—
Ohgihara, Takahiro; Murakami, Yoshikazu; Mizunuma, Yasuyuki; and Nakano, Hiroyuki, 4,873,496, Cl. 331-96.000.
- Murata, Hiroyuki: See—
Wakabayashi, Minoru; Murata, Hiroyuki; Sugino, Yasuo; Yamao, Masanobu; and Nishikawa, Takao, 4,872,972, Cl. 209-143.000.
- Murata Kikai Kabushiki Kaisha: See—
Azuma, Ichiro; Tokura, Seiichi; Nishimura, Shinichiro; and Seo, Hiroshi, 4,873,092, Cl. 424-499.000.
- Katayama, Isao, 4,873,418, Cl. 219-121.600.
- Murata, Moriyo, to Kabushiki Kaisha Toshiba. Endoscope with color correcting mechanism. 4,872,446, Cl. 128-6.000.
- Murayama, Yasushi: See—
Hirose, Yoshihiko; Aoki, Tomohiro; Chiku, Kazuyoshi; Murayama, Yasushi; Uchida, Takashi; Matsuzawa, Kunihiko; and Kanekura, Kazunori, 4,873,541, Cl. 346-160.100.
- Murphy, Bruce L.: See—
Schumacher, Doris P.; Murphy, Bruce L.; and Clark, Jon E., 4,873,335, Cl. 546-194.000.
- Murphy, Mark A.; Smith, Brad L.; Aguiló, Adolfo; and Tau, Kwoliang D., to Hoechst Celanese Corporation. Process for making 1,3-diols from epoxides. 4,873,378, Cl. 568-867.000.
- Murphy, Mark A., to Hoechst Celanese Corporation. Process for making 1,3-diols from epoxides. 4,873,379, Cl. 568-867.000.
- Muto, Tetsuji: See—
Sato, Makoto; Shiraishi, Shuji; and Muto, Tetsuji, 4,873,639, Cl. 364-426.020.
- Mutschlechner, Johann: See—
Wohlleben, Rudolf; and Mutschlechner, Johann, 4,873,534, Cl. 343-786.000.
- Myer, Robert E., to American Telephone and Telegraph Company. AT&T Bell Laboratories. Amplifier with modulated resistor gain control. 4,873,492, Cl. 330-86.000.
- Myers, Clyde J.; Stephenson, Daniel L.; and Travieso, Ruben, to American Telephone and Telegraph Company. AT&T Bell Laboratories. Connector assembly having a latching mechanism. 4,872,736, Cl. 350-96.200.
- Myers, Donald O.; and Venclovas, Ruta J., to Motorola Inc. Post seal etching of transducer diaphragm. 4,872,945, Cl. 156-627.000.
- Myers, Ed: See—
Aidlin, Samuel S.; Aidlin, Stephen H.; Bailey, Russell O.; and Myers, Ed, 4,873,410, Cl. 219-56.100.
- Myers, Robert A., to NCR Corporation. Programmable ultraviolet lamp control system. 4,873,470, Cl. 315-240.000.
- Myers, Terrance L., to Ingersoll-Rand Company. Fluid-jet-cutting nozzle assembly. 4,872,615, Cl. 239-587.000.
- Nabisco Brands, Inc.: See—
Banks, Lori; Busk, Grant C., Jr.; Chiang, Bin; and Thulin, Robert, 4,873,098, Cl. 426-94.000.
- Cordera, Robert J., 4,873,103, Cl. 426-233.000.
- Fazzolare, Richard D.; Szwerc, Joseph A.; and McFeaters, Rich, 4,873,093, Cl. 426-28.000.
- Spiel, Albert A.; Roe, James; and Spanier, Henry C., 4,873,096, Cl. 426-72.000.
- Nagahara, Kazuyuki: See—
Timura, Yoshio; and Nagahara, Kazuyuki, 4,873,479, Cl. 320-2.000.
- Nagai, Noboru; Hashimoto, Yoshisato; Tsuboike, Yoshihiko; and Kato, Noboru, to Kioritz Corporation. Exhaust device for working machine. 4,872,308, Cl. 60-316.000.
- Nagaishi, Hatsu; Seimiya, Yasuo; Tamura, Hideyuki; Miwa, Hiromichi; Sanbuchi, Hiroshi; Uchida, Masaaki; and Takahata, Toshio, to Nissan Motor Company, Limited. Induction volume sensing arrangement for an internal combustion engine or the like. 4,873,641, Cl. 364-431.040.
- Naganuma, Hiroshi: See—
Ishizaka, Yoshiro; Naganuma, Hiroshi; Sato, Kenji; Kishi, Yuji; Ishida, Yoshihisa; and Goto, Kiyokazu, 4,872,320, Cl. 62-255.000.
- Nagaoka, Yoshitomi: See—
Kobayashi, Masaaki; Yamanishi, Kazuhiro; Takeuchi, Akihiro; and Nagaoka, Yoshitomi, 4,873,583, Cl. 358-310.000.
- Nagashima, Hideo: See—
Matsushita, Junichi; Saito, Hajime; and Nagashima, Hideo, 4,873,053, Cl. 419-11.000.
- Nagata, Mitsuhiro; Hayashi, Tadashi; Hashimoto, Yoshinobu; and Nakamura, Kiyoshi, to Kabushiki Kaisha Toshiba. Holder for sealing member. 4,873,208, Cl. 501-89.000.
- Nagata, Teruyuki: See—
Miura, Tohru; Nagata, Teruyuki; Okazaki, Koju; Furuya, Masayuki; and Nishida, Emiko, 4,873,374, Cl. 568-743.000.
- Nagy, Ernest J. Applicator device. 4,872,411, Cl. 111-7.100.
- Nagy, Neil F. Truck bed liners. 4,872,720, Cl. 296-39.100.
- Naito, Kazuo: See—
Yoshikawa, Masato; Fukuura, Yukio; Akiyama, Setsuo; Nakamura, Makoto; Naito, Kazuo; and Honda, Toshio, 4,872,932, Cl. 156-151.000.
- Naito, Taketoshi: See—
Okamoto, Shosuke; Okada, Yoshio; Okunomiya, Akiko; Naito, Taketoshi; Kimura, Yoshio; Yamada, Morihiko; Ohno, Norio; Katsura, Yasuhiro; Nojima, Hiroshi; and Shishikura, Takashi, 4,873,253, Cl. 514-352.000.
- Naka, Hideo: See—
Kobashi, Toshiyuki; and Naka, Hideo, 4,873,352, Cl. 556-105.000.
- Nakada, Akio: See—
Kanehira, Katsuyuki; Takayama, Syuichi; Amano, Atsushi; Hibino, Hiroki; Uchiyama, Naoki; and Nakada, Akio, 4,872,458, Cl. 128-401.000.
- Nakadozono, Hiroshi; and Mori, Yusuke, to Nissan Motor Company, Limited. Meter for a vehicle. 4,872,415, Cl. 116-288.000.
- Nakagawa, Banri; and Nojima, Katsuyuki, to International Business Machines Corporation. Video display system for scrolling text in selected portions of a display. 4,873,514, Cl. 340-726.000.
- Nakagawa, Ippei: See—
Matsui, Haruo; Nakagawa, Ippei; and Kato, Kiyotaka, 4,873,073, Cl. 423-617.000.
- Nakagawa, Kazushige; Koh, Makoto; Sera, Kyoji; Ozeki, Tadashi; and Iwasaki, Masahiro, to Shimadzu Corporation. Bent axis type axial piston pump or motor. 4,872,394, Cl. 91-506.000.
- Nakagawa, Wataru: See—
Tsuruoka, Michihiko; Nakagawa, Wataru; Miyoshi, Noriomi; Konosu, Naohiro; and Hashimoto, Tadao, 4,872,335, Cl. 73-30.000.
- Nakahata, Kimio: See—
Yoshikawa, Masao; and Nakahata, Kimio, 4,872,418, Cl. 118-657.000.
- Nakaishi, Akio: See—
Tsubakimoto, Tsuneo; Ito, Hayami; Tatsumi, Shuhei; Kajibata, Yoshihiro; Takao, Shoichi; Goto, Takakiyo; Nakaishi, Akio; Rakutani, Kenji; Tamura, Toshio; and Kobayashi, Hiroya, 4,872,885, Cl. 44-51.000.
- Nakajima, Nobuyoshi, to Fuji Photo Film Co., Ltd. Radiation image read-out method and apparatus. 4,873,437, Cl. 250-327.200.
- Nakajima, Toyohi: See—
Mieno, Toshiyuki; Nakajima, Toyohi; Okada, Yasushi; and Oono, Nobuyuki, 4,873,642, Cl. 364-431.060.
- Nakamine, Takeshi: See—
Kubodera, Seiti; and Nakamine, Takeshi, 4,873,220, Cl. 503-227.000.
- Nakamori, Masaharu: See—
Satake, Tokuki; Sakai, Hiroshi; Nakatani, Hayami; Nakamori, Masaharu; and Ishibashi, Masaru, 4,873,156, Cl. 429-31.000.
- Nakamura, Hironori; Yotsui, Toshiaki; Sato, Yoichi; Umetsubo, Toshiaki; and Ohkawa, Hideo, to CALP Kogyo Kabushiki Kaisha. Combination roll. 4,872,247, Cl. 29-125.000.
- Nakamura, Kazuharu; Mito, Yoshio; Nakanishi, Yutaka; Yamada, Toshihiko; Nakamura, Kenji; and Itoh, Kiyonobu, to Toyotomi Kogyo

- Co., Ltd. Fire-extinguishing device for oil burner. 4,872,829, Cl. 431-33.000.
- Nakamura, Kenji: See—
Nakamura, Kazuharu; Mito, Yoshio; Nakanishi, Yutaka; Yamada, Toshiko; Nakamura, Kenji; and Itoh, Kiyonobu, 4,872,829, Cl. 431-33.000.
- Nakamura, Kiyoshi: See—
Nagata, Mitsuhiro; Hayashi, Tadashi; Hashimoto, Yoshinobu; and Nakamura, Kiyoshi, 4,873,208, Cl. 501-89.000.
- Tobita, Toshimitsu; Inaba, Hiromi; Yamazaki, Masachika; Suzuki, Masato; Morita, Yuzo; Kajiyama, Toshiki; Nakamura, Kiyoshi; and Yoneda, Kenji, 4,872,532, Cl. 187-121.000.
- Nakamura, Makoto: See—
Yoshikawa, Masato; Fukuura, Yukio; Akiyama, Setsuo; Nakamura, Makoto; Naito, Kazuo; and Honda, Toshio, 4,872,932, Cl. 156-151.000.
- Nakamura, Masatoshi, to Nissan Motor Company. Vehicular brake control system. 4,872,731, Cl. 303-93.000.
- Nakamura, Noboru: See—
Fujita, Takashi; Hihara, Toshio; Kogure, Yoshio; Sekioka, Riyouchi; and Nakamura, Noboru, 4,872,881, Cl. 8-549.000.
- Nakamura, Shigeru; Machida, Sadatsugi; and Toda, Tsuyoshi, to Hitachi, Ltd. Optical head and optical information processor using the same. 4,873,678, Cl. 369-13.000.
- Nakamura, Shinichi: See—
Nohira, Hiroyuki; Kamei, Masanao; Nakamura, Shinichi; Yoshinaga, Kazuo; Kai, Mariko; and Katagiri, Kazuharu, 4,873,018, Cl. 252-299.010.
- Nakamura, Susumu, to Fuji Jukogyo Kabushiki Kaisha. Transmission ratio control system for a continuously variable transmission. 4,872,377, Cl. 74-867.000.
- Nakamura, Tadashi. Soft-metal made can body with squashing guides. 4,872,576, Cl. 220-83.000.
- Nakanishi, Yutaka: See—
Nakamura, Kazuharu; Mito, Yoshio; Nakanishi, Yutaka; Yamada, Toshiko; Nakamura, Kenji; and Itoh, Kiyonobu, 4,872,829, Cl. 431-33.000.
- Nakano, Hiroyuki: See—
Ohgihara, Takahiro; Murakami, Yoshikazu; Mizunuma, Yasuyuki; and Nakano, Hiroyuki, 4,873,496, Cl. 331-96.000.
- Nakano, Kinichiro: See—
Takeuchi, Mikio; Nakano, Kinichiro; Mitamura, Kenichi; and Tomoda, Takahisa, 4,873,530, Cl. 343-711.000.
- Nakano, Mamoru: See—
Ikebuchi, Iwao; Nakano, Mamoru; Fuse, Kazuo; and Ganze, Akira, 4,872,973, Cl. 209-144.000.
- Nakatani, Hayami: See—
Satake, Tokuki; Sakai, Hiroshi; Nakatani, Hayami; Nakamori, Masaharu; and Ishibashi, Masaru, 4,873,156, Cl. 429-31.000.
- Nakayama, Haruki, to Konica Corporation. Auto-focus camera. 4,873,542, Cl. 354-400.000.
- Nakayama, Toshimasa: See—
Tanaka, Hatsuaki; Sato, Yoshiyuki; Kohara, Hidekatsu; and Nakayama, Toshimasa, 4,873,177, Cl. 430-326.000.
- Nakazato, Ryoji, to G-C Dental Industrial Corp. Resinous compositions for denture base. 4,873,269, Cl. 523-115.000.
- Nakazato, Yoichi: See—
Kageyama, Hidehei; Mitsuya, Yoshihide; and Nakazato, Yoichi, 4,872,776, Cl. 401-65.000.
- Nakhamkin, Michael, to Gibbs & Hill, Inc. Retrofit of simple cycle gas turbines for compressed air energy storage application. 4,872,307, Cl. 60-39.020.
- Nalco Chemical Company: See—
Allenson, Stephan J., 4,873,280, Cl. 524-437.000.
- Schild, Ronald H.; Koepf-Gall, Sandra; and Broxterman, Gregory C., 4,872,999, Cl. 210-754.000.
- Nantt, Wolfgang: See—
Zimmermann, Gunther; Friedrich, Reinhard; Nantt, Wolfgang; and Weissert, Wolfgang, 4,872,587, Cl. 220-375.000.
- Naoumidis, Aristides: See—
Struck, Bernd D.; Neumeister, Herbert; and Naoumidis, Aristides, 4,873,121, Cl. 427-77.000.
- Napier, James J.; and Griffith, Ronald C., to Fisons Corporation. 2-amino-N-(2-phenylindan-2-yl)acetamides useful as anti-epileptics. 4,873,241, Cl. 514-237.800.
- Narukawa, Kiyotada: See—
Komatsu, Masato; Baba, Isao; Mikami, Takashi; Narukawa, Kiyotada; and Kanai, Tsuyoshi, 4,873,288, Cl. 525-194.000.
- Narukawa, Osamu: See—
Kaneshiki, Toshitaka; Narukawa, Osamu; Haneda, Tadayoshi; and Endo, Toshiyuki, 4,873,383, Cl. 570-211.000.
- Nath, Gunther: See—
Kreitmair, Albert; and Nath, Gunther, 4,873,446, Cl. 250-492.100.
- Nathan, Robert H.; and Hislop, Lawrence A., to NCR Corporation. Point of sale automatic back-up system and method. 4,873,631, Cl. 364-405.000.
- National Research Development Corporation: See—
Lindsey, Kevin, 4,872,291, Cl. 51-166.00R.
- Mansfield, Peter; and Chapman, Barry L. W., 4,873,503, Cl. 335-216.000.
- Mitchell, Stephen W., 4,872,428, Cl. 123-90.170.
- Nicholson, John W.; and Wilson, Alan D., 4,873,130, Cl. 428-35.800.
- See, Chung W.; and Vaez-Iravan, Mehdi, 4,873,434, Cl. 250-235.000.
- National Science Council: See—
Ma, Chen-chi M.; and Shih, Wen-cheng, 4,873,128, Cl. 427-434.700.
- National Semiconductor Corporation: See—
Kowshik, Vikram; Boddu, Sudhakar; and Lucero, Elroy M., 4,873,671, Cl. 365-189.120.
- Wong, Hee, 4,873,700, Cl. 375-76.000.
- National Starch and Chemical Corporation: See—
Maliczyszyn, Walter; and Hernandez, Henry R., 4,872,951, Cl. 162-135.000.
- Natsume, Naohiro: See—
Yamada, Yutaka; Kozawa, Tadashi; Natsume, Naohiro; and Komatsubara, Hirofumi, 4,872,806, Cl. 415-55.500.
- NCR Corporation: See—
Jones, Jack E.; and Bulmahn, David J., 4,872,505, Cl. 165-80.300.
- Myers, Robert A., 4,873,470, Cl. 315-240.000.
- Nathan, Robert H.; and Hislop, Lawrence A., 4,873,631, Cl. 364-405.000.
- NEC Corporation: See—
Matai, Masahiro; Ohya, Takashi; and Mori, Toshihiro, 4,873,519, Cl. 340-825.440.
- Satoh, Yayoi; and Mizukami, Toshihiko, 4,873,724, Cl. 381-40.000.
- Shibagaki, Kouichi; and Fukui, Akira, 4,873,723, Cl. 381-34.000.
- Uesugi, Fumihiko; and Morishige, Yukio, 4,873,413, Cl. 219-121.680.
- NEC Electronics Inc.: See—
Gerhard, Bruce; and Schulman, Bruce, 4,872,339, Cl. 73-204.140.
- NEC Home Electronics Ltd.: See—
Morishita, Masanobu, 4,872,750, Cl. 353-7.000.
- Nederlandse Organisatie voor Toegepast-Natuurwetenschappelijk Onderzoek TNO: See—
Van Wijk, Hendrik F., 4,872,990, Cl. 210-644.000.
- Negishi, Kenji; Sasaki, Hidemi; and Fujishiro, Takeshi, to Fuji Photo Film Co., Ltd. Mechanism for supporting and guiding a head carriage. 4,873,598, Cl. 360-106.000.
- Nelson, III: Alvin T.: See—
Cothran, Michael W.; and Nelson, III: Alvin T., 4,872,629, Cl. 248-231.200.
- Nelson Industries Inc.: See—
Goplen, Gary D.; and Iles, Lawrence F., 4,872,528, Cl. 181-228.000.
- Nelson, Jack R., to Triton Engineering Services Company. Flat bottom drilling bit with polycrystalline cutters. 4,872,520, Cl. 175-329.000.
- Nelson, Linda H., to General Electric Company. Inhibition of irradiation yellowing in polysulfone compositions. 4,873,278, Cl. 524-380.000.
- Nelson, Linda H., to General Electric Company. Copolyester-carbonate and polyester resin blends exhibiting improved color properties. 4,873,279, Cl. 524-384.000.
- Nelson, Lloyd M.: See—
Boyer, Billy G.; Nelson, Lloyd M.; Soucie, Wayne L.; and Hayes, William K., 4,872,533, Cl. 188-2.00D.
- Nelson, Loren D.; Erb, Lee A.; Ware, Randolph H.; and Rottner, Donald, to Radiometrics Corporation. Microwave radiometer and methods for sensing atmospheric moisture and temperature. 4,873,481, Cl. 324-58.50R.
- Nemcovsky, Rhonda L.: See—
Jones, Gerald M.; and Nemcovsky, Rhonda L., 4,872,259, Cl. 29-764.000.
- Nemo, Thomas E.: See—
Hagen, Gary P.; and Nemo, Thomas E., 4,873,386, Cl. 585-471.000.
- Nemoto, Kenji: See—
Minagawa, Takehiro; Stou, Toshio; Miyata, Masao; Nemoto, Kenji; and Uchida, Kuninobu, 4,872,793, Cl. 409-244.000.
- Nentwig, Gunther: See—
Kruger, Bernd-Wieland; Sasse, Klaus; Hoefer, Franz-Peter; Nentwig, Gunther; and Berhrens, Wolfgang, 4,873,252, Cl. 514-315.000.
- Nerger, Klaus K., to Mannesmann Aktiengesellschaft. Support for a gripper for an industrial robot. 4,872,718, Cl. 294-86.400.
- Nestle S.A.: See—
Smith, John M., 4,872,876, Cl. 623-6.000.
- Neulinger, Franz; Schummer, Helmut; Donig, Gerhard; and Schmidt, Walter, to Metallgesellschaft AG; and Siemens AG. Voltage supply with recovery protection for a thyristor. 4,873,620, Cl. 363-57.000.
- Neumann, Peter: See—
Schaefer, Gerhard; Eilingsfeld, Heinz; Neumann, Peter; and Stumpp, Michael, 4,873,372, Cl. 568-34.000.
- Neumeister, Herbert: See—
Struck, Bernd D.; Neumeister, Herbert; and Naoumidis, Aristides, 4,873,121, Cl. 427-77.000.
- Neun, John A.: See—
Watts, Robert J.; Rice, David A.; and Neun, John A., 4,872,337, Cl. 73-162.000.
- Neupauer, Elfriede, to Siemens A.G. Method and apparatus for controlling a static converter at an asymmetrical network. 4,873,619, Cl. 363-51.000.
- Newkirk, Raymond K.; and Batzlioff, Richard L., to Forward Technology Industries, Inc. Apparatus and method for bonding a plastic container and spout. 4,872,935, Cl. 156-250.000.
- Newman, Neil A.; Bankstahl, Herbert A.; Griffiths, John M.; Forsgren, Lyle M.; and Beck, Wayne T., to Brunswick Corporation. Operation optimizing system for a marine drive unit. 4,872,857, Cl. 440-1.000.
- Newman, Neil A.: See—
Griffiths, John M.; Forsgren, Lyle M.; Newman, Neil A.; and Beck, Wayne T., 4,872,859, Cl. 440-53.000.

- NGK Spark Plug Co., Ltd.: See—
Akao, Shigeaki; Ishida, Noboru; and Kawamura, Mitsuyoshi, 4,872,431, Cl. 123-188.00A.
- Matsumura, Shuzo; Mizuno, Takanori; Aoki, Noboru; and Suzuki, Takahiro, 4,873,466, Cl. 313-131.00R.
- Nichols, Donald H.: See—
Jensen, Richard E.; Nichols, Donald H.; and Hemphill, D. Gary, 4,873,193, Cl. 436-176.000.
- Nichols, Raymond L. Apparatus for squat exercise. 4,872,670, Cl. 272-134.000.
- Nicholson, John W.; and Wilson, Alan D., to National Research Development Corporation. Coating process for the preparation of coherent protective layer. 4,873,130, Cl. 428-35.800.
- Nickason, Barry E.; and DiGirolamo, Orazio, to CCL Industries Inc. Recovery of propellant from aerosol can filling operation. 4,872,491, Cl. 141-20.000.
- Niebylski, Leonard M., to Ethyl Corporation. Preceramic compositions and ceramic products. 4,873,353, Cl. 556-402.000.
- Nielsen, Ernst P. F. Apparatus for cleaning medical hand instruments and implements for treatment of the hair, skin and/or body. 4,872,235, Cl. 15-104.920.
- Niemeyer, Robert H., III, to AM International Corporation. Pen shuttle guide and spring return. 4,873,538, Cl. 346-139.00R.
- Niemitz, Matthias: See—
Scheer, Wolfgang; Fuhrmann, Hartmut; Kossmehl, Gerhard; Niemitz, Matthias; and Kabbeck-Kupjai, Detlef, 4,872,962, Cl. 204-224.00R.
- Nihei, Kanta: See—
Yasukawa, Wataru, deceased; Kiyoshige, Masanori; Horikawa, Takeshi; Okada, Tomonobu; Ochi, Tadafumi; Aoki, Yoshiaki; Higashida, Masahiko; Kawashima, Takashi; Koe, Shigeaki; Ono, Hideo; Nihei, Kanta; Takasugi, Syunji; and Take, Koji, 4,872,293, Cl. 51-410.000.
- Nihon Plast Co., Ltd.: See—
Minagawa, Takehiro; Stou, Toshio; Miyata, Masao; Nemoto, Kenji; and Uchida, Kuninobu, 4,872,793, Cl. 409-244.000.
- Nihon Technical Kabushiki Kaisha: See—
Hatanaka, Ryouosuke, 4,873,597, Cl. 360-105.000.
- Nilsson, Mats; Tagesson, Bert; and Novak, Ladislav, to Alfa-Laval Thermal AB. Gasket for plate heat exchanger. 4,872,506, Cl. 165-166.000.
- Nippon ABS, Ltd.: See—
Arikawa, Tetsuro, 4,872,729, Cl. 303-92.000.
- Nippon Hoso Kyokai: See—
Kobayashi, Hirokazu; Miyamoto, Yukihiro; Takai, Masaaki; Fujisawa, Syuichi; and Miyazawa, Hiroshi, 4,873,684, Cl. 370-102.000.
- Nippon Mektron, Ltd.: See—
Kameda, Eiichi, 4,872,934, Cl. 156-250.000.
- Nippon Oil Co., Ltd.: See—
Kajikawa, Teruo; and Yoshino, Toshio, 4,872,930, Cl. 156-72.000.
- Nippon Seiko Kabushiki Kaisha: See—
Saito, Hiroyuki, 4,872,703, Cl. 280-804.000.
- Nippon Sheet Glass Co., Ltd.: See—
Sakurai, Kaoru; Murakami, Harunori; Mizukami, Hikaru; and Fujita, Kazuhisa, 4,873,532, Cl. 343-713.000.
- Nippon Shinyaku Co., Ltd.: See—
Kimura, Kiyoshi; Ueda, Fusao; and Ogasawara, Takashi, 4,873,242, Cl. 514-242.000.
- Nippon Shokubai Kabaku Kogyo Co., Ltd.: See—
Tsubakimoto, Tsuneo; Ito, Hayami; Tatsumi, Shuhei; Kajibata, Yoshihiro; Takao, Shoichi; Goto, Takakiyo; Nakaishi, Akio; Rakutani, Kenji; Tamura, Toshio; and Kobayashi, Hiroya, 4,872,885, Cl. 44-51.000.
- Nippon Shokubai Kagaku Kogyo Co., Ltd.: See—
Kawajiri, Tatsuya; Onodera, Hideo; Uchida, Shinichi; Aoki, Yukio; and Wada, Masahiro, 4,873,217, Cl. 502-311.000.
- Nippon Steel Corporation: See—
Kawasaki, Yoshiaki; Hioki, Yoshihiro; Ohno, Yuichi; Ichida, Kozaburo; Yamaguchi, Susumu; Sudo, Michitaka; and Chikazawa, Bunichiro, 4,872,245, Cl. 29-81.00A.
- Nippondenso Co., Ltd.: See—
Takagi, Kozi; Ido, Noriyuki; Ohno, Sadayuki; Suzuki, Hideaki; Inoue, Yoshiaki; and Nomura, Yoshihisa, 4,872,730, Cl. 303-92.000.
- Nishida, Emiko: See—
Miura, Tohru; Nagata, Teruyuki; Okazaki, Koju; Furuya, Masayuki; and Nishida, Emiko, 4,873,374, Cl. 568-743.000.
- Nishida, Takeshi: See—
Umemoto, Mitsumasa; Asano, Tamotsu; Horie, Hironobu; Takagi, Akinobu; Tamura, Nobuyasu; and Nishida, Takeshi, 4,873,373, Cl. 568-637.000.
- Nishihara, Takashi: See—
Shiraishi, Shuji; and Nishihara, Takashi, 4,873,638, Cl. 364-426.010.
- Nishikawa, Takao: See—
Wakabayashi, Minoru; Murata, Hiroyuki; Sugino, Yasuo; Yamao, Masanobu; and Nishikawa, Takao, 4,872,972, Cl. 209-143.000.
- Nishimura, Shinichiro: See—
Azuma, Ichiro; Tokura, Seiichi; Nishimura, Shinichiro; and Seo, Hiroshi, 4,873,092, Cl. 424-499.000.
- Nishinoiri, Hiroshi; Saikawa, Masahiko; Takaya, Yoshikazu; and Kanada, Eiji, to Mitsubishi Paper Mills, Ltd. Method for making lithographic printing plate. 4,873,170, Cl. 430-204.000.
- Nishio, Kouji; and Hanamura, Yoshihiko, to Tokyo Kogaku Kikai Kabushiki Kaisha. Noncontact type tonometer. 4,872,460, Cl. 128-648.000.
- Nishiyama, Hiromi: See—
Arai, Kunio; Nishiyama, Hiromi; Aoyama, Hiroshi; and Kanaya, Yasuhiko, 4,872,787, Cl. 408-1.00R.
- Nishiyama, Tamotsu; and Kuninobu, Shigeo, to Matsushita Electric Industrial Co., Ltd. Arithmetic processor using redundant signed digit arithmetic. 4,873,660, Cl. 364-768.000.
- Nishizono, Taiji, to K.K. Chibakou Shoji. Condom applicator. 4,872,463, Cl. 128-844.000.
- Nissan Chemical Industries, Ltd.: See—
Kato, Etsuro, 4,873,064, Cl. 423-85.000.
- Nissan Motor Company: See—
Nakamura, Masatoshi, 4,872,731, Cl. 303-93.000.
- Nissan Motor Company, Limited: See—
Akatsu, Yohsuke; Fukushima, Naoto; Fukunaga, Yukio; Hano, Sunao; and Satoh, Masaharu, 4,872,701, Cl. 280-703.000.
- Nagaishi, Hatsu; Seimiya, Yasuo; Tamura, Hideyuki; Miwa, Hiromichi; Sanbuchi, Hiroshi; Uchida, Masaaki; and Takahata, Toshio, 4,873,641, Cl. 364-431.040.
- Nakadozono, Hiroshi; and Mori, Yusuke, 4,872,415, Cl. 116-288.000.
- Tabata, Toshiyuki; Ishiyama, Tatsuro; Ushijima, Takao; and Dan, Takuya, 4,872,650, Cl. 267-140.100.
- Takeuchi, Mikio; Nakano, Kinichiro; Mitamura, Kenichi; and Tomoda, Takahisa, 4,873,530, Cl. 343-711.000.
- Togo, Sigeru; Saito, Yoichi; Tateyama, Masayuki; Okuma, Genji; and Miyazaki, Hiroya, 4,873,475, Cl. 318-489.000.
- Nisshin Steel Co., Ltd.: See—
Shinoda, Kenichi; Iwao, Tomoyoshi; Isayama, Tomoaki; and Higo, Yuichi, 4,873,149, Cl. 428-609.000.
- Nitsch, Wilhelm: See—
Zahn, Wolfgang; Fursich, Manfred; Nitsch, Wilhelm; Rauh, Hans-Jurgen; and Treiber, Helmut, 4,873,546, Cl. 355-38.000.
- Niwa, Katuhiro; Abe, Nobuyasu; Kajikyo, Katuji; Suzuoki, Tsutomu; Tabuti, Katumi; and Arii, Yoshifumi, to Gunze Limited. Apparatus for cutting tubular knitted fabric. 4,872,383, Cl. 83-175.000.
- Niwa, Takashi: See—
Honda, Sueaki; Hayashi, Mitsuji; Niwa, Takashi; Hayakawa, Akihiko; and Bingo, Hideyuki, 4,873,402, Cl. 200-283.000.
- Nixdorf, Richard D.: See—
Weaver, Samuel C.; and Nixdorf, Richard D., 4,873,069, Cl. 423-345.000.
- NKK Corporation: See—
Koshihara, Toshio; Misawa, Rokuro; Sagawa, Yuzo; Takehara, Kimio; Matoba, Yuji; and Ishihara, Koji, 4,872,762, Cl. 374-5.000.
- Miyazaki, Takao; Yamada, Yoshiro; and Komine, Isamu, 4,872,758, Cl. 356-381.000.
- Nobelpharma AB: See—
Brainovic, Izidor, 4,872,839, Cl. 433-173.000.
- Noble, Wendell P., Jr.: See—
Crichtlow, Dale L.; DeBrosse, John K.; Mohler, Rick L.; Noble, Wendell P., Jr.; and Parries, Paul C., 4,873,205, Cl. 437-200.000.
- Nocolaou, Kyriacos C.: See—
Abe, Yoshihiro; and Nocolaou, Kyriacos C., 4,873,024, Cl. 260-405.500.
- Noda, Yasuyoshi, to KTX Co., Ltd. Porous die. 4,872,827, Cl. 425-526.000.
- Noguchi, Aiko: See—
Tanaka, Yukioka; Omura, Hisao; Irinatsu, Yuuichi; Kobayashi, Takashi; and Noguchi, Aiko, 4,873,109, Cl. 426-607.000.
- Nohira, Hiroyuki; Kamei, Masanao; Nakamura, Shinichi; Yoshinaga, Kazuo; Kai, Mariko; and Katagiri, Kazuharu, to Canon Kabushiki Kaisha; and Yamakawa Yakuhin Kogyo Kabushiki Kaisha. Optically active compound, process for producing same and liquid crystal composition containing same. 4,873,018, Cl. 252-299.010.
- Nojima, Hiroshi: See—
Okamoto, Shosuke; Okada, Yoshio; Okunomiya, Akiko; Naito, Taketoshi; Kimura, Yoshio; Yamada, Morihiko; Ohno, Norio; Katsura, Yasuhiro; Nojima, Hiroshi; and Shishikura, Takashi, 4,873,253, Cl. 514-352.000.
- Nojima, Katsuyuki: See—
Nakagawa, Banri; and Nojima, Katsuyuki, 4,873,514, Cl. 340-726.000.
- Nomura, Yoshihisa: See—
Takagi, Kozi; Ido, Noriyuki; Ohno, Sadayuki; Suzuki, Hideaki; Inoue, Yoshiaki; and Nomura, Yoshihisa, 4,872,730, Cl. 303-92.000.
- Nonami, Tetsuo: See—
Miyazaki, Akihiko; Nonami, Tetsuo; and Ikuno, Yuji, 4,873,572, Cl. 358-98.000.
- Nonini, Geremia, to Danieli & C. Officine Meccaniche SpA. Plant for straightening and cutting to length rolled sections or bars. 4,872,330, Cl. 72-131.000.
- Noonan, Edward B.: See—
Dong, Dennis F.; Noonan, Edward B.; Rogers, Derek J.; Clifford, Arthur L.; Benesch, Katharina; and Loftfield, Richard E., 4,872,957, Cl. 204-84.000.
- Noorda, Brent S.: See—
Mezei, Louis M.; Albom, Bradley S.; Coppock, Stan; Moehle, Stephen J.; Noorda, Brent S.; Widunas, Joseph T.; and Zeitlin, James A., 4,873,633, Cl. 364-413.080.
- Nordby, Rasmus: See—
Crandall, Douglas; Cavanna, Vicente; Shankar, Pradip; and Nordby, Rasmus, 4,873,703, Cl. 375-118.000.
- Norden, Alexander R., to Connectron, Inc. Adjustable terminal block equipment. 4,872,855, Cl. 439-717.000.

- Noren, Tore H., to Hobart Corporation. Low energy, low water consumption warewasher. 4,872,466, Cl. 134-57.00D.
- Norling, Brian L.: See—
Hanson, Richard A.; Peters, Rex B.; Norling, Brian L.; and Urbach, Edward A., 4,872,342, Cl. 73-517.00R.
- North American Philips Corporation: See—
Darby, Ted A., 4,873,574, Cl. 358-139.00D.
- Northern Telecom Limited: See—
Geadah, Youssef A.; and Lefebvre, Martin C., 4,873,667, Cl. 365-189.07D.
- Irwin, George F.; Smelters, Paul J.; Robertson, David J.; and Maginley, Ronald J., 4,873,682, Cl. 370-58.100.
- Kahn, David A.; Pacey, Grant K.; Hvezda, Jaroslav M.; and Dalgleish, Jack F., 4,872,739, Cl. 350-96.160.
- Lefebvre, Martin C.; Ciambello, Carmine A.; and Geadah, Youssef A., 4,873,666, Cl. 365-189.07D.
- Williams, Robert J.; and Smith, Randall J., 4,872,824, Cl. 425-113.00D.
- Norton, John A.: See—
Boat, John L., 4,872,279, Cl. 42-90.00D.
- Novak, Ladislav: See—
Nilsson, Mats; Tagesson, Bernt; and Novak, Ladislav, 4,872,506, Cl. 165-166.00D.
- Nowakowsky, Bernhard H.; Beck, Juergen; Hartmann, Heinrich; and Vamvakaris, Christos, to BASF Aktiengesellschaft. Batchwise preparation of crosslinked, finely divided polymers. 4,873,299, Cl. 526-73.00D.
- Nozaki, Masahiro, to Toyoda Gosei Co., Ltd. Sealing structure for automobile. 4,872,288, Cl. 49-485.00D.
- Nunley, Alvin, III: See—
Bailey, James B.; Gibson, Robert R.; Nunley, Alvin, III; and Utz, Q. Wayne, 4,873,676, Cl. 367-98.00D.
- Nurseries Co. Ltd.: See—
Drumm, Kevin R., 4,872,689, Cl. 277-9.500.
- Nutt, Wendell G.: See—
Friesen, Harold W.; and Nutt, Wendell G., 4,873,393, Cl. 174-34.00D.
- O-I Brockway Glass, Inc.: See—
McCausland, Thomas W., 4,873,674, Cl. 65-374.120.
- O.M.V. S.p.A. (Officine Meccaniche Veronesi): See—
Padovani, Pietro, 4,872,826, Cl. 425-388.00D.
- Occidental Chemical Corporation: See—
Miller, George T., 4,873,153, Cl. 428-659.00D.
- Occidental Chemical Corporation: See—
Dannels, Bobby F.; Olsen, Deborah J.; and Forcucci, John, 4,873,382, Cl. 570-177.00D.
- Ochi, Tadafumi: See—
Yasukawa, Wataru, deceased; Kiyoshige, Masanori; Horikawa, Takeshi; Okada, Tomonobu; Ochi, Tadafumi; Aoki, Yoshiaki; Higashida, Masahiko; Kawashima, Takashi; Koe, Shigeki; Ono, Hideo; Nihei, Kanta; Takasugi, Syunji; and Take, Koji, 4,872,293, Cl. 51-410.00D.
- O'Connor, Chadwell. Wheel-less walking dolly. 4,872,524, Cl. 180-8.60D.
- O'Connor, Chadwell. Locking tripod leg. 4,872,627, Cl. 248-168.00D.
- O'Connor, Chadwell. Mechanically counterbalancing platform. 4,872,628, Cl. 248-178.00D.
- Ocel Communications Corp.: See—
Barnett, Paul M.; Welch, Douglas A.; and MacMillan, Duncan J., Jr., 4,873,718, Cl. 379-156.00D.
- ODL, Incorporated: See—
DeBlock, David A.; and Artwick, Kert E., 4,872,498, Cl. 160-90.00D.
- Ogasawara, Takashi: See—
Kimura, Kiyoshi; Ueda, Fusao; and Ogasawara, Takashi, 4,873,242, Cl. 514-242.00D.
- Ogata, Naoya; Sanui, Kohei; Yui, Nobuhiko; Kataoka, Kazunori; Okano, Teruo; and Sakurai, Yasuhisa, to Research Development Corporation of Japan. Antithrombogenic synthetic polymer and process for its preparation. 4,873,292, Cl. 525-408.00D.
- Ogawa, Takashi: See—
Wakamori, Takehisa; Ogawa, Takashi; Ito, Ryoji; and Shimanaka, Chikafumi, 4,872,257, Cl. 29-701.00D.
- Ogawa, Toshio; Fujii, Mituru; Asai, Tadamichi; Ikegami, Akira; Ohtsu, Hiroshi; and Ato, Kazuhiko, to Hitachi, Ltd. Electrically conductive paste, electronic circuit component and method for producing same. 4,873,022, Cl. 428-209.00D.
- Ogiso, Taro, to Maraho Co., Ltd. Percutaneous absorption preparation. 4,873,081, Cl. 424-81.00D.
- Oguri, Shigenori; and Terada, Kosei, to Yamaha Corporation. Automatic rhythm performing apparatus with modifiable correspondence between stored rhythm patterns and produced instrument tones. 4,872,385, Cl. 84-635.00D.
- O'Hare, Louis R. Fixation of nitrogen by solar energy. 4,873,061, Cl. 422-188.00D.
- Ohashi, Masashi: See—
Sasaki, Nobukazu; Kasamura, Toshiro; Ohashi, Masashi; Okuda, Naoki; Kusumoto, Toshihiko; Maeda, Yasunori; Ozawa, Takashi; Yamamoto, Yasuyoshi; Kubota, Atsushi; Kimura, Akiyoshi; and Masuda, Makoto, 4,873,547, Cl. 355-316.00D.
- Ohashi, Toshihiro: See—
Sato, Hiroshi; Ohashi, Toshihiro; Hamada, Toyohide; Umakoshi, Yukimori; Suzuki, Takamichi; Wada, Yuuji; Hara, Shigeo; and Fukumoto, Youshuke, 4,872,618, Cl. 242-4.00R.
- Oghihara, Takahiro; Murakami, Yoshikazu; Mizunuma, Yasuyuki; and Nakano, Hiroyuki, to Sony Corporation. Tuned oscillator. 4,873,496, Cl. 331-96.00D.
- Ohio University: See—
Wagner, Thomas E.; and Hoppe, Peter C., 4,873,191, Cl. 435-172.300.
- Ohkawa, Hideo: See—
Nakamura, Hironori; Yotsui, Toshiaki; Sato, Youichi; Umetsubo, Toshiaki; and Ohkawa, Hideo, 4,872,247, Cl. 29-125.00D.
- Ohmine, Megumi: See—
Moriyasu, Masaharu; Morita, Takeshi; and Ohmine, Megumi, 4,873,417, Cl. 219-121.60D.
- Ohnishi, Tetsuya: See—
Suzuki, Yasumichi; Ikeda, Yoshinori; Katoh, Koichi; Ohnishi, Tetsuya; Kadowaki, Toshihiro; and Honma, Toshio, 4,873,570, Cl. 358-80.00D.
- Ohno, Norio: See—
Okamoto, Shosuke; Okada, Yoshio; Okunomiya, Akiko; Naito, Taketoshi; Kimura, Yoshio; Yamada, Morihiko; Ohno, Norio; Katsuura, Yasuhiro; Nojima, Hiroshi; and Shishikura, Takashi, 4,873,253, Cl. 514-352.00D.
- Ohno, Sadayuki: See—
Takagi, Kozi; Ido, Noriyuki; Ohno, Sadayuki; Suzuki, Hideaki; Inoue, Yoshiaki; and Nomura, Yoshihisa, 4,872,730, Cl. 303-92.00D.
- Ohno, Yuichi: See—
Kawasaki, Yoshiki; Hioki, Yoshihiro; Ohno, Yuichi; Ichida, Kozaburo; Yamaguchi, Susumu; Sudo, Michitaka; and Chikazawa, Bunichiro, 4,872,245, Cl. 29-81.00A.
- Ohta, Shinichi, to Canon Kabushiki Kaisha. Image recording apparatus for producing a plurality of pulse width modulated signals on the basis of image data. 4,873,537, Cl. 346-108.00D.
- Ohtsu, Hiroshi: See—
Ogawa, Toshio; Fujii, Mituru; Asai, Tadamichi; Ikegami, Akira; Ohtsu, Hiroshi; and Ato, Kazuhiko, 4,873,022, Cl. 428-209.00D.
- Ohtsuka, Shuichi: See—
Yamana, Keiichi; Imai, Masaru; and Ohtsuka, Shuichi, 4,873,545, Cl. 355-256.00D.
- Ohuchi, Takashi: See—
Hirota, Toshio; Ohuchi, Takashi; and Yamamoto, Osamu, 4,873,155, Cl. 429-26.00D.
- Ohyagi, Takashi: See—
Matai, Masahiro; Ohyagi, Takashi; and Mori, Toshihiro, 4,873,519, Cl. 340-825.44D.
- Oikawa, Tetsuo: See—
Mori, Nobufumi; Katoh, Takayuki; Oikawa, Tetsuo; Harada, Yoshiyasu; and Miyahara, Junji, 4,873,440, Cl. 250-327.200.
- Oike, Tomoyasu, to Minnesota Mining and Manufacturing Company. Marker for locating a buried object. 4,873,533, Cl. 343-744.00D.
- Oil Dynamics, Inc.: See—
Wilson, Brown L., 4,872,808, Cl. 415-170.100.
- Okabe, Yoshimi; Iwamoto, Keiichi; Torichigai, Masaaki; Kaneko, Shozo; Ichinari, Joji; and Koizumi, Kiyoshi, to Tokvo Electric Power Co.; and Mitsubishi Jukogyo Kabushiki Kaisha. Automated ultrasonic examination system for heat transfer tubes in a boiler. 4,872,347, Cl. 73-634.00D.
- Okada, Takeji; Sawade, Minoru; Imai, Minoru; and Tachibana, Dai-suke, to Shimizu Construction Co., Ltd. Resin-coated aggregates. 4,873,145, Cl. 428-407.00D.
- Okada, Tomonobu: See—
Yasukawa, Wataru, deceased; Kiyoshige, Masanori; Horikawa, Takeshi; Okada, Tomonobu; Ochi, Tadafumi; Aoki, Yoshiaki; Higashida, Masahiko; Kawashima, Takashi; Koe, Shigeki; Ono, Hideo; Nihei, Kanta; Takasugi, Syunji; and Take, Koji, 4,872,293, Cl. 51-410.00D.
- Okada, Yasushi: See—
Mieno, Toshiyuki; Nakajima, Toyohide; Okada, Yasushi; and Oono, Nobuyuki, 4,873,642, Cl. 364-431.06D.
- Okada, Yoshio: See—
Okamoto, Shosuke; Okada, Yoshio; Okunomiya, Akiko; Naito, Taketoshi; Kimura, Yoshio; Yamada, Morihiko; Ohno, Norio; Katsuura, Yasuhiro; Nojima, Hiroshi; and Shishikura, Takashi, 4,873,253, Cl. 514-352.00D.
- Okada, Yoshiyuki: See—
Aoki, Isao; Kuragano, Takashi; Okajima, Nobuyuki; and Okada, Yoshiyuki, 4,872,901, Cl. 71-90.00D.
- Okai, Makoto: See—
Uomi, Kazuhisa; Tsuji, Shinji; Sakano, Shinji; Okai, Makoto; and Chinone, Naoki, 4,873,691, Cl. 372-20.00D.
- Okajima, Nobuyuki: See—
Aoki, Isao; Kuragano, Takashi; Okajima, Nobuyuki; and Okada, Yoshiyuki, 4,872,901, Cl. 71-90.00D.
- Okamoto, Kenkichi: See—
Kono, Koichi; Okamoto, Kenkichi; Iwasaki, Rumi; and Sawada, Shuichi, 4,873,034, Cl. 264-41.00D.
- Okamoto, Shosuke; Okada, Yoshio; Okunomiya, Akiko; Naito, Taketoshi; Kimura, Yoshio; Yamada, Morihiko; Ohno, Norio; Katsuura, Yasuhiro; Nojima, Hiroshi; and Shishikura, Takashi, to Okamoto, Shosuke; and Showa Denko Kabushiki Kaisha. Phenylalanine derivative and proteinase inhibitor. 4,873,253, Cl. 514-352.00D.
- Okamoto, Tatsuo: See—
Watakabe, Yaichiro; Morimoto, Hiroaki; and Okamoto, Tatsuo, 4,873,163, Cl. 430-5.00D.
- Okamura, Michiya: See—
Yui, Hiroshi; Okamura, Michiya; Ikeda, Masakazu; and Matsuo, Norio, 4,873,282, Cl. 524-496.00D.

- Okamura, Yasushi: See—
Harada, Tsutomu; and Okamura, Yasushi, 4,873,596, Cl. 360-99.110.
- Okano, Teruo: See—
Ogata, Naoya; Sanui, Kohei; Yui, Nobuhiko; Kataoka, Kazunori; Okano, Teruo; and Sakurai, Yasuhisa, 4,873,292, Cl. 525-408.00D.
- Okazaki, Koji: See—
Miura, Tohru; Nagata, Teruyuki; Okazaki, Koji; Furuya, Masayuki; and Nishida, Emiko, 4,873,374, Cl. 568-743.00D.
- Oki Electric Industry Co., Ltd.: See—
Kawakatsu, Akira, 4,873,200, Cl. 437-31.00D.
- Kita, Akio, 4,873,557, Cl. 357-23.100.
- Yoshida, Takuji, 4,873,458, Cl. 307-362.00D.
- Okita, Tsutomu, to Fuji Photo Film Co., Ltd. Metallic thin film type magnetic recording medium. 4,873,138, Cl. 428-336.00D.
- Oklahoma Arrow, Inc.: See—
MacFarlane, Ronald L.; and Wilson, Dirk A., 4,872,516, Cl. 173-134.00D.
- Okuda, Naoki: See—
Sasaki, Nobukazu; Kasamura, Toshiro; Ohashi, Masashi; Okuda, Naoki; Kusumoto, Toshihiko; Maeda, Yasunori; Ozawa, Takashi; Yamamoto, Yasuyoshi; Kubota, Atsushi; Kimura, Akiyoshi; and Masuda, Makoto, 4,873,547, Cl. 355-316.00D.
- Okuda, Yosiro: See—
Takedoi, Atsushi; Kondo, Hiroyuki; Isoai, Masaru; Yoshinaga, Yoshitaka; Harada, Toshiharu; Okuda, Yosiro; Sumita, Hiroshi; Kawasaki, Hirofumi; and Mori, Kohji, 4,873,010, Cl. 252-62.59D.
- Okuma, Genji: See—
Togo, Sigeru; Saito, Yoichi; Tateyama, Masayuki; Okuma, Genji; and Miyazaki, Hiroya, 4,873,475, Cl. 318-489.00D.
- Okunomiya, Akiko: See—
Okamoto, Shosuke; Okada, Yoshio; Okunomiya, Akiko; Naito, Taketoshi; Kimura, Yoshio; Yamada, Morihiko; Ohno, Norio; Katsuura, Yasuhiro; Nojima, Hiroshi; and Shishikura, Takashi, 4,873,253, Cl. 514-352.00D.
- Oldfield, John: See—
Hughes, Leslie R.; Oldfield, John; and Tucker, Howard, 4,873,329, Cl. 544-265.00D.
- O'Lenick, Anthony J., Jr.; and Fanelli, Joseph J., to GAF Corporation. Cationic soil release polymers. 4,873,003, Cl. 252-8.75D.
- O'Lenick, Anthony J., Jr.; and Fanelli, Joseph J., to GAF Corporation. Mixture of cationic benzene carboxylate polymers from the reaction of haloacetyl terminated poly(ether-esters) with terminal quaternizing agents. 4,873,294, Cl. 525-419.00D.
- Olisar, Ronald A.; and Knierr, Daniel G., to Tektronix, Inc. High speed state machine. 4,873,456, Cl. 307-272.100.
- Olsen, Deborah J.: See—
Dannels, Bobby F.; Olsen, Deborah J.; and Forcucci, John, 4,873,382, Cl. 570-177.00D.
- Olson, Fred C.: See—
Mayhew, Eric; Ehrke, M. Jane; Mace, Kenneth; Szoka, Francis; and Olson, Fred C., 4,873,088, Cl. 424-450.00D.
- Olson, Kurt D., to UOP. Process for the production of amides. 4,873,325, Cl. 540-536.00D.
- Olson, Thomas B.: See—
Streich, Herbert K.; Leach, Robert D.; Johnson, Joel R.; Olson, Thomas B.; and Townsend, Donald L., 4,873,422, Cl. 219-370.00D.
- Olympus Optical Co., Ltd.: See—
Kanehira, Katsuyuki; Takayama, Syuichi; Amano, Atsushi; Hibino, Hiroki; Uchiyama, Naoki; and Nakada, Akio, 4,872,458, Cl. 128-401.00D.
- Katoh, Akira; Ida, Masatoshi; Yunoki, Yutaka; Harada, Hisayuki; Inoue, Manabu; and Fukuda, Yoshio, 4,873,580, Cl. 358-335.00D.
- Matsuzaki, Minoru; Itoh, Junichi; and Watanabe, Youji, 4,873,543, Cl. 354-402.00D.
- Miyazaki, Akihiko; Nonami, Tetsuo; and Ikuno, Yuji, 4,873,572, Cl. 358-98.00D.
- OMI International Corporation: See—
Darken, Jeffrey, 4,873,122, Cl. 427-97.00D.
- Omori, Takuro; and Yanagiuchi, Shigenobu, to Sharp Kabushiki Kaisha. Command translating computer. 4,873,628, Cl. 364-200.00D.
- Omron Tateisi Electronics Co.: See—
Honda, Sueaki; Hayashi, Mitsuji; Niwa, Takashi; Hayakawa, Akihiko; and Bingo, Hideyuki, 4,873,402, Cl. 200-283.00D.
- Miyawaki, Yoshinori, 4,872,461, Cl. 128-681.00D.
- Shirai, Hironobu, 4,873,448, Cl. 250-551.00D.
- Omura, Hisao: See—
Tanaka, Yukitaka; Omura, Hisao; Irinatsu, Yuuichi; Kobayashi, Takashi; and Noguchi, Aiko, 4,873,109, Cl. 426-607.00D.
- Omura, Takashi; Kikkawa, Sadanobu; Morimitsu, Toshihiko; Harada, Naoki; and Miyamoto, Tetsuya, to Sumitomo Chemical Company, Limited. Monazo compounds having a triozinyl bridging group and two vinylsulfone type fiber reactive groups. 4,873,321, Cl. 534-642.00D.
- Oncogen: See—
Hellstrom, Ingegerd; Brown, Joseph P.; Hellstrom, Karl E.; Horn, Diane; and Linsley, Peter, 4,873,188, Cl. 435-7.00D.
- Ondeyka, John G.: See—
Goegelman, Robert T.; and Ondeyka, John G., 4,873,247, Cl. 514-257.00D.
- O'Neal, Patrick E.: See—
Crecelius, Ross E.; O'Neal, Patrick E.; and Crecelius, David B., 4,872,571, Cl. 215-232.00D.
- Ono, Hideo: See—
Yasukawa, Wataru, deceased; Kiyoshige, Masanori; Horikawa, Takeshi; Okada, Tomonobu; Ochi, Tadafumi; Aoki, Yoshiaki; Higashida, Masahiko; Kawashima, Takashi; Koe, Shigeki; Ono, Hideo; Nihei, Kanta; Takasugi, Syunji; and Take, Koji, 4,872,293, Cl. 51-410.00D.
- Ono, Hitooshi; and Kato, Yoshiaki, to Mitsubishi Kasei Corporation. Electrophotographic photoreceptor comprising a charge transport medium and a bis-azo compound containing oxygen. 4,873,164, Cl. 430-58.00D.
- Ono, Shuji; and Yamamoto, Masafumi, to Fuji Photo Film Co., Ltd. Laser beam scanning system. 4,873,435, Cl. 250-235.00D.
- Onodera, Hideo: See—
Kawajiri, Tatsuya; Onodera, Hideo; Uchida, Shinichi; Aoki, Yukio; and Wada, Masahiro, 4,873,217, Cl. 502-311.00D.
- Onodera, Kageotshi; Koizumi, Tatsuya; Kato, Toshiyuki; Sotani, Junji; Momo, Masaki; and Furuya, Shuichi, to Fukura Electric Company, Ltd., The. Method of making heat transfer tube. 4,873,127, Cl. 427-376.80D.
- Oono, Nobuyuki: See—
Mieno, Toshiyuki; Nakajima, Toyohide; Okada, Yasushi; and Oono, Nobuyuki, 4,873,642, Cl. 364-431.06D.
- Ootsuka, Hiroshi: See—
Tanaka, Yoshihiro; Tsuji, Sadafusa; Hata, Yoshiaki; Inoue, Manabu; Ootsuka, Hiroshi; Iwata, Michihiro; Ishito, Fumiki; and Hayama, Koh, 4,873,544, Cl. 354-457.00D.
- Optical Diagnostic Systems, Inc.: See—
Kamieniecki, Emil; Reiss, Leszek; and Goldfarb, William C., 4,873,436, Cl. 250-315.300.
- Oquendo, Javier N.; and Leone, Joseph A., to Atlantic Richfield Company. Method and apparatus for analyzing diluted and undiluted fluid samples. 4,872,992, Cl. 210-659.00D.
- Orbanic, Robert S.: See—
Johnson, Robert R.; and Orbanic, Robert S., 4,872,260, Cl. 29-827.00D.
- Ore-Ida Vended Products, Inc.: See—
Middleton, Philip N.; Green, Glen R.; and Girlock, Harry, 4,872,474, Cl. 137-493.80D.
- Orion-yhtymä Oy: See—
Lindholm, Stig O. E., 4,873,330, Cl. 544-291.00D.
- Orr, Clyde, Jr.; and Camp, Ronnie, to Micromeritics Instrument Corp. Automatic sample feeder for suspended samples. 4,872,353, Cl. 73-864.85D.
- Orscheln Co.: See—
Boyer, Billy G.; Nelson, Lloyd M.; Soucie, Wayne L.; and Hayes, William K., 4,872,533, Cl. 188-2.00D.
- Porter, Curtis H., 4,872,368, Cl. 74-542.00D.
- Osamu, Anazawa, to Sanden Corporation. Article storage and dispensing device with sold out indicating mechanism. 4,872,592, Cl. 221-6.00D.
- Oshima, Akira. Seal mechanism for butterfly valve with press contacting seal effective in both inflow and outflow directions. 4,872,642, Cl. 251-173.00D.
- Oshima, Hiroshi: See—
Wachi, Shun; Arik, Yuusaku; and Oshima, Hiroshi, 4,873,384, Cl. 570-247.00D.
- Ostrander, Kenneth A., to Minnesota Mining and Manufacturing Company. Multi input lightning detection system. 4,873,483, Cl. 324-72.00D.
- O'Sullivan, Kevin B.: See—
Troutner, Arthur L.; and O'Sullivan, Kevin B., 4,872,299, Cl. 52-693.00D.
- Otsuka Koki Kabushiki Kaisha: See—
Masuda, Satoru; and Ishigami, Hiroyuki, 4,872,548, Cl. 198-859.00D.
- Otsuka Pharmaceutical Co., Ltd.: See—
Miyazaki, Wasei; and Inoue, Yasuhiko, 4,873,261, Cl. 514-462.00D.
- Otsuki, Hajime, to Minolta Camera Kabushiki Kaisha. Reader-printer. 4,873,552, Cl. 355-271.00D.
- Ott, Karl-Heinz: See—
Lindner, Christian; Wittmann, Dieter; Trabert, Ludwig; Suling, Carlhan; Bartl, Herbert; and Ott, Karl-Heinz, 4,873,289, Cl. 525-293.00D.
- Ouchi, Mitsuyuki; and Aono, Koichi, to Toyota Jidosha Kabushiki Kaisha. Differential control device. 4,872,373, Cl. 74-711.00D.
- Outboard Marine Corporation: See—
VanRens, Russell J., 4,872,637, Cl. 249-59.00D.
- Owashi, Hitoaki: See—
Furuhata, Takashi; Owashi, Hitoaki; Ito, Takayasu; and Hamaguchi, Masakazu, 4,873,582, Cl. 358-310.00D.
- Owens-Corning Fiberglass Corporation: See—
Blackwood, Albert J.; and Brady, Thomas R., 4,873,303, Cl. 427-365.00D.
- Owens-Illinois Plastic Products Inc.: See—
Panzolo, Aldo, 4,872,549, Cl. 206-158.00D.
- Owsley, Patrick A.: See—
Maki, Gary K.; Cameron, Kelly B.; and Owsley, Patrick A., 4,873,688, Cl. 371-37.100.
- Oy Uponor AB: See—
Jarvenkylä, Jyri, 4,873,048, Cl. 264-504.00D.
- Ozaki, Shinya: See—
Inazawa, Yoshizumi; Yamada, Masaki; Ishibashi, Hiroshi; and Ozaki, Shinya, 4,873,589, Cl. 360-53.00D.
- Ozawa, Kazuhisa: See—
Mogi, Hiroyuki; and Ozawa, Kazuhisa, 4,872,850, Cl. 439-264.00D.
- Ozawa, Masayuki, to Mitsubishi Denki Kabushiki Kaisha. Ignition circuit for internal combustion engine. 4,872,441, Cl. 123-651.00D.
- Ozawa, Takashi: See—
Sasaki, Nobukazu; Kasamura, Toshiro; Ohashi, Masashi; Okuda, Naoki; Kusumoto, Toshihiko; Maeda, Yasunori; Ozawa, Takashi;

- Yamamoto, Yasuyoshi; Kubota, Atsushi; Kimura, Akiyoshi; and Masuda, Makoto, 4,873,547, Cl. 355-316.000.
- Ozeki, Tadashi: See—
Nakagawa, Kazushige; Koh, Makoto; Sera, Kyoji; Ozeki, Tadashi; and Iwasaki, Masahiro, 4,872,394, Cl. 91-506.000.
- Pacesetter Infusion, Ltd.: See—
Gorton, Lanny A.; and Pelmulder, John P., 4,872,813, Cl. 417-63.000.
- Pacey, Grant K.: See—
Kahn, David A.; Pacey, Grant K.; Hvezda, Jaroslav M.; and Dalgleish, Jack F., 4,872,739, Cl. 350-96.160.
- Pacific Security Systems of America, Inc.: See—
Peirish, Alfred J.; Schmidt, Theodore E.; and Thomas, William C., 4,872,286, Cl. 49-449.000.
- Padovani, Pietro, to O.M.V. S.p.A. (Officine Meccaniche Veronesi). Apparatus for obtaining a negative pressure in chambers formed by a flat extractor plate supporting hollow thermoformed objects. 4,872,826, Cl. 425-388.000.
- Page, Nancy M.: See—
Valyocak, Ernest W.; Page, Nancy M.; and Chu, Cynthia T-W., 4,873,067, Cl. 423-279.000.
- Palitz, Bernard G., Jr. Child resistant electrical socket or socket attachment. 4,872,852, Cl. 439-307.000.
- Pallozzi, Franco: See—
Federici, Franco; Pallozzi, Franco; Cozzi, Ennio; and Turco, Pietro, 4,873,307, Cl. 528-60.000.
- Palmer, Darrel, to Ballard Medical Products. Aspirating/ventilating apparatus and method. 4,872,579, Cl. 128-205.190.
- Pan, Victor T.: See—
Juliana, Anthony; Leung, Wai C.; Pan, Victor T.; Rosen, Hal J.; and Strand, Timothy C., 4,873,430, Cl. 250-225.000.
- Pankow, Mark L. Contact lens cleaning apparatus. 4,872,965, Cl. 204-299.00R.
- Pannier, Gerard, to Regie Nationale des Usines Renault. Safety control device for an actuator of the flap solenoid valve type. 4,873,606, Cl. 361-152.000.
- Panzolo, Aldo, to Owens-Illinois Plastic Products Inc. Carrier for bottles. 4,872,549, Cl. 206-158.000.
- Papapetros, Peter A. Motor vehicle servicing tool. 4,872,644, Cl. 254-10.500.
- Papi, Adolfo: See—
Brehmer, Roland; and Papi, Adolfo, 4,873,421, Cl. 219-341.000.
- Paradise, Francis M.; and Paradise, James R.: See—
Paradise, Francis M.; and Paradise, James R., 4,872,647, Cl. 256-1.000.
- Paramythioti, Michel; and d'Aligny, Auguste. Process and apparatus for three-dimensional surveying. 4,873,449, Cl. 250-560.000.
- Pardenek, Sandra A.: See—
Fleming, James W.; Johnson, David W., Jr.; MacChesney, John B.; and Pardenek, Sandra A., 4,872,895, Cl. 65-18.100.
- Pargeter, Christopher: See—
Jenkins, Dianne M.; and Pargeter, Christopher, 4,873,047, Cl. 264-322.000.
- Parker, Byron M.: See—
Parker, Trent J.; and Parker, Byron M., 4,872,955, Cl. 202-154.000.
- Parker, Robert. Treadmill having improved deck. 4,872,664, Cl. 272-69.000.
- Parker, Trent J.; and Parker, Byron M., to Uni-Frac Inc. Vapor/liquid contact column structure. 4,872,955, Cl. 202-154.000.
- Parks, Gerald A., to Iowa State University Research Foundation, Inc. Switching device. 4,873,405, Cl. 200-547.000.
- Parravicini, Francesco: See—
Farina, Carlo; Pinza, Mario; Cerri, Alberto; and Parravicini, Francesco, 4,873,328, Cl. 544-239.000.
- Parries, Paul C.: See—
Critchlow, Dale L.; DeBrosse, John K.; Mohler, Rick L.; Noble, Wendell P., Jr.; and Parries, Paul C., 4,873,205, Cl. 437-200.000.
- Parry, Daniel J.; and Parry, John C., to J. C. Parry & Sons, Inc. Film roll holder with drum brake. 4,872,623, Cl. 242-96.000.
- Parry, John C.: See—
Parry, Daniel J.; and Parry, John C., 4,872,623, Cl. 242-96.000.
- Parsons, William H.; Patchett, Arthur A.; and Thorsett, Eugene D., to Merck & Co., Inc. Benzofused lactams as antihypertensives. 4,873,235, Cl. 514-312.000.
- Pasternak, Mordechai: See—
Barteis, Craig R.; Dorawala, Tansukhlal G.; Stephenson, Michael T.; Pasternak, Mordechai; and Reale, John, Jr., 4,872,991, Cl. 210-651.000.
- Pastor, Jose: See—
Hunter, Kevin D.; Durst, Robert T., Jr.; and Pastor, Jose, 4,873,645, Cl. 364-479.000.
- Patchett, Arthur A.: See—
Parsons, William H.; Patchett, Arthur A.; and Thorsett, Eugene D., 4,873,235, Cl. 514-312.000.
- Patentverwertungsgesellschaft burgerlichen Rechts: See—
Gajic, Branco R., 4,872,900, Cl. 71-23.000.
- Patio Enclosures, Inc.: See—
Hetzl, Joseph R.; and Virgins, Kenneth L., 4,872,297, Cl. 52-92.000.
- Paul, Ana: See—
Paul, Marius A.; and Paul, Ana, 4,872,433, Cl. 123-257.000.
- Paul, Marius A.; and Paul, Ana. Combustion chamber configurations for two cycle engines. 4,872,433, Cl. 123-257.000.
- Paulson, Kenneth R.: See—
Grimmer, Derrick P.; Paulson, Kenneth R.; and Gilbert, James R., 4,873,201, Cl. 437-51.000.
- Paumard, Maurice: See—
Langlais, Joel; and Paumard, Maurice, 4,873,425, Cl. 235-441.000.
- Pavlik, Jonn P. Toilet-tank leak detector, chemical economizer. 4,872,222, Cl. 4-228.000.
- Payne, Le Roy. Ditch lining apparatus and method and product therefrom. 4,872,784, Cl. 405-270.000.
- Pearson, Stanley R.: See—
Henley, John P.; Pearson, Stanley R.; Peters, Bruce C.; and LaFitte, Larry L., 4,872,886, Cl. 48-197.00R.
- Peirish, Alfred J.; Schmidt, Theodore E.; and Thomas, William C., to Pacific Security Systems of America, Inc. External latch structure for locking a door in different positions. 4,872,286, Cl. 49-449.000.
- Pekala, Richard W., to United States of America. Energy. Low density, resorcinol-formaldehyde aerogels. 4,873,218, Cl. 502-418.000.
- Pellerin, Daniel, to U.S. Philips Corporation. Method and apparatus for collecting errors in the digital data of a television signal. 4,873,689, Cl. 371-37.100.
- Pelmulder, John P.: See—
Gorton, Lanny A.; and Pelmulder, John P., 4,872,813, Cl. 417-63.000.
- Penn, Paul E.; Werckman, Roger A., Jr.; and Waymire, John W., to Dart Controls, Inc. Modular motor controller. 4,873,473, Cl. 388-814.000.
- Penning, Thomas D.: See—
Johnson, Carl R.; and Penning, Thomas D., 4,873,360, Cl. 560-121.000.
- Pennzoil Products Company: See—
Chiu, I-Ching, 4,873,370, Cl. 564-500.000.
- Penril Corporation: See—
Tretter, Steven A., 4,873,701, Cl. 375-27.000.
- Pentastem S.p.A.: See—
Virdia, Antonio, 4,873,427, Cl. 235-492.000.
- Periou, Pierre, to Rockwell-CIM. Screw jack safe against overload for a movable element such as a seat structure. 4,872,903, Cl. 74-89.150.
- Perkin-Elmer Corporation, The: See—
Dorfman, Mitchell R., 4,872,904, Cl. 75-0.5BA.
- Golay, Marcel, 4,872,979, Cl. 210-198.200.
- Sussmeier, John, 4,872,891, Cl. 55-387.000.
- Perloff, David S.: See—
Lane, Leslie A.; Lybeck, Lynn V.; Perloff, David S.; and Kumagi, Shoji, 4,873,623, Cl. 364-188.000.
- Perlov, Ilya: See—
Wang, David N.; White, John M.; Law, Kam S.; Leung, Cissy; Umotoy, Salvador P.; Collins, Kenneth S.; Adamik, John A.; Perlov, Ilya; and Maydan, Dan, 4,872,947, Cl. 156-643.000.
- Permian Research Corporation: See—
Johnson, Marion; and Hahn, Granville J., 4,872,573, Cl. 215-347.000.
- Perrault, Ronald. Skeleton device. 4,872,268, Cl. 33-512.000.
- Perry, John F.: See—
Loeb, Marvin P.; and Perry, John F., 4,872,464, Cl. 128-844.000.
- Peters, Bruce C.: See—
Henley, John P.; Pearson, Stanley R.; Peters, Bruce C.; and LaFitte, Larry L., 4,872,886, Cl. 48-197.00R.
- Peters, Rex B.; and Cornelius, Craig J., to Sundstrand Data Control, Inc. Matched pairs of force transducers. 4,872,343, Cl. 73-517.0AV.
- Peters, Rex B.: See—
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Jansen, Johannes J.; Mossou, Bernardus H. F.; and Poort, Hans, 4,873,147, Cl. 428-533.000.
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Jones, James V., 4,873,206, Cl. 501-71.000.
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Areau, Larry D., 4,872,907, Cl. 75-65.00R.
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Schoon, Hinrich, 4,872,559, Cl. 206-538.000.
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Counts, Richard; and Pritchett, Rob, 4,873,403, Cl. 200-330.000.
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Jones, Alun G.; Davison, Alan; Kronauge, James; and Abrams, Michael J., 4,872,561, Cl. 206-569.000.
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Warder, William G.; and Frye, David R., 4,872,563, Cl. 206-634.000.
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Bucher, Michael S.; Russo, Paul J.; and Schaar, Robert J., 4,872,919, Cl. 134-3.000.
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Steenburg, Kip V., 4,872,692, Cl. 280-30.000.
- Productech Reflow Solder Equipment Inc.: See—
Zimmer, Gero, 4,872,604, Cl. 228-9.000.
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Schneider, Richard T., 4,873,443, Cl. 250-336.200.
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Kuhn, Michael H.; Helzel, Thomas; Proksa, Roland; and Van Den Berg, Noel J. M., 4,873,486, Cl. 324-307.000.
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Lane, Leslie A.; Lybeck, Lynn V.; Perloff, David S.; and Kumagi, Shoji, 4,873,623, Cl. 364-188.000.
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- Pukalo, Walter P.: See—
Critton, Thomas J.; Johnson, Donald S.; Pukalo, Walter P.; and Yorio, Ralph, 4,872,369, Cl. 74-574.000.
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- Quernemoen, Daniel R., to Fluoroware, Inc. Reinforced carrier with embedded rigid insert. 4,872,554, Cl. 206-454.000.
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Popovic, Vida, 4,873,141, Cl. 428-357.000.
- Quinzio, Giovanni: See—
Rapp, Werner; Link, Walter; and Quinzio, Giovanni, 4,873,400, Cl. 178-19.000.
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Benner, Harold T., Jr.; and Dieterlen, Paul E., 4,872,382, Cl. 83-152.000.
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Rosso, Walter, 4,872,774, Cl. 401-29.000.
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Schniter, Jorg, 4,872,797, Cl. 412-25.000.
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Borth, David E.; Wang, Chih-Fei; Rabe, Duane C.; and Labedz, Gerald P., 4,873,683, Cl. 370-95.100.
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Nelson, Loren D.; Erb, Lee A.; Ware, Randolph H.; and Rottner, Donald, 4,873,481, Cl. 324-58.50R.
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Gutov, Sergei K.; Plessner, Dmitry A.; and Radutsky, Grigory A., 4,872,800, Cl. 414-278.000.
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Hammann, Peter; Grabley, Susanne; Raether, Wolfgang; Ciommer, Bernd; Kluge, Heinz; and Sachse, Burkhard, 4,873,347, Cl. 549-267.000.
- Rafalow, Lee M.: See—
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- Ragard, Phillip A., to Universal Instruments Corporation. Pick and place method and apparatus. 4,872,258, Cl. 29-740.000.
- Raines, Charles D.: See—
Dayen, Leonid; and Raines, Charles D., 4,872,535, Cl. 188-170.000.
- Rakutani, Kenji: See—
Tsubakimoto, Tsuneo; Ito, Hayami; Tatsumi, Shuhei; Kajibata, Yoshihiro; Takao, Shiochi; Goto, Takakiyo; Nakaishi, Akio; Rakutani, Kenji; Tamura, Toshio; and Kobayashi, Hiroya, 4,872,885, Cl. 44-51.000.
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- Ramirez, Lawrence; and Whiteside, Walter, to G. LeBlanc Corporation. Detachable mouthpiece assembly. 4,872,389, Cl. 84-387.00R.
- Ramtron Corporation: See—
Eaton, S. Sheffield, Jr., 4,873,664, Cl. 365-145.000.
- Randall, Jack E., to CPT Corporation. Method and apparatus for effectively doubling the operational speed of selected digital circuits. 4,873,704, Cl. 377-47.000.
- Rao, Nancy A.: See—
McIntyre, John M.; Anderson, Kenneth W.; Rao, Nancy A.; and Hickner, Richard A., 4,872,961, Cl. 204-181.700.
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Kellner, Carl S.; and Rao, V. N. Mallikarjuna, 4,873,381, Cl. 570-126.000.
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- Raspor, Otto C.: See—
Chau, C. C.; Im, Jang-hi; Raspor, Otto C.; and Tung, Lu H., 4,873,037, Cl. 264-49.000.
- Rauh, Hans-Jurgen: See—
Zahn, Wolfgang; Fursich, Manfred; Nitsch, Wilhelm; Rauh, Hans-Jurgen; and Treiber, Helmut, 4,873,546, Cl. 355-38.000.
- Raviv, Daniel, to Case Western Reserve University. Method and apparatus for reconstructing three-dimensional surfaces from two-dimensional images. 4,873,651, Cl. 364-513.000.
- Raychem Corporation: See—
Kapgan, Michael, 4,872,713, Cl. 285-381.000.
- Raycon Corporation: See—
Johnson, Trevor A.; and Gorscak, Sharon L., 4,873,415, Cl. 219-121.640.
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Fronheiser, Dennis R.; Hayward, Jack; Reafler, Gerald G.; and Schuler, James R., 4,872,270, Cl. 34-23.000.
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Bartels, Craig R.; Dorawala, Tansukhlal G.; Stephenson, Michael T.; Pasternak, Mordechai; and Reale, John, Jr., 4,872,991, Cl. 210-651.000.
- Rearwin, Earle W.; and Rearwin, Gayle L., to It's A Peach, Inc. Elasticized knitted band. 4,872,324, Cl. 66-172.00E.
- Rearwin, Gayle L.: See—
Rearwin, Earle W.; and Rearwin, Gayle L., 4,872,324, Cl. 66-172.00E.
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Landwehr, Reinhard; and Rebers, Gunter, 4,873,049, Cl. 264-513.000.
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- Redkey, Robert H.: See—
Doran, Brian A.; and Redkey, Robert H., 4,872,683, Cl. 271-164.000.
- Reed, William A., to U-Line Corporation. Unitary ice maker with fresh food compartment and control system therefor. 4,872,317, Cl. 62-135.000.
- Rees, Theodore D.: See—
Chung, Chi H.; Rees, Theodore D.; and Turner, Ian, 4,873,680, Cl. 369-59.000.
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Pannier, Gerard, 4,873,606, Cl. 361-152.000.
- Reimer, Kerry D.: See—
Wittnebel, Bruce W.; Reimer, Kerry D.; and Miller, Leonard F., 4,873,135, Cl. 428-192.000.
- Reiss, Leszek: See—
Kamieniecki, Emil; Reiss, Leszek; and Goldfarb, William C., 4,873,436, Cl. 250-315.300.
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Powers, Thomas P.; Seppala, Earl E.; and Young, James C., 4,872,392, Cl. 89-193.000.
- Rengstl, Alfred, to Wacker-Chemie GmbH. Process for reducing the halogen content of halogen-containing polycarbosilanes and polysilanes. 4,873,297, Cl. 525-474.000.
- Renk, Russell R.: See—
Herbst, Robert J.; and Renk, Russell R., 4,872,959, Cl. 204-109.000.
- Repta, A. J., to Merck & Co., Inc. Rectally absorbable form of L-dopa. 4,873,263, Cl. 514-535.000.
- Research Development Corporation of Japan: See—
Ogata, Naoya; Sanui, Kohei; Yui, Nobuhiko; Kataoka, Kazunori; Okano, Teruo; and Sakurai, Yasuhisa, 4,873,292, Cl. 525-408.000.
- Reyneri, Justin M.: See—
El Gamal, Abbas A.; El-Ayat, Khaled A.; Greene, Jonathan W.; Guo, Ta-Pen R.; and Reyneri, Justin M., 4,873,459, Cl. 307-465.000.
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Dunton, Harvey R.; and Rez, Donald H., 4,872,913, Cl. 106-88.000.
- Rheinmetall GmbH: See—
Becker, Wilfried; and Bisping, Bernhard, 4,872,409, Cl. 102-517.000.
- Boder, Dieter, 4,873,416, Cl. 219-121.640.
- Rhone-Poulenc Chimie: See—
Cavezzan, Jacques; Frances, Jean-Marc; and Millet, Claude, 4,873,305, Cl. 528-18.000.
- Rhone-Poulenc Nederlands B.V.: See—
Chou, David T.; and Cain, Paul A., 4,873,264, Cl. 514-594.000.
- Rhone-Poulenc Specialites Chimiques: See—
Cros, Patrick; and Papon, Robert, 4,873,323, Cl. 536-114.000.
- Ricco, Mario: See—
Ausiello, Francesco P.; Ricco, Mario; and De Mattheis, Sisto Luigi, 4,872,438, Cl. 123-514.000.
- Rice, David A.: See—
Watts, Robert J.; Rice, David A.; and Neun, John A., 4,872,337, Cl. 73-162.000.
- Richeson, William E.; and Erickson, Frederick L., to Magnavox Government and Industrial Electronics Company. Air powered valve actuator. 4,872,425, Cl. 123-90.130.
- Richter, Bernd: See—
Junge, Bodo; Richter, Bernd; Glaser, Thomas; Traber, Jorg; and Allen, George S., 4,873,262, Cl. 514-510.000.
- Rickmann, Hans-Werner: See—
Giersch, Dieter; Rickmann, Hans-Werner; and Wibbeling, Ulrich, 4,872,274, Cl. 37-64.000.
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Kameyama, Toshiaki; and Kobayashi, Yuichi, 4,872,660, Cl. 271-9.000.
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- Sasaki, Eiichi, 4,873,535, Cl. 346-1.100.
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Wingo, James C., Jr., 4,872,216, Cl. 2-2.000.
- Rieder, Werner, to Minnesota Mining and Manufacturing Company. Process for the preparation of aromatic polyesters and apparatus for carrying out this process. 4,873,060, Cl. 422-135.000.
- Riesen, Peter, to Sulzer Brother Limited. Projectile-catching brake for a loom. 4,872,487, Cl. 139-185.000.
- Ring, Klaus: See—
Heckmann, Klaus; Manecke, Georg; Pfannenmuller, Beate; Ring, Klaus; and Ringsdorf, Helmut, 4,873,033, Cl. 264-41.000.
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- Rippel, Wally E., to California Institute of Technology. Monolithic transistor gate energy recovery system. 4,873,460, Cl. 307-571.000.

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Hoye, Robert S.; and Roach, Theodore H., 4,872,672, Cl. 273-1.00E.
- Roane, Bobby A., to Texas Instruments Incorporated. Method and apparatus for providing interconnection between metallization layers on semiconductor devices. 4,873,565, Cl. 357-71.000.
- Robert Bosch GmbH: See—
Burk, Peter; and Hahn, Klaus, 4,873,640, Cl. 364-426.046.
- Hecht, Hans; and Kuhn, Winfried, 4,873,490, Cl. 328-3.000.
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Chmurny, Alan B.; Gross, Akiva T.; Kupper, Robert J.; and Roberts, Rowena L., 4,873,359, Cl. 560-40.000.
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- Robertshaw Controls Company: See—
Katchka, Jay R.; Yeaman, George A.; and McKinney, Richard W., 4,872,830, Cl. 431-54.000.
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Irwin, George F.; Smelters, Paul J.; Robertson, David J.; and Maginley, Ronald J., 4,873,682, Cl. 370-58.100.
- Robertson, Douglas D., to Brigham & Women's Hospital. X-ray tomography phantoms, method and system. 4,873,707, Cl. 378-18.000.
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- Rogers, Derek J.: See—
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- Rolls Royce Inc.: See—
Ma, Kong; and Pinder, John T., 4,873,414, Cl. 219-121.700.
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- Rosenblum, Myron, to Brandeis University. Organometallic polymer. 4,873,304, Cl. 528-9.000.
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- Ross, Milton I. Method and apparatus for making encapsulated electronic circuit devices. 4,872,825, Cl. 425-117.000.
- Ross, Rudi: See—
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- Ross, Stephen T.: See—
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Roberts, Teddy P.; and Rozanski, Walter J., Jr., 4,873,711, Cl. 379-58.000.
- Ruark, Darryl L., to A. O. Smith Corporation. Water heater with power vent access door. 4,872,443, Cl. 126-361.000.
- Rubbo, Richard P.: See—
Lehr, Douglas J.; Bell, Merle L.; Rubbo, Richard P.; and Forehand, Richard L., 4,872,510, Cl. 166-327.000.
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- Ruesch, James R., to Micro Motion Incorporated. Net oil computer. 4,872,351, Cl. 73-861.040.
- Rufin, Denis; and Hirase, Ikuo, to L'Air Liquide, Societe Anonyme Pour l'Etude et l'Exploitation des Procédes Georges Claude. Process for the control in real time of the selectivity of the etching by analysis of the plasma gases in a process of reactive ionic etching and a reactor therefore. 4,872,944, Cl. 156-626.000.
- Rugora, Edoardo: See—
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- Ruiz, Mark R. Edible food product and package. 4,873,099, Cl. 426-104.000.
- Rundle, Kevin W. Extraction of soluble materials from whole citrus fruit. 4,873,095, Cl. 426-50.000.
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Brickl, Rolf; Schepky, Gottfried; Rupprecht, Eckhard; and Greischel, Andreas, 4,873,080, Cl. 424-80.000.
- Rushforth, Kevin C.: See—
Dickson, Calvin M.; and Rushforth, Kevin C., 4,873,515, Cl. 340-728.000.
- Russo, Paul J.: See—
Bucher, Michael S.; Russo, Paul J.; and Schaar, Robert J., 4,872,919, Cl. 134-3.000.
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- Rutigliano, Frank. Drip-can holder. 4,872,631, Cl. 248-313.000.
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- Rye, Ralph K. Adjustable armed chair. 4,872,727, Cl. 297-411.000.
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Lake, Connie, 4,872,608, Cl. 229-2.5EC.
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Alexander, William B.; and Frenger, Paul, 4,873,654, Cl. 364-551.010.
- Sagami Chemical Research Center: See—
Umamoto, Teruo; and Gotoh, Yoshihiko, 4,873,027, Cl. 562-83.000.

- Sagawa, Yuzo: See—
Koshihara, Toshio; Misawa, Rokuro; Sagawa, Yuzo; Takehara, Kimio; Matoba, Yuji; and Ishihara, Koji, 4,872,762, Cl. 374-5,000.
- Saika, Masahiko: See—
Nishinoiri, Hiroshi; Saikawa, Masahiko; Takaya, Yoshikazu; and Kanada, Eiji, 4,873,170, Cl. 430-204,000.
- Saiki, Kozo: See—
Kaji, Kichiro; Shimasaki, Katsunori; Yamamoto, Masakazu; Saiki, Kozo; Yura, Keita; Habata, Hidetsugu; Kimura, Isao; and Suzuki, Tetsuo, 4,873,070, Cl. 423-345,000.
- St. Phillips, Eric A.: See—
Sharps, Gordon V., Jr.; and St. Phillips, Eric A., 4,872,942, Cl. 156-515,000.
- Saito, Akihiro: See—
Fujii, Susumi; Ishida, Hiromi; Morioka, Masataka; Saito, Akihiro; and van der Meer, Roelof, 4,873,276, Cl. 524-153,000.
- Saito, Hajime: See—
Matsushita, Junichi; Saito, Hajime; and Nagashima, Hideo, 4,873,053, Cl. 419-11,000.
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- Saito, Hiroyuki, to Nippon Seiko Kabushiki Kaisha. Passive seat belt system, 4,872,703, Cl. 280-804,000.
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- Saito, Yoshihiko: See—
Suzuki, Koji; Tsukada, Tetsuro; Saito, Yoshihiko; Arai, Kiyotaka; and Mori, Hiroshi, 4,872,958, Cl. 204-98,000.
- Saito, Yoshio: See—
Kido, Keishiro; and Saito, Yoshio, 4,873,059, Cl. 422-100,000.
- Saitoh, Masayuki: See—
Tanaka, Takaharu; Saitoh, Masayuki; Higuchi, Naoki; and Hashimoto, Masaki, 4,873,342, Cl. 548-518,000.
- Sakai, Akira: See—
Matsuyama, Jinsho; Hirai, Yutaka; Ueki, Masao; and Sakai, Akira, 4,873,125, Cl. 427-248,100.
- Sakai Chemical Industry Co., Ltd.: See—
Fujita, Kunitaroh; Wachi, Toshio; and Ikeda, Yoshiaki, 4,873,351, Cl. 556-76,000.
- Sakai, Hiroshi: See—
Satake, Tokuki; Sakai, Hiroshi; Nakatani, Hayami; Nakamori, Masaharu; and Ishibashi, Masaru, 4,873,156, Cl. 429-31,000.
- Sakai, Takashi, to Akebono Brake Industry Co., Ltd.; and Akebono Research and Development Centre Ltd. Safety device for a radiator cap, 4,872,584, Cl. 220-201,000.
- Sakamoto, Keiji: See—
Kurakake, Mitsuo; Sakamoto, Keiji; and Iwamoto, Takashi, 4,873,476, Cl. 318-568,200.
- Sakamoto, Kenji; Ishikawa, Nobuo; and Hayakawa, Motomu, to Seiko Epson Corporation. Charging apparatus for an electronic device, 4,873,677, Cl. 368-204,000.
- Sakamoto, Toshihide: See—
Fujisawa, Norio; Sakamoto, Toshihide; Ito, Toshiyasu; and Shimada, Junichi, 4,872,745, Cl. 350-357,000.
- Sakano, Shinji: See—
Uomi, Kazuhisa; Tsuji, Shinji; Sakano, Shinji; Okai, Makoto; and Chiono, Naoki, 4,873,691, Cl. 372-20,000.
- Sakunaga, Kenichi: See—
Terada, Hiromu; Fukahori, Noyuki; and Sakunaga, Kenichi, 4,872,740, Cl. 350-96,260.
- Sakurai, Kaoru; Murakami, Harunori; Mizukami, Hikaru; and Fujita, Kazuhisa, to Nippon Sheet Glass Co., Ltd. Antenna apparatus for a vehicle, 4,873,532, Cl. 343-713,000.
- Sakurai, Yasuhisa: See—
Ogata, Naoya; Sanui, Kohei; Yui, Nobuhiko; Kataoka, Kazunori; Okano, Teruo; and Sakurai, Yasuhisa, 4,873,292, Cl. 525-408,000.
- Salan, Antonio: See—
Ciaperoni, Aldemaro; Cappelli, Alberto; D'Andolfo, Francesco; and Salan, Antonio, 4,873,296, Cl. 525-434,000.
- Sallay, Stephen I. Insecticidal composition, 4,873,084, Cl. 424-658,000.
- Salomon, S.A.: See—
Szafranski, Pierre, 4,872,698, Cl. 280-605,000.
- Salz, Gilbert; and Sullivan, Mark. Prophylactic apron, 4,872,462, Cl. 128-842,000.
- Sam Sung Electronic Co. Ltd.: See—
Kwon, Hisung, 4,873,454, Cl. 307-140,000.
- Samsung Electronics Co., Ltd.: See—
Han, Bong H., 4,872,527, Cl. 181-160,000.
- Sanbuchi, Hiroshi: See—
Nagaishi, Hatsu; Seimiya, Yasuo; Tamura, Hideyuki; Miwa, Hiromichi; Sanbuchi, Hiroshi; Uchida, Masaaki; and Takahata, Toshio, 4,873,641, Cl. 364-431,040.
- Sanden Corporation: See—
Osamu, Anazawa, 4,872,592, Cl. 221-6,000.
- Takai, Kazuhiko, 4,872,815, Cl. 417-222,000.
- Sanders, Robert J.: See—
Fuller, Robert T.; and Sanders, Robert J., 4,872,580, Cl. 211-45,000.
- Sanders, Robert N.: See—
Laurent, Sebastian M.; and Sanders, Robert N., 4,873,097, Cl. 426-74,000.
- Laurent, Sebastian M.; and Sanders, Robert N., 4,872,421, Cl. 119-1,000.
- Sanders, Ward L.: See—
Brendford, Thomas; Sanders, Ward L.; and Coon, Dennis C., 4,872,656, Cl. 269-322,000.
- Sanderson, John R.; and Larkin, John M., to Texaco Inc. Catalyst for removing peroxide contaminants from tertiary butyl alcohol, 4,873,380, Cl. 568-914,000.
- Sandvik AB: See—
Lundell, Lars-Gunnar, 4,872,515, Cl. 173-132,000.
- Sanemitsu, Yuzuru: See—
Katoh, Tsuguhiko; Maeda, Kiyoto; Shiroshita, Masao; Yamashita, Norihisa; Sanemitsu, Yuzuru; and Inoue, Satoru, 4,873,248, Cl. 514-269,000.
- Sanielevici, Sergio A., to Tektronix, Inc. Integrated sample and hold circuit, 4,873,457, Cl. 307-353,000.
- Sankyo Company Limited: See—
Yoshioka, Takao; Kanai, Tsutomu; Aizawa, Yuichi; Horikoshi, Hiroyoshi; and Hasegawa, Kazuo, 4,873,255, Cl. 514-369,000.
- Sanofi: See—
Radisson, Joel, 4,873,343, Cl. 549-74,000.
- Wermuth, Camille G.; Schlewer, Gilbert; and Heulme, Michel, 4,873,243, Cl. 514-248,000.
- Sanshin Kogyo Kabushiki Kaisha: See—
Hasegawa, Junichi; and Takahashi, Hideharu, 4,872,858, Cl. 440-38,000.
- Sant, Peter: See—
Beverwijk, Christiaan D. M.; De Jong, Feike; and Sant, Peter, 4,873,004, Cl. 252-32,500.
- Sanui, Kohei: See—
Ogata, Naoya; Sanui, Kohei; Yui, Nobuhiko; Kataoka, Kazunori; Okano, Teruo; and Sakurai, Yasuhisa, 4,873,292, Cl. 525-408,000.
- Sanyal, Amalendu; Moy, Peter; and Cosentino, Frank, to Digital Equipment Corporation. Method of and apparatus for surface mounting electronic components onto a printed wiring board, 4,872,261, Cl. 29-840,000.
- Sanyo Electric Co., Ltd.: See—
Ishizaka, Yoshirou; Naganuma, Hiroshi; Sato, Kenji; Kishi, Yuji; Ishida, Yoshihisa; and Goto, Kiyokazu, 4,872,320, Cl. 62-255,000.
- Miyazaki, Noriyuki; and Matsuoka, Tetsunori, 4,873,160, Cl. 429-170,000.
- Saotome, Yasushi; Miyazawa, Takeo; and Endo, Takeshi, to M & D Research Co., Ltd. Optically active, ethylenically unsaturated polymers of amino penicillanic acid compounds, 4,873,301, Cl. 526-257,000.
- Sapienza, Samuel J., IV, to Siemens-Bendix Automotive Electronics L.P. Variable camshaft timing system, 4,872,426, Cl. 123-90,150.
- Sarasota Automation Limited: See—
Jefferis, Brian C., 4,873,494, Cl. 331-65,000.
- Sargent, Desmond J., to Post Office, The. Information handling system and terminal apparatus therefor, 4,873,662, Cl. 364-900,000.
- Sarna, David E. Y.; and Mailick, Daniel, to Image Business Systems Corporation. Technique for reading bar codes, 4,873,426, Cl. 235-462,000.
- Sarumaru, Kohei: See—
Kadowaki, Koji; Sarumaru, Kohei; and Shibano, Takeshi, 4,873,368, Cl. 562-532,000.
- Sasakawa, Atsushi: See—
Matsuda, Toshiharu; Sasakawa, Atsushi; Hayashi, Shoichiro; and Konai, Yutaka, 4,873,366, Cl. 562-416,000.
- Sasaki, Eiichi, to Ricoh Company, Ltd. Method of driving thermal head, 4,873,535, Cl. 346-1,100.
- Sasaki, Hidemi: See—
Negishi, Kenji; Sasaki, Hidemi; and Fujishiro, Takeshi, 4,873,598, Cl. 360-106,000.
- Sasaki, Hitoshi; and Igota, Shoji, to Ajinomoto Co., Inc. Resin coated can with folded seam, 4,872,590, Cl. 220-457,000.
- Sasaki, Isao: See—
Hirayama, Shigemitsu; Akashi, Takamichi; Ikuta, Akio; Sasaki, Isao; and Fukuda, Hiroshi, 4,872,974, Cl. 210-90,000.
- Sasaki, Kiyohiko: See—
Ishima, Tsutomu; and Sasaki, Kiyohiko, 4,872,842, Cl. 439-15,000.
- Sasaki, Nobukazu; Kasamura, Toshiro; Ohashi, Masashi; Okuda, Naoki; Kusumoto, Toshihiko; Maeda, Yasunori; Ozawa, Takashi; Yamamoto, Yasuyoshi; Kubota, Atsushi; Kimura, Akiyoshi; and Masuda, Makoto, to Canon Kabushiki Kaisha. Sheet conveying apparatus, 4,873,547, Cl. 355-316,000.
- Sasaoka, Senzo; Yoshida, Tetsuo; and Inoue, Nobuaki, to Fuji Photo Film Co., Ltd. Method of forming image providing a change in sensitivity by altering the pH of the developer, 4,873,173, Cl. 430-964,000.
- Sasse, Klaus: See—
Kruger, Bernd-Wieland; Sasse, Klaus; Hoever, Franz-Peter; Nentwig, Gunther; and Berhrens, Wolfgang, 4,873,252, Cl. 514-315,000.
- Satake, Tokuki; Sakai, Hiroshi; Nakatani, Hayami; Nakamori, Masaharu; and Ishibashi, Masaru, to Mitsubishi Jukogyo Kabushiki Kaisha. Solid electrolytic fuel cell and method for manufacturing same, 4,873,156, Cl. 429-31,000.
- Satake, Yoshikatsu; Iizuka, Yo; Kouyama, Toshihiko; Katto, Takayuki; and Shiiki, Zenya, to Kureha Kagaku Kogyo K.K. Molded or formed poly(arylene thioether-ketone) articles, 4,873,283, Cl. 524-520,000.
- Satalich, Timothy A.: See—
Davidson, Wayne A.; Ernst, John P.; Herkes, Marybeth; Kuppawami, Ram; Satalich, Timothy A.; and Stanaway, John J., Jr., 4,873,717, Cl. 379-157,000.

- Sato, Chikara: See—
Yoshimura, Katsuji; Kozuki, Susumu; Edakubo, Hiroo; and Sato, Chikara, 4,873,587, Cl. 360-9,100.
- Sato, Hatsu: See—
Adachi, Ikuo; Yamamori, Teruo; Ueda, Motohiko; and Sato, Hatsu, 4,873,334, Cl. 514-303,000.
- Sato, Hideki; and Mizunoya, Nobuyuki, to Kabushiki Kaisha Toshiba. Aluminum nitride circuit substrate, 4,873,151, Cl. 428-627,000.
- Sato, Hiroshi; Ohashi, Toshihiro; Hamada, Toyohide; Umakoshi, Yukimori; Suzuki, Takamichi; Wada, Yuuji; Hara, Shigeo; and Fukumoto, Youshuke, to Hitachi, Ltd. Apparatus for winding coil on toroidal core, 4,872,618, Cl. 242-4,00R.
- Sato, Katsuyuki: See—
Shimizu, Shinji; Tsuchiya, Osamu; and Sato, Katsuyuki, 4,873,559, Cl. 357-23,600.
- Sato, Kenji: See—
Ishizaka, Yoshirou; Naganuma, Hiroshi; Sato, Kenji; Kishi, Yuji; Ishida, Yoshihisa; and Goto, Kiyokazu, 4,872,320, Cl. 62-255,000.
- Sato, Makoto; Shiraishi, Shuji; and Muto, Tetsuji, to Honda Giken Kogyo Kabushiki Kaisha. Traction control system for controlling slip of a driving wheel of a vehicle, 4,873,639, Cl. 364-426,020.
- Sato, Toshihiro: See—
Inoue, Kazutaka; Sato, Toshihiro; and Kobayashi, Masao, 4,873,391, Cl. 585-639,000.
- Sato, Yoshiyuki: See—
Tanaka, Hatsuaki; Sato, Yoshiyuki; Kohara, Hidekatsu; and Nakayama, Toshimasa, 4,873,177, Cl. 430-326,000.
- Sato, Youichi: See—
Nakamura, Hironori; Yotsui, Toshiaki; Sato, Youichi; Umetsubo, Toshiaki; and Ohkawa, Hideo, 4,872,247, Cl. 29-125,000.
- Satoh, Masaharu: See—
Akatsu, Yohsuke; Fukushima, Naoto; Fukunaga, Yukio; Hana, Surao; and Satoh, Masaharu, 4,872,701, Cl. 280-703,000.
- Satoh, Motohiro; Yamada, Toshihiro; Kohono, Akiomi; Yamamoto, Akihiko; Taguchi, Keiji; Daikoku, Takahiro; and Kobayashi, Fumi-uki, to Hitachi, Ltd. Sealed structure and production method thereof, 4,872,606, Cl. 228-121,000.
- Satoh, Yayoi; and Mizukami, Toshihiko, to NEC Corporation. Multiple encoder including an inverse filter, 4,873,724, Cl. 381-40,000.
- Satomi, Tomoaki: See—
Ueno, Hiroshi; Satomi, Tomoaki; and Yoshida, Teruo, 4,872,771, Cl. 384-492,000.
- Sattmann, Karl. Automatic cylinder profiling gage, 4,872,269, Cl. 33-552,000.
- Saussier, Alain; and Seiblet, Bruno R., to Societe Nationale D'Etude et de Construction de Moteurs D'Aviation. Method and device for coding and decoding a broadband transmission, 4,873,699, Cl. 375-1,000.
- Sawada, Shuichi: See—
Kono, Koichi; Okamoto, Kenkichi; Iwasaki, Rumi; and Sawada, Shuichi, 4,873,034, Cl. 264-41,000.
- Sawaide, Minoru: See—
Okada, Takeji; Sawaide, Minoru; Imai, Minoru; and Tachibana, Daisuke, 4,873,145, Cl. 428-407,000.
- Sawamura, Norio; Matsuo, Takaharu; Tsumura, Kazunobu; and Ebihara, Yoshitaka, to Fuji Oil Company, Limited. Process for preparing enzyme preparation, 4,873,194, Cl. 435-198,000.
- Scaramucci, John P. Swing check valve, 4,872,477, Cl. 137-515,500.
- Scaramucci, John P. Swing check valve, 4,872,478, Cl. 137-515,700.
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- Schaar, Robert J.: See—
Bucher, Michael S.; Russo, Paul J.; and Schaar, Robert J., 4,872,919, Cl. 134-3,000.
- Schaefer, Gerhard; Eilingsfeld, Heinz; Neumann, Peter; and Stumpp, Michael, to BASF Aktiengesellschaft. Isolation of 4,4'-dichlorodiphenyl sulfone, 4,873,372, Cl. 568-34,000.
- Schaffer, A. M.: See—
Walker, Darrell W.; and Schaffer, A. M., 4,873,211, Cl. 502-64,000.
- Scharf, Curtis R.: See—
Vinci, James N.; and Scharf, Curtis R., 4,873,006, Cl. 252-38,000.
- Schatzmann, Hans-Rudolf: See—
Danigel, Harald; and Schatzmann, Hans-Rudolf, 4,872,753, Cl. 356-246,000.
- Scheer, Wolfgang; Fuhrmann, Hartmut; Kossmehl, Gerhard; Niemitz, Matthias; and Kabbeck-Kupijai, Detlef, to MAN Technologie GmbH. Printing press, 4,872,962, Cl. 204-224,00R.
- Schepky, Gottfried: See—
Brickl, Rolf; Schepky, Gottfried; Rupprecht, Eckhard; and Greischel, Andreas, 4,873,080, Cl. 424-80,000.
- Schering Corporation: See—
Schumacher, Doris P.; Murphy, Bruce L.; and Clark, Jon E., 4,873,335, Cl. 546-194,000.
- Scheuble, Bernard: See—
Krause, Joachim; Wachtler, Andreas; Scheuble, Bernard; and Weber, Georg, 4,873,019, Cl. 252-299,610.
- Schild, Ronald H.; Koepf-Gall, Sandra; and Broxterman, Gregory C., to Nalco Chemical Company. Mixture of halides such as NaOCl and a bromide salt for removal of mussels and barnacles from salt or brackish water, 4,872,999, Cl. 210-754,000.
- Schilling, Walter W.: See—
Churchland, Mark T.; and Schilling, Walter W., 4,872,544, Cl. 198-382,000.
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Wermuth, Camille G.; Schlewer, Gilbert; and Heulme, Michel, 4,873,243, Cl. 514-248,000.
- Schlumberger Industries: See—
Barraud, Claude, 4,873,721, Cl. 380-9,000.
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Talroy, Robert C.; Ward, Sarah G.; and Schmidt, Parbury P., 4,873,226, Cl. 514-46,000.
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Peirash, Alfred J.; Schmidt, Theodore E.; and Thomas, William C., 4,872,286, Cl. 49-449,000.
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- Schneider, Peter J. Separable and breakaway valve interconnecting a fluid line, 4,872,471, Cl. 137-68,100.
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Behr, Hans; Vetter, Kurt; Schneider, Rolf; and Luderer, Fred, 4,872,616, Cl. 239-703,000.
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Schrage, Timothy L.; Schrage, Jay T.; and Schrage, Lester, 4,872,785, Cl. 406-155,000.
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Dietrich, Klaus; Hauer, Hans; and Schreier, Klaus, 4,873,521, Cl. 340-825,520.
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Fronheiser, Dennis R.; Hayward, Jack; Reafler, Gerald G.; and Schuler, James R., 4,872,270, Cl. 34-23,000.
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Gerhard, Bruce; and Schulman, Bruce, 4,872,339, Cl. 73-204,140.
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- Schulz, Guenther; Druschke, Wolfgang; and Jaeger, Helmut, to BASF Aktiengesellschaft. Preparation of monoolefinically unsaturated carboxyl-containing versatic esters, 4,873,023, Cl. 260-404,800.
- Schumacher, Doris P.; Murphy, Bruce L.; and Clark, Jon E., to Schering Corporation. 3-phenethyl-2-benzene-amides or aza-derivatives thereof, 4,873,335, Cl. 546-194,000.
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Neulinger, Franz; Schummer, Helmut; Donig, Gerhard; and Schmidt, Walter, 4,873,620, Cl. 363-57,000.
- Schwartz, John E. Valve apparatus, 4,872,640, Cl. 251-147,000.
- Schweighardt, Frank K.; Bailey, Webb I.; Lileck, John T.; Graybill, John K.; and Lutz, Eugene G., to Air Products and Chemicals, Inc. Perfluorinated propyl derivative compounds, 4,873,315, Cl. 570-130,000.

- Schweitzer, Edmund O., Jr. Electromechanical pulse counter. 4,873,706, Cl. 377-85.000.
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Counsell, Raymond E.; Longino, Marc A.; Weichert, Jamey P.; and Schwendner, Susan P., 4,873,075, Cl. 424-1.100.
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Knoblock, Glenn A.; and Scotlen, Brian L., 4,872,635, Cl. 248-406.200.
- Scordo, Dominick: See—
Baranyai, Lawrence; and Scordo, Dominick, 4,873,663, Cl. 365-73.000.
- Scott Bader Company Limited: See—
Chaudhry, Arshad-Ul-Haq, 4,873,124, Cl. 427-207.100.
- Scott, Jeffery W.: See—
Coldren, Larry A.; Scott, Jeffery W.; and Yan, Ran H., 4,873,696, Cl. 372-96.000.
- Scott Paper Company: See—
Sigmund, Jerry A., 4,872,601, Cl. 225-38.000.
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- Scoville, John R.: See—
DeOliveira, Egidio L.; and Scoville, John R., 4,872,454, Cl. 128-303.140.
- Seaburn, William H.: See—
Englehart, John D.; and Seaburn, William H., 4,872,589, Cl. 220-410.000.
- Seiblet, Bruno R.: See—
Saussier, Alain; and Seiblet, Bruno R., 4,873,699, Cl. 375-1.000.
- Sechrist, Paul A., to UOP. Method for valveless control of particle transport. 4,872,969, Cl. 208-173.000.
- See, Chung W.; and Vaez-Iravani, Mehdi, to National Research Development Corporation. Scanning optical microscope using single laser beam. 4,873,434, Cl. 250-235.000.
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Dhillon, Major S.; Hsieh, Shane; and Seeley, Douglas A., 4,873,174, Cl. 430-309.000.
- Seidemann, Lothar: See—
Auth, Rudolf; Seidemann, Lothar; and Maas, Heinz, 4,872,906, Cl. 75-5.000.
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Sakamoto, Kenji; Ishikawa, Nobuo; and Hayakawa, Motomu, 4,873,677, Cl. 368-204.000.
- Seiko Instruments Inc.: See—
Hirotomi, Jun, 4,873,477, Cl. 318-603.000.
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Nagaishi, Hatsu; Seimiya, Yasuo; Tamura, Hideyuki; Miwa, Hiromichi; Sanbuchi, Hiroshi; Uchida, Masaaki; and Takahata, Toshio, 4,873,641, Cl. 364-431.040.
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- Sekiya, Shigeo, to Isuzu Motors Limited. Engine brake device. 4,872,434, Cl. 123-320.000.
- Selenia Industrie Elettrotecniche Associate S.p.A.: See—
Bernardi, Sergio, 4,872,943, Cl. 156-621.000.
- Selitrrennikoff, Claude P., to University Patents, Inc. Protoplasts of temperature-sensitive strains of neurospora crassa OS-1. 4,873,196, Cl. 435-254.000.
- Semitool, Inc.: See—
Thompson, Raymon F.; and Funk, Larry, 4,872,638, Cl. 251-54.000.
- Senga, Takao; Takaoka, Kazuichi; Yamamoto, Hirokazu; and Hashimoto, Takumi, to Mitsubishi Paper Mills, Ltd. Liquid developer for electrophotography. 4,873,166, Cl. 430-137.000.
- Seo, Hiroshi: See—
Azuma, Ichiro; Tokura, Seiichi; Nishimura, Shinichiro; and Seo, Hiroshi, 4,873,092, Cl. 424-499.000.
- Separation Dynamics, Inc.: See—
Taylor, John A., 4,872,982, Cl. 210-490.000.
- Seppala, Earl E.: See—
Powers, Thomas P.; Seppala, Earl E.; and Young, James C., 4,872,392, Cl. 89-193.000.
- Sera, Kyoji: See—
Nakagawa, Kazushige; Koh, Makoto; Sera, Kyoji; Ozeki, Tadashi; and Iwasaki, Masahiro, 4,872,394, Cl. 91-506.000.
- Serita, Tamio; and Takeuchi, Hiroyuki, to Chisso Corporation. Method for producing shaped articles of ceramics. 4,873,039, Cl. 264-65.000.
- Setoriya, Takeshi: See—
Kobayashi, Hiroo; Fujino, Hitoshi; Yagi, Tadashi; Adachi, Nobukazu; Hayakawa, Yasuyoshi; and Setoriya, Takeshi, 4,873,548, Cl. 355-200.000.
- SGS-Thomson Microelectronics S.A.: See—
Cambois, Joel, 4,873,658, Cl. 364-725.000.
- Shadrach III, William S.; Mandler, Michael; Moch, Ihor D.; Zitomer, Bernard; and Stewart II, John L., to Sunshine Biscuits, Inc. Carton including detachable coupon. 4,872,555, Cl. 206-459.000.
- Shah, Nyan S., to International Medical Products, Inc. Conveniently hand held self-contained electronic manometer and pressure modulating device. 4,872,483, Cl. 137-557.000.
- Shamp, Daniel L., to Prosthetic Consultants Inc. Prosthetic device for above-knee amputation. 4,872,879, Cl. 623-36.000.
- Shankar, Pradip: See—
Crandall, Douglas; Cavanna, Vicente; Shankar, Pradip; and Nordby, Rasmus, 4,873,703, Cl. 375-118.000.
- Shanrock, Clay: See—
Howard, Albert, 4,872,823, Cl. 425-64.000.
- Shapiro, Warren B.: See—
Hahn, Charles R.; and Shapiro, Warren B., 4,873,079, Cl. 424-70.000.
- Sharma, Suresh C.: See—
Schmalz, Karl J.; Sharma, Suresh C.; and Christopherson, Richard I., 4,873,228, Cl. 514-49.000.
- Sharp Kabushiki Kaisha: See—
Inaba, Masakatsu, 4,873,553, Cl. 355-295.000.
- Omori, Takuro; and Yanagiuchi, Shigenobu, 4,873,628, Cl. 364-200.000.
- Sharps, Gordon V., Jr.; and St. Phillips, Eric A., to Mobil Oil Corporation. Seal bar including clamped seal element. 4,872,942, Cl. 156-515.000.
- Shaw, Daniel G.; and MacCline, Billy. Rotatable fluid conductor for well apparatus. 4,872,517, Cl. 173-163.000.
- Shaw, Henry: See—
Gryson, Dirk; and Shaw, Henry, 4,872,488, Cl. 139-353.000.
- Shaw, Richard E.; and Wolverton, Steven R., to Cooper Industries, Inc. Poppet valve flow seat. 4,872,481, Cl. 137-543.170.
- Shaw, Edward T.; and Kesling, Haven S., Jr., to Arco Chemical Technology, Inc. Process for the preparation of methylene diphenylene diisocyanates and polymethylene polyphenylene poly (diisocyanates). 4,873,364, Cl. 560-344.000.
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Beverwijk, Christiaan D. M.; De Jong, Feike; and Sant, Peter, 4,873,004, Cl. 252-32.500.
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- Corley, Larry S., 4,873,309, Cl. 528-102.000.
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- Epel, Joseph N., 4,873,044, Cl. 264-257.000.
- Sie, Swan T.; Drent, Eit; and Jager, Willem W., 4,873,267, Cl. 518-700.000.
- Stapersma, Johan, 4,873,212, Cl. 502-158.000.
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- Shen, Hsin-Der. Air vent throat of indoor ventilating device capable of preventing noise. 4,872,398, Cl. 98-42.080.
- Shepard, Daniel R. Disposable cat litter system. 4,872,420, Cl. 119-1.000.
- Sheppard, Harold A. Fender fast clip remover. 4,872,251, Cl. 29-243.560.
- Sherman, Fred: See—
Fishman, Jack; Arnold, John; Sherman, Fred; and Hsiao, Jane, 4,873,076, Cl. 424-10.000.
- Shibagaki, Kouichi; and Fukui, Akira, to NEC Corporation. Method and apparatus for multi-pulse speech coding. 4,873,723, Cl. 381-34.000.
- Shibano, Takeshi: See—
Kadowaki, Koju; Sarumaru, Kohei; and Shibano, Takeshi, 4,873,368, Cl. 562-532.000.
- Shibata, Yoji, to Hitachi, Ltd. Automatic data/voice sending/receiving mode switching device. 4,873,715, Cl. 379-93.000.
- Shih, Shan: See—
Trachman, Edward G.; Shih, Shan; and Arzoian, John, 4,872,374, Cl. 74-731.000.
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- Shih, Wen-cheng: See—
Ma, Chen-chi M.; and Shih, Wen-cheng, 4,873,128, Cl. 427-434.700.
- Shiiki, Zenya: See—
Satake, Yoshikatsu; Iizuka, Yo; Kouyama, Toshitaka; Katto, Takayuki; and Shiiki, Zenya, 4,873,283, Cl. 524-520.000.
- Shimada, Junichi: See—
Fujisawa, Norio; Sakamoto, Toshishige; Ito, Toshiyasu; and Shimada, Junichi, 4,872,745, Cl. 350-357.000.
- Shimadzu Corporation: See—
Nakagawa, Kazushige; Koh, Makoto; Sera, Kyoji; Ozeki, Tadashi; and Iwasaki, Masahiro, 4,872,394, Cl. 91-506.000.
- Shimanaka, Chikafumi: See—
Wakamori, Takehisa; Ogawa, Takashi; Ito, Ryoji; and Shimanaka, Chikafumi, 4,872,257, Cl. 29-701.000.
- Shimasaki, Katsunori: See—
Kaji, Kichiro; Shimasaki, Katsunori; Yamamoto, Masakazu; Saiki, Kozo; Yura, Keita; Habata, Hidetsugu; Kimura, Isao; and Suzuki, Tetsuo, 4,873,070, Cl. 423-345.000.
- Shimitzu Construction Co., Ltd.: See—
Okada, Takeji; Sawade, Minoru; Imai, Minoru; and Tachibana, Daisuke, 4,873,145, Cl. 428-407.000.
- Shimizu, Akira; and Kaneko, Norio, to Canon Kabushiki Kaisha. Dielectric articles and condensers using the same. 4,873,610, Cl. 361-313.000.
- Shimizu, Chiuyuki; and Yoshida, Tamio, to Toshiba Silicone Co., Ltd. Polyether end-blocked with hydrolyzable silyl groups, method of manufacturing and room temperature curable composition using the polyether. 4,873,272, Cl. 523-212.000.
- Shimizu, Shinji; Tsuchiya, Osamu; and Sato, Katsuyuki, to Hitachi, Ltd. Semiconductor memory device and a process for producing the same. 4,873,559, Cl. 357-23.600.
- Shimizu, Yoshiki: See—
Kubo, Motonobu; and Shimizu, Yoshiki, 4,873,375, Cl. 568-812.000.

- Shimohigashi, Katsuhiro: See—
Etoh, Jun; Shimohigashi, Katsuhiro; Miyazawa, Kazuyuki; Kimura, Katsutaka; and Akiba, Takesada, 4,873,672, Cl. 365-218.000.
- Shimura, Masato: See—
Taketani, Noriaki; Asano, Hideki; Endo, Akira; Abe, Tomiya; Ibamoto, Masahiko; Mukai, Junji; Tanno, Seikichi; Eguchi, Shuji; and Shimura, Masato, 4,873,030, Cl. 264-1.500.
- Shinoda, Kenichi; Iwao, Tomoyoshi; Isayama, Tomoaki; and Higo, Yuichi, to Nishin Steel Co., Ltd. Vibration-damper metal sheets. 4,873,149, Cl. 428-609.000.
- Shinto Paint Co., Ltd.: See—
Suzuki, Tameyuki; and Kamakura, Takuro, 4,873,175, Cl. 430-311.000.
- Shionogi & Co., Ltd.: See—
Adachi, Ikuo; Yamamoto, Teruo; Ueda, Motohiko; and Sato, Hatsu, 4,873,334, Cl. 514-303.000.
- Shiple Company Inc.: See—
Fisher, Thomas A., 4,873,176, Cl. 430-313.000.
- Shipley, Larry W.: See—
Jankower, Laura J.; and Shipley, Larry W., 4,873,091, Cl. 424-489.000.
- Shirai, Hidenobu: See—
Suzuki, Masafumi; and Shirai, Hidenobu, 4,872,964, Cl. 204-298.000.
- Shirai, Hironobu, to Omron Tateisi Electronics Co. Input circuit having a photo-coupler with bi-directional indicator. 4,873,448, Cl. 250-551.000.
- Shiraishi, Shuji; and Nishihara, Takashi, to Honda Giken Kogyo Kabushiki Kaisha. Traction control system for controlling slip of a driving wheel of a vehicle. 4,873,638, Cl. 364-426.010.
- Shiraishi, Shuji: See—
Sato, Makoto; Shiraishi, Shuji; and Muto, Tetsuji, 4,873,639, Cl. 364-426.020.
- Shiroshita, Masao: See—
Katoh, Tsuguhiko; Maeda, Kiyoto; Shiroshita, Masao; Yamashita, Norihisa; Sanemitsu, Yuzuru; and Inoue, Satoru, 4,873,248, Cl. 514-269.000.
- Shishido, Tadao: See—
Ishiguro, Shoji; Hirano, Shigeo; Shishido, Tadao; and Miyake, Akio, 4,873,172, Cl. 430-264.000.
- Shishikura, Takashi: See—
Okamoto, Shosuke; Okada, Yoshio; Okunomiya, Akiko; Naito, Taketoshi; Kimura, Yoshio; Yamada, Morihiko; Ohno, Norio; Katsura, Yasuhiro; Nojima, Hiroshi; and Shishikura, Takashi, 4,873,253, Cl. 514-352.000.
- Shitara, Tetsuo: See—
Umezawa, Sumio; Tsuchiya, Tsutomu; Takeuchi, Tomio; Umezawa, Kazuo; Takahashi, Yoshiaki; Shitara, Tetsuo; Kobayashi, Yoshihiko; and Takagi, Yasushi, 4,873,225, Cl. 514-41.000.
- Shively, John E.: See—
Crawford, Frances G.; Shively, John E.; Todd, Charles W.; and Yang, Y. H. Joy, 4,873,313, Cl. 530-387.000.
- Shoger, Kirk D.: See—
Tegeler, John J.; and Shoger, Kirk D., 4,873,239, Cl. 514-227.800.
- Short, Allen T.; and Wilkinson, Raleigh J., to J. R. Short Milling Company. Method for producing breakfast cereal. 4,873,110, Cl. 426-621.000.
- Shoukry, Ehsan I.: See—
Clem, Kenneth R.; Heider, Kenneth J.; Kegerreis, James E.; and Shoukry, Ehsan I., 4,872,967, Cl. 208-65.000.
- Shows Denko Kabushiki Kaisha: See—
Kurosawa, Shigeru; and Matsuki, Kunio, 4,873,295, Cl. 525-420.000.
- Okamoto, Shosuke; Okada, Yoshio; Okunomiya, Akiko; Naito, Taketoshi; Kimura, Yoshio; Yamada, Morihiko; Ohno, Norio; Katsura, Yasuhiro; Nojima, Hiroshi; and Shishikura, Takashi, 4,873,253, Cl. 514-352.000.
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- Shutt, Eric; Altene, Andries G.; and Jenkins, John W., to Johnson Matthey Public Limited Company. Oxidative conversion of methane to ethylene and ethane. 4,873,388, Cl. 585-500.000.
- Siano, James C. Railroad tie replacement apparatus. 4,872,646, Cl. 254-43.000.
- Sibigtroth, James M., to Motorola, Inc. Output compare system and method for a data processor. 4,873,624, Cl. 364-200.000.
- Sibole, Wade. Segmented die. 4,872,790, Cl. 408-221.000.
- Siddall, William E.: See—
Baratz, Alan E.; Clarke, Kathryn E.; Pollard, Melinda R.; Pofzefsky, Diane P.; Rafalow, Lee M.; Siddall, William E.; and Gray, James P., 4,873,517, Cl. 340-825.030.
- Sie, Swan T.; Drent, Eit; and Jager, Willem W., to Shell Oil Company. Process for the production of methanol and a composition suitable for use as a catalyst in said process. 4,873,267, Cl. 518-700.000.
- Siegel, Israel. Diagnosis of free fatty acid toxicity by monitoring red blood cells morphologic changes. 4,872,752, Cl. 356-39.000.
- Siemens AG: See—
Neulinger, Franz; Schummer, Helmut; Donig, Gerhard; and Schmidt, Walter, 4,873,620, Cl. 363-57.000.
- Siemens Aktiengesellschaft: See—
Arnold, Kraft-Ulrich; and Clauss, Fernand, 4,873,058, Cl. 422-89.000.
- Dietrich, Klaus; Hauer, Hans; and Schreier, Klaus, 4,873,521, Cl. 340-825.520.
- Eckardt, Bernd, 4,873,050, Cl. 376-283.000.
- Haeussler, Klaus M.; Wittmann, Julius; Gaukel, Gisela; and Auer, Franz, 4,873,697, Cl. 372-108.000.
- Neupauer, Elfriede, 4,873,619, Cl. 363-51.000.
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- Schultes, Helmut, 4,872,436, Cl. 123-339.000.
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- Winnerl, Josef; and Takacs, Dezso, 4,873,668, Cl. 365-189.090.
- Siemens-Bendix Automotive Electronics L.P.: See—
Sapienza, Samuel J., IV, 4,872,426, Cl. 123-90.150.
- Sigmund, Jerry A., to Scott Paper Company. Two large roll toilet tissue dispenser. 4,872,601, Cl. 225-38.000.
- Sigworth, Geoffrey K., to KB Alloys, Inc. Third element additions to aluminum-titanium master alloys. 4,873,054, Cl. 420-552.000.
- Sih, John C.; and Cho, Moo J., to Upjohn Company. The N-substituted derivatives of 2-(pyridylalkenesulfonyl) benzimidazoles as gastric antisecretory agents. 4,873,337, Cl. 546-271.000.
- Siissalo, Ilkka T.: See—
Aaltonen, Pirkko K.; and Siissalo, Ilkka T., 4,873,111, Cl. 426-623.000.
- Sikora, Joseph: See—
Good, William R.; Mikes, John; and Sikora, Joseph, 4,873,086, Cl. 424-409.000.
- Silber, Cory J.: See—
VanderPol, Jerald; Silber, Cory J.; and Astle, William H., 4,872,249, Cl. 29-157.400.
- Silvano, Tomba; and Tomba, Giuseppe, to Brai Systems SRL. Torque-multiplying kinematic device particularly for bicycles and bicycles employing said kinematic device. 4,872,695, Cl. 280-257.000.
- Silverman, Melvin K.: See—
Thompson, Steven L.; and Silverman, Melvin K., 4,873,077, Cl. 424-61.000.
- Silvester, Lenard F.: See—
Chang, On-Kok; Hall, John C.; Phillips, Jeffrey; and Silvester, Lenard F., 4,873,158, Cl. 424-61.000.
- Simi, David G. Vehicle position indicator. 4,873,509, Cl. 340-436.000.
- Simonyi, Istvan: See—
Petocz, Lujza; Simonyi, Istvan; Beck, Ivan; Giger, Gabor; Fekete, Marton; Kiszely, Eniko; Mandi, Attila; Gorgenyi, Frigyes; Dietz, Andras; Sumeg nee Zukovics, Katalin; and Jakfalvi, Elemér, 4,873,249, Cl. 514-275.000.
- Simpson, Bruce: See—
Davis, Cecil J.; Abernathy, Joseph V.; Matthews, Robert T.; Hildenbrand, Randall C.; Simpson, Bruce; Jones, John I.; Loewenstein, Lee M.; and Bohlman, James G., 4,872,938, Cl. 156-345.000.
- Simpson, Sharon M., to Minnesota Mining and Manufacturing Company. Supersensitization of silver halide photothermographic emulsions. 4,873,184, Cl. 430-617.000.
- Sinclair, Michael J.: See—
Blanton, Keith A.; Finlay, William M.; Sinclair, Michael J.; and Tumbler, John E., 4,873,585, Cl. 358-335.000.
- Singer, Victor, to Morton Thiokol, Inc. Rocket motor extendible nozzle exit cone. 4,872,612, Cl. 239-265.190.
- Sioshansi, Piran: See—
Bunker, Stephen N.; and Sioshansi, Piran, 4,872,922, Cl. 148-4.000.
- Sipple, Gene L. Weighted refuse container. 4,872,582, Cl. 220-1.00T.
- Sivavec, Timothy M.: See—
Anderson, Patricia P.; Sivavec, Timothy M.; and Takekoshi, Tohru, 4,873,367, Cl. 562-425.000.
- Sivers, Rolf V.: See—
Hawener, Juergen; Havemann, Kim; and Sivers, Rolf V., 4,872,624, Cl. 244-54.000.
- Skelton, Lawrence. Method and apparatus for roofing. 4,872,331, Cl. 72-181.000.
- SKF GmbH: See—
Brandenstein, Manfred; Haas, Roland; Friedrich, Wolfgang; and Herrmann, Gerhard, 4,872,768, Cl. 384-223.000.
- Skibinski, Robert E., to Mid-America Scale, Inc. Torque suspension weighing scale. 4,872,523, Cl. 177-255.000.
- Skinner, Timothy J.; Spurney, Joseph L.; and Ma, Weiming, to General Motors Corporation. Variable displacement compressor passive destroyer. 4,872,814, Cl. 417-222.000.
- Skowronski, Michael J.: See—
Hallmark, Richard K.; Skowronski, Michael J.; and Stephens, William D., 4,873,268, Cl. 521-48.500.
- Sliger, Willamena. Chest protector. 4,872,215, Cl. 2-2.000.
- Sloss Industries Corporation: See—
Hallmark, Richard K.; Skowronski, Michael J.; and Stephens, William D., 4,873,268, Cl. 521-48.500.
- Smedby, Leif: See—
Jorstad, Storker; and Smedby, Leif, 4,872,978, Cl. 210-181.000.
- Smeed, Clifford G. Spike shoe slip. 4,872,273, Cl. 36-135.000.
- Smelters, Paul J.: See—
Irwin, George F.; Smelters, Paul J.; Robertson, David J.; and Maginley, Ronald J., 4,873,682, Cl. 370-58.100.
- Smeltz, Palmer D., Jr.: See—
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- Smith, Benjamin L. Automatic fishhook setting device. 4,872,280, Cl. 43-15.000.

- Smith, Bernard: See—
Branovich, Louis E.; Smith, Bernard; Freeman, Gerard L.; and Eckart, Donald W., 4,872,864, Cl. 445-50.000.
- Smith, Brad L.: See—
Murphy, Mark A.; Smith, Brad L.; Aguiló, Adolfo; and Tau, Kwoliang D., 4,873,378, Cl. 568-867.000.
- Smith, Douglas W. P., to Devron-Hercules, Inc. Dielectric cross machine moisture control, 4,873,407, Cl. 219-10.430.
- Smith, Jimmy L. Hinged closure attachment for insulated beverage can container, 4,872,577, Cl. 220-85.0CH.
- Smith, John M., to Nestle S.A. Universal fit intraocular lens, 4,872,876, Cl. 623-6.000.
- Smith, Kristin S. Skipping rope assembly, 4,872,666, Cl. 272-75.000.
- Smith, Lloyd J. Chalk dust remover, 4,872,237, Cl. 15-210.00R.
- Smith & Nephew (Latin America), Inc.: See—
Johns, Owen L., 4,872,869, Cl. 604-342.000.
- Smith, Pamela S.; and Smith, Peter H., deceased (by Smith, Pamela S., executor), to General Electric Company. Magneton with micro-processor based feedback control, 4,873,408, Cl. 219-10.55B.
- Smith, Pamela S., executor: See—
Smith, Pamela S.; and Smith, Peter H., deceased, 4,873,408, Cl. 219-10.55B.
- Smith, Peter H., deceased: See—
Smith, Pamela S.; and Smith, Peter H., deceased, 4,873,408, Cl. 219-10.55B.
- Smith, Peter J.: See—
Krause, Janusz J. H.; Smith, Peter J.; and Woolhouse, Robin A., 4,873,046, Cl. 264-288.400.
- Smith, Randall J.: See—
Williams, Robert J.; and Smith, Randall J., 4,872,824, Cl. 425-113.000.
- Smith, Walton J. Decreasing the toxicity of an ibuprofen salt, 4,873,231, Cl. 514-557.000.
- Smith, Wayne: See—
Duffey, Donald; Hardee, Sellers; Smith, Wayne; Elliott, James; Gardner, Robert; and Suess, Claus, 4,872,500, Cl. 164-34.000.
- Smith, William E., to EZE Products, Inc. Apparatus for improving the quality of paper manufactured from recycled paper with a hydrokinetic amplifier, 4,872,953, Cl. 162-261.000.
- SmithKline Beckman Corporation: See—
Kaiser, Carl; Kruse, Lawrence I.; and Ross, Stephen T., 4,873,357, Cl. 558-414.000.
- SNIA Fibre S.p.A.: See—
Ciaperoni, Aldemaro; Cappelli, Alberto; D'Andolfo, Francesco; and Salan, Antonio, 4,873,296, Cl. 525-434.000.
- Snidach, James R. Automotive sunscreen, 4,872,721, Cl. 296-97.200.
- Snijders, Jacobus M. H.: See—
Erkens, Leonardus J. H.; Algra, Gerben P.; Snijders, Jacobus M. H.; Geurts, Herman J. J. M.; and Pugin, Andre, 4,872,915, Cl. 106-433.000.
- Snow Brand Milk Products Co., Ltd.: See—
Deya, Eiki; Yanahira, Shuichi; Abiko, Kenkichi; and Kikuchi, Eiichi, 4,873,229, Cl. 514-54.000.
- Snow, Roger: See—
Cacioli, Paul; and Snow, Roger, 4,873,082, Cl. 424-83.000.
- Societe Anonyme dite: Alstom: See—
Heddebaut, Marc; Mainardi, Pierre; Degauque, Pierre; and Duhot, Denis, 4,873,531, Cl. 343-711.000.
- Societe d'Exploitation de Brevets Pour l'Industrie et la Marine Sebim: See—
Gemignani, Andre, 4,872,639, Cl. 251-61.400.
- Societe Nationale D'Etude et de Construction de Moteurs D'Aviation: See—
Sausser, Alain; and Seiblet, Bruno R., 4,873,699, Cl. 375-1.000.
- Solco Basel: See—
Chia, Han-Lie; Popescu, Horia; and Boehmer, Gabrielle, 4,873,074, Cl. 424-1.100.
- Somerville Packaging Corporation: See—
DePaul, Richard E., 4,872,609, Cl. 229-134.000.
- Someya, Atsushi: See—
Baba, Takeshi; Matsuoka, Kazuhiko; Usui, Masayuki; Minoura, Kazuo; Someya, Atsushi; and Suzuki, Masayuki, 4,872,743, Cl. 350-353.000.
- Somfy: See—
Plumer, Louis, 4,872,256, Cl. 29-598.000.
- Sommer, Hans D., to Steyr-Daimler-Puch AG. Drive system for a motor vehicle comprising means for permanently driving a first pair of wheels and automatically operable means for selectively driving a second pair of wheels, 4,872,525, Cl. 180-197.000.
- Sommer, Michael B.: See—
Bogeso, Klaus P.; and Sommer, Michael B., 4,873,344, Cl. 541-77.000.
- Son, Masayoshi, to Datatnet Corp. Automatic dialer, 4,873,720, Cl. 379-356.000.
- Sone, Yoshinori: See—
Iida, Toshikatsu; Fujiwara, Takayoshi; and Sone, Yoshinori, 4,872,820, Cl. 418-220.000.
- Sonoco Products Company: See—
Dancy, Hugh G., 4,872,766, Cl. 383-10.000.
- Sonoda, Hidefumi; Mori, Eiji; Kawase, Mitsuo; Yoneshige, Kazuhiro; Takahashi, Akira; Komiya, Hirokazu; and Tanaka, Akira, to Toyota Jidosha Kabushiki Kaisha; Aisan Industry Co., Ltd.; and Jeco Co., Ltd. Device for preventing outflow of a fuel vapor from a fuel tank, 4,872,439, Cl. 123-518.000.
- Sony Corporation: See—
Hiramatsu, Akihiko, 4,873,588, Cl. 360-47.000.
- Inazawa, Yoshizumi; Yamada, Masaki; Ishibashi, Hiroshi; and Ozaki, Shinya, 4,873,589, Cl. 360-53.000.
- Kume, Hidehiro; Matsumoto, Yoshiyuki; and Yoshitoshi, You, 4,873,429, Cl. 250-216.000.
- Ohgihara, Takahiro; Murakami, Yoshikazu; Mizunuma, Yasuyuki; and Nakano, Hiroyuki, 4,873,496, Cl. 331-96.000.
- Yamanouchi, Kiyoshi; and Iwase, Sumio, 4,873,713, Cl. 379-67.000.
- Sorg GmbH & Co. KG: See—
Krejci, Heinrich; and Kessel, Rudi, 4,872,897, Cl. 65-128.000.
- Sotani, Junji: See—
Onodera, Kagetoshi; Koizumi, Tatsuya; Kato, Toshiyuki; Sotani, Junji; Momo, Masauki; and Furuya, Shuichi, 4,873,127, Cl. 427-376.800.
- Soucie, Wayne L.: See—
Boyer, Billy G.; Nelson, Lloyd M.; Soucie, Wayne L.; and Hayes, William K., 4,872,533, Cl. 188-2.00D.
- Soultz, Donald J.; and Daniels, Neil A., to Geodisplay Technology Limited Partnership. Automated map display system, 4,873,513, Cl. 340-723.000.
- Southard, James H.: See—
Belzer, Folkert O.; and Southard, James H., 4,873,230, Cl. 514-60.000.
- Southwick, Everett W.: See—
Howe, Charles R.; Southwick, Everett W.; and Cox, Richard H., 4,872,917, Cl. 131-275.000.
- Spanier, Henry C.: See—
Spiel, Albert A.; Roe, James; and Spanier, Henry C., 4,873,096, Cl. 426-72.000.
- Spease, Arthur L., to Teleflex Incorporated. Lost motion end fitting, 4,872,367, Cl. 74-502.600.
- Spectra, Inc.: See—
Fulton, Steven J.; Spehrley, Charles W., Jr.; and Young, Lawrence R., 4,873,134, Cl. 428-156.000.
- Spectra-Physics: See—
Johnson, Bertram C.; DiFonzo, John C.; and Herbst, Richard L., 4,873,692, Cl. 372-20.000.
- Spehrley, Charles W., Jr.: See—
Fulton, Steven J.; Spehrley, Charles W., Jr.; and Young, Lawrence R., 4,873,134, Cl. 428-156.000.
- Spiel, Albert A.; Roe, James; and Spanier, Henry C., to Nabisco Brands, Inc. Simulated egg treats for pets, 4,873,096, Cl. 426-72.000.
- Spielman, Edgar E., Jr.: See—
Lee, John Y.; and Spielman, Edgar E., Jr., 4,873,377, Cl. 568-844.000.
- Spinner, Raphael F.; Marley, Clement F.; Brown, Mary; and Grant, Cathy, to Marley, Clement F. Steel knot for ropes, 4,872,240, Cl. 16-114.00B.
- Spire Corporation: See—
Bunker, Stephen N.; and Sioshansi, Piran, 4,872,922, Cl. 148-4.000.
- Spirol International Corporation: See—
Stearns, Ralph A., 4,872,603, Cl. 227-97.000.
- Sprague, Barry N.: See—
Epperly, William R.; Sullivan, James C.; and Sprague, Barry N., 4,873,066, Cl. 423-235.000.
- Springer, Hartmut; Kuhn, Manfred; and Buch, Holger M., to Hoechst Aktiengesellschaft. Water-soluble monoazo and disazo dyes containing a fiber-reactive 2-chloro-4-(nitrophenylamino-alkylamino)-s-triazin-6-ylamino grouping with a fiber-reactive group of the vinylsulfone series as a substituent in the nitrophenyl moiety, 4,873,320, Cl. 534-632.000.
- Springfield Armory, Inc.: See—
McCubbin, Kim M., 4,872,792, Cl. 409-131.000.
- Sprout-Bauer, Inc.: See—
Foresman, James D., 4,872,617, Cl. 241-247.000.
- Spruytenburg, Fred T.; McDonald, Charles; and Hodgetts, Michael J. Closed-loop microwave popcorn control, 4,873,409, Cl. 219-10.55M.
- Spurney, Joseph L.: See—
Skinner, Timothy J.; Spurney, Joseph L.; and Ma, Weiming, 4,872,814, Cl. 417-222.000.
- Staalat B.V.: See—
van der Schoot, Jelle, 4,872,564, Cl. 209-511.000.
- Stace, Christopher: See—
White, Henry J.; and Stace, Christopher, 4,872,742, Cl. 350-348.000.
- Stack, Eugene V., to Dow Chemical Company. The Pipe aligning apparatus, 4,872,709, Cl. 285-39.000.
- Stanaway, John J., Jr.: See—
Davidson, Wayne A.; Ernst, John P.; Herkes, Marybeth; Kuppawami, Ram; Satalich, Timothy A.; and Stanaway, John J., Jr., 4,873,717, Cl. 379-157.000.
- Standard Concrete Products, Inc.: See—
Dunton, Harvey R.; and Rez, Donald H., 4,872,913, Cl. 106-88.000.
- Standard Oil Company, The: See—
Brazdil, James F.; and Guttman, Andrew T., 4,873,215, Cl. 502-202.000.
- Staperson, Johan, to Shell Oil Company. Nitrogen-containing bidentate compound immobilized on a solid inorganic carrier, 4,873,212, Cl. 502-158.000.
- Staperson, Johan, to Shell Oil Company. Nitrogen-containing bidentate compound immobilized on a solid inorganic carrier, 4,873,333, Cl. 546-14.000.
- State of Israel, Atomic Energy Commission, Soreo Nuclear Research Center, The: See—
Haruvy, Yair; Katz, Moshe; and Horowitz, Abraham A., 4,872,220, Cl. 2-243.00A.

- Staudt, Hans-Joachim: See—
Erdmann, Fritz; Thamm, Horst-Dieter; and Staudt, Hans-Joachim, 4,873,169, Cl. 430-192.000.
- STC PLC: See—
Hunt, Rowland G., 4,873,199, Cl. 437-31.000.
- Stearns, Ralph A., to Spirol International Corporation. Insert installation machine, 4,872,603, Cl. 227-97.000.
- Steelcase Inc.: See—
Knoblock, Glenn A.; and Scolten, Brian L., 4,872,635, Cl. 248-300.200.
- Steenburg, Kip V., to Prodigy Corp. Convertible carriage with biased wheel retraction, 4,872,692, Cl. 280-30.000.
- Steigmaier, Alwin, to Robert Bosch GmbH. Hydraulic vehicle brake system, 4,872,732, Cl. 303-110.000.
- Stephens, William D.: See—
Hallmark, Richard K.; Skowronski, Michael J.; and Stephens, William D., 4,873,268, Cl. 521-48.500.
- Stephenson, Daniel L.: See—
Myers, Clyde J.; Stephenson, Daniel L.; and Travieso, Ruben, 4,872,736, Cl. 350-96.200.
- Stephenson, Michael T.: See—
Bartels, Craig R.; Dorawala, Tansukhlal G.; Stephenson, Michael T.; Pasternak, Mordechai; and Reale, John, Jr., 4,872,991, Cl. 210-651.000.
- Sterling Drug Inc.: See—
Weller, Jeanne M., 4,873,000, Cl. 252-8.600.
- Sterman, Saul C., to Med Optics Corp. System for tinting contact lenses, 4,872,405, Cl. 101-44.000.
- Stevens, Robert A.: See—
Proxmire, Deborah L.; Endres, Dan D.; Wilson, John C.; Johnson, Lynn A.; Zehner, Georgia L.; Boland, Leona G.; and Stevens, Robert A., 4,872,871, Cl. 604-394.000.
- Stewart Decatur Security Systems, Inc.: See—
Bentley, Leroy, 4,872,284, Cl. 49-16.000.
- Stewart II, John L.: See—
Shadrach III, William S.; Mandler, Michael; Moch, Ihor D.; Ziotomer, Bernard; and Stewart II, John L., 4,872,555, Cl. 206-459.000.
- Stewart, Joseph A.: See—
Mouser, Charles L.; and Stewart, Joseph A., 4,873,648, Cl. 364-500.000.
- Steyr-Daimler-Puch AG: See—
Erhart, Erich, 4,872,489, Cl. 141-5.000.
- Sommer, Hans D., 4,872,525, Cl. 180-197.000.
- Stiasny, Janos G., to Club Mate Products Inc. Portable golf club head cleaner, 4,872,232, Cl. 15-21.00E.
- Stich-Baumeister, Eva-M.; Dohnke, Karl-Otto; and Winnacker, Albrecht, to Siemens Aktiengesellschaft. Sensor for gases or ions, 4,872,759, Cl. 356-432.000.
- Stingelin, Willy, to Ciba-Geigy Corporation. Disazo dyes containing a pyrimidine coupling component and a cationic alkyl ammonium group, 4,873,319, Cl. 534-604.000.
- STK Ceramics Laboratory Corp.: See—
Matsushita, Junichi; Saito, Hajime; and Nagashima, Hideo, 4,873,053, Cl. 419-11.000.
- Stone, Eugene E., III. Reinforced pant structure, 4,872,221, Cl. 2-404.000.
- Stoner, Eugene M., to Ares, Inc. Gun for firing telescoped ammunition, plus searing means, 4,872,391, Cl. 89-155.000.
- Stoops, John F., to Tektronix, Inc. Digital Correction of linear system distortion, 4,873,646, Cl. 364-487.000.
- Stou, Toshio: See—
Minagawa, Takehiro; Stou, Toshio; Miyata, Masao; Nemoto, Kenji; and Uchida, Kuninobu, 4,872,793, Cl. 409-244.000.
- Strand, Timothy C.: See—
Juliana, Anthony; Leung, Wai C.; Pan, Victor T.; Rosen, Hal J.; and Strand, Timothy C., 4,873,430, Cl. 250-225.000.
- Stranges, Frank. Dual purpose carrying container, 4,872,550, Cl. 206-315.100.
- Stratoflex, Inc.: See—
Konecny, James W.; Huston, Rodney L.; and Vyse, Gerrard N., 4,872,710, Cl. 285-81.000.
- Stratton, Lawrence J.: See—
Dean, Thomas E.; Henrich, William H.; Fischer, David M.; Stratton, Lawrence J.; and Pietsch, Herbert E., 4,873,471, Cl. 315-308.000.
- Streich, Herbert K.; Leach, Robert D.; Johnson, Joel R.; Olson, Thomas B.; and Townsend, Donald L., to Arvin Industries, Inc. Wall mounted heater with plug mount and support, 4,873,422, Cl. 219-370.000.
- Streichenberger, Rodolphe. Artificial substrates for marine biomass enhancement and wave energy absorption, 4,872,782, Cl. 405-24.000.
- Streicher, Willi: See—
Behre, Horst; Blank, Heinz U.; Marzolph, Gerhard; and Streicher, Willi, 4,873,026, Cl. 562-72.000.
- Stringfellow, William T.; Goldsmith, Charles D.; and Davis, Lois T., to Sybron Chemicals, Inc. Use of bacteria for control of algal bloom in wastewater, lagoons, or ponds, 4,872,986, Cl. 210-611.000.
- Stroms, Karl F., to International Business Machines Corp. Programmable magnetic repulsion punching apparatus, 4,872,381, Cl. 83-76.100.
- Struck, Bernd D.; Neumeister, Herbert; and Naoumidis, Aristides, to Kernforschungsanlage Julich GmbH. Cathode/membrane assembly and method of making same, 4,873,121, Cl. 427-77.000.
- Strum, Josef; and Prange, Wilfried, to Thyssen Stahl Aktiengesellschaft. Apparatus for the continuous welding of strips and/or sheets, 4,872,940, Cl. 156-379.800.
- Stryker Corporation: See—
Brennan, Thomas J.; and Evans, James A., 4,873,461, Cl. 310-47.000.
- Stumpp, Michael: See—
Schaefer, Gerhard; Eiliagsfeld, Heinz; Neumann, Peter; and Stumpp, Michael, 4,873,372, Cl. 568-34.000.
- Sturm, Michael. Exhaust gas turbine connected to engine output, 4,872,311, Cl. 60-615.000.
- Sudo, Michitaka: See—
Kawasaki, Yoshiki; Hioki, Yoshihiro; Ohno, Yuichi; Ichida, Kozaburo; Yamaguchi, Susumu; Sudo, Michitaka; and Chikazawa, Bunichiro, 4,872,245, Cl. 29-81.00A.
- Sueoka, Kuniaki, to International Business Machines Corporation. Magnetic head assembly for perpendicular magnetic recording, 4,873,599, Cl. 360-126.000.
- Suess, Claus: See—
Duffey, Donald; Hardee, Sellers; Smith, Wayne; Elliott, James; Gardner, Robert; and Suess, Claus, 4,872,500, Cl. 164-34.000.
- Suga, Shuzo: See—
Miyasaka, Nobuaki; and Suga, Shuzo, 4,873,181, Cl. 430-523.000.
- Suganami, Takuya: See—
Kazumoto, Yoshio; Suganami, Takuya; Furuishi, Yoshiro; and Kashiwamura, Kazuo, 4,872,313, Cl. 62-6.000.
- Sugawa, Etsuko: See—
Haruta, Masahiro; Kuwae, Yoko; Munakata, Hirohide; Yuasa, Satoshi; and Sugawa, Etsuko, 4,873,178, Cl. 430-327.000.
- Sugimoto, Kenichi: See—
Morishita, Masataka; Aikawa, Renji; Katsuragi, Shigeo; Yamamoto, Yoshiaki; and Sugimoto, Kenichi, 4,873,087, Cl. 424-433.000.
- Sugimura, Kazuo: See—
Sugimura, Nobuyuki; and Sugimura, Kazuo, 4,872,486, Cl. 138-30.000.
- Sugimura, Nobuyuki; and Sugimura, Kazuo. Accumulator having inclined communication holes, 4,872,486, Cl. 138-30.000.
- Sugino, Yasuo: See—
Wakabayashi, Minoru; Murata, Hiroyuki; Sugino, Yasuo; Yamao, Masanobu; and Nishikawa, Takao, 4,872,972, Cl. 209-143.000.
- Suling, Carlhans: See—
Lindner, Christian; Wittmann, Dieter; Trabert, Ludwig; Suling, Carlhans; Bartl, Herbert; and Ott, Karl-Heinz, 4,873,289, Cl. 525-293.000.
- Sullivan, James C.: See—
Epperly, William R.; Sullivan, James C.; and Sprague, Barry N., 4,873,066, Cl. 423-235.000.
- Sullivan, Mark: See—
Salz, Gilbert; and Sullivan, Mark, 4,872,462, Cl. 128-842.000.
- Sullivan, Michael C. Air ratchet holder, 4,872,633, Cl. 248-340.000.
- Sulzer Brother Limited: See—
Riesen, Peter, 4,872,487, Cl. 139-185.000.
- Sumeg nee Zukovics, Katalin: See—
Petocz, Lujza; Simonyi, Istvan; Beck, Ivan; Gigler, Gabor; Fekete, Marton; Kiszely, Eniko; Mandi, Attila; Gorgenyi, Frigyes; Dietz, Andras; Sumeg nee Zukovics, Katalin; and Jakfalvi, Elemer, 4,873,249, Cl. 514-275.000.
- Sumita, Hiroshi: See—
Takedoi, Atsushi; Kondo, Hiroyuki; Isoai, Masaru; Yoshinaga, Yoshitaka; Harada, Toshiharu; Okuda, Yosro; Sumita, Hiroshi; Kawasaki, Hirofumi; and Mori, Kohji, 4,873,010, Cl. 252-62.590.
- Sumitomo Chemical Co., Ltd.: See—
Katoh, Tsuguhiro; Maeda, Kiyoto; Shiroshita, Masao; Yamashita, Norihisa; Sanemitsu, Yuzuru; and Inoue, Satoru, 4,873,248, Cl. 514-269.000.
- Masui, Syohei; Matsumoto, Masahito; and Usui, Nobuhiro, 4,873,041, Cl. 264-135.000.
- Omura, Takashi; Kikkawa, Sadanobu; Morimitsu, Toshihiko; Harada, Naoki; and Miyamoto, Tetsuya, 4,873,321, Cl. 534-642.000.
- Sumitomo Electric Industries, Ltd.: See—
Kotani, Toshihiro; and Tada, Kohji, 4,873,062, Cl. 422-249.000.
- Saen, Haruo; and Kobayashi, Kougi, 4,873,411, Cl. 219-93.000.
- Summa, William J.: See—
Canestaro, Michael J.; and Summa, William J., 4,873,123, Cl. 427-96.000.
- Summers, James B., Jr.; Gunn, Bruce P.; and Brooks, Dee W., to Abbott Laboratories. Indole, benzofuran, benzothiophene containing lipoxigenase inhibiting compounds, 4,873,259, Cl. 514-443.000.
- Sun Chemical Corporation: See—
Latosky, Joseph A., 4,872,916, Cl. 106-503.000.
- Sun, Donald J. C. Golf club head with impact insert member, 4,872,685, Cl. 273-169.000.
- Sunami, Hideo; Kimura, Shinichiro; and Kaga, Toru, to Hitachi, Ltd. Dynamic random access memory having buried word lines, 4,873,560, Cl. 357-23.600.
- Sunami, Hideo: See—
Kaga, Toru; Kimura, Shinichiro; Kure, Tokuo; Kawamoto, Yoshifumi; and Sunami, Hideo, 4,873,203, Cl. 437-67.000.
- Sundstrand Data Control, Inc.: See—
Hanson, Richard A.; Peters, Rex B.; Norling, Brian L.; and Urbach, Edward A., 4,872,342, Cl. 73-517.00R.
- Peters, Rex B.; and Cornelius, Craig J., 4,872,343, Cl. 73-517.0AV.
- Sunshine Biscuits, Inc.: See—
Shadrach III, William S.; Mandler, Michael; Moch, Ihor D.; Ziotomer, Bernard; and Stewart II, John L., 4,872,555, Cl. 206-459.000.

- Suntory Limited: See—
Tanaka, Takaharu; Saitoh, Masayuki; Higuchi, Naoki; and Hashimoto, Masaki, 4,873,342, Cl. 548-518.000.
- Sussexmeier, John, to Perkin-Elmer Corporation, The. Desiccant system. 4,872,891, Cl. 55-387.000.
- Suter, Erwin: See—
Robertson, Peter M.; and Suter, Erwin, 4,873,057, Cl. 422-75.000.
- Sutherland, Deborah S.: See—
Tomczuk, Bruce E.; and Sutherland, Deborah S., 4,873,251, Cl. 514-303.000.
- Suzuki, Hideaki: See—
Takagi, Kozi; Ido, Noriyuki; Ohno, Sadayuki; Suzuki, Hideaki; Inoue, Yoshiaki; and Nomura, Yoshihisa, 4,872,730, Cl. 303-92.000.
- Suzuki, Koji; Tsukada, Tetsuro; Saito, Yoshihiko; Arai, Kiyotaka; and Mori, Hiroshi, to Asahi Glass Company, Ltd. Ion exchange membrane for electrolysis. 4,872,958, Cl. 204-98.000.
- Suzuki, Masafumi; and Shirai, Hidenobu, to Fujitsu Limited. Planar magnetron sputtering apparatus and its magnetic source. 4,872,964, Cl. 204-298.000.
- Suzuki, Masato: See—
Horiuchi, Kotaro; and Suzuki, Masato, 4,872,805, Cl. 415-7.000.
- Tobita, Toshimitsu; Inaba, Hiromi; Yamazaki, Masachika; Suzuki, Masato; Morita, Yuzo; Kajiya, Toshiaki; Nakamura, Kiyoshi; and Yoneda, Kenji, 4,872,532, Cl. 187-121.000.
- Suzuki, Masayuki: See—
Baba, Takeshi; Matsuo, Kazuhiko; Usui, Masayuki; Minoura, Kazuo; Somya, Atsushi; and Suzuki, Masayuki, 4,872,743, Cl. 350-353.000.
- Suzuki, Takahiro: See—
Matsumura, Shuzo; Mizuno, Takahiro; Aoki, Noboru; and Suzuki, Takahiro, 4,873,466, Cl. 313-131.000.
- Suzuki, Takamichi: See—
Sato, Hiroshi; Ohashi, Toshihiro; Hamada, Toyohide; Umakoshi, Yukimori; Suzuki, Takamichi; Wada, Yuuji; Hara, Shigeo; and Fukumoto, Yousuke, 4,872,618, Cl. 242-4.00R.
- Suzuki, Takao: See—
Asano, Katuhiko; and Suzuki, Takao, 4,872,314, Cl. 62-49.100.
- Suzuki, Tameyuki; and Kamakura, Takuro, to Shinto Paint Co., Ltd. Method of forming functional coating film between fine electric conductive circuits. 4,873,175, Cl. 430-311.000.
- Suzuki, Tatsuo; and Isono, Keinosuke, to Material Engineering Technology Laboratory, Incorporated. Medical fluid-filled plastic container and methods of making same. 4,872,553, Cl. 206-524.400.
- Suzuki, Tetsuo: See—
Kaji, Kichiro; Shimazaki, Katsunori; Yamamoto, Masakazu; Saito, Kozo; Yura, Keita; Habata, Hidetsugu; Kimura, Isao; and Suzuki, Tetsuo, 4,873,070, Cl. 423-345.000.
- Suzuki, Yasumichi; Ikeda, Yoshimori; Katoh, Koichi; Ohnishi, Tetsuya; Kadowaki, Toshihiro; and Honma, Toshio, to Canon Kabushiki Kaisha. Color image processing apparatus for selectively altering image colors. 4,873,570, Cl. 358-80.000.
- Suzuki, Tsutomu: See—
Niwa, Katuhiko; Abe, Nobuyasu; Kajikiyo, Katuji; Suzuki, Tsutomu; Tabuti, Katumi; and Arai, Yoshifumi, 4,872,383, Cl. 83-175.000.
- Swan, Ellen L.; Basu, Rajat S.; Lund, Earl A. E.; and Wilson, David P., to Allied-Signal Inc. Azeotrope-like compositions of 1,1,2-trichloro-1,2,2-trifluoroethane, methanol, nitromethane and dimethoxymethane. 4,873,015, Cl. 252-171.000.
- Swanboard Masonite AB: See—
Alsterhall, Lars, 4,872,952, Cl. 162-152.000.
- Swarthoff, Ton: See—
Thom, David; Swarthoff, Ton; and Maat, Jan, 4,873,016, Cl. 252-174.120.
- Sweeney, Michael B.: See—
Pless, Benjamin D.; and Sweeney, Michael B., 4,872,459, Cl. 128-419.0PG.
- Sybron Chemicals, Inc.: See—
Greco, William J., Jr., 4,873,611, Cl. 361-315.000.
- Stringfellow, William T.; Goldsmith, Charles D.; and Davis, Lois T., 4,872,986, Cl. 210-611.000.
- Synectics, Inc.: See—
Daleo, Stephen L.; and Compton, James B., 4,873,563, Cl. 357-41.000.
- Syntex: See—
Krantz, Alexander; and Young, John M., 4,873,232, Cl. 514-159.000.
- Syntex (U.S.A.) Inc.: See—
Muchowski, Joseph M.; and Greenhouse, Robert, 4,873,340, Cl. 548-453.000.
- Szafranski, Pierre, to Salomon, S.A. Ski brake associated with a ski binding. 4,872,698, Cl. 280-605.000.
- Szasz, Tibor: See—
Wittmann, Heinz; Erdei, Roland; and Szasz, Tibor, 4,872,272, Cl. 36-117.000.
- Szczesny, David S.: See—
Grebe, Robert K.; Lucius, John E.; and Szczesny, David S., 4,872,844, Cl. 439-69.000.
- Szilagy, Imre; Dekany, Gyula; Frank, Judit; Horvath, Gabor; and Kulcsar, Gabor, to Chinoyn Gyogyszer es Vegyeszeti Termek Gyara R.T. Oxypiricin, a new antibiotic. 4,873,348, Cl. 549-271.000.
- Szoka, Francis: See—
Mayhew, Eric; Ehrke, M. Jane; Mace, Kenneth; Szoka, Francis; and Olson, Fred C., 4,873,088, Cl. 424-450.000.
- Szwerc, Joseph A.: See—
Fazzolare, Richard D.; Szwerc, Joseph A.; and McFeaters, Rich., 4,873,093, Cl. 426-28.000.
- Tabata, Toshiyuki; Ishiyama, Tatsuro; Ushijima, Takao; and Dan, Takuya, to Nissan Motor Co., Ltd.; and Bridgestone Corporation. Vibration insulating device. 4,872,650, Cl. 267-140.100.
- Tabuti, Katumi: See—
Niwa, Katuhiko; Abe, Nobuyasu; Kajikiyo, Katuji; Suzuki, Tsutomu; Tabuti, Katumi; and Arai, Yoshifumi, 4,872,383, Cl. 83-175.000.
- Tachi-S Co. Ltd.: See—
Urai, Muneharu, 4,873,036, Cl. 264-46.600.
- Tachibana, Daisuke: See—
Okada, Takeji; Sawade, Minoru; Imai, Minoru; and Tachibana, Daisuke, 4,873,145, Cl. 428-407.000.
- Tachibana, Kimie; Kaneko, Yutaka; and Ishii, Fumio, to Konica Corporation. Silver halide color photographic light-sensitive material containing pyrazolazole type cyan coupler. 4,873,183, Cl. 430-550.000.
- Tada, Kohji: See—
Kotani, Toshihiro; and Tada, Kohji, 4,873,062, Cl. 422-249.000.
- Tada, Tetsuo; and Yamada, Tsuyoshi, to Mitsubishi Denki Kabushiki Kaisha. Test assist circuit for a semiconductor device providing fault isolation. 4,873,686, Cl. 371-22.400.
- Tada, Tomio; Hirobe, Junichi; Takamatsu, Junichi; Hori, Kazuto; and Aikawa, Yukihiro, to Mita Industrial Co., Ltd. Device for detecting the life of an image forming process unit, opening of a seal of the unit and attachment of the unit to an image forming apparatus. 4,873,549, Cl. 355-206.000.
- Tada, Yasuji: See—
Yukawa, Isao; and Tada, Yasuji, 4,872,289, Cl. 51-5.00R.
- Tagawa, Takashi: See—
Hattori, Shuzo; Tagawa, Takashi; and Asano, Motomu, 4,873,709, Cl. 378-142.000.
- Tagesson, Bernd: See—
Nilsson, Mats; Tagesson, Bernd; and Novak, Ladislav, 4,872,506, Cl. 165-166.000.
- Taguchi, Katsuhiko; and Mitsumori, Kazuya, to JUKI Corporation. Apparatus for positioning a magnetic disk on a disk drive. 4,873,595, Cl. 360-99.050.
- Taguchi, Katsuyuki: See—
Ishiwata, Tetsuo; and Taguchi, Katsuyuki, 4,873,590, Cl. 360-73.140.
- Taguchi, Keiji: See—
Sato, Motohiro; Yamada, Toshihiro; Kohono, Akiomi; Yamamoto, Akihiko; Taguchi, Keiji; Daikoku, Takahiro; and Kobayashi, Fumiaki, 4,872,606, Cl. 228-121.000.
- Taheri, Syde A. Method and apparatus for transarterial aortic graft insertion and implantation. 4,872,874, Cl. 623-1.000.
- Tajika, Hiroshi: See—
Tajima, Hatsuo; Hosoi, Atsushi; Hoshika, Norihisa; Tajika, Hiroshi; and Kinoshita, Masahide, 4,873,551, Cl. 355-251.000.
- Tajima, Hatsuo; Hosoi, Atsushi; Hoshika, Norihisa; Tajika, Hiroshi; and Kinoshita, Masahide, to Canon Kabushiki Kaisha. Developing apparatus using magnetic carrier under AC field. 4,873,551, Cl. 355-251.000.
- Takacs, Dezzo: See—
Winnerl, Josef; and Takacs, Dezzo, 4,873,668, Cl. 365-189.090.
- Takagi, Akinobu: See—
Umamoto, Mitsumasa; Asano, Tamotsu; Horie, Hironobu; Takagi, Akinobu; Tamura, Nobuyasu; and Nishida, Takeshi, 4,873,373, Cl. 568-637.000.
- Takagi, Kozi; Ido, Noriyuki; Ohno, Sadayuki; Suzuki, Hideaki; Inoue, Yoshiaki; and Nomura, Yoshihisa, to Nippondenso Co., Ltd.; and Toyota Jidosha Kabushiki Kaisha. Braking control apparatus for use in motor vehicle. 4,872,730, Cl. 303-92.000.
- Takagi, Yasushi: See—
Umezawa, Sumio; Tsuchiya, Tsutomu; Takeuchi, Tomio; Umezawa, Kazuo; Takahashi, Yoshiaki; Shitara, Tetsuo; Kobayashi, Yoshihiko; and Takagi, Yasushi, 4,873,225, Cl. 514-41.000.
- Takahashi, Akira: See—
Sonoda, Hidefumi; Mori, Eiji; Kawase, Mitsuo; Yoneshige, Kazuhiro; Takahashi, Akira; Komiya, Hirokazu; and Tanaka, Akira, 4,872,439, Cl. 123-518.000.
- Takahashi, Hideharu: See—
Hasegawa, Junichi; and Takahashi, Hideharu, 4,872,858, Cl. 440-38.000.
- Takahashi, Susumu, to Kanto Yakin Kogyo Kabushiki Kaisha. High temperature heating furnace. 4,873,423, Cl. 219-390.000.
- Takahashi, Yoshiaki: See—
Umezawa, Sumio; Tsuchiya, Tsutomu; Takeuchi, Tomio; Umezawa, Kazuo; Takahashi, Yoshiaki; Shitara, Tetsuo; Kobayashi, Yoshihiko; and Takagi, Yasushi, 4,873,225, Cl. 514-41.000.
- Takahashi, Kenji: See—
Hosoi, Yuichi; and Takahashi, Kenji, 4,873,438, Cl. 250-327.200.
- Takahata, Toshio: See—
Nagaishi, Hatsuo; Seimiya, Yasuo; Tamura, Hideyuki; Miwa, Hiromichi; Sanbuchi, Hiroshi; Uchida, Masaaki; and Takahata, Toshio, 4,873,641, Cl. 364-431.040.
- Takai, Kazuhiko, to Sanden Corporation. Slant plate type compressor with variable displacement mechanism. 4,872,815, Cl. 417-222.000.
- Takai, Masaoki: See—
Kobayashi, Hirokazu; Miyamoto, Yukihiro; Takai, Masaoki; Fujisawa, Syuichi; and Miyazawa, Hiroshi, 4,873,684, Cl. 370-102.000.

- Takamatsu, Junichi: See—
Tada, Tomio; Hirobe, Junichi; Takamatsu, Junichi; Hori, Kazuto; and Aikawa, Yukihiro, 4,873,549, Cl. 355-206.000.
- Takami, Akira, to Mitsubishi Denki Kabushiki Kaisha. Rotary pump having alternating pistons controlled by non-circular gears. 4,872,818, Cl. 418-36.000.
- Takao, Shoichi: See—
Tsubakimoto, Tsuneo; Ito, Hayami; Tatsumi, Shuhei; Kajibata, Yoshihiro; Takao, Shoichi; Goto, Takakiyo; Nakaishi, Akio; Rakutani, Kenji; Tamura, Toshio; and Kobayashi, Hiroya, 4,872,885, Cl. 44-51.000.
- Takaoka, Kazuchiyo: See—
Senga, Takao; Takaoka, Kazuchiyo; Yamamoto, Hirokazu; and Hashimoto, Takami, 4,873,166, Cl. 430-137.000.
- Takashima, Hideyuki: See—
Fukuhori, Toshio; Takashima, Hideyuki; and Morinaga, Hitoshi, 4,872,737, Cl. 350-96.200.
- Takasugi, Syunji: See—
Yasukawa, Wataru, deceased; Kiyoshige, Masanori; Horikawa, Takeshi; Okada, Tomonobu; Ochi, Tadafumi; Aoki, Yoshiaki; Higashida, Masahiko; Kawashima, Takashi; Koe, Shigeki; Ono, Hideo; Nihei, Kanta; Takasugi, Syunji; and Take, Koji, 4,872,293, Cl. 51-410.000.
- Takaya, Yoshikazu: See—
Nishinoiri, Hiroshi; Saikawa, Masahiko; Takaya, Yoshikazu; and Nakada, Eiji, 4,873,170, Cl. 430-204.000.
- Takayama, Syuichi: See—
Kanehira, Katsuyuki; Takayama, Syuichi; Amano, Atsushi; Hibino, Hiroki; Uchiyama, Naoki; and Nakada, Akio, 4,872,458, Cl. 128-401.000.
- Take, Koji: See—
Yasukawa, Wataru, deceased; Kiyoshige, Masanori; Horikawa, Takeshi; Okada, Tomonobu; Ochi, Tadafumi; Aoki, Yoshiaki; Higashida, Masahiko; Kawashima, Takashi; Koe, Shigeki; Ono, Hideo; Nihei, Kanta; Takasugi, Syunji; and Take, Koji, 4,872,293, Cl. 51-410.000.
- Takeda Chemical Industries, Ltd.: See—
Aoki, Isao; Kuragano, Takashi; Okajima, Nobuyuki; and Okada, Yoshiyuki, 4,872,901, Cl. 71-90.000.
- Takedoi, Atsushi; Kondo, Hiroyuki; Isoai, Masaru; Yoshinaga, Yoshitaka; Harada, Toshiharu; Okuda, Yosiro; Sumita, Hiroshi; Kawasaki, Hirofumi; and Mori, Kohji, to Toda Kogyo Corp. Spindle-like magnetic iron oxide particles and process for producing the same. 4,873,010, Cl. 252-62.590.
- Takehara, Kimio: See—
Koshihara, Toshio; Misawa, Rokuro; Sagawa, Yuzo; Takehara, Kimio; Matoba, Yuji; and Ishihara, Koji, 4,872,762, Cl. 374-5.000.
- Takekoshi, Tohru: See—
Anderson, Patricia P.; Sivavec, Timothy M.; and Takekoshi, Tohru, 4,873,367, Cl. 562-425.000.
- Taketani, Noriaki; Asano, Hideki; Endo, Akira; Abe, Tomiya; Ibamoto, Masahiko; Mukai, Junji; Tanno, Seikichi; Eguchi, Shuji; and Shimura, Masato, to Hitachi, Ltd.; and Hitachi Cable, Ltd. Method of molding a resinous optical transmitting element. 4,873,030, Cl. 264-1.500.
- Takeuchi, Akihiko; and Tomoyuki, Yoji, to Canon Kabushiki Kaisha. Image processing apparatus using conversion means. 4,873,428, Cl. 250-214.0DC.
- Takeuchi, Akihiro: See—
Kobayashi, Masaaki; Yamanishi, Kazuhiro; Takeuchi, Akihiro; and Nagaoka, Yoshitomi, 4,873,583, Cl. 358-310.000.
- Takeuchi, Hiroyuki: See—
Serita, Tamio; and Takeuchi, Hiroyuki, 4,873,039, Cl. 264-65.000.
- Takeuchi, Mikio; Nakano, Kinichiro; Mitamura, Kenichi; and Tomoda, Takahisa, to Nissan Motor Co., Ltd. Antenna device in automotive keyless entry system. 4,873,530, Cl. 343-711.000.
- Takeuchi, Tomio: See—
Umezawa, Sumio; Tsuchiya, Tsutomu; Takeuchi, Tomio; Umezawa, Kazuo; Takahashi, Yoshiaki; Shitara, Tetsuo; Kobayashi, Yoshihiko; and Takagi, Yasushi, 4,873,225, Cl. 514-41.000.
- Talroy, Robert C.; Ward, Sarah G.; and Schmidt, Parbury P., to Delta Metals, Inc. Method of inhibiting herpetic lesions by the use of platinum coordination compounds. 4,873,226, Cl. 514-46.000.
- Tama Chemicals Co., Ltd.: See—
Itou, Takeo; Matsuda, Hidemi; Yoshizako, Mamoru; and Yagi, Osamu, 4,873,120, Cl. 427-64.000.
- Tamashima, Atsuzo: See—
Masujima, Sho; Yagi, Hiroshi; Tamashima, Atsuzo; and Tamashima, Jun, 4,873,397, Cl. 174-117.00A.
- Tamashima, Jun: See—
Masujima, Sho; Yagi, Hiroshi; Tamashima, Atsuzo; and Tamashima, Jun, 4,873,397, Cl. 174-117.00A.
- Tamura, Hideyuki: See—
Nagaishi, Hatsuo; Seimiya, Yasuo; Tamura, Hideyuki; Miwa, Hiromichi; Sanbuchi, Hiroshi; Uchida, Masaaki; and Takahata, Toshio, 4,873,641, Cl. 364-431.040.
- Tamura, Nobuyasu: See—
Umamoto, Mitsumasa; Asano, Tamotsu; Horie, Hironobu; Takagi, Akinobu; Tamura, Nobuyasu; and Nishida, Takeshi, 4,873,373, Cl. 568-637.000.
- Tamura, Toshio: See—
Tsubakimoto, Tsuneo; Ito, Hayami; Tatsumi, Shuhei; Kajibata, Yoshihiro; Takao, Shoichi; Goto, Takakiyo; Nakaishi, Akio; Rakutani, Kenji; Tamura, Toshio; and Kobayashi, Hiroya, 4,872,885, Cl. 44-51.000.
- Tan, William, to Motorola, Inc. Antenna system for a wrist carried paging receiver. 4,873,527, Cl. 343-718.000.
- Tanaka, Akira: See—
Sonoda, Hidefumi; Mori, Eiji; Kawase, Mitsuo; Yoneshige, Kazuhiro; Takahashi, Akira; Komiya, Hirokazu; and Tanaka, Akira, 4,872,439, Cl. 123-518.000.
- Tanaka, Hatsuyuki; Sato, Yoshiyuki; Kohara, Hidekatsu; and Nakayama, Toshimasa, to Tokyo Ohka Kogyo Co., Ltd. Method for forming a resist pattern on a substrate surface and a scum-remover therefor. 4,873,177, Cl. 430-326.000.
- Tanaka, Hiroshi: See—
Yato, Tadao; Hagino, Sadaaki; and Tanaka, Hiroshi, 4,873,031, Cl. 264-0.500.
- Tanaka, Koji, to Japan Exlan Company Limited. Water-swellaible fiber. 4,873,143, Cl. 428-373.000.
- Tanaka, Masanao: See—
Hattori, Tsuyoshi; Tanaka, Masanao; and Matsuzaka, Syoji, 4,873,576, Cl. 358-224.000.
- Tanaka, Masashi: See—
Kubo, Yoshimasa; Honda, Masao; Tanaka, Masashi; and Asahi, Akihiko, 4,873,195, Cl. 435-254.000.
- Tanaka, Seizo, to Mitsubishi Denki Kabushiki Kaisha. Device for forecasting breakage cables in an industrial robot. 4,873,511, Cl. 340-677.000.
- Tanaka, Takaharu; Saitoh, Masayuki; Higuchi, Naoki; and Hashimoto, Masaki, to Suntory Limited. Dipeptide derivative and synthesis and use thereof. 4,873,342, Cl. 548-518.000.
- Tanaka, Yasunori; and Hashimoto, Hideo, to Kabushiki Kaisha Toshita; and Tosbac Computer System Co., Ltd. Complementary semiconductor memory device with pull-up and pull down. 4,873,670, Cl. 365-189.110.
- Tanaka, Yoshihiro; Tsuji, Sadafusa; Hata, Yoshiaki; Inoue, Manabu; Ootsuka, Hiroshi; Iwata, Michihiro; Ishito, Fumiaki; and Hayama, Koh, to Minolta Camera Kabushiki Kaisha. Photographic camera having a piezo-electric actuating element. 4,873,544, Cl. 354-457.000.
- Tanaka, Yukioka; Omura, Hisao; Irinatsu, Yuuichi; Kobayashi, Takashi; and Noguchi, Aiko, to Kao Corporation. Cacao butter substitute composition. 4,873,109, Cl. 426-607.000.
- Tanno, Seikichi: See—
Taketani, Noriaki; Asano, Hideki; Endo, Akira; Abe, Tomiya; Ibamoto, Masahiko; Mukai, Junji; Tanno, Seikichi; Eguchi, Shuji; and Shimura, Masato, 4,873,030, Cl. 264-1.500.
- Tao, Muneo: See—
Fujimoto, Masayuki; Tao, Muneo; and Uchida, Kuniaki, 4,872,831, Cl. 431-73.000.
- Tapping, Ronald E.: See—
Enright, Philip G.; Hobbis, Andrew J.; and Tapping, Ronald E., 4,872,908, Cl. 75-68.00R.
- Tateyama, Masayuki: See—
Togo, Sigeru; Saito, Yoichi; Tateyama, Masayuki; Okuma, Genji; and Miyazaki, Hiroya, 4,873,475, Cl. 318-489.000.
- Tatsumi, Shuhei: See—
Tsubakimoto, Tsuneo; Ito, Hayami; Tatsumi, Shuhei; Kajibata, Yoshihiro; Takao, Shoichi; Goto, Takakiyo; Nakaishi, Akio; Rakutani, Kenji; Tamura, Toshio; and Kobayashi, Hiroya, 4,872,885, Cl. 44-51.000.
- Tau, Kwoliang D.: See—
Murphy, Mark A.; Smith, Brad L.; Aguiló, Adolfo; and Tau, Kwoliang D., 4,873,378, Cl. 568-867.000.
- Taub, Floyd, to Digene Diagnostics, Incorporated. Bifunctional DNA-protein conjugating agent. 4,873,187, Cl. 435-5.000.
- Taylor, John A., to Separation Dynamics, Inc. Composite semipermeable membranes and method of making same. 4,872,982, Cl. 210-490.000.
- Taylor, Lloyd D.: See—
George, Louis J.; and Taylor, Lloyd D., 4,873,171, Cl. 430-213.000.
- Taylor, Paul D.: See—
Liu, Kou-Chang; and Taylor, Paul D., 4,873,336, Cl. 546-243.000.
- TDK Corporation: See—
Masujima, Sho; Yagi, Hiroshi; Tamashima, Atsuzo; and Tamashima, Jun, 4,873,397, Cl. 174-117.00A.
- Team Incorporated: See—
Bori, Jacques E. F., 4,872,840, Cl. 433-173.000.
- Techno-Frontier Ltd.: See—
Kobayashi, Hiroshi; Kobayashi, Masae; and Machida, Haruhiko, 4,872,445, Cl. 126-376.000.
- Technometal Gesellschaft für Metalltechnologie mbH: See—
Holtermann, Heinz; and Luven, Arno, 4,872,648, Cl. 266-275.000.
- Techsonic Industries, Inc.: See—
Bailey, James B.; Gibson, Robert R.; Nunley, Alvin, III; and Utz, Q. Wayne, 4,873,676, Cl. 367-98.000.
- Tecnol, Inc.: See—
Hubbard, Vance M.; and Brunson, Welton K., 4,872,599, Cl. 224-208.000.
- Tecnoma: See—
Ballu, Patrick, 4,872,467, Cl. 134-104.200.
- Tedham, Thomas A.; and Leung, See C., to Wang Laboratories, Inc. Multi-position base for supporting a cabinet. 4,872,733, Cl. 312-255.000.
- Tegawa, Masao: See—
Kuwabara, Takasi; Yoshiji, Takeo; and Tegawa, Masao, 4,872,417, Cl. 118-411.000.
- Tegeler, John J.; and Shoger, Kirk D., to Hoechst-Roussel Pharmaceuticals, Inc. Arylthiadiazolylsulfonamides and derivatives. 4,873,239, Cl. 514-227.800.

- Teirlinck, Didier, to Cegedur Societe de Transformation de l'Aluminium Pechiney. Sheets of aluminium alloy containing magnesium, suitable for producing bodies of cans by drawing and ironing, and method of obtaining said sheets. 4,872,921, Cl. 148-2.000.
- Tektronix, Inc.: See—
Olisar, Ronald A.; and Knierim, Daniel G., 4,873,456, Cl. 307-272.100.
- Sanielevisci, Sergio A., 4,873,457, Cl. 307-353.000.
- Spoons, John F., 4,873,646, Cl. 364-487.000.
- Teledyne Industries, Inc.: See—
Dalbke, Gary R., 4,872,777, Cl. 401-199.000.
- Teleflex Incorporated: See—
Spease, Arthur L., 4,872,367, Cl. 74-502.600.
- Wolf, Jeffrey, 4,872,365, Cl. 74-501.600.
- Teles De Menezes, Antonio, Junior. Wind turbine having combination wind deflecting and frame orienting means as well as dual rudders. 4,872,804, Cl. 415-2.100.
- Temkin, Henryk: See—
Antresyan, Aram; Garbinski, Paul A.; Mattera, Vincent D., Jr.; and Temkin, Henryk, 4,873,558, Cl. 357-23.200.
- Tenud, Leander: See—
McGarrity, John; Tenud, Leander; and Meul, Thomas, 4,873,339, Cl. 548-110.000.
- Terada, Hiroshi; Fukahori, Naoyuki; and Sakunaga, Kenichi, to Mitsubishi Rayon Company, Ltd. Endoscope. 4,872,740, Cl. 350-96.260.
- Terada, Kosei: See—
Oguri, Shigenori; and Terada, Kosei, 4,872,385, Cl. 84-635.000.
- Terayama, Satoshi: See—
Sekine, Noboru; Aoki, Takashi; and Terayama, Satoshi, 4,872,540, Cl. 192-0.076.
- Tews, Richard R., to Kimberly-Clark Corporation. Method of forming rapidly disintegrating paper tubes. 4,872,933, Cl. 156-184.000.
- Texaco Inc.: See—
Bartels, Craig R.; Dorawala, Tansukhlal G.; Stephenson, Michael T.; Pasternak, Mordechai; and Reale, John, Jr., 4,872,991, Cl. 210-651.000.
- Sanderson, John R.; and Larkin, John M., 4,873,380, Cl. 568-914.000.
- Texas Instruments Incorporated: See—
Davis, Cecil J.; Abernathy, Joseph V.; Matthews, Robert T.; Hildenbrand, Randall C.; Simpson, Bruce; Jones, John I.; Loewenstein, Lee M.; and Bohlman, James G., 4,872,938, Cl. 156-345.000.
- Jensen, Millard J.; and Levine, Jules D., 4,872,607, Cl. 228-180.100.
- Roane, Bobby A., 4,873,565, Cl. 357-71.000.
- Texidor, Teodoro A. Lined carton. 4,872,588, Cl. 220-403.000.
- Texim International: See—
Guity-Mehr, Hossein F., 4,873,396, Cl. 174-66.000.
- Thakur, Madhukar N.: See—
Kuchimanchi, Ravi; and Thakur, Madhukar N., 4,872,682, Cl. 273-153.000.
- Thamm, Horst-Dieter: See—
Erdmann, Fritz; Thamm, Horst-Dieter; and Staudt, Hans-Joachim, 4,873,169, Cl. 430-192.000.
- Thenoz, Yves: See—
Cazaux, Yvon; Thenoz, Yves; Heralut, Didier; and Blanchard, Pierre, 4,873,562, Cl. 357-24.000.
- Theodoropoulos, Spyros. Oxazine-ureas and thiazine urea chromophores. 4,873,318, Cl. 530-387.000.
- Therm-O-Disc, Incorporated: See—
Ankenman, Bruce E.; and Cunitz, Donald G., 4,873,508, Cl. 338-25.000.
- Antonas, Adamantios, 4,873,507, Cl. 338-22.00R.
- Theros, Brian S., to Klein Tools Corporation. Working clamshell blister package for pliers or similar hand tools. 4,872,551, Cl. 206-349.000.
- Thom, David; Swarthoff, Ton; and Maat, Jan, to Lever Brothers Company. Enzymatic detergent composition. 4,873,016, Cl. 252-174.120.
- Thomas, Alvin D., to Crellin, Inc. Spring dye tube. 4,872,621, Cl. 242-118.110.
- Thomas, Graham A.; and Borer, Timothy J., to British Broadcasting Corporation. Video signal processing for bandwidth reduction. 4,873,573, Cl. 358-133.000.
- Thomas Industries Inc.: See—
Dean, Thomas E.; Henrich, William H.; Fischer, David M.; Stratton, Lawrence J.; and Pietsch, Herbert E., 4,873,471, Cl. 315-308.000.
- Thomas J. Lipton, Inc.: See—
Butcher, Ian; and Hillman, Kevin P., 4,873,104, Cl. 426-249.000.
- Thomas, William C.: See—
Peirish, Alfred J.; Schmidt, Theodore E.; and Thomas, William C., 4,872,286, Cl. 49-449.000.
- Thomes Pharmacal Co., Inc.: See—
Blackman, Steven T., 4,873,265, Cl. 514-651.000.
- Thompson, Frank B., to United Technologies Corporation. Static pressure system for gas turbine engines. 4,872,807, Cl. 415-118.000.
- Thompson, Howard D. Apparatus for assisted parturition of livestock and method of making same. 4,872,457, Cl. 128-352.000.
- Thompson, Marshall A. Corner painting attachment for paint rollers. 4,872,236, Cl. 15-118.000.
- Thompson, Mortimer S., to Tri-Tech Systems International Inc. Closure cap with a seal and method of and apparatus for forming such closure and seal. 4,872,304, Cl. 53-487.000.
- Thompson, Raymon F.; and Funk, Larry, to Semitool, Inc. Slow acting fluid valve. 4,872,638, Cl. 251-54.000.
- Thompson, Steven L.; and Silverman, Melvin K. Liquid fiber wrap fingernail reinforcement composition. 4,873,077, Cl. 424-61.000.
- Thomson-CSF: See—
Cazaux, Yvon; Thenoz, Yves; Heralut, Didier; and Blanchard, Pierre, 4,873,562, Cl. 357-24.000.
- de Chambost, Emmanuel; Micheron, Francois; Vallet, Francois; and Vignolle, Jean-Michel, 4,873,455, Cl. 307-201.000.
- Girard, Bernard, 4,873,528, Cl. 343-770.000.
- Thorn, Richard P., to Lord Corporation. Fluid filled resilient bushing. 4,872,651, Cl. 267-140.100.
- Thorsett, Eugene D.: See—
Parsons, William H.; Patchett, Arthur A.; and Thorsett, Eugene D., 4,873,235, Cl. 514-312.000.
- Thottathil, John K.: See—
Petrillo, Edward W., Jr.; Karanewsky, Donald S.; Thottathil, John K.; Heikes, James E.; and Grosso, John A., 4,873,356, Cl. 558-180.000.
- Thouzeau, Andre: See—
Aime, Jean-Marc; Mention, Georges; and Thouzeau, Andre, 4,873,270, Cl. 523-128.000.
- Thulin, Robert: See—
Banks, Lori; Busk, Grant C., Jr.; Chiang, Bin; and Thulin, Robert, 4,873,098, Cl. 426-94.000.
- Thyes, Marco: See—
Rossy, Philip A.; Thyes, Marco; Franke, Albrecht; Koenig, Horst; Lehmann, Hans D.; Gries, Josef; Friedrich, Ludwig; and Lenke, Dieter, 4,873,246, Cl. 514-252.000.
- Thyssen Stahl AG: See—
Auth, Rudolf; Seidelmann, Lothar; and Maas, Heinz, 4,872,906, Cl. 75-5.000.
- Thyssen Stahl Aktiengesellschaft: See—
Strum, Joseph; and Prange, Wilfried, 4,872,940, Cl. 156-379.800.
- Tiffany, John, to Grendahl, Dennis T. Intraocular lens with ultraviolet screening agent. 4,872,877, Cl. 623-6.000.
- Tiffany, John S., to Grendahl, Dennis T. Optical brightener in an intraocular lens. 4,872,878, Cl. 623-6.000.
- TMC Corporation: See—
Wittmann, Heinz; Erdei, Roland; and Szasz, Tibor, 4,872,272, Cl. 36-117.000.
- Toa Nenryo Kogyo K.K.: See—
Komatsu, Masato; Baba, Isao; Mikami, Takashi; Narukawa, Kiyotada; and Kanai, Tsuyoshi, 4,873,288, Cl. 525-194.000.
- Matsumura, Mitsuo; and Yoshida, Toshihiko, 4,873,115, Cl. 427-34.000.
- Toa Nenryo Kogyo Kabushiki Kaisha: See—
Kono, Koichi; Okamoto, Kenkichi; Iwasaki, Rumi; and Sawada, Shuichi, 4,873,034, Cl. 264-41.000.
- Tobita, Toshimitsu; Inaba, Hiromi; Yamazaki, Masachika; Suzuki, Masato; Morita, Yuzo; Kajiyama, Toshiaki; Nakamura, Kiyoshi; and Yoneda, Kenji, to Hitachi, Ltd. Signal transmission method and system in elevator equipment. 4,872,532, Cl. 187-121.000.
- Toda Kogyo Corp.: See—
Takedoi, Atsushi; Kondo, Hiroyuki; Isoai, Masaru; Yoshinaga, Yoshitaka; Harada, Toshiharu; Okuda, Yosiro; Sumita, Hiroshi; Kawasaki, Hirofumi; and Mori, Kohji, 4,873,010, Cl. 252-62.590.
- Toda, Tsuyoshi: See—
Nakamura, Shigeru; Machida, Sadatsugi; and Toda, Tsuyoshi, 4,873,678, Cl. 369-13.000.
- Todd, Charles W.: See—
Crawford, Frances G.; Shively, John E.; Todd, Charles W.; and Yang, Y. H. Joy, 4,873,313, Cl. 530-387.000.
- Tognoni, Keith I.; Fitzgerald, John; Welch, Glenn; and Yonkers, Paul, to Digital Equipment Corporation. Video circuit enclosure for attachment to a cathode ray tube. 4,873,578, Cl. 358-254.000.
- Togo, Sigeru; Saito, Yoichi; Tateyama, Masayuki; Okuma, Genji; and Miyazaki, Hiroya, to Nissan Motor Co., Ltd. Electrically powered power steering system for industrial vehicle or the like. 4,873,475, Cl. 318-489.000.
- Tokura, Seiichi: See—
Azuma, Ichiro; Tokura, Seiichi; Nishimura, Shinichiro; and Seo, Hiroshi, 4,873,092, Cl. 424-499.000.
- Tokyo Electric Power Co.: See—
Okabe, Yoshimi; Iwamoto, Keiichi; Torichigai, Masaaki; Kaneko, Shozo; Ichinari, Joji; and Koizumi, Kiyoshi, 4,872,347, Cl. 73-634.000.
- Tokyo Electron Limited: See—
Imahashi, Issei, 4,873,447, Cl. 250-492.200.
- Tokyo Kogaku Kikai Kabushiki Kaisha: See—
Nishio, Kouji; and Hanamura, Yoshihiko, 4,872,460, Cl. 128-648.000.
- Tokyo Ohka Kogyo Co., Ltd.: See—
Tanaka, Hatsuyuki; Sato, Yoshiyuki; Kohara, Hidekatsu; and Nakayama, Toshimasa, 4,873,177, Cl. 430-326.000.
- Tomaschke, John E., to Hydranautics Corporation. Interfacially synthesized reverse osmosis membrane containing an amine salt and processes for preparing the same. 4,872,984, Cl. 210-500.380.
- Tomba, Giuseppe: See—
Silvano, Tomba; and Tomba, Giuseppe, 4,872,695, Cl. 280-257.000.
- Tomczuk, Bruce E.; and Sutherland, Deborah S., to A. H. Robins Company, Incorporated. Method of treating animals using fused imidazoheterocyclic compounds. 4,873,251, Cl. 514-303.000.
- Tominari, Noboru, to Dynavector, Inc. Multi-channel reproducing system. 4,873,722, Cl. 381-17.000.
- Tomita, Katsuhiko: See—
Kotani, Haruo; and Tomita, Katsuhiko, 4,872,956, Cl. 204-1.00T.
- Kotani, Haruo; and Tomita, Katsuhiko, 4,872,966, Cl. 204-414.000.

- Tomoda, Takahisa: See—
Takeuchi, Mikio; Nakano, Kinichiro; Mitamura, Kenichi; and Tomoda, Takahisa, 4,873,530, Cl. 343-711.000.
- Tomoyuki, Yoji: See—
Takeuchi, Akihiko; and Tomoyuki, Yoji, 4,873,428, Cl. 250-214.0DC.
- Toms, Douglas: See—
Kolodess, Michael S.; Toms, Douglas; and Pierson, Bruce A., 4,873,106, Cl. 426-481.000.
- Tomskikh, Sergei F.: See—
Arbeniev, Alexandr S.; Ignatiev, Alexandr A.; Zhilin, Vitaly A.; Melnikov, Alexandr S.; and Tomskikh, Sergei F., 4,872,760, Cl. 366-7.000.
- Tonegawa, Susumu: See—
Saito, Haruo; Kranz, David M.; Eisen, Herman N.; and Tonegawa, Susumu, 4,873,190, Cl. 435-172.300.
- Tongu, Shinji, to Yazaki Corporation. Air-cooled absorption type cooling/heating water generating apparatus. 4,872,319, Cl. 62-141.000.
- Topcik, Barry, to Union Carbide Chemicals and Plastics Company Inc. Process for extruding a thermoplastic copolymer. 4,873,042, Cl. 264-211.240.
- Torichigai, Masaaki: See—
Okabe, Yoshimi; Iwamoto, Keiichi; Torichigai, Masaaki; Kaneko, Shozo; Ichinari, Joji; and Koizumi, Kiyoshi, 4,872,347, Cl. 73-634.000.
- Torielli, Alessandro: See—
Licciardi, Luigi; and Torielli, Alessandro, 4,873,659, Cl. 364-784.000.
- Torrington Company, The: See—
Dickinson, Thorn W., 4,872,770, Cl. 384-484.000.
- Tosbac Computer System Co., Ltd.: See—
Tanaka, Yasunori; and Hashimoto, Hideo, 4,873,670, Cl. 365-189.110.
- Toshiba Ceramics Co., Ltd.: See—
Matsushita, Junichi; Saito, Hajime; and Nagashima, Hideo, 4,873,053, Cl. 419-11.000.
- Toshiba Silicone Co., Ltd.: See—
Shimizu, Chiyuki; and Yoshida, Tamio, 4,873,272, Cl. 523-212.000.
- Toussaint, Francois; and Goelff, Pierre, to Glaverbel. Transparent fire-screening panels. 4,873,146, Cl. 428-428.000.
- Townsend, Charles P. Energy absorbing ball. 4,872,676, Cl. 273-58.00H.
- Townsend, Donald L.: See—
Streich, Herbert K.; Leach, Robert D.; Johnson, Joel R.; Olson, Thomas B.; and Townsend, Donald L., 4,873,422, Cl. 219-370.000.
- Toyo Bosoki Kabushiki Kaisha: See—
Kashima, Toshihiro; and Fukuda, Minoru, 4,873,131, Cl. 428-64.000.
- Toyo Jozo Company, Ltd.: See—
Morishita, Masataka; Aikawa, Renji; Katsuragi, Shigeo; Yamamoto, Yoshiaki; and Sugimoto, Kenichi, 4,873,087, Cl. 424-433.000.
- Toyoda Gosei Co., Ltd.: See—
Fujisawa, Norio; Sakamoto, Toshishige; Ito, Toshiyasu; and Shimada, Junichi, 4,872,745, Cl. 350-357.000.
- Kaga, Koichi; Hosoi, Akio; and Yamaguchi, Takao, 4,872,364, Cl. 74-484.00H.
- Nozaki, Masahiro, 4,872,288, Cl. 49-485.000.
- Toyota Jidosha Kabushiki Kaisha: See—
Asada, Toshiyuki; Ushijima, Fumihiko; and Higashiyama, Yasuhiko, 4,872,376, Cl. 74-765.000.
- Ouchi, Mitsuyuki; and Aono, Koichi, 4,872,373, Cl. 74-711.000.
- Sonoda, Hidefumi; Mori, Eiji; Kawase, Mitsuo; Yoneshige, Kazuhiro; Takahashi, Akira; Komiya, Hirokazu; and Tanaka, Akira, 4,872,439, Cl. 123-518.000.
- Takagi, Kozi; Ido, Noriyuki; Ohno, Sadayuki; Suzuki, Hideaki; Inoue, Yoshiaki; and Nomura, Yoshihisa, 4,872,730, Cl. 303-92.000.
- Toyotomi Kogyo Co., Ltd.: See—
Nakamura, Kazuharu; Mito, Yoshio; Nakanishi, Yutaka; Yamada, Toshihiko; Nakamura, Kenji; and Itoh, Kiyonobu, 4,872,829, Cl. 431-33.000.
- Traber, Jorg: See—
Junge, Bodo; Richter, Bernd; Glaser, Thomas; Traber, Jorg; and Allen, George S., 4,873,262, Cl. 514-510.000.
- Trabert, Ludwig: See—
Lindner, Christian; Wittmann, Dieter; Trabert, Ludwig; Suling, Carlhans; Bartl, Herbert; and Ott, Karl-Heinz, 4,873,289, Cl. 525-293.000.
- Trachman, Edward G.; Shih, Shan; and Arzoian, John, to Rockwell International Corporation. Planetary transmission apparatus having a four element torque converter. 4,872,374, Cl. 74-731.000.
- Trachman, Edward G.; Shih, Shan; and Arzoian, John, to Rockwell International Corporation. Control method for planetary transmission having four element torque converter. 4,872,375, Cl. 74-731.000.
- Trainor, Diane A., to ICI Americas Inc. Difluoro peptide compounds. 4,873,221, Cl. 514-18.000.
- Transphase Systems, Inc.: See—
Ames, Douglas A., 4,872,557, Cl. 206-504.000.
- Trasko, Theodore W. Golf course and method of playing a golf game. 4,872,686, Cl. 273-176.0AB.
- Travieso, Ruben: See—
Myers, Clyde J.; Stephenson, Daniel L.; and Travieso, Ruben, 4,872,736, Cl. 350-96.200.
- Travis, Tonny D. Dusting apparatus. 4,872,598, Cl. 222-630.000.
- Treiber, Helmut: See—
Zahn, Wolfgang; Fursich, Manfred; Nitsch, Wilhelm; Rauh, Hans-Jürgen; and Treiber, Helmut, 4,873,546, Cl. 355-38.000.
- Tresper, Erhard: See—
Jakob, Wolfgang; Alewelt, Wolfgang; and Tresper, Erhard, 4,873,326, Cl. 540-538.000.
- Tretter, Steven A., to Penril Corporation. Modem and method for 8 dimensional trellis code modulation. 4,873,701, Cl. 375-27.000.
- Tri-Tech Systems International Inc.: See—
Thompson, Mortimer S., 4,872,304, Cl. 53-487.000.
- Tri Tool Inc.: See—
VanderPol, Jerald; Silber, Cory J.; and Astle, William H., 4,872,249, Cl. 29-157.400.
- Trio Kabushiki Kaisha: See—
Kobayashi, Hirokazu; Miyamoto, Yukihiro; Takai, Masaaki; Fujisawa, Syuichi; and Miyazawa, Hiroshi, 4,873,684, Cl. 370-102.000.
- Triton Engineering Services Company: See—
Nelson, Jack R., 4,872,520, Cl. 175-329.000.
- Trojan Technologies, Inc.: See—
Maarschalkerweerd, Jan, 4,872,980, Cl. 210-243.000.
- Troutner, Arthur L.; and O'Sullivan, Kevin B., to Trus Joist Corporation. Key clip support member. 4,872,299, Cl. 52-693.000.
- Trummlitz, Gunter: See—
Engel, Wolfram; Eberlein, Wolfgang; Mihm, Gerhard; Trummlitz, Gunter; Mayer, Norbert; and De Jonge, Adriaan, 4,873,236, Cl. 514-220.000.
- Trus Joist Corporation: See—
Troutner, Arthur L.; and O'Sullivan, Kevin B., 4,872,299, Cl. 52-693.000.
- TRW Inc.: See—
Koutsoukos, Elias P., 4,873,214, Cl. 502-185.000.
- Rabe, William T.; and Gilbert, Wendell L., 4,872,393, Cl. 91-375.00A.
- TRW Repa GmbH: See—
Biller, Dieter; and Biller, Joachim, 4,872,704, Cl. 280-808.000.
- Tselesin, Naum: See—
Drita, Vladimir; and Tselesin, Naum, 4,873,605, Cl. 361-143.000.
- Tsinberg, Mikhail, to U.S. Philips Corporation. Extended horizontal resolution of luminance and chrominance in a high definition television system. 4,873,567, Cl. 358-12.000.
- Tsirlunikov, Mosel V.; and Zusanovsky, Zinoviy A., to Vseojunzy Nauchno-Issledovatel'skiy I Ispytatelnyy Institut Meditsinskoi Tekhniki. Method for treatment of sexual impotence in men. 4,872,447, Cl. 128-79.000.
- Tsividis, Yannis. Switched neural networks. 4,873,661, Cl. 364-807.000.
- Tsubakimoto, Tsuneo; Ito, Hayami; Tatsumi, Shuhei; Kajibata, Yoshihiro; Takao, Shoichi; Goto, Takakiyo; Nakaishi, Akio; Rakutani, Kenji; Tamura, Toshio; and Kobayashi, Hiroya, to Kawasaki Jukogyo Kagushiki Kaisha; and Nippon Shokubai Kabaku Kogyo Co., Ltd. Dispersant for aqueous slurry of carbonaceous solid and aqueous carbonaceous solid slurry composition incorporating said dispersant therein. 4,872,885, Cl. 44-51.000.
- Tsuboike, Yoshihiko: See—
Nagai, Noboru; Hashimoto, Yoshisato; Tsuboike, Yoshihiko; and Kaito, Noboru, 4,872,308, Cl. 60-316.000.
- Tsuchiya, Osamu: See—
Shimizu, Shinji; Tsuchiya, Osamu; and Sato, Katsuyuki, 4,873,559, Cl. 357-23.600.
- Tsuchiya, Tsutomu: See—
Umezawa, Sumio; Tsuchiya, Tsutomu; Takeuchi, Tomio; Umezawa, Kazuo; Takahashi, Yoshiaki; Shitara, Tetsuo; Kobayashi, Yoshihiko; and Takagi, Yasushi, 4,873,225, Cl. 514-41.000.
- Tsuji, Sadafusa: See—
Tanaka, Yoshihiro; Tsuji, Sadafusa; Hata, Yoshiaki; Inoue, Manabu; Ootsuka, Hiroshi; Iwata, Michihiro; Ishito, Fumiaki; and Hayama, Koh, 4,873,544, Cl. 354-457.000.
- Tsuji, Shinji: See—
Uomi, Kazuhisa; Tsuji, Shinji; Sakano, Shinji; Okai, Makoto; and Chinone, Naoki, 4,873,691, Cl. 372-20.000.
- Tsukada, Tetsuro: See—
Suzuki, Koji; Tsukada, Tetsuro; Saito, Yoshihiko; Arai, Kiyotaka; and Mori, Hiroshi, 4,872,958, Cl. 204-98.000.
- Tsukamoto, Takahiro, to Canon Kabushiki Kaisha. Thermal recorder for printing dot patterns having higher density at ends of pattern. 4,872,772, Cl. 400-120.000.
- Tsumura, Kazunobu: See—
Sawamura, Norio; Matsuo, Takaharu; Tsumura, Kazunobu; and Ebihara, Yoshitaka, 4,873,194, Cl. 435-198.000.
- Tsuruoka, Michihiko; Nakagawa, Wataru; Miyoshi, Noriomi; Konosu, Naohiro; and Hashimoto, Tadao, to Fuji Electric Co., Ltd. Vibrating type transducer. 4,872,335, Cl. 73-30.000.
- Tucker, Howard: See—
Hughes, Leslie R.; Oldfield, John; and Tucker, Howard, 4,873,329, Cl. 544-265.000.
- Tullis, Barclay J.; and Baer, Richard G., to Hewlett-Packard Company. Hot chuck assembly for integrated circuit wafers. 4,872,835, Cl. 432-225.000.
- Tumblin, John E.: See—
Blanton, Keith A.; Finlay, William M.; Sinclair, Michael J.; and Tumblin, John E., 4,873,585, Cl. 358-335.000.
- Tung, Lu H.: See—
Chau, C. C.; Im, Jang-hi; Raspor, Otto C.; and Tung, Lu H., 4,873,037, Cl. 264-49.000.

- Turco, Pietro: See—
Federici, Franco; Pallozzi, Franco; Cozzi, Ennio; and Turco, Pietro, 4,873,307, Cl. 528-60.000.
- Turner, Ian: See—
Chung, Chi H.; Rees, Theodore D.; and Turner, Ian, 4,873,680, Cl. 369-59.000.
- U-Line Corporation: See—
Reed, William A., 4,872,317, Cl. 62-135.000.
- UBE Industries, Ltd.: See—
Joh, Yasushi, 4,872,867, Cl. 604-269.000.
- Uchida, Kuniaki: See—
Fujimoto, Masayuki; Tao, Muneo; and Uchida, Kuniaki, 4,872,831, Cl. 431-73.000.
- Uchida, Kuninobu: See—
Minagawa, Takehiro; Stou, Toshio; Miyata, Masao; Nemoto, Kenji; and Uchida, Kuninobu, 4,872,793, Cl. 409-244.000.
- Uchida, Masaki: See—
Nagashi, Hideo; Seimiya, Yasuo; Tamura, Hideyuki; Miwa, Hiroshi; Sanbuchi, Hiroshi; Uchida, Masaki; and Takahata, Toshio, 4,873,641, Cl. 364-431.040.
- Uchida, Mitsuru: See—
Yasuda, Satoshi; and Kuribayashi, Tetsuya, to Canon Kabushiki Kaisha. One-component toner for dry electrophotography containing metal complex as charge control agent, 4,873,185, Cl. 430-90.000.
- Uchida, Shinichi: See—
Kawajiri, Tatsuya; Onodera, Hideo; Uchida, Shinichi; Aoki, Yukio; and Wada, Masahiro, 4,873,217, Cl. 502-311.000.
- Uchida, Takashi: See—
Hirose, Yoshihiko; Aoki, Tomohiro; Chiku, Kazuyoshi; Murayama, Yasushi; Uchida, Takashi; Matsuzawa, Kunihiko; and Kanekura, Kazunori, 4,873,541, Cl. 346-160.100.
- Uchiyama, Naoki: See—
Kanehira, Katsuyuki; Takayama, Syuichi; Amano, Atsushi; Hibino, Hiroki; Uchiyama, Naoki; and Nakada, Akio, 4,872,458, Cl. 128-401.000.
- Uclaf, Rousel: See—
Cossediere, Daniel; Gigliotti, Giuseppe; and Moguilewsky, Martine, 4,873,256, Cl. 514-391.000.
- Ueda, Fusao: See—
Kimura, Kiyoshi; Ueda, Fusao; and Ogasawara, Takashi, 4,873,242, Cl. 514-242.000.
- Ueda, Hiroyuki, to Canon Kabushiki Kaisha. Printing wheel discriminating apparatus, 4,872,773, Cl. 400-144.200.
- Ueda, Motohiko: See—
Adachi, Ikuro; Yamamori, Teruo; Ueda, Motohiko; and Sato, Hatsu, 4,873,334, Cl. 514-303.000.
- Ueki, Masao: See—
Matsuyama, Jinsho; Hirai, Yutaka; Ueki, Masao; and Sakai, Akira, 4,873,125, Cl. 427-248.100.
- Ueno, Hiroshi; Satomi, Tomoki; and Yoshida, Teruo, to Koyo Seiko Co., Ltd. Bearing, 4,872,771, Cl. 384-492.000.
- Uesugi, Akio; Kakei, Tsutomu; and Minato, Shinichiro, to Fuji Photo Film Co., Ltd. Method of manufacturing supports for lithographic printing plate, 4,872,946, Cl. 156-637.000.
- Uesugi, Fumihiko; and Morishige, Yukio, to NEC Corporation. Method and apparatus for writing a line on a patterned substrate, 4,873,413, Cl. 219-121.680.
- Ueyama, Yoshiji; and Asayama, Yoshiaki, to Mitsubishi Denki Kabushiki Kaisha. Throttle valve controlling apparatus including relative position limiting means for throttle valves, 4,872,435, Cl. 123-336.000.
- Umakoshi, Yukimori: See—
Sato, Hiroshi; Ohashi, Toshihiro; Hamada, Toyohide; Umakoshi, Yukimori; Suzuki, Takamichi; Wada, Yuuji; Hara, Shigeo; and Fukumoto, Yoshitake, 4,872,618, Cl. 242-4.00R.
- Umemoto, Mitsumasa; Asano, Tamotsu; Horie, Hironobu; Takagi, Akinobu; Tamura, Nobuyasu; and Nishida, Takeshi, to Mitsui Toatsu Chemicals, Inc. Process for preparation of 3-phenoxybenzyl 2-(4-alkoxyphenyl)-2-methylpropyl ethers, 4,873,373, Cl. 568-637.000.
- Umemoto, Teruo; and Gotoh, Yoshihiko, to Sagami Chemical Research Center. Fluoroalkylaryliodonium compounds, 4,873,027, Cl. 562-83.000.
- Umetsubo, Toshiaki: See—
Nakamura, Hironori; Yotsui, Toshiaki; Sato, Youichi; Umetsubo, Toshiaki; and Ohkawa, Hideo, 4,872,247, Cl. 29-125.000.
- Umezawa, Kazuo: See—
Umezawa, Sumio; Tsuchiya, Tsutomu; Takeuchi, Tomio; Umezawa, Kazuo; Takahashi, Yoshiaki; Shitara, Tetsuo; Kobayashi, Yoshihiko; and Takagi, Yasushi, 4,873,225, Cl. 514-41.000.
- Umezawa, Sumio; Tsuchiya, Tsutomu; Takeuchi, Tomio; Umezawa, Kazuo; Takahashi, Yoshiaki; Shitara, Tetsuo; Kobayashi, Yoshihiko; and Takagi, Yasushi, to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai. 1-n-(4-amino-3-fluoro-2-hydroxybutyl)-kanamycins, 4,873,225, Cl. 514-41.000.
- Umotoy, Salvador P.: See—
Wang, David N.; White, John M.; Law, Kam S.; Leung, Cissy; Umotoy, Salvador P.; Collins, Kenneth S.; Adamik, John A.; Perlov, Ilya; and Maydan, Dan, 4,872,947, Cl. 156-643.000.
- Unger, Larry E., to Mid-South Products Engineering, Inc. Safety packaging for hypodermic syringes with needles and the like, 4,872,552, Cl. 206-365.000.
- Uni-Frac Inc.: See—
Parker, Trent J.; and Parker, Byron M., 4,872,955, Cl. 202-154.000.
- Unicorn Electrical Products: See—
Vogele, Thomas A., 4,873,600, Cl. 361-426.000.
- Unilever Patent Holdings B.V.: See—
De Rooij, Johannes F. M.; and Meakins, Stephen E., 4,873,108, Cl. 426-533.000.
- Union Camp Corporation: See—
Bornack, Walter K., Jr.; and McNally, Keith R., 4,873,311, Cl. 528-272.000.
- Union Carbide Chemicals and Plastics Company Inc.: See—
Ancker, Fred H., 4,873,116, Cl. 428-36.900.
- Brode, George L., II; and Merritt, Frederick M., II, 4,873,293, Cl. 525-417.000.
- Topcik, Barry, 4,873,042, Cl. 264-211.240.
- Union Carbide Corporation: See—
Howard, Ronald A., 4,872,914, Cl. 106-285.000.
- King, Stephen W., 4,873,017, Cl. 252-183.110.
- Unisys Corporation: See—
Rusterholz, John T.; Lahti, Archie E.; Bushard, Louis B.; Byers, Larry L.; Hamstra, James R.; and Homan, Charles J., 4,873,630, Cl. 364-200.000.
- U.S. Automation Co.: See—
Borodin, Daniel J., 4,872,923, Cl. 148-11.50R.
- United States of America
Administrator, National Aeronautics and Space Administration: See—
Kleinberg, Leonard L., 4,873,498, Cl. 331-116.0FE.
- Air Force: See—
Barasch, Marian; and Mirella, Charles H., 4,872,354, Cl. 73-865.800.
- Eylon, Daniel; Froes, Francis H.; and Yoltan, Charles F., 4,872,927, Cl. 148-20.300.
- Hutta, Joseph J., 4,872,894, Cl. 65-3.110.
- Agriculture: See—
Jochim, Michael M.; and Jones, Suzanne C., 4,873,189, Cl. 435-68.000.
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Algor, Marshall M., 4,873,499, Cl. 331-117.00R.
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Kato, Toshio; Uotani, Kunihiko; and Ito, Mitsuhiko, 4,872,659, Cl. 271-9.000.
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Anderson, David J., 4,873,346, Cl. 548-157.000.
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Geisinger, Penrod C., 4,872,490, Cl. 141-7.000.
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Miram, George V.; Green, Michael C.; and Merdian, George K., 4,873,468, Cl. 313-411.000.
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Grein-Wiegand, Alcide, 4,873,113, Cl. 427-2.000.
- Vartiainen, Seppo; and Aalto, Erkki, to Halton Oy. Air purifier, 4,872,892, Cl. 55-345.000.
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Arthurs, Edward; Goodman, Matthew S.; Kobrinski, Haim; and Vecchi, Mario P., 4,873,681, Cl. 370-3.000.
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Fischer, James R., 4,872,243, Cl. 24-442.000.
- Venclovas, Ruta J.: See—
Myers, Donald O.; and Venclovas, Ruta J., 4,872,945, Cl. 156-627.000.
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Brown, Wesley D.; Hill, Edward C.; and Vercellone, Peter T., 4,872,810, Cl. 416-145.000.
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Quetsch, Karl-Heinz; and Vetter, Hennig, 4,872,404, Cl. 100-125.000.
- Vetter, Kurt: See—
Behr, Hans; Vetter, Kurt; Schneider, Rolf; and Luderer, Fred, 4,872,616, Cl. 239-703.000.
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Quetsch, Karl-Heinz; and Vetter, Hennig, 4,872,404, Cl. 100-125.000.
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Critton, Thomas J.; Johnson, Donald S.; Pukalo, Walter P.; and Yorio, Ralph, 4,872,369, Cl. 74-574.000.
- Victor Company of Japan, Ltd.: See—
Fujiwara, Nobuo, 4,873,493, Cl. 330-285.000.
- Viets, Michael I. Ladder stabilizer assembly, 4,872,529, Cl. 182-172.000.
- Vignolle, Jean-Michel: See—
de Chambost, Emmanuel; Micheron, Francois; Vallet, Francois; and Vignolle, Jean-Michel, 4,873,455, Cl. 307-201.000.
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Vinczer, Peter S.; and Vinczer, Ferenc B., 4,873,412, Cl. 219-95.000.
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- Virdia, Antonio, to Pentasystem S.p.A. Card or pass in plastic material incorporating an integrated memory circuit, 4,873,427, Cl. 235-492.000.
- Virgins, Kenneth L.: See—
Hetzel, Joseph R.; and Virgins, Kenneth L., 4,872,297, Cl. 52-92.000.
- Visintainer, Robert J.: See—
Addie, Graeme R.; and Visintainer, Robert J., 4,872,809, Cl. 415-206.000.
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Arbeniev, Alexandr S.; Ignatiev, Alexandr A.; Zhilin, Vitaly A.; Melnikov, Alexandr S.; and Tomskikh, Sergei F., 4,872,760, Cl. 366-7.000.
- Vogele, Thomas A., to Unicorn Electrical Products. Utility pedestal, 4,873,600, Cl. 361-426.000.
- Vogg, Hubert: See—
Braun, Hartmut; and Vogg, Hubert, 4,873,065, Cl. 423-210.000.
- Volvo Car B.V.: See—
Van Oijen, Lambertus J.; and Willems, Fokke, 4,872,328, Cl. 70-237.000.
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Doyen, Daniel; and Vriz, Tarcisio, 4,873,495, Cl. 331-68.000.

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Tsirjulinikov, Moisei V.; and Zusanovsky, Zinoviy A., 4,872,447, Cl. 128-79.000.
- Vasojunzy Nauchno-Issledovatel'skiy I Proektny Institut Aluminievoy, Magnievoy I Elektrodnoy: See—
Grebennik, Anatoly F.; Glagovsky, Boris A.; Moskovenko, Igor B.; and Lasukova, Ijudmila P., 4,872,344, Cl. 73-579.000.
- Vyse, Gerrard N.: See—
Konecny, James W.; Huston, Rodney L.; and Vyse, Gerrard N., 4,872,710, Cl. 285-81.000.
- W. B. Marvin Manufacturing Company, The: See—
Chaney, David B., 4,872,399, Cl. 98-94.100.
- W. R. Grace & Co. - Conn.: See—
Chmurny, Alan B.; Gross, Akiva T.; Kupper, Robert J.; and Roberts, Rowena L., 4,873,359, Cl. 560-40.000.
- Quirk, Jennifer M.; and Carter, Charles G., 4,873,358, Cl. 560-22.000.
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- Wachi, Toshio: See—
Fujita, Kohtaroh; Wachi, Toshio; and Ikeda, Yoshiaki, 4,873,351, Cl. 556-76.000.
- Wachtler, Andreas: See—
Krause, Joachim; Wachtler, Andreas; Scheuble, Bernard; and Weber, Georg, 4,873,019, Cl. 252-299.610.
- Wacker-Chemie GmbH: See—
Rengstl, Alfred, 4,873,297, Cl. 525-474.000.
- Wada, Masahiro: See—
Kawajiri, Tatsuya; Onodera, Hideo; Uchida, Shinichi; Aoki, Yukio; and Wada, Masahiro, 4,873,217, Cl. 502-311.000.
- Wada, Yuuji: See—
Sato, Hiroshi; Ohashi, Toshihiro; Hamada, Toyohide; Umakoshi, Yukimori; Suzuki, Takamichi; Wada, Yuuji; Hara, Shigeo; and Fukumoto, Yousuke, 4,872,618, Cl. 242-4.000.
- Wade, Wallace R.: See—
Rao, Venulapalli Durga N.; and Wade, Wallace R., 4,872,432, Cl. 123-193.0CP.
- Wagner, John C. Cleaning apparatus and method for bath enclosures. 4,872,225, Cl. 4-662.000.
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- Walker, Kevin E.: See—
Korsunsky, Iosif; Walker, Kevin E.; and Brown, Robert W., 4,872,845, Cl. 439-70.000.
- Walley, David H.; and DeVries, Marvin R. Stop leak composition. 4,872,911, Cl. 106-33.000.
- Wang, Chih-Fei: See—
Borth, David E.; Wang, Chih-Fei; Rabe, Duane C.; and Labeledz, Gerald P., 4,873,683, Cl. 370-95.100.
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- Wang Laboratories, Inc.: See—
Tedham, Thomas A.; and Leung, See C., 4,872,733, Cl. 312-255.000.
- Wang, Patrick S., to Johnson Electric Industrial Manufactory Limited. Terminal in an electric motor. 4,873,464, Cl. 310-249.000.
- Ward, Sarah G.: See—
Talroy, Robert C.; Ward, Sarah G.; and Schmidt, Parbury P., 4,873,226, Cl. 514-46.000.
- Warder, William G.; and Frye, David R., to Pro-Tech-Tube, Inc. Protective enclosure for hazardous material primary containers. 4,872,563, Cl. 206-634.000.
- Ware, Randolph H.: See—
Nelson, Loren D.; Erb, Lee A.; Ware, Randolph H.; and Rottner, Donald, 4,873,481, Cl. 324-58.50R.
- Warn Industries, Inc.: See—
Johnson, Richard G., 4,873,474, Cl. 318-434.000.
- Warner, Brian. Adjustable damper means for shock absorber. 4,872,537, Cl. 188-319.000.
- Warner-Lambert Company: See—
Cherukuri, Subraman R.; and Mansukhani, Gul, 4,872,884, Cl. 426-3.000.
- Warnqvist, Bjorn S.: See—
Anderson, Alf O.; and Warnqvist, Bjorn S., 4,872,950, Cl. 162-15.000.
- Watakabe, Yaichiro; Morimoto, Hiroaki; and Okamoto, Tatsuo, to Mitsubishi Denki Kabushiki Kaisha. Photomask material. 4,873,163, Cl. 430-5.000.
- Watakabe, Yaichiro: See—
Yoshioka, Nobuyuki; Fujiwara, Nobuo; and Watakabe, Yaichiro, 4,873,162, Cl. 430-5.000.
- Watanabe, Chuichi, to Dow Chemical Company. The. Variable flow capillary gas chromatography method. 4,872,334, Cl. 73-23.100.
- Watanabe, Takao: See—
Hori, Ryoichi; Itoh, Kiyoo; Kitsukawa, Goro; Kawajiri, Yoshiki; Watanabe, Takao; and Kawahara, Takayuki, 4,873,673, Cl. 365-230.060.
- Watanabe, Toshio, to Ricoh Company, Ltd. Electrophotographic copier including means for sensing the size of an original document. 4,873,550, Cl. 355-232.000.
- Watanabe, Youji: See—
Matsuzaki, Minoru; Itoh, Junichi; and Watanabe, Youji, 4,873,543, Cl. 354-402.000.
- Watanabe, Yukio: See—
Kimura, Tsutomu; and Watanabe, Yukio, 4,873,441, Cl. 250-327.200.
- Watjen, Frank; and Hansen, Holger C., to A/S Ferrosan. Tricyclic heterocyclic compounds as psychopharmaceuticals. 4,873,244, Cl. 514-250.000.
- Watts, Robert J.; Rice, David A.; and Neun, John A. Nondestructive testing of gears. 4,872,337, Cl. 73-162.000.
- Watts, W. David. Bar and coil descenders. 4,872,294, Cl. 51-420.000.
- Waymire, John W.: See—
Penn, Paul E.; Werckman, Roger A., Jr.; and Waymire, John W., 4,873,473, Cl. 388-814.000.
- Weakliem, Herbert A.: See—
Akhtar, Masud; and Weakliem, Herbert A., 4,873,119, Cl. 427-39.000.
- Weaver, Samuel C.; and Nixdorf, Richard D., to American Matrix, Inc. Method for the preparation of silicon carbide whiskers. 4,873,069, Cl. 423-345.000.
- Weber, Georg: See—
Krause, Joachim; Wachtler, Andreas; Scheuble, Bernard; and Weber, Georg, 4,873,019, Cl. 252-299.610.
- Weber S.r.l.: See—
Ausello, Francesco P.; Riccio, Mario; and De Matthaeis, Sisto Luigi, 4,872,438, Cl. 123-514.000.
- Webster, Van K., to AMP Incorporated. Circuit card retaining device. 4,872,853, Cl. 439-327.000.
- Wedhorn, Norman G. Knock-down boom for pick-up truck. 4,872,581, Cl. 212-180.000.
- Wehowsky, Frank; and Liebig, Martin, to Hoechst Aktiengesellschaft. Urethanes containing fluorine and polysiloxane, process for their preparation and their use. 4,873,306, Cl. 528-28.000.
- Weichert, Jamey P.: See—
Counsell, Raymond E.; Longino, Marc A.; Weichert, Jamey P.; and Schwendner, Susan P., 4,873,075, Cl. 424-1.100.
- Weinhold, Karl. Device for connecting a hose end to a connecting spigot. 4,872,711, Cl. 285-88.000.
- Weiss, Herbert W., to General Electric Company. Method and apparatus for controlling an alternating current motor particularly at low speeds. 4,873,478, Cl. 318-779.000.
- Weiss, Ronald R., to Gold Medal Products Co. Cotton candy machine. 4,872,821, Cl. 425-9.000.
- Weisser, Harald: See—
Bertiller, Roland; Maier, Roland; and Weisser, Harald, 4,872,390, Cl. 89-29.000.
- Weissert, Wolfgang: See—
Zimmermann, Gunther; Friedrich, Reinhard; Nantt, Wolfgang; and Weissert, Wolfgang, 4,872,587, Cl. 220-375.000.
- Welbon, William W.: See—
Bourne, Roy S.; Eichman, Clarence C.; and Welbon, William W., 4,872,905, Cl. 75-0.50C.
- Welch, Douglas A.: See—
Barnett, Paul M.; Welch, Douglas A.; and MacMillan, Duncan J., Jr., 4,873,718, Cl. 379-156.000.
- Welch, Glenn: See—
Tognoni, Keith I.; Fitzgerald, John; Welch, Glenn; and Yonkers, Paul, 4,873,578, Cl. 358-254.000.
- Weller, Jeanne M., to Sterling Drug Inc. Carpet freshening and deodorizing composition. 4,873,000, Cl. 252-8.600.
- Welter, Andre; Fischer, Harmut; Christiaens, Leon; Wendel, Albrecht; Etschenberg, Eugen; Dereu, Norbert; Kuhl, Peter; and Graf, Eric, to A Nattermann & CIE GmbH. Diselenobis-benzoic acid amides of primary and secondary amines and processes for the treatment of diseases in humans caused by a cell injury. 4,873,350, Cl. 549-436.000.
- Wen, David D. High dynamic range charge-coupled device. 4,873,561, Cl. 357-24.000.
- Wendel, Albrecht: See—
Welter, Andre; Fischer, Harmut; Christiaens, Leon; Wendel, Albrecht; Etschenberg, Eugen; Dereu, Norbert; Kuhl, Peter; and Graf, Eric, 4,873,350, Cl. 549-436.000.
- Werckman, Roger A., Jr.: See—
Penn, Paul E.; Werckman, Roger A., Jr.; and Waymire, John W., 4,873,473, Cl. 388-814.000.
- Wermuth, Camille G.; Schlewer, Gilbert; and Heaulme, Michel, to SANOFI. Derivatives of 3-imino-pyridazine, process for obtaining them and pharmaceutical compositions containing them. 4,873,243, Cl. 514-248.000.
- Westinghouse Electric Corp.: See—
Abodishish, Hani A., 4,873,072, Cl. 423-608.000.
- Duncan, Robert; and Craver, James E., 4,873,051, Cl. 376-438.000.
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- Whiteside, Walter: See—
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- Wibbeling, Ulrich: See—
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- Wilkinson, Stanley B., to General Electric Company. Ripple attenuator for AC power transmission line protective relays. 4,873,602, Cl. 361-78.000.
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Ronco, Robert L., Sr.; and Wolk, Piero, 4,872,507, Cl. 166-57.000.
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Loeb, Marvin P.; and Perry, John F., 4,872,464, Cl. 128-844.000.
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Masujima, Sho; Yagi, Hiroshi; Tamashima, Atsuzo; and Tamashima, Jun, 4,873,397, Cl. 174-117.00A.
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Itou, Takeo; Matsuda, Hidemi; Yoshizako, Mamoru; and Yagi, Osamu, 4,873,120, Cl. 427-64.000.
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Karakida, Ken-ichi; and Yagi, Shigeru, 4,873,165, Cl. 430-66.000.
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Inazawa, Yoshizumi; Yamada, Masaki; Ishibashi, Hiroshi; and Ozaki, Shinya, 4,873,589, Cl. 360-53.000.
- Yamada, Morihiko: See—
Okamoto, Shosuke; Okada, Yoshio; Okunomiya, Akiko; Naito, Taketoshi; Kimura, Yoshio; Yamada, Morihiko; Ohno, Norio; Katsuura, Yasuhiro; Nojima, Hiroshi; and Shishikura, Takashi, 4,873,253, Cl. 514-352.000.

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Nakamura, Kazuharu; Mito, Yoshio; Nakanishi, Yutaka; Yamada, Toshihiko; Nakamura, Kenji; and Itoh, Kiyonobu, 4,872,829, Cl. 431-33.000.
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Sato, Motohiro; Yamada, Toshihiro; Kohono, Akiomi; Yamamoto, Akihiko; Taguchi, Keiji; Daikoku, Takahiro; and Kobayashi, Fumiaki, 4,872,606, Cl. 228-121.000.
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Tada, Tetsuo; and Yamada, Tsuyoshi, 4,873,686, Cl. 371-22.400.
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Miyazaki, Takao; Yamada, Yoshiro; and Komine, Isamu, 4,872,758, Cl. 356-381.000.
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Higuchi, Noboru; Matsui, Keizo; Kobayashi, Chuzo; and Yamaguchi, Shigeru, 4,872,763, Cl. 366-160.000.
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Kawasaki, Yoshiaki; Hioki, Yoshihiro; Ohno, Yuichi; Ichida, Kozaburo; Yamaguchi, Susumu; Sudo, Michitaka; and Chikazawa, Bunichiro, 4,872,245, Cl. 29-81.00A.
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Kaga, Koichi; Hosoi, Akio; and Yamaguchi, Takao, 4,872,364, Cl. 74-484.00H.
- Yamaha Corporation: See—
Oguri, Shigenori; and Terada, Kosei, 4,872,385, Cl. 84-635.000.
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Horiuchi, Kotaro; and Suzuki, Masato, 4,872,805, Cl. 415-7.000.
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Nohira, Hiroyuki; Kamei, Masanao; Nakamura, Shinichi; Yoshinaga, Kazuo; Kai, Mariko; and Katagiri, Kazuharu, 4,873,018, Cl. 252-299.010.
- Yamamoto, Teruo: See—
Adachi, Ikuo; Yamamoto, Teruo; Ueda, Motohiko; and Sato, Hatsu, 4,873,334, Cl. 514-303.000.
- Yamamoto, Akihiko: See—
Sato, Motohiro; Yamada, Toshihiro; Kohono, Akiomi; Yamamoto, Akihiko; Taguchi, Keiji; Daikoku, Takahiro; and Kobayashi, Fumiaki, 4,872,606, Cl. 228-121.000.
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Senga, Takao; Takaoka, Kazuchiyo; Yamamoto, Hirokazu; and Hashimoto, Takimi, 4,873,166, Cl. 430-137.000.
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Ono, Shuji; and Yamamoto, Masafumi, 4,873,435, Cl. 250-235.000.
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Kaji, Kichiro; Shimasaki, Katsunori; Yamamoto, Masakazu; Saiki, Kozo; Yura, Keita; Habata, Hidetsugu; Kimura, Isao; and Suzuki, Tetsuo, 4,873,070, Cl. 423-345.000.
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Hirota, Toshio; Ohuchi, Takashi; and Yamamoto, Osamu, 4,873,155, Cl. 429-26.000.
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Minowa, Takehiko; and Yamamoto, Toshifumi, 4,873,536, Cl. 346-76.0PH.
- Yamamoto, Yasuyoshi: See—
Sasaki, Nobukazu; Kasamura, Toshiro; Ohashi, Masashi; Okuda, Naoki; Kusumoto, Toshihiko; Maeda, Yasunori; Ozawa, Takashi; Yamamoto, Yasuyoshi; Kubota, Atsushi; Kimura, Akiyoshi; and Masuda, Makoto, 4,873,547, Cl. 355-316.000.
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Morishita, Masataka; Aikawa, Renji; Katsuragi, Shigeo; Yamamoto, Yoshiaki; and Sugimoto, Kenichi, 4,873,087, Cl. 424-433.000.
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- Yamanishi, Kazuhiro: See—
Kobayashi, Masaaki; Yamanishi, Kazuhiro; Takeuchi, Akihiro; and Nagaoka, Yoshitomi, 4,873,583, Cl. 358-310.000.
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- Yamao, Masanobu: See—
Wakabayashi, Minoru; Murata, Hiroyuki; Sugino, Yasuo; Yamao, Masanobu; and Nishikawa, Takao, 4,872,972, Cl. 209-143.000.
- Yamashita, Norihisa: See—
Kato, Tsuguhiko; Maeda, Kiyoto; Shirohita, Masao; Yamashita, Norihisa; Sanemitsu, Yuzuru; and Inoue, Satoru, 4,873,248, Cl. 514-269.000.
- Yamazaki, Masachika: See—
Tobita, Toshimitsu; Inaba, Hiromi; Yamazaki, Masachika; Suzuki, Masato; Morita, Yuzo; Kajiya, Toshiaki; Nakamura, Kiyoshi; and Yoneda, Kenji, 4,872,532, Cl. 187-121.000.
- Yan, Ran H.: See—
Coldren, Larry A.; Scott, Jeffery W.; and Yan, Ran H., 4,873,696, Cl. 372-96.000.
- Yanagiuchi, Shigenobu: See—
Omori, Takuro; and Yanagiuchi, Shigenobu, 4,873,628, Cl. 364-200.000.
- Yanahira, Shuichi: See—
Deya, Eiki; Yanahira, Shuichi; Abiko, Kenkichi; and Kikuchi, Eiichi, 4,873,229, Cl. 514-54.000.
- Yanai, Akio: See—
Yasunaga, Tadashi; and Yanai, Akio, 4,873,154, Cl. 428-694.000.
- Yang, Y. H. Joy: See—
Crawford, Frances G.; Shively, John E.; Todd, Charles W.; and Yang, Y. H. Joy, 4,873,313, Cl. 530-387.000.
- Yano, Akechi. Roll with an arched shaft, 4,872,246, Cl. 29-116.100.
- Yanushefski, Katherine A.: See—
Hokanson, John L.; Smeltz, Palmer D., Jr.; Yanushefski, Katherine A.; Yanushefski, Michael J.; and Young, Craig A., 4,873,566, Cl. 357-74.000.
- Yanushefski, Michael J.: See—
Hokanson, John L.; Smeltz, Palmer D., Jr.; Yanushefski, Katherine A.; Yanushefski, Michael J.; and Young, Craig A., 4,873,566, Cl. 357-74.000.
- Yasuda, Satoshi: See—
Uchida, Mitsuru; Yasuda, Satoshi; and Kuribayashi, Tetsuya, 4,873,185, Cl. 430-903.000.
- Yasukawa, Shigeo, sole heir: See—
Yasukawa, Wataru, deceased; Kiyoshige, Masanori; Horikawa, Takeshi; Okada, Tomonobu; Ochi, Tadafumi; Aoki, Yoshiaki; Higashida, Masahiko; Kawashima, Takashi; Koe, Shigeo; Ono, Hideo; Nihei, Kanta; Takasugi, Syunji; and Take, Koji, 4,872,293, Cl. 51-410.000.
- Yasukawa, Wataru, deceased (by Yasukawa, Shigeo, sole heir): See—
Kiyoshige, Masanori; Horikawa, Takeshi; Okada, Tomonobu; Ochi, Tadafumi; Aoki, Yoshiaki; Higashida, Masahiko; Kawashima, Takashi; Koe, Shigeo; Ono, Hideo; Nihei, Kanta; Takasugi, Syunji; and Take, Koji, 4,872,293, Cl. 51-410.000.
- Yasunaga, Tadashi; and Yanai, Akio, to Fuji Photo Film Co., Ltd. Magnetic recording medium containing Fe, Co, N and O, 4,873,154, Cl. 428-694.000.
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Kimura, Takashi; Yatomi, Toshiya; and Edakubo, Hiroo, 4,873,591, Cl. 360-85.000.
- Yazaki Corporation: See—
Tongu, Shinji, 4,872,319, Cl. 62-141.000.
- Yeager, Gary W.; and Schissel, David N., to General Electric Company. Hydroxy-terminated arylene ethers, and method for making, 4,873,371, Cl. 568-33.000.
- Yeaman, George A.: See—
Katchka, Jay R.; Yeaman, George A.; and McKinney, Richard W., 4,872,830, Cl. 431-54.000.
- Yeazel, Kenneth L.; and Forester, Robert J., to Crane Carrier Company. Side refuse loader for vehicles, 4,872,801, Cl. 414-409.000.
- Yinger, William W. Plant support, 4,872,283, Cl. 47-70.000.
- Yokohama Rubber Co., Ltd., The: See—
Hanada, Ryoji; Morikawa, Tuneso; and Kabe, Kazuyuki, 4,872,497, Cl. 152-541.000.
- Yolton, Charles F.: See—
Eylon, Daniel; Froes, Francis H.; and Yolton, Charles F., 4,872,927, Cl. 148-20.300.
- Yoneda, Kenji: See—
Yoneda, Toshimitsu; Inaba, Hiromi; Yamazaki, Masachika; Suzuki, Masato; Morita, Yuzo; Kajiya, Toshiaki; Nakamura, Kiyoshi; and Yoneda, Kenji, 4,872,532, Cl. 187-121.000.
- Yoneshige, Kazuhiro: See—
Sonoda, Hidefumi; Mori, Eiji; Kawase, Mitsuo; Yoneshige, Kazuhiro; Takahashi, Akira; Komiya, Hirokazu; and Tanaka, Akira, 4,872,439, Cl. 123-518.000.
- Yonkers, Paul: See—
Tognoni, Keith I.; Fitzgerald, John; Welch, Glenn; and Yonkers, Paul, 4,873,578, Cl. 358-254.000.
- Yorio, Ralph: See—
Crittton, Thomas J.; Johnson, Donald S.; Pukalo, Walter P.; and Yorio, Ralph, 4,872,369, Cl. 74-574.000.
- Yoshida, Katsuhira; and Kubo, Yuji, to Mitsubishi Chemical Industries Limited. Metal-containing indoaniline compound and optical recording medium employing the compound, 4,873,332, Cl. 546-7.000.
- Yoshida, Takuji, to Oki Electric Industry Co., Ltd. Voltage level detecting circuit having a level converter, 4,873,458, Cl. 307-362.000.
- Yoshida, Tamio: See—
Shimizu, Chiyuki; and Yoshida, Tamio, 4,873,272, Cl. 523-212.000.
- Yoshida, Teruo: See—
Ueno, Hiroshi; Satomi, Tomoaki; and Yoshida, Teruo, 4,872,771, Cl. 384-492.000.
- Yoshida, Tetsuo: See—
Sasaoka, Senzo; Yoshida, Tetsuo; and Inoue, Nobuaki, 4,873,173, Cl. 430-964.000.
- Yoshida, Toshihiko: See—
Matsumura, Mitsuo; and Yoshida, Toshihiko, 4,873,115, Cl. 427-34.000.
- Yoshii, Akio: See—
Archer, Gary D.; Huff, Eugene G.; Madrid, Miguel T., Jr.; and Yoshii, Akio, 4,873,625, Cl. 364-200.000.

- Yoshiji, Takeo: See—
Kuwabara, Takasi; Yoshiji, Takeo; and Tegawa, Masao, 4,872,417, Cl. 118-411.000.
- Yoshikawa, Masao; and Nakahata, Kimio, to Canon Kabushiki Kaisha. Magnet roll developing apparatus, 4,872,418, Cl. 118-657.000.
- Yoshikawa, Masato; Fukuura, Yukio; Akiyama, Setsuo; Nakamura, Makoto; Naito, Kazuo; and Honda, Toshio, to Bridgestone Corporation. Method for making rubbery composite materials by plating a metal substrate with a cobalt alloy, 4,872,932, Cl. 156-151.000.
- Yoshimura, Hiroshi, to Hakkio Metal Industries Limited. Electric soldering iron, 4,873,608, Cl. 361-220.000.
- Yoshimura, Katsuji; Kozuki, Susumu; Edakubo, Hiroo; and Sato, Chikara, to Canon Kabushiki Kaisha. Video signal reproducing apparatus with memory, 4,873,587, Cl. 360-9.100.
- Yoshinaga, Kazuo: See—
Nohira, Hiroyuki; Kamei, Masanao; Nakamura, Shinichi; Yoshinaga, Kazuo; Kai, Mariko; and Katagiri, Kazuharu, 4,873,018, Cl. 252-299.010.
- Yoshinaga, Yoshitaka: See—
Takedoi, Atsushi; Kondo, Hiroyuki; Isoi, Masaru; Yoshinaga, Yoshitaka; Harada, Toshiharu; Okuda, Yosihiro; Sumita, Hiroshi; Kawasaki, Hirofumi; and Mori, Kohji, 4,873,010, Cl. 252-62.590.
- Yoshino, Toshio: See—
Kajikawa, Teruo; and Yoshino, Toshio, 4,872,930, Cl. 156-72.000.
- Yoshioka, Nobuyuki; Fujiwara, Nobuo; and Watakabe, Yaichiro, to Mitsubishi Denki Kabushiki Kaisha. X-ray mask and a manufacture method therefor, 4,873,162, Cl. 430-5.000.
- Yoshioka, Takao; Kanai, Tutomu; Aizawa, Yuichi; Horikoshi, Hiroyoshi; and Hasegawa, Kazuo, to Sankyo Company Limited. Thiazolidinone derivatives, their preparation and their use, 4,873,255, Cl. 514-369.000.
- Yoshitoshi, You: See—
Kume, Hidehiro; Matsumoto, Yoshiyuki; and Yoshitoshi, You, 4,873,429, Cl. 250-216.000.
- Yoshizaki, Hideo: See—
Arai, Koichi; and Yoshizaki, Hideo, 4,873,222, Cl. 514-21.000.
- Yoshizako, Mamoru: See—
Itou, Takeo; Matsuda, Hidemi; Yoshizako, Mamoru; and Yagi, Osamu, 4,873,120, Cl. 427-64.000.
- Yotsui, Toshiaki: See—
Nakamura, Hironori; Yotsui, Toshiaki; Sato, Youichi; Umetsubo, Toshiaki; and Ohkawa, Hideo, 4,872,247, Cl. 29-125.000.
- Young, Craig A.: See—
Hokanson, John L.; Smeltz, Palmer D., Jr.; Yanushefski, Katherine A.; Yanushefski, Michael J.; and Young, Craig A., 4,873,566, Cl. 357-74.000.
- Young, James C.: See—
Powers, Thomas P.; Seppala, Earl E.; and Young, James C., 4,872,392, Cl. 89-193.000.
- Young, John M.: See—
Krantz, Alexander; and Young, John M., 4,873,232, Cl. 514-159.000.
- Young, Lawrence R.: See—
Fulton, Steven J.; Spehrley, Charles W., Jr.; and Young, Lawrence R., 4,873,134, Cl. 428-156.000.
- Young, William A.; Ko, Wai-Shing; Davidson, Curtis R.; and Whitehurst, Thomas, to Pittway Corporation. Infrared actuated control switch assembly, 4,873,469, Cl. 315-155.000.
- Youtz, Stephen E.: See—
Mierzewski, Eugene P.; Grunden, Michael T.; and Youtz, Stephen E., 4,872,828, Cl. 431-16.000.
- Yuasa, Satoshi: See—
Haruta, Masahiro; Kuwae, Yoko; Munakata, Hirohide; Yuasa, Satoshi; and Sugawa, Etsuko, 4,873,178, Cl. 430-327.000.
- Yue, Zheng. Hydraulic pumps or motors and hydrostatic transmitting systems, 4,872,536, Cl. 188-290.000.
- Yui, Hiroshi; Okamura, Michiya; Ikeda, Masakazu; and Matsuo, Norio, to Mitsubishi Petrochemical Co., Ltd. Polyacetal resin composition, 4,873,282, Cl. 524-496.000.
- Yui, Nobuhiko: See—
Ogata, Naoya; Sanui, Kohei; Yui, Nobuhiko; Kataoka, Kazunori; Okano, Teruo; and Sakurai, Yasuhisa, 4,873,292, Cl. 525-408.000.
- Yukawa, Isao; and Tada, Yasuji, to Disco Abrasive Systems, Ltd. Cutter, 4,872,289, Cl. 51-5.00R.
- Yunoki, Yutaka: See—
Kato, Akira; Ida, Masatoshi; Yunoki, Yutaka; Harada, Hisayuki; Inoue, Manabu; and Fukuda, Yoshio, 4,873,580, Cl. 358-335.000.
- Yura, Keita: See—
Kaji, Kichiro; Shimasaki, Katsunori; Yamamoto, Masakazu; Saiki, Kozo; Yura, Keita; Habata, Hidetsugu; Kimura, Isao; and Suzuki, Tetsuo, 4,873,070, Cl. 423-345.000.
- Zackl, Bernd: See—
Bantle, Manfred; Munz, Volker; Zackl, Bernd; Dietz, Matthias; and Armbrust, Eberhard, 4,872,372, Cl. 74-710.500.
- Zahn, Markus: See—
Melcher, James R.; Morin, Alfred J., II; and Zahn, Markus, 4,873,489, Cl. 324-453.000.
- Zahn, Wolfgang; Fursich, Manfred; Nitsch, Wilhelm; Rauh, Hans-Jürgen; and Treiber, Helmut, to AGFA-Gevaert Aktiengesellschaft. Color printing method and apparatus, 4,873,546, Cl. 355-38.000.
- Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai: See—
Umezawa, Sumio; Tsuchiya, Tsutomu; Takeuchi, Tomio; Umezawa, Kazuo; Takahashi, Yoshiaki; Shitara, Tetsuo; Kobayashi, Yoshihiko; and Takagi, Yasushi, 4,873,225, Cl. 514-41.000.
- Zakim, David: See—
Scott, Anthony W.; and Zakim, David, 4,873,089, Cl. 424-450.000.
- Zamora, Antonio: See—
Frisch, Rudolf A.; and Zamora, Antonio, 4,873,634, Cl. 364-419.000.
- Zandona, Oliver J., to Ashland Oil, Inc. Progressive flow cracking of coal/oil mixtures with high metals content catalyst, 4,872,971, Cl. 208-419.000.
- Zehner, Georgia L.: See—
Proxmire, Deborah L.; Endres, Dan D.; Wilson, John C.; Johnson, Lynn A.; Zehner, Georgia L.; Boland, Leona G.; and Stevens, Robert A., 4,872,871, Cl. 604-394.000.
- Zeitlin, James A.: See—
Mezei, Louis M.; Albom, Bradley S.; Coppock, Stan; Mochle, Stephen J.; Noorda, Brent S.; Widunas, Joseph T.; and Zeitlin, James A., 4,873,633, Cl. 364-413.080.
- Zelenka, Lyn: See—
Zelenka, Zdenek; and Zelenka, Lyn, 4,872,583, Cl. 220-94.00R.
- Zelenka, Zdenek; and Zelenka, Lyn. Handle structure for paint container, 4,872,583, Cl. 220-94.00R.
- Zellweger Uster Ltd.: See—
Robertson, Peter M.; and Suter, Erwin, 4,873,057, Cl. 422-75.000.
- Zhilin, Vitaly A.: See—
Arbeniev, Alexandr S.; Ignatiev, Alexandr A.; Zhilin, Vitaly A.; Melnikov, Alexandr S.; and Tomsikh, Sergei F., 4,872,760, Cl. 366-7.000.
- Zimmer, Gero, to Productech Reflow Solder Equipment Inc. Heated tool with stop mechanism, 4,872,604, Cl. 228-9.000.
- Zimmermann, Gunther; Friedrich, Reinhard; Nant, Wolfgang; and Weissert, Wolfgang, to Andreas Stihl. Closure for a fuel tank, 4,872,587, Cl. 220-375.000.
- Zingerman, Joel R., to Merck & Co., Inc. Controlled release bolus device, 4,872,873, Cl. 604-892.100.
- Zitomer, Bernard: See—
Shadrach III, William S.; Mandler, Michael; Moch, Ihor D.; Zitomer, Bernard; and Stewart II, John L., 4,872,555, Cl. 206-459.000.
- Zollinger, Ezra J. Fertilizer injecting implement and method, 4,872,412, Cl. 111-121.000.
- Zusmanovsky, Zinovy A.: See—
Tsirulnikov, Moisei V.; and Zusmanovsky, Zinovy A., 4,872,447, Cl. 128-79.000.
- 501 Abbeybench Limited: See—
Jenkinson, Margaret; and Dunne, John, 4,872,290, Cl. 51-109.00R.

LIST OF REISSUE PATENTEEES

TO WHOM

PATENTS WERE ISSUED ON THE 10TH DAY OF OCTOBER, 1989

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

- Advanced Mechanical Technology, Inc.: See—
Gerstmann, Joseph; and Vasilakis, Andrew D., Re. 33,082, Cl. 122-20.00B.
- American Home Products Corporation: See—
Jones, Flavie L.; and Kelly, Mark L., Re. 33,088, Cl. 346-1.100.
- Bradford, Michael P.; Parkinson, Gerald W.; and Grant, Ross M., to United Technologies Corporation. Electric power distribution and load transfer system. Re. 33,087, Cl. 307-64.000.
- Bru, Jean. Process for manufacturing effervescent granules and tablets and high efficiency granulation tower for such process. Re. 33,086, Cl. 424-44.000.
- Gerstmann, Joseph; and Vasilakis, Andrew D., to Advanced Mechanical Technology, Inc. Combustion product condensing water heater. Re. 33,082, Cl. 122-20.00B.
- Grant, Ross M.: See—
Bradford, Michael P.; Parkinson, Gerald W.; and Grant, Ross M., Re. 33,087, Cl. 307-64.000.
- Jones, Flavie L.; and Kelly, Mark L., to American Home Products Corporation. Method and apparatus for recording medical information on a strip chart. Re. 33,088, Cl. 346-1.100.
- Kelly, Mark L.: See—
Jones, Flavie L.; and Kelly, Mark L., Re. 33,088, Cl. 346-1.100.
- Maples, James A.: See—
Pepper, Robert B.; and Maples, James A., Re. 33,089, Cl. 364-480.000.
- Parkinson, Gerald W.: See—
Bradford, Michael P.; Parkinson, Gerald W.; and Grant, Ross M., Re. 33,087, Cl. 307-64.000.
- Pellegrino, Raymond W. Controlled dispensing apparatus. Re. 33,083, Cl. 222-181.000.
- Pepper, Robert B.; and Maples, James A. Position sensing and indicating device. Re. 33,089, Cl. 364-480.000.
- Petersen, Ross K. Precleaner. Re. 33,085, Cl. 55-327.000.
- Ranson, Jean-Francois. Intermittently operating pneumatic device for pumping solid-carrying liquids and slurries. Re. 33,084, Cl. 406-50.000.
- United Technologies Corporation: See—
Bradford, Michael P.; Parkinson, Gerald W.; and Grant, Ross M., Re. 33,087, Cl. 307-64.000.
- Vasilakis, Andrew D.: See—
Gerstmann, Joseph; and Vasilakis, Andrew D., Re. 33,082, Cl. 122-20.00B.

LIST OF REEXAMINATION PATENTEEES

TO WHOM

CERTIFICATES WERE ISSUED

- Curran, William F. Massaging device. B1 4,506,660, 10-10-89, Cl. 128-57.000.
- Du Pont de Nemours, E. I., and Company: See—
Levitt, George. B1 4,659,369, Cl. 71-92.000.
- Levitt, George, to Du Pont de Nemours, E. I., and Company. Herbicidal acetals and ketals. B1 4,659,369, 10-10-89, Cl. 71-92.000.
- Nakamura, Hitoshi: See—
Takahashi, Akio; Tsumuki, Chiaki; and Nakamura, Hitoshi, B1 4,236,923, Cl. 419-6.000.
- Takahashi, Akio; Tsumuki, Chiaki; and Nakamura, Hitoshi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Method of metallurgically joining a fitting to a shaft. B1 4,236,923, 10-10-89, Cl. 419-6.000.
- Toyota Jidosha Kogyo Kabushiki Kaisha: See—
Takahashi, Akio; Tsumuki, Chiaki; and Nakamura, Hitoshi, B1 4,236,923, Cl. 419-6.000.
- Tsumuki, Chiaki: See—
Takahashi, Akio; Tsumuki, Chiaki; and Nakamura, Hitoshi, B1 4,236,923, Cl. 419-6.000.
- Uht, Frank O., to Uht, R. Wayne. Backwash baffle and stabilizing device for propeller driven watercraft. B1 3,965,838, 10-10-89, Cl. 114-145.00A.
- Uht, R. Wayne: See—
Uht, Frank O., B1 3,965,838, Cl. 114-145.00A.

LIST OF DESIGN PATENTEEES

- Aavid Engineering, Inc.: See—
McCarthy, Alfred F., 303,951, Cl. D13-23.000.
- Alco Industries, Inc.: See—
Goetz, Charles R., 303,885, Cl. D6-484.000.
- Alderton, Gordon H.: See—
Gill, Neil F.; and Alderton, Gordon H., 303,923, Cl. D8-394.000.
- AMP Incorporated: See—
Hatfield, John G., 303,917, Cl. D8-51.000.
- Ancona, Bruce: See—
Ancona, Jane; and Ancona, Bruce, 303,899, Cl. D7-71.000.
- Ancona, Jane; and Ancona, Bruce, 303,900, Cl. D7-71.000.
- Ancona, Jane; and Ancona, Bruce, to M. Kamenstein, Inc. Wood spice rack. 303,899, 10-10-89, Cl. D7-71.000.
- Ancona, Jane; and Ancona, Bruce, to M. Kamenstein, Inc. Plastic spice rack. 303,900, 10-10-89, Cl. D7-71.000.
- Anderson, Georgette M. Pie crust shield. 303,908, 10-10-89, Cl. D7-387.000.
- Arai, Shiro. Twin function graphic equalizer. 303,971, 10-10-89, Cl. D14-217.000.
- Argyropoulos, James, to Cherokee Group, The. High top moccasin toe walker. 303,867, 10-10-89, Cl. D2-268.000.
- Argyropoulos, James, to Cherokee Group, The. Low top moccasin toe walker. 303,868, 10-10-89, Cl. D2-268.000.
- Asahi Corporation: See—
Driscoll, Dennis, 303,871, Cl. D2-320.000.
- Asou, Tohru, to Mitsubishi Denki Kabushiki Kaisha. Outdoor video display unit. 303,962, 10-10-89, Cl. D14-128.000.
- Avia Group International, Inc.: See—
Selbiger, Lawrence, 303,870, Cl. D2-314.000.
- Baus, Heinz G. Mirrored cabinet. 303,894, 10-10-89, Cl. D6-559.000.
- Baus, Heinz G. Mirrored cabinet. 303,895, 10-10-89, Cl. D6-559.000.
- Baus, Heinz G. Mirrored cabinet. 303,896, 10-10-89, Cl. D6-561.000.
- Benyo, John R.: See—
Scheid, William J.; McKee, John M.; Kurcbart, Robert; Ranalletta, Joseph V.; Benyo, John R.; and Toth, Richard J., 303,969, Cl. D14-191.000.
- Blochlinger, Alfred; Collins, Christopher; Petroff, Cvetan; and Tench, Wallace, to McPherson's Limited. Utility knife or similar article. 303,921, 10-10-89, Cl. D8-98.000.
- Bonstead, Douglas L.; and Dixon, Herbert O., to Deflecta-Shield Corporation. Sun visor. 303,948, 10-10-89, Cl. D12-191.000.

LIST OF DESIGN PATENTEEES

PI 65

- Bottcher, Charles E. Corner support bracket for plaques or the like. 303,942, 10-10-89, Cl. D11-164.000.
- Bridgestone Corporation: See—
Himuro, Yasuo; and Masuda, Hidenori, 303,944, Cl. D12-146.000.
- Tsuda, Toru; and Sakamaki, Yuji, 303,945, Cl. D12-147.000.
- Brown, John M. Illuminated menu display panel. 303,893, 10-10-89, Cl. D6-559.000.
- Brussing, Bernd, to Hans Friedrich Hefendehl. Diskette storage container. 303,873, 10-10-89, Cl. D3-35.000.
- Buchweitz, Albert F., Jr.; and Heggeland, Bruce, to IPD Innovative Plastic Designs Inc. Support leg for computer equipment. 303,988, 10-10-89, Cl. D18-23.000.
- Burgess, Samuel C. Seaplane with pontoons. 303,950, 10-10-89, Cl. D12-324.000.
- Butler, Mark R. Hand held tool for packing and loading of leaves. 303,912, 10-10-89, Cl. D8-1.000.
- Canon Kabushiki Kaisha: See—
Kimura, Hiroyuki; and Hara, Yoshiaki, 303,976, Cl. D16-134.000.
- Matsuoka, Fumiya; and Hasegawa, Takeshi, 303,982, Cl. D18-7.000.
- Takemata, Keiko; and Yoshioka, Eiichi, 303,981, Cl. D18-7.000.
- Cartier International B.V.: See—
Perrin, Alain-Dominique, 303,940, Cl. D11-13.000.
- Perrin, Alain-Dominique, 303,941, Cl. D11-21.000.
- Cherokee Group, The: See—
Argyropoulos, James, 303,867, Cl. D2-268.000.
- Argyropoulos, James, 303,868, Cl. D2-268.000.
- Chromcraft Furniture Corporation: See—
Stafford, John R., 303,888, Cl. D6-502.000.
- Ciarfeo, Elizabeth A.: See—
King, M. Frazier, Jr.; and Ciarfeo, Elizabeth A., 303,937, Cl. D10-39.000.
- Clarence J. Venne, Inc.: See—
Venne, Clarence J.; and Venne, Richard A., 303,926, Cl. D9-349.000.
- Clemens, George S.; and Mackay, Spencer L., to Dental Research Corporation. Combined electric periodontal brush and mounting bracket. 303,876, 10-10-89, Cl. D4-101.000.
- Coleman, Ronald. Pennant clock. 303,935, 10-10-89, Cl. D10-6.000.
- Collins, Christopher: See—
Blochlinger, Alfred; Collins, Christopher; Petroff, Cvetan; and Tench, Wallace, 303,921, Cl. D8-98.000.
- Collins, Martin W.; and Smith, William B., to SoundScape Speakers, Inc. Outdoor loudspeaker. 303,970, 10-10-89, Cl. D14-216.000.
- Colvin, Davis S., to Colvin, Davis S. Double-ended box wrench. 303,916, 10-10-89, Cl. D8-22.000.
- Combined Optical Industries Limited: See—
Steel, Veronica G.; and Francis, David F., 303,977, Cl. D16-135.000.
- Concepcion, Juan F.: See—
Lucas, Michael P.; Tabor, Robert; Gerstman, Richard B.; and Concepcion, Juan F., 303,865, Cl. D1-109.000.
- Lucas, Michael P.; Tabor, Robert; Gerstman, Richard B.; and Concepcion, Juan F., 303,866, Cl. D1-109.000.
- Cranston, William V., III; Martin, Randall W.; and Young, Mark A., to International Business Machines Corporation. Card shroud enclosure for an industrial computer. 303,958, 10-10-89, Cl. D14-114.000.
- Deblue, Jacqueline, to Leonard S.A. Wristwatch. 303,936, 10-10-89, Cl. D10-32.000.
- Decor Corporation Proprietary Limited, The: See—
Wolfenden, Anthony H., 303,904, Cl. D7-317.000.
- Deflecta-Shield Corporation: See—
Bonstead, Douglas L.; and Dixon, Herbert O., 303,948, Cl. D12-191.000.
- DeLucchi, Michele: See—
Sottas, Ettore; and DeLucchi, Michele, 303,882, Cl. D6-422.000.
- Dental Research Corporation: See—
Clemens, George S.; and Mackay, Spencer L., 303,876, Cl. D4-101.000.
- Ditzik, Richard J. Computer display terminal. 303,956, 10-10-89, Cl. D14-106.000.
- Dixon, Herbert O.: See—
Bonstead, Douglas L.; and Dixon, Herbert O., 303,948, Cl. D12-191.000.
- Drew, Douglas, to Noma Inc. Electrical connector. 303,952, 10-10-89, Cl. D13-30.000.
- Drew, Douglas, to Noma Inc. Electrical connector. 303,953, 10-10-89, Cl. D13-30.000.
- Driscoll, Dennis, to Asahi Corporation. Sole. 303,871, 10-10-89, Cl. D2-320.000.
- Durand, Jean-Jacques. Platter or similar article. 303,898, 10-10-89, Cl. D7-28.000.
- Durand, Jean-Jacques. Perfume bottle. 303,930, 10-10-89, Cl. D9-403.000.
- Durham, Ira M., Jr., to Methodist Hospital System, The. Headwall unit for hospital rooms. 303,889, 10-10-89, Cl. D6-505.000.
- Duro-Dyne Corporation: See—
Hinden, Milton; and Lyons, John, 303,914, Cl. D8-14.100.
- Eastern Company, The: See—
Russell, Richard H.; Kaiser, David W.; and O'Grady, Richard M., 303,922, Cl. D8-321.000.
- Francis, David F.: See—
Steel, Veronica G.; and Francis, David F., 303,977, Cl. D16-135.000.
- Frane, Joseph M. Clamp for filleting fish. 303,901, 10-10-89, Cl. D7-99.000.
- Fratelli Guzzini S.p.A.: See—
Gecchelin, Bruno, 303,902, Cl. D7-102.000.
- Fritzsche, Jochen, to Siemens Aktiengesellschaft. Telephone station. 303,966, 10-10-89, Cl. D14-151.000.
- Fujitsu Limited: See—
Kokihara, Mitsuharu, 303,963, Cl. D14-138.000.
- Fukushima, Kazuyuki: See—
Suyama, Tsutomu; Wakamatsu, Masaharu; Yamamuro, Takahiko; and Fukushima, Kazuyuki, 303,959, Cl. D14-114.000.
- Fukutome, Satoshi, to Sharp Kabushiki Kaisha. Combination handset transceiver and message recorder telephone stand therefor. 303,964, 10-10-89, Cl. D14-141.000.
- Fusco, Vincent: See—
Michels, Dennis; Kaplan, Alan; and Fusco, Vincent, 303,954, Cl. D14-155.000.
- Gecchelin, Bruno, to Fratelli Guzzini S.p.A. Server for cakes, pies and the like. 303,902, 10-10-89, Cl. D7-102.000.
- General Foods Corp.: See—
Mileos, George, 303,925, Cl. D9-306.000.
- Gerstman, Richard B.: See—
Lucas, Michael P.; Tabor, Robert; Gerstman, Richard B.; and Concepcion, Juan F., 303,865, Cl. D1-109.000.
- Lucas, Michael P.; Tabor, Robert; Gerstman, Richard B.; and Concepcion, Juan F., 303,866, Cl. D1-109.000.
- Gibert, Jose M. P., to Industria Auxiliar Manodomeesticos, S.A. Vacuum flask. 303,905, 10-10-89, Cl. D7-317.000.
- Gickler, Alan E., to Johnson Manufacturing Company. Combined radiator tab lifter and crimper. 303,918, 10-10-89, Cl. D8-52.000.
- Gill, Neil F.; and Alderton, Gordon H., to Lindapter International Limited. Grid clamp for support beam or the like. 303,923, 10-10-89, Cl. D8-394.000.
- Goetz, Charles R., to Alco Industries, Inc. Table. 303,885, 10-10-89, Cl. D6-484.000.
- Gold Star Co., Ltd.: See—
Shin, Myung C., 303,967, Cl. D14-162.000.
- Goldsmith, Howard G., to Todd Enterprises, Inc. Foldable seat for use primarily in a boat. 303,878, 10-10-89, Cl. D6-368.000.
- Goodyear Tire & Rubber Company, The: See—
Graas, Maurice, 303,946, Cl. D12-147.000.
- Graas, Maurice, to Goodyear Tire & Rubber Company, The. Tire. 303,946, 10-10-89, Cl. D12-147.000.
- Grottsch, Gerald, to J. S. Staedtler GmbH & Co. Retractable holder for an eraser or similar article. 303,992, 10-10-89, Cl. D19-53.000.
- Hans Friedrich Hefendehl: See—
Brussing, Bernd, 303,873, Cl. D3-35.000.
- Hara, Yoshiaki: See—
Kimura, Hiroyuki; and Hara, Yoshiaki, 303,976, Cl. D16-134.000.
- Hasegawa, Takeshi: See—
Matsuoka, Fumiya; and Hasegawa, Takeshi, 303,982, Cl. D18-7.000.
- Hatfield, John G., to AMP Incorporated. Multiple stroke ratchet tool for crimping, cutting or the like. 303,917, 10-10-89, Cl. D8-51.000.
- Hedenberg, Conny; and Tiller, Alfred. Apparatus for applying seat covers to automobile backrests or the like. 303,975, 10-10-89, Cl. D15-199.000.
- Heggeland, Bruce: See—
Buchweitz, Albert F., Jr.; and Heggeland, Bruce, 303,988, Cl. D18-23.000.
- Helstab, Edmond J., to Northern Telecom Limited. Base for telephone set. 303,965, 10-10-89, Cl. D14-142.000.
- Higson, Donnie W.; and Higson, Michael E. Foldable beach equipment carrier. 303,883, 10-10-89, Cl. D6-429.000.
- Higson, Michael E.: See—
Higson, Donnie W.; and Higson, Michael E., 303,883, Cl. D6-429.000.
- Hill, Ernest H. Holster. 303,875, 10-10-89, Cl. D3-101.000.
- Himuro, Yasuo; and Masuda, Hidenori, to Bridgestone Corporation. Automobile tire. 303,944, 10-10-89, Cl. D12-146.000.
- Hinden, Milton; and Lyons, John, to Duro-Dyne Corporation. Caulking gun. 303,914, 10-10-89, Cl. D8-14.100.
- Honda Giken Kogyo Kabushiki Kaisha: See—
Nakatsuka, Toshiki, 303,949, Cl. D12-211.000.
- Iacovelli, Marc R., to Rally Manufacturing, Inc. Combined digital clock and compass for vehicles. 303,933, 10-10-89, Cl. D10-2.000.
- Iacovelli, Marc R., to Rally Manufacturing, Inc. Combined digital clock, thermometer and compass for vehicles. 303,934, 10-10-89, Cl. D10-2.000.
- Iacovelli, Marc R., to Rally Manufacturing, Inc. Combined thermometer and compass for vehicles. 303,938, 10-10-89, Cl. D10-53.000.
- Industria Auxiliar Manodomeesticos, S.A.: See—
Gibert, Jose M. P., 303,905, Cl. D7-317.000.
- Inomata, Hideko: See—
Kiyooka, Katsumi; Ueno, Tetsuo; Iramina, Keiko; and Inomata, Hideko, 303,973, Cl. D15-10.000.
- International Business Machines Corporation: See—
Cranston, William V., III; Martin, Randall W.; and Young, Mark A., 303,958, Cl. D14-114.000.
- IPD Innovative Plastic Designs Inc.: See—
Buchweitz, Albert F., Jr.; and Heggeland, Bruce, 303,988, Cl. D18-23.000.
- Iramina, Keiko: See—
Kiyooka, Katsumi; Ueno, Tetsuo; Iramina, Keiko; and Inomata, Hideko, 303,973, Cl. D15-10.000.
- Iwahashi, Wataru, to Sharp Kabushiki Kaisha. Microwave oven. 303,907, 10-10-89, Cl. D7-351.000.

J. S. Staedtler GmbH & Co.: See—
Grotsch, Gerald, 303,992, Cl. D19-53.000.
Jacobs, Rexy. Sports shoe. 303,869, 10-10-89, Cl. D2-310.000.
Johnson Manufacturing Company: See—
Gickler, Alan E., 303,918, Cl. D8-52.000.
Kaiser, David W.: See—
Russell, Richard H.; Kaiser, David W.; and O'Grady, Richard M., 303,922, Cl. D8-321.000.
Kandel, Frederick S., to Majestic Tool Corp. Handle for a screwdriver. 303,920, 10-10-89, Cl. D8-83.000.
Kaplan, Alan: See—
Michels, Dennis; Kaplan, Alan; and Fusco, Vincent, 303,954, Cl. D14-155.000.
Karr, Craig C. Power roller element. 303,974, 10-10-89, Cl. D15-126.000.
Kates, Fred W.; and Yeranosian, Karl, to Revlon, Inc. Combined display and dispenser rack. 303,880, 10-10-89, Cl. D6-408.000.
Kato, Shuzo; Sakama, Satoru; and Takahashi, Tamihei, to NCR Corporation. Receipt-journal printer or similar article. 303,979, 10-10-89, Cl. D18-13.000.
Kato, Shuzo; and Watanabe, Shingo, to NCR Corporation. Slip printer or similar article. 303,983, 10-10-89, Cl. D18-13.000.
Kato, Shuzo; and Takahashi, Tamihei, to NCR Corporation. Receipt-slip printer or similar article. 303,986, 10-10-89, Cl. D18-13.000.
Kato, Shuzo; Nakamura, Yasushi; and Kusayanagi, Masao, to NCR Corporation. Receipt-journal printer or similar article. 303,987, 10-10-89, Cl. D18-13.000.
Katsunori, Takagi: See—
Toru, Kawamura; and Katsunori, Takagi, 303,960, Cl. D14-118.000.
Kazunori, Mano: See—
Yoshiaki, Ueda; and Kazunori, Mano, 303,903, Cl. D7-309.000.
Kim, Suk E., to SKC Limited. Reel for a video tape recorder. 303,961, 10-10-89, Cl. D14-122.000.
Kimura, Hiroyuki; and Hara, Yoshiaki, to Canon Kabushiki Kaisha. Lens for camera. 303,976, 10-10-89, Cl. D16-134.000.
King, M. Frazier, Jr.; and Ciarfo, Elizabeth A. Watch with neon-like illumination ring. 303,937, 10-10-89, Cl. D10-39.000.
Kiyooka, Katsumi; Ueno, Tetsuo; Iramina, Keiko; and Inomata, Hideko, to Komatsu Zenoah Company. Portable internal combustion engine and tools. 303,973, 10-10-89, Cl. D15-10.000.
Klein, Otto G. Corner protector. 303,924, 10-10-89, Cl. D8-403.000.
Knudson, Kevin M. Beverage can opening ring. 303,915, 10-10-89, Cl. D8-18.000.
Kohler Co.: See—
Reid, Mary J., 303,886, Cl. D6-499.000.
Reid, Mary J., 303,887, Cl. D6-499.000.
Kokihara, Mitsuhiro, to Fujitsu Limited. Portable telephone. 303,963, 10-10-89, Cl. D14-138.000.
Komatsu Zenoah Company: See—
Kiyooka, Katsumi; Ueno, Tetsuo; Iramina, Keiko; and Inomata, Hideko, 303,973, Cl. D15-10.000.
Korner, Lucy. Book. 303,989, 10-10-89, Cl. D19-26.000.
Koyama, Keichi: See—
Shiozawa, Hajime; and Koyama, Keichi, 303,955, Cl. D14-100.000.
Kurbart, Robert: See—
Scheid, William J.; McKee, John M.; Kurbart, Robert; Ranalletta, Joseph V.; Benyo, John R.; and Toth, Richard J., 303,969, Cl. D14-191.000.
Kusayanagi, Masao: See—
Kato, Shuzo; Nakamura, Yasushi; and Kusayanagi, Masao, 303,987, Cl. D18-13.000.
Leap, Earl J. Tree soaker. 303,913, 10-10-89, Cl. D8-1.000.
Lee, George C. Candy dispenser. 303,994, 10-10-89, Cl. D20-7.000.
Lee, Raymond N. Paper roll holder. 303,891, 10-10-89, Cl. D6-523.000.
Leonard S.A.: See—
Deblue, Jacqueline, 303,936, Cl. D10-32.000.
Lindapter International Limited: See—
Gill, Neil F.; and Alderton, Gordon H., 303,923, Cl. D8-394.000.
Lucas, Michael P.; Tabor, Robert; Gerstman, Richard B.; and Concepcion, Juan F., to Nabisco Brands, Inc. Cookie having openings there-through. 303,865, 10-10-89, Cl. D1-109.000.
Lucas, Michael P.; Tabor, Robert; Gerstman, Richard B.; and Concepcion, Juan F., to Nabisco Brands, Inc. Cookie having openings there-through. 303,866, 10-10-89, Cl. D1-109.000.
Lyons, John: See—
Hinden, Milton; and Lyons, John, 303,914, Cl. D8-14.100.
M. Kamenstein, Inc.: See—
Ancona, Jane; and Ancona, Bruce, 303,899, Cl. D7-71.000.
Ancona, Jane; and Ancona, Bruce, 303,900, Cl. D7-71.000.
Mackay, Spencer L.: See—
Clemens, George S.; and Mackay, Spencer L., 303,876, Cl. D4-101.000.
Majestic Tool Corp.: See—
Kandel, Frederick S., 303,920, Cl. D8-83.000.
Markus, Isidoro N. Modular office work station. 303,881, 10-10-89, Cl. D6-421.000.
Martin, Randall W.: See—
Cranston, William V., III; Martin, Randall W.; and Young, Mark A., 303,958, Cl. D14-114.000.
Masuda, Hidenori: See—
Himuro, Yasuo; and Masuda, Hidenori, 303,944, Cl. D12-146.000.
Matsuoka, Fumiya; and Hasegawa, Takeshi, to Canon Kabushiki Kaisha. Desk-top electronic calculator. 303,982, 10-10-89, Cl. D18-7.000.
Matsushita Electric Industrial Co., Ltd.: See—
Yoshiaki, Ueda; and Kazunori, Mano, 303,903, Cl. D7-309.000.

McCarthy, Alfred F., to Aavid Engineering, Inc. Heat-sink cover for leadless electronic chip-carrier sockets. 303,951, 10-10-89, Cl. D13-23.000.
McKee, John M.: See—
Scheid, William J.; McKee, John M.; Kurbart, Robert; Ranalletta, Joseph V.; Benyo, John R.; and Toth, Richard J., 303,969, Cl. D14-191.000.
McPherson's Limited: See—
Blochlinger, Alfred; Collins, Christopher; Petroff, Cvetan; and Tench, Wallace, 303,921, Cl. D8-98.000.
Mednis, Juris M., to Universal Symetrics Corporation. Bottle. 303,928, 10-10-89, Cl. D9-375.000.
Methodist Hospital System, The: See—
Durham, Ira M., Jr., 303,889, Cl. D6-505.000.
Michels, Dennis; Kaplan, Alan; and Fusco, Vincent, to Sound Sender, Inc. Tape player adapter for car radios. 303,954, 10-10-89, Cl. D14-155.000.
Mileos, George, to General Foods Corp. Combined package and dispenser for extrudible comestibles. 303,925, 10-10-89, Cl. D9-306.000.
Miller, Jack V.: See—
Miller, Ruth E.; and Miller, Jack V., 303,931, Cl. D9-415.000.
Miller, Ruth E.; and Miller, Jack V. Book blister package. 303,931, 10-10-89, Cl. D9-415.000.
Minami, Hiroo, to Yoshida Kogyo K. K. Slider pull tab for slide fastener. 303,943, 10-10-89, Cl. D11-221.000.
Minolta Camera Kabushiki Kaisha: See—
Toru, Kawamura; and Katsunori, Takagi, 303,960, Cl. D14-118.000.
Mitsubishi Denki Kabushiki Kaisha: See—
Asou, Tohru, 303,962, Cl. D14-128.000.
Suyama, Tsutomu; Wakamatsu, Masaharu; Yamamuro, Takahiko; and Fukushima, Kazuyuki, 303,959, Cl. D14-114.000.
Mohasco Upholstered Furniture Corporation: See—
Williams, David P. G., 303,879, Cl. D6-397.000.
Motorola, Inc.: See—
Scheid, William J.; McKee, John M.; Kurbart, Robert; Ranalletta, Joseph V.; Benyo, John R.; and Toth, Richard J., 303,969, Cl. D14-191.000.
Murphy, Kent D. Miniature pen with cap. 303,991, 10-10-89, Cl. D19-48.000.
Nabisco Brands, Inc.: See—
Lucas, Michael P.; Tabor, Robert; Gerstman, Richard B.; and Concepcion, Juan F., 303,865, Cl. D1-109.000.
Lucas, Michael P.; Tabor, Robert; Gerstman, Richard B.; and Concepcion, Juan F., 303,866, Cl. D1-109.000.
Nakamura, Shingo; and Shibuya, Norio, to NEC Corporation. Optical disk unit for electronic computers. 303,957, 10-10-89, Cl. D14-109.000.
Nakamura, Yasushi: See—
Kato, Shuzo; Nakamura, Yasushi; and Kusayanagi, Masao, 303,987, Cl. D18-13.000.
Nakatsuka, Toshiki, to Honda Giken Kogyo Kabushiki Kaisha. Vehicle wheel. 303,949, 10-10-89, Cl. D12-211.000.
NCR Corporation: See—
Kato, Shuzo; Sakama, Satoru; and Takahashi, Tamihei, 303,979, Cl. D18-13.000.
Kato, Shuzo; and Watanabe, Shingo, 303,983, Cl. D18-13.000.
Kato, Shuzo; and Takahashi, Tamihei, 303,986, Cl. D18-13.000.
Kato, Shuzo; Nakamura, Yasushi; and Kusayanagi, Masao, 303,987, Cl. D18-13.000.
NEC Corporation: See—
Nakamura, Shingo; and Shibuya, Norio, 303,957, Cl. D14-109.000.
Uozumi, Takao, 303,972, Cl. D14-231.000.
Nishibori, Hiroshi, to Sharp Kabushiki Kaisha. Microwave oven. 303,906, 10-10-89, Cl. D7-351.000.
Noma Inc.: See—
Drew, Douglas, 303,952, Cl. D13-30.000.
Drew, Douglas, 303,953, Cl. D13-30.000.
Northern Telecom Limited: See—
Helstab, Edmond J., 303,965, Cl. D14-142.000.
Norton, Ian F., to Union Carbide Canada Limited. Bench. 303,877, 10-10-89, Cl. D6-349.000.
O'Grady, Richard M.: See—
Russell, Richard H.; Kaiser, David W.; and O'Grady, Richard M., 303,922, Cl. D8-321.000.
Olivetti Synthesis, S.p.A.: See—
Sottasa, Ettore; and DeLucchi, Michele, 303,882, Cl. D6-422.000.
Parker, William G. Locking tube roller. 303,892, 10-10-89, Cl. D6-541.000.
Pasillas, Norbert. Chef's hat bottle cap. 303,932, 10-10-89, Cl. D9-451.000.
Pate, Louis. Combined hairstyling scissors-comb. 303,919, 10-10-89, Cl. D8-57.000.
Pentel of America, Ltd.: See—
Pettersson, Tor, 303,990, Cl. D19-48.000.
Perrin, Alain-Dominique, to Cartier International B.V. Link chain for bracelet or the like. 303,940, 10-10-89, Cl. D11-13.000.
Perrin, Alain-Dominique, to Cartier International B.V. Link chain for bracelet or the like. 303,941, 10-10-89, Cl. D11-21.000.
Petroff, Cvetan: See—
Blochlinger, Alfred; Collins, Christopher; Petroff, Cvetan; and Tench, Wallace, 303,921, Cl. D8-98.000.
Pettersson, Tor, to Pentel of America, Ltd. Pen. 303,990, 10-10-89, Cl. D19-48.000.
Phillips, Katherine A. Pillow. 303,897, 10-10-89, Cl. D6-601.000.

Phinney, Raymond C., to Quaker Oats Company, The. Combined video camera and recorder. 303,978, 10-10-89, Cl. D16-202.000.
Pilot, Douglas J. Toilet paper guard. 303,890, 10-10-89, Cl. D6-523.000.
Plus Corporation: See—
Tamamura, Hiromi, 303,872, Cl. D3-18.000.
Procter & Gamble Company, The: See—
Ross, Samuel, 303,929, Cl. D9-376.000.
Quaker Oats Company, The: See—
Phinney, Raymond C., 303,978, Cl. D16-202.000.
Rally Manufacturing, Inc.: See—
Iacovelli, Marc R., 303,933, Cl. D10-2.000.
Iacovelli, Marc R., 303,934, Cl. D10-2.000.
Iacovelli, Marc R., 303,938, Cl. D10-53.000.
Ranalletta, Joseph V.: See—
Scheid, William J.; McKee, John M.; Kurbart, Robert; Ranalletta, Joseph V.; Benyo, John R.; and Toth, Richard J., 303,969, Cl. D14-191.000.
Reid, Mary J., to Kohler Co. Table leg or the like. 303,886, 10-10-89, Cl. D6-499.000.
Reid, Mary J., to Kohler Co. Table leg or the like. 303,887, 10-10-89, Cl. D6-499.000.
Revlon, Inc.: See—
Kates, Fred W.; and Yeranosian, Karl, 303,880, Cl. D6-408.000.
Yeranosian, Karl, 303,884, Cl. D6-455.000.
Ross, Samuel, to Procter & Gamble Company, The. Bottle. 303,929, 10-10-89, Cl. D9-376.000.
Rubbermaid Commercial Products, Inc.: See—
Szablak, Michael J.; and Tomblin, Glen E., 303,993, Cl. D19-78.000.
Russell, Richard H.; Kaiser, David W.; and O'Grady, Richard M., to Eastern Company, The. Housings for latches or locks. 303,922, 10-10-89, Cl. D8-321.000.
Saari, Vivian L. Plant support. 303,911, 10-10-89, Cl. D8-1.000.
Sakaguchi, Hiroshi: See—
Yubisui, Takahisa; Sakaguchi, Hiroshi; and Takahashi, Toshiya, 303,980, Cl. D18-7.000.
Sakama, Satoru: See—
Kato, Shuzo; Sakama, Satoru; and Takahashi, Tamihei, 303,979, Cl. D18-13.000.
Sakamaki, Yuji: See—
Tsuda, Toru; and Sakamaki, Yuji, 303,945, Cl. D12-147.000.
Scheid, William J.; McKee, John M.; Kurbart, Robert; Ranalletta, Joseph V.; Benyo, John R.; and Toth, Richard J., to Motorola, Inc. Radio pager or similar article. 303,969, 10-10-89, Cl. D14-191.000.
Selbiger, Lawrence, to Avia Group International, Inc. Shoe upper. 303,870, 10-10-89, Cl. D2-314.000.
Sharp Kabushiki Kaisha: See—
Fukutome, Satoshi, 303,964, Cl. D14-141.000.
Iwahashi, Wataru, 303,907, Cl. D7-351.000.
Nishibori, Hiroshi, 303,906, Cl. D7-351.000.
Shiozawa, Hajime; and Koyama, Keichi, 303,955, Cl. D14-100.000.
Tomoiike, Maki, 303,985, Cl. D18-13.000.
Tsujimoto, Kazuo, 303,968, Cl. D14-171.000.
Tsukada, Akira, 303,984, Cl. D18-13.000.
Yubisui, Takahisa; Sakaguchi, Hiroshi; and Takahashi, Toshiya, 303,980, Cl. D18-7.000.
Shibuya, Norio: See—
Nakamura, Shingo; and Shibuya, Norio, 303,957, Cl. D14-109.000.
Shin, Myung C., to Gold Star Co., Ltd. Combined cassette player and radio receiver for the blind. 303,967, 10-10-89, Cl. D14-162.000.
Shiozawa, Hajime; and Koyama, Keichi, to Sharp Kabushiki Kaisha. Pocket computer. 303,955, 10-10-89, Cl. D14-100.000.
Siemens Aktiengesellschaft: See—
Fritzsche, Jochen, 303,966, Cl. D14-151.000.
Sjoberg, Robert J. Roasting basket. 303,910, 10-10-89, Cl. D7-409.000.
SKC Limited: See—
Kim, Suk E., 303,961, Cl. D14-122.000.
Smith, William B.: See—
Collins, Martin W.; and Smith, William B., 303,970, Cl. D14-216.000.
Sottasa, Ettore; and DeLucchi, Michele, to Olivetti Synthesis, S.p.A. Desk. 303,882, 10-10-89, Cl. D6-422.000.
Sound Sender, Inc.: See—
Michels, Dennis; Kaplan, Alan; and Fusco, Vincent, 303,954, Cl. D14-155.000.
SoundScape Speakers, Inc.: See—
Collins, Martin W.; and Smith, William B., 303,970, Cl. D14-216.000.
Stafford, John R., to Chromcraft Furniture Corporation. Seat. 303,888, 10-10-89, Cl. D6-502.000.
Stankus, Genevieve K.; Stankus, Robert; and Stankus, Gerald. Stovetop grease spatter shield. 303,909, 10-10-89, Cl. D7-406.000.
Stankus, Gerald: See—
Stankus, Genevieve K.; Stankus, Robert; and Stankus, Gerald, 303,909, Cl. D7-406.000.
Stankus, Robert: See—
Stankus, Genevieve K.; Stankus, Robert; and Stankus, Gerald, 303,909, Cl. D7-406.000.
Steel, Veronica C.; and Francis, David F., to Combined Optical Industries Limited. Magnifier. 303,977, 10-10-89, Cl. D16-135.000.

Suyama, Tsutomu; Wakamatsu, Masaharu; Yamamuro, Takahiko; and Fukushima, Kazuyuki, to Mitsubishi Denki Kabushiki Kaisha. Base for display monitor. 303,959, 10-10-89, Cl. D14-114.000.
Szablak, Michael J.; and Tomblin, Glen E., to Rubbermaid Commercial Products, Inc. Note pad holder. 303,993, 10-10-89, Cl. D19-78.000.
Tabor, Robert: See—
Lucas, Michael P.; Tabor, Robert; Gerstman, Richard B.; and Concepcion, Juan F., 303,865, Cl. D1-109.000.
Lucas, Michael P.; Tabor, Robert; Gerstman, Richard B.; and Concepcion, Juan F., 303,866, Cl. D1-109.000.
Takahashi, Tamihei: See—
Kato, Shuzo; Sakama, Satoru; and Takahashi, Tamihei, 303,979, Cl. D18-13.000.
Kato, Shuzo; and Takahashi, Tamihei, 303,986, Cl. D18-13.000.
Takahashi, Toshiya: See—
Yubisui, Takahisa; Sakaguchi, Hiroshi; and Takahashi, Toshiya, 303,980, Cl. D18-7.000.
Takemata, Keiko; and Yoshioka, Eiichi, to Canon Kabushiki Kaisha. Desk-top electronic calculator. 303,981, 10-10-89, Cl. D18-7.000.
Tamamura, Hiromi, to Plus Corporation. Combined scissors with cap. 303,872, 10-10-89, Cl. D3-18.000.
Tench, Wallace: See—
Blochlinger, Alfred; Collins, Christopher; Petroff, Cvetan; and Tench, Wallace, 303,921, Cl. D8-98.000.
Tillner, Alfred: See—
Hedenberg, Conny; and Tillner, Alfred, 303,975, Cl. D15-199.000.
Todd Enterprises, Inc.: See—
Goldsmith, Howard G., 303,878, Cl. D6-368.000.
Tokyo Compass Mfg. Co., Ltd.: See—
Yusa, Toshikazu, 303,939, Cl. D10-74.000.
Tomblin, Glen E.: See—
Szablak, Michael J.; and Tomblin, Glen E., 303,993, Cl. D19-78.000.
Tomoiike, Maki, to Sharp Kabushiki Kaisha. Printer for cash register. 303,985, 10-10-89, Cl. D18-13.000.
Toru, Kawamura; and Katsunori, Takagi, to Minolta Camera Kabushiki Kaisha. Facsimile. 303,960, 10-10-89, Cl. D14-118.000.
Toth, Richard J.: See—
Scheid, William J.; McKee, John M.; Kurbart, Robert; Ranalletta, Joseph V.; Benyo, John R.; and Toth, Richard J., 303,969, Cl. D14-191.000.
Tsuda, Toru; and Sakamaki, Yuji, to Bridgestone Corporation. Automobile tire. 303,945, 10-10-89, Cl. D12-147.000.
Tsujimoto, Kazuo, to Sharp Kabushiki Kaisha. Clock radio. 303,968, 10-10-89, Cl. D14-171.000.
Tsukada, Akira, to Sharp Kabushiki Kaisha. Printer for cash register. 303,984, 10-10-89, Cl. D18-13.000.
Ueno, Tetsuo: See—
Kiyooka, Katsumi; Ueno, Tetsuo; Iramina, Keiko; and Inomata, Hideko, 303,973, Cl. D15-10.000.
Union Carbide Canada Limited: See—
Norton, Ian F., 303,877, Cl. D6-349.000.
Universal Symetrics Corporation: See—
Mednis, Juris M., 303,928, Cl. D9-375.000.
Uozumi, Takao, to NEC Corporation. Antenna for a mini satellite earth station. 303,972, 10-10-89, Cl. D14-231.000.
Venne, Clarence J.; and Venne, Richard A., to Clarence J. Venne, Inc. Ink dispensing bottle. 303,926, 10-10-89, Cl. D9-349.000.
Venne, Richard A.: See—
Venne, Clarence J.; and Venne, Richard A., 303,926, Cl. D9-349.000.
Wakamatsu, Masaharu: See—
Suyama, Tsutomu; Wakamatsu, Masaharu; Yamamuro, Takahiko; and Fukushima, Kazuyuki, 303,959, Cl. D14-114.000.
Watanabe, Shingo: See—
Kato, Shuzo; and Watanabe, Shingo, 303,983, Cl. D18-13.000.
Weber, Heinz. Container with cap. 303,927, 10-10-89, Cl. D9-371.000.
Wei-Mu, Lai. Cosmetic case or similar article. 303,874, 10-10-89, Cl. D3-39.000.
Williams, David P. G., to Mohasco Upholstered Furniture Corporation. Swivel desk and display unit. 303,879, 10-10-89, Cl. D6-397.000.
Woffenden, Anthony H., to Decor Corporation Proprietary Limited. The. Covered jug. 303,904, 10-10-89, Cl. D7-317.000.
Yamamuro, Takahiko: See—
Suyama, Tsutomu; Wakamatsu, Masaharu; Yamamuro, Takahiko; and Fukushima, Kazuyuki, 303,959, Cl. D14-114.000.
Yehuda, Yehuda. Rearview mirror. 303,947, 10-10-89, Cl. D12-187.000.
Yeranosian, Karl, to Revlon, Inc. Display stand. 303,884, 10-10-89, Cl. D6-455.000.
Yeranosian, Karl: See—
Kates, Fred W.; and Yeranosian, Karl, 303,880, Cl. D6-408.000.
Yoshiaki, Ueda; and Kazunori, Mano, to Matsushita Electric Industrial Co., Ltd. Automatic coffee maker. 303,903, 10-10-89, Cl. D7-309.000.
Yoshida Kogyo K. K.: See—
Minami, Hiroo, 303,943, Cl. D11-221.000.
Yoshioka, Eiichi: See—
Takemata, Keiko; and Yoshioka, Eiichi, 303,981, Cl. D18-7.000.
Young, Mark A.: See—
Cranston, William V., III; Martin, Randall W.; and Young, Mark A., 303,958, Cl. D14-114.000.
Yubisui, Takahisa; Sakaguchi, Hiroshi; and Takahashi, Toshiya, to Sharp Kabushiki Kaisha. Electronic calculator. 303,980, 10-10-89, Cl. D18-7.000.
Yusa, Toshikazu, to Tokyo Compass Mfg. Co., Ltd. Compass holder. 303,939, 10-10-89, Cl. D10-74.000.

LIST OF PLANT PATENTEES

Toyama, Thomas K., to Washington State University Research Foundation. Apricot tree PA 7201-1. 7,045, 10-10-89, Cl. 39.000.
Washington State University Research Foundation: See—
Toyama, Thomas K., 7,045, Cl. 39.000.

Rosa, Henry A. Hosta plant Solar Flare. 7,046, 10-10-89, Cl. 68.000.

PI 68

CLASSIFICATION OF PATENTS

ISSUED OCTOBER 10, 1989

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2	2	4,872,215	101	4,872,276	CLASS 66	454	4,872,384	336	4,872,435	11.5 R	4,872,923
	15	4,872,216		4,872,277			4,872,387	339	4,872,436	12.1	4,872,924
	171.5	4,872,218		4,872,278			4,872,388	463	4,872,437	13.1	4,872,926
	209	4,872,219		4,872,279			4,872,389	514	4,872,438	20.3	4,872,927
	243 A	4,872,220		4,872,280			4,872,390	518	4,872,439	24	4,872,928
		4,872,221		4,872,281			4,872,391	590	4,872,440		
				4,872,282			4,872,392	651	4,872,441	CLASS 149	
							4,872,393		4,872,442	46	4,872,929
							4,872,394		4,872,443	CLASS 152	
							4,872,395		4,872,444	228	4,872,930
							4,872,396		4,872,445	541	4,872,931
							4,872,397		4,872,446	CLASS 156	
							4,872,398		4,872,447	72	4,872,932
							4,872,399		4,872,448	151	4,872,933
							4,872,400		4,872,449	250	4,872,934
							4,872,401		4,872,450	307.3	4,872,935
							4,872,402		4,872,451	313	4,872,937
							4,872,403		4,872,452	345	4,872,938
							4,872,404		4,872,453	354	4,872,939
							4,872,405		4,872,454	379.8	4,872,940
							4,872,406		4,872,455	497	4,872,941
							4,872,407		4,872,456	515	4,872,942
							4,872,408		4,872,457	621	4,872,943
							4,872,409		4,872,458	626	4,872,944
							4,872,410		4,872,459	627	4,872,945
							4,872,411		4,872,460	637	4,872,946
							4,872,412		4,872,461	643	4,872,947
							4,872,413		4,872,462	CLASS 159	
							4,872,414		4,872,463	6.2	4,872,948
							4,872,415		4,872,464	47.3	4,872,949
							4,872,416		4,872,465	CLASS 160	
							4,872,417		4,872,466	90	4,872,948
							4,872,418		4,872,467	168.1	4,872,949
							4,872,419		4,872,468	CLASS 162	
							4,872,420		4,872,469	15	4,872,950
							4,872,421		4,872,470	135	4,872,951
							4,872,422		4,872,471	152	4,872,952
							4,872,423		4,872,472	261	4,872,953
							4,872,424		4,872,473	CLASS 164	
							4,872,425		4,872,474	34	4,872,500
							4,872,426		4,872,475	CLASS 165	
							4,872,427		4,872,476	1	4,872,501
							4,872,428		4,872,477	39	4,872,502
							4,872,429		4,872,478	54	4,872,503
							4,872,430		4,872,479	80.3	4,872,504
							4,872,431		4,872,480	166	4,872,505
							4,872,432		4,872,481	167	4,872,506
							4,872,433		4,872,482	CLASS 166	
							4,872,434		4,872,483	57	4,872,507
							4,872,435		4,872,484	84	4,872,508
							4,872,436		4,872,485	278	4,872,509
							4,872,437		4,872,486	327	4,872,510
							4,872,438		4,872,487	CLASS 169	
							4,872,439		4,872,488	12	4,872,511
							4,872,440		4,872,489	51	4,872,512
							4,872,441		4,872,490	57	4,872,513
							4,872,442		4,872,491	CLASS 173	
							4,872,443		4,872,492	132	4,872,514
							4,872,444		4,872,493	134	4,872,515
							4,872,445		4,872,494	163	4,872,516
							4,872,446		4,872,495	CLASS 174	
							4,872,447		4,872,496	34	4,873,393
							4,872,448		4,872,497	35 GC	4,873,395
							4,872,449		4,872,498	35 R	4,873,394
							4,872,450		4,872,499	66	4,873,396
							4,872,451		4,872,500	117 A	4,873,397
							4,872,452		4,872,501	CLASS 175	
							4,872,453		4,872,502	18	4,872,518
							4,872,454		4,872,503	320	4,872,519
							4,872,455		4,872,504	329	4,872,520
							4,872,456		4,872,505	CLASS 177	
							4,872,457		4,872,506	25.15	4,872,521
							4,872,458		4,872,507	229	4,872,522
							4,872,459		4,872,508	255	4,872,523
							4,872,460		4,872,509	CLASS 178	
							4,872,461		4,872,510	18	4,873,398

PI 69

19	4,873,399	243	4,872,980	CLASS 232	17	4,872,610	CLASS 256	808	4,872,704	CLASS 328	3	4,873,490
8 6	4,872,524	490	4,872,981	CLASS 180	17	4,872,610	CLASS 260	67	4,872,705	CLASS 330	155	4,873,491
197	4,872,525	500 29	4,872,982	CLASS 181	441	4,873,425	CLASS 261	102	4,872,706	CLASS 331	86	4,873,492
102	4,872,526	602	4,872,983	CLASS 182	442	4,873,426	CLASS 262	285	4,872,707	CLASS 332	285	4,873,493
160	4,872,527	611	4,872,984	CLASS 183	443	4,873,427	CLASS 263	39	4,872,708	CLASS 333	65	4,873,494
228	4,872,528	635	4,872,985	CLASS 184	444	4,873,428	CLASS 264	81	4,872,709	CLASS 334	68	4,873,495
172	4,872,529	636	4,872,986	CLASS 185	445	4,873,429	CLASS 265	341	4,872,710	CLASS 335	96	4,873,496
6 12	4,872,530	638	4,872,987	CLASS 186	446	4,873,430	CLASS 266	381	4,872,711	CLASS 336	108 B	4,873,497
6 4	4,872,531	644	4,872,988	CLASS 187	447	4,873,431	CLASS 267	116 FE	4,872,712	CLASS 337	117 R	4,873,498
121	4,872,532	651	4,872,989	CLASS 188	448	4,873,432	CLASS 268	117 R	4,872,713	CLASS 338	432	4,873,499
2 D	4,872,533	659	4,872,990	CLASS 189	449	4,873,433	CLASS 269	201	4,872,714	CLASS 339	23.1	4,873,500
32	4,872,534	661	4,872,991	CLASS 190	450	4,873,434	CLASS 270	39	4,872,715	CLASS 340	23.2	4,873,501
170	4,872,535	669	4,872,992	CLASS 191	451	4,873,435	CLASS 271	336 3	4,872,716	CLASS 341	23.6	4,873,502
290	4,872,536	670	4,872,993	CLASS 192	452	4,873,436	CLASS 272	340	4,872,717	CLASS 342	24	4,873,503
319	4,872,537	671	4,872,994	CLASS 193	453	4,873,437	CLASS 273	86.4	4,872,718	CLASS 343	41	4,873,504
111	4,872,538	673	4,872,995	CLASS 194	454	4,873,438	CLASS 274	257	4,872,719	CLASS 344	49	4,873,505
0 076	4,872,539	674	4,872,996	CLASS 195	455	4,873,439	CLASS 275	34	4,872,720	CLASS 345	71	4,873,506
217	4,872,541	675	4,872,997	CLASS 196	456	4,873,440	CLASS 276	214	4,872,721	CLASS 346	74	4,873,507
312	4,872,542	676	4,872,998	CLASS 197	457	4,873,441	CLASS 277	216	4,872,722	CLASS 347	436	4,873,508
347	4,872,543	677	4,872,999	CLASS 198	458	4,873,442	CLASS 278	218	4,872,723	CLASS 348	580	4,873,509
382	4,872,544	678	4,873,000	CLASS 199	459	4,873,443	CLASS 279	250	4,872,724	CLASS 349	677	4,873,510
394	4,872,545	679	4,873,001	CLASS 200	460	4,873,444	CLASS 280	367	4,872,725	CLASS 350	679	4,873,511
659	4,872,546	680	4,873,002	CLASS 201	461	4,873,445	CLASS 281	411	4,872,726	CLASS 351	723	4,873,512
859	4,872,548	681	4,873,003	CLASS 202	462	4,873,446	CLASS 282	92	4,872,727	CLASS 352	726	4,873,513
61.45 M	4,873,401	682	4,873,004	CLASS 203	463	4,873,447	CLASS 283	93	4,872,728	CLASS 353	728	4,873,514
283	4,873,402	683	4,873,005	CLASS 204	464	4,873,448	CLASS 284	93	4,872,729	CLASS 354	784	4,873,515
330	4,873,403	684	4,873,006	CLASS 205	465	4,873,449	CLASS 285	110	4,872,730	CLASS 355	825.030	4,873,516
332	4,873,404	685	4,873,007	CLASS 206	466	4,873,450	CLASS 286	224	4,872,731	CLASS 356	825.070	4,873,517
547	4,873,405	686	4,873,008	CLASS 207	467	4,873,451	CLASS 287	224	4,872,732	CLASS 357	825.44	4,873,518
105	4,872,954	687	4,873,009	CLASS 208	468	4,873,452	CLASS 288	825.52	4,873,519	CLASS 358	825.58	4,873,519
154	4,872,955	688	4,873,010	CLASS 209	469	4,873,453	CLASS 289	853	4,873,520	CLASS 359	825.58	4,873,520
1 T	4,872,956	689	4,873,011	CLASS 210	470	4,873,454	CLASS 290	884	4,873,521	CLASS 360	825.58	4,873,521
84	4,872,957	690	4,873,012	CLASS 211	471	4,873,455	CLASS 291	73	4,873,522	CLASS 361	9.1	4,873,587
98	4,872,958	691	4,873,013	CLASS 212	472	4,873,456	CLASS 292	145	4,873,523	CLASS 362	47	4,873,588
109	4,872,959	692	4,873,014	CLASS 213	473	4,873,457	CLASS 293	359	4,873,524	CLASS 363	53	4,873,589
181.7	4,872,960	693	4,873,015	CLASS 214	474	4,873,458	CLASS 294	700 MS	4,873,525	CLASS 364	711	4,873,590
224 R	4,872,961	694	4,873,016	CLASS 215	475	4,873,459	CLASS 295	713	4,873,526	CLASS 365	713	4,873,591
297 W	4,872,962	695	4,873,017	CLASS 216	476	4,873,460	CLASS 296	718	4,873,527	CLASS 366	90	4,873,592
298	4,872,963	696	4,873,018	CLASS 217	477	4,873,461	CLASS 297	744	4,873,528	CLASS 367	90.05	4,873,593
299 R	4,872,964	697	4,873,019	CLASS 218	478	4,873,462	CLASS 298	770	4,873,529	CLASS 368	99.11	4,873,594
414	4,872,965	698	4,873,020	CLASS 219	479	4,873,463	CLASS 299	786	4,873,530	CLASS 369	105	4,873,595
158	4,872,549	699	4,873,021	CLASS 220	480	4,873,464	CLASS 300	106	4,873,531	CLASS 370	106	4,873,596
315 I	4,872,550	700	4,873,022	CLASS 221	481	4,873,465	CLASS 301	126	4,873,532	CLASS 371	102	4,873,597
349	4,872,551	701	4,873,023	CLASS 222	482	4,873,466	CLASS 302	160 I	4,873,533	CLASS 372	8	4,873,690
365	4,872,552	702	4,873,024	CLASS 223	483	4,873,467	CLASS 303	96 16	4,872,739	CLASS 373	20	4,873,691
454	4,872,554	703	4,873,025	CLASS 224	484	4,873,468	CLASS 304	96 20	4,872,740	CLASS 374	315	4,873,692
459	4,872,555	704	4,873,026	CLASS 225	485	4,873,469	CLASS 305	96 26	4,872,741	CLASS 375	321	4,873,693
484	4,872,556	705	4,873,027	CLASS 226	486	4,873,470	CLASS 306	96 29	4,872,742	CLASS 376	33	4,873,694
504	4,872,557	706	4,873,028	CLASS 227	487	4,873,471	CLASS 307	104	4,872,743	CLASS 377	38	4,873,695
522	4,872,558	707	4,873,029	CLASS 228	488	4,873,472	CLASS 308	104	4,872,744	CLASS 378	58	4,873,696
524.4	4,872,559	708	4,873,030	CLASS 229	489	4,873,473	CLASS 309	104	4,872,745	CLASS 379	96	4,873,697
538	4,872,560	709	4,873,031	CLASS 230	490	4,873,474	CLASS 310	104	4,872,746	CLASS 380	108	4,873,698
557	4,872,561	710	4,873,032	CLASS 231	491	4,873,475	CLASS 311	104	4,872,747	CLASS 381	156	4,873,616
569	4,872,562	711	4,873,033	CLASS 232	492	4,873,476	CLASS 312	104	4,872,748	CLASS 382	156	4,873,617
631.3	4,872,563	712	4,873,034	CLASS 233	493	4,873,477	CLASS 313	104	4,872,749	CLASS 383	156	4,873,618
634	4,872,564	713	4,873,035	CLASS 234	494	4,873,478	CLASS 314	104	4,872,750	CLASS 384	156	4,873,619
65	4,872,967	714	4,873,036	CLASS 235	495	4,873,479	CLASS 315	104	4,872,751	CLASS 385	156	4,873,620
111	4,872,968	715	4,873,037	CLASS 236	496	4,873,480	CLASS 316	104	4,872,752	CLASS 386	156	4,873,621
140	4,872,969	716	4,873,038	CLASS 237	497	4,873,481	CLASS 317	104	4,872,753	CLASS 387	156	4,873,622
173	4,872,970	717	4,873,039	CLASS 238	498	4,873,482	CLASS 318	104	4,872,754	CLASS 388	156	4,873,623
419	4,872,971	718	4,873,040	CLASS 239	499	4,873,483	CLASS 319	104	4,872,755	CLASS 389	156	4,873,624
143	4,872,972	719	4,873,041	CLASS 240	500	4,873,484	CLASS 320	104	4,872,756	CLASS 390	156	4,873,625
144	4,872,973	720	4,873,042	CLASS 241	501	4,873,485	CLASS 321	104	4,872,757	CLASS 391	156	4,873,626
511	4,872,974	721	4,873,043	CLASS 242	502	4,873,486	CLASS 322	104	4,872,758	CLASS 392	156	4,873,627
699	4,872,975	722	4,873,044	CLASS 243	503	4,873,487	CLASS 323	104	4,872,759	CLASS 393	156	4,873,628
90	4,872,976	723	4,873,045	CLASS 244	504	4,873,488	CLASS 324	104	4,872,760	CLASS 394	156	4,873,629
99	4,872,977	724	4,873,046	CLASS 245	505	4,873,489	CLASS 325	104	4,872,761	CLASS 395	156	4,873,630
130	4,872,978	725	4,873,047	CLASS 246	506	4,873,490	CLASS 326	104	4,872,762	CLASS 396	156	4,873,631
173	4,872,979	726	4,873,048	CLASS 247	507	4,873,491	CLASS 327	104	4,872,763	CLASS 397	156	4,873,632
181	4,872,980	727	4,873,049	CLASS 248	508	4,873,492	CLASS 328	104	4,872,764	CLASS 398	156	4,873,633
198.2	4,872,981	728	4,873,050	CLASS 249	509	4,873,493	CLASS 329	104	4,872,765	CLASS 399	156	4,873,634

CLASS 355			4,873,629	438	4,873,051	CLASS 416			39	4,873,118	CLASS 436	4,873,194
38	4,873,546	405	4,873,630	47	4,873,704	145	4,872,810	77	4,873,119	254	4,873,195	
206	4,873,548	412.08	4,873,633	85	4,873,706	162	4,872,811	96	4,873,120		4,873,196	
232	4,873,549	413.13	4,873,632	CLASS 378			CLASS 417			CLASS 436		
251	4,873,550	419	4,873,634		4,873,707	63	4,872,813	97	4,873,122	77	4,873,197	
256	4,873,551	422	4,873,635		4,873,708	222	4,872,814	130	4,873,102	176	4,873,193	
271	4,873,552	424.1	4,873,636	62	4,873,709	360	4,872,815	207.1	4,873,124	CLASS 437		
295	4,873,553	426.01	4,873,638	142	4,873,710	407	4,872,816	248.1	4,873,125	5	4,873,198	
309	4,873,554	426.02	4,873,639	177			4,872,817	365	4,873,126	31	4,873,199	
316	4,873,547	426.04	4,873,640	CLASS 379			CLASS 418			CLASS 438		
CLASS 356			4,873,641	58	4,873,711	36	4,872,818	376.8	4,873,127	77	4,873,200	
35.5	4,872,751	431.04	4,873,642		4,873,712	61.3	4,872,819	434.7	4,873,128	51	4,873,201	
39	4,872,752	431.06	4,873,643		4,873,713	220	4,872,820			62	4,873,202	
246	4,872,753	431.08	4,873,644	67	4,873,714			35.8	4,873,130	67	4,873,203	
350	4,872,754	431.10	4,873,645	88	4,873,715			36.9	4,873,131	200	4,873,204	
360	4,872,755	431.12	Re 33,089	93	4,873,716	CLASS 419			CLASS 439			
361	4,872,756	431.14	4,873,646	134	4,873,717	2	4,873,052		4,873,132	15	4,872,842	
376	4,872,757	431.16	4,873,647	156	4,873,718	6	B1 4,236,923	107	4,873,133	69	4,872,843	
381	4,872,758	431.18	4,873,648	215	4,873,719	11	4,873,053	156	4,873,134	200	4,872,844	
432	4,872,759	431.20	4,873,649	356	4,873,720			192	4,873,135	783	4,872,845	
CLASS 357			4,873,650	CLASS 380			CLASS 420			CLASS 440		
4	4,873,555	510	4,873,651	552	4,873,721	552	4,873,054	216	4,873,136	83	4,872,846	
8	4,873,556	513	4,873,652	582			4,873,055	336	4,873,137	103	4,872,847	
23.1	4,873,557	515.01	4,873,653	9		CLASS 422			CLASS 441			
23.2	4,873,558	525	4,873,654	17	4,873,722	61	4,873,056	361	4,873,138	133	4,872,848	
23.6	4,873,559	553	4,873,655	34	4,873,723	75	4,873,057	369	4,873,139	139	4,872,849	
24	4,873,560	578	4,873,656	40	4,873,724	100	4,873,058		4,873,140	205	4,872,850	
41	4,873,561	725	4,873,657	140		135	4,873,059	357	4,873,141	264	4,872,851	
49	4,873,562	768	4,873,658	10	4,872,766	188	4,873,060	359	4,873,142	307	4,872,852	
71	4,873,563	768	4,873,659	249		250	4,873,061	373	4,873,143	327	4,872,853	
74	4,873,564	768	4,873,660	250			4,873,062	395	4,873,144	517	4,872,854	
CLASS 358			4,873,661	CLASS 381			CLASS 423			CLASS 442		
12	4,873,567	73	4,873,662	99	4,872,767	552	4,873,063	428	4,873,145	777	4,872,855	
22	4,873,568	145	4,873,663	223	4,872,768	582		533	4,873,146	783	4,872,856	
75	4,873,569	154	4,873,664	226	4,872,769		4,873,064	570	4,873,147			
93	4,873,570	189.01	4,873,665	230	4,872,770	65	4,873,065	627	4,873,148			
98	4,873,571	189.07	4,873,666	492	4,872,771	210	4,873,066		4,873,149	1	4,872,857	
133	4,873,572	189.09	4,873,667	235	4,872,772	235	4,873,067	659	4,873,150	38	4,872,858	
139	4,873,573	189.11	4,873,668	315		239	4,873,068	694	4,873,151	53	4,872,859	
166	4,873,574	189.12	4,873,669	345	4,873,473	315	4,873,069		4,873,152	113	4,872,860	
224	4,873,575	218	4,873,670	400		345	4,873,070	CLASS 429			79	4,872,861
254	4,873,576	230.06	4,873,671	120	4,872,772		4,873,071	26	4,873,153	CLASS 445		
310	4,873,577		4,873,672	617	4,873,773		4,873,072	31	4,873,154	22	4,872,862	
CLASS 359			4,873,673	CLASS 401			CLASS 424			CLASS 501		
9.1	4,873,587		4,873,674	29	4,872,774	1.1	4,873,073	57	4,873,155	50	4,872,864	
47	4,873,588	7	4,872,760	52	4,872,775	10	4,873,074	170	4,873,156	71	4,873,206	
53	4,873,589	79	4,872,761	69	4,872,776	44	4,873,075	225	4,873,157		4,873,207	
73.14	4,873,590	251	4,872,762	105	4,872,777	61	Re 33,086		4,873,158	95	4,873,208	
85	4,873,591		4,872,763	266	4,872,778	44	4,873,077	5	4,873,159	98	4,873,210	
90	4,873,592		4,872,764	CLASS 403			CLASS 430			CLASS 502		
96.5	4,873,593			171	4,872,779	70	4,873,078	58	4,873,160			
97.03	4,873,594			26	4,872,780	81	4,873,079	66	4,873,161	158	4,873,211	
99.05	4,873,595			CLASS 404			CLASS 431			CLASS 503		
105.17	4,873,596			12	4,872,781	81	4,873,080	137	4,873,162	161	4,873,212	
106.9	4,873,597			186	4,872,782	81	4,873,081	138	4,873,163	185	4,873,214	
126	4,873,598			270	4,872,783	81	4,873,082	192	4,873,164	202	4,873,215	
CLASS 360			4,873,599	CLASS 405			CLASS 432			CLASS 504		
9.1	4,873,587		4,873,674	400	4,872,784	400	4,873,083	264	4,873,165	211	4,873,216	
47	4,873,588		4,873,675	489	Re 33,084	451	4,873,084	309	4,873,166	418	4,873,218	
53	4,873,589		4,873,676	499	4,872,785	489	4,873,085	311	4,873,167	204	4,873,219	
85	4,873,590			658	4,872,786	499	4,873,086	313	4,873,168	227	4,873,220	
90	4,873,591			CLASS 406			CLASS 433			CLASS 505		
96.5	4,873,592			50	4,872,787	451	4,873,087	326	4,873,169			
97.03	4,873,593			68	4,872,788	489	4,873,088	327	4,873,170	204	4,873,221	
99.05	4,873,594			155	4,872,789	499	4,873,089	382	4,873,171	227	4,873,222	
105.17	4,873,595			CLASS 407			CLASS 434			CLASS 506		
106.9	4,873,596			9	4,872,790	499	4,873,090	491	4,873,172			
126	4,873,597			46	4,872,791	499	4,873,091	523	4,873,173	18	4,873,223	
CLASS 361			4,873,678	CLASS 408			CLASS 435			CLASS 507		
78	4,873,601	8.2	4,873,687	9	4,872,792	499	4,873,092	546	4,873,174	21	4,873,224	
96	4,873,602	21.2	4,873,688	113	4,872,793	499	4,873,093	550	4,873,175	23	4,873,225	
104	4,873,603	22.4	4,873,689	164		499	4,873,094	617	4,873,176	30	4,873,226	
142	4,873,604	36	4,873,690	317		499	4,873,095	903	4,873,177	41	4,873,227	
154	4,873,605	37.1	4,873,691	526		499	4,873,096		4,873,178	47	4,873,228	
200	4,873,606	41.3	4,873,692	12	4,872,794	499	4,873,097	16	4,873,179	59	4,873,229	
210	4,873,607	42.4	4,873,693	131	4,872,795	499	4,873,098	33	4,873,180	60	4,873,230	
220	4,873,608	43.5	4,873,694	244		499	4,873,099	73	4,873,181	159	4,873,231	
232	4,873,609	44.6	4,873,695	CLASS 409			CLASS 436			CLASS 508		
233	4,873,610	45.7	4,873,696	38	4,872,796	2	4,872,822	90	4,873,182	219	4,873,232	
313	4,873,611	46.8	4,873,697	112	4,872,797	3	4,872,823	354	4,873,183	220	4,873,233	
315	4,873,612	47.9	4,873,698	131		499	4,872,824		4,873,184	221	4,873,234	
321	4,873,613	49.0	4,873,699	244		499	4,872,825		4,873,185	222	4,873,235	
385	4,873,614	50	4,873,700	317		499	4,872,826		4,873,186	223	4,873,236	
394	4,873,615	51	4,873,701	526		499	4,872,827		4,873,187	224	4,873,237	
395	4,873,616	52	4,873,702	12	4,872,797	499	4,872,828		4,873,188	225	4,873,238	
426	4,873,617	53	4,873,703	28	4,872,798	499	4,872,829		4,873,189	226	4,873,239	
CLASS 362			4,873,704	CLASS 410			CLASS 437			CLASS 509		
9.1	4,873,587		4,873,674	38	4,872,799	499	4,872,830		4,873,190	227	4,873,240	
47	4,873,588		4,873,675	43	4,872,800	499	4,872,831		4,873,191	228	4,873,241	
53	4,873,589		4,873,676	50	4,872,801	499	4,872,832		4,873,192	229	4,873,242	
73.14	4,873,590		4,873,677	53	4,872,802	499	4,872,833		4,873,193	230	4,873,243	
85	4,873,591		4,873,678	59	4,872,803	499	4,872,834		4,873,194	231	4,873,244	
90	4,873,592		4,873,679	60	4,872,804	499	4,872,835		4,873,195	232	4,873,245	
96.5	4,873,593		4,873,680	61	4,872,805	499	4,872,836		4,873,196	233	4,873,246	
97.03	4,873,594		4,873,681	62	4,872,806	499	4,872,837		4,873,197	234	4,873,247	
99.05	4,873,595		4,873,682	63	4,872,807	499	4,872,838		4,873,198	235	4,873,248	
105.17	4,873,596		4,873,683	64	4,872,808	499	4,872,839		4,873,199	236	4,873,249	
106.9	4,873,597		4,873,684	65	4,872,809	499	4,872,840		4,873,200	237	4,873,250	
126	4,873,598		4,873,685	66	4,872,810	499	4,872,841		4,873,201	238	4,873,251	
CLASS 363			4,873,686	CLASS 411			CLASS 438			CLASS 510		
17	4,873,616	156	4,873,698	141.3	4,872,798	499	4,872,842		4,873,202	239	4,873,252	
57	4,873,617	157	4,873,699	180	4,872,799	499	4,872,843		4,873,203	240	4,873,253	
51	4,873,618	158	4,873,700	278	4,872,800	499	4,872,844		4,873,204	241	4,873,254	
CLASS 364			4,873,701	CLASS 412			CLASS 439			CLASS 511		
15												

CLASSIFICATION OF PATENTS

391	4,873,256	496	4,873,282	272	4,873,311	CLASS 520	CLASS 521	CLASS 522
410	4,873,257	520	4,873,283	487	4,873,314	CLASS 523	CLASS 524	CLASS 525
411	4,873,258	548	4,873,284	7	4,873,332	CLASS 526	CLASS 527	CLASS 528
443	4,873,259			14	4,873,333	CLASS 529	CLASS 530	CLASS 531
444	4,873,260	CLASS 525		194	4,873,335	CLASS 532	CLASS 533	CLASS 534
462	4,873,261	28	4,873,285	243	4,873,336	CLASS 535	CLASS 536	CLASS 537
510	4,873,262	92	4,873,286	271	4,873,337	CLASS 538	CLASS 539	CLASS 540
535	4,873,263		4,873,287	293	4,873,338	CLASS 541	CLASS 542	CLASS 543
557	4,873,231	194	4,873,288	344	4,873,364	CLASS 544	CLASS 545	CLASS 546
594	4,873,264	293	4,873,289	345	4,873,365	CLASS 547	CLASS 548	CLASS 549
651	4,873,265	337	4,873,290	415	4,873,385	CLASS 550	CLASS 551	CLASS 552
653	4,873,266	348	4,873,291	471	4,873,386	CLASS 553	CLASS 554	CLASS 555
		408	4,873,292	482	4,873,387	CLASS 556	CLASS 557	CLASS 558
700	4,873,267	417	4,873,293	500	4,873,388	CLASS 559	CLASS 560	CLASS 561
		419	4,873,294	533	4,873,389	CLASS 562	CLASS 563	CLASS 564
485	4,873,268	420	4,873,295	538	4,873,390	CLASS 565	CLASS 566	CLASS 567
		434	4,873,296	639	4,873,391	CLASS 568	CLASS 569	CLASS 570
115	4,873,269	474	4,873,297	640	4,873,392	CLASS 571	CLASS 572	CLASS 573
128	4,873,270	479	4,873,298			CLASS 574	CLASS 575	CLASS 576
136	4,873,271					CLASS 577	CLASS 578	CLASS 579
212	4,873,272	73	4,873,299			CLASS 580	CLASS 581	CLASS 582
407	4,873,273	142	4,873,300			CLASS 583	CLASS 584	CLASS 585
500	4,873,274	257	4,873,301			CLASS 586	CLASS 587	CLASS 588
		333	4,873,302			CLASS 589	CLASS 590	CLASS 591
						CLASS 592	CLASS 593	CLASS 594
						CLASS 595	CLASS 596	CLASS 597
						CLASS 598	CLASS 599	CLASS 600
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						CLASS 625	CLASS 626	CLASS 627
						CLASS 628	CLASS 629	CLASS 630
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						CLASS 649	CLASS 650	CLASS 651
						CLASS 652	CLASS 653	CLASS 654
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						CLASS 658	CLASS 659	CLASS 660
						CLASS 661	CLASS 662	CLASS 663
						CLASS 664	CLASS 665	CLASS 666
						CLASS 667	CLASS 668	CLASS 669
						CLASS 670	CLASS 671	CLASS 672
						CLASS 673	CLASS 674	CLASS 675
						CLASS 676	CLASS 677	CLASS 678
						CLASS 679	CLASS 680	CLASS 681
						CLASS 682	CLASS 683	CLASS 684
						CLASS 685	CLASS 686	CLASS 687
						CLASS 688	CLASS 689	CLASS 690
						CLASS 691	CLASS 692	CLASS 693
						CLASS 694	CLASS 695	CLASS 696
						CLASS 697	CLASS 698	CLASS 699
						CLASS 700	CLASS 701	CLASS 702
						CLASS 703	CLASS 704	CLASS 705
						CLASS 706	CLASS 707	CLASS 708
						CLASS 709	CLASS 710	CLASS 711
						CLASS 712	CLASS 713	CLASS 714
						CLASS 715	CLASS 716	CLASS 717
						CLASS 718	CLASS 719	CLASS 720
						CLASS 721	CLASS 722	CLASS 723
						CLASS 724	CLASS 725	CLASS 726
						CLASS 727	CLASS 728	CLASS 729
						CLASS 730	CLASS 731	CLASS 732
						CLASS 733	CLASS 734	CLASS 735
						CLASS 736	CLASS 737	CLASS 738
						CLASS 739	CLASS 740	CLASS 741
						CLASS 742	CLASS 743	CLASS 744
						CLASS 745	CLASS 746	CLASS 747
						CLASS 748	CLASS 749	CLASS 750
						CLASS 751	CLASS 752	CLASS 753
						CLASS 754	CLASS 755	CLASS 756
						CLASS 757	CLASS 758	CLASS 759
						CLASS 760	CLASS 761	CLASS 762
						CLASS 763	CLASS 764	CLASS 765
						CLASS 766	CLASS 767	CLASS 768
						CLASS 769	CLASS 770	CLASS 771
						CLASS 772	CLASS 773	CLASS 774
						CLASS 775	CLASS 776	CLASS 777
						CLASS 778	CLASS 779	CLASS 780
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						CLASS 784	CLASS 785	CLASS 786
						CLASS 787	CLASS 788	CLASS 789
						CLASS 790	CLASS 791	CLASS 792
						CLASS 793	CLASS 794	CLASS 795
						CLASS 796	CLASS 797	CLASS 798
						CLASS 799	CLASS 800	CLASS 801
						CLASS 802	CLASS 803	CLASS 804
						CLASS 805	CLASS 806	CLASS 807
						CLASS 808	CLASS 809	CLASS 810
						CLASS 811	CLASS 812	CLASS 813
						CLASS 814	CLASS 815	CLASS 816
						CLASS 817	CLASS 818	CLASS 819
						CLASS 820	CLASS 821	CLASS 822
						CLASS 823	CLASS 824	CLASS 825
						CLASS 826	CLASS 827	CLASS 828
						CLASS 829	CLASS 830	CLASS 831
						CLASS 832	CLASS 833	CLASS 834
						CLASS 835	CLASS 836	CLASS 837
						CLASS 838	CLASS 839	CLASS 840
						CLASS 841	CLASS 842	CLASS 843
						CLASS 844	CLASS 845	CLASS 846
						CLASS 847	CLASS 848	CLASS 849
						CLASS 850	CLASS 851	CLASS 852
						CLASS 853	CLASS 854	CLASS 855
						CLASS 856	CLASS 857	CLASS 858
						CLASS 859	CLASS 860	CLASS 861
						CLASS 862	CLASS 863	CLASS 864
						CLASS 865	CLASS 866	CLASS 867
						CLASS 868	CLASS 869	CLASS 870
						CLASS 871	CLASS 872	CLASS 873
						CLASS 874	CLASS 875	CLASS 876
						CLASS 877	CLASS 878	CLASS 879
						CLASS 880	CLASS 881	CLASS 882
						CLASS 883	CLASS 884	CLASS 885
						CLASS 886	CLASS 887	CLASS 888
						CLASS 889	CLASS 890	CLASS 891
						CLASS 892	CLASS 893	CLASS 894
						CLASS 895	CLASS 896	CLASS 897
						CLASS 898	CLASS 899	CLASS 900

CLASSIFICATION OF DESIGNS

D1—	109	303,865		303,887		406	303,909		415	303,931		126	303,974
D2—	268	303,866		303,888		409	303,910		451	303,932		199	303,975
		303,867		303,889		505	303,911		2	303,933		134	303,976
		303,868		303,890		523	303,912			303,934		109	303,977
		303,869		303,891			303,913			303,935		114	303,978
		303,870		303,892		141	303,914			303,936			303,979
		303,871		303,893		18	303,915			303,937			303,980
		303,872		303,894		22	303,916			303,938			303,981
		303,873		303,895		51	303,917			303,939			303,982
		303,874		303,896		52	303,918			303,940			303,983
		303,875		303,897		57	303,919			303,941			303,984
		303,876		303,898		83	303,920			303,942			303,985
		303,877		303,899		98	303,921			303,943			303,986
		303,878		303,900		321	303,922			303,944			303,987
		303,879		303,901		394	303,923			303,945			303,988
		303,880		303,902		403	303,924			303,946			303,989
		303,881		303,903		306	303,925			303,947			303,990
		303,882		303,904		349	303,926			303,948			303,991
		303,883		303,905		371	303,927			303,949			303,992
		303,884		303,906		375	303,928			303,950			303,993
		303,885		303,907		376	303,929			303,951			303,994
		303,886		303,908		403	303,930			303,952			

CLASSIFICATION OF PLANTS

P—	19	7,045		68	7,046								
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GEOGRAPHICAL INDEX
OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

PI 74 GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

22 :	4,872,413 4,872,421 4,872,507 4,872,886 4,872,967 4,873,091 4,873,097 4,873,300 4,873,341 4,873,353 4,873,377 4,873,654 4,872,556 4,872,227 4,872,278 4,872,623 4,872,682 4,872,790 4,873,028 4,873,137 4,873,186 4,873,187 4,873,197 4,873,206 4,873,358 4,873,359 4,873,498 4,873,701 Re 33,082 4,872,261 4,872,263 4,872,316 4,872,339 4,872,484 4,872,561 4,872,692 4,872,733 4,872,751 4,872,767 4,872,799 4,872,811 4,872,840 4,872,894 4,872,922 4,873,056 4,873,133 4,873,171 4,873,176 4,873,190 4,873,286 4,873,304 4,873,316 4,873,367 4,873,436 4,873,439 4,873,489 4,873,578 4,873,626 4,873,652 4,873,707 4,872,221 4,872,269 4,872,271 4,872,281 4,872,296 4,872,337 4,872,366 4,872,367 4,872,370 4,872,374 4,872,375 4,872,384 4,872,429 4,872,432 4,872,450 4,872,498 4,872,504 4,872,518 4,872,581 4,872,613 4,872,635 4,872,667 4,872,707 4,872,709 4,872,725 4,872,726 4,872,727 4,872,761 4,872,789 4,872,841	4,872,923 4,872,982 4,872,997 4,873,037 4,873,044 4,873,063 4,873,075 4,873,226 4,873,285 4,873,298 4,873,337 4,873,346 4,873,360 4,873,461 4,873,558 4,873,643 4,872,264 4,872,326 4,872,535 4,872,554 4,872,562 4,872,699 4,872,747 4,872,935 4,872,993 4,873,020 4,873,135 4,873,140 4,873,184 4,873,193 4,873,201 4,873,308 4,873,483 4,873,594 4,873,605 4,873,630 4,873,649 4,873,704 4,872,250 4,872,368 4,872,741 4,872,814 4,872,851 4,872,852 4,872,854 4,872,975 4,873,055 4,873,506 4,873,563 4,873,632 4,872,638 4,872,640 4,872,668 4,872,693 4,872,784 4,872,976 4,872,629 4,873,509 4,872,783 4,873,032 4,873,134 4,873,231 4,873,419 4,873,462 4,872,277 4,872,307 4,872,448 4,872,555 4,872,589 4,872,673 4,872,744 4,872,765 4,872,864 4,872,873 4,872,884 4,872,895 4,872,951 4,872,968 4,873,000 4,873,001 4,873,002 4,873,062 4,873,098 4,873,103 4,873,116 4,873,119 4,873,174 4,873,216 4,873,224 4,873,234	4,873,235 4,873,239 4,873,246 4,873,247 4,873,257 4,873,260 4,873,293 4,873,324 4,873,335 4,873,336 4,873,356 4,873,357 4,873,426 4,873,492 4,873,558 4,873,577 4,873,604 4,873,611 4,873,634 4,873,663 4,873,681 4,873,444 4,872,258 4,872,354 4,872,369 4,872,381 4,872,387 4,872,392 4,872,395 4,872,420 4,872,454 4,872,468 4,872,568 4,872,578 4,872,597 4,872,621 4,872,631 4,872,647 4,872,663 4,872,741 4,872,814 4,872,851 4,872,852 4,872,854 4,872,975 4,872,996 4,873,093 4,873,096 4,873,123 4,873,136 4,873,153 4,873,204 4,873,231 4,873,265 4,873,266 4,873,287 4,873,311 4,873,318 4,873,354 4,873,371 4,873,382 4,873,485 4,872,510 4,873,516 4,873,517 4,873,539 4,873,554 4,873,567 4,873,661 4,873,708 4,872,228 4,872,233 4,872,238 4,872,324 4,872,416 4,872,500 4,872,620 4,872,872 4,872,981 4,873,192 4,873,258	4,873,264 4,873,499 4,872,297 4,872,304 4,872,349 4,872,382 4,872,399 4,872,419 4,872,483 4,872,549 4,872,591 4,872,705 4,872,778 4,872,780 4,872,812 4,872,821 4,872,879 4,872,890 4,872,898 4,872,914 4,872,916 4,872,919 4,872,925 4,872,927 4,872,963 4,873,005 4,873,006 4,873,013 4,873,038 4,873,100 4,873,106 4,873,132 4,873,168 4,873,191 4,873,215 4,873,290 4,873,291 4,873,303 4,873,504 4,873,507 4,873,508 4,873,651 4,872,251 4,872,282 4,872,477 4,872,478 4,872,479 4,872,794 4,872,801 4,872,808 4,872,832 4,872,911 4,873,128 4,873,609 4,873,648 4,873,409 4,872,224 4,872,286 4,872,422 4,872,949 4,873,456 4,872,254 4,873,474 4,873,538 4,873,646 Re 33,083 4,872,259 4,872,260 4,872,300 4,872,306 4,872,365 4,872,449 4,872,482 4,872,601 4,872,605 4,872,609 4,872,617 4,872,646 4,872,651 4,872,656 4,872,679 4,872,791 4,872,825 4,872,845 4,872,846 4,872,849 4,872,853 4,872,870 4,872,893 4,872,910	4,872,912 4,872,929 4,872,937 4,872,995 4,873,043 4,873,054 4,873,067 4,873,085 4,873,126 4,873,148 4,873,152 4,873,157 4,873,198 4,873,207 4,873,211 4,873,221 4,873,238 4,873,271 4,873,274 4,873,281 4,873,315 4,873,331 4,873,345 4,873,364 4,873,385 4,873,389 4,873,512 4,873,555 4,873,556 4,873,566 4,873,602 4,873,615 4,873,674 4,873,675 4,873,676 4,873,685 4,872,534 4,872,593 4,872,221 4,872,276 4,872,322 4,872,443 4,872,481 4,872,600 4,872,680 4,872,766 4,872,953 4,873,051 4,872,267 4,872,218 4,872,327 4,872,492 4,872,670 4,872,887 4,873,069 4,873,078 4,873,471 4,873,574 4,872,949 4,872,216 4,872,254 4,872,336 4,872,345 4,872,379 4,872,457 4,872,510 4,872,517 4,872,520 4,872,526 4,872,530 4,872,560 4,872,573 4,872,599 4,872,607 4,872,625 4,872,664 4,872,706 4,872,708 4,872,710 4,872,719 4,872,875 4,872,938 4,872,954 4,872,961 4,872,985 4,872,992 4,872,996 4,873,107 4,873,139	4,873,213 4,873,280 4,873,309 4,873,313 4,873,370 4,873,378 4,873,379 4,873,380 4,873,395 4,873,403 4,873,450 4,873,488 4,873,565 4,873,624 4,873,629 4,873,635 4,873,636 4,873,655 4,873,665 4,873,675 4,872,412 4,872,519 4,872,579 4,872,865 4,872,899 4,872,909 4,872,955 4,873,072 4,873,515 4,872,538 4,873,205 4,872,309 4,872,426 4,872,474 4,872,485 4,872,585 4,872,672 4,872,917 4,872,918 4,872,960 4,872,998 4,873,008 4,873,029 4,873,144 4,873,251 4,873,478 4,873,513 4,873,657 4,872,342 4,872,343 4,872,378 4,872,410 4,872,632 4,872,802 4,873,188 4,873,406 4,873,523 4,873,705 3,965,838 4,872,215 4,872,598 4,873,017 4,873,325 4,873,390 4,872,243 4,872,317 4,872,389 4,872,397 4,872,452 4,872,502 4,872,528 4,872,531 4,872,582 4,872,637 4,872,728 4,872,833 4,872,857 4,872,859 4,872,860 4,872,871 4,872,933 4,873,094 4,873,101 4,873,219 4,873,230 4,873,273 4,873,404 4,873,453 4,873,470
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DESIGN PATENTS

01 :	303,942		303,974	17 :	303,876		33 :	303,951		303,914		303,917
04 :	303,875		303,990		303,935		34 :	303,865		303,925		303,926
06 :	303,867		303,994		303,988			303,866		303,954	44 :	303,878
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	303,956		303,970	32 :	303,893							

PLANT PATENTS

39	7,046	53	7,045				
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OC

17

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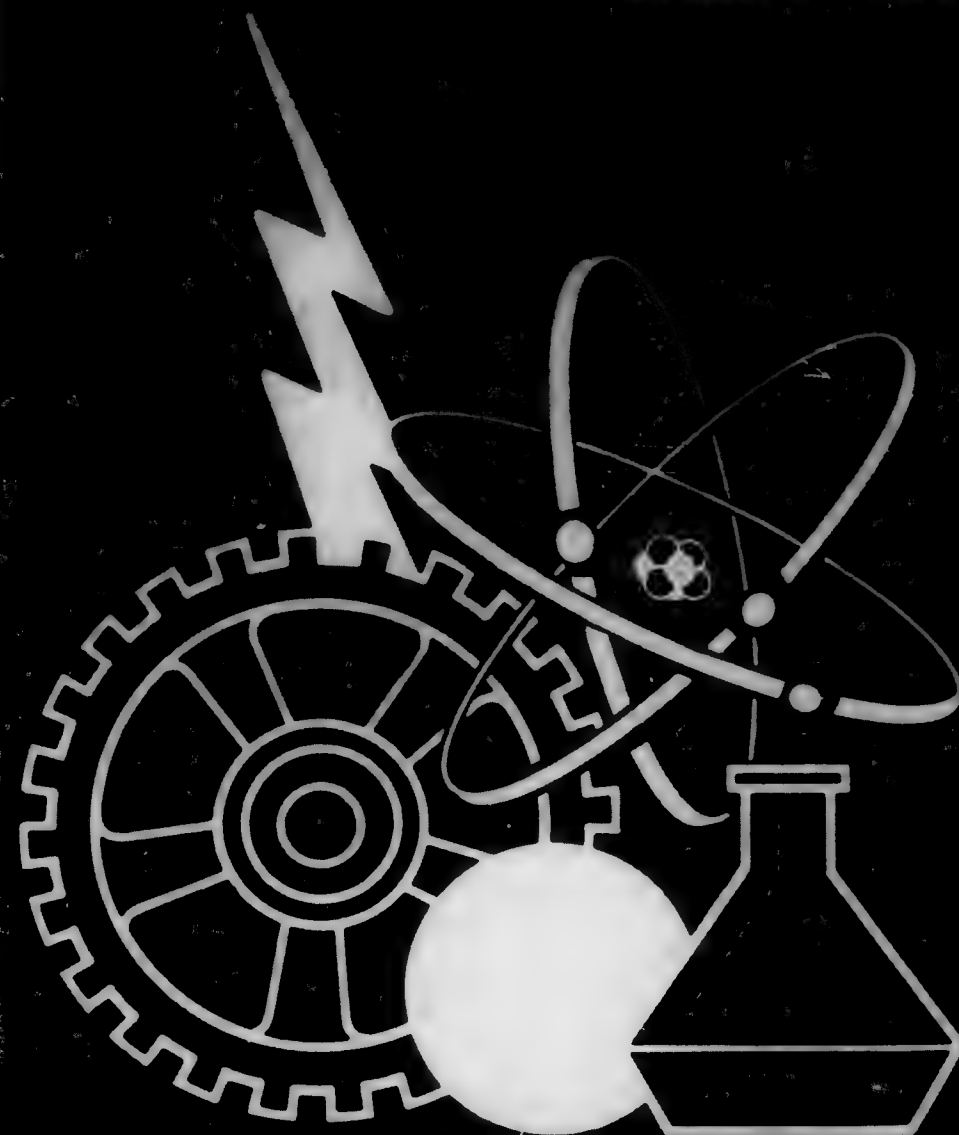
Vol. 1107 Number 3

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PATENTS

October 17, 1989



PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

CONTENTS

	Page
Patent and Trademark Office Notices	
Patent Cooperation Treaty (PCT) Information	1107 OG 58
Notice of Maintenance Fees Payable	1107 OG 58
Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees	1107 OG 59
Reissue Applications Filed	1107 OG 61
Requests for Reexaminations Filed	1107 OG 61
Service by Publication	1107 OG 62
Registration to Practice	1107 OG 62
Patent Certificates of Correction	1107 OG 63
Special Boxes for Mail	1107 OG 64
Reference Collections of U.S. Patents Available for Public Use in	
Patent Depository Libraries	1107 OG 65
Condition of Patent Applications	1107 OG 67
Reexaminations	1071
Reissue Patents Granted (33,090)	1073
Plant Patents Granted (7,047)	1077
Patents Granted	
General and Mechanical (4,873,725)	1079
Chemical (4,874,390)	1311
Electrical (4,874,903)	1455
Design Patents Granted (303,995)	1571
Index of Patentees	PI 1
Indices of Reissue, Reexamination and Design Plant Patentees	PI 74
Classification of	
Patents (Including Reissues and Reexaminations)	PI 69
Designs, and Plants Applications	PI 72
Geographical Index of Residence of Inventors	
Patents (Including Reissues and Reexaminations)	PI 73
Designs and Plant Applications	PI 74
Change of Address Form and Subscription Order Form	Back Page

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THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
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COPIES OF PATENTS are furnished by the Patent and Trademark Office at \$1.50 each; PLANT PATENTS in color, \$10.00 each; copies of TRADEMARKS at \$1.50 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1107 O.G. 5 on Oct. 3, 1989.

For use of the European Patent Office as a Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 5 on Sept. 28, 1982.

For use of the European Patent Office as an international Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2 on July 7, 1987 and at 1091 O.G. 2 on June 7, 1988.

The Search fee of the European Patent Office was changed due to a difference in the exchange rate of the U.S. dollar in relation to the German Mark as of Sept. 1, 1989, and was announced in the *Official Gazette* at 1105 O.G. 36 on Aug. 15, 1989.

International PCT fees were changed on June 1, 1989 due to a difference in the exchange rate of the U.S. dollar in relation to the Swiss Franc and were announced in the *Official Gazette* at 1102 O.G. 90 on May 30, 1989.

Certain domestic PCT fees and charges for International Search and Preliminary Examination have been changed effective Apr. 17, 1989 and were announced in the *Official Gazette* at 1100 O.G. 24 on Mar. 7, 1989.

The current schedule of PCT fees is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office as Searching Authority (ISA)	
—No corresponding prior U.S. national application filed:	550.00
—Corresponding prior U.S. national application filed:	380.00
—Supplemental search fee, per additional invention:	150.00
European Patent Office as Searching Authority:	1040.00
Preliminary examination fee	
U.S. Patent and Trademark Office as Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as Searching Authority:	400.00
—Additional examination fee, per additional invention:	130.00
—Searching Authority not the USPTO:	600.00
—Additional examination fee, per additional invention:	200.00
International fees	
Basic fee:	436.00
Basic Supplemental fee (for each page over 30):	9.00
Designation fee per country or region for the first 10 national or regional offices:	106.00
Designation fee for 11th and subsequent designations:	No Charge
Handling fee:	134.00

U.S. National Stage fees

	Small Entity	Non-small Entity
U.S. Patent and Trademark Office was Preliminary Examining Authority (IPEA)	165.00	330.00
USPTO was ISA but not IPEA	185.00	370.00

USPTO was neither ISA nor IPEA	250.00	500.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(2) to (4)	25.00	50.00
—For each independent claim in excess of 3	18.00	36.00
—For each claim in excess of 20	6.00	12.00
—For each application containing a multiple dependent claim	60.00	120.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39.1	60.00	120.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39.1	30.00	30.00

September 12, 1989. DONALD J. QUIGG,
Assistant Secretary and Commissioner
of Patents and Trademarks.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on application filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Apr. 17, 1989. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the patent.

Attention is drawn to the patents which were issued on October 14, 1986, for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents	4,616,365 through 4,617,683
Reissue Patents based on the above identified patents.	

Attention is drawn to the patents which were issued on October 12, 1982 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents	4,353,133 through 4,354,278
Reissue Patents based on the above identified patents.	

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months and seven years and six months are set forth in 37 CFR 1.20(e), (f), (h) and (i), as amended effective Apr. 17, 1989, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or

OCTOBER 17, 1989

U. S. PATENT AND TRADEMARK OFFICE

1107 OG 59

after after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:	4,531,274	06/561,420	07/30/85
4,531,275	06/460,295	07/30/85	
4,531,281	06/486,047	07/30/85	
4,531,296	06/463,888	07/30/85	
"(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant:	4,531,298	06/497,425	07/30/85
4,531,302	06/603,124	07/30/85	
4,531,309	06/416,920	07/30/85	
4,531,310	06/569,756	07/30/85	
4,531,311	06/507,244	07/30/85	
4,531,315	06/646,304	07/30/85	
4,531,316	06/331,965	07/30/85	
"(h) For maintaining an original or reissue patent except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:	4,531,321	06/457,492	07/30/85
4,531,322	06/499,493	07/30/85	
4,531,323	06/497,155	07/30/85	
4,531,327	06/488,239	07/30/85	
By a small entity (\$1.9(f))	4,531,328	06/655,238	07/30/85
By other than a small entity:	4,531,330	06/344,748	07/30/85
4,531,335	06/447,961	07/30/85	
"(i) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant:	4,531,346	06/428,178	07/30/85
4,531,350	06/649,062	07/30/85	
4,531,353	06/539,096	07/30/85	
4,531,360	06/423,859	07/30/85	
4,531,362	06/701,644	07/30/85	
4,531,367	06/404,330	07/30/85	
By a small entity (\$1.9(f))	4,531,381	06/647,760	07/30/85
By other than a small entity:	4,531,383	06/563,162	07/30/85
4,531,384	06/515,761	07/30/85	
4,531,393	06/540,795	07/30/85	
4,531,401	06/564,914	07/30/85	
4,531,404	06/566,727	07/30/85	
4,531,414	06/612,335	07/30/85	
4,531,429	06/505,923	07/30/85	
"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982:	4,531,437	06/544,622	07/30/85
4,531,446	06/401,844	07/30/85	
4,531,452	06/554,553	07/30/85	
4,531,455	06/569,243	07/30/85	
4,531,458	06/513,201	07/30/85	
4,531,465	06/595,614	07/30/85	
4,531,469	06/559,274	07/30/85	
"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:	4,531,472	06/554,548	07/30/85
4,531,473	06/484,617	07/30/85	
4,531,477	06/595,709	07/30/85	
4,531,480	06/438,647	07/30/85	
4,531,492	06/593,982	07/30/85	
4,531,497	06/492,708	07/30/85	
4,531,498	06/228,861	07/30/85	
4,531,499	06/401,286	07/30/85	
4,531,506	06/604,382	07/30/85	
4,531,513	06/553,031	07/30/85	
4,531,517	06/478,301	07/30/85	
4,531,518	06/531,066	07/30/85	
4,531,519	06/621,881	07/30/85	
4,531,525	06/554,935	07/30/85	
4,531,530	06/531,735	07/30/85	
4,531,553	06/555,592	07/30/85	
4,531,567	06/448,790	07/30/85	
4,531,574	06/453,636	07/30/85	
4,531,577	06/388,607	07/30/85	
4,531,600	06/556,316	07/30/85	
4,531,607	06/615,915	07/30/85	
4,531,613	06/603,252	07/30/85	
4,531,619	06/423,220	07/30/85	
4,531,624	06/274,405	07/30/85	
4,531,632	06/602,004	07/30/85	
4,531,633	06/416,957	07/30/85	
4,531,634	06/565,696	07/30/85	
4,531,635	06/595,562	07/30/85	
4,531,637	06/583,248	07/30/85	
4,531,638	06/553,362	07/30/85	
4,531,640	06/531,431	07/30/85	
4,531,642	06/567,667	07/30/85	
4,531,655	06/504,613	07/30/85	
4,531,674	06/506,359	07/30/85	
4,531,675	06/545,089	07/30/85	
4,531,679	06/623,535	07/30/85	
4,531,685	06/474,355	07/30/85	
4,531,686	06/532,542	07/30/85	
4,531,688	06/531,294	07/30/85	

PATENTS WHICH EXPIRED JULY 30, 1989 DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,531,245	06/587,205	07/30/85
4,531,246	06/564,558	07/30/85
4,531,251	06/512,374	07/30/85
4,531,256	06/603,928	07/30/85
4,531,269	06/593,460	07/30/85

Patent Number	Serial Number	Issue Date	4,532,040	06/605,750	07/30/85
4,531,690	06/588,360	07/30/85	4,532,049	06/608,884	07/30/85
4,531,696	06/375,827	07/30/85	4,532,050	06/643,739	07/30/85
4,531,706	06/500,813	07/30/85	4,532,074	06/622,646	07/30/85
4,531,714	06/536,349	07/30/85	4,532,083	06/437,768	07/30/85
4,531,715	06/619,268	07/30/85	4,532,084	06/513,537	07/30/85
4,531,719	06/469,618	07/30/85	4,532,090	06/505,307	07/30/85
4,531,728	06/637,550	07/30/85	4,532,096	06/493,092	07/30/85
4,531,731	06/569,278	07/30/85	4,532,101	06/435,791	07/30/85
4,531,736	06/578,472	07/30/85	4,532,102	06/500,107	07/30/85
4,531,737	06/574,527	07/30/85	4,532,114	06/505,027	07/30/85
4,531,739	06/611,469	07/30/85	4,532,118	06/594,913	07/30/85
4,531,741	06/625,132	07/30/85	4,532,128	06/651,654	07/30/85
4,531,742	06/546,880	07/30/85	4,532,136	06/570,225	07/30/85
4,531,743	06/435,907	07/30/85	4,532,138	06/528,494	07/30/85
4,531,744	06/581,619	07/30/85	4,532,146	06/607,712	07/30/85
4,531,749	06/500,212	07/30/85	4,532,160	06/521,759	07/30/85
4,531,750	06/678,757	07/30/88	4,532,162	06/489,854	07/30/85
4,531,752	06/452,067	07/30/85	4,532,163	06/469,619	07/30/85
4,531,770	06/459,309	07/30/85	4,532,174	06/509,805	07/30/85
4,531,771	06/340,573	07/30/85	4,532,194	06/530,050	07/30/85
4,531,772	06/679,085	07/30/85	4,532,195	06/563,874	07/30/85
4,531,774	06/472,116	07/30/85	4,532,197	06/495,251	07/30/85
4,531,784	06/476,226	07/30/85	4,532,209	06/415,129	07/30/85
4,531,785	06/445,254	07/30/85	4,532,218	06/278,548	07/30/85
4,531,794	06/574,380	07/30/85	4,532,225	06/639,273	07/30/85
4,531,804	06/498,402	07/30/85	4,532,227	06/218,610	07/30/85
4,531,806	06/555,051	07/30/85	4,532,230	06/506,559	07/30/85
4,531,815	06/500,808	07/30/85	4,532,234	06/530,085	07/30/85
4,531,816	06/516,309	07/30/85	4,532,251	06/446,802	07/30/85
4,531,821	06/560,128	07/30/85	4,532,256	06/560,655	07/30/85
4,531,836	06/473,326	07/30/85	4,532,277	06/565,589	07/30/85
4,531,840	06/561,219	07/30/85	4,532,292	06/624,599	07/30/85
4,531,843	06/470,478	07/30/85	4,532,318	06/647,947	07/30/85
4,531,847	06/555,790	07/30/85	4,532,324	06/573,772	07/30/85
4,531,849	06/655,939	07/30/85	4,532,334	06/437,281	07/30/85
4,531,856	06/388,511	07/30/85	4,532,357	06/613,570	07/30/85
4,531,858	06/542,176	07/30/85	4,532,359	06/602,570	07/30/85
4,531,861	06/523,117	07/30/85	4,532,363	06/615,328	07/30/85
4,531,873	06/495,587	07/30/85	4,532,364	06/533,915	07/30/85
4,531,874	06/495,586	07/30/85	4,532,367	06/412,851	07/30/85
4,531,880	06/509,194	07/30/85	4,532,385	06/300,721	07/30/85
4,531,883	06/448,023	07/30/85	4,532,398	06/446,050	07/30/85
4,531,884	06/441,641	07/30/85	4,532,399	06/661,270	07/30/85
4,531,886	06/482,029	07/30/85	4,532,410	06/531,407	07/30/85
4,531,890	06/460,249	07/30/85	4,532,412	06/506,667	07/30/85
4,531,896	06/591,021	07/30/85	4,532,416	06/455,044	07/30/85
4,531,899	06/526,153	07/30/85	4,532,431	06/431,119	07/30/85
4,531,918	06/586,718	07/30/85	4,532,440	06/438,750	07/30/85
4,531,924	06/500,890	07/30/85	4,532,460	06/397,261	07/30/85
4,531,926	06/512,540	07/30/85	4,532,462	06/607,635	07/30/85
4,531,929	06/524,246	07/30/85	4,532,464	06/565,864	07/30/85
4,531,931	06/464,096	07/30/85	4,532,465	06/513,004	07/30/85
4,531,938	06/511,251	07/30/85	4,532,471	06/373,984	07/30/85
4,531,940	06/524,643	07/30/85	4,532,475	06/585,925	07/30/85
4,531,942	06/593,545	07/30/85	4,532,493	06/572,243	07/30/85
4,531,947	06/593,626	07/30/85	4,532,510	06/391,765	07/30/85
4,531,952	06/625,772	07/30/85	4,532,526	06/486,937	07/30/85
4,531,957	06/570,379	07/30/85	4,532,538	06/347,030	07/30/85
4,531,963	06/431,906	07/30/85	4,532,542	06/481,187	07/30/85
4,531,964	06/527,493	07/30/85	4,532,572	06/551,468	07/30/85
4,531,965	06/443,373	07/30/85	4,532,580	06/593,181	07/30/85
4,531,968	06/595,225	07/30/85	4,532,595	06/446,246	07/30/85
4,531,975	06/573,597	07/30/85	4,532,614	06/269,427	07/30/85
4,531,989	06/596,345	07/30/85	4,532,620	06/400,232	07/30/85
4,532,001	06/452,920	07/30/85	4,532,622	06/547,143	07/30/85
4,532,017	06/446,626	07/30/85	4,532,623	06/590,794	07/30/85
4,532,026	06/395,865	07/30/85	4,532,634	06/531,921	07/30/85
4,532,030	06/533,201	07/30/85	4,532,643	06/419,936	07/30/85

NOTIFICATION OF ACCEPTANCE OF DELAYED PAYMENT OF MAINTENANCE FEE
(35 U.S.C. 41 (c); 37 CFR 1.378)

The patent(s) listed below are considered as not having expired but are subject to the conditions set forth in 35 U.S.C. 41(c)(2), in view of the Petition to Accept Late Payment of the maintenance fees which has been GRANTED BY THE COMMISSIONER OF PATENTS AND TRADEMARKS, as provided for under 35 U.S.C. 41(c)(1) and 37 CFR 1.378

Patent No.	Serial No.	Patent Date	Application Filing Date	Delayed Payment Acceptance Date
4,443,198	06/364,769	04/17/84	04/02/82	09/18/89
4,455,450	06/305,739	06/19/84	09/25/81	09/18/89

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

Re. 32,201, Re. S. N. 401,725, Filed Aug. 21, 1989, Cl. 340/747, APPARATUS AND METHOD FOR READING AND WRITING TEXT CHARACTER IN A GRAPHICS DISPLAY, David J. Bradley, Owner of Record: *International Business Machines Corp., Armonk, N.Y.*, Attorney or Agent: Alan J. Kasper, Ex. Gp.: 264

4,396,994, Re. S. N. 397,342, Filed Aug. 22, 1989, Cl. 364, DATA SHIFTING AND ROTATING APPARATUS, Sung M. Kang, Owner of Record: *A.T. & T. Bell Telephone Laboratories, Murray Hill, N.J.*, Attorney or Agent: D. I. Caplan, Ex. Gp.: 237

4,465,969, Re. S. N. 06/893,434, Filed Aug. 5, 1988, Cl. 324/96, VOLTAGE AND ELECTRIC FIELD MEASURING DEVICE USING LIGHT, Koji Tada et al., Owner of Record: *Sumitomo Electric Industries, Ltd., Osaka, Japan*, Attorney or Agent: Darryl Mexic, Ex. Gp.: 267

4,690,714, Re. S. N. 400,517, Filed Aug. 30, 1989, Cl. 437/208, METHOD OF MAKING ACTIVE SOLID STATE DEVICES, Chou H. Li, Owner of Record: *Inventor*, Attorney or Agent: Ivan S. Kavrukov, Ex. Gp.: 114

4,694,385, Re. S. N. 403,556, Filed Sept. 6, 1989, Cl. 363/19, SWITCHED-MODE POWER SUPPLY WITH DELAY NETWORK TO REDUCE SWITCHING LOSSES, Antonius A. M. Marinus, Owner of Record: *U. S. Philips Corp., New York, N.Y.*, Attorney or Agent: Bernard Franzblau, Ex. Gp.: 212

4,707,095, Re. S. N. 370,589, Filed June 21, 1989, Cl. 354/173, FILM REWINDER, Yoshiyuki Nakako et al., Owner of Record: *Nikon Corp., Tokyo, Japan*, Attorney or Agent: Mitchell W. Shapiro, Ex. Gp.: 211

4,719,862, Re. S. N. 400,312, Filed Aug. 3, 1989, Cl. 111/7, BLADE SHANK ASSEMBLY USED IN A FERTILIZER APPLICATOR ASSEMBLY, Delmar D. Edmisson, Owner of Record: *Adams Hard-Facing Company, Inc., Guyton, Okla.*, Attorney or Agent: William R. Laney, Ex. Gp.: 331

4,721,783, Re. S. N. 394,247, Filed Aug. 15, 1989, Cl. 544, ANTI-SPASMODIC AGENTS HAVING A HETEROCYCLIC RING, William M. Davis, Owner of Record: *United Pharmaceuticals Inc.,* Attorney or Agent: Austin R. Miller, Ex. Gp.: 129

4,732,028, Re. S. N. 402,658, Filed Sept. 5, 1989, Cl. 72/190, ROTARY APPARATUS, Ernest R. Bodnar, Owner of Record: *Inventor*, Attorney or Agent: George A. Rolston, Ex. Gp.: 321

4,742,279, Re. S. N. 402,001, Filed Aug. 31, 1989, Cl. 315/382, COLOR DISPLAY TUBE WITH REDUCED DEFLECTION DEFOCUSING, Jan Gerritsen et al., Owner of Record: *U. S. Philips Corp., Tarrytown, N.Y.*, Attorney or Agent: Thomas A. Briody, Ex. Gp.: 252

4,751,154, Re. S. N. 404,309, Filed Aug. 31, 1989, Cl. 429/53, BATTERY EXPLOSION ATTENUATION MATERIAL AND METHOD, Richard R. Binder et al., Owner of Record: *Globe Union Inc., Milwaukee, Wis.*, Attorney or Agent: Edward L. Levine, Ex. Gp.: 114

4,759,642, Re. S. N. 402,545, Filed Aug. 18, 1989, Cl. 383/63, RECLOSABLE BAG ESPECIALLY SUITABLE FOR CEREAL PACKAGING AND METHOD, Donald L. Vanerden, Owner of Record: *Minigrip Inc., Orangeburg, N.Y.*, Attorney or Agent: Richard J. Schwarz, Ex. Gp.: 241

4,802,428, Re. S. N. 399,602, Filed Aug. 28, 1989, Cl. 114/61, PLANING CATAMARAN VESSEL, Thomas G. Lang, Owner of Record: *Inventor*, Attorney or Agent: Carl R. Brown, Ex. Gp.: 315

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

4,567,738, Reexam. No. 90/001,839, Requested Aug. 14, 1989, Cl. 66/85, STRUCTURAL FABRIC AND METHOD OF MAKING SAME, Harold K. Hutson et al., Owner of Record: *Hexcel Corp., Minneapolis, Minn.*, Attorney or Agent: Unknown, Ex. Gp.: 240, Requester: Burlington Industries, Inc., Greensboro, N. C.

4,574,614, Reexam. No. 90/001,838, Requested Sept. 8, 1989, Cl. 72/447, APPARATUS FOR REPAIRING AND STRAIGHTENING VEHICLES, Carl R. Field, Owner of Record: *Doz-Mor, Inc., Des Moines, Iowa*, Attorney or Agent: Henderson & Sturm, Ex. Gp.: 320, Requester: Hein-Werner Corp., Waukesha, Wis.

4,631,215, Reexam. No. 90/001,842, Requested Sept. 12, 1989, Cl. 428/105, EXTRUDED ARTICLE AND METHOD OF MAKING THE SAME, Dennis G. Welygan, Owner of Record: *The Minnesota Mining & Manufacturing Co., St. Paul, Minn.*, Attorney or Agent: Richard Francis, Ex. Gp.: 150, Requester: Owner

4,634,485, Reexam. No. 90/001,843, Requested Sept. 12, 1989, Cl. 156/244, EXTRUDED ARTICLE AND METHOD OF MAKING THE SAME, Dennis G. Welygan, et al., Owner of Record: *The Minnesota Mining & Manufacturing Co., St. Paul, Minn.*, Attorney or Agent: Richard Francis, Ex. Gp.: 150, Requester: Owner

4,742,050, Reexam. No. 90/001,840, Requested Sept. 11, 1989, Cl. 514/34, SENSITIZATION OF HYPOXIC TUMOR CELLS AND CONTROL OF GROWTH THEREOF, John M. Yuhas, et al., Owner of Record: *Adamantech Inc., Linwood, Pa.*, Attorney or Agent: Donald R. Johnson, Ex. Gp.: 180, Requester: Owner

4,758,457, Reexam. No. 90/001,841, Requested Sept. 9, 1989, Cl. 428/82, FLOOR MAT WITH INTEGRAL RETAINER MEANS, Mark Altus, Owner of Record: *The 2500 Corp., Birmingham, Miss.*, Attorney or Agent: D. E. Dolgorukov, Ex. Gp.: 150, Requester: Owner

4,797,170, Reexam. No. 90/001,837, Requested Sept. 6, 1989, Cl. 156/71, SYSTEM FOR HOLDING CARPET IN PLACE WITHOUT STRETCHING, Merle R. Hoopengardner, Owner of Record: *Jactac Inc., Lafayette, Calif.*, Attorney or Agent: Unknown, Ex. Gp.: 130, Requester: Orcon Corp., Union City, Calif.

Service by Publication

A petition to cancel the registration identified below having been filed, and the notice of such proceeding sent by registered mail to registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrant listed herein, its assigns or legal representatives, shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

Santa Cruz Imports, Inc., South San Francisco, Calif., Reg. No. 1,275,314, for the mark "SANTA CRUZ" and design, Canc. No. 17,900

ERMA S. BROWN
Administrator of the Trademark Trial
and Appeal Board
For JEFFREY M. SAMUELS
Assistant Commissioner for Trademarks

Service by Publication

A petition to cancel each of the registrations identified below having been filed, and the notice of such proceedings sent by certified mail to registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrant listed herein, their assigns or legal representatives shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

Hampton Shops, Patterson, N.J., Reg. No. 559,850, for the mark "HAMPTON FURNITURE SHOPS", Canc. No. 17,471.

Eco Pump Corporation, South Plainfield, N. J., Reg. No. 947,214, for the mark "CHEM-X", Canc. No. 17,623.

Advance Schools, Inc., Chicago, Ill., Reg. No. 1,002,397, for the mark "A NEW SCHOOL OF THOUGHT", Canc. No. 17,665.

Sanger Fruit Growers Association, Sanger, Calif., Reg. No. 182,747, for the mark "ROSE", Canc. No. 17,767.

Alpha Designs, Inc., Cincinnati, Ohio, Reg. No. 922,633, for the mark "DIAPERMATE", Canc. no. 17,803.

Anabolic, Inc., Glendale, Calif., Reg. No. 443,689, for the mark "NUTRI-NEWS", Canc. No. 17,839.

Prosol Corporation, Milltown, N.J., Reg. NO. 1,277,194, for the mark "PROTACK", Canc. No. 17,871.

Jarco Manufacturing Corp., Patterson, N.J., Reg. No. 588,148, for the mark "FLIPPO", Canc. No. 17,987.

Martin Geller, dba Artbeats, Brooklyn, N.Y., Reg. No. 1,288,991, for the mark "ARTBEATS", Canc. No. 18,008.

ERMA S. BROWN
Administrator of the
Trademark Trial and
Appeal Board
For JEFFREY M. SAMUELS
Assistant Commissioner for
Trademarks

REGISTRATION TO PRACTICE

The following list contains the names of persons applying for registration to practice before the United States Patent and Trademark Office. These persons have been given provisional recognition pursuant to 37 CFR 10.9(a) to prepare and prosecute patent applications before the Office. Final approval for registration is subject to establishing to the satisfaction of the Director of the Office of Enrollment and Discipline that the person seeking registration is of good moral character and repute. [37 CFR 10.7 (a)]. Accordingly, any information tending to affect the eligibility of any of the following applicants on moral, ethical, or other grounds should be furnished the Director, Office of Enrollment and Discipline on or before November 13, 1989:

Andes, William Scott, 3585 Miller Rd., Springfield, Ohio 45502
Burnett, Robert F., 6322 Alberta St., Springfield, Va. 22152
Crosby, Gene P., 2201 Scroggins Rd., Alexandria, Va. 22302
Feldman, Peter, 8802 Liberty La., Potomac, Md. 20854
Forrer, Donald D., 1260 Chanler La., Bowie, Md. 20715
Gubernick, Franklin L., 1420 Nott St., Schenectady, N.Y. 12308
Kucia, Richard R., 1707 Crestwood Dr., Alexandria, Va. 22302
Mackey, Robert R., 6323 Phyllis La., Alexandria, Va. 22312
Nixon, Norman A., 24451 Lake Shore Blvd., Cleveland, Ohio 44123
Showalter, Robert L., Jr., 7116 Creekwater Dr., Centerville, Ohio 45459
Tanenholtz, Alvin E., 12304 Old Canal Rd., Potomac, Md. 20854
Telesz, Andrew J., 4015 North 20th St., Arlington, Va. 22207
Wan, Gene, 613 N. Tazewell St., Arlington, Va. 22203

Sept. 22, 1989

CAMERON WEIFFENBACH,
Director of Enrollment
and Discipline

PATENT NOTICES

Certificates of Correction For Week of October 17, 1989

B1. 4,526,828	4,787,672	4,801,232	4,816,045
PLT. 6698	4,788,414	4,801,379	4,816,485
RE. 32892	4,788,445	4,801,663	4,816,498
D. 298,883	4,788,599	4,801,666	4,816,588
D. 300,013	4,789,152	4,802,584	4,816,634
4,580,457	4,789,535	4,803,008	4,816,638
4,596,787	4,789,717	4,805,150	4,816,733
4,628,779	4,790,501	4,805,165	4,816,996
4,629,025	4,790,534	4,805,224	4,817,437
4,653,137	4,790,783	4,806,172	4,817,567
4,662,515	4,790,866	4,806,329	4,817,789
4,672,604	4,791,229	4,806,492	4,817,871
4,689,129	4,791,631	4,808,459	4,817,970
4,715,217	4,791,920	4,809,054	4,818,076
4,726,210	4,792,157	4,809,344	4,818,290
4,745,159	4,792,480	4,809,403	4,818,729
4,749,269	4,792,635	4,809,676	4,818,879
4,760,072	4,792,668	4,810,000	4,819,120
4,762,532	4,793,169	4,810,072	4,819,155
4,764,061	4,793,408	4,810,143	4,820,992
4,767,087	4,793,421	4,810,171	4,821,065
4,767,586	4,793,531	4,811,199	4,821,223
4,768,787	4,794,162	4,811,493	4,822,624
4,770,224	4,794,212	4,811,494	4,823,858
4,771,002	4,794,233	4,811,685	4,823,898
4,771,301	4,794,409	4,811,910	4,823,995
4,774,294	4,794,716	4,812,316	4,824,000
4,774,918	4,795,713	4,812,642	4,824,139
4,776,193	4,796,648	4,812,824	4,824,672
4,776,676	4,797,330	4,813,132	4,827,035
4,778,738	4,797,344	4,813,159	4,827,272
4,778,821	4,797,627	4,813,325	4,828,439
4,781,441	4,798,081	4,813,501	4,829,076
4,782,247	4,798,115	4,813,503	4,829,294
4,782,732	4,798,208	4,815,055	4,831,165
4,783,257	4,798,676	4,815,320	4,831,547
4,784,123	4,799,550	4,815,512	4,836,935
4,784,578	4,801,026	4,815,814	

SPECIAL BOXES FOR MAIL

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Box SN	New patent application and associated papers and fees.
PATENT APPLICATION	
TRADEMARK APPLICATION	
Box Assignments	New trademark application and associated papers and fees.
	All assignment documents except those filed in new patent applications.

Reference Collection of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries (PDLs), receive current issues of U.S. Patents and maintain collections of earlier-issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections, which are organized in patent number sequence, are available for use by the public free of charge. Each of the PDLs, in addition, offers supplemental reference publications of the U.S. Patent Classification System, including the *Manual of Classification*, *Index to the U.S. Patent Classification*, *Classification Definitions*, and provides technical staff assistance in their use to aid the public, in gaining effective access to information contained in patents. CASSIS (Classification And Search Support Information System); which provides direct, on-line access to Patent and Trademark Office data, is available at all PDLs. Facilities for making paper copies of patents from either microfilm or paper collections are generally provided for a fee.

Since there are variations in the scope of patent collections among the PDLs and in their hours of service to the public, anyone contemplating use of the patents at a particular library is urged to contact that library, in advance, about its collection and hours in order to avert possible inconvenience.

State	Name of Library	Telephone Contact
Alabama	Auburn University Libraries	(205) 844-1747
	Birmingham Public Library	(205) 226-3680
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Arizona	Tempe: Noble Library, Arizona State University	(602) 965-7607
Arkansas	Little Rock: Arkansas State Library	(501) 682-2053
California	Los Angeles Public Library	(213) 612-3273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale Patent Clearinghouse	(408) 730-7290
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Oklahoma	Stillwater: Oklahoma State University Library	(405) 744-7086
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Pennsylvania	Philadelphia, The Free Library of	(215) 686-5331
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	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
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South Carolina	Charleston: Medical University of South Carolina Library	(803) 792-2371
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	Houston: The Fondren Library, Rice University	(713) 572-8101 Ext.2587
	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Utah	Richmond: Virginia Commonwealth University Library	(804) 367-1104
Virginia	Seattle: Engineering Library, University of Washington	(206) 543-0740
Washington	Madison: Kurt F. Wendt Library, University of Wisconsin	(608) 262-6845
Wisconsin	Madison	(414) 278-3247
	Milwaukee Public Library	

PATENT EXAMINING CORPS

JAMES E. DENNY, Acting Assistant Commissioner
STEPHEN G. KUNIN, Acting Deputy Assistant Commissioner
CONDITION OF PATENT APPLICATIONS AS OF September 9, 1989

PATENT EXAMINING GROUPS

Actual Filing Date of Oldest
New Case Awaiting Action

CHEMICAL EXAMINING GROUPS

GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	5-26-87
ORGANIC CHEMISTRY GROUP 120—S. N. ZAHARNA, Director	6-16-87
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	4-15-87
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	5-14-87
BIOTECHNOLOGY, GROUP 180—J. E. KITTLE, Director	7-30-86

ELECTRICAL EXAMINING GROUPS

INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—D. G. Kelly, Director	5-4-87
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	12-23-86
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—G. GOLDBERG, Director	5-28-87
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M. BLIX, Director	5-27-88
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director	8-18-87
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. LEVY, Acting Director	7-2-87
DESIGN, GROUP 290—K. L. CAGE, Director	2-6-86

MECHANICAL EXAMINING GROUPS

HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	1-12-88
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—N. GODICI, Acting Director	4-13-88
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—J. J. LOVE, Director	4-20-87
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—C. CROYLE, Acting Director	2-26-88
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	10-3-88

Expiration of patents: The patents within the range of numbers indicated below expire during September 1989, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

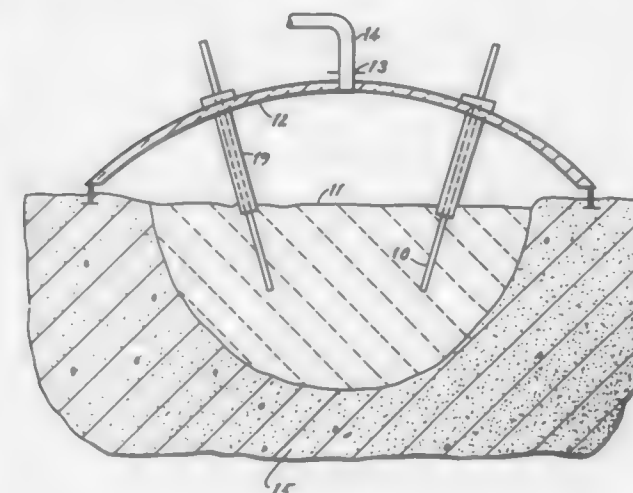
Patents	Numbers 3,688,314 to 3,694,813 inclusive
Plant Patents	None

REEXAMINATIONS

OCTOBER 17, 1989

Matter enclosed in heavy brackets [] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 4,376,598 (1142nd)
IN-SITU VITRIFICATION OF SOIL
 Richard A. Brouns, Kennewick; James L. Buelt, and William F. Bonner, both of Richland, all of Wash., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.
 Reexamination Request No. 90/001,507, May 5, 1988.
 Reexamination Certificate for Patent No. 4,376,598, issued Mar. 15, 1983, Ser. No. 251,663, Apr. 6, 1981.
 Filed May 5, 1988, Ser. No. 251,663
 Int. Cl.⁴ E02D 3/00
 U.S. Cl. 405—258



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 5, 10, and 12-14 are cancelled.

Claims 1-3, 6 and 8 are determined to be patentable as amended.

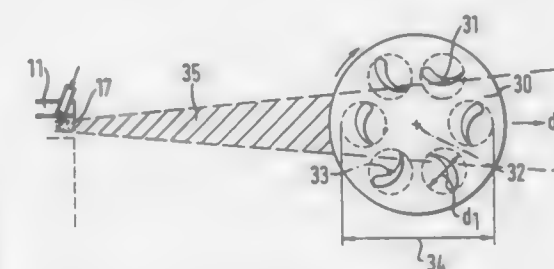
Claims 4, 7, 9, 11 and 15, dependent on an amended claim, are determined to be patentable.

New claims 16-31 are added and determined to be patentable.

1. A method for in-situ vitrification of soil, comprising the following steps:

inserting at least one pair of electrodes into [the] soil in the ground at spaced positions from one another;
 providing an initial electrically conductive resistance path in the soil across the electrodes;
 passing electrical current through the electrically conductive resistance path by application of current to the electrodes to heat the soil about the path to its melting temperature, thereby establishing a current-carrying pathway through the molten soil between the electrodes;
 continuing application of current to the electrodes until the soil between them and immediately adjacent to them has been melted; [and]
 retaining said melted soil in the ground; and
 terminating application of current to the electrodes to permit cooling and solidification of substantially all the melted soil in situ between the electrode positions into a solid mass.

B1 4,596,718 (1143rd)
VACUUM PLASMA COATING APPARATUS
 Heiko Gruner, Beinwil am See, Switzerland, assignor to Plasmainvent AG, Zug, Switzerland
 Reexamination Request No. 90/001,486, Apr. 6, 1988.
 Reexamination Certificate for Patent No. 4,596,718, issued Jun. 24, 1986, Ser. No. 746,105, Jun. 18, 1985.
 Filed Apr. 6, 1988, Ser. No. 746,105
 Claims priority, application Fed. Rep. of Germany, Jun. 19, 1984, 3422718
 Int. Cl.⁴ B05D 1/08
 U.S. Cl. 427—34



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1 and 11 are determined to be patentable as amended.

Claims 2-10, dependent on an amended claim, are determined to be patentable.

1. Vacuum plasma coating apparatus comprising: means for supporting a plurality of parts to be coated in a manner for moving the parts with a plurality of degrees of freedom; and a plasma torch for producing a plasma jet and arranged in a vacuum chamber for displacement along a plurality of axes relative to the part to be coated; said means for moving the parts to be coated being arranged to move the parts simultaneously or sequentially through the plasma jet, the part nearest the plasma torch at any moment being arranged in the plasma jet in such manner that the jet extends at least occasionally laterally beyond an outer dimension of the part, and all parts to be coated moving within a predetermined spray distance range when they are located in the plasma jet, said predetermined spray distance range defined as a distance range from the plasma torch within which a plasma sprayed material remains in at least a softened state, and wherein a plurality of parts are coated simultaneously.

B1 4,617,052 (1144th)
PROCESS FOR PREPARING A MOTHER ALLOY FOR MAKING AMORPHOUS METAL
 Tomoo Takenouchi; Yoshiaki Ichinomiya, and Yoshiyuki Iwanami, all of Hokkaido, Japan
 Reexamination Request No. 90/001,207, Mar. 31, 1987.
 Reexamination Certificate for Patent No. 4,617,052, issued Oct. 14, 1986, Ser. No. 771,078, Aug. 30, 1985.
 Filed Mar. 31, 1987, Ser. No. 771,078
 Claims priority, application Japan, Jan. 28, 1985, 60-12489
 Int. Cl.⁴ C21C 33/00
 U.S. Cl. 420—129

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1-10 are cancelled.

[1. A process for preparing a mother alloy for making a Fe-B-Si base amorphous metal, comprising the steps of: providing a molten metal containing an iron source and ferrosilicon; adding to the molten metal a mineral ore containing a boron oxide; reducing a predetermined amount of the boron oxide in the molten metal by the reducing action of carbon or aluminum that is initially present in the metal or externally added together with the mineral ore, thereby dissolving said boron oxide as elemental boron in the molten metal; removing the carbon or aluminum by supplying an oxidant; adjusting the contents of boron and silicon in the molten metal to be within a desired composition range.]

**B1 Des. 273,843 (1141st)
CONTAINER BODY**

Kenard E. Urion, Woodbury, N.J., assignor to Scott Paper Co., Philadelphia, Pa.

Reexamination Request No. 90/001,526, Jun. 17, 1988.
Reexamination Certificate for Patent No. Des. 273,843, issued May 15, 1984, Ser. No. 232,279, Feb. 6, 1981.
Filed Jun. 17, 1988, Ser. No. 232,279

U.S. Cl. D9-339

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claim 1 is cancelled.

REISSUES

OCTOBER 17, 1989

Matter enclosed in heavy brackets [] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

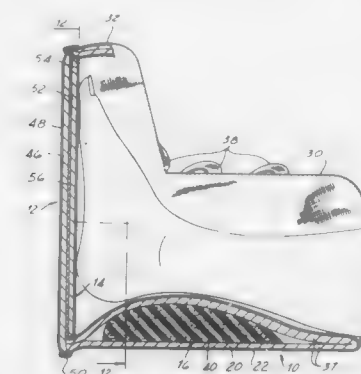
Re. 33,090

ISOTHERMIC PROTECTIVE BOOT

Ramon Berguer, West Bloomfield, Mich., assignor to Lunax Corporation, New Baltimore, Mich.
Original No. 4,369,588, dated Jan. 25, 1983, Ser. No. 227,367, Jan. 22, 1981. Application for reissue May 27, 1988, Ser. No. 199,921

Int. Cl.⁴ A43B 1/02, 1/10, 7/14
U.S. Cl. 36-9 R

5 Claims



19. An isothermic protective boot having a foot-receiving part and a contiguous leg-receiving part adapted to extend up to at least the lower portion of the calf of a lower extremity of a patient, said boot having a complete inner lining of relatively soft, non-allergenic material, said boot also having a layer of relatively soft, flexible, compressible isothermic protective material throughout the full extent of both its parts, a body of flexible, compressible weight-bearing material along at least a portion of the back of said leg-receiving part in a position to extend along the heel cord of the patient such that when the patient is lying on his back the weight-bearing surface of the extremity of the patient will be over the heel cord and lower aspect of the calf thus relieving the bottom of the heel of any substantial weight bearing, said boot being sufficiently flexible to afford the patient at least limited ambulation, the exterior of said boot being soft and devoid of hard surfaces and sharp edges to preclude injury to the patient's other extremity, said boot having confronting edges at the front permitting said boot to be opened along said confronting edges to apply and remove said boot, said boot being adapted to cover and protect the lower calf portion and foot of the patient from the rear of the boot around the sides thereof to said confronting edges at the front of the boot, and releasable fastening means for the front of said boot adapted to provide a connection between said confronting edges.

Re. 33,091

ASH DISPOSAL DAMPER FOR BARBECUE KETTLE
Erich J. Schlosser, Lindenhurst, Ill., assignor to Weber-Stephen Products Co., Palatine, Ill.

Original No. 4,624,239, dated Nov. 25, 1986, Ser. No. 804,446, Dec. 4, 1985. Continuation-in-part of Ser. No. 222,125, Jan. 22, 1981, abandoned. Application for reissue Nov. 21, 1985, Ser. No. 800,584

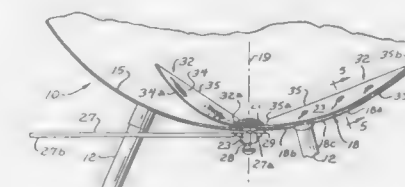
Int. Cl.⁴ F24C 1/16

U.S. Cl. 126-9 B

13 Claims

1. In a kettle-type barbecue grill having a [generally hemispherical] bottom extending around a center vertical axis and having a plurality of air intake openings equally circumferentially-spaced around said bottom with damper means for covering said air intake openings, the improvement of said damper means including a post rotatable about said vertical

axis and having a removable radial arm for each of said openings retained thereon and extending therefrom, said removable arms being maintained at a predetermined angular orientation on said post, said bottom having an aperture aligned with said vertical axis and said post being received into said aperture,



and a handle secured to said post below said bottom, and releasably retained on said post to retain said post in said aperture, so that said arms can be telescoped on said post, and said post can be inserted into said aperture and retained therein by said handle without the use of any tools.

Re. 33,092

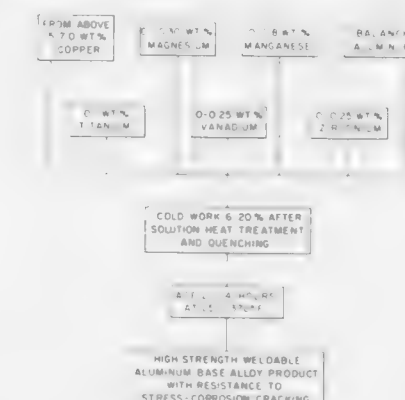
HIGH STRENGTH WELDABLE ALUMINUM BASE ALLOY PRODUCT AND METHOD OF MAKING SAME
Robert E. Sanders, Jr., and Jocelyn I. Petit, both of New Kensington, Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Original No. 4,610,733, dated Sep. 9, 1986, Ser. No. 683,021, Dec. 18, 1984. Application for reissue Jun. 8, 1987, Ser. No. 76,051

Int. Cl.⁴ C22F 1/04

U.S. Cl. 148-12.7 A

23 Claims



15. A method of making an aluminum base alloy product characterized by high strength including high resistance to ballistic penetration, resistance to stress-corrosion cracking, and weldability, comprising the steps of:

- forming an alloy consisting essentially of from above 5 wt. % to 7 wt. % copper, 0 to 0.8 wt. % manganese, 0.1 wt. % titanium max, 0 to 0.25 wt. % vanadium, 0 to 0.25 wt. % zirconium and 0.1 to 0.3 wt. % magnesium with the balance consisting essentially of aluminum;
- cold working the alloy an amount equal to at least 6% stretching at room temperature after solution heat treatment and quenching; and
- aging the cold worked alloy for at least 2 hours at a temperature of at least 121° C. (250° F.).

Re. 33,093

BIOADHESIVE EXTRUDED FILM FOR INTRA-ORAL DRUG DELIVERY AND PROCESS

Michael T. Schiraldi, East Brunswick, N.J.; Martin M. Perl, Brooklyn, N.Y., and Howard Rubin, Rockaway, N.J., assignors to Johnson & Johnson Consumer Products, Inc., New Brunswick, N.J.

Original No. 4,713,243, dated Dec. 15, 1987, Ser. No. 874,904, Jan. 16, 1986. Application for reissue Nov. 16, 1988, Ser. No. 272,354

Int. Cl.⁴ A01N 59/10; A61K 33/16

U.S. Cl. 424—676

9 Claims

1. A pharmaceutically acceptable controlled-releasing medicament-containing extruded single or multi-layered thin film, capable of adhering to a wet mucous surface, comprising a water soluble or swellable polymer matrix bioadhesive layer which can adhere to a wet mucous surface and which bioadhesive layer consists essentially of [40-95] 20-93% by weight of a hydroxypropyl cellulose having a molecular weight above 100,000, 5-60% of a homopolymer of ethylene oxide having a molecular weight from 3,000,000 to 5,000,000, 0-10% of a water-insoluble polymer selected from the group consisting of ethyl cellulose, propyl cellulose, polyethylene and polypropylene, and 2-10% of a plasticizer, said film having incorporated therein a pharmaceutically effective amount of said medicament.

Re. 33,094

ELECTROPHOTOGRAPHIC MEMBER WITH ALPHA-SI LAYERS

Eiichi Maruyama, Kodaira, Japan; Sachio Ishioka, Burlingame, Calif.; Yoshinori Imamura, Suarashi, Japan; Hirokazu Matsubara, Hamuramachi, Japan; Yasuharu Shimomoto, Hamamatsu, Japan; Shinkichi Horigome, Tachikawa, Japan, and Yoshio Taniguchi, Hino, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

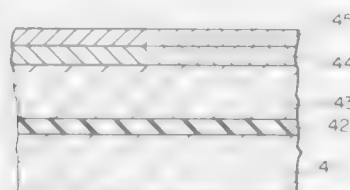
Original No. 4,378,417, dated Mar. 29, 1983, Ser. No. 254,294, Apr. 15, 1981. Application for reissue Sep. 11, 1986, Ser. No. 162,312

Claims priority, application Japan, Apr. 16, 1980, 55-49236

Int. Cl.⁴ G03G 5/082

U.S. Cl. 430—57

16 Claims



8. [An] In an electrophotographic member [according to claim 1,] comprising at least a predetermined supporter having a conductive surface and an amorphous silicon layer which is electrically in contact with said conductive surface and which contains hydrogen and silicon as indispensable constituent elements thereof, the improvement comprising an amorphous silicon layer in which the silicon amounts to at least 50 atomic % and the hydrogen amounts to at least 1 atomic % and, at most, 50 atomic %, said amorphous layer comprising a first region, a second region, and a third region,

said first region being at least 10 nm thick, extending inwardly from an outer surface of said amorphous silicon layer and being made of amorphous silicon which has an optical forbidden band gap of at least 1.6 eV and a resistivity of at least $10^{10} \Omega \cdot \text{cm}$;

said second region being located at least 10 nm from said surface of said amorphous layer, having a thickness of at least 10 nm, and being made of amorphous silicon which contains germanium and which has an optical forbidden band gap

that is smaller than that of said first region at the surface of the amorphous silicon and that is at least 1.1 eV; and said third region being located on a side opposite to said surface side formed by said first region and being made of amorphous silicon which has an optical forbidden band gap of at least 1.6 eV and a resistivity of at least $10^{10} \Omega \cdot \text{cm}$, and further comprising a layer on the side of the supporter in electrical contact with the amorphous silicon for suppressing the injection of excess carriers from the supporter side.

Re. 33,095

MAGNESIUM CALCIUM ACETATE PRODUCTS, AND PROCESS FOR THEIR MANUFACTURE

Alan B. Gancy, 265 Robineau Rd., Syracuse, N.Y. 13207
Original No. 46,997,25, dated Oct. 13, 1987, Ser. No. 941,171, Dec. 12, 1986. Application for reissue Mar. 15, 1988, Ser. No. 168,433

Int. Cl.⁴ C09K 3/18

U.S. Cl. 252—70

15 Claims

1. An economical process for the manufacture of magnesium calcium acetate hydrate comprising the following steps:

- introducing finely divided ore containing chemically active calcium oxide and chemically active magnesium oxide to an agitated reaction vessel such that the mol fraction of magnesium in said ore falls within the range 0.68-14 1.0.
 - introducing to said agitation reaction vessel a measured quantity of water such that the number of mols of water is numerically equal to x times the number of mols of said chemically active magnesium oxide, minus one-half the number of moles of acetic acid introduced where x equals 4.5-6;
 - introducing to said agitated reaction vessel a measured amount of acetic acid stoichiometrically equivalent to said chemically active calcium oxide and chemically active magnesium oxide;
 - allowing the product formed through steps a., b. and c. to freeze.
9. A new composition of matter, useful as as surface deicer, having the empirical formula



where

$n/(m+n)$ is equal to 0.68-0.99, and W is equal to [3-4] 0-4.

10. The composition of matter of claim 9 wherein $n/(m+n)$ is equal to 0.8, and w equals [3-4] 0-4.

Re. 33,096

SEMICONDUCTOR SUBSTRATE

Seiichi Iwamatsu, Suwa, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan

Original No. 4,576,851, dated Mar. 18, 1986, Ser. No. 723,708, Apr. 16, 1985. Continuation of Ser. No. 394,070, Jul. 1, 1982, abandoned. Application for reissue Mar. 17, 1988, Ser. No. 171,370

Claims priority, application Japan, Jul. 2, 1981, 56-104298; Jul. 24, 1981, 56-116008

Int. Cl.⁴ H01L 27/12, 29/06, 21/305, 21/306

U.S. Cl. 428—156

16 Claims



9. A semiconductor substrate, comprising a single-crystal semiconductor material having a planar surface and an island of the semiconductor material projecting from the surface forming a projecting region and an insulating film having an opening for cooperating with the projecting region to form a smooth surface

Re. 33,097

POSITION DETECTOR

Christopher I. Moir, Malvern Link, England, assignor to Helitune Limited, United Kingdom

Original No. 4,604,526, dated Aug. 5, 1986, Ser. No. 550,479, Nov. 9, 1983. Application for reissue May 16, 1988, Ser. No. 194,551

Claims priority, application United Kingdom, Nov. 10, 1982, 8232096

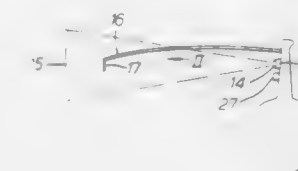
Int. Cl.⁴ G01N 21/86

U.S. Cl. 250—561

14 Claims

4. [A detector as claimed in claim 1, in which the] A position detector comprising means defining an elongate field of view, for viewing a target which is arranged to cross the field of view in any of a range of positions along the length of the field of view and

which has a reference part, which said reference part is a slot extending perpendicularly to the length of elongation of the field of view, a sensor in the form of a line of sensitive elements extending parallel with the field of view and positioned to receive



an image of the field of view, and electronic means for repeatedly scanning the elements in scanning cycles and for detecting the particular sensitive element which receives the image of the reference part of the target as the target crosses the field of view.

PLANT PATENTS

GRANTED OCTOBER 17, 1989

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

7,047

SPRAY CARNATION NAMED LONBANKIR

Nicole Barberet-Maiolino, and Henri Blanc, both of Antibes, France, assignors to Etablissements Barberet et Blanc, Laboratoire de Physiologie Vegetale, Les-Maures, France

Filed Oct. 11, 1988, Ser. No. 255,483

Int. Cl.⁴ A01H 5/00

U.S. Cl. Plt.—71

1 Claim

1. The new and distinct spray carnation cultivar and the parts thereof, substantially as herein shown and described, characterized in particular by the light purple coloration of its flowers, which are produced profusely at several times during the year, the plant having a vigorous growth habit with abundant foliage and good resistance to *Fusarium oxysporum*.

7,048

SPRAY CARNATION NAMED LONDUCI

Nicole Barberet-Maiolino, and Henri Blanc, both of Antibes, France, assignors to Etablissements Barberet et Blanc, Laboratoire de Physiologie Vegetale, Les-Maures, France

Filed Oct. 11, 1988, Ser. No. 255,482

Int. Cl.⁴ A01H 5/00

U.S. Cl. Plt.—73

1 Claim

1. The new and distinct spray carnation variety and the parts thereof, substantially as herein shown and described, characterized by the bright red color of its blossoms, its profuse production of flowers during the Spring, Midseason and Fall growing seasons, its abundant foliage, and its strong, rigid and upright growth habit.

1077

PATENTS

GRANTED OCT. 17, 1989

ERRATA

For CLASS	See PATENT NO.
441-036	4,873,933
131-364	4,874,004
248-097	4,874,141
248-185	4,874,142
285-082	4,874,174
221-221	4,874,236
562-002	4,874,556
562-851	4,874,557
562-894	4,874,558
426-074	4,874,606
148-012	4,874,644
536-055	4,874,752
524-482	4,874,783
355-309	4,874,958
174-052	4,875,138
346-155	4,873,334
548-157	4,873,346
568-319	4,873,363
568-344	4,873,364
568-345	4,873,365
388-814	4,873,473
346-140	4,873,622
065-374	4,873,674
370-058	4,873,694
371-021	4,873,705
328-062	4,873,708

PATENTS

GRANTED OCTOBER 17, 1989

GENERAL AND MECHANICAL

4,873,725

INFANT CARE APRON

Tonia L. Mitchell, 4147 Casey, Norcross, Ga. 30093

Filed Apr. 21, 1988, Ser. No. 184,185

Int. Cl.⁴ A41D 13/04

U.S. Cl. 2—48



1. An apron-type garment adapted to be worn by a caregiver for an infant comprising:

- a. a front panel fabricated from an air permeable, multilayered material which gives the front panel sufficient rigidity that sections of the front panel situated proximate any depressions in the contour of the caregiver's body and tend to bridge the depressions so that the front panel forms a shield that makes only minimal contact with the caregiver's body;
- b. means for securing the mid-section of the front panel about the caregiver's waist;
- c. rear panels that are approximately one-half as long as the front panel, the rear panels being fabricated from the multilayered material; upper edges of the front panel and of first and second rear panels being joined together to form first and second junctures, respectively; the rear panels together covering most of the caregiver's back above the waist, contiguous portions of the front panel and of the rear panels covering the caregiver's shoulders and extending laterally therefrom; each of the rear panels having an inner edge, the inner edges being disposed proximate and alignable generally parallel to each other;
- d. the front panel and the rear panels defining an opening which is sized large enough for the caregiver's head, the opening being disposed between the first and second junctures;
- e. means for adjusting the size of the opening, the adjusting means including a pair of ties, each tie being attached to one of the inner edges and positioned so that the pair of ties can be fastened together; the garment, once the size of the opening is properly adjusted, being removable without undoing the fastening between the ties; and
- f. any points of attachment between the front panel and the first and second rear panels being disposed within the first and second junctures, respectively, so that the garment can be laid out flat and easily donned in a cape-like fashion.

4,873,726

CAP ASSEMBLY

Ray Tapia, 1740 W. Kenneth Rd., Glendale, Calif. 91201

Filed Jul. 29, 1988, Ser. No. 226,416

Int. Cl.⁴ A42B 1/02

7 Claims U.S. Cl. 2—195

6 Claims



1. A visored cap apparatus comprising:

- (a) a crown assembly including:
 - (i) a head covering portion having a circumferentially extending band, said band including an exterior arcuate portion provided with a multiplicity of small first engagement members; and
 - (ii) an interior flexible guide band having first and second ends affixed to said circumferentially extending band, at circumferentially spaced location, said guide band being movable between a first retracted position and a second extended position; and
 - (iii) a generally arcuate shaped stiffening band carried by said head covering portion intermediate said first and second ends of said guide band, and
- (b) a visor assembly including an eye shade portion and an upstanding generally arcuate shaped portion, said arcuate shaped portion having first and second surfaces, said first surface having a multiplicity of small second engagement members for locking engagement with said first engagement members provided on said arcuate portion of said band of said head covering portion.

4,873,727

MARINE TOILET DEODORANT DISPENSER

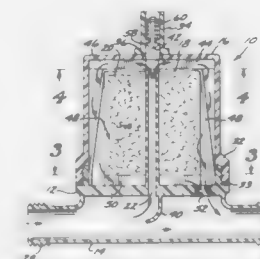
Donald A. Homan, Lighthouse Yacht Landing, Birth 203B, Space D-10, Wilmington, Calif. 90744

Filed May 15, 1987, Ser. No. 50,489

Int. Cl.⁴ E03D 9/02

U.S. Cl. 4—226

29 Claims



1. A deodorant dispenser for chemically treating the flushing fluid of a marine toilet comprising, in combination: means for mounting said deodorant dispenser to a flushing fluid line and including a fluid passage therethrough and a

central passage communication with said fluid passage and extending laterally therefrom;
 means for admitting said flushing fluid, said admitting means in mechanical communication with said fluid passage for providing an inlet connection;
 means for discharging said flushing fluid, said discharging means in mechanical communication with said fluid passage for providing an outlet connection, said admitting and discharging means each being of constant diameter;
 fluid collecting means connected to said mounting means for capturing a portion of said flushing fluid in said fluid passage and for routing said portion into said central passage within said deodorant dispenser;
 solid chemical block mounted around said central passage, containing means snugly seated within said mounting means for encapsulating said solid chemical block mounted about said central passage, an annular space between said containing means and said block, said containing means having a plurality of vertical slots for directing said flushing fluid to said annular space between said containing means and said block, said containing means being enclosed within a housing means and being easily replaced without contacting said block; and
 fluid passing means formed between said containing means and said housing means for passing said flushing fluid from said central passage to said annular space for providing contact between said flushing fluid and said block forming a chemically treated flushing fluid
 outlet means formed in said mounting means in fluid communication between said annular space and said fluid passage wherein said housing means cooperates with said central passage for routing said flushing fluid through said dispenser and being threadably engaged to said mounting means for providing a leakproof seal.

4,873,728

PORTABLE DISINFECTING DEVICE FOR A TOILET SEAT AND OTHER SURFACES

Salvatore Bono, 885 Manor La., Bay Shore, N.Y. 11706

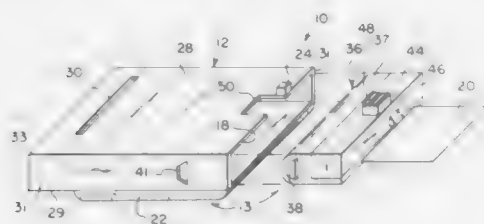
Filed Sep. 14, 1988, Ser. No. 244,019

The portion of the term of this patent subsequent to Dec. 22, 2004, has been disclaimed.

Int. Cl.⁴ A47K 17/00

U.S. Cl. 4-233

5 Claims



1. A portable disinfecting device for a toilet seat and other surfaces which comprises:

- (a) a housing that will slide on rim width of the toilet seat and against the other surfaces when said housing is manually manipulated said housing including a top wall having a top slot thereacross near one end and a cutout area at other end for mounting an activate button, a bottom wall having a bottom slot thereacross directly below said top slot for receiving a disinfectant tissue and forwarding it through said top slot, a pair of side walls, each having an aperture for receiving a pair of spring biased members, one end wall having an open end opposite said end wall;
- (b) means for disinfecting the toilet seat and the other surfaces, said means disposed in said housing and extends therefrom so as to make contact with the toilet seat and the other surface said disinfecting means including a pair of

take-up rollers rotatably mounted within said housing in alignment with said top slot in said top wall and said bottom slot in said bottom wall, a sponge member affixed to underside of said bottom wall of said housing between said bottom slot and said open end, a replaceable refill cartridge which is received within said open end of said housing, said refill cartridge being a casing with a roll of disinfectant tissue therein that extends outwardly from one side, said casing having a pair of spring biased latch members which mate with said apertures in said side wall of said housing, and a dispenser mounted into said refill cartridge for spraying disinfectant liquid therefrom onto said disinfectant tissue that extends outwardly from said casing whereby said disinfectant tissue goes around said sponge member for making contact with the toilet seat and other surfaces, then goes into said bottom slot in said bottom wall of said housing, between said take-up rollers and upwardly through said top slot in said top wall.

4,873,729

AUTOMATIC DEVICE FOR THE DISINFECTION OF W.C. BOWLS AND SEATS

Jacques Micallef, 14 rue Murillo, F-75008 Paris, France

PCT No. PCT/FR84/00264, § 371 Date Jul. 17, 1985, § 102(e)

Date Jul. 17, 1985, PCT Pub. No. WO85/02214, PCT Pub. Date May 23, 1985

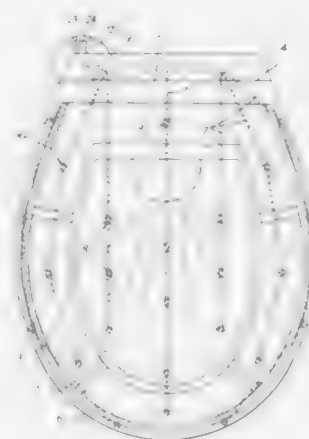
PCT Filed Nov. 16, 1984, Ser. No. 756,435

Claims priority, application France, Nov. 18, 1983, 83 18364

Int. Cl.⁴ A47K 13/00

U.S. Cl. 4-233

14 Claims



1. In a toilet comprising a pan, a fixed seat integral with the upper edge of the pan and a folding seat movable between an upper position and a lower position in which a lower face of said folding seat engages the fixed seat, an automatic disinfection device which comprises:

- (a) a folding lid made of molded plastic material, said folding lid being movable between an upper open position and a lower closed position, said folding lid having a plane portion and a curved edge of which the inner surface, in the closed position, registers with the outer edges of the folding seat and of the fixed seat,
- (b) a sealing joint fixed to the end portion of the curved edge of the lid and adapted, in the closed position of the lid, to come in close contact with the external peripheral surface of the pan,
- (c) molded ducts in the folding lid,
- (d) a plurality of dispersal heads provided on the entire inner surface of the plane portion and of the curved edge of the folding lid, said heads being disposed to project a disinfection product on the inner surface of the pan, on the fixed seat and on the upper and lower surfaces of the folding

seat, each dispersal head being connected to one of said ducts,

- (e) a main duct molded in a rear part of said folding lid and to which said ducts are connected,
- (f) a tank containing a disinfectant product under pressure, disposed in the vicinity of the rear portion of said folding lid,
- (g) a flexible duct connecting said main duct to an outlet of the tank,
- (h) and means on said folding lid adapted to co-act with a control portion of said tank to cause, in the closed position of said lid, said tank outlet to feed the dispersal heads through said flexible duct, said main duct and said ducts with disinfection product.

4,873,730

DISENGAGABLE RING FITTING FOR A TOILET

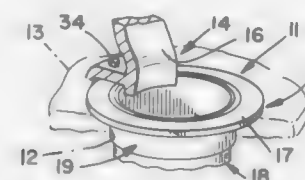
Casper Cuschera, 1047 - 77th Ave., Oakland, Calif. 94621

Filed Oct. 15, 1985, Ser. No. 787,040

Int. Cl.⁴ E03D 11/00

U.S. Cl. 4-252 R

10 Claims



1. A fitting for coupling the base of a toilet or the like to a floor and to a drain pipe thereat, the fitting having a cylindrical sleeve proportioned for engagement on the upper end of said drain pipe in coaxial relationship thereon and wherein said sleeve has a flange at the upper end, said fitting further including a ring disposed at the upper end of said sleeve in coaxial relationship therewith, the ring having a plurality of passages through which fasteners may be extended to couple said ring to said floor and to couple said toilet base to said ring, said ring being of larger diameter than said flange of said sleeve and having an inner edge which extends beneath said flange, wherein the improvement comprises:

- said ring having a plurality of notches in said inner edge thereof, said notches being at spaced apart locations around said inner edge of said ring, and
- a plurality of ring retainer projections extending radially outwardly from the outer surface of said sleeve beneath said inner edge of said ring, said projections being at locations around the circumference of said sleeve that are spaced apart by distances corresponding to the spacing of said notches around said inner edge of said ring, said projections being equidistantly spaced from said flange by a distance at least equal to the thickness of said inner edge of said ring to enable movement of said inner edge along the space between said flange and said projections when said ring is rotated to move said notches away from the locations of said projections, said projections being proportioned to pass through said notches to enable separation of said ring from said sleeve when said ring is rotated to bring said notches and projections to the same locations.

4,873,731

ADJUSTABLE BED SYSTEM

Robert M. Williamson, 1708 Matthews La., Austin, Tex. 78745

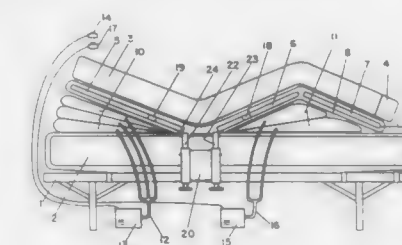
Continuation-in-part of Ser. No. 54,203, May 26, 1987, Pat. No. 4,839,932. This application Feb. 1, 1989, Ser. No. 305,009

The portion of the term of this patent subsequent to Jun. 20, 2006, has been disclaimed.

Int. Cl.⁴ A47C 20/08; A61G 7/06

U.S. Cl. 5-68

2 Claims



1. An inflatable bed system comprising:
 a sectional mattress support frame;
 a means for securing a mattress to said frame;
 an inflatable member dispositionable beneath a section of said frame to raise and lower said frame;
 a means for inflating and deflating said member, said inflating and deflating means further comprising:
 first and second blowers oppositely positioned within a blower housing, said first blower adapted to positively pressurize said inflatable member to raise said frame and said second blower adapted to positively withdraw air from said inflatable member to lower said frame.

4,873,732

TRAUMA STRETCHER

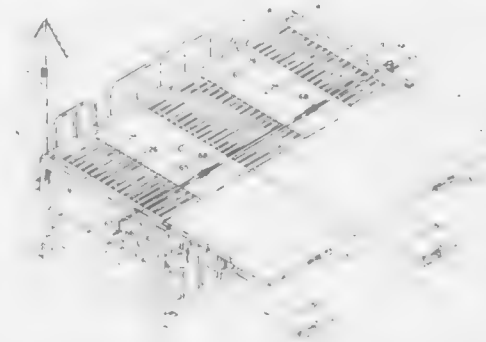
Roberto Perez, 860 Harrison Ave., #1208, Boston, Mass. 02118

Filed Oct. 24, 1988, Ser. No. 261,260

Int. Cl.⁴ A61G 7/10

U.S. Cl. 5-81 B

8 Claims



1. A trauma stretcher for use in transferring a patient to and from stretcher to bed or operating table, comprising:
 a generally rectangular wheeled chassis frame with a top, bottom, two sides and two ends;
 a generally flat rectangular platform with top and bottom faces mounted thereon the platform's top face having a plurality of rows of roller bars whereby said rows are parallel to each other and are positioned so that each row is perpendicularly oriented to the platform's longitudinal axis and each individual roller bar is oriented parallel to the platform's longitudinal axis;
 a rectangular patient litter with top and bottom faces slidably positioned atop said platform;
 a plurality of extension arms pivotally attached to the sides of said chassis and having means for sliding said litter across;

a plurality of stabilizer legs pivotally attached to the sides of said chassis; and a rod with two ends and a plurality of knurled gears formed concentrically about its surface circumference wherein said rod is positioned across the platform's top face in line with the longitudinal axis of the platform and having its ends inserted through top end crossbars forming a portion of the chassis frame.

4,873,733 TOY BED

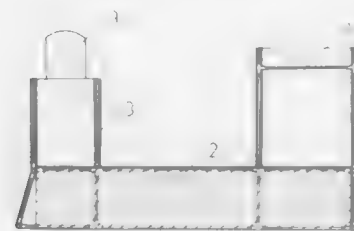
Ted T. H. Wang, Room 401, 168, Chung Cheng 4 Road, Kaohsiung, Taiwan

Continuation-in-part of Ser. No. 947,722, Dec. 30, 1986, abandoned. This application May 5, 1988, Ser. No. 188,698

Int. Cl.⁴ A47D 7/00

U.S. Cl. 5—93 R

9 Claims



1. An assembled toy bed, which comprises a frame, mattress and cover, the frame comprising tubes and joints, each tube having two ends and each joint having at least two openings for receiving the ends of the tubes, the joints combining the tubes together to form a rigid three dimensional structure having a shape mimicking one of a locomotive, car, ship, submarine and tank, the mattress being tightly surrounded by the frame and stabilizing the frame, and the cover being made of a single sheet of a material, having a shape corresponding to the frame, and arranged to tightly encompass the frame.

4,873,734 BUMPER SHEET

Dianne J. Pollard, 69 Jackson Way, Alamo, Calif. 94507

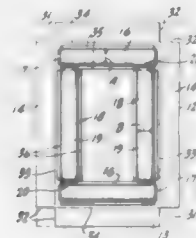
Continuation-in-part of Ser. No. 878,292, Jun. 25, 1986, Pat. No. 4,754,509, which is a continuation of Ser. No. 723,109, Apr. 15, 1985, Pat. No. 4,607,402. This application Jul. 1, 1988, Ser. No. 214,084

The portion of the term of this patent subsequent to Aug. 26, 2003, has been disclaimed.

Int. Cl.⁴ A47C 21/08

U.S. Cl. 5—425

9 Claims



1. A bumper sheet for covering the top surface of a base such as a mattress within a secure rest area defined by structural members such as crib slats or bed rails for preventing a person or object resting on the mattress from falling off, the bumper sheet comprising:

a sheet of covering material selected from cloth and other flexible materials; elongated pockets attached along all of the peripheral edges of the top surface of the base for providing a bumper restraint along the associated edge of the sheet and base, the individual pockets comprising a relatively narrow elongated strip of material selected from cloth and other flexible materials attached to the sheet substantially continuously along the length of the strip; and at least one form-retaining insert sized for removable insertion into an associated pocket; the inserts and associated pockets forming a bumper of configuration defined by the configuration of the associated pockets, for providing a barrier against insertion of body members such as the hands and legs into said structural members.

4,873,735 PERCH FOR INFANTS AND HANDICAPPED INDIVIDUALS

Daniel R. Fermaglich, and Lois F. Fermaglich, both of 9 Van Dwyne Rd., Mountain Lakes, N.J. 07046

Continuation-in-part of Ser. No. 867,466, May 23, 1986, abandoned, which is a continuation-in-part of Ser. No. 552,603, Nov. 17, 1983, abandoned. This application Jul. 24, 1987, Ser. No. 77,371

Int. Cl.⁴ A47C 20/00

U.S. Cl. 5—431

23 Claims



1. A perch for an infant or a handicapped person, comprising supporting means for supporting an individual in a prone, generally fetal-like position in which all of the individual's limbs are freely suspended below the individual's body and in which the individual's head is arranged at a higher elevation than the rest of the individual's body, said supporting means including a support member, having a midsection which is long enough and wide enough to support the individual's chest and abdomen and which is arranged at a first angle inclined relative to the horizontal, an upper end in the form of a ledge which extends outwardly from said midsection far enough to support the individual's head and which is arranged at a second angle inclined relative to the horizontal such that said second angle is less than said first angle, a lower end in the form of a saddle which extends upwardly and outwardly from said midsection far enough to self-support and cradle the individual's buttocks, a first pair of cutouts provided in said midsection of said support member adjacent said lower end thereof, each cutout of said first pair of cutouts being wide enough to receive one leg of the individual such that the individual's legs straddle said support member on opposite sides thereof, and a second pair of cutouts provided in said midsection of said support member adjacent said upper end thereof, each cutout of said second pair of cutouts being wide enough to receive one arm of the individual such that the individual's arms straddle said support member on opposite sides thereof, and a base member attached to said support member such that said support member is positioned a distance above a support surface, said distance being selected such that the individual's limbs are suspended above the support surface.

4,873,736 PILLOW STRUCTURE

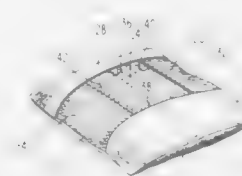
William M. Sapp, and Julia E. Harrell, both of Dalton, Ga., assignors to Crown Crafts, Inc., Calhoun, Ga.

Filed Oct. 19, 1987, Ser. No. 109,520

Int. Cl.⁴ A47G 9/00

U.S. Cl. 5—434

16 Claims



1. A pillow comprising: a pillow body having a surface including a first surface portion and a second surface portion, said first and second surface portions being disposed on opposite sides of a plane, said pillow body having a thickness in a direction perpendicular to the plane, said thickness increasing inwardly from the perimeter of the pillow body; a plurality of panels each having a plurality of edge sections and being connected along at least two of said edge sections to said pillow body, each of said panels being movable between a first position disposed on a first side of the plane adjacent said first surface portion and a second position disposed on a second side of the plane adjacent said second surface portion, each of said plurality of panels covering less than one-half of said first surface portion when each of said panels is positioned in said first position and covering less than one-half of said second surface portion when each of said panels is positioned in said second position; and means for releasably maintaining said plurality of panels in said first and second positions so that the panels can be freely moved between the positions to orient the panels in various configurations.

4,873,737 FLUID FILLED MATTRESS WITH HEIGHT MEASURING AND CONTROL DEVICES

Franciscus G. Savenije, Deventer, Netherlands, assignor to Auping B.V., Netherlands

Filed Oct. 9, 1986, Ser. No. 917,219

Claims priority, application Netherlands, Oct. 11, 1985, 85077W

Int. Cl.⁴ A47C 27/08, 27/10

U.S. Cl. 5—453

17 Claims



1. A mattress comprising a closed chamber which is filled with a fluid and which is provided with at least one of a means for supplying fluid to the chamber and a means for removing fluid from the chamber, the mattress further comprising at least at one point a measuring device for measuring the distance between the top face of the chamber and the bottom face of the chamber, said measuring device being connected to a device for making use of the measured values, such as a read-off device.

4,873,738 APPARATUS FOR STRIPPING CONCRETE FORMS FROM BRIDGE STRUCTURES

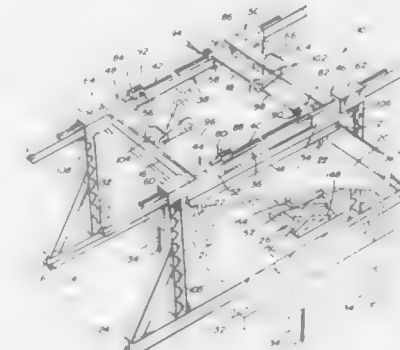
Hal C. Shook, Kensington, Ga., and Carmon D. Holland, Laurel, Miss., assignors to CFC Fabrication Corporation, Chattanooga, Tenn.

Filed Sep. 29, 1988, Ser. No. 250,949

Int. Cl.⁴ E01D 21/00

U.S. Cl. 14—1

14 Claims



1. Apparatus for stripping concrete forms from a longitudinally elongated roadbed extending transversely of a multi-section bridge under construction, said roadbed being supported by longitudinally spaced apart piers including pier caps extending a finite distance transversely, said apparatus comprising a carriage having interconnected longitudinally and transversely elongated beams, propulsion means carried on said carriage for selectively propelling said carriage longitudinally along said roadbed between sections of said bridge, a pair of transversely extending carrier beams supported by said carriage at longitudinally spaced positions, each carrier beam being longer than said finite distance and having ends extending transversely beyond a respective end of said pier caps, each carrier beam having means defining transversely extending tracks, a pair of housings carried on each carrier beam and disposed for riding along said tracks, drive means for selectively moving said housings transversely relatively to said carrier beams between first and second positions, a support frame secured to each housing transversely outboard of said roadbed and depending downwardly beneath said roadbed, a work platform support section carried by each support frame beneath said roadbed, each work platform support section comprising a transversely extending beam having an inboard and an outboard end, means defining a transversely extending rail on each work platform support section beam, the inboard ends of the work platform support section beams associated with each carrier beam normally abutting to form a continuous work platform support with a continuous rail when said housings are disposed in said first position and being separated and outboard of a respective transverse end of each pier cap when said housings have been driven to said second position, a longitudinally elongated stripping buggy mounted for movement on said rails, and means for selectively driving said buggy transversely along said rails, whereby concrete forms may be removed onto said buggy from each bridge section in seriatim and transferred to a subsequent bridge section and said apparatus may be moved longitudinally along said bridge from one section to another.

4,873,739 CHIMNEY CLEANING DEVICE

Armando J. Bardini, 136 Hanley Dr., Grass Valley, Calif. 95945

Filed Apr. 5, 1988, Ser. No. 177,601

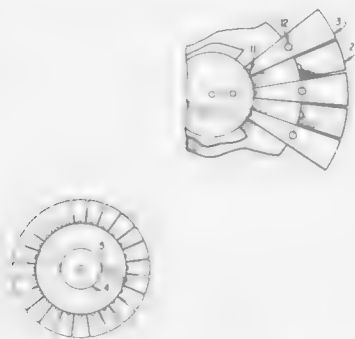
Int. Cl.⁴ F23J 3/00

U.S. Cl. 15—242

2 Claims

1. A chimney cleaning device adapted to move downwardly

into a chimney with reduced contact with the interior walls in one direction and with firm scraping contact with the walls in the opposite direction, the cleaning device comprises two spaced segmented flat membranes, each of said membranes conforming to the shape and size of said chimney, each of said membranes being configured to provide multiple radially extending blade segments, each segment being separated by voids therebetween, each of said membranes being attached between an axially aligned hub member and an axially aligned disc member, said hub members being of a smaller inner diameter and said disc members being of a large outer diameter, said membranes being attached to said hub and disc members one above and parallel to each other, said membranes being oriented so that the blade segments of one membrane are directly above the voids of the other membrane, said two membranes,



in combination, contacting the entire inside surfaces of the chimney, the perimeters of said smaller diameter hubs forming a plurality of inner located bending points for each of the blade segments in order to allow said blade segments to bend upwardly when said cleaning device is moved downwardly into said chimney to thereby provide only light contact of said blade segments with the interior walls, the perimeters of said outer larger diameter disc members forming a plurality of further outwardly located bending points for each of said blade segments in order to allow said blade segments to bend downwardly at said outer bending points when said cleaning device is moved upwardly in the opposite direction to thereby provide a more forcible scraping action of said blade segments against the interior walls of the chimney, wherein each of said blade segments is provided with a hole at each of said bending points to relieve the flexure of said blade segments.

4,873,740

WIPING MIRROR ASSEMBLY

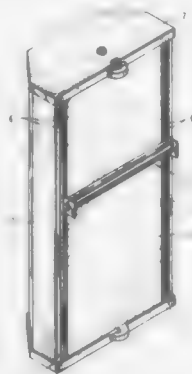
Michael C. Vahrenwald, 2816 Terry Lake Rd., and John A. Brown, 612 Agape Way, both of Fort Collins, Colo. 80524
Filed Mar. 4, 1987, Ser. No. 21,478
Int. Cl. B60S 1/26, 1/44

U.S. Cl. 15—250 B

56 Claims

1. A wiping mirror assembly comprising:
 - a. a mirror having inside and outside surfaces, oppositely-disposed side portions, and oppositely-disposed end portions;
 - b. a means for wiping said mirror disposed between and perpendicular to said side portions of the mirror and having first and second ends;
 - c. an upper end plate and a lower end plate, said end plates connected to opposite end portions of said mirror;
 - d. a means for oscillating said wiper means, said oscillating means having a helical screw disposed between said upper

and lower end plates having ascending and descending threads; and



- e. a bracket connected to said oscillating means and having first and second ends which are connected to said first and second ends of said wiping means, respectively.

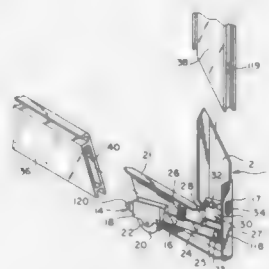
4,873,741

SLIDING DOOR ROLLER APPARATUS

Harry Riegelman, Lewisburg, W. Va., assignor to Columbia Manufacturing Corporation, Gardena, Calif.
Filed Mar. 31, 1987, Ser. No. 32,744
Int. Cl. E05D 13/02

U.S. Cl. 16—105

16 Claims



1. A sliding door roller apparatus comprising:
 - a mounting bracket; a holding member connected to said mounting bracket; and
 - a wheel assembly removably mounted to said mounting bracket wherein said wheel assembly includes a wheel, an axle, and a resilient wheel housing having two opposing, resilient sidewalls each sidewall having an integral end portion extending toward the end portion of the other sidewall, and said end portions are biased toward each other to overlap each other and engage said holding member and are also resiliently separable to disengage said holding member.

4,873,742

SAFETY TIE DOWN BAR HAND GRIP SYSTEM

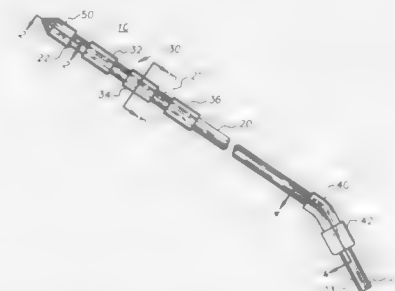
Raymond J. Dillon, 13181 Highland Rd., Highland, Md. 20777
Filed Jul. 22, 1988, Ser. No. 223,019
Int. Cl. B25G 1/06, 3/02

U.S. Cl. 16—111 R

14 Claims

1. A safety tie-down bar hand grip system for use with a ratcheting tightening device, comprising:
 - a handle member extending in a direction defining a longitudinal axis and having at least one ratchet end section; hand hold means encompassing discrete portions of said tubular handle member for providing a gripping surface on said handle member, said hand hold means including

(1) a plurality of annular hand grip members in longitudinally displaced relationship each with respect to the other, and (2) at least one ratchet stop member positionally located on said ratchet end section, said ratchet stop member being formed by a cylindrical wall of predetermined diameter extending between first and second open ends and being positionally located by said first end being



longitudinally displaced a predetermined distance from said hand grip members, said second end of said ratchet stop member includes an annular rim portion having a diameter larger than said diameter of said cylindrical wall, said annular rim portion being formed by a portion of said cylindrical wall being folded back upon itself; and, an end cap member releasably coupled to an end of said handle member.

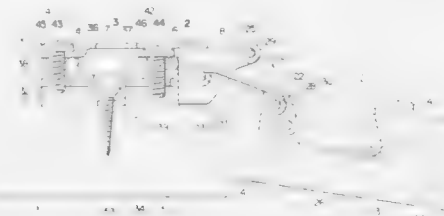
4,873,743

HINGE

Hiroaki Toyama, Yamanashi, Japan, assignor to Kabushiki Kaisha Murakoshi Seiko, Tokyo, Japan
Filed Dec. 29, 1988, Ser. No. 291,521
Int. Cl. E05F 1/14

U.S. Cl. 16—237

2 Claims



1. In a hinge comprising a base having a front portion and a rear portion, a pivotable member connected to the front portion of the base so that the pivotable member can be turned so as to be opened and closed, and a mounting member having an upper portion with front and rear sections which is formed so that the base can be secured thereto, and which is adapted to be attached to an object article, the improvement characterized in that said base consists of an upper wall having a front end and a rear end and upper and lower sides and side wall so as to have a substantially U-shaped cross section and so that the base can be fitted over the mounting member, said upper wall is provided with a longitudinally extending recess having a width and being opened at the rear end thereof and an opening having a width and being located in front of this recess, said side walls are provided with locking members in the portions thereof which are in the vicinity of the opening in the upper wall, said locking members having upper sides, rear and front screws having heads with upper and lower sides and diameters which are larger than the width of the recess and the opening in the upper wall of the base, the heads of the screws are engaged with the rear and front sections of the upper portion of the mounting member, said rear screw is engaged with the recess in the upper wall of the base with the head thereof

positioned above the recess, to render the base longitudinally slidable, and said head of the front screw is located below the upper wall of said base and opposite from the lower side of said upper wall to the opening in the upper wall of the base and engaged at least from the upper side with the upper sides of the locking members on both side walls of the base to keep the base longitudinally slidable.

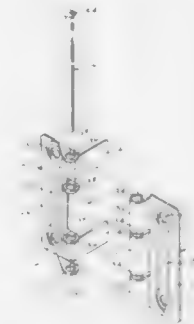
4,873,744

DOOR HINGE

Leonard E. Johnson, Jr., Elkhart, Ind., assignor to L. E. Johnson Products, Inc., Elkhart, Ind.
Filed Mar. 14, 1988, Ser. No. 167,699
Int. Cl. E05D 11/04

U.S. Cl. 16—247

6 Claims



1. A door hinge adapted to pivotally secure a door to a member, said hinge comprising first and second hinge plates adapted to be secured to said door and member respectively, one of said first and second hinge plates including only parallel spaced apart tab parts each having an opening aligned with a said opening in another tab part, the other of said first and second hinge plates including only spaced apart knuckle parts each having an opening aligned with said opening in another knuckle part, each knuckle part position between adjacent pairs of tab parts with said openings in the tab parts and knuckle parts being aligned, a pin extending through said aligned openings, two of said tab parts supportingly engaging two of said knuckle parts when said first and second hinge plates are secured to said door and member.

4,873,745

UNHINGEABLE AND CONCEALED HINGE FOR SWITCHING BOXES

Dieter Ramsauer, Am Neuhaushofen 20, D-5620, Velbert 11, Fed. Rep. of Germany
Filed Jan. 11, 1988, Ser. No. 142,376
Claims priority, application Fed. Rep. of Germany, Jan. 9, 1987, 8700368

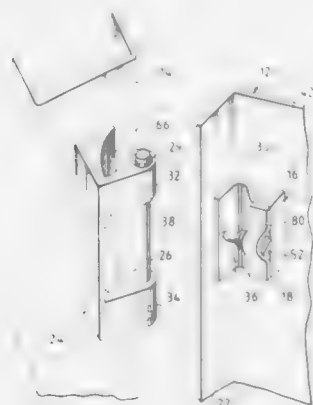
Int. Cl. E05D 7/10

U.S. Cl. 16—258

13 Claims

1. In combination, a concealed hinge and door assembly for switching boxes comprising:
 - a door leaf with an inner surface and an edge section with an inner surface, the inner surfaces of the door leaf and the edge section of the door leaf forming a corner area;
 - a first hinge part attached to the inner surface of the door leaf;
 - a second hinge part surrounding the first hinge part in a shape of a U and connectable with a frame limb of the box, said second hinge part having U-limbs each with an end having a bearing eye;
 - a bearing bolt for effecting an articulated connection of the hinge parts, the first hinge part having a bearing block with a U-shaped cross-section forming a bearing eye which accommodates the bearing bolt, the bearing block

being fixed in the corner area of the edge section of the door leaf and having, over an open end of the U-shaped cross-section, a movable clamping arrangement for clamping the bearing bolt in the U-shaped cross-section, said bearing bolt extending an entire distance between the bearing eyes of the ends of the U-limbs of the second hinge part, said clamping arrangement including an elongated clamping member having a portion movable in a longitudi-



dinal direction into and out of said bearing eye of said first hinge part; and
means for guiding said clamping member longitudinally towards and away from said bearing eye of said first hinge part, said guiding means including a bent limb with a bend at which extends a surface in said longitudinal direction from said open end and along which said clamping member moves longitudinally, said bent limb being integrally formed with said bearing block.

4,873,746

METHOD AND APPARATUS FOR REMOVING BREAST MEAT FROM POULTRY CARCASS

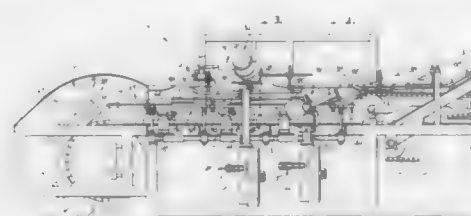
Donald J. Scheier, Kansas City, Mo., and Jack L. Hathorn, Springdale, Ark., assignors to Simon-Johnson Company, Kansas City, Kans.

Division of Ser. No. 147,703, Jan. 25, 1988, Pat. No. 4,827,570. This application Jan. 23, 1989, Ser. No. 300,773

Int. Cl.⁴ A22C 21/00

U.S. Cl. 17-11

19 Claims



1. In poultry processing apparatus for partially severing the joint between the wings and the front half of a poultry carcass for subsequent pulling of the wings and breast meat connected thereto away from the carcass, said apparatus including means for conveying the carcass along a path of travel and a pair of cutting means for partially severing the joints between each wing and the carcass, the improvement of which comprises:
means mounting said cutting means for shifting movement toward an operative position in front of the joints relative to said path of travel of the carcass and a non-operative

position spaced away from and laterally aside of the path of travel of said carcass; and
means for moving said cutting means toward and away from said operative position in timed, coordinated relationship to the movement of said poultry carcass along said path of travel.

4,873,747

APPARATUS AND METHOD FOR MOUNTING A RESILIENT FINGER TO A POULTRY PLUCKING APPARATUS OR THE LIKE

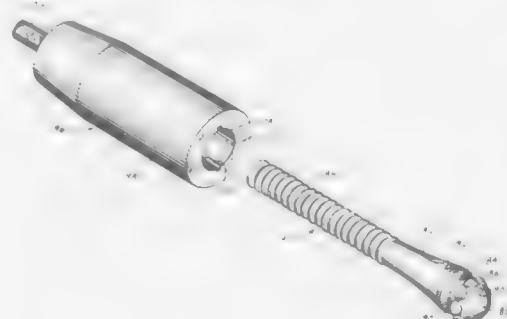
Larry S. Dewberry, Marietta, Ga., and Richard H. Schlipp, Delafield, Wis., assignors to Waukesha Rubber Company, Inc., Waukesha, Wis.

Continuation-in-part of Ser. No. 153,994, Feb. 9, 1988, Pat. No. 4,799,293. This application Nov. 17, 1988, Ser. No. 272,762

Int. Cl.⁴ A22C 21/02

U.S. Cl. 17-11.1 R

12 Claims



1. An assembly for use in a poultry processing apparatus or the like, comprising:

a movable member including one or more openings extending between an inner and an outer surface;

one or more fingers adapted for mounting in said one or more openings, each said finger comprising:

a shank terminating in a shoulder adapted for placement adjacent the outer surface of said movable member and having a transverse dimension greater than that of said opening;

a neck provided against said shoulder and adapted for placement within said opening and having a reduced transverse dimension relative to said shoulder;

a head provided adjacent said neck and having a base portion, wherein said base portion is provided with a series of spaced resilient protrusions about its periphery providing a transverse dimension to said base portion greater than that of said opening, said head being adapted for insertion through said opening for mounting said finger to said movable member, whereby each said protrusion deforms during insertion so as to allow said head to pass through said opening, said protrusions providing a lower surface adapted to engage the area of said movable member adjacent said opening after insertion of said finger head therethrough and return of said protrusions to their undeformed condition, for retaining said finger on said movable member; and

means for accommodating passage of said head through said opening in said movable member by providing deformation of said base portion of said head as it passes through said opening and thereafter allowing said base portion of said head to return to its undeformed condition for securing said finger to said movable member by positioning of said finger head on one side of said movable member and said finger shoulder on the other side of said movable member.

4,873,748

BURNISHED END SHIRRED CASING STICK, METHOD AND APPARATUS

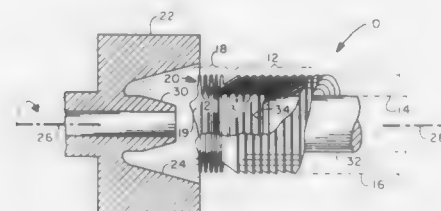
John J. Eryan, Blytheville, Ark., and Orville D. Booth, Loudon, Tenn., assignors to Viakase Corporation, Chicago, Ill.

Filed Aug. 8, 1988, Ser. No. 229,661

Int. Cl.⁴ A22C 13/02

U.S. Cl. 17-49

24 Claims



1. A method of forming an end face of a shirred casing stick to a desired profile comprising the steps of:

(a) providing a shirred stick composed of generally conical pleats of shirred cellulosic casing nested tightly together, the pleat inner folds defining a shirred stick axial bore opening through said end face;

(b) positioning a tool surface spaced from and in axial alignment with said end face, the tool surface being a negative to the desired profile and including a central pilot insertable into the stick bore;

(c) moving said tool surface and stick axially together thereby introducing said pilot into said bore and pressing said tool surface against said end face;

(d) spinning the tool surface and pilot relative to said stick in one direction about the longitudinal axis of the stick bore while maintaining a pressing relationship between the tool surface and said end face sufficient for both burnishing said end face to a profile which is substantially a positive reproduction of said tool surface and burnishing said pleat inner folds adjacent the opening of said bore through said end face; and

(e) continuing said spinning while axially separating the tool surface and stick.

4,873,749

METHOD AND APPARATUS FOR SUPPORTING ANIMAL CARCASSES AND PULLING HIDES THEREFROM

William F. Couture, Amarillo, Tex., assignor to IBP, Inc., Dakota City, Nebr.

Filed Jan. 15, 1988, Ser. No. 144,009

Int. Cl.⁴ A22C 25/02; A22B 5/16

U.S. Cl. 17-50

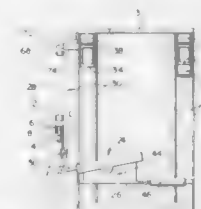
20 Claims

1. Apparatus for holding the legs of an animal carcass while a hide pulling machine pulls the hide of the carcass toward and over the head of the carcass, comprising,

means for suspending a carcass with its head hanging downwardly,

two leg gripping assemblies positioned near said suspending means for gripping the legs of a carcass on the suspending means to hold the carcass against forces imposed on the carcass when the hide is pulled downwardly toward the head of the carcass, each said leg gripping assembly including a pair of jaws which are relatively movable from an open position to a closed position where they define a leg receiving space and are operable to grip a leg of a carcass therebetween, each of said leg gripping assemblies while its jaws are in said open position being spaced apart

a distance which permits the entry thereto and exit therefrom of a leg of a carcass, and



jaw actuator means for moving the jaws between said open and closed positions.

4,873,750

ATTACHMENT FOR SLIDE FASTENER SLIDER PULL TAB

Richard J. Tracy, 1002 Forest Dr., Elgin, Ill. 60123

Filed Jan. 13, 1988, Ser. No. 143,524

Int. Cl.⁴ A44B 12/26

U.S. Cl. 24-429

9 Claims



1. An attachment for the pull tab of a slide fastener slider for ornamentation and for enhancing the operation of the slider, said attachment comprising:

a body of soft, tough, very flexible, very tactile elastomeric material defining a channel for receiving the pull tab; said channel having an entry orifice at one end for entry of the pull tab; and

locking means in said channel and attached to said body for locking the inserted pull tab in said channel; said locking means being of substantially harder and stiffer material than said body; said locking means comprising a spring metal clip comprising:

a tongue support side;

a tab restraining side;

resilient connecting means for connecting and maintaining said support side and said restraining side spaced in opposition across said channel; and

a locking tongue having one end connected to said tongue support side and projecting into said channel toward said restraining side in a direction away from said entry orifice and terminating in an engaging end for engaging the sur-

face of the inserted pull tab and thereby locking the inserted pull tab in said channel.

4,873,751

FABRICATION OR REPAIR TECHNIQUE FOR INTEGRALLY BLADED ROTOR ASSEMBLY

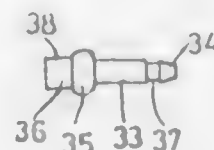
Raymond M. Walker, Port St. Lucie; Donald P. Achon, Stuart; Robert W. Baumgarten, Lake Park, and Ralph B. Bogard, North Palm Beach, all of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 27, 1988, Ser. No. 289,868

Int. Cl.⁴ B21K 3/04; B23P 15/02

U.S. Cl. 29—156.8 B

3 Claims



1. A method for replacing a blade on an integrally bladed rotor, which comprises a disk having a plurality of integral blades projecting from the rim of the disk, including the steps of:

- removing a preexisting blade, leaving a stub, a portion of said preexisting blade, projecting from the disk rim, said blade stub having a face which constitutes a surface to which a replacement blade will be bonded;
- positioning a replacement blade adjacent to said stub, said replacement blade having a circumferential collar about its periphery adjacent the proposed bond with the adjacent surfaces of said stub and said replacement comprising an intended bond;
- applying a force between said stub and said replacement blade, with said force being applied to the replacement blade through said collar;
- locally heating said intended bond, between said stub and said replacement blade, to a temperature which causes softening, metal flow and bonding;
- removing said collar from said replacement blade by machining.

4,873,752

MANUFACTURING METHOD OF THE GAS-FLOW VALVE NOZZLE OF A LIGHTER

Yoon-Gi Suck, 1092-35, Daerim 2dong Youngdeungpo-ku, Seoul, Rep. of Korea (150)

Filed Feb. 16, 1988, Ser. No. 156,350

Claims priority, application Rep. of Korea, Apr. 13, 1987, 87-33111

Int. Cl.⁴ B21K 21/08

U.S. Cl. 29—157 C

6 Claims

1. A method of manufacturing a gas-flow valve nozzle, comprising the steps of:

- drawing a segment of tubular bar material to a location above a space between first and second dies;
- cutting a segment of the bar material to a length substantially the same as the distance between the first and second dies, and urging the cut portion of bar material into the space between the first and second dies so that one end of the segment is registered with a first hole in the first die, and the other end of the bar material is in registration with a second hole in the second die;
- moving the first die relatively toward the second die so that ends of the segment of bar material enter the respective first and second holes with which they are registered,

wherein an end of the segment entering the second hole in the second die is compressed and tapered by an inner wall defining the second hole;

- urging the segment of bar material out of the first hole in the first die some measure so that an annular protrusion is formed on the segment as the segment plastically deforms into a narrow space maintained between the first and second die;
- retaining the segment of bar material in the second hole while the first die is withdrawn away from the second die so that the end of the segment of bar material received within the first hole is retracted therefrom, moving the first die so that the end of the segment of bar material previously received within the first hole comes into regis-

tration with a third hole, having a diameter greater than that of the end of the segment of bar material, formed in the first die, closing the first die toward the second die so that the end of the segment of bar material enters the third hole, and expanding the end of the segment of bar material received within the third hole until its diameter achieves that of the third hole;

- withdrawing the first die away from the second die so that the segment of bar material is retracted from the third hole, and ejecting the segment of bar material from the second hole in the second die; and
- machining the segment of bar material processed in accordance with steps (a)-(f) to render the segment a finished gas-flow nozzle.

4,873,753

CONTROL SYSTEM FOR A ROTATION STATION FOR REMOTELY INSTALLING A MECHANICAL TUBE PLUG

Eric A. Kiesche, Ringgold, Ga., and Samuel B. Crabtree, Chattanooga, Tenn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Feb. 1, 1988, Ser. No. 151,115

Int. Cl.⁴ B23P 7/00

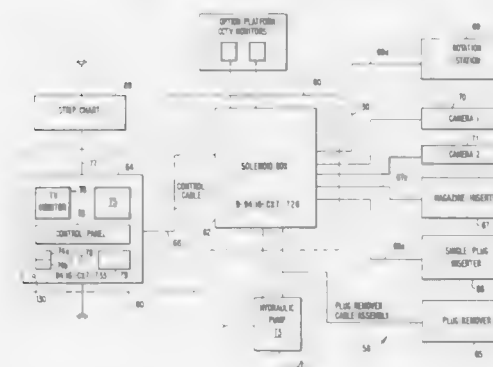
U.S. Cl. 29—157.3 R

16 Claims

1. In an apparatus for installing a mechanical tube plug used to seal a heat exchange tube of the type in a nuclear facility and comprising means for rolling said mechanical tube plug and providing a signal indication of torque while rolling, comprising:

- a controller console having a plurality of switches and indicators for providing a rotation control signal for controlling rotation of said rolling means, said controller located at a point which is relatively safe and remote from a potentially unsafe site of said rolling means; and
- a solenoid assembly located proximate to said site of rolling in said potentially unsafe area and in circuit with said controller, said solenoid receiving said rotation control signal and including circuit means for receiving said torque indication signal, said solenoid assembly including means for setting a predetermined torque, in response to a

signal input at said control console, said circuit means operating to terminate said rotation control signal and



disable said rolling means when said predetermined torque limit is reached.

4,873,754

TOOL FOR REMOVING SNAP RINGS

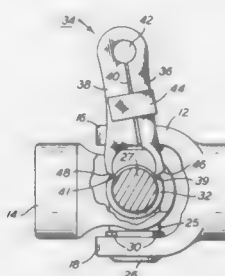
Vernon E. Gleason, 11 Pondview Dr., Pittsford, N.Y. 14534

Filed Aug. 12, 1988, Ser. No. 231,380

Int. Cl.⁴ B23P 19/04

U.S. Cl. 29—229

6 Claims



1. An articulated, self-aligning tool for removing radial retaining rings from grooved surfaces, said tool comprising:

- two resilient, integral prongs adapted to be moved from each other by the application of force, said prongs being substantially separated from each other by an orifice and a slot appearing therebetween, said slot communicating with said orifice, wherein:
 - each of said prongs is comprised of an inner edge, an outer edge, and a pointed end forming an acute angle with said inner edge and extending outwardly from said inner edge; and
 - means for maintaining said prongs in parallel, in-line relation to each other.

4,873,755

SWAGING TOOL HAVING INDICATING MEANS

Lonnie E. Johnston, Bedford, Ohio, assignor to Crawford Fitting Company, Solon, Ohio

Filed May 25, 1988, Ser. No. 198,775

Int. Cl.⁴ B23P 19/06; B23Q 15/14

U.S. Cl. 29—237

25 Claims

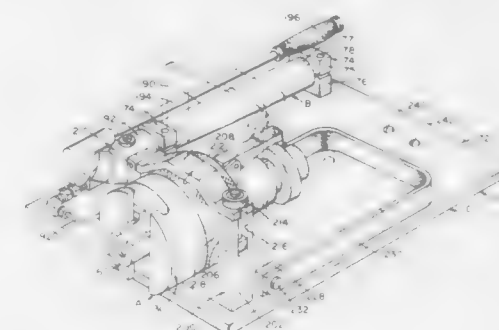
1. A device for swaging a ferrule onto the periphery of a cylindrical member comprising:

- a piston mounted for reciprocation within a body;
- an anvil member drivably connected to said piston and having a recess in one end to receive the end of the cylindrical member;
- camming means associated with said anvil member for cam-

ming a ferrule carried on the end of the cylindrical member into tight peripheral engagement therewith; and, gauge means associated with said camming means for measuring the movement of the camming means relative to the body, said gauge means comprising:

an articulated signal member, comprising:

- a first arm,
- a second arm which is secured to one end of said first arm and is selectively pivotable thereabout,
- a means for urging said second arm to one end position in relation to said first arm, said means for urging being



secured to at least one of said first arm and said second arm and being in operative connection with the other of said first arm and said second arm,

a biasing means for moving said signal member from a first to a second position, and

a means for holding said signal member in said first position until a predetermined amount of relative movement has taken place between said camming means and said body at which time said signal member is caused to move suddenly to said second position under the action of said biasing means.

4,873,756

MACHINE TOOL

Hisaaki Yamane, and Noboru Hirose, both of Aichi, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

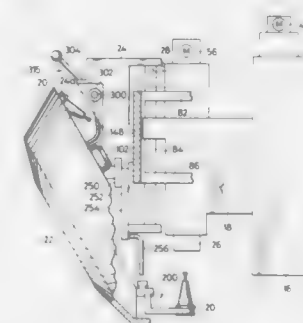
Filed Jan. 30, 1987, Ser. No. 8,654

Claims priority, application Japan, Feb. 5, 1986, 61-15270[U]; Feb. 7, 1986, 61-26477; Feb. 7, 1986, 61-16987[U]

Int. Cl.⁴ B23Q 3/157

U.S. Cl. 29—568

12 Claims



1. A machine tool for machining a workpiece, the machine tool of the type having a main spindle head rotatably supporting a main spindle with a tool mount at one end, the spindle head being reciprocal relative to the machine tool frame in the axial direction of the main spindle, the machine tool further comprising:

a tool holding member installed in the tool mount of said main spindle;
automatic means for changing a tool held in said tool holding member during "double action" reciprocal tool-changing movement of said spindle head, said automatic means including:

- a tool support carried on said frame and movable in the axial direction of said main spindle independently of said main spindle;
- a tool magazine rotatably supported on, and axially movable with, said tool support, said magazine having a plurality of tool holders each capable of detachably holding a tool, and spaced about the magazine periphery, said magazine for indexing a selected tool holder into and out of axial alignment with said main spindle;
- a first cam-and-crank means interconnecting said main spindle head, said frame, and said tool support for moving said tool support together with said spindle head a predetermined distance during the "double action" movement of said main spindle head relative to said frame, the tool being held in said main spindle also being engaged to be held by one of said plurality of tool holders of said tool magazine during movement in said predetermined distance, said first cam-and-crank means also for moving said tool support and said spindle head away from each other by a predetermined distance during the "double action" movement;
- a second cam-and-crank means interconnecting said main spindle head and said frame for causing said tool holding member to release said tool from said tool holding member during a preselected portion of said "double action" movement; and
- means for preventing movement of said tool support below a fixed axial location, said spindle head being axially movable below said fixed location for performing machining operations.

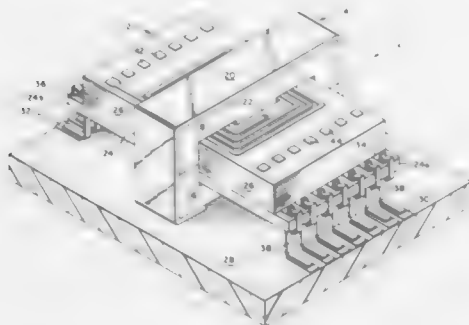
4,873,757

METHOD OF MAKING A MULTILAYER ELECTRICAL COIL

K. Barry A. Williams, Duxbury, Mass., assignor to The Foxboro Company, Foxboro, Mass.
Division of Ser. No. 70,640, Jul. 8, 1987, which is a continuation of Ser. No. 767,327, Aug. 21, 1985. This application Jun. 27, 1988, Ser. No. 212,143
Int. Cl.⁴ H01F 7/06

U.S. Cl. 29—602.1

6 Claims



1. A thin film additive method of fabricating a multi-planar-coil winding for an inductive component, comprising the steps of

patterning a first insulating film layer with a continuous spiral planar channel, and a plurality of outer apertures outside said spiral, the inner end of said spiral channel terminating at a first one of a predetermined plurality of inner locations distributed about a central section of said layer, the outer end of said spiral channel terminating at a first one of said outer apertures,

plating the channel and apertures of said first layer full of conductive metal to form a first coil,
bonding a second thin film insulating layer over said first layer,
forming in said second insulating layer, a plurality of outer apertures in registration with the outer apertures of the first insulating layer, and a single inner aperture at said first location in registration with the inner end of the conductive spiral defined in said first insulating layer,
plating the apertures in said second layer full of conductive metal,
bonding a third thin film insulating layer over said second layer,
patterning said third insulating layer with a second planar spiral channel having an inner end terminating in registration with said inner aperture in said second insulating layer and a plurality of outer apertures in registration with the outer apertures in said first and second insulating layers, the outer end of said spiral channel terminating at a second one of said outer apertures, and
plating said apertures and channel in said third layer full of conductive metal to form a second coil,
whereby, a monolithic thin film multi-planar-coil winding is formed with the outer ends of each planar coil being connected to solid metal plated posts extending through the layers.

4,873,758

METHOD OF MAKING A THERMOMETER PROBE

Yoshihisa Masuo, Shiga, Japan, assignor to Omron Tateisi Electronics Co., Kyoto, Japan

Division of Ser. No. 914,254, Oct. 2, 1986, abandoned. This application Jun. 2, 1988, Ser. No. 201,459
Claims priority, application Japan, Oct. 2, 1985, 60-149964
Int. Cl.⁴ H01C 17/02

U.S. Cl. 29—612

5 Claims



1. A method of producing a thermometer probe, comprising the steps of:

- providing at least a pair of leads enclosed within an open-ended sheath;
- exposing the pair of leads by axially compressing the sheath; cutting an exposed portion on one of the leads;
- connecting the exposed portion of the cut lead to one end of a temperature sensing element;
- connecting an exposed portion of the uncut lead to an opposing end of the temperature sensing element;
- soldering the exposed portions of the leads to the corresponding ends of the temperature sensing element;
- pulling back the sheath to its original position;
- enclosing the leads and temperature sensing element with the sheath; and thereafter
- welding the open end portion of the sheath closed.

4,873,759

TIRE DEBEADING MACHINE

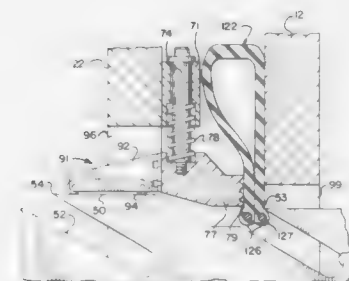
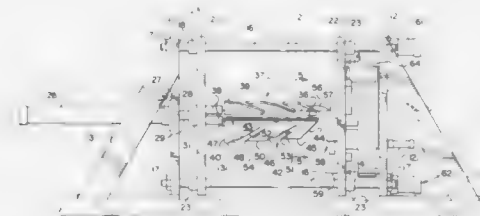
Edward K. Burch, Northbrook, Ill., assignor to Nu-Tech Systems, Inc., Rosemont, Ill.

Filed May 25, 1988, Ser. No. 198,218

Int. Cl.⁴ B23P 19/00

U.S. Cl. 29—700

20 Claims



1. Apparatus for operating on tires such as automotive tires, each of said tires having first and second annular side walls, bead wires and a center circular tire opening, said tire opening having a tire axis at substantially the center thereof and extending perpendicularly to said tire opening, said apparatus comprising first and second clamp means positioned adjacent one another and adapted to receive a tire therebetween, said clamp means having clamp openings therein which are substantially concentric with said tire opening of a tire between said clamp means, first power means for moving said first and second clamp means toward each other and thereby clamping the side walls of the tire therebetween, a harpoon movable on a line of movement which is generally parallel with said tire axis, second power means for moving said harpoon along said line of movement, movement of said harpoon in said forward direction causing said harpoon to move through said clamp openings and said tire opening, said harpoon having means thereon for engaging a tire between said first and second clamp means and moving the tire to substantially center said tire opening with said clamp openings during said movement of said harpoon, means for actuating said first power means to move said first and second clamp means to clamp said side walls after a said tire opening has been substantially centered, and said harpoon further having at least one barb formed thereon, and said barb engaging and pulling said bead wires from the carcass of the tire after said side walls are clamped by said clamp means.

4,873,760

VESSEL LID MOUNTING AND DEMOUNTING APPARATUS

Naoto Watanabe, Omiya; Akira Tanaka; Takayuki Matsumoto, both of Yokohama; Yutaka Ohmura, Yokohama, and Hisao Kojima, Yokohama, all of Japan, assignors to Ishikawajima-Harima Heavy Industries Co., Ltd., Tokyo, Japan

Filed Dec. 29, 1987, Ser. No. 139,270

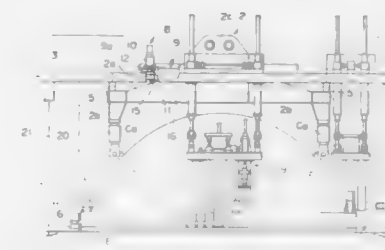
Claims priority, application Japan, Dec. 29, 1986, 61-311168;

Jan. 10, 1987, 62-3848; Jan. 10, 1987, 62-3849

Int. Cl.⁴ B23P 21/00, 19/04; G21C 19/00

U.S. Cl. 29—714

19 Claims



1. An apparatus for mounting and demounting a lid of a vessel on and from a body thereof, said lid and said body having their respective ring-like end flanges fastened to each other by means of a plurality of stud bolt and nut assemblies arranged in circumferentially spaced relation on a pitch circle concentric to a center of said lid, each of said stud bolt and nut assemblies including a stud bolt having an axis thereof extending vertically, and at least one nut threadably engageable with the stud bolt, said apparatus comprising:

- a sling to be fixed to said lid;
- a turntable supported on said sling for turning movement in a horizontal plane relative to said sling about a vertical axis passing through a center of said pitch circle;
- drive means mounted between said sling and said turntable for turning the same about said vertical axis;
- a plurality of operating units supported by said turntable and arranged in circumferentially spaced relation on a circle concentric to said vertical axis, which circle has a diameter equal to that of said pitch circle, each of said operating units including nut transporting means for transporting the nuts to and from the respective stud bolts, and stud bolt attaching and detaching means for attaching and detaching the stud bolts to and from said end flange of said body of said vessel; and
- positioning means for moving said turntable in the horizontal plane relatively to said sling so as to bring said operating units into vertical alignment with the stud bolts.

4,873,761

INSERTION/EXTRACTION TOOL

Iosif Korsunsky, Harrisburg; Gerald L. Foreman, and Steven P. Bateman, both of Hummelstown, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Aug. 30, 1988, Ser. No. 238,636

Int. Cl.⁴ H05K 13/04

U.S. Cl. 29—741

12 Claims

1. A tool for manipulating a chip carrier socket assembly having a chip carrier and a chip carrier socket, the tool comprising:

- handle means;
- engagement means for engaging the chip carrier and the chip carrier socket, the engagement means provided proximate the chip carrier and the chip carrier socket, and

being movable between an open and a closed position, thereby allowing the engagement means to cooperate with the chip carrier socket assembly;

frame means which are movable relative to the handle means, the frame means provided adjacent the engagement means, the movable frame means being movable between a first position, in which the chip carrier will be inserted into the chip carrier socket, and a second position, in which the chip carrier will be extracted from the chip carrier socket;

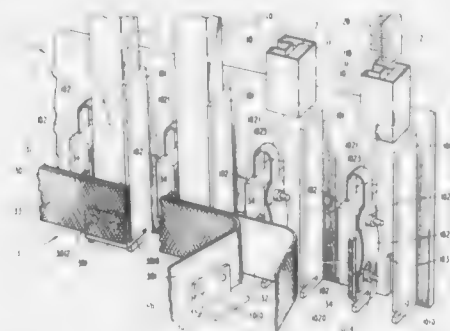


a first camming means, provided on the frame means, the first means cooperates with the engagement means when the frame means is provided in the first position, such that as the handle means are operated, the tool inserts the chip carrier in the chip carrier socket; and

a second camming means, provided on the frame means, the second means cooperates with the engagement means when the frame means is in the second position, such that as the handle means are operated, the tool extracts the chip carrier from the chip carrier socket.

4,873,762

COMPONENT INSERTION MACHINE APPARATUS
William A. Elliott, Reynoldsburg; Richard A. Greene, Pickerington; Robert P. Kennedy, Columbus; Robert P. Poe, Jr., Columbus, and William H. Steece, Columbus, all of Ohio, assignors to American Telephone and Telegraph Company, AT&T Technologies Inc., Berkeley Heights, N.J.
Division of Ser. No. 190,976, May 6, 1988, Pat. No. 4,831,696.
This application Oct. 31, 1988, Ser. No. 265,378
Int. Cl.⁴ B23P 19/00; B23Q 7/10; B65H 31/20; H05K 3/30
U.S. Cl. 29—809 5 Claims



1. A component insertion machine having apparatus for

loading components from component magazines into the component insertion machine comprising

means having adhesive members for releasably mounting said means on the component loading apparatus and having a plurality of component retention members each located on said means to correspond with ones of the component magazines for retaining components in the component magazines and removable after installation of the component loading apparatus on the component insertion machine to disengage each component retention member from said component magazines.

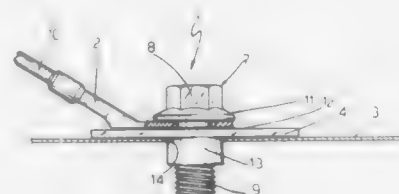
4,873,763

METHOD FOR OBTAINING ELECTRICAL EARTH CONNECTION DEVICE, PARTICULARLY FOR VEHICLES

Piero Volontà, and Matteo Piccirillo, both of Turin, both of Italy, assignors to Fiat Auto S.p.A., Turin, Italy
Continuation of Ser. No. 97,458, Sep. 15, 1987, abandoned. This application Nov. 1, 1988, Ser. No. 266,347
Claims priority, application Italy, Sep. 16, 1988, 53831/86[U]
Int. Cl.⁴ H01R 43/00

U.S. Cl. 29—825

4 Claims



1. A method for obtaining an electrical earth connection device for vehicles, comprising the steps of:

(a) providing a metal plate for having a threaded seat (6), and a screw (7) having a threaded shank (9) and a head (8) provided with an annular flange (11);

(b) tightening the screw (7) with a predetermined torque wrench setting in order to abut with perfect adherence the lower surface of the flange (11) against the upper surface of the plate (4) in the area surrounding said seat (6);

(c) affixing the assembly so formed to a portion (3) of a vehicle body and then painting the vehicle body and the assembly so formed by immersion in a painting bath; and

(d) at least partially unscrewing the screw (7) from the seat (6) after painting and mounting a cable terminal (2) on the shank (9), and thereafter tightening the screw (7) into the seat (6) until the cable terminal (2) is clamped between the plate (4) and the flange (11).

4,873,764

COMPONENT MOUNTING PROCESS FOR PRINTED CIRCUIT BOARDS

Frank W. Grimm, Alsip, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.
Division of Ser. No. 137,496, Dec. 23, 1987. This application Oct. 21, 1988, Ser. No. 260,852
Int. Cl.⁴ H05K 3/36

U.S. Cl. 29—830

5 Claims



1. For use in the manufacture of a layered printed circuit

board assembly having first and second layers with electrically conductive patterns thereon, a process for through-mounting in said assembly a surface-mount device having an electrically conductive cap at each end, comprising:

providing aligned holes in said first and second layers adjoining said conductive patterns;

providing an inner layer between said first and second layers and forming said layer of plastic tape inherently compliant and yielding for receiving said surface-mount device;

coating said tape with an easily performable metal layer providing electrical shielding between said layers;

inserting said device through said aligned holes and said material;

electrically and mechanically connecting at least one of said end caps of said surface-mount device to at least one of said conductive layers;

said inner layer, by virtue of its being inherently compliant and yielding, physically retaining said surface-mount device in place pending the electrical and mechanical connection of the electrically conductive end caps to the conductive patterns

4,873,765

METHOD OF MAKING AN ELECTRICAL CONNECTOR

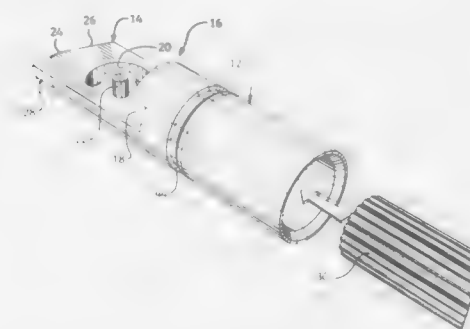
Walter M. Werner, Downingtown, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Aug. 29, 1988, Ser. No. 238,020

Int. Cl.⁴ H01R 43/00

U.S. Cl. 29—876

3 Claims



1. A method for making an electrical connector comprising the steps of:

impact-extruding a slug of conductive material into a form having a cylindrical wire barrel at one end and at the other end an outwardly extending tang having a curved surface and an outwardly extending flat blade, said tang and blade overlying and spaced from each other;

shortening said tang so that only a short portion thereof overlies said blade;

coining an arcuate recess in said blade intermediate a free end thereof and said wire barrel and on a surface facing said tang;

punching a hole through said blade adjacent said recess;

shearing a corner off of said blade at the free end;

cutting a slot into said blade at the face of said free end, said slot being parallel to the plane of said blade; and

inserting an upstanding pin in said punched hole.

4,873,766

POWER SAW

Robert H. Johnston, 311 NW 97 La., Coral Springs, Fla. 33065
Filed Apr. 25, 1988, Ser. No. 186,024

Int. Cl.⁴ B23D 45/16

U.S. Cl. 30—166.1

2 Claims

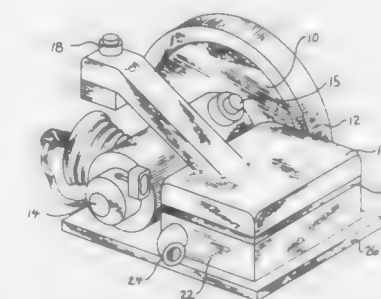
1. A portable hand held power saw, comprising:

(a) an internal combustion engine having a rotational me-

chanical output, said engine mounted upon a rigid level platform;

(b) a gas tank for supplying fuel to said engine, said gas tank comprising a part of a handle for the holding of said power saw;

(c) a muffler and exhaust system secured intermediately between said gas tank and said rigid platform, said muffler



in fluid communication with said internal combustion engine and hot vapor generated thereby;

(d) a work element coupled to said mechanical output of said gas engine; and

(e) mechanical clutch coupling means interposed between said output of said engine and said work element along the axis of rotation of said work element.

4,873,767

SAFETY LETTER OPENER

Hin C. Lok, 205 Spyglass La., Walnutster, Calif. 91789-2041
Continuation-in-part of Ser. No. 124,267, Nov. 23, 1987, Pat. No. 4,803,782. This application Jun. 20, 1988, Ser. No. 209,017
Int. Cl.⁴ B26B 3/00

U.S. Cl. 30—278

16 Claims



1. A device for opening an envelope comprising a hollow sleeve formed by longitudinal surrounding walls extending parallel to a linear longitudinal direction of movement and which define a cavity therewith having an open end and at its opposite end a solid end wall extending perpendicular to said longitudinal direction of movement and joined to and spaced longitudinally from said longitudinal surrounding walls to define an envelope receiving slot of uniform width throughout extending perpendicular to said direction of movement, a ram extending into said open end of said sleeve whereby said sleeve and said ram are movable relative to each other in telescoping, linear reciprocal fashion in said longitudinal direction of movement, a blade mounted on said ram having at least one cutting edge directed toward said slot and disposed within said cavity and extending in said longitudinal direction of movement, means operable externally of said sleeve and said ram for adjustably limiting the extent of relative longitudinal movement

between said ram and said sleeve to control the maximum extent to which said blade is movable longitudinally into said slot and to prevent said cutting edge of said blade from extending across the entire width of said slot, and biasing means captured within said cavity and between said sleeve and said ram and disposed to urge said cutting edge of said blade away from said slot.

4,873,768

DIMENSIONING HEAD FOR PLUG GAGE

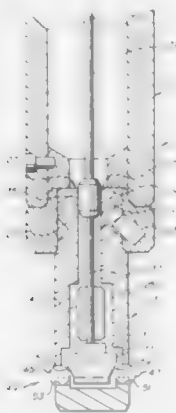
Richard G. Van Sickle, Sterling Heights, and George Bour, Lake-Holly, both of Mich., assignors to GTE Valeron Corporation, Troy, Mich.

Filed Apr. 17, 1987, Ser. No. 39,408

Int. Cl.⁴ G01B 5/12

U.S. Cl. 33—178 R

1 Claim



1. A plug gage of the type comprising a combination dimensioning head and detector, said dimensioning head comprising an elongated cylindrically shaped housing with a longitudinal axis and having an open end and a closed end, a gaging member mounted in said housing for movement along the longitudinal axis, said gaging member being normally biased toward the closed end having a gage contacting portion projecting toward the open end, a pair of balls adapted to move and contact surfaces to be dimensioned exterior to said housing, said housing having a pair of stationary guide surfaces projecting in a direction transverse to the longitudinal axis, each guide surface forming a V-groove and being adapted to guide a respective ball, said gaging member moveable in an axial direction and having a pair of outwardly facing planar surfaces, said pair of outwardly facing planar surfaces converging toward the closed end at a predetermined angle to the longitudinal axis, each of said respective balls being contacted by a respective guide surface and a respective planar surface, each V-groove presenting a pair of parallel lines of contact, whereby said gaging members moves toward the open end as said balls are urged inwardly when contacting surfaces exterior to the housing during engaging, and wherein said detector comprises a rod aligned along said longitudinal axis and in engagement with said gage contacting portion whereby movement of said gaging member is transmitted to said rod for detecting movement of said balls, said detector further comprising an outer portion overlapping said cylindrically shaped elongated housing, said cylindrically shaped elongated housing having a V-shaped circumferential groove extending entirely around the periphery, said detector including at least one set screw for urging said detector into mating relationship with said dimensioning

head whereby said dimensioning head maybe adjustably rotated with respect to said detector.

4,873,769

CABINETRY INSTRUMENT

Anthony J. Casanave, P.O. Box 880, 3404 Waterview Rd., Toano, Va. 23168

Filed Aug. 1, 1988, Ser. No. 227,545

Int. Cl.⁴ G01B 3/00; F05D 11/00

U.S. Cl. 33—194

19 Claims



1. An instrument for accurately measuring and positioning cabinet and furniture door hinges comprising: an elongated measuring rod having a measurement scale thereon; a door contact member transversely attached to an end of said measuring rod; at least one sleeve member slidably disposed on said measuring rod; means extending through a first side of said at least one sleeve member to selectively engage said measuring rod and releasably fix said sleeve member in position thereon; a hinge template releasably connected to said sleeve member; said hinge template including a base portion and an elongated tenon extending from said base portion; an elongated mortise formed in a second side of said sleeve member opposite to said first side; said mortise serving to receive said elongated tenon of said hinge template; and, means for releasably securing said elongated tenon within said elongated mortise of said sleeve member.

4,873,770

CAPACITIVE MEASUREMENT SYSTEM

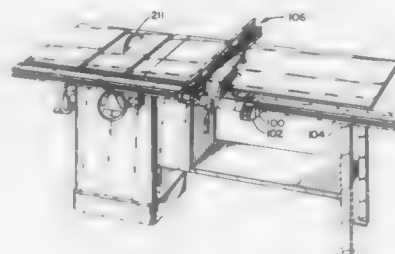
David J. Luttmer, Glenshaw; Thomas L. Panian, Allison Park; Barry D. Wixey, and Raymond L. Wilson, both of Pittsburgh, all of Pa., assignors to Delta International Machinery Corp., Pittsburgh, Pa.

Filed Aug. 19, 1988, Ser. No. 233,493

Int. Cl.⁴ G01B 7/02

U.S. Cl. 33—706

30 Claims



1. A capacitive measurement system, comprising:

- (a) means for generating a plurality of waveforms;
- (b) reader reference means comprising a calibrated reference member for use with a reader head in making a measurement, the calibrated reference member comprising one element of a capacitor;
- (c) reader head means comprising a reader element configured to move laterally with respect to the calibrated reference member for making the measurement relative to a reference position on the reader reference means, the reader element comprising:
 - (i) a plurality of reader regions comprising the other element of the capacitor, the reader regions further comprising means for receiving the waveforms; and
 - (ii) signal input means for receiving two signals resulting from coupling of the two capacitor elements, the signal input means being isolated from the reader regions; and
- (d) phase shift detection means for detecting a predetermined phase shift level between the two signals received by the signal input means when there is no lateral movement between the calibrated reference member and the reader element, for detecting a decreasing phase shift level between the two signals received by the signal input means when there is lateral movement in a first direction, and for detecting an increasing phase shift level between the two signals received by the signal input means when there is lateral movement in the opposite direction, the phase shift detection means comprising means for detecting the magnitude of the lateral movement by detecting the magnitude of the phase shift in a particular direction.

4,873,771

SLIDE GAUGE

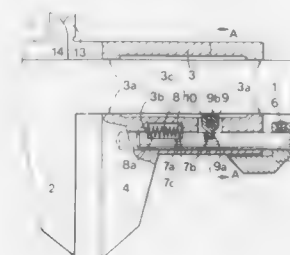
Robert Wüst, Delemont, France, assignor to Schnyder & Cie, Bevilard, Switzerland

Filed Mar. 14, 1988, Ser. No. 170,682

Int. Cl.⁴ G01B 5/02

U.S. Cl. 33—802

8 Claims



1. slide caliper, comprising a beam with at least one measuring jaw mounted thereon, a slide sliding along the beam and provided with at least one measuring jaw, a pusher supported in the slide to be movable in two opposite measuring directions, by means of which the slide can be shifted on the beam in the two opposite directions, wherein the pusher is resiliently supported with respect to the slide in the two aforementioned directions, a spring supported under a predetermined bias between the slide and the pusher, this bias being larger than the displacement resistance of the slide on the beam, so that the spring prevents a relative displacement between the pusher and the slide during the free displacement of the slide in the two aforementioned directions, a clamping element for selectively clamping the slide to the beam and releasing the slide for movement along the beam, and means responsive to movement of the pusher relative to the slide upon the imposition on the pusher of a force greater than said bias, to move the clamping element to clamp the beam, thereby to limit the measuring force exerted by said jaws on an object being measured.

4,873,772

STEAM TREATMENT OF CROPS

Jack Maher, deceased, late of Forbes, Australia (by Molly Veronica Maher, Robert James Maher, co-executors), assignor to Riyate Pty. Limited, Australia

Continuation-in-part of Ser. No. 583,385, Feb. 24, 1985, Pat. No. 4,604,857. This application Jun. 30, 1986, Ser. No. 880,176

Claims priority, application Australia, Feb. 25, 1983, 11434/83

Int. Cl.⁴ F26B 19/00

U.S. Cl. 34—60

6 Claims



1. A crop conditioner comprising an elongated treatment chamber having front and rear ends, for receiving crop to be conditioned without moving, mechanically handling or disturbing the crop, a plurality of steam outlet nozzles within the chamber near the front end thereof adapted to direct steam to the crop after entering the inlet, and means for supplying steam to the outlet nozzles.

4,873,773

CLOTHES DRYER FOR USE WITH FORCED AIR HEATING SYSTEM

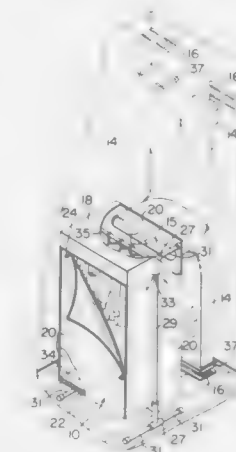
Sidney J. Canonge, Huntington Beach, Calif., assignor to William H. Takahashi, Anaheim, Calif.

Filed May 2, 1988, Ser. No. 189,021

Int. Cl.⁴ F26B 19/00

U.S. Cl. 34—90

14 Claims



1. A portable clothes dryer comprising: a bag having flexible walls that have multiple minute openings therethrough for the limited outflow of air from the bag, a hot air intake duct having one of its ends connectible to a pre-existing conventional hot air register and its other end connected to said bag for introducing pressurized hot air to the bag interior space, and means for hanging items of clothing within the bag, said bag being fully closable so that outflow of air from the bag is substantially solely through said minute openings for limited outflow of air, said minute openings being sized to exert a back pressure on the pressurized air within the bag whereby the bag walls are caused to balloon outwardly such that hot air within the bag is in a pressurized semi-trapped state.

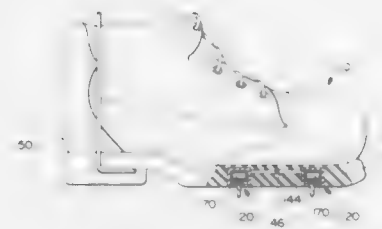
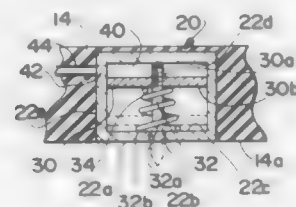
4,873,774

SHOE SOLE WITH RETRACTABLE CLEATS

Alan W. Lafever, Cookeville, Tenn., assignor to Universal Plastics Incorporated, Cookeville, Tenn., a part interest
Filed Mar. 1, 1988, Ser. No. 162,588
Int. Cl.⁴ A43C 15/14; A43B 13/24

U.S. Cl. 36—61

9 Claims



1. A shoe sole, comprising:

a sole portion for supporting the wearer's foot;
at least one chamber provided in said sole portion, said chamber having top, side and bottom walls enclosing an interior volume of said chamber, at least one opening being provided in said bottom wall;
a cleat plate provided horizontally in each said chamber and vertically movable therein, said cleat plate having at least one cleat extending from a bottom thereof in a position corresponding with said opening in said chamber bottom wall, said cleat being able to pass through said opening;
means for urging said cleat plate upwardly away from said chamber bottom wall;
a fluid communication port in each said chamber whereby fluid pressure may be communicated to said chamber; and
an inflatable member provided in each said chamber between said cleat plate and said chamber top wall, said inflatable member being in fluid communication with said fluid communication port of said chamber.

9. A shoe sole, comprising:

a sole portion for supporting the wearer's foot;
at least one chamber provided in said sole portion, said chamber having top, side and bottom walls enclosing an interior volume of said chamber, at least one opening being provided in said bottom wall;
a cleat plate provided horizontally in each said chamber and vertically movable therein, said cleat plate having at least one cleat extending from a bottom thereof in a position corresponding with said opening in said chamber bottom wall, said at least one cleat being able to pass through said opening, said at least one cleat being threadedly held in said cleat plate whereby the position of said cleat relative to said cleat plate is adjustable, an upper end of said at least one cleat protruding above said cleat plate for abutting said chamber top wall to provide a positive stop limit to upward vertical excursion of said cleat plate in said chamber;
means for urging said cleat plate upwardly away from said chamber bottom wall; and
a source of fluid pressure in selective fluid communication with a portion of said chamber interior volume above said cleat plate, for selectively pressurizing said space above

said cleat plate to force said cleat plate downwardly against the urging of said urging means to extend said at least one cleat plate thereof through said opening in said chamber bottom wall.

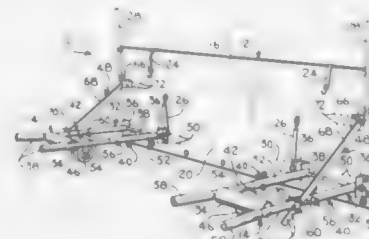
4,873,775

VEHICULAR ATTACHMENT SYSTEM FOR A SNOWPLOW OR THE LIKE

Stephen J. Richey, 5708 Raintree, Parkville, Mo. 64152
Filed Nov. 17, 1987, Ser. No. 121,517
Int. Cl.⁴ E01H 5/04

U.S. Cl. 37—231

15 Claims



1. An implement for a wheeled vehicle for allowing at least one rotatable support wheel of the vehicle to propel said implement ahead of the vehicle in the direction of travel thereof, the wheel being rotatable about an axis generally transverse to the direction of travel of the vehicle and presenting a peripheral portion located on the direction-of-travel edge of the wheel, said implement comprising:

blade means; and
engagement means coupled with said blade means for engaging the peripheral portion of the wheel for receiving substantially all of the propulsion force therefrom required for propelling said blade means ahead of the vehicle during movement thereof in the direction of travel, said engagement means further including means for preventing the wheel from riding thereover during movement in the direction of travel, said engagement means further including guide alignment means for maintaining alignment of the vehicle wheel with said engagement means without connection to the vehicle.

4,873,776

HINGED ILLUMINATED SIGN

Andrew B. Hoffart, Mission Viejo, Calif., assignor to American Display Inc., Rancho Santa Margarita, Calif.
Filed Oct. 31, 1988, Ser. No. 264,801
Int. Cl.⁴ G09F 13/04

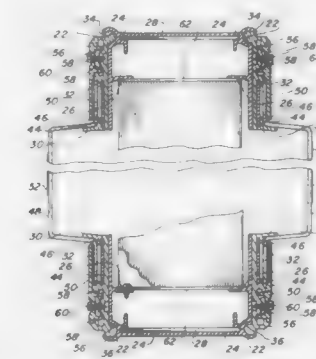
U.S. Cl. 40—572

7 Claims

1. An illuminated sign with integral hinged sides comprising:
(a) an extruded U-section shaped rectangular body having a first side and a second side and having a radial socket along an outer edge of both the first and second side, also a pair of internal recessed angle receiving grooves and a pair of inwardly depending support legs, said body formed into a rectangle having mitered corners, defining a structural frame;
(b) a plurality of angle brackets, one on each corner, so configured as to slideably engage said angle receiving grooves in said body creating a structurally reinforced corner;
(c) a pair of rectangular hinged casings, slightly smaller in girth than said body having a face recess and an outwardly extending radial protuberance along a top edge and an outwardly extending pointed lip on the remaining edges, the radial protuberance slightly smaller in diameter than

the body radial socket and pivotally positioned therein allowing the casings to be retained and hinge outwardly from the body for access inside;

(d) integral self-latching means characterized by said outwardly extended pointed lips on the perimeter of the casing, contiguously engaging the body radial socket on the edge of both the first side and the second side retaining the casings in place by frictional resistance while allowing opening thereof by utilizing a slight bending moment of the body radial socket creating a snap acting closure;
(e) a pair of translucent faces, one on each side of the sign having a peripheral flange and a raised center portion with the flange embracing the face recess of the casing, the face providing a message in the form of a design or indicia on the center portion thereof visible from a distance;



(f) a pair of "F" shaped rectangular face retaining copings nested into said hinged casing joined together with attaching means each coping having a pair of inwardly depending spacer legs of a configuration that overlaps said peripheral flange of the translucent face, retaining the face between the coping and the hinged casing in a removable manner allowing the face to be replaced if damaged; and
(g) lighting means inside the sign providing an electrically actuated light source creating the illumination necessary to make the sign visible from a distance at night and to provide a pleasing appearance through the translucent face distinctly outlining a design or indicia positioned thereupon.

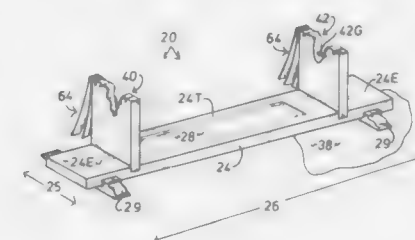
4,873,777

PRESS FIT GUN CRADLE FOR FIREARM MAINTENANCE AND REPAIR

Robert C. Southard, HC 32, Box 3-A, Locust Grove, Ark. 72550
Continuation-in-part of Ser. No. 158,945, Feb. 22, 1988, Pat. No. 4,807,381. This application Sep. 19, 1988, Ser. No. 246,082
Int. Cl.⁴ F41C 29/00

U.S. Cl. 42—94

9 Claims



1. A gun cradle for firearms for temporarily retaining said firearms without damage for maintenance, repair or adjustments, said gun cradle comprising:
a generally planar base having a top, an underside, a pair of

opposed spaced-apart ends, a length, and a width, said base adapted to be disposed upon a supporting surface;
a pair of spaced-apart, parallel, generally horizontal stabilizers coupled to the underside of said base and extending generally perpendicularly relative to the length of said base for firmly and stably supporting said base upon said surface, said stabilizers having a predetermined length and said stabilizers spaced apart from one another a first preselected distance;
a pair of rigid, spaced-apart, vertical sides extending perpendicularly upwardly from said base near opposite ends thereof, each of said sides comprising a bottom secured to said base, a top, and at least one firearm-receptive groove formed in said top, said sides spaced apart from one another at a second preselected distance;
a leather strap permanently disposed upon said tops of each of said vertical sides, said strap lying within said grooves and forming a compliant, nondestructive surface to firmly brace said firearm when press-fitted into said grooves; and
a plurality of additional leather straps adapted to suitably shim at least a portion of a firearm to enable it to be compressively and snugly frictionally fitted within said grooves in cooperation with said first mentioned leather straps, said plurality of straps comprising at least one reservoir of straps pivotally secured to at least one of said vertical sides adjacent said at least one firearm-receptive groove by a fastener so that one or more of said additional straps may be rotated relative to said fastener for subsequent deployment in said groove to aid in shimming.

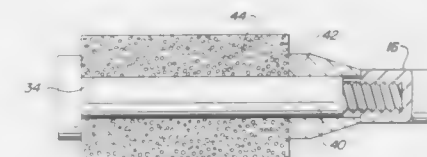
4,873,778

GUN BORE CLEANING APPARATUS

M. R. Stipp, P.O. Box 2613, Midland, Tex. 79702
Filed Dec. 12, 1988, Ser. No. 283,203
Int. Cl.⁴ F41C 31/00

U.S. Cl. 42—95

10 Claims



1. A swab assembly for connection to a cleaning rod or the like, for use with a cleaning rod or the like in cleaning the bore of a shotgun, said assembly comprising:
a spindle constructed from rigid material and a cleaning element removably mounted thereon, said cleaning element having a cylindrical exterior surface and a central bore extending axially therethrough, said cleaning element being constructed of polyethylene closed cell foam and being of a greater diameter than the bore of said gun,
said spindle having a central cylindrical portion for receiving said cleaning element, said cylindrical portion being of a size to extend through the central bore in said cleaning element, a pair of spaced annular shoulders at opposite ends of said central portion, said shoulders being spaced apart to correspond to the axial length of said cleaning element, each of said shoulders terminating in a cylindrical guide surface extending axially in a direction away from said central position, each of said shoulders being small enough in diameter to slide axially through the bore and being smaller in diameter than said cleaning element.

4,873,779

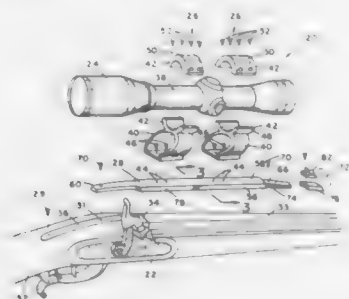
SCOPE MOUNT BASE FOR A BLACK POWDER RIFLE
Larry J. Ellison, Sevierville, and John R. Smelser, Dandridge, both of Tenn., assignors to Leonard G. Adams, Alcoa, Tenn., a part interest

Filed Feb. 16, 1989, Ser. No. 311,603

Int. Cl.⁴ F41G 1/38

U.S. Cl. 42—101

13 Claims



1. A scope mount base for a black powder rifle having a pair of factory-formed, pre-tapped openings along its length, one of the pre-tapped openings adapted to receive a screw for holding a rear sight against the rifle barrel and the other of the pre-tapped openings adapted to receive a screw for joining the rifle breech to the rifle stock, said mount base comprising:

bar means including a forward portion for attachment to the rifle barrel by means of a screw threadably received by said one pre-tapped opening and a rearward portion for attachment to the breech by means of a screw threadably received by said other pre-tapped opening; and said forward and rearward portions joined to one another and providing means by which a scope can be secured to said bar means for mounting the scope upon the rifle.

4,873,780

DEVICE FOR RETAINING A FISH LINE AGAINST A TAPERED FISHING ROD

Henry J. Lancette, 2050 Delaware, Apt. 437, St. Paul, Minn. 55110

Filed Feb. 1, 1988, Ser. No. 150,983

Int. Cl.⁴ A01K 87/00

U.S. Cl. 43—25.2

4 Claims



1. In combination with a tapered fishing rod having a flexible fish line extending longitudinally therealong, a plastic device retaining said fish line in a fixed relation with said fishing rod comprising a shank member and a pair of jaw members integral therewith having a lateral spacing greater than a first tapered portion of said rod and having a cross section less than a second tapered portion of said rod, said jaw members tightly engaging a third tapered portion of said rod residing between said first and second portions to retain a portion of said fish line

in a fixed relation with said third rod portion, said jaw members possessing a limited degree of inherent resiliency and having a low coefficient of friction, thereby enabling said device to be smoothly slid along said tapered rod from said first portion to said third portion to cause said jaw members to tightly engage said third portion.

4,873,781

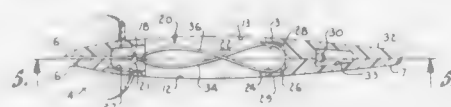
HIDDEN HOOK ARTIFICIAL LURE
Mitchell G. Bates, 908 Brooke Ct., Nixa, Mo. 65714

Filed Jul. 6, 1988, Ser. No. 215,569

Int. Cl.⁴ A01K 83/00

U.S. Cl. 43—35

4 Claims



1. An artificial fishing lure with hidden hooks comprising: a body having a nose and a tail portion, and a cavity therein, and having a recess adjacent said nose portion thereof and a recess adjacent said tail portion thereof, said tail recess having abutment walls;

opposed elongated slits each positioned on an opposed side of said body medially positioned between said nose and said tail portions and extending longitudinally thereof; a spring hook assembly formed from a single member and having a medially positioned bite portion with opposed ends respectively terminating in hook arms and hook ends; a trigger assembly having a first eye protruding from said nose end for attachment to a fishing line and a second eye for engagement with said bite portion of said spring hook assembly;

whereby said spring hook assembly is adapted to be selectively shifted between a retracted and an extended position in response to the movement of said trigger assembly, said hook ends being confined within said tail recess by said abutment walls when in said retracted position, and said hook arms and said hook ends advancing forwardly when said trigger is activated to extend outwardly through said slits.

4,873,782

SWIVEL TAIL ARTICULATED FISHING LURE
Clyde S. Gudermuth, Jr., Fort Smith, Ark., assignor to EBSco Industries, Inc., Ala.

Filed Jul. 5, 1988, Ser. No. 215,721

Int. Cl.⁴ A01K 85/00

U.S. Cl. 43—42.15

9 Claims



1. A fishing lure comprising: a hollow forward body portion having a forward end and a

rear end portion defining an opening into the interior of the forward body portion, said hollow forward body portion including:

an upper body part; and

a lower body part, each of said upper and lower body parts having a forward end and a rear end, and having a closure plate at the rear end thereof, each of said closure plates defining a semicircular opening, with the closure plate semicircular openings registering to form a substantially circular opening at the time when said upper body part and lower body part are joined along a plane extending through the longitudinal axis thereof, said closure plates each having a beveled surface thereon immediately adjacent its respective closure plate semicircular opening to define a tapered, outwardly, flaring frustoconical surface surrounding said opening and facing rearwardly;

a body tail section of generally frustoconical configuration; a neck projecting from said tail section through the circular opening defined by said closure plates in the rear ends of said upper body part and said lower body part;

rear partition means on said upper and lower body parts spaced forwardly from, and defining with, said closure plates, a chamber in the rear end portion of said forward body portion of said lure;

a semispherical ball element secured to the neck at a location within said chamber in the rear portion of said forward body portion of the lure with the arcuate semispherical surface of said semispherical ball element facing rearwardly toward said closure plates and forming a bearing surface to permit said semispherical ball element to rotate in every direction of movement and through 360° against said closure plates to thereby permit said neck and said tail section to rotate about the projected axis of said forward body portion and to pivot in any direction with respect to said longitudinal axis; and

a diving plane subassembly secured to the forward end portion of said forward body portion and projecting forwardly and downwardly therefrom.

4,873,783

SIDE STEPPER WORMS WITH HOOK POCKET
Welbourne D. McGahee, Melbourne, Fla., and John W. Campbell, Montgomery, Ala., assignors to Loop-A-Line, Inc., Melbourne, Fla.

Filed Feb. 7, 1989, Ser. No. 307,823

Int. Cl.⁴ A01K 85/00

U.S. Cl. 43—42.24

23 Claims



1. A fishing lure, comprising:

a live bait emulating body including a membrane with a pocket formed therein for containing a hook that has been threaded on said body; and said membrane dimensioned to completely enclosed said hook and the hook gap.

4,873,784

DISK SHAPED FISHING LINE BOBBER
Terry L. Petron, 3905 25th Ave., So., Minneapolis, Minn. 55406

Filed Feb. 13, 1989, Ser. No. 309,116

Int. Cl.⁴ A01K 93/00

U.S. Cl. 43—44.95

1 Claim

1. A bobber to be mounted on a fishing line comprising: a pair of buoyant plate-like members in a juxtaposed operated position;

an axial rivet with the head portions larger than the shaft portion, wherein the center of said members are captured,

compressed, and depressed between the heads of the rivet whereby said bobber is attached to said fishing line by



wrapping said line around said shaft positioning said line within said member's compressed region.

4,873,785

TRAP

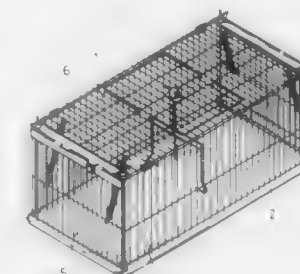
Shun T. Lai, No. 7, Alley 73, Wan Nien Lane, Tung Ho Li, Yuan Lin Chen, Jang-Hwa Hsien, Taiwan

Filed Mar. 13, 1989, Ser. No. 322,507

Int. Cl.⁴ A01M 23/18

U.S. Cl. 43—61

2 Claims



1. A trap comprising a top plate, a bottom plate, four side doors, two elongated elements and a delicate sensing means, wherein two of said side doors face each other are openable and connected to said top door by springs, each of said openable doors having a slot thereon, said sensing means comprising a block which is above said top plate and a plurality of hooks which are below said top door, said block being substantially rectangular with two small protuberances parts protruding oppositely therefrom, each of said elongated elements being substantially L-shaped with a crooked end;

when in use, two of said openable doors being opened and held horizontally by said elongated elements which are attached to said block with said crooked end of said elongated members while an end of a straight portion of said elongated elements are inserted into said slots of said openable doors.

4,873,786

BUG WHACKER LIGHT

Nicholas N. Franco, 3380 NW. 46 Ave., Lauderdale Lakes, Fla.

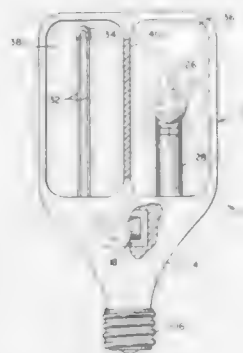
11/17

Filed Jul. 18, 1988, Ser. No. 220,722

Int. Cl.⁴ A01M 1/04, 1/22; F21V 33/00; H05C 3/00

U.S. Cl. 43—112

5 Claims



1. An insect killing light comprising:
 - a glass envelope having a transparent central divider wall integrally attached in said envelope defining first and second compartments having respective openings in side-by-side relation and facing in the same direction, threaded base means for the envelope for receipt in a light bulb socket,
 - a high voltage circuit means in said envelope and including a pair of electrodes that are spaced apart and are fixedly secured in said envelope at one end and that extend, spaced apart, upwardly within the first compartment providing a means for killing the insects, and
 - an electric light bulb mounted in said second compartment for illuminating the surrounding space while also attracting insects.

4,873,787

ENTRY STRUCTURE FOR FLEXIBLE BAG TYPE INSECT TRAP

Rodney G. Schneidmiller, S. 1911 Conklin, Veradale, Wash.

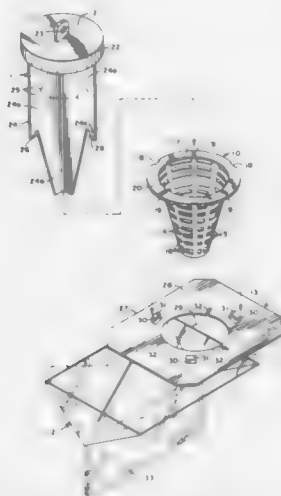
9/9/87

Filed Sep. 14, 1988, Ser. No. 244,042

Int. Cl.⁴ A01M 1/10

U.S. Cl. 43—122

5 Claims



1. An entry structure for a containment type insect trap, having a flexible containment bag with an orifice defined in its

top portion for passage of and interconnection with the entry structure, comprising, in combination:

- a peripherally defined truncated conic entry member having an annular rim extending outwardly from the base, said annular rim having first means to releasably fasten a fastening plate adjacent thereto and second fastening means to fasten a pillar of a closing structure thereto;
- a closing structure having an upper cap carried by a depending pillar defining plural elongate channels extending inwardly from its periphery, said pillar having a lower portion configured to fit within the truncated conic entry member and fastening means to cooperatively fasten with the second fastening means of the conic entryway member; and
- a fastening plate, defining a medial entry orifice slidably carrying the upper portion of the closing structure pillar, said fastening plate configured to fit immediately upwardly adjacent the annular rim of the entry member and having means to releasably fasten with the first fastening means of the annular rim.

4,873,788

BRACKET ASSEMBLY AND PLANT LEAF LIFTER AND PROTECTOR

Jose A. Viramontes, Star Rte., Box 18-A, Mesilla Park, N. Mex.

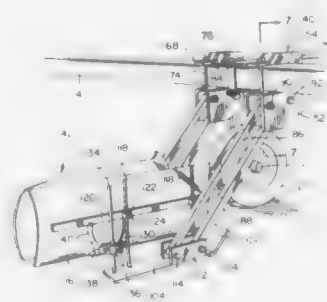
8/11/87

Filed Jan. 24, 1988, Ser. No. 211,040

Int. Cl.⁴ A01G 25/00

U.S. Cl. 47—1.7

15 Claims



1. In combination with a tool bar for support rearwardly of a tractor having a three point hitch, said tool bar including an A-frame bracket and a pair of horizontally spaced bracket assemblies disposed on the tool bar for mounting engagement with the lower arms and upper arm of a three point hitch, bracket assemblies mounted on the tool bar in pairs with each pair of bracket assemblies supporting a plant leaf lifter and protector extending downwardly and rearwardly therefrom for movement along a path adjacent opposite surfaces of a row of plants and including a discharge nozzle for discharging liquid material onto the ground surface adjacent the plants with the plant leaf lifter and protector protecting the plants from direct contact with the discharged material, each of the bracket assemblies comprising a pair of generally parallel side plates with each of the side plates including a rearwardly opening notch of a configuration to receive the tool bar, rigid means interconnecting the side plates with the edges of the notches in the side plates engaging a substantial portion of the periphery of the tool bar, a pivotal clamp plate mounted between the side plates at the upper end of the notch and extending rearwardly into overlying relation to the tool bar, a clamp bolt extending through the clamp plate and a threaded fitting rigid with the bottom of the notch rearwardly of the tool bar whereby the bracket assemblies may be adjustably and tightly clamped to the tool bar.

4,873,789

SOIL STERILIZER

Andrew J. Plattner, 4663 Hedgewood Dr., Birmingham, Mich.

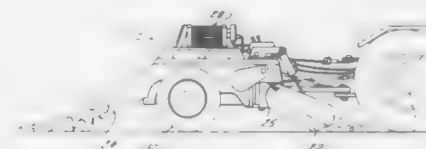
4/30/10

Filed Jan. 20, 1987, Ser. No. 5,151

Int. Cl.⁴ A01B 77/00

U.S. Cl. 47—1.42

4 Claims



1. An apparatus for soil sterilization to control undesirable biotica resident therein, comprising in combination:
 - a shielded chamber with a baffled inlet and a baffled outlet; means for generating electromagnetic energy having a frequency in the range of from 60 to 3,000,000 gigaHertz, said energy being contained within the chamber;
 - a conveyor means to continuously convey portions of unsterilized soil into the baffled inlet, through the chamber and out the baffled outlet, whereby the soil is exposed to the electromagnetic energy within the chamber for a sufficient duration to cause significant death and disability of the undesirable biotica resident therein;
 - means whereby the apparatus is mounted on wheels and may be moved across portions of a tillable field;
 - a scalping blade for removing soil from a tillable field to a predetermined depth for deposit on the conveyor means;
 - a screening device between the scalping blade and baffled inlet for selective removal of objects from the soil of a size larger than a predetermined value;
 - means for discharging the sterilized soil back on to the tillable field;
 - means for measuring the radiation level of the sterilized soil immediately prior to discharge; and
 - a power plant capable of powering the generating means with an output capacity of at least 300 roentgens.

4,873,790

PLANT SPINNER

Joseph Laterza, 1456 Middle Country Rd., Centereach, N.Y.

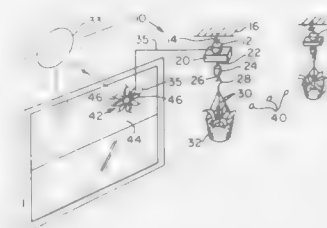
11/7/88

Filed Aug. 26, 1988, Ser. No. 237,279

Int. Cl.⁴ A01G 9/02

U.S. Cl. 47—67

7 Claims



1. A plant spinner for plants cultivated by window light comprising:
 - an assembly housing for mounting on a stationary support;
 - an electric motor secured in said housing;
 - a reduction gear box secured to said motor for reduction of the speed thereof;
 - a swivel secured to an output shaft of the gear box and having means for connection to a potted plant to effect rotation thereof by the motor and operable to permit rotation of the potted plant relative to the output shaft for protection of said motor and said solar cell in the event of obstruction of free rotation of the potted plant; and,
 - a solar cell device comprising a simulated plant with a plu-

rality of solar cells thereon at least one of which is electrically connected to the motor for supplying power thereto; and, means for securing said simulated plant to a window pane for exposure of the solar cells to light from the sun.

4,873,791

TORQUE ROD OPERATED COUNTERBALANCING HINGE AND DOOR ASSEMBLY

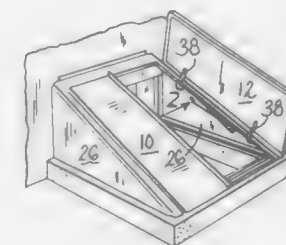
Robert Lyons, Sr., Hamden, Conn., assignor to The Bilco Company, West Haven, Conn.

Filed Oct. 27, 1988, Ser. No. 263,533

Int. Cl.⁴ E05F 1/10

U.S. Cl. 49—386

19 Claims



17. A counterbalancing hinge comprising:
 - a first hinge member;
 - a second hinge member hingedly connected to the first hinge member at a hinge point, said second hinge member integrally including a cam means having a cam surface formed thereon; and
 - a counterbalance torque means for producing a counterbalancing torque at the hinge point which is a substantially sinusoidal function of the opening angle of the hinge, said counterbalance torque means including:
 - a lever arm means rotatably mounted at a pivot point, said pivot point being located at a position displaced from the location of the hinge point
 - said lever arm means having a bearing surface for contacting the cam surface; and
 - a linear force producing means operatively connected between the lever arm means and the first hinge member.

4,873,792

POLISHING APPARATUS

Thomas A. Linke, Wadsworth; Issa R. Dandan, Niles; Troy W. Livingston, Northbrook, all of Ill., and Alan W. Wilkerson, Cedarburg, Wis., assignors to Buehler, Ltd., Lake Bluff, Ill.

Filed Jun. 1, 1988, Ser. No. 200,842

Int. Cl.⁴ B24B 49/04

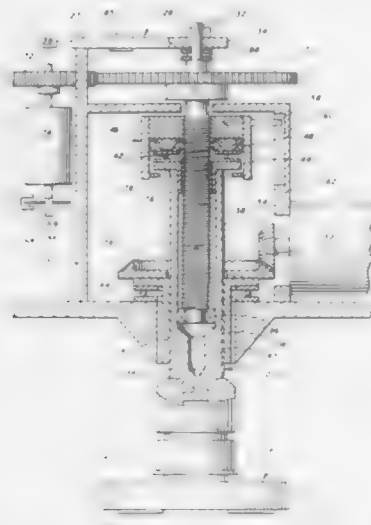
U.S. Cl. 51—165.8

21 Claims

18. In apparatus for grinding or polishing specimens comprising a vertical shaft; means for rotating said vertical shaft;

means for attaching a holder for specimens to be polished to the lower end of the vertical shaft; and means for pressing specimens carried in such an attached holder at a predetermined force against a polishing surface, the improvement comprising, in combination:

said pressing means comprising a strain gauge, said strain gauge carrying said vertical shaft at the upper end of the shaft whereby the strain gauge may emit a signal responsive to the sensed weight of the shaft and parts carried thereon; and electrically operated mechanical means for vertically advancing and retracting said shaft in a manner



responsive to signals from said strain gauge during the grinding process, said shaft including a vertical rod, and a vertical member which is relatively rotatable with respect to said vertical rod, said vertical member being in telescoping relation with said vertical rod; means for rotating said vertical member; means for causing said vertical rod and vertical member to increase or decrease its overall length as said vertical rod is rotated relative to said apparatus, said electrically operated mechanical means being adapted to rotate said vertical rod to vertically advance or retract said shaft in response to signals from said strain gauge by increasing or decreasing said overall length.

4,873,793

NUMERICALLY CONTROLLED MACHINE TOOL
Hiroaki Asano, Okazaki; Toshio Tsujiuchi, Kariya; Takao Yoneda, Nagoya; Nobuhiro Ishihara, Aichi; Toshio Maruyama, Kariya, and Norio Ohta, Okazaki, all of Japan, assignors to Toyota-Koki Kabushiki-Kaisha, Kariya, Japan
Filed Sep. 3, 1987, Ser. No. 92,689

Claims priority, application Japan, Sep. 22, 1986, 61-224272; Sep. 22, 1986, 61-224273

Int. Cl.⁴ B24B 51/00

U.S. Cl. 51—165.71

9 Claims

1. A numerically controlled machine tool, which has a tool feed axis servomotor, for grinding a non-circular workpiece according to profile data which define a profile generating movement of a tool along the final shape of non-circular workpiece, said numerically controlled machine tool comprising:

a numerical controller for outputting a command position signal according to execution profile data calculated from ideal profile data corresponding to an ideal final shape of said workpiece and compensated for position error due to a follow delay characteristic of said numerically controlled machine tool;

position detecting means for detecting the position of the tool feed axis servomotor, and for outputting a position feedback signal;

a follow error detecting circuit for inputting said command

signal position and said position feedback signal, and for detecting a position follow error of said servomotor so as to produce an error signal corresponding to said detected position error;

a velocity compensation signal generating circuit for gener-



ating a compensation signal corresponding to a commanded velocity of said servomotor;
an adding circuit for adding said compensation signal to said signal error; and
an amplifier for driving said servomotor according to the output signal of said adding circuit.

4,873,794

HOLDER FOR MILLING COUNTERSINK FILLER PLUGS

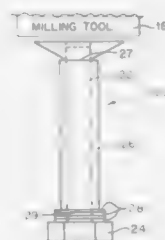
Jeffrey L. Shurtliff, Clinton, and Michael E. Thomas, Layton, both of Utah, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 21, 1986, Ser. No. 865,323

Int. Cl.⁴ B24B 41/06

U.S. Cl. 51—227 R

3 Claims



1. A holder for milling a surface of a countersink filler plug, said filler plug being made of a material having a predetermined hardness and having a hole therein of a preselected diameter, and said hole having a longitudinal axis substantially perpendicular to said surface of said filler plug, said holder comprising:

means having a shank made of a material harder than said predetermined hardness of said filler plug and a base for supporting said filler plug adjacent a milling tool, said shank being of a predetermined height and a predetermined diameter, said predetermined diameter being slightly less than said preselected diameter of said hole in said filler plug;

a sleeve slidably mounted upon said shank and being of a height slightly less than said predetermined height of said shank; and

height adjustment means interposed between an end of said sleeve and said base of said support means for controlling the position of said sleeve relative to said support means in order to expose a predetermined amount of said shank beyond said sleeve;

whereby said predetermined amount of said shank protrudes into said hole of said filler plug so as to mount said filler plug upon said support means in abutting relationship with

said sleeve in order to control the amount of material which remains as part of said filler plug during the milling procedure.

4,873,795

COVERING FOR A GROUND OPENING

Hansruedi Spiess, Delemont, and Francois Galvanetto, Alle, both of Switzerland, assignors to Von Roll, AG., Gerlafingen, Switzerland

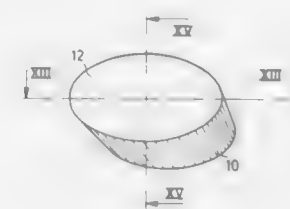
Filed Nov. 2, 1988, Ser. No. 266,395

Claims priority, application European Pat. Off., May 12, 1988, 88107651.7

Int. Cl.⁴ E02D 29/14

U.S. Cl. 52—20

14 Claims



1. Covering for a ground opening, comprising a frame and a cover inserted and supported in the frame, the cover having an external circumferential supporting surface and the frame having an internal bearing surface, said supporting surface and said bearing surface being formed as mating cooperating surfaces inclined with respect to a cover plane, said supporting surface of the cover and said bearing surface of the frame being partial surfaces of a sloping rotation-symmetrical body essentially bounded by sections in such a way that the inclination of the support surface of the cover and the bearing surface of the frame have along a circumference thereof a different slope with respect to the cover plane so that the cover can be placed into the frame in only one position.

4,873,796

DOME STRUCTURE

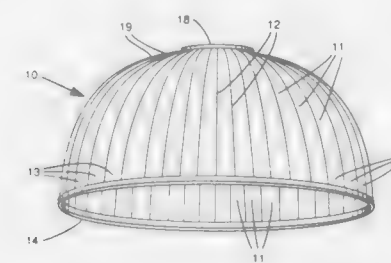
Kemal Akmes, 178 Flood Ave., San Francisco, Calif. 94131

Filed May 27, 1988, Ser. No. 199,601

Int. Cl.⁴ E04B 1/32

U.S. Cl. 52—80

14 Claims



1. A dome-like structure, comprising,
a large plurality of separately formed generally arcuate wood segments, preformed in said generally arcuate shape and essentially unstressed in the assembled dome-like structure, each subtending an arc from a base end of the segment and of the structure to an apex end of the segment and of the structure, each segment having outer and inner faces which taper in width from a maximum width at the base end of the segment progressively to a minimum width at the apex end of the segment,
substantially each segment being connected at its two edges directly to two similar adjacent segments, one on either

side, at joints lying in planes substantially perpendicular to a base plane containing the base ends of a segment, and the edges of adjacent segments being closely and substantially abutted, with the edge angle between the edge of a segment and a face of the segment varying from the base end to the apex end, from a maximum deviation from perpendicular at the base end to substantially perpendicular at the apex end,

shape reinforcing means at least at the base ends of the segments, for reinforcing the shape of the base end of the structure,

the structural connections between segments being made entirely via the edges of the segments, aside from the presence of said shape reinforcing means, and

the segments together serving as structural supporting elements of the dome-like structure as well as inner and outer surfaces of the structure without any other structural framework or connection members on the inner or outer surfaces along or traversing the segments between the base ends and the apex ends.

4,873,797

STRESSED SKIN POST AND BEAM BUILDING CONSTRUCTION SYSTEM

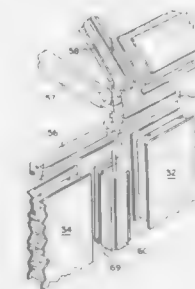
Robert J. Rydeen, Brentwood, N.H., assignor to R. J. Rydeen & Associates, Brentwood, N.H.

Filed Jun. 1, 1988, Ser. No. 201,048

Int. Cl.⁴ E04C 1/24

U.S. Cl. 52—93

8 Claims

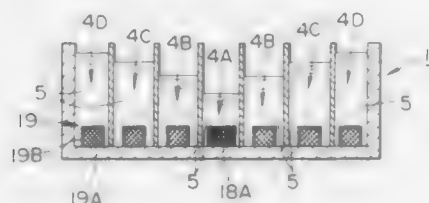


1. A stressed skin post and beam construction comprising:
(a) a first post;
(b) a first beam parallel to an exterior wall of the building and resting on said first post;
(c) a second beam aligned with said first beam and resting on said first beam; and
(d) a second post, a sill, and a stressed skin wall panel wherein;
(e) said stressed skin consists of an exterior wall panel, an interior wall panel and rigid insulating material structurally connecting the exterior and interior wall panels together;
(f) said second post is adjacent said first post and supports said first beam;
(g) said first and second posts rest on said sill;
(h) adjacent, exterior edges of said first and second posts and said first beam have two-sided cutouts therein, said cutouts rigidly receiving opposite side and end portions of said exterior wall panel; and
(i) inwardly facing surfaces adjacent interior edges of said first and second posts and said first beam have grooves therein, said grooves respectively receiving side and end portions of said interior wall panel.

4,873,798

APPARATUS FOR SUPPRESSING VIBRATION OF STRUCTURE

Takanori Sato, Tokyo, Japan, assignor to Shimizu Construction Co., Ltd., Tokyo, Japan
 Filed Nov. 14, 1988, Ser. No. 271,104
 Claims priority, application Japan, Nov. 17, 1987, 62-290236
 Int. Cl.⁴ F16F 7/10; F23J 13/00
 U.S. Cl. 52—167 DF 7 Claims



1. An apparatus for suppressing vibration of a structure, the apparatus comprising:

a tank adapted to be mounted in the structure and having a bottom;

at least one annular partition wall concentrically arranged within said tank and erected on the bottom of said tank, said partition wall defining a plurality of annular chambers concentric about a vertical axis of said tank to receive a liquid for suppressing vibration of the structure, each of said chambers being adapted to contain such an amount of said liquid that said liquid in each chamber is equal in natural period to the structure, the total amount of said liquid in said tank being such that a ratio of effective mass of said liquid over mass of the structure is about 1/300 to about 1/50; and

vibration damping means arranged in at least one of said chambers for damping vibration of said liquid contained in the at least one chamber, occasioned due to swinging of the structure, said vibration damping means comprising one or more screen members, each of said screen members comprising a mesh and being erected on the bottom of said tank and extending radially from said vertical axis relative to at least one said chamber, wherein said screen member allows said liquid to flow therethrough so as to baffle a circumferential flow of said liquid to said chamber due to the swinging of the structure.

4,873,799

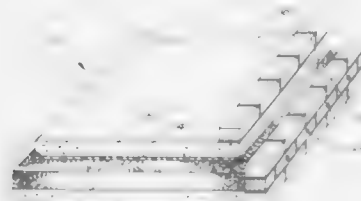
DAMP-PROOF COMPOSITE FLOORING

Attila J. Flink, 29 Waratah St., Rushcutters Bay NSW, Australia (2011)

Filed Aug. 24, 1987, Ser. No. 88,630
 Int. Cl.⁴ E02D 27/00

U.S. Cl. 52—169.8

17 Claims



1. A flooring system comprising:

a lower surface sloping to at least one side;

a collection chamber, situated to receive water from said lower surface;
 a drainage layer, comprising bricks or brick piers, situated above said lower surface such that water can flow along said lower surface;
 a substantially water impervious layer, disposed above said drainage layer;
 said drainage layer defining a cavity between said lower surface and said substantially water impervious layer;
 a floor layer, disposed above and in contact with said substantially water impervious layer; and
 pump means for removing water from said collection chamber.

4,873,800

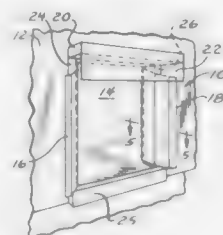
LOADING DOCK SEAL

John A. Frommelt, Dubuque, Iowa, and Kenneth Lenz, East Dubuque, Ill., assignors to Frommelt Industries, Inc., Dubuque, Iowa

Filed Feb. 3, 1988, Ser. No. 151,874
 Int. Cl.⁴ E04H 14/00

U.S. Cl. 52—173 DS

15 Claims



1. A seal for use with a vehicle having a pair of facing, generally vertical side panels having rear edge portions, said seal comprising:

a plurality of flexible, resilient members each having a distal end and a proximal end mounted to a wall in a spaced manner adjacent to a lateral portion of an opening in said wall and extending outward from said wall and away from the opening therein when not in use;

a cover disposed over and encompassing said flexible, resilient members;

at least one generally vertically oriented reinforcing member extending substantially the entire length of said seal, wherein said at least one generally vertically oriented reinforcing member is disposed in a spaced manner from the proximal end of each of said flexible, resilient members; and

gripping means attached to said cover and facing the opening in the wall for allowing said seal to be pulled inwardly toward the opening and into an aft portion of the vehicle such that upon release of said gripping means the distal end of said flexible, resilient members engages an inner portion of said side panel and said seal extends between the vehicle and the wall.

4,873,801

METHOD AND APPARATUS FOR SEALING AND PROTECTING LOADING DOCK DOORWAYS

William L. Winters, 2975 Haywood Ave., Chattanooga, Tenn. 37415

Filed Nov. 28, 1988, Ser. No. 276,965
 Int. Cl.⁴ E04H 14/00

U.S. Cl. 52—173 DS

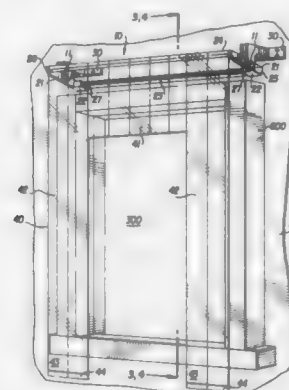
14 Claims

1. A self-positioning, durable, loading dock doorway seal and protector for providing a weather and conditioned-air seal between docking vehicles and loading dock structure and for providing protection to doorway structure, padding and seal material comprising:

a rocker arm assembly having a pair of rocker arms with

each arm having an inner end and an outer end and a coincident axis point, counterweight support means, counterweights of slightly more weight than necessary to counterbalance said rocker arm assembly, and a curtain anchoring means;
 means for mounting said rocker arm assembly to a loading dock wall;
 means for rotatably attaching said rocker arm assembly to said mounting means;
 means attached to said mounting means for restraining the rotation of said rocker arm assembly;
 means for attaching said counterweight support means to said rocker arms;

surfaces of the first and second elements is intermittent and is substantially only on the apices of said first element.



a plurality of vertically split and overlapping sealing strips attached at one end to said curtain anchoring means whereby said strips are arranged to form a top curtain section and two side curtain sections which are positioned on said curtain anchoring means to border the top and sides of a loading dock doorway;
 means for attaching said strips to said curtain anchoring means; and,
 weighting means attached to the face end of each sealing strip comprising said side curtain sections to provide for curtain stability and proper sealing tension against the sides of docking vehicles.

4,873,802

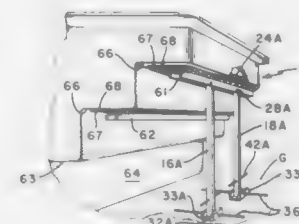
PLASTIC MODULE RIGIDIZING SYSTEM

Donald E. Dahowski, York, Pa., assignor to Quaker Plastic Corporation, Mountville, Pa.

Filed Nov. 17, 1987, Ser. No. 121,496
 Int. Cl.⁴ E04H 3/16

U.S. Cl. 52—184

17 Claims



11. A prefabricated structural module whose flexure is stabilized so as to have a controlled rigidity comprising in combination

(a) a first element of plastic composition and

(b) a second element permanently bonded to and having a different coefficient of expansion from said first element, said first element presenting a surface to which the surface of the of said second element is bonded comprised of a plurality of apices and valleys and wherein the bonding between the

1. A double glazed window structure consisting of a rectangular window frame; a first pane seated in said window frame; said first pane having an exterior surface, an interior surface and a periphery; said window frame being recessed to abuttingly contact said interior surface along said periphery to receive said first pane to define a one piece unit; glazing means abutting the periphery of said exterior surface of said first pane and said window frame to securely fasten and retain said first pane in said window frame; a sealant tape mounted around and adhered to the peripheral interior surface of said first pane, a flat longitudinally extending rigid retainer support member mounted on said window frame closely adjacent said peripheral interior surface of said first pane; said retainer having a forwardly disposed edge and a rearwardly disposed edge; said forwardly disposed edge abutting said first pane; said retainer having a plurality of spaced holes closely adjacent to said forwardly disposed edge to receive securing means to fasten said retainer to said window frame; said retainer having a midportion located between said forwardly disposed edge and said rearwardly disposed edge; said retainer having a longitudinally extending flange member integrally connected to said midportion of said retainer; said flange member cooperative with that portion of said retainer adjacent to said rearwardly disposed edge to define a narrow channel therebetween; said flange portion disposed inside of said narrow channel has at least a pair of abutments; a second pane having the peripheral edge of one surface in abutting contact with said sealant tape; said second pane having its peripheral edge in sealing contact with said flange; a thin longitudinally extending flat rigid trim member having a running length with an upper portion and a lower portion; the juncture of said upper portion and said lower portion having an outwardly extending thin continuous strip member; and said strip member having an abutment for locking engagement with said abutments in said narrow channel to position the uppermost end of said upper portion against the other peripheral surface of said second pane to exert a pressure thereon as said lower portion flexes and contacts said window frame.

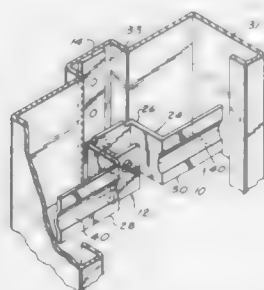
4,873,804

DRYWALL FRAME COMPRESSION ANCHOR ASSEMBLY AND FRAME

Gopal S. Kukke, Manalapan, N.J., assignor to Pioneer Industries, Division of Core Industries, Inc., Carlstadt, N.J.
Filed Oct. 11, 1988, Ser. No. 256,046
Int. Cl.⁴ E06B 1/60

U.S. Cl. 52—217

23 Claims



1. A drywall frame compression anchor assembly for use with a frame to be mounted in an opening of a wall, comprising:

- support means having a pair of spaced support legs;
- a jamb anchor including a center portion and a pair of oppositely extending wings projecting therefrom, said jamb anchor moveably mounted between said support legs; and
- means for moving said jamb anchor between said support legs to engage the surface of an opening of a wall including a threaded opening in said center portion of said jamb anchor and screw means having a head and a shank portion, said shank portion arranged in threaded engagement with said threaded opening in said center portion and supported by an opening in at least one of said support legs so that upon rotation of said screw means, the jamb anchor travels along said shank portion between said support legs.

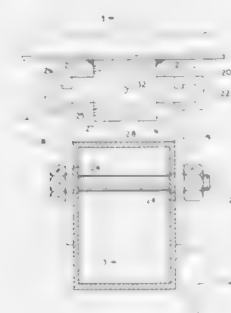
4,873,805

CONNECTING MEANS OF CURTAINWALL SUPPORTING MULLIONS

Raymond M. L. Ting, 318 Holiday Dr., Pittsburgh, Pa. 15237
Filed Jul. 21, 1988, Ser. No. 222,564
Int. Cl.⁴ E04B 2/88

U.S. Cl. 52—235

6 Claims



1. A curtainwall structure forming an exterior wall surface defining a X-direction being horizontally perpendicular to said wall surface, a Y-direction being vertically parallel to said wall surface, and a Z-direction being horizontally parallel to said wall surface, said curtainwall structure being supported on at least two spaced apart mullions spanning in said Y-direction, each said mullion being connected to a building frame at at least two locations along said Y-direction using a first connection means and at least one second connection means, said first connection being fixed in both said X-direction and Y-direction,

said second connection means being fixed in said X-direction and slidable in said Y-direction, the improvement of said second connection means comprising:

- (a) a housing clip having at least one web integrally connecting with two spaced apart flanges;
- (b) said housing clip being firmly fixed to said building frame in said X-direction, Y-direction, and Z-direction, forming a hollow space along said Z-direction, said hollow space being defined by a hollow depth in said X-direction, a hollow height in said Y-direction, and a hollow length in said Z-direction;
- (c) a holding clip having a width in said Z-direction being larger than said hollow length, a length in said Y-direction being smaller than said hollow height, a depth in said X-direction being smaller than said hollow depth, and having an engaging profile slidable in said Y-direction and fixed in said X-direction and Z-direction along side edge parallel to said Y-direction;
- (d) said holding clip being secured and fixed in said X-direction within said hollow space where said engaging profiles being positioned out of said hollow space;
- (e) at least one fastening clip having a slidable engaging profile matched with said engaging profile of said holding clip and an integral fastening flange having a surface parallel to a plane defined by said X-direction and Y-direction;
- (f) said mullion being firmly fastened to said fastening flange of said fastening clip slidably engaged along the edge of said holding clip.

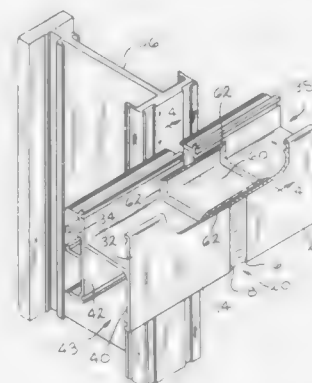
4,873,806

FLEXIBLE SPLICE FOR METAL FRAME MEMBERS IN A CURTAIN WALL

Fred G. Jeschke, Whitmore Lake, Mich., assignor to American Glass and Metal Corporation, Plymouth, Mich.
Filed Nov. 14, 1988, Ser. No. 270,075
Int. Cl.⁴ E04H 1/00; E04C 3/30

U.S. Cl. 52—235

4 Claims



1. In a curtain wall structure having a plurality of wall panel members supported vertically in a frame structure wherein the frame structure includes:

- a plurality of support members for said panels arranged in end-to-end relation with adjacent ends of adjacent members being spaced from one another; the improvement comprising:
- at least one slab member formed of a flexible sealant material bridging the space between the adjacent ends of a pair of adjacent support members, and a flowable silicone caulking material adhering said slab to said adjacent ends of said adjacent members.

4,873,807

ROOF INSULATING AND WATERPROOFING METHODS AND STRUCTURES

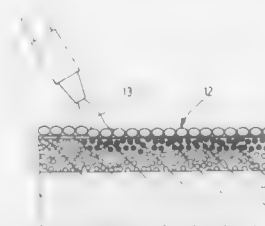
Stanislaw Filip, 141 Davisville Ave. Apt. 806, Toronto, Ontario, Canada M4S 1G7
Filed Sep. 28, 1988, Ser. No. 250,067

Claims priority, application United Kingdom, Sep. 30, 1987, #7221939

U.S. Cl. 52—408

Int. Cl.⁴ E04B 1/00

7 Claims



1. A method of insulating and waterproofing a generally horizontal roof, comprising:

- forming an insulating layer of heat-resistant foam material over the roof;
- forming a layer of tar immediately over and against the insulating layer;
- depositing a layer of gravel over the tar layer;
- heating the tar sufficiently that the tar is drawn upwardly through the gravel to form a bond with the gravel layer and the tar forms a bond with the layer of foam material.

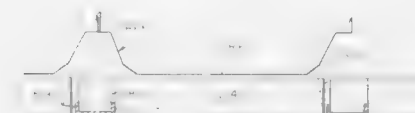
4,873,808

SPACER BLOCK FOR STANDING SEAM ROOF

Raymond K. Heisey, Jr.; W. David Barker, both of Kansas City; Arturo C. Mariano, Independent, and Vernon L. Thurnau, Kansas City, all of Mo., assignors to Butler Manufacturing Company, Kansas City, Mo.
Continuation of Ser. No. 602,488, Apr. 20, 1984, abandoned.
This application Mar. 27, 1989, Ser. No. 328,717
Int. Cl.⁴ E04D 1/34; E04B 5/00

U.S. Cl. 52—478

22 Claims



1. A standing seam roof panel support device, comprising: an elongated spacer block for supporting and spacing a roof panel upon a building roof structural element; external aligning means on one end of said spacer block for contacting engagement with a roof panel mounting clip; additional external aligning means on the other end of said spacer block for complementary association with another roof panel mounting clip; and said external aligning means on said one end of said spacer block for engaging a roof panel mounting clip comprising a single tenon projection extending outwardly from said end so that transverse flanges on said mounting clip can transversely engage with said tenon projection on opposite sides thereof to locate and align the spacer block both longitudinally and laterally on the roof structural element.

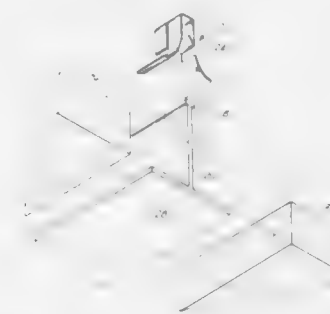
4,873,809

CEILING TILE HOLD DOWN CLIP

Harold J. Paul, 2015 Magnolia Ave., Pensacola, Fla. 32503
Continuation-in-part of Ser. No. 170,810, Mar. 21, 1988. This application Aug. 26, 1988, Ser. No. 240,063
Int. Cl.⁴ E04B 5/57

U.S. Cl. 52—489

3 Claims



3. A ceiling tile hold down clip for mounting on the cross support of a plurality of ceiling tile sections, said clip comprising:

- (a) a substantially flat rectangular main body portion, thus defining opposing lateral sides and edges;
- (b) a pair of arcuately shaped spaced apart retaining arms extending downwardly and outwardly from diagonally positioned portions of the opposing lateral sides of said main body portion, said retaining arms having lower and upper portions, said lower portion being substantially widened with respect to said the upper portion thereof, but widened no further than said edges of said main body portion, and adapted for engaging with its lower concave surface the upper surface of one of said ceiling tile sections; and,
- (c) a pair of locking arms extending downwardly from opposing sides of said main body portion and positioned opposed and substantially parallel to said retaining arms at the upper portions of said retaining and locking arms, each of said locking arms having proximate and distal ends, and having at its distal end a lip portion which extends inwardly toward said opposed retaining arm and upwardly toward said main body portion for engaging said cross support of said ceiling tile section.

4,873,810

ELEMENTS HAVING A MULTI-DIRECTIONAL CELLULAR STRUCTURE WHOSE INERTIA MAY VARY, AND METHODS OF MANUFACTURE

Jean Lecaroz, 6, Place Corneille, 92100 Boulogne, France
PCT No. PCT/FR85/00259, § 371 Date Jul. 6, 1987, § 102(e)
Date Jul. 6, 1987, PCT Pub. No. WO87/01789, PCT Pub. Date Mar. 26, 1987

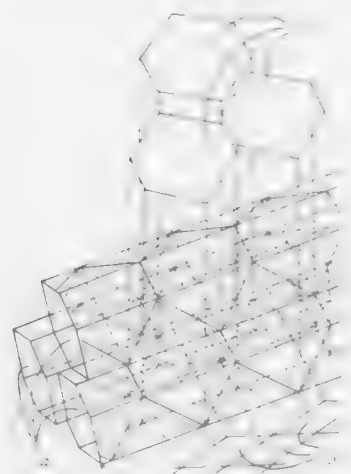
PCT Filed Sep. 23, 1985, Ser. No. 72,241
Int. Cl.⁴ E04B 1/62

U.S. Cl. 52—575

39 Claims

1. An element of multi-directional cellular structure formed by a plurality of series of hollow closed shell-like elements each of polygonal section which intersect, each of said series being composed of a plurality of convex closed prismatic shell-like elements of a same direction which are joined by one common plate face, wherein only the shell-like elements of a same series have common face planes, and the intersections of the shell-like elements define juxtaposed cells, each edge on

one shell-like element of a given direction intersecting at least one edge of a shell-like element of another direction and each



edge of each cell being entirely contained in the intersection of the planes of the shell-like elements.

4,873,811

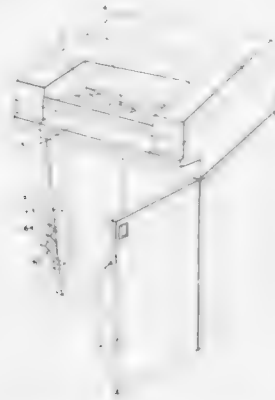
SHREDDER

Masayoshi Izumitani, and Akihiro Soga, both of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Continuation of Ser. No. 47,766, May 8, 1987, abandoned. This application Aug. 29, 1988, Ser. No. 239,026

Claims priority, application Japan, May 13, 1986, 61-72427
Int. Cl.⁴ B65B 51/06

U.S. Cl. 53—138 A

3 Claims



1. In a shredder having a housing which contains a bag therein for holding shredded materials and a door for opening and closing an opening in said housing through which said bag is removed from inside said housing, the improvement wherein said shredder further comprises a bag closing device retractably attached to said housing near said opening such that said bag closing device is normally contained inside said housing and is automatically moved, when said door is opened, to an operative position at which said bag closing device is operable.

4,873,812

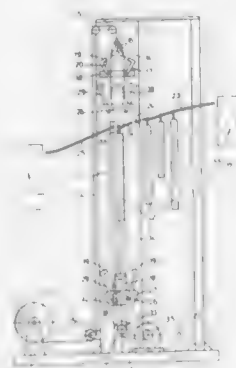
CLOTHING ARTICLE PACKAGING MACHINE

Wilfried Pavel, Halle/Westf., Fed. Rep. of Germany, assignor to Wilfried Pavel Maschinenbau, Halle/Westf., Fed. Rep. of Germany

Filed Sep. 10, 1987, Ser. No. 95,099
Int. Cl.⁴ B65B 9/12, 5/02

U.S. Cl. 53—241

18 Claims



1. A packaging machine for packaging objects, especially clothing articles, in a packaging portion of a hose-shaped synthetic plastic material foil that is contained on a roll, comprising:

- a machine frame;
- means for rotatably mounting the roll of the synthetic plastic material foil on said machine frame;
- means for guiding the foil unwound from the roll along a predetermined path to an upper region of said machine frame, including diverting rollers engaging the unwound foil;
- means for opening the hose-shaped foil at said upper region of said machine frame;
- means for welding the foil at said upper region of said machine frame along a predetermined imaginary line situated between the packaging portion and the remainder of the foil with attendant formation of an upper welding seam, and for dissociating the packaging portion at said upper welding seam from the remainder of the foil;
- means for supporting the objects to be packaged;
- means for pulling the opened hose-shaped foil downwardly over the clothing article to be packaged, including a foil-pulling carriage guided on said machine frame for an up-and-down displacement, and means including a motor for upwardly and downwardly displacing said carriage;
- lower welding means mounted on said carriage for joint movement therewith and operative for welding the packaging portion of the foil after it has been pulled all the way over the clothing article being packaged, at a location disposed downwardly of the clothing article, with attendant formation of a lower welding seam; and
- means for transporting the clothing articles hanging on clothes hangers having respective hooks, including a supply conveyor, a displaceable receiving carrier including a carrier beam, and means for transferring the clothing articles suspended by the hooks of their hangers from said supply conveyor to said receiving carrier, including a transfer guide which receives the clothing articles in their suspended positions from said supply conveyor, and means to pivot the transfer guide up and down about a horizontally and inclinedly extending pivoting axle, thereby transferring the clothing articles to said receiving carrier in such a manner that the hooks of their hangers engage and extend over and partially around said carrier beam.

4,873,813

METHOD OF PACKAGING BOX FLATS

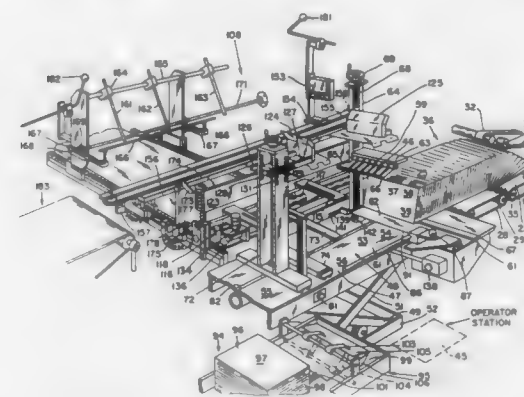
Raymond A. Labombarde, Nashua, and Robert A. Tremblay, Hollis, both of N.H., assignors to International Paper Box Machine Co., Inc., Nashua, N.H.

Division of Ser. No. 872,559, Jan. 10, 1986, Pat. No. 4,707,970, which is a continuation-in-part of Ser. No. 583,640, Feb. 27, 1984, abandoned. This application Mar. 17, 1987, Ser. No. 26,756

Int. Cl.⁴ B65B 63/02

U.S. Cl. 53—438

3 Claims



1. The method of individually and successively filling a plurality of empty corrugated cases with pre-counted, compressed slugs of flats, by a single operator, at a single station proximate the delivery end of the stacker apron of a folder-gluer, by means of an inspection and compressor table, in extension of said apron, a cantilevered back stop, a case gripper, and a substantially horizontal transfer table which comprises the steps of:

- advancing said flats in pre-counted segmented, individual slugs, while in upright position on edge, for easy grasp of a slug between the hands of the operator;
- presenting a plurality of flat, tubular, corrugated cases, each with the leading top flaps folded back, individually and successively to the operator, at said station, for withdrawal and insertion into said case gripper to close the minor bottom flaps and hold open the top flaps;
- positioning said case gripper, with the open case therein, supported on a side wall of the level of said transfer table ready to slidably receive a compressed slug of flats therein;
- sliding the element, pre-counted slug of flats from said apron onto said transfer table, compressing the slug and then sliding the compressed slug into the case in said case gripper;
- then moving said case gripper and case away from said transfer table for discharge.

4,873,814

METHOD OF MAKING A SHRINK WRAP PACKAGE

Charles C. Harris, 1611 Manufacturers Dr., St. Louis, Mo. 63026

Division of Ser. No. 233,886, Aug. 16, 1988, Pat. No. 4,815,603, which is a continuation of Ser. No. 916,711, Oct. 8, 1986, abandoned. This application Dec. 9, 1988, Ser. No. 282,378

Int. Cl.⁴ B65B 43/02, 53/06

U.S. Cl. 53—442

6 Claims

1. A method of producing a shrink-wrap plastic package from a container having peripheral margin defining an open top comprising the steps of:

- (a) forming a plastic shell having front and rear panels defining an upper shell portion having upper margins and a lower shell portion having lower margins,
- (b) disposing the shell in a flat condition,
- (c) heat sealing the upper margins to close the upper shell

portion but maintaining the lower shell margins in an unsealed condition,

(d) perforating the front and rear panels at least the upper shell portion while the front and rear panels are in the flat condition the perforations in the front and rear panels being in register,



(e) placing the shell over the open top of the container so that the lower shell portion is disposed below the container margin and the upper shell portion is disposed above the container margin,

(f) applying heated air to the shell to shrink said shell into shrink wrap relation with the container, the vent openings being of sufficient size and number to permit air passage in and out of the shell upper portion.

4,873,815

APPARATUS FOR FILLING AND CLOSING SACKS WHICH ARE OPEN AT ONE END

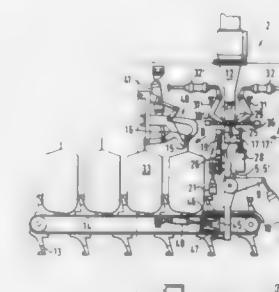
Konrad Tetenborg, Heinz Eschmann, and Helmut Hüwelmann, all of Lengerich, Fed. Rep. of Germany, assignors to Windmoller & Holscher, Lengerich, Fed. Rep. of Germany
Filed May 11, 1988, Ser. No. 192,635

Claims priority, application Fed. Rep. of Germany, May 11, 1987, 3715684

Int. Cl.⁴ B65B 43/26

U.S. Cl. 53—570

11 Claims



1. An apparatus for filling and closing sacks comprising means defining a sack filling station and means defining a sack welding station, a transfer conveyor having means for conveying sacks in a freely suspended condition into the filling station, spaced pivoted arms in the filling station having free ends with grippers for taking sacks over from the transfer conveyor and gripping opposite upper ends of a sack, a pair suction cups in the filling stations for pulling side walls of the sacks apart adjacent upper edges thereof between the grippers, a filling pipe in the filling station, means for lowering the filling pipe into a sack when said walls have been pulled apart for filling the sack and for lifting the pipe from the sack, a turning drive for rotating said arms to move a sack from the filling station to the welding station and for returning the arms to the filling station, actuating means for closing the grippers to grip a sack at the filling station and for opening the grippers at the welding station, and welding jaws at the welding station for forming a weld adjacent said upper edges of a sack prior to opening of the grippers.

4,873,816

ARRANGEMENT FOR FITTING VALVE SACKS ON FILLING PIPE OF PACKAGING MACHINE

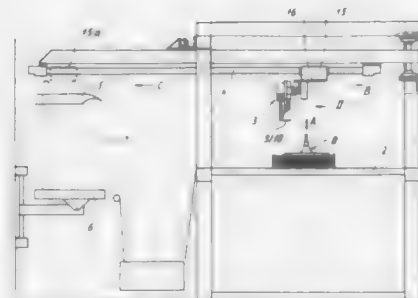
Helmut Mittelbach, Oelde, Fed. Rep. of Germany, assignor to Haver & Boecker, Oelde, Fed. Rep. of Germany
Filed Jan. 7, 1988, Ser. No. 142,801

Claims priority, application Fed. Rep. of Germany, Jan. 8, 1987, 3700345; May 13, 1987, 3715926

Int. Cl.⁴ B65B 43/26

U.S. Cl. 53—573

31 Claims



1. An arrangement for fitting on a filling pipe of a packaging machine non-rigid side-fold valve sacks including each a valve, said arrangement comprising a displaceable spreading means having valve spreading elements insertable into a preliminary open valve of a first valve sack separated from a valve sack stack for pulling up the valve, said spreading means being rotatable about a horizontal axis to position the valve relative to the filling pipe, said arrangement further comprising means forming a horizontal guide path for supporting said spreading means for movement therealong for fitting the first valve sack on the filling pipe.

4,873,817

ELECTRICALLY CONTROLLED PRESSURE RELIEF VALVE SYSTEM AND METHOD

Louis C. Harms, Evanston, Ill., assignor to United Technologies Automotive, Inc., Dearborn, Mich.

Filed Aug. 1, 1988, Ser. No. 226,658

Int. Cl.⁴ A01D 47/00, 75/28; F16K 31/06, 31/122

U.S. Cl. 56—10.2

11 Claims



1. An electrically controlled pressure relief valve system for varying the maximum allowable line pressure in an associated fluid line in response to an electrical signal, comprising:
an inlet line for containing fluid under pressure;
a tank line leading to a fluid tank at a relatively low pressure to that normally contained in said inlet line;
a proportional, pressure relief valve located in line between said inlet line and said tank line, blocking the two off when

a relatively low pressure exists in said inlet line, said pressure relief valve including

a cartridge,

a longitudinally extended cage held by said cartridge and associated with said inlet line,

a longitudinally movably, centrally open pilot spool located within said cage in and in fluid communication with said inlet line, said spool having a front orifice associated with the centrally open area of said spool and communicating with said inlet line and having a substantially smaller cross-sectional area than the most adjacent part of said inlet line, causing a pressure drop across said spool as fluid passes through said orifice from said inlet line, and said cage having a back orifice associated with said centrally open area through which fluid can flow under certain pressure conditions to said tank line,

a valve element seat surrounding said back orifice,

a longitudinally movable valve element associated with said seat tending to close off said back orifice tending to prevent fluid flow through it, and

biasing spring means associated with said movable valve element for applying an initial, minimum resistive biasing force against said valve element tending to keep it seated in said seat;

a direct, side port leading from said inlet line to said tank, said port having a cross-sectional area substantially greater than said front orifice and being located in juxtaposition to the side of said pilot spool and being normally blocked off by said spool under the action of said biasing spring at least until the pressure in said inlet line at least equals the resistive biasing force but, as the inlet pressure increases, said pilot spool tending to allow fluid to flow from said inlet line through said front orifice to said centrally open area through said back orifice overcoming the biasing force of said spring to said tank, upon which said spool begins to move back until it exposes said port to said inlet line, causing the relatively high pressure of said inlet line to be limited by the relatively low pressure in said tank line;

electrical means associated with said valve element for applying a supplemental resistive force to it, increasing the resistive pressure upon it over the initial, biasing spring force, further tending to keep said valve element seated, closing off any fluid flow through said back orifice;

electrical signal means associated with said electrical means for varying the amount of resistive force applied by said electrical means to said valve element, allowing the maximum allowed pressure allowed in said inlet line before it is exhausted to said tank line to be variously set by utilizing said electrical signal; and

work means associated with said inlet line, which work means is caused to do desirable work at a rate set in accordance with the varying set maximum pressure levels in said inlet line, said electrical signal means effectively controlling said work means in accordance with the electrical signal produced by said electrical signal means.

9. An agricultural combine with an electrically controlled pressure relief valve system for varying the maximum allowable line pressure in an associated hydraulic fluid line in response to an electrical signal, comprising:

an inlet line for containing hydraulic fluid under pressure;

a tank line leading to a hydraulic fluid tank at a relatively low pressure to that normally contained in said inlet line;

a proportional, pressure relief valve located in line between said inlet line and said tank line, blocking the two off when a relatively low pressure exists in said inlet line, said pressure relief valve including

a cartridge,

a longitudinally extended cage held by said cartridge and associated with said inlet line,

a longitudinally movably, centrally open pilot spool located within said cage and in fluid communication with said inlet line, said spool having a front orifice associ-

ated with the centrally open area of said spool and communicating with said inlet line and having a substantially smaller cross-sectional area than the most adjacent part of said inlet line, causing a pressure drop across said spool as fluid passes through said orifice from said inlet line, and said cage having a back orifice associated with said centrally open area through which fluid can flow under certain pressure conditions to said tank line,

a valve element seat surrounding said back orifice,

a longitudinally movable valve element associated with said seat tending to close off said back orifice tending to prevent fluid flow through it, and

biasing spring means associated with said movable valve element for applying an initial, minimum resistive biasing force against said valve element tending to keep it seated in said seat;

a direct, side port leading from said inlet line to said tank, said port having a cross-sectional area substantially greater than said front orifice and being located in juxtaposition to the side of said pilot spool and being normally blocked off by said spool under the action of said biasing spring at least until the pressure in said inlet line at least equals the resistive biasing force but, as the inlet pressure increases, said pilot spool tending to allow hydraulic fluid to flow from said inlet line through said front orifice to said centrally open area through said back orifice overcoming the biasing force of said spring to said tank, upon which said spool begins to move back until it exposes said port to said inlet line, causing the relatively high pressure of said inlet line to be limited by the relatively low pressure in said tank line;

electrical means associated with said valve element for applying a supplemental resistive force to it, increasing the resistive pressure upon it over the initial, biasing spring force, further tending to keep said valve element seated, closing off any fluid flow through said back orifice;

electrical signal means associated with said electrical means for varying the amount of resistive force applied by said electrical means to said valve element, allowing the maximum allowed pressure allowed in said inlet line before it is exhausted to said tank line to be variously set by utilizing said electrical signal; and

work means associated with said inlet line, which work means is caused to do desirable work at a rate set in accordance with the varying set maximum pressure levels in said inlet line, said electrical signal means effectively controlling said work means in accordance with the electrical signal produced by said electrical signal means, said work means including:

an agricultural combine;

a combine header carried by said combine;

an hydraulic circuit associated with said inlet line, said tank line and said pressure relief valve;

hydraulic lift means included in said circuit and connected to said header for moving said combine header to a vertical position off of the ground and at a speed dependent upon the hydraulic pressure existent in said inlet line, said hydraulic lift means including

a gravity lowered hydraulic ram connected to said combine head; and

an "on/off" control valve connected between said hydraulic ram and said inlet line controlling the hydraulic fluid pressure supplied to said ram controlling its direction and speed of movement in conjunction with said pressure relief valve,

ground contour sensing means associated with said combine measuring the changing contour of the ground over which said combine travels as the combine travels over the ground and is being operatively used, said ground contour sensing means including a ski sled carried by said combine in contact with the ground; and

computer means associated with said combine for interpreting the output of said ground sensing means and controlling said electrical signal means producing ap-

propriate electrical signals to be sent to said electrical means appropriately changing the set maximum allowed pressure allowed in said inlet line, appropriately moving said combine header in response thereto.

4,873,818

LATERALLY ADJUSTABLE MOWER

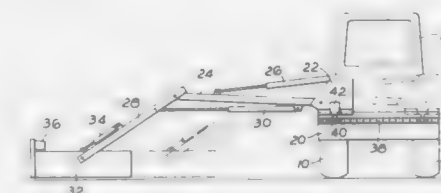
Anthony L. Turner, Alcester, England, assignor to Turner International (Engineering) Limited, England
Continuation of Ser. No. 853,431, Apr. 18, 1986, abandoned.

This application Feb. 25, 1988, Ser. No. 163,195

Int. Cl.⁴ A01D 34/64, 35/28

U.S. Cl. 56—10.8

5 Claims



1. A mobile mower comprising a vehicle having a length dimension and a width dimension; a cutting head; a mounting bracket having length and width dimensions each of which is substantially less than the width dimension of said vehicle; extensible and retractable articulated linkage means interposed between said cutting head and said bracket; means securing one end of said articulated linkage means to said cutting head; means securing the opposite end of said articulated linkage means to said bracket; power means for extending and retracting said articulated linkage means to enable said cutting head to be moved toward and away from said bracket; a support beam secured to said vehicle and extending from side to side of said vehicle; means mounting said bracket directly on said beam for movements to and fro along a path from either side of said vehicle to the other side thereof, said path having a length dimension corresponding substantially to the width dimension of said vehicle; and reversible power drive means for driving said bracket in a selected one of two opposite directions along said path regardless of whether said vehicle is moving or stationary, thereby enabling said cutting head to be moved to and from any selected position on said path between a maximum extended position relative to one side of said vehicle and a maximum retracted position closely adjacent said one side of said vehicle, said maximum positions being determined in part by the length dimension of said path and the position of said bracket on said path, said drive means when inactive being operable to maintain said bracket in said selected position.

4,873,819

GRASS TRIMMER

Charles C. Shivers, 614 W. English, Corydon, Iowa 50060, and Alvin Arnold, 505 N. Front St., Humeston, Iowa 50123
Continuation of Ser. No. 924,276, Oct. 29, 1986, abandoned.

This application Aug. 12, 1988, Ser. No. 232,564

Int. Cl.⁴ A01D 34/63

U.S. Cl. 56—17.5

10 Claims

1. A grass and weed trimmer apparatus comprising:

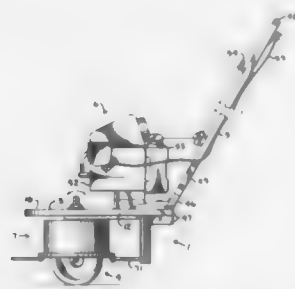
(a) a structural frame;

(b) an operator handle connected to said frame and adapted to be manipulated by an operator;

(c) a single surface engaging wheel allowing locomotion of said apparatus over a surface; said wheel being connected to and supporting said structural frame; during normal operation said single wheel fully supporting said frame except for operator support provided through said handle;

(d) rotatable cutting means connected to said frame and rotating about said wheel such that said wheel supports said frame from generally directly beneath said cutting

means; said apparatus being free of additional surface engaging support structure during operational use other than that provided by said wheel and interaction with an operator such that said frame may be selectively tilted from side to side and front to back about said wheel by an operator during use to vary cutting height associated with



said cutting means whereby said cutting means may be selectively positioned in close proximity to the ground at any location along a 360° arc surrounding said wheel so as to be able to cut close to the ground on any side of said wheel during use; and
(e) motor means connected to said frame and operably driving said cutting means.

4,873,820

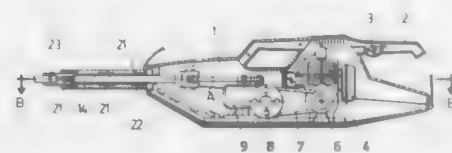
PORTABLE VIBRATING APPARATUS FOR THE COLLECTION OF FRUITS

D. Aurelio T. Martorell, Tarragona, Spain, assignor to Geiver, S.A., Uldecoosa, Spain

Filed Dec. 6, 1988, Ser. No. 280,639
Int. Cl. A01D 46/00

U.S. Cl. 56—340.1

1 Claim



1. Portable vibrating apparatus for the collection of fruits, which having been designed to produce oscillating movements on the branches of certain fruit trees, preferably olive trees and dry fruit trees, to obtain the detachment of the fruits and their respective fall, and being provided to be handled manually by an operator, consisting of a general casing in which there is a motor which drives a transmission to produce a reciprocating movement in a shaft to which is coupled a rod through which there will be produce the beating or vibration of the branches of the tree in question, is essentially characterized in that between the output shaft of the motor and the corresponding transmission system, formed by a pulley and V-belt, a centrifugal clutch has been provided, while at the output of said transmission device the corresponding reducing gear has been provided whose output shaft is disposed vertically to articulate thereon a crank of variable radius on whose other end there articulates a correcting rod which is hinged by its free end to the corresponding shaft that receives the reciprocating movement, to which shaft is coupled in turn axially a rod through which the branches of the tree are beaten; the provision having been made that the articulation between the connecting rod and the shaft subjected to reciprocating movement is materialized by a ball and socket between which and the corresponding retention bolt thereof a needle cage has been provided, said socket being disposed at a forked end belonging to the shaft intended to receive said reciprocating movement; with the further particularity that the coupling between the latter and the rod occurs through a sleeve inserted between both parts,

permitting the removal of that rod from the shaft; being characterized further in that on the free end of the rod there has been provided, removably, an element functioning as hook or grip for its adaptation to the branches of the trees, in order that the reciprocating movement transmitted to the rod will produce the oscillatory movement of the branches and consequently the detachment of the fruit.

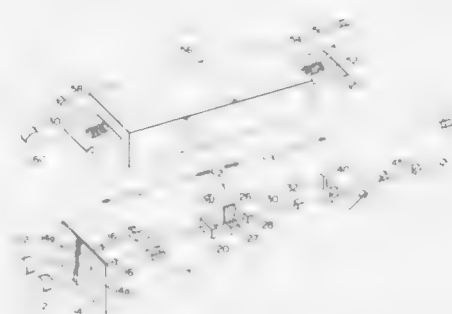
4,873,821

APPARATUS AND PROCESS FOR FORMING ALTERNATE TWIST PLYED YARN

Donald E. Hallam; Peter Popper, both of Wilmington, Del.; Harold F. Staunton, Avondale, Pa.; Robert E. Taylor, Columbia, S.C., and Paul W. Yngve, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Continuation-in-part of Ser. No. 181,847, Apr. 15, 1988, abandoned. This application Apr. 29, 1988, Ser. No. 188,559
Int. Cl. D02G 3/28, 3/38

U.S. Cl. 57—293

19 Claims



1. A process for forming alternate twist plied yarn from a plurality of strands comprising the steps of advancing the strands at a predetermined rate under tension in a path adjacent to each other, twisting the strands each the same in a first direction and rate as they advance along said path, plying said twisted strands, stopping the forward motion of said strands, bonding the ply twisted strands to form a bond, stopping the twisting of the strands, then repeating said steps while twisting said strands each the same in the opposite direction to form a ply reversal node adjacent the bond.

4,873,822

ENERGY PRODUCING INSTALLATION WITH INTERNAL COMBUSTION ENGINE AND TURBINE

Henry Benaroya, 41 Boulevard du Commandant Charcot, 92200 Neuilly sur Seine, France

PCT No. PCT/FR87/00270, § 371 Date Mar. 4, 1988, § 102(e) Date Mar. 4, 1988, PCT Pub. No. WO88/00279, PCT Pub. Date Jan. 14, 1988

PCT Filed Jul. 8, 1987, Ser. No. 171,428

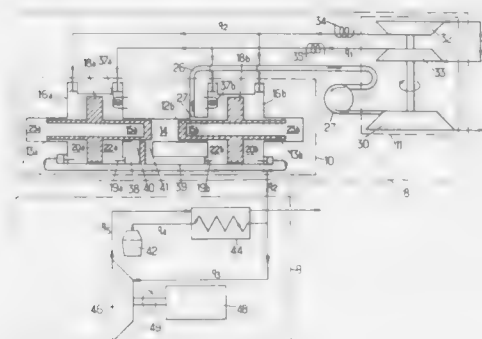
Claims priority, application France, Jul. 9, 1986, 86 10015
Int. Cl. F02C 3/00

U.S. Cl. 60—39.75

7 Claims

1. Energy producing installation comprising:
a compression unit including
at least one Diesel cycle free piston module, having two rectilinearly movable assemblies each formed of a Diesel piston and a compressor piston, the compressor pistons each defining two compressor compartments and said compressor compartments consisting of internal primary compartments and external secondary compartments, and the Diesel pistons defining a Diesel chamber, and
turboblower means for supercharging said module, having an expansion turbine fed with the exhaust gases of the Diesel chamber, a primary rotary compressor driven by said expansion turbine, connected to receive atmo-

spheric air and to deliver a primary air flow to said internal primary compartments and a secondary rotary compressor connected to receive atmospheric air and to deliver a secondary air flow to said external secondary compartments, and
a power unit including



combustion chamber means having an air inlet connected to receive part at least of the secondary air flow from said external compartments, and
turbine means having a rotary power shaft delivering the output power of said installation and having an input connected to receive combustion gases from said combustion chamber.

4,873,823

AIR INJECTION PIPE ASSEMBLY AND METHOD OF MAKING

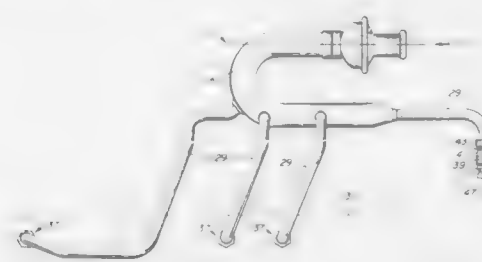
Gary Curtha, Grand Rapids, Mich., assignor to McNerney Incorporated, Grand Rapids, Mich.

Filed Apr. 3, 1989, Ser. No. 332,603

Int. Cl. F01M 3/30

U.S. Cl. 60—293

9 Claims



1. An air injection pipe assembly adapted for delivering atmospheric air to and along the length of the exhaust manifold of a vehicle engine comprising:

a manifold air tube spaced from said exhaust manifold, having an inlet at one end and an outlet at its other end;
a plurality of spaced lateral outlets along the length of said manifold air tube intermediate its ends;
an air inlet valve having an outlet pipe snugly projected into the inlet of said manifold air tube;
means securing said air valve outlet to said manifold air tube inlet;
a plurality of irregularly shaped air injection tubes, at their one ends projected into said manifold air tube lateral outlets and into the manifold air tube outlet respectively;
an annular braze securing and sealing said one ends respectively of said air injection tubes to said manifold air tube; and
a flare fitting upon the other end of the air injection tubes adapted for projection into spaced openings in said ex-

haust manifold and secured and sealed to said exhaust manifold.

4,873,824

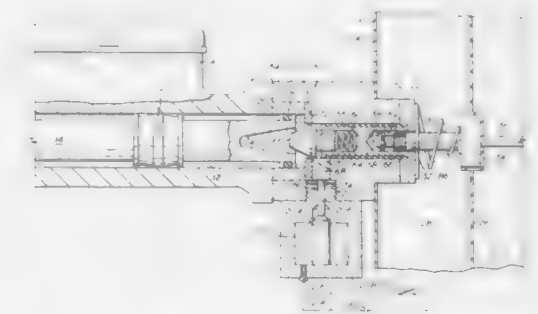
MASTER CYLINDER PRESSURE-RETAINING VEHICULAR ANTI-THEFT BRAKE LOCKING MECHANISM

Terry L. Cox, 2608 Wheaton No. 103, Houston, Tex. 77082
Filed Feb. 12, 1987, Ser. No. 13,953

Int. Cl. F15B 15/26

U.S. Cl. 60—545

19 Claims



12. A brake locking mechanism for use with a hydraulic vehicle brake system having a master cylinder with a piston reciprocable between a brake applying position in which a hydraulic fluid is compressed and a brake releasing position in which the hydraulic fluid is depressurized, and an actuator rod in an actuator housing for reciprocating the piston operable by a driver of the vehicle, comprising:

(a) a lock housing having first and second ends adapted to register with the actuator housing and master cylinder, respectively, to fit securely therebetween;
(b) a longitudinal bore formed through the lock housing;
(c) a ratcheted rod slideable in the longitudinal bore and adapted to reciprocate the piston responsively to urging of the actuator rod;
(d) a pawl concealed within said lock housing and positioned adjacent the longitudinal bore to releasably engage the ratcheted rod; and
(e) remotely operable means for engaging the pawl with the ratcheted rod with the ratcheted rod positioned to engage the piston in the brake applying position, thereby rendering release of the piston nonresponsive to the actuator rod, and for disengaging the pawl from the ratcheted rod, thereby returning the brake system to normal operation.

4,873,825

POSITIVE DISPLACEMENT ENGINE COMPOUNDED WITH A GAS TURBINE ENGINE

John A. Jenes, 7 Hollies Close, Newton Solney, Burton-on-Trent, Staffordshire, DE15 0SB, England

PCT No. PCT/GB87/00024, § 371 Date Sep. 15, 1987, § 102(e) Date Sep. 15, 1987, PCT Pub. No. WO87/04492, PCT Pub. Date Jul. 30, 1987

PCT Filed Jan. 16, 1987, Ser. No. 101,300

Claims priority, application United Kingdom, Jan. 16, 1986, 86 01063

Int. Cl. F02B 37/00, 41/10

U.S. Cl. 60—606

10 Claims

1. A prime mover comprising a positive displacement engine compounded with a gas turbine engine, the prime mover having power outputs comprising a low speed output from said positive displacement engine and a high speed output from said gas turbine engine, said gas turbine engine having combustion chamber means, a turbocompressor and a turbine, said prime mover having turbocharging air delivery means for delivering turbocharging air from the said turbocompressor to said positive displacement engine and combustion gas exhaust means

a fluid-tight housing;
 a cylindrically-shaped piston freely mounted in said fluid-tight housing and separating said housing into a variable cold volume and a constant pressure chamber, the area of said piston facing said variable cold volume being greater than the area of said piston facing said constant pressure chamber, said piston having a fluid passageway therein extending from said variable cold volume to a location along its radial surface;
 gas supply means for supplying high pressure gas to said variable cold volume when said variable cold volume is substantially at its minimum volume and for supplying high pressure gas to said constant pressure chamber;
 gas exhaust means for venting cold gas from said variable cold volume when said variable cold volume is substantially at its maximum volume; and
 heat exchanger means thermally coupled to said gas supply means in the vicinity of said gas exhaust means for exchanging heat therebetween and to the surrounding environment.

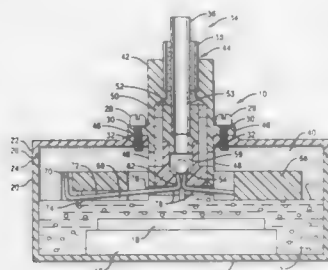
4,873,832

LIQUID LEVEL CONTROL FOR A CRYOGENIC FLUID
 Warren W. Porter, Escondido, Calif., assignor to NCR Corporation, Dayton, Ohio

Filed Dec. 8, 1988, Ser. No. 281,310
 Int. Cl.⁴ F17C 13/02

U.S. Cl. 62—49.2

12 Claims



3. An apparatus for controlling a cryogenic fluid level, comprising:

a valve housing having a lower portion which serves as a datum for the cryogenic fluid level;
 float means for mechanically indicating the cryogenic fluid level relative to the datum;
 said float means has a disk shape with an axially symmetric aperture therein;
 actuator means connected to the float means for providing a mechanical force and displacement that are functions of a difference between the cryogenic fluid level and the datum; and
 valve means located within the valve housing responsive to said actuator means for controlling a flow of a cryogenic fluid from an input to an output thereof to reduce the difference between the cryogenic fluid level and the datum.

4,873,833

APPARATUS COMPRISING A HIGH-VACUUM CHAMBER

Loren N. Pfeiffer, Harding Township, Morris County, and Kenneth W. West, Mendham Township, Morris County, both of N.J., assignors to American Telephone Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Nov. 23, 1988, Ser. No. 276,082
 Int. Cl.⁴ B01D 8/00

U.S. Cl. 62—55.5

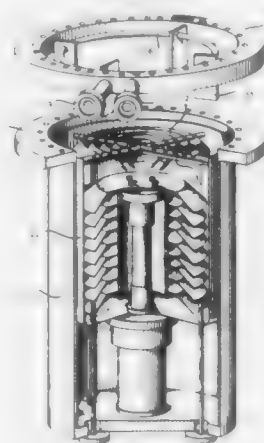
8 Claims

8. Apparatus comprising an evacuable chamber and at least one cryopump for removing gas from the chamber, the cryopump comprising a mounting flange and a primary pumping

stage, the primary pumping stage further comprising a primary condenser array,

characterized in that the apparatus further comprises:

- a mounting ring having first and second faces, the first face being adapted for sealingly attaching to the mounting flange of the cryopump and the second face being adapted for sealingly attaching to the evacuable chamber;
- a copper tube for conducting liquid nitrogen adjacent the primary condenser array, the copper tube having first and second ends and being configured substantially in the shape of a ring;
- at least one low-temperature valve for controlling the flow of liquid nitrogen through the copper tube;



- at least one purge valve for controlling the flow of purge gas for expelling residual liquid nitrogen from the copper tube;
- at least one copper mounting block mounted to the copper tube and to the primary condenser array for thermally conductively attaching the copper tube to the primary condenser array;
- a conduit for conducting liquid nitrogen from the low-temperature valve and purge gas from the purge valve through the mounting ring to the first end of the copper tube; and
- a conduit for conducting liquid nitrogen and purge gas from the second end of the copper tube through the mounting ring.

4,873,834

COOLING PLANT LOAD REDUCTION APPARATUS AND METHOD

Doyle W. Cox, 309 Council Rd., Georgetown, Tex. 78628
 Filed Apr. 11, 1988, Ser. No. 180,205

Int. Cl.⁴ F25B 9/00

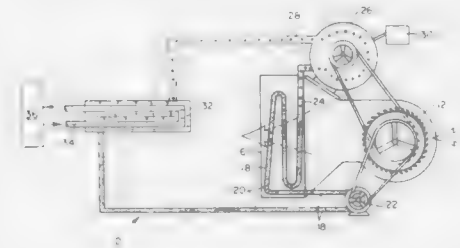
U.S. Cl. 62—87

9 Claims

- A cooling plant load reduction apparatus comprising:
 - a blower means for collection and direction of heated air from within a structure;
 - an expansion means, containing a coolant means, located in the path of said heated air directed from said blower means whereby said coolant absorbs heat from said heated air and air leaving said expansion means is cooler than said heated air entering;
 - a turbine means, mechanically connected to said blower means and a pump means, connected to said expansion means so that said coolant means, heated by said heated air, is passed through said turbine means;
 - a generator means connected to said turbine means so

that as said coolant means passed through said turbine means said generator produces electricity;
 E. a condenser means which collect and cools said coolant means from said turbine means; and

(II) of increased temperature and increased concentration of constituent B.



F. said pump means for directing said coolant means from said condenser means to said expansion means under pressure so that heat and electrical loads within said structure are reduced.

4,873,835

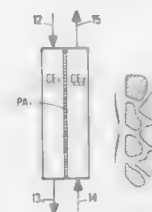
PROCESS FOR THE SIMULTANEOUS EXCHANGE OF HEAT AND MATTER THROUGH A POROUS WALL
 Alexandre Rojey, Garches, and Alain Grehier, Paris, both of France, assignors to Institut Francais du Pétrole, Rueil-Malmaison, France

Filed Jan. 12, 1988, Ser. No. 143,097

Claims priority, application France, Jan. 13, 1987, 87 00359
 Int. Cl.⁴ B01D 53/22

U.S. Cl. 62—93

20 Claims



1. Process for the simultaneous transfer of heat and matter from a relatively hot gaseous phase (I) to a relatively cold gaseous phase (II), the relatively hot gaseous phase (I) comprising at least two constituents A and B having different condensation temperatures, the condensation temperature of A being lower than the condensation temperature of B and at least the constituent B being at least in part condensable under the conditions of the process, said process comprising circulating the gaseous phase (I) in contact with the first face of an exchange wall permeable to at least the constituent B in the liquid state and circulating the gaseous phase (II) in contact with the second face of the porous exchange wall, in a direction substantially parallel and opposite that of the flow of the gaseous phase (I), the temperature of the gaseous phase (II) at the beginning of the contact being sufficiently low to permit the condensation of at least a fraction of the constituent B of the gaseous phase (I) and the maintenance of the resulting condensate in at least a part of the thickness of the porous portion of the exchange wall, the temperature of the gaseous phase (II) not however being too low to avoid total condensation of the constituents A and B of said gaseous phase (I) in the course of said contact, the conditions of pressure on each side of the wall being mutually adapted to permit said condensation of a fraction of the constituent B on the said first face and the vaporisation of said condensed fraction on said second face, and withdrawing separately the gaseous phase (I) of lowered temperature, of lowered concentration of constituent B and of increased concentration of constituent A and the gaseous phase

4,873,836

FLOW NOISE SUPPRESSION FOR ELECTRONIC VALVES

Michael B. Thompson, Hoffman Estates, Ill., assignor to Eaton Corporation, Cleveland, Ohio

Filed Jan. 6, 1988, Ser. No. 202,638

Int. Cl.⁴ F25B 41/04

U.S. Cl. 62—158

4 Claims



1. A method of controlling refrigerant flow in a refrigeration system of the type having a compressor electrically energized for pumping refrigerant in a closed loop through an exothermic heat exchanger for condensing, through an electrically operated expansion valve for expansion and through an endothermic heat exchanger for cooling a compartment and returning to the compressor comprising the steps of:

- initially energizing the compressor and pulsing said valve at a relatively high initial frequency;
- maintaining said relatively high frequency pulsing for a predetermined time interval; and
- decreasing the frequency of said pulsing to a level less than two-thirds of said initial frequency.

4,873,837

DUAL EVAPORATOR AIR CONDITIONER

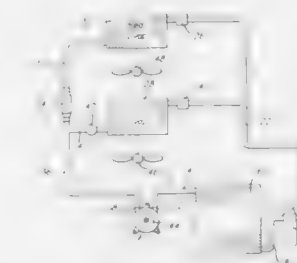
Theodore L. Murray, Xenia, Ohio, assignor to Chrysler Motors Corporation, Highland Park, Mich.

Filed Oct. 3, 1988, Ser. No. 252,474

Int. Cl.⁴ F25B 5/00

U.S. Cl. 62—199

2 Claims



1. In an automobile having an interior with forward and rearward portions to be cooled, an improved air conditioner including two evaporators for cooling, the evaporators being widely spaced from one another, one being located in the forward portion of the interior and one being located in the rearward portion of the interior to selectively permit either simultaneous or separate cooling of the forward and rearward portions; a refrigerant compressor for pumping refrigerant to the two evaporators, the compressor being located near the

forward evaporator and widely spaced from the rearward evaporator; each evaporator having a selectively energized fan mean which passes air over the evaporator's outer cooling surface respectively; an elongated suction conduit which extends longitudinally of the automobile from the rear evaporator to the compressor for returning refrigerant thereto; a relatively short conduit extending from the forward evaporator to the suction conduit and interconnected thereto for the return to the compressor of refrigerant discharged from the forward evaporator; control means to alternately activate and deactivate the compressor in response to the refrigerant pressure discharged from the forward evaporator for the purpose of maintaining the related temperature of the outer surface of the forward evaporator above a frost producing low temperature and below a noticeably uncomfortable high temperature in the forward portion of the automobile interior, the low temperature related indicator initiating compressor deactivation and the higher temperature related indicator initiating compressor activation; a one-way refrigerant flow check valve in flow control relation to the rear evaporator suction conduit for allowing only a flow from the rear evaporator to the compressor, the check valve being positioned just upstream from where the short conduit leading from the forward evaporator connects to the rear suction conduit so that refrigerant which is discharged from the forward evaporator is prohibited from flowing to the rearward evaporator whereby such reverse flow would otherwise occur whenever the rear fan means is inactive and the compressor is deactivated causing an undesirable decrease in the refrigerant pressure which the compressor control would falsely interpret and thus delay the reactivation of the compressor resulting in a blast of higher temperature air from the forward evaporator than is desired.

4,873,838

REFRIGERANT METERING IN A VARIABLE FLOW SYSTEM

Roger J. Voorhis, Liverpool, and John M. Palmer, Syracuse, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y. Continuation of Ser. No. 925,758, Oct. 31, 1986, abandoned. This application Mar. 28, 1988, Ser. No. 137,009

Int. Cl.⁴ F25B 41/00

U.S. Cl. 62—207

11 Claims



1. In a refrigeration system of the type having a compressor driven by a variable speed motor and a heat exchanger coil for transferring heat to a contained refrigerant, an improved expansion device and control comprising:

- a motor control means responsive to sensed conditions for controlling the speed of the variable speed motor by way of a command speed signal;
- an orifice for conducting refrigerant to the evaporator coils said orifice acting as a throttle to expand the refrigerant from a liquid to a gaseous state;
- a piston associated with said orifice and selectively movable between a closed position to block the flow of refrigerant through said orifice and an opened position to expose said orifice to the free flow of refrigerant therethrough; and
- valve control means responsive to said command speed signal for selectively causing the piston to alternate between the open and closed positions with the ratios of open to closed time being controlled to selectively regu-

late the resultant flow volume to a rate which is substantially proportional to said command speed when the compressor is being driven above a predetermined speed.

4,873,839

COMBUSTION-POWERED COMPOUND REFRIGERATION SYSTEM

Daniel J. Dessanti, Brooklyn, and Hans P. Schorr, Douglaston, both of N.Y., assignors to The Brooklyn Union Gas Company, Brooklyn, N.Y.

Filed Oct. 11, 1988, Ser. No. 255,436

Int. Cl.⁴ F25B 27/00

U.S. Cl. 62—238.6

14 Claims



1. An improved refrigeration system comprising a refrigerant vapor compressor driven by a prime mover powered by the combustion of a fluid fuel, a condenser connected to said compressor to condense the hot compressed refrigerant vapor, a heat exchanger connected to receive the condensed refrigerant and to effect subcooling thereof, a pressure-reducing valve connected for the expansion of the subcooled refrigerant and for the discharge of the expanded refrigerant into an evaporator equipped with heat transfer surface for the recovery of refrigeration from said evaporator by a fluid passed in contact with said heat transfer surface, said evaporator being connected to pass refrigerant vapor therefrom back to said compressor, and an ammonia absorption refrigeration unit connected to utilize waste heat of the hot exhaust gases from said prime mover and further connected to pass liquid ammonia through an ammonia subcooler, said subcooler being connected for the flow of subcooled liquid ammonia through a pressure-reducing valve to said heat exchanger to effect said subcooling of said condensed refrigerant by evaporation of said liquid ammonia, said heat exchanger being connected for the return of ammonia vapor through said subcooler to said absorption refrigeration unit.

4,873,840

ENERGY CO-GENERATION SYSTEM

Rolf Gilliusson, Sollentuna, Sweden, assignor to SwedSteam AB, Danderyd, Sweden

Filed Feb. 11, 1988, Ser. No. 155,161

Int. Cl.⁴ F25B 27/00

U.S. Cl. 62—238.6

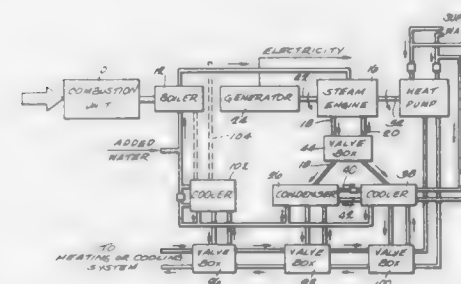
19 Claims

1. A co-generation system for producing electricity, heating and cooling, the co-generation system comprising:

- a combustion unit;
- a boiler operably connected to the combustion unit and adapted to produce steam;
- steam engine including at least one cylinder having a steam inlet port and a steam exhaust port, an output shaft, and a reciprocating piston housed in the cylinder and connected to the output shaft for rotatably driving the output shaft; means for supplying steam from the boiler to the steam inlet port of the steam engine;
- an electrical generator selectively operably connected to the output shaft of the steam engine so as to be selectively

driven by the steam engine for the production of electricity;

condenser means selectively operably connected to the exhaust port of the steam engine, the condenser means including means for supplying heat to a heat system and



means for causing condensation of the steam discharged by the exhaust port; and

an absorption cooler means selectively operably connected to the exhaust port of the steam engine, the absorption cooler means including means for cooling fluid of a cooling system.

4,873,841

PORTABLE COOLER

William Bradshaw, 9144 S. Massasoit, Oak Lawn, Ill. 60453, and Robert Shepard, 6101 LaGrande, Oak Forest, Ill. 60452

Filed Apr. 3, 1989, Ser. No. 331,796

Int. Cl.⁴ B60H 1/32

U.S. Cl. 62—239

15 Claims



1. A portable cooler comprising:

- a cooling compartment;
- an axle positioned through the lower portion of one end of the cooling compartment and extending beyond the sides of the cooling compartment;
- a pair of wheels, one of which is coupled to each end of the axle;
- a wheel nut coupled to the end of axle securing said wheels to the axle;
- a pair of handle support structures coupled to opposite sides of the cooler compartment each support structure having a handle support axle;
- a lifting handle coupled to the handle support axle of each handle support structure enabling the cooler to be easily lifted to and from a vehicle; and
- a pulling handle coupled to one of the handle support axles wherein said pulling handle being easily rotated about the handle axle enabling a user to easily and comfortably pull the portable cooler.

4,873,842

THREE-PHASE HEAT PUMP

Didier Payre; Georges Crozat, both of Perpignan, and Bernard Spinner, Cornella Del Vercol, all of France, assignors to Societe Nationale Elf Aquitaine, Paris La Defense, France

Continuation-in-part of Ser. No. 623,964, Jun. 25, 1984, abandoned. This application Jul. 28, 1987, Ser. No. 78,591

Claims priority, application France, Jul. 1, 1983, 83 10955

Int. Cl.⁴ F25B 17/08

U.S. Cl. 62—480

12 Claims



1. A thermochemical heat pump which comprises:

- a first reactor, a liquid in equilibrium with its vapor phase in said first reactor, wherein the gas produced by the first reactor is water vapor;
- a second reactor, a reaction medium in said second reactor, comprising a two-phase medium wherein the two-phase medium is selected from the group consisting of (1) a solid and a liquid solution saturated with a said solid, wherein the solid in the second reactor, is selected from (a) halides of the group consisting of $\text{CaCl}_2 \cdot (6-2)\text{H}_2\text{O}$, $\text{CaCl}_2 \cdot (2-1)\text{H}_2\text{O}$ and $\text{CaCl}_2 \cdot (1-0)\text{H}_2\text{O}$ and (b) compounds selected from the group of chlorides, bromides, iodides or fluorides of alkaline metals or alkaline earth metals, said compounds undergoing dehydration-rehydration in a reversible manner and (2) two-non-miscible liquids;
- a conduit connecting said first reactor and said second reactor so as to form a monovariant three-phase system, and whereby an exchange of calories takes place between said first and second reactors by means of a monovariant reaction between the vapor of said reactor and the liquid phase of said second reactor.

4,873,843

MULTIPLE SOURCE AND/OR SENSOR COLDHEAD MOUNT

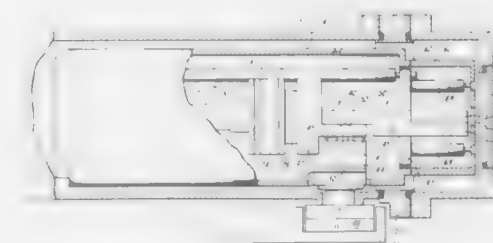
Curt V. Volten, Chestnut Hill, Mass., assignor to Spectra-Physics, Inc., San Jose, Calif.

Filed Jul. 18, 1988, Ser. No. 220,269

Int. Cl.⁴ F25B 19/00

U.S. Cl. 62—51.1

19 Claims



1. A refrigerator environment for multiple laser sources and/or sensors comprising:

- a vacuum housing comprising:
- a first housing portion;

a separate second housing portion longitudinally extending from said first housing portion; and
 a window opening at the end of said second housing portion to permit the passage of laser light;
 a cold-shield within said vacuum housing comprising:
 a first cold-shield portion;
 a second cold-shield portion longitudinally extending from said second cold-shield portion; and
 an aperture at the end of said second cold-shield portion to permit the passage of laser light;
 a cold-finger within said cold-shield thermally coupled to a cryogenic refrigerator; and
 a mounting station assembly comprising:
 an insulating stand-off assembly;
 a mount mechanically coupled to said stand-off assembly and thermally coupled to said cold-finger; and
 a cold-head assembly support thermally and mechanically coupled to said mount.

4,873,844

METHOD AND APPARATUS FOR THE PRODUCTION OF TEXTILE STRIP

Bertram Frenzel; Dietmar Grenzendorfer; Heinz Kemter; Wolfgang Wünsch, and Peter Zeisberg, all of Karl-Marx-Stadt, German Democratic Rep., assignors to VEB Kombinat Textima, Karl-Marx-Stadt, German Democratic Rep.

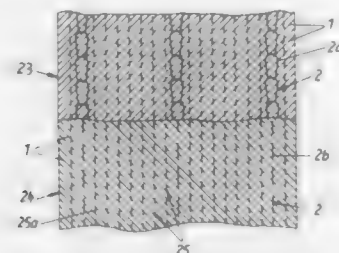
Continuation of Ser. No. 559,116, Dec. 7, 1983, abandoned. This application Feb. 12, 1987, Ser. No. 14,152

Claims priority, application German Democratic Rep., Feb. 28, 1983, 2483026

Int. Cl.⁴ D04B 23/06

U.S. Cl. 66—84 A

20 Claims



1. A warp knitting machine, and especially a sewing-knitting machine, for producing a warp-knit fabric having endless oblique and diagonal filling threads, comprising

a pair of spaced-apart parallel chain conveyors for transporting a plurality of filling-thread sections to a stitch-forming site of the machine;

a plurality of hooks carried on each chain conveyor for holding a plurality of filling thread sections between said chain conveyors, each filling thread section being defined by a section of filling thread extending from a hook holding the filling thread section on one of said chain conveyors to a hook holding the filling thread section on the other of said chain conveyors;

means for laying filling thread sections in said hooks between said chain conveyors, said means for laying comprising a first filling laying device for laying filling thread sections, said first filling laying device being movable back and forth between said chain conveyors obliquely and diagonally with respect to the direction of transportation of said chain conveyors for inserting the endless filling threads forming the filling thread sections onto the hooks of said chain conveyors at an oblique and diagonal angle to the direction of transportation of said chain conveyors, said first filling laying device including means for guiding the endless filling threads from said first filling laying device onto said hooks;

means for controlling movement of said filling thread laying means relative to movement of said chain conveyors so

that each respective hook holding a respective filling thread section on one of the chain conveyors is longitudinally displaced with respect to the chain conveyors from the hook on the other chain conveyor also holding that filling thread section; and
 means for combining the endless filling threads of filling thread sections inserted on the hooks of said chain conveyors by warp-knitted stitches, thereby to produce said fabric having endless oblique and diagonal filling threads.

4,873,845

DEVICE FOR SUPPORTING THE THREAD GUIDE OF AN AUTOMATIC FLAT KNITTING MACHINE

Benito Stoppazzini, Sala Bolognese, Italy, assignor to E.M.M. Emiliana Macchine Maglieria S.r.l., Padulle di Sala Bolognese, Italy

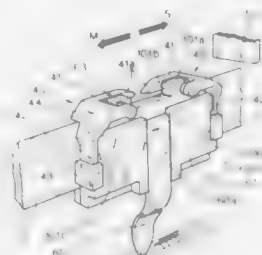
Filed Feb. 24, 1989, Ser. No. 314,974

Claims priority, application Italy, Mar. 1, 1988, 4750/88

Int. Cl.⁴ D04B 15/52

U.S. Cl. 66—126 R

3 Claims



1. Improved device for supporting the thread guide of an automatic flat knitting machine, said machine comprising at least one bar, located parallel to and above needle beds of said machine, a carriage, able to move in a horizontal plane, and fitted with anchor plates, being able to move in a vertical plane, said anchor plates being able to strike against slides and draw along said slides in directions of movement of said carriage with said slides mounted so that they couple with said bar and can be drawn along a section of the said bar delimited by two consecutive stops fixed to the same bar, each of said slides comprising a body featuring: a horizontal groove in one face of said body and coupling in complementary fashion with said bar; a vertical groove on the opposite face of said body, designed to receive an upper portion of a thread guide, said thread guide extending towards said needle beds; a track formed by an upper rib of said body, said track featuring a ledge for each direction of movement of said carriage, said ledges being designed to be struck by said anchor plate, in a lowered position, for said slide to be drawn along, with said slide comprising: two rockers, mounted so that they pivot on said body, in a symmetrical position in relation to a plane perpendicular to said bar, each of said rockers working in conjunction with one of said ledges and comprising two arms, first and second respectively, with said first arm extending beside said track, beyond a corresponding ledge towards the centre of said body, and with said second arm extending downwards by a side of said body, with said rocker able to rotate through a predetermined angle around the axis of said pivot, from a first position in which said first arm is aligned with said track, and said second arm is situated alongside said side to a second position in which said first arm is lowered and said second arm is moved away from said side, and viceversa; it being possible for said rotation to be alternatively free, actively effected or prevented, said rotation being free, from said first position to said second position, and effected in synchrony with the striking of said anchor plate first against said first arm and then against said ledge, said rotation being actively ef-

fect, from said second position to said first position, as a result of said second arm striking against one of said stops or against said second arm of a further identical slide, said rotation finally being prevented in said first position as a result of said slide itself being in a stopped position with its said second arm stopped up against one of said stops or against said second arm of another slide.

4,873,846

TEXTILE STEAMING APPARATUS

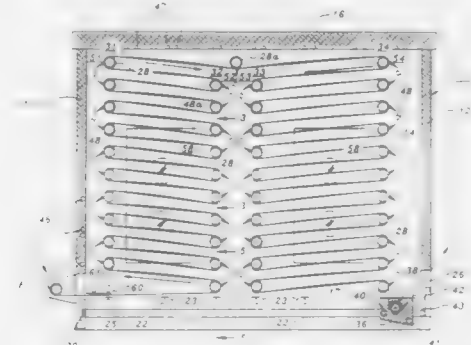
James E. Talbert, Jr., Lancaster, S.C., assignor to Morrison Textile Machinery Company, Fort Lawn, S.C.

Filed Dec. 30, 1988, Ser. No. 292,415

Int. Cl.⁴ D06B 3/12, 23/30

U.S. Cl. 68—5 E

19 Claims



1. A textile steamer for steaming a continuously advancing fabric and having provision for the rapid wash down of the interior components of the steamer between fabric steaming operations, said steaming comprising

an enclosed chamber,
 means for introducing steam into said chamber,
 at least two vertical rows of fabric guide rollers mounted in said housing, and with the rollers being disposed along parallel horizontal axes and such that a fabric may be threaded onto the rollers in a sinusoidal path to define generally horizontal runs of the fabric between the rollers,

water spray means mounted within said chamber for directing a water spray onto the full length of each of said rollers to permit the rollers to be cleaned between fabric steaming operations, said water spray means comprising at least two vertical rows of water delivery pipes positioned parallel to and laterally outside of respective ones of said vertical rows of rollers, and nozzle means mounted on each of said pipes for directing the water spray onto the full length of at least one adjacent roller, and wherein any water dripping from the water delivery pipes or nozzle means during normal operation of the steamer will not fall upon said horizontal runs of fabric.

4,873,847

APPARATUS FOR DYEING A FABRIC MATERIAL
 Tomoaki Kasai, Kurobe, and Seizo Sekiguchi, Uozu, both of Japan, assignors to Yoshida Kogyo K. K., Tokyo, Japan

Filed Oct. 25, 1988, Ser. No. 261,932

Claims priority, application Japan, Oct. 27, 1987, 62-269273

Int. Cl.⁴ D06B 3/28

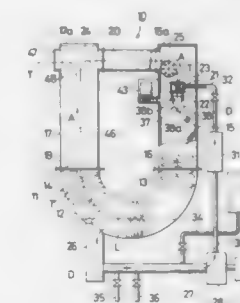
U.S. Cl. 68—178

9 Claims

1. An apparatus for dyeing a fabric material which comprises:

- (i) a substantially semicircular tubular vessel having at opposite ends thereof upwardly directed openings;
- (ii) a first vertical conduit connected at one end to one of the openings in said vessel;

- (iii) a second vertical conduit connected at one end to the other opening in said vessel;
- (iv) a horizontal connecting conduit extending between and interconnecting said first and second vertical conduits at the respective upper ends thereof;
- (v) a dye feed box having a jet nozzle and disposed in said first conduit;
- (vi) a flow deflecting means rotatably mounted in said first



4,873,848

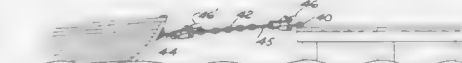
LOCKING SYSTEM FOR SECURING VALUABLES
 Henry W. Honeyman, III, 118 Peninsula Rd., Matunuck Point, Wakefield, R.I. 02879

Filed Jan. 30, 1989, Ser. No. 302,934

Int. Cl.⁴ E05B 73/00

U.S. Cl. 70—14

6 Claims



1. A device for securing valuable property such as a boat against unauthorized use comprising a hasp having a portion thereon bent into a U shape to form two legs, said hasp having at one end thereof an eye, the legs of the U shaped portion having slots passing completely therethrough and in substantial alignment, a latch lug pivoted to the body of the hasp to pass through the slots in the U-shaped portion of the hasp whereby the U-shaped portion of the hasp may engage chain links, loops of cable or the like to secure the property.

4,873,849

LOCK PROTECTOR

Thomas A. Goodson, 2717 Northwest 157th St., and Ronald D. Truelove, 2713 Northwest 157th St., both of Edmond, Okla. 73013

Continuation of Ser. No. 79,885, Jul. 30, 1987, Pat. No. 4,799,369. This application Jan. 23, 1989, Ser. No. 300,791

The portion of the term of this patent subsequent to Jan. 24, 2006, has been disclaimed.

Int. Cl.⁴ E05B 67/38

U.S. Cl. 70—54

16 Claims

1. A lock protector for a padlock, said lock protector comprising:

- a pair of spaced body members adapted for receiving a shackle connected to said padlock therebetween, for pre-

venting tampering access to said shackle, said body members defining aligned transverse slots therethrough parallel to legs of said shackle and adapted for receiving a locking eye therethrough engagable by said shackle, said body members defining a planar surface positionable adjacent



cent a body of said padlock when said padlock is in a locked position for preventing rotation of said padlock about said body members; and
a neck member integrally formed with said body members and extending between said body members and between said legs of said shackle.

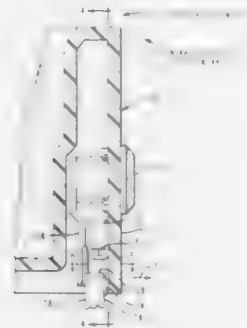
4,873,850

ANTI-JAMMING UP DEVICE FOR A DRAWER

Dale R. Lyons, and Don E. Beam, both of Cambridge, Ohio, assignors to NCR Corporation, Dayton, Ohio
Filed Dec. 19, 1988, Ser. No. 286,410
Int. Cl.⁴ E05B 65/46

U.S. Cl. 70—85

6 Claims



1. A drawer assembly comprising:

- a frame;
- a drawer having a front panel;
- mounting means for mounting said drawer for movement between open and closed positions relative to said frame;
- a key lock mounted in said drawer, with said key lock having a locking arm moveable between locking and unlocking positions by a key associated with said key lock;
- said frame having an abutment member with said abutment member having a locking side and a non-locking side, said abutment member cooperating with said locking arm to lock said drawer in said closed position when said locking arm is moved to said locking position by said key to engage said locking side of said abutment member after said drawer is moved to said closed position;
- a latching mechanism coupled between said drawer and said frame for latching said drawer in said closed position when said drawer is moved to said closed position and for unlatching said drawer permitting it to move towards said open position upon at least one predetermined event, with one said predetermined event being the movement of said locking arm from said locking position to said unlocking position; and
- support means positioned between said front panel and said locking arm to provide support for said locking arm when said locking arm is inadvertently placed in said locking

position prior to said drawer being moved to said closed position to thereby prevent bending of said locking arm when contacting said non-locking side of said abutment member and also to prevent said drawer from being moved close enough to said closed position which would cause said latching mechanism to latch said drawer to said frame.

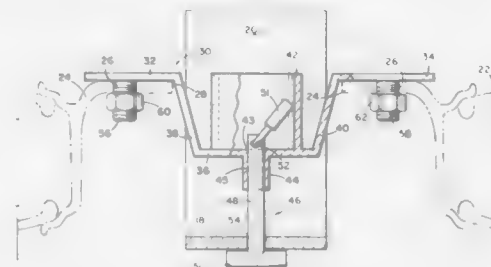
4,873,851

SPARE TIRE LOCK FOR TRUCK-TRAILER WHEELS

Daniel W. Arnett, 8206 N. 122nd E. Ave., Owasso, Okla. 74055
Filed Mar. 20, 1989, Ser. No. 325,951
Int. Cl.⁴ E05B 65/12

U.S. Cl. 70—259

4 Claims



1. A spare tire locking device for truck-trailer wheels and the like vehicles and for use in association with a conventional tire carrier of the type having a first horizontal member whose length is at least equal to the maximum diameter of the wheel and tire to be supported thereon, the carrier having vertical side members extending upwardly from the ends of the first horizontal member and welded at their upper ends to the frame of the vehicle and the carrier having a second horizontal member attached to and extending from the center of the first horizontal member at right angles thereto, the length of the second horizontal member being such that a majority of the wheel and tire will be supported on the carrier with only a portion of the tire projecting outwardly therefrom, the second horizontal member being provided with a vertical side member connected to the outer end of the second horizontal member and being welded at its upper end to the frame of the vehicle; the spare tire locking device comprising a generally gull-shaped member having a pair of upper and outwardly extending horizontal arms adapted to overlie a rim portion only of the wheel, a lower flat central portion connecting with the inner ends of the horizontal arms through a pair of upright members, a stud projecting downwardly from each horizontal arm, the studs being receivable in diametrically opposite bolt holes in the rim for bolting the gull-shaped member against the rim with the central portion and upright member being received in a pre-existing central opening in the rim, a hollow cylinder attached to the upper surface of the flat central portion, a smaller cylindrical tube attached to the upperside of the flat central portion in concentric relation with the cylinder and communicating with the cylinder through a hole in the central portion, and a T-bar having a vertical portion adapted to pass first through a pre-bored hole in the conventional tire carrier on which the wheel is mounted with the gull-shaped member attached thereto, the T-bar being adapted to pass upwardly through the tube and into the interior of the cylinder, the T-bar having a horizontal handle connected to the lower end of the vertical portion and a hole at the upper end of the vertical portion for attachment of a padlock to the vertical portion when it projects upwardly into the cylinder.

4,873,852

FORK FOR THE FIXATION OF A CYLINDER LOCK PLUG

Gay Neyret, 11, rue du Fort, 69340 Francheville, France
Filed Oct. 31, 1988, Ser. No. 264,361
Claims priority, application France, Nov. 6, 1987, 87 15752
Int. Cl.⁴ E05B 09/08

U.S. Cl. 70—451

10 Claims



1. A fixation fork for a cylinder lock plug, provided for being placed underneath the head of the plug to maintain it flat against a fixation panel, characterized by the fact that it is fast with a second fork cooperating with the end of the plug which is opposite the head, one of said forks being provided with wings bearing on the fixation panel.

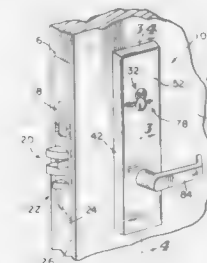
4,873,853

ESCUTCHEON ASSEMBLY

William R. Foshee, Noblesville, Ind., assignor to Best Lock Corporation, Indianapolis, Ind.
Filed Mar. 23, 1989, Ser. No. 328,105
Int. Cl.⁴ E05B 15/02

U.S. Cl. 70—452

6 Claims



1. An escutcheon for shielding a portion of a door panel or the like, the escutcheon comprising
a cover plate having outer and inner faces, the cover plate being formed to include an elongated lock cylinder-receiving cavity having an annular rear opening in the inner face and a figure-8-shaped front opening in the outer face.

4,873,854

COMPUTER CONTROLLED COILING MACHINE

Frank S. Russell, Northboro, and Timothy J. Hallihan, Charlton Depot, both of Mass., assignors to Sleeper & Hartley Corp., Worcester, Mass.

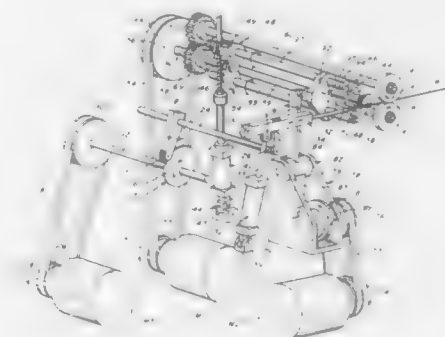
Filed Oct. 30, 1987, Ser. No. 116,068
Int. Cl.⁴ B21F 3/04, 11/00

U.S. Cl. 72—12

46 Claims

1. A wire coiling machine having a work station at which a coil spring is formed and comprised of:
a machine frame,
a pair of feed rollers supported in said machine frame adjacent said work station,
first motor means supported in said machine frame and selectively controlled to operate said feed rollers for directing wire to said work station for coiling,

a pitch tool,
means for operatively supporting said pitch tool at said work station,
second motor means supported in said machine frame and selectively controlled to operate said pitch tool for controlling the pitch of the spring formed at said work station,
first intercoupling means comprising first cam means having a continuously variable diameter control surface providing a continuously variable diameter coupling between said second motor means and said pitch tool for effecting positional linear control of the pitch tool at the work station at various preselected positions corresponding to various pitches of the coil spring being formed, wherein increments in movement of said first cam means over a predetermined range thereof provide corresponding increments in movement of said pitch tool over a predetermined range thereof, said increments of said respective ranges being linearly interrelated to selectively control spring pitch as a linear function of first cam means position,
a diameter tool,
means for operating supporting said diameter tool at said work station,
third motor means supported in said machine frame and selectively controlled to operate said diameter tool for



controlling the diameter of the spring formed at said work station,
second intercoupling means comprising second cam means having a continuously variable diameter control surface providing a continuously variable diameter coupling between said third motor means and said diameter tool for effecting positional linear control of the diameter tool at the work station at various preselected positions corresponding to various diameters of the coil spring being formed, wherein increments in movement of said second cam means over a predetermined range thereof provide corresponding increments in movement of said diameter tool over a predetermined range thereof, said increments of said respective ranges being linearly interrelated to selectively control spring diameter as a linear function of second cam means position,
and computer control means including keyboard entry means for setting predetermined parameters regarding wire feed, spring pitch and spring diameter in constructing a predetermined spring,
said computer control means including means for providing three separate control signals corresponding respectively to and for operating said first, second and third motor means to thereby carry out the desired steps in forming said predetermined spring in accordance with said predetermined parameters set.

4,873,855

SHOT SENSING SHOT PEENING SYSTEM AND METHOD

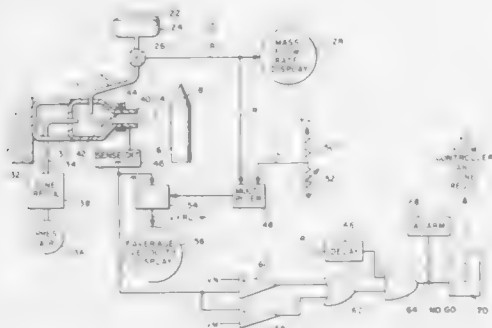
Robert A. Thompson, New York, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed May 2, 1988, Ser. No. 188,828

Int. Cl.⁴ B24C 7/00

U.S. Cl. 72-53

20 Claims



1. A shot peening system comprising:
 - a gun for shot peening, said gun having a nozzle with an outlet;
 - a first sensor in contact with said nozzle adjacent said nozzle outlet, said first sensor including a coil having an inductance which varies according to the amount of shot passing through said nozzle outlet;
 - first sensing circuit means connected to said coil for sensing the inductance of said coil and generating an amount signal representative of said amount of shot passing through said nozzle outlet;
 - a second sensor responsive to the amount of shot supplied to said gun;
 - second sensing circuit means connected to said second sensor for generating a time-dependent signal corresponding to the amount of shot supplied to said gun during a unit period of time; and
 - calculation means for receiving as inputs said amount signal and said time-dependent signal and generating therefrom a velocity signal representative of the average velocity of shot leaving the gun.

4,873,856

KNURLING MACHINE AND THE LIKE

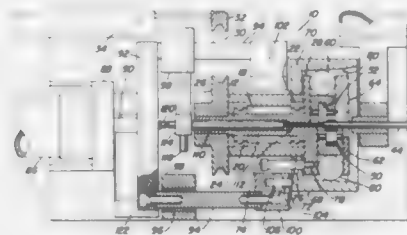
David E. King, Harrison, Tenn., assignor to C & D Engineering Company, Chattanooga, Tenn.

Filed Jun. 30, 1988, Ser. No. 213,362

Int. Cl.⁴ B21H 7/14

U.S. Cl. 72-121

18 Claims



1. Apparatus for deforming a cylindrical surface of a workpiece comprising, a disk having a front face and an axial channel for receiving said workpiece secured in front of said front face, rotatable drive means for rotating said disk about an axis extending through said channel, a plurality of radial slots extending from said channel to the circumference of said disk, a

slide member disposed in a respective slot so as to have a radially inward end and a radially outward end, a deforming tool in the form of a roller rotatably carried by each of said slide members at said radially inward end, each of said rollers having an axis of rotation substantially parallel to the axis of said channel, a cam follower carried by each slide member at the respective radially outward end and extending out of each respective slot, an annular shell disposed concentrically about said disk, said shell having an internal annular surface abutting said cam followers, means connecting said shell to said disk for rotation therewith and for axial movement relatively thereto, said internal surface being annularly inclined relative to said axis to define an annular cam having a varying diameter increasing from a first end toward a second end, and axial drive means for moving said shell axially relatively to said disk in the direction in which said diameter increases so that progressively smaller diameter portions of said internal surface abut said followers to move said deforming tools progressively closer toward said channel for progressively deforming said workpiece.

4,873,857

DEVICE TO DRAW EXTRUDED STOCK FOR AN EXTRUSION PRESS

Cristiani Giancarlo, Gorizia, Italy, assignor to Danieli & C. Officine Meccaniche SpA, Buttrio, Italy

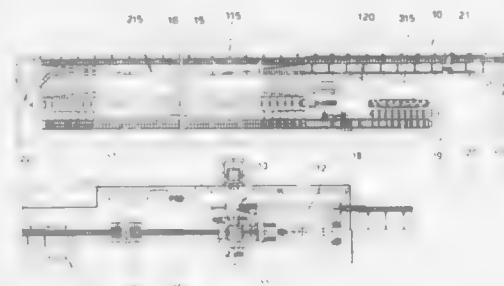
Filed May 13, 1988, Ser. No. 193,524

Claims priority, application Italy, May 22, 1987, 83377 A/87

Int. Cl.⁴ B21C 35/02

U.S. Cl. 72-257

16 Claims



1. Device to draw extruded stock for an extrusion press, in which downstream of an extrusion press (11) is a withdrawal track (15) cooperating with two carriages (21) bearing engagement vices (24), an endless runway (20) being comprised in coordination with the withdrawal track (15) and having one segment (115) parallel to the withdrawal track (15) and bearing the two carriages (21), the endless runway (20) including two straight segments (115-215) and two connecting bends (22), the device being characterized in that the endless runway (20) comprises at least one switch point (120) and a parking line (315) for the carriages (21).

4,873,858

MANUFACTURE OF WIRE BINDING ELEMENTS

Leonard W. N. Jones, Surrey, Great Britain, assignor to James Burn International Ltd., United Kingdom

Filed May 19, 1988, Ser. No. 196,365

Claims priority, application United Kingdom, May 22, 1987, 8712149

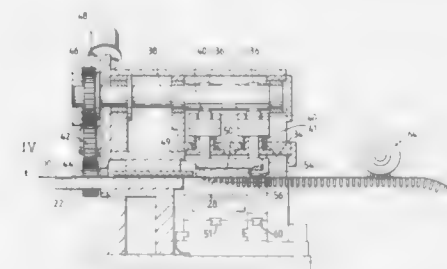
Int. Cl.⁴ B21F 45/16

U.S. Cl. 72-312

5 Claims

1. A binding strip forming machine comprising
 - rotary feed means for feeding a multi-prong binding strip into a forming station in response to rotation of said feed
 - forming means located at said forming station for forming

successive prongs of said multi-prong binding strip into a desired configuration, arresting means connected with said rotary feed means for arresting the feed of successive prongs in said forming station, clamp means located at said forming station for clamping successive prongs in place at said forming station during forming thereof, and



rotary clamp actuation means connected between said rotary feed means and said clamp means, said clamp actuation means causing said clamp means to function in response to rotation of said clamp actuation means, said rotary feed means completing at least two revolutions for each revolution completed by said clamp actuation means.

4,873,859

APPARATUS FOR CONTROLLING MOVEMENT IN A SINGLE ACTION FORMING PRESS

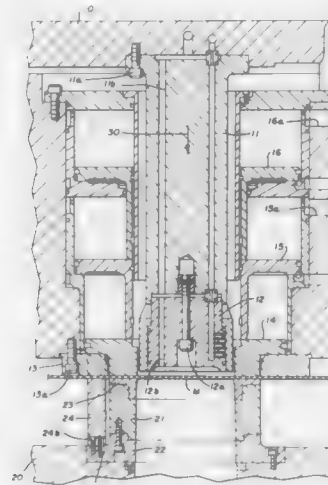
Joseph D. Bulso, Jr., Canton, and James A. McClung, North Canton, both of Ohio, assignors to Redicon Corporation, Canton, Ohio

Continuation of Ser. No. 12,625, Feb. 9, 1987, Pat. No. 4,796,454. This application May 23, 1988, Ser. No. 197,824

Int. Cl.⁴ B21D 22/00

U.S. Cl. 72-336

3 Claims



1. In a press for forming objects from a piece of material, said press having a movable slide and a fixed base, the improvement comprising:
 - (a) a draw horn secured to the slide for movement therewith toward and away from the base;
 - (b) a draw pad carried by the slide and movable toward the base and into engagement with the material under fluid pressure;
 - (c) a blank cut edge carried by the slide for movement therewith toward and away from the base;

(d) a blank and draw die carried by the base for cooperation with said cut edge and said draw horn; and
(e) a plurality of stop members carried by and projecting from the base and dimensioned so as to directly engage the draw pad without engaging the material and arrest its movement toward the base after a predetermined amount of travel thereof and after engagement with the material by said draw pad and movement of said blank cut edge toward the base.

4,873,860

LIFTING BEAM ASSEMBLY FOR A FORMING PRESS

Eberhard Werner, Leverkusen, Fed. Rep. of Germany, assignor to Eumuco Aktiengesellschaft für Maschinenbau, Leverkusen, Fed. Rep. of Germany

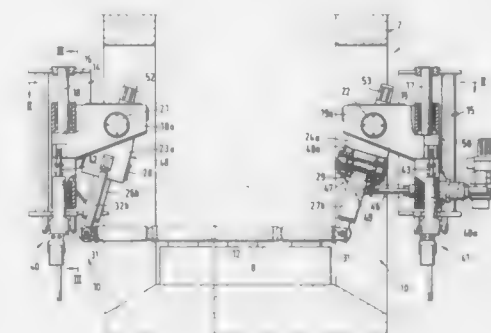
Filed Aug. 18, 1987, Ser. No. 86,531

Claims priority, application Fed. Rep. of Germany, Feb. 26, 1987, 3706160

Int. Cl.⁴ B21J 13/08

U.S. Cl. 72-405

14 Claims



1. A lifting beam assembly for transporting workpieces from work station to work station in a forming press, said assembly comprising:
 - (a) support means for mounting transport beam means to the forming press for grasping workpieces to be transported within the forming press;
 - (b) first drive means including slide member means slidably mounted on the support means for executing vertical movement to raise and lower the transport beam means;
 - (c) second drive means including swing arm means pivotally mounted to the slide member means for executing longitudinal movement of the transport beam means in a direction parallel to the direction traveled from work station to work station;
 - (d) third drive means mounted to swing with the swing arm means for pivotally executing transverse opening and closing movement of the transport beam means; and
 - (e) each said drive means including movement actuating means for effecting said respective vertical, longitudinal and transverse movements, and an actuating shaft secured at one end thereof for hydraulic actuation by electrohydraulic booster means and coupled at the other end thereof to the movement actuating means.

4,873,861

LIFTING ARRANGEMENT IN VEHICLE CHASSIS STRAIGHTENING BENCHES

Hans R. Bergstrom, Kungälv, Sweden, assignor to Car-O-Liner Company, Wixom, Mich.

Filed Jun. 29, 1988, Ser. No. 212,874

Claims priority, application Sweden, Jun. 30, 1987, 8702701

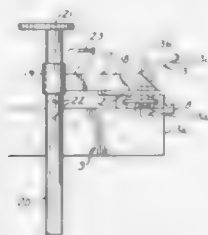
Int. Cl.⁴ B21D 01/12

U.S. Cl. 72-457

14 Claims

1. A lifting apparatus for a vehicle chassis straightening bench having a horizontal chassis support frame with an elongated

gate guide track carried by the frame and the frame being constructed and arranged to be raised and lowered above a base plane, which comprises: a guide attachment constructed to be removably receivable on and releasably securable to the guide track, a manually operable clamp carried by said guide attachment and constructed and arranged to releasably secure said guide attachment when on the track to the frame, an arm separate and removable from said guide attachment and constructed and arranged to be carried by, supported by and releasably secured to said guide attachment, a post guide secured to said arm and constructed and arranged to slidably receive a post, a post slidably received in said post guide and



with its axis extending substantially vertically when said arm is received on said guide attachment when received on the guide track and secured to the frame, the upper end of the post constructed and arranged to support a part of a vehicle chassis, said straightening bench and lifting apparatus in assembled relationship being constructed and arranged such that lowering of the support frame from a raised position will result in displacement of the upper end of the post relative to the frame and said post having a length such that when the frame is lowered through a predetermined distance said post supports the chassis part and upon further lowering of the frame said chassis part will be displaced by said post relative to the frame.

4,873,862

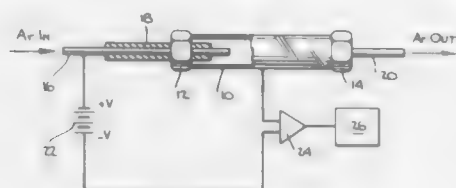
IONIZATION DETECTORS FOR GAS CHROMATOGRAPHY

Raymond P. W. Scott, Avon, and Elena Katz, Westport, both of Conn., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Continuation-in-part of Ser. No. 852,489, Apr. 16, 1986, abandoned, which is a continuation-in-part of Ser. No. 808,965, Dec. 16, 1985, abandoned. This application Jan. 9, 1987, Ser. No. 4,810

Int. Cl.⁴ G01N 31/08

U.S. Cl. 73—23.1



1. For use in gas chromatography, a detector of the type including a detection chamber, means for establishing an electrical potential across said chamber, and means for causing evolution of free electrons in said chamber, the improvement wherein the electron evolution causing means comprises:

- a noble gas within said chamber;
- a volume of glass having a surface in said chamber in contact with said noble gas, at least said surface of the glass having been subjected to preconditioning treatment for stabilizing its emissivity of electrons; and

means for heating said glass and noble gas to a temperature sufficient to induce evolution of electrons therefrom.

4,873,863

VOLUMETRIC LEAK DETECTION MEANS AND METHOD

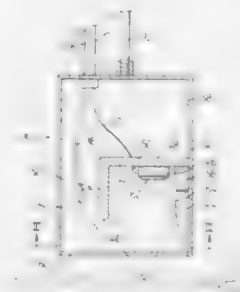
J. D. Bruhl, 2074 Audubon Dr., Glendale Heights, Ill. 60137, and William R. Geisinger, 204 Parkchester Rd., Elk Grove, Ill. 60007

Filed Nov. 29, 1988, Ser. No. 277,314

Int. Cl.⁴ G01M 3/38; G01F 23/22

U.S. Cl. 73—49.2

16 Claims



1. In a method of volumetric leak detection, the steps of:
 - (a) directing a collimated beam of energy onto a surface of a liquid;
 - (b) causing said beam to be reflected from said surface;
 - (c) receiving said beam reflected from said surface with a reflector;
 - (d) receiving said reflected beam from said reflector receptor;
 - (e) detecting a position of a footprint of said beam on said receptor;
 - (f) causing said footprint to change position in exaggerated proportion relative to changes in the level of said surface by means of a curved reflecting surface on said reflector;
 - (g) detecting any changes of the position of said footprint;
 - (h) correlating said changes in position of said footprint with changes in the level of said surface; and
 - (i) correlating changes in the level of said surface with volumetric changes in said liquid.

4,873,864

PRESSURE GAUGE WITH A MOVABLE INTERIOR SCALE

Tien-Tsai Huang, No. 4, Lane 30, Wu-Chuan St., Pan-Chiao, Taiwan

Filed Jul. 8, 1988, Ser. No. 216,373

Int. Cl.⁴ B60C 23/02; G01L 7/16

U.S. Cl. 73—146.8

2 Claims

1. A pressure gauge comprising:
 - an elongated hollow body having a closed chamber therein, an intake passage communicating with said closed chamber and having an air inlet communicating exteriorly of said pressure gauge, a charge port provided between said closed chamber and said intake passage, and a discharge port communicating with said closed chamber and exteriorly of said pressure gauge;
 - a spring-biased charge valve disposed at said charge port, normally biased to close said charge port so as to stop air flow between said closed chamber and said intake passage when no pressurized air enters said intake passage, and driven to open said charge port by pressurized air entering said intake passage;
 - a sliding member mounted in said closed chamber in sealing engagement therewith, and slidable in said closed chamber when pressurized air enters said closed chamber, said

discharge port being positioned between said charge port and said sliding member;

a pressure indicating scale carried by and extending away from said sliding member;

a display hole formed in said body and aligned with said scale so that said scale is visible through said display hole;



- a spring-biased discharge valve disposed at said discharge port normally biased to close said discharge port and manually openable to release pressurized air in said closed chamber; and
- a spring connected at an upper end to said charge valve and at a lower end to said sliding member for biasing said sliding member to return to a normal position when said pressurized air is released from said closed chamber.

4,873,865

FUEL SENDER ASSEMBLY REQUIRING NO CALIBRATION

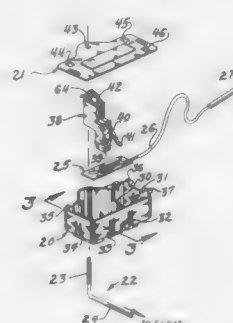
Robert D. Gaston, Dearborn Heights, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 27, 1988, Ser. No. 289,883

Int. Cl.⁴ G01F 23/32, 23/36

U.S. Cl. 73—317

8 Claims



1. A fuel sender assembly comprising:
 - a float rod having a pivot portion and an arm portion;
 - a housing member having a rod hole rotatably securing said pivot portion and having an arcuate slot radially disposed from said rod hole;
 - a resistance element secured to said housing member and having a first connection thereto;
 - a carrier element extending through said arcuate slot, said carrier element having an interior portion receiving said pivot portion and having an exterior portion receiving said arm portion; and
 - spring contact means rigidly coupled to said interior portion of said carrier element for slidably contacting said resistance element as a second connection thereto;
- whereby said carrier element abuts the ends of said arcuate slot to provide stop limits for the rotation of said float rod.

4,873,866

METHOD OF HYDROSTATIC WEIGHING AND KIT

Bert L. Fairbanks, 2306 22nd Avenue South, Lethbridge, Alberta, Canada (T1K 1J5)

Filed Apr. 3, 1987, Ser. No. 33,771

Int. Cl.⁴ G01N 9/08

U.S. Cl. 73—437

8 Claims



1. A method of determining density of a person's body which comprises:
 - A. filling with water and closing a rigid container capable of being grasped by the person whose body density is being determined and sinking the person and container in a body of water, adding, if necessary, a weight X to the container;
 - B. removing water from said container until it contains just enough air to suspend the person grasping it in the body of water above the bottom and below the surface;
 - C. determining the weight of water in grams required to refill the container, taking as the person's weight in grams in water (i) that weight where no weight X is added and (ii) that weight less weight X where added; and
 - D. calculating the density of the person's body from the formula $D = W_a / (K)$ where W_a is the weight of the person in air in grams, $K = W_a - W_w$ divided by the density of the water where W_w is the weight of the person's body in grams in water as determined in step C.

4,873,867

REDUNDANT SIGNAL DEVICE FOR AUTO CRASH TESTING

Walter K. McPherson, Marysville, and James L. Blaker, West Liberty, both of Ohio, assignors to TRC, Inc., East Liberty, Ohio

Filed Feb. 12, 1988, Ser. No. 155,606

Int. Cl.⁴ G01P 15/08

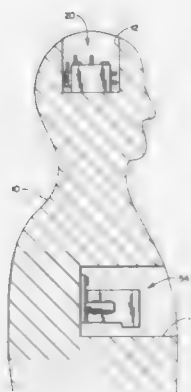
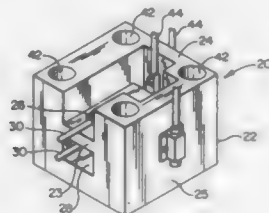
U.S. Cl. 73—493

1 Claim

1. An apparatus for measuring simulated body forces relative to certain reference planes comprising an anthropomorphic dummy; a force site cavity within said dummy, and a mounting block provided with acceleration sensing means mounted within said force site cavity, said mounting block comprising, in combination;

- (1) at least three wall segments forming a mounting block cavity; a respective one of said three wall segments positioned parallel to a respective one of three reference planes disposed perpendicular to and intersecting one another; a first one of said three wall segments forming a first pair of opposing parallel attachment surfaces closely spaced from one another wherein at least one of said first pair of attachment surfaces is disposed within the interior of said cavity; a second one of said three wall segments forming a second pair of opposing, parallel attachment surfaces closely spaced from one another wherein at least one of said second pair of attachment surfaces is disposed within the interior of said cavity, and a third one of said three wall segments forming a third pair of opposing parallel attachment surfaces closely spaced from one another wherein at least one of said third pair of attachment surfaces is disposed within the interior of said cavity;
- (2) force sensing means including a first pair of acceleration

sensing means, a respective one of said first pair mounted to a respective one of said first pair of attachment surfaces with respective seismic mass centers disposed within a predetermined distance from a selected common reference point, a second pair of acceleration sensing means; a respective one of said second pair mounted to a respective one of said second pair of attachment surfaces with respective seismic mass centers disposed within a predetermined distance from said selected common reference point; and a third pair of acceleration sensing means, a



respective one of said third pair mounted to a respective one of said third pair of attachment surfaces with respective seismic mass centers disposed within a predetermined distance from said selected common reference point; and whereof the sensitive axis of each member forming a respective pair of acceleration sensing means is aligned parallel to the sensitive axis of the other member of the pair and perpendicular to one of said reference planes to intersect the sensitive axis of one member of two different pairs of acceleration sensing means at a selected point within said mounting block cavity.

4,873,868

FORCE MEASUREMENT SENSOR INTEGRATED ON SILICON, AND A METHOD OF MANUFACTURE
Andre Pierre, Lyon; Francois Batlleu, Rambouillet; Jean-Pierre Brosselard, Paris; Alfred Permy, Marseille; Francois-Xavier Piro, and Serge Spirkovitch, both of Paris, all of France, assignors to Metravib R.D.S., Ecully Cedex, France
PCT No. PCT/FR87/00206, § 371 Date Feb. 9, 1988, § 102(e) Date Feb. 9, 1988, PCT Pub. No. WO87/07729, PCT Pub. Date Dec. 17, 1987

PCT Filed Jun. 10, 1987, Ser. No. 162,329

Claims priority, application France, Jun. 10, 1986, 86 08525
Int. Cl. G01P 15/08, 15/125

U.S. Cl. 73—517 R

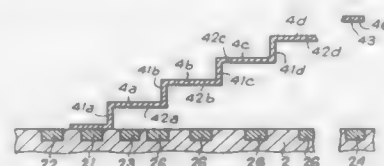
7 Claims

1. A force measurement sensor integrated on silicon, comprising:

a mono-crystalline silicon substrate having a first dopant and covered on at least a portion of its surface by a doped layer having a second dopant;
a variable capacitor comprising a first moving plate includ-

ing a flexible conducting blade having a free end which is deformable by bending, said plate having an "anchor portion applied to a localized zone of said doped layer, and which is mounted so as to have a cantilevered portion including a set of staircase steps, each staircase step being shorter than a critical sticking length and co-operating with a doped zone having a high concentration of impurities situated beneath said step and capable of being individually biased, and a fixed second plate including a conducting zone made on said doped layer, said conducting zone facing said first plate and separated therefrom by an empty space which is a few microns across;

a first doped zone which is doped with a high concentration of said first dopant and which is situated in said doped



layer, the anchor portion being located on said first doped zone in order to constitute the gate of a junction field effect transistor (JFET);

second and third doped zones which are doped with a high concentration of said second dopant situated on either side of said first doped zone to constitute the drain and source zones of the JFET, the doped layer defining a zone having a low concentration of said second dopant situated beneath said first doped zone between said second and third doped zones in order to constitute the channel of said JFET whose gate is directly connected via the flexible blade to the moving plate of the variable capacitor; and means for detecting a signal representative of variations in the position of said flexible blade.

4,873,869

DEVICE FOR THE SCANNING OF OBJECTS BY MEANS OF ULTRASOUND ECHOGRAPHY

Mathias Fink, Meudon, France, assignor to U.S. Philips Corporation and Fujitsu Limited, Japan

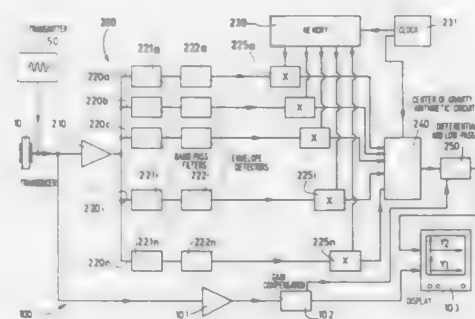
Filed Aug. 26, 1982, Ser. No. 411,731

Claims priority, application France, Oct. 19, 1981, 81 19585

Int. Cl. G01N 29/00

U.S. Cl. 73—626

18 Claims



13. A method for measuring the attenuation of ultrasound in an object, comprising the steps of:
transmitting an ultrasound pulse into the object;
receiving a reflected ultrasound wave from the object;
analyzing the spectrum of a first parameter which represents the strength of the reflected wave; and
calculating a second parameter which is an indicator of the spread of the first parameter as a function of frequency

over the entire frequency range of the received wave and which is also directly locally correlated with the slope of the curve of the variation of the ultrasound attenuation in the object as a function of frequency.

4,873,870

MICRO-DISPLACEMENT FORCE TRANSDUCER

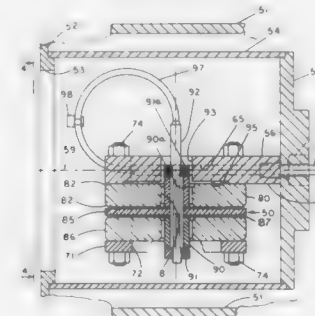
Leroy C. Delatorre, Sugarland, Tex., assignor to Panex Corporation, Sugarland, Tex.

Filed Jan. 19, 1988, Ser. No. 145,373

Int. Cl. G01L 7/04, 9/12

U.S. Cl. 73—733

25 Claims



1. A force sensitive capacitance device for developing capacitance values as a function of force applied to said device, said force sensitive capacitance device having a capacitor member with a micro-displacement range of movement for developing said capacitance values, said force sensitive device being disposed between a reference base support member and a force linkage member attached to said capacitor member, a pressure responsive member attached to said force linkage member, said pressure responsive member having a relatively large displacement range of movement as compared to the displacement range of movement of said capacitor member, said pressure responsive member being responsive to pressure to displace said force linkage means, said capacitor member being constructed from quartz and being cylindrically shaped about a central axis, said capacitance device further including cylindrically shaped base members constructed from quartz and disposed to either side of said capacitor member, a tubular boss member constructed from quartz and bonded to said capacitor member, said force linkage member being coupled to said boss member.

4,873,871

MECHANICAL FIELD EFFECT TRANSISTOR SENSOR
Monty W. Bai, Scottsdale, and Douglas J. Huhmann, Tempe, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 17, 1988, Ser. No. 207,993

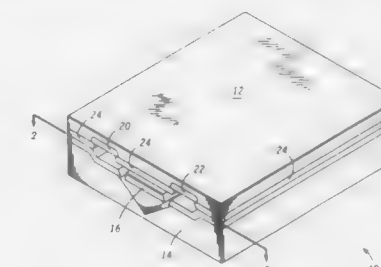
Int. Cl. G01B 7/16

U.S. Cl. 73—777

9 Claims

1. A mechanical field effect transistor sensor comprising:
semiconductor portion means for conducting a current when a surface concentration of electrons of said semiconductor portion means is altered;
deflectable semiconductor means for sensing movement of the sensor;
a bottom portion of said deflectable semiconductor means secured above said semiconductor portion means;
said deflectable semiconductor means deflectable in a vertical direction with respect to said semiconductor portion means;

gate means for altering said surface electron concentration of said semiconductor portion;



said gate means micromachined onto a bottom side of a deflecting portion of said deflectable semiconductor means, and adjacent to said semiconductor portion.

4,873,872

FLOAT FOR FLUID MEASUREMENTS

Lawrence I. Wechaler, 1 Wooleys Lane, Great Neck, N.Y. 11023

Filed Jan. 25, 1988, Ser. No. 148,011

Int. Cl. G01F 1/22, 1/28; G01N 11/12

U.S. Cl. 73—861.57

2 Claims



1. A flowmeter comprising a vertically disposed tube which is open at both ends and has a tapered bore and a plurality of members disposed within the bore, at least one of the members having an aperture coaxial with the bore, arranged so that the successive members of the plurality respond to different ranges of fluid flow rate through the tube and, for any flow rate within a selected range, one of the members is maintained at a position between the ends of the tube.

4,873,873

AIR FLOW METERING TERMINAL AND CONTROL SYSTEM

James L. Day, Victor, N.Y., assignor to James L. Day Co., Inc., Victor, N.Y.

Filed Feb. 1, 1988, Ser. No. 150,968

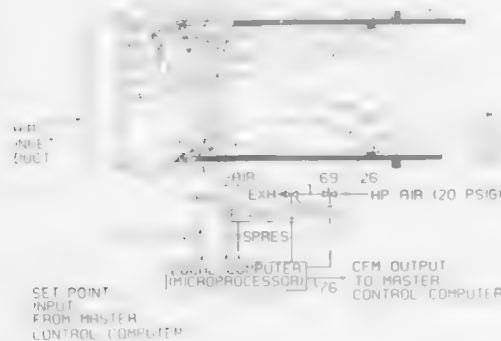
Int. Cl. G01F 1/44

U.S. Cl. 73—861.63

15 Claims

1. An air flow metering system wherein air flow rate in a duct is both measured and controlled, said system comprising means movable in said duct for controlling the area therein for the passage of air therethrough in accordance with the position thereof, actuator means operative in response to an actuating signal for moving said controlling means and changing the

position thereof, position sensor means for providing a first output in response to the position of said controlling means, transducer means responsive to said actuating signal for pro-



viding a second output which is a function of the air pressure in said duct against said controlling means, and means responsive to said first and second outputs for determining the flow rate in said duct.

4,873,874

MAGNETOELASTIC TORQUE TRANSDUCER

Jarl Sobel, Västerås, Sweden, assignor to Asea Brown Boveri AB, Västerås, Sweden

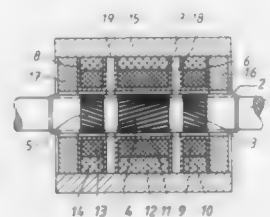
Filed Sep. 19, 1988, Ser. No. 246,271

Claims priority, application Sweden, Sep. 28, 1987, 8703720

Int. Cl.⁴ G01L 3/10

U.S. Cl. 73—862.36

6 Claims



1. A magnetoelastic torque transducer comprising a shaft, stationary coils concentric with the shaft in order to excite the transducer with alternating current, and stationary coils concentric with the shaft to measure the external torsional moment applied on the shaft, and a magnetic casing also located concentrically with the shaft, where said shaft has three parallel annular zones provided with such anisotropy that the magnetic field in the shaft is deflected by an angle α approximately equal to 45° to a generatrix to the shaft in the outermost zones and is deflected by an angle α approximately equal to -45° to a generatrix to the shaft in the intermediate zone, the axial extension of both outer zones being substantially half that of the intermediate zone and where the excitation is arranged using three separate coils, connected in series, each being located concentric with an annular zone and the outer excitation coils being wound with substantially half as many turns as the central excitation coil and that concentric with each excitation coil is a measuring coil, the outer measuring coils being wound with substantially half as many turns as the central measuring coil and this being arranged to be inverse-connected to the outer measuring coils.

4,873,875
SYSTEM FOR OPTICALLY INTERROGATING LIQUID SAMPLES AND FOR WITHDRAWING SELECTED SAMPLE PORTIONS

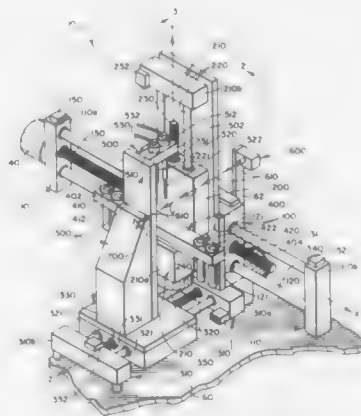
William H. Cork, Brecksville, Ohio, assignor to Prism Technology, Inc., Brecksville, Ohio

Filed Jun. 27, 1986, Ser. No. 879,588

Int. Cl.⁴ G01N 1/14, 21/17

U.S. Cl. 73—863.01

5 Claims



1. A method for interrogating a sample of liquid to locate at any vertical location within the sample a region of interest in the form of a layer of liquid of substantially an degree of thinness to as low as on the order of 10–50 microns that has top and bottom surfaces that extend substantially horizontally, and to withdraw and collect liquid from the region of interest, wherein the sample is of a type that has at least one light influencing characteristic that varies from position to position within the sample, including the steps of:

- projecting a beam of collimated, polarized light from a laser along a substantially horizontal path of travel;
- arranging the relative positions of said path of travel and of the sample of liquid so that the beam of light intercepts selected portions of the sample of liquid as the beam is projected along said path of travel;
- arranging the relative positions of said path of travel, the sample of liquid, and a light sensitive detector means to cause the detector means to receive light from the beam that has been transmitted substantially in a straight line path through said selected sample portions;
- effecting relative movement of the sample with respect to said path of travel and the detector means, to cause scanning by the beam of light of said selected sample portions, with light from the beam that has been transmitted through said selected sample portions that have been scanned by the beam of light (referred to hereinafter as "said scanned sample portions") being received by the detector means.
- Operating the detector means to sense received light from said scanned sample portions and to generate an electrical output signal that has a value which is representative of at least one sense characteristic of the received light, with variations in values of the output signal being representative of variations from position to position within said scanned sample portions of at least one transmitted light influencing characteristic of the sample, and to coordinate output signal values with indications of corresponding positions within the sample, to thereby locate within said scanned sample portions at least one region of interest;
- providing liquid withdrawal means for insertion into the sample, with the liquid withdrawal means having structure defining an inlet opening for withdrawing liquid from the sample through the inlet opening;

- effecting relative movement of the sample of liquid and the liquid withdrawal means to insert the liquid withdrawal means into the sample of liquid to position the inlet opening thereof substantially at any desired vertical location in the sample in communication with liquid within the layer that forms said region of interest;
- operating the liquid withdrawal means to effect withdrawal of liquid from within the layer that forms said region of interest through the inlet opening and to collect the withdrawn liquid; and,
- wherein the step of effecting positioning of the sample includes the steps of:
 - providing the sample in an elongate, vertically extending test tube formed of substantially transparent material such as glass, with the test tube defining an interior of substantially circular cross section wherein the sample is carried; and,
 - moving the test tube containing the sample in a substantially horizontal direction that extends transverse to said path of travel of the light beam to be transmitted through a layer of the sample while operating the detector means to locate the optimum relative positioning of the test tube and said path of travel of the light beam that maximizes the light transmission through the sample, whereby the test tube is caused to be horizontally centered with respect to the travel path of the beam.

4,873,876

CHEMICAL PROCESS SAMPLER

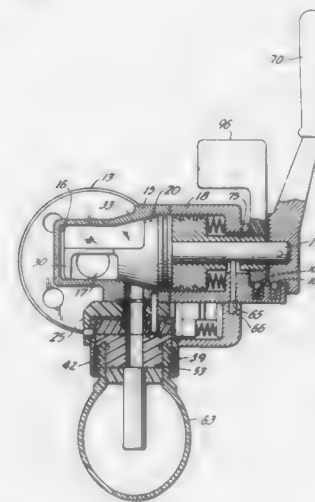
Michael Sheridan, Old Bridge, N.J., and Kenneth Jaffe, Boulder, Colo., assignors to Ethylene Corp., Murray Hill, N.J.

Filed Nov. 7, 1988, Ser. No. 267,984

Int. Cl.⁴ G01N 1/20

U.S. Cl. 73—863.86

9 Claims



1. A chemical process sampler for use in extracting samples of material from a process line, comprising: a housing element adapted for in line positioning with respect to said process line, said housing element having laterally extending inlet and outlet passages for removal and return of samples to and from said process line; a valve element positioned within said housing having first, second and third positions of adjustment, a first position permitting continuous flow of material through said housing while maintaining said inlet and outlet passages in closed condition, a second position of which blocks flow of material directly through said housing, and directs said flow through said inlet and outlet passages; and a third position of which blocks said inlet passage while permitting flow through said outlet passage.

4,873,877

PRECISION LIQUID HANDLING APPARATUS

Arthur Harris, Palos Verdes Estates, Calif., assignor to Davis Meditech, Davis, Calif.

Filed Aug. 17, 1987, Ser. No. 85,659

The portion of the term of this patent subsequent to Apr. 19, 2005, has been disclaimed.

Int. Cl.⁴ G01N 1/14

U.S. Cl. 73—864.16

9 Claims



- A liquid handling apparatus comprising:
 - at least one first liquid reservoir;
 - a liquid metering and aspirating device comprising:
 - a threaded hollow base member having a bottom closure wall;
 - a rigid stator non-rotatably mounted within said base member;
 - a threaded liquid container adapted to be threadably interconnected with said base member upon rotation of said container relative to said base member, said container having an inner wall and a top closure wall;
 - liquid delivery means for conducting fluid from the interior of said liquid container to the exterior of the device; and
 - a non-rotatable plunger reciprocally movable a precise axial distance within said liquid container only upon rotation of said container relative to said base member, said plunger having:
 - sealing means adapted to sealably engage said inner wall of said liquid container for preventing leakage of fluid between said plunger and said inner wall upon non-rotatable axial movement of said plunger within said liquid container; and
 - connecting means for operably interconnecting said plunger with said stator for preventing rotation of said plunger relative to said stator;
 - first transfer means operably associated with said liquid delivery means of said liquid metering and aspirating device and said first liquid reservoir for transferring liquid between said liquid delivery means and said first liquid reservoir.

4,873,878

APPARATUS FOR INSPECTING AND HANGING PANTS

David W. Milton, Middletown, Ohio, assignor to Cintas Corporation, Cincinnati, Ohio

Filed Dec. 29, 1987, Ser. No. 139,293

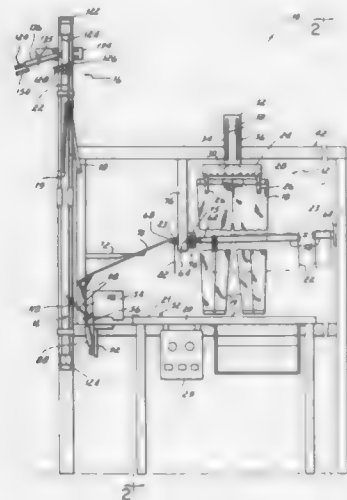
Int. Cl.⁴ G01N 33/36

U.S. Cl. 73—865.8

24 Claims

- Apparatus for inspecting and hanging pants comprising: an inspection station including gripper means for gripping a pair of pants in position for inspection;
- a hanging station including hanger support means for supporting a hanger, and pant support means for support-

ing the pair of pants in a position to engage a hanger on said hanger support means;



take-away means for removing the hanger from said hanger support means so that the pants are draped onto the hanger and lifted from said pant support means.

4,873,879

VARIABLE SPEED TRANSMISSION

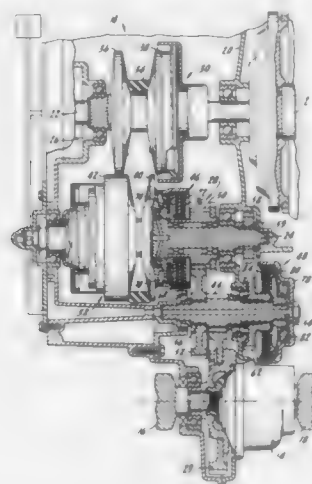
Roger P. Butterfield, Interlaken; Guenter J. Neumann, Ithaca, and Carl A. Wykstra, Dryden, all of, assignors to Borg-Warner Automotive, Inc., Troy, Mich.

Filed Sep. 8, 1987, Ser. No. 93,671

Int. Cl.⁴ F16H 37/02

U.S. Cl. 74—689

4 Claims



1. In combination with a vehicle including an engine having a rotary output member, a continuously variable transmission operable in forward and reverse modes, said transmission comprising:

- a driving shaft directly connected to said rotary output member;
- a driven shaft;
- stepless variable coupling means for interconnecting said shafts, said coupling means comprising driving and driven pulley assemblies which are interconnected with an endless belt, each pulley assembly including a pair of split sheaves, with one sheave being fixedly mounted and the other sheave being axially slidable on their respective shafts;
- a differential having a ring gear for driving at least one

rotary output power shaft extending from said differential; and

bidirectional gear drive mechanism means for transferring rotary motion between said driven shaft and said differential such that said rotary output member and said rotary output power shafts rotate in the same direction during the forward mode of operation, said mechanism means comprising:

- a two gear forward drive path including a forward gear rotatably mounted on said driven shaft and intermeshing with an intermediate gear spline connected to an intermediate shaft; a three gear reverse drive path including a reverse gear mounted on said driven shaft, an idler gear mounted on a stub shaft and a driven gear which is rotatably mounted on said intermediate shaft; a transfer gear connected onto said intermediate shaft between said intermediate gear and said driven gear for continuous meshing engagement with the differential ring gear and adapted to be driven by either gear mesh; a first fluid actuated starting clutch assembly for selectively connecting said driven shaft with said output power shafts through said differential and the two gear forward drive path; and, a second fluid actuated starting clutch assembly for selectively connecting said driven shaft with said output power shafts through said differential and the three gear reverse drive path, with the direction of output shaft rotation being controlled as a function of selective clutch engagement.

4,873,880

GEARBOX WITH ELECTRONICALLY-CONTROLLED HYDRAULIC CLUTCHES, FOR AGRICULTURAL TRACTORS AND SIMILAR VEHICLES

Giuseppe Amedei, and Giovanni Tornatore, both of Torino, Italy, assignors to Fiatgeotech-Tecnologie per la terra S.p.A., Modena, Italy

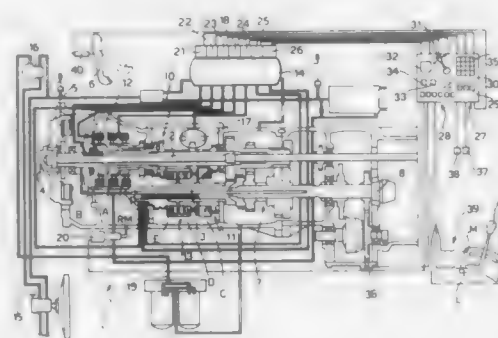
Filed Apr. 1, 1988, Ser. No. 176,549

Claims priority, application Italy, Apr. 1, 1988, 67258 A/87

Int. Cl.⁴ F16H 5/48

U.S. Cl. 74—336 R

13 Claims



1. A gearbox with a large number of ratios, for agricultural tractors and similar vehicles, including a driving shaft and a driven shaft which are parallel to each other, first and second reduction stages carried by the driving shaft and the driven shaft and having permanently meshed gears defining a plurality of forward and reverse gear ratios, first and second hydraulic friction clutch units for engaging the gear ratios of the first and second reduction stages, hydraulic distributor means for engaging and disengaging the first and second clutch units in a combinable manner, a first manual control and respective piloting valve units for operating the distributor means to effect gear changes without interrupting the transmission of torque between the driving shaft and the driven shaft, a control pedal for operating the hydraulic friction clutches of the first unit as starting clutches, a flexible coupling operatively associated with the input of the driving shaft, a final mechanical,

geared speed-range reduction stage operatively associated with the output of the driven shaft, and a second manual control for operating the final reduction stage, wherein the valve units include exclusively electro-hydraulic proportional-response valves, and wherein there are provided means for monitoring the operative conditions of the gearbox and of the tractor in which it is installed, which are adapted to generate electrical signals indicative of these conditions, and an electronic control unit which is supplied with these signals and is arranged to pilot the electro-hydraulic proportional-response valves so as to regulate the manner of combined engagement and disengagement of the hydraulic clutches in dependence of the operative conditions according to variable laws of pressure variation of said hydraulic clutches.

4,873,881

ELECTRICALLY ACTUATED X-Y SHIFTING MECHANISM

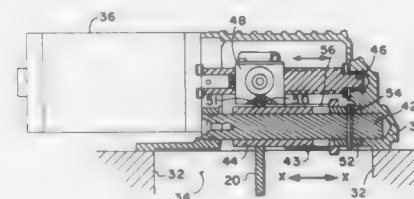
Stephen A. Edelen, Battle Creek; David T. Allen, Kalamazoo, and Bill E. Zylman, Portage, all of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Jan. 6, 1989, Ser. No. 294,030

Int. Cl.⁴ F16H 5/44; B60K 20/16

U.S. Cl. 74—336 R

9 Claims



1. An electrically actuated X—Y shifting mechanism for controlling the shifting of change gears of a mechanical change gear transmission of the type having at least one shift rail axially movable in a first axial (Y—Y) direction in a shift bar housing, said shift rail having a shift fork associated therewith and a block mechanism selectively engagable by an inner end of a mountable operated shift lever extending through an opening in the shift bar housing that is movable in a second (X—X) direction substantially transverse to the (Y—Y) direction for registration with the shift rail block mechanism and is movable in the (Y—Y) direction for engaging and causing said block mechanism to move the shift rail associated therewith axially to cause the shift fork associated therewith to effect the change gear shift, said mechanism comprising:

- a shift mechanism housing mountable to said shift bar housing and having a shift finger extending into the shift rail housing opening therefrom,
- a first shaft member mounted for rotation on the mechanism housing and having the central rotational axis thereof in substantial parallel alignment with the (X—X) direction,
- a first carrier member disposed coaxially about the first shaft member and axially movable in opposite directions therealong and rotatable in opposite rotational directions about the rotational axis thereof, said carrier member having the shift finger fixedly secured thereto such that the axial movement of carrier member moves the shift finger in the (X—X) direction and rotational movement of the carrier member moves the shift finger in the (Y—Y) direction,
- a second shaft member journaled for rotation in opposite rotational directions on the mechanism housing in spaced-apart relationship to the first shaft member, said shaft member externally threaded and having a central rotational axis thereof in substantial parallel alignment with the first shaft member central rotational axis,
- a first threaded traversing member threadingly engaged with the second shaft member and operable to traverse in opposite axial directions therealong in response to rotation of the second shaft member in opposite rotational direc-

tions, said traversing member operably connected to the first carrier member by means enabling the traversing member to move the first carrier member axially along the first shaft member in and cause the shift finger to move in the (X—X) direction whilst enabling the first carrier member to rotate in opposite rotational directions about the first shaft member and cause the shift finger to move in the (Y—Y) direction,

at least one electrical motor mounted on the mechanism assembly and powered by an electrical power source, said motor drivingly connected to the second shaft member and operable to rotate the second shaft member in a rotational direction determined by an electrical shift rail selection instruction signal received thereby, means enabling the motor to rotate the first shaft member in a rotational direction determined by an electrical gear change shift instruction signal received thereby, means for rotating the first carrier member in response to rotation of the first shaft member, and electrical circuit control means, operative to provide said shift rail selection instruction signal and said gear change shift instruction signal to in response to one of a selected operator input signal (S₁) or speed signal (S₂) received thereby.

4,873,882

MANUAL TRANSMISSION AND GEAR RATTLE DAMPER THEREFOR

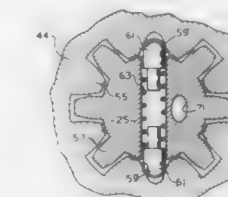
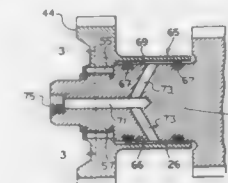
Edward J. Goscenski, Jr., Battle Creek, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Sep. 28, 1988, Ser. No. 250,208

Int. Cl.⁴ F16H 57/00

U.S. Cl. 74—411

9 Claims



1. A manual transmission of the type including housing means, an input shaft rotatably supported relative to said housing means and adapted to receive input drive torque from a source of motive power, and defining an axis of rotation; an output shaft rotatably supported relative to said housing means and defining an axis of rotation generally parallel to said input shaft; a countershaft rotatably supported relative to said housing means and having an axis of rotation generally parallel to said axes of said input and output shafts; a head gear being fixed to rotate with said countershaft, and to transmit input drive torque thereto from said input shaft; a first drive gear having a set of peripheral gear teeth and being fixed to receive input drive torque from said countershaft; a first driven gear having a set of peripheral gear teeth in engagement with said gear teeth of said first drive gear; means shiftable between a first position in which said first driven gear is operable to transmit drive torque from said first drive gear to said output shaft, and a second position in which said first driven gear is operable to free-wheel relative to said output shaft; and means for dampen-

ing the transmission of torsional vibrations from said head gear to said countershaft, characterized by:

- (a) said countershaft and said head gear cooperating to define lost motion means operable to limit the rotation of said head gear relative to said countershaft;
- (b) means biasing said countershaft toward a centered position relative to said head gear, wherein said countershaft is disposed between its rotational limits, relative to said head gear; and
- (c) said head gear and said countershaft cooperating to define a viscous damper portion, disposed separately from said lost motion means, said viscous damper portion being operable when filled with viscous fluid, to dampen relative rotation between said countershaft and said head gear.

4,873,883

MECHANICAL TRANSMISSION MANUAL CONTROL DEVICE

Venant André, Meyzieu, France, assignor to Renault Vehicules Industriels, Lyons, France

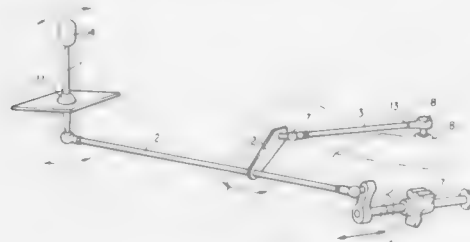
Filed Nov. 4, 1987, Ser. No. 116,686

Claims priority, application France, Nov. 7, 1986, 86 15547

Int. Cl.⁴ F16H 57/06

U.S. Cl. 74—473 R

11 Claims



1. A mechanical transmission manual control device comprising:

- (a) a manual gear control lever pivotally mounted on a shifting ball and having a manually operable portion at one end;
- (b) a transmission control connector including a selector;
- (c) a main control connecting rod connected between another end of said manual gear control lever and said transmission control connector, said main control connecting rod having a connecting rod lever fixed thereon;
- (d) a reaction link pivotally connected to said connecting rod lever; and
- (e) means for modifying one of said manual gear control lever, said transmission gear connector, said main control connecting rod, and said reaction link such that positions of said manually operable portion and said selector are changed relative to one another, said means comprising:
 - (i) an actuator connected to a stationary element and
 - (ii) a reversing lever having one end pivotally connected to said stationary element and another end pivotally connected to a movable rod of said actuator, said reaction link being pivotally connected to a mid-portion of said reversing lever.

4,873,884

APPARATUS FOR SUPPORTING SHIFT LEVER FOR TRANSMISSION

Ichiji Yamada, Toyota; Yutake Inuzuka, Nishio; Isao Ichihara; Michiyuki Murakami, both of Toyoake; George Suzuki, Chiryu; Ryon Yanahashi, Aichi, and Takeshi Kondo, Nagoya, all of Japan, assignors to Toyota Jidosha Kabushi Kaisha and Tsuda Industries, Co., Ltd., both of Aichi, Japan

Filed Aug. 17, 1988, Ser. No. 233,034

Claims priority, application Japan, Sep. 8, 1987, 62-137099[U]; Sep. 8, 1987, 62-137100[U]; Sep. 21, 1987, 62-144149[U]; Jun. 13, 1988, 63-145062

Int. Cl.⁴ G05G 8/16; F16C 11/06; F16D 11/2

U.S. Cl. 74—473 P

8 Claims



1. A shift lever supporting apparatus for a transmission, comprising:

- a cylindrical shift lever mounting portion for receiving a ball portion of a shift lever;
- a pyramidal retainer portion contiguously provided below said shift lever mounting portion;
- a plate portion contiguously provided below said retainer portion;
- a bearing portion for mounting a select bell-crank, said bearing portion being contiguously provided on said retainer portion and in close proximity to said shift lever mounting portion, said four portions, that is, said mounting portion, said retainer portion, said plate portion and said bearing portion, being formed integral with each other;
- a seat surface for supporting the ball portion of said shift lever, said seat surface being provided inside said shift lever mounting portion;
- a U-shaped notch provided in the side wall of said shift lever mounting portion, said notch allowing insertion of a select lever extending from said ball portion; and
- a cap detachably fitted on said shift lever mounting portion for pressing and retaining said ball portion on said seat surface.

4,873,885

DEVICE FOR THE DISCONNECTABLE COUPLING OF A TOGGLE JOINT TO A TELEMANTIPULATOR SLAVE ARM

Eric Teillauchet, and Angelo Bandiera, both of Vendome, France, assignors to Societe Nouvelle D'Exploitation La Calbene, Velizy-Villacoublay, France

Filed May 10, 1988, Ser. No. 192,198

Claims priority, application France, May 20, 1987, 87 07068

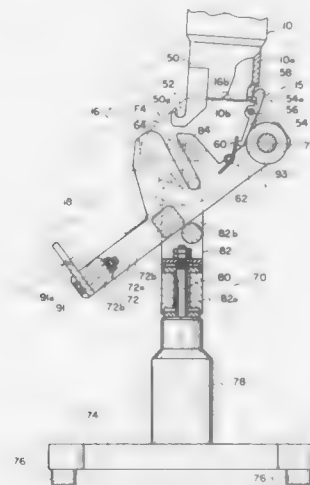
Int. Cl.⁴ B25J 3/00; G05G 1/04

U.S. Cl. 74—520

6 Claims

1. Device for the disconnectable coupling of a toggle joint (16) to a telemanipulator slave arm (10, 14), said arm having a shaft (10a) with a longitudinal axis and an open end in which are mounted driving gears (26a, 26b, 26c) whose axis is perpen-

dicular to said longitudinal axis (24), and the toggle joint (16) having a case (16a) supporting driven gears (30a, 30b, 30c) about a transverse axis (28) adjacent to an opening of the case and a gripper support rod (38, 40, 48) having an axis orthogonal to said transverse axis mounted in the case (16a) by a pivot pin (34) parallel to said transverse axis (28), the coupling device (15) connecting the case (16a) to the shaft (10a) in such a way that the opening of the case is adjacent to the open end of the shaft, the pairwise meshed driving and driven gears with their parallel oriented axes are located in a plane containing the longitudinal axis of the arm and the pivot pin of the gripper support rod located on one side of said plane, wherein said device (15) comprises:



at least one spindle (52) fixed to the toggle joint case (16a) in accordance with an axis parallel to the pivot pin (34) of the gripper support rod and located on the same side as said pivot pin with respect to said plane beyond said opening;

at least one rigid hook (50) fixed to the shaft (10a) and projecting beyond its open end so as to partially surround said spindle (52) under the effect of a relative pivoting between the toggle joint (16) and the end of the arm about the axis of the spindle; and

means (54, 58, 60) for locking the case (16a) to the end of the shaft (10a) located on the opposite side with respect to said plane.

4,873,886

ARMREST FOR BICYCLE HANDLEBAR

Rolf Renner, P. O. Box 1819, Healdsburg, Calif. 95448

Filed Jan. 26, 1988, Ser. No. 148,670

Int. Cl.⁴ B62K 21/12

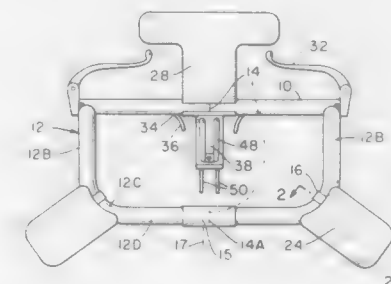
U.S. Cl. 74—551.8

2 Claims

1. A handlebar for mounting to a bicycle having a handlebar stem, said handlebar comprising:

- a bent tubing portion forming a U-shape and terminating in two ends, said bent tubing portion including a pair of curved sections adjacent a central section, said central section conditioned for attachment to said bicycle handlebar stem;
- a straight tubing portion connecting said bent tubing portion ends; and
- a pair of armrest portions connected to said bent tubing portion curved sections wherein said armrest portions each comprise a generally rectangular armrest bearing a concave side for placement against said curved section, and a central hole, and further comprising a tubular hand-

grip for insertion into said central hole, said handgrip including clamping means for attachment to said bent



tubing portion curved sections, and further including a flange portion for capture of said armrest.

4,873,887

TORSION-VIBRATION DAMPER

Rainer Andra, Limburg; Klaus Kurr, Weinheim-Hohensachsen; Gunter Ullrich, Hemsbach, and Udo Dorge, Laudenbach, all of Fed. Rep. of Germany, assignors to Firma Carl Freudenberg, Weinheim/Bergstrasse, Fed. Rep. of Germany

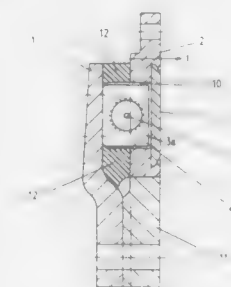
Filed Nov. 5, 1987, Ser. No. 117,792

Claims priority, application Fed. Rep. of Germany, Nov. 15, 1986, 3639190

Int. Cl.⁴ F16F 15/10

U.S. Cl. 74—573 F

10 Claims



1. A torsion-vibration damper for isolating small amplitude torsional vibrations and damping large amplitude torsional vibrations comprising:

- first and second rings having walls rotatable relative to each other about an axis of rotation;
- at least one liquid-filled chamber spaced from the axis of rotation, said chamber being circumferentially bounded by a wall of said first ring;
- said second ring including a partition dividing said at least one liquid-filled chamber into subchambers;
- at least one passage connecting said subchambers permitting flow therebetween for damping large amplitude torsional vibrations; and
- a resilient wall part forming at least part of the boundary of said subchambers, said resilient wall part isolating small amplitude torsional vibrations.

4,873,888

VISCOSITY DAMPER

Jiro Matsuyama, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

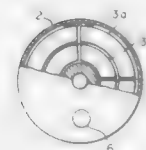
Filed Mar. 30, 1988, Ser. No. 175,223

Claims priority, application Japan, May 26, 1987, 62-130214

Int. Cl.⁴ F16F 15/16

U.S. Cl. 74-574

3 Claims



1. A viscosity damper which comprises:
 - a damper casing attached to a motor shaft to be driven therewith;
 - a viscous fluid filled in said damper casing and at least two inertia bodies each being surrounded by said viscous fluid so as not to be restricted from moving by said casing and so as to be movable independent of said casing and having different diameters and which are arranged in a co-axial relation with a space formed between said inertia bodies in the radial direction in said damper casing.
2. A viscosity damper which comprises:
 - a damper casing attached to a motor shaft to be driven therewith;
 - a viscous fluid filled in said damper casing; and
 - at least two inertia body arrangements each being surrounded by said viscous fluid so as not to be restricted from moving by said casing and so as to be movable independent of said casing and having different arc radius which are arranged in a co-axial relation with a space formed between said inertia body arrangements in the radial direction in said damper casing wherein each said inertia body arrangement is split in the circumferential direction into a plurality of pieces.

4,873,889

TIE BAR WITH INTERNAL LUBRICATION

Richard J. Dittlinger, South Bend, Ind., assignor to Allied-Signal Inc., Morristown, N.J.

Continuation of Ser. No. 645,210, Aug. 29, 1984, abandoned.

This application Dec. 3, 1985, Ser. No. 804,231

Int. Cl.⁴ G05G 1/00

U.S. Cl. 74-579 R

12 Claims

1. A connecting attachment of joining flexing structures subjected to high tensile stress, a tension-torsion tie-bar comprising:
 - a pair of spaced-apart bushings having spaced radially extending flanges;
 - a plurality of dry wrapped superimposed bands each including individual wires disposed in parallel arrangement and closely adjacent to one another and to the wires of adjacent superimposed bands, said wires each having a dry film lubricant thereon so that said wires may move freely relative to one another;
 - the bushings and plurality of superimposed bands comprising a solid link having semicircular ends with said bands extending as a pair of parallel, spaced-apart side portions, the bushings and spaced-apart side portions defining an

area therebetween, the side portions and bands about the bushings having a substantially constant cross section of uniform thickness, and

a non-carcinogenic adhesive composition disposed continuously between the spaced-apart side portions and bushings and about the perimeters of said spaced-apart side portions to encapsulate the side portions, the adhesive composition extending to the perimeters and not between the adjacent



wires and superimposed bands so that the wires and bands form said constant cross section free of a composition matrix therebetween and the free movement of the wires relative to one another may occur without restraint from said composition, the composition filling completely said area between said side portions and bushings and maintaining the bushings in spaced-apart relationship, to provide a torsionally resilient tie-bar.

4,873,890

PEDAL FOR A BICYCLE

Masashi Nagano, Izumi, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

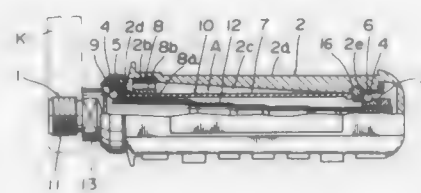
Filed Sep. 12, 1988, Ser. No. 242,815

Claims priority, application Japan, Sep. 14, 1987, 62-140644[U]

Int. Cl.⁴ G05G 1/14

U.S. Cl. 74-594.4

4 Claims



1. A pedal for a bicycle, said pedal comprising:
 - a shaft unit comprising a pedal shaft and a cylindrical rotary member rotatably supported to said pedal shaft;
 - a pedal body having at its outer surface a foot bearing surface and at its center portion a receiving bore in which said shaft unit is inserted;
 - support means for supporting said shaft unit inserted into said receiving bore of said pedal body at an axial outside portion of said pedal shaft to enable a portion of said pedal body disposed axially inward of said axial outside portion of said pedal shaft to be displaceable radially of said pedal shaft more than a portion of said pedal body located at said axial outside portion of said pedal shaft; and
 - an elastic member disposed at an axial inside portion of said pedal shaft within said receiving bore of said pedal body and comprising means for elastically supporting said pedal body relative to said shaft unit.

4,873,891

APPARATUS FOR IMPROVING EFFICIENCY AND CONSISTENCY OF A DRAG RACE CAR

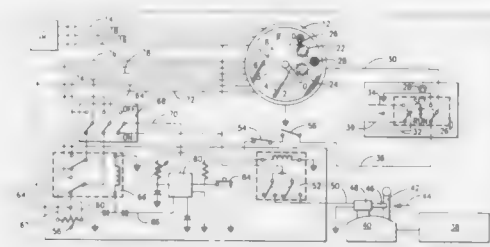
Gary Guanciale, 500 Eagle La. #4, Camillus, N.Y. 13031

Filed Dec. 19, 1988, Ser. No. 286,090

Int. Cl.⁴ B60K 20/02

U.S. Cl. 74-625

12 Claims



1. In a drag racing car having an engine, an electrical power source, means for generating electrical signals commensurate with the rotational speed (RPM) of said engine, a tachometer providing a visual indication of said RPM, an automatic transmission having a neutral position and a plurality of forward gears, and a manually operable shifting lever movable to place said transmission in successively higher gears, the combination therewith of automatic shifting means for sequentially changing to a successively higher gear in response to said engine speed increasing to a selectively adjustable, predetermined RPM level from a lower RPM level, said automatic shifting means comprising:
 - (a) solenoid means including an armature movable in response to actuation of said solenoid;
 - (b) means coupling said armature to said shifting lever for movement of said shifting lever to change to a successively higher gear in response to movement of said armature;
 - (c) means limiting movement of said shifting lever to change by a single gear increment upon each actuation of said solenoid;
 - (d) relay means having contacts movable upon energization of said relay means to actuate said solenoid;
 - (e) means for actuating said relay means in response to said engine rpm reaching said predetermined level; and
 - (f) manually adjustable means for selectively adjusting the value of said predetermined RPM level.

4,873,892

POWER TRANSFER DEVICE

Masahiro Ohkubo, Osaka, Japan, assignor to Kabushiki Kaisha Daikin Seisakusho, Neyagawa, Japan

Continuation of Ser. No. 724,575, Apr. 18, 1985, abandoned.

This application Aug. 18, 1987, Ser. No. 88,494

Claims priority, application Japan, Apr. 18, 1984, 59-77677; Apr. 18, 1984, 59-77678

Int. Cl.⁴ F16H 1/44

U.S. Cl. 74-710.5

3 Claims

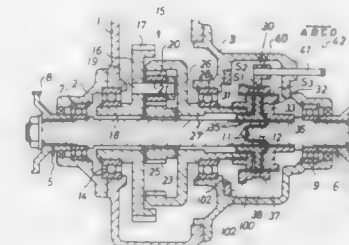
1. A power transfer device for a vehicle comprising:
 - a power input part;
 - an intermediate gear mechanism including three members, an intermediate input gear supported by said power input part in a driving relation;
 - an intermediate output gear meshing with said intermediate input gear and
 - a first gear (23) meshing with said intermediate input gear (20);
 - a first shaft being in meshing engagement and fixedly connected to said first gear of said intermediate gear mechanism;
 - a second shaft coaxially and rotatably journaled to said first shaft, forming a joint portion;

a stationary member mounted on a stationary portion of the vehicle;

a dog clutch mechanism housed at said joint portion of said first shaft and said second shaft and having a lock gear mechanism for selectively controlling the connection of said intermediate output gear with said first shaft, said second shaft and said stationary member; and

a control mechanism connected to said dog clutch mechanism, wherein, said dog clutch mechanism comprises:

an input part which is mounted at a peripheral portion of said first shaft and is connected to said intermediate output



- a second output part which is in meshing engagement and fixedly connected to said second shaft;
- a first auxiliary output part which is in meshing engagement and fixedly connected to said first shaft and is housed between said input part and said second output part;
- said dog clutch mechanism is selectively connectable to said stationary member, said input part, said second output part and said first auxiliary output part and includes said lock gear mechanism which can be actuated by said control mechanism for selectively connecting said lock gear mechanism with said stationary member, said input part, said second output part and said first auxiliary output part.

4,873,893

INFINITELY VARIABLE POSITIVE MECHANICAL TRANSMISSIONS

John H. Blakemore, 11213 S. Taylor St., Oak Park, Ill. 60304

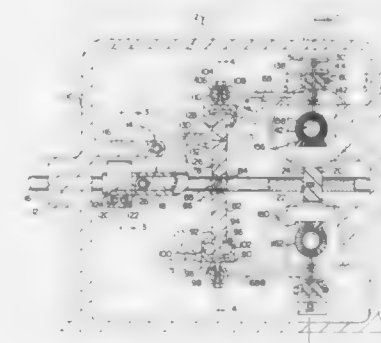
Division of Ser. No. 609,235, May 11, 1984, Pat. No. 4,763,544.

This application May 2, 1988, Ser. No. 189,035

Int. Cl.⁴ F16H 37/06, 3/74

U.S. Cl. 74-752 B

7 Claims



1. A transmission comprising, in combination: an input shaft, an output shaft, means including a housing for mounting the input and output shafts on a common axis with each of said

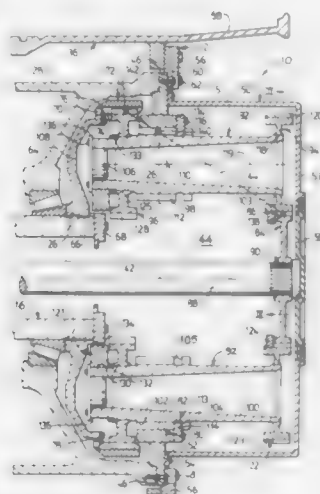
shafts rotatable with respect to each other and with respect to the housing, a wobble plate with an opening at its center disposed about the input shaft, means operatively associated with the input shaft to wobble the wobble plate about a fixed position on the input shaft in unison with rotation of the input shaft, a first helical gear having a central axis, said first helical gear being mounted on the output shaft with its central axis coaxial with the output shaft for rotation with the output shaft, a third shaft mounted on the housing, said third shaft having a central axis disposed normal to the central axis of the first helical gear, a second helical gear journaled on said third shaft and meshed with the first helical gear, the second helical gear being rotatable with respect to both the housing and the third shaft, a second plate pivotally mounted on the third shaft and extending outwardly from the first helical gear, a connecting rod disposed in a plane traversing the input and output shafts, said plane being perpendicular to the axis of the third shaft, the connecting rod being pivotally mounted at one end on the second plate, the other end of said rod being coupled to the periphery of the wobble plate, and a one-way clutch mounted between the second plate and the second helical gear, said one-way clutch comprising a second rod mounted on the second plate outwardly of the second helical gear, the axis of the second rod being parallel to the axis of the third shaft, a casing mounted on the second rod and secured thereto, a pin mounted on the casing normal to the second rod and spaced from the second rod, said pin being disposed in the plane normal to the third shaft and centrally traversing the second helical gear, a third helical gear journaled on the pin and engaging the periphery of the second helical gear, and a pivot mechanism coupled to the casing to pivot the casing on the second rod.

4,873,894

BALANCED FREE-PLANET DRIVE MECHANISM
Bennett W. Avery, Princeville, and William K. Engel, Peoria, Ill., both of Ill., assignors to Caterpillar Inc., Peoria, Ill.
Filed Oct. 31, 1988, Ser. No. 264,583
Int. Cl.⁴ F16H 1/36, 1/28

U.S. Cl. 74—785

29 Claims



1. A balanced free-planet drive mechanism comprising:
a hollow support assembly;
a ground-engaging wheel rotatably mounted on the support assembly along a central axis;
a reaction ring gear connected to the support assembly;
an output ring gear connected to the wheel;
an input sun gear arranged along the axis;
a plurality of floating planet elements individually including an axially outer gear intermeshed with the sun gear, an axially inner gear intermeshed with the reaction ring gear,

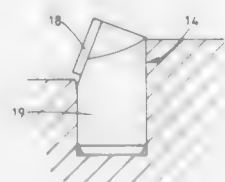
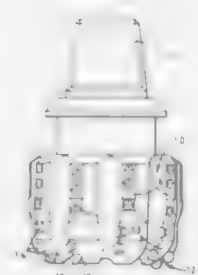
and an axially intermediate gear intermeshed with the output ring gear; and
rolling ring means for limiting radial inward movement of the planet elements, the rolling ring means being substantially concentrically disposed on the central axis.

4,873,895

MANUFACTURE OF ROTARY DRILL BITS
Malcolm R. Taylor, Gloucester; John D. Barr, Cheltenham, and John R. Smart, Gloucester, all of England, assignors to Reed Tool Company Limited, Gloucestershire, England
Filed Oct. 31, 1988, Ser. No. 265,237
Claims priority, application United Kingdom, Nov. 3, 1987, 8723470

Int. Cl.⁴ B21K 5/02; E21B 10/46
U.S. Cl. 76—108 A

15 Claims



1. A method of manufacturing a rotary drill bit of the kind comprising a bit body having a shank for connection to a drill string, a bit face on the bit body, a plurality of cutting structures mounted in sockets in the bit body and projecting from the face of the bit, and a number of openings in the face of the bit communicating with a passage in the bit body for supplying drilling fluid to the face of the bit, the method including the steps of dimensioning each cutting structure and the socket within which it is to be received to provide a clearance between the cutting structure and the socket, inserting the cutting structure in the socket, filling said clearance with a settable liquid, and then solidifying said liquid, the settable liquid solidifying at a temperature less than 400° C. and retaining its integrity, after solidification, at least up to a temperature of 180° C.

4,873,896

LIFT-TAB CONTAINER OPENER
Alan Hull, 100 Melrose East, Apt. 505, Seattle, Wash. 98102
Filed Dec. 12, 1988, Ser. No. 283,074
Int. Cl.⁴ B67B 7/40

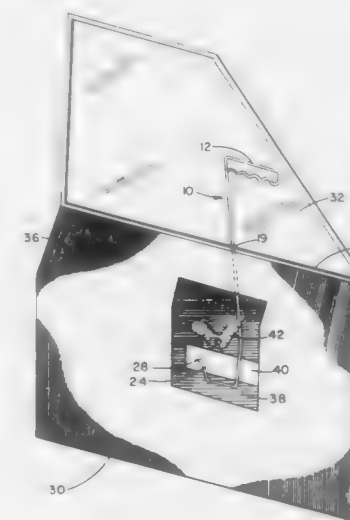
U.S. Cl. 81—3.27

3 Claims

1. An opener for lift tab containers, said containers having a first longitudinal axis, a top and a tab attached to said top, said opener being attachable to a support surface and comprising:
a base attached to said support surface and having a flange extending generally horizontally from said support surface,
lift tab engaging means,
hinge means for attaching said tab engaging means to said

flange, said tab engaging means being attached to said flange by said hinge means, said hinge means limiting upward motion of said tab engaging means to a generally horizontal position and allowing free downward motion, spring means incorporated in said hinge means to urge said tab engaging means to said generally horizontal position, said lift tab engaging means comprising:
a base portion having a second longitudinal axis, an upper surface,
a lower surface, first and second edges and a first end, first and second flanges extending from said first and second edges perpendicular to said upper surface,
said first flange having a first top edge and said second flange having a second top edge,
first and second tabs extending from said first and second top

mately 0.250 inches away from said axis formed by said second section at substantially a 65 degree angle;
(e) a fifth section following said fourth section forming a 115 degree angle with a radius of approximately 0.250 inches, said fifth section being substantially perpendicularly in relation to said axis formed by said second section;
(f) a tip tapered at approximately 15 degree angle following said fifth section;



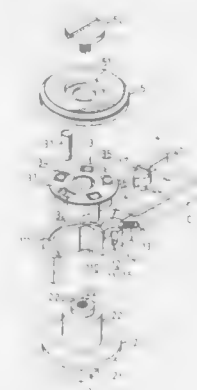
- (g) a ring placed on said elongated first section 6.25 inches above beginning of said second section;
(h) said elongated first section is at least 6.25 inches long;
(i) said second section is substantially 3.750 inches long;
(j) said third section is approximately 2.625 inches long;
(k) said fourth section is substantially 2.125 inches long; and
(l) said fifth section and said tip are approximately 0.375 inches long.

4,873,898

RATCHETLESS REVERSIBLE WRENCH
Shyh Chern, No. 111, Lane 41, Sec. 1, Hsingien Rd., Tali Hsiang, Taichung Hsien, Taiwan
Filed Jan. 23, 1989, Ser. No. 299,777
Int. Cl.⁴ B25B 13/46

U.S. Cl. 81—59.1

1 Claim



4,873,897
DEVICE FOR UNLOCKING CAR DOORS
Sam Williams, 1843 Winchester, Memphis, Tenn. 38116
Filed Nov. 14, 1988, Ser. No. 270,238
Int. Cl.⁴ E05B 19/20

U.S. Cl. 81—15.9

1 Claim

1. A convenient device for unlocking car doors having vertical sliding locks with certain anti-theft mechanisms comprising:

- (a) an elongated first section following a handle section;
(b) a second section following said elongated first section forming an obtuse angle of substantially 165 degrees with a radius of approximately 0.250 inches, said second section defining a base axis;
(c) a third section following said second section forming approximately a 90 degree angle with a radius of substantially 0.125 inches;
(d) a fourth section following said third section forming substantially a 115 degree angle with a radius of approxi-

1. A ratchetless reversible wrench with a handle portion (8) and a head portion (1) at one end thereof, said head portion (1) comprising the combination of:

- (a) a substantially circular post compartment (11); said post compartment (11) having a plurality of concave receptacles (110) evenly spaced therearound; said post compart-

- ment (11) having an annular recess (111) at an upper end thereof;
- (b) a driving head piece (2) including an annular slip plate (21), a driving head block (23), and a cylindrical block (22); an upper surface of said slip plate (21) slidably contacting a lower surface of said post compartment (11); said cylindrical block (22) having a circular protrusion (220) at an upper end thereof;
- (c) a circular post plate (3) including a plurality of gaps (32) evenly spaced therearound; each gap (32) having a slanted retainer plate (33) respectively set at each end thereof to retain a respective engagement post (31) in each gap (32) therein; a center hole (34) being set on said post plate (3) for tightly engaging with said circular protrusion (220);
- (d) a circular tab (5) for covering said post plate (3); said tab (5) having a counterbore (51) thereon with a hole in the center thereof for receiving a screw (52); said screw (52) being threadably securable with threads (221) of said cylindrical block (22);
- (e) a first bore (16) which is positioned proximate to a rear end of said post compartment (11); said first bore (16) having a central second bore (12) and a third bore (13) which extends angularly towards said handle portion (0);
- (f) a lever switch (4); said lever switch (4) having an arm (43), a circular portion (17), and a pivot post (44) thereon; said lever switch (4) being rotatable in said second bore (12) and having a vertically extending protuberance (41) on a front end thereof which is engageable with a notch (35) on said post plate (3);
- said arm (43) being rotatable about said pivot post (44) so that said protuberance (41) engages with a notch (35) on said post plate (3) to urge said post plate (3) and engagement posts (31) to rotate and wedge between a wall of said post compartment (11) and said cylindrical block (22) so as to frictionally urge said cylindrical block (22) and a driving head block (23) to rotate.

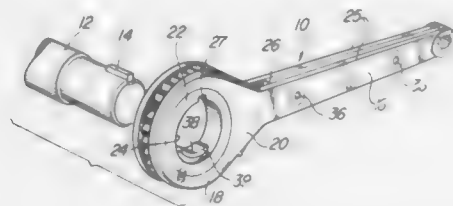
4,873,899

ADJUSTABLE RATCHET WRENCH FOR KEYED SHAFTS

Tadenz L. Mazurek, 2241 Bernard, Hamtramck, Mich. 48212
Filed Dec. 18, 1987, Ser. No. 134,882Int. Cl.⁴ B25B 13/46, 13/16, 13/58

U.S. Cl. 81-63

13 Claims



1. A ratchet wrench (10) for turning a shaft (12) having a key (14), comprising:
- an elongated handle (16);
 - a head (18) connected to one end (20) of the handle;
 - a socket element (22) disposed within said head and having a substantially cylindrical inner diameter (24) extending along an axis (X) perpendicular to the handle, said socket element having a key receiving slot (27) extending outwardly from the inner diameter and in the same direction as said axis, said socket element further having an arcuate slot (42) therein;
 - ratchet means (28) operatively associated with said head and said socket element for selectively locking the socket element against rotation about the axis in one direction while permitting rotation in an opposite direction;
 - a crescent block (38) having an arcuate face (40) and an outer surface (41) shaped to be received by the arcuate

slot (42) of the socket element, said arcuate face being eccentric relative to the outer surface and intersecting the outer surface (41) at two spaced ends of the crescent block, said crescent block being received within the inner diameter of the socket element diametrically opposite the key receiving slot with the ends being substantially equidistant from the key receiving slot, said crescent block being adjustable within the inner diameter of the socket element to receive and retain a shaft within the inner diameter of the socket element; and

an adjustment screw (45) connected to the socket element and said crescent block to adjust said crescent block within the socket element.

4,873,900

SCREW DRIVING DEVICE

Massimo Ciunaga, 1639 Bissonnet, Houston, Tex. 77005

Filed Dec. 8, 1986, Ser. No. 944,470

Int. Cl.⁴ B25B 15/02

U.S. Cl. 81-436

2 Claims



1. A screw driving device comprising:
- a shank;
 - a bit of rectangular cross-section formed at an end of the shank, two opposing surfaces of said bit being parallel to one another, parallel to the longitudinal axis of the shank and, when inserted into a screw slot, parallel to the longitudinal axis of the screw slot;
 - a flat surface on an end of said bit, wherein said flat surface is perpendicular to the longitudinal axis of said shank;
 - a means for applying torque to said shank; and
 - a blade of rectangular cross-section formed onto the end of said shank, upon which said bit is formed, wherein said blade tapers outwardly on all sides from said shank to a dimension greater than the diameter of said shank and wherein said blade thence tapers inwardly on all sides to the point where said bit is formed, the bit having a cross-sectional area not greater than the cross-sectional area of the blade at the point at which the blade meets the bit.

4,873,901

APPARATUS FOR CUTTING AND STRIPPING INSULATION FROM WIRE SEGMENTS HAVING DIFFERENT GAUGE CONDUCTORS

Herbert M. Stoehr, New Berlin, Wis., assignor to Artos Engineering Company, New Berlin, Wis.

Filed Sep. 16, 1988, Ser. No. 245,359

Int. Cl.⁴ H02G 1/12

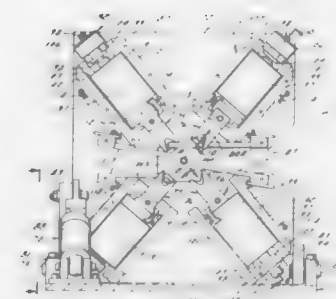
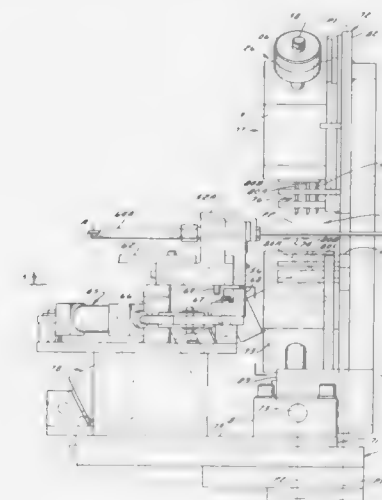
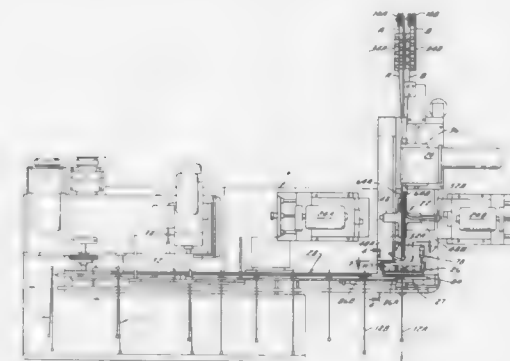
U.S. Cl. 81-9.51

13 Claims

1. An apparatus for cutting a portion of insulation adjacent the ends of wire segments having different gauge conductors for the purpose of stripping said cut portion from said conductor comprising:
- a main frame;

a workstation on said frame presenting a processing point at which said wire segment will be momentarily positioned for cutting said insulation as said segment follows a path of travel during processing;

a plurality of sets of cutting knives, each of said sets of knives having a cutting edge profile sized to cut the insulation on a specific gauge of conductor; and



means for reciprocally mounting each of said sets of cutting knives on said main frame to extend radially away from opposite sides of said processing point to circumferentially space all of said sets around said processing point and for causing reciprocal movement of said knives in each set toward said processing point to a closed cutting position and away from said processing point to an open position to enable selective energization of a set of knives properly sized to fit the gauge of the wire segment conductor then at said process point.

4,873,902

RAILROAD RAIL COLD SAW

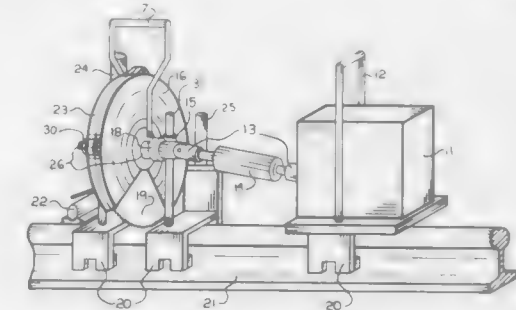
Adrian H. Krieg, 119 Maplevale Dr., Woodbridge, Conn. 06525
Continuation of Ser. No. 851,128, Apr. 11, 1986, abandoned.

This application Apr. 7, 1988, Ser. No. 180,671

Int. Cl.⁴ B27B 5/18; B23Q 3/08; B23D 47/08

U.S. Cl. 83-745

8 Claims



1. A railroad rail cold sawing device for securement about a railroad rail having a central web and flanges connected to opposite ends of the web, said device comprising:
- a circular sawing section having a cold circular saw blade positioned above said rail;
 - a motor drive section;
 - first clamping means for removably clamping said sawing section to said central web of said railroad rail, regardless of any curvature in the central web;
 - second clamping means for removably clamping said drive section to said central web adjacent to said circular sawing section, regardless of any curvature in the central web; and
 - connection means removably connecting said drive section and said sawing section for causing rotation of said cold circular saw blade, said connection means including at least one joint means for permitting relative movement of said circular sawing section with respect to said drive section in at least a plane parallel to said web.

4,873,903

SAW CHAIN WITH WEAR LINK

Michael D. Harfst, Milwaukie, Oreg., assignor to Blount, Inc., Montgomery, Ala.

Filed Jul. 7, 1988, Ser. No. 216,191

Int. Cl.⁴ B27B 33/14

U.S. Cl. 83-830

11 Claims



1. In a saw chain having drive links and side links formed of steel pivotally interconnected by pin means extending through circular openings in said links, the drive links being constructed to ride in a center groove of a saw bar and the undersides of the side links being constructed to ride along the outer surfaces of a pair of parallel rails defining the groove, each side link receiving a pair of said pin means, the improvement comprising a plurality of wear links mounted one adjacent each of said side links and slidably engaging said rails, each of said wear links having a pair of openings receiving said pair of pin means connecting the adjacent side link in the chain, said wear links being formed of a material having greater resistance to abrasion than said steel.

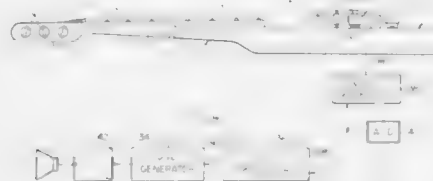
4,873,904

ELECTRONIC MUSICAL INSTRUMENT HAVING PLAYING AND PARAMETER ADJUSTMENT MODES
Takashi Norimatsu, Shizuoka, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan

Filed Apr. 21, 1988, Ser. No. 184,602
Claims priority, application Japan, Apr. 22, 1987, 62-100772; Apr. 22, 1987, 62-100773; Apr. 22, 1987, 62-100774
Int. Cl.⁴ G10H 1/18, 3/18

U.S. Cl. 84—722

4 Claims



3. An electronic musical instrument having a parameter adjustment mode and a playing mode of operation, comprising
- a plurality of fret members located at predetermined spacings;
 - a string stretched over said fret members so that a player's depression of the string causes contact between the string and at least one of said fret members;
 - vibration generating means for producing supersonic vibrations in said string;
 - a fret-position detecting means responsive to the supersonic vibrations transmitted from said means for detecting the fret member contacted by said string;
 - string displacement detecting means for detecting an amount of lateral displacement of said string on any of said fret members and producing data representative of the detected amount of lateral displacement of said string;
 - memory means for storing said data representative of the amount of lateral displacement detected with said string maintained in a non-bent state; and
 - means for comparing the amount of lateral displacement of said string from the data produced by said string displacement detecting means during said playing operation with the data stored in said stored means for thereby producing bent-string data representative of a corrected amount of lateral displacement of said string.

4,873,905

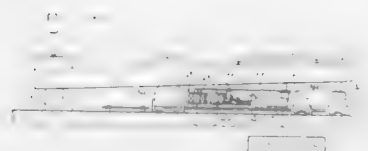
AUTOMATIC PLAYER PIANO

Kazuo Murakami, Yasutoshi Kaneko, and Takasi Tamaki, all of Shizuoka, Japan, assignors to Yamaha Corporation, Hamamatsu, Japan

Filed May 17, 1988, Ser. No. 194,872
Claims priority, application Japan, May 18, 1987, 62-74670(U); Aug. 26, 1987, 62-129333(U)
Int. Cl.⁴ G10F 1/02; G10C 3/20

U.S. Cl. 84—20

6 Claims



1. An automatic player piano comprising
- a keyboard provided with a plurality of keys each having

a front end portion, an intermediate portion and a rear end portion, said front end portion being pressed by a player for requesting a sound;

- key supporting means each provided on a key bed and having a front rail capable of engagement with said front end portion, a back rail capable of engagement with said rear end portion and a balance rail provided between the front rail and the back rail and rockably supporting said intermediate portion;
- a sound producing mechanism associated with said keys and operative to produce a sound;
- a plurality of key action mechanisms each engageable with the rear end portion of each key and operative to transfer a motion of the key to said sound producing mechanism; and
- a plurality of key actuator units each provided between said front and balance rails of said key supporting means and operative to pull down each of said keys for requesting a sound upon activation thereof, in which each of said key actuator units comprises a solenoid-operated key actuator movable up and down and means for connecting said key actuator to a lower side of each of said keys so that the key is pulled down when the key actuator is energized, wherein each of said key actuator units comprises an elongated plate member rockably supported by a bracket, a hook member fixed to each key and capable of being brought into engagement with one end of the elongated plate member, and the solenoid-operated key actuator operative to drive the other end of the elongated plate member for pulling down the hook member.

4,873,906

ADJUSTABLE STRINGPLATE MOUNTING MEANS FOR A GRAND PIANO

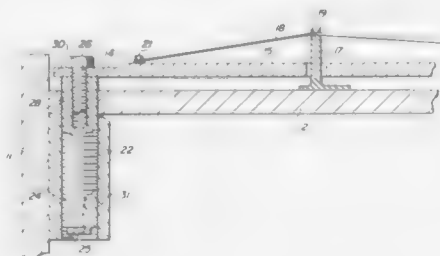
Lewis F. Herwig, 4417 E. Hearn Rd., Phoenix, Ariz. 85032

Filed Feb. 21, 1989, Ser. No. 313,046

Int. Cl.⁴ G10C 3/04

U.S. Cl. 84—184

6 Claims



1. In a musical instrument having a sound board affixed to a frame with an apertured stringplate mounted thereover, the improvement which comprises:

- elongate threaded means for movably engaging the frame and having first and second ends, the first end of said elongate threaded means extending through the soundboard for placement of the stringplate thereon;
- receiving means contained in the first end of said elongate means and aligned with an aperture in the stringplate, and
- fastening means extending through the aperture in said stringplate into said receiving means for urging said stringplate thereagainst, the rotation of said elongate means providing adjustment of the spacing between the stringplate and the soundingboard.

4,873,907

COMPOSITE-MATERIALS ACOUSTIC STRINGED MUSICAL INSTRUMENT

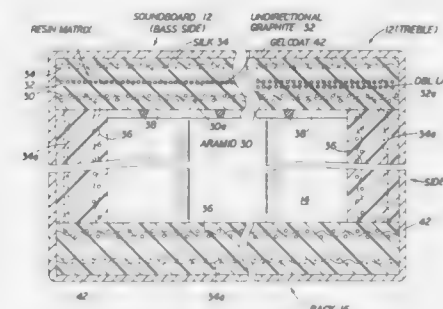
John A. Decker, Jr.; Linda M. Decker, both of Wailuku, and Christopher J. Halford, Makawao, all of Hi., assignors to Kuan Technology, Ltd., Wailuku, Hi.

Filed Jul. 31, 1987, Ser. No. 80,312

Int. Cl.⁴ G10D 3/02

U.S. Cl. 84—291

12 Claims



1. A soundboard for an acoustic stringed instrument, comprising
- a composite-materials plate having a predetermined area density matching that of corresponding wooden soundboards for the same type of stringed instrument while having a predetermined bulk density (unmatched to and substantially exceeding the bulk density of such wooden soundboards).

4,873,908

COLLAPSIBLE ELECTRIC GUITAR

James G. Moore, 904 Nickolaus Pl., Woodstock, Ga. 30188

Filed Aug. 3, 1988, Ser. No. 227,143

Int. Cl.⁴ G10D 3/00

U.S. Cl. 84—291

16 Claims



1. A collapsible guitar, comprising:
- a main body having a neck portion;
 - a central body;
 - means for rotatably attaching said central body to said main body so that said central body and said main body are foldable together;
 - an outer body having an upper body and a rear body; means

for connecting said upper body to said rear body so that said upper body can be rotated into generally longitudinal alignment with said rear body; and means for detachably connecting said outer body to said main body.

4,873,909

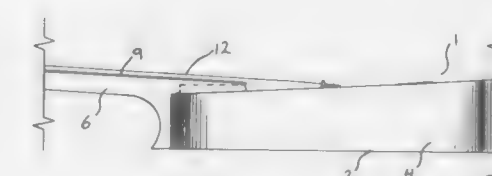
STRINGED MUSICAL INSTRUMENT

Thomas Humphrey, 124 W. 72 St., New York, N.Y. 10023
Continuation of Ser. No. 913,690, Sep. 30, 1986, abandoned. This application Dec. 8, 1987, Ser. No. 220,485

Int. Cl.⁴ G10D 1/08

U.S. Cl. 84—293

11 Claims



1. A guitar comprising: a body including a soundboard and a bottom interconnected by a sidewall; an elongated neck having an upper surface, a first end portion that extends on the soundboard and is fixed thereto, and a second free end; a fingerboard fixed to the upper surface of said neck, such that a portion of the fingerboard extends over the soundboard; wherein the upper surface of the neck and the fingerboard, in the portion extending over the soundboard, are elevated a distance above the soundboard, and wherein the neck and soundboard are arranged at an obtuse angle relative to one another so that the elevation of the neck upper surface and fingerboard relative to said soundboard increases in the direction of the free end of the neck; means on the free end of the neck for holding one end of each of a plurality of strings; and means for securing the other end of the strings to the body so that said strings extend along said fingerboard; said means including a bridge having a saddle over which the strings are directed to apply a downward force thereon.

4,873,910

DRUM FOOT PEDAL APPARATUS

Makoto Kurosaki, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan

Filed Mar. 7, 1989, Ser. No. 319,684

Claims priority, application Japan, Mar. 8, 1988, 63-29877

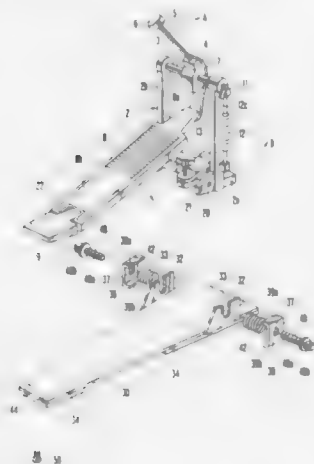
Int. Cl.⁴ G10D 13/02

U.S. Cl. 84—422.1

5 Claims

1. A drum foot pedal apparatus comprising:
- a beater for striking a drum;
 - a frame for pivotally supporting a pivot shaft of said beater at both ends thereof;
 - a foot pedal, a front end of which is connected to said pivot shaft of said beater through a belt and a rear end of which is pivotally connected to a heel; and
 - a flat stabilizing plate disposed under said heel, said foot pedal, and said frame, said frame being provided with screw holes at both side surfaces of a lower end portion of said frame, said stabilizing plate being provided with screw mounting portions having upward open U-shaped grooves respectively corresponding to said screw holes of said frame, said screw mounting portions being located on a frame side;
 - springs
 - fixing metal pieces;
 - fastening bolts; and

means for preventing said frame from being separated from said stabilizing plate,

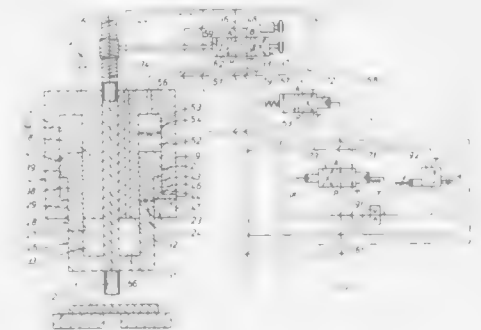
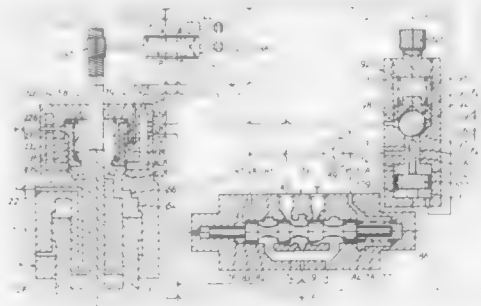


said fastening bolts being threadably engaged with said screw holes of said frame through said U-shaped grooves of said screw mounting portions, said springs, and said fixing metal pieces, respectively.

4,873,912
HYDRAULIC DRIVING ARRANGEMENT
Eckehart Schulze, Weissach, Fed. Rep. of Germany, assignor to Hartmann & Lammle GmbH & Co. KG, Fed. Rep. of Germany

Filed Jun. 9, 1983, Ser. No. 502,552
Claims priority, application Fed. Rep. of Germany, Jun. 9, 1982, 3221758

Int. Cl.⁴ F15B 13/16
U.S. Cl. 91—389 25 Claims

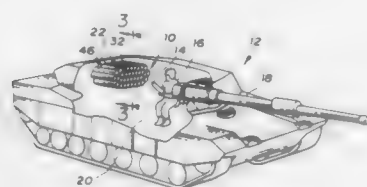


4,873,911
DOUBLE LOOP AMMUNITION MAGAZINE OF COMPACT CONSTRUCTION

Anthony J. Suchocki, Rochester Hills, Mich., assignor to General Dynamics Land Systems, Inc., Warren, Mich.

Filed Nov. 21, 1988, Ser. No. 273,940
Int. Cl.⁴ F41D 10/22

U.S. Cl. 89—34 20 Claims



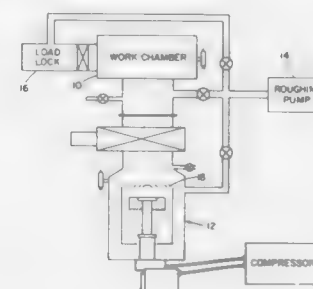
1. An ammunition magazine for storing rounds of ammunition, comprising: an outer storage loop of an endless construction for storing a first set of rounds of ammunition; the outer loop having a pair of turns and a pair of generally straight reaches extending between its turns; an inner storage loop of an endless construction within the outer loop for storing a second set of rounds of ammunition; the inner loop having a pair of turns and a pair of generally straight reaches extending between its turns and respectively nested with the pair of straight reaches of the outer loop; and a separator plate that separates the reaches of the inner loop from each other to permit movement of the loops with the reaches of the inner loop moving in opposite directions to each other.

1. A hydraulic driving arrangement for a machine element processing a workpiece and performing an operating cycle composed of a rapid feed motion directed towards the workpiece, followed by a working stroke effected in the same direction and serving to process the workpiece, and finally an oppositely directed rapid return motion, with a hydraulic cylinder serving as driving element and comprising at least three working services respectively defining each delimiting a face of a first, a second and a third pressure chamber, a rapid feed motion and a rapid return motion of the piston of the hydraulic cylinder for the machine element being controllable by an alternate admission and release of pressure to and from the first and the second pressure chambers of the hydraulic cylinder, while a feeding power can be increased, if necessary to perform the working stroke, by admitting pressure to the third pressure chamber of the hydraulic cylinder delimited by the said third working surface, characterized in that for motion control of the machine element with respect to direction and lift a hydraulic control circuit is provided, the hydraulic control circuit comprising a hydromechanical actual-value feedback device adapted to be supplied with pre-setting signals characteristic of at least end positions of the machine element for pre-setting the desired values, said hydraulic control circuit effecting both an alternative supply of pressure to the first and the second pressure chambers and, if necessary, the supply of pressure to the third pressure chamber; that for changing over the hydraulic cylinder from rapid-feed motion to the working stroke a reversing valve with hydraulic pilot valve is provided which, in a first flow position corresponding to the rapid-feed motions, connects the third pressure chamber of the hydraulic

cylinder with a tank of a pressure supply source, and, in a second flow position connects the same pressure chamber with the a pressure outlet of a final control element of the control circuit; and that, for controlling the reversing valve, a pilot control valve arrangement is provided which responds to a output pressure P_A of the hydraulic control circuit and which moves the reversing valve into a second flow position when said output pressure P_A exceeds a pre-determined threshold P_{s1} , and returns the reversing valve into a first flow position when the output pressure P_A of the control circuit has dropped to a value P_{s2} corresponding maximally to a value P_{s1} . A_1/A_L , wherein: A_1 is a size of a surface of a piston upon which the output pressure P_A of the hydraulic control circuit acts during rapid-feed motion of the hydraulic cylinder and A_L is a size of an overall surface of a piston upon which the controller output pressure P_A acts during the working stroke of the hydraulic cylinder.

4,873,913
DRY ROUGHING PUMP HAVING A GAS FILM BEARING
Gerald R. Pruitt, Mendon, and Peter Bertsch, Harvard, both of Mass., assignors to Helix Technology Corporation, Waltham, Mass.

Filed Sep. 12, 1986, Ser. No. 906,741
Int. Cl.⁴ F01B 31/10, 31/00
U.S. Cl. 92—158 26 Claims



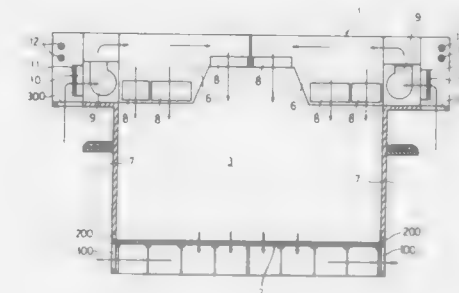
1. A vacuum pump assembly coupled to draw a vacuum and comprising a piston assembly positioned for axial movement within a cylinder with an evacuation space at one end thereof and separated from the cylinder by an oil free clearance seal, a source of pressurized gas; said pressurized gas being applied to the clearance seal to provide an air bearing.

4,873,914
CLEAN ROOM SYSTEM AND UNIT FOR THE SAME
CLEAN ROOM SYSTEM
Shoji Hirayama, Yamato, Japan, assignor to Hirayama Setsubi Kabushiki Kaisha, Japan

Filed Feb. 4, 1988, Ser. No. 152,367
Int. Cl.⁴ F24F 9/00
U.S. Cl. 98—31.6 1 Claim

1. A clean room system comprising:
a plurality of cleaning units each comprising:
a conduit having a substantially inverted L-shaped cross-section defining a hollow ceiling and a hollow wall extending from a rear end of said ceiling to a floor, the hollow wall communicating at an upper end thereof with the hollow ceiling and at a lower end thereof with the floor of the room to create an air flow path for directing air from said hollow wall through said hollow ceiling and into said room and recirculating air from said room through said floor and into said hollow wall; an air purifying filter disposed at a front end of the hollow ceiling to purify air passing between said hollow ceiling and said room;

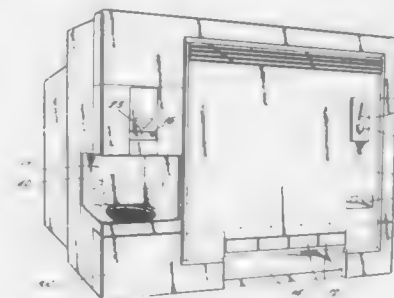
an air fan located in said hollow ceiling upstream of said filter in said air flow path;
an air conditioner control unit located in the rear end of the hollow ceiling adjacent to and upstream of said air fan in said air flow path;
cold water supply and return conduits for providing communication between said air conditioner control unit and a cold water supply source located outside said room, said cold water supply and return conduits having a predetermined length and being located at the rear end of said hollow ceiling upstream of said air conditioner in the air flow path; and
each cleaning unit being connected laterally and longitudinally to an adjacent cleaning unit at ends and sides of



the hollow ceiling and hollow wall of each cleaning unit;
a corresponding plurality of hollow floor systems each connected for communicating with a hollow wall of a corresponding cleaning unit;
opposing wall plates each connected to an endmost cleaning unit and corresponding floor system to define an enclosed room; and
connecting means for connecting the cold water supply and return conduits of one cleaning unit with the corresponding cold water supply and return conduits of an adjacent cleaning unit, the cold water supply and return conduits of one endmost cleaning unit being connected to said cold water supply source.

4,873,915
BEVERAGE PREPARING MACHINES
Alec T. Newman; Andrew C. Bentley; Christine A. King, all of Banbury; Alistair J. MacMahon, Northants; Robert W. Tansley, and Andrew R. Gibbs, both of Warwickshire, all of United Kingdom, assignors to General Foods Limited, Banbury, England

Filed Mar. 15, 1989, Ser. No. 324,150
Claims priority, application United Kingdom, Mar. 21, 1988, 8806470
Int. Cl.⁴ A47J 31/00
U.S. Cl. 99—289 R 16 Claims



1. A machine for preparing a beverage by employing a

package (10;200) containing at least one beverage ingredient comprising a point of entry (16;209) for the package into the machine, a brewing station within the machine at which the package is supplied with an aqueous medium to produce the required beverage, and drive means (24;217, 221, 222) which engage the package at the point of entry and convey the package to the brewing station, characterised in that the drive means includes a coupling between a drive part (24;226) and a part (30;252) associated with the package, the coupling enabling the drive to the package to be engaged and disengaged and allowing the part (30;252) associated with the package to move independently of the drive part (24;226).

4,873,916
METHOD AND DEVICE FOR THE PREPARATION OF COFFEE

Petrus J. C. Picaer, Rotterdam, Netherlands, assignor to De Erven De Weduwe J. Van Nelle B.V., Netherlands

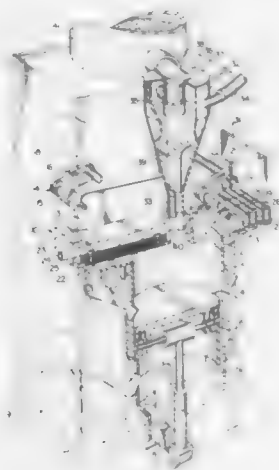
Filed Feb. 12, 1988, Ser. No. 155,554

Claims priority, application Netherlands, Feb. 4, 1987, 8700455; Nov. 26, 1987, 8702837

Int. Cl.⁴ A47J 31/00

U.S. Cl. 99—289 R

22 Claims



1. Device for preparing coffee comprising:

a cylindrical container having an open top and a vertically reciprocable piston forming the underside of the container,

a filter and means for moving the filter between a position closing the open top of said container to allow brewed coffee to be expelled therethrough and a position exposing the container to the introduction of ground coffee and hot water,

and supply means for supplying ground coffee and hot water into the open top of the container in substantial vertical direction only so that hardly any turbulence will occur in the container and the ground coffee will come to float on the hot water, the supply means being equipped to mix coffee and water.

4,873,917
APPARATUS FOR CONTINUOUSLY COOKING RICE BY STEAMING

Tayoshi Sugimura, Tokyo; Kenji Hori, and Kiyoyuki Oba, both of Kobe, all of Japan, assignors to Iseki Food Engineering Kabushiki Kaisha, Tokyo and Kabushiki Kaisha Horiken, Hyogo, both of Japan

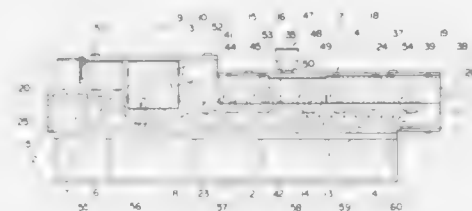
Filed Oct. 18, 1988, Ser. No. 259,195

Claims priority, application Japan, Oct. 19, 1987, 62-263533

Int. Cl.⁴ A47J 37/12

U.S. Cl. 99—355

5 Claims



1. An apparatus for continuously cooking rice by steaming comprising:

a tank for storing rice after being immersed in water;
a first conveyor for conveying rice supplied from said tank;
a primary steaming unit for exposing rice being conveyed on said first conveyor to steam;

a water tank for immersing rice discharged from said first conveyor to water at a high temperature;
conveying means for forwardly conveying rice in said water tank;

a second conveyor for conveying rice discharged from said water tank;

a seasoning liquid feeder provided above an inlet end of said second conveyor for supplying a seasoning liquid such as salt, shoyu, sake, vinegar, edible oil to rice being conveyed;

an ingredient feeder provided above an inlet end of said second conveyor for supplying vegetables, meat, fish and other ingredients to rice being conveyed; and

a secondary steaming unit disposed behind said seasoning liquid feeder and ingredient feeder for exposing rice being conveyed on said second conveyor to steam.

4,873,918
STRAINER POT WITH WHISTLING SPOUT

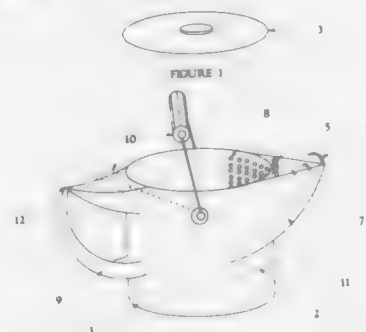
Geri I. Goldman, 340 Wixon Pond Rd., Mahopac, N.Y. 10541

Filed Aug. 22, 1988, Ser. No. 234,515

Int. Cl.⁴ A47J 27/212, 27/21

U.S. Cl. 99—403

7 Claims



1. A utensil facilitating the boiling and straining of food items, which also alerts the user when the water comes to a boil, is manufactured of a heat safe material comprising of:

a cylindrical pot with perforations in an upper area and a plurality of measuring intervals on the inside circumference,

a spout which is attached to said pot over said perforated area,
a spout cover hinged to top of said spout,
a removable pot lid which fits on top of said pot,
a fixed pot handle which is attached vertically and opposite said spout to said pot,
a rotating pot handle which is attached so same pivots about said pot.

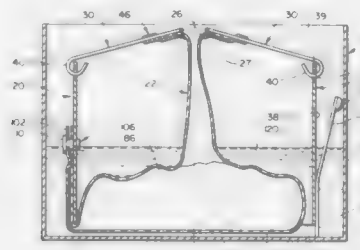
4,873,919
DISPOSABLE BAGS
Alexander P. Janssen, c/o Data Visible, P.O. Box 7767, Charlottesville, Va. 22901

Continuation of Ser. No. 145,516, Jan. 19, 1988, abandoned. This application Apr. 28, 1989, Ser. No. 346,271

Int. Cl.⁴ A47G 27/10

U.S. Cl. 99—403

16 Claims



1. The combination of a cooking utensil accessory and a cooking bag which can be used in association with said accessory and in a cooking vessel to facilitate the cooking of comestibles in said bag, said accessory including: a base which is adapted to be supported in said cooking vessel and a plurality of inwardly extending elements fixed to said base for concomitant pivotable movement relative thereto, there being bag engageable means at the inner ends of said elements to which the bag can be attached at an opening defining edge thereof, whereby said elements can be concomitantly rotated toward each other to constrict the opening during the cooking of the comestibles and away from each other to enlarge the opening and furnish access to the comestibles in the bag, and there being witness marks around the periphery of the bag at the opening defining edge thereof at equal intervals corresponding to those between the bag engageable inner ends of said pivotable, inwardly extending elements to identify locations around said periphery where the bag engageable means of the inwardly extending elements can be so attached to said bag as to provide equal lengths of bag material between each pair of adjacent elements and thereby permit said bag to be fully opened by the concomitant rotation of said inwardly extending elements away from each other.

4,873,920
VACUUM FRYING AND OIL SEPARATING DEVICE
Chen-Shi Yang, No. 2, Lane 1558, Ming-Chueng E. Road, Taipei, Taiwan

Filed Jun. 10, 1988, Ser. No. 205,348

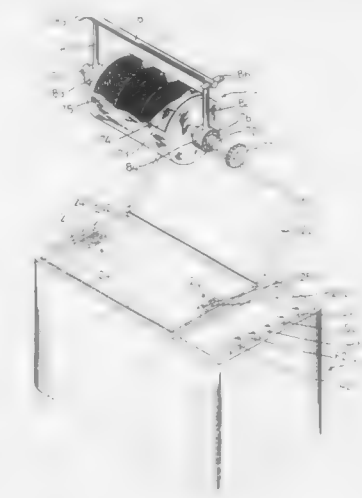
Int. Cl.⁴ A47J 37/12

U.S. Cl. 99—409

4 Claims

1. A vacuum frying and oil separating device comprising:
(a) a vessel-shaped outer case having an inner space defining a frying compartment provided with an opening and a lid for closing off the opening in an airtight manner;
(b) a pair of support projectors disposed on opposite walls of the frying compartment, each projector including a recess formed in a top surface thereof;
(c) a portable container unit disposable within the frying compartment and including a case formed of wire net for containing raw materials to be fried, a port hole in the case, a lid for closing the port hole, a pair of shafts extend-

ing laterally from opposite sides of the case, a handle having spaced connecting means for rotatably suspending the case by the shafts, a pair of support plates extending transversely at opposite ends of the handle for engagement within the recesses of the projectors, and a first gear secured on one shaft;
(d) a driving means including a variable speed reversible motor disposed within the inner space and including a



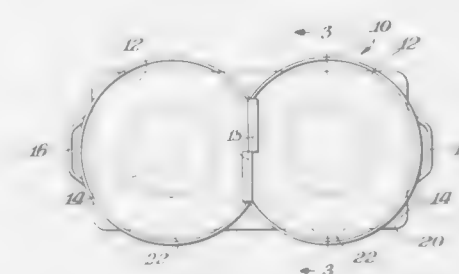
4,873,921
MULTIPLE UNIT WOK APPARATUS
Robert A. Plane, Sr., Wilmington, Del., assignor to Plane Caterers, Inc., Wilmington, Del.

Filed Jul. 14, 1988, Ser. No. 219,557

Int. Cl.⁴ A47J 37/10

U.S. Cl. 99—422

5 Claims



1. Multiple unit wok apparatus comprising at least two similar wok bowls detachably affixed together at an intersecting joint therebetween by interlocking connector clamp means, said intersecting joint being arcuate downwardly when said apparatus is in the cooking position, thereby allowing cooked or partially cooked foods and juices to be shifted easily from one wok bowl to another by the cook, using a spoon, spatula or other appropriate tool, with substantially no spillage.

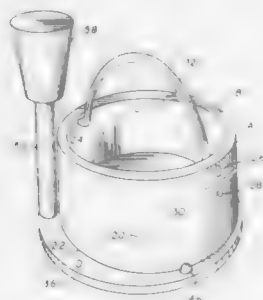
4,873,922

COMBINED EGG POACHER AND SERVING PLATE
Franklyn G. Umboltz, 644 Riverview Rd., Flagler Beach, Fla.
FROM

Filed Sep. 6, 1988, Ser. No. 241,065
Int. Cl.⁴ A47J 43/18

U.S. Cl. 99—426

5 Claims



1. A poaching device comprising a body member defining a poaching chamber and having a smooth undersurface, and a plate member having a smooth upper surface complementing said body member undersurface for supporting said body member and forming a semi-tight seal between said body and plate members, a small flow-controlling orifice extending from the outside and communicating with said chamber spaced from said undersurface wherein said orifice has a diameter of about 0.0625 inch.

4,873,923

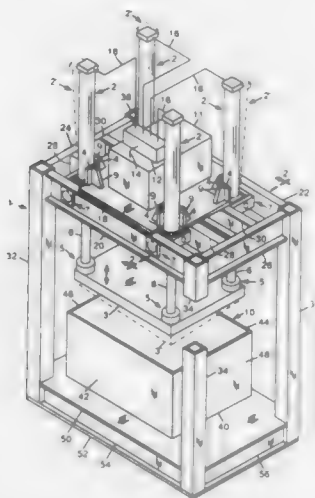
HYDRAULIC PRESS PLATON SUPPORT

Douglas E. Manning, 7300 Rule Rd., Knoxville, Tenn. 37920
Continuation-in-part of Ser. No. 864,294, May 16, 1986,
abandoned. This application Aug. 29, 1988, Ser. No. 239,040

Int. Cl.⁴ B30B 1/08, 1/34

U.S. Cl. 100—258 R

2 Claims



1. In a hydraulic press having a press frame, at least four hydraulic cylinders mounted to said press frame, a cylinder rod in each of said cylinders, a platen supported by said cylinder rods, a hydraulic fluid pumping means, and a hydraulic flow dividing means providing near equal hydraulic flow to activate each of the cylinders, a platen support arrangement comprising:

a swivel joint connection between each of said cylinders and said press frame, said swivel joint connections thus allow-

ing pivotal movements in directions perpendicular to the longitudinal axis of said cylinders;
a swivel joint connection between each of said cylinder rods and said platen, said swivel joint connections thus allowing pivotal movement in directions perpendicular to the longitudinal axis of said cylinders; and
stop means located on said press frame for restraining said hydraulic cylinders, thus limiting swivel movement.

4,873,924

FLAT-BED PRESS AND FLAT-BED PRINTING METHOD
Tsutomu Nonomura, and Hidetoshi Abe, both of Tokyo, Japan,
assignors to Toyo Ink Manufacturing Co., Ltd., Tokyo, Japan
PCT No. PCT/JP87/00879, § 371 Date Jun. 21, 1988, § 102(e)
Date Jun. 21, 1988, PCT Pub. No. WO88/03478, PCT Pub.
Date May 19, 1988

PCT Filed Nov. 11, 1987, Ser. No. 233,656

Claims priority, application Japan, Nov. 12, 1986, 61-267729;
Nov. 20, 1986, 61-275181; Sep. 17, 1987, 62-233193

Int. Cl.⁴ B41F 3/34

U.S. Cl. 101—146

5 Claims



1. A flat-bed press wherein a carriage including an ink roller, a dampening roller and a blanket is moved on a press body frame provided with a plate bed, a paper bed, and a dampening unit and an inking unit which are at both ends of said press body frame, comprising (a) a table on which the materials to be printed are placed, a feed head having one or more suckers for retaining thereon a material to be printed, and a transfer means for moving said feed head and carrying said material to be printed which is held on said suckers to a paper bed, all of which parts are provided in said press body frame, (b) a means for setting the number of materials to be printed, (c) a blanket washing unit provided in said press body frame and adapted to wash said blanket in said carriage after the completion of each color printing of a designated number of materials, (d) an ink washing unit adapted to wash said ink roller in said carriage and said inking unit in said press body frame, and consisting of a washing oil supply unit provided in said carriage, and a scraping doctor provided in said press body frame, (e) an ink supply unit having an ink supply roller consisting of an ink distributing roller member and an ink oscillating roller member, and an ink supply means adapted to be moved reciprocatingly along said ink distributing roller member and provided with a plurality of ink discharge nozzles the number of which is in accordance with that of the colors of the ink in use.

4,873,925

SPRAY NOZZLE AND VALVE ASSEMBLY

Sten Hultberg, Löddeköping, and Birger Hansson, Akarp, both
of Sweden, assignors to Jimek International AB, Malmö,
Sweden

Filed Jan. 19, 1988, Ser. No. 145,327
Int. Cl.⁴ B41F 7/30; B41L 25/06

U.S. Cl. 101—147

14 Claims

1. In a printing apparatus comprising a rotary roll and a spray dampener for spraying liquid onto said roll, said spray dampener comprising a plurality of liquid sprayer assemblies spaced along the length of said roll for directing overlapping sprays toward said roll, each sprayer assembly comprising:
valve means,
nozzle means including a liquid spray outlet at a front end

thereof and a valve seat at a rear end thereof, said nozzle means directed toward said roll, and
means releasably mounting said nozzle means to said valve means;
said valve means comprising:
a valve housing including a throughbore communicating with a liquid inlet,
a solenoid plunger slidably mounted in said throughbore for reciprocable movement therein, and



a valve stem removably mounted at a front end of said plunger and including a front sealing surface arranged to contact said valve seat,
said valve seat, said valve stem, said plunger, and said nozzle means being coaxially arranged,
said valve stem being detachable from said plunger in response to the application of suitable force to a front end of said valve stem,
said throughbore being wide enough to permit forward removal of said valve stem from said plunger when said nozzle means is removed from said valve means.

4,873,926

CLAMPING GRIPPER WITH RESULTANT FORCE THROUGH CONTACT POINT

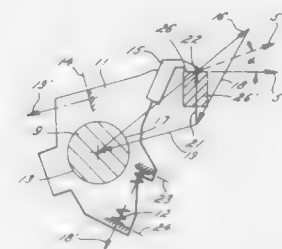
Clans Simeth, Offenbach am Main, and Valentin Gensheimer, Muhlheim am Main, both of Fed. Rep. of Germany, assignors to MAN Poland Druckmaschinen AG, Fed. Rep. of Germany
Filed Sep. 23, 1987, Ser. No. 101,287

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1986, 3632768

Int. Cl.⁴ B41F 21/04, 1/30

U.S. Cl. 101—409

1 Claim



1. A clamping gripper for a sheet-fed rotary press having an

oscillating gripper actuating shaft, said clamping gripper comprising, in combination:

a gripper support;
a main gripper member moveable between a gripping position and a non-gripping position and having a gripper finger urged toward said gripper support at a transfer point and effecting a load force thereon when said main gripper member is in said gripping position;
clamping means for securing said main gripper member to said gripper shaft, said clamping means including a generally radially extending post and a generally radially extending stop lug;
spring means interposed between said main gripper member and said post for exerting a first tangentially extending force;
and adjusting screw means disposed between said main gripper member and said stop lug for effecting a second tangentially extending force when said gripper member is in said non-gripping position;
said first and second tangentially extending forces being disposed so that the resultant of said forces intersects said transfer point when said gripper member is in said non-gripping position;
said load force and said first tangentially extending force being disposed so that this resultant force intersects said transfer point when said gripper member is in said gripping position; and
said main gripper member having a circumferentially closed bore surrounding said gripper actuating shaft with the contact point therebetween disposed substantially along the line of said resultant forces.

4,873,927

PYROTECHNIC FUZE FOR PROJECTILES, ROCKETS, BOMBLETS AND MINES

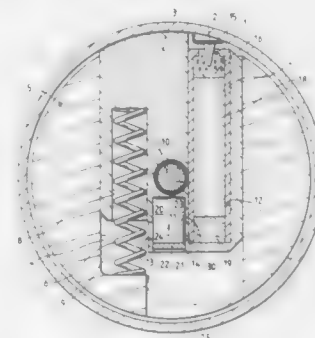
Werner Rudenauer, Roth, Fed. Rep. of Germany, assignor to DIEHL GmbH & Co., Nuremberg, Fed. Rep. of Germany
Filed Nov. 29, 1988, Ser. No. 277,272

Claims priority, application Fed. Rep. of Germany, Dec. 3, 1987, 3740966

Int. Cl.⁴ F42B 13/50; F42C 15/04, 15/22

U.S. Cl. 102—269

3 Claims



1. A pyrotechnic fuze for projectiles, rockets, bomblets and mines, including a transversely movable housing of a slider; triggering means for a delay detonator and an explosive charge triggering detonator in said housing, said delay detonator being arranged transversely of the detonator; and a transmission detonator being arranged in the slider in parallel with the delay detonator intermediate the explosive charge triggering detonator and a transfer composition for the delay detonator for the triggering of an explosive charge, said slider including a passageway section at the transfer detonator communicating with a gas expansion space intermediate said slider and a guideway for said slider.

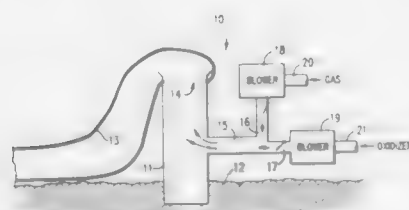
4,873,928

NUCLEAR-SIZED EXPLOSIONS WITHOUT RADIATION
 Frank E. Lowther, Plano, Tex., assignor to APTI, Inc., Los Angeles, Calif.

Filed Jun. 15, 1987, Ser. No. 62,020
 Int. Cl.⁴ F42B 3/00

U.S. Cl. 102-323

15 Claims



1. A method for producing a violent and destructive explosion having high shock energies comprising:
 - partially filling an expendable structure with an initial mixture of combustible gas and an oxidizer gas in concentrations rich in said combustible gas so that said initial mixture is incapable of burning or exploding;
 - mixing additional oxidizer gas into said initial mixture after said initial mixture is in place and contained within said structure to thereby create an explosive mixture within said structure; and
 - detonating said explosive mixture to produce said explosion and thereby destroying said expendable structure.

4,873,929

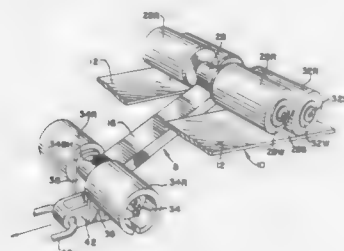
PUSHER UNIT

Frank J. Witecki, 3885 Harrison St., Gary, Ind. 46408
 Filed Apr. 2, 1987, Ser. No. 34,388

Int. Cl.⁴ B61B 10/04, 13/12

U.S. Cl. 104-172.3

6 Claims



1. A pusher unit for use on an endless-chain conveyor for transporting a vehicle forwardly along a generally horizontal, slotted track positioned above the chain by engaging a tire of the vehicle, comprising:
 - a straight metal bar having a front end which is adapted to be coupled to the endless chain and a free end which is adapted to project out of a slot in the track;
 - a pair of transverse axle members affixed to said bar and extending to either side of said bar, one of said axle members being affixed at one of the bottom or top surfaces of said bar near its free end, and the other being affixed to the other of the bottom or top surfaces a short distance forward of the first axle, each of said axles being positioned at a right angle to said bar so as to be transverse to the track slot, said axle members each extending sideways from the bar by a fixed distance;
 - four roller sleeves mounted for rotation about said axle members, one roller sleeve being mounted on each side

extension of said axles, said sleeves having a central bore sized to secure the axle member in a loose fit; means at the front end of said bar for receiving a third cylindrical axle member, said means and axle member being bolted together through holes formed in both; and a pair of rollers mounted for rotation about the third axle member, one on either side of the bar.

4,873,930

SULFUR REMOVAL BY SORBENT INJECTION IN SECONDARY COMBUSTION ZONES

Andrea L. F. Egense, Cerritos, and John D. Kuenzly, Redondo Beach, both of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Continuation of Ser. No. 252,035, Sep. 29, 1988, abandoned, which is a continuation of Ser. No. 79,373, Jul. 30, 1987, abandoned. This application Mar. 7, 1989, Ser. No. 319,803
 Int. Cl.⁴ F23J 11/00

U.S. Cl. 110-345

56 Claims



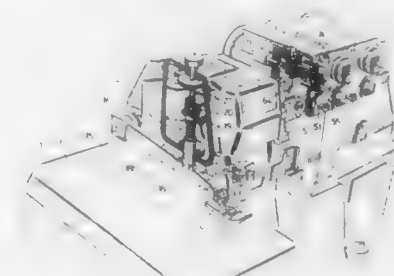
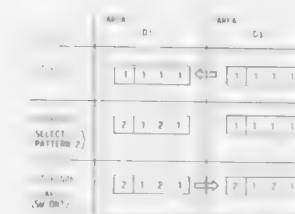
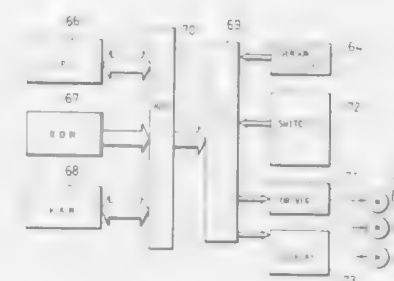
1. In an apparatus for combustion of sulfur-containing particulate carbonaceous fuel wherein oxidizer gas and particulate fuel are introduced into a substantially cylindrical primary combustion chamber and wherein the input velocities, mass-flow rates and combustion temperatures are regulated to minimize the concentration of volatilized and liquid slag in the output gaseous products of combustion, and wherein the walls of the combustion chamber are maintained within a temperature range such that a layer of solidified slag is retained on the inside surfaces of the walls, the improvement comprising, in combination:

- (a) means for preheating said oxidizer gas and introducing the preheated oxidizer gas into said chamber in a manner to establish a high-velocity swirling flow of a mixture comprising oxidizer and combustion products within said chamber;
- (b) means for injecting particulate fuel into said chamber near the center of one end thereof in a pattern such that substantially all of the fuel particles are intercepted by said swirling flow and most of the carbon contained in the particles is converted to oxides of carbon before the particles reach the walls of the chamber;
- (c) means regulating the oxidizer and fuel input velocities and mass-flow rates for maintaining a relatively fuel-rich combustion regime within a longitudinally-extending central portion of the primary combustion zone within said chamber, providing a relatively oxygen-rich annular region adjacent the walls, driving substantially all the slag content of the fuel to the walls of the chamber and keeping the temperature of the gaseous combustion products substantially higher than the ash-fusion temperature of the non-combustible constituents of the fuel;
- (d) slag recovery means comprising a slag-recovery chamber coupled to receive combustion products from said primary combustion chamber for collecting substantially all liquid slag entrained in said combustion products, separately disposing of all slag collected in the system, and

conducting thermal energy-carrying gaseous products to an associated heat utilization equipment;

- (e) sulfur-capture means for combining with said gaseous products, substantially as such products enter the heat utilization equipment,
- (i) sufficient calcium-containing sorbent to provide a calcium-to-sulfur molar ratio in the range from about 2 to about 5 and
- (ii) sufficient supplementary oxidizer to keep the temperature at which said sorbent initially contacts sulfur constituents of the gaseous products within the range from about 1600° F. to about 2300° F.;
- (f) with said sulfur-capture means comprising sorbent injection means for introducing calcium-containing sorbent into the gaseous products downstream from said primary combustion zone and before such products pass into the heat utilization equipment, and oxidant addition means for adding supplementary oxidant to said gaseous products after removal of substantially all non-combustible mineral constituents therefrom, and with said sorbent injection means and oxidant addition means being operative to maintain a time-temperature profile for the sorbent particles in transit to and through the heat utilization equipment such that the sulfur sorbent reacts with and captures a preponderance of the sulfur constituents at an effective capture temperature of less than about 2300° F., while maintaining a stoichiometry in the heat utilization equipment of from about 1.1 to about 1.3.

selecting means for selecting one of the combination pattern stored in said memory means, and



adjusting means for adjusting the nip pressure of each thread regulator individually in accordance with the selected combination pattern.

4,873,932

STEPPER DRIVEN STITCH PATTERNING MECHANISM FOR SEWING MACHINES USING SPIRAL CAM GROOVE AND FOLLOWER

Kenneth D. Adams, Madison, N.J., assignor to SSMC Inc., Fairfield, N.J.

Filed Feb. 1, 1989, Ser. No. 304,540
 Int. Cl.⁴ D05B 3/02

U.S. Cl. 112-443

7 Claims

1. In a sewing machine having a frame, stitch forming mechanism carried in said frame for stitch forming and stitch pattern influencing motion, a stepper motor secured in said sewing machine frame, and drive mechanism responsive to actuation from said stepper motor for imparting said stitch pattern influencing motion to said stitch forming instrumentality, said drive mechanism comprising:

- a cam supported in said sewing machine frame, and having an axis of rotation,
- a drive connection between said stepper motor and said cam, a spiral cam groove formed in said cam and extending radially of the axis of rotation of said cam,
- a cam follower having a free extremity adapted to track said cam groove,
- a cam follower support operatively associated with said

4,873,931

PROGRAMMED THREAD REGULATING APPARATUS FOR A SEWING MACHINE

Katsumi Takagi, Toshihito Negoro, and Itaru Tamagawa, all of Osaka, Japan, assignors to Pegasus Sewing Machine Mfg. Co., Ltd., Osaka, Japan

Filed May 10, 1988, Ser. No. 192,093

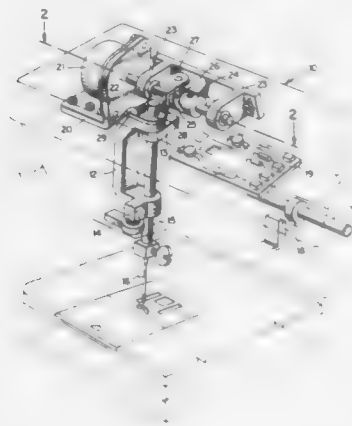
Claims priority, application Japan, May 11, 1987, 62-114971
 Int. Cl.⁴ D05B 19/00, 47/04

U.S. Cl. 112-121.11

17 Claims

1. A thread regulating apparatus for a sewing machine to make a seam by using plural threads simultaneously, having a plurality of thread regulators each nipping the thread to apply tension to the thread, the tension being variable by changing a nip pressure, said apparatus comprising:
 - memory means, comprising a RAM, for storing combination patterns of tension values of the threads, each tension value being applied by its respective thread regulator according to the balance of the tension values between the regulators,

stitch forming instrumentality, said cam follower carried on said cam follower support in a position extending substantially radially of said cam rotation axis, said cam groove and said follower extremity each having different cross sectional shapes, said shapes being inter-



lated to provide simultaneous point contact of the cam follower with each side of said cam groove, and spring means biasing said cam and said cam follower into engagement to maintain said point contact of said cam follower with each said of said cam groove.

4,873,933

FLOAT-FREE ARRANGEMENT FOR MARINE RADIO DISTRESS BEACONS

Brian S. Bennett, Hertfordshire, and David Smith, Kent, both of England, assignors to Clifford & Snell Limited, Surrey, England

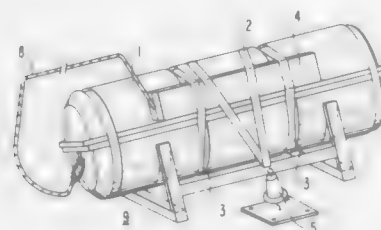
Filed Oct. 31, 1988, Ser. No. 264,885

Claims priority, application United Kingdom, Oct. 30, 1987, 8725812

Int. Cl.⁴ B63C 9/22

U.S. Cl. 441-36

6 Claims



1. A marine radio distress beacon in combination with an automatic self-inflating life-raft, the life-raft having a casing and retaining straps encircling the casing, the retaining straps being breakable by force resulting from self-inflation of the life-raft, the distress beacon being mounted on an exterior surface of the casing so as to be retained thereon by at least one of the said retaining straps so as to be released on breakage of the straps.

4,873,934

ADJUSTABLE SHEET FOR A WINDSURFING HARNESS

Greg Renault, P.O. Box 832, La Jolla, Calif. 92038

Filed Jan. 17, 1988, Ser. No. 214,214

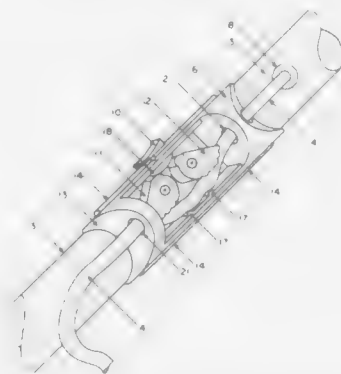
Int. Cl.⁴ B63B 35/00

U.S. Cl. 114-39.2

2 Claims

1. An adjustable sheet for a windsurfing harness on a boom of an articulated mast of a windsurfing board comprising:

an elastic means, one end of which is securely attached to said boom, a sheet which is attached to the other end of said elastic means, a dual-action clamp through which said sheet is routed, said dual-action clamp having a pair of mirror symmetrical cams, a multiplicity of serrated poles at the extremity of each of said cams to lock said sheet, a pivot means attaching said cams to said dual-action clamp,



a spring means to tension to said cams against said sheet, and a quick release means to disengage said dual action clamp, so that in said dual-action clamp, said poles of said cams are tensioned through said pivots against said sheet locking said sheet in place so said sheet can not slide in either direction, and by actuating said quick release means, the sheet is disengaged from said dual-action clamp and said sheet may be elongated or shortened in accord with the tension of the elastic means to accommodate a new position of the boom and articulated mast.

4,873,935

COMBINED CANOE SEAT AND PORTAGE YOKE

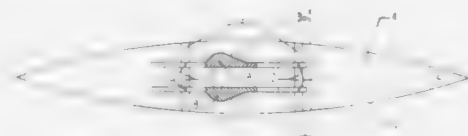
Robert S. Lastig, Rte. 3, Box 194, Berkeley Springs, W. Va. 25411

Filed Sep. 4, 1987, Ser. No. 93,238

Int. Cl.⁴ B36B 17/00

U.S. Cl. 114-347

15 Claims



1. A combined canoe seat and portage yoke which comprises: fore and aft support members transversely extended across the width of the canoe and spaced longitudinally apart along the length of the canoe, first and second saddle yoke portions each having means for engaging said fore and aft support members, said fore and aft support members comprising first mounting means for locating said saddle yoke portions in respective first positions defining a seat configuration wherein said saddle yoke portions are: generally horizontal, longitudinally extended, disposed at a level above the bottom of the canoe, and spaced substantially contiguous with each other; whereby a paddler may straddle said saddle yoke portions and utilize the combined breadth of said portions to comfortably support the buttocks while sitting or kneeling in the canoe,

said fore and aft support members comprising second mounting means for locating said saddle yoke portions in respective second positions defining a portage yoke configuration wherein said saddle yoke portions are: generally horizontal, longitudinally extended, disposed at a level above the bottom of the canoe, and spaced laterally apart from each other on generally opposite sides of the canoe; whereby said saddle yoke portions will define two support surfaces for engagement by the shoulders of a carrier when the canoe is inverted for transport.

4,873,936

SWITCHING MECHANISM FOR ANTI-THEFT SYSTEM

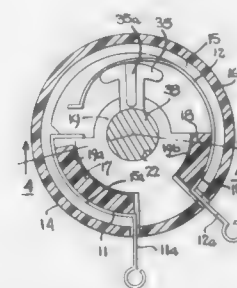
Robert J. Ponticelli, 20274 Delita Dr., Woodland Hills, Calif. 91364

Filed Oct. 31, 1988, Ser. No. 265,404

Int. Cl.⁴ B60R 27/00

U.S. Cl. 116-33

7 Claims



1. A switching mechanism for use in a theft alarm system for providing an alarm signal when an attempt is made to remove equipment being protected thereby, said alarm system being actuated by providing power from a power source through said switching mechanism to an alarm device when a predetermined piece of hardware is removed from the equipment, said mechanism comprising:

a casing having an aperture formed therein and extending completely therethrough; first and second spring contact members retained in said casing; a camming member slidably mounted in said casing; said first spring contact member abutting against said camming member and urging said camming member towards said aperture, said piece of hardware being fitted into said aperture in abutment against said camming member so as to urge said camming member away from said aperture, thereby retaining said first spring contact member in a first predetermined position; the camming member being permitted to be driven by said first spring member into said aperture with said first spring contact member in a second predetermined position; said first spring contact member being in contact with said second spring contact member in one of said predetermined positions and not being in contact with said second spring contact member in the other of said predetermined positions; whereby when said piece of hardware is removed from the equipment, said alarm system is actuated.

4,873,937

METHOD AND APPARATUS FOR SPRAYING POWDER INTO A CONTINUOUS TOW

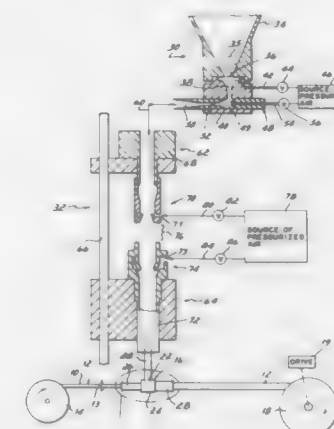
John J. Binder, Lorain, and Thomas A. Kaiser, Vermilion, both of Ohio, assignors to Nordson Corporation, Westlake, Ohio

Filed Jan. 28, 1988, Ser. No. 149,539

Int. Cl.⁴ B05B 15/12

U.S. Cl. 118-44

8 Claims



1. Apparatus for spraying particulate powder material into an axially moving tow formed of individual strands, comprising:

a spraying chamber having a hollow interior with a longitudinal axis, said spraying chamber being formed with a powder inlet port and a vent; a hollow inlet guide and a hollow outlet guide each connected to said spraying chamber communicating with said hollow interior thereof, said hollow inlet guide being adapted to receive a tow which is axially movable through said spraying chamber and out said hollow outlet guide; a powder spray device mounted to said powder inlet port of said spraying chamber, said powder spray device having a discharge outlet which is oriented at an angle relative to said longitudinal axis of said spraying chamber and which is located on one side of said tow movable axially through said spraying chamber, said powder spray device being effective to spray a stream of air-entrained particulate powder material through said powder inlet port into said hollow interior of said spraying chamber at a velocity such that individual strands of the tow are separated from one another with said spraying chamber and the particulate powder material is lodged between the exterior surface of adjacent strands throughout substantially the entire thickness of the tow.

4,873,938

SOLDERING APPARATUS

Alexander J. Ciniglio, Holly Lodge, Ridgeway, Hutton Mount, Brentwood, England

Filed Jun. 26, 1986, Ser. No. 878,776

Claims priority, application United Kingdom, Jul. 10, 1985, 8517452; Oct. 22, 1985, 8526016; Mar. 5, 1986, 8605389; Jun. 3, 1986, 8613400

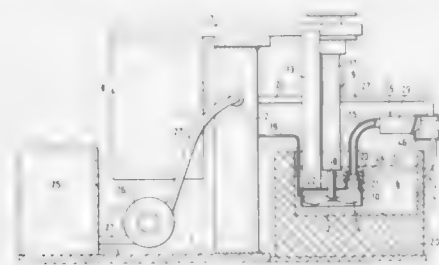
Int. Cl.⁴ B05C 5/02, 5/04

U.S. Cl. 118-302

6 Claims

1. Apparatus for applying solder to a wire or a connecting lead of an electrical or electronic component, comprising a bath for containing molten solder, a pump, a nozzle, a conduit connecting the pump and the nozzle, the pump being arranged to pump solder from the bath to the nozzle via the conduit, wherein the nozzle has a downwardly directed exit such that solder is pumped out of the nozzle to form a downwardly flowing stream of solder, wherein the exit is located at an end

of the nozzle and guide means is provided for guiding a wire or lead to be soldered below the level of the exit, and wherein the



guide means comprises an arm extending laterally from the nozzle and a lower edge of the arm slopes upwardly away from the exit.

4,873,939

SHORT-DWELL COATER FOR COATING A WEB WITH COATING MIX

Juhani Eskelinen, Helsinki, Finland, assignor to Valmet Paper Machinery Inc., Helsinki, Finland

Filed Nov. 13, 1987, Ser. No. 120,476

Claims priority, application Finland, Nov. 14, 1986, 864649

Int. Cl.⁴ B05C 3/02

U.S. Cl. 118—410

6 Claims



1. A short-dwell coater for coating a web positioned against a backing roll, said web being coating with a coating mix as said web moves in a coating direction from a forward to a rear side of said coater, said short-dwell coater comprising:

- a front lip;
- an intermediate lip positioned behind said front lip;
- a mouth piece formed by said front lip and said intermediate lip defining an application zone with said web whereat the coating mix is applied to the web, said front lip acts as a support for at least said intermediate lip and mouth piece;
- means for moving said front lip toward and away from said web for adjusting size of the application zone;
- feeder means for feeding the coating mix to the application zone, said feeder means being positioned next to said front lip; and
- doctor blade means positioned rearwardly of said application zone for doctoring excess coating mix away from the web, said excess coating mix being kept separate from coating mix to be applied to the web, said intermediate lip having a side facing the doctor blade means which forms an obtuse angle with the web to prevent reflow of the excess coating mix to the application zone.

4,873,940

IMAGE DEVELOPING DEVICE

Toyohiko Kanagawa, Kanagawa; Toshio Kaneko; Shuichi Endo, both of Tokyo; Yoshihiro Ogata, and Toshihiko Takaya, both of Kanagawa, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

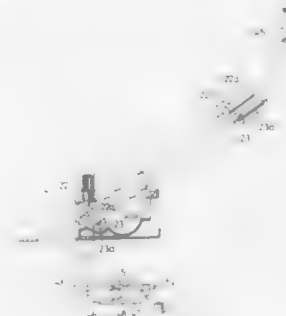
Filed Oct. 23, 1986, Ser. No. 922,357

Claims priority, application Japan, Oct. 23, 1985, 60-0236979; Feb. 20, 1986, 61-023485[U]

Int. Cl.⁴ G03G 15/08

U.S. Cl. 118—651

16 Claims



1. An image developing device comprising:

- a developing roller for supplying a thin layer of one-component toner to a latent image carrier;
- a toner supply roller independently rotatable in abutting engagement and in pressure contact with said developing roller, said toner supply roller being electrically conductive;
- said toner being triboelectrically charged by said toner supply roller; and
- bias voltage distributing means for applying a voltage VB to said developing roller and a voltage VR to said toner supply roller, where both voltages are of the same polarity, VB being less than VR when the toner is positively chargeable, and VB being greater than VR when the toner is negatively chargeable.

4,873,941

ENVELOPE FLAP MOISTENER

Kevin J. O'Dea, Sandy Hook, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Dec. 28, 1988, Ser. No. 291,097

Int. Cl.⁴ B05C 1/02, 5/00

U.S. Cl. 118—669

4 Claims



1. In a moistening arrangement for moistening the flap of an envelope moving in a first direction in a given plane, said flap having an edge, said arrangement having a nozzle directed to spray a liquid at an envelope flap along a given locus in said plane, a source of first signals that are a function of the position of said edge in said plane and means responsive to said first signals for moving said nozzle in a direction substantially parallel to said plane for moistening said flap at positions thereof; the improvement wherein said nozzle comprises a hollow needle having a bore sufficiently small that the flow of liquid therethrough is substantially independent of pressure applied to said liquid.

4,873,942

PLASMA ENHANCED CHEMICAL VAPOR DEPOSITION WAFER HOLDING FIXTURE

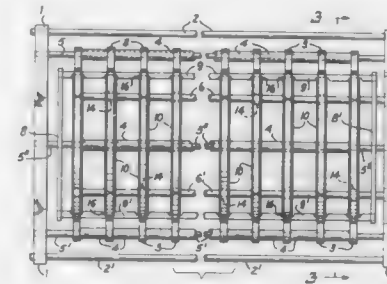
George M. Eagle, Phoenix, Ariz., assignor to The Stackpole Corporation

Filed Jun. 8, 1988, Ser. No. 204,210

Int. Cl.⁴ C23C 16/00, 14/00; B05B 5/02; B05C 5/00

U.S. Cl. 118—728

15 Claims



1. A holding fixture for plasma enhanced chemical vapor deposition processing of semiconductor wafer workpieces comprising a frame boat assembly for holding workpieces to be subjected to a flow of reactant gases serially across the workpieces in a direction perpendicular to the broad faces of the workpieces and to the longitudinal axis of the boat, said boat including in combination:

- a pair of upright, spaced-apart insulating frame end members having a first set of spaced-apart parallel, elongated, insulating rods secured between the end members for holding the boat in assembled relation;
- an electrode supporting cradle secured within the boat for holding a plurality of flat, spaced-apart, electrically conductive electrodes in an upright position with the flat surfaces parallel to each other and perpendicular to the longitudinal axis of the boat;
- a workpiece holding rack comprised by at least two spaced-apart, parallel insulating workpiece support elongated rods each being seated in longitudinally aligned apertures formed on lower opposite sides of the periphery of the array of flat, spaced-apart, parallel electrically conductive electrodes for holding the workpieces flat against opposed flat surfaces of the respective electrodes; and
- means for applying an electric potential difference between alternate ones of the array of spaced-apart, parallel electrically conductive electrodes.

4,873,943

MILK FLOW INDICATOR

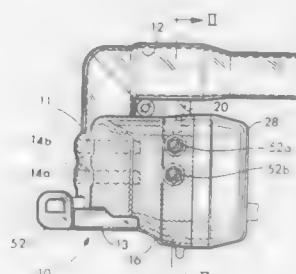
Ronald J. Pulvermacher, Cottage Grove, Wis., assignor to Dairy Equipment Co., Madison, Wis.

Filed Dec. 28, 1987, Ser. No. 138,219

Int. Cl.⁴ A01J 3/00

U.S. Cl. 119—14.16

21 Claims



1. A milk flow indicator adapted for insertion in the milk

flow line of dairy barn milking equipment, the indicator comprising:

- (a) a body member formed of a durable material having a milk flow passageway extending therethrough and a housing formed into it;
- (b) electrical means for sensing milk flow received in the body member adjacent to the passageway;
- (c) electrically actuated indicating means for indicating a presence of milk flow in the milk flow passageway;
- (d) an electrical circuit received in and sealed into the housing for operating the sensing means and the indicating means to sense milk flow and indicate the status of the flow;
- (e) a rechargeable battery received in the indicator and electrically connected to the electrical circuit but isolated from ground and external electrical connections so that the indicator is portable and self-contained and can be inserted independently in the milk flow line without electrical connection and still indicate condition of milk flow;
- (f) contacts mounted on the external surface of the indicator and electrically connected to the battery so that the battery can be recharged by external power without removal from the indicator.

4,873,944

PARTIALLY LIQUID-COOLED TYPE FORCED AIR-COOLING SYSTEM FOR INTERNAL COMBUSTION ENGINE

Kiichiro Yamada, Osaka, Japan, assignor to Kubota Ltd., Osaka, Japan

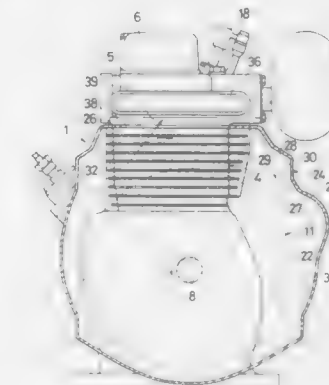
Filed May 2, 1988, Ser. No. 189,418

Claims priority, application Japan, May 2, 1987, 62-66913; May 2, 1987, 62-66914

Int. Cl.⁴ P01P 9/04

U.S. Cl. 123—41.57

17 Claims



1. A partially liquid-cooled air-cooling system for an internal combustion engine, comprising:

- a rotatable shaft projecting forwardly from a front wall of a crankcase of said internal combustion engine, said shaft having a centrifugal cooling fan fixedly secured thereto in front of a crankcase, said cooling fan being encircled by a fan casing;
- a back portion of a draft chamber formed within said fan casing, provided with a cooling air delivery opening adapted to direct cooling air about at least a cylinder of the engine;
- a liquid-cooling jacket, formed to be in at least a portion of a cylinder head of the engine so as to be connected in communication to a radiator for cooling a flow of a cooling liquid therethrough; and
- an upper wall portion of an encircling wall of said fan casing being provided with an air distribution opening arranged

at a side of said cylinder head, said radiator being located adjacent to said distributing opening.

4,873,945

CYLINDER BLOCK CONSTRUCTION FOR V-TYPE ENGINES

Shinichi Tamba, and Hitomi Miyake, both of Hyogo, Japan, assigns to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Continuation of Ser. No. 863,247, May 14, 1986, abandoned.

This application Apr. 14, 1988, Ser. No. 183,527

Claims priority, application Japan, May 17, 1985, 60-106376

Int. Cl.⁴ F02B 75/22

U.S. Cl. 123—55 R

5 Claims



cut-in groove formed in said protruding edge portion substantially flush with said lower side surface for allowing any liquid remaining in said intake port to flow into said pre-compression chamber.

4,873,947

VARIABLE COMPRESSION RATIO DIRECT INJECTION ENGINE

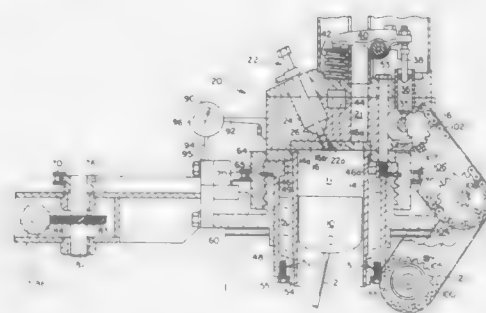
Thomas W. Ryan, III; Milan J. Maymar, and Orin M. Anderson, all of San Antonio, Tex., assigns to Southwest Research Institute, San Antonio, Tex.

Filed Feb. 22, 1988, Ser. No. 158,317

Int. Cl.⁴ F02B 75/04

U.S. Cl. 123—78 C

11 Claims



1. A one-piece die-cast crankcase and cylinder block casing structure for V-type two-cylinder internal combustion engines, comprising a combined crankcase and cylinder block casing open at one end wall side thereof, the structure being formed so that a bottom wall (3c) is declined in gradually widening cross-section in a vertical plane which includes the crankshaft central axis, toward the one end wall side (3a) in order to allow removal from a die-casting mold during projection of said structure, the cylinder block portion of the cast casing including right and left cylinder opposed to each other at 90° integrally mounted on a top side of the crankcase, a separate end cover mounted on the one-end wall side to close the crankcase, a first pair of bearings mounted in the separate end cover and an end wall of the crankcase opposite to the one end wall side for supporting the crankshaft, and a second pair of bearings mounted in the separate end cover and an opposite end wall for supporting a camshaft.

4,873,946

TWO-CYCLE INTERNAL COMBUSTION ENGINE

Isoo Masuda, Tachikawa; Takashi Fukuoka, Fuchu, and Fujii Kobayashi, Hachioji, all of Japan, assigns to Kioritz Corporation, Tokyo, Japan

Filed Aug. 9, 1988, Ser. No. 230,141

Claims priority, application Japan, Aug. 25, 1987, 62-128963[U]

Int. Cl.⁴ F02B 33/04

U.S. Cl. 123—45 PD

1 Claim

1. In a two-cycle internal combustion engine having a cylinder, a reciprocating piston provided in said cylinder, a connecting rod pivoted to said piston through the intermediary of a bearing portion, and an intake port formed in the side wall of the cylinder so as to be opened and closed by said piston and adapted to supply air-fuel mixture to a pre-compression chamber, the improvement comprises a protruding edge portion formed in a lower side surface of said intake port adjacent to said pre-compression chamber and adapted to deflect the air-

1. A compression ignition engine, said engine having a crankcase, crankshaft, a counterbalance case and flywheel, a connecting rod and piston assembly, a cylinder liner, and a cam shaft, comprising:

a holder for supporting said cylinder liner;

a head assembly connected to said holder, said head assembly including valve means;

means for alternately raising or lowering said cylinder liner relative to said crankshaft, thereby varying the compression ratio of said engine; and

means for maintaining a substantially constant valve timing relationship as said cylinder liner is raised or lowered, said means for maintaining a substantially constant valve timing relationship comprising a timing shaft and a hinged linkage mechanism in operative engagement with said timing shaft and said cam shaft.

4,873,948

PNEUMATIC ACTUATOR WITH SOLENOID OPERATED CONTROL VALVES

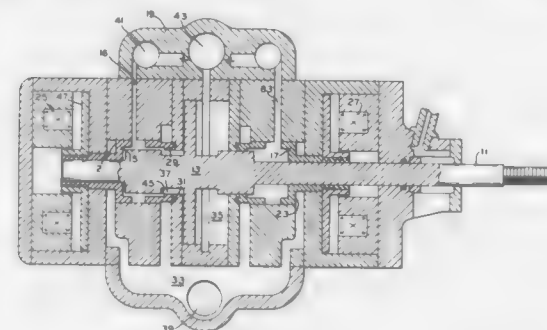
Richeson, William E., and Frederick L. Erickson, both of Fort Wayne, Ind., assigns to Magnavox Government and Industrial Electronics Company, Fort Wayne, Ind.

Filed Jan. 20, 1988, Ser. No. 209,273

Int. Cl.⁴ F01L 9/02, 9/04

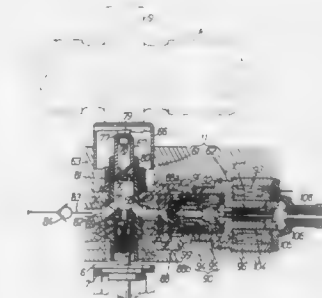
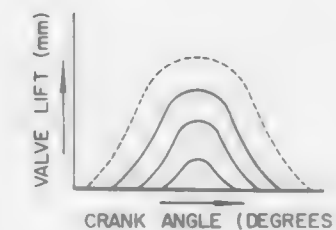
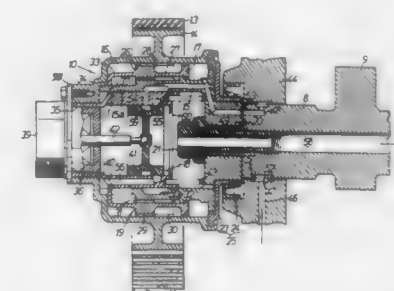
U.S. Cl. 123—90.11

14 Claims



10. A pneumatically powered valve actuator comprising a valve actuator housing; a piston reciprocable within the housing along an axis, the piston having a pair of oppositely facing primary working surfaces; a pressurized air source; a pair of air control valves reciprocable along said axis relative to both the housing and the piston between open and closed positions; means for selectively opening one of said air control valves to supply pressurized air from the air source to one of said primary working surfaces causing the piston to move; pneumatic means for decelerating the piston near the extremities of its reciprocation; and an intermediate pressure air source including differentially controllable valving means for supplying air from the intermediate pressure source to the pneumatic means to compensate for variations in external forces opposing piston motion.

means for transmitting a valve-opening force from the cam to the valve, and hydraulic valve means for selectively releasing



the valve-opening force in response to engine operating conditions.

4,873,949

METHOD OF AND APPARATUS FOR CONTROLLING VALVE OPERATION IN AN INTERNAL COMBUSTION ENGINE

Yoshihiro Fujiyoshi, Kanagawa; Takatoshi Aoki, Tokyo, and Yasuhiro Urata, Saitama, all of Japan, assigns to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 18, 1988, Ser. No. 273,882

Claims priority, application Japan, Nov. 19, 1987, 62-292617

Int. Cl.⁴ F01L 9/02, 1/02

U.S. Cl. 123—90.12

13 Claims

7. An apparatus for controlling valve operation in an internal combustion engine having a crankshaft for driving a camshaft with a cam for opening and closing an intake or exhaust valve which is spring-biased in a closing direction, said apparatus comprising, phase control means disposed between the crankshaft and the camshaft and lift control means disposed between the cam and the intake or exhaust valve, said phase control means including hydraulic means for changing the angular relationship between the camshaft and a timing wheel driven by the crankshaft for driving the camshaft, means for controlling said hydraulic means in response to engine operating conditions, said lift control means including hydraulic piston

4,873,950

ENGINE START CONTROL APPARATUS

Masaki Furuyama, Hoya, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 22, 1988, Ser. No. 234,685

Claims priority, application Japan, Aug. 28, 1987, 62-216128

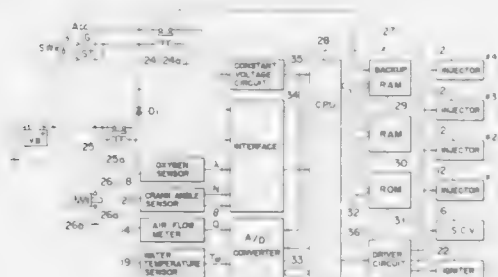
Int. Cl.⁴ F02D 45/00, 41/06

U.S. Cl. 123—179 B

6 Claims

1. An engine start control apparatus comprising: at least one sensor for detecting an engine condition; a backup memory for storing data obtained by using the content of a detection by said sensor; control means for controlling said engine in accordance with the stored data in said backup memory; starting condition detector means for detecting a start ready state of said engine and outputting a start ready signal; signal processing means for processing said content of a detection by said sensor and storing the processed result

into said backup memory when said start ready signal is received;
means for detecting a start operation of said engine; and



means for supplying a source voltage to said control means in response to an output signal from said start detection

4,873,951

CONNECTING ROD WITH POLYMERIC COATED SIDEFACE

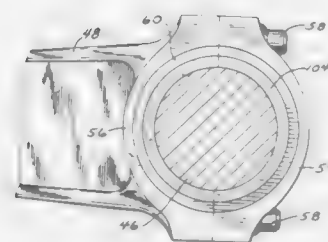
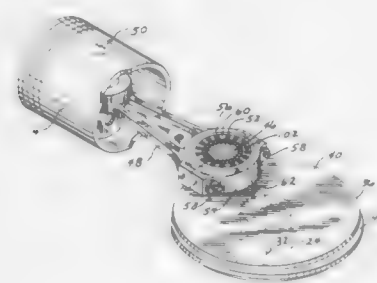
Steven C. Garthwaite, Fond du Lac, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Dec. 19, 1988, Ser. No. 286,514

Int. Cl.⁴ F01M 1/00

U.S. Cl. 123—196 W

15 Claims



1. A two-cycle internal combustion engine comprising a piston reciprocal in a cylinder between a crankcase chamber and a combustion chamber, said engine having a crankshaft rotatably journaled therein along a crankshaft center-line, said crankshaft having a plurality of crankarms extending radially relative to said center-line, said crankarms having facing crankfaces, a crankpin extending axially between a pair of said crankarms perpendicularly from said crankfaces and parallel to and eccentrically offset from said crankshaft center-line, said piston having a connecting rod rotatably journaled on said crankpin, said connecting rod have sidefaces sliding along said crankfaces of said crankarms, said sidefaces of said connecting rod having a polymeric material coating thereon having a low coefficient of sliding friction and providing a bearing between said sidefaces of said connecting rod and said crankfaces of said

crankarms to prevent galling and eliminate the need to silver plate said sidefaces of said connecting rod.

4,873,952

ENGINE CYLINDER HEAD WITH PRECOMBUSTION CHAMBERS USING POROUS CERAMICS INSERT

Yoshinori Narita, and Mitsuyoshi Kawamura, both of Aichi, Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya, Japan

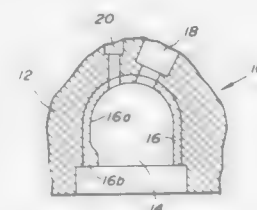
Filed Feb. 26, 1988, Ser. No. 161,013

Claims priority, application Japan, Mar. 2, 1987, 62-28799[U]

Int. Cl.⁴ F02B 19/16

U.S. Cl. 123—270

16 Claims



1. A cylinder head for an internal combustion engine, comprising:
 - a cast metal body having at least one recess which provides a precombustion chamber; and
 - a hollow member which is made of porous ceramics of which porosity is in the range from 5 to 50% and is cast-inserted in the inner wall surface of said cast metal body defining said recess such that the inner surface of the hollow member defines at least a major portion of the precombustion chamber, the cast-inserted hollow member being machine-finished and impregnated with an inorganic refractory material.
9. A method of producing a cylinder head for an internal combustion engine, comprising the steps of:
 - casting a metal into a cylinder head body having at least one recess which provides a precombustion chamber with insert of a hollow member made of a porous ceramics of which porosity is in the range from 5 to 50% for each of said at least one recess such that the inner-surface of the cast-inserted hollow member defines at least a major portion of the precombustion chamber;
 - machine-finishing the cast-inserted hollow member;
 - impregnating the machine-finished hollow ceramics member with a treatment liquid comprising an inorganic refractory material; and
 - dissipating the liquid component of said treatment liquid from the hollow ceramics member to leave pores in the hollow ceramics member impregnated with said refractory material.

4,873,953

INDUCTION PORT ARRANGEMENT FOR INTERNAL COMBUSTION ENGINE HAVING MULTIPLE INLET VALVES PER COMBUSTION CHAMBER

Shigeo Muranaka, Yokosuka; Kouzaburo Ohkawa, Yokohama; Junichi Yokoyama, Zushi; Yutaka Matayoshi, Yokosuka, and Shigeru Kamegaya, Tokyo, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Continuation of Ser. No. 788,134, Oct. 16, 1985, abandoned.

This application Oct. 17, 1988, Ser. No. 258,048

Claims priority, application Japan, Oct. 17, 1984, 59-217548; Jan. 24, 1985, 60-9851

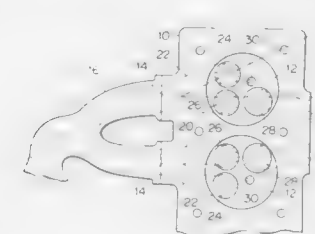
Int. Cl.⁴ F02M 35/10

U.S. Cl. 123—308

13 Claims

11. An internal combustion engine comprising:
 - a combustion chamber;
 - a spark plug;
 - a first inlet valve;

- a second inlet valve;
- an exhaust valve;
- a bifurcate intake port having a main section adapted to communicate with an induction system and first and second branch passages which lead from said main section to said first and second inlet valves, respectively,
- said first branch passage comprising:
 - (a) means for introducing an air-fuel mixture, which flows



- therethrough and which contains liquid fuel, into said combustion chamber in a manner to impart a swirl thereto and to cause said swirling mixture to intersect with and flow over said spark plug; and
- (b) means for imparting a velocity to the liquid fuel of said air-fuel mixture sufficient to carry an amount of said liquid fuel along a path which is non-intersective with said spark plug which is sufficient to substantially obviate wetting of said spark plug.

4,873,954

FAIL-SAFE IDLE BYPASS SYSTEM

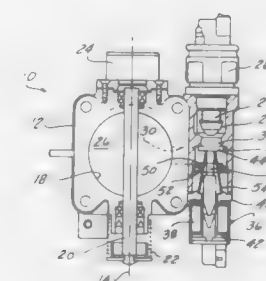
Daryl O. Codling, Rochester, Mich., assignor to Colt Industries Inc., New York, N.Y.

Filed Jul. 27, 1988, Ser. No. 224,719

Int. Cl.⁴ F02D 41/22, 41/16

U.S. Cl. 123—339

14 Claims



1. An idle bypass system for allowing a predetermined amount of fluid flow to an intake manifold of an engine, said system comprising

- a throttle body having a longitudinal axis and forming a central passageway along said axis;
- throttle plate means disposed within said central passageway transversely to said longitudinal axis for rotation between an open and closed position to allow fluid flow through said central passageway;
- said throttle body including means forming a secondary passageway and having an inlet communicating with said central passageway upstream of said throttle plate means and an outlet communicating with the intake manifold downstream of said throttle plate means to allow fluid flow to bypass said throttle plate means when in said closed position;
- motor means secured to said throttle body and cooperating with said secondary passageway for allowing a predetermined amount of fluid flow through said outlet; and
- solenoid-actuated valve means secured to said throttle body and cooperating with said secondary passageway for

blocking fluid flow to said motor means and allowing a predetermined amount of fluid flow to the intake manifold when the amount of fluid flow past said motor means is not within predetermined limits.

4,873,955

IDLE AIR FLOW SHUTOFF VALVE

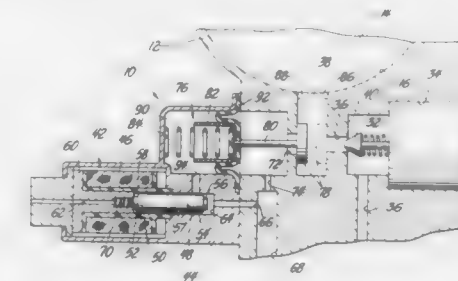
Lawrence McAuliffe, Jr., Southfield, Mich., assignor to Colt Industries Inc., New York, N.Y.

Filed Sep. 19, 1988, Ser. No. 245,651

Int. Cl.⁴ F02D 41/22, 41/16

U.S. Cl. 123—339

21 Claims



1. An idle fluid flow shutoff assembly for allowing a predetermined amount of fluid flow to an intake manifold of an engine, said assembly comprising:

- a throttle body having a longitudinal axis and forming a central passageway along the axis;
- throttle plate means disposed within said central passageway transversely to the longitudinal axis for rotation between an open and closed position to allow fluid flow through said central passageway;
- said throttle body including means forming a secondary passageway and having an inlet communicating with said central passageway upstream of said throttle plate means and an outlet communicating with the intake manifold downstream of said throttle plate means to allow fluid flow to bypass said throttle plate means when in said closed position;
- motor means secured to said throttle body and cooperating with said secondary passageway for allowing a predetermined amount of fluid flow through said outlet;
- pressure-actuated valve means moveable in response to the absence and presence of a predetermined pressure level and cooperating with said secondary passageway for allowing a predetermined amount of fluid flow to the intake manifold when the amount of fluid flow past said motor means is not within predetermined limits.

4,873,956

FUEL INJECTION PUMP FOR INTERNAL COMBUSTION ENGINES

Wolfgang Fehlmann, Stuttgart; Gerald Hofer, Bad Aibling; Dieter Junger, Stuttgart; Anton Karle, Leonberg, and Helmut Laufer, Gerlingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 17, 1987, Ser. No. 134,265

Claims priority, application Fed. Rep. of Germany, Feb. 13, 1987, 3704578

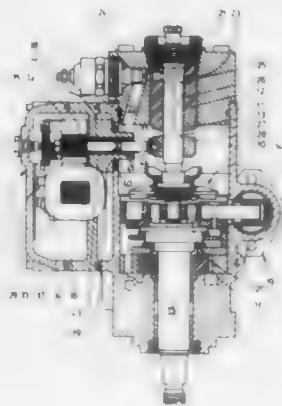
Int. Cl.⁴ F02M 39/00

U.S. Cl. 123—357

2 Claims

1. A fuel injection pump for internal combustion engines comprising a pump housing, a pump interior enclosed by said pump housing, said pump interior adapted to receive fuel under pressure, a pump piston that defines a pump work chamber for receiving fuel under pressure during an intake stroke of said pump piston, a final control element housing secured to said pump housing, a quantity adjusting device for controlling

the fuel injection quantity pumped at high pressure by said pump piston, an actuating part having a first end connected to said quantity adjusting device for adjusting said quantity adjusting device, said actuating part including a control shaft (30) of constant diameter supported in a slide bearing (41) supported in a wall of said final control element housing, said actuating part including a second end being actuable by an electrical final control element being disposed in a final control



element chamber in said final control element housing, said final control element chamber communicating through at least one liquid-carrying opening with the pump interior and through a relief line (45) with a relief chamber (18), said at least one liquid-carrying opening embodied as a throttle gap (44) of constant cross section, and said throttle gap (44) of constant cross section embodied by a bearing gap of said slide bearing (41).

4,873,957

THROTTLE VALVE CONTROL APPARATUS

Yoshiji Ueyama, and Yoshiaki Asayama, both of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP88/00160, § 371 Date Sep. 27, 1988, § 102(e) Date Sep. 27, 1988, PCT Pub. No. WO88/06681, PCT Pub. Date Sep. 7, 1988

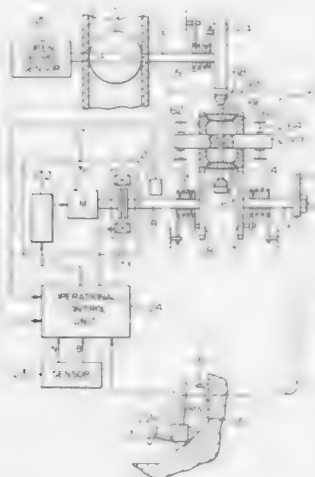
PCT Filed Feb. 17, 1988, Ser. No. 294,640

Claims priority, application Japan, Feb. 25, 1987, 62-41850

Int. Cl.⁴ F02D 9/02

U.S. Cl. 123—399

3 Claims



1. A throttle valve control apparatus comprising a valve shaft for opening and closing a throttle valve for changing the

engine output, a differential gear unit for driving said valve shaft, a first and a second drive gear in mesh with said differential gear unit, and a first and a second drive means for independently driving said drive gears, characterized in that said valve shaft and said first and second drive gears are each provided with a return spring acting in a direction in which said throttle valve is closed.

4,873,958

ENGINE IGNITION TIMING CONTROL SYSTEM

Kunihiro Abe, Higashimurayama, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

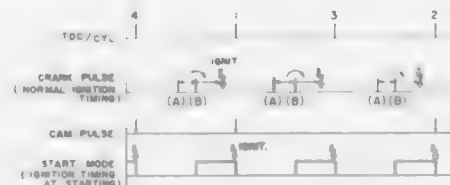
Filed Aug. 22, 1988, Ser. No. 234,687

Claims priority, application Japan, Aug. 28, 1987, 62-215978

Int. Cl.⁴ F02P 5/15, 11/00

U.S. Cl. 123—424

4 Claims



1. An engine ignition timing control system having a cam angle sensor for detecting specific cam angles and outputting corresponding cam angle signals, a crank angle sensor for detecting specific crank angles and outputting corresponding crank pulse signals, and a control unit for receiving as input signals from said sensors and controlling the engine ignition timing, said control unit comprising an engine starting detection means for detecting the starting of the engine, a crank pulse identifying means for receiving as input signals from said cam angle sensor and said crank angle sensor and identifying at least two crank pulses, a cyclic period calculation means for determining the cyclic period corresponding to the angular speed of the crankshaft in accordance with said at least two crank pulses thus identified by said crank pulse identifying means, and ignition timing calculation means for calculating ignition timing, whereby, when said engine starting detection means detects the engine starting, an ignition signal is outputted in response to a signal from said cam angle sensor, and, when said engine starting detection means detects completion of the engine starting, an ignition timing is determined and an ignition signal is outputted by said ignition timing calculation means in response to a signal from said crank angle sensor by way of said crank pulse identifying means and said cyclic period calculation means.

4,873,959

FUEL INJECTION PUMPING APPARATUS

David J. C. Law, London, and Lukhbir S. Panesar, Middlesex, both of England, assignors to Lucas Industries Public Limited Company, Birmingham, England

Filed Mar. 20, 1989, Ser. No. 325,540

Claims priority, application United Kingdom, Mar. 25, 1988, 8807137

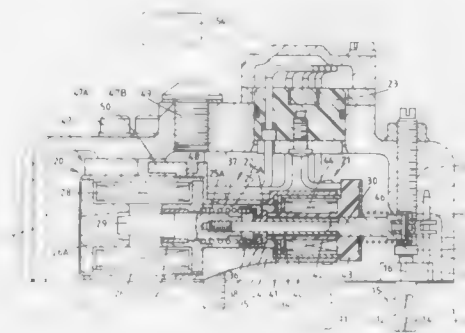
Int. Cl.⁴ F02M 39/00

U.S. Cl. 123—458

11 Claims

1. A fuel injection pumping apparatus for supplying fuel to an internal combustion engine comprising a body which houses a high pressure fuel pump, an angularly adjustable throttle member mounted in the body, for controlling fuel flow from a low pressure fuel pump to the high pressure fuel pump, the throttle member mounting an arm on the exterior of the body, a hollow housing adapted to be secured to the body, an electromagnetic actuator including an armature, an axially movable connecting rod connected at one end to the armature and its other end to said arm, a transducer including a core

member which is mounted about and movable with said connecting rod, a support for the actuator and the transducer and a clamp which adjustably clamps the support to the housing,



said clamp being releasable to enable for a given axial setting of the connecting rod, the quantity of fuel delivered by the apparatus to be adjusted to the desired value by moving the support relative to the housing.

4,873,960

ELECTRONICALLY-CONTROLLED FUEL INJECTION SYSTEM FOR INTERNAL COMBUSTION ENGINES

Hiroshi Kamifuji, Yoshiyuki Tanabe, and Kiyomi Morita, all of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

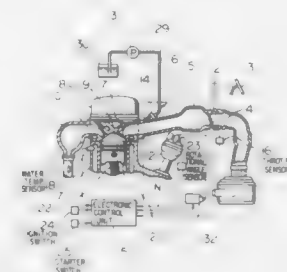
Filed Jul. 1, 1988, Ser. No. 214,484

Claims priority, application Japan, Jul. 3, 1987, 62-165197

Int. Cl.⁴ F02D 41/30, 41/04; F02M 51/00

U.S. Cl. 123—480

5 Claims



1. An electronically-controlled fuel injection system for an internal combustion engine comprising: means including a computer for electronically controlling a fuel injection quantity of an engine; means for detecting a rotational speed of said engine; a throttle sensor having lower and higher opening regions for detecting an opening of a throttle valve; means for storing a ratio between slopes of output voltage characteristic curves respectively derived from said regions with respect to a throttle opening in a range where ranges of throttle openings to be detected in said regions overlap; and means for correcting an output voltage generated from one of said regions in accordance with said ratio in a throttle opening range exceeding said overlapping range.

4,873,961

AIR-FUEL RATIO CONTROL FOR SUPERCHARGED AUTOMOBILE ENGINE

Hideki Tanaka, Hiroshima, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan

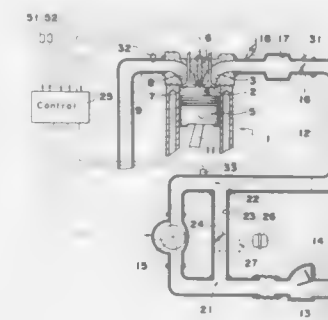
Filed Apr. 4, 1988, Ser. No. 177,343

Claims priority, application Japan, Apr. 2, 1987, 62-82004

Int. Cl.⁴ F02D 23/02

U.S. Cl. 123—564

13 Claims



1. An air/fuel control system of a supercharged automotive engine having a combustion chamber, introducing means for introducing air and fuel to said combustion chamber, and a supercharger for pressurizing charges of intake air introduced to said combustion chamber by the introducing means, said air/fuel control system comprising:

detecting means disposed in the engine for detecting a plurality of parameters representative of a condition under which the engine is operating and for issuing signals corresponding to said condition;

an air/fuel ratio regulating means operatively connected to the introducing means for regulating the ratio of air to fuel introduced by said introducing means to the combustion chamber;

supercharger operating means for rendering the operation of the supercharger effective and ineffective in the engine; and

control means operatively connected to said detecting means for receiving the signals issued by said detecting means and for evaluating the signals,

the control means operatively connected to said supercharger operating means for controlling said supercharger operating means to render the operation of the supercharger effective or ineffective based on the evaluation of the signals received, and

the control means also operatively connected to said air/fuel ratio regulating means for controlling said air/fuel ratio regulating means to regulate said ratio to a predetermined value higher than the stoichiometric value when the control means controls said supercharger operating means to render the operation of the supercharger effective and the control means evaluates the signals as representative of a steady operating condition of the engine in which a predetermined maximum amount of engine output is required, and to regulate said ratio to a predetermined value that is lower than the stoichiometric value when the control means evaluates the signals to be indicative of an engine operating condition in which an amount of engine output is required that is greater than said predetermined maximum amount.

4,873,962

HIGH EFFICIENCY ELECTRICAL ALTERNATOR SYSTEM

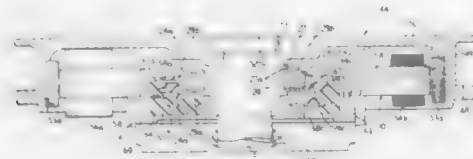
Edward J. Safranek, Arlington Heights, Ill., assignor to F & B Mfg. Co., Gurnee, Ill.

Filed May 9, 1988, Ser. No. 191,875

Int. Cl.⁴ F02P 1/00

U.S. Cl. 123-599

5 Claims



1. An alternator employed in an engine having a drive shaft, comprising:

a flywheel connected to the drive shaft forming a rotor of the alternator, and said rotor having an interior cup-shaped portion receiving a plurality of ceramic magnets;

a stator constructed of silicon steel laminations positioned within the cup-shaped portion of the rotor and having at least one alternator coil on a stator pole positioned relative to the magnets on the rotor such that the magnets are directly adjacent and move past a pole face of the pole as the rotor rotates;

the rotor cup-shaped portion being circumferentially defined by an outer circular wall surrounding the stator and having said ceramic magnets mounted directly on an inside surface thereof facing the at least one stator pole face;

a ring-shaped starter motor ring gear surrounding the rotor and mounted on an outside surface of said outer circular wall;

the outer circular wall having a thickness at a location where the magnets are mounted of equal to or less than 0.3 inches;

said thickness of the outer circular wall expressed as a percentage of radius of the rotor from a central axis thereof to said outer surface of the outer circular wall being equal to or less than 7%; and

said rotor being of one-piece construction and comprising a ductile iron casting.

4,873,963

ARROW SLING DEVICE, AND METHODS OF CONSTRUCTING AND UTILIZING SAME

Arie W. Lemmen, 401 Howard Ave., Lot 4, Holland, Mich.

Filed Dec. 11, 1987, Ser. No. 131,566

Int. Cl.⁴ F41B 3/00

U.S. Cl. 124-20 B

18 Claims



14. An arrow sling device, comprising:

a body portion including spaced legs extending upwardly at respective sides of said body portion;

a grip handle extending downwardly from said body portion;

resilient sling means for propelling an arrow, said sling means being connected with said body portion;

arrow guide means comprising a pair of gates supported on said spaced legs for guiding a shaft portion of an arrow loaded on said device; and

retainer means for normally holding said arrow guide means in a guiding position wherein said arrow is guided by said arrow guide means, and for permitting said arrow guide means to automatically move to an open release position when said arrow is propelled by said sling means.

4,873,964

APPARATUS FOR PLAYING GOLF FROM A GOLF CART

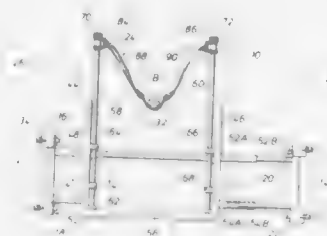
Vincent J. Bonoon, 7334 Oak Hill, Houston, Tex. 77087

Filed Oct. 14, 1988, Ser. No. 257,689

Int. Cl.⁴ A63B 53/00; F41B 7/00

U.S. Cl. 124-20 R

19 Claims



1. Apparatus adapted for playing golf from a golf cart used for moving a player about a golf course and wherein a golf ball is projected from the golf cart, the apparatus comprising:

projecting means controlled by the player for moving the golf ball from the golf cart to the golf course while the player remains in the golf cart; and

laterally disposed attachment means spaced apart on opposite sides of said projecting means for attaching said projecting means to spaced apart members on the golf cart.

4,873,965

FLEXIBLE ENDOSCOPE

Guido Danieli, 28/A, Viale Filippetti, I-20122 Milano, Italy

Filed Jul. 15, 1988, Ser. No. 219,388

Claims priority, application Italy, Jul. 31, 1987, 21550 A/87

Int. Cl.⁴ A61B 1/06

U.S. Cl. 128-6

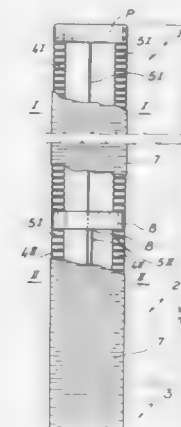
17 Claims

1. A flexible endoscope comprising a handle for an operator, control means on said handle to operate the endoscope, a flexible section, a first terminal articulated length composed of a plurality of articulated ring elements and controlled by said control means through the medium of motor means and two first pairs of wires passing through holes in said plurality of articulated ring elements, means on the tip of the terminal length for taking images in the cavity where the operation is taking place and for transmitting them to the outside, and means ancillary to the operation of said image-taking means, said ancillary means including

means for lighting said cavity, and

means for washing said cavity and said image-taking means, wherein said endoscope also comprises, between said flexible section and said terminal articulated length, at least one additional articulated length controlled by a control means on said handle through motor means, and two second pairs of wires, each pair of said wires having the upper end fastened to a ring at the upper end of the addi-

tional articulated length and the lower end fastened to a motor means able to pull a wire and slacken the other wire, each motor means for each articulated length being in the form of an assembly comprising a pair of electric motors capable of rotation in both directions of revolu-



tion, each associated with means adapted to impart a linear movement, in one direction or in the other one, to the lower ends of a pair of wires, and each assembly of motor means being controlled by an assembly of means located on an outer face of the handle.

4,873,966

FOOTREST HAVING HEATING, VIBRATION AND MASSAGING ADJUSTED BY USER'S FEET

Michael Gitter, 4 Longfellow Place Apt. 1703, 80 Staniford St., Boston, Mass. 02114

Filed Dec. 21, 1987, Ser. No. 135,715

Int. Cl.⁴ A61H 23/02, 15/00

U.S. Cl. 128-33

18 Claims

1. A footrest comprising:

a panel having a top part with a footrest surface; support means for movably mounting said panel to permit adjustable angular positioning of said top surface relative to horizontal;

vibrator means mounted inside said panel and responsive to application of voltage thereto for imparting vibration to said top surface;

selectively actuable vibration switch means mounted on said top part for selectively applying voltage to said vibrator means;

electrical heater means mounted inside said panel and responsive to passage of current therethrough for heating said top surface;

selectively actuable heater switch means mounted on said top part for selectively passing current through said heater means; and

massaging means for stimulating circulation in the soles of the feet of a user of said footrest, said massaging means comprising at least one roller member mounted on said panel for rotational movement about an axis extending substantially parallel to said top surface, said roller projecting at least partially above said top surface to permit selective rotation thereof by said user moving a foot along said top surface past said roller;

wherein said panel has: a length dimension corresponding to the heel-to-toe direction along which the feet of a user extend when using the footrest; a width dimension extending transversely of said length dimension; and a thickness dimension perpendicular to and very much smaller than both said length and width dimensions; said panel having first and second transversely spaced mounting slots defined entirely through said thickness dimension and ex-

tending lengthwise along most of said length dimension; and wherein said support means comprises:

a frame having a base portion adapted to rest on a floor surface and two upstanding transversely-spaced supports having the same transverse spacing as said slots in said panel, each support including first and second upwardly converging edges having a lengthwise spacing near said base that is greater than the length of said slots, and a lengthwise spacing near the support top that is smaller than the length of said slots, each support having a transverse dimension no greater than the width of said slots in order to permit a top portion of each support to fit through a respective slot, whereby said panel can be selectively tilted at different angles relative to horizontal by selectively positioning said slots relative to said first and second edges of said supports.

4,873,967

KNEE ORTHOSIS

Jeffrey L. Sutherland, 39 Ximeno Ave., Long Beach, Calif. 90803

Filed Apr. 27, 1987, Ser. No. 42,807

Int. Cl.⁴ A61F 5/00

U.S. Cl. 128-80 C

37 Claims



28. A knee orthosis for providing forces to restrain and restrict the movement of a leg during flexion and extension about the knee, comprising:

an upper orthotic assembly including a hard resilient upper shell adapted to substantially conform to the shape of the adjacent portion of the leg, also including means for affixing said assembly to the leg;

a lower orthotic assembly including a hard resilient lower shell with a softer inner lining adapted to substantially conform to the shape of the adjacent portion of the leg, also including means for affixing the assembly to the leg; and,

two orthosis linkages, one of the medial side of the knee, the other on the lateral side of the knee, each having a central portion and at least three members having an end proximate to the central portion and an end remote from the central portion, including:

a lower member connected to the lower shell, and rotatably connected to the central portion at a single axis pivot;

a short upper member pivotally connected to the upper shell at its remote end, and

a long upper member pivotally connected to the upper shell at its remote end, and pivotally connected to the proximate end of the short upper member at its proximate end, said pivotal connection being affixed to the central portion at an upper pivot point, said long upper member having a portion extending from the upper pivot point, said extended portion having a slidable contact surface on its posterior edge and said lower member having a fulcrum surface on its anterior edge proximate to the central portion, so that the contact surface and the fulcrum surface slidably engage begin-

ning at a first position within the range of 15° to 45° of full extension, and continually slidably engage between said first position and a second position of full extension.

4,873,968

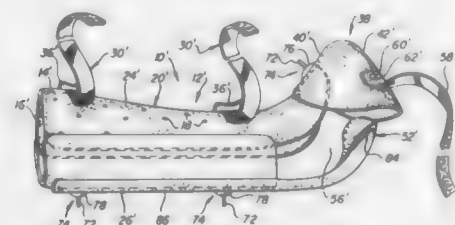
ADJUSTABLE HAND SPLINT

Alan Finniston, Hialeah; Burkhalter, William E.; Reyes, Franklin, both of Miami, and Loren I. Latta, Plantation, all of Fla., assignors to Maramed Precision Corporation, Hialeah, Fla.

Continuation-in-part of Ser. No. 934,856, Nov. 25, 1986, Pat. No. 4,765,319. This application Aug. 22, 1988, Ser. No. 234,648 Int. Cl.⁴ A61F 5/04

U.S. Cl. 128—87 R

11 Claims



1. A hand splint for immobilizing a hand, wrist, and distal forearm of a user, comprising:

a sleeve in which the hand, wrist and distal forearm are received, said sleeve being made of a semi-rigid material and including

(a) an elongate shell adapted to extend over the wrist and distal forearm, said shell including a volar shell portion and a dorsal shell portion which is partially received in said volar shell portion;

(b) a dorsal hood extending from said dorsal shell portion, said dorsal hood including a metacarpal hood portion which is adapted to cover the dorsum of the hand and a phalanx hood portion which is adapted to cover the proximal phalanges and which terminates thereat; said metacarpal hood portion adapted to form a dorsiflexion angle of between 60° to 80° with the axis of the forearm so that a comfortable maximal dorsiflexion of the wrist is achieved; and said metacarpal hood portion forming a hood angle of between 75° to 90° with said phalanx hood portion;

(c) a first attaching and locking means for adjustably attaching said dorsal hood to said dorsal shell portion while said hand splint is being fitted to the user and for subsequently locking said dorsal hood in the adjusted position to said dorsal shell portion after fitting;

(d) a palm arch support extending from said volar shell portion, said palm arch support extending adjacent said metacarpal hood portion in order to maintain the hand in said dorsal hood with the wrist in dorsiflexion by abutment with said metacarpal hood portion and the metacarpal-phalangeal joints at an angle of greater than about 90° to 105° by abutment of the proximal phalanges with said phalanx hood portion;

(e) a second attaching and locking means for adjustably attaching said palm arch support to said volar shell portion while said hand splint is being fitted to the user and for subsequently locking said palm arch support in the adjusted position to said volar shell portion after fitting; and

(f) a thumb opening between said dorsal hood and said palm arch support defined by borders thereof, said borders being adapted to be recessed from the thumb such that the thumb of the user extends through the thumb opening and all joints of the thumb are free to move; and

a holding means for holding said sleeve in radial abutment with the hand, wrist and distal forearm of the user.

4,873,969
METHOD AND APPARATUS FOR REMOVAL OF BONE CEMENT

Donald L. Huebner, 3716 Prestwick Dr., Los Angeles, Calif. 90017

Continuation-in-part of Ser. No. 131,830, Dec. 11, 1987. This application Aug. 15, 1988, Ser. No. 232,506 Int. Cl.⁴ A61F 5/04

U.S. Cl. 128—92 R

10 Claims



1. A process for removing bone cement from a bone cavity during a prosthetic revision, comprising:

providing a surgical instrument having a heated tip at its working end and a heat element carried by the instrument for heating the tip;

heating the tip by the heat element to a temperature sufficient to mold one or more grooves into the bone cement upon direct contact by the heated tip of the surgical instrument; insert the heated tip into the bone cement to mold one or more grooves into it,

removing the heated tip and, allowing the bone cement to reharden which produces weakened areas in the bone cement in the vicinity of the molded grooves, placing a surgical impact type chisel against the sections of the bone cement between said weakened areas, and removing the sections of bone cement by direct impacting of the chisel; and

repeating the molding and impacting steps until substantially all bone cement is removed from the cavity.

4,873,970

WARNING DEVICE TO INDICATE THE STATE OF GASES EXHAUSTION OF A GAS FILTER RETAINING DANGEROUS GASES

Michael Freidank; Jürgen Coym, and Axel Schubert, all of Berlin, Fed. Rep. of Germany, assignors to Anergesellschaft GmbH, Berlin, Fed. Rep. of Germany

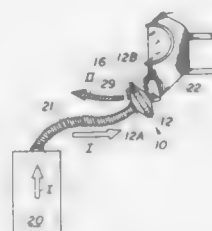
Continuation of Ser. No. 41,595, Apr. 22, 1987, abandoned. This application Mar. 10, 1989, Ser. No. 323,069

Claims priority, application Fed. Rep. of Germany, Apr. 22, 1986, 3613512

Int. Cl.⁴ A62B 7/10

U.S. Cl. 128—202.22

12 Claims



1. A warning device for indicating the exhaustion of a separate gas filter retaining a toxic gas which device functions independently from the gas filter and comprises:

a housing having an inlet and an outlet through which gas is able to enter and leave the housing;

electrochemical means for directly detecting the overall concentration of the toxic gas that enters the housing from the gas filter, said electrochemical means disposed within the housing;

means for alerting disposed on the housing; and

means for activating the alerting means when a predeter-

mined concentration of toxic gas is detected, said activation means disposed within said housing.

4,873,971

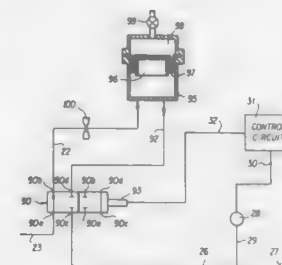
METHOD AND MEANS FOR DISPENSING RESPIRATING GASES BY EFFECTING A KNOWN DISPLACEMENT

Warren E. Perkins, 9960 S A-1-A, Apt. 1901, Jensen Beach, Fla. 34957

Continuation-in-part of Ser. No. 783,121, Oct. 2, 1985, Pat. No. 4,705,034. This application Oct. 26, 1987, Ser. No. 112,117 Int. Cl.⁴ A61M 16/00

U.S. Cl. 128—201.23

9 Claims



1. A device for supplying premeasured doses of respiring gas to a patient in synchronization with the respiratory cycle of the patient, comprising:

a source of respiring gas at relatively high pressure; containment means having a volume sized to measure a prescribed single dose quantity of said respiring gas at source pressure and to temporarily store said measured dose;

means for sensing the onset of inhalations of the patient and for producing signals in response to said sensing;

first gas flow routing means for connecting said gas source to said containment means;

second gas flow routing means and cannula means, said second gas flow routing means connecting said containment means to one end of said cannula means;

means connected to the other end of said cannula means and adapted for communication with the nasal cavity of the patient;

valve means positioned in both said first and second gas flow routing means, said valve means arranged to alternate between two positions, the first of said positions connecting said source of respiring gas to said containment means through said first gas flow routing means thereby filling said containment means with respiring gas at source pressure, said valve means arranged to move to the second of said positions in response to a sensed inhalation signal, said second valve position connecting said containment means to said cannula means through said second gas flow routing means thereby releasing said measured dose quantity of respiring gas from said containment means and conveying said gas dose to the patient, said valve means arranged to return to the first of said positions after delivery of said measured gas dose to the patient has been completed.

4,873,972

DISPOSABLE FILTER RESPIRATOR WITH INNER MOLDED FACE FLANGE

Mark Magidson, Los Angeles, and Otto L. Huber, Beverly Hills, both of Calif., assignors to Moldex/Metric Products, Inc., Culver City, Calif.

Filed Feb. 4, 1988, Ser. No. 152,365

Int. Cl.⁴ A62B 7/00

U.S. Cl. 128—206.12

27 Claims

1. A filter respirator forming a face mask to be worn upon

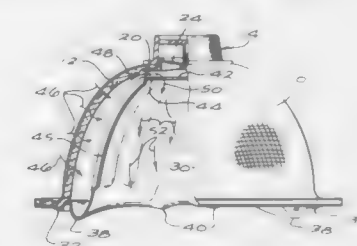
the face of a user for providing filtering of impurities in the air, including,

a support layer of flexible material including outer peripheral edges generally conforming to the contours of the face of the user and forming a flexible support layer of filter material and constructed to allow air inhaled by the user to flow through the support layer,

a separate layer of filter material supported by the support layer of flexible material and having properties of filtering impurities in the air inhaled by the user,

an exhalation valve extending through the support layer and the filter layer in a central position for exhausting air exhaled by the user and including an inside surface within the central position, and

a non-porous flexible inner flange forming a flexible half-mask conforming to the contours of the face of the user,



means providing for the passage of the inhaled air through the support layer and the layer of filter material and the deflection of such inhaled air by the inner flange, said means comprising said inner flange being sealingly attached to the outer peripheral edges of at least the support layer, the inner flange extending inwardly to the central position to direct the inhaled air, after deflection, to the central position and including a central opening with a surrounding portion conforming and contiguous to the inside surface of the exhalation valve, the surrounding portion of the inner flange being movable away from the inside surface of the exhalation valve, upon the inhalation of air by the user, and thereby forming an inhalation passage between the inside surface of the exhalation valve and the surrounding portion of the central opening of the inner flange to permit the passage of inhaled air to the user.

4,873,973

MULTI-PART NEUTRAL ELECTRODE FOR AN HF SURGICAL INSTRUMENT

Uwe Hagen, Forchheim, and Udo Redler, Effeltrich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, both of, Fed. Rep. of Germany

Filed Apr. 21, 1988, Ser. No. 184,460

Claims priority, application Fed. Rep. of Germany, Jul. 13, 1987, 3723128; Sep. 3, 1987, 3729516

Int. Cl.⁴ A61B 17/39

U.S. Cl. 128—303.13

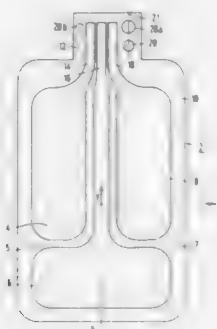
20 Claims

1. A multi-part neutral electrode for an HF surgical instrument having partial electrodes arranged on a common carrier, in combination with a connecting clamp including two facing elements having respective inner surfaces urged together by spring force, one of said elements including electrical contacts therein and said two elements releasably clamping said neutral electrode for making electrical connection thereto, wherein:

an edge portion of said carrier is provided with an extension, said carrier extension having parallel electrical connections thereon leading from said partial electrodes;

said carrier extension including first and second openings arranged asymmetrically with respect to said parallel electrical connections and offset from the center of said carrier extension; and

one of the two facing elements of said connecting clamp is provided on its inner surface with first and second projec-



tions located for alignment with said first and second openings of said carrier extension.

4,873,974

NEUTRAL ELECTRODE FOR A HIGH-FREQUENCY SURGICAL INSTRUMENT

Uwe Hagen, Forchheim, and Udo Redler, Effeltrich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany
Filed Apr. 21, 1988, Ser. No. 184,461

Claims priority, application Fed. Rep. of Germany, Sep. 11, 1987, 3730604

Int. Cl.⁴ A61B 17/39

U.S. Cl. 128—303.13

4 Claims



1. A neutral electrode assembly for a high-frequency surgical instrument, comprising:
an electrode carrier; and
at least three partial electrodes arranged in a predetermined direction next to each other on said electrode carrier so that the partial electrodes have surface areas which are decreasingly smaller in the predetermined direction, and the electrode carrier has on one side which is essentially parallel to the predetermined direction an electrical line terminal to which electrical connection lines lead from the partial electrodes.

4,873,975

ANASTOMOSIS DEVICE AND METHOD

David J. Walsh, Mississauga; William M. Loughheed, Toronto; Fred Gentili, and Mahmood Fazl, both of Toronto, all of Canada, assignors to Walsh Manufacturing (Mississauga) Limited, Ontario, Canada

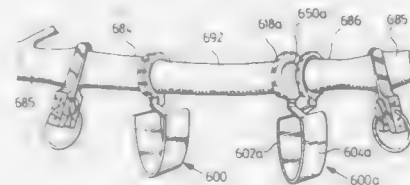
Continuation of Ser. No. 923,209, Oct. 27, 1986, Pat. No. 4,771,775, which is a division of Ser. No. 598,900, Apr. 10, 1984, Pat. No. 4,657,019. This application Dec. 14, 1987, Ser. No. 132,599

The portion of the term of this patent subsequent to Sep. 20, 2005, has been disclaimed.

Int. Cl.⁴ A61B 17/04, 17/08

U.S. Cl. 128—334 R

5 Claims



1. A unitary anastomosis device for non-suture end-to-end connection of tubular tissue members to be anastomosed comprising:

a first support member having a permanently formed first orifice wall defining a first orifice in said first support member for axial passage of a free open end of a first tubular tissue member therethrough,

a second support member having a permanently formed second orifice wall defining a second orifice in said second support member for axial passage of a free open end of a second tubular tissue member therethrough,

said first support member having means integral therewith and outwardly of said first orifice wall to secure the everted free open end of said first tubular tissue member thereto,

said second support member having means integral therewith and outwardly of said second orifice wall to secure the everted free open end of said second tubular tissue member thereto, and

a spring loaded body member integral with said first and second support members adapted to hold said first and second support members in a first position in which the support members are in a substantially contacting relationship with said first and second orifices in axial alignment, and a second position in which said first and second support members are in spaced apart relationship with said first and second orifices in axial alignment,

said support members being substantially annular and said first and second orifices being circular, said first and second orifice walls being circular, said means integral with said first and second support members comprising a plurality of outwardly extending spaced apart teeth,

the teeth on said first support member being adapted to engage an end of said first tubular member passed through said first orifice and everted thereover,

the teeth on said second support member being adapted to engage an end of said second tubular member passed through said second orifice and everted thereover,

whereby in said first position an annulus of tissue material at said everted end of said first tubular member is held against anastomotic separation in engagement with an annulus of tissue material at said everted end of said second tubular member,

said spring loaded body member urging said support members into said first position,

said first and second support members being separable to said second position responsive to pressure on said body member countering the spring loading,

said body member having a generally U-shaped portion having opposed first and second leg members, said leg members terminating at their opposed free ends in first and second arms, said arms being in cross-over relationship, said arms terminating in said first and second support members.

4,873,976

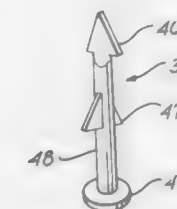
SURGICAL FASTENERS AND METHOD

Saul N. Schreiber, 6525 N. Central Ave., Phoenix, Ariz. 85012
Filed Feb. 28, 1984, Ser. No. 584,464

Int. Cl.⁴ A61B 17/04

U.S. Cl. 128—334 R

31 Claims



16. A single unit suture for body tissue repair comprising:
a solid base member having a substantially flat portion for seating against an exterior surface of said tissue;
a single, rigid cylindrical shaft portion upstanding from and integrally connected to said base member and having a pointed end for insertion into said tissue; and
barb means positioned along said shaft portion.

4,873,977

STAPLING METHOD AND APPARATUS FOR VESICLE-URETHRAL RE-ANASTOMOSIS FOLLOWING RETROPUBIC PROSTATECTOMY AND OTHER TUBULAR ANASTOMOSIS

Odis L. Avant, 4703 89th St., Lubbock, Tex. 79423, and Duane A. Crawford, Lubbock, Tex., assignors to Odis L. Avant, Lubbock, Tex.

Filed Feb. 11, 1987, Ser. No. 13,855

Int. Cl.⁴ A61B 17/04; B31B 1/00; A61M 3/00, 29/00

U.S. Cl. 128—334 R

74 Claims



1. A surgical apparatus for effecting the connection of first and second hollow body members comprising:

(a) first and second connector components;

(b) a first operator comprising an elongated hollow tube having a distal end and dimensioned to be inserted in and through said first body member to position said distal end generally adjacent a part of said first body member to be joined to said second body member and including selectively operable first connection permitting means provided in said distal end;

(c) anvil means dimensioned to be positionable in said first body member and including second connection permitting

means operable for engagement with said first connection permitting means for connecting said anvil means to said distal end of said elongated hollow tube and further including first alignment means spaced from said second connection permitting means and a first connector component supporting means for supporting said first connector component;

(d) a second operator including a tubular housing having a distal end and being dimensioned to be positionable in said second body member with its distal end adjacent a portion of said second body member to be joined to said first body member, a second connector component supporting means in said distal end for supporting said second connector component, and second alignment means engageable with said first alignment means of said anvil means for effecting proper alignment of said first and second connector components in a ready condition and force exerting movable means mounted for movement in said tubular housing toward said anvil means when said first and second alignment means are in said ready condition, for forcefully moving said second connector component toward said first connector component to effect locking engagement of said first and second connector components; and

(e) wherein said first and second connector components include mutually facing clamping surfaces for clamping generally annular tissue portions of said first and second body members together when said second alignment means is engaged with said first alignment means and wherein said clamping surfaces include mutually engaging interlocking means which hold said annular tissue portions in clamped engagement with each other following locking engagement of said first and second connector components.

4,873,978

DEVICE AND METHOD FOR EMBOLI RETRIEVAL

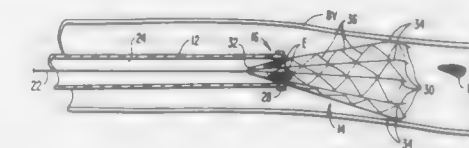
Robert Ginsburg, 2489 Alpine Rd., Menlo Park, Calif. 94025

Filed Dec. 4, 1987, Ser. No. 128,770

Int. Cl.⁴ A61M 29/00

U.S. Cl. 128—345

13 Claims



1. A catheter device for capturing and retrieving emboli from a blood vessel, said catheter device comprising:

an elongate catheter body having a proximate end and a distal end;

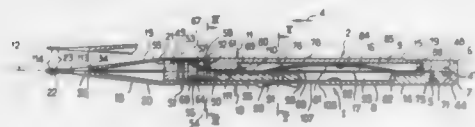
a strainer mounted at the distal end of the catheter body, said strainer comprising a plurality of tines which are shiftable between an opened configuration where they are capable of capturing emboli and a closed configuration where they are capable of retaining captured emboli, said tines having inwardly curved tips; and

means actuatable from the proximate end for selectively shifting the tines of the strainer between the opened configuration and the closed configuration.

4,873,979

MICRO-SURGICAL INSTRUMENT FOR USE AS GRIPPER OF SCISSORS

Khalil Hanna, 19 rue Las Cases, 75007 Paris, France
 PCT No. PCT/FR87/00078, § 371 Date Nov. 17, 1987, § 102(e)
 Date Nov. 17, 1987, PCT Pub. No. WO87/05484, PCT Pub.
 Date Sep. 24, 1987
 PCT Filed Mar. 18, 1987, Ser. No. 128,074
 Claims priority, application France, Mar. 18, 1986, 86 03828
 Int. Cl.⁴ A61B 17/30
 U.S. Cl. 128—354 33 Claims



1. A microsurgical instrument for use as pincers or scissors, said microsurgical instrument comprising:
 two rigid longitudinal arms mutually pivoted about a defined transverse axis and have on one hand respective proximal ends and on the other hand respective distal ends, said distal ends being longitudinally spaced with respect to said axis and adapted to co-operate in a pinching or cutting action, respectively, by relative rotation of the two arms about said axis in a first direction corresponding to a mutual approach of said distal ends, the arms having respective manual operation zones for relative rotation about said axis in said first direction whilst there is provided means for resilient urging of the arms into relative rotation about said axis in a second direction opposite to said first direction and corresponding to a mutual spacing of said distal ends,
 said axis being situated at the proximal ends of the arms, and said manual operation zones being situated between said axis and the distal ends of the arms,
 both of the arms have in a fixed manner, at their proximal ends, at least one respective longitudinal lug arranged side to side, and said at least one respective longitudinal lug being pierced on said axis with respective bores in which is engaged a common pivot pin.

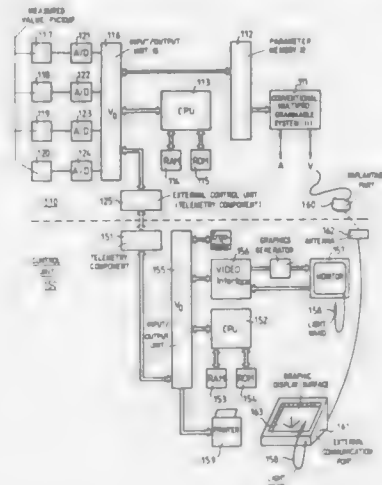
4,873,980

HEART PACEMAKER

Max Schaldach, Erlangen, Fed. Rep. of Germany, assignor to Mess-und Therapiegeräte GmbH & Co., Berlin, Fed. Rep. of Germany
 Continuation-in-part of Ser. No. 908,367, Sep. 17, 1986, abandoned. This application Mar. 17, 1987, Ser. No. 26,674
 Claims priority, application Fed. Rep. of Germany, Sep. 17, 1985, 3533502
 Int. Cl.⁴ A61N 1/36
 U.S. Cl. 128—419 10 Claims

1. A cardiac pacemaker, comprising:
 means for applying stimulating pulses to the heart of the patient at a rate determined by a pacing parameter;
 means for detecting a first physiological parameter which is correlated with physical exertion of the patient and producing a first output signal representative of said first physiological parameter;
 a memory having a plurality of memory locations containing data;
 a means for producing a first address signal as a function of said first physiological parameter;
 a means for producing at least one further address signal;
 a means for addressing said plurality of memory locations as a function of said first address signal and said further address signal and for outputting the addressed data as a second output signal;

circuitry means receiving said first output signal for varying the pacing parameter as a function of said first output

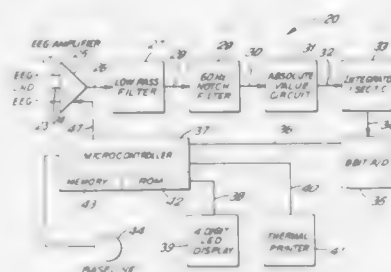


signal, said circuitry means being controllable by the addressed data received by said circuitry means.

4,873,981

ELECTROCONVULSIVE THERAPY APPARATUS AND METHOD FOR AUTOMATIC MONITORING OF PATIENT SEIZURES

Richard Abrams, Chicago, and Conrad M. Swartz, Lake Forest, both of Ill., assignors to Somatix, Inc., Lake Bluff, Ill.
 Filed Oct. 14, 1988, Ser. No. 258,209
 Int. Cl.⁴ A61N 1/36
 U.S. Cl. 128—419 S 13 Claims



8. A system for electroconvulsive therapy ECT to monitor the termination of an induced seizure in a patient, the system including:

an ECT device including a plurality of electrodes removably securable on the head of the patient and means for applying electricity through the electrodes in an electroconvulsive therapy session to induce seizure, and
 an electroencephalograph EEG means to detect electrical brain waves of the patient including means to amplify the brain waves and connected thereto, at least one electrode adapted to be removably secured to the head of the patient; system memory means to establish and store in system memory a baseline reference of a brain wave parameter, timer means to commence monitoring of brain waves for the termination of the seizure in the range of 1-30 seconds after ceasing the said application to induce seizure, measurement means for automatically measuring the termination of seizure as determined by the decline of the monitored brain wave parameter to the said baseline reference, display means to display said termination of seizure, an elapsed time means for measuring the time

4,873,982

EXAMINATION GARMENT

Judith A. Morrison, 651 Fabian Rd., Indianapolis, Ind. 46217
 Filed Oct. 24, 1988, Ser. No. 261,331
 Int. Cl.⁴ A61B 5/00
 U.S. Cl. 128—630 6 Claims



1. A touch sensitive cancer detection garment to be worn during a tactile examination of the human body for lumps, in which the garment is worn over the area being examined, said garment comprising:

- first and second plies having contacting surfaces which glide easily over each other due to a low coefficient of friction so that an effective tactile examination may be conducted of an area of the body over which the garment is worn; and
- said first ply is located next to the skin when the garment is worn on the body and said second ply is sized slightly larger than said first ply such that when said second ply is secured to said first ply, said second ply fits loosely over said first ply to facilitate a greater range of sliding movement of said second ply relative to said first ply; and
- means for securing said plies together to form said garment; and
- said first ply is dominantly elastic in a first direction and said second ply is dominantly elastic in a second direction wherein, when said plies are joined together to form said garment, said first and second directions are substantially perpendicular to each other; and
- means for securing the garment on an area of the human body.

4,873,983

STEERABLE GUIDEWIRE FOR VASCULAR SYSTEM

R. Edward Winters, Andover, Mass., assignor to Advanced Biomedical Devices, Inc., Andover, Mass.
 Filed Jan. 27, 1988, Ser. No. 148,906
 Int. Cl.⁴ A61M 25/00
 U.S. Cl. 128—657 5 Claims

1. A steerable guidewire arranged to be transported through the vascular system comprising in combination:
 a. a helically wound tapered spring terminating at the distal end in a smooth rounded tip;
 b. a length of tubing attached to the proximal end of said spring;
 c. a safety wire disposed within and attached to the inner surface of said spring, said wire extending to the tip of said spring, said wire having sufficient rigidity to allow said spring to be curved at its distal end; and
 d. a tapered core wire moveably disposed within said tubing and said spring; the tip of said core wire arranged to be

extended to the inner tip of said spring whereby the distal end of said spring will be variably stiffened and straight-



ened according to the position of said core wire within said spring.

4,873,984

TECHNIQUES FOR CALCULATING ULTRASONIC INTEGRATED BACKSCATTER USING FREQUENCY OR TIME DOMAIN TECHNIQUES

Thomas J. Hunt, Derry, N.H.; James G. Miller, Clayton, Mo.; Lewis J. Thomas, III, Schenectady, N.Y.; Hewlett E. Melton, Jr., Andover, and Thomas A. Shoup, Lowell, both of Mass., assignors to Hewlett-Packard Company, Palo Alto, Calif.
 Filed May 30, 1986, Ser. No. 869,502
 Int. Cl.⁴ A61B 10/00
 U.S. Cl. 128—660.07 7 Claims



1. Apparatus for deriving signals indicative of the integrated ultrasonic backscatter of tissue lying along lines in a cross sectional area of a body comprising:

means for respectively launching pulses of ultrasonic pressure waves along a plurality of lines in a cross sectional area of a body in sequence,
 transducer means for continually deriving first electrical signals from pressure waves scattered by tissues lying along each line,
 circuit means responsive to said first electrical signals for continuously producing second electrical signals representing the instantaneous ultrasonic power scattered by the tissue, and
 circuit means for continuously integrating said second signals as they are produced so as to obtain third signals representing the ultrasonic energy scattered by a given volume of tissue that moves outward along said lines after a pulse is launched.

4,873,985

ULTRASONIC IMAGING APPARATUS UTILIZING DOPPLER FLOW METERING

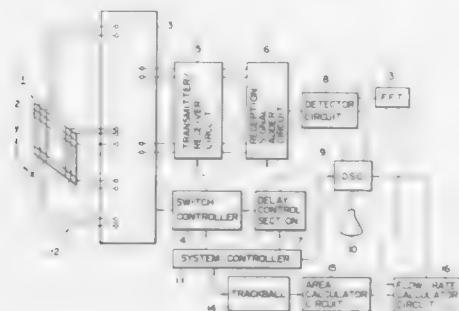
Hirotsuka Nakajima, Tochigi, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
 Filed Jan. 4, 1988, Ser. No. 140,680
 Claims priority, application Japan, Jan. 12, 1987, 62-3204
 Int. Cl.⁴ A61B 8/06
 U.S. Cl. 128—661.09 9 Claims

1. An ultrasonic imaging apparatus comprising:
 ultrasonic transducer means, having a plurality of ultrasonic transducer elements arranged in a matrix having column and row lines, for emitting first and second ultrasonic

beams to an object having a blood vessel extending in a predetermined direction therein and for converting echoes of the ultrasonic beams into first and second echo signals;

driving means, coupled to said ultrasonic transducer means, for selectively driving said transducer elements for generating the first ultrasonic beam for scanning the object in a first B-scan orientation corresponding to the row lines, to obtain a first B-mode image, and the second ultrasonic beam for scanning the object in a second B-scan orientation corresponding to the column lines, to obtain a second B-mode image crossing the first B-mode image;

means for designating a selected scanning position in the



second B-scan orientation, the second B-mode image crossing the first B-mode image at the selected scanning position;

means for converting, into first and second image signals corresponding to the first and second B-mode images, respectively, the first and second echo signals output from said ultrasonic transducer means, said first and second echo signals corresponding to the echo signals obtained by scanning the object in the first and second B-scan orientations, said converting means including means for detecting a Doppler component from the first image signal; and display means, coupled to said transducer means, responsive to the first and second image signals for displaying the first and second B-mode images.

4,873,986

DISPOSABLE APPARATUS FOR MONITORING INTRAUTERINE PRESSURE AND FETAL HEART RATE
William D. Wallace, Salt Lake City, Utah, assignor to Utah Medical Products, Salt Lake City, Utah
Continuation-in-part of Ser. No. 033,420, Apr. 1, 1987, Pat. No. 4,785,822. This application Apr. 27, 1988, Ser. No. 186,894
Int. Cl.⁴ A61B 5/02

U.S. Cl. 128-670

44 Claims



1. An apparatus for monitoring intrauterine pressure pulses and fetal heart rate, comprising:

a pressure transducer having a diaphragm with first and second sides, said first side being in communication with said intrauterine pressure pulses;
cable means for providing a plurality of electrical conductors, at least two of said plurality of conductors being connected to said pressure transducer;
vent means for introducing atmospheric pressure to said second side of said diaphragm;
means for connecting the plurality of electrical conductors to a monitoring device; and
a pair of electrode means for independently receiving electrical signals through amniotic fluid generated by the

heart of a fetus, each said electrode means being located on an outside surface of said cable means so as to be in electrical contact with said amniotic fluid and being positioned at a leading end of said cable means adjacent said transducer such that when said leading end is inserted into the uterus of a patient, each said electrode means senses fetal heart rate through amniotic fluid within the uterus, each said electrode means being connected to at least one of the plurality of electrical conductors such that the fetal heart rate and the intrauterine pressure may be displayed by said monitoring device.

4,873,987

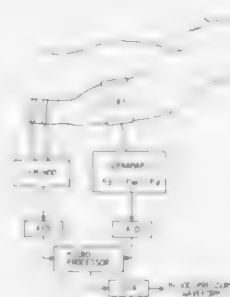
NONINVASIVE CONTINUOUS MONITOR OF ARTERIAL BLOOD PRESSURE WAVEFORM
Ljubomir Djordjevic, 4170 North Marine Dr., Apt. 18H, Chicago, Ill. 60613, and Anthony K. Ivankovich, 526 Woodland, Glenview, Ill. 60025

Filed Jun. 30, 1988, Ser. No. 213,358

Int. Cl.⁴ A61B 5/02

U.S. Cl. 128-672

28 Claims



1. A method of continuously, noninvasively measuring blood pressure, said method comprising the steps of: noninvasively determining at least discrete systolic and diastolic blood pressure values; simultaneously, noninvasively monitoring the patient with a waveform signal means to generate a sample continuous non-pressure waveform signal; inputting said discrete systolic and diastolic blood pressure values and said sample continuous non-pressure waveform signal to a microprocessor; calculating at least systolic and diastolic points for said sample continuous non-pressure waveform signal; calibrating said systolic and diastolic points with said systolic and diastolic blood pressure values, respectively, and storing said calibrated information; continuously, noninvasively monitoring said patient with said waveform signal means to generate a continuous non-pressure waveform signal; using said calibrated information to transform said continuous non-pressure waveform signal into a continuous blood pressure waveform.

4,873,988

VASOMETRIC TEST APPARATUS FOR TESTING BLOOD SUPPLY TO THE TOE OF A PATIENT
Karl-Heinz Affeldt, and Ulrich Hantel, both of Berlin, Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 16, 1988, Ser. No. 194,463

Claims priority, application Fed. Rep. of Germany, May 21, 1987, 3717046

Int. Cl.⁴ A61B 5/02

U.S. Cl. 128-687

17 Claims

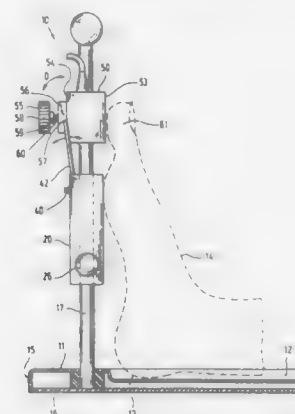
1. Vasometric test apparatus for testing blood supply to a toe (61) of the foot (14) of a patient, comprising

a base plate (11) formed with a depression to receive the heel (13) of the foot of the patient and thereby locate the foot of the patient with respect to a predetermined position on the base plate, whereby the foot is in upright vertical position;

an upstanding support structure (17, 18) projecting from the base plate (11) and extending vertically at an essentially right angle to the base plate;

a support element (20) adjustably positioned on the support structure (17, 18), said support element having a back wall (22) positioned for contacting the underside of the foot (14) of the patient in an essentially upright or vertical position, with the toe (61) projecting vertically;

a pulse sensor (50) having a sensing surface (53), supported



from said support element (20) for contact with the toe of the patient; and

means for placing said pulse sensor to align the sensing surface (53) thereof with the toe of the patient and in controlled resilient position with respect to the toe of the patient when the heel (13) of the patient's foot is in said depression and extending vertically, and the foot is resting against said back wall (22) of the support element, said sensor placing means including means (26, 34, 40, 55, 60) for controllably resiliently supporting said pulse sensor (50) on said support element (20) for controlled resilient positioning with respect to the toe of the patient, and for controlled movement in three dimensions of the pulse sensor with respect to said base plate (11), whereby said pulse sensor can be aligned with the toe of the patient.

4,873,989

FLUID FLOW SENSING APPARATUS FOR IN VIVO AND INDUSTRIAL APPLICATIONS EMPLOYING NOVEL OPTICAL FIBER PRESSURE SENSORS

Robert E. Einzig, Herndon, Va., assignor to Optical Technologies, Inc., Herndon, Va.

Continuation-in-part of Ser. No. 587,464, Mar. 8, 1984, abandoned, and a continuation-in-part of Ser. No. 776,118, Feb. 25, 1985. This application Oct. 3, 1986, Ser. No. 915,113

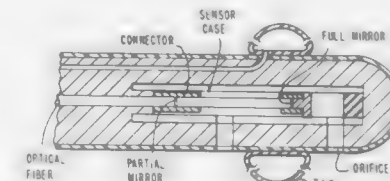
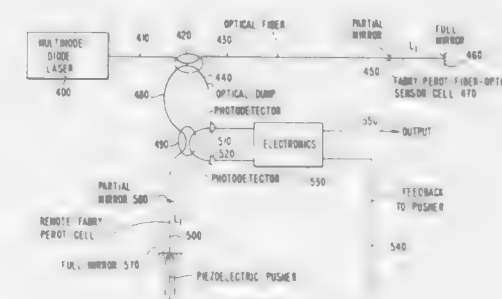
Int. Cl.⁴ A61B 5/02

U.S. Cl. 128-692

16 Claims

1. A fiber optic fluid differential pressure measuring device comprising a radiant energy emitting means having a predetermined coherence length an optical fiber sensor configured as an interferometer segment mounted on an optic fiber; said sensor interferometer segment causing path deviations of a measuring beam to be greater than the coherence length of the radiant energy emitted from said radiant energy emitting means; a pair of orifices adapted to be in communication with the fluid pressure to be measured, said orifices positioned at each end of the optical fiber sensor segment; means for positioning said optical fiber sensor segment in the fluid to be measured; means for creating constriction in the fluid to be measured spaced between the pair of orifices; a fiber optical demodulator

interferometer segment; said demodulator interferometer segment causing the path length of the said measuring beam to be within the coherence length of said radiant energy emitting means; means connecting the optical fiber sensor interferome-



4,873,990

CIRCUMFERENTIAL PRESSURE PROBE

Harlan K. Holmes, Newport News; Thomas C. Moore, Jr., Poquoson, and Andrew J. Fantl, Richmond, all of Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C. and Virginia Commonwealth University, Richmond, Va.

Filed Sep. 23, 1988, Ser. No. 248,020

Int. Cl.⁴ A61B 5/00

U.S. Cl. 128-748

5 Claims



1. A probe for measuring circumferential pressures inside a body cavity comprising:

a circularly sectioned, longitudinally extended support tube, said support tube having an internal lumen and an outside wall, said outside wall consisting of an elastic material, said material capable of being deformed by pressures in the range expected to exist in the area inside the body cavity which is under investigation and tending to return to its original configuration once the pressure is removed, at least one deformable wall sensor along the length of the support tube, each such sensor comprising:
slot means extending through the outside wall of the support tube so that an essentially rectangular flexible

wall section is separated from the support tube on three sides, the fourth side of the flexible wall section remained attached longitudinally to the support tube; and deformation measurement means such that when the flexible wall section is displaced inwardly by an externally applied pressure and deformed, a signal proportional to the degree of deformation is produced which is detectable by an external sensing means;

external connecting means for connecting the deformable wall sensor to an external sensing means, said external connecting means passing through the lumen of the support tube and terminating at a connection with the external sensing means; and

protecting means for protecting sensor components from substances in the area inside the body cavity which is under investigation so that said substances cannot penetrate the slot means.

4,873,991

BIOPSY NEEDLE

Bruce A. J. Skinner, 115 Upton Rd., Sauter Ste. Marie, Ontario, Canada (P6A 3W2)

Filed Sep. 21, 1988, Ser. No. 247,169

Int. Cl.⁴ A61B 10/00

U.S. Cl. 128—754

14 Claims



1. A biopsy needle for sampling tissue and the like, said biopsy needle comprising:

- a sidewall of a rigid material defining a hollow interior portion;
- a sharpened forward end associated with said sidewall for severing the tissue;
- a lanced section disposed along said sidewall, said lanced section being formed from said rigid material of said sidewall itself and defining a rigid blade sloping and facing rearwardly away from said forward end and penetrating said hollow interior portion whereby upon inserting said needle into a subject, severing a tissue with said sharpened end, passing a tissue into said hollow interior and slicing off a tissue sample by rotating said blade 360 degrees, a tissue sample is securely held within said needle as said needle is withdrawn from a subject

4,873,992

CERVICAL CYTOLOGY DEVICE

Irman D. Bayne, Littleton, Colo., assignor to Medical Dynamics, Inc., Englewood, Colo.

Division of Ser. No. 28,458, Mar. 20, 1987, Pat. No. 4,754,764. This application Feb. 8, 1988, Ser. No. 153,417

Int. Cl.⁴ A61B 10/00

U.S. Cl. 128—756

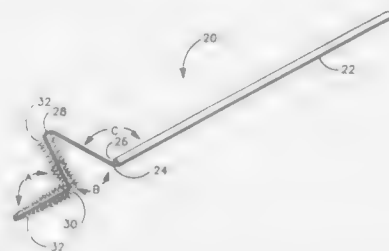
9 Claims

1. A cervical cytology device for simultaneously collecting cytology cell samples from the endocervix and exocervix, said device comprising:

- a handle for manipulating and rotating said device and having a handle shaft bent to provide a proximally extending handle portion and a laterally extending offset portion;
- an intermediate region, with a shaft surrounded by cell collecting means attached at one end to said laterally extending offset portion of said handle and having a surface sized and configured to scrape cytology cell samples from the exocervix when said device is rotated and said

intermediate collecting means is in contact with the exocervix;

- a distal region with a shaft surrounded by cell collecting means attached to said shaft of said intermediate cell collecting means, said collecting means having a surface sized and configured to scrape cytology cell samples from



the endocervix when the device is rotated and said distal collecting means is in contact with the endocervix; said intermediate region shaft being integral with said distal region shaft but extending laterally from said distal region shaft

said handle portion being axially aligned with said shaft of said distal region.

4,873,993

CUVETTE

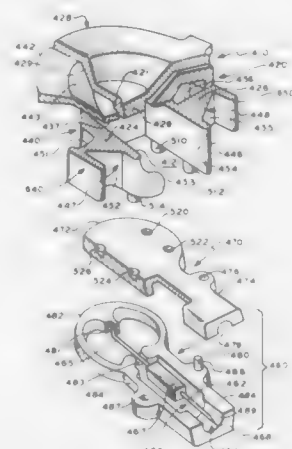
Peter M. Meserol, Montville, and Thomas Palmieri, Paramus, both of N.J., assignors to Personal Diagnostics, Inc., Whippany, N.J.

Continuation-in-part of Ser. No. 888,752, Jul. 22, 1986, abandoned. This application Jul. 13, 1987, Ser. No. 69,505

Int. Cl.⁴ A61B 5/00

U.S. Cl. 128—760

5 Claims



- 1. A combination lancet and cuvette apparatus, comprising: cuvette providing a cavity for receiving an optically transparent medium including a reagent test system for reacting with a sample portion of a fluid of interest; said cuvette made of optically transparent material and provided with a shape and optical elements for causing a beam of light to pass therethrough and through said medium by total internal reflectance and for causing said beam of light to be reflected back along a line different from the direction of the line of entry of said light beam into said cuvette;
- a lancet provided on and extending from said cuvette and including a rearward portion and a forward tip for producing skin puncture to produce said body fluid of interest;

said cuvette comprising a cuvette body member including a generally funnel-shaped upper portion including a bottom and an inwardly extending generally spherical surface providing a depression, and a closed wall portion formed integrally with said upper portion and extending downwardly therefrom, said closed wall including opposed wall portions provided with integrally formed opposed angular portions providing said optical elements with each optical element including flat outer and inner surfaces for being disposed perpendicular to said beam of light and an outer angular surface for being disposed at a predetermined angle with respect to one of said flat surfaces;

said lancet comprising a lancet support member including a resilient rearward portion and a forward portion, said rearward and forward portions of said lancet support member cooperatively providing an internal chamber for slidably receiving said lancet with said forward tip of said lancet extending outwardly out of said lancet support member through an opening formed in said forward portion of said lancet support member and with said rearward portion of said lancet secured to said resilient rearward portion of said lancet support member, upon sufficient force being applied externally to said resilient rearward portion of said lancet support member said resilient rearward portion being bowed inwardly to advance said lancet sufficiently forward to cause said forward tip of said lancet to produce said skin puncture and provide said body fluid of interest;

said closed wall including a bottom portion and said rearward portion of said lancet support member including a top portion, said bottom and top portions provided with mutually engageable connecting members for securing said lancet support member to the bottom portion of said closed wall and upon said top portion of said rearward portion of said lancet support member being secured to said bottom portion of said closed wall, said top portion of said rearward portion of said lancet support member, said closed wall and said bottom of said generally funnel-shaped upper portion providing in combination said cavity for receiving said medium including a reagent test system;

said bottom of said generally funnel-shaped upper portion provided with a centrally formed access opening extending therethrough and providing access to said cavity for said sample portion and said depression for facilitating wiping of said sample portion of said fluid of interest into and through said access opening and into said cavity; and upon said beam of light perpendicularly striking said outer flat surface of one of said angular portions of said closed wall, said beam of light entering and passing into said one angular portion substantially without refractance and striking the interface between said outer angular surface of said one angular portion and the surrounding medium at an angle above the critical angle for total internal reflectance and being reflected internally therefrom through said one angular portion and exiting said flat inner surface of said one angular portion substantially without refractance, said beam of light continuing through said cavity, through said optically transparent medium and perpendicularly striking said flat outer surface of said other angular portion and passing into said other angular portion substantially without refraction and striking the interface between said outer angular surface of said other angular portion and the surrounding medium at an angle above the critical angle for total internal reflectance and being reflected internally therefrom through said other angular portion and perpendicularly exiting said outer flat surface of said other angular portion substantially without refractance.

4,873,994

DEVICE FOR DETERMINING THE FORCES IN THE AREA OF THE CONTACT SURFACES BETWEEN A SPECTACLE FRAME AND THE HEAD OF THE WEARER

Wilhelm Anger, Moritz-Servetta, and Christoph Leuzinger, Zuffikon, both of Switzerland, assignors to Eyemetrics-System AG, Steinbockstrasse, Switzerland

Continuation of Ser. No. 898,715, Aug. 21, 1986, abandoned.

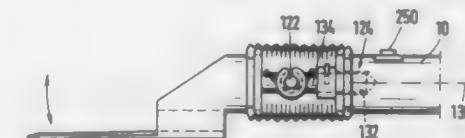
This application Jan. 26, 1989, Ser. No. 303,055

Claims priority, application Fed. Rep. of Germany, Mar. 24, 1986, 3610897

Int. Cl.⁴ A61B 5/00

U.S. Cl. 128—774

15 Claims



- 1. A device for measuring contact forces between a spectacle frame and the head of a spectacle wearer comprising: a rigid holder; a sensor for measuring forces directed in a first direction, said sensor being comprised of a transducer and an elongated portion having a free end which supports relatively moveable parts insertable between said spectacle frame and the head of a wearer, said elongated portion being engageable with said transducer such that relative movement of said relatively moveable parts in said first direction causes said transducer to provide a signal which represents the contact force to be determined; and a flexible hinge having a pivot axis which extends substantially perpendicular to said first direction, said hinge having a portion on one side of said pivot axis connected to said sensor and a portion on the other side of said pivot axis connected to said rigid holder, said hinge being of sufficient flexibility relative to said rigid holder so as to prevent movement of said holder in said first direction from appreciably affecting measurement of said contact forces.

4,873,995

HEATING APPARATUS FOR HYPERTHERMIA

Makoto Kikuchi, Mitaka; Shinsaku Mori, Tokyo; Yoshio Nikawa, Tokyo, and Takashige Terakawa, Tokyo, all of Japan, assignors to Tokyo Kelki Co., Ltd., Tokyo, Japan

Division of Ser. No. 757,850, Jul. 22, 1985, Pat. No. 4,744,372.

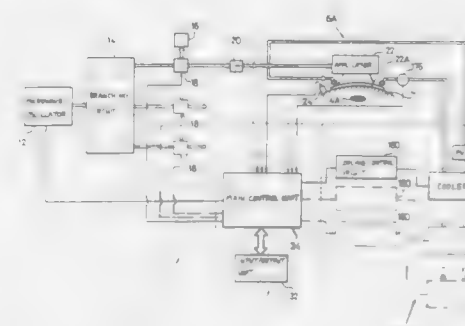
This application Nov. 16, 1987, Ser. No. 121,218

Claims priority, application Japan, Jul. 31, 1984, 59-162464; Jul. 31, 1984, 59-162465; Jul. 31, 1984, 59-162466; Jul. 31, 1984, 59-162467

Int. Cl.⁴ A61N 5/02

U.S. Cl. 128—804

9 Claims



- 1. Hyperthermia apparatus comprising:
 - (a) at least one treatment branch including:
 - (1) a microwave source for generating microwaves that are applied to the branch;

- (2) an application for applying microwaves in the branch to a treatment region of a patient;
- (3) a cooling mechanism for cooling the surface of said treatment region when coolant is supplied to said cooling mechanism;
- (4) a coolant reservoir;
- (5) a pump operable to exchange coolant between said reservoir and said cooling mechanism; and
- (6) a cooling control circuit connected to said reservoir for effecting step-wise changes in the temperature of the coolant in said reservoir in response to control signals;
- (b) a main control unit comprising:
- (1) means for periodically reducing the power level in said branch to zero;
 - (2) means made effective each time the power level in said branch is zero for measuring internal and surface temperatures of said treatment region; and
 - (3) means responsive to the internal and surface temperatures each time they are measured for generating a control signal that is applied to said cooling control circuit such that the latter controls the temperature of coolant in the reservoir in accordance with the measured internal and surface temperatures.

4,873,996

VAGINAL STIMULATOR FOR CONTROLLING URINARY INCONTINENCE IN WOMEN

Donald D. Maurer, Anoka, Minn., assignor to Empl, Inc., St. Paul, Minn.

Division of Ser. No. 916,118, Oct. 6, 1986, Pat. No. 4,785,828. This application Aug. 18, 1988, Ser. No. 233,232

Int. Cl.⁴ A61F 13/00

U.S. Cl. 128—844

4 Claims



1. A condom which can be removably unrolled onto a vaginal plug of the type having electrodes on an exterior surface of the plug, wherein the condom is collapsible, fabricated of stretchable, pliable and impermeable material, and includes at least one pair of spaced-apart conductive elements positioned so as to be in electrical contact with the electrodes when the condom is unrolled onto the plug.

4,873,997

SURGICAL DRAPE

Lyman R. Marshall, Asheville, N.C., assignor to Scherer Healthcare Ltd., Asheville, N.C.

Filed Apr. 25, 1988, Ser. No. 186,099

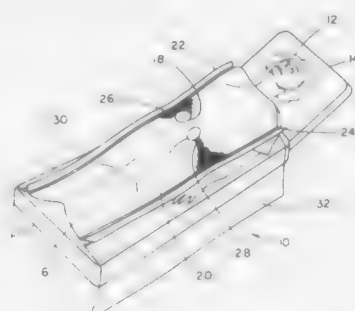
Int. Cl.⁴ A61F 13/00

U.S. Cl. 128—849

2 Claims

1. An improved surgical drape comprising: a first sheet for receiving fluid runoff from a site of surgical procedure; means for directing the fluid along a portion of said first sheet; said means for directing located on said first sheet; at least a second sheet connected to said first sheet; a third sheet; said first sheet

being located between said second and third sheets; said means for directing includes first and second pleats; said second sheet



connected to said first pleat and said third sheet connected to said second pleat.

4,873,998

SURGICAL HAND PROTECTOR SYSTEM

Danny W. Joyner, Erwinna, Pa., assignor to Johnson & Johnson Patient Care, Inc., New Brunswick, N.J.

Filed Oct. 21, 1988, Ser. No. 260,630

Int. Cl.⁴ A61F 13/00

U.S. Cl. 128—879

3 Claims



1. A surgical hand protector system comprising:
- a molded thermoplastic band for emplacement over the base of the hand, said band forming a continuous loop to rest between the thumb and index finger of the hand and around the palm and back of the hand, said band containing perforations into which can be placed the fingers;
- a molded projection connected to said band and formed from the same thermoplastic material as said band, said projection covering a portion of the thumb and containing a perforation through which can be placed the thumb;
- said band and said projection having continuous open ends through which the hand is insertable, said band and said projection forming an open portion which exposes a part of the palm below the third and fourth fingers to allow greater dexterity during use of said system; and
- a pliable surgical glove emplaced over the hand to cover the areas of the hand exposed by said band and said projection;
- wherein the hand is completely covered yet retains dexterity and mobility when protected by said system.

4,873,999

CIGARETTE HOLDER

Rosa M. Steinert, 103 Glenmore Ave., Central Islip, N.Y. 11722

Filed Nov. 18, 1988, Ser. No. 272,798

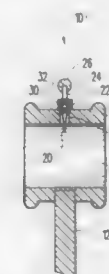
Int. Cl.⁴ A24F 13/08, 13/12

U.S. Cl. 131—259

3 Claims

1. A cigarette holder, comprising:

- a flattened handle portion at one end of said stem;
- a generally cylindrical holding element at an opposite end of said stem;
- a cylindrical passage formed centrally through said holding element, a longitudinal axis of said passage extending generally perpendicular to said stem;
- a transverse aperture extending through a cylindrical side wall of said holding element and intersecting said cylindrical passage, a longitudinal axis of said transverse aperture in alignment with said stem;
- a cup-shaped retaining boss on an exterior portion of said holding element, surrounding said transverse aperture, said boss having a reduced diameter aperture in alignment with said transverse aperture;



- an elongated retaining pin having a sharpened tapered end portion inserted into said transverse aperture;
- an enlarged head portion on an outer end of said retaining pin, exterior of said boss;
- a radial flange on an intermediate portion of said retaining pin, said radial flange having a diameter slightly less than said transverse aperture and greater than said boss aperture;

- a coil spring surrounding said retaining pin and having a first end in abutment with said radial flange and an opposite end in abutment with an interior top wall of said boss, said spring biasing said sharpened tapered end portion of said retaining pin toward said cylindrical passage.

4,874,000

METHOD AND APPARATUS FOR DRYING AND COOLING EXTRUDED TOBACCO-CONTAINING MATERIAL

Ronald A. Tamol; Jose G. Nepomuceno; Gus D. Keritsis; George H. Burnett, all of Richmond; Richard A. Thesing, Glen Allen; Warren D. Winterson, Midlothian, and Walter A. Nichols, Richmond, all of Va., assignors to Philip Morris Incorporated, New York, N.Y.

Continuation-in-part of Ser. No. 900,715, Aug. 27, 1986, which is a continuation-in-part of Ser. No. 740,325, Jun. 3, 1985, Pat. No. 4,632,131, which is a continuation-in-part of Ser. No. 627,407, Jul. 3, 1984, abandoned, which is a continuation-in-part of Ser. No. 723,883, Apr. 16, 1985, Pat. No. 4,625,737, which is a continuation of Ser. No. 457,505, Dec. 30, 1982, Pat. No. 4,510,950. This application Jul. 17, 1987, Ser. No. 74,990

Int. Cl.⁴ A24B 3/14

U.S. Cl. 131—375

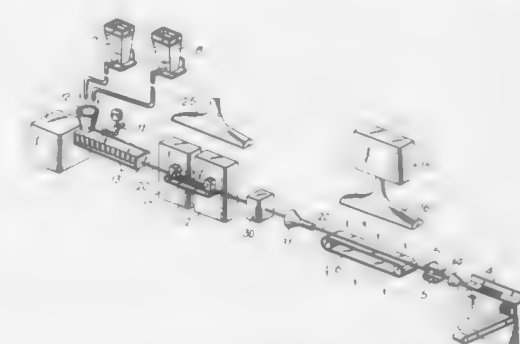
43 Claims

1. A method for processing continuously extruded tobacco-containing materials, comprising:

- drying the extruded material by passing it from the die of the extruder to and through a microwave resonant cavity energized by microwave energy, and propagating microwave energy from a source into the resonant cavity, wherein the microwave frequency is responsive to the resonant frequency of the moisture or other solvent to convert them to a gaseous product; and
- exposing the extruded material to said microwave energy to reduce the OV level of the extruded material to an OV

level at about or below the equilibrium OV level for of the extruded material; and

cooling the extruded material so that the surface tempera-



ture of the extruded material is decreased below the bulk temperature to provide the extruded material with a structure adequately rigid and stable dimensionally for forming into smoking articles.

4,874,001

MANICURIST'S BIT

Lori Ferraris, Los Angeles, Calif., assignor to Kosepts Beauty Supply, Inc., Los Angeles, Calif.

Filed Nov. 2, 1987, Ser. No. 115,703

Int. Cl.⁴ A45D 29/05

U.S. Cl. 132—75.8

7 Claims



1. A bit for shaping artificial surfaces, comprising:
- a substantially cylindrically-shaped body portion;
- a plurality of knurls, each knurl having a leading edge and a trailing edge, said leading edge and trailing edge of each knurl protruding from said body portion, said leading edge and trailing edge being angled with respect to the normal line of the body portion at the point of protrusion and being substantially parallel, and each of said knurls having a planar surface area connecting said leading and trailing edges;
- wherein one end of said body portion has a concave surface

4,874,002

APPARATUS FOR FLUSHING A PIPING SYSTEM

Göran Sundholm, Helsingforsvägen 23 A, SF-02700 Grankulla, Finland

PCT No. PCT/Finland/86/00078, § 371 Date Feb. 26, 1987, § 102(e) Date Feb. 26, 1987, PCT Pub. No. WO87/00455, PCT Pub. Date Jan. 29, 1987

PCT Filed Jul. 7, 1986, Ser. No. 34,557

Claims priority, application Finland, Jul. 22, 1985, 852846; Jan. 24, 1986, 860340

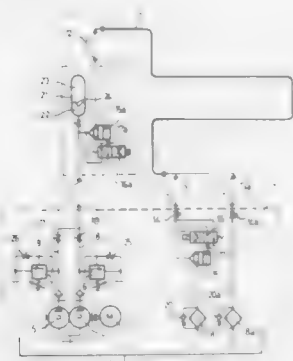
Int. Cl.⁴ B08B 9/06

U.S. Cl. 134—111

10 Claims

1. An apparatus for flushing a piping system, comprising:
- liquid pump means (4, 50) for providing pressure liquid at an operational pressure higher than that to overcome a pressure fall of a piping system (2, 51) at a turbulent flow;
- at least one pressure liquid accumulator (21, 41, 55) connected to the liquid pump means for receiving the pressure

liquid therefrom, the pressure liquid accumulator comprising a liquid space having an inlet/discharge opening for receiving and discharging the pressure liquid into and out of the liquid space, a continuously closed gas space for a gas, and a flexible membrane between the liquid and closed gas spaces for compressing the gas in the closed gas space when the pressure liquid is received in the liquid space, whereby the pressure in the pressure liquid accumulator increases;



connection means for connecting the inlet/discharge opening to the piping system and providing the pressure liquid discharge out of the former to the latter; at least one blocking valve means (15, 15a, 44, 56) for inhibiting the provision of the pressure liquid discharge to the piping system by the connection means until a predetermined pressure is reached in the pressure liquid accumulator and then suddenly opening for suddenly permitting the provision of the same, whereby to produce a powerful flow pulse through the piping system.

4,874,003

FLITCH WASHER

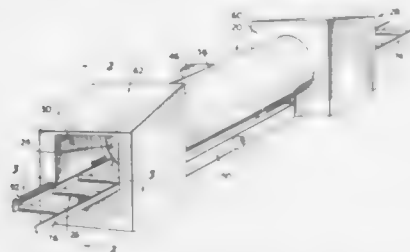
George Weil, Mississauga, Canada, assignor to David R. Webb Co., Inc., Edinburgh, Ind.

Filed Dec. 16, 1983, Ser. No. 562,460

Int. Cl.⁴ B08B 3/02

U.S. Cl. 134—111

8 Claims



4. A flitch washer comprising a first inner cylinder defining a passageway open at an entry end and an exit end, means for conveying a flitch through the passageway from the entry end to the exit end, means comprising a plurality of openings through the first inner cylinder and a plurality of nozzles and plugs for engaging the openings, the nozzles and plugs engaging the openings in a selected pattern to provide a selected spray pattern for the washing fluid into the passageway, said selected spray pattern including a pattern portion directing the washing fluid longitudinally inwardly from nozzles adjacent the entry end and exit end of the passageway toward the center of the length of the passageway, and means for supplying washing fluid to the nozzles, said washing fluid supply means comprising a second outer

cylinder having an axis extending generally parallel to the axis of the inner cylinder and having ends adjacent the entry and exit ends of the passageway, means for closing the spaces between the ends of the outer cylinder and the inner cylinder to define a volume between them and means for providing washing fluid through the outer cylinder and into the volume to supply washing fluid to the nozzles.

4,874,004

COAXIAL CIGARETTE

Horst Borowski, Hamburg; Erwin Kausch, Jesteburg; Erhard Rittershaus; Gert Rudolph, both of Hamburg, and Werner Schneider, Quickborn, all of Fed. Rep. of Germany, assignors to B.A.T. Cigarettenfabriken GmbH, Hamburg, Fed. Rep. of Germany

Filed Dec. 9, 1988, Ser. No. 281,640

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1987, 3743597

Int. Cl.⁴ A24D 1/00; A24C 5/18

U.S. Cl. 131—364

20 Claims



1. A coaxial cigarette comprising an inner core of a smokable material which burns substantially residue-free, a first wrapper for the inner core, an outer jacket of another smokable material surrounding the inner core, a second wrapper for the outer jacket, and a ventilated coaxial filter comprising a filter core having an internal diameter which corresponds substantially to a diameter of the inner core, and a filter jacket; the filter core having an air-impermeable third wrapper; the filter jacket having an air-permeable fourth wrapper; the first wrapper of the inner core and the second wrapper of the outer jacket being provided with glowing agents; and a draw resistance of the inner core being lower than another draw resistance of the outer jacket.

4,874,005

CURRENT TO PRESSURE TRANSDUCER EMPLOYING MAGNETIC FLUID

Robert I. Potter, 11200 Canon Vista, San Jose, Calif. 95127

Filed Dec. 7, 1988, Ser. No. 281,125

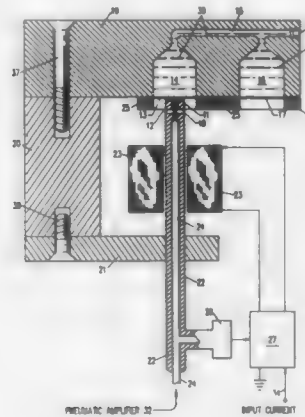
Int. Cl.⁴ G05D 16/00

U.S. Cl. 137—85

10 Claims

1. A current-to-pressure transducer comprising: means for supplying a flow of air; first and second chambers and a means connecting said chambers, each of said chambers having an open end; magnetic fluid disposed within said chambers and said connection means; first and second flexible diaphragms respectively positioned against said open ends for containing said fluid within said chambers; and

electromagnetic means energized by an input electrical current for coacting with said magnetic fluid to deform a



selected one of said diaphragms thereby varying the air pressure in said supply means.

4,874,006

DIVERTER VALVE AND VACUUM BREAKER USABLE THEREWITH

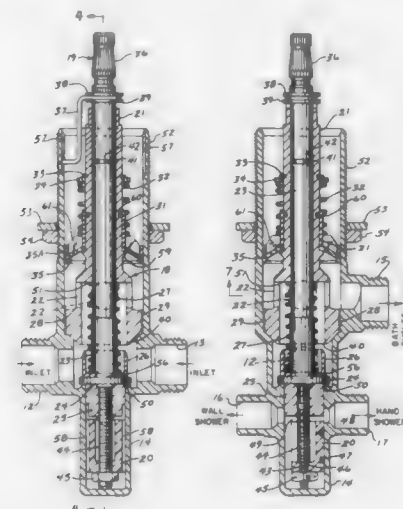
Muhammad Iqbal, Sheboygan, Wis., assignor to Kohler Co., Kohler, Wis.

Filed Jan. 26, 1989, Ser. No. 301,484

Int. Cl.⁴ F16K 11/02

U.S. Cl. 137—119

6 Claims



1. A valve assembly for directing fluid flow from at least one inlet to at least three outlets, comprising:

a valve body having an axial bore with at least one radially disposed fluid inlet, a first radially disposed outlet spaced in one direction from said inlet, and second and third radially disposed outlets axially spaced from the first outlet; valve seat means in the valve body; a valve stem having a plurality of sealing means attached thereto, the stem being positioned for axial and rotational movement in the valve body and for selective abutting contact of a first sealing means with the valve seat means and a second sealing means with the second and third outlets; the valve seat means, valve stem, and valve body being configured and juxtaposed such that axial movement of the valve stem can change fluid flow from the first outlet

to the second outlet and such that rotation of the valve stem can change fluid flow from the second outlet to the third outlet.

4,874,007

RESTRICTOR VALVE FLOW PASSAGE POP-UP WEAR INDICATOR

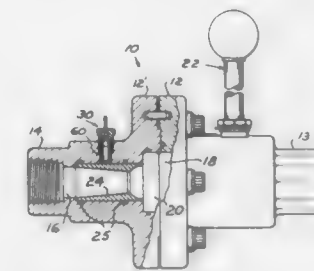
Julian S. Taylor, 8300 S.W. 8, Oklahoma City, Okla. 73128

Filed Jan. 12, 1989, Ser. No. 296,114

Int. Cl.⁴ G01M 3/28

U.S. Cl. 137—312

4 Claims



1. In a flow restrictor valve having a turbulence diffuser and flow passageway wall protector in its outlet passageway downstream from flow throttling discs and having a lateral bore communicating with a peripheral portion of the diffuser, the improvement comprising:

worn diffuser indicating means in the lateral bore including a tubular body having an outward end and having an annular inwardly facing shoulder intermediate the ends of its bore; fluid pressure responsive means including a piston having a piston head contained by the inward end portion of said body and including a piston rod projecting toward said end surface axially slidable in said indicating means having a first position normally disposed inwardly of said outer end surface and having a second position projecting outwardly of said outer end surface in response to a worn condition of said turbulence diffuser permitting fluid under greater than atmospheric pressure actuating said pressure responsive means; a tubular cage surrounding said piston head and having an inward end adjacent said shoulder; and, a seal ring interposed between the inwardly disposed end of said cage and said annular shoulder.

4,874,008

VALVE MOUNTING AND BLOCK MANIFOLD

John E. Lawson, Horsell Woking, England, assignor to Cameron Iron Works U.S.A., Inc., Houston, Tex.

Filed Apr. 20, 1988, Ser. No. 183,900

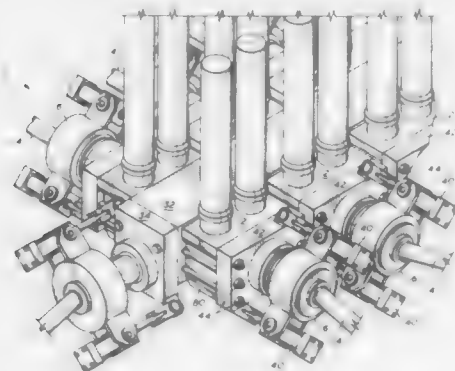
Int. Cl.⁴ F16K 43/00

U.S. Cl. 137—315

6 Claims

1. A valve and valve mounting comprising a first mounting member, a second mounting member spaced from said first mounting member, a valve having a body, a valve member and a valve actuator, a plurality of hydraulic tensioning members secured by securing means to each of said mounting members, said hydraulic tensioning members having a connection for the supply of hydraulic fluid under pressure whereby said tensioning members are elongated by such pressure, said mounting members being spaced sufficiently apart to allow said valve body to pass therethrough when said tensioning members are elongated by hydraulic pressure, the body of said valve having a width slightly smaller than the distance between said first and second mounting mem-

bers when said tensioning members are elongated by hydraulic pressure, and means on said tensioning members for tightening the securing means to one of said mounting flanges while said



tensioning members are elongated under pressure whereby with said valve body positioned between said flanges release of the hydraulic pressure on said tensioning members moves said flanges into tight engagement with said valve body.

4,874,009

ANTI-SEIZING CAP RING

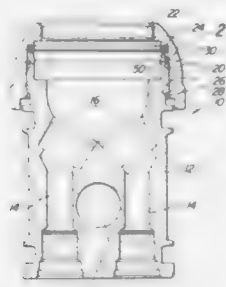
Daniel A. Pickerrell, Noblesville, Donald C. Schrock, Carmel, both of Ind., and Larry G. Turner, Fenton, Mich., assignors to Masco Corporation of Indiana, Taylor, Mich.

Filed Sep. 6, 1988, Ser. No. 240,330

Int. Cl.⁴ F16K 11/02, 51/00

U.S. Cl. 137—454.6

7 Claims



1. A valve housing assembly including:
 - a body member having ports for water flow and a cavity for receiving a valve mechanism; said body member having a threaded section, and an end shoulder exterior of said cavity
 - a cap having a central opening for receiving a control handle therethrough, a complementary shoulder section about said opening opposing said end shoulder of said body member and having a complementary threaded section for engagement with said threaded section of said body;
 - a semi-rigid abutment means interposed between said opposing shoulders for providing an abutment stop as said cap is threadably tightened onto said body;
 - said semi-rigid abutment means having creep after said cap is tightened onto said body to alleviate seizing forces between said respective threaded sections to allow said cap to be threadably loosened from said body member.

4,874,010

HEATER CONTROL VALVE

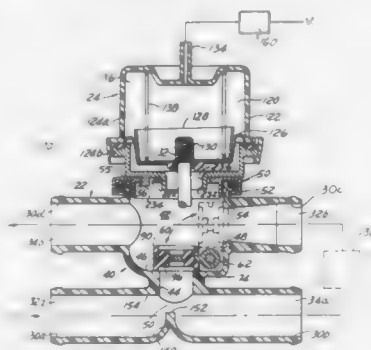
Allan W. DeJong, and Paul D. Perry, both of Chatham, Canada, assignors to Siemens-Bendix Automotive Electronics Limited, Chatham, Canada

Filed May 26, 1988, Ser. No. 199,216

Int. Cl.⁴ G05D 11/035

U.S. Cl. 137—484.4

20 Claims



1. A fluid control valve comprising:
 - a valve body defining a chamber and a bypass passage, for receiving fluid, extending therefrom,
 - first conduit means, in fluid communication with the bypass passage, for defining a first inlet adapted to receive fluid and a first outlet adapted to communicate fluid to an external device;
 - second conduit means, in communication with the chamber for defining a second inlet, adapted to receive flow from the external device, and a second outlet;
 - the valve body further including a first seating surface, within the chamber, disposed about a downstream end of the bypass passage and a second seating surface disposed about the second inlet within the chamber;
 - flow control means for regulating the flow rate of fluid, from the first inlet to the first outlet, to a maximum value, and for prohibiting fluid flow through the external device by terminating fluid communication between the second inlet and second outlet
 - wherein the flow control means comprises:
 - a bypass valve, rotatable between a first position in sealing engagement with the first seating surface and a second position in sealing engagement with the second seating surface.

4,874,011

GAS PRESSURE REGULATOR FOR CONTROLLING LOW PRESSURE

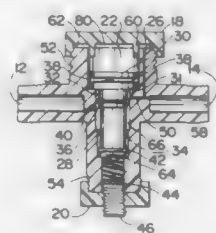
Pasquale S. Canzano, 31 Candlewicke Dr., Dover, Del. 19901, and Brock J. Vinton, 501 Greenbank Rd., Wilmington, Del. 19804

Filed Jan. 12, 1989, Ser. No. 296,223

Int. Cl.⁴ G05D 16/10

U.S. Cl. 137—505.13

14 Claims



1. A pressure regulator comprising:

- a rigid housing having inlet and outlet ports said inlet port being below said outlet port, a hollow interior, having at least two bores, the upper bore disposed above and having a larger inner diameter than the lower bore and the lower bore being below the inlet port, said inlet and outlet ports being in communication with said hollow interior, a top cap sealing the top of the hollow interior and a recycle bore connecting said outlet port with said hollow interior in close proximity to the top cap;
- A plunger slidably mounted in the hollow interior of the housing and having a lip and an upper portion disposed directly above a lower portion, said upper portion having a larger cross sectional area than the lower portion and the excess surface area of said upper portion forming said lip at the interface of said upper portion and said lower portion, said plunger having at least two sealing means, an upper sealing means and a middle sealing means being below said upper sealing means, both sealing means being in said upper portion of the plunger;
- The plunger being movable between a closed position, said middle sealing means being above said inlet port and below said outlet port and said upper sealing means being above said outlet port; and an open position, said middle sealing means and said upper sealing means being above the outlet port;
- A lower sealing means being below said middle sealing means and below said inlet port.

4,874,012

MAGNETIC OPERATOR FLOW DEVICE

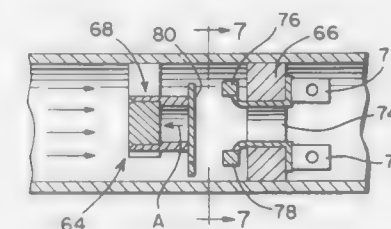
Wallace W. Velle, Alta Loma, Calif., assignor to Mallard Products, Inc., Rancho Cucamonga, Calif.

Filed Oct. 12, 1988, Ser. No. 256,622

Int. Cl.⁴ F16K 37/00

U.S. Cl. 137—557

6 Claims



1. A magnetically operated flow device disposed within a flow passage defined by an encircling inwardly facing wall and defining upstream and downstream directions, said flow passage being at least generally regular in transverse cross-sectional shape about a central zone of said flow passage, a thin, lightweight, flat and magnetically attracted flow responsive valve plate disposed in said flow passage and movable therein in upstream and downstream directions between upstream and downstream limit positions and constituting a partial drag obstruction to fluid flow through said passage outwardly of said central zone and thus being biased in a downstream direction by fluid flow through said passage in said downstream direction, support means mounted in said central zone upstream from said upstream limit position in spaced relation relative to the wall of said flow passage for fluid flow through said passage in said downstream direction about said support means, said support means including an abutment portion in said central zone projecting from said support means in said downstream direction and defining a downstream facing abutment against which said valve plate may abut to define said upstream limit position thereof with said valve plate disposed generally normal to the longitudinal extent of said passage, magnet means mounted from said support means centrally in said passage and spaced a predetermined distance upstream from said upstream limit position of said valve plate to define a predetermined gap between said magnet and said valve plate

when the latter is in said upstream limit position, said valve plate occupying a sufficient cross-sectional area of said passage outwardly of said central zone to effect said partial drag obstruction, said gap being of a dimension measured longitudinally of said flow passage and the magnetic attraction between said magnet and said valve plate when the latter is in the upstream limit position thereof being sufficiently low such that low gas flow at low differential pressure less than one PSI will be sufficient to shift said valve plate in said downstream direction from said upstream limit position to said downstream limit position, an annular seat body mounted transverse in said passage from said wall with one axial end thereof positioned for abutment by said valve plate when the latter is in said downstream limit position and disposed generally normal to said passage, said valve plate including a central imperforate portion thereof of greater area than the area bound by the inner periphery of said annular seat body, the magnetic attraction between said magnet and valve plate, when the latter is in said downstream limit position and said valve plate is free of differential pressure acting thereon, being sufficient to effect positive magnetic retrieval of said valve plate in said upstream direction from said downstream limit position to said upstream limit position, said valve plate including an outer periphery defining peripherally spaced guide projections in close proximity to said flow passage all for guiding movement of said valve plate between said upstream and downstream limit positions.

4,874,013

EMERGENCY FUEL SYSTEM APPARATUS

J. Roy Hack, Jr., 5405 S. Rosemont, Tucson, Ariz. 85706

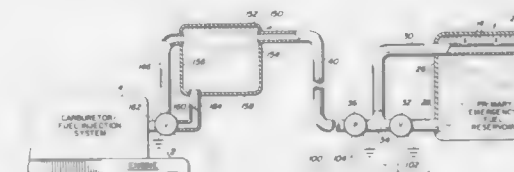
Continuation-in-part of Ser. No. 111,818, Oct. 22, 1987,

abandoned. This application Nov. 10, 1988, Ser. No. 269,294

Int. Cl.⁴ F03B 11/00; F02M 59/00

U.S. Cl. 137—571

16 Claims



1. In a vehicle having a main tank, an engine, a main fuel conduit extending from the main fuel tank to the engine, and a fuel pump for pumping fuel from the main fuel tank to the engine, emergency fuel reservoir apparatus, comprising, in combination:
 - primary emergency fuel tank means adjacent to the main fuel tank for holding a first quantity of fuel;
 - first conduit means extending between the primary emergency fuel tank means and the main fuel conduit;
 - first valve means in the first conduit means for controlling the flow of fuel from the primary emergency fuel tank means to the main fuel conduit;
 - secondary emergency fuel tank means disposed adjacent to the engine for holding a second quantity of fuel;
 - second conduit means extending between the secondary emergency fuel tank means and the main fuel conduit;
 - second valve means in the second conduit for controlling the flow of fuel from the secondary emergency fuel tank means to the main fuel conduit; and
 - means for controlling the first valve means and the second valve means.

4,874,014

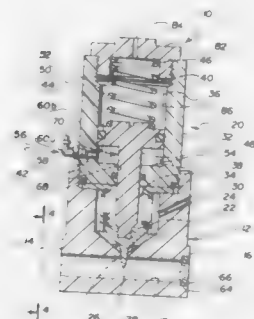
FLOW CONTROL MANIFOLD

Robert W. Grant, and William M. Jensen, both of Excelsior, Minn., assignors to FSI International, Inc., Chaska, Minn.
Filed Dec. 21, 1987, Ser. No. 135,939

Int. Cl.⁴ F16K 11/22

U.S. Cl. 137—606

14 Claims



1. A fluid dispensing and metering unit for dispensing a desired fluid amount into a fluid conducting duct, comprising:

(a) a block having a proximal and distal face, and a fluid conducting duct axially extending from said proximal face through said block to said distal face;

(b) means in communication with said fluid conducting duct of said block for dispensing fluid into said duct, said dispensing means intersecting said fluid conducting duct generally intermediate to said proximal block face and said distal block face, said dispensing means comprising:

(1) a flexible bellows mounted in said block creating a fluid tight cavity between said block and said bellows, said cavity having an aperture leading into said fluid conducting duct, said bellows having a tip sealingly engaging said aperture and extending into said duct;

(2) a fluid port, said port extending from outside of the said block into said fluid-tight cavity;

(3) a housing mounted on said bellows forming a chamber between said housing and said bellows, said housing having a hollow housing cavity with a proximal distal end, and a passageway from said proximal end of the hollow cavity to said bellows chamber; and

(4) a piston springable mounted on said distal end of said hollow cavity of said housing, said piston having a longitudinal shaft held in a fluid-tight relation within said housing passageway and extending into said bellows chamber to threadably engage said bellows, and said piston having a larger diameter portion in fluid-tight relation with said housing, said larger diameter portion dividing the hollow housing cavity into an upper and lower portion;

whereby retraction of the piston toward the distal end of the hollow housing cavity draws the bellows towards the housing thereby removing the bellows tip from the aperture and allowing fluids from the fluid port now residing in the fluid cavity to pass through the aperture of the cavity into the fluid conducting duct; and

(c) means connected to said dispensing means for modulating the dispensing of the fluid, said modulating means using a pressurized fluid to interact with the dispensing means for controlling the amount of fluid entering the fluid conducting duct.

4,874,015

MONITORING SYSTEM

Manfred Schirmacher, Bergkamen, Fed. Rep. of Germany, assignor to Schering Aktiengesellschaft, Bergkamen, Fed. Rep. of Germany

Filed Jan. 6, 1989, Ser. No. 294,758

Claims priority, application Fed. Rep. of Germany, Mar. 3, 1988, 38 15 100

Int. Cl.⁴ F16K 35/00

U.S. Cl. 137—637.05

6 Claims



1. In a monitoring system for monitoring the condition of interconnection between at least two pipelines; a connecting line for coupling said pipelines to each other; and shut-off elements for closing the ends of each of said pipelines; the improvement in that said connecting line is electrically-conductive so as to form a closed electrical circuit across the ends of the pipeline which are to be interconnected, said connecting line and a monitoring installation; control means for actuating the shut-off elements for said pipelines being exclusively activatable by the monitoring installation; and at least the monitoring installation including means for determining the operating condition of said electrical circuit.

4,874,016

METHOD FOR IMPROVING SIGNAL-TO-NOISE RATIOS IN FLUIDIC CIRCUITS AND APPARATUS ADAPTED FOR USE THEREWITH

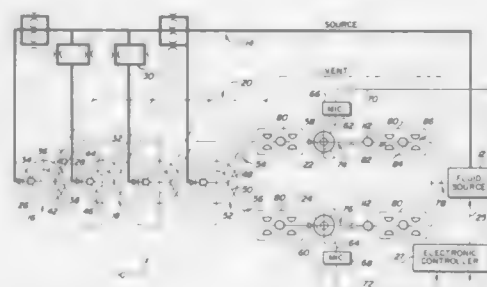
Raymond R. Tseng, Tempe, Ariz., assignor to Allied-Signal Inc., Phoenix, Ariz.

Filed Feb. 28, 1989, Ser. No. 318,094

Int. Cl.⁴ F15C 1/08

U.S. Cl. 137—826

17 Claims



1. A fluidic circuit having a last-stage fluidic amplifier from which fluidic outputs are communicated along two separate flow paths to two separate fluidic oscillators, said circuit being adapted to vent fluid from said oscillators along two initially separate vent paths, said vent paths leading to a common vent, said circuit having circuit elements comprising:

a first low-pass filter interposed in one of said flow paths between said last-stage amplifier and one of said oscillators;

a second low-pass filter interposed in the other of said flow

paths between said last-stage amplifier and the other of said oscillators;

a third low-pass filter interposed in one of said vent paths between said one oscillator and said common vent; and
a fourth low-pass filter interposed in the other of said vent paths between the other of said oscillators and said common vent.

4,874,017

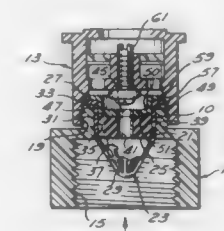
WICKEN AND FLOW REGULATOR ASSEMBLY

Donald W. Hendrickson, P.O. Box 999, Corona, Calif. 91718
Continuation-in-part of Ser. No. 27,440, Mar. 18, 1987, Pat. No. 4,830,057. This application Mar. 10, 1988, Ser. No. 160,727

Int. Cl.⁴ F15D 1/02

U.S. Cl. 138—45

3 Claims



1. A fluid flow regulator assembly adapted to be held by a pair of fittings within the mouth of a fluid flow channel, comprising:

an elastomeric, generally disc-shaped flow restrictor which controls the flow of fluid by permitting a controlled volumetric rate of fluid flow through a bore extending through said restrictor;

a molded, non-threaded housing for said flow restrictor, said housing including an interior wall partially forming a chamber on the downstream end of the housing in which said flow restrictor is removably insertable, an axially thin, flat outwardly extending flange surrounding said chamber on said downstream end clampable between said pair of fittings to hold said housing at said mouth of said fluid channel, structure on the upstream end of said housing for confining said restrictor within said chamber, said structure defining an opening communicating with said fluid flow channel; and

a cap removably secured to the downstream end of said housing to capture said restrictor in said chamber and forming with said housing a replaceable assembly to be held by said fittings, said cap including a bore for communicating with said fluid flow channel, said cap and said restrictor cooperating to form a gap between the cap and a portion of said restrictor, said gap permitting said restrictor to flex in the downstream direction in response to the input pressure of fluid against said restrictor.

4,874,018

TRANSMISSION FOR WEAVING LOOMS

Philippe Van Bogaert, Schaarbeek, and André Vandenbroucke, Langemark, both of Belgium, assignors to Picanol N.V., Leper, Belgium

Continuation of Ser. No. 33,736, Apr. 3, 1987, abandoned. This application Feb. 21, 1989, Ser. No. 312,389

Claims priority, application Netherlands, Apr. 7, 1986, 8600870

Int. Cl.⁴ D03D 51/08

U.S. Cl. 139—1 E

9 Claims

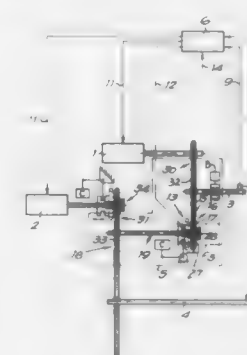
1. In a drive system for weaving machines including a main drive shaft for the machine batten arranged to be rotated at a first drive speed, an auxiliary drive shaft for the machine heddles arranged to be rotated at a second drive speed, said main and auxiliary drive shafts connected together through a coupling means for synchronous rotation at selected rotational

angular positions relative to each other, the improvement comprising:

said coupling means arranged to be remotely controlled between locked and unlocked condition responsive to coupling locking signals, said main and auxiliary drive shafts being locked against relative rotation when the coupling means is locked and relatively rotatable when the coupling means is unlocked, and said coupling means being arranged to lock and unlock said main and auxiliary drive shafts at a large number of different relative angular positions;

a coupling control means for controlling locking and unlocking of said coupling means;

a main and auxiliary drive motor means connected in driving relationship with the main and auxiliary drive shafts, respectively, operation of said drive motor means being controlled at least in part by main and auxiliary motor drive control signals;



angular position detecting means for determining the relative angular positions of said main and auxiliary drive shafts and for generating angular position signals related to the detected relative angular positions of the shafts;

said coupling control means arranged to receive said angular position signals; to receive a set value corresponding to the desired angular relationship between said main and auxiliary drive shafts; and to generate said coupling locking signals and said main and auxiliary motor drive control signals in response thereto;

whereby said main and auxiliary drive shafts can be uncoupled from each other at the coupling means, rotated relative to each other by at least one drive motor means and recoupled at the coupling means in a different relative angular relationship corresponding to a set value under the control of said coupling control means.

4,874,019

WALLCOVERING SUBSTRATE FORMED OF TEXTURED, CONTINUOUS, MULTI-FILAMENT YARNS HAVING HYDROPHILIC CHARACTERISTICS

James H. Whetstone, 3012 Lake Forest Dr., Greensboro, N.C. 27409

Division of Ser. No. 146,968, Jan. 22, 1988. This application Mar. 27, 1989, Ser. No. 329,288

Int. Cl.⁴ D03D 15/10

U.S. Cl. 139—420 A

7 Claims

1. Improved gauze formed primarily of textured, continuous, multi-filament, polymeric yarns having a surfactant incor-

porated into the interfilamentary structure thereof; said surfactant having the characteristics of:

(a) being water dispersible and water insoluble;



(b) having an HLB factor in the range of 7-10; and
(c) being heat stable to at least 350° F.

4,874,020

SYSTEM FOR CONTROLLING THE RELEASE OF FUEL VAPORS FROM A VEHICLE FUEL TANK

George H. Bucci, Tolland, Conn., assignor to Whitehead Engineered Products, Inc., Meriden, Conn.

Continuation-in-part of Ser. No. 31,030, Mar. 26, 1987. This application Oct. 5, 1988, Ser. No. 253,855

Int. Cl. B65D 90/28

U.S. Cl. 141-59

20 Claims



13. Apparatus for controlling the release of fuel vapors from a vehicle fuel tank comprising:

- a cap;
- first means for carrying fuel to the fuel tank, said first means being sized to receive a fuel pump nozzle and having a mouth at one end through which the fuel pump nozzle enters the means;
- second means for attaching the cap to the mouth to seal closed the mouth;
- third means for carrying fuel vapors from the first means to a vapor capture device, said third means being connected to the first means at a level below the mouth;
- fourth means for opening and closing the third means, said fourth means being operated by the attachment and detachment of the cap to the mouth such that attachment moves the cap into contact with the fourth means to close said means and detachment moves the cap out of contact with the fourth means to open said means, said fourth means also opening when the cap is attached and the pressure within the third means exceeds a predetermined value;
- fifth means for carrying fuel vapors from the fuel tank to the first means, said fifth means being connected to the first means at a level below the mouth;
- sixth means for coordinated opening and closing of the first and fifth means, said sixth means being operated by the insertion of a fuel pump nozzle into and the removal of a fuel pump nozzle from the first means such that insertion

causes the first means to open and the fifth means to close and removal causes the fifth means to open and the first means to close, said closure of the first means occurring at a level below the mouth, above the level at which the third means connects to the first means, and above the level at which the fifth means connects to the first means.

4,874,021

ASEPTIC FILLING UNIT FOR PACKING MACHINES FOR LONG-LASTING PRODUCTS WITH FLUID BEHAVIOR

Ulf Ringdahl, Löddeköpinge, Sweden, and Vittorio Mattei, Modena, Italy, assignors to Tetra Dev-Co., Modena, Italy

Continuation of Ser. No. 812,401, Dec. 20, 1985, abandoned.

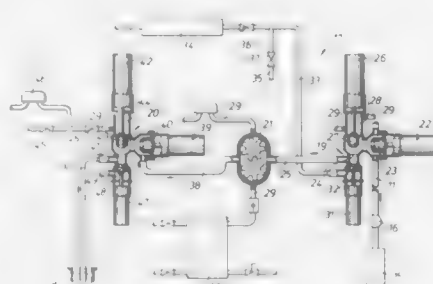
This application Jun. 8, 1988, Ser. No. 205,499

Claims priority, application Italy, Dec. 28, 1984, 24286/84

Int. Cl. B65B 3/04

U.S. Cl. 141-85

9 Claims



- In an apparatus for the aseptic filling of fluid products into containers, by means of packing machines of the type wherein a feed pipe feeds the products from a supply line under sterile conditions into said containers, the improvement comprising: a metering unit for metering the fluid products to be fed into the containers, said metering unit arranged between a feed pipe and a supply line; isolation means for selectively connecting the metering unit to the supply line, the feed pipe, a source of sterilizing fluid, and a washing unit, said isolation means being positioned between said products feed pipe and said products supply line, said isolation means including two valve groups, between said valve groups the metering unit is connected by related pipes; the isolation means including means for forming an aseptic seal barrier between the metering unit and the supply line and between the metering unit and the feed pipe; and wherein each of said valve groups has three valves.

4,874,022

FILLING STATION FOR A CARTRIDGE FILLING AND SEALING MACHINE

Ernst Schwerdtel, Munich, and Hans-Jörg Lang, Eisenhofen, both of Fed. Rep. of Germany, assignors to Ludwig Schwerdtel GmbH, Karlsruhe, Fed. Rep. of Germany

Filed May 5, 1988, Ser. No. 195,781

Claims priority, application Fed. Rep. of Germany, May 14, 1987, 3716119

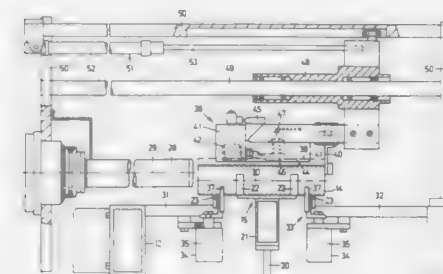
Int. Cl. B65B 43/58

U.S. Cl. 141-165

21 Claims

- A filling station for a cartridge filling and sealing machine for filling viscous or pasty materials into cylindrical cartridges, comprising: a filler valve; a positioning and centering device for positioning and centering the cartridges in a position in alignment with said filler valve;

a displacement drive for adjusting the position of said positioning and centering device and the filler valve in relation to each other; and said positioning and centering device comprising a unit having a contact surface for the cartridges and at least one



vacuum suction holder disposed in said unit, said at least one vacuum suction holder comprising a suction hose having an open end disposed in said unit, the open end of said suction hose extending beyond said contact surface and being in the shape of a bellows.

4,874,023

DECAP DISPENSING SYSTEM FOR WATER COOLER BOTTLES

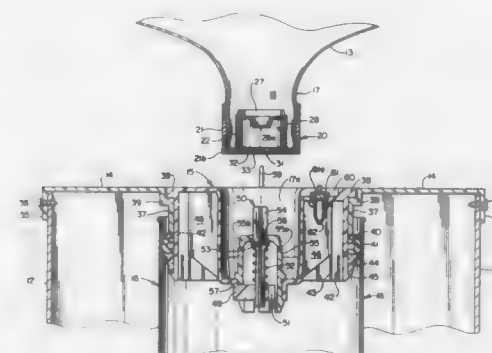
John G. Ulm, Upper Sandusky, Ohio, assignor to Liqui-Box Corporation, Worthington, Ohio

Filed Sep. 30, 1988, Ser. No. 251,267

Int. Cl. B65B 3/04

U.S. Cl. 141-346

18 Claims



ducing relative axial movement between the annular skirt on the socket member and the annular wall of the reservoir.

4,874,024

WOOD PROCESSING DEVICE HAVING SELF-REVERSING FEATURE

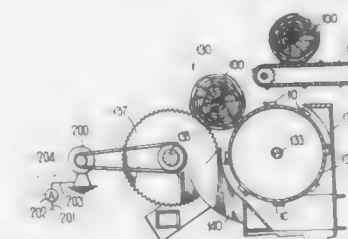
Stanley Arasmitz, P. O. Box 2458, Rome, Ga. 31064

Division of Ser. No. 124,043, Nov. 23, 1987, Pat. No. 4,802,631, which is a division of Ser. No. 917,855, Oct. 14, 1986, Pat. No. 4,776,375. This application Dec. 2, 1988, Ser. No. 278,737

Int. Cl. B27B 1/00; B77C 1/00

U.S. Cl. 144-174

2 Claims



- A wood processing apparatus comprising: an elongate cylindrical drum rotatably mounted about a horizontal longitudinal axis; at least one cutter extending outwardly from the surface of said drum; means for rotating said cylindrical drum about its longitudinal axis in a first direction such that said cutter follows a circular path; feed means for mounted rotation adjacent to said drum in a direction opposite to said first direction for feeding said wood into said path of said cutter; sensing means for sensing a predetermined level of power required to rotate said feed means; and reversing means responsive to said sensing means for reversing the rotational direction of said feed means.

4,874,025

MITER SAW UTILITY STAND

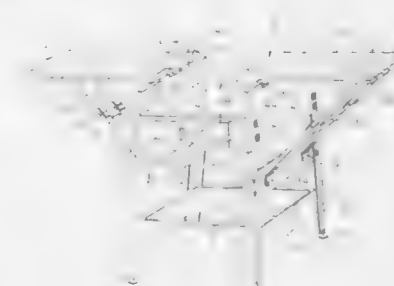
Gary D. Cleveland, 1014 June St., New Bedford, Mass. 02745

Filed May 16, 1988, Ser. No. 194,196

Int. Cl. B25H 1/16, 1/14, 1/06

U.S. Cl. 144-287

16 Claims



- A miter saw utility stand comprising: a pair of wing means for supporting a workpiece, each of said wing means extending longitudinally and having an opening separating them; a pair of fence means for bracing the workpiece, each of said fence means being mounted perpendicular to and flush with a longitudinal edge of a respective one of said wing means; a pair of first adjustable sidewall means for adjusting the height of said wing means, said pair of first adjustable sidewall means being mounted perpendicular to and flush with a longitudinal edge of a respective one of said wing means;

sidewall means being connected to the transverse edges of said pair of wing means;
table top means for holding the saw, said table top means being located below and parallel to a plane created by the length of said pair of wing means, the width of said table top means being about equal to the length of the opening separating said pair of wing means;
a pair of brace means for supporting said pair of wing means, one end of each of said brace means being mounted to a respective one of said wing means;
a pair of second adjustable sidewall means for adjusting the height of said pair of brace means and said pair of wing means relative to said table top means, each of said second adjustable sidewall means being connected to a respective one of said brace means; and
leg means for supporting said pair of first and second adjustable sidewall means and said table top means, said leg means being connected to said pair of first and second adjustable sidewall means and said table top means.

4,874,026

VEHICLE WINDOW SCREEN ASSEMBLY

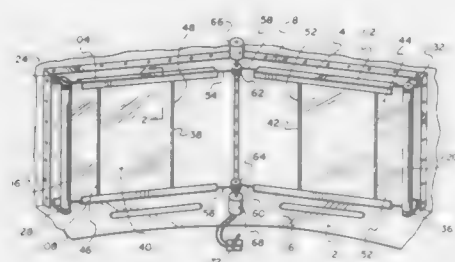
Dayer Worrall, 1345 E. Lester, South Weber, Utah 84403

Filed Apr. 4, 1988, Ser. No. 177,061

Int. Cl.⁴ E06B 9/08

U.S. Cl. 160—23.1

16 Claims



1. A retractable window screen assembly for covering a vehicle window and the like comprising
a first flexible screen for blocking at least a portion of light impinging thereon, said screen having a top edge, a bottom edge and a free end,
a first spring-loaded, generally cylindrical roller about which the screen is wrapped, with the free end exposed, said roller being mountable at its ends in a position oriented generally vertically adjacent to a side of the vehicle window so that when the free end of the screen is pulled horizontally toward the opposite side of the window, the roller rotates to unwind the screen, and when the free end is released, the roller retracts and rolls up the screen,
screen positioning means attached to the free end of the screen and controllable to selectively pull the screen horizontally toward the opposite side of the window to substantially cover the window, or release the screen to allow it to be retracted and rolled up on the roller,
first guide means attached to the window adjacent the top edge and bottom edge of the screen when it is unrolled from the roller for holding the top and bottom edges of the screen in close proximity to the window to produce an air pocket between the screen and the window, and
a pair of elongate, flexible metallic strips, one of which is attached to extend along the top edge of the screen and the other of which is attached to extend along the bottom edge of the screen, and wherein said guide means comprises a pair of strip magnets attached to the window, each in general alignment with the respective metallic strip when the screen is unrolled from the roller to attract and hold the metallic strips for sliding engagement and movement along the said strip magnets as said screen is unrolled from and rolled back onto said roller.

4,874,027

OFFICE SPACE DIVIDING ARRANGEMENT

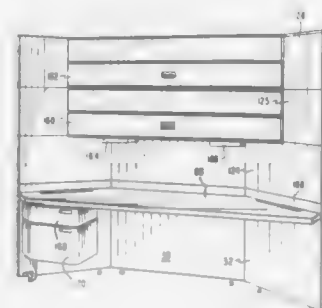
Bruce K. Boundy, Alto, Mich., and Raoul J. P. Schoumaker, Greenbay, Wis., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 20, 1988, Ser. No. 197,018

Int. Cl.⁴ F06B 9/24; A47B 5/00

U.S. Cl. 160—230

33 Claims



1. An office space dividing arrangement, comprising:
at least one work station,
said at least one work station including a first module having first and second sides, first and second ends, and upper and lower edges which extend between said ends,
said first module having at least one joint, said at least one joint defining a bend line which extends between said upper and lower edges to define at least first and second integrally joined sections,
said first module being in a functional configuration in which said at least first and second sections intersect at a first predetermined angle to define a free-standing base portion of said at least one work station,
said first module being foldable along said bend line to a shipping configuration which minimizes shipping space,
a work surface supported by the upper edge of the first module, with the first side facing the work surface,
and a flexible skin on the second side which extends uninterruptedly between the first and second ends.

4,874,028

TEMPORARY DETACHABLE DOORWAY SCREEN APPARATUS

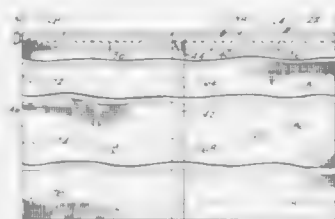
Carol J. Lynch, and Debbie J. Corday, both of 18550 Hatteras St. #92, Tarzana, Calif. 91356

Filed May 6, 1988, Ser. No. 190,887

Int. Cl.⁴ A47H 23/01

U.S. Cl. 160—332

7 Claims



1. Temporary detachable doorway screening apparatus for a doorway defined by a door frame having a top frame member spaced above a floor and vertical side members extending from the floor to the top frame member, thereby forming an enclosed area within an open doorway of a dwelling, the apparatus comprising:

a flexible sheet of screening material shaped to cover substantially the entire enclosed area within said open doorway, the flexible sheet being made from a flexible polymeric mesh for allowing passage of light and air while preventing annoying pests from entering through the doorway and having upper, lower and vertical margins which also enhance flexibility so the entire sheet of screening material can be rolled up or unrolled for positioning it to cover the enclosed area within the doorway,
the sheet of screening material being provided as a pair of side-by-side screen sections normally separated from one another and overlapping vertically along a central portion of the screen to form an opening along the overlapped portions of the screen sections,
an elongated tension rod adjustable in length to apply spring pressure at its ends to the side frame members of the door frame for frictionally and releasably holding the tension rod above the door opening,
means for securing the tension rod to a top portion of the screen,
means providing vertically spaced apart fastener elements along the overlapping center portion of the screen for releasably opening or closing the screen from the floor continuously upwardly for most of the height of the screen; and
means providing vertically spaced apart fastener elements along the vertical outer margins of the screen sections for releasable attachment to cooperating vertically spaced apart fastener elements releasably secured in a non-marring fashion to the side frame members of the door frame.

4,874,029

COUNTERGRAVITY CASTING PROCESS AND APPARATUS USING DESTRUCTIBLE PATTERNS SUSPENDED IN AN INHERENTLY UNSTABLE MASS OF PARTICULATE MOLD MATERIAL

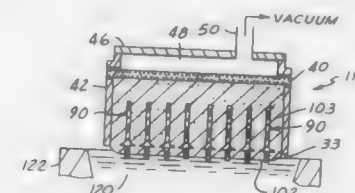
George D. Chandley, Amherst, N.H., assignor to General Motors Corporation, Detroit, Mich.

Filed May 9, 1988, Ser. No. 191,544

Int. Cl.⁴ B22C 9/04; B22D 18/06

U.S. Cl. 164—34

101 Claims



1. A method for the countergravity casting of molten metal comprising:
(a) holding an inherently unstable mass of particulate mold material in an open bottom container around a destructible pattern therein by exerting external fluid pressure on a bottom side of the mass exceeding the internal pressure in said container,
(b) relatively moving the container and an underlying molten metal pool to place said bottom side in the molten metal pool, and
(c) drawing molten metal through an ingate between the bottom side and the pattern to destroy and replace the pattern in said mass when the bottom side is placed in the molten metal pool.
43. A countergravity casting mold comprising:
(a) a container having an open bottom end,
(b) an inherently unstable mass of particulate mold material defining a metal-receiving molding cavity in the container, said mass having a bottom side for contacting an underlying molten metal pool,

(c) a destructible pattern embedded in the mass and shaping said cavity,
(d) ingate means between said pattern and bottom side, and
(e) means for establishing a negative pressure differential between the inside and the outside of said container sufficient to hold the particulate mold material in the container around the pattern.

4,874,030

BLENDS OF POLY(PROPYLENE CARBONATE) AND POLY(METHYL METHACRYLATE) AND THEIR USE IN DECOMPOSITION MOLDING

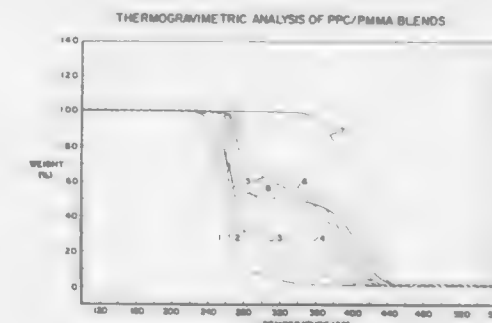
Jeffrey A. Kuphal, Blandon; Lloyd M. Robeson, Macungie, and James J. Weber, Allentown, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Mar. 22, 1989, Ser. No. 326,938

Int. Cl.⁴ B22C 9/02

U.S. Cl. 164—34

6 Claims



1. A method of pattern casting which comprises forming a pattern from a foamed blend of a polymer of propylene carbonate units and a polymer of methyl methacrylate within a shell, pouring molten metal into said shell in contact with said foamed blend, thereby decomposing said polymers, and permitting the decomposition products from said polymers to leave said shell as gases during said pouring step.

4,874,031

CANTILEVERED INTEGRAL AIRFOIL METHOD

David F. Janney, 930 San Pedro, Coral Gables, Fla. 33156

Division of Ser. No. 718,347, Apr. 1, 1985, abandoned. This

application Jan. 27, 1987, Ser. No. 6,987

Int. Cl.⁴ B21K 3/04; B22D 23/00

U.S. Cl. 164—76.1

5 Claims

1. The method of forming a cantilevered airfoil integral casting blank comprising the steps of,
forming an investment casting mold for molding said cantilevered airfoil,
adding to said mold a cavity forming means, said cavity connecting the peripheral portions at the ends of each of said blades to define, upon casting, a stabilizing band,
filling the mold from a location to direct molten metal to flow toward the stabilizing bands, and fill the cavity which is to become the stabilizing band,

removing the thus-cast turbine wheel blank with stabilizing bands from the mold,



removing the stabilizing band from the ends of the airfoil blades.

4,874,032

DIE CASTING CONTROLLING METHOD

Yotaro Hatamura, 12-11, Kohinata 2-chome, Bunkyo-ku, Tokyo, Japan

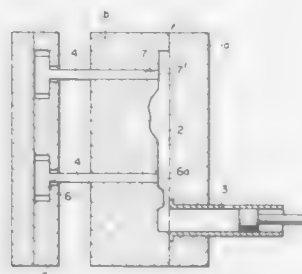
Continuation of Ser. No. 96,977, Sep. 14, 1987, abandoned. This application Mar. 27, 1989, Ser. No. 331,083

Claims priority, application Japan, Sep. 13, 1986, 61-216824; Sep. 13, 1986, 61-216825; Sep. 13, 1986, 61-216826; Nov. 17, 1986, 61-274564

Int. Cl.⁴ B22D 17/32

U.S. Cl. 164—457

5 Claims



1. A method of controlling a die casting operation, comprising the steps of:

(a) directly measuring:

- (i) injection pressure of molten metal into a cavity continuously throughout a casting cycle by at least one pressure sensor mounted in a die;
- (ii) pressure of said molten metal adjacent a pouring gate, continuously throughout the casting cycle by at least one pressure sensor;
- (iii) pressure of said molten metal far away from said pouring gate, continuously throughout the casting cycle by at least one pressure sensor; and
- (iv) temperature and heat flux of the cavity surface continuously throughout the casting cycle at at least two positions by at least one temperature sensor mounted in the die;

- (b) comparing measured values obtained from step (a) with reference pressure and temperature values; and
- (c) controlling said die casting operation in response to said comparison.

4,874,033

RAPID WARMER FOR BLOOD AND BLOOD PRODUCTS

Marie L. Nicholas Marchiani Chatelain, Le Leadiguères, Résidence St. Mury 38240, Meylan, France (F-38240), and Jean-Pierre Pellini, Tèche, Vinay, France (F-38470)

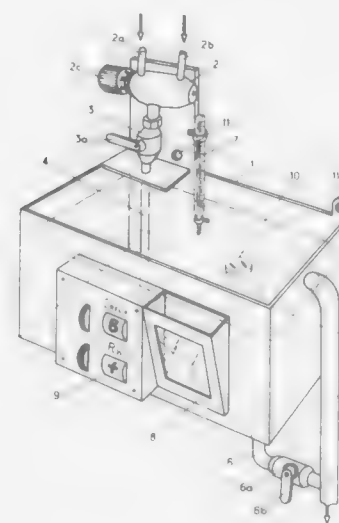
Filed Nov. 24, 1987, Ser. No. 124,611

Claims priority, application France, Nov. 28, 1986, 86 16859

Int. Cl.⁴ A61M 1/36; A61F 7/00

U.S. Cl. 165—1

17 Claims



8. A process for warming or defrosting products for injection or perfusion, particularly blood products, contained in hermetically sealed bottles or bags, comprising the steps of:

filling up and continuously circulating water in an upwardly opened cell by water circulating means comprising an inlet line and an overflow outlet line;

controlling the temperature and the flow rate of the water by means of an adjustable thermostatic tap connectable on the one hand to a cold water distribution network and on the other hand to a hot water distribution network, and an adjustable flow control valve, said adjustable thermostatic tap and said adjustable flow control valve being fitted in said inlet line of the water circulating means, said overflow outlet line forming an overflow for draining the water and having an inlet provided at an upper part of said cell, the outlet of said temperature controlled water inlet line opening into a lower part of said cell adjacent a first lateral side of said cell, the inlet of said overflow outlet line being located adjacent a second lateral side of said cell opposite said first side;

introducing at least one bottle or bag of product into said cell such that said at least one bottle or bag of product is submerged by the temperature controlled water continuously circulating around the at least one bottle or bag; and removing the at least one bottle or bag of product from the cell when the product contained therein is warmed or defrosted.

4,874,034

REFRACTORY UNIT FOR A HEAT REGENERATOR

Kimio Hirata, and Yasuo Saito, both of Chiba, Japan, assignors to Toshiba Monofrax Co., Ltd., Katori, Japan

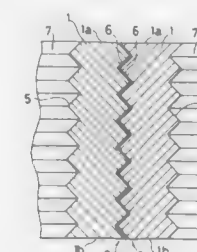
Filed Feb. 24, 1988, Ser. No. 159,939

Claims priority, application Japan, Mar. 3, 1987, 62-46680; Jul. 21, 1987, 62-180015; Jul. 21, 1987, 62-180016

Int. Cl.⁴ F28D 17/02

U.S. Cl. 165—9.1

15 Claims



1. A refractory unit for a heat regenerator comprising a unit body having a first end surface, a second end surface, an outer wall, an inner wall, a flow passage formed by the inner wall and extending between the first and second end surfaces, the flow passage having a center line, the outer wall including a series of concave and convex strips, the inner wall including a series of concave and convex strips, and four corners adapted to engage with corresponding corners of other adjacent refractory units when said units are arranged, thereby to form a further flow passage defined by the outer walls of the refractory units, each of the corners having a series of concave and convex strips;

wherein all of the refractory units are substantially the same in shape and include means for engaging with one another in a fitting condition by alternately turning the refractory units upside down.

4,874,035

HEAT EXCHANGER FOR COOLING TOWER

Ken Kashiwada, Fujisawa; Tadanobu Muto, Tokyo, and Tetsuo Sasaki, Fujisawa, all of Japan, assignors to Shinwa Sangyo Co., Ltd., Tokyo, Japan

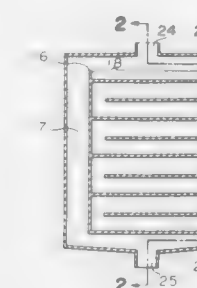
Filed Aug. 16, 1988, Ser. No. 233,265

Claims priority, application Japan, Nov. 17, 1987, 62-290120; Nov. 25, 1987, 62-295045; Nov. 27, 1987, 62-297732

Int. Cl.⁴ F28F 3/04

U.S. Cl. 165—38

5 Claims



1. A heat exchanger for cooling tower comprising a plurality of thin, flat liquid-flowing passages and a plurality of thin, flat air-flowing passages which are alternately interposed between the adjacent liquid-flowing passages, each of said liquid-flowing passages being separated from each of said air-flowing passages by a heat exchanging partition plate made of a metallic plate or a synthetic resin plate so as not to have air contact with liquid passed therethrough, said heat exchanger being

characterized in that deflectors are arranged on the surface of each of said partition plates in the direction of its width so as to project toward said liquid-flowing passages to thereby form a liquid-falling speed reducing part, and a vertically extending overflowed-liquid escaping conduit is formed adjacent said liquid-falling speed reducing part by means of a dam.

4,874,036

HEATING AND AIR CONDITIONING SYSTEM FOR A FORKLIFT

Kenji Masuda, Nitta, Japan, assignor to Sanden Corporation, Gunma, Japan

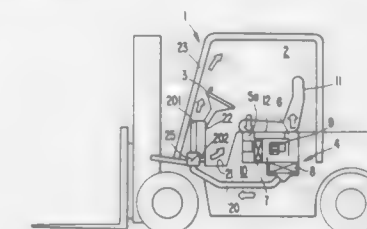
Filed Jul. 14, 1988, Ser. No. 218,987

Claims priority, application Japan, Jul. 14, 1987, 62-106925[U]; Jul. 14, 1987, 62-106926[U]

Int. Cl.⁴ B60H 1/00

U.S. Cl. 165—42

9 Claims



1. A heating and air conditioning system for a forklift having a cabin with a seat and a front glass, said heating and air conditioning system comprising a heating and air conditioning unit disposed within an engine room located below the seat, said heating and air conditioning unit comprising an evaporator, a fan, and a heater core, said heating and air conditioning unit having an air flow path between said evaporator and said fan and an air flow path between said fan and said heater core, wherein said heater core is positioned below said fan at a substantially right angle to said evaporator so that the air flow path between said evaporator and said fan is substantially perpendicular to the air flow path between said fan and said heater core, an inlet port disposed on said heating and air conditioning unit adjacent said evaporator, a first outlet port disposed on said heating and air conditioning unit adjacent said heater core, and a duct having a first and adjacent said heater core and a second end extending to a front portion of the cabin under the floor of the cabin.

4,874,037

APPARATUS FOR COOLING A HOT PRODUCT GAS
Gero Papst, Kaarst, Fed. Rep. of Germany, and Michael Nagl, Linz, Austria, assignors to Korf Engineering GmbH, Fed. Rep. of Germany and Voest-Alpine Aktiengesellschaft, Austria

Filed Jul. 18, 1985, Ser. No. 756,294

Claims priority, application Fed. Rep. of Germany, Jul. 18, 1984, 3427088

Int. Cl.⁴ F28F 19/00; C10J 3/68; F28D 21/00

U.S. Cl. 165—47

9 Claims

1. Apparatus for cooling a flowing hot product gas containing tacky particles which lose their tackiness on cooling, comprising:

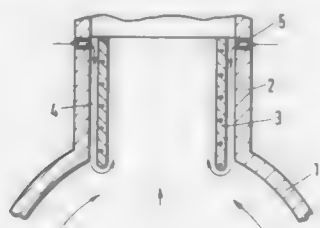
an outer wall of a means emitting said hot product gas containing tacky particles having a longitudinal axis, an upstream portion which converges in the direction of the flow of the hot product gas and a tubular portion which intersects said upstream portion and has a longitudinal axis, the hot product gas flowing into said tubular portion from said converging portion with said converging portion turning the flow of hot product gas radially inwardly

of the tubular portion toward said tubular portion longitudinal axis;

an annular tubular insert wall positioned within said outer wall tubular portion and being spaced therefrom to define an annular gap between said tubular insert wall and said outer wall tubular portion, said annular gap extending axially of said insert wall, said tubular insert wall having an upstream end and a downstream end, with said upstream end being located adjacent to the intersection of said outer wall tubular portion and said converging portion;

a cooling gas inlet port in said outer wall tubular portion for guiding cooling gas into said annular gap, said inlet port being located nearer to said tubular insert wall downstream end than to said upstream end so that cooling gas flowing into said annular gap from said inlet port flows upstream of the hot product gas flow direction;

said tubular insert wall upstream end defining with said outer wall a cooling gas outlet port, said cooling gas outlet



port opening into the hot product gas and being oriented to direct cooling gas upstream into the flowing hot product gas;

the configuration of the insert wall upstream end and its position with respect to the upstream portion of the means emitting the hot product gas being arranged to cause said cooling gas to flow in said annular gap and to contact said annular tubular insert wall and to flow into the hot product gas adjacent to the cooling gas outlet port at an angle to the flow direction of hot product gas flowing past said outlet port, said cooling gas being turned radially inward and then back into the flow direction of the hot product gas to flow around said insert wall upstream end and back along said tubular insert wall to be positioned between the hot product gas and said insert wall for essentially the entire length of said insert wall whereby cooling gas defines a film which prevents the tacky particles from contacting said insert wall and cools the hot product gas and said insert wall.

4,874,038

ECONOMICAL HOUSE AIR COOLING ARRANGEMENT
George E. Ehlert, 1111 Wadsworth Avenue, North Chicago, Ill. 60064

Filed Feb. 14, 1989, Ser. No. 309,866
Int. Cl.⁴ F25B 29/00; F25D 23/12

U.S. Cl. 165—48.1 4 Claims

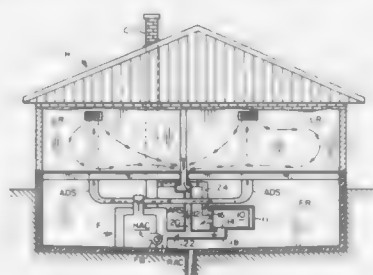
2. An economical air cooling arrangement for installation in a house having living rooms, a furnace room separate from the living rooms, a chimney extending to the outside of the house from the furnace room, and a conventional forced air heating system that includes a furnace located in the furnace room and having hot air and cold air chambers, an air delivery system connected to the furnace hot air chamber for delivering air from the furnace to the living rooms in the house, an air return system connected to the furnace cold air chamber for returning air from the living rooms to the furnace, and a blower in the furnace for forcing air from the air return system through the furnace into the air delivery system, said arrangement comprising:

(a) a conventional window mountable type of air cooling and dehumidifying unit located in the furnace room, and

which has an air intake opening and separate cool air and warm air discharge openings;

(b) means connecting said unit cool air discharge opening directly to a return duct of the air return system;

(c) said return duct having an air intake opening located in the furnace room between the furnace and said means



connecting said unit cool air discharge opening to the air return system;

(d) means connecting said unit warm air discharge opening to said chimney;

(e) means for venting air from the furnace room into said unit air intake opening.

4,874,039

PLATE HEAT EXCHANGER

Bo Nilsson, Kävlinge, Sweden, assignor to Alfa-Laval Thermal AB, Tumba, Sweden

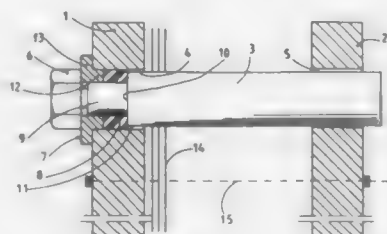
PCT No. PCT/SE87/00634, § 371 Date Jun. 28, 1988, § 102(e) Date Jun. 28, 1988, PCT Pub. No. WO88/05520, PCT Pub. Date Jul. 28, 1988

PCT Filed Dec. 28, 1987, Ser. No. 216,540

Claims priority, application Sweden, Jan. 16, 1987, 8700162 Int. Cl.⁴ F28F 3/08

U.S. Cl. 165—78

10 Claims



1. Plate heat exchanger comprising a frame plate, a pressure plate, heat exchange plates clamped between said frame plate and said pressure plate and a carrying bar for supporting said plates, each of said pressure plates and said heat exchange plates having holes for receiving said carrying bar, said carrying bar passing through said hole in said pressure plate and extending at least a distance into said hole in said frame plate, said pressure plate being slidable on said carrying bar, said pressure plate and said frame plate being identical so that the hole for the carrying bar in the frame plate is identical to the hole for the carrying bar in the pressure plate and a locking device for fastening the carrying bar in the frame plate.

4,874,040

UNIVERSAL HEAT EXCHANGER

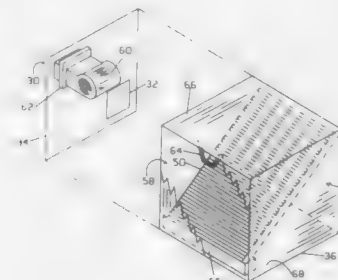
Donald C. Herrmann, 6902 Doral, North Landerdale, Fla. 33068

Filed Jul. 1, 1988, Ser. No. 214,427

Int. Cl.⁴ F24H 3/06; F28H 13/12

U.S. Cl. 165—122

13 Claims



1. A heat exchanger for use in any of a number of possible configurations, comprising in combination:

a rectangular housing means having a top, a bottom and a removable first panel, said first panel having a first surface having surface area and with four corners including a first and a second corner situated diagonally opposite one another, and a third and fourth corner situated diagonally opposite one another;

heat exchanging means situated approximately diagonally within said housing spanning from approximately said third corner to said fourth corner such that said housing is partitioned into a first chamber adjacent said first corner and a second chamber adjacent said second corner;

return means, situated near first corner on said first surface and occupying less than approximately $\frac{1}{4}$ of said surface area, for coupling air to said first chamber;

supply means, situated near said second corner on said first surface and occupying less than approximately $\frac{1}{4}$ of said surface area, for coupling air from said second chamber; and

air circulation means, situated within one of said first and second chambers and coupled to said first panel, for forcing air to pass by said heat exchanging means and thereby pass from said first chamber to said second chamber; whereby, said first panel may be rotated by 180 degrees to reverse the direction of air flow through said heat exchanging means and reverse the orientation of said supply means and said return means.

4,874,041

BAR SUPPORT SHIM AND METHOD

David L. Crick, and James K. Hayes, both of Chattanooga, Tenn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Oct. 19, 1987, Ser. No. 109,874

Int. Cl.⁴ F28D 7/00

U.S. Cl. 165—162

5 Claims

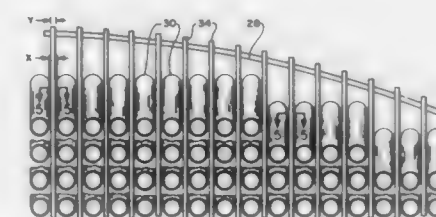
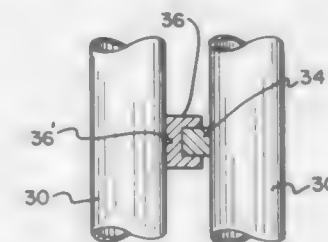
1. In a nuclear steam generator having anti-vibration bars for limiting the motion of spaced heat exchanging tubes, the improvement comprising:

a shim located between every n^{th} tube, said shims having a thickness equal to n times the dimensional difference $(x-y)$ of the distance x between a pair of tubes and the width y of an anti-vibration bar between the tubes, where n is greater than one.

5. The method of reducing vibration damage to heat exchanging tubes of a tube bundle in nuclear steam generators having anti-vibration bars located between the tubes and attached at their ends to wrap-around bars on the outside of the tube bundle, which method includes the step of:

cutting and removing the wrap-around bars from the outside of the tube bundle;

inserting and expanding a bladder to spread a pair of tubes in the bundle on opposite sides of an anti-vibration bar apart; moving the anti-vibration bar between the pair of tubes to one side of the opening created by the bladder; inserting a shim of modular lengths between the anti-vibration bar and one tube of said pair of tubes;



repeating the bladder inserting and expanding, the anti-vibration bar moving and the shim inserting steps at intervals along the bundle; and

welding a wrap-around bar to the ends of the anti-vibration bars on the outside of the tube bundle.

4,874,042

CORRUGATED CARDBOARD HEAT EXCHANGER

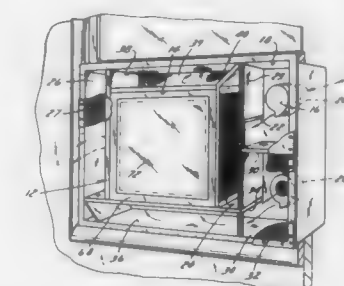
William Becker, Rte. #1, Princeton, Wis. 57968

Filed May 27, 1988, Ser. No. 199,525

Int. Cl.⁴ F28F 3/10

U.S. Cl. 165—166

9 Claims



8. A heat exchange core comprising a plurality of frames formed from a corrugated cardboard material having a plurality of flow paths, a plastic film secured to one side of said frame to form a heat transfer surface on one side of said frame, said frames being stacked so that each alternate frame is turned 90° with respect to each adjacent frame, whereby the air paths of each alternate frame form a first flow path in one direction through said core and the air paths in the alternate frames form a second air path in the other direction through said core.

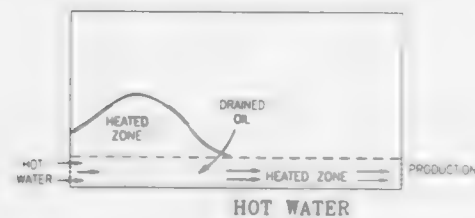
4,874,043

METHOD OF PRODUCING VISCOUS OIL FROM SUBTERRANEAN FORMATION

Earl M. Joseph, Robert J. Pritchard, and Arshad H. Sufi, all of Tulsa, Okla., assignors to Amoco Corporation, Chicago, Ill.
Filed Sep. 19, 1988, Ser. No. 246,223
Int. Cl.⁴ E21B 43/24

U.S. Cl. 166—272

5 Claims



1. A method for producing viscous oil from a subterranean formation penetrated by an injection well and a spaced apart production well, said method comprising the steps of:

- establishing fluid flow communication between the injection well and the production well in a flow path along lower portions of a formation pay zone containing said viscous oil;
- heating the flow path and adjacent portions of the pay zone by injecting hot water or low quality steam into and through the flow path for a time sufficient to raise the temperature of the adjacent pay zone and viscous oil to a temperature at least sufficient to liquify the viscous oil and make it mobile in the heated zone and displaceable by hot water;
- injecting alternating slugs of hot water and steam through the injection well and into the pay zone overlying the heated flow path to cause the viscous oil in the pay zone to liquify and drain into the heated flow path and to be displaced toward the production well by hot water;
- subsequent to step (c), displacing substantially all of the oil in the heated path by hot water; and
- recovering produced fluids through the production well.

4,874,044

METHOD FOR OIL RECOVERY USING A MODIFIED HETEROPOLYSACCHARIDE

Peter D. Robinson, Poughkeepsie, and Arthur J. Stipanovic, Wappingers Falls, both of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Oct. 11, 1988, Ser. No. 256,014

Int. Cl.⁴ C08B 37/00; C12P 19/04; E21B 43/22

U.S. Cl. 166—275

4 Claims

1. A process for recovering hydrocarbons from a subterranean hydrocarbon bearing formation penetrated by an injection well and a production well which comprises:

- injecting into the formation via said injection well an aqueous drive fluid comprising water and more than 50 ppm of a beta-fluoropyruvate modified NW11 heteropolysaccharide;
 - forcing said aqueous drive fluid through the formation and
 - recovering hydrocarbons from said production well.
2. A process for producing a heteropolysaccharide comprising:
- inoculating *Xanthobacter* sp. strain NW11-ATCC 53272 into an aqueous fermentation medium containing a carbon and nitrogen source;
 - adding from 0.3 to 3.0 mM beta-fluoropyruvate to the fermentation after 0 to 24 hours;
 - incubating said inoculated material at a temperature ranging from 26° to 30° C. for a period of about 120 to about 170 hours to form a heteropolysaccharide and

(d) recovering the polysaccharide.

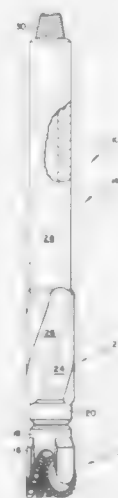
4,874,045

STRAIGHT HOLE DRILLING METHOD AND ASSEMBLY

Charles H. Clayton, 202 Pecos, Portland, Tex. 78374
Filed Dec. 27, 1988, Ser. No. 290,578
Int. Cl.⁴ E21B 7/00, 17/22

U.S. Cl. 175—57

20 Claims



- A method of drilling a well comprising matching a particular bit with a particular stabilizer including measuring a first maximum outer diameter of a bit; selecting a stabilizer having a maximum outer diameter; machining the bit and removing material from the outer surface thereof to a second maximum diameter less than the first diameter and greater than the maximum outer diameter of the stabilizer.
- A method of drilling a well comprising drilling a bore hole in the earth to a depth and determining the angle of departure of the bore hole relative to a vertical axis; reducing the angle of departure of the bore hole relative to the vertical axis including matching a particular bit with a particular stabilizer including measuring a maximum outer diameter of a bit; selecting a stabilizer having an outer surface providing a first maximum outer diameter; and machining the stabilizer and removing material from the outer surface thereof to a second maximum diameter less than the first diameter and less than the maximum outer diameter of the bit; and drilling a continuation of the bore hole with the matched bit and stabilizer.

4,874,046

GROOVE CUTTER FOR CONCRETE BORES

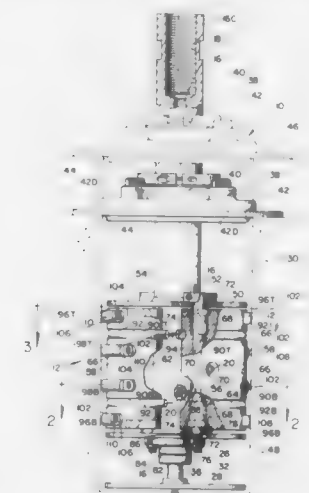
Marvin G. Hurd, 105 Field St., Lakewood, Colo. 80226
Filed Apr. 1, 1988, Ser. No. 177,357
Int. Cl.⁴ E21B 10/32

U.S. Cl. 175—292

5 Claims

- In a rotary groove-cutting tool of the type having a rotatable center shaft and two or more generally-arcuate flyweight subassemblies mounted for rotational movement with said center shaft, said subassemblies each being mounted for pivotal movement between a retracted inoperative position when at rest and an extended operative one upon being rotated, and in

which said flyweight subassemblies in extended position swing out toward the bore wall about eccentrically-located axes paralleling the center shaft but displaced radially therefrom, the improvement comprising a means carried by said flyweight subassemblies especially adapted for cutting circumferential



grooves in concrete bores likely to have voids therein, which comprises: at least two circumferentially elongate cutters having outwardly-facing abrasive cutting surfaces arranged one above the other in vertically-spaced stacked relation for cutting separate grooves, said cutters being circumferentially staggered while having portions thereof overlapped.

4,874,047

METHOD AND APPARATUS FOR RETAINING ROLLER CONE OF DRILL BIT

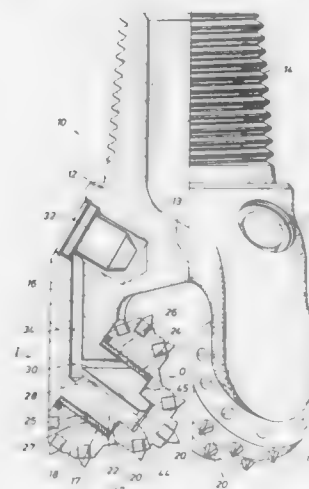
Charles E. Hixon, Houston, Tex., assignor to Cummins Engine Company, Inc., Columbus, Ind.

Filed Jul. 21, 1988, Ser. No. 222,139

Int. Cl.⁴ E21B 10/20, 10/22; B21K 5/02

U.S. Cl. 175—369

20 Claims



- A roller cone type rock bit comprising: a bit body including at least one depending leg, said leg having an outer free end and an inner end continuous with the remainder of said bit body; a roller cone having an axial internal hollow disposed in generally coaxially surrounding relation to said leg adja-

cent said outer end and sized to define an annular space therebetween;

and a plurality of separately pre-formed retention members being mounted on said leg by an interference fit and rotatable relative to said cone, and a second of said retention members—disposed longitudinally inwardly of said first retention member along said leg—being fixedly mounted on said cone and rotatable relative to said leg, and said retention members having means cooperative therebetween to prevent relative movement of said second retention member longitudinally past said first retention member.

17. A method of rotatably mounting a cone member for a roller cone type rock bit on a depending leg member of a bit body, wherein said leg member has cylindrical outer wall means with a first end which is free and a second end which is continuous with the remainder of said bit body, and said cone member has an axial internal hollow having cylindrical inner wall means with a first end adjacent the base of said cone and at which said hollow opens through said cone, and a second end adjacent the apex of said cone and which is closed, said method comprising the steps of:

placing first retention means adjacent the second end of the respective wall means of one of said members, and in relatively rotatable relation thereto, with said first retention means extending radially beyond the respective wall means to form a first axially facing shoulder;

then affixing second retention means to said one member adjacent the first end of its respective wall means, with said second retention means also extending radially beyond the respective wall means to form a second axially facing shoulder facing in a direction opposite to said first shoulder;

then telescoping said members so as to place said inner wall means in coaxially surrounding relation to said outer wall means and the other of said members in relatively rotatable relation to said second retention means;

and affixing said other of said members to said first retention means.

4,874,048

LOADING AND WEIGHING STRUCTURE FOR COMBINATION WEIGHING MACHINE

Shozo Kawanishi, Kobe, and Tadaaki Higuchi, Akashi, both of Japan, assignors to Yamato Scale Company, Limited, Akashi, Japan

Filed May 4, 1987, Ser. No. 46,833

Claims priority, application Japan, May 21, 1986, 61-77470[U]

The portion of the term of this patent subsequent to May 6, 2097, has been disclaimed.

Int. Cl.⁴ G01G 13/00, 13/16

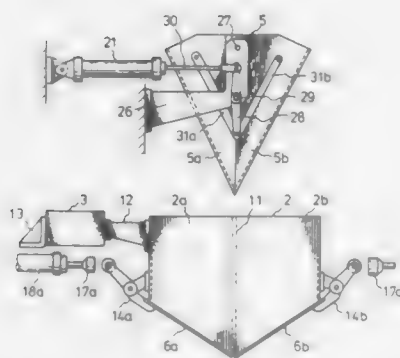
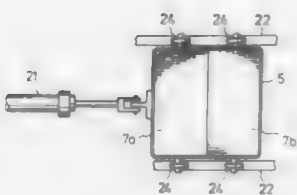
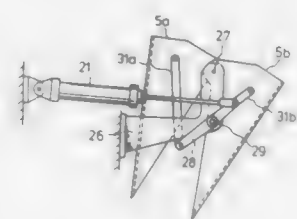
U.S. Cl. 177—25.18

3 Claims

- A product feeding and weighing structure for a combination weighing machine, comprising a weigh hopper having a partition therein dividing the hopper into two chambers, a feed hopper disposed above the weigh hopper having discharge gate means adapted for opening to feed the contents of the feed hopper into either of the two chambers of the weigh hopper, and means for selectively effecting substantially linear horizontal movement of the feed hopper in one direction with respect to said partition for feeding the contents of the feed hopper through said discharge gate means into one chamber of the

weighing hopper and in the opposite direction with respect to the partition for feeding the contents of the feed hopper

ing a weight signal indicative of the weight of material in the first hopper; and



through said discharge gate means into the other chamber of the weighing hopper.

4,874,049

AUTOMATIC WEIGHING METHOD AND APPARATUS
Howard Kee, Palermo, and Frederick Goff, Marysville, both of Calif., assignors to Kee Equipment and Engineering, Oakland, Calif.

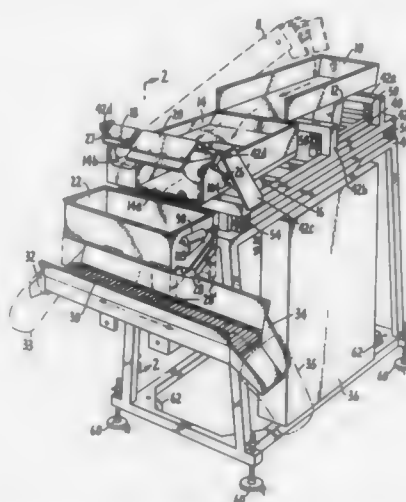
Filed Feb. 3, 1989, Ser. No. 306,814
Int. Cl.⁴ G01G 13/16, 13/24, 13/02

U.S. Cl. 177—59

23 Claims

1. An apparatus for weighing material, including: a first gated bin for receiving and accumulating portions of the material, and including a means for releasing the material accumulated therein;
- a first weighing hopper, positioned for receiving and accumulating the material released from the first gated bin, and including a means for releasing the material accumulated therein;
- a first weight sensor coupled to the first hopper, for generat-

ing a weight signal indicative of the weight of material in the first hopper; and



a first reversible conveyor, positioned for receiving the material released from the first hopper.

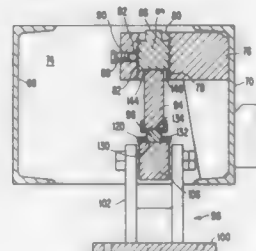
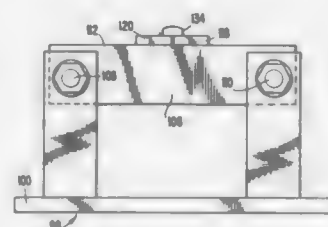
4,874,050

PORTABLE DECK TRUCK SCALE
Thomas F. Strasser, and Herbert L. Stott, both of Meridian, Miss., assignors to Fairbanks Inc., Kans.

Filed Nov. 15, 1988, Ser. No. 271,992
Int. Cl.⁴ G01G 19/02, 21/22

U.S. Cl. 177—134

18 Claims



1. A portable deck truck scale comprising a scale deck including at least one deck section, said deck section having first

and second spaced sidewalls extending between spaced end walls and including a top deck assembly, bottom plate means spaced from said top deck assembly and a metal support means positioned between and joined to said top deck assembly and bottom plate means, said metal support means including "V"-shaped support beams extending longitudinally of said deck section between said spaced end walls substantially across the extent of said deck section between said first and second sidewalls, each said "V"-shaped support beam having an apex which is joined to either said top deck assembly or said bottom plate means and beam sidewalls which extend angularly away from said apex to form an apex angle at said apex, the apex angle of a plurality of said support beams adjacent to each of said first and second spaced sidewalls being less than the apex angle of the remaining support beams, load cell means mounted beneath said scale deck, and load transmitting means extending between said scale deck and said load cell means to transmit forces from said scale deck to said load cell means.

4,874,051

LEAF SPRING

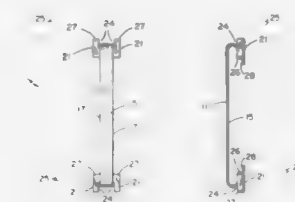
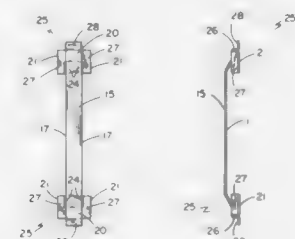
John S. Borchard, 97-A Lowell Ave., Newton, Mass. 02160

Filed Feb. 13, 1989, Ser. No. 309,184

Int. Cl.⁴ G01G 3/08; F16F 1/18, 1/20

U.S. Cl. 177—229

7 Claims



1. A leaf spring used in measuring apparatus for masses and forces, comprised of:

- a flat, thin strip formed into an elongated flexible member terminating at either end into polygonal shapes with an overall width greater than the width of the elongated member, wherein each polygonal shape has four or more edges and is formed into a spring footing having three or more downwardly bent sides with one or more sides having outward flanges formed near their edges.

4,874,052

SUSPENSION SYSTEM FOR A VEHICLE

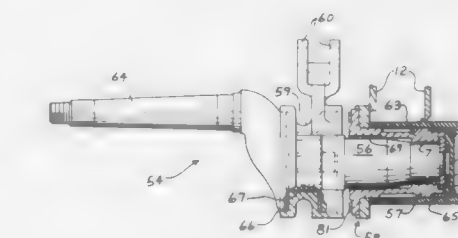
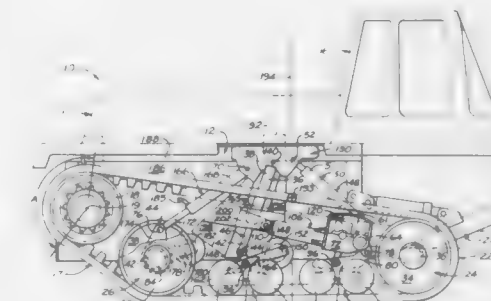
Robert J. Purcell, Washington, and Robert R. Farris, Peoria, both of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Dec. 23, 1987, Ser. No. 137,273

Int. Cl.⁴ B60G 5/06, 13/06; B62D 55/14

U.S. Cl. 180—9.1

16 Claims



1. A recoil support assembly for and idler wheel of a vehicle having a frame, comprising:

- recoil means for pivotally supporting the idler wheel with respect to the frame and resiliently reacting primarily to substantially horizontal forces applied to said idler wheel, said recoil means including a hydropneumatic recoil strut having a first portion connected to the frame and a second portion connected to the idler wheel, said recoil means further including a lever arm unit having a first shaft portion, a second shaft portion and an intermediate portion having ears, said lever arm unit being pivotally mounted to said frame by said first shaft portion; and
- suspension strut means for pivotally supporting the second portion of said recoil means and said idler wheel on said frame and resiliently reacting primarily to substantially vertical forces applied to said wheel, said strut means including a hydropneumatic suspension strut having a first end connected to said vehicle frame and a second end connected to said ears on said intermediate portion of said lever arm unit.

4,874,053

TORQUE DETECTING APPARATUS

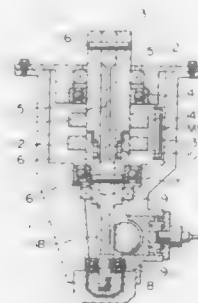
Hiroshi Kimura; Shotaro Naito, both of Katsuta; Kunio Miyashita, Hitachi; Yasuo Noto, Katsuta; Noboru Sugiyama, Mito; Tadashi Takahashi, Hitachi; Hirohisa Yamamura, Hitachi; Seizi Yamashita, Katsuta; Syoichi Kawamata, Hitachi; Fumio Tajima, Ibaraki, and Shigeru Horikoshi, Mito, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Jan. 22, 1988, Ser. No. 209,998

Claims priority, application Japan, Jan. 22, 1987, 62-155061; Oct. 9, 1987, 62-253692; Oct. 9, 1987, 62-253693; Oct. 9, 1987, 62-253694; Oct. 21, 1987, 62-263930

Int. Cl.⁴ B62D 5/04

U.S. Cl. 180—79.1

35 Claims



1. A torque detecting apparatus comprising: a driving shaft and a driven shaft connected coaxially with said driving shaft by a torsion bar; a first drum fitted on said driving shaft and a second drum fitted on said driven shaft; magnetic signals recorded on the surface of said first and second drums; and a magnetic sensor for detecting the rotational angles of said first and second drums in a non-contact manner, said apparatus detecting a torque from a difference of rotational angles of said first and second drums, wherein said driving shaft and driven shaft are connected at free end portions thereof by a coupling bearing so that said shafts are allowed to have a relative rotation, and wherein said first and second drums are fitted on the external circumference of free ends of said driving shaft and driven shaft.

4,874,054

CONTROL IN A VEHICLE FOUR WHEEL STEERING SYSTEM

Kenichi Watanabe, Hiroshima, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan

Filed Aug. 26, 1987, Ser. No. 89,552

Claims priority, application Japan, Aug. 27, 1986, 61-201085; Aug. 27, 1986, 61-201086; Aug. 27, 1986, 61-201087

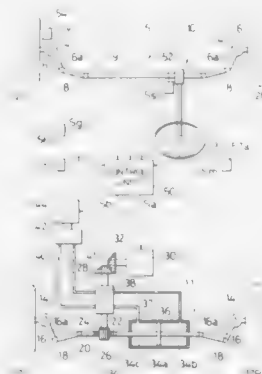
Int. Cl.⁴ B62D 5/06

U.S. Cl. 180—140

15 Claims

1. A vehicle four wheel steering system including a manually actuated steering member, front wheel steering means for producing a steering angle in each of front wheels in response to an actuation of the steering member, rear wheel steering means for producing a steering angle in each of rear wheels in response to a steering movement of the front wheel, said rear wheel steering means including steering ratio setting means for determining a steering ratio of the steering angle of the rear wheel to the steering angle of the front wheel in accordance with a vehicle operating condition, the improvement comprising side force detecting means for detecting a side force produced in the vehicle in a transverse direction of the vehicle and producing a side force signal, steering ratio modifying means responsive to said side force signal for modifying the steering

ratio so that the steering angle of the rear wheel is added with a modification steering angle in a direction opposite to the



4,874,055

CHARIOT TYPE GOLF CART

Robin F. C. Beer, Seafeld Ballymoney, Gorey, County Wexford, Ireland

Filed Dec. 16, 1987, Ser. No. 134,039

Int. Cl.⁴ B62D 51/00

U.S. Cl. 180—19.2

4 Claims

1. A golf cart comprising: a frame having a front end and a rear end; a platform mounted to said frame upon which a golfer may stand; a pair of rear wheels mounted to said frame substantially straddling said platform, said wheels having a common axis oriented substantially perpendicular to a fore and aft cart center line which extends centrally through said platform; a front wheel steerably mounted adjacent said frame front end along said cart center line said front and rear wheels being tangent to a cart operative support plane; drive means for driving at least one of said rear wheels; bag support means for supporting a golf bag in a designated space upon said platform; and means for steering and supporting the cart for storage in an upended position and which includes a bar steerably coupled with said front wheel and having an elongated handle portion, oriented substantially parallel to said common axis of said rear wheels, said bar being adjustably mounted to locate said handle portion in a first position above said frame for gripping by a golfer standing upon said platform, a second position forwardly of said frame for gripping by a golfer walking beside said cart and a third position adjacent said frame rear end said handle portion and said frame rear end being coextensive in a cart storage

plane substantially perpendicular to said cart operative plane in said third position.

4,874,056

DRIVING FORCE DISTRIBUTION CONTROL SYSTEM FOR A 4 WHEEL DRIVE VEHICLE

Genpei Naito, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

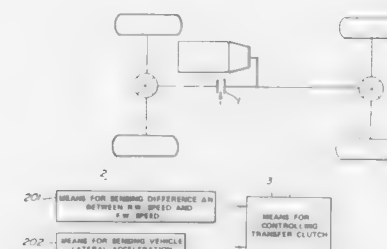
Filed Dec. 2, 1987, Ser. No. 127,319

Claims priority, application Japan, Dec. 3, 1986, 61-288498

Int. Cl.⁴ B60K 17/344

U.S. Cl. 180—233

10 Claims



1. A driving force distribution control system for a vehicle having a prime mover, primary driving wheels and secondary driving wheels, said control system comprising:

a transfer mechanism for transmitting a driving torque from said prime mover to said primary and secondary driving wheels, said transfer mechanism comprising a transfer clutch which is disposed in a drive path to said secondary wheels and capable of varying a clutch engagement force to vary a secondary drive torque transmitted through said transfer clutch to said secondary driving wheels,

actuating means for actuating said transfer clutch to vary a driving torque distribution between said primary and secondary wheels by varying said clutch engagement force of said transfer clutch in response to a control signal, wheel speed difference sensing means for sensing a wheel speed difference between a revolving speed of said primary wheels and a revolving speed of said secondary wheels,

lateral acceleration sensing means for sensing a lateral acceleration of said vehicle, and

control means, connected to said wheel speed difference sensing means and said lateral acceleration sensing means, for producing said control signal and for increasing said clutch engagement force more gradually as said wheel speed difference increases when said lateral acceleration is high than when said lateral acceleration is low, said control means further comprising:

signal producing means for increasing said clutch engagement force of said transfer clutch so as to increase a tendency to a four wheel drive condition with an increase of said wheel speed difference by producing said control signal representing said clutch engagement force in accordance with a control characteristic between said clutch engagement force and said wheel speed difference, and characteristic determining means for varying said control characteristic in accordance with said lateral acceleration so that a rate of increase of said clutch engagement force with respect to said wheel speed difference is increased, at least within a limited range of said wheel speed difference, when said lateral acceleration decreases, said characteristic determining means comprising selection means for selecting a predetermined gradual relationship as said control characteristic at least when said lateral acceleration is equal to a predetermined high value, and a predetermined steep relationship at least when said lateral acceleration is equal to a predetermined low value lower than said high value, said gradual and steep relationships being relationships between said clutch engagement force and

said wheel speed difference determined so that, for any given value of said wheel speed difference, said clutch engagement force of said steep relationship is equal to or greater than that of said gradual relationship.

4,874,057

HYDROMECHANICAL ALL WHEEL DRIVE

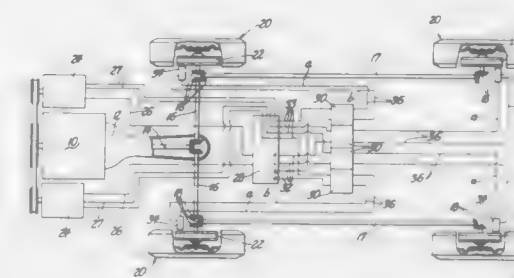
Roger M. Smith, 7261 Lyons, Inlay City, Mich. 48444

Filed Mar. 29, 1988, Ser. No. 174,926

Int. Cl.⁴ B60K 17/356

U.S. Cl. 180—242

5 Claims



1. A wheel traction sensor for a vehicle wherein the vehicle has a right side and a left side, at least two wheels on each side, each wheel on the left side being parallel with and axially aligned with a corresponding wheel on the right side, the vehicle further having both mechanical and hydraulic drive inputs to each wheel, the hydraulic drive inputs including a hydraulic pump/motor attached to each wheel, the pump/motors having an output pressure corresponding to the rotational speed of the wheel; the sum of the output pressures on the right side corresponding to the sum of the rotational speeds of the wheels on the right side; the sum of the output pressures on the left side corresponding to the sum of the rotational speeds of the wheels on the left side; the wheel traction sensor comprising:

a left row of cylinders equal in number to the pairs of parallel wheels, each cylinder in the left row of cylinders communicating with the output pressure from a pump/motor on the left side;

a right row of cylinders equal in number to the pairs of parallel wheels, each cylinder in the right row of cylinders communicating with the output pressure from a pump/motor on the right side;

a piston disposed within each cylinder;

a first means for simultaneously moving the pistons in the right row of cylinders along equidistant parallel paths;

a second means for simultaneously moving the pistons in the left row of cylinders along equidistant parallel paths;

the output pressures from the wheels on the left side actuates the pistons in the left row of cylinders, and causes the first moving means to move a first distance corresponding to the sum of the rotational speeds of the wheels left side;

the output pressures from the wheels on the right side actuates the pistons in the right row of cylinders, and causes the second moving means to move a second distance corresponding to the sum of the rotational speeds of the wheels right side;

the difference between the first distance and the second distance corresponding to the difference in traction between the wheels on left side and right side of the vehicle.

4,874,058

VISCOUS SHEAR COUPLING

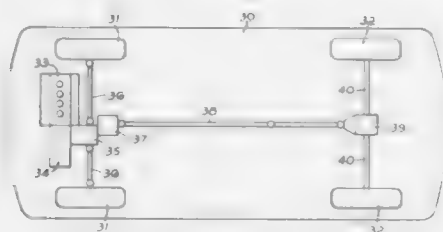
Georg Kwoke, Siegburg, Fed. Rep. of Germany, assignor to Viscodrive GmbH

Filed Jul. 21, 1988, Ser. No. 222,276

Int. Cl.⁴ B60K 17/348; F16D 31/06

U.S. Cl. 180—248

20 Claims



16. A motor vehicle including a prime mover and a drive transmission having front and rear pairs of drivable wheels wherein, when the vehicle is being driven, the wheels of the front pair are driven directly and permanently from the prime mover via an inter wheel differential gear and the wheels of the rear pair are connected to the prime mover via viscous shear coupling means comprising at least one viscous shear coupling including a housing part; a hub part within the housing part, the parts being relatively rotatable about a common axis; a viscous liquid in the housing part; first and second sets of annular plate in the housing part, the plates of the first set being rotationally fast with the housing part and being interleaved with the plates of the second set which are rotationally fast with the hub part; pump means for the viscous liquid and communicating with the interior of the housing part and means connecting the pump means to the said parts so that the pump means is operated when there is relative rotation between said parts such that the pump means tends to fill the portion of the housing part containing the plates with the viscous liquid when the housing part and the hub part rotate relative to one another in one sense and tends to empty said portion of viscous liquid when said parts rotate relative to one another in the opposite sense; the viscous shear coupling means being arranged so that if one or both of the rear wheels overrun both of the front wheels, the pump means of the viscous shear coupling connected to the overrunning wheel or wheels tends to empty said portion of the housing part containing the plates in the or each such coupling to reduce the torque transmitted by the or each such viscous shear coupling, and said pump means is a screw pump.

4,874,059

CONTROL DEVICE FOR DIFFERENTIAL LIMITING MECHANISMS OF FOUR-WHEEL DRIVE CAR

Norimichi Kasagawa, Susono, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Jun. 1, 1988, Ser. No. 200,924

Claims priority, application Japan, Jun. 26, 1987, 62-157839

Int. Cl.⁴ B60R 17/34

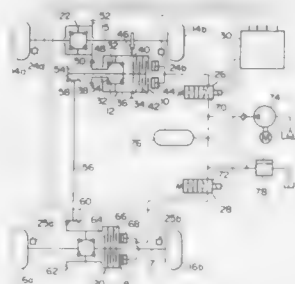
U.S. Cl. 180—249

7 Claims

1. A control device for controlling differential limiting mechanisms of a full time four-wheel drive car provided with a central differential gear having a first differential limiting mechanism, a differential gear having a second differential limiting mechanism incorporated in one of a drive shaft connected with front wheels and a drive shaft connected with rear wheels and a differential gear incorporated in the other of said drive shafts, comprising:

means for detecting the rotational frequencies of left and right front wheels and left and right rear wheels; means for operating said respective differential limiting mechanisms; and a controller for receiving signals from said rotational frequency detecting means, wherein said controller controls said respective operating

means such that the differential motion between the front and rear wheels is greatly limited by said first differential limiting mechanism when a difference between the rotational frequencies of the front and rear wheels is equal to or larger than a first predetermined value and differential



motion between the right and left wheels is greatly limited by said second differential limiting mechanism when a difference between the rotational frequencies of the left and right wheels is equal to or larger than a second predetermined value.

4,874,060

DEVICE FOR RECEIVING SOUND WAVES IN A WELL

Philippe Guerendel, Paris; Charles Naville, Massy; Jean Laurent, Orgeval, and Pascal Dedole, Ruell Malmaison, all of France, assignors to Institut Francais du Petrole & Compagnie Generale de Geophysique, Ruell-Malmaison, France

Continuation of Ser. No. 706,874, Feb. 28, 1985, abandoned.

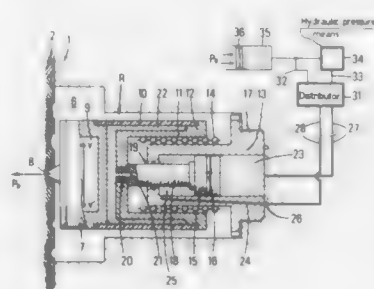
This application May 7, 1987, Ser. No. 46,644

Claims priority, application France, Feb. 28, 1984, 85 03197

Int. Cl.⁴ G01V 1/00, 1/40

U.S. Cl. 181—102

18 Claims



1. A sound wave reception device to be positioned in a probe lowered into a borehole at an end of a cable, said probe having a cavity and being provided with at least one anchoring movable arm, opening of said at least one arm pushing the probe towards a wall of the borehole, said device comprising at least one directional receiver assembly displaceable in said probe cavity and an actuating jack associated with pressure means for moving the at least one receiver assembly in said cavity along an axis of said jack between a retracted position away from a wall of the borehole and a position in which the at least one receiver assembly is coupled with said wall of the borehole, and resilient suspension means, interposed between the actuating jack and said at least one receiving assembly, for resiliently suspending said at least one receiver assembly; said at least one receiver assembly being suspended by said suspension means and permitted by deformation of the suspension means to oscillate along a direction substantially perpendicular to the axis of said jack; whereby vibrations from the probe to the at least one receiver assembly are damped at least along a direction substantially perpendicular to the axis of said jack.

4,874,061

DOWNHOLE ORBITAL SEISMIC SOURCE

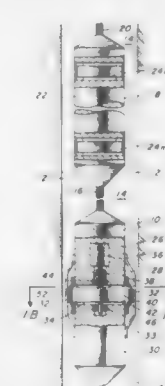
Jack H. Cole, Ponca City, Okla., assignor to Conoco Inc., Ponca City, Okla.

Filed Jan. 19, 1988, Ser. No. 145,019

Int. Cl.⁴ G01V 1/40

U.S. Cl. 181—106

15 Claims



1. A downhole seismic source for the simultaneous generation of elliptically polarized shear wave seismic energy and compression wave seismic energy into a fluid-filled borehole wall comprising:

an elongated cylindrical frame means immersible in said fluid-filled borehole, said frame means having a central axis and first and second ends and an outer wall supportable at a point along said borehole wall; means including a cable connected to said cylindrical frame means first end for supporting the frame means at selected positions along said borehole; and drive means disposed in said frame means in approximately equal spacing from the first and second ends and energizable to impart an eccentric orbital motion to at least a circumferential portion of the frame means outer wall thereby to generate an elliptically polarized shear wave in said borehole wall.

4,874,062

MUFFLER

Kouichi Yanagida, Toyota; Shinichiro Kano, Kariya; Takeshi Gotou, and Takashi Hirose, both of Aichi, all of Japan, assignors to Kojima Press Industry Co., Ltd., Aichi, Japan

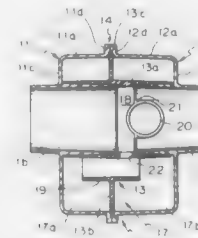
Filed Sep. 6, 1988, Ser. No. 240,935

Claims priority, application Japan, Sep. 7, 1987, 62-136589[U]

Int. Cl.⁴ F01N 1/02

U.S. Cl. 181—250

20 Claims



1. A muffler, comprising: a pipe having a tubular wall; a casing attached to an outer face of said tubular wall, and said casing covering a predetermined region of said outer face of said tubular wall to define a resonance chamber therein; a wall member in contact with said outer face of said tubular

wall and extending essentially over the entire region of said outer face of said tubular wall; at least one separating wall connected to said wall member at one end thereof and connected to an inner wall of said casing, which faces said wall member, at another end thereof, to divide said resonance chamber into at least two resonance chamber portions; and communicating means for communicating an interior of said pipe with said resonance chamber portions, said communicating means having at least one opening means extending through both said tubular wall and said wall member.

4,874,063

PORTABLE ELEVATOR TRAFFIC PATTERN MONITORING SYSTEM

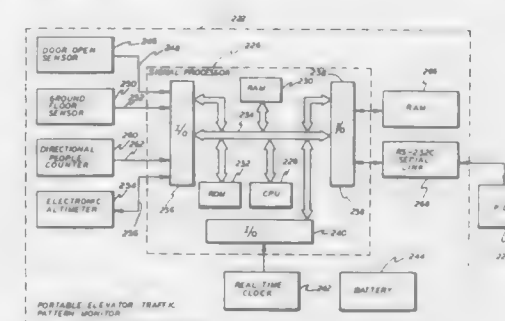
Kenneth D. Taylor, South Windsor, Conn., assignor to Otis Elevator Company, Farmington, Conn.

Filed Oct. 27, 1988, Ser. No. 263,676

Int. Cl.⁴ B66B 3/00

U.S. Cl. 187—130

4 Claims



1. Apparatus for an elevator, comprising: a portable housing for mounting therein a plurality of components, said plurality comprising: person sensing means, responsive to the presence of a person, for providing a person signal indicative of a direction of movement of said person; height sensing means, responsive to the altitude of said portable housing for providing a floor signal; clock means for providing a time signal indicative of the time of day; and signal processing means, responsive to said person signal, said floor signal and said time signal for storing said person, floor and time signals.

4,874,064

BRAKE APPARATUS FOR AUTOMOTIVE VEHICLE

Toshio Oono, Okazaki, Japan, assignor to Aisin Takaoka Limited, Toyota, Japan

Filed Jun. 17, 1987, Ser. No. 63,240

Claims priority, application Japan, Jun. 25, 1986, 61-148893

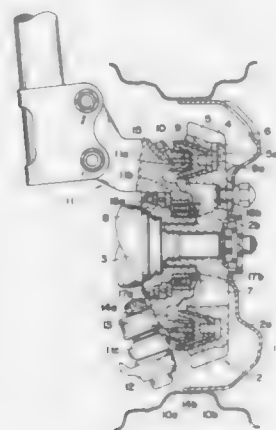
Int. Cl.⁴ F16D 55/02

U.S. Cl. 188—70 R

12 Claims

1. A brake apparatus for an automotive vehicle comprising: a wheel hub mounted for rotation about an axis of rotation and having inner and outer axial ends, said wheel hub including a rotary disk and a hub body, said rotary disk being provided with an annular V groove in a side thereof facing the inner axial end, said groove being concentric with said axis of rotation; a separate and discrete bearing support member abutting said hub body and having an outer circumferential surface and a flange portion extending radially outwardly of said hub body at said inner axial end of said wheel hub; a steering knuckle mounted adjacent said inner axial end of said wheel hub and being provided with an annular por-

tion which is concentric with said axis of rotation and which extends axially of and radially outwardly of said bearing support member, said annular portion having an inner circumferential surface and including a projection extending radially inwardly of said annular portion at an axial position intermediate said inner and outer axial ends of said wheel hub;
a V-shaped brake member mounted on said steering knuckle and being engageable and disengageable with said V-



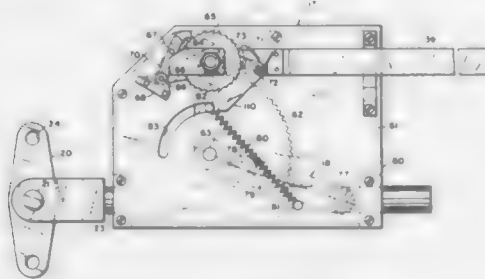
groove through movement in a direction parallel with said axis of rotation of the wheel hub; and
bearing means for radially and axially supporting the wheel hub relative to said steering knuckle, said bearing means being disposed between said outer circumferential surface of said bearing support member and the inner circumferential surface of the annular portion of the steering knuckle, and being axially secured between said projection and said flange portion.

4,874,068

PARKING BRAKE SYSTEM FOR RAILWAY VEHICLES
Thomas H. Eagle, Clayton, N.Y., assignor to General Signal Corporation, Stamford, Conn.
Division of Ser. No. 932,418, Nov. 19, 1986, Pat. No. 4,746,171.
This application Feb. 26, 1988, Ser. No. 160,900
Int. Cl.⁴ F16D 65/30

U.S. Cl. 188—265

7 Claims



1. A manual handbrake mechanism adapted to selectively govern utilization of a spring handbrake cylinder to control brakes of a brake rigging comprising;
(a) a handbrake mechanism housing;
(b) a handbrake rod journaled in the housing for axial movement to first and second axially operated positions;
(c) locking means in the housing for selectively limiting axial movement of the handbrake rod in a particular direction;
(d) a manual handbrake handle for selectively governing the locking means; and
(e) the locking means being in the form of a toggle that is

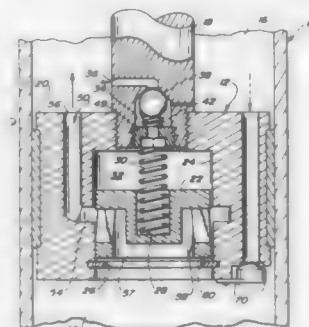
normally in a reset locking position restraining the handbrake rod against axial movement in a particular direction.

4,874,066

VARIABLE FLOW SHOCK ABSORBER AND METHOD
Ilan Silberstein, Tiburon, Calif., assignor to S.U.I. Corporation, Tiburon, Calif.
Continuation of Ser. No. 128,588, Dec. 4, 1987. This application Feb. 14, 1989, Ser. No. 311,082
Int. Cl.⁴ F16E 9/34

U.S. Cl. 188—280

9 Claims



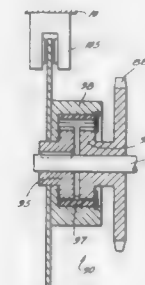
1. A shock absorber comprising, in combination:
a cylinder having an interior with fluid therein;
a piston rod;
a piston mounted within said cylinder interior defining first and second chambers in said cylinder and a primary passageway permitting the flow of fluid from said first chamber into said second chamber as fluid is pressurized in said first chamber by movement of said piston, said piston including relatively moveable first and second piston elements defining a variable-sized, fluid-filled space in continuous communication with said second chamber through a fluid-flow restricting vent spaced from said primary passageway, formed in said shock absorber, and providing communication between said space and said second chamber, said first piston element being fixedly mounted relative to said piston rod, movable with said piston rod, and defining a recess, and said second piston element having a peripheral wall at least partially disposed within said recess and said second piston element being gradually displaceable relative to said first piston element toward said piston rod within said recess responsive to pressurization of fluid in said first chamber to force the fluid in said space through said fluid-flow restricting vent and into said second chamber whereby the size of said space is gradually reduced as a function of the amount of fluid forced through said fluid-flow restricting vent, said primary passageway including at least one flow path defined by said first piston element and communicating with said recess and at least one aperture defined by said second piston element in the peripheral wall thereof in communication with said flow path, relative movement of said piston elements gradually displacing said aperture relative to said flow path to gradually modify the effective size of said primary passageway in response to the gradual reduction of said space size caused by fluid pressure within said first chamber exceeding fluid pressure within said second chamber and fluid flowing through said fluid-flow restricting vent, said flow path including a groove defined by said first piston element about the periphery of said recess, said groove and said aperture being so configured as to be in continuous at least partial registry during gradual displacement of said aperture.

4,874,067

AUTOMATIC CHANGEOVER FOR CARTONERS
Joseph D. Greenwell, Florence, Ky., assignor to R. A. & Co. Inc. Jones, Covington, Ky.
Division of Ser. No. 928,526, Nov. 7, 1986, Pat. No. 4,718,540.
This application Nov. 3, 1987, Ser. No. 116,165
Int. Cl.⁴ B60K 41/26; B65G 15/20

U.S. Cl. 192—4 R

4 Claims



1. In a cartoner having a frame, a main drive, and at least one operating element connected to said main drive to be driven in synchronism with said main drive, a mechanism for varying the position of said element with respect to a reference position on said main drive comprising,
a phase variator connected between said main drive and said element,
said phase variator having a housing, a driving gear, a driven gear and an intermediate gear interconnecting the driving and driven gears, all said gears normally having no relative rotation, thereby functioning as a rigid drive coupling,
said gears being rotatable with respect to said housing when said housing is blocked against rotation,
a brake fixed to said cartoner frame and engageable with said variator to block movement of the housing to force relative movement of the driving and driven gears, thereby causing said element to shift its relationship with respect to the said reference position,
a computer,
means connected to said computer for detecting the position of said element with respect to said reference position,
means for setting in said computer a desired position for said element,
and means for effecting release of said brake when said desired phase position is achieved.

4,874,069

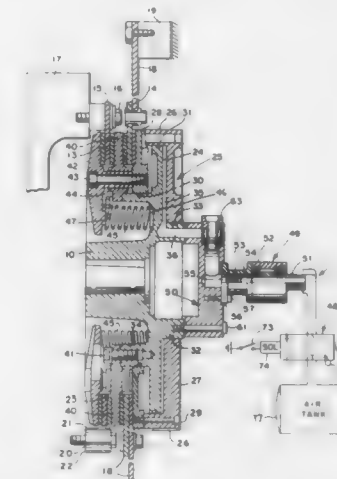
CLUTCH AND BRAKE RAPID EXHAUST MANIFOLD
Marcus H. Collins, Akron, and Ronald W. Diesch, Lodi, both of Ohio, assignors to Eaton Corporation, Cleveland, Ohio
Filed Jan. 19, 1988, Ser. No. 145,154
Int. Cl.⁴ F16D 67/04

U.S. Cl. 192—18 A

6 Claims

4. A spring operated brake and fluid operated clutch apparatus comprising;
a hub adapted to be rotatable with a driven input shaft;
a piston and cylinder means rotatable with said hub and forming a pressure chamber;
a rotor connected to said hub for rotation therewith;
a rotatable clutch disc connectable to a rotatable output member;
a non-rotatable brake disc;
spring means biasing said brake disc and said rotor toward each other and said clutch disc and said rotor away from each other;
said pressure chamber adapted to be connected to a source of pressurized fluid, said pressure chamber when pressurized operatively connecting said rotor and said clutch disc against the bias of said spring means and disconnecting said rotor and said brake disc, said spring means opera-

tively connecting said rotor and said brake disc and disconnecting said rotor and said clutch disc when said pressurized chamber is depressurized;
a fluid circuit for directing fluid between the source of pressurized fluid, said pressure chamber and the atmosphere, said fluid circuit comprising a manifold member having a centrally located main fluid passageway therein and a plurality of second passageways, each of which communicates at one end thereof with said main fluid passageway



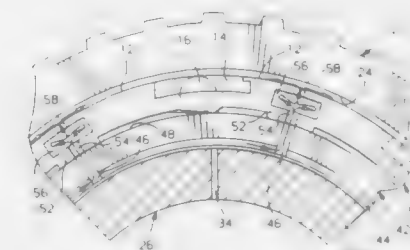
and at the opposite end thereof with said pressure chamber, a plurality of quick release valves, each of which is disposed in one of said plurality of second passageways and each of which includes an exhaust passageway therein for directing fluid from said pressure chamber, said main fluid passageway being in fluid communication with the source of pressurized fluid and valve means for disconnecting said source of pressurized fluid from said main fluid passageway and simultaneously exhausting the pressurized fluid in said main fluid passageway.

4,874,069

ROLLER CLUTCH WITH IMPROVED LUBRICATION
Frederick E. Lederman, Sandusky, Ohio, assignor to General Motors Corporation, Detroit, Mich.
Filed Aug. 31, 1988, Ser. No. 238,788
Int. Cl.⁴ F16D 15/00

U.S. Cl. 192—45

3 Claims



1. In a roller clutch of the type that has a cage that is installed to a cam race and which is located between said cam race and a pathway race with a bearing surface of said cage riding on a cylindrical surface of said pathway race, and in which said cam race is secured to a mounting structure and tightly abutted with a portion of said mounting structure so that said mounting structure and abutted cam race together create a primary closed oil path that ends at an edge of said

cam race, and in which pressurized oil is provided to said primary oil path as said clutch operates, an improved cage for said roller clutch, comprising,

an internal passage in said cage that is open through one face of said cage and which registers with said primary oil path at said cam race edge when said cage is installed to said cam race,

means maintaining said one cage face abutted with said mounting structure portion after said cam race has been secured to said mounting structure, and,

a port connecting said cage internal passage to said cage bearing surface,

whereby, after said cage has been installed to said cam race and said cam race has been secured to said mounting structure, said cage and mounting structure together create a secondary closed oil path that connects to said primary oil path, so that pressurized oil may be supplied directly between said cage bearing surface and said pathway race cylindrical surface.

4,874,070

CONTROL FOR AUT SYSTEM START FROM STOP OPERATION

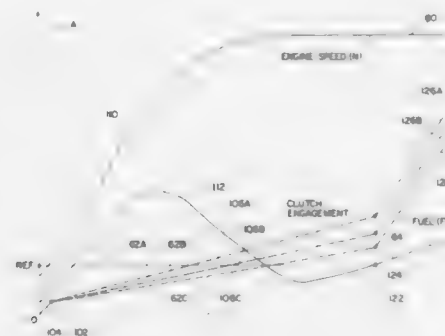
Richard A. Nellums, Astley Park, England, and Eugene R. Braun, Royal Oak, Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Feb. 10, 1988, Ser. No. 154,396

Int. Cl.⁴ B60K 41/02

U.S. Cl. 192-0.052

31 Claims



1. A method for controlling a vehicle start from stop system (10) for vehicles having an operator actuated throttle pedal (24), a fuel control (26) for controlling the amount of fuel supplied to a fuel controlled engine (14), a transmission (12) having a plurality of gear ratio combinations selectively engageable between a transmission input shaft and a transmission output shaft (20), said transmission input shaft being operatively connected to said engine by means of a selectively engageable and disengageable friction clutch (16), said start from stop system comprising an information processing unit (42) having means for receiving a plurality of input signals including an input (N) signal indicative of the rotational speed of the engine and an input signal (THL) indicative of the operator setting of the throttle pedal, said processing unit including means for processing said input signals in accordance with predetermined logic rules for determining a reference value (REF) equal to a predetermined percentage of maximum fuel supply to the engine and for generating command output signals whereby said system is operated in accordance with said logic rules, and means (26, 30, 34) associated with said system effective to actuate said transmission system in response to said command output signals from said processing unit;

said processing unit having means to sense vehicle start from stop operation and, in a vehicle start from stop operation, issuing command output signals to clutch control means (30) for controlling the rate of engagement of said clutch and to fuel control means (26) for controlling the amount

of fuel (FC) supplied to said engine; the method characterized by:

setting a target engine speed value (A) as a function of the operator setting (THL) of the throttle pedal (138, 140); modulating the amount of fuel supplied to the engine to cause the engine speed of rapidly, in a damped manner, substantially equal said target engine speed and then modulating the amount of fuel to said engine to cause said engine speed to be maintained at said target engine speed value (146, 148); and

causing said clutch to engage at a first rate of engagement (106) until engine speed (N) has been caused to equal and be maintained at said target value (A) and the amount of fuel (FC) currently being supplied to the engine is equal to or greater than said reference value (REF), then causing said clutch to be engaged at a second (126) more rapid rate of engagement.

4,874,071

VISCOUS CLUTCH FOR ENGINE COOLING FAN

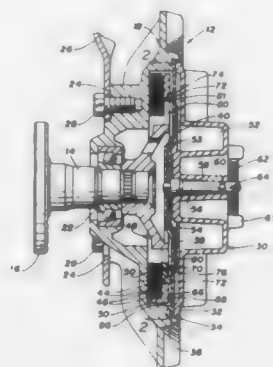
Charles R. White, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 12, 1988, Ser. No. 231,311

Int. Cl.⁴ F16D 35/00, 43/25

U.S. Cl. 192-58 B

4 Claims



1. A bladed fan and hydraulic clutch assembly for inducing a flow of cooling air through a radiator in which engine coolant is circulated comprising an input shaft member adapted to be rotatably driven, clutch plate means rotatably driven by said shaft member, said clutch plate means having a plurality of axially extending and concentric lands, rotatable clutch body means axially spaced from said clutch plate means having a plurality of axially extending and concentric lands interleaved with said lands of said clutch plate means to form a fluid shear zone therebetween, a pump plate fixed to said clutch body means and encasing said clutch plate in said clutch body means, reservoir means for containing a quantity of viscous shear fluid for operating said clutch assembly, an outlet opening for said reservoir, control means for opening and closing said outlet opening, axially extending openings formed in the face of said clutch plate and extending to the concentric lands thereof, annular fluid seal ring means adjacent to said clutch plate openings and operatively interposed between said pump plate and said clutch plate to slidably contact said pump plate and block the flow of fluid outwardly therefrom and blocker arm means extending inwardly from said fluid seal ring means and directly into said axially extending openings for partially blocking a portion of said openings to restrict the flow of fluid therethrough to thereby control the engagement of said clutch, fan blade means extending from said clutch body means, said pump plate having pumping means associated therewith to pump fluid exiting from said shear zone back to said reservoir.

4,874,072

VISCOUS FAN DRIVE CONTROL WITH INTEGRATED SPEED SENSOR

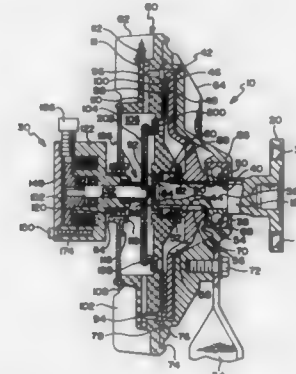
Robert J. Mohan, Madison Heights, and Walter K. O'Neill, Birmingham, both of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Nov. 10, 1987, Ser. No. 119,133

Int. Cl.⁴ F16D 35/00

U.S. Cl. 192-58 B

18 Claims



1. A viscous fluid clutch comprising: first and second members mounted for relative rotation about a common axis and defining cooperating shear surfaces; means operative to generate a flow of viscous fluid between said surfaces; valving means operable to effect modulation of said flow and including an element carried by one of said members displaceable between a first limit of travel for minimum torque transmission and a second limit of travel for maximum torque transmission; actuator means operative to selectively position said element between said limits of travel in response to an actuation signal, said actuator means including a substantially grounded thrust surface operative to frictionally engage said valving means to extract kinetic energy from said one of said members and input it to said valving means to move said valving means and thereby effect said modulation; means operative to sense the rotational speed of said one of said members and to generate a speed signal as a function thereof, said speed sensing means comprising flag and sensor elements disposed in relative rotational alignment, one of said elements carried by said actuator means and the other of said elements carried by said one of said members; and control means operative to generate said actuation signal as a function of said speed signal.

4,874,073

CLUTCH RELEASE BEARING DEVICE

Kenichi Tagawa, Fujisawa, Japan, assignor to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 21, 1988, Ser. No. 171,394

Claims priority, application Japan, Apr. 2, 1987, 61-79697

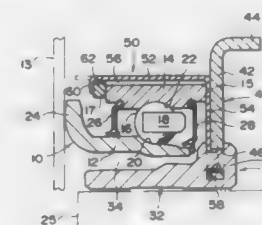
Int. Cl.⁴ F16C 19/00; F16D 23/14

U.S. Cl. 192-98

5 Claims

1. A clutch release bearing device, comprising a clutch release bearing to be abutted against a diaphragm spring for a vehicle clutch, and bearing holding means, said bearing holding means including a synthetic resin sleeve fitted on a fixed guide, a hollow-disk shaped anvil extending radially outward from said sleeve for receiving a drive force from a fork and having a plurality of holes formed circumferentially along an inner periphery thereof, and a bearing case extending from said anvil and holding said clutch release bearing, said bearing case

having a flange juxtaposed to said anvil and having an inner periphery provided with through-holes having circumferential walls protruding into the holes of said anvil and coupling said bearing case to said anvil by engagement with the peripheries



of said holes of said anvil, the inner peripheries of said flange and said anvil being disposed within the resin of said sleeve with the resin of said sleeve filled in said holes of said anvil such that said sleeve, said bearing case, and said anvil are integrally coupled with one another.

4,874,074

TORSIONAL VIBRATION DAMPING MECHANISM

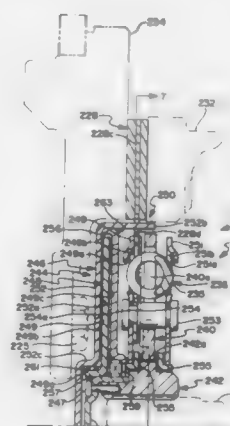
Gerald D. Damon, Farmington, and David P. Godlew, Birmingham, both of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Aug. 20, 1987, Ser. No. 87,587

Int. Cl.⁴ F16D 3/14

U.S. Cl. 192-106.2

4 Claims



1. A torsional vibration damping mechanism adapted to be rotationally interposed in a driveline between an output drive of a prime mover and an input drive of a transmission having in-gear and neutral positions respectively connecting and disconnecting the input drive with a load; the mechanism comprising:

first and second assemblies disposed for relative rotation about a common axis, the first assembly including first and second radially extending, axially spaced apart wall members secured together and adapted for selective driving connection to the prime mover drive via a friction ring, the second assembly being an annular hub member adapted to be slidably splined to the transmission input drive, and the wall members each including an inner peripheral portion journaled on the hub member; an intermediate means including a radially extending member disposed between the first and second wall members and radially outward of the hub member, the member of the intermediate means including a plurality of internal spline teeth mating with a plurality of external spline teeth on the hub member, the mating teeth having a predetermined amount of circumferential free play therebetween;

a first spring set comprising a plurality helical compression springs of relatively high spring rate circumferentially spaced apart and resiliently interconnecting the wall members with the intermediate means member;

a second spring set comprising at least one idle rattle spring having a relatively low spring rate and resiliently disposed between the intermediate means member and the hub member for resiliently opposing the free play between the spline teeth; and

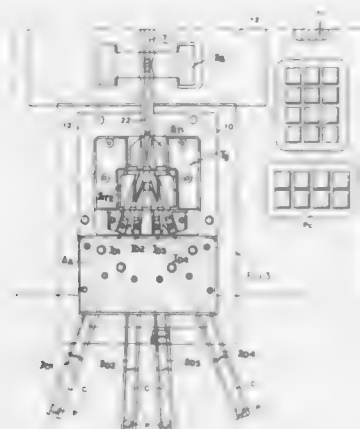
a viscous shear damper assembly including housing and clutch assemblies mounted for relative rotation and respectively connected to the first assembly and the hub member of the second assembly, the clutch assembly disposed in a chamber defined by the housing assembly and being in viscous shear clutching coaction in response to flexing of either of the spring sets.

4,874,075

SWITCH TRACK ASSEMBLY FOR HIGH-SPEED HANDLING OF ELECTRONIC COMPONENTS
 Frank V. Linker, and Frank V. Linker, Jr., both of Broomall, Pa., assignors to American Tech Manufacturing Corp., Erlanger, Ky.
 Continuation of Ser. No. 49,437, May 14, 1987, abandoned, which is a continuation of Ser. No. 866,222, May 22, 1986, Pat. No. 4,705,152. This application Nov. 16, 1988, Ser. No. 273,108. The portion of the term of this patent subsequent to May 19, 2004, has been disclaimed.
 Int. Cl. B65G 11/20

U.S. Cl. 193—39

1 Claim



1. A switch track mechanism for selectively directing electronic components moving along and straddling a trackway to at least two discharge or accumulator stations comprising a fixed track section being formed by the trackway, said fixed track section straddled by the electronic components, a movable track section operatively associated with said fixed track section and disposed on opposite sides thereof, said movable track section straddled by the electronic components and operable between first and second limit positions, at least two accumulator stations downstream of said track sections and means for actuating the movable track section between predetermined first and second limit positions whereby electronic components may be directed from the trackway to a select one of the accumulator stations, said fixed track sections having two opposed first contact surfaces and said movable track section having two opposed second contact surfaces, one of the second contact surfaces confronting and engageable with one of the first contact surfaces, determining said first limit position, the other second contact surface confronting and engageable with the other first contact surface, determining said second limit position, accurate registry of said fixed and

movable track sections at said limit positions being determined solely by engagement of said confronting track sections.

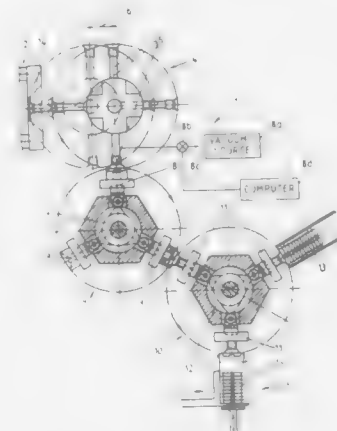
4,874,076

DEVICE FOR TRANSFERRING PACKAGES
 Horst Kaplan, and Gerhard Grube, both of Bielefeld, Fed. Rep. of Germany, assignors to Otto Hünkel GmbH, Hanover, Fed. Rep. of Germany
 Continuation of Ser. No. 52,696, May 21, 1987, abandoned. This application Nov. 14, 1988, Ser. No. 273,174
 Claims priority, application Fed. Rep. of Germany, May 22, 1986, 3617259

Int. Cl. B65G 29/00

U.S. Cl. 198—370

10 Claims



1. Apparatus for transferring package articles from an article packaging machine to a box-packing machine, comprising: storage means for storing a predetermined supply of said packaged articles in a supply shaft; transfer means for transferring packaged articles from said packaging machine directly to said box-packing machine; means for diverting defectively packaged articles away from said box-packing machine so that defectively packaged articles do not reach said box-packing machine; means for replacing the defectively packaged article directly with a packaged article from said supply shaft in said storage means without interrupting the flow of packaged articles to said box-packing machine; said transfer means transferring the packaged article from said supply shaft to said box-packing machine at a location in substantially close proximity to said box-packing machine for replacing said defectively packaged article, said packaging machine being substantially distant from said box-packing machine compared to the distance between said supply shaft and said box-packing machine; said transfer means having a gripper for picking up and advancing packaged articles leaving said article packaging machine; said supply shaft having an opening for the passage of articles to said supply shaft and from said supply shaft, said opening being positioned in a path of conveyance of said gripper.

4,874,077

DEVICE FOR TRANSFERRING A LITHOGRAPHIC PLATE

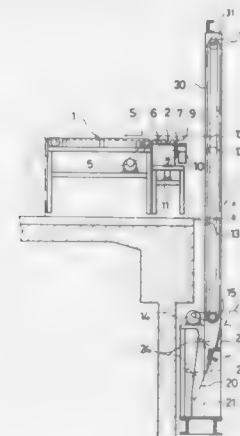
Akio Yaguchi, Hidaka, and Takatsugu Kyoo, Iruama, both of Japan, assignors to Teikokimoto Chai Co., Japan
 Filed Apr. 8, 1988, Ser. No. 180,443
 Int. Cl. B65G 15/00

U.S. Cl. 198—408

5 Claims

1. A device for transferring a lithographic plate (S) from a horizontal conveyor (1) to an overhead conveyor (25), which device comprises elevating means (3) having a hook member (13) for engaging a folded end portion (12) of a lithographic

plate to raise the lithographic plate into a vertical position and then lower the lithographic plate onto a positioning bed (4) provided in the vicinity of the lower end of the elevating means, the elevating means moves in a path having a bottom portion defining a locus of points through which the hook member travels, the positioning bed having a pivotable portion



(23) for pivoting the lithographic plate deposited on the positioning bed, so that the folded end of the lithographic plate is positioned internally of the locus (B) of the hook member whereby the lithographic plate is separated from the hook member and upon movement of the pivotable portion of the positioning bed, the lithographic plate is transferred to the overhead conveyor.

4,874,078

PACKAGE HANDLING AND RE-ORIENTING APPARATUS, PARTICULARLY COMPRESSIVE PAPER ROLLS, SUCH AS TOILET PAPER, KITCHEN TOWELS, AND THE LIKE

Dieter Meyer, Ludwigshafen, Fed. Rep. of Germany, assignor to Paper Converting Machine GmbH, Schifferstadt, Fed. Rep. of Germany

Filed Jun. 1, 1988, Ser. No. 201,575

Claims priority, application Fed. Rep. of Germany, Jun. 12, 1987, 3719574

Int. Cl. B65G 47/24

U.S. Cl. 198—409

12 Claims



1. Package handling and reorienting apparatus, particularly to receive rolls of compressible paper products, such as toilet paper, kitchen towels and the like, from a supply transport apparatus, (2,3) and turn the packages (1) by 90° to stand the packages on end for delivery to a removal apparatus (6), said handling and reorienting apparatus including a generally L-shaped angled movable receiver (4) having two support surfaces (4a, 4b) defining a generally L-shaped structure, said support surfaces being joined at a corner of the L-shaped structure; means for supporting said receiver to receive the packages at a starting position of the receiver on one (4a) of said support surfaces, the receiver with the packages thereon pivoting about 90°, and translating between the supply apparatus (2) and the removal apparatus (6), for delivering said products (1), turned 90°, to the removal apparatus, and

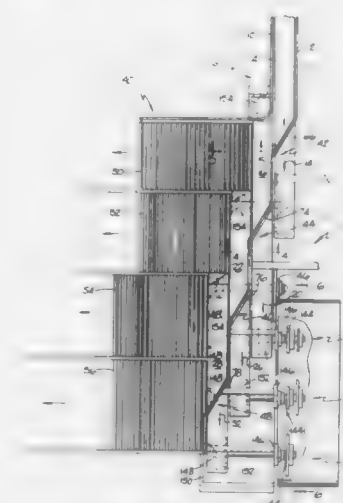
the receiver moving in reverse pivoting and translatory movement to the starting position; wherein said support means for the receiver includes a guide means (8) guiding translatory movement of the receiver from said starting position to the removal apparatus and means for pivoting said receiver at a speed which is higher when the receiver moves from the removal apparatus towards said starting position than when the receiver moves from the starting position towards the removal apparatus, comprising a reciprocally movable guide track (13), and an engagement means (14) coupled to and movable in the guide track and secured to the receiver; and a moving means (15) coupled to the guide track (13) to reciprocally move the guide track into selectively different positions as the receiver (4) moves from the starting position towards the removal apparatus (6) and vice versa.

4,874,079

ARTICLE TRANSFERRING CONVEYING SYSTEM
 Robert L. Frenkel, Englewood; Christopher S. Derks, and Donald L. Armstrong, both of Arvada, all of Colo., assignors to Adolph Coors Company, Golden, Colo.
 Filed Feb. 8, 1988, Ser. No. 153,311
 Int. Cl. B65G 47/68

U.S. Cl. 198—436

14 Claims



1. Apparatus for changing a single row of moving articles into a plurality of rows of moving articles comprising: a first continuously moving conveyor having a first plurality of articles in a continuous stream supported on an upper surface thereof; said plurality of articles comprising a single row of articles moving with said upper surface in a first linear direction; at least a portion of each of said plurality of articles having a generally cylindrical outer surface adapted to contact the generally cylindrical outer surfaces of adjacent articles and each of said generally cylindrical outer surfaces having substantially the same diameter; at least a second continuously moving conveyor moving in a second linear direction; said first and second linear directions being parallel to each other; at least a portion of said first continuously moving conveyor and at least a portion of said second continuously moving conveyor being in a side by side relationship; said second continuously moving conveyor moving at a velocity which is less than the velocity of said first continuously moving conveyor; at least a first fixedly mounted deflector means for succes-

sively contacting each of said articles on said first continuously moving conveyor to apply a force thereto and to guide the movement of said successive articles toward and onto said second continuously moving conveyor;

each of said generally cylindrical outer surfaces of said deflected articles being moved toward and onto said second continuously moving conveyor being in contacting relationship with the article in front of it and the article in back of it;

said first deflector means having a beginning portion and an ending portion;

at least one continuously moving collection conveyor moving in a third linear direction;

said third linear direction being substantially perpendicular to said first and second linear directions;

said at least a first deflector means and said slower moving second continuously moving conveyor cooperating to produce force applying means adjacent to said ending portion of said at least a first deflector means for applying a force to at least one article of said deflected articles to move said at least one deflected article over said second continuously moving conveyor and onto said continuously moving collection conveyor means at a first location and leaving at least another one of said deflected articles on said second continuously moving conveyor for movement therewith;

at least a second deflected article located between said first and second continuously moving conveyors and in contact with said at least one deflected article; and

said at least a second deflected article applying a pushing force to said at least one deflected article to ensure contact of said at least one deflected article with at least said second deflected article and a third deflected article on said second continuously moving conveyor means so that said at least a third deflected article applies a restraining force on said at least one deflected article so that the resultant of said pushing and restraining forces extends in a direction to move said at least one deflected article over said second continuously moving conveyor means and onto said continuously moving collection conveyor at said first location;

said second continuously moving conveyor having a second plurality of articles in a continuous stream supported on an upper surface thereof and moving therewith in a single row;

at least a third continuously moving conveyor moving in a fourth linear direction;

said second and fourth linear directions being parallel to each other;

at least a portion of said second continuously moving conveyor and at least a portion of said third continuously moving conveyor being in a side by side relationship;

said third continuously moving conveyor moving at a velocity which is less than the velocity of said second continuously moving conveyor;

at least a second fixedly mounted deflector means for successively contacting each of said second plurality of articles on said second continuously moving conveyor to apply a force thereto and to guide the movement of said successive articles toward and onto said third continuously moving conveyor;

each of said generally cylindrical outer surfaces of said deflected articles being moved toward and onto said third continuously moving conveyor being in contacting relationship with the article in front of it and the article in back of it;

said second deflector means having a beginning portion and an ending portion; and

said at least a second deflector means and said slower continuously moving third conveyor cooperating to produce force applying means adjacent to said ending portion of said at least a second deflector means for applying a force to at least one article of said articles deflected by said second deflector means to move said at least one deflected article of said articles deflected by said at least a second

deflector means over said third continuously moving conveyor and onto said continuously moving collection conveyor means at a second location spaced a distance from said first location and leaving at least another one of said deflected articles on said third continuously moving conveyor for movement therewith.

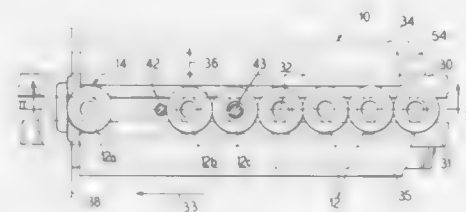
4,874,080 CONVEYOR

Lacien J. Wroblewski, 16 W. 171 Shore Ct., Hinsdale, Ill. 60521
Filed Jun. 10, 1988, Ser. No. 205,379

Int. Cl.⁴ B65G 37/00

U.S. Cl. 198—463.6

19 Claims



1. A device for conveying articles from an input end to an output end with a continuous orientation along a center line as a column of articles, said device comprising a main frame, at least one pair of continuous belts having contact surfaces, first means for mounting said pair of continuous belts in the main frame with an adjustable spacing therebetween relative to said center line, drive means for driving the belts at the continuous speed, second means for guiding articles being carried by said belts to move along the center line, said second means being adjustable relative to said belts and center line, said second means coacting with the first means to control the amount of conveying force being transferred between the pair of belts to each of said articles, third means for holding the articles in a single layer in said column on said pair of belts, fourth means for holding an article at the exit end in an exit position, and fifth means for releasing one article at a time from a leading end of the column of articles to be carried by the belts to said exit position while retaining the remaining articles of the column in a position spaced from said exit position.

4,874,081

DEVICE FOR TRANSFERRING PRINTED CIRCUIT BOARD

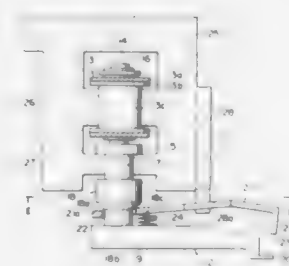
Kenichi Kondo, Tokyo, Japan, assignor to Nihon Den-Nettsu Kikai Co., Ltd., Japan

Filed Nov. 2, 1988, Ser. No. 265,959

Claims priority, application Japan, Nov. 20, 1987, 62-291857
Int. Cl.⁴ B65G 29/00

U.S. Cl. 198—803.9

7 Claims



1. A device for transferring printed circuit boards, comprising:
a pair of spaced apart, endless roller chains each guided by a

guide rail to define a printed circuit board transferring path therebetween;

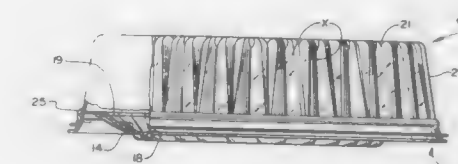
a plurality of support members fixed to said chains for movement therewith and each adapted to support thereon a side edge portion of a printed circuit board, so that the printed circuit board can be transferred along said path with opposite side edge portions thereof being supported on the support members;

a clamp plate member pivotally mounted on each of said support members and adapted to move between a close position where said clamp plate member is engageable with an upper surface of the side edge portion of the printed circuit board supported on the support members and an open position where said clamp plate member is incapable of engaging with the printed circuit board;

means provided on each of said support members for urging the corresponding clamp plate member to rotate so that the clamp plate member is normally maintained in the open position; and

engaging plates fixed to each of said guide rails and having a lower surface engageable with upper surfaces of the clamp plate members to maintain the clamp plate members in the close positions, whereby the printed circuit board supported on the supporting members is clamped between the supporting members and the clamp plate members during the engagement of the clamp plate members with the engaging plates.

center section, a rim section disposed in spaced encompassing relation with respect to said center section, and an intermediate section interconnecting said center and rim sections; said rim section including a ledge portion having an inner segment connected to the intermediate section, and a continuous skirt portion downwardly extending from an outer segment of the



4,874,082

CONVEYOR SKIRT BOARD, CLAMP AND MOUNTING ARRANGEMENT

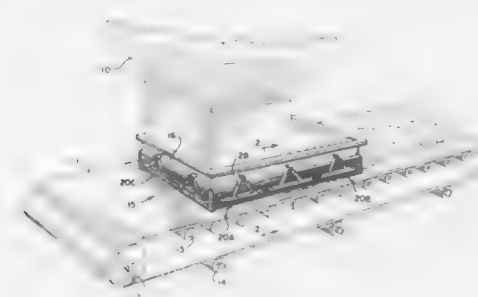
Robert T. Swinderman, Kewanee, Ill., assignor to Martin Engineering Company, Neponset, Ill.

Filed Oct. 14, 1988, Ser. No. 257,504

Int. Cl.⁴ B65G 21/20

U.S. Cl. 198—836

14 Claims



1. A skirt board mountable adjacent a mounting plate to contact a conveyor belt and seal against the escape of conveyed material, said skirt board including a pair of opposed side faces, at least one of which is formed so as to define a specially constructed engagement surface which includes a plurality of grooves oriented to define a ratchet surface and adapted when contacted by a stop means having a projection, to permit movement of said skirt board toward said conveyor belt but to retard movement of said skirt board away from said belt.

4,874,083

SERVING TRAY AND COVER THEREFOR

Patricia A. Antoni, Wheeling; Timothy J. Nolan, Streamwood; Thomas J. Hayes, Wauconda; Theodore R. Arneson, Mt. Prospect, and Jerry E. Coleman, Wheeling, all of Ill., assignors to Packaging Corporation of America, Evanston, Ill.

Filed Mar. 1, 1988, Ser. No. 162,419

Int. Cl.⁴ B65D 25/00

U.S. Cl. 206—45.32

20 Claims

1. A food serving tray for use with a removable cover, said tray being formed of thin gauge material and comprising a

ledge portion, said skirt portion having upper edge segments spaced from the underside of said ledge portion and cooperating therewith to form a plurality of spaced, outwardly extending, substantially rigid marginal lips, each lip being adapted to be lockingly engaged by an encompassing yieldable peripheral segment of the cover when the tray and cover are in assembled relation.

4,874,084

COLOR CODING DEVICE, KIT OF COMPONENTS THEREOF, AND METHODS OF CONSTRUCTING AND UTILIZING SAME

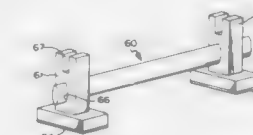
Richard A. Strasser, Yale, Mich., assignor to Hope Sexton, Yale, Mich.

Filed Mar. 7, 1988, Ser. No. 164,507

Int. Cl.⁴ B65D 85/16

U.S. Cl. 206—231

9 Claims



1. A kit of components, comprising:
a plurality of one piece unitary, integral, resilient clips; said plurality of clips are provided in color coded pairs of said clips so that the color of any particular color coded pair of said clips is different than the color of all the remainder of said color coded pairs of said clips; and
a holder for selectively and releasably securing and displaying said clips having an elongated shaft with a cross-section which substantially conforms to the shape of said plurality of clips, said shaft being integral with a base member substantially the length of said shaft.

6. A kit of components, comprising:

a plurality of one piece unitary, integral, resilient clips; said plurality of clips are provided in color coded pairs of said clips so that the color of any particular color coded pair of said clips is different than the color of all the remainder of said color coded pairs of said clips; a holder means selectively and releasably securing and displaying said clips having two end pieces for slidably and removably receiving an elongated shaft to which said plurality of color coded pairs of clips are selectively and releasably secured and displayed.

9. A kit of components, comprising:

a plurality of one-piece unitary, integral, resilient clips; each said clip comprises a one-piece unitary integral main portion provided with an integral first arm at a first end thereof and an integral second arm at a second end thereof;

said plurality of clips are provided in adjacent color coded pairs of said clips so that the color of any particular color coded pair of said clips is different than the color of all the remainder of said color coded pairs of said clips; and said color coded pairs of clips are used to aid in the assembly and disassembly of automobile engines such that one of said pair of color coded clips is used to identify a first part and the other of said pair of color coded clips is used to identify a second part to be mated to said first part so that said first and second parts may easily be put together.

4,874,085

STORAGE CASSETTE FOR HIGH STORAGE DENSITY, DISC-SHAPED INFORMATION CARRIERS

Hermann Grobecker, Garbsen; Werner Heber, Lehrte; Adelbert Zielasek, Burgwedel, all of Fed. Rep. of Germany, and Frederik B. Nusselder, Bussum, Netherlands, assignors to Polygram GmbH, New York, N.Y.

Division of Ser. No. 145,749, Jan. 19, 1988, abandoned, which is a continuation of Ser. No. 829,062, Feb. 13, 1986, abandoned, which is a division of Ser. No. 459,232, Jan. 19, 1983, abandoned. This application Oct. 18, 1988, Ser. No. 259,554

Claims priority, application Fed. Rep. of Germany, Feb. 16, 1982, 3205478

Int. Cl.⁴ B65D 85/30

U.S. Cl. 206—309

9 Claims



1. A storage container for an information record having a peripheral edge; an information area adjacent the peripheral edge carrying information tracks; and a central area adjacent the information area, said central area being free of information tracks and having a central hole having an inner surface, said container comprising a box-like bottom and a cover, said bottom having an inside bottom surface, edge means extending from said bottom surface and defining an open top, an elevated rest carried by said bottom surface, said elevated rest having a substantially planar surface for receiving and supporting an information record placed in the container only in its central area, and a central peg arrangement carried by said rest for engaging the inner surface of the central hole, in a closed condition of the container said cover extending between said edge means and closing said top, and said central peg arrangement and elevated rest together forming a sole means for retaining the information carrier in such position with respect to the container that the record information area and the peripheral edge are free of contact with the container, independent of the orientation of the container.

4,874,086
FILM CARRIER AND A METHOD FOR MANUFACTURING A SEMICONDUCTOR DEVICE UTILIZING THE SAME

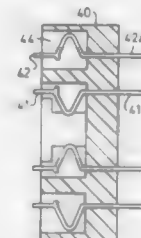
Makoto Imamura, and Ryouichi Miyamoto, both of Kawasaki, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 20, 1988, Ser. No. 196,670

Claims priority, application Japan, Jun. 8, 1987, 62-141392
Int. Cl.⁴ H01L 39/02

U.S. Cl. 206—330

9 Claims



1. A film carrier for a semiconductor device being tested in a tester having a plurality of test pins arranged in at least one group of test pins with a predetermined interval between adjacent pins, comprising:

a film substrate; and conductive lead means supported by the substrate for electrical connection with the semiconductor device, including (i) temporary testing lead portion means for contacting the test pins during testing of the semiconductor device, including a plurality of substantially parallel test segments with a predetermined gap between adjacent test segments, and

(ii) circuit lead portion means for connecting the semiconductor device to a circuit after removal of the test segments from the conductive lead means following testing, including a plurality of substantially parallel circuit segments with a predetermined space between adjacent circuit segments, the space being smaller than the gap

4,874,087

PAINT BRUSH HOLDER

James K. Mayne, Southwick, Mass., assignor to American Brush Corporation, Claremont, N.H.

Continuation of Ser. No. 776,212, Sep. 16, 1985, abandoned. This application Mar. 18, 1988, Ser. No. 169,739

Int. Cl.⁴ B65D 83/10

U.S. Cl. 206—362.4

3 Claims



1. A display device for holding paint brushes structured to define a first holder for receiving a brush having a handle and carried by said display device, a second holder for receiving a card bearing instructions for use of the brush, said second

holder comprising first and second coextensive, elongate, rectangular panels connected throughout their longitudinal edges to each other to form a mounting means and separable between said edges such as to define a first pocket for slidably receiving the card, such first holder comprising a third rectangular panel mounted to the face of one of the first and second panels, said third panel being narrower in width and shorter in length than said panels and being positioned with its edges symmetrically spaced from said edges of the panels and with its ends spaced from the ends of the panels with one end at a greater distance than the other from the end of the first and second panels and in spaced parallel relation to the panels so as to define therewith a second pocket for receiving the brush, a ledge at the inner side of the third panel at the lower edge for engagement with the ferrule of the brush to suspend the brush therein and an aperture in the third panel at the top to expose the bristles of the brush for inspection, a portion of said mounting means extending below said ledge for a distance at least as great as the length of said brush handle, and suspending means for suspending said display device for display or storage.

4,874,088

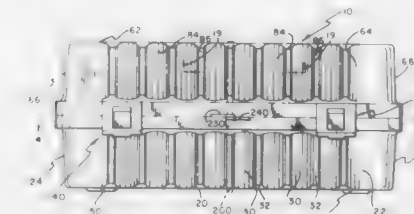
CONTAINER AND METHOD FOR CARRYING AND TRANSPORTING COMPUTER TAPE CARTRIDGES
David G. Leben, 105 S. Broadway, Suite 640, Wichita, Kans. 67202

Filed Dec. 21, 1988, Ser. No. 287,739

Int. Cl.⁴ B65D 25/18, 85/67

U.S. Cl. 206—387

15 Claims



1. A container for carrying and transporting computer tape cartridges and the like comprising

a container base having a base bottom, a pair of base hollow upright side walls integrally secured to said base bottom, and a pair of base end walls integrally secured to said base bottom and to said base side walls, each of said base hollow upright side walls having a base outside wall and a base inside wall with said base outside wall having a structure defining a plurality of hollow dome-shaped protrusions spaced by an abridging outside wall member and with said base inside wall having a structure defining a plurality of hollow dome-shaped ribs spaced by an abridging inside wall member, and said base bottom having a base outside wall and a base inside wall having a structure defining a plurality of hollow dome-shaped ridges spaced by an abridging base inside wall member, said dome-shaped ribs integrally connected to said dome-shaped ridges; and

a container lid pivotally secured to said container base, said container lid having a structure defining a handle recess.

4,874,089

LIGHT-TIGHT CASSETTE

Tsukasa Matsuda; Kazuo Ui, and Hiroshi Maeda, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-Ashigawa, Japan

Filed Nov. 3, 1988, Ser. No. 266,846

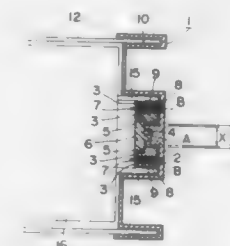
Claims priority, application Japan, Nov. 6, 1987, 62-279355
Int. Cl.⁴ B65D 85/38

U.S. Cl. 206—397

2 Claims

1. In a light-tight cassette for a roll of light-sensitive strip material comprising a body having a slot for extending the

light-sensitive strip material and end panels closing both end openings of the body and supporting said roll, the improvement which comprises at least one of the end panels having a



rotary core to which the core of the roll is fixed, a bearing means which rotatably supports the rotary core and a curing type hot-melt adhesive to releasably fix the rotary core to the end panel.

4,874,090

SELF-SEAL STERILIZATION POUCH

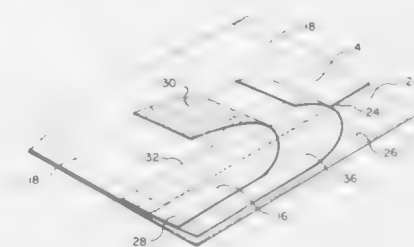
Denis G. Dyke, Edinboro, Pa., assignor to American Sterilizer Company, Erie, Pa.

Filed Oct. 24, 1988, Ser. No. 261,197

Int. Cl.⁴ B65D 33/16

U.S. Cl. 206—439

8 Claims



1. A sterilizable pouch comprising:

a first sheet-like member made of a material which is impermeable to microorganisms and a second sheet-like member, opposing said first member, made of a material which is impermeable to microorganisms, and one or both of said first and second members having at least a portion thereof made of a material which is permeable to gases, said first member extending outwardly beyond one edge of said second member to define a flap, said edge of said second member and said flap defining an opening therebetween, said first member and said second member being sealed to one another along all edges thereof except for said opening to define said pouch for receiving items to be sterilized;

sealing means having an upper surface and an adhesive coated lower surface connected along one edge to said second member proximate said opening; and a liner for removably covering said adhesive coated lower surface; said sealing means being dimensioned to cover said opening and at least a portion of said flap adjacent said opening when said liner is removed and said adhesive coated lower surface is pressed against said opening and said flap to close and seal said opening.

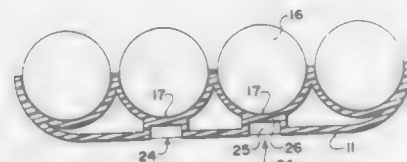
4,874,091

CORE SAMPLE BOX

Albert R. McEwen, 303-10124-159th Street, Edmonton, Alberta, Canada T5P 2F9, and William J. Forrest, 15-9510 Morinville Drive, Morinville, Alberta, Canada T0G 1P0
Filed Jul. 14, 1988, Ser. No. 218,955
Int. Cl.⁴ B65D 85/20

U.S. Cl. 206-443

17 Claims



1. A container for drill core samples comprising an integrally molded body defining a core engaging layer and an outer layer, said core engaging layer having two elongate longitudinal side edges and two transverse end edges and between said side edges a plurality of elongate parallel receptacles arranged side by side each for receiving a length of core sample and each having a surface against which the sample engages shaped to confine the sample against vertical movement toward the layer and against side to side movement, said outer layer being connected to said core engaging layer at said side edges and at said transverse end edges and being spaced therefrom to define a hollow interior of the body therebetween and including a plurality of separate, spaced, molded indented portions thereof each engaging and connecting with a separate portion of said core engaging layer.

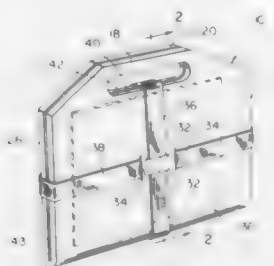
4,874,092

X-R CASE

Francisco J. Lara, Harlingen, Tex., assignor to Ferrero & Wepfer, Harlingen, Tex., a part interest
Filed Jul. 14, 1988, Ser. No. 218,921
Int. Cl.⁴ B65D 27/00

U.S. Cl. 206-492

8 Claims



1. A case for containing hand-carrying panels to be protected during storage and transit, said case including an elongated panel construction incorporating opposite side longitudinal edges and opposite end transverse edges, said panel assembly including hinge defining means extending transversely thereof centrally intermediate said opposite end edges and dividing said panel assembly into a pair of opposite end panel sections relatively angularly displaceable about said hinge defining means between substantially coplanar open positions and closely juxtaposed parallel closed positions with one pair of corresponding inner sides of said panel sections opposing each other and the other pair of corresponding outer sides of said panel sections facing outwardly of said case in opposite directions, one of said panel sections including a pair of first laterally spaced parallel slots formed therethrough, extending transversely of said panel assembly and centrally located on said one panel section, said one panel section also including a pair of second laterally spaced parallel slots formed therethrough, extending longitudinally of said panel assembly and centrally

located on said one panel section, first and second strap means threaded through said first and second pair of slots, respectively, with longitudinal mid-portions of said first and second straps extending over the inner side of said one panel section between said first and second slots, said strap means each including end portions thereof projecting outwardly of the ends of said slots opening through the outer side of said one panel section, said end portions extending over the outer side of said one panel section away from remote sides of the corresponding slots, said end portions of said first and second strap means being of sufficient length to extend lengthwise and transversely of and about said panel assembly when said panel sections are in the closed position with the terminal ends of the end portions of each strap means overlap engaged with each other closely outward of the outer side of the other panel section, said terminal ends of each said strap means including coacting fastening means operative to releasably secure each pair of overlap engaged terminal ends together.

4,874,093

CLAM-LIKE PACKAGING SYSTEM

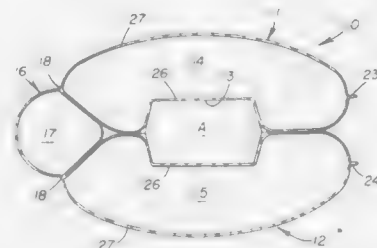
Daniel A. Pharo, 1901 Ave. of the Stars, Suite 450, Los Angeles, Calif. 90067

Continuation-in-part of Ser. No. 89,228, Aug. 25, 1987. This application Oct. 25, 1988, Ser. No. 262,537

Int. Cl.⁴ B65D 81/02

U.S. Cl. 206-522

10 Claims



1. A packaging system having opposite frontal and rearward sides and opposite lateral sides, said packaging system comprising

a first bag portion defining a first chamber means therein for being at least partially filled with a filler medium,
a second bag portion defining a second chamber means therein for being at least partially filled with said filler medium, said first bag portion overlying said second bag portion to define a pocket therebetween adapted to have an article retained therein and the frontal side of each of said first and second bag portions being closed,

connection means for connecting said first and second bag portions together at the rearward side of said packaging system, said connection means comprising at least one seam formed transversely across said first and second bag portions to secure them together and wherein said seam is formed at the rearward side of said packaging system to define at least one passage between said first and second bag portions intercommunicating said first and second chamber means, and

seam means securing overlying side edge portions of said first and second bag portions together at each of the lateral sides of said packaging system, said first and second bag portions remaining unattached to each other at the frontal side of said packaging system, between the closed frontal sides of said first and second bag portions, to expose said pocket thereat, said first and second bag portions each being formed by a pair of overlying first and second panels and wherein said first panels oppose each other to define said pocket therebetween and said seam means are

formed at overlying side edge portions of said first and second panels.

one edge of said stack and consisting essentially of a formed mass molded under heat and pressure of paper-waste cuttings

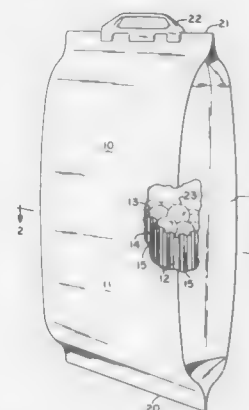
4,874,094

CUSHIONED BAG

Richard H. Blanke, Jr., 9102 Clayton Rd., St. Louis, Mo. 63124
Continuation of Ser. No. 608,526, May 8, 1984, abandoned, which is a continuation of Ser. No. 433,636, Oct. 12, 1982, abandoned. This application May 19, 1986, Ser. No. 867,889
Int. Cl.⁴ B65D 81/02

U.S. Cl. 206-522

3 Claims



1. A cushioned bag comprising:

- (a) an extruded plastic, continuously formed tubular outer wall,
- (b) an extruded plastic, continuously formed tubular inner wall coextensive with said outer wall and having a plurality of spaced, longitudinally extending channel portions and longitudinally extending intermediate portions,
- (c) continuous longitudinal sealing means, sealing said inner wall intermediate portions to said outer wall between the top and bottom of said bag and defining longitudinally extending columns, and
- (d) continuous transverse sealing means, sealing said inner wall to said outer wall and cooperating with said longitudinally sealing means to define a plurality of sealed cushion columns of air and substantially sealing top and bottom of the bag shut.

4,874,095

EDGE PROTECTOR AND METHOD OF MAKING SAME

Hans Warych, Gelsenkirchen, Fed. Rep. of Germany, assignor to Signode System GmbH, Dinslaken, Fed. Rep. of Germany
Filed Jun. 3, 1988, Ser. No. 202,725

Claims priority, application Fed. Rep. of Germany, Jan. 3, 1987, 3718545

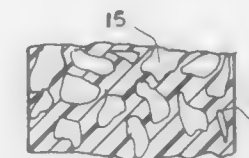
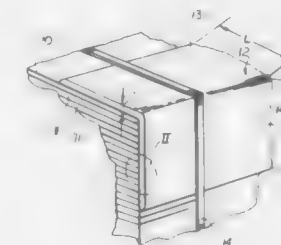
Int. Cl.⁴ B65D 57/00; B32B 5/16

U.S. Cl. 206-586

6 Claims

1. An edge protector for a stack of articles consisting essentially of a formed mass molded under heat and pressure of paper-waste cuttings and thermoplastic synthetic resin binder, said edge protector having an angular cross section and being composed of packing paper coated on at least one side with the thermoplastic synthetic resin of said binder.

2. A package comprising a stack of articles, a moisture-resistant edge protector of L-shaped cross section fitted over at least



and thermoplastic synthetic resin binder, and at least one strap surrounding said stack and braced against said edge protector.

4,874,096

SEALED PACKET WITH AN ADHESIVE STRIP FOR OPENING AND RECLOSING

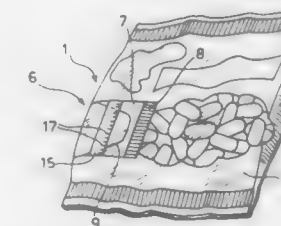
Emilio Tescera-Chiesa, Leumann, Italy, assignor to Sales S.p.A., Turin, Italy

Filed Jul. 5, 1988, Ser. No. 215,153

Claims priority, application Italy, Jul. 2, 1987, 53496/87[U]
Int. Cl.⁴ B65D 3/26, 33/36

U.S. Cl. 206-621

6 Claims



1. A packet with an adhesive strip for opening and closing a wall of said sealed packet containing food products in the form of pieces, particularly but not exclusively sweets and the like, and having a shaped cut in said wall, said adhesive strip being transparent and having an adhesive face with a non-adhesive gripper tongue at one end and applied in a partially detachable and re-attachable manner to the wall of the packet in correspondence with the cut therein, so as to achieve controlled tearing of the wall during first detachment of the adhesive strip in order to define an opening through which the products in the packet can be removed, said opening being reclosable by re-attachment of the adhesive strip, and indicator means associated with the adhesive strip to provide indications of any fraudulent opening of the packet, wherein the indicator means comprise a supplementary strip having a width which is less than the length of the adhesive strip and being disposed transversely beneath the adhesive strip, the supplementary strip extending through the cut in the packet and being operatively connected to the adhesive strip in such a manner that its condition is modified in a visually perceptible manner during the tearing of the wall during first detachment of the adhesive strip.

4,874,097

MECHANISM FOR SEPARATING THE CLOSED PISTACHIO NUTS FROM THE OPEN PISTACHIO NUTS OF ARGINA AND ROTTEN LEGUMES

Nikos Argiriadis, Meliteos 6, Neapoli, Thessaloniki 567.27, Greece

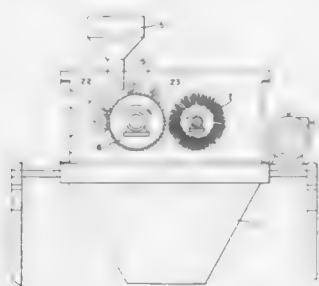
Filed Mar. 17, 1988, Ser. No. 169,588

Claims priority, application Greece, Mar. 19, 1987, 870447

Int. Cl.⁴ B07C 5/34

U.S. Cl. 209—616

3 Claims



1. An apparatus for separating open or rotten legumes or pistachio nuts from closed or good legumes or pistachio nuts, comprising

a first elongated cylinder having outwardly projecting edges along its exterior surface;

a second cylinder having at least one brush on its outer circumference;

means for positioning said cylinders in side-by-side relationship at a longitudinal inclination so that said cylinders have an upper end and a lower end;

a laterally inclined plate adjacent said first cylinder on a side thereof opposite from said second cylinder, said inclined plate and said first cylinder forming a trough therebetween;

means for feeding plastic pistachio nuts or legumes to the upper end of said first cylinder so that said nuts or legumes fall in said trough;

means for rotating said cylinders in opposite directions whereby rejected nuts or beans are caught by said outwardly projecting edges and transferred by said first cylinder from said trough to said second cylinder; and collection means for good pistachio nuts or legumes at the lower end of said first cylinder.

4,874,098

SHIPPING RACK FOR VEHICLE AIR DAMS

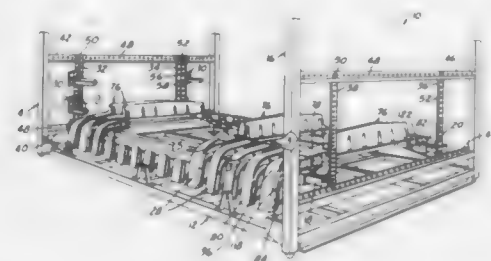
Julie M. Moulds, Royal Oak, Mich., assignor to Chrysler Motors Corporation, Highland Park, Mich.

Filed Apr. 4, 1988, Ser. No. 177,214

Int. Cl.⁴ A47F 7/00

U.S. Cl. 211—13

5 Claims



1. A shipping rack for vehicle air dams, the dams being of the type fabricated of flexible plastic material and comprising an elongated central portion for positionment beneath the

bumper of a vehicle, relatively short end portions extending from the central portion, the end portions adapted to wrap around the sides of a vehicle, each end portion having, when positioned on the rack, a generally vertically extending wall section with an opening provided therein, the central portion having, when positioned on the rack, a generally horizontally extending tab at each end thereof, each of said tabs extending towards the wall section of the adjacent end portion, the shipping rack including a bottom wall having a length and a width, an upstanding end wall at each end of the length of the bottom wall, a pair of generally parallel support bars extending between said end walls, at least one air dam support member carried on each support bar, said air dam support members being oppositely disposed, the support members each having a generally triangular shape defining a generally horizontal support surface and a generally vertical support surface, a pin extending outwardly from one side of each air dam support member adjacent to the generally vertical support surface, each air dam support member having a slot therein adjacent to the generally horizontal support surface, a vehicle air dam received on and supported by said air dam support member with the outer ends of the central portion of the air dam supported by said surfaces and the air dam end portions supported by said generally vertical support surfaces with said pins extending through the openings in said wall sections and with said tabs extending into the slots provided in the air dam support member to thereby retain the air dam in place on the air dam support members.

4,874,099

NAPKIN HOLDER

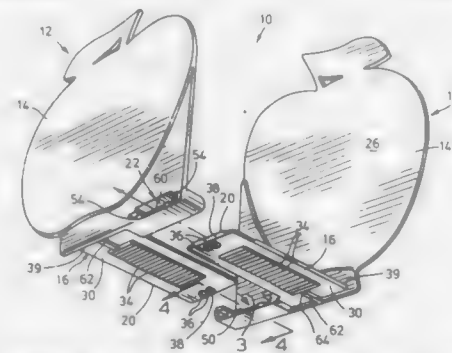
John Arnott, and Gary Kaga, both of Toronto, Canada, assignors to Ontario Limited, Toronto, Canada

Filed Oct. 26, 1987, Ser. No. 112,161

Int. Cl.⁴ A47F 7/00

U.S. Cl. 211—50

16 Claims



1. An adjustable holder having first and second opposed slideable end units, detent means and stop means, each of said end units having a support panel and a longitudinally extending base wherein:

(a) the base of said first end unit comprises a tongue having proximal and distal ends, said tongue having first and second substantially planar opposed surfaces;

(b) the base of said second end unit comprises a complementary slot having a longitudinally extending surface;

(c) said first opposed surface and said longitudinally extending surface comprising said detent means to prevent movement of one of said end units relative to the other of said end units; and

(d) said distal end of said tongue and said slot comprise said stop means and are dimensioned so that in at least one direction, the distal end of said tongue is larger than said slot such that when said tongue is inserted in said slot, an increased amount of external force must be applied to said adjustable holder to withdraw said tongue from said slot than to adjust the distance between the end units.

4,874,100

BELT HOLDER

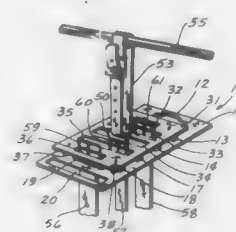
Billie T. Smagula, 403 Balboa Dr., Universal City, Tex. 78148

Filed Dec. 5, 1988, Ser. No. 280,239

Int. Cl.⁴ A47F 7/00

U.S. Cl. 211—60.1

7 Claims



1. A belt holder comprising:

a first rigid plate having a first elongated slot disposed there-through;

a second rigid plate spaced from and rigidly affixed to said first rigid plate, a second elongated slot disposed there-through, said second elongated slot being generally aligned with but larger than said first elongated slot in the first rigid plate;

means for attaching at least one of said first and second plates to a clothes closet bar whereby said belt holder is suspended therefrom; and

a flexible belt having a buckle attached to one end, said belt extending through said first slot and said buckle being disposed at least partially between the first and second rigid plates and within said second elongated slot, said one end of said belt having said buckle attached thereto being too large to pass through said first slot and whereby the other end of said belt hangs downwardly from said first rigid plate.

4,874,101

TAMPER EVIDENT CAP

Gregory J. Zalut, 24640 Laetham, East Detroit, Mich. 48021

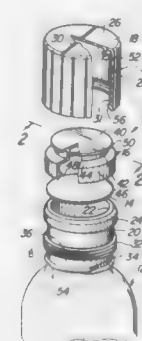
Continuation-in-part of Ser. No. 52,072, May 21, 1987,

abandoned. This application May 27, 1988, Ser. No. 201,329

Int. Cl.⁴ B65D 41/34

U.S. Cl. 215—251

2 Claims



1. A tamper evident cap member (18) for a container comprising a substantially cup-shaped cap having a base portion (26) and an annular flange portion (28), said flange portion (28) including a threaded portion (31) spaced from said base portion (26), and a plurality of flexible fingers (52) extending into said cap member (18) from said base portion (26) for engaging an annular flange (50) of a cover member (16) and retaining the cover member (16) with the cap member (18) and against the base portion (26).

4,874,102

MEDICAL FAIL SAFE RELEASABLE LOCKS AND/OR SEALS FOR CAPPED DISPOSABLE CENTRIFUGE CONTAINERS, CRYOGENIC VIALS AND THE LIKE

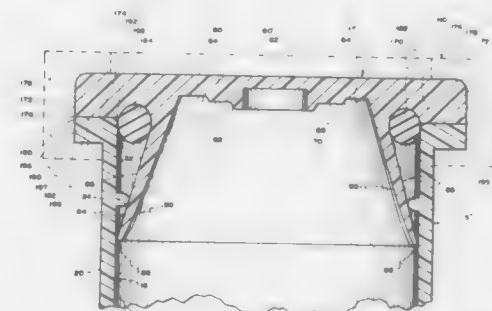
Paul M. Jeannop, and David H. Jeffa, both of Salt Lake City, Utah, assignors to Multi-Technology Inc., Salt Lake City, Utah

Continuation-in-part of Ser. No. 191,518, May 9, 1988, Pat. No. 4,830,209. This application Oct. 31, 1988, Ser. No. 265,178

Int. Cl.⁴ B65D 45/00

U.S. Cl. 215—273

13 Claims



1. A combination comprising:

a liquid specimen container comprising wall means defining a closed distal end and an open proximal end;

a cap comprising male means which project into the container opening when the cap is closed;

a releasable externally-applied lock comprising means holding the cap and the container at the opening thereof in a leak-free closed state during centrifuging, boiling, freezing and like processing in a specimen testing laboratory, the lock being formed of synthetic resinous material with memory, the combination accommodating removal of all or part of the processed specimen from the container through the opening after the lock is externally removed and the cap is open;

seal means carried by the male means so as to be compressively interposed between the male means of the cap and the wall means of the container in sealing relation.

4,874,103

RECEPTACLE FOR RECEIVING INFECTIOUS WASTE MATERIAL

Tony M. Quisenberry, Austin, and Fred E. Wahlenmeier, San Antonio, both of Tex., assignors to Winfield Corporation, San Diego, Calif.

Filed Oct. 1, 1986, Ser. No. 914,111

Int. Cl.⁴ B65D 90/00

U.S. Cl. 220—1 T

10 Claims



1. A disposable waste receptacle comprising: a substantially impermeate container for holding the waste

and having an edge defining an opening, the edge including a lip structure;
 a substantially flat cover overlying said opening and including pawl means for engaging said lip structure to nonreleasably lock the cover in place over the opening, the cover including:
 a generally flat top portion having an outer periphery and a recess inwardly spaced from the outer periphery;
 a substantially flat shoulder surface within the recess and generally parallel to the top portion;
 an open trough for receiving the waste and defining an open aperture extending through the shoulder with the shoulder surrounding the aperture;
 an engagement slot extending through the shoulder;
 a lid hingedly coupled to the top portion for movement between a first position remote from the aperture and a second position overlying the aperture, the lid having a projecting lug operatively received in the engagement slot with the lid in the second position, the lug operative to prevent return of the lid to the first position once the lug is received in the slot, the lid being cooperatively dimensioned to the recess for reception therein, such that, in the second position, the lid adjoins the shoulder surface and the cover and lid are generally flat in relation to each other.

4,874,104

HOT WATER STORAGE TANK

Josef Klammer, Esplanade 28, Gmunden, Austria 4810, and Werner Grosschädl, Hutterweg 2, Bad Ischl, Austria 4820
 Filed Jul. 29, 1988, Ser. No. 225,967

Claims priority, application Fed. Rep. of Germany, Jan. 12, 1988, 380,000

Int. Cl.⁴ B65D 6/16; F24H 1/18, 9/14

U.S. Cl. 220—4 B

18 Claims



1. A hot water storage tank having an upper side and an underside, an access opening in said underside for a heating element positioned within the tank, and cold water supply, and hot water outflow, connectors communicating with the interior of the tank, the tank comprising at least two juxtaposed, vertical, pressure tight, cylindrical vessels interconnected by way of upper and lower piping connections, the cylindrical vessels being assembled from separate telescopic modular elements of plastic material which are relatively adjustable to determine a desired capacity of the tank, whereby said telescopic modular elements are bonded together after said desired capacity has been determined, said modular elements comprising a tubular central element and upper and lower lid elements attachable to the top and bottom, respectively, of said central element in overlapping relationship therewith, said piping connections communicating with said lid elements at apices thereof and said access opening, which is provided in a lower

lid element, tapering outwardly thereof for the insertion of the heating element into said opening and securing it therein.

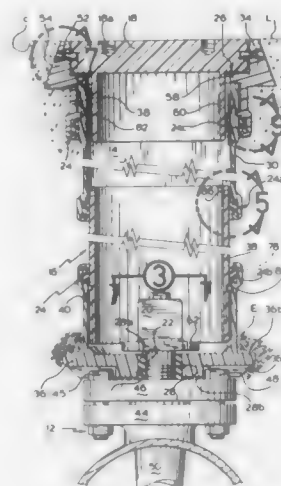
4,874,105
VALVE BOX

André Tetreault, 236 Cowie Street, Granby, Canada (J2G 3B8)
 Filed Jan. 9, 1989, Ser. No. 294,748

Int. Cl.⁴ B65D 88/76; F16L 57/00

U.S. Cl. 220—4 C

16 Claims



1. A valve box for use with a water valve from an aqueduct branch pipe or the like, comprising: an upright, ground-engaging, elongated, tubular assembly, a cover member mounted to the top of said tubular assembly, first locking means to releasably lock said cover member to said tubular assembly, first gasket means to seal the connection of said cover member to said tubular assembly cooperatively with said first locking means, a floor member mounted to the bottom of said tubular assembly, second locking means to releasably lock said floor member to said tubular assembly, second gasket means to seal the connection of said floor member to said tubular assembly; said floor member having a through-bore for rotatably receiving an operative shaft of said valve, said shaft having gripping means at its free end adapted to project within said tubular assembly; and third gasket means, to seal the connection between said shaft and said floor member.

4,874,106

COLLAPSIBLE CONTAINERS

Edward S. Robbins, III, 459 N. Court St., Florence, Ala. 35630
 Filed Sep. 7, 1988, Ser. No. 241,378

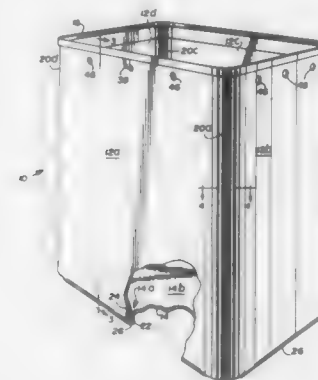
Int. Cl.⁴ B65D 6/22

U.S. Cl. 220—4 F

37 Claims

1. A collapsible container comprising:
 plural side walls;
 hinge means joining adjacent side walls so as to allow said side walls to be moved between (a) a collapsed condition in which said side walls lie substantially flat, and (b) an erected condition in which said side walls define, in cross-section, an interior area for receiving articles therewithin;
 a bottom wall which establishes a peripheral edge region sized and configured so as to closely match said interior area of said erected side walls; and
 means for removably coupling said bottom wall to lower regions of said side walls when in said erected condition, whereby said side walls are maintained in said erected condition, wherein

said bottom wall includes seal means extending upwardly from said peripheral edge region and providing sealing



contact with said side walls when said bottom wall is removably coupled to said lower regions thereof.

4,874,107

MULTIPLE COMPARTMENT CONTAINER

José L. Arnan-Munoz, Montigny-Le-Bretonneux, and Henri Cornette, Pontolse, both of France, assignors to The Procter & Gamble Company, Cincinnati, Ohio

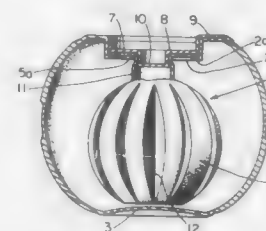
Filed Mar. 25, 1988, Ser. No. 173,490

Claims priority, application France, Mar. 25, 1987, 87 04168

Int. Cl.⁴ B65D 25/00

U.S. Cl. 220—20

15 Claims



1. Single-use container for packaging substances which do not exhibit satisfactory compatibility when brought together, said container comprising:

- a generally rigid outer enclosure of overall spherical shape defining a compartment and having an opening, said compartment being adapted to hold a liquid; and
- an expandable inner compartment generally within said outer enclosure and having an orifice disposed peripherally to said inner compartment and said compartment defined by said outer enclosure, the mouth of said orifice being encircled by an annular flange having a plurality of holes therein which access the interior of said outer enclosure, said annular flange adjoining the edges of said opening, said inner compartment being adapted to hold a liquid and having an unexpanded position and an expanded position, the transverse dimension of said inner compartment allows passage of said inner compartment through said opening when said inner compartment is in the unexpanded position, the transverse dimension of said inner compartment being greater than said opening when said inner compartment is in the expanded position.

4,874,108

SEALER FOR CONTAINERS

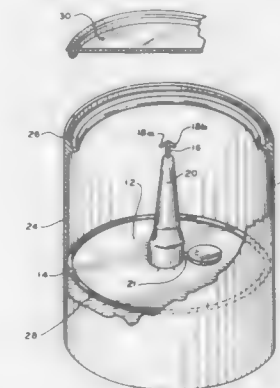
Raymond J. Valasek, Newberg, Oreg., assignor to Chromatic Paint Corporation, Stoney Point, N.Y.

Filed Nov. 3, 1988, Ser. No. 266,647

Int. Cl.⁴ B65D 25/10

U.S. Cl. 220—93

14 Claims



1. A sealing means for use with a container, said container including an interior wall portion, said sealing means comprising:

- a sealing portion, said sealing portion having a cross-sectional area at least that of the interior cross-sectional area of said container, said sealing portion having a perimeter portion sealingly engageable with said interior wall portion of said container;
- a handle portion attached to said sealing portion; and
- a tube, said tube having a length less than that of said handle portion, said tube surrounding at least said handle portion, and said sealing portion is retractable within said tube upon pulling of said handle portion.

4,874,109

CAN HOLDER

John L. Cook, 23638 Anza Ave., Ste. E, Torrance, Calif. 90505
 Filed Oct. 27, 1988, Ser. No. 263,544

Int. Cl.⁴ B65D 7/42

U.S. Cl. 220—94 R

8 Claims



1. A can holder assembly comprising a collar, said collar having an inner surface and an outer surface, two semirigid lugs integrally mounted on said outer surface, said lugs being substantially parallel to each other, spaced apart to receive a handle projection, and having substantially smooth opposing faces, means in each lug to receive rotatably protrusions on each side of said handle projection, said handle projection having a camming face on one end and a handle on the other end, the camming face being located down and away from the collar when the handle is in the raised position and pressing against a locking tab which is an integral part of the collar and located between the lugs when the handle is depressed.

4,874,110

LENS STRUCTURE FOR A COMBINED RADIO/AUDIO TAPE CASSETTE PLAYER OR THE LIKE

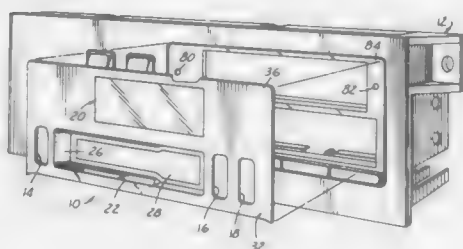
Frank H. Klein; Steven F. Selby, and Sigmund Klueger, all of Huntsville, Ala., assignors to Chrysler Motors Corporation, Highland Park, Mich.

Filed Oct. 27, 1988, Ser. No. 263,316

Int. Cl.⁴ H02G 3/41; B65D 51/18

U.S. Cl. 220—241

6 Claims



1. A lens structure for a combined vehicle radio/audio tape cassette player or the like to permit display of information generated by the combined vehicle radio/audio tape cassette player, the lens structure comprising a forward panel injection molded of a clear thermoplastic resin, the forward panel having an opening therein for insertion of an audio tape cassette, the forward panel having a forward surface and a rearward surface, a lens portion on said rearward surface projecting rearwardly therefrom, the lens portion forming, with the contiguous forward portion of the forward panel, a lens, a rearward panel injection molded of an opaque thermoplastic resin onto the forward panel and heat fused to the portion of the rearward surface of the forward panel adjacent to, but not including, the rearward surface of said lens, a door, hinge structure pivotally mounting the door on the rearward panel over the tape cassette opening, and spring means urging the door to a normally closed position blocking the tape cassette opening.

4,874,111

MULTI-COMPARTMENT REFUSE CONTAINER

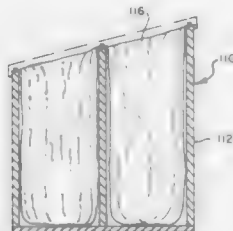
Cletas Heller, Du Bois, Pa., assignor to Heller Triangle Spring Co., Du Bois, Pa.

Filed Jan. 27, 1989, Ser. No. 303,716

Int. Cl.⁴ B65D 25/16

U.S. Cl. 220—404

6 Claims



1. A multiple compartment refuse container comprising:
(a) a container, said container provided with at least one internal partition, said at least one partition dividing said container into at least two compartments, each of said compartments adapted to receive a trash liner;
(b) a plurality of pin receiving members provided on a top surface of said at least one partition;
(c) a plurality of pins sized to fit into said pin receiving members on said at least one partition, said pins adapted to secure said trash liners in each of said compartments; and

(d) a removable lid sized and positioned to fit over and seal said container.

4,874,112

FILTER DISPENSER

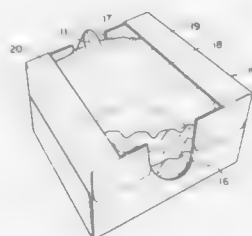
Merle W. Mulder, 0-288 Begole, SW., Grand Rapids, Mich. 49504, and Vernon J. Mol, III, 1627 Havana, SW., Wyoming, Mich. 49509

Filed Mar. 23, 1987, Ser. No. 29,088

Int. Cl.⁴ B65G 59/00; B65H 1/00

U.S. Cl. 221—1

2 Claims



1. A method of preparing a stack of interengaged pleated frusto-conical sheets of material for removal of said sheets one-by-one from said stack, comprising:
turning said stack inside-out.

4,874,113

DISPENSERS FOR COSMETICS

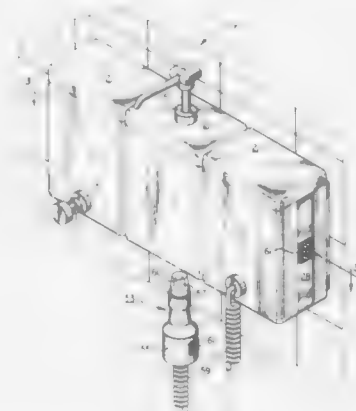
Laurie H. Schmidt, P.O. Box 541237, Dallas, Tex. 75354-1237

Filed Feb. 22, 1988, Ser. No. 158,798

Int. Cl.⁴ B67D 5/60

U.S. Cl. 222—143

8 Claims



1. A dispenser for cosmetics adapted to constitute a unit of a modular array of essentially similar dispensers and comprising a body of substantially rectangular horizontal cross-section, having front, rear and side walls, a bottom and a top wall; the side walls of said dispenser having respective male and female alignment means of complementary shape, whereby two such dispensers can be aligned in an aligned, side by side, array with the male alignment means of one dispenser engaged with the female alignment means of the other; said male and female alignment means extending substantially vertically over at least the major part of the wall surface whereby the two dispensers can be aligned by vertical relative motion between them; mounting means for the dispenser, said mounting means comprising a plate, separate from the dispenser, adapted to be secured to a vertical surface, such as a wall, the plate being of substantially the same width as the rear wall of the body, whereby when two dispensers are arranged in said array, the

4,874,115

DISPENSER FOR PASTY OR FLOWABLE MEDIA

Georg Wehrhach, Wald-Michelbach, Fed. Rep. of Germany, assignor to Coronet-Werke Heinrich Schlerf GmbH, Wald-Michelbach, Fed. Rep. of Germany

PCT No. PCT/EP86/00634, § 371 Date Jul. 13, 1987, § 102(e) Date Jul. 13, 1987, PCT Pub. No. WO87/02971, PCT Pub. Date May 21, 1987

PCT Filed Nov. 4, 1986, Ser. No. 85,567

Claims priority, application Fed. Rep. of Germany, Nov. 12, 1985, 3539999

Int. Cl.⁴ B67D 5/42, 5/22

U.S. Cl. 222—386

8 Claims

**DEVICE FOR DISPENSING A PREDETERMINED QUANTITY OF A LIQUID**

Jean Guigan, 9, rue Jean Mermoz, 75008 Paris, France

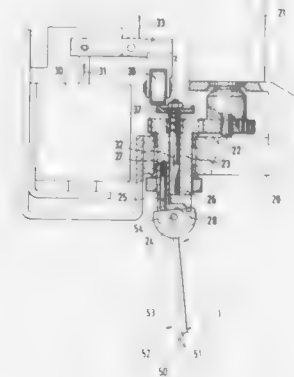
Filed Nov. 10, 1988, Ser. No. 269,349

Claims priority, application France, Nov. 13, 1987, 8715688

Int. Cl.⁴ B67D 5/64

U.S. Cl. 222—168

5 Claims



1. A device for dispensing a predetermined quantity of a liquid, the device comprising:

a pipette constituted by a rod having a substantially spherical element fixed at one end thereof, said element comprising a hollow hemisphere partially closed by a diametrical partition, thereby defining a volume corresponding to said predetermined quantity, a portion of spherical cap extending from said hemisphere to form a liquid inlet chamber which is wide open, said chamber including a peripheral opening leading to the outside and an opening through said partition and putting it into communication with said volume, said two openings being at a distance from the center of said hemisphere;

mechanical means for holding the free end of said rod in such a manner that the pipette is either in a first position for filling and for calibration purposes, or else in a second position for emptying purposes, said two positions corresponding to said diametrical partition being tilted symmetrically in two different directions relative to a vertical plane; and

means for rotating said pipette at high speed about a vertical axis both in said first position and in said second position, with the hemisphere being further from the axis of rotation than said inlet chamber when in said first position, and closer in said second position.

4,874,116

GAS BLENDING APPARATUS

Merton R. Falloa, Woodland Hills, Calif., and Thomas W. Clements, Ambler, Pa., assignors to McDantim, Inc., Woodland Hills, Calif.

Filed Jun. 1, 1988, Ser. No. 201,002

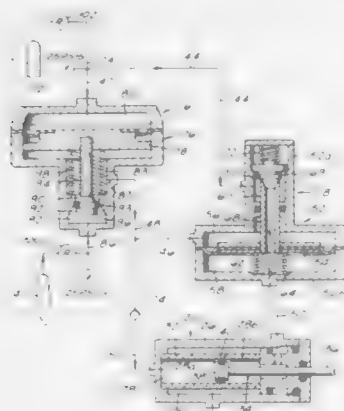
Int. Cl.⁴ B65D 83/14; B67D 1/04, 1/12

U.S. Cl. 222—399

10 Claims

6. A beverage dispensing system, comprising:
(a) a container including dispenser means from which beverage is to be dispensed by the pressure of a gaseous mixture comprising a first gas containing nitrogen and a second gas containing carbon dioxide;
(b) a source of said first gas under pressure;
(c) a source of said second gas under pressure;
(d) a gas blending means in communication with said container and in communication with said sources of first and second gases for blending said gases into a gaseous mixture of adjustable proportions; said gas blending means comprising a housing having first and second chambers

divided by a porous member and including reciprocal means reciprocally movable within said first chamber from a first position to a second position to divide said first chamber into first and second portions of varying volumes, said second chamber being in communication with said container, said first portion of said first chamber being in communication with said source of said first gas and said second portion of said first chamber being in communication with said source of said second gas;



- (e) a pneumatic relay means in communication with said gas blending means and said sources of said first and second gases for supplying said second gas to said gas blending means upon demand resulting from beverage being dispensed from said container; and
- (f) control means in communication with said sources of said first and second gases for controlling the flow of said first gas to said pneumatic relay means and to said gas blending means;

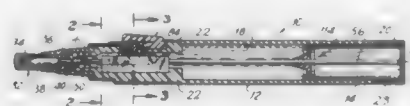
4,874,117

MANUALLY-OPERATED FLUID DISPENSER AND ASSOCIATED CLOSURE CAP
Nathan Kay, Encino; Donald W. McNab, Long Beach, and Edward J. Moyn, San Gabriel, all of Calif., assignors to Photofinish Cosmetics Inc., Encino, Calif.

Filed May 17, 1988, Ser. No. 194,840
Int. Cl.⁴ B67D 3/00

U.S. Cl. 222-487

38 Claims



1. In a fluid dispenser for manually-effected operator-controlled discharge of a stored fluid:
an elongated dispenser housing defining an interior space for storing fluid dischargeable from the housing, said housing including a fluid discharge opening and a vent opening proximate opposite ends of the housing;
variable length means normally urged to a maximum longitudinal extension between and for concurrently closing said fluid discharge and vent openings; and
fluid discharge actuating means operatively movable between a first and a second position for causing foreshortening of said variable length means relative to said maximum longitudinal extension to space said variable length means from and concurrently open said fluid discharge

and vent openings whereby stored fluid is discharged from said dispenser through said fluid discharge opening and air enters the housing through said vent opening.

4,874,118

PISTOL HOLSTER WITH LIMITING SWING CLUTCH
John K. Parlante, 998 Sheldon Ave., Staten Island, N.Y. 10309
Filed May 19, 1986, Ser. No. 864,261
Int. Cl.⁴ F41C 33/02

U.S. Cl. 224-198

10 Claims



1. A swivel joint fastener device comprising in combination a first element having a first head having a substantially flat first under-face and having a male-threaded shaft and male threads thereof extending from said first head's said first under-face surface, a second element having a second head with a substantially flat second under-face surface and having a female-threaded shaft and female threads thereof extending from said second under-face surface, a flexible washer mounted in juxtaposition to said second under-face surface and around said female-threaded shaft, a plurality of separate members each pivotally mounted on said female-threaded shaft and compressed between said first under-surface and said flexible washer such that each of said separate members is oppositely rotatable around said female-threaded shaft relative to a remaining other one of the separate members and such that each of the separate members is flexible toward and away from a remaining other one of the separate members, and a swivel-limiting means for limiting number of degrees of rotation of one of said separate members relative to a remaining one of said separate members, mounted on said female-threaded shaft in a compressed state of being compressed tightly between adjacent revolvable elements each having a substantially flat face compressed flushly against the flat face of the other, and each having flange means limiting the extent of each revolvable member's revolving movement around said female-threaded shaft relative to the other revolvable member, said compressed state being of sufficiently high compression to maintain said flat faces in a compressed operative state, and said flexible washer flexibly yielding sufficiently to permit said separate members of the swivel-limiting means to revolve one relative to the other while concurrently avoiding excessive pressure on said male and female shafts and heads thereof, said excessive pressure being pressure sufficiently high for one of said male threads and of said female threads to shear-off a remaining one of said male threads and of said female threads with a resulting shearing-off of the head of one or more of the first and second elements when exerted against at least one of the first and second heads, thereby making possible a flexing of the separate members toward and away from each other and thereby avoiding said excessive shearing pressures on said first and second heads of said first and second elements during such flexing.

4,874,119

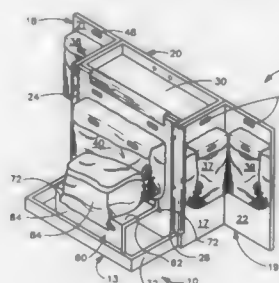
TOOL PACK APPARATUS

Robert W. Winter, 1530 Eisenhower, #242, Boulder, Colo.
[REDACTED]

Filed Nov. 4, 1988, Ser. No. 267,229
Int. Cl.⁴ A45F 3/02; A47B 81/00

U.S. Cl. 224-202

54 Claims



1. A tool pack for repair personnel adapted for carrying work items such as tools, equipment, parts and the like comprising:

- a back panel having a front surface, a back surface, a back panel upper edge portion, a back panel lower edge portion and first and second back panel side edge portion, said back panel defining a back of the tool pack;
- a bottom panel having a bottom panel rear edge portion rigidly attached to the back panel lower edge portion, said bottom panel extending forwardly of said back panel to define a base for the tool pack;
- a lid member including a top panel portion defining a top for the tool pack, said lid member pivotally mounted to the back panel upper edge portion and pivotable between a closed position in which the lid member extends forwardly of said back panel in a position above said bottom panel and an open position in which the lid member extends rearwardly of said back panel, said top panel having a first surface facing the bottom panel when the lid member is in the closed position;
- first and second door members, said first door member having a first front panel and a first side panel attached to one another and a first door rear edge portion opposite said first front panel, said first door member pivotally mounted along said first door rear edge portion to the first back panel side edge portion, and said second door member having a second front panel and a second side panel rigidly attached to one another and a second door rear edge portion opposite said second front panel with said second door member pivotally mounted along said second door rear edge portion to the second back panel side edge portion, said first and second door members pivotable between a door closed position and a door open position wherein said first and second front panels in the door closed position extend in spaced relation in front of said front surface to define at least a portion of a front of the tool pack and wherein said side panels extend forwardly of said back panel to define sides of said tool pack and wherein said side panels in the door open position extend rearwardly of said back panel, said first and second door members each having top edge portions which are movable into abutting relation with said lid member when said lid member is in the open position and said first and second door members are moved into the door open position; and
- means for releasably securing the lid member to each of said first and second door members when said lid member is in the open position and when the first and second door members are in the door open position whereby said door members support the lid member above a support surface on which the tool pack is placed, whereby the first and second door members in the open position help prevent the tool pack from tipping in a rearward direction when

the tool pack is placed on the support surface, and whereby the lid member when in the closed position and the first and second door members when in the door closed position enclose a compartment in which to store and carry the work items.

4,874,120

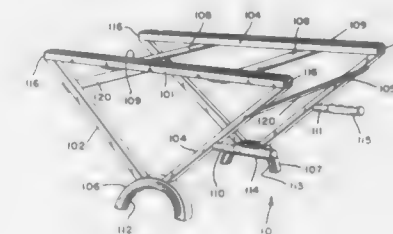
CARGO TRANSPORTING CARRIER

Eric R. Paton, and William U. Cooley, both of 2633 Beland, Redondo Beach, Calif. 90278

Filed Nov. 24, 1986, Ser. No. 933,983
Int. Cl.⁴ A63C 15/06; A45F 5/00

U.S. Cl. 224-266

14 Claims



1. An arrangement for transporting cargo adapted to be placed on the upper surface of both shoulders of a user with the users head positioned below the cargo a sufficient distance to allow the head of the user mobility, comprising, in combination:

- a bed means, having a surface upon which said cargo may be loaded, having a plurality of horizontal support members, each having a front end and a rear end, and a plurality of bed cross members each having a right end and a left end and attached to said horizontal support members whereby said bed means has a right front portion, a left front portion, a right rear portion and a left rear portion and a left most and a right most horizontal support member;
- a plurality of vertical support members each having a first and a second end and at least the first of said plurality of vertical support members attached at a preselected angle by said first end to said right front portion, at least the second of said plurality of vertical support members attached at a preselected angle by said first end to said left front portion, at least the third of said plurality of vertical support members attached at a preselected angle by said first end to said right rear portion and at least the fourth of said plurality of vertical support members attached at a preselected angle by said first end to said left rear portion of said bed means whereby said plurality of vertical support members support said bed means above the head of the user;
- a plurality of support cross members each having a first end and a second end;
- at least the first of said plurality of support cross members attached by said first end to a preselected portion of said at least first vertical support member attached to said right front portion of said bed means and attached by said second end to a preselected portion of said at least second vertical support member attached to said left front portion of said bed means;
- at least a second of said plurality of support cross members attached by said first end to a preselected portion of said at least third vertical support member attached to said right rear portion of said bed means and attached by said second end to a preselected portion of said at least fourth vertical support member attached to said left rear portion of said bed means;
- whereby said plurality of support cross members keep said plurality of vertical support members in a fixed preselected relation;
- a left shoulder support means having an upper and a lower surface, said upper surface connected to said second end

of said at least second vertical support member attached to said left front portion of said bed means and connected to said second end of said at least fourth vertical support member attached to said left rear portion of said bed means;

a right shoulder support means having an upper and a lower surface, said upper surface connected to said second end of said at least first vertical support member attached to said right front portion of said bed means and connected to said second end of said at least third vertical support member attached to said right rear portion of said bed means;

a right handle mounted on the front most of said at least first vertical support member attached to said right front portion of said bed means; and

a left handle mounted on the front most of said at least second vertical support member attached to said left front portion of said bed means.

4,874,121

WEB FEED TRACTOR BELT ASSEMBLY

Bernard Rubinshtein, Spokane, Wash., assignor to Output Technology Corporation, Spokane, Wash.

Filed May 3, 1988, Ser. No. 189,521

Int. Cl.⁴ G03B 1/30

U.S. Cl. 226—74

14 Claims



1. A web feed tractor mechanism for feeding a web in a longitudinal path in which the web has circular feed perforations of a prescribed inside diameter formed in parallel edge sections along the side edges of the web, comprising:

a pair of edge drive belts having drive pins thereon adapted to project into the feed perforations in which one of the drive belts has a first set of projecting pins and the other drive belt has a second set of projecting pins;

drive means for supporting the edge drive belts substantially parallel with each other along corresponding edge sections of the web and for synchronously driving the belts to move the drive pins into the perforations and to move the web forward in the longitudinal direction;

wherein each of the first set of pins of one of the belts has a tapered front surface, a tapered rear surface, a tapered left side surface and a tapered right side surface extending outward from a base of the first pin, in which the diametrical distances between the front and rear surfaces and the left side and right side surfaces at the base are substantially equal the prescribed inside diameter of the feed perforations for driving the web in the longitudinal direction and stabilizing the web in the lateral direction to prevent lateral movement of the engaged edge section relative to the one belt;

wherein each of the second set of pins of the other belt have a reduced cross-section at its base with a tapered front surface, a tapered rear surface, a tapered left side surface and a tapered right side surface in which the diametrical distance between the front and rear surfaces at their bases substantially equals the prescribed inside diameter of the perforations to engage the inside edge of the perforation for driving the web in the longitudinal direction and wherein the diametrical distance between the left side surface and the right side surface at their bases is substantially less than the prescribed inside diameter of the perforations to form a lateral gap between at least one of the side surfaces and the inside edge of the perforations to accommodate laterally misalignments and inaccuracies to minimize lateral tension on the web.

4,874,122

BENT BACK BOX STAPLE AND STAPLE CLOSING MECHANISM WITH SPLIT ACTUATOR

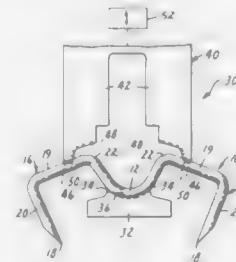
Harold E. Froelich, Minn., and Floyd L. Follen, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 885,221, Jul. 14, 1986, abandoned. This application Aug. 25, 1988, Ser. No. 238,972

Int. Cl.⁴ B25C 5/06; A61B 17/04

U.S. Cl. 227—19

8 Claims



1. An unused open wire staple for suturing living tissue, said open staple comprising a generally U-shaped central portion having opposite ends and at least one arcuate part; and outer portions terminating in sharp points, said outer portions each comprising a generally straight proximal part and a generally straight distal part with said parts disposed at about a right angle to each other and with said sharp point being on the end of said distal part opposite said proximal part, and the end of said proximal part opposite said distal part being disposed at about a right angle to and connected to one end of said central portion, said staple being closable by bending generally straight the arcuate part of said central portion adjacent each of said outer portions so that said outer portions can enter and gather living tissue, during such closure the sharp points on said distal parts moving to adjacent positions with said distal parts generally aligned with each other to provide a generally rectangular closed staple, and the central portion of the closed staple subsequently being bendable to retract the outer portions of the staple from the living tissue, the distal parts having a length sufficiently greater than the length of the central portion that the sharp points of the outer portions overlap when the staple is closed.

4,874,123

GUTTER INSTALLATION TOOL

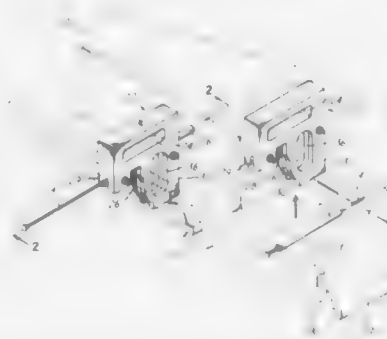
Roger W. Mercer, II, Rte. 2, Box 236, Marshall, Va. 22115, and Roger W. Mercer, 1340 Arlington Dr., Fairborn, Ohio 45324

Filed Nov. 17, 1988, Ser. No. 272,348

Int. Cl.⁴ B25C 1/02

U.S. Cl. 227—147

3 Claims



1. A gutter installation tool for positioning on a gutter being installed onto a building portion and detachably holding and

positioning a gutter nail and gutter ferrule, said gutter installation tool comprising: a handle having means thereon for locating against a portion of said gutter, and further having means thereon for detachably holding and positioning a gutter ferrule within said gutter and means thereon for detachably holding and positioning a gutter nail outside of said gutter to be in substantial coaxial longitudinal alignment with said ferrule, said installation tool being detachable after said nail has been partially driven into said building portion.

4,874,124

PROCESS FOR CARRYING OUT THE SOLDERING OF ELECTRONIC COMPONENTS ON A SUPPORT

Ken W. E. Johns, Ashford; Stuart Briggs, Richmond, both of England, and Luciano Flabbi, Milan, Italy, assignors to Montedison S.p.A., Italy

Continuation of Ser. No. 836,144, Mar. 4, 1986, abandoned. This application Jan. 26, 1988, Ser. No. 149,979

Claims priority, application Italy, Mar. 6, 1985, 19790A/85

Int. Cl.⁴ B23K 31/02; C09K 5/00

U.S. Cl. 228—180.1

12 Claims

1. A process for bonding electronic components to a support, the process consisting essentially of arranging said components on the support together with a bonding material, and then placing the thus-obtained assembly in contact with a perfluoropolyether in the liquid state having a temperature equal to or greater than the temperature at which said bonding material develops its binding properties, said perfluoropolyether having a molecular weight exceeding 5000.

4,874,125

FOLDING CORRUGATED BOARD CARTON

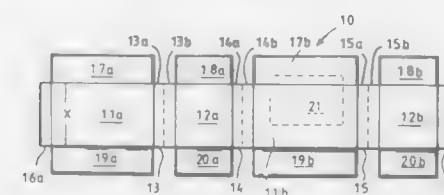
Howard M. Bates, Forest Hills, N.Y., assignor to CALPAC Incorporated, Uniondale, N.Y.

Filed Sep. 12, 1988, Ser. No. 243,328

Int. Cl.⁴ B65D 5/02

U.S. Cl. 229—132

10 Claims



1. A rigid folding carton suitable for the shipping of goods and their point-of-purchase display which is formed from a one-piece blank of corrugated board, which blank comprises:

a) at least three closure-forming wall panels each possessing a length dimension and each possessing an identical height dimension, the exterior surface of each wall panel being continuously flat for substantially its full expanse, the first and last of said wall panels in the series each terminating in a foldable extension panel which is substantially coextensive with the height of the panel, each wall panel being joined to a successive wall panel in the series through a foldable bridging panel which is substantially coextensive with the height of the thus-joined wall panels; and, b) at least one closure flap hingedly connected to the top or bottom of one of said wall panels, the exterior surface of the closure flap being continuously flat for substantially its full expanse,

such that in the assembled condition of the carton, the foldable extension panel of the first wall panel is folded 180° and joined to the wall panel of which it is an extension, the foldable extension panel of the second wall panel is folded at an angle which is equal to 360° divided by the number of wall panels and as folded, is joined to the free surface of the folded extension panel of the first wall panel to form

an internal vertical corner gusset element which is substantially coextensive with the height of the wall panels and each bridging panel joining successive wall panels is folded into subpanels which are joined to each other and to a portion of an adjacent wall panel to provide another internal vertical corner gusset element which is substantially coextensive with the height of the wall panels, the total number of said internal corner gusset elements being equal to the total number of wall panels, said internal vertical corner gusset elements imparting substantially increased vertical crush strength to said carton compared to a carton of the same dimensions and same grade corrugated board lacking vertical corner gusset elements.

4,874,126

CONTAINER OPENING DEVICE

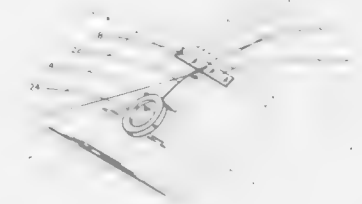
Lawrence G. Miller, 5615 Barna Ave., Titusville, Fla. 32780

Filed Mar. 29, 1989, Ser. No. 329,966

Int. Cl.⁴ B65D 5/44

U.S. Cl. 229—160.2

8 Claims



1. In a carton formed from a semi-rigid paper board material and having an initially closed dispensing opening formed by a pair of overfolded flaps joined at a central apex, the improvement comprising:

a strip secured to said carton and extending between said flaps and having a central folding joint disposed at said central apex;

a cord having a first end secured at central point of said strip; and

grasping means at an opposite end of said cord whereby said dispensing opening may be opened by pulling said grasping means.

4,874,127

CLIMATE CONTROL APPARATUS

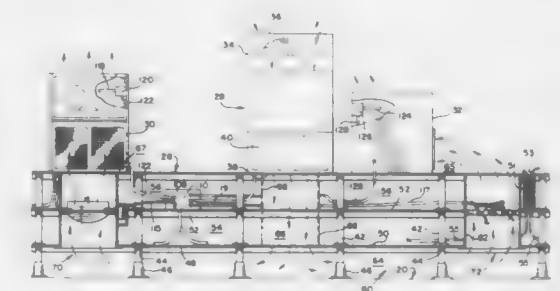
William R. Collier, 1 S. 141 Spring Rd., Oakbrook Terrace, Ill. 60181

Filed Nov. 12, 1987, Ser. No. 119,805

Int. Cl.⁴ F24F 13/10

U.S. Cl. 236—49.5

5 Claims



1. A climate control apparatus for disposition within a building room interior, said apparatus comprising, in combination,

an access floor assembly disposed within said building room interior, said access floor assembly including an uppermost working area floor lying above said spaced apart from a building floor in said room interior, said access floor assembly further including at least one intermediate floor lying between said working area floor and said building floor so as to define, at least in part, at least one a wireway region between said intermediate floor and said work area floor and an HVAC main plenum space between said building floor and said intermediate floor, at least one plenum inlet extending between a conditioned air source outside said main plenum space and the interior of said main plenum space, and a plurality of plenum outlet stacks extending vertically through said at least one wireway region and between said main plenum space and a plenum outlet area above said working area floor, a control damper unit disposed in each of said plenum outlet stacks, means for adjusting each of said control dampers so as to increase or decrease air flow therethrough, a temperature sensing element disposed adjacent each of said plenum outlet areas and lying above said working area floor, a control unit adapted to communicate with and control the output of an associate HVAC unit, said control unit being operatively connected to each of said temperature sensing units, each of said control dampers, and said HVAC unit, whereby said HVAC unit may controlled so as to provide sufficient conditioned air for said room interior as a whole, and whereby each of said control dampers may permit air flow therethrough as needed to provide a desired air temperature in the vicinity its associated plenum outlet area in said working area floor.

4,874,128

RAIL-TIE FASTENING ASSEMBLY

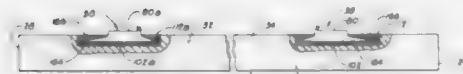
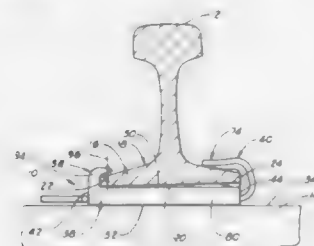
S. Hudson Owen, Marshfield, Wis., assignor to Kerr-McGee Chemical Corporation, Oklahoma City, Okla.

Filed Dec. 3, 1987, Ser. No. 128,174

Int. Cl.⁴ E01B 2/00, 9/00

U.S. Cl. 238—355

66 Claims



22. A rail-tie fastening assembly for connecting a rail having a rail flange with an upper surface, a lower surface, a first side and a second side to a tie having an upper surface, comprising: a rail seat assembly connectable to the upper surface of the tie having a first end, a second end, a first side, a second side, an upper surface and a lower surface, a seat hook assembly being formed on the rail seat assembly generally near the first end of the rail seat assembly and being adapted to engage the first side of the rail flange and to extend a distance generally over a portion of the upper surface of the rail flange generally near the first side of the rail flange, the seat hook assembly being spaced a distance from the upper surface of the rail flange; and a rail anchor having a first side, a second side, a first end and a second end, an anchor hook assembly being formed on

the rail anchor generally near the second end of the rail anchor, a portion of the anchor hook assembly being adapted to extend a distance generally over and engage a portion of the upper surface of the rail flange generally near the second side of the rail flange and a portion of the anchor hook assembly being engageable with the second side of the rail flange, the rail anchor being connectable to the rail seat assembly in an assembled position to permit limited vertical movement of the anchor hook assembly and portion of the rail flange engaged thereby.

29. A rail-tie fastening assembly adapted for use with a rail having a rail flange, comprising:

a tie having an upper surface with cavity means formed in a portion thereof of the upper surface;
a base anchor means disposed in the cavity means in the tie after the cavity means has been formed in the tie, the cavity means having a sufficient size whereby the base anchor means is disposable within the cavity means;
means for connecting the base anchor means to the tie, comprising;

compound means disposed in the cavity means whereby the compound means covers at least a portion of the portion of the base anchor means disposed in the cavity means and whereby the compound means substantially fills the portion of the cavity means not occupied by the base anchor means and cooperates to secure the base anchor means in the cavity means.

means connected to the base anchor means and connectable to the rail flange for connecting the rail to the tie via the base anchor means.

62. A method for connecting a rail having a rail flange with an upper surface, a lower surface, a first side and a second side to a tie having a first end, a second end and an upper surface, using a pair of rail seat plates wherein each rail seat plate is connected to a base anchor means and a rail anchor, comprising the steps of:

forming a first cavity in the upper surface of the tie, generally near the first end of the tie;

forming a second cavity in the upper surface of the tie generally near the first end of the tie, the second cavity extending generally parallel with the first cavity and being spaced a distance therefrom;

disposing the base anchor means having the first rail seat plate connected thereto in the first cavity in the tie, the first cavity being sized with respect to the base anchor means connected to the first rail seat plate so that the first seat plate is disposed generally on the upper surface of the tie when the base anchor means with the first rail seat plate connected thereto is disposed in the first cavity;

securing the base anchor means with the first rail seat plate connected thereto in the cavity;

disposing the base anchor means having the second rail seat plate connected thereto in the second cavity in the tie, the second cavity in the tie being sized with respect to the base anchor means connected to the second rail seat plate so that the second rail seat plate is disposed generally on the upper surface of the tie when the base anchor means with the second rail seat plate is connected thereto is disposed in the first cavity; and

securing the base anchor means with the second rail seat plate connected thereto in the second cavity, the first rail seat plate and the second rail seat plate each being sized and positioned in the respective first and second cavities so that a space is formed between the first and the second rail seat plates defining an anchor slot, the rail anchor being movable through a portion of the anchor slot for connecting the rail anchor to the first and the second rail slot plates.

4,874,129

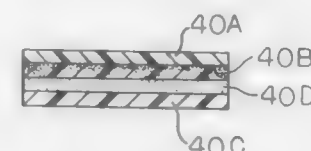
MULTI-LAMINATE FRAGRANCE RELEASE DEVICE
Alfred J. DiSapio, Greenwich, Conn.; William R. Pfister, Bay City, and Mary A. Sheeran, Midland, both of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Jun. 30, 1988, Ser. No. 213,738

Int. Cl.⁴ A61L 9/12

U.S. Cl. 239—36

22 Claims



1. A multi-layered multi-laminate sustained release device capable of releasing fragrances at a controlled rate for a prolonged period of time comprising a first layer of a pressure sensitive adhesive release liner for providing a protective peel strip for the device, a second layer of a silicone pressure sensitive adhesive for adhering the device to a substrate to which it is applied, a third layer of a fragrance impregnated matrix which is a silicone material selected from the group consisting of silicone elastomers, silicone elastomers having adhesive characteristics, and elastomeric silicone pressure sensitive adhesives, a fourth layer of a permeable facelock backing member on the surface of the device for controlling the rate of release of the fragrance from the impregnated matrix, the fragrance in the impregnated matrix constituting of from about one-half of one percent to about forty percent by weight of the impregnated matrix, the matrix including a release rate modifying excipient for increasing the solubility of the fragrance in the matrix resulting in an increase in the release capability of the device.

4,874,130

DEVICE FOR DISTRIBUTING A GRANULAR OR POWDERY SUBSTANCE

Jan Wondergem, Rijnshout, Netherlands, assignor to Multinorm B.V., Netherlands

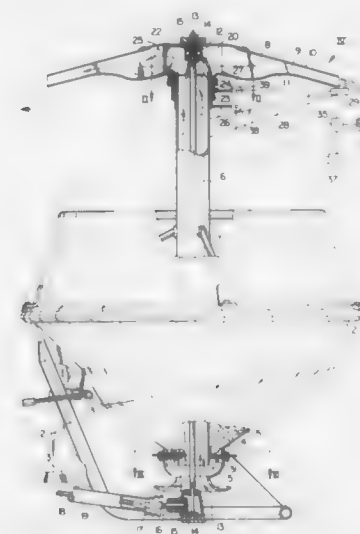
Filed Jun. 23, 1987, Ser. No. 65,583

Claims priority, application Netherlands, Jun. 23, 1986, 8601629

Int. Cl.⁴ A01C 15/14, 17/00

U.S. Cl. 239—63

16 Claims



1. A device for distributing a granular or powdery substance

4,874,131

COLOR DOSIFICATION/APPLICATION MACHINE

Francisco B. Sanchez-Robles, and Maria De La Paloma M. Manterola, both of C/Calixto III no. 51 32a, 46008 Valencia, Spain

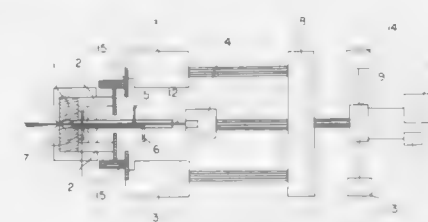
Filed May 20, 1987, Ser. No. 51,643

Claims priority, application Spain, May 23, 1986, 555270

Int. Cl.⁴ B05B 7/00

U.S. Cl. 239—307

7 Claims



1. A color dosification and application machine comprising: a rotary cutter, said rotary cutter having a face plane and an internal plane;
a drive element for rotating said rotary cutter; and
a plurality of blades, each of said blades emerging in an oblique position from said rotary cutter and forming a helical channel in said rotary cutter, said helical channel being between said face plane and said internal plane whereby color pigment bars are engaged during said rotating of said rotary cutter at a periphery of said blades and are converted into powder, said powder being transported from said periphery of said blades to an axially

positioned needle having a central nozzle wherein said powder is mixed with pressurized air and fluid emerging through said nozzle.

4,874,132

DRIP IRRIGATION APPARATUS

Gideon Gilead, P.O.B. 26025, Jerusalem, Israel
Continuation of Ser. No. 157,838, Jan. 9, 1980, abandoned. This application Aug. 12, 1983, Ser. No. 522,728

Claims priority, application Fed. Rep. of Germany, Jan. 19, 1979, 2924708

Int. Cl.⁴ B05B 15/00

U.S. Cl. 239—542

22 Claims



1. Drip irrigation apparatus comprising an elongated element of uniform cross-section including:

a seamless leak resistant extruded closed portion defining first and second generally parallel and uniformly spaced main surfaces having a first cross-sectional extent and first and second side surfaces integrally joined to said first and second main surfaces and having a second cross sectional extent less than said first cross sectional extent, said seamless closed portion defining a volume therewithin; and at least one solid portion integrally formed therewith with said seamless closed portion and extending outwardly from at least one of said first and second side surfaces, said elongated element defining parallel side edges, said parallel side edges being joined to define a water supply channel having said extruded closed portion extending only over part thereof,

at least one of said first and second main surfaces of said seamless extruded closed portion being embossed thereby defining adjacent portions of said first and second main surfaces at selected locations thereon, said first and second main surfaces being joined to each other at said selected locations at which at least one of said first and second main surfaces are embossed to define a pressure reducing pathway at locations wherein neither of first and second main surfaces are embossed or joined to each other, said pathway having a multiplicity of bends and turns and communicating with said water supply channel; and also comprising a water outlet permitting exit of water from said pressure reducing pathway.

4,874,133

GAS SUPPLY AND DISTRIBUTION CENTER

Hans-Gerd Gethke, Auf der Höhe 4, D-5107, Steckenborn, Japan; Detlef Eitner, Grunenthal 12, D-5100, Aachen, Japan, and Friedel Engelhard, Aiselsfeld 7, D-5204, Lohmar 21, Japan

Continuation of Ser. No. 177,240, Apr. 4, 1988, abandoned, which is a division of Ser. No. 028,417, Mar. 20, 1987, Pat. No. 4,786,297. This application Oct. 17, 1988, Ser. No. 259,410

Claims priority, application Fed. Rep. of Germany, Oct. 9, 1986, 3634377

The portion of the term of this patent subsequent to Nov. 22, 2005, has been disclaimed.

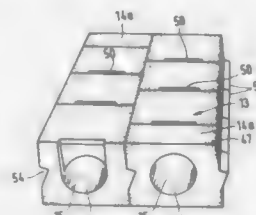
Int. Cl.⁴ B05B 1/14

U.S. Cl. 239—555

11 Claims

1. A gas duct comprising at least two blocks each having opposite first and second faces, the first and second faces of adjacent blocks being in abutment with each other, a gas channel in each block extending between the first and second faces thereof, said gas channels being in fluid communication with each other, each block having an upper surface, a recess in each block first face extending between the associated gas channel and the upper surface thereof thereby defining with

the adjacent block second face a gas exit aperture, each block includes opposite third and fourth faces provided with respective complementary contoured projections and recesses adapted to interdigitate adjacent gas ducts, each gas channel being defined by an interior peripheral surface of a predetermined peripheral configuration having a maximum transverse



dimension as defined by a transverse plane through each gas channel, and each recess and gas exit aperture having a transverse size at least equal to said maximum transverse dimension whereby a substantial portion of each gas channel is exposed directly to atmosphere through its associated recess and gas exit aperture.

4,874,134

SOLID WASTE PROCESSING FACILITY AND PROCESS

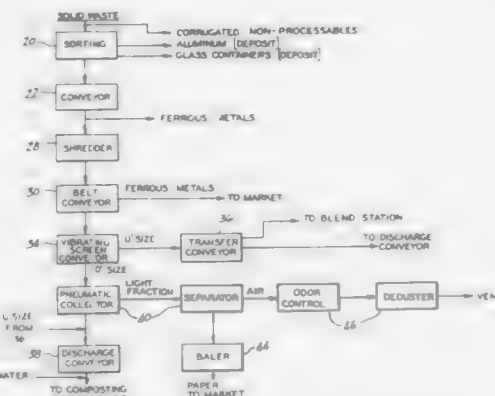
Thomas J. Wiens, 455 Westwood, Denver, Colo. 80206

Filed Jul. 18, 1988, Ser. No. 220,791

Int. Cl.⁴ B02C 21/00

U.S. Cl. 241—19

23 Claims



1. A process for treating solid waste materials and forming a compost from a biodegradable waste material fraction, said process comprising:

receiving untreated solid waste material at a receiving station; manually removing bulky valuables, non-processable materials and redeemable materials from said untreated waste material; said removing step including manually removing plastic and non-ferrous materials; magnetically separating a first ferrous metal fraction from said waste material; comminuting said waste material after separating out said first ferrous metal fraction; magnetically separating a second ferrous metal fraction from said comminuted waste material; pneumatically separating a paper fraction in a dry state from said comminuted waste material leaving a substantially biodegradable fraction; and forming a compost from said substantially biodegradable fraction.

4,874,135

MILL THROAT FOR PULVERIZER

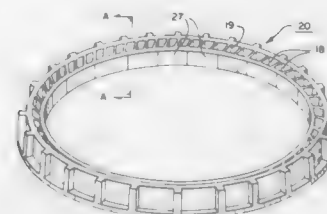
Robert S. Provost, Suite 283, 6393 Penn Ave., Pittsburgh, Pa. 15206

Filed Dec. 29, 1988, Ser. No. 290,377

Int. Cl.⁴ B02C 15/06

U.S. Cl. 241—57

4 Claims



1. In a coal pulverizer of generally cylindrical shape and vertical central axis and having a mill assembly which thrusts pulverized coal centrifugally from the mill and a source of forced air to propel a mixture of the so-thrust coal and air vertically to classifier means and subsequently to a combustion zone; a throat ring surrounding the said mill the throat mill being uniformly composed of a plurality of angularly disposed vertical channels through which the air is upwardly passed, each said channel having an exit port over which pulverized coal is passed, each said exit port being of essentially greater cross-section than the cross-section of that remainder of each corresponding channel extending beneath the exit port and being formed by a convex outer diameter exit bevel coterminal with the upper surface of the throat ring.

4,874,136

PULP REFINING APPARATUS

David R. Webster, 32 Forden Avenue, Westmount, Quebec, Canada H3Y 2Y8

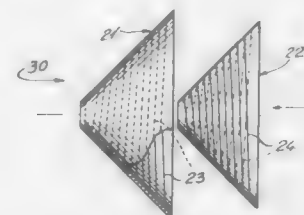
Continuation of Ser. No. 895,749, Aug. 12, 1986, abandoned, which is a continuation of Ser. No. 629,560, Jul. 10, 1984, abandoned, which is a continuation of Ser. No. 311,251, Oct. 14, 1981, abandoned. This application Jan. 22, 1988, Ser. No. 148,167

Claims priority, application Canada, Sep. 30, 1981, 387,006

Int. Cl.⁴ B02C 7/12

U.S. Cl. 241—251

4 Claims



1. In a high speed pulp refiner having a pair of refiner members having opposed surfaces defining a gap, each member formed with alternating grooves and lands extending continuously between a central port and a peripheral port through which a pulp slurry flows, the edges of the lands defining work edges, the direction of the work edges on one surface being opposite to the direction of work edges on the opposed surface forming intersections therewith, drive means for rotating at least one of the members relative to the other, the grooves and lands defined in the at least one member extending from the one of the central and peripheral ports to the other of said ports in a spiral pattern of at least one revolution having a direction on the member from one port to the other which is opposite to the direction of rotation such that as the at least one member rotates, the intersections will move downstream which will provide a screw pump action to the pulp slurry as it advances

from one port to the other, the pitch of the spiral lands forming the work edges on the opposed surfaces of the respective refiner members being such that each of the intersections of the opposed work edges defines an obtuse angle on the downstream side of the lands relative to the direction of rotation and pulp slurry flow such that the pulp fibers suspended in the pulp slurry will be subjected to a pinching action.

4,874,137

ULTRASONIC CELL-DESTROYER

Shigeru Chiba, WACORE Yoshino-cho Garden 110, 319-3 Nakamura-cho 5-chome, Minami-ka, Yokohama-shi, Kanagawa-ken, Japan

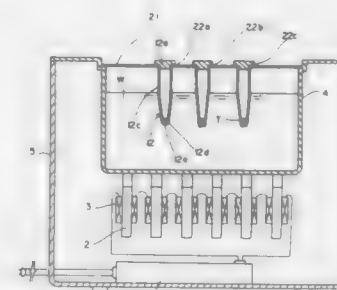
Filed Nov. 14, 1988, Ser. No. 270,217

Claims priority, application Japan, Aug. 1, 1988, 63-192223

Int. Cl.⁴ B02C 19/18

U.S. Cl. 241—301

7 Claims



1. An ultrasonic cell-destroyer comprising at least one closed container 12 comprising a container body 12c and a closure 12a for containing a given quantity of liquid T in which cells to be destroyed are suspended, and a vessel 4 equipped with ultrasonic wave generator means at its bottom so as to destroy cells in the container 12, which is partly soaked in the bath W of the vessel 4, characterized in that the container body 12c has an upward converging or concave groove 12e on its bottom 12d.

4,874,138

ROTARY TRANSMISSION DEVICE FOR A PLURALITY OF CABLES BETWEEN TWO RESTRICTEDLY ROTATABLE STRUCTURES

Günther Kettnering, Freising, Fed. Rep. of Germany, assignor to Max-Planck-Gesellschaft zur Förderung der Wissenschaften e.V., Goettingen, Fed. Rep. of Germany

Filed Apr. 18, 1988, Ser. No. 182,933

Claims priority, application Fed. Rep. of Germany, Apr. 22, 1987, 3713506

Int. Cl.⁴ H02G 11/06; B64G 1/42

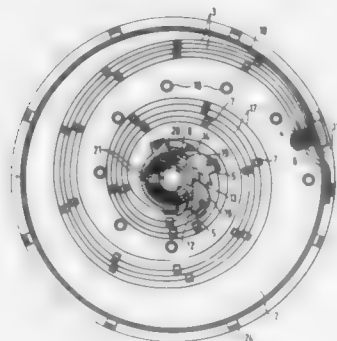
U.S. Cl. 242—54 R

11 Claims

1. A rotary transmission device for a plurality of cables between two coaxial, rotatable structures comprising:

two spaced apart plates, between which at least one support band is arranged said support band being laid perpendicular to the plates along a spiral, thereby forming spiral windings, the support band having a first end fastened at the one structure and a second end fastened at the other structure, a plurality of electrical cables laid along the outer side of said support band, a plurality of fastening devices distributed along the support band in spaced apart relation for fastening said electrical cables to said support band, means for slidably mounting said support band with respect to said plate, wherein one of said structures is provided with a cylindrical

housing comprising a cylindrical wall, a bottom and a cover, the bottom and the cover being formed by said plates, said other structure comprising a substantially cylindrical hollow hub concentrically extending into said housing, and wherein the support band is secured at its ends to the wall of the housing and at the hollow hub, respectively, said ends extending tangentially to the wall and the hub, at least one axial passage slit for the cables being formed in said hub,



wherein the cables are laid in a wavelike course along the support band, and
wherein said fastening devices fixedly fasten said cables to the support band at every second apex of the wavelike course and retain said cables at every other apex of the wavelike course, said fastening devices providing radial and axial clearances with respect to the spiral at said every other apex.

4,874,139

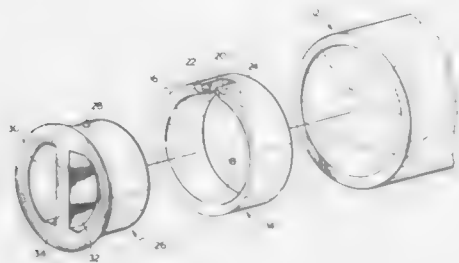
TUBULAR CORE ASSEMBLIES FOR ROLLS OF PAPER OR OTHER SHEET MATERIAL

Daniel Kewin, 16 Dogwood Drive, Brantford, Ontario, Canada
N3R 1K3

Filed Oct. 31, 1988, Ser. No. 264,656
Int. Cl.⁴ B65H 75/18

U.S. Cl. 242—68.6

6 Claims



1. A tubular core assembly for a roll of paper or other sheet material comprising:
a hollow cylindrical core member formed by multiple wraps of paperboard material,
an annular collar within each opposite end portion of the core member, each collar being a rigid body of non-isotropic material and having an outer annular surface glued to the inner annular surface of the core member and an inner annular surface having a configuration complementary to the outer annular surface of a roll supporting chuck so that the chuck is receivable therein with a close fit and
a pair of plugs insertable into the collars at opposite ends of the tubular core assembly, each plug comprising a body of non-isotropic material with a solid cross-section having an uninterrupted circular outer circumference, each plug having a length substantially equal to the length of the

collar, and each plug having an outer annular surface complementary to that of the internal annular surface of the collar so as to be a close fit therein.

4,874,140

FISHING REEL

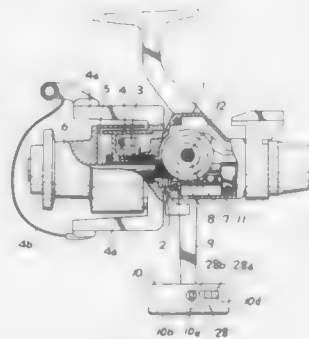
Yasuhiro Hitomi, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Oct. 26, 1988, Ser. No. 262,706

Claims priority, application Japan, Oct. 31, 1987, 62-276407
Int. Cl.⁴ A01K 89/01

U.S. Cl. 242—223

4 Claims



1. A fishing reel, comprising:
a reel body;
a spool supported relative to said reel body;
a handle rotatably mounted on said reel body for winding up a fishing line on said spool;
a grip shaft fixed to a free end of said handle;
a grip rotatably supported relative to said grip shaft and comprising a cavity;
a counter means, responsive to rotation of said grip shaft relative to said grip, for counting a number of complete revolutions of said grip shaft relative to said grip when said handle rotates and providing an output representing said number of revolutions, said counter means being housed in said cavity;
a converter means, receiving said output representing said number of revolutions from said counter means, for converting said number of revolutions into a length of said wound fishing line; and
a display means, responsive to said converter means, for displaying an indication of said length, said display means being disposed on an exterior surface of said grip, such that, when said handle is rotated to wind-up said fishing line on said spool, said display means on said grip displays said indication of said length of said wound fishing line.

4,874,141

FREEZER BAG SUPPORTING STAND

Richard H. Schulz, 845 N. I. Street, Livermore, Calif. 94550

Continuation-in-part of Ser. No. 126,640, Nov. 30, 1987,

abandoned. This application Nov. 29, 1988, Ser. No. 277,202

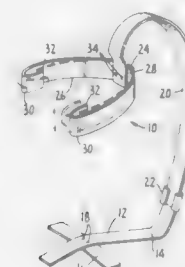
Int. Cl.⁴ A63B 55/04

U.S. Cl. 248—97

4 Claims

1. A stand for supporting bags comprising:
a base, said base being generally horizontally oriented;
a stanchion connected to said base, said stanchion being J-shaped having one end thereof extending into a bag to be supported, said stanchion being generally curved along the length thereof and being flexible and capable of arcing and bending; and
a bag-engaging collar which is generally C-shaped and generally horizontally oriented and connected to said stanchion, said collar having a center section interconnected

with said stanchion and ends, movement of said ends by hand manipulation inwardly toward each other allowing insertion of said collar within the mouth of a bag to be supported, said collar opening outwardly to engage the inside of a bag to be supported, loading of a bag arcing and bending said stanchion gradually upon loading, said collar



remaining generally horizontal to avoid spillage, said collar and the bending of said stanchion by arcing maintaining a bag in column and supporting a bag primarily upon said base, movement of said ends and spring-back of said stanchion allowing easy removal of said collar from a loaded bag.

4,874,142

BLOW DRYER HOLDER

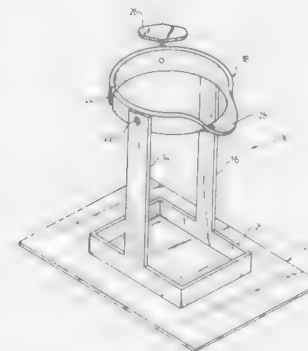
Sharon G. Gelatt, 9 N. Kern Ave., Woodland, Calif. 95695

Filed Nov. 25, 1988, Ser. No. 275,918

Int. Cl.⁴ F16M 11/10

U.S. Cl. 248—185

1 Claim



1. An appliance holder for holding a blow dryer, comprising:
a support base;
an upstanding tray on said support base for storing miscellaneous accessory items;
a pair of spaced parallel upstanding support arms connected to opposite side wall portions of said tray;
a cylindrical support ring;
means mounting said support ring for pivotal adjustment between said support arms;
a thumb screw threadably received through said support ring for selective frictional engagement with a blow dryer;
a gap formed in a cylindrical side wall of said support ring, said gap serving to permit an electric cord to be positioned therethrough during insertion of a blow dryer within said support ring;
and
a longitudinally extending support member forming a part of said support ring, said support member providing additional stability to said blow dryer when said blow dryer is retained within said support ring, said support member positioned substantially opposite from said thumbscrew,

whereby said thumbscrew forces said blow dryer into engagement with said support member.

4,874,143

TAPE CASSETTE HAVING REWIND CONTROL MECHANISM

Richard J. Armstrong, and Robert Granzotto, both of Toronto, Canada, assignors to Arena Recreations (Toronto) Limited

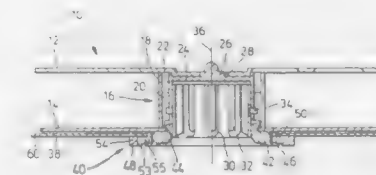
and William L. Heisey, both of Toronto, Canada

Filed Jun. 9, 1988, Ser. No. 204,564

Int. Cl.⁴ G11B 23/087

U.S. Cl. 242—198

8 Claims



1. In a tape cassette having a housing and a pair of spools located in the housing, a first of said spools being a take-up spool which is mounted in the housing for rotation about its axis in a first direction to wind and a second direction to unwind a tape or the like from or onto the other spool, the improvement of:

- (a) an engagement member mounted in the housing for rotation about the axis of the take-up spool,
(b) one-way coupling means arranged to communicate between the engagement member and the take-up spool, said coupling means engaging automatically to prevent rotation of the spool relative to the engagement member in the unwinding direction and releasing automatically to permit free rotation of the spool relative to the engagement member in the winding direction,
(c) locking means in said housing, said locking means being operable to engage said engagement member to secure it against rotation about the axis of the take-up spool and thereby prevent rotation of the take-up spool as a result of the automatic engagement of the coupling when an attempt is made to rotate the take-up spool relative to the engagement member in the unwinding direction and to disengage the engagement member to permit free rotation of the engagement member and spool about its second axis to allow the spool to be rewound.

4,874,144

BAIL FOR SPINNING REEL

Hideo Murakami, Hiroshima, Japan, assignor to Ryobi, Ltd., Hiroshima, Japan

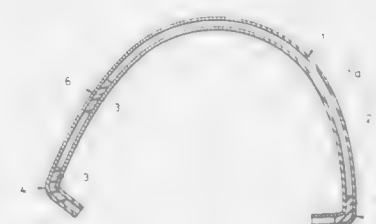
Filed Sep. 21, 1987, Ser. No. 98,957

Claims priority, application Japan, Sep. 22, 1986, 61-1453[U]

Int. Cl.⁴ A01K 89/01

U.S. Cl. 242—235

4 Claims



1. A fishing reel bail assembly for mounting on a rotor of a fishing reel, comprising a hollow arcuate metallic tube having

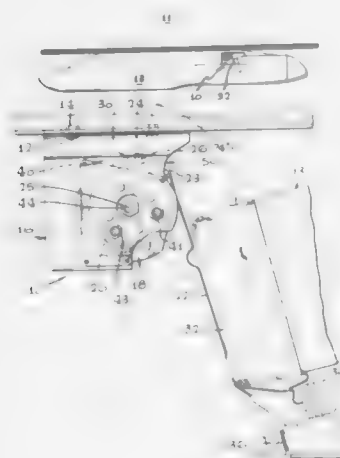
first and second ends, means including the first and second ends for attachment to bail support arms of the fishing reel rotor, and synthetic resin disposed at a plurality of predetermined locations within the tube between the first and second ends for reinforcing said tube.

4,874,145

MISSILE AIR INLET COVER RETRACTOR SYSTEM
Robert J. Prentice, El Segundo, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.
Filed Oct. 27, 1986, Ser. No. 923,450
Int. Cl.⁴ B64D 1/04

U.S. Cl. 244—53 B

14 Claims



1. In a system useable for launch of missiles from a transport aircraft, article retraction apparatus comprising:
a housing detachably mounted on said aircraft, said housing having a recess for containment of articles retracted from said missile during or immediately prior to launch;
a rotor contained within said housing, said rotor being spring driven and coupled to said article by flexible retractor means;
adjustment means for controlling said spring driven rotor in tension and total travel; and
means for initiating operation of said retraction apparatus.

4,874,146

STEERABLE KITE

Edmund Heid, Togostrasse 72, D-1000 Berlin 65, Fed. Rep. of Germany

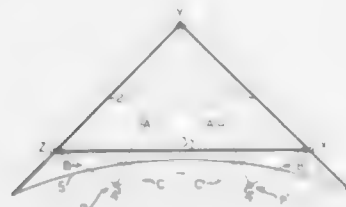
Filed Sep. 19, 1988, Ser. No. 256,679

Claims priority, application Fed. Rep. of Germany, Sep. 18, 1987, 87126133[U]

Int. Cl.⁴ B64C 31/06

U.S. Cl. 244—153 B

11 Claims



4. A steerable kite, comprising:

(a) first and second lateral members secured to each other at adjacent ends;
(b) a cross-member secured at a first end to the first lateral member and at a second end to the second lateral member;
(c) a means for covering a region located between the first lateral member and the second lateral member; and
(d) a means for controlling the kite;
wherein the lateral members, the cross-member, and the covering means form a single chamber system.

4,874,147

TRAY AND TOOL HOLDER ADAPTABLE TO STEPLADDERS

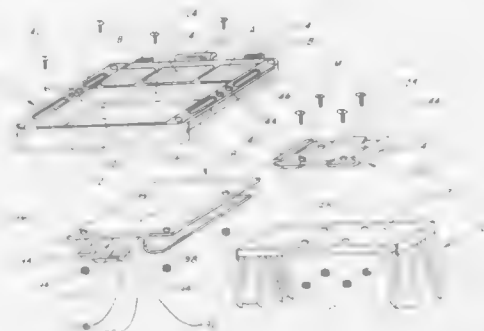
Raymond J. Ory, 7 N. Parkway Dr., and Paul Smeltzer, 8 N. Parkway Dr., both of Naperville, Ill. 60540

Filed Apr. 14, 1988, Ser. No. 181,677

Int. Cl.⁴ E06C 7/14

U.S. Cl. 248—210

5 Claims



1. A tool and small parts utility tray with mounting plates comprising:

a rectangular tray having four exterior corners formed by the intersection of two lateral and two longitudinal exterior walls, a floor panel and interior wall elements defining open upwardly facing recessed compartments adapted to receive a closure plate hingedly attached to an upper edge of a lateral exterior wall, lateral outwardly extending flange elements attached to oppositely facing longitudinal exterior wall portions, open ended cylindrical vertical bearing surfaces formed and defined by surrounding wall portions rotatably received within said vertical bearing surfaces a shaft having a castor wheel assembly attached thereto, mounting plates comprising: an upper and a lower mounting plate for readily attaching and detaching said utility tray to a supporting surface; said upper mounting plate is rectangular in shape having a pair of length and a pair of width edge portions and an upper and a lower surface; a rib depending from the lower surface and adjacent each of said length edge portions of the plate, each of said ribs forming a longitudinal "U" shaped outwardly facing channel section; a latch with a hook shaped catch formed therewith, the latch attached to said lower surface of said upper mounting plate and a free-end extending outwardly beyond a first width edge portion of said upper plate, said hook shaped catch facing rearward toward the said second width edge portion and formed outwardly of said lower surface of said upper mounting plate; the latch being biased downward away from said lower surface of said upper mounting plate; a spring biased plunger residing within a spring and plunger housing have two end faces, said plunger housing attached to said lower surface of the upper mounting plate, parallel to and equidistant from the "U" shaped longitudinal channel sections, said plunger biased outwardly of a first end face of said spring and plunger housing and toward said latch; said upper surface of said upper mounting plate in contact with and attached to said floor panel of said utility tray; said lower mounting plate formed and having a rectangular shaped in

plan, a "U" shaped inwardly facing upturned channel formed along two length edge portions of said rectangular lower mounting plate, a first and second lip formed upwardly and at the mid-point of each of two width edge portions of the lower rectangular mounting plate, said lower mounting plate attached to said supporting surface, wherein said outwardly facing "U" shaped channels of the upper mounting plate slidably receive, in dovetail fashion, the inwardly facing channels of the lower mounting plate; said spring biased plunger forcibly urged inward of said spring plunger housing by moving contact with said first upwardly formed lip, downwardly biased latch of said hook engagingly capturing the second upwardly formed lip of the lower mounting plate thereby releasably locking said utility tray in a predetermined location relative to said mounting surface whereby the utility tray when detachedly removed from said supporting surface converts to a wheeled tool and small part utility tray.

4,874,148

UNIVERSAL DISPLAY BRACKET

S. R. Gainter, Rockford, Ill., assignor to Newell Co., Freeport, Ill.

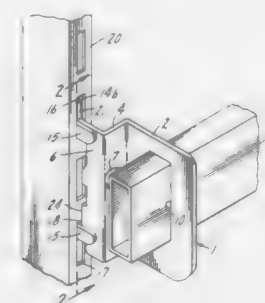
Continuation of Ser. No. 936,206, Dec. 12, 1986, abandoned.

This application Sep. 21, 1988, Ser. No. 248,276

Int. Cl.⁴ F16L 3/08

U.S. Cl. 248—225.2

8 Claims



1. A display bracket for use with a plurality of vertical slotted upright systems, one system having a slot spacing of a given distance and another system having a slot spacing different from the spacing in said one system, said display bracket including:

a bracket body,
said bracket body being adapted, when assembled to a slotted upright, to project transversely outwardly from said slotted upright,
means, carried by the bracket body, for securing the bracket to a slotted upright in any one of several slotted upright systems, all of which have dissimilar slot spacings, and for stabilizing the bracket, said bracket securing and stabilizing means comprising

a connecting and locking member projecting rearwardly from the bracket body at a first location on the bracket body, and
a stabilizing member projecting rearwardly from the bracket body at a second location on the bracket body, said second location being beneath said first location,
said connecting and locking member having a shank adapted to penetrate a slot in a vertical upright and a retaining portion extending downwardly from the shank at the distal end portion thereof,
said downwardly extending retaining portion being spaced from the bracket body a distance greater than the thickness of the slot material in a slotted upright with which it is adapted to be assembled,
said stabilizing member having a vertical height less than the vertical height of a slot in which it is adapted to be received,
said stabilizing member further being located beneath the

shank of the connecting end locking member a distance sufficient to enable said stabilizing member to be received in a stabilizer receiving slot in each of variety of systems.

4,874,149

POST SUPPORT

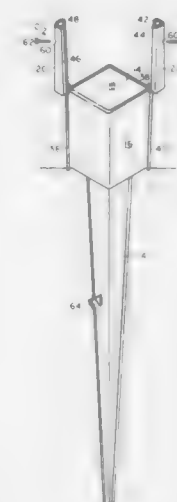
Daniel Miceli, Bristol, Conn., assignor to The Gordon Corporation, Southington, Conn.

Filed Sep. 15, 1988, Ser. No. 244,951

Int. Cl.⁴ F16M 13/00

U.S. Cl. 248—530

24 Claims



22. A post support for securing a post in the ground in a generally vertical, upright position which post support comprises:

(a) an elongated cruciform, ground-engaging element adapted to be driven generally vertically into the ground;
(b) a flat drive plate element secured to the top of the cruciform ground-engaging element to permit the use of a short section of the post to drive the ground-engaging element into the ground;
(c) a pair of upright, vertical wall sections each having side edges with edge folds, the opposing side edges spaced apart a slight distance, the wall sections forming a square, hollow, post-receiving section to receive the end of a square post to be supported; and
(d) a pair of generally right angled wedge end caps each having folded edges and adapted to fit in a slidable, wedging relationship with the edge fold of the wall sections so that when the wedge end caps are driven downwardly, the side of the pair of wall sections are forced inwardly into a post securing relationship with the end of the post.

4,874,150

SEGMENTAL FORMWORK FOR ROUND STRUCTURES

Otto Heinze, Montlingen, Switzerland, assignor to Jugo-Import-Export-Anstalt, Furstentum, Liechtenstein

PCT No. PCT/EP86/00028, § 371 Date Nov. 4, 1986, § 102(e) Date Nov. 4, 1986, PCT Pub. No. WO86/04378, PCT Pub. Date Jul. 31, 1986

PCT Filed Jan. 24, 1986, Ser. No. 923,787

Claims priority, application Austria, Jan. 24, 1985, 190/85

Int. Cl.⁴ E04G 11/20

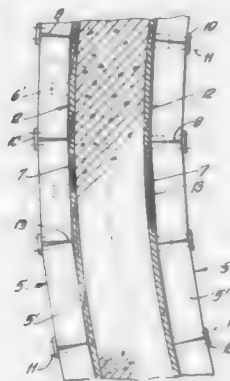
U.S. Cl. 249—18

8 Claims

1. A segmental formwork for round structures, comprising: an internal formwork having at least two vertically spaced polygonal stretchers with a plurality of buckling points (8) around each stretcher, a soldier fixed between said stretchers for each buckling point, and at least one form-

work board being at least substantially continuously curved and being mounted for horizontal movement to each of said stretchers and each of said soldiers, said stretchers bearing directly against said at least one formwork board; and

an external formwork spaced outwardly from said internal formwork and having at least two vertically spaced polygonal stretchers with a plurality of buckling points (8) around each stretcher, a soldier fixed between said stretchers for each buckling point, and at least one formwork board being at least substantially continuously



curved and being mounted for horizontal movement to each of said stretchers and each of said soldiers, said stretchers bearing directly against said at least one formwork board;

each said soldier of said internal formwork being fixed between said stretchers of said internal formwork at a respective buckling point of said internal formwork, and said soldiers of said external formwork being fixed midway between said stretchers of said external formwork at intermediate locations of said stretchers between buckling points of said stretchers.

4,874,151

GAS PUMP LEVER HOLDING DEVICE

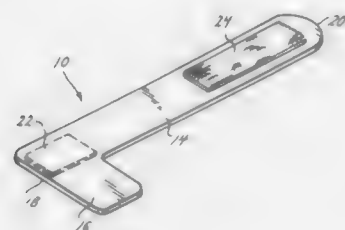
Terry Fritz, 20 Green, No. 3, St. Charles, Mo. 63303

Filed Feb. 17, 1989, Ser. No. 312,897

Int. Cl. G05G 5/06; F16K 31/00

U.S. Cl. 251-90

16 Claims



1. An adjustable gas pump trigger lever holding device adapted to be secured to an automatic gas pump nozzle having an operator's handle and a trigger lever below the handle that is manually adjusted between a closed and open position to regulate fluid flow from the nozzle, the holding device comprising:

a flexible strap having first and second ends and of predetermined length, the strap being adapted to extend in a loop around the top of the nozzle handle and the bottom of a nozzle trigger that has been manually adjusted to a desired position for a desired rate of fluid flow from the nozzle; coupling means adapted to releasably secure the first end of the strap to the second end of the strap to form a loop

having a desired peripheral length extending around the top of a nozzle handle and the bottom of a nozzle trigger that has been manually adjusted to a desired position for a desired rate of fluid flow from the nozzle, thereby holding the nozzle trigger in the adjusted position; and

a tab section extending from the strap, the tab being adapted to maintain the first end of the strap stationary relative to the gas pump nozzle when the tab is held stationary relative to the nozzle, thereby enabling the strap to be releasably secured to the nozzle by manipulating only the second end of the strap around the nozzle handle and trigger and securing it to the first end of the strap by the coupling means.

4,874,152

CABLE GRIPPING BLOCK

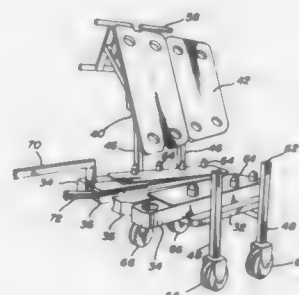
Joseph E. Roberts, 318 Hibernian St., Savannah, Ga. 31401, and William A. Griswold, Jr., 111 Dove Ln., Savannah, Ga. 31406

Filed Apr. 13, 1988, Ser. No. 180,906

Int. Cl. B66D 3/02

U.S. Cl. 254-264

5 Claims



1. A cable gripping block for linear tensioning of a cable, comprising,

a base plate with a pair of traction block means affixed thereon;

a pair of clamping block means movably slidable between said traction block means;

said traction block means having inner face slide surfaces between which said clamping block means slide, where each inner face slide surface forms an angle with the longitudinal axis of a cable being tensioned;

said clamping block means having slide surfaces to match with the inner face slide surfaces of said traction block means where said clamping block means has a wedge shape with an apex angle which is equal to the angle formed between the adjacent slide surfaces and the longitudinal axis of said traction block means;

a cover plate means for closing said cable gripping block and locking said clamping block means between said traction block means, said cover plate means having a trapezoidal shape;

a securing means for securing said cover plate to said traction block means including tenon means on said traction block means and matching tenon receiving cavities in said cover plate means;

said tenon means having a suitable shape for guiding said tenons onto said cavities in said cover plate means;

means for lifting said cover plate means off of said tenon

said cover plate means including at least two trapezoidal sections, and where one of the sections is larger than the other with the smaller section having a base length equal to the length of the smaller of the parallel lengths of the larger section;

said cover plate sections each having a pair of manual lifting handles;

said tenon means having orifice means therethrough for receiving a locking pin.

4,874,153

PROCESS FOR PRODUCING CERAMIC PRODUCTS USING THE SLUDGE OBTAINED BY SEWAGE TREATMENTRyusuke Hashimoto, Niwa, and Mitsuru Iwata, Kani, both of Japan, assignors to Fujimi Tile Co., Ltd., Nagoya, Japan
PCT No. PCT/JP86/00536, § 371 Date Aug. 13, 1987, § 102(e)
Date Aug. 13, 1987

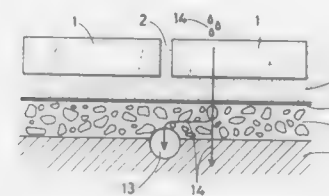
PCT Filed Oct. 23, 1986, Ser. No. 71,273

Claims priority, application Japan, Oct. 24, 1985, 60-238170; Jan. 27, 1986, 61-15079

Int. Cl. C04B 35/64

U.S. Cl. 264-63

6 Claims



1. A process for producing ceramic products comprising the steps of (a) mixing together at least ashes prepared by burning a sludge obtained by sewage treatment and a plastic ceramic raw material to prepare a moldable body; (b) molding the body into a desired shape; and (c) firing the molded body.

4,874,154

ENCAPSULATED SPRING ASSEMBLY FOR RECLINING FURNITURE

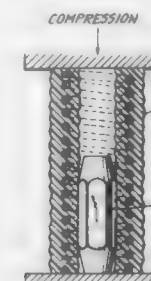
Paul J. Zimbone, Raynham, Mass., assignor to Acushnet Company, New Bedford, Mass.

Continuation of Ser. No. 64,333, Jun. 19, 1987, abandoned. This application Feb. 23, 1989, Ser. No. 316,549

Int. Cl. F16M 3/00; B60G 11/52

U.S. Cl. 267-140.4

7 Claims



1. In reclining furniture having a reclining mechanism for providing resistance during periods of movement of said reclining furniture wherein a spring assembly is used in said reclining mechanism to provide said resistance, the improvement in said spring assembly comprising: an encapsulated helical spring, encapsulated in a polymeric material to provide constant force during periods of compression and expansion of said helical spring in said reclining mechanism of said reclining furniture, said encapsulated helical spring having a hollow internal area, said hollow internal area having an inner diameter, said encapsulated spring having an effective length; and a rigid dowel member inserted in said hollow internal area, said rigid dowel member having an outer diameter substantially equal to the inner diameter of said hollow internal area, said

4,874,155

FAST CLAMP

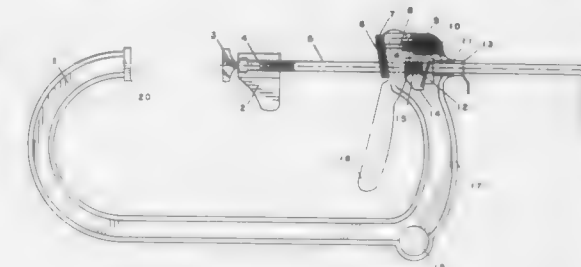
Ashley S. Goul, P.O. Box 1869, Boise, Id. 83701

Filed Sep. 9, 1988, Ser. No. 242,633

Int. Cl. B66F 3/00

U.S. Cl. 269-6

5 Claims



1. A clamping apparatus for clamping a workpiece, comprising:

a clamp body, the body having a first end with a contact point and an opposing handle end defining a sleeve aligned with the contact point;

a plunger sized to slide within the sleeve toward and away from the contact point;

advancing means for moving the plunger toward the contact point, the advancing means having a first end defining an opening through which the plunger extends and a second end spaced apart from the plunger;

trigger means pivotally mounted to the handle end for pressing the second end of the advancing means toward the contact point when the trigger means is squeezed, the advancing means when so pressed wedging against the plunger to move the plunger toward the contact point;

retracting means for urging the second end of the advancing means toward the handle end when the trigger means is released, the advancing means when so moved sliding freely relative to the plunger;

locking means for maintaining the plunger in place after it has been moved by the action of the trigger means and advancing means, the locking means having a first end defining an opening through which the plunger extends, a second end spaced apart from the plunger, and a bias means urging the second end away from a position perpendicular to the plunger to allow movement of the plunger toward the contact point but to prevent movement of the plunger away from the contact point; and

release means for urging the second end of the locking means toward a position perpendicular to the plunger to allow for movement of the plunger away from the contact point.

4,874,156

HAND OR FOOT MANIPULATED SELF CLAMPING DEVICE

Abe Goldzwerg, 14627 Healy St., Sherman Oaks, Calif. 91405

Filed Jan. 7, 1988, Ser. No. 141,542

Int. Cl. B25B 1/16

U.S. Cl. 269-158

5 Claims

1. A holding tool and vice combination suitable for holding, adjusting and clamping a work piece by independent use of a foot pedal and the operator's hands, the combination comprising:

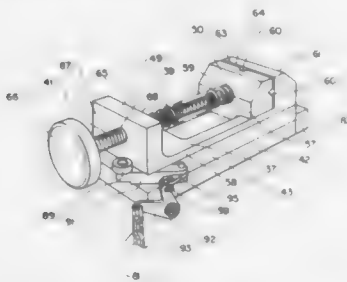
a stationary base with a raised edge;

a secondary base resting on the stationary base and removable therefrom;

a stationary jaw integral with the secondary base;

a slotted slide slidably attached to the secondary base;

- a movable jaw integral with the slotted slide at its one extremity;
- a slide raise integral with the slotted slide at its other extremity;
- a spring means acting to spread apart the stationary jaw and the slide raise and thereby providing a holding force to push together the movable jaw and the stationary jaw to hold the work piece;



- a clamping means to provide a rigid vise grip on the work piece between the stationary jaw and the movable jaw independent of the spring means; and
- a linkage means to translate the vertical motion of the foot pedal to horizontal motion of the slotted slide in a direction moving the movable jaw away from the stationary jaw to open the gap between the jaws to admit the work piece, thereby compressing the spring means.

4,874,157

METHOD FOR MINIMIZING MATERIAL UTILIZATION DURING SPREADING OF A MATERIAL WEB

Rolf Jung, Waiblingen; Albert Buss, Muensingen, and Winfried Buchmann, Hemmingen, all of Fed. Rep. of Germany, assignors to Krass u. Reichert GmbH & Co. KG Spezialmaschinenfabrik, Fellbach, Fed. Rep. of Germany

Filed Apr. 12, 1988, Ser. No. 180,520

Claims priority, application Fed. Rep. of Germany, Apr. 16, 1987, 3713010

Int. Cl.⁴ B65H 29/46

U.S. Cl. 270—30

34 Claims



1. A method for minimizing material utilization during spreading of a flawed material web, in particular a fabric web, wherein if the flaw falls in at least one pattern piece of a pattern the following steps are executed:

- (a) proceeding from a region determined by said flaw, placing a set of at least two virtual stop lines extending transversely to the spreading direction over the entire width of said material web according to predefined criteria in the pattern representation and all the flawless pattern pieces cut by said virtual stop lines are determined;
- (b) applying an optimization criterion for minimizing material utilization which takes into consideration the flawless pattern pieces cut by said virtual stop lines and the flawed pattern pieces and selecting the one of said virtual stop lines resulting in a minimum waste of material;

- (c) interrupting the spreading at said selected stop line;
- (d) determining a maximum distance from said stop line which maximum distance corresponds to the furthest distance of a starting point of one of said flawless pattern pieces cut by said stop line or of one of said flawed pattern pieces from said stop line;
- (e) placing a restart line parallel to said stop line in the direction opposite to the spreading direction at least within the maximum distance from said stop line;
- (f) driving the spreading machine back from said stop line in the direction opposite to the spreading direction to said restart line; and
- (g) continuing spreading from said restart line.

4,874,158

DISPENSING FOLD IMPROVEMENT FOR A CLIP REPARATOR

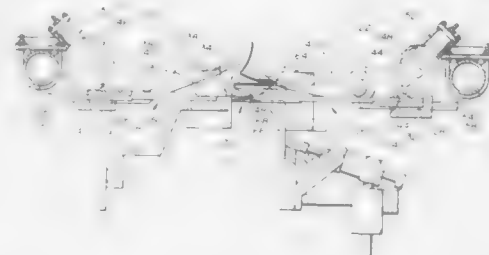
Tim G. Retzlaff, Washburn, Wis., assignor to C. G. Bretting Manufacturing Co., Inc., Ashland, Wis.

Filed Jun. 20, 1988, Ser. No. 209,220

Int. Cl.⁴ B41L 1/32

U.S. Cl. 270—39

14 Claims



1. A method of forming a dispensing fold for a clip of a predetermined number of interfolded sheets from a continuously building interfolding process stack comprising the steps of:

- a. continuously interfolding and supporting a plurality of individual sheets on a stack supporting means at a package building station to form an interfolding process stack along a principal axis with one layer of the interfolded sheets depending freely from the bottom of the stack below the stack supporting means;
- b. advancing a first dispensing fold finger lateral to the principal axis to an actuated position wherein a leading edge of the first dispensing fold finger is in contact with a mediate portion of the depending layer; and
- c. advancing a second dispensing fold finger lateral to the principal axis to an actuated position overlapping and subjacent the first dispensing fold finger in its actuated position such that the depending layer is folded against the first dispensing fold finger.

4,874,159

PAPER FEED DEVICE AND PAPER CASSETTE THEREFOR

Mikihiko Maeno; Yukio Ohta; Yoshiharu Momiyama; Hisao Ono; Katsumasa Takahata; Kazuyuki Ozono; Makoto Shimizu, and Mikio Yamamoto, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Apr. 13, 1988, Ser. No. 182,250

Claims priority, application Japan, Apr. 16, 1987, 62-92029; Apr. 16, 1987, 62-56711[U]; Apr. 17, 1987, 62-57534[U]; May 14, 1987, 62-70911[U]; May 28, 1987, 62-79873[U]

Int. Cl.⁴ B65H 1/12

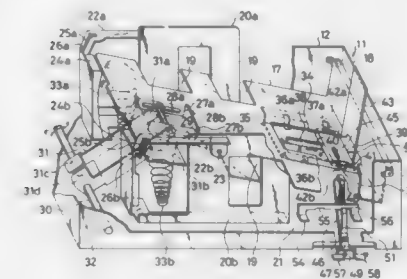
U.S. Cl. 271—171

14 Claims

1. A paper cassette which stores media on a media load plate, said media load plate being journaled at one end so that it is able to rotate and being raised and lowered by moving the other end, and which performs paper feed by pushing up said

other end of the media load plate with a spring thereby pressing the top of the media against a hopping roller, wherein said media load plate has an opening toward said one end, said paper cassette comprising:

- a guide bracket attached to said media load plate so that it covers the opening from the lower side of said media load plate, said guide bracket possessing multiple first stopping means in positions corresponding to the lengths in the media delivery direction of the multiple types of media,



a media back edge guide assembly which is able to move in the delivery direction of the media, which possesses a second stopping means which engages with one of said first stopping means, and which is positioned according to the sizes of a number of types of media, said media back edge guide assembly comprising a slide block and a guide plate said slide block being provided between the media load plate and said guide bracket.

4,874,160

PAPER CARTRIDGE WITH PAPER ALIGNING MEANS

Kazushi Yamamoto, Osaka, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

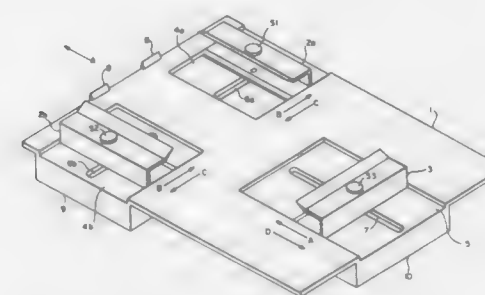
Filed Nov. 12, 1987, Ser. No. 119,536

Claims priority, application Japan, Nov. 20, 1986, 61-180294[U]

Int. Cl.⁴ B65H 9/06

U.S. Cl. 271—227

9 Claims



1. In a paper cartridge comprising a table for placing and storing thereon sheets of paper transported along a paper transporting passageway which defines a direction of transportation, two side plates parallel to said direction of transportation adapted to individually contact the two edges of sheets placed on said table, and to move perpendicularly to said direction of transportation, and a back plate adapted to contact the back edges of sheets placed on said table and to move in said direction of transportation, the improvement wherein said paper cartridge further comprises a first mechanism for moving said two side plates symmetrically with respect to a central axis along said direction of transportation, a second mechanism for moving said back plate along said direction of transportation, detectors attached to said side and back plates and adapted to detect edges of sheets, and side-plate and back-plate control means for operating said first and second mechanisms,

respectively, according to outputs from said detectors, said control means being so programmed as to automatically operate said mechanisms when sheets of paper are placed on said table to move said side and back plates away from one another to home positions thereof, to thereafter move said side plates towards each other while measuring a distance L traveled by said side plates between a first point in time when one of said detectors attached to one of said side plates detects a sheet and a second point in time when another one of said detectors attached to the other of said side plates detects said sheet, and to further move said side plates by a/2 if L is greater than a, a being a distance determined by the positions of said detectors on the respective ones of said plates.

4,874,151

SHEET TRANSPORTING APPARATUS

Sadanobu Murasaki, Ischawa, and Hiroyuki Makiyama, Tokyo, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Japan

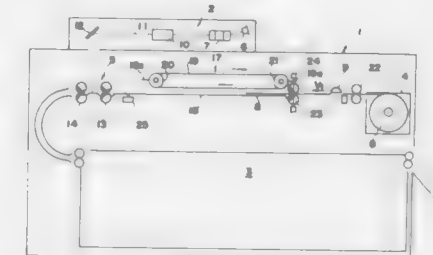
Filed Nov. 18, 1987, Ser. No. 124,955

Claims priority, application Japan, Nov. 19, 1986, 61-275578

Int. Cl.⁴ B65H 5/16

U.S. Cl. 271—265

11 Claims



1. A sheet transporting apparatus comprising; transport means for transporting a sheet at a predetermined speed V0;

- a guide member provided upstream of said transport means with respect to a sheet transport direction for guiding the sheet toward the transport means; and
- a projecting member which is movable from a start point to a terminal point along the guide member in the sheet transport direction for urging the rear end of the sheet toward the transport means during its movement and delivering the sheet to the transporting means, said projecting member being movable initially from said start point to said terminal point at a speed V1 as the projecting member urges the sheet toward the transport means and then as a leading end of the sheet moves from a speed adjusting position to said transport means at a speed V2 lower than the speed V1 and lower than the speed V0.

4,874,162

MOTION PICTURE AMUSEMENT RIDE

Douglas Trumbull, Santa Monica; David Collins, Westlake Village; Wayne Smith, Los Angeles, all of Calif., and Robert Spieldiener, Vaduz, Switzerland, assignors to Showscan Film Corporation, Culver City, Calif.

Continuation of Ser. No. 121,122, Nov. 16, 1987, Pat. No. 4,798,376, which is a continuation of Ser. No. 811,104, Dec. 19, 1985, Pat. No. 4,752,965. This application Nov. 14, 1988, Ser. No. 270,352

The portion of the term of this patent subsequent to Jun. 21, 2005, has been disclaimed.

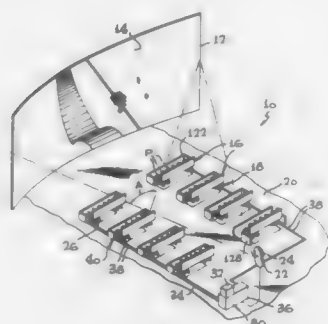
Int. Cl.⁴ A63G 31/16

U.S. Cl. 272—18

7 Claims

1. An amusement ride apparatus comprising; means for holding a plurality of passengers; image means including a screen viewable by said passengers

and means for forming a predetermined motion picture image on said screen with at least a portion of said image representing the view from a moving vehicle;
drive means for moving said passenger holding means in synchronism with said motion picture image to simulate, at least partially, forces that would be experienced by passengers in said moving vehicle;
said means for holding passengers comprising a plurality of passenger-holding frames, said drive means comprising a plurality of sets of actuators, each said set of actuators associated with a different one of said frames and control-



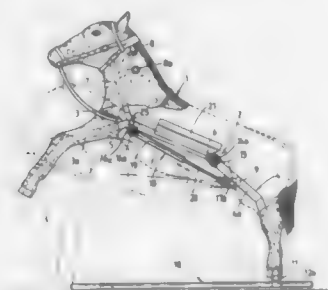
lable to move the corresponding frame, and said drive means includes means for controlling said sets of actuators in synchronism;
each said passenger-holding frame includes at least one seat positioned to hold a seated passenger facing in a predetermined forward direction towards said screen;
each said set of actuators is constructed to tilt said seat about an axis (32) that extends primarily horizontally and perpendicular to said forward direction;
each said frame being tiltable about its own individual said axis with said axis of one of said frames spaced further from said screen than said axis of a second of said frames.

4,874,163 ROCKING TOY

Sebastiano R. Chiavetta, and Giorgio De Guglielmi, both of Schio, Italy, assigns to Applause, Inc., Woodland Hills, Calif. and Jockline, S R L., Italy
Filed Oct. 2, 1987, Ser. No. 104,642
Claims priority, application Italy, Jun. 19, 1987, 48078 A/87
Int. Cl. A63G 17/00

U.S. Cl. 272—53.2

7 Claims



1. A rocking toy comprising:
a base;
a support frame carried by said base, said frame having a hind section and a fore section pivotally coupled to the hind section;
an external, flexible, animal-shaped body supported by the support frame;

means for rigidly supporting the hind section on the base;
resilient means coupling the hind section to the fore section for compressively storing the energy of a downward movement of the fore section, and assisting an upward movement of the fore section by releasing said energy.

4,874,164

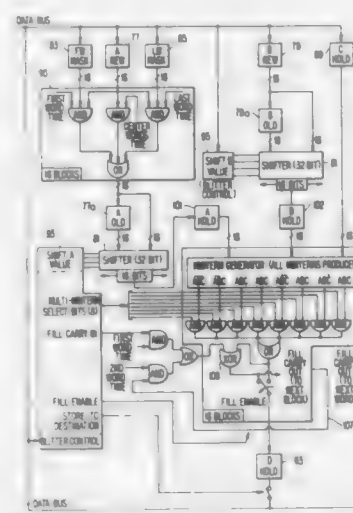
PERSONAL COMPUTER APPARATUS FOR BLOCK TRANSFER OF BIT-MAPPED IMAGE DATA

Jay G. Miner, Mtn. View; Dave Dean, Ukiah; Joseph C. Decuir, Albany; Ronald H. Nicholson, Sunnyvale, and Akio Tanaka, Burlingame, all of, assigns to Commodore-Amiga, Inc., Los Gatos, Calif.

Filed Jul. 18, 1986, Ser. No. 886,796
Int. Cl. A63F 9/22

U.S. Cl. 273—1 E

32 Claims



1. A personal computer system to provide video output signals to a raster display, wherein an image consisting of a plurality of pixels is assembled on a screen of the raster display by an electron beam scanning the screen, and wherein the visual characteristics of a pixel being scanned by the electron beam are determined by the video output signals provided by the personal computer system when the pixel is being scanned, and wherein the personal computer system comprises:

central processor means for executing program instructions; memory means including a plurality of addresses for storing bit-mapped image data, wherein the visual characteristics of a pixel are defined by bit-mapped image data stored in at least one address corresponding to the pixel; data bus means coupled to the processor means and the memory means for transferring data; address bus means coupled to the processor means and the memory means for transferring an address to the memory

pointer means, coupled to the address bus means, for selecting a plurality of source addresses in the memory means as a plurality of sources of unprocessed bit-mapped image data to be transferred on the data bus means, and for selecting a destination address in the memory means as a destination of processed bit-mapped image data to be transferred on the data bus means;

blitter means, coupled to the data bus means, for transferring a block of bit-mapped image data between the blitter means and the memory means, and for processing the block of bit-mapped image data, wherein the blitter means includes:
means for receiving from the data bus means unprocessed

bit-mapped image data stored in the memory means at the plurality of source addresses;
logic means, for executing a logical operation on unprocessed bit-mapped image data simultaneously input from the receiving means for each of the plurality of source addresses, to generate processed bit-mapped image data; and
means for providing the processed bit-mapped image data to the data bus means for storage in the memory means at the destination address; and
image display means, for receiving bit-mapped image data stored in at least one address corresponding to a pixel, and for generating the video output signals determining the visual characteristics of the pixel.

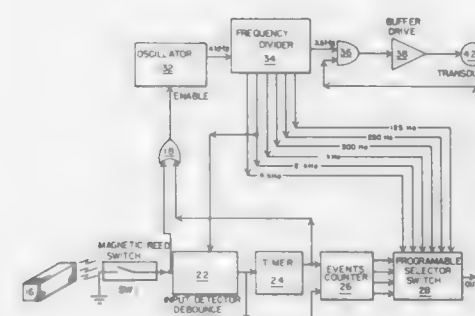
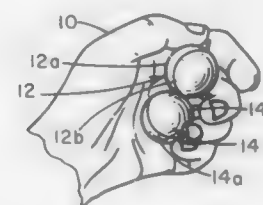
4,874,165

EXECUTIVE BALLS

Joseph Steinberg, 1 Verton Ct., East Northport, N.Y. 11779, and Raphaela McCabe, 9 Audrey St., Miller Place, N.Y. 11764
Filed Aug. 29, 1988, Ser. No. 237,975
Int. Cl. A63F 9/06

U.S. Cl. 273—1 GC

10 Claims



1. A sound producing game device for challenging the dexterity and coordination of a player comprising:

- a first sphere containing means for establishing a magnetic field;
- a second sphere containing switch means for being actuated by said magnetic field when said first and second spheres come within a predetermined position of each other;
- circuit means in response to actuation of said switch means for producing an audible signal at a preselected frequency, said audible signal terminating after a predetermined period of time after initiation of said audible signal; and
- said circuit means including means in response to the repeated actuation of said switch means within said predetermined period of time to initiate another audible signal at a different preselected frequency, the other audible signal terminating after said predetermined time measured from the initiation of said other audible signal unless said switch means is again actuated and initiates a new audible signal at a different frequency.

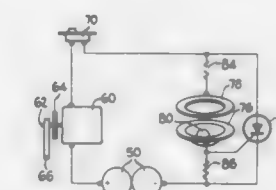
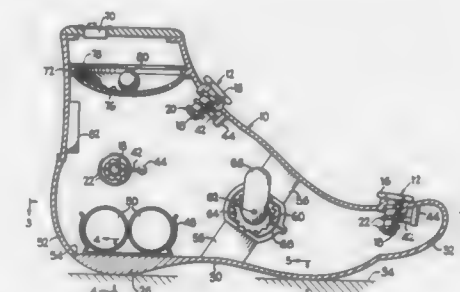
4,874,166

SKILL ACTION GAME WITH A TILTABLE HOUSING AND AN ALARM PRODUCING DISTURBANCE SENSOR

Wayne A. Kuma, River Forest, Ill., assignor to Marvin Glass & Associates, Chicago, Ill.
Filed Jan. 17, 1989, Ser. No. 296,988
Int. Cl. A63F 9/00

U.S. Cl. 273—1 GC

18 Claims



1. A skill action game comprising in combination:
a housing;
the housing having a bottom;
a curved surface depending from the bottom such that the housing is not stable when placed upon a substantially planar surface;
a plurality of items removably carried by the housing;
means sensing tilting of the housing relative to the substantially planar surface; and
an alarm activated by the sensing means.

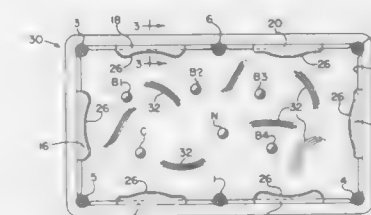
4,874,167

APPARATUS AND METHOD FOR SIMULATING THE GAME OF GOLF

Devere D. Hillard, 1109 N. Valley Rd., Apache Junction, Ariz. 85210

Filed Oct. 5, 1988, Ser. No. 253,571
Int. Cl. A63D 15/06; A63B 67/02
U.S. Cl. 273—14

17 Claims



1. A simulated golf game comprising:
a playing surface having a contour and a raised peripheral edge around said playing surface, said raised peripheral edge having a longitudinally contoured resilient portion facing and defining said area of play;
a plurality of ball receiving pockets positioned at spaced

apart locations around the peripheral edge opening into said area of play;

means for selectively changing the longitudinal contour of selective sections of said resilient portion of said peripheral edge to selectively change the longitudinal contour of the resilient portion of the peripheral edge to substantially an infinite number of different longitudinal contours providing for selectively changing the area of play into substantially an infinite number of different shapes;

at least one playing ball, and

a cueball, whereby at least one player propels said cue ball using a cue stick to strike and direct said playing ball around said area of play into each pocket in a predetermined order.

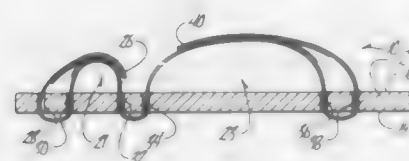
4,874,168

BALL CATCHING TRAINER

Robert L. Wright, Des Moines, Iowa, assignor to Creative Athletic Products and Services, Inc., Des Moines, Iowa
Filed Jul. 29, 1988, Ser. No. 225,888
Int. Cl.⁴ A63B 71/02

U.S. Cl. 273—26 C

2 Claims



1. A ball catcher trainer comprising,

a body member having a front ball-side and a rear-hand side, said body member having openings extending through said body member between the front and rear sides,

a hand strap means on said rear side extending through said openings to hold said strap to said body member and to form finger pockets on said back side adapted to receive a user's fingers for holding said body member on the user's one hand,

said finger pockets including one pocket for the user's thumb and one pocket for the other four fingers,

said strap means being woven through said openings back and fourth between the front and rear sides to form said thumb and four finger pockets, and

said strap including one end on said rear side of said body member with the strap extending through a first opening to the front side and returning through a second opening to the rear side and then extending through a third opening to the front side and forming said thumb pocket on the rear side between said second and third openings, and then back through a fourth opening to the rear side to form said four-finger pocket by extending back to the front side through a fifth opening, and then lastly extending through a sixth opening to the rear side where said other end is adapted to be secured to said four-finger pocket, and said one end is adapted to be secured to said thumb pocket.

4,874,169

HALL

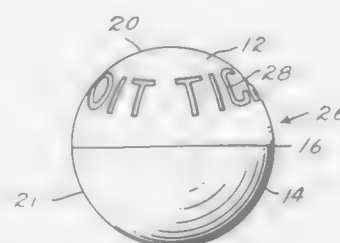
Peter G. Litchfield, 6 Ella Grove, Chelsea, Victoria, Australia
(3196)

Continuation of Ser. No. 834,964, Feb. 28, 1986, abandoned, which is a continuation-in-part of Ser. No. 676,941, Nov. 30, 1984, abandoned. This application Mar. 21, 1988, Ser. No. 171,464

Claims priority, application Australia, Dec. 2, 1983, PG2670
Int. Cl.⁴ A63B 39/08

U.S. Cl. 273—60 R

9 Claims



1. A hand projectable game ball of generally spherical shape including a pair of complementary hemispherical portions joined along a generally equatorial line, one of said hemispheres of said pair including a predetermined unit-form surface configuration extending over the entire surface of said hemisphere, the other hemisphere of said pair including an equatorial zone immediately adjacent said equatorial line, a polar zone and an intermediate zone between said polar and said equatorial zones, and flight control means on said other hemisphere substantially influencing the flight of the ball when thrown and confined solely to the area of said other hemisphere delineated as said intermediate zone and occupying between 1 and 30 percent of said second hemispherical surface.

4,874,170

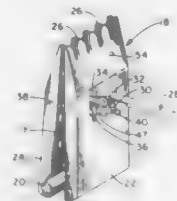
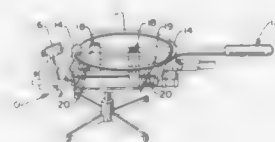
STRING CLAMP FOR RACQUET STRINGING MACHINE

Ronald G. Zech, El Cajon, Calif., assignor to Ektelon, San Diego, Calif.

Filed Sep. 26, 1988, Ser. No. 249,602
Int. Cl.⁴ A63B 51/14

U.S. Cl. 273—73 A

8 Claims



1. A toggle action string clamp for a racquet stringing machine comprising:

parallel top and bottom vise members having finger-like projections extending along the longitudinal axis of said members from one end thereof, and a semicircular groove located in the other end thereof at right angles to said axis, said grooves facing each other;

a handle member which includes a U-shaped portion and a grip lever portion;

an adjustable U-shaped wedge block;

two spacer nuts, and

two angular link members,

wherein said link members are positioned in slots in said vise members, the end portions of said link members being respectively pivotally connected to said bottom vise member, and to said handle member by means of connecting pins, the connecting pin connecting said handle member passing through elongate holes in the U-shaped portion thereof, and wherein the connecting pin passing through said handle member also passes through said spacer nuts, one of which is positioned on each side of said handle member, and wherein further, said wedge block is connected to said handle member by an adjustment screw and is positioned between shoulders located on said handle member, and said spacer nuts, and wherein still further, said top vise member is located between said bottom vise member and said handle member and has a locking pin extending through the slots located therein, at right angles thereto, whereby the U-shaped portion of said handle member can be formed against said locking pin, urging said vise members together when the clamp is positioned in its closed position.

4,874,171

GOLF CLUB SET

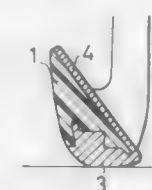
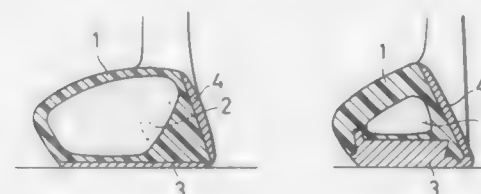
Hiroshi Ezaki, Yoneji Kobayashi, and Katsumi Iida, all of Tokyo, Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Sep. 10, 1987, Ser. No. 95,281

Claims priority, application Japan, Sep. 12, 1986, 61-215081
Int. Cl.⁴ A63B 53/00, 53/04

U.S. Cl. 273—77 A

3 Claims



1. A golf club set comprising first, second and third groups of golf clubs, each of the clubs in the set comprising a shaft connected to a head at one end of said shaft, each of the heads having a hitting face for hitting a golf ball, said hitting face being inclined to define a loft angle, each of the clubs of the set having said loft angle selected from the range of 9° to 50°, the loft angle of each of the clubs in the set being different and increasing within said first, second and third groups, each of the clubs having a shaft length decreasing from club to club as the loft angle increases from club to club, each of the heads having a center of gravity a distance Z from the hitting face and located within the head, the distance Z decreasing from club to club as the loft angle increases from club to club, each golf club head of the first group of golf clubs having a loft angle selected in the range of from 9° to 25°, each golf club head of the first group of clubs being constructed with a sole plate attached to a first group shell molded of a synthetic resin, a filled cavity formed within the first group shell, each golf club head of the second group of golf clubs having a loft angle selected in the range of from 22° to 31° and being constructed with a second group shell of a synthetic resin, a filled cavity

formed within the second group shell and a sole plate integrally molded with the second group shell, and each golf club head of the third group of golf clubs having a loft angle selected in the range of from 28° to 50° and being constructed with a solid means of synthetic resin having a relatively high specific gravity as compared to the synthetic resin of the first group shell and the second group shell, and a sole plate integrally molded with the solid mass of synthetic resin.

4,874,172

REEL TARE FIXING DEVICE AND REEL

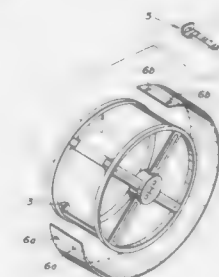
Kikuo Nakamura, Iruma, Japan, assignor to Sigma, Incorporated, Tokyo, Japan

Filed Nov. 1, 1988, Ser. No. 265,714

Claims priority, application Japan, Nov. 13, 1987, 62-287927
Int. Cl.⁴ A63F 5/04

U.S. Cl. 273—143 R

21 Claims



20. A device for securing a reel tape to a circular reel frame of a slot machine, comprising a support means adapted to secure end portions of the tape in overlapping relationship, and mounting means for mounting the support means to the frame, the mounting means being adapted to locate the support means radially and circumferentially with respect to the frame and to allow adjustment of the circumferential location therealong.

4,874,173

SLOT MACHINE

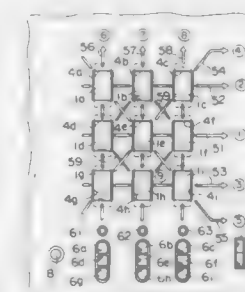
Ryutaro Kishishita, 109 Yamatecho, Naka-ku, Yokohama, Kanagawa, Japan

Filed May 2, 1988, Ser. No. 189,328

Claims priority, application Japan, Dec. 11, 1987, 62-187803[U]; Dec. 25, 1987, 62-327427; Feb. 18, 1988, 63-34069
Int. Cl.⁴ A63F 5/04

U.S. Cl. 273—143 R

4 Claims



1. A wheel mechanism for a slot machine, comprising:

(a) an n-by-n spaced apart matrix of relatively small diameter cylindrical bodies, where n is at least three;

(b) n-times-n independently controlled motors, each of said motors being capable of rotating one of said bodies;

(c) a control means operated by a slot machine user for selectively stopping the rotation of said bodies, said control means comprising:

a first stopping device for simultaneously stopping a line of said bodies in said matrix;
n-times-n second stopping devices for stopping each of said bodies individually,
whereby a user may determine the number of bodies to be stopped and the order of stopping said bodies.

4,874,174

TUBE CONNECTING UNIT

Fumio Kojima; Yoshikazu Tachiri, and Yoshikazu Kato, all of Toyota, Japan, assignors to Aisin Seiki Kabushiki Kaisha and Toyota Jidosha Kabushiki Kaisha, both of Aichi, Japan

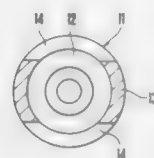
Filed Mar. 7, 1988, Ser. No. 165,057

Claims priority, application Japan, Mar. 5, 1987, 62-32304; Aug. 31, 1987, 62-217600

Int. Cl.⁴ F16L 21/06

U.S. Cl. 285—82

2 Claims



1. A tube connecting unit comprising:

- a cylindrical adapter having a stepped inner bore and a pair of opposite slits formed in the periphery thereof and extending into communication with said inner bore;
- a cylindrical connector fitted in the stepped inner bore of said cylindrical adapter and having an inner bore for receiving a tube and an annular groove formed on the periphery thereof in alignment with said slits of the adapter;
- a tube inserted into the inner bore of said connector, one end portion of said tube being provided with a bead, a flange and an annular groove between said bead and said flange for receiving a sealing member, said bead and said flange being disposed in guiding engagement with said inner bore of said adapter with said flange engaging one end of said connector to prevent the tube from slipping out of the connector;
- a sealing member disposed in said groove in engagement with said inner bore of said adapter; and
- a spring member comprising a clip spring and a stopper for resiliently engaging said connector to said adapter and preventing the connector from slipping out of the adapter, said clip spring having a pair of arms fitted in said slits of the adapter and in said annular groove of the connector, an arched portion connecting the ends of said arms and a pair of extending portions formed on the other ends of each of said arms, said stopper comprising a first portion adapted to be inserted in between the extending portions for maintaining the spring force of the clip spring and a second portion engaging with either the peripheral surface of said connector or said adapter for maintaining stability of said first portion.

4,874,175

LOTTERY DICE

Daniel E. Fischer, 2845 N. Kings Rd., Virginia Beach, Va. 23452

Filed Oct. 11, 1988, Ser. No. 256,054

Int. Cl.⁴ A63F 9/04

U.S. Cl. 273—146

4 Claims

1. A gaming device suitable for selecting random numbers for lottery games comprising:

- a hexahedral die having faces valued from zero to four and a base surface inscribed with a symbol;
- means for biasing said hexahedral die such that there is a

reduced probability for the appearance of the symbol on the uppermost surface of the die when the die is thrown, said biasing means comprising the inward slanting of the



sides of the die so as to reduce the surface area of the face opposite said base to approximately two-thirds of the surface area of the base; and
a second die keyed to a second range of numbers.

4,874,176

THREE-DIMENSIONAL PUZZLE

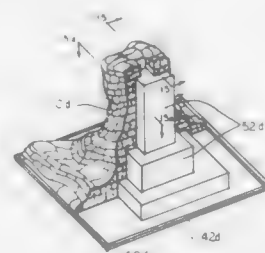
Seymour Anerbach, 115 Heaketh St., Chevy Chase, Md. 20015

Filed Mar. 31, 1987, Ser. No. 32,343

Int. Cl.⁴ A63F 9/12

U.S. Cl. 273—157 R

22 Claims



6. A three-dimensional puzzle for forming solely a single intelligible three-dimensional representation, comprising:

- a plurality of puzzle pieces identical in geometric form in plan and having top, bottom, and side surfaces, the top surface of each puzzle piece being in three-dimensional sculpted form and which sculpted surfaces in the aggregate and upon assembly of the puzzle pieces into predetermined positions form solely a predetermined single intelligible three-dimensional representation, with any other assembly of said pieces forming a non-intelligible three-dimensional configuration;
- the side surfaces of said puzzle pieces extending linearly in lateral directions and being free of any means, including interlocks between said side surfaces, which would indicate the location and orientation of any puzzle piece in the final assembly of the puzzle, each side surface of each puzzle piece adjacent another puzzle piece abutting and lying in conformal relation with a side surface of said adjacent puzzle piece without any interlock therebetween upon assembly of said puzzle pieces, the bottom surface of each said puzzle piece having an interlocking part, said bottom surface and said interlocking part of each puzzle piece being identical in shape to the shapes of the bottom surface and interlocking part of each other puzzle piece, respectively, and being free of any means which would indicate the location and orientation of any puzzle piece in the final assembly of the puzzle;
- a base underlying the puzzle pieces and carrying a plurality of elements cooperable with said interlocking parts to retain said pieces in said predetermined assembly with said side surfaces abutting one another, said base being free of any means, including said elements, which would indicate

the location and orientation of any puzzle piece in the final assembly of the puzzle; and
at least one filler piece for underlying at least a portion of one of said puzzle pieces for elevating said one puzzle piece to elevate its sculpted surface above the elevation thereof without said filler piece, said elevated puzzle piece having its sculpted surface forming upon assembly with said plurality of puzzle pieces and said filler piece the three-dimensional representation.

4,874,177

HORSE RACING GAME

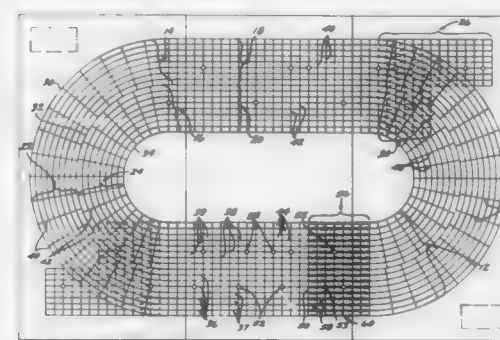
Ronald E. Girardin, 67660 Paletto Rd., Cathedral City, Calif. 91304

Filed May 30, 1984, Ser. No. 615,284

Int. Cl.⁴ A63F 3/00

U.S. Cl. 273—246

36 Claims



1. A horse racing game comprising:

- a gameboard bearing the representation of a racetrack divided into a plurality of lanes, said lanes being divided by a plurality of transversely extending lines dividing said racetrack into a grid of position squares marking fixed distances along said lanes,
- a plurality of moveable markers representing entries in a simulated race to be enacted on said gameboard, said markers being moveable around said represented racetrack in order to mark the progress of said entries during the running of said simulated race,
- random number generator means and,
- a plurality of horse performance cards, each of said cards bearing information regarding a potential said entry in said simulated race, said information including a numbers matrix comprising a selector column of selector numbers selectable according to numbers generated by said random number generator means, and a move column adjacent said selector column and containing a series of move numbers registering with respective said selector numbers, each of said move numbers directly indicating the distance in terms of said position squares that said marker corresponding to said horse performance card is to move about said represented racetrack on any given move, said numbers matrix inscribed on each of said horse performance cards representing the actual performance of a real horse in a real historical racing event.

4,874,178

PARLOR LOTTERY GAME

George J. Gage, 2201 N. Beverly Glen Blvd., Los Angeles, Calif. 90077

Filed Jan. 13, 1989, Ser. No. 296,605

Int. Cl.⁴ A63F 3/06

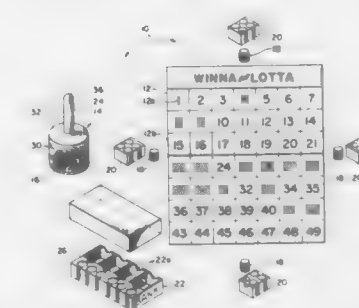
U.S. Cl. 273—274

1 Claim

1. A parlor board game for two or more participating players comprising:

- a foldable playing board having a square grid pattern whereon numerical indicia are imprinted;

said numerical indicia are imprinted on the surface of the board in a consecutive order;
said imprinted numerical indicia duplicating the numerical sequence imprinted on the tickets of a state lottery;
a hollow transparent shaker device;
said transparent shaker having enclosed therein a plurality of spherical balls imprinted with numerical indicia conformal to the indicia imprinted on said playing board;
said transparent shaker having a transparent hollow handle wherein a restricted quantity of said balls can be funneled from an enlarged chamber of said shaker into said handle to provide a random selection of numbers or indicia to facilitate the playing of the game;



a plurality of colored players' chips, distributed equally to each of the participating players in accordance to their color distinction at the commencement of the game;
a player's chip deposit box wherein said player's chips can be deposited during the progression of the game, said container color-coded to match said colored player's chips to be contained therein;
a banker's container wherein a plurality of separate color-coded compartments permits the storage of players' pay-off chips as well as the players' chip deposit boxes; and
an enclosing cover for said banker's container.

4,874,179

MECHANICAL ROPING DUMMY

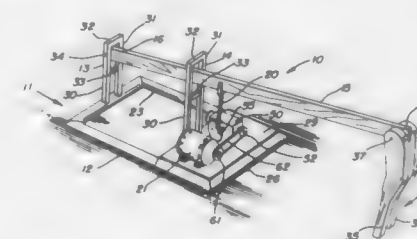
Tommy L. Henderson, P.O. Box 43, Seadrift, Tex. 77983

Filed May 19, 1989, Ser. No. 354,305

Int. Cl.⁴ A63B 69/00

U.S. Cl. 273—338

16 Claims



1. A mechanical roping dummy for use in practice roping comprising

- a stand having a base and first and second upright frames rigid with said base and spaced respectively in fore and aft alignment thereon,
- an elongated bar pivotally mounted at one end on said first upright frame for oscillation in a vertical plane and being guided in its vertical oscillation by said second upright frame,
- said bar overlying said base with its other end extending rearwardly beyond the base,
- a pair of legs resembling the hind legs of an animal pivotally mounted on the rearward end of said bar and depending

therefrom, each leg being on an opposite side of said bar from the other leg,
resilient means extending between said bar and said legs for biased said legs in a forward direction,
a drive arm pivotally connected to said bar between the ends thereof for moving said bar in vertical oscillation,
a motor mounted on said base, and means driven by said motor for driving said drive arm to oscillate said bar.

4,874,180

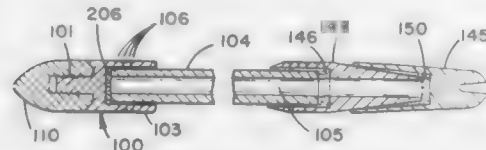
ARROW SHAFT END ADAPTOR APPARATUS AND BALANCE PIN APPARATUS AND METHOD

Conrad F. Flageron, Chatfield; Dennis L. Carlson, Brooklyn Park; Bruce A. Nelson, Chatfield, and Robert D. Eickhoff, Fountain, all of Minn., assignors to AFC, Inc., Chatfield, Minn.

Filed Sep. 29, 1987, Ser. No. 102,028
Int. Cl.⁴ F41B 5/02

U.S. Cl. 273-416

2 Claims



1. A single piece end adaptor for attachment to a hollow circular arrow shaft, said arrow shaft having a first end and a second end and an opening with an inner surface defined therethrough, said single piece end adaptor comprising:

a cylindrical body having a ferrule end and an externally threaded end,

and ferrule end having an outer diameter and a cylindrical bore with a continuous inner surface defined upwardly therein, the inner surface of said bore adhesively engageable about a portion of the first end of the circular arrow shaft;

said externally threaded end opposite said ferrule end having constant pitch and constant diameter external threads defined thereabout, and an inclined surface defined in a circular manner about the intersection of said ferrule end and said externally threaded end, said inclined surface tapered inward from said outer diameter of said ferrule end towards said bore of said ferrule end, said inclined surface having an inner diameter greater than the diameter of the constant diameter external threads, said external threads and said inclined surface formed to threadedly receive and retain an arrow point with cooperating constant pitch and constant diameter internal threads and inclined surface so that impact forces from the arrow point are not transmitted to the inner surface of said circular arrow shaft.

2. A method of making an arrow comprising the steps of: providing a hollow circular shaft having a first end and a second end and opening with an inner surface defined therethrough,

providing a single piece end adaptor having:

a ferrule end with an outer diameter and a cylindrical bore with a continuous inner surface defined upwardly therein, the inner surface of said bore adhesively engageable about a portion of the first end of said hollow circular shaft; and

an externally threaded end opposite said ferrule end, said externally threaded end having:

constant pitch and constant diameter external threads defined thereabout, and
an inclined surface defined in a circular manner about the intersection of said ferrule end and said externally threaded end, said inclined surface tapered inward from said outer diameter of said ferrule end towards said bore of said ferrule end, said inclined surface having an inner diameter greater than the diameter of

the constant diameter external threads, said external threads and said inclined surface formed to threadedly receive and retain an arrow point with cooperating constant pitch and constant diameter internal threads and inclined surface so that impact forces from the arrow point are not transmitted to the inner surface of said circular shaft.

adhesively engaging a portion of said inner surface of said bore of said ferrule end to the first end of said hollow circular shaft,
threading an arrow point on the externally threaded end of said end adaptor, and
contacting said inclined surface of said arrow point with said inclined surface of said externally threaded end.

4,874,181

COUPLING MEMBER FOR SECURING A DRILLING HEAD TO THE ROTATABLE ROD OF A PNEUMATIC TOOL BODY

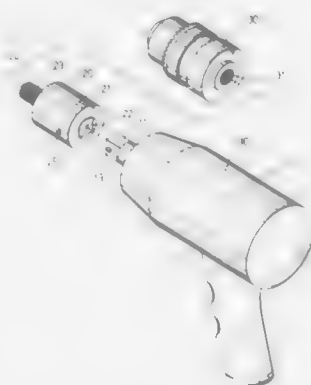
Shing-Wang Hsu, No. 51-2, Lane 265, Tai Ping Rd., Tai Ping Hsiang, Taichung Hsien, Taiwan

Filed Aug. 31, 1988, Ser. No. 238,911

Claims priority, application Taiwan, May 31, 1988, 77205185
Int. Cl.⁴ B23B 51/12

U.S. Cl. 279-1 A

1 Claim



1. A coupling member for releasably securing a drilling head (30) to the rotatable rod (11) of a pneumatic tool body (10), said rotatable rod (11) including a coupling end portion of rectangular cross-section, said drilling head (30) comprising a generally cylindrical body having a coupling end surface, a first threaded hole (31) formed axially in said cylindrical body and extending inwardly from said coupling end surface, a second fastener hole (32) of smaller diameter than said first hole formed in said cylindrical body, said fastener hole extending axially inwardly from the end of said cylindrical body opposite said coupling end surface and communicating with said first threaded hole (31), said fastener hole (32) having an enlarged counter bore portion (34) including an outwardly flaring surface at the end of said fastener hole (32) opposite said first threaded hole (31), said coupling member (20) comprising a generally cylindrical main body (21) having a rectangular socket (22) extending axially inwardly at one of its ends for snugly receiving said coupling end portion of said rotatable rod (11), an externally threaded extension (23) projecting from the other end of said coupling member (20) for mating reception in said first threaded hole of said drilling head (30), a threaded hole (24) extending axially into said extension (23) from the free end thereof, and a bolt (40) extending through said second fastener hole (32) of said drilling head (30) and threaded into said threaded hole (24) of said coupling member (20), said bolt (40) including a head whose undersurface tapers to matingly engage said outwardly flaring surface at the end of said fastener hole (32) whereby said drilling head (30) is se-

cured to said coupling member (20) in rigid axial alignment therewith.

4,874,182

STROLLER APPARATUS FOR JUVENILE CAR SEAT

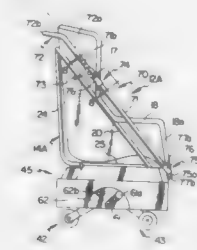
Gary E. Clark, Sikeston, Mo., assignor to Wade Parker, Sikeston, Mo. and Richard G. Heywood, St. Louis, Mo.

Filed Dec. 28, 1987, Ser. No. 138,196

Int. Cl.⁴ B62B 1/04

U.S. Cl. 280-30

18 Claims



1. In combination with a juvenile car seat having a supporting base adapted to be positioned on a vehicle seat; a stroller apparatus for converting such car seat into a mobile stroller unit, comprising a base frame encased in a rigid shell housing, mechanical latching means for releasably interlocking the supporting base of said car seat to said base frame of said stroller apparatus, a set of front wheels mounted on said base frame for conjoint movement between an extended stroller position and a retracted car seat position in which said front wheels are recessed within said shell housing, a separate set of rear wheels mounted on said base frame for conjoint movement between an extended stroller position and a retracted car seat position recessed within the shell housing, lever means constructed and arranged for selectively actuating said front and rear wheel sets between said extended and retracted positions, and extensible handle means for said apparatus comprising a pair of elongated lower slide members, an upper handle frame having side members positioned for sliding movement relative to said slide members between an extended operative stroller position and an inoperative car seat position, said side members being interconnected by an upper cross handle member, locking means for releasably locking said slide and side members in said extended stroller position, and mounting means for securing said lower slide members relative to said stroller apparatus base frame, said mounting means comprising angularly related side struts secured to opposite sides of said base frame and being connected by strut plates, said slide members being connected to said strut plates and extending angularly downwardly adjacent to the opposite sides of said base frame.

4,874,183

FOUR-WHEEL STEERING APPARATUS OF A VEHICLE

Isamu Chikuma; Satoru Shimada, and Hiroshi Eda, all of Maebashi, Japan, assignors to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 7, 1988, Ser. No. 216,183

Claims priority, application Japan, Jul. 31, 1987, 62-190282
Int. Cl.⁴ B62D 7/14

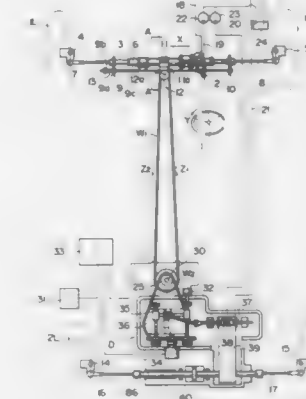
U.S. Cl. 280-91

6 Claims

1. A four-wheel steering apparatus of a vehicle comprising: a front-wheel steering mechanism for steering front wheels; a rear-wheel steering mechanism for steering rear wheels; a steering gear mechanism operatively connected to said front-wheel steering mechanism and effecting a steering operation; a steering angle extracting mechanism operatively connected to said steering gear mechanism for extracting the steering angle of the front wheels, said steering angle

extracting mechanism comprising a restraining member movable axially along an axis of the front wheels in response to the steering operation, and a string member fixed to said restraining member and displaceable lengthwise in response to the movement of said restraining member; and

rear-wheel steering angle control means operatively connected to said steering angle extracting mechanism for controlling the amount and the direction of steer to be transmitted to the rear wheels, said rear-wheel steering angle control means comprising a rotatable member rotat-



able on a center of rotation in response to the displacement of said string member and having an arcuate guide portion of predetermined curvature, a slider member slidable along said guide portion to determine a steering ratio and the direction of the rear wheels with respect to the front wheels, and means including a transmission member engaged with said slider member and shiftable in accordance with the amount and the direction of rotation of said rotatable member and the position of said slider member along said guide portion for controlling said rear-wheel steering mechanism.

4,874,184

TRAILER

John D. Boyer, Riverside, Calif., assignor to Road Systems, Inc., Fontana, Calif.

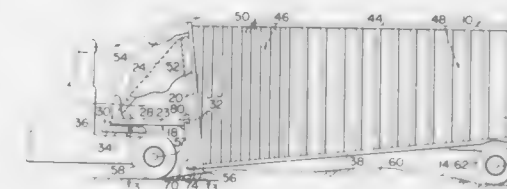
Continuation of Ser. No. 798,843, Nov. 18, 1985, abandoned.

This application Mar. 21, 1988, Ser. No. 175,689

Int. Cl.⁴ B62D 53/06, 63/06

U.S. Cl. 280-423.1

15 Claims



1. A roadway trailer for towing by a tractor truck and having a front, a rear and a body structure including side walls, the trailer comprising:

an underframe supporting the body structure, a generally flat floor rigidly secured to the underframe, side walls of the body structure extending generally upwardly from the underframe, said side walls having upper edges and having their front portions substantially taller than their rear portions, at least one rear axle connected to the underframe and carrying wheels to support the trailer on the roadway, and

hitch attachment means connected to the front of the trailer at a hitch point disposed substantially above the underframe, the underframe and floor inclining downwardly toward the trailer front and said side walls upper edges being generally horizontal when the hitch point is connected for towing of the trailer by the tractor truck.

4,874,185

VEHICLE SUSPENSION SUPPORTING CONSTRUCTION

Takao Kijima, Hiroshima, and Takeshi Edahiro, Higashihiroshima, both of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

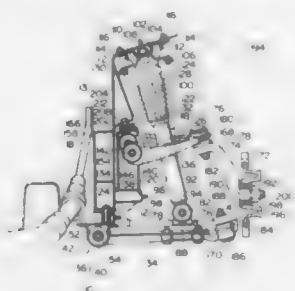
Filed Jul. 7, 1988, Ser. No. 216,651

Claims priority, application Japan, Jul. 7, 1987, 62-104199

Int. Cl.⁴ B60G 3/00, 3/20

U.S. Cl. 280—690

20 Claims



1. A suspension supporting construction for supporting a vehicle suspension apparatus having a wheel supporting member for supporting a wheel of a vehicle for rotation, upper and lower arms pivotally mounting upper and lower ends of the wheel supporting member, respectively, and a suspension supporting member for supporting the upper and lower arms for swingable motion so as to allow said wheel supporting member to move up and down relatively to a car body of said vehicle, said suspension supporting member comprising:

- a cross member extending over the width of said car body and resiliently connected to said car body;
- a supporting frame formed as an integral part of said cross member and extending upward from said cross member for pivotally mounting an inner end of said upper arm; and
- a connecting mount through which said supporting frame is resiliently connected to said car body.

4,874,186

PAPER SHEETS BINDING SYSTEM

Charles T. Growwith III, Los Altos; Edwin A. Selpp III, Menlo Park; Rickson San, and James R. Yurchenco, both of Palo Alto, all of Calif., assignors to Taurus Holdings, Inc., Mountain View, Calif.

Filed Nov. 13, 1987, Ser. No. 120,069

Int. Cl.⁴ B42D 1/00; B42F 13/30, 3/00; F16B 35/04

U.S. Cl. 281—28

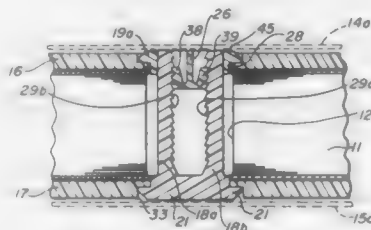
26 Claims

1. An apertured paper sheets binding connector comprising: a binding member including a pair of elongated parallel posts integrally extending from a common head, each of said posts including inwardly facing ratcheted surfaces extending from a planar inner surface and oppositely-disposed flat outwardly-facing surfaces parallel to said planar inner surface;

a locking collar having a pair of matching throughapertures, an integral medial cross-bar extending between and separating said apertures, and at least one pawl hingedly mounted to said cross-bar, said apertures including oppositely-disposed peripheral flat sections, corresponding to

and allowing sliding passage of said posts outwardly facing flat surfaces therepast;

wherein said posts are insertable into at least one paper sheet aperture from one side of a stack of paper sheets and through said locking collar, said locking collar including a head juxtaposed to a paper sheet aperture on an opposite side of said stack of paper sheets; and



wherein said at least one pawl ratchets along said at least one of said ratcheted surfaces until said posts flat head and said locking collar head clamp said paper sheets together; excess length of said posts being breakable across a cross section of said posts from a root of said ratchet surfaces across said posts to said posts flat surfaces generally in a plane of an exterior surface of said locking collar head.

4,874,187

INSURANCE FORM PACKET

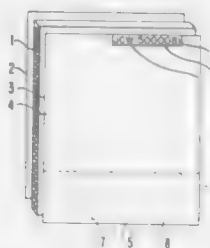
Fredrick Schanfeld, Washington, D.C., assignor to National Electronics Warranty Corporation, Washington, D.C.

Filed Oct. 6, 1987, Ser. No. 105,045

Int. Cl.⁴ B42D 15/00, 15/02; B65D 85/00; A47B 97/02

U.S. Cl. 283—70

11 Claims



1. An insurance form comprising: two sheets of printed information at both sides of a stiff support, at least one of said sheets having at least one line of weakening; said stiff support material of at least about 1/8 inch thickness with deformable edges of at least the same size as said two printed sheets, and a transparent or substantially transparent viewing enclosure means for restraining said two sheets of printed information against said support material and for viewing at least a portion of said information.

4,874,188

FIDUCIARY OR SECURITY OBJECT ENABLING VISUAL OR OPTICAL AUTHENTICATION

Philippe Gravière, Paris; Jacques Duchateau, Requin, and Maurice Perro, Viroflay, all of France, assignors to B.R.I.C.-Bureau de Recherche pour l'Innovation et la Convergence & Banque de France, Paris, France

Filed Oct. 8, 1987, Ser. No. 105,741

Claims priority, application France, Oct. 10, 1986, 86 14161

Int. Cl.⁴ B42D 15/00

U.S. Cl. 283—89

15 Claims

1. A fiduciary or security object having optical characteristics enabling its identification and rendering difficult its repro-

duction, comprising on at least one part, an organic matrix selected from the group consisting of resins of the acrylic, vinyl, silicon, polymethylmethacrylate (PMMA), polyethylene and polyamide types; incorporating in said organic matrix at least one sparkling doping material with short remanence and at least one photoluminescent doping material with long-lasting remanence forming a light cascade which absorbs solar radiation and re-emits radiation at a first predetermined wavelength, absorbs an ultraviolet radiation and re-emits, radiation at a second predetermined wavelength, and, after exposure to said radiation, emits radiation at a third predetermined wavelength, said doping materials being selected from the group consisting of photoluminescent cyclic aromatic compounds and crystals of sulfide or tungstate doped with one element selected from the group consisting of copper, cobalt, manganese, silver, bismuth, europium and terbium—.

4,874,189

ADJUSTABLE SPACER DEVICE

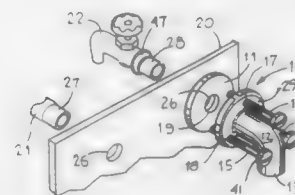
Geno P. Gardner, 43 Willow Street, Mystic, Conn. 06355

Filed Mar. 23, 1987, Ser. No. 29,651

Int. Cl.⁴ F16L 41/00

U.S. Cl. 285—39

13 Claims



1. An adjustable spacer device constructed and arranged to aid in the alignment and connection of a water supply pipe to a faucet fixture and for adjustably securing the faucet to the rear of an installed and difficult to reach vertically disposed sink portion, said adjustable spacer device comprising:

- a) a flanged elbow conduit of a predetermined diameter having an inlet end and an outlet end, said elbow conduit having a circumferentially disposed flange at said outlet end and having a plurality of spaced and threaded apertures therethrough,
- b) a plurality of threaded bolt members for the adjustable threading through said plurality of threaded apertures, said bolt members each having an elongated threaded bottom portion and an end portion for turning said bolt members, said threaded portion of each said bolt member being threaded through said elbow flange a predetermined outward distance with respect to said flanged elbow outlet end, and
- c) an annular rigid plate member parallel spaced from said elbow conduit flange and having opposing faces, one face being for abutment with said threaded bolt member ends and said other face being for engaging only the back portion of the vertical sink portion, said plate member having a centrally disposed aperture therethrough having a diameter generally equal to the diameter of said elbow conduit and being for the communicative extension of the faucet fixture therethrough whereby, said device is initially adjustable by means of said bolt members with respect to said annular plate member and said elbow conduit to align said device with the faucet fixture and the water supply pipe.

4,874,190

SPECIALIZED HOSE CONNECTOR FOR CONNECTING HYDRAULIC HOSES AND PORTS OF DIFFERENT RATINGS

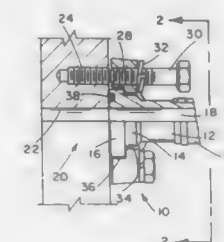
David W. Reynolds, Huxley, Iowa, assignor to Sundstrand Corporation, Rockford, Ill.

Filed Jan. 11, 1988, Ser. No. 142,107

Int. Cl.⁴ F16L 23/00

U.S. Cl. 285—158

7 Claims



1. A connector for connecting a fluid conduit of a first code standard to a fluid port of a second code standard different than said first code standard and wherein said fluid conduit has a flange head dimensioned according to said first code standard, said fluid port is dimensioned according to said second code standard, said connector having an opening dimensioned according to said first code standard for receiving said fluid conduit flange head, and said connector having securing means positioned according to said second code standard and being adapted for connecting said connector to said fluid port.

4,874,191

FLUE GAS CONDUIT CONNECTOR

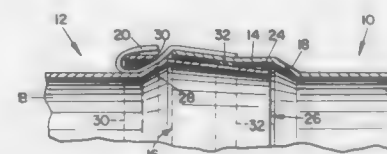
Lloyd C. Green, Greenfield, Mass., assignor to Heat-Fab, Inc., Greenfield, Mass.

Filed May 22, 1989, Ser. No. 354,878

Int. Cl.⁴ F16L 25/00

U.S. Cl. 285—332.3

1 Claim

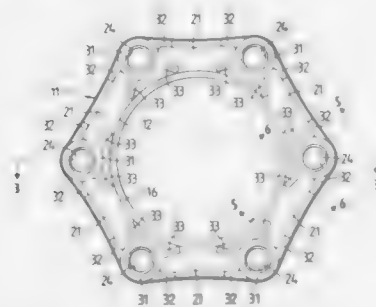


1. A flue gas conduit connector for joining together the ends of first and second flue gas conduits comprising:

- a first annular female tapered end joint on the end of the first flue gas conduit,
- a second complementary annular male tapered end joint on the end of the second flue gas conduit, and abutment means provided intermediate said second and end and said second tapered end joint,
- a resilient sealing gasket on the outer periphery of the second male tapered end joint,
- a plurality of locking tabs secured to the outer periphery of the first female tapered end joint and having free ends extending substantially-horizontally outwardly therefrom at spaced intervals therearound,
- a locking ring loosely sleeved on the first flue gas conduit adjacent the second male tapered end joint,
- the second tapered end joint being of appropriate size and configuration as to mate snugly with the first tapered end joint when the ends of the first and second flue gas conduits are brought into face-to-face confrontation, with the free ends of the locking tabs passing over said abutment means and below the locking ring, whereby when the free ends of the locking tabs are bent back upon themselves over the locking ring, said locking tabs engage said abut-

ment means and the first and second tapered end joints are pulled together with the sealing gasket providing a leak-proof seal between the tapered end joints and providing a flue passage uncorrupted by low alloy fasteners.

4,874,192
PIPE JOINT GLAND REINFORCING STRUCTURE
Kenneth W. Key, 2609 Old Gadaden Hwy., Anniston, Ala. 36206
Filed Jan. 15, 1988, Ser. No. 207,171
Int. Cl.⁴ F16L 19/03
U.S. Cl. 285—337 8 Claims

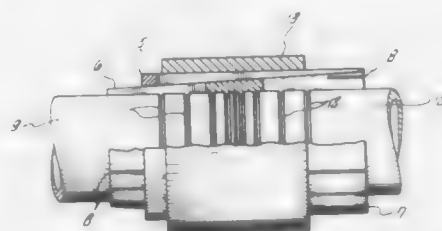


1. A pipe joint gland for forming an effective seal and preventing the separation of pipe sections comprising:
 - (a) an annular web-like structure extending about said pipe section, having a substantially uniform thickness and being generally planar;
 - (b) wall-like portion extending downwardly and inwardly of said web-like structure about said pipe section;
 - (c) a plurality of evenly spaced bosses formed on the circumference of and extending above said web-like structure, each having a bolt hole therethrough;
 - (d) a pair of downwardly sloping reinforcing ribs extending circumferentially on either side of each of said bosses along the periphery of said web-like structure; and
 - (e) a second pair of downwardly sloping reinforcing ribs extending radially from each said boss with each rib of each pair being bisected by a radius of said pipe joint gland wherein each reinforcing rib tapers from the top of an associated boss to the surface of said web-like structure.

4,874,193
HEAT-RECOVERABLE COMPOSITION COUPLING DEVICE
Charles L. Martin, Palo Alto, Calif., assignor to Raychem Corporation, Menlo Park, Calif.
Continuation of Ser. No. 552,711, Nov. 17, 1983, abandoned, which is a division of Ser. No. 29,212, Apr. 12, 1979, Pat. No. 4,455,041, which is a continuation of Ser. No. 608,206, Aug. 22, 1975, abandoned. This application Jan. 23, 1986, Ser. No. 578,525
Claims priority, application Sweden, Apr. 9, 1975, 75040709
Int. Cl.⁴ F16L 17/02
U.S. Cl. 285—369 33 Claims

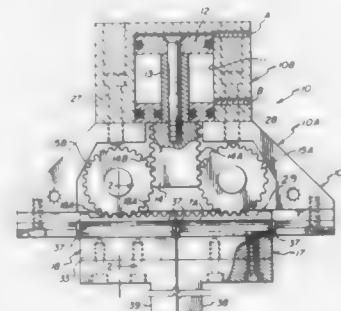
1. A composite device for securely engaging at least one substrate which comprises:
 - (a) at least one tubular, heat-recoverable, metallic compression sleeve; and
 - (b) at least one tubular, metallic insert snugly and concentrically disposed within, adjacent to, and in contact with the compression sleeve so that when the compression sleeve is heated above its transition temperature, the insert is altered in at least one of its dimensions and is driven inwardly by the heat-recovered sleeve for securely engaging and forming a gas-tight seal with the substrate, the insert having an inner surface and an outer surface, the

inner surface of said insert being tapered and the diameter of the outer surface being substantially constant, wherein



said insert is structurally weakened to facilitate its deformation by said sleeve.

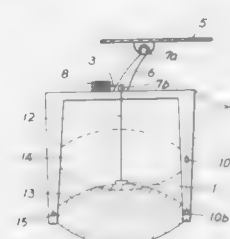
4,874,194
GRIPPER DEVICE
Nicky Borcea, 95 Steep Hill Rd., Weston, Conn. 06883, and Alexandru D. Ionescu, 190 Sport Hill Rd., Easton, Conn. 06617
Filed Jan. 28, 1988, Ser. No. 212,483
Int. Cl.⁴ B25J 15/08
U.S. Cl. 294—88 2 Claims



1. A robotic gripping device comprising
 - a housing,
 - means defining a cylinder included on said housing,
 - a piston disposed in said cylinder,
 - a piston rod connected to said piston,
 - a double edge rack connected to said piston rod,
 - a spur gear disposed in meshing relationship with each edge of said rack whereby said spur gears are actuated in unison,
 - a track means connected to said housing defining a guideway,
 - a pair of rack carriages disposed in said guideway, each of said rack carriages being in meshing relationship with one of said spur gears,
 - roller bearing means disposed between said track means and said rack carriages within said guideway,
 - finger grippers connected to each of said rack carriages for movement toward and away from one another upon actuation of said piston,
 - said finger grippers being disposed in co-axial alignment, wherein said track means comprises
 - a pair of opposed rail members,
 - said pair of rail members having spaced apart edge portions defining said guideway therebetween,
 - each of said edge portions having angularly disposed surfaces,
 - each of said rack carriages having opposed end portions and longitudinal side portions, said side portions, having angularly disposed surfaces complementing the angular sur-

faces of said rail members and disposed contiguous therewith, said bearing means being disposed between said complementary angular surfaces of said rail members and said complementary angular surfaces of said rack carriages whereby said rack carriages are disposed in rolling engagement with said rail members, end stops connected to the opposed end portions of said rack carriages, said end stops extending laterally of said angular surfaces of said rack carriages, and said end stops containing said bearing means therebetween whereby said bearing means moves in unison with said rack carriages, wherein said bearing means comprises an elongated cage having angularly disposed sides, and a plurality of roller bearings maintained in longitudinally spaced relationship on each side of said cage, whereby the roller bearings are disposed in rolling engagement with the corresponding angular surfaces of said rail members and complementary angular surfaces of said rack carriages.

4,874,195
ANTI-GLARE SHIELD FOR THE FRONT WINDSHIELD OF CARS
Chih-Hsiung Lu, 4th Fl. No. 5, Lane 306, Kung Kuan Rd., Peitou, Taipei, Taiwan, and Jill H. Lu, 907 Manley Dr., San Gabriel, Calif. 91776
Filed Jul. 5, 1988, Ser. No. 219,728
Int. Cl.⁴ B60J 3/02
U.S. Cl. 296—97.4 5 Claims

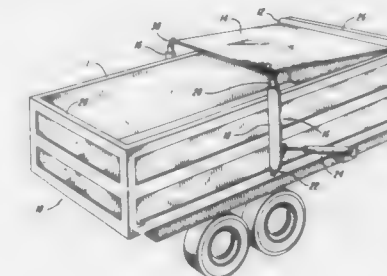


1. An anti-glare shield for a front windshield of a car comprising: an anti-glare glass having a central portion of an upper edge of said glass suspendingly secured to a shaft of a DC motor by a cable, said glass having two side edges slidably engaged with a pair of transparent vertical frames disposed on two opposite sides of said glass, said glass suspended under said cable being generally perpendicular to said cable, said DC motor mounted on an upper portion of said transparent frames, a photocell installed on one of said pair of transparent frames for actuating said motor, so as to slide said anti-glare glass, and two microswitches installed on the other of said pair of transparent frames for stopping a running of said motor, thereby stopping a sliding movement of said anti-glare glass.

4,874,196
TRUCK COVER HAVING AN IMPROVED TELESCOPIC ARM ASSEMBLY
Harvey R. Goldstein, and Edward N. Haddad, Jr., both of Worcester, Mass., assignors to Pioneer Consolidated Corp., North Oxford, Mass.
Filed Jun. 18, 1987, Ser. No. 63,524
Int. Cl.⁴ B60P 7/04; E04F 10/06
U.S. Cl. 296—98 22 Claims

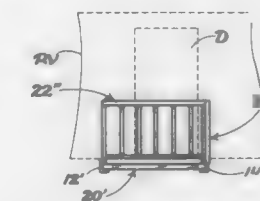
1. Apparatus for drawing a flexible cover over an upwardly open container body having an upper edge and for maintaining loose articles in said container body, said apparatus comprising:
 - a flexible cover of a size substantially cover the open container body;
 - a pair of telescopic arms pivotally attached at one end to the

container and connected at the other end to the cover, constructed and arranged to maintain the cover in close proximity to said upper edge; means for pivotally moving said telescopic arms to cause said connected ends to traverse from one end of the container body to an opposite end; and



means for retracting said telescopic arms during pivotal movement from one end of the container body to a first pivotal position and for extending said telescopic arms during pivotal movement from the first pivotal position to the opposite end of the container body, wherein a minor portion of said telescopic arms extends above said upper edge at any intermediate pivotal position between said one end and said opposite end of the container body.

4,874,197
RETRACTABLE PORCH FOR MOBILE HOMES
Robert G. Grable, P.O. Box 1163, Calusa, Calif. 95932
Filed Oct. 25, 1988, Ser. No. 262,349
Int. Cl.⁴ B60R 3/02
U.S. Cl. 296—162 1 Claim



1. A retractable porch for mobile homes, comprising: a pair of spaced parallel frame rails for securement to a frame, below a door, on an underside of a mobile home; said frame rails formed from channel beam members having facing channels forming a guide track; a pair of centrally intersecting diagonal brace struts extending between said frame rails; a generally rectangular porch platform supported on a porch frame; said porch frame having parallel side members terminating in attachment strut members dimensioned for insertion into said frame rail channels; said attachment strut member each having roller bearings for guiding said porch platform for reciprocal sliding movement in said guide track for movement between extended and retracted positions; a first vertically extending stationary side porch railing extending perpendicular to said porch side members; a second side porch railing mounted by hinges on said porch frame for movement between collapse horizontal and vertical extended positions; retractable legs on an underside of said porch platform; and said first side porch railing disposed adjacent said mobile home door and said second side porch railing disposed

beneath said mobile home when said porch platform is in a retracted position in said guide track.

4,874,198

COVER STRIP FOR THE LOWER EDGE OF A BONDED WINDSCREEN OF A MOTOR CAR

Tragott Roller, Wildberg, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

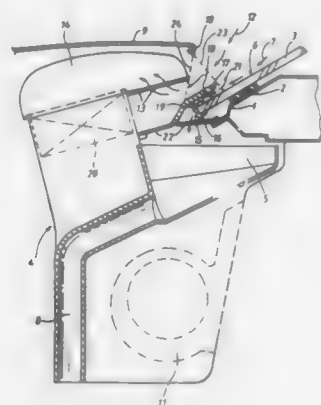
Filed Oct. 26, 1988, Ser. No. 262,598

Claims priority, application Fed. Rep. of Germany, Oct. 30, 1987, 3736780

Int. Cl.⁴ B60J 1/02

U.S. Cl. 296—192

9 Claims



1. Cover strip arrangement for the lower edge of a bonded windscreen of a motor car, wherein the cover strip is located in the air suction region of a blower which sucks external air through between an external surface of the windscreen and a rear edge of an engine hood into an air filter located beneath the engine hood, wherein the cover strip is located in the discharge path of a stream of water being discharged along the external surface of the windscreen and is arranged to maintain an interval from the external surface of the windscreen and maintains a sufficient interval from the engine hood for the air suction, and wherein the cover strip is anchorable to the windscreen by means of clips arranged at a mutual interval and forms with the windscreen a passage duct which introduces the stream of water into a water catching tank adjacent to a lower edge of the windscreen.

4,874,199

POWER-DRIVEN COWL FOR AN AUTOMOTIVE VEHICLE

Takeshi Yamamoto, Hiroshima, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan

Filed Oct. 19, 1987, Ser. No. 109,890

Claims priority, application Japan, Oct. 17, 1986, 61-245185; Oct. 17, 1986, 61-245186

Int. Cl.⁴ B62D 25/08; B60S 1/04

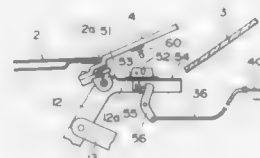
U.S. Cl. 296—192

9 Claims

1. A power-driven cowl for an automotive vehicle having a cowl panel which is shiftable between a closed position wherein said cowl panel closes a space formed between the rear end of an engine hood panel and a front windshield glass to cover a front windshield wiper housed in said space, and an open position wherein said cowl panel open said space to uncover said front windshield wiper so as to allow it to operate, said power-driven cowl comprising:

mounting means mounting said cowl panel for pivotal movement;
motor driven cowl shifting means coupled to said mounting means for moving said mounting means downwardly and forwardly relative to said hood so as to shift said cowl panel between said closed and open positions;
cowl driving means mounted on said mounting means for

causing said cowl panel, when said cowl panel is in said closed position covering said front windshield wiper, to pivotally move to uncover said front windshield wiper, said mounting means being stationary during the pivotal movement; and



locking means disposed between said mounting means and said cowl panel for releasably locking said cowl panel at said covering position.

4,874,200

MODULAR VEHICLE BODY

Tetsuji Nasa, Yokohama, and Jun Shiina, Zama, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

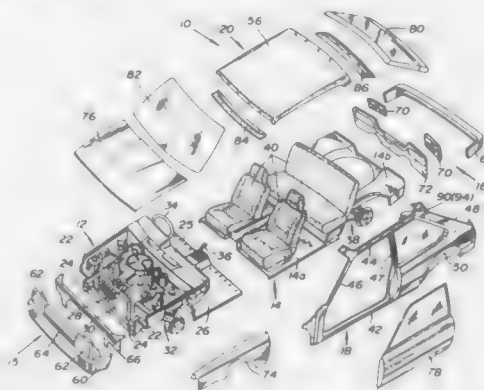
Filed Mar. 29, 1988, Ser. No. 174,914

Claims priority, application Japan, Mar. 30, 1987, 62-77206

Int. Cl.⁴ B62D 25/00

U.S. Cl. 296—197

6 Claims



1. A vehicle body structure comprising:
an engine compartment assembly having a cowl box and a dash lower panel at the rear end thereof;
a floor assembly having a front floor panel and a rear floor panel;
a pair of body side assemblies each having a front pillar, rear pillar, roof side rail and a side still;
a roof assembly having a roof panel;
said engine compartment assembly, floor assembly, body side assemblies and roof assembly constituting indepen-

dent vehicle body sections which are prepared and painted independently;
mechanical fastening means for mechanically fastening said engine compartment assembly, floor assembly, body side assemblies and roof assembly together; and
grounding means for electrically connecting said engine compartment assembly, floor assembly, body side assemblies and roof assembly to each other.

4,874,201

SUPPORT AND GUIDE STRUCTURE FOR THE WINDOWS OF A MOTOR VEHICLE BODY

Oscar Scaglietti, Montale di Castellano Rangone, Italy, assignor to Ferrari Engineering S.p.A., Modena, Italy

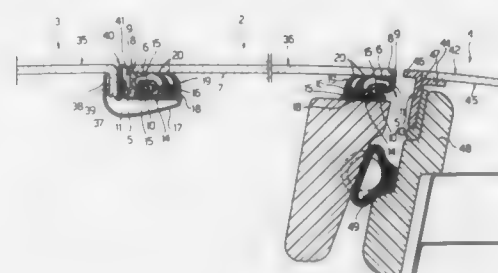
Filed Jun. 16, 1988, Ser. No. 207,247

Claims priority, application Italy, Jun. 16, 1987, 67512 A/87

Int. Cl.⁴ B60J 5/04

U.S. Cl. 296—201

11 Claims



1. A support and guide structure for the windows of a motor vehicle body having at least one door (1) with a substantially vertically movable window (2) which is delimited by a pair of lateral edges (8) and an upper edge (26), characterized by the fact that it comprises a pair of window support elements (5) of elongate form and constant cross-section, each of which comprises an abutment tongue (6) to be fixedly fastened to a part of the rear surface (7) of the window contiguous to one of the said lateral edges, a frame tongue (9) orthogonal to the abutment tongue and adapted to surround the said lateral edge of the window, a guide tongue (10) parallel to the said abutment tongue and disposed rearwardly of it and projecting towards the central part of the said window, and a connection wall (11) connecting together the said abutment tongue and the said guide tongue; a pair of guide elements (14) of elongate form and constant U-shape cross-section, each of which is adapted to guide a corresponding support element during movement of the window, and each of which comprises a pair of parallel guide tongues (15), defining with a base wall (16), a guide channel for the said guide tongue of a corresponding support element, each of the said guide elements being fixed to a corresponding upright (17) of the said door.

4,874,202

SLIDING TYPE SUNROOF LIFT DOWN DEVICE

Hironori Ochiai, Nagoya; Etsuo Suzuki, Miura, and Kazuo Ikuta, Hiratsuka, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Aichi and Kanto Jidosha Kogyo Kabushiki Kaisha, Kanagawa, both of Japan

Filed Apr. 28, 1988, Ser. No. 187,243

Claims priority, application Japan, Apr. 30, 1987, 62-107541

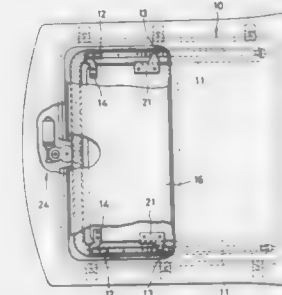
Int. Cl.⁴ B60J 7/10

U.S. Cl. 296—222

3 Claims

1. A sliding type sunroof for a vehicle, comprising:
a pair of rails;
a pair of front shoes, each of said front shoes being slidably retained in a corresponding one of said pair of rails;
a sunroof panel operatively connected to said pair of front shoes and selectively positioned between a closed position and an open position, said open position being defined by a gap extending inwardly along an exterior of the vehicle,

said sunroof panel being supported by said front shoe and being slidable together with said front shoe between said open and said closed position; and
a lift down device including a bracket pivotally connected to said front shoe at a pivot point, said sunroof panel being secured to said lift down device at said pivot point, said bracket being rotatable about said pivot point to slide said front shoe and thereby space said sunroof panel inwardly



VEHICLE PASSENGER SEAT FOR HANDICAPPED PERSONS

Alvera S. Healey, Rte. 23, Box 398, Newland, N.C. 28657
Continuation-in-part of Ser. No. 892,708, Aug. 1, 1986, abandoned, which is a continuation-in-part of Ser. No. 748,018, Jun. 24, 1985, abandoned. This application Mar. 7, 1988, Ser. No. 164,890

Int. Cl.⁴ A47C 15/00; A61G 5/00

U.S. Cl. 297—250

3 Claims



1. A vehicle passenger safety seat for handicapped persons; said seat being of the type which can be detachably but securely mounted over an existing conventional van, bus, or other such vehicle seat, and comprising:

(a) a supporting frame having a vertical back member and a rigidly attached seat member, said back member further including a first retaining means associated with said back member for engagement over, across, and a prescribed distance downwardly behind the top of the vehicle seat to prevent said safety seat from tilting forwardly;
(b) said first retaining means comprising:
(i) a first pair of retractable straps extending, one on either side, from the upper area of said back member; each of said straps including a clasp on the free end thereof;
(ii) latch means secured to the floor of the vehicle at a

position substantially in alignment with the rear of the mid portion of the vehicle seat, for receiving and locking said clasp therein;

- (c) a second retaining means for further securing said safety seat in position on the frame of the vehicle seat; said first and second retaining means cooperating to prevent forward or backward tilting or lateral movement of said safety seat;
- (d) a cushion member overlying said back and seat members;
- (e) a pair of arms rests movably attached one on either side of said vertical back member for supporting the arms of the passenger;
- (f) vertically adjustable foot support means mounted in the front of said seat member for supporting the feet of the passenger;
- (g) said second retaining means comprising:
 - (i) a second retractable strap extending from the rear face of said foot support means and including a clasp on the free end of said strap for engagement in said latch means;
 - (h) harness means for securing the passenger in said safety seat;

whereby said safety seat can be selectively positioned on the seat of a van or bus, with said first retaining means over the top of the vehicle seat and said second retaining means securely fastened beneath the vehicle seat, for the safe transport of the handicapped passenger.

4,874,204

HINGE JOINT FOR USE IN THE SEATS OF MOTOR VEHICLES

Hansjörg Walk, Reutlingen, Fed. Rep. of Germany, assignor to Kelper Recaro GmbH & Company, Remscheid, Fed. Rep. of Germany

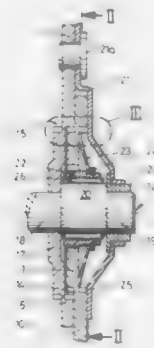
Filed Jun. 24, 1988, Ser. No. 211,364

Claims priority, application Fed. Rep. of Germany, Jul. 17, 1987, 3723710

Int. Cl.⁴ B60H 1/02

U.S. Cl. 297—362

11 Claims



1. A hinge joint, particularly for movably connecting the back rest with the body-supporting part of a seat for use in a motor vehicle, comprising a pintle having at least one first portion and at least one second portion eccentric to said first portion; a first component surrounding the first portion of said pintle and having a first gear; a second component surrounding the second portion of said pintle and having a second gear mating with said first gear, one of said gears surrounding the other of said gears and said one gear having $n+m$ teeth wherein n is the number of teeth on said other gear and m is a whole number including one; a sleeve axially movably surrounding one portion of said pintle; and means for maintaining said gears in mesh including a biasing member reacting against said sleeve and bearing axially and radially against one of said components, one of said components being connectable with

the body-supporting part and the other of said components being connectable with the back rest.

4,874,205

RECLINER ASSEMBLY FOR VEHICLE SEAT

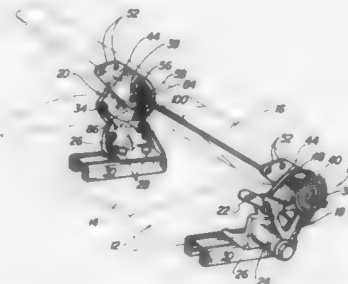
Majid Arefinejad, Southfield; Dennis J. Brothers, St. Clair Shores, and Frederick Kosinski, Royal Oak, all of Mich., assignors to Semec, Inc., Troy, Mich.

Filed Apr. 11, 1988, Ser. No. 179,739

Int. Cl.⁴ B60N 1/02

U.S. Cl. 297—379

7 Claims



1. A recliner assembly for a seat having a backrest which is movable between a generally upright position, a fully reclined forward position, and a fully reclined rear position, said recliner assembly comprising:

- a stationary plate;
- a moving plate rotatably mounted to said stationary plate, said moving plate connected to said backrest, and means for rotating said moving plate and backrest in a first direction toward said fully reclined forward position;
- said moving plate includes a recessed area having an edge and said stationary plate includes an opposed recessed area, actuator means contained between and enclosed within the recessed areas for movement therein, and means for biasing said actuator means into engagement with the edge of the recessed area in said moving plate; means for moving said actuator means out of engagement with the edge of the recessed area in said moving plate when said backrest is in said generally upright position wherein said backrest automatically rotates in said first direction to said fully reclined position in response to said rotating means;
- said backrest being selectively manually movable in a second direction from said generally upright position toward said fully reclined rear position when said actuator means is moved out of engagement with the edge of the recessed area in said moving plate; and
- means for maintaining a spaced relationship between said actuator means and the edge of the recessed area in said moving plate throughout the movement of said backrest from said generally upright position to said fully reclined forward position and from said fully reclined forward position to said generally upright position;
- wherein said actuator means includes a pawl member, said biasing means for said actuator means includes a cam member engaging said pawl member, said cam member mounted on a camshaft, said pawl member having a toothed portion along an edge thereof, said edge of the moving plate recessed area having a toothed portion, said spring means connected to said camshaft for normally biasing the toothed portions into engagement with one another;
- wherein said moving means includes a lever connected to said camshaft for applying a rotative force to said camshaft which is opposite to the rotative force being applied to said camshaft by said spring means;
- wherein said means for maintaining a spaced relation includes means for permitting translational movement of

said camshaft and an irregularly shaped opening within the recessed area of said moving plate which engages said camshaft for moving the toothed portions apart during movement of said moving plate.

4,874,206

TIRE WHEEL AND WHEEL COVER SPRAY SHIELD AND KIT

Thomas J. Sampson, 10514 Aqueduct Ave., Granada Hills, Calif. 91344

Filed Dec. 7, 1987, Ser. No. 129,232

Int. Cl.⁴ B05C 11/16; B60B 7/00

U.S. Cl. 301—37 R

5 Claims



2. An improved removable tire wheel and wheel cover spray shield, said shield comprising, in combination:

- (a) a generally cylindrical disc;
- (b) a handle connected to the outer face of said disc;
- (c) securing means connected to the inner face of said disc for releasably securing said disc over the outer face of a tire wheel or wheel cover to protect the same during spraying of a tire bearing the same;
- (d) wherein said disc is generally flat and said securing means comprises an annular wheel and wheel cover rim-gripping hook projecting inwardly from said inner disc face, and
- (e) wherein said disc includes a plurality of peripheral concentric circular score lines dividing the periphery of said disc into a plurality of concentric rings, and a plurality of concentric peripheral hooks on the inner face of said disc at the level of said score lines, whereby the diameter of said disc can be decreased by breaking away one or more of said rings from the remainder of said disc.

4,874,207

HYDRAULIC BRAKING SYSTEM FOR AN AUTOMOTIVE VEHICLE

Michiharu Nishii; Masamoto Ando, both of Toyota, and Yoshihiko Tada, Aichi, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Jun. 27, 1988, Ser. No. 214,373

Claims priority, application Japan, Jun. 27, 1987, 62-160113; Aug. 13, 1987, 62-202249; Aug. 13, 1987, 62-202252; Aug. 13, 1987, 62-202253

Int. Cl.⁴ B60T 8/44

U.S. Cl. 303—52

16 Claims

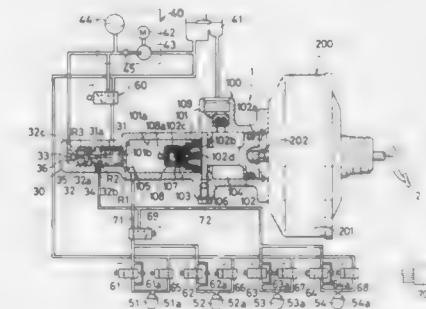
1. A hydraulic braking system for an automotive vehicle, comprising:

- a power source for generating a hydraulic power pressure;
- a reservoir for storing an amount of hydraulic fluid;
- a master cylinder having a housing defining therein a bore, a master piston slidably disposed in said bore to form a pressure chamber for introducing said hydraulic fluid thereto from said reservoir and generating a hydraulic braking pressure in response to depression of a brake pedal;
- a regulator having a housing defining therein a regulator chamber for introducing said hydraulic power pressure thereto from said power source and regulating said hydraulic power pressure into a regulated hydraulic pres-

sure in response to said hydraulic braking pressure generated in said master cylinder, said regulator being positioned in substantially coaxial relationship with said master cylinder and responsive mechanically to depression of said brake pedal;

said regulator being arranged to control the communication of said regulator chamber with said power source and said reservoir normally in response to said hydraulic braking pressure generated in said master cylinder, and in response to depression of said brake pedal when said hydraulic braking pressure generated in said master cylinder is less than a predetermined value;

a plurality of wheel brake cylinders for braking respective road wheels, said wheel brake cylinders being divided into a first group of wheel brake cylinders communicated with said pressure chamber of said master cylinder and a second group of wheel brake cylinders communicated with said regulator chamber,



said regulator comprising a housing defining therein a bore coaxial with said pressure chamber of said master cylinder, a piston axially slidably disposed in said bore of said regulator to form a regulator chamber therein, and valve means disposed within said regulator chamber for controlling the communication of said regulator chamber with said power source and said reservoir in response to movement of said piston, said piston being applied at one end thereof with a hydraulic pressure in said regulator chamber and at the other end thereof with said hydraulic braking pressure in said master cylinder, said valve means normally allowing a flow of said hydraulic fluid from said reservoir into said regulator chamber, and said valve means inhibiting the flow of said hydraulic fluid from said reservoir and introducing said hydraulic power pressure into said regulator chamber when said hydraulic braking pressure in said master cylinder exceeds said hydraulic pressure in said regulator chamber.

4,874,208

ANTI-SKID CONTROL SYSTEM

Heinz Siegel, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 13, 1989, Ser. No. 322,462

Claims priority, application Fed. Rep. of Germany, Jun. 10, 1988, 3819812

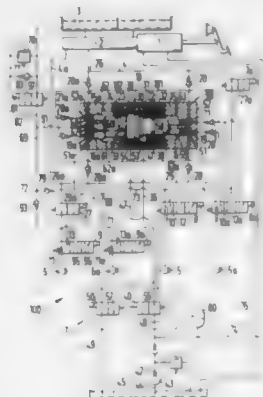
Int. Cl.⁴ B60T 8/32, 8/34, 13/12, 17/02

U.S. Cl. 303—116

20 Claims

1. An anti-skid control system for vehicles, with the wheels of which each respective wheel brake cylinder communicates via a brake line with said multi-circuit master cylinder, at least one first valve assembly associated with one of the anti-skid-controlled wheel and located in a brake line, said at least one valve assembly assumes switching positions in an anti-skid control situation, for at least pressure buildup and pressure reduction; at least one fluid feed device associated with one of the brake circuits, said feed device receives pressure fluid flowing back from said at least one first valve assembly under

pressure reduction conditions and pumps the pressure fluid in a direction of the brake line, a piston pump that serves said at least one feed device (90), said piston pump has an actuating piston (18), which is acted upon by pressure fluid that in an anti-skid control situation is carried in alternation from a control valve assembly (17) into a first or a second hydraulic chamber section (53, 54) disposed each on one side of said actuating piston (18) and in so doing displaces the actuating



piston (18) such that at least two pump pistons (15, 15a; 16, 16a) contacting said actuating piston (18) are simultaneously actuated into cylinder chambers (19, 19a; 21, 21), which in one displacement direction, upon pressure reduction, aspirates pressure fluid from the wheel brakes into the respective cylinder chamber via check valves (28, 28a), and in another displacement direction pumps pressure fluid back into the brake line (4, 4a) from the respective cylinder chamber (19, 19a; 21, 21a) via other check valves (20, 20a).

4,874,209

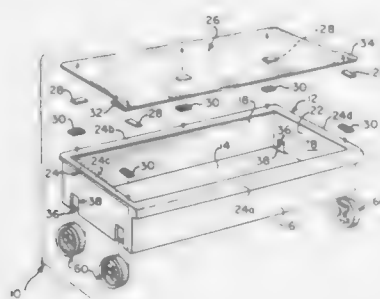
ROLLING DRAWER

Charles M. Spitzer, Roslyn Heights, N.Y., and Paul F. Siegel, Ridgefield, Conn., assignors to A-Bee Syndicate, Inc., New York, N.Y.

Filed Jan. 9, 1989, Ser. No. 294,817
Int. Cl.⁴ A47B 91/00

U.S. Cl. 312—250

11 Claims



1. A rolling drawer for storing articles, said drawer comprising:
a drawer-like tray to store the articles including a bottom panel and a pair of upstanding side panels connected to the side edges of said bottom panel, said bottom panel having at least one cut-out opening formed along each of its side edges and said side panels each having an open ended slot communicating with a respective one of said cut-out openings and projecting upwardly therefrom;
at least one pair of wheel assemblies for supporting said tray for rolling movement upon a support surface, each of said wheel assemblies comprising a wheel and a bracket member;

means for rotatably mounting said wheel to said bracket member;
said bracket member including an elongated plate having a width dimension greater than the corresponding width dimension of said open ended slots; and
mounting means on said bracket member to removably mount a separate one of said wheel assemblies to each side of said tray, said mounting means configured to pass through one of said cut-out openings and engage the associated side panel when said bracket member is moved upwardly into a mounted position on said side panel.

4,874,210

PRODUCT DISPLAY AND DISPENSING UNIT

Francis A. Carroll, Sandymount, Ireland, assignor to Institute for Industrial Research and Standards, Dublin, Ireland

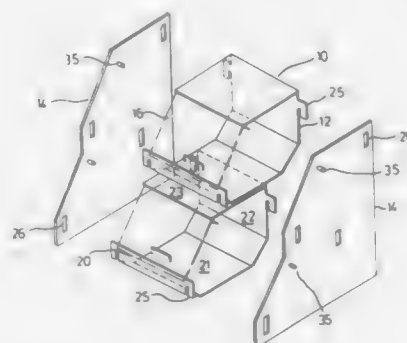
Filed Jan. 30, 1987, Ser. No. 68,195

Claims priority, application Ireland, Jul. 2, 1986, 1782/86; Belgium, Dec. 30, 1986, 0/217640

Int. Cl.⁴ A47B 43/00

U.S. Cl. 312—257.1

15 Claims



1. A product display and dispensing unit comprising at least one compartment for loose products, each compartment comprising a body member and a pair of side panels with pairs of complementary engageable and disengageable means for fastening together the side panels and the body member, each of said pairs comprising a key fixedly attached to said body member and a slot in a side panel, said key forming an open ended notch that is complementarily engageable and disengageable with said slot, said key being fixedly attached to said body member both prior to and during engagement with said slot, said pairs of complementary engageable and disengageable means being the only means for fastening together the side panels and the body member.

4,874,211

FOLDABLE UTILITY CABINET

Walter G. Nichols, 2112-F Sunnydale Blvd., Clearwater, Fla. 34615

Filed Jan. 11, 1989, Ser. No. 295,842

Int. Cl.⁴ A47B 49/00

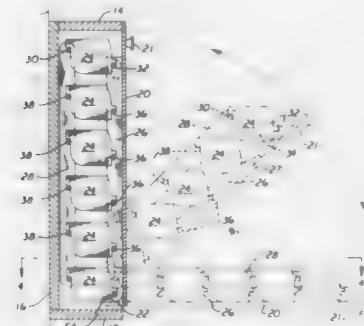
U.S. Cl. 312—269

4 Claims

1. In a utility cabinet for wall mounting having a frame with a bottom member and hollow interior and a lowerable front door having longitudinal sides and a bottom hinged at its bottom to the bottom of the cabinet frame, the improvement comprising:

a first pair of parallel side support members spaced apart from each other, each side support members integral with an inside surface of the front door, the side support members each located interior to and spaced apart from a longitudinal edge of the front door; a second pair of parallel support members spaced apart from each other hinged to the first pair of side support members and spaced apart from the first pair of side support members in an open

configuration, with the hinges maintaining the first and second pairs in parallel spaced apart relation;
a first set of multiple parallel rods mounted at right angles to and connecting the first side support members; a second set of multiple parallel rods mounted at right angles to and connecting the second pair of side support members;



multiple removable compartments each resting on a rod connecting the first side support members and an adjacent rod connecting the second side support members, so that each compartment remains upright whether the front door is in a locked configuration to the cabinet frame or is hinged away from the cabinet frame.

4,874,212

DEVICE FOR FASTENING A FRONT PLATE TO METAL DRAWER SIDE WALLS

Erich Röck, Höchst, and Klaus Brüstle, Lauterach, both of Australia, assignors to Julius Blum Gesellschaft M.B.H., Höchst, Australia

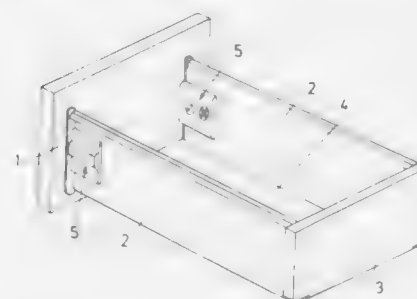
Filed May 3, 1988, Ser. No. 191,021

Claims priority, application Austria, May 4, 1987, 1103/87

Int. Cl.⁴ A47B 88/04

U.S. Cl. 312—330.1

8 Claims



1. A device for use in mounting a drawer front panel to a metal side wall of the drawer, said device comprising:
a block member formed of plastic material and adapted to be attached to a drawer front panel, said block member having therein a groove defined by spaced portions of said block member;
an adjustment plate positioned within said groove;
a projection extending into said groove from one of said portions of said block member or from said adjustment plate;
whereby said block member is fittable over a front end of a drawer metal side wall with the side wall inserted in said groove with said portions of said block member embracing opposite sides of the front end of the side wall, with said adjustment plate adapted to extend into a recess formed in the front end of the side wall and having upper and lower edges to abut upper and lower edges, respectively, of the side wall defining the recess, and with said

projection extending into a slot formed in the side wall behind the recess, to thereby form means for initially fastening said block to the side wall;
cooperating means provided on said block member and on said adjustment plate for selectively adjusting the relative vertical position of said block member, and thereby of the front plate, with respect to said adjustment plate, and thereby to the side wall; and
screw means, extending in a direction to be parallel to the front plate and transverse to said groove and adapted to extend through the slot in the side wall, for tightly connecting said portions of said block member to the side wall, and thereby for preventing further vertical adjustment.

4,874,213

METHOD OF FORMING VOLUME PHASE REFLECTION HOLOGRAMS

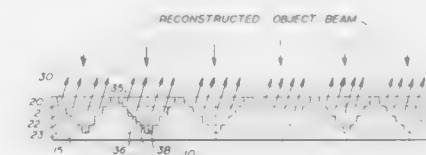
James J. Cowan, Lexington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Division of Ser. No. 84,568, Aug. 10, 1987. This application Jun. 9, 1988, Ser. No. 204,379

Int. Cl.⁴ G03H 1/28

U.S. Cl. 350—3.67

12 Claims



1. A method for forming a volume phase reflection hologram comprising the steps of:

exposing a holographic phase medium by projecting onto one of its surfaces two beams disposed at an angle to one another to form in said medium interference fringes that are substantially perpendicular to said surface and have a predetermined periodicity; and
further exposing said medium with from opposite sides with two more beams to form therein interference fringes that are parallel to said medium surfaces and of finer periodicity than that of said predetermined periodicity of said perpendicular fringes so that both said parallel and perpendicular interference fringes combine to provide as exposure pattern in said medium that varies in exposure level both over the surface and depth of said medium in the form of fine generally varying multiple steps distributed depthwise in the medium within a coarser surface pattern.

4,874,214

CLEAR HOLOGRAPHIC HELMET VISOR AND PROCESS OF PRODUCING SAME

Francoise Cheysson, Montrouge, and Jean-Blaise Migozzi, Orsay, both of France, assignors to Thomson-CSF, Paris, France

Filed Apr. 18, 1988, Ser. No. 182,448

Claims priority, application France, Apr. 22, 1987, 87 05702

Int. Cl.⁴ G02B 5/32

U.S. Cl. 350—3.7

11 Claims

1. A holographic visor apparatus comprising:
a generator for producing a light image to be collimated, an optical collimating and combining assembly including a flat holographic plate and a spherical holographic plate used off-axis and including a holographic element, for providing a view of a collimated image superimposed on a landscape, radiation of the light image being reflected from the flat plate to the spherical plate which produces a collimation of the image at infinity, wherein the holo-

graphic element of the spherical plate is of a type that is determined by means of a computer and recorded by making use of a digital hologram in order to minimize



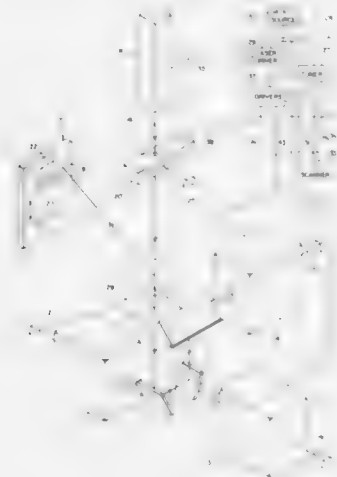
aberrations and to produce for the field of utilization which is contemplated an exit pupil at a distance substantially equal to the focal distance with respect to the spherical mirror.

4,874,215

TUNABLE RESONANT MECHANICAL SYSTEM
Jean I. Montaga, Brookline, Mass., assignor to General Scanning, Inc., Watertown, Mass.

Filed Apr. 23, 1987, Ser. No. 41,786

Int. Cl.⁴ G02B 26/10; H02K 33/00, 11/00; F16K 1/14
U.S. Cl. 350—6.6 31 Claims



1. A resonant mechanical system whose natural resonant frequency can be tuned, comprising
a mass movable within a range of excursion,
a spring structure for urging said mass toward a neutral position within said range of excursion,
said spring structure being comprised of a material whose elastic properties change with temperature over a desired tuning range, and
a tuner for detecting a frequency of said mechanical system, and for controllably varying the temperature of at least part of said spring structure in response to said detected frequency to tune said natural resonant frequency.

4,874,216 VARIABLE-WAVEGUIDE OPTICAL BRANCHING FILTER

Katsuyuki Utaka, Musashino; Kazuo Sakai, Tokyo; Yuichi Matsushima, Tanashi, and Shigeyuki Akiba, Tokyo, all of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Tokyo, Japan

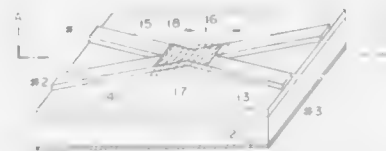
Filed Jun. 23, 1988, Ser. No. 210,640

Claims priority, application Japan, Jul. 2, 1987, 62-163901

Int. Cl.⁴ G02B 6/34

U.S. Cl. 350—96.19

7 Claims



1. A variable-wavelength optical branching filter, comprising: two optical waveguides intersecting each other at a predetermined angle, one of the two optical waveguides being employed in use as an input side waveguide for propagating therein incident light, the other of the two optical waveguides being employed as an output side waveguide for obtaining therefrom output light;

a material having a refractive index variable in response to application of input energy to the same and disposed at an intersection of the two optical waveguides;
means for applying said input energy to said material to produce the output light at the output side waveguide;
and a diffraction grating disposed at the intersection of the two optical waveguides for specifying a particular wavelength of the output light by the period of the diffraction grating, and the specified wavelength being variable by changing the refractive index of said material.

4,874,217

LIGHT SOURCE AND DETECTOR PACKAGES

Adrian P. Janssen, Exeter, Great Britain, assignor to STC PLC, London, England

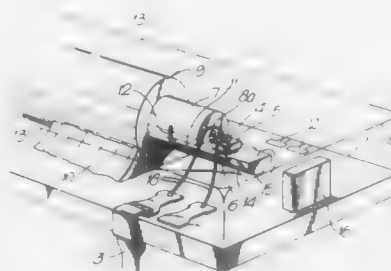
Filed Apr. 8, 1988, Ser. No. 179,395

Claims priority, application United Kingdom, Apr. 21, 1987, 8709311

Int. Cl.⁴ G02B 6/42

U.S. Cl. 350—96.20

5 Claims



1. A semiconductor optical transmission device comprising: a substrate; a source or detector; an optical fibre optically coupled to the source or detector; a cantilever support structure coextensive with and supporting the fibre; said source or detector being mounted on the free end of said cantilever structure; said structure being cantilevered from said substrate.

4,874,218

REVERSIBLE OPTICAL SWITCH

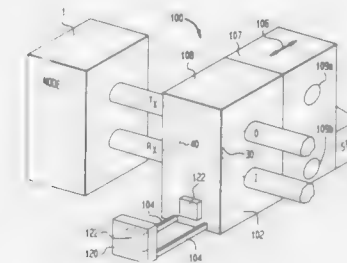
Terry P. Bowen, Etters; Sherry J. Harms, Hummelstown, and John C. Hoffer, Harrisburg, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jul. 19, 1988, Ser. No. 221,059

Int. Cl.⁴ G02B 6/36

U.S. Cl. 350—96.20

7 Claims



1. An optical switch comprising, a first pair of optical fibers for alignment with an optical coupling, a second pair of optical fibers for alignment with an optical coupling, a first optical coupling for coupling optical fibers of the first pair to corresponding optical fibers of the second pair, a second optical coupling for coupling the optical fibers of the first pair to each other and for coupling the optical fibers of the second pair to each other, and a mechanized assembly for aligning either the first or the second optical coupling with the corresponding optical fibers, wherein the improvement comprises;

the optical fibers of the first pair are aligned with corresponding duplex connectors of a transceiver, and the optical fibers of the second pair are aligned with one end of an interconnect housing having a second end into which are pluggably received a corresponding connector for optical cable in alignment with the duplex connectors and corresponding optical fibers of each pair,
a solenoid for moving the mechanized assembly,
the mechanized assembly includes lenses aligned with corresponding optical fibers of each pair, and
the mechanized assembly includes a pair of waveguides with looped optical paths, each of the looped optical paths being in alignment with a corresponding pair of optical fibers upon movement of the mechanized assembly by the solenoid.

4,874,219

ANIMAL-RESISTANT CABLE

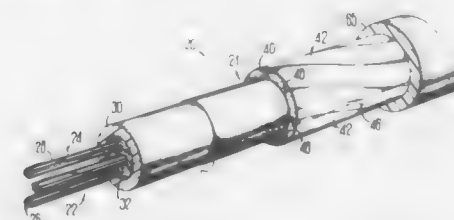
Candido J. Arroyo, Lithonia, and Parbhubhai D. Patel, Dunwoody, both of Ga., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed May 17, 1988, Ser. No. 194,760

Int. Cl.⁴ G02B 6/44

U.S. Cl. 350—96.23

22 Claims



1. An animal-resistant cable, which comprises:
a core which comprises at least one transmission media; and
a sheath system which encloses said core, said sheath system comprising:
a plurality of longitudinally extending segments each of

which has an arcuately shaped cross section transverse to a longitudinal axis of the cable that encloses less than one-half the periphery of said core, and each of which is made of a dielectric material comprising fibers embedded in a matrix that discourages repeated attacks by the same animal and that provides suitable tensile and compressive strength for said cable, said segments cooperating to provide a shell enclosing said core with facing longitudinal edge surfaces of adjacent segments preformed to be substantially contiguous, and said segments being stranded helically about said core and being sufficient in number to allow said cable to be routed in a path having a predetermined radius without damaging said cable; and
an outer jacket comprising a plastic material being disposed about said segments.

4,874,220

VIEWING OPTICAL SYSTEM FOR USE WITH ENDOSCOPE

Masakazu Yamagata, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

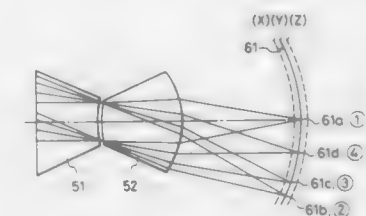
Filed Feb. 17, 1988, Ser. No. 156,633

Claims priority, application Japan, Feb. 17, 1987, 62-21724[U]

Int. Cl.⁴ G02B 23/26

U.S. Cl. 350—96.26

3 Claims



1. An endoscope viewing system consisting of in order, a rigid objective lens unit receiving light from an object to be examined under illumination, a flexible optical-fiber image guide transmitting the image of the object focused by said rigid objective lens unit on a light receiving end surface of said optical-fiber image guide, said optical-fiber image guide consisting of a multiplicity of optical fibers fixed in side-to-side, parallel fashion, and a rigid eyepiece for observing the image emerging from a light emerging surface at the opposite end of said image guide from said light-receiving surface, the improvement wherein;

said rigid objective lens unit consists of a first lens imaging a curved image plane conjugate with an object plane; and wherein the light-receiving end surface of the optical-fiber image guide is curved to substantially conform to said curved image plane of said rigid objective lens unit and is positioned at said image plane, such that all parts of said image are in focus at said light-receiving fiber image guide end surface permitting a sharp image of the object to be observed through said rigid eyepiece.

4,874,221

FIBRE-TYPE LIGHT WAVELENGTH CONVERSION DEVICE

Seiichi Ohsawa, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed May 1, 1989, Ser. No. 345,162

Claims priority, application Japan, Oct. 14, 1988, 63-259041

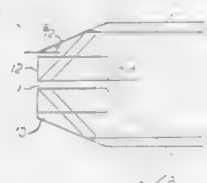
Int. Cl.⁴ G02F 1/35

U.S. Cl. 350—96.29

4 Claims

1. A fibre-type light wavelength conversion device for changing the wavelength of an incident beam and emerging it as a beam having a predetermined wavelength, comprising:

a core;
a cladding layer around said core; and



a transparent conical layer provided around said cladding layer, said conical layer having a diameter increasing at a predetermined inclination from an end of incidence toward an end of emergence.

4,874,222

HERMETIC COATINGS FOR NON-SILICA BASED OPTICAL FIBERS

Lubos J. B. Vacha; Peter C. Schultz, both of Sturbridge, Mass.; Cornelius T. Moynihan, Watervliet, N.Y.; Satyabrata Raychandhuri, Sturbridge, Mass.; Ken C. Cadies, Pittsford, N.Y.; Barry B. Harbison, Alexandria, Va., and Reza Mossadegh, Silver Spring, Mass., assignors to SpecTran Corporation, Sturbridge, Mass.

Continuation-in-part of Ser. No. 846,331, Mar. 31, 1986, Pat. No. 4,735,856, which is a continuation-in-part of Ser. No. 74,646, Jul. 17, 1987. This application Feb. 25, 1988, Ser. No. 160,545

Int. Cl.⁴ G02B 6/00; B05D 5/06; D02G 3/00

U.S. Cl. 350—96.34

37 Claims

1. An optical fiber product having a non-silica based optical fiber and an encapsulating hermetic coating comprising at least one of carbon, an inorganic fluoride, a metalloid or a ceramic compound in a thickness sufficient to impart moisture resistance to said optical fiber product.

26. An optical fiber product comprising: a core of a fluoride glass comprising about 25–39 mole percent ZrF_4 , about 13–27 mole percent HfF_4 , about 10–24 mole percent BaF_2 , about 1–6 mole percent LaF_3 , about 2–5 mole percent AlF_3 , about 9–25 mole percent NaF and 0 to 1 mole percent SnF_4 ; a fluoride glass cladding adjacent said core; an oxide glass coating of an alkali-borophosphate or an alkali-group II metal-phosphate adjacent said cladding; and an encapsulating hermetic coating comprising at least one of carbon, a metal, a metalloid, or a ceramic compound having a density of between about 3.2 and 6.3 g/cc, said hermetic coating having a coefficient of thermal expansion of between about 5.5° and $15^\circ \times 10^{-6} C^{-1}$ and being present in a thickness sufficient to impart moisture resistance to the optical fiber product.

4,874,223

OPTICAL NOTCH FILTER FOR DISCRIMINATING AGAINST COHERENT RADIATION

Thomas R. O'Meara, Malibu, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Continuation of Ser. No. 83,410, Aug. 10, 1987, abandoned. This application Feb. 17, 1989, Ser. No. 312,428

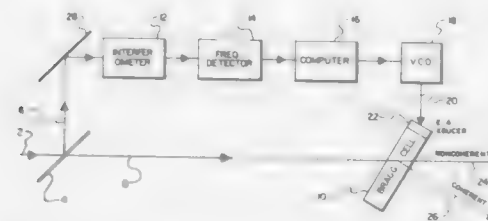
Int. Cl.⁴ G02B 27/00; G02F 1/33; G01J 3/45

U.S. Cl. 350—163

20 Claims

18. An optical filter system, comprising:
an optical filter,
means for receiving an input optical radiation beam and transmitting at least a portion of the beam to the filter,
means for detecting the presence of a predetermined characteristic of the beam,
means for generating a control signal for application to said

filter in response to the detection of said predetermined characteristic, said control signal operating upon said



filter to modify said predetermined characteristic within the beam, and
means for applying the control signal to the filter.

4,874,224

VEHICULAR DISPLAY VIEW CONTROL SYSTEM

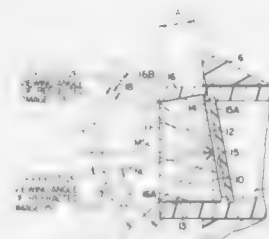
Robert F. Gutman, St. Clair Shores, and Robert Migrin, Dearborn, both of Mich., assignors to United Technologies Automotive, Inc., Dearborn, Mich.

Filed May 24, 1988, Ser. No. 198,025

Int. Cl.⁴ G02B 27/14; G01D 11/28; B60Q 1/00; G08B 5/36

U.S. Cl. 350—174

32 Claims



1. An automotive informational display system using associated light of the visible spectrum to view informational indicia and having limited angles of viewing the informational indicia from in front of the display system, comprising:

a vehicle having at least one passenger seat having a seating surface upon which an occupant sits in while traveling in the vehicle;
a light transmitting optical element, located in said vehicle in a position viewable by an occupant sitting on said seating surface, having a transparent body having a first index of refraction and having at least three, spaced, operative faces, including
a front, light transmitting surface,
an internal refractive surface, and
a separate, internal, secondary surface spaced from said refractive surface;

an interfacing medium interfacing with said refractive surface and having a second, different index of refraction less than that of said first index of refraction; and
an informational indicia element, associated with said interfacing medium and said refractive surface of said optical element, having the informational indicia associated with it to be displayed to a first limited area above the seating surface of said passenger seat and located in front of said front, light transmitting surface of said optical element using light of the visible spectrum, and undisplayed at a second, limited area different than said first area but also located at a vertical level above the seating surface of said passenger seat and in front of said front, light transmitting surface of said optical element, said front, light transmitting surface being viewable from both said first and said second areas;
the geometry of said optical element itself and the relative

angles and separation distances of said spaced, light transmitting, reflective and secondary surfaces, the relative indices of refraction of said optical element and said interfacing medium, and the wavelength(s) of the light used in association with the informational display, in combination causing light coming from said indicia element to be transmitted to said first area and preventing light from said indicia element from being transmitted to said second area, the informational indicia being viewable in said first area but unseen in said second area.

4,874,225

SOLAR GREENHOUSE ROOF

Anthony S. Pruszenski, Jr., Plum Island, Mass., assignor to Energy Innovations, Inc., Mineral Wells, Tex.

Filed Jul. 14, 1988, Ser. No. 219,605

Int. Cl.⁴ G02B 17/00, 27/00

U.S. Cl. 350—259

13 Claims



1. A solar greenhouse roof system comprising:

(a) a base;
(b) a plurality of relatively large light reflectors mounted atop said base;
(c) one or more relatively small focusing light reflectors located so as to receive reflected light from said large light reflectors; and
(d) one or more light transparent pipes mounted in holes in said base and functioning to receive reflected light from said one or more relatively small focusing light reflectors and to filter out certain frequencies of said reflected light, each light-transparent pipe consisting of a plate of light-transparent material arranged to receive light at one edge and to discharge light at another, opposite edge.

4,874,226

LICENSE PLATE LENSES

Kevin McDonald, 768 Georgia Ave., Akron, Ohio 44306

Filed Apr. 15, 1988, Ser. No. 182,117

Int. Cl.⁴ G02B 27/00

U.S. Cl. 350—319

5 Claims



1. A license plate lens, comprising:

(a) a rectangularly-shaped plastic lens having a plurality of orifices so as to coincide with a license plate holder of most, if not all, automobiles, and;
(b) a logo or other nomenclature vacuum-formed in said plastic lens so as to create a raised and enhanced surface in said lens.

4,874,227

LARGE-SIZED LIQUID CRYSTAL DISPLAY

Hideki Matsukawa; Takeshi Masuyama; Minoru Hirota; Yasuo Wakahata; Masahiro Itoh, and Shinji Harada, all of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

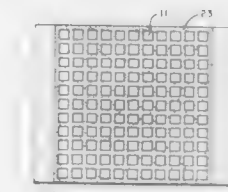
Continuation-in-part of Ser. No. 807,073, Nov. 27, 1985, abandoned. This application Feb. 9, 1988, Ser. No. 154,436

Claims priority, application Japan, Mar. 28, 1984, 59-61479

Int. Cl.⁴ G02F 1/13

U.S. Cl. 350—334

26 Claims



2. A large-sized liquid crystal display comprising:

(a) a large number of liquid crystal display devices on a single plane, each formed by arranging pixels in liquid crystal interposed between transparent substrates which allow light from a light source to pass through;
(b) a plurality of light guides each having at least one light guide element corresponding to each of said liquid crystal display devices for guiding light rays, each of said light guides being positioned to cover display portions of said respective liquid crystal display devices and also junctions between said liquid crystal display devices; and
(c) a plurality of opaque masking members each provided at the front surface of each of said liquid crystal display devices such that said pixels in said liquid crystal display devices are respectively encircled thereby when viewed from the front of said liquid crystal display devices.

4,874,228

BACK-LIT DISPLAY

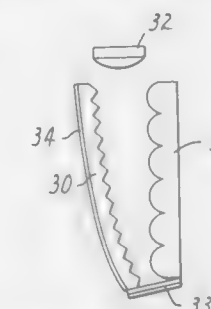
Kenneth A. Aho, Chicago City; Jeffrey J. Melby, St. Paul, and Richard A. Miller, Stillwater, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 30,033, Mar. 24, 1987, Pat. No. 4,799,137. This application Jan. 3, 1989, Ser. No. 292,762

Int. Cl.⁴ G02F 1/133, 1/01

U.S. Cl. 350—345

18 Claims



1. A back-lit display comprising:

a housing defining an optical cavity having an optical window;
a light reflecting film in said optical cavity, said light reflecting film having first and second major surfaces, said first surface being a structured surface having a plurality of

triangular prisms thereon and said second surface being a smooth surface, and a light reflecting means adjacent said second surface for reflecting light approaching said second surface from said first surface;
a first light source positioned so that light rays approach said film in a direction that is almost parallel to said second surface of said film; and
display means in said optical window.

4,874,129

PLANAR DIMMER

Toshiyasu Ito, Jun Minoura, Takaaki Mori, Shigeyuki Takahashi, Mamoru Kato, Junichi Shimada, and Fujio Hayakawa, all of Aichi, Japan, assignors to Toyoda Gosei Co., Ltd., Nishigatsugi, Japan

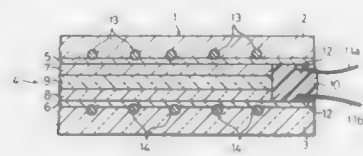
Filed Mar. 25, 1988, Ser. No. 173,594

Claims priority, application Japan, Mar. 31, 1987, 62-49746[U]; Apr. 28, 1987, 62-64626[U]

Int. Cl.⁴ G02F 1/17

U.S. Cl. 350—357

8 Claims



1. A planar dimmer comprising a transparent base,

- a dimming means, capable of dimming, comprising a first electrode layer disposed on said base, a second electrode layer set facing said first electrode layer, and a coloring means, disposed between said first and second electrode layers, that colors and discolors in response to a stimulus from said electrodes, and
- a conducting means disposed between said base and first electrode layer in such a way to be in contact with said first electrode layer to apply a uniform voltage throughout said first electrode layer, said conducting means comprising a plurality of long, fine conductors arranged throughout the surface of said first electrode layer.

4,874,230

ZOOM LENS WITH A VARIABLE POWER LENS ELEMENT

Shigeyuki Suda, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

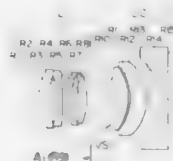
Filed Jan. 15, 1987, Ser. No. 3,461

Claims priority, application Japan, Jan. 28, 1986, 61-016512

Int. Cl.⁴ G02B 15/15, 9/64

U.S. Cl. 350—423

6 Claims



1. A zoom lens which is provided with a forward unit having a positive power and a rearward unit including an element having a surface shape which is variable, and wherein from the wide angle end to the telephoto end, said forward unit and said rearward unit are both moved from the image surface side to the object side and at the same time, the radius of curvature of said variable surface is varied, and when the power of said

rearward unit at the wide angle end is ψ_2 and the power of said rearward unit at the telephoto end is $\psi_2 + \Delta\psi_2$ is negative.

4,874,231

ZOOM LENS

Yasuhiro Aono, Kawasaki, Japan, assignor to Nikon Corporation, Tokyo, Japan

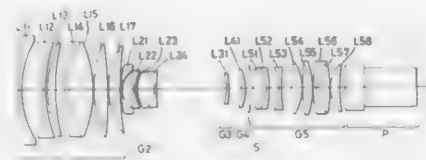
Filed Oct. 21, 1988, Ser. No. 260,717

Claims priority, application Japan, Nov. 11, 1987, 62-284842

Int. Cl.⁴ G02B 15/14

U.S. Cl. 350—427

9 Claims



1. A zoom lens of five-unit construction including, in succession from the object side: a first lens unit having a positive refractive power and which is fixed during magnification change; a second lens unit of negative refractive power having the function as a variator effecting magnification change and which is movable linearly on the optic axis toward the image side during the magnification change from the wide angle end to the telephoto end; a third lens unit and a fourth lens unit, having the function as a compensator for correcting the fluctuation of the image surface caused by the magnification change of said second lens unit and for keeping the position of said image surface constant, movable on the optic axis with different locuses so as to describe a curve convex toward the object side in conformity with said movement of said second lens unit; a fifth lens unit having an imaging function and fixed with said first lens unit during magnification change; and a stop disposed more adjacent to the image side than said fourth lens unit.

4,874,232

IMAGING OPTICAL SYSTEM

Akira Hasegawa, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

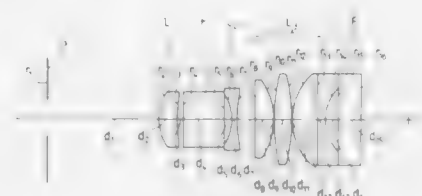
Filed Nov. 10, 1988, Ser. No. 269,453

Claims priority, application Japan, Nov. 13, 1987, 62-285454

Int. Cl.⁴ G02B 15/14, 9/60

U.S. Cl. 350—427

4 Claims



1. An imaging optical system comprising a first lens unit having positive refractive power and the function of a compensator, a second lens unit having negative refractive power and the function of a variator, a third lens unit having positive refractive power and the function of an imaging lens, and a stop arranged before the first lens unit, said imaging optical system being so designed as to satisfy the following conditions (1), (2) and (3):

- (1) $1.4 > \beta_1/\beta_{ST} > 0.71$
- (2) $f_W \leq f_1 \leq f_T$
- (3) $2 < f_W/f_3 < 3.2$

wherein the reference symbol f_1 represents focal length of the first lens unit, the reference symbol f_3 designates focal length of

the third lens unit, the reference symbol f_W denotes focal length of the optical system as a whole at the wide position thereof, the reference symbol f_T represents focal length of the optical system as a whole at the tele position thereof, the reference symbol β_1 designates magnification of the first lens unit, and the reference symbol β_{ST} denotes magnification of the optical system as a whole at an intermediate focal length thereof.

4,874,233

DIAPHRAGM CONTROL DEVICE FOR INTERCHANGEABLE LENS

Hiroshi Yamamoto, Kanagawa; Shigeru Yoshida, and Katumi Yoshida, both of Saitama, all of Japan, assignors to Canon Kabushiki Kaisha and Canon Denchi Kabushiki Kaisha, both of Tokyo, Japan

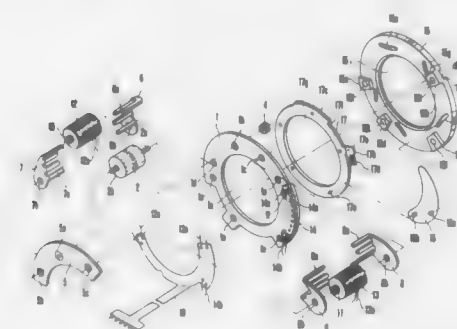
Filed Apr. 7, 1987, Ser. No. 35,453

Claims priority, application Japan, Apr. 14, 1986, 61-055846[U]; Apr. 14, 1986, 61-085516; Jul. 16, 1986, 61-167494; Jul. 17, 1986, 61-168913; Jul. 17, 1986, 61-168914; Jul. 18, 1986, 61-169431

Int. Cl.⁴ G02B 15/00, 7/14

U.S. Cl. 350—429

18 Claims



12. A diaphragm device for an interchangeable lens, comprising:

- (a) a cam plate having an optical path opening in a central portion thereof;
- (b) a rotary plate having an optical path hole in a central portion thereof and being arranged to face said cam plate, said rotary plate having a toothed portion on a part of an outer peripheral surface thereof, said toothed portion being disposed inside of an outermost peripheral surface of said cam plate;
- (c) a plurality of diaphragm blades rotatably mounted between said rotary plate and said cam plate and arranged to open or close said optical path opening and said optical path hole when said rotary plate rotates;
- (d) a motor located outside of said optical path opening and said optical path hole; and
- (e) a gear to be rotated by a rotating force of said motor and engageable with said toothed portion of said rotary plate so as to rotate said rotary plate by the rotating force of said motor.

4,874,234

TORIC CONTACT LENS WITH DISPLACED CENTER OF GRAVITY

Otto Wichterle, Prague, Czechoslovakia, assignor to Ceskoslovenska akademie ved, Czechoslovakia

Filed Jan. 11, 1985, Ser. No. 743,519

Claims priority, application Czechoslovakia, Jan. 18, 1984, 4634-86

Int. Cl.⁴ G02C 7/04

U.S. Cl. 351—161

5 Claims

1. A toric contact lens with a center of gravity displaced in the direction towards its edge due to one-sided thickening, wherein an optical zone of the said lens has a center of gravity

precisely in the lens axis, the thickening being along one edge of the lens to displace the center of gravity of the whole lens outside its axis, said thickening having the shape of a drop



which would be formed by the running down due to gravity of a liquid wetting the front convex surface of the lens after placing the lens in a vertical position.

4,874,235

STEREOSCOPIC VIEWING SYSTEM AND METHOD

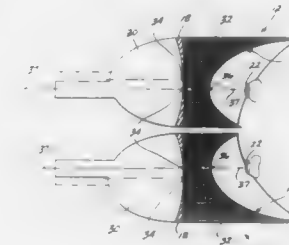
John A. Webster, 2077 Dike Rd., Mt. Vernon, Wash. 98273

Filed Nov. 17, 1987, Ser. No. 121,441

Int. Cl.⁴ A61B 3/08; G02C 1/00

U.S. Cl. 351—201

11 Claims



1. Apparatus for the viewing of stereoscopic images by a viewer, the apparatus being used in conjunction with contact lenses that cause the viewer's eyes to be closely focused, comprising:

- image display means including means for receiving signals representative of left and right images, left and right concave display surfaces, each surface having a display center, and means for displaying said left and right images on said display surfaces; and
- mounting means for closely mounting said display surfaces at fixed positions relative to the viewer's head such that the viewer's centerlines of vision are aligned with said display centers, whereby the viewer's eyes are focused on said display surfaces.

4,874,236

OPHTHALMOLOGIC APPARATUS FOR FUNDUS EXAMINATION

Fabian Abraham, Bnei-Brak, Israel, assignor to Ramot University Authority for Applied Research and Industrial Development Ltd., Tel-Aviv, Israel

Filed Mar. 2, 1988, Ser. No. 163,049

Claims priority, application Israel, Mar. 4, 1987, 81776

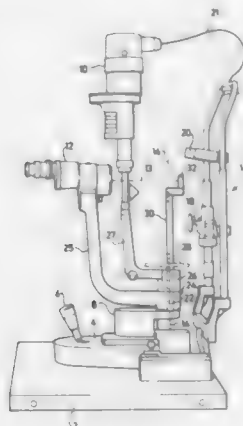
Int. Cl.⁴ A61B 3/10

U.S. Cl. 351—205

14 Claims

1. Ophthalmologic apparatus for fundus examination of a patient's eyes, comprising: a base, an illumination device carried by said base and rotatable about a vertical axis, a microscope carried by said base and rotatable about said vertical axis, a fixture for fixing the patient's head and eyes with respect to said vertical axis, a vertical rod carried by said base along said vertical axis, and a lens carried at the upper end of said

vertical rod in the optical axis of the microscope and the examined eye and displaced from said vertical axis towards said



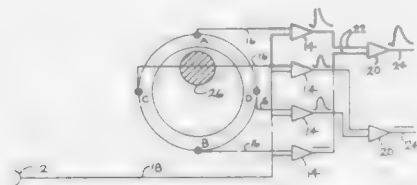
examined eye for a fixed distance, corresponding to the power of said lens, such as to image the retina of the examined eye at a location for reimagining it by the microscope.

4,874,237

ELECTRORETINOGRAM APPARATUS

Stephen J. Cringle, Hillarys, Australia, assignor to Lions Eye Inst. of Western Australia, Nedlunda, Australia
Filed May 5, 1988, Ser. No. 190,755
Claims priority, application Australia, May 7, 1987, PI1790
Int. Cl.⁴ A61B 3/10, 5/04
U.S. Cl. 351—221

8 Claims



1. An electroretinogram apparatus for taking measurements of signals from a person's eye in response to stimulus which comprises a first reference electrode arranged to be electrically connected to a part of the person's body and a plurality of second scleral electrodes arranged to be distributed in spaced apart manner, about the sclera away from the cornea, means for simultaneously recording the amplitude of signals from the plurality of second scleral electrodes and means for recording differences between opposed pairs of electrodes of the plurality of second scleral electrodes thereby allowing the determination of the magnitude and location of a lesion that may be present in the eye.

4,874,238

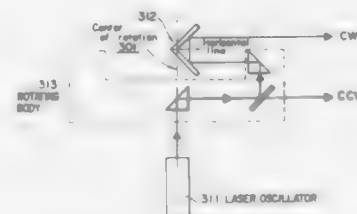
METHOD AND DEVICE FOR MEASUREMENT WITH LASER BEAM

Tatsuyuki Ochi, Nobuo Tanaka, and Kohel Mio, all of Yokohama, Japan, assignors to Kajima Corporation, Tokyo, Japan
Filed Jun. 25, 1987, Ser. No. 66,423
Claims priority, application Japan, Aug. 27, 1986, 61-199096; Dec. 3, 1986, 61-286783; Jan. 26, 1987, 62-13986
Int. Cl.⁴ G01C 1/00; G02B 26/08
U.S. Cl. 356—1

6 Claims

2. A device for detecting an angle using a laser, comprising a laser device for rotatingly irradiating at least two laser beams in substantially parallel horizontal planes, said laser device being placed at a reference point, a measuring point sensor for

detecting said laser beams, said sensor being placed at a measuring point which forms a first line between said reference point and said measuring point, a time measuring device for measuring time intervals between detections of said laser beams and an angle computing display device that calculates



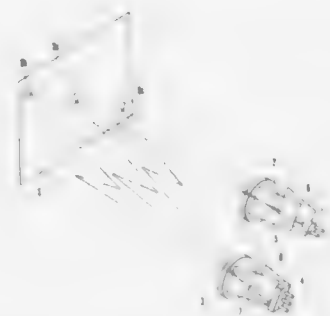
an angle between a symmetrical axis of said two laser beams and said first line and then displays said angle, wherein said laser device has at least one prism means for splitting a laser beam from a laser oscillator means and for projecting said two laser beams which rotate in opposite angular directions.

4,874,239

DISTANCE MEASURING DEVICE

Shuichi Tamura, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 31,158, Mar. 25, 1987, abandoned, which is a continuation of Ser. No. 636,590, Aug. 1, 1984, abandoned. This application Mar. 21, 1988, Ser. No. 171,151
Claims priority, application Japan, Aug. 10, 1983, 58-145068
Int. Cl.⁴ G01C 3/08; G03B 3/00
U.S. Cl. 356—4

48 Claims



1. A transmitting/receiving device for projecting a plurality of signal light beams toward a plurality of places on an object and receiving the signal light beams reflected from the object, comprising:

- light emitting means for emitting light;
- reflection means for reflecting a portion of the light emitted from said light emitting means in a non-parallel direction with respect to the unreflected portion of said emitted light;
- a projection member for forming said plurality of signal light beams by converging the unreflected portion of said emitted light toward a first place on the object, and by converging the reflected portion of the emitted light toward a second place on the object, the plurality of formed signal light beams emanating from a common portion of said projection member and being projected respectively to said first and second places; and
- light receiving means for receiving the signal light beams reflected from said object.

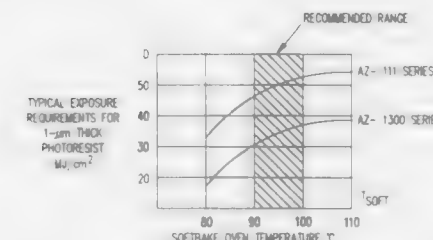
4,874,240

CHARACTERIZATION OF SEMICONDUCTOR RESIST MATERIAL DURING PROCESSING

Michael P. C. Watts, Portola Valley; Thiloma I. Perera, Sunnyvale; David W. Myers; Robert G. Ozarski, both of Livermore; John F. Schipper, Palo Alto, and Raul V. Tan, San Jose, all of Calif., assignors to Hoechst Celanese, Somerville, N.J.
Filed Mar. 1, 1988, Ser. No. 162,431
Int. Cl.⁴ G01B 11/00

U.S. Cl. 356—73

10 Claims



1. A method for evaluating the quality of a semiconductor resist material produced by a softbake process, that contains a solute and a solvent and that is deposited as a substantially planar film on a substrate, the method comprising the steps of: determining the absorption $a=1-e^{-\alpha L}$ (L =single pass optical path length in the film of interest, if any) and absorption coefficient (αL) of the substrate surface before the coat process begins, through a measurement of Total Reflectivity of the substrate surface for a predetermined wavelength λ , predetermined incidence angle θ_1 and known index of refraction of the substrate; depositing a resist film on the substrate at an estimated predetermined thickness; determining the thickness of the resist film through a measurement of Total Reflectivity of the resist film at each of a sequence of one or more predetermined wavelengths $\lambda_1, \lambda_2, \dots, \lambda_r$ at a sequence of one or more predetermined film incidence angles $\theta_{1,1}, \theta_{1,2}, \dots, \theta_{1,r}$ (with $r \geq 3$); determining the absorption of $a=1-e^{-\alpha L}$ of the resist film after the coat process and before completion of the softbake process through a measurement of Total Reflectivity of the resist film for a predetermined wavelength λ , predetermined film incidence angle θ_1 , and predetermined film thickness h ; forming the quantity $\Delta=\alpha L-(\alpha L)_0$ for each of the sequence of combinations of substrate and resist film deposited thereon; comparing the value of Δ for each such combination with a predetermined target value Δ_t ; performing the softbake process for each such combination; forming the quantity $\rho=h/\Delta$ for each of the sequence of combinations of substrate and resist film deposited thereon; and comparing the value of ρ for each such combination with a predetermined target value ρ_t .

4,874,241

APPARATUS FOR THE INSPECTION OF TUBULAR TEXTILE PRODUCTS

Noël Egea, and Corinne Olive, both of Le Vigan, France, assignors to Societe Compagnie Generale Textile Cogetex, Le Vigan, France

Filed Jul. 22, 1988, Ser. No. 223,431

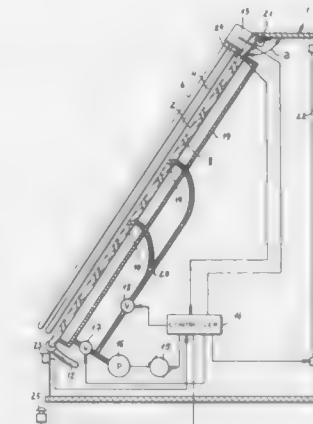
Claims priority, application France, Jul. 23, 1987, 8710847
Int. Cl.⁴ G01N 21/88

U.S. Cl. 356—238

9 Claims

1. An apparatus for the inspection of tubular textile products, comprising:
an illuminated table;
a form for receiving a tubular textile product to be inspected and disposed along a front face of said illuminated table,

said form comprising two pairs of mutually parallel arms extending generally upwardly and each receiving a tubular textile portion with each pair including a fixed arm and a transversely movable arm;
means for displacing said transversely movable arms upon the respective textile portions having been drawn over the respective pairs of arms, thereby spreading said portions



and enabling inspection thereof with light from said table, said table being traversed over the entire thickness thereof by oblique orifices oriented to direct respective jets of air forwardly toward said front face and upwardly at said tubular textile product to be inspected and to draw said portions upwardly over said arms; and
means along a rear surface of said table communicating with said orifices for delivering compressed air to said orifices.

4,874,242

DEVICE FOR DETECTION OF EXTRANEOUS SUBSTANCES THROUGH A WALL AND A SYSTEM FOR AIDING THE DRIVING OF AUTOMOBILES OR AIRPLANES

Jean-Jacques Bezaud, Chanton; Philippe Feppon, Paris, and Pierre Rodionoff, Courbevoie, all of France, assignors to Jaeger, Levallois Perret, France

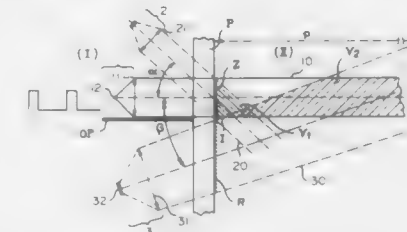
Filed Jul. 3, 1986, Ser. No. 881,900

Claims priority, application France, Jul. 4, 1985, 85 10277; Feb. 17, 1986, 86 02093

Int. Cl.⁴ G01N 21/49; G60Q 1/08; G08B 21/00

U.S. Cl. 356—341

26 Claims



1. A device for detecting the presence of extraneous substances in the vicinity of the surface of a separation wall between a first and a second medium, the wall having a first medium surface exposed to the first medium and a second medium surface exposed to the second medium, the substances being positioned in said first or second medium, said device comprising, on a first medium side of said wall:
means for illumination of said wall by means of a source of electromagnetic radiation having a wavelength which corresponds to the transparency or semi-transparency of the constitutive material of said wall, said means permit-

ting illumination of the surfaces of said wall by an illumination beam in accordance with a reference illumination zone;

first directional detector means sensitive to said electromagnetic radiation and having a first reception cone that permits, in the region of said second medium surface of said wall, substantial covering of said reference illumination zone, said reception cone having, with respect to said illumination beam, an inclination such that a volume resulting from intersection of said illumination beam and said reception cone beyond said second medium surface of said wall is a minimum;

second directional detector means sensitive to said electromagnetic radiation, and having a second reception cone that permits in the region of said second medium surface the defining of a reception zone adjacent said reference illumination zone, the second reception cone having, with respect to said illumination beam, an inclination such that a volume resulting from intersection of said illumination beam and said second reception cone beyond said second medium surface of said wall is a maximum, the illumination beam and the second reception cone having adjacent generatrices which intersect at a point of intersection situated in said second medium in the vicinity of said second medium surface of said wall, one of the extraneous substances being a solid, liquid or pasty substance deposited or precipitated on said second medium surface of said wall, particularly in said reference illumination zone, and a second extraneous substance detected being a vapor, aerosol, or solid particles in suspension in said second medium, said first and second detector means being electronically coupled in order that a first detected signal delivered by said first detector means constitutes a reference correction signal vis-a-vis a second detected signal delivered by said second detector means, said second detected signal being representative of retrodiffusion alone of said illumination beam by said second extraneous substance in suspension in said second medium.

4,874,243

APPARATUS FOR CONTINUOUSLY MEASURING THE TURBIDITY OF A FLUID

Benno Perren, Austrasse 33, 5430 Wettingen, Switzerland
PCT No. PCT/CH87/00108, § 371 Date Apr. 25, 1988, § 102(e)
Date Apr. 25, 1988, PCT Pub. No. WO88/01737, PCT Pub.
Date Mar. 10, 1988

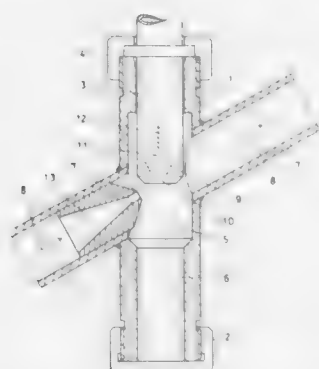
PCT Filed Aug. 26, 1987, Ser. No. 194,990

Claims priority, application Switzerland, Sep. 1, 1986,
3505,746

Int. Cl.⁴ G01N 21/15, 21/53

U.S. Cl. 356—342

14 Claims



1. An apparatus for continuously measuring turbidity of a fluid which contains particles causing turbidity, comprising: a turbidity measuring device containing a measuring cham-

ber and a measuring probe extending into said measuring chamber;

throughflow means for throughpassing at least a portion of the fluid to be investigated;

said throughflow means being connected to said turbidity measuring device for throughpassing said fluid to be investigated through said measuring chamber in a predetermined throughflow direction;

said measuring probe extending into said measuring chamber, containing an end face located in said measuring chamber and a single end window located at said end face and extending at a predetermined angle relative to said throughflow direction of said fluid to be investigated;

said throughflow means directing said fluid to be investigated to impinge at a predetermined angle upon said single end window located at said end face of said measuring probe, and at a fluid flow rate sufficient to prevent deposit formation on said single end window;

radiation guide means contained in said measuring probe for guiding and passing radiation through said single end window located at said end face of said measuring probe for irradiating said fluid to be investigated and throughpassing through said measuring chamber; and

an optical system contained in said measuring probe and cooperating with said single end window for receiving reflected radiation reflected by turbidity causing particles present in said fluid to be investigated and throughpassing through said measuring chamber.

4,874,244

METHOD AND APPARATUS FOR INCREASING THE UNAMBIGUOUS SENSING RANGE IN AN INTERFEROMETRIC FIBER GYROSCOPE

Alan D. Kersey, Springfield, Va., assignor to Sachs/Freeman Associates, Inc., Landover, Md.

Filed Jun. 30, 1987, Ser. No. 68,181

Int. Cl.⁴ G01B 9/02

U.S. Cl. 356—350

28 Claims



1. A device for determining the operational fringe number of an interferometric optical fiber system comprising:

(a) means for providing first and second light signals having different wavelengths;

(b) means for combining said first and second signals into a combined input;

(c) means for introducing said combined input into an interferometric fiber system;

(d) means for detecting an output emanating from said interferometric system resulting from the introduction of said combined input into said system;

(e) means for dividing said output into a plurality of output signals, each representing a portion of said output attributable to one of said light signals; and

(f) means for determining the phase lag between said output signals, said phase lag being used to determine said operational fringe number.

4,874,245

OPTICAL SHAFT ANGULAR AND TORSIONAL DISPLACEMENT AND SPEED SENSING SYSTEM

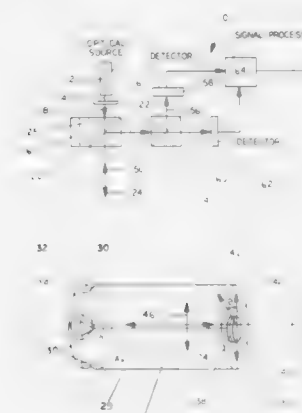
William B. Spillman, Jr., Charlotte; Robert E. Rudd, III, Middlebury; Sylvester M. Ellinger, North Ferrisburg; Douglas R. Patriquin, Middlebury, and Bruce R. Kline, Starksboro, all of Vt., assignors to Simmonds Precision Products, Inc., Wilmington, Del.

Continuation-in-part of Ser. No. 162,794, Feb. 26, 1988. This application Jun. 3, 1988, Ser. No. 201,800

Int. Cl.⁴ G01B 11/26

U.S. Cl. 356—364

17 Claims



1. An apparatus for determining the displacement of a hollow rotatable shaft comprising:

polarization means disposed on a rotatably mounted hollow shaft for changing the polarization state of light energy; said polarization means comprising a retardation plate, said plate being disposed on an end of the shaft;

light producing means adapted to produce polarized light energy and direct the light energy toward said plate;

said detector means being adapted to detect the change in the polarization state of the light energy from said polarization means; and

means for determining the torsional displacement of said shaft from the detected change in polarization state of the light energy.

4,874,246

ARRANGEMENT FOR OPTICALLY MEASURING A DISTANCE BETWEEN A SURFACE AND A REFERENCE PLANE

Arie J. Dea Boef, Eindhoven, Netherlands, assignor to U.S. Philips Corp., New York, N.Y.

Continuation of Ser. No. 55,656, May 28, 1987, abandoned. This application Jan. 17, 1989, Ser. No. 298,200

Claims priority, application Netherlands, Jun. 4, 1986,
8601433

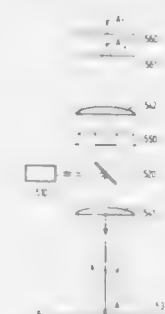
Int. Cl.⁴ G01B 11/24

U.S. Cl. 356—375

13 Claims

1. An apparatus for optically measuring the distance between a surface and a reference plane, comprising a radiation-source unit for illuminating an area on the surface with a narrow substantially parallel beam of radiation, a radiation-sensitive detection system for converting the radiation reflected from the surface into an electric signal, and an optical system having spherical aberration arranged between the surface and the detection system for concentrating radiation reflected from the surface on the detection system and said detection system being located at a position such that the radiation reflected from the surface is of a small cross section due to said spherical aberration, means for directing said radiation from said radiation-source unit along the optical axis of the optical system wherein a radiation-blocking plate is arranged in the radiation

path between the surface and the detection system, which plate is formed with at least two radiation windows which are situated at a predetermined distance from one another and at a predetermined distance from the optical axis of the optical system, so as to select corresponding portions from the radiation beam originating from said surface in order to form on the



radiation-sensitive detection system radiation spots corresponding to the radiation windows in the radiation-blocking plate, the extent of the pattern of radiation spots thus formed being a measure of the distance between the surface and the reference plane.

4,874,247

MEASUREMENT POSITION SYNCHRONIZATION METHOD FOR A SCANNING DENSITOMETER

Hideo Watanabe, and Yoshiaki Kurata, both of Ibaraki, Japan, assignors to Komori Printing Machinery Co., Ltd., Tokyo, Japan

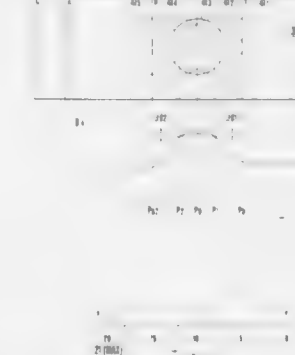
Filed Dec. 4, 1987, Ser. No. 128,693

Claims priority, application Japan, Dec. 8, 1986, 61-290505

Int. Cl.⁴ G01J 3/50

U.S. Cl. 356—402

9 Claims



1. A measurement position synchronization method applied to a scanning densitometer to photoelectrically scan a control strip comprising a plurality of color patches of respective colors printed on a paper to thereby calculate densities of said color patches in each color, said method comprising the steps of

(a) detecting measured values of scanning a color patch of a specified color;

(b) calculating points which have varied respectively by predetermined levels, on the side of a reference level included in said measured values;

(c) determining the intermediate point of said both points to calculate an actual measurement central point of said color patch of said specified color, and

(d) carrying out synchronization of measurement positions in accordance with the difference between, scheduled central point and said actual measurement central point.

4,874,248

APPARATUS AND METHOD FOR MIXING A GEL AND LIQUID

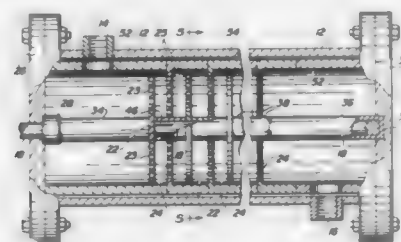
Wayne E. Luetzelshwab, Littleton, Colo., assignor to Marathon Oil Company, Findlay, Ohio

Filed Jul. 27, 1988, Ser. No. 225,104

Int. Cl.⁴ B01F 7/02

U.S. Cl. 366—307

6 Claims



1. Apparatus for diffusing a liquid of relatively low viscosity into a gel of relatively high viscosity, comprising:

- a chamber having an inlet through which a gel and a liquid are introduced into the chamber and an outlet downstream from the inlet through which the diluted gel and liquid are discharged;
- a plurality of rotatable discs mounted for rotation in the chamber, the discs containing apertures through which the gel and liquid flow during passage from the inlet to the outlet;
- means for rotating the rotatable discs to break the gel into relatively small particles;
- the apertures being defined at least in part by edges which break the portions of gel passing through the apertures into smaller particles; and
- stationary plates mounted between the rotatable discs, the stationary plates containing apertures through which the gel and liquid flow during passage between adjacent rotating discs;
- the apertures in the rotatable discs and stationary plates being larger in discs and plates located nearer the inlet than in discs and plates located nearer the outlet;
- whereby the gel is continuously subjected to forces tending to break the gel particles down to smaller size, thereby substantially increasing the amount of surface area of the gel exposed to the liquid to greatly accelerate the diffusion of the relatively low viscosity liquid into the gel.

4,874,249

ARRANGEMENT FOR CONTINUOUS MIXING OF LIQUIDS

Jan Kabátek, and Pavel Dítl, both of Praha, Czechoslovakia, assignors to České vysoké učení Technické, rektorát, Praha, Czechoslovakia

Filed Oct. 7, 1988, Ser. No. 254,622

Claims priority, application Czechoslovakia, Oct. 7, 1987, 7710-W7

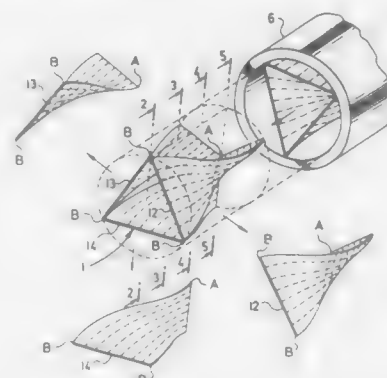
Int. Cl.⁴ B01F 5/06

U.S. Cl. 366—339

3 Claims

1. An arrangement for continuous mixing of fluid media, said arrangement comprising a plurality of inserts with helical surfaces, arranged in a row in a conduit, each said insert comprising a plurality of helical insert members forming a polygon at the inlet of the insert, and extending along the conduit so as to create gaps between individual members, the helical insert members of each insert being mutually connected together at the inlet of the conduit and within a distance of 0.5 to one times the length of the insert, the width of each helical insert member

being variable along the length thereof, whereby the overall throughflow area of the gaps between the helical insert mem-



bers is about 0.2 to 3 times the area of the polygon formed at the inlet of the insert.

4,874,250

APPARATUS FOR EXAMINATION OF HEATS OF TRANSFORMATION OF MATERIAL SAMPLES

Winfried Güner, Überlingen, Fed. Rep. of Germany, assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Continuation of Ser. No. 604,780, Apr. 27, 1984, abandoned.

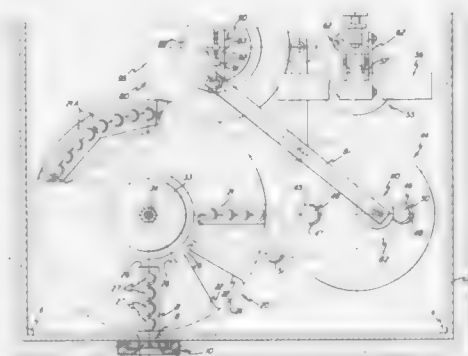
This application Dec. 4, 1986, Ser. No. 942,934

Claims priority, application Fed. Rep. of Germany, May 28, 1983, 3319410

Int. Cl.⁴ G01N 25/20, 25/00

U.S. Cl. 374—43

13 Claims



1. Apparatus for examination of heats of transformation of material samples, comprising:

- a test sample receiver (45) for one of a plurality of individually encapsulated test samples;
- a reference sample receiver (46) for a reference sample;
- a program-controlled cooling or heating device for the controlled cooling or heating of said test and reference samples;
- a measuring device responsive to differences in the heating-up characteristic of said test and reference samples;
- a test sample store for receiving said plurality of individually encapsulated test samples, said test sample store including a turntable adapted to receive elongate sample carriers radially disposed thereon and adapted to contain a plurality of radially-juxtaposed test sample encapsulations;
- a program-controlled transfer mechanism by which one of said plurality of test samples can be transferred from said test sample store into, and removed from, said test sample receiver, said transfer mechanism including

- a lever transmission from which one point in a plane of motion describes a coupler curve passing by said test sample store and said test sample receiver,
- a driving motor for driving said lever transmission, and
- a lifting mechanism movable in a direction normal to said plane of motion for engaging the encapsulation of each said test sample and arranged in said one point of said lever transmission said lever transmission being
- a four-membered lever transmission so dimensioned with respect to its structure-fixed points and the lengths of its members that the coupler curve described by said lifting mechanism extends substantially rectilinearly and radially to said turntable, said lever transmission including
- a first lever connected to a rotatable shaft of said driving motor and extending radially thereto,
- a second lever pivoted in a pivotal point on said first lever and carrying said lifting mechanism, and
- a third lever pivoted at one end of a structure-fixed point and at another end on said second lever between said pivotal point and said lifting mechanism, and
- a program control device for controlling said cooling or heating device and said transfer mechanism whereby during one measurement cycle a test sample is first transferred from said test sample store into said test sample receiver by said transfer mechanism, said cooling or heating device effects the cooling or heating of said test and reference samples to carry out said measurement, and thereafter said test sample is removed from said test sample receiver by said transfer mechanism after said measurement.

4,874,251

THERMAL WAVE IMAGING APPARATUS

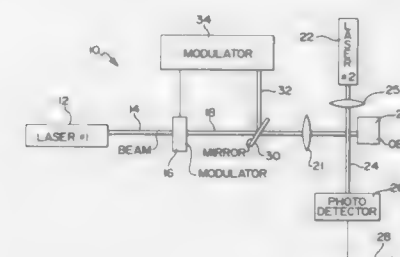
Robert L. Thomas, Huntington Wood; Pao-Kuang Kuo, Troy, and Lawrence D. Favro, Huntington Wood, all of Mich., assignors to Wayne State University, Detroit, Mich.

Continuation of Ser. No. 596,515, Apr. 4, 1984, Pat. No. 4,589,783. This application Feb. 10, 1986, Ser. No. 808,350

Int. Cl.⁴ G01N 21/00, 25/00

U.S. Cl. 374—45

4 Claims



1. An imaging apparatus utilizing A.C. electrical signals generated by a thermal wave scan apparatus and indicative of the configuration of the surface and subsurface of a solid object to produce an on-line, real-time image useful in detecting the presence of surface and subsurface irregularities therein, in which a first heating energy beam is directed through the object to generate a temperature gradient, said imaging apparatus comprising:
- means for converting the A.C. electrical signals generated by the thermal wave scan apparatus to digital signals;
 - memory means for storing the digital signals;
 - central processing means for controlling the transfer of the digital signals to the memory means;
 - means for displaying an on-line, real-time image of the surface and subsurface of the object; and
 - means for generating control signals for controlling X and Y axis point deflection of the displaying means for addressing the memory means to output therefrom signals to

control the intensity of each displayed point on the displaying means.

4,874,252

ELECTRONIC THERMOMETER

Horst Ziegler, Paderborn, and Horst Behlen, Paderborn-Dahl, both of Fed. Rep. of Germany, assignors to W. C. Heraeus GmbH, Hanau, Fed. Rep. of Germany

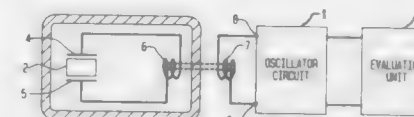
Filed Oct. 25, 1988, Ser. No. 262,512

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1987, 3744196

Int. Cl.⁴ G01K 11/26, 7/32

U.S. Cl. 374—117

12 Claims



1. An electronic thermometer having a generally cylindrical rotatable sealed housing (3) of electrically insulating material; an oscillator comprising a temperature-sensitive piezoelectric element (2) with a mechanical resonance frequency which is temperature-dependent, located inside said housing (3), said element including a pair of terminals (4,5); an oscillator circuit (1), having a pair of oscillator input terminals (8,9) galvanically separated from said rotatable housing and piezoelectric element, and an output; evaluation unit means (10) for detecting temperature, connected to said oscillator output;
- a first coil (6) located adjacent an outer wall of said rotatable housing (3) and connected across said piezoelectric element terminals (4,5), and
- a second coil (7) separated from said rotatable housing (3), but aligned with said first coil (6), and connected across said oscillator input terminals (8,9),
- said coils (6,7) transmitting a temperature-dependent signal from said piezoelectric element (2) to said oscillator circuit (1), thus directly specifying the oscillation frequency thereof, while providing said galvanic separation therebetween.

4,874,253

RADIATION DETECTOR WITH TEMPERATURE DISPLAY

Francesco Pompei, Wayland, and Michael W. Burke, Natick, both of Mass., assignors to Exergen Corporation, Natick, Mass.

Filed Mar. 27, 1987, Ser. No. 32,067

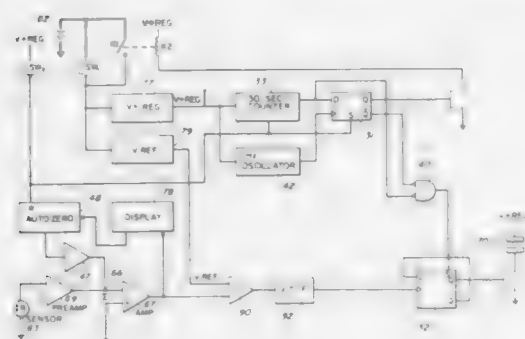
Int. Cl.⁴ G01J 5/26

U.S. Cl. 374—121

34 Claims

10. A radiation detector comprising:
- a radiation sensor providing a radiation signal indicative of sensed radiation;
 - an autozero circuit which establishes a reference signal which is summed by summing means with the radiation signal from the radiation sensor to provide a display signal;
 - a display assembly responsive to the display signal and having a multicolor display for providing a visual indication of the amount of radiation sensed by the radiation sensor, the display arranged in segments of different colors;
 - a sound generator means for generating an audible signal with differing pulse frequencies, each pulse frequency corresponding to an amount of radiation indicated by the display such that the pulse frequency increases for increasing amounts of radiation indicated on the display
 - means for filtering out short wavelengths on the order of less than about 1.5 microns while allowing longer wave-

lengths above about 1.5 microns generated by sources of interest to be sensed by the sensor; and
a timing circuit means initialized when power is applied to the detector and which maintains power supply to circuits of the detector for a predetermined length of time through control of an internal power switch means and thereafter



automatically shuts off the detector by applying a control signal to the internal power switch means and a signal to actuate the sound generator means prior to shut-off of the detector said reference signal being reset when the detector is turned on subsequent to its automatically shutting off.

4,874,254

COOLANT OUTLET ELEMENT FOR USE IN COOLING SYSTEM OF INTERNAL COMBUSTION ENGINE

Tsunao Miyamura, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

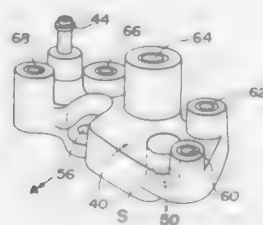
Filed Sep. 15, 1988, Ser. No. 244,683

Claims priority, application Japan, Sep. 30, 1987, 62-149940[U]

Int. Cl.⁴ G01K 1/00

U.S. Cl. 374—208

4 Claims



1. A coolant outlet element for use in an internal combustion engine for mounting a plurality of temperature sensing elements for detecting the temperature of coolant in the engine, comprising a shell body formed with a coolant inlet port adapted to be directly connected with a coolant extraction port of the engine, a coolant outlet port adapted to be connected with a coolant pump equipped in the engine, a coolant passage defined in said shell body to extend between said coolant inlet port and said coolant outlet port, at least one inner deflector wall portion for deflecting said coolant passage in turn in a U-shape in said shell body, and a plurality of temperature sensing element fitting apertures positioned in series along said coolant passage as spaced apart from one another so as to receive the temperature sensing elements in a manner that temperature sensing portions of said temperature sensing elements are exposed to a flow of coolant passing along said coolant passage.

4,874,255

TOP GUSSET BAG WITH INTEGRAL HANDLE

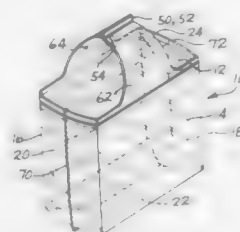
James R. Ball, Kent, and Delbert J. Barnard, Federal Way, both of Wash., assignors to Cello Bag Company, Inc., Seattle, Wash.

Filed Dec. 2, 1988, Ser. No. 278,785

Int. Cl.⁴ B65D 33/10

U.S. Cl. 383—8

15 Claims



1. A handle bag, comprising:
first and second panels of flexible thermoplastic material overlying one another and together presenting an upper boundary and a lower boundary;
a web of thermoplastic material folded on itself, to form two web sections joined by a bight, and two edges near each other opposite the bight, said folded web being positioned between the two panels, with the bight of the folded web directed towards the lower boundary of the panels and the edges of the folded web spaced from the upper boundary of the panels a distance at least as large as the folded width of the web;
a heat seal on each side of the bag connecting an edge portion of each web section to an adjoining portion of the adjacent panel, to connect the web edge portions to the panels along lines which extend parallel to the bight and edges of the web and also parallel to the upper and lower boundaries of the panels;
heat seals sealing the panels and folded web together along spaced apart lines which extend parallel to each other and perpendicular to the bight and edges of the folded web and also perpendicular to the upper and lower boundaries of the panels, to form bag side seals which connect together the two sections of the folded web and the adjoining portions of the two panels, in the region where the folded web is between the two panels, and which also connect the two panels together in the regions of the panels which extend between the bight of the folded web and the lower boundary of the panels;
said panels being connected to each other and to the folded web by the heat seals in a manner so that the bag when filled can approximate the shape of a hexahedron with the web unfolded to form a closed top for the bag;
said panels being connected together at the upper boundary of the panels; and
wherein the portions of the panels that are located between the upper boundary of the panels and the heat seals which connect the web to the panels form a handle which extends over the closed top of the bag from one side of the bag to the other.

4,874,256

BAG WITH CARRYING HANDLE FOR CONTAINING MERCHANDISE

Patrick A. Baines, Charlotte, N.C., assignor to Venture Packaging, Inc., Charlotte, N.C.

Filed May 24, 1988, Ser. No. 198,102

Int. Cl.⁴ B65D 33/06

U.S. Cl. 383—21

11 Claims

1. A bag for receiving and containing merchandise and the like, said bag comprising a sheet of flaccid material folded along a fold line to provide two juxtaposed wall panels having adjacent side edges joined to one another, said fold line being

tucked inwardly between said juxtaposed wall panels forming top edges along said wall panels and provides overlapping portions of said wall panels thereby forming a gusset consisting of said overlapping portions of said wall panels, a separate strip of material folded along a fold line extending along the length thereof to provide side portions on opposite sides of said fold line, said strip being disposed about said wall panels externally of said gusset with said fold line of said strip extending generally parallel to and adjacent to said top edges of said wall panels with said side portions of said strip extending across portions of said wall panels respectively, seal means joining the side portions of said strip of material at each end thereof to said

form a tape strip U-shaped portion, said brim portions having marginal edges on sides of the respective zipper strip portions remote from said tape strip U-shaped portion, said marginal edges being sealed to said sealing edges of said bag body with said sheet U-shaped portion facing said tape strip U-shaped portion in opposed relationship.

4,874,258

BULK CARGO CONTAINER WITH INNER LINER

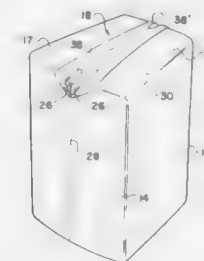
Frank J. Marino, Opa Locka, Fla., assignor to Marino Technologies, Inc., Opa Locka, Fla.

Filed Jun. 23, 1988, Ser. No. 210,326

Int. Cl.⁴ B65D 30/08

U.S. Cl. 383—111

4 Claims



respective portions of said wall panels at seals formed in a V-shaped pattern defined by lines extending diagonally between said side edges and said top edges of said wall panels, and said strip having a slit therein at each end thereof along said fold line whereby the filling of said bag with merchandise will result in said wall panels assuming an open disposition having an end panel formed by said gusset, said slit having a predetermined length to permit said side portions of said strip to separate at said ends thereof and to permit said wall panels to assume said open disposition when said bag is filled, with said strip extending across said end panel and adjacent thereto to provide a handle for lifting and carrying said bag with the weight of said merchandise being borne at said seals.

4,874,257

METHOD OF FORMING A CLOSED FILLED BAG, A BAG CONSTRUCTION AND AN APPARATUS FOR FORMING THE BAG

Hirofumi Inagaki, Aichi, Japan, assignor to Nihon Tokkyo Kanri Company Limited, Tokyo, Japan

Filed Jan. 25, 1988, Ser. No. 148,352

Claims priority, application Japan, Jan. 27, 1987, 62-17738; Jan. 28, 1987, 62-11027[U]; Jan. 29, 1987, 62-12404[U]; Mar. 17, 1987, 62-63305

Int. Cl.⁴ B65D 33/16

U.S. Cl. 383—63

5 Claims



1. A bag construction, comprising a plastic seamless sheet having an U-shaped portion with sealing edges and a first and second pair of opposed ends which are sealable to cooperate with the U-shaped portion to define a bag body, a tap strip having opposed brim portions each having a zipper strip portion with a projection on one and a receiving socket on the other which are interengageable and hold said brim portions to

1. In a bulk cargo container comprising an outer bag member formed of flexible material and including upstanding and interconnected side walls, top and bottom wall means associated with the respective upper and lower ends of said side walls, and seam means extending around at least portions of the upper and lower ends of said side walls and serving to join said top and bottom wall means thereto, and an impervious inner liner of flexible material positioned within said outer bag member and including an outer surface generally conforming to the inner surface of said outer bag member, the combination thereof with of means for releasably fastening said liner in said outer bag member, and wherein said releasable fastening means includes first mechanical fastening means fixed to the inner surface of said outer bag member and in spaced-apart locations adjacent the upper and lower ends of the side walls thereof, and second mechanical fastening means fixed to the outer surface of said liner and positioned adjacent said first fastening means, said first and second fastening means being contained entirely within the area between the inner surface of said outer bag member and the outer surface of said liner and being connectable together to maintain said liner in conforming condition relative to said outer bag member during both loading of material into said cargo container and unloading of material from said cargo container, and said first and second fastening means being separable to permit removal of said liner from said outer bag member.

4,874,259

BEARING DEVICE ASSEMBLY

Isoo Sato, Sagami-hara; Nobuhiko Miyake, Yokohama, and Souji Nishida, Fujisawa, all of Japan, assignors to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 14, 1988, Ser. No. 144,319

Claims priority, application Japan, Jan. 19, 1987, 62-5763[U]

Int. Cl.⁴ F16C 43/04

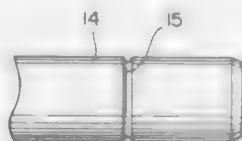
U.S. Cl. 384—445

11 Claims

1. In a bearing device assembly including a shaft member supported by a rolling bearing at an intermediate position thereof, and a rotary member mounting seat press fitted to one

axial end of said shaft member, said shaft member having a rust resisting oil attached thereto, the improvement comprising:

a ring-shaped recess formed in at least one of a peripheral surface of the one axial end of said shaft member at one end thereof and an inner surface of said rotary member mounting seat, shoulder means formed on said recess for



scraping off the oil attached to said one axial end of said shaft member by relative movement between the shoulder means of said recess and an end face of one of said shaft member and said rotary member mounting seat, and for directing any remaining oil on the fitting surface into said recess after said shaft member has been fitted into said rotary member mounting seat.

4,874,260

CAGE OUTER DIAMETER PROFILE

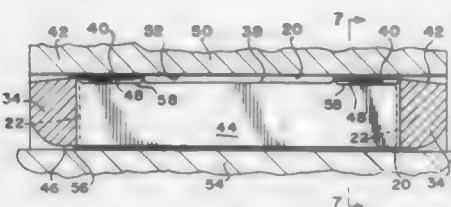
Stephen T. Podhajski, Norfolk, Conn., assignor to The Torrington Company, Torrington, Conn.

Filed Mar. 21, 1988, Ser. No. 171,046

Int. Cl.⁴ F16C 33/48

U.S. Cl. 384-470

3 Claims



1. A cage-and-roller assembly comprising an annular cage and multiple rollers concentric with and radially inward of an outer raceway and lubricated with a fluid lubricant, wherein said cage comprises:

two annular end rims having outer surfaces; multiple cross-bars, each of said cross-bars having a midsection outer surface, two land surfaces, two side surfaces and two ends, each of said ends being joined to one of said end rims, and said cross-bar land surfaces extending radially outwardly a greater distance than said midsection outer surface and said end rim outer surfaces so as to allow said cross-bar land surfaces to ride on said outer raceway; multiple pockets defined by said end rims and said cross-bars, and sized to accommodate one of said rollers in each of said pockets; and multiple ramp surfaces formed axially on each side of each of said cross-bar land surfaces, each of said ramp surfaces being formed at the juncture of said cross-bar land surface and one of said two cross-bar side surfaces, said ramp surface forming a tangential angle with said cross-bar land surface, and said ramp surface extending circumferentially from said cross-bar land surface into the adjacent pocket so as to limit outward radial motion of said rollers, said tangential angle of said ramp surfaces resulting in a hydrodynamic wedge effect to increase the pressure of said fluid lubricant between said cross-bar land surfaces and said outer raceway.

4,874,261

SEAL FOR BEARINGS

Franco Colanzi, and Angelo Vignotto, both of Turin, Italy, assignors to Riv-SKF Officine di Villar Perosa S.p.A., Turin, Italy

Filed Nov. 28, 1988, Ser. No. 276,800

Claims priority, application Italy, Dec. 23, 1987, 68117 A/87

Int. Cl.⁴ F16C 33/78

U.S. Cl. 384-484

10 Claims



1. Sealing shield assembly for a rolling bearing having at least one ring with a seat comprising at least one essentially reinforcing member and an anchoring device made of an elastomeric material for securing said reinforcing member in the bearing seat, said reinforcing member including a peripheral annular sleeve portion shaped like a cylindrical sleeve, and said anchoring device including a radially elastically compressible sleeve section made of an elastomeric material and secured as a unit to the said reinforcing sleeve portion on a lateral coupling surface thereof, adapted to be interposed between the said annular sleeve portion and the bearing seat, a plurality of axial grooves on a separate lateral surface opposite the said coupling surface of said reinforcing annular sleeve portion, said grooves extending from a continuous annular end portion of the said elastomeric sleeve section to a point corresponding to a terminal rim of the said sleeve section interrupted by the said grooves, said elastomeric sleeve section being capable of interacting radially with interference with the bearing seat.

4,874,262

PRINTER HAVING PIVOTABLE RIBBON GUIDE

Takeshi Yokoi, Kakamigahara, and Shigeo Nakamura, Kasugai, both of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

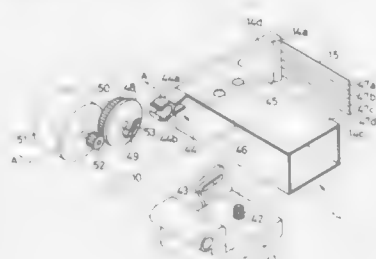
Filed Apr. 13, 1988, Ser. No. 271,811

Claims priority, application Japan, Apr. 15, 1987, 62-94078

Int. Cl.⁴ B41J 35/16

U.S. Cl. 400-216.1

24 Claims



1. A printer comprising:

a generally elongate platen supported at opposite ends thereof by a frame;

a first guide shaft and a second guide shaft which are supported at opposite ends thereof by said frame, so as to

extend parallel to said platen, said second guide shaft being spaced by a greater distance away from said platen than said first guide shaft;

a carriage slidably supported by said first and second guide shafts, for movements along said platen;

a print head mounted on said carriage so as to face said platen;

a ribbon cassette including a ribbon, and a ribbon container which accommodates said print ribbon such that an active length of said ribbon is exposed outside said container;

a ribbon guide supported by said second guide shaft pivotally about a central longitudinal axis of second guide shaft, for supporting said active length of said ribbon so as to pass between said platen and said print head;

ribbon-guide drive means for pivoting said ribbon guide about said second guide shaft and thereby moving said active length of the print ribbon relative to said print head and said platen, in a direction perpendicular to a longitudinal direction of said platen.

4,874,263

TWO BY ONE TWILL WEAVE FOR AN IMPRESSION PATTERN

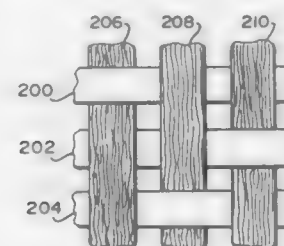
Jones McCall, 105 1/2 Sunset Dr.; Tom McClure, 102-D Yester Oaks, West, and Letcher Moore, 2904 Stratford Dr., all of Greensboro, N.C. 27405

Continuation of Ser. No. 869,708, Jun. 2, 1986, abandoned. This application Dec. 15, 1988, Ser. No. 285,364

Int. Cl.⁴ B41J 31/02

U.S. Cl. 400-241.3

24 Claims



1. An impression printing tape constructed of fabric comprising a plurality of synthetic yarns interlaced with one another in a two by one twill weave, and wherein ink applied to the fabric is stored within interstices formed between the interlaced synthetic yarns.

4,874,264

SELECTIVE MAGNETIC ATTACHMENT OF A PRINT HEAD TO A DRIVE BELT

Takami Suzuki; Yoshikuni Tatara, both of Yokohama, and Tomoyuki Moriya, Hiratsuka, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 935,300, Nov. 26, 1986, abandoned, which is a continuation of Ser. No. 609,500, May 11, 1984, abandoned. This application Aug. 19, 1987, Ser. No. 86,956

Claims priority, application Japan, May 12, 1983, 58-83254; Aug. 20, 1983, 58-150957; Aug. 25, 1983, 58-154035; Aug. 31, 1983, 58-157788; Sep. 9, 1983, 58-165029

Int. Cl.⁴ B41J 19/56

U.S. Cl. 400-335

7 Claims

1. A printer for printing graphic information as well as character information selectively, comprising:

a housing;

a platen roller rotatably supported in said housing;

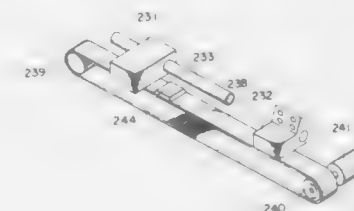
first driving means for driving said platen roller to rotate it;

a plurality of printing means supported to be movable independently from one another along said platen roller in a reciprocating manner;

second driving means for driving at least one of said printing means to move it along said platen roller;

coupling means for selectively coupling at least one of said printing means to said second driving means; and

control means connected to said first and second driving means, said plurality of printing means and said coupling means for controlling the operation of said printer, wherein



said second driving means includes a transmitting member disposed along said platen roller and a driving motor for driving said transmitting member in either direction, and said coupling means includes at least one magnetic element fixedly attached to said transmitting member and a plurality of electromagnet units each fixedly provided in a corresponding one of said printing means, one of said plurality of electromagnet units being selectively energized by said control means to be coupled to said magnetic element.

4,874,265

IMPACT MECHANISM FOR IMPACT PRINTER

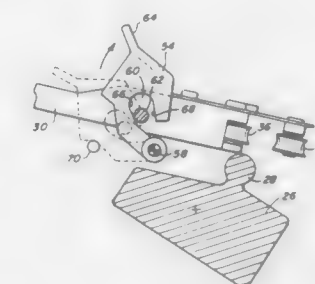
Helmut K. Waibel, Fremont, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Jun. 14, 1988, Ser. No. 206,555

Int. Cl.⁴ B41J 9/04

U.S. Cl. 400-357

2 Claims



1. An impact mechanism is an impact printer, for delivering a printing force to drive a character element against a platen by means of a print tip normally spaced from the surface of said platen by a throat distance and movable toward and away from said platen, said character element and said print tip being supported upon a carriage mounted upon said printer for reciprocating movement in a path substantially parallel to the axis of said platen, including

a rockable bail bar having an axis of rotation substantially parallel to the axis of said platen, and constrained to limited angular movement toward and away from said platen, a prime mover connected to bail bar for imparting the rocking movement thereto,

a push rod for interconnecting said print tip and said bail bar so as to close said throat distance for delivering an impact force to said platen as said bail bar is moved toward said platen, and

decoupling means supported upon said carriage and associated with said push rod for decoupling it from and recou-

pling it to said bail bar, said decoupling means comprising a pivotable lever including a handle portion and a camming surface, and said push rod including a cam follower cooperable with said camming surface.

4,874,265

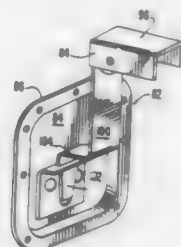
METHOD AND APPARATUS FOR FORMING A DIE
Marvin W. Thompson, Pasadena; Timothy C. Jennings, Arcadia; James A. Scott, Anaheim, all of Calif.; Ronald W. Phenicle, Warrenton, Va.; Margaret H. Murphy, La Verne, Calif.; Gabriel D. Nakash, Phillips Ranch, Calif.; James R. Biggers, Ontario, Calif.; Lynne M. Boudreau, Monrovia, Calif., and Jorge H. Cariel Contreras, Baldwin Park, Calif., assignors to Anvil Cases, Inc., Rosemead, Calif.

Division of Ser. No. 57,124, Jan. 2, 1987, Pat. No. 4,819,567.
This application Jul. 26, 1988, Ser. No. 224,415

Int. Cl.⁴ F16B 12/02

U.S. Cl. 403—407.1

5 Claims



1. Fastener means for fastening a top portion of a storage member to a bottom portion of a storage member comprising:
 - (a) first and second fastener members;
 - (b) said first fastener member including a support member fixed to the top portion of said storage member, and a tongue having a base portion rotatably fixed to said support member and being movable between an open and in closed position; and
 - (c) clamping means for holding said tongue in a closed position;
 - (d) said second fastener member fixed to said bottom portion of said storage member, and having a first and second opposed walls in spaced relationship and third and fourth opposing walls in spaced relationship, said walls connected by a bottom surface to define a recess, a bracket, said bracket including a lateral portion extending outwardly from said bottom surface with a slot therethrough for receiving said tongue; and
 - (e) said bracket, said tongue and said recess configured to permit fastening of said first fastener member with said second fastener member with said top portion and said bottom portion in abutting relationship.

4,874,267

TUNNEL BORING MACHINE

Gordon R. Ince, Essex, England, assignor to James Howden & Company Limited, Glasgow, Scotland

Filed Dec. 15, 1987, Ser. No. 133,344

Claims priority, application United Kingdom, Dec. 18, 1986, 8530119

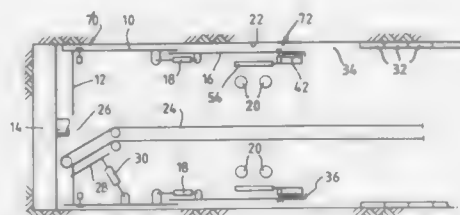
Int. Cl.⁴ E21D 9/06

U.S. Cl. 405—142

11 Claims

1. A tunnel boring machine comprising a front, substantially cylindrical shield, a cutting head mounted at the forward end of said front shield, a rear substantially cylindrical shield mounted co-axially with respect to said front shield and telescopically arranged thereto and having a rearward edge, radially extendible grippers mounted on said rear shield forwardly of said rearward edge and movable radially outwardly to grip the wall of the tunnel cut by said cutting head, hydraulic rams to move said front shield axially with respect to said rear shield, at least one shutter mounted on said rear shield, means mounting said at least one shutter for movement axially of said

machine between a forward, retracted position and a rearward extended position, in which latter position said at least one



shutter extends rearwardly of the rear-most edge of the rear shield, and an auxiliary hydraulic ram associated with said at least one shutter to move it between said positions.

4,874,268

METHOD AND APPARATUS FOR BUILDING PIPELINE AND SHIELD TUNNELLING MACHINE

Toshio Akesaka, Yokohama, Japan, assignor to Kabushiki Kaisha Iseki Kaihatsu Koki, Tokyo, Japan

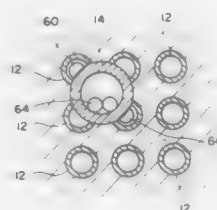
Filed Oct. 19, 1988, Ser. No. 259,927

Claims priority, application Japan, Nov. 18, 1987, 62-289565

Int. Cl.⁴ E02D 29/10

U.S. Cl. 405—184

4 Claims



3. A shield tunneling machine used for building a new pipeline while breaking a plurality of existing pipelines extending parallel to each other, comprising:
 - a shield body;
 - a cutter assembly disposed in front of said body so as to be rotatable about an axis parallel to an axis of said body; and
 - a pair of stabilizers disposed on said body so as to project respectively from an opposed outer peripheral portion of said body;
 wherein said cutter assembly is dimensioned for breaking said existing pipelines so as to form a plurality of opposed remaining portions while said machine is advanced, and wherein each of said stabilizers is disposed and dimensioned so as to slideably engage with one of said remaining portions while said machine is advanced.

4,874,269

SEMI SUBMERSIBLE DEVICE AND METHOD OF TRANSPORTING A MARINE SUPERSTRUCTURE AND PLACING IT ONTO OR REMOVING IT FROM A MARINE STRUCTURE

Edward D. Dysarz, 11423 Tricola La., Houston, Tex. 77072
Continuation-in-part of Ser. No. 887,536, Jul. 21, 1986, Pat. No. 4,829,924. This application May 2, 1988, Ser. No. 189,386

Int. Cl.⁴ E02B 17/00; B63B 35/44

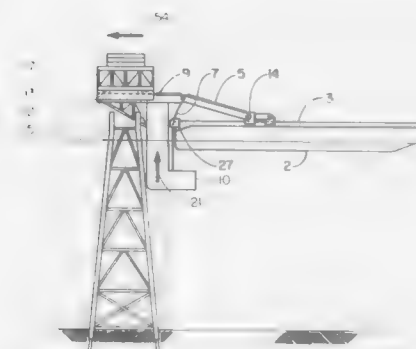
U.S. Cl. 405—209

16 Claims

1. A method of transporting a semi submersible vessel and a marine superstructure on a second vessel that is floating in a body of water, to an erection site and further removing said semi submersible vessel from said second vessel and further placing said marine superstructure onto said semi

submersible vessel, said semi submersible vessel having at least one fixed and rigid beam cantilevered from only one side of said semi submersible vessel and further placing said one side of said semi submersible vessel with said cantilever beam near only one side of a marine superstructure and further placing said marine superstructure onto a marine structure comprising the steps of:

- A. removing said semi submersible vessel from said second vessel;
- B. ballasting said semi submersible vessel, causing said semi submersible vessel to turn into an upright vertical position;
- C. removing said marine superstructure from said second vessel and placing said marine superstructure onto said semi submersible vessel;
- D. elevating said semi submersible vessel with said marine superstructure to a position higher than said marine structure;



- E. placing said fixed and rigid cantilevered beam over said marine structure;
- F. placing said marine superstructure onto said fixed and rigid cantilever beam;
- G. placing said marine superstructure on said fixed and rigid cantilever beam, over said marine structure;
- H. lowering said semi submersible vessel and thereby lowering said marine superstructure supported on said fixed and rigid cantilever beam onto said marine structure;
- I. further lowering said semi submersible vessel, relative to said marine structure and further lowering said fixed and rigid cantilever beam until said marine superstructure is supported on said marine structure and is no longer supported on said fixed and rigid cantilever beam and said fixed and rigid cantilever beam is disengaged from said marine superstructure;
- J. further withdrawing said fixed and rigid cantilever beam from below said marine superstructure.

4,874,270

METHOD AND APPARATUS FOR REDUCING IMPEDANCE OR CORE MATERIAL IN SONIC PILE DRIVING

Albert G. Bodine, 7877 Woodley Ave., Van Nuys, Calif. 91406
Filed Apr. 1, 1985, Ser. No. 718,702

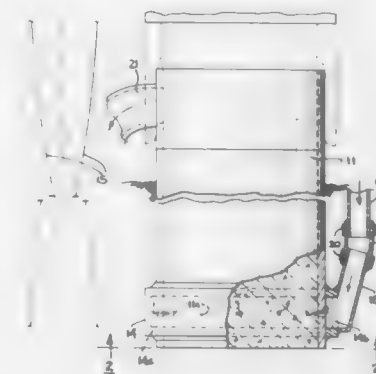
Int. Cl.⁴ E02D 15/00

U.S. Cl. 405—248

5 Claims

1. In a pile driving apparatus, for sonically driving a tubular pile member having an open bottom end into an earthen formation, the improvement being means for lowering the impedance presented to the sonic driving action by earthen core material lodged in the open bottom end comprising:
 - a cylindrical shoe member attached to the bottom of the pile member in concentricity therewith, said shoe member forming a concentric channel around the pile member;
 - said pile member having apertures formed around the bottom end thereof, said apertures providing fluid communi-

cation between said concentric channel and the earthen core material, and



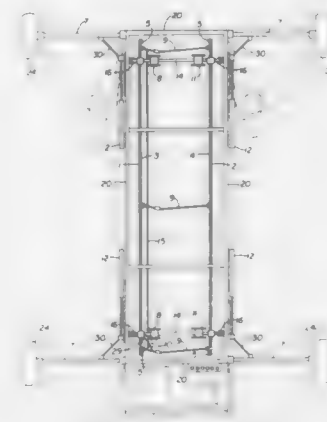
means for feeding foam material to the said shoe member, said foam material being mixed with the core material so as to lower the impedance thereof to the sonic driving.

4,874,271

SELF-PROPELLED TRENCH SHORING MACHINE
Jimmie D. Arnold, P.O. Box 301, Monte Vista, Colo. 81144
Filed Dec. 22, 1986, Ser. No. 944,995Int. Cl.⁴ E02D 17/00

U.S. Cl. 405—283

7 Claims



1. A trench shoring machine, comprising:
 - a main frame having first and second spaced apart longitudinally extending side walls, and first and second spaced apart, transversely extending opposite end walls joining said side walls;
 - first and second pairs of substantially vertical guide members carried by said main frame with one member of each pair being near an opposite transverse side wall of the main frame and each pair of guide members being near an opposite one of the end walls of the main frame;
 - first and second transversely extending carrier bars respectively engaging said first and second pairs of vertical guide members for guided vertical travel with respect to the main frame;
 - a first plurality of shoring plates including a top plate and a lower plate;
 - a pair of carrier brackets connected to said top plate and each supported from a different one of said carrier bars for movement along the length of the carrier bars with the top plate, transversely of the main frame, and for substantially

vertical movement with the top plate and carrier bars with respect to the vertical guide members;
an elongated member joined to said lower plate for selectively moving the lower plate between relatively upper and lower vertical positions with respect to the main frame, wherein the lower plate in said upper position supports the top plate in a relatively upper position, and the lower plate in said lower position permits the top plate to move to a relatively lower position; and
means for moving said elongated member to selectively move the lower plate between the upper and lower positions.

4,874,272

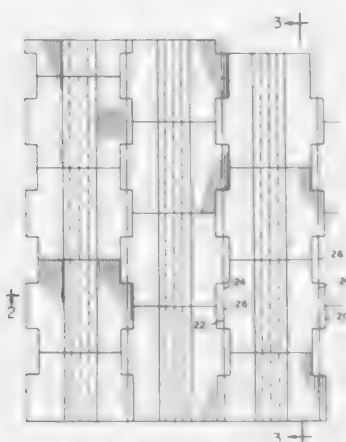
CANTILEVER RETAINING WALL SYSTEM USING DISCRETE PRECAST FACING PANELS

Philip D. Egan, Great Falls, Va., assignor to The Reinforced Earth Company, Arlington, Va.

Filed Nov. 9, 1987, Ser. No. 117,845
Int. Cl.⁴ E02D 29/00

U.S. Cl. 405—284

4 Claims



1. An improved cantilever type, retaining wall for retention of fill, said wall comprising, in combination:

a plurality of preformed wall panels forming in combination a vertical, generally planar retaining structure for supporting the fill behind said wall panels; said panels defining a repeating mosaic pattern and each panel including a facing portion and in integral, cantilever beam, an enclosed preform projecting from a back side of each panel, said panels arranged in the mosaic with the preforms of vertically adjacent panels aligned to define a preform mold passage extending the height of vertically adjacent panels;

a plurality of vertical beam members aligned at the backside of the wall panels, said members each defining a generally vertical cantilever beam that is cast in place and formed by the preforms;

means for mechanically connecting each of the cast in place beam between adjacent preforms comprising reinforcing members retained within the preform and extending vertically between adjacent preforms prior to forming the cast in place beam; and wall panel fill against the backside of the panels.

4,874,273 APPARATUS FOR HOLDING AND/OR CONVEYING ARTICLES BY FLUID

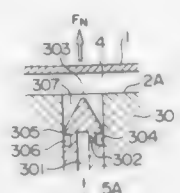
Hiromitsu Tokiwa, Nihari; Nobuo Tsumaki, Ushiku, and Toshifumi Koike, Nihari, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 16, 1988, Ser. No. 155,808
Claims priority, application Japan, Mar. 16, 1987, 62-58836; Mar. 16, 1987, 62-58837

Int. Cl.⁴ B65G 51/03, 47/24, 51/16

U.S. Cl. 406—88

10 Claims



4. In a conveyor apparatus in which a fluid film is formed between a delivery surface of a delivery path and an article to be conveyed, and said article is conveyed in a non-contact condition relative to said delivery surface by said fluid film, the improvement comprising: fluid injection means provided in said delivery surface for supplying fluid at a low flow rate to form said fluid film between said delivery surface and article, said fluid injection means being formed in said delivery surface; a pressurized fluid supply source connected to said fluid injection means for supplying pressurized fluid to said fluid injection means; flow rate adjusting means disclosed between said pressurized fluid supply source and said fluid injection means for adjusting a flow rate; detecting means for detecting a position of said article to be conveyed; and controlling means for controlling said flow rate adjusting means in accordance with signal supplied from said detecting means; said fluid injecting means includes a pressurized fluid supplying portion, a resistance portion for applying a resistance to pressurized fluid from said pressurized fluid supplying portion, a suppression portion for suppressing a flow velocity of the fluid from said resistance portion, and an opening portion for allowing the fluid from said suppressing portion to flow toward the article with its resistance being smaller than a resistance of said resistance portion.

4,874,274

APPARATUS FOR REMOVING DROSS RIDGES FROM THE SIDES AND ENDS OF A METAL WORKPIECE

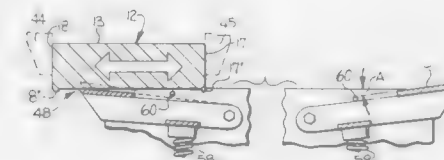
Matthew A. Mancuso, New Kensington, Pa., assignor to Kelbler-Thompson Corporation, Kensington, Pa.

Continuation of Ser. No. 141,055, Jan. 5, 1988, abandoned. This application Nov. 4, 1988, Ser. No. 267,715

Int. Cl.⁴ B23D 1/00

U.S. Cl. 409—300

17 Claims



1. An apparatus for removing a dross ridge along a side edge of a metal workpiece of the type resulting from a torch cutting operation or the like, and comprising

workpiece support means having opposite ends and opposite side edges, and defining a longitudinal direction between said ends, and a transverse direction between said side edges,

workpiece transport means for moving a metal workpiece supported on said support means in opposite transverse directions,

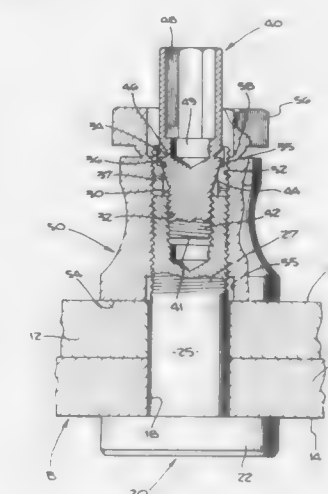
cutting blade means extending along at least one side edge of said support means, with said at least one cutting blade means comprising a plurality of separate blades which are aligned along the associated side edge of said support means, and wherein each of said blades includes an outer generally flat surface and a longitudinally extending side, and with the junction of the outer surface and the side defining a longitudinally extending cutting edge,

means mounting each of said blades for separate pivotal movement about a longitudinal axis which is spaced from said cutting edge, and with the cutting edges thereof facing outwardly from said support means, and

means for separately biasing each of said blades about its associated longitudinal pivotal axis in a direction toward the adjacent surface of a workpiece supported on said support means, and so that each cutting edge may be held in contact with the adjacent surface of a workpiece moving transversely across said support means, and such that said at least one cutting blade means is adapted to engage and remove a dross ridge formed on the adjacent workpiece surface when the workpiece is moved in a transverse direction across said support means with the dross ridge disposed substantially parallel to the longitudinal direction and opposing said cutting edge.

serted into the end opening of the bolt, the bolt and wedge may be passed through the opening, the nut may be applied to the end of the bolt and tightened, and the wedge may thereafter be tightened in order to expand the end of the bolt;

the end opening of the bolt having interior threads which are threadably engaged by the wedge member but in an opposite rotational sense to that in which the nut is applied to the bolt; and



the wedge member having a driving portion on its outer end, and a weakened circumferential wall which fractures and shears off when a predetermined torque is applied for tightening the wedge member, the location of the weakened wall being such that after the shearing action takes place the remaining part of the wedge member is substantially contained within the end of the bolt.

4,874,276

FASTER

Tatsuya Iguchi, Toyota, Japan, assignor to Nifco, Inc., Yokohama, Japan

Filed Sep. 7, 1988, Ser. No. 241,432

Claims priority, application Japan, Sep. 14, 1987, 61-140483[U]

Int. Cl.⁴ F16B 13/04

U.S. Cl. 411—48

13 Claims



8. A fastener system as set forth in claim 7, wherein: said insertion member has a flange portion provided at one end thereof for engaging and seating upon said flanged portion of said substantially cylindrical outer member when said insertion member is disposed within said axial bore of said substantially cylindrical outer member so as to radially expand said second opposite end of said substantially cylindrical body portion of said substantially cylindrical outer member.

4,874,275

SECURE THREE-PIECE THREADED FASTENER, AND METHOD

Alexander S. Gotman, Los Angeles, Calif., assignor to Gene W. Arant; Marvin H. Kleinberg and Marshall A. Lerner, all of Los Angeles, Calif.

Filed Jun. 22, 1987, Ser. No. 64,466

Int. Cl.⁴ F16B 31/00, 39/02

U.S. Cl. 411—5

10 Claims

1. A three-piece fastener including a bolt with a shank having a concentric opening in its threaded end, a nut adapted to fit over the threaded end of the bolt, and a wedge member which is insertable into the end opening of the bolt for expanding and thereby securing it;

the threaded end of the bolt being axially slotted to facilitate its expansion, and the outer diameter of the wedge member being smaller than the outer diameter of the threaded end of the bolt, so that when the bolt is to be inserted into an opening of a structure in order to accomplish a fastening action, the wedge member may first be loosely in-

4,874,277

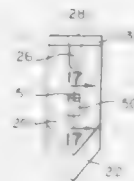
WALL FASTENER AND METHOD OF FABRICATION
Thomas E. Nowak, Elk Grove Village; Edward J. Smith, Arlington Heights, both of Ill., and Eustathios Vassilion, 12 S. Townview La., Newark, Del. 19711, assignors to Eustathios Vassilion, Newark, Del.

Continuation-in-part of Ser. No. 1,756, Jan. 9, 1987, Pat. No. 4,765,788. This application Aug. 14, 1987, Ser. No. 85,154

Int. Cl.⁴ F16B 13/04

U.S. Cl. 411-41

3 Claims



1. A quenched, thin, sheet metal anchor for a fastening member for a hollow wall, the fastening member comprising in addition to the anchor a fastener for insertion in the anchor, the anchor comprising a substantially flat head portion and a hold therethrough, said hole having an axis perpendicular to the head, a substantially flat neck in a plane perpendicular to the head containing the axis, the neck having an opening therethrough, the opening extending in the plane of the neck the full length of the neck along the axis and, first and second, thin flat sheet metal spreadable anchoring blades extending from said neck in the direction of the axis, the blades being coplanar with the neck, each of the blades having an inner and an outer surface, the inner surface of the first blade being adjacent the inner surface of the second blade, at least one of said blades terminating in a point, the first blade, having a bent portion extending obliquely from the first blade toward the second blade, the bent portion comprising an end and two lateral sides and forming a first part of a complementary engaging means, the second part of the complementary engaging means being on the second blade, the bent portion extending at least partially into the engaging means in the second blade, at least one of the two lateral sides of the bent portion frictionally engaging at least a part of the engaging means in the second blade.

4,874,278

WOOD SCREW WITH CHIP REMOVING PORTION
Fukunouke Kawashita, Kawachinagano, Japan, assignor to Kabushiki Kaisha Yamahiro, Osaka, Japan

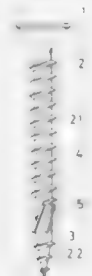
Filed Aug. 31, 1987, Ser. No. 90,917

Claims priority, application Japan, Feb. 16, 1987, 62-20901

Int. Cl.⁴ F16B 25/02

U.S. Cl. 411-386

4 Claims



1. A wood screw comprising:
a head for receiving a fastening tool;
a shank extending from said head, said shank having a fastening screw portion extending over a first portion thereof,

said fastening screw portion having at least one screw thread;

- a chips removing screw portion adjacent said fastening screw portion, said chips removing screw portion extending over a second portion of said shank, said shank in said first and second portions having generally the same diameter, said chips removing portion having more screw threads than said first portion of the shank, one of said screw threads of said chips removing screw portion being in engagement with said at least one screw thread of said first portion of the shank, another one of said screw threads of said chips removing screw portion being free of said at least one screw thread, the screw threads of said chips removing screw portion having a larger lead angle than the at least one screw thread of said first portion of the shank; and
 - a tip portion adjacent said chips removing screw portion such that said chips removing screw portion is between said first portion of the shank and said tip portion, said tip portion having at least one screw thread form thereon and being adapted to penetrate an article, said screw thread of the tip portion adjacent the chips removing screw portion having an outer diameter which is generally the same as an outer diameter of the at least one screw thread of the first portion of the shank, said at least one screw thread of said first portion of the shank being located on a helical extension line of said screw thread of said tip portion;
- said chips removing screw portion conveying and spreading chips formed by said article toward said first portion of the shank upon penetration of said article by said tip portion and upon formation of a hole in said article.

4,874,279

SEMI-AUTOMATIC BINDER

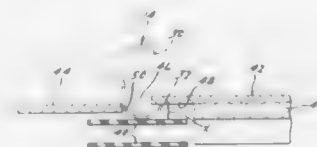
Ernst Pfaffle, Neuffen, Fed. Rep. of Germany, assignor to Sickinger Company, Auburn Hills, Mich.

Filed Apr. 15, 1988, Ser. No. 182,108

Int. Cl.⁴ B42B 5/10

U.S. Cl. 412-39

13 Claims



1. A semi-automatic binding apparatus for loosely binding together a plurality of sheets by means of an elongated continuous formed wire member having a plurality of generally C-shaped spaced loops receivable within openings provided along an edge portion of said sheets, said apparatus comprising:
means for supporting said elongated continuous wire member in such a manner as to enable said sheets to be assembled thereto, said supporting means including first and second spaced elongated members defining a channel therebetween, one end of each of said C-shaped loops being supported by the undersurface of one of said first and second elongated members, the other end of each of said C-shaped loops projecting through said channel and above the upper surface of said one elongated member whereby said sheets may be assembled thereto; and
closing means longitudinally spaced from said supporting means for receiving said wire members with said sheets assembled thereto and exerting a pressure thereon operative to close said loops to thereby secure said sheets in assembled relationship.

4,874,280

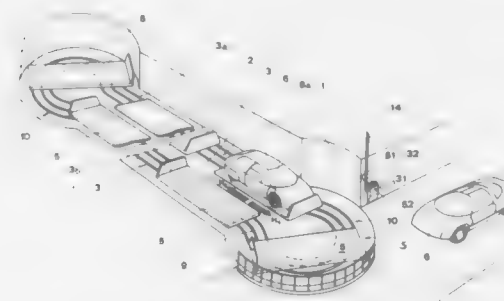
SELF-SERVICE, COMPUTER-OPERATED, MECHANICAL-ELECTRONIC EQUIPMENT FOR PARKING VEHICLES CLOSELY IN SIDE BY SIDE ROWS
Enzo Gamberini, Zola Predosa, Italy, assignor to V.B. Di Gamberini Enzo, Bologna, Italy

Filed Jul. 21, 1986, Ser. No. 887,812

Int. Cl.⁴ E04H 6/34

U.S. Cl. 414-234

3 Claims



1. A self service, computer operated, mechanical-electronic equipment for parking vehicles closely in side by side rows, comprising: at least one guide fixed to a base and positioned above said base, said guide constituted by at least two endless rails each configured to define a longitudinal intermediate section and two circular end sections, and a track profiled similarly to the profile of said rails and positioned between said rails; at least one pair of movable elements of support, equidistant one with respect to the other, carried by said rails in a way to undergo sliding motion controlled by said track; at least one platform on which to receive an identical number of vehicles; each platform resting on a pair of said movable elements of support; means for driving, synchronously said movable elements of support with it being possible for each platform to transit at a station for loading and unloading at least one vehicle onto and from the said platform, said pair of movable elements of support constituted by at least two independent bars, namely a front bar and a rear bar, the center part of each bar being pivotally connected to a corresponding platform, said bars being able to rotate with respect to said platform by vertical pins positioned between said platform and said center part of each bar, said vertical pins being connected to said drive means by said vertical pins contacting said drive means; and means for orienting and guiding said bars and designed to maintain each of said bars substantially perpendicular to the instantaneous relative motion direction, said means for orienting and guiding the bars comprising for each bar, two rollers, the first of which is sustained by the aforesaid vertical pin connected to said drive means, whereas the second is sustained by a further vertical pin rigidly fitted to the said center part of the corresponding bar through an arm, both said rollers sliding in alignment between two opposite inner surfaces of said track to cause the rotation of the related said bar irrespective of the curving radius of said track and rails.

4,874,281

METHOD OF MAKING UP BATCHES OF SMALL ITEMS, AND AN INSTALLATION IMPLEMENTING THE METHOD

Jean-Marcel Bergerlioux, Chateaufort sur Isere; Claude Pavie, Houillies, and Christian Plent, Bourg les Valence, all of France, assignors to Societe Anonyme dite: Compagnie Generale D'Automatisme CGA-HBS, Paris, France

Filed Mar. 27, 1987, Ser. No. 30,648

Claims priority, application France, Mar. 27, 1986, 86 04449

Int. Cl.⁴ B65G 37/00

U.S. Cl. 414-285

16 Claims

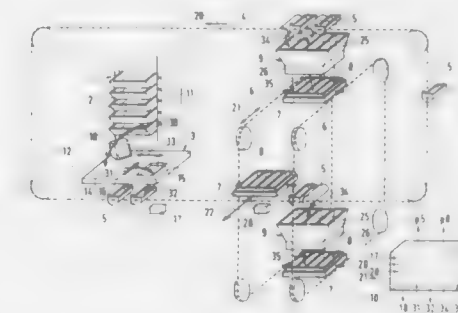
1. An installation for making up batches of small items in

individual packs in response to a set of orders specifying the different varieties of items required in each batch together with corresponding quantities thereof, said installation comprising a storage bay storing a plurality of possible varieties of items, variety by variety,

a first endless delivery conveyor holding a plurality of buckets for delivering individual items, the delivery conveyor running substantially around said installation, with a clear space between opposite runs extending substantially along the installation;

a station for injecting individual items onto said buckets, mounted facing both said storage bay and said delivery conveyor;

at least one second endless sorting conveyor holding packs for sorting into batches the injected items, mounted orthogonally to the delivery conveyor, with a clear space between opposed runs and with orthogonal paths therebetween passing close to each other and defining transfer



zones for transferring the items from the buckets to the packs;

first drive means for driving said delivery conveyor; individual second drive means for each, sorting conveyor; first means for holding said buckets horizontal on said delivery conveyor, except in the transfer zones,

second retractable means for holding said buckets horizontal and third retractable means for tipping said buckets in the transfer zones, and means coupling said second and third retractable means in a reciprocating configuration through a control member whereby, whenever one of them is retracted the other is engaged, and

a central control unit coupled to said injection station to determine the position of each injected item onto said delivery conveyor, and to said individual second drive means to cause coincidences between the injected items and the packs in the transfer zones and to control said control member corresponding to each coincidence to effect transferring of items from the buckets to the packs.

4,874,282

PALLET STOCKER APPARATUS FOR PRINTER

Tenzo Orihara, Tokyo; Sigeo Sumi, Saitama, and Hiroshi Taguchi, Tokyo, all of Japan, assignors to Somar Corporation, Tokyo, Japan

Filed Oct. 29, 1987, Ser. No. 113,968

Claims priority, application Japan, Jan. 17, 1986, 61-7593

Int. Cl.⁴ B65B 69/00

U.S. Cl. 414-416

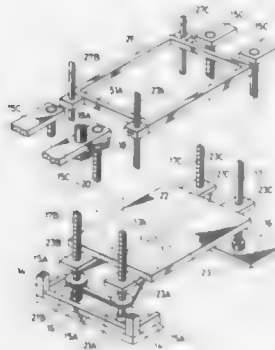
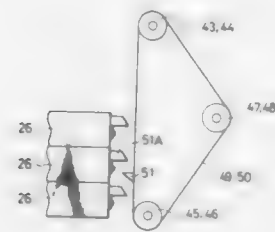
8 Claims

1. A pallet stocker system, comprising:

a pallet stocker for storing a plurality of pallets piled in a stack, said pallets being used to store sheets and having first pawl members; and

means for transferring said sheets from selected ones of said pallets in said pallet stocker and to selected ones of said pallets in said pallet stocker, said transferring of said sheets to and from said pallet being performed with a vertical motion of said transferred sheets separating from or coming into contact with said pallets;

said pallet stocker comprising
a pallet support mechanism for supporting in said stack said plurality of pallets, and
a pallet carrier mechanism for vertically moving a selected one of any of said plurality of pallets, thereby moving all



of said pallets above said selected pallet in said stack, said pallet carrier mechanism including a chain having a second pawl member selectively engagable with one of said first pawl members and further comprising driving means for driving said chain in opposite vertical directions.

4,874,283

FRONT DISPENSING TRUCK WITH VERTICALLY AND HORIZONTALLY SWINGABLE SCREW CONVEYOR

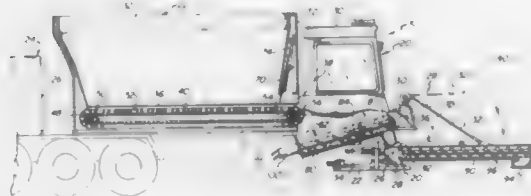
Irvin H. Hurley, Jr., Wallingford, Conn., assignor to Tilcon Tomasso, New Britain, Conn.

Filed Feb. 29, 1988, Ser. No. 162,091

Int. Cl.⁴ B60P 1/40

U.S. Cl. 414—504

20 Claims



1. A front discharge material transporting and dispensing truck, comprising:

a truck comprising a frame having a forward portion and a rear portion, and a middle portion therebetween;
an engine mounted on the rear portion of the truck;
a cab located in the forward portion of said truck;
a container for the material to be transported and dispensed located in the middle portion of said truck, said container having an opening at its forward end;
means for conveying material located in the bottom of said container and extending from the rear to the forward end

of said container for moving material forwardly to said container opening;

a first trough extending forwardly underneath said cab from the forward end of said container, the rearward end of said first trough having an opening adjacent said container opening for receiving material from said container;

a first screw auger disposed within said first trough for transporting said material beneath said cab and through said first trough;

a second trough extending forwardly from a point adjacent the forward end of said first trough, said second trough having an opening at its rearward end for receiving material from the forward end of said first trough, and having an opening at its forward end for dispensing said material;

a second screw auger disposed within said second trough for transporting said material through said second trough;

a platform rigidly connected to the frame of the forward end of said truck underneath said cab;

a mounting plate adapted to receive and partially surround the rearward end of said second trough, said mounting plate being mounted on said platform;

a pivot mounting securing said second trough to said surrounding portions of said mounting plate;

a pivot mounting securing said mounting plate to said platform said two pivot mountings permitting said second trough a range of horizontal and vertical movement such that said dispensing opening may be located at a selected point adjacent the ground within the range of spacial movement provided by said pivot mountings;

said second trough being vertically swingable relative to said surrounding portions;

said rearward end of said second trough lying underneath said truck;

means for transmitting power from said engine to said conveying means to operate said conveying means;

means for transmitting power from said engine to said first and second screw augers to operate said first and second screw augers;

means for synchronizing said first screw auger and second screw auger such that the operation of said second screw auger begins before the operation of said first screw auger; hydraulically activated means for moving said dispensing opening in the forward end of said second trough operably connected to said second trough and providing a sufficient force within a substantial portion of the range of movement of said trough to direct and locate said dispensing opening at a selected point adjacent the ground to deliver material thereto;

means for vertically swinging the end portions of said second trough.

4,874,284

KIT FOR TRANSPORTING ALL TERRAIN VEHICLES

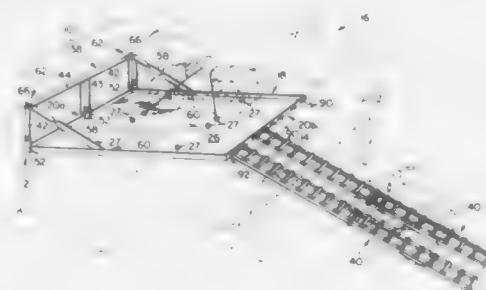
James Truitt New, Jr., P.O. Box 1421, Wimberley, Tex. 78676

Filed Dec. 3, 1987, Ser. No. 128,072

Int. Cl.⁴ B65G 67/02

U.S. Cl. 414—537

1 Claim



1. A kit for adapting a pickup truck for safely loading, trans-

porting, and unloading two all terrain vehicles on a platform over said truck's bed area while preserving cargo space in said bed area comprising:

a platform frame, rectangular in shape and having dimensions approximately equal to dimensions of said truck bed, said platform frame being made from angle iron and having first and second short sides each with first and second short side ends and first and second long sides each with first and second long side ends, said short sides and said long sides being joined together at right angles whereby a vertical long side lip of each said long side which lies perpendicular to the plane defined by said frame joins with a like-oriented vertical short side lip of each said short side and a horizontal long side lip of each said long side which is oriented parallel with said plane joins with a like-oriented horizontal short side lip of each said short side, said horizontal long side lip of said first and second long sides having holes sized for allowing bolts to pass therethrough to engage said platform frame with side walls of said bed, said platform frame to be attached to said side walls whereby said vertical long side lips and said vertical short side lips extend away from said bed;

a platform floor having dimensions for residing within a boundary defined by said vertical long side lips and said vertical short side lips while being supported by said horizontal long side lips and said horizontal short side lips; first and second hinge brackets made from metal strips each having first and second hinge bracket ends, said first ends of said first and second hinge brackets being respectively attached to said vertical short side lip of a first said short side and to said vertical short side lip of a second said short side adjacent to said first and said second short sides' connection with said first long side, said first and second hinge brackets each having a hole near said second hinge bracket end for allowing a bolt to pass therethrough;

a safety barrier to prevent said vehicles from being accidentally driven off of said platform during loading, said safety barrier being constructed of angle iron, said barrier comprising first and second side pieces approximately eighteen inches in length, each having first and second side piece ends, said barrier further comprising a cross piece having first and second cross piece ends and being approximately 1/2 inch shorter in length than said long sides, said first and second side pieces and said cross piece being connected to form three sides of a rectangle with said first and second side pieces' first side piece ends being respectively connected with said first and second cross piece ends, said second side piece ends each having a second hole passing therethrough for allowing a bolt to pass through each said side piece and thereafter to pass through said first hole of said hinge bracket to hingedly couple said safety barrier with said frame in a manner to allow said safety barrier be lowered and raised;

first and second threaded studs attached to said cross piece adjacent respectively to said first ends of said first and second side pieces and extending outward from said cross piece parallel with said side pieces;

first and second safety barrier braces each having first and second brace ends, said safety barrier braces being made from strips of metal, said first brace ends of said first and second safety barrier braces being respectively attached to said first and second short sides on their said vertical short side lips at positions and in orientations whereby said second brace ends respectively reach said first and second threaded studs when said safety barrier is in a raised position, said safety barrier braces each having a third hole near their said second safety barrier ends sized for allowing said threaded studs to pass therethrough to couple said safety barrier with said braces;

first and second ramps for loading said vehicles, said ramps each having first and second ramp connecting cylinders attached at an end of each said ramp on either side of said ramp, said ramps comprising two spans hingedly connected whereby said ramps may be changed between an

extended usable configuration and a collapsed transportation/storage configuration;

first, second, third, and fourth pairs of frame connector cylinders mounted on said vertical long side lips of said first and said second long sides, said frame connector cylinders of each said pair being relatively positioned whereby said ramp connector cylinders of either of said ramps may juxtapose said frame connector cylinders of any said pair so a pin may be used to couple said ramp connector cylinders with said frame connector cylinders, said first and fourth pairs being positioned respectively adjacent to said first and second long side ends of said first and second long sides and said second and third pairs being positioned relative to said first and fourth pairs whereby ramps connected to said first and second pairs are properly spaced for driving said vehicle thereon and whereby ramps connected to said third and fourth pairs are properly spaced for driving said vehicle thereon;

said kit when installed providing means for loading said vehicles on said truck while preserving cargo space in said bed area, providing means for loading said vehicles on said platform and unloading said vehicles from said platform by driving said vehicles forward under their own power in a forward direction, and providing a barrier for preventing said vehicles from being accidentally driven over said first long side during loading from said second long side.

4,874,285

LOW PROFILE VEHICLE LIFTING AND TOWING DEVICE

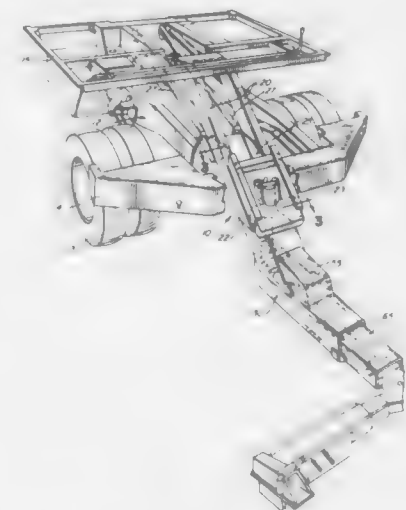
Leslie Bubik, Toronto, Canada, assignor to Vulcan Equipment Company, Ontario, Canada

Filed Jan. 1, 1988, Ser. No. 200,795

Int. Cl.⁴ B60P 3/12

U.S. Cl. 414—563

11 Claims



1. A vehicle lifting and towing device comprising:

A column fixably attached to a chassis of a towing vehicle inclined downward and rearward from the towing vehicle at a fixed angle;

a carriage slidably engaged with said column;

a lifting boom housing pivotally connected to a lower rearward portion of the carriage;

at least one lifting cylinder mounted in non-collinear relationship to said column; said lifting cylinder being pivotally connected at one end to an upper forward portion of the carriage and extending toward the front of the towing vehicle and pivotally connected to the chassis of the towing vehicle at its opposite end; and
a tilt cylinder having one end pivotally connected to and

operable within the carriage and the other end pivotally connected to the lifting boom housing.

4,874,286

MANIPULATOR WITH ROD MECHANISM

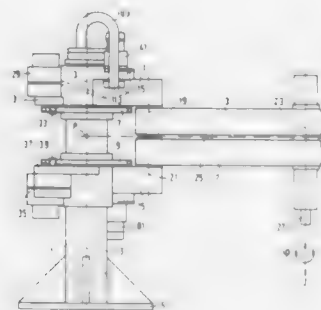
Marinus P. Koster; Henricus J. J. Bouwens; Anton A. J. Van Tartwijk, and Willem L. G. De Peuter, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 4,941, Jan. 20, 1987, abandoned. This application May 20, 1988, Ser. No. 198,618

Claims priority, application Netherlands, Jan. 23, 1986, 8601143

Int. Cl.⁴ B25J 18/00

U.S. Cl. 414—744.5



1. A manipulator comprising a rod mechanism with four arms which are pivotable with respect to each other about a plurality of axes, first and second of said arms being of the same length, separate drive means for each of said first and second of said arms for rotating its associated arm about a main axis each independent of the other, said main axis extending parallel to the axes about which said arms are pivotable and perpendicular to the plane in which each of said arms pivots, a tool holder, third and fourth of said arms each with one end pivotably connected to said first and second arms respectively, said third and fourth arms being of the same length and being pivotably movable with respect to each other at their other ends opposite said one ends about an axis parallel to said main axis, said other ends supporting said tool holder, said first and second arms producing movement of said tool holder radially with respect to said main axis when their drive means drive them with oppositely directed angular velocities about the main axis, said first and second arms producing rotational movement of said tool holder with respect to the main axis when their drive means drive them with angular velocities about the main axis in the same direction, and parallel drive means for moving said tool holder in directions along the axis about which said third and fourth arms pivot independent of movement of any of said arms, said drive means for said first and second arms including an individual electric motor secured to each associated arm, each said motor being rotatable, an associated pinion driven by each said motor when said motor is rotated and an associated toothed ring cooperating with each said pinion for moving its associated arm, each said ring having an axis coinciding with said main axis.

4,874,287

VARIABLE-GEOMETRY TURBOCOMPRESSOR

Hubert Grieb, Unterpfaffenhofen, Fed. Rep. of Germany, assignor to MTU Motoren- und Turbinen-Union München GmbH, Fed. Rep. of Germany

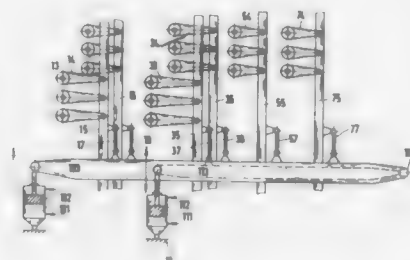
Filed Feb. 24, 1987, Ser. No. 17,459

Claims priority, application Fed. Rep. of Germany, Feb. 28, 1986, 3616395

Int. Cl.⁴ F01D 17/12

U.S. Cl. 415—149.2

16 Claims



5 Claims

1. Variable-geometry turbocompressor for compressing a fluid stream having at least one variable compressor inlet stator preceding a first compressor rotor stage, wherein the first compressor rotor stage is directly followed in a compressing flow direction by a first variable stator which includes separate inlet and outlet stator cascades arranged one downstream of the other in tandem construction and wherein the separate inlet stator cascade is adjusted variably and independently of the separate outlet stator cascade so that a compressed fluid stream which exits the first compressor rotor stage is adjustably deflected.

4,874,288

INLET GUIDE VANE ASSEMBLY

D. Davorin Kapich, 3111 Serrano Dr., Carlsbad, Calif. 92009

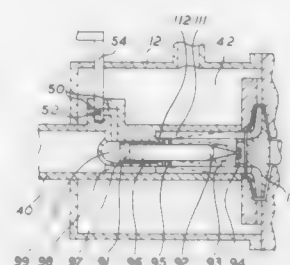
Continuation-in-part of Ser. No. 40,858, Apr. 21, 1987, Pat. No. 4,764,088. This application May 3, 1988, Ser. No. 189,653

The portion of the term of this patent subsequent to Aug. 16, 2005, has been disclaimed.

Int. Cl.⁴ F04D 29/36

U.S. Cl. 415—150

10 Claims



1. An inlet guide vane assembly for a pump or a compressor having rotary blades comprising:
a housing means defining a passageway for providing a fluid passageway to said rotary blades,
a plurality of guide vanes, each of said guide vanes being pivotably disposed in said housing means so that by pivoting said vane about a pivot axis said guide vane may be inserted into or removed from said passageway, the extent of such insertion being determined by the degree of pivot of said vane about said axis,
a control means to control the degree of pivot of said guide vanes, wherein the passageway defined by said housing is an circular passageway, wherein said control means com-

prises an annular piston disposed in said housing means so that axial movement of said piston will apply a force on said plurality of guide vanes causing pivotal movement of said plurality of guide vanes, wherein said control means further comprises a pressure means for applying a pressure differential across said annular piston to cause said piston to move axially, wherein said control means further comprises a counteracting force means to apply forces counteracting forces exerted by said pressure means, wherein said pressure means further comprises a fluid flow passageway means permitting fluid passage from the discharge of said pump or a compressor to said annular piston such that the pressure of said discharge is utilized to apply the pressure differential across said piston, wherein said pressure means further comprises a control valve disposed in said fluid flow passage means and the configuration of said piston in said housing means is such as to permit fluid leakage past such piston so that the pressure on said piston can be controlled by adjustments of said control valve.

4,874,290

TURBINE BLADE TOP CLEARANCE CONTROL SYSTEM

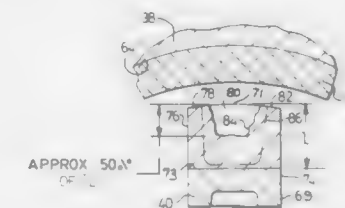
John N. Cang, San Diego; Joseph R. Gast, Alpine; John J. Hensley, and Christian M. Waldhelm, both of San Diego, all of Calif., assignors to Solar Turbines Incorporated, San Diego, Calif.

Filed Aug. 26, 1988, Ser. No. 236,874

Int. Cl.⁴ F01D 11/08

U.S. Cl. 415—173.4

10 Claims



1. An axial flow turbine suitable for a gas turbine engine comprising;
a rotatable turbine wheel having an annular array of turbine blades attached thereto;
a shroud assembly having a radially inwardly facing surface positioned adjacent and radially outwardly of said turbine blades;
a coating affixed to the surface, said coating being resistant to high temperature, oxidation, corrosion and sulfidation and being rub-tolerant; and
each of said blades having a metallic body of a predetermined strength sufficient to resist structural deformation at normal operating parameters of the engine and an outer tip formed on the body and positioned adjacent the coating, said outer tip being comprised of a material which has a predetermined strength less than that of the body yet has sufficient strength to prevent breakage thereof and separation from the metallic body during rubbing contact between the tip and the coating, said material being resistant to high temperature, oxidation, corrosion, sulfidation and thermal fatigue at normal operating parameters of the engine, said outer tip being formed on the metallic body by a weld layered puddling build-up using a filler rod having the material as an ingredient thereof wherein said outer tip is made of a nickel base material selected to include approximately 20-24% chromium, 13-15% tungsten and 1-3% molybdenum.

4,874,291

ROTOR ARRANGEMENT FOR A ROTORCRAFT

Bryan W. Roberts, Epping; Alan R. Flea, Ashfield, and John Blackler, Picnic Point, all of Australia, assignors to University of Sydney, Sydney, Australia

Filed May 20, 1988, Ser. No. 196,987

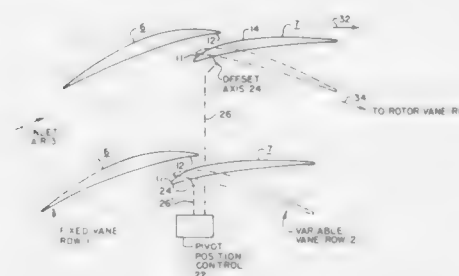
Claims priority, application Australia, May 25, 1987, PI2097

Int. Cl.⁴ B64C 27/08

U.S. Cl. 416—122

9 Claims

1. A preliminary upstream stator vane assembly positioned between an inlet portion of a rotary gas turbine engine and a rotor row thereof, comprising:
(a) a first circumferential row of non-movable leading guide vanes and a second circumferential row of movable trailing guide vanes;
(b) means for positioning the leading nose portion of each movable vane substantially axially ahead of, and adjacent, the trailing edge portion of an associated non-movable vane to form air passage slots; and
(c) vane angle control means for pivoting each movable vane about a pivot axis displaced away from and in a non-intersecting relationship with respect to said movable vane and wherein each pivot axis of each movable vane is located to maintain widths of said slots substantially constant as said movable vanes are pivoted.



adjusted longitudinal position of the rod, and the rod having a rearward portion bent substantially right-angularly thereto and adapted to rest against the power drill externally thereof.

4,874,297

RADIAL PUMP

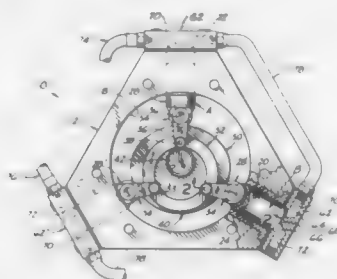
Arthur R. Collins, P.O. Box 57078, Oklahoma City, Okla. 73112, and Carroll E. Clarkson, 9505 Ridgeview Dr., Oklahoma City, Okla. 73120

Filed Dec. 19, 1988, Ser. No. 286,182

Int. Cl.⁴ F04B 1/04

U.S. Cl. 417-265

9 Claims



1. A rotary pump, comprising:

pump body means having a central chamber and having a plurality of pump cylinders extending outwardly therefrom in a radial array;

a like plurality of pump pistons reciprocable in said pump cylinders;

a like plurality of cylinder head means overlying the outward end of said cylinder bores and forming a cylinder inlet port and a cylinder outlet port for pumping fluid therethrough;

first tubular means connecting a source of fluid with a selected cylinder head inlet port;

second tubular means connecting the cylinder head outlet port of the terminal cylinder head of the radial array;

conduit means extending between and connecting the remaining cylinder head outlet ports, in sequence, to the remaining cylinder head inlet ports of the radial array;

rotary drive means including a drive shaft axially extending into the pump chamber and having a surrounding cam eccentric rotatable therewith;

tether means surrounding an intermediate portion of the drive shaft adjacent the cam;

means extending between and pivotally connected at its respective end portions with the respective piston and said tether means for sequentially reciprocating said pistons in response to angular rotation of said cam eccentric; and,

seal means on the outer end of the respective piston cooperating with the respective cylinder head means for closing said inlet port and said outlet port when the respective piston reaches the outer limit of its travel.

4,874,298

DOUBLE SELECTABLE DELIVERY PUMP

Bruno Mainardi, Padova, and Domenico Vivian, Grumolo Delle Abbadesse, all of Italy, assignors to Nuova Sme S.p.A., Grumolo DI Zocco VI, Italy

Filed Mar. 7, 1988, Ser. No. 164,703

Claims priority, application Italy, Mar. 17, 1987, 41554A/87

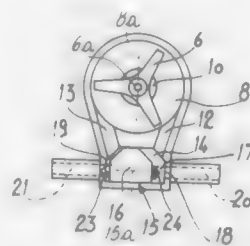
Int. Cl.⁴ F01D 1/30; F04B 39/10, 35/04

U.S. Cl. 417-315

10 Claims

1. Double selected delivery pump, comprising a body defining a cylindrical chamber, an impeller with double direction of rotation rotatably arranged in said cylindrical chamber, a compartment in communication with said chamber, delivery conduits in communication with said compartment and valve means controlling the flow of fluid through said delivery con-

duits, wherein said compartment is a seat, said delivery conduits are arranged to open at opposite ends of said seat, duct means being comprised tangentially connected with said cylindrical chamber and opening into said seat near said opposite ends thereof, and wherein said valve means are in the form of a distribution element slidably arranged in said seat, said distributor element having shutter means for alternatively closing the fluid flow through said delivery conduits depending on the



rotation direction of said impeller, wherein said ducts which extend from said cylindrical seat have a parallelepipedal shape and end at respective one of two inclined sides of a first isosceles trapezoid-shaped portion of said distribution seat for said distribution element, said distribution seat defining also a second substantially parallelepipedal portion connected to said first portion, said first and second portions having common longer sides.

4,874,299

HIGH PRECISION PUMP

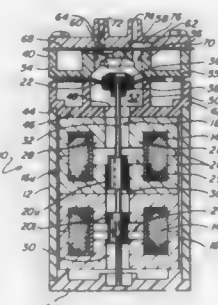
Benjamin L. Lopez, Golden; Steven A. Beard, Denver, and Kirby Phillips, Lakewood, all of Colo., assignors to Life Loc, Inc., Wheatridge, Colo.

Continuation-in-part of Ser. No. 35,758, Apr. 8, 1987, Pat. No. 4,749,553. This application Jun. 6, 1988, Ser. No. 203,279

Int. Cl.⁴ F04B 43/14

U.S. Cl. 417-413

5 Claims



1. An improved pump comprising in combination:

a reciprocally acting motor means comprising a shaft retained for reciprocal movement, first and second magnet means attached to the shaft at predetermined axially spaced locations, first and second electromagnetic means arranged in axial alignment with said shaft and associated with the first and second magnet means respectively, to alternately attract the first and second magnet means when energized,

a flexible diaphragm operatively connected with the shaft to be deflected upon movement of the shaft, and means defining in cooperation with the diaphragm a pumping chamber in which the volume of the chamber varies in relation to the deflection of the diaphragm,

an inlet to the pump chamber, an inlet one-way valve which allows the fluid to flow into the pumping chamber and prevents fluid flow through the inlet out of the pumping chamber, an outlet from the pumping chamber, and an

outlet one-way valve which allows the fluid to exit the pumping chamber and prevents fluid flow through the outlet into the pumping chamber, and

means for alternately energizing and deenergizing the first and second electromagnetic means at a predetermined rate to reciprocate the shaft in alternatively opposite directions with each energization of one electromagnetic means and to deflect the diaphragm at a related predetermined rate to obtain a predetermined volumetric flow through the pumping chamber, and

said first and second electromagnetic means each include a core gap into which the associated magnet means is drawn when the electromagnetic means is energized, and the core gaps of the first and second electromagnetic means are spaced axially a greater predetermined distance than the axial predetermined spacing of the first and second magnet means on the shaft.

4,874,301

FUEL PUMPING APPARATUS

Godfrey Greeves, Hatch End; James C. Potter, London; Richard J. Andrews, Guildford, and Kenneth M. Harris, Maidstone, all of England, assignors to Lucas Industries Public Limited Company, Birmingham, England

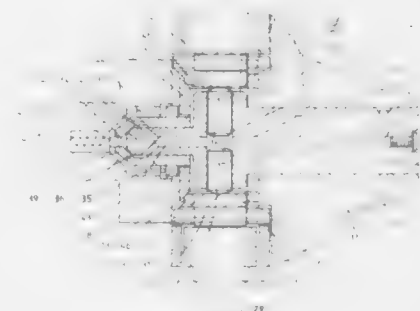
Filed Feb. 23, 1988, Ser. No. 159,397

Claims priority, application United Kingdom, Mar. 14, 1987, 8706090; Jan. 16, 1988, 8800958

Int. Cl.⁴ F02M 41/14

U.S. Cl. 417-462

17 Claims



4,874,300

CERAMIC STEP BEARING IN A CENTRIFUGAL PUMP

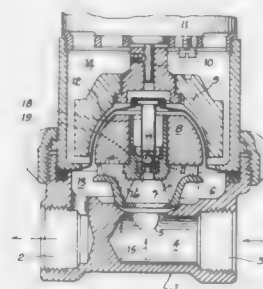
Karsten A. Laing, 1253 La Jolla Rancho Rd., La Jolla, Calif. 92037; Ludwig Ludin, Kesselackerstr. 23, Anglikon, CH5611, Switzerland, and Johannes N. Laing, 1253 La Jolla Ranch Rd., La Jolla, Calif. 92037

Filed Dec. 21, 1987, Ser. No. 135,733

Int. Cl.⁴ F04B 17/00, 35/04

U.S. Cl. 411-420

24 Claims



1. A centrifugal pump-motor assembly comprising an impeller having a magnetically interactive rotor, a driving unit generating a rotating magnetic field having magnetic forces in an axial direction towards a step bearing and generally perpendicular to the plane of said rotating magnetic field, a magnetically permeable wall separating the rotor from the driving unit, wherein the improvement comprises a step bearing comprising:

a convex member partially made of ceramic material; on a stationary strut fixedly supporting said convex member; and

a rotatably and rockably mounted concave cap attached to said impeller-rotor-unit, said concave cap shaped to be supported by said convex member when proximate and gliding over said convex member wherein said separation wall encloses a common annular gliding region wherein the convex member of the step bearing consists of a ball set in a metal shell, the center region of said shell being fixed to said strut attached to a stationary part of the pump-motor assembly.

1. A rotary distributor fuel pumping apparatus for supplying fuel to an internal combustion engine comprising a rotary distributor member housed in a body, a drive shaft coupled to the distributor member and driven in use in timed relationship with an associated engine, a plunger located within a bore in the distributor member, a plurality of cam lobes formed on a cam ring for imparting inward movement to the plunger as the distributor member is rotated, means for feeding fuel to the bore to effect outward movement of the plunger, further means for distributing the fuel displaced from the bore during successive inward movements of the plunger to a plurality of outlet ports in turn, characterised by a valve member carried by the distributor member and movable relative thereto, the valve member being shaped to engage with a seating to prevent the flow of fuel through a spill path from the bore, mechanical means operable by said cam lobes for moving the valve member away from the seating to open the spill path, the spill path being opened before the inward movement of the plunger under the action of a cam lobe has been completed.

4,874,302

SCROLL COMPRESSOR WITH OIL FEEDING PASSAGES IN THRUST BEARING

Norihide Kobayashi; Tsutomu Inabe; Tadashi Kimura, and Masahiro Sugihara, all of Wakayama, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 8, 1988, Ser. No. 216,309

Claims priority, application Japan, Jul. 8, 1987, 62-171590

Int. Cl.⁴ F04C 18/04, 29/02; F16C 33/10

U.S. Cl. 418-55

5 Claims

1. A scroll type compressor which comprises in combination:

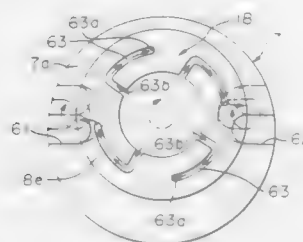
a bearing support having guide grooves extending in the diametral direction and an oil returning passage opening in the axial direction;

a stationary scroll member having a spiral wrap and fixed on said bearing support;

an orbiting scroll member having a spiral wrap which is combined with the spiral wrap of said stationary scroll member and guide grooves extending in the direction perpendicular to the direction of extension of said guide grooves of said bearing support;

an annular thrust bearing interposed between said orbiting scroll member and said bearing support, and having a

multitude of oil feeding passages, each communicatively connected with said oil returning passage; and an Oldham coupling disposed on and around said thrust bearing and having claws which slide in and along said both guide grooves,



wherein each said oil feeding passage is so formed as to have a terminal part within a plane of said thrust bearing, and a substantially circumferentially extending part of the passage is made to open at a position where it is intermittently communicating with said guide groove of said orbiting scroll member.

4,874,303

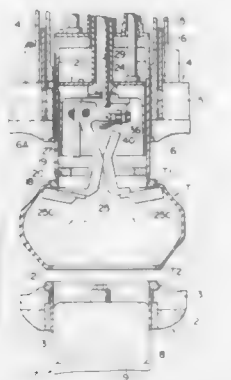
TIRE VULCANIZING PRESS

Katumi Ichikawa, Akashi; Itaru Amano, Kobe; Yasuhiko Hujeda, Akashi; Shikao Misumi, Kobe; Seisuke Hukumura, Miki, and Hideo Miyauchi, Kobe, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan
Filed Oct. 20, 1988, Ser. No. 260,029

Claims priority, application Japan, Mar. 22, 1988, 63-68533
Int. Cl.⁴ B29C 35/02

U.S. Cl. 425—28.1

5 Claims



1. A tire vulcanizing press wherein an upper die element and a lower die element are mounted for opening and closing movement relative to each other and a plurality of sectors each having a link extending in a vertical direction and a sectoral portion extending in a radially outward direction from a lower end of said link are mounted in a radial arrangement for movement between an open position and a closed position such that an upper bead of a green tire may be gripped and loaded in position between said die elements by means of said sectors and wherein the inner face of a tire loaded in position between said die elements is shaped and the tire is vulcanized by means of an expandable and contractible elastic forming member and a heated pressurizing medium supplied into said elastic forming member, comprising:

an inner cylinder mounted for relative up and down movement on said upper die element and having at a lower end portion thereof a bead ring adapted to form part of said upper die element, and
a sector housing mounted for relative up and down movement in said inner cylinder and having movably mounted

thereon said plurality of sectors for movement between the open position and the closed position;
the upper bead of the green tire being adapted for being gripped between said bead ring provided on said inner cylinder and said sectoral portions of said sectors;
said sectoral portions of said sectors being adapted for being accommodated in the lower end portion of said inner cylinder when said sectors are in the closed position;
an upper mounting ring having said elastic forming member thereon; and
a ring fitting portion being provided for receiving and retaining therein during vulcanization said upper mounting ring.

4,874,304

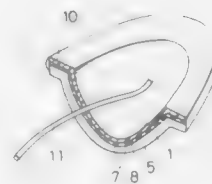
POROUS MOLD FOR PRESSURE SLIP CASTING

Haruyuki Ito, and Akio Matsumoto, both of Kitakyushu, Japan, assignors to Toto Ltd., Kitakyushu, Japan
Division of Ser. No. 77,657, Jul. 24, 1987. This application Feb. 3, 1988, Ser. No. 152,040

Claims priority, application Japan, Jul. 26, 1986, 61-176370
Int. Cl.⁴ B28B 1/26

U.S. Cl. 425—84

5 Claims



1. A porous mold for pressure slip casting, said porous mold comprising:

a surface porous layer having an average pore diameter of at most 20 microns and a thickness of 5 to 40 mm, said surface porous layer having a molding surface and a rear surface located opposite to said molding surface;
an adhesive applied in a pattern to said rear surface of said surface porous layer to leave an unapplied portion on said rear surface;
a coarse porous layer covering the adhesive applied and unapplied portions of said rear surface of said surface porous layer, said coarse porous layer being made of a mixture of a liquid resin and a filler of a particle size of 0.1 to 5.0 mm at a volume ratio of 15 to 50:100, said coarse porous layer having a thickness of 5 to 30 mm;
a sealing adhesive resin covering substantially an outer surface of said coarse porous layer; and
means for passage of water from and air into said coarse porous layer.

4,874,305

ACCUMULATOR EXTRUSION HEAD FOR PRODUCING STRIPED PARISONS

Paul E. McGill, Neahank, and Frank J. Pittigliano, Bedminster, both of N.J., assignors to Somerset Technologies, Inc., New Brunswick, N.J.

Filed Nov. 3, 1988, Ser. No. 266,689

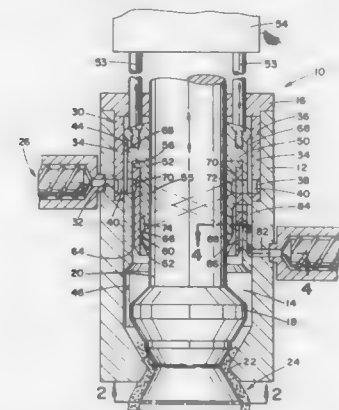
Int. Cl.⁴ B29C 47/54

U.S. Cl. 425—131.1

8 Claims

4. An accumulator head for producing a parison having at least one stripe extending longitudinally thereof comprising:
an extrusion head body member and a central mandrel cooperating to define an annular extrusion chamber terminating in an annular outlet nozzle;
an annular ram mounted in said extrusion chamber for reciprocation toward and away from said outlet nozzle;
first supply means for supplying a first extrusion material to said extrusion chamber; and

second supply means for supplying a second extrusion material to said extrusion chamber, said second supply means including a supply passage means comprising a plurality of small openings extending through said ram and along a



longitudinal direction of said ram for supplying a radially continuous stripe of said second extrusion material through the forward end of said ram to said extrusion chamber during movement of said ram toward said outlet nozzle.

4,874,306

MIDRING DIE

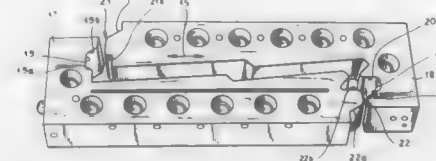
Kenton Gearhart, Moundridge, Kans., assignor to American Maplan Corporation, McPherson, Kans.

Filed Nov. 30, 1988, Ser. No. 278,044

Int. Cl.⁴ B29C 47/12

U.S. Cl. 425—192 R

7 Claims



1. An extrusion die for the extrusion of a wide thin workpiece from a synthetic resin, comprising:

a die body formed with a passage for an extrudable synthetic resin; and
a die lip detachably mounted on said body and defining a die orifice having substantially a shape corresponding to the cross section of said workpiece, said die lip being of substantially rectangular parallelepipedal configuration and consisting exclusively of:
a first elongated lip member having a contoured surface defining one side of said orifice along one side of said first lip member,
a second elongated lip member having a contoured surface defining an opposite side of said orifice along one side of said second lip member juxtaposable with said one side of said first lip member, said lip members being relatively shiftable in a direction generally parallel to the longitudinal dimensions of said members, said orifice being elongated in said direction and said members being formed with mutually engageable sealing surfaces at each end of said orifice extending generally in said direction;
respective formations on opposite ends of said lip members matingly engageable upon movement of said lip members in said direction and including, at each end of said orifice, respective pairs of mating surfaces inclined to said direction and forcing said lip members against one another at

said sealing surfaces upon relative movement of said lip members in said direction, and
means interconnecting said lip members generally in said direction for displacing said lip members relatively in said direction, said means interconnecting said lip members generally in said direction comprising a respective pair of screws traversing each of said members and threaded into the other of said members at respective ends of said members, said screws extending generally parallel to said sealing surfaces, said formations including a respective projection on a respective end of each of said lip members and formed in one piece therewith, extending transversely to said direction and mating with the other end of the other lip member, each of said other ends mating with a respective projection being formed unitarily with a nose projecting in said direction and formed with both a respective one of said inclined surfaces and a respective one of said sealing surfaces, each projection having a recess complementarily shaped to the respective nose and receiving same with a clearance of about 0.005 to 1 mm in said direction.

4,874,307

CUTTING DEVICE FOR HIGH-TEMPERATURE GRANULATION OF THERMOPLASTIC POLYMERS

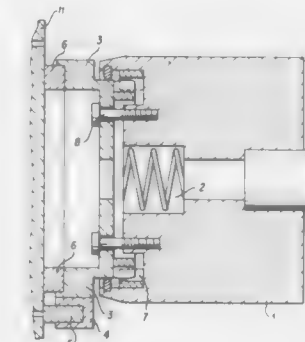
Lucia Comper, Castel D'Ario, and Francesco Ferrari, Virgilio, both of Italy, assignors to Montedipe S.p.A., Milan, Italy

Filed Nov. 2, 1987, Ser. No. 115,118

Claims priority, application Italy, Nov. 3, 1986, 22214 A/86
Int. Cl.⁴ B29B 9/00

U.S. Cl. 425—311

15 Claims



1. A cutting device for high-temperature granulation of thermoplastic polymers, which comprises:

(a) a rotor adapted to be rigidly keyed on a drive shaft;
(b) a blade-carrier disc on which a thrust bearing is coaxially applied;
(c) blades which are adapted to face a cutting plate and which are rigidly attached to the bladecarrier disc; and
(d) an articulated system located between the rotor and the disc.

4,874,308

VACUUM ASSISTED TRANSFER MOLD AND VENT PIN

George N. Atlas, 30 E. Brown Rd. #1102, Mesa, Ariz. 85201; Leroy C. Donnally, 3425 N. 42nd St., Phoenix, Ariz. 85018; Donald P. Urban, 2639 W. La Senda, Mesa, Ariz. 85202; James M. Perkins, 2230 W. Hayward, Phoenix, Ariz. 85021; and Timothy C. Wilson, 42798 Twilight Ct., Rancho California, Calif. 92390

Filed Apr. 4, 1988, Ser. No. 177,195

Int. Cl.⁴ B29C 45/02, 45/34

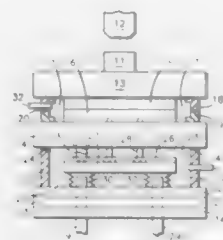
U.S. Cl. 425—544

10 Claims

1. A vacuum assisted transfer mold comprising:

mold plate means for forming a cavity about a device to be encapsulated;
a top mold base coupled to the top of said mold plate means;
a bottom mold base coupled to the bottom of said mold plate

first vacuum wall means for creating an atmospheric seal about said mold plate means, said first vacuum wall means being disposed between said top and bottom mold bases;
a backup plate coupled to said bottom mold base opposite said mold plate means;
an opening extending through said bottom mold base;
a vent pin extending through said opening in said bottom mold base into said mold plate means;
vent pin retaining means for retaining a base portion of said pin, said retaining means being disposed between said bottom mold base and said backup plate; and
second vacuum wall means for creating an atmospheric seal about said vent pin retaining means, said second vacuum



wall means being disposed between said bottom mold base and said backup plate;
said vacuum wall means including means through which a vacuum can be applied to said transfer mold;
said vent pin retaining means including means for axially moving said vent pin within said opening in said bottom mold base to cause said vent pin to enter said cavity and function as an ejector;
said vent pin having first and second surface portions therealong that are configured to cooperate in said opening in said bottom mold base whereby said vent pin operates to vent said cavity and clean said opening in said bottom mold base;
a seal capable of reciprocal motion coupled between said vent pin retaining means and said backup plate; and
a push rod extending through said backup plate and surrounded by said seal to enable said vent pin retaining means to be reciprocated between said backup plate and said bottom mold base.

4,874,309

DIE CLAMPING APPARATUS

Yuki Kushibe, and Hiroshi Sato, both of Nagoya, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan
Filed Jun. 8, 1988, Ser. No. 204,528

Claims priority, application Japan, Jun. 22, 1987, 62-153542; Jun. 24, 1987, 62-157154

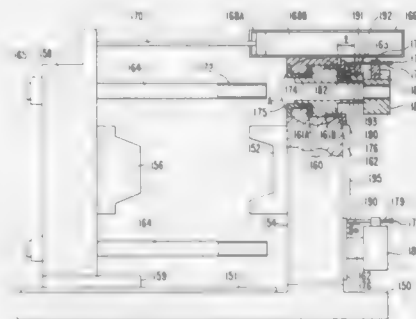
Int. Cl.⁴ B29C 45/66

U.S. Cl. 425-589

4 Claims

1. A die clamping apparatus comprising:
a fixed die plate immovably fixed in the apparatus, said fixed die plate having a mounting surface for supporting a fixed die;
a movable die plate movably supported in the apparatus, said movable die plate having a mounting surface for supporting a movable die opposite to the fixed die, and
moving means operatively connected to said movable die plate for causing said movable die plate to advance toward said fixed die plate and close said dies and for causing said movable die plate to retreat from said fixed die plate and open said dies;

tie bars fixedly secured to one of said die plates and immovable relative to said one of said die plates,
said tie bars each including a first end from which the tie bars extend from said one of said die plates toward the other of said die plates, a tip end opposite said first end, and one of a thread and a series of grooves extending along the outer circumferential surface of said tip end;
hydraulic cylinders disposed on the other of said die plates across from said tie bars, respectively,
each of said hydraulic cylinders including a ram having an insert hole extending therethrough in an axial direction aligned with a respective one of said tie bars, the tip end of each of said tie bars extending through a respective said insert hole when said dies are closed,
each said ram being movable in a direction parallel to said axial direction;
a respective coupling means operatively associated with each of said tie bars, supported by said other of said die



plates and movable relative thereto in directions parallel to said axial direction, and positioned adjacent a surface of said other of said die plates opposite the mounting surface thereof,
each said coupling means having a peripheral surface that is complimentary to said one of said thread and series of grooves extending along the tip end of a respective one of said tie bars, and
said peripheral surface movable, in directions perpendicular to said axial direction, into and out of mating engagement with said one of said threads and series of grooves of said respective one of said tie bars when said dies are closed so as to couple said die plates through said tie bars;
means for causing said coupling means to move in said axial direction with said ram; and
stopper means operatively connected to each said coupling means for adjustably setting a relative position, in said axial direction, of said coupling means and the tip ends of said tie bars with respect to when said dies are closed.

4,874,310

LOW NOX BURNER

Howard Seemann, Seaford, N.Y., and Chad F. Gottschlich, Philadelphia, Pa., assignors to Selas Corporation of America, Dresher, Pa.

Filed Feb. 25, 1988, Ser. No. 160,265

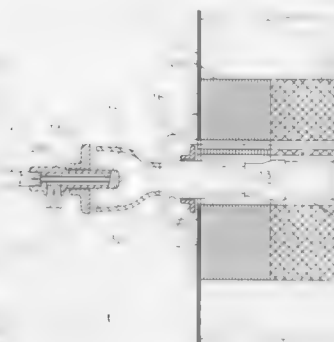
Int. Cl.⁴ F23C 7/00

U.S. Cl. 431-8

19 Claims

1. A controlled primary air inspirating gas burner comprising:
a burner body having a burner tip adapted to be installed in a furnace or the like for combustion of gaseous fuel therein,
a fuel inspirating jet positioned in said body upstream of said tip and having an open gaseous fuel orifice for introduction of gaseous fuel into said burner body,
means for supplying gaseous fuel under pressure to said inspirating jet,
means forming an induced primary air passageway upstream

of said burner tip for flow of induced primary air into said body for mixing with said gaseous fuel prior to exiting said burner tip,
means forming a separate control primary air passageway located upstream of said induced primary air passageway and extending into said burner body adjacent said inspirating jet for separately introducing control primary air into said body,



pressure means connected to introduce said control primary air into said fuel inspirating jet, and
separate control means for controlling the rate of introduction of said control primary air into said burner body, whereby the NOx content of the resulting flue gas can be reduced in the absence of secondary air.

4,874,311

METHOD AND APPARATUS FOR IMPROVED REGENERATIVE FURNACE

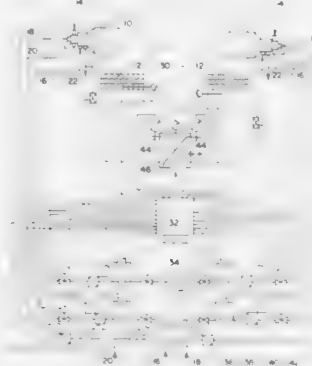
Gregory M. Gitman, Duluth, Ga., assignor to American Combustion, Inc., Norcross, Ga.

Filed Aug. 3, 1987, Ser. No. 60,420

Int. Cl.⁴ F27B 14/00

U.S. Cl. 432-13

13 Claims



1. A method of melting material in a regenerative furnace comprising the steps of:
(a) directing a stream of preheated combustion air toward the interior of said furnace;
(b) introducing controllable amounts of an auxiliary fuel into a combustion chamber;
(c) introducing an auxiliary oxidizing gas into said combustion chamber so that said oxidizing gas mixes with said auxiliary fuel and combusts to produce hot combustion products;
(d) directing a main fuel into said combustion chamber so that said main fuel is pyrolyzed by said hot combustion

products to produce a hot luminous stream of combustible gas; and
(e) directing said hot luminous stream of combustible gas from said combustion chamber to the interior of said furnace to mix with said combustion air to form a final luminous flame envelope to heat the material to be melted.

4,874,312

HEATING AND HANDLING SYSTEM FOR OBJECTS

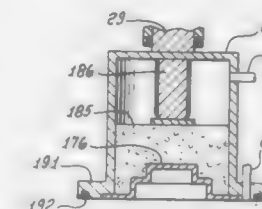
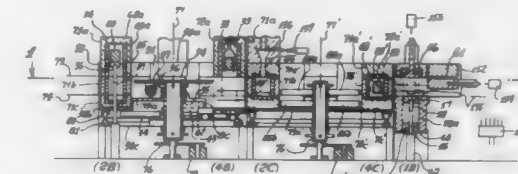
Robert W. Hailey, 2030-229 Beverly Plaza, Long Beach, Calif. 90815
Division of Ser. No. 948,229, Dec. 31, 1986, Pat. No. 4,758,157, which is a continuation-in-part of Ser. No. 710,541, Mar. 11, 1985, Pat. No. 4,634,375. This application Jun. 3, 1988, Ser. No.

201,842

Int. Cl.⁴ F27B 9/00

U.S. Cl. 432-122

4 Claims



1. In combination, a shell at an entry port of an entry chamber associated with a processing chamber that contains furnace means, and conformable structure carried by the shell, the conformable structure configured to be moved to fit the top of a charge to be entered into the entry chamber, said structure providing operating means to displace atmospheric gas in the entry chamber out of the space between that structure and the top section of a charge supporting base adapted to closely fit the bottom of the charge at said entry port of said entry chamber.

4,874,313

REFRACTORY CLAD LID FOR HEATING VESSEL

Ronald L. Schweninger, Ridgeley, W. Va., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Sep. 26, 1988, Ser. No. 248,678

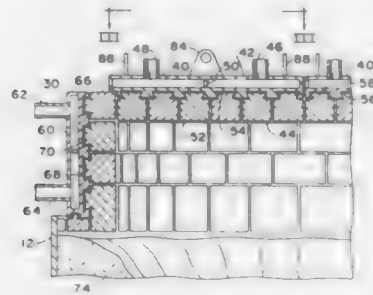
Int. Cl.⁴ F27D 1/00

U.S. Cl. 432-247

4 Claims

1. A protective panel for a heating vessel comprising:
a hollow support member having an engagable surface;
a plurality of refractory blocks having an engagable surface, wherein said engagable surfaces of said support member and blocks include grooves and projections interlocking with said grooves so as to maintain said refractory blocks along said member in generally abutting relationship to form a refractory facing;
means for mounting said support member to position said refractory facing toward the inside of said heating vessel; and

means to circulate cooling fluid through said support member to cool said refractory facing and prevent deterioration of said blocks from a hostile environment within said vessel.



tion of said blocks from a hostile environment within said vessel.

4,874,314

SOCKET TO CLAMPINGLY HOLD DENTAL TOOLS
Ernst O. Floor, Bensheim; Hermann Landgraf, Lorch, and Werner Schwarz, Heppenheim, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

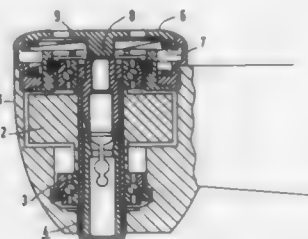
Filed Dec. 11, 1987, Ser. No. 132,008

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1986, 3644055

Int. Cl.⁴ A61C 1/14

U.S. Cl. 433-129

16 Claims



1. A socket for clamping a cylindrical shaft of a dental tool, said socket having an outer sleeve, a clamping sleeve, and a displaceable ram, said outer sleeve having means for mounting the socket for rotation in a housing, said ram being inserted in said outer sleeve and being freely, axially displaceable between a position adjacent a first end of the outer sleeve and an inwardly disposed position that is closer to a second end of said outer sleeve, said ram having outer tapering surfaces extending at an angle to the axis of said outer sleeve on an end of the ram pointing towards said second end of said outer sleeve, said clamping sleeve having longitudinal slots extending inward from a first end to form resilient tongues, each of said tongues having an inner tapering surface extending at an angle to the axis of the clamping sleeve, said clamping sleeve being inserted into the outer sleeve with the first end of the clamping sleeve adjacent the outer tapering surfaces of said ram, means for securing the clamping sleeve in an axially immobile position in the outer sleeve, said ram being moved from a retracted position towards the clamping sleeve with the tapering surface of the ram coacting with the tapering surfaces of the tongues to urge the tongues from a closed position on a shaft of a tool inserted in the clamping sleeve to a radially outward unclamping position to release said tool, said angle of the outer tapering surfaces being greater than the angle of the inner tapering surfaces so that the contact between tapering surfaces of each tongue and ram form substantially a line contact with one another that is offset from the slots while in the unclamping position.

4,874,315 METHOD FOR BONDING OF RESTORATIVE MATERIALS TO A TOOTH

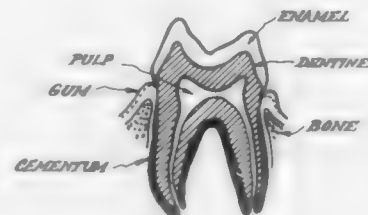
John D. B. Featherstone; Lyndon F. Cooper, both of Rochester; Michael L. Myers, Pittsford, all of N.Y., and Dennis G. A. Nelson, Wellington, New Zealand, assignors to Eastman Dental Center, Rochester, N.Y.

Filed Feb. 19, 1987, Ser. No. 16,250

Int. Cl.⁴ A61C 5/00

U.S. Cl. 433-215

14 Claims



1. A method for treating a tooth with a restorative material comprising the steps of pretreating at least a portion of the surface area of the dentin or cementum of said tooth with light from a laser, which is of a wave length between 9.0 and 11.0 micrometers for a duration sufficient to apply about 5 J of laser energy to said dentin or cementum, and then applying a restorative material to the pretreated surface area of said tooth.

4,874,316

CONNECTOR APPARATUS

Yoshiyuki Kamon; Akira Ogiwara, both of Kanagawa, and Koji Nagano, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

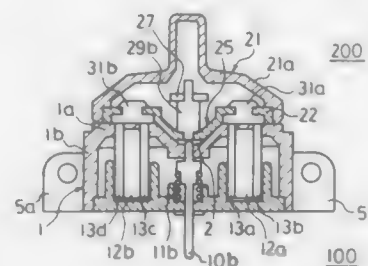
Filed Apr. 12, 1988, Ser. No. 180,847

Claims priority, application Japan, Apr. 30, 1987, 62-107342

Int. Cl.⁴ H01R 11/30

U.S. Cl. 439-39

5 Claims



1. A connector apparatus for a stereo headphone comprising:

- a) a plug including a first housing having a first contact face and a convex mating portion formed on said first contact face, said convex mating portion being in the shape of a truncated pyramid but with one side of the pyramid having a different angle of inclination than the opposite side, a plurality of first terminals including left and right terminals for stereo and an earth terminal, said terminals being accommodated in said first housing and having one end exposed to the outside of said first housing from said convex mating portion, a plurality of electrical leads separately connected between different ones of the other ends of said first terminals and said stereo headphone, and a first magnetic coupling means located at both sides of said convex mating portion; and
- b) a socket including a second housing having a second contact face and a concave mating portion formed on said second contact face, said concave mating portion being in the shape of a truncated pyramid but with one side of the

pyramid and the other side of the pyramid having corresponding angles of inclination to those of said one side and the opposite side of the pyramid of said plug, a plurality of second terminals including left and right terminals for stereo and an earth terminal, said second terminals being accommodated in said second housing and exposed to the outside of said second housing at their ends from said concave mating portion, and a second magnetic coupling means located at both sides of said concave mating portion on said second contact face.

4,874,318

MOUNTING ARRANGEMENT FOR A CHIP CARRIER
Arthur T. Spencer, Biggleswade, United Kingdom, assignor to Flexicon Systems Limited, Cambridge, United Kingdom
PCT No. PCT/GB88/00183, § 371 Date Nov. 2, 1988, § 102(e)
Date Nov. 2, 1988, PCT Pub. No. WO88/07807, PCT Pub. Date Oct. 6, 1988

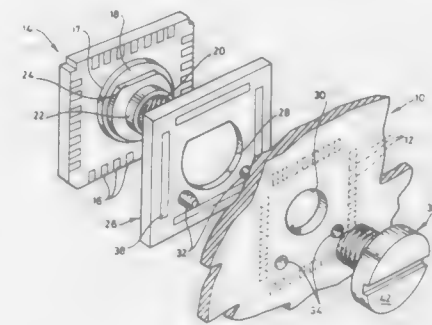
PCT Filed Mar. 10, 1988, Ser. No. 269,740

Claims priority, application United Kingdom, Mar. 31, 1987, 8707663; May 8, 1987, 8710951

Int. Cl.⁴ H01R 23/72

U.S. Cl. 439-71

10 Claims



4,874,317

JACKFIELD WITH FRONT TERMINALS

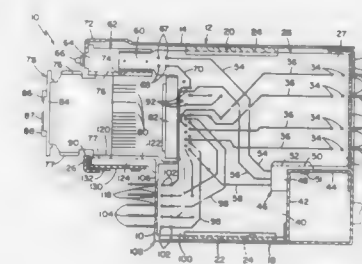
Frederick L. Lau, Skokie, Ill., assignor to Switchcraft, Inc., Chicago, Ill.

Filed Aug. 15, 1988, Ser. No. 232,358

Int. Cl.⁴ H01R 9/09; H05K 7/10

U.S. Cl. 439-54

3 Claims



1. A printed circuit board assembly comprising:

- a printed circuit board having an edge with a right angle connector adapted for receiving and removably mating with an electrical jack module, said printed circuit board having a plurality of printed circuit conductors with respective end portions disposed in spaced relationship with one another at a portion of said edge adjacent to said right angle connector;
- a linear array of laterally spaced terminals disposed along said portion of said edge, each of said terminals having a proximal end portion connected electrically to a respective one of said end portions of said conductors and having a distal end portion projected outwardly of said edge of said board; and
- a dielectric bracket having a first leg disposed along said portion of said edge and being secured to said board, said bracket having an orthogonal second leg integrally joined to an end portion of said first leg and projected outwardly of said edge of said board, said first leg of said bracket having disposed therein a linear array of mutually spaced apertures through which respective distal end portions of said terminals extend, said orthogonal second leg of said bracket having a collinear surface provided with a channel adapted for receiving said electrical jack module in sliding engagement.

4,874,319

TERMINAL LEAD SHIELDING FOR HEADERS AND CONNECTORS

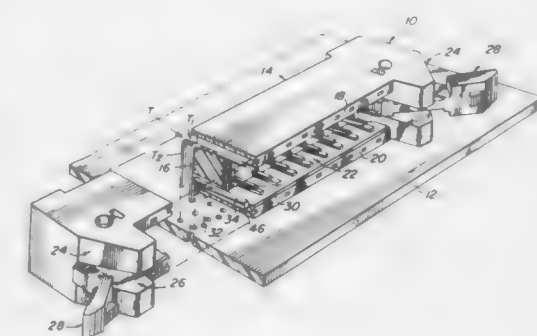
Alexander W. Hasircoglu, Lancaster, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 20, 1988, Ser. No. 222,090

Int. Cl.⁴ H01R 4/66

U.S. Cl. 439-108

23 Claims



1. An electrical connection device comprising:

- a housing having at least one row of spaced apart electrical contacts for effecting connection with respective contacts of a complementary type, each said electrical contact having a tail portion having a first segment extending in a rearward direction from said housing and a second seg-

ment extending at an angle in a selected direction relative to its first segment;
 a first row of spaced apart ground contacts on one side of said row of electrical contacts and a second row of spaced apart ground contacts on the other side of said row of electrical contacts, each said ground contact having a tail portion having a first segment extending in a rearward direction from said housing and a second segment extending at an angle in the selected direction relative to its first segment, the respective tail portions of said first and second rows of ground contacts arranged intermediate said tail portions of each of said electrical contacts, and wherein respective said second segments of said tail portions of said electrical contacts and said ground contacts extend at a substantially right angle relative to their respective said first segments.

4,874,320

FLEXIBLE LIGHT RAIL

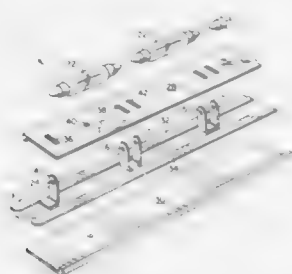
Herbert D. Freed, P.O. Box 370375, Miami, Fla. 33137, and Dennis Leach, 211, Tottenham Rd., Palmers Grn, London, England

Filed May 24, 1988, Ser. No. 198,083

Int. Cl.⁴ H01R 4/66

U.S. Cl. 439—115

23 Claims



1. An apparatus for supporting a plurality of lighting fixtures comprising:
 a first conductive strip having a first plurality of lateral extensions connected thereto, each of said first plurality of lateral extensions having attached thereto one or more first contact tabs, said first contact tabs being generally perpendicular to the surface of said first conductive strip;
 a second conductive strip essentially parallel to said first conductive strip creating a space therebetween, said second conductive strip having a second plurality of lateral extensions connected thereto, each of said second plurality of lateral extensions having attached thereto one or more second contact tabs, said second contact tabs being generally perpendicular to the surface of said second conductive strip, said first and second contact tabs being located along said space between said first and second conductive strips; and
 means for electrically insulating said first and second conductive strips.

4,874,321

ADAPTER

Hans Wagener, Dietzholztal, and Jurgen Zachrel, Dillenburg, both of Fed. Rep. of Germany, assignors to Rittal-Werk Rudolf Loh GmbH & Co., KG, Herborn, Fed. Rep. of Germany

Filed Dec. 11, 1987, Ser. No. 131,750

Claims priority, application Fed. Rep. of Germany, Dec. 12, 1986, 3642517

Int. Cl.⁴ H01R 25/14, 4/30

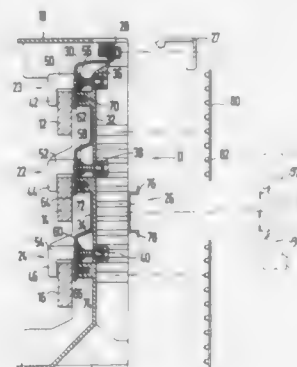
U.S. Cl. 439—119

13 Claims

1. An adapter apparatus for mechanical and electrical connection of installation devices such as automatic circuit breakers, motor protection switches, contactors, relays, and the like

with bus rails of a bus bar system which can accommodate installation devices equipped with mounting feet for standard mounting brackets, comprising:

an adapter housing which may be placed over the bus rails, the housing having a front and a rear;



at least one contact bar secured to the housing, the contact bar extending to the front side to form lead connector points;
 an adjustable clamp secured to each contact bar and facing a respective bus rail; and
 means on the front of the adapted housing for mounting of installation devices.

4,874,322

SURFACE APPLIED WIRING APPARATUS

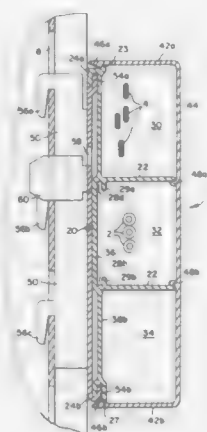
Frank P. Dola, Hudson; Steven Feldman, and John K. Erwin, both of Seminole, all of Fla., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Sep. 28, 1987, Ser. No. 101,713

Int. Cl.⁴ H02G 3/04

U.S. Cl. 439—210

23 Claims



1. An assembly for use in deploying wires along a wall comprising a raceway with elongate compartments for housing the wires, the raceway comprising at least one elongate member with a rear panel, the elongate compartments being located along the interior of the rear panel, the rear panel having at least one elongate tongue and groove on the exterior, each tongue being spaced from the rear panel with said groove formed between the tongue and the exterior of the rear panel, the assembly further comprising a plurality of hanger brackets, each securable to the wall and engageable with the rear panel, each hanger bracket having at least one protruding lip received within the groove on the rear panel when the raceway is

mounted on said hanger brackets secured to the wall, the rear panel of the raceway comprising an extruded member having a constant cross section along its length, the groove formed between the tongue and rear panel being continuous so that the raceway can be mounted on said hanger brackets at any position along its length.

4,874,323

CONNECTOR

Yasuji Shibano, Izumisano, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

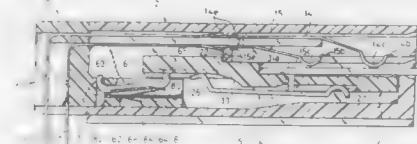
Filed Oct. 28, 1988, Ser. No. 264,037

Claims priority, application Japan, Nov. 11, 1987, 62-172107[U]

Int. Cl.⁴ H01R 9/09

U.S. Cl. 439—260

5 Claims



1. A connector comprising:
 A connector body provided in the front side thereof with a card inserting/removing port:
 contact pieces disposed, at predetermined spatial intervals, in the inner part of said card inserting/removing port in said connector body;
 a resettable slider in said connector body adapted to be moved from an advance position to a retreat position by a card inserted through said card inserting/removing port;
 a swing member disposed at the opposite side of said slider to the side thereof on which said contact pieces are disposed, and extending over said slider and a card inserted through said card inserting/removing port, said swing member being supported by said connector body so as to be swingable around the axis of said swing member, said axis being at a right angle to a card inserting/removing direction, whereby, as said slider is moved from said advance position to said retreat position, one swing end of said swing member is pushed by said slider and displaced in a direction away from said contact pieces, and the other swing end of said swing member is displaced in a direction toward said contact pieces, causing the card inserted through said card inserting/removing port to be moved in a direction toward said contact pieces, such that the terminals of said card come in contact with contact portions of said contact pieces.

4,874,324

UNDERWATER ELECTRICAL CONNECTOR

James K. Andersen, Arnold, and Carl L. Hikes, Severna Park, both of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 3, 1988, Ser. No. 227,576

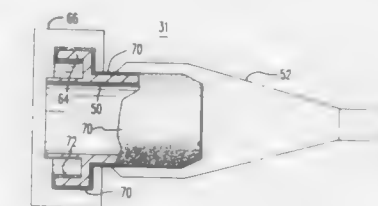
Int. Cl.⁴ H01R 13/52

U.S. Cl. 439—271

6 Claims

1. In an underwater electrical connector, the improvement comprising:
 (A) a generally cylindrical metallic connector shell;
 (B) at least one electrical conductor positioned within the interior of said shell;
 (C) an encapsulating boot surrounding a portion of said shell;
 (D) a protective plastic coating deposited on the surface of said shell at least in the area where surrounded by said

boot as well as areas which may be exposed to the ambient water medium;



(E) said boot being in intimate bonded contact with said coating.

4,874,325

ELECTRICAL CONNECTOR WITH INTERFACE SEAL

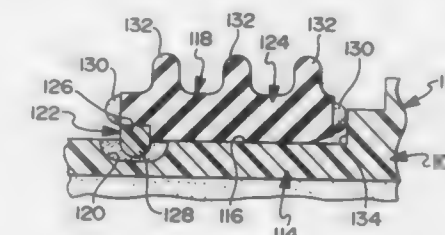
Gregory L. Bensing; Joseph H. Gladd, both of Courtland, and John A. Yurtin, Southington, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Sep. 23, 1988, Ser. No. 248,059

Int. Cl.⁴ H01R 13/52

U.S. Cl. 439—272

10 Claims



1. An electrical connector having an interface sealing arrangement comprising:
 a thermoplastic connector body which houses a plurality of electrical terminals and which has a plug portion of reduced size which serves as mounting surface for an interface seal,
 said plug portion having a conformation which opens onto the mounting surface,
 said interface seal having a sealing portion which is made of an elastomeric material and a retainer portion which is made of thermoplastic material or elastomeric material having a higher durometer than the elastomeric material of the sealing portion,
 said retainer portion including a portion which snaps into the conformation which opens onto the mounting surface to assure that the interface seal is always correctly positioned for sealing engagement with a mating connector body.

4,874,326

ELASTOMERIC ELECTRICAL ISOLATION MEMBRANE

Victor J. Marolda, Jr., Salem, Conn., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 20, 1988, Ser. No. 246,703

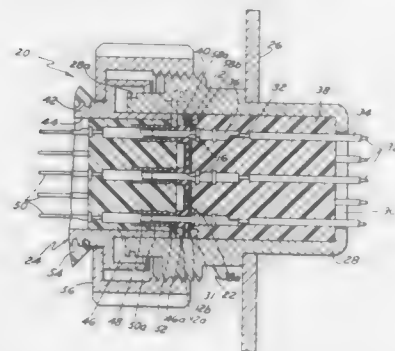
Int. Cl.⁴ H01R 13/52

U.S. Cl. 439—273

2 Claims

1. In combination with an open face pressure tolerant plug to receptacle type electrical connector and a dielectric grease, an electrical isolation membrane, comprising:
 a circular dielectric elastomer disk having a preselected diameter "d₁", thickness "t" and Shore durometer; and
 a plurality of dielectric cylindrical elastomer embossments, each embossment having a longitudinal centerline arranged orthogonally with respect to the plane of said

elastomer disk, each embossment being fixedly attached to said elastomer disk at a preselected location so as to form a preselected pattern having at least an embossment spacing "y", each said embossment having an outside diameter "d₂" slightly larger than the corresponding socket cavity of said receptacle it will contact and an inside diameter "d₃" slightly smaller than the pin diameter of said plug, each of said plurality of embossments further comprises first and second conical ends, each end having an identical surface of preselected angle "x" formed thereon with respect to said embossment centerline, at least one said conical surface being disposed a preselected height "h" above the surface of said elastomeric disk;



said membrane being coated with said dielectric grease and disposed between said plug and said receptacle of said electrical connector, said plug and said receptacle then being engaged and tightened whereby said embossments first contact said socket cavities, then purge said dielectric grease and water from said cavities, and when fully tightened employ hydrostatic pressure produced from tightening to squeeze out most remaining grease and water while any remaining water is broken up into a discontinuous series of microspheres, said dielectric grease coated membrane thereby providing electrical isolation between pins of said plug while said connector has been assembled in an aqueous environment.

4,874,327

UNIVERSAL CABLE HEAD FOR A MULTICONDUCTOR LOGGING CABLE

Matthew Ip, Austin, Tex., assignor to Halliburton Logging Services, Inc., Houston, Tex.

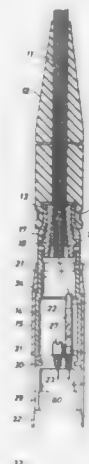
Filed Nov. 7, 1988, Ser. No. 267,854
Int. Cl.⁴ H01R 7/02

U.S. Cl. 439-275

10 Claims

1. A universal cable head which comprises:
 - (a) an armored logging cable having up to seven electrical conductors therein and incorporating a woven wire rope, and a surrounding armor wrap;
 - (b) stress relieving stinger means on said cable;
 - (c) an encircling housing on the end of said cable having an external shoulder thereon connecting with said stress relieving stinger to transfer axial loads from said cable to said housing;
 - (d) an internal transverse bulkhead within said housing adjacent to an internal cavity therein;
 - (e) electrical feedthrus supported by said transverse bulkhead, said feedthrus having a cable end formed with terminals for connection of conductors in said logging cable;
 - (f) exposed mating connectors in a prearranged pattern supported by said bulkhead, said connectors being electrically connected to said feedthrus;

- (g) said housing extending past and encircling said mating connectors; and



- (h) a rotatable, shoulder limited sleeve on the exterior of said housing having threading means thereon for connecting with a mating female connector.

4,874,328

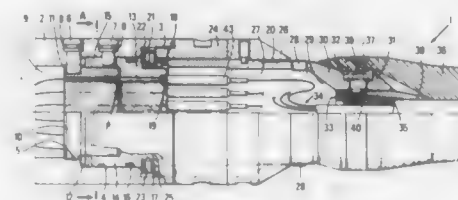
CONNECTION DEVICE FOR THE MECHANICAL AND ELECTRICAL CONNECTION OF A MULTI-CONDUCTOR CABLE TO A WELL PROBE

Jean-Claude Le Dall, route de l'Empereur, and Jean-Claude Marchand, Les Millepertuis, both of France, assignors to Institut Français du Pétrole et Géomécanique, Neuilly-Malmaison, France

Filed May 4, 1988, Ser. No. 190,153
Claims priority, application France, May 5, 1987, 87 06360
Int. Cl.⁴ H01R 13/52

U.S. Cl. 439-278

8 Claims



1. A connection device for the electric and mechanical connection of a well-probe to a multi-conductor cable to the end of which the probe is lowered into a well or bore hole, comprising electric connection means for connection between different electric conductors in the well-probe and conductors of the multi-conductor cable and mechanical connection means for fixing the cable to the end of the well probe, wherein the electric connection means comprises a separation disk with a tubular extension and a female electric connector able to penetrate into the tubular extension, the separation disk being provided with sealed passages for a set of pins which are adapted, on one side thereof for plugging on to a set of hollow rods electrically connected to the conductors of the cable and on the opposite side on female pins of the electric female connector, which are electrically connected to the conductors inside the probe, and the mechanical connection means include an annular sleeve having at one end a fitting associated with means for retaining the cable and adapted for receiving at its opposite end a terminal part of a body of the probe which includes cavities capable of containing the separation disk and the female electric connector; the mechanical connection means including fool-proof means cooperating with the separa-

tion disk, the female electric connector and the sleeve for a proper angular orientation of the same with respect to one another, and means for securing the annular sleeve to the terminal part of the body of the well-probe, said mechanical connection means acting by drawing the annular sleeve and the terminal part together, to form a correct electrical connection between the disk and the female electric connector and to isolate inside of the body sealingly from the well.

4,874,329

POCKET ASSEMBLY

Kuang-Shih Yu, 10F, 546, Min Chuan E. Rd., Taipei, Taiwan
Continuation-in-part of Ser. No. 97,511, Sep. 15, 1987, Pat. No. 4,781,616. This application Oct. 24, 1988, Ser. No. 261,982

Int. Cl.⁴ H01R 4/24

U.S. Cl. 439-409

3 Claims



1. A socket assembly having a screwshell provided for holding an electric lamp bulb, an insulating plate for being positioned on top of the screwshell, and a positive terminal member disposed in the screwshell with one end extending through the top thereof, comprising:

a non-conductive body with an L-shaped recess in a middle portion fixedly connected to the screwshell at a lower end by a plurality of riveting pins;

conducting means disposed on said non-conductive body and having two piercing terminal portions respectively connected to the screwshell and the positive terminal member for effecting electrical connections therewith;

a coupling means, formed in shape of an "L" with a horizontal portion and a vertical portion in conjunction with said L-shaped recess, pivotally connected to said non-conductive body for enabling close engagement with said L-shaped recess, having an accommodating means therein for receiving two electrical cords while permitting the electrical cords to be exposed in registry with said conducting means, rotatable to press said electrical cords against said conducting means so that said piercing terminal portions of said conducting means may be inserted into the electrical cords and achieve electrical connection, respectively; and

a retaining means for retaining said coupling means within said L-shaped recess of said non-conductive body.

4,874,330

CAPACITY MODULAR PLUG

Stephen B. Bogese, II, and Charles E. Hall, both of Roanoke, Va., assignors to Virginia Plastics Company, Roanoke, Va.
Continuation of Ser. No. 178,853, Mar. 29, 1988, abandoned, which is a continuation of Ser. No. 73,294, Jul. 7, 1987, abandoned, which is a continuation of Ser. No. 805,571, Dec. 2, 1985, abandoned, which is a continuation of Ser. No. 588,565, Mar. 12, 1984, abandoned. This application Mar. 3, 1989, Ser. No. 318,514

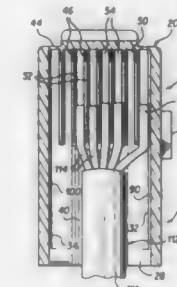
Int. Cl.⁴ H01R 4/24

U.S. Cl. 439-418

20 Claims

1. In a modular plug characterized by a unipartite rigid dielectric housing having a free end for insertion in a mating modular jack, a movable locking tab extending angularly rearwardly from the free end of the housing and adapted to mate with a tab-receiving latch in the modular jack, a cable input end for receiving a multi-conductor cable having an outer

jacket, a terminal receiving side having plurality of slots for receiving substantially planar contact terminals having insulation-piercing tangs at the lower portion thereof for terminating the conductors of the cable and an upper portion for making electrical contact with the spring contact members of the mating modular jack, a cable receiving cavity defined by first and second substantially planar side walls and top and bottom walls, said cavity including a forward region that is insertable into the mating modular jack and a rear region that is not normally insertable into the mating modular jack, said cavity



including in the forward region thereof a plurality of conductor-receiving troughs.

the improvement which comprises first and second conductor-receiving grooves formed in the first and second side walls of the cavity of said housing, said grooves each extending longitudinally in said side walls and being substantially parallel to the conductor-receiving troughs; said grooves each sized to receive one of the conductors of said multi-conductor cable, the number of conductors which can be received in the cavity being greater than the number of troughs formed in said housing.

4,874,331

STRAIN RELIEF AND CONNECTOR - CABLE ASSEMBLY BEARING THE SAME

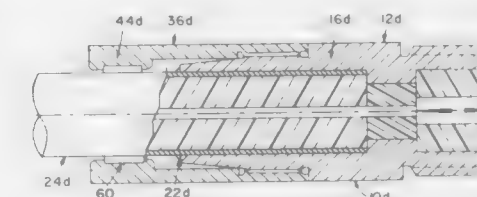
Ralph Iverson, Granada Hills, Calif., assignor to Whittaker Corporation, Los Angeles, Calif.

Filed May 9, 1988, Ser. No. 220,864

Int. Cl.⁴ H01R 13/59

U.S. Cl. 439-449

3 Claims



1. An improved electronic cable and connector assembly having a strain relief device, said assembly comprising, in combination:

(a) a metal-jacketed, semi-rigid, mineral-filled electronic cable,

(b) a metallic connector assembly, one end of which is connected to said cable, and,

(c) a hollow, generally tubular metal fitting with a central passageway extending longitudinally therethrough, an expanded end of said fitting being slip fitted over the exterior of said connector assembly adjacent to said one cable-connected end and enclosing the same, and extending over and enclosing the junction of said connector assembly and said cable, said connector assembly and said cable being joined at said junction by one of brazing and

welding, said fitting also extending over and enclosing said cable to protect said junction against damage, said fitting having a reduced diameter opposite end with an extended lip of substantially uniform thickness enclosing, abutting and supporting said cable peripherally against strain at a point remote from said junction, said lip being lined with an elastomeric ring of extended surface area for high mechanical shock application.

4,874,332

ELECTRICAL PLUGS AND CONNECTORS WITH AUTOMATIC CORD CLAMPS

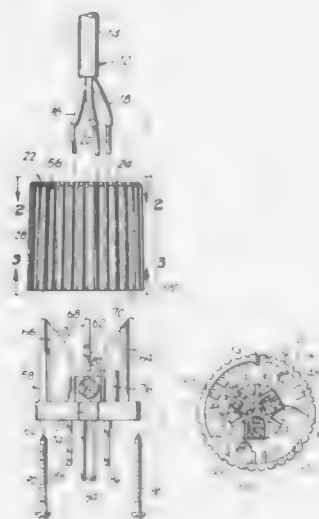
Ronald G. Munroe, Hallandale, Fla., assignor to Eagle Electric Manufacturing Co., Inc., Long Island City, N.Y.

Filed Mar. 6, 1989, Ser. No. 318,849

Int. Cl.⁴ H01R 13/59

U.S. Cl. 439-462

12 Claims



1. An electrical cord clamping device, comprising:
 - (a) an outer husk having a base wall bounding a hole through which an electrical wire is insertable along a longitudinal axis, and a generally cylindrical side wall extending longitudinally away from the base wall and bounding therewith an interior compartment, said base wall having a plurality of movable, inclined, locking legs unitary therewith spaced around the hole about said axis and extending into the compartment from the base wall and inclined relative to, and terminating short of, said axis;
 - (b) an inner main body insertable into the interior compartment along said axis to an assembled position of use, said main body having a support wall on which at least one electrical terminal for connection to the electrical wire is supported, said support wall having a plurality of camming projections rigid with, and extending longitudinally away from, the support wall and spaced about said axis so that each such projection faces a respective said leg; and
 - (c) locking means for longitudinally moving the main body into the interior compartment to the assembled position, and for longitudinally moving the projections against the legs to move all the legs toward said axis and circumferentially clamp the wire within, and resist removal of the wire from, the interior compartment.

4,874,333

SHUNTED MODULAR ELECTRICAL CONNECTOR

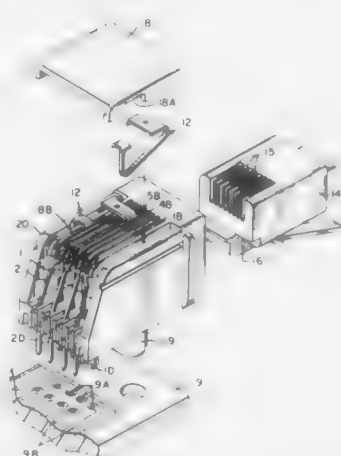
Carl G. Reed, Clemmons, N.C., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 8, 1985, Ser. No. 709,961

Int. Cl.⁴ H01R 13/00

U.S. Cl. 439-514

12 Claims



1. An electrical connector for use in interconnecting and disconnecting a plurality of separate conductors upon attachment to a mating electrical connector, the first electrical connector comprising:
 - a housing having a front mating face means including a cavity profiled for receiving the mating electrical connector;
 - a plurality of contact elements, each having first portions extending into the housing cavity and second portions fixed relative to the housing; and
 - at least one shunting element having fixed and moveable contact portions disposed in contact with separate laterally spaced contact element second portions fixed relative to the housing, and an intermediate portion connectable the fixed and movable contact portions, disposed in the housing cavity, movement of the intermediate portion upon insertion of the mating electrical connector into the housing cavity moving the movable contact portion to disrupt the connection between the separate contact elements.

4,874,334

ELECTRICAL OUTLET POSITIONER

Michael D. Golden, 429 Isabella Ter., Corona del Mar, Calif. 92675

Filed Oct. 18, 1988, Ser. No. 259,538

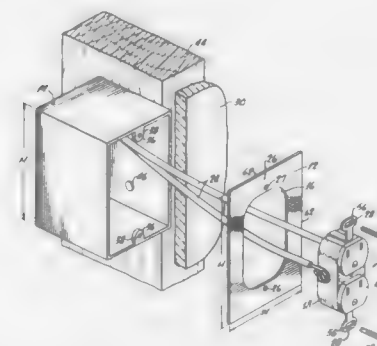
Int. Cl.⁴ H01R 13/60

U.S. Cl. 439-538

6 Claims

1. Positioner apparatus for a wall mounted electrical fixture comprising, in combination:
 - a conventional faceplate for a 110 volt outlet or switch;
 - a flat rectangular plate having outside dimensions equal to that of the conventional faceplate, said flat rectangular plate comprising:
 - means defining an opening through said flat rectangular plate of sufficient size to enable a body of a conventional 110 volt outlet or switch to pass therethrough;
 - means defining aligning portions of the flat rectangular plate for both engaging ear portions of said conventional 110 volt outlet or switch and aligning the body of the conventional 110 volt outlet or switch in a perpendicular relationship with a wall despite the orientation of the electrical box with the wall and without intrusion of the flat rectangular plate into said electrical box or wall when said

conventional 110 volt outlet or switch is mounted to the electrical box; and
 means for causing vertical alignment of the flat rectangular plate with the conventional faceplate and enabling horizontal alignment of the flat rectangular plate with the conventional faceplate when said conventional faceplate



is attached to the conventional 110 volt outlet or switch, said last mentioned means comprising means defining a pair of holes in a spaced apart relationship in said flat rectangular plate for enabling the mounting of said conventional outlet or switch to said electrical box by screws extending through the flat rectangular plate holes.

4,874,335

CABLE ASSEMBLY FOR MINERAL MINING INSTALLATIONS

Willy Kussel, Werne, and Reiner Frank, Sprockhövel, both of Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhütte Westfalen GmbH, Lunen, Fed. Rep. of Germany

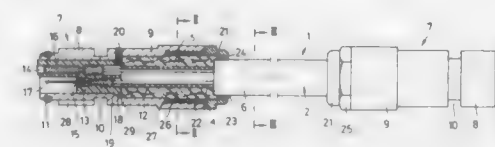
Filed Jun. 27, 1988, Ser. No. 212,378

Claims priority, application Fed. Rep. of Germany, Jun. 27, 1987, 3721304

Int. Cl.⁴ H01R 13/426

U.S. Cl. 439-589

5 Claims



1. A multi-core electrical cable assembly for use in electro-hydraulic control systems for mineral mining installations; said cable assembly comprising:
 - a flexible cable (1) composed of a multi-layered sheath surrounding a plurality of electrical conductors (3); said sheath including an inner plastics insulation layer (4) snugly fitting around the conductors, a braided metallic armored intermediate layer (5) surrounding the inner layer, and an outer plastics insulation layer (6) surrounding the intermediate layer; a connector (7) provided on one of the ends of the cable; said connector comprising a one-piece cylindrical component defining a plug portion (8) with an interior surface and an exterior surface for mating with a socket of a complementary connector, and a screw-threaded sleeve portion (9) having a stepped interior bore surface larger than the interior surface of the plug portion to provide a shoulder (19) therebetween; a plastics sealing body with a stepped exterior disposed within the stepped bore surface to lock within the sleeve portion, said sealing body serving to receive and bond-in an end region of said one end of the cable with the conductors of the cables extending through the sealing body, and the inner and intermediate layers of the cable extend-

ing substantially through the sealing body; a plastics carrier (13) with through bars (14, 15) containing electrical plug and socket forming contacts (16, 17) terminating the conductors within the plug portion; the carrier having a flange (18) which fits into the sleeve portion to lock the carrier in the connector and prevent withdrawal from the connector in a direction opposite to the cable; releasable means (20) for restraining rotation of the contact carrier within the connector;
 a screw-threaded locking ring (21) engaging within the sleeve portion, the screw-threaded ring having a flange (23);
 a sealing ring (24) tightly surrounding the outer layer of the cable and abutting the flange of the locking ring to secure the cable exterior to the connector;
 means (28) on the plug portion for locating the connector in the correct orientation with respect to the complementary connector; and
 means (10) on the plug portion for cooperating with a releasable clamping device for detachably securing the connector to the complementary connector.

4,874,336

SHIELDED ELECTRICAL CONNECTOR FOR PRINTED CIRCUIT BOARD MOUNTING

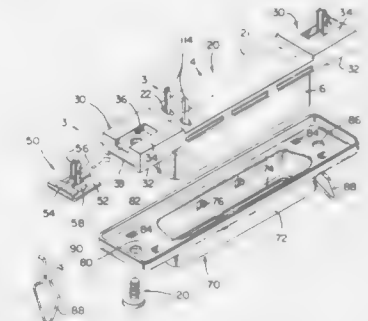
Edward K. Marsh, Kernersville, N.C., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 15, 1988, Ser. No. 168,360

Int. Cl.⁴ H01R 13/648

U.S. Cl. 439-607

2 Claims



1. A shielded electrical connector of the type for mounting on printed circuit boards comprises:
 - an insulative housing having a flange means which supports the housing for mounting purposes and includes a shroud extending forwardly from the flange thereby defining a front mating face;
 - shielding means profiled for receipt over the shroud of the housing and over a front face of the flange means;
 - a retention member comprising a U-shaped clip portion received over an end of the flange means at each end of the housing, and including retention means extending from the clip portion for electrical connection to a grounding pad on a connectable printed circuit board, each U-shaped clip portion comprising a plate portion and a strap portion, where each plate portion comprises a hemispherically shaped threaded portion facing the strap portion and lying within a recess on the front face of the flange means, and each hemispherically shaped threaded member is lying within a hemispherically shaped portion of the recess, and the strap portion is lying within a further recess on a rear side of the flange, and the retention means extending from the strap portions; and
 - securement means, comprising threaded members cooperable with the threaded portions of the retention members and the shielding means to effect electrical contact between the retention members and the shielding means.

4,874,337

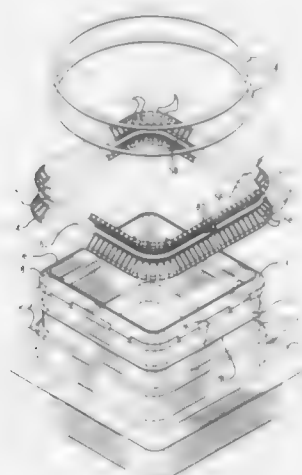
METHOD OF MOUNTING A REPLACEABLE EMI
SPRING STRIP

Edward J. Paikovitz, Jr., Hershey, and Susan E. Wright, Harrisburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 23, 1988, Ser. No. 275,292
Int. Cl.⁴ H01R 13/648

U.S. Cl. 439—609

17 Claims



13. An assembly of an electrical connector conductive plug-like shell and a means therearound for providing conductive engagement with a mated electrical connector conductive receptacle-like shell therearound, comprising:

a conductive plug-like shell having a peripheral recess around the outer surface thereof rearwardly of a forward end thereof, a metal strip within said peripheral recess and around said shell, and elastomeric fastening means around said metal strip securing said metal strip to said shell, said metal shell having at least first spring fingers therealong extending outwardly from said recess and disposed and adapted to be engaged by a mating connector receptacle-like conductive shell and be deflected radially inwardly thereby toward said recess bottom, establishing grounding engagement with said mating shell;

said peripheral shell recess having a bottom surface defining a circumference, said recess bottom surface having forwardly and rearwardly facing stop surfaces spaced closely together and located approximately centrally of said peripheral recess;

said metal strip including a body section having a length approximately equal to said circumference, said metal strip having outwardly and inwardly facing major surfaces, said metal strip further including a plurality of said at least first spring fingers extending from said body section outwardly at an angle from said outwardly facing major surface and in one of a forwardly and rearwardly direction to free ends curved arcuately inwardly;

said metal strip further including on said body section a projection formed therealong extending outwardly from one of said outwardly and inwardly facing surfaces defining a corresponding groove extending into the other of said outwardly and inwardly facing surfaces and further defining forwardly and rearwardly facing surfaces corresponding respectively to said rearwardly and forwardly facing shell stop surfaces and adapted to fit thereagainst in stopping engagement upon said metal strip being disposed and secured within said peripheral shell recess;

said metal strip being disposed in and along said peripheral shell recess with said inwardly facing strip surface against said recess bottom surface and said corresponding said forwardly and rearwardly facing strip surfaces against

said rearwardly and forwardly facing shell stop surfaces; and

said elastomeric fastening means comprising at least one elastically deformable annulus having a circumference slightly less than said shell circumference along said recess bottom surface, securing said metal strip to said shell and against axial movement therealong by being stretched to hold said metal strip against said recess bottom surface and to hold said rearwardly facing strip surface against said forwardly facing shell stop surface and said forwardly facing strip surface against said rearwardly facing shell stop surface, whereby said metal strip is removable upon removal of said elastomeric means and a like metal strip is securable thereon with a like said elastomeric means facilitating repair.

4,874,338

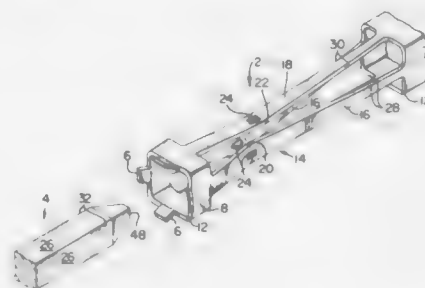
RECEPTACLE BOX TERMINAL WITH IMPROVED
CONTACT AREA

Johannes C. W. Bakermans, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 31, 1987, Ser. No. 32,899
Int. Cl.⁴ H01R 11/22

U.S. Cl. 439—851

10 Claims



1. A contact socket for receiving a contact pin comprising: a pin receiving end and an inner end, the inside dimensions of the ends being greater than the dimensions of the pin; an intermediate portion between the pin receiving end and the inner end having an even number of at least two similar beams which are integrally attached to the pin receiving end as well as the inner end, the beams being equally spaced around the axis of the socket;

each of the beams projects inward toward the axis of the socket such that a contact section is provided at an apex of each beam which is nearest the axis of the socket;

an embossment positioned on the apex of each beam, each embossment projects inwardly towards the axis of the socket, the embossments on each pair of opposed beams being aligned with respect to the axis of the socket, the minimum distance between the surface of the embossments being less than the width of the contact pin;

the associated pairs of beams having their embossments spaced from the pin receiving end; and

each embossment has a lead in surface integral therewith, the lead in surface cooperating with the pin to reduce the insertion force to prevent the pin from harming the embossment as the pin is inserted into the socket along the axis thereof.

4,874,339

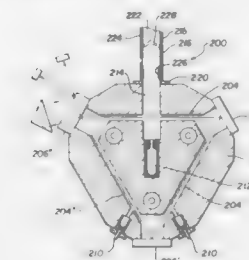
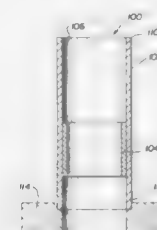
PUMPING TUBULATION GETTER

V. David Bratz, Colorado Springs, Colo., assignor to SAES Getters S.p.A., Milan, Italy

Filed Aug. 9, 1985, Ser. No. 764,134
Int. Cl.⁴ H01J 9/00

U.S. Cl. 445—28

4 Claims



3. A method of manufacturing a ring laser gyroscope comprising the steps of:

(i) attaching one end of a pumping tubulation getter device to the outer wall of the ring laser gyroscope wherein the pumping tubulation getter device comprises:

(I) a hollow cylindrical tube of oxygen free high conductivity copper tubing adapted to be compression bonded by means of a pinch-off tool for the formation of the vacuum tight seal; and

(II) an electrophoretically deposited layer of porous sintered non-evaporable getter material selectively deposited on the internal surface of the hollow cylindrical tube leaving getter free zones at the ends of the hollow cylindrical tube;

wherein the getter material comprises:

A. a sintered particulate getter material selected from the group consisting of Zr and Ti the particles of which pass through a U.S. standard screen of 300 mesh/inch; and

B. an antiserfing material selected from the group consisting of:

(a) a Zr—Al alloy comprising from 5 to 30 percent weight of aluminum balance zirconium; and

(b) a Zr—Ni alloy; and

(c) a Zr—Fe alloy; and

(d) a Zr—M₁—M₂ alloy in which M₁ is a metal selected from the group consisting of vanadium and niobium and M₂ is a metal selected from the group consisting of nickel and iron; and

(e) graphite; and

(f) tungsten; and

(g) molybdenum; and

(h) niobium; and

(i) tantalum; and

wherein the weight ratio A:B is from 19:1 to 2:3 and wherein said particles of zirconium-aluminum alloy are generally spaced out of contact with each other;

(ii) evacuating the ring laser gyroscope via the hollow cylindrical tube; and

(iii) heating the ring laser gyroscope to a temperature of from 25° C. to 280° C. for a time of from 30 minutes to 5 days; and

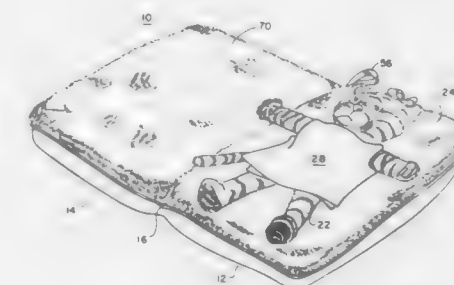
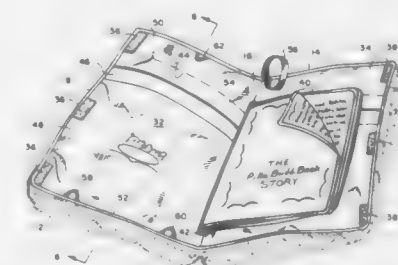
(iv) activating the getter material by high frequency induc-

tion heating while air cooling the tube wall attachment area; and
(v) compression bonding the second end of the getter device by means of a pinch-off tool to form a vacuum tight seal.

4,874,340

COMBINED AMUSEMENT DEVICE AND TRANSPORT
AND STORAGE PACKAlice R. Smallwood, 1517 Montclair Dr., Plano, Tex. 75075
Filed Jul. 21, 1988, Ser. No. 222,155Int. Cl.⁴ A63H 33/00; A47C 20/02; A45F 4/02; B42D 3/00
U.S. Cl. 446—28

16 Claims



1. A combined amusement and storage device comprising: first and second members joined together along a central portion of said device, each of said members having inner and outer major surfaces with a flexible material disposed therebetween, said members for being folded relative to one another such that the respective inner major surfaces of said members are substantially in facing contact and for being unfolded relative to one another to expose the respective inner major surfaces of said members;

each member having a first panel for overlapping a portion of the corresponding inner major surface to define a first pouch, a second panel for overlapping a portion of the first panel to define a second pouch and a third panel for overlapping a portion of the corresponding inner major surface which is not overlapped by the first panel and a portion of the first panel to conceal said first pouch; and a three dimensional object attached to an outer major surface of the first member, such that when the first and second members are unfolded and their respective inner major surfaces positioned face down, the second member provides a cushioned headrest adjacent to the three dimensional object on the outer major surface of the first member.

4,874,341 FOLDING POLYGONAL TOY CONSTRUCTION ELEMENT

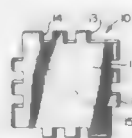
James T. Ziegler, Toronto, Canada, assignor to Novation Design Ltd., Ontario, Canada

Filed Oct. 25, 1988, Ser. No. 261,924

Int. Cl.⁴ A63H 33/08, 33/12, 33/00

U.S. Cl. 446—109

6 Claims



1. A toy construction element in the form of a polygon comprising a substantially flat body portion having four or more edge faces of substantially equal length and top and bottom faces, each edge face having formed thereon a plurality of outwardly projecting integrally formed connectors adapted to connect with corresponding projecting connectors on an edge face of another construction element in a snap-together lateral interlock between adjacent elements while permitting hinging action between connected elements on an axis parallel to the connected edge faces,

wherein said construction element has at least one line of reduced thickness extending across the body of the element from apices of the polygon and through the center of the body of the element to form at least one living hinge which separates the body of the element into at least two equal triangular portions joined by at least one living hinge, the three sides of each triangular portion including at least one living hinge and at least one edge face.

4,874,342

JUMP CHUTE MARBLE RACE TOY

Daniel B. Klitsner, San Francisco, Calif., assignor to Discovery Toys, Inc., San Francisco, Calif.

Filed Jul. 1, 1988, Ser. No. 214,239

Int. Cl.⁴ A63H 29/08

U.S. Cl. 446—168

8 Claims



1. A toy for use with a marble race game in which the marble moves along a tortuous path comprising:
a chute having an entrance, a jump, and a downwardly extending speed track connecting the entrance and the jump;
a landing spaced from the jump and having a planar surface substantially larger than the width of the marble, an arcu-

ate boundary projecting upwardly from said planar surface, and an exit positioned at a terminal end of said arcuate boundary and said planar surface; and
the chute configured and the landing positioned so that a marble enters the chute through the entrance, travels down the speed track, into the jump, out of the chute in a trajectory, lands at the landing and passes through the exit for traverse of the marble through the game.

4,874,343

TOY DETECTION AND SIGNALING CIRCUIT

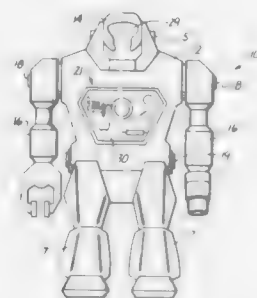
Doreen Rosenthal, Sal Luis Obispo, Calif., assignor to Mattel, Inc., Hawthorne, Calif.

Filed Oct. 23, 1987, Ser. No. 113,104

Int. Cl.⁴ A63H 30/00, 33/22, 3/28

U.S. Cl. 446—175

9 Claims



1. A toy for detecting and signaling changes in ambient light level comprising:

a toy figure assembly;

detection circuit means including a single photodetector responsive to ambient light and light reflected from moving objects to produce an electrical signal having lower frequency and higher frequency signal components and a comparator means having a frequency selective voltage divider network for causing said higher frequency signal component to be detected and said lower frequency signal component to be ignored whereby when said higher frequency signal component is of sufficient amplitude to exceed a predetermined bias voltage of said lower frequency signal component a change in output of said comparator means is produced; and

signaling means disposed in said toy figure assembly responsive to said comparator means for producing signals in response to changes in the output of said comparator

4,874,344

SOFT ANIMAL TOYS

John E. Kanter, 135 4th Street, Parkmore, Sandton, Transvaal, *South Africa*

Filed Jun. 29, 1988, Ser. No. 213,233

Claims priority, application South Africa, Jul. 2, 1987, 87/4804

Int. Cl.⁴ A63H 3/00, 3/02; G09B 23/28

U.S. Cl. 446—268

3 Claims

1. A toy which of soft construction and which comprises:
a parent fantasy animal toy;
a cavity in the abdomen of the parent fantasy animal toy;
a closable opening situated between the legs of the parent fantasy animal toy and leading into the cavity;
an infant fantasy animal toy located inside the cavity and distending the abdomen of the parent fantasy animal toy to give the parent fantasy animal toy the external appearance of being pregnant;
said infant fantasy animal toy having the appearance of an infant of the parent and being removable from the cavity

through the opening with the result that the parent fantasy animal toy reverts to an appearance of non-pregnancy;
a container for the parent fantasy animal toy having the appearance of a bed or sleeping bag and in which the



parent fantasy animal toy is locatable with its head protruding visibly from the container; and
straps attached to the container for enabling the container to be worn in the manner of a back-pack by a child.

4,874,345

DOLL WITH CHANGEABLE HAIR PIECE

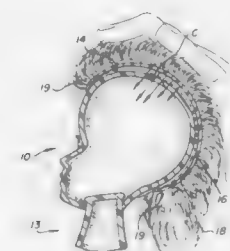
Clara Dirks, 1412 S. Quincy St., Arlington, Va. 22204

Filed Nov. 29, 1988, Ser. No. 277,652

Int. Cl.⁴ A63H 3/44

U.S. Cl. 446—394

1 Claim



1. A doll's head with changeable hair piece, comprising:
(a) a hair piece having front, rear sides and central portion and having a top side and an underside and having hair mounted only on the entire top side thereof from front to rear and from side to side and the central portion;
(b) a head including a convex crown portion having front, rear sides and a central portion and a face portion;
(c) said hair piece including a single stretchable, flexible, snap-fit concave suction cup having front, rear sides and central portion and having its front, rear sides and central portion coextensive with said front, rear sides and central portion of said top side and having a dimension substantially equal to said hair piece and said crown and forming when stretched and snapped onto said crown a vacuum above substantially the entire crown including said front,

rear sides and central portion to resist efforts to remove said hair piece from said crown when said hair on said hair piece is grasped;

(d) said suction cup having a continuously curved central concavity cooperating with the continuous convexity of said head and including a peelable inwardly curved concave elastic peripheral edge of a greater curvature than the curvature of said curved central concavity of said cup and having its concavity continuous with the concavity of the cup so that said edge may be easily peeled back so as to break the suction between the cup and said crown to release said cup from said crown; and

(e) said suction cup having a normal dimension slightly less than said crown so that said cup when applied to said doll's head stretches outwardly over and against said entire crown to produce suction pressure over the entire crown front to rear sides and central portion.

4,874,346

FREE FLYING MAGNETIC LEVITATOR

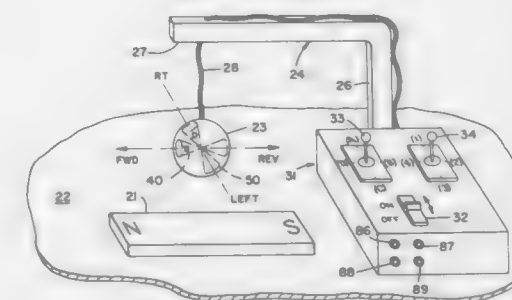
How Wachspress, P.O. Box 99141, San Francisco, Calif. 94109

Filed Jan. 6, 1988, Ser. No. 141,566

Int. Cl.⁴ A63H 33/26

U.S. Cl. 446—484

13 Claims



1. A free flying magnetic levitator adapted for disposition in an external surrounding dipole magnetic field having substantially parallel lines of force and comprising

at least a first pair of axially elongated toroidally wound magnet windings with each having a tapered configuration from a small diameter and to an outer large diameter end and said windings being disposed axially of each other with the small diameter ends contiguous to form a tripole magnet, and

means for controllably energizing said magnetic windings by current flowing between the small diameter ends and the large diameter ends to establish a magnetic field having like magnetic poles at the outer large diameter ends whereby the energized pair of magnet windings produce a tripole magnetic field having a dipole vector potential field generating forces of interaction with the external surrounding the dipole magnetic field for moving the levitator in the surrounding dipole magnetic field.

4,874,347

COIN SEPARATOR

Osamu Kobayashi, Tsurugashima; Koji Yukimoto, Sakado, and Mitsugu Mikami, Kawagoe, all of Japan, assignors to Kabushiki Kaisha Nippon Coalux, Tokyo, Japan

Filed Mar. 16, 1988, Ser. No. 169,246

Claims priority, application Japan, Mar. 23, 1987, 62-42293

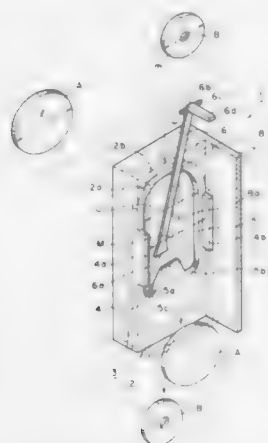
Int. Cl.⁴ G07D 3/02

U.S. Cl. 453—5

3 Claims

1. A separator comprising:
a first coin passage through which a plurality of coins having different diameters are introduced in a substantially downward moving direction;

said first coin passage having a rear surface;
 a second coin passage formed in part by a casing juxtaposed to the rear surface of said first coin passage so as to move selected coins in a substantially downward moving direction;
 a plate disposed between and in part defining said first and second coin passages;
 said plate being attached to and detachable from said casing;
 an elongated hole formed in said plate and disposed lengthwise in the direction of downward coin movement, the diameter of said elongated hole being less than large diameter coins among a plurality of coins and greater than small diameter coins among a plurality of coins which move downwardly relative to said first coin passage, said



elongated hole being formed with arcuate cutouts on both sides of a lower upwardly projecting portion of said plate, said arcuate cutouts open in opposite upward relationship to the downward direction of coin movement, said upwardly projecting plate portion and a periphery of said arcuate cutouts tapering upwardly in cross-section so as to form an upwardly decreasing wall thickness; and
 a tongue having a lower end adapted for entry into said elongated hole so as to allow the coins which have moved downwardly from the upstream side of said first coin passage to be urged toward said elongated hole with smaller diameter coins passing through said elongated hole into said second coin passage and large diameter coins moving said tongue out of said elongated hole to pass downwardly in said first coin passage.

4,874,348

HANDLING DEVICE FOR COINS, TOKENS AND THE LIKE

Dennis R. Lafreniere, and Ronald E. McConnell, both of Swift Current, Canada, assignors to Dennis R. Lafreniere, Swift Current, Canada

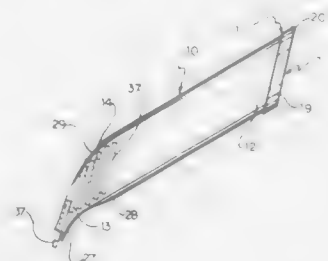
Filed May 6, 1988, Ser. No. 191,230
 Int. Cl.⁴ G07D 1/00

U.S. Cl. 453—50

19 Claims

1. A device for the loading, storing and selective dispensing of coins, tokens and the like comprising an elongated tubular holder portion having a lower side, loading means at one end thereof and selective dispensing means at the other end thereof, said selective dispensing means including a transversely situated dispensing slot adjacent the distal end of said other end and forwardly thereof and situated in a plane below said lower side of said tubular holder portion and including inclined chute means operatively connecting said slot with said other end of said tubular portion, said chute means including a substantially planar base portion inclining upwardly towards said lower side of said tubular holder portion and blending into said lower side with a smooth curve, said base portion extending at an obtuse angle from said lower side, the cross sectional

configuration of the dispensing means increasing from said slot to the full diameter of said tubular holder portion whereby the orientation of a coin, token or the like changes from a position spanning said tubular holder portion in which the vertical plane of the coin, token or the like is at a rearwardly inclined



angle to the horizontal longitudinal axis of the tubular holder portion, to a planar position upon said base portion of said dispenser means and means to detachably retain said coin, token or the like upon said base portion until dispensed through said slot.

4,874,349

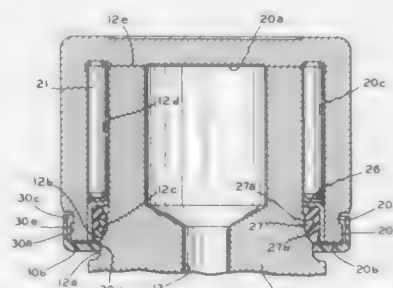
SEAL AND DUST GUARD ASSEMBLY FOR A UNIVERSAL JOINT TRUNNION

Ray A. Gall, Toledo, Ohio, assignor to Dana Corporation, Toledo, Ohio

Filed Dec. 7, 1987, Ser. No. 129,802
 Int. Cl.⁴ F16C 33/76; F16D 3/41

U.S. Cl. 464—14

4 Claims



1. A cross member for a universal joint comprising:

- a body portion having a least one trunnion extending outwardly from said body portion, said trunnion including an outer friction surface extending outwardly from said body portion and an outer bearing surface extending outwardly from said friction surface;
- a bearing cup having an open end an inner bearing surface, said bearing cup being disposed about said trunnion such that said inner bearing surface of said bearing cup is disposed co-axially about said outer bearing surface of said trunnion;
- bearing means disposed between said inner bearing surface of said bearing cup and said outer bearing surface of said trunnion for permitting rotation of said bearing cup relative to said trunnion;
- a seal assembly secure within said inner bearing surface of said bearing cup and adapted to sealingly engage said trunnion; and
- a dust guard connected to said bearing cup including an axially extending portion and a radially extending portion, said radially extending portion extending adjacent to said open end of said bearing cup and terminating in an inner friction surface, said inner friction surface of said dust guard being frictionally engaged with said outer friction

surface of said trunnion to retain said bearing cup thereon, at least one groove being formed throughout an inner surface of said radially extending portion and said axially extending portion.

4,874,350

TORSIONAL DAMPER DEVICE COMPRISING TWO COAXIAL PARTS COOPERATING WITH CIRCUMFERENTIALLY ACTING SPRINGS

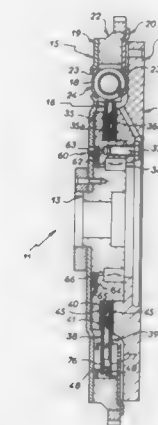
Pierre Case, Ermont, and Gastave Chassegnat, Taverny, both of France, assignors to Valeo, Paris, France

Filed Aug. 19, 1987, Ser. No. 86,800

Claims priority, application France, Aug. 21, 1986, 86 11936
 Int. Cl.⁴ F16D 3/66, 7/02

U.S. Cl. 464—68

6 Claims



1. Torsional damper device comprising coaxial first and second parts adapted to rotate relative to each other to a limited degree, two substantially parallel annular flanges and pivoted base members on said first part, two parallel plates on said second part disposed axially between said two flanges and having at least one pair of radial arms comprising parallel, substantially circumferential fingers, springs disposed substantially circumferentially between said base members, a surface on each base member opposite that in contact with the respective spring, rounded recesses in said surfaces in which said fingers engage on relative rotation between said two parts, rotational interlocking means for constraining said plates to rotate in unison together and adapted to establish a circumferential correspondence between said radial arms of said at least one pair and said fingers thereof, and said rotational interlocking means comprising at least one projection on one of said plates parallel to the common axis of said two parts and a corresponding hole in the other of said plates into which said projection is inserted.

4,874,351

CONTINUOUSLY VARIABLE BELT-DRIVE TRANSMISSION

Patrick Jackson, 240 Ayer Rd., Williamsville, N.Y. 14221

Filed Nov. 2, 1988, Ser. No. 266,165

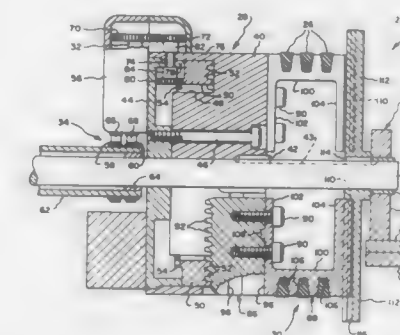
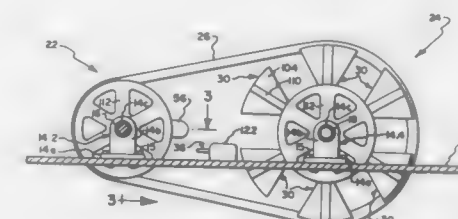
Int. Cl.⁴ F16H 55/54

U.S. Cl. 474—49

8 Claims

1. A continuously variable belt drive transmission having a support; laterally spaced apart first and second shafts journaled for rotation on the support; first and second adjustable sheaves mounted on the first and second shafts, respectively, the sheaves being in parallel alignment with each other, each of the sheaves including a body secured to the associated shaft for rotation therewith and a plurality of sheave segments mounted on the body for radial inward and outward movement; and a power transmitting belt extending between the first and second sheaves;

characterized by control means capable of selectively moving the segments radially inwardly or outwardly while the body is rotating with its associated shaft, the control means carried by the body of each of the first and second sheaves, the motor



4,874,352

FLUIDIC TENSIONER

Tadasu Suzuki, Kawagoe, Japan, assignor to Tsubakimoto Chain Co., Japan

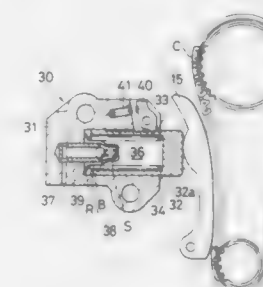
Filed Mar. 23, 1988, Ser. No. 172,314

Claims priority, application Japan, Aug. 6, 1987, 62-119784;
 Oct. 9, 1987, 62-154131

Int. Cl.⁴ F16H 7/08

U.S. Cl. 474—110

2 Claims



1. A hydraulic ball-type check valve tensioner having a plunger internally provided with a fluid chamber and slidably fitted in a housing in association with a spring biasing said plunger in a protruding direction, a passage formed in said housing communicating said chamber with an external source of fluid pressure, and a check ball mechanism provided between said housing and said chamber to permit fluid flow into

said chamber while blocking flow in the reverse direction, wherein the improvement comprises:

- a rack formed on the outer surface of said plunger; and
- a ratchet rotatably supported on said housing in meshing engagement with said rack and biased by a spring in a direction opposite to said protruding direction.

4,874,353

GROOVED PULLEY AND MANUFACTURING METHOD THEREFOR

Ken Matsumoto, Toyohashi, and Masanobu Yamazaki, Kozai, both of Japan, assignors to Fuji Kiko Company, Limited, Tokyo, Japan

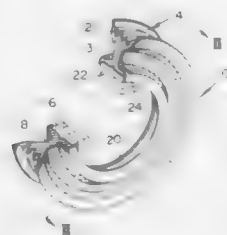
Continuation-in-part of Ser. No. 865,462, May 21, 1986, Pat. No. 4,767,387, which is a continuation of Ser. No. 612,341, May 21, 1984, abandoned. This application Jan. 6, 1988, Ser. No. 141,226

Claims priority, application Japan, May 23, 1983, 58-90403; Apr. 13, 1984, 59-74525; Apr. 13, 1984, 59-74526

Int. Cl.⁴ F16H 55/32

U.S. Cl. 474-168

7 Claims



1. A pulley comprising:

- a substantially flat, generally annular web having an inner and an outer peripheral edge; and
- a cold rolled annular flange integrally formed on the outer peripheral edge of the web, the flange having a central section axially aligned with the web and two axially extending sections, each axially extending section extending axially beyond the web in a respective axial direction, the flange having a plurality of grooves, and the web and the flange comprising metal having continuous fiber-like metal grains extending from the web, through the center section of the flange and into a respective axially extending section of the flange.

4,874,354

METHOD AND APPARATUS FOR AUTOMATICALLY OPENING BAGS

Robert B. Johnson, Santa Clara, and Robert P. Smith, Santa Cruz, both of Calif., assignors to K & R Equipment, Incorporated, San Jose, Calif.

Division of Ser. No. 44,005, Apr. 29, 1987, Pat. No. 4,795,413. This application Oct. 11, 1988, Ser. No. 256,397

Int. Cl.⁴ B31B 7/78, 7/80

U.S. Cl. 493-101

10 Claims

1. An improved method for lining a container with flexible film bag-type liner, said container having an open top end and a bottom end positioned over a source of vacuum, said liner having a sealed end, an unsealed end, a first side, a second side, a first edge and a second edge, said method comprising the steps of:

- suspending the unsealed end of the liner between at least two jaw assemblies and a like number of flexible tongues such that a first jaw assembly faces the first side of said liner, a second jaw assembly faces the second side of said liner, a first flexible tongue is mounted facing the second side of said liner opposite said first jaw assembly and a second flexible tongue is mounted facing the first side of said liner opposite said second jaw assembly, each said jaw assembly having a first jaw and a second jaw, said first jaw being movable away from said second jaw to open the

jaws and being movable toward and into contact with said second jaw to close the jaws;

opening said jaws of each said jaw assemblies and moving said jaw assemblies and said tongues toward said liner until the tongues contact the sides of the liner and push both sides of the liner between the open jaws of the jaw assembly mounted opposite;

closing the jaws;

moving the jaw assemblies and the flexible tongues apart, such that each jaw assembly retains only the side of the liner with which it is in direct contact, to separate said sides of said liner and open the unsealed end;

directing a stream of air into the opened, unsealed end of the liner to further separate the sides of the liner;

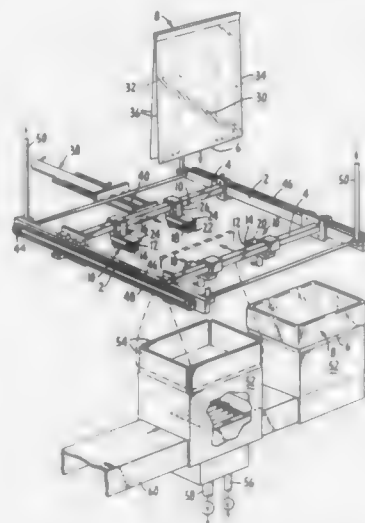
moving the jaw assemblies holding the open end of said liner over the open top end of the container to be liner;

actuating the source of vacuum of invert said liner, drawing said sealed end of said liner into said bottom end of said container; and,

opening the jaws and moving the jaw assemblies away from the lined container.

5. An apparatus for lining containers with a flexible film liner having a first side, a second side, a first edge, a second edge, a sealed end and an unsealed end, said apparatus comprising:

- a means for suspending the liner such that the unsealed end is down;



a liner opener having at least two jaw assemblies mounted on the first side of the liner at the unsealed end, one such jaw assembly being mounted at about the first edge and one such jaw assembly being mounted at about the second edge, and an identical number of jaw assemblies mounted on the second side of the liner facing the jaw assemblies mounted on the first side, and, a means for slidably moving the jaw assemblies mounted on the first side of the liner towards and into contact with and away from the jaw assemblies mounted on the second side of the liner, each jaw assembly comprising a first jaw and a second jaw, each of said jaws having a gripping surface, a flexible tongue which extends beyond the first and second jaw, and a means for moving the first and second jaw with respect to each other such that when the gripping surface of the first jaw is spaced away from the gripping surface of the second jaw the jaws are in an open position, and such that when the gripping surface of the first jaw is in contact with and exerts pressure against the gripping surface of the second jaw the jaws are in a closed position, the jaw assemblies on the first side of the liner being mounted for relative movement towards and away from the jaw assemblies on the second side of the liner such that when the jaw

assemblies on the first side are slidably moved toward the jaw assemblies on the second side, the jaws of each jaw assembly move to said open position and the tongues of the jaw assemblies on the first side push both sides of the liner between the gripping surfaces of the jaws of the jaw assemblies on the second side and the tongues of the jaw assemblies on the second side push both sides of the liner between the gripping surfaces of the jaws of the jaw assemblies of the first side thus allowing the jaw assemblies of the first side to grasp and hold the first side of the unsealed end of the liner and the jaw assemblies on the second side to grasp and hold the second side of the unsealed end of the liner when the jaws are moved to said closed position and the jaw assemblies on the first side are moved away from the jaw assemblies on the second side, for spreading open the unsealed end of the liner;

an air blower for directing air into the opened, unsealed end of the liner;

a means for moving the liner opener down over a container having an open container top and an air permeable container bottom, such that after the liner has been opened and air has been directed into the opened, unsealed end of the liner, the open end of the liner can be placed over the open container top; and,

a means for applying a vacuum to the air permeable bottom of the container to draw the sealed end of the liner into the container.

4,874,355

METHOD IN THE PRODUCTION OF A CONTAINER, OR A CONTAINER BLANK, RESPECTIVELY, AND A DEVICE FOR USE WITH SAID METHOD

Knut O. Nesse, Terneuzen, Netherlands, assignor to Elopak Systems AG, Glattpburg, Switzerland

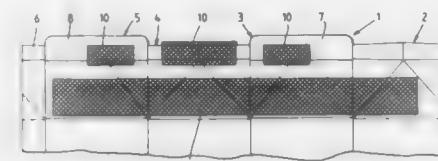
Filed Mar. 29, 1988, Ser. No. 174,869

Claims priority, application Norway, Apr. 6, 1987, 871430

Int. Cl.⁴ B31B 3/74

U.S. Cl. 493-148

5 Claims



1. A method of producing a container of the type where the container is to be filled with a product that may foam during filling or sealing comprising:

- (a) providing a blank cardboard material coated with an impregnated layer suitable for the product to be contained and with the blank having a sealing zone for forming a sealed closure upon forming the blank into a container and another zone adjacent to but spaced from said sealing zone so that, when the blank is formed into a container, said another zone will be located interiorly with respect to said sealing zone,
- (b) applying an antifoam medium in the form of a narrow strip to said another zone spaced from said sealing zone by means of roll with said medium containing a composition not soluble in water and having a molecular weight of between 400-10,000 with at least 40% by weight consisting of alkylene oxy groups with 2-4 carbon atoms and of which at least 60% consist of alkylene oxy groups with 3-4 carbon atoms, and
- (c) shaping the blank into a container so that upon filling, any foam generated will first contact said another zone prior to contacting said sealing zone.

4,874,356

METHOD OF MAKING A PIECE CONTAINING MULTIPLE POP-UPS

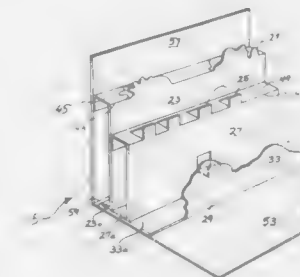
John K. Volkert, Northfield, Ill., assignor to One Up, Inc., Northfield, Ill.

Filed Jul. 10, 1987, Ser. No. 72,338

Int. Cl.⁴ B05C 1/00

U.S. Cl. 493-335

18 Claims



1. A method of making a promotional piece having multiple interconnected pop-ups, which method comprises die-cutting a continuous web of printed sheet material to create a series of successive blanks each of which includes a plurality of pop-up panels associated with a pair of basepieces and is arranged to extend transversely across the width of said web, applying a plurality of glue lines to each of said blanks of said web, cutting said web longitudinally into at least three continuous ribbons, a first ribbon containing a first pop-up panel, a second ribbon containing a second pop-up panel, and a third ribbon containing said basepieces, folding said first ribbon upon itself along a line extending longitudinally of said web, locating said folded first ribbon and said second ribbon in superimposed positions upon said third ribbon so that there is attachment of at least one of said pop-up panels to at least one of said basepieces via at least one of said glue lines, folding said third ribbon upon itself along a line extending longitudinally of said web so as to sandwich said first and second ribbons therebetween with adjacent ribbons interconnected to each other by said glue lines, and transversely cutting said continuous web to form a plurality of identical promotional pieces having interconnected pop-ups.

4,874,357

CENTRIFUGAL FLOTATION APPARATUS

Thomas P. Campbell, 1145 Lakeshore Dr., Coos Bay, Oreg. 97420

Filed Mar. 27, 1989, Ser. No. 329,294

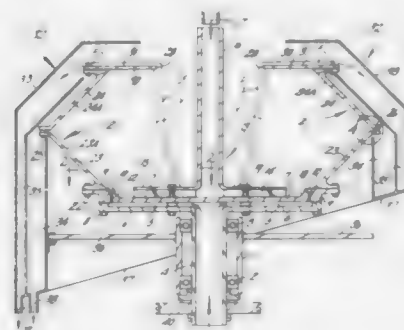
Int. Cl.⁴ B04B 11/00

U.S. Cl. 494-26

11 Claims

1. A centrifugal apparatus for separating by flotation mineral or metallic particles from a slurry, said apparatus comprising, a base, impellor means for dispersing the slurry about the impellor axis, a bowl assembly about said impellor means and into which the slurry is discharged by the impellor means, drive means for said bowl assembly, bubble generating means discharging streams of bubbles, conduit means in communication with a source of air to provide an air flow to bubble generating means, an inclined surface outwardly of the impellor means and against which slurry impinges prior to emergence with the bubble streams generated by

the bubble generating means, a first bowl outlet, a second bowl outlet offset from said first outlet, and



collector means disposed about said bowl assembly and defining chambers for the separate collection of material from the first and second outlets.

4,874,358

DUAL AXIS CONTINUOUS FLOW CENTRIFUGATION APPARATUS AND METHOD

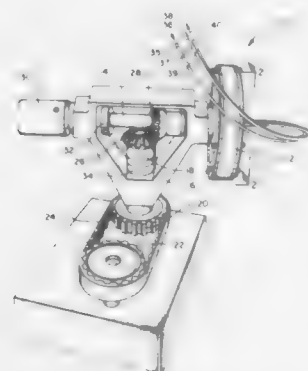
Owen D. Brimhall, West Valley City; Stephen C. Peterson, Salt Lake City; Oleg Kotlyar, Salt Lake City, and Dilip N. Ghosh Roy, Salt Lake City, all of Utah, assignors to Utah Bioresearch, Inc., Salt Lake City, Utah

Filed Feb. 1, 1989, Ser. No. 305,528

Int. Cl.⁴ B04B 5/00, 9/00

U.S. Cl. 494—37

12 Claims



10. A method for providing faster separation of components in a liquid medium during continuous flow centrifugation comprising:

preparing a centrifuge head having a flat, circular inlet chamber, an angled centrifuge chamber at the outer periphery of the inlet chamber, the centrifuge chamber having a relatively thin cross section and being configured as a truncated surface of a right circular cone having an outer periphery and an inner periphery with the inlet chamber interconnecting to the centrifuge chamber adjacent the midsection of the centrifuge chamber, a red blood cell chamber in fluid communication with the outer periphery of the centrifuge chamber, and a plasma chamber in fluid communication with the inner periphery of the inner periphery of the centrifuge chamber; mounting a flexible, plasma conduit to the centrifuge head in fluid communication with the plasma chamber, and a flexible, red blood cell conduit to the centrifuge head in fluid communication with the red blood cell chamber; securing the centrifuge head to a rotatable, horizontal axle; rotating the horizontal axle in an horizontal plane while turning the horizontal axle to rotate the centrifuge head in

a vertical orientation while matching each rotation of the centrifuge head with each rotation of the horizontal axle in the horizontal plane thereby precluding twisting of the whole blood, plasma, and red blood cell conduits.

4,874,359

POWER INFUSER

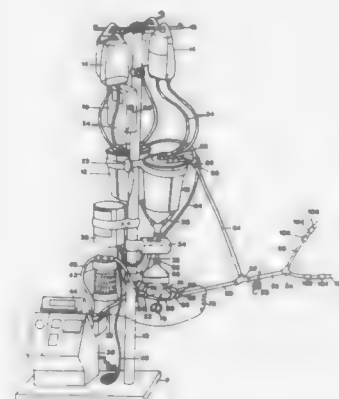
Frederick R. White, 3656 Glazier Way, Ann Arbor, Mich. 48105, and Roy E. Bolles, 50 Woodland Dr., Iowa City, Iowa 52240

Filed Dec. 14, 1987, Ser. No. 132,967

Int. Cl.⁴ A61M 37/00

U.S. Cl. 604—4

22 Claims



1. A power infuser comprising at least one cardiotomy reservoir and means to charge the reservoir with fluid, fluid conduit means providing a recirculatory loop communicating from and returning to the reservoir, an air embolus sensor in a near downstream location relative to the reservoir in the loop, a non-fluid contact pump in the loop downstream of the air embolus sensor, means to control the temperature of the fluid in the loop, a bubble trap-filter in a far downstream location relative to the reservoir in the loop said bubble trap-filter having an inlet and outlet, said fluid conduit means including tubing means in fluid communication with the filter outlet at one end and with the reservoir at a second end to complete the recirculatory loop, and separate means in fluid communication with the tubing means between the bubble-trap filter outlet and reservoir to selectively discharge fluid from the loop to a patient, said discharge means being downstream of the bubble trap-filter.

4,874,360

URETERAL STENT SYSTEM

Jay R. Goldberg, Northbrook, Ill., and Donald V. Hillegass, Franksville, Wis., assignors to Medical Engineering Corporation, Racine, Wis.

Filed Jul. 1, 1988, Ser. No. 214,180

Int. Cl.⁴ A61M 25/00

U.S. Cl. 604—8

1 Claim

1. In a ureteral stent comprising an elongated member having a soft, flexible main body with a first hook at one end for placement in the bladder of a patient and a second hook at the other end for placement in the patient's kidney, the improvement which comprises forming said stent of a homogeneous, essentially linear, segmented aliphatic polyurethane elastomer composed of three repeating units, a diol, a diisocyanate and a macroglycol, the main body and first hook of said stent having a durometer of about 50 to about 80 Shore "A" and the second

hook having a durometer of about 95 Shore "A" and a good memory that enables it to quickly resume its hook shape at



body temperature when a hook straightening force has been removed.

4,874,361

METHOD FOR HEALING DAMAGED SKIN

Zein E. Obagi, 200 Surry Dr., Bonita, Calif. 92002

Filed Dec. 29, 1986, Ser. No. 947,085

Int. Cl.⁴ A61N 1/30

U.S. Cl. 604—20

16 Claims

1. A method of treating damaged areas of skin comprising the steps of:

applying to said damaged area a therapeutically effective amount of a composition comprising trichloroacetic acid, a surfactant having growth stimulatory activity, and an emulsifier; and irradiating said area of damaged skin in contact with said composition for a time sufficient to induce peeling of said damaged area.

4,874,362

METHOD AND DEVICE FOR INSUFFLATING GAS

Peter P. Wiest, Hessenallee 8, 1000 Berlin 19, and Hubert Fuchs, Grunewaldstr. 13, 1000 Berlin 41, both of Fed. Rep. of Germany

Filed Mar. 27, 1987, Ser. No. 32,005

Claims priority, application Fed. Rep. of Germany, Mar. 27, 1986, 3611018

Int. Cl.⁴ A61M 13/00

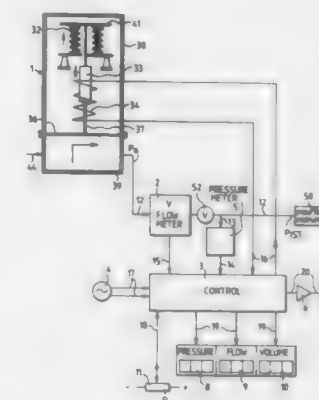
U.S. Cl. 604—26

5 Claims

1. A device for controlling the admission of insufflating gas in to a body cavity through an inflow needle, particularly for laparoscopy comprising:

a pressure gas line; a pressure reducer means connected to said gas line for supplying gas at a pressure reducer exit pressure, which is a working pressure to the needle; a pressure meter connected to said gas line downstream of said pressure reducer means and means for outputting a signal representative of gas pressure in said gas line; a flow meter connected to said gas line downstream of said pressure reducer means and means for outputting a signal representative of gas flow in said gas line; a clock pulse generator means for providing a timed pulse; a nominal pressure generator means for maintaining a preset nominal pressure; and, control means operatively connected to said pressure reducer means via a pressure a reducer means control line, connected to said pressure meter via a pressure meter line

for receiving a signal representative of gas pressure in said gas line, connected to said flow meter via a flow meter line for receiving a signal representative of gas flow in said gas line, connected to said pulse generator means for receiving a continuous timed pulse signal and connected to said nominal pressure generator means via a pressure generator means control line, said control means being for varying the working pressure as a function of said timed pulse signal by repeatedly, at successive clock pulses, controlling said pressure reducer means to reach a preset nominal gas line pressure in said pressure gas line in response to a signal from said nominal pressure generator means and for repeatedly operating said flow meter to detect the gas



flow rate through said flow line, comparing at successive clock pulses, the gas flow rate detected by the flow meter at the preset nominal gas pressure to a preset flow rate value and regulating the pressure reducer exit pressure to a maximum pressure value of 50 mm Hg. higher than the nominal pressure set by the nominal pressure generator means and back to the preset nominal gas pressure for subsequent comparisons if the flow meter indicates a flow rate exceeding the preset flow rate value until the flow rate falls to the preset value, and regulating the pressure reducer means to an exit pressure equal to the preset nominal pressure value, if the flow measured by said flow meter at said preset nominal gas pressure is less than the preset flow rate value.

4,874,363

COLON HYDROTHERAPY AND EVACUATOR SYSTEM

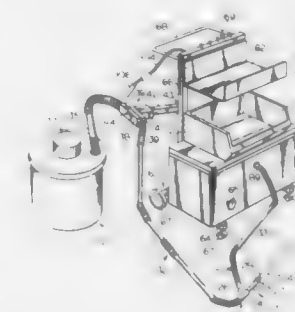
Walter L. Abell, 2773 Spaulding Dr., Dunwoody, Ga. 30338

Continuation-in-part of Ser. No. 889,228, Jul. 25, 1986, abandoned. This application Jul. 23, 1987, Ser. No. 77,734

Int. Cl.⁴ A61M 1/00

U.S. Cl. 604—28

12 Claims



12. A method for clearing a blockage from a speculum of the type having a tubular body defining a single longitudinal pas-

sageway therethrough, a tapered end with opposing nozzle openings in communication with said passageway for insertion into the colon of a patient and a discharge end having discharge and liquid inlet openings in communication with said passageway for positioning outside the anal canal comprising the steps of:

- selecting a flow rate for moving liquid through the liquid inlet opening;
- moving liquid through the liquid inlet opening while preventing the flow of liquid through the discharge opening;
- discontinuing the movement of liquid through the liquid inlet opening while allowing the flow of liquid through the discharge opening; and
- repeating the steps of moving liquid through the liquid inlet opening and discontinuing the movement of liquid through the liquid inlet opening in a rapid, alternating manner to generate a pulsating flow of liquid through the nozzle openings to break up the blocking material so that it can flow through said longitudinal passageway and out the discharge opening.

4,874,364

INSPECTION INSTRUMENT CHANNEL ASPIRATOR AND PRESSURE NEUTRALIZING DEVICE

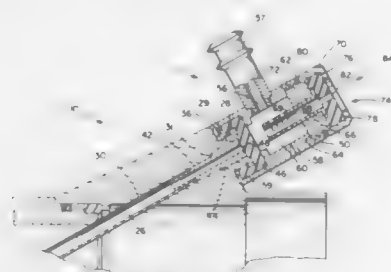
David L. Morris, Melton-Mobray, England; Mihail Filip, Shelton, Conn.; Frank D. D'Amelio, Oxford, Conn.; Dominick G. Esposito, Danbury, Conn., and Robert H. Quint, Jamaica, N.Y., assignors to Circon Corporation, Santa Barbara, Calif.

Filed Mar. 22, 1988, Ser. No. 171,569

Int. Cl.⁴ A61M 1/00

U.S. Cl. 604—35

22 Claims



1. A pressure neutralizing device for use with a working channel of an inspection instrument, the device comprising: frame means having a first aperture means, a second aperture means and a chamber means therebetween for passage of a working instrument therethrough, said first aperture means being positionable proximate a working channel of an inspection instrument for communication therewith; first pressure buffer means positioned at said first aperture means for providing a buffer between a working channel of an inspection instrument and said chamber means of the device, said first pressure buffer means being adapted to pass a working instrument therethrough; second pressure buffer means positioned at said second aperture means for providing a buffer between said chamber means and a working inlet of the device, said second pressure buffer means being adapted to pass a working instrument therethrough; and means operably coupled to said chamber means for reducing the pressure between said first and second buffer means whereby material passing through said first buffer means into said chamber means from a working channel of an inspection instrument can be substantially prevented from exiting through said working inlet at the pressure or an elevated velocity.

4,874,365 FEEDING TUBE FACILITATING IMPROVED PLACEMENT AND PERMITTING SUBSEQUENT DELIVERY OF A SECOND PRESCRIBED PRODUCT AND METHOD THEREFOR

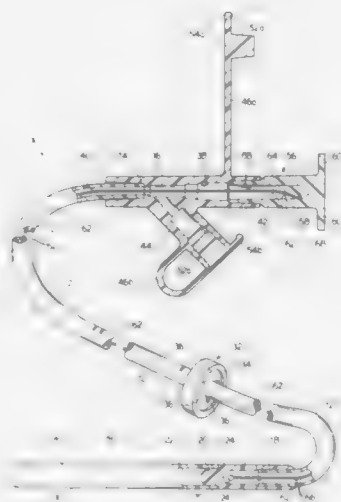
Warren P. Frederick, Wonder Lake; Sarah L. Steele, Evanston; David D. Rhodes, Palatine, and Christopher L. Arns, Lake Bluff, all of Ill., assignors to Baxter International Inc., Deerfield, Ill.

Filed Oct. 11, 1984, Ser. No. 659,809

Int. Cl.⁴ A61M 25/00

U.S. Cl. 604—54

4 Claims



1. A naso-gastric feeding tube comprising:
 - (A) a flexible, hollow tube having an open proximal end and a distal end;
 - (B) a discharge aperture defined near said distal end, in communication with the interior of said hollow tube;
 - (C) a hollow adapter permanently mounted on said open proximal end, the interior of said adapter being in open communication with the interior of the hollow tube, said adapter further including a stylet port and a placement port;
 - (D) at least one of said stylet port and said placement port including closure means associated therewith for closing said one port;
 - (E) a stylet including:
 - (i) a stylet plug removably mounted in said stylet port, and
 - (ii) a stylet wire permanently mounted at its proximal end to said stylet plug and extending substantially the entire length of said hollow tube, within said hollow tube;
 - (F) the maximum exterior diameter of said stylet wire being sufficiently less than the interior diameter of said hollow tube, so that said placement port is in open fluid communication with said discharge aperture so that fluid may be withdrawn through said discharge aperture through said placement port while said stylet wire is in said tube; and
 - (G) said stylet port and said placement port having means for simultaneously receiving separate products for discharge through said discharge aperture when said stylet is removed from said tube.

4,874,366 HOUSING ENABLING PASSIVE MIXING OF A BENEFICIAL AGENT WITH A DILUENT

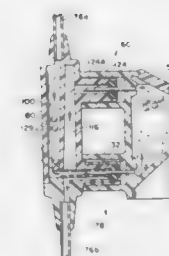
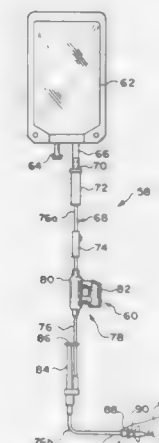
Brian Zdeb, Round Lake Park; Steve Pearson, and Glenn L. Slater, both of Ingleside, all of Ill., assignors to Baxter International Inc., Deerfield, Ill.

Continuation of Ser. No. 154,523, Feb. 7, 1988, abandoned, which is a continuation of Ser. No. 721,991, Dec. 3, 1984, abandoned. This application Dec. 19, 1988, Ser. No. 287,504

Int. Cl.⁴ A61M 5/00

U.S. Cl. 604—56

41 Claims



1. A housing means adapted for insertion in an intravenous delivery system including a fluid source and a fluid conduit, wherein fluid is delivered from the fluid source through the fluid conduit to the intravenous system of a patient, the housing means being adapted for receiving a beneficial agent to be mixed with fluid flowing through the fluid conduit, said housing means comprising:
 - (a) a receptacle adapted for insertion into the fluid conduit and including inlet means adapted for connection to an upstream portion of the fluid conduit and outlet means adapted for connection to a downstream portion of the fluid conduit;
 - (b) a separate cartridge including a chamber, selectively secured to said receptacle, said chamber adapted for receiving the beneficial agent, said chamber including an upstream end adapted for fluid communication with said inlet means, said chamber further including a downstream end;
 - (c) a discharge segment disposed in both said cartridge and said receptacle when said cartridge is secured to said receptacle, including a discharge segment upstream and adapted for communication with said chamber downstream end, and a discharge segment downstream end in communication with said outlet means;
 - (d) connecting means in both said receptacle and said cartridge for securing said cartridge to said receptacle;
 - (e) whereby when said cartridge is not secured to said receptacle, liquid from the fluid source may still be delivered to the patient through the fluid conduit, including said receptacle, with no liquid leaving said receptacle between said receptacle inlet means and said receptacle outlet means;
 - (f) whereby, when said chamber is in fluid communication

with said receptacle and said discharge segment, virtually all liquid which flows out said outlet means flows through all three of said inlet means, said chamber and said discharge segment, forming a fluid pathway in said housing;

- (g) further whereby said chamber downstream end is disposed at an elevation higher than said chamber upstream end, so that the direction of liquid flow through at least a portion of said chamber is in a generally upward direction, generally opposite to the direction of liquid flow from the fluid source to the patient;
- (h) such that as fluid flows through said housing, the beneficial agent in said chamber mixes with the liquid and is delivered therewith to the patient.

4,874,367

HYPODERMIC JET INJECTOR AND CARTRIDGE THEREFOR

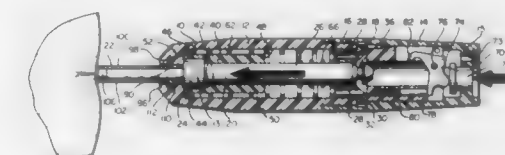
Bryant Edwards, Clarendon Hills, Ill., assignor to Marpan International, Inc., Clarendon Hills, Ill.

Filed Feb. 5, 1988, Ser. No. 152,467

Int. Cl.⁴ A61M 5/30

U.S. Cl. 604—72

6 Claims



1. A hypodermic jet injector comprising a gun and a medication containing cartridge; said gun comprising:
 - an elongated hollow body having an opening in one end;
 - piston means positioned in said elongated body to move axially and longitudinally within said elongated body, spring means urging one end of said piston means toward said opening, trigger means adapted to releasably hold said piston means away from said opening in opposition to the urging of said spring means, a plunger affixed to the one end of said piston means and extending through said opening in said one end of said elongated body;
 - cartridge engaging means affixed to said one end of said elongated body, said cartridge engaging means comprising a shoulder and a slot, said shoulder connected to the exterior of said elongated body adjacent to said opening in said one end of said elongated body, said slot positioned between said shoulder and said body, transverse to the axis of said elongated body;
- said cartridge comprising:
 - an elongated tube having a closed end and an open end, an orifice positioned in said closed end, a plug slidably positioned in the open end of said tube and a medicament in the space defined by said tube and said plug;
 - an interrupted flange affixed to said tube adjacent to said open end, said flange extending transverse to the axis of said tube;
 - a collar extending longitudinally from said tube and beyond said interrupted flange, at said open end, of said tube;
 - said cartridge removably locked onto said gun by inserting said collar into the opening in said one end of the elongated body of said gun with the interruption in said flange passing over said shoulder, said collar surrounding said plunger, and rotating said cartridge, whereby said interrupted flange engages the slot in said shoulder and thereby locks said cartridge to said gun to maintain said cartridge in said locked position when said trigger means releases said piston means and said spring urges said piston means toward said opening.

4,874,368

FIBRIN GLUE DELIVERY SYSTEM

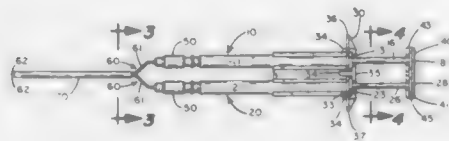
Curtis H. Miller, Burnsville, Minn.; I. Kaufman Arenberg, and John H. Altshuler, both of Englewood, Colo., assignors to Micromedica, Inc., St. Paul, Minn.

Filed Jul. 25, 1988, Ser. No. 224,078

Int. Cl.⁴ A61M 5/08

U.S. Cl. 604—82

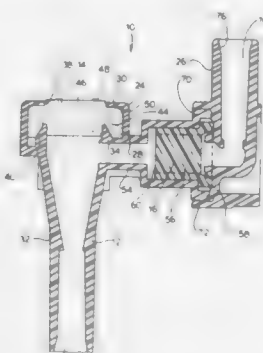
3 Claims



1. A delivery system for applying to a treatment site a tissue adhesive having a pair of components which must be kept separate from each other until they reach the treatment site, said delivery system comprised of:

- a first syringe body for storing a first tissue adhesive component and a second syringe body for separately storing a second tissue adhesive component;
- a separate piston type plunger, having an elongated shaft, a head and a push flange, associated with each of said syringe bodies for expelling from each of said syringe bodies its associated tissue component;
- a hypodermic needle, having an elongated portion, associated with each of said syringe bodies;
- means for connecting said syringe bodies to said hypodermic needles so that each of said tissue adhesive components is afforded an independent flow path from its syringe body, through said connecting means and through its hypodermic needle preventing the comingling of said first and second tissue adhesive components before they reach the treatment site;
- a hollow sleeve surrounding the elongated portions of said hypodermic needles retaining said elongated portions in parallel registration with respect to each other and forming a structure which permits the needles to be bent simultaneously into a desired shape; and
- means for retaining said syringe bodies in parallel alignment.

top, and a cone-shaped outlet portion integral with the cylindrical portion and extending away from the top; and



a disc-shaped stopper positioned in said center opening between the top and the ledge of the cylindrical portion.

4,874,370

ADAPTER DEVICE FOR IRRIGATING THE INTESTINE
Albert Heimerl, Ammersbek; Hans-Adolf Brammer, Buchholz, and Wolfgang Hofeditz, Hamburg, all of Fed. Rep. of Germany, assignors to Beiersdorf Aktiengesellschaft, Hamburg, Fed. Rep. of Germany

Continuation of Ser. No. 932,966, Nov. 20, 1986, abandoned.

This application Mar. 9, 1988, Ser. No. 165,877

Claims priority, application Fed. Rep. of Germany, Nov. 30, 1985, 8533814

Int. Cl.⁴ A61M 11/00

U.S. Cl. 604—93

9 Claims



1. In combination, for irrigating the intestines during surgery, an irrigating cannula for connection to the intestines at one location, a conical adapter for connection to the intestines at a second location, the adapter having one or more trimming guides in the form of scores, means for securing the intestines to said adapter, and a hose connected to the adapter, whereby when said cannula, adapter, hose and securing means are in working positions an irrigating liquid can be introduced through the cannula and withdrawn through the hose.

4,874,369

SELF-PRIMING INJECTION SITE WITH CHECK VALVE
Lee Kulle, Mundelein; Vince Desecki, Ingleside, and John M. Hess, III, Cary, all of Ill., assignors to Baxter International Inc., Deerfield, Ill.

Filed Jul. 27, 1987, Ser. No. 78,485

Int. Cl.⁴ A61M 37/00

U.S. Cl. 604—86

27 Claims

1. An injection site for use in an apparatus for administering a parenteral solution to a patient, said injection site comprising: a stopper housing including a top with a center opening, a cylindrical portion having an O-shaped ledge positioned therein, said O-shaped ledge having a lip turn towards said

4,874,371

CONTROL HANDLE

Richard H. Comben, Minneapolis; Byron L. Gilman, Plymouth, and Leonid Shturman, Minnetonka, all of Minn., assignors to Medilase, Inc., Minneapolis, Minn.

Filed Nov. 5, 1987, Ser. No. 117,479

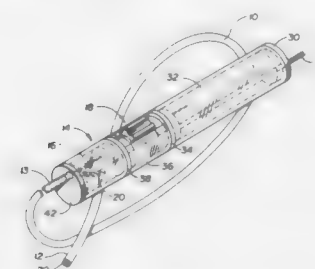
Int. Cl.⁴ A61B 1/00

U.S. Cl. 604—95

22 Claims

1. A control handle comprising:
a body having a longitudinal axis;
a rotatable control wheel having a center axis about which the wheel is attached to the body;

elongated torque transmitting means extending through the body along an axis coincident with the center axis of the control wheel, off-axis from the longitudinal axis of said body and attached to the control wheel such that rotating



the control wheel in a direction substantially perpendicular to the axis rotates the torque means about said center axis over its entire length; and
working means remote from the body attached to the torque means for rotation therewith.

4,874,372

NON-REUSABLE SYRINGE

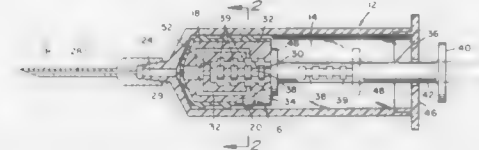
William McArthur, 23041 LaGranja Dr., Valencia, Calif. 91354, and Thomas M. Soukup, 4722 Karling Pl., Palmdale, Calif. 91350

Filed Sep. 27, 1988, Ser. No. 251,201

Int. Cl.⁴ A61M 5/00

U.S. Cl. 604—110

13 Claims



1. Non-reusable syringe for drawing fluid from a fluid source comprising:

- a body having a fluid chamber and a fluid inlet in communication with said fluid chamber;
- plunger means reciprocally movable within said fluid chamber from a first position to a second position to draw fluid from the fluid source through said fluid inlet toward said fluid chamber, said plunger means comprising a plunger sealably movable within said fluid chamber, said plunger having an internal chamber and a fluid passageway interconnecting said internal chamber with said fluid inlet of said body;
- a plunger handle for moving said plunger between said first and second positions; and
- connector means for interconnecting said plunger handle and said plunger means for permitting only one time movement of said plunger means from said first position to said second position.

4,874,373

DIP FORMED CATHETER AND ASSEMBLY

Ronald B. Luther, 530 Kings Rd., Newport Beach, Calif. 92663, and Billy H. Hannaford, 1822 1/2 Newport Blvd., #372, Costa Mesa, Calif. 92627

Filed Mar. 3, 1987, Ser. No. 21,135

Int. Cl.⁴ A61M 5/18

U.S. Cl. 604—164

21 Claims

1. A catheter and needle assembly formed by a process of:
a. dip coating a mandrel from a solution of an expandable, hydrophilic polymer;

- expanding the polymer coating away from the mandrel by contacting the polymer with a liquid containing water;
- removing the polymer coating in the form of a catheter from the mandrel, the catheter defining a longitudinal cavity approximating the shape of the mandrel; and



- inserting a needle into the longitudinal cavity of the catheter and drying the catheter to contract the catheter about the needle;
- the catheter being expandable due to contact with a liquid containing water, and thereby being removable from the needle.

4,874,374

MEDICAL TOOL INTRODUCTION CANNULA AND METHOD OF MANUFACTURING THE SAME

Tadashi Kousai; Toshinobu Ishida, and Yousuke Moriuchi, all of Fuji, Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan

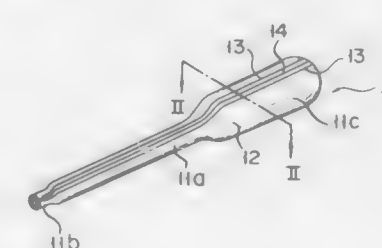
Division of Ser. No. 176,601, Apr. 1, 1988, This application Mar. 28, 1989, Ser. No. 329,799

Claims priority, application Japan, Apr. 8, 1987, 62-86251; Aug. 14, 1987, 62-202858

Int. Cl.⁴ A61M 25/00

U.S. Cl. 604—164

7 Claims



1. A medical tool introduction cannula for introducing a rod-like medical tool such as a catheter into a living body, wherein said introduction cannula comprises:

- a tubular body having a longitudinal hollow portion for receiving said medical tool therethrough;
 - a plurality of strip members in said tubular body, and which are liquid-tightly integrated to extend along a longitudinal direction of said tubular body;
 - one of said strip members comprising a molded body of a mixture of ethylene-vinyl acetate copolymer and polypropylene mixed at a weight ratio of 1:1 to 1:5; and
 - another of said strip members disposed adjacent to and extending along said one strip member, and comprising a molded body of polypropylene;
- said one strip member and said another strip member being bonded with a strength that allows said strip member to be separated from said another strip member by hand.

4,874,375

TISSUE RETRACTOR

Arthur E. Ellison, Adams Rd., Williamstown, Mass. 01267

Filed Apr. 13, 1987, Ser. No. 37,841

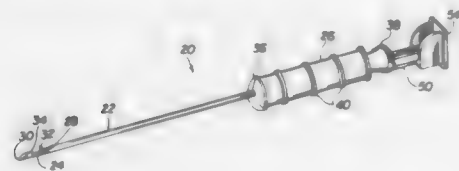
Int. Cl.⁴ A61M 5/18

U.S. Cl. 604—164

20 Claims

1. An apparatus for use during arthroscopic surgery on tissue comprising:

a substantially tubular sheath having a hollow interior and an outer surface, and
an obturator having an outer surface slidably contained within said sheath, said obturator having a first end which is sharp and pointed, and a reduced cross-sectional area



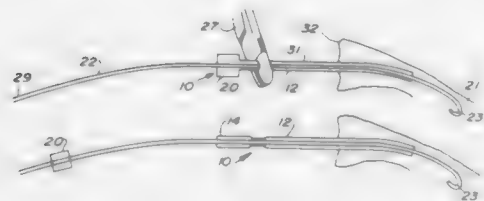
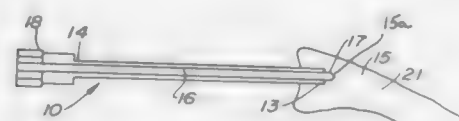
near said first end, the outer surface of said obturator between said first end and said reduced cross-sectional area being without a slicing edge, so that the tissue may be retained against said reduced cross-sectional area without slicing through the tissue when said obturator is advanced out of said sheath.

4,874,376 NEEDLE GUIDE ASSEMBLY

Irvin F. Hawkins, Jr., 1600 Archer Rd., Gainesville, Fla. 32610
Filed Apr. 13, 1987, Ser. No. 37,331
Int. Cl.⁴ A61M 5/00

U.S. Cl. 604—165

24 Claims



1. A needle guide set for use in the placement of tubular surgical instruments within a human or animal body, comprising:

- a needle guide outer cannula;
- a locator needle; and
- a guide wire;
- said needle guide outer cannula including a hollow tubular member having a distal end and a crimpable proximal end portion;
- said locator needle having a proximal end and a distal end with a sharp piercing tip portion, said locator needle constructed and arranged to be removably positioned within said needle guide outer cannula with its proximal end located adjacent to the proximal end portion of said needle guide outer cannula and with said sharp tip portion projecting from said distal end of said needle guide outer cannula to facilitate penetration of the said body by said needle guide outer cannula and the positioning of the distal end of said needle guide outer cannula in the proximity of a target area within the body;
- said guide wire having a distal end and a proximal end, said guide wire being insertable into the body through said needle guide outer cannula, after said locator needle has been withdrawn therefrom, said guide outer cannula proximal portion being crimped onto said guide wire to increase the effective length of said needle guide outer cannula to form a guide assembly of a length substantially

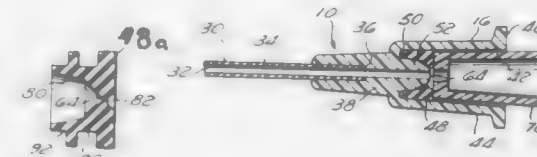
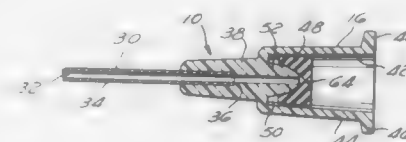
greater than the length of said outer cannula for advancing the tubular surgical instrument to the target area.

4,874,377 SELF-OCCLUDING INTRAVASCULAR CANNULA ASSEMBLY

Ken W. Newgard, Orange, and Mark G. Gordon, Tustin, both of Calif., assignors to Davis Newgard Revocable Family Living Trust, Calif., a part interest
Filed May 26, 1988, Ser. No. 199,118
Int. Cl.⁴ P61M 5/00, 25/00

U.S. Cl. 604—167

8 Claims



1. A self-occluding cannula assembly comprising:

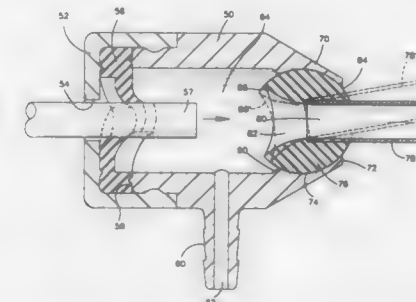
- a generally tubular cannula sheath having a proximal end, a distal end, and an inner lumen extending axially there-through;
- a connecting hub formed on the proximal end of said cannula sheath, said connecting hub having an axial bore formed therein, said axial bore being fluidly consistent with the inner lumen of said cannula sheath; and
- an occluding means comprising:
 - a frusto conical dilator projection;
 - an annular seating groove formed around said frusto conical dilator projection; and
 - an obturator member comprising a generally disc shaped body disposed transversely within said connecting hub, proximal to said dilator projection, said disc shaped body having at least one elastically openable and closable aperture and at least one notch formed therein;
- said obturator member normally residing in an "occluding" position wherein said openable and closable aperture remains closed so as to substantially preclude fluid from flowing through said cannula lumen;
- said obturator member being slidably movable relative to said dilator projection such that the application of distally directed pressure against said obturator member will cause said obturator member to distally advance to a "non-occluding" position wherein at least a portion of said obturator member is advanced into said seating groove and the notch portion of said obturator member is advanced over at least a portion of said frusto conical dilator projection such that said dilator projection exerts sufficient pressure against said obturator member to cause said openable and closable aperture to assume an open configuration whereby fluid is permitted to flow through said cannula lumen and further whereby, upon removal of said distally directed pressure, said obturator member will resiliently return to its "occluding" position.

4,874,378 CATHETER SHEATH INTRODUCER

Richard A. Hillstead, Hollywood, Fla., assignor to Cordis Corporation, Miami, Fla.
Filed Jan. 1, 1988, Ser. No. 201,473
Int. Cl.⁴ A61M 25/00

U.S. Cl. 604—167

10 Claims



1. A catheter sheath introducer for use in introducing a catheter into the body vessel and comprising:
 - a tubular housing having proximal and distal ends and having a passageway extending through said proximal and distal ends and the housing for slidably receiving an elongated catheter so that the catheter may pass through the housing from said proximal end to said distal end before introduction into a said body vessel;
 - a tubular cannula extending from the distal end of said housing but not directly connected to said housing and adapted to be inserted into a said body vessel and being in communication with said passageway so that said catheter may slidably extend through the distal end of said housing and thence through said cannula and into a said body vessel;
 - flexible coupling means connecting a first end of said cannula with said housing at the distal end thereof without any significant overlap between said first end and said housing and in such a manner that said cannula may be angularly displaced with respect to the distal end of said housing, without any bending of said cannula so that said cannula does not deform.

4,874,379 CANNULA

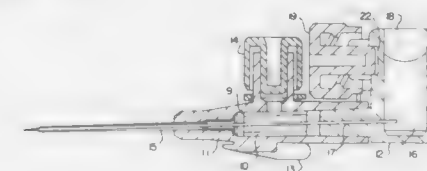
Clas Gabrán, Helsinki, Finland, assignor to Oy Stille Ab, Helsinki, Finland

Filed Jun. 15, 1988, Ser. No. 207,769

Claims priority, application Finland, Jun. 17, 1987, 872707
Int. Cl.⁴ A61M 5/00

U.S. Cl. 604—168

5 Claims



1. A cannula for introducing liquid into the vein of a patient comprising:
 - a main body defining front and rear openings and a passage therebetween having a first longitudinal axis;
 - a catheter projecting out from said front opening and capable of being inserted into the patient's vein to place the patient's vein into fluid communication with said passage;
 - a rear body defining an indicating chamber having a second longitudinal axis and having a male coupling element with an aperture passing therethrough projecting substantially perpendicularly away from said indicating chamber, said male coupling element being removably inserted into said

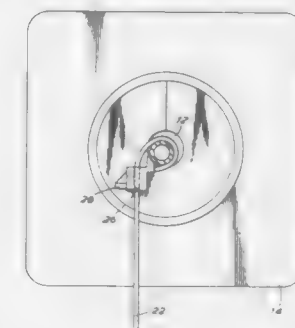
rear opening of said main body coaxially with said first longitudinal axis so that said second longitudinal axis is substantially perpendicular to said first longitudinal axis;
a hollow steel needle affixed to said rear body and passing through said aperture of said male coupling element, said passage, and said catheter, to be thereby capable of placing said indicating chamber in fluid communication with the patient's vein when said catheter is inserted into the vein; and
a rear plug detachably affixed to said rear body so that when said male coupling element is withdrawn from said rear opening to separate said rear body from said main body, said rear plug can be detached from said rear body and connected to said main body to cap said rear opening.

4,874,380 CATHETER RETAINING DEVICE

Mark L. Heaketh, Whytegate, United Kingdom, assignor to E. R. Squibb and Sons, Inc., Princeton, N.J.
Filed Jan. 7, 1988, Ser. No. 142,618
Int. Cl.⁴ A61M 5/32

U.S. Cl. 604—180

5 Claims



1. A releasable catheter retaining device comprising a substantially planar flange having a central hole therein and mounted on a pad of medical grade skin-compatible adhesive material, the flange being made in one piece with a post extending from the side of the flange opposite to the pad and with an elongated tab extending from the post, there being a slot in the post for receiving the free end of the tab, the arrangement being such that the tab can be passed through the slot after encircling a catheter which extends through the hole, and wherein the post has a resilient detent associated with the slot, the detent having a detent tooth, the detent and tooth being movable in a plane parallel to the plane of the flange between a first position in which the detent tooth grips the tab in the slot and a second position in which the tooth is disengaged from the tab and at least partially withdrawn from the slot and the tab is released.

4,874,381 HYPODERMIC SYRINGE

Udo J. Vetter, Ravensburg, Fed. Rep. of Germany, assignor to Arzneimittel GmbH Apotheker Vetter & Co. Ravensburg, Ravensburg, Fed. Rep. of Germany
Filed Jun. 24, 1988, Ser. No. 211,229
Claims priority, application European Pat. Off., Feb. 16, 1988, 88 102,236.2

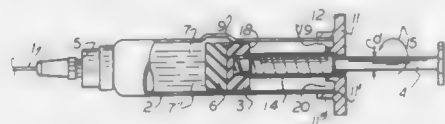
Int. Cl.⁴ A61M 5/08

U.S. Cl. 604—191

10 Claims

1. A medicinal syringe, comprising:
 - a generally cylindrical syringe body formed with a first end having a needle-receiving fitting, a second and opposite said first end and a bypass intermediate said ends;
 - a first piston slidable in said body proximal to said second end;

- a second piston slidable in said body between said first piston and said first end, said pistons defining a liquid compartment between them adapted to communicate with a downstream compartment between said second piston and said first end through said bypass upon displacement of said second piston so that opposite sides thereof are bridged by said bypass;
- a piston-actuating stem axially engaged by said first piston, extending out of said second end and axially displaceable to drive said pistons toward said first end of said body; and velocity damping means formed at said second end or said body for restricting a velocity of displacement of said first piston substantially until said first piston reaches said



bypass, thereby limiting a velocity with which liquid from said liquid compartment enters said downstream compartment, and thereafter disengaging to permit less-braked axial displacement of said pistons by said stem, said damping means including a cap fitted onto said second end and formed with a central bore having an internal screwthread, said stem having over part of its length an axially extend in shank having an external screwthread threadedly engaging said internal screwthread, and shank having a length such that said external screwthread passes out of said internal screwthread upon rotation of said stem to advance said first piston as said first piston reaches said bypass.

4,874,382

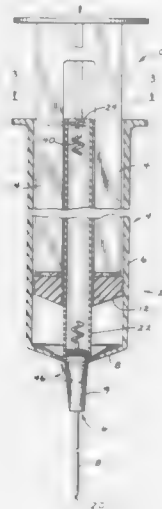
SAFETY SYRINGE

Peer Lindemann, West Bend, and Victor M. Haughton, Dousman, both of Wis., assignors to Servetus Partnership, Milwaukee, Wis.

Filed Oct. 15, 1987, Ser. No. 109,189
Int. Cl.⁴ A61M 5/00

U.S. Cl. 604—195

19 Claims



1. A syringe, comprising:
a body portion for holding fluid;
a hollow needle interconnected with said body portion for transferring fluid between said body portion and a patient, said needle having a head portion and a sharpened tip, said needle being movable between an extended position in

which said sharpened tip projects outwardly from said body portion and said head portion is positioned such that the interior of said hollow needle is in communication with the interior of said body portion, and a retracted position in which the sharpened tip of said needle is enclosed;

a plunger associated with said body portion for ejecting fluid through said needle from the interior of said body portion of drawing fluid through said needle into the interior of said body portion;

a protective sheath associated with said syringe into which needle is withdrawn into its retracted position after use for enclosing the tip of said needle to prevent accidental contact therewith;

disarming means associated with said syringe for disarming said needle after use by moving said needle from its extended position to its retracted position, said disarming means including biasing means for biasing said needle toward its retracted position; and

actuator means associated with said syringe and actuable by the user of said syringe for actuating said disarming means, said actuator means comprising releasable retainer means for retaining said syringe in an armed condition wherein said needle is in its extended position during use against the force of said biasing means, and wherein said releasable retainer means releases said needle upon actuation to withdraw said needle into said sheath by the force of said biasing means to convert said syringe to its disarmed condition to prevent accidental contact therewith, said releasable retainer means comprising a movable rod associated with said body portion of said syringe and movable ball-type detent means associated with said syringe for retaining said needle in its extended position against the biasing force of said biasing means during use, and wherein said rod is movable so as to effect movement of said ball-type detent mechanism, said movement of said ball-type detent mechanism effecting a release of said needle for allowing said needle to be withdrawn into said protective sheath by said biasing means after use to achieve said disarmed condition.

4,874,383

SYRINGE SHIELD

R. David McNaughton, 95 Dobler Ave., Red Deer, Alberta, Canada T4R 1X3

Filed Dec. 8, 1987, Ser. No. 130,277
Claims priority, application Canada, Mar. 17, 1987, 532233
Int. Cl.⁴ A61M 5/32

U.S. Cl. 604—198

5 Claims



1. A syringe comprising:
a barrel having a hypodermic needle mounted on one end thereof, said barrel being of transparent cylindrical form over the major portion of its length;
a piston mounted for movement longitudinally within said barrel and connected to a handle that projects from the opposite end of said barrel;
a sleeve dimensioned to fit over said barrel, and mounted to be slidable therealong, said sleeve having an internal projection and being movable axially between an extended position wherein it projects from said one end of said barrel beyond the tip of said needle and a retracted position wherein it coaxially surrounds said barrel and exposes said needle for use, said sleeves having a length that corresponds to that of said barrel and comprising a cylindrical wall that is transparent such that in said retracted position

it affords unimpeded visibility of substantially the entire extent of said transparent portion and thus the interior of said barrel;

first locking means for securely locking said sleeve in said extended position in which said needle is fully covered to prevent injury to a user by said needle, said first locking means comprising walls that define a locking recess in said barrel into which recess said internal projection can be positioned by predetermined movement of said sleeve relative to said barrel in said extended position, said barrel including an inclined ramp that approaches said locking recess to guide and facilitate entry of said projection into said recess; and

a second locking means to securely lock said sleeve when in said retracted position against axial movement relative to said barrel.

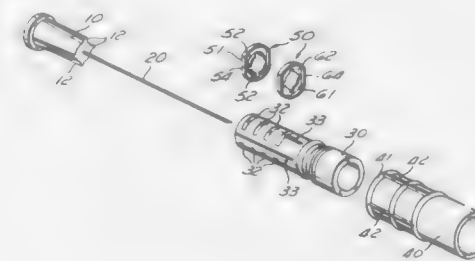
4,874,384

NEEDLE SAFETY GUARD

Chris E. Nunez, Garden Grove, Calif., assignor to International Medical Innovators, Inc., San Clemente, Calif.

Filed Jul. 13, 1987, Ser. No. 72,665
Int. Cl.⁴ A61M 5/32

U.S. Cl. 604—198



5. An apparatus capable of being mounted to a hub of a medical needle in order to guard the tip of the medical needle, the apparatus comprising:

- a first tubular sleeve;
engagement means, retained and carried by the first tubular sleeve, for frictionally engaging a hub of the medical needle in order to mount the first tubular sleeve coaxially thereupon; and
a second tubular sleeve sliding from the first tubular sleeve to a sufficient extension so as to guard a tip of the medical needle, said engagement means comprising a clip insert formed substantially in the shape of an internal tooth lock washer.

4,874,385

PLUNGER LOCK DEVICE

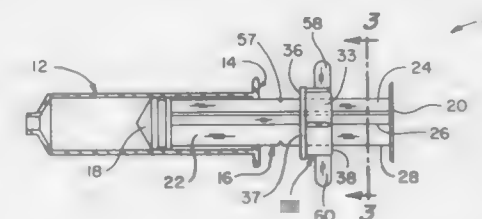
John P. Moran, Herculaneum; Richard W. Gilson, Dellwood, and Thomas W. Heubel, Chesterfield, all of Mo., assignors to Sherwood Medical Company, St. Louis, Mo.

Filed Dec. 16, 1987, Ser. No. 133,302
Int. Cl.⁴ A61M 5/00

U.S. Cl. 604—208

13 Claims

1. In a syringe having a syringe housing with a plunger slidably positioned therein and extendable therefrom, the improvement comprising a locking member mounted on the plunger externally of the syringe housing, said locking member and said plunger having means cooperatively engageable in selected relative positions thereof including inwardly extending cam means on the locking member and means on the plunger member engageable therewith in said selected relative position, said locking member being angularly movable on the plunger between a first position in which the locking member is free to be moved along the length of the plunger to any desired position therealong and a second position angularly related to the first position in any desired position therealong



concert, said last named second position limiting longitudinal movement of the plunger relative to the syringe housing.

4,874,386

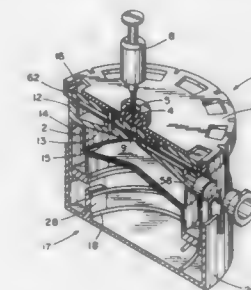
FLUID DISPENSING DEVICE

Matthew O'Boyle, Houston, Tex., assignor to STA-SET Corporation, Houston, Tex.

Continuation-in-part of Ser. No. 938,620, Dec. 5, 1986, Pat. No. 4,822,344. This application May 15, 1987, Ser. No. 49,940
Int. Cl.⁴ A61D 5/005

U.S. Cl. 604—246

16 Claims



1. An ambulatory fluid drug dispensing device comprising a reservoir for a liquid to be administered parenterally to a patient, means for introducing liquid in the reservoir, means for placing the liquid in the reservoir under constant pressure for dispensing the liquid from the device, said means for placing including a spring for applying a constant force to the liquid in the reservoir and means for tensioning said spring to initially apply the constant force on the liquid in the reservoir after the liquid has been introduced in the reservoir and flow control means for adjustably controlling the flow rate of the liquid dispensed from the device, said flow control means comprising means defining an elongated passage through which liquid from said reservoir can be flowed to an outlet of said device and means for changing the length of said elongated passage through which the liquid is flowed to thereby change the flow rate of the liquid through the passage.

4,874,387

COVER FOR BODY FLUID DRAINAGE BAG AND TUBING

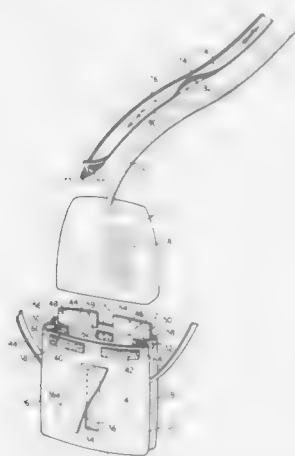
Delores A. Boone, 1092 Kennedy St., Norfolk, Va. 23513
Filed Nov. 1, 1988, Ser. No. 265,440
Int. Cl.⁴ A61M 1/00

U.S. Cl. 604—326

8 Claims

1. A cover for a body fluid drainage bag and tubing in combination comprising:
a bag cover having front and back panels which are joined along end and bottom edges, but which are separated along a top edge to form an open edge, said bag cover

being of a size for enclosing a transparent body-fluid bag between the front and back panels;
 a tubing cover comprising an elongated sheet of flexible material having first and second opposite side edges and first and second opposite end edges, said tube cover further including a tube forming attachment means for selectively attaching the first and second opposite side edges together so as to hold the sheet of flexible material in a tubular shape or for selectively separating to allow the elongated sheet of flexible material to be opened up with its side edges apart;



an end-edge attachment means for engaging said first end of said elongated sheet of flexible material and said bag cover near the top edge thereof for holding said first end of said elongated sheet in said open edge of said bag cover; whereby a fluid drainage bag can be placed in said bag cover with said tubing extending through said open edge, said tubing outside said bag cover being covered by said elongated sheet of flexible material held in a tubular shape by said tube forming attachment means about said tubing.

4,874,388

MULTI-LAYER DELIVERY SYSTEM

Patrick S. L. Wong, Hayward; Felix Theeuwes, and James B. Eckenhoff, both of Los Altos, all of Calif., assignors to ALZA Corporation, Palo Alto, Calif.

Filed Jan. 25, 1987, Ser. No. 66,906
 Int. Cl. A61K 9/24

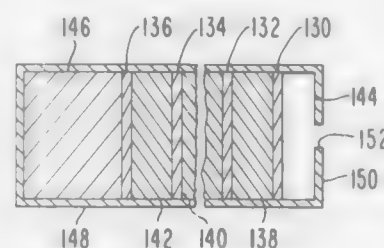
U.S. Cl. 604-891.1

26 Claims

1. A drug dispenser for use in a fluid-containing environment comprising, in combination:

- a rigid housing having an outlet at one end thereof;
- a fluid activated driving member within a portion of said housing proximate the end of said housing opposite to said outlet and in contact with said housing, at least that portion of the housing contacting the driving member having a predetermined permeation rate to the environmental fluid;
- a first set of drug layers longitudinally disposed within said housing between said driving means and said outlet;

- a second set of layers longitudinally disposed within said housing and alternating with said first drug layers; and
- an expansion chamber defining an empty volume within said housing between the drug layer most proximate the



outlet and the outlet; whereby said drug layers must be displaced through the expansion chamber by said driving means after exposure of said dispenser to the fluid environment.

4,874,389

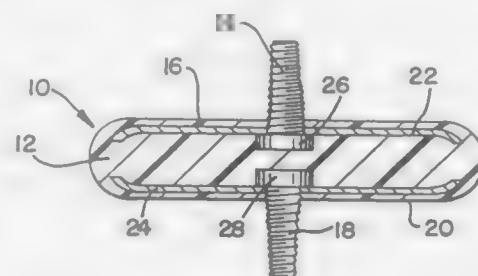
REPLACEMENT DISC

Ernest L. Downey, 10559 S. Ave. G., Chicago, Ill. 60617
 Filed Dec. 7, 1987, Ser. No. 129,302

Int. Cl. A61F 2/44

U.S. Cl. 623-17

20 Claims



1. A replacement disc for use between adjacent vertebrae comprising:

- a unitary body portion having substantially opposing first and second surfaces and being adapted to fit and be held between said adjacent vertebrae;

first threaded means having a first proximal end substantially level with said first surface and a first distal end distally therefrom, said first threaded means being tapered in a direction from said first proximal end to said first distal end wherein said first distal end is about 30% to about 60% of the cross sectional area of said first proximal end;

second threaded means having a second proximal end substantially level with said second surface and a second distal end distally therefrom, said second threaded means being tapered in a direction from said second proximal end to said second distal end wherein said second distal end is about 30% to about 60% of the cross-sectional area of said second proximal end.

CHEMICAL

4,874,390

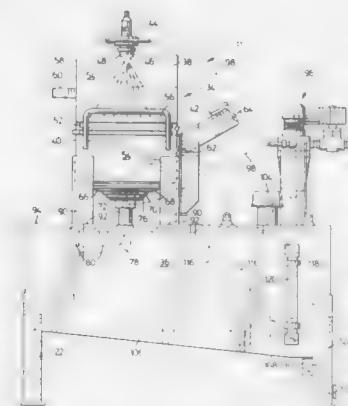
METHOD AND APPARATUS FOR TINTING YARN
 Clayton M. Legault, Kingston, Canada, assignor to Du Pont Canada Inc., Mississauga, Canada

Filed Sep. 29, 1988, Ser. No. 251,962

Int. Cl. D06B 1/02

U.S. Cl. 8-149.1

14 Claims



8. Apparatus for tinting yarn, said apparatus comprising a tinting chamber having openings therein to allow for passage of yarn therethrough, yarn guide means for guiding said yarn through said tinting chamber, spray nozzles locatable within said chamber for spraying a fine atomized spray of tint onto said yarn within said chamber, said nozzles each having a compressed air inlet and a tint inlet, and means for exhausting excess tint from said chamber; and

a tint reservoir located beneath said tinting chamber, said tint reservoir being connected to the tint inlets of the nozzles whereby compressed air entering said air inlet siphons tint from said reservoir to transport it to said nozzles.

13. A process for tinting yarn comprising passing yarn through an at least partially enclosed spraying zone, spraying yarn with tint in said spraying zone, and simultaneously removing excess tint from said spraying zone, wherein said step of removing excess tint comprises providing a draining zone connected to said spraying zone and to a tint storage zone, creating suction in said draining zone to draw excess tint from said spraying zone through said draining zone to said reservoir and deflecting excess tint in said spraying zone toward said draining zone, and wherein the tint storage zone is located below the spraying zone and wherein tint is transported to said spraying zone by siphoning.

4,874,391

PROCESS FOR PHOTOCHEMICAL STABILIZATION OF POLYAMIDE FIBER MATERIAL AND MIXTURES THEREOF WITH OTHER FIBERS: WATER-SOLUBLE COPPER COMPLEX DYE AND LIGHT-STABILIZER

Gerhard Reinert, Allschwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jul. 20, 1987, Ser. No. 75,805

Claims priority, application Switzerland, Jul. 29, 1986, 3034/86

Int. Cl. D06M 13/26, 11/04; D06P 1/62, 3/24

U.S. Cl. 8-442

23 Claims

1. A process for the photochemical stabilization of polyamide fibre material or mixtures thereof with other fibre materials, which comprises applying to the fibre material from an aqueous bath a mixture of

(A) a water-soluble copper complex azo dye or a mixture of a water-soluble copper complex azo dye and a non-chromophoric water-soluble copper complex which has fibre affinity and is selected from the group consisting of

bisazomethines, acylhydrazones, semicarbazones and thiosemicarbazones of aromatic aldehydes and ketones, (B) a light stabilizer selected from the group consisting of 2-hydroxybenzophenone, 2-(2'-hydroxyphenyl)-benzotriazole and sterically hindered amines, and if desired (C) an antioxidant.

4,874,392

MONOAZO DYES HAVING A SUBSTITUTED 1,4-PHENYLENE COUPLING COMPONENT RADICAL HAVING ONE C₆-14 ALKYL GROUP OR MOIETY
 Beat Henzi, Basle, Switzerland, assignor to Sandoz Ltd., Basle, Switzerland

Filed Jul. 29, 1987, Ser. No. 79,080

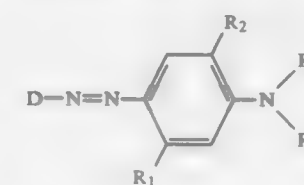
Claims priority, application Fed. Rep. of Germany, Aug. 1, 1986, 3626139

Int. Cl. C09B 29/08; D06P 1/18, 3/54

U.S. Cl. 8-662

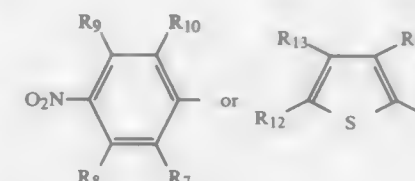
20 Claims

1. A process of dyeing a textile substrate comprising applying a compound of the formula



to a textile substrate from an aqueous medium, wherein

D is



wherein

R₇ is hydrogen, cyano or halo,R₈ is hydrogen or chloro,R₉ is hydrogen or chloro, with the proviso that at least one of R₈ and R₉ is hydrogen,R₁₀ is cyano or nitro,R₁₁ is formyl, cyano, nitro, (C₁-4alkoxy)carbonyl or (C₁-4alkyl)carbonyl,R₁₂ is hydrogen, chloro, C₁-3alkyl or phenyl, andR₁₃ is cyano, nitro or (C₁-4alkoxy)carbonyl,R₁₄ is hydrogen, C₁-2alkyl, C₁-2alkoxy, formylamino; (C₁-4alkyl)carbonylamino; (C₁-4alkyl)carbonylamino the alkyl group of which is substituted by 1 to 3 substituents independently selected from halo, C₁-3alkoxy, cyano, phenyl, phenoxy and benzyloxy; (C₂-4alkenyl)carbonylamino; halo(C₂-4alkenyl)carbonylamino; benzoylamino; benzoylamino the phenyl group of which is substituted by 1 to 3 substituents independently selected from halo, C₁-4alkyl and C₁-4alkoxy; (C₁-4alkoxy)carbonylamino; (C₁-4alkoxy)carbonylamino the alkyl moiety of which is substituted by 1 to 3 substituents independently selected from halo, C₁-3alkoxy, cyano, phenyl, phenoxy and benzyloxy; (C₈-14alkyl)carbonylamino or (C₈-14alkoxy)carbonylamino,R₂ is C₁-4alkoxy or 2-(C₁-4alkoxy)ethoxy,R₃ is hydrogen, C₁-4alkyl, C₈-14alkyl, 2-(C₈-14alkoxy)carbonyloxyethyl, 2-(C₈-14alkyl)carbonyloxyethyl or 2-(C₈-14alkoxy)carbonyloxyethyl, andR₄ is hydrogen, C₁-4alkyl, 2-cyanoethyl, 2-(C₁-3alkoxy)ethyl, 2-(C₁-4alkyl)carbonyloxyethyl, 2-(C₁-4alkoxy)-

carbonylethyl, 2-(C₁₋₄alkoxy)carbonyloxyethyl, C₃₋₄alkenyl,



C₈₋₁₄alkyl, 2-(C₈₋₁₄alkyl)carbonyloxyethyl, 2-(C₈₋₁₄alkoxy)carbonylethyl or 2-(C₈₋₁₄alkoxy)carbonyloxyethyl, wherein

R₅ is C₁₋₄alkyl, allyl, (C₁₋₃alkyl)carbonyl, phenyl or phenyl substituted by 1 to 3 substituents independently selected from halo, C₁₋₂alkyl and C₁₋₂alkoxy, and R₆ is hydrogen, C₁₋₄alkyl or (C₁₋₃alkyl)carbonyl, with the proviso that one and only one of R₁, R₃ and R₄ is or contains a C₈₋₁₄alkyl group or moiety.

4,874,393

METHOD OF PRODUCING FUEL OF RELATIVELY HIGHER CALORIFIC VALUE FROM LOW RANK AND OXIDIZED COAL

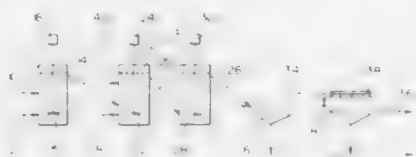
Josef A. Mikhlin, Montreal; C. Edward Capes, Ottawa; Hareesh S. Divanji, Montreal, and Richard D. Coleman, Orleans, all of Canada, assignors to Canadian Patent and Development Ltd., Ottawa, Canada

Filed Jan. 29, 1987, Ser. No. 67,111

Claims priority, application Canada, Jul. 4, 1986, 513,163
Int. Cl.⁴ B01J 2/06; C01L 9/10

U.S. Cl. 44—20

2 Claims



1. A method of producing fuel of relatively higher calorific value from low-rank and oxidized coal, comprising:

- (a) agitating to thoroughly mix electrolyte selected from the group consisting of concentrated sulphuric acid, concentrated hydrochloric acid and sulphur trioxide gas with an aqueous slurry of the coal comminuted to an ash release particle size essentially smaller than 35 mesh Tyler Standard Screen, to condition the coal slurry for oil agglomeration of the carbonaceous portion of the coal therein by a coal derived oil; then
- (b) adding coal derived agglomerating oil to the conditioned coal slurry, the coal slurry containing about 10 to about 40 wt% oil, and about 0.5 to about 5.0 vol % electrolyte; then
- (c) agitating the mixture of coal derived agglomerating oil and conditioned coal slurry to form agglomerates of carbonaceous material of the coal in the mixture, the agglomerates containing about 10 to about 50 wt %, coal derived oil; then
- (d) separating the agglomerates from the remainder of the mixture; and then
- (e) washing the separated agglomerates with water.

4,874,394

CRUDE OIL AND FUEL OIL COMPOSITIONS

Robert D. Tack, Oxford; Rodger F. Andrews, Didcot, and Sally J. Ayres, Stanton Harcourt, all of United Kingdom, assignors to Exxon Chemical Patents Inc., Linden, N.J.

Filed Jan. 22, 1988, Ser. No. 146,976

Claims priority, application United Kingdom, Jan. 27, 1987, 17-01956

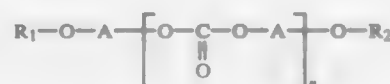
Int. Cl.⁴ C10L 1/18

U.S. Cl. 44—70

17 Claims

1. A wax containing oil composition comprising (a) crude oil or fuel oil and (b) a wax crystal modifying amount of at least

one polycarbonate having a number average molecular weight from about 300 to about 3000 and represented by the structural formula:



wherein R₁ is selected from the group consisting of hydrogen, alkyl, alkoxy carbonyl, alkyl carbonyl, aralkyl, aralkoxycarbonyl, aralkylcarbonyl, alkaryl, alkaryl oxy carbonyl, and alkaryl carbonyl; R₂ is independently selected from the same groups defined in connection with R₁ provided R₂ may not be alkoxy carbonyl, aralkoxy carbonyl or alkaryl oxy carbonyl; A is independently selected from the group consisting of C₃ to about C₁₈ alkylene, cycloalkylene, and arylene, provided that when A is alkylene, it can be interrupted by a bridging group selected from the group consisting of oxy, thio, amido ureylene, carbamate and tertiary amino; and n is a number greater than 2.

4,874,395

AMINE NEUTRALIZED ALKENYLSUCCINIC ANHYDRIDE PROPYLENE GLYCOL ADDUCTS AS CORROSION INHIBITORS FOR HYDROCARBON FUELS

George R. Meyer, Missouri City, Tex., assignor to Nalco Chemical Company, Naperville, Ill.

Filed Sep. 2, 1988, Ser. No. 239,801

Int. Cl.⁴ C10L 1/18; C07C 101/02

U.S. Cl. 44—71

5 Claims

1. A corrosion inhibitor composition for hydrocarbon fuels from the group consisting of gasolines and diesel fuel oils comprising a C₁₀—C₂₄ alkenyl succinic anhydride esterified with between 0.5—1.5 moles of a water-soluble glycol and then neutralized with an aliphatic hydrocarbon amine.

4,874,396

BRIQUETS FOR SMOKE SEASONING FOOD PRODUCTS

H. C. McLeod, 1407 South Cir., Mt. Prospect, Ill. 60056

Filed Jul. 18, 1988, Ser. No. 220,478

Int. Cl.⁴ C10L 5/40

U.S. Cl. 44—589

15 Claims

1. For use in cooking food products with charcoal or artificially heated coals, briquets adapted to be placed directly on or proximate to hot coals effective to generate fumes and/or smoke for seasoning the food products with spices as the products are being cooked, said briquets comprising carrier means and a seasoning liquid impregnated into the carrier means, said carrier means initially being dried and readily absorbant and afterwards forming between 70—90% of the weight of the briquets and the seasoning liquid forming between 10—30% of the weight of the briquets, said briquets being wet both in appearance and to the touch; the seasoning liquid being non-combustible and the briquets supporting combustion only after extended exposure to the heat of the coals; the seasoning liquid including spices in the form of liquid components of wine, soy sauce, whiskey, molasses and water, and solid components of bay leaves, onion powder, and garlic powder; the liquid and solid components being blended together in a ratio by weight of between 0.1—3% solid to 99.9—97% liquid.

4,874,397

COAL GASIFICATION PROCESS

Walter L. Heitz, Edwardsville, Ill., assignor to Shell Oil Company, Houston, Tex.

Filed Dec. 29, 1987, Ser. No. 138,770

Int. Cl.⁴ C10J 3/00, 3/84

U.S. Cl. 48—210

4 Claims

1. A process for the gasification of coal comprising (a) oxidizing particulate coal under conditions to produce synthesis gas and producing synthesis gas at a temperature of from about 1050° C. to about 1800° C. containing molten flyslag particles; (b) passing said synthesis gas and molten flyslag particles to a heat exchange zone having walls cooler than the melting point of said flyslag particles, quenching and cooling said synthesis gas and solidifying said flyslag particles in said heat exchange zone during which flyslag deposits are formed on said walls, the superficial velocity of the synthesis gas and flyslag particles passing through said heat exchange zone being maintained at a rate of from about 4 meters per second to about 12 meters per second; (c) increasing the rate of flow of the synthesis gas and flyslag particles through said heat exchange zone to a rate greater than about 12 meters per second for a time sufficient to reduce the flyslag deposits present on the walls of said heat exchange zone; and (d) resuming the flow of the synthesis gas and flyslag particles through said heat exchange zone at a rate of from about 4 meters per second to about 12 meters per second.

4,874,398

DIAMOND COMPACTS AND PROCESS FOR MAKING SAME

Alfred E. Ringwood, 3 Vancouver St., Redhill, Australia

PCT No. PCT/AU85/00201, § 371 Date Jun. 19, 1986, § 102(e)

Date Jun. 19, 1986, PCT Pub. No. WO86/01433, PCT Pub.

Date Mar. 13, 1986

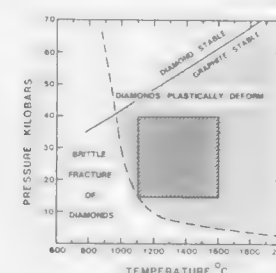
PCT Filed Aug. 23, 1985, Ser. No. 882,937

Claims priority, application Australia, Aug. 24, 1984, PG6772/84

Int. Cl.⁴ B24D 3/00

U.S. Cl. 51—293

18 Claims



1. A process for producing a diamond compact for cutting, turning drilling, and otherwise working ultra-hard ceramics, carbides and rocks which comprises:

- (i) intimately mixing a mass of particulate diamond crystals with a solid particulate powder bonding agent in the proportions 60—95 volume percent of diamond to 40—5 volume percent of bonding agent, the bonding agent comprising an element which reacts with carbon to form a stable carbide having a melting point exceeding about 1600° C. or a metallic alloy containing such element;
- (ii) subjecting the mixture to a temperature in the range of 1100°—1600° C. at a mean confining pressure in the range of 10 kbars to 40 kbars, said combination of mean confining pressure and temperature lying within the graphite stability field; and
- (iii) maintaining the temperature and pressure conditions of the mixture for a period greater than about 3 minutes to cause said element in the bonding agent to react extensively with carbon in the diamond crystals to form an

interstitial carbide phase having a melting point about 1600° C. providing a strong bond between the diamond crystals while inhibiting the formation of free graphite by retrogressive transformation from diamond, said period being sufficient to result in substantial plastic deformation of the diamond crystals whereby contact between the diamond crystals occur over extended mating surfaces and also to result in substantial chemical equilibrium between the bonding agent and the diamond crystals whereby there is produced a thermally stable diamond compact having a minimum melting point above 1600° C. and a compressive strength above 10 kbars at ambient temperature.

4,874,399

ELECTRET FILTER MADE OF FIBERS CONTAINING POLYPROPYLENE AND POLY(4-METHYL-1-PENTENE)

John F. Reed, Arden Hills, and Marvin E. Jones, Stillwater, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jan. 25, 1988, Ser. No. 147,989

Int. Cl.⁴ B01D 35/06

U.S. Cl. 55—2

20 Claims

1. Method of removing particulate matter from a gaseous fluid comprising passing the fluid through an electret filter comprising electret fibers containing at least one percent by weight of poly(4-methyl-1-pentene).

4. Electret filter comprising electret fibers containing polypropylene and at least one percent by weight of poly(4-methyl-1-pentene) per 100 parts of total polyolefin.

4,874,400

METHOD OF AND APPARATUS FOR REMOVING GASEOUS POLLUTANTS FROM EXHAUST GASES

Egon Jury, Egelsbach, Fed. Rep. of Germany, assignor to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

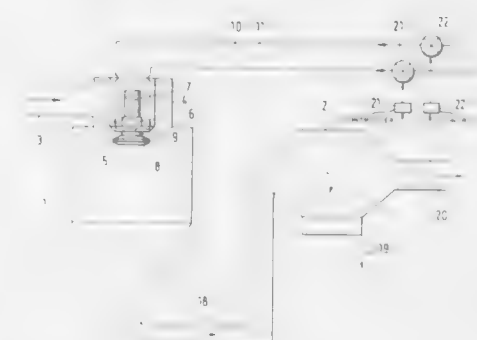
Filed Sep. 14, 1988, Ser. No. 244,666

Claims priority, application Fed. Rep. of Germany, Sep. 25, 1987, 3732353

Int. Cl.⁴ B01D 47/16; B03C 3/01

U.S. Cl. 55—8

10 Claims



1. A method of removing a gaseous pollutant from a gas stream, comprising the steps of:

- (a) treating said gas stream in a spray absorber by
 - (a₁) rotating an atomizing disk having a compartment at the bottom in said absorber;
 - (a₂) introducing separately through the atomizing disk into the compartment at the bottom of said disk, water and a suspension in a liquid of particles capable of reacting with said gaseous pollutant to absorb said gaseous pollutant in said particles;
 - (a₃) mixing the water and the suspension in said compartment at the bottom of said disk for a residence time

sufficiently short to ensure that reaction products formed as the water is mixed with the suspension will not be able to deposit anywhere along a path along which they flow jointly before entering the gas stream;

- (a) discharging into said gas stream in said absorber in an atomized spray, a mixture of the water and the suspension from atomizing nozzles of said disk during the rotation thereof to cool said gas stream and take up said gaseous pollutant in said particles while suspending said particles in said gas stream; and
- (b) thereafter collecting said particles from said gas stream in a dust collector.

4,874,401

GAS SEPARATION MEMBRANES FROM BISPHENOL AF POLYCARBONATES AND POLYESTERCARBONATES

Thomas O. Jeanes, Antioch, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Filed Nov. 20, 1987, Ser. No. 123,495

Int. Cl.⁴ B01D 53/22

U.S. Cl. 55—16

28 Claims

1. A method of separating gases comprising
- (a) contacting with a feed gas mixture under pressure one side of a semi-permeable membrane comprising a thin discriminating layer of polycarbonate or polyester carbonate, wherein the diphenolic residue in the polymer backbone is based on bisphenol AF;
- (b) maintaining a pressure differential across the membrane under conditions such that a component(s) of the feed gas selectively permeates through the membrane from the high pressure side to the low pressure side of the membrane;
- (c) removing the permeated gas which is enriched in the faster permeating component(s) from the low pressure side of the membrane; and
- (d) removing the nonpermeated gas which is depleted in the faster permeating component(s) from the high pressure side of the membrane.

4,874,402

PROCESS FOR PURIFYING AND COOLING A HOT GAS

Jacobus E. Vogel, The Hague, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 30,279, Mar. 24, 1987, abandoned, which is a continuation of Ser. No. 688,281, Jan. 4, 1985, abandoned, which is a continuation of Ser. No. 443,981, Nov. 23, 1982, abandoned. This application Jul. 13, 1988, Ser. No. 220,449

Int. Cl.⁴ B01D 53/14

U.S. Cl. 55—22

18 Claims

1. A process for purifying and cooling hot synthesis gas containing flyash particles comprising
- (a) passing said synthesis gas through at least one heat exchange to cool said synthesis gas;
- (b) passing cooled synthesis gas from step (a) through at least

one cyclone, and separating flyash particles from said synthesis gas in at least one cyclone;

- (c) passing synthesis gas, from which flyash particles have been removed in step (b), through a water scrubber, and forming purified synthesis gas and an aqueous suspension of flyash particles; and
- (d) injecting at least a portion of the aqueous suspension formed in step (c) into the synthesis gas before entry of the synthesis gas into said at least one heat exchanger and agglomerating the flyash particles in the hot synthesis gas, the aqueous suspension, or in the hot synthesis gas and the aqueous suspension by addition of and adhesive agent to the hot synthesis gas, the aqueous suspension, or the hot synthesis gas and the aqueous suspension.

4,874,403

PROCESS FOR TREATING WASTE GASES CONTAINING TRICHLOROTRIFLUOROETHANE AND APPARATUS THEREFOR

Toshiharu Hasumoto; Kunio Kashiwada; Minoru Konishi, and Nobuo Fujishiro, all of Kawasaki, Japan, assignors to Showa Denko Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 15, 1988, Ser. No. 232,497

Claims priority, application Japan, Dec. 25, 1987, 62-328958

Int. Cl.⁴ B01D 19/00

U.S. Cl. 55—55

1 Claim

1. A method of treating a trichlorotrifluoroethane containing waste gas which comprises contacting at atmospheric pressure or under pressurized conditions a trichlorotrifluoroethane containing waste gas with at least one absorber selected from the group consisting of saturated mineral oils, alkyl diphenyl ether based oils, silicone oils, trifluorochloroethylene based oils, and perfluoropolyether based oils, having a vapor pressure of not higher than 7.6×10^{-2} mmHg at 25° C. and a viscosity of not higher than 500 cp at 25° C., to remove trichlorotrifluoroethane contained in the waste gas by absorbing, and depressurizing the absorber having absorbed therein trichlorotrifluoroethane to recover trichlorotrifluoroethane.

4,874,404

VACUUM CLEANER

Jerald O. Boswell, P.O. Box 5666, Wilmington, N.C. 28403

Filed Mar. 1, 1989, Ser. No. 317,536

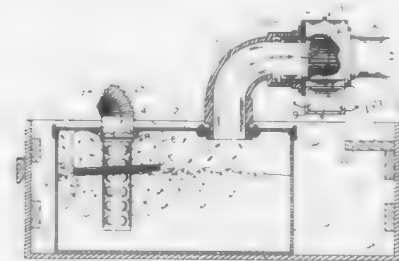
Int. Cl.⁴ B01D 47/02

U.S. Cl. 55—86

13 Claims

1. A vacuum cleaner, comprising:
- (a) an enclosed reservoir of water having an air entry tube connected to an enclosed space above the water;
- (b) a vacuum production means connected to the enclosed space;
- (c) a float means connected to said air entry tube, wherein said float means comprises flexible bag cylinder attached to said air entry tube at a first end of said bag cylinder, said

bag cylinder surrounding a pipe cylinder; and a buoyant piece connected to a second end of said bag cylinder;



wherein said pipe cylinder is within said float means and is connected to said air entry tube, and said pipe cylinder has a plurality of holes.

4,874,405

COUPLING FLUID SEPARATION MEMBRANE ELEMENTS

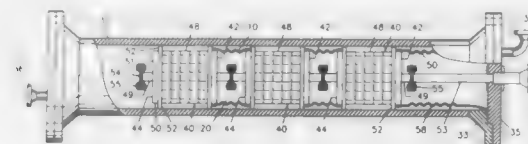
Bhupender S. Minhas, Columbia, Md., assignor to W. R. Grace & Co.-Conn., New York, N.Y.

Filed Feb. 14, 1989, Ser. No. 310,429

Int. Cl.⁴ B01D 13/00

U.S. Cl. 55—158

8 Claims



1. An improved method of coupling in series the membrane elements of a fluid separation module containing a plurality of membrane elements for separating fluids from a fluid mixture, each membrane element having a membrane with a feed end and a residual end, the improvement comprising the steps of:

- (a) providing a flexible coupling member for each membrane element with the optional exception of the last membrane element in the series; each coupling member having an open first end adapted to be secured to the residual end of a membrane element, an open second end adapted to be secured to the feed end of a membrane element and a passage between said first and second ends, the walls of said passage being essentially impervious to the fluid mixture; and
- (b) securing the first end of the coupling members to the residual end of each membrane element with the optional exception of the last membrane element in the series, and securing the second end of the coupling members to the feed end of the next membrane element in the series, if any.

4,874,406

JET SPRAY ATMOSPHERIC DEAERATOR

Martin Bekedam, 103 Brookline, Moraga, Calif. 94556

Filed Nov. 28, 1988, Ser. No. 276,926

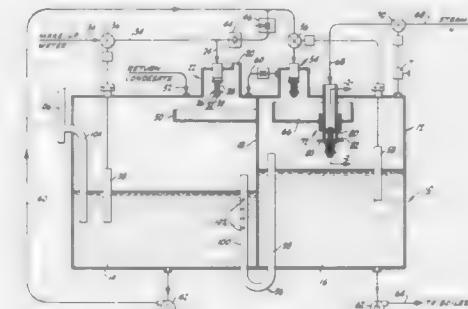
Int. Cl.⁴ B01D 19/00

U.S. Cl. 55—198

19 Claims

18. An atmospheric jet spray deaerator unit comprising:
- a first vessel means for containing a quantity of water at atmospheric pressure, the first means having an unrestricted vent means for venting the first vessel means to atmosphere, the vent means including a water spray nozzle to purge vented non-condensable gases of water vapor and steam;
- a second vessel means for containing a quantity of water under pressure slightly higher than atmospheric pressure,

the second vessel means having a steam jet deaerator means for deaerating water in the second vessel means, the steam jet deaerator means including a steam supply conduit having a steam discharge valve with a water disperser element and means for supplying water at the disperser element in contact with steam discharged from the steam supply conduit, and, steam supply regulating means with a pressure sensing means for sensing pressure in the second vessel means and controlling the regulating means to maintain a predetermined pressure in the second vessel means by pressurized steam supplied to the second vessel means;



a safety means communicating between the first vessel means and the second vessel means for releasing excess pressure in the second vessel means to the first vessel means;

a non-condensable gas relief means for passing non-condensable gases from the second vessel means to the first vessel means that includes a constricted gas flow conduit means having a water spray nozzle in the second vessel means for purging passed gases of water vapor and steam; and, water conduit means for circulating water from the first vessel means to the steam jet deaerator means in the second vessel means, circulating water from the second vessel means to a boiler and receiving condensate in the first vessel means from the boiler.

4,874,407

REGENERABLE FILTER

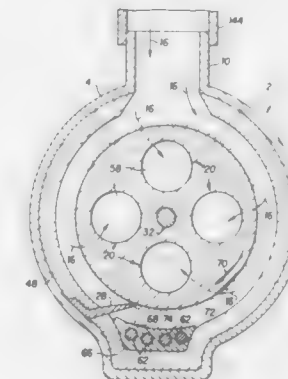
Leonard R. Lefkowitz, 14 Alpine Dr., Latham, N.Y. 12110

Filed Feb. 7, 1989, Ser. No. 306,911

Int. Cl.⁴ B01D 46/04

U.S. Cl. 55—213

16 Claims



1. A regenerable filter for exhaust gas streams containing combustible particles wherein said exhaust gas streams pass through a filter medium which is provided to remove said combustible particles from said exhaust gas streams and to

cause said combustible particles so removed to build up upon a surface of said filter medium, comprising:

a sealed housing having an entry conduit and an exit conduit for passage of said exhaust gas streams into and out of said sealed housing, respectively;

at least one filter medium having at least one porous surface and being disposed within said sealed housing between said entry conduit and said exit conduit so that said exhaust gas streams can flow into said sealed housing at said entry conduit, through said at least one porous surface and out of said sealed housing at said exit conduit, said at least one filter medium being sealed relative to said exhaust gas streams to prevent passage of said exhaust gas streams to said exit conduit except through said at least one porous surface, combustible particles building up upon said at least one porous surface as said exhaust gas streams flow through said at least one porous surface;

means disposed within said sealed housing in close proximity to said at least one porous surface for removing said combustible particles from said at least one porous surface while leaving a thin precoat of said combustible particles on said at least one porous surface; and,

means disposed within said sealed housing and in close proximity to said at least one porous surface and out of the flow path of said exhaust gas stream for burning said combustible particles as said combustible particles are removed from said at least one porous surface by said removing means.

4,874,408

LIQUID DRAIN ASSEMBLY

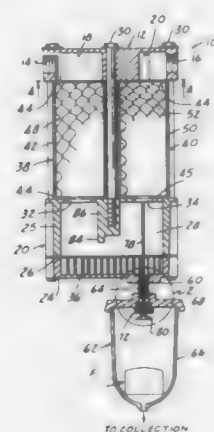
Kenneth W. Overby, Hamilton, Ind., assignor to La-Man Corporation, Hamilton, Ind.

Continuation of Ser. No. 115,416, Nov. 2, 1987, abandoned. This application May 2, 1988, Ser. No. 188,638

Int. Cl.⁴ B01D 19/00

U.S. Cl. 55—218

40 Claims



1. A liquid drain assembly comprising

a liquid collection basin configured to receive a flow of compressed air and formed to include a sump, the liquid collection basin being formed to include aspirator means for temporarily accelerating a flow of compressed air in the liquid collection basin to produce a region of negative pressure in a throat passage defined by the aspirator means, the liquid collection basin also being formed to include means for passing the flow of compressed air received therein through the throat passage, enclosure means for defining an enclosed volume configured to collect liquid drained from the sump, means for conducting liquid from the sump formed in the liquid collection basin into the enclosed volume, the con-

ducting means interconnecting the liquid collection basin and the enclosure means, and

means for drawing liquid into the enclosed volume through the conducting means in response to development of negative pressure in the throat passage of the aspirator means, the drawing means including an aspirator tube having an inlet opening and an outlet opening, the aspirator tube extending through the conducting means to position its inlet opening in the enclosed volume and its outlet opening above the crest of liquid in the sump, the aspirator tube being connected to the aspirator means to position the outlet opening of the aspirator tube in the throat passage so that air present in the enclosed volume is drawn into the aspirator tube in response to development of negative pressure in the throat passage to develop sufficient negative pressure in the enclosed volume to draw liquid collected in the sump into the enclosed volume through the conducting means.

4,874,409

EQUIPMENT FOR CONTINUOUS SEPARATION OF SMALL PARTICLES AND VAPOURS OF SUBLIMABLE COMPOUNDS

Jaroslav Vítovec; Jan Cermák, and Jiri Smolík, all of Prague, Czechoslovakia, assignors to Československá akademie věd, Czechoslovakia

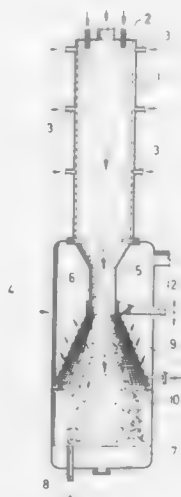
Filed Jan. 6, 1989, Ser. No. 294,288

Claims priority, application Czechoslovakia, Jan. 18, 1988, 332-88

Int. Cl.⁴ B01D 59/08

U.S. Cl. 55—267

5 Claims



1. Equipment for continuous separation of small particles and vapours of subliming compounds at their separation from a mixture formed after desublimation of vapours of subliming compounds in a desublimator to which is attached a separator in whose upper part is situated a conical vessel, whose larger cross section forms the outlet throat of the separator and whose smaller cross section is equipped with an outlet throat while in the bottom part of the separator is located a well, which is equipped with a heating system and an outlet device, wherein between the outlet throat (6) and the well (7) is located a filter (9) of conical shape with angles of walls 10° to 45°, whose upper end is attached to the outlet throat (6).

4,874,410

VACUUM PRODUCING APPARATUS

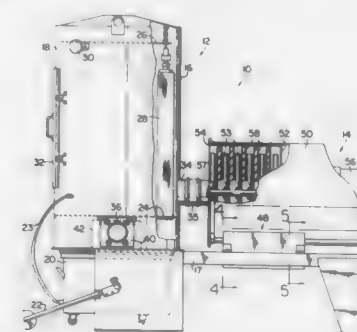
James C. Poor, E. Granby, Conn., assignor to The Spencer Turbine Company, Windsor, Conn.

Filed Mar. 20, 1989, Ser. No. 325,790

Int. Cl.⁴ B01D 46/00

U.S. Cl. 55—276

16 Claims



1. In a vacuum producing apparatus including a bag separator having a generally cylindrical axially vertically extending housing, a lower bag head disposed within the housing and cooperating with the walls of the housing to define upper and lower chambers within the housing, an upper bag head disposed within the upper chamber above the lower bag head, a plurality of separator bags disposed within the upper chamber and supported by and extending between the upper and lower bag heads, the separator bags opening into the lower chamber, air inlet means for defining an airflow path into the lower chamber, air outlet means for defining an airflow path from said upper chamber, and exhausting means connected to said air outlet means for evacuating air from the upper chamber, the improvement comprising said air inlet means defining a radially inwardly directed airflow path, an expendable target plate, and means releasably supporting said target plate in depending relation to said lower bag head in the path of airflow into said lower chamber from said air inlet means.

4,874,411

AIR FILTERING MECHANISM

Paul E. M. Snaauwaert, Curitiba, Brazil; Geert R. J. Vergote, Izegem, and Daniel C. Witdoek, Hooghe, all of Belgium, assignors to Ford New Holland, Inc., New Holland, Pa.

Filed Dec. 2, 1987, Ser. No. 127,996

Claims priority, application European Pat. Off., Dec. 5, 1986, 86,201,301.9

Int. Cl.⁴ B01D 46/38

U.S. Cl. 55—290

6 Claims

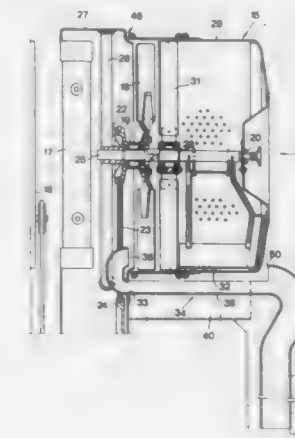
1. An air filtering mechanism for use on mobile equipment comprising:

a perforate filter element having an external surface and being rotatably mounted on said mobile equipment; drive means for rotatably moving said filter element during operation of said mobile equipment; a fan operable to draw air through said filter element, said air bearing foreign matter which is restrained by said filter and retained on said external surface by the flow of air effected by said fan passing through said perforate filter element;

duct means provided adjacent said filter element, said duct means having an inlet adjacent the downstream pressure side of said fan so that filtered air flows through said duct means along said external surface of said filter element, said duct means further having an open portion directed towards said filter element adjacent said external surface, the duct means being operable to channel a cleaning air blast in a generally parallel direction relative to and closely adjacent said external surface so that the cleaning air blast through the duct means removes foreign matter

collected on the filter element by virtue of the external surface of said filter element being exposed to said cleaning air blast in the duct means through the open portion thereof; and

a baffle provided closely adjacent the filter element along an internal surface thereof for blanking off the perforations



thereof over a predetermined region so as to obstruct the passage therethrough of air to be filtered, the baffle being stationary and being positioned directly opposite to said open portion of said duct means such that successive sections of the filter element are blanked off along the internal surface thereof by the baffle during rotation of said filter element.

4,874,412

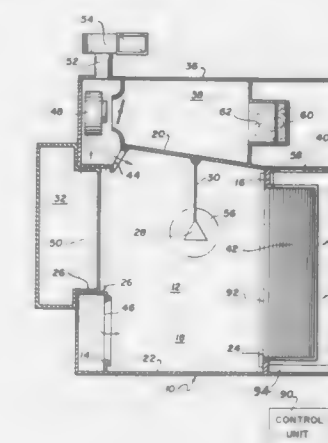
PAINT SPRAY BOOTH AND FILTER THEREFOR
William C. Nowack, Twin Lakes, Wis., assignor to Richmond Bank, Richmond, Ill.

Filed Jun. 3, 1988, Ser. No. 202,789

Int. Cl.⁴ B01D 50/00

U.S. Cl. 55—385.1

23 Claims



1. A paint spray booth comprising a first wall means defining a work chamber adapted to receive objects to be painted and a second wall means adjacent to the first wall means defining a plenum chamber, said first wall means having an opening communicating with the plenum chamber and an aperture spaced from the opening communicating with the plenum chamber, said second wall means having an orifice communicating with the ambient atmosphere, a filter sealed in the opening, air circulation means in the plenum chamber for moving air through the filter into the plenum chamber, through the

plenum chamber, dividing the flow of air to direct a portion thereof through the aperture back into the work chamber and a portion thereof through the orifice to the ambient atmosphere, wherein the filter is disposed in a plane and comprises a plurality of elongated members, each of said members having a first flat elongated portion with opposite edges and the axes of the first portions of the members being disposed parallel to each other in a common plane, each of said members having a second and a third flat portion extending from opposite edges of the first portion, the second portions being disposed in a second common plane parallel to the common plane of the axes of the first portions and spaced from each other to form openings therebetween for the passage of air, the third flat portions being spaced from each other and forming slots therebetween for the passage of air, the third portions directly confronting the work chamber and each slot having an area less than the area of the downstream opening, whereby air directed toward the filter passes through the slots and thereafter the openings.

4,874,413

PROCESS AND INSTALLATION FOR SUPPLYING NITROGEN TO AN APPARATUS

Jean-Yves Thonneller, Sassenage, France, assignor to L'Air Liquide, Societe Anonyme Pour L'Etude et L'Exploitation des Procédés Georges Claude, Paris, France

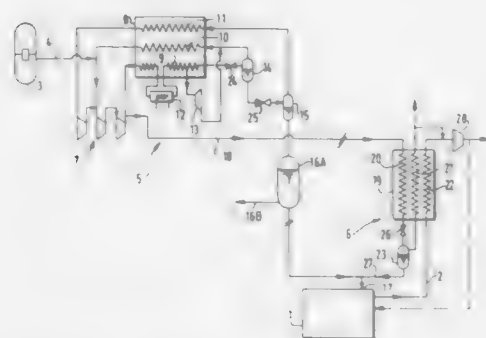
Filed Jan. 11, 1988, Ser. No. 142,663

Claims priority, application France, Jan. 16, 1987, 87 00435

Int. Cl.⁴ F25J 3/06

U.S. Cl. 62—23

16 Claims



1. Process for supplying nitrogen to an apparatus which has a principal supply of liquid nitrogen and discharges gaseous nitrogen at low temperature and low pressure, said process comprising liquefying an additional nitrogen stream under high pressure by heat exchange with said gaseous nitrogen discharged by said apparatus, expanding the liquid thus obtained to a supply pressure of said apparatus, and adding the expanded liquid to said principal supply of liquid nitrogen of said apparatus.

4,874,414

ION EXCHANGE PROCESSING METHOD OF GLASS

Yoshikazu Kaite, and Takashi Yamagishi, both of Hyogo, Japan, assignors to Nippon Sheet Glass Co., Ltd., Japan

Filed Sep. 23, 1988, Ser. No. 248,430

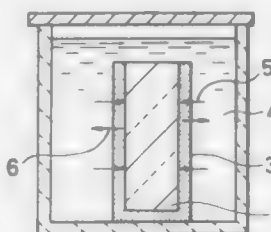
Int. Cl.⁴ C03C 18/12, 21/00

U.S. Cl. 65—20.13

10 Claims

1. An ion exchange processing method of glass, where a glass body and a media containing monovalent cation are contacted, thereby exchanging such cation with a monovalent cation contained in the glass body, characterized by having an essential surface of said glass body coated with an inorganic

porous layer formed by drying and sintering a slurry or paste, which contains more than 3 weight % clay, and by carrying



out the ion exchange through said porous layer and, thereafter removing said porous layer from the glass body.

4,874,415

METHOD OF MANUFACTURING A HIGH MECHANICAL STRENGTH OPTICAL FIBER BY DRAWING UNDER HIGH TENSION

Jean-Yves Bonlort, Limours, and Jacques Leboucq, Sainte Genevieve Des Bois, both of France, assignors to Alcatel N.V., Amsterdam, Netherlands

Filed Dec. 9, 1988, Ser. No. 281,604

Claims priority, application France, Dec. 10, 1987, 87 17220

Int. Cl.⁴ C03B 37/027; C03C 25/02

U.S. Cl. 65—3.11

1 Claim



1. A method of manufacturing an optical fiber by drawing, said method being intended to provide a fiber constituted by glass and surrounded by an organic protective coating, said fiber having an axis, a fiber outside radius, and a composition which is uniform along the lengthwise direction of the fiber and which follows an internal composition law inside the fiber relating the composition of each point of the fiber to the relative radius of the point, with the relative radius of any point being given by the ratio of the measured distance between said point and the axis divided by the outside radius, said method comprising the following operations:

preparing a glass preform having the same internal composition law as the fiber to be made, but having an initial outside radius which is larger than said outside radius of the fiber;

continuous fiber-drawing, said fiber-drawing comprising the following operations:

heating a lengthwise end portion of said preform in order to soften it right through to constitute a visco-elastic mass (20);

applying sufficient longitudinal fiber-drawing tension to said visco-elastic mass to cause the glass thereof to be

drawn down in a drawing-down zone (Z1) with the outside radius of the mass of glass reducing progressively until said radius reaches said outside radius of the fiber, while said internal composition law is conserved such that the result of said operation is to constitute said fiber;

progressively cooling the glass from its surface in said drawing-room zone in such a manner that a sufficiently large fraction of the cross-section of said glass solidifies in a surface solidification zone (Z2) at the end of said drawing-down zone for said solidified fraction to withstand said fiber-drawing tension elastically once its outside radius reaches said outside radius of the fiber;

further cooling the fiber obtained in this way in an additional cooling zone (Z3) in order to solidify the glass of the fiber completely;

said fiber-drawing operation being followed, in a covering zone (Z5) downstream from said additional cooling zone, by a covering operation during which said protective covering is applied around the fiber resulting from said fiber-drawing in order to protect the surface thereof;

said fiber-drawing tension being applied to said visco-elastic mass (20) and to said fiber via said protective covering in a traction zone situated downstream from said covering zone;

said method being characterized by the fact that it further includes:

treatment consisting in a surface reheating operation under tension through an average thickness lying between 5 microns and 10 microns, said operation being performed during said fiber-drawing operation in a reheat zone (Z4) between said additional cooling zone and said covering zone, and in which the outside surface of the fiber (F) under a tension lying in the range 0.4N to 1.4N is heated sufficiently to cause a surface layer (28) of said fiber to soften, thereby eliminating any surface microcracks that may result from said fiber-drawing operation, with the duration of said reheating being sufficiently short to ensure that a majority axial fraction (30) of the cross-section of the fiber remains solid and withstands said fiber-drawing tension elastically; and

a second cooling operation in a second cooling zone between said reheating zone and said covering zone, thereby solidifying said surface layer while said majority axial fraction is still under tension for withstanding said fiber-drawing tension, such that said majority axial fraction retains a permanent residual tension downstream from said traction zone, thereby applying permanent longitudinal compression to said solidified surface layer.

4,874,416

BASE MATERIAL OF OPTICAL FIBERS AND A METHOD FOR THE PREPARATION THEREOF

Kiyoshi Yokokawa, and Kazuo Koya, both of Gunma, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 908,881, Sep. 15, 1986, abandoned, which is a division of Ser. No. 686,197, Dec. 26, 1984, abandoned. This application Apr. 25, 1988, Ser. No. 188,118

Claims priority, application Japan, Dec. 28, 1983, 58-251949

Int. Cl.⁴ C03B 37/018

U.S. Cl. 65—3.12

2 Claims

1. A method for the preparation of a glassy base material for optical fibers comprising a rod-shaped core portion, a first cladding layer on and surrounding the core portion and a second cladding layer formed of fused synthetic silica on and surrounding the first cladding layer integrally vitrified together which comprises the steps of:

(a) forming a soot preform as a rod-like soot deposit of silica particles for the core and first cladding layer by axial deposition of siliceous particles produced by the flame hydrolysis of a gaseous starting material containing a

silicon compound onto a rotating target, as a growing rod soot preform;

(b) dehydrating and vitrifying the soot preform into a glassy rod of the core portion and the first cladding layer;

(c) forming a layer of silica soot deposit as a second cladding layer soot preform on and surrounding the glassy rod obtained from step (b) by the deposition of siliceous particles produced by the flame hydrolysis of a gaseous starting material containing a silicon compound;

(d) controlling the amount of soot deposition of the second cladding so that the thickness of the first cladding layer is in the range from 10 to 80 percent of the overall thickness of the total cladding layer after the second cladding layer is formed, the deposition control being effected by measuring the increase in weight of the rod as the second cladding is being formed using a load-measuring-means and controlling the degree of deposition of the second cladding in response to the measured increase in weight so as to provide said 10 to 80 percent of said overall thickness; and

(e) vitrifying the layer of the soot deposit to form the second cladding layer on and surrounding the glassy rod integrally.

4,874,417

METHOD OF PURIFYING VITREOUS SILICA

John A. Winterburn, Tynemouth, United Kingdom, assignor to Thermal Syndicate P.L.C., Wallsend, Tyne and Wear, England

Continuation of Ser. No. 897,636, Jul. 7, 1986, Pat. No.

4,759,787. This application Apr. 12, 1988, Ser. No. 180,440

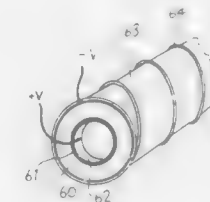
Claims priority, application United Kingdom, Nov. 5, 1984,

1427915

Int. Cl.⁴ C03B 15/00, 19/00; C03C 23/00

U.S. Cl. 65—111

4 Claims



1. In a method of improving the quality of a body of vitreous silica containing alkali metal ions selected from the group consisting of sodium ions, potassium ions and lithium ions and present as an impurity in the body, in which at least a major part of the concentration of at least one of said group of alkali metal ions in the body close to one boundary surface is made to migrate away from said one boundary surface of the body towards an opposite boundary surface thereof by applying a polarizing potential of between 10v/mm and 1000v/mm thickness across the boundary surfaces of the body while the body is maintained at an elevated temperature, the improvement of carrying out electrolysis at a temperature above 1000° C. by maintaining a polarizing potential of the same polarity across the boundary surface during cooling of the body at least until the temperature of the body is less than 800° C., whereby the concentration of said at least one alkali metal ion in the vitreous silica material adjacent to said one boundary surface is made less than 0.1 ppm.

4,874,418

BLOW BOX FOR GLASS TEMPERING

Hans-Werner Kuster, Aachen, Fed. Rep. of Germany; Herbert Radermacher, Raeren, and Luc Vanaachen, Eupen, both of Belgium, assignors to Saint-Gobain Vitrage "Les Miroirs", Courbevoie, France

Division of Ser. No. 39,026, Apr. 16, 1987, Pat. No. 4,816,058.

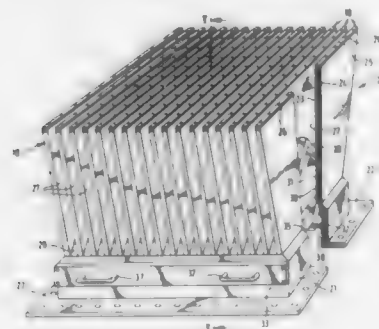
This application Aug. 12, 1988, Ser. No. 231,390

Claims priority, application Fed. Rep. of Germany, Apr. 16, 1986, 36127205

Int. Cl.⁴ C03B 27/04

U.S. Cl. 65—348

2 Claims



1. An apparatus for thermally tempering a pane or panes of glass, comprising: first and second oppositely situated and spaced-apart blow boxes and means for supplying air under pressure to each, each said blow box comprising an air distribution box and a series of spaced-apart nozzle webs extending over the entire width of said air distribution box, each said nozzle web defined by opposed major side walls extending the length of said distribution box, an upper closure strip in which bore holes are provided, and frontal and rear plates attached to said side walls, said side walls bearing, on the opposed interior faces supports for a sealing rod which can be introduced through an opening in said frontal and rear plate,

a sealing rod for each nozzle web which may be inserted in said opening, and thereby occlude at least one bore hole in said closure strip, said sealing rods being supported against said closure strip by said support means so as to block the air supply to said occluded bores when inserted, and means for supplying said panes to the space between said first and second blow boxes.

4,874,419

SUBSTRATE FOR GROWING SHIITAKE MUSHROOMS

Lung-chi Wu, Napoleon, Ohio, assignor to Campbell Soup Company, Camden, N.J.

Continuation of Ser. No. 750,152, Jul. 1, 1985, abandoned. This application Jan. 17, 1989, Ser. No. 298,319

Int. Cl.⁴ C05F 11/08, 9/04, 11/02

U.S. Cl. 71—5

8 Claims

1. A process for preparing a nutrient substrate composition suitable for growth of shiitake mushrooms consisting essentially of

preparing a nitrogen-containing compost mixture consisting essentially of a vegetative waste, a mineral fertilizer and water, said mixture having a moisture content of about 65% to 80%;

aerobically digesting the mixture at an ambient temperature range of between about 18° C. to 30° C. for between about 1 to 9 days;

pasteurizing the aerobically digested mixture; and further digesting the pasteurized mixture at a mesothermic temperature of between about 45° to 55° C. for between about 3 to 5 days.

4,874,420

HERBICIDAL SUBSTITUTED TRIAZINES

Heinz-Jürgen Wroblewski; Joachim Kluth; Klaus-Günther Tietjen, all of Langenfeld; Hans-Joachim Santel, Leverkusen; Robert R. Schmidt, Bergisch-Gladbach, and Harry Strang, Düsseldorf, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 15, 1988, Ser. No. 220,036

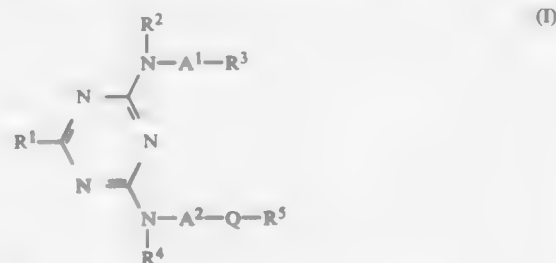
Claims priority, application Fed. Rep. of Germany, Jul. 23, 1987, 3724378; Jan. 16, 1988, 3801113

Int. Cl.⁴ A01N 43/70; C07D 251/50, 251/52, 251/18

U.S. Cl. 71—93

8 Claims

1. A substituted triazine of the formula



in which

A¹ represents optionally branched and optionally phenyl-substituted alkanediyl with 1 to 4 carbon atoms,

A² represents optionally branched alkanediyl with 1 to 4 carbon atoms,

Q represents oxygen, sulphur, NH or N-(C₁-C₄-alkyl),

R¹ represents hydrogen, hydroxyl, nitro, cyano, cyanoamino, azido, fluorine, chlorine, bromine, iodine, C₁-C₄-alkoxy, C₁-C₄-alkylthio (which is optionally substituted by cyano, fluorine and/or chlorine), C₁-C₄-alkyl, C₁-C₄-alkoxy-carbonyl, aminocarbonyl, C₁-C₄-alkyl-amino-carbonyl, di-(C₁-C₄-alkyl)-amino-carbonyl, amino, C₁-C₄-alkylamino or di-(C₁-C₄-alkyl)-amino,

R² represents hydrogen, C₁-C₄-alkyl, C₂-C₄-alkenyl or C₂-C₄-alkynyl,

R³ represents an aromatic or heteroaromatic radical from the group consisting of phenyl, naphthyl, pyridyl, quinolyl, isoquinolyl, pyrimidinyl, furyl, thienyl, pyrrolyl, pyrazolyl and imidazolyl which is optionally substituted by fluorine, chlorine, bromine, iodine, cyano, nitro, C₁-C₄-alkyl (which is optionally substituted by fluorine and/or chlorine), C₁-C₄-alkoxy or C₁-C₂-alkylenedioxy (which are optionally substituted by fluorine and/or chlorine), C₁-C₄-alkylthio, C₁-C₄-alkyl-sulphonyl or C₁-C₄-alkylsulphonyl (which are optionally substituted by fluorine and/or chlorine), di-(C₁-C₂-alkyl)-amino and/or by C₁-C₄-alkoxy-carbonyl,

R⁴ represents hydrogen, C₁-C₄-alkyl, C₂-C₄-alkenyl or C₂-C₄-alkynyl and

R⁵ represents hydrogen or C₁-C₄-alkyl.

5. A herbicidal composition comprising a herbicidally effective amount of a compound according to claim 1 and a diluent.

4,874,421

HERBICIDAL METHOD WITH IMPROVED CROP TOLERANCE

William A. Kleschick, Martinez; Jacob Secor, Walnut Creek, and Theodore W. Holmsen, Clayton, all of Calif., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jun. 14, 1988, Ser. No. 206,537

Int. Cl.⁴ A01N 43/40

U.S. Cl. 71—9 H

9 Claims

1. A method of selectively controlling undesirable vegetation in rice crops which comprises contacting rice seeds or plants with a crop-protecting sub-phytotoxic, acetyl-coenzyme A carboxylase and thereafter, within the period during which the acetyl-coenzyme A carboxylase activity level in the rice

plants is elevated, contacting the rice plants and the locus thereof postemergently with an undesirable vegetation controlling amount of the same pyridinyloxyphenoxypropanoate herbicide.

4,874,422

1-PHENYL-3-CARBOXYAMIDOPYRROLIDONES AND THEIR USE AS HERBICIDES

Frank X. Woolard, Richmond, Calif., assignor to ICI Americas Inc., Wilmington, Del.

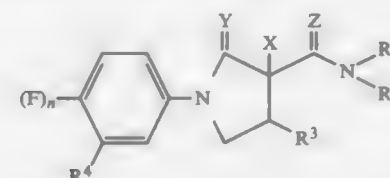
Filed Dec. 27, 1988, Ser. No. 290,139

Int. Cl.⁴ A01N 43/36, 43/40; C07D 295/10, 213/50

U.S. Cl. 71—95

63 Claims

1. A compound having the formula



in which:

R¹ is a member selected from the group consisting of H, C₁-C₆ alkyl, C₂-C₆ alkenyl, C₂-C₆ alkynyl, C₃-C₆ cycloalkyl, C₁-C₆ alkoxy, phenyl, halo-substituted phenyl, benzyl, halo-substituted benzyl, and C₁-C₆ alkyl substituted with one or more members selected from the group consisting of C₁-C₆ alkoxy, C₁-C₆ alkylthio, phenyl, hydroxyl and cyano, and

R² is a member selected from the group consisting of H and C₁-C₆ alkyl, or

R¹ and R² are combined to form a member selected from the group consisting of C₂-C₆ alkylene and C₂-C₆ alkyleneoxy-alkylene;

R³ is a member selected from the group consisting of C₁-C₆ alkyl and C₂-C₆ alkenyl;

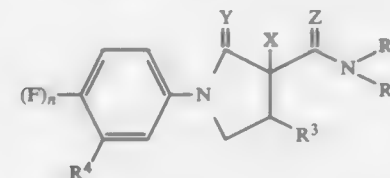
R⁴ is a member selected from the group consisting of H, halogen, CH₃, CF₃, CF₂CHF₂, OCF₂CHF₂, OCHF₂, OCF₃, SCH₃, S(O)CH₃, SO₂CH₃, methoxyiminomethyl, methoxyimino-1-ethyl, benzyloxyiminomethyl, and benzyloxyimino-1-ethyl;

n is zero or 1;

X is a member selected from the group consisting of H and halogen;

Y is a member selected from the group consisting of O and S; and Z is a member selected from the group consisting of O and S.

43. A method of controlling undesirable vegetation comprising applying to said vegetation or to the locus thereof an herbicidally effective amount of a compound having the formula



in which:

R¹ is a member selected from the group consisting of H, C₁-C₆ alkyl, C₂-C₆ alkenyl, C₂-C₆ alkynyl, C₃-C₆ cycloalkyl, C₁-C₆ alkoxy, phenyl, halo-substituted phenyl, benzyl, halo-substituted benzyl, and C₁-C₆ alkyl substituted with one or more members selected from the group consisting of C₁-C₆ alkoxy, C₁-C₆ alkylthio, phenyl, hydroxyl and cyano, and

R² is a member selected from the group consisting of H and C₁-C₆ alkyl, or

R¹ and R² are combined to form a member selected from the

group consisting of C₂-C₆ alkylene and C₂-C₆ alkyleneoxy-alkylene;

R³ is a member selected from the group consisting of C₁-C₆ alkyl and C₂-C₆ alkenyl;

R⁴ is a member selected from the group consisting of H, halogen, CH₃, CF₃, CF₂CHF₂, OCF₂CHF₂, OCHF₂, OCF₃, SCH₃, S(O)CH₃, SO₂CH₃, methoxyiminomethyl, methoxyimino-1-ethyl, benzyloxyiminomethyl, and benzyloxyimino-1-ethyl;

n is zero or 1;

X is a member selected from the group consisting of H and halogen;

Y is a member selected from the group consisting of O and S; and

Z is a member selected from the group consisting of O and S.

4,874,423

SOLID, HERBICIDAL COMPLEXES

George T. Colegrove, San Diego, and Thomas A. Lindroth, Spring Valley, both of Calif., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 785,624, Oct. 8, 1985. This application Sep. 8, 1986, Ser. No. 904,322

Int. Cl.⁴ A01N 43/36

U.S. Cl. 71—95

4 Claims

1. A solid, herbicidal bipyridinium quaternary salt/heteropolysaccharide complex comprising 14–55% (wt.) bipyridinium salt, calculated as cation, wherein the heteropolysaccharide in said complex is a low viscosity heteropolysaccharide, wherein said heteropolysaccharide is xanthan gum or S-194 having a 5% (wt.) aqueous solution viscosity of 15–300 cP or guar gum having a 5% (wt.) aqueous solution viscosity of 15–100 cP as measured on a Brookfield LVT viscometer, at 25° C., spindle 2, 60 rpm.

4,874,424

HERBICIDAL AGENTS

Klaus Jelich, Wuppertal; Herbert Gayer, Monheim; Wolfgang Krämer, Burscheid; Hans-Joachim Santel, Leverkusen; Robert R. Schmidt, Bergisch-Gladbach, and Harry Strang, Düsseldorf, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 27, 1988, Ser. No. 186,548

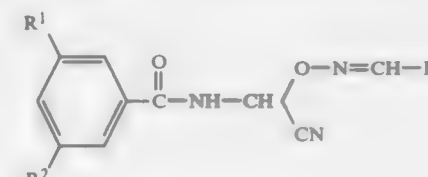
Claims priority, application Fed. Rep. of Germany, May 8, 1987, 3715248

Int. Cl.⁴ A01N 37/34

U.S. Cl. 71—105

5 Claims

1. A method of combating unwanted vegetation which comprises applying to such vegetation or to a locus from which it is desired to exclude such vegetation a herbicidally effective amount of an alkoximinomethylamide of the formula



in which

R represents hydrogen, or represents straight-chain or branched alkyl with 1 to 4 carbon atoms,

R¹ represents hydrogen, fluorine, chlorine, bromine, iodine or nitro, or represents in each case straight-chain or branched halogenoalkyl with in each case 1 to 4 carbon atoms and 1 to 9 identical or different halogen atoms, and R² represents fluorine, chlorine, bromine, iodine, cyano or nitro, or represents in each case straight-chain or branched alkyl with in each case 1 to 4 carbon atoms, or

represents in each case straight-chain or branched halogenoalkyl, halogenoalkoxy or halogenoalkylthio with in each case 1 to 4 carbon atoms and 1 to 9 identical or different halogen atoms or represents alkoxy-carbonyl with 1 to 5 carbon atoms.

4,874,425

STABLE AQUEOUS SUSPENSION CONCENTRATE COMPOSITIONS

Masami Kimura, Hamamatsu; Kaiji Kawai, Toyohashi, and Yukiya Tobe, Kanagawa, all of Japan, assignors to American Cyanamid Company, Stamford, Conn.

Filed May 23, 1986, Ser. No. 887,108

Int. Cl.⁴ A01N 33/04

U.S. Cl. 71-121

4 Claims

1. An aqueous flowable pesticidal concentrate composition comprising, on a weight to weight basis: about 10.0% to 60.0% pendimethalin, in the yellow microcrystalline form; about 1.0% to 10.0% sodium or calcium lignin sulfonate; about 0.05% to 0.5% thickening agent; about 0.1% to 1.0% antiseptic agent; about 0.05% to 1.0% montmorillonite; and the remainder water to total said composition to 100%.

4,874,426

SURFACE TENSIO-METER AND CONCENTRATION CONTROLLING DEVICE

Hajime Honda, 4-1-6, Yamato-cho, Nada-ku, Kobe-shi, Hyogo-ken, Japan

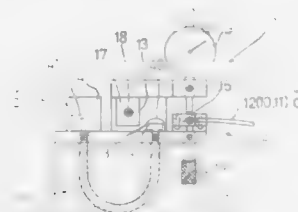
Filed Sep. 29, 1988, Ser. No. 250,671

Claims priority, application Japan, Sep. 29, 1987, 62-244600

Int. Cl.⁴ G01N 13/02

U.S. Cl. 73-64.4

32 Claims



1. A surface tensiometer comprising:

a measurement container (1) having an upper edge (3) on an upper end thereof opened on a horizontal plane perpendicular to an axis of said measurement container with its lower end communicating with an end of a connecting pipe (5);

an inlet container (2) having an upper edge (4) thereof opened on a plane perpendicular to its axis located at a position higher than the upper edge (3) of said measurement container (1) with an open bottom edge that communicates with the opposite end of the connecting pipe (5); and

measuring means (7) for measuring a height of a highest position of a convex liquid surface statically formed on said upper end of said measurement container when in an equilibrium between an upward force exerted by a pressure difference in said inlet container relative to the liquid in said measurement container due to a height difference between a liquid surface of a liquid in said inlet container and said measurement container (1), with the height of the concave liquid surface being raised from the opened upper edge (3) of said measurement container (1) after the liquid introduced into said inlet container (2) reaches and overflows from said measurement container (1) and then reaches said equilibrium.

4,874,427

METHODS FOR MELTING AND REFINING A POWDERY ORE CONTAINING METAL OXIDES

Takao Hamada; Nobuo Tsuchiya; Toshihiro Inatani, all of Chiba; Eiji Katayama; Toshimitsu Koitabashi, both of Chiba; Kyoji Okabe; Mitsuo Sumito, both of Chiba, and Yoshiyasu Takada, Chiba, all of Japan, assignors to Kawasaki Steel Corporation, Kobe City, Japan

Continuation of Ser. No. 646,028, Aug. 29, 1984, abandoned, which is a continuation of Ser. No. 371,677, Apr. 26, 1982, abandoned. This application Dec. 2, 1987, Ser. No. 127,600

Claims priority, application Japan, Apr. 28, 1981, 56-63294; May 8, 1981, 56-68110; May 21, 1981, 56-75639; Jul. 16, 1981, 56-111357

Int. Cl.⁴ C21B 11/08

U.S. Cl. 75-26

7 Claims



1. In a method for melting and refining a powdery or fine granular ore containing metal oxide comprising

(1) charging said ore and a reducing gas to a fluidized bed type of preliminary reducing furnace to preliminarily reduce said ore therein,

(2) charging the preliminarily reduced ore heated at a high temperature into a vertical melting and reducing furnace,

(3) introducing air or oxygen-enriched air at elevated temperature into said melting and reducing furnace so that said ore is melted and reduced therein by a carbonaceous solid reducing agent and air or oxygen-enriched air, and

(4) discharging molten metal and molten slag from the melting and reducing furnace,

the improvement which comprises generating a reducing gas at elevated temperature in a vertical melting and reducing furnace containing a carbonaceous reducing agent and provided with upper and lower tuyeres,

blowing at least a part of said reducing gas, discharged from said melting and reducing furnace, into the preliminary reducing furnace to preliminarily reduce said ore therein, and

introducing the preliminarily reduced ore into said melting and reducing furnace via at least the upper of the tuyeres and introducing air or oxygen-enriched air via at least the lower of the tuyeres.

4,874,428

FLUIDIZING A LIME-SILICA SLAG

Joyce C. Niedringhaus, and Michael L. Lowry, both of Middletown, Ohio, assignors to Armeo Inc., Middletown, Ohio

Filed Sep. 12, 1988, Ser. No. 242,981

Int. Cl.⁴ C21C 7/02

U.S. Cl. 75-30

13 Claims

1. A method of fluidizing a slag, comprising: providing a lime-silica type slag covering a molten metal, providing an acid flux containing a source of fluoride ion and complex sodium compound, mixing said acid flux with said lime-silica slag to form a treated slag containing at least about 1% by weight F⁻ and at least about 1% by weight Na₂O,

whereby the melting point of said treated slag is below the melting point of said lime-silica slag, removing said treated slag from said molten metal.

4,874,429

HYDROMETALLURGICAL PROCESS FOR THE RECOVERY OF SILVER FROM COPPER ELECTROLYSIS ANODE SLUDGE

Josef Bertha, Brixlegg, Austria, assignor to Austria Metall Aktiengesellschaft, Braunau am Inn, Austria

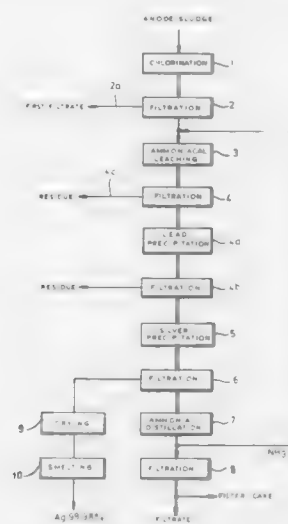
Filed Nov. 2, 1987, Ser. No. 116,595

Claims priority, application Austria, Oct. 31, 1986, 2906/86 The portion of the term of this patent subsequent to May 19, 2004, has been disclaimed.

Int. Cl.⁴ C22B 11/04

U.S. Cl. 75-118 R

6 Claims



1. A hydrometallurgical process for the treatment of a copper-electrolysis anode sludge raw material which contains silver, lead and copper, and additionally one or more constituents selected from the group consisting of Au, platinum-group metals, Se, Te, Sb, Sn, As, Bi, Ni, Zn and Fe, sulfate ion, chloride ion and silica, comprising the steps of:

(a) slurrying said raw material with hydrochloric acid and introducing a sodium hypochlorite solution to the resulting slurry to generate nascent chlorine and chlorinate said raw material therewith;

(b) filtering said slurry to recover a first filtrate containing soluble chlorides of said constituents and a first solid filtered phase containing the silver of said raw material in the form of precipitated AgCl;

(c) extracting said first solid filtered phase with ammonia to recover an extract containing silver in solution in the form of Ag(NH₃)₂Cl and dissolved lead;

(d) precipitating the lead from said extract and filtering same to form a second filtrate containing the Ag(NH₃)₂Cl;

(e) displacing silver from said second filtrate with at least one substance selected from the group consisting of Cu²⁺ compounds, copper powder and bronze dust to precipitate a silver powder at a temperature of at least room temperature and with agitation, and increasing the volume of said silver powder by adding to said second filtrate a flocculating agent;

(f) filtering the second filtrate to recover a silver-powder precipitate and an ammoniacal third filtrate;

(g) reacting said third filtrate with calcium hydroxide to liberate ammonia, and distilling off the liberated ammonia to recover same while producing a suspension of a calcium salt;

(h) filtering said suspension to recover a filter cake; and

(i) smelting the silver-powder precipitate recovered in step

(f) to obtain a product of enriched silver content relative to said silver-powder.

4,874,430

COMPOSITE SILVER BASE ELECTRICAL CONTACT MATERIAL

Norman S. Bornstein, West Hartford, Conn., assignor to Hamilton Standard Controls, Inc., Farmington, Conn.

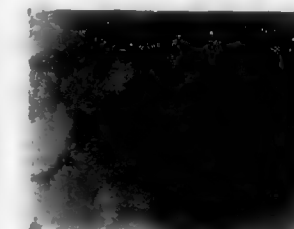
Division of Ser. No. 189,272, May 2, 1988, Pat. No. 4,834,939.

This application Jan. 23, 1989, Ser. No. 300,399

Int. Cl.⁴ C22C 29/12

U.S. Cl. 75-234

4 Claims



1. An electrical contact material consisting essentially of 4 to 15 wt. % cadmium oxide as dispersed particles 2 to 8 wt. % nickel, said nickel being present as discrete particles surrounded by nickel oxide, balance essentially silver.

4,874,431

LOW VOLATILITY WATER REPELLENTS

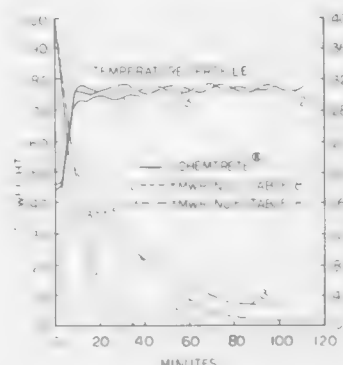
Kenneth C. Fey; Alan L. Freiberg, both of Midland, Mich., and John G. Price, South Glamorgan, United Kingdom, assignors to Dow Corning Corporation, Midland, Mich.

Filed Jul. 14, 1988, Ser. No. 218,781

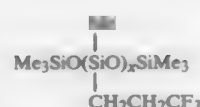
Int. Cl.⁴ C09K 3/19

U.S. Cl. 106-2

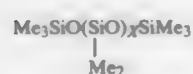
8 Claims



1. A method of reducing the volatility and decreasing the evaporation loss of water repellent compositions containing a solution of an alkylalkoxysilane with C₁ to C₆ alkyl groups on silicon, or a blend of alkylalkoxysilanes each having C₁ to C₆ alkyl groups on silicon, and a carrier selected from the group consisting of (i) alcohols, (ii) mineral spirits, and (iii) glycol ethers, for application to a porous substrate, comprising adding to the solution at least one metal salt catalyst, and adding to the solution an effective amount of surface depositing water beading agent, the surface depositing water beading agent being selected from the group consisting of:



- where X=10 to 100,
b. an amine salt functional siloxane copolymer,
c. trimethylsilyl endcapped polysilicate,
d.



- where x=0 to 800,
e. a room temperature curable silicone rubber, and
f. $(\text{Me}_3\text{SiO})_4\text{Si}$.

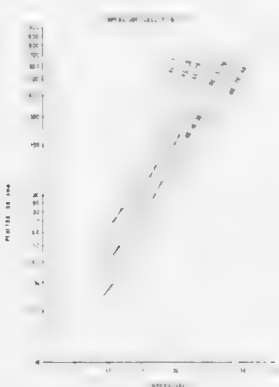
4,874,432

MULTIGRADE ASPHALT CEMENT PRODUCT AND PROCESS

Anthony J. Kriech, and Herbert L. Wissel, both of Indianapolis, Ind., assignors to Asphalt Materials, Inc., Indianapolis, Ind.
Filed Jun. 27, 1988, Ser. No. 211,775
Int. Cl.⁴ C08L 95/00

U.S. Cl. 106—273.1

49 Claims



1. A process for producing gelled multigrade asphalt cement comprising:
a. liquefying an asphalt material that is substantially dry,
b. saponifying therein at least one fatty acid and at least one resin acid by reacting with at least a saponifiable amount of a substantially dry alkali metal base, and
c. removing the water of reaction to produce gelled multigrade asphalt cement.

4,874,433

METHODS OF PREPARING ENCAPSULATED PIGMENTS

Akos Kiss, Alzenau-Wasserslos; Peter Kleinschmit, Hanau; Juergen Hanich, Frankfurt; Guenter Halbritter, Rodenbach, and Jenny Horst, Gelnhausen, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 3, 1988, Ser. No. 201,947

Claims priority, application Fed. Rep. of Germany, Jun. 6, 1987, 3719051

Int. Cl.⁴ C08K 3/00

U.S. Cl. 106—450

5 Claims

1. A method of preparing encapsulated pigments comprising a chromophoric or color-bearing substance which is encapsulated in a transparent casing compound of a substance stable against chemical attacks and glass stream vitrification, said

method comprising binding the chromophoric substance or its initial components in and/or to a zeolite, followed by mixing with the encapsulating substance or its initial components and subsequently calcining at 500° C.

4,874,434

METHOD OF TREATING A TITANIUM STRUCTURE

Olen L. Riggs, Jr., Oklahoma City, Okla., assignor to Kerr-McGee Chemical Corporation, Oklahoma City, Okla.

Filed May 16, 1988, Ser. No. 194,644

Int. Cl.⁴ C23G 1/10; B08B 3/08

U.S. Cl. 134—3

4 Claims

1. A method for treating a structure fabricated from a titanium base alloy composition consisting essentially of about 0.25 to about 1.5 weight percent of iron and about 0.1 to about 1.5 weight percent of copper, based on the weight of the composition, the balance being substantially all titanium apart from incidental impurities and where said titanium base alloy composition further is characterized by inherent properties of positive open circuit corrosion potentials and substantially reduced rates of corrosion, said method comprising:

- providing an aqueous pickling solution comprising at least about 5 g/l of hydrofluoric acid and at least about 25 g/l of sulfuric acid;
contacting said aqueous solution with said fabricated structure; and
maintaining said aqueous solution, while in contact with said fabricated structure, at a temperature of at least about ambient temperature and continuing said contact at said temperature for a period ranging up to about 24 hours whereby upon discontinuing said contact, said inherent properties of the titanium base alloy composition from which the structure is fabricated are retained.

4,874,435

OZONIZATION OF CONTAINERS

Louis D. Caracciolo, 267A Hayemill Rd., Atco, N.J. 08004

Filed Dec. 28, 1987, Ser. No. 138,349

Int. Cl.⁴ A61L 2/00; B08B 3/02, 3/08

U.S. Cl. 134—22.18

8 Claims

1. A process for cleaning and sterilizing a wooden container comprising the step of spraying the interior surfaces of the wooden container with a stream of ozonated water under a pressure of at least about 1200 lbs/in² to result in penetration of the ozonated water beneath the surfaces, wherein the concentration of ozone in water is at least 0.2 ppm.

5. A process for cleaning and sterilizing wooden vessels comprising the step of spraying the inner surfaces of the vessels with a stream of ozonated water at a pressure which is sufficient to remove a veneer of wood from the surfaces which is at least one-sixteenth of an inch thick, wherein the concentration of ozone in water is at least 0.2 ppm.

4,874,436

METHOD FOR PRODUCING HIGH PURITY ELECTROLYTIC COPPER

Takashi Ogata, Toda; Masanori Kato, Tokyo; Yoshio Kawasumi, Toda; Chikara Tominaga, Tokyo, and Kanji Tanaka, Obita, all of Japan, assignors to Nippon Mining Co., Ltd., Tokyo, Japan

Division of Ser. No. 80,336, Jul. 30, 1987, Pat. No. 4,792,369.

This application Aug. 26, 1988, Ser. No. 237,492

Claims priority, application Japan, Feb. 19, 1987, 62-34434; Jun. 26, 1987, 62-157565; Jun. 26, 1987, 62-157566

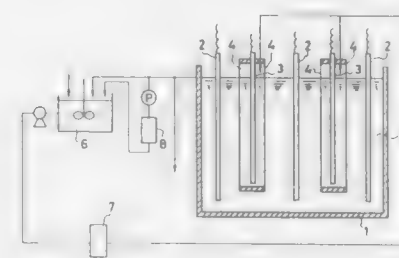
Int. Cl.⁴ B22D 25/00; C25C 1/12

U.S. Cl. 148—2

18 Claims

1. A process for the electrolytic refining of electrolytic copper containing silver, as an impurity, whereby to obtain highly pure copper containing not more than 0.5 ppm of silver and not more than 0.5 ppm of sulfur, using an electrolytic cell comprising anode means made of electrolytic copper, cathode means on which said highly pure copper is deposited and a

nitric acid electrolytic solution, and in which diaphragm means is disposed between said anode means and said cathode means whereby the cell is divided into anode and cathode chamber means, which comprises the steps of: passing direct electrolysis current through said cell whereby said highly pure copper is deposited on said cathode means and silver is dissolved in the electrolytic solution in said anode chamber means, removing a portion of the silver-containing electrolytic solution from said



anode chamber means, contacting said silver-containing electrolytic solution with metallic copper in the presence of chlorine ions effective to precipitate silver, then filtering said silver-containing electrolytic solution through a filter having a pore diameter of 0.1 micron to 2 microns and thereby separating the precipitated silver from the remainder of said electrolytic solution and recirculating the remainder of said electrolytic solution to said cathode chamber means.

4,874,437

METHOD OF ADJUSTING HARDNESS OF METALLIC MATERIAL

Yoshihiko Masuda, Yokohama, and Masanobu Murakosi, Yokosuka, both of Japan, assignors to Kioritz Corporation, Tokyo, Japan

Filed Feb. 8, 1989, Ser. No. 307,545

Int. Cl.⁴ C21D 2/00

U.S. Cl. 148—150

3 Claims

1. A method of adjusting the hardness of a metallic material which is required to form tough and hard portions adjacent to each other, comprising the steps of:

- induction-tempering both of said tough and hard portions which have been given a hardness required for said hard portion to a hardness required for said tough portion;
induction-hardening said hard portion alone to a hardness higher than that required for said hard portion; and
induction-tempering said hard portion alone to a hardness required for said hard portion.

4,874,438

INTERMETALLIC COMPOUND SEMICONDUCTOR THIN FILM AND METHOD OF MANUFACTURING SAME

Masahide Oshita; Masaaki Isai, both of Hamamatsu, and Toshiaki Fukunaka, Samukawa, all of Japan, assignors to Toyo Communication Equipment Co., Ltd., Japan

PCT No. PCT/JP87/00205, § 371 Date Nov. 30, 1987, § 102(e)

Date Nov. 30, 1987

PCT Filed Apr. 1, 1987, Ser. No. 138,192

Claims priority, application Japan, Apr. 1, 1986, 61-75114; Mar. 20, 1987, 62-67292

Int. Cl.⁴ H01L 43/08

U.S. Cl. 148—400

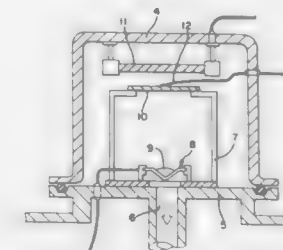
15 Claims

1. A method for manufacturing an intermetallic compound semiconductor thin film comprising the steps of:

- (a) providing an evaporation source containing a III-V Group intermetallic composition;
(b) providing a deposition substrate and raising the deposition substrate temperature to a first elevated level;
(c) maintaining said deposition substrate temperature at said first elevated level while gradually increasing the temper-

ature of said evaporation source to vaporize said III-V Group intermetallic composition;

- (d) passing vapors from said evaporation source to said deposition substrate;
(e) terminating the increase in temperature of the evaporation source when an early stage of the deposition of a thin film of III Group material occurs on the surface of said deposition substrate;
(f) maintaining the temperature of the evaporation source at the temperature where said early stage of film deposition occurs on the deposition substrate to begin deposition of a III-V Group intermetallic compound on said deposition substrate;
(g) lowering the temperature of said deposition substrate to a predetermined second elevated level of temperature below said first elevated level when formation of an initial



nucleus of III-V Group intermetallic compound begins on the surface of said deposition substrate; and

- (h) maintaining said deposition substrate temperature at said predetermined second elevated level for a predetermined amount of time to produce a III-V Group intermetallic compound semiconductor thin film on the surface of said deposition substrate.

14. An intermetallic compound semiconductor thin film comprising a single crystal deposition film of In-Sb having a thickness of from about 0.15 to about 0.6 μm, an electron mobility from about 10⁴ to about 5 × 10⁴ cm²/V.sec, and a stoichiometric composition ratio of In to Sb of about 1:1.

15. An intermetallic compound semiconductor thin film comprising a single crystal deposition film of In-As having a thickness of from about 0.15 to about 0.6 μm, an electron mobility from about 10⁴ to about 5 × 10⁴ cm²/V.sec, and a stoichiometric composition ratio of In to As of about 1:1.

4,874,439

SYNCHRONIZER RING IN SPEED VARIATOR MADE OF WEAR-RESISTANT COPPER ALLOY HAVING HIGH STRENGTH AND TOUGHNESS

Hidetoshi Akutsu, Saitama, Japan, assignor to Mitsubishi Kinzoku Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 18, 1988, Ser. No. 157,634

Claims priority, application Japan, Feb. 24, 1987, 62-40661; Feb. 24, 1987, 62-40662; Aug. 25, 1987, 62-210671; Aug. 25, 1987, 62-210672; Aug. 25, 1987, 62-210673; Aug. 25, 1987, 62-210674; Aug. 25, 1987, 62-210675

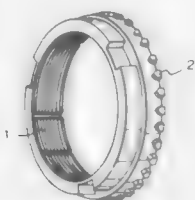
Int. Cl.⁴ C22C 9/00

U.S. Cl. 148—433

10 Claims

7. A synchronizer ring made of a wear-resistant Cu alloy having high strength and toughness, said alloy consisting essentially of on a weight basis of 17–40% Zn, 2–11% Al, 0.5–6% Mn, 0.1–2% Si, 0.1–3% of at least one of Fe, Ni and Co, 0.003–3% of Mg, 30–1,000 ppm of oxygen, and at least one optional element selected from the group consisting of (i)

0-1% Cr and (ii) 0-2% of at least one of Pb and Sn, and the balance being Cu and incidental impurities, and having a struc-



ture wherein intermetallic compounds and oxides are uniformly dispersed in a matrix.

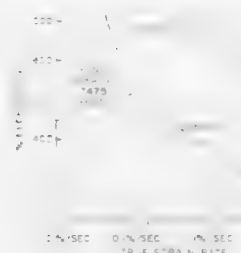
4,874,440

SUPERPLASTIC ALUMINUM PRODUCTS AND ALLOYS
Ralph R. Sawtell, Lafayette, Calif.; Philip E. Bretz, and Craig L. Jensen, both of Plum, Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 841,648, Mar. 20, 1986, Pat. No. 4,689,090. This application Aug. 14, 1987, Ser. No. 85,851
Int. Cl.⁴ C22F 1/04

U.S. Cl. 148-437

66 Claims



1. A superplastically formed article of manufacture comprising a superplastically formed aluminum alloy comprising more than 50% aluminum and including some amount of up to 10% each of one or more elements from the group of yttrium, gadolinium, holmium, dysprosium, erbium, ytterbium, lutetium, and terbium, the grand total of said elements not exceeding 20%.

4,874,441

EXPLOSIVE FOR WARHEADS AND SOLID ROCKET PROPELLANT

Vinzenz Bankhamer, Engendorf, and Gerhard Zeman, Hallein, both of Austria, assignors to Advanced Explosives Gesellschaft b.R., Hallein, Austria

Filed Dec. 28, 1988, Ser. No. 291,010

Claims priority, application Austria, Jan. 5, 1988, 13/88

Int. Cl.⁴ C06G 33/06

U.S. Cl. 149-42

10 Claims

1. An explosive for warheads and solid rocket propellant, comprising a high-energy secondary explosive with an inorganic perchlorate and metal component with a high level of affinity for oxygen as well as desensitizing and binding agents, characterized in that, in said secondary explosive, the oxygen balance sheet is balanced by the perchlorate component which is present in a substantially stoichiometric amount relative to said explosive to approximately give a complete reaction to form carbon dioxide and water.

4,874,442

METHOD FOR APPLYING STRAND FILLING COMPOUND

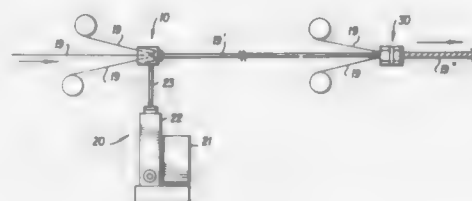
Clinton E. Watkins, and Bobby A. Rowland, both of Carroll County, Ga., assignors to Southwire Company, Carrollton, Ga.

Filed Sep. 1, 1987, Ser. No. 91,810

Int. Cl.⁴ H01B 13/14

U.S. Cl. 156-48

11 Claims



1. Method for application of moisture blocking compound to the interstitial spaces of a stranded conductor, comprising: feeding a plurality of electrical wires into a cone die; applying a moisture blocking compound to the individual strands of wire; passing said plurality of strands of wire and said moisture blocking compound through an exit die; loosely stranding said plurality of wires together; passing said loosely stranded conductor through closing blocks; and collecting said stranded conductor.

4,874,443

METHOD FOR APPLYING ELASTOMERIC MATERIAL ONTO A DRUM

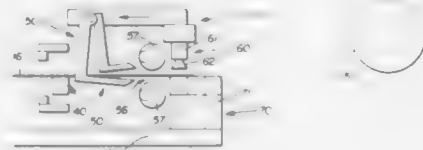
Kent K. Kipling, Solon, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 424,736, Sep. 27, 1982, abandoned. This application Oct. 16, 1987, Ser. No. 110,594

Int. Cl.⁴ B29H 15/04

U.S. Cl. 156-64

4 Claims



1. A method for use in a system employing a plurality of drums having varying circumferences for applying a length of elastomeric material from a continuous length of said elastomeric material to a selected one of said drums, comprising the steps of:

- transporting a first end of said elastomeric material in a forwardly generally horizontal direction to the selected drum;
- moving said first end of said elastomeric material in a generally vertical direction and into contact with said drum for attaching said first end to said drum;
- rotating said drum to cause said elastomeric material to wrap partially around said drum;
- measuring the angular displacement of said drum and providing an output thereof;
- calculating the length of elastomeric material required to completely wrap around the drum based upon the measured angular displacement of said drum;
- cutting a portion of the elastomeric material from the continuous length thereof to form a second end in response to the calculated length required to wrap around

said drum which length is shorter than the circumference of the smallest drum in the system;

- transporting the second end in a generally horizontal direction away from said drum to stretch said cut portion of elastomeric material in order to abut the first end when said portion is completely wrapped about said drum;
- rotating the drum to completely wrap said stretched cut portion about said drum; and
- centering the cut portion of elastomeric material with respect to the drum after the first end has been attached to said drum and prior to said cut portion being completely wrapped about said drum.

4,874,444

DIE-BONDING METHOD AND APPARATUS THEREFOR

Takeo Satou, and Yasuhiko Shimizu, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jan. 19, 1988, Ser. No. 145,320

Claims priority, application Japan, Jan. 19, 1987, 62-9578

Int. Cl.⁴ B65D 83/14

U.S. Cl. 156-64

24 Claims



1. A die-bonding method for applying high pressure air to a resin vessel under a predetermined discharge condition to thereby discharge resin onto a portion subject to bonding, thus to adhesively join or connect a semiconductor chip to said portion subject to bonding by said resin discharged, said method including:

- a process of detecting a pressure waveform applied to said resin vessel; and
- a process of controlling said discharge condition to compensate a difference between a pressure waveform detected and a predetermined reference pressure waveform so that a predetermined resin quantity is discharged at all times even when the quantity of the resin within said resin vessel varies.

4,874,445

METHOD FOR REPAIRING FUEL TANKS

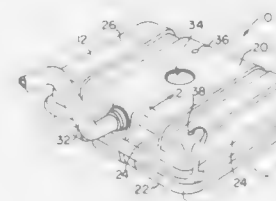
Patrick J. Lavoie, Lakefield, Canada, assignor to Gas Tank Renn - USA, Detroit, Mich.

Filed May 3, 1988, Ser. No. 189,669

Int. Cl.⁴ B32B 35/00

U.S. Cl. 156-64

11 Claims



1. A method for repairing a fuel tank having an outer surface and an inner surface comprising the steps of: eliminating all fuel from said tank;

removing tar and rust from said inner and outer surfaces; covering leakage holes in said tank with a sealing material; coating at least one of said outer and said inner surfaces with a plastisol compound; and bonding said plastisol compound to said tank by heating said plastisol compound to a predetermined temperature of at least 350° F., for a predetermined time.

4,874,446

METHOD OF MAKING A JEWELRY DISPLAY CARD
Elkin, Alfred A., Pawtucket, R.I., and Sylvestre M. Costa, Seekonk, Mass., assignors to Plastic Development, Inc., Pawtucket, R.I.

Filed Jun. 20, 1988, Ser. No. 208,977

Int. Cl.⁴ B32B 31/20; A45C 11/16

U.S. Cl. 156-66

4 Claims

1. A method of making a jewelry display card comprising:
 - assembling an elongated plastic hanger member on the rear side of a substantially flat plastic card member, said hanger member being of generally U-shaped sectional configuration and including an elongated, substantially flat front flange portion having an upper end, an upper portion which extends rearwardly from the upper end of said flange portion and a rear portion which extends downwardly from said upper portion;
 - welding the flange portion of said hanger member to the rear side of said card member so that said hanger member is spaced inwardly from the perimeter of said card member by at least approximately one-sixteenth of an inch;
 - thereafter overlaying a foam pad on the front side of said card member;
 - overlaying a flexible plastic sheet on said foam pad; and
 - welding said plastic sheet to secure said plastic sheets to said card member around substantially the entire perimeter of said card member.

4,874,447

MELT BLOWN NONWOVEN WEB FROM FIBER COMPRISING AN ELASTOMER

Donald R. Hazelton, Chatham, N.J., and William J. Hodgson, Jr., Baytown, Tex., assignors to Exxon Chemical Patents, Inc., Linden, N.J.

Division of Ser. No. 6,867, Jan. 27, 1987, Pat. No. 4,804,577.

This application Nov. 17, 1988, Ser. No. 272,581

Int. Cl.⁴ D04H 3/16

U.S. Cl. 156-167

14 Claims

1. A method of preparing a nonwoven web comprising
 - forming a polymeric blend comprising (i) from 5 to 75 wt % of an elastomeric copolymer of an isolefin and a conjugated diolefin and (ii) from 25 to 95 wt % of a thermoplastic olefin polymer resin;
 - heating the blend to form a melt;
 - extruding the melt through die openings to form a row of fibers while blowing hot gases on both sides thereof to draw down the fibers and substantially reduce their diameters; and
 - collecting the fibers to form a web.

4,874,448

METHOD OF MAKING SEAT-LIKE OBJECT

Muneharu Urai, Tokyo, Japan, assignor to Tachi-S Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 883,992, Jul. 10, 1986, abandoned. This application May 9, 1988, Ser. No. 195,479

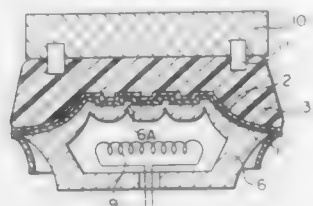
Int. Cl.⁴ B29C 51/14; B65G 7/00

U.S. Cl. 156-196

5 Claims

1. A method of making a seat-like object comprising the steps of:
 - sandwiching and heating a gas permeable surface layer between upper and lower molds with three-dimensional projections having the same shape as an outer shape of a

- porous cushion body to give the surface layer the same shape as the cushion body;
- (b) preheating said cushion body by filling with hot air, thereby raising the temperature of the cushion body before being stuck together with the surface layer; and



- (c) putting and heating a weld sheet between the preshaped surface layer and the preheated cushion body, thereby causing the weld sheet to melt and stick the surface layer and the cushion body together, the melting of the weld sheet being carried out so as to allow the air to pass through the combined product formed from the surface layer and the cushion body after the weld sheet is melted.

4,874,449

PROCESS FOR DRESSING A SUBSTANTIALLY FLAT SUBSTRATE SUCH AS SPLIT LEATHER OR A TEXTILE MATERIAL

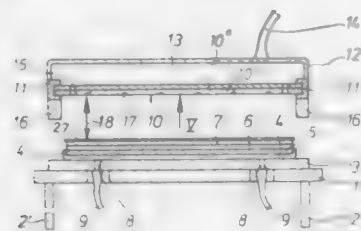
Philipp Schaefer, Oberstrasse 16, D-3000 Hannover 1, Fed. Rep. of Germany, and Helmut Schaefer, Avellino, Italy, assignors to Philipp Schaefer, Hannover, Fed. Rep. of Germany. Continuation-in-part of Ser. No. 800,609, Nov. 21, 1985, abandoned, which is a division of Ser. No. 577,154, Feb. 6, 1984, Pat. No. 4,581,261. This application Dec. 22, 1987, Ser. No. 136,711.

Claims priority, application European Pat. Off., Aug. 4, 1983, EP 89 0127.0

Int. Cl.⁴ B29D 7/01; B32B 31/26, 31/28

U.S. Cl. 156—246

57 Claims



1. A process for forming a dressing on a substantially flat substrate having on at least one side a rough surface with fibers protruding therefrom, such as split leather or a textile material having on at least one side a split-leather-like appearance, the process comprising the steps of sequentially:

- heating a support member having an upper side consisting of silicone rubber having antiadhesive properties and formed with small recesses for transmitting a pattern to said dressing;
- applying a first aqueous dispersion of synthetic plastics material onto the upper side of the heated support member for forming a layer of the aqueous dispersion which, as a result of the heat of the support member, forms a cohesive solidified first layer of the dressing having a thickness between 0.07 mm and 0.22 mm;
- further heating this support member from a bottom side opposite the upper side of the support member at least until the solidification of the first layer is complete;
- applying a second aqueous dispersion of synthetic plastics material onto the solidified first layer;
- placing the substrate with its rough surface onto the solidified first layer while the applied second dispersion of

synthetic plastics material is still in a wet stage, whereby the fibers of the rough surface are immersed in the wet second dispersion;

heating the support member from the bottom side together with the solidified first layer, with the second aqueous dispersion, and with the substrate to a temperature of at least 85° C. so the second dispersion solidifies to form a second layer and applying a pressure onto an upper side of the substrate opposite the rough surface by means of a laminar, yielding pressing element during a time interval of at

heating the support member from the bottom side together with the solidified first layer, with the aqueous dispersion, and with the substrate to a temperature of at least 85° C. so the second dispersion solidifies to form a second layer and applying a pressure onto the upper side of the substrate opposite the rough surface by means of a laminar yielding pressing element during a time interval of at least 10 seconds, whereby vapor generated during the solidification of the second layer is at least partially removed via the substrate; and

removing from the support member the substrate provided with the dressing formed by the solidified first and second layers.

4,874,450

LAMINATING TRANSPARENT OR TRANSLUCENT MATERIALS USING IONIC DYE-COUNTER ION COMPLEXES

Peter Gottschalk, Centerville, Ohio, assignor to The Mead Corporation, Dayton, Ohio

Continuation of Ser. No. 8,709, Jan. 29, 1987, abandoned. This application Jul. 11, 1988, Ser. No. 220,363

Int. Cl.⁴ B32B 33/00

U.S. Cl. 156—275.5

24 Claims

1. A process for laminating a transparent or translucent substrate which comprises the steps of:

coating a photohardenable composition on one surface of a first substrate, said photohardenable composition comprising a free radical addition polymerizable or crosslinkable compound and a dye-reactive counter ion complex, said complex being capable of absorbing actinic radiation and producing free radicals which initiate free radical polymerization or crosslinking of said compound and being a stable non-transient compound prior to actinic radiation, applying a second substrate to said photohardenable composition to form a laminate in which said photohardenable composition is interposed between said first and said second substrate, and

exposing said laminate to actinic radiation; at least one of said substrates being transparent or translucent.

4,874,451

METHOD OF FORMING A DISPOSABLE DIAPER WITH CONTINUOUS/INTERMITTENT ROWS OF ADHESIVE

Bentley J. Boger, Atlanta, and Peter J. Petrecca, Dunwoody, both of Ga., assignors to Nordson Corporation, Westlake, Ohio

Continuation-in-part of Ser. No. 55,656, May 29, 1987, abandoned, which is a division of Ser. No. 841,587, Mar. 20, 1986, Pat. No. 4,687,137. This application Jul. 8, 1988, Ser. No. 216,766

Int. Cl.⁴ B32B 31/08, 31/12

U.S. Cl. 156—291

6 Claims

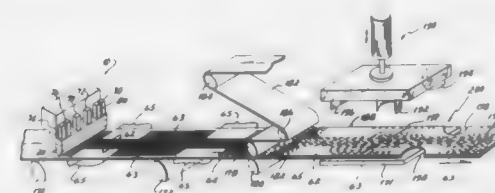
1. A method of manufacturing disposable diapers comprising:

passing a surface of a backing sheet portion of a disposable diaper beneath an adhesive dispenser connected to a source of molten thermoplastic material, said adhesive dispenser having first discharge orifices and second discharge orifices;

continuously dispensing multiple, parallel rows of molten

thermoplastic adhesive from said first discharge orifices of said adhesive dispenser onto a center portion of the backing sheet;

intermittently dispensing multiple, parallel rows of molten thermoplastic adhesive from said second discharge orifices of said adhesive dispenser onto outer portions of the backing sheet on either side of the center portion to form



spaced areas on the outer portions of the backing sheet with no adhesive;

adhering a non-woven layer portion of the disposable diaper to the backing sheet;

removing said spaced areas without adhesive from the outer portions of the backing sheet between said intermittent rows of adhesive to form the leg holes of the disposable diaper.

4,874,452

ARTICLES OF MANUFACTURE AND THEIR PRODUCTION

Gregory A. Ferro, Hoffman Estates, Ill., assignor to Imi-Tech Corporation, Elk Grove Village, Ill.

Filed Oct. 24, 1988, Ser. No. 261,124

Int. Cl.⁴ C09J 5/02

U.S. Cl. 156—308.6

35 Claims

1. A process forming a recurable article which comprises compressing and heat curing while interposed between a plurality of substrates a non-resilient, non-flexible recurable material formed by subjecting cured polyimide foam to the action of pressurized steam.

4,874,453

APPARATUS AND METHOD FOR PLASMA TREATMENT OF RESIN MATERIAL

Kenji Fukuta, Takaoki Kaneko, and Yoshinobu Takahashi, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

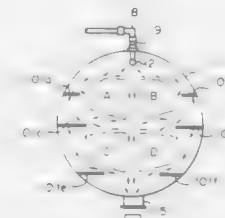
Division of Ser. No. 772,208, Sep. 5, 1985, Pat. No. 4,595,570, which is a continuation of Ser. No. 583,181, Feb. 24, 1985, abandoned. This application Jan. 8, 1986, Ser. No. 817,115

Claims priority, application Japan, Feb. 25, 1983, 58-29371; Feb. 25, 1983, 58-29372; Mar. 10, 1983, 58-38204

Int. Cl.⁴ B01J 19/08

U.S. Cl. 156—345

1 Claim



1. An apparatus for plasma treatment, capable of plasma-treating a plurality of works of resin material by irradiating the surfaces of the works with a microwave discharge plasma within a vacuum reaction chamber having an inner wall, comprising a plasma introducing port formed in the wall of the reaction chamber, a plasma-irradiating pipe connected to the plasma introducing port, said plasma-irradiating pipe being

provided with a number of nozzle holes for injecting the plasma into the reaction chamber to form a flow of plasma and to irradiate therewith the surfaces of the works, a discharge port formed in the wall of the reaction chamber to reduce the internal pressure of the reaction chamber, a plurality of deflecting plates projecting from the inner wall of the reaction chamber toward the works centrally disposed within the interior of the reaction chamber, said plurality of deflecting plates being inclined toward the flow of plasma so as to diffuse said flow of plasma toward the works so that a substantially uniform distribution of plasma is provided on the works.

4,874,454

DECAL TRANSFER DEVICE

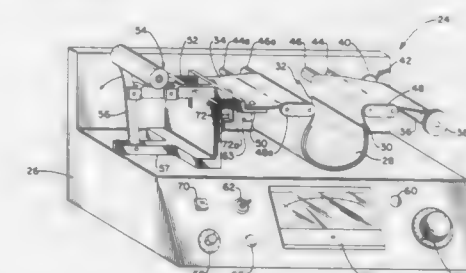
Anselm Talalay, Cleveland, and Herbert H. Borsvold, Akron, both of Ohio, assignors to Roger Landy and U.S. Printcraft, both of Copley, Ohio

Filed Apr. 24, 1987, Ser. No. 42,053

Int. Cl.⁴ H05B 1/00; B44C 1/17; B32B 31/00

U.S. Cl. 156—359

5 Claims



1. A printing device for accomplishing sublimation design transfers through the use of heat and pressure which includes a flexible transfer head comprising:

a flexible heating pad structure adapted for deformation about a sublimation design accepting, curvilinear substrate to provide heat and pressure to a sublimation design during deformation, and

heating pad deformation means, wherein said heating pad structure comprises a laminate structure which includes a thin flexible heated sheet and a pad support belt, said structure being disposed in a loop configuration formed between two spaced heating pad structure supports which are stationary during said deformation, wherein said heating pad deformation means comprises means for tightening said loop about said substrate, wherein the curvilinear substrate comprises a substantially cylindrically shaped substrate, while said stationary, spaced heating pad structure supports comprise support members spaced apart from each other at a distance less than the diameter of said cylindrically shaped substrate, and said structure covers more than 180 degrees of the cylindrically shaped substrate's surface, and wherein means are provided for adjusting the size of the loop prior to tightening said tightening means about said cylindrically shaped substrate.

4,874,455

APPARATUS FOR FORMING ENDLESS TIRE REINFORCING BELTS

David J. Ginter, Clinton, Conn., assignor to The Armstrong Rubber Co., New Haven, Conn.

Filed Jan. 29, 1987, Ser. No. 8,623

Int. Cl.⁴ B65H 81/08

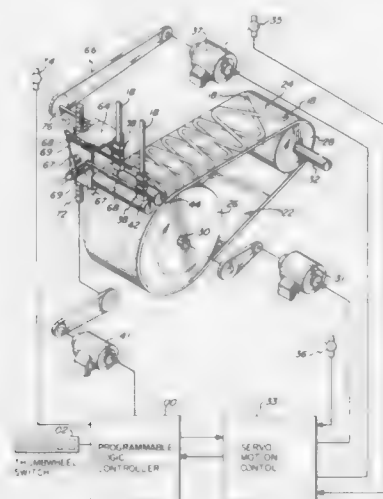
U.S. Cl. 156—397

9 Claims

1. Apparatus for weaving a woven endless tire reinforcing belt for a single pneumatic tire from at least one coated continuous cord reinforcement laid on an endless weaving surface by reciprocating a reinforcement guide means while rotating said surface to lay said cord reinforcement on said surface in a

zig-zag pattern across said belt from one side to the other of said belt, said apparatus comprising:

- (a) means for reading and storing information representative of said zig-zag pattern for first and second belt portions 1 and 2 forming said belt within the same tire, including the widths W_1 and W_2 of each portion; the cord angles A_1 and A_2 of each said portion; and the number of traverses GR_1 and GR_2 of each said portion respectively;
- (b) computer means for generating signals to control the weaving of said belt as represented by said information by first weaving said first belt portion of GR_1 traverses having width W_1 and cord angle A_1 and thereafter weaving said second belt portion of GR_2 traverses having width W_2 and cord angle A_2 on the radially outward side of said first portion;
- (c) first servomotor means for rotating said weaving surface, said first servomotor means being responsive to control signals generated by said computer means to rotate said weaving surface at an angular velocity controlled by said computer means;
- (d) first encoder means to provide a weaving surface angular velocity feedback signal to said computer means;
- (e) second servomotor means operatively connected to said guide means for reciprocating said guide means;



- (f) second encoder means operatively connected to said second servomotor means for monitoring the reciprocation of said guide means to provide a reciprocation feedback signal to said computer means, said computer means also for comparing said weaving surface angular velocity feedback signal and said reciprocation feedback signal with the cord angle of the belt portion being woven and generating a control signal to said reciprocation means to weave said belt portion having a corresponding gear ratio;
- (g) stepper motor means operatively connected to said guide means for adjusting the amplitude of reciprocation of said guide means to thereby adjust the width of the belt portion being laid by said reciprocating means, said stepper motor means being responsive to control signals from said computer means to adjust said amplitude to first weave a belt portion of width W_1 and thereafter weave a belt portion of width W_2 ; and
- (h) third encoder means operatively connected to said guide means for counting the number of reciprocations of said guide means, said third encoder means being operatively connected to said computer means, said computer means for generating signals to said stepper motor means, said first servomotor means, and said second servomotor means to begin the weaving of said second belt portion when the number of traverses counted by said third encoder means is GR_1 .

4,874,456

VACUUM DRUM APPARATUS FOR PROVIDING SANITARY ARTICLES

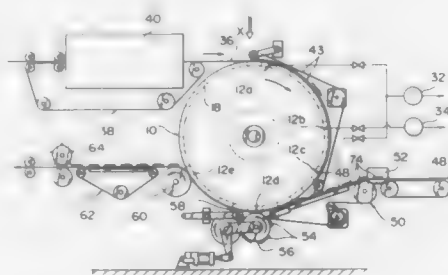
Katsumasa Takagi, Yokohama, Japan, assignor to Koyo Disposable Goods Company, Japan

Filed May 19, 1988, Ser. No. 196,622

Int. Cl.⁴ B29C 51/10, 51/22, 51/36, 51/42

U.S. Cl. 156-471

17 Claims



1. An apparatus for producing sanitary articles having absorptive pads for bodily fluids encased between a body contacting sheet of fluid permeable material and a covering sheet of fluid impermeable material, said apparatus comprising: heating means for heating the fluid impermeable sheet to a temperature where it is deformable;
- a drum including a stationary flange having vacuum source port means and a rotary drum portion and a plurality of dies with open cavities facing outward provided on the circumferential surface of the rotary drum member, each of said cavities providing a forming surface therein;
- a plurality of pins, provided on opposite sides of the circumferential surface of said rotary drum member, for impaling and holding in place the edges of the strip of fluid impermeable material;
- first transfer means for feeding the strip of fluid impermeable sheet onto the rotating surface of said rotary drum member;
- vacuum means communicating with said vacuum source port means and for applying a relatively low degree of vacuum and, in sequence, a relatively high degree of vacuum to each cavity to force the heated impermeable sheet into each cavity, against the forming surface therein, and to thereby form pockets in said impermeable sheet;
- means for placing a plurality of the absorptive pads along a length of a strip of the fluid permeable sheet material with equal spacing between the pads;
- second transfer means for feeding a strip of the fluid permeable sheet material into contact with the rotating drum with the pads resting on the fluid permeable sheet coming into registration with said die cavities so that one pad is placed within each pocket formed within the strip of fluid impermeable material;
- sealing means for sealing said strip of fluid impermeable material to said strip of fluid permeable material around the periphery of each of the absorptive pads; and
- severing means for separating the assembled strips between adjacent absorptive pads to form the sanitary articles.

4,874,457

WEB CORRUGATING APPARATUS

Morris K. Swieringa, Lahaska, Pa., assignor to McNeil-PC, Inc., Milltown, N.J.

Filed Apr. 21, 1988, Ser. No. 184,516

Int. Cl.⁴ B31F 1/34

U.S. Cl. 156-474

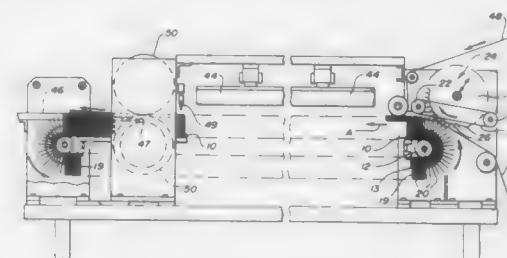
14 Claims

1. An apparatus for corrugating a web made of at least partially heat softenable fibers, said web having a length and transverse width, as said web moves in a direction parallel to said length, comprising:

- (a) at least one first support means comprising a first paddle

having an edge which extends transverse to the direction of movement of said web, to movably support said web at a first location;

- (b) at least one second support means comprising a second paddle having an edge, which extends transverse to the direction of movement of said web, to movably support said web at a second location spaced longitudinally along said web from said first location;
- (c) a first endless drive means having said first paddle fixed thereto to extend radially outward therefrom, a second endless drive means having said second paddle fixed thereto to extend radially outward therefrom, said drive



- means movable in a direction parallel to the direction of movement of said web along a path which is arcuate along first portion and substantially straight along a second portion such that said web is supported at said first and second locations by said first and second paddles and the separation between said first and second locations is closed to fold a web portion extending therebetween as said first and second paddles move to said second portion of said path; and
- (d) heating means to heat said web after said separation has been closed to soften and bond fibers of adjacent folds of the web together prior to removal of said corrugated web from said paddles.

4,874,458

SINGLE CRYSTAL GROWING METHOD HAVING IMPROVED MELT CONTROL

Minoru Nishizawa, Tokyo, Japan, assignor to Gakai Electric Works Co., Ltd., Tokyo, Japan

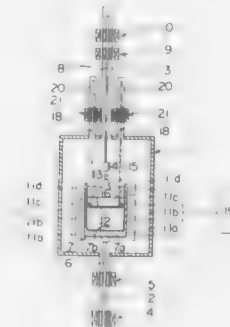
Filed Nov. 27, 1984, Ser. No. 675,409

Claims priority, application Japan, Aug. 31, 1984, 59-182435; Aug. 31, 1984, 59-182436; Aug. 31, 1984, 59-182437

Int. Cl.⁴ C30B 15/24

U.S. Cl. 156-607

5 Claims



1. A method of growing a single crystal comprising pulling a single crystal from a feed melt contained in a crucible under a high pressure inert gas atmosphere, covering the surface of the feed melt with a liquid sealing agent, floating an unperforated baffle plate having an outside diameter somewhat smaller

than the inside diameter of the crucible in a predetermined position below the surface of the feed melt to define a spacing between the baffle plate and the surface of the feed melt and to define a gap between outside and inner peripheries of the baffle plate and the crucible, respectively, controlling the spacing between said baffle plate and the surface of the feed melt so that said spacing is maintained at a predetermined spacing during pulling of the single crystal, causing relative rotation between the baffle plate and the crucible, the periphery of the baffle plate including a feed melt guiding portion which causes movement of the feed melt from below the baffle plate smoothly upward through the gap between the relatively rotating baffle plate and the crucible to a solid-melt interface region above the baffle plate, heating discrete vertically spaced points in the feed melt preselectedly and controlling the heat applied to said discrete vertically spaced points in the feed melt.

4,874,459

LOW DAMAGE-PRODUCING, ANISOTROPIC, CHEMICALLY ENHANCED ETCHING METHOD AND APPARATUS

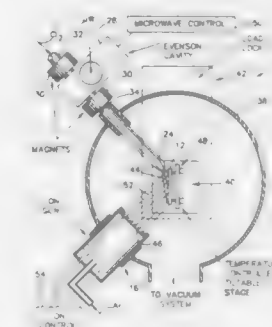
Larry A. Coldren, Santa Barbara, and Jay A. Skidmore, Goleta, both of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Oct. 17, 1988, Ser. No. 258,646

Int. Cl.⁴ H01L 21/306; B44C 1/22; C03C 15/00, 25/06

U.S. Cl. 156-643

40 Claims



32. The method of operating low damage-producing, anisotropic, chemically enhanced etching apparatus comprising the steps of:

- (a) providing an evacuated chamber into which a substrate to be etched can be placed;
- (b) providing a temperature controlled tiltable stage in the chamber for receiving and holding the substrate at a proper angle for etching;
- (c) connecting an input into a microwave cavity to a supply of molecular chlorine for selectively exciting and disassociating molecular chlorine;
- (d) connecting an outlet from the microwave cavity to be conducted and discharged close adjacent and against the stage;
- (e) connecting first control means to the microwave cavity for controlling the flow of excited chlorine radicals being emitted from the microwave cavity;
- (f) providing an ion gun producing a beam of Ar^+ ions and directing the beam of ions against the position of a substrate to be etched mounted on the stage;
- (g) connecting second control means to the ion gun to control the beam of ions;
- (h) placing a substrate to be etched into the evacuated chamber on the stage receiving at a desired angle for etching; and
- (i) using the first and second control means to control the amount of excited chlorine radicals and Ar^+ ions impinging on the substrate.

4,874,460

METHOD AND APPARATUS FOR MODIFYING
PATTERNED FILMYoshitomo Nakagawa, and Takehiro Yamaoka, both of Tokyo,
Japan, assignors to Seiko Instruments Inc., Tokyo, Japan
Filed Nov. 16, 1988, Ser. No. 272,017Claims priority, application Japan, Nov. 16, 1987, 62-288656;
May 6, 1988, 63-110191Int. Cl.⁴ B44C 1/22; C03C 15/00, 25/06; C23F 1/02
U.S. Cl. 156—626 7 Claims

5. A method for modifying a patterned film on a sample surface, comprising:

producing a focussed ion beam and causing the beam to impinge upon the sample surface to microscopically machine a small region of the surface which contains the patterned film, impingement of the beam causing secondary charged particles to be emitted from the sample surface;

causing the focussed beam to scan the sample surface by impinging on each one of a plurality of spots in the region in a given sequence and impinging on each spot for a given period of time;

detecting the secondary charged particles emitted from the sample surface in response to impingement of the beam; and

spraying etching gas capable of etching the film onto the surface region while the beam is being caused to scan the region.

4,874,461

METHOD FOR MANUFACTURING LIQUID CRYSTAL
DEVICE WITH SPACERS FORMED BY
PHOTOLITHOGRAPHYMasahiko Sato; Toshimitsu Konuma, both of Atsugi; Seiichi
Odaka, Kisakata; Toshihara Yamaguchi, Zama; Toshio Wata-
nabe, Atsugi; Osamu Aoyagi, Atsugi; Kaoru Tabata, Atsugi;
Chizuru Isigaki, Atsugi; Hiroyuki Sakayori, Machida; Ippai
Kobayashi, Atsugi; Akio Osabe, Atsugi, and Shunpei
Yamazaki, Tokyo, all of Japan, assignors to Semiconductor
Energy Laboratory Co., Ltd., Atsugi, JapanDivision of Ser. No. 87,275, Aug. 20, 1987. This application Jul.
21, 1988, Ser. No. 222,633Claims priority, application Japan, Aug. 20, 1986, 61-196424
Int. Cl.⁴ B44C 1/22; B29C 37/00; C03C 15/00, 25/06

U.S. Cl. 156—633 8 Claims

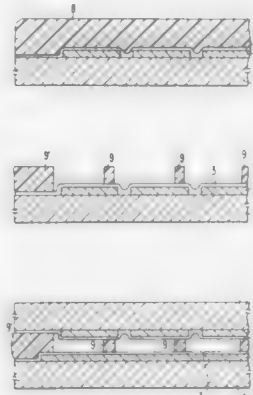
1. A method for manufacturing a liquid crystal device comprising the step of:

forming electrode arrangement on the inside surfaces of a pair of substrates;

coating the inside surface of one of said substrate with photo-curable resin;

exposing the photocurable resin coating to illumination except for the portions to be pillars and sealing member through a mask;

removing the uncured portion of said photocurable resin with a solvent; and



joining and uniting said pair of substrates;
disposing a liquid crystal between said pair of substrates.

4,874,462

METHOD OF FORMING PATTERNED FILM ON
SUBSTRATE SURFACE BY USING METAL ALKOXIDE
GELKensuke Makita, Mie; Akimasa Hattori, Matsusaka, and Kat-
suto Tanaka, Matsusaka, all of Japan, assignors to Central
Glass Company, Limited, Ube, Japan

Filed Dec. 8, 1988, Ser. No. 281,269

Claims priority, application Japan, Dec. 9, 1987, 62-309389
Int. Cl.⁴ B44C 1/22; C03C 15/00, 25/06; C23F 1/02

U.S. Cl. 156—635 21 Claims

1. in a method of forming a patterned film of an inorganic metal compound on a substrate, the method having the steps of applying a metal alkoxide sol to a substrate to form a sol film on the substrate, allowing the sol film to turn into a gel film by hydrolysis of the metal alkoxide, removing the gel film in the unnecessary area or areas by selective etching, and then baking the film in the remaining area or areas to completely convert the material of the film into the desired inorganic metal compound.

the improvement comprising making said selective etching by the steps of applying a viscous liquid, which is capable of at least partially decomposing the gel film, to the gel film in the unnecessary area or areas and allowing the applied viscous liquid to permeate into and moisten the underlying gel film, heating the gel film which is moistened with said viscous liquid in the unnecessary area or areas at a temperature lower than 300° C. to thereby harden the gel film in the necessary area or areas, and removing the gel film in the unnecessary area or areas together with the residue of the applied viscous liquid by washing with at least one washing liquid.

4,874,463

INTEGRATED CIRCUITS FROM WAFERS HAVING
IMPROVED FLATNESSJeffrey T. Kozs, Whitehall, and Anton J. Miller, Lehigh County,
both of Pa., assignors to AT&T Bell Laboratories, Murray
Hill, N.Y.

Filed Dec. 23, 1988, Ser. No. 290,653

Int. Cl.⁴ H01L 21/306; B44C 1/22; C03C 15/00, 25/06
U.S. Cl. 156—645 17 Claims

1. A method of making integrated circuits formed on a given side of a wafer,
characterized in that said wafer is prepared by steps com-
prising:

- (1) forming an etch resistant coating on said given side of said wafer having a surface with depressions;
- (2) removing said etch resistant coating from the surface of said given side while retaining the coating on the sidewalls of depressions in the surface;

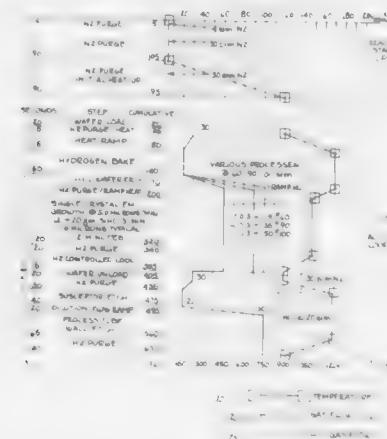


- (3) isotropically etching said given side so as to remove a depth of material from said given side and to undercut at least a portion of said etch resistant coating on the side-
walls; and
- (4) removing the remaining portions of said etch resistant coating from the given side of said wafer,
whereby a wafer having improved flatness is obtained.

4,874,464

PROCESS FOR EPITAXIAL DEPOSITION OF SILICON
Dennis L. Goodwin, Tempe; Mark R. Hawkins, Mesa; Wayne L.
Johnson, Phoenix; Aage Olsen, Chandler, and McDonald
Robinson, Paradise Valley, all of Ariz., assignors to Epsilon
Limited Partnership, Tempe, Ariz.

Filed Mar. 14, 1988, Ser. No. 167,347

Int. Cl.⁴ H01L 21/306, 21/205; C03B 23/00; B44C 1/22
U.S. Cl. 156—646 21 Claims

1. A process for epitaxial deposition of a semiconductor material onto a substrate, comprising the steps of:
loading the substrate onto a susceptor in a deposition reactor
reaction chamber at an elevated temperature;
purging the deposition reactor of ambient gases while simul-
taneously heating the deposition reactor to a temperature
greater than deposition temperature;

etching the substrate with an etchant gas to remove impuri-
ties from its exposed surface;
purging the deposition reactor of said etchant gas while
simultaneously reducing the temperature of the deposition
reactor to deposition temperature;
flowing a gaseous stream of a reactant semiconductor spe-
cies into the deposition reactor, thereby depositing said
reactant semiconductor species onto said exposed surface
of said semiconductor wafer;
purging the deposition reactor of ambient gases while cool-
ing the deposition reactor to said elevated temperature;
and
unloading the semiconductor wafer having said reactant
semiconductor species deposited thereupon.

4,874,465

TISSUE PRODUCTS CONTAINING SLICED FIBERS
Faith E. Cochrane; Michael J. Smith, both of Neenah, and John
D. Litvay, Appleton, all of Wis., assignors to Kimberly-Clark
Corporation, Neenah, Wis.

Filed Mar. 28, 1988, Ser. No. 173,961

Int. Cl.⁴ D21H 5/24

U.S. Cl. 162—111 5 Claims

1. A tissue product comprising a fibrous sheet having a dry
basis weight of from about 5 to about 40 pounds per 2880
square feet and having a bulk density of less than about 0.20
grams per cubic centimeter, said sheet comprising from about
5 to 100 weight percent lengthwise-sliced individual fibers
based on the total fiber content of the product, said lengthwise-
sliced fibers exhibiting a substantially reduced Coarseness
Index.

4,874,466

PAPER MAKING FILLER COMPOSITION AND
METHODCarolyn A. Savino, Naperville, Ill., assignor to Nalco Chemical
Company, Naperville, Ill.

Continuation of Ser. No. 920,092, Oct. 17, 1986, abandoned.

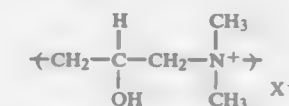
This application Sep. 28, 1988, Ser. No. 250,224

Int. Cl.⁴ D21H 3/78, 3/48

U.S. Cl. 162—164.3 4 Claims

1. A method of treating a paper making pulp to increase the
uniformity of titanium dioxide distribution within the web of
the paper produced from said pulp comprising:

admixing with water a cationic water soluble polymer com-
prised of at least fifty percent by weight of repeating units
consisting of a quaternary ammonium salt moiety having the
structural formula of



wherein X is a halide or a sulfate, said cationic water soluble
polymer having a molecular weight of from 5,000 to
50,000, and agitating said mixture;
adding to said mixture of water and cationic water soluble
polymer, with agitation, an amount of titanium dioxide to
form a dispersion in which said cationic water soluble
polymer is present in the amount of from 0.1 to 2.0 weight
percent based on said titanium dioxide;
said dispersion characterized in that the charge of said dis-
persion is cationic and in that auto-flocculation is inhibited
upon dilution of said dispersion to about 5 weight percent
titanium dioxide in water; and
admixing said dispersion with paper making pulp.

4,874,467

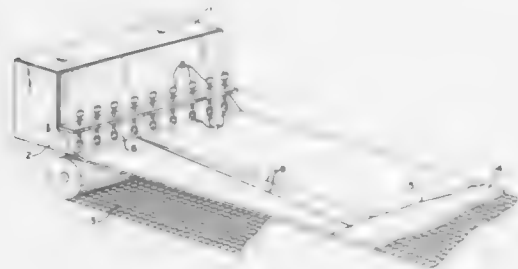
METHOD OF CONTROLLING CROSS PROFILE OF PROPERTIES OF PAPER WEB

Hakan I. Karlsson, Åkersberga; Inge J. Lundqvist, Spånga; Bengt Y. Hårdin, Hågersten, and Thomas L. Östman, Spånga, all of Sweden, assignors to Svenska Trafskapsinstitutet, Sweden

Continuation of Ser. No. 438,573, Nov. 1, 1982, abandoned, which is a continuation of Ser. No. 264,838, May 18, 1981, abandoned. This application Aug. 14, 1987, Ser. No. 86,195 Claims priority, application Sweden, Jun. 2, 1980, 8004084 Int. Cl.⁴ D21F 1/02, 7/00, 9/02

U.S. Cl. 162—198

9 Claims



1. A method of controlling a cross profile of properties of a paper web across a feed direction thereof in a paper machine, wherein said cross profile can be affected by several setting positions across the web in such a manner that a definite change in a setting position brings about a corresponding response in said cross profile, said response extending in a lateral direction beyond that web portion which corresponds to the web width of the setting, said method comprising the steps of:

- measuring an actual cross profile and comparing with a desired cross profile;
- indicating a deviation between the measured cross profile and the desired cross profile in the form of a first error cross profile;
- comparing each of the responses from the setting positions by turn with the first error cross profile for determining necessary mutual relative change in each setting position by multiplying the first error profile with the response locally about each setting position and summing up the result;
- calculating the corresponding necessary relative change in the cross profile from said determined necessary relative change in each setting position by means of the responses;
- determining an amplifying factor (k) by minimizing the difference between the desired cross profile and the measured cross profile added to the result of k multiplied with the necessary relative cross profile change;
- calculating necessary absolute change in each setting position as k corresponding relative change;
- determining the resulting change in cross profile by means of the responses;
- adding said determined change in cross profile to the measured cross profile and comparing with the desired cross profile to determine a deviation which constitutes a second error cross profile;
- repeating the method with said second error cross profile if the deviation is greater than a predetermined degree; and
- utilizing the calculated necessary absolute change in each setting position for adjustment in the setting positions.

4,874,468

APPARATUS FOR THE LIQUID TREATMENT OF A FIBROUS BOARD BETWEEN TWO ENDLESS FORAMINOUS BELTS OR WIRES

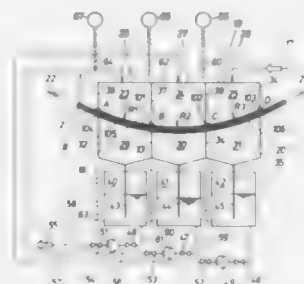
Johann Sbaschnigg, Graz, and Franz Petschauer, Lannach, both of Austria, assignors to Maschinenfabrik Andritz Aktiengesellschaft, Graz, Austria

Continuation of Ser. No. 7,080, Jan. 27, 1987, abandoned. This application Oct. 20, 1988, Ser. No. 262,255

Claims priority, application Austria, Feb. 18, 1986, A 417/86 Int. Cl.⁴ D21C 9/02

U.S. Cl. 162—300

16 Claims



1. An improved apparatus for the treatment of a material passed between upper and lower foraminous belts, the material being made to pass between the foraminous belts along at least two treatment containers for a treatment liquid a source of treatment liquid being connected to said treatment containers, at least one of the treatment containers being provided with a wall having orifices on a side of the treatment containers facing the material for applying the treatment liquid to the foraminous belts and the material therebetween, comprising:

- a first of the treatment containers being arranged above the upper foraminous belt in contact with the same, said treatment container being formed as a pressure container;
 - means for maintaining pressure of the interior of said first treatment container;
 - said first treatment container being provided with a bottom having orifices facing the upper belt for generating a pressure difference in the upper belt and being otherwise closed against the environment so that the first treatment container dispenses the treatment liquid under superpressure to the upper and lower belts and to the material therebetween;
 - at least one pressureless collecting container, open to the environment, arranged opposite the first treatment container below the upper foraminous belt;
 - said at least two treatment containers having side walls and walls facing the foraminous belts, said side walls being arranged immediately side by side, said facing walls being in tight contact with the foraminous belts, said facing walls being, as far as they are located on the same side of the material, continuously merging with one another and thus generating guiding surfaces for the foraminous belts and the material;
 - an adjustable perforated pressure plate located adjacent the lower belt opposite the first treatment container; and
 - means for adjusting the pressure plate for the purpose of tightly pressing the foraminous belts and the material therebetween against the first treatment container, the face of the pressure plate facing the material being formed plane.
7. An improved apparatus for the treatment of a material passed between upper and lower foraminous belts, the material being made to pass between the foraminous belts along at least two treatment containers for a treatment liquid, a source of treatment liquid being connected to said treatment containers, at least one of the treatment containers closed to the environment having means for sealing walls against the foraminous

belts and thus against the material, but otherwise open towards the foraminous belts, comprising:

- a first of the treatment containers being arranged adjacent the upper foraminous belt in contact with the same, said treatment container being formed as a pressure container;
- means for maintaining pressure of the interior of said first treatment container;
- said first treatment container being closed against the environment having means for sealing the walls against the upper belt, but otherwise open towards the upper belt, so the first treatment container dispenses the treatment liquid under superpressure to the upper and lower belts and to the material therebetween;
- said at least two treatment containers having side walls and walls facing the foraminous belts, said side walls being arranged immediately side by side, said facing walls being in tight contact with the foraminous belts and said facing walls being formed convexly, said facing walls being, as far as they are located on the same side of the material, continuously merging with one another and thus generating smoothly curving guiding surfaces for the foraminous belts and the material each treatment container has an open pressureless collecting container, open to the environment, arranged below a respective upper treatment container and adjacent the lower foraminous belt, of essentially identical dimensions of horizontal cross sections where they face the foraminous belts;
- each open pressureless collecting container has side walls; and
- each side wall of each treatment container is perpendicularly aligned above a side wall of an open pressureless collecting container; and means for adjusting the position of said pressure containers.

4,874,469

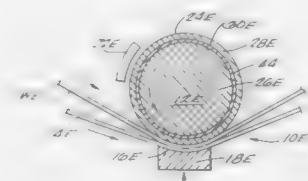
HEATED EXTENDED NIP PRESS WITH POROUS ROLL LAYERS

Jeffrey H. Pulkowski; Elizabeth A. Macklem, both of Beloit, Wis., and L. H. Busker, Rockton, Ill., assignors to Beloit Corporation, Beloit, Wis.

Continuation-in-part of Ser. No. 895,885, Aug. 12, 1986, Pat. No. 4,738,752. This application Aug. 27, 1987, Ser. No. 89,887 Int. Cl.⁴ D21F 3/00, 5/00

U.S. Cl. 162—359

7 Claims



1. An apparatus for removing fluid from a fibrous web, said apparatus comprising:

- a press member;
- blanket means cooperating with said press member for defining therebetween an elongate pressing section such that the web is pressed between said press member and said blanket means during passage through said pressing section;
- a pressing shoe for urging said blanket means toward said press member such that when the web passes through said pressing section, fluid is removed from the web;
- heating means disposed adjacent to said press member for transferring heat to the web and structured such that when the web passes through said press section, the web is subjected for an extended period to increased pressure and temperature so that water vapor generated within said pressing section during passage through said pressing

section forces the fluid in the liquid phase away from the web;

- said press member defining a pressing surface which is porous for inhibiting delamination of the web;
- said press member further including:
 - a first solid inner layer;
 - a second outer layer extending around said first layer, said second layer having a pore size of between 5–50 microns; and
 - a third intermediate layer disposed between said first and second layers, said third layer having a pore size within the range of 50–100 microns such that said third layer assists in ventilating said second layer and the web.

4,874,470

PAPERMAKING PRESS SECTION AND TRANSFER ARRANGEMENT TO DRYER SECTION

Borgeir Skauge, Beloit, Wis., assignor to Beloit Corporation, Beloit, Wis.

Filed Oct. 4, 1988, Ser. No. 253,283

Int. Cl.⁴ B21F 3/04

U.S. Cl. 162—360.1

15 Claims



1. A press apparatus for pressing water from a web which extends from a forming section to said press apparatus and subsequently from said press apparatus to a drying section, said apparatus comprising:

- pick-up means disposed closely adjacent to the forming section for picking-up the formed web from the forming section;
- a roll couple disposed downstream relative to said pick-up means, said roll couple defining therebetween a first nip for pressing a first portion of water from the formed web;
- transfer means cooperating with said pick-up means and said roll couple for transferring the web from said pick-up means to said first nip;
- a press roll disposed downstream relative to said roll couple;
- a first backing roll disposed downstream relative to said roll couple, said first backing roll cooperating with said press roll for defining therebetween a second nip for pressing a second portion of water from the web, said transfer means cooperating with said first backing roll for transferring the web from said first to said second nip;
- a second backing roll disposed downstream relative to said second nip, said second backing roll cooperating with said press roll for defining therebetween a third nip for pressing a third portion of water from the web;
- a doctor cooperating with said press roll for doctoring the web from said press roll after passage of the web through said third nip;
- a broke pit disposed beneath said doctor for receiving broke doctoring from said press roll;
- guide means disposed downstream relative to said third nip for guiding the web away from said press roll subsequent to the passage of the web through said third nip;
- a further press roll disposed downstream relative to said third nip, said guide means guiding the web from said third nip to said further press roll;
- a further backing roll cooperating with said further press roll for defining therebetween a fourth nip;

a further doctor cooperating with said further press roll for doctoring the web from said further press roll after passage of the web through said fourth nip;
 a further broke pit disposed beneath said further doctor for receiving broke doctored from said further press roll; and lead-in means disposed closely adjacent to and below said further press roll and downstream relative to said fourth nip and upstream relative to said further doctor blade for leading the web from said further press roll to the drying section;
 said lead-in means further includes a lead-in roll disposed closely adjacent to said further press roll for drawing the web away from said further press roll;
 a lead-in felt extending around said lead-in roll such that the web is supported by said lead-in felt and said lead-in roll towards the dryer section; and the dryer section further includes:
 a vacuum transfer roll disposed above and in abutting relationship with said lead-in felt such that the web is disposed between said lead-in felt and said transfer roll;
 a dryer felt extending around said vacuum transfer roll such that the web is drawn by said vacuum transfer roll away from said lead-in felt and so that the web is guided by said dryer felt through the dryer section.

4,874,471

DEVICE FOR CASTING A METAL IN THE PASTY PHASE

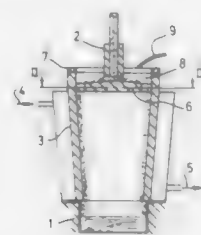
Stéphan Wilmette, Ninane, Chaud-Fontaine, Belgium, assignor to Centre de Recherches Metallurgiques-Centrum Voor Research in de Metallurgie, Brussels, Belgium
 Filed Nov. 27, 1987, Ser. No. 126,261

Claims priority, application Luxembourg, Nov. 26, 1986, 86688; Jan. 16, 1987, 86739

Int. Cl.⁴ B22D 11/124

U.S. Cl. 164—437

19 Claims



1. A device for continuously casting a metal in the pasty phase in a continuous casting mold comprising:
 a casting nozzle having an outlet;
 a vertical conduit disposed upstream of the mold with respect to the direction of travel of the metal from the casting nozzle, said conduit having an inlet, an outlet, and an inner surface extending between said conduit inlet and outlet;
 said conduit comprising,
 an inlet section adjacent said inlet,
 an inner surface formed of refractory material on said inlet section, and
 a downstream section disposed downstream of said inlet section;
 cooling means for cooling said downstream section of said conduit externally of said inner surface thereof;
 a distributor member disposed in said inlet section of said conduit having a surface in closely spaced relationship to said nozzle outlet for receiving metal poured thereon from said nozzle outlet, said distributor surface extending transversely with respect to said conduit inlet section a sufficient distance for discharging the metal directly against said inner surface of said inlet section; and means for injecting a gaseous agent into said conduit at a position downstream of and adjacent to said distributor member

for producing a gas pocket within said conduit for urging the metal against said inner surface of said conduit.

4,874,472

DRY CLEANING EQUIPMENT UTILIZING PERCHLOROETHYLENE RECOVERY PROCESS

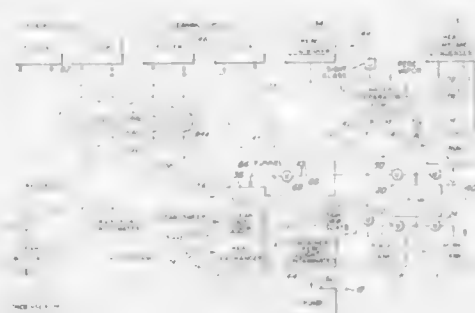
Tilo Kohler, West Babylon, N.Y., assignor to Richard L. Miller, Dix Hills, N.Y.

Division of Ser. No. 857, Jan. 6, 1987, Pat. No. 4,780,218. This application Oct. 20, 1988, Ser. No. 260,114

Int. Cl.⁴ B01D 3/02

U.S. Cl. 202—169

1 Claim



1. In a dry cleaning apparatus using perchlorethylene as a cleaning solvent, said apparatus including a drum for tumbling the fabric to be cleaned together with said solvent, a still for receiving contaminated solvent after use in said drum, a source of steam, means for feeding said steam into said still for sweeping the still and dissolving the contaminants from said solvent, a condenser for receiving said mixture of solvent and steam and condensing said mixture, a water separator receiving the condensed mixture from said condenser and removing condensed water from said mixture leaving solvent from which contaminants have been removed, and a storage tank for holding said condensed solvent with a conduit passing the decontaminated solvent from said water separator to said storage tank whereby the solvent in the storage tank can be used again in the drum, the improvement which comprises:
 means for enabling transfer of substantially all of said contaminated solvent from said drum to said still, including,
 (a) means connected with said conduit for diverting said solvent into a holding container at selected intervals during operation of said dry cleaning apparatus, and
 (b) pump means for passing said solvent from said holding container into said still for further decontamination thereof, whereby a substantially higher amount of contaminated solvent is recovered and substantially less contaminated solvent is discarded.

4,874,473

SEPARATION OF DIASTEREOMERS BY EXTRACTIVE DISTILLATION

Dieter Arit, Cologne; Ulrich Schwartz, Leverkusen; Hans-Walter Brandt; Wolfgang Arit, both of Odenthal, and Andreas Nickel, Wetter, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany
 Filed Apr. 16, 1987, Ser. No. 39,550

Claims priority, application Fed. Rep. of Germany, Apr. 25, 1986, 3613975

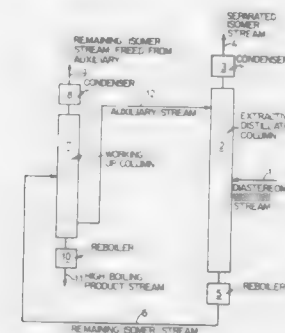
Int. Cl.⁴ B01D 3/40; C07B 57/00

U.S. Cl. 203—1

6 Claims

1. A process for the separation of diastereomers from each other wherein said diastereomers are selected from the group consisting of cis/trans permethic acid esters, cis/trans acid chlorides of permethic acid, menthol/isomenthol and the methyl esters of cis/trans caronaldehyde acid comprising adding to a mixture of diastereomers an auxiliary which allows or improves the resolution of said diastereomer mixture by distilla-

tion and separating the diastereomers by extractive distillation said auxiliary being selected from the group consisting of glycerol, diethanolamine, diphenyl ether, acetamide, N-methylacetamide, N-methylformamide, acetone, furfural, acetonitrile, dimethylformamide, dimethylacetamide, N-methyl-



pyrrolidone, N-formylmorpholine, benzyl alcohol, phenol, dimethylsulphoxide, sulpholane, glutaric acid dinitrile, succinic acid dinitrile, succinic acid amide, N-methylcaprolactam, 4-methylmorpholine, 2-pyrrolidone and 1-methyl-oxo-phospholine.

4,874,474

PROCESS FOR DEHYDRATING A MIXTURE OF METHANOL AND HIGHER ALCOHOLS

Carlo Rescatti, San Donato Milanese; Rizziero Ricci, Cortemaggiore; Adriano Scazzosi, Corbetta, and Flavio Cianci, San Donato Milanese, all of Italy, assignors to Snamprogetti S.p.A., Milan, Italy

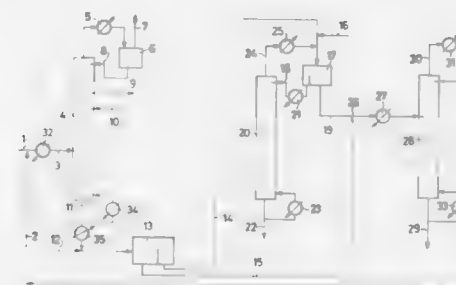
Filed Apr. 1, 1988, Ser. No. 176,457

Claims priority, application Italy, Apr. 2, 1987, 19938 A/87

Int. Cl.⁴ E01D 3/14

U.S. Cl. 203—18

18 Claims



1. A process comprising dehydrating a mixture of methanol and higher alcohols containing 20 to 80% by weight of methanol, 1 to 60% by weight of at least a higher alcohol selected from the group consisting of those having 2 to 10 carbon atoms, 1 to 50% by weight of water, and 0.1 to 10% by weight of hydrocarbons, oxygen-containing organic compounds different from alcohols, and combinations thereof, by the following steps:

(a) feeding to a first rectification tower said mixture of methanol and higher alcohols to be dehydrated, a gaseous stream being discharged from the tower head which contains a portion of the hydrocarbons, oxygen-containing organic compounds different from the alcohols or combinations thereof; from a side point at a level higher than $\frac{1}{3}$ of the tower height, a stream containing methanol, ethanol or combinations thereof being drawn; and from the tower bottom a stream with a methanol, ethanol or combinations

thereof having a content not larger than 10% by weight being obtained;

(b) separating at least once the stream obtained from the bottom of the first column into two phases, one of which is aqueous, and the other phase being organic;
 (c) feeding the organic phase to a second tower of azeotropic distillation, using a liquid-vapor and liquid-liquid separation agent; at the bottom an anhydrous stream being obtained, which contains the higher alcohols; and from the tower head a stream being obtained, which contains methanol, ethanol, propanol or combinations thereof, water, and the separation agent used, which is added to the stream obtained from the bottom of the first tower; and
 (d) feeding the aqueous phase to a third rectification tower; from the bottom a stream being removed, which contains water, and an overhead stream being recovered, which is enriched with methanol and upper alcohols, which is recycled by being added to the mixture of methanol and higher alcohols to be dehydrated before the latter is fed to the first rectification tower.

4,874,475

MOLTEN SALT EXTRACTIVE DISTILLATION PROCESS FOR ZIRCONIUM-HAFNIUM SEPARATION

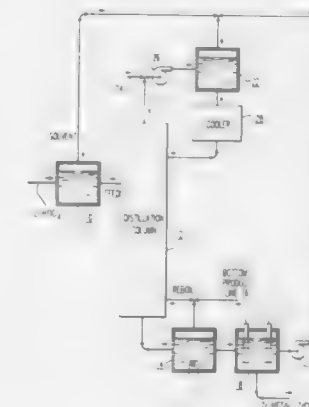
David F. McLaughlin, Oakmont, and Richard A. Stoltz, Murrysville Boro, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 12, 1988, Ser. No. 242,570

Int. Cl.⁴ B01D 3/40; C01G 25/04, 27/04; C22B 34/14

U.S. Cl. 203—51

3 Claims



1. In a process for zirconium-hafnium separation which utilizes an extractive distillation column with a mixture of zirconium and hafnium tetrachlorides introduced into a distillation column having a top and a bottom with hafnium enriched overheads taken from the top of the column and a molten salt solvent circulated through the column to provide a liquid phase, and with molten salt solvent containing zirconium chloride being taken from the bottom of the distillation column, the improvements comprising:

a. utilizing a molten salt solvent consisting principally of lithium chloride and at least one of sodium, potassium, magnesium and calcium chlorides;
 b. stripping of the zirconium chloride taken from the bottom of the distillation column by electrochemically reducing zirconium from the molten salt solvent; and
 c. utilizing a pressurized reflux condenser on the top of the column to add said hafnium chloride enriched overheads to the molten salt solvent previously stripped of zirconium chloride which molten salt solvent is being circulated back to the top of the column.

4,874,476

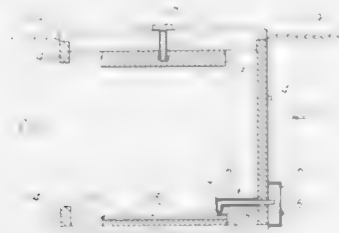
FIXTURE FOR PLATING TALL CONTACT BUMPS ON INTEGRATED CIRCUIT

Roger J. Stierman, Richardson; Archie N. McCauley, Little Elm, and Robert C. Zart, Dallas, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 37,760, Apr. 13, 1987. This application Oct. 5, 1988, Ser. No. 253,804
Int. Cl.⁴ C25D 5/02

U.S. Cl. 204—15

3 Claims



1. A method of plating bumps on metallization on the face of a wafer, comprising the steps of:
 - placing the wafer face up on sealing means in a bump-plating fixture so that the back of the wafer abuts the sealing means and the wafer is disposed below an anode means in the fixture;
 - placing force means against the metallization on the face of the wafer to effect electrical connection of the force means with the metallization;
 - whereby said force means causes the back of the wafer to press against the sealing means to form a high integrity seal to prevent the plating bath from coming into contact with the back of the wafer;
 - inserting the fixture with the wafer into a clean up or presoak bath;
 - removing the fixture and wafer from the clean up or presoak bath; and
 - inserting the fixture with the wafer into the plating bath.

4,874,477

PROCESS FOR PREPARING THE THROUGH HOLE WALLS OF A PRINTED WIRING BOARD FOR ELECTROPLATING

Phillip Pendleton, Kinnelon, N.J., assignor to Olin Hunt Specialty Products Inc., Palisades Park, N.J.

Filed Apr. 21, 1989, Ser. No. 341,614
Int. Cl.⁴ C25D 5/02, 5/54

U.S. Cl. 204—15

18 Claims

1. A process for electroplating the walls of through holes in a laminated printed wiring board comprised of at least one non-conducting layer laminated to at least two separate conductive metal layers, which comprises the steps:
 - (a) contacting said printed wiring board with an aqueous polyelectrolyte homopolymer conditioner solution having a charge density from about 0.2 to about 2.5 milliequivalents (positive charge) per gram of dissolved polymer and having a pH in range from about 3 to about 5, followed by;
 - (b) contacting said printed wiring board with a dispersion of carbon black comprising:
 - (1) carbon black particles having an average particle size of less than about 3.0 microns in said dispersion;
 - (2) an effective dispersing amount of a surfactant which is compatible with said carbon black; and
 - (3) a liquid dispersing medium, wherein the amount of carbon black is sufficient to coat substantially all of said non-conducting surfaces and is less than about 4% by weight of said liquid dispersing medium; then
 - (c) separating substantially all of the liquid dispersing medium from said dispersion, thereby depositing said applied

carbon black particles in a substantially continuous layer on said non-conducting portions of said hole walls; and
(d) electroplating a substantially continuous metal layer over the deposited carbon black layer on said non-conducting portions of hole walls, thereby electrically connecting said metal layers of said printed wiring board.

4,874,478

METHOD OF FORMING A FLEXIBLE ABRASIVE

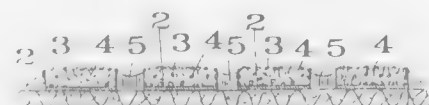
Maher Ishak, Pte. Claire, and Alexander Schwartz, Westmont, both of Canada, assignors to Diabrasive International Ltd., Ville St. Laurent, Canada

Filed Feb. 29, 1988, Ser. No. 161,940

Claims priority, application Canada, Feb. 27, 1987, 530811; Mar. 13, 1987, 531996; Oct. 21, 1987, 549901; Nov. 20, 1987, 552387; Jan. 7, 1988, 556049
Int. Cl.⁴ C25D 15/00

U.S. Cl. 204—16

34 Claims



1. A method of forming an abrasive member, comprising:
 - laminating a metal foil to one surface of a non-conductive flexible sheet to form a composite substrate,
 - applying a mask of plating resistant material to the exposed surface of the metal foil, said plating resistant material having a multitude of discrete openings therein,
 - electrodepositing metal through said discrete openings onto said metal foil in the presence of particulate abrasive material so that the electrodeposited metal adheres directly to said metal foil and the abrasive material becomes embedded in the electrodeposits,
 - stripping away the mask from the sheet to expose the metal foil, and
 - etching away the metal foil between the discrete metal electrodeposits to expose the flexible sheet.

4,874,479

METHOD AND DEVICE FOR FEEDING PLATE SHAPED OBJECTS INTO AND FROM SUSPENSION FRAMES OF AN INSTALLATION FOR CHEMICAL TREATMENT IN BATHS, PARTICULARLY IN ELECTROPLATING BATHS

Peter Haase, Feucht; Thomas Kosikowski, Nuremberg, and Horst Steger, Altdorf, all of Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Division of Ser. No. 153,133, Feb. 8, 1988. This application Jan. 17, 1989, Ser. No. 298,517

Claims priority, application Fed. Rep. of Germany, Feb. 6, 1987, 3703542

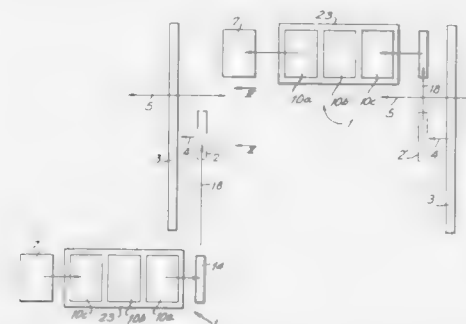
Int. Cl.⁴ C25O 5/00

U.S. Cl. 204—27

5 Claims

1. A method of loading or unloading plate-like objects to or from suspension frames mounted on a supporting structure in an installation for chemical treatment of the objects in baths, particularly in electroplating baths, wherein the objects in the suspension frames are held in vertical position, comprising the steps of placing the plate shaped objects one after the other in a station arranged near a side of the supporting structure; orienting each object into a vertical position at the station; transporting the objects in their vertical position from the station to a feeding point opposite an assigned suspension frame; transferring the objects at the feeding point into the

assigned frame; after the chemical treatment, separating the object from the suspension frame at a transfer point; and trans-



porting the objects from the transfer point to a discharging station.

4,874,480

PROCESS FOR TREATMENT OF TITANIUM AND TITANIUM ALLOYS

Sakae Sonoda, Kouji Hetsugi, Yoshihiko Sawasaki, Kouji Kaburagi, and Yasunobu Matsushima, all of Kanagawa, Japan, assignors to Henkel Corporation, Ambler, Pa.

Filed Apr. 20, 1988, Ser. No. 184,548

Claims priority, application Japan, Apr. 20, 1987, 62-97216
Int. Cl.⁴ C25D 11/36

U.S. Cl. 204—56.1

19 Claims

1. A process for improving the lubricity and cold working characteristics of an object made of titanium or a titanium alloy, said process comprising:
 - (a) immersing said object made of titanium or titanium alloy as a cathode in an electrolytic conversion coating solution containing an effective concentration of acidic zinc phosphate present as zinc and phosphoric acid ions;
 - (b) maintaining electrolysis conditions to form an adherent zinc phosphate film on said object; and
 - (c) treating said adherent zinc phosphate film with a lubricant.
15. A process for improving the lubricity and cold working characteristics of an object made of titanium or a titanium alloy, said process comprising:
 - (a) treating said object made of titanium or titanium alloy with a colloidal titanium-based surface adjustment agent;
 - (b) immersing said object made of titanium or titanium alloy as a cathode in an electrolytic conversion coating solution containing an effective concentration of acidiz zinc phosphate present as zinc and phosphoric acid ions;
 - (c) maintaining electrolysis conditions to form an adherent zinc phosphate film on said object; and
 - (d) treating said adherent zinc phosphate film with a lubricant.

4,874,481

N,N'-DIPHENYLBENZIDINE POLYMER AND METHOD OF PRODUCING THE SAME

Tetsuro Suzuki, Fuji; Masao Yoshikawa, Numazu, and Akio Kojima, Hiratsuka, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 900,414, Aug. 26, 1986, abandoned.

This application May 2, 1988, Ser. No. 188,756

Claims priority, application Japan, Sep. 2, 1985, 60-191991
Int. Cl.⁴ C25B 3/00, 3/10

U.S. Cl. 204—59 R

15 Claims

1. An N,N'-diphenylbenzidine polymer prepared by electrochemically polymerizing N, N'-diphenylbenzidine having the formula (I) as monomer:



(I)

4,874,482

PROCESS FOR THE ELECTROLYTIC PRODUCTION OF NON-METALS

Anthony Honders; Alfred J. Horstik, and Gerbrand J. M. Van Eyden, all of Arnhem, Netherlands, assignors to Shell Internationale Research Maatschappij B.V., The Hague, Netherlands

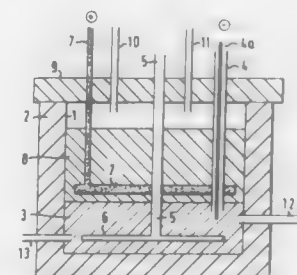
Filed Mar. 15, 1988, Ser. No. 167,752

Claims priority, application United Kingdom, Apr. 1, 1987, 8707760

Int. Cl.⁴ C25B 1/00

U.S. Cl. 204—60

22 Claims



1. A process for the production of non-metallic element Nm or a mixture/compound containing Nm from a non-metal halide NmX_n or a complex halide A_mNmX_o by electrolysis in a cell comprising an anode, a liquid metal cathode comprising one or more metals M and a liquid electrolyte comprising a salt melt of one or more alkali metal halides or alkaline earth metal halides, which comprises the steps of: introducing non-metallic halide NmX_n or complex halide A_mNmX_o directly into the liquid metal cathode and withdrawing Nm or a mixture/compound containing Nm from the metal cathode material, wherein Nm represents a non-metallic element selected from the group consisting of 3a, 4a, 5a, and 6a of the periodic table, X represents halogen, n represents the valency of Nm, A represents an alkali metal and o represents the valency of Nm plus

4,874,483

PROCESS FOR THE PREPARATION OF REDOX BATTERY ELECTROLYTE AND RECOVERY OF LEAD CHLORIDE

Ataru Wakabayashi; Yoshichi Umehara, both of Yokohama; Satsuki Morie; Ikuro Kuwahara, both of Kawasaki, and Yoshimi Okada, Yokohama, all of Japan, assignors to Chiyoda Corporation, Japan

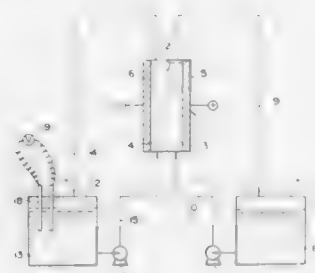
Filed Jan. 31, 1989, Ser. No. 304,265

Claims priority, application Japan, Feb. 4, 1988, 63-22844; Nov. 24, 1988, 63-297966

Int. Cl.⁴ H01M 8/18; C25B 1/26; C25C 1/24

U.S. Cl. 204-94

10 Claims



1. A process for the preparation of a redox battery electrolyte, comprising the steps of:

(a) dissolving a raw material containing sources of chromium ions and/or iron ions and nickel ions in a hydrochloric acid-containing aqueous liquid to form a solution containing chromium ions and/or iron ions and nickel ions;

(b) subjecting the solution to an electrolytic reduction in a cathode compartment in the presence of lead ions until the electric potential of the solution becomes lower than -0.6 V vs. saturated calomel electrode, thereby to cause the nickel ions to deposit on the cathode together with the lead ions.

2. A process according to claim 1, further comprising the steps of:

(c) after step (b), discharging the solution from the cathode compartment for recovery;

(d) then introducing a cleaning liquid into the cathode compartment to dissolve the deposits on the cathode to obtain a liquor containing lead and nickel ions;

(e) discharging said liquor from the cathode compartment;

(f) recovering the lead ions as lead chloride.

4. A process according to claim 2, wherein said cleaning liquid is hydrochloric acid and wherein step (d) includes subjecting the cathode on which nickel and lead have deposited to anodic oxidation in the hydrochloric acid.

4,874,484

ETCHING METHOD FOR GENERATING APERTURED OPENINGS OR TRENCHES IN LAYERS OR SUBSTRATES COMPOSED OF N-DOPED SILICON

Helmut Foell, and Volker Lehmann, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed May 13, 1988, Ser. No. 193,760

Claims priority, application Fed. Rep. of Germany, May 27, 1987, 3717851

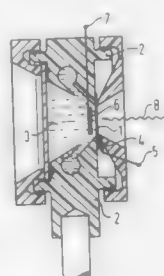
Int. Cl.⁴ C25F 3/12

U.S. Cl. 204-129.3

9 Claims

1. A method for generating apertured openings or trenches in substrates composed of n-silicon, as used in the manufacture of semiconductor components, especially LSI semiconductor circuits, through masked etching, wherein an electrolytic etching is carried out in an electrolyte containing hydrofluoric acid, through the application of a constant or chronologically varying potential, the silicon substrate being connected as a

positively polarized electrode of an electrolysis cell, the electrolysis being injected by illuminating the silicon member



proceeding from a backside and a structured silicon nitride layer is used as an etching mask.

4,874,485

METHOD FOR THE TREATMENT OF WASTE MATTER
David F. Steele, Caithness, United Kingdom, assignor to United Kingdom Atomic Energy Authority, London, United Kingdom

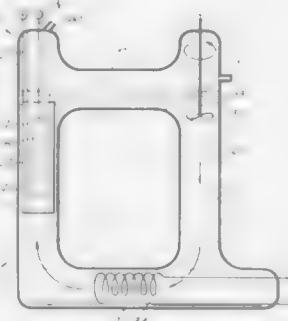
Filed Jun. 13, 1988, Ser. No. 205,848

Claims priority, application United Kingdom, Jun. 29, 1987, 8715195; Jun. 29, 1987, 8715196

Int. Cl.⁴ C02F 1/46

U.S. Cl. 204-130

14 Claims



1. A method of treating organic waste matter in which an aqueous electrolyte comprising nitric acid and containing silver ions as an electrochemically regenerable primary oxidising species is subjected to an electric potential, characterised in that the method is performed at a temperature above 50° C. to produce secondary oxidising species from the interaction of the primary oxidising species and the aqueous electrolyte, and the organic matter is added to the electrolyte either continuously or periodically whereby decomposition of the initially and the subsequently added organic matter is predominantly effected by the secondary oxidising species, the primary oxidising species following reduction in the course of the interaction with the aqueous electrolyte being regenerated by the electric potential.

4,874,486

PROCESS FOR THE RECYCLING OF ELECTRICAL BATTERIES, ASSEMBLED PRINTED CIRCUIT BOARDS AND ELECTRONIC COMPONENTS

Jozef Haulik, Zurich, Switzerland, assignor to RecyTec S.A., Switzerland

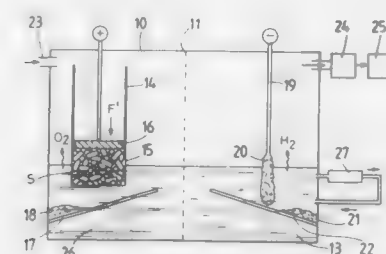
Filed Dec. 3, 1987, Ser. No. 128,398

Claims priority, application Switzerland, Dec. 12, 1986, 4940/86

Int. Cl.⁴ C25F 5/00

U.S. Cl. 204-140

13 Claims



1. A process for the recycling of electrical batteries for equipment of any chemical composition, and of assembled printed circuit boards and electronic components, the starting materials being heated and metals present in the residue being electrolytically deposited, wherein:

(a) a pyrolysis of the unsorted mixture is carried out in a closed furnace at a temperature between 450° C. and 650° C.;

(b) The pyrolysis slag is treated with water or with forofluoric wash acid diluted with water and filtered;

(c) the filter cake is dissolved in borofluoric acid solution;

(d) said borofluoric acid solution is used as an electrolyte for carrying out an electrolysis of the dissolved pyrolysis slag in a low-temperature range;

(e) a separation of the anode sludge and the cathode sludge accumulating under both electrodes is carried out, and these sludges are treated for reutilization of the resulting products.

4,874,487

CORROSION PROTECTION

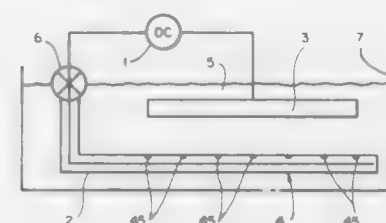
James P. Reed, San Francisco; Michael Masia, and Albert Highe, both of Redwood City, all of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Continuation of Ser. No. 888,198, Jul. 18, 1986, abandoned. This application Jan. 11, 1988, Ser. No. 142,153

Int. Cl.⁴ C23F 13/02

U.S. Cl. 204-147

19 Claims



1. An assembly for cathodically protecting an electrically conductive substrate from corrosion, the assembly comprising

(1) an electrically conductive substrate which is liable to corrosion;

(2) an elongate distributed anode which has a shape corre-

sponding generally to the shape of the substrate and which is relatively close to all points on the substrate; and

(3) a barrier which (i) lies between the substrate and the anode, (ii) is spaced apart from the substrate and from the anode, and (iii) is in the form of a tube which surrounds the anode and has a plurality of ion-permeable sections therein such that, when the anode and the substrate are electrically connected to opposite poles of a DC power source and are electrically connected by means of an electrolyte, the barrier restricts the flow of current between the substrate and the anode so that the resistance between the substrate and the anode is Q times the resistance between them in the absence of barrier, where Q is at least 1.5; and

(4) a pump for pumping liquid electrolyte down the tube and through the ion-permeable sections towards the substrate.

4,874,488

PHOTOCHEMICAL DIMERIZATION AND FUNCTIONALIZATION OF ALKANES, ETHERS, PRIMARY AND SECONDARY ALCOHOLS, PHOSPHINE OXIDES AND SILANES

Robert H. Crabtree, Bethany, and Stephen H. Brown, East Haven, both of Conn., assignors to Yale University, New Haven, Conn.

Continuation-in-part of Ser. No. 928,491, Nov. 10, 1986, Pat. No. 4,725,342. This application Nov. 10, 1987, Ser. No. 119,461. The portion of the term of this patent subsequent to Feb. 16, 2005, has been disclaimed.

Int. Cl.⁴ B01J 19/08; C07C 2/76, 29/00, 31/00

U.S. Cl. 204-157.15

24 Claims

1. A method of improving at least one of the selectivity and space-time yield of a Group IIB photosensitized vapor phase dimerization, which comprises dimerizing a gaseous mixture of (a) a Group IIB metal and (b) a saturated hydrocarbon secondary alcohol, or a mixture of either a saturated hydrocarbon or a saturated hydrocarbon ether, and a saturated hydrocarbon secondary alcohol, at a reaction temperature at which the reaction product condenses immediately upon the formation thereof and remains condensed while exposed to the photosensitizing radiant energy.

4,874,489

PROCESS FOR THE PRODUCTION OF CHLORINE DIOXIDE

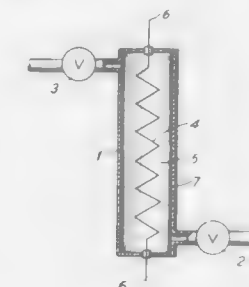
Joseph Callera, 2220 Casper Dr., Lake Havasu City, Ariz. 86403

Filed Jul. 11, 1988, Ser. No. 217,385

Int. Cl.⁴ C01B 11/02

U.S. Cl. 204-157.44

10 Claims



1. Process of producing chlorine dioxide which comprises introducing a chlorite into a reaction space and subjecting the chlorite to ultraviolet radiation.

4,874,490

PRE-CAST GEL SYSTEMS FOR TWO-DIMENSIONAL ELECTROPHORESIS

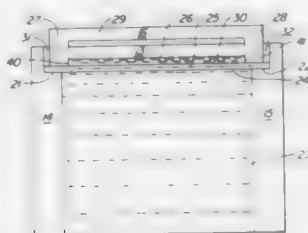
Denis F. Hochstrasser, Geneva, Switzerland, assignor to Bio-Rad Laboratories, Inc., Hercules, Calif.

Filed Nov. 4, 1988, Ser. No. 267,069

Int. Cl.⁴ G01N 27/26

U.S. Cl. 204—182.1

21 Claims



20. A method for separating a sample into components by two-dimensional electrophoresis, said method comprising:

- providing a two-dimensional electrophoresis gel arrangement comprising a first gel in the form of an elongate strip having an elongate dimension and a second gel in the form of a slab, said first and second gels retained on a single gel support means, and said first and second gels separated by an intervening region of a material which is solid at room temperature and has a melting point between about 25° C. and about 75° C.;
- loading said sample onto said first gel at one end thereof;
- imposing an electric field across said first gel in a direction parallel to said elongate dimension, to effect electrophoretic separation therein of said components of said sample into zones;
- heating said nonconductive material above said melting point;
- removing said nonconductive material while in the liquid state; and
- moving said first gel toward said second gel to place said first and second gels in direct contact; and
- imposing an electric field across both said first and second gels in a direction transverse to said elongate dimension, to effect electrophoretic separation of said zones in said second gel.

4,874,491

METHOD OF SUPPLYING BUFFER SOLUTIONS TO ELECTROPHORETIC SEPARATION PROCEDURES

Ralph I. Stalberg, Uppsala, Sweden, assignor to Pharmacia AB, Uppsala, Sweden

PCT No. PCT/SE87/00057, § 371 Date Sep. 14, 1987, § 102(e) Date Sep. 14, 1987, PCT Pub. No. WO87/04948, PCT Pub. Date Aug. 27, 1987

PCT Filed Feb. 19, 1987, Ser. No. 103,040

Claims priority, application Sweden, Feb. 13, 1986, 8600628

Int. Cl.⁴ B01K 5/00

U.S. Cl. 204—182.8

4 Claims



1. In the known electrophoretic separation process that involves depositing a sample volume on a gel matrix that is in contact with two electrodes and a buffer substance, then applying an electric field between two electrodes whereby charged components of the sample are caused to migrate in the gel matrix, the improvement comprising that said buffer substance is incorporated in a gel material so as to form a solid buffer gel

that has good mechanical strength properties such that a supporting vessel is not required, said gel material being selected from the group consisting of agarose and a polyacrylamide.

4,874,492

ANALYSIS OF SAMPLES BY ELECTROPHORESIS USING A CHARGE COUPLED DEVICE

Craig D. Mackay, Cambridge, Great Britain, assignor to Astromed Limited, Cambridge, Great Britain

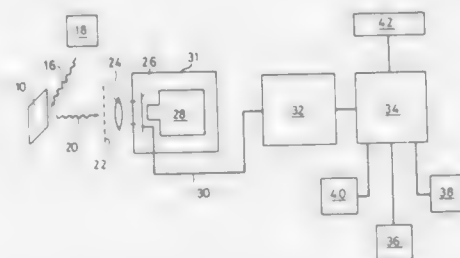
Continuation-in-part of Ser. No. 867,494, May 28, 1986, abandoned. This application Jun. 6, 1988, Ser. No. 203,482

Claims priority, application United Kingdom, May 29, 1985, 851352N

Int. Cl.⁴ G01N 27/26

U.S. Cl. 204—182.8

12 Claims



1. A method of analysing biological samples by use of electrophoresis comprising the steps of: treating the samples with fluorescent marking material so that components of the samples are fluorescently marked; applying the fluorescently marked samples to an electrophoretic gel; running the gel to effect electrophoresis causing differential migration of different components; irradiating the gel with an U/V source to render the marked components visible; detecting the pattern of light emanating from the marked components by means of a light sensitive charge coupled device (CCD), said CCD being a silicon CCD having a two-dimensional detector array and being operated in slow scan mode; and cooling the CCD to a temperature less than -25 degrees C. During detection.

4,874,493

METHOD OF DEPOSITION OF METAL INTO CAVITIES ON A SUBSTRATE

Ju-Don T. Pan, Austin, Tex., assignor to Microelectronics and Computer Technology Corporation, Austin, Tex.

Filed Mar. 28, 1988, Ser. No. 174,054

Int. Cl.⁴ C23C 14/46; H01L 21/88

U.S. Cl. 204—192.11

6 Claims



1. A process for achieving the deposition of a metal into cavities in a substantially flat surface of a substrate and substan-

tially filling the cavities without leaving enclosed holes comprising:

- depositing metal in the cavities and on the surface of the substrate by ion beam sputter deposition, and simultaneously re-sputtering the deposited metal on the flat surface by ion beam milling thereby substantially completely removing the film on the flat surface without removing the metal deposited in the cavities.

4,874,494

SEMICONDUCTOR MANUFACTURING APPARATUS

Tadahiro Ohmi, 1-17-301, Komegakuro 2-chome, Sendai-shi, Miyagi-Ken 980, Japan

PCT No. PCT/JP87/00357, § 371 Date Feb. 5, 1988, § 102(e) Date Feb. 5, 1988, PCT Pub. No. WO87/07651, PCT Pub. Date Dec. 17, 1987

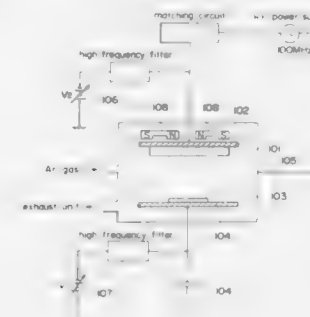
PCT Filed Jan. 6, 1987, Ser. No. 157,507

Claims priority, application Japan, Jun. 6, 1986, 61-131188

Int. Cl.⁴ C23C 14/36

U.S. Cl. 204—192.12

5 Claims



3. A method for depositing a thin film on a substrate surface by bias-sputtering, comprising the steps of: mounting a target on a target electrode in a vacuum vessel; applying a power source of high frequency greater than 100 MHz to said target and further applying a desired DC bias potential to at least one of a susceptor serving to hold said substrate and said target.

4,874,495

APPARATUS FOR PRODUCING A FIBER AGGREGATE

Tomohito Ito, Ohbu, Renichi Isomura, Kariya, Hidetoshi Hirai, Ichinomiya, and Fukuo Gomi, Nagoya, all of Japan, assignors to Kabushiki Kaisha Toyota Jidoshokki Seisakusho, Kariya, Japan

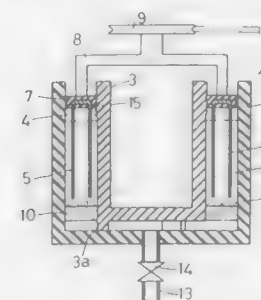
Filed Sep. 22, 1987, Ser. No. 99,900

Claims priority, application Japan, Sep. 24, 1986, 61-225592; Mar. 11, 1987, 62-55799

Int. Cl.⁴ C25D 17/10, 9/00

U.S. Cl. 204—212

9 Claims



6. An apparatus for producing a fiber aggregate comprising: a vessel having a closed base comprising an inner cylinder

and a concentric outer cylinder having a central axis and including an annular space therebetween;

- a plurality of electrodes, comprising positive electrodes and negative electrodes disposed alternately in the annular space at equal intervals, wherein said electrodes are selected from the group consisting of foil electrodes, mesh electrodes, electrodes comprising a plurality of substantially vertical wires disposed in a plane, and a combination thereof;

means for rotating said electrodes around the central axis of said annular space;

means for filtering disposed in a lower part of said annular space;

means for raising said electrodes in relation to accumulated height of a layer of aggregated fiber on said filtering means;

means for draining disposed at the bottom of said vessel; and

means for applying voltage connected to said electrodes.

4,874,496

DEVICE FOR SILVERIZING DRINKING WATER

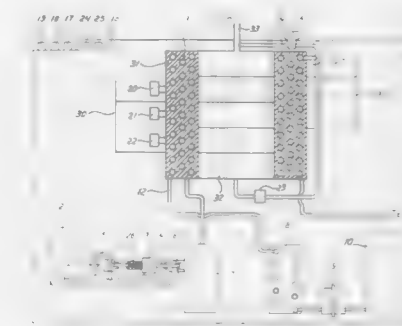
Maryann Chak, and Alexander Chak, both of 2901 Ocean Pkwy., Brooklyn, N.Y. 11235

Filed Jan. 6, 1989, Ser. No. 294,381

Int. Cl.⁴ C25B 9/00, 15/00

U.S. Cl. 204—229

11 Claims



1. A device for silverizing drinking water, comprising a plurality of electrodes including electrodes composed of silver and connectable with an electrical source; means forming an inlet and an outlet arranged so that water passes from said inlet to said outlet near said electrodes to be saturated with silver ions; and means for maintaining a desired temperature of water and including means for cooling the water and means for heating the water, and means for alternately activating said cooling means and said heating means in response to sensing a temperature of water.

9. A device for silverizing water as defined in claim 1; and further comprising means for activating said electrodes upon filling the water to a predetermined level and including an activating switch and a float arranged to activate said switch upon filling the water to a predetermined level and therefore raising the float to said level.

4,874,497

THIN FILM FORMING APPARATUS

Morito Matsuo, Hitachi, and Ken'ichi Ono, Mito, both of Japan, assignors to Nippon Telegraph and Telephone Corporation, Tokyo, Japan

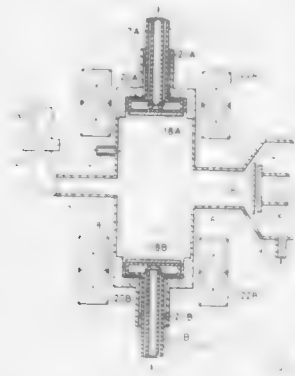
PCT No. PCT/JP87/00759, § 371 Date Jan. 8, 1988, § 102(e) Date Jan. 8, 1988, PCT Pub. No. WO88/02791, PCT Pub. Date Apr. 21, 1988

PCT Filed Oct. 8, 1987, Ser. No. 210,511

Claims priority, application Japan, Oct. 11, 1986, 61-241740 Int. Cl.⁴ C23C 14/34

U.S. Cl. 204—298

4 Claims



1. A thin film forming apparatus comprising:

- a vacuum chamber consisting of a vacuum waveguide having a microwave introduction window at one end thereof, said microwave introduction window being connected to a microwave waveguide, a plasma generation chamber having a diameter and a length sufficient to define a microwave cavity resonator for causing resonance of the introduced microwave energy, and a specimen chamber adapted to contain a specimen substrate to be coated with a thin film, all connected with each other in the order named, and further having a gas introduction inlet;
- at least one pair of magnetic field generating means which are disposed around the outer side of both the end portions of said plasma generation chamber so that a mirror field is produced in such a way that the center of the magnetic field exists within said plasma generation chamber;
- a pair of targets disposed within and at both ends of said plasma generation chamber perpendicular to the directions of the magnetic fluxes produced by said at least one pair of magnetic field generating means and adapted to be applied with a negative potential; and
- said specimen chamber being connected to said plasma generation chamber in the direction perpendicular to said magnetic fluxes, whereby said specimen substrate is not subjected to bombardment by high energy particles.

4,874,498

APPARATUS FOR REGULATING THE CONCENTRATION OF AN OXIDIZING SOLUTION BY MEASURING THE REDOX POTENTIAL THEREOF

Jean-Michel Freal-Saison, Chatou, France, assignor to Henkel France S.A., Gentilly, France

Filed Mar. 16, 1987, Ser. No. 25,958

Claims priority, application France, Mar. 17, 1986, 86 03745 Int. Cl.⁴ G01N 27/26, 27/28

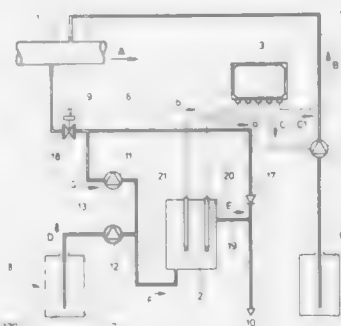
U.S. Cl. 204—400

21 Claims

- 1. A system for regulating the concentration of an oxidizing solution which contains disinfecting molecules and which is circulated in a closed circuit manner in a main pipe, by measuring the Redox Potential of said oxidizing solution, comprising
 - a. a reservoir for a concentrated solution of disinfecting

molecules connected to said main pipe by readjustment pipe means;

- b. means for selectively directing said concentrated solution into said main pipe;
- c. a measuring cell means having electrode means for measuring the Redox Potential and pH of the oxidizing solution;
- d. a regulator responsive to said electrode means to determine a value of the concentration of the disinfecting molecules in response to signals transmitted by the electrode means, to compare said value with a control value and to control operation of the directing means so as to inject into the main pipe an adequate quantity of the concentrated solution to establish the control value in the oxidizing



ing solution, with injection of the concentrated solution being automatically stopped when the control value is reached;

- e. a secondary pipe means leading from the main pipe upstream of the readjustment pipe means relative to flow direction of the oxidizing solution, to the measuring cell means to introduce a portion of the oxidizing solution to the measuring cell means;
- f. a reservoir means containing an adapting solution containing a reducing agent and a buffer element; and
- g. means to supply said adapting solution in a given proportion to said portion of the oxidizing solution in order to reduce its redox potential to a level at which it is possible to measure, and inhibit polarization of the electrode means and buffer the pH of said portion of the oxidizing solution.

4,874,499

ELECTROCHEMICAL MICROSENSORS AND METHOD OF MAKING SUCH SENSORS

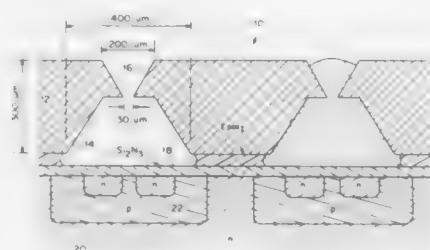
Rosemary L. Smith, and Scott D. Collins, both of Newton, Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed May 23, 1988, Ser. No. 197,561

Int. Cl.⁴ G01N 27/30

U.S. Cl. 204—403

40 Claims



1. An electrochemical microsensor comprising:

- a substrate containing microelectronic means for sensing potential or current;

4,874,501

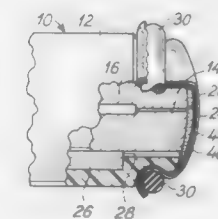
MEMBRANE FOR AN ELECTROCHEMICAL MEASURING ELECTRODE DEVICE

Torben F. Christiansen, Holte, and Finn Kokholm, Copenhagen, both of Denmark, assignors to Radiometer A/S, Copenhagen, Denmark

Division of Ser. No. 106,959, Oct. 14, 1987, Pat. No. 4,780,192, which is a continuation of Ser. No. 875,645, Jun. 18, 1986, abandoned. This application Jun. 29, 1988, Ser. No. 213,243 Claims priority, application Denmark, Jun. 18, 1985, 2738/85 Int. Cl.⁴ G01N 27/42

U.S. Cl. 204—415

12 Claims



- a micromachined structure having openings extending into a cavity therein from opposite sides of the structure, wherein said structure has been produced by photolithographic transfer of a two dimensional pattern onto a material to form a three dimensional structure following selective removal of the material; and
- wherein the structure containing the cavity has been positioned over the substrate so that an opening into the cavity extends over the sensing means and the cavity containing structure has been adhered to the substrate using a process which simultaneously adheres multiple structures to substrates as a single unit, with an adhesive forming a seal between the substrate and structure at a temperature less than approximately 400° C.

23. A method for manufacturing a chemical microsensor comprising:

- (i) providing a substrate containing microelectronic means for sensing potential or current;
- (ii) providing a micromachined structure having openings extending into a cavity therein from opposite sides of the structure, wherein said structure has been produced by photolithographic transfer of a two dimensional pattern onto a material to form a three dimensional structure following selective removal of the material; and
- (iii) positioning the structure containing the cavity over the substrate wherein an opening into the cavity extends over the sensing means; and
- (iv) using a process to adhere the cavity containing structure to the substrate which simultaneously adheres multiple structures to substrates as a single unit, at a temperature less than approximately 400° C.

4,874,500

MICROELECTROCHEMICAL SENSOR AND SENSOR ARRAY

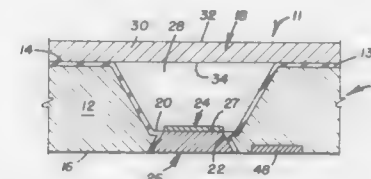
Marc J. Madou, Palo Alto, and Takaaki Otagawa, Fremont, both of Calif., assignors to SRI International, Menlo Park, Calif.

Filed Jul. 15, 1987, Ser. No. 73,805

Int. Cl.⁴ G01N 27/30

U.S. Cl. 204—412

54 Claims



- 1. A microelectrochemical electrode structure, comprising:
 - a monolithic substrate having a front surface and a back surface facing generally away from one another, a first well extending into said substrate from said front surface towards said back surface and ending in a first well bottom, and a first passage extending into said substrate from said back surface to said first well bottom;
 - a first electrode wholly between said front and back surfaces of said substrate; and
 - a first conductor in said first passage electrically communicating said first electrode to adjacent said back surface.

4,874,502

METHOD OF PURIFYING COAL TARS FOR USE IN THE PRODUCTION OF CARBON PRODUCTS

Masatoshi Tsuchitani, Ichihara, and Sakae Naito, Chiba, both of Japan, assignors to Maruzen Petrochemical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 936,978, Nov. 28, 1986, abandoned, which is a continuation-in-part of Ser. No. 850,143, Apr. 10, 1986, abandoned. This application Jul. 19, 1988, Ser. No. 231,998

Claims priority, application Japan, Apr. 16, 1985, 60-80793 Int. Cl.⁴ C10C 1/08, 1/04; D01F 9/12, 9/14

U.S. Cl. 208—45

4 Claims

- 1. A method of preparing a starting material for use in the production of a carbon product, said method comprising the following steps:

- distilling or flash distilling coal tars, containing light component having an initial boiling point of not more than 280° C. at atmospheric pressure with a fraction in an amount of at least 10% by weight which has a boiling point between the initial boiling point and 350° C. at atmospheric pressure and xylene-insoluble components in an amount of 15% or less by weight, to remove said light component; said distilling or flash distilling being performed at a temperature of 250° C. to 350° C. to prevent substantially all thermally induced condensation, polymerization or decomposition reactions;
- obtaining a heavy component which remains in the bottom of the distillation or flash column; said heavy component having a greater xylene-insoluble content of at least 1% and not more than 10% by weight than that of said coal tar; and having a xylene-insoluble content of not more than 20% by weight of said heavy component;
- dissolving the obtained heavy component in 1-3 times its amount of a monocyclic aromatic hydrocarbon solvent to form a solution at a temperature ranging from ambient temperature to the boiling point of said solvent and which

imparts flowability to said heavy component under atmospheric pressure or application of pressure; separating and eliminating the insoluble component from the resulting solution by filtration or centrifugation, which insoluble component comprises free carbon and components having very high molecular weights; and subsequently eliminating the solvent by distillation so as to obtain a purified heavy component substantially being free of the above insoluble component, as said starting material.

4,874,503

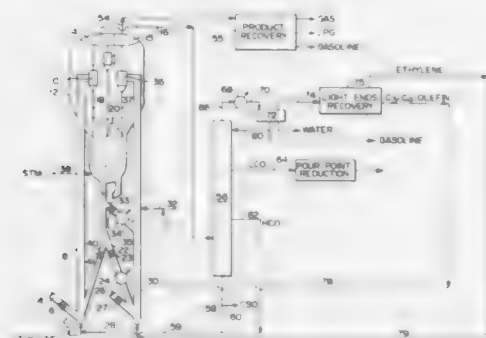
MULTIPLE RISER FLUIDIZED CATALYTIC CRACKING PROCESS EMPLOYING A MIXED CATALYST

Joseph A. Herbst, Turnersville; Hartley Owen, Belle Mead, both of N.J., and Paul H. Schipper, Wilmington, Del., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 144,731, Jan. 15, 1988, abandoned, which is a continuation of Ser. No. 903,352, Sep. 3, 1986, abandoned. This application Dec. 22, 1988, Ser. No. 291,411
Int. Cl.⁴ C10G 57/00; C07C 2/02

U.S. Cl. 208—67

22 Claims



1. A fluidized catalytic cracking (FCC) process for cracking in a first riser reactor a heavy feed to cracked products comprising lighter products including light olefins comprising ethylene, and olefinic gasoline over a catalyst mixture comprising a FCC catalyst and a shape selective zeolite additive said process characterized by:

- recovering as a product the gasoline fraction produced by riser cracking of the heavy feed in the first riser;
- recovering an ethylene rich charge material consisting essentially of catalytically cracked products and comprising at least 10 weight percent ethylene and the balance comprising propylene and butylene and mixtures thereof;
- separately recovering a light olefinic feed with a higher boiling point than the ethylene rich material, comprising C₃ and C₄ olefins and mixtures thereof;
- contacting in the base of a second riser reactor a feed consisting essentially of the ethylene rich charge material with the FCC catalyst and shape selective zeolite additive at a temperature of 400°–750° F.;
- converting in an exothermic conversion reaction a majority of the ethylene rich charge material in the base of the second riser to C₅⁺ as an intermediate product;
- contacting the mixture of C₅⁺ intermediate product and catalyst with the light olefinic feed comprising C₃ and C₄ olefins and mixtures thereof;
- reacting the C₅⁺ intermediate product with the light olefinic feed to form high octane gasoline which is discharged from the second riser.

4,874,504

PH CONTROL BY BULKY ORGANIC BASES DURING NOBLE-METAL EXCHANGE OF ZEOLITE CATALYSTS

Roland von Ballmoos, Hopewell, and Francis X. Ryan, Lambertville, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 139,211, Dec. 29, 1987, Pat. No. 4,814,306. This application Mar. 20, 1989, Ser. No. 325,636

Int. Cl.⁴ C10G 11/05, 35/095; C07C 2/12, 5/22

U.S. Cl. 208—111

26 Claims

1. A process for the conversion of hydrocarbons comprising the steps of contacting said hydrocarbons with a composite catalyst under conversion conditions which catalyst comprises a noble metal-containing zeolite prepared by a method comprising:

- mixing a zeolite with water to form an aqueous suspension;
- adjusting the pH of the aqueous suspension of step (a) to between about 4 and about 11 with an organic base of a size sufficient to prevent entry of the organic cations into the pores of the zeolite catalyst;
- adding to the suspension of step (b) an aqueous noble-metal salt solution;
- maintaining the pH of the mixture of step (c) at a uniform value between about 4 and about 11 by the controlled addition of the organic base of step (b), above;
- filtering the zeolite-water suspension of step (c) to separate the solid zeolite material; and
- drying the solid zeolite material.

4,874,505

RECYCLE OF OILY REFINERY WASTES

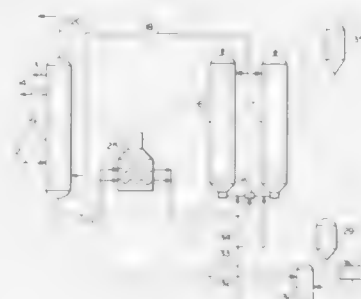
Mark P. Bartilucci, Clementon; Grant G. Karsner, Voorhees Township, Camden County, and William J. Tracy, III, Sewell, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Feb. 2, 1988, Ser. No. 151,380

Int. Cl.⁴ C10G 9/14, 17/00

U.S. Cl. 208—131

13 Claims



1. A process for recycling of petroleum containing sludge comprising:

- segregating waste oil-containing sludges into a relatively high oil content sludge and a relatively high water content sludge;
- introducing the high oil content sludge into a delayed coking drum under delayed coking conditions in the presence of a liquid coker hydrocarbon feedstock to form coke;
- introducing the high water content sludge into a delayed coking drum to quench the coke formed in the coking drum.

4,874,506

CATALYTIC TWO-STAGE COAL HYDROGENATION PROCESS USING EXTINCTION RECYCLE OF HEAVY LIQUID FRACTION

James B. MacArthur, Denville, N.J.; Alfred G. Comolli, Yardley, Pa., and Joseph B. McLean, Somerville, N.J., assignors to HRI, Inc., Lawrenceville, N.J.

Continuation-in-part of Ser. No. 876,307, Jun. 18, 1986, which is a continuation of Ser. No. 725,458, Apr. 22, 1985, abandoned.

This application Oct. 16, 1987, Ser. No. 109,646

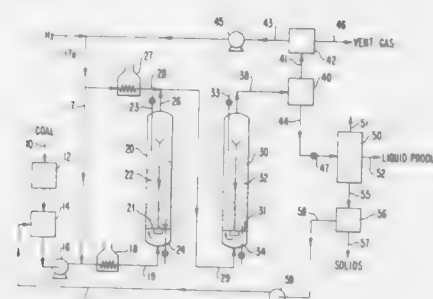
The portion of the term of this patent subsequent to Aug. 1, 2006,

has been disclaimed.

Int. Cl.⁴ C10G 1/00

U.S. Cl. 208—413

14 Claims



1. A process for catalytic two-stage hydrogenation of coal with selective liquid recycle to produce increased yields of low-boiling hydrocarbon liquid and gaseous products, comprising:

- feeding particulate coal and a hydrocarbon slurring oil at an oil:coal weight ratio between 1.0 and 4.0 and a temperature below a distillation cut point temperature of 600°–750° F. into a pressurized first stage catalytic reaction zone containing coal-derived liquid and hydrogen and an ebullated bed of particulate hydrogenation catalyst;
- passing said coal and hydrogen upwardly through said first stage ebullated bed of particulate hydrogenation catalyst, said bed being maintained at 700°–800° F. temperature, 1000–4000 psig hydrogen partial pressure and space velocity of 10–90 lb coal/hr per ft³ catalyst settled volume to rapidly heat the coal and catalytically hydrogenate it to produce a partially hydrogenated and hydro-converted coal-derived material;
- withdrawing said partially hydrogenated coal-derived material containing gas and liquid fractions from said first stage reaction zone, and passing said material directly to a close-coupled second stage catalytic reaction zone together with additional hydrogen, said second stage reaction zone being maintained at 760°–860° F. temperature and 1000–4000 psig hydrogen partial pressure for further reacting and hydrocracking the liquid fraction material therein with minimal dehydrogenation reactions to produce gas and lower boiling hydrocarbon liquid materials;
- withdrawing from said second stage catalytic reaction zone the hydrocracked material containing gas and liquid fractions, and phase separating said material into separate gas and liquid fractions;
- distilling said liquid fraction at 600°–750° F. temperature and passing the distillation bottoms from said distillation to a liquid-solids separation step, from which a liquid stream normally boiling above the 600°–750° F. distillation temperature and containing less than about 20 W % concentration of particulate solids is entirely extinction recycled to the coal slurring step, and a stream containing an increased solids concentration and substantially no hydrocarbon liquid material is removed from said liquid-solids separation step as the sole additional stream resulting from said liquid-solids separation step; and

(f) recovering hydrocarbon gas and low boiling C₄-750° F. fraction hydrocarbon liquid products from the process.

4,874,507

SEPARATING CONSTITUENTS OF A MIXTURE OF PARTICLES

David R. Whitlock, 138 Vassal La., Cambridge, Mass. 02138

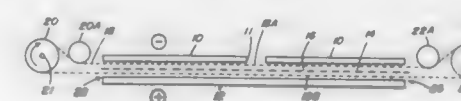
Continuation-in-part of Ser. No. 872,082, Jun. 6, 1986. This

application Mar. 29, 1988, Ser. No. 174,601

Int. Cl.⁴ B03C 9/00; B01D 17/00

U.S. Cl. 209—11

42 Claims



1. A method of separating different components of a mixture of a material in a separation chamber without requiring pneumatic, hydraulic or gravitational conveyance comprising the steps of:

- admitting said material into the separation chamber, said separation chamber having means defining confronting surfaces spaced more closely than the respective lengths of said confronting surfaces;
- impressing a separation influence toward at least one of said confronting surfaces of said separation chamber wherein said separation influence is chosen from the list of electric field, electric field gradient, magnetic field, magnetic field gradient, shear field, acceleration field, temperature gradient, vibration, gravitation field, flow field, shear gradient, concentration gradient, chemical affinity;
- separating said different components in the direction of said separation influence according to their relative influenceability to said separation influence;
- mechanically moving components of like net influenceability in streams each of unlike net influenceability near each other transversely to said separation influence, said streams being in communication parallel to said separation influence, so as to transfer a portion of at least one of said components to another of said respective streams of virtue of the continued action of said separation influence as said streams progress transversely to said separation influence;
- removing separated streams from said separation chamber.

4,874,508

MAGNETIC SEPARATOR

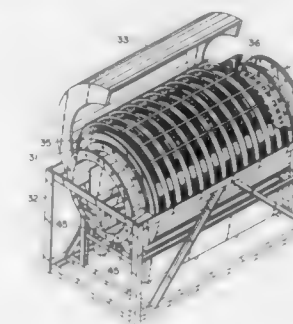
Alan J. Fritz, Grand Rapids, Minn., assignor to Magnetics North, Inc., Grand Rapids, Minn.

Filed Jan. 19, 1988, Ser. No. 146,039

Int. Cl.⁴ B03C 1/14

U.S. Cl. 209—214

30 Claims



1. A magnetic separator device comprising:

- (a) at least one race having first and second opposite side-walls and matrix material positioned therebetween, said race opposite sidewalls being flexible and selectively deformable toward and away from one another;
- (b) expansion means selectively expanding at least a portion of said matrix material from a more dense orientation to a less dense orientation;
- (c) motive means selectively rotating said race through a 360° arc about a central-axis-of-rotation;
- (d) ore-slurry feed means for selectively feeding an ore-slurry into said matrix material;
- (e) a magnetic zone including a first magnetic field applied across said race during a first selected portion of the 360° arc-of-rotation, to selectively retain magnetic material from the ore-slurry feed in said matrix materials; and
- (f) a release zone comprising a selected portion of said 360° arc-of-rotation at which no substantial magnetic field is applied across said race.

4,874,509

OXIDATION SATURATION DEVICE

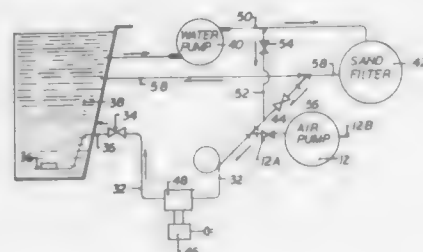
Donald Bullock, 31 Logging Hill Rd., Concord, N.H. 03301

Filed Apr. 24, 1987, Ser. No. 42,419

Int. Cl.⁴ B01F 3/04; C02C 5/06

U.S. Cl. 210—169

1 Claim



1. An apparatus for dissolving air in water circulated in a swimming pool, said swimming pool having a water filter and a circulating pump, said apparatus comprising:
- a pool water circulating pipe connecting the pool pump, the filter and an inlet and outlet to the pool;
- means for supplying air under pressure into water circulating in said pool water circulating pipe; said circulating pipe including a substantially long tube connected downstream of said means for supplying and for transporting a mixture of air and pool water, said tube having a length of at least about 25 feet to ensure optimum dissolution and saturation of the air into the water;
- a means for generating an alternating electrical or magnetic field in said mixture circulated in said pool water circulating pipe; and
- a back pressure valve means for maintaining a predetermined air-water pressure in said tube to achieve dissolution and saturation of the air into the water in said tube, said circulating pipe including an outflow end distributor means located at the bottom of said pool for introducing a supersaturated air-water mixture into said pool.

4,874,510

FILTER FOR FUEL TANK

Mizusawa Akira, and Kazumasa Kurihara, both of Yokohama, Japan, assignors to Nifco Inc., Yokohama, Japan

Continuation of Ser. No. 946,819, Dec. 29, 1986, abandoned.

This application Apr. 7, 1988, Ser. No. 180,704

Claims priority, application Japan, Jan. 17, 1986, 616271

Int. Cl.⁴ B01D 35/02

U.S. Cl. 210—172

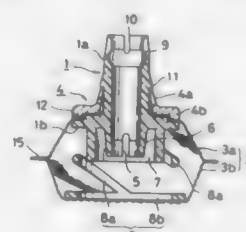
5 Claims

1. A fuel tank filter comprising: a mounting member provided on one end thereof with a cylindrical portion having a central bore for through passage of a fuel suction pipe and on

the other end thereof with a squeezing portion having at least one slit for gripping securement to the pipe;

a filter net member acting alone to filter fuel and having an opening filter on and fastened to said mounting member;

shape retaining means formed integrally with and supported by said mounting member, and disposed inside said net



member, said shape retaining means comprising resilient means arranged in annular pattern engaging and resiliently maintaining a circular portion of said filter net member substantially flat, said filter net member extending from said circular portion toward said mounting member and outwardly from said circular portion to a margin of maximum diameter and then tapering inwardly from said margin of maximum diameter to said mounting member.

4,874,511

APATITE CHROMATOGRAPHY COLUMN SYSTEM

Tsutomu Kawasaki, Tokyo, and Wataru Kobayashi, Tsuruoka, both of Japan, assignors to Koken Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 21,702, Mar. 4, 1987, abandoned. This application Oct. 19, 1988, Ser. No. 259,767

Claims priority, application Japan, Mar. 7, 1986, 61-49699

Int. Cl.⁴ B01D 15/08

U.S. Cl. 210—198.2

6 Claims



1. A column system for use in chromatography comprising:
- a main column packed with an adsorbent composed of secondary particles formed by aggregation of fine primary hydroxyapatite crystal particles,
- said secondary particles having been sintered, wherein a sintering bond is formed between the aggregated fine primary hydroxyapatite crystal particles; and
- a precolumn provided at the fluid inlet into said main column so as to be connected in communication with or disconnected from said main column packed with a second adsorbent consisting of hydroxyapatite crystal particles having resistivity to the chemical and physical loads applied from the fluid introduced into the column,
- said second adsorbent being either of a first type hydroxyapatite crystal particles or a second type hydroxyapatite crystal particles,
- wherein said first type hydroxyapatite crystal particles hav-

ing been produced by having an alkali act on crystal particles of brushite used as the starting material, and said second type hydroxyapatite crystal particles having been produced by the steps of heating brushite crystal particles used as the starting material, to a temperature range of not lower than the dehydration transition temperature and not higher than the decomposition temperature thereof, to cause dehydration and phase transition of the brushite crystal particles, and thus producing monetite crystal particles, and subsequently acting an alkali on the thus produced monetite crystal particles to produce hydroxyapatite substantially monocystal particles.

4,874,512

FILTER PRESS CLOTH HANGER

Douglas W. Brown, Staffordshire, England, assignor to Coal Industry (Patents) Limited, London, England

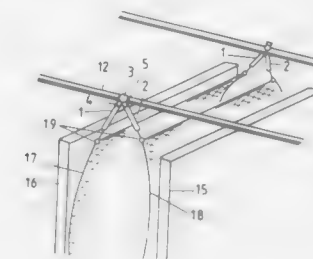
Filed Aug. 10, 1988, Ser. No. 230,423

Claims priority, application United Kingdom, Sep. 3, 1987, 8720721

Int. Cl.⁴ B01D 25/32

U.S. Cl. 210—225

13 Claims



1. A filter press cloth hanger for a filter press comprising a pair of arms hinged connected at their upper ends and each including at their lower ends latching means for attaching each arm to a respective filter cloth suspension member to the lower end of the arm in a filter press, each of said arms including spring loaded extendable means carrying the latching means and means for suspending the cloth hanger above the filter press via the hinged connection.

4,874,513

DISPOSABLE FILTER UNIT WITH FILTER SUPPORT MEANS AT BOTH SIDES OF THE FILTER ELEMENT

Asok Chakraborty, Gottingen; Herbert Urlaub, Einbeck; Franz Grof, and Klaus Cosack, both of Dassel, all of Fed. Rep. of Germany, assignors to Schleicher & Schuell GmbH, Fed. Rep. of Germany

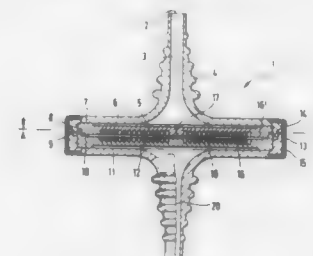
Filed Jan. 19, 1989, Ser. No. 300,232

Claims priority, application Fed. Rep. of Germany, Jan. 22, 1988, 3801866

Int. Cl.⁴ B01D 27/08, 29/04

U.S. Cl. 210—321.84

5 Claims



1. A disposable filter unit comprising a pair of housing parts

connected together, wherein each housing part includes a centrally arranged connecting sleeve serving as one of an inlet for fluid to be treated and an outlet for the filtrate, respectively, a filter support means for supporting a filter element arranged between said filter support means, said filter support means including:

a pair of grate-shaped filter supports (5,12) having concentrically arranged substantially coplanar circular webs (16);

a baffle plate (17) arranged centrally with respect to the webs (16) and substantially coplanar therewith;

radially extending supports webs (18) to which webs (16) and the baffle plate (17) are fixed at a side of the filter support facing away from the filter element;

a broad support area defined by a ring-type web (16') located peripherally about the support webs;

said filter supports including lipped edges (9,10) at the peripheral ring-type webs (16') interlocking with each other in a fluid-tight and form locking manner while simultaneously fixing the filter element between the filter supports;

wherein peripheral edges (13,14) of the housing parts (6,11) including means for interlocking with each other in a fluid-tight and form locking manner, and

said connecting sleeves (3,20) having funnel-shaped inlet and outlet fluid flow passages arranged such that the filter support means comes into contact with the housing parts (6,11) only at peripheral areas (7,8) thereof.

4,874,514

TUBULAR ELEMENT FOR REVERSE OSMOSIS WATER PURIFICATION

Walter P. Casey Jr., Las Vegas, Nev., assignor to Wetco of Delaware, Inc., Decatur, Ga.

Continuation-in-part of Ser. No. 567,184, Dec. 30, 1983, Pat. No. 4,715,952, which is a continuation of Ser. No. 357,213, Mar. 11, 1982, abandoned. This application Jun. 20, 1984, Ser. No. 622,499

Int. Cl.⁴ B01D 13/01

U.S. Cl. 210—321.87

12 Claims



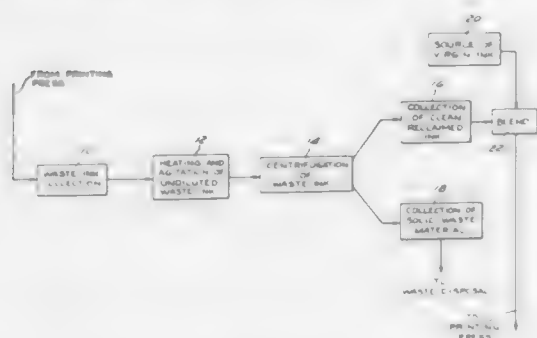
1. An element for reverse osmosis purification of an aqueous fluid comprising a rigid, impermeable, straight, elongate, hollow cylindrical tubular member, said member having a plurality of substantially parallel grooves circumferentially spaced around the external periphery of the tubular member, each groove extending substantially the entire length of the tubular member, a single elongate fiber having a substantially circular cross-section wrapped helically around the external periphery of the tubular member substantially along the entire length of said member, each turn being substantially uniformly spaced apart from each adjacent turn by a distance of from about $\frac{1}{4}$ to about $\frac{3}{4}$ of the fiber diameter, and a reverse osmosis membrane supported on the fiber.

4,874,515

INK RECLAMATION SYSTEM

John L. McKelvey, Lakeland, Fla., assignor to The Ink Company, W. Sacramento, Calif.
Division of Ser. No. 137,235, Dec. 22, 1987, Pat. No. 4,818,284.
This application Oct. 13, 1988, Ser. No. 257,290
Int. Cl.⁴ B01D 17/038; C09D 11/02
U.S. Cl. 210—360.1

16 Claims



1. A system comprising: means for reclaiming undiluted waste ink containing solid and liquid contaminants, including:
 - a first vessel means for storing, heating and agitating undiluted waste ink, said first vessel including means to maintain said undiluted waste ink at sufficient temperature, and under sufficient agitation for sufficient time to cause volatilization of at least some of said liquid contaminants therefrom;
 - a centrifuge means fluidly connected to said first vessel means, said centrifuge means, including means to receive said heated and agitated undiluted waste ink from and to separate said solid contaminants therefrom, thereby providing an undiluted liquid clarified ink fraction and a solid contaminant fraction; and
 - a second vessel means including means to subsequently collect and blend said undiluted clarified ink with a sufficient quantity of virgin ink to form a clarified ink/virgin ink mixture having desirable properties.
7. A system comprising: means for reclaiming undiluted waste ink containing solid and liquid contaminants, including:
 - a first vessel means for storing, heating and agitating undiluted waste ink, said first vessel including means to maintain said undiluted waste ink at sufficient temperature, and under sufficient agitation for sufficient time to cause volatilization of at least some of said liquid contaminants therefrom;
 - a centrifuge means fluidly connected to said first vessel means including means to receive said heated and agitated undiluted waste ink from said first vessel means and to separate therefrom said solid contaminants, thereby providing an undiluted liquid clarified ink fraction and a solid contaminant fraction; and
 - a second vessel means including means to subsequently collect and blend said undiluted clarified ink with a sufficient quantity of virgin ink to form a clarified ink/virgin ink mixture having desirable properties.

4,874,516

A CERAMIC FILTER FOR SEMI-ULTRAFILTRATION
Kuniharu Kondo, Nagoya, Japan, assignor to NGK Insulators, Ltd., Nagoya, Japan

Filed Dec. 23, 1985, Ser. No. 812,056

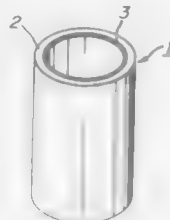
Claims priority, application Japan, Dec. 29, 1984, 59-279080
Int. Cl.⁴ B01D 13/00

U.S. Cl. 210—490

9 Claims

1. A filter comprising:
 - a substrate consisting essentially of a ceramic porous material, said ceramic porous material having an average pore diameter of between about 0.5 microns and about 10 mi-

cons and having a pore volume of 30–50% based on an apparent volume of the substrate; and
a microporous membrane consisting essentially of a high polymeric resin having an average pore diameter of about 0.1 microns to about 1 micron, said membrane covering at



least one surface of said ceramic porous material to a thickness of about 30–500 microns above said at least one surface and said membrane partly permeating into said ceramic porous material, thereby forming an intermediary layer between said ceramic porous material and said microporous membrane.

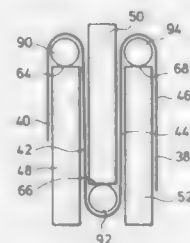
4,874,517

FILTER ARRANGEMENT WITH PLEAT DISTANCE PIECE

Hans W. Esch, Altenhasel, Fed. Rep. of Germany, assignor to AVK Filtertechnik GmbH, Hasselroth, Fed. Rep. of Germany
Filed Jul. 20, 1987, Ser. No. 75,466
Int. Cl.⁴ B01D 27/06

U.S. Cl. 210—493.5

7 Claims



1. A filter arrangement comprising:
 - a pleated filter means including a plurality of adjacent sections extending parallel to each other; and
 - a distance piece consisting essentially of a sheet of material having essentially continuous zigzag folds in a longitudinal direction and defining essentially longitudinal zigzag edges, said distance piece extending between and uniformly supporting each of said adjacent sections, and a cap extending along the plane defined by one of said zigzag longitudinal edges, said cap having a maximum width corresponding to the width of said zigzag folds and being detachably arranged on said one of said zigzag longitudinal edges, said cap supporting said filter means and being essentially free of edges in the range supporting said filter means.

4,874,518

POROUS SILICA MICROSPHERES HAVING A SILANOL ENRICHED SURFACE

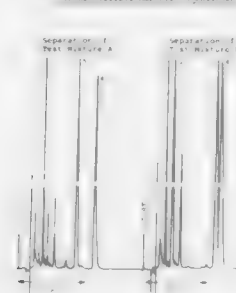
Joseph J. Kirkland, Wilmington, Del., and Jürgen Köhler, Waltrup, Fed. Rep. of Germany, assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 117,430, Nov. 6, 1987, abandoned, which is a continuation of Ser. No. 798,332, Nov. 1, 1985, abandoned. This application Dec. 21, 1988, Ser. No. 287,650
Int. Cl.⁴ B01D 15/08

U.S. Cl. 210—502.1

17 Claims

SEPARATION OF TEST MIXTURE A AND B



10. A chromatographic material comprising improved porous silica microspheres having an average diameter of 0.5 to about 35 μm , substantially all of said microspheres having a diameter ranging from about 0.5 to about 1.5 times said average diameter; said microspheres consisting essentially of a plurality of substantially uniform-size colloidal particles, having a silica surface, arranged in an interconnected three-dimensional lattice; said colloidal particles occupying less than about 50 volume percent of said microspheres with the remaining volume being occupied by interconnected pores having a substantially uniform pore size distribution; said microspheres having a completely silanized surface, wherein the microspheres are prepared according to a process comprising:
 - (a) contacting heat strengthened thermally-dehydroxylated porous silica microspheres having surface concentration of silanol groups of less than about 5.5 $\mu\text{mol}/\text{m}^2$ with water in the presence of HF or at least one basic activator selected from the group consisting of quaternary ammonium hydroxides, ammonium hydroxide, and organic amines at a temperature of about ambient temperature to about 100° C. for sufficient time to generate a surface concentration of silanol groups of from about 8 to about 16 $\mu\text{mol}/\text{m}^2$; and
 - (b) contacting the porous silica microspheres prepared in step (a) with a silanizing agent at a temperature of from about 25° to about 100° C. for sufficient time to generate a completely silanized surface.

4,874,519

PROCESS FOR TREATING WASTEWATER

Ronald E. Williamson, Hillsborough, N.C., assignor to Orange Water & Sewer Authority, Carrboro, N.C.

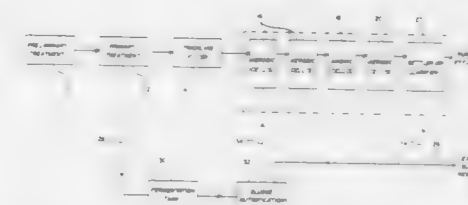
Continuation-in-part of Ser. No. 201,185, Jun. 2, 1988, abandoned. This application Aug. 30, 1988, Ser. No. 238,059
Int. Cl.⁴ C02F 3/30

U.S. Cl. 210—605

22 Claims

1. A method of removing phosphorus and other pollutants from a pretreated wastewater stream having a relatively low BOD to phosphorus ratio comprising:
 - a separating suspended solids from the wastewater stream and conveying the suspended solids into a fermentation tank and the liquid fraction of the wastewater to further treatment;
 - retaining the suspended solids in the fermentation tank a

- sufficient time to permit hydrolysis of the suspended solids so as to form soluble substrates;
- c. producing a side stream of return activated sludge;
 - d. dividing the side stream of return activated sludge into at least two streams;
 - e. mixing soluble substrates with the return activated sludge of one stream while generally separating the return activated sludge of the other stream from initial contact with the soluble substrates so as to effectively increase the food to mass ratio of the return activated sludge of the stream initially mixed with the soluble substrates;



- f. mixing the soluble substrates with return activated sludge and holding the mixture for a selected time period under anaerobic conditions to form conditioned return activated sludge;
- g. passing the liquid effluent from the primary treatment through a fixed film reactor and producing a pretreated wastewater effluent having a relatively low BOD to phosphorus ratio;
- h. mixing the low BOD to phosphorus effluent with the conditioned return activated sludge; and
- i. passing the mixture of pretreated effluent and return activated sludge through a series of treatment zones to effectuate the removal of phosphorus and other pollutants.

4,874,520

CHROMATOGRAPHIC PROCESS

Siu-Leung Lee, Upper Arlington, Ohio, assignor to Battelle Development Corporation, Columbus, Ohio

Division of Ser. No. 855,544, Apr. 23, 1986, abandoned. This application Jun. 23, 1988, Ser. No. 210,595
Int. Cl.⁴ B01D 15/08

U.S. Cl. 210—635

2 Claims

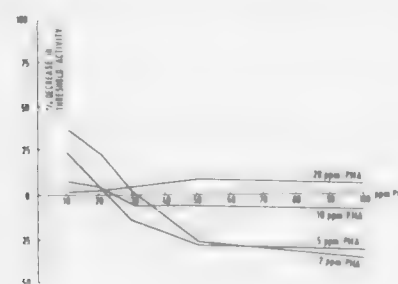


1. An improved process for separating ionizable chemical substances from a solution mixture by ion exchange chromatography of the type using a stationary phase consisting of a chemically modified support material capable of reversibly fixing macromolecules wherein the improvement comprises: providing a hydroxy bearing support material, reacting the support material with an organotin compound of the formula,



wherein n is 1, 2, or 3,

group consisting of polyacrylates, polymethacrylates, polyphosphates, phosphonates, aminophosphonates, polymeric



carboxylic acids, co- or ter-polymers of carboxylic acids and one or more other monomers, nitrites, molybdates, silicates, phosphino or phosphono carboxylic acids, and phosphates.

4,874,527

METHOD FOR CONTROLLING SILICA/SILICATE DEPOSITION IN AQUEOUS SYSTEMS USING IMINES
Jasbir S. Gill, Coraopolis, Pa., assignor to Calgon Corporation, Pittsburgh, Pa.

Filed Apr. 28, 1988, Ser. No. 187,172
Int. Cl.⁴ C02F 5/14

U.S. Cl. 210—700

2 Claims

1. A method for controlling silica/silicate deposition including calcium and magnesium silicates in an aqueous system having a pH of less than about 9 comprising adding to said system an effective amount of a composition comprising: (a) a water soluble polyethylene imine having a molecular weight of less than about 20,000; (b) diethylene triamine penta(methylene phosphonic acid); and (c) a molybdate ion source; wherein the weight ratio of (a):(b), on an active basis, ranges from about 4:1 to about 1:4 and wherein the weight ratio of (a):(c), on an active basis, ranges from about 4:1 to about 1:4.

4,874,528

METHOD FOR TREATING DISPERSIONS OF OLEOPHILIC LIQUIDS AND WATER
Michael R. Foreman, Maurice, La.; Albert F. Hadermann, Ijamsville, Md.; and Jerry C. Trippe, Fairfax Station, Va., assignors to General Technology Applications, Inc., Manassas, Va.

Filed Jul. 18, 1988, Ser. No. 220,628
Int. Cl.⁴ B01D 17/04

U.S. Cl. 210—705

20 Claims



1. A method for treating a dispersion of an oleophilic liquid in water to obtain separation of the oleophilic liquid from the water phase comprising:

forming a solution of a polymer in a solvent, said polymer being soluble in said oleophilic liquid and having a molec-

ular weight sufficient to impart viscoelastic properties to said solution, said solvent being miscible with said oleophilic liquid;

contacting said dispersion with said polymer solution to dissolve polymer molecules in the oleophilic droplets of said dispersion thereby rendering said droplets viscoelastic and promoting their agglomeration with said solution; and

separating said polymer solution, now containing oleophilic liquid, from the water phase.

4,874,529

PROCESS AND APPARATUS FOR REDUCING THE CONCENTRATION OF SUSPENDED SOLIDS IN CLARIFIED GEOTHERMAL BRINE

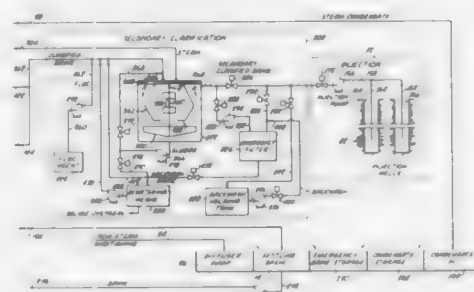
John L. Featherstone; S. Timothy Spang, both of El Centro; David G. Newell, Palm Desert, and Darrell L. Gallup, Chino, all of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Continuation-in-part of Ser. No. 814,099, Dec. 27, 1985, Pat. No. 4,728,438. This application Feb. 29, 1988, Ser. No. 162,005. The portion of the term of this patent subsequent to Mar. 1, 2005, has been disclaimed.

Int. Cl.⁴ C02F 1/56

U.S. Cl. 210—713

29 Claims



1. A process for reducing the concentration of residual solids suspended in geothermal brine overflow from a primary brine clarification stage in which a mixture of hot, flashed, silica-rich geothermal brine and suspended siliceous material is separated so as to provide a siliceous sludge and said geothermal brine overflow having a residual amount of solids still remaining suspended therein, and ferrous ions, the process comprising:

- flowing the geothermal brine overflow, comprising at most about 300 PPM solids by weight, from said primary brine clarification stage into a secondary clarifier vessel;
- blanketing the geothermal brine overflow from the primary brine clarification stage with steam in order to prevent oxidation of ferrous ions in the geothermal brine;
- contacting said geothermal brine overflow from the primary brine clarification stage in the secondary clarifier vessel with a flocculating agent so as to cause at least some of the solids suspended in the brine to flocculate;
- discharging from the secondary clarifier vessel an underflow of flocculated solids and brine and an overflow;
- recirculating at least a portion of said flocculated solids so as to provide a preestablished solids concentration in reaction and flocculating regions of the secondary clarifier vessel in which the flocculating agent and brine are contacted;
- discharging from the secondary clarifier vessel a secondarily clarified brine overflow in which the concentration of residual suspended solids is substantially reduced over the concentration of residual solids suspended in the brine overflow from the primary clarification stage; and
- preventing circulation of the secondary clarifier vessel overflow and the secondary clarifier vessel underflow to the primary brine clarification stage.

4,874,530

METHOD FOR TREATING PHOTOGRAPHIC PROCESSING WASTE SOLUTION

Kazuhiko Kobayashi; Masayuki Kurematu; Shigeharu Koboshi; Nobutaka Goto, and Naoki Takabayashi, all of Hino, Japan, assignors to KNICA Corporation, Tokyo, Japan

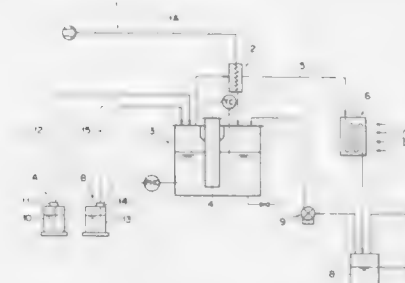
Filed Nov. 27, 1987, Ser. No. 126,408

Claims priority, application Japan, Dec. 5, 1986, 61-291137; Dec. 8, 1986, 61-291944; Dec. 10, 1986, 61-293798; Dec. 10, 1986, 61-293799; Dec. 10, 1986, 61-293800

Int. Cl.⁴ C02F 1/62

U.S. Cl. 210—718

21 Claims



1. A method for treating a photographic processing waste solution containing at least thiosulfate ions, comprising heating the photographic processing waste solution to evaporate the solvent and concentrate the solute in the remaining solution, and further comprising

- introducing sulfite ions or a compound capable of releasing sulfite ions into the photographic processing waste solution at the time or before heating of the photographic processing waste solution.

4,874,531

APPARATUS AND METHOD FOR SEPARATING WATER FROM AVIATION FUEL, AND FLOAT CONTROL THEREFOR

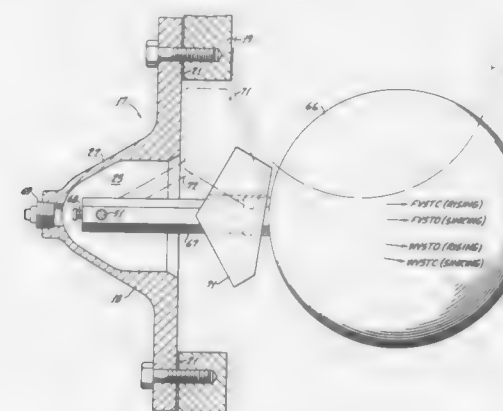
Harold W. Easiga, Fullerton, Calif., assignor to Cla-Val Co., Costa Mesa, Calif.

Continuation of Ser. No. 36,401, Apr. 9, 1987, abandoned. This application Feb. 15, 1989, Ser. No. 312,344

Int. Cl.⁴ B01D 17/12

U.S. Cl. 210—744

21 Claims



16. A method of separating water from aviation fuel, which comprises:

- delivering highly-pressurized aviation fuel to a filter separator tank,
- providing a float element in the bottom of said tank,

(c) causing said float element to be sufficiently buoyant that it will float in said fuel,

(d) associating said float element with a weight that is sufficiently heavy to cause said float element to float at an interface between said fuel and water that is separated from said fuel by said filter separator tank and therefore collects at the bottom of said tank,

(e) associating said float element with valve means that shut off the flow of fuel out of said tank when said interface rises to a predetermined level, and that drain water from said tank when said float element rises to a predetermined level,

(f) periodically discontinuing the association between said float element and said weight,

(g) determining whether or not said float element rises in response to said discontinuing, and

(h) employing the presence or absence of said rising as the criterion determining whether or not said float element has waterlogged.

4,874,532

METHOD FOR DECONTAMINATION OF TOXIC CHEMICAL AGENTS

Shelby D. Worley, Auburn, Ala., assignor to PPG Industries, Inc., Pittsburgh, Pa.

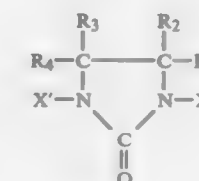
Filed Jun. 29, 1988, Ser. No. 212,822

Int. Cl.⁴ C02F 1/58

U.S. Cl. 210—755

11 Claims

1. A method for decontaminating a toxic chemical agent susceptible to oxidation by halogen, which comprises contacting said chemical agent with a decontaminating amount of N,N'-dihalo-2-imidazolidinone represented by the graphic formula,



wherein X and X' are each halogen selected from the group consisting of chlorine and bromine, provided that at least one of X and X' is chlorine, R₁, R₂, R₃ and R₄ are each selected from the group consisting of hydrogen, C₁-C₄ alkyl, C₁-C₄ alkoxy, hydroxy and substituted phenyl, provided that not more than one of the R₁-R₄ is hydrogen, said phenyl substituents each being selected from the group consisting of C₁-C₄ alkyl, C₁-C₄ alkoxy and hydroxy.

4,874,533

APPARATUS AND PROCESS FOR FILTERING FLUIDS
Ronald A. Boze, 19 Wisteria La., Covington, La. 70433, and Theodore A. Warning, 11227 Rippling Meadow, Houston, Tex. 77064

Continuation-in-part of Ser. No. 843,996, Mar. 25, 1986, Pat. No. 4,704,210. This application Sep. 14, 1987, Ser. No. 96,634

Int. Cl.⁴ B01D 37/02

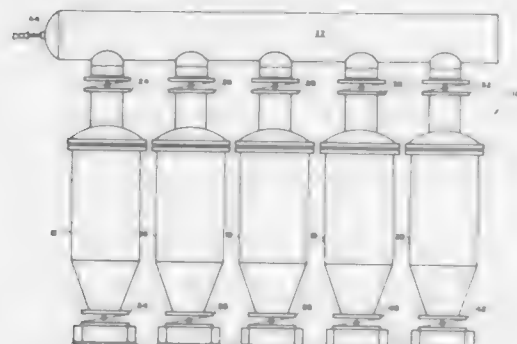
U.S. Cl. 210—778

2 Claims

1. A process of filtering a fluid having suspended contaminants, comprising the steps of:

providing a filtration vessel having at least one filter element mounted therein, the filter element having an interior and an exterior, wherein the filter element comprises a hollow conduit having an interior and an exterior surface, with the conduit being formed by a wedge wire wound in a helical fashion with coils being secured in a helical relationship by axial braces securedly attached to the wire on the interior of conduit; providing means for delivering the fluid to be filtered into the filtration vessel;

introducing a flow of the contaminated fluid into the filtration vessel;
forming a layer of filter media on the exterior of the filter element;
removing filtrate from the interior of the filter element and delivering it outside of the filtration vessel;
detecting a pressure differential of a predetermined value across the filter element;
interrupting a flow of contaminated fluid into the filtration vessel;



providing a backflushing reservoir containing a pressurized backflushing fluid;
backflushing the filter element by a fluid pressurized to a level at least slightly above the level of pressure differential across the filter element at a velocity sufficient to create a backflushing shock capable of dislodging the contaminants which formed a layer on the exterior on the filter element; and removing the dislodged contaminants from the filtration vessel.

4,874,534

METHOD FOR REMOVAL OF ORGANIC SOLVENTS FROM AQUEOUS PROCESS STREAMS

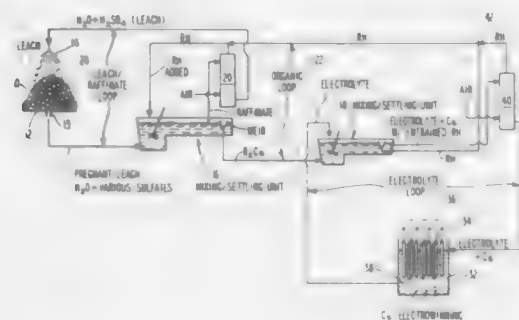
James L. Sorenson; Mark D. Yarbro, both of San Manuel, and Charles A. Glockner, Tucson, all of Ariz., assignors to Magma Copper Company, San Manuel, Ariz.

Filed Jan. 11, 1988, Ser. No. 141,736

Int. Cl.⁴ B01D 21/00

U.S. Cl. 210—903

16 Claims



1. A method of removal of entrained droplets of an organic solvent immiscible in water from an aqueous process stream comprising the steps of:

introducing the process stream containing the entrained organic solvent droplets, said solvent being present in said stream in a concentration of no more than about 500 ppm, at an upper location in a vertically extending vessel,
introducing air in a manner such that bubbles are formed at a lower location in the vessel,
permitting said bubbles to rise upwardly through said aqueous process stream, whereupon said droplets of organic

solvent are effectively bound to said bubbles and a froth thereof accumulates on the upper surface of said aqueous solution in said vessel,
withdrawing the aqueous process stream having had the organics removed therefrom from an outlet in the vessel beneath the point of introduction of the air thereto, and removing the froth from the top of the vessel.

4,874,533

SCALE INHIBITORS

Ian C. Callaghan, Wokingham, and Ian Livsey, Twickenham, both of England, assignors to The British Petroleum Company p.l.c., London, England

Continuation of Ser. No. 839,144, Mar. 12, 1986, abandoned.

This application Apr. 28, 1988, Ser. No. 188,689

Claims priority, application United Kingdom, Mar. 14, 1985, 8506616

Int. Cl.⁴ E21B 43/28; C02F 5/14

U.S. Cl. 252—8.552

7 Claims

1. A scale inhibiting composition comprising the combination of

- a copolymer of isobutene and maleic acid or anhydride wherein the copolymer has 3–3000 units derived from isobutene and 3–3000 units derived from maleic acid or anhydride, said copolymer being in its acid or alkali metal or ammonium form,
- a 1-hydroxyethyl 1,1-diphosphonic acid or salt form selected from the group consisting of alkali metal, ammonium, amine and alkanolamine salt form; said components (a) and (b) being present in a weight ratio in the range of 10:1 to 1:10.

4,874,536

SYNTHETIC SURFACTANT CAKES WITH MAGNESIUM CHLORIDE

Wilbur C. Strickland, Jr., Cincinnati, and Rosalyn F. Sterling, Milford, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jun. 29, 1984, Ser. No. 625,984

Int. Cl.⁴ C11D 1/12, 1/755

U.S. Cl. 252—90

12 Claims

1. A solid water-soluble toilet bowl cleaning cake consisting essentially of from 20% to 90% C₉–C₁₅ alkyl sulfate C₉–C₁₅ alkyl benzene sulfonate co-surfactant having a 1:1.5 to 1.5:1 ratio and from 0.5% to 25% weight magnesium chloride wherein said cake is present in a dosing toilet bowl dispenser.

4,874,537

STABLE LIQUID NONAQUEOUS DETERGENT COMPOSITIONS

David Peterson; Loren Chen, both of Pleasanton, and Robert J. Bliff, Oakley, all of Calif., assignors to The Clorox Company, Oakland, Calif.

Filed Sep. 28, 1988, Ser. No. 251,719

Int. Cl.⁴ C11D 3/075, 3/39

U.S. Cl. 252—99

15 Claims

1. A stable liquid, nonaqueous, detergent composition comprising, by weight percent:

- 20–90% of a liquid portion which comprises an alkylated nonionic surfactant;
- a solids portion which comprises:
 - 5–50% of a builder;
 - 0–20% of an oxidant; said solids being stably suspended in said liquid portion, by means of
- 0.5–20% of a sulfonated, lower alkylated condensed ring aryl compound; and
- 0–5% of a hydrolytic enzyme.

4,874,538

TOILET SOAP BAR COMPOSITIONS CONTAINING WATER SOLUBLE POLYMERS

Geoffrey G. Dawson, Ponteland, and Michael K. Williams, Wokingham, both of England, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Oct. 23, 1986, Ser. No. 922,366

Claims priority, application United Kingdom, Oct. 29, 1985, 8526647; Mar. 13, 1986, 8606239

Int. Cl.⁴ C11D 9/26, 9/30, 17/00

U.S. Cl. 252—117

10 Claims

1. A beta-phase milled transparent or translucent toilet bar composition comprising:

- from about 45% to about 95% by weight of soluble alkali metal soap of C₈–C₂₄ fatty acids,
- from about 0% to about 45% of synthetic surfactant selected from the group consisting of anionic surfactant, amphoteric surfactant, and mixtures thereof, and
- from about 0.01% to about 5% of water-soluble polymer having a molecular weight of from about 20,000 to about 5,000,000 selected from the group consisting of
 - cationic polymer selected from the group consisting of cationic guar gums, quaternized cellulose ethers, quaternized vinylpyrrolidone acrylate or methacrylate copolymers of aminoalcohol, copolymers of dimethyldiallyl ammonium chloride and acrylamide, homopolymers of dimethyldiallyl ammonium chloride, and mixtures thereof;
 - nonionic polymers selected from the group consisting of guar gum and hydroxypropyl guar gum having a degree of substitution of from about 0.3 to about 1.2; and
 - mixtures thereof;
 wherein at least about 50% by weight of the soap is in the beta-phase.

4,874,540

GRAFT COPOLYMERS OF A POLYETHER MOIETY ON A POLYCARBOXYLATE BACKBONE

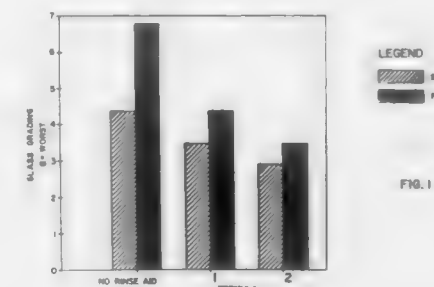
Richard B. Greenwald, Eagan; Chung-Tsing Liu, Bloomington, and James A. McDonnell, St. Paul, all of Minn., assignors to Ecolab Inc., St. Paul, Minn.

Continuation-in-part of Ser. No. 887,891, Jul. 18, 1986, abandoned. This application Sep. 3, 1987, Ser. No. 92,686

Int. Cl.⁴ C11D 3/37

U.S. Cl. 252—174.24

31 Claims



1. A polymeric, water treating composition comprising a graft block copolymer with a chelation value above about 1875, the graft block copolymer having 10 to 50 wt-% of a backbone polymer having repeating units derived from an alpha, beta unsaturated carboxylic acid monomer, the carboxylic acid selected from the group consisting of acrylic acid, methacrylic acid, itaconic acid, or mixtures thereof, and grafted thereon 50 to 90 wt-% of polymeric moieties having repeating units derived from an alkylene oxide, said grafted moieties terminating in a hydroxyl group the polymer having been prepared by reacting the components at a temperature of about ambient to about 100° C.

4,874,541

ALL-IN-ONE BOILER WATER TREATMENT COMPOSITION

Lyle H. Steimel, Forest Park, and Ronald J. Christensen, Montgomery, both of Ohio, assignors to DuBois Chemicals, Inc., Cincinnati, Ohio

Continuation of Ser. No. 133,504, Dec. 16, 1987, abandoned.

This application Jun. 10, 1988, Ser. No. 204,861

Int. Cl.⁴ C02F 5/12

U.S. Cl. 252—178

6 Claims

1. A concentrated all-in-one boiler water treatment composition consisting of

- Glucosheptonate: 0% to 0.2%
 - Sulfite: 0.1% to 14%
 - Polyhydroxy acid: 0.1 to 5%
 - Diethylaminoethanol: 0.0 to 15.0%
 - 1st polymer: 0.1 to 4%
 - Polymaleate: 0.01 to 4%
 - Carbonate: 0 to 7%
 - Water soluble base: 0 to 20%
 - Water: to 100%
- wherein said sulfite is selected from the group consisting of sodium sulfite and potassium sulfite;
wherein said 1st polymer is selected from the group consisting of;
wherein said carbonate is selected from the group consisting of sodium carbonate and potassium carbonate;
wherein said polyhydroxy acid is selected from the group consisting of ascorbic acid and erythorbic acid.

4,874,539

CARBOXY HYDROXAMIC ACID POLYMERS AND THEIR USE AS DETERGENT ADDITIVES

K. Robert Huffman, Stamford, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Filed Aug. 6, 1987, Ser. No. 82,263

Int. Cl.⁴ C11D 3/20, 3/37

U.S. Cl. 252—174.24

9 Claims

4. A process for preparing polymeric carboxyl hydroxamic acids comprising

- reacting polyacrylic acid with a compound of the formula R' represents an organic radical of 1 to 12 carbon atoms selected from the group consisting of straight for branched claim alkyl, aryl, alkaryl, aralkyl or alkenyl radicals and X represents a halogen atom or an organic anhydride residue having the formula R'C:OO-, wherein R' is as defined above, wherein said reaction being conducted in the absence of a catalyst and
 - reacting the resultant polymeric anhydride with a hydroxylamine compound of the formula HRNOH, wherein R represents hydrogen or C–C₆ alkyl, cycloalkyl, or phenyl group.
9. A detergent composition with transition metal ion chelating activity comprising one or more detergents, and about 3% to about 12% by weight of the total composition of a polymer having randomly alternating repeating units consisting essentially of those the formulae wherein R represents hydrogen or C₁–C₆ alkyl, cycloalkyl or a phenyl group.

4,874,543

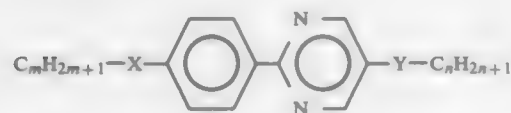
PHENYL-PYRIMIDINE LIQUID CRYSTAL COMPOUNDS AND LIQUID CRYSTAL COMPOSITIONS CONTAINING THE SAME

Ryotchi Higuchi; Takao Sakurai; Tadahiko Yokota; Naoko Mikami; Eri Yamamoto, and Koji Takenchi, all of Kawasaki, Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan
Filed Mar. 31, 1988, Ser. No. 176,154

Claims priority, application Japan, Mar. 31, 1987, 62-78289; Oct. 29, 1987, 62-274389

Int. Cl.⁴ G02F 1/13; C09K 19/34; C07D 239/02
U.S. Cl. 252-299.61 15 Claims

1. A compound of the formula:



wherein either X is —O—, Y is —OCOO—, m is 7-10 and n is 5-12; or X is —OCOO—, Y is a direct bond, m is 5-12 and n is 7-12.

4,874,543

LIQUID CRYSTAL COMPOSITION

Tetsushi Yoshida, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Nov. 12, 1987, Ser. No. 120,091

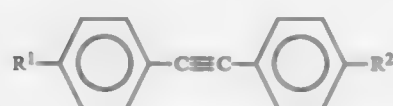
Claims priority, application Japan, Nov. 14, 1986, 61-270928

Int. Cl.⁴ C09K 19/06, 19/4, 19/30, 19/34

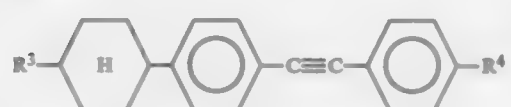
U.S. Cl. 252-299.61 27 Claims

1. A liquid crystal composition having positive dielectric anisotropy, comprising:

30 to 60 wt % based on the total weight of said liquid crystal composition of a first liquid crystal material comprising at least one liquid crystal compound represented by formula (I):



wherein R¹ represents a straight-chain alkyl group having 2 to 5 carbon atoms, and R² represents a straight-chain alkyl or alkoxy group having 1 to 5 carbon atoms; 1 to 20 wt % of a second liquid crystal material comprising at least one liquid crystal compound represented by formula (II):

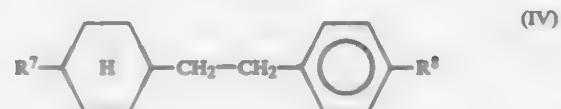


wherein R³ represents a straight-chain alkyl group having 2 to 4 carbon atoms and R⁴ represents a straight chain alkyl group having 1 to 4 carbon atoms; 10 to 30 wt % of a third liquid crystal material containing a liquid crystal compound represented by formula (III) and optionally a liquid crystal compound represented by formula (IV):



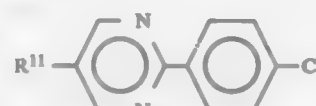
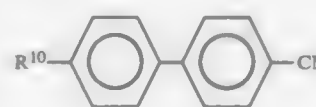
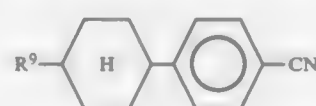
and

-continued



wherein each of R⁵ and R⁷ independently represents a straight-chain alkyl group having 2 to 5 carbon atoms, R⁶ represents a straight-chain alkyl or alkoxy group having 2 to 5 carbon atoms, or —O—CH₂—CH=CH—CH₃, and R⁸ represents an alkoxy group having 2 to 4 carbon atoms; and

5 to 50 wt % of a fourth liquid crystal material containing at least one selected from liquid crystal compounds represented by formulas (V) to (VII):



wherein each of R⁹ and R¹⁰ independently represents a straight-chain alkyl group having 2 to 5 carbon atoms, and R¹¹ represents a straight-chain alkyl group having 4 to 7 carbon atoms, said liquid crystal composition, as a whole, having optical anisotropy of at least 0.18.

4,874,544

FERROELECTRIC LIQUID CRYSTALS

Bak G. Yong; Barth Petra; Demus Dietrich; Joachimi Detlev, all of Halle; Barbara Kampa, Halle-Neustadt; Saskia Köhler, Halle-Neustadt; Kristine Mohr, Halle-Neustadt; Reinhard Paschke, Halle-Neustadt; Gerhard Peisl, Halle-Neustadt; Ulrich Rosenfeld, Halle; Wolfgang Schäfer, Potsdam; Klaus-Dieter Scherf, Halle; Carsten Tschirake, Halle; Wolfgang Weisflog, Halle-Neustadt, and Horst Zschke, Halle, all of German Democratic Rep., assignors to VEB Werk fuer Fernsehelektronik im VEB Kombinat Mikroelektronik, Berlin, German Democratic Rep.

Filed Feb. 3, 1988, Ser. No. 151,731

Claims priority, application German Democratic Rep., Feb. 19, 1987, 300041

Int. Cl.⁴ G02F 19/34; C07D 239/02, 285/12

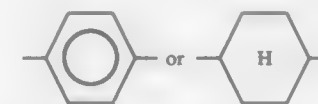
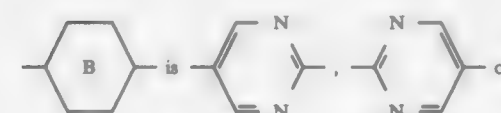
U.S. Cl. 252-299.61 18 Claims

1. A chiral halogenated alkyl group containing ferroelectric liquid crystal compound of the formula



wherein R¹ is C₂H₂+1—, (CH₃)₂CH—, (CH₃)₂CH—CH₂—, or C₂H₅—CH(CH₃)—, in which 1=3-12,

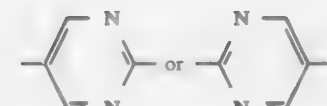
R² is C₆H_{2k+1}— or C₆H_{2k+1}O—, in which k=1-12, X is Cl or F,



with the proviso that if



is



R¹ is only C₂H₅—CH(CH₃)—.

4,874,545

CHIRAL ESTERS OF α-SUBSTITUTED PHENYLALKANOIC ACIDS AND MESOGENIC HYDROXY COMPOUNDS, AND THEIR USE AS A DOPING SUBSTANCE IN LIQUID CRYSTAL PHASES
Gerd Heppke; Günter Scherowsky; Christian Bahr, and Lutz Lehmann, all of Berlin, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

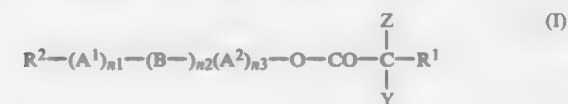
Filed Jun. 12, 1987, Ser. No. 62,062

Claims priority, application Fed. Rep. of Germany, Jun. 14, 1986, 3620049

Int. Cl.⁴ C09K 19/34, 19/30, 19/20, 19/12

U.S. Cl. 252-299.61 3 Claims

1. An optically active ester of the formula (I)



wherein

R² is a straight-chain (C₄-C₁₀)-alkyl, where one CH₂ group may be replaced by an O or S atom;
A¹ and A², independently of one another, are 1,4-phenylene, 1,4-cyclohexylene or pyrimidine-2,5-diyl;
B is CO—O or O—CO;
n₁ is 1;
n₂ is 0 or 1;
n₃ is 1 or 2;
Y is CF₃;
Z is OCH₃; and
R¹ is phenyl.

4,874,546

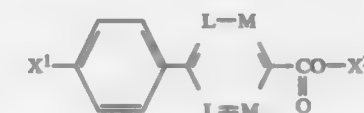
PHENYLPYRIMIDINECARBOXYLATE DERIVATIVE
Naoyuki Yoshida, Kamakura; Kisei Kitano, and Tetsuya Ogawa, both of Yokohama, all of Japan, assignors to Chisso Corporation, Japan

Continuation-in-part of Ser. No. 863,505, May 15, 1986, abandoned. This application Jul. 20, 1987, Ser. No. 75,657
Claims priority, application Japan, May 15, 1985, 60-103512; May 21, 1985, 60-108504

Int. Cl.⁴ G02F 1/13; C09K 19/34; C07D 239/02

U.S. Cl. 252-299.61 12 Claims

1. A phenylpyrimidinecarboxylate derivative expressed by the general formula



wherein X¹ represents an alkyl group or an alkoxy group each of 1 to 10 carbon atoms; X² represents a 4-substituted phenyl group having as a substituent an alkyl group of 1 to 10 carbon atoms and L represents —N— and M represents —C—.

4,874,547

BI-MODAL SILICONE EMULSIONS, SILICONE EMULSIFICATION PROCESS AND EMULSIONS THEREFROM

Dipak Narula, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Apr. 2, 1985, Ser. No. 718,985

Int. Cl.⁴ B01J 13/00; C09K 3/00

U.S. Cl. 252-312 20 Claims

1. An emulsification process comprising
(I) intimately mixing components consisting essentially of (A) 100 parts by weight of a polydimethylsiloxane fluid having a viscosity of up to 50 pascal-seconds at 25° and consisting essentially of from 1 to 100 parts by weight of (i) a nonvolatile polydimethylsiloxane portion having a viscosity of at least 30 pascal-seconds at 25° C. and from 0 to 99 parts by weight of (ii) a volatile polydimethylsiloxane portion and (B) from 1 to 5 millimols, per millimol of primary surfactant, of a nonionic secondary surfactant having an HLB number of from 7 to 9.
(II) intimately mixing with the mixture of (I) components consisting essentially of (C) at least 3 millimols of a non-ionic primary surfactant having an HLB number of from 13 to 15 and (D) an emulsion-forming amount of water to form a rough silicone-in-water emulsion, and
(III) subjecting the rough emulsion to the comminuting action of a low shear generating means for a period of time sufficient to reduce the average particle size of the silicone to a value less than about 2 micrometers; the temperature of the emulsion being maintained at a value of from about 1° to 40° C. during said subjecting.
13. A bi-modal silicone-in-water emulsion composition consisting essentially of
(A) 100 parts by weight of bi-modal polydimethylsiloxane fluid component having a viscosity of up to 50 pascal-seconds at 25° C. and consisting essentially of
(i) 1 to 75 parts by weight of a nonvolatile polydimethylsiloxane portion having a viscosity at 25° C. of at least 30 pascal-seconds and
(ii) 25 to 99 parts by weight of a volatile polydimethylsiloxane portion,
(B) from 1 to 5 millimols, per millimol of primary surfactant, of a nonionic secondary surfactant having an HLB number of from 7 to 9,
(C) at least 3 millimols of a nonionic primary surfactant having an HLB number of from 13 to 15, and
(D) an emulsion-forming amount of water.

4,874,548

CONDUCTIVE ADHESIVE

Robert J. Hajovsky, Scotland, Tex., assignor to Ameron, Inc., Monterey Park, Calif.

Filed Mar. 14, 1988, Ser. No. 167,368
Int. Cl.⁴ H01B 1/06

U.S. Cl. 252-511

20 Claims

1. An electrically conductive adhesive composition comprising a curable thermosetting resin and conductive fibers in a concentration of from about 0.7 to less than about five percent by weight of the composition, the conductive fibers each having a length of from about 4 to about 8 millimeters.

9. An electrically conductive adhesive composition comprising a curable epoxy resin and stainless steel fibers, said stainless steel fibers having a length of from about 4 mm to about 8 mm and being present in a concentration of from about 0.7 to not more than about 5% by weight of the composition.

4,874,549

PRESSURE SENSITIVE ELECTRO-CONDUCTIVE MATERIALS

Michael Michalchik, Los Altos, Calif., assignor to Advanced Micro-Matrix, Inc., Altadena, Calif.

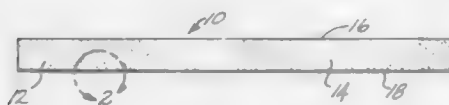
Division of Ser. No. 809,075, Dec. 13, 1985, Pat. No. 4,745,301.

This application Apr. 26, 1988, Ser. No. 186,186

Int. Cl.⁴ H01B 1/06

U.S. Cl. 252-511

12 Claims



1. A process for the preparation of a pressure sensitive electro-conductive material comprising the steps of:

- Preparing a solvent system comprising water, a water miscible carbon-wetting organic solvent, and a surfactant;
- Mixing finely divided electro-conductive carbon particles into the solvent system to form a uniform slurry;
- Maintaining the slurry for a predetermined period of time to obtain substantial wetting of the carbon particles of the solvent system to form a pre-agglomeration composition;
- Dispersing the pre-agglomeration composition into an aqueous elastomeric composition to form an elastomeric-carbon composition containing electrically conductive micro-agglomerates comprising unbound finely divided electro-conductive carbon particles enclosed by a matrix of elastomeric material and bound finely divided electro-conductive carbon particles; and
- Drying said elastomeric-carbon composition to obtain the pressure-sensitive electroconductive material.

4,874,550

THICK-FILM COPPER CONDUCTOR INKS

Ashok N. Prabhu, East Windsor; Kenneth W. Hang, and Edward J. Conlon, both of Princeton, all of N.J., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 87,583, Aug. 20, 1987, Pat. No. 4,808,770, which is a continuation-in-part of Ser. No. 914,303, Oct. 2, 1986, abandoned. This application Dec. 2, 1988, Ser. No. 278,987

Int. Cl.⁴ H01B 1/06

U.S. Cl. 252-512

7 Claims

1. A copper conductor ink comprising, on a weight basis: (a) from about 65 to about 85 percent of copper powder; (b) from about 5 to about 15 percent of a devitrifying glass frit selected from the group consisting of a zinc-calcium-aluminum-silicate glass frit, a zinc-magnesium-barium-aluminum-silicate glass frit and mixtures thereof, which does not begin to flow until the furnace temperature is

above about 700° C., the zinc-calcium-aluminum-silicate glass frit comprising, on a weight basis:

- from about 7 to about 12 percent of zinc oxide;
- from about 25 to about 45 percent of calcium oxide;
- from about 10 to about 20 percent of aluminum oxide;
- from about 35 to about 50 percent of silicon dioxide;
- from 0 to about 2 percent of phosphorus pentoxide;

and

- from 0 to about 5 percent of zirconium silicate; and the zinc-magnesium-barium-aluminum-silicate glass frit comprising, on a weight basis:

- from about 15 to about 25 percent of zinc oxide;
- from about 10 to about 25 percent of magnesium oxide;
- from about 3 to about 12 percent of barium oxide;
- from about 5 to about 20 percent of aluminum oxide;
- from about 35 to about 50 percent of silicon dioxide;
- from 0 to about 5 percent of phosphorus pentoxide;

and

- from 0 to about 5 percent of zirconium silicate; and (c) from about 5 to about 25 percent of a solution of at least one resin as binder.

4,874,551

δ-LACTONE DERIVATIVES AND PROCESS OF PREPARING SAME

Tetsuji Kametani, Tokyo, and Toshio Honda, Yokohama, both of Japan, assignors to Itaro Horiuchi & Co., Ltd, Tokyo, Japan
Filed Apr. 6, 1987, Ser. No. 34,734

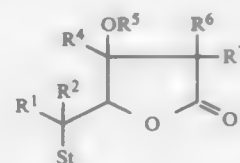
Claims priority, application Japan, Apr. 18, 1986, 61-88278

Int. Cl.⁴ C07J 19/00, 21/00, 53/00, 63/00

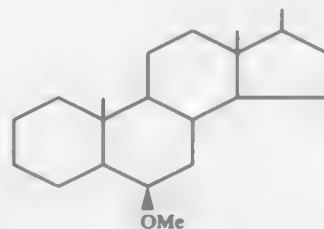
U.S. Cl. 260-397.1

15 Claims

1. Gamma-lactone derivatives represented by the formula (I)



wherein when R¹ is methyl group, R² is hydrogen, hydroxyl group or trifluoroacetoxy group and R³ is hydrogen, or R² may combine with R³ to form π bond; when R¹ combines with R² to form methylene group, R³ is hydrogen; R⁴ and R⁶ hydrogen, respectively, or may combine to form π bond; R⁵ is hydrogen or a protecting group for hydroxyl group; R⁷ is hydrogen or straight-chain or branched alkyl group; and St is a steroid nucleus represented by the following formula (A):



(A)

4,874,552

PROCESS FOR SIMULTANEOUS BLEACHING AND NEUTRALIZATION OF ALPHA-SULFOFATTY ACID ESTERS

Hans-Joachim Richter, Moenchengladbach; Udo Kreutzler, Monheim; Franz-Josef Cardack, Hase; Klaus Koester, Langenfeld, and Hubert Harth, Duesseldorf, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Jun. 15, 1987, Ser. No. 62,736

Claims priority, application Fed. Rep. of Germany, Jun. 14, 1986, 3620158

Int. Cl.⁴ C07C 143/12

U.S. Cl. 260-400

17 Claims

1. A process for the production of solid, substantially anhydrous alkali metal salts of α-sulf fatty acid alkyl esters by oxidative bleaching and neutralization of α-sulf fatty acid alkyl esters containing from 8 to 22 carbon atoms in the fatty acid chain and from 1 to 6 carbon atoms in the ester alkyl radical, comprising the steps of

- simultaneously mixing together solid or molten α-sulf fatty acid alkyl esters, an aqueous solution of hydrogen peroxide or an H₂O₂-yielding compound, and solid alkali metal carbonate at a temperature of from about 20 to about 80° C., wherein the ratio by weight of ester to H₂O₂ is from about 1:0.01 to about 1:0.06 and the molar ratio of ester to alkali metal carbonate is in the range of from about 1:0.5 to about 1:0.75;
- destroying the foam formed through the release of CO₂ under a pressure of from about 0.2 to about 1.0 bar, and at a temperature of from about 50° to about 70° C., and
- degassing and dehydrating the product formed under a pressure of from about 15 to about 100 mbar and at a temperature of from about 50° to about 80° C.

4,874,553

AQUEOUS PHOSPHOLIPID SOLUTIONS CONTAINING A SOLUBILIZING AGENT

Hager, Jörg; Miklos Ghyczy, both of Cologne; Vincent Feyen, Bergheim; Paul Imberge, Pulheim-Sinthern; Ulrich Brandenburg, Cologne, and Peter Wilperath, Bergisch Gladbach, all of Fed. Rep. of Germany, assignors to A. Nattermann & Cie. GmbH, Cologne, Fed. Rep. of Germany

Filed Mar. 11, 1987, Ser. No. 24,565

Claims priority, application Fed. Rep. of Germany, Mar. 14, 1986, 3620453

Int. Cl.⁴ C07E 9/10

U.S. Cl. 260-403

12 Claims

1. An aqueous phospholipid solution comprising as a solubilizing agent at least one of (1) one or more compounds of the formula I



in which R denotes hydrogen or an acyl radical of a carboxylic acid having 1-22 carbon atoms, A denotes a straight-chain or branched alkylene group having 1-10 carbon atoms and R₁ and R₂, which are identical or different denote hydrogen or an alkyl group having 1-8 carbon atoms, or (2) one or more salts of an inorganic or an organic acid and

(RO-A-N⁺R₁R₂R₃) wherein R, A, R₁ and R₂ are as defined above and R₃ denotes a hydrogen or an alkyl group having 1-8 carbon atoms.

4,874,554

QUATERNARY AMMONIUM COMPOUNDS

Fritz Lange, Essen; Peter Busch, Erkrath, and Klaus Thiele, Langenfeld, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Jul. 10, 1987, Ser. No. 72,379

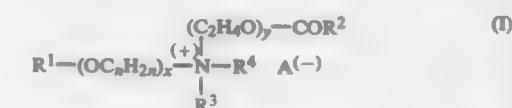
Claims priority, application Fed. Rep. of Germany, Jul. 10, 1986, 3623215

Int. Cl.⁴ C07C 107/08

U.S. Cl. 260-404

5 Claims

1. A quaternary ammonium compound of the formula:



wherein:

- R¹ is a C₈₋₂₂ alkyl;
R² is a C₇₋₂₁ alkyl;
R³ is a —(C₂H₄O)_x—H, or —(C₂H₄O)_x—COR²;
R⁴ is a C₁₋₄ alkyl or benzyl;
n is 2 or 3;
x is a number from 1 to 10;
y and z are each a number from 1 to 10; and
A is chloride, bromide, or R⁵OSO₃(—) where R⁵ is a C₁₋₄ alkyl.

4,874,555

SOYBEAN PROCESS

Ray Upchurch, Texarkana, Ark., assignor to The French Oil Mill Machinery Co., Piqua, Ohio

Filed May 2, 1988, Ser. No. 189,260

Int. Cl.⁴ C11B 1/10

U.S. Cl. 260-412.4

15 Claims

1. In a method for processing soybeans in which hull portions are separated from the kernel portions of the soybean, the improvement comprising cracking said kernels into a plurality of kernel portions, pulverizing said cracked kernel portions to form powder-like particles, steam-treating said pulverized kernels under pressure conditions, and forming porous pellets by passing said steam-treated particles through a die orifice.

4,874,556

PROCESS FOR THE DESENSITIZATION OF WATER-INSOLUBLE PEROXYCARBOXYLIC ACIDS

Manfred Dankowski, Moenchengladbach, and Willi Hofen, Rodenbach, both of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 63,045, Jun. 17, 1987, abandoned. This application Oct. 28, 1988, Ser. No. 266,237

Claims priority, application Fed. Rep. of Germany, Aug. 25, 1986, 3628263

Int. Cl.⁴ C07C 179/133

U.S. Cl. 562-2

12 Claims

1. A process for the desensitization of water insoluble peroxycarboxylic acids with essentially sodium sulfate as the desensitizing agent, comprising contacting said peroxycarboxylic acids in the absence of an organic solvent with the desensitizing agent in the aqueous phase, which is essentially sodium sulfate to thereby obtain the desensitized peroxycarboxylic acids, separating said acids from mother liquor that is formed thereby, withdrawing heat from said mother liquor after separation of the desensitized peroxycarboxylic acids to thereby crystallize pure sodium sulfate in the form of the decahydrate or heptahydrate or mixtures thereof, separating the crystallized sodium sulfate hydrates free of impurities from the spent liquor which contained the impurities present in the desensitization process and is discharged from the system and returning

at least part of the separated sodium sulfate to the process for contacting with untreated peroxydicarboxylic acids.

4,874,557

PROCESS FOR THE PREPARATION OF PERFLUORINATED CARBONYL FLUORIDES

Alfred Kruse, Kelheim; Günter Siegemund, Hofheim am Taunus, and Werner Schwertfeger, Langgöns, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Nov. 3, 1988, Ser. No. 266,919

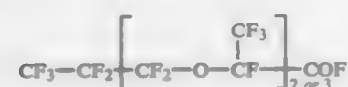
Claims priority, application Fed. Rep. of Germany, Nov. 7, 1987, 3737920

Int. Cl.⁴ C07C 51/29

U.S. Cl. 562—851

8 Claims

1. A process for the preparation of perfluorinated carbonyl fluorides of the formula



by oligomerisation of hexafluoropropene oxide in the presence of a catalyst, wherein the catalyst comprises an alkali metal fluoride, a carboxylic acid dinitrile and an ether of the formula



in which x denotes an integer from 2 to 6.

4,874,558

POLYMER CATALYZED SYNTHESIS OF ACID ANHYDRIDES

Wilmer K. Fife, Indianapolis, Ind., and Zhi-Dong Zhang, Tianjin, China, assignors to Indiana University Foundation, Bloomington, Ind.

Continuation-in-part of Ser. No. 52,439, May 21, 1987. This application Dec. 13, 1988, Ser. No. 284,846

Int. Cl.⁴ C07C 51/56

U.S. Cl. 562—894

15 Claims

1. A process for preparing acid anhydrides comprising the step of:

reacting a carboxylic acid or carboxylate salt with an acid halide or acyl activating agent in the presence of a catalyst selected from the group consisting of a solid phase copolymer of 4-vinylpyridine, a solid phase copolymer of 4-vinylpyridine 1-oxide, and a water soluble homopolymer of 4-vinylpyridine 1-oxide at a temperature of about 0° C. to ambient.

4,874,559

PROCESS AND DEVICES FOR OPERATION OF AN APPARATUS WHICH FUNCTIONS BY USING A FLOW OF A LIQUID FILM

Pierre Brun, Grenoble, France, assignor to Compagnie Européenne Du Zirconium Cezus, Courbevoie, France

Filed Jan. 19, 1989, Ser. No. 298,896

Claims priority, application France, Jan. 21, 1988, 88 01006

Int. Cl.⁴ B01F 3/04

U.S. Cl. 261—67

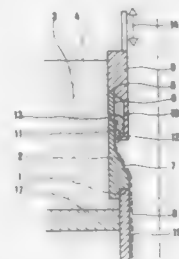
17 Claims

1. A process for operating an apparatus such as an evaporator, absorber or exchanger, which functions using a flow of a plurality of liquid films over a plurality of flow surfaces, in which the liquid films are fed by gravity from a source which is permanently fed with a flow rate (d₁) which is slightly higher than the minimum flow rate (d₀) below which the film or films breaks or break down, comprising the steps of:

(a) firstly feeding each film with a permanent flow rate (kd₁) corresponding to the feed flow rate (d₁) of the source, k

being 1 and equal to 1/n in the case of n identical flow surfaces;

(b) then for a brief period increasing the feed flow rate for each film to a transient value (kd₂) permitting a continuous film to be established over the whole of the corresponding flow surface;



(c) then returning the operation to the permanent feed flow rate (kd₁) for the film in question; the short periods of feeding the flow surfaces at their transient flow rates (kd₂) being displaced in respect of time in relation to those different surfaces.

4,874,560

APPARATUS FOR EFFECTING SELECTED PATTERNS OF FLUID FLOW

James A. Titmas, Dallas, Tex., assignor to Oxidyne Corporation, Dallas, Tex.

Continuation of Ser. No. 204,130, Jan. 6, 1988, abandoned. This application Jun. 30, 1989, Ser. No. 373,685

Int. Cl.⁴ B01F 3/04

U.S. Cl. 261—76

16 Claims



1. Apparatus for effecting a selected pattern of fluid flow comprising a body for separating a first fluid and second fluid having a first surface along which the first fluid flows, a second surface, and a plurality of discrete groupings of holes passing through the body from the second surface to the first surface through which a second fluid flows, wherein each grouping contains a plurality of closely associated holes arranged in a substantially straight line and each grouping is substantially perpendicular to the next successive grouping.

4,874,561

METHOD FOR DESIGNING PARAMETRIC MOLDING APPARATUS

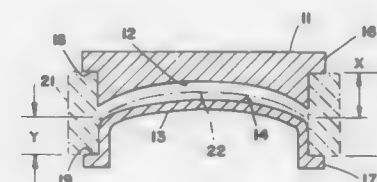
David P. Spector, Sanalito, Calif., assignor to Sola USA, Inc., Petaluma, Calif.

Filed Mar. 3, 1988, Ser. No. 163,771

Int. Cl.⁴ B29D 11/00

U.S. Cl. 264—1.1

4 Claims



1. A method for producing ophthalmic lenses, comprising the steps of providing a first plurality of front surface molding dies having concave optical forming surfaces, providing a second plurality of rear surface molding dies having convex optical forming surfaces, providing a lens forming assembly adapted to retain an arbitrarily selected pair of dies comprising any one of said first plurality of front surface molding dies and any one of said second plurality of rear surface molding dies in confronting relationship, defining an imaginary molding reference curve disposed between said pair of dies, providing first spacing means for each of said first plurality of dies to interact with said lens forming assembly and space the respective concave optical forming surface of each of said first plurality of dies a first fixed distance from said reference curve, providing second spacing means for each of said second plurality of dies to interact with said lens forming assembly and space the respective convex optical forming surface of each of said second plurality of dies a second fixed distance from said reference curve, whereby the spacing at closest approach of any arbitrarily selected pair of dies is a constant, and thereafter forming a lens between said dies.

4,874,562

PROCESS FOR PREPARING TOWS FROM COMPOSITE FIBER BLENDS

Paul McMahon, Mountlake, Tai-Shung Chung, Summit, and Lincoln Ying, Bridgewater, all of N.J., assignors to BASF Structural Materials Inc., Charlotte, N.C.

Continuation of Ser. No. 589,817, Mar. 15, 1984, abandoned.

This application Dec. 5, 1986, Ser. No. 940,234

The portion of the term of this patent subsequent to Dec. 1, 2004, has been disclaimed.

Int. Cl.⁴ D01G 13/00

U.S. Cl. 264—29.2

20 Claims



1. A process for preparing a continuous, substantially uniform tow useful in forming composite molded articles which comprises:

- forming a continuous tow of continuous carbon fibers;
- forming a continuous tow of continuous thermoplastic polymers fibers having a melting point of at least about 50° C.;
- uniformly and continuously spreading the thermoplastic polymer fiber tow to a selected width to preserve the separation of the individual fibers;
- uniformly and continuously spreading the carbon fiber tow to a width that is essentially the same as the selected width for the thermoplastic polymer fiber tow;
- intimately, uniformly and continuously intermixing the spread carbon fiber tow and the spread thermoplastic polymer fiber tow in a relatively tension-free state by bringing the tows into simultaneous contact with each other in substantially the same area such that there is provided a substantially uniform distribution of the thermoplastic fibers and the carbon fibers within an intimately intermixed tow; and
- continuously withdrawing the intimately intermixed tow.

4,874,564

MOLDING PROCESS AND DEVICE THEREFOR

Kiyoshi Sadani, and Yoshihiko Sunami, both of Kashima, Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka, Japan

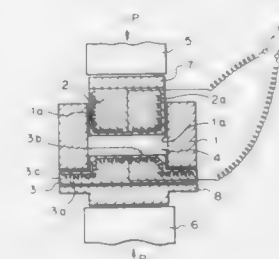
Filed Dec. 17, 1987, Ser. No. 134,057

Claims priority, application Japan, Dec. 18, 1986, 61-302345; Mar. 3, 1987, 62-048294

Int. Cl.⁴ B29C 43/18, 43/36, 43/52

U.S. Cl. 264—24.7

16 Claims



1. A method of molding a molding compound which contains pitch, wherein the pitch, when heated, melts with evolving gas and then sets or solidifies at a higher temperature, comprising the steps of:

- putting the molding compound into a mold;
- heating the molding compound under pressure at a tempera-

4,874,562

METHOD OF MOLDING A POLYVINYL ALCOHOL CONTACT LENS

Sueng-Hyu Hyon, and Yoshito Ikada, both of Uji, Japan, assignors to Biomaterials Universe, Inc., Kyoto, Japan

PCT No. PCT/JP87/00082, § 371 Date Sep. 30, 1987, § 102(e) Date Sep. 30, 1987, PCT Pub. No. WO87/01524, PCT Pub. Date Aug. 27, 1987

PCT Filed Feb. 9, 1987, Ser. No. 117,171

Claims priority, application Japan, Feb. 13, 1986, 61-29189

Int. Cl.⁴ B29D 11/00

U.S. Cl. 264—1.4

5 Claims

1. A method of manufacturing a soft contact lens, comprising forming a solution of poly(vinyl alcohol) in a mixed solvent of water and an organic solvent in a weight ratio of water to organic solvent of 90:10 to 10:90, pouring the solution in a mold having a shape of a contact lens, crystallizing the poly(vinyl alcohol) at a temperature of not more than 0° C., taking the crystallized poly(vinyl alcohol) out of the mold, and then replacing the organic solvent in the crystallized poly(vinyl alcohol) with water.

ture sufficient to cause the setting of the pitch wherein the molding compound is subject to a compressive force along a direction and the compound is heated on each of two ends which lie along the direction of the compressive force, whereby a temperature gradient is created along the direction of the compressive force, thereby progressively advancing the setting of said molding compound from one end of the molding compound which is at a higher temperature to the opposite end which is at a lower temperature; cooling the molding compound after the molding compound has been set; and removing the resulting molding from the mold.

16. A molding device for molding a molding compound comprising:

a mold frame having a bore extending therethrough, said mold frame being made of an iron alloy having a linear expansion coefficient ranging from 0 to $1.2 \times 10^{-6}/^{\circ}\text{C}$; upper and lower punches slidably inserted in said bore of the mold frame; means for pressing said upper and lower punches against a molding compound poured into a space in the bore limited by said upper and lower punches; and means for heating said upper and lower punches, said means for heating comprising means for separately heating said upper and lower punches.

4,874,565

PLASTISOL SLUSH PROCESS

Frank J. Preston, Hampton, N.H., assignor to Ex-Cell-O Corporation, Troy, Mich.

Continuation of Ser. No. 851,017, Apr. 11, 1986, abandoned.

This application Apr. 22, 1988, Ser. No. 185,101

Int. Cl.⁴ B29B 17/00; B29C 41/18

U.S. Cl. 264—37

4 Claims



1. In an open mold method for coating a thin plastic shell on a heated surface of an open ended mold cavity block having an open end and a low point by use of a conversion process in which less than 10 percent of a liquid plastisol charge is deposited as gelled material on the heated surface and a remainder of the liquid plastisol charge is recycled back to a source of plastisol and wherein cycle time of the process is limited by time required to circulate the liquid plastisol into and from the mold cavity to fully coat the heated surface thereon, the improvement comprising:

reducing fill volume in the open ended mold cavity block to substantially twenty percent of a volume of the open ended mold cavity block bounded by the heated surface of the open ended mold cavity block; directing a charge of the liquid plastisol from a source of material through the open end of the mold into the low point thereof and filling the reduced fill volume to fully coat the heated surface of the open ended mold cavity block with the liquid plastisol material; recycling seventy-five percent of the liquid plastisol occupying the reduced fill volume and returning it to the source for reuse in subsequent filling of the reduced fill volume in the open ended mold cavity block; providing a movable insert having a volume reducing position in an interior of the mold and a plastisol recovery position out of the mold interior, locating the movable insert in its volume reducing position to reduce the fill

volume of the open ended mold only when liquid plastisol is being directed into the reduced volume; and thereafter locating the insert in its plastisol recovery position for recovering plastisol waste from the insert as the liquid plastisol is being recycled back to the source.

4,874,566

METHOD AND DEVICE FOR PRODUCING SHAPED OBJECTS FROM THERMOPLASTIC PLASTICS

Uwe Henschel, Klosterstrasse 22, 6520 Worms, Fed. Rep. of Germany

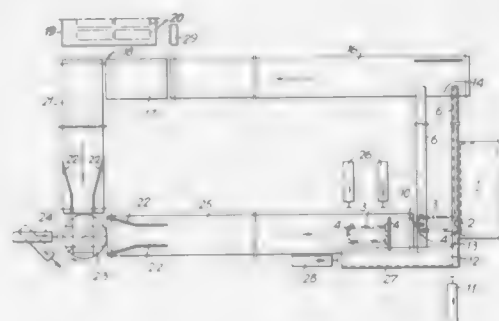
Filed Jan. 4, 1987, Ser. No. 58,355

Claims priority, application Fed. Rep. of Germany, Jun. 6, 1986, 3619144

Int. Cl.⁴ B29C 47/02, 47/02

U.S. Cl. 264—40.2

9 Claims



1. In a method for producing shaped objects from thermoplastics, particularly non-cleaned and non-sorted plastic refuse, comprising the steps of providing an extruder in which a plastic refuse is plasticized, providing mods for shaping objects, feeding a plasticized plastic from said extruder into said molds, cooling said molds, removing shaped objects from said molds and feeding said mods for refilling with plasticized plastic towards said extruder, the improvement comprising treating plastic refuse containing non-plastic inclusions in said extruder while milling and homogeneously mixing said non-plastic inclusions with molten plastic and friction-heating and generating pressure up to about 140 Bar, closing one of said molds at least at end faces thereof by base plates one of which has a filling opening, displacing said one mold along guides extending transversely of a nozzle of said extruder from a storage position to a filling position with said base plate having said filling opening facing said nozzle, filling said one mold positioned against said nozzle with the plasticized plastic of about 100 kg under pressure generated in said extruder, applying to said one mold a displacing stroke when a required filling of said one mold in the filling position is reached, moving the filled one mold laterally of said nozzle over a waiting distance to a discharge position of said guides while maintaining said filling opening closed and simultaneously displacing another mold from the storage position towards said nozzle while an extruder-side base plate sealingly slides against edges of said nozzle during a mold exchange and closing said nozzle to prevent discharge of the filling plastic thereof during the mold exchange, removing said one mold from said discharge position and cooling said one mold, removing the shaped object from said one mold and feeding the emptied one mold to an input position of said guides, and repeating the same steps for said another mold.

4,874,567
MICROPOROUS MEMBRANES FROM POLYPROPYLENE

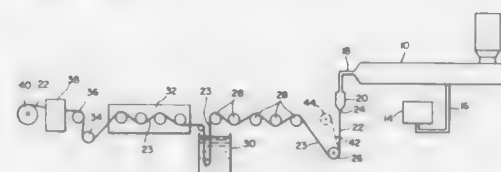
George Lopatin, Newton Centre; Larry Y. Yen, Tewksbury, and Randall R. Rogers, Billerica, all of Mass., assignors to Millipore Corporation, Bedford, Mass.

Filed Apr. 24, 1987, Ser. No. 42,138

Int. Cl.⁴ B29D 27/04

U.S. Cl. 264—45.1

8 Claims



1. A process for forming a microporous polypropylene membrane which comprises the following steps in sequence: (a) forming a melt-blend consisting essentially of polypropylene and a solvent capable of effecting solid liquid phase separations of polypropylene therefrom containing between about 5 and 20 weight percent polypropylene based upon the weight of the blend; (b) shaping said melt-blend to form a shaped precursor to said membrane; (c) cooling said shaped precursor to a temperature at which said solvent separates from polypropylene by solid-liquid phase separation to form a gel film; (d) selectively extracting said solvent formed from said gel film in step (c) to form a microporous polypropylene membrane; and (e) drying said membrane from step (d) while said membrane is restrained to prevent said membrane from shrinking.

4,874,568

PROCESS OF MAKING A POROUS MEMBRANE

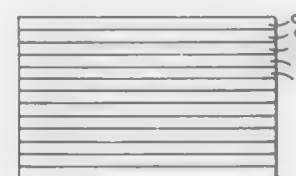
C. C. Chau, and Jang-hi Im, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Sep. 26, 1988, Ser. No. 249,035

Int. Cl.⁴ B29C 43/30, 67/04, 67/20; B32B 31/24

U.S. Cl. 264—49

21 Claims



1. A process for preparing a microporous material comprising: coextruding a plurality of interdigitated layers of at least a first polymeric material and a second different polymeric material to form a laminate product, such that said layers each have a thickness of from 0.03 to 5 microns, at least one of said polymeric materials having preferential solubility in a selected solvent with respect to the other of said polymeric materials; pulverizing the resulting laminate product and recoextruding the pulverized product at least once to again form a layered material wherein each of said layers has a thickness of from about 0.03 to about 5 microns; pulverizing said recoextruded material and forming a melt composition of the resulting pulverized granules into a thin, solid material; contacting said solid material with an extraction medium which has a preferential solubility for at least one of said polymeric materials, whereby said preferentially soluble

polymeric material is removed from said solid material to leave a porous material; and separating said extraction medium from said porous unitary material.

4,874,569

CERAMIC COMPOSITE AND METHODS OF MAKING THE SAME

Jack A. Kuszyk, and Christopher R. Kennedy, both of Newark, Del., assignors to Lanxide Technology Company, LP, Newark, Del.

Filed Jan. 12, 1987, Ser. No. 2,048

Int. Cl.⁴ C04B 35/71, 35/02

U.S. Cl. 264—60

23 Claims

1. A method for producing a self-supporting ceramic composite comprising (1) a ceramic matrix obtained by oxidation of a parent metal comprising an aluminum alloy to form a polycrystalline material comprising an oxidation reaction product of the parent metal with at least one oxidant; and (2) at least one filler embedded by the matrix, which method comprises:

(a) positioning a parent metal, comprising an aluminum alloy having at least about 1% by weight zinc, adjacent to a permeable mass of filler having at least one defined surface boundary and orienting said parent metal and said filler relative to each other so that formation of an oxidation reaction product of the parent metal with an oxidant will occur into said mass of filler and in a direction towards said defined surface boundary; (b) heating said parent metal to a first temperature above its melting point but below the melting point of said oxidation reaction product to form a body of molten parent metal and reacting the molten parent metal with said oxidant at said first temperature to form said oxidation reaction product, and at said first temperature maintaining at least a portion of said oxidation reaction product in contact with and extending between said body of molten metal and said oxidant, to draw molten metal through the oxidation reaction product towards the oxidant and towards and into the adjacent mass of filler so that fresh oxidation reaction product continues to form within the mass of filler at an interface between the oxidant and previously formed oxidation reaction product, and continuing said reaction for a time sufficient to infiltrate said mass of filler to said defined surface boundary, with said ceramic matrix, said ceramic matrix containing at least some residual non-oxidized metallic constituents of said parent metal; and (c) heating the resulting infiltrated mass of step (b) in at least one environment selected from the group consisting of an oxygen-containing atmosphere, an inert atmosphere and a vacuum to a second temperature above the first temperature but below the melting point of the oxidation reaction product to remove or oxidize at least a substantial portion of said residual non-oxidized metallic constituents of said parent metal without substantial formation of oxidation reaction product beyond said defined surface boundary, thereby producing a self-supporting ceramic composite.

4,874,570

METHOD OF MAKING A GAMES RACKET

Robert C. Haines, Huddersfield, England, assignor to Dunlop Limited, United Kingdom

Filed Jun. 3, 1987, Ser. No. 56,944

Claims priority, application United Kingdom, Jan. 16, 1985, 85-01006

Int. Cl.⁴ B29C 33/12, 45/36

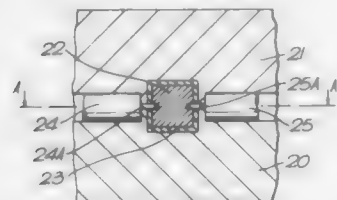
U.S. Cl. 264—154

10 Claims

1. A method of molding a games racket frame of fiber reinforced plastic material comprising a hollow head and shaft, in which the head and shaft are integrally-molded, said method comprising injecting thermoplastics material into an injection mold and

around a fusible core, the core having the desired internal shape of the head and shaft and having a melting point below the injection temperature, supporting the shaft portion of the core in the injection mold adjacent its head end and in the region of the eventual handle.

positioning at least one pair of locating means in the shaft portion between the head end and handle region of the shaft, one of each pair of said locating means lying on opposite sides of the shaft portion of the core, the locating means being positioned to correspond to the neutral surface of the eventual shaft and projecting through the thermoplastics material, said neutral surface being the



notional surface of the shaft in which there are no tensile or compressive stresses in the shaft when the shaft is subject to flexure by the racket contacting a ball, positioning said at least one pair of locating means longitudinally of the shaft so that the greatest unclamped length of the shaft portion of the core between supports, divided by the depth of the shaft portion of the core, is less than 10, allowing the molding to set, then raising the temperature to an amount sufficient to melt the core but insufficient to melt or deform the molding and removing the molten core and the locating means so as to leave a pair of holes corresponding to each said pair of locating means.

4,874,571

APPARATUS FOR CALENDERING PLASTIC WEB EXTRUDED FROM A SLOT DIE

Heinz Müller, Windeck, Fed. Rep. of Germany, assignor to Reifenhauser GmbH & Co. Maschinenfabrik, Troisdorf, Fed. Rep. of Germany

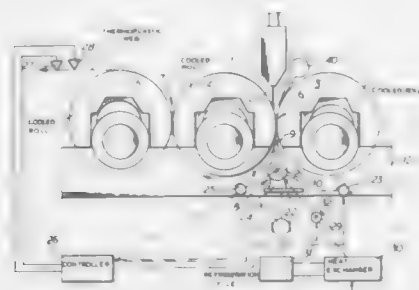
Filed Jan. 11, 1988, Ser. No. 142,466

Claims priority, application Fed. Rep. of Germany, Jan. 31, 1987, 3702945

Int. Cl.⁴ B29C 47/90

U.S. Cl. 264—175

15 Claims



1. An apparatus for calendaring a plastic web extruded from a slot die, said apparatus comprising at least two cooled calendaring rolls said rolls operating in conjunction with each other and together defining a calendaring nip, said slot die being positioned on one side of said calendaring nip, said plastic web continuously coming off the first of said rolls and being threaded around the second of said rolls, and having in the region of said calendaring nip a blowing device for cooling

gas, said blowing device providing cooling gas along the length of said calendaring nip into the channel between the first of said rolls and the plastic web coming off the roll, and said blowing device being a blowing duct extending the breadth of said calendaring rolls, and having a slot aperture for said cooling gas.

11. A method for calendaring a plastic web comprising the steps of:

extruding a plastic through a slot die to form said plastic web; directing said extruded plastic web into a calendaring nip formed between a first and a second cooled calendaring roll and operating said rolls in relative counterrotation, said slot die being positioned on one side of said rolls; threading said plastic web continuously coming off the first calendaring roll around the second calendaring rolls; and blowing cooling gas from a blowing device along the length of said calendaring nip into a channel between the first of said rolls and the plastic web coming off the roll.

4,874,572

METHOD OF AND APPARATUS FOR MEASURING VAPOR DENSITY

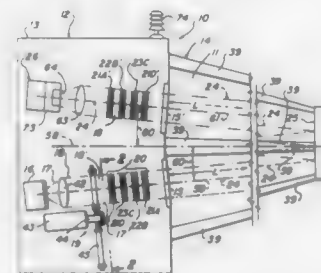
Loren D. Nelson, Morrison, and Todd A. Cerni, Littleton, both of Colo., assignors to Ophir Corporation, Colo.

Filed May 6, 1987, Ser. No. 46,286

Int. Cl.⁴ G21C 17/00; G01J 1/00

U.S. Cl. 376—256

32 Claims



1. In an apparatus for measuring the concentration of individual components of a multi-component system, said apparatus being in the form of a hygrometer, wherein said multi-component system includes at least water vapor in the coolant-gas stream of a gas-cooled nuclear reactor, said apparatus including means for transmitting an electromagnetic radiation input signal through a sample that has at least one of said system components therein, said electromagnetic radiation input signal being within a broad wavelength band that includes a given wavelength selected for strong absorption by said one component in said sample; the improvement comprising:

means responsive to said electromagnetic radiation input signal after transmission thereof through said sample for generating an output signal indicative of the concentration of said one component in said sample, said generating means including means fabricated from indium arsenide and being linearly responsive to said transmitted electromagnetic radiation input signal at said given wavelength and over a relatively wide portion of said wavelength band of said input signal for generating said output signal, said indium arsenide generating means being positioned to respond to the electromagnetic radiation input signal after transmission through said coolant-gas stream and any water vapor therein.

4,874,573

LID ARRANGEMENT

Ian A. Wood, Rothley, and Edward A. Hornfield, Cheltenham, both of England, assignors to The English Electric Company Limited, England

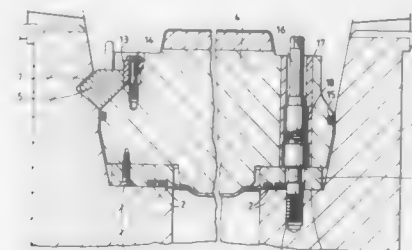
Filed Mar. 22, 1988, Ser. No. 171,689

Claims priority, application United Kingdom, Apr. 3, 1987, 8707972; Jan. 15, 1988, 8800887

Int. Cl.⁴ G21F 5/00

U.S. Cl. 376—272

13 Claims



4. A container comprising, in combination:

(A) a vessel having an opening; and

(B) a lid assembly to be secured in said opening to seal said opening, said lid assembly including

(i) a deformable inner lid member,

(ii) an outer lid member,

(iii) means for securing said inner and outer lid members together to form a single unit which is to be inserted, inner lid member first, into said opening,

(iv) means for attaching said inner lid member to said vessel so that, in use, said inner lid member seals said opening,

(v) stop means associated with said outer lid member,

(vi) said securing means being operative for releasing said outer lid member from said inner lid member on the occurrence of a fault condition which results in deformation of said inner lid member, thereby allowing said outer lid member to move relative to said vessel, and

(vii) said stop means then being operative for restricting the extent of movement of said outer lid member relative to said vessel so as to limit the degree of deformation of said inner lid member and prevent leakage of the seal.

4,874,574

CONTROL ROD

Takao Igarashi; Satoshi Sugawara; Yuichiro Yoshimoto, all of Hitachi; Shozo Saito, Mito; Takashi Fukumoto; Zenichiro Endo, both of Hitachi, and Katsutoshi Shinbo, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 9, 1987, Ser. No. 23,230

Claims priority, application Japan, Mar. 14, 1986, 61-54819; Mar. 20, 1986, 61-60579; Apr. 11, 1986, 61-82118; Nov. 12, 1986, 61-267611

Int. Cl.⁴ G21C 7/10

U.S. Cl. 376—333

28 Claims

1. In a boiling water nuclear reactor having a core, control rods for controlling the reactivity of said core, and insertion means disposed below said core for inserting said control rods into said core, each said control rod comprising:

a neutron absorption region containing therein neutron absorbers made of absorption nuclear chain type neutron absorber in which nuclides that absorb further neutrons appear in the nuclides formed by the neutron absorption reaction or disintegrated nuclides thereof and which are low in attenuation speed of the neutron absorption effect;

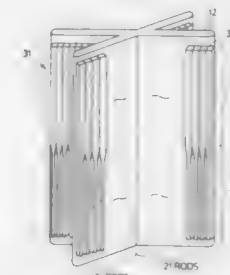
and

means for supporting said neutron absorbers in a predeter-

mined position so as to prevent axial and radial movement thereof;

wherein said neutron absorption region is divided into upper and lower regions in an axial direction of said control rod, said upper and lower regions having identical neutron absorbers, and said upper region of said control rod is inserted into said core by said insertion means before insertion of said lower region into said core by said insertion means;

the quantity of said absorption nuclear chain type neutron absorber contained in said lower region in a section per-



pendicular to the axial direction is smaller than the quantity of said absorption nuclear chain type neutron absorber contained in said upper region in a section perpendicular to the axial direction; and

a boundary between said upper and lower regions at which the quantity of said absorption nuclear chain type neutron absorber physically changes in the axial direction between said upper and lower regions is positioned within a range of from 1/3 to 2/3 of the full length of said neutron absorption region in the axial direction from a lower end of said neutron absorption region.

4,874,575

MULTIPLE DISCHARGE CYLINDRICAL PUMP COLLECTOR

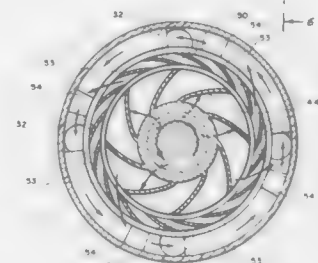
Charlton Dunn, Calabasas; Robert J. Bremner, Woodland Hills, and Sen Y. Meng, Reseda, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Continuation of Ser. No. 69,994, Jul. 6, 1987, abandoned. This application Sep. 15, 1988, Ser. No. 246,888

Int. Cl.⁴ G21D 1/04

U.S. Cl. 376—404

2 Claims



1. In an improved method for circulating fluid coolant through a reactor core of a pool-type nuclear reactor having a sealed containment vessel containing a reactor core submerged in a body of liquid coolant, said method for circulating coolant including utilization of a rotary pump including an impeller for producing a highly circumferential flow of cooling fluid and a method for collecting and discharging coolant fluid, the improvement to the method of collecting and discharging coolant fluid including the steps of:

(1) producing a substantially uniform circumferential flow of

the fluid by directing said flow through a plurality of diffuser vanes and into an annular collector located radially outboard from said impeller, said annular collector having an entirely closed outer periphery; and

(2) turning said flow of cooling fluid into a substantially axially direction while maintaining a substantially constant average flow velocity by directing the coolant flow from said annular collector into a plurality of individual passageways located in an axial position relative to said annular collector.

4,874,576

METHOD OF PRODUCING NODULAR CAST IRON
Karl J. Reifferscheid, Karben, Fed. Rep. of Germany, assignor to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany
Filed Jan. 19, 1989, Ser. No. 300,330
Claims priority, application Fed. Rep. of Germany, Jan. 23, 1988, 3801917

Int. Cl.⁴ C22C 33/08

U.S. Cl. 420—22 12 Claims
1. A method of producing nodular cast iron which comprises the steps of:

- forming a cast iron melt in a furnace;
- tapping said cast iron melt from said furnace in a stream into a receiver for said cast iron;
- continuously adding to said cast iron melt in said stream during the tapping of said cast iron melt and in a first treatment stage, a quantity of at least one rare earth metal in a form of steel-sheathed wire in an amount sufficient to convert oxygen and sulfur contained in the tapped melt to finely dispersed nonmetallic phases of rare earth oxide, rare earth oxysulfide and rare earth sulfide; and
- thereafter adding magnesium metal to the tapped melt without rare earths in a second treatment stage, in a form of a steel-sheathed wire, and in an amount sufficient for the formation of predominantly nodular graphite in the cast iron upon solidification thereof, the amount of said magnesium metal added being sufficient to impart to the cast iron a residual magnesium content of substantially 0.02 and 0.07% by weight and a residual sulfur content of substantially 0.005 to 0.025% by weight.

4,874,577

WEAR-RESISTANT INTERMETALLIC COMPOUND ALLOY HAVING IMPROVED MACHINEABILITY
Saburo Wakita, and Junji Hoshi, both of Omiya, Japan, assignors to Mitsubishi Kinzoku Kabushiki Kaisha, Tokyo, Japan
Continuation-in-part of Ser. No. 938,005, Dec. 4, 1986, abandoned. This application Nov. 9, 1987, Ser. No. 120,177
Claims priority, application Japan, Dec. 23, 1985, 60-289600; Feb. 12, 1986, 61-28508; Feb. 12, 1986, 61-28509; Feb. 12, 1986, 61-28510

Int. Cl.⁴ C22C 14/00, 19/03, 19/07, 30/00

U.S. Cl. 420—417 14 Claims

1. A wear-resistant intermetallic compound alloy having superior machineability which consists essentially of: (i) 45–60% of Co or (ii) a Co and Ni content of 45–60% with the Co content being at least 5%; at least one of 0.1–2% of Hf and 0.05–2% of Re; 0.1–2% of at least one element selected from the group consisting of Si, P, Cu, Zn, Ga, Ge, Cd, In, Sn, Sb, Pb, and Bi; 0–2% of C; and 0–5% of at least one element selected from the group consisting of Zr, Fe, V, Nb, Ta, Cr, Mo, W and Mn; the balance being Ti and incidental impurities, the percent being atomic percent.

4,874,578

ALUMINIUM ALLOY FOR SUPERPLASTIC FORMING
Heinrich Homberger, Beringen, Switzerland; Jürgen Tlamm, Steislingen, Fed. Rep. of Germany, and Pedro Rodrigues, Lisboa, Portugal, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Jun. 20, 1988, Ser. No. 209,081

Claims priority, application Switzerland, Jun. 23, 1987, 2359/87

Int. Cl.⁴ C22C 21/00

U.S. Cl. 420—541 12 Claims

1. An aluminum alloy having excellent superplastic forming properties, the alloy consisting essentially of:

- 0.8–2.5% of iron,
- 3.5–6.0% of magnesium,
- 0.1–0.6% of manganese,
- 0.05–0.5% of zirconium,
- at most 6.0% of zinc,
- at most 3.0% of copper,
- at most 0.3% of silicon,
- at most 0.05% of titanium,
- at most 0.05% of chromium,

the balance being substantially aluminum of commercial purity.

4,874,579

ACYLATED 3-AMINO-1,2,4-TRIAZOLES AS CORROSION INHIBITORS FOR NON-FERROUS METALS

Karl-Heinz Schmid, Mettmann; Josef Penninger, Hilden, and Hinrich Moeller, Monheim, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Düsseldorf, Fed. Rep. of Germany

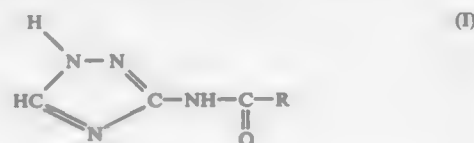
Filed Jun. 12, 1987, Ser. No. 62,294

Claims priority, application Fed. Rep. of Germany, Jun. 13, 1986, 3629023

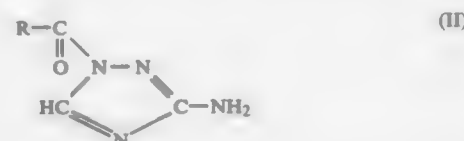
Int. Cl.⁴ C23F 11/04, 11/00

U.S. Cl. 422—16 11 Claims

1. A method for corrosion inhibition for nonferrous metals which contact an aqueous medium, oils and oil-containing emulsions, comprising: incorporating in said aqueous medium, oils, or oil-containing emulsions, which contact a non-ferrous metal, a corrosion-inhibition-effective amount of at least one 3-acylamino-1,2,4-triazole compound of the formula



and/or at least one 1-acyl-3-amino-1,2,4 triazole compound of the formula



wherein R is an unsubstituted linear or branched C₁₋₁₁ alkyl, whereby corrosion of the non-ferrous metal is inhibited by the presence of said at least one triazole compound.

4,874,580

PRESSURE-CONTROLLING METHOD

Ko Segisawa, Yasushi Matsumura, both of Nara; Hideofumi Okamoto, Sakai, and Hiroshi Hayami, Nara, all of Japan, assignors to House Food Industrial Company Limited, Japan
Continuation of Ser. No. 743,952, Jun. 12, 1985, abandoned.

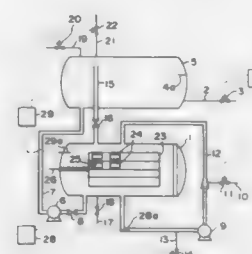
This application Sep. 14, 1987, Ser. No. 97,401

Claims priority, application Japan, Jun. 12, 1984, 59-121066

Int. Cl.⁴ A23L 3/12; A61L 2/06

U.S. Cl. 422—25

1 Claim



1. A method for sterilizing a sealed package containing air, comprising the steps of placing the package in a sealable treatment tank, sealing said sealable treatment tank, introducing hot water into said sealable treatment tank at a predetermined temperature, further heating said hot water to another predetermined temperature and maintaining said other predetermined temperature constant for a predetermined time, removing said hot water while introducing hot water for a predetermined cooling period of time within said sealable treatment tank during said steps of introducing hot water, further heating said hot water and maintaining said other predetermined temperature to change the rate-of-change of said pressure to near a point-of-change in a pressure rise in said package and controlling said pressure within said sealable treatment tank during said step of removing said hot water while introducing cool water for said predetermined cooling period of time whereby the lowering of pressure in the treatment tank begins at a period within the range of 30% of the predetermined cooling period of time to maintain the pressure in said sealable treatment tank near a point-of-change of the pressure within said package.

4,874,581

O₂/CO₂ CONTROL IN BLOOD OXYGENATORS

Karl M. Sutherland, Westminster, and Matthew Jenuisaitia, Irvine, both of Calif., assignors to Baxter International Inc., Deerfield, Ill.

Continuation of Ser. No. 874,288, Jun. 13, 1986, abandoned.

This application Jul. 7, 1988, Ser. No. 216,070

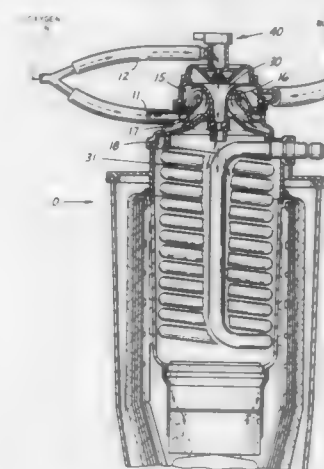
Int. Cl.⁴ A61M 1/32

U.S. Cl. 422—46

8 Claims

1. A blood oxygenator comprising:
 - a housing which defines a blood receiving compartment, said housing having blood inlet and outlet ports which communicate with said blood receiving compartment through which blood enters and exits said compartment, said housing further having a plurality of gas inlet ports which communicate with said blood receiving compartment through which an oxygen enriched gas enters said compartment;
 - means which selectively communicates with said gas ports for defining at least two gas flow pathways through said compartment;
 - a diffuser means associated with a first of said pathways which is operable for fractioning said gas into a plurality of microbubbles which are dispersed in any of said blood in said compartment;
 - a gas feed means associated with a second of said gas pathways which is operable for dispersing a substantially continuous, unsparged defined volume of gas in any of said

blood in said compartment separate from said microbubbles dispersed in said body by said fractioning means; wherein said housing compartment includes first a second portions for receiving said blood from said blood inlet ports, said first portion being positioned to receive said plurality of microbubbles from said diffuser means, and



said second portion being positioned to receive said substantially continuous, unsparged flow of gas from said gas feed means, said first and second portions being in at least partial fluid communication; and means associated with both of said gas flow pathways which is operable for controlling the flow of gas between said pathways.

4,874,582

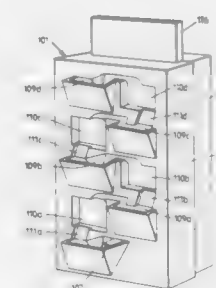
SAMPLE HANDLING UNIT FOR CENTRIFUGATION
Alan J. Gordon, Liverpool, and Donald G. Billington, Stoke on Trent, both of England, assignors to Shandon Scientific Limited, Runcorn, England

Continuation-in-part of Ser. No. 871,081, Jun. 5, 1986, abandoned. This application Oct. 19, 1987, Ser. No. 109,584
Claims priority, application United Kingdom, Jun. 10, 1985, 8514590

Int. Cl.⁴ G01N 35/00

U.S. Cl. 422—102

8 Claims



1. For centrifugation apparatus, a sample handling unit comprising a body having means therein defining:
 - a sample chamber adapted to receive fluent sample material when the body is in a vertically arranged position for centrifugation and having a deposition chamber with an open side,
 - means for receiving a deposit receiving element with a deposit receiving surface juxtaposed to the open side of the deposition chamber to receive thereon sample material

under the influence of an artificial gravitational field effected by centrifugation,
 a treatment fluid reservoir having an upper opening and adapted to receive and retain treatment fluid when the body is in a vertically arranged position for centrifugation and in the absence of an artificial gravitational field,
 means through which sample material may be supplied to the sample chamber through and upper opening therein without passages through the treatment fluid reservoir;
 a buffer chamber constructed and arranged relatively to the treatment fluid reservoir to receive therefrom treatment fluid therein under the influence of an artificial gravitational field effected by centrifugation, and
 flow path means including a weir communicating the buffer chamber with the sample chamber constructed and arranged to retain treatment fluid in the buffer chamber while said artificial gravitational field is maintained by to allow flow of treatment fluid in said flow path means when said artificial gravitational field is reduced.

4,874,583

BUBBLE CAP ASSEMBLY IN AN EBULLATED BED REACTOR

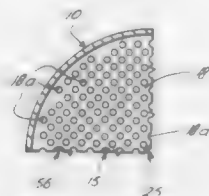
James H. Colvert, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Nov. 27, 1987, Ser. No. 125,834

Int. Cl.⁴ B01J 8/18

U.S. Cl. 422-143

3 Claims



3. In combination with a high pressure reaction vessel adapted for the reaction of a fluid hydrocarbon feed with hydrogen rich gas at elevated temperatures and pressures in the presence of a bed of a particulate solid catalyst, said reaction being the type wherein the gas and feed materials are passed upwardly through the bed at velocities whereby the bed is expanded to a volume greater than its static volume and the particulate solid catalyst is put in a state of random motion and wherein the mixture of fluid hydrocarbon, gas and solid constitute a turbulent zone wherein minimum solid settling takes place, the lower portion of which is defined by a transversely extending partition having a plurality of substantially regularly and uniformly disposed perforations extending through the partition;

a bubble cap assembly including risers being mounted in said perforations and including caps surmounting said risers, said risers having fluid flow ports above said partition, said bubble cap assembly having a ball check valve in the riser to prevent downflow of said particulate solid catalyst, and restricting the downflow of fluid, said ball check valve including a ball and a valve seat, said valve seat having an orifice adapted to be substantially closed by the ball, said orifice having a smaller internal diameter than that of the riser such that the velocity of the liquid flowing through said orifice is in excess of the transport velocity within said riser whereby catalyst particles entering said riser will be carried through said orifice, wherein the improvement comprises:
 said riser containing an orifice mixer upstream of said valve seat orifice.

4,874,584

FLUIDIZED BED REACTOR

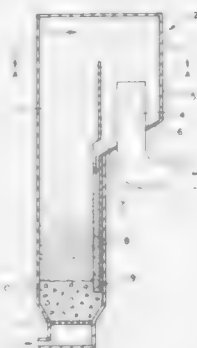
Seppo Ruotta, Karhula, Finland, assignor to A. Ahlstrom Osakeyhtiö, Karhula, Finland

Continuation-in-part of Ser. No. 397,363, Jul. 12, 1982, abandoned. This application Dec. 20, 1984, Ser. No. 684,016

Int. Cl.⁴ F27B 15/09, 15/12

U.S. Cl. 422-145

6 Claims



1. In a fluidized bed reactor wherein solid particles are entrained by gases flowing through the reactor, solids are separated from the gases and are returned to the lower part of the fluidized bed reactor, said reactor having in the upper part a chamber, a cyclone separator connected to said chamber, said cyclone separator having a vortex chamber, a return pipe for returning the solids separated from the gases to the lower part of the fluidized bed reactor, a discharge pipe for removal of the gases, the improvement which comprises the vortex chamber being inclined towards the reactor, the gas discharge pipe going through the bottom of the vortex chamber and directing downwards the gases from which the solid material has been removed, the gas discharge pipe is arranged so that its walls form a cylindrical partition between the solid particles and the gas in the bottom of the vortex chamber, and the discharge pipe has a diameter not less than 0.25D and not greater than 0.6D, wherein D is the diameter of said vortex chamber.

4,874,585

ECONOMIC RECOVERY AND UTILIZATION OF BOILER FLUE GAS POLLUTANTS

Arthur F. Johnson, Boulder, Colo., and Robert L. Sackett, Los Angeles, Calif., assignors to RCM Industries Corporation, Los Angeles, Calif.

Filed Mar. 8, 1988, Ser. No. 165,312

Int. Cl.⁴ B01J 8/12

U.S. Cl. 422-171

33 Claims

1. An article of manufacture for removing SO₂, NO_x and other pollutants from a flue gas stream containing these pollutants, comprising:

- a horizontal housing defining a duct for flow of flue gas therethrough;
- at least three vertical beds of particulates disposed in succession transversely in said duct, whereby said flue gas flows in succession through each of said beds;
- means for supplying a particulate material for removing entrained fly ash from said flue gas stream to a first one of said beds;
- means for supplying a particulate material for removing sulfuric acid from said flue gas stream to a second one of said beds;
- a third one of said beds comprising a regenerable particulate catalyst for carrying an alkali reactant thereon for reacting with sulfur dioxide in said flue stream;
- means for injecting an alkali material into said flue gas stream upstream of said third bed; and

means for inducing high velocity turbulent flow of said flue gas through said at least three beds.

4,874,586

RAGHOUSE BAG DESIGN FOR SIMULTANEOUS PARTICULATE CAPTURE AND CHEMICAL REACTION

Thomas Skymanski, Stow, Ohio, and Stephen M. Turner, Richmond, Tex., assignors to Norton Company, Worcester, Mass.

Filed Dec. 3, 1987, Ser. No. 128,558

Int. Cl.⁴ B01D 46/02

U.S. Cl. 422-177

3 Claims



1. Bag for use in removing particulate from a gas stream and simultaneously treating undesirable gaseous components of the gas stream, comprising:

- (a) a first tubular porous wall,
- (b) a second tubular porous wall mounted in telescoping, coextensive relationship inwardly of the first tubular wall to define a space between the two walls,
- (c) means located at substantial longitudinal intervals between the tubular walls to divide the space into a plurality of discrete compartments,
- (d) solid particles of chemical contained in each of the compartments, the chemical particles acting to treat an undesirable gaseous component,

wherein passage of a gas stream laterally through the tubular walls and space therebetween initially encounters the first wall and deposits particulate thereon, the gas stream subsequently passing through the particles of chemical and the second wall.

4,874,587

HAZARDOUS WASTE REACTOR SYSTEM

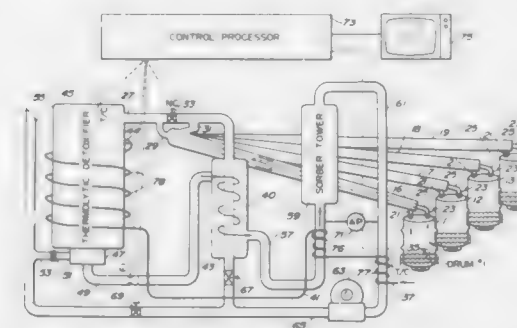
Terry R. Galloway, Berkeley, Calif., assignor to Thermolytic Decomposer, Richmond, Calif.

Continuation-in-part of Ser. No. 903,235, Sep. 3, 1986, abandoned. This application Aug. 26, 1987, Ser. No. 89,573

Int. Cl.⁴ B01J 10/00

U.S. Cl. 422-189

11 Claims



1. A method for noncombustively decomposing organic

compounds, comprising passing a gaseous mixture of the organic compounds and water into a reactor which includes a reaction zone having a temperature range between about 200° C and 1820° C to noncombustively decompose the organic compounds in the gaseous mixture, maintaining the ratio of water to organic compounds present in said gaseous mixture in said reaction zone such that the amount of water is greater than the stoichiometric amount necessary to combine with 100% of the organic compounds present in the gaseous mixture, and maintaining a residence time and mixing of said gaseous mixture and said water in said reaction zone to react substantially all of said organic compounds with said water to produce carbon monoxide and hydrogen as reaction product.

4,874,588

METHOD AND APPARATUS FOR RAPIDLY DISSOLVING POLYMERS IN WATER

Edwin T. Sortwell, Wheaton; Manuel Slovinsky, Woodridge, and Alan R. Mikkelsen, Downers Grove, all of Ill., assignors to Diotec Polymers, Batavia, Ill.

Division of Ser. No. 594,559, Mar. 29, 1984, Pat. No. 4,529,794. This application Mar. 5, 1985, Ser. No. 708,247

Int. Cl.⁴ C09C 1/00

U.S. Cl. 422-269

33 Claims

1. An apparatus for rapidly dissolving particles of a water soluble polymer in water, comprising:

- (a) a mixing apparatus for contacting said particles with water to form a suspension of said particles in water communication with;
- (b) a particle size reduction apparatus for subjecting said suspension to instantaneous and momentary conditions of high cutting shear simultaneously with or immediately after formation of said suspension of finely divide said particles without substantial molecular degradation of said polymer to form a solution of said polymer in water; and,
- (c) means for discharging said solution from said particle size reduction apparatus immediately after formation with said solution.

4,874,589

METHOD FOR DESULFURIZATION OF SULFUR OR HYDROGEN SULFIDE-CONTAINING GASES

Lothar Görlich, Dissen, Fed. Rep. of Germany, assignor to UTB Umwelttechnik Buchs AG, Buchs, Switzerland

Continuation of Ser. No. 916,715, Oct. 8, 1986, abandoned. This application Apr. 28, 1988, Ser. No. 188,742

Claims priority, application Switzerland, Oct. 11, 1985, 8394/85

Int. Cl.⁴ C01B 17/05

U.S. Cl. 423-220

23 Claims

1. Method of desulfurization of gases containing sulfur contaminants, utilizing the steps of
 providing reservoirs (27, 31, 33) of washing or scrubbing liquid;
 washing the gas in an absorber (11) with a washing liquid and thereby forming a contaminated liquid including sulfur compounds in the washing liquid;
 circulating the washing liquid in a first scrubbing loop from said reservoir (31) through said absorber (11) back to reservoir (31) at a first flow rate and in a second regenerating loop, through a regenerator vessel (59) and back into said reservoir (35) at a second flow rate;
 in said second loop, aerating and oxidizing the sulfur compounds and decontaminating the washing liquid by introducing a gas containing oxygen to the washing liquid;
 removing elemental sulfur from the oxidized liquid and introducing the decontaminated liquid via said reservoir (33) into the first loop prior to the washing step, wherein the aerating and oxidizing step comprises introducing oxygen to the contaminated liquid in said regenerator vessel (59) under hyperbaric pressure

which is sufficient to effect oxidation of hydrogen sulfide to elemental sulfur, drawing off a portion of said liquid in said regenerator vessel at a third flow rate and contacting said portion with said oxygen while reintroducing said portion into said regenerator vessel; and wherein the step of circulating the washing liquid prior to reintroduction of the liquid to the washing step comprises the step of degassing the liquid, after the aerating and oxidizing step in said regenerator vessel (59).

4,874,398

CATALYTIC REDUCTION OF NITROGEN OXIDES
Mark T. Stanulka, Peekskill, N.Y., and Alan P. Risch, New Fairfield, Conn., assignors to UOP, Des Plaines, Ill.
Filed Apr. 7, 1988, Ser. No. 178,912
Int. Cl.⁴ B01J 8/00; C01B 21/00, 17/00

U.S. Cl. 423—239 26 Claims
1. A method for catalytically reducing one or more nitrogen oxides from a gaseous stream containing one or more nitrogen oxides and one or more sulfur oxides which comprises contacting said gaseous stream and ammonia with a microporous non-zeolitic molecular sieve composition at effective reduction conditions, wherein said microporous non-zeolitic molecular sieve composition is hydrogen-forming cation exchanged prior to said contacting in said method.

4,874,591

PROCESS FOR THE PURIFICATION OF WASTE GASES CONTAINING HYDROCHLORIC ACID AND SULPHUR DIOXIDE

Josef Jeney, Vienna, Austria, assignor to Maschinenfabrik Andritz Actienengesellschaft, Graz-Andritz, Austria
Filed Jul. 28, 1988, Ser. No. 225,380
Claims priority, application Austria, Jul. 29, 1987, 1915/87
Int. Cl.⁴ C01B 7/00, 17/00, 7/01

U.S. Cl. 423—240 7 Claims
1. A process for the purification of a waste gas containing hydrochloric acid and sulphur dioxide comprising the steps of: contacting a waste gas containing hydrochloric acid and sulphur dioxide with a magnesium-containing scrubbing agent to produce reaction products, said magnesium-containing scrubbing agent being free of gypsum; adding a calcium-containing reagent to said reaction products to produce a chloride-containing liquid and a precipitate of particulate calcium sulphate; and then subjecting said chloride-containing liquid to pyrohydrolysis to produce hydrochloric acid of 16 to 30 mass % and to regenerate said magnesium-containing scrubbing agent.

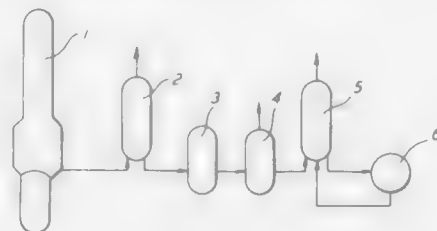
4,874,592

PRODUCTION PROCESS OF XENON
Masami Shino, Hideaki Takano, Jitsuo Nakata, and Katsuhiko Noro, all of Wakayama, Japan, assignors to Kyodo Oxygen Co., Ltd., Japan

Filed Aug. 23, 1988, Ser. No. 235,328
Int. Cl.⁴ B01D 53/04, 53/36; C01B 23/00
U.S. Cl. 423—262 9 Claims

1. A process for the production of Xenon that includes the steps of venting liquid oxygen from the rectifying column of an air separator sequentially into a plurality of adsorption-desorption stages which contain columns filled with an adsorbent for adsorbing Xenon from the vented liquid oxygen, adsorbing and desorbing Xenon sequentially in each of the

adsorption-desorption stages to concentrate the recovered Xenon,



catalytically removing hydrocarbon substances (CmHn) from Xenon gas recovered from the first adsorption-desorption stage.

4,874,593

CONVERSION OF PYROPHORIC P₄-CONTAINING MATERIAL TO P₂O₅ MATERIAL

Anston K. Roberts, Chino; William E. Trainer, Anaheim, both of Calif., and David L. Biederman, Columbia, Tenn., assignors to Stauffer Chemical Company, Shelton, Conn.

Continuation-in-part of Ser. No. 894,529, Aug. 8, 1986, Pat. No. 4,686,904. This application Jul. 27, 1987, Ser. No. 78,430
The portion of the term of this patent subsequent to Aug. 8, 2004, has been disclaimed.

Int. Cl.⁴ C01B 25/12, 25/01, 25/02, 25/04
U.S. Cl. 423—322 5 Claims

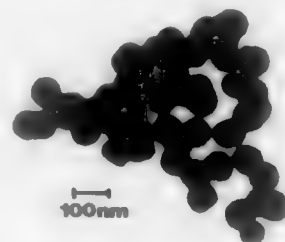
1. A process for treating a pyrophoric P₄-containing material to convert at least a portion of it to substantially non-pyrophoric P₂O₅ material which comprises supplying streams of fluid P₄-containing material and an oxygen-containing gas to a reactor filled with water such that the P₄-containing material and oxygen in the oxygen-containing gas react with one another after both have entered the aqueous medium within the reactor to thereby form the P₂O₅ material.

4,874,594

SILICA WITH A HIGH OIL ABSORPTION CAPABILITY AND A CONTROLLED PRIMARY STRUCTURE AND PROCESS FOR THE PRODUCTION THEREOF

Yvonick Chevallier, Decines, France, assignor to Rhone-Poulenc Specialites Chimiques, Courbevoie, France
Division of Ser. No. 879,492, Jun. 24, 1986, Pat. No. 4,708,859, which is a continuation of Ser. No. 753,874, Sep. 11, 1985, abandoned. This application Aug. 5, 1987, Ser. No. 81,980
Claims priority, application France, Jul. 11, 1984, 84 11004
Int. Cl.⁴ C01B 33/12

U.S. Cl. 423—335 10 Claims



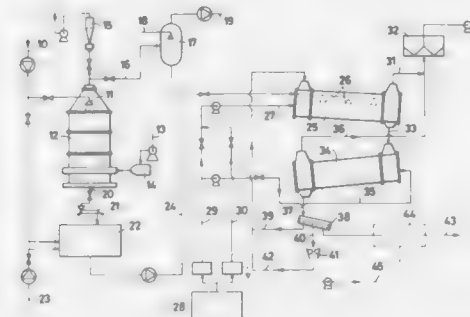
1. A precipitated silica in the form of aggregates having a means projected area by number of said aggregates higher than about 8,000 nm², and further having an inter-aggregate pore volume of about 1 cm³/g or higher and having a homogeneous inter-aggregate pore population.

4,874,595

PROCESS FOR PRODUCING CALCIUM-UREA NITRATE
Antonio Crispoldi; Andrea Moriconi, both of Terni, and Mario Chiappafreddo, Amelia, all of Italy, assignors to Enichem Agricoltura S.p.A., Palermo; OCM S.r.l., Amelia and Tecnocentro S.r.l., Terni, all of Italy

Filed Feb. 5, 1988, Ser. No. 152,854
Claims priority, application Italy, Feb. 13, 1987, 19363A/87
Int. Cl.⁴ C06B 1/04

U.S. Cl. 423—397 14 Claims



1. A process for the production of calcium-urea nitrate as a granular, free-flowing solid free from the tendency of forming dust, comprising:

- preparing a liquid composition containing urea nitrate and calcium nitrate in a molar ratio of about or equal 4:1 at a temperature not greater than 170° C., said composition having a water content ranging from 0 to 15% by weight;
- spraying said liquid composition under pressure of a hot gas and at a temperature equal or about equal to its temperature of formation through spray nozzles provided within a revolving drum onto moving solid particles of calcium-urea nitrate within the drum, which particles are at a temperature of 40° to about 100° C., the salt particles within the drum being under a stream of gas; and
- recovering calcium-urea nitrate from the solid product within the drum.

4,874,596

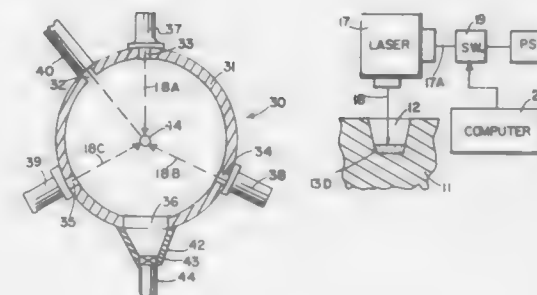
PRODUCTION OF CRYSTALLINE STRUCTURES

Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840
Continuation of Ser. No. 302,644, Sep. 15, 1981, abandoned, which is a continuation-in-part of Ser. No. 110,477, Jan. 8, 1980, abandoned, which is a continuation of Ser. No. 815,692, Jul. 14, 1977, abandoned, which is a continuation of Ser. No. 547,733, Feb. 6, 1975, which is a continuation-in-part of Ser. No. 93,779, Nov. 30, 1970, Pat. No. 4,207,154, said Ser. No. 302,644, is a continuation-in-part of Ser. No. 74,388, Sep. 10, 1979, Pat. No. 4,385,880, Ser. No. 958,514, Nov. 7, 1978, abandoned, and Ser. No. 165,445, Jul. 26, 1971, which is a continuation of Ser. No. 710,517, Mar. 5, 1970, which is a continuation of Ser. No. 501,695, Oct. 22, 1965. This application Jun. 28, 1984, Ser. No. 625,197

Int. Cl.⁴ B01J 3/06; G21B 1/00
U.S. Cl. 423—446 18 Claims

1. A method of changing the structure of a solid material comprising: disposing a quantity of a first reaction material in a solid state, which first material has a first crystalline structure, at a first location in a reaction chamber, and generating and directing at least one collimated high energy radiant energy beam along an axis which intersects said first location within said reaction chamber and is directed against said reaction material disposed at said first location; causing said high energy radiant energy beam to transfer a substantial portion of its radiant energy to said reaction material and to generate a shock wave in said

reaction material wherein the energy transferred to said reaction material includes the energy of said shock wave which reacts on and heats said reaction material and con-



verts at least a portion thereof from said first crystalline state to a second state having a crystalline structure which is substantially different from said first crystalline structure of said reaction material.

4,874,599

PROCESS FOR PRODUCING PEROVSKITE-TYPE OXIDES OF THE ABO₃ TYPE

Kyoko Oda; Kunimasa Takahashi, both of Mie, and Iwao Seo, Ibaraki, all of Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

Filed Jan. 15, 1988, Ser. No. 144,172
Claims priority, application Japan, Jan. 20, 1987, 62-9080; Feb. 27, 1987, 62-44970; Feb. 27, 1987, 62-44971
Int. Cl.⁴ C01G 23/00, 25/00

U.S. Cl. 423—598 10 Claims

1. A process for producing a ABO₃ perovskite oxide where A is at least one element selected from the group consisting of Pb, Ca, Sr, and La; and B is at least one element selected from the group consisting of Ti and Zr which comprises allowing an acidic aqueous solution containing A and B ions in amounts corresponding to their proportions in said perovskite oxide to have contact with oxalic acid in the presence of at least one alcohol selected from the group consisting of ethanol, propanol, butanol, pentanol and hexanol, to effect formation of a precipitate of oxalic acid salts that serves as a precursor of said oxide, and subsequently calcining said precursor precipitate to effect formation of said perovskite oxide, wherein the oxalic acid that is contacted by said acidic aqueous solution is in an amount that is equal to the sum of 0.98 to 1.02 moles per mole of at least one B element in said acidic aqueous solution and acid radicals present in the solution containing said precursor precipitate are neutralized with ammonia or an amine.

4,874,599

MAGNESIUM FLUORIDE RECOVERY METHOD

Richard L. Gay, Canoga Park, and Donald E. McKenzie, Woodland Hills, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Nov. 14, 1985, Ser. No. 798,080
Int. Cl.⁴ C01F 5/28

U.S. Cl. 423—490 14 Claims
1. A method of obtaining magnesium fluoride substantially

free from radioactive uranium from a slag formed in the production of metallic uranium by the reduction of depleted uranium tetrafluoride with metallic magnesium in a retort wherein the slag contains the free metals magnesium and uranium and also oxides and fluorides of said metals, said slag having a radioactivity level of at least about 7,000 pCi/gm, which method comprises the sequential steps of:

- grinding said slag to a median particle size of about 200 microns;
- contacting said ground slag in a reaction zone with an acid having a strength of from about 0.5 to 1.5 N for a time of from about 4 to about 20 hours in the presence of a catalytic amount of iron, said reaction zone being maintained at a temperature within the range of from about 60° to 90° C. and the weight of ratio of slag to acid being within the range of from about 1:2 to 1:6 to produce a liquid product and a particulate solid product;
- removing the liquid product from step (b);
- treating the particulate solid product from step (c) in accordance with step (b); and
- repeating steps (c) and (d) at least one more time to produce a solid residue consisting essentially of magnesium fluoride substantially free of uranium and having a residual radioactivity level of less than about 1000 pCi/gm.

4,874,000

NO-CARRIER-ADDED [^{11}C]PUTRESCINE

Daniel W. McPherson, Baltimore, Md.; Joanna S. Fowler, Bellport, and Alfred P. Wolf, Setauket, both of N.Y., assignors to The United States of America as Represented by the United States Department of Energy, Washington, D.C.
Filed Apr. 17, 1986, Ser. No. 853,105
Int. Cl.⁴ A61K 49/02; C07C 87/14

U.S. Cl. 424—1.1

3 Claims

1. A method of imaging brain tumors which comprises injecting a radiologically tolerable dose of no-carrier-added [^{11}C]putrescine having a radiochemical purity of at least 95% and a specific activity greater than 1.4 curies per micro-mole and then taking an image of the brain area with positron emission tomography.

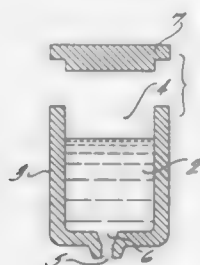
4,874,601

HADIOLAKELLING KIT

Richard J. Flanagan, Hudson, Canada, assignor to Merck & Co., Inc., Rahway, N.J.
Continuation-in-part of Ser. No. 16,030, Apr. 17, 1987, abandoned, which is a continuation of Ser. No. 718,766, Apr. 1, 1985, abandoned. This application Jun. 14, 1988, Ser. No. 206,452
Int. Cl.⁴ A61K 49/02; B65D 69/00

U.S. Cl. 424—1.1

8 Claims



1. A kit for direct preparation of radio-labeled compounds of the formula R-Z which comprises
(a) a vessel component containing a

Resin-S-Hg-R

(A)

ingredient and a halogen-containing oxidizing agent wherein R is an organic group, and
(b) a source of MZ⁺, wherein M is an alkali metal and Z⁺ is a halogen isotope.

4,874,602

REDUCTION OF THE SEVERITY
3'-AZIDO-3'-DEOXYTHYMIDINE-INDUCED ANEMIA
USING BENZYLACYCLOURIDINE

Paul Calabrese, 27 Glen Ave., Barrington, R.I. 02806; Michael C. Wiemann, 11 Villa Ave., Providence, R.I. 02906, and Ming Y. W. Chu, Four Azalea Ct., Barrington, R.I. 02806
Filed Feb. 22, 1988, Ser. No. 158,463
Int. Cl.⁴ A61K 31/70, 31/505

U.S. Cl. 424—10

5 Claims

1. A method of reducing anemia caused by the administration of 3'-azido-3'-deoxythymidine to an animal which comprises administering to said animal an effective anemia-inhibiting amount of 5-benzylacetyluridine.

4,874,603

USE OF VITAMIN E FOR NORMALIZATION OF BLOOD
COAGULATION DURING THERAPY WITH HIGH
UNSATURATED FATTY ACIDS OF OMEGA-3 TYPE

Uwe Fratzter, Lauberweg 29, D-6719 Hettensleiden, BRD, Fed. Rep. of Germany
Filed Mar. 15, 1988, Ser. No. 168,155
Claims priority, application Fed. Rep. of Germany, Jun. 6, 1987, 3719097
Int. Cl.⁴ A61K 31/355, 31/20

U.S. Cl. 424—10

4 Claims

1. A method for normalization of blood coagulation during intake of a high omega-3 fatty acid, by increasing prothrombin time in a person taking said fatty acid, comprising the step of combining oral administration to said person of said fatty acid with oral administration of vitamin E to said person, wherein said vitamin E is administered in an amount ranging from about 40% to 100% by weight of said amount of fatty acid.

4,874,604

HAIRSPRAY WITH IMPROVED
ADHESION/REMOVABILITY UPON WASHING

John A. Sramek, Racine, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.
Filed Jun. 23, 1988, Ser. No. 213,566
Int. Cl.⁴ A61L 7/11

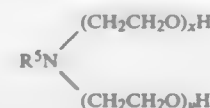
U.S. Cl. 424—47

23 Claims

1. A hair setting composition having improved adhesion to the hair and removability from the hair upon washing comprising from 0.5% to 8% by weight of a hair setting resin containing pendant carboxyl radicals and a solvent for the resin wherein from about 10 to 100% of the carboxyl radicals are neutralized with a neutralizing agent consisting of
(a) up to 40 mole percent, based on the mole percent of the carboxyl radicals to be neutralized, of at least one long chain amine selected from the group consisting of



where R¹ is a hydrocarbon radical having from about 9 to 14 carbon atoms, R² is an alkylene radical of 2 to 4 carbon atoms, and each of R³ and R⁴ are alkyl radicals of 1 to 2 carbon atoms or hydrogen,



where R⁵ is a hydrocarbon radical having from 10 to 18 carbon

atoms and the sum of x+y has an average value of from about 5 to 25, and



where R⁶ is a hydrocarbon radical of from 8 to 16 carbon atoms, R⁷ is an alkyl radical of 1 to 2 carbon atoms, and each of R⁸ and R⁹ are alkyl radicals of 1 to 2 carbon atoms or hydrogen; and

- the balance of the neutralizing agent being a water soluble, cosmetically acceptable basic compound, said hair setting resin being a polymer of an acid selected from the group consisting of acrylic acid, methacrylic acid, crotonic acid and maleic anhydride and at least one monomer selected from the group consisting of monoesters and amides of an acid selected from the group consisting of acrylic acid and methacrylic acid, vinyl acetate and methyl vinyl ether.
- the balance of the neutralizing agent being a water soluble, cosmetically acceptable basic compound.

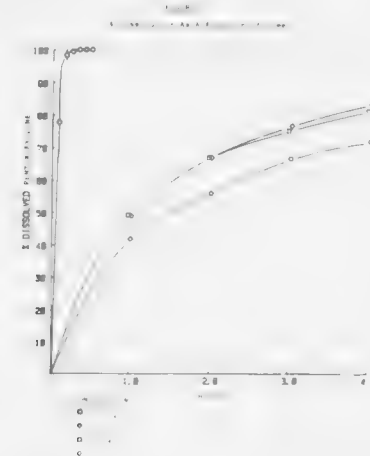
4,874,605

STABILIZED DELAYED RELEASE EMULSION

Joseph J. Urban, Jr., Richboro, Pa.; Norman Henderson, Gladstone, N.J., and Anthony J. Behe, Harleysville, Pa., assignors to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.
Filed Nov. 27, 1987, Ser. No. 125,673
Int. Cl.⁴ A61K 31/74

U.S. Cl. 424—78

10 Claims



- An emulsion comprising:
(a) a lipophilic external phase,
(b) a hydrophilic internal phase having incorporated therein:
(i) pentoxifylline, said pentoxifylline being substantially insoluble in the lipophilic external phase; and
(ii) a gelling agent.

4,874,606

RAPID REHYDRATING BEVERAGE

Peter C. Boyle, Princeton, N.J.; Daniel G. Steffen, East Windsor, N.J.; John L. Melton, Bordentown, N.J.; Gus D. Coccodrilli, Jr., Yorktown Heights, N.Y., and Michael A. Nagy, Hightstown, N.J., assignors to General Foods Corp., White Plains, N.Y.
Continuation-in-part of Ser. No. 677,937, Dec. 14, 1984, abandoned. This application Jul. 23, 1986, Ser. No. 889,047
Int. Cl.⁴ A23L 2/00

U.S. Cl. 426—74

10 Claims

- A flavored and sweetened aqueous beverage comprising:
(a) water in an amount of at least 94.0% by weight;
(b) sodium salt in an amount sufficient to provide about 0.025 to 0.042% by weight Na;

- chloride salt in an amount sufficient to provide about 0.025 to 0.54% by weight chloride;
- citric acid and/or citrate salts in an amount effective to provide about 0.05 to 0.15% by weight citric acid; and
- about 0.02 to 0.06% by weight L-aspartyl-L-phenyl-alanine methyl ester.

4,874,607

SLOW RELEASE BERLEY

Peter C. Hodgson, 27 Eighth Street, Weston, New South Wales 2326, Australia
Filed May 6, 1986, Ser. No. 860,075
Claims priority, application Australia, May 8, 1985, PH0470; Nov. 19, 1985, PH3474
Int. Cl.⁴ A01N 25/00

U.S. Cl. 424—84

43 Claims

1. A slow release berley composition comprising a mixture of from about 10% to about 35% by weight flour, from about 1.0% to about 20% by weight extracted fish oil, from about 30% to about 70% by weight bran, from about 5% to about 40% by weight water and from a trace to about 14% by weight of one or more water soluble alkali metal or alkaline earth metal salts or combinations thereof.

4,874,608

THERAPEUTIC METHOD FOR TREATING
MALIGNANCIES

A. Arthur Gottlieb, New Orleans, La., assignor to Imreg, Inc., New Orleans, La.
Filed Apr. 27, 1987, Ser. No. 43,175
The portion of the term of this patent subsequent to Aug. 28, 2001, has been disclaimed.
Int. Cl.⁴ A61K 37/02, 35/00

U.S. Cl. 424—85.1

11 Claims

1. A method of treating mammalian solid tumors comprising administering to a mammalian subject an effective dosage amount of at least one amplifier of the immune system, where said amplifier essentially consists of at least one of the following: Beta-1.0, TG, or TGG.

4,874,609

TREATMENT OF HUMAN VIRAL INFECTIONS

Janet L. Rideout, Raleigh; David W. Barry, Chapel Hill; Sandra N. Lehrman, Durham; Martha H. St. Clair, Durham, and Phillip A. Furman, Durham, all of N.C., assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.
Continuation of Ser. No. 776,899, Sep. 17, 1985, Pat. No. 4,724,232. This application Feb. 8, 1988, Ser. No. 153,258
Claims priority, application United Kingdom, Mar. 16, 1985, 8506869; May 9, 1985, 8511774
Int. Cl.⁴ A61K 39/00, 31/70

U.S. Cl. 424—85.4

3 Claims

1. A method of treating a human having AIDS comprising the administration to said human an effective amount of 3'-azido-3'-deoxythymidine or a pharmaceutically acceptable salt thereof and interferon.

4,874,610

TALL OIL NEUTRALS TO PROTECT PLANTS FROM
INSECTS AND THE LIKE

Michael J. Cousin, Circleville, Ohio, assignor to The Mead Corporation, Dayton, Ohio
Filed Jun. 23, 1987, Ser. No. 65,434
Int. Cl.⁴ A01N 65/00

U.S. Cl. 424—196.1

8 Claims

1. A method for protecting plants from insects, mites, and similar pests which comprises the step of applying tall oil neutrals to plants in an amount effective to protect said plants from said insects, mites, and similar pests.

4,874,611

MICROENCAPSULATED ANT BAIT

Wilfred W. Wilson, Brazoria; Sotiros C. Polemenakos; J. Larry Potter, both of Lake Jackson; Donald J. Mangold, San Antonio; William W. Harlowe, San Antonio, and Herman W. Schlameus, San Antonio, all of, assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 746,896, Jun. 20, 1985, abandoned. This application Dec. 7, 1987, Ser. No. 129,503
Int. Cl.⁴ A01N 25/08, 25/28; B01J 13/02

U.S. Cl. 424-410

11 Claims

1. A solid insecticidal bait comprising a generally spherical pellet of approximately 300 or more microns diameter having an enclosed core primarily made of a target insect attractant food, and mixed therein an insect toxicant in sufficient quantity for effective eradication, and including a surrounding polymeric water resistant shell impervious to the attractant food, said shell formed of poly(vinyl alcohol) or type B gelatin mixed with an attractant protein and gelling agent and wherein the core is up to about 70% by weight of the bait.

4,874,612

MULTI-COMPONENT LONG-ACTING MEDICAMENT FORMULATION FOR IMPLANTATION

Patrick B. Deasy, Dublin, Ireland, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany
Filed Feb. 3, 1988, Ser. No. 152,004

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1987, 3704275; Mar. 27, 1987, 3710175

Int. Cl.⁴ A61K 9/22

U.S. Cl. 424-425

18 Claims

1. A multi-component long-acting implant which contains at least two shaped pieces containing active compound, wherein these shaped pieces contain biologically degradable copolymers of lactic acid and glycolic acid with a ratio by weight of lactide to glycolide of 90:10 to 60:40, and wherein there are at least two types of shaped pieces, A and B, type A containing copolymers with a content olactide which is 5 to 15% by weight lower than in type B.

4,874,613

TASTE CONCEALING PHARMACEUTICAL DOSAGE UNIT

Charles Hsiao, Copper City, Fla., assignor to Baker Cummins Pharmaceuticals, Inc., Miami, Fla.

Continuation-in-part of Ser. No. 23,035, Mar. 6, 1987, abandoned. This application Oct. 5, 1988, Ser. No. 253,704

Int. Cl.⁴ A61K 9/54

U.S. Cl. 424-458

15 Claims

1. A pharmaceutical dosage unit comprising a plurality of subdosage units disposed within a container, each of said subdosage units being a pellet having an average diameter not greater than about 1 mm and including:

- (a) an inner core particle coated with an orally active pharmaceutical agent;
- (b) a first layer surrounding said core consisting of an inert clay or water-soluble polymer; and
- (c) a second layer surrounding said first layer comprising a mixture of from about 10% to about 90% by weight of a cationic copolymeric acrylate resin, and from about 10% to about 90% by weight of a basic compound selected from the group consisting of calcium carbonate, aluminum hydroxide and magnesium carbonate.

4,874,614

PHARMACEUTICAL TABLETING METHOD

Wallace E. Becker, Raymond, Wis., assignor to Abbott Laboratories, Abbott Park, Ill.

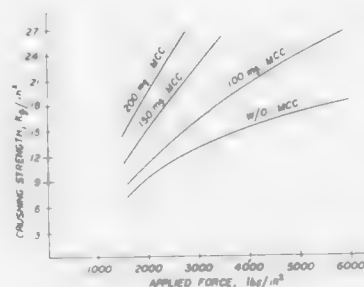
Continuation of Ser. No. 75,260, Jul. 16, 1987, abandoned, which is a continuation of Ser. No. 715,693, Mar. 25, 1985, abandoned.

This application Jan. 30, 1989, Ser. No. 303,008

Int. Cl.⁴ A61K 9/20, 9/26, 31/18, 31/71

U.S. Cl. 424-465

5 Claims



1. In an improved method of making a pharmaceutical tablet comprised of a tablet matrix of friable enteric or controlled release coated fracturable granules and the tablet having a hardness sufficient to resist an applied fracturing pressure of at least 15 kg/in², the improvement comprising: incorporating into the matrix prior to applying at least said fracturing pressure, microcrystalline cellulose in the amount of from about 10% to about 50%, by weight of the total matrix.

4,874,615

PROCESS FOR PREPARING WINE

Ulrich Gruenhoff, and Bernhard Schneider, both of Bad Hoenningen, Fed. Rep. of Germany, assignors to Kohlensäurewerk Deutschland GmbH, Bad Hoenningen, Fed. Rep. of Germany
Filed Mar. 15, 1988, Ser. No. 168,442

Claims priority, application Fed. Rep. of Germany, Mar. 16, 1987, 3708465

Int. Cl.⁴ C12G 1/02

U.S. Cl. 426-15

10 Claims

1. A process of preparing wine comprising the steps of adding carbon dioxide to grape material and converting the grape material into a mash comprising crushed grape material in the presence of the added carbon dioxide, collecting initially formed must from the mash, and fermenting the must.

4,874,616

METHOD FOR PRODUCING MUCOID AND PHAGE RESISTANT GROUP N STREPTOCOCCUS STRAINS FROM NON-MUCOID AND PHAGE SENSITIVE PARENT STRAINS

Ebenezer R. Vedamuthu, Bradenton, Fla., assignor to Microlife Technics, Inc., Sarasota, Fla.

Division of Ser. No. 786,631, Oct. 11, 1985. This application Apr. 29, 1988, Ser. No. 188,469

Int. Cl.⁴ A23C 9/12, 19/00; C12N 15/00

U.S. Cl. 426-43

3 Claims

1. A method of increasing the thickness of milk products without addition of stabilizers which comprises:

- (a) providing in a milk containing product a *Streptococcus lactis* or *Streptococcus lactis* subspecies *diacetylactis* transconjugant harboring plasmid containing DNA isolated from an 18.5 Mdal parental plasmid referred to as PSRQ 2202 which encodes for production of a mucoid substance from *Streptococcus cremoris* (MS) NRRL-B-15995; and
- (b) incubating the milk containing product with the *Streptococcus lactis* or *Streptococcus lactis* subspecies *diacetylactis* transconjugant to develop a mucoid substance and to increase the thickness of the milk containing product.

4,874,617

BANANA PROCESSING

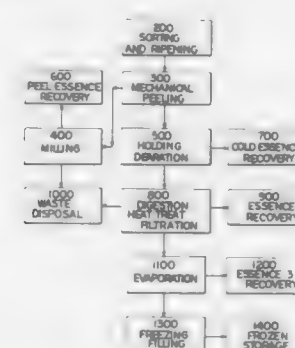
Pedro Sole, Suffern, N.Y., assignor to United Brands Company, New York, N.Y.

Filed Dec. 4, 1987, Ser. No. 128,633

Int. Cl.⁴ A23L 2/02

U.S. Cl. 426-49

14 Claims



1. A process for obtaining banana juice from a banana, said process comprising

providing whole, ripe bananas, each said banana comprising a peel about a pulp, said peel comprising an outer epidermis, a chlorenchyma, and a peel parenchyma; placing a quantity of said bananas into a mechanical peeling device;

within said mechanical peeling device, separating banana pulp and peel parenchyma from the other epidermis and the chlorenchyma of banana peels;

digesting said pulp and peel parenchyma with an enzyme to cause said pulp and peel parenchyma to evolve into a solid portion and a liquid portion, said liquid portion comprising said banana juice;

separating said liquid portion from said solid portion; and removing by vacuum deaeration and evaporation from said liquid portion volatile components comprising a banana essence and water, thereby concentrating said liquid portion, said concentrated liquid portion comprising concentrated, de-flavored banana juice.

4,874,618

PACKAGE CONTAINING A MOISTURE RESISTANT EDIBLE INTERNAL BARRIER

Jonathan Seaborne, Corcoran, and David C. Egbert, Plymouth, both of Minn., assignors to General Mills, Inc., Minneapolis, Minn.

Continuation of Ser. No. 813,889, Dec. 27, 1985, abandoned. This application Nov. 3, 1987, Ser. No. 117,442

The portion of the term of this patent subsequent to Apr. 28, 2004, has been disclaimed.

Int. Cl.⁴ A21D 15/08; A23C 19/14; A23G 3/00; B65D 81/34, 25/08

U.S. Cl. 426-76

29 Claims

1. A packaged food article for food having two dissimilar phases which exhibits greater storage stability due to reduced migration between the phases, comprising:

- A. a container having, vertically arranged, a first lower compartment and a second upper compartment;
- B. an interjacent edible barrier, said barrier spaced within the container defining the bottom of the upper compartment and the top of the lower compartment and having opposed upper and lower major surfaces and wherein the edible barrier is laminated and includes:
 1. an edible, smooth surfaced, planar substrate having an opposed pair of major surfaces thereby defining an upper major surface and a lower major surface;
 2. a first layer overlaying or underlying said substrate in the form of an edible, continuous, flexible, non-water swell-

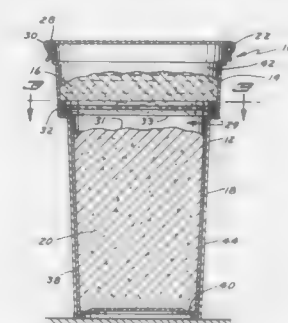
ing, low-water vapor permeable film and comprises a member selected from the group consisting of

(a) a composition comprising the heat cured reaction polymer product of

(1) unbleached, dewaxed, filtered, carbon black decolorized, virgin, edible shellac, and

(2) a first reactant member selected from the group consisting of hydroxypropyl cellulose, hydroxypropyl methyl cellulose, and mixtures thereof, wherein the ratio of the reactant member and shellac ranges from 0.001 to 2:1, and wherein the product has an average molecular weight of at least 2,000, and

(b) a composition comprising the heat cured reaction polymer product of unbleached, dewaxed, filtered,



carbon black decolorized, virgin, edible shellac and wherein the product has an average molecular weight ranging from about 1,500 to 6,000, and

(c) mixtures of composition (a) and composition (b);

C. means for securably positioning the barrier within the container including an internal shoulder intermediate the upper and lower compartments;

D. a first food phase having a first water activity in the lower compartment having a top surface;

E. a second food phase having a second water activity differing from the first water activity in the upper compartment; and

F. an insulative air space intermediate the lower major surface of the barrier and the top surface on the first food phase and wherein the first layer is intermediate the substrate and the food phase having the higher water activity.

4,874,619

METHOD FOR BLACK DYEING PASTA FOODSTUFFS, AND FOODSTUFFS OBTAINED BY SAID METHOD

Covi Leonardo, via Umbria 2; Bacioli Giorgio, Via Lamponi, 12, and Degli E. Raffaele, Via Venturoli, 65, all of Bologna, Italy
Filed Jul. 20, 1988, Ser. No. 221,996

Claims priority, application Italy, Jul. 20, 1987, 3561 A/87

Int. Cl.⁴ H23L 1/16, 1/275; H21D 2/36

U.S. Cl. 426-94

7 Claims

1. A method of making black pasta which comprises the steps of:

- (a) forming a pasta dough;
- (b) incorporating into said pasta dough a quantity of powdered walnut hull and a quantity of freeze-dried spinach sufficient to impart to said dough a black coloration upon treatment with steam;
- (c) shaping the dough to which the powdered walnut hull and freeze-dried spinach have been added to form a pasta product;
- (d) treating said product with steam to impart a black coloration to said pasta product; and
- (e) packaging the pasta product subsequent to the treatment thereof with steam to form said black coloration.

4,874,620

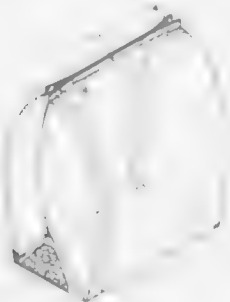
MICROWAVABLE PACKAGE INCORPORATING CONTROLLED VENTING

Abraham H. Mendenhall, Morris County, N.J.; Joseph F. Irace, and Joseph Skudrzyk, both of St. Louis County, Mo., assignors to Packaging Concepts, Inc., St. Louis, Mo.
Continuation of Ser. No. 913,964, Oct. 1, 1986, abandoned. This application Sep. 15, 1988, Ser. No. 244,279

Int. Cl.⁴ B65D 30/26, 33/01, 81/34

U.S. Cl. 426—113

1 Claim

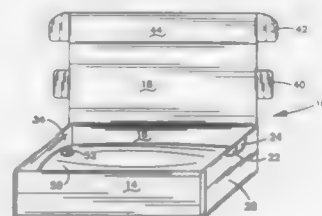


1. A ventable, sealed package containing food to be microwave heated for consumption, said package being capable of allowing said food to be heated in a microwave oven while in said package, said package comprising a bag, said bag comprising a series of walls comprising longitudinally oriented front, back and inwardly folded gusseted side panels, and a bottom panel providing lower closure for the package, and a top sealed edge sealing upper portions of said front and back panels and gusseted side panels together to seal said food between the panels which food is contained therein, said bag and thus each of said panels being formed from the same continuous blank and comprising a laminated sheet comprising a heat sealable and non-wicking innermost layer, an impermeate moisture barrier intermediate layer and an impermeate outer layer, said innermost heat sealable layer having at least one array of a plurality of slits through its thickness, said slits oriented relative to each other longitudinally along the bag between the bottom panel and the top sealed edge at at least one location in at least one of said longitudinally oriented panels, said innermost layer and intermediate layer being laminated to each other over substantially the whole area of each of said longitudinally oriented panels and said bottom panel except in at least one narrow unlaminate area relative to the area of said longitudinally oriented panels which narrow area overlies the array of slits, there being one narrow area for each array of slits, said array of slits forming vent passages allowing gaseous communication from inside said bag to said unlaminate area between said innermost and intermediate layers, said unlaminate area extending longitudinally to said top sealed edge such that said unlaminate area forms at least one vertical channel which opens exteriorly of the bag at the top sealed edge allowing gaseous communication from said vent channel to the exterior of the bag, said top sealed edge comprising opposing portions of said innermost layers of said vertically oriented panels being sealed together to completely seal access to the interior of the bag from the exterior at the top, said at least one array of vent passage slits and said at least one channel between said innermost and intermediate layers dimensioned such that controlled venting of said bag occurs during microwave heating with any internally generated pressure and steam passing through said vent passages into said at least one vent channel between said innermost and intermediate layers and out through said bag at the top sealed edge with said top sealed edge between said opposed sealed innermost layers remaining completely closed.

4,874,621

PACKAGING METHOD AND SYSTEM FOR EDIBLE SOLID FATS AND THE LIKE

Thomas D. Loughrin, Medina, Ohio, assignor to Durkee Industrial Foods Corporation, Cleveland, Ohio
Filed Feb. 4, 1987, Ser. No. 10,617
Int. Cl.⁴ B65B 3/17; B65D 77/06, 85/74
U.S. Cl. 426—124 13 Claims



1. A method of packaging a hard fat or hard fat containing product which is normally solid at room temperature comprising the steps of:

- heating said product to a molten state;
- positioning a rectangular air and moisture impermeable bag having opposed broad sides horizontally on one of its broad sides, said bag comprising flexible multiple plies with one of said plies being metallized and having a fill nozzle on its broad side opposite said one broad side;
- at least two opposed edges of said bag being sealed to completely seal said product;
- filling said bag while in said horizontal position through said fill nozzle with said product, either while fully molten or partially cooled, but still plastic, to at least a substantially full state and closing said fill nozzle so that said bag adopts a pillow or pillow-like configuration;
- placing said bag substantially horizontally in a shipping container on said one broad side, either before filling or after filling, but if after filling, before said product is hardened;
- said shipping container having side and end walls confining said bag edges and dimensioned to securely hold said pillow or pillow-like configuration; and
- allowing said product to cool and solidify while so confined in said container with said bag lying substantially horizontally on said one broad side.

4,874,622

SPICE-ODOR ANTIMYCOTIC CONTAINING CELLULOSIC CASING ARTICLE

Dennis A. Gaynor, Woodridge, and James R. Hansen, Tinley Park, both of Ill., assignors to Viskase Corporation, Chicago, Ill.

Filed Jul. 1, 1987, Ser. No. 68,301

Int. Cl.⁴ A22C 13/00

U.S. Cl. 426—135

12 Claims

1. A moisturized cellulosic casing article with water activity of at least 0.80 and having in the casing wall a spice-derived natural or synthetic equivalent antimycotic compound, imparting a food-related odor to the casing, at a concentration below about 0.2 percent based on the total casing article weight, the antimycotic compound comprising a benzene ring containing at least one phenolic hydroxyl group with at least two hydrogen substitutions (F) wherein F is a member selected from the group consisting of alkoxy, alkyl and acyl groups and wherein at least one of the F members is either an acyl group of comprises at least two carbon atoms.

4,874,623

METHOD FOR MAKING A COEXTRUDED MEAT PRODUCT

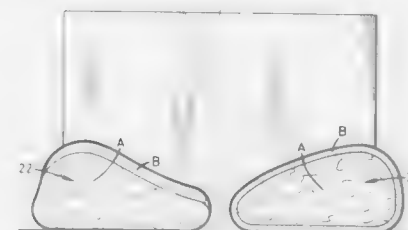
Bernard T. Matthews, Norwich; David J. Joll, Holt, and Habeeb M. Ziauddin, Norwich, all of England, assignors to Bernard Matthews plc, England
Continuation of Ser. No. 8,332, Jan. 29, 1987, abandoned. This application Jan. 5, 1989, Ser. No. 293,810

Claims priority, application United Kingdom, Mar. 21, 1986, 8607103

Int. Cl.⁴ A23L 1/31; A23P 1/12

U.S. Cl. 426—272

4 Claims



1. A method of manufacturing a meat product comprising a lean meat core and a fatty outer layer, comprising the steps of:

- (a) forming thin cold slices of lean whole-muscle meat;
- (b) agitating said thin cold slices in admixture with a fluid adhesive based on lean meat for a short period sufficient to coat the slices with adhesive but neither to cause significant discharge of protein from the slices nor to compact the slices into a mass;
- (c) loading the slices into hoppers and thereafter pumping the slices to and through one section of an extrusion head to thereby compact and restructure the slices into a non-oriented simulation of lean whole-muscle meat;
- (d) pumping a fatty substance to and through another section of the extrusion head so that a coextrudate of non-oriented meat and fat emerges;
- (e) conveying the coextrudate through an elongate freezer to case harden the coextrudate into a partially frozen log;
- (f) cutting the log into relatively short lengths.

4,874,624

PROCESS FOR MANUFACTURING A RECONSTITUTABLE CEREAL

Francis Conroy, Thurles; John Flahavan, and Edward Flahavan, both of Kilmacthomas, all of Ireland, assignors to Food and Cereal Research Limited, Waterford, Ireland

Filed Sep. 9, 1988, Ser. No. 242,680

Claims priority, application Ireland, Sep. 9, 1987, 2407/87

Int. Cl.⁴ A23L 1/168

U.S. Cl. 426—457

14 Claims

1. A process for manufacturing a reconstitutable oat cereal comprising the steps of:

- de-husking, cleaning and enzyme inactivating raw oats;
- forming the de-husked, cleaned and enzyme inactivated oats into flakes having a moisture content of between 8% and 16% by weight;
- conditioning the oats with water until the oats have a moisture content of between 16% and 23% by weight;
- cooking the conditioned oats in an extruder cooker at a residence time of from 10 seconds to 120 seconds and at a pressure at the die face of the cooker sufficient to plasticise and cook the oats;
- discharging exudate from the extruder cooker;
- flaking the exudate; and
- drying the flaked exudate to a moisture content of between 2% and 12% by weight.

4,874,625

FLAVORING MATERIAL POSSESSING FERMENTED SOY SAUCE CHARACTERISTICS

Guy J. Hartman, Decatur, Ill., assignor to A. E. Staley Manufacturing Company, Decatur, Ill.
Filed Aug. 12, 1987, Ser. No. 84,598
Int. Cl.⁴ A23L 1/22

U.S. Cl. 426—533

2 Claims

1. A process of preparing an edible material useful as a flavoring consisting essentially of:

- (a) first mixing a protein hydrolysate with an aqueous reducing sugar source, said aqueous reducing sugar source being substantially free of ethanol, to form an aqueous mixture;
- (b) mixing said aqueous mixture with an amount of ethanol sufficient to form a slurry wherein the liquid medium of said slurry is comprised of a major amount of weight of ethanol and a minor amount by weight of water; and
- (c) heating the slurry at a temperature and for a time sufficient to increase the absorption by said mixture of visible radiation to provide a flavoring having flavor notes characteristics of fermented soy sauce without the need for resort to fermentation.

4,874,626

EDIBLE PLASTIC PRODUCT

Wilhelmus A. M. Castenmiller, Vlaardingen; Allan K. Chesters, and Peter B. Ernsting, both of Delft, all of Netherlands, assignors to Lever Brothers Company, New York, N.Y.

Filed Mar. 16, 1988, Ser. No. 168,828

Claims priority, application United Kingdom, Mar. 20, 1987, 8706711

Int. Cl.⁴ A23D 3/00

U.S. Cl. 426—564

8 Claims

1. Edible plastified product comprising a continuous fat phase, 0.5–30 volume % of a dispersed gas phase present as gas bubbles with means diameter of 1 to 100 microns, and 0.5 to 65% of a dispersed aqueous phase, where the dispersed gas phase comprises 10 to 100 vol. % helium.

4,874,627

NON-FAT DAIRY COMPOSITIONS

Donald G. Greig, Petaluma, and Edward L. Bonneau, III, Mill Valley, both of Calif., assignors to Nouvelle Ice Cream Corporation, San Rafael, Calif.

Filed Jun. 14, 1988, Ser. No. 206,616

Int. Cl.⁴ A23G 3/32, 3/30, 9/02

U.S. Cl. 426—565

15 Claims

1. A caramelized non-fat dairy dessert composition having a total solids range of from about 9 percent to about 98 percent, said composition consisting essentially of: (a) non-fat milk, 0–100 percent; (b) milk solids non-fat, 0–100 percent; (c) sweetener, 0–80 percent; (d) liquid selected from the group consisting of water and fruit juice, 0–91 percent; and (e) stabilizer, 0–2.5 percent; wherein said percents are percents by weight based upon the total weight of said composition; and wherein the compositions contain at least 0.5 percent MSNF, and wherein at least a portion of the milk solids in the MSNF are caramelized milk solids.

4,874,628

PROCESS FOR THE MANUFACTURE OF CAST JELLY GUM CONFECTIONARIES

James L. Eden, East Millstone; James J. Kasica, Somerville, and James P. Zallie, Bound Brook, all of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed Sep. 12, 1988, Ser. No. 242,852

Int. Cl.⁴ A23G 6/00

U.S. Cl. 426—578

19 Claims

1. A process for the manufacture of a jelly gum confectionary by casting, which comprises the steps of:

- (a) preparing a dispersion of about 1 to 15%, on a dry solids

basis, of a pregelatinized high amylose starch having an amylose content of at least about 40% amylose or a combination thereof with up to about 9 parts of a converted starch other than a high amylose starch, about 80-95% of a sweetener, and sufficient water, the percentages being by weight and totaling 100%; wherein the pregelatinized high amylose starch is selected from the group consisting of an unconverted starch, a converted starch, and mixtures thereof and wherein the pregelatinized unconverted or converted high amylose starch is selected from the group consisting of (i) a spray-dried uniformly gelatinized granular starch in the form of indented spheres, with at least a majority of the granules being whole and unbroken, the starch granules being in the form of loosely-bound agglomerates or individual granules, (ii) a spray-dried, non-granular starch, characterized in that the starch is substantially non-crystalline, substantially non-retrograded, and fully pre-dispersed, (iii) a drum-dried fully dispersed, non-granular starch which is a porous, fluffy powder, and (iv) mixtures thereof;

- (b) continuously cooking the dispersion at at least 107° C. (225° F.) and less than 166° C. (330° F.) in a jet-cooker for a time sufficient to fully solubilize the starch or starches; and
- (c) casting the cooked dispersion.

4,874,629

PURIFICATION OF FISH OIL

Stephen S. Chang, 29 Gloucester Ct., East Brunswick, N.J. 08816; Yongde Bao, 267 George St., New Brunswick, N.J. 08901, and Timothy J. Pelura, 3336 Solomon Ln., Alameda, Calif. 94501

Filed May 2, 1988, Ser. No. 189,198
Int. Cl.⁴ A23D 5/00; C11B 3/12

U.S. Cl. 426-601

11 Claims

1. A process of treating an edible fish oil containing EPA and DHA consisting essentially of:
- subjecting said oil to vacuum steam distillation under mild conditions for a time sufficient to reduce low temperature boiling and less polar volatile flavor compounds;
- contacting said oil with an adsorbent selected from the group consisting of silica gel and silicic acid to reduce high temperature boiling and more polar volatile flavor compounds and undesirable minor constituents selected from the group consisting of polymers, cholesterol, pigments, pesticides, PCB'S, heavy metals and mixtures thereof, and
- recovering the treated oil.

4,874,630

PROCESS FOR PRODUCING RETORT BEAN CURDS

Koji Sengoku, and Yoshiaki Nagatome, both of Osaka, Japan, assignors to House Food Industries, Co., Osaka, Japan

Continuation of Ser. No. 925,942, Nov. 3, 1986, abandoned. This application Apr. 6, 1989, Ser. No. 333,814

Claims priority, application Japan, Apr. 30, 1986, 61-97897
Int. Cl.⁴ A23L 1/20

U.S. Cl. 426-634

5 Claims

1. A process for producing retort bean curds wherein an effective amount of a solidification agent to ensure gelling is added to soybean milk or an aqueous solution of soybean protein extract, the resulting mixture is placed into a heat-resisting synthetic resin mold container and the content of said mold container is subjected to retort treatment, comprising, further adding to said soybean milk or aqueous solution of soybean protein extract polyoxyethylene sorbitan fatty acid ester of above HLB-14 and cane sugar fatty acid ester of above HLB-11 together with said solidification agent, and when the amount of said polyoxyethylene sorbitan fatty acid ester is A, and the amount of said cane sugar fatty acid ester is B, in percent by weight based on the weight of said soybean milk or aqueous solution of soybean protein extract, the polyoxyethylene sorbitan fatty acid ester and cane sugar fatty acid ester are

added to said soybean milk or aqueous solution of soybean protein extract so that the sum of the amounts satisfies the formula $0.18 > A \times 2.5 + B \geq 0.09$, and based on the weight of said soybean milk or aqueous solution of soybean protein extract, the amounts of said polyoxyethylene sorbitan fatty acid ester is between about 0.01% to about 0.032% by weight and said cane sugar fatty acid ester is between about 0.01 to 0.1% by weight.

4,874,631

MULTI-CHAMBER DEPOSITION SYSTEM

Richard L. Jacobson, Roseville; Frank R. Jeffrey, Shoreview, and Roger K. Westerberg, Cottage Grove, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

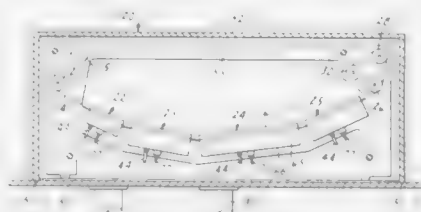
Continuation of Ser. No. 877,161, Jan. 23, 1986, abandoned.

This application Feb. 16, 1988, Ser. No. 157,238

Int. Cl.⁴ C23C 16/00

U.S. Cl. 427-39

1 Claim



1. A method for depositing thin coatings on a substrate comprising the steps of:
- evacuating a large chamber in which has been placed a roll of web material;
- advancing the web material from the supply roll through a web cleaning chamber disposed within said large evacuated chamber in the presence of a glow discharge;
- advancing the web material through a deposition chamber disposed within said large evacuated chamber and depositing thereon elements in the presence of a glow discharge resulting from the introduction of process gas into said deposition chamber at a pressure above that of said large chamber;
- advancing the web material through a second deposition chamber disposed within said large evacuated chamber in which is applied a second coating on the web material from elements in a process gas applied in the presence of glow discharge at a pressure above that of said large chamber;
- advancing the web material through a third deposition chamber disposed within said large evacuated chamber to apply a third thin coating on the web material of an element in the presence of a glow discharge of a process gas; rewinding the web material on a take-up roll disposed within said large chamber; and
- maintaining the reduced atmosphere within said large chamber below the pressure in said deposition chambers for restricting diffusion of process gas from one deposition chamber to another deposition chamber.

4,874,632

PROCESS FOR FORMING PATTERN FILM

Yoshitomo Nakagawa; Takashi Kaito; Hideo Houjiyo, and Masahiro Yamamoto, all of Tokyo, Japan, assignors to Seiko Instruments, Inc., Japan

Continuation of Ser. No. 706,478, Feb. 28, 1985, abandoned.

This application Oct. 17, 1986, Ser. No. 921,820

Claims priority, application Japan, Feb. 29, 1984, 59-38131

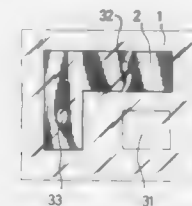
Int. Cl.⁴ B05D 3/06

U.S. Cl. 427-41

33 Claims

1. A process for repairing a white-spot defect in the surface

of a photomask comprising: forming and directing a vapor stream of a polymerizable or carbonizable organic compound onto a surface of a photomask at the region of a white-spot defect; and irradiating the surface of the photomask in the



region of the white-spot defect with an ion beam effective to selectively polymerize or carbonize the organic compound at the photomask surface in the region of the white-spot defect to thereby repair the white-spot defect.

4,874,633

METHOD OF PRODUCING MAGNETIC RECORDING MEDIUM

Kazunori Komatsu; Hiroshi Chikamasa, and Tsunehiko Sato, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

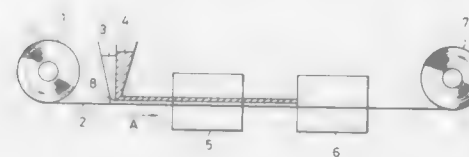
Filed Oct. 17, 1986, Ser. No. 919,941

Claims priority, application Japan, Oct. 18, 1985, 60-231097

Int. Cl.⁴ H01F 10/02

U.S. Cl. 427-48

2 Claims



1. In a method for producing a magnetic recording medium by forming a magnetic layer by the steps of applying a magnetic film forming liquid onto a continuously running non-magnetic support, applying a magnetic field onto the magnetic film forming liquid before the magnetic film forming liquid has dried, and then drying the magnetic film forming liquid, the improvement comprising: forming a non-magnetic undercoating layer on the support simultaneously with forming the magnetic layer by simultaneously applying to the support a non-magnetic undercoating forming liquid and the magnetic film forming liquid, and applying the magnetic field before both the magnetic film forming liquid and non-magnetic undercoating forming liquid have dried, and wherein the magnetic layer is formed with a thickness of no more than 2 microns.

4,874,634

VAPOR PHASE DEPOSITION OF CADMIUM AND MERCURY TELLURIDE FOR ELECTRONIC DEVICE MANUFACTURE

Brian C. Easton, Reigate, and Peter A. C. Whiffin, Horsham, both of England, assignors to U.S. Philips Corp., New York, N.Y.

Filed Apr. 14, 1988, Ser. No. 181,280

Claims priority, application United Kingdom, Apr. 16, 1987, 87/09785

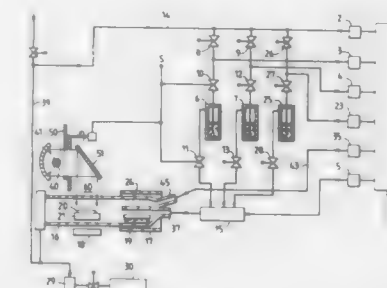
Int. Cl.⁴ B05D 3/06

U.S. Cl. 427-54.1

9 Claims

1. In the manufacture of an electronic device, a method of depositing alternate layers of cadmium telluride and mercury telluride on a substrate in a reaction zone inside a reactor vessel, comprising the steps of (a) passing a gas stream containing a volatile tellurium compound over the substrate while

maintaining an atmosphere of mercury vapour in the reaction zone, and (b) periodically switching on and off a supply of a volatile cadmium compound to the reaction zone so as to deposit cadmium telluride when the supply is on and to deposit mercury telluride when the supply is off, the surface of the substrate being irradiated with electromagnetic radiation during the deposition, characterized by periodically switching the



intensity of the irradiation during the deposition in such manner that the irradiation intensity is reduced to reduce photodissociation of the volatile compounds when the supply of the volatile cadmium compound is switched on, and that, when said supply is switched off, the irradiation intensity is increased to promote photodissociation of the volatile tellurium compound by the electromagnetic radiation.

4,874,635

METHOD FOR REMOVING RESIDUAL PRECIOUS METAL CATALYST FROM THE SURFACE OF METAL-PLATED PLASTICS

Bradley R. Karas, Amsterdam; Donald F. Foust, Scotin, and William V. Dumas, Delanson, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 4, 1988, Ser. No. 177,254

Int. Cl.⁴ H05K 3/46

U.S. Cl. 427-96

23 Claims

1. A method for removing residual precious metal catalyst from a polyimide, polycarbonate, polysulfone, polyphenylene oxide, polyphenylene sulfide or polyester surface having a metal plated on at least a portion thereof, comprising oxidation of the precious metal without substantial degradation of the plated metal by a reagent which, as incorporated into an aqueous solution, has a standard potential equal to or greater than the standard potential for the half-reaction of the precious metal under a pH influence corresponding to the pH of said aqueous solution, said reagent being a permanganate salt, a hypochlorite salt, hydrogen peroxide, peroxide salt or a ceric salt, followed by washing away the oxidized precious metal.

4,874,636

METHOD FOR PREPARING MAGNETIC RECORDING MEDIUM

Tsutomu Okita; Hiromi Nakahara, and Hiroshi Ogawa, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 6, 1988, Ser. No. 253,637

Claims priority, application Japan, Oct. 6, 1987, 62-250787
Int. Cl.⁴ B05D 5/12

U.S. Cl. 427-130

7 Claims

1. A method for preparing a magnetic recording medium comprising the steps of: dispersing ferromagnetic particles in a binder solution; coating the resulting magnetic coating composition on a nonmagnetic support to provide a magnetic layer; drying said magnetic layer; and providing a calendaring treatment with said magnetic layer, wherein said binder solution comprises at least one compound selected from the group consisting of a polyurethane resin having a tan δ peak temperature of 30° C. or higher as a result of measuring dynamic

viscoelasticity, a cellulose acetate butyrate, a cellulose acetate propionate, and a butyral resin; and when said magnetic layer is dried until the solvent content of said magnetic layer is in the range of from 0.1 to 3 wt%, said calendering treatment is provided with said magnetic layer.

4,874,637

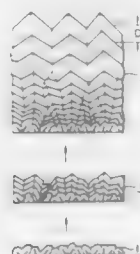
METHOD OF MAKING THIN FILM MAGNETIC RECORDING MEDIUM

Takeshi Miyabayashi, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Japan
Division of Ser. No. 46,265, May 4, 1987. This application Oct. 24, 1988, Ser. No. 261,782

Claims priority, application Japan, Jan. 5, 1986, 61-103499
Int. Cl.⁴ B05D 5/12

U.S. Cl. 427—131

5 Claims



1. A method of producing a thin film magnetic recording medium comprising the step of:

- dipping a substrate in an electroless plating solution for depositing a crystal of a cobalt magnetic material on said substrate to form a first crystal film thereon;
- adding a metallic salt solution for suppressing growth of a grain size of a crystal structure into said electroless plating solution at least once after a predetermined period of time has passed from the dipping of said substrate under the condition that said substrate is dipped in said electroless plating solution to thereby form a grain size suppression film on said first crystal film; and
- forming then a second crystal film having a crystal structure of a small grain size on said grain size suppression film.

4,874,638

PROCESS FOR IMPROVING THE ADHESION OF POLYMERIC SUBSTANCES

Herbert Eck, Burghausen; Gerald Fleischmann, Emmerting; Alfred Prause, Burghausen, and Kunigunde Kolbig, Gumpersdorf-Postann, all of Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany
Filed Mar. 21, 1988, Ser. No. 171,050

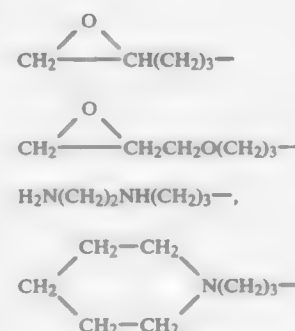
Claims priority, application Fed. Rep. of Germany, Apr. 3, 1987, 3711225

Int. Cl.⁴ B05D 3/02, 3/10

U.S. Cl. 427—222

8 Claims

1. A process for improving the adhesion of polymeric substances containing organic groups or composed of such groups to the surfaces of alkaline earth metal carbonates, which comprises applying to the alkaline earth metal carbonate surface an organic aprotic solvent solution containing at least one organo-silicon compound having fluorine bonded directly to silicon and an average of not more than 1.8 SiC-bonded organic radicals per silicon atom, in which an organic group of the silicone compound is selected from the group consisting of hydrocarbon radicals having from 1 to 18 carbon atoms, halogen substituted hydrocarbon radicals, mercaptoalkyl radicals, acyloxyalkyl radicals, radicals of the formula



and cyanoalkyl radicals, and then removing the solvent before applying a polymeric substance containing organic groups to the alkaline earth metal carbonate surface.

4,874,639

COATING METHOD IN COATING LINE AND COATING APPARATUS THEREFOR

Masataka Matsui; Toshiaki Aono; Yoshio Tanimoto; Tadimitsu Nakahama, and Takakazu Yamane, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Sep. 24, 1987, Ser. No. 100,767

Claims priority, application Japan, Sep. 25, 1986, 61-226458; Mar. 26, 1987, 62-70388; Mar. 26, 1987, 62-70389; Apr. 30, 1987, 62-104426; Apr. 30, 1987, 62-104427

Int. Cl.⁴ B05D 1/02

U.S. Cl. 427—240

46 Claims



1. A coating method in a coating line for coating a vehicle body with a paint containing a volatilizable solvent to form a highly reflective surface coating on the body, comprising:

- a spraying step in which the paint is sprayed to form a coat in a film thickness thicker than a thickness at which the paint sags on a surface extending at least upwardly and downwardly; and
- a drying step comprising sequential setting and baking steps in which the body is held in an ambient temperature during the setting step which is lower than the ambient temperature during the baking step and in which the body having substantially all the applied coat thereon is rotated about its horizontal axis until the paint sprayed thereon achieves a substantially sagless state, the rotation of the body in the setting step being carried out at a speed which is high enough to rotate the body from a vertical position to a horizontal position before the paint coated thereon substantially sags due to gravity yet which is low enough so as to cause no sagging as a result of centrifugal force.

4,874,640

IMPACT ABSORBING COMPOSITES AND THEIR PRODUCTION

Byron A. Donzia, 28 E. Rivercrest Dr., Houston, Tex. 77042
Continuation-in-part of Ser. No. 99,368, Sep. 21, 1987, abandoned. This application Jan. 7, 1988, Ser. No. 141,592

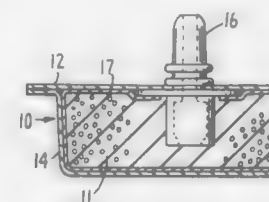
Int. Cl.⁴ B05D 1/18, 1/02

U.S. Cl. 427—42i

10 Claims

1. A method for producing a shock-absorbing composite for absorbing and dispersing impacting forces comprising forming a flexible foam core shaped and sized as required for said shock-absorbing composite, applying to the outer surface of

said core a layer of prepolymer solution/suspension, curing the layer of prepolymer solution/suspension to yield a flexible



plastic layer thereby forming a flexible enclosure surrounding and adhered on all sides to said core, said flexible enclosure being capable of having its internal pressure changed.

4,874,641

METHOD OF PROVIDING A BARRIER BETWEEN A SUBSTRATE AND THE ATMOSPHERE AND COMPOSITIONS THEREFOR

Paul A. Kittle, West Chester, Pa., assignor to Rusmar Incorporated, West Chester, Pa.

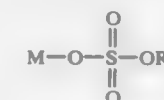
Filed Nov. 24, 1987, Ser. No. 124,890

Int. Cl.⁴ B05D 5/00; B05C 1/16

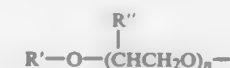
U.S. Cl. 427—244

11 Claims

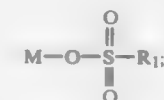
1. The method of forming a barrier layer between a substrate and the outdoor atmosphere, wherein the substrate is a material producing dust, noxious fumes, or odors or blowing trash, or a plant subject to damage from adverse atmospheric conditions, which comprises applying to the substrate an essentially biodegradable foam prepared from an aqueous composition comprising, in an approximately 1:1 molar ratio, (A) at least one anionic surface active sulfate having the formula



where —OR is an alkoxy, alkyleneoxy or alkaryloxy group having from 10 to 20 carbon atoms or an alkyl polyether group



in which R' is an alkyl group containing from 10 to 20 carbon atoms, R'' is H or an alkyl group containing up to 4 carbon atoms, and n is an integer from 1 to 12, or a sulfonate having the formula



where R₁ is an alkyl, alkylene or alkaryl group containing from 10 to 20 carbon atoms, and where M is a monovalent cation, and (B) a carboxylic acid salt, R₂COOM₁, where R₂ is an alkyl group containing from 8 to 30 carbon atoms and M₁ is a monovalent cation.

4,874,642

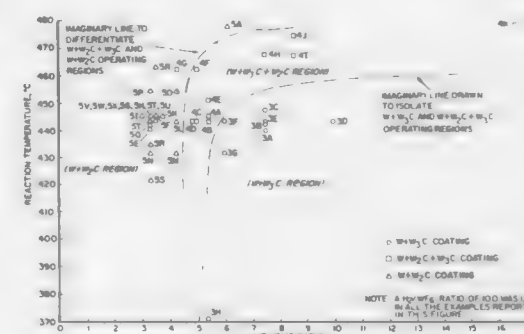
METHOD FOR DEPOSITING A HARD, FINE-GRAINED, NON-COLUMNAR ALLOY OF TUNGSTEN AND CARBON ON A SUBSTRATE

Diwaker Garg, Macungie, Pa.; Beth A. Klucher, Sherman Oaks, Calif.; Paul N. Dyer, Allentown, Pa.; Richard W. Kidd, Newhall, Calif., and Christopher Coccarelli, Whitehall, Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.
Filed Sep. 3, 1987, Ser. No. 92,809

Int. Cl.⁴ C23C 16/32

U.S. Cl. 427—249

28 Claims



1. A method for depositing a hard, fine-grained, non-columnar alloy of tungsten and carbon having a substantially lamellar or layered microstructure on a substrate, said alloy consisting essentially of a mixture of a tungsten phase and a carbide phase wherein said carbide phase is selected from the group consisting of (1) W₂C, (2) W₃C, and (3) a mixture of W₂C + W₃C, said method comprising the steps of: providing, in a chemical vapor deposition reactor, a mixture of process gases comprised essentially of (1) tungsten hexafluoride, (2) a volatile oxygen- and hydrogen-containing organic compound, and (3) hydrogen; controlling the ratio of said tungsten hexafluoride to said oxygen- and hydrogen-containing organic compound within said reactor so that the W/C atomic ratio is within the range of about 1 to about 6; controlling the reaction temperature so it is within the range of about 350° to about 550° C.; controlling the total pressure within the range of about 1 Torr. to about 1,000 Torr.; and controlling the ratio of H₂ to WF₆ within the range of about 4 to about 20 to produce W and W₂C, W and W₃C, or W and W₂C and W₃C.

4,874,643

AROMATIC SILANE POLYMER COATINGS

Susan L. Oldham, Torrance; William E. Elias, Redondo Beach; Stephen J. Bigus, Long Beach, and Kreisler S. Y. Lan, Alhambra, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

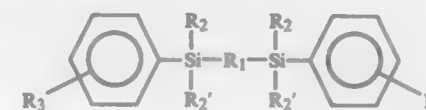
Continuation-in-part of Ser. No. 46,013, May 5, 1987. This application Jul. 13, 1988, Ser. No. 218,177

Int. Cl.⁴ B05D 3/04, 3/10; B32B 9/04

U.S. Cl. 427—340

6 Claims

1. A method for rendering a substrate resistant to erosion by a plasma comprising oxygen, comprising forming on the surface of said substrate a layer of a cured polymer of a compound having the formula



where:

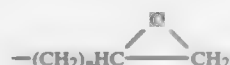
R₁ is selected from the group consisting of:

- (a) an aliphatic hydrocarbon group containing 2 to 10 carbon atoms, and

(b) a group having the formula



where $n=1$ to 3
 $m=0$ to 5
 R_2 and R_2' are each selected from the group consisting of an alkyl group containing 1 to 4 carbon atoms, an unsubstituted aryl group, and a substituted aryl group; and
 R_3 comprises:



$n=0$ to 10

4,874,644

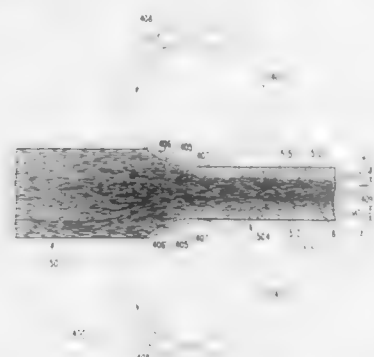
VARIABLE STRENGTH MATERIALS FORMED THROUGH RAPID DEFORMATION

Hugo S. Ferguson, Averill Park, N.Y., assignor to MRE Corporation, Sand Lake, N.Y.

Continuation-in-part of Ser. No. 31,428, Mar. 27, 1987, abandoned. This application Mar. 22, 1988, Ser. No. 171,642
 Int. Cl.⁴ C21D 7/00, 7/02, 7/13

U.S. Cl. 148—12 R

22 Claims



1. A material produced from a base metal, having a structure capable of undergoing an allotropic transformation and having continuous heating upper and lower transformation temperatures, wherein the base metal was deformed at a sufficiently rapid rate to produce a rate of change in internal energy of the base metal sufficient to depress the allotropic transformation temperatures and induce an allotropic transformation to have occurred in a portion of the base metal, said material comprising, in cross-section:

- a first region substantially comprised of substantially equiaxed grains and extending inward from a surface of said material to a finite depth below said surface, wherein substantially all the base metal situated in said first region attained a temperature equal to or greater than the upper transformation temperature and thereby transformed into said substantially equiaxed grains;
- a second region, substantially comprised of non-transformed grains and situated within a remainder of the material, wherein substantially all the base metal situated in said second region attained a temperature less than the lower transformation temperature and thereby did not transform; and
- a third region, situated between said first and second regions, substantially comprised of both substantially equiaxed and non-transformed grains, wherein the base metal situated in said third region attained a temperature greater than or

equal to said lower transformation temperature and thereby experienced at least partial transformation.

4,874,645

PLASTIC STRUCTURAL MEMBER

Hiroyuki Fujiki, Fujisawa; Yoshiharu Michiura, Chigasaki, and Kiyoshi Inoue, Isehara, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama and Ichikoh Industries Limited, Tokyo, both of Japan

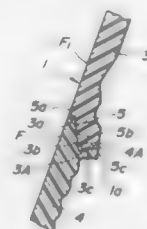
Filed Apr. 28, 1987, Ser. No. 43,403

Claims priority, application Japan, Apr. 30, 1986, 61-101609

Int. Cl.⁴ B60R 13/00

U.S. Cl. 428—31

15 Claims



1. An automotive vehicle body plastic finisher comprising: first and second plastic parts joined at a parting plane with each other with no gap therebetween and having respective surfaces which are planarly aligned with each other to form a common outer surface, at least one of said first and second plastic parts being coloured, said first and second plastic parts and said parting plane extending generally horizontally, said common outer surface being generally vertical; said parting plane including a first section generally perpendicular to said outer surface; and a second section contiguous to said first section and inclined relative to said outer surface.

4,874,646

ULTRAFINE TUBE AND METHOD FOR ITS PRODUCTION

Yoshihiko Tsujino, Sakai; Yuuji Hamada; Masakazu Sakata, both of Hirakata; Takanori Fujii, Hirakata, and Yukinori Kuwano, Katano, all of Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi, Japan

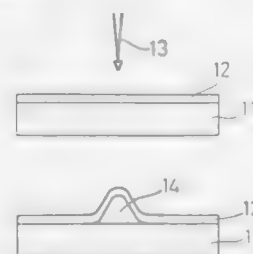
Filed May 17, 1988, Ser. No. 196,170

Claims priority, application Japan, May 18, 1987, 62-120803

Int. Cl.⁴ B27N 5/02

U.S. Cl. 428—34.1

7 Claims



4. A method for producing ultrafine tubes according to claim 1 wherein said highly polymerized material is selected from the group consisting of polymethyl methacrylate, polymethyl isopropenyl ketone, polytrichloroethyl methacrylate, poly- α -cyanoacrylate, polyhexafluorobutyl methacrylate, poly- α -methylstyrene, polytrifluoro- α -chloroacrylate, poly-1-butene, polymethacrylate esters and derivatives thereof, and polyacrylate esters and derivatives thereof.

4,874,647

POLYESTER COMPOSITION, MOLDED POLYESTER LAMINATE AND USE THEREOF

Tadao Yatsu, and Yoshinori Akana, both of Iwakuni, Japan, assignors to Mitsui Petrochemical Industries, Inc., Tokyo, Japan

Continuation of Ser. No. 127,316, Dec. 2, 1987, abandoned. This application Nov. 28, 1988, Ser. No. 277,524

Claims priority, application Japan, Dec. 4, 1986, 61-287776; Dec. 9, 1986, 61-291489

Int. Cl.⁴ B65D 1/00; B32B 27/08, 27/36

U.S. Cl. 428—35.7

4 Claims

1. A molded polyester laminate comprising (I) a layer of a polyester composition comprising (A) 20 to 80% by weight of a polyalkylene terephthalate comprising ethylene terephthalate as a main unit and having an intrinsic viscosity $[\eta]$ in the range of from 0.6 to 1.2 dl/g as measured in o-chlorophenol at 25° C., and (B) 20 to 80% by weight of a polycarbonate comprising bisphenol-A as a diol component and having an intrinsic viscosity $[\eta]$ in the range of from 0.6 to 1.2 dl/g as measured in o-chlorophenol at 25° C., said composition having an intrinsic viscosity $[\eta]$ in the range of from 0.6 to 1.2 dl/g as measured in o-chlorophenol at 25° C. and a single glass transition temperature T_g in the range of from 80° to 130° C., and (II) a layer of a polyalkylene terephthalate comprising ethylene terephthalate as a main unit.

4,874,648

METHOD OF MAKING FLAME RESISTANT POLYIMIDE FOAM INSULATION AND THE RESULTING INSULATION

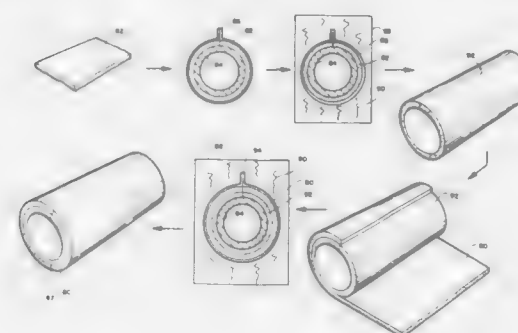
Francis V. Hill, and Lola E. Crosswhite, both of San Diego, Calif., assignors to Sorrento Engineers, Inc., National City, Calif.

Filed Mar. 17, 1988, Ser. No. 167,796

Int. Cl.⁴ B32B 1/08, 1/10

U.S. Cl. 428—35.9

19 Claims



14. The method of making a rigid tubular duct having high insulation efficiency and a highly flame resistant outer surface which comprises the steps of:

providing an uncured sheet of open cell polyimide foam uniformly impregnated with a liquid polyimide resin precursor; wrapping said uncured sheet at least once around a collapsible mandrel; covering said uncured sheet with a cover having an internal configuration corresponding to said mandrel shape and spaced uniformly therefrom; heating the assembly at a temperature of from about 400° to 650° F. for a period sufficient to cure said impregnating resin; whereby a tubular rigid foam duct is produced; providing a substantially uniform low density sheet of polyimide foam which had been foamed unconstrained; pressing said low density sheet between opposed surfaces to

a thickness of from about 25 to 40 per cent of its original thickness; heating said low density sheet at a temperature of from about 400° to 650° F. for a period sufficient to stabilize the foam at higher density; applying a coating of liquid polyimide resin precursor to one surface of the stabilized foam sheet; drying the coated surface; wrapping said stabilized foam sheet around said rigid foam duct with the coated surface in contact with said duct; holding said stabilized foam sheet in place; heating the resulting assembly to a temperature of from about 400° to 650° F. for a period sufficient to cure said coating polyimide precursor; and whereby a high efficiency rigid insulated duct having a highly flame resistant outer face is produced.

4,874,649

PROCESS FOR PRODUCING HOLLOW BODIES OF THERMOPLASTIC MATERIAL

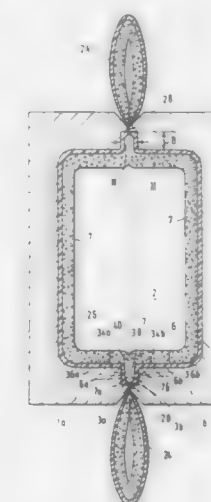
Werner Daubenbüchel, Bergisch-Gladbach, and Alfred Jira, Königswinter, both of Fed. Rep. of Germany, assignors to Krupp Kautex Maschinenbau GmbH, Fed. Rep. of Germany
 Filed Feb. 10, 1988, Ser. No. 154,677

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1987, 3708006

Int. Cl.⁴ B32B 5/20; B29C 67/22, 49/22, 49/04

U.S. Cl. 428—36.5

25 Claims



1. A hollow body of thermoplastic material produced by a co-extrusion blow molding process and comprising a wall provided by a plurality of layers of which at least one layer is at least partially foamed, wherein the hollow body which is produced from a co-extrusion preform has a welded seam for closing the hollow body at regions thereof at which excess material has been squeezed off the preform when the mold was closed, wherein said welded seam at least over part of the extent thereof is in the form of a flange portion which projects outwardly relative to the adjacent wall regions of the hollow body, and wherein the flange portion is of a thickness perpendicular to its longitudinal extent, which is less than double the wall thickness of the preform in the foamed condition of said at least one layer of foamable material.

4,874,650

THERMOSETTING FOAMING SEALER

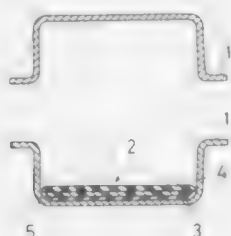
Osamu Kitoh, Nagoya, and Masahiko Ohashi, Inazawa, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha and Iida Industry Co., Ltd., both of Japan

Filed Dec. 20, 1988, Ser. No. 287,295

Claims priority, application Japan, Dec. 21, 1987, 62-323480
Int. Cl.⁴ B32B 3/26

U.S. Cl. 428—68

12 Claims



1. A thermosetting foaming sealer for filling up a vacant space comprising:

- a foaming substance having a shape substantially agreeing with a vacant space to be filled up; and
- a restraining substance for restraining said foaming substance in a compressed state; wherein said restraining substance is an elastomer having high viscosity at room temperature, substantially maintaining said compressed state of said compressed foaming substance, and coming to have low viscosity during paint film baking.

4,874,651

END STRUCTURE FOR SYNTHETIC RESIN MEMBER

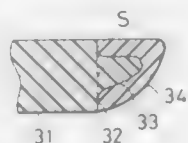
Ryoji Takai, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jun. 22, 1987, Ser. No. 64,483

Claims priority, application Japan, Sep. 5, 1986, 61-136246[U]
Int. Cl.⁴ B60R 13/04

U.S. Cl. 428—81

6 Claims



1. An end structure for a synthetic resin member, comprising:

- an end surface of said member, said end surface including a first generally central region and a second region radially surrounding said first region;
- a projection provided to protrude from the first region so as to expose an entire outer peripheral surface of said projection and said second region; and
- a portion of synthetic resin injection molded onto said member so as to completely cover said outer peripheral surface of said projection and said second region.

4,874,652

PERFORATED ROOFING MATERIAL AND A METHOD OF MANUFACTURING THE SAME

Jan Hollander, Zuidhorn, Netherlands, assignor to B.V. Asphalt-en Chemische Fabriek Smid and Hollander, Groningen, Netherlands

Continuation of Ser. No. 880,418, Jun. 30, 1986, abandoned.

This application Jun. 29, 1988, Ser. No. 213,467

Claims priority, application Netherlands, Jul. 1, 1985, 850119W

U.S. Cl. 428—137

Int. Cl.⁴ B32B 3/10

4 Claims



1. An improved perforated roofing material, for use as a first layer in a multi-layer bituminous roofing system of the type in which fluidized bonding agent is applied on top of a perforated roofing material for covering and bonding the perforated roofing material to a roofing surface, comprising:

- a bitumenized carrier having first and second surfaces;
- a metal foil mounted to said first surface to form a metalized roofing material, the metal foil in use being positioned directly against the roofing surface;
- the metalized roofing material having perforations formed therethrough, the perforations occupying about 15%–30% of the surface area of the metalized roofing material and being about 40–80 mm across, said perforations permitting the fluidized bonding agent to pass freely through the perforations and contact and bond to the roofing surface substantially over the expanse of each of the perforations only; and
- the metal foil being chosen to dissipate heat substantially laterally such that during installation of the metalized roofing material on the roofing surface, the bonding agent does not spread substantially beyond the expanse of the perforations.

4,874,653

HIGH STRENGTH LAMINATE

Ole-Bendt Rasmussen, Forchwaldstrasse 23, CH-6318 Walchwil/Zug, Switzerland

Division of Ser. No. 915,988, Oct. 6, 1986, Pat. No. 4,767,488.

This application Jul. 7, 1988, Ser. No. 216,024

Claims priority, application Denmark, Oct. 4, 1985, 4553/85

Int. Cl.⁴ B32B 3/28, 27/08, 5/12

U.S. Cl. 428—182

8 Claims



1. A high-strength laminate comprising at least two generally weakly adhered biaxially oriented films, each formed of a polymer composition which exhibits a distinct fibrous morphology with the fibres forming a distinct generally unidirectional grain when observed on a macroscale but with the fibre-ports strongly deflected from this grain direction on a microscale and with said unidirectional grain in at least two of the

films criss-crossing each other, characterized in that one surface of said laminate has a shallow corrugated configuration with the corrugations being generally linearly directed, while the other surface has an essentially smooth planar configuration essentially free of any microtopography.

7. A laminate comprising at least two adhered biaxially oriented polymeric films, characterized in that one surface of said laminate has a shallow corrugated configuration with the corrugations being generally linearly directed, while the other surface has an essentially smooth planar configuration essentially free of any microtopography.

4,874,654

VEHICLE WINDOW GLASS

Masaaki Funaki, Koki Kunihiro, and Yutaka Ichinomiya, all of Osaka, Japan, assignors to Nippon Sheet Glass Co., Ltd., Osaka, Japan

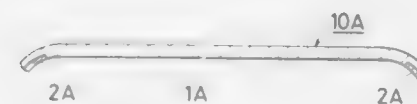
Filed Jun. 6, 1988, Ser. No. 203,223

Claims priority, application Japan, Jun. 15, 1987, 62-91649[U]

Int. Cl.⁴ B32B 3/00, 3/02

U.S. Cl. 428—192

16 Claims



1. A multi colored molded window glass consisting essentially of:

- a central part made of a single layer transparent organic glass, and
- a peripheral part made of colored organic glass with at least one of translucent and opaque properties made of a transparent organic glass material incorporated with a pigment, said peripheral part being securely attached to a periphery of the central part, forming a composite glass, said window glass having characteristics so that the window glass retains original intended shape and has substantially no distortion of vision at a boundary between the central part and the peripheral part and an accurate surface due to uniform sink and shrinkage.

4,874,655

FUSIBLE TEXTILE PRODUCT AND METHOD OF MANUFACTURE

Pierre Grosheas, Peronne, France, assignor to Lainiere de Picardie, France

Filed Nov. 13, 1987, Ser. No. 120,843

Claims priority, application France, Nov. 14, 1986, 86 15878

Int. Cl.⁴ B32B 27/14

U.S. Cl. 428—198

24 Claims

1. A thermally-fusible product intended particularly for the textile industry, comprising:

- a textile substrate having a pair of opposed external faces;
- points of a thermally-fusible polymer distributed on one of said external faces of said substrate to form an interface therewith; and
- chemical means for acting on said thermally-fusible polymer in order to partially modify the chemical structure of said thermally-fusible polymer at least at said interface so as to prevent said thermally-fusible polymer from flowing through said substrate under the influence of heat, pressure, or steam, said chemical means comprising at least one reactive material selected from the group consisting of thermolabile aminoaldehyde products, urea formols and melamine formols, said at least one reactive material reacting with said thermally-fusible polymer in the presence of a reactive means for stimulating, assuring, or promoting the reaction between said reactive material and at least part of said thermally-fusible polymer and in

the presence of a mixture comprising at least one of an acid catalyst, an ammonium salt, and a magnesium salt.

4,874,656

MULTI-LAYER PACKAGING MATERIAL

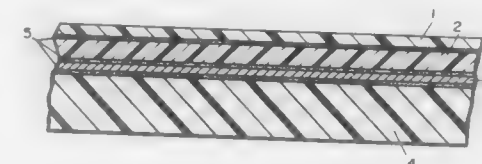
Veikko O. Rantanen, Kauttua, Finland, assignor to A. Ahlstrom Corporation, Karhula, Finland

Filed Apr. 27, 1988, Ser. No. 186,854

Int. Cl.⁴ B32B 27/06, 27/08

U.S. Cl. 428—216

15 Claims



1. A multi-layer laminate having a high mechanical resistance and an impermeability to gases and vapors, comprising at least the following layers:

- (A) a first outer layer of polyester having a thickness of about 12–24 μm ;
- (B) a first inner layer of oriented polypropylene having a thickness of about 20–40 μm , affixed to the first outer layer of polyester;
- (C) a second inner layer of metallic foil having a thickness of about 9–18 μm affixed to the first inner layer of oriented polypropylene;
- (D) a second outer layer of polyethylene having a thickness of about 65–130 μm affixed to the second inner layer of metallic foil; and layers of adhesive between said first outer and first inner layers, between said first inner and second inner layers, and between said second inner and second outer layers.

4,874,657

METHODS OF PRODUCING BIAXIALLY-ORIENTED POLYMER PRODUCT, AND THE PRODUCT PRODUCED THEREBY

Ying-Cheng Lo, Mundelein, Ill., and Darral V. Humphries, Allentown, Pa., assignors to Kusan, Inc., Nashville, Tenn.

Continuation-in-part of Ser. No. 806,994, Dec. 9, 1985, Pat. No. 4,789,514. This application Nov. 24, 1986, Ser. No. 933,951

Int. Cl.⁴ B29C 55/16, 43/16, 43/48

U.S. Cl. 428—220

33 Claims



18. A method of producing biaxially-oriented polymer sheet from feedstock of solid polymer comprising the steps of: reducing the thickness of the feedstock between a pair of opposed, continuous belts which converge in at least one zone to biaxially orient the material of the feedstock while reducing the thickness of the feedstock to that of the sheet; maintaining the temperature of the feedstock between the glass transition temperature and the viscous flow temperature of the material thereof during the step of reducing the thickness of the feedstock; and

restraining the sheet produced by reducing the thickness of the feedstock to the thickness of the sheet so that the sheet stabilizes, whereby the sheet emerges from the restraining step as a sheet having a stable, planar configuration.

28. The sheet produced continuously by the process of claim 18, wherein the sheet is rectangular in cross-section and in the direction of sheet extent formed of a semi-crystalline thermoplastic polymer which is biaxially-oriented; the sheet having a density which is equal to or greater than the density of the unoriented polymer and having a microstructure substantially devoid of process-induced microvoids and microfibrils; the sheet being comprised of compressed, platelet-like, crystalline aggregates, which are biaxially-oriented in the direction of the sheet extent, the sheet having a substantially uniform distribution of deformed crystalline aggregates over the length and width thereof and through the thickness thereof.

4,874,658

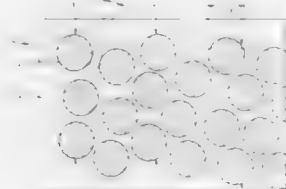
SYNTHETIC FILAMENT-REINFORCED POLYMER MATERIAL SHEET AND PROCESS FOR PRODUCING THE SAME

Yoshiyuki Sasaki, Takatsuki, and Tetsuo Okamoto, Ibaraki, both of Japan, assignors to Teijin Limited, Osaka, Japan
Filed Sep. 10, 1987, Ser. No. 95,342

Claims priority, application Japan, Sep. 11, 1986, 61-212780
Int. Cl.⁴ B32B 27/04; D04H 1/06

U.S. Cl. 428—220

7 Claims



1. A synthetic filament-reinforced polymer material sheet having a thickness of 0.25 mm or less and a specific tensile strength of 3.4×10^6 cm or more, and comprising:

a reinforcing sheet comprising a number of individual synthetic polymer filaments straightened and arranged substantially in parallel to each other and spaced from each other at an average interval equal to or smaller than the average thickness of the individual filaments, and having a width W and a thickness T thereof satisfying the relationship:

$$W/T \geq 40$$

and a coefficient of variation in the thickness thereof of 30% or less; and

a polymer material impregnated in the reinforcing sheet to fill the spaces among the individual filaments.

4,874,659

ELECTRET FIBER SHEET AND METHOD OF PRODUCING SAME

Katsutoshi Ando, Otsu, and Yo Ogawa, Kusatsu, both of Japan, assignors to Toray Industries, Tokyo, Japan
Filed Oct. 23, 1985, Ser. No. 790,572

Claims priority, application Japan, Oct. 24, 1984, 59-221976; Jan. 30, 1985, 59-14396

Int. Cl.⁴ B30C 3/00; B29C 71/04; B32B 33/00; C07C 3/24
U.S. Cl. 428—221

18 Claims

1. An electret fiber sheet having polarized charges of ordered orientation on the surfaces thereof, said electric fiber sheet being made from a sheet having a weight of 80 g/cm² or less and a covering factor of 60% or higher, wherein said

electret fiber sheet has at least one measurable activation energy of depolarization of at least 0.2 eV.

11. A process for producing an electret fiber sheet having polarized charges of ordered orientation and having either at least one measurable activation energy of depolarization of at least 0.2 eV or a total amount of polarized charge per unit area of at least 2×10^{-10} C/cm² said process comprising the steps of:

placing a fiber sheet having a weight of 80 g/m² or less and a covering factor of 60% or higher between a non-contact type voltage-application electrode and an earth electrode facing one another;

placing a supplemental material having a volume resistivity higher than that of said earth electrode and lower than that of said fiber sheet between said earth electrode and said fiber sheet; and

applying voltage of at least 3kV at an electric current density of at least 1×10^{-6} mA/cm².

4,874,660

PAPER MACHINE FELTS

Robert B. Davis, Framingham; Charles E. Kramer, Walpole, and Sandra K. Barlow, Blackstone, all of Mass., assignors to Albany Research (UK) Limited, Great Britain
Filed Apr. 14, 1988, Ser. No. 181,389

Claims priority, application United Kingdom, Apr. 15, 1987, #709067

Int. Cl.⁴ B32B 5/02

U.S. Cl. 428—234

10 Claims

1. A felt for use in a paper making machine comprising a woven base and at least one layer of batt fibre needled thereto, characterised in that said batt fibre comprises fibres of polyamide-12 formed by the extrusion of a melt of polyamide-12 having an intrinsic viscosity of not less than 0.6 dl/gm.

4,874,661

IMPACT ENHANCED PREPREGS AND FORMULATIONS

James M. Browne, 21 Pillon Real, Pleasant Hill, Calif. 94523, and Paul A. Steiner, 732 San Juan Ct., Concord, Calif. 94518
Filed Dec. 15, 1987, Ser. No. 132,287

Int. Cl.⁴ B32B 7/00

U.S. Cl. 428—246

18 Claims

1. A prepreg formulation comprising prepreg fabric and filament fibers unidirectionally aligned, a thermosetting matrix resin of a mixed resin and thin surface layers of extremely fine fibers, fibrils or particles of a thermoformable polymer having at least one of a T_m or T_g greater than about 300° C. or no T_m or T_g and a decomposition temperature greater than about 300° C.

4,874,662

PROCESS FOR IMPREGNATING ORGANIC FIBERS

Karl Huhn, Burghausen, Fed. Rep. of Germany, assignor to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany
Filed Aug. 26, 1988, Ser. No. 240,040

Claims priority, application Fed. Rep. of Germany, Sep. 10, 1987, 3730413

Int. Cl.⁴ B32B 7/00, 25/00; C08G 77/26

U.S. Cl. 428—266

26 Claims

1. A process for treating an organic fiber which comprises: impregnating the organic fiber with a composition comprising an organopolysiloxane (I) containing, in addition to diorganosiloxane units in which the two SiC-bonded organic radicals are monovalent hydrocarbon radicals, at least two monovalent SiC-bonded radicals containing basic nitrogen wherein at least a portion of the SiC-bonded radicals containing basic nitrogen comprise SiC-bonded N-cyclohexylaminoalkyl radicals.

19. A treated fiber of the process of claim 1.

4,874,663

OVERFINISH FOR ABRASION RESISTANT ZERO TWIST FABRIC

Robert M. Marshall, Chesterfield, Va., assignor to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Nov. 23, 1987, Ser. No. 124,202

Int. Cl.⁴ B32B 27/02, 33/00; D06M 13/18, 15/53

U.S. Cl. 428—272

14 Claims

1. Abrasion resistant fabric woven from synthetic fiber selected from the group consisting of polyester and polyamide, the fabric having been woven from substantially untwisted yarn and treated with an overfinish composition in an amount sufficient to give enhanced abrasion resistance to the fabric, the overfinish composition comprising an aqueous dispersion containing effective amounts of

(a) a crystallizable copolymer consisting essentially of 10 to 50 percent by weight linear polyethylene terephthalate segments having sufficient ethylene terephthalate units to confer crystallinity on the compound and 50 to 90 percent by weight polyoxyethylene terephthalate segments having an average molecular weight of 1000 to 4000, the molar ratio of polyethylene terephthalate to polyoxyethylene terephthalate being from 2:1 to 6:1, the viscosity ratio of the copolymer being between 1.10 and 1.50, and the melting point measured by the temperature of disappearance of birefringence being above 100° C.;

(b) a compound selected from the group consisting of a polyethyleneglycol ester formed by reacting a C₆ to C₂₂ fatty acid with ethylene oxide, such that polyoxyethylene segments within the reaction product have an average molecular weight of 200 to 1000, and

a polyethyleneglycol ether formed by reacting a C₆ to C₂₂ fatty alcohol with ethylene oxide, such that polyoxyethylene segments within the reaction product have an average molecular weight of 200 to 1000; and

(c) a compound selected from the group consisting of sodium dialkyl-naphthalene sulfonate and potassium dialkyl-naphthalene sulfonate.

4,874,664

BIREFRINGENT PLATE AND MANUFACTURING METHOD FOR THE SAME

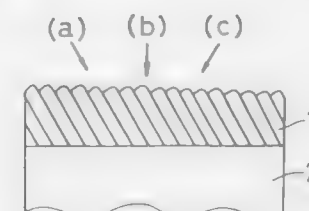
Shigeki Hamaguchi, Aichi; Yasuhiro Ohtsuka, Toyota; Tomoyoshi Motohiro, Seto; Yasunori Taga, Nagoya, and Masahiko Ishii, Aichi, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha and Kabushiki Kaisha Toyota Chuo Kenkyusho, both of Aichi, Japan
Filed Nov. 10, 1987, Ser. No. 118,932

Claims priority, application Japan, Nov. 21, 1986, 61-278981; Nov. 25, 1986, 61-280114

Int. Cl.⁴ G02B 5/30, 1/10

U.S. Cl. 428—325

6 Claims



1. A birefringent plate comprising a transparent substrate and an obliquely evaporated film formed on said transparent substrate by evaporating a dielectric material obliquely to the normal of said transparent substrate, wherein said obliquely evaporated film is composed of at least two layers, said two layers are formed by evaporating said dielectric material in evaporation directions differing from each other, and each of said two layers is composed of inclined columnar structures, the columnar structures of each layer being inclined at an angle

differing from that of the columnar structures of the other layer, so as to reduce visual angle dependence.

4,874,665

HEAT SHRINKABLE WRAP

Anthony J. Doherty, Natick, Mass., assignor to The Kendall Company, Boston, Mass.

Division of Ser. No. 3,091, Jan. 14, 1987. This application Aug. 25, 1988, Ser. No. 236,427

Int. Cl.⁴ C09J 7/02

U.S. Cl. 428—345

5 Claims

1. A heatshrinkable polyolefinic film having a smooth surface and an apposed rough surface, said film being oriented by stretching in the machine direction to increase its length by at least 10 percent, said film further being differentially crosslinked throughout its thickness, the greatest crosslinking being at or near said smooth surface, the extent of crosslinking decreasing as the distance from said smooth surface increases, said rough surface being characterized as being substantially free of crosslinking.

4,874,666

POLYOLEFINIC BICONSTITUENT FIBER AND NONWOVE FABRIC PRODUCED THEREFROM

Eiichi Kubo; Koichi Nagasaka; Yoshiaki Miyahara, all of Kyoto; Syunichi Kiriyama, Nara, and Yasunobu Mishima, Kyoto, all of Japan, assignors to Unitika Ltd., Hyogo, Japan
Filed Jan. 12, 1988, Ser. No. 142,962

Claims priority, application Japan, Jan. 12, 1987, 62-5586; Mar. 11, 1987, 55806; Mar. 11, 1987, 55807; May 30, 1987, 137512

Int. Cl.⁴ D02G 3/04; C08L 23/08, 23/12

U.S. Cl. 428—398

7 Claims

1. A biconstituent fiber produced by melt-spinning a blend comprising 99 to 50 wt % of a linear low-density polyethylene that is a linear low-density copolymer of ethylene and at least one α -olefin having 4 to 8 carbon atoms substantially present in an amount of 1 to 15 wt % and which has a density of 0.900 to 0.940 g/cm³, a melt index of 25 to 100 g/10 min as measured by the method specified in ASTM D-1238(E), and a heat of fusion of at least 25 cal/g, and 1 to 50 wt % of a crystalline polypropylene having a melt flow rate of less than 20 g/10 min as measured by the method specified in ASTM D-1238(L).

4,874,667

MICROENCAPSULATED PLATINUM-GROUP METALS AND COMPOUNDS THEREOF

Chi-Long Lee, and Robin L. Willis, Jr., both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Jul. 20, 1987, Ser. No. 75,789

The portion of the term of this patent subsequent to Nov. 15, 2005, has been disclaimed.

Int. Cl.⁴ B32B 27/00, 9/04, 25/00

U.S. Cl. 428—402.22

7 Claims

1. A microencapsulated liquid compound of a platinum-group metal consisting essentially of microcapsules wherein said liquid compound is completely enveloped within one or two layers of thermoplastic organic polymers, the average diameter of said microcapsules is less than 500 microns, and said thermoplastic organic polymers constitute at least 50 percent of the weight of said microcapsules.

4,874,661

MAGNETIC POWDER AND MAGNETIC RECORDING MEDIUM COMPRISING THE SAME

Seiichi Asada, Osaka; Toshinobu Sueyoshi, and Akira Miyake, both of Kyoto, all of Japan, assignors to Hitachi Maxell, Ltd., Osaka, Japan

Filed Jul. 7, 1987, Ser. No. 70,697

Claims priority, application Japan, Jul. 9, 1986, 61-162580
Int. Cl.⁴ G11B 5/70

U.S. Cl. 428—403

9 Claims

1. Magnetic powder particles comprising a metal powder and an aluminum-containing oxide which has a corundum structure at least in a surface region of each of said magnetic powder particles.

4,874,669

CURABLE COMPOSITIONS CONTAINING AN EPOXY RESIN, A DIFUNCTIONAL PHENOL AND A POLYFUNCTIONAL PHENOL

Paul A. Larson; Dale J. Aldrich, both of Lake Jackson, and Jody R. Berman, West Columbia, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Aug. 15, 1988, Ser. No. 232,414

Int. Cl.⁴ C08G 59/08, 59/32; C08L 63/04

U.S. Cl. 428—416

44 Claims

1. A composition which comprises
(A) at least one aromatic based epoxy resin having an average number of epoxide groups per molecule of more than 2; and
(B) a phenolic hydroxyl-containing component consisting essentially of a mixture of
(1) at least one phenolic hydroxyl-containing compound having an average of not more than 2 phenolic hydroxyl groups per molecule; and
(2) at least one phenolic hydroxyl-containing compound having an average of more than 2 phenolic hydroxyl groups per molecule;
(C) optionally, at least one ketone solvent as the only solvent for components (A) and (B); and
(D) optionally, one or more stabilizers; and
wherein components (A) and (B) are present in quantities which provide a ratio of phenolic hydroxyl groups for each epoxy group of from about 0.75:1 to about 1.5:1; component (B1) is present in an amount which provides a ratio of phenolic hydroxyl groups per epoxide group contained in component A of from about 0.1:1 to about 0.65:1; (C) is present in an amount of from about zero to about 75 weight percent based upon the combined weight of components (A), (B), (C) and (D); and component (D) is present in an amount of from about zero to about 1 percent by weight based upon the weight of component (A).

4,874,670

TIRE HAVING CURED PHOTOPOLYMER AIR BARRIER COATING

Wyndham Boon, North Canton; Robert J. Gartland, Austintown, and Patrick J. Pesata, Jr., Medina, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Nov. 30, 1987, Ser. No. 126,989

Int. Cl.⁴ B32B 27/00

U.S. Cl. 428—423.9

30 Claims

1. A composite elastomer article comprising:
(a) an elastomer having low air permeability, high elongation and low 100 percent modulus, said elastomer being in the form of a sheet or film, said elastomer being a reaction product formed by radiation curing of a composition comprising:
(1) from about 60 to about 90 parts by weight of an end capped prepolymer having a molecular weight in the range of about 2,500 to about 10,000, said prepolymer being a reaction product of (i) a polyester diol having a molecular weight in the range of about 700 to about 1500, and formed by reaction of an alkanediol contain-

ing from 2 to about 6 carbon atoms with an aliphatic dicarboxylic acid containing from 2 to about 10 carbon atoms; (ii) an organic diisocyanate and (iii) an addition polymerizable end group compound having one carbon-to-carbon double bond and one hydroxyl group per molecule, wherein the mole ratio of —NCO groups is said diisocyanate to —OH groups in said diol is from about 1.12 to about 1.4, and wherein said end capped prepolymer is prepared by first reacting said polyester diol with said diisocyanate to form a diisocyanate terminated polyester urethane prepolymer comprising alternating units of said polyester diol and said diisocyanate and containing from about 2 to about 8 polyester diol units per mole, and then reacting said diisocyanate terminated prepolymer with said end group compound;

(2) from about 40 to about 10 parts by weight of a mono-functional addition polymerizable reactive diluent monomer or mixture thereof;
(b) said sheet or film being adhered to a polymeric substrate.

4,874,671

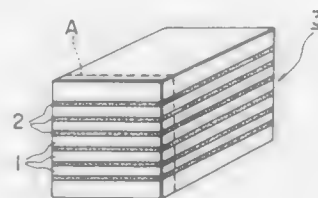
HEAT-RESISTANT ANTI-GLARE SCREEN

Kazutoki Tahara, and Toshihiko Egawa, both of Saitama, Japan, assignors to Shin-Etsu Polymer Co., Ltd., Tokyo, Japan
Continuation-in-part of Ser. No. 118,403, Nov. 9, 1987, abandoned, which is a continuation of Ser. No. 853,615, Apr. 18, 1986, abandoned. This application Jul. 20, 1988, Ser. No. 221,644

Claims priority, application Japan, Apr. 22, 1985, 60-86027
Int. Cl.⁴ B32B 5/14, 25/20

U.S. Cl. 428—447

8 Claims



1. An anti-glare screen which comprises (a) a silicone rubber-made anti-glaring base sheet integrally composed of alternately arranged narrow sections of a transparent silicone rubber and a colored and opaque silicone rubber disposed in a stripe-wise manner, (b) a transparent lining sheet of a thermoplastic resin integrally bonded to one surface of the anti-glaring base sheet of silicone rubbers and (c) a layer of a pressure-sensitive adhesive formed on the surface of the anti-glaring base sheet of silicone rubbers not in contact with the transparent lining sheet of a thermoplastic resin.

4,874,672

PLASTIC SUBSTRATE HAVING AN ADHERENT PHOTO-PRODUCT COATING ON ITS SURFACE AND A METHOD OF COATING SAID PLASTIC SUBSTRATE

Robert M. Etter, and Phillip J. Neumiller, both of Racine, Wis., assignors to S. C. Johnson & Son, Inc., Racine, Wis.
Continuation-in-part of Ser. No. 3,350, Jan. 14, 1987, Pat. No. 4,794,131. This application Feb. 18, 1988, Ser. No. 157,192
The portion of the term of this patent subsequent to Dec. 27, 2005, has been disclaimed.

Int. Cl.⁴ B32B 27/28

U.S. Cl. 428—457

17 Claims

1. A plastic substrate having on its surface an adherent photo-product coating, which coating is formed by exposing to light in the presence of an oxygen source, a reactant mixture having a pH from about 7 to 10.5 comprising:
(a) 2,2',4,4'-tetrahydroxybenzophenone;
(b) ammonium hydroxide; and

(c) optionally a trace amount of at least one reactive metal selected from the group consisting of zinc, copper, nickel, silver, iron, manganese, lead, cobalt, zirconium, mercury, palladium, cadmium, ruthenium, rhodium, and mixtures thereof;
in a solvent.

4,874,673

USE OF FUGITIVE PLASTICIZER IN AUTODEPOSITING COMPOSITION

Joseph C. Donovan, Drexel Hill, and Bashir M. Ahmed, Ambler, both of Pa., assignors to Henkel Corporation, Ambler, Pa.
Continuation of Ser. No. 22,555, Mar. 5, 1987, abandoned, which is a continuation of Ser. No. 684,662, Dec. 20, 1984, abandoned.
This application Nov. 19, 1987, Ser. No. 122,617

Int. Cl.⁴ B32B 15/08

U.S. Cl. 428—463

5 Claims

1. In a process for forming an autodeposition coating on a metallic substrate by immersing said substrate in a autodeposition composition comprising an aqueous latex dispersion, an acid, and an oxidizing agent, for a time effective to impart a coating of a desired thickness, and then heat-curing said coating, the improvement comprising:

- (A) employing a latex composition whose resin solid monomers consist essentially of a mixture of
(1) about 1–10 wt. % of acrylic acid or an alkyl substituted acrylic acid;
(2) about 25–50 wt. % of an acrylic ester or an alkyl substituted acrylic ester;
(3) about 15–40 wt. % of a nitrilomonomer; and
(4) about 10–50 wt. % of an addition polymerizable aryl monomer, wherein the percentages are based on the weight of the resin solids; and
(B) adding to said autodeposition composition a plasticizer-effective and film cracking-preventative effective amount of a fugitive plasticizer which is substantially water insoluble and vaporizable at the fusion temperature of said latex composition and which is selected from the group consisting of 2,2,4-trimethylpentanediol-1,3 monoisobutyrate, tributoxymethyl phosphate, ethylene glycol monohexyl ether, diethylene glycol monohexyl ether, and a mixture of phenyl glycol ethers.

4,874,674

METAL-CERAMIC COMPOSITE BODIES

Isao Oda, and Takao Soma, both of Nagoya, Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan

Filed Feb. 9, 1987, Ser. No. 12,508

Claims priority, application Japan, Feb. 19, 1986, 61-32851

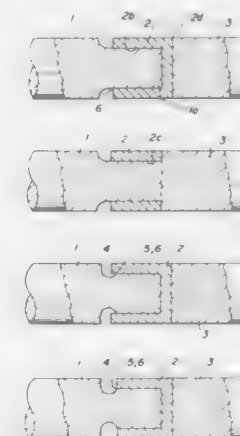
Int. Cl.⁴ F16B 11/00

U.S. Cl. 428—469

8 Claims

1. A metal-ceramic composite body comprising:
a ceramic member having a protruding portion;
a metallic member; and
an intermediate metallic member positioned between said ceramic member and said metallic member, said intermediate metallic member having a thermal expansion coefficient which is lower than that of said metallic member, said intermediate metallic member having a first end including a concave portion in which said ceramic protruding portion is fitted and a second end joined to said metallic member;
wherein a difference between an outer diameter of said

ceramic protruding portion and an inner diameter of said concave portion, after said protruding portion is pulled



from said concave portion, is not less than 0.2% of said outer diameter.

4,874,675

METHOD OF PROTECTING OR RECONDITIONING A SURFACE WITH A POLYMER CONCRETE

Gary W. Cecka, Paoli, Pa., assignor to Sartomer Company, Inc., West Chester, Pa.

Division of Ser. No. 800,858, Nov. 22, 1985, Pat. No. 4,722,976.

This application Sep. 25, 1987, Ser. No. 101,082

Int. Cl.⁴ B32B 13/12, 27/04; C08J 5/24

U.S. Cl. 428—521

12 Claims

1. A method for protecting or reconditioning a surface, which comprises coating, patching, or impregnating the surface with a polymer concrete composition comprising a substantially non-aqueous slurry of (1) an aggregate material and (2) an amount of a monomer binder system effective to bind the aggregate, upon curing, into a polymer concrete, wherein the monomer binder system comprises:

- (a) a liquid comonomer component selected from (i) an addition copolymerizable component comprising at least one monoethylenically unsaturated monomer or a mixture of at least one monoethylenically unsaturated monomer and at least one polyethylenically unsaturated monomer, and (ii) a condensation copolymerizable compound having at least one active hydrogen-containing group;
(b) a solid, thermoplastic macromonomer component dissolved in the liquid comonomer component and copolymerizable therewith to form a copolymer, the macromonomer component (b) comprising an anionically polymerized linear polymer terminated at one or both ends with a polymerizable and group, selected from (i) an addition polymer, copolymerizable exclusively with said addition copolymerizable liquid comonomer component (a)(i), of the formula:



wherein R is a hydrocarbon group containing up to about 20 carbon atoms, Z is the residue of a vinyl aromatic monomer, n is a positive integer such that the molecular weight of Z is about 2,000–50,000, and X is a polymerizable, monoethylenically unsaturated end group, and (ii) a polymer copolymerizable exclusively with said condensation copolymerizable liquid comonomer component (a)(ii), prepared by polymerizable of at least one conjugated diene, at least one vinyl aromatic hydrocarbon, or a mixture of at least one conjugated diene and at least one vinyl aromatic hydrocarbon, capping with carbon dioxide to provide carboxyl termination, or capping with an alkylene

oxide, alkylene episulfide or sulfur followed by hydrolysis to provide hydroxyl or thiol termination; and
(c) a polymerization catalyst for catalyzing the copolymerization; and permitting the polymer concrete composition to cure under ambient conditions.

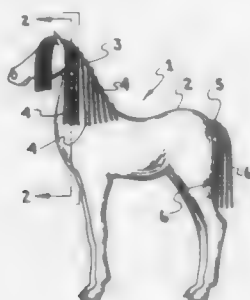
4,874,676

SCULPTURE HAVING SIMULATED HAIR
Ruth E. Miller, and Jack V. Miller, both of 700 N. Auburn Ave.,
Sierra Madre, Calif. 91024

Filed Apr. 25, 1988, Ser. No. 185,396
Int. Cl.⁴ A63H 3/44; B44C 3/06

U.S. Cl. 428—542.2

9 Claims



1. A piece of sculpture representing an animal having hair including:
a rigid body;
a plurality of thin, elongated metallic link chain strands, each having a first end and a second end;
a means of attaching the first end of each chain to the body, leaving the second end hanging free and representing hair.

4,874,677

MATRIX MATERIAL FOR REGENERATORS
Dieter Reiche, Dresden; Matthias Thuerk, and Roderich Duerksen, both of Jena, all of Fed. Rep. of Germany, assignors to Veb Hockvakuum Dresden, Dresden, German Democratic Rep.

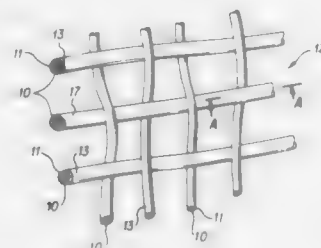
Filed Sep. 20, 1988, Ser. No. 247,021

Claims priority, application German Democratic Rep., Nov. 2, 1987, 308515

Int. Cl.⁴ B23P 17/06

U.S. Cl. 428—605

4 Claims



1. A matrix material for regenerators, comprising a plurality of screen meshes, each of which consist of a stable basic mesh, with wire diameters between 0.005 and 0.015 mm and of a lead sheathing with a thickness of 0.025 to 0.075 mm, is layered into a stack.

4,874,678

ELONGATED SOLID ELECTROLYTE CELL CONFIGURATIONS AND FLEXIBLE CONNECTIONS THEREFOR

Philip Reichner, Plum Boro, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 10, 1987, Ser. No. 130,927

Int. Cl.⁴ H01M 8/10, 2/00, 4/86

U.S. Cl. 429—30

15 Claims



1. A high-temperature solid electrolyte, flat, axially elongated, electrochemical cell combination, having a large cushion area of flexible, current collector material, comprising: a wide, porous, inner electrode having a top surface and a plurality of axial, interior gas feed chamber, where the cross-sectional width of the inner electrode is transverse to the axial, interior gas feed chambers; solid electrolyte contacting the inner electrode except for a major portion of the inner electrode top surface; outer electrode contacting the electrolyte; non-porous; ceramic, electronically conducting interconnection material contacting the inner electrode and covering the portion of the inner electrode top surface not covered by electrolyte, where the interconnection material covers from 60% to 100% of the cross-sectional width of the inner electrode; and at least one axially elongated, electronically conductive, flexible, porous, metal fiber, current collector-cushioning strip material in electronic connection with the inner electrode through contact with from about 20% to 100% of the interconnection material width.

4,874,679

STORAGE BATTERY WITH INDICATING DEVICE
Shiro Miyagawa, Osaka, Japan, assignor to Miyagawa Kasei Industry Co., Ltd., Osaka, Japan

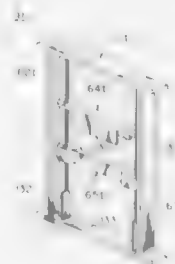
Filed Jul. 11, 1988, Ser. No. 217,543

Claims priority, application Japan, Jul. 11, 1987, 62-173491; Nov. 5, 1987, 62-280210; Feb. 2, 1988, 63-23557; Feb. 2, 1988, 63-23558; Mar. 1, 1988, 63-48341

Int. Cl.⁴ H01M 10/48

U.S. Cl. 429—91

28 Claims



1. A storage battery, comprising a casing for containing an electrolyte, a window (6) in said casing for viewing the interior of the casing through said window in a lateral wall (4) of the casing, indicating means (9) installed in said casing behind said window for indicating changes in the electrolyte liquid level and in the specific gravity of the electrolyte, said indicating means comprising a pair of guide rails (62, 63) vertically extending in parallel to said lateral wall in which said window is formed, first and second floats (64 and 65) disposed be-

tween said guide rails in a position visible through said window, said floats having at their respective opposite ends guide portions slidably fitted on said pair of guide rails, said first float (64) having a specific gravity so that the first float always floats on the liquid surface of the electrolyte for indicating an electrolyte level in said casing, said second float (65) being disposed below said first float (64) and having such a buoyancy that the second float will rise and sink according to changes in the specific gravity of the electrolyte for indicating the specific gravity of the electrolyte, and said first float (64) having a shield (130) for hiding said second float (65) from the field of vision through said window when said second float (65) is floating.

4,874,680

LITHIUM SECONDARY BATTERY

Nobuharu Koshiba, Nara; Toshihiko Ikebata, Katano, and Kenichi Takata, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

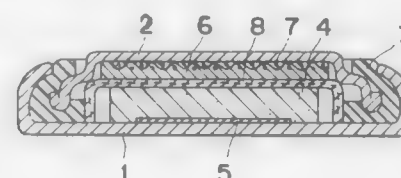
Filed Dec. 13, 1988, Ser. No. 283,806

Claims priority, application Japan, Oct. 21, 1988, 63-266346

Int. Cl.⁴ H01M 6/16

U.S. Cl. 429—197

11 Claims



1. A lithium secondary battery which comprises:
a positive electrode made of vanadium pentoxide as a principle component;
a negative electrode made of lithium absorbing alloy;
an electrolyte prepared from an organic solvent dissolved with lithium salt; and
said lithium absorbing alloy being an alloy containing aluminum as a principle component, the amount of lithium absorbed by the alloy being not greater than 8 wt % relative to the weight of the vanadium pentoxide and not smaller than 4 wt % relative to the alloy containing the aluminum as the principal component.

4,874,681

WOVEN-GRID SEALED QUASI-BIPOLAR LEAD-ACID BATTERY CONSTRUCTION AND FABRICATING METHOD

Wally E. Rippel, 3308 Alegre La., Altadena, Calif. 91001

Filed Apr. 14, 1988, Ser. No. 181,745

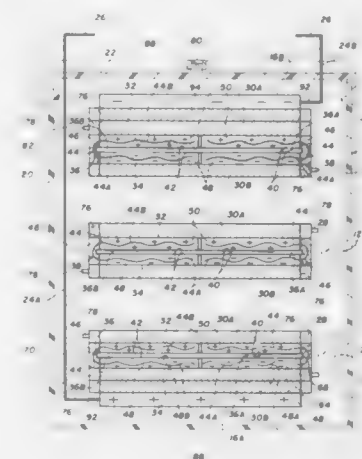
Int. Cl.⁴ H01M 10/18

U.S. Cl. 429—210

22 Claims

1. In a bipolar battery construction, the combination comprising:
a plurality of bipolar cells disposed in side-by-side relation to form a stack of said cells;
said each bipolar cell being loaded with an electrolyte and composed of a bipolar electrode plate and a pair of separator plates disposed on opposite sides of said electrode plate;
said bipolar electrode plate of each cell being composed of a partition sheet and a pair of bipolar electrode elements folded into a hairpin configuration and applied over opposite edges of said partition sheet so as to cover opposite surfaces of adjacent halves of said partition sheet;
said partition sheet and electrode elements of said electrode plate of each cell together defining a peripheral border portion about said electrode plate containing sealable means, said pair of separator plates each cell having respective peripheral border portions containing sealable

means bonded directly to said sealable means on said peripheral border portion of said electrode plate to form



4,874,682

ORGANIC PHOTOCONDUCTORS WITH REDUCED FATIGUE

John Campbell Scott, Los Gatos, and Meredith D. Shattuck, Hollister, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 28, 1988, Ser. No. 264,464

Int. Cl.⁴ G03G 5/14

U.S. Cl. 430—59

5 Claims

1. An organic photoconductor comprising a charge generation layer and a charge transport layer which is a source of acidic protons, said charge transport layer comprising a charge transport material, a binder and distributed uniformly throughout said charge transport layer a nonvolatile basic amine selected from the group consisting of 1,8-bis-(dimethylamino)-naphthalene and poly(vinyl pyridine).

4,874,683

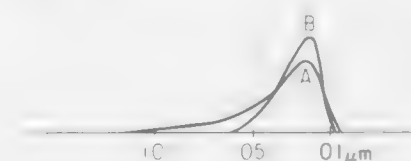
LIQUID DEVELOPER FOR ELECTROPHOTOGRAPHY
Miyuki Shirai, and Akira Nogami, both of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan
Continuation of Ser. No. 893,026, Aug. 1, 1986, abandoned. This application Sep. 6, 1988, Ser. No. 241,832

Claims priority, application Japan, Aug. 9, 1985, 60-176527

Int. Cl.⁴ G03G 11/00, 9/12

U.S. Cl. 430—114

7 Claims



1. A liquid developer for electrophotography, said developer comprising a non-aqueous solvent having toner particles dispersed therein, said particles comprising:

- a colorant;
- a high molecular compound produced in a non-aqueous medium by polymerization of a first monomer component, said first component being soluble in said non-aqueous solvent and being represented by general formula I



wherein R is selected from H, $-\text{CH}_3$, and $-\text{C}_2\text{H}_5$, A is selected from $-\text{COOC}_n\text{H}_{2n+1}$ and $-\text{OC}_n\text{H}_{2n+1}$, n being an integer of from 6 to 20, and a second monomer component insoluble or slightly soluble in said aqueous solution, said second component being at least one monomer selected from vinyl monomers and vinyl carboxylic acid monomers, provided that the monomers are substituted with a substituent so that Taft's aliphatic polar substituent constant σ is not less than 0.45 in absolute value, and said high molecular compound is present in an amount of from 2.5×10^{-4} to 5.5×10^{-4} mols per gram of said colorant and;

a thermoplastic resin selected from the group consisting of waxes, polyolefins, and mixtures thereof, which is insoluble or slightly soluble in said non-aqueous solvent at ordinary temperatures, wherein said thermoplastic resin comprises from 5 to 95% of the total amount of said high molecular compound and said thermoplastic resin, and the number of toner particles having a diameter less than 0.06 μm is not more than 5%, and the number of particles exceeding 1.5 μm in diameter is not more than 3%, both based on the total number of toner particles.

4,874,684

LIGHT-SENSITIVE MATERIAL CONTAINING SILVER HALIDE, REDUCING AGENT AND POLYMERIZABLE COMPOUND IN MICROCAPSULES SEPARATELY

Soichiro Yamamoto, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 3, 1987, Ser. No. 92,841

Claims priority, application Japan, Sep. 3, 1986, 61-208786
Int. Cl.⁴ G03C 1/72

U.S. Cl. 430—138 6 Claims

1. A light-sensitive material comprising a light-sensitive layer which contains silver halide, a reducing agent, an ethylenically unsaturated polymerizable compound and a color image forming substance provided on a support, wherein the silver halide, the polymerizable compound and the color image forming substance are contained in at least four kinds of microcapsules (I), (II), (III) and (IV) which are dispersed in the light-sensitive layer, and wherein

each of the microcapsules (I), (II) and (III) differs from each other with respect to the spectral sensitivity of the silver halide,

the difference between the spectral sensitivity peaks of any two kinds of the microcapsules (I), (II) and (III) is not less than 60 nm,

the hue of the color image forming substance contained in the microcapsule (I) is the same as that in the microcapsule (II),

the hue of the color image forming substance contained in the microcapsule (III) is different from those in the microcapsules (I) and (II),

the spectral sensitivity of the silver halide and the hue of the color image forming substance contained in microcapsules (IV) is different from those of microcapsules (I), (II) and (III), and

said three hues of the color image forming substances contained in microcapsules (I), (II), (III) and (IV) are yellow, magenta and cyan.

PHOTOCURABLE COMPOSITION CONTAINING A PHOTOREDUCTION DYE A THIOL AND AN N,N'-DIALKYLANILINE

Paul C. Adair, Springboro, Ohio, assignor to The Mead Corporation, Dayton, Ohio

Filed Nov. 27, 1987, Ser. No. 125,963
Int. Cl.⁴ G03C 1/72

U.S. Cl. 430—138 11 Claims

1. A dye-sensitized photopolymerizable composition comprising a free radical addition polymerizable material, and a photoinitiator, said photoinitiator consisting essentially of a photoreducible dye, a thiol and an N,N'-dialkylaniline.

4,874,686

PHOTOSENSITIVE LITHOGRAPHIC PLATE NECESSITATING NO DAMPENING WATER

Yoshihiko Urabe; Tatsuji Higashi; Hiroshi Takahashi, and Nobuyuki Kita, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

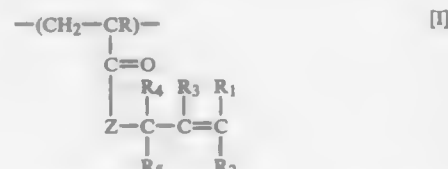
Filed Mar. 13, 1989, Ser. No. 322,511

Claims priority, application Japan, Mar. 18, 1988, 63-65038
Int. Cl.⁴ G03C 1/68, 1/70, 1/71

U.S. Cl. 430—272 12 Claims

1. A photosensitive lithographic plate necessitating no dampening water and comprising, on a support, a photosensitive layer and a silicone rubber layer in this order, said rubber layer being formed by addition reaction of $-\text{SiH}$ group with a $-\text{CH}=\text{CH}-$ group to cause crosslinking, characterized in that said photosensitive layer comprises the following components:

(1) a polymer comprising at least a structural unit of the following general formula (I):



wherein R represents a hydrogen atom or a methyl group; R_1 , R_2 , R_3 , R_4 and R_5 each represents a member selected from the group consisting of a hydrogen atom, a halogen atom, a carboxyl group, a sulfo group, a cyano group, an amido group, an amino group, an alkyl group, an aryl group, an alkoxy group, an aryloxy group, an alkylamino group, an arylamino group, an alkylsulfonyl group and an arylsulfo group; and Z represents an oxygen atom, a sulfur atom, $-\text{NH}-$, $-\text{NR}_6-$ (R_6 represents an alkyl group), $-\text{OCH}_2\text{CH}_2\text{O}-$ or $-\text{OCH}_2\text{CH}(\text{OH})-$, ---

(2) a photopolymerization initiator.

4,874,687

METHOD FOR FORMING AN IMAGE

Masamichi Itabashi, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 18, 1987, Ser. No. 122,716

Claims priority, application Japan, Nov. 18, 1986, 61-274917
Int. Cl.⁴ G03C 5/24, 5/36, 5/38, 1/30

U.S. Cl. 430—446 27 Claims

1. A method for forming a silver image comprising the steps of:

(a) imagewise exposing a light-sensitive silver halide photographic material comprising a support having provided on at least one surface thereof a light-sensitive chemically sensitized silver halide emulsion, at least one of an active halogen hardening agent and a bisvinylsulfone hardening agent, and a slightly water-soluble basic metallic compound; and

(b) developing said exposed material with a developer solution containing a compound capable of reacting with said basic metallic compound to release a base.

4,874,688

SILVER HALIDE PHOTOGRAPHIC MATERIALS COMPRISING SPECIFIC ORGANIC SOLVENTS

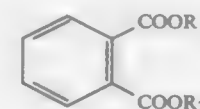
Takashi Ozawa, and Hidetoshi Kobayashi, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 4, 1988, Ser. No. 164,372

Claims priority, application Japan, Mar. 4, 1987, 62-49083
Int. Cl.⁴ G03C 7/26, 1/06

U.S. Cl. 430—546 6 Claims

1. A silver halide photographic material comprising a support having provided thereon at least one hydrophilic organic colloid layer, said at least one layer comprising one or more photographic additives dispersed therein with at least one phthalic acid ester of the general formula (I):



where R_1 and R_2 , which may be same or different, each represents a branched alkyl group having 7 carbon atoms.

4,874,689

SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL

Junichi Yamanouchi; Shigetoshi Ono; Tsumoru Hirano; Toshiyuki Watanabe; Nobuo Sakai, and Keiji Miyahashi, Minami-Ashigara, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 22, 1987, Ser. No. 52,881

Claims priority, application Japan, May 24, 1986, 61-119902
Int. Cl.⁴ G03C 7/32

U.S. Cl. 430—548 19 Claims

1. A silver halide color photographic material comprising at least one non-diffusive lipophilic polymer coupler having a number-average molecular weight of about 1,000 to about 10,000 produced by a polymerization reaction which employs a chain-transfer agent having 8 or more carbon atoms.

4,874,690

LYOPHILIZATION OF RED BLOOD CELLS

Raymond P. Goodrich, Jr.; Christine M. Williams, both of Pasadena, Calif.; Robert S. Franco, and Murray Weiner, both of Cincinnati, Ohio, assignors to Cryopharm Corporation, Pasadena, Calif.

Filed Aug. 26, 1988, Ser. No. 237,588

U.S. Cl. 435—2 9 Claims

1. A process for the lyophilization of erythrocytes, comprising immersing a plurality of erythrocytes in a buffered solution which includes:

a monosaccharide which is present in the solution in a concentration of from about 7.0 to 37.5%;
a polymer having a molecular weight of from about 5K to about 80K which is present in a concentration of from about 0.7% up to saturation in the solution;
a polyanion which is present in a concentration of from 0.01 weight percent up to saturation in the solution;
freezing the solution; and
drying the erythrocytes by sublimation of the water.

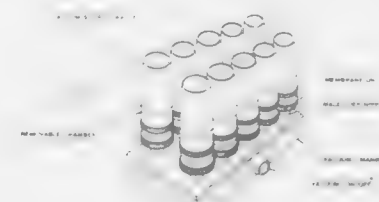
4,874,691

MEMBRANE-SUPPORTED IMMUNOASSAYS

Howard Chandler, West Vancouver, Canada, assignor to Quadra Logic Technologies Inc., Vancouver, Canada

Filed Oct. 16, 1987, Ser. No. 109,436

Int. Cl.⁴ G01N 33/544 32 Claims



(1) 1. A method to conduct an assay for an analyte in a sample, wherein the analyte binds to an affinity partner, which method comprises:

drawing a volume of said sample by means of a pressure gradient through a membrane in which the affinity partner for the analyte is contained into a receiving chamber on which said membrane is mounted, wherein said pressure gradient is obtained by creating a partial vacuum in said receiving chamber, and detecting the analyte bound in the membrane.

4,874,692

BINDER COMPOSITION AND ANALYTICAL ELEMENT HAVING STABILIZED PEROXIDASE IN LAYER CONTAINING THE COMPOSITION

Jon N. Eikenberry, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 20, 1987, Ser. No. 75,480

Int. Cl.⁴ G01N 33/50 17 Claims

12. A method for the determination of an immunologically reactive ligand comprising the steps of:

A. in the presence of a receptor for said ligand, contacting a sample of a liquid suspected of containing the ligand with an analytical element comprising an absorbent carrier material having a water-soluble layer containing a peroxidase-labeled ligand analog for the ligand uniformly distributed in from 0.1 to 10.0 g/m² of poly(vinylalcohol) and from 0.2 to 20 g/m² of glycerol; provided that the concentration of the glycerol in the layer is greater than 1.0 times the concentration of poly(vinylalcohol); and
B. determining the amount of the ligand as a result of the presence of complexed or uncomplexed ligand analog.

4,874,693

METHOD FOR ASSESSING PLACENTAL DYSFUNCTION

Mark Bogart, 3432 Pershing Ave., San Diego, Calif. 92104

Filed Oct. 10, 1986, Ser. No. 917,985

Int. Cl.⁴ G01N 33/53, 33/543, 33/577; C12Q 1/68

U.S. Cl. 435—7 17 Claims

1. A method for identifying a pregnant women with substantial risk of gestating a fetus having an aneuploid chromosomal abnormality, comprising
a. combining bodily fluids taken from said female gestating said fetus during the 18th through 25th weeks of her pregnancy in an aqueous buffered assay medium with labeled human chorionic gonadotropin (HCG) hormone, wherein said label provides a detectable signal and antibodies to HCG;

- b. determining the amount of labeled HCG either bound or unbound to said antibodies as a measure of HCG in said sample; and
- c. comparing the level of said HCG in said sample with levels of HCG measured during the same time interval of pregnancy in women gestating normal fetuses, said comparison being determinative of the presence of the aneuploid abnormality in said fetus.

4,874,694

USE OF PHOSPHOPROTEIN PATTERNS FOR DIAGNOSIS OF NEUROLOGICAL AND PSYCHIATRIC DISORDERS

Samuel E. Gandy, and Paul Greengard, both of New York, N.Y., assignors to The Rockefeller University, New York, N.Y.

Filed Apr. 7, 1987, Ser. No. 35,347

Int. Cl.⁴ C12Q 1/48; C07G 17/00, 15/00; C07K 3/12

U.S. Cl. 435—13 12 Claims

1. A method for analyzing the cerebrospinal fluid of a mammal to determine the presence or development of a neurological or psychiatric pathology selected from the group consisting of Alzheimer disease, Huntington disease, Parkinson disease, dystonia, ataxia, schizophrenia, epilepsy, brain tumor, brain irradiation, head trauma, acute and chronic encephalitic and vascular disease, which comprises:

- incubating a sample of said mammalian cerebrospinal fluid in the presence of 32-P labelled adenosine triphosphate (ATP) and a protein kinase capable of transferring phosphate from the adenosine triphosphate (ATP);
- terminating the reaction in (a) after a pre-determined time;
- applying a sample of the terminated reaction of (b) to a gel for electrophoresis to form a sampled gel;
- electrophoresing the sampled gel of (c);
- performing autoradiography on the electrophoresed gel of (d);
- comparing the pattern of the autoradiography of (e) with a set of sample patterns of known neurological and psychiatric pathologies to ascertain the particular pathology of the cerebrospinal fluid being analyzed.

4,874,695

RAPID IDENTIFICATION OF YEAST AND OTHER FUNGAL MICROORGANISMS BY ENZYME DETECTION

David H. Pincus, New Hyde Park, N.Y., assignor to American Home Products Corp., New York, N.Y.

Continuation-in-part of Ser. No. 473,381, Mar. 8, 1983, abandoned. This application Feb. 21, 1985, Ser. No. 703,644

Int. Cl.⁴ C12Q 1/44, 1/36, 1/04; C12P 19/24

U.S. Cl. 435—19 13 Claims

1. A method for the rapid identification of microorganisms within about 6 hours of incubation of said microorganisms selected from the group consisting of genera and species of yeast and other fungal microorganisms comprising:

- culturing an unknown yeast or other fungal microorganisms in a non-inhibitory mycological culture medium for 48 to 72 hours at 25°–30° C. to stimulate the production or multiply the presence of colonies containing one or more enzymes characteristic of said microorganism;
- suspending and homogenously mixing, from the medium of step(a), a sufficient number of morphologically similar colonies of the so cultured unknown microorganism containing said enzyme(s) in an aqueous suspending medium to prepare an inoculum having a turbidity equivalent of at least McFarland No. 3 of the unknown microorganism;
- separately mixing the inoculum with one or more substrates selected from a first group selected from the group consisting of chromogenic substrates for detecting the presence or absence of acetate esterase, leucyl-glycine aminopeptidase, and glycyl-glycine aminopeptidase, said chromogenic substrates capable of reacting with said enzyme(s) to produce a colored product or a product

convertible to a colored product said products selected from the group consisting of β -naphthylamine, p-nitroaniline, indoxyl, o-nitrophenol, p-nitrophenol, β -naphthol and substituted naphthols and said substrates further defined as being the esters and amides formed between the group consisting of acetic acid, leucyl-glycine and glycyl-glycine with the products;

- incubating the inoculum substrate mixtures of step(c) at about 36° C. from about 2 to about 6 hours to obtain the product(s) whereby the unknown yeast or other fungal microorganism is identified by comparing detected enzyme activity characteristic of said microorganism with characteristic enzyme activity of known genera and species of yeast and other fungal microorganisms.

4,874,696

NOVEL BACTERIUM INDUCIBLE TO PRODUCE UNIQUE STEROID-TRANSFORMING ENZYMES: PREPARATION AND APPLICATIONS THEREOF

Donna W. Payne, Columbia, and Paul Talalay, Baltimore, both of Md., assignors to The Johns Hopkins University, Med School, Baltimore, Md.

Filed Oct. 23, 1985, Ser. No. 790,447

Int. Cl.⁴ C12Q 1/32; C12N 9/04; C12R 1/05

U.S. Cl. 435—26 16 Claims

3. An enzymatic assay for detecting hydroxyl or carbonyl compounds comprising reacting a hydroxyl or carbonyl compound or both in a buffered medium with an NAD or NADP linked-dehydrogenase having specificity for reacting with said compound, transferring hydrogen from NADH or NADPH to an analog of NAD or NADP and measuring the rate of accumulation of the reduced analog of NAD or NADP.

4,874,697

NOVEL HOST *E. COLI* AND USE THEREOF

Keijiro Sugimura, Shunjiro Sugimoto, and Housai Shirasawa, all of Osaka, Japan, assignors to Santory Limited, Osaka, Japan

Filed Dec. 29, 1986, Ser. No. 947,398

Claims priority, application Japan, Dec. 27, 1985, 60-295140

Int. Cl.⁴ C12P 21/00; C12R 1/185

U.S. Cl. 435—68 5 Claims

1. A protease deficient mutant derived from *Escherichia coli* strain W3110, said mutant being designated W3110(M25):FERM BP-1097.

4. A process for producing human immune interferon, said process comprising the steps of:

- culturing *Escherichia coli* strain W3110(M25) transformed with a plasmid containing the human immune interferon gene or derivatives thereof, and
- extracting and/or purifying the interferon therefrom.

4,874,698

PROCESS FOR PRODUCING TRYPTOPHAN

Akio Ozaki, Ryolchi Katsumata, both of Tokyo, and Tetsuo Oka, Yokohama, all of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 580,815, Feb. 16, 1984. This application Jul. 16, 1987, Ser. No. 73,888

Claims priority, application Japan, Feb. 17, 1983, 58-25398

Int. Cl.⁴ C12P 13/22; C12N 1/20, 15/00; C12R 1/13

U.S. Cl. 435—108 8 Claims

1. A process for producing tryptophan, which comprises: transforming a host microorganism belonging to the genus *Corynebacterium* or *Brevibacterium* with a vector containing a DNA fragment containing an anthranilic acid synthetase gene isolated from *Brevibacterium flavum* ATCC 14067 or *Corynebacterium glutamicum* ATCC 13032, culturing the transformant in a nutrient medium containing a molasses carbon source, accumulating tryptophan in the culture medium and recovering tryptophan therefrom.

4,874,699

REACTION METHOD FOR TRANSESTERIFYING FATS AND OILS

Shoji Maruzeni, Wataru Matsumoto, and Nozomi Yasuda, all of Tokyo, Japan, assignors to Asahi Denka Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 611,964, May 18, 1984, abandoned.

This application Aug. 21, 1986, Ser. No. 898,513

Claims priority, application Japan, May 19, 1983, 58-88167; Jul. 12, 1983, 58-126392; Mar. 26, 1984, 59-57739

Int. Cl.⁴ C12P 7/62

U.S. Cl. 435—135 27 Claims

1. A two-step reaction method for the transesterification of fats and oils, comprising:

- hydrolyzing fats and oils to produce diglycerides by reacting said fats and oils with lipase having 1,3 position specificity in the presence of 0.01 to 0.10 parts by weight of water per 1 part by weight of fats and oils;
- esterifying said diglycerides to produce triglycerides by reacting said diglycerides with at least one fatty acid while at the same time removing water from said reaction to increase the rate of esterification and reduce the rate of hydrolyzation, the first and/or second reaction steps being carried out by adding an aliphatic monohydric alcohol having 4 to 18 carbon atoms to the reaction system, wherein the amount of alcohol being added corresponds to 50–90 mol % of free fatty acid estimated to be produced if added in the first step, and the amount of alcohol being added corresponds to 50–90 mol % of remaining free fatty acid, if added in the second step.

4,874,700

PROCESS FOR THE PRODUCTION OF L-MALIC ACID

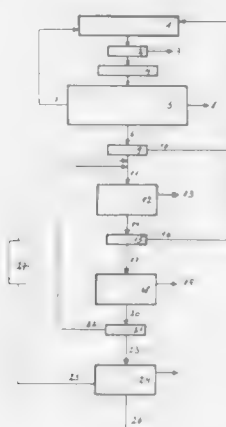
Reinhold Seipenbusch, Gladbeck, Fed. Rep. of Germany, assignor to Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Sep. 20, 1985, Ser. No. 778,464

Claims priority, application Fed. Rep. of Germany, Sep. 22, 1984, 3434918

Int. Cl.⁴ C12P 7/46

U.S. Cl. 435—145 17 Claims



1. A process for preparing L-malic acid by separation from a reaction mixture produced in the biotechnical conversion of fumaric acid salts to L-malic acid salts, which mixture is substantially free of cellular substances

comprising electrolysing the reaction mixture in an electrochemical unit having at least three cells separated from one another by dialysis membranes thereby continuously separating out three solutions, which are an acid concentrate solution containing L-malic acid and fumaric acid, an alkali concentrate solution containing the hydroxide of the cation of the fumaric acid and L-malic acid salts, and a diluted

product solution containing nonionic components of the reaction mixture and residual fumarate and L-malate; and recovering purified L-malic acid by concentration/crystallization of the acid concentrate

4,874,701

PREPARATION OF CONIFERYLALDEHYDE BY A MICROORGANISM

Bryan Cooper, Mannheim, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Feb. 9, 1987, Ser. No. 12,495

Claims priority, application Fed. Rep. of Germany, Feb. 15, 1986, 3604874

Int. Cl.⁴ C12P 7/24, 7/02, 7/22

U.S. Cl. 435—147 4 Claims

1. A process for preparing coniferylaldehyde, which comprises:

- cultivating *Arthrobacter globiformis* DSM 3597 or a mutant thereof, in the presence of n-eugenol, and allowing coniferylaldehyde to accumulate, wherein said mutant of *Arthrobacter globiformis* DSM 3597 is one which is capable of converting n-eugenol into coniferylaldehyde without further changing the coniferylaldehyde.

4,874,702

VECTORS AND METHODS FOR MAKING SUCH VECTORS AND FOR EXPRESSIVE CLONED GENES

Walter C. Flers, Destelbergen, and René Erik Remant, Vinderhout, both of Belgium, assignors to Biogen, Inc., Cambridge, Mass.

Continuation of Ser. No. 250,606, Apr. 3, 1981, abandoned. This application Oct. 20, 1986, Ser. No. 921,803

Claims priority, application United Kingdom, Sep. 8, 1980, 8028983

Int. Cl.⁴ C12N 15/00, 1/20; C12P 21/00

U.S. Cl. 435—172 18 Claims

1. A plasmid vector comprising at least one DNA sequence comprising the leftward promoter and operator derived from bacteriophage λ , P_{LOR} , said DNA sequence further comprising at least one endonuclease recognition site located less than 300 base pairs downstream from P_{LOR} and located between P_{LOR} and any sequences of λ DNA downstream of the Hae III site at 73.1% of bacteriophage λ in said DNA sequence.

4,874,703

EXPRESSION VECTORS FOR USE IN *E. COLI*

S. Richard Jaskunas, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Aug. 26, 1985, Ser. No. 769,221

Int. Cl.⁴ C12N 15/00, 1/20; C07H 15/12; C12P 1/04

U.S. Cl. 435—252.33 24 Claims

1. The lambda pL-ipp hybrid transcriptional and translational activating sequence of the following structure:

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10      20      30
5'-GATCTCTCAC CTACCAAACA ATGCCCCCT
3'-CTAGAGAGTG GATGTTTGT TACGGGGGA

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40      50      60
GCAAAAAATA AATTCATATA AAAAACATAC
CGTTTTTAT TTAAGTATAT TTTTGTATG

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70      80      90
AGATAACCAT CTGCGGTGAT AAATTATCTC
TCTATTGGTA GACGCCACTA TTTAATAGAG

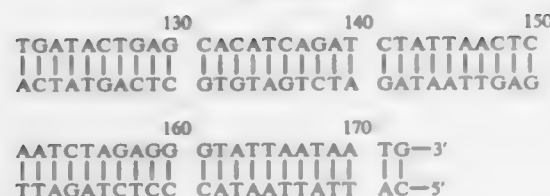
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100     110     120
TGGCGGTGTT GACATAAATA CCACTGGCGG
ACCGCCACAA CTGTATTAT GGTGACCGCC

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-continued



wherein

A is deoxyadenyl;
 G is deoxyguanyl;
 C is deoxycytidyl; and
 T is thymidyl.

24. A plasmid selected from the group consisting of plasmids pKC283PX, pKC283-L, pKC283-LB, pL32, pKC283PRS, pPR12AR1 and pPR12AR1.

4,874,704

METHOD FOR INHIBITING FOOD-BORNE HUMAN PATHOGENS AND PREVENTING MICROBIAL SPOILAGE IN REFRIGERATED FOODS USING A LACTOBACILLUS

Donald P. Boudreaux; Mark A. Matrozza, both of Sarasota, and Marianne F. Leverone, Bradenton, all of Fla., assignors to Microlife Technica, Inc., Sarasota, Fla.

Continuation-in-part of Ser. No. 49,852, May 15, 1987. This application Mar. 14, 1988, Ser. No. 167,556

Int. Cl.⁴ C12N 1/20

U.S. Cl. 435-252.9

23 Claims

1. A method for inhibition of food-borne human pathogen or spoilage microorganisms in a refrigerated processed food which has been subjected to a treatment and then packaged prior to consumption which comprises:

- (a) inoculating the processed food following any heat treatment of the food which would inactivate the cells with a number of cells of a Lactobacillus which remain viable during refrigerated storage without fermentation of the food by the Lactobacillus and which cells produce hydrogen peroxide during the refrigerated storage to inhibit the microorganisms; and
- (b) storing the food in the package at refrigeration temperatures which prevent the number of the cells from increasing significantly except during transient temperature abuse to thereby inhibit the microorganisms.

4,874,705

DNA ENCODING AN ANTIGENIC PROTEIN DERIVED FROM EIMERIA TENELLA AND VACCINES FOR PREVENTION OF COCCIDIOSIS CAUSED BY EIMERIA TENELLA

William H. Andrews, Belmont; Virginia M. Brothers, Albany; James G. Files, Belmont; Irene Kuhn, San Francisco; Michael T. McCaman, San Bruno; Leland S. Paul, Woodside; Stacey R. Sias, San Anselmo, all of Calif.; Thomas C. Gore, Charles City; Karel Z. Newman, Jr., Clear Lake, both of Iowa, and John L. Tedesco, St. Peters, Mo., assignors to Solvay & Cie, S.A., Brussels, Belgium

Continuation-in-part of Ser. No. 734,085, May 16, 1985, which is a continuation-in-part of Ser. No. 617,483, Jan. 5, 1984, abandoned. This application Dec. 6, 1985, Ser. No. 805,824

Int. Cl.⁴ C12N 1/20, 15/00; C07H 21/04

U.S. Cl. 435-252.33

26 Claims

1. An isolated genomic DNA molecule having the nucleic acid sequence set forth in FIG. 1 and encoding an antigenic protein derived from *Eimeria tenella*, the protein having a molecular weight of about 25,000 daltons and being composed of two polypeptides joined by a disulfide bond, one of the polypeptides being characterized by a molecular weight of about 17,000 daltons and by a blocked N-terminal amino acid and having the amino acid sequence set forth in FIG. 1 and the

other of the polypeptides being characterized by a molecular weight of about 8,000 daltons and having the amino acid sequence set forth in FIG. 1.

4,874,706

MANUFACTURE AND USE OF TAGETITOXIN

Richard D. Durbin, Cross Plains, Wis.; Jean H. Lakens, Cambridge, Mass.; Thomas F. Uchytel, and Nicholas Rhodehamel, both of Madison, Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Continuation-in-part of Ser. No. 906,486, Sep. 10, 1986, abandoned. This application Feb. 17, 1987, Ser. No. 15,174

Int. Cl.⁴ C12R 1/38

U.S. Cl. 435-253.3

5 Claims

1. A biologically pure culture of a strain of *Pseudomonas syringae* pv. *tagetis* which has been mutated to produce tagetitoxin at a level at least ten fold higher than wild-type strain.

4,874,707

PROCESS FOR PRODUCING AN AQUEOUS SUSPENSION OF NITRIFYING BACTERIA

Eberhard Bock, Hamburg, Fed. Rep. of Germany, assignor to TetraWerke Dr.rer.nat. U. Baensch GmbH, Herrentelch, Fed. Rep. of Germany

PCT No. PCT/EP87/00538, § 371 Date Jul. 25, 1988, § 102(e) Date Jul. 25, 1988, PCT Pub. No. WO88/02397, PCT Pub. Date Apr. 7, 1988

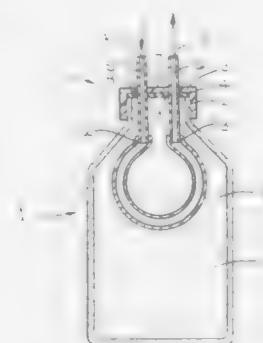
PCT Filed Sep. 22, 1987, Ser. No. 249,913

Claims priority, application Fed. Rep. of Germany, Sep. 25, 1986, 3632532

Int. Cl.⁴ C12N 1/20

U.S. Cl. 435-253.6

15 Claims



1. A process for producing an aqueous suspension of nitrifying bacteria, in which the bacteria remain metabolically and physiologically active under the induction of specific nitrification enzyme systems, can be kept for long periods in the absence of oxygen at a stationary growth phase and can be finally used, comprising a growth medium containing ammonia or nitrite, and separate compartments having a higher or lower oxygen partial pressure created in a sealed culture flask.

4,874,708

PROCESS FOR THE PREPARATION OF INTRA-VEINOUSLY ADMINISTERED GAMMA-GLOBULINS AND THE GAMMA-GLOBULINS OBTAINED

Marie-France Makula, La Cerisale, 18D rue de Tourvielle, 69 005 Lyon, and Jacques Liantaud, Le Petit Paris, 69 760 Limonest, both of France

PCT No. PCT/FR86/00184, § 371 Date Jan. 23, 1987, § 102(e) Date Jan. 23, 1987, PCT Pub. No. WO86/06963, PCT Pub. Date Dec. 4, 1986

PCT Filed May 30, 1986, Ser. No. 12,662

Claims priority, application France, May 30, 1985, 85 08094 Int. Cl.⁴ C07K 3/12

U.S. Cl. 435-272

11 Claims

1. A process for the production of gamma-globulins free of aggregates, dimers and kallikrein and administrable intravenously, comprising subjecting a fraction rich in gamma-globulins to fractionation with polyethylene-glycol (PEG) and to a step of controlled enzymatic treatment with an enzyme selected from the group consisting of pepsins, plasmins and papains, said enzymatic treatment being conducted at a suitable pH and in a manner that avoids appreciable proteolysis.

4,874,709

SOLVENT AND METHOD FOR THE KARL-FISCHER DETERMINATION OF WATER

Wolfgang Fischer, Darmstadt, and Karl D. Krenn, Pfungstadt, both of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit Beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Jul. 12, 1988, Ser. No. 217,912

Claims priority, application Fed. Rep. of Germany, Jul. 13, 1987, 3723084

Int. Cl.⁴ G01N 33/18

U.S. Cl. 436-42

19 Claims

1. A method for determining the water content of a sample using a Karl-Fischer titration comprising conducting the Karl-Fischer titration using a Karl-Fischer solvent system containing at least one higher alcohol which is an aliphatic alcohol containing 8 to 12 carbon atoms.

4,874,710

ASSAY AND PRODUCT IN WHICH BINDER AND LIPOSOMES ARE SUPPORTED ON A SOLID SUPPORT

Uri Piran, Norwood, Mass., assignor to Becton Dickinson and Company, Franklin Lakes, N.J.

Filed Feb. 20, 1986, Ser. No. 831,410

Int. Cl.⁴ G01N 33/53, 33/566, 33/543, 33/537

U.S. Cl. 436-518

16 Claims

1. An assay for an analyte, comprising: contacting an analyte with a binder for at least the analyte in the presence of a conjugate, said conjugate comprising a ligand coupled to a liposome lysing agent; said ligand portion of the conjugate being bound by one of the analyte and binder, whereby a portion of the conjugate is bound to the binder; contacting unbound conjugate with liposomes which include in the interior thereof a detectable marker, said binder and liposomes being supported on separate portions of a solid support, said contacting lysing the liposomes; and determining marker released from the liposomes by contact with the liposome lysing agent of the unbound conjugate as a measure of analyte.

4,874,711

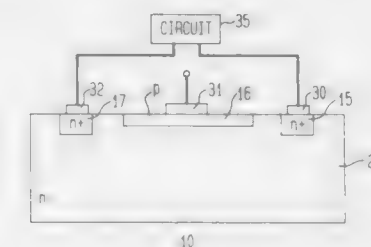
METHOD FOR ALTERING CHARACTERISTICS OF ACTIVE SEMICONDUCTOR DEVICES

David W. Hughes, Chamblee; Robert K. Feeney, Doraville, and David R. Hertling, Stone Mountain, all of Ga., assignors to Georgia Tech Research Corporation, Atlanta, Ga.

Continuation-in-part of Ser. No. 53,474, May 26, 1987, abandoned. This application Jan. 19, 1988, Ser. No. 145,623 Int. Cl.⁴ H01L 21/326, 21/66

U.S. Cl. 437-8

16 Claims



1. A method for altering an electrical characteristic of a circuit having at least one active semiconductor device and at least one electrode contacted to the active semiconductor device, the method comprising the step of applying at least one electrical pulse to the active semiconductor device, including applying the pulse to at least one of the at least one electrode, the pulse having sufficient amplitude of one or more of its electrical parameters and time duration to alter the electrical characteristics of the device, and, thereby, to alter the electrical characteristic of the circuit, the amplitudes of the electrical parameters and the time duration of the at least one pulse being sufficient to form dendrites or filaments of material from the at least one electrode in the active semiconductor device wherein the dendrites or filaments are not of a geometry to cause a short to be formed between any pair of electrodes of the active semiconductor device and wherein, after the steps of applying the method have been completed, no short has been formed thereby between any pair of electrodes of the circuit.

4,874,712

FABRICATION METHOD OF BIPOLAR TRANSISTOR

Myung S. Kim, Seoul; Hyun S. Kang, Suwon; Soon K. Lim, and Hee K. Park, both of Bucheon, all of Rep. of Korea, assignors to Samsung Semiconductor & Telecommunication Co., Ltd., Gumi City, Rep. of Korea

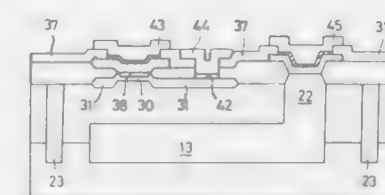
Filed Sep. 26, 1988, Ser. No. 249,401

Claims priority, application Rep. of Korea, Sep. 26, 1987, 87-10713

Int. Cl.⁴ H01L 21/225

U.S. Cl. 437-31

2 Claims



1. The fabrication method of the bipolar transistor characterized by the thing that the formation method of the base and the emitter region is made up with the process mentioned below in the fabrication method of the bipolar transistor which is fully equipped with the collector region of the 1st conduction type on the silicon substrate of the 1st conduction type and the base region of the 2nd conduction type in the collector region and the emitter region of the 1st conduction type in the base region:

- a. the process in which ions of the 2nd conduction type are implanted into the region where the said base is to be formed to form the 1st base region,
- b. the process in which the nitride layer and the oxide layer for the masking are formed sequentially on the surface of the substrate, and the oxide and the nitride layer of the remaining region except for the region, where the emitter is to be formed, are etched to form the masking layer,
- c. the process in which ions of the 2nd conduction type are implanted into the region, where the base is to be formed, with the higher dose than that of the ion implantation of the said process by using the masking layer of the region, where the said emitter is to be formed, as the mask to form the 2nd base region,
- d. the process in which the side walls of the nitride layer for the masking are etched to define the emitter region,
- e. the process in which, after the oxide layer for the masking is removed and the annealing is proceeded to activate the ion-implanted region in the process c, a specified oxide layer is formed by using the nitride layer as the mask,
- f. the process in which the nitride layer is removed and the window is formed on the region, where the emitter is to be formed, and the collector contact region,
- g. the process in which the polycrystalline silicon layer is formed on the surface of the substrate and ions of the 1st conduction type are implanted into the polycrystalline silicon layer,
- h. the process in which the doped polycrystalline silicon layer is etched to form the polycrystalline silicon emitter contact and the polycrystalline silicon collector contact,
- i. the process in which the oxide layer, which is the protection layer, is formed on the surface of the substrate and the heat treatment for the formation of the emitter region is proceeded,
- j. the process in which the window is formed for the electrode contacts of the emitter, the base and the collector region,
- k. and the process in which metal is connected to the conductor layer through the window.

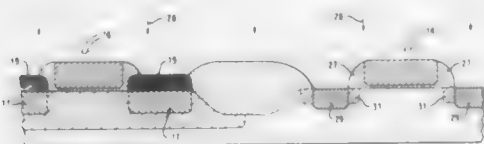
4,874,713

METHOD OF MAKING ASYMMETRICALLY OPTIMIZED CMOS FIELD EFFECT TRANSISTORS
Samuel C. Gioia, Colorado Springs, Colo., assignor to NCR Corporation, Dayton, Ohio

Filed May 1, 1989, Ser. No. 345,875
Int. Cl.⁴ H01L 21/265

U.S. Cl. 437—34

11 Claims



1. A process for forming CMOS field effect transistor integrated circuits, comprising the steps of:
 - forming in an active region of a semiconductor substrate first and second polysilicon gate electrodes with underlying gate dielectrics;
 - forming a capping dielectric layer over the first and second polysilicon gate electrodes;
 - forming a photolithographic mask over the second polysilicon gate electrode and associated field effect transistor source/drain regions;
 - doping the substrate in the presence of the photolithographic mask to form source/drain regions in the semiconductor substrate aligned to the first polysilicon gate electrode;
 - selectively forming metallic regions over the source/drain regions of the first polysilicon gate electrode;
 - thereafter lightly doping source/drain regions of the second polysilicon gate electrode in alignment with the second

polysilicon gate electrode using said metallic regions as a mask;
forming a sidewall dielectric for the second polysilicon gate electrode; and
heavily doping the source/drain region of the second polysilicon gate electrode in alignment with the sidewall dielectric.

4,874,714

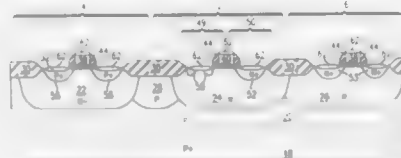
METHOD OF MAKING LATERALLY ORIENTED SCHOTTKY DIODE

Robert H. Eklund, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jun. 2, 1988, Ser. No. 201,506
Int. Cl.⁴ H01L 21/22, 21/265

U.S. Cl. 437—39

12 Claims



1. A method of manufacturing a metal-semiconductor diode in a substrate having semiconducting surface areas thereon, said method comprising the steps of:
 - forming a well region in said substrate at one of said surface areas, said well region containing a first conductivity type dopant at a first level of concentration;
 - forming a spacer on said substrate overlying a portion of said well region;
 - forming a first mask layer overall;
 - removing selected portions of said first mask layer to expose a first edge of said spacer and a portion of the well region adjacent to said first edge of said spacer;
 - forming an ohmic contact region in said portion of said well region exposed by said first mask layer, said ohmic contact region containing a first conductivity type dopant at a second level of concentration, said second level of concentration being greater than said first level of concentration;
 - forming a metallic layer overlying and in contact with a portion of said well region adjacent to a second side of said spacer, said second side opposing said first side, a boundary between said metallic layer and said well region being a rectifying junction.

4,874,715

READ ONLY MEMORY WITH IMPROVED CHANNEL LENGTH CONTROL AND METHOD OF FORMING

James L. Paterson, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 54,113, May 20, 1987, Pat. No. 4,763,177, which is a continuation of Ser. No. 702,562, Feb. 19, 1985, abandoned. This application Jun. 10, 1988, Ser. No. 206,410

Int. Cl.⁴ H01L 29/96

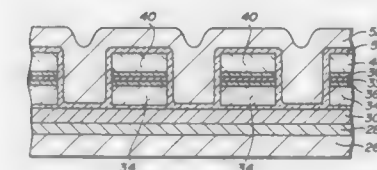
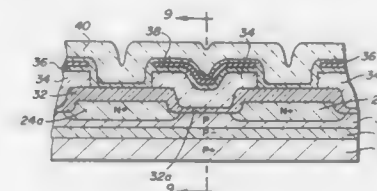
U.S. Cl. 437—43

22 Claims

1. A method of making a semiconductor device comprising:
 - doping a region at face of a semiconductor body with a conductivity-type determining impurity,
 - forming a layer of insulator material over said doped region,
 - forming first and second trenches extending through said insulator layer and said doped region into said semiconductor body, a portion of said doped region extending contiguously from said first trench to said second trench,
 - forming a gate insulating layer covering said first and second trenches,
 - forming a layer of conductive material over said trenches to form first and second floating gates therein, respectively,

forming a third insulating layer over said first and second floating gates, and
forming a second conductive layer over said third insulating layer and contiguous over said first and second floating gates.

12. A method of making a floating gate semiconductor memory in the form of an array of rows and columns of memory cells comprising the steps of:
 - forming a doped region over a portion of a face of a semiconductor body at which said array is to be formed,
 - forming a layer of oxide over said doped region,
 - forming spaced apart elongated trenches extending through



said oxide and doped region into said semiconductor body thereunder, to divide said doped region into columns between said trenches,
forming a first gate insulating layer covering said trenches, forming polycrystalline silicon floating gates overlying spaced apart locations of said trenches, those floating gates which overlie a common trench defining a column of memory cells,
forming a second gate insulating layer over said floating gates, and
forming strips of polycrystalline silicon, each strip overlying a plurality of said floating gates in a plurality of columns to define a row of memory cells.

4,874,716

PROCESS FOR FABRICATING INTEGRATED CIRCUIT STRUCTURE WITH EXTREMELY SMOOTH POLYSILICONE DIELECTRIC INTERFACE

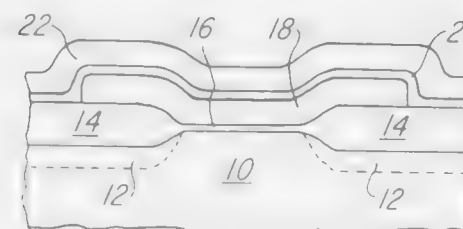
Kalipatnam V. Rao, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 846,683, Apr. 1, 1986, abandoned. This application Jan. 22, 1988, Ser. No. 146,936

Int. Cl.⁴ H01L 21/263

U.S. Cl. 437—43

17 Claims



1. A process for fabricating an integrated circuit structure on a substrate, comprising:

depositing a conductive layer of amorphous silicon on said substrate;
depositing a dielectric layer on said conductive layer of amorphous silicon in such a manner as to define an interface between said dielectric layer and said conductive layer of amorphous silicon of extreme smoothness having a roughness factor measured by a maximum local excursion in either direction normal to said interface no greater than 60 angstroms; and
crystallizing said conductive layer of amorphous silicon to form polycrystalline silicon as said conductive layer, while maintaining the smoothness of said interface between said dielectric layer and said conductive layer of polycrystalline silicon with a roughness factor measured by a maximum local excursion in either direction normal to said interface no greater than 60 angstroms.

4,874,717

SEMICONDUCTOR CIRCUIT CONTAINING INTEGRATED BIPOLAR AND MOS TRANSISTORS ON A CHIP AND METHOD OF PRODUCING SAME

Franz Neppi, and Ulrich Schwabe, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

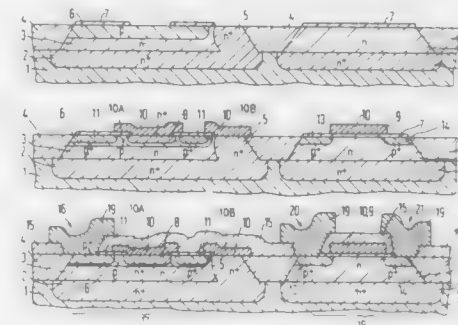
Division of Ser. No. 502,511, Jun. 9, 1979, abandoned. This application Nov. 2, 1988, Ser. No. 265,948

Claims priority, application Fed. Rep. of Germany, Aug. 12, 1982, 3230077

Int. Cl.⁴ H01L 21/265

U.S. Cl. 437—59

11 Claims



1. A method for producing an integrated semiconductor circuit having at least one npn bipolar transistor and at least one p-channel MOS field effect transistor in a p-doped silicon substrate, comprising steps of:

- (a) defining an active region of said circuit by producing first and second n⁺-doped zones spaced from one another in the substrate by masked ion implantation;
- (b) applying an epitaxial n⁺-doped layer on the first and second n⁺-doped zones;
- (c) etching an insulation trough in a region between the n⁺-doped zones;
- (d) providing an insulating oxide in the insulation trough;
- (e) by use of a mask providing an n⁺ deep diffusion through the epitaxial n⁺-doped layer to the first n⁺-doped zone, said first n⁺-doped zone serving as a collector region of the bipolar transistor;
- (f) removing the mask for the deep diffusion, and applying another mask for a base implantation in the bipolar transistor, and then generating a base zone with p-doping ions in the bipolar transistor;
- (g) applying an oxide layer on the surface of the substrate and with a photo-lithographic process defining an emitter zone by removing a portion of the oxide layer above the base zone and defining an opening for a collector contact by removing a portion of the oxide layer above the n⁺ deep diffusion zone;

- (h) generating the emitter zone by ion implantation and diffusion of n-doping ions;
- (i) depositing a surface-wide silicide layer and structuring the silicide layer by a photolithographic process to define an emitter zone contact and collector zone contact for the bipolar transistor and a gate electrode for the MOS transistor;
- (j) using the structured silicide layer as an implantation mask for a base contact region implantation and for generation of source and drain zones in the MOS transistor;
- (k) annealing the structured silicide layer;
- (l) applying an insulation layer as an intermediate oxide;
- (m) etching contact hole regions through the insulation layer for a base contact and source and drain contacts; and
- (n) providing a metallization structuring of an outer metal interconnect level so as to form said base contact, source contact, and drain contact.

4,874,718

METHOD FOR FORMING SOI FILM

Yasuo Inoue, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

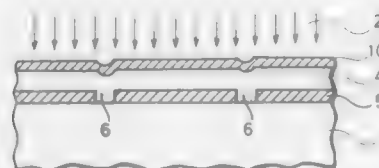
Filed Jul. 28, 1988, Ser. No. 225,462

Claims priority, application Japan, Jul. 28, 1987, 62-189377

Int. Cl.⁴ H01L 21/76

U.S. Cl. 437-62

12 Claims



1. An SOI film forming method for forming by solid phase epitaxial growth an SOI film formed of a monocrystalline silicon film isolated from a monocrystalline silicon layer through an oxide film on said monocrystalline silicon layer, comprising the steps of:

- forming an oxide film having a through hole portion on said monocrystalline silicon layer,
- forming an amorphous layer on the surface of said oxide film and inside said through hole portion,
- forming the monocrystalline silicon film by epitaxially growing said amorphous layer with a surface region of said monocrystalline silicon layer positioned in said through hole portion as a nucleus, and
- forming an oxide layer in said through hole portion provided in said oxide film.

4,874,719

METHOD FOR MANUFACTURING AN ELECTRICAL CONNECTION BETWEEN CONDUCTOR LEVELS

Kei Kurokawa, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 44,208, Apr. 30, 1987, abandoned. This application Jul. 18, 1988, Ser. No. 221,008

Claims priority, application Japan, May 6, 1986, 61-103413

Int. Cl.⁴ H01L 21/283, 21/31

U.S. Cl. 437-195

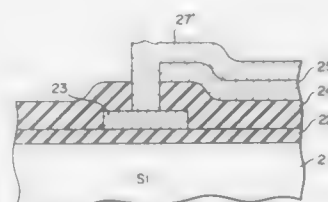
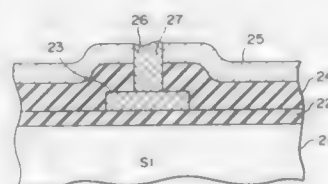
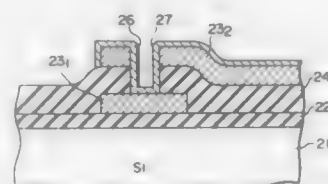
9 Claims

1. A method for manufacturing a semiconductor device, comprising the steps of:

- (a) forming a first conductive pattern;
- (b) forming an insulation interlayer so that it covers the first conductive pattern;
- (c) forming, on the insulation interlayer, a conductive film on which a second conductive pattern is formed;
- (d) forming a contact hole, at a predetermined location, in both said conductive film and said insulation interlayer, so

that said contact hole reaches said first conductive pattern;

- (e) forming a conductive layer for both covering the interior of the contact hole and directly covering the upper surface of the conductive film, so that a wiring is made be-



tween the conductive film and the first conductive pattern; and

- (f) subsequent to the formation of said conductive layer by step (e), selectively etching said conductive film and said conductive layer, to form the second conductive pattern.

4,874,720

METHOD OF MAKING A METAL-GATE MOS VLSI DEVICE

James M. McDavid, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

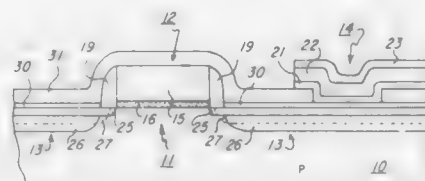
Division of Ser. No. 624,166, Jun. 25, 1984, Pat. No. 4,736,233.

This application Dec. 21, 1987, Ser. No. 136,043

Int. Cl.⁴ H01L 21/265, 3/00

U.S. Cl. 437-203

9 Claims



1. A method of making a gate, a contact and interconnect structure in a process for manufacture of MOS integrated circuits, comprising the steps of:

- forming a metal gate on a face of a silicon body by applying

- a layer of tungsten overlying and adhered to a thin layer of silicon oxide on said face, and applying a coating of oxide on the sidewalls of said gate;
- forming heavily-doped source/drain regions in said face, said source/drain regions being self-aligned with said oxide on the sidewalls of the metal gate,
- forming selectively a tungsten metal layer on the surface of said source/drain regions self-aligned with said oxide on the sidewalls of the metal gate,
- forming a thick deposited insulator coating on said face over said metal gate and over said tungsten metal layer and source/drain regions,
- applying a metal contact and interconnect strip extending along said face overlying said insulator coating and extending into a contact hole in said insulator coating to make electrical connection to said tungsten metal layer, including: first applying a layer of molybdenum over said tungsten layer in said contact hole and over said insulator coating, and thereafter applying a thicker layer of tungsten over said molybdenum and a layer of gold over said thicker layer of tungsten.

6. A method of making a gate, contact and interconnect structure in a process for manufacture of MOS integrated circuits, comprising the steps of:

- forming a metal gate on a face of a silicon body by applying a layer of tungsten overlying and adhered to a thin layer of silicon oxide on said face, and applying a coating of oxide on the sidewalls of said gate;
- forming heavily-doped source/drain regions in said face, said source/drain regions being self-aligned with said oxide on the sidewalls of the metal gate,
- forming selectively a tungsten metal layer on the surface of said source/drain regions self-aligned with said oxide on the sidewalls of the metal gate,
- forming a thick deposited insulator coating on said face over said metal gate and over said tungsten metal layer and source/drain regions,
- applying a metal contact and interconnect strip extending along said face overlying said insulator coating and extending into a contact hole in said insulator coating to make electrical connection to said tungsten metal layer.

4,874,721

METHOD OF MANUFACTURING A MULTICHIP PACKAGE WITH INCREASED ADHESIVE STRENGTH

Mitsuru Kimura, and Shoji Nakakita, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Division of Ser. No. 180,697, Apr. 8, 1988, abandoned, which is a continuation of Ser. No. 928,559, Nov. 10, 1986, abandoned.

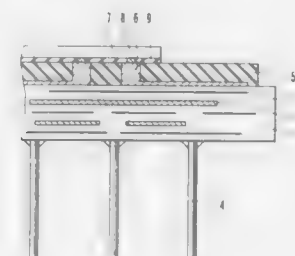
This application Oct. 18, 1988, Ser. No. 259,319

Claims priority, application Japan, Nov. 11, 1985, 60-250,652; Nov. 11, 1985, 60-250,653; Nov. 22, 1985, 60-261,483

Int. Cl.⁴ H01L 21/60

U.S. Cl. 437-209

2 Claims



1. A method for manufacturing a multichip package comprising the steps of:

- forming a first polyimide insulating layer on a surface of a ceramic multilayer substrate having a circuit wiring therein;
- forming a first wiring connected to said circuit wiring of said

multilayer substrate with a part of said first wiring being exposed at an open surface of said first polyimide insulating layer;

forming a second polyimide insulating layer on a surface of a semiconductor element;

forming a second wiring connected with a circuit wiring of said semiconductor element in said second polyimide insulating layer with a part of said second wiring being exposed at an open surface of said second polyimide insulating layer;

positioning said semiconductor element on said substrate such that said part of said first wiring and said part of said second wiring oppose to each other; and

applying a predetermined pressure and a predetermined temperature in a predetermined gas atmosphere for a predetermined time period to cause said first and second polyimide insulating layers to be cured and bonded with each other and to cause the parts of said first and second wiring to be connected to each other by thermocompression bonding.

4,874,722

PROCESS OF PACKAGING A SEMICONDUCTOR DEVICE WITH REDUCED STRESS FORCES

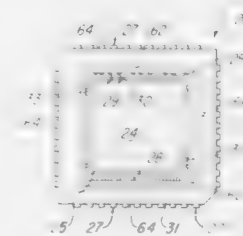
George A. Bednarz, Plano; Reginald W. Smith, Arlington; Gretchen W. Roeding, Carrollton, and Howard R. Test, Plano, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 40,449, Apr. 16, 1987, abandoned. This application Apr. 28, 1988, Ser. No. 188,185

Int. Cl.⁴ H01L 25/02

U.S. Cl. 437-209

8 Claims



1. A method of producing a cavity package semiconductor device, comprising the steps of:

- (a) providing a bar pad having a plurality of bar pad straps, each said bar pad strap extending outwardly from the outer edge of said bar pad and spaced about the edge of said bar pad;
- (b) mounting an integrated circuit having bond pads thereon on said bar pad;
- (c) providing a plurality of lead fingers;
- (d) molding a package material ring onto a central portion of each said lead fingers and said bar pad straps to grip and surround each said lead finger with said package material, with a portion of each said lead finger extending externally of said ring at both the exterior and interior thereof and to secure said bar pad straps therein;
- (e) electrically coupling said bond pads to the portion of predetermined ones of said lead fingers extending toward the interior of said ring; and
- (f) enclosing both ends of said ring to provide a cavity in said

ring to suspend said bar pad with integrated circuit thereon within said cavity with said bar pad straps.

4,874,723

SELECTIVE ETCHING OF TUNGSTEN BY REMOTE AND IN SITU PLASMA GENERATION

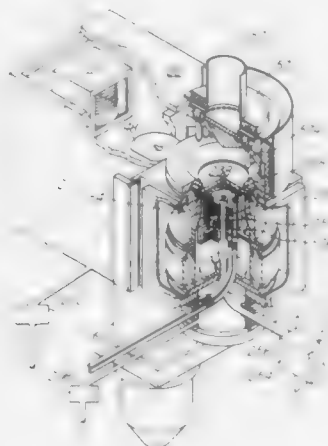
Rhett B. Jucha, Celeste; Duane E. Carter, Plano; Cecil J. Davis, Greenville, and Sue E. Crank, Coppell, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 16, 1987, Ser. No. 74,375

Int. Cl.⁴ H01L 21/306

U.S. Cl. 437—245

17 Claims



1. A method for etching tungsten on a wafer comprising:
 - (a) transferring a wafer into a vacuum processing chamber;
 - (b) applying a pressure to said chamber less than ambient to maintain said chamber at less than ambient;
 - (c) providing a sulfur containing fluorine gas to a remote plasma chamber separated from said chamber and producing a remote plasma;
 - (d) providing a carbon containing fluorine gas to said remote plasma chamber separated from said chamber and producing a remote plasma;
 - (e) adding a bromine containing gas to said remote plasma chamber; and
 - (f) applying a radio frequency signal across two electrodes one of which is adjacent to the wafer and causing a plasma to be formed whose dark space is in the vicinity of the surface of the slice;
 - (g) flowing the gas mixture over said wafer disposed within said chamber.

4,874,724

ALKALI ZINC ALUMINOPHOSPHATE GLASS-CERAMIC

George H. Beall, Big Flat; Joseph E. Pierson, Painted Post, and Candace J. Quinn, Corning, all of N.Y., assignors to Corning Incorporated, Corning, N.Y.

Filed Oct. 17, 1988, Ser. No. 258,673

Int. Cl.⁴ C03C 10/02, 3/17, 3/21

U.S. Cl. 501—10

4 Claims

1. A glass-ceramic exhibiting an apparent annealing point greater than 400° C. and excellent resistance to moisture attack, said glass-ceramic consisting essentially, expressed in terms of mole percent on the oxide basis, of:

Li ₂ O	5-25	ZnO	35-50
Na ₂ O	0-15	Al ₂ O ₃	0.75-6
K ₂ O	0-10	P ₂ O ₅	29-37
Li ₂ O + Na ₂ O + K ₂ O	5-25		

4,874,725

HIGH-DENSITY SINTERED ARTICLE OF SILICON CARBIDE

Mitsuhiko Furukawa; Takashi Kitahira; Sakae Tanaka, and Kiyohito Misumi, all of Fukuoka, Japan, assignors to Nippon Tungsten Co., Ltd., Fukuoka, Japan

Continuation of Ser. No. 912,162, Sep. 24, 1986, abandoned, which is a continuation of Ser. No. 748,652, Jun. 25, 1985, abandoned. This application Dec. 4, 1987, Ser. No. 129,856. The portion of the term of this patent subsequent to Aug. 22, 2006, has been disclaimed.

Int. Cl.⁴ C04B 35/56

U.S. Cl. 501—89

11 Claims

1. A high-density sintered article for use as a structural material which is exposed to elevated temperatures, comprising silicon carbide and a composite oxide, said composite oxide consisting essentially of erbium oxide and aluminum oxide, said composite oxide being in the form of a powder obtained by grinding a garnet synthesized from said erbium oxide and said aluminum oxide, said silicon carbide and composite oxide being mixed to form a mixture to be sintered to form said article, the amount of said erbium oxide being 2 to 12% and the amount of said aluminum oxide being more than 0% and up to 2%, said percentages being percentages by weight of said mixture, the size of the pores of the article not exceeding 1.0 μm, the size of the crystal grains of the article not exceeding 5 μm, and the relative density of said article not being less than 98.8%.

6. A method of making a high-density sintered article for use as a structural material which is exposed to elevated temperatures, comprising mixing erbium oxide and aluminum oxide to form a mixture thereof, heating said mixture to synthesize a garnet, grinding said garnet to form a powder, mixing said powder with silicon carbide to form a composition containing 2 to 12% erbium oxide and more than 0% and up to 2% aluminum oxide, and sintering said composition to form said sintered article, said percentages being percentages by weight of said composition, the size of the pores of the article not exceeding 1.0 μm, the size of the crystal grains of the article not exceeding 5 μm, and the relative density of said article not being less than 98.8%.

4,874,726

LIGHTWEIGHT FUSED SILICA REFRACTORY COMPOSITIONS

Thomas R. Kleeb, Pittsburgh, and Berhl E. Wishon, Bethel Park, both of Pa., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Nov. 18, 1987, Ser. No. 121,951

Int. Cl.⁴ C04B 33/14, 35/10, 38/08

U.S. Cl. 501—124

4 Claims

1. A refractory composition consisting essentially of a fused silica composition containing about 40 to 95 weight percent vitreous silica, up to about 25 weight percent of a calcined refractory aggregate, and the balance a calcium aluminate cement; and for each 100 parts by weight of said fused silica composition from about 3 to 15 parts by weight of alumina-silica based hollow microspheres.

4,874,727

PARTICULATE LEAD TITANATE CERAMIC AND COMPOSITE MATERIAL CONTAINING SAME

Kanji Ohya; Tsutomu Tsunooka; Koji Ogura; Hirofumi Ozeki, and Takashi Yamamoto, all of Nagoya, Japan, assignors to NGK Spark Plug Co., Ltd., Aichi, Japan

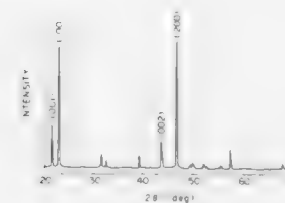
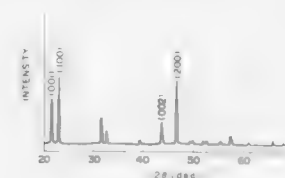
Filed Aug. 20, 1987, Ser. No. 87,658

Claims priority, application Japan, Aug. 29, 1986, 61-204199. The portion of the term of this patent subsequent to May 10, 2005, has been disclaimed.

Int. Cl.⁴ C04B 35/46

U.S. Cl. 501—134

17 Claims



1. A dielectric particulate lead ceramic composition consisting essentially of rectangular parallelepiped particles having the formula $Pb_{1+x}TiO_{3+x}$ wherein x is from 0.01 to 0.08.

4,874,728

ORGANOPHILIC CLAY MODIFIED WITH SILANE COMPOUNDS

Donald R. Elliott, Louisville, and Gary W. Beall, Fairfield, both of Ky., assignors to United Catalyst Inc., Louisville, Ky.

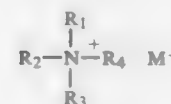
Continuation-in-part of Ser. No. 50,473, Mar. 26, 1987, abandoned, which is a continuation-in-part of Ser. No. 796,867, Nov. 12, 1985, abandoned. This application Mar. 21, 1988, Ser. No. 171,424

Int. Cl.⁴ C04B 33/04

U.S. Cl. 501—148

14 Claims

1. An organophilic clay dry powder comprising the reaction product of
 - (a) a smectite type clay having a cation exchange capacity of at least about 75 milliequivalents per 100 grams of clay on a 100 percent active basis;
 - (b) a quaternary ammonium compound having the structure



wherein R₁ is an alkyl group having about 12 to about 22 carbon atoms, wherein R₂, R₃ and R₄ are alkyl groups containing 1 to about 22 carbon atoms, aryl groups and arylalkyl groups containing 7 to about 22 carbon atoms and wherein M is chloride, bromide, iodide, nitrate, nitrite, sulfate, hydroxide or C₁ to C₁₈ carboxylate; and

(c) an organosilane having the formula:



wherein n is an integer of 1 to 3, wherein R is an organic radical having a carbon atom directly linked to the silicon

atom and wherein X is alkoxy, acryloxy, amino or halogen.

4,874,729

PROCESS FOR THE PREPARATION OF MODIFIED ZEOLITES

Aan H. Klazinga, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Apr. 12, 1988, Ser. No. 180,748

Claims priority, application United Kingdom, Apr. 14, 1987, 8708961

Int. Cl.⁴ B01J 29/08

U.S. Cl. 502—61

18 Claims

1. A process for the preparation of a modified zeolite by treatment with a solution of one or more metal salts and a calcination which process comprises treating a zeolite having an alkali oxide/aluminum oxide molar ratio between about 0.13 and about 1.0 with a solution of a salt of a multi-valent metal-ion having an atomic number of from about 12 to about 83 and converting it by calcination into a product having a unit cell size between about 24.21 Å and 24.60 Å.

6. The process of claim 1 wherein said solution of one or more metal salts contains a metal having a valency of 2, 3 or mixtures thereof.

7. The process of claim 6 wherein said metal salt is selected from the group consisting of magnesium, aluminum, gallium, iron, copper, nickel, manganese, cobalt, zinc and mixtures thereof.

15. A catalytically active composition which comprises a modified zeolite having a unit cell size of between about 24.21 Å and about 24.40 Å prepared by the process of claim 1.

16. The catalytically active composition of claim 15 wherein said composition further comprises at least one hydrogenation component of a Group VI metal, at least one hydrogenation component of a Group VIII metal or mixture thereof.

4,874,730

PROCESS FOR THE PREPARATION OF MODIFIED ZEOLITES

Aan Hendrik Klazinga, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Apr. 12, 1988, Ser. No. 180,747

Claims priority, application United Kingdom, Apr. 14, 1987, 8708962

Int. Cl.⁴ B01J 29/08

U.S. Cl. 502—61

17 Claims

1. A process for the preparation of a modified Y zeolite by treatment with a solution of a metal salt and a calcination which comprises treating a Y zeolite having an alkali oxide/aluminum oxide molar ratio not greater than about 0.13 with a solution of a multi-valent metal salt having a cationic radius between about 0.6 and about 1.0 Å and converting it by calcination into a product having a unit cell size between about 24.21 Å and about 24.65 Å.

3. The process of claim 1 wherein said solution of said multi-valent metal ion has a cationic radius between about 0.60 Å and about 0.80 Å.

4. The process of claim 3 wherein said multi-valent metal salt is selected from the group consisting of gallium, iron, copper, magnesium, cobalt, nickel and mixtures thereof.

14. A catalytically active composition comprising a zeolite having a unit cell size about 24.21 Å and about 24.40 Å prepared by the process of claim 1, and a binder.

15. The composition of claim 14 wherein said composition additionally contains at least one hydrogenation component of a Group VI metal, at least one hydrogenation component of a Group VIII metal or mixtures thereof.

4,874,731

CATALYST FOR THE ISOMERIZATION OF AROMATICS

J. W. Adrian Sachter, Des Plaines, and R. Joe Lawson, Palestine, both of Ill., assignors to UOP, Des Plaines, Ill.
Filed Oct. 13, 1987, Ser. No. 107,604
Int. Cl.⁴ B01J 29/32, 29/36

U.S. Cl. 502—66 8 Claims

1. An isomerization catalyst useful for the isomerization of C₈ aromatics and conversion of ethylbenzene comprising 2 to 60 wt. % of a pentasil zeolite, 0.05 to 3 wt. % platinum, 0.1 to 2 wt. % bismuth, and an alumina binder.

4,874,732

COBALT FISCHER-TROPSCH CATALYSTS HAVING IMPROVED SELECTIVITY

James G. Miller, Pearl River, and Jule A. Rabo, Armonk, both of N.Y., assignors to UOP, Des Plaines, Ill.
Filed Jul. 13, 1987, Ser. No. 72,747
Int. Cl.⁴ B01J 29/10

U.S. Cl. 502—74 5 Claims

1. A cobalt Fischer-Tropsch catalyst supported by an ultrahydrophobic molecular sieve in combination with an effective amount of a promoter selected from the group comprising Mn oxide and the combination of Mn oxide and Zr oxide.

4,874,733

COBALT FISCHER-TROPSCH CATALYSTS HAVING IMPROVED SELECTIVITY

James G. Miller, Pearl River, and Jule A. Rabo, Armonk, both of N.Y., assignors to UOP, Des Plaines, Ill.
Filed Jul. 13, 1987, Ser. No. 72,748
Int. Cl.⁴ B01J 29/14

U.S. Cl. 502—74 3 Claims

1. A cobalt Fischer-Tropsch catalyst supported by a steam treated, acid extracted LZ-210 molecular sieve.

4,874,734

PROCESS FOR PRODUCING SOLID CATALYST FOR POLYMERIZATION OF OLEFINS

Mamoru Kioka, and Norio Kashiwa, both of Iwakuni, Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan
Filed Mar. 29, 1988, Ser. No. 174,967
Claims priority, application Japan, Apr. 3, 1987, 62-81287
Int. Cl.⁴ C08F 4/64

U.S. Cl. 502—104 34 Claims

1. A process for producing a solid catalyst for polymerization of olefins, which comprises bringing a solution of an aluminosilicate into contact with a suspension of a particulate carrier having supported thereon a compound of a transition metal of Group IVB of the periodic table in a solvent in which the aluminosilicate is insoluble or sparingly soluble.

4,874,735

BILAYER ELECTRONICALLY CONDUCTIVE POLYMERS AND PROCESS FOR THEIR PRODUCTION

R. N. O'Brien, Victoria, Canada, and K. S. V. Santhanam, Bombay, India, assignors to University of Victoria, Canada
Filed Jan. 22, 1987, Ser. No. 64,468
Claims priority, application Canada, Feb. 27, 1987, 530,773
Int. Cl.⁴ B01J 31/06

U.S. Cl. 502—159 16 Claims

9. An article comprising: a bilayer, electronically-conductive film comprising an outer film of a polycarbazole and a base film of a polypyrrole, said bilayer film having been stripped from an electrode on which a coherent coating, consisting of said bilayer film had previously been applied, the polypyrrole component of said bilayer film having previously been in contact with said electrode.

4,874,736

CATALYST COMPOSITIONS AND PROCESSES FOR POLYMERIZING CARBON MONOXIDE AND OLEFINICALLY UNSATURATED HYDROCARBONS

Eit Drent, CM Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Division of Ser. No. 940,876, Dec. 10, 1986, Pat. No. 4,788,279.
This application Sep. 23, 1988, Ser. No. 248,067

Claims priority, application Netherlands, Dec. 10, 1985, E033395

Int. Cl.⁴ C08F 4/10, 4/20, 4/22, 4/26

U.S. Cl. 502—165 11 Claims

1. A catalyst composition which comprises
 - (1) a compound of a Group VIII metal selected from the group consisting of palladium, cobalt and nickel, said compound being a salt of a carboxylic acid,
 - (2) a metal salt having an anion of a non-hydrohalogenic acid with a pK_a less than 6, wherein the metal is selected from the group consisting of nickel, copper, iron, cobalt, chromium, manganese and vanadium,
 - (3) a nitrogen bidentate ligand of the general formula



wherein X and Y represent similar or different organic bridging groups, each bridging group having a bridge containing three or four atoms, wherein at least two of the atoms in the bridge are carbon atoms, and

- (4) an organic oxidant selected from the group consisting of unsubstituted 1,4-benzoquinones, 1,4-benzoquinones substituted with one or more groups selected from chloro, methyl, hydroxy or nitro groups, alkyl nitrites, and aromatic nitro compounds, said aromatic nitro compounds being selected from nitrobenzene, nitrotoluene or nitrochlorobenzene.

4,874,737

SILICATE-MODIFIED MAGNESIUM ALKOXIDE POLYMERIZATION CATALYSTS

Robert C. Job, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Sep. 6, 1988, Ser. No. 240,298

Int. Cl.⁴ C08F 4/64

U.S. Cl. 502—171 7 Claims

1. A process for improving the productivity of a polymerization catalyst formed from a magnesium alkoxide which normally undergoes poor metathesis towards production of magnesium chloride, which comprises treating said magnesium alkoxide with a silane of the formula R'_mSi(OR)_{4-m} where R=C_nH_{2n+1}, n≥2, 0≤m<4 and R' may be an aryl or alkyl, wherein an alcohol may be formed and become bound to the alkoxide, at or above the temperature at which the alcohol formed would dissociate from the alkoxide prior to subjecting said magnesium alkoxide to metathesis.

4,874,738

CATALYST FOR AMMOXIDATION OF PARAFFINS

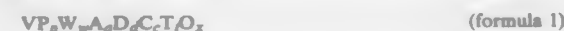
James F. Brazdil, Jr., Mayfield Village; Linda C. Glaeser, Lyndhurst, and Mark A. Toft, Lakewood, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Sep. 9, 1988, Ser. No. 242,236

Int. Cl.⁴ B01J 27/16, 27/18, 27/188, 27/198

U.S. Cl. 502—209 4 Claims

1. A complex metal oxide catalyst composition that has 0-99 weight percent of a diluent/support and 100-1 weight percent of a catalyst having the elements and the proportions indicated by the empirical formula:



where

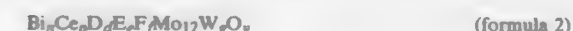
A is one or more of Sn, Mo, B and Ge;

D is one or more of Fe, Co, Ni, Cr, Pb, Mn, Zn, Se, Te, Ga, Zr, In and As;

C is one or more of an alkali metal and Tl;

T is one or more of Ca, Sr, Mg and Ba; and

where a is 0-10; d is 0-10; c is 0-1; t is 0-10; p is 0.1-20; w is 0.2-10; the ratio (a+c+d+t+w):(1+p) is no more than 6; and no more than 2 atoms of Mo are present per atom of V, which catalyst composition is in particulate form and is admixed with a co-catalyst composition also in particulate form and having 0-99 weight percent of a diluent/support and 100-1 weight percent of a co-catalyst having the elements and the proportions indicated by the empirical formula:



where

D is one or more of Fe, Mn, Pb, Co, Ni, Cu, Sn, P, Cr, Y, Mg, Ca, Sr, Ba and rare earths other than Ce and Sm

E is one or more of Sb, Ge, As, Se, Te and V

F is one or more of an alkali metal, Tl, Ag and Sm and where n is 0.01-24, p is 0.01-24, (n+p) is 0.1-24, d is 0-10, c is 0-10, f is 0-6, g is 0-8, y is determined by the oxidation state of other elements, wherein the weight ratio of said catalyst composition to said co-catalyst composition is in the range of 0.001 to 2.5.

4,874,739

SILVER-CONTAINING CATALYST, PROCESS FOR THE PREPARATION OF THE CATALYST AND THE CATALYST PREPARED BY THE PROCESS

Goese Boxhoorn, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Jul. 11, 1988, Ser. No. 217,263

Claims priority, application United Kingdom, Jul. 15, 1987, E716651

Int. Cl.⁴ B01J 23/04, 23/14, 23/36, 23/50

U.S. Cl. 502—218 30 Claims

1. A process for the preparation of a silver-containing catalyst suitable for the oxidation of ethylene to ethylene oxide which comprises:

- (a) mixing alumina with a tin compound and with an alkali metal compound,
- (b) calcining the mixture to obtain an alkali metal-enriched and tin-modified alumina carrier,
- (c) impregnating the carrier with a solution of a silver compound, which is sufficient to cause precipitation on the carrier of from 1 to 25 per cent by weight, on the total catalyst, of silver and before, during or after that impregnation also impregnating the carrier with one or more dissolved alkali metal compounds and with a rhenium compound as promoters,
- (d) precipitating the silver compound on the carrier and
- (e) reducing the silver compound to metallic silver.

4,874,740

THERMOSENSITIVE RECORDING MATERIAL

Shigetoshi Hiraishi, Tokyo; Naomasa Koike, Takasago; Kazuyoshi Kondo, and Mitsuru Fuchigami, both of Tokyo, all of Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Division of Ser. No. 822,590, Jan. 27, 1986, Pat. No. 4,742,042.

This application Feb. 2, 1988, Ser. No. 151,461

Claims priority, application Japan, Jan. 31, 1985, 60-15385; Mar. 4, 1985, 60-43192; Mar. 4, 1985, 60-43193; Mar. 4, 1985, 60-43194; Mar. 4, 1985, 60-43195; Apr. 2, 1985, 60-069691

Int. Cl.⁴ B41M 5/18

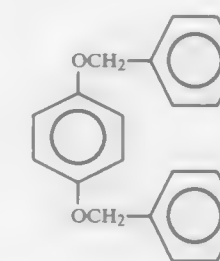
U.S. Cl. 503—201 14 Claims

1. A thermosensitive recording material comprising a support and, provided thereon, a thermosensitive recording layer containing a generally colorless or slightly colored dye precursor

and a developer which, upon being heated, reacts with said dye precursor to develop color, wherein said thermosensitive recording layer contains as sensitizer a compound selected from a group consisting of p-benzylbiphenyl, diaryl esters of adipic acid,



(wherein R₁ and R₂ each represents an alkyl, aralkyl, or aryl group), and



and said developer is bis(3-allyl-4-hydroxyphenyl)sulfone or combination of bis(3-allyl-4-hydroxyphenyl)sulfone and 3-allyl-4,4'-dihydroxydiphenylsulfone.

4,874,741

NON-ENHANCED LASER EVAPORATION OF OXIDE SUPERCONDUCTORS

David T. Shaw, East Amherst; Sarath Witanachchi, Buffalo, and Hoi-Sing Kwok, East Amherst, all of N.Y., assignors to The Research Foundation of State University of New York, Albany, N.Y.

Filed Apr. 14, 1988, Ser. No. 181,514

Int. Cl.⁴ B05D 3/06, 5/12

U.S. Cl. 505—1 9 Claims

1. A method of depositing a superconducting layer on a substrate which comprises the steps of:

- a. forming at least one mixture of a source material for an oxide superconducting layer,
- b. evaporating said source material by a laser beam means, and
- c. depositing said source material on a substrate under an ionized oxygen atmosphere to directly form an orientated, thin superconducting layer on said substrate.

4,874,742

SYNTHETIC WHOLE BLOOD AND A PROCESS FOR PREPARING THE SAME

Charles S. Ecanow, Skokie, and Bernard Ecanow, Wilmette, both of Ill., assignors to Synthetic Blood Corporation, Deerfield, Ill.

Continuation of Ser. No. 591,774, Mar. 21, 1984, abandoned, which is a continuation of Ser. No. 383,868, Jun. 1, 1982, Pat. No. 4,439,424, which is a continuation of Ser. No. 222,364, Jan. 5, 1981, Pat. No. 4,343,797, which is a continuation-in-part of Ser. No. 146,028, May 2, 1980, abandoned, which is a continuation-in-part of Ser. No. 47,071, Jun. 11, 1979, abandoned. This application Sep. 15, 1987, Ser. No. 96,746. The portion of the term of this patent subsequent to Aug. 10, 1999, has been disclaimed.

Int. Cl.⁴ A61K 37/02

U.S. Cl. 514—2 19 Claims

1. A synthetic whole blood substitute, comprising a non-toxic two phase liquid system, both said phases being aqueous, wherein:

- one of said phases is an aqueous liquid coacervate phase

(internal suspension phase) which is relatively non-polar and which is capable, when introduced into a body's circulation, of functioning as a substitute for at least part of the erythrocyte portion of whole blood;

the other of said phases is an aqueous liquid external equilibrium phase which is relatively polar and which is capable, when introduced into said circulation, of functioning as a substitute for at least part of the plasma portion of whole blood;

said relatively non-polar coacervate phase is insoluble in and in equilibrium with said relatively polar external equilibrium phase;

said two phase liquid system comprises water, a surface active agent, an electrolyte and albumin in amounts effective for the formation of said two phases, and to obtain osmotic pressure and viscosity similar to that of whole blood;

whereby said two phase liquid system, upon introduction into said circulation, can establish, reestablish and maintain normal osmotic pressures, and can transport and transfer oxygen, carbon dioxide and other physiological gases, and carry nutrients, drugs and various physiological entities in stable form over extended periods of time.

11. A process for preparing a synthetic whole blood substitute, consisting essentially of a non-toxic two phase liquid system, both said phases being aqueous, comprising the steps of: dispersion albumin in an aqueous solution which includes sodium chloride adding to said solution a phospholipid and an electrolyte; thoroughly mixing said solution; storing said mixture undisturbed for a period of time to form a two phase coacervate system;

one of said phases being an aqueous liquid coacervate phase (internal suspension phase) which is relatively non-polar and which is capable, when introduced into a body's circulation, of functioning as a substitute for at least part of the erythrocyte portion of whole blood;

the other of said phases being an aqueous liquid external equilibrium phase which is relatively polar and which is capable, when introduced into said circulation, of functioning as a substitute for at least part of the plasma portion of whole blood;

said relatively non-polar coacervate phase being insoluble in and in equilibrium with said relatively polar external equilibrium phase;

whereby said two phase liquid system, upon introduction into said circulation, can establish, reestablish and maintain normal osmotic pressures, and can transport and transfer oxygen, carbon dioxide and other physiological gases, and carry nutrients, drugs and various physiological entities in stable form over extended periods of time.

4,874,743

DNA SEQUENCES, RECOMBINANT DNA MOLECULES AND PROCESSES FOR PRODUCING HUMAN PHOSPHOLIPASE INHIBITOR-LIKE POLYPEPTIDES

Barbara P. Wallner, Cambridge; R. Blake Pepinsky, Watertown, and Jeffrey L. Garwin, Bedford, all of Mass., assignors to Biogen, Inc., Cambridge, Mass.

Continuation-in-part of Ser. No. 690,146, Jan. 10, 1985. This application Mar. 15, 1985, Ser. No. 712,376

Int. Cl.⁴ A61K 37/02; C07K 13/00

U.S. Cl. 514—12

9 Claims

1. A substantially pure phospholipase inhibitor, the phospholipase inhibitor:

- being capable of inhibiting phospholipase A₂ enzymes; and
- comprising the following tryptic fragments:
 - ser, glu, ile, asp, met, asn, glu, ile, lys;
 - lys, val, phe, gln, asn, atyr, arg;
 - thr, pro, ala, gln, phe, asp, ala, asp, glu, leu, leu, arg;
 - ala, ala, tyr, leu, gln, glu, thr, gly, lys, pro, leu, asp, glu, glu, thr, leu, lys; and
 - gly, leu, gly, thr, asp, glu;

the phospholipase inhibitor further being selected from the group consisting of:

- a mature phospholipase inhibitor protein, and
- an f-met-phospholipase inhibitor protein

4,874,744

METHOD OF USING MELANOCYTE STIMULATING HORMONE AS DERMATIS TREATMENT

James J. Nordlund, and Lawrence A. Rheins, both of Cincinnati, Ohio, assignors to University of Cincinnati, Cincinnati, Ohio

Filed Mar. 13, 1989, Ser. No. 323,606

Int. Cl.⁴ A61K 37/02; C07K 7/08

U.S. Cl. 514—13

9 Claims

1. A method of treating dermatitis of a mammal comprising applying an effective amount of melanocyte stimulating hormone to a dermatitis affected portion of said mammal's epidermal layer.

4,874,745

RENIN-INHIBITORY PEPSTATIN PHENYL DERIVATIVES

Leeyuan Huang, Watchung; Lawrence Koupal, Colonia; Joseph Dunn, Jr., Parlin; Jerrold M. Liesch, Princeton Junction; Otto Hensens, Red Bank, and H. Boyd Woodruff, Watchung, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

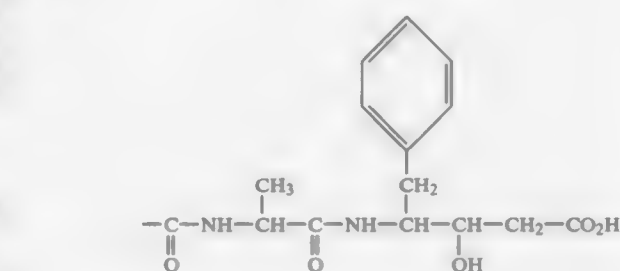
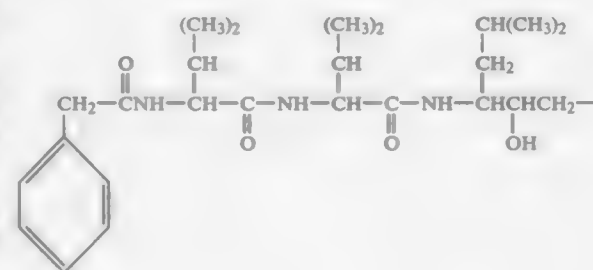
Filed Oct. 1, 1987, Ser. No. 103,324

Int. Cl.⁴ H61K 37/43; C07K 5/10

U.S. Cl. 514—18

6 Claims

1. A compound of the formula



or a pharmaceutically-acceptable salt thereof.

4,874,746

WOUND HEALING COMPOSITION OF TGF-ALPHA AND PDGF

Harry N. Antoniades, Newton, and Samuel E. Lynch, Jamaica Plain, both of Mass., assignors to Institute of Molecular Biology, Inc., Boston and President and Fellows of Harvard College, Cambridge, both of Mass.

Filed Dec. 22, 1987, Ser. No. 136,399

Int. Cl.⁴ A61K 37/36

U.S. Cl. 514—21

8 Claims

5. A wound healing composition comprising purified platelet-derived growth factor and purified transforming growth factor alpha, in a weight to weight ratio of 1:4 to 25:1.

4,874,747

POLYCYCLIC HETEROCYCLIC COMPOUNDS, A PROCESS FOR THEIR PREPARATION AND THEIR USE IN HUMAN AND VETERINARY MEDICINE

Braham Shroot, Antibes; Jacques Eustache, Grasse; Jean-Michel Bernardon, Nice, and Philippe Nedoncelle, Grasse, all of France, assignors to Centre International de Recherches Dermatologiques (CIRD), Valbonne, France

Filed Apr. 29, 1988, Ser. No. 188,547

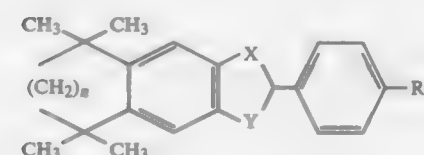
Claims priority, application France, Apr. 30, 1987, 87 06152

Int. Cl.⁴ A61K 31/42, 31/535; C07D 413/10

U.S. Cl. 514—23

12 Claims

1. A polycyclic heterocyclic compound having the formula



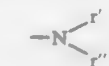
wherein

n is 1 or 2,

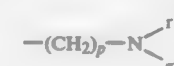
R₁ represents (i) hydrogen, (ii) —CH₂OH or (iii)



R₂ represents (a) hydrogen, (b)



or (c) —OR₃ wherein R₃ represents hydrogen, alkyl having 1-20 carbon atoms, monohydroxyalkyl, polyhydroxyalkyl, phenyl, phenyl substituted by halogen, hydroxy, nitro or lower alkyl, benzyl, phenethyl, a sugar radical selected from the group consisting of glucose, mannose, erythrose and galactose, or



wherein p is 1, 2 or 3 and r' and r'' represents hydrogen, lower alkyl, monohydroxyalkyl, polyhydroxyalkyl, phenyl, phenyl substituted by halogen, hydroxy, nitro or lower alkyl, aminated sugar radical selected from the group consisting of glucosamine, galactosamine and mannosamine, or r' and r'' taken together form a heterocycle selected from the group consisting of piperidino, piperazino, morpholino, pyrrolidino and 4-(2'-hydroxyethyl) piperazino,

X represents oxygen,

Y represents a nitrogen atom, or a salt of said polycyclic heterocyclic compound of formula I.

4,874,748

CLONING VECTORS FOR STREPTOMYCES AND USE THEREOF IN MACROLIDE ANTIBIOTIC PRODUCTION

Leonard Katz; James Tsan, both of Waukegan, and James B. McAlpine, Libertyville, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Mar. 24, 1986, Ser. No. 843,116

Int. Cl.⁴ A61K 31/71; C07H 17/08

U.S. Cl. 514—29

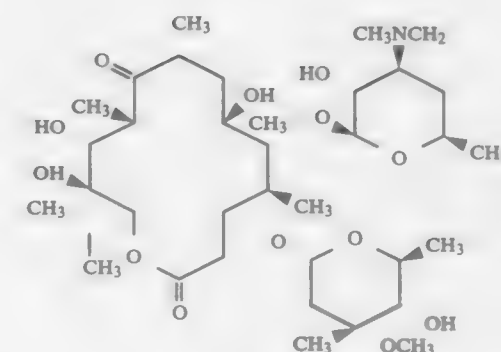
9 Claims

9. An antibiotic composition comprising:

a diluent or carrier compatible with antibiotic activity; and

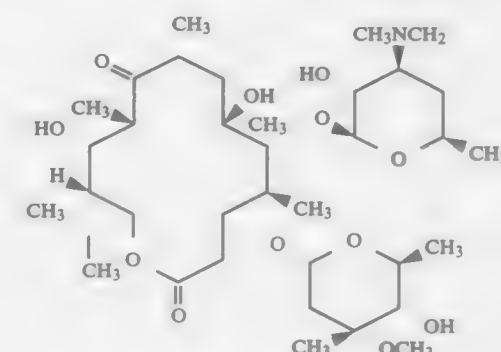
an effective amount of an antibiotic selected from the group consisting of:

2-norerythromycin A:



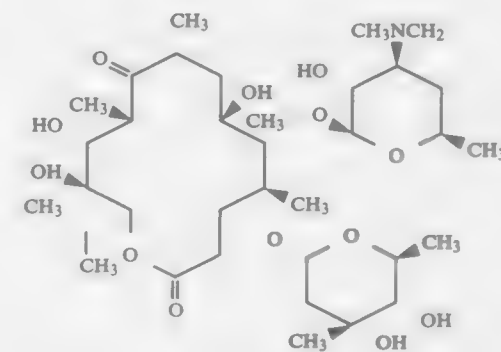
or a pharmaceutically acceptable salt thereof;

2-norerythromycin B:



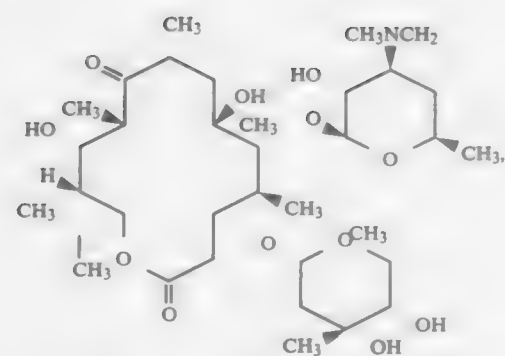
or a pharmaceutically acceptable salt thereof;

2-norerythromycin C:



or a pharmaceutically acceptable salt thereof; and

2-norerythromycin D:



or a pharmaceutically acceptable salt thereof.

4,874,749

4'-DEOXY-4'-N-METHYLAMINO AVERMECTIN Bla/B1b

Helmut Mrozik, Matawan, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Jul. 31, 1987, Ser. No. 80,942

The portion of the term of this patent subsequent to Jan. 24, 2001, has been disclaimed.

Int. Cl.⁴ A61K 31/70; C07H 17/04

U.S. Cl. 514—30

7 Claims

1. 4'-Deoxy-4'-N-methylamino avermectin Bla/B1b and pharmaceutically acceptable acid addition salts thereof.

4. A method for the treatment of agricultural insects which comprises applying to an area infested with such agricultural insects an effective amount of the compound of claim 1.

4,874,750

PHARMACEUTICAL COMPOSITION CONTAINING A DERIVATIVE OF PARA-AMINOBENZOIC ACID AS AN ACTIVE INGREDIENT

Chikao Yoshikumi, Kunitachi; Yoshio Ohmura, Funabashi; Fumio Hirose, Tokyo; Masanori Ikuzawa, Tachikawa; Kenichi Matsunaga; Takayoshi Fujii, both of Tokyo; Minoru Ohara, and Takao Ando, both of Tokyo, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan Division of Ser. No. 786,851, Oct. 11, 1985, Pat. No. 4,673,669, which is a division of Ser. No. 294,574, Aug. 20, 1981, Pat. No. 4,637,998, which is a division of Ser. No. 81,190, Oct. 2, 1979, Pat. No. 4,322,408, which is a continuation-in-part of Ser. No. 24,095, Mar. 26, 1979, abandoned. This application Sep. 17, 1986, Ser. No. 908,273

Claims priority, application Japan, Apr. 11, 1978, 53-42576; May 26, 1978, 53-63146; Dec. 29, 1978, 53-161385; Dec. 29, 1978, 53-161386

The portion of the term of this patent subsequent to Apr. 19, 2000, has been disclaimed.

Int. Cl.⁴ A61K 31/70

U.S. Cl. 514—42

16 Claims

1. A method for the treatment of tumor, which comprises administering to a patient suffering from tumor an effective amount of a compound of the formula:



wherein R¹ denotes one member selected from the group consisting of the residual groups formed by removing OH at 1(alpha) or 1(beta) position from arabinose, glucose, galactose and mannose, or a pharmaceutically acceptable salt thereof.

4,874,751

ANTIBACTERIAL TREATMENT

Lowrie M. Beacham, III, Durham; Harry S. LeBlanc, Raleigh, and George A. Freeman, Cary, all of N.C., assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Continuation of Ser. No. 776,901, Sep. 17, 1985, abandoned. This application Dec. 2, 1988, Ser. No. 279,324

Claims priority, application United Kingdom, Mar. 16, 1985, 8506868; May 9, 1985, 8511775

Int. Cl.⁴ A61K 31/70

U.S. Cl. 514—50

6 Claims

1. A method of treating a susceptible gram-negative bacteria infection in an animal having a susceptible gram-negative bacteria infection comprising administering to said animal an effective gram-negative bacteria infection treatment amount of 3'-azido-3'-deoxythymidine or a pharmaceutically acceptable alkali metal, alkaline earth or ammonium salt thereof.

4,874,752

BENZOQUINONE DERIVATIVES AND PRODUCTION THEREOF

Shinji Terao, Toyonaka; Hisayoshi Okazaki, Kyoto, and Isuke Imada, Izumi, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Division of Ser. No. 168,321, Mar. 18, 1988, Pat. No. 4,808,339, which is a division of Ser. No. 717,098, Mar. 28, 1985, Pat. No. 4,751,303, which is a division of Ser. No. 484,232, Apr. 12, 1983, Pat. No. 4,526,719. This application Nov. 8, 1988, Ser. No. 358,495

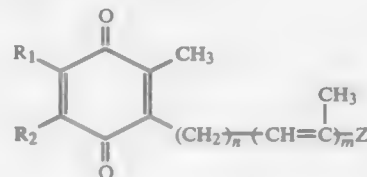
Claims priority, application Japan, Apr. 13, 1982, 57-62224

Int. Cl.⁴ C08G 18/08; C07C 50/06; C07D 233/64

U.S. Cl. 536—55.2

9 Claims

1. A compound of the formula



wherein R₁ and R₂ are the same or different and each is methyl or methoxy; n is an integer of 0 to 21; m is 0 or 1, and Z is: a group of the formula —COR₅ wherein R₅ is an α-amino acid residue or a substituted or unsubstituted glucosamine residue.

4,874,753

INSECTICIDAL COMPOSITION

Rodney C. Baker, Berkhamsted, England, assignor to AECT Limited, Johannesburg, South Africa

Filed Nov. 25, 1985, Ser. No. 801,306

Int. Cl.⁴ A01N 37/34, 43/38, 53/00, 57/00

U.S. Cl. 514—89

9 Claims

1. A dog pour-on formulation for localized external application to dogs, which includes

an insecticidally effective amount of a non-systemic compound which is tolerated by dogs and which is effective against insects selected from the group consisting of fleas and ticks; and

a C₁—C₄ alcohol as carrier for the compound, with the proviso that the formulation contains no pyrethroid, no spreading oil, and no gel- or film-forming agent.

4,874,754

NOVEL 19-NOR-STEROIDS

Francois Nique, Pavillons sous Bois; Lucien Nedelec, Le Raincy; Marie-Madeleine Bouton, Paris, and Daniel Philibert, La Varenne Saint-Hilaire, all of France, assignors to Roussel Uclaf, Paris, France

Filed Feb. 17, 1988, Ser. No. 157,417

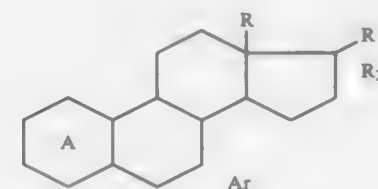
Claims priority, application France, Feb. 18, 1987, 87 02072

Int. Cl.⁴ A61K 31/58, 31/56; C07J 1/00

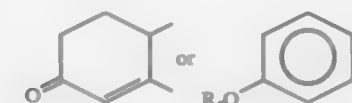
U.S. Cl. 514—178

12 Claims

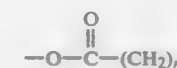
1. A 19-nor-steroid compound of the formula



wherein the A ring is either



Re is selected from the group consisting of hydrogen, acyl and alkyl of 1 to 6 carbon atoms unsubstituted or substituted with amino or dialkylamino, R is methyl or ethyl, R₁ is selected from the group consisting of hydroxyl, protected hydroxyl, acyloxy and alkoxy of 1 to 4 carbon atoms, R₂ is selected from the group consisting of hydrogen, alkyl of 1 to 8 carbon atoms, alkenyl and alkynyl of 2 to 8 carbon atoms, acyl, aralkyl of 7 to 15 carbon atoms, the substituents other than hydrogen being unsubstituted or substituted with at least one member of the group consisting of halogen, alkyl of 1 to 4 carbon atoms for the aryl and aralkyl, methoxy, ethoxy, propoxy, isopropoxy and butyloxy, methylthio, ethylthio, propylthio, isopropylthio and butylthio, amino, methylamino, ethylamino, dimethyl-amino, diethylamino, methyl-ethylamino, each of the dialkyl-amino optionally being in oxidized form, amino-methyl or aminoethyl, dimethyl-aminomethyl, dimethylamino-ethyl, dimethylaminoethoxy, hydroxyl, acetoxy, a group of the formula



CO₂H in which n=2 to 5, acetyl propionyl, butyryl, benzoyl, carboxy, methoxycarbonyl or ethoxycarbonyl, cyano, trifluoromethyl, aryl and aralkyl optionally substituted or R₁ and R₂ together form a group selected from the group consisting of



Ar is a 5- or 6-membered aryl selected from the group consisting of (a) phenyl unsubstituted or substituted with at least one member of the group consisting of halogen, alkyl, alkoxy, alkylthio of 1 to 4 carbon atoms, amino, alkylamino, dialkyl-amino, dialkylaminoalkoxy, hydroxyl, acyl, free, esterified or salfied carboxyl, cyano, trifluoromethyl, phenyl or benzyl unsubstituted or substituted with at least one alkyl of 1 to 4 carbon atoms and (b) a heterocyclic selected from the group consisting of thienyl, furyl, thiazolyl, isothiazolyl, oxazolyl,

isoxazolyl, thiadiazolyl, pyridyl and piperidyl or their salts with non-toxic, pharmaceutically acceptable bases or acids.

4,874,755

ANTI-INFLAMMATORY AND ANTIDEGENERATIVE COMPOUNDS ISOLATED FROM L-681,512

Bonnie M. Ashe, Scotch Plains, and Daniel S. Fletcher, Bridge-water, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

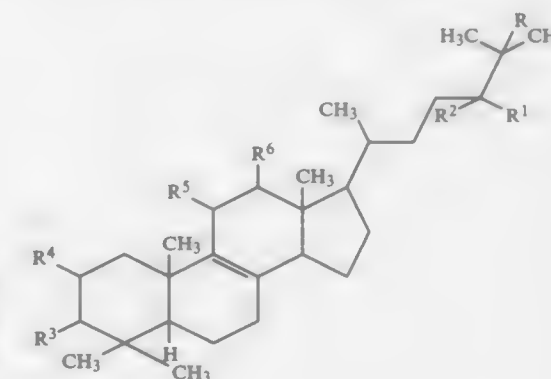
Filed Dec. 21, 1987, Ser. No. 135,898

Int. Cl.⁴ A61K 31/56

U.S. Cl. 514—179

2 Claims

1. A method of treating inflammation and degeneration in mammals which comprises administering to a mammal in need of such treatment an anti-inflammatory and antidegenerative amount a compound having the formula:



wherein:

R is OH or is absent;
R¹ and R² together form —CH₂—CH₂O—;
R³ is OH, HSO₃O, HOCOCH₂CH₂CO₂;
R⁴ is OH, HOC₁₅H₃₀CO₂, AcO, or is absent
R⁵ is —O, OH, AcO; and
R⁶ is CH₃, OH, AcO.

4,874,756

BENZODIPYRROLES, PROCESSES FOR THE PREPARATION THEREOF AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Alfred Mertens, Schriesheim; Wolfgang von der Saal, Weinheim; Herbert Berger, Mannheim; Bernd Müller-Beckmann, Grästadt, and Klaus Strein, Hemsbach, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Filed Aug. 29, 1986, Ser. No. 902,182

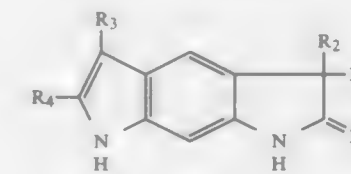
Claims priority, application Fed. Rep. of Germany, Aug. 29, 1985, 3530825

Int. Cl.⁴ A61K 31/55; C07D 487/04

U.S. Cl. 514—212

16 Claims

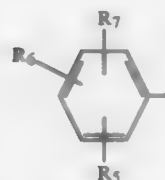
1. A compound of the formula:



wherein

R₁ is hydrogen, C₁—C₆ alkyl, C₂—C₆ alkenyl, or C₃—C₇ cyclo-alkyl;
R₂ is hydrogen, C₁—C₆ alkyl, C₂—C₆ alkenyl, cyano, or a carbonyl group substituted by hydroxyl, C₁—C₆ alkyl,

C₁-C₆ alkoxy, amino, C₁-C₆ alkylamino, di-C₁hd 1]l -C₆-alkyl-amino or hydrazino; or
 R₂ and R₁ together with the carbon to which they are attached form a C₃-C₇ cycloalkylene ring, or R₁ and R₂ together form C₃-C₇ cycloalkylidene,
 R₃ is hydrogen, cyano, C₁-C₇ alkyl, C₂-C₇ alkenyl, C₃-C₇ cycloalkyl, C₃-C₇ cycloalkenyl, C₁-C₇ alkylcarbonyl, C₁-C₇ alkoxy-carbonyl, carboxyl, aminocarbonyl, C₁-C₇ alkylaminocarbonyl, di-C₁-C₇-alkylaminocarbonyl, or C₆-C₁₂ aryl;
 R₄ is hydrogen, C₁-C₇ alkyl, trihalomethyl, C₃-C₇ cycloalkyl, hydroxyl, cyano, carboxyl, C₁-C₇ alkoxy-carbonyl, C₁-C₇ alkyl-carbonyl, aminocarbonyl, C₁-C₇ alkylaminocarbonyl or di-C₁-C₇-alkylamino-carbonyl, or R₄ is a phenyl ring of the formula:



wherein R₅, R₆ and R₇ are the same or different and wherein R₅, R₆ and R₇ each represents hydrogen, C₁-C₅ alkyl-sulphonyloxy, trifluoromethanesulphonyloxy, C₁-C₅ alkyl-sulphonylamino, trifluoromethanesulphonylamino, N-C₁-C₅-alkyl-C₁-C₅-alkyl-sulphonylamino, N-C₁-C₅-alkyl-trifluoromethanesulphonylamino, C₁-C₅-alkyl-sulphenylmethyl, C₁-C₅-alkylsulphenylmethyl, C₁-C₅-alkylsulphonylmethyl; a carbonyl group substituted by a hydroxyl, C₁-C₅-alkoxy, amino, C₁-C₅-alkylamino or di-C₁-C₅-alkyl-amino; or a sulphonyl group substituted by an amino, C₁-C₅ alkylamino, di-C₁-C₅-alkyl-amino or by morpholino, pyrrolidino, piperidino or hexamethyleneiminosulphonyl; or a C₁-C₅ alkylcarbonylamino, amino-carbonylamino, C₁C₃ alkylaminocarbonylamino, C₁-C₅ alkylthio, C₁-C₅ alkylsulphenyl, C₁-C₅ alkylsulphonyl, nitro, halogen, amino, hydroxyl, C₁-C₅-alkyl, C₁-C₅-alkoxy, C₂-C₅ alkenyloxy, C₂-C₅ alkynyloxy, cyano-C₁-C₅-alkoxy, carboxy-C₁-C₅-alkoxy, C₁-C₅-alkoxy-carbonyl-C₁-C₅-alkoxy, di-C₁-C₅-alkylamino, 1-imidazolyl, trifluoromethyl or cyano group, X is oxygen or sulphur
 a tautomer thereof or
 a physiologically acceptable salt thereof with an inorganic or organic acid.

13. A method of treating heart or circulatory diseases in a patient having the disease comprising administering an effective amount for treating heart or circulatory diseases, of the compound of claim 1.

4,874,757 ANTINFLAMMATORY COMPOSITIONS AND METHODS

Thomas C. Crawford; Stanley L. Keely, both of Ledyard; David L. Larson, East Lyme; Joseph G. Lombardino, Niantic, and James J. Maciejko, Mystic, all of Conn., assignors to Pfizer Inc., New York, N.Y.

Division of Ser. No. 179,829, Apr. 11, 1988, Pat. No. 4,812,455, which is a division of Ser. No. 941,140, Dec. 12, 1986, Pat. No. 4,766,117, which is a division of Ser. No. 821,183, Jan. 21, 1986, Pat. No. 4,672,061, which is a division of Ser. No. 695,590, Jan. 28, 1985, Pat. No. 4,579,846, which is a continuation-in-part of Ser. No. 659,602, Oct. 11, 1984, abandoned. This application Nov. 4, 1988, Ser. No. 267,157
 Int. Cl.⁴ A61K 31/54

U.S. Cl. 514—226.5 4 Claims

1. A method for reducing gastric irritation or ulceration in a mammal being treated with an anti-inflammatory effective amount of piroxicam or a pharmaceutical acceptable salt thereof which comprises coadministration of acetaminophen

or a pharmaceutically acceptable salt thereof in an amount which reduces said gastric irritation or ulcerations.

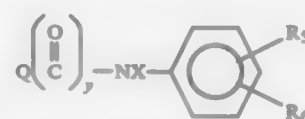
4,874,758 NOVEL ENOLAMIDES, PHARMACEUTICAL COMPOSITIONS AND METHODS OF USE THEREOF FOR ACTIVITY AS MODULATORS OF THE ARACHIDONIC ACID CASCADE

Mary E. Carethers, Cincinnati, Ohio; Wlaczslaw A. Centenko; David T. Connor, both of Ann Arbor, Mich.; Elizabeth A. Johnson, Corte Madera, Calif.; John S. Kiely, Ann Arbor, Mich.; Charles F. Schwender, Calton, N.J.; Jagadiah C. Sircar, Ann Arbor, Mich.; Roderick J. Sorenson, Ann Arbor, Mich.; Paul C. Unangst, Ann Arbor, Mich., and Robert F. Bruns, Ann Arbor, Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

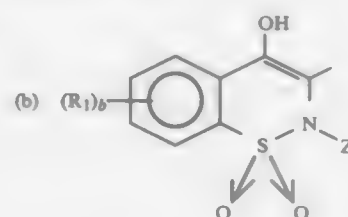
(II) Division of Ser. No. 121,264, Nov. 16, 1987, which is a division of Ser. No. 782,623, Oct. 1, 1985, Pat. No. 4,761,424. This application Mar. 4, 1988, Ser. No. 164,355
 Int. Cl.⁴ A61K 31/38; C07D 279/02, 279/16

U.S. Cl. 514—226.5 11 Claims

1. A compound having the formula



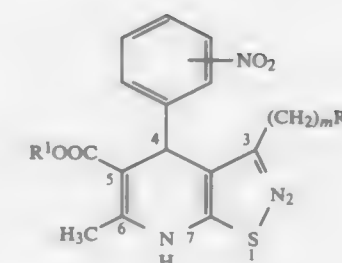
and pharmaceutically acceptable salts thereof, wherein (1) y is one or two; (2) Q is a substituent selected from the group consisting of the formula



wherein b is zero, one, two, three, or four, X and Z are independently hydrogen or lower alkyl; R₁ may be the same or different if b is two or more, selected from a group consisting of alkyl of from one to four carbons, inclusive; alkoxy of from one to four carbons, inclusive; carboalkoxy of from two to four carbons, inclusive; hydroxy, halogen, nitro, amino, mono- and di-alkylamino having each alkyl the same or different of from one to four carbons, inclusive; alkylsulfonamido of from one to four carbons, inclusive; alkylsulfonyl of from one to four carbons, inclusive; and —(CH=CH—CH=CH)— taken together with an adjacent ring carbon to form a benzo radical; (3) R₅ is hydrogen; alkyl of from one to four carbons, inclusive; alkoxy of from one to four carbons, inclusive; carboalkoxy of from two to four carbons, inclusive; hydroxy; halogen; or —CH=CH—CH=CH— taken together with adjacent carbons to form a benzo radical; (4) R₆ is alkyl of from six to twenty carbons, —CH=CH—R₄, —(CH₂)_nCOR₄, or —(CH₂)_n—R₄ wherein n is zero to four, inclusive; and R₄ is phenyl optionally substituted at the two through six positions by hydrogen, carboalkoxy, having alkoxy of from one to four carbons, inclusive; alkoxy, or thioalkoxy of from one to four carbons, inclusive; phenalkoxy of from one to four carbons inclusive; amino, monoalkyl and dialkyl amino having the alkyl of from one to four carbons, inclusive; alkanoylamino of from one to four carbons, inclusive; alkanoylamino of from two to six carbons, inclusive; carboxyl, benzo, halogen, hydroxy, hydroxyalkyl of from one to four carbons, inclusive; alkanoyl of from one to four carbons, phenyl; with the overall proviso that when Q is

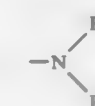
I₂ having y as one, then R₆ cannot be alkyl, R₄ cannot be phenyl in —(CH₂)_n—R₄ and R₅ cannot be —(CH=CH—CH=CH).

10. A pharmaceutical composition comprising an antiasthmatic, antiallergic, cardiovascular, antimigraine or antiinflammatory effective amount of a compound as claimed in claim 1 together with a pharmaceutically acceptable carrier.

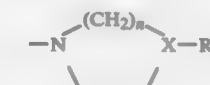


wherein

R¹ represents an alkyl group which may be substituted, R² represents a hydroxyl group, a benzyloxy group, a lower alkoxy group, a group of the formula

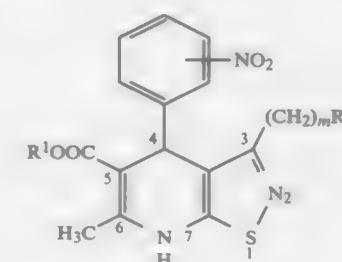


in which R³ and R⁴ are identical or different and each represents a hydrogen atom, a lower alkyl group, an aralkyl group, an aralkynyl group, an aryloxyalkyl group, an arylaminoalkyl group, a pyridylalkyl group or a benzazolyalkyl group, or R³ and R⁴ form a ring and represent a group of the formula



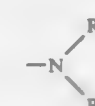
where X represents a methine group, a nitrogen atom or an oxygen atom, n is an integer of 1 or 2, and when X is a methine group or a nitrogen atom, R⁵ represents a hydrogen atom, a lower alkyl group, a lower hydroxyalkyl group, an aryl group, an aryloxy group, an aralkyl group, a furyl group, a pyridyl group or a diphenylmethane group each of which may be substituted, and m is an integer of 1 to 3; or an acid addition salt thereof.

4. An agent for treating cardiovascular diseases, said agent comprising as an active ingredient a 4,7-dihydroisothiazolo[5,4-b]pyridine derivative represented by the general formula



wherein

R¹ represents an alkyl group which may be substituted, R² represents a hydroxyl group, a benzyloxy group, a lower alkoxy group, a group of the formula



in which R³ and R⁴ are identical or different and each

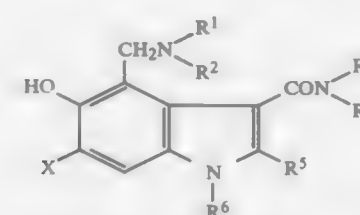
4,874,759 5-HYDROXYINDOLE-3-CARBOXYLIC ACID AMIDE COMPOUNDS, PHARMACEUTICAL COMPOSITIONS AND USE

Tetsuya Tahara, Nakatsu; Tsuguo Ikebe, Shimoge; Ichiro Hakamada, and Osamu Yaoka, both of Nakatsu, all of Japan, assignors to Yoshitomi Pharmaceutical Industries, Ltd., Osaka, Japan

PCT No. PCT/JP88/00035, § 371 Date Sep. 23, 1988, § 102(e) Date Sep. 23, 1988, PCT Pub. No. WO88/05432, PCT Pub. Date Jul. 28, 1988

PCT Filed Jan. 19, 1988, Ser. No. 261,836
 Claims priority, application Japan, Jan. 23, 1987, 62-14943
 Int. Cl.⁴ A61K 31/405, 31/535; C07D 209/42, 413/06
 U.S. Cl. 514—232.5 6 Claims

1. A 5-hydroxyindole-3-carboxylic acid amide compound of the general formula:



wherein R¹, R², R³ and R⁴ are, the same or different, respectively a hydrogen atom, an alkyl group, an aryl group, an aralkyl group or a heteroaryl group, or R¹ and R² and/or R³ and R⁴ are respectively groups which are combined to each other taken together with the adjacent nitrogen atom to form a heterocyclic group, R⁵ is an alkyl group, R⁶ is a hydrogen atom, an alkyl group, a cycloalkyl group, an aryl group or an aralkyl group and X is a hydrogen atom, a halogen atom or a lower alkanoyl group, or its acid addition salt.

5. A pharmaceutical composition comprising a compound as claimed in claim 1 and a pharmaceutically acceptable additive.

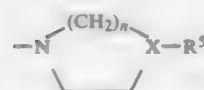
4,874,760 4,7-DIHYDROISOTHIAZOLO[5,4-B]PYRIDINE DERIVATIVES AND CARDIOVASCULAR TREATING AGENTS CONTAINING SAID DERIVATIVES

Shin-ichi Yamada, Fukushima; Takao Goto, Koori; Toshihisa Mashiko, Fukushima; Kentaro Kogi, Shiraiishi; Yukiko Oguchi, and Seisichi Narita, both of Fukushima, all of Japan, assignors to Toa Eiyo, Ltd., Tokyo, Japan

Filed Jan. 5, 1988, Ser. No. 140,999
 Claims priority, application Japan, Jan. 9, 1987, 62-1782
 Int. Cl.⁴ A61K 31/435, 31/535; C07D 513/04
 U.S. Cl. 514—234.2 4 Claims

1. A 4,7-dihydroisothiazolo[5,4-b]pyridine derivative represented by the general formula

represents a hydrogen atom, a lower alkyl group, an aralkyl group, an aralkynyl group, an aryloxyalkyl group, an arylaminoalkyl group, a pyridylalkyl group or a benzozolylalkyl group, or R^3 and R^4 form a ring and represent a group of the formula



where X represents a methine group, a nitrogen atom or an oxygen atom, n is an integer of 1 or 2, and when X is a methine group or a nitrogen atom, R^5 represents a hydrogen atom, a lower alkyl group, a lower hydroxyalkyl group, an aryl group, an aryloxy group, an aralkyl group, a furoyl group, a pyridyl group or a diphenylmethane group each of which may be substituted, and m is an integer of 1 to 3; or an acid addition salt thereof and a pharmaceutically accepted carrier.

4,874,761

4-ARYLCARBONYL-1-(4-MORPHOLINYL)-LOWER-ALKYL-1H-INDOLES

Thomas E. D'Ambra, North Greenbush, and Malcolm R. Bell, East Greenbush, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

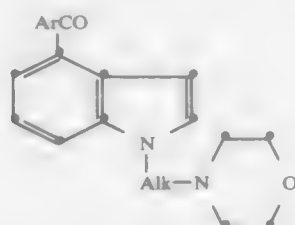
Division of Ser. No. 13,313, Feb. 11, 1987, Pat. No. 4,840,950. This application Apr. 12, 1989, Ser. No. 337,220

Int. Cl.⁴ A61K 31/535

U.S. Cl. 514—235.2

1 Claim

1. A method for the relief of pain in a patient requiring such treatment which comprises administering orally or parenterally to such patient a medicament in solid or liquid dosage form containing, as the active component thereof, an analgesically effective amount of a compound having the formula:



where Ar is lower-alkoxyphenyl or 1-naphthyl, and Alk is lower-alkylene containing from one to four carbon atoms or a pharmaceutically acceptable acid-addition salt thereof.

4,874,762

2-AMINO-4-NICOTINOYLAMINO-6-ARYL-S-TRIAZINES AS NOOTROPIC AGENTS

Kiyoshi Kimura, Takatsuki; Fusao Ueda, Shiga, and Masaru Tamara, Kyoto, all of Japan, assignors to Nippon Shinyaku Co., Ltd., Japan

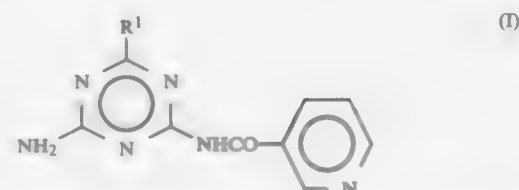
Filed May 20, 1988, Ser. No. 197,103

Claims priority, application Japan, May 20, 1987, 62-124625 Int. Cl.⁴ A61K 31/53

U.S. Cl. 514—242

9 Claims

1. A method of treating dementia in humans and animals which comprises administering to a human or animal in need thereof a therapeutically effective amount of a compound of the formula I:



or a pharmaceutically acceptable salt thereof wherein R^1 is hydrogen, lower alkyl, aryl or haloaryl, in combination with a pharmaceutically acceptable carrier.

4,874,763

PHARMACEUTICALLY EFFICACIOUS PTERIDINE DERIVATIVES

Ingrid Hofmann, Frankfurt am Main; Ernst Mutschler, Mainz-Hechtsheim, and Angelika Christner, Bickenbach, all of Fed. Rep. of Germany, assignors to Roehm GmbH Chemische Fabrik, Darmstadt, Fed. Rep. of Germany

Filed Oct. 5, 1988, Ser. No. 253,699

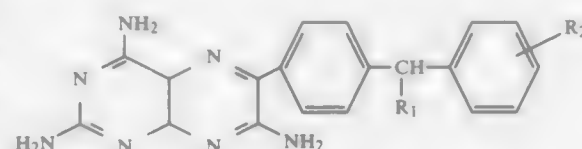
Claims priority, application Fed. Rep. of Germany, Nov. 28, 1987, 3740441

Int. Cl.⁴ A61K 31/50

U.S. Cl. 514—249

7 Claims

1. A pharmaceutically efficacious pteridine compound of formula:



wherein R_1 is hydrogen, halogen, trifluoromethyl, nitro, a $-(A)_n-OR_3$ group, wherein R_3 is hydrogen or a C_{1-6} alkyl group, a $-(A)_n-NR_4R_5$ group, wherein R_4 and R_5 independently of each other are hydrogen or a C_{1-6} alkyl group or R_4 and R_5 together with the nitrogen atom form a 5- or 6-membered ring that is substituted with a C_{1-4} alkyl group and wherein A is a linking group having 1 to 6 linking carbon atoms, one of which can be replaced by oxygen and wherein n is zero or one, and

wherein R_2 is hydrogen or, independently of R_1 , has the same meaning as R_1 , with the proviso that R_1 and R_2 are not simultaneously hydrogen, and the physiologically acceptable acid addition salts thereof.

4,874,764

BENZOHETEROCYCLIC COMPOUNDS

Hiraki Ueda; Hisashi Miyamoto; Shinji Aki, and Tatsuya Otsuka, all of Tokushima, Japan, assignors to Otsuka Pharmaceutical Company, Limited, Tokyo, Japan

Continuation-in-part of Ser. No. 17,247, Feb. 20, 1987, abandoned. This application Jun. 18, 1987, Ser. No. 63,401

Claims priority, application Japan, Feb. 25, 1986, 61-40921; May 8, 1986, 61-105655; May 22, 1986, 61-118568; Jul. 23, 1986, 61-173370; Aug. 19, 1986, 61-193838; Sep. 30, 1986, 61-233837; Oct. 15, 1986, 61-246050; Dec. 18, 1986, 61-303515; Feb. 19, 1987, 62-37000

Int. Cl.⁴ A61K 31/495; C07D 403/04

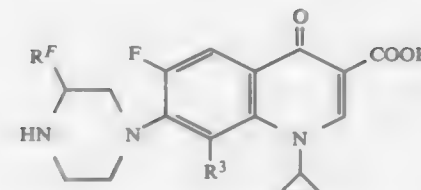
U.S. Cl. 514—254

9 Claims

1. A compound of the formula:

wherein

[1] R_1, R_2, R_3 are the same or different and stand for hydrogen or halogen or a trihalomethyl, lower alkyl, lower alkoxy, nitro, hydroxyl or phenylalkyloxy group; R_4 stands for hydrogen or halogen or a trihalomethyl, lower alkyl, lower alkoxy, nitro, hydroxyl, phenylalkyloxy or an 1-(2-propenyl-4-piperazinyl) group; R_5 stands for hydrogen or a C_{1-14} alkyl group; R_6 represents a C_{3-6} alkenyl or alkynyl group; and n is 2 or 3, or a pharmaceutically acceptable acid addition salt.



wherein R^3 is C_{1-6} alkyl and R^F is C_{1-6} alkyl, or a pharmaceutically acceptable salt thereof.

7. A method for the treatment of bacterial infectious diseases, which comprising administering an effective amount of the compound as set forth in claim 1 as an antimicrobial agent.

4,874,765

1,4-DISUBSTITUTED PIPERAZINES HAVING DOPAMINERGIC ACTIVITY

Erzsébet Lapis; Edit Tóth, both of Budapest; Béla Kiss, Vecsés; József Törley, Budapest; Éva Pálósi, Budapest; István Hajdu, Budapest; László Szporay, Budapest; Dóra Groó, Budapest, and István Laszlovazky, Budapest, all of Hungary, assignors to Richter Gedeon Vegyeszeti Gyar, Budapest, Hungary

Filed Apr. 22, 1987, Ser. No. 41,206

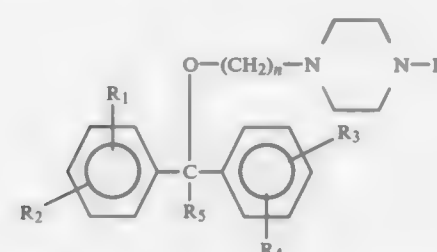
Claims priority, application Hungary, Apr. 22, 1986, 2251/1749/86

Int. Cl.⁴ A61K 31/495; C07D 295/08, 295/10

U.S. Cl. 514—255

4 Claims

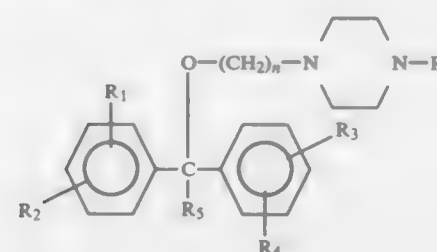
1. A 1,4-disubstituted piperazine having dopaminergic activity of the formula (I),



wherein

R_1, R_2, R_3 are the same or different and stand for hydrogen or halogen or a trihalomethyl, lower alkyl, lower alkoxy, nitro, hydroxyl or phenylalkyloxy group; R_4 stands for hydrogen or halogen or a trihalomethyl, lower alkyl, lower alkoxy, nitro, hydroxyl, phenylalkyloxy or an 1-(2-propenyl-4-piperazinyl) group; R_5 stands for hydrogen or a C_{1-4} alkyl group; R_6 represents a C_{3-6} alkenyl or alkynyl group; and n is 2 or 3, and pharmaceutically acceptable acid addition salts thereof.

4. A method of treating diseases arising from a decrease in the dopamine level which comprises administering to a mammal (including man) in need of such treatment a therapeutically effective amount of the 1,4-disubstituted piperazine of the formula (I).



4,874,768

1,2-DISUBSTITUTED ERGOLINES USEFUL FOR PRODUCING CENTRAL ANTIDOPAMINERGIC OR α_1 -RECEPTOR-BLOCKING ACTIVITY

Andreas Huth; Gerhard Sauer, and Helmut Wachtel, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin, Fed. Rep. of Germany

Filed Oct. 6, 1986, Ser. No. 915,358

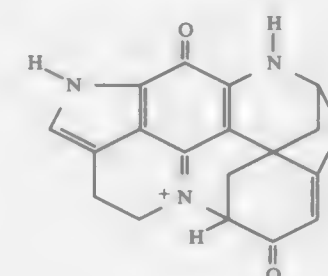
Claims priority, application Fed. Rep. of Germany, Oct. 4, 1985, 3535929

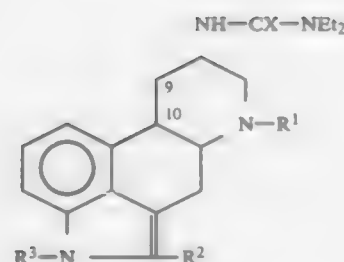
Int. Cl.⁴ A61K 31/48; C07D 45/12

U.S. Cl. 514—288

14 Claims

1. A 1, 2-substituted ergoline compound of general formula I



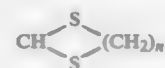


wherein

X is an oxygen or sulfur atom,
R¹ is a lower alkyl group.

R² is (a) halogen; (b) a C₂₋₄-carboxylic acid; (c) a lower alkyl, lower alkenyl or alkynyl group; (d) an alkyl, alkynyl or alkenyl group which is substituted by (i) OR₄ wherein R₄ is hydrogen, lower alkyl, tetrahydropyranyl or C₅₋₆-cycloalkyl, (ii) phenyl, pyridinyl, thiophenyl, furanyl, pyrimidinyl, imidazolyl or pyrazolyl, (iii) phenyl, pyridinyl, thiophenyl, furanyl, pyrimidinyl, imidazolyl or pyrazolyl substituted by a lower alkyl, lower alkoxy or halogen group; (e) an S-R⁵ group wherein R⁵ means (i) a lower alkyl group, (ii) a lower alkyl group substituted by phenyl, pyridinyl, thiophenyl, furanyl, pyrimidinyl, imidazolyl, or pyrazolyl in turn substituted by a lower alkyl, lower alkoxy or halogen group;

(f) a



group wherein n=2 or 3; or

(g) a —CHO group.

R₃ is lower alkyl or the acyl group of a C₂₋₄-carboxylic acid, and

C₉ C₁₀ is a CC-single or a CC-double bond, and the hydrogen atom in the 10-position is in the α-location if C₉ C₁₀ is a CC-single bond, as well as a physiologically compatible acid addition salt thereof.

12. A method of producing an antidepressant effect, comprising administering an effective amount of a compound of claim 1.

13. A method of producing a neuroleptic effect, comprising administering an effective amount of a compound of claim 1.

14. A method of treating schizophrenia, comprising administering an effective amount of a compound of claim 1.

4,874,769

QUINOLINYL ETHER OR THIOETHER TETRAZOLES AS AGENTS FOR THE TREATMENT OF HYPERSENSITIVE AILMENTS

Raymond Youssefieh, Princeton Junction; Utpal Chakraborty, Flemington, both of N.J.; Ernest Magnien, Norwich, Vt.; Rohit Desai, Millwood, and Thomas D-Y Lee, Scarsdale, both of N.Y., assignors to Rorer Pharmaceutical Corporation, Fort Washington, Pa.

PCT No. PCT/US87/00560, § 371 Date Jan. 5, 1988, § 102(e) Date Jan. 5, 1988, PCT Pub. No. WO87/05510, PCT Pub. Date Sep. 24, 1987

Continuation-in-part of Ser. No. 839,410, Mar. 13, 1986, Pat. No. 4,839,369, and a continuation of Ser. No. 723,781, Apr. 16, 1985, Pat. No. 4,631,287, which is a continuation-in-part of Ser. No. 911,028, Sep. 24, 1986. This PCT application Mar. 11, 1987, Ser. No. 124,800

The portion of the term of this patent subsequent to Dec. 23, 2003, has been disclaimed.

Int. Cl.⁴ A61K 31/47; C07D 265/30, 295/00

U.S. Cl. 514—314

6 Claims

1. A compound selected from the group consisting of 5-[3-(2-ethyl-5-(2-quinolylmethoxy)phenoxy)propyl]tetrazole, 5-[3-

(2-methyl-4-(2-quinolylmethoxy)phenoxy)propyl]tetrazole, 5-[3-(5-methyl-3-(2-quinolylmethoxy)phenoxy)propyl]tetrazole, 5-[3-(4-(2-(5-bromo-6-methoxy)quinolylmethoxy)phenoxy)propyl]tetrazole, 5-[3-(4-(2-(6-methoxy)quinolylmethoxy)phenoxy)propyl]tetrazole, 5-[3-(4-(2-quinolylmethoxy)thiophenoxy)propyl]tetrazole, 5-[3-(4-(2-quinolylmethoxy)phenyl)ethyl]tetrazole, 5-[4-(4-(2-quinolylmethoxy)phenyl)butyl]tetrazole and 5-[3-(2-quinolylmethoxy)phenoxy)methyl]tetrazole.

4,874,770

ARYL-SUBSTITUTED (N-PIPERIDINYL)METHYL- AND (N-PIPERIDINYL) METHYLAZOLES HAVING ANTI-PSYCHOTIC PROPERTIES

Ineke Van Wijngaarden; Cornelis Kruse; Johannes A. M. Van Der Heyden, and Martinus T. M. Tulp, all of Weesp, Netherlands, assignors to Duphar International Research B.V., Weesp, Netherlands

Division of Ser. No. 18,164, Feb. 24, 1987, Pat. No. 4,772,604. This application Jul. 1, 1988, Ser. No. 214,310

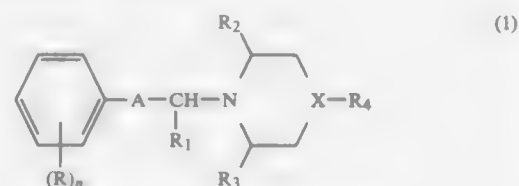
Claims priority, application Netherlands, Feb. 27, 1986, 660,445

Int. Cl.⁴ A61K 31/445; C07D 211/10, 211/14

U.S. Cl. 514—326

4 Claims

1. Compounds of formula 1



in which the symbols have the following meanings:

R is methyl, methoxy or halogen;

n is 0-2;

R₁, R₂ and R₃ are hydrogen;

X is a carbon atom which is substituted with a group R₅, in which R₅ is hydrogen or hydroxyl;

R₄ is phenyl or benzoyl, which may be substituted with halogen or methoxy;

A is pyrrole or pyrazole, which may be substituted with methyl or phenyl; and the acid addition salts and prodrugs thereof.

4. A method of treating affections in the central nervous system, characterized in that an effective amount of a compound as claimed in claim 1 is used.

4,874,771

ETHANESULFONAMIDE DERIVATIVES

Ronald K. Russell, Titusville, N.J., assignor to Ortho Pharmaceutical Corporation, Raritan, N.J.

Filed Sep. 6, 1988, Ser. No. 240,976

Int. Cl.⁴ A61K 31/445, 31/495; C07D 211/18, 295/08

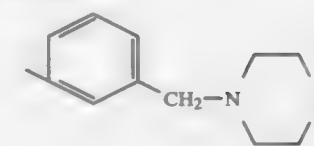
U.S. Cl. 514—331

7 Claims

1. A compound of the formula



-continued



where

R₁ is hydrogen or C₁₋₃ alkyl;

R₂ is hydrogen or a pharmaceutically acceptable alkali or alkaline earth metal ion;

R₃ is hydrogen, Cl, Br, F, C₁₋₆ alkyl, C₃₋₆ branched-chain alkyl, C₁₋₆ alkoxy, C₁₋₆ branched-chain alkoxy, CF₃, nitro, —NHCOC₁₋₃ alkyl, NR₅R₆ or CO₂R₇ when R₄ is hydrogen, or R₃ and R₄ are the same or different and are Cl, Br, F or CF₃;

R₅ and R₆ are the same or different and are hydrogen or C₁₋₃ alkyl;

R₇ is hydrogen or C₁₋₆ alkyl;

X is O, NR₈, CHR₈ or —(CH₂)_n—;

R₈ is C₁₋₃ alkyl; and

n is 0, 1, 2 or 3;

and its physiologically acceptable salts.

4,874,772

ANTI-ASTHMATIC AGENT

Seisuo Kobayashi, Gunma; Tsugio Nakazawa, Gunma; Yasumasa Yoshie, Gunma; Yasushi Abiko, Tokyo, and Kinya Kameda, Tokyo, all of Japan, assignors to Daiichi Selyaku Co., Ltd., Tokyo, Japan

Filed Apr. 27, 1988, Ser. No. 186,859

Claims priority, application Japan, Apr. 27, 1987, 62-103727

Int. Cl.⁴ A61K 31/44

U.S. Cl. 514—341

2 Claims

1. A process for treating asthma which comprises administering 2-[2-phenyl-2-(pyridinyl)]-ethyl-2-imidazoline in an amount effective for treating asthma to a patient in need of such treatment.

4,874,773

3-AMINOCARBONYL-1,4-DIHYDROPYRIDINE-5-CARBOXYLIC ACID COMPOUNDS, AND PHARMACEUTICAL COMPOSITION CONTAINING THE SAME

Masakazu Hisaki, Hikone; Kenichi Kashima, Fujidaira; Yasuhiko Sakamoto, Habikino; Masakazu Hojo, Kyoto; Osamu Katayama, Kusatsu, and Hiroyoshi Hata, Yokohama, all of Japan, assignors to Nippon Shoji Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 920,124, Oct. 17, 1986, abandoned.

This application Aug. 30, 1988, Ser. No. 239,005

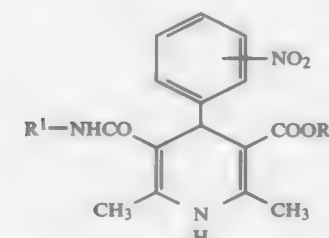
Claims priority, application Japan, Oct. 21, 1985, 60-235909

Int. Cl.⁴ C07D 211/86; A61K 31/455

U.S. Cl. 514—355

12 Claims

1. A compound of the formula:



wherein R¹ is isopropyl, an allyl, propargyl, or a cycloalkyl having 3 to 8 carbon atoms, and R² is an alkyl selected from the group consisting of n-heptyl, n-octyl, n-nonyl and n-decyl.

4,874,774

NIFEDIPINE COMPOSITIONS AND THE PRODUCTION THEREOF

Kotchi Ushimaru, Kamikyo; Tomoaki Hamakawa, Fushimi, and Tomio Koga, Shiga, all of Japan, assignors to Nippon Shinyaku Co., Ltd., Japan

Continuation of Ser. No. 670,547, Nov. 13, 1984, abandoned.

This application Aug. 12, 1986, Ser. No. 895,806

Claims priority, application Japan, Nov. 17, 1983, 58-217396

Int. Cl.⁴ A61K 31/44

U.S. Cl. 514—356

12 Claims

1. A pharmaceutical composition in rectal administration form which comprises a coronary vasodilating effective amount or a hypotensively effective amount of 1,4-dihydro-2,6-dimethyl-4-(2'-nitrophenyl)-3,5-dicarbomethoxy-pyridine in combination with a pharmaceutically acceptable carrier suitable for formulating rectally administrable compositions which comprises a mixture of 5 to 50 parts by weight of a polyethylene glycol and 50 to 95 parts by weight of a fatty acid glyceride of 12 to 18 carbon atoms.

4,874,775

AGRICULTURALLY USEFUL SULFONAMIDES

Erika V. Krumkalns, Indianapolis, and David L. Smiley, Greenfield, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

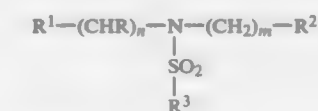
Filed Jun. 11, 1985, Ser. No. 743,234

Int. Cl.⁴ A61K 31/44; C07D 213/42

U.S. Cl. 514—357

35 Claims

1. A compound of the formula



wherein

n is 1;

m is 0, 1 or 2;

R is hydrogen; C₁₋₄ alkyl; phenyl; or phenyl monosubstituted with fluoro, chloro, bromo or iodo;

R¹ is pyridinyl; pyridinyl oxide; or 5-pyrimidinyl;

R² is C₃₋₈ cycloalkyl; C₄₋₁₀ alkyl; cyano; phenyl mono- or disubstituted with fluoro, chloro, bromo, iodo, C₁₋₃ alkyl, C₁₋₃ (fluoro, chloro or bromo)alkyl, C₁₋₃ alkoxy, C₁₋₃ (fluoro, chloro or bromo)alkoxy, C₁₋₃ alkylthio, hydroxy, nitro, or cyano; or phenyl monosubstituted with C₃₋₈ cycloalkylmethoxy or phenoxy;

R³ is C₁₋₆ alkyl; C₁₋₃ alkylamino; di(C₁₋₃ alkyl)amino; C₁₋₃ (fluoro, chloro or bromo)alkyl; phenyl; or phenyl mono- or disubstituted with fluoro, chloro, bromo, iodo, C₁₋₃ alkyl, or C₁₋₃ (fluoro, chloro or bromo)alkyl; provided that R₂ is cyano only when m is 1 or 2; or an acid addition salt of compounds wherein R¹ is pyridinyl or 5-pyrimidinyl; provided that salts of compounds wherein R¹ is 5-pyrimidinyl are only hydrohalides.

16. A method of reducing the adverse effects of phytopathogens on plants which comprises applying a phytopathogen-inhibiting amount of a compound of claim 1 to the plant or to the soil in which the plant grows.

4,874,776

COMPOUND HAVING MUCUS REGULATING AND ELASTASE-INHIBITORY ACTIVITIES, FOR THE THERAPY OF PULMONAL EMPHYSEMA AND PULMONAL FIBROSIS

Giuseppe Quadro, Milan, Italy, assignor to Yason S.r.l., Milan, Italy

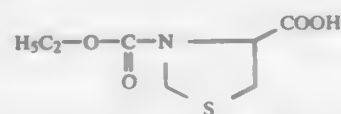
Filed Jul. 11, 1988, Ser. No. 217,384

Int. Cl.⁴ C07D 277/06; A06K 31/425

U.S. Cl. 514—365

4 Claims

1. N-carbethoxy-4-thiazolidine-carboxylic acid lysine salt.
2. The method of treatment of chronic and acute affections of the respiratory system and hepatic intoxication which consists of administering to a subject in need of such treatment a compound which is a N-carbethoxy-4-thiazolidine-carboxylic acid of formula I



in the amount of 200–2 g daily or a pharmaceutically acceptable salt thereof which is an alkali, an alkaline earth, a basic amino acid salt in an equivalent amount.

4,874,777

LEUKOTRIENE ANTAGONISTS

F. Patrick Carr, Indianapolis; Robert D. Dillard, Zionsville, and Doris E. McCullough, Carmel, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

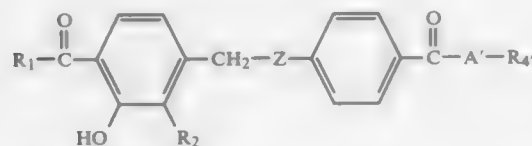
Filed Apr. 10, 1987, Ser. No. 37,284

Int. Cl.⁴ C07D 257/04; A61K 31/41, 31/05; C07C 39/02

U.S. Cl. 514—381

20 Claims

1. A compound of the formula



and pharmaceutically acceptable salts thereof, wherein: R₁ is C₁–C₆ alkyl; R₂ is C₁–C₆ alkyl; Z is



A' is straight or branched chain C₁–C₆ alkylidene; p is 0, 1, or 2; and R₄ is —COOH or 5-tetrazolyl.

10. A method of treating a mammal suffering from or susceptible to any condition characterized by an excessive release of leukotrienes, which comprises administering to said mammal a leukotriene antagonizing amount of a compound of claim 1.

4,874,778

1-CARBAMOYL-2-PYRAZOLINES, COMPOSITION CONTAINING THEM, AND INSECTICIDAL AND ACARICIDAL METHOD OF USING THEM

Salcem Farooq, Airdorf, Switzerland, assignor to Ciba-Geigy Corporation, Airdorf, N.Y.

Continuation of Ser. No. 796,379, Nov. 8, 1985, abandoned. This application Jun. 22, 1987, Ser. No. 65,667

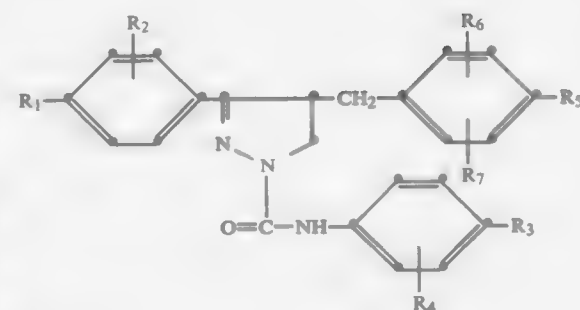
Claims priority, application Switzerland, Nov. 16, 1984, 5489/84; Oct. 22, 1985, 4551/85

Int. Cl.⁴ A01N 43/56; C07D 231/06

U.S. Cl. 514—403

8 Claims

1. A compound of the formula



wherein:

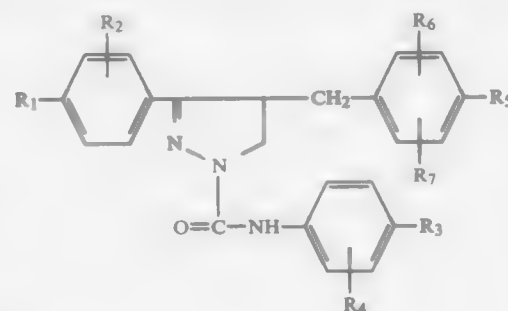
R₁ is chlorine or fluorine;

R₃ is OCF₃;

R₅ is fluorine or chlorine; and

R₂, R₄, R₆ and R₇ are hydrogen.

6. A method of controlling insects and representative of the order Acarina, which method comprises contacting or treating said insects and representatives of the order Acarina or the locus thereof with an amount effective to control insects or members of the order Acarina of a compound of the formula



wherein

R₁ is chlorine or fluorine;

R₃ is OCF₃;

R₅ is fluorine or chlorine; and

R₂, R₄, R₆ and R₇ are hydrogen.

4,874,779

MITOMYCIN PHOSPHATE DERIVATIVES

Peter D. Senter, Seattle, Wash., assignor to Bristol-Myers Company, New York, N.Y.

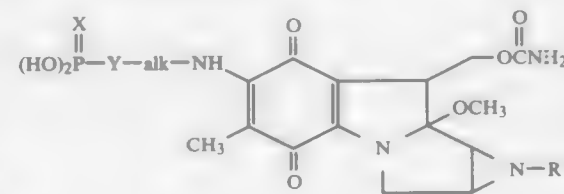
Filed Jun. 29, 1988, Ser. No. 213,201

Int. Cl.⁴ C07D 487/14; A61K 31/40

U.S. Cl. 514—410

9 Claims

1. A compound having the formula



wherein

X and Y are independently oxygen or sulfur;

alk represents a linear or branched carbon chain having 2 to 8 carbon atoms; and

R¹ is H or methyl;

or a pharmaceutically acceptable salt thereof.

4,874,780

ANTICANCER COMPOUNDS

Bernt Borretzen; Rolf O. Larsen, both of Fornebu; Erik O. Pettersen; John M. Dornish, both of Oslo, and Rolf Oftebro, Hvalstad, all of Norway, assignors to Norsk Hydro a.s., Oslo, Norway

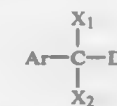
Filed Mar. 11, 1987, Ser. No. 24,783

Int. Cl.⁴ A61K 31/335

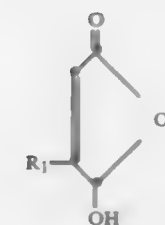
U.S. Cl. 514—452

4 Claims

1. A compound of the formula:



wherein Ar is unsubstituted phenyl or phenyl which is substituted by alkyl of 1–5 carbon atoms, cycloalkyl of 3–6 carbon atoms, halogen, nitro, amino, monoalkylamino of 1–5 carbon atoms or dialkylamino of 1–5 carbon atoms in each alkyl group, said Ar being non-deuterated or partly or completely deuterated and X₁ and X₂ together with the carbon atom to which they are attached form a cyclic acetal; or a pharmaceutically acceptable salt thereof.



wherein R₁ is a C₁₆–C₂₀ straight or branched chain hydrocarbyl group optionally containing a total of 1–6 double and/or triple bonds and optionally containing an aldehyde or hydroxymethyl group, or R-alk- where alk is a C₂–C₁₂ straight or branched chain alkylidene group optionally containing 1 or 2 double or triple bonds and R is naphthalenyloxy or benzylphenoxy.

4,874,783

ENHANCING COLOR STABILITY TO STERILIZING RADIATION OF POLYMER COMPOSITIONS

Linda H. Nelson, Evansville, Ind.; Roger W. Avakian, Braunschweig, Belgium, and Arnold Factor, Scotia, N.Y., assignors to General Electric Company, Pittsfield, Mass.

Division of Ser. No. 769,277, Aug. 26, 1985, which is a continuation-in-part of Ser. No. 579,103, Feb. 10, 1984, abandoned. This application Dec. 22, 1987, Ser. No. 136,606

Int. Cl.⁴ C08K 5/01

U.S. Cl. 524—482

13 Claims

1. An irradiation sterilized medical article which is made from a composition comprising an aromatic carbonate polymer in admixture with an effective amount of a stabilizing hydroaromatic compound effective to inhibit yellowing upon exposure to sterilizing radiation, said hydroaromatic compound comprising the partially hydrogenated carbon skeleton of an aromatic system or the partially hydrogenated carbon skeleton of an aromatic system in combination with an unsaturated ring.

4,874,781

PESTICIDES

Michael Elliott, Stevenage; Norman F. Jones, Luton, and Bhupinder P. S. Khambay, Harrow Weald, all of England, assignors to National Research Development Corporation, London, United Kingdom

Continuation of Ser. No. 903,452, Sep. 4, 1986, abandoned. This application Jan. 11, 1988, Ser. No. 143,319

Claims priority, application United Kingdom, Sep. 4, 1985, 2521941

Int. Cl.⁴ A01N 37/10, 37/34; C07D 317/52; C07C 69/612

U.S. Cl. 514—463

6 Claims

1. A compound of formula I



in which formula:

Ar represents a phenyl or naphthyl group unsubstituted or substituted by one or more halogen, alkoxy, haloalkoxy, methylenedioxy, C₁–C₆ alkyl or haloalkyl groups; R₁ represents the group —C(CF₃)=CH₂; and R₂ CHD represents the residue of a benzyl, fluorobenzyl or α-cyanobenzyl alcohol substituted by a phenoxy, benzyl or benzoyl group.

4,874,784

QUATERNARY AMMONIUM COMPOUNDS

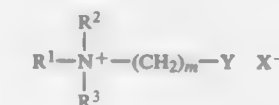
Kim R. Smith; James E. Borland, and Joe D. Sauer, all of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va. Division of Ser. No. 910,417, Sep. 22, 1986, Pat. No. 4,824,867, and a continuation-in-part of Ser. No. 894,938, Aug. 8, 1986, and a continuation-in-part of Ser. No. 782,353, Oct. 1, 1985. This application Feb. 17, 1989, Ser. No. 312,125

Int. Cl.⁴ A01N 41/02

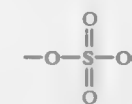
U.S. Cl. 514—517

9 Claims

1. A method of inhibiting the growth of bacteria, said method comprising contacting said bacteria with a bactericidal amount of a quaternary ammonium compound having the formula:



wherein R¹ is an alkyl containing 8–10 carbon atoms, R² is an alkyl containing 8–20 carbon atoms, methyl or ethyl, R³ is methyl or ethyl, m is an integer from 1 to 6, X is an anion and Y is



4,874,782

FURANONE DERIVATIVES

Rosanne Bonjouklian, Indianapolis, Ind.; Christopher J. M. Meade, Lightwater, England; Edward D. Mihelich, and Michael L. Phillips, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation of Ser. No. 750,801, Jul. 1, 1985, abandoned. This application Jun. 26, 1987, Ser. No. 66,907

Int. Cl.⁴ C07D 307/60; A61K 31/365

U.S. Cl. 514—473

13 Claims

1. A compound of the formula

4,874,785

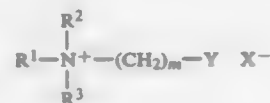
QUATERNARY AMMONIUM COMPOUNDS

Kim R. Smith; James E. Borland, and Joe D. Sauer, all of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va. Division of Ser. No. 910,417, Sep. 22, 1986, Pat. No. 4,824,867, which is a continuation-in-part of Ser. No. 894,938, Aug. 8, 1986, which is a continuation-in-part of Ser. No. 782,353, Oct. 1, 1985. This application Feb. 17, 1989, Ser. No. 312,260 Int. Cl.⁴ A01N 37/34

U.S. Cl. 514—526

9 Claims

1. A method of inhibiting the growth of bacteria, said method comprising contacting said bacteria with a bactericidal amount of a quaternary ammonium compound having the formula:



wherein R¹ is an alkyl containing 8–20 carbon atoms, R² is an alkyl containing 8–20 carbon atoms, methyl or ethyl, R³ is methyl or ethyl, m is an integer from 1 to 6, X is an anion and Y is —CN.

4,874,786

CYANOACETAMIDO-DERIVATIVES HAVING A FUNGICIDAL ACTIVITY

Angelo Menconi, Carrara Marina; Giovanni Camaggi, Lodi; Franco Gozzo, San Donato Milanese; Luigi Mireana, Milan, and Carlo Garavaglia, Cuggiono, all of Italy, assignors to Montedison S.p.A., Milan, Italy

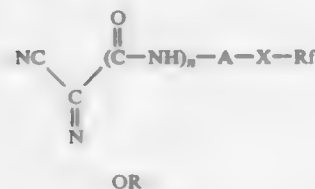
Filed Apr. 9, 1987, Ser. No. 36,465

Claims priority, application Italy, Apr. 15, 1986, 20081 A/86 Int. Cl.⁴ A61K 31/10, 31/16, 31/165; C07C 103/00

U.S. Cl. 514—528

7 Claims

1. Compounds having the formula:



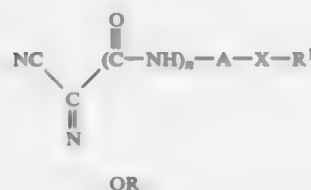
wherein:

R is H, a C₁–C₄ alkyl, an alkenyl, an alkynyl radical; n is 1 or 2;

A represents a C₁–C₆ alkylenic, or an arylenic bridge; X represents O, S, SO, SO₂;

R^f represents polyfluoroalkyl radicals containing from 1 to 4 carbon atoms and at least 2 fluorine atoms, and polyfluoroalkenyl radicals containing from 2 to 4 carbon atoms and at least 2 fluorine atoms.

4. A method of fighting fungus infections in useful plants, consisting essentially in distributing on the plants, or their organs or seeds, when the infection is expected or is already in progress, an effective amount of a compound having the formula:



wherein:

R is H, a C₁–C₄ alkyl, an alkenyl, an alkynyl radical; n is 1 or 2;

A represents a C₁–C₆ alkylenic, or an arylenic bridge; X represents O, S, SO, and SO₂; and

R¹ represents C₁–C₆ alkyl radicals, a phenyl radical, polyfluoroalkyl radicals containing from 1 to 4 carbon atoms and at least 2 fluorine atoms, polyfluoroalkenyl radicals containing from 2 to 4 carbon atoms and at least 2 fluorine atoms, but excluding compounds having the formula (I) wherein A is an alkylene, n is 2, and R¹ is a C₁–C₆ alkyl radical.

4,874,787

INSECTICIDAL ARTICLE FOR ELECTRIC FUMIGATOR

Shinobu Yamamoto; Kunihiko Okada; Satoshi Ohi, all of Hiroshima; Shiro Oyama, Urawa, and Yasuharu Takei, Hiroshima, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Aug. 10, 1987, Ser. No. 83,249

Claims priority, application Japan, Aug. 15, 1986, 61-191527 Int. Cl.⁴ A61K 31/05; A01N 65/00

U.S. Cl. 514—531.125

6 Claims

1. An insecticidal article for electric fumigator consisting essentially of:

(a) a preparation comprising 2-methyl-4-oxo-3-(2-propynyl) cyclopent-2-enyl-chrysanthemate and a synergist selected from the group consisting of α-[2-(butoxyethoxy)ethoxy]-4,5-methylenedioxy-2-propyltoluene, octachlorodipropyl ether and N-(2-ethylhexyl)-bicyclo-[2,2,1]-hept-5-en-2,3-dicarboximide, wherein the weight ratio of said synergist to said chrysanthemate ranges from 1/8 to 8, and

(b) a porous mat suitable for use on an insecticidal mat, said porous mat being impregnated with said preparation.

4,874,788

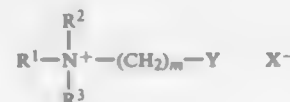
QUATERNARY AMMONIUM COMPOUNDS

Kim R. Smith; James E. Borland, and Joe D. Sauer, all of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va. Division of Ser. No. 910,417, Sep. 22, 1986, Pat. No. 4,824,867, which is a continuation-in-part of Ser. No. 894,938, Aug. 8, 1986, which is a continuation-in-part of Ser. No. 782,353, Oct. 1, 1985. This application Feb. 17, 1989, Ser. No. 312,124 Int. Cl.⁴ A01N 37/02, 37/12, 37/44

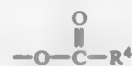
U.S. Cl. 514—534

9 Claims

1. A method of inhibiting the growth of bacteria, said method comprising contacting said bacteria with a bactericidal amount of a quaternary ammonium compound having the formula:



(I) wherein R¹ is an alkyl containing 8–20 carbon atoms, R² is an alkyl containing 8–20 carbon atoms, methyl or ethyl, R³ is methyl or ethyl, m is an integer from 1 to 6, X is an anion and Y is



wherein R⁴ is an alkyl containing 1–12 carbon atoms or phenyl.

4,874,789

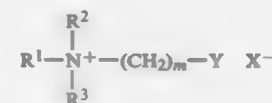
QUATERNARY AMMONIUM COMPOUNDS

Kim R. Smith; James E. Borland, and Joe D. Sauer, all of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va. Division of Ser. No. 910,417, Sep. 22, 1986, Pat. No. 4,824,867, which is a continuation-in-part of Ser. No. 782,353, Oct. 1, 1985. This application Feb. 17, 1989, Ser. No. 312,131 Int. Cl.⁴ A01N 37/12, 37/44

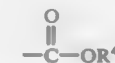
U.S. Cl. 514—551

7 Claims

1. A method of inhibiting the growth of bacteria, said method comprising contacting said bacteria with a bactericidal amount of a quaternary ammonium compound having the formula:



wherein R¹ is an alkyl containing 8–20 carbon atoms, R² is an alkyl containing 8–20 carbon atoms, methyl or ethyl, R³ is methyl or ethyl, m is an integer from 1 to 6, X is an anion and Y is



wherein R⁴ is an alkyl containing 1–12 carbon atoms.

4,874,790

METHOD FOR IMPROVING THE GLUCOSE METABOLISM OF AN ANIMAL HAVING DIABETIC TENDENCIES

Ronald T. Stanko, Pittsburgh, Pa., assignor to Montefiore Hospital Association of Western Pennsylvania, Pittsburgh, Pa. Filed Aug. 15, 1988, Ser. No. 232,119

Int. Cl.⁴ A61K 31/19

U.S. Cl. 514—557

9 Claims

1. A method for treating an animal having diabetic tendencies to improve its Glucose Tolerance, as measured by a Glucose Tolerance Test, which comprises administering orally to the animal a therapeutically effective amount of pyruvate and dihydroxyacetone prior to administering a Glucose Tolerance Test whereby the animal exhibits lower values in the said Glucose Tolerance Test than exhibited in the absence of said amount.

4,874,791

STIMULATION OF HAIR GROWTH WITH ALIPHATIC CARBOXYLIC ACIDS

Kuniaki Adachi, Odawara; Hideo Tamai, Kanagawa, and Masanao Sadai, Hiratsuka, all of Japan, assignors to Lion Corporation, Tokyo, Japan

Continuation of Ser. No. 724,354, Apr. 18, 1985, abandoned, which is a continuation of Ser. No. 518,447, Jul. 29, 1983, abandoned. This application Oct. 28, 1986, Ser. No. 923,902

Claims priority, application Japan, Aug. 10, 1982, 57-137909

Int. Cl.⁴ A61K 31/20

U.S. Cl. 514—558

10 Claims

1. A method of stimulating growth of human hair on a human head suffering from or susceptible to alopecia which comprises bringing active human hair follicles on a human head from a telogen state into a normal anagen state by applying to said follicles a growth stimulating amount of an effective ingredient which is an aliphatic carboxylic acid which possesses an odd number of carbon atoms or derivative thereof and is selected from the group consisting of n-hendecanoic acid, n-tridecanoic acid, n-pentadecanoic acid, n-heptadecanoic acid, a glyceride of said acids, a metal salt of said acids and mixtures thereof.

4,874,792

THIOPHENYL ALKANOIC ACIDS USEFUL AS LEUKOTRIENE ANTAGONISTS

John G. Gleason, Delran; Ralph F. Hall, Robbinsville, both of N.J.; Thomas W. Ku, Dresher, and Carl D. Perchonock, Philadelphia, both of Pa., assignors to Smithkline Beckman Corporation, Philadelphia, Pa.

Continuation of Ser. No. 926,314, Oct. 31, 1986, abandoned, and a continuation-in-part of Ser. No. 848,608, Apr. 7, 1986, abandoned, which is a continuation-in-part of Ser. No. 725,264, Apr. 19, 1985, abandoned. This application Mar. 25, 1988, Ser. No. 173,210

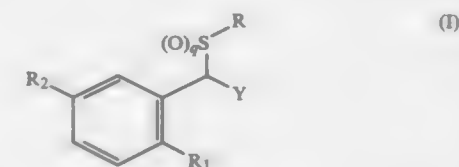
The portion of the term of this patent subsequent to Apr. 11, 2006, has been disclaimed.

Int. Cl.⁴ C07C 149/40; A61K 31/10

U.S. Cl. 514—570

48 Claims

1. A compound represented by the following structural formula (I):

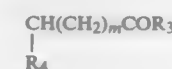


wherein R₁ is C₈ to C₁₃ alkyl, C₇ to C₁₂ alkoxy, C₇ to C₁₂ alkylthio, C₁₀ to C₁₂ 1-alkynyl, 10-undecynyl, 11-dodecynyl, phenyl-C₄ to C₁₀ alkyl, phenyl-C₃ to C₉ alkoxy, phenylthio-C₃ to C₉ alkyl with the phenyl optionally mono substituted with bromo, chloro, trifluoromethyl, C₁ to C₄ alkoxy, methylthio or trifluoromethylthio, furyl-C₄ to C₁₀ alkyl, trifluoromethyl-C₇ to C₁₂ alkyl or cyclohexyl-C₄ to C₁₀ alkyl;

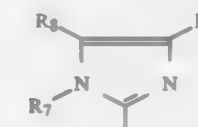
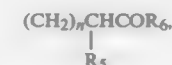
R₂ is hydrogen, bromo, chloro, methyl, trifluoromethyl, hydroxy, C₁ to C₄ alkoxy or nitro; or R₁ is hydrogen and R₂ is C₈ to C₁₃ alkyl, C₇ to C₁₂ alkoxy, C₇ to C₁₂ alkylthio, C₁₀ to C₁₂ 1-alkynyl, 10-undecynyl, 11-dodecynyl, phenyl-C₄ to C₁₀ alkyl, phenyl-C₃ to C₉ alkoxy, phenylthio-C₃ to C₉ alkyl with the phenyl optionally mono substituted with bromo, chloro, trifluoromethyl, C₁ to C₄ alkoxy, methylthio or trifluoromethylthio, furyl-C₄ to C₁₀ 30 alkyl, trifluoromethyl-C₇ to C₁₂ alkyl or cyclohexyl-C₄ to C₁₀ alkyl;

q is 0, 1 or 2, with the proviso that any of R₁ and R₂ above are not alkylthio or phenylthioalkyl when q is 1 or 2;

Y is COR₃;

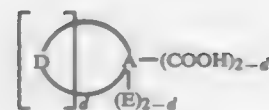


or (CH₂)₀₋₁-tetrazol-5-yl; R₃ is hydroxy or amino; R₄ is hydrogen, methyl, fluoro; m is 0 or 1; R is



n is 0 to 6;

R₅ is hydrogen, amino, or NHCOCH₂CH₂CH(NH₂)CO₂H;



D is divalent radical $-(C=O)-N(G)-(C=O)-(CH_2)_x-$, where X is 0 or 1,

E is monovalent radical $-(CH_2)_x-C(=O)NH-G$, where x is 0 or 1,

d is 0, 1 or 2,
A is an organic tetravalent radical of 2 to 48 carbons, when A is a non-aromatic tetravalent radical, two groups of two valences on adjacent carbon atoms are present to accommodate the one or two D diradical or diradicals and/or the one or two E monovalent radical or radicals and/or the one or two COOH group or groups; and when A is an aromatic tetravalent radical, two groups of two valences in ortho or peri position are present to accommodate the one or two D diradical or diradicals and/or the E monovalent radical or radicals and/or the COOH group or groups, and

G is a monovalent stabilizer radical selected from the group consisting of (a) hindered phenol-substituted amido, (b) hindered amine-substituted amido, (c) dialkyl sulfide-substituted amido, (d) a compound selected from the group consisting of 2-hydroxybenzophenone-substituted amido and 2-hydroxy-benzophenone-substituted alkyl, (e) a compound selected from the group consisting of 2-(2-hydroxyphenyl)-2H-benzotriazole-substituted amido and 2-(2-hydroxyphenyl)-2H-benzotriazole-substituted alkyl, (f) secondary aromatic amine-substituted amido, (g) a compound selected from the group consisting of benzimidazole-substituted amido and benzothiazole-substituted amido, (h) oxanilide-substituted amido, (i) halogenated aromatic-substituted amido, and mixtures thereof.

18. A polymer composition comprising a synthetic polymer which is subject to thermal, oxidative or actinic light degradation and an effective amount for stabilization of the stabilizer compound of claim 1.

4,874,804

HOT MELT ADHESIVES BASED ON ETHYLENE-N-BUTYL ACRYLATE

Francis X. Brady, Whitehouse Station, and Thomas F. Kauffman, Phillipsburg, both of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Division of Ser. No. 64,261, Jun. 19, 1987, Pat. No. 4,816,306.

This application Aug. 24, 1988, Ser. No. 235,577

Int. Cl.⁴ C08L 23/08, 33/08, 91/06

U.S. Cl. 524—100

9 Claims

1. Hot melt adhesive compositions consisting essentially of:
 - (a) 35 to 45% by weight of at least one ethylene n-butyl acrylate copolymer containing 25–45% by weight n-butyl acrylate and having a melt index of at least 50;
 - (b) 35 to 55% of a terpene phenolic tackifier having a Ring and Ball softening point of at least about 110° C.; and
 - (c) 10 to 20% by weight of a polyethylene or Fischer-Tropsch synthetic wax having a melting point above about 100° C.;

said adhesive characterized by a viscosity of less than 4000 cps at 175° C., fiber tearing bonds from Kraft paper within the complete range of -18°C . to 70°C ., a Ring and Ball softening point of 105°C ., a cloud point less than 120°C ., clarity at 175°C . and less than a 10% viscosity change after 72 hours at 175°C . with no char, skinning or gel formation.

4,874,805

NOVEL OXAZOLIDINES

Rolf Mülhaupt, Marty, Switzerland, and Hubert Simon, Mulhouse, France, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 70,741, Jul. 6, 1987, Pat. No. 4,772,716.

This application Jan. 29, 1988, Ser. No. 212,853

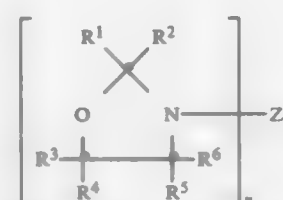
Claims priority, application Switzerland, Jul. 14, 1986, 1817/86

Int. Cl.⁴ C08K 5/54

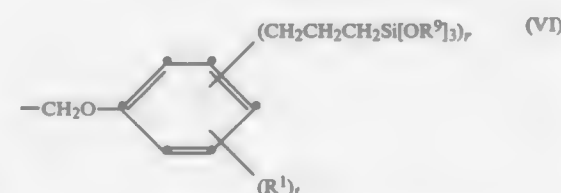
U.S. Cl. 524—188

3 Claims

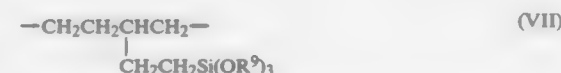
1. A moisture-curing epoxide or polyurethane resin containing at least one compound of formula I



in which R¹ is hydrogen, C₁–C₁₂-alkyl, C₅–C₇-cycloalkyl, phenyl or benzyl and R² is hydrogen or C₁–C₄-alkyl, or R¹ and R², together with the C atom to which they are attached, form a 5-membered or 6-membered ring, and R³, R⁴, R⁵ and R⁶ are identical or different and are hydrogen, C₁–C₁₂-alkyl, phenyl which is unsubstituted or monosubstituted to trisubstituted by C₁–C₄-alkyl, halogen or C₁–C₄-alkoxy, or is a group of the formula $-\text{CH}_2\text{OR}^7$ (II) in which R⁷ is C₁–C₁₂-alkyl, phenyl which is unsubstituted or monosubstituted to trisubstituted by C₁–C₄-alkyl, halogen or C₁–C₄-alkoxy, or is $-\text{C}(\text{O})-\text{R}^8$, and R⁸ is C₁–C₁₂-alkyl, and additionally not more than two of the radicals R³, R⁴, R⁵ and R⁶ are one or two groups of the formula $-\text{CH}_2\text{CH}_2\text{Si}(\text{OR}^9)_3$ (III), $-\text{CH}_2\text{OC}(\text{O})\text{CH}_2\text{CH}_2\text{Si}(\text{OR}^9)_3$ (IV), $-\text{CH}_2\text{O}(\text{C}_m\text{H}_{2m})\text{Si}(\text{OR}^9)_3$ (V) or



in which R⁹ is C₁–C₄-alkyl or phenyl and m is a number from 1 to 8 and r is a number 1 or 2 and t is 0, 1 or 2 and R¹ is as defined above, or in addition, compounds of the formula I in which R⁴ and R⁵ together form a group of the formula



in which R⁹ is as defined above and R³ and R⁶ in this case are hydrogen, n is 1 or 2, and, when n is 1, Z is the organic radical of a primary amine ZNH₂ without the NH₂ group, and, when n is 2, Z is the divalent organic radical of a diprimary diamine NH₂ZNH₂ without the two NH₂ groups; subject to the proviso that the compound of formula I contains one to three—Si(OR⁹)₃ groups.

4,874,806

EMULSION PAINT

Peter D. Kay, Hartlepool, and Keith McDonald, Middlesbrough, both of England, assignors to Tioxide Group PLC, London, England

Filed Jul. 13, 1988, Ser. No. 218,216

Claims priority, application United Kingdom, Jul. 25, 1987, 1117667

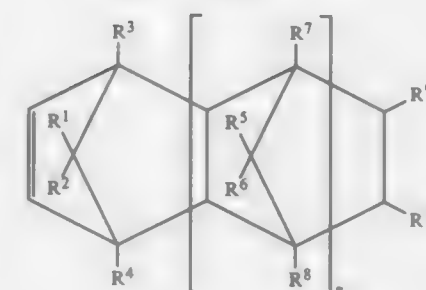
Int. Cl.⁴ C08K 5/16; C08L 31/04, 31/02; C07F 7/28

U.S. Cl. 524—204

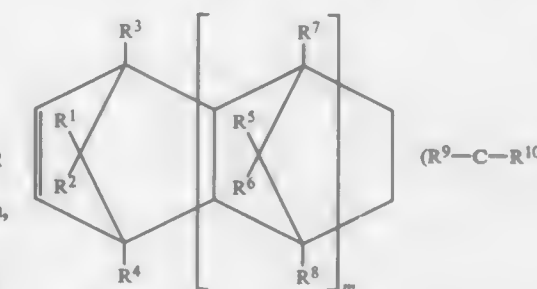
17 Claims

1. An emulsion paint which comprises an aqueous dispersion of a film-forming polymer and a titanium chelate comprising the reaction product of a titanium orthoester, a glycol or glycol ether, an alkanolamine and an alpha-hydroxy carboxylic acid.

General formula



(I)



(II)

4,874,807

SELF-LUBRICATING THERMOPLASTIC RESIN WEAR PAINT

Toshihiko Endo, and Nobuyuki Matsunaga, both of Fuji, Japan, assignors to Polyplastics Co., Ltd., Osaka, Japan

Filed May 6, 1988, Ser. No. 191,304

Claims priority, application Japan, May 8, 1987, 62-112074

Int. Cl.⁴ C08K 5/54

U.S. Cl. 524—267

3 Claims

1. A self-lubricating wear part having improved anti-friction and anti-frictional noise characteristics formed of a thermoplastic resin composition which consists essentially of (i) between 99.9 to 80.0 parts by weight of a thermoplastic polyester or polyacetal resin, and (ii) a self-lubricating effective amount between 0.1 to 20 parts by weight of a silicon oil having a viscosity of 150,000 cSt or more.

wherein n and m are each 0 or a positive integer, l is an integer of at least 3, and R¹ to R¹⁰ each represent hydrogen atom, halogen atom or hydrocarbon group.

4,874,809

REINFORCED POLYESTERS, ARTICLE THEREOF AND METHOD OF MAKING LOW WARPAGE ARTICLES

Gerald T. Keep, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 25, 1988, Ser. No. 148,242

Int. Cl.⁴ C08L 67/02

U.S. Cl. 524—449

1 Claim

1. A reinforced polyester composition useful in the production of a molded article of low warpage, said composition comprising

- (a) about 55% to about 99%, based on total polyester weight, of poly(ethylene terephthalate),
 - (b) about 1% to about 45%, based on total polyester weight, of the homopolymer poly(cyclohexanedimethylene terephthalate),
 - (c) about 5% to about 50%, based on the total weight of the composition, of glass fibers, and
 - (d) about 5% to about 50%, based on the total weight of the composition, of mica
- the total glass fiber and mica weight being less than 75% based on the total weight of the composition.

4,874,810

IMPACT MODIFIED POLYPHENYLENE ETHER-POLYAMIDE COMPOSITIONS

Gim F. Lee, Jr., Albany, N.Y.; Jean M. Heuschen, Halsteren, and Roelof Van Der Meer, Jan Van Goyenstraat, both of Netherlands, assignors to General Electric Company, Selkirk, N.Y.

Continuation-in-part of Ser. No. 837,474, Mar. 7, 1986, abandoned. This application Mar. 6, 1987, Ser. No. 22,856

Int. Cl.⁴ C08L 53/02, 71/04, 77/00

U.S. Cl. 524—505

20 Claims

1. A thermoplastic composition comprising:
A. 100 parts by weight of a base resin comprising a compatibilized polyphenylene ether resin and polyamide resin,
B. 1 to 30 parts by weight per 100 parts of base resin A. of a selectively hydrogenated diblock copolymer of the A-B

type wherein block A is an alkenyl aromatic polymer and block B is an ethylene-propylene polymer, and C. 5 to 45 weight percent of glass fibers based upon the weight of components A., B., and C. taken together.

4,874,811

ALKALINE AQUEOUS UNIVERSAL ADHESIVE CONTAINING POLY(METH)ACRYLATE
Jürgen Borchers, Lastsen, and Petra Babolz, Garbsen, both of Fed. Rep. of Germany, assigns to Pelikan Aktiengesellschaft, Hanover, Fed. Rep. of Germany
Continuation of Ser. No. 132,503, Dec. 14, 1987, abandoned.
This application Apr. 21, 1989, Ser. No. 342,699
Claims priority, application Fed. Rep. of Germany, Dec. 12, 1986, 364,244

Int. Cl.⁴ C08L 39/00

U.S. Cl. 524—516

19 Claims

1. An alkali aqueous universal poly(meth)acrylate based adhesive which consists essentially of an aqueous solution of 5 to 40% by weight of a mixture of a poly(meth)acrylate having a free carboxyl group and a degree of esterification of 0.55 to 0.85 and polyvinylpyrrolidone in a weight ratio of 10:1 to 1:5.

4,874,812

SINGLE-COMPONENT POLYURETHANE COATING MASS
Günter Müller, Thun, Switzerland; Rolf Nagel, Baden-Baden, Fed. Rep. of Germany, and Jürg Stähli, Steffisburg, Switzerland, assigns to Metallogal AG, Bern, Switzerland
Filed Mar. 2, 1988, Ser. No. 162,926
Claims priority, application European Pat. Off., Mar. 9, 1987, 8710333.1

Int. Cl.⁴ C08L 75/04

U.S. Cl. 524—712

10 Claims

1. A single-component polyurethane coating mass applicable in a dry layer up to 2000 microns thick having a non-aromatic isocyanate component, said isocyanate component comprising: a mixture containing about 50 to about 67 wt. % of an isocyanate selected from the group consisting of aliphatic di- and polyisocyanate and about 33 to about 50 wt. % of an isocyanate selected from the group consisting of cycloaliphatic di- and polyisocyanates.

4,874,813

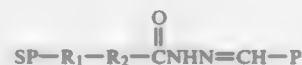
PROTEINS BOUND TO A MARKER OR SOLID PHASE SUPPORT MATRIX USING A HYDRAZONE LINKAGE
Daniel J. O'Shaughnessy, 256 Congressional La. #T3, Rockville, Md. 20851

Filed Feb. 9, 1987, Ser. No. 12,456
Int. Cl.⁴ C07G 7/00; C08L 89/00

U.S. Cl. 525—54.1

28 Claims

1. A composition having the formula:



wherein:

SP is a solid phase support matrix or marker molecule;
R₁ is a linking group;
R₂ is a spacer arm having a chain of at least six atoms, with at least one of said atoms being a tertiary amine which is protonated at a pH less than about eight, and the remaining of said atoms being carbon, oxygen, or nitrogen; and
P is a protein.

4,874,814

CROSS-LINKED POLYVINYL BUTYRAL
George E. Cartier, Springfield, and Peter H. Farmer, Longmeadow, both of Mass., assigns to Monsanto Company, St. Louis, Mo.
Continuation of Ser. No. 751,116, Jul. 2, 1985, abandoned. This application Feb. 27, 1989, Ser. No. 316,564
Int. Cl.⁴ C08F 8/00

U.S. Cl. 525—61

7 Claims

1. Polyvinyl butyral lightly cross-linked through stable intermolecular linkages wherein the extent of cross-linking is adequate to increase the viscosity of the polyvinyl butyral by about 2% to about 85% over its viscosity in the absence of such linkages said polyvinyl butyral containing 70 to 95 weight % vinyl butyral units.

4,874,815

ANIS COMPOSITIONS HAVING TRIMODAL RUBBER PARTICLE DISTRIBUTIONS
Robert A. Bubeck, Robert B. Clipper, and David E. Henton, all of Midland, Mich., assigns to The Dow Chemical Company, Midland, Mich.
Continuation of Ser. No. 697,379, Feb. 1, 1985, abandoned. This application Sep. 8, 1987, Ser. No. 96,247
Int. Cl.⁴ C08L 51/04

U.S. Cl. 525—71

10 Claims

1. An improved rubber-modified, impact resistant polymeric composition comprising:

- a matrix comprising an interpolymer, said interpolymer being polymerized from a monovinylidene aromatic monomer and an ethylenically unsaturated nitrile monomer; and
- dispersed in said matrix, in the form of discrete particles, from about 6 to about 40 weight percent, based on total polymeric composition weight, of elastomeric material wherein the improvement consists of the dispersed elastomeric material comprising the following three different grafted rubber components:
 - a component of small, emulsion polymerized particles, being from about 10 to about 90 weight percent of the total elastomeric material and having a volume average diameter from about 0.05 micron to about 0.25 micron;
 - a component of small, mass polymerized particles, being from about 5 to about 85 weight percent of the total elastomeric material, and having a volume average diameter from about 0.5 micron to about 3.0 microns; and
 - a component of large, mass polymerized particles, being from about 5.0 to about 50 weight percent of the total elastomeric material, and having a volume average diameter which is at least two times greater than the volume average diameter of the small mass polymerized particle, said volume average diameter of the large mass polymerized particle being from about 1.0 micron to about 10 microns.

4,874,816

VINYL COPOLYMERS WITH GRAFTED-ON POLYCARBONATE CHAINS, THEIR PRODUCTION AND USE
Ralf Dujardin, Wolfgang Ebert, Rolf-Volker Meyer, Klaus Berg, all of Krefeld; Ulrich Grigo, Kempen, and Wolfgang Wehnert, Krefeld, all of Fed. Rep. of Germany, assigns to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany
Filed May 13, 1988, Ser. No. 194,648
Claims priority, application Fed. Rep. of Germany, May 22, 1987, 3717172

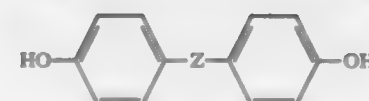
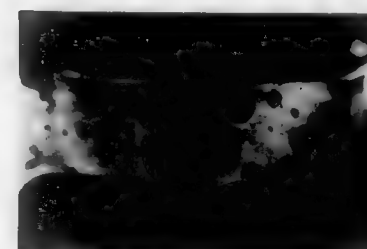
Int. Cl.⁴ C08L 69/00

U.S. Cl. 525—146

3 Claims

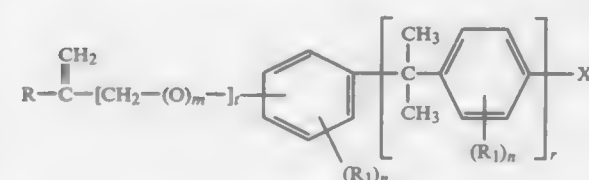
1. A mixture of
(A) 70 to 20% by weight of a thermoplastic aromatic poly-

carbonate based on diphenols corresponding to the following formula



in which Z is a single bond, a C₁-C₈ alkylene radical, C₂-C₁₂ alkylidene radical, a cyclohexylidene radical, a benzylidene radical, a methylbenzylidene radical, a bis-(phenyl)-methylene radical, —S—, —SO₂—, —CO— or —O—, having Mw values (weight average molecular weights determined in known manner via the relative solution viscosity) of 15,000 to 120,000 and

- 30 to 80% by weight of a thermoplastic polystyrene having an Mw value (weight average molecular weight determined in known manner by gel permeation chromatography) of 20,000 to 400,000, characterized in that they contain 0.5% by weight to 15% by weight, based on 100% by weight of (A)+(B), of a vinyl copolymer with a grafted-on polycarbonate chain of which the vinyl copolymer graft base has a number average molecular weight as determined by gel permeation chromatography of 45,000 to 95,000 and the polycarbonate chain has a degree of polycondensation of recurring carbonate structural units of 35 to 70 and in which the ratio by weight of vinyl copolymer graft base to grafted on polycarbonate chain is between 35% by weight to 65% by weight an 55% by weight to 45% by weight, characterized in that 95 mol % to 99.5 % of styrene and 5 mol % to 0.5 mol % of compounds corresponding to the following formula



in which R is a hydrogen atom or C₁-C₄-alkyl, R₁ is Cl, Br, C₁-C₄-alkyl, cyclohexyl or C₁-C₄-alkoxy, m is 0 or 1, n is 0, 1 or 2, r is 0 or 1, t is 0 or 1 and x is —O—Si(CH₃)₃, are copolymerized in known manner by radically initiated mass polymerization to a number average molecular weight of 45,000 to 95,000 and the polymer is subsequently reacted without isolation with diphenols, phosgene and monophenols under the conditions of the two-phase interfacial process in aqueous alkaline phase with addition of an inert organic solvent, the quantity of diphenol being selected so that the content of polycarbonate chain in the grafted vinyl copolymer is between 65% and 45% by weight based on the total weight of the grafted vinyl copolymer, including grafted-on polycarbonate chain and the quantity of said monophenols being gauged so that the average chain length of the grafted-on polycarbonate chain comprises 35 to 70 recurring carbonate structural units and the quantity of inert organic solvent having to be gauged in such a way that the final viscosity of the

organic phase of the reaction mixture is between 5 and 25 mPa.s.

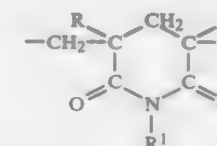
4,874,817

COMPOSITIONS OF IMIDIZED ACRYLIC POLYMERS AND POLYAMIDES
Harold K. Inskip, Newark, and Marion G. Waggoner, Hockessin, both of Del., assigns to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Continuation-in-part of Ser. No. 376,230, May 7, 1982, abandoned. This application Mar. 23, 1983, Ser. No. 476,092
Int. Cl.⁴ C08L 77/00

U.S. Cl. 525—183

7 Claims

- A molding blend comprising about 40-95 volume percent of a polyamide resin of molecular weight of at least 15000 and complementally, about, 60-5 volume percent of an imidized acrylic resin, said imidized acrylic resin containing at least 10% by weight recurring imide units of the formula



wherein R is hydrogen or hydrocarbyl of 1-20 carbon atoms; and R₁ is —CH₃ or H.

4,874,818

PRIMER COMPOSITIONS
Shosaku Yamamoto; Kazuo Kakinuma; Hiroshi Ishioka, all of Yokohama; Fumio Sodeyama, Chigasaki; Junji Mayumi, Tsu City, and Riehiro Maruta, Yokkaichi, all of Japan, assigns to Nippon Oil and Fats Co., Ltd., Tokyo, Japan
Filed Jul. 28, 1987, Ser. No. 78,854
Claims priority, application Japan, Aug. 21, 1986, 61-194076
Int. Cl.⁴ C08L 31/02, 35/06

U.S. Cl. 525—183

2 Claims

- A primer composition consisting essentially of a polycaprolactone graft copolymer having a primary hydroxyl group, said copolymer being obtained by graft-polymerizing a styrenebutadiene-styrene block copolymer or it hydrogenated copolymer with a ring opened polymer of ε-caprolactone and a hydroxyl group-containing acrylic or methacrylic ester, said composition having a grafting ratio of said ring opened polymer within the range of 0.5-50% by weight.

4,874,819

POLYMER BLEND
Eric R. George, Houston, Tex.; Robert G. Lutz, Santa Rosa, Calif., and Edgar J. Smutny, Houston, Tex., assigns to Shell Oil Company, Houston, Tex.
Continuation-in-part of Ser. No. 135,429, Dec. 21, 1987, abandoned. This application Jun. 8, 1988, Ser. No. 203,960
Int. Cl.⁴ C08L 23/00, 33/02, 101/06

U.S. Cl. 525—185

13 Claims

- A composition comprising a non-miscible blend of a linear alternating polymer of carbon monoxide and at least one ethylenically unsaturated hydrocarbon of from 2 to 20 carbon atoms inclusive and an ethylene-α,β-ethylenically unsaturated carboxylic acid copolymer, said α,β-ethylenically unsaturated carboxylic acid having up to 10 carbon atoms, wherein the amount of said ethylene-α,β-ethylenically unsaturated carboxylic acid copolymer is 0.01% to 35% by weight based on the total blend.

4,874,820

COPOLYMER COMPOSITIONS CONTAINING A NARROW MWD COMPONENT AND PROCESS OF MAKING SAME

Charles Cosewitz, Westfield; Shiaw Ju, Edison, and Gary W. Verstrate, Matawan, all of N.J., assignors to Exxon Research and Engineering Company, Linden, N.J.

Continuation-in-part of Ser. No. 840,562, Dec. 26, 1985, which is a continuation-in-part of Ser. No. 681,951, Dec. 14, 1984, abandoned, which is a continuation-in-part of Ser. No. 504,582, Jan. 15, 1983, Pat. No. 4,540,753. This application Dec. 27, 1985, Ser. No. 813,725

Int. Cl.⁴ C08L 23/16, 23/18, 23/26

U.S. Cl. 525—240

9 Claims

1. An ethylene alpha-olefin copolymer composition comprising:

- (a) a first copolymer having at least one of $\overline{M}_w/\overline{M}_n$ less than 2 and $\overline{M}_w/\overline{M}_n$ less than 1.8; and
- (b) a second copolymer having $\overline{M}_w/\overline{M}_n$ greater than or equal to 2, wherein said first copolymer is an ethylene alpha-olefin copolymer formed of monomers comprising 3-18 carbon atoms, wherein 95 weight percent of the copolymer chains of the first copolymer have an ethylene composition that differs from the average weight percent ethylene composition of the first copolymer by not more than 15 weight percent, and wherein at least 2 portions of essentially each copolymer chain of the first copolymer, each portion comprising at least about 5 weight percent of the chain, differ in composition from one another by at least about 5 weight percent ethylene.

4,874,821

BLOCK COPOLYMER AND PROCESS FOR PREPARING IT

Enrico Agostinis, Milan; Sergio Castro, Ravenna, and Alessandro Zazzetta, Cesena, all of Italy, assignors to Enichem Elastomeri S.p.A., Palermo, Italy

Filed Nov. 5, 1987, Ser. No. 117,631

Claims priority, application Italy, Jul. 31, 1987, 21563 A/87

Int. Cl.⁴ C08F 297/04

U.S. Cl. 525—271

8 Claims

1. Linear copolymer consisting of four alternating blocks, endowed with a good balance between mechanical properties, rheologic properties and properties of resistance to thermooxidation, having the following general formula:

B1-A1-B2-A2

wherein:

B1 and B2 are polydienic blocks, and
A1 and A2 are polyvinylaromatic blocks, having a weight average molecular weight of from 30,000 to 250,000, and a global content of monomer butadiene units of from 40 to 80% by weight, wherein the weight average molecular weight of B1 block is from 0.1 to 0.5 times the weight average molecular weight of B2 block, and the weight average molecular weight of A1 block is from 0.25 to 2.0 times the weight average molecular weight of A2 block, and which furthermore contains between B1 and A1 blocks a copolymer moiety formed by randomly linked monomer dienic and vinylaromatic units, characterized in that said copolymer moiety represents from 5 to 15% of the weight of the total copolymer.

4,874,822

PROCESS FOR THE ACRYLAMIDOACYLATION OF ALCOHOLS

Jerald K. Rasmussen; Steven M. Heilmann; Larry R. Krepaki, and Dean M. Moren, all of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 7, 1988, Ser. No. 178,507

Int. Cl.⁴ C08F 8/30; C07C 102/00, 103/133

U.S. Cl. 525—279

22 Claims

1. A process comprising the steps of
(a) reacting an alkenyl azlactone, a hydroxy functional compound, and a catalytically effective amount of a bicyclic amidine or a trivalent phosphorus compound, and
(b) isolating the resulting acrylamide or methacrylamide functional monomer, oligomer, or polymer.

4,874,823

CHLORINATED POLYVINYL CHLORIDE-VINYL ACETATE COPOLYMERS HAVING GOOD LOW AND HIGH TEMPERATURE STABILITY

Bernard F. Clnadr, Brecksville, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Nov. 25, 1987, Ser. No. 125,423

Int. Cl.⁴ C08F 8/22

U.S. Cl. 525—329.2

11 Claims

1. A chlorinated vinyl chloride-vinyl component type copolymer having low temperature stability, comprising: the chlorinated vinyl chloride-vinyl component type copolymer, said copolymer containing from about 57 percent to about 65 percent by weight of chlorine therein, said copolymer containing from about 70 percent to about 95 percent by weight of vinyl chloride repeating units therein based upon the total number of vinyl chloride and vinyl component repeating units and, from about 5 percent to about 30 percent by weight of vinyl component repeating units therein based upon the total weight of vinyl chloride repeating units and vinyl component repeating units, said vinyl component repeating unit made from monomers of vinyl acetate, methyl acrylate, methyl methacrylate, vinylidene chloride, alpha-methylstyrene, styrene, acrylonitrile, and combinations thereof, said chlorinated polyvinyl chloride-vinyl acetate type copolymer having a stability of 120° C. for 20 minutes as measured by hydrogen chloride elimination of 0.0050 mole percent or less.

4,874,824

PROCESS FOR MANUFACTURING LOW-ACID, GLUTARIC-ANHYDRIDE-CONTAINING COPOLYMERS

Michael P. Hallden-Abberton, Maple Glen; Leslie A. Cohen, Langhorne, Pa., and Robert S. Wood, Holland, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Nov. 23, 1987, Ser. No. 123,683

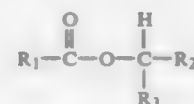
Int. Cl.⁴ C08F 8/00

U.S. Cl. 525—379

19 Claims

1. A process for preparing thermoplastic copolymers of glutaric anhydride and (meth)acrylic ester, which process comprises reacting

(a) a (meth)acrylic ester polymer polymerized from monomers having the formula



wherein R_1 is $\text{CH}_2=\text{CH}-$ or $\text{CH}_2=\text{C}(\text{CH}_3)-$

and R_2 and R_3 are independently selected from among H,

alkyl, cycloalkyl, aryl, alkaryl and aralkyl groups, the total of carbon atoms in R_2 and R_3 being from 0 to 21, with
(b) a secondary amine selected from among dialkylamines, diarylamines and alkylarylamines, at a temperature of from about 150° to about 400° C., and subsequently isolating the polymer product.

4,874,825

POLYMER BLEND OF CARBON MONOXIDE OLEFIN COPOLYMER AND POLYETHER ESTERAMIDE POLYMER

William P. Gergen, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Jan. 20, 1988, Ser. No. 208,437

Int. Cl.⁴ C08G 67/02

U.S. Cl. 525—425

13 Claims

1. A composition comprising a non-miscible blend of, as a major component, a linear alternating polymer of carbon monoxide and at least one ethylenically unsaturated hydrocarbon and, as a minor component, a polyether esteramide polymer.

4,874,826

METHOD OF PREPARING POLYPHENYLENE OXIDE COMPOSITION AND LAMINATES USING SUCH COMPOSITIONS

Takaaki Sakamoto, Yawata; Munehiko Itoh, Kobe, and Shuji Maeda, Yawata, all of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 896,964, Sep. 21, 1987, which is a continuation of Ser. No. 840,753, Mar. 18, 1986, abandoned.

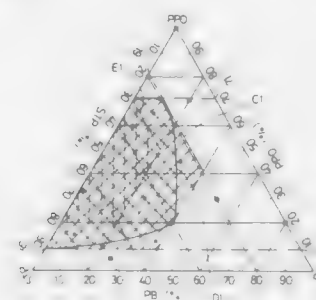
This application Feb. 19, 1988, Ser. No. 157,936

Claims priority, application Japan, Mar. 25, 1985, 60-61542; Mar. 25, 1985, 60-61543; Mar. 25, 1985, 60-61544; Mar. 25, 1985, 60-61545; Mar. 25, 1985, 60-61546; Mar. 25, 1985, 60-61547; Mar. 25, 1985, 60-61548; Jun. 15, 1985, 60-130158

Int. Cl.⁴ C08F 283/00

U.S. Cl. 525—534

44 Claims



1. A method of preparing a film-forming polyphenylene oxide composition, comprising: mixing from above 7 and below 93 weight % of polyphenylene oxide, above 7 and below 93 weight of a setting means selected from the group consisting of a crosslinking monomer, a crosslinking polymer, and mixtures thereof, and an initiator; and allowing said setting means and said initiator to crosslink so as to provide said composition with the ability to form a film.

PRODUCTION OF HIGHLY-DISPERSIBLE WATER-SOLUBLE POLYMERS

Ratana Kanhon, Geolphi, and Brigitte H. Licht, Burlington, both of Canada, assignors to Hart Chemical Limited, Geolphi, Canada

Continuation-in-part of Ser. No. 169,115, Mar. 9, 1988, abandoned, which is a continuation of Ser. No. 2,997, Jan. 13, 1987. This application Aug. 24, 1988, Ser. No. 235,505

Int. Cl.⁴ C08F 2/00

U.S. Cl. 526—214

14 Claims

1. A process for preparing a highly-dispersible particulate water-soluble polymer having a molecular weight in the range of about 50,000 to about 15,000,000, which comprises:

forming an aqueous reaction mixture comprising at least one vinyl monomer having a concentration of about 30 to about 70 wt. %, at least one surfactant selected from the group consisting of anionic, non-ionic and cationic surfactants in an amount of about 50 to about 15,000 ppm based on the weight of monomer, at least one ultraviolet light-decomposable free-radical initiator in an amount of about 40 to about 200 ppm based on the weight of monomer, at least one heat-decomposable free-radical initiator in an amount of about 50 to about 500 ppm based on the weight of monomer, and at least one chain transfer agent in an amount of about 5 to about 25,000 ppm based on the weight of monomer;

sequentially polymerizing said monomer solution by first irradiating with long wavelength ultraviolet radiation to activate said ultraviolet light-decomposable free radical initiator, and when said monomer mixture reaches a temperature which activates said heat-decomposable initiator, discontinuing said irradiation and allowing the polymerization to continue to completion; and

particulating the resulting polymer to produce a water-dispersible particulate water-soluble polymer having resistance to agglomeration and gel formation upon contact with water.

4,874,828

HEAT RESISTANT THERMOSETTING PHOSPHAZENE-IMIDE COPOLYMERS

Alexander Lakacs, III, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

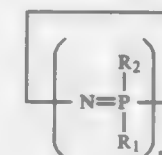
Filed Oct. 1, 1987, Ser. No. 104,150

Int. Cl.⁴ C08F 222/40

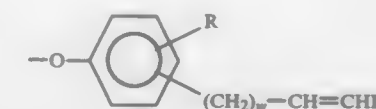
U.S. Cl. 526—262

4 Claims

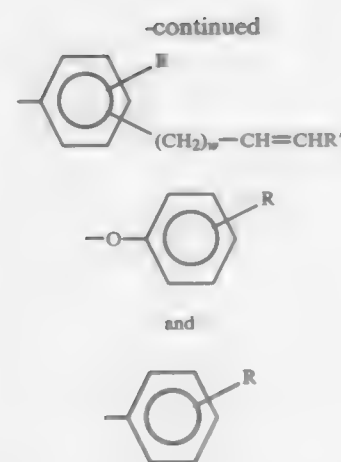
2. A crosslinked thermoset polymer which comprises a heat-catalyzed reaction product of a bis-maleimide based di-nophile and a cyclophosphazene having the general formula:



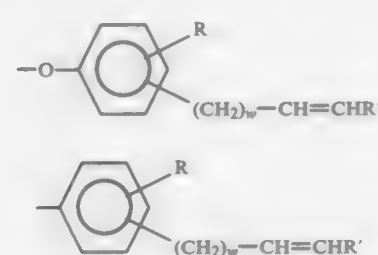
where n is 3 or 4 and R_1 and R_2 are the same or different and are selected from the group consisting of:



(a)



where $w=0$ or 1 , and R and R' are H or a nonreactive moiety, and the average degree of substitution per cyclophosphazene ring by R_1 and R_2 radicals selected from the group consisting of:



is at least two.

4,874,829

PROCESS FOR PREPARING

α -METHYLSTYRENE-ACRYLONITRILE POLYMERS
Chris E. Schwier, Northampton, and Wan C. Wu, Longmeadow, both of Mass., assignors to Monsanto Company, St. Louis, Mo.

Filed May 22, 1987, Ser. No. 53,222
Int. Cl.⁴ C08F 212/12, 220/44

U.S. Cl. 526-262

7 Claims

1. A method of forming a polymer of α -methylstyrene and acrylonitrile which comprises: polymerizing by free radical polymerization α -methylstyrene and acrylonitrile monomers, and optionally, in minor amount, one or more other monomers copolymerizable therewith, in a substantially uniform, homogeneous reaction medium containing a concentration of unpolymerized α -methylstyrene which is lower by at least 5 weight % than the concentration of α -methylstyrene in the polymer being simultaneously formed, said monomers fed and said polymer withdrawn from the reaction medium continuously, the polymerization rate of said monomers being at least about 20% faster than the rate under azeotropic conditions.

4,874,830

ACRYLIC COPOLYMER AND SKIN PROTECTIVE

Izumi Saitoh, Hyogo; Shigeru Kido, Osaka; Yoshio Sasaki, and Syuichiro Shinohara, both of Fukui, all of Japan, assignors to Shionogi & Co., Ltd., Osaka and Nissin Chemical Co., Ltd., Fukui, both of Japan

Filed Oct. 19, 1987, Ser. No. 109,619
Claims priority, application Japan, Oct. 23, 1986, 61-253071; Oct. 23, 1986, 61-253072

Int. Cl.⁴ C08F 120/12

U.S. Cl. 526-318.4

4 Claims

1. A skin-protective acrylic copolymer of ethyl acrylate and methacrylic acid wherein the weight ratio of ethyl acrylate to

methacrylic acid is in a range between 75:25 and 95:5, said copolymer containing therein residual monomers in amounts of 50 ppm or less, but substantially no surfactants.

(b)

(c)

(d)

4,874,831

ROOM-TEMPERATURE-CURED POLYURETHANES AND POLYUREAS

David W. House, Arlington Heights, and Ray V. Scott, Jr., Addison, both of Ill., assignors to UOP, Des Plaines, Ill.

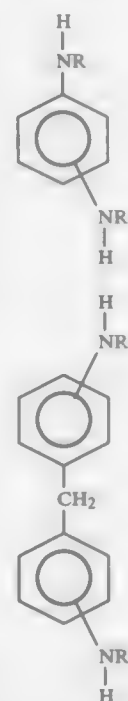
Filed Jun. 17, 1988, Ser. No. 208,355

Int. Cl.⁴ C08G 18/18

U.S. Cl. 528-48

32 Claims

1. A method of coating an object of metal, masonry, glass, wood, or plastic comprising applying to a surface of said object a polyurethane or polyurea composition resulting from the reaction at ambient conditions of a polyol or polyamine, a polyisocyanate and a primary amine-free curing composition comprising an aromatic alkyl-substituted secondary polyamine having a structure selected from the group consisting of



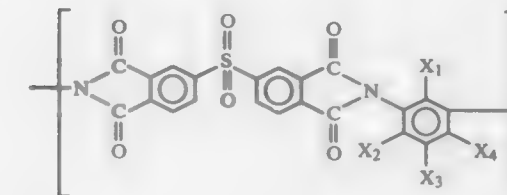
4,874,834

(3) COLORLESS TRANSPARENT POLYIMIDE SHAPED ARTICLE AND PROCESS FOR PRODUCING THE SAME
Kazami Higashi, and Yuzuru Noda, both of Osaka, Japan, assignors to Nitto Electric Industrial Co., Ltd., Osaka, Japan
Filed Mar. 6, 1987, Ser. No. 22,898
Int. Cl.⁴ C08G 69/26

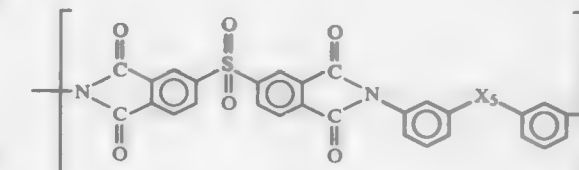
U.S. Cl. 528-176

11 Claims

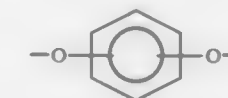
1. A colorless transparent polyimide shaped article comprising as a main component at least one recurring unit selected from the group consisting of a recurring unit represented by formula (I)



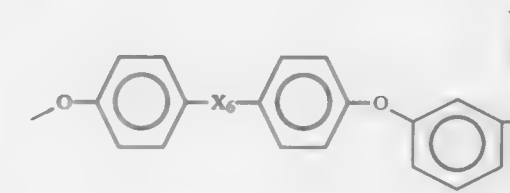
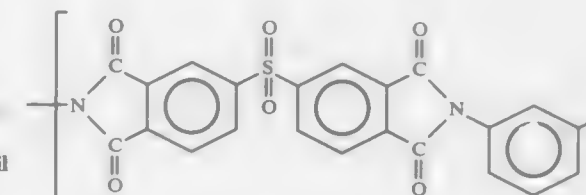
wherein X_1 , X_2 , X_3 and X_4 , which may be the same or different, each represents $-H$, $-CH_3$, $-C_2H_5$, $-NO_2$, $-F$, $-COOH$ or $-Cl$ a recurring unit represented by formula (II)



wherein X_5 represents $-O-$, $-SO_2-$, $-CH_2-$, $-S-$, $-CO-$ or

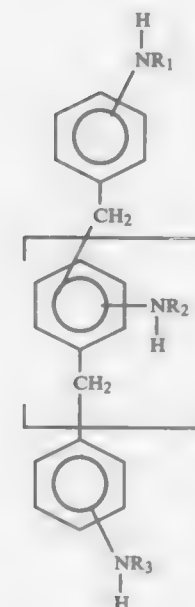


and
a recurring unit represented by formula (III)



wherein X_6 represents $-SO_2-$, $-C(CH_3)_2-$ or $-C(CF_3)_2-$.

-continued



where each alkyl group R , R' , R_1 , R_2 and R_3 may be independently selected, R_2 and one of R_1 and R_3 may also be H and contains from 1 to about 20 carbon atoms, in the presence of a catalytic composition comprising an aliphatic carboxylic acid and an organometallic catalytic compound.

4,874,832

MICROCAPSULES HAVING POLYURETHANE WALLS
Gert Jabs, Odenthal, Fed. Rep. of Germany, and Adolf Richartz, Apapa, Nigeria, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany
Continuation of Ser. No. 105,853, Oct. 7, 1987, abandoned. This application Dec. 9, 1988, Ser. No. 282,182

Claims priority, application Fed. Rep. of Germany, Oct. 22, 1986, 3635822

Int. Cl.⁴ C08G 18/30

U.S. Cl. 528-60

8 Claims

1. A single walled microcapsule having a single polyurethane containing in which at least 50% of the capsule wall consists of a polyurethane which is obtained by reacting a diisocyanate and/or polyisocyanate with a polyether polyol which contains at least one tertiary amino group.

4,874,833

COMPOSITION CONTAINING EPOXY RESIN AND ALKYL HINDERED POLYAROMATIC DIAMINE AND MONOAROMATIC AMINE CURING AGENTS

Jacqueline A. Kershaw, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Aug. 22, 1988, Ser. No. 234,712

Int. Cl.⁴ C08L 63/10

U.S. Cl. 528-90

20 Claims

1. A curable epoxy resin composition comprising
(a) a low viscosity liquid epoxy resin;
(b) an alkyl hindered aromatic primary diamine curing agent having at least two aromatic rings;
(c) an amine cure accelerator;
(d) a liquid monoaromatic primary amine curing agent;
(e) at least one reactive ethylenically unsaturated monomer; and
(f) a peroxide polymerization initiator.

4,874,835

POLYETHERIMIDES AND PRECURSORS THEREOF FROM OXYDIPHTHALIC ANHYDRIDE DIESTER AND A MIXTURE OF DIAMINES

Donald R. Berdahl, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 95,962, Sep. 14, 1987, abandoned. This application Jul. 15, 1988, Ser. No. 223,746

Int. Cl.⁴ C08G 73/10

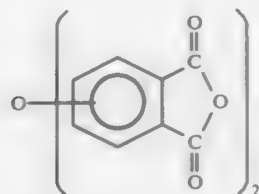
U.S. Cl. 528—179

17 Claims

1. A method for preparing a polyetherimide precursor composition which comprises blending, at a temperature up to about 50° C., reagents consisting of:

(A) a mixture of at least two diamines selected from the group consisting of m-phenylenediamine, p-phenylenediamine and 4-aminophenyl ether, each of said diamines being present in the amount of about 25–75 mole percent of said mixture; and

(B) the esterification product of the reaction of (B-1) at least one ether tetracarboxylic acid dianhydride of the formula



and (B-2) at least one alkanol of the formula R¹OH, wherein R¹ is a C₁₋₄ primary or secondary alkyl radical; reagent B-2 being employed in the amount of about 10–20 moles per mole of reagent B-1; said esterification product being principally a tetracarboxylic acid diester with one carboxy group on each benzene ring esterified.

4,874,836

THERMOPLASTIC WHOLLY AROMATIC POLYIMIDE ESTERS AND PROCESS FOR PRODUCING THE SAME

Makoto Wakabayashi, Kenichi Fujiwara, and Hideo Hayashi, all of Chiba, Japan, assignors to Idemitsu Petrochemical Co., Ltd., Tokyo, Japan

Filed Oct. 26, 1988, Ser. No. 262,796

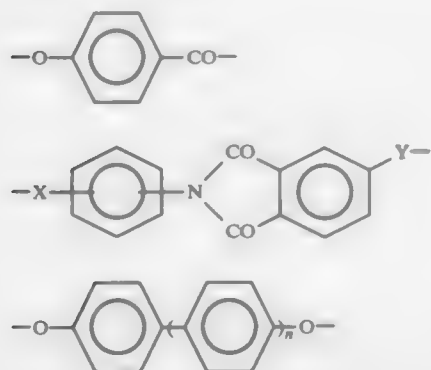
Claims priority, application Japan, Oct. 28, 1987, 62-270380; Jun. 2, 1988, 63-134484

Int. Cl.⁴ C08G 69/44

U.S. Cl. 528—185

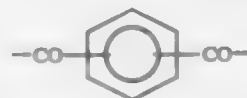
10 Claims

1. A thermoplastic wholly aromatic polyimide ester consisting essentially of structural units represented by the general formulas I, II, III, and IV:



-continued

IV



wherein X and Y are either —O— or —CO— and are either identical with or different from each other, n is an integer of 0 or 1, X group and imide group in unit II are present at para or meta position to each other, two carbonyl groups in unit IV are present at para or meta position to each other, and each end of units I, II, III, and IV is bonded to another end through ester bond, and wherein the polyimide ester has a melt viscosity of 1.0 to 1.0×10⁵ Pa-s measured at a shear stress of 0.025 MPa and a temperature of 300° to 400° C.

4,874,837

AMINATED HYDROXYLATED POLYESTER POLYOL RESIN AND MOLDING COMPOSITIONS COMPRISED THEREOF

James P. Berahas, Newark, Ohio, and Russell H. Tobias, Valparaiso, Ind., assignors to Owens-Corning Fiberglass Corporation, Toledo, Ohio

Filed Jan. 11, 1988, Ser. No. 141,808

Int. Cl.⁴ C08G 69/44; C08F 20/00

U.S. Cl. 528—291

17 Claims

1. An aminated, hydroxylated polyester polyol resin comprising the product of a reaction of:

- an acid anhydride selected from the group including maleic acid anhydride or a mixture of maleic acid anhydride and a polyfunctional acid anhydride having at least 2 functional hydroxyl groups;
- a low molecular weight polyether polyol having a molecular weight of about 100 to about 600 selected from the group including diethylene glycol or a mixture of diethylene glycol and at least one other polyether polyol having a molecular weight of about 100 to about 600; wherein (a) and (b) are reacted together to form a prepolymer;
- a lower alkylene oxide having from 2 to 4 carbon atoms; wherein the prepolymer is reacted with (c) to form an unsaturated polyester intermediate resin; and
- a mono- or di-functional amino compound selected from the group including diethanolamine or a mixture of diethanolamine and at least one mono- or di-functional amino compounds containing at least one isocyanate reactive group attached to the nitrogen of the mono- or di-functional amino compound; wherein the Michael Addition Reaction is used to add (d) across double bonds of the unsaturated polyester intermediate resin to form the aminated, hydroxylated polyester polyol resin.

4,874,838

LIQUID CRYSTAL COPOLYETHERS FROM 7-OXA-BICYCLO-(2,2,1)-HEPTANE

Leonardo Fiore, Milan; Giuseppe Motroni, Novara, and Mauro Maritano, Como, all of Italy, assignors to Montedison S.p.A., Milan, Italy

Filed Sep. 11, 1987, Ser. No. 95,596

Claims priority, application Italy, Sep. 15, 1986, 21697 A/86

Int. Cl.⁴ C08G 65/08, 65/24

U.S. Cl. 528—406

7 Claims

- Copolyethers displaying anisotropic liquid-crystal properties in the molten state consisting of copolymers of 7-oxa-bicyclo(2,2,1)heptane, optionally substituted in the 2-, 3-, 5-, and/or 6-positions with alkyl radicals having 1 or 2 carbon atoms, with one or more single ring cycloaliphatic ether(s) having the formulae:

4,874,841

PARTICULATE POLYMER AND PREPARATION PROCESS THEREOF

Teruhiko Sugimori, Fumio Suzuki, Hideaki Habara, and Hiromasa Inada, all of Ohtake, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Aug. 19, 1986, Ser. No. 898,018

Claims priority, application Japan, Aug. 21, 1985, 60-181820; Aug. 30, 1985, 60-191399

Int. Cl.⁴ C08J 3/16

U.S. Cl. 528—491

8 Claims

1. A process for preparing a particulate polymer by the agglomeration of polymer particles contained in a polymer latex obtained by emulsion polymerization, said polymer being a 5–80 wt. % elastomer component containing copolymer and said particulate polymer being composed of primary particles and/or secondary particles, said primary particles being in the form of a compact mass substantially free of voids and having particle sizes of at least 20 μm and said secondary particles being formed by the agglomeration of at least some of said primary particles, which process comprises:

mixing by stirring or shaking a mixture of the polymer latex having a solids content of 5–60 wt. % with an amount of a coagulant sufficient to coagulate the polymer latex and an organic liquid having low solubility in water and being capable of dissolving at least one homopolymer of the individual monomers constituting the polymer which solvent is a member selected from the group consisting of aromatic hydrocarbons, alkyl substituted derivatives thereof, halogenated hydrocarbons and isobutyl ketone, wherein the volume proportion of the polymer in the entire mixture is 3% or higher and the organic liquid is mixed in an amount of 3–40 parts by weight per 100 parts by weight of the polymer solids contained in the polymer latex.

4,874,842

PROCESS FOR CURING THERMOSETTING RESINS BY MEANS OF A LIQUID HEAT TRANSMITTER

Ken Johns, Asford, Great Britain; Alberto Re, and Gianangelo Bargigia, both of Milan, Italy, assignors to Ausimont S.p.A., Milan, Italy

Filed Apr. 13, 1988, Ser. No. 180,892

Claims priority, application Italy, Apr. 17, 1987, 20167 A/87

Int. Cl.⁴ C08G 59/14

U.S. Cl. 528—494

6 Claims

1. A process for the thermal vulcanization of thermosetting resins or vulcanizable elastomers or polymers characterized in that an article to be vulcanized is brought into contact with a process liquid at a predetermined temperature for a time sufficient to obtain a complete vulcanization, said liquid belonging to the class of the perfluoropolyethers.

4,874,843

CHROMATOGRAPHIC PURIFICATION PROCESS

Patrick J. Baker, Greenwood, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Dec. 3, 1987, Ser. No. 128,351

Int. Cl.⁴ C07K 1/14

U.S. Cl. 530—317

11 Claims

1. A process for purifying fermentation products which comprises:

- contacting an aqueous solution of a fermentation product with a non-functionalized macroporous copolymer of styrene and divinylbenzene in aqueous phase;
- physically removing the water from the charged resin;
- rewetting the charged resin with a polar organic solvent;
- washing the resin with a polar organic solvent that is the same as or different than the polar organic solvent used in step (C) to remove non-uv impurities;
- eluting the fermentation product from the non-functional resin by increasing the polarity of the solvent; and



(II)

wherein R₁ and R₂ are equal to or different from each other and represent H, a halogen, an alkyl radical having 1 or 2 carbon atoms in which one or more hydrogen atoms are optionally replaced by halogens, a phenyl radical or a substituted phenyl radical, and wherein the 7-oxa-bicyclo(2,2,1)heptane is present in a molar amount from 80 to 98% in said copolyethers.

4,874,839

STABILIZATION OF POLY(ARYLENE ETHER KETONES)

Wayne Montoya, Newark, and Robert H. Reamey, Menlo Park, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Filed Aug. 5, 1988, Ser. No. 229,082

Int. Cl.⁴ C08F 6/00

U.S. Cl. 528—480

12 Claims

1. A method of stabilizing a poly(arylene ether ketone), comprising heating the poly(arylene ether ketone) at a temperature between about 240° C. and about 325° C. for a period of between about 0.5 and about 24 hours, prior to any melt-processing of the poly(arylene ether ketone).

4,874,840

STABILIZATION OF POLY(ARYLENE ETHER KETONES)

Paul Becker, San Bruno, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

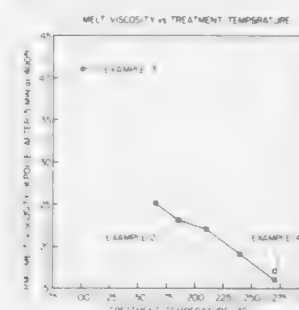
Filed Aug. 5, 1988, Ser. No. 229,083

The portion of the term of this patent subsequent to Oct. 17, 2006, has been disclaimed.

Int. Cl.⁴ C08G 8/02, 14/00

U.S. Cl. 528—480

14 Claims



f. recovering the fermentation product.

4,874,844

TRIPEPTIDE WITH IMMUNOSTIMULATING ACTIVITY
Brunetto Brunetti, Milan, and Marco Prada, Casalpusterleno, both of Italy, assignors to Ellem Industria Farmaceutica S.p.A., Milan, Italy

Filed Apr. 6, 1987, Ser. No. 35,045

Claims priority, application Italy, Apr. 9, 1986, 20026 A/86
Int. Cl.⁴ C07K 5/08

U.S. Cl. 530—331

3 Claims

1. A tripeptide consisting of L-Arg (arginine), L-Lys (lysine) and L-Glu (glutamic acid) and having the following structure: Arg-Lys-Glu or a pharmaceutically acceptable salt thereof.

4,874,845

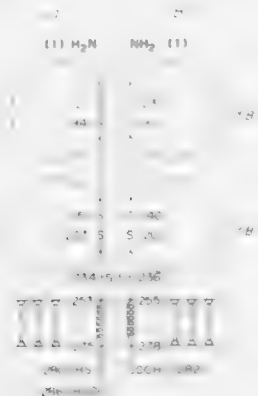
T LYMPHOCYTE RECEPTOR SUBUNIT

Harno Saito, Arlington; David M. Kranz, Somerville; Herman N. Eisen, Waban, and Susumu Tonegawa, Chestnut Hill, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Jun. 13, 1984, Ser. No. 620,122

Int. Cl.⁴ C07K 13/00; C12P 21/00; C12N 15/00; C07H 15/12
U.S. Cl. 530—395

16 Claims



5. A cDNA sequence sufficiently homologous to a nucleotide sequence encoding a polypeptide component of a mammalian T-lymphocyte receptor gamma subunit to be isolated by hybridization, said protein comprising a variable region having a cysteine residue, a constant region having two cysteine residues, a region joining the variable and constant region having a cysteine residue, a transmembrane region having predominantly cationic amino acids and a cysteine residue, having a molecular weight of 33,000 daltons and being devoid of N-X-S/T glycosylation sites when said protein is produced by an alloreactive Cytotoxic-T lymphocyte clone 2C of BALB.B origin and specific for the D end of the BALB/c H-2 complex (d haplotype).

8. The cDNA sequence of claim 5 wherein said sequence encodes a polypeptide component of a protein specific to the surface of a human T lymphocyte.

4,874,846

PROCESS FOR THE PREPARATION OF ARYOXYBENZOIC ACIDS CONTAINING A SULFONAMIDE GROUP

Alain Chene, Lyon, France, assignor to Rhone-Poulenc Agrochimie S.A., Lyon, France

Continuation of Ser. No. 563,033, Dec. 19, 1983, abandoned.

This application May 26, 1987, Ser. No. 54,411

Claims priority, application France, Dec. 17, 1982, 82 21509; Feb. 17, 1983, 83 02807

Int. Cl.⁴ C07B 45/04

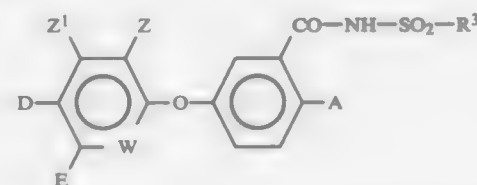
U.S. Cl. 534—560

26 Claims

1. A process for preparing a 3-(phenoxy)-N-sulphonylbenza-

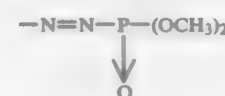
midic comprising reacting (i) the corresponding 3-phenoxybenzoic acid with (ii) a sulphonamide in liquid phase in the presence of a halogenating agent POCl₃, and in the absence of an acid acceptor, said reaction forming a hydrochloric acid and a 3-(phenoxy)-N-sulphonylbenzamide, said reaction taking place at a temperature such that the hydrochloric acid is removed progressively in gaseous form from the reaction medium as it is formed.

4. A process for preparing an end product compound having the formula:



wherein:

A is selected from: hydrogen; fluorine; chlorine; bromine; iodine; nitro; —N=NCF₃; PO₃H₂; PO₃alkyl, the alkyl group having from 1 to 4 carbon atoms; NH₂; NHOH; N⁺; a carboxyl group; a carboxylic alkyl ester; a carboxylic amide; a carboxylic salt; a monoalkylamino group; a dialkylamino group; NH—CO—R¹, wherein R¹ is selected from the group consisting of an alkyl radical, an alkoxy radical, a monoalkylamino group and a dialkylamino group; an alkyl group; a trialkyl-ammonium group; NHO₂R² where R² is selected from the group consisting of alkyl and phenyl; NHCONHSO₂R²; an alkylthio group; an alkylsulphanyl group; an alkylsulphonyl group; a cyanosulphonyl group; a hydroxyl group; an alkanoyloxy group; an alkoxy group; an alkoxy substituted by alkoxycarbonyl; SH; a nitroso group; —SCN; an azide group; CF₃;



and an acyl group;
Z is selected from: hydrogen; fluorine; chlorine; bromine; iodine; an alkyl group; an alkoxy group; an alkylsulphanyl group; an alkylsulphonyl group; CF₃; NO₂; cyano; NH₂; NHCOR¹; and CONH₂;

Z¹ is selected from: hydrogen; halogen; an alkylamino group and a dialkylamino group;

D is selected from: fluorine; chlorine; bromine; iodine; an alkylthio group; an alkylsulphanyl group; an alkylsulphonyl group; a halogenoalkyl group; a sulphonyl group; a formyl group; an alkylcarbonyl group; cyano; and a dimethylamino group;

E is selected from: hydrogen; a halogenoalkyl group; an alkoxy group; an alkylsulphanyl group; an alkylsulphonyl group; cyano; NH₂; CONH₂; and NH—CO—R¹;

W is selected from the group consisting of trivalent nitrogen, and —C(G)—;

G is selected from the group consisting of hydrogen; fluorine; chlorine; bromine; iodine; an alkyl group; an alkoxy group; an alkylsulphanyl group; an alkylsulphonyl group; trifluoromethyl; nitro; cyano; NH₂; HNCOR¹; and CONH₂;

R₃ is selected from the group consisting of substituted or unsubstituted phenyl, said substituents selected from the group consisting of one or more halogens, alkyl and nitro; unsubstituted or substituted pyridyl, said substituents selected from the group consisting of one or more halogens, alkyl and nitro; unsubstituted or substituted thienyl, said substituents selected from the group consisting of one or more halogens, alkyl and nitro; an alkenyl or alkynyl

4,874,848

ASYMMETRICAL POLYAZO CHROMIUM COMPLEX DYES COMPRISING RESORCINOL AS A COUPLING COMPONENT

Gerhard Back, Lörrach, Fed. Rep. of Germany, and Fabio Beffa, Riehen, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

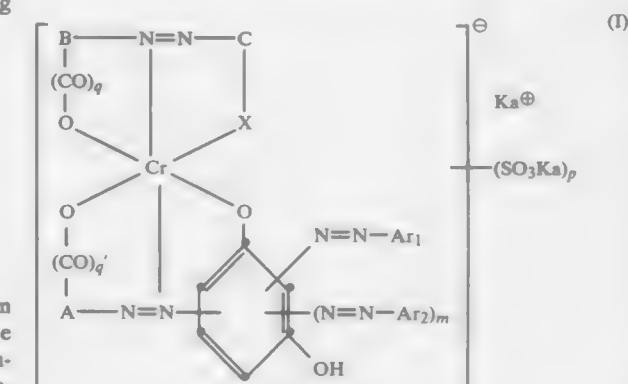
Continuation-in-part of Ser. No. 447,351, Dec. 6, 1982, abandoned. This application Jun. 4, 1986, Ser. No. 873,436
Claims priority, application Switzerland, Dec. 15, 1981, 7993/81

Int. Cl.⁴ C09B 45/06, 45/16, 45/26; D06P 1/10

U.S. Cl. 534—684

13 Claims

1. A chromium complex dye of the formula



in which

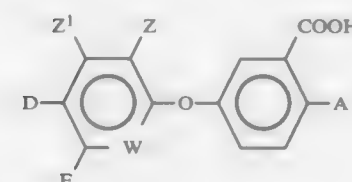
A is benzene or naphthalene which carries a hydroxyl or carboxyl group in o-position relative to the azo group, and which is unsubstituted or substituted by low molecular weight alkyl or alkoxy, halogen, nitro, cyano, sulfo, carboxyl, phosphono, alkylsulfonyl, sulfamides or acylamino selected from the group consisting of low molecular weight alkanoylamino, low molecular weight alkylsulfonylamino, low molecular weight alkoxycarbonylamino, sulfonylamino, aroylamino and arylsulfonylamino,

B is benzene or naphthalene which carries a hydroxyl or carboxyl group in o-position relative to the azo group, and which is unsubstituted or substituted by the substituents mentioned for A,

C is a coupling component which contains the group X in o- or α-position relative to the azo group and apart from the group X there is no hydroxyl group or unsubstituted amino group if C is a phenol coupling component as defined below, the coupling component C being selected from the group consisting of phenols coupling in o-position and unsubstituted or substituted by low molecular weight alkyl or alkoxy, dialkylamino or acylamino which is C₁—C₄-alkanoylamino, C₁—C₄-alkylsulfonylamino, C₁—C₄-alkoxycarbonylamino, aroylamino or arylsulfonylamino; naphthols which are unsubstituted or substituted by C₁—C₄-alkyl or alkoxy, chlorine, amino, sulfo or acylamino which is as defined above; 5-pyrazolones or 5-aminopyrazoles each of which has in the 1-position phenyl or naphthyl which is unsubstituted or substituted by chlorine, nitro, C₁—C₄-alkyl or alkoxy groups or sulfo groups and which have in the 3-position a C₁—C₄-alkyl or carboxyl group; naphthylamines which are unsubstituted or substituted by sulfo, sulfonamido or sulfone groups; acetacetamides which, if they contain an anilide nucleus, are unsubstituted in said nucleus or substituted by chlorine, bromine, nitro or C₁—C₄-alkyl, alkoxy or sulfo groups; 6-hydroxy-3-cyano- or 6-hydroxy-3-carboxamido-4-alkyl-2-pyridones which are substituted in the 1-position by unsubstituted C₁—C₄-alkyl, β-hydroxyethyl, β-aminoethyl or γ-isopropoxypropyl, or by phenyl, and are unsubstituted in the 4-position or are substituted there by a C₁—C₄-alkyl group, or hydroxyquinolones,

radical having two to four carbon atoms; an alkyl radical having one to four carbon atoms, said alkyl group being optionally substituted with one or more moieties selected from fluorine, chlorine, bromine, iodine, carboxyl, alkoxy-carbonyl having two to five carbon atoms, alkylcarbonyl, having two to five carbon atoms, monoalkylcarbonyl wherein said alkyl moiety has from one to four carbon atoms, dialkylcarbonyl, wherein said alkyl moiety has from one to four carbon atoms, alkylsulphonyl having from one to four carbon atoms, alkylsulphanyl having from one to four carbon atoms, alkylsulphoxy having two to five carbon atoms, and cyano;

said process comprising reacting an acid compound having the formula:



with a compound having the formula R³—SO₂—NH₂ in the presence of a halogenating agent, POCl₃, and in the absence of an acid acceptor, wherein said reactants comprise a reaction medium having a liquid phase, said reaction forming the desired end product compound and hydrochloric acid in gaseous form, said reaction taking place at a temperature sufficient to cause the gaseous hydrochloric acid to leave progressively from the reaction medium as it is formed without causing the decomposition of the reactants.

4,874,847

PROCESS FOR THE DIAZOTISATION OF PRIMARY AROMATIC AMINES WHICH ARE SPARINGLY SOLUBLE IN WATER

Rüdiger Oxenius, Rheinfelden, Fed. Rep. of Germany; Ernst Bürgi, Dornach, Switzerland; Vladimir Arnold, Basel, Switzerland, and Ferenc Rakoczi, Zurich, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 803,710, Dec. 2, 1985, abandoned. This application Dec. 22, 1987, Ser. No. 136,530

Claims priority, application Switzerland, Dec. 6, 1984, 8415/84

Int. Cl.⁴ C07C 113/04

U.S. Cl. 534—565

12 Claims

1. A process for diazotizing weakly basic primary aromatic amines which are sparingly soluble in water, which comprises the steps of first preparing a melt or solution of the amine in a water-soluble solvent at a temperature in the range from 30° C. to 150° C., precipitating said amine in the form of a reactive suspension consisting essentially of the free amine by adding said melt or solution to a stirred mixture of water, ice or a mixture thereof and an effective amount of a dispersant, and diazotizing said reactive suspension of the amine by reaction with a commercially available diazotizing agent in the temperature range from 10° to 100° C. for 0.1 to 20 minutes.

X is oxygen or a group of the formula $-\text{NR}-$ in which R is hydrogen or a C_1-C_4 -alkyl group;
 Ar_1 and Ar_2 are the same or different and are independently of each other unsubstituted benzene or naphthalene or benzene which is substituted by chlorine, bromine, nitro, sulfo, sulfamoyl, N-monoalkylated or N,N-dialkylated sulfamoyl, alkylsulfonyl, alkyl or alkoxy, or naphthyl which is substituted by sulfo, or thiazolyl, benzothiazolyl, imidazolyl, quinolinyl, oxazolyl or benzoxazolyl,
 m is 0 to 1,
 q and q' independently of each other are 0 or 1,
 p is an integer from 0 to 6, and
 Ka^+ is a cation.

4,874,849

ASYMMETRIC 1:2-CHROMIUM COMPLEX DYES CONTAINING TWO AZO DYES, ONE CONTAINING AN ACETOACETANILIDE COUPLING COMPONENT

Gerhard Beck, Lörrach, Fed. Rep. of Germany; Fabie Beffa, Riehen, Switzerland; Ulrich Schlesinger, Binzen, Fed. Rep. of Germany, and Alois Püntener, Rheinfelden, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 19, 1986, Ser. No. 944,621

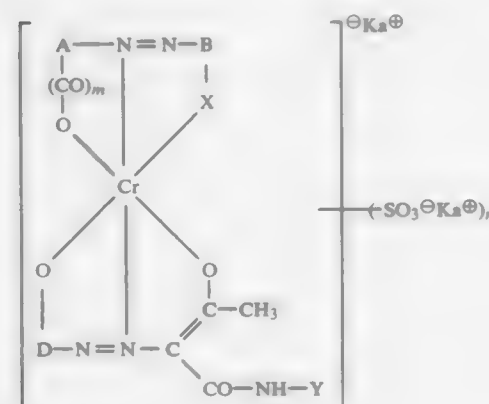
Claims priority, application Switzerland, Dec. 23, 1985, 5517/85; Dec. 23, 1985, 5514/85

Int. Cl.⁴ C09B 45/06, 45/16, 45/26, 45/48

U.S. Cl. 534—696

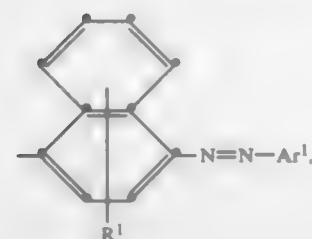
21 Claims

1. A 1:2-chromium complex dye of the formula

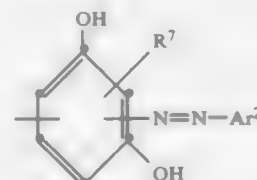


wherein

A and D are each independently of the other a benzene or naphthalene radical of a diazo component, which component carries the hydroxyl or carboxyl group in the ortho-position to the azo group;
 B is the radical of a coupling component which carries the group X adjacent to the azo group;
 X is oxygen or a radical of the formula $-\text{NR}-$, in which R is hydrogen or C_1-C_4 -alkyl;
 Y is a radical of the formula



in which formulae R^1 and R^5 are each independently of the other hydrogen or sulfo, R^4 is hydrogen or nitro, R^6 is hydrogen, methyl, methoxy or chlorine and R^2 and R^3 are each independently of the other hydrogen, halogen, nitro or sulfo;
 Ar^1 is a benzene or naphthalene radical which is unsubstituted or substituted by halogen, nitro, sulfo, C_1-C_4 -alkyl or C_1-C_4 -alkoxy;
 m is 0 or 1;
 n is an integer from 1 to 7; and
 Ka^+ is a cation;
 with the proviso that if Y is phenylaminophenyl, B is a substituted resorcinol radical of the formula



wherein R^7 is hydrogen, C_1-C_4 -alkyl, halogen, carboxy or sulfo and Ar^2 is a benzene or naphthalene radical which is unsubstituted or substituted by halogen, nitro, sulfo, C_1-C_4 -alkyl or C_1-C_4 -alkoxy.

4,874,850

PHARMACEUTICAL PREPARATIONS

Henrich H. Paradies, Iserlohn, Fed. Rep. of Germany, assignor to Medice Chem.-Pharm. Fabrik Putter GmbH & Co., Fed. Rep. of Germany

Filed Aug. 6, 1987, Ser. No. 83,463

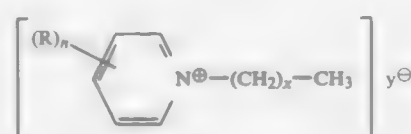
Claims priority, application Fed. Rep. of Germany, Aug. 7, 1986, 3626700

Int. Cl.⁴ C07D 213/55, 213/68, 213/20; C08B 37/04

U.S. Cl. 536—3

9 Claims

1. A compound of the formula



in which R, n, and x are such that:
 R is 4-OH, n is 1, and x is 8-20;

R is 4— $[(\text{CH}_2(\text{CH}_2)_m)_2\text{CH}-]$ where m is 8-20, n is 1, and x is 0 or 8-20; or
 R is 3,5-di— $[(\text{CH}_2(\text{CH}_2)_m)_2\text{O}-\text{C}(\text{O})-]$ where m is 8-20, n is 2, and x is 0 or 8-20; and y^- is a monovalent anion.

4,874,851

3',4'-DINITROGEN SUBSTITUTED EPIPODOPHYLLOTOXIN GLUCOSIDE DERIVATIVES

Dolatrai M. Vyas, Madison; Mark G. Saulnier, Middletown, and John F. Kadow, New Haven, all of Conn., assignors to Bristol-Meyers Company, New York, N.Y.

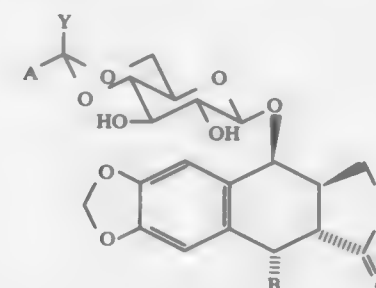
Filed Jul. 1, 1987, Ser. No. 68,376

Int. Cl.⁴ C07H 15/24

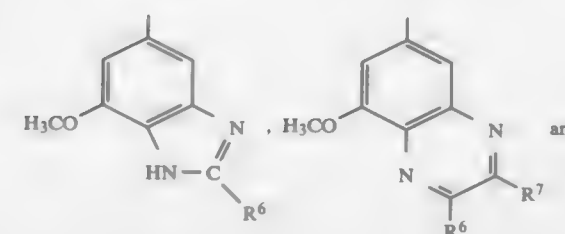
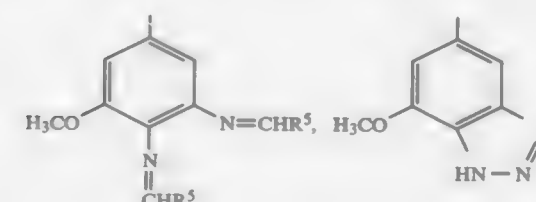
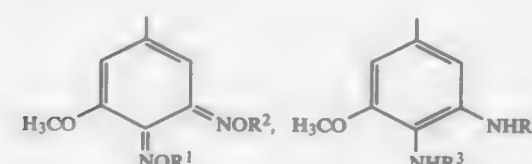
U.S. Cl. 536—17.2

18 Claims

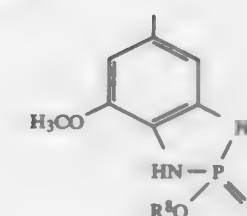
1. A compound having the formula



wherein Y is H and A is selected from the group consisting of (C_1-10) -alkyl; (C_2-10) -alkenyl; (C_3-6) -cycloalkyl; 2-furyl; 2-thienyl; phenyl; and phenyl substituted with one or more groups selected from halo, (C_1-8) -alkyl, (C_1-8) -alkoxy, hydroxy, nitro, and amino; or
 A and Y are each (C_1-8) -alkyl; or
 A and Y and the carbon to which they are attached join to form a (C_3-6) -cycloalkyl group and
 B is selected from the group consisting of



-continued



wherein R^1 and R^2 are independently selected from the group consisting of (C_1-5) -alkyl, phenyl, and phenyl (C_1-5) -alkyl; R^3 and R^4 are independently H, (C_1-5) -alkenyl, or halo-substituted (C_2-5) -alkenyl; R^5 is phenyl, phenyl substituted with one or more groups selected from (C_1-5) -alkoxy and nitro, or a heteroaryl selected from the group consisting of thienyl, furyl, and pyridyl; R^6 and R^7 are each H or (C_1-5) -alkyl; R^8 is (C_1-5) -alkyl; and X is oxygen or sulfur.

4,874,852

GLYCOSIDATION CATALYST AND PROCESS FOR PREPARING GLYCOSIDE DERIVATIVES

Keisuke Kinomura, Kakogawa; Sadaya Kitazawa, Himeji; Yasushi Takata, and Toshiyuki Sakakibara, both of Kobe, all of Japan, assignors to Nippon Fine Chemical Co., Ltd., Osaka, Japan

Division of Ser. No. 101,458, Sep. 28, 1987. This application Mar. 10, 1989, Ser. No. 321,809

Claims priority, application Japan, Sep. 29, 1986, 61-230485; Dec. 22, 1986, 61-307434

Int. Cl.⁴ C07G 3/00, 17/00; C07H 15/04; B01J 27/14

U.S. Cl. 536—18.6

8 Claims

1. A process for preparing a glycoside derivative by conversion of a saccharide compound to a glycoside derivative, characterized in that the reaction for conversion to glycoside is conducted in the presence of a catalyst comprising at least one of the heteropoly acids represented by the formula



wherein X is P, As, Si or Ge, M is at least one species selected from the group consisting of Mo, W and V, a is 3 or 4, b is an integer of 0 to 30, p is 1 or 2, q is 12 or 18, and r is 40 or 62, with the proviso that when X is P or As, a is 3 or 4; when X is Si or Ge, a is 4; and further (1) when X is P or As and a is 3, or when X is Si or Ge and a is 4, M is at least one species selected from the group consisting of Mo, W and V, p is 1, q is 12 and r is 40; and (2) when X is P or As and a is 6, M is Mo or W, p is 2, q is 18 and r is 62.

4,874,853

SYNTHETIC OLIGONUCLEOTIDES USEFUL IN DIAGNOSIS OF CHRONIC MYELOGENOUS LEUKEMIA

John J. Rossi, Glendora, Calif., assignor to City of Hope, Duarte, Calif.

Filed Apr. 18, 1988, Ser. No. 182,434

Int. Cl.⁴ C07H 21/04

U.S. Cl. 536—27

4 Claims

2. A synthetic oligonucleotide including the sequence



or the sequence



4,874,854

LOW VISCOSITY HETEROPOLYSACCHARIDES

George T. Colegrove, San Diego, and Thomas A. Lindroth, Spring Valley, both of Calif., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Oct. 8, 1985, Ser. No. 785,624
Int. Cl.⁴ C07G 17/001; C08B 37/00

U.S. Cl. 536-114

4 Claims

1. A low viscosity heteropolysaccharide wherein said heteropolysaccharide is xanthan gum or S-194 having a 5% (wt.) aqueous solution viscosity of 5-300 cP or guar gum having a 5% (wt.) aqueous solution viscosity of 15-100 cP as measured on a Brookfield LVT viscometer, at 25° C., spindle 2, 60 rpm.

4,874,855

STERIOD COMPOUNDS AND PROCESS OF PREPARING THE SAME

Hidetatsu Takagaki, Sakura; Masayoshi Abe, Chiba; Michihiro Watanabe, Ichihara; Kazuyuki Takeuchi, Sodegaura; Shigenori Nakanishi, Chiba; Yuuko Nakata, Tomakomai, and Keiji Yamazaki, Sakura, all of Japan, assignors to Dainippon Ink and Chemicals, Inc., Tokyo, Japan

Filed May 3, 1988, Ser. No. 189,849

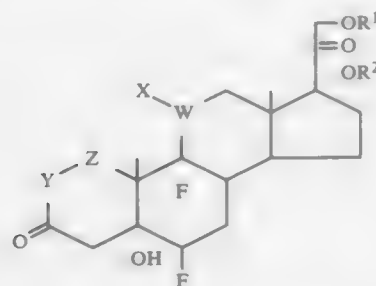
Claims priority, application Japan, Nov. 4, 1987, 62-278931

Int. Cl.⁴ C07J 1/00

U.S. Cl. 540-3

17 Claims

1. A steroid compound represented by general formula



wherein X and W together as >W-X represent a carbonyl group (>C=O) or a hydroxymethylene group (>CH(OH)), the hydroxy moiety of the hydroxymethylene group being of β-arrangement, and OR¹ and OR² independently represent an ester residue, and Y and Z together as -Y-Z- represent a -(PpSe)CH-CH₂- group where Pp represent a phenyl group or a 2-pyridyl group, or Y and Z each represent an ethenylene group or a 1-bromoethenylene group.

4,874,856

3-(SUBSTITUTED)PROPENYL-7-(AMINO-THIAZOLYLACETAMIDO) CEPH-3-EM-4-CARBOXYLIC ACIDS AND ESTERS THEREOF

Seiji Iimura; Yoshio Abe, both of Tokyo; Jun Okumura, Yokohama; Takayuki Naito, Kawasaki, and Hajime Kamachi, Chiba, all of Japan, assignors to Bristol-Myers Company, New York, N.Y.

Continuation-in-part of Ser. No. 882,110, Jul. 3, 1986, abandoned, which is a continuation-in-part of Ser. No. 748,359, Jun. 24, 1985, Pat. No. 4,708,955. This application Aug. 17, 1987, Ser. No. 86,138

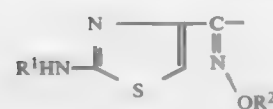
The portion of the term of this patent subsequent to Nov. 24, 2004, has been disclaimed.

Int. Cl.⁴ C07D 501/46

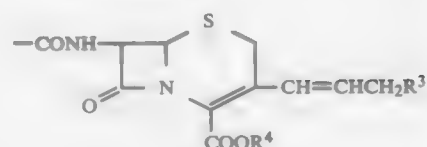
U.S. Cl. 540-222

13 Claims

1. A compound of the formula



-continued



wherein

R¹ is hydrogen or a conventional amino-protecting group, R² is hydrogen, or alkanoyl having 2 to 4 carbon atoms, R³ is hydrogen or lower alkanoyloxy having 2 to 3 carbon atoms, and when R² and R³ are each hydrogen, R⁴ is also hydrogen, and R⁴ is hydrogen, (5-methyl-2-oxo-1,3-dioxolen-4-yl)methyl, 1-(ethoxycarbonyloxy)ethyl, 1-(pivaloyloxy)ethyl, 1-(cyclohexylacetoxy)ethyl, or 1-(cyclohexyloxycarbonyloxy)ethyl.

4,874,857

AMINOALKOXYTRIPHENDIOXAZINE DYESTUFFS USEFUL FOR DYEING AND PRINTING HYDROXYL- AND AMINO-CONTAINING MATERIALS

Wolfgang Harms, Leverkusen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 29, 1987, Ser. No. 102,460

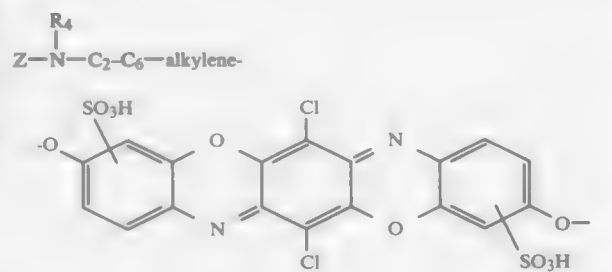
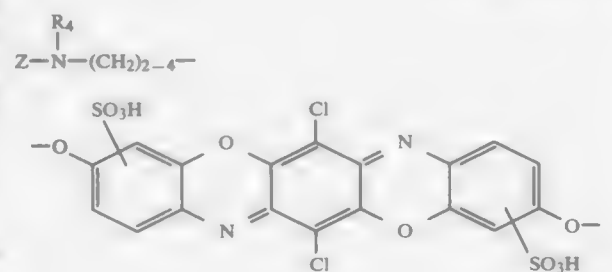
Claims priority, application Fed. Rep. of Germany, Oct. 17, 1986, 3635312

Int. Cl.⁴ C09B 19/00, 62/022; D06P 3/10, 3/66

U.S. Cl. 544-75

3 Claims

1. A dyestuff of the formula

C₂-C₆-alkylene-N-Z;

-(CH₂)₂₋₄-N-Z;

or

4,874,858

TRIAZINE-CONTAINING MULTISILANE COUPLING AGENTS FOR COATING GLASS FIBERS, FOR ADHESIVES, AND FOR PROTECTIVE COATINGS

Angelo J. Magistro, Brecksville, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

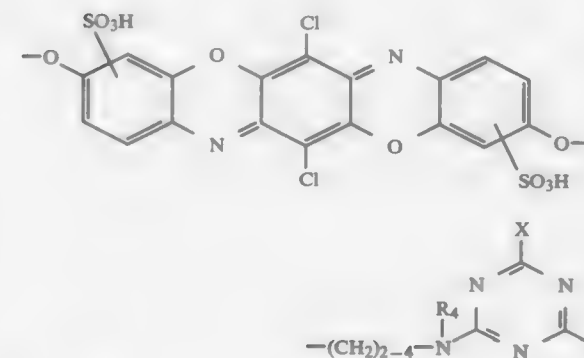
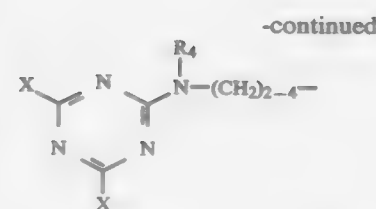
Filed Mar. 28, 1988, Ser. No. 173,898

Int. Cl.⁴ C07D 251/54

U.S. Cl. 544-196

2 Claims

1. A triazine-ring containing multisilane having a structure selected from



in which

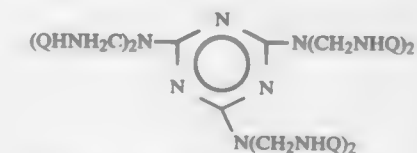
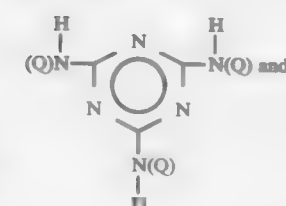
R₄=H, C₁-C₄-alkyl

Z=fibre-reactive halogen-triazinyl or halogenpyrimidinyl radical,

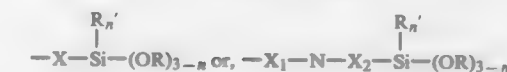
X=Cl, F and

A=an aminobenzene or aminonaphthalene radical.

3. A dyestuff of the formula



wherein Q represents



wherein X, X₁, and X₂ represents a divalent radical selected from the group consisting of C₁-C₁₀ alkylene

-(CH₂)₇₋₁₀and C₆-C₂₀ aralkyl;R represents C₁-C₅ lower alkyl;

R' represents H, C₁-C₈ alkyl, phenyl, or C₇-C₁₈ aralkyl; and, n has a value of 0 or 1.

4,874,859

DI-BISHYDROXYPROPYL CYANURIC ACID, TRISUBSTITUTED DERIVATIVES THEREOF AND A PROCESS FOR THEIR PREPARATION

Remy Teissier, Toulouse, and Serge Clamens, Tournefeuille, both of France, assignors to Societe Chimique des Charbonnages, Paris, France

Filed Dec. 11, 1987, Ser. No. 131,793

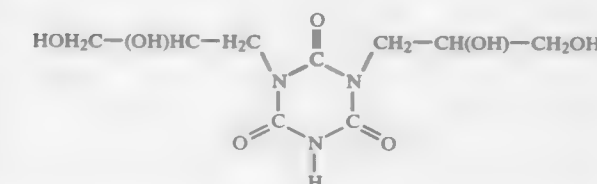
Claims priority, application France, Dec. 11, 1986, 86 17329

Int. Cl.⁴ C07D 251/04; C08F 20/00, 283/04; C08G 18/10

U.S. Cl. 544-221

4 Claims

1. A trisubstituted derivative of cyanuric acid of the formula (II)



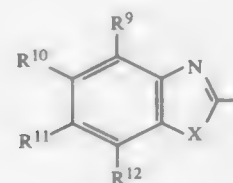
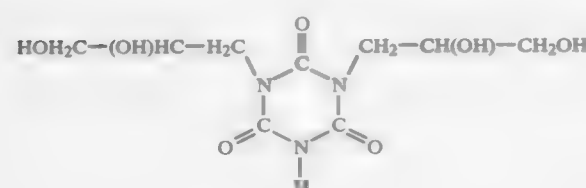
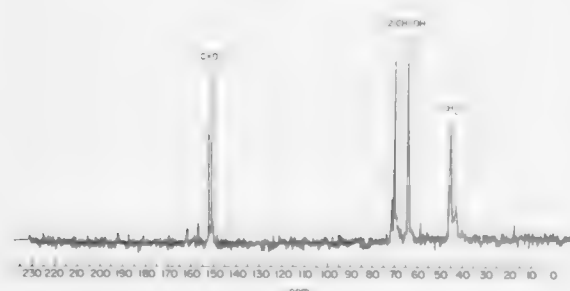
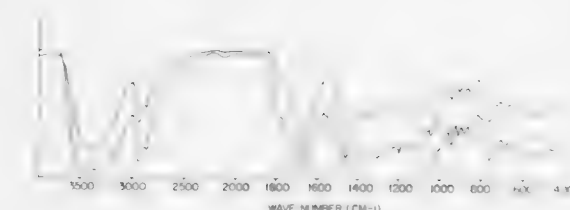
wherein R is an alkyl group containing a polymerizable ethylenic functional group.

4. A cyanuric acid derivative of the formula (I)

in which

R₄=H, C₁-C₄-alkyl

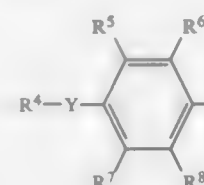
Z=H.



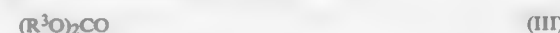
where R^9 , R^{10} , R^{11} and R^{12} are identical or different and stand for hydrogen, halogen, alkyl, alkoxy, halogenoalkyl or halogenoalkoxy, X stands for oxygen, sulphur or a grouping $-\text{N}=\text{CH}-$, R^5 , R^6 , R^7 and R^8 are identical or different and stand for hydrogen, halogen, alkyl or alkoxy, Y stands for oxygen, sulphur or the groupings $-\text{CO}-$, $-\text{SO}-$, $-\text{SO}_2-$, $-\text{CH}_2-$, $-\text{CH}_2\text{O}-$ or $-\text{OCH}_2-$, and R^1 and R^2 stand for hydrogen, halogen and optionally halogen-substituted C_1 - C_6 -alkyl, C_1 - C_6 -alkoxy, C_1 - C_6 -alkylthio and C_1 - C_6 -alkylsulphonyl and for optionally halogen-, C_1 - C_2 -alkyl-, C_1 - C_2 -alkoxy-, C_1 - C_2 -alkylthio-, halogeno- C_1 - C_2 -alkyl-, halogeno- C_1 - C_2 -alkoxy- and/or halogeno- C_1 - C_2 -alkylthio-substituted aryl having 6 to 10 carbon atoms, comprising reacting a biuret of the formula



in which R is



with a dialkyl carbonate of the formula



in which R^3 stands for alkyl, in the presence of sodium methylate and distilling off by-product alcohol.

4,874,860

PROCESS FOR PREPARING 1,3,5-TRIAZINETRIONES

Bernd Gallenkamp, Wuppertal; Andreas Günther, Cologne; Karl-Heinrich Mohrmann, Bergisch-Gladbach, and Thomas Schmidt, Haan, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany. Continuation of Ser. No. 858,407, May 1, 1986, abandoned. This application Dec. 18, 1987, Ser. No. 136,253.

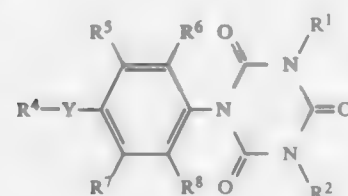
Claims priority, application Fed. Rep. of Germany, May 9, 1985, 3516632.

Int. Cl.⁴ C07D 251/34

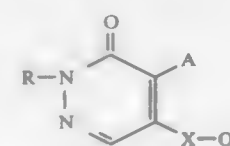
U.S. Cl. 544-221

2 Claims

1. A process for preparing a 1,3,5-triazinetriene of the formula



in which R^4 stands for a phenyl which is optionally substituted by halogen, cyano, nitro, amino, alkyl, alkoxy, alkylthio, alkylsulphonyl, alkylsulphonyl, halogenoalkyl, halogenoalkoxy, halogenoalkylthio, halogenoalkylsulphonyl, hydroxycarbonyl, alkylcarbonyl, alkoxy carbonyl, aminocarbonyl, alkoxy carbonylamino and/or sulphonylamino or for the radical



wherein,

A denotes a straight or branched C_1 to C_6 alkyl, R denotes a straight or branched C_1 to C_6 alkyl, X denotes oxygen or sulfur atom,

4,874,861

PYRIDAZINONE DERIVATIVES, PREPARATION THEREOF, AND INSECTICIDAL, ACARICIDAL, NEMATOCIDAL, FUNGICIDAL COMPOSITIONS

Tomoyuki Ogura; Yasuo Kawamura; Shigeru Ishii; Masatoshi Baba; Masakazu Taniguchi, all of Funabashi; Masayoshi Hiroe, Shiraoka; Kiminori Hirata, Shiraoka, and Yoshinori Ochiai, Shiraoka, all of Japan, assignors to Nissan Chemical Industries, Ltd., Tokyo, Japan.

Continuation of Ser. No. 800,665, Nov. 22, 1985, abandoned.

This application Nov. 30, 1987, Ser. No. 127,518.

Claims priority, application Japan, Nov. 29, 1984, 59-252123; May 22, 1985, 60-109624.

Int. Cl.⁴ C07D 237/18, 237/16, 403/12, 401/12

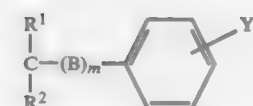
U.S. Cl. 544-229

3 Claims

1. A 3(2H)-pyridazinone of formula (I):

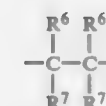
(I)

Q denotes a group:



R^1 and R^2 denote each independently hydrogen, a lower alkyl, a lower haloalkyl, or 4-tert-butylphenyl,

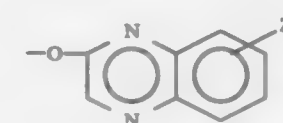
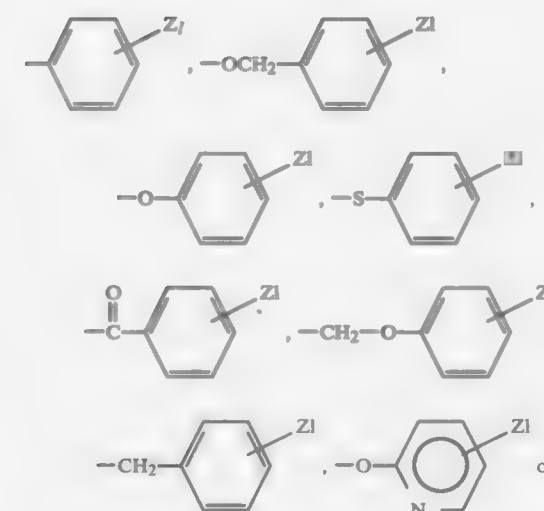
B denotes a $-\text{CR}^6=\text{CR}^7-$, $-\text{CR}^6\text{R}^7\text{O}-$ or



R^6 and R^7 denote each independently hydrogen or a C_1 to C_3 alkyl

m is 0 or 1,

Y denotes hydrogen, a halogen, a C_1 or C_6 alkyl, a cycloalkyl, a cycloalkyloxy, a C_1 to C_6 alkyloxy, a C_1 to C_6 alkylthio, a C_1 to C_6 alkylsulfinyl, a C_1 to C_6 alkylsulfonyl, a lower haloalkyl, a lower haloalkyloxy, a lower haloalkylthio, a lower alkenyloxy, trimethylsilyl, a lower alkoxy carbonyl, dimethylamino, nitro, cyano, SCN,



(wherein, Z denotes a halogen, a lower alkyl, a lower alkoxy, a cycloalkyl, a lower haloalkyl, a lower alkoxy carbonyl or nitro and l is 1 or an integer of from 1 to 5, said Z being the same or different when l is an integer of 2 to 5), n is an integer of from 1 to 5, said Y being the same or different when n is an integer of 2 to 5.

4,874,862

PROCESS FOR PREPARING GUANINE DERIVATIVES

Jagdish C. Sircar; Catherine R. Brungardt, both of Ann Arbor, Mich., and Charles F. Schwender, Gladstone, N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

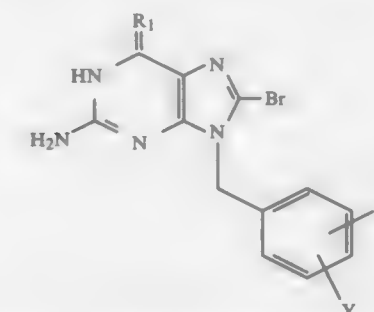
Division of Ser. No. 698,805, Feb. 11, 1985, which is a continuation-in-part of Ser. No. 593,063, Mar. 26, 1984, abandoned. This application Oct. 14, 1987, Ser. No. 108,658.

Int. Cl.⁴ C07D 473/18; A61K 31/52

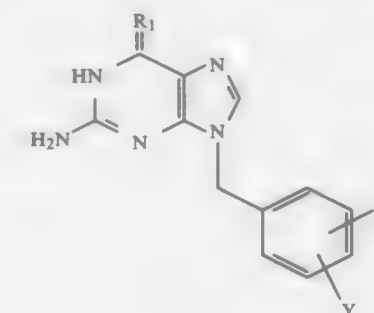
U.S. Cl. 544-276

2 Claims

1. A process for the preparation of a compound of the formula



wherein R_1 is O, Y is hydrogen, and X and Y are each independently halogen, alkyl of one to four carbon atoms, alkoxy of one to four carbon atoms, hydroxy, trifluoromethyl, CN, SO_2R_3 , COOR_3 or NR_3R_4 , in which n is 0, 1, 2 or 3 and or R_4 are each independently hydrogen or alkyl of one to four carbon atoms, which comprises treating a compound of the formula



with N-bromosuccinimide in an organic solvent.

4,874,863

BISNAPHTHALIMIDES

Miguel F. Brana; José M. C. Berlanga, both of Madrid, Spain; Gerhard Keilhauer, Dannstadt-Schauernheim, and Erich Schlick, Neuhofen, both of Fed. Rep. of Germany, assignors to Knoll AG, Ludwigshafen, Fed. Rep. of Germany.

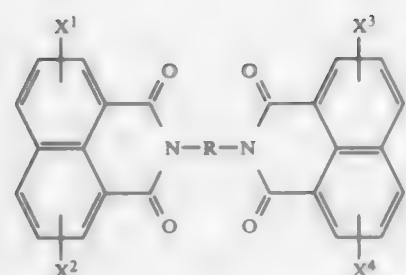
Filed Mar. 1, 1988, Ser. No. 162,490. Claims priority, application Fed. Rep. of Germany, Mar. 10, 1987, 3707651.

Int. Cl.⁴ C07D 221/14

U.S. Cl. 540-99

4 Claims

1. A bisnaphthalimide of the formula



where X^1 , X^2 , X^3 and X^4 are identical or different and are each hydrogen, nitro, amino, C_1 - C_6 -alkylamino, di- C_1 - C_6 -alkylamino, hydroxyl, C_1 - C_6 -alkoxy, halogen, trihalomethyl, C_1 - C_6 -alkyl, formyl, C_1 - C_6 -alkylcarbonyl, ureyl, C_1 - C_6 -alkylureyl or C_1 - C_6 -alkylcarbonylamino and R is a straight chain or branched C_4 - C_{10} -alkylene which is interrupted at one or two points in the chain by a secondary or tertiary amino group, where 2 nitrogen atoms may additionally be bonded to one another by an alkylene group, or a salt with a physiologically tolerated acid.

4,874,864

BENZAMIDE PROTEASE INHIBITORS

Rodney C. Schnur, Mystic, and Anton F. J. Fliri, Norwich, both of Conn., assignors to Pfizer Inc., New York, N.Y.

Filed May 24, 1988, Ser. No. 197,927

Int. Cl.⁴ C07D 215/16, 239/02, 285/08, 263/48

U.S. Cl. 546-153

3 Claims

1. A compound of the formula



or a pharmaceutically acceptable salt thereof, wherein HET is quinol-8-yl, 6-methoxyquinol-8-yl or quinol-3-yl n is an integer of 0 to 2; and R¹ is a hydrogen or (C_1 - C_3)alkyl.

4,874,865

PREPARATION OF SUBSTITUTED LACTAMS

Ludwig Wambach, Heidelberg, and Martin Fischer, Ludwigshafen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

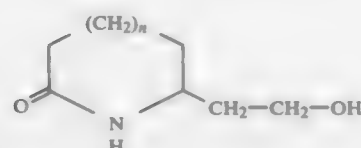
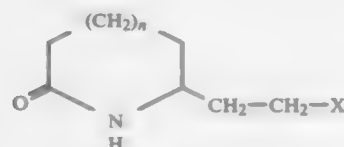
Filed Jun. 2, 1988, Ser. No. 200,956

Int. Cl.⁴ C07D 211/76, 207/26

U.S. Cl. 546-243

3 Claims

1. A process for the preparation of a substituted lactam of the formula Ia, Ib or Ic



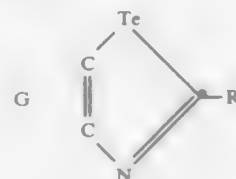
Ia

Ib

U.S. Cl. 548-100

45 Claims

1. A benzotellurazole or naphthotellurazole of the formula:



where

G completes a benzo or naphtho ring which is unsubstituted

4,874,866

PHOTOGRAPHICALLY USEFUL CHALCOGENAZOLES, CHALCOGENAZOLINES, AND CHALCOGENAZOLINIUM AND CHALCOGENAZOLIUM SALTS

Wolfgang H. H. Gunther, Webster; Ronald E. Leone, and Rosemary Przyklick, both of Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

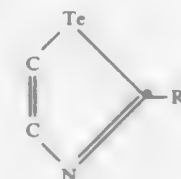
Division of Ser. No. 660,155, Oct. 12, 1984, Pat. No. 4,576,905, which is a continuation-in-part of Ser. No. 529,829, Sep. 6, 1983, abandoned. This application Oct. 3, 1985, Ser. No. 783,727

Int. Cl.⁴ C07D 293/12

U.S. Cl. 548-100

Ia

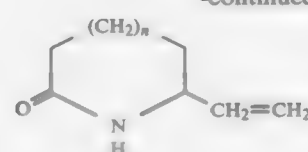
Ib



where

G completes a benzo or naphtho ring which is unsubstituted

-continued



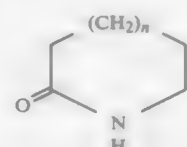
Ic

where n is 0 or 1 and X is one of the following groups

- O-CO-R¹
- O-SO₂-R¹
- CO-R²
- CO-O-R³
- CO-NR⁴R⁵

where R¹ is a radical of a carboxylic or sulfonic acid of 1 to 8 carbon atoms, R² is C_1 - C_6 -alkyl, R³ is hydrogen or an alkyl, aryl or aralkyl group of not more than 8 carbon atoms and R⁴ and R⁵ are each hydrogen or C_1 - C_4 -alkyl and may furthermore be bonded to form a 5-membered or 6-membered ring, wherein

(a) for the preparation of Ia, a lactam of the formula II



II

is reacted at from 100° to 200° C. with a vinyl compound of the formula III



III

and a compound IV which forms free radicals,

(b) for the preparation of Ib, a compound Ia prepared as in part a above in which X is a (-O-CO-R¹) or (-O-SO₂-R¹) group is subjected to hydrolytic cleavage, and

(c) for the preparation of Ic from a compound Ib prepared as in part b above or from a compound Ia prepared as in part a above in which X is a (-O-CO-R¹) or (-O-SO₂-R¹) group, water or an acid R¹-COOH or R¹-SO₃H is eliminated by heating in the presence or absence of a catalyst.

or substituted with at least one substituent chosen from the group consisting of (a) a hydrocarbon linked directly or through a divalent oxygen or sulfur atom, an amino group, an amido group, a sulfonamido group, a ureido group, or a thioureido group; (b) a hydroxy group; and (c) a -C(O)M or -S(O₂)M group;

R is a hydrocarbon linked directly or through a divalent oxy, thio, or carbonyl linkage, an imino group, an amino group, an amido group, a ureido group, a formamidine disulfide group, or a -C(O)M group; and

M is independently chosen to complete an acid, ester, thioester, or salt; all aromatic hydrocarbon moieties being independently chosen from the group consisting of phenyl and naphthyl and all aliphatic hydrocarbon moieties containing up to 18 carbon atoms.

4,874,867

TETRAZOLE INTERMEDIATES TO ANTIHYPERTENSIVE COMPOUNDS

Paul E. Aldrich, Wilmington; John Jonas V. Duncia, Newark, and Michael E. Pierce, Wilmington, all of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 53,198, May 22, 1987, Pat. No. 4,820,843.

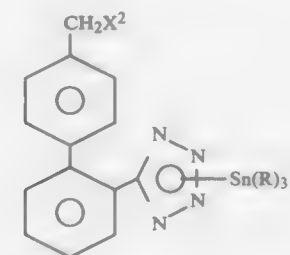
This application Nov. 23, 1988, Ser. No. 275,583

Int. Cl.⁴ C07D 257/04; C07F 7/22

U.S. Cl. 548-101

10 Claims

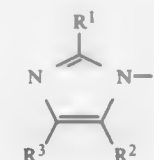
1. A tetrazole having the formula:



wherein

R is alkyl of 1-6 carbon atoms, phenyl or cyclohexyl;

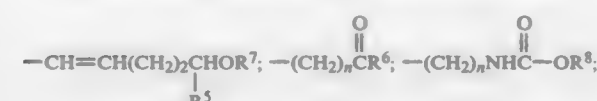
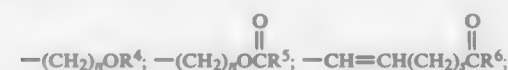
X² is H, Cl, Br, I, O-tosyl, OH, O-mesyl, or



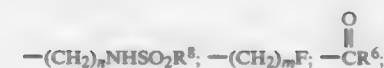
R¹ is alkyl of 3-10 carbon atoms, alkenyl of 3 to 10 carbon atoms, alkynyl of 3 to 10 carbon atoms, alkynyl of 3 to 10 carbon atoms, and benzyl substituted with up to two groups selected from alkoxy of 1 to 4 carbon atoms, halogen, alkyl of 1 to 4 carbon atoms, nitro and amino;

R² is phenylalkenyl wherein the aliphatic portion is 2 to 4 carbon atoms, -(CH₂)_m-imidazolyl-1-yl, -(CH₂)_m-1,2,3-triazolyl optionally substituted with one or two groups selected from CO₂CH₃ and alkyl of 1 to 4 carbon atoms,

(CH₂)_m-tetrazolyl,



-continued



R³ is H, F, Cl, Br, I, NO₂, CF₃, or CN;

R⁴ is H, alkyl of 1 to 6 carbon atoms, cycloalkyl of 3 to 6 carbon atoms, phenyl or benzyl;

R⁵ is H, alkyl or perfluoroalkyl of 1 to 8 carbon atoms, cycloalkyl of 3 to 6 carbon atoms, phenyl or benzyl;

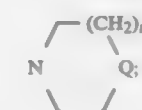
R⁶ is H, alkyl of 1-5 carbon atoms, OR⁹ or NR¹⁰R¹¹;

R⁷ is H, alkyl of 1 to 6 carbon atoms, cycloalkyl of 3 to 6 carbon atoms, phenyl, benzyl, acyl of 1 to 4 carbon atoms, phenacyl;

R⁸ is alkyl of 1 to 6 carbon atoms or perfluoroalkyl of 1 to 6 carbon atoms, 1-adamantyl, 1-naphthyl, 1-(1-naphthyl)ethyl, or (CH₂)_pC₆H₅;

R⁹ is H, alkyl of 1 to 6 carbon atoms, cycloalkyl of 3 to 6 carbon atoms; or phenyl;

R¹⁰ and R¹¹ independently are H, alkyl of 1 to 4 carbon atoms, phenyl, benzyl or taken together to form a ring of the Formula



(I)

Q is NR¹², O or CH₂;

R¹² is H, alkyl of 1 to 4 carbon atoms, or phenyl;

m is 1 to 5;

n is 1 to 10;

s is 0 to 5;

p is 0 to 3;

t is 0 or 1.

4,874,868

VOLATILE SILICONS

Raymond E. Bolich, Jr., Maineville, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Mar. 16, 1988, Ser. No. 168,720

Int. Cl.⁴ C07F 7/10, 7/08

U.S. Cl. 548-110

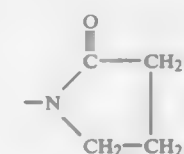
2 Claims

1. A volatile silicon compound having the structure:



where (1) Y=3 to 6, (2) total carbons ≤ 14, (3) R can be independently C_1 - C_{10} alkyl and (4) at least one R per molecule must be selected from -R₁ R₂ where R₁= C_1 - C_4 alkylene and R₂ is selected from the group consisting of (i) -O-R₃ where R₃= C_1 - C_5 alkyl, (ii) -C₁- C_7 ketone,

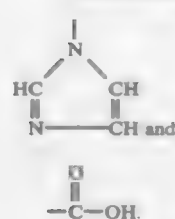
(iii)



(iv)



-continued



(v)

cycloalkyl, C₁₋₃ alkylthio, phenyl, phenylthio or substituted phenyl in which the substituents are V and W and when n is 2 to 5, each of the R_{3s} and R_{4s} are independently hydrogen, C₁₋₃ alkyl, C₃₋₇ cycloalkyl or only one of the R_{3s} and R_{4s} is phenyl or substituted phenyl;

R₅ is hydrogen, halogen, hydroxy, C₁₋₅ alkyl, phenyl or substituted phenyl in which the substituents are V and W, or R₅ is a group selected from:

- (a) C₁₋₅ alkylthio or phenylthio or substituted phenylthio in which the substituents are V and W;
(b) C₁₋₅-alkanoyloxy-C₁₋₄-alkyl;

(vi)

4,874,869

HYDANTOIN DERIVATIVES AND MEDICINES CONTAINING THE SAME

Kouichiro Ueda, Saitama; Satoru Tanaka, Tokyo; Toshinobu Kuni; Kengo Kagei, both of Gifu; Tadaaki Sato; Hideki Ono, both of Aichi; Issai Ohtsuka; Mayumi Kawase, both of Gifu; Toshihara Ohgoh, Aichi, and Tsuneo Wakabayashi, Gifu, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan
Continuation of Ser. No. 815,309, Dec. 31, 1985, abandoned, which is a continuation of Ser. No. 688,146, Dec. 31, 1984, abandoned, which is a division of Ser. No. 500,801, Jun. 7, 1983, Pat. No. 4,540,704, which is a continuation of Ser. No. 284,566, Jul. 17, 1981, abandoned. This application Jul. 13, 1987, Ser. No. 73,915

Claims priority, application Japan, Jul. 21, 1980, 60-98695
The portion of the term of this patent subsequent to Sep. 10, 2002, has been disclaimed.

Int. Cl.⁴ C07D 491/10

U.S. Cl. 548-309

1 Claim

1. the hydantoin derivative 6-fluoro-2,2-dimethyl-spiro[chroman-4,4'-imidazolidine]-2',5'-dione and pharmaceutically acceptable salts thereof.

4,874,870

INTERMEDIATES FOR PREPARING HMG-COA REDUCTASE INHIBITORS

Samuel L. Graham, Harleysville, and Thomas H. Scholz, Souderton, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

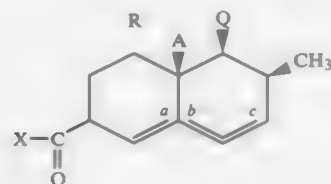
Division of Ser. No. 65,223, Jan. 22, 1987, Pat. No. 4,795,811.
This application Aug. 12, 1988, Ser. No. 231,321

Int. Cl.⁴ C07D 405/10

U.S. Cl. 548-336

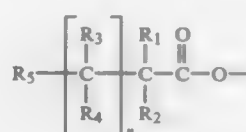
5 Claims

1. A compound represented by the structural formula (II),



II

wherein X is selected from: imidazole-1-yl or benzimidazol-1-yl
wherein R is



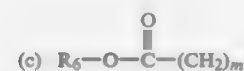
wherein:

n is 0 to 5

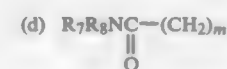
R₁ and R₂ independently are hydrogen, C₁₋₅ alkyl, or R₁ and R₂ together with the carbon atom to which they are attached form a carbocyclic ring of 3 to 8 carbon atoms;
R₃ and R₄ are independently hydrogen, C₁₋₃ alkyl, C₃₋₇

z is 0 to 2 and P₂ and P₁ are lower alkyl or P₂ and P₁ together with the oxygens and carbon to which they are attached form a ring of 5 to 8 atoms;

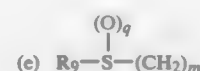
A is H or OH; and a, b and c represent single bonds or one of a, b or c represents a double bond or a and c are both double bonds.



in which m is 0 to 3 and R₆ is C₁₋₅ alkyl;



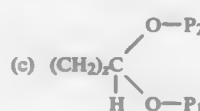
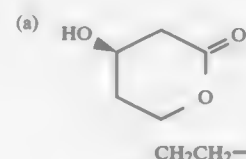
in which R₇ and R₈ are independently C₁₋₅-alkyl or R₇ and R₈ together with the nitrogen atom to which they are attached form a heterocycle selected from piperidinyl, morpholinyl, pyrrolidinyl, piperazinyl or thiomorpholinyl;



in which q is 0 to 2 and R₉ is C₁₋₅ alkyl or phenyl or substituted phenyl in which the substituents are V and W;

V and W independently are hydrogen, halogen, hydroxy, trifluoromethyl, C₁₋₃ alkyl, C₁₋₃-alkyloxy and hydroxy-C₁₋₃ alkyl; and

Q is selected from:



4,874,871

PROCESS FOR PREPARING (+)-2,3-DIHYDRO-1H-PYRROLO[1,2-A]PYRROLE-1-CARBOXYLIC ACID AND RELATED COMPOUNDS

Michael P. Fleming, Longmont; George C. Schloemer, Lyons, and Hiralal N. Khatri, Louisville, all of Colo., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Mar. 25, 1987, Ser. No. 30,774

Int. Cl.⁴ C07D 487/04, 207/337, 207/333

U.S. Cl. 548-543

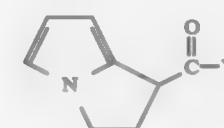
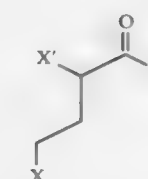
20 Claims

1. A process for producing a compound of formula IX.

in which

X and X' are independently halogen.

17. A compound of formula XII,



in which Y is

OH;

O⁻M⁺, wherein M is an alkali metal; or

NRR', wherein R is lower alkyl and R' is lower alkyl or aryl,

or NRR' is the residue of a saturated cyclic amine, which comprises the reaction of a compound of formula XII,

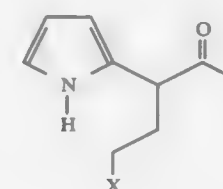
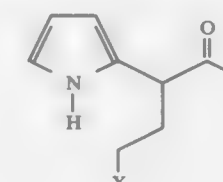
in which

X is halogen; and

Y is OH;

O⁻M⁺, wherein M is an alkali metal; or

NRR', wherein R is lower alkyl and R' is lower alkyl or aryl, or NRR' is the residue of a saturated cyclic amine.



in which

Y is as previously defined; and

X is halogen,

with a strong base in an aprotic polar solvent.

9. A process for producing a compound of formula XII.

U.S. Cl. 548-531

3 Claims

1. A compound of formula XVI,

4,874,872 PROCESS FOR PREPARING (+)-2,3-DIHYDRO-1H-PYRROLO[1,2-A]PYRROLE-1,7-DICARBOXYLATES

Michael P. Fleming, Longmont; Hiralal N. Khatri, Louisville, and George C. Schloemer, Lyons, all of Colo., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Division of Ser. No. 3,104, Jan. 14, 1987, Pat. No. 4,849,526.

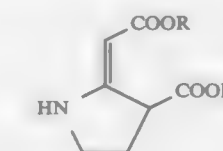
This application Oct. 11, 1988, Ser. No. 255,799

Int. Cl.⁴ C07D 207/16

U.S. Cl. 548-531

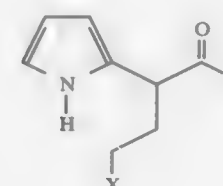
3 Claims

1. A compound of formula XVI,



in which

each R is independently lower alkyl.



in which

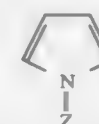
Y is OH,

O⁻M⁺, wherein M is an alkali metal, or

NRR', wherein R is lower alkyl and R' is lower alkyl or aryl, or NRR' is the residue of a saturated cyclic amine; and

X is halogen,

which comprises the reaction of a compound of formula X,



in which Z is Li, MgCl, or MgBr, with a compound of formula XI,

4,874,873 PROCESS FOR THE PREPARATION OF 3-ACYLPYRROLIDONES

Frank X. Woolard, Richmond, Calif., assignor to ICI Americas Inc., Wilmington, Del.

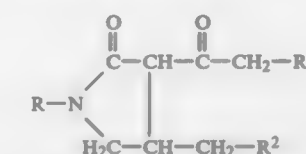
Filed Dec. 27, 1988, Ser. No. 290,219

Int. Cl.⁴ C07D 207/46; A01N 43/36, 43/40

U.S. Cl. 548-540

12 Claims

1. A process for the manufacture of a compound having the formula



wherein

R is lower alkyl, lower haloalkyl, lower cycloalkyl, lower cycloalkylalkyl, benzyl, chlorobenzyl or the group



in which each of X and Y is independently hydrogen, halogen, lower alkyl, lower haloalkyl, lower alkoxy, lower haloalkoxy, lower alkylsulfinyl, lower haloalkylsulfinyl, lower alkylsulfonyl, lower haloalkylsulfonyl, phenoxy, substituted phenoxy, pyridyloxy, or substituted pyridyloxy;

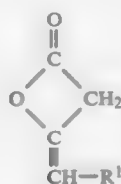
R¹ is hydrogen or halogen; and

R² is hydrogen or lower alkyl; which process comprises

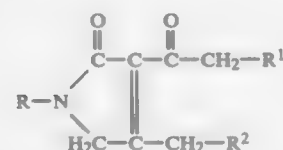
(a) reacting a compound having the formula



wherein R and R² are as defined above, with a diketene of the formula



wherein R¹ is as defined above, in the presence of a catalytic amount of a tertiary amine, to give a pyrroliden-2-one of the formula



and,

(b) reducing the compound of formula IV with hydrogen gas in the presence of a noble metal catalyst to give a compound of formula I.

4,874,874

PREPARATION OF 3-SULPHENYLMALIMIDES

Engelbert Kule, Bergisch Gladbach, and Alfons Adler, Cologne, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany
Filed Oct. 26, 1987, Ser. No. 113,688

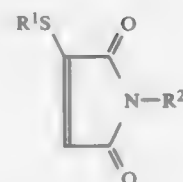
Claims priority, application Fed. Rep. of Germany, Nov. 4, 1986, 3637507

Int. Cl.⁴ C07D 207/456

U.S. Cl. 548—544

4 Claims

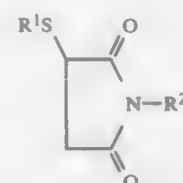
1. A process for the preparation of a 3-sulphenylmaleimide of the formula



in which

R¹ is alkyl, or optionally substituted cycloalkyl or aralkyl, and

R² is optionally substituted alkyl, cycloalkyl, aryl or aralkyl, comprising reacting a 3-sulphenylsuccinimide of the formula



with an equimolar amount of hydrogen peroxide in the presence of a lower alkanecarboxylic acid as a solvent.

4,874,875

PERFLUORO-AMINO-OXAZIRIDINES

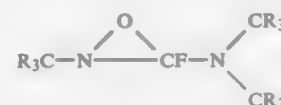
Walter Navarrini, Milan, Italy, and Darryl D. Desmarten, Clemson, S.C., assignors to Ausimont S.r.l., Milan, Italy
Filed Nov. 7, 1988, Ser. No. 268,248

Claims priority, application Italy, Nov. 10, 1987, 22576 A/87
Int. Cl.⁴ C07D 301/03

U.S. Cl. 548—959

2 Claims

1. Perfluoro-oxaziridines characterized by the presence of an aminic group in position 3 of the oxaziridine ring, of the formula:



where each R is independently either F or a perfluoroalkyl group having from 1 to 10 carbon atoms.

4,874,876

PROCESS FOR THE PREPARATION OF 2-(2-THIENYL)-ETHYLAMINE AND DERIVATIVES THEREOF

Neil J. O'Reilly, and Henry C. Lin, both of Grand Island, N.Y., assignors to Occidental Chemical Corporation, Niagara Falls, N.Y.

Filed Nov. 2, 1988, Ser. No. 265,980

Int. Cl.⁴ C07D 333/58

U.S. Cl. 549—49

9 Claims

1. A process for the preparation of 2-(2-thienyl)-ethylamine derivatives having the formula:



wherein R₁ and R₂ are hydrogen or taken together form a phenyl ring comprising:

(a) reacting a derivative having the formula:

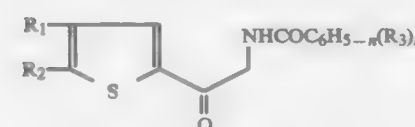


with a mixture of an acylating compound selected from the group consisting of:

(R₃)_nC₆H₅-nCONHCH₂COCl, and

(R₃)_nC₆H₅-nC≡NCH₂COO;

wherein R₃ is selected from the group consisting of C₁₋₄ lower alkyl, C₁₋₄ lower alkoxy, phenoxy, NO₂, CF₃, Cl, Br, I and F, and n=0 to 3, and an acylating catalyst to give a derivative having the formula:



(b) reducing and hydrolyzing the derivative of formula (III) to give the derivative of formula (I).

4,874,877

PROCESS FOR OPTICALLY ACTIVE 3-(METHANE-SULFONYLOXY)THIOLANE AND ANALOGS

Frank J. Urban, Waterford, Conn., assignor to Pfizer Inc., New York, N.Y.

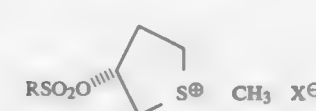
Filed Apr. 19, 1988, Ser. No. 183,102

Int. Cl.⁴ C07D 333/32

U.S. Cl. 549—66

3 Claims

1. A compound having the formula



wherein R is (C₁₋₃)alkyl, phenyl or tolyl and X is RSO₃ or halogen.

4,874,878

CERTAIN DIHYDROBENZOFURAN BUTANOIC AND PENTANOIC ACID DERIVATIVES

Jean L. Peglion, Le Vesinet; Jean C. Poignant, Bures sur Yvette, and Joel Vian, Chaville, all of France, assignors to Adir Et Cie, Neuilly-sur-Seine, France

Division of Ser. No. 173,286, Mar. 25, 1988, Pat. No. 4,851,429.

This application Jan. 24, 1989, Ser. No. 301,160

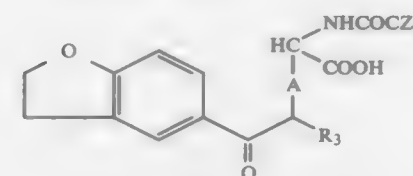
Claims priority, application France, Apr. 1, 1987, 87 04550

Int. Cl.⁴ C07D 307/78

U.S. Cl. 549—462

4 Claims

1. A compound of formula IV



in which

(II)

R₃ denotes a hydrogen atom or a linear or branched alkyl radical containing 1 to 4 carbon atoms, inclusive
A denotes a single bond or a methylene radical, or a radical of formula



(i) in which

R₄ denotes a linear or branched alkyl radical containing 1 to 4 carbon atoms, inclusive and

Z denotes a hydrogen atom or a fluorine atom.

4,874,879 PROCESS FOR STARTING-UP AN ETHYLENE OXIDE REACTOR

Ann M. Lauritzen, Houston; David S. Baker, Sugarland; Margot H. Christiansen, Houston; Beamon M. Johnson, Brookshire, and John G. Schuren, Houston, all of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Jul. 25, 1988, Ser. No. 224,049

Int. Cl.⁴ C07D 301/10

U.S. Cl. 549—536

17 Claims

1. A process for starting up a fixed bed ethylene oxide reactor containing a catalyst comprising silver, alkali metal promoter and rhenium co-promoter supported on an alumina carrier, which process comprises:

- heating the reactor to a temperature between about 400° F. and 475° F.,
- passing an ethylene-containing gas over the catalyst in the reactor at a flow rate between about 5 to about 40 percent of the design flow rate,
- adding a chlorohydrocarbon moderator to the gas passing over the catalyst and after between about 0.1 to about 10 cubic centimeters of moderator (basis liquid) per cubic foot of catalyst has been added,
- adding oxygen to the gas passing over catalyst, and raising the reactor temperature and gas flow rates to operating conditions.

4,874,880 BIS(DI-, TRI- OR TETRA-SUBSTITUTED-CYCLOPENTADIENYL)-ZIRCONIUM DIHALIDES

Shinya Miya, Ichihara-shi; Masato Harada, Kisarazu-shi; Takaya Misa, Kawaguchi, and Hiroshi Yamazaki, Tokorozawa-shi, all of Japan, assignors to Chisso Corporation and The Institute of Physical & Chemical Research, both of Japan

Filed Feb. 22, 1988, Ser. No. 158,924

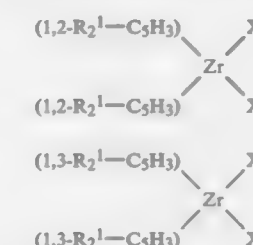
Claims priority, application Japan, Mar. 10, 1987, 62-54367; Mar. 10, 1987, 62-54368; Mar. 10, 1987, 62-54369; Mar. 23, 1987, 62-68630; Mar. 25, 1987, 62-71157

Int. Cl.⁴ C07F 7/00

U.S. Cl. 556—53

3 Claims

1. Bis(di-substituted-cyclopentadienyl)zirconium dihalides represented by the following general formula or,



wherein R¹ denotes a substituent group on the cyclopentadienyl ring which is an alkyl radical of 1 to 5 carbon atoms;

$R_2^1-C_5H_3$ stands for a di-substituted cyclopentadienyl radical; and X is a halogen atom.

4,874,881

METHOD FOR PRODUCING A POLYDIORGANOSILOXANE HAVING A PENDENT ALKENYL RADICAL AT ITS MOLECULAR CENTER

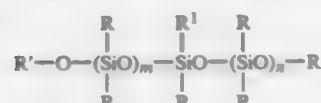
Toshio Suzuki, and Tadashi Okawa, both of Chiba, Japan, assignors to Toray Silicone Company, Ltd., Tokyo, Japan
Filed Sep. 8, 1988, Ser. No. 242,016

Claims priority, application Japan, Sep. 8, 1987, 62-224939
Int. Cl.⁴ C07F 7/08

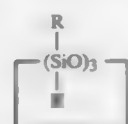
U.S. Cl. 556—453

11 Claims

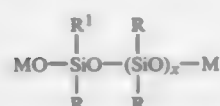
1. A method for the preparation of a polydiorganosiloxane having a pendant alkenyl radical in the middle of the molecular chain with the following formula



comprising polymerizing cyclic trisiloxane of the formula



using an organopolysiloxane alkali metal salt of the formula



as the polymerization initiator under nonequilibrium conditions where the ingredients are substantially anhydrous, terminating the polymerization when the target polydiorganosiloxane is obtained, in the above formulas, R^1 is an alkenyl radical; each R is a monovalent hydrocarbon group or monovalent halogenated hydrocarbon group, and these groups may be the same or different; M is an alkali metal; x is an integer having a value from one to ten; R' is the hydrogen atom or a monovalent endcapping group; m is at least x+3; and n is at least x+3.

4,874,882

PROCESS FOR PREPARING MONOSODIUM PHOSPHOENOLPYRUVATE

Naotaka Hamasaki, Fukuoka; Hirotsugu Kawamura, Ube; Norio Ohtsu, Ube; Ichiro Nakakoshi, Ube; Kikuo Ataka, Ube; Kiyosi Oomori, Ube, and Masahiko Kouno, Ube, all of Japan, assignors to Ube Industries, Ltd., Ube, Japan
Filed Mar. 18, 1987, Ser. No. 27,631

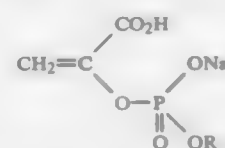
Claims priority, application Japan, Mar. 25, 1986, 61-64744; May 19, 1986, 61-112482

Int. Cl.⁴ C07F 9/09

U.S. Cl. 558—131

10 Claims

1. A process for preparing monosodium phosphoenolpyruvate, which comprises hydrolyzing monosodium monosubstituted phosphoenolpyruvate of Formula (I):



wherein, R represents C_1-C_6 alkyl group, a C_3-C_{10} cycloalkyl

group or a C_7-C_{10} aralkyl group, with water to form said monosodium phosphoenolpyruvate.

4,874,883

PROCESS FOR THE PRODUCTION AND ISOLATION OF MONOALKYL PHOSPHORIC ACID ESTERS

Günter Uphues, Monheim; Uwe Ploog, Haan, and Klandia Bischof, Werne, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Düsseldorf, Fed. Rep. of Germany
Filed Jan. 29, 1988, Ser. No. 150,691

Claims priority, application Fed. Rep. of Germany, Jan. 30, 1987, 3702766

Int. Cl.⁴ C07F 9/09

U.S. Cl. 558—150

10 Claims

1. A process for the production and isolation of monoalkyl-phosphoric acid esters, comprising the steps of

- reacting at least one fatty alcohol containing from 8 to 18 carbon atoms with from an about 0.2 to an about 2 molar excess of polyphosphoric acid in an inert solvent having a boiling point in the range of from about 60 to about 140° C. selected from the group consisting of alkanes, aromatics, and cycloalkanes at a temperature of from about 60° to about 130° C.;
- maintaining the resulting reaction mixture at a temperature of from about 90° to about 130° C. for a period of time of from about 120 to about 300 minutes;
- hydrolyzing the reaction mixture with from about 0.5 to about 1.0 mole of water, based on the quantity of phosphorus atoms in the reaction mixture, at a temperature of from about 90° to about 100° C. to form a hydrolysis product;
- neutralizing from about 40 to about 65%, based on acid number, of the hydrolysis product with an alkali metal hydroxide;
- maintaining the resulting mixture containing the partially neutralized hydrolysis product for a period of from about 30 to about 180 minutes at a temperature of from about 50° to about 95° C. to form two phases; and
- separating the resulting phases.

4,874,884

PROMOTER SYNERGISM IN PENTENENITRILE HYDROCYANATION

Ronald J. McKinney, Wilmington, Del., and Robert B. Osborne, Orange, Tex., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 176,241, Mar. 31, 1988. This application Feb. 14, 1989, Ser. No. 310,411

Int. Cl.⁴ C07C 120/02

U.S. Cl. 558—338

6 Claims

1. In a process for producing adiponitrile by the addition of hydrogen cyanide to pentenenitriles in the presence of a zerovalent nickel catalyst and catalyst promoter, the improvement comprising conducting the process in the presence of a combination of two Lewis acid promoters, LA_A and LA_B , wherein the rate constant for the rate of isomerization of 3-pentenitrile to 4-pentenitrile, k_1 , in the presence of the first Lewis acid promoter, LA_A is greater than k_1 in the presence of the second Lewis acid promoter, LA_B , and wherein the rate constant for the rate of hydrocyanation of 4-pentenitrile to adiponitrile, k_2 , in the presence of LA_B is greater than k_2 in the presence of LA_A .

4,874,885

PROCESS FOR THE PREPARATION OF MERCAPTOMETHYLPHENOLS

Werner Stegmann, Liestal; Hans R. Meier; Samuel Evans, both of Marly; Roger Martin, Tentsingen, and Reto Laisoli, Hötstein, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 15, 1987, Ser. No. 133,414

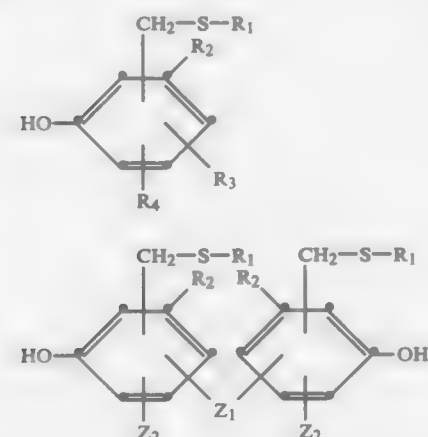
Claims priority, application Switzerland, Dec. 24, 1986, 5737/86

Int. Cl.⁴ C07C 149/36, 149/70, 149/41

U.S. Cl. 560—15

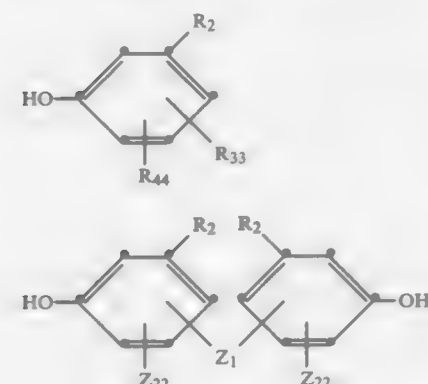
10 Claims

1. A process for the preparation of a compound of formula I or II



wherein

R_1 is C_1-C_{20} alkyl which is unsubstituted or substituted by 1 or 2 hydroxyl groups or interrupted by $-O-$, or is C_1-C_{20} alkylene- $COOR_5$, C_1-C_{20} alkylene- $C-NR_5R_6$, C_5-C_{12} cycloalkyl, phenyl, 1-naphthyl, 2-naphthyl, C_1-C_{20} alkylphenyl or phenyl- C_1-C_{20} alkyl;
 R_2 is hydrogen, C_1-C_{20} alkyl, C_2-C_{18} alkenyl or halogen;
 R_3 and R_4 are each independently of the other C_1-C_{20} alkyl, allyl, C_5-C_{12} cycloalkyl, phenyl, phenyl- C_1-C_{20} alkyl, halogen or $-\text{CH}_2-S-R_1$, with the proviso that at least one of R_3 and R_4 is $-\text{CH}_2-S-R_1$;
 R_5 is C_1-C_{20} alkyl, allyl, C_5-C_{12} cycloalkyl, phenyl or benzyl;
 R_6 is hydrogen, C_1-C_{20} alkyl or C_2-C_{18} alkenyl;
 Z_1 is $-S-$ or $-C(Z_3)(Z_4)-$;
 Z_2 is hydrogen, C_1-C_{20} alkyl or $-\text{CH}_2-S-R_1$;
 Z_3 is hydrogen or methyl and Z_4 is hydrogen or C_1-C_{20} alkyl, with the proviso that the phenols of formula I or II in m-position do not contain the functional group $-\text{CH}_2-S-R_1$, by reaction of a phenol of formula III or IV



wherein

R_2 and Z_1 are as previously defined, R_3 and R_4 are each independently of the other hydro-

gen, C_1-C_{20} alkyl, allyl, C_5-C_{12} cycloalkyl, phenyl, phenyl- C_1-C_{20} alkyl or halogen, with the proviso that at least one of R_3 and R_4 is hydrogen, and Z_2 is hydrogen or C_1-C_{20} alkyl, with formaldehyde or a compound that liberates formaldehyde under the reaction conditions and with at least one mercaptan R_1-SH , in the presence of a base, said base being mono- or dimethylamine or mono- or diethylamine.

4,874,886

NOVEL FLUORINATED BIS(SALICYLATES)

Charles B. Grant, Pittsburg, Calif., assignor to The Dow Chemical Company, Midland, Mich.

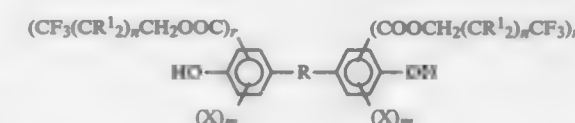
Filed Nov. 7, 1988, Ser. No. 268,118

Int. Cl.⁴ C07C 69/88

U.S. Cl. 560—70

12 Claims

1. The fluorinated bis(salicylate) corresponding to the formula:



wherein

R is a C_{1-18} divalent hydrocarbon radical, a C_{1-18} divalent inertly substituted hydrocarbon radical, or a C_{1-18} divalent halocarbon radical;
 R^1 is independently in each occurrence a hydrogen or fluorine;
X is independently in each occurrence hydrogen, a halogen, a C_{1-3} alkyl, a C_{1-3} haloalkyl, or a nitrile;
m is independently in each occurrence an integer between 0 and 3 inclusive;
n is independently in each occurrence an integer between 0 and 6 inclusive; and
r is independently in each occurrence an integer between 1 and 4 inclusive.

4,874,887

PROCESS FOR THE PREPARATION OF PYRETHROID TYPE ESTER COMPOUNDS

Sang H. Jung, and Seung K. Kim, both of Chungcheongnam, Rep. of Korea, assignors to Lucky, Ltd., Seoul, Rep. of Korea
PCT No. PCT/KR88/00003, § 371 Date Oct. 7, 1988, § 102(e) Date Oct. 7, 1988, PCT Pub. No. WO88/06151, PCT Pub. Date Aug. 25, 1988

PCT Filed Feb. 2, 1988, Ser. No. 259,267

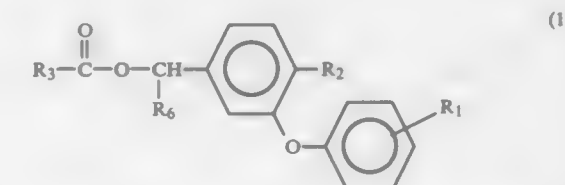
Claims priority, application Rep. of Korea, Feb. 13, 1987, 87 1205; Feb. 13, 1987, 87 1206

Int. Cl.⁴ C07C 121/75

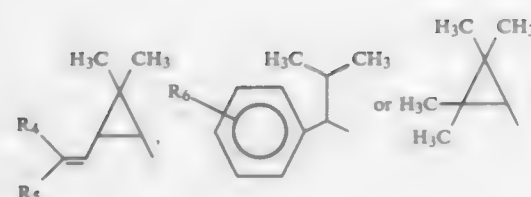
U.S. Cl. 560—124

20 Claims

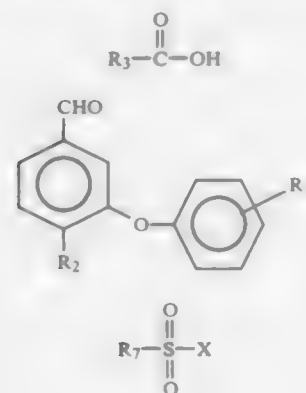
1. A process for the preparation of a pyrethroid ester compound of the general formula (I):



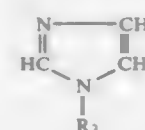
wherein R_1 and R_2 are the same or different from each other and represent a hydrogen or a halogen atom; R_3 represents



(wherein R_4 and R_5 represent a chlorine or bromine atom or a methyl group when R_4 is identical to R_5 , but R_4 represents a chlorine or bromine atom or a methyl group and R_5 represents a trifluoromethyl group when R_4 is different from R_5 , and R_6 represents a halogen atom or difluoromethoxy group); and R_6 represents a cyano group, which comprises reacting an organic acid of the general formula (II), an aldehyde of the general formula (III) and a water-soluble cyanide with a sulphonyl compound of the general formula (IV) wherein R_7 represents an aryl, alkyl or an optionally-substituted aryl and X is a halogen, azide, cyanide, imidazole, triazole, nitrotriazole or tetrazole, in the presence of a two-phase solvent system consisting of water and a substantially water-immiscible aprotic solvent and a phase transfer catalyst and then reacting the reaction mixture with a water-soluble inorganic base:



- (II) where R_1 and R_2 are identical or different and are each alkyl of 1 to 4 carbon atoms, or R_1 and R_2 , together with the nitrogen on which they are substituents, may form a 5- or 7-membered ring which may additionally contain an oxygen or nitrogen atom, and an imidazole of the formula:
- (III)



- (IV) where R_3 is alkyl of 1 to 4 carbon atoms.

4,874,890

PROCESS FOR THE PRODUCTION OF DEUTERATED METHYL ACRYLATE OR DEUTERATED METHYL METHACRYLATE

Masaaki Kato, Tetsuya Uno, Masao Kobayashi, and Naoto Osuga, all of Otake, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 807,710, Dec. 11, 1985, abandoned. This application Feb. 8, 1988, Ser. No. 154,485

Claims priority, application Japan, Dec. 21, 1984, 59-270319 Int. Cl.⁴ C07C 69/52

U.S. Cl. 560—205 10 Claims

1. A process for the production of deuterated methyl acrylate or deuterated methyl methacrylate, comprising the direct substitution of deuterium, from a source chosen from at least one of heavy water and deuterium gas, for the hydrogens in methyl acrylate or methyl methacrylate in the presence of at least one platinum group metal catalyst selected from the group consisting of platinum and palladium catalysts at a temperature in the range of from room temperature up to 300° C.

4,874,891

OPEN "D" RING HORMONE ANALOGS

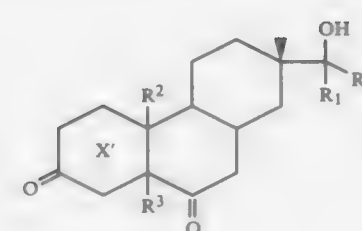
Douglas F. Covey, and Richard J. Auchus, both of St. Louis, Mo., assignors to Washington University, St. Louis, Mo.

Filed May 1, 1986, Ser. No. 858,393

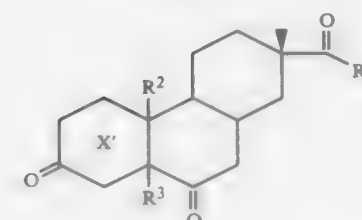
Int. Cl.⁴ C07C 67/02

U.S. Cl. 560—256 11 Claims

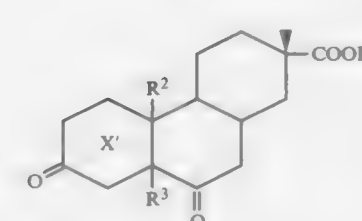
1. A compound of the formula



or



or



wherein x represents the presence or absence of 0, 1, or 2 conjugated or unconjugated π bond(s); and wherein:
 R^2 is H, alkyl(1-6), 2-propynyl, or allenyl;
 R^3 is H or OR^5 , wherein R^5 is H, acyl of (1-7 carbon atoms), or alkyl(1-6); and
 wherein R_1 and R_2 is each independently H, alkyl(1-6) or is $-C=CR_3$, $-CH=CHR_3$, or $-CH=C=CHR_3$, wherein R_3 is selected from the group consisting of H, halo, CF_3 , alkyl of (1-6) carbon atoms, acyloxy, carboxy carboalkoxy, alkoxy, or alkylthio.

4,874,892

PROCESS FOR THE PREPARATION OF 6-HYDROXYNAPHTHALENE-1-CARBOXYLIC FROM 1-AMINOMETHYLNAPHTHALENE-6-SULPHONIC ACID

Erich Hammerschmidt, and Heinz U. Blank, both of Leverkusen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 109,525, Oct. 15, 1987, Pat. No. 4,795,596. This application Jul. 18, 1988, Ser. No. 220,294

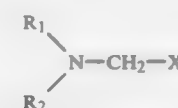
Claims priority, application Fed. Rep. of Germany, Oct. 31, 1986, 3637138

Int. Cl.⁴ C07C 51/265

U.S. Cl. 562—409 6 Claims

1. A process for the preparation of 6-hydroxynaphthalene-1-carboxylic acid comprising the following steps:

- (a) amidalkylating naphthalene-2-sulphonic acid in an acid medium with an amidalkylating agent of the formula



in which
 R_1 is acyl,

- R_2 is hydrogen or acyl, or
 R_1 and R_2 together form a diacyl radical,
 X is halogen, and R_3O -group or an $(R_1)(R_2)N$ -group and
 R_3 is hydrogen, acyl or an $(R_1)(R_2)N-CH_2-$ group;
 (b) splitting off the acyl radical R_1 or the acyl radicals R_1 and R_2 from the amidalkylation product by acid or alkaline hydrolysis;
 (c) oxidizing the 1-aminomethyl-naphthalene-6-sulphonic acid obtained in step (b) to form a 1-carboxynaphthalene-6-sulphonic acid; and
 (d) converting the 1-carboxynaphthalene-6-sulphonic acid by alkali fusion into the 6-hydroxynaphthalene-1-carboxylic acid.

4,874,893

INDUSTRIAL PROCESS FOR THE PREPARATION OF AMINO ACIDS BY HYDROLYSIS OF PROTEINS IN ACID MEDIUM

Michel Florik, Chamalieres, France, assignor to Laboratoires Florik S.A. Zone Industrielle Du Brezet, Clermont-Ferrand, France

PCT No. PCT/FR87/00094, § 371 Date Jan. 27, 1988, § 102(e) Date Jan. 27, 1988, PCT Pub. No. WO87/05895, PCT Pub. Date Oct. 8, 1987

PCT Filed Mar. 26, 1987, Ser. No. 133,045

Claims priority, application France, Mar. 27, 1986, 86 04441 Int. Cl.⁴ C07C 99/02

U.S. Cl. 562—443 6 Claims

1. In a process for the industrial preparation of amino acids by hydrolysis of protein of animal or vegetable origin in a sulfuric acid medium within a reaction tank, comprising:

conducting protein hydrolysis with sulfuric acid having a concentration of at least 12N and at a temperature of at least 100° C., stopping the hydrolysis by addition of water so as to lower the temperature and to reduce the sulfuric acid concentration to a value of 6N or less and removing the excess of sulfuric acid by neutralization, the improvement wherein the reaction tank is charged with water and an initial portion of a sulfuric acid solution in an amount necessary for said hydrolysis of said protein, said tank is heated at a temperature between 100° C. and the boiling point thereof prior to the addition of said protein to said tank, said water diluting the sulfuric acid solution initially added, so that the concentration of sulfuric acid within said reaction tank is about 12-14N, the protein to be hydrolyzed is then added simultaneously with but separately from a remaining portion of said sulfuric acid solution in an amount necessary for said hydrolysis in an amount corresponding to that required for the neutralization of amine groups of amino acids generated by the hydrolysis of the protein, so that said protein and said remaining portion of said sulfuric acid solution are added at independently adjustable rates while maintaining the concentration of acid with said reaction tank at about 12-14N.

4,874,894

PROCESS FOR THE PRODUCTION OF BENZENESULFONAMIDES

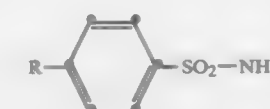
Ramamurthi Kannan, Edgewood, Ky., assignor to Hilton Davis Co., Cincinnati, Ohio

Filed Apr. 29, 1987, Ser. No. 43,788

Int. Cl.⁴ C07C 143/882

U.S. Cl. 564—93 7 Claims

1. A process for the production of a 4-R-benzenesulfonamide of the formula



wherein R represents a non-tertiary C₁ to C₁₆ alkyl or a non-tertiary C₁ to C₁₆ alkoxy, which consists of in the first step reacting a R-benzene with sulfuric acid and phosphorus oxychloride to produce a 4-R-benzenesulfonyl chloride of the formula:



and in a second step amidating said 4-R-benzenesulfonyl chloride with ammonia in an aqueous medium to obtain said 4-R-benzenesulfonamide:

4,874,895

PROCESS FOR PURIFYING CRUDE TRIFLURALIN
Donatello Graziello, Valdarno, Italy, assignor to Finchimica S.p.A., Manerbio, Italy
Continuation of Ser. No. 129,347, Nov. 27, 1987, abandoned, which is a continuation of Ser. No. 824,888, Jan. 31, 1986, abandoned. This application Feb. 17, 1989, Ser. No. 313,356
Claims priority, application Italy, Dec. 18, 1985, 23247 A/85
Int. Cl.⁴ C07C 85/26, 111/00, 85/11, 87/60

U.S. Cl. 564-437 8 Claims

1. An improved process for purifying crude trifluralin containing nitrosamines to reduce the level thereof to below at least 0.5 ppm, wherein crude trifluralin is treated by mixing under agitation with an aqueous solution of hydrobromic acid, wherein the improvements consists of adding to said aqueous solution an amount of sulfamic acid of from 0.1 to 3 g per liter of said aqueous hydrobromic acid solution and an amount of a bisulfite of an alkali metal corresponding to a content of sulphur dioxide of from 0.3 to 1.2 g/l of said aqueous solution.

4,874,896

PROCESS FOR THE PRODUCTION OF ALKYLAMINES
Kurt D. Olson, Cross Lanes, and Steven W. Kaiser, South Charleston, both of W. Va., assignors to UOP, Des Plaines, Ill.

Filed Dec. 23, 1987, Ser. No. 137,198
Int. Cl.⁴ C07C 85/06; B61J 27/182

U.S. Cl. 564-479 62 Claims

1. A process for preparing an alkylamine which comprises contacting an alcohol with at least one compound having the formula:



wherein each R' group is a member selected from hydrogen or an alkyl radical containing from 1 to 12 carbon atoms, each of said R' groups being the same or different from other R' groups in the said compound, with a non-zeolitic molecular sieve under conditions effective to produce the alkylamine.

4,874,897

BISPHOSPHINE PRODUCTION

Friedrich Bickelhaupt, and Thomas van der Does, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed May 4, 1988, Ser. No. 190,187
Claims priority, application Netherlands, May 5, 1987, 8701053

Int. Cl.⁴ C07F 9/02

U.S. Cl. 568-13 7 Claims

1. A process for the production of 1,3-bis[di(2-alkoxyphenyl)phosphino]propane which comprises (1) reacting 2-alkoxyphenyl halide with magnesium, thereby producing the corresponding 2-alkoxyphenyl-magnesium halide; (2) reacting said 2-alkoxyphenylmagnesium halide with phosphorus trihalide, thereby producing the corresponding di(2-alkoxyphenyl)-

phosphorus halide; (3) producing from said di(2-alkoxyphenyl)phosphorus halide the corresponding di(2-alkoxyphenyl)phosphine by reaction with alkali metal-containing hydride followed by hydrolysis; and (4) reacting the di(2-alkoxyphenyl)phosphine with 1,3-dihalopropane in the presence of strong base, and recovering 1,3-bis[di(2-alkoxyphenyl)phosphino]propane from the resulting mixture.

4,874,898

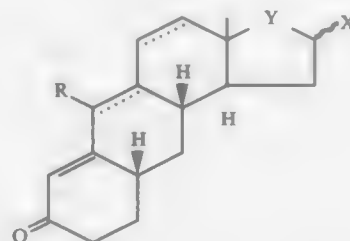
NOVEL SUBSTITUTED ANTHRASTEROID DERIVATIVES

Ken'ichi Takeda, Hyogo, and Isao Horibe, Osaka, both of Japan, assignors to Shionogi and Co., Ltd. Patent Department, Osaka, Japan

Filed Jul. 7, 1988, Ser. No. 216,525
Claims priority, application Japan, Jul. 31, 1987, 62-193608
Int. Cl.⁴ C07C 49/617

U.S. Cl. 568-369 7 Claims

1. A substituted anthrasteroid derivative represented by the following formula:



wherein R is hydrogen or lower alkyl; X is hydrogen, lower alkyl, halogen, hydroxy, hydroxymethyl, or halomethyl; Y is C=O, CH~OR', or OH C...R'', wherein R' is (1) hydrogen, (2) lower alkyl, (3) saturated or unsaturated cycloalkyl optionally substituted by ethyl, methoxy, or ethoxy, or (4) aliphatic lower acyl which may have carboxy or its lower alkyl ester at the terminal; R'' is lower alkyl or lower alkynyl; the dotted line indicates the presence or absence of a double bond; and the wavy line indicates an α or β configuration with the proviso that in the absence of a double bond between 5a and 6 positions, the configuration of the hydrogen atom at the 5a position is α; or an ethylene acetal derivative thereof.

4,874,899

PREPARATION OF UNSATURATED AND SATURATED KETONES

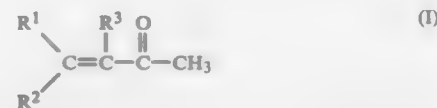
Wolfgang Hoelderich, Frankenthal; Leopold Hupfer, Friedelsheim, and Kurt Schneider, Bad Duerkheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jun. 15, 1988, Ser. No. 206,731
Claims priority, application Fed. Rep. of Germany, Jun. 24, 1987, 3720850

Int. Cl.⁴ C07C 45/55

U.S. Cl. 568-386 5 Claims

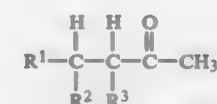
1. A process for the preparation of an unsaturated ketone of the formula (I)



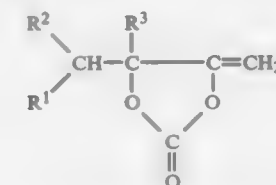
or a saturated ketone of the formula (II)

condensing citral with a ketone in the presence of a catalytic proportion of lithium hydroxide.

(II)



where R¹, R² and R³ are each hydrogen, alkyl of 1 to 12 carbon atoms or a cycloalkyl, aryl, aralkyl or alkylaryl radical, or R¹ and R³ or R² and R³, together with the carbon atoms to which they are bonded, may form a cycloalkane, wherein a 5-methylene-1,3-dioxolane which is substituted in the 4-position and is of the formula (III)



(III)

where R¹, R² and R³ have the above meanings, (a) for the preparation of an unsaturated ketone (I), is converted in the gas phase at a temperature of from 100° to 500° C. in a fixed or fluidized catalyst bed, or in the liquid phase at a temperature of from 50° to 200° C. in the presence of a zeolite and/or of a B, Ce, Fe, Zr or Sr phosphate as catalysts and (b) for the preparation of a saturated ketone (II), is converted in the gas phase at a temperature of from 100° to 500° C. in a fixed or fluidized catalyst bed, or in the liquid phase at a temperature of from 50° to 200° C. in the presence of hydrogen over a zeolite and/or a B, Ce, Fe, Zr or Sr phosphate, which carries one or more hydrogenation components, as catalysts.

4,874,900

PREPARATION OF PSEUDOIONONES

Peter W. D. Mitchell, Freehold, N.J., assignor to Union Camp Corporation, Wayne, N.J.

Filed Jun. 16, 1987, Ser. No. 62,884
Int. Cl.⁴ C07C 45/45

U.S. Cl. 568-390 15 Claims

1. A method of preparing a pseudoionone which comprises:

4,874,901

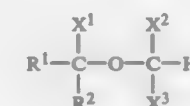
PROCESS FOR THE PRODUCTION OF POLYFLUORINATED ETHERS

Donald F. Halpern, Fanwood, and Mark L. Robin, South Plainfield, both of N.J., assignors to BOC, Inc., New Providence, N.J.

Filed May 6, 1988, Ser. No. 191,442
Int. Cl.⁴ C07C 41/22

U.S. Cl. 568-683 12 Claims

1. A method for the fluorination of a compound of the formula:



wherein X¹, X² and X³ are hydrogen, chloro, or fluoro, with the proviso that at least one is chloro and R¹ and R² are either hydrogen or halo lower alkyl with the proviso that at least one is halo lower alkyl, said method comprising reacting sodium fluoride or potassium fluoride with said compound at an elevated temperature and pressure in the absence of added solvent.

4,874,902

METHOD FOR THE PREPARATION OF FLUOROMETHYL 1,1,1,3,3,3-HEXAFLUORO-2-PROPYL ETHER

Chialang Huang, Edison, and Gerald G. Vernice, Nutley, both of N.J., assignors to BOC, Inc., New Providence, N.J.

Filed May 20, 1988, Ser. No. 196,712
Int. Cl.⁴ C07C 41/22

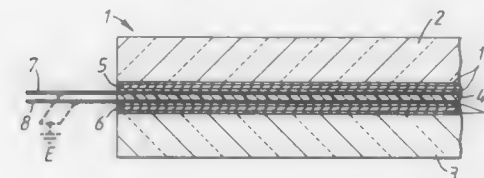
U.S. Cl. 568-683 2 Claims

1. A method for the preparation of fluoromethyl 1,1,1,3,3,3-hexafluoro-2-propyl ether comprising reacting methyl 1,1,1,3,3,3-hexachloro-2-propyl ether or or chloromethyl 1,1,1,3,3,3-hexachloro-2-propyl ether with chlorine trifluoride or bromine trifluoride.

ELECTRICAL

4,874,903
SHIELDING PANEL
Leslie T. Clarke, Merseyside, England, assignor to Pilkington PLC, Merseyside, England
Filed May 27, 1988, Ser. No. 199,715
Claims priority, application United Kingdom, Jun. 9, 1987, 8713437
Int. Cl.⁴ H05K 9/00
U.S. Cl. 174—35 MS

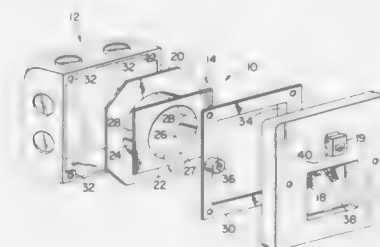
15 Claims



1. A translucent electromagnetic shielding panel comprising, in combination,
a first pane of glass or plastic carrying a silver layer on one of its major surfaces, the thickness of the silver layer being up to 30 nm,
a second pane of glass or plastic carrying a silver layer on one of its major surfaces, the thickness of the silver layer being up to 30 nm, with the first and second said panes being positioned in an opposed, spaced relationship,
and first and second electrical connection means in contact with the periphery of the silver layers on each of said respective first and second panes for providing an electrical connection of the silver layers to earth.

4,874,904
FIBER OPTIC FACEPLATE ASSEMBLY
Raymond J. DeSanti, Worcester, Mass., assignor to Brintec Corporation, Williamantic, Conn.
Filed Apr. 14, 1988, Ser. No. 181,594
Int. Cl.⁴ H02G 3/08
U.S. Cl. 174—53

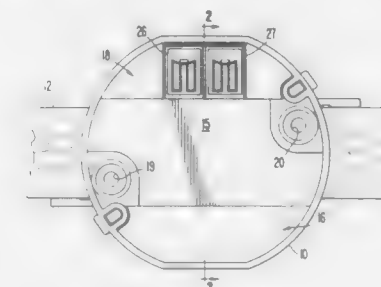
15 Claims



1. A fiber optic faceplate assembly for an outlet box having a frontal opening, said faceplate assembly comprising the faceplate, a fiber optic connector mounted in fixed position on said faceplate, and insert means for positioning within the outlet box and defining a forwardly extending cylindrical bore for receiving and storing in coiled condition an elongated portion of at least one optical fiber coupled to said fiber optic connector, said insert means having a front wall at the forward end of said bore including a frontal aperture therethrough communicating with said bore and through which the one optical fiber is payed into and out of said bore, said frontal aperture having a cross-sectional area smaller than the frontal cross-sectional area of said bore, means for releasably securing said insert within the outlet box and means for releasably attaching said faceplate to the outlet box to form a substantial closure for the frontal opening.

4,874,905
CABLE CLAMPS FOR ELECTRICAL BOX
Kenneth R. Schnell, and Gregory J. Kesler, both of South Bend, Ind., assignors to Hubbell Incorporated, Orange, Conn.
Filed Oct. 31, 1988, Ser. No. 264,877
Int. Cl.⁴ H02G 3/08, 15/007
U.S. Cl. 174—65 R

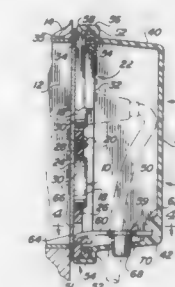
3 Claims



1. An electrical ceiling box and cable clamp structure, the ceiling box being of the type having means defining an entrance port for an electrical cable, the structure comprising an elongated tab extending across and substantially closing said entrance port;
hinge means at the proximal end of said tab connecting said tab to said box to permit said tab to be hingedly swung into said box and away from said port so that a cable can be inserted through said port and into said box;
an arcuately curved wall formed on an inner surface of said tab near the distal end of said tab, said curved wall having a concave surface facing generally toward said distal end of said tab and being dimensioned to receive the end of a finger to facilitate swinging said tab into said box; and means defining a recess at the base of said concave surface of said wall, said recess being shaped and dimensioned to receive the end of a blade screwdriver to facilitate the use of a blade screwdriver to swing said tab into said box.

4,874,906
PLUG ENCLOSING OUTLET COVER
Michael J. Shotey, 7733 E. Cypress, Scottsdale, Ariz. 85257
Continuation of Ser. No. 66,993, Jun. 29, 1987, Pat. No. 4,803,307. This application Dec. 14, 1988, Ser. No. 284,071
The portion of the term of this patent subsequent to Feb. 7, 2006, has been disclaimed.
Int. Cl.⁴ H02G 3/18
U.S. Cl. 174—67

2 Claims



1. A weatherproof cover for an outdoor electrical outlet, said cover comprising:
(a) a waterproof, corrosion-resistant and electrically non-conductive mounting plate;
(b) fastener means for demountably securing said mounting plate to the outlet;
(c) said mounting plate including a lip;

- (d) a waterproof, corrosion-resistant lid member for enclosing the outdoor electrical outlet and the plug of at least one electrical cord mountable therein, said lid member being movably attached to said mounting plate and having means formed therein for allowing the electrical cord of the plugged in plug to extend from said lid member;
- (e) said lid member including a hook portion depending from engaging said lip to pivotally engage said lid member with said mounting plate;
- (f) first sealing member disposed between said mounting plate and the outlet for preventing passage of foreign elements therebetween; and
- (g) a second sealing member disposed between said mounting plate and said lid member for preventing passage of foreign elements therebetween.

4,874,907

PRINTED CIRCUIT BOARD

Norio Ishikawa, Kanagawa, Japan, assignor to Mitsubishi Denki K.K., Tokyo, Japan

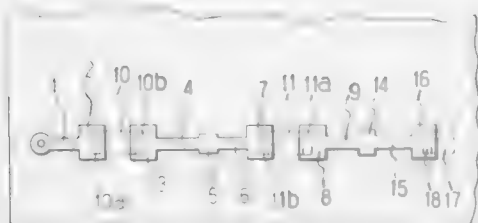
Filed May 20, 1988, Ser. No. 196,603

Claims priority, application Japan, Jun. 5, 1987, 62-87224[U]

Int. Cl.⁴ H05K 1/00

U.S. Cl. 174—68.5

4 Claims



1. A printed circuit board comprising:
- a substrate;
 - a first component connection land provided on a surface of said substrate, to which an end of a first electronic component is to be connected;
 - a second component connection land provided on said surface, to which an end of a second electronic component is to be connected;
 - a wiring pattern provided on said surface to link said first and second component connection lands;
 - a signal output land made from a portion of said wiring pattern; and
 - a solder-resist layer for covering said printed circuit board except for said first, second, and signal output lands.

4,874,908

WIRING HARNESS

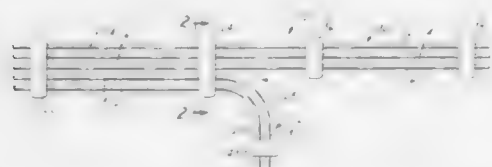
Ronald C. Johanson, Stillwater, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jul. 8, 1987, Ser. No. 67,763

Int. Cl.⁴ B60R 16/02; H02G 3/02

U.S. Cl. 174—72 A

23 Claims



1. A wiring harness and support structure for conveying energy with respect to the support structure, comprising:

- (a) at least two wires having opposed ends and arranged in a row for transmitting energy therethrough;
- (b) at least two spaced pads extending generally transverse to said wires intermediate said opposed ends of said wires and through which said wires extend in spaced relationship to each other, said pads being molded about said wires; and
- (c) mounting means for securing at least two of said pads to said support structure so that said pads support and position said wires with respect to said support structure.

4,874,909

ELECTRICAL SPLICE CONNECTOR

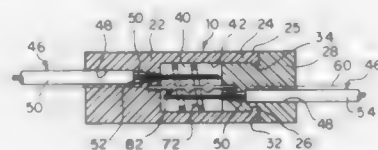
David C. Velke, Sr., 3305 Aldie Rd., Catharpin, Va. 22018; George P. Maraden, 7621 Mary Cassatt Dr., Potomac, Md. 20854, and Burton C. Leffingwell, 242 Meadows Ln., Leesburg, Va. 22075

Filed Sep. 30, 1988, Ser. No. 251,370

Int. Cl.⁴ H02G 15/115

U.S. Cl. 174—845

17 Claims



1. A cable connector for uniting the bared ends of conductors of two cables comprising;
- main and secondary body sections each having a conductor hole therethrough, said body sections disposed in axial alignment and having inner end faces spaced apart to define a cavity therebetween, means joining said body sections together to allow angular displacement therebetween;
 - a grip element within said cavity and having at least one coil terminating in first and second ends;
 - said body section inner end faces each having holding means thereon angularly offset from said conductor holes and receiving and retaining said grip element ends whereby, following insertion of two cable conductor ends through said conductor holes and into said cavity within the confines of said grip element coil and subsequently twisting said body sections relative one another, said grip element coil is constricted in a crimped manner about the two conductor ends thereby electrically and mechanically interlocking the conductor ends.

4,874,910

HIGH LEAD DENSITY VACUUM FEEDTHROUGH

Joseph R. McCoy, Frankfort, N.Y., assignor to Government of the United States as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 22, 1988, Ser. No. 184,678

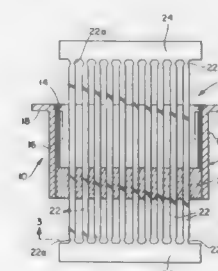
Int. Cl.⁴ H01B 17/26

U.S. Cl. 174—152 GM

3 Claims

1. A vacuum feedthrough comprising, in combination;
- a case having an open interior defined by a pair of elongated, closely spaced, parallel sidewalls and short, opposed, adjoining endwalls;
 - said case including first and second opposed, open ends, said case sidewalls and endwalls at said first end being integrally formed having a laterally offset, continuous, perimetrical flange facilitating feedthrough affixation to a vacuum enclosure;
 - a plurality of leads extending through said case open interior and having opposed ends extending beyond the opposed open ends of said case, said leads being arranged in closely spaced, parallel, side-by-side relation in a linear array

- oriented parallel to and equi-distant between said side-walls;
- a hermetic glass seal closing off said case open interior and effecting a lead-to-glass seal, said glass seal being located adjacent said second open end in spaced relation to said first open end of said case so that it occupies the case from said second open end to a fraction of the distance to the first open end;



- said plurality of leads being in the form of a lead frame created from a metallic sheet having a planar array of closely spaced, coextensive rectangular leads integrally interconnected at the opposed ends thereof by separate headers. The leads having junctions with the headers at each end which are relieved to create weak points, said headers being severed from said lead ends at said junctions subsequent to the formation of said glass seal.

4,874,911

ELECTRICAL REVERSING SWITCH

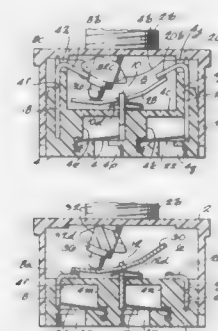
Timothy L. Parrish, Kenly, N.C., assignor to Eaton Corporation, Cleveland, Ohio

Filed Mar. 28, 1988, Ser. No. 173,893

Int. Cl.⁴ H01H 9/00

U.S. Cl. 200—6 R

8 Claims



1. An electrical reversing switch having an insulating housing wherein a pair of switch poles are arranged side-by-side, each pole having a pair of spaced stationary contacts, a fulcrum contact disposed intermediate said stationary contacts, and a rocking contactor supported on said fulcrum contact pivotally movable in opposite directions to cause opposite ends thereof to engage one or the other of said pair of stationary contacts, and an actuator pivotally mounted in said housing having means resiliently engaging an upper surface of said contactor in each pole, said means traversing said upper surface of each said contactor across a plane of the respective fulcrum contact as said actuator is pivoted, said actuator assuming stable positions at either side of said fulcrum contacts wherein said means drives a respective contactor into engagement with a respective one or the other of said stationary contacts, characterized in that:

said stationary contacts in one pole are disposed below the respective contactor and stationary contacts in the other pole

are disposed above the respective contactor, said contactor of one switch pole engaging a stationary contact of said one switch pole on one side of said fulcrum contact of said one switch pole, and said contactor of the other switch pole engaging a stationary contact of said other switch pole on an opposite side of said fulcrum contact of said other switch pole when said actuator assumes one of said stable positions.

4,874,912

HOOK SWITCH

Toshio Kakuta, Higashiosaka, and Hiroyuki Nagano, Kadoma, both of Japan, assignors to Hosiden Electronics Co., Ltd., Osaka, Japan

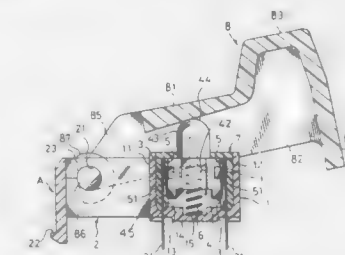
Filed May 19, 1988, Ser. No. 196,056

Claims priority, application Japan, Jul. 28, 1987, 62-115403

Int. Cl.⁴ H01H 15/02, 3/02

U.S. Cl. 200—16 D

10 Claims



1. A hook switch, comprising:
- a box-shaped body having a bottom wall and an open end;
 - at least one fixed contact piece having a contact surface located within said body;
 - a slider slidably received within said body, and having a protrusion with a spherical top protruding through said open end of said body;
 - at least one movable contact piece which elastically contacts the contact surface of said at least one fixed contact piece when the slider slides in said body;
 - a spring located between the slider and the bottom wall of said body, said spring exerting a biasing force in a direction to put the slider out from said at least one opening;
 - a cover mounted on the open end of said body to prevent the slider from slipping out of said body due to said biasing force of said spring, said cover having a through-hole formed therein through which said protrusion of said slider is inserted;
 - an arm extending outwardly from said body, said arm defining a tip; and
 - an actuator supported rotatably on the tip of said arm, said actuator having a top wall which abuts against said protrusion of said slider.

4,874,913

LUMINOUS ELEMENT HOLDING STRUCTURE FOR AN ILLUMINATED KEY SWITCH

Kazuo Aoki, and Sadao Tachibana, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Apr. 22, 1988, Ser. No. 189,134

Claims priority, application Japan, Apr. 30, 1987, 62-65340[U]

Int. Cl.⁴ H01H 9/16; F21V 33/00

U.S. Cl. 200—314

3 Claims

1. A luminous element holding structure of an illuminated key switch, said structure comprising:
- a base plate;
 - a switch element disposed on said base plate,
 - said switch element having a pair of contacts, a switch ele-

ment recess extending therein, and a pair of electrodes fixed thereto in said recess;

a holding plate disposed over said switch element and having a holding plate through hole extending therethrough;

a housing mounted to said holding plate within said holding plate through hole and resting on said switch element, said housing having a hollow substantially cubic body with a housing recess defined in one corner thereof, a peripheral flange extending around said body at a mid-portion thereof and seated on a surface of said holding plate, a housing through hole extending through the upper wall of the cubic body, a pair of catches disposed on opposite sides of said cubic body and engaging said holding plate at a surface thereof opposite the surface of said holding plate on which said peripheral flange is seated, and a partial flange extending in said housing recess along a plane common to a plane in which said peripheral flange is disposed and partitioning said housing recess into an upper recess portion and a lower recess portion,

said partial flange having a partial flange through hole extending therethrough;

a key movably supported by said housing for actuating said pair of contacts,



said key having a hollow substantially prismoidal head including a transparent window, and a stem extending from said head toward said contacts;

a luminous element holder having a first portion adjacent said housing in said lower recess portion and a second portion adjacent an edge of said switching element defining said switching element recess, said first portion having a shape complimentary to said lower recess portion,

said luminous element holder comprising an insulating member and a pair of conductive members,

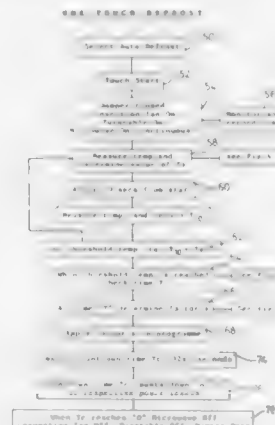
said insulating member including a head portion that is adjacent said edge of said switching element, has a shape complimentary thereto and constitutes the entire said second portion of the luminous holder, and a leg portion extending from said head portion,

said conductive members attached to said insulating member, disposed at opposite sides of said leg portion, contacting said electrodes, respectively, and each having a holder through hole extending therein; and

a luminous element including a luminous head extending through said partial flange through hole, and a pair of lead wires each of which extends from said luminous head into a respective said holder through hole.

4,874,914
MICROWAVE OVENS AND METHODS OF DEFROSTING FOOD THEREIN
 Kenneth I Eke, Woldingham, England, assignor to Microwave Ovens Limited, Shirley, England
 Filed Jan. 26, 1989, Ser. No. 301,464
 Claims priority, application United Kingdom, Feb. 5, 1988, 8802875

Int. Cl.⁴ H05B 6/68
 U.S. Cl. 219—10.55 M 14 Claims



1. A method of defrosting a frozen food item in a microwave oven, comprising the steps of:

placing the food item in a cavity of the oven;

recirculating air through said cavity throughout a defrosting period including first and second defrosting stages;

taking an initial ambient temperature sensing of said recirculating air;

introducing continuous microwave power into said cavity to heat the food item;

determining a threshold temperature, said steps of recirculating air, introducing continuous microwave power, and taking an initial ambient temperature sensing occurring substantially simultaneously to begin said first defrosting stage and said step of determining a threshold temperature occurring at a predetermined time after the beginning of said first defrosting stage;

monitoring the temperature of the recirculating air;

measuring elapsed time from beginning said first defrosting stage until the temperature of the recirculating air reaches said threshold temperature;

terminating said first defrosting stage when the temperature of the recirculating air reaches said threshold temperature;

calculating the duration of said second defrosting stage;

initiating said second defrosting stage, said second defrosting stage further comprising the steps of maintaining the continuous flow of recirculating air and introducing pulsed microwave power into said cavity; and

terminating said defrosting period.

4,874,915
APPARATUS FOR THE RAPID MICROWAVE THAWING OF CRYOPRESERVED BLOOD, BLOOD COMPONENTS, AND TISSUE
 Frank M. Harms, Marietta; Victor Tripp, Tucker, and Thomas B. Wells, Smyrna, all of Ga., assignors to Lifeblood Advanced Blood Bank Systems, Inc., Atlanta, Ga.
 Filed Dec. 30, 1988, Ser. No. 292,574
 Int. Cl.⁴ H05B 6/80

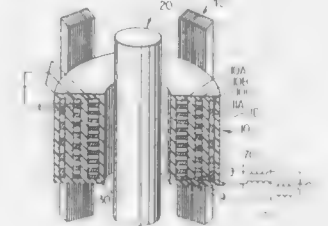
U.S. Cl. 219—10.55 F 64 Claims
 1. An apparatus for thawing a frozen material, comprising: a microwave generator selectively operable to generate microwaves;

a hollow waveguide for confining and guiding said microwaves to propagate in a plurality of odd-numbered modes of propagations, said waveguide defining an axis of propagation and being configured such that at a predetermined point along said axis of propagation the cumulative effect of said plurality of odd-numbered modes of propagation creates an approximately uniform electromagnetic field across a predetermined transverse cross section of said waveguide, said waveguide further defining a reservoir therein such that said reservoir can be filled with a liquid dielectric medium;

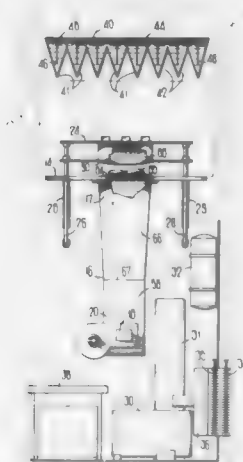
a first flexible membrane for supporting a frozen material to be thawed thereupon, said first flexible membrane being disposed transversely to said axis of propagation at said predetermined point along said axis of propagation; and

a cap assembly having an opening at one end thereof and defining a cavity therein, said cap assembly including a second flexible membrane sealing said opening at said one end of said cap assembly such that said cavity in said cap assembly is capable of containing a liquid therein, and said

4,874,916
INDUCTION HEATING AND MELTING SYSTEMS HAVING IMPROVED INDUCTION COILS
 Patrick E. Burke, North York, Canada, assignor to Guthrie Canadian Investments Limited, Scarborough, Canada
 Continuation-in-part of Ser. No. 875,884, Jan. 13, 1986, abandoned. This application Nov. 30, 1987, Ser. No. 127,537
 Claims priority, application Canada, Jan. 17, 1986, 499813
 Int. Cl.⁴ H05B 6/42
 U.S. Cl. 219—10.75 46 Claims



1. In electric inductive heating apparatus an improved inductive coil comprising a rigid open ended sleeve-like coil unit that includes two or more co-axial, co-extensive helical coil windings embedded in a temperature resistant, reinforced resin, each of said coil windings comprising a plurality of helical turns of multi-strand insulated conductor, means for connecting said coil windings in parallel and current balancing means operative in response to current flow respective ones of said coil windings thereby automatically forcing said coil windings to maintain a selected predetermined share of current flow including during variations of load and/or frequency.



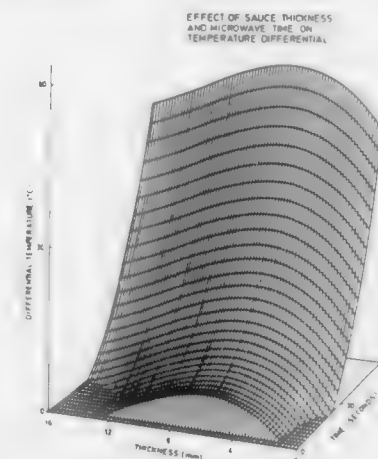
4,874,917
MICROWAVE FOOD PRODUCT AND METHOD OF MANUFACTURE
 John R. Weimer, Stacy, Minn., assignor to The Pillsbury Company, Minneapolis, Minn.
 Filed Oct. 23, 1986, Ser. No. 922,573
 Int. Cl.⁴ H05B 6/80
 U.S. Cl. 219—10.55 M 42 Claims

cap assembly being mounted adjacent said hollow waveguide and translatable to bring said second flexible membrane at said one end of said cap assembly into engagement with a frozen material to be thawed supported on said first flexible membrane;

whereby when said material to be thawed is positioned between said first and second flexible membranes and said cap assembly is translated, said flexible membranes intimately conform to said material to be thawed such that said first and second membranes completely encapsulate said material to be thawed;

whereby when said material to be thawed is so encapsulated between said first and second flexible membranes and said reservoir in said hollow waveguide and said cavity in said cap assembly are filled with a liquid dielectric medium, said material to be thawed is surrounded by said liquid dielectric medium; and

whereby said electromagnetic field at said predetermined point along said axis of propagation heats said material to be thawed.



1. A method of making a food product for use in a microwave oven, said method including:

(a) positioning at least one edible product in a container having at least one conductive member associated therewith forming a waveguide, said container having at least a portion thereof sufficiently transparent to microwave radiation to permit microwave radiation to enter said container and expose said at least one edible product therein to microwave radiation; and

(b) adjusting the impedance sufficiently of said at least one

edible product such that upon exposure to microwave radiation said at least one edible product heats within a preselected temperature relationship range and after a time period of exposure to microwave radiation reaches a preselected temperature within a preselected temperature range.

4,874,918

VACUUM BRAZING APPARATUS

Osamu Okubo, Takeo Kato, and Tetsuro Tsuchida, all of Kanagawa, Japan, assignors to Nihon Sinks Gijutsu Kabushiki Kaisha, Kanagawa and Nippondenso Co., Ltd., Aichi, both of, Japan

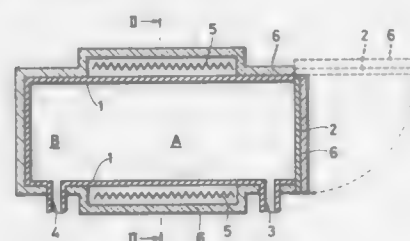
Filed Feb. 12, 1988, Ser. No. 155,288

Claims priority, application Japan, Feb. 14, 1987, 62-31815; Feb. 14, 1987, 62-31816

Int. Cl. B23K 1/02

U.S. Cl. 219—85.11

14 Claims



1. A vacuum brazing apparatus comprising:

a vacuum chamber the internal space of which consists of two regions, said regions being formed by the flow of an inert gas, the first region of said two regions being communicating with an inlet opening, in said first region are placed articles provided with brazing material being heated to be brazed with each other, the second region of said two regions being communicating with a discharge opening; and heating means arranged outside of an outer peripheral wall as to correspond to said first region in said vacuum chamber for heating said articles to be brazed, wherein metallic components of said brazing material emitted from said articles during the brazing operation are caused to flow from said first region toward said second region, the temperature of which is lower than that of said first region, by a flow of inert gas introduced from said inlet opening, and are coagulated on an internal wall of said vacuum chamber corresponding to said second region.

4,874,919

LASER APPARATUS FOR REPETITIVELY MARKING A MOVING SHEET

Antony S. Bransden, Grove; John H. P. C. Megaw, Shillingford; Malcolm J. Terry, Stevenston, and Brooke A. Ward, Goring, all of England, assignors to The Wiggins Teape Group Limited, Basingstoke, England

Filed Jan. 14, 1988, Ser. No. 143,950

Claims priority, application United Kingdom, Jan. 14, 1987, 8700765

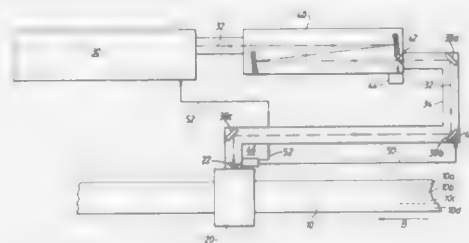
Int. Cl. B23K 26/00

U.S. Cl. 219—121.68

44 Claims

1. An optical apparatus for use in producing an image on a moving sheet of material, comprising a beam entry point for receiving a laser beam in a predetermined alignment, at least one mask-receiving means for receiving a mask bearing an image, optical means including first and second optical elements carried by a structure repetitively movable in a predetermined path to intercept the beam at different times in each such movement to switch the beam to the at least one mask-receiving means, and said optical means being adapted to focus the received laser beam to a line at the mask-receiving means to

which the beam is switched, the mask-receiving means and optical means being so arranged to provide a relative motion



between the line and the mask-receiving means at which it is focussed for scanning a mask received therein.

4,874,920

ELECTRONIC DEVICE MANUFACTURING METHODS

Shunpei Yamazaki, Kenji Itoh, and Susumu Nagayama, all of Tokyo, Japan, assignors to Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan

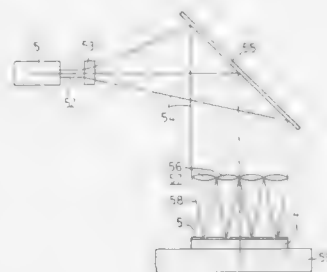
Continuation of Ser. No. 62,596, Jun. 16, 1987, abandoned, which is a division of Ser. No. 740,764, Jun. 3, 1985, Pat. No. 4,713,518. This application Jan. 13, 1989, Ser. No. 298,263

Claims priority, application Japan, Jun. 8, 1984, 59-117538; Oct. 8, 1984, 59-211769

Int. Cl. B23K 26/00

U.S. Cl. 219—121.85

9 Claims



1. A laser scribing method for producing a plurality of grooves on a semiconductor layer comprising: expanding laser light emitted from an eximer laser with respect to the cross-section of the laser light; contracting the expanded laser light in only one direction by a convex lens; focusing the contracted laser light on said semiconductor layer; and subliming a part of said semiconductor layer wherein said convex lens is the lens nearest the semiconductor layer forming a focal point where said subliming takes place.

4,874,921

PORTABLE AUXILIARY AUTOMOBILE HEATER

Barry V. Gerbig, Jr., P.O. Box 2712, Middlebury, Vt. 05753

Filed Jun. 19, 1987, Ser. No. 64,082

Int. Cl. B60L 1/02

U.S. Cl. 219—202

1 Claim

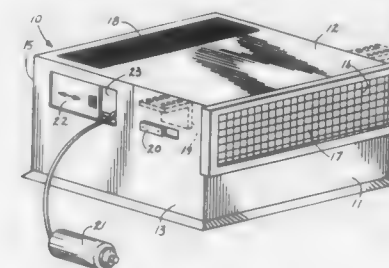
1. A new and improved portable automotive heater for pre-heating a passenger compartment of an automobile comprising a housing further including therein,

- (a) a heated air outlet means, and
- (b) an air intake means, and
- (c) a timing mechanism wherein said timing mechanism includes a digital timer/clock including an independent power supply means independent of a plural selective

electrical power supply means for providing electrical energy to said timing mechanism, and

(d) said plural selective electrical power supply means including an AC power input supply means and a DC electrical input supply means for providing electrical power to said automotive heater when said timing mechanism permits flow of electrical power to thereby provide heated air directed from said outlet means, and

said plural selective power supply means further includes an AC/DC switch enabling selective use of either said AC



electrical power supply means or DC power supply means to direct electrical power to said automotive heater, and a compartment is provided in said housing for storage for said DC power supply means, and a selective on/off switch provided on said housing enabling selective energization or de-energization of power to said portable automotive heater, and bracketry means is positioned on said automotive pre-heater housing for attachment of said automotive heater to a passenger compartment of an automobile.

4,874,922

GRANULE VISE FOR MANUFACTURING A MAGNETIC HEAD CORE WITH A GLASS FILLET ADJACENT THE INNER EDGE OF THE GAP

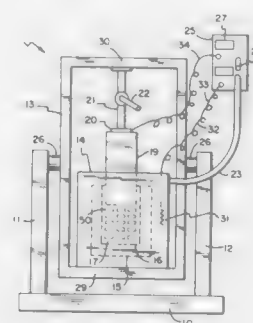
Timothy W. Vadnais, Victoria, and Douglas J. Hennenfent, Minneapolis, both of Minn., assignors to Impris Technology Incorporated, Minnetonka, Minn.

Filed Nov. 30, 1988, Ser. No. 277,732

Int. Cl. H05B 1/00

U.S. Cl. 219—243

1 Claim



1. Apparatus for simultaneously bonding individual ones of ferrite I bars to individual ones of ferrite C bars to form a plurality of O bars each having approximately the exterior shape of a rectangular prism from which individual head cores may be cut, each said O bar having an interior opening which extends the length of the O bar and a non-magnetic flux gap layer extending the length of the O bar between opposing faces of the I and C bars and along the interior opening, said flux gap layer having an interior edge bordering the interior opening and a length defined by the thickness of the flux gap layer, each said O bar further requiring a fillet along the flux gap interior edge to be formed upon melting, by application of heat, of a

rod of bonding material within the O bar interior opening, comprising

- (a) a base having a pair of projecting spaced apart arms;
 - (b) a rigid frame mounted between the projecting arms for rotation about a horizontal axis, said frame having spaced apart mounting beams;
 - (c) a heat resistant cylinder block attached to one mounting beam of the frame and having a cylindrical cavity therein opening toward the other mounting beam, and with the axis of the cylindrical cavity directed toward the other mounting beam;
 - (d) a quantity of rigid, heat resistant granules at least partly filling the cylindrical cavity, in which the individual unbonded O bars may be embedded with their gap length dimension substantially parallel to the axis of the cavity and their length dimension substantially parallel to the axis of rotation of the frame;
 - (e) a heat resistant pressure die having an external cylindrical shape substantially conforming to the cylindrical cavity and adapted to slide into the cylindrical cavity;
 - (f) compressing means mounted on the other mounting beam for forcing the pressure die into the cylindrical cavity to compress the granules, and
 - (g) heating means mounted on the one mounting beam in surrounding relation to the cylinder block for heating the contents of the cylinder block cavity;
- wherein activating the compressing means forcing the pressure die against the granules and rotating the frame to orient each unbonded O bar with the interior edge of its flux gap at the lowest point within the interior opening of each O bar, allows the rod of bonding material within its interior opening to fall into a position adjacent to the interior edge of the flux gap, to thereby cause the bonding material rod to form the fillet adjacent the flux gap upon activating the heating means.

4,874,923

GLOW PLUG FOR DIESEL ENGINE WITH A U-SHAPED SIALON CERAMIC HEATER

Koji Hatanaka, Kenzi Maruta, and Hirohisa Suwabe, all of Saitama, Japan, assignors to Jidosha Kiki Co., Ltd. and Hitachi Metals, Ltd., both of Tokyo, Japan

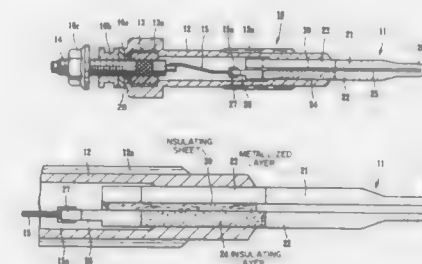
Continuation of Ser. No. 170,673, Mar. 18, 1988, abandoned, which is a continuation of Ser. No. 3,494, Jan. 15, 1987, abandoned. This application Apr. 28, 1989, Ser. No. 346,382

Claims priority, application Japan, Jan. 22, 1986, 61-9933

Int. Cl. F23Q 7/22; F02P 19/00; H05B 3/00; H01C 1/14

U.S. Cl. 219—270

6 Claims



1. A glow plug for a diesel engine, comprising an elongated hollow metallic holder, a ceramic heater having a U-shape as a whole and supported by said hollow holder, so as to project from one end thereof, wherein said ceramic heater is obtained by adding titanium nitrate to SIALON or α -SIALON so that its characteristics are varied from insulating to conducting, an external electrical connecting terminal extending into the other end of said holder,

means for electrically connecting an end of said ceramic heater to said external connecting terminal, and an insulating member supporting said external connecting terminal in an electrically insulated condition with respect to said hollow holder, wherein

said ceramic heater includes a U-shaped heating portion of resistive ceramic material projecting outwardly from said one holder end, and a pair of lead portions of a resistive ceramic material integral with and extending backward from the ends of said U-shaped heating portion and parallel to each other, said lead portions being spaced from each other to define a slit therebetween open to the interior of the hollow holder, said U-shaped heating portion and part of said lead portions projecting outwardly from said one end of said holder, wherein said U-shaped heating portion has a thickness less than that of said lead portions, one lead portion being connected electrically to the interior of said hollow holder, and the other lead portion being electrically insulated from said hollow holder and electrically connected to said external connecting terminal through the interior of said hollow holder via said connecting means, and

a sintered ceramic sheet of SIALON which is integrally bonded to at least portion of said pair of lead portions for sealing said slit formed between said lead portions and to seal the interior of the hollow holder against entry of combustion gases.

4,874,924

PTC HEATING DEVICE

Shinobu Yamamoto; Fumitoshi Hoshida, both of Hiroshima; Michikazu Takeuchi, Tokyo; Shou Kotani, Tokyo, and Sumihiko Yasuda, Tokyo, all of Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Apr. 19, 1988, Ser. No. 183,710

Claims priority, application Japan, Apr. 21, 1987, 60163; Nov. 16, 1987, 174598

Int. Cl.⁴ H05B 3/14; A61L 9/03

U.S. Cl. 219—274

13 Claims



1. A PTC heating device for incorporation in electric vaporizer apparatus for heating and vaporizing liquid material, said electric vaporizer apparatus including storage means for containing said liquid material therein, a wick for drawing said liquid material from said storage means therethrough, and a case for housing said storage means therein, said wick having an elongated body for immersion in said liquid material in said storage means, one end portion of said elongated body projecting from said storage means, comprising:

a casing of heat-resistant electrically insulating material having a recess formed therein and a heat-conducting portion made of electrically insulating material having good thermal conductivity and formed integrally with said casing in a manner to vertically protrude from an outer surface of a bottom of said recess toward an opened side of said casing;

said heat-conducting portion having a vertical through-hole of a substantially cylindrical shape and a pair of planar surfaces formed on opposite portions of an outer surface of a wall surrounding said through-hole;

two substantially plate-like PTC thermistors each having a

first electrode and a second electrode on respective first and second surfaces, thereof;

a first electrode member comprising a pair of spaced apart planar contact sections and an intermediate section interconnecting said spaced apart planar contact sections;

said first electrode member disposed in said recess of said casing with said planar contact sections having said heat-conducting portion interposed therebetween to form a surface of said heat-conducting portion;

each of said PTC thermistors disposed in said recess of said casing in a manner to be located on one of said planar contact sections of said first electrode member to form a surface contact with the planar contact section at said second electrode;

means on each of said planar contact sections of said first electrode member for preventing movement of a PTC thermistor in contact therewith;

a second electrode member formed of elastic material disposed in said recess of said casing and having means for engaging said respective first electrodes of said PTC thermistors on said planar contact sections of said first electrode member to elastically press said PTC thermistors onto respective planar surfaces of said heat-conducting portion through said planar contact section of said first electrode member;

a cover plate having a through-hole and located on said opened side of said casing;

means for mounting said PTC heating device with said case of said electric vaporizer extending therethrough and arranged on said cover plate;

said mounting means comprising a plate-like body having a through-hole formed therein, and a plurality of arms extending radially from peripheral portions of said plate-like body;

a heat-radiating member of a substantially cylindrical shape mounted to said casing in a manner to be inserted through said through-hole of said mounting means, said cover plate and said heat-conducting portion, said cylindrical heat-radiating member having a bore for receiving said one end portion of said wick when said PTC heating device is incorporated in said electric vaporizer apparatus; first cooperating means on said cover plate and said casing for preventing a rotational movement of said cover plate on said casing; and

second cooperating means on said mounting means and said cover plate for preventing a rotational movement of said mounting means on said cover plate.

4,874,925

ELECTRICALLY HEATED HOSE ASSEMBLY FOR CONVEYING ELECTRICALLY CONDUCTIVE LIQUIDS

Wilk A. Dickenson, 2149 Beech St., Abilene, Tex. 79601

Filed Jun. 1, 1987, Ser. No. 56,433

Int. Cl.⁴ H05B 1/02, 3/58; F24H 1/12

U.S. Cl. 249—301

13 Claims

1. A hose assembly comprising:

a hose member for conveying an electrically conductive liquid therethrough, said member including an outer layer of material and an inner layer of electrically insulative material, said inner layer of electrically insulative material forming a cavity for conveying said electrically conductive liquid;

a first electrically conductive member positioned within said cavity so as to be exposed to any electrically conductive liquid conveyed by said hose member and extending as a continuous member along substantially the entire length of said hose member;

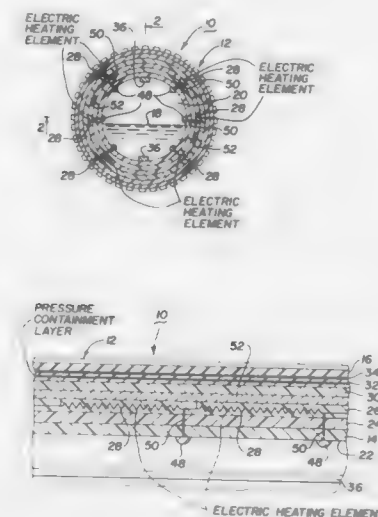
means for operatively connecting said first electrically conductive member to a first terminal of a power source;

a plurality of heating elements having a first terminal and a second terminal with at least one of said plurality of heating elements being positioned in a separate section of

predetermined length of said hose member along the length of said hose member to independently provide heat to each separate section, said plurality of heating elements being positioned between said outer and inner layers of material of said hose member;

means for operatively connecting said first terminal of each of said plurality of heating elements to a second terminal of the power source;

a plurality of second electrically conductive members with at least one of said plurality of second electrically conductive members being positioned within the cavity in each separate section of hose member of predetermined length and positioned so as to be exposed to any electrically conductive liquid conveyed by said hose member; and



means for operatively connecting each of the at least one of said plurality of second electrically conductive members positioned in each separate section of hose member to said second terminal of each of the at least one of said plurality of heating elements positioned in each separate section of hose member,

whereby the presence of an electrically conductive liquid in a separate section of the hose member provides electrical continuity between the at least one second electrically conductive member in said section and said continuous first electrically conductive member to complete the electrical circuit to the at least one heating element in said separate section to cause heating of said separate section of said hose member.

4,874,926

ELECTRIC HEATING LOAD MANAGEMENT CONTROL

Steven B. Sanders, 69 Tiemann Pl., New York, N.Y. 10027

Filed Aug. 17, 1988, Ser. No. 233,717

Int. Cl.⁴ H05B 1/02

U.S. Cl. 219—486

5 Claims

1. In a residential electrical heating system of the type that includes

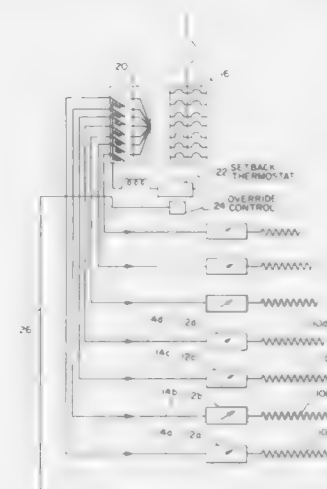
an individual electrical heating element in each of a plurality of rooms in a residence,

a multiline circuit breaker having one side thereof connected to a remotely generated source of electrical power and a second side providing a plurality of power distribution outlets,

an individual electrical power transmission line extending within said residence from a power distribution outlet on said circuit breaker to each of said heating elements and a manually settable thermostat disposed in each of said power transmission lines for controlling the transmission of electric power to each said heating element in response

to a desired ambient temperature condition within said room,

improved load management control means comprising a normally closed low voltage controllable thermal relay interposed in each said power transmission line intermediate the power distribution outlet on said circuit breaker and said manually settable thermostat therein, means disposed in said residence and settable by the occupant of the residence for shifting said normally closed thermal relays to the open condition independent of the



ambient temperature conditions in said heating element containing rooms for precluding the flow of electrical power through said power transmission lines under predetermined residential dictated parameters of operation and signal generating means disposed remote from said residence for selectively and independently actuating said shifting means in response to extrinsic system load management parameters to open said thermal relays to preclude transmission of electric power to said electrical heating elements in said residence.

4,874,927

HEATING ROLL FOR FIXING TONER

Ryoichi Shibata, and Toshiyuki Kasakoshi, both of Saitama, Japan, assignors to Hitachi Metals, Ltd., Tokyo, Japan

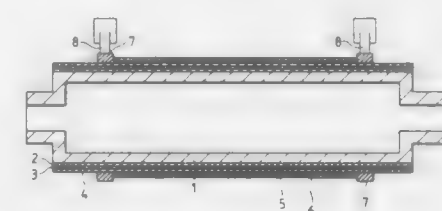
Filed Jun. 7, 1988, Ser. No. 203,121

Claims priority, application Japan, Jun. 9, 1987, 62-143560

Int. Cl.⁴ G03G 15/20

U.S. Cl. 219—469

3 Claims



1. In a heating roll for fixing toner of the type in which a heating resistor layer is provided on the circumference of a cylindrical substrate so that when a voltage is applied to the heating resistor layer through an electrode, the heating resistor layer generates heat, wherein the improvement comprises the heating resistor layer being constituted by an Fe-Cr-Al alloy phase dispersed into a ceramic substrate phase, said Fe-Cr-Al alloy phase being electrically continuous in the axial direction

of said heating roll said Fe-Cr-Al alloy comprising 64-89 wt % of Fe, 10-30 wt. % of Cr, and 2-10 wt. % of Al.

4,874,928

A HEATING APPARATUS FOR AUTOMATICALLY DISTINGUISHING THE CONDITION OF FOOD TO BE REHEATED

Iano Kasei, Nara, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

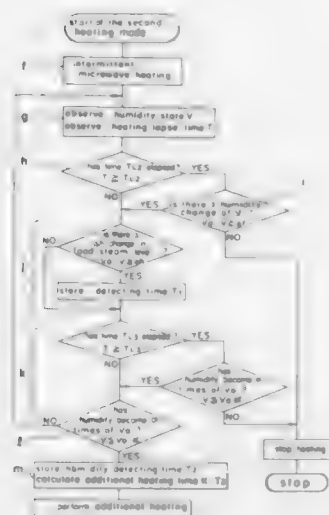
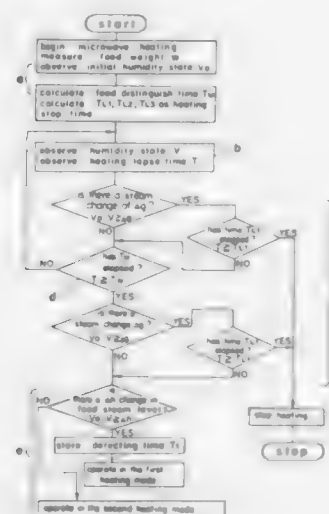
Filed Apr. 29, 1988, Ser. No. 188,539

Claims priority, application Japan, Apr. 30, 1987, 62-106631; Jul. 20, 1987, 62-180466

Int. Cl.⁴ H05B 6/68

U.S. Cl. 219-492

9 Claims



1. An automatic heating apparatus comprising:
 - a heating means for heating an object, said heating means operable in a plurality of different heating modes;
 - a first sensor means for detecting the weight of an object;
 - a second sensor means for detecting the amount of gas or steam generated by an object as the object is heated by said heating means;
 - control means operatively connected to said heating means, said first sensor means and said second sensor means for performing a heating controlling operation during which said control means controls said heating

means to operate in one of said heating modes by selecting said one of said heating modes based on the weight detected by said first sensor means and the amount of gas or steam detected by said second sensor means; an input means operatively connected to said control means for inputting a command to said control means to initiate said heating controlling operation; and said control means including a calculation means for calculating a detection time period based on the weight of an object detected by said first sensor means at the initiation of said heat controlling operation, a timer means for measuring the time that has lapsed from the initiation of said heating controlling operation, a comparison means for comparing the change in the amount of steam or gas detected by said second sensor means from the initiation of said heating controlling operation until said detection time period lapses with a predetermined value, identification means for categorizing the object based on the comparison made by said comparison means, and selecting means for selecting one of said heating sequences based on the categorization of the object by said identification

4,874,929

TOASTER OVEN/BROILER WITH CONTINUOUSLY ENERGIZED INDICATOR

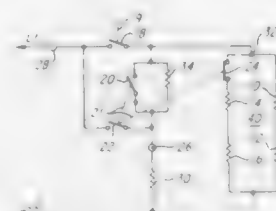
Philip H. Houser, Chillicothe, Ohio, assignor to Proctor-Silex, Inc., Glen Allen, Va.

Filed Nov. 24, 1987, Ser. No. 124,733

Int. Cl.⁴ H05B 1/02

U.S. Cl. 219-506

18 Claims



1. A control and indicator circuit for a kitchen appliance operable in a toast mode and an oven mode and having first and second leads for connecting said appliance to a voltage source, said circuit comprising:

a toast mode switch for initiating said toast mode; heating means connected between said toast mode switch and said second lead whereby said heating means is continuously energized during said toast mode; thermostatic switch means having contacts connected in parallel with said toast mode switch and in series with said heating means, said thermostatic switch means being responsive to heat generated by said heating means for selectively deenergizing said heating means during said oven mode by opening said contacts to control the temperature in said appliance; control switch means and an indicator circuit means including indicator means connected in a series circuit between said first and second leads, said control switch means being closed only during said oven mode; and, resistor means connected at one side to said toast mode switch, said thermostatic switch means and said heating means and connected at the other side to said series circuit intermediate said control switch means and said indicator

4,874,930

ELECTROCONDUCTIVE FILM SYSTEM FOR AIRCRAFT WINDOWS

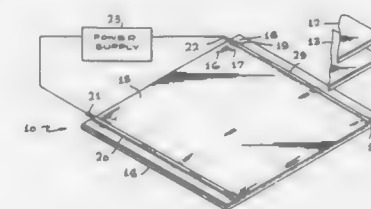
David L. Voss, Van Nuys; Howard S. DeCamp, Northridge, and Gordon W. Culp, Van Nuys, all of Calif., assignors to Sierra Corporation, Sylmar, Calif.

Continuation of Ser. No. 529,975, Sep. 7, 1983, Pat. No. 4,707,586, which is a continuation-in-part of Ser. No. 262,494, May 11, 1981. This application Aug. 13, 1987, Ser. No. 85,123

Int. Cl.⁴ H05B 3/06

U.S. Cl. 219-522

7 Claims



1. A composite transparency comprising:
 - (a) an outer layer of rigid, transparent, electrically-insulating material having an inner major surface;
 - (b) a transparent electrically-insulating basecoat on the inner major surface of the outer layer and secured thereto;
 - (c) a plurality of spaced-apart electroconductive metal film runs comprising a strike coat portion vacuum deposited in adhering relationship onto the basecoat and an electroplated portion electrodeposited onto the strike coat portion; and
 - (d) a transparent interlayer of relatively flexible electrically-insulating plastic bonded to the transparent basecoat on the inner major surface of the outer layer to thereby sandwich the spaced-apart electroconductive metal film runs between the basecoat and the interlayer.

4,874,931

METHOD FOR AUTOMATIC BILL HANDLING AND BILL CONTAINER USED THEREFOR

Yoshinobu Oka, Yokohama, and Koichi Sato, Fujisawa, both of Japan, assignors to International Business Machines Corp., Armonk, N.Y.

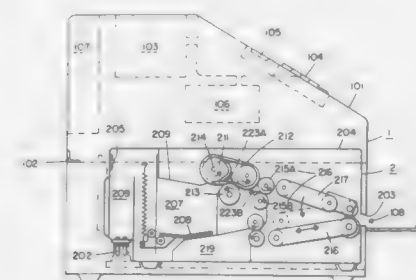
Filed Sep. 14, 1988, Ser. No. 244,680

Claims priority, application Japan, Sep. 17, 1987, 62-231259

Int. Cl.⁴ G06F 15/30

U.S. Cl. 235-379

7 Claims



1. An automatic bill handler including a main body and means associated with said main body for entering user data and instructions and for determining the validity or invalidity thereof, said bill handler further adapted to receive a detachable bill container which comprises:
 - a bill hopper;
 - conveyor means for moving bills from said bill hopper and stacking said bills in a temporary bill storage area;

sensor means associated with said conveyor means for sensing bills; a bill outlet for the discharge of bills from said bill container; a withdrawal bill storage area; additional conveyor means for moving said bills from said temporary bill storage area to either said bill outlet or said withdrawal bill storage area depending upon said determination of the validity or invalidity of said user data and instructions.

4,874,932

CARD AUTHORIZATION TERMINAL

Ryuichi Kimiza, Otsu, Japan, assignor to Omron Tateisi Electronics Co., Kyoto, Japan

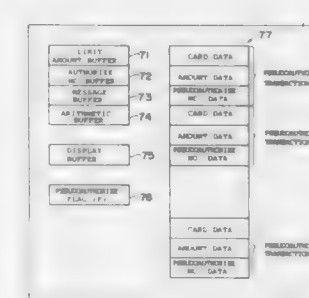
Filed Sep. 21, 1988, Ser. No. 247,348

Claims priority, application Japan, Sep. 26, 1987, 62-241155; Sep. 26, 1987, 62-241156; Oct. 9, 1987, 62-255661

Int. Cl.⁴ G06F 15/30

U.S. Cl. 235-379

13 Claims



1. A card authorization terminal, comprising:
 - (a) reading means for reading card data;
 - (b) inputting means for inputting transaction amount data;
 - (c) authorization processing means for transmitting card data read by said reading means and transaction amount data inputted by said inputting means to a host computer for authorization request and by receiving and displaying authorization results transmitted from the host computer, when the transaction amount data inputted by said inputting means satisfies authorization requirement conditions;
 - (d) pseudoauthorization processing means for effecting a pretended authorization processing by displaying predetermined pseudoauthorization results without transmitting an authorization request to the host computer, when the transaction amount data inputted by said inputting means satisfies pseudoauthorization conditions;
 - (e) storing means for storing card data read by said reading means and transaction amount data inputted by said inputting means whenever a pseudoauthorization processing is effected by said pseudoauthorization processing means;
 - (f) detecting means for detecting whether card data and transaction amount data are stored in said storing means; and
 - (g) controlling means for allowing said detecting means to detect whether card data and transaction amount data are stored in said storing means when an authorization processing is effected by said authorization processing means, and for transmitting data stored in said storing means to the host computer, without interrupting communications after an authorization processing by said authorization processing means, when data storage is detected by said detecting means.

4,874,933

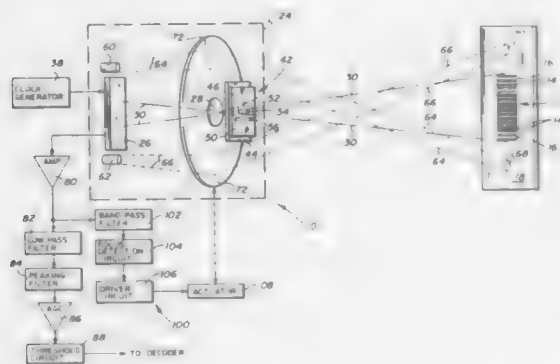
AMBIENT ILLUMINATION BAR CODE READER
Medford D. Sanner, Irving, Tex., assignor to Recognition Equipment Incorporated, Dallas, Tex.

Filed Aug. 21, 1987, Ser. No. 88,397

Int. Cl.⁴ G06K 7/10

U.S. Cl. 235-470

11 Claims



1. A bar code scanner for scanning bar codes having a plurality of parallel bar symbols recorded in contrastive light reflecting properties and for converting optically readable information into an electrical signal comprising:

- an image sensor having a plurality of optical imaging elements arranged in a linear array and being activated to produce an analog output signal indicative of the width of the bar symbols by reflected light received from the plurality of parallel bar symbols, the plurality of parallel bar symbols being illuminated by ambient light only and not by a light source associated with the bar code scanner;
- clock generator means for generating clocking signals at a predetermined frequency and for applying said clocking signals to said image sensor to enable optical reading of the bar symbols;
- means for filtering said analog output signal to thereby filter clock noise associated with said clocking signals from said analog output signal and for generating a filtered signal;
- means for increasing the amplitude of said filtered signal above a predetermined frequency;
- means for automatically controlling the amplitude of said filtered signal and for generating a normalized analog signal; and
- means for converting said normalized analog signal to a digital signal indicative of the width of the bar symbols.

4,874,934

IC CARD WHICH DISPLAYS EMBOSSED INFORMATION TO PREVENT COUNTERFEITING
Jiro Nakahara, Fujisawa; Akito Ueshin, Yokohama, and Shiro Okajima, Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 24, 1987, Ser. No. 66,021

Claims priority, application Japan, Jun. 28, 1986, 61-152160

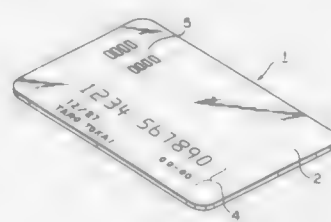
Int. Cl.⁴ G06K 19/06

U.S. Cl. 235-492

13 Claims

1. An IC card having predetermined information embossed on its surface, comprising:
a display section;
storage means for storing the predetermined information;

control means for reading out the predetermined information in response to a read instruction, and for displaying



the readout predetermined information on said display section.

4,874,935

SMART CARD APPARATUS AND METHOD OF PROGRAMMING SAME

Thomas L. Younger, Minnetonka, Minn., assignor to Data Card Corporation, Minneapolis, Minn.

Continuation of Ser. No. 838,095, Mar. 10, 1986, abandoned.

This application Oct. 5, 1988, Ser. No. 253,873

Int. Cl.⁴ G06K 19/06

U.S. Cl. 235-492

13 Claims



1. A method for making a smart card including a microcomputer; the method comprising the steps of:

- a. programming the microcomputer with a smart card control program;
- b. defining data dictionary means for defining data stored in the microcomputer; and
- c. programming the microcomputer with the data dictionary means and personalized data.

4,874,936

HEXAGONAL INFORMATION ENCODING ARTICLE, PROCESS AND SYSTEM

Donald G. Chandler, Pennington; Eric P. Batterman, Cherry Hill, and Govind Shah, Princeton Junction, all of N.J., assignors to United Parcel Service of America, Inc., Greenwich, Conn.

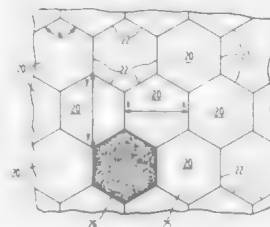
Filed Apr. 8, 1988, Ser. No. 178,600

Int. Cl.⁴ G06K 19/06

U.S. Cl. 235-494

79 Claims

MICROFICHE APPENDIX INCLUDED
(1 Microfiche, 78 Pages)



1. An optically readable label for storing encoded informa-

tion comprising a multiplicity of information-encoded hexagons contiguously arranged in a honeycomb pattern, each hexagon having one of at least two different optical properties.

4,874,937

DIGITAL SUN SENSOR

Truguhiko Okamoto, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

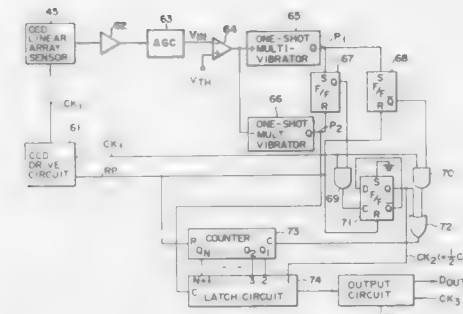
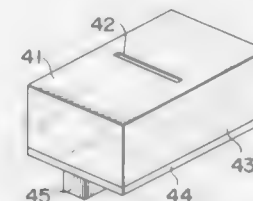
Filed Mar. 9, 1987, Ser. No. 23,719

Claims priority, application Japan, Mar. 12, 1986, 61-54094

Int. Cl.⁴ G01C 1/00; G01B 11/26

U.S. Cl. 250-203 R

1 Claim



1. A digital sun sensor comprising:

- first clock signal generating means for generating a first clock signal;
- a linear array sensor having a light-receiving surface and a plurality of photosensing elements arranged in a line, and designed to convert light into electrical charges and to convert the electrical charges into electrical signals by the first clock signal;
- an opaque layer having a slit therein extending at right angles to the line in which photosensing elements are arranged for diffracting light, thereby to apply the light onto said linear array sensor;
- a prism interposed between said opaque layer and said linear array sensor;
- a band-pass filter mounted on the light-receiving surface of said linear array sensor for passing light of a specified wavelength;
- an automatic gain control circuit for maintaining the electrical signals supplied from said linear array sensor at a predetermined peak value;
- a comparator for comparing the output signal of said automatic gain control circuit with a predetermined reference level, thereby to produce an output signal which has a first level when the output signal of said automatic gain control circuit is equal to or higher than said reference level and has a second level when the output signal of said automatic gain control circuit is lower than the reference level;
- first timing pulse generating means for generating a first timing pulse when the output signal of said comparator changes from the second level to the first level;
- second timing pulse generating means for generating a sec-

- ond timing pulse when the output signal of said comparator changes from the first level to the second level;
- reset signal generating means for generating a reset signal before an electrical signal of the first photosensing element of said linear array sensor driven by the first clock signal is transferred to said automatic gain control circuit;
- first control signal generating means for continuously generating a first control signal upon receiving the reset signal from the reset signal generating means until the first timing pulse from said first timing pulse generating means has been received;
- second control signal generating means for continuously generating a second control signal upon receiving the first timing pulse from said first timing pulse generating means until the second timing pulse from said second timing pulse generating means has been received;
- second clock generating means for generating a second clock signal having a frequency half that of the first clock signal by dividing the frequency of the first clock signal when it receives the second control signal from said second control signal generating means;
- clock selecting means for selecting the first clock signal from said first clock generating means when it receives first control signal from said first control signal generating means and selecting the second clock signal from said second clock generating means when it receives the second control signal from said second control signal generating means;
- a counter having N bit-output terminals, where N is defined as an integer, for counting the pulses of the first and second clock signals selected by said clock selecting means, the counted value being cleared to "0" by the reset signal;
- a latch circuit having (N+1) bit-input terminals, for receiving a pulse of said second clock signal at the lowest bit-input terminal, receiving the N output bits from said counter at the other bit-input terminals, and latching each bit input when it receives the second timing pulse from said second timing pulse generating means.

4,874,938

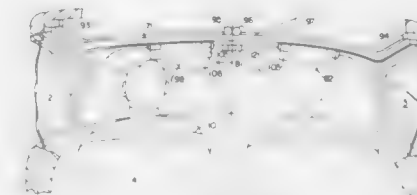
AUTOMATIC MOTOR VEHICLE VISOR SYSTEM
Cliff Chuang, Lowell, Mass., assignor to Prospects Corp., Lowell, Mass.

Filed Mar. 16, 1988, Ser. No. 168,674

Int. Cl.⁴ G01J 1/20

U.S. Cl. 250-203 R

20 Claims



1. In a motor vehicle having a windshield and a driver's station for viewing outside the vehicle through the windshield, an automatic electrically energized sun blocking system comprising,
 - (a) means for detecting the direction of the sun and producing signals representative of said direction,
 - (b) one or more sunlight blocking visors located immediately at or adjacent said windshield,
 - (c) means for movably supporting said visor
 - (d) means for changing the position of said sun light blocking visor and
 - (e) means in electrical circuit with said detecting means and said means for changing position of said sun light blocking

visor for changing the position of said sunlight blocking visor to block sunlight from the eyes said driver.

4,874,335

METHOD AND APPARATUS FOR DETECTING POSITION/VARIANCE OF INPUT LIGHT USING LINEAR AND QUADRATIC OUTPUTS

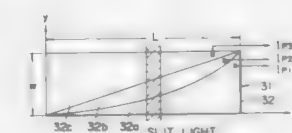
Yoshiro Nishimoto; Yasuji Yoneda; Shinichi Imaoka; Yasuhide Nakai; Akimitsu Nakane; Yoshihiko Onishi; Hiroyuki Tachibana; Takayoshi Inoue, all of Kobe; Takaya Kusaka; Urawa; Hiroyuki Takamatsu, Kobe; Shigeki Tojyo, Osaka; Hiroshi Kajikawa, and Kozo Nishimura, both of Kobe, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Sep. 25, 1987, Ser. No. 101,170

Claims priority, application Japan, Sep. 25, 1986, 61-224985
Int. Cl.⁴ H01J 40/14

U.S. Cl. 250—211 J

9 Claims



1. A method for detecting position/variante of input light using a photoelectric conversion device receiving input light comprising the steps of taking out a linear output proportional to an average of the distances between one end of said photoelectric conversion device and positions of the input light and a quadratic output proportional to an average of the squares of the distances between one end of said photoelectric conversion device and the positions of the input light, detecting the same as the position of said input light based on the linear output and, based on the linear output and the quadratic output, calculating to detect variance of said input light.

4,874,940

METHOD AND APPARATUS FOR INSPECTION OF A TRANSPARENT CONTAINER

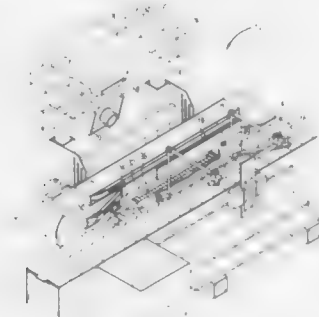
James H. McMeekin, Brockway; Alan E. Lerch; Ronald S. Chollock, both of DuBois, and James F. Wesdock, Reynoldsville, all of Pa., assignors to Brockway, Inc. (N.Y.), Jacksonville, Fla.

Filed Jan. 11, 1988, Ser. No. 141,844

Int. Cl.⁴ G01N 9/04; G06M 7/00; H01J 40/14

U.S. Cl. 250—223 B

40 Claims



1. A method for inspecting a transparent container, said

container having a bottom and a side wall, comprising the steps of:

focusing light from a light source into a line of light that extends along the length of the bottom of at least one container to be inspected, said focused light entering said container through the exterior surface of said container bottom,

detecting the intensity of the light passing through said container side wall, after said focused light has passed through said container bottom and been reflected at least at one predetermined angle, and comparing the detected intensity of said reflected light with a predetermined threshold value, said predetermined threshold value providing a measure of the acceptability of said container.

4,874,941

OPTICAL DISPLACEMENT SENSOR WITH A MULTI-PERIOD GRATING

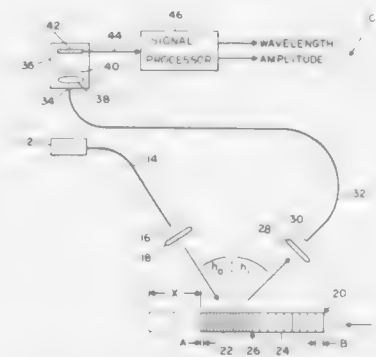
William B. Spillman Jr., Charlotte, Vt., assignor to Simmonds Precision Products, Inc., Wilmington, Del.

Filed May 11, 1988, Ser. No. 192,716

Int. Cl.⁴ H01J 3/14

U.S. Cl. 250—237 G

10 Claims



1. An optical displacement sensor, comprising:
a diffraction grating having a first grating period and a different second grating period;
means for irradiating said diffraction grating at a predetermined angle with broadband optical radiation;
means for detecting a change in a characteristic of the light diffracted from said diffraction grating as a consequence of irradiation of the boundary between the first and second gratings as the boundary is displaced relative the irradiating light, said detecting means having a second optical fiber having an input end and an output end;
means for focusing the diffracted light into said input end of said second optical fiber; and
means coupled to said output end of said second optical fiber for determining at least the wavelength of the diffracted light.

4,874,942

ROTATION, ACCELERATION, AND GRAVITY SENSORS USING QUANTUM-MECHANICAL MATTER-WAVE INTERFEROMETRY WITH NEUTRAL ATOMS AND MOLECULES

John F. Clauser, 975 Murrieta Blvd. #22, Livermore, Calif.

Filed Oct. 26, 1987, Ser. No. 113,620

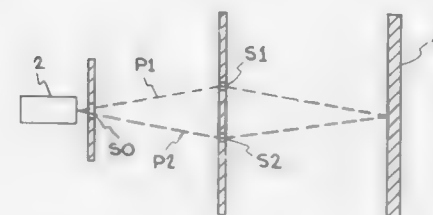
Int. Cl.⁴ H05H 3/00; G01P 15/00

U.S. Cl. 250—251

30 Claims

1. Apparatus for simultaneously measuring and distinguishing between rotation and acceleration plus gravity, comprising a plurality of neutral particle matter-wave interferometers, each comprising

a means for producing neutral particles selected from atoms and molecules,
propagation path defining means which form a plurality of positionally separated paths, along which the particles and their associated matter waves propagate,
a region where the quantum-mechanical matter-waves associated with the particles interfere,
a means for detecting the interference between the matter waves,



and further, in which one of the interferometers propagates neutral particles, further selected from particles with a mass that is different from the particle mass propagating in at least one of the other interferometers, and particles with a kinetic energy that is different from the particle kinetic energy propagating in at least one of the other interferometers.

4,874,943

MASS SPECTROMETER ION EXCITATION SYSTEM

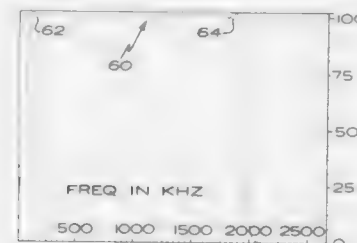
Robert B. Spencer, Madison, Wis., assignor to Nicolet Instrument Corporation, Madison, Wis.

Filed Jan. 28, 1985, Ser. No. 695,847

Int. Cl.⁴ H01J 49/36

U.S. Cl. 250—281

36 Claims



1. In an ion cyclotron resonance mass spectrometer of the type having means for trapping gaseous ions within an analyzer cell, means for exciting the ions into resonance, and means for detecting the ions, the improvement wherein the means for exciting the ions comprises:

means for producing a swept radio-frequency field having a generally constant-amplitude power spectrum over a range of frequencies of interest and causing the field to have an envelope having an onset region which gradually varies from a first level to a second level.

4,874,944

MASS SPECTROMETER

Yoshiaki Kato, Mito, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

PCT No. PCT/JP87/00434, § 371 Date Jan. 13, 1988, § 102(e) Date Jan. 13, 1988, PCT Pub. No. WO87/01452, PCT Pub. Date Mar. 12, 1987

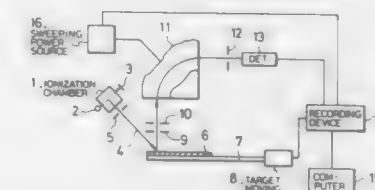
PCT Filed Jun. 26, 1987, Ser. No. 149,223

Claims priority, application Japan, Jul. 4, 1986, 61-156056

Int. Cl.⁴ B01D 59/44

U.S. Cl. 250—288

8 Claims



1. A mass spectrometer comprising:
means for generating a primary beam so that said primary beams is directed to a first predetermined position;
means for holding a target carrying sample components;
means for moving said target so that said sample components are situated at said first predetermined position;
means for mass-dispersing ions that are generated by bombarding said sample components with said primary beam when said sample components are situated at said first predetermined position;
means for effecting mass number sweeping so that the mass-dispersed ions having various mass numbers are passed through a second predetermined position;
means for detecting the ions passing through said second predetermined position; and
means for controlling said target moving means in such a manner as to stop said target when each of said sample components are situated at said first predetermined position and for controlling said mass number sweeping effecting means in such a manner so as to effect said mass number sweeping during the stoppage of said target and to start said mass number sweeping after the passage of a predetermined period from the stop of said target till the quantity of ions generated from said sample components are substantially stabilized.

4,874,945

ELECTRON MICROSCOPE EQUIPPED WITH SCANNING TUNNELING MICROSCOPE

Kimio Ohi, Tokyo, Japan, assignor to Jeol Ltd., Tokyo, Japan

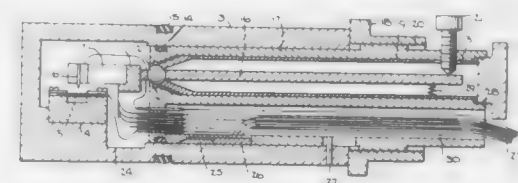
Filed Oct. 21, 1988, Ser. No. 260,525

Claims priority, application Japan, Oct. 23, 1987, 62-267880

Int. Cl.⁴ H01J 37/00

U.S. Cl. 250—306

4 Claims



1. An apparatus for observing a surface of a sample, said apparatus comprising:
a transmission electron microscope comprising an objective lens, said lens comprising an upper pole piece and a lower pole piece;

- a holder disposed between the upper pole piece and the lower pole piece, and the sample being secured inside the holder;
- a scanning tunneling microscope comprising a scanner and a probe tip, the scanner being mounted inside the holder; and
- a shift mechanism arranged and constructed to move the scanner inside the holder in two directions parallel to the surface of the sample and in a direction perpendicular to the surface of the sample.

4,874,946

METHOD AND APPARATUS FOR ANALYZING THE INTERNAL CHEMISTRY AND COMPOSITIONAL VARIATIONS OF MATERIALS AND DEVICES

Lawrence L. Kazmeraki, Lakewood, Colo., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

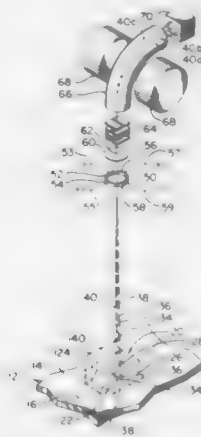
Filed Apr. 30, 1985, Ser. No. 728,970

The portion of the term of this patent subsequent to Nov. 17, 2004, has been disclaimed.

Int. Cl.⁴ H01J 37/252; G01N 23/225

U.S. Cl. 250—309

19 Claims



13. Apparatus for determining and analyzing the chemical and compositional structure of solid devices, comprising:
- sputtering means for eroding the material composition from a selected volume of the device;
 - secondary ion mass spectrometer means for determining the chemical types and concentrations of various materials eroded from various selected points in the volume, said secondary ion mass spectrometer means including collection means positioned adjacent the eroding surface of the selected volume for collecting and routing into said secondary ion mass spectrometer means the materials sputtered from any selected point on an exposed surface of said volume for determination by secondary ion mass spectrometry of the chemical type and concentration of the materials sputtered from the selected point;
 - raster means connected to said collection means for selecting sequential points of collection by rastering the collection means in selected increments of space and time over the exposed surface of the volume simultaneously with operation of the sputtering means;
 - recording means for recording the types and concentrations of the various materials removed from the selected points in conjunction with the location of each of such points; and
 - display means for displaying simultaneously the types and concentrations of the various materials removed from selected combinations of points in the volume.

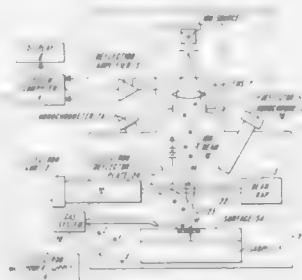
4,874,947 FOCUSED ION BEAM IMAGING AND PROCESS CONTROL

Billy W. Ward, Rockport, and Michael L. Ward, Gloucester, both of Mass., assignors to Micron Corporation, Beverly, Mass.

Filed Feb. 26, 1988, Ser. No. 160,578
Int. Cl.⁴ H01J 37/304

U.S. Cl. 250—309

22 Claims



1. Ion beam machining apparatus comprising:
 - A. ion beam source means for directing a fine-focus ion beam onto an impingement site on a target for sputtering particles from the target, said ion beam defining an axis of incidence onto the target, said axis of incidence defining a Z-coordinate axis,
 - B. electron source means for projecting a stream of electrons onto the target for neutralizing charge produced on the said ion beam relative to the target and maintain a selected sub-micron positional accuracy of said ion beam relative to the target, said electron source means having means for reducing emission of light energy, from said electron source means, which can impinge upon said photon detector means,
 - C. photon detector means for detecting photons emitted in response to incidence of said ion beam on the target, and for generating photon detector signals representative of selected emission characteristics of said emitted photons,
 - D. output means in electrical circuit with said photon detector means for detecting, in response to said photon detector signals, transitions between different material constituents within the target, and for identifying, in response to detected transitions between different material constituents within the target, a Z axis coordinate of the impingement site of said ion beam within the target,
 - E. scanner means for selectively deflecting the position of the impingement site on the target, along a raster pattern, said raster pattern defining an X-Y plane substantially perpendicular to said Z axis, and
 - F. means in electrical circuit with said scanner means for generating position signals representative of X-Y coordinates of the impingement site relative to said X-Y plane.

4,874,948

METHOD AND APPARATUS FOR EVALUATING THE DEGREE OF CURE IN POLYMERIC COMPOSITES

Paolo Cielo, Montreal; Jean-Claude Krapex, Longueuil; Kenneth C. Cole, St-Hubert, and Ghislain Vaudreuil, Boncherville, all of Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Filed Dec. 28, 1987, Ser. No. 138,072

Claims priority, application Canada, Dec. 29, 1986, 526374
Int. Cl.⁴ G01N 21/00

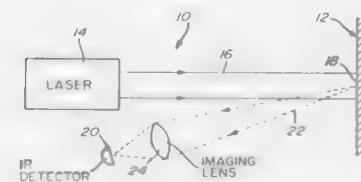
U.S. Cl. 250—341

63 Claims

1. A method of evaluating the degree of cure in a polymeric composite, which comprises the steps of:
 - (a) heating a surface portion of the polymeric composite to substantially curing temperature, over a predetermined period of time;
 - (b) continuously monitoring with a non-contact temperature

sensing means temperature fluctuations of the heated surface portion during said predetermined period of time to obtain data comprising surface temperature values measured as a function of time; and

ing compensating for the inaccuracy due to variations in the temperature of the sample by applying to the measurement a



- (c) processing the data obtained in step (b) including comparing with a calibration reference to obtain an evaluation of the degree of cure of said polymeric composite.

4,874,949

METHOD OF MEASURING LUNG VASCULAR FUNCTION AND TRANSCAPILLARY TRANSPORT BY THE USE OF NONRADIOACTIVE MARKERS

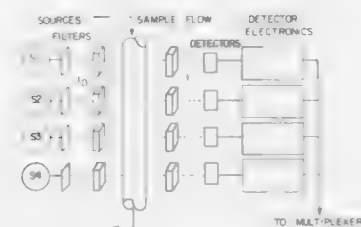
Thomas R. Harris, and Robert L. Galloway, Jr., both of Nashville, Tenn., assignors to Vanderbilt University, Nashville, Tenn.

Filed Sep. 14, 1987, Ser. No. 96,856

Int. Cl.⁴ G01N 21/35

U.S. Cl. 250—343

8 Claims



1. An indicator dilution method for measuring lung vascular function, said method comprising:
 - injecting an indicator mixture which comprises 1, 2 propane-diol into the circulatory system so that the mixture becomes diluted with blood,
 - withdrawing a sample of arterial blood,
 - measuring the transmittance of filtered light through the blood.

4,874,950

ASPHALT CONTENT GAUGE WITH COMPENSATION FOR SAMPLE TEMPERATURE DEVIATIONS

Ali Regimand, Raleigh, N.C., assignor to Troxler Electronic Laboratories, Inc., Research Triangle Park, N.C.

Filed Mar. 30, 1988, Ser. No. 175,144

Int. Cl.⁴ G01N 23/05

U.S. Cl. 250—390.04

7 Claims

1. An improvement in the method of determining the hydrogen content of a hydrogen-containing material wherein a sample of the material is subjected to a fast neutron source and neutrons which are thermalized by the presence of hydrogen in the material are detected to thus obtain a measurement of the hydrogen content of the material, said improvement compris-

correction factor which is a function of both the temperature of the sample and the hydrogen content of the sample.

4,874,951

SOLID-STATE TRACK RECORDER DOSIMETRY DEVICE TO MEASURE ABSOLUTE REACTION RATES AND NEUTRON FLUENCE AS A FUNCTION OF TIME

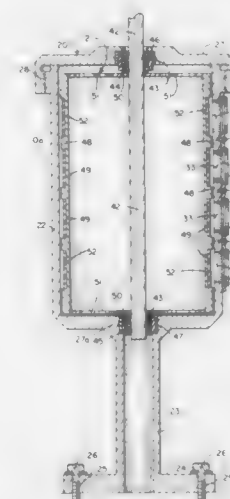
Raymond Gold, and James H. Roberts, both of 1393 George Washington Way, Suite No. 7, P.O. Box 944, Richland, Wash. 99352

Filed Jul. 13, 1987, Ser. No. 72,776

Int. Cl.⁴ G01T 5/00, 1/02

U.S. Cl. 250—472.1

18 Claims



1. A radiation dosimeter apparatus, to determine especially time dependent intensity and energy spectrum of neutron burst radiation, comprising in combination:
 - a first housing member rotatable relative to a second recording member said first member housing at least one means, including at least one opening, enabling radiation to enter through the said first member from a source exterior thereof, and
 - a second relatively rotatable recording member mounted adjacent said first member, said second member having means for accepting solid state track recording material in rotatable alignment with said opening in the first member, and
 - means for rotating said first and second members relative

each other at a predetermined angular velocity such that radiation entering through the openings in the first member impinges on said solid state track recording material carried by the second members to sense radiation in a qualitative fashion and in a time oriented manner.

4,874,952

DEVICE FOR ACCELERATED PHOTO-AGING OF MATERIALS CONTAINING POLYMERS

Rene Arnaud, Clermont-Ferrand; Jean-Lac Gardette, Aubiere, and Jacques Lemaire, Beaumont, all of France, assignors to Universite De Clermont II, Laboratoire De Photochimie, Aubiere, France

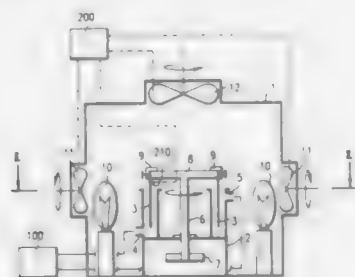
Filed Apr. 28, 1988, Ser. No. 187,367

Claims priority, application France, Apr. 28, 1987, 87 06216

Int. Cl. G01N 17/00

U.S. Cl. 250-455.1

12 Claims



1. A device for the accelerated photo-aging of materials containing polymers, for enabling samples of said materials to be submitted to the simultaneous action of ultraviolet radiation, temperature and oxygen in an aqueous or gaseous phase, with a view toward analyzing and interpreting the phenomena of photodegradation, comprising:

- (a) an external enclosure having a vertical axis of symmetry,
- (b) at least four sources of ultraviolet radiation evenly distributed about said axis of symmetry in said external enclosure for emitting beams of radiation in a selected wavelength range,
- (c) a vat defining an annular space and having at least one cylindrical wall which is transparent to radiation having a wavelength at least equal to 295 ± 5 nm and which is coaxial with the external enclosure, (p1) (d) means for circulating a liquid aqueous phase within said vat,
- (e) a sample holder arranged coaxial with said transparent cylindrical wall and including means for holding a sample immersed in the liquid aqueous phase within said vat,
- (f) means for rotating said sample holder around said axis of symmetry, wherein said sample rotates in the liquid aqueous phase,
- (g) means for regulating the temperature of the aqueous phase,
- (h) means providing oxygen saturation of the circulating aqueous phase,
- (i) means for circulating a gaseous phase inside the external enclosure, and
- (j) means for regulating the means for circulating the gaseous phase such that the temperature of the exposed samples is regulated.

4,874,953 METHOD FOR GENERATION OF TUNABLE FAR INFRARED RADIATION FROM TWO-DIMENSIONAL PLASMONS

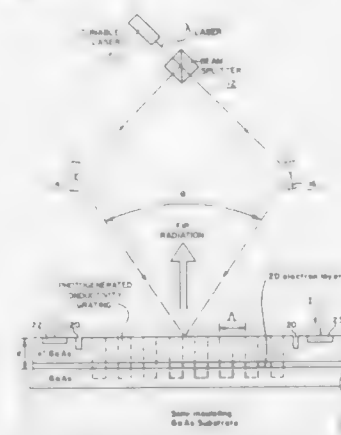
Joseph Katz, Pasadena, Calif., assignor to California Institute of Technology, Pasadena, Calif.

Filed Oct. 6, 1988, Ser. No. 254,141

Int. Cl. H01S 3/19

U.S. Cl. 250-493.1

10 Claims



1. A method for generating far infrared radiation from two-dimensional plasmons in an inversion layer of electrons of a semiconductor device without a metallic grating comprising the steps of producing two coherent beams of radiation at the same wavelength selected for the radiation to be strongly absorbed by said semiconductor device, and directing said coherent beams onto a surface of said semiconductor device parallel to said inversion layer at an angle with respect to each other to produce an interference pattern that generates a photoconductivity grating penetrating through said inversion layer of electrons, thereby to couple out a beam of far infrared radiation through said surface.

4,874,954

PROJECTION EXPOSURE APPARATUS

Kazuo Takahashi, and Hiroyoshi Kubo, both of Kawasaki, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

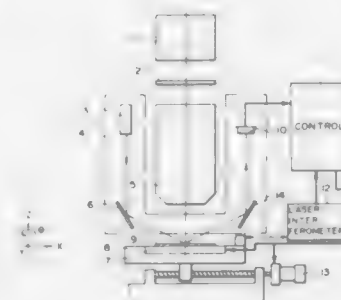
Continuation of Ser. No. 151,308, Feb. 1, 1988, abandoned. This application Mar. 1, 1989, Ser. No. 319,877

Claims priority, application Japan, Feb. 2, 1987, 62-023159; Apr. 21, 1987, 62-096320

Int. Cl. G01N 21/80

U.S. Cl. 250-548

21 Claims



1. An exposure apparatus, comprising: an imaging optical system usable to project, in sequence, images of a pattern including chip patterns an original upon different regions of a workpiece, said imaging optical system having an optical axis; detecting means operable to irradiate, with a light, a pre-

terminated portion of a first region of the workpiece to detect the position of said first portion with respect to a direction of said optical axis of said imaging optical system;

a workpiece carrying stage for carrying thereon the workpiece and being movable in a plane perpendicular to said optical axis, said workpiece carrying stage being movable to allow detection of the position of said first region with respect to the direction of said optical axis by said detecting means and the projection of the image of the pattern upon said first region by said imaging optical system;

aligning means operable, in accordance with the detection by said detecting means, to bring the position of said first region with respect to the direction of said optical axis into coincidence with the image of the pattern projected by said imaging optical system; and

correcting means operable, in accordance with the position of a second region of a workpiece with respect to the surface of the workpiece, to move said workpiece carrying stage to a position which is different from a position at which the image of the pattern of the original can be projected upon said second region, such that at said different position of said workpiece carrying stage the position of said second region with respect to the direction of said optical axis is detected by said detecting means.

4,874,955

METHOD AND APPARATUS FOR MEASURING A THREE-DIMENSIONAL CURVED SURFACE SHAPE

Mitsunaki Uesugi; Masaichi Inomata, and Isamu Komine, all of Kanagawa, Japan, assignors to NKK Corporation, Tokyo, Japan

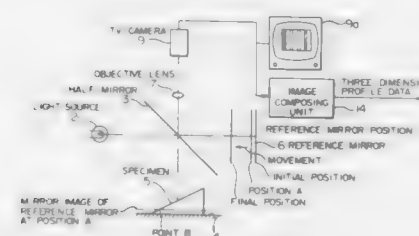
Filed Oct. 17, 1988, Ser. No. 258,603

Claims priority, application Japan, May 17, 1988, 63-118201

Int. Cl. G02B 27/42

U.S. Cl. 250-550

5 Claims



1. A method of measuring a three-dimensional curved surface shape comprising the steps of:

- producing interference fringes on a surface of an object to be measured in accordance with a difference in optical path length between the surface of said object to be measured and a reference plane;
- measuring a position of said reference plane or of a reference surface of said object to be measured in the direction of an optical path or a quantity equivalent to said position while moving said reference plane or said object in said optical axis direction;
- picking up a pattern of said interference fringes produced on the surface of said object to be measured;
- processing from moment to moment a video signal generated by picking up the surface of said object to be measured to form a composite image in which a value of each of picture elements is represented by a position of said reference plane or said object reference surface in said optical axis direction or a quantity equivalent thereto at an instant that one of positions on said object surface corresponding to each said picture element attains a maximum brightness; and
- measuring a three-dimensional curved surface shape of said

object to be measured in accordance with said composite image.

4,874,956

METHOD AND APPARATUS FOR INSPECTING SEMICONDUCTOR DEVICES FOR THEIR BONDING STATUS

Toshihiro Kato, Chigasaki; Masamichi Shindo, and Yoshihito Fukasawa, both of Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

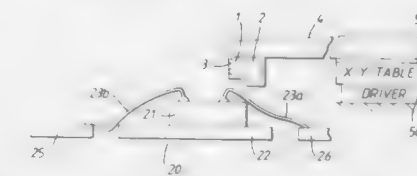
Filed Apr. 4, 1988, Ser. No. 177,412

Claims priority, application Japan, Apr. 14, 1987, 62-89713

Int. Cl. G01N 21/86

U.S. Cl. 250-560

11 Claims



1. An apparatus for inspecting the bonding status of semiconductor device comprising: stage means for supporting the semiconductor device; light source means for generating a focused light beam; scanning means for scanning the focused light beam on the semiconductor device; detecting means for sensing the light reflected from the semiconductor device, and producing detected output signals corresponding to the distance between the reflection point of the focused light beam and the light source

critical level signal generating means for generating a predetermined critical level signal having a value such that a detected output signal less than said critical level signal will only be generated by a defectively bonded semiconductor device; and

comparing means for comparing the level of the detected output signals with said predetermined critical level signal,

whereby differences between said detected output signals and ideal output signals which are indicative of defective bonding in a defective semiconductor device may be distinguished from the differences which are not indicative of a defective semiconductor device.

4,874,957

CONTACT TYPE IMAGE SENSOR

Saburo Sasaki, Sendai; Tsutomu Ishida, Machida, and Kenji Yanamoto, Miyagi, all of Japan, assignors to Ricoh Company, Ltd., Tokyo and Ricoh Research Institute of General Electronics, Natori, both of Japan

Filed Sep. 27, 1988, Ser. No. 249,673

Claims priority, application Japan, Oct. 2, 1987, 62-250426

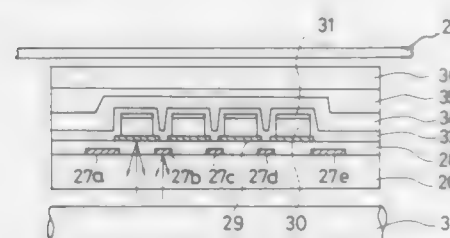
Int. Cl. H01J 40/14

U.S. Cl. 250-578

12 Claims

1. A contact type image sensor comprising: a transparent insulating substrate; a plurality of opaque metallic films formed on top of the transparent insulating substrate; a transparent insulating film formed so as to cover the plurality of opaque metallic films; a plurality of lower electrodes formed on top of the transparent insulating film, each having a light window, each opaque metallic film being located between adjacent lower electrodes so as to prevent light emitted from a light source from being irradiated on a document to be scanned; a plurality of photoelectric conversion layers formed on the lower electrodes;

a plurality of transparent conductive films each formed on top of the corresponding photoelectric conversion layer; transparent interlayer insulating film formed so as to cover the plurality of photoelectric conversion layers, the transparent interlayer insulating film having through holes for establishing connections with the transparent conductive films; and



a plurality of upper extension electrodes each connected to the corresponding transparent conductive film through the through hole, each opaque metallic film being located between adjacent upper extension electrodes so as to prevent the light from being irradiated on the document, wherein only light which is emitted from the light source and then passes through the light window, is irradiated on the document.

4,874,958

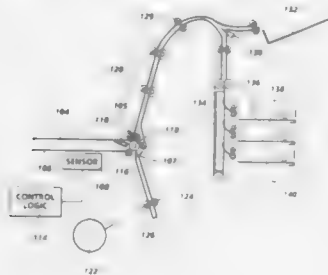
SHEET EDGE DETECTOR

Barbara A. Sampath, Fairport, and Richard C. Schenk, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 4, 1988, Ser. No. 253,151
Int. Cl. G03G 15/00

U.S. Cl. 355-309

17 Claims



1. An apparatus for determining the location of an edge of a sheet, including:
means for advancing the sheet; and
means for distinguishing between the edge of the sheet and a hole in the marginal region thereof.

4,874,959

MARINE ENGINE WITH LOUVERED FLYWHEEL COVER SHROUD

Stephen E. Sheridan, Fond du Lac, Wis., assignor to Brunswick Corporation, Skokie, Ill.

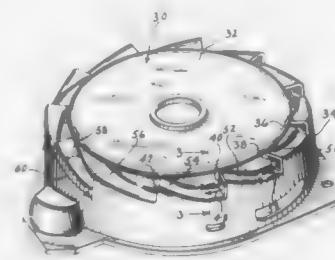
Filed Apr. 1, 1988, Ser. No. 176,608
Int. Cl. H02K 5/20

U.S. Cl. 290-1 B

7 Claims

1. In a two cycle internal combustion marine engine having a vertical crankshaft extending upwardly through a crankcase and alternator, and a flywheel secured to the top of the crankshaft, a flywheel cover shroud comprising an inverted dish-like member over said flywheel and said alternator, said cover shroud having one or more vents therein exhausting air, to cool said alternator, wherein said cover shroud has a top wall and an extending side wall, and said vents are formed by one or

more openings in said cover shroud along an upper perimeter thereof, and said side wall is generally cylindrical and extends downwardly from the outer perimeter of said top wall, and wherein said openings are formed at the top of said side wall at the interface with said top wall, and wherein each of said



openings has a width and a height extending in a vertical plane which extends radially from said crankshaft, such that air flowing circumferentially along an arc within said cover shroud exits said cover shroud through said opening by flowing along a horizontal arcuate direction perpendicular to said vertical radial plane of said opening.

4,874,960

PROGRAMMABLE CONTROLLER CAPACITOR AND BATTERY BACKED RAM MEMORY BOARD

Jeffrey J. Cybela, Glendale, Wis., assignor to Square D Company, Palatine, Ill.

Filed Mar. 4, 1988, Ser. No. 164,148
Int. Cl. H02J 9/02; G11C 11/34

U.S. Cl. 307-64

8 Claims



1. A switching network for a programmable controller carried on a removable card assembly including memory components that receive power on a power lead, said card assembly including a source lead adapted to be connected to a line source of electrical power that is subject to failure, said electrical power occurring at a certain voltage, said network transmitting electrical power to said power lead, said switching network comprising:

a switch connected between said source lead and said power lead, said switch being normally closed to conduct electrical power from said source lead to said power lead and becoming open upon at least partial loss of said certain voltage of said line source electrical power;
capacitance means having high capacity and normally receiving electrical charge at the voltage of said line source power supply from said source lead, and supplying electrical power to said power lead upon the voltage at said power lead falling below said certain voltage due to at least a temporary failure in said line source power supply; and

first battery means having a first voltage substantially less than said certain voltage of said line source electrical power supply, said first battery means being connected to said power lead and supplying power to said power lead upon the voltage on said power lead falling substantially to said first voltage.

4,874,961

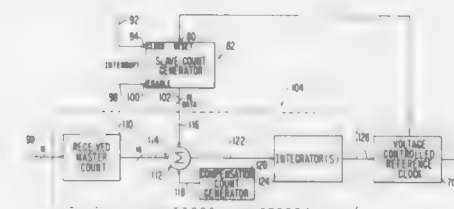
ELECTRICAL POWER GENERATING SYSTEM HAVING PARALLEL GENERATOR CONTROL

Eric A. Henderson, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Oct. 31, 1988, Ser. No. 264,886
Int. Cl. H02J 1/10

U.S. Cl. 307-87

51 Claims



1. An alternating current generating system having at least one slave generator with each slave generator being controlled by an associated slave generator control unit with alternating current generated by each slave generator being at least locked in phase to alternating current generated by a master generator controlled by a master generator control unit wherein:

the master generator control unit includes a master count generator for generating a synchronization count varying from a minimum to a maximum during each cycle of the alternating current generated by the master generator with the synchronization count being proportional at any time during a cycle of the alternating current to a phase of electrical current being generated by the master generator with respect to a time reference;

each of the slave generator control units includes a slave count generator, each slave count generator generating a synchronization count varying from the minimum to the maximum during each cycle of the alternating current generated by the slave generator controlled by the slave generator control unit with the synchronization count of each slave count generator at any time during a cycle of alternating current generated by the slave generator controlled by the slave generator control unit being proportional to a phase of the generated alternating current measured with respect to a time reference;

a transmission system is coupled to the master generator control unit and each of the slave generator control units for periodically transmitting the synchronization count from the master count generator to each slave generator control unit;

each slave generator control unit has a processor for generating a correction count which is a function of a difference between the synchronization count received from the master control unit and the synchronization count of the slave count generator; and

each slave generator control unit has a controller for adjusting at least the phase of the alternating current generated by the slave generator controlled by the slave generator control unit as a function of the correction count.

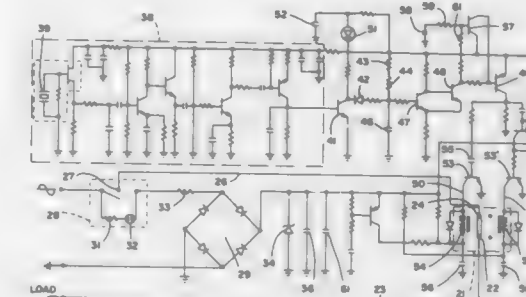
4,874,962
LOW POWER, LEAKAGE CURRENT SWITCHING CIRCUIT

Albert L. Hermann, 2555 Nicholson St., San Leandro, Calif. 94577

Filed May 21, 1987, Ser. No. 52,482
Int. Cl. H01H 47/12

U.S. Cl. 307-116

21 Claims



1. A low power switching circuit for delivering AC electrical power to a load from a AC power supply having a hot leg, a neutral leg and earth ground connections, including full wave rectifier means connected between the hot leg and the earth ground connection, current limiting means connected between the hot leg and said rectifier means to restrict current flow to said rectifier means to less than 500 microamps, relay means having normally open contacts, means for connecting one of said normally open contacts to the hot leg and the other of said normally open contacts to said load, transistor switching circuit means for operating said relay means in response to an actuating signal, said transistor switching circuit and said relay means being connected to said rectifier means and driven solely by the direct current therefrom, and sensor means for generating said actuating signal in response to human presence proximate to said low power switching circuit.

4,874,963

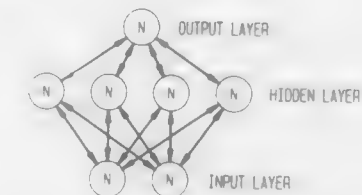
NEUROMORPHIC LEARNING NETWORKS

Joshua Alspector, Westfield, N.J., assignor to Bell Communications Research, Inc., Livingston, N.J.

Filed Feb. 11, 1988, Ser. No. 155,150
Int. Cl. G06G 7/12

U.S. Cl. 307-201

12 Claims



1. A neuron network comprising interconnected input, hidden and output layers of neurons, said neurons comprising "on-off" or threshold electronic devices, all of said neurons which are connected being symmetrically connected by means of automatically-adjustable synapse pairs, each of said synapses comprises a plurality of drain-source circuits of field effect transistors, said source-drain circuits having resistances or conductances which differ from each other by ratios of 2 to 1, whereby different combinations of said source-drain circuits can be switched in parallel to provide any resistance or conductance, in a binary sequence, for each of said synap-

ses, said synapses being controlled by the output of an Up-Down counter, and means to control the reading of said counter depending on the results of a correlation of the states of each connected pair of said neurons following the application of sets of training signals to said neurons network.

4,874,964

CURRENT GENERATING CIRCUIT

Tetsuya Kondo, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

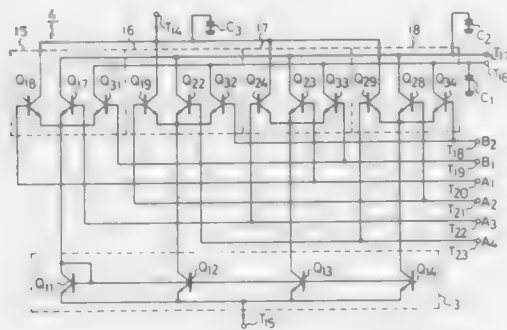
Filed Apr. 20, 1988, Ser. No. 184,126

Claims priority, application Japan, May 28, 1987, 62-132398; May 29, 1987, 62-135529

Int. Cl.⁴ H03K 3/02; H03M 1/00

U.S. Cl. 307—270

10 Claims



1. A current generating circuit for generating a plurality of currents accurately in a predetermined integer ratio, comprising:

- a current dividing circuit for dividing an input current into 2^n (n is a positive integer) output currents;
- a current change-over circuit for switching respective output currents from said current dividing circuit in a predetermined ratio and providing an output current in response to a predetermined number of clock signals in one cyclic period fed to input terminals of said change-over circuit; and
- a plurality of current synthesizing circuits for synthesizing output currents from said current dividing circuits and generating a corresponding plurality of output currents in the predetermined ratio in response to a predetermined number of current synthesizing signals in said one cyclic period.

4,874,965

CIRCUIT DEVICE FOR THE POWER-ON RESET OF DIGITAL INTEGRATED CIRCUITS IN MOS TECHNOLOGY

Giovanni Campardo, Bergamo, Italy, and David Novosel, New Wilmington, Pa., assignors to SGS Microelettronica S.p.A., Catania, Italy

Filed Nov. 25, 1987, Ser. No. 125,344

Int. Cl.⁴ G11C 11/00; H03K 3/01

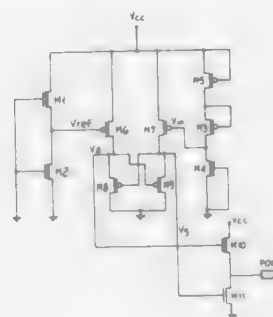
U.S. Cl. 307—272.3

6 Claims

1. A power-on reset circuit for providing a reset pulse when the supply voltage rises above a preset threshold, said circuit comprising:

- a reference voltage generator connected between the supply voltage and the ground, supplying a reference signal having a constant preset value when the supply voltage is higher than the preset threshold;
- a supply follower providing an input signal which follows the supply voltage with a preset reduction factor;
- a bistable comparator having a first input driven by said reference signal and a second input driven by said input signal and switching from a first initially assumed state to

a second state when the input signal exceeds the reference signal; wherein said reference voltage generator



comprises two depletion transistors coupled in series between the supply voltage and the ground, each having their gate connected to the ground, the node between said two transistors providing said reference signal.

4,874,966

MULTIVIBRATOR CIRCUIT HAVING COMPENSATED DELAY TIME

Heinz H. Gehrt; Günter Hildebrandt, both of Hamburg, and Karl-Heinz Rehfeldt, Ellerbek, all of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

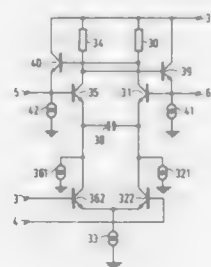
Filed Jan. 22, 1988, Ser. No. 146,889

Claims priority, application Fed. Rep. of Germany, Jan. 31, 1987, 3702854; Feb. 27, 1987, 3706319

Int. Cl.⁴ H03K 3/281, 5/13

U.S. Cl. 307—291

9 Claims



1. A multivibrator comprising:

first and a second current branch, each of which comprises a series arrangement of a resistance, a main current path of a main transistor and a controllable current source, a first connection node between the main transistor main current path and the controllable current source of the first branch being coupled via a capacitance to another first connection node between the main current path of the main transistor and the controllable current source of the second branch, a control electrode of the main transistor in one current branch being coupled to a second connection node between the resistance and the main current path of the other current branch so that the controllable current sources are oppositely controlled for generating alternately in each of the current branches in a first logical state a first current and in a second logical state a second current, and means connecting a respective constant current source in parallel with each controllable current source.

4,874,967

LOW POWER VOLTAGE CLAMP CIRCUIT

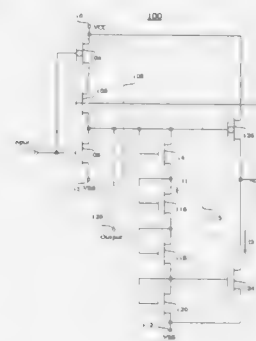
Peter Deane, Sunnyvale, Calif., assignor to Xicor, Inc., Milpitas, Calif.

Filed Dec. 15, 1987, Ser. No. 133,125

Int. Cl.⁴ H03K 3/01

U.S. Cl. 307—296.8

33 Claims



1. An improved voltage clamping circuit for clamping a voltage at a predetermined voltage, said voltage clamping circuit having a power source terminal having a supply voltage coupled thereto, an output terminal and a reference terminal, comprising:

voltage sensing and clamping means coupled between said output terminal of said voltage clamping circuit and said reference terminal for controlling the voltage appearing between said output terminal and said reference terminal, including means for developing and sensing said voltage and for clamping said voltage at a predetermined voltage; control circuit means coupled to said voltage sensing and clamping means for generating a control signal related to said voltage; and current generating means coupled to said control circuit means and connected between said power source terminal and said voltage sensing and clamping means for generating a current responsive to said control signal, said generated current being of sufficient magnitude to produce said voltage across said voltage sensing and clamping means.

4,874,968

COMPONENT PRODUCED USING INTEGRATED TECHNOLOGY FOR THE FABRICATION OF INTEGRATED CIRCUITS

Werner Brockmann, Altenbeken, Fed. Rep. of Germany, assignor to Nixdorf Computer AG, Paderborn, Fed. Rep. of Germany

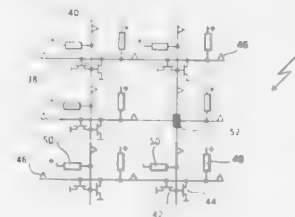
Filed Dec. 3, 1987, Ser. No. 128,392

Claims priority, application Fed. Rep. of Germany, Dec. 4, 1986, 3641452

Int. Cl.⁴ H03K 3/26, 19/23, 19/094

U.S. Cl. 307—303

10 Claims



1. An integrated circuit component with at least one programmable matrix type connecting field formed on a substrate

and having line and column conductors forming a plurality of intersection points, and

at least some of said intersection points each having associated with it two coupling elements each connected between and associated with the line and column conductor crossing one another at the involved intersection point, each of said two coupling elements associated with an intersection point having an initial active or inactive state and being capable of being deactivated or activated to give it a state opposite to that of its initial state,

one of said coupling elements when active serving to connect the associated line conductor to another terminal in response to signals on the associated column conductor and the other of said coupling elements when active serving to connect the associated column conductor to another terminal in response to signals on the associated line conductor.

4,874,969

HIGH SPEED CMOS COMPARATOR WITH HYSTERESIS

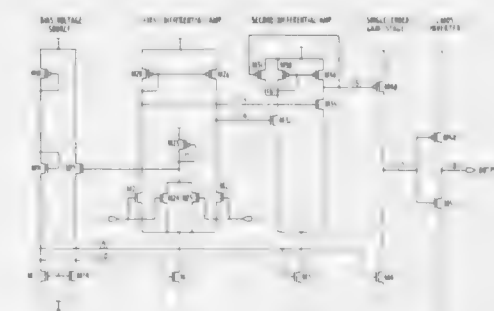
William H. Meadows, Arlington, Tex., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Jun. 8, 1988, Ser. No. 204,111

Int. Cl.⁴ H03K 5/24

U.S. Cl. 307—355

3 Claims



1. A differential gain stage comprising:

- a constant current source;
- first and second N-channel transistors having their gates connected to receive first and second input signals, respectively, and their commonly connected sources connected to the constant current source, the drain of the first N-channel transistor connected to a first output node, the drain of the second N-channel transistor connected to a second output node;
- a current mirror comprising a first and second P-channel transistors having their commonly-connected gates connected to the first output node and their commonly connected sources connected to a supply voltage, the drain of the first P-channel transistor connected to the first output node, the drain of the second P-channel transistor connected to the second output node; and
- a hysteresis element consisting of a third P-channel transistor having its gate directly connected to the second output node, its source directly connected to the supply voltage and its drain directly connected to the first output node.

4,874,970

ECL OUTPUT WITH DARLINGTON OR COMMON COLLECTOR-COMMON EMITTER DRIVE
Bruce H. Coy, and Raymond C. Yuen, both of San Diego, Calif., assignors to Applied Micro Circuits Corporation, San Diego, Calif.

Filed May 11, 1988, Ser. No. 193,261
Int. Cl.⁴ H03K 19/092, 19/086

U.S. Cl. 307—475

9 Claims



1. An output driver comprising:

- a differential pair of transistors having a first input terminal connected to a buffer input terminal, a second input terminal connected to a first reference potential, a first output terminal for providing a first output signal, and a second output terminal for providing a second output signal logically opposite to said first output signal provided on said first output terminal;
- a Darlington pair of transistors having an input terminal connected to said first output terminal of said differential pair of transistors, having an output terminal connected to an output buffer output terminal, and having an intermediate terminal connected to the emitter of the first transistor of said Darlington pair of transistors;
- a first transistor having a first current handling terminal connected to a positive potential, having a control terminal connected to said second output terminal of said differential pair of transistors and having a second current handling terminal;
- a first resistor having a first terminal connected to said second current handling terminal of said first transistor and having a second terminal connected to a circuit potential;
- a capacitor having a first plate connected to said second current handling terminal of said first transistor and having a second plate;
- a second transistor having a first current handling terminal connected to said intermediate terminal of said Darlington pair, having a control terminal connected to said second plate of said capacitor and having a second current handling terminal connected to said circuit potential; and
- a third transistor having a first current handling terminal connected to said output terminal of said Darlington pair, having a second current handling terminal connected to said circuit potential and having a control terminal connected to said second current handling terminal of said second transistor.

7. The output circuit of claim 6, wherein said emitter follower and said output transistor are connected in a Darlington configuration.

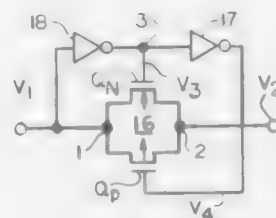
4,874,971

EDGE-SENSITIVE DYNAMIC SWITCH

Thomas D. Fletcher, Orem, Utah, assignor to North American Philips Corporation, Signetics Division, Sunnyvale, Calif.
Continuation-in-part of Ser. No. 934,753, Nov. 25, 1986, Pat. No. 4,740,717. This application Apr. 8, 1988, Ser. No. 180,425
Int. Cl.⁴ H03K 5/153

U.S. Cl. 307—605

11 Claims



1. An electronic circuit comprising (a) a pair of complementary field-effect transistors (FET's), each having a first source/drain element, a second source/drain element, and a gate electrode, the first source/drain elements coupled together through a first node at which a first signal is present, the second source/drain elements coupled together through a second node at which a second signal is present, both of the first and second signals substantially varying between a low voltage level and a high voltage level, and (b) an inverter responsive to a third signal at a third node coupled to the gate electrode of one of the FET's for providing a substantially inverse fourth signal to the gate electrode of the other FET, characterized by delay means for causing the third signal to continually follow the first signal, either directly or inversely, by a specified time delay.

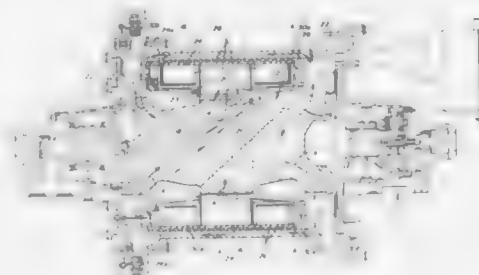
4,874,972

MAGNETIC ISOLATION AND COOLING SYSTEM IN DYNAMOELECTRIC MACHINES

Madan L. Bansal, and William A. Byrd, both of Rockford, Ill., assignors to Sandstrand Corporation, Rockford, Ill.
Filed Dec. 30, 1987, Ser. No. 139,638
Int. Cl.⁴ H02K 9/08

U.S. Cl. 310—57

6 Claims



1. In a dynamoelectric machine, an integral magnetic isolation and cooling system, comprising:

- a central rotor;
- a stator about the rotor;
- an independent housing about the stator and fabricated of magnetically permeable material to define a flux path therethrough;
- a cooling jacket about the stator between the housing and the stator, the cooling jacket having coolant passage means and being fabricated of non-magnetic material to isolate the flux path between the housing and the stator and around the cooling jacket; and
- end members of non-magnetic material at opposite ends of

the stator to facilitate isolating the flux path between the housing and the stator.

4,874,973

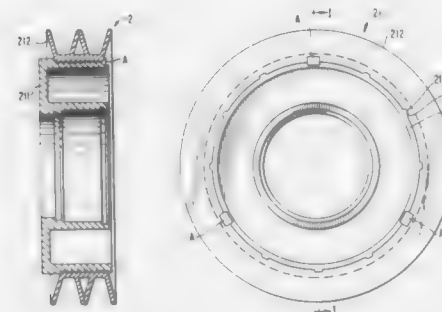
METHOD AND ARRANGEMENT FOR SECURING A PULLEY TO A ROTOR IN AN ELECTROMAGNETIC CLUTCH

Takashi Matsushita, and Genzo Yanai, both of Iseaki, Japan, assignors to Sanden Corporation, Gunma, Japan
Filed Jun. 3, 1988, Ser. No. 201,904

Claims priority, application Japan, Jun. 5, 1987, 62-140081
Int. Cl.⁴ H02K 7/10; F16D 27/04

U.S. Cl. 310—78

11 Claims



1. An attachment device for use in an electromagnetic clutch for attaching a pulley to an outer peripheral surface of a rotor, said device including:

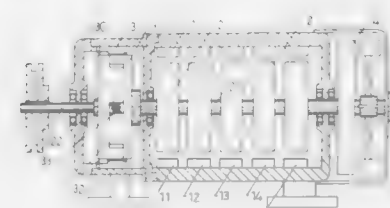
- complementary engaging means respectively disposed on said rotor and said pulley for preventing relative rotational movement of said pulley and said rotor when said pulley is coupled to said rotor, said complementary engaging means comprising a plurality of axial grooves disposed on one of said rotor and said pulley and a plurality of axial projections formed on the other of said rotor and said pulley.

4,874,974

MOTOR WITH AN AUTO OUTPUT ADJUSTING DEVICE
Yao-Yu Wu, No. 181, Sec. 4, Chin-Hwa Road, Tainan, Taiwan
Filed Dec. 9, 1987, Ser. No. 130,602
Int. Cl.⁴ H02K 3/00

U.S. Cl. 310—112

3 Claims



1. A motor with an auto output adjusting device, comprising a main shaft, a secondary shaft, a stator and a rotor, said stator having a plurality of independent coils with separate contact points able to drive individually the rotor by only one or more than two of said independent coils, a torque sensor connected between the main and the secondary shafts for sensing the torque the main shaft transmits to the secondary shaft, and an electric circuit responsive to the torque sensed by said torque sensor to automatically increase the number of coils which are energized after the motor is started and in response to load changes, wherein said torque sensor comprises a main and a secondary gear disc facing and engaging each other, the main gear disc being fixed on the main shaft while the secondary

gear disc is fixed on the secondary shaft, a plurality of members protrude longitudinally on both the main and the secondary gear discs, spring means are set between said protruding members of the main gear disc and the secondary gear disc, the peripheral edge of the main gear disc including protrusions having an inclined surface facing the secondary gear disc, the peripheral edge of the secondary gear disc having supporters which confront said protrusion and having a hole therein, a sensing rod having one end thereof touching the inclined surface of the protrusions on the main gear disc, penetrating through the hole of the confronting supporter of the secondary gear disc having the other end thereof operatively coupled to a ring shutter and photoelectric switches operatively controlled by said ring shutter, the protrusions of the main gear disc are synchronously moved to push or release the sensing rods, which then move the ring shutter out or in the photoelectric switches in response to load changes, said electric circuit coupling said photoelectric switches to command the turning-on or turning-off of the stator independent coils in response to said load changes.

4,874,975

BRUSHLESS DC MOTOR

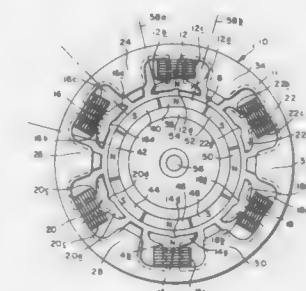
Friedrich R. Hertrich, Boulder, Colo., assignor to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 670,958, Nov. 13, 1984, abandoned.
This application Dec. 1, 1987, Ser. No. 127,625

Int. Cl.⁴ H02K 1/10

U.S. Cl. 310—186

9 Claims



1. A multiple-phase brushless DC motor comprising:
A. a field

- (1) having a plurality of pairs of diametrically opposed main field poles, the number of such pairs corresponding with the number of phases of the electrical excitation of said motor;
- (2) having a coil on each of said main field poles, the coils on each of said main field pole pairs being connected in series to form a coil pair, the coils of each of said coil pairs being connected so that current through the pair provides the same polarity in both of the poles of the main field pole pair;
- (3) with each of said main field poles having a pole face with a generally arcuate cross section, said cross section having a centrally disposed depression extending radially away from the face,

B. an armature having

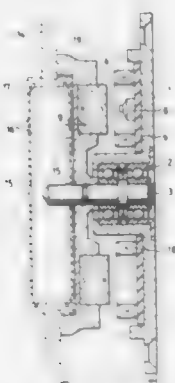
- (1) a plurality of poles and
- (2) permanent magnets for magnetizing the armature poles;
- C. the arcuate extent of each of the armature poles being greater than one-half of the pitch of said main field poles and substantially less than the main field pole pitch,
- D. the numbers of said main field poles and armature poles and the arcuate extent of each of the main field poles being such that within any 180 degree sector no more than one boundary between said armature poles is opposite a space between two of said main field poles for any given armature position,

E. said motor further comprising auxiliary poles disposed in the gaps between the main field poles.

4,874,976

SPINDLE MOTOR FOR DRIVING DISCS

Masahiro Ohsawa, and Eichi Yonesawa, both of Kanagawa, Japan, assignors to Fuji Electric Co., Ltd., Kanagawa, Japan
Filed Aug. 8, 1988, Ser. No. 229,663
Claims priority, application Japan, Sep. 4, 1987, 62-221483
Int. Cl.⁴ H02K 1/22, 21/12
U.S. Cl. 310—268 3 Claims

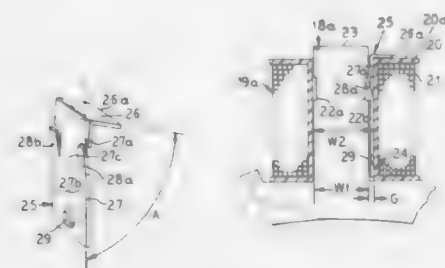


1. A spindle motor for driving a magneto-optical disc, being of compact size, comprised of a non-magnetic clamping rotor having an upper and lower face, a set of stator coils, and a plurality of field magnets which are internally mounted abutting said lower face of the clamping rotor, operative to fixedly hold said magneto-optical disc in a non-contacting manner with respect to said field magnets and in a predetermined position at an end portion of a motor driven shaft by a magnetic flux of said internally-mounted field magnets which attract a mounting disc of magnetic material attached to said magneto-optical disc.

4,874,977

STATOR ASSEMBLY HAVING COIL BOBBINS WITH RETAINING CLIPS

Edward J. Safranek, Arlington Heights, Ill., assignor to F & B Mfg. Co., Gurnee, Ill.
Filed May 9, 1988, Ser. No. 191,878
Int. Cl.⁴ H02K 1/18, 15/02
U.S. Cl. 310—269 7 Claims



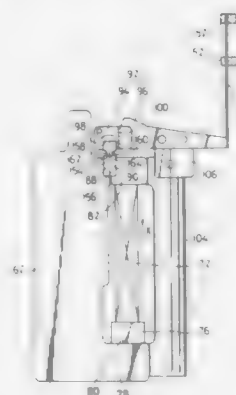
1. A stator, comprising:
a plurality of stacked laminations forming a stator assembly having a plurality of pole legs;
at least one of the pole legs having a bobbin with an associated coil wound and impregnated thereon slidably received on the pole leg;
locking clip means inserted in a gap between a side of the pole leg and a side of an aperture of the bobbin for retain-

ing the bobbin on the pole leg, an opposite side of the pole leg being flush with an opposite side of the aperture;
said pole legs being rectangular in cross section, having a cross-sectional area at an end face which is the same as a cross-sectional area interiorly of the end face, and having at least one notch provided in a side thereof;
said locking clip means comprising a springable metal clip having at one end a bent lip which forms an angle of less than 90° relative to a main body portion of the clip, and wherein said main body portion has two springy kick-out tabs which engage in said notch; and
the main body portion also having an embossment extending above the main body portion in a direction which is the same as a direction in which said kick-out tabs extend above the main body portion.

4,874,978

DEVICE FOR MAGNIFYING DISPLACEMENT OF PIEZOELECTRIC ELEMENT OR THE LIKE AND METHOD OF PRODUCING SAME

Atsuo Sakaida, Gifu; Yasuji Chikaoaka, Aichi; Yasuo Imoto, Nagoya; Akira Iriguchi, Nagoya, and Yoshiyuki Ikezaki, Nagoya, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan
Filed Jun. 3, 1988, Ser. No. 202,035
Claims priority, application Japan, Jun. 9, 1987, 62-143530; Jun. 12, 1987, 62-90834[U]; Jun. 16, 1987, 62-149535; Oct. 30, 1987, 62-277169; Jan. 23, 1988, 63-13229; Jan. 25, 1988, 63-14019; Jan. 29, 1988, 63-19844; Feb. 2, 1988, 63-23561
Int. Cl.⁴ H01L 41/08 28 Claims



1. A device for magnifying displacement of a piezoelectric element adapted to be displaced by application of voltage thereto, comprising:

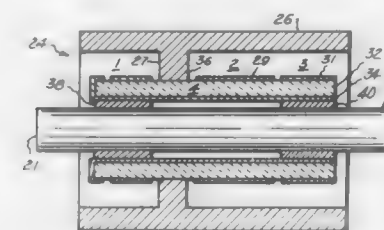
- a frame extending substantially parallel to a direction of displacement of said piezoelectric element, said piezoelectric element being mounted on said frame;
- a movable member fixed to one end of said piezoelectric element with respect to said direction of displacement and adapted to be displaced in a direction substantially parallel to said frame;
- a first mount surface formed on said frame and extending substantially parallel to said direction of displacement;
- a second mount surface formed on a surface of said movable member which faces said first mount surface and extending substantially parallel to said direction of displacement, said second mount surface facing said first mount surface;
- a first leaf spring mounted at a first end portion thereof on said first mount surface and extending substantially parallel to said direction of displacement;
- a second leaf spring mounted at a first end portion thereof on said second mount surface and extending substantially parallel to said direction of displacement, said second leaf

spring being positioned adjacent to said first leaf spring; and
a rolling member fixed to second end portions of said first and second leaf springs, wherein when said piezoelectric element is displaced, said second leaf spring is displaced along said first leaf spring through said movable member to roll said rolling member.

4,874,979

ELECTROMECHANICAL TRANSLATION APPARATUS

Louis N. Rapp, Dansville, N.Y., assignor to Burleigh Instruments, Inc., Flabers, N.Y.
Filed Oct. 3, 1988, Ser. No. 253,162
Int. Cl.⁴ H01L 41/08 6 Claims

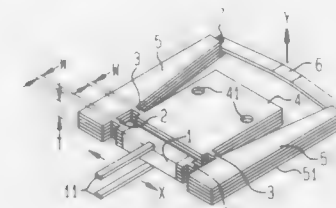


1. An electromechanical translator which comprises a housing, a shaft moveable with respect to said housing, a piezoelectric driver in said housing having a plurality of sections which expand and contract, said sections being disposed in end-to-end relationship, said sections including a first section spaced sufficiently from said shaft so that it remains out of contact with said shaft when it extends, and second and third sections each disposed facing an opposite end of said first section and sufficiently close to said shaft to clamp to said shaft upon expansion thereof, said driver being connected to said housing in an area thereon separate from said first section and spaced from one of the opposite ends of said first section, and means for applying voltages to said first section to change the length thereof and to said second and third sections for the selective clamping thereof to said shaft.

4,874,980

LAMINATED MECHANICAL AMPLIFICATION MECHANISM FOR PIEZOELECTRIC ELEMENTS

Kazuhiko Mine; Kei Sanada, both of Tokyo, and Mitsutaru Ide, Hyogo, all of Japan, assignors to NEC Corporation, Tokyo, Japan
Filed Dec. 19, 1988, Ser. No. 286,245
Claims priority, application Japan, Dec. 17, 1987, 62-320352
Int. Cl.⁴ H01L 41/08 5 Claims



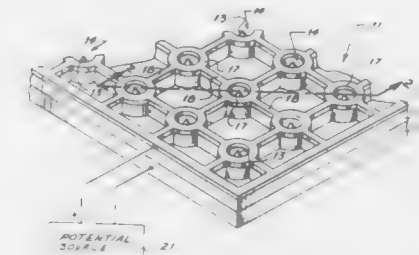
1. A mechanical amplification mechanism for piezoelectric elements comprising: a plurality of base plates laminated to each other, each of said base plates having a pair of fulcrum members protruding from opposite side edges thereof in a first direction, a pair of laminated lever arms respectively fixed to said fulcrum members such that each of said laminated lever

arms is fixed to each of said fulcrum members, the longitudinal axes of each of said lever arms being disposed in a second direction which is perpendicular to said first direction, each of said lever arms having first and second portions with said fulcrum member serving as a positional boundary, said first portions being longer than said second portions, each of said base plates and each pair of said lever arms being formed from the same thin metal plate in an integrated form via said fulcrum members, a piezoelectric element fixed between the second portions of said lever arms, and a beam member fixed between the first portions of said lever arms.

4,874,981

AUTOMATICALLY FOCUSING FIELD EMISSION ELECTRODE

Charles A. Spindt, Menlo Park, Calif., assignor to SRI International, Menlo Park, Calif.
Filed May 10, 1988, Ser. No. 192,341
Int. Cl.⁴ H01J 1/30, 9/02 21 Claims



1. A particle field emission structure comprising, in combination: at least one particle emission site having one or more emitting tips for electrically charged particles; an electrically conductive base structure positioned to provide electrical energy to said emitting tips for electrically charged particles to be emitted therefrom; an electrically conductive control electrode structure positioned at said site for controlling the extraction of particles from said site; means for applying a potential difference between said base structure and said control electrode to extract electrically charged particles from said particle emission site; said control electrode, base structure, and potential applying means being selected to have an electromagnetic interaction between said control electrode and said base structure providing both an extraction potential for said particles and automatically establishing a potential field pattern in the spatial volume adjacent said control electrode structure on the side thereof opposite said base structure which will provide desired trajectories therethrough of particles formed at said site.

4,874,982

DISPLAY DEVICE WITH ADJUSTABLE DEFLECTION UNIT

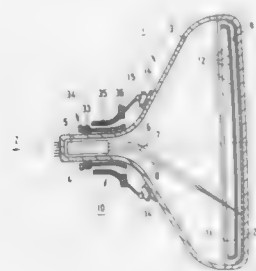
Dik R. Overdijk; Antonius J. J. Bolder; Leopold C. M. Beirens, and Piet C. J. Van Rens, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.
Filed Jun. 17, 1988, Ser. No. 208,952
Claims priority, application Netherlands, Jun. 18, 1987, 8701471

Int. Cl.⁴ H01J 29/70; H01F 3/00

U.S. Cl. 313—440 4 Claims

1. A cathode ray tube display device comprising: an envelope formed by a display window, a neck and a funnel-shaped portion which connects the display window to the neck, a plurality of reference surfaces on said envelope; a plurality of adjustable elements engaging said reference surfaces; a deflection unit mounted on the envelope at the area of the transition

from the neck to the conical part of the envelope, and attached to said adjustable elements for connecting the deflection unit to



the envelope, the position of the deflection unit relative to the envelope being adjustable by adjusting the adjustable elements.

4,874,983

PICTURE DISPLAY SYSTEM INCLUDING A DEFLECTION UNIT WITH A DOUBLE SADDLE COIL SYSTEM

Albertus A. S. Sluyterman, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

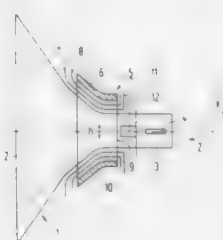
Filed May 19, 1988, Ser. No. 196,652

Claims priority, application Netherlands, May 29, 1987, 8701276

Int. Cl.⁴ H01J 29/76; H01F 3/12

U.S. Cl. 313-440

11 Claims



1. A picture display system including a colour display tube having a neck accommodating an electron gun assembly for generating three electron beams, and an electromagnetic deflection unit surrounding the paths of the electron beams which have left the electron assembly, said deflection unit comprising

- a field deflection coil of the saddle type having a front and a rear end for deflecting electron beams generated in the display tube in a vertical direction;
- a line deflection coil of the saddle type likewise having a front and a rear end for deflecting electron beams generated in the display tube in a horizontal direction, and a yoke ring of ferromagnetic material surrounding the two deflection coils and having front and rear end faces extending transversely to the tube axis, the electron beam traversing the coils in the direction from the rear to the front ends when the deflection unit is arranged on a display tube, characterized in that the deflection unit also has first and second magnetically permeable portions arranged symmetrically with respect to the plane of symmetry of the field deflection coil on either side of the tube axis, each magnetically permeable portion having a first end located opposite the rear end face of the yoke ring and a second end located at the neck of the display tube in the proximity of the location where the electron beams leave the electron gun assembly, the length of the first and second magnetically permeable portions and their distance to the yoke ring being dimensioned for providing a self-convergent picture display system.

4,874,984 FLUORESCENT LAMP BASED ON A PHOSPHOR EXCITED BY A MOLECULAR DISCHARGE

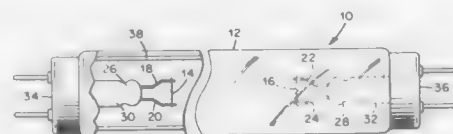
A. Gary Sigal, Lexington; Walter P. Lapatovich, Hudson, and Michael N. Alexander, Lexington, all of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Apr. 11, 1988, Ser. No. 179,815

Int. Cl.⁴ H01J 1/63, 63/04

U.S. Cl. 313-486

4 Claims



1. A green emitting fluorescent lamp comprising a glass envelope having an inner wall, said inner wall of said glass envelope being coated with a manganese doped magnesium aluminate phosphor which emits visible light upon absorption of ultraviolet radiation of about 206 nm, said fluorescent lamp having corrosion resistant filamentary electron emitting electrodes, and said glass envelope enclosing a fill material which forms a plasma emitting ultraviolet radiation of about 206 nm during electrical discharge, said fill material comprises an iodine containing molecular vapor and an inert gas selected from the group consisting of neon, argon, krypton, xenon, and mixtures thereof.

4,874,985

PHOSPHOR AND ELECTRON EXCITED FLUORESCENT DISPLAY DEVICE USING THE SAME

Takashi Hase, Ebina, and Hidemi Yoshida, Odawara, both of Japan, assignors to Kasei Optonix Limited, Japan
Continuation of Ser. No. 925,495, Oct. 29, 1986, abandoned, which is a continuation of Ser. No. 669,430, Nov. 8, 1984, abandoned, which is a division of Ser. No. 467,395, Feb. 17, 1983, abandoned. This application Jul. 25, 1988, Ser. No. 224,285
Claims priority, application Japan, Feb. 19, 1982, 59-25545; Apr. 30, 1982, 59-74006; Apr. 30, 1982, 59-74007; Jun. 7, 1982, 59-97329

Int. Cl.⁴ H01J 1/63, 29/20; C09K 11/54

U.S. Cl. 313-487

5 Claims



1. An electron excited fluorescent display device comprising, as a white emitting ingredient of a fluorescent screen, a sulfide phosphor emitting white light comprising a long after-glow yellow emitting phosphor and a long after-glow blue emitting phosphor, wherein the weight ratio of said long after-glow yellow emitting phosphor to said long after-glow blue emitting phosphor is within the range between 0.34 and 5.00, said long after-glow yellow emitting phosphor being represented by the formula:



wherein M^I is at least one of copper and gold, X' is aluminum, and x, e, f and g are numbers respectively satisfying the conditions of $0 \leq x \leq 0.3$, $10^{-6} \leq e \leq 10^{-2}$, $5 \times 10^{-7} \leq f \leq 5 \times 10^{-4}$ and $5 \times 10^{-7} \leq g \leq 10^{-3}$; and said long after-glow blue emitting phosphor being represented by the formula:



wherein M^I is at least one of copper and gold, X is at least one of chlorine, bromine, iodine, fluorine and aluminum, and a, b, c and d are numbers respectively satisfying the conditions of $5 \times 10^{-6} \leq a \leq 10^{-3}$, $0 \leq b \leq 2 \times 10^{-4}$, $10^{-8} \leq c \leq 10^{-3}$, and $5 \times 10^{-8} \leq d \leq 5 \times 10^{-4}$.

4,874,986

TRICHROMATIC ELECTROLUMINESCENT MATRIX SCREEN, AND METHOD OF MANUFACTURE

Roger Menn, 5 rue Latour prolongee, 60140, Liancourt; Christian Brunel, 5 rue Moliere, 92120 Montrouge, and Dario Pedile, 59 rue de la Bourgogne, 95430 Auvers/Seine, all of France

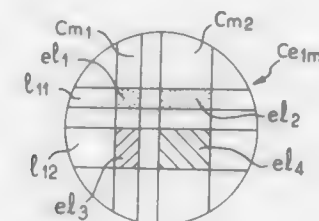
Filed May 20, 1986, Ser. No. 864,979

Claims priority, application France, May 20, 1985, 85 07556

Int. Cl.⁴ H01J 1/62

U.S. Cl. 313-505

4 Claims



1. In an electroluminescent matrix screen comprising:

- (a) two parallel plates;
- (b) a plurality of parallel line electrodes comprising n identical adjacent groups of two parallel line electrodes provided on a first plate;
- (c) a plurality of parallel column electrodes comprising m identical adjacent groups of two parallel column electrodes provided on a second plate, said parallel column electrodes being perpendicular to the parallel line electrodes; and
- (d) light emitting elements in an electroluminescent material provided between the line electrodes and the column electrodes at the cross points of said line electrodes and said column electrodes;
- (e) whereby an intersection of the n groups of two parallel line electrodes and the m groups of two parallel column electrodes defines $n \times m$ identical basic cells, each constituted by a two lines by two columns submatrix comprising four electroluminescent elements and
- (f) wherein the electrodes have various widths so that the electroluminescent elements have corresponding various areas, the improvement wherein:
- (g) the four electroluminescent elements of each basic cell, constituted by a two lines by two columns submatrix, are selected from three different base colors;
- (h) said basic cells have each two of their electroluminescent elements emitting the same color;
- (i) each line electrode and each column electrode cooperates at most with two colors; and
- (j) the various widths of the electrodes and the corresponding areas of the various electroluminescent elements are selected within each cell so as to provide three sources of different colors having similar luminances.

4,874,987

MODULAR X-RAY IMAGE INTENSIFIER TUBE

Bart van der Eljk; Johannes N. van de Wiek; Engelbertus Rongea, all of Heerlen, and Christiaan J. G. H. Walms, Eindhoven, all of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

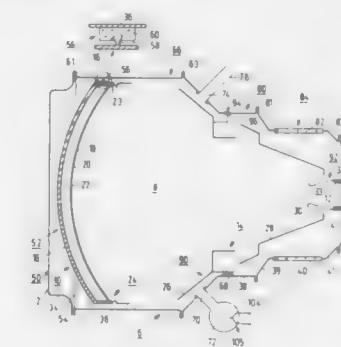
Filed Aug. 31, 1987, Ser. No. 91,680

Claims priority, application Netherlands, Sep. 2, 1986, 8602212

Int. Cl.⁴ H01J 35/16, 43/28

U.S. Cl. 313-525

16 Claims



1. An x-ray image intensifier tube of the type comprising an evacuated space having therein an entrance screen, an exit screen, and an electron-optical imaging system, said tube further comprising modules as follows:

- an entrance window module,
- a jacket module fixed to said entrance window module,
- a cone module comprising a conical intermediate ring fixed to said jacket module, said cone module constricting the cross section of said space away from said jacket module,
- an exit module, and
- an insulator module comprising a first sealing ring, a second sealing ring, and an insulating ring therebetween, said first sealing ring being fixed to said cone module, said exit module being fixed to said second sealing ring.

4,874,988

PULSED METAL HALIDE ARC DISCHARGE LIGHT SOURCE

George J. English, North Reading; Harold L. Rothwell, Jr., Georgetown, both of Mass., and Donald F. Garrity, Jr., Chester, N.H., assignors to GTE Products Corporation, Danvers, Mass.

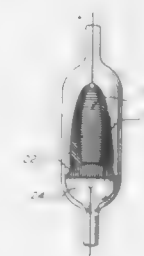
Continuation of Ser. No. 135,405, Dec. 18, 1987, abandoned.

This application May 24, 1989, Ser. No. 356,655

Int. Cl.⁴ H01J 61/38

U.S. Cl. 313-620

21 Claims



1. A pulsed metal halide arc discharge light source comprising:

- (a) a light-transmissive envelope hermetically enclosing an interior;

- (b) an anode and a cathode passing through said envelope and protruding into said interior, the internal terminations of said anode and cathode being spaced apart;
- (c) an inert gas and an emissive material within said interior, said emissive material covering said cathode such that there is a minimum gap between said internal termination of said anode and the surface of said emissive material, said emissive material including at least one recrystallized metal halide salt, the temperature of said emissive material being less than one hundred degrees Centigrade during an application of a short duration electrical pulse across said anode and cathode; and
- (d) an arc discharge positioned between said anode and cathode during said application of said electrical pulse, said arc discharge including first, second, and third regions emitting colored light, said first region being plume-like and adjacent said metal halide salt, the color of the light emitted from said first region being substantially determined by said metal halide salt, said second region being a central core positioned between said first region and said anode, the color of the emitted light of said second region being substantially determined by said inert gas, said third region surrounding said second region, the color of said third region being determined by said inert gas and said metal halide salt.

4,874,989

ELECTRONIC BALLAST UNIT WITH INTEGRAL LIGHT SENSOR AND CIRCUIT

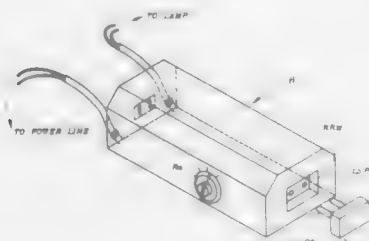
Ole K. Nilsson, Caesar Dr., Rt. 5, Barrington, Ill. 60010

Filed Dec. 11, 1986, Ser. No. 940,600

Int. Cl.⁴ H05B 41/36

U.S. Cl. 315-151

20 Claims



10. The combinations of:
housing means having an outer surface;
ballast circuit means comprised within the housing means, the ballast circuit means: (i) being connectable with a source of electric power, (ii) having control terminal means, and (iii) being operable in a substantially non-dissipative manner to provide an output current at a ballast output, the output current having a magnitude affected by a control input provided to the control terminal means;
- light sensor means connected with the control terminal means and operative, in response to receiving a flux of illumination, to provide said control input, the light sensor means being comprised substantially within said outer surface;
- the housing means, the ballast circuit means, and the light sensor means being combined and integrate in such manner as to constitute an integral ballast suitable for use in a lighting fixture for powering a gas discharge lamp.

4,874,990
NOTCH GAP TRANSFORMER AND LIGHTING SYSTEM INCORPORATING SAME

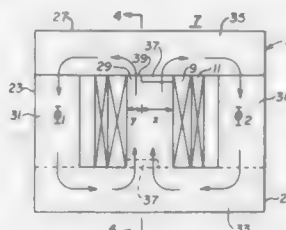
Dennis A. Dobnick, Watscka, Ill., assignor to QSE Sales & Management, Inc., Watscka, Ill.

Filed Aug. 22, 1988, Ser. No. 234,792

Int. Cl.⁴ H05B 41/16

U.S. Cl. 315-276

22 Claims



1. A lighting system powered by an ac source producing a sinusoidal voltage waveform, said system comprising a filament lamp, a transformer having a primary winding connected to the ac source and a secondary winding connected to the filament lamp, and a control circuit connected in series with the ac source and the primary winding of the transformer which selectively clips with a substantially zero switching interval the sinusoidal voltage waveform applied to the primary winding of the transformer by the ac source to control the intensity of light produced by the lamp, said transformer having a core of magnetic material upon which said primary and secondary windings are wound and defining a magnetic flux path, and at least one notch gap extending only partially across said magnetic flux path, said at least one notch gap having a volume storing sufficient magnetic energy to delay the duration of the switching interval of the clipped sinusoidal voltage waveform by an amount which substantially eliminates inductive spikes in said clipped sinusoidal voltage waveform to thereby substantially reduce filament ringing.

4,874,991

TOUCH CONTROLLED MULTIPLE POSITION LAMP

Thomas R. Ruskin, 85 E. India Row, Ste. 5F, Boston, Mass. 02110

Filed Jun. 30, 1987, Ser. No. 67,875

Int. Cl.⁴ F21S 1/12

U.S. Cl. 315-362

18 Claims



1. A floor lamp comprising a base assembly, an illuminator assembly, and a telescoping tube assembly for positioning said illuminator assembly above said base assembly:
(a) said telescoping tube assembly including a lower tube, an

- upper tube, and an inner tube, all composed of metal, said lower tube, said upper tube and said inner tube being substantially coaxial;
- (b) said inner tube being split to provide a paraxial opening, which, in cross-section, has a solid sector that subtends an angle of at least 180 degrees and an open sector that subtends an angle of no greater than 180 degrees;
- (c) said upper tube having a vertical section that is adjustable within said lower tube in height along its axis and in orientation about its axis;
- (d) a projection from said upper tube relatively adjacent to its lower end and relatively remote from its upper end extending into said open sector of the inner tube for setting limits on said orientation;
- (e) a fixture for locking said upper tube in adjusted height and adjusted orientation to said lower tube;
- (f) said illuminator assembly including an electrical control and a lamp socket;
- (g) said electrical control being responsive to a change of reactance generated by manual contact with at least one of said base assembly, said telescoping tube assembly and said illuminator assembly; and
- (h) an electrical power cord extending from outside of the floor lamp, through the lower tube, through the fixture, through the upper tube and to the electrical control.

4,874,992

CLOSED LOOP ADAPTIVE RASTER DEFLECTION SIGNAL GENERATOR

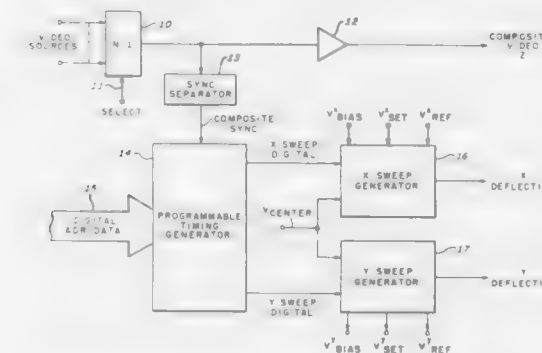
David J. Benson, Newington, Conn., and James A. Burroughs, San Jose, Calif., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Aug. 4, 1988, Ser. No. 228,615

Int. Cl.⁴ H01J 29/70, 29/54; H04N 5/06

U.S. Cl. 315-387

9 Claims



1. Raster deflection signal generation apparatus for use in a video display system having at least one video input channel for displaying a video image on a CRT screen, comprising programmable timing generator means for providing sweep control signals in accordance with predetermined timing characteristics of said channel and synchronized to a first sync signal said programmable timing generator means including,
means for providing said first sync signal,
means for providing a second sync signal from a composite video signal supplied by said at least one video input channel
phase detector means responsive to said first and second sync signals for providing an error signal representative of a phase difference therebetween,
oscillator means coupled to said first sync means and responsive to said error signal for providing a clock signal at a frequency that phase locks said first and second sync signals,
raster sweep generation means responsive to said sweep control signals for generating raster deflection signals, and
servo means responsive to said raster deflection signals for

maintaining said raster deflection signals positioned with respect to a predetermined reference so that said video image remains centered on said CRT screen.

4,874,993

SENSORLESS BRUSHLESS MOTOR

Masato Tanaka, and Toshiya Kan, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

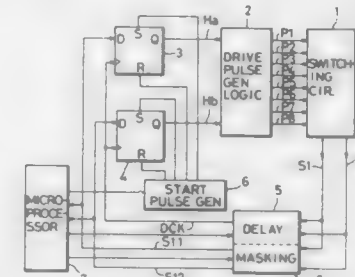
Filed Sep. 30, 1988, Ser. No. 251,236

Claims priority, application Japan, Oct. 31, 1987, 62-276833

Int. Cl.⁴ H02P 6/02

U.S. Cl. 318-254

20 Claims



1. A sensorless brushless motor comprising:
a rotor having a magnet;
an excitation coil;
a switching circuit for performing energization switching of said excitation coil;
a reference position detector for detecting a reference position of rotor rotation based on a voltage induced in said excitation coil by said magnet;
a delay circuit for producing a delay clock signal having clock pulses delayed by a predetermined amount from the reference position detected by said reference position detector;
a delay pulse signal forming circuit for forming a delay pulse signal based on the delay clock signal from said delay circuit;
a switching signal generator for generating an energization switching signal based on the delay pulse signal and supplying the switching signal to said switching circuit; and
a control circuit for detecting a rotational speed of said rotor for controlling the amount of delay in said delay circuit, and adjusting the energization switching position to said excitation coil in accordance with the rotational speed of said rotor.
9. A sensorless brushless motor comprising:
a rotor;
an excitation coil;
a switching circuit for performing energization switching of the excitation coil;
a reference position detector for detecting a reference position of rotor rotation based on a voltage induced in said excitation coil by said rotor;
a delay circuit for producing a delay clock signal having pulses delayed by a predetermined amount from the reference position detected by said reference position detector;
a delay pulse signal forming circuit for producing a delay pulse signal based on the delay clock signal from said delay circuit;
a switching signal generator for generating an energization switching signal fed to said switching circuit in response to the delay pulse signal; and
a masking circuit for forming a noise masking signal based on at least the delay clock signal for suppressing noise pulses in a detection output of said reference position detector at the reference position.

4,874,994

CONTROL CIRCUIT FOR A CONTROLLER FOR USE WITH A CONTROLLED ELEMENT

Gerd Eisenberg, Rosdorf, Fed. Rep. of Germany, assignor to BTS Broadcast Television Systems GmbH, Darmstadt, Fed. Rep. of Germany

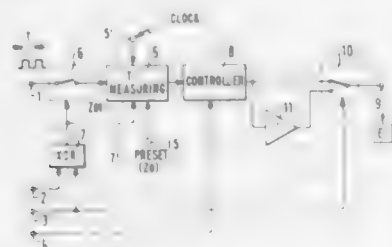
Filed May 17, 1988, Ser. No. 194,811

Claims priority, application Fed. Rep. of Germany, Jun. 12, 1987, 3719580

Int. Cl.⁴ H02P 1/22

U.S. Cl. 318—257

6 Claims



1. A control circuit for providing a control signal output (9) to a reversible controlled element (E), comprising an actual operating level input (1) for receiving a variable repetition pulse signal; an actual operating sign output (2); a command sign input (3); a command level value input (4); a measuring circuit (5) receiving signals from said actual operating level input and said command level value input for providing a signal representative of the frequency of the actual operating level input; and a controller (8) connected to and controlled by said measuring circuit (5) for providing a control signal at said control signal output (9); said control circuit, in accordance with the invention further comprising: a controlled gate circuit (6) interposed between said actual operating level input (1) and said measuring circuit (5); a two-input antivalence circuit (7) forming a conjunctive or AND-function gate (7), connected to the actual operating sign input (2) for receiving a digital operating sign input signal, and also connected to the command sign input (3) for receiving a digital command sign input signal, said two-input antivalence circuit (7) providing an output signal to the gate circuit to control the gate circuit to be conductive if and only if the signs of the two input signals agree; an inverting circuit (11) connected between the controller (8) and the control signal output (9) for providing an inverted control signal at said control signal output; and means (10) coupled to said controller and said inverting circuit for selecting one of said control signal and said inverted control signal under the control of the command sign input in dependence on the sign of the signal applied thereto.

4,874,995

PASSIVE SEAT BELT DEVICE

Osamu Kawai, and Shunji Mizumura, both of Fujisawa, Japan, assignors to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 12,660, Feb. 9, 1987, abandoned. This application Oct. 18, 1988, Ser. No. 259,406

Claims priority, application Japan, Feb. 14, 1986, 61-29034; Jun. 12, 1986, 61-134796

Int. Cl.⁴ H02H 7/08

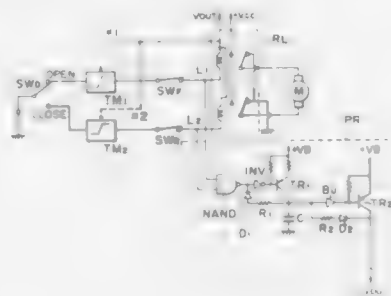
U.S. Cl. 318—484

12 Claims

1. A passive seat belt device for automatically fastening and releasing a seat belt, having a driving unit comprising:

a motor for driving the seat belt between a fasten position and a release position, and means responsive to states of motor energization and motor deenergization for controlling said motor as a function of motor energization time and motor deenergization time in such a manner as to prevent overload of said motor, said controlling means comprising a capacitor which charges during periods of motor energization and which discharges during periods of motor deenergization.

8. A passive seat belt device for automatically fastening and releasing a seat belt, having a driving unit comprising: a motor for driving the seat belt between a fasten position and a release position, and



means responsive to states of motor energization and motor deenergization for controlling said motor as a function solely of motor energization time and motor deenergization time in such a manner as to prevent overload of said motor, and wherein said controlling means integrates the motor energization time over successive periods of motor energization and adjusts the integrated motor energization time for deenergization time of intervening periods of motor deenergization, said controlling means controlling said motor in accordance with the adjusted integrated motor energization time.

4,874,996

MULTIPLE HEAD WOODWORKING APPARATUS WITH AUTOMATED HEAD POSITIONING APPARATUS

Bruce C. Rosenthal, Sheboygan, Wis., assignor to Kohler General Corporation, Sheboygan Falls, Wis.

Filed Jun. 13, 1988, Ser. No. 206,265

Int. Cl.⁴ G05B 19/18

U.S. Cl. 318—567

21 Claims



1. A multiple head woodworking apparatus, comprising a conveyor means including support means for fixedly supporting a series of wood parts and sequentially moving the support means past a plurality of spaced working tools supported in fixed orientation with respect to said parts, means supporting each of said tools for selective linear movement relative to said

conveyor means and having a plurality of linear axis of movement, motors for positioning each of the tools, an absolute electronic scale unit for each axis including a scale having a detectable indicia thereon and a relatively moving electronic readout head coupled to said scale and establishing an output signal directly related to the absolute position of said head on said scale, relative movement of said scale and said readout head in accordance with the positioning of said tool establishing an absolute position signal of the corresponding tool, a control unit having a command signal input, a multiplexing means connected to said heads and to said motors to receive signals corresponding to said position signals and connected to each readout head and to said motor drive unit for positioning said tool on each axis in accordance with a predetermined signal match between said signals.

4,874,997

DIGITAL ROBOT CONTROL PROVIDING PULSE WIDTH MODULATION FOR A BRUSHLESS DC DRIVE

Kenneth E. Daggett, Murrysville, Pa.; Elmer M. Onaga, Brookfield Center; Richard J. Casler, Jr., Newtown, both of Conn., and Richard A. Johnson, Murrysville, Pa., assignors to Unimation, Inc., Danbury, Conn.

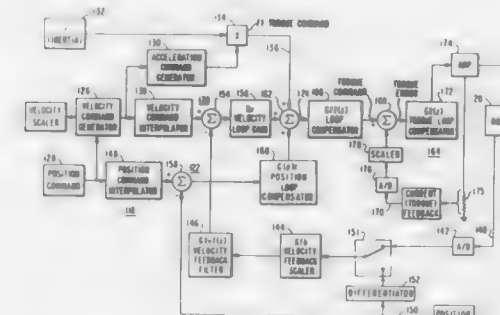
Continuation of Ser. No. 932,974, Nov. 20, 1986. This

application Apr. 1, 1988, Ser. No. 178,813

Int. Cl.⁴ G05B 5/00

U.S. Cl. 318—568.1

5 Claims



1. A system for digitally controlling and energizing a brushless DC arm joint motor in a robot control, said system comprising:

three interconnected phase windings for said motor; a power amplifier having first through sixth switching means interconnected with said windings to direct drive current through series paired windings corresponding to the switching operation of pairs of said switching means; a digital pulse width modulator circuit having up/down counter means for generating a sawtooth voltage waveform representing counts as a function of time; means for comparing the counter means count to a voltage signal representing control command so as to digitally control and define the time width of forward and reverse reference control pulses for said power amplifier switching means in accordance with the compared control command voltage signal and the polarity of the control command signal; means for generating an enabling reference control pulse for each of said reference control pulses; means for generating a plurality of phase displaced signals representative of motor rotor position; means for generating respective control pulses which operate the six power amplifier switching means and correspond in time width to said reference control pulses; and commutating means responsive to said position signals and the polarity of the control command signal to apply successive pairs of said switch control pulses to said switching means so as to produce digitally commutated, pulse width modulated, motor drive current for the command

time as the motor current path is commutated from winding pair to winding pair in accordance with the polarity of the control command signal and a predetermined sequence of phase rotation.

4,874,998

MAGNETICALLY LEVITATED FINE MOTION ROBOT WRIST WITH PROGRAMMABLE COMPLIANCE

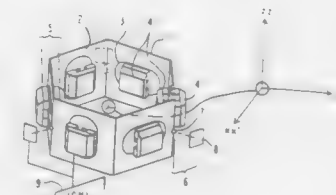
Ralph L. Hollis Jr., Yorktown Heights, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 61,930, Jun. 11, 1987, abandoned. This application Jun. 21, 1988, Ser. No. 211,113

Int. Cl.⁴ G05D 11/08

U.S. Cl. 318—568.21

16 Claims



1. A six-degree-of-freedom fine motion device, having but a single moving part, comprising:

(a) a stator support unit (9) defining a base and a dual enclosure having dual walls upthrust from the base to define a dual periphery; (b) a multiplicity of forcer magnets (4) disposed at spaced positions about said dual periphery; (c) a flotor unit (1) having a related periphery nested in said dual periphery of said stator support unit (9); (d) forcer elements (5) including a multiplicity of forcer element flotor coils (3) arrayed about said periphery of said flotor unit (1) in active juxtaposition with said forcer magnets (4); (e) position and orientation sensing means (6) arrayed about said dual periphery of said stator support unit (9) and about said periphery of said flotor unit (1) to sense the relative positions and orientations of said stator support unit and said flotor unit; and (f) control means connected to said position and orientation sensing means (6) in feedback mode, for providing respective forcer elements (5) with electrodynamic actuation appropriate to maintain equilibrium at a desired starting position and orientation, appropriate to cause motion to a desired final position and orientation according to a force-to-displacement ratio K, and appropriate to provide a desired compliance in at least one degree of freedom by selectively lessening the force-to-displacement ratio K in a related set of forcer elements (5).

4,874,999

AUTOMATIC CONTROL SYSTEM

Takao Kuwabara, Hitachi, and Kazuo Takahashi, Hitachiota, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 23, 1988, Ser. No. 275,367

Claims priority, application Japan, Nov. 25, 1987, 62-295282

Int. Cl.⁴ G05B 11/42

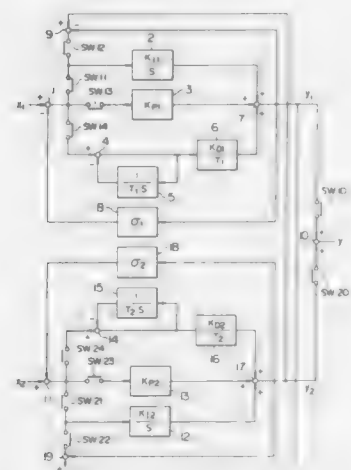
U.S. Cl. 318—610

8 Claims

1. An automatic control system for controlling an object comprising:

a first control circuit; a second control circuit including an integration circuit receiving an error signal between a target signal and a feedback signal, at least one of a proportional circuit and a differentiation circuit receiving the error signal, and an adder circuit for adding an output of the integration circuit and an output of at least one of the proportional

circuit and the differentiation circuit, said feedback signal being provided by an output of the adder circuit; and a selection circuit for selecting one of the outputs of the first and second control circuits; said automatic control system further comprising: first means for applying the error signal to the input of the



integration circuit of the second control circuit when control of the object is switched from the output of the first control circuit to the second control circuit; and second means for applying the error signal to at least one of the proportional circuit and the differentiation circuit of the second control circuit after the lapse of a predetermined time following the operation of the first means.

4,875,000

CURRENT FAULT DETECTION SYSTEM AND METHOD FOR AC CONTROLLER

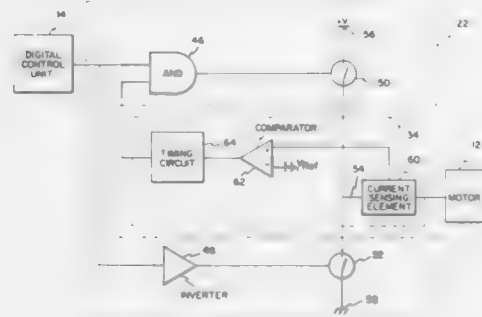
John J. Fry, Wickliffe; John W. Robertson, Jr., Chesterland, and Edward Bastijanic, Concord, all of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.
Continuation of Ser. No. 935,353, Nov. 26, 1986, abandoned.

This application Aug. 10, 1988, Ser. No. 233,929

Int. Cl.⁴ H02P 5/40

U.S. Cl. 318—798

5 Claims



1. An overcurrent fault detection system for multiphase AC motor control systems comprising: digital control means for controlling the motor control system through digital pulses; multiphase AC power generation means connected to said digital control means for supplying AC multiphase power to a motor, said power generation means including a separate power driving means for generating each phase of the multiphase power and an overcurrent detection means for each phase of said multiphase power permitting an individual power phase to be disabled without disabling

the other power phases, each of said power driving means including an AND gate and inverter means, said AND gate and said inverter means each receiving the same signals from said digital control means and producing digital signals that are opposite to each other in logic value, each of said overcurrent detection means including means for sensing the electrical current passing through said individual power phase and producing a signal representative thereof, means for comparing said signal produced by said current sensing means with a signal having a pre-determined magnitude and producing an output signal if the magnitude of said signal produced by said current sensing means exceeds the magnitude of said pre-determined signal, and timing means connecting the output of said comparing means to an input of said AND gate, said timing means receiving said output signal produced by said comparing means and producing a signal for disabling said individual power phase for a first pre-determined period of time; and

mechanical feedback means attached through a load to the motor to disable the entire motor control system through said digital control means if the motor stalls for a second pre-determined period of time indicating the existence of a severe overcurrent condition in the motor control system.

4,875,001

ELECTRONIC SWITCHING POWER SUPPLY WITH A CHOKE CONVERTER

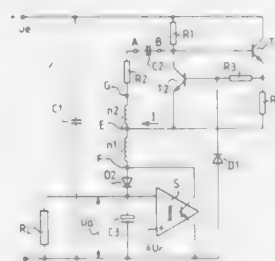
Günther Bergt, Niederrhausen, Fed. Rep. of Germany, assignor to Braun Aktiengesellschaft, Kronberg, Fed. Rep. of Germany
Filed Dec. 8, 1988, Ser. No. 281,487

Claims priority, application Fed. Rep. of Germany, Dec. 16, 1987, 3742613

Int. Cl.⁴ H02M 3/158

U.S. Cl. 323—223

5 Claims



1. A circuitry for regulating the output voltage (U_a) of an electronic switching power supply supplying power to an electrical load (RL) connected in parallel with an output capacitor (C3) from a dc voltage source (U_e) of varying voltage level, including a choke converter having the circuit of a first transistor (T1) connected in series with a choke (n1), said choke (n1) being charged with a rising current in the conductive state of said first transistor while in its off-state the energy stored in said choke (n1) flows through a diode (D1) to said output capacitor (C3) which discharges through said electrical load (RL), with an emitter resistor (R4) which is connected in series with said first transistor (T1) and in parallel with the base-emitter circuit of a second transistor (T2) having its collector connected to the base of said first transistor (T1), and with a feedback coil (n2) magnetically coupled to said choke (n1), said feedback coil (n2) having its one end connected to the base of said first transistor (T1) through a current-limiting resistor (R2) and a feedback capacitor (C2) connected in series, while its other end is connected to the junction of the choke (n1) and the emitter resistor (R4), characterized in that the variation of time (t2) necessary for the regulation of the output voltage (U_a), during which time current flows from said choke (n1) to said output capacitor (C3), is accomplished by means of

a threshold switch (S) short-circuiting the coil of said choke (n1).

4,875,002

METHOD OF TESTING SEMICONDUCTOR WAFERS

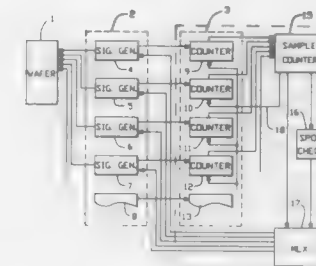
Hideo Sakamoto, Temri, and Hiroshi Tsugita, Nara, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Continuation of Ser. No. 734,346, May 15, 1985, abandoned.

This application Nov. 24, 1987, Ser. No. 129,895

Claims priority, application Japan, May 30, 1984, 59-112742
Int. Cl.⁴ G01R 31/28; G06F 15/20

U.S. Cl. 324—73 R

6 Claims



1. A method of testing wafers with many chips thereon comprising the steps of:
conducting tests of a plurality of kinds on chips on said wafers during a predetermined initial period,
counting the number of wafers which failed in each of said plurality of kinds of tests,
storing said numbers, and
automatically selecting one or more of said plurality of kinds of tests for subsequent testing of wafers on the basis of said stored numbers.

4,875,003

NON-CONTACT I/O SIGNAL PAD SCAN TESTING OF VLSI CIRCUITS

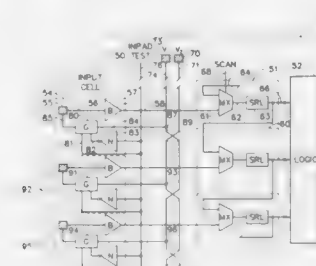
Gary R. Burke, Encinitas, Calif., assignor to Silicon Connections Corporation, San Diego, Calif.

Filed Feb. 21, 1989, Ser. No. 314,510

Int. Cl.⁴ G01R 31/28

U.S. Cl. 324—73 R

5 Claims



1. In a microcircuit device which includes a plurality of input cells, a plurality of output cells, a plurality of serially-connected first boundary scan cells, and a plurality of serially-connected second boundary scan cells, each input cell including an input buffer and an input signal pad connected to the input of the input buffer, each output cell including an output buffer and an output signal pad connected to the output of the output buffer, each of the plurality of first boundary scan cells connected to receive the output of the input buffer of a respective one of said input cells or the output of a respective one of said first boundary scan cells, and each of the plurality of second boundary scan cells connected to provide the input of the output buffer of a respective one of said output cells, said

microcircuit device further including means connecting said first boundary scan cells to said second boundary scan cells for serially shifting a pattern of signals into and through said second boundary scan cells, an improvement for signal pad scanning of said input and output cells, wherein said improvement comprises:

a first input stimulus bus;
a second input stimulus bus;
for each of said input cells, a gate circuit having an output connected to the input signal pad of said input cell, a signal input, and a control input connected to said input signal pad test bus, said gate circuit connecting its signal input to its output in response to an input signal pad test signal on said input signal pad test bus;
the signal inputs of said gate circuits being connected alternately to said first and second input stimulus busses;
an output signal pad test bus;
an output signal pad signal bus; and,
for each said output cell:

a gate circuit having an output connected to said output signal pad signal bus, a signal input connected to the output signal pad of said output cell, and a control input, said gate circuit connecting its signal input to its output in response to an output signal pad test control signal on said control input; and,
a signal circuit means connected to said output signal pad test bus, said second boundary scan cells, and to said gate circuit control input for generating said output signal pad test control signal in response to the conjunction of a predetermined test pattern serially shifted through said second boundary scan cells and an output pad test signal on said output pad test bus.

4,875,004

HIGH SPEED SEMICONDUCTOR CHARACTERIZATION TECHNIQUE

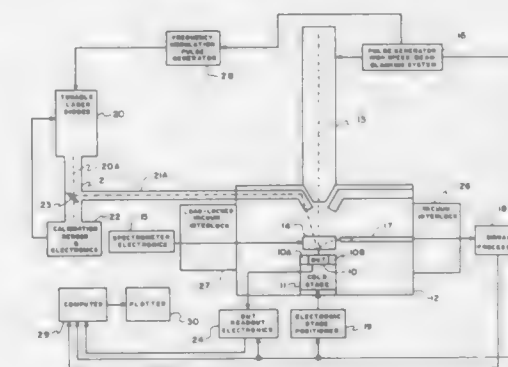
Phillip R. Boyd, Upper Marlboro, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, Del.

Filed Jan. 1, 1988, Ser. No. 200,813

Int. Cl.⁴ G01R 31/26, 31/28

U.S. Cl. 324—158 D

7 Claims



1. A test system for evaluating LSI arrays of photodiodes with an isolated electrode for each diode and a common electrode for all diodes comprising:
a vacuum chamber including an externally moveable coolable stage means for mounting said array within said chamber;
an electron beam generator mounted on said chamber and focussed on only one isolated electrode of said array;
an externally mounted tuneable laser attached to said chamber with a beam irradiating all diodes in same array;
a current conducting measuring means coupled only between the common electrode of said array and said elec-

tron beam generator to measure the electro-optical response of each photodiode as function of current between said generator and said common electrode as well as secondary electron emission from said isolated electrode; and

- a pulse generating means coupled between said common electrode, said beam generator and said laser to redirect the beam from said generator sequentially to each of at least a first set said diodes and to sequentially tune said laser to a plurality of optical frequencies, such that each diode may be irradiated by said plurality of frequencies.

4,875,003

MECHANISM FOR TURNING OVER A TEST HEAD OF A WATER PROBING MACHINE

Michimasa Terada, Tokyo, and Hisashi Nakajima, Yamanashi, both of Japan, assignors to Tokyo Electron Limited, Tokyo, Japan

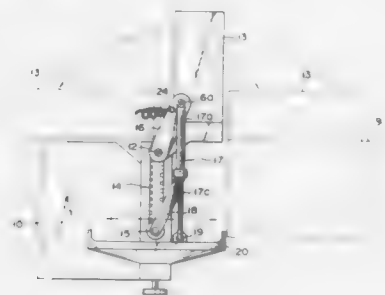
Filed Aug. 5, 1988, Ser. No. 228,491

Claims priority, application Japan, Aug. 7, 1987, 62-199538

Int. Cl.⁴ G01R 31/02; B25B 11/00

U.S. Cl. 324—158 F

16 Claims



1. A mechanism for turning over a heavyweight object, comprising:

- a quadric crank chain disposed substantially within a vertical plane to support an object of transfer;
- slide means coupled to a first movable link corresponding to the side opposite to a fixed link of the quadric crank chain, said sliding means serving to slide the first movable link in vertical direction; and
- guide means for supportingly guiding the slide means in a horizontal direction,

said object of transfer being attached to a second movable link corresponding to a side adjacent to the fixed link of the quadric crank chain, so that the object of transfer, along with the second movable link, revolves within the vertical plane when the first movable link slides vertically.

4,875,006

ULTRA-HIGH-SPEED DIGITAL TEST SYSTEM USING ELECTRO-OPTIC SIGNAL SAMPLING

Francois G. Henley, San Jose; Hee-June Choi, Fremont; Dean J. Kratzer, Palo Alto, and Maurice R. Barr, Saratoga, all of Calif., assignors to Photon Dynamics, Inc., San Jose, Calif.

Filed Sep. 1, 1988, Ser. No. 239,577

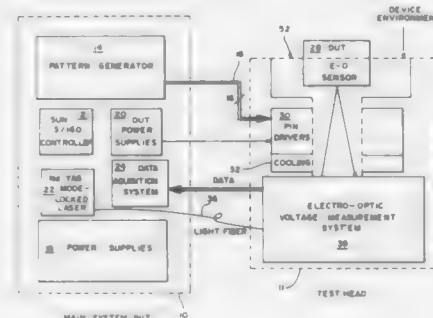
Int. Cl.⁴ G01R 19/00; 5/28

U.S. Cl. 324—158 R

8 Claims

1. A high-speed test system for semiconductor integrated circuits comprising
- an adapter board for receiving a circuit for test,
 - a plurality of driver circuits positioned around said adapter board,
 - an electro-optic sensor positioned below said adapter board,
 - connector means connecting said plurality of driver circuits to contacts of a circuit undergoing test and for connecting contacts of a circuit undergoing test to said electro-optic sensor,

electro-optical voltage measuring means, laser means for generating light sampling pulses, optical means for directing said light sampling pulses to said electro-optic sensor and for directing said light sampling pulses from said electro-optic sensor to said electro-optic voltage measuring means, and



control means for controlling operation of said driver circuits, said electro-optical voltage measuring means and said optical means, said control means including a test signal pattern generator, a system time base, and data acquisition means.

4,875,007

EDDY CURRENT PROXIMITY SYSTEM

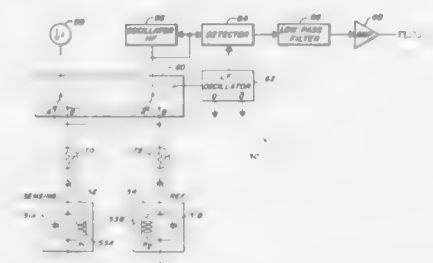
Haskell Ginn, Belmont, Mass., assignor to The Indikon Company, Inc., Cambridge, Mass.

Continuation of Ser. No. 159,507, Feb. 17, 1988, abandoned, which is a continuation of Ser. No. 786,145, Oct. 8, 1985, abandoned, which is a continuation of Ser. No. 444,442, Nov. 24, 1982, abandoned. This application Dec. 30, 1988, Ser. No. 797,640

Int. Cl.⁴ G01B 7/14; G01N 27/90

U.S. Cl. 324—207

8 Claims



1. An eddy-current probe system for detecting distance to a metallic target comprising:

- a first probe for sensing the metallic target at a first distance and providing a first output corresponding to the first distance of said first probe to the metallic target;
- a second probe for sensing a metallic reference target at a reference distance and providing a second output corresponding to the reference distance of said second probe to the metallic reference target;
- said first and second outputs having amplitudes compensated for environmental effects experienced by said first and second probes;
- a first source of excitation comprising a single high frequency oscillator providing a high frequency AC excitation signal;
- means for providing resonant tuning of said first and second probes in response to excitation from said single high frequency oscillator;
- switch means connected to said first probe, said second

probe and said single high frequency oscillator for selectively energizing each said first and second probes by said high frequency AC excitation signal from said single high frequency oscillator periodically wherein said first and second probes periodically provide said first and second outputs respectively representative of the first and the reference distances;

means for causing said switch means to periodically switch said high frequency AC excitation signal from said single high frequency oscillator between said first and second probes, respectively;

alternate excitation of said first and second probes by said single high frequency oscillator providing periodically said first and second outputs having amplitudes similarly affected by environment effects; and

means for providing a periodic output signal having an amplitude variation corresponding to differences in amplitude between the periodically provided first and second outputs and compensated for environmental effects due to said alternate excitation of said first and second probes by said single high frequency oscillator, the amplitude variation corresponding to the first distance of said first probe to the metallic target.

4,875,008

DEVICE FOR SENSING THE ANGULAR POSITION OF A SHAFT

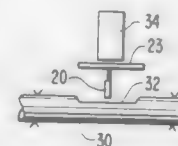
David M. Lorenzen, Hamden, Conn., assignor to North American Philips Corporation, New York, N.Y.

Filed Feb. 16, 1988, Ser. No. 156,101

Int. Cl.⁴ G01B 7/14; G01R 33/02; H03K 17/00; H01L 43/06

U.S. Cl. 324—208

12 Claims



1. The combination of a shaft rotatable about a central axis between first and second angular positions and a device for sensing the angular position of said shaft, said combination comprising:

- a magnet arranged with its polar axis perpendicular to the axis of said shaft for creating a magnetic field between said magnet and said shaft;
- a sensing portion extending over a distance on said shaft for changing the direction of said magnetic field as said shaft is rotated between said first and second angular positions; said sensing portion having a cross section exhibiting a minimum radius and symmetrically increasing radius on either side of said minimum radius;
- a directionally responsive sensing element situated in said directionally changing magnetic field between said shaft and said magnet, said element being substantially perpendicular to said axis of said shaft, said element producing thereacross a resistance which varies at least substantially linearly as a function of the direction of the field as said shaft is rotated from said first position to said second position.

4,875,009

CIRCUIT BOARD AND SENSING COIL POSITIONING SYSTEM FOR PROXIMITY SENSOR

Denis J. Leveque, Milwaukee, Wis., assignor to Eaton Corporation, Cleveland, Ohio

Filed Dec. 16, 1987, Ser. No. 133,819

Int. Cl.⁴ G01B 7/14; G01R 33/00; G01N 27/72

U.S. Cl. 324—208

20 Claims

1. A proximity switch for use with a power actuated device

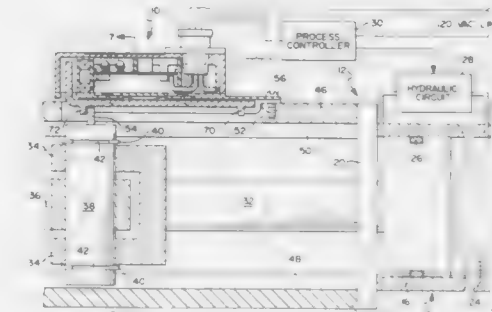
including a member mounted for movement between predetermined limits of travel, said switch comprising:

means operative to change conductive state in response to a control signal;

a substantially closed housing assembly defining a cavity therein, said housing assembly including means operative to shield at least a portion of said cavity from external electromagnetic fields;

retainer means formed of non-ferrous, electrical insulating material nestingly received within said cavity and defining a coil receiving recess within said shielded cavity portion;

a generally toroidal, open core inductive circuit element disposed in a fixed, predetermined orientation within said recess;



means operative to electrically energize said inductive element to establish a flux field having a characteristic amplitude thereabout substantially within said shielded cavity portion;

target means disposed substantially within said shielded cavity portion and displaceable along an axis of said inductive element between a position remote from said inductive element wherein said target means is substantially outside of said flux field and a sensed position adjacent said element wherein said target means is within said flux field to effect a change in said characteristic amplitude;

circuit means operative to generate said control signal as a function of said change in characteristic amplitude; and means operatively engaging said target means to effect displacement thereof in response to said member movement.

4,875,010

CIRCUIT FOR DETECTING AC MAGNETIC FIELD DUE TO MAGNETIC RESONANCE WITH A VARIABLE RESISTANCE FOR NOISE SUPPRESSION

Koichi Yokosawa, Kokubunji; Etsuji Yamamoto, Akishima; Hideaki Nakane, Hachioji; Masao Yabusaki, Tokyo, and Yukiko Ogura, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

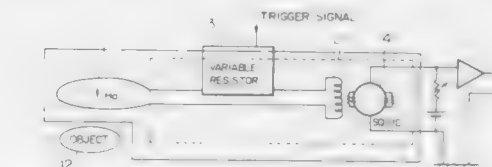
Filed Mar. 28, 1988, Ser. No. 174,424

Claims priority, application Japan, Mar. 28, 1987, 62-74887

Int. Cl.⁴ G01V 3/00; G01R 33/02

U.S. Cl. 324—248

18 Claims



1. A circuit for detecting, during a signal detection period, an AC magnetic field due to magnetic resonance in an object which lies in a DC magnetic field wherein the strength of said

a second conversion means including (a) voltage dividing means for dividing a total voltage obtained by adding the rectified voltage and said feedback voltage, (b) voltage-to-current converting means directly connected to said voltage dividing means for converting a voltage divided by said voltage dividing means into a current, and (c) rectifying means for rectifying said current from said voltage-to-current converting means; and

a summing means for summing the electric currents from the two conversion means and outputting the summed current as the squared electric current.

4,875,017

DIGITAL FM DEMODULATING APPARATUS

Yoshihisa Sakazaki, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

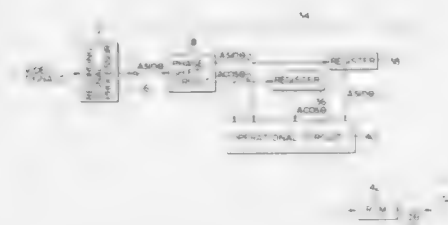
Filed Dec. 6, 1988, Ser. No. 280,353

Claims priority, application Japan, Dec. 8, 1987, 62-310020

Int. Cl.⁴ H03D 3/00

U.S. Cl. 329—336

5 Claims



1. A digital FM demodulating apparatus comprising: generating means for generating a pair of digital FM signals having a phase difference of 90° on the basis of an input digital FM signal; delay means for delaying the pair of digital FM signals generated by said generating means by a predetermined time period; calculating means for calculating data such that a result of synthesis of outputs from said generating means and said delay means becomes a value obtained by differentiating a phase component of the input digital FM signal by a time; and converting means for performing \tan^{-1} conversion in accordance with the output data from said calculating means in order to obtain the phase component of the input digital FM signal.

4,875,018

CURRENT MIRROR CIRCUIT ASSEMBLY

Dieter Draxelmayer, Villach, Austria, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

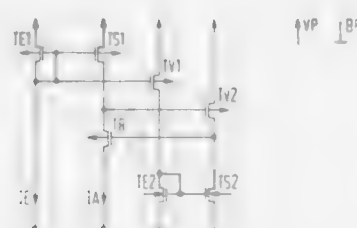
Filed Sep. 18, 1987, Ser. No. 99,104

Claims priority, application Fed. Rep. of Germany, Sep. 24, 1986, 3632432

Int. Cl.⁴ H03F 3/16

U.S. Cl. 330—288

6 Claims



1. Current mirror circuit assembly, comprising a first current

mirror circuit formed of a first input transistor connected as a diode and a first mirror transistor, said input transistor and said mirror transistor having gate terminals connected to one another and output circuits with output terminals, one of said output terminals of each of said input transistor and said mirror transistor being connected to a supply potential, a regulating transistor having an output circuit connected in series with said output circuit of said mirror transistor, a second current mirror circuit formed of respective second input and mirror transistors with respective output circuits, other transistors each having respective gates, each being controlled by another one of said output terminals of a respective one of said first input transistor and said first mirror transistor, one of said other transistors having a feedback connected to said regulating transistor, and said other transistors being connected to said output circuits of said second transistors of said second current mirror circuit.

4,875,019

RECEIVER PREAMPLIFIER WITH TUNED CIRCUIT ADAPTED FOR LORAN RECEPTION

Mark B. Monson; Thomas P. Blandino, both of Madison; Dennis E. Bahr, Middleton, and Kendall E. Post, Madison, all of Wis., assignors to Bahr Technologies, Inc., Madison, Wis.

Filed Jul. 21, 1988, Ser. No. 222,723

Int. Cl.⁴ H03F 3/191, 3/16

U.S. Cl. 330—302

39 Claims



1. A preamplifier system for a receiver adapted to be connected to an antenna to receive a radio signal of a particular selected carrier frequency, such as a LORAN-C radio signal, and having a passband of frequencies which includes the selected carrier frequency, comprising:

- input means for receiving the signal from the antenna;
- a high input impedance buffer amplifier with an input and output and having its input connected to the input means;
- a parallel tuned circuit connected between the input to the buffer amplifier and ground, the tuned circuit comprising the parallel combination of an inductance, capacitance and resistance, the values of which are selected to provide a resonant frequency which will pass the carrier frequency of the particular signal to be received; and
- a secondary filter section connected to the output of the buffer amplifier.

4,875,020

ANALOG INTEGRATED CIRCUIT HAVING INTRINSIC TOPOLOGIES AND CHARACTERISTICS SELECTABLE BY A DIGITAL CONTROL

Vincenzo Daniele, Brugherio; Marco M. Monti, Milano; Michele Tallercio, Arluno, and Piero Capocelli, Milano, all of Italy, assignors to SGS-Thomson Microelectronics s.r.l., Italy

Filed Dec. 21, 1988, Ser. No. 287,299

Claims priority, application Italy, Dec. 22, 1987, 83684 A/87

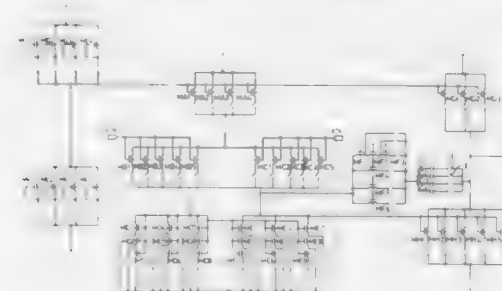
Int. Cl.⁴ H03F 3/04, 3/16

U.S. Cl. 330—307

17 Claims

7. An integrated operational amplifier having intrinsic characteristics selected by digital control means among an arbitrary large number of intrinsic characteristics which may be exhibited by the integrated operational amplifier, which has batteries of transistors and of compensation capacitors, each of said batteries circuitally representing a transistor and a compensation capacitor, respectively, of the functional circuit of the operational amplifier;

an integrated selection switch functionally connected in series with each transistor and each compensation capacitor of said batteries of transistors and of capacitors; the selection of a certain transistor and of a certain capacitor belonging to said respective batteries by means of the closing of the relative integrated switch in order to form a



functional circuit of the integrated operational amplifier having certain intrinsic characteristics corresponding to the ensemble of the intrinsic characteristics of the selected circuit components which compose the amplifier being effected by means of a nonvolatile memory integrated on the same chip as the operational amplifier and permanently programmed.

4,875,021

PSEUDO-NOISE SEQUENCE GENERATOR

Noriyoshi Sonetaka, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

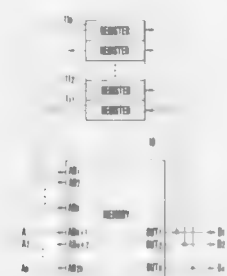
Filed Jul. 1, 1988, Ser. No. 214,077

Claims priority, application Japan, Jul. 1, 1987, 62-164271

Int. Cl.⁴ H03B 29/00

U.S. Cl. 331—78

2 Claims



1. A pseudo-noise sequence generator comprising: a memory accessed by a 2n-bit address signal to output a parallel n-bit pseudo-noise sequence, n out of 2n address signal input terminals of said memory receiving n parallel digital signal bits; and n registers for delaying each bit of n-bit data output from said memory by one clock and outputting the delayed n-bit data, the outputs from said n registers being supplied to remaining n address signal input terminals of said 2n address signal input terminals of said memory in one-to-one correspondence, wherein said memory prestores pseudo-noise sequence data corresponding to an address signal input from said 2n address signal input terminals.

4,875,022

HIGH POWER MICROWAVE EXPANDER FOR PRODUCING FAST RISE TIME PULSES

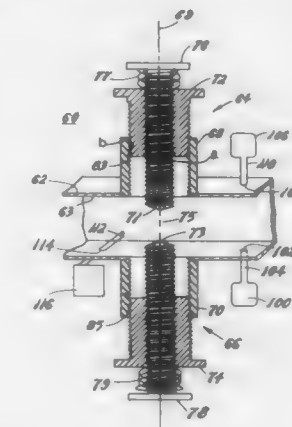
Mark D. Berry, Columbia; Robert J. Tan, Beltsville, and Robert V. Garver, Boyds, all of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 28, 1988, Ser. No. 174,283

Int. Cl.⁴ H03K 5/04, 3/537

U.S. Cl. 333—20

28 Claims



11. An apparatus for producing high power microwave pulses that have extremely fast rise times compared to rise times of a signal delivered from a microwave signal source comprising:

- a rectangular waveguide transmission line having input and output ends and a predetermined internal pressure, said waveguide transmission line having a spark gap ranging from about 0.01-0.10 inch positioned between said input and output ends;
- means for coupling said microwave signal source to said input end of said waveguide transmission line; and
- means for coupling a load to said output end of said waveguide transmission line; whereby said microwave signal source delivers an input pulse, having a rise time, via said input end of said waveguide transmission line to the spark gap, the spark gap presenting a high impedance during the initial rise of the input pulse until the power of the input pulse reaches an arcing threshold of said spark gap causing said spark gap to arc, resulting in an output pulse delivered to said load that has a rise time that is faster than the rise time of the input pulse.

4,875,023

VARIABLE ATTENUATOR HAVING VOLTAGE VARIABLE FET RESISTOR WITH CHOSEN RESISTANCE-VOLTAGE RELATIONSHIP

Barak Maoz, Highland Park, N.J., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed May 10, 1988, Ser. No. 192,193

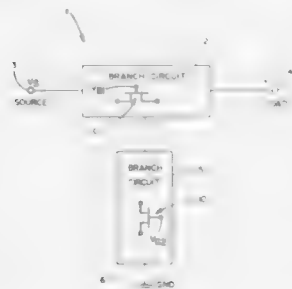
Int. Cl.⁴ H01P 1/22

U.S. Cl. 333—81 R

31 Claims

- A variable attenuator comprising: (a) a first branch circuit coupled to a source terminal and a load terminal, said first branch circuit including at least one voltage variable FET resistor having output and input terminals and a control voltage terminal; (b) a second branch circuit coupled to said first branch circuit and a common terminal, said second branch circuit including at least one voltage variable FET resistor having input and output terminals and a control voltage terminal; (c) each of said voltage variable FET resistors comprising: (i) a FET network including a plurality of FET segments

having source, drain and gate electrodes, the drain electrodes of each of the plurality of FET segments being coupled to said output terminal, the source electrodes of each of the plurality of FET segments being coupled to said input terminal, and the gate electrodes of each of the plurality of FET segments being coupled



to said control voltage terminal, each of said plurality of FET segments having a predetermined gate width; and (ii) a voltage divider network coupled to said gate electrodes of said plurality of FET segments for providing a different predetermined gate voltage to each of said gate electrodes.

4,875,024

LOW LOSS POWER SPLITTER

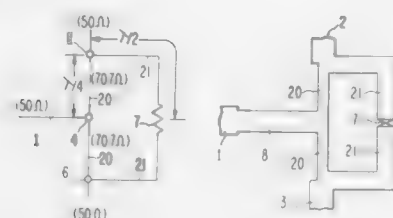
Thomas E. Roberts, Saratoga, Calif., assignor to Ford Aerospace Corporation, Newport Beach, Calif.

Filed Dec. 5, 1988, Ser. No. 279,757

Int. Cl.⁴ H01P 5/12

U.S. Cl. 333-127

7 Claims



1. Apparatus for splitting electromagnetic energy, comprising:

- an input conductor having an input port at one end thereof;
- two output conductors, each having an output port at one end thereof;
- first and second impedance transforming conductors that are each substantially a quarter of a wavelength long and that couple the input port to the two output ports, respectively;
- an isolation resistor, having first and second ends, positioned between the two output ports; and
- first and second unity impedance transformers that couple the first and second ends of the isolation resistor, respectively, with the first and second output ports, respectively, wherein each unity impedance transformer is substantially one-half wavelength long.

4,875,025

MICROSTRIP TRANSMISSION LINE FOR COUPLING TO A DIELECTRIC RESONATOR

Carlo Buoli, Mirandola, Italy, assignor to Siemens Telecomunicazioni S.p.A., Milan, Italy

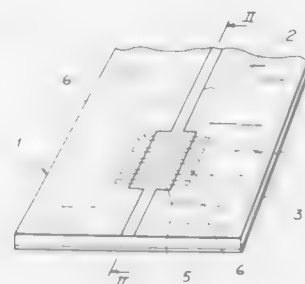
Filed Apr. 29, 1987, Ser. No. 44,011

Claims priority, application Italy, May 14, 1986, 20428 A/86

Int. Cl.⁴ H01P 7/06

U.S. Cl. 333-230

8 Claims



1. A microstrip transmission line for coupling to a dielectric resonator comprising a conductive path and a metallic ground plane applied to opposite faces of an insulating support characterized in that the ground plane has a plurality of parallel slots placed under said conductive path and transversely thereto for coupling the resonator at only a resonant frequency and not disturbing the transmission line at other frequencies, the conductive path being provided with an enlarged portion arranged above the plurality of parallel slots.

4,875,026

DIELECTRIC WAVEGUIDE HAVING HIGHER ORDER MODE SUPPRESSION

Jeffrey A. Walter, Wilmington; Kailash C. Garg, Newark, and Joseph C. Rowan, Wilmington, all of Del., assignors to W. L. Gore & Associates, Inc., Newark, Del.

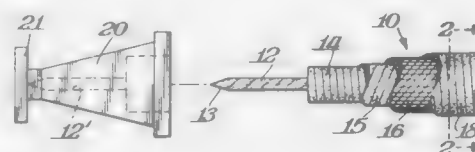
Filed Aug. 17, 1987, Ser. No. 86,403

The portion of the term of this patent subsequent to Nov. 15, 2005, has been disclaimed.

Int. Cl.⁴ H01P 1/162

U.S. Cl. 333-251

13 Claims



1. A dielectric waveguide for the transmission of electromagnetic waves having a dominant mode and higher order modes, said dielectric waveguide comprising:

- (a) a core of PTFE;
- (b) at least one layer of PTFE cladding wrapped around said core;
- (c) a higher order mode suppression layer of an electromagnetically lossy material covering said cladding, said higher order mode suppression layer providing suppression of modes other than the dominant mode;
- (d) an electromagnetic shielding layer covering said mode suppression layer; and
- (e) a carbon-filled PTFE tape covering said electromagnetic shielding layer.

4,875,027

WAVEGUIDE TWIST

Georg Spinner, Am Eichberg 12/8152, Feldkirchen-Westerham, Fed. Rep. of Germany

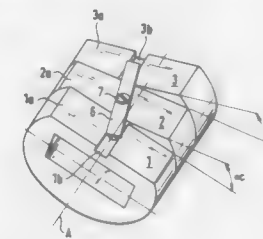
Filed Sep. 22, 1988, Ser. No. 247,916

Claims priority, application Fed. Rep. of Germany, Oct. 2, 1987, 3733397

Int. Cl.⁴ H01P 1/02

U.S. Cl. 333-254

13 Claims



1. A waveguide twist, comprising: a plurality of waveguide sections, the number of which being at least three, said waveguide sections defining a longitudinal axis and including a first waveguide section and a last waveguide section and being arranged in succession from said first waveguide section to said last waveguide section; and lever means for allowing said waveguide sections to be rotated relative to each other, said lever means including a lever externally supported on each of said waveguide sections arranged between said first waveguide section and said last waveguide section and being rotatable about an axis perpendicular to said longitudinal axis, said lever having two axial ends engaging in a groove of adjoining waveguide sections for longitudinal displacement, with said groove extending parallel to said longitudinal axis.

4,875,028

WARNING TRIANGLE

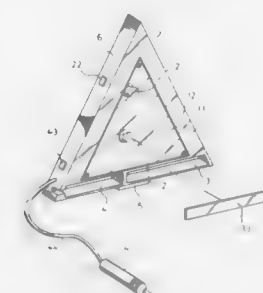
An-Chuan Chou, No. 12, Yung An St., Tainan, Taiwan

Filed Mar. 19, 1986, Ser. No. 841,205

Int. Cl.⁴ B60Q 1/00

U.S. Cl. 340-473

1 Claim



1. A warning triangle 1, comprising a triangle structure with an open side, said triangle structure having a lower portion wherein there is formed a plug storage chamber, a battery chamber, and a securable cover hinged to the battery chamber; an extension cord connected at one end to an interior wall of said triangle structure; an adapter plug connected to the other end of said extension cord; an outer triangular plate mounted on the open side of said triangle structure, said outer triangular plate having a triangular opening at the central part thereof; an inner triangular plate mounted on the triangular opening

of said outer triangular plate, said inner triangular plate being translucent in color; spring means disposed within said triangle structure coupled to said extension cord for retraction and winding thereof; an automatic winding switch mounted on said triangle structure for securing a predetermined length of said extension cord while in use; a plurality of light bulbs switchably coupled to a power source, said light bulbs disposed within said triangle structure for illumination of said inner triangular plate; means for controlling said light bulbs to give continuous or blinking light; and, magnets provided on bottom and back sides of said triangle structure for allowing said warning triangle to be conveniently secured on any metal part of a vehicle.

4,875,029

SUPPRESSED TRANSIENT UNIFORM DETECTION SENSITIVITY PIR DETECTOR

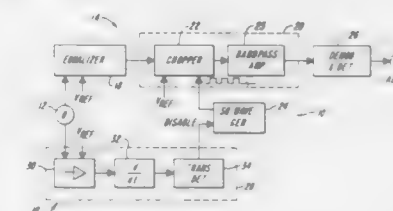
John K. Guscott, Lynnfield; Gerard G. Steimack, Newton, and Charles A. Boulos, Milford, all of Mass., assignors to Aritech Corporation, Framingham, Mass.

Filed Dec. 30, 1987, Ser. No. 139,652

Int. Cl.⁴ G08B 13/18

U.S. Cl. 340-567

11 Claims



1. A uniform-detection-sensitivity passive infrared detector, comprising: infrared sensor means for providing a target detection signal having an amplitude that diminishes with increasing target velocity over a range of detectable target velocities, said infrared sensor means including a pyroelectric detector; and equalizer means coupled to the infrared sensor means for increasingly boosting the amplitude of the target detection signal with increasing target velocity so as to provide a target-velocity-compensated signal that is substantially flat over the range of detectable target velocities; said equalizer means including an analog passive network having a resistor capacitor network.

4,875,030

SLEEP-PREVENTING ALARM DEVICE

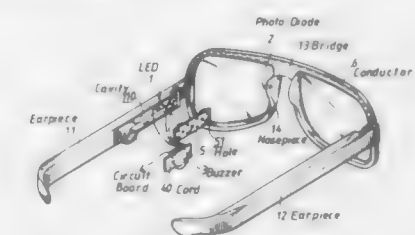
Shui W. Chin, 3 Fl., No. 30, Lane 60, Swang Yuan St., Taipei, Taiwan

Filed Mar. 13, 1989, Ser. No. 322,109

Int. Cl.⁴ G08B 23/00

U.S. Cl. 340-575

1 Claim



1. A sleep-preventing alarm device incorporated within a

pair of glasses comprising a light emitting diode, a photo diode, a buzzer, a power source and a printed circuit board electrically connected to said light emitting diode, said photo diode and said buzzer;

said photo diode being lodged in a bridge of said glasses with a capsule portion of said photo diode protruding from a nosepiece of said glasses;

an earpiece of said glasses having a cavity to receive said printed circuit board and said light emitting diode therein;

an opening of said cavity being covered by a cover and a plate; and

said printed circuit board being fixedly mounted on said cover; said plate having a plurality of holes to receive said light emitting diode, said holes being oriented at a slant to said plate in a direction of said photo diode.

4,875,031

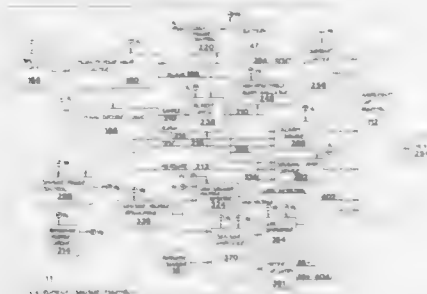
VAPOR MONITORING SYSTEM

Ernest A. Filippi, P.O. Box 1809, Porterville, Calif. 93258, and Kenneth L. Miller, 22209 Halldale Ave., Torrance, Calif. 90501

Filed Dec. 18, 1987, Ser. No. 134,866
Int. Cl. G01B 21/00

U.S. Cl. 340—605

19 Claims



1. Apparatus for detecting hazardous gases comprising:
 - a pressure containment housing adapted to be placed in a well or conduit to a predetermined depth below ground level;
 - an instrument head;
 - an electrical cable coupling the instrument head to the pressure containment housing, said cable having a length sufficient to allow the instrument head to be located near the top of the well or conduit when the pressure containment housing is in the well or conduit at said predetermined depth below ground level;
 - an actuatable signalling means within the instrument head;
 - a gas sensor carried by the housing for sensing the presence of hazardous gases in the well or conduit at said predetermined depth below ground level;
 - a portable power unit carried by the housing and coupled with the gas sensor and the signalling element by way of said electrical cable to actuate the signalling means when power is supplied by the power unit to the gas sensor; and
 - timing means carried by the housing and coupled with the power unit to supply electrical power to the gas sensor and the signalling means periodically.

4,875,032

METHOD AND APPARATUS FOR PROCESSING COLORIMETRIC PARAMETERS OF A COLOR SAMPLE

Paul A. McManna, 240 N.W. Glencoe Dr., Sherwood, Oreg. 97140, and Robert J. Beaton, 12905 S.W. Rita Dr., Beaverton, Oreg. 97005

Filed Oct. 26, 1987, Ser. No. 113,022
Int. Cl. G09G 1/28

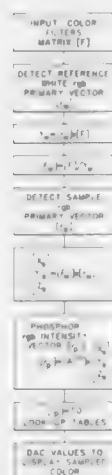
U.S. Cl. 340—703

4 Claims

1. A method for processing colorimetric parameters of a color sample for reproducing the color of the sample on a

video monitor screen, wherein the color sample is illuminated by a reference light having tristimulus values and is definable by a primary intensity vector denoting relative first color, second color and third color luminous intensity levels of the illuminated color sample, and wherein the video monitor includes a plurality of phosphor sets, the luminous intensity of the phosphor sets being variable to produce colors on the monitor screen, any particular color produced on the monitor screen being definable by a phosphor intensity vector that denotes the relative values of the luminous intensity levels of the phosphor sets at the time the particular color is produced on the monitor screen, the method comprising the steps of:

- (a) directing through each of three color filters a source light having tristimulus values representing a standard CIE



- illuminant, and generating a color filters matrix representative of the relative intensity contributions of each filter color to the tristimulus values of the source light;
- (b) directing the reference light through each of the color filters, and generating a reference primary vector representative of the relative primary intensity contribution of each filter color to the reference light;
- (c) weighting the color filters matrix to reflect the differences between the tristimulus values of the source light and the tristimulus values of the reference light;
- (d) detecting the primary intensity vector of the color sample; and
- (e) multiplying the detected primary intensity vector of the color sample and the weighted color filters matrix to generate the tristimulus values of the color sample.

4,875,033

GRAPHICS INPUT APPARATUS

Kiyotaka Kato, and Michitaka Oshima, both of Hyogo, Japan, assigns to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 2, 1987, Ser. No. 57,032
Claims priority, application Japan, Jun. 5, 1986, 61-129197;
Jun. 5, 1986, 61-129198

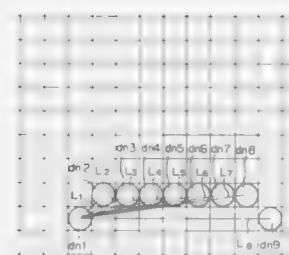
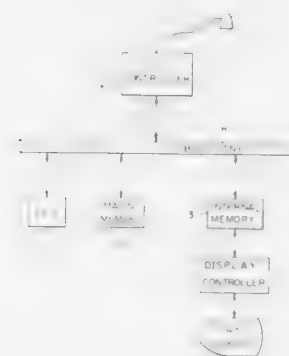
Int. Cl. G09G 1/00

U.S. Cl. 340—706

27 Claims

1. A graphics input apparatus, which includes:
 - memory means;
 - display device means capable of displaying a figure in a picture plane having $m \times n$ pixels;
 - positions indicating means for indicating predetermined positions in the picture plane of said display device means;
 - cursor displaying means for displaying a cursor at the positions indicated by said position indicating means;
 - element inputting means for executing a first step of displaying at the display position of said cursor a starting point of

elements forming the figure to be drawn in the picture plane of said display device means as a starting node, a second step of storing in said memory means a node number of a node if the numbered node is present in the vicinity of the starting node, or of assigning a specified node number to a node if there are no nodes already numbered present in the vicinity of the starting node and storing the specified node number in said memory means, a third step of displaying pixels at the display positions of said cursor indicated by said position indicating means from the posi-



tion of the starting node as an element, a fourth step of displaying an ending point of the element at the display position of said cursor as an ending node, a fifth step of storing a node number of a node if the numbered node is present in the vicinity of the ending node, and of assigning and storing a specified node number to a node if there are no nodes already numbered present in the vicinity of the ending node, and a sixth step of storing information between the starting node and the ending node; and shape recognition means for recognizing the shape of the element is a predetermined manner.

4,875,034

STEREOSCOPIC GRAPHICS DISPLAY SYSTEM WITH MULTIPLE WINDOWS FOR DISPLAYING MULTIPLE IMAGES

Daniel A. Brokenshire, 3413 SW. Dickinson St., Portland, Oreg. 97219

Filed Feb. 8, 1988, Ser. No. 153,116
Int. Cl. G09G 1/06

U.S. Cl. 340—721

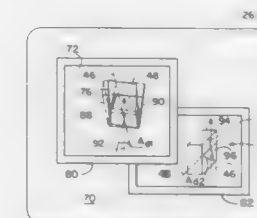
8 Claims

1. In a stereoscopic graphics display system having a display screen upon which an image is formed in accordance with stereoscopic image data representing right- and left-eye views differing by a preselected amount of binocular disparity that is established by a binocular viewing model, a method of forming on the display screen plural windows within which plural images are formed, comprising:

designating for each one of the windows a corresponding

region of the display screen, each region including a marginal peripheral portion;

assigning to each window a first binocular viewing model by which images are rendered within the region corresponding to the window and a second binocular viewing model by which a border is rendered with zero binocular disparity within the marginal peripheral portion; and



rendering within the marginal peripheral portions of the regions borders that represent outlines of the corresponding windows,

whereby each border is rendered with zero disparity and the stereoscopic graphics display system is capable of rendering the right- and left-eye views of a stereoscopic image within each of the plural windows in accordance with the first binocular viewing model assigned to the window.

4,875,035

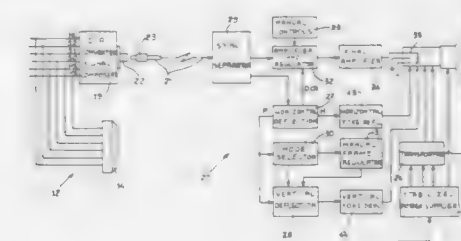
ARRANGEMENT FOR THE DISPLAY OF PROCESSING DATA BY MEANS OF PIXELS ON A CATHODE RAY TUBE

Franco Furno, Zimone, and Luigi Biondi, San Martino Canavese, both of Italy, assigns to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy

Filed Feb. 29, 1988, Ser. No. 162,252
Claims priority, application Italy, Mar. 31, 1987, 67248 A/87
Int. Cl. G09G 1/16

U.S. Cl. 340—731

5 Claims



1. Arrangement for the display of processing data by means of pixels on a cathode ray tube—CRT—comprising a circuit for control of the CRT including means for horizontal and vertical deflection of the signal of the pixel on the tube to provide for scanning of the CRT and comprising a control means operable to generate a plurality of first logic signals which define the pixel to be displayed, the control means including means operable to generate at least two further logic signals which define synchronization of the first logical signals with scanning of the tube effected by the deflection means, and a signal composer circuit operable to combine the first logic signals into a single control signal, characterized in that the composer circuit is operable to combine in the control signal also the further logic signals to create a single composite signal, a synchronization separator circuit being provided for separating the synchronization signals from the composite signal, for controlling the deflection means, wherein the display may be produced in accordance with at least two different resolution formats, characterized in that the separator circuit is operable to control format selection means in such a way as to control

deflection of the pixel signal on the tube in accordance with the selected format.

4,875,036

LIQUID CRYSTAL DISPLAY DEVICE FOR BOTH INPUTTING AND OUTPUTTING INFORMATION

Isamu Washizaka, Kyoto; Yukihiro Inoue, Kashihara, and Yoshio Okajima, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

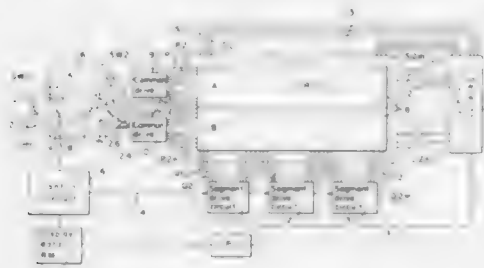
Continuation of Ser. No. 778,006, Sep. 20, 1985, abandoned. This application Apr. 18, 1988, Ser. No. 185,281

Claims priority, application Japan, Sep. 22, 1984, 59-199291

Int. Cl.⁴ G09G 3/36

U.S. Cl. 340—784

10 Claims



1. A system for introducing and displaying information comprising:

a flat panel matrix display unit having a plurality of pixels arranged in a matrix, each of said pixels associated with one of a plurality of common row electrodes, N;

input means for introducing the information into the system; said input means including a plurality of information receiving elements each corresponding to an individual pixel of said flat panel matrix display;

said input means detecting a portion of said flat panel matrix display unit being inputted upon;

common drive means, responsive to said input means, for sequentially scanning said common row electrodes of said matrix display unit with scan voltage pulses;

said common row electrodes being divided into K common row electrode groups each having N/K common row electrodes and defining a display portion;

said common drive means sequentially scanning said common row electrodes of at least one of said common row electrode groups to display the information introduced by said input means thereon;

said common drive means driving said common row electrodes of said portion detected by said input means with a common electrode scan voltage pulse which has a higher duty cycle than the duty cycle 1/N needed to scan all N common row electrodes to improve contrast of the displayed information, thereby operating the system in a partial display mode; and

said common drive means driving said common row electrodes with a common electrode scan voltage pulse which has a duty cycle of 1/N when the system is operable in a fully display mode.

4,875,037 AUTOMATIC REROUTING OF CALLS THROUGH DATA BUSES

Carlos Eacolar, East Windsor, N.J., assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 437,814, Oct. 29, 1982, abandoned.

This application Aug. 12, 1985, Ser. No. 764,775

Int. Cl.⁴ H04Q 1/00

U.S. Cl. 340—825.01

7 Claims



1. in a communication system having a communicating source entity, at least two communicating destination entities and at least two buses, each bus interconnecting in parallel the three communicating entities for delivering data communications from the source to the destination entities, a method for enabling the source entity to select buses to deliver the data communications, comprising the steps of:

directing an initial communication to be delivered to any one of the destination entities over only a selected one of the buses; and

directing subsequent communications to be delivered to the one destination entity over only another one of the buses while still directing subsequent communications to be delivered to other ones of the destination entities only over the selected one bus when delivery of the initial communication fails.

4,875,038 FREQUENCY DIVISION MULTIPLEXED ACKNOWLEDGE BACK PAGING SYSTEM

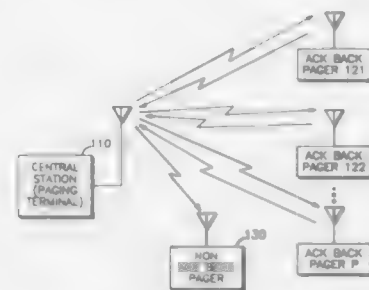
Kazimierz Siwiak, Coral Springs; Leon Jasinski, Fort Lauderdale, and Francis R. Steel, Parkland, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 7, 1988, Ser. No. 141,654

Int. Cl.⁴ H04Q 9/00

U.S. Cl. 340—825.44

21 Claims



1. An acknowledge back pager having a unique address associated therewith, said pager comprising: receiving means for receiving paging signals from a central station, said paging signals including a batch of M pager addresses transmitted in a sequential order during a first

time frame, wherein M is the number of pager addresses in said batch;

decoding means, coupled to said receiving means, for detecting the presence of said pager's address within said batch of M addresses

address order determining means, coupled to said decoding means, for determining the order of said pager's address within said batch of M addresses

sub-band transmitting means for transmitting an acknowledge back signal on a selected one of a plurality of M predetermined frequency sub-bands, said selected one of said sub-bands exhibiting a predetermined relationship to the order of the address of said pager within said batch of M addresses

4,875,039

PAGING SYSTEM WITH TRANSMISSION PROTOCOL COMPATIBLE WITH ANALOG AND DIGITAL TRANSMITTERS

Andrew A. Andros, Spring, Tex.; Thomas J. Campana, Jr., Chicago, Ill.; Gary F. Theles, Palos Park, Ill., and Robert A. Kinast, Chicago, Ill., assignors to Telefind Corp., Miami, Fla.

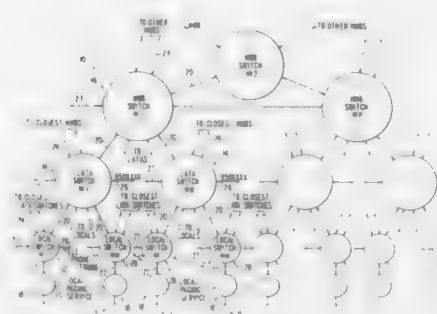
Filed Feb. 22, 1988, Ser. No. 158,981

Int. Cl.⁴ H04Q 7/00; H03C 3/08

U.S. Cl. 340—825.440

26 Claims

MICROFICHE APPENDIX INCLUDED
(276 Microfiche, 3 Pages)



1. A paging system comprising:

(a) a transmitter for transmitting pages which are comprised of characters with the characters of each page modulating a carrier which is broadcast by the transmitter, the transmitter utilizing one of an analog transmission protocol or a digital transmission protocol to transmit other pages and a transmission protocol different from the analog or digital transmission protocol but compatible with the transmitter being used to transmit other pages with the analog or digital transmission protocols;

(b) means for receiving pages to be broadcast by the transmitter;

(c) a memory, coupled to the means for receiving, for storing the received pages to be broadcast; and

(d) control means, coupled to the memory and to the transmitter, for encoding each character of each page with the different transmission protocol by utilizing a plurality of frequencies each encoding a different value with each character being encoded with at least one value and for providing the encoded characters in a page to the transmitter for broadcast by the transmitter.

4,875,040

DEVICE FOR REMOTE CONTROL OF ELECTRICAL APPARATUS

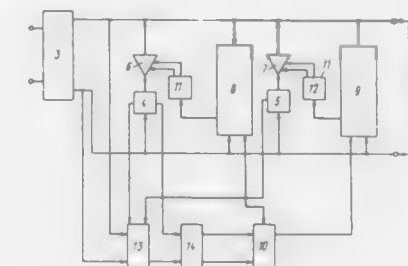
Vitaly S. Dzhaban, ulitsa 50-letia SSSR, 37, kv. 41; Alexander D. Sazhin, ulitsa Gertsena, 38, kv. 44; Valery K. Zhaitnikov, ulitsa 50-letia SSSR, 143A, kv. 28, and Anatoly I. Komoplyanko, ulitsa Schetnina, 17, kv. 179, all of Donetsk, U.S.S.R.

Filed May 6, 1988, Ser. No. 190,771

Int. Cl.⁴ H04Q 9/00

U.S. Cl. 340—825.060

4 Claims



1. A device for remote control of an electrical apparatus, comprising:

a communication line leading to a control desk;

a power supply connected to said communication line for supplying a communication signal thereon

a first signalling means for signalling that said communication line is in operation mode, said signalling means having an input coupled to said power supply;

a first current amplifier coupled between an output of said first signalling means and said communication line;

a first current comparison means coupled to said communication line and to a control input of said first current amplifier for comparing a current flow on said communication line in one direction with a current flow in an opposite direction for determining that said communication line is in said operation mode and for providing a first control signal to said first current amplifier, said first current amplifier operating said first signalling means into a first mode indicating that said communication line in said operation mode;

a first interference suppression means coupled between said first current comparison means and said first current amplifier for suppressing signals coupled to said first current comparison means from said communication line other than said communication signal;

a second signalling means for signalling that said communication line is in said operation mode, said second signalling means having an input coupled to said power supply;

a second current amplifier coupled between an output of said second signalling means and said communication line;

a second current comparison means coupled to said communication line and to a control input of said second current amplifier for comparing a current flow on said communication line in one direction with a current flow in an opposite direction for determining that said communication line is in said operation mode and for providing a second control signal to said second current amplifier, said second current amplifier operating said second signalling means into a first mode indicating that said communication line is in said operation mode;

a second interference suppression means coupled between said second current comparison means and said second current amplifier for suppressing signals coupled to said second current comparison means from said communication line other than said communication signal;

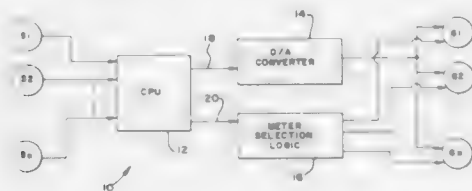
a logic circuit means coupled to an output of said first and said second signalling means and being coupled to said power supply for determining that said first and said second signalling means are in said first mode; actuating means coupled to an output of said logic circuit

means and an output of said first signalling means for actuating said electrical apparatus when said first and said second signalling means are in said first mode.

4,875,041
TIME MULTIPLEXED CONTROL OF AIR CORE GAUGES FROM A MICROPROCESSOR ADDRESS/DATA BUS

Robert D. Dannenberg, Fort Wayne, Ind., assignor to Navistar International Transportation Corp., Chicago, Ill.
Filed Nov. 21, 1988, Ser. No. 274,094
Int. Cl.⁴ H04Q 9/00
U.S. Cl. 340—870.13

7 Claims



1. In an instrumentation system in which data representing the values of various parameters of interest is presented to a central processing unit (CPU), and the CPU processes the data presented to it and in turn intermittently presents the data for each parameter of interest as a multi-bit value on a multi-bit digital data bus, the improvement for displaying the data for each parameter of interest via the air core meter movement of a corresponding gauge by addressing each gauge via an address bus when data for the gauge is present on the data bus, said improvement comprising:

- a digital-to-analog converter circuit that is shared by all gauges, said digital-to-analog converter circuit having an input and an output, the input of said digital-to-analog converter circuit being coupled to the data bus;
- gauge selection means having an input coupled to the address bus and a plurality of outputs each of which is connected to a corresponding gauge, said gauge selection means comprising means for selectively activating its outputs in accordance with addresses supplied to it via the address bus so as to enable each gauge to be selectively activated to receive data;
- each gauge comprising a sample and hold circuit having a first input coupled to the digital-to-analog converter circuit output and a second input coupled to a particular one of the gauge selection means outputs, each sample and hold circuit comprising means for causing the signal at its first input to be sampled and to be held at an output thereof when its second input is activated by said gauge selection means; and
- each gauge further comprising a driver circuit having an input that is coupled to the output of its sample and hold circuit and an output by which the movement of its air core meter is operated.

4,875,042
MULTI CHANNEL TEMPERATURE CONTROLLER UTILIZING ELECTRONIC MULTIPLEXER
Seiji Oki, Mishima; Tooru Shimamura, Muko; Kazutomo Naganawa, Suita; and Toshiya Tanamura, Nagaokakyo, all of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

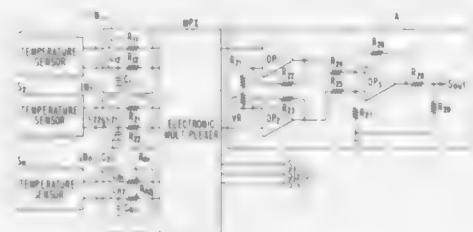
Filed Jan. 12, 1987, Ser. No. 2,328
Claims priority, application Japan, Jan. 10, 1986, 61-2160(U); Jan. 13, 1986, 61-3184(U)
Int. Cl.⁴ G08C 19/30

U.S. Cl. 340—870.170

5 Claims

1. A multi channel temperature controller, comprising:

a plurality of temperature sensors producing a plurality of output signals;
a selection means for providing a plurality of selection signals;
an electronic multiplexer which receives said plurality of output signals from said plurality of temperature sensors and from said selection means, said electronic multiplexer



sequentially supplying said signals to its output according to at least one of said selection signals;
a plurality of input circuits, one interposed between said electronic multiplexer and each of said temperature sensors for removing noise from said output signals; and
an amplifier which receives said output of said electronic multiplexer.

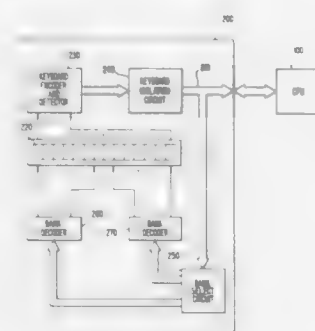
4,875,043
BI-DIRECTIONAL KEYBOARD INTERFACE CIRCUIT
Gregory A. Gisoni, Murrysville, and James M. Forker, Monroeville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 812,214, Dec. 23, 1985, abandoned.
This application Feb. 8, 1988, Ser. No. 154,430

Int. Cl.⁴ H03M 11/00

U.S. Cl. 341—22

12 Claims



1. A keyboard and interface circuit connectable to a computer, said circuit comprising:

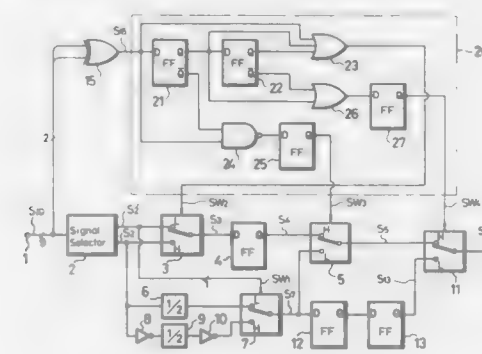
- a keyboard having keys and lights corresponding to the keys;
- encoder and detection means for detecting key selection and producing a key code corresponding to a selected key;
- a parallel bi-directional interface bus, having one set of bi-directional lines where all lines are bi-directional, for both transferring the key code to the computer and transferring a first light selection code corresponding to the key code from the computer;
- isolation means for isolating said encoder and detection means from said bi-directional bus; and
- decoder means for decoding the first light code and activating the light corresponding to the selected key.

4,875,044
DIGITAL LIMITING CIRCUIT
Yoshiyuki Ohta, and Taku Kihara, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan
Filed Dec. 1, 1987, Ser. No. 127,279
Claims priority, application Japan, Dec. 9, 1986, 61-293277; Mar. 13, 1987, 62-058216

Int. Cl.⁴ H03M 7/30

U.S. Cl. 341—87

7 Claims



1. A digital limiting circuit for limiting an input digital signal with $n+1$ bits, where n is a positive integer, so that an output digital signal with n bits is generated, said limiting circuit comprising:

- an input terminal supplied with the input digital signal with $n+1$ bits;
- digital signal level detecting means supplied with the most significant bit and the second most significant bit of said input digital signal for detecting whether the level L of said input digital signal is within the range

$$2^n \leq L < 2^{n+1} + 2^n;$$

switching signal generating means supplied with the output of said signal level detecting means for generating a switching signal;

digital signal converting means for converting said input digital signal with $n+1$ bits into a converted digital signal with n bits;

modified signal generating means for generating a modified signal composed of a digital signal having an extreme value of an n bit digital signal and a digital signal having the average value of said extreme value and said converted digital signal, where said extreme value is the lowest or highest value or to be represented in said output signal; and

selecting means controlled by said switching signal and for selecting said modified signal or said converted digital signal, whereby said output digital signal with n bits is obtained from said selecting means.

4,875,045
VARIABLE GAIN ENCODER APPARATUS AND METHOD
David L. Lynch, Kanata, and Guy C. Quesnel, Nepean, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Mar. 9, 1988, Ser. No. 165,851

Int. Cl.⁴ H03M 1/18

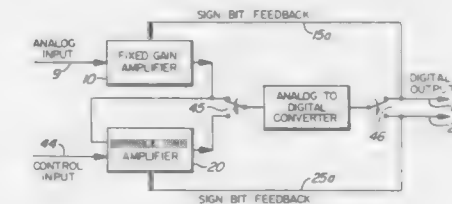
U.S. Cl. 341—139

18 Claims

1. A gain controllable analog to digital (A/D) encoder for providing digital words being representative of samples of an input analog signal, comprising:

- an analog to digital converter circuit for generating said digital words each consisting of plural bits, including a sign bit;
- a first means for generating a fixed gain analog signal in

response to the input analog signal, the first means being mid-operating point stabilized in response to the sign bits corresponding to the fixed gain analog signal; and
a second means for supplying a variably controlled gain



analog signal to the converter circuit in response to the stabilized mid-operating point fixed gain analog signal from the first means, the variably controlled gain analog signal from the second means being mid-operating point stabilized in response to the sign bits of the digital words.

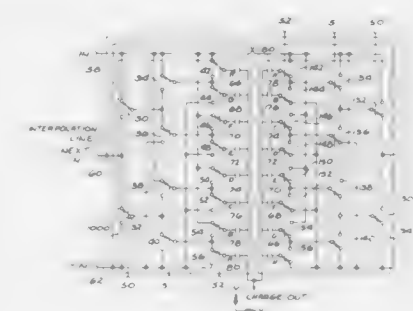
4,875,046
CENTROIDING ALGORITHM FOR NETWORKS USED IN A/D AND D/A CONVERTERS
Lanny L. Lewyn, Laguna Beach, Calif., assignor to Brooktree Corporation, San Diego, Calif.

Filed Jul. 11, 1986, Ser. No. 884,472

Int. Cl.⁴ H03M 1/76

U.S. Cl. 341—148

32 Claims



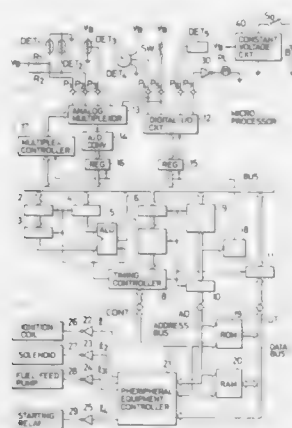
1. In combination for converting a binary coded value into an analog value,

- means for providing a plurality of signals each having first and second logic levels coding for binary values of "1" and "0" and each identifying a binary value of an individual binary significance, the signals in the plurality cumulatively coding for the analog value;
- an integrated circuit chip,
- means disposed on the integrated circuit chip for decoding the logic levels of the binary signals in the plurality,
- a plurality of output means each disposed on the chip at an individual position in a first direction relative to a centroid position to produce an output signal having characteristics dependent upon such individual disposition, each of the output means in the plurality being operatively coupled to the decoding means to provide the output signal for an individual one of the analog values and for all analog values less than such individual analog value, and
- means disposed on the integrated circuit chip for producing additional signals each having characteristics corresponding substantially to the characteristics of the signal from an individual one of the output means in the plurality but offsetting the characteristics produced in the output signal, from such individual one of the output means as a result of the disposition of such individual one of the output means in the plurality at the individual position in

the first direction relative to the centroid position, to obtain the production of signals, for each of the analog values coded by the logic levels of the binary signals, corresponding to that which would be obtained for a disposition of each of the output means in the plurality of the centroid position in the first direction.

4,875,047
SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE
HAVING A WIRING LAYOUT TO AVOID
INTERSECTING BETWEEN ANALOG SIGNAL WIRING
LAYERS AND DIGITAL SIGNAL WIRING LAYERS
Shiro Baba, Tokorozawa, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 21, 1982, Ser. No. 420,877
Claims priority, application Japan, Sep. 21, 1981, 147894
Int. Cl.⁴ H03K 13/20
U.S. Cl. 341—155 15 Claims

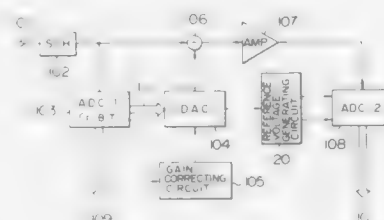


1. A semiconductor integrated circuit device comprising: an analog signal transmission link formed on a semiconductor substrate in a first prescribed geometrical pattern; a first prescribed, analog signal-handling, electronic circuit formed on said substrate and coupled to said analog signal transmission link so that analog signals may be exchanged between said first prescribed circuit and said analog signal transmission link; a digital signal transmission link comprising a plurality of digital signal conveying paths and formed on said substrate in a second prescribed geometrical pattern separated from said first prescribed geometrical pattern so as not to overlap said first pattern; a second prescribed, digital signal-handling, electronic circuit formed on said substrate and coupled to said digital signal transmission link so that digital signals may be exchanged between said second prescribed circuit and said digital signal transmission link; and a plurality of bonding pad electrodes arranged on said substrate at positions adjacent to and separating respective ones of said digital signal conveying paths from said analog signal transmission link, wherein said plurality of bonding pad electrodes are arranged adjacent a peripheral portion of said substrate, and wherein said analog transmission link has a portion which is disposed along said peripheral portion of said substrate between an edge of said substrate and said bonding pad electrodes.

4,875,048
TWO-STEP PARALLEL ANALOG TO DIGITAL
CONVERTER

Toshihiko Shimizu, Tokyo; Masao Hotta, Hanno, and Kenji Maio, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

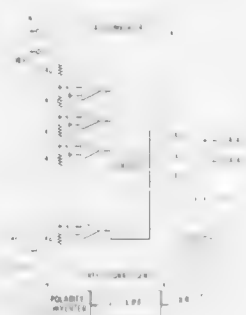
Filed Aug. 29, 1988, Ser. No. 237,757
Claims priority, application Japan, Aug. 28, 1987, 62-212747
Int. Cl.⁴ H03K 13/02; H03M 1/36
U.S. Cl. 341—156 9 Claims



4. A two-step parallel analog to digital converter comprising: a first flash-type A/D converter for subjecting an analog input to A/D conversion to determine upper significant bits; a D/A converter for reconverting said upper significant bits output to an analog value; a subtracting amplifier for amplifying a difference between the output of said D/A converter and said analog input; a second flash-type A/D converter for subjecting the output of said subtracting amplifier to A/D conversion to determine lower significant bits; a circuit for correcting a gain of said D/A converter; and a circuit for generating references for said second flash-type A/D converter.

4,875,049
AUTOMATIC LEVEL CONTROL CIRCUIT FOR AN AD
CONVERTER

Yasuharu Yoshida, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan
Continuation of Ser. No. 795,142, Nov. 5, 1985, abandoned. This application Feb. 11, 1988, Ser. No. 157,154
Claims priority, application Japan, Nov. 6, 1984, 59-233826
Int. Cl.⁴ H03M 1/78
U.S. Cl. 341—159 12 Claims



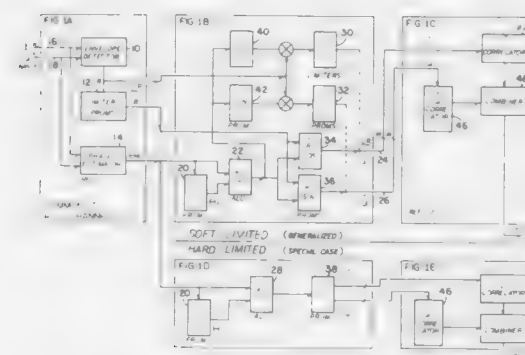
1. An automatic level control circuit for use in a multi-level signal transmission system comprising an analog-to-digital (A/D) converter for discriminating a demodulated multi-level baseband signal with respect to a plurality of reference levels to produce a plurality of decoded digital signals and an error digital signal, and a reference voltage generator, including logic circuit means, responsive to for providing a reference

voltage to said A/D converter to uniformly shift said plurality of reference levels, said reference levels being controlled to optimum ones responsive to a variation in the level of said input signal.

4,875,050
GENERALIZED DOPPLER MATCHED BINARY PULSE
COMPRESSOR

Dev D. Rathi, Los Angeles, Calif., assignor to ITT Gilfillan, a division of ITT Corporation, Van Nuys, Calif.

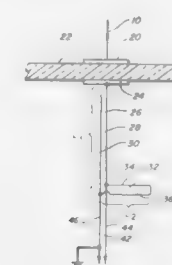
Filed Feb. 12, 1988, Ser. No. 155,423
Int. Cl.⁴ G01S 7/32, 7/44; G06F 7/38
U.S. Cl. 342—195 3 Claims



1. A doppler matched binary pulse compressor having means to initiate operation thereof; means to generate a doppler matched filter bank; means to compress the pulses from the doppler matched filter; means to estimate the input signal phase in real time including a phase estimator having a quadrant detector, means to scale the quadrature components while preserving the signal phase, means to reduce accuracy computations to 45° or less of the first quadrant, and means to reconstruct the phase to place the signal in the proper quadrant; and means to select the overall optimal filter in real time.

4,875,051
ANTENNA WITH IMPEDANCE MATCHING MEMBER
Herbert R. Blase, 3314 Olcott Ave., Chicago, Ill. 60634

Filed May 4, 1988, Ser. No. 190,001
Int. Cl.⁴ H01Q 1/32
U.S. Cl. 343—715 15 Claims



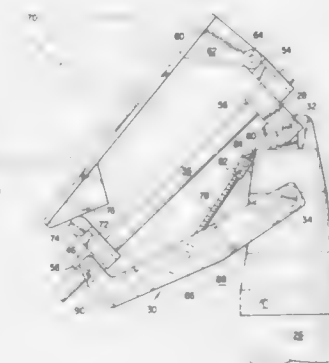
1. An on-glass antenna for use with a desired frequency for connection to the window of a vehicle, which comprises: a radiator for location on the outside of the vehicle window; a first transfer member for fastening to the outside of the vehicle window; means for connecting said radiator to said first transfer member; a second transfer member for fastening to the inside of the vehicle window in substantial alignment with said first transfer member; a cable for coupling said radiator to a transmitter/receiver,

said cable comprising a first cable portion having a first end and a second end, and an impedance matching member; said first cable portion including a first conductor and a spaced second conductor with said first and second conductors extending substantially from said first end of the first cable portion to said second end thereof; means connecting said first conductor at said first end of said first cable portion to said second transfer member; said impedance matching member comprising an electrical conductor bridging said first conductor to said second conductor of said first cable portion at said second end of said first cable portion, said impedance matching member and said first cable portion together having an electrical length of about $\frac{1}{4}$ wavelength with respect to said desired frequency.

4,875,052
ADJUSTABLE ORIENTATION APPARATUS WITH
SIMULTANEOUS ADJUSTMENT OF POLAR AND
DECLINATION ANGLES

Dean H. Anderson, and Mark M. Tomann, both of Garrison, N.Y., assignors to Hudson Valley Metal Works, Inc., Newburgh, N.Y.

Filed Jun. 16, 1986, Ser. No. 874,426
Int. Cl.⁴ H01Q 1/12, 3/08
U.S. Cl. 343—882 5 Claims



1. An adjustable orientation apparatus, comprising: first means to be oriented in accordance with a polar angle corresponding to the latitude of the geographical location of said apparatus, and a declination angle of an external object to be tracked by said apparatus; base means; second means comprising a polar axis shaft with a substantially, permanently fixed pivot casting and a first support arm, said second means orients said first means at said polar angle by said first support arm being pivotably secured to said base member at a first pivot point; said first means pivotably connected to said pivot casting at a second pivot point; third means comprising a sliding cam member and a cam plate, said cam plate secured to said first means, said cam member slidably received on said polar axis shaft at an end opposite said pivot casting, said third means orients said first means at said declination angle by pivotal movement of said first means about said second pivot point; support means pivotably secured to said base means at a third pivot point and slidably received on said polar axis shaft adjacent said cam member; manual angle adjustment means which permits adjustment of said polar angle and said declination angle by way of a single adjustment, said adjustment means interconnecting said base means and said support means; wherein, said adjustment means causes said support means to pivot

about said third pivot point and to slide along said polar axis shaft, said sliding in turn causes said cam member to slide along said polar axis shaft and said cam plate causing said first means to pivot about said second pivot point, said polar axis shaft pivoting about said first pivot point.

4,875,053

DRIVE CONTROL DEVICE FOR AN ELECTRICALLY-DRIVEN EXTENDING AND RETRACTING ANTENNA

Jiro Harada, Tokyo, Japan, assignor to Harada Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 22, 1988, Ser. No. 210,007

Claims priority, application Japan, Sep. 30, 1987, 62-244338

Int. Cl.⁴ H01Q 1/10

U.S. Cl. 343—903

3 Claims



1. A drive control device for an electrically driving an extending and retracting antenna system comprising:

a rotary plate continuously rotatable by rotation of a drive motor of said antenna via a reduction gear mechanism, said rotary plate rotating approximately once in the time required to complete extension or retraction of said antenna;

a washer-shaped conducting part attached to one side surface of said rotary plate, said conducting part having a small cut-out area formed in one part of its circumference which is non-conducting;

a first contact continuously in electrical contact with said conducting part;

a second contact provided such that said second contact is in continuous electrical contact with said conducting part until extension of said antenna is completed and when extension of said antenna is completed, said second contact is in contact with said non-conducting small cut-out area and not in electrical contact with said conducting part;

a third contact provided such that said third contact is in continuous electrical contact with said conducting part until retraction of said antenna is completed and when retraction of said antenna is completed, said third contact is in contact with said non-conducting small cut-out area and not in electrical contact with said conducting part; whereby said first and second contacts provide a limit switch for extension of said antenna and said first and third

contacts provide a limit switch for retraction of said antenna.

4,875,054

CLEAN AIR HOOD FOR FLUID JET PRINTING

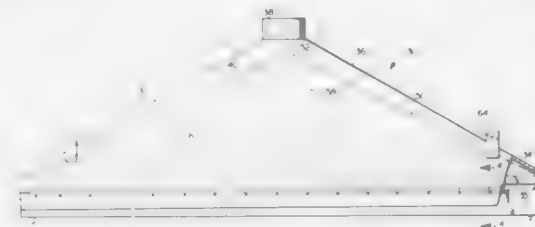
Timothy H. V. Archer, Centerville; Randy Bowman, Franklin, both of Ohio, and Michael I. Glenn, Burlington, N.C., assignors to Burlington Industries, Inc., Greensboro, N.C.

Filed May 27, 1987, Ser. No. 54,490

Int. Cl.⁴ G01D 15/18; B05B 5/02

U.S. Cl. 346—1.1

22 Claims



1. Apparatus for providing a curtain of air about the elongated print head of a fluid jet printer comprising:

a hood having an elongated opening at one end thereof in opposition to and spaced above the print head;

said hood having an air inlet; and

means carried by said hood for directing air from said inlet for exit through said opening along one side of said hood to form an elongated air curtain along the corresponding side of the print head;

said hood having opposed spaced side walls, said directing means including a pair of baffles carried within said hood and respectively spaced from the opposed side walls, said baffles and corresponding side walls terminating in discrete air outlets adjacent opposite sides of said opening to form a pair of discrete, laterally spaced, air curtains issuing from opposite sides of the hood, respectively.

4,875,055

SIMPLIFIED MULTICOLOR FLUID SYSTEM FOR CONTINUOUS INK JET PRINTER

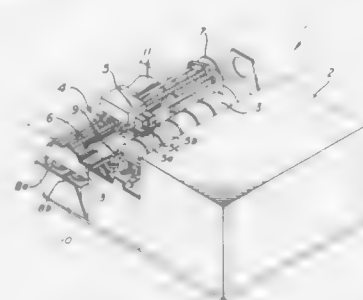
James D. McCann, Waynesville, Ohio; Lawrence R. Young, West Lebanon, N.H., and John M. Brandon, Dayton, Ohio, assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 21, 1988, Ser. No. 273,549

Int. Cl.⁴ G01D 15/18

U.S. Cl. 346—75

4 Claims



1. In continuous ink jet printing system of the kind having a housing means forming a chamber for receiving a plurality of ink cartridges, a plurality of ink supply means for delivering ink to respective print heads from said cartridges and a plurality of ink return means for returning ink respectively from said print head to said cartridges, the improvement wherein:

(a) said ink cartridges have a vent opening to said cartridge interior;

(b) said cartridge housing is substantially air-tight and includes means for evacuating said chamber.

4,875,056

THERMAL RECORDING APPARATUS WITH VARIABLY CONTROLLED ENERGIZATION OF THE HEATING ELEMENTS THEREOF

Takeshi Ono, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

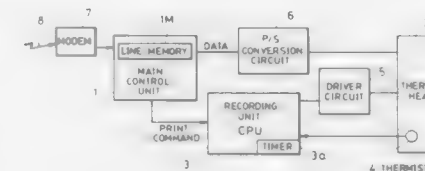
Filed Jan. 12, 1987, Ser. No. 2,204

Claims priority, application Japan, Jan. 17, 1986, 61-6348; Jan. 30, 1986, 61-16752

Int. Cl.⁴ G01D 15/10; B41J 3/20

U.S. Cl. 346—76 PH

12 Claims



1. A thermal recording apparatus for recording on a recording medium, the apparatus comprising:

a recording head having a plurality of heating elements, provided as a plurality of individually controllable blocks, for recording on the recording medium when selected said heating elements are energized during recording cycles; determining means for respectively determining the number of heating elements selected for energization in each of said blocks in the recording cycle; and

control means for variably and respectively controlling the amount of energy supplied to said selected heating elements in each of said blocks in accordance with the number of said heating elements determined by said determining means.

4,875,057

MODULAR OPTICAL PRINthead FOR HARD COPY PRINTERS

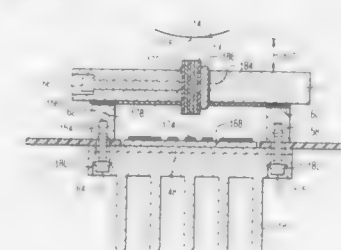
Edwin A. Hediger, Fairport; Yee S. Ng, Fairmont, and Hieu Pham, Webster, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 1, 1988, Ser. No. 239,564

Int. Cl.⁴ G01D 15/14, 9/42

U.S. Cl. 346—107 R

12 Claims



1. A modular printhead assembly for selectively exposing a moving photosensitive surface to provide a latent image, said printhead comprising:

a circuit arrangement including a linear array of light emitting diodes (LED's) which extend along a first axis; a rigid heat sink to which the LED circuit arrangement is connected; a linear optical lens; a lens supporting structure non-adjustably attached to said heat sink to form an integral lens-LED combination; adjustable means for securing the lens to the supporting structure after the lens has been aligned; and

a printed circuit board (PCB) positioned substantially between the heat sink and the supporting structure; said lens supporting structure also providing means for mounting and registering the aligned printhead in associated apparatus, with said registration allowing the aligned printhead assembly to be interchanged between different apparatus without realignment of the lens.

4,875,058

VALVE DEVICE FOR A MATRIX PRINTER

Jiri Vonasek, Kungälv, Sweden, assignor to Markpoint System AB, Gothenburg, Sweden

Filed Dec. 9, 1987, Ser. No. 130,531

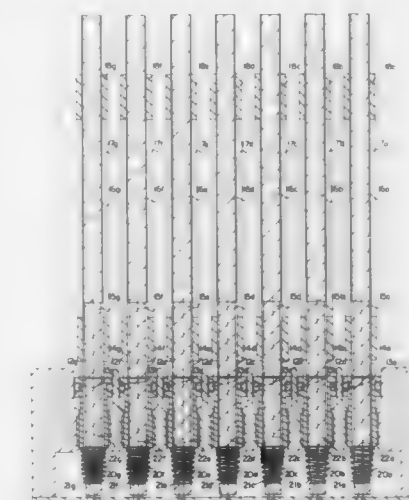
Claims priority, application Sweden, Dec. 12, 1986, 86 05348; Nov. 25, 1987, 87 04675

The portion of the term of this patent subsequent to Apr. 12, 2005, has been disclaimed.

Int. Cl.⁴ G01D 15/16

U.S. Cl. 346—140 R

17 Claims



1. In a device for providing liquid tight closure and opening, respectively, of a passage in a printer device for generating characters by the output of a certain amount of liquid for character recording, for instance ink, through the passage, comprising an armature provided with a valve body having a head portion in the passage, and means for a controlled armature reciprocating movement for obtaining said closure and opening operations, the improvement:

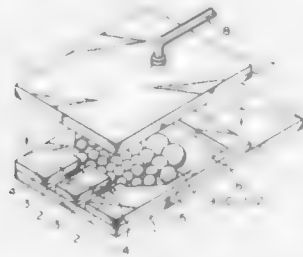
wherein the passage is formed in a plate-shaped, grindable element that is grindable to a smooth condition with a long term maintenance of the smoothness and generally free from internal strains, and wherein the head portion has an at least partially smooth surface for direct abutment against the smooth grinded element, around the opening of the passage facing the armature.

4,875,059

WITH A LIQUID SUPPLY PATH HAVING DISPOSED THEREIN A FILLER PROVIDING PARTIAL FLOW BLOCKAGE THAT VARIES UPSTREAM OF THE DISCHARGE ORIFICE

Kazuki Masuda, Sagami, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 155,082, Feb. 11, 1988, abandoned. This application Feb. 12, 1988, Ser. No. 155,505
Claims priority, application Japan, Feb. 13, 1987, 62-029713
Int. Cl.⁴ B01D 15/16; B41J 3/04
U.S. Cl. 346—140 R 15 Claims



1. An ink jet recording head having:
 - a liquid supply path communicating with a discharge port for providing for ink for discharge through said discharge port;
 - energy generating means provided correspondingly to said liquid supply path for generating energy to discharge the ink; and
 - a filler disposed in said liquid supply path upstream of said energy generating means and partially blocking said liquid supply path so as to define a flow path having a varying percentage of voids, wherein said percentage of voids increases in the upstream direction of said liquid supply path.

4,875,060

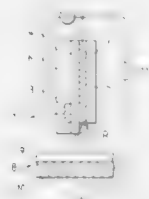
DISCHARGE HEAD FOR AN ELECTROSTATIC RECORDING DEVICE

Koji Masuda; Yuji Suemitsu, and Kazuo Asano, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan
Filed Nov. 25, 1988, Ser. No. 275,865

Claims priority, application Japan, Nov. 27, 1987, 62-297665
Int. Cl.⁴ G01D 15/00

U.S. Cl. 346—155

21 Claims



1. A discharge head for use in electrostatically recording an image on a recording body comprising:
 - a first insulation layer having a first side and a second side;
 - a plurality of discharge electrodes disposed on said first side of said first insulation layer, each of said electrodes having a tip end;
 - an induction electrode disposed on said second side of said first insulation layer; and
 - a second insulation layer disposed on said discharge electrodes to cover all but the tip ends of said discharge electrodes.

4,875,061

COLOR IMAGE RECORDING APPARATUS

Kouji Kobayakawa, Ichinomiya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Japan

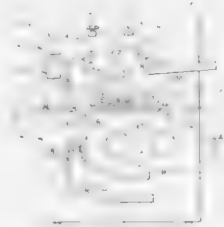
Filed Mar. 22, 1989, Ser. No. 327,090

Claims priority, application Japan, Mar. 23, 1988, 63-38997[U]

Int. Cl.⁴ G01D 15/00

U.S. Cl. 346—157

6 Claims



1. A color image recording apparatus for recording an image on an image recording medium through an intermediate recording medium which carries an intermediate image which is one of a monochromatic color image or colored original image, said intermediate recording medium being supplied from one of a monochromatic image forming unit and a manual insertion tray, said intermediate recording medium being superposed with said image recording medium at an exposure zone for light exposure for forming a latent image on said image recording medium; said apparatus comprising:

- light source for irradiating one of red, green, blue and white light onto said image recording medium through said intermediate recording medium at said exposure zone;
- a sheet delivering and aligning means disposed upstream of said exposure zone for delivering aligned intermediate recording medium to said exposure zone, said delivering and aligning means being positioned downstream of said monochromatic image forming unit and said manual insertion tray;
- color identification means disposed at a position adjacent said sheet delivering and aligning means for identifying colors of said intermediate image, said identification means generating a signal indicative of said colors; and
- light selection means for automatically lighting one of said red, green, blue and white light in response to said signal.

4,875,062

ION PROJECTION PRINT HEAD

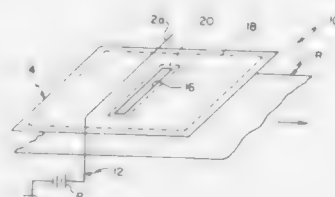
David M. Rakov, Irondequoit, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 27, 1988, Ser. No. 290,657

Int. Cl.⁴ G01D 15/00

U.S. Cl. 346—159

9 Claims



1. An ion projection print head for applying ions line-by-line from a substantially uniform linear ion source, in a modulated pattern to a moving ion receptor substrate to form a latent image charge pattern on such substrate corresponding to infor-

mation to be reproduced, said ion projection print head comprising:

- a substantially planar mask having an elongated slot defined therethrough;
- a continuous electrode formed on the side of said mask between said mask and said ion source;
- a plurality of electrodes formed on the side of said mask opposite from said continuous electrode, said plurality of electrodes being spaced apart from one another and terminating at said slot; and
- means for selectively applying an electrical bias to said plurality of electrodes respectively to modulate ion flow through said slot from the ion source to said receptor substrate.

4,875,063

ELECTROSTATIC RECORDING APPARATUS

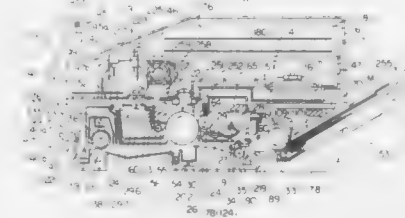
Hiroaki Idenawa, Hiratsuka; Hideaki Mochimaru, Yokohama; Hajime Kanda; Nobuhiro Makita, both of Tokyo; Yoshiaki Tanaka, Kawasaki; Takahiro Yagisita, Yokohama; Takanori Yamaki, Tokyo; Takeshi Motohashi; Masayoshi Miyamoto, both of Yokohama; Hisao Ishizu, Tokyo; Yasuhiro Sagawa, Yamato; Tadaaki Kanno, Yokosuka; Tomoo Sankoda, Yamato; Hiroshi Hosokawa, Yokohama; Hideo Aoki, Yokohama; Takami Suzuki, Yokohama; Hiromi Takada, Yokohama, and Toshio Shimazaki, Tokyo, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Sep. 1, 1987, Ser. No. 91,751

Int. Cl.⁴ G01D 15/00

U.S. Cl. 346—160.1

11 Claims



1. In an electrostatic recording apparatus having a casing in which various devices for executing an electrostatic recording process are accommodated, said apparatus capable of recording data in or on various kinds of transfer materials, said devices comprising at least a photoconductive element assembly and a developing assembly, said photoconductive element assembly comprising a photoconductive element, chargers, and a toner collecting tank, and said developing assembly comprising a developing roller which is detachable from said casing, a toner supply roller, a developing tank, a rotary shaft and connecting lever mounted on said rotary shaft of said developing roller for detachably connecting said developing roller to said casing while limiting up-down movement of said developing roller, and means for exerting a pressure force acting on said connecting lever during connection of said casing with said connecting lever, said pressure force changing to a weaker pressure force after said connection of said casing with said connecting lever is accomplished.

4,875,064

PROJECTOR APPARATUS WITH MIRROR MEANS

Osamu Umeda, Gifu; Tohru Nakakura, Tokyo; Makoto Sato, Tokyo, and Tatsuo Shimazaki, Tokyo, all of Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Filed Jul. 30, 1987, Ser. No. 79,883

Claims priority, application Japan, Aug. 6, 1986, 61-119814; Mar. 28, 1987, 62-46179; Jul. 3, 1987, 62-101814

Int. Cl.⁴ G03B 21/10

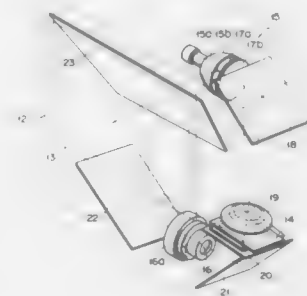
U.S. Cl. 353—78

19 Claims

1. A projector apparatus including, within a case having a display window equipped with a transmission type screen, a

transmission type liquid crystal display panel, a light source means for illuminating said liquid crystal display panel from behind, and a projection lens means for projecting a display image of said liquid crystal display panel as an enlarged image on said transmission type screen, said projector apparatus comprising:

- a first mirror means for reflecting light emitted from said light source to be incident substantially perpendicular to said liquid crystal display panel;
- a focusing lens means for focusing light transmitted through said liquid crystal display panel onto said projection lens means;
- a second mirror means for reflecting the focused light in the



- direction of an optical axis of said projection lens means to be incident on said projection lens means;
- a third mirror means for reflecting the light projected from said projection lens means in a direction parallel to said transmission type screen;
- a fourth mirror means for reflecting the light reflected by said third mirror means toward said transmission type screen; and
- wherein a plane is defined by light reflected from the first mirror means to the second mirror means and on to the third mirror means, said first, second and third mirror means each bend light that is respectively incident thereon by 90° in said plane, and said fourth mirror means reflects light in a direction perpendicular to said plane.

4,875,065

CAMERA

Takayuki Kubodera; Shizuo Nakamura; Masanori Onizawa; Hirotaka Shirohita, all of Tokyo; Eiichi Mochizuki, Nagano; Masao Tsujimura; Toshikatsu Atsuta, both of Tokyo, and Takayoshi Morooka, Nagano, all of Japan, assignors to Kyocera Corporation, Kyoto, Japan

Filed Feb. 12, 1988, Ser. No. 155,316

Claims priority, application Japan, Feb. 13, 1987, 62-20529[U]; Jul. 29, 1987, 62-189173[U]

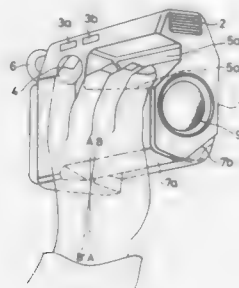
Int. Cl.⁴ G03B 17/02

U.S. Cl. 354—82

4 Claims

1. A camera comprising a camera body extended along the optical axis thereof, in which said camera body has a recess at a position where at least one of the index, middle, ring and little fingers is placed when a person holds said camera body with the hand from

below and in which a camera bottom, which the palm touches when a person holds said camera body with the



hand from below, had an inclined surface relatively small in width on a side of said camera body.

4,875,066

PHOTOGRAPHY SHADE AND VIGNETTER

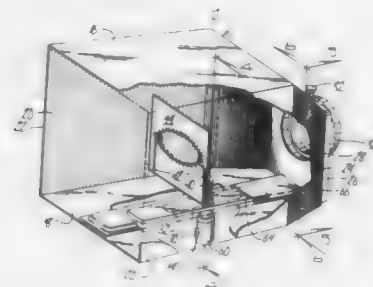
Martin R. Rickard, N. Park Ave. Extension, Box C, New Sharon, Iowa 50207

Filed May 31, 1988, Ser. No. 200,560

Int. Cl.⁴ G03B 11/00

U.S. Cl. 354-296

16 Claims



1. A photographic shade and adjustable vignetter assembly comprising:

- a shade having an open forward end, a rearward end, an upper wall, a lower wall, and opposite side walls, the walls being interconnected to form an enclosure,
- attachment means on the rearward end of the shade for releasably attaching the shade to a camera lens;
- a vignetter mounted within the shade enclosure for holding a vignette; and
- mounting means for adjustably positioning the vignetter within the shade enclosure, the mounting means allowing forward, rearward, upward, downward and rotational movement of the vignetter within the shade enclosure and with respect to the lens.

4,875,067

PROCESSING APPARATUS

Hisao Kanzaki, and Hisao Ohba, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-Ashigara, Japan

Filed Jul. 18, 1988, Ser. No. 220,252

Claims priority, application Japan, Jul. 23, 1987, 62-184371

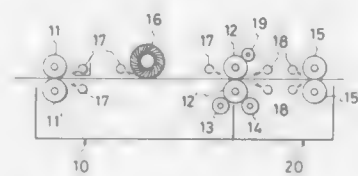
Int. Cl.⁴ G03B 5/04, 3/08

U.S. Cl. 354-325

11 Claims

1. A conveying type apparatus for processing light-sensitive plates provided with at least two processing baths which comprises a roller type device for removing a processing solution from the plate processed, wherein said device comprises a pair of squeeze rollers and is disposed at the boundary between a preceding bath and an adjacent subsequent bath so as to separate the solutions in these baths from one another; and means for removing the processing solution on the roller surface; wherein the means for removing a processing solution comprises a roller pressed against a lower roller of the paired

rollers and disposed on the side of the preceding bath, a roller pressed to the lower roller of the paired rollers and disposed on the side of the subsequent bath and a roller pressed to an upper roller of the paired rollers and disposed on the side of the subsequent bath.



rollers and disposed on the side of the preceding bath, a roller pressed to the lower roller of the paired rollers and disposed on the side of the subsequent bath and a roller pressed to an upper roller of the paired rollers and disposed on the side of the subsequent bath.

4,875,068

INTEGRATED FUSER CONNECTOR AND ALIGNMENT MEMBER

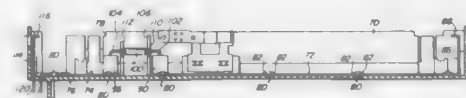
Robert S. Pawlik, and Kenneth R. Rasch, both of Webster, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 25, 1988, Ser. No. 147,941

Int. Cl.⁴ G03G 15/00; H05B 01/00; H01C 10/16

U.S. Cl. 355-286

5 Claims



1. A fuser assembly in a printing machine comprising: a molded, essentially rectangularly shaped housing having a plurality of integral posts disposed along a first surface of the housing,

an elongated flat, electrically conductive contact strip having at least one set of integral, oppositely disposed spring clips and a first and a second upright extending tab, the spring clips engaging opposite sides of one of said plurality of integral posts to secure the contact strip to the housing and align the contact strip within the housing,

a fuser roll with an associated electrical heating element disposed in proximity to the housing, one end of the heating element being secured to the distal end of the first upright extending tab, and

a thermo cutoff element, the thermo cutoff element being electrically connected to the heating element, one end of the thermo cutoff element being secured to the distal end of the second upright extending tab.

4,875,069

ANTI-FOULING DEVICE FOR SHEET GRIPPER

Yusaku Takada, Tokyo, and Kenji Takeda, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 145,595, Jan. 19, 1988, abandoned. This application Nov. 14, 1988, Ser. No. 271,364

Claims priority, application Japan, Jan. 19, 1987, 62-008308; Jan. 19, 1987, 62-004950[U]

Int. Cl.⁴ G03G 15/00

U.S. Cl. 355-271

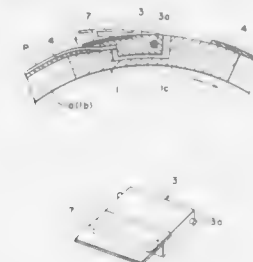
23 Claims

1. A transfer device for transferring a toner image onto a transfer material, comprising:

transfer material supporting means having a sheet-like material for supporting the transfer material and a supporting member for supporting the sheet-like material for movement along an endless path;

gripping means, mounted in an opening in said supporting

member for releasably gripping an end of the transfer material; and



a sheet member mounted on said gripping means to cover at least a portion of said gripping means.

4,875,071

SHADING CORRECTING APPARATUS FOR PHOTOGRAPHIC PRINTER

Kazuo Shiota, Kanagawa, Japan, assignor to Fuji Photo Film Co. Ltd., Kanagawa, Japan

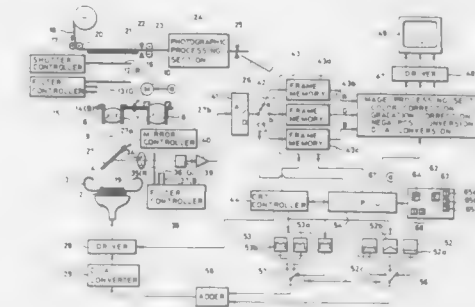
Filed Jul. 13, 1988, Ser. No. 218,409

Claims priority, application Japan, Jul. 15, 1987, 62-176471; Jul. 31, 1987, 62-191687

Int. Cl.⁴ G03B 27/72

U.S. Cl. 355-20

9 Claims



1. A shading correcting apparatus for a photographic printer having a plurality of interchangeable printing lenses for printing an image of an original illuminated with a CRT on a photographic material, said shading correcting apparatus comprising:

- memory means for memorizing data on illumination patterns of said CRT for each of said plurality of interchangeable printing lens;
- means for selecting said data for one of said plurality of interchangeable printing lenses used, and
- means for actuating said CRT to emit light so as to make an illumination pattern according to said selected data, thereby correcting shading produced due to said used printing lens.

4,875,070

METHOD OF REMOVING TONER FROM A ROTATING DRUM IN A XEROGRAPHIC COPYING MACHINE USING A VIBRATING BLADE

Yutaka Hattori, Kamakura, Japan, assignor to The Yokohama Rubber Co., Ltd., Tokyo, Japan

Filed Dec. 28, 1987, Ser. No. 138,082

Claims priority, application Japan, Dec. 30, 1986, 61-311727

Int. Cl.⁴ G03G 21/00, 15/06

U.S. Cl. 355-299

3 Claims



1. A method of removing a toner deposited on a rotating drum in a xerographic copying machine, comprising:

- (a) positioning a blade having a scraping edge which is disposed closely adjacent the outer surface of the drum, the blade being defined by said scraping edge, an outer edge opposite said scraping edge and remote from the drum and two opposite end edges, the blade having a width extending between said scraping edge and said outer edge and a length extending between said end edges; and
- (b) imparting vibrations to the blade from one of said edges other than said scraping edge to produce non-standing vibration waves which run through the blade to bring said scraping edge alternately into and out of contact with the outer surface of the drum at short time intervals so as to remove toner therefrom.

4,875,072

AUTOMATIC DOCUMENT FEEDER

Kazuyuki Ohnishi, Nara; Yoshiteru Mori, Osaka, and Masakiyo Okuda, both of Osaka, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

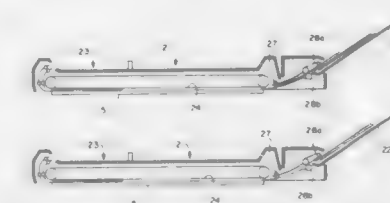
Continuation of Ser. No. 2,808, Jan. 13, 1987, abandoned. This application May 26, 1988, Ser. No. 201,313

Claims priority, application Japan, Jan. 18, 1986, 61-9396

Int. Cl.⁴ G03B 27/32, 27/52

U.S. Cl. 355-23

3 Claims



1. In an automatic document feeder associated with an automatic two-side copying machine which operates selectively in a one-side copying mode wherein only one surface of an original document is scanned or a two-side copying mode wherein both surfaces of an original are successively scanned, said document feeder comprising a document table where a document is placed for copying, a tray means where documents to be copied are originally placed, said document table and said tray means defining a waiting position therebetween, and pre-feeding means for moving a document to be copied next from said tray means until the front edge of said next document reaches said waiting position, the improvement wherein said automatic

document feeder is so controlled as to automatically operate said pre-feeding means when said copying machine is operating in said one-side copying mode of operation or when said copying machine is scanning the first surface of a document in said two-side copying mode of operation and to automatically prevent said pre-feeding means from functioning when said copying machine is scanning the second surface of a document in said two-side copying mode of operation.

4,875,073

COLOR PICTURE IMAGE RECORDING APPARATUS CAPABLE OF ADJUSTING COLOR TONE IN THE COPY

Masashi Ueda; Yoichi Horaguchi, both of Nagoya, and Kenji Sakakibara, Ichinomiya, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

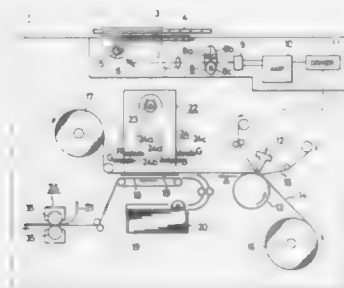
Filed Mar. 11, 1988, Ser. No. 167,140

Claims priority, application Japan, Mar. 12, 1987, 62-57188; Jan. 29, 1988, 63-20986

Int. Cl.⁴ G03B 27/32, 27/52

U.S. Cl. 355—27

11 Claims



1. A color image recording apparatus for recording an image of an original on a developer sheet with the use of a light-transmissive sheet and a photosensitive recording sheet, said apparatus comprising:

image forming means for forming a light shielding image corresponding to said image of said original on said light-transmissive sheet, said light-transmissive sheet on which said light shielding image is formed being used as a mask member, said mask member being moved in a first direction;

a lamp for emitting a white light;
filter means disposed to receive said white light and selectively passing a light of a predetermined wavelength, a filtering characteristic of said filter means being variable;
exposure means disposed downstream of said image forming means relative to the moving direction of said mask member for exposing said photosensitive recording sheet to said filtered light through said mask member to form a latent image corresponding to said light-shielding image on said photo-sensitive recording sheet, said photosensitive recording sheet carrying said latent image being moved in a second direction; and

developing means disposed downstream of said exposure means relative to the moving direction of said photo-sensitive recording sheet for developing said latent image into a visible image on said developer sheet, said developer sheet being held in superposed relation with said photo-sensitive recording sheet, whereby a color tone of said visible image is adjustable by varying said filtering characteristic of said filter means.

4,875,074

IMAGE RECORDING APPARATUS

Kazuo Sangyoji; Jun Sakai; Shigeyuki Hayashi; Makoto Suzuki, and Yasuo Kimura, all of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

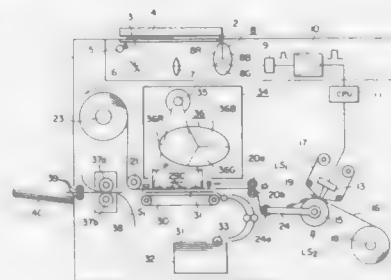
Filed Mar. 25, 1988, Ser. No. 173,610

Claims priority, application Japan, Apr. 1, 1987, 62-50566[U]; Apr. 6, 1987, 62-85176; Apr. 22, 1987, 62-61148[U]; Sep. 22, 1987, 62-238459

Int. Cl.⁴ G03B 27/32, 27/52

U.S. Cl. 355—27

11 Claims



1. An image recording apparatus for recording an image corresponding to an original on a developing medium with the use of a light-transmissive sheet and a photosensitive recording medium, said apparatus comprising:

image-forming means for sequentially forming each of a plurality of light-shielding images on said light-transmissive sheet movable in a predetermined direction;

exposing means disposed downstream of said image-forming means relative to the movement of said light-transmissive sheet for exposing said photosensitive recording medium to light through said light-transmissive sheet to form on said photosensitive recording medium a latent image corresponding to said light-shielding image;

accumulating means disposed between said image-forming means and said exposing means for accumulating said light-transmissive sheet carrying said light shielding image thereon;

developing means disposed downstream of said exposing means for developing said latent image on said photosensitive recording medium into a visible image on said developing medium, said developing medium being held in superposed relation with said photosensitive recording medium; and

control means for controlling said image-forming means and said accumulating means to form a subsequent light-shielding image on a light-transmissive sheet during exposure of a photosensitive recording medium through a previous light-shielding image on a light-transmissive sheet and holding the light-transmissive sheet carrying said subsequent light-shielding image in a standby condition at said accumulating means to prevent said sheet from being fed into said exposing means during the exposure through said previous light-shielding image.

4,875,075

IMAGE READING DEVICE AND IMAGE FORMING APPARATUS HAVING SAME

Sumitoshi Sootome, Yachiyo; Morikazu Mizutani, Tokyo; Isao Ikemoto, Kawasaki; Shinji Kanemitsu, Tokyo; Hajime Kitajima, and Shigeyoshi Onoda, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 12, 1987, Ser. No. 61,222

Claims priority, application Japan, Jul. 4, 1986, 61-157510

Int. Cl.⁴ G03B 27/48, 27/50

U.S. Cl. 355—50

38 Claims

1. An image forming apparatus for forming an image of an

original using as optical image of the original, said apparatus comprising:

a first assembly;

a second assembly cooperable with said first assembly, said second assembly being movable relative to said first assembly between a closed position wherein said apparatus is operable and an open position wherein said apparatus is opened;

a reciprocable original supporting member for supporting an original;

a first guide member on said first assembly, for guiding reciprocating movement of said original supporting member adjacent one of such sides of said original supporting member as are parallel to a direction of the reciprocating movement;

optical means, in said second assembly, for forming the

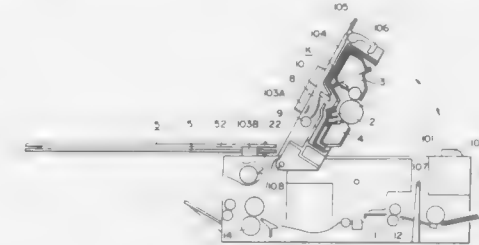


image of the original supported on said original supporting member;

a second guiding member, on said second assembly, for guiding and positioning said original supporting member adjacent another of said sides of said original supporting member, wherein said original supporting member is movable to be disengaged from said second guiding member when said second assembly is to be moved said open position, said second guiding member being contactable with said original supporting member to correctly position said original supporting member with respect to said second assembly when it is engaged with said original supporting member, whereby said second guiding member is effective to correctly position said original supporting member with respect to said optical means, while allowing disengagement of said original supporting member therefrom.

4,875,076

EXPOSURE APPARATUS

Makoto Torigoe, Kawasaki, and Akiyoshi Suzuki, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

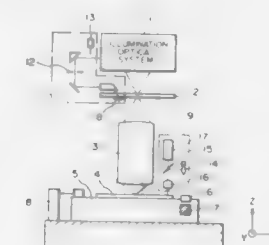
Filed Jun. 14, 1988, Ser. No. 206,490

Claims priority, application Japan, Jun. 15, 1987, 62-147005; Sep. 29, 1987, 62-245244; Oct. 27, 1987, 62-271388; Dec. 28, 1987, 62-329722

Int. Cl.⁴ G03B 27/42

U.S. Cl. 355—53

24 Claims



1. An exposure apparatus, comprising:

a projection optical system operable to project, by use of a

light of a wavelength, a pattern formed on a first object upon a second object;

a movable stage for holding thereon the second object; illumination means for irradiating a mark formed on the first object with a light having substantially the same wavelength as the light used for the projection of the pattern upon the second object;

recording means including an erasably writable recording medium provided on said movable stage at a position different from the position at which the second object is held by said movable stage;

detecting means operable to detect, without intervention of said projection optical system, an image recorded on said recording medium; and

control means operable to control said illumination means so that an image of the mark on the first object is recorded on said recording medium with the intervention of said projection optical system.

4,875,077

IMAGE-FORMING MACHINE

Junichi Takamatsu, Sennan, and Kazunori Akiyama, Suita, both of Japan, assignors to Mita Industrial Co., Ltd, Tokyo, Japan

Division of Ser. No. 50,438, May 18, 1987, Pat. No. 4,829,334

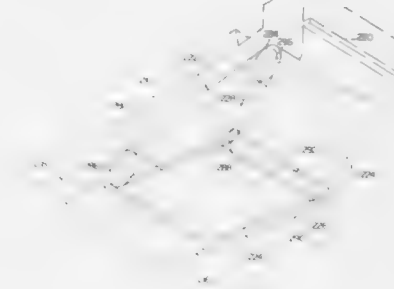
This application Dec. 15, 1988, Ser. No. 284,734

Claims priority, application Japan, May 28, 1986, 61-79541[U]; Oct. 13, 1986, 61-242597; Nov. 28, 1986, 61-281698

Int. Cl.⁴ G03G 15/00

U.S. Cl. 355—212

6 Claims



1. An image-forming machine comprising:

a main body member and a process unit adapted to be detachably mounted on the main body member;

said process unit including a process unit frame adapted to be mounted on the main body member and an image bearing member mounted on the process unit frame and adapted to be moved in a predetermined direction,

said image-bearing member having on the greater portion of the surface thereof an image-forming area on which to form an image, and having on the remainder of the surface thereof a non-image-forming area on which substantially no image is to be formed; and

said process unit frame having a transfer opening for passage of a sheet material therethrough to bring the sheet material into intimate contact with the image-forming area of the image bearing member;

said image-bearing member and said process unit frame cooperating so that when an image-forming step is over, the non-image-forming area of the image bearing member is positioned at the transfer opening of the process unit frame.

4,875,078

DEAD TIME COMPENSATION FOR TONER REPLENISHMENT

William A. Resch, III, Pittsford, and Jonathan E. Moak, Macedon, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 8, 1988, Ser. No. 241,993
Int. Cl.⁴ G03G 15/08

U.S. Cl. 355-246

15 Claims



1. Toner replenishment control apparatus for development stations having means to add, mix, and charge toner particles, said apparatus comprising:

- means for monitoring the toner concentration in the developer mix;
- means for producing and storing initial toner concentration error and associated replenishment rate reference signals;
- means to produce an output replenishment rate based on the present toner concentration error signal and an initial toner concentration error signal and its associated replenishment rate reference signal stored for a period sufficiently long to assure that the toner has been well mixed and charged.

4,875,079

TONER DENSITY CONTROL FOR MULTICOLOR ELECTROPHOTOGRAPHIC COPIER

Takashi Bisaiji, Yokohama; Noboru Sawayama, and Hideo Yoo, both of Tokyo, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Mar. 18, 1988, Ser. No. 170,264
Claims priority, application Japan, Mar. 19, 1987, 62-64596; Mar. 19, 1987, 62-64597

Int. Cl.⁴ G03G 15/08, 15/01

U.S. Cl. 355-246

14 Claims



1. A toner density control device for an image recorder

which has a plurality of developing units arranged around a photoconductive element and selectively moves said developing units toward said photoconductive element according to a particular mode selected to develop an electrostatic latent image which is provided on said photoconductive element by toner of particular color which is stored in said developing unit, said device comprising:

- toner supplying means each being associated with a respective one of said developing units for supplying toner to said developing unit associated;
- sensing means responsive to the density of each of said toner stored in said individual developing units for producing a sense signal representative of said density;
- mode specifying means for specifying said mode and generating a mode signal which is representative of said mode specified; and
- control means responsive to said sense signal from said sensing means and said mode signal from said mode specifying means for generating a control signal which controls each of said toner supplying means, thereby maintaining the density of toner stored in each of said developing units constant;
- said control means controlling said sensing means such that said sensing means senses at a predetermined period the density of toner stored in one of said developing units which has been selected by said mode specified, wherein said period differs from one of said developing units to another.

4,875,080

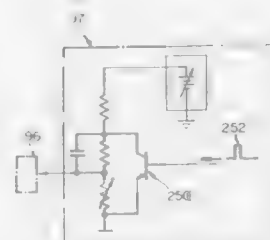
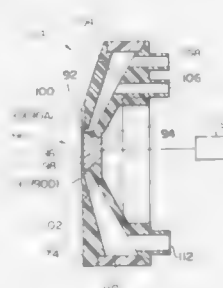
METHOD OF AND APPARATUS FOR DEVELOPING ELECTROPHOTOGRAPHIC FILM USING LIQUID DEVELOPER

Akinori Kimura, and Akira Yoda, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Continuation of Ser. No. 3,359, Jan. 14, 1987, abandoned. This application Jul. 5, 1988, Ser. No. 217,103

Claims priority, application Japan, Jan. 14, 1986, 61-5723
Int. Cl.⁴ G03G 15/10

U.S. Cl. 355-246

20 Claims



1. A method of developing an electrophotographic film wherein a liquid developer is supplied to a gap defined between a photosensitive layer side of said film that is electrically charged and an electrode disposed in opposing relation to said

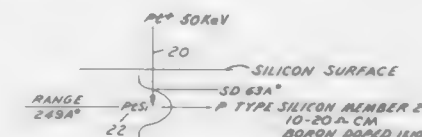
4,875,082

SCHOTTKY BARRIER PHOTODIODE STRUCTURE

Richard A. Bredthauer, Dana Point, Calif., assignor to Ford Aerospace Corporation, Newport Beach, Calif.
Continuation of Ser. No. 39,181, Apr. 16, 1987, abandoned, which is a division of Ser. No. 876,563, Jun. 20, 1986, Pat. No. 4,742,017. This application Dec. 14, 1988, Ser. No. 285,354
Int. Cl.⁴ H01L 29/48, 27/14

U.S. Cl. 357-15

4 Claims



1. A Schottky barrier photodiode for detecting infrared radiation having a structure wherein:

- a p-type silicon substrate has a N+ type silicon guard ring, a metal silicide is within the boundary of the N+ guard ring, a relatively thin oxide passivation layer is formed on the metal silicide, and a thicker silicon dioxide passivation layer is formed on the remainder of the p-type silicon;
- said metal silicide is formed of at least two metals including platinum and palladium having a distribution with a maximum concentration below the silicon surface, with decreasing concentration on both sides of the maximum concentration; and
- a reflecting metal layer is formed on said relatively thin oxide passivation layer to reflect infrared radiation back to said metal silicide.

4,875,081

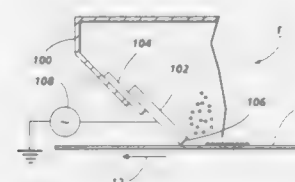
ELECTROPHOTOGRAPHIC DEVICE HAVING A.C. BIASED CLEANING MEMBER

William L. Goffe, Webster, and Joseph G. Schram, Liverpool, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 24, 1988, Ser. No. 261,869
Int. Cl.⁴ G03G 15/08, 15/00

U.S. Cl. 355-303

29 Claims



1. In an electrophotographic device having a charge retentive surface for development of latent images formed thereon with toner, a transfer station for transferring developed latent images to another surface, and means of cleaning residual toner remaining after transfer of the developed latent images from said charge retentive surface, said cleaning means comprising:

- a conductive cleaning member;
- said cleaning member supported adjacent to the charge retentive surface;
- an A.C. power supply, electrically connected to said cleaning member, and driving said cleaning member to produce an electric field at said charge retentive surface, whereby residual toner, remaining after transfer of the developed latent images from said charge retentive surface, is released from said charge retentive surface into a cloud as it approaches said cleaning member, and
- means for removing said clouded toner from the area adjacent to said cleaning member.

4,875,083

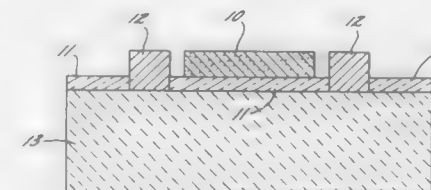
METAL-INSULATOR-SEMICONDUCTOR CAPACITOR FORMED ON SILICON CARBIDE

John W. Palmour, Raleigh, N.C., assignor to North Carolina State University, Raleigh, N.C.

Filed Oct. 26, 1987, Ser. No. 113,572
Int. Cl.⁴ H01L 29/24, 29/93, 29/94

U.S. Cl. 357-23.6

14 Claims



1. A variable capacitance metal-insulator-semiconductor capacitor with reduced series resistance and lesser leakage current, suitable for operation at high temperatures and high radiation densities, and comprising:

- a substantially variable capacitance doped semiconductor portion formed of silicon carbide having substantially uniform high resistivity for substantially varying the capacitance thereof when said doped semiconductor portion is depleted of carriers;
- a substantially constant capacitance portion of insulator material upon one surface of said silicon carbide semiconductor portion;
- a metal portion upon said substantially constant capacitance insulator portion for defining an active region of said silicon carbide semiconductor portion, and for variably depleting said active region of carriers when a bias is applied to said metal portion; and
- an ohmic contact upon said one surface of said silicon carbide semiconductor portion so that a bias applied to said

metal portion variably depletes said silicon carbide semiconductor portion of carriers, substantially varies the capacitance of said silicon carbide semiconductor portion, and correspondingly substantially varies the total capacitance of said capacitor.

4,875,084

OPTOELECTRIC TRANSDUCER

Shigeru Tohyama, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

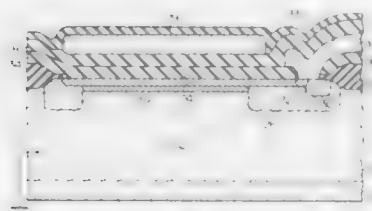
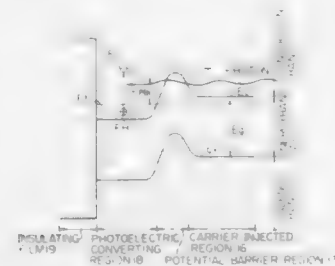
Filed Mar. 28, 1988, Ser. No. 174,464

Claims priority, application Japan, Mar. 26, 1987, 52-73240

Int. Cl.⁴ H01L 27/14, 31/06

U.S. Cl. 357—30

18 Claims



1. An optoelectric transducer operative to produce electric charges in the presence of incident light, comprising:

- a carrier injected region with a first conductivity type formed of a nondegeneratively doped semiconductor material;
- a potential-barrier region contiguous to said carrier injected region for producing a first homojunction and formed of a material selected from the group consisting of as first semiconductor material of said first conductivity type lower in impurity atom concentration than said carrier injected region, an intrinsic semiconductor material and a second semiconductor material of a second conductivity type opposite to said first conductivity type;
- a photoelectric converting region with said first conductivity type formed of a degeneratively doped semiconductor material and operative to produce hot majority carriers and hot minority carriers upon an illumination of said incident light, said hot majority carriers being injected into said carrier injected region, a second homojunction being formed between said potential-barrier region and said photoelectric converting region, said second semiconductor material having a thickness and an impurity atom concentration selected in such a manner as to be perfectly depleted due to depletion layers extending from said first and second homojunctions in at least an electric charge producing operation; and
- short-circuit means electrically interconnecting said photoelectric converting region and said potential-barrier region, in which a cut-off wavelength of said incident light is decided by a barrier height at said second homojunction, wherein said short-circuit means provides a

potential barrier lower than that between said potential-barrier region and said photoelectric converting region with respect to minority carriers produced in the photoelectric converting region.

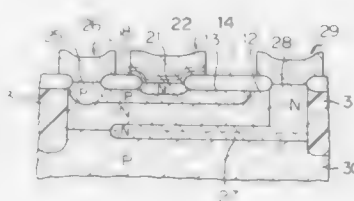
4,875,085

SEMICONDUCTOR DEVICE WITH SHALLOW N-TYPE REGION WITH ARSENIC OR ANTIMONY AND PHOSPHORUS

Katsunobu Ueno, and Osamu Hataishi, both of Yokohama, Japan, assignors to Fujitsu Limited, Kawasaki, Japan
Continuation of Ser. No. 915,522, Oct. 6, 1986, abandoned, which is a division of Ser. No. 640,577, Aug. 14, 1984, Pat. No. 4,629,520. This application May 17, 1988, Ser. No. 195,468
Claims priority, application Japan, Aug. 30, 1983, 58-159949
Int. Cl.⁴ H01L 29/72

U.S. Cl. 357—34

3 Claims



1. A semiconductor device, comprising:

- a single crystalline substrate;
- a p-type semiconductor epitaxial layer of single crystalline silicon formed on said single crystalline layer;
- an n-type region, formed in said p-type semiconductor epitaxial layer, comprising an upper subregion with phosphorous and at least one of arsenic and antimony diffused therein and a lower subregion, below the upper subregion, with the at least one of arsenic and antimony and substantially no phosphorous diffused therein;
- an insulation film, formed on said p-type semiconductor epitaxial layer, having a window at said n-type region;
- a first polycrystalline silicon film, formed on said n-type region and at the window in said insulation film, including silicon, phosphorous and the at least one of arsenic and antimony;
- a second polycrystalline silicon film, formed on said first polycrystalline film, including silicon and phosphorous, said first and second films having identical predetermined patterns; and
- a metal layer formed on said second polycrystalline silicon film, whereby said first and second polycrystalline silicon films and said metal layer form a contact structure for said n-type region.

4,875,086

SILICON-ON-INSULATOR INTEGRATED CIRCUITS AND METHOD

Satwinder D. S. Malhi, Garland; Chi-Cheong Shen; Kenneth E. Bean, both of Richardson, and Peng-Heng Chang, Dallas, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed May 22, 1987, Ser. No. 53,440

Int. Cl.⁴ H01L 23/08, 23/14, 23/10, 25/08

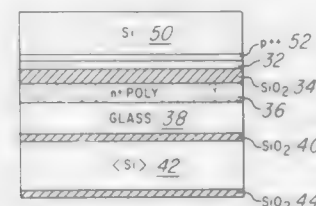
U.S. Cl. 357—54

13 Claims

1. An integrated circuit, comprising:

- a silicon layer with active devices;
- said silicon layer on an insulating layer;
- said insulating layer on a buffer layer; and
- a glass layer bonding said buffer layer to a substrate, said

glass layer of composition characterized by heating of a mixture of glass particles in a liquid between said buffer



layer and said substrate to partially drive off and partially decompose said liquid plus fire said glass particles.

4,875,087

INTEGRATED CIRCUIT DEVICE HAVING STRIP LINE STRUCTURE THEREIN

Akira Miyauchi, Kawasaki; Hiroshi Nishimoto, Tokyo; Tadaaki Okiyama; Hiroo Kitasagami, both of Kawasaki; Masahiro Sugimoto; Haruo Tamada, both of Yokohama, and Shinji Emori, Urawa, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

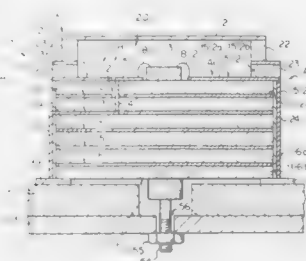
Continuation of Ser. No. 851,205, Apr. 14, 1986. This application Jul. 22, 1988, Ser. No. 222,303

Claims priority, application Japan, Apr. 13, 1985, 60-077550

Int. Cl.⁴ H01L 23/12, 23/14

U.S. Cl. 357—71

7 Claims



1. An integrated circuit device, comprising:

- a first insulation layer having top and bottom surfaces;
- a strip line layer formed on the top surface of said first insulation layer and having a first portion of a first width, a second portion of a second width smaller than said first width, and a third portion of a width greater than said second width;
- a second insulation layer formed on said second portion of said strip line layer;
- a semiconductor chip mounted on the top surface of said first insulation layer and electrically coupled to said strip line layer;
- a first conductive layer formed on the bottom surface of said first insulation layer;
- a second conductive layer formed on said second insulation layer;
- a wall portion formed on said second conductive layer; and
- a cap formed on said wall portion, said cap, said wall portion, said second conductive layer and said second insulation layer forming a hermetically sealed cavity, said first portion of said strip line layer being hermetically sealed within said cavity and, with said first insulation layer and said first conductive layer, forming a microstrip line structure having a first characteristic impedance, and said first insulation layer, said second portion of said strip line layer and said second insulating layer forming a triplate strip line structure having a second characteristic impedance equal to said first characteristic impedance.

4,875,088

SEMICONDUCTOR DEVICE HAVING A BACKPLATE ELECTRODE

Hidemitsu Egawa, Tokyo; Ritschiron Aoki, Ichikawa, and Katsuya Okumura, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 20, 1987, Ser. No. 28,386

Claims priority, application Japan, Mar. 29, 1986, 61-72116

Int. Cl.⁴ H01L 23/48

U.S. Cl. 357—67

28 Claims



1. A semiconductor device comprising:

- a semiconductor pellet having a top surface on which an integrated circuit is formed and a back surface formed by a semiconductor material; and
- backplate electrode means, including a metal nitride film having conductivity and an anti-oxidation property, said backplate electrode means being formed on the entire back surface of said pellet, for obtaining at said back surface of said pellet a substantially uniform backplate potential.

4,875,089

MULTI-STANDARD VECTORSCOPE

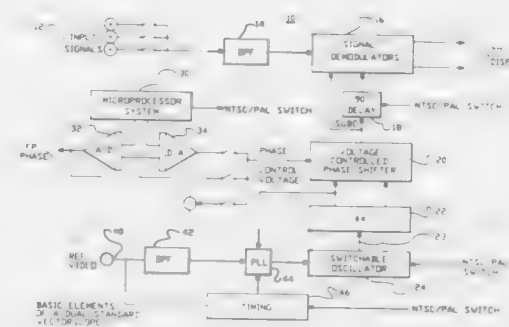
John L. Judge, Hillsboro, Oreg., assignor to Magni Systems, Inc., Beaverton, Oreg.

Continuation of Ser. No. 204,647, Jun. 9, 1988, abandoned. This application Mar. 22, 1989, Ser. No. 328,741

Int. Cl.⁴ H04N 17/02, 11/20

U.S. Cl. 358—10

6 Claims



1. A multi-standard vectorscope comprising

- demodulator means for receiving input video signals,
- switchable oscillator means connected to said demodulator means for generating at least first and second oscillator signals, said oscillator means connected to receive first and second standard color information signals which correspond to said first and second oscillator signals, respectively,
- control means for switching between said first and second oscillator signals depending upon whether said oscillator means receives said first or second standard signals,
- said demodulator means responsive to said first or second oscillator signals to demodulate said input video signals.

4,875,090

INFORMATION DATA TRANSMISSION SYSTEM

Makoto Shimokoriyama; Shinichi Yamashita; Naoto Abe, all of Kanagawa; Motokazu Kashida, Tokyo; Masahiro Takel, and Koji Takahashi, both of Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

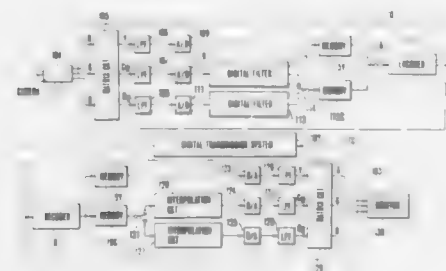
Filed Jan. 16, 1987, Ser. No. 3,941

Claims priority, application Japan, Jan. 27, 1986, 61-016387

Int. Cl.⁴ H04N 11/06

U.S. Cl. 358-12

14 Claims



1. An image information signal transmission system for transmitting an image information signal including at least a luminance information signal and a chrominance information signal, comprising:

(A) conversion means for receiving said luminance information signal and said chrominance information signal and for converting these signals to respective digital signals, thereby producing respective digital luminance information data and digital chrominance information data corresponding to said luminance information signal and said chrominance information signal;

(B) predictive encoding means for receiving said digital luminance information data and said digital chrominance information data and for predictively encoding both said data to produce respective predictively encoded digital luminance information data and predictively encoded digital chrominance information data corresponding to said digital luminance information data; and

(C) data output means for receiving said digital luminance information data and said digital chrominance information data produced by said conversion means and said predictively encoded digital luminance information data and said predictively encoded digital chrominance information data and, with regard to at least said digital luminance information data and said digital chrominance information data, for producing outputs of the digital luminance information data and the digital chrominance information data in such a manner that the amount of the digital luminance information data output corresponding to a predetermined amount of said luminance information signal received by said conversion means is equal to the amount of the digital chrominance information data output corresponding to a predetermined amount of the chrominance information signal received by said conversion means.

4,875,091

FIELD SEQUENTIAL COLOR IMAGING APPARATUS

Hidetoshi Yamada, Tokyo, and Tatsuo Nagasaki, Yokohama, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Mar. 16, 1988, Ser. No. 168,796

Claims priority, application Japan, Mar. 17, 1987, 62-61684

Int. Cl.⁴ H04N 9/04, 7/18, 9/67

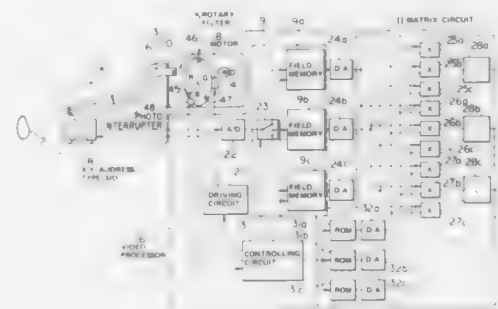
U.S. Cl. 358-42

12 Claims

1. A field sequential color imaging apparatus comprising:
a field sequential illumination means for illuminating an object by light having different wavelengths for each of several fields;
an imaging means comprised of an image forming lens for

forming an image of said object, and an X-Y addressed solid state imaging device disposed in the focal plane of said image forming lens;

a solid state imaging device drive means for applying a drive signal to said X-Y addressed solid state imaging device for each of said fields so as to allow a signal which has been photoelectrically converted by said solid state imaging device to be read out;



a memory means comprised of field memories for temporarily storing signals of corresponding fields which have been read out from said solid state imaging device; and
a matrix means for performing on a plurality of signals read out from said memory means a weighting which accounts for the timing at which said signals were read out from said solid state imaging device and for adding the weighted results so as to produce predetermined color video signals.

4,875,092

IMAGE FORMING APPARATUS WITH POSITIONING-MARK FORMING FUNCTION

Eiichi Yamanishi, Kawasaki; Yasuo Abuyama, Ebina, and Akihiko Someya, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

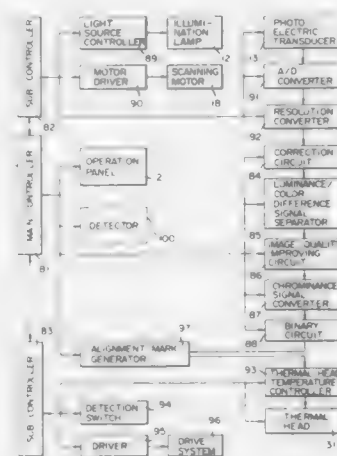
Filed Aug. 12, 1987, Ser. No. 84,560

Claims priority, application Japan, Aug. 15, 1986, 61-190599; Aug. 15, 1986, 61-191264

Int. Cl.⁴ H04N 1/46

U.S. Cl. 358-75

9 Claims



1. An image forming apparatus comprising:
scanning means for optically scanning an original to obtain color signals of different colors;
color converting means for converting the color signals from said scanning means into image formation signals of different colors;

determining means for determining whether the image forming medium is a normal paper sheet or a graphic arts film; image forming means for forming a single- or multi-color image on an image forming medium by using a single- or multi-color image transfer medium in accordance with one or a plurality of image formation signals outputted from said color converting means;
means for forming the image by controlling said image forming means in accordance with a determination result of said determining means;
generating means for generating a positioning-mark pattern; and
means for adding the positioning-mark pattern from said generating means to the single- or multi-color image when the image is formed by said image forming means.

4,875,093

ULTRAFAST CONTINUOUS IMAGING APPARATUS

Musubu Koishi; Yoshihiko Mizushima, and Hirofumi Kaa, all of Shizuoka, Japan, assignors to Hamamatsu Photonics Kabushiki Kaisha, Shizuoka, Japan

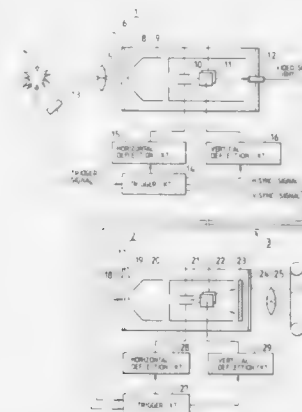
Filed Sep. 30, 1988, Ser. No. 251,595

Claims priority, application Japan, Sep. 30, 1987, 62-246894

Int. Cl.⁴ H04N 5/04, 5/08

U.S. Cl. 358-83

6 Claims



1. An ultrafast continuous imaging apparatus comprising:
image pickup means for converting light from an object to first electron beams, deflecting said first electron beams to produce electron signals corresponding to pixel groups each comprising at least one pixel and successively and continuously converting said electron signals to time-series light signals, and
image receiving means for converting said time-series light signals to second electron beams, deflecting said second electron beams in synchronism with said image pickup means and converting said deflected second electron beams to a reproduced image.

4,875,094

METHOD OF AND DEVICE FOR ESTIMATING MOTION IN A SEQUENCE OF PICTURES

Mohammad-Reza Haghighi, Fontenay-Aux-Roses, and Bertrand Boutros, Paris, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 8, 1988, Ser. No. 179,109

Claims priority, application France, Apr. 10, 1987, 87 05121

The portion of the term of this patent subsequent to Aug. 23, 2005, has been disclaimed.

Int. Cl.⁴ H04N 7/18, 7/12

U.S. Cl. 358-105

4 Claims

1. A method of estimating motion in a picture sequence in which each picture is divided into blocks of I×J elements, where I and J are integers greater than one, and in which the

luminosity of each element is expressed in a digital form and each of these blocks is defined by two coordinates (m,n), respectively, indicating the row of the picture line in which the block is present and the row of the block on this m-th line, characterized in that it comprises:

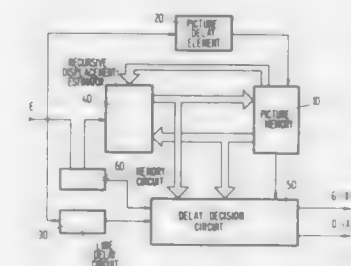
(A) preserving the preceding picture with respect to the current picture for constituting a reference picture;

(B) defining three groups for the blocks classified as fixed blocks, moving blocks and blocks referred to as exposed blocks, in which groups the blocks are classified with a delay of L blocks in accordance with the scanning of the picture by examining a given number of possible group sequences for the L blocks succeeding the current block X considered and in accordance with a given classification criterion, said criterion for the fixed and moving blocks being the difference in luminosity between two successive pictures, taking the displacement of the blocks of one picture with respect to the other into account for the moving blocks, and the difference in luminosity between two adjacent lines for the exposed blocks;

(C) constructing a classification tree whose 3^L branches at each successive level are equal in number to those of the possible groups and which correspond from the first to the Lth level to the sequences of possible groups for the L considered successive blocks of the picture sequence;

(D) associating two parameters with each branch of each level:

(a) a first parameter referred to as displacement vector representative of the possible displacement of the block



with respect to the picture or to the preceding line and determined, by means of a recursive displacement estimation method, for the central element which is representative of the said block;

(b) a second parameter referred to as accumulated distortion representative of the cumulative sum of the classification errors of the preceding blocks, the groups of these blocks being those of the tree branches traversed to arrive at the current branch, each classification error being rendered minimum by taking into account the influence of a displacement estimated for a block on the displacement estimated for the L following blocks, said influence being only examined, among the 3^L possible branches of the tree, for M branches of the weakest accumulated distortion referred to as surviving branches, where M is a limited number chosen to be substantially smaller than the maximum number of branches 3^L;

(E) in accordance with this procedure relating to L blocks, taking a decision of the majority type concerning the effective group and concerning the displacement vector of the block situated L blocks earlier with respect to the current block, said decision being taken by examining the surviving branches and by classifying each block situated L blocks earlier in the group to which the largest number of these surviving branches corresponds, the corresponding displacement vector being thus considered as the displacement of this block situated L blocks earlier, said decision procedure being identically repeated but for the L last blocks of the picture sequence in which one avoids taking a decision.

4,875,085

NOISE-SHAPING PREDICTIVE CODING SYSTEM

Shuichi Matsumoto, Fujimi, and Hitomi Murakami, Yokohama, both of Japan, assignors to Kokusai Denzetsu Deawa Kabushiki Kaisha, Tokyo, Japan

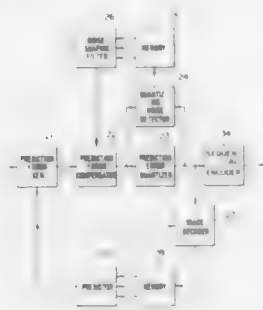
Filed Jan. 15, 1988, Ser. No. 207,121

Claims priority, application Japan, Jan. 30, 1987, 62-161351; Jan. 30, 1987, 62-161352

Int. Cl.⁴ H04N 7/137

U.S. Cl. 358—133

5 Claims



1. A noise-shaping, predictive coding method using information of already coded picture elements to obtain a predicted value of a next picture element to be coded, comprising: obtaining a prediction error value between an input picture element and said predicted value; obtaining a noise shaping filter value for compensating for said prediction error value from information of quantizing noise superimposed on said already coded picture elements; quantizing a difference value between the prediction error value and said noise shaping filter value into a predetermined quantization representative value; consolidating quantization representative values of several picture elements into one block; and coding the one block using a short or long code which is assigned in dependence on whether the probability of occurrence of the assigned code is high or low.

4,875,096

ENCODING OF AUDIO AND DIGITAL SIGNALS IN A VIDEO SIGNAL

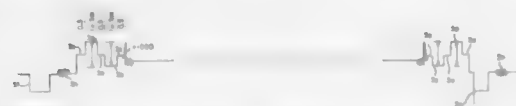
Ralph H. Beer, Manchester, N.H.; Kenneth J. Curran, Redondo Beach, and Jay Smith, III, Los Angeles, both of Calif., assignors to Smith Engineering, Calver City, Calif.

Filed Aug. 20, 1989, Ser. No. 898,268

Int. Cl.⁴ H04N 7/04

U.S. Cl. 358—143

4 Claims



1. A method of encoding multiple audio and digital signals into a video signal having a plurality of displayable video areas, each area comprising substantially the entire period between a pair of horizontal sync pulses, comprising the steps of: sampling the audio signals to produce a set of samples; amplitude modulating said samples onto sampling pulses; placing the amplitude modulated sampling pulses into a portion of each of a plurality of said displayable video areas; and encoding digital commands in the form of bits in the video signal, one bit occupying substantially the entire portion

of a selected one of said displayable video areas not allotted to the amplitude modulated sampling pulses.

4,875,097

PERSPECTIVE PROCESSING OF A VIDEO SIGNAL

Richard A. Jackson, Nevada City, Calif., assignor to The Grass Valley Group, Inc., Grass Valley, Calif.

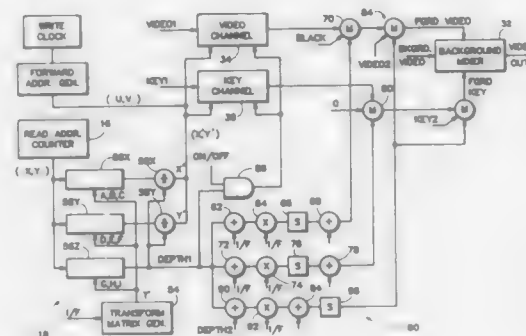
Continuation of Ser. No. 922,633, Oct. 24, 1986, abandoned.

This application May 26, 1988, Ser. No. 203,575

Int. Cl.⁴ H04N 3/223, 5/262

U.S. Cl. 358—180

19 Claims



12. Apparatus for processing a video signal comprising: means for generating a depth signal having a depth value for each pixel of a scene represented by the video signal; means for generating a perspective dim key signal from the depth signal; and means for combining the video signal with a black signal under control of the perspective dim key signal to produce a dimmed video signal.

4,875,098

OUTPUT SIGNAL PROCESSING CIRCUIT FOR CCD REGISTER

Isamu Yamamoto, and Takashi Asaida, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

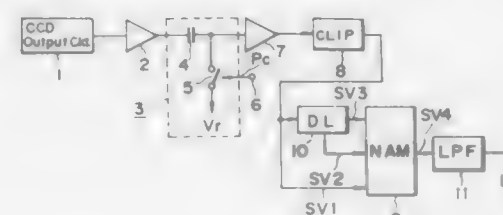
Filed Oct. 12, 1988, Ser. No. 256,407

Claims priority, application Japan, Oct. 20, 1987, 62-264808

Int. Cl.⁴ H04N 5/18

U.S. Cl. 358—213.16

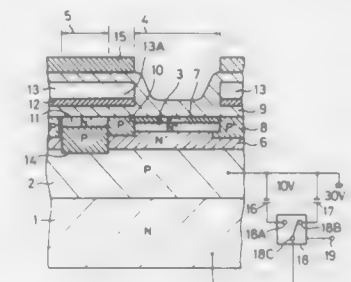
7 Claims



5. A solid-state video camera comprising: a solid-state image pickup device of charge coupled type (CCD type) including photo-sensitive elements arranged into a matrix; a plurality of vertical shift registers for shifting charges generated in said photo-sensitive elements in a vertical direction; and a plurality of horizontal shift registers each shifting a charge from a selected one of said vertical shift registers in a horizontal direction and generating a pulsed video information signal having a precharge duration, a reference duration and a signal duration repeatedly;

a plurality of output signal processing circuits connected to said horizontal shift registers respectively and each including a clamp circuit for clamping said pulsed video information signal in such a manner that the voltage of said reference duration becomes a stable clamp voltage; a plurality of selective delay means respectively supplied with the outputs of the clamp circuits for selectively delaying the same so that the delays imparted to the individual outputs of said clamp circuits become different from one another; and non-additive mixing circuit means supplied with the outputs of said selective delay means for generating a combined video information signal.

accumulated in a signal charge accumulating region formed on a surface side of said region of a second conductivity type to



4,875,099

DEVICE FOR MERGING PLURAL SENSOR OUTPUTS ONTO A SINGLE CONDUCTOR

Shunji Sakai; Tohru Kitagawa; Kunikazu Suzuki, and Naohiro Watanabe, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

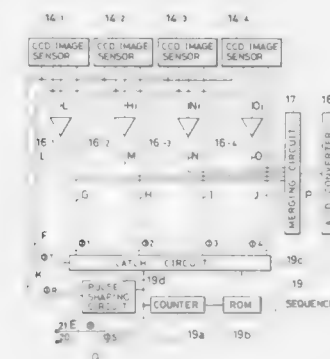
Filed May 23, 1988, Ser. No. 197,403

Claims priority, application Japan, May 22, 1987, 62-123692; May 22, 1987, 62-123693; May 22, 1987, 62-123694

Int. Cl.⁴ H04N 3/14

U.S. Cl. 358—213.11

17 Claims



1. A contact-type image scanner having a plurality of CCD image sensors arranged in a row, comprising: a timing control means for individually controlling at least one clock control signal for each of said CCD image sensors; and a merging circuit for merging output signals from said CCD image sensors into one merged signal output.

4,875,100

ELECTRONIC SHUTTER FOR A CCD IMAGE SENSOR

Kazuya Yonemoto; Yoshiaki Kagawa; Kikue Ishikawa; Tomoyuki Suzuki, and Masaharu Hamasaki, all of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Oct. 21, 1987, Ser. No. 110,844

Claims priority, application Japan, Oct. 23, 1986, 61-252375; Dec. 23, 1986, 61-307474

Int. Cl.⁴ H04N 5/335

U.S. Cl. 358—213.19

2 Claims

2. A method for utilizing a CCD image device as an electronic shutter for an electronic camera comprising the step of applying a voltage potential across a semiconductor substrate of a first conductivity type and a region of a second conductivity type formed upon said semiconductor substrate within a horizontal blanking period to thereby discharge signal charges

said semiconductor substrate within said horizontal blanking period.

4,875,101

SOLID STATE PHOTOVOLTAIC IMAGING DEVICE WITH EXCESS CHARGE ELIMINATOR

Yukio Endo, and Nozomu Harada, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

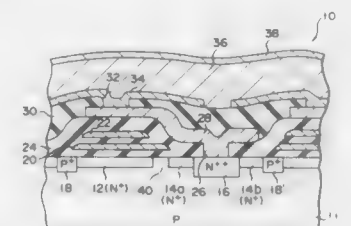
Filed Sep. 4, 1987, Ser. No. 94,002

Claims priority, application Japan, Sep. 11, 1986, 61-212557

Int. Cl.⁴ H04N 5/335

U.S. Cl. 358—213.19

8 Claims



1. An image sensing device comprising: (a) a CCD image sensor, comprising semiconductive cells which are aligned on a substrate to define picture elements of said image sensor and to form at least one linear cell array, a photosensitive layer which is arranged above said substrate, is conducted to said semiconductive cells, and photovoltaically generates charges upon incidence of image light thereonto, the charges being supplied to said semiconductive cells and stored therein, a vertical charge transfer section which is formed on said substrate and has a plurality of transfer electrodes aligned along said linear cell array, said vertical charge transfer section having first and second end portions, a horizontal charge transfer section provided on said substrate to be coupled to the first end portion of said vertical charge transfer section, and a semiconductive drain layer provided on said substrate to be coupled to the second end portion of said vertical charge transfer section; and (b) driver means, electrically connected to said image sensor, for (i) in a signal charge readout mode of said image sensor, driving said vertical charge transfer section to move charges flowing from said linear cell array in a first transfer direction and to partially transfer the charges to said horizontal charge transfer section, and for (ii) in an excess charge sweep-out mode performed in a vertical blanking period of said image sensor, driving said vertical charge transfer section to move residual charges left therein in a second transfer direction opposite to the first transfer direction and to transfer the charges to said drain layer,

whereby the residual charges are discharged to said drain layer as excess charges.

4,875,102

AUTOMATIC CORRECTING OF PICTURE UNSTEADINESS IN TELEVISION FILM SCANNING
Dieter Poetsch, Ober-Ramstadt, Fed. Rep. of Germany, assignor to BTS Broadcast Television Systems GmbH, Darmstadt, Fed. Rep. of Germany

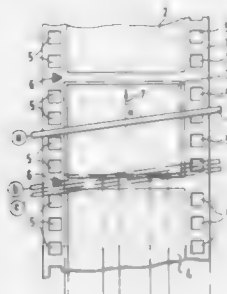
Filed Oct. 24, 1988, Ser. No. 261,973

Claims priority, application Fed. Rep. of Germany, Oct. 30, 1987, 3736789

Int. Cl.⁴ H04N 5/253

U.S. Cl. 358—214

49 Claims



1. Method of detecting and electronically correcting picture unsteadiness in television scanning of continuously advancing motion picture films comprising the steps of:

scanning, at an oblique angle (α) to the direction of advance of the film, by means of a light source and a light sensor, reference features of the film which are selected from the group consisting of sprocket holes of the film, marks produced photographically on the film outside picture boundaries, picture edge boundaries and picture content features determined by picture to picture comparison to be stationary in the picture, in order to produce a scanned position signal pattern, first doing so to produce a reference position signal pattern and then storing said reference signal pattern in a reference pattern memory and thereafter repeating the scanning for transmission of television pictures and producing a currently observed position signal pattern relating to the scanned referenced features; comparing said reference signal pattern and said currently observed position signal to produce a difference signal; deriving from said difference signal at least one horizontal correction signal for horizontal picture position correction and at least vertical correction signal for vertical picture position correction and performing, by means of said horizontal and vertical correction signals, electronic compensation of horizontal and vertical unsteadiness in television pictures of scanned motion picture film frames.

4,875,103

APPARATUS AND METHOD FOR ALIGNING A REPOSITIONABLE IMAGING SENSOR WITH A PHOTOGRAPHIC IMAGE IN A FILM VIDEO SYSTEM
Mark E. Bridges, Spencerport; Robert W. Easterly, Churchville, and John R. Fredlund, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 19, 1988, Ser. No. 233,783

Int. Cl.⁴ H04N 3/36

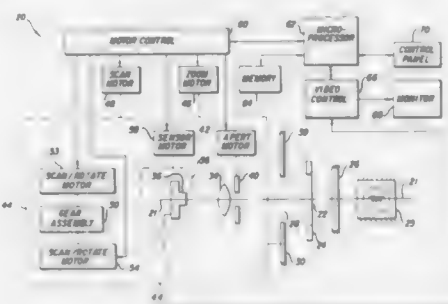
U.S. Cl. 358—214

11 Claims

1. Apparatus which transfers to video an image previously recorded on a photographic medium such as film or a print, said apparatus comprising:

a. sensor means for generating a first output signal in response to light energy;

- b. light means for directing light energy toward the sensor
- c. means for masking at least part of the light energy from reaching the sensor means;
- d. means, responsive to the first output signal, for detecting a remaining part of the light energy which reaches the sensor means; and



- e. means for repositioning the sensor means relative to the masking means until a change in the amount of light reaching the detecting means is determined in order to identify an edge of the masking means, the repositioning means including: (i) means for moving the sensor means relative to the masking means and (ii) means for generating an edge signal when an edge of the mask is identified, the moving means being responsive to the edge signal in order to orient the sensor means relative to the masking means.

4,875,104

DOCUMENT SHEET POSITION DETECTING DEVICE FOR IMAGE FORMING APPARATUS
Kouichi Kamon, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

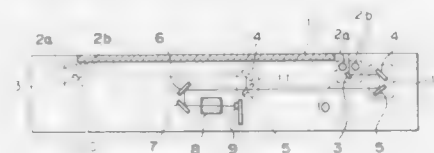
Filed May 11, 1988, Ser. No. 192,522

Claims priority, application Japan, May 13, 1987, 62-114465

Int. Cl.⁴ H04N 1/00, 1/40

U.S. Cl. 358—400

35 Claims



1. A document sheet position detecting device for optically detecting the extension of an image bearing document sheet by a raster scanning operation, comprising:

- a document sheet cover for pressing said document sheet onto a contact glass platen, said cover being colored by a certain predetermined color;
- illumination means for illuminating the surface of said image bearing document sheet;
- an optical system for passing light rays reflected by said surface of said image bearing document sheet;
- a photoelectric converter element for receiving light rays and for converting said light rays into electric signals;

digital converter means for converting the outputs from said photoelectric converter element into digital signals;

an optical filter for shielding light rays reflected by said document cover and for transmitting therethrough light rays reflected by the background of said image bearing document sheet during a document sheet position detecting operation, said optical filter being interposed in the optical path of the reflected light during the document sheet position detecting operation and retracted from the optical path of the reflected light during the normal image read-out operation; and

data processing means for detecting at least one end of said image bearing document sheet by processing positional data fed from said photoelectric converter means, the positional data indicating said document sheet cover being differentiated from the positional data indicating the background of said image bearing document sheet by the difference in quantity of light rays reflected by said background of said image bearing document sheet and passing through said optical filter to be received by said photoelectric converter means.

4,875,105

VIDEO SIGNAL PROCESSING DEVICE
Kazuhito Ohashi, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 894,127, Aug. 7, 1986, abandoned. This application Jan. 7, 1988, Ser. No. 144,591

Claims priority, application Japan, Aug. 7, 1985, 60-172440; Aug. 7, 1985, 60-172441

Int. Cl.⁴ H04N 9/07, 9/81, 11/10

U.S. Cl. 358—310

12 Claims



1. A video signal processing device, comprising:
- image sensing means for permitting non-destructive read-out;
- clock pulse generating means for generating clock pulses in one horizontal scanning period, said clock pulse generating means being arranged so as to generate first clock pulses having a first frequency during a first period shorter than said horizontal scanning period, and so as to generate second clock pulses having a second frequency higher than said first frequency during a second period other than said first period in said one horizontal scanning period; and
- signal processing means for forming a first video signal by using a signal put out from said image sensing means by driving said image sensing means with said first clock pulses generated by said clock pulse generating means, and a second video signal by using a signal put out from said image sensing means by driving said image sensing means with said second clock pulses generated by said clock pulse generating means, said to put said first and second video signals in the horizontal scanning period in a time-division multiplexing manner.

4,875,106

METHOD AND APPARATUS FOR CONCEALING ERRORS IN REPRODUCED DIGITAL SIGNALS UTILIZING FIR FILTER

Jürgen Heitman, Alsbach/Hühnelein, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

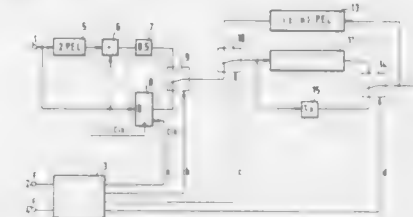
Filed May 24, 1988, Ser. No. 198,133

Claims priority, application Fed. Rep. of Germany, Jan. 11, 1987, 3719405

Int. Cl.⁴ H04N 5/94

U.S. Cl. 358—314

8 Claims



1. Method of concealing errors in the reproduction of recorded digital video signals comprising successions of digital words corresponding to pixels, comprising the steps of:
- detecting erroneous pixel words and replacing them with artificial pixel words marking the presence of an erroneous pixel while also supplying an error designating signal in timed relation to each said artificial pixel word;
- passing successive pixel words through a finite-impulse-response (FIR) digital filter for correction of erroneous pixel words under control of a signal derived from said error designating signals when said erroneous pixel words respectively are in a central position in said FIR filter, and transmitted to said FIR filter in the event that more than one erroneous pixel word is to be present at the same time in said filter, said auxiliary pixel words being derived from values of pixels neighboring the pixel represented by the erroneous pixel word to be replaced thereby.

4,875,107

CAMCORDER

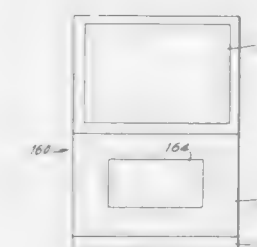
Thomas Heidt, Long Valley, N.J., and James C. Wickstead, Pitney Rd. and W. Main, Mendham, N.J. 07945, assignors to James C. Wickstead, Mendham, N.J.

Filed Dec. 4, 1986, Ser. No. 938,087

Int. Cl.⁴ H04N 5/78

U.S. Cl. 360—9.1

72 Claims



1. A video apparatus for storing video images on a recording medium, comprising:
- camera means for converting light images into electrical video signals; the camera means including lens means for focusing light and first integrator means for integrating the light focused by the lens means; the lens means being an aspheric lens;
- processing means coupled to the camera means including means for converting the electronic video signals into a low bandwidth frequency modulated storage signal with a

bandwidth substantially lower than a standard television video signal; and recording means coupled to the processing means for storing the low bandwidth frequency modulated storage signal on an audio cassette having a standard speed allowing storage of an audio bandwidth signal, the recording means including drive means for driving the audio cassette at higher than normal speed to increase the bandwidth storage capacity of the audio cassette and recording head means for storing the low bandwidth frequency modulated storage signal on the audio cassette.

4,875,108

PHASE LOCK LOOP

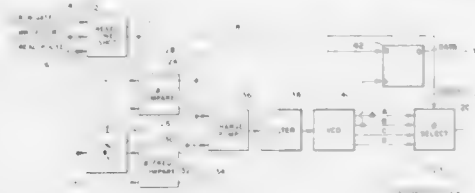
Vadim B. Minuhin, Bloomington; Evgeny J. Berzon, St. Louis Pk., and Vernon F. VonDeylen, Bloomington, all of Minn., assignors to Magnetic Peripherals Inc., Minneapolis, Minn.

Filed Aug. 2, 1988, Ser. No. 227,216

Int. Cl.⁴ G11B 5/09; H03L 7/00

U.S. Cl. 360—51

7 Claims



1. A phase lock loop comprising compare means responsive to an input signal and to a clock signal for determining the phase difference between said input signal and said clock signal; charge pump means responsive to the phase difference determined by said compare means for providing a pump signal; oscillator means responsive to said pump signal for providing a periodic signal having a frequency determined by said pump signal; phase shift means responsive to said oscillator means for providing a plurality of signals each at said frequency of said periodic signal and each phase shifted from the others of said plurality of signals by a predetermined amount; and phase select means for selecting the one of said plurality of signals whose phase is closest to the phase of said input signal, and providing said selected one signal as said clock signal.

4,875,109

RECORD/NOT RECORD LATCH FOR RECORDING CASSETTE

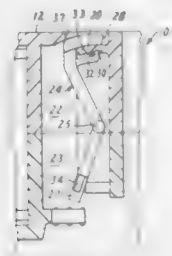
Robert L. Hanson, East Bethel, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 9, 1988, Ser. No. 191,342

Int. Cl.⁴ G11B 15/04, 23/02

U.S. Cl. 360—60

8 Claims



1. A recording cassette formed to provide a record/not record opening extending through both an under wall of the cassette and a top wall which is visible when the cassette is in place on a recorder, a latch which is pivotable between two

positions wherein a plug at one extremity of the latch either blocks or unblocks the record/not record opening at said under wall of the cassette while the other extremity of the latch can either be seen or unseen at the opening in said visible wall of the cassette, depending upon the position to which the latch has been pivoted.

4,875,110

ROTARY HEAD APPARATUS WITH MOTOR MAGNET AND YOKE SURROUNDING MOTOR STATOR COIL

Saburo Kazama, Hiratsuka, and Akira Tamura, Ibaraki, both of Japan, assignors to Hitachi Ltd., Tokyo, Japan

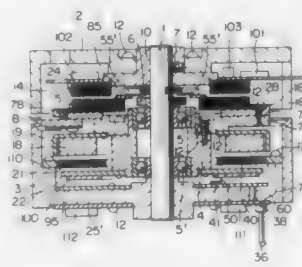
Filed Oct. 8, 1986, Ser. No. 917,068

Claims priority, application Japan, Oct. 9, 1985, 60-223559

Int. Cl.⁴ G11B 15/61

U.S. Cl. 360—64

15 Claims



1. A rotary head apparatus comprising:
a hollow upper cylindrical drum;
a hollow lower cylindrical drum forming a pair with said upper drum;
a center shaft for fixedly connecting said upper and lower drums;
rotary head means rotatably received in a hollow space defined by said upper and lower drums and including a plurality of magnetic heads;
bearing means for rotatably supporting said rotary head means around said center shaft;
brushless motor of flat formation type including a stator coil fixed to said hollow lower cylindrical drum and motor magnetic circuit means having a magnet and a cooperating member disposed in opposition to said magnet, said stator coil having a respective coil pole thereof disposed in a plane perpendicular to the rotation axis of said center shaft and said magnet having a respective magnetic pole thereof disposed in a plane perpendicular to the rotation axis of said center shaft, said stator coil being sandwiched between said magnet and said cooperating member and said magnet and said cooperating member being integrally fixed to said rotary head means; and
a rotary transformer mounted between said hollow upper cylindrical drum and said rotary head means, and an opening mounted on a side wall of said hollow upper cylindrical drum for leading outwardly wiring members of said rotary transformer mounted within said hollow upper cylindrical drum.

4,875,111

APPARATUS FOR REPRODUCING A DIGITAL SIGNAL

Kentaro Odaka, Tokyo; Tadashi Fukami, and Shinya Ozaki, both of Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Aug. 19, 1987, Ser. No. 87,093

Claims priority, application Japan, Aug. 21, 1986, 61-196020

Int. Cl.⁴ G11B 15/14

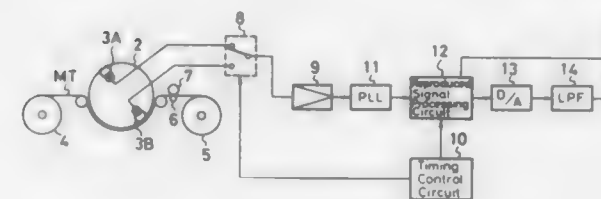
U.S. Cl. 360—64

10 Claims

1. Apparatus for reproducing a digital signal recorded in a track formed on a tape by a recording apparatus having rotary

head rotating at a predetermined speed and mounted on a rotary drum having a predetermined diameter, the reproducing apparatus comprising:

a rotary drum;
n rotary heads mounted on the rotary drum, where n is an integer;
driving means for rotating said n rotary heads at a speed at least twice the predetermined rotation speed of the rotary head of the recording apparatus;



guiding means for wrapping the tape on the periphery of the rotary drum with a wrap angle of $360^\circ/n$; and demodulating means connected to the rotary heads and supplied with all digital signals reproduced by said n rotary heads during each rotation of each of the rotary heads and for demodulating the reproduced digital signals.

4,875,112

COMPOUND PULSE DIMMING CIRCUITRY FOR CONDITIONING READBACK SIGNALS

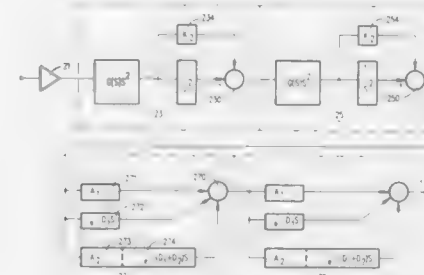
Martin H. Dost; Emil Hopner; Constantin M. Melas, all of Los Gatos, and Lionel D. Provazek, Campbell, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 31, 1985, Ser. No. 815,110

Int. Cl.⁴ G11B 5/035

U.S. Cl. 360—65

23 Claims



1. Apparatus for conditioning pulse signals representing digital data, said apparatus comprising:
delay line equalizer means for equalizing the pulse signals;

and
filter equalizer means coupled to said delay line equalizer means for complementarily equalizing said pulse signals, and including a first path for filtering the pulse signals and to provide filtered pulses at an output, a second path for feeding forward a signal representing the time derivative of said filtered pulse signals at an output, and combining means for combining the signals at the output of the first and second paths.

4,875,113

AUTOMATIC STOPPING DEVICE FOR A TAPE FEEDING APPARATUS

Tadao Arata, Inagi, Japan, assignor to Tanashin Denki Co., Ltd., Tokyo, Japan

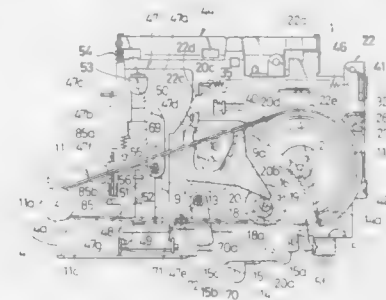
Filed Dec. 28, 1987, Ser. No. 138,915

Claims priority, application Japan, Aug. 14, 1987, 62-124345; Aug. 14, 1987, 62-124346

Int. Cl.⁴ G11B 15/48, 15/22; B65H 59/33

U.S. Cl. 360—74.2

19 Claims



1. An automatic stopping device for a tape feeding apparatus which includes a capstan shaft, a reel shaft, a motor for normally rotating said capstan shaft and said reel shaft, and a switch for interrupting energization of said motor to stop rotation of said capstan shaft and said reel shaft, comprising a turning force transmitting member connected to said motor via said capstan shaft, a pivotal member supporting said turning force transmitting member for rotation thereon and mounted for pivotal motion between an operative position in which transmission of a turning force from said turning force transmitting member to said reel shaft is enabled and an inoperative position in which transmission of a turning force is disabled, said switch being located for operation by said pivotal member so as to deenergize said motor in response to the inoperative position of said pivotal member, means for biasing said pivotal member toward the operative position, frictional coupling means interposed between said turning force transmitting member and said reel shaft, detecting means for detecting stopping of rotation of said reel shaft, operating means on said turning force transmitting member operable when said detecting means detects stopping of rotation of said reel shaft for cooperating with said detecting means to pivot said pivotal member from the operative to the inoperative position, and a movable member mounted for movement between an operative mode position and a rest mode position and operable upon movement thereof from the operative mode position to the rest mode position after stopping of said motor for disabling cooperation between said detecting means and said operating member.

4,875,114

SYSTEM FOR DETECTING A REFERENCE TRACK ON A DISK SURFACE IN A DISC STORAGE UNIT

Eiji Moteki, Kawasaki, Japan, assignor to Fuji Electric Company Ltd., Kawasaki, Japan

Filed Oct. 9, 1987, Ser. No. 106,882

Claims priority, application Japan, Dec. 3, 1986, 61-288008

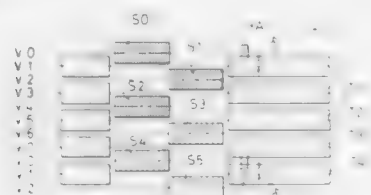
Int. Cl.⁴ G11B 5/596

U.S. Cl. 360—77.08

15 Claims

1. A system for detecting a reference track on a disc surface in a disc storage unit wherein the disc surface has a plurality of tracks and servo information for indicating an off-track amount of a position of a read/write head relative to said tracks is written on said disc surface, comprising:
said servo information having first servo information for identifying said reference track of said tracks and second servo information associated with the remaining tracks other than said reference track;

means for reading out said servo information by said read/write head;
 means for judging whether the servo information read out is said first servo information or said second servo information; and
 means for detecting said read/write head is on said reference track when said means for judging judged said first servo information;



wherein said servo information is written in such a way that said servo information interrupts a part of said track, and that the center of an area onto which said servo information is written is deviated by about one half the distance between said tracks relative to the center of said track, and each servo information is written onto said area in such a way that each successive area is alternately deviated in the longitudinal direction of said track between two adjacent tracks.

4,875,115

DIGITAL SIGNAL TAPE RECORDING/REPRODUCING APPARATUS WITH IMPROVED SERVO CONTROL
 Seichi Yokosawa, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Sep. 8, 1987, Ser. No. 93,470

Claims priority, application Japan, Sep. 5, 1986, 61-208055; Sep. 5, 1986, 61-208056

Int. Cl. G11B 5/584, 15/467

U.S. Cl. 360-77.15

4 Claims



1. A digital signal reproducing apparatus having at least two rotary heads for reproducing a plurality of signals on a recording medium, said plurality of signals containing digital signals, a tracking pilot signal composed of a low-frequency signal, and a sync signal, wherein said plurality of signals are recorded on each of a plurality of helical tracks in a predetermined format with a recording region in one track being independent of a recording region in another track along a longitudinal direction, positions of the pilot signals recorded on three consecutive tracks differ from one track to another, and different sync signals are recorded in different respective positions on adjacent tracks, each of said rotary heads has a width greater than the width of each track, and upon obtaining amounts of crosstalk between pilot signals of a current track and of two tracks adjacent to the current track being reproduced, said crosstalk amounts being provided at outputs of the respective rotary heads by scanning each of the tracks, a capstan servo is con-

trolled in accordance with a difference between the amounts of crosstalk of the pilot signals that are picked up by said rotary heads from the two tracks adjacent to the current track being reproduced, the improvement comprising:

means for detecting a sync signal;
 means for sampling, from output signals of said rotary heads, levels of frequency components of said pilot signals and holding said levels in response to said sync signal detected by said sync detection means;
 means for comparing said levels being held in said sampling and holding means with a predetermined level; and
 means for deciding whether a difference in level between a level being held in said sampling and holding means and levels of the pilot signal frequency components in the output signals of the respective rotary heads reproduced after a predetermined period of time from the detection of said sync signal by said sync detection means is supplied to said capstan servo as a signal representative of an amount of track deviation.

4,875,116

TRANSDUCER POSITION CONTROL SYSTEM FOR DATA TRANSFER APPARATUS EMPLOYING DISKLIKE RECORD MEDIA

Kazuhiko Yasuda, Fussa, and Sumio Wada, Koga, both of Japan, assignors to Teac Corporation, Tokyo, Japan

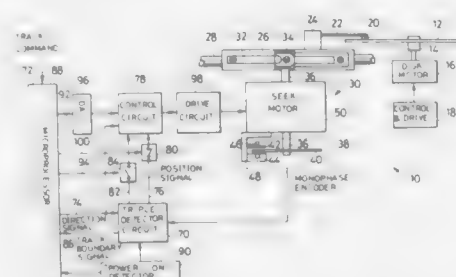
Filed Feb. 9, 1988, Ser. No. 153,999

Claims priority, application Japan, Feb. 19, 1987, 62-37414

Int. Cl. G11B 5/596

U.S. Cl. 360-78.11

7 Claims



1. In an apparatus for data transfer with a disklike record medium having a multiplicity of concentric data tracks formed thereon with a predefined pitch, there being a centerline on each data track and boundaries between the data tracks, in combination:

(a) means for imparting rotation to the record medium;
 (b) a transducer for data transfer with the record medium;
 (c) positioning means including an electric seek motor for transporting the transducer across the data tracks on the record medium in order to position the transducer on any desired track;
 (d) an encoder comprising:

(1) a fixed member having an aperture defined therein;
 (2) a movable member disposed opposite the fixed member and bidirectionally movable relative to the fixed member in step with the transducer, the movable member having defined therein a multiplicity of equally spaced apertures, with nonapertured parts intervening therebetween, which are arranged in a row in the direction of the movement of the movable member, each aperture of the movable member being defined in part by a pair of opposed side edges of the movable member extending across the direction of the movement of the movable member, each aperture and each nonapertured part of the movable member having a centerline extending across the direction of the bidirectional movement of the movable member, the dimensions of each aperture and each nonapertured part of the movable member as measured substantially in the direction of the movement

of the movable member being equal to each other and to the pitch of the data tracks on the record medium, the movable member and the record medium being in prescribed phase relation to each other such that the centerlines of the apertures and nonapertured parts of the movable member correspond to the boundaries of the data tracks on the record medium and the side edges of the apertures correspond to the centerlines of the data tracks;

- (3) a light source; and
- (4) a photodetector to be irradiated by the light source when each aperture in the movable member comes into register with the aperture in the fixed member, the photodetector providing an electric output which varies in magnitude depending upon the intensity of irradiation by the light source;
- (e) a detector circuit connected to the photodetector of the encoder for deriving from its output a transducer position signal indicative of the position of the transducer with respect to the data tracks on the record medium; the detector circuit comprising:
 - (1) a phase inverter circuit connected to the photodetector of the encoder;
 - (2) a comparator having an input connected directly to the photodetector and another input connected to the phase inverter circuit for providing an output indicative of the results of comparison between the two inputs;
 - (3) a track boundary detector circuit connected to the photodetector for providing a series of track boundary pulses representative of the boundaries between the data tracks on the record medium;
 - (4) a flip flop circuit means connected to the comparator and to the track boundary detector circuit for latching the output from the comparator on being clocked by the track boundary pulses and for providing first and second outputs having a phase difference of 180 degrees;
 - (5) a first position signal switch connected to the photodetector for passing the output therefrom when actuated by the first output from the flip flop circuit means;
 - (6) a second position signal switch connected to the phase inverter circuit for passing the output therefrom when actuated by the second output from the flip flop circuit means; and
 - (7) output circuit means for combining the outputs from the first and second position signal switches to provide the transducer position signal; and
 - (f) control circuit means connected to the detector circuit and to the seek motor of the positioning means for controlling the seek motor in response to the transducer position signal in order to position the transducer on any desired data track on the record medium in centerline alignment therewith.

4,875,117

DIGITAL HEAD POSITIONER ASSEMBLY
 Arnold Slezak, Newbury Park, and Lloyd Levy, Northridge, both of Calif., assignors to Micropolis Corporation, Chatsworth, Calif.

Continuation-in-part of Ser. No. 113,614, Oct. 26, 1987, Pat. No. 4,796,122, which is a continuation-in-part of Ser. No. 944,466, Dec. 19, 1986, Pat. No. 4,754,353. This application Dec. 29, 1988, Ser. No. 291,695

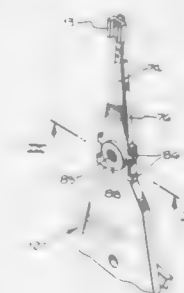
Int. Cl. G11B 5/55, 17/02, 21/08

U.S. Cl. 360-98.01

19 Claims

1. A Winchester type digital storage system comprising: a plurality of hard storage disks spaced apart from one another and mounted coaxially, said disks having magnetizable surfaces; means for rotating said storage disks; a plurality of magnet heads for reading and writing digital information on the surfaces of said disks; head positioning means for mounting said heads in proximity to the surfaces of said disks, and for shifting the position of said heads across said disks, said head positioning means

including individual spring load beam mounting means for each head, and a main rotatable integral metal positioner body member, said integral metal positioner member having a central opening; bearing means engaging said central opening for rotatably mounting said positioner member about a central axis; said positioner body member including rigid integral arms extending outwardly to support said spring mounting means, said integral arms and said body member being a single homogeneous structure free of any joints;



the outward extent of said rigid arms from said central axis being substantially greater than the length of said spring mounting means; and said load beam mounting means having holes at their inner ends overlying said arms, and being secured to the ends of said arms by mounting plates overlying said holes, with material from said mounting plates extending through the holes in said load beam means and into rigid bonding engagement with said arms.

4,875,118

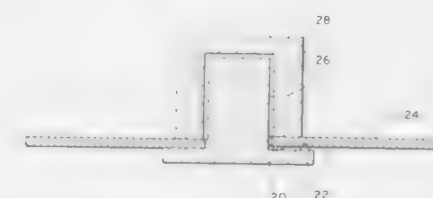
REDUCING HARMFUL RUNOUT IN A RIGID MAGNETIC DISK THROUGH USE OF SHIMS
 Farid Kaymaram, Cambridge, Mass., assignor to Magnetic Peripherals Inc., Minneapolis, Minn.

Filed Apr. 4, 1988, Ser. No. 176,968

Int. Cl. G11B 17/02

U.S. Cl. 360-99.12

2 Claims



1. In a magnetic disk drive having a drive spindle and a disk support supporting a rigid magnetic disk and a clamp pressing said magnetic disk against said disk support, the improvement comprising a sized shim sandwiched between said magnetic disk and said disk support adjacent said disk spindle at a single location about a segment of the circumference of said disk spindle, said sized shim having a thickness sized as to form a substantially smooth sinusoidal circumferential profile to said magnetic disk.

4,875,119

HEAD LOADING MECHANISM FOR FLEXIBLE DISC DRIVE

Yashiko Ando, Tachikawa; Yasushi Noda, Tokyo, and Yohji Abe, Kiyose, all of Japan, assignors to Teac Corporation, Tokyo, Japan

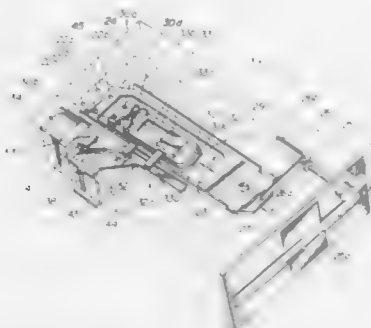
Filed Mar. 2, 1988, Ser. No. 162,999

Claims priority, application Japan, Mar. 3, 1987, 62-30912[U]; Mar. 3, 1987, 62-30913[U]; Mar. 5, 1987, 62-32474[U]

Int. Cl.⁴ G11B 5/54

U.S. Cl. 360—105

14 Claims



1. A head loading mechanism for a flexible disc drive unit, for bringing into contact and withdrawing a magnetic read/write head with and from a flexible magnetic disc, comprising: disc loading means rotatably supported in the disc drive unit, for positioning the magnetic disc at a fixed position where the magnetic disc is rotatably held; head loading means rotatably supported in the disc drive unit, for carrying the magnetic head; head load bail means rotatably supported in the disc drive unit, for positioning the magnetic head over the magnetic disc with a gap (g₁) in a state where the bail means makes contact with the head loading means; bail urging means for urging the bail means in a direction in which contact is made between the bail means and the head loading means so that the magnetic head is withdrawn from the magnetic disc; driving means for driving the bail means to be disengaged from the head loading means against a force due to the bail urging means to bring the magnetic head into contact with the magnetic disc; and adjusting means for adjusting a rotational position of the bail means with respect to the head loading means so that the gap (g₁) is varied, the adjusting means being mounted on the bail means to rotate together with the bail means and engaging with the disc loading means so as to determine the rotational position of the bail means with respect to the head loading mechanism.

4,875,120

HEAD DRIVING APPARATUS WITH COARSE AND FINE ADJUSTMENTS

Kiyoshi Takahashi, Tokyo, and Masayuki Noda, Kanagawa, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Aug. 16, 1988, Ser. No. 232,780

Claims priority, application Japan, Aug. 18, 1987, 62-204334; Oct. 31, 1987, 62-167547[U]

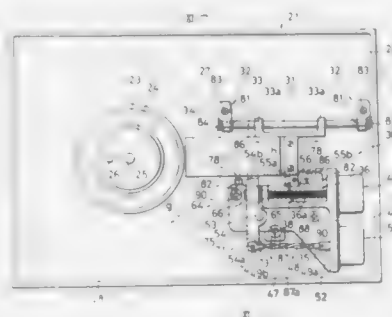
Int. Cl.⁴ G11B 5/54

U.S. Cl. 360—106

10 Claims

2. A head driving apparatus for displacing a head to record on and/or to reproduce from recording mediums, the head driving apparatus comprising: a lead screw to which the head is movably attached; a first motor rotatively driving the lead screw to coarsely displace the head;

a plurality of slender rods, affixed at respective ends to one another; a second motor for turning one end of the affixed slender rods; urging means for applying a force to urge the other end of the affixed slender rods in a direction of stretching the slender rods; holding means for holding the other end of the affixed slender rods proximal the urging means in a nonrotatable state; and fine drive means for finely displacing the lead screw in the



axial direction thereof, the fine drive means being connected to the other end of the affixed slender rods proximal the urging means, whereby the head is coarsely displaced due to rotation of the lead screw driven by the first motor, and finely displaced in the axial direction of the lead screw due to fine displacement of the lead screw by the fine drive means connected to the affixed slender rods, when the one end of the affixed slender rods is turned by the second motor to intertwine the slender rods with one another and the other end of the affixed slender rods is finely displaced against the force of the urging means.

4,875,121

MAGNETIC HEAD SUPPORTING DEVICE

Yoshito Tanaka, and Nobuhiro Umebayashi, both of Ibaraki, Japan, assignors to Hitachi Maxell, Ltd., Ibaraki, Japan

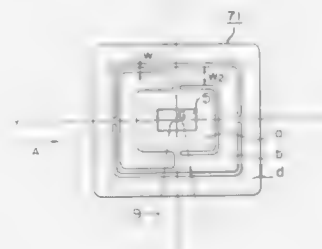
Filed May 8, 1987, Ser. No. 47,154

Claims priority, application Japan, May 12, 1986, 61-109161

Int. Cl.⁴ G11B 5/56, 21/24

U.S. Cl. 360—129

4 Claims



1. A magnetic head supporting device for supporting at least one magnetic head making contact with a flexible magnetic disk so as to record and reproduce signals on and from said flexible magnetic disk in a running direction, said magnetic supporting device comprising: a gimbal spring having one surface side near to said flexible magnetic disk and another surface side remote from said flexible magnetic disk and further having a central portion

with a center point to which said magnetic head is secured on said one surface side; and a pivot making contact with said center portion on said another surface side so as to support said magnetic head through said gimbal spring; wherein said gimbal spring includes an intermediate frame portion which supports said central portion in such a manner as to impart thereto a degree of freedom of rotation about a first axis passing through said center point orthogonally to said running direction and which has a first portion upstream of said first axis as viewed in the running direction and a second portion downstream of said first axis, said intermediate frame portion having a shape symmetric with respect to a second axis passing through said center point and extending orthogonally to said first axis; and an outer holding portion which supports said intermediate frame portion in such a manner as to impart thereto a degree of freedom of rotation about said second axis, the width of said first portion of said intermediate frame portion, measured along said first axis, being larger than the width of said second portion so that intermediate frame portion is asymmetrical with respect to said first axis such that said gimbal spring has a greater spring stiffness downstream of said first axis than upstream of said first axis as views in the running direction to prevent lifting of the magnetic head from the flexible magnetic disc.

4,875,122

HEAD TRANSPORT ASSEMBLY HAVING SIMPLIFIED MUTUALLY INDEPENDENT POSITIONAL ADJUSTMENTS

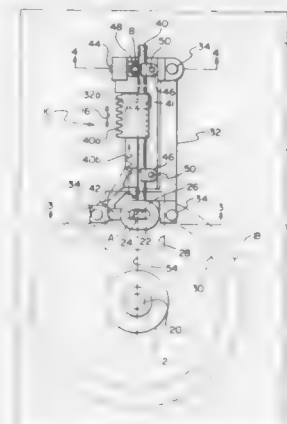
Steven D. Daniels, Churchville; Daniel C. Maslanka, and John E. Morse, both of Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 14, 1988, Ser. No. 167,679

Int. Cl.⁴ G11B 5/56

U.S. Cl. 360—109

8 Claims



1. A transport assembly for supporting a transducer in relation to a recording medium mounted for rotation on a drive motor and for moving the transducer through a path intersecting a spindle of the drive motor, said assembly comprising: a transport for supporting the transducer relative to a first adjustment point and a second adjustment point outboard of said first adjustment point in relation to the motor spindle; means for supporting said transport for movement along a guide path that is generally parallel to the path intersecting the drive motor, said adjustment points being proximate said guide path; means acting upon the first adjustment point for pivoting said transport about said second adjustment point thereby

to intersect the transducer with the path intersecting the drive motor; and means acting upon the second adjustment point for pivoting said transport about said first adjustment point thereby to set the azimuth of the transducer.

4,875,123

ADJUSTABLE AUDIO CONTROL-ERASER AND TAPE GUIDE ASSEMBLY FOR A CASSETTE TAPE VIDEO TAPE RECORDER

Sung S. Kang, Suwon, Rep. of Korea, assignor to Gold Star Co., Ltd., Seoul, Rep. of Korea

Continuation of Ser. No. 939,959, Dec. 10, 1986, abandoned.

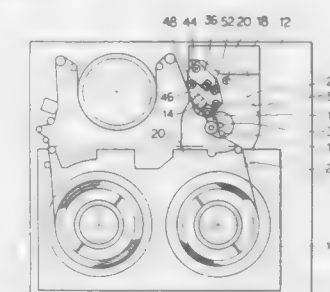
This application Jan. 17, 1989, Ser. No. 298,270

Claims priority, application Rep. of Korea, Dec. 10, 1985, 16577/1985

Int. Cl.⁴ G11B 5/56

U.S. Cl. 360—109

1 Claim



1. An adjustable audio control eraser and tape guide assembly for a cassette type video recorder which comprises: a housing having a main base plate; a tape cassette disposed on the front portion of said main base plate; and an audio control eraser and tape guide assembly disposed on the rear portion of said main base plate, said assembly including: a printed circuit board supported on said main base plate, a motor member underlying said printed circuit board, said motor member having a rotator and a stator attached thereto, a stator yoke attached to said printed circuit board, an elongated member passing through said stator yoke, said printed circuit board, and said stator and attached to said stator, a head base connected to said stator yoke through a bushing by a first connection device at a first end portion of said head base and to a stator yoke flange disposed on said stator yoke by a second connection device at a second end portion of said head base, said stator yoke flange being provided with a first tape guide and a second tape guide one of said tape guides being disposed on each end portion of said stator yoke flange, respectively, said head base having elongated openings at said first and second end portions thereof through which said respective first and second connection devices pass, a head plate having an adjustable audio control eraser head member disposed thereon said head plate being connected to said head base by first, second, and third screws, said first screw having a coil spring wound around an upper portion thereof for biasing said head plate with respect to said head base, and said second and third screws coaxing with said first screw for movement of said head plate with said audio control eraser head member, upon tightening or loosening of the second or third screws, a trigonal pyramide shaped protrusion integrally formed on said head base for inclining said audio control eraser head member with respect to said first screw by tightening or loosening said second and third screws, and

a rectangular opening disposed on said head base and aligned with a hole disposed on said stator yoke for adjusting said head base along with the head plate and audio control eraser head member by applying a rotational force thereto, said head base, head plate and audio control eraser head member being moved in a generally horizontal direction during the adjusting after said first and second connection devices are loosened and the rotational force is applied, said elongated openings in said head base accommodating movement of said head base whereafter said first and second connection devices are tightened to restrain further movement of said head base, whereby the assembly provides for a slim type cassette type video recorder and for ready adjustment in positioning of said audio control eraser head member.

4,875,124

THIN FILM MAGNETIC HEADS WITH THERMALLY CROSSLINKED INSULATION

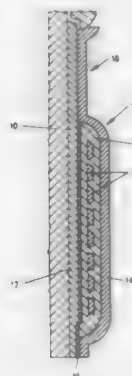
Heidi L. Dickstein, Morgan Hill; Hiroyuki Hiraoka, Saratoga, and James H. Lee, San Jose, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 141,738, Jan. 11, 1988, abandoned. This application Apr. 18, 1988, Ser. No. 182,535

Int. Cl.⁴ G11B 5/16

U.S. Cl. 360—126

6 Claims



1. A thin film magnetic head characterized in that the electrical insulation which surrounds the conductive coil comprises a photosensitive resin which has been crosslinked by a thermally activated crosslinking agent or promotor.

4,875,125

TAPE HEAD CLEANER CARTRIDGE

Kyriacos Joannou, Wayland; Kenneth Wilson, Lexington, and Alan B. Lowry, Canton, all of Mass., assignors to Peritcomp Corporation, Natick, Mass.

Filed Oct. 14, 1987, Ser. No. 108,062

Int. Cl.⁴ G11B 5/41

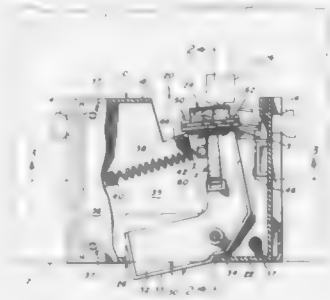
U.S. Cl. 360—128

28 Claims

1. A tape head cleaner cartridge adapted for receipt in a tape machine having a magnetic tape head that is supported for tape travel thereby, said cartridge comprising:

- a cartridge housing having front and rear walls,
- a cleaning pad,
- a pad support and actuating lever having separate support and actuating ends,
- means pivotally supporting said lever in the cartridge housing,
- said means pivotally supporting said lever providing motion of said lever support end in the tape travel direction;
- means at the lever support end for supporting said cleaning pad adjacent said front wall
- said cartridge housing front wall having means defining an

access opening to permit positioning of said cleaning pad for contact with said tape head, said cartridge housing rear wall having means defining an aperture for receiving at least part of the lever actuating end, means disposed in the cartridge housing for biasing the lever



is a direction generally parallel to said tape travel direction whereby said lever is predisposed to move to a first position,

said actuating end of the lever being capable of manual manipulation to a second position whereby the cleaning pad transitions across the tape head in the direction of tape travel between said first and second positions.

4,875,126

STATIONARY TAPE GUIDE FOR A MAGNETIC TAPE RECHORDER

Niro Nakamichi, Kodaira, Japan, assignor to Nakamichi Corporation, Tokyo, Japan

Filed Feb. 10, 1988, Ser. No. 154,265

Int. Cl.⁴ G11B 15/60

U.S. Cl. 360—130.23

13 Claims



1. A stationary tape guide for guiding a magnetic tape withdrawn from a tape cassette and securing said tape in close proximity to a helical scanning cylinder, said guide comprising:

- (a) a block having, on its front face which confronts said tape, a laterally extending guide path the contour of which includes a first straight guide projection inclined with respect to a horizontal reference plane which first projection is forwardly convexed toward said tape; and
- (b) said block being integrally provided with a second straight guide projection inclined with respect to said reference plane and a single orthogonal guide projection extending orthogonal to said reference plane said first, second, and orthogonal projections lying in series along said guide path.

4,875,127

APPARATUS AND METHOD FOR PRECISE TAPE GUIDING IN A MAGNETIC TAPE TRANSPORT

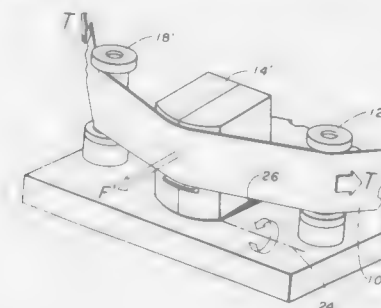
Richard J. McClure, San Diego, Calif., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 6, 1988, Ser. No. 178,400

Int. Cl.⁴ G11B 15/60

U.S. Cl. 360—130.21

5 Claims



1. An improved apparatus for transporting a magnetic tape wherein the plane of said magnetic tape is perpendicular to a reference plane having a magnetic transducer fixedly mounted thereon, said transducer further having a surface adapted for contacting said tape, said improved apparatus comprising:

- a. means for positioning said transducer to fix said surface at an angle substantially equal to 0.5 degrees with respect to a line perpendicular to said reference plane, whereby a force component urges said tape axially along said transducer surface, and
- b. tape support means integral with said transducer, whereby said tape is restrained from further axial movement along said transducer surface.

4,875,128

DISC CARTRIDGE

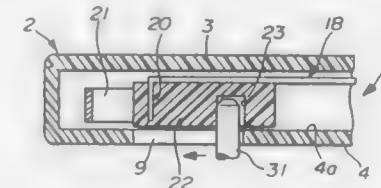
Vurnen Leonard; Arthur K. Kato; Kiyoshi Ohmori; Keisuke Fujiwara, and Yutaka Soda, all of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn. and Sony Corporation, Tokyo, Japan

Filed Jul. 11, 1988, Ser. No. 217,440

Int. Cl.⁴ G11B 23/03

U.S. Cl. 360—133

5 Claims



1. A disc cartridge adapted for insertion in a disc drive including a release pin, the cartridge comprising:

- a cartridge body including an upper shell and a lower shell having a long and narrow receiving opening for receiving said release pin of said disc drive unit;
- a disc rotatably housed in said cartridge;
- a disc restraint disposed between said disc and said upper shell for restraining said disc with respect to said cartridge when said release pin is in a first position and releasing said disc for rotation within said cartridge when said release pin is in a second position; and
- a cover attached to said restraint for engaging said release pin and moving said restraint in response to movement of said release pin, said cover further closing said receiving opening to prevent the entrance of contaminants into said cartridge when said release pin is in either of said first or

second positions and when said release pin is in motion between said first and said second positions.

4,875,129

INLINE MAGNETIC HEAD ASSEMBLY FOR USE IN A CASSETTE LOADED RECORDER

John M. Favron, Del Mar, Calif.; Christopher A. Lacey, Willimantic, Conn., and George W. Brock, La Jolla, Calif., assignors to Eastman Kodak Co., Rochester, N.Y.

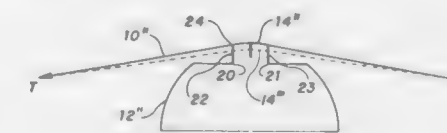
Continuation of Ser. No. 138,764, Dec. 28, 1987, abandoned.

This application Nov. 21, 1988, Ser. No. 274,507

Int. Cl.⁴ G11B 5/22

U.S. Cl. 360—122

5 Claims



1. In a recording system including first and second magnetic head assemblies, the improvement comprising:

- a. means for transporting a recording medium over said first and said second magnetic head assemblies in sequence, said means including a span of said medium between said first and said second head assemblies,
- b. first transducing element and second transducing element located on first and second lands of said first and said second head assemblies respectively,
- c. means external to said first and to said second magnetic head assemblies for guiding said recording medium at nominal wrap angles relative to said first and said second transducing elements,
- d. said first magnetic head assembly further comprising a first pair of outriggers for contacting said recording medium before said recording medium contacts said first land having said first transducing element located thereon, wherein at least one of said first pair of outriggers contacts said medium,
- a second pair of outriggers for contacting said recording medium after said recording medium contacts said first land having said first transducing element located thereon, wherein at least one of said second pair of outriggers supports one end of said span of said medium,
- e. said second magnetic head assembly further comprising a third pair of outriggers for contacting said recording medium before said recording medium contacts said second land having said second transducing element located thereon, wherein at least one of said third pair of outriggers supports the other end of said span of said medium,
- a fourth pair of outriggers for contacting said recording medium after said recording medium contacts said second land having said second transducing element located thereon, wherein at least one of said fourth pair of outriggers contacts said medium,
- wherein said first pair of outriggers, said first land, and said second pair of outriggers comprise the contour of a first constant area profile, and said third pair of outriggers, said second land, and said fourth pair of outriggers comprise the contour of a second constant area profile.

4,875,130

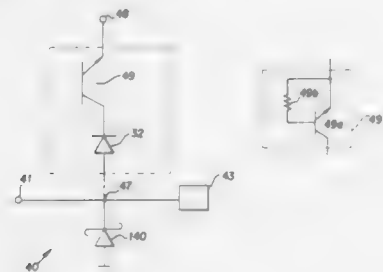
ESD LOW RESISTANCE INPUT STRUCTURE
 Jeff Huard, Payallup, Wash., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Jul. 6, 1988, Ser. No. 215,865

Int. Cl.⁴ H02H 9/04

U.S. Cl. 361—56

23 Claims



1. A circuit comprising:
 an input terminal for receiving an input signal;
 a first supply terminal for receiving a first supply voltage;
 a second supply terminal for receiving a second supply voltage; and
 a first clamp circuit for clamping the voltage level on said input terminal to a voltage in excess of said first supply voltage, thereby preventing said voltage level from exceeding a predefined magnitude in a first polarity defined by said first supply voltage minus said second supply voltage, said first clamp circuit being connected between said input terminal and said first supply terminal, said first clamp circuit comprising a reduced beta bipolar transistor having a first current handling terminal connected to said first supply terminal and a second current handling terminal connected to said input terminal.

4,875,131

CIRCUIT CONFIGURATION FOR MONITORING A SEMICONDUCTOR STRUCTURAL ELEMENT AND PROVIDING A SIGNAL WHEN THE TEMPERATURE EXCEEDS A PREDETERMINED LEVEL

Ludwig Leipold; Rainald Sander; Jenoe Tihanyi, and Roland Weber, all of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

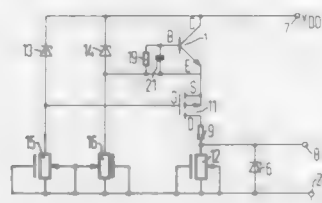
Filed Apr. 25, 1989, Ser. No. 342,835

Claims priority, application Fed. Rep. of Germany, Aug. 11, 1988, 3816259

Int. Cl.⁴ H02H 5/04

U.S. Cl. 361—103

6 Claims



1. A circuit for monitoring the temperature of a semiconductor structural element and providing a signal when the temperature exceeds a preset limit, the circuit includes a bipolar transistor connected thermally to the semiconductor structural element, and a first current source connected in series to the bipolar transistor, the improvement comprising:
 a MOSFET, wherein the source of the mosfet is coupled to the emitter of the bipolar transistor and the drain of the MOSFET is coupled to the current source;

- a Zener diode for maintaining the gate of the MOSFET at a first potential; and
- a second Zener diode for maintaining the source of the MOSFET at a second potential, the difference between the first potential and the second potential at the operating temperature of the semiconductor structural element being smaller than the threshold voltage of the MOSFET.

4,875,132

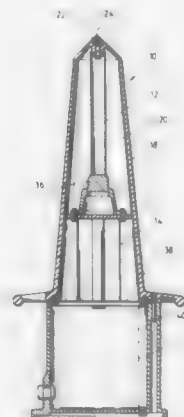
ANTENNA GROUNDING SYSTEM
 James E. Olivenbaum, Houston, Tex., assignor to Tideland Signal Corporation, Houston, Tex.

Filed Nov. 3, 1988, Ser. No. 266,541

Int. Cl.⁴ H02H 9/04

U.S. Cl. 361—117

1 Claim



1. A lightning protected antenna comprising,
 at least one metallic antenna,
 an electronic housing containing electrical power and controls positioned below said antenna,
 a non magnetic, electrically non-conductive enclosure surrounding said antenna and housing,
 a metal tip on the top of the enclosure,
 a first electrically conductive lead connected between the tip and said antenna,
 a second electrically conductive lead connected to the antenna and extending through the enclosure at a position below the antenna for connection to ground, wherein said first and second conductive leads include spring biased contacts, and said first and second conductive leads are in electrical communication with the antenna at the ends of the antenna.

4,875,133

SIMULATING STATICELECTRICITY DISCHARGES
 Takeyoshi Kawamura, Yokohama, Japan, assignor to Sanki Electronic Industry Co., Ltd., Yokohama, Japan

Filed Mar. 11, 1986, Ser. No. 838,387

Claims priority, application Japan, Mar. 12, 1985, 60-049733

Int. Cl.⁴ H05F 3/04; G01R 29/12

U.S. Cl. 361—230

19 Claims

1. An apparatus for simulating electrostatic discharge, comprising:

- (a) first means for applying an electrostatic discharge substantially equivalent to that generated by an electrified human body to an object to be tested, the first means comprising a first electrostatic capacitor and third means including a space defining a gap for supplying energy built up in said first electrostatic capacitance element to said object to be tested via a first resistor and via said gap across which the electrostatic discharge occurs; and
- (b) second means for shortening the rise time of the discharge current of the electrostatic discharge from said

4,875,135

PRESSURE SENSOR

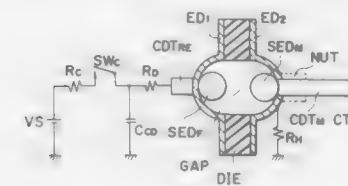
Robert P. Bishop, Carver, Mass.; Anthony J. Sabetti, Greenville, R.I., and Thomas Charbonneau, Plainville, Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 2, 1988, Ser. No. 278,877

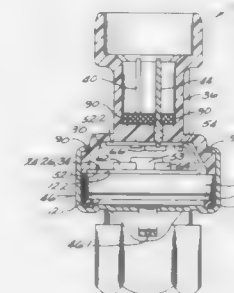
Int. Cl.⁴ H01G 7/00

U.S. Cl. 361—283

8 Claims



- and discharging the given amount of electric charge across said gap before said third means supplies the energy accumulated by the first electrostatic capacitance element to the object to be tested.



4,875,134
PRESSURE SENSOR CONSTRUCTION AND METHOD FOR ITS FABRICATION

Heikki Kuusma, Helsinki, Finland, assignor to Vaisala Oy, Helsinki, Finland

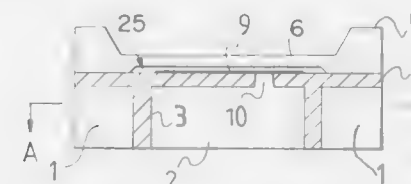
Filed Jan. 9, 1989, Ser. No. 294,799

Claims priority, application Finland, Jan. 18, 1988, 880206

Int. Cl.⁴ H04G 7/00; G01L 9/12

U.S. Cl. 361—282

8 Claims



1. A capacitive pressure sensor construction comprising
 a base part (1, 2, 4), comprising a planar, electrically conductive silicon layer (1, 2) and a thereupon permanently bonded planar intermediate layer (4) of an insulating material, e.g., glass, with an essentially smaller thickness than that of the silicon layer (1, 2),
 a fixed planar capacitor electrode (9) fabricated on the base part (1, 2, 4), and
 a deflecting membranous capacitor electrode (6) fabricated of silicon and essentially integral with a surrounding, essentially thicker base element (5), and gappedly spaced from and aligned at least approximately coincident with the fixed capacitor electrode (9), so that a hermetically sealed chamber (25) remains between the fixed electrode (9) and the membranous electrode (6),

characterized in that

- the base part (1, 2, 4) is perpendicularly divided into areas (1, 2) galvanically isolated from each other, namely to a contact area (2), which is coincident with the fixed capacitor electrode (9), galvanically connected to said electrode and designed with an area maximally equal to that of said electrode, and to at least one bonding area (1), which is isolated from the contact area (2) by an insulating layer (3) and to which a bonding voltage can be applied during the anodic bonding process in order to bond the base part to the base element (5) of the membranous capacitor electrode.

4,875,136

CERAMIC CAPACITOR AND METHOD OF MANUFACTURING THE SAME

Harunobu Sano; Yukio Sakabe, both of Kyoto, and Goro Nishio, Hyogo, all of Japan, assignors to Murata Manufacturing Co., Ltd., Japan

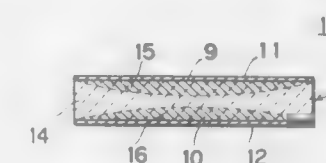
Filed Aug. 31, 1988, Ser. No. 239,188

Claims priority, application Japan, Sep. 3, 1987, 62-221652; Oct. 6, 1987, 62-253377; Oct. 6, 1987, 62-253378

Int. Cl.⁴ H01G 4/10, 7/00

U.S. Cl. 361—321

15 Claims



1. A ceramic capacitor comprising:
 a ceramic body obtained by firing, in a reducing atmosphere, a ceramic composition which is not made semiconductive upon firing in a reducing atmosphere; and
 at least a pair of capacitance extracting electrodes which are opposite to each other and enclose at least a part of said ceramic body therebetween, said electrodes containing a base metal, said part of said ceramic body held between said pair of capacitance extracting electrodes including a dielectric

layer and also including a semiconductive portion which is in contact with at least one surface of said dielectric layer and at least one of said pair of capacitance extracting electrodes, said semiconductive portion being obtained by diffusing a reducing agent in a stage at which said ceramic body is fired.

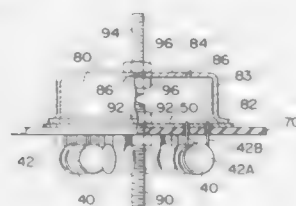
4,875,137

UNIFORM CURRENT AND VOLTAGE DISTRIBUTION DEVICE

Robert D. Rozanski, Huntington Beach; James R. Medlock, III, West Covina, and Stephen F. Larson, La Habra Heights, all of Calif., assignors to L.E.A. Dynatech, Santa Fe Springs, Calif.
Filed Jan. 10, 1989, Ser. No. 295,379
Int. Cl.⁴ H02B 1/00; H05K 1/16

U.S. Cl. 361—331

21 Claims U.S. Cl. 361—410



1. A uniform current and voltage distribution device comprising:

- first terminal means;
- second terminal means;
- first electrical bus means electrically connected to said first terminal means;
- second electrical bus means electrically isolated from said first electrical bus means and electrically connected to said second terminal means; and
- a plurality of electrical circuit components connected between said first and second bus means so as to form a plurality of circuit paths of equal length, each circuit path running between said first terminal means, said first electrical bus means, a corresponding one of said electrical components, said second electrical bus means, and said second terminal means.

4,875,138

VARIABLE PITCH IC BOND PAD ARRANGEMENT
Michael D. Cusack, Monument, Colo., assignor to United Technologies Corporation, Hartford, Conn.
Continuation-in-part of Ser. No. 920,632, Oct. 20, 1986, Pat. No. 4,753,820. This application Jun. 24, 1988, Ser. No. 210,900
Int. Cl.⁴ H05K 01/18

U.S. Cl. 174—52.4

7 Claims



1. A ceramic package comprising:
a ceramic substrate of ceramic having a shrinkage tolerance during firing;

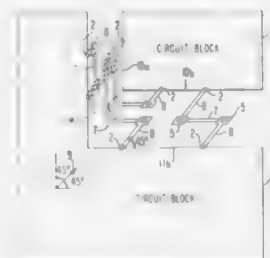
a plurality of spaced bond pads for registration with an electric circuit module;
a selected alignment point associated with said bond pads; said bond pads having varying widths increasing incrementally from a minimum width adjacent to said alignment point through a plurality of spaced pads beyond the pad closest to said alignment point to a maximum width for the pad located furthest from said alignment point.

4,875,139

BUILDING BLOCK LSI

Masahiro Fukui, Matsubara, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Dec. 10, 1987, Ser. No. 131,006
Claims priority, application Japan, Dec. 16, 1986, 61-299482
Int. Cl.⁴ H05K 1/18

3 Claims



1. A building block LSI comprising:
a plurality of circuit blocks;
an L-shaped channel formed between adjacent said circuit blocks, said L-shaped channel extending in two different directions from a corner portion of said L-shaped channel, and said two different directions defining a first angle therebetween;
a first set of wires disposed in said L-shaped channel and extending in said different directions;
a second set of wires extending at a second angle from said circuit blocks into said L-shaped channel, said second angle being half that of said first angle;
wherein said first set of wires and said second set of wires are connected such that said adjacent circuit blocks are interconnected electrically.

4,875,140

SUPPORT FOR PRINTED CIRCUIT BOARDS
Guy Delpech, Ballainvilliers, and Gilles Garnier, Fontenay-le-Fleury, both of France, assignors to U.S. Philips Corporation, New York, N.Y.
Filed Apr. 12, 1988, Ser. No. 188,528

Claims priority, application France, May 6, 1987, 8706394

Int. Cl.⁴ H05K 1/18

U.S. Cl. 361—412

5 Claims



1. A support for printed circuit boards formed by a column comprising at least one base on which a circuit board is to be supported, a collar for insertion in a hole in the circuit board, and a coupling member, wherein a damper can be inserted

between said base and said circuit board, the compression of said damper being ensured by said coupling member which includes clip means for clipping said coupling member to said circuit board by engaging both the upper and the lower surface of said board, said coupling member including additional means for engaging part of said column.

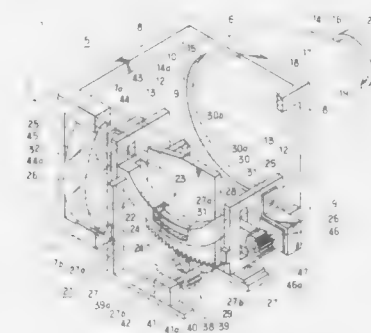
4,875,141

HEADLIGHT FOR VEHICLE

Shizuya Miyachi, and Kiyoshi Wada, both of Shimizu, Japan, assignors to Koito Seisakusho Co., Ltd., Shizuoka, Japan
Filed Dec. 21, 1987, Ser. No. 138,544
Claims priority, application Japan, Dec. 20, 1986, 61-304632
Int. Cl.⁴ B60Q 1/04

U.S. Cl. 362—61

8 Claims



1. A headlight for use in a vehicle and comprising a lamp body, a reflective mirror mounted in the lamp body and having a front opening, a bulb mounted in the reflective mirror and acting as the light source of the headlight, a douser plate mounted on the lamp body at the location between the front opening of the mirror and the bulb and intercepting a part of the light emitted from the bulb, means for supporting the douser plate on the lamp body such that the douser plate can incline transversely with respect to the lamp body, and driving means provided on the lamp body for transversely inclining the douser plate.

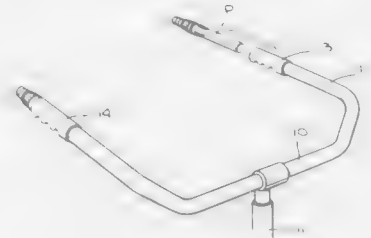
4,875,142

BICYCLE SAFETY LIGHTS

Donald Spector, 390 Mountain Rd., Union City, N.J. 07087
Filed Apr. 1, 1986, Ser. No. 846,892
Int. Cl.⁴ B62J 6/00; F21L 7/00

U.S. Cl. 362—72

7 Claims



1. Self-contained starboard and port light units receivable in the back-swept hollow, open-ended arms of a bicycle handlebar to provide light signals that are highly visible to drivers of vehicle to the rear of the bicyclist, each unit comprising:
A. a tubular battery case molded of synthetic plastic material having exterior wedging means constituted by tapered ribs forming wedging elements adapted to wedge the case into a handlebar arm, whereby the case is securely held

therein, said case having a front end that projects from the open end of the arm;
B. at least one cylindrical battery cell in said case whose positive pole is exposed at the front end of the case, and whose negative pole is connected to a fixed switch contact at the end of the front end of the case; and
C. a rotatable beacon assembly removably coupled to the front end of the case, said assembly including a tubular mounting supporting a lens, and a light bulb disposed in the mounting whose center terminal engages the negative pole of the battery cell and whose base terminal is connected to a movable contact such that when the assembly is rotated to a given angular position, the movable contact engages the fixed contact to supply power to the bulb, said bulb being trapped in the assembly whereby to replace the bulb, the assembly is decoupled from the case which remains wedged in the arm; said mounting being provided with an externally-threaded shank, the front end of the case being externally threaded, and a union coupling the shank to the front end of the case.

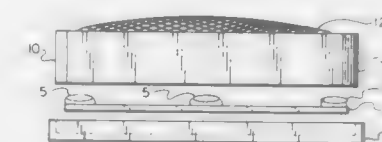
4,875,143

ROTATING LIGHT CIRCUIT AND SPEAKER COVER
Robert Fernandez, 1345 NW. 130th St., North Miami, Fla. 33167

Continuation-in-part of Ser. No. 76,898, Jul. 23, 1987, abandoned. This application Feb. 6, 1989, Ser. No. 306,462
Int. Cl.⁴ F21V 33/00

U.S. Cl. 362—86

18 Claims



1. A rotating light circuit and speaker cover apparatus comprising:
an audio signal permeable grid;
a frame circumscribing and attached to a periphery of the grid;
a plurality of lighting means in luminous energy communication with, and disposed beneath, the frame to selectively emit light at least partially transmitted through said frame;
a counter in electrical communication with each of the lighting means to selectively energize and de-energize same in a predetermined sequence, said counter mounted in proximity to the lighting means beneath the frame;
a clock generating electrical pulses which are electrically communicated to the counter to control timing of said counter, said clock mounted in proximity to the counter beneath the frame; and
at least one electrical conductor to establish electrical communication between the circuit and a pre-existing power source.

4,875,144

FABRIC WITH ILLUMINATED CHANGING DISPLAY
Harry L. Wainwright, 918 Delaware Ave., Bethlehem, Pa. 18015
Filed Sep. 14, 1987, Ser. No. 96,557
Int. Cl.⁴ F21L 15/08

U.S. Cl. 362—103

3 Claims

1. A fabric with an illuminated animated display including a first frame and a second frame and comprising:
(A) a fabric outer surface;
(B) a first plurality of flexible optical fibers each having a first end and a second end;
(C) a second plurality of flexible optical fibers each having a first end and a second end;
(D) said first plurality of optical fibers gathered into a first bundle;

- (E) said second plurality of optical fibers gathered into a second bundle;
- (F) a portion of said second ends of said first bundle of optical fibers secured to said fabric and extending to said fabric outer surface to form at least a portion of said first and second frames of said display;
- (G) a portion of said second ends of said second bundle of optical fibers secured to said fabric and extending to said fabric outer surface to form at least a portion of said second frame of said display;



- (H) a first light source means adjacent said first ends of said first bundle of optical fibers to emit light to said first ends and through said fibers to sequentially illuminate said second ends forming at least a portion of said first and second frames of said display on said fabric outer surface;
- (I) a second light source means adjacent said first ends of said second bundle of optical fibers to emit light to said first ends and through said fibers to sequentially illuminate said second ends forming at least a portion of said second frame of said display on said fabric outer surface to create the appearance of animation of said display.

4,875,145

LIGHT APPARATUS FOR ANIMAL PETS

Robert E. Roberts, 2033 N. Sunset Rd., Apache Junction, Ariz. 85119

Filed Apr. 18, 1988, Ser. No. 182,404

Int. Cl.⁴ F21L 15/08

U.S. Cl. 362—103

14 Claims



1. Light apparatus for attaching to pets, comprising, in combination:
- a collar fastened about a pet;
- housing means, including a light transmissible portion;
- means for securing the housing means to the collar in a predetermined orientation and for allowing the housing means to move relative to the pet and relative to the collar while maintaining the predetermined orientation;
- light producing means disposed within the housing means

for producing light transmissible through at least a portion of the housing means; and

electric circuitry means selectively connected to the light producing means, including

battery means for providing an electric current for the light producing means, and

switch means for selectively connecting and disconnecting the battery means and the light producing means.

4,875,146

FLASHLIGHT BULB MOUNTING

John H. Drame, London, United Kingdom, assignor to Duracell Inc., Bethel, Conn.

PCT No. PCT/US86/01732, § 371 Date May 19, 1987, § 102(e) Date May 19, 1987, PCT Pub. No. WO87/01175, PCT Pub. Date Feb. 26, 1987

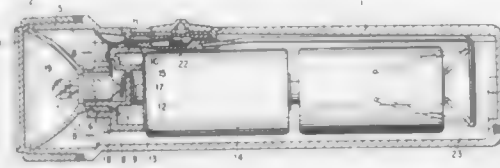
PCT Filed Aug. 20, 1986, Ser. No. 60,244

Claims priority, application United Kingdom, Aug. 21, 1985, 2,388,888

Int. Cl.⁴ F21L 7/00

U.S. Cl. 362—202

2 Claims



1. A portable lamp comprising a lamp body, a bulb holder in the lamp body, a battery space adjacent the bulb holder for containing at least one battery cell, and means for limiting relative movement of the battery cell towards the bulb holder, characterized in that the bulb holder is a body of plastic material which includes the said movement limiting means as an integral part thereof, with said bulb holder and the integral, movement limiting means comprising inner and outer annular walls, a flange integral with and extending radially between a forward portion of the outer annular wall and the inner annular wall, and radial ribs extending rearwardly of the said flange and being integral with said flange and with the said outer annular wall, and the said movement limiting means extending axially beyond the central contact tip of the bulb, whereby said movement limiting means is adapted to be contacted by the adjacent battery cell upon any axial forward movement thereof to divert shock away from said central contact tip of the bulb.

4,875,147

DELAYED ACTION FLASHLIGHT

Robert T. Auer, East Stroudsburg, Pa., assignor to Buddy L. Corporation, New York, N.Y.

Filed Mar. 20, 1989, Ser. No. 325,947

Int. Cl.⁴ F21L 7/00, 11/00

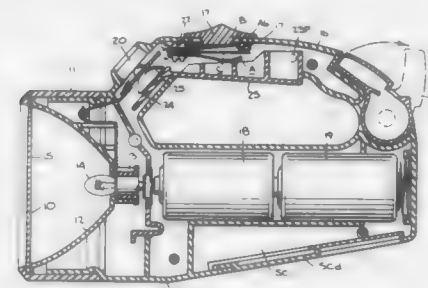
U.S. Cl. 362—205

9 Claims

1. A flashlight provided with a casing housing a battery supply and a light bulb, and having a U-shaped handle graspable by an operator to direct a light beam projected from the bulb, said flashlight incorporating a delayed action switch assembly adapted to connect said supply to said bulb for a predetermined interval, at the conclusion of which the flashlight is automatically turned off, said assembly comprising:

- (a) a pivoted trigger lever mounted on the underside of the handle, said lever having a flat leading section;
- (b) a suction cup having memory characteristics, and means mounting the cup fixedly within the casing at a position at which it is engaged by the flat leading section when the lever is momentarily depressed, said cup being then compressed and collapsed by the flat leading section to retain

the lever in a depressed state for a predetermined interval determined by the memory characteristics of the cup, at the conclusion of which the cup resumes its normal form and the lever is released; and



(c) switch means cooperating with said lever operative to connect said supply to said bulb only when said lever is in the depressed state.

4,875,148

CONTROL FOR PRODUCING A LOW MAGNITUDE VOLTAGE AT THE OUTPUT OF A PWM INVERTER

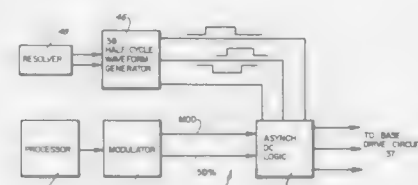
Derrick I. Roe, Rockford, Ill.; Christopher J. Rozman, Delavan, Wis., and Bradley J. Recker, Rockford, Ill., assignors to Sundstrand Corporation, Rockville, Ill.

Filed Dec. 16, 1988, Ser. No. 285,117

Int. Cl.⁴ H02M 1/44

U.S. Cl. 363—41

9 Claims



1. A method of operating an inverter to produce an output voltage having two levels wherein the inverter includes first and second switches coupled to an inverter output, the switches being operable in a first switch state during which both switches are on or both switches are off and in a second switch state during which one switch is on and the other is off and wherein each switch has a minimum on time limit, comprising the steps of:

producing first and second switch control signals each having alternating switch on and switch off portions wherein each switch on portion is of a duration in excess of the minimum on time limit of a switch; and

operating the first and second switches in accordance with the first and second switch control signals, respectively, to produce the output voltage wherein the switches are operated in one of the switch states for a duration less than the minimum on time limit of a switch to cause the output voltage to assume one of the levels during such time.

4,875,149

PHASE SEPARATION CONTROL

Christopher J. Rozman, Delavan, Wis.; Derrick I. Roe, and Bradley J. Recker, both of Rockford, Ill., assignors to Sundstrand Corporation, Rockville, Ill.

Filed Dec. 16, 1988, Ser. No. 285,118

Int. Cl.⁴ H02M 1/12

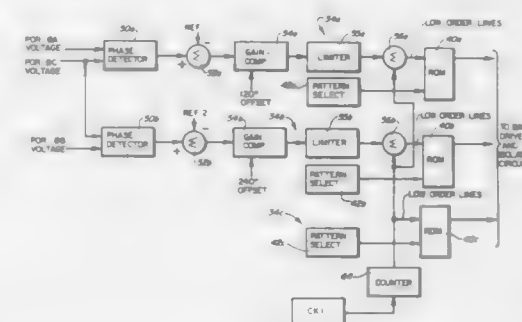
U.S. Cl. 363—41

11 Claims

1. A waveform generator which develops a certain number of phase outputs at desired angular displacements relative to a reference phase output wherein each phase output is produced

by at least one switch controlled by a control waveform, comprising:

means for determining the angular deviation of each of the certain number of phase outputs from the desired angular displacement for such phase output; and



means responsive to the determining means for adjusting the control waveform for each switch in time based upon the angular deviation of the phase output produced by such switch so that the angular deviations are minimized.

4,875,150

PARALLEL OSCILLATORY CIRCUIT FREQUENCY CONVERTER WITH SAFETY CIRCUIT

Hans G. Matthes, Wermelskirchen, Fed. Rep. of Germany, assignor to AEG-Eltherm GmbH, Remscheid-Hasten, Fed. Rep. of Germany

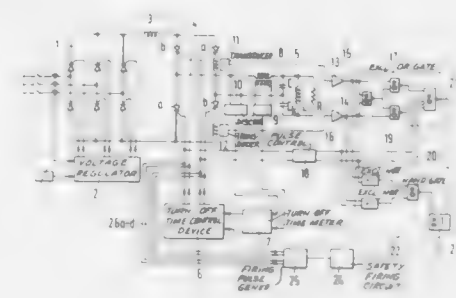
Filed Aug. 3, 1988, Ser. No. 227,895

Claims priority, application Fed. Rep. of Germany, Sep. 5, 1987, 3729786

Int. Cl.⁴ H02M 7/515; H02H 7/00

U.S. Cl. 363—51

4 Claims



1. A parallel oscillatory circuit frequency converter comprising: a rectifier; an inverse rectifier having two pairs of thyristors arranged in a bridge circuit; a parallel oscillatory circuit including an inductance and a series connection of two capacitors of which one capacitor is connected to load points of the bridge circuit; a turn-off time control device for the alternate firing of the pairs of thyristors in diagonally adjacent branches of the bridge circuit with a cycle frequency adapted to maintain a minimum turn-off time; a detector circuit coupled to the pairs of thyristors to detect incorrect firing thereof; and a safety firing circuit controlled by the detector circuit to deliver firing pulses without delay to all the thyristors at least until all the thyristors are current-carrying.

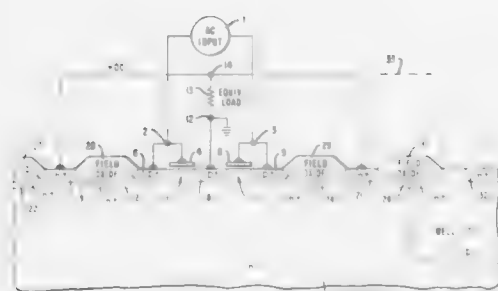
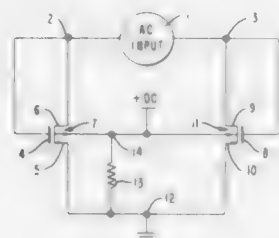
4,875,151

TWO TRANSISTOR FULL WAVE RECTIFIER

Daniel L. Ellsworth, and Maurice M. Moll, both of Fort Collins, Colo., assignors to NCR Corporation, Dayton, Ohio
Filed Aug. 11, 1986, Ser. No. 895,408
Int. Cl.⁴ H02M 7/217

U.S. Cl. 363-127

12 Claims



1. A two transistor full wave rectifier, comprising: first and second field effect transistors of first conductivity type, each resident in a substrate region of second conductivity type and each having respective first and second electrode regions and a gate electrode;
 - a first node, defining a common connection of a DC load terminal, the first electrode region of the first field effect transistor and the first electrode region of the second field effect transistor;
 - a second node, defining a common connection of the second electrode region of the first field effect transistor, the gate electrode of the first field effect transistor and the first of two connections to a source of AC voltage;
 - a third node, defining a common connection of the second electrode region of the second field effect transistor, the gate electrode of the second field effect transistor and the second of the two connections to the source of AC voltage; and
 - a fourth node, defining a common connection of the other DC load terminal and the second conductivity type substrate region of each resident field effect transistor.

4,875,152

ELECTRICAL TAP SWITCH

William H. Foster, Box 694, Kinistino, SASK S0J 1H0, Can-
ada

Filed Mar. 16, 1988, Ser. No. 169,013

Int. Cl.⁴ H02M 1/00

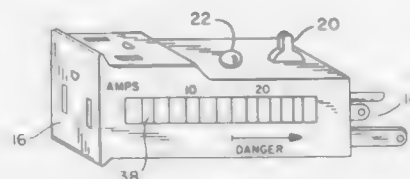
U.S. Cl. 363-146

4 Claims

1. An electrical tap switch, comprising:
 - (a) a generally rectilinear shell;
 - (b) a power plug mounted directly on said shell;
 - (c) a first power outlet;
 - (d) a second power outlet connected in parallel to said first power outlet;
 - (e) a double pole double throw switch with switch actuator projecting upward from a top surface of said shell,

wherein said switch is in series between said plug and said outlets; and,

- (f) an indicator connected in parallel with both said outlets whereby closing said double pole switch energizes both said power outlets, wherein said indicator turns on when said power outlets are energized, wherein said plug projects outward from one end of said shell, said first outlet is integral to the end of said shell, and said second outlet is integral to the top of said shell and is located in



close proximity to said first outlet, thereby allowing for in-line use of said electrical tap switch, wherein said indicator comprises a current transformer consisting of a conductor wrapped around a common switched current carrying conductor, a diode to rectify the current from ac to dc; an amplifier to increase the amplitude of the rectified voltage, a driver, and a bar graph display, mounted to the front of said shell and driven by said driver, such that said bar graph displays the total current delivered to said outlets.

4,875,153

MECHANISM FOR ACCURATELY MOUNTING AN ELECTRONIC LIGHT EMITTING PRINTHEAD ASSEMBLY

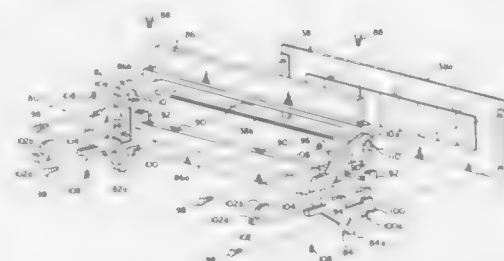
Douglas A. Hons, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 5, 1988, Ser. No. 279,737

Int. Cl.⁴ G01J 15/00

U.S. Cl. 346-155

14 Claims



1. In a reproduction apparatus including an image receiving member, at least one support for said image receiving member, and an electronic light emitting print head assembly including light emitting elements and a focusing lens, a mechanism for accurately mounting said electronic print head assembly rela-

tive to said image receiving member, said mechanism comprising:

- a frame; means for mounting said print head assembly at a preselected location in said frame; a first feature defined in said frame, said first feature including a locating surface spaced at a preselected distance from the plane through the geometric center line of said focusing lens of said print head assembly; a second feature defined by said frame, said second feature including a pair of interconnected locating surfaces, the first of said pair of locating surfaces spaced at a preselected distance from the plane through the geometric center line of said focusing lens, and the second of said pair of locating surfaces spaced at a preselected distance from the image plane of said focusing lens; a locating member supported in said reproduction apparatus; and means for urging said frame in a direction such that said locating surface of said first feature engages said locating member and said second feature engages the support for said image receiving member.

4,875,154

MICROCOMPUTER WITH DISCONNECTED, OPEN, INDEPENDENT, BIMEMORY ARCHITECTURE, ALLOWING LARGE INTERACTING, INTERCONNECTED MULTI-MICROCOMPUTER PARALLEL SYSTEMS ACCOMODATING MULTIPLE LEVELS OF PROGRAMMER DEFINED HEIRARCHY

Maurice E. Mitchell, 601 Terra California, #4, Walnut Creek, Calif. 94595

Continuation-in-part of Ser. No. 541,453, Oct. 13, 1983, abandoned. This application Jun. 12, 1987, Ser. No. 61,338

Int. Cl.⁴ G06F 13/00

U.S. Cl. 364-206

28 Claims



1. A microcomputer data processing apparatus, comprising: a Central Processing Unit (CPU), a path configuring means, path control circuits connecting said CPU to said path configuring means, a plurality of contacts comprised of a plurality of distinct sets, wherein said CPU further comprises a dedicated memory address circuit, a dedicated memory data circuit, a dedicated memory control circuit and a dedicated power circuit, wherein said path configuring means further comprises a dedicated memory address circuit, a dedicated memory data circuit and a dedicated memory control circuit, wherein each said dedicated memory address, data, and control circuit includes a plurality of dedicated memory address, data, and control lines respectively, wherein said memory control lines are comprised of a read/write line, timing lines and status lines, first switch means comprised of at least three distinct parts for connecting said dedicated memory address, data, and

control circuits of said path configuring means to each of said first three sets of contacts, and second switch means for connecting said dedicated memory address, data, and control lines of said path configuring means to said dedicated memory address, data, and control lines of said CPU respectively, wherein said first and second switch means assume a non signal-conducting state when said CPU power circuit is not supplied with power, wherein said lines of said CPU and said contacts assume a non-signal conducting state when said first and second switch means are in said non-signal conducting state, means for causing said first and second switch means to remain in said non signal-conducting state upon application of power to said CPU power circuit and to assume a signal-conductive state upon receipt of an appropriate signal from said CPU, and to assume a non signal-conducting state upon receipt of an appropriate signal from said CPU.

4,875,155

PERIPHERAL SUBSYSTEM HAVING READ/WRITE CACHE WITH RECORD ACCESS

James L. Iskiyan; Vernon J. Legvold; Peter L. H. Leung, and Guy E. Martin, all of Tucson, Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 28, 1985, Ser. No. 749,897

Int. Cl.⁴ G06F 12/08

U.S. Cl. 364-200

15 Claims



1. In a data storage hierarchy having a front store and a back store each of which have a multiplicity of addressable data storage locations with diverse ones of the addressable data storage locations being further divided into addressable record locations of diverse sizes; programmable processor means connected to said front and back stores and data transfer means connected to said programmable processor means and to said front and back stores for effecting data transfers between the stores in response to commands received from the programmable processor means; attachments means connected to said programmable processor means and to said data transfer means for effecting data transfers between the attachment means and said data transfer means in response to commands received from the programmable processor means; control storage means operatively connected to the programmable processor means for supplying programming indicia signals to the programmable processor means and for storing control signals supplied by the programmable processor means and for supplying such stored processor control signals to said programmable processor means; the improvement, including the combination of: means for indicating for each record of each track of each device in said back store; means responsive to said indicating means for transferring said first or said second version of said record in accordance with predetermined criteria;

indicating further comprising: a first table having at least one bit for each device in said back store; a second table having at least one bit for each track of each said device; and a third table having a plurality of entries, each entry having indicia of location of a record in said cache; means for controlling asynchronous destaging of records, in response to information stored in said first and second tables; and said asynchronous control means comprising a fourth table for storing information for each record to be asynchronously destaged to the back store whether a first version of record data stored in said front store is modified with respect to a second version of said record stored in back store.

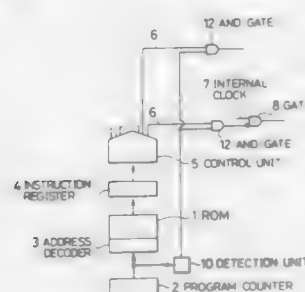
4,875,156

COMPUTER HAVING A PROTECTION DEVICE TO SELECTIVELY BLOCK INCORRECT CONTROL SIGNALS

Koji Tanigawa, and Tomoaki Yoshida, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan
Filed Mar. 3, 1987, Ser. No. 22,062
Claims priority, application Japan, Mar. 5, 1986, 61-46381
Int. Cl. G06F 11/00

U.S. Cl. 364-200

8 Claims



1. A computer for executing a program stored therein, the program having a first type of instruction and a second type of instruction, comprising:

- a program memory having a first area for storing the first type of instruction and a second area for storing the second type of instruction,
- a program counter providing an address code,
- said program memory being responsive to said address code for producing an instruction code stored at a memory location designated by said address code,
- a control unit responsive to said instruction code from said program memory for producing a control signal corresponding to the first type of instruction for controlling computer operation, and
- protection means for suppressing the control signal produced by said control unit corresponding to the first type of instruction when said address code provided by said program counter does not designate a memory location in said first area.

4,875,157

ALTERNATE MEMORY ADDRESSING FOR INFORMATION STORAGE AND RETRIEVAL

James J. Frimmel, Jr., San Diego, Calif.; Thomas Ouellette, Fairfax, and Richard N. Deglin, Reston, both of Va., assignors to International Telecommunications Corporation, Herndon, Va.
Filed Mar. 18, 1987, Ser. No. 27,240
Int. Cl. G06F 12/00

U.S. Cl. 364-200

8 Claims

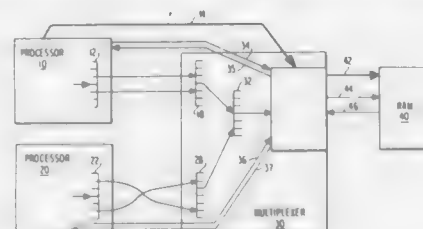
1. An apparatus for the alternate addressing of a common memory system for storing and retrieval of digitized information comprising:

- first processor means connected to said memory system for

writing said digitized information to said memory system, said digitized information written to said memory system being organized as a plurality of channels on a row-by-row basis in said memory system;

second processor means connected to said memory system for reading from said memory system said digitized information in defined segments as a plurality of frames from each of said plurality of channels on a column-by-column basis in said memory system; and

switching means for selectively connecting said first and second processor means to different address spaces of said memory system, said first and second processor means having simultaneous access to said memory system.



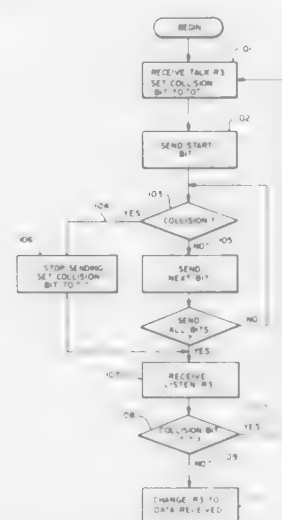
4,875,158

METHOD FOR REQUESTING SERVICE BY A DEVICE WHICH GENERATES A SERVICE REQUEST SIGNAL SUCCESSIVELY UNTIL IT IS SERVICED

Peter B. Ashkin, Los Gatos, and Michael Clark, Glendale, both of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.
Division of Ser. No. 765,396, Aug. 14, 1985. This application
Dec. 14, 1987, Ser. No. 132,121
Int. Cl. G06F 13/14, 13/38

U.S. Cl. 364-200

4 Claims



1. A method for requesting service by a device coupled to a host computer through a communication medium, comprising the steps of:

- (1) the host computer setting a service request bit of the device to a first logical value to allow the device to produce a service request signal if the device requires servicing;
- (2) the device determining that it requires servicing and setting an internal flag bit to a first logical value to indicate that the device requires servicing;
- (3) the device monitoring a command from the host computer to see if the command is addressed to the device;

- (4) if the command is not addressed to the device and if the service request bit is set to the first logical value, then the device generating a service request signal on the medium after the command by holding the communication medium low for a first period of time;
- (5) if the command is addressed to the device, if the device determines that the command is not a command that services the device, and if the service request bit is set to the first logical value, then the device:
 - (a) generating the service request signal on the medium after the command by holding the medium low for the first period of time and
 - (b) performing the command;
- (6) if the command is addressed to the device, if the device determines that the command is not a command that services the device, and if the service request bit is not set to the first logical value, then the device performing the command without generating the service request signal;
- (7) repeating steps 3, 4, 5, and 6 until the device receives a command addressed to the device that services the device.

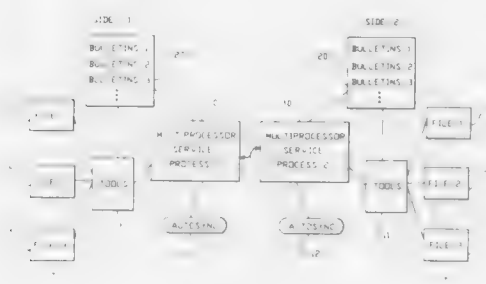
4,875,159

VERSION MANAGEMENT SYSTEM USING PLURAL CONTROL FIELDS FOR SYNCHRONIZING TWO VERSIONS OF FILES IN A MULTIPROCESSOR SYSTEM

Richard W. Cary, Los Gatos, and Richard D. Guyon, Mountain View, both of Calif., assignors to Amdahl Corporation, Sunnyvale, Calif.
Filed Dec. 22, 1987, Ser. No. 136,859
Int. Cl. G06F 13/42, 9/46, 15/16, 15/40

U.S. Cl. 364-200

25 Claims



18. In a data processing system storing a first version of a pre-specified plurality of data sets and storing a second version of the pre-specified plurality of data sets, an apparatus for synchronizing the first and second versions of the pre-specified plurality of data sets, comprising:

- processing means, associated with each of the first and second versions for reading and writing the versions of the pre-specified data sets, including
- means for storing an index node identifying the version with a sync-complete control field and a sync-in-progress control field, the sync-complete control field indicating when set that the identified version is synchronized and the sync-in-progress control field indicating when set that the identified version is in the process of being synchronized;
- means for clearing the sync-complete control field and the sync-in-progress control field in a given index node in response to a write to the version identified by the given index node; and
- synchronizing means, in communication with the processing means, for synchronizing the first and second versions, including
- first means for detecting the sync-complete control field for the first and second versions, and if either or both are cleared, then setting the sync-in-progress control field in the index node identifying a selected version of the first and second versions;

means for transferring a copy of the selected version to a temporary file to establish a temporary version;

second means for detecting the sync-in-progress control field for the selected version, and if it is set when the temporary version is complete, then setting the sync-complete control field and clearing the sync-in-progress control field in the index node identifying the selected version;

means for setting the sync-complete control field in the temporary version; and

means for updating the index node for the temporary version to rename the temporary version to the name of the one of the first and second versions not selected by the first means for detecting and removing the version not selected.

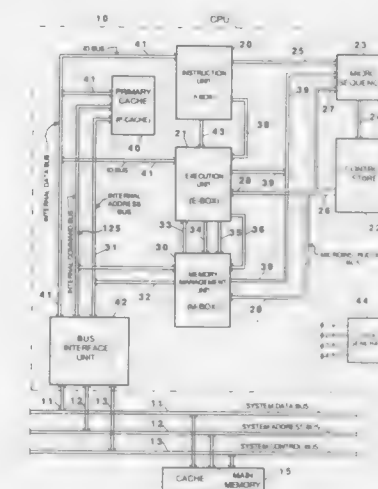
4,875,160

METHOD FOR IMPLEMENTING SYNCHRONOUS PIPELINE EXCEPTION RECOVERY

John F. Brown, III, Northborough, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.
Filed Jul. 20, 1988, Ser. No. 221,934
Int. Cl. G06F 9/38

U.S. Cl. 364-200

27 Claims



1. A processor comprising:

- (a) an execution unit having a plurality of execution stages for accessing operands from local registers, performing operations on said operands, and for storing results of said operations;
- (b) a memory interface unit having a plurality of stages including a memory-request stage for receiving memory address from said execution unit and a memory-access stage for evaluating said memory address to determine if said memory address is available for access and for accessing a memory if said address is available or for issuing an exception control signal if said memory address is not available for access;
- (c) pipelining means for applying sets of control bits to each of said stages of said execution unit and to each of said memory-request stage and said memory-access stage of said memory interface unit in successive ones of machine cycles of the processor.
- (d) latch means for holding a set of said control bits applied to said memory-access stage of said memory interface unit when said exception control signal is issued in a given one of said machine cycles, and for thereafter re-applying said set of control bits to said memory-access stage in a subsequent one of said machine cycles after said given machine cycle.

4,875,161 SCIENTIFIC PROCESSOR VECTOR FILE ORGANIZATION

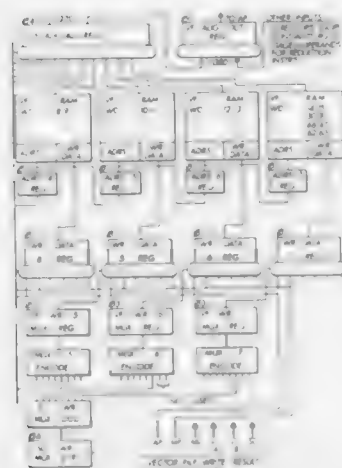
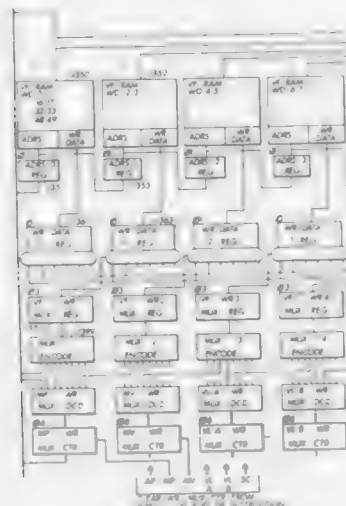
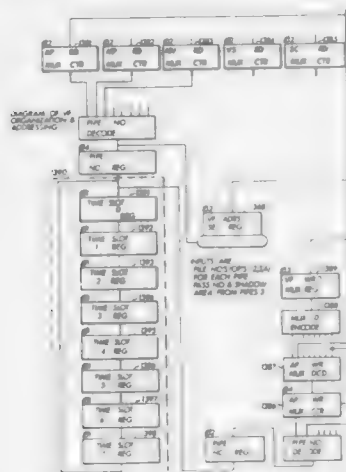
Archib E. Lahti, Fridley, Minn., assignor to Unisys Corporation, Blue Bell, Pa.

Continuation of Ser. No. 761,137, Jul. 31, 1985, abandoned. This application Nov. 14, 1988, Ser. No. 273,173

Int. Cl.⁴ G06F 15/347, 12/06

U.S. Cl. 364-200

11 Claims



1. In a scientific vector processor having multiple independent instruction execution pipelines, a vector file memory system comprising:

a first vector file means for addressably storing a plurality of vector files made up of vector elements in a predetermined storage configuration;

a second equal vector file means for addressably storing a second plurality of vector files made up of vector elements in said predetermined storage configuration;

each of said first and second vector file means including an identical plurality of N memory blocks, wherein each of said memory blocks comprises a random access memory means having storage locations for storing vector elements, addressing means for providing address signals for addressing said storage locations, and a separate writing means for writing vector elements in addressed ones of said storage locations;

each of said random access memory means including a plurality of successive addressable storage locations wherein each such successive location stores contiguous information successively separated by N locations, where N equals the number of said N memory blocks;

N address registers, each coupled to said addressing means of a respectively associated one of said N memory blocks wherein N-1 of said N address registers are successively interconnected one to another such that the output of each of said address registers is connected to the input of a successive one of said address register; and

a time slot management mechanism coupled to each of said first and said second vector file means to allocated and maintain memory access by the multiple independent instruction execution pipelines in a predetermined sequence of said N memory blocks.

4,875,162 AUTOMATED INTERFACING OF DESIGN/ENGINEERING SOFTWARE WITH PROJECT MANAGEMENT SOFTWARE

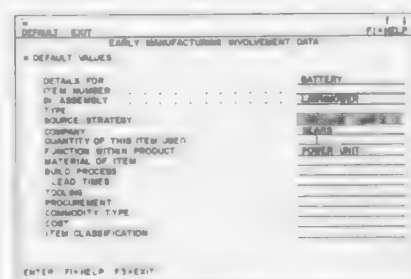
Kate M. Ferriter, Atlanta, and Robert B. Mathis, Merietta, both of Ga., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 28, 1987, Ser. No. 115,073

Int. Cl.⁴ G06F 15/21

U.S. Cl. 364-401

4 Claims



1. A method for the automatic interfacing of a conceptual design tool with a project management tool, said conceptual design tool providing for the early manufacturing involvement information needed to aid and improve the total design and manufacturing effort to produce a final product, said method comprising the steps of:

using said conceptual design tool, prompting a user to input a functional product structure;

capturing product structure data input by the user in a database;

using said conceptual design tool, prompting a user to input manufacturing details for each item in the functional product structure;

capturing manufacturing detail data input by the user in said database;

prompting a user for rules which determine which items of the product structure are critical;

selecting items from database which fulfill criticality requirements;

ordering selected critical items according to lead times from manufacturing detail data gathered by said conceptual design tool and captured in said database;

formatting the ordered selected items in a file of said project management tool; and

importing the formatted file into said project management tool.

4,875,163 ELECTRONIC CASH REGISTER SYSTEM WITH FASTER ACCESS TIME TO PRICE LOOK-UP FILE

Hiroaki Ishii, Ohtsu, Japan, assignor to Omron Tateisi Electronics Co., Kyoto, Japan

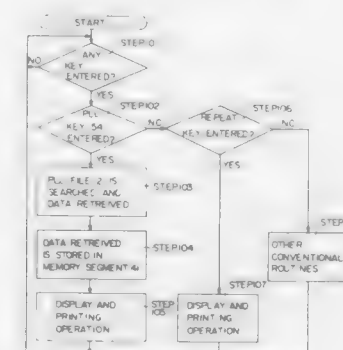
Filed Sep. 14, 1987, Ser. No. 95,625

Claims priority, application Japan, Sep. 22, 1986, 61-224355; Sep. 24, 1986, 61-227000

Int. Cl.⁴ G06F 15/00

U.S. Cl. 364-405

14 Claims



1. An electronic cash register system, comprising:

a PLU file storing item data corresponding to different classes of articles to be processed by said electronic cash register system, said item data comprising at least a PLU code and an item price data, wherein each particular article to be processed is within one of said classes of articles and all particular articles within a same class have the same item data;

storage means for receiving and temporarily storing item data from said PLU file, corresponding to different classes of articles processed by said electronic cash register system;

access means for accessing said item data stored in said storage means when a present particular article being processed by said ECR system is within a same class of articles as a preceding article processed by said electronic cash register system and having its item data stored in said storage means; and

output means, responsive to said item data accessed by said access means, for providing an output representation of at least said item price data.

4,875,164 PROCESSING SYSTEM FOR A GAMBLING GAME

Jean-Jacques Monfort, 3 allée des Rives de Bagatelle, Suresnes 92150, France

PCT No. PCT/FR85/00301, § 371 Date Jun. 24, 1986, § 102(e)

Date Jun. 24, 1986, PCT Pub. No. WO86/02752, PCT Pub. Date May 9, 1986

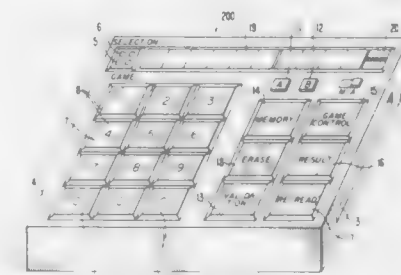
PCT Filed Oct. 23, 1985, Ser. No. 885,608

Claims priority, application France, Oct. 23, 1984, 84 16340

Int. Cl.⁴ G06F 15/28

U.S. Cl. 364-412

20 Claims



1. A system for processing a gambling game having determined paying and stake rules, said game consisting of receiving and recording bets of gamblers, collecting sums paid by the gamblers with respect to a stake, carrying out a drawing in accordance with the rules of the game and distributing winnings to those gamblers whose bets correspond to the drawing, said system comprising:

an information support comprising a memory zone capable of being erased and written into;

a first means, said first means being independent and portable and comprising a first reading means, an erasing means, and a first writing means for respectively reading, erasing and writing bet data in said information support, and a checking means for checking the result after the drawing;

a second means associated with a computer of a bets managing center, said second means comprising a second reading means for reading bet data written in said information support by said first means, and a sending means for sending to said computer of said bets managing center bet data to be recorded, and an indicating and recording means for indicating and collecting sums to be collected with respect to the stake, and a second writing means for writing in said information support in a zone inaccessible to said first means indications relating to the bet data.

4,875,165 METHOD FOR DETERMINATION OF 3-D STRUCTURE IN BIPLANE ANGIOGRAPHY

Laura E. Fencil, Chicago; Charles E. Metz, and Kunio Doi, both of Willowbrook, Ill., assignors to University of Chicago, Chicago, Ill.

Filed Nov. 27, 1987, Ser. No. 126,266

Int. Cl.⁴ G01B 11/24; G06F 15/42

U.S. Cl. 364-413.22

13 Claims

1. A method for determination of 3-D structure of an object in biplane angiography, comprising:

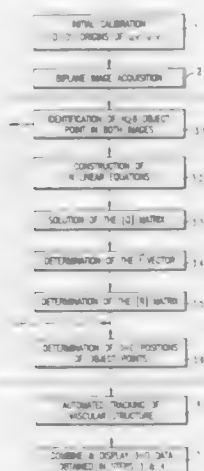
providing first and second imaging systems including first and second x-ray sources each having a focal spot and respective first and second x-ray sensitive receivers each defining an image plane, said first x-ray source arranged to transmit x-rays from its focal spot in a first direction through said object to the image plane of said first receiver and said second x-ray source arranged to transmit x-rays from its focal spot in a second direction arbitrarily selected with respect to said first direction through said object to the image plane of said second receiver;

determining the distances (D, D') of perpendicular lines from the focal spot of each x-ray source to the image plane of the respective receiver;

determining the points on respective image planes where respective perpendicular lines from the respective focal spots to the respective image planes intersect the respective image planes and defining said points on respective image planes as the origins of respective two dimensional image coordinate systems (uv), (u'v') at the respective image planes, wherein said focal spots and the respective image planes define respective first and second three-dimensional coordinate systems having respective z axes coincident with said perpendicular lines (D, D') in the directions of respective image planes, x axes parallel to respective of the image plane axes (u, u') and y axes parallel to respective of the image plane axes (v, v'), where the relative geometry of said first three dimensional coordinate system with respect to said second three dimensional coordinate system is defined by

$$x_1' = [R](x_1 - t),$$

where x_1' is the position vector of the object point (x_1', y_1', z_1') in said second three dimensional coordinate system, x_1 is the position vector of the same object point (x_1, y_1, z_1) in said first three dimensional coordinate system, [R] is a rotation matrix defining the rotation in three-dimensional space between the



first and second three-dimensional coordinate systems and t expresses, in the first coordinate system xyz, a unit translation vector that moves the origin of the first coordinate system xyz to the origin of the second coordinate system;

irradiating said object with x-rays from said x-ray sources and producing respective first and second images defined by digital image data based on the x-rays received by said first and second receivers;

determining from each of said first and second images the image coordinates ((u, v), (u', v')) in the respective coordinate systems of N objects points, where $N \geq 8$, which correspond to the same object points in the object;

scaling the image coordinates (u_1, v_1), (u'_1, v'_1) of said eight points by respectively dividing said image coordinates by the respective distances (D, D') to obtain normalized image coordinates (ξ_1, η_1), (ξ'_1, η'_1);

constructing N linear equations, one for each object point, containing only normalized image coordinates (ξ_1, η_1), (ξ'_1, η'_1) and nine unknown elements (q_{ki}), where q_{ki} represent an unknown relative geometry between the two imaging systems in terms of nonlinear combinations of the elements of the translation vector (t) and the rotation matrix [R];

solving the N linear equations for eight of the q_{ki} values relative to the ninth q_{ki} value to produce a matrix [Q*]; and

determining scaled three dimensional coordinate (x_1, y_1, z_1) of

said N object points expressed in units of a unit translation vector t from the product matrix [Q*]^T[A*].

4,875,166

BANDWIDTH ENHANCING SEISMIC ACQUISITION SYSTEM AND METHOD

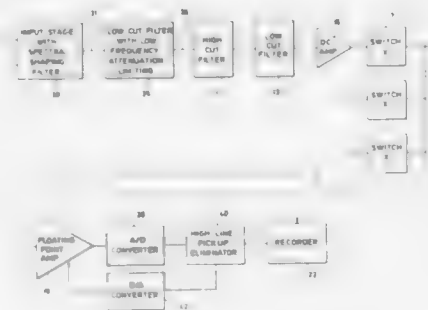
Paul E. Carroll; Roy W. James, III, both of Houston; Charles K. Bowen, Richmond, and Gillian C. Smith, Houston, all of Tex., assignors to Input/Output, Inc., Stafford, Tex.

Filed Oct. 9, 1987, Ser. No. 107,500

Int. Cl.⁴ G06C 7/48

U.S. Cl. 364—421

20 Claims



13. In combination with a geophysical data acquisition system channel, including an input stage responsive to seismic signals and a recorder for storing representations of said signals, an attenuated limited low-cut filter disposed between said input stage and said recorder, said attenuated limited low-cut filter comprising,

first means for producing a cut-off frequency f_c such that signals of frequency below f_c are increasingly attenuated with decreases in frequency below said cut-off frequency f_c , and

second means for limiting attenuation of such signals at low frequencies approaching zero frequency,

whereby said attenuation limited low-cut filter has an input-output response characterized by a cut-off frequency f_c and limited attenuation at low frequencies approaching zero frequency.

4,875,167

ODOMETER DATA COMPUTING APPARATUS

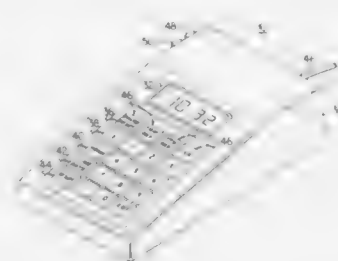
John W. Price, Garland, and John F. Brady, III, Dallas, both of Tex., assignors to Mileage Validator, Inc., Richardson, Tex.

Continuation of Ser. No. 861,436, May 9, 1986, abandoned. This application Jun. 28, 1988, Ser. No. 214,919

Int. Cl.⁴ G06F 15/74

U.S. Cl. 364—424.04

2 Claims



1. An odometer monitoring system for a vehicle comprising: (a) a power supply means for producing a stable voltage from a vehicle power supply responsive to ignition switch turn on of the vehicle;

(b) a sensor means including a sensor for sensing the rotations of a drive shaft and a means for generating signals representative of the drive shaft rotations;

(c) a clock means for generating clock pulses and time and date information;

(d) input means including digit keys, odometer key, time/date key, start key, pause key, end of trip key, trip report key, and year to date key;

a calibration switch means for selecting either a distance calibration operation mode or a distance measurement mode of operation;

(f) a display means for displaying operation information; and

(g) an odometer computer means connected to the power supply means for receiving electrical operating power, said odometer computer means including counting means and first and second storage means, the counting means being connected to the sensor means for counting the number of signals output by the sensor means, means connected to the calibration switch means for activating the counting means for selectively determining the number of drive shaft rotations per measurement unit for calibration or for accumulating the number of drive shaft rotations during a trip, means connected to the counting means for determining the distance being traveled using the number of drive shaft rotations per measurement unit and the number of rotations counted during a trip for storage in the first storage means; means connected to the odometer key and digit keys for entering an odometer reading into the first storage means; means connected to the clock means and display means and responsive to the time and date key and digit keys for setting the clock, means connected to the start key for loading into the first storage means trip information for the beginning of a business trip including the current time and date and odometer reading and incrementing a trip number, means connected to the end of trip key for loading trip ending trip report information including time and date, trip distance, and odometer reading into the first storage means, means connected to the pause key for interrupting a business trip in progress for storing trip report information for a nonbusiness use and at the end thereof responsive to the pause key for resuming tallying the distance of the business trip for a business trip report, means connected to the clock and date means for determining whether the year has ended, means connected to the start key and clock means for determining whether a trip is in progress at the end of the year, means connected to the end of trip key for ending any trip in progress, means connected to the first storage means for accumulating total distance and business trip distance for a year and a year to date report, means interconnecting the first and second storage means for transferring the year or year to date report date to the second storage means and clearing the first storage means for receiving the next year to date information; and means connected to the year to date key and a period key for outputting year to date report information selectively from either the first storage means or from the second storage means to an output port, and a trip report means connected to the trip report key for outputting the trip report information to the output port.

4,875,168

ENGINE SPEED CONTROL APPARATUS

Anthony N. Martin, Simsbury, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 22, 1987, Ser. No. 136,797

Int. Cl.⁴ F02C 9/42

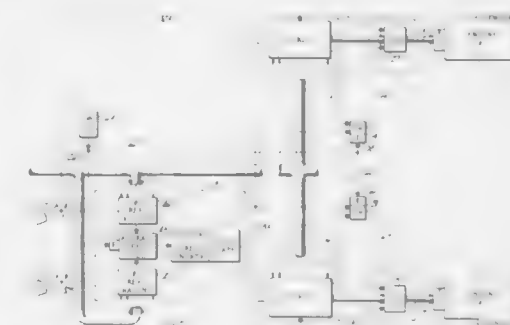
U.S. Cl. 364—431.01

2 Claims

1. Apparatus for synchronizing the speed of engines on an aircraft, the engines being of the type having an electronic engine control (EEC) unit and a fuel control unit (FCU), the EEC unit having speed rating logic (SRL) circuitry and speed governing loop (SGL) circuitry, the SRL circuitry including a signal processor with signal memory for storing signals repre-

sented an engine speed algorithm, the processor using the algorithm to calculate the magnitude of an EEC command speed signal (N sel) in response to sensed operating data received from the aircraft, the SGL circuitry receiving the EEC command speed signal at an input thereof for providing a command fuel flow signal (Wf) to the FCU at a magnitude dependent on the magnitude of the EEC command speed signal, the FCU controlling fuel to the engine in dependence on the magnitude of the command fuel flow signal, the apparatus comprising:

synchronizer reference unit (SRU) means, responsive to the sensed operating data from the aircraft, and having SRL circuitry for calculating a SRU command speed signal at a magnitude substantially equal to that of the EEC command speed signal; and



electronic switch means, one associated with each EEC unit, each switch means receiving the EEC command speed signal from the SRL circuitry of the associated EEC unit at a first input thereof, and each switch connected at an output thereof to the input of the SGL circuitry of the associated EEC unit, each switch further receiving the SRU command speed signal from the SRU means at a second input thereof, each said switch means being responsive to operator control for selectively connecting one of said inputs to said output, whereby the SGL circuitry provides the command fuel flow at a magnitude dependent, alternately, on the magnitude of the EEC command speed signal and on the magnitude of the SRU command speed signal.

4,875,169

METHOD FOR IMPROVING THE LIMIT OF DETECTION IN A DATA SIGNAL

Robert E. Synovec, and Edward S. Yueng, both of Ames, Iowa, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Continuation of Ser. No. 851,129, Apr. 11, 1986, abandoned.

This application May 27, 1988, Ser. No. 201,304

Int. Cl.⁴ G06F 15/20; G01N 31/08

U.S. Cl. 364—497

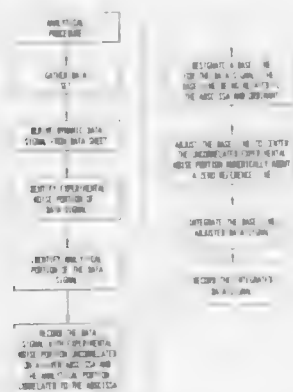
11 Claims

1. A method for improving limit of detection for a data set represented in a dynamic data signal derived from an analytical procedure in which an experimental noise portion of the data signal is uncorrelated to a given abscissa and an analytical portion of the data signal is correlated to said abscissas, comprising:

collecting, in recorded form on a record means, said data signal by monitoring with detector means at least one analytical procedure, involving analytical equipment and material to be analyzed, to gather said data set, and converting said data set into said data signal which includes said analytical portion and said experimental noise portion;

with the data signal in collected and recorded form, desig-

nating a base line for said data signal after observation of the data signal;
adjusting said base line of said data signal to center said experimental noise portion numerically about a zero reference line while preserving correlation to the abscissa; and



integrating said data signal, after base line adjustment, and preserving corresponding correlated abscissa information for each point of said data signal, said integration producing an enhanced integrated data signal, in recorded form on a record means, with respect to the adjusted base line while causing said experimental noise portion to be minimized, improving said limit of detection.

4,875,170

METHOD AND APPARATUS FOR ESTIMATING LIFE EXPECTANCY OF MECHANICAL STRUCTURES

Shigeo Sakurai, Hitachi; Sadao Umezawa, Mito; Saburo Usami, Hitachi; Hiroshi Miyata, Mito; Hajime Toriya, Hitachi; Kuniyoshi Tsubouchi, Mito, and Ryotchi Kaneko, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

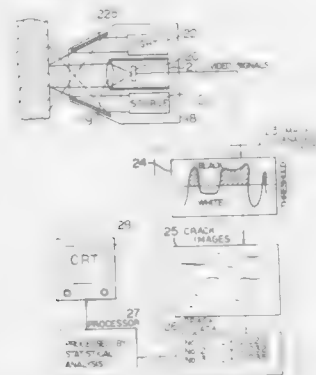
Continuation of Ser. No. 850,105, Apr. 10, 1986, abandoned.

This application May 31, 1988, Ser. No. 206,924

Int. Cl.⁴ G06F 15/20; G01M 7/00; G01N 21/16

U.S. Cl. 364—507

13 Claims



5. An apparatus for estimating a life expectancy of a mechanical structure to which a number of repeated loads is applied, said apparatus comprising:

determining and estimating means for experimentally determining a relationship between a maximum crack length of micro cracks formed in the surface of the structure and a life ratio of the structure, wherein a life ratio represents the number of repeated loads applied to the structure to the number of loads needed to be applied to the structure in order for rupture to occur, and for estimating a life expectancy value of the structure by calculating a current

life ratio from the maximum crack length of the micro cracks based on said relationship;
detecting means for detecting a maximum crack length and providing a signal indicating said maximum crack length to said determining and estimating means; and
displaying means for receiving and displaying the estimated life expectancy value of the structure.

4,875,171

WHEEL SPEED CONTROL SYSTEM INCORPORATING IN-GEAR VIBRATION DETECTION AND ELIMINATION MEANS

Hideaki Fujioke, and Koji Takata, both of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

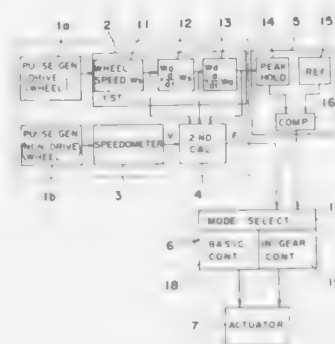
Filed Sep. 25, 1987, Ser. No. 100,865

Claims priority, application Japan, Sep. 26, 1986, 61-228700

Int. Cl.⁴ G01H 11/00; G01M 13/02

U.S. Cl. 364—508

20 Claims



8. An in-gear vibration elimination system provided in a vehicle comprising:

means for detecting a speed of a drive wheel;
means for detecting a speed of a non-drive wheel;
means for obtaining a speed of a vehicle;
means for detecting a deviation of the drive wheel speed from the vehicle speed;
wheel speed control means for controlling the speed of the drive wheel to maintain the deviation within a predetermined limit;
means for taking a differential of said drive wheel speed;
means for producing a reference level;
means for comparing said differential with said reference level and for producing an in-gear signal indicative of the in-gear vibration when said differential exceeds said reference level; and
interrupting means for interrupting the operation of said wheel speed control means in response to said in-gear signal, thereby eliminating the in-gear vibration caused by said wheel speed control means.

4,875,172

LOCOMOTION-COMMAND METHOD FOR MOBILE ROBOTS

Yutaka Kanayama, Nijhari, Japan, assignor to Yutaka Kanayama, Ibaragi and Glory Kogyo Kabushiki Kaisha, Hyogo, both of Japan

Continuation of Ser. No. 91,362, Aug. 28, 1987, abandoned,

which is a continuation of Ser. No. 715,002, Mar. 22, 1985,

abandoned. This application Aug. 19, 1988, Ser. No. 235,710

Claims priority, application Japan, Sep. 28, 1984, 59-203326

Int. Cl.⁴ G06F 15/50

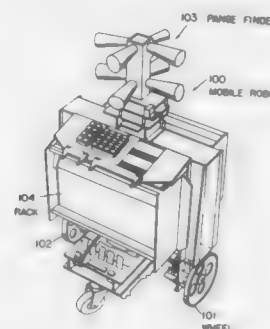
U.S. Cl. 364—513

5 Claims

1. A control method for the travel motion of a mobile robot across an area definable by Cartesian coordinates along a traveling route using a main control module sending out coordinate

related control commands as well as a locomotion module moving together with the robot and responding to the control commands and self-controlling the local direction of movement of the robot, characterized by the steps of:

self-controlling of robot by the locomotion module such that said robot follows a given straight line;
sending a change of course from the main control module to the locomotion module, said change of course command



comprising data indicative of a location at which a change of course is to occur and data indicative of an angle between the given straight line and a new direction of travel; executing the change of course command by the locomotion module when the mobile robot reaches the location at which said change of course is to occur; and self-controlling the mobile robot by the locomotion module such that said robot follows a straight line along said angle in said new direction of travel.

4,875,173

IMAGE ENLARGING METHOD AND DEVICE

Aldo Nakajima, Toyokawa, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

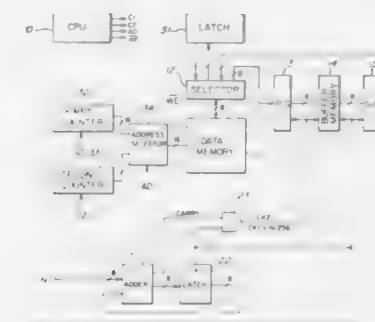
Filed Apr. 15, 1986, Ser. No. 852,439

Claims priority, application Japan, Apr. 16, 1985, 60-81913; Apr. 16, 1985, 60-81914

Int. Cl.⁴ G06F 3/15

U.S. Cl. 364—518

12 Claims



12. Apparatus with limited memory capabilities for enlarging an image represented by digital data in order to provide a magnified image thereof comprising:

memory means for storing the data representative of the image;
means for defining the original position of the image to be enlarged;
means for defining the magnification of the image;
means for defining the resultant position of the desired magnified image displaced from the original position;
means for shifting the original position to another position when there is an overlap of the defined enlarged image position and the original position, and
means for transmitting data of the magnified image for stor-

age in the same memory means whereby a magnified image is provided without loss of content and with limited use of memory capability.

4,875,174

INSTANT LABEL PRINTER FOR HOST COMPUTER

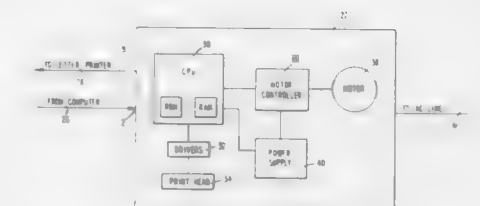
Robert Olodort, Los Angeles; Charles Micalizzi, Capistrano Beach; Louis Cambruzzi, Placentia, and Randy Turchik, Laguna Hills, all of Calif., assignors to Print Things, Santa Monica, Calif.

Filed Mar. 6, 1987, Ser. No. 23,075

Int. Cl.⁴ G06F 3/09

U.S. Cl. 364—519

10 Claims



1. a label printing system for interfacing with a host computer, said host computer executing application programs, such as a word processing program, and including a keyboard, a display screen and screen driver means for driving said display screen, said label printing system comprising:
label printer means for recording data on a label;
printer control means providing control signals to drive said label printer means;
interface means for interfacing said label printer control means to said host computer; and
a control program executable by said host computer and independent of said application program for
(a) interrogating said screen driver means for data displayed on said display screen in response to the application program executed by said host computer;
(b) importing to said control program a portion of said displayed data to be printed on said label; and
(c) supplying the imported data portion to said printer control means.

4,875,175

METHOD AND DEVICE FOR ANALYZING AND MEASURING PHYSICAL PARAMETERS OF A LAYERED MATERIAL BY THERMAL RADIOMETRY

Michel Egee; Robert Dartois, both of Reims; Jean Marx, Com-montrenil; Etienne Merienne, Reims; Marcel Regalia, Reims; Philippe Poplimont, Reims, and Etienne Van Schel, Reims, all of France, assignors to Universite de Reims Champagne-Ardenne, Reims, France

Filed Feb. 5, 1987, Ser. No. 11,497

Claims priority, application France, Feb. 6, 1986, 86 01613

Int. Cl.⁴ G01N 21/41; G06F 15/20

U.S. Cl. 364—551.01

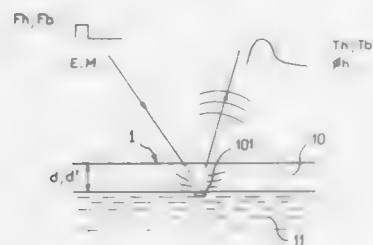
22 Claims

1. Method of analyzing and measuring by thermal radiometry physical parameters of a layered material comprising a base layer and a surface layer, wherein to determine said parameters such as the absorptivity B and diffusivity A of said surface layer and the thermal resistance R of the interface between said two layers of a sample relative to a reference sample having a surface layer of known thickness d' the method consists in:

(a) exciting the surface layer side of said reference sample by means of a flux of thermal energy amplitude modulated according to a periodic law at a high frequency Fh very much greater than a value for which the thermal diffusion length l' of said surface layer is small relative to the thickness d' of said surface layer.
(b) detecting the thermal signal generated by said reference

sample as a result of absorption and measuring the amplitude T_h and phase shift ϕ_h of said thermal signal relative to the amplitude modulation excitation signal;

(c) exiting the surface layer side of said reference sample by means of a flux of thermal energy amplitude modulated according to a periodic law at a low frequency F_b such that said thermal diffusion length l' of said surface layer is approximately equal to its thickness;



(d) detecting the thermal signal generated by said reference sample in response to said excitation and measuring the amplitude T_b of said thermal signal; and

(e) determining the parameter A from the ratio of the amplitudes of said thermal signal at said low and said high frequencies, T_b/T_h , and from the equation:

$$B\sqrt{A} = \frac{\tan\left(\phi + \frac{\pi}{2}\right)}{1 - \tan\left(\phi + \frac{\pi}{2}\right)} \sqrt{4\pi F_h}$$

by interpolation using an array of values $d\sqrt{A}$, T_b/T_h , $B\sqrt{A}$ and where ϕ represents the measured phase shift and then determining the parameter B .

4,875,176

METHOD AND APPARATUS FOR MEASURING SURFACE TEMPERATURES

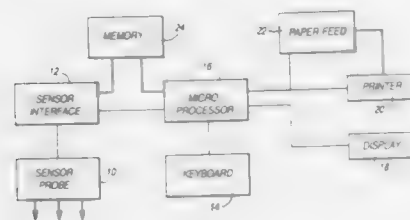
Curtis L. Harach, 13309 Pennybacker La., Fairfax, Va. 22033, and Kerry B. Beach, Herndon, Va., assignors to Curtis L. Harach, Centerville, Va.

Filed Oct. 22, 1987, Ser. No. 111,753

Int. Cl. G01K 1/02

U.S. Cl. 364—557

12 Claims



1. An apparatus for measuring temperature across the surface of a tire comprising:

- three temperature sensors for sensing temperature of material along the surfaces simultaneously at three spaced locations;
- adjustable means for adjusting the location of each sensor;
- an interface means for converting analog temperature measurements of said sensing means to a digital output;
- a display for displaying simultaneously three separate representations of the temperatures sensed;

- a microprocessor;
- an operator keyboard for inputting commands into said microcomputer;
- memory means for storing data from said interface means corresponding to the digital output thereof;
- means for connecting said sensors, said microprocessor, said keyboard, and said memory means to a power source;
- said microprocessor cooperating with said interface means, said display, said power source, and said keyboard to display a representation corresponding to the temperatures sensed.

4,875,177

DATUMING OF ANALOGUE MEASUREMENT PROBES

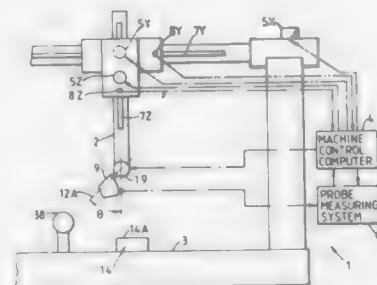
Thomas B. Jarman, Cirencester, United Kingdom, assignor to Renishaw plc, Wotton-under-Edge, United Kingdom
Filed Oct. 2, 1987, Ser. No. 103,752

Claims priority, application United Kingdom, Oct. 8, 1986, No. 24191

Int. Cl. G01C 25/00

U.S. Cl. 364—559

8 Claims



1. A method of datuming an analogue measurement probe in position determining apparatus, the probe having an output indicative of a distance of a surface of an object from the probe along a measurement axis of the probe when the distance is within a measuring range of the probe, the apparatus having means for moving the probe relative to the object and position determining means for taking a reading of the position of the probe with respect to at least one measurement axis of the apparatus, the method comprising:

- providing a test object having a datum point;
- moving the probe into a plurality of surface-sensing positions with respect to the test object and using the position determining means to take a first set and a second set of said readings, the readings within each set being in respect of different surface positions of the test object and being sufficient to make a determination from that set of readings of the position of said datum point of the test object, each reading of the first set being taken when the probe output indicates that the probe is substantially at a first point within its measuring range and each reading of the second set being taken when the probe output indicates that the probe is substantially at a second point within its measuring range;
- making a first determination of the position of said datum point of the test object from the first set of readings and a second determination thereof from the second set of readings; and
- deriving from the first and second determinations of the position of said datum point a correction factor for use in correcting the probe output for any angular deviation between the measurement axis of the probe and the measurement axis of the apparatus.

4,875,178

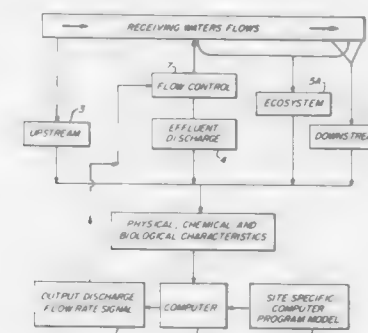
METHOD TO CONTROL THE DISCHARGE OF EFFLUENT

Leonard C. Cook, 9881 Tomahawk Trail, Wexford, Pa. 15090
Filed May 2, 1988, Ser. No. 189,023

Int. Cl. G06G 7/48

U.S. Cl. 364—578

12 Claims



2. A method to control the discharge of effluent to receiving waters including the steps of determining the flow rate of effluent to be discharged to the receiving waters according to the expression:

$$F_{ed} = \frac{F_{dnsm} \times C_{dnsm} - F_{upstm} \times C_{upstm}}{C_{ed}}$$

where:

- F_{ed} is equal to the flow rate of effluent discharge;
- F_{dnsm} is equal to the flow rate of the receiving waters downstream of the effluent discharge;
- C_{dnsm} is equal to the predetermined maximum allowable concentration of a substance in the receiving waters downstream of the effluent discharge;
- F_{upstm} is equal to the rate of stream flow upstream of the effluent discharge;
- C_{upstm} is equal to the concentration of the substance upstream of the discharge location; and
- C_{ed} is equal to the concentration of the substance in the effluent discharge; and using a signal corresponding to a computed value of said F_{ed} for controlling the discharge of effluent to the receiving waters so as not to exceed predetermined water quality criteria of the receiving waters in the zone of influence.

4,875,179

READING ASSISTANCE DEVICE FOR WORD PROCESSOR

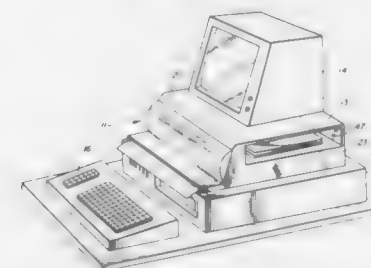
Gideon Gelman, 36/4 Arlozerov, Petah-Tiqva, Israel (49208)

Filed Jul. 31, 1987, Ser. No. 80,441

Int. Cl. B41J 11/38

U.S. Cl. 364—708

9 Claims



1. A reading assistance device for use with a word process-

ing system including a video display terminal and for displaying written material from a length of paper, said device comprising:

- a housing including a bottom for engaging a subtending horizontal support surface, a top for supporting said video display terminal, a central divider defining a retrieval compartment within said housing, a front having a transparent section for viewing said paper, an inlet for receiving said paper and means to access said compartment for removal of said paper;
- guide means disposed in said housing for guiding said paper along a direct path from said inlet past said transparent section to said retrieval compartment without emerging from said housing so that the user can view selected portions of said paper; and
- drive means disposed in said housing for engaging said paper and moving said paper along said guide means.

4,875,180

MULTI-FUNCTION SCALER FOR NORMALIZATION OF NUMBERS

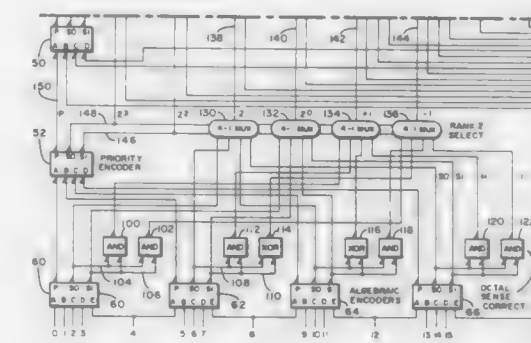
Glen R. Kregness, Minnetonka, and Walter L. Quinton, White Bear Lake, both of Minn., assignors to Unisys Corporation, Blue Bell, Pa.

Filed May 9, 1988, Ser. No. 192,081

Int. Cl. G06F 7/38

U.S. Cl. 364—715.03

8 Claims



1. A scaler for the justification of binary numbers having an excess number of sign bits comprising,

- encoding means partitioned into a plurality of sub-encoding means wherein a first sub-encoding means receives the most-significant sign bit of the number, and a plurality of the next most-significant bits of the number, and the remaining sub-encoding means of said plurality, and each receives a number of successive bits of the binary number which are equal in number to the number of next most-significant bits plus the sign bit that is supplied to said first encoding means, and all of the bits of the number are supplied to said encoding means, each of said sub-encoding means being constructed so that an output signal is provided which indicates whether or not all of the bits supplied to said sub-encoding means are of the same value as the most-significant bit applied to said sub-encoding means, and an output count that signifies which of the bits supplied to said sub-encoding means is the next most-significant bit that differs in value from the most-significant bit supplied to said sub-encoding means, and
- scale count means coupled to said encoding means for providing a scale count representation of the number of next most-significant bits of said binary number that are of the same value as said most-significant sign bit.

4,875,181

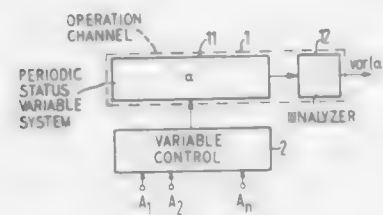
METHOD OF APPARATUS FOR REALIZING A LOGICAL OPERATION BY MODIFYING A FLOW OF ENERGY

Friedrich-Wilhelm Hagemeyer, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany
Continuation of Ser. No. 767,072, Aug. 19, 1985, abandoned, which is a continuation of Ser. No. 393,050, Jan. 28, 1982, abandoned. This application Jan. 9, 1987, Ser. No. 60,936
Claims priority, application Fed. Rep. of Germany, Aug. 18, 1981, 3132623

Int. Cl.⁴ G06F 7/56

U.S. Cl. 364—716

13 Claims



1. A logical operation system, comprising:
an operation channel means having a status variable associated therewith whose value can be selectively changed by variable control signals input to the operation channel means, said operation channel means having an output at which the selectively changed status variable is present;
analyzer means connected to said output of the operation channel means for providing logical values at its output according to an evaluation function applied to the selectively changed status variable output from the operation channel means; and
variable control means connected to said operation channel means for providing said variable control signals thereto, said variable control means having logical variable signals input thereto and operation control signals input thereto, said variable control means employing the logical variable signals and the operation control signals for varying the variable control signals such that the logical variable signals cause changes of the status variable and a magnitude of said changes is varied by the operation control signals, and said variable control means determining a selective change from one logical operation to a completely different logical operation based on values of the operation control signals.

4,875,182

MINIATURE DIGITAL COMPUTER CIRCUIT FOR DETERMINING VALUES OF COMBINED VARYING QUANTITIES

Yu-Tsang G. Hwang, Dix Hills, N.Y., assignor to Republic Electronics Company, Hauppauge, N.Y.
Filed Jul. 13, 1987, Ser. No. 73,004
Int. Cl.⁴ G06F 15/328

U.S. Cl. 364—732

5 Claims

1. A miniature digital computer circuit comprising:
first and second sources of digital data signals respectively representing a first function having the format $X(t)$, where $X(t)$ is a function of t which is a continually varying first quantity, and a second function having the format $Y(t)$, where $Y(t)$ is a second function of t which is a continually varying second quantity, said digital data signals having the format of two trains of successive groups of pulses, said groups of pulses in each of said trains having a prescribed number of bits;
first and second pulse readout memory means connected to said first and second data signal sources and arranged to produce first and second partial derivative digital readouts having the respective formats $\partial F(X,Y)/\partial X$ and

$\partial F(X,Y)/\partial Y$, where $\partial F(X,Y)/\partial X$ and $\partial F(X,Y)/\partial Y$ represent the partial derivatives of the function $F(X,Y)$ taken only with respect to said first and second functions, and ∂X , ∂Y represent the partial differentials of said first and second varying quantities;

first digital multiplier means connected to said first memory means and said first data signal input source for receiving therefrom and multiplying said first partial derivative of digital readout data pulses by ΔX , where ΔX represents the instantaneous change in quantity X from instant to instant, to produce a first digital multiplication product having the format $\partial F(X,Y)/\partial X \Delta X$;

second digital multiplier means connected to said second



memory means and said second data signal input source for multiplying said second partial derivative digital readout data pulses by ΔY , where ΔY represents the instantaneous change in said second quantity from instant to instant, to produce a second digital multiplication product having the format $\partial F(X,Y)/\partial Y \Delta Y$; and
digital adder means connected to said first and second multiplier means to receive said digital multiplication products therefrom and to add said products together to produce a digital sum having the format $\Delta F(X,Y)$, where $\Delta F(X,Y) = \partial F(X,Y)/\partial X \Delta X + \partial F(X,Y)/\partial Y \Delta Y$, and where $\Delta F(X,Y)$ represents the two first order terms of the partial derivative expansion of the function $F(X,Y)$.

4,875,183

NEURAL NETWORKS

Hans P. Graf, North Middletown, and Richard E. Howard, Highland Park, both of N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Nov. 19, 1987, Ser. No. 122,870

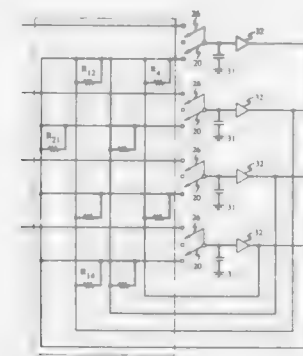
Int. Cl.⁴ G06G 7/02

U.S. Cl. 364—807

9 Claims

1. A process for the parallel processing of signals by a neural network, said neural network comprising (a) a multiplicity of inputs for a matrix with rows and columns connected by interconnected elements and (b) active elements interacting with said matrix, said processes comprising the steps of (1) applying a signal to said multiplicity of inputs wherein switches present in said matrix are located such that each of said inputs is made between a switch in said matrix and the input of one of said

active elements and such that, with the switch open, essentially no processing of information occurs, and (2) closing said



switches wherein the parallel processing of said applied inputs is initiated.

4,875,184

FUZZY LOGIC COMPUTERS AND CIRCUITS

Takeshi Yamakawa, Kumamoto, Japan, assignor to Omron Tateisi Electronics Co., Kyoto, Japan

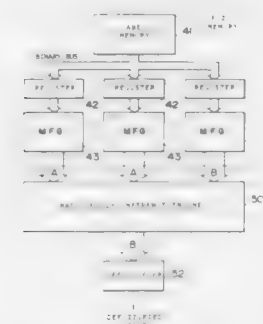
Filed Nov. 5, 1987, Ser. No. 116,777

Claims priority, application Japan, Nov. 13, 1986, 61-268564

Int. Cl.⁴ G07G 7/00

U.S. Cl. 364—807

8 Claims



1. A fuzzy computer comprising:

a plurality of fuzzy membership function generator circuits, each of said fuzzy membership generator signal distributed on a plurality of lines which represents a predetermined fuzzy membership function, and
a fuzzy inference engine which receives as inputs the electric signals outputted by said plurality of fuzzy membership function generator circuits, said fuzzy inference engine executing a predetermined fuzzy operation and for outputting the result of said operation as an electric signal distributed on a plurality of lines.

4,875,185

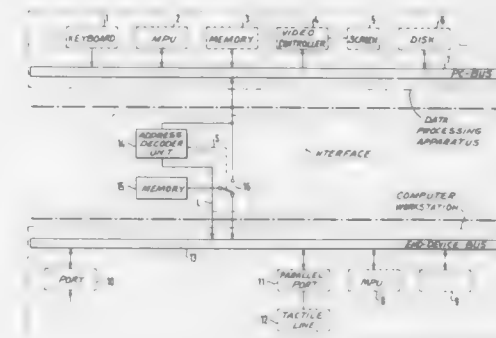
WORKSTATION FOR A VISION-IMPAIRED USER WITH INTERFACE FOR SELECTIVELY FEEDING DISPLAY DATA FROM A BUS OR A CONNECTED COMPUTER

Hans-Jürgen Bornschein, Schwerte, Fed. Rep. of Germany, assignor to F. H. Papez GmbH & Co. KG, Schwerte, Fed. Rep. of Germany
Filed Nov. 17, 1986, Ser. No. 931,674
Claims priority, application Fed. Rep. of Germany, Nov. 18, 1985, 3540878; Mar. 7, 1986, 3607549

Int. Cl.⁴ G06F 13/38, 3/14

U.S. Cl. 364—900

18 Claims



1. A computer workstation for a vision-impaired user for connection to a data processing apparatus which includes a microprocessor, data input means, memory storage means, visual output means and at least a data bus connecting said microprocessor, data input means, memory storage means and visual output means for transmission of data therebetween, said workstation comprising:

a workstation microprocessor;
main memory means for storing data;
display means for representing at least one of auditory, visual and tactile information for recognition by a vision-impaired user; and
interface means for connecting said workstation to the data processing apparatus so that information displayed on the visual output means of the data processing apparatus is also represented on said workstation display means for a vision-impaired user, said interface means being connected to the data bus of the data processing apparatus and comprising:
interface memory means for storing data; and
data transfer controller comprising: means for sensing that particular data being transmitted on the data processing apparatus data bus is directed to the visual output means, means for feeding the sensed data which is directed to the visual output means from the data bus to said interface memory means so as to store said sensed data in said interface memory means, means for sensing the cessation of said data transmission on the data bus to the visual output means, and means for causing the data stored in said interface memory means to be fed, after said cessation of data transmission, to said display means for representation by said display means for recognition by a vision-impaired user.

4,875,186

PERIPHERAL EMULATION APPARATUS

Carl R. Blume, Jr., Newton, Mass., assignor to Prime Computer, Inc., Natick, Mass.

Filed Feb. 28, 1986, Ser. No. 834,751

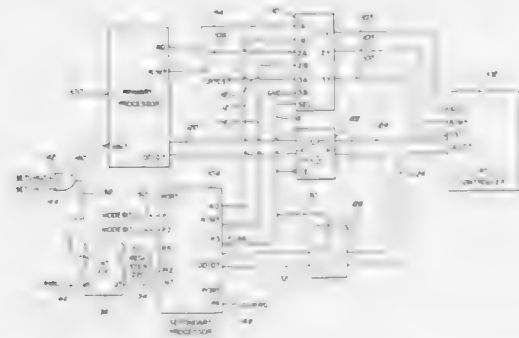
Int. Cl.⁴ G06F 13/00

U.S. Cl. 364—900

19 Claims

1. In a data processing system having a first processor generating address and data signals, at least one peripheral unit

having a plurality of registers for storing parameter data which controls the operation of said peripheral unit, at least selected ones of said registers being device specific registers, and means responsive to said address and said data signals for transferring said parameter data from said first processor to said registers, apparatus for allowing a software program written for use with a different peripheral unit to operate with said peripheral unit, said apparatus comprising



means responsive to said address and said data signals for generating a flag signal when said parameter data is being transferred from said first processor to said device specific registers;
means responsive to said flag signal for temporarily disconnecting said first processor from said peripheral unit; and
means responsive to said address and data signals for providing and writing alternate parameter data into said device specific registers.

4,875,187

PROCESSING APPARATUS FOR GENERATING FLOW CHARTS

Carolyn M. Smith, Ipswich, England, assignor to British Telecommunications, plc, London, England

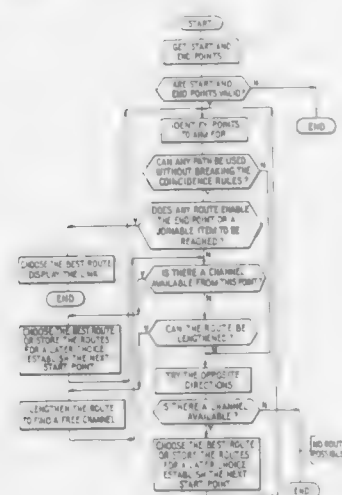
Filed Jul. 29, 1987, Ser. No. 78,945

Claims priority, application United Kingdom, Jul. 31, 1986, 8618665

Int. Cl.⁴ G06F 15/20

U.S. Cl. 364—900

9 Claims



1. Apparatus for generating a flow chart consisting of boxes, joined by connecting links, the apparatus comprising:
A. a data processing unit;

B. an input device connected to said data processing unit;

C. a display device which is also connected to said data processing unit and which has vertical and horizontal

the data processing unit including means for causing display on the display device of a plurality of boxes and means for accepting from the input device data identifying a starting box and an end box, the processing unit further comprising means for causing display on the display device of a connecting link between the starting box and the end box, said data processing unit also including:

(a) means for defining a link start point associated with the starting box, and a link end point associated with the end box; (b) means for calculating whether first and second lines joining the link start point and respective first and second intermediate target points are obstructed by a non-permitted obstacle, said lines being parallel respectively to the horizontal and vertical axes of the display device, and having a length equal respectively to horizontal and vertical displacement of the link end point from the link start point, such that said intermediate target points may be joined to the link end point by respectively third and fourth lines parallel respectively to the vertical and horizontal axes;

(c) means for determining when no such obstacle is discovered, whether the said third and fourth lines joining said intermediate target points, and the link end point, are obstructed by non-permitted obstacles, and for generating when no obstacle is encountered to the third and fourth lines, a connecting link on the display device, composed of the first and third, or of the second and fourth said lines; (d) means for determining, when either said first and said second lines are obstructed, whether a channel exists which is not obstructed by non-permitted obstacles, said channel joining the respective first or second line, and a line parallel thereto, and displaced therefrom by respectively vertical or horizontal displacement of the link start point from the link end point; and

(e) means for storing a value to indicate the first and second lines respectively to be allowable, in accordance with whether or not a corresponding channel is found to exist for said lines respectively, and means for defining a junction of the channel with the respective first or second line as a new start point, in construction of a desired connecting link.

4,875,188

VOLTAGE MARGINING CIRCUIT FOR FLASH EPROM

Owen W. Jungroth, Sonoma, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Filed Jan. 12, 1988, Ser. No. 144,567

Int. Cl.⁴ G11C 11/34, 11/00, 7/00; H02J 1/10

U.S. Cl. 365—185

15 Claims



1. An electrically erasable and electrically programmable read-only memory fabricated on a silicon substrate and having a plurality of memory cells each of which has a floating gate,

an improvement for verifying erasing and programming comprising:

first circuit means incorporated on said substrate for providing a first potential lower than the potential used for programming said cells, said first potential being coupled to said cells to verify that said cells have been programmed, said first circuit means comprising: first and second field-effect transistors coupled in series and matched to one another; a first resistor means coupled to a programming potential for developing said first potential and a bias potential, the gates of said first and said second transistors being coupled to said first resistor means such that the gate of said first transistor is approximately at said first potential and the gate of said second transistor is at said bias potential, a first node disposed between said first transistor and said second transistor providing said first potential,

second circuit means incorporated on said substrate for providing a second potential lower than said first potential, said second potential being coupled to said cells to verify that said cells have been erased, said second circuit comprising: third and fourth field-effect transistors coupled in series and matched to one another; a second resistor means coupled to a programming potential for developing said second potential and a second bias potential, the gates of said third and said fourth transistors being coupled to said second resistor means such that the gate of said third transistor is approximately at said second potential and the gate of said fourth transistor is at said second bias potential; said second potential being provided at a second node disposed between said third and fourth transistors;

a selection means for selecting said first circuit means to transfer said first potential from the gate of said first transistor to said first node to verify that said cells have been programmed, and for selecting said second circuit means to transfer said second potential from the gate of said third transistor to said second node to verify that said cells have been erased.

4,875,189

RANDOM ACCESS MEMORY DEVICE WITH NIBBLE MODE OPERATION

Takashi Obara, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

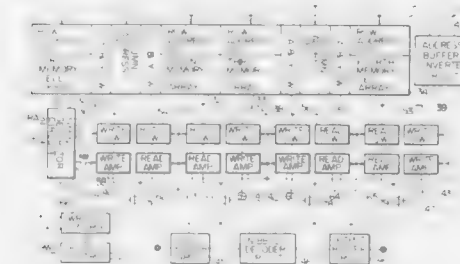
Filed Jan. 28, 1988, Ser. No. 149,282

Claims priority, application Japan, Jan. 28, 1987, 62-19293

Int. Cl.⁴ G11C 8/00

U.S. Cl. 365—189.04

7 Claims



1. A random access memory device with a read-out mode operation and a write-in mode operation, said write-in mode operation having a random access stage followed by a simultaneous access stage, comprising:

(a) plural memory cell arrays each having a plurality of memory cells arranged in rows and columns;
(b) addressing means operative to produce a bit control signal and internal address signals specifying certain memory cells each selected from each memory cell array for said read-out mode operation and said write-in mode

operation, one of said certain memory cells being directly specified by a row address signal and a column address signal supplied from an external source;

(c) plural read/write switching circuits associated with said plural memory cell arrays, respectively, each of said read/write switching circuits being provided with a write-in switch and a read-out switch which are capable of electrically connecting each of said certain memory cells through said addressing means;

(d) plural data amplifier circuits paired with said read/write switching circuits, respectively, each of said data amplifier circuits being provided with a write data amplifier and a read data amplifier which are coupled to said write-in switch and said read-out switch, respectively;

(e) a data input buffer circuit supplied with a new data bit from said external source;

(f) a data output buffer circuit operative to transfer data bits preserved in said certain memory cells to an external destination in sequence;

(g) switching means provided with plural switching transistors having respective conduction paths coupled at one ends thereof to said data amplifier circuits, respectively, and at the other ends thereof to said data input buffer circuit or said data output buffer circuit;

(h) a data control circuit responsive to said bit control signal and operative to cause one of said switching transistors to turn on in said write-in mode operation, said data control circuit being further operative to cause said switching transistors to successively turn on in said read-out mode operation; and

(i) a read/write control circuit operative to produce first and second activation signals the former of which is supplied to said write-in switches and said write data amplifiers for activation and the latter of which is supplied to said read-out switches and said read data amplifiers, said first activation signal allowing said write-in switch of one of said read/write switching circuit and said write data amplifier of one of said data amplifier circuits to transfer said new data bit to said memory cell directly specified by said row and column address signals in said random access stage, said second activation signal allowing said read-out switches of said read/write switching circuits except for said one of said read/write switching circuits and said read data amplifiers of said data amplifier circuits except for said one of said data amplifier circuits to read out said data bits from said certain memory cells except for said certain memory cell directly specified by said row and column address signals in said random access stage, said first activation signal allowing all of said write-in switches and all of said write data amplifiers to write said new data bit and said data bits into certain memory cells.

4,875,190

TWO-DIMENSIONAL MEMORY UNIT HAVING A 2D ARRAY OF INDIVIDUALLY ADDRESSABLE BLOCKS EACH HAVING A 2D ARRAY OF CELLS

Yukio Sakano, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Dec. 21, 1987, Ser. No. 135,349

Claims priority, application Japan, Dec. 26, 1986, 61-310101

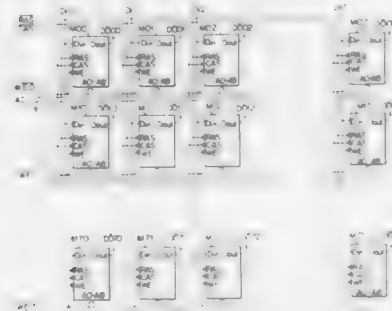
Int. Cl.⁴ G11C 7/00

U.S. Cl. 365—189.04

8 Claims

1. A two-dimensional memory device comprising:
memory block means comprising a plurality of individually addressable memory blocks, each memory block having a plurality of memory cells arranged along each of at least two axes in at least one of a square and a non-square array of selectable dimensions;
memory block assembly means comprising a plurality of said memory block means arranged along each of at least two address information generating means for generating address

information for at least one of a data reading and a data writing cycle with respect to each of said axes of said memory block assembly means, and control means for selectively causing said address information with respect to each respective memory block means simultaneously access all memory cells of said respective memory block



means during at least one of said data writing and data reading cycle; and data input and output control means for performing selection control on data which are inputted or outputted from a memory cell group of a respective memory block means which is accessed by said address information generating means during at least one of data writing and data reading.

4,875,191

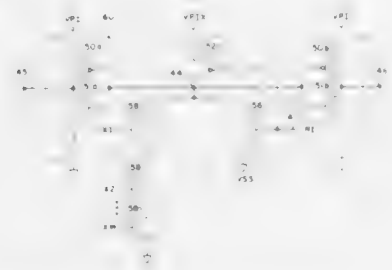
INTEGRATED READ AND PROGRAMMING ROW DRIVER

Theodor Mulder, Milpitas, and Ronald W. Swartz, Granite Bay, both of Calif., assignors to Intel Corporation, Santa Clara, Calif.

Filed Jul. 21, 1988, Ser. No. 222,408
Int. Cl.⁴ G11C 13/00

U.S. Cl. 365—189.01

12 Claims



12. In a CMOS erasable programmable logic device having two memory arrays, a read and programming driver for driving a corresponding word line of each array, comprising:

- a first output inverter having two transistors, a first p-channel transistor having its source coupled to a first power source, its drain coupled to a first word line, and its gate coupled to a node; and a first n-channel transistor having its source coupled to a power return, its drain coupled to said first word line, and its gate coupled to said node, such that a potential on said node controls said first output inverter;
- a second output inverter having two transistors, a second p-channel transistor having its source coupled to said first power source, its drain coupled to a second word line, and its gate coupled to said node, and a second n-channel transistor having its source coupled to said power return, its drain coupled to said second word line, and its gate coupled to said node, such that said potential said node controls said second output inverter;
- a third p-channel transistor having its source coupled to a

second power source, its drain coupled to said node, and its gate coupled to a read signal;

- a third n-channel transistor having its source coupled to said power return, its drain coupled to said node, and its gate coupled to said read signal; such that said read signal activates one of said third n-channel and p-channel transistors to control said potential on said node during a read cycle;
- a plurality of n-channel programming transistors coupled in series between said node and said return and being in parallel to said third n-channel transistor, wherein during a programming cycle said third p-channel transistor is activated and said third n-channel transistor is deactivated, such that said programming transistors control said potential on said node.

4,875,192

SEMICONDUCTOR MEMORY WITH AN IMPROVED NIBBLE MODE ARRANGEMENT

Tetsuro Matsumoto, Tachikawa, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

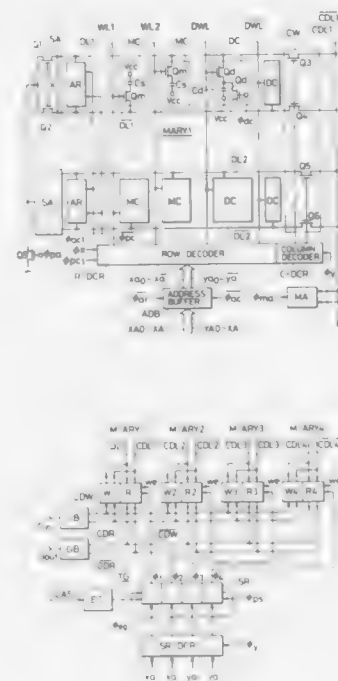
Continuation of Ser. No. 685,553, Dec. 24, 1984, abandoned.

This application Nov. 30, 1987, Ser. No. 127,621

Claims priority, application Japan, Dec. 23, 1983, 58-241966
Int. Cl.⁴ G11C 7/00, 8/00

U.S. Cl. 365—193

15 Claims



1. A semiconductor memory comprising:

- a plurality of memory arrays each of which includes a plurality of dynamic memory cells;
- a plurality of read circuits coupled respectively to said memory arrays;
- a timing generator which detects every change in a column address strobe signal applied to said semiconductor memory, wherein said timing generator includes means to form timing signals in response to said detected changes; and
- a control circuit which, upon receipt of said timing signals, produces control signals to successively operate said plurality of read circuits so that said semiconductor memory successively produces output data in synchronism with every change in said column address strobe signal in read operation.

4,875,193

SEMICONDUCTOR MEMORY WITH IMPROVED CELL ARRANGEMENT

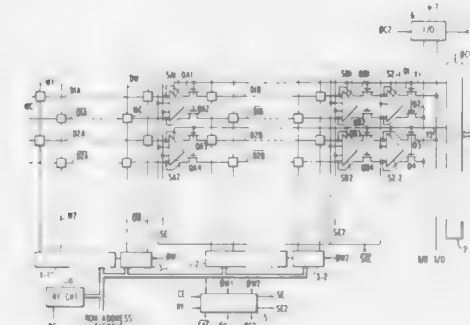
Machio Segawa, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Dec. 28, 1987, Ser. No. 138,482

Claims priority, application Japan, Dec. 23, 1986, 61-309763
Int. Cl.⁴ G11C 13/00

U.S. Cl. 365—207

6 Claims



1. A semiconductor memory device comprising:

- a pair of bit lines, said pair of bit lines being divided into a first pair of sub-bit lines and a second pair of sub-bit lines, first memory cells coupled to said first pair of sub-bit lines, second memory cells coupled to said second pair of sub-bit lines, first word lines intersecting with said first pair of sub-bit lines and coupled only to said first memory cells, second word lines intersecting with said second pair of sub-bit lines and coupled only to said second memory cells, a first sense amplifier having a pair of input terminals connected to said first pair of sub-bit lines, a second sense amplifier having a pair of input terminals connected to said second pair of sub-bit lines, means for selecting one of said first and second word lines,
- a pair of bus lines, a pair of first switches coupled between said first pair of sub-bit lines and said second pair of sub-bit lines to control an electrical connection between said first and second pairs of sub-bit lines, a third sense amplifier having a pair of input terminals, a pair of second switches coupled between said second pair of sub-bit lines and the pair of input terminals of said third sense amplifier, a pair of third switches coupled between said pair of bus lines and the pair of input terminals of said third sense amplifier, first means for selectively enabling said pair of third switches in accordance with column address information, second means for operatively enabling said pair of first switches and said pair of second switches simultaneously only when said pair of third switches are enabled, third means for operatively enabling said first sense amplifier when said pair of third switches are not enabled and one of said first word lines is selected and enabling said second sense amplifier when said pair of third switches are not enabled and one of said second word lines is selected.

4,875,194

SEMICONDUCTOR MEMORY DEVICE WITH PROTECTION CELLS

Tatsunori Murotani, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Feb. 26, 1988, Ser. No. 160,982

Claims priority, application Japan, Feb. 26, 1987, 62-44296
Int. Cl.⁴ G11C 7/02

U.S. Cl. 365—210

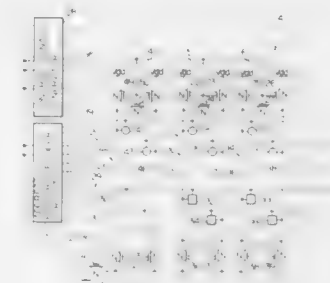
8 Claims

1. A semiconductor memory device fabricated on a semiconductor substrate, comprising:

- (a) a memory cell array having a plurality of memory cells each capable of preserving a data information in the form

of electric charges, said memory cells being arranged in rows and columns;

- (b) a plurality of bit line pairs each associated with said memory cells in two of said columns and having first and second bit lines coupled to said memory cells in said two of said columns, respectively;
- (c) charging means operative to supply each of said bit line pairs with electric charges for equalizing said first bit line to said second bit line;
- (d) a plurality of word lines each coupled to said memory cells in each row;
- (e) reference means operative to supply said first bit lines or said second bit lines with a reference information upon activation thereof;
- (f) peripheral circuits including an addressing circuit operative to activate said reference means, said addressing circuit being operative to activate one of said word lines so as to allow said memory cells coupled thereto to be electrically connected to said second bit lines or said first



bit lines for transferring said data information, a difference voltage taking place between said first and second bit lines of each bit line pair on the basis of said data information and said reference information;

- (g) a plurality of sense amplifier circuits each associated with each of said bit line pairs and operative to decide a logic level of said data information on the basis of said difference voltage between said first and second bit lines of each bit line pair when the sense amplifier circuit is activated;
- (h) interconnecting means operative to couple said sense amplifier circuits to a constant voltage source for activation of said sense amplifier circuits; and
- (i) protection cells located between said peripheral circuits and said memory cell array and capable of preserving dummy information each in the form of electric charges, said protection cells being coupled to one of said bit line pairs, one of said sense amplifier circuits associated with said one of said bit line pairs being directly controlled by said addressing circuit when said addressing circuit activate said reference means and said one of said word lines.

4,875,195

SEMICONDUCTOR DEVICE WITH A REFERENCE VOLTAGE GENERATOR

Masaki Momodomi, Yokohama, and Koji Sakui, Tokyo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 5, 1987, Ser. No. 46,155

Claims priority, application Japan, May 6, 1986, 61-103404
Int. Cl.⁴ G11C 8/00

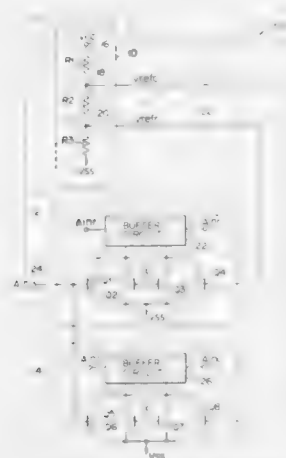
U.S. Cl. 365—230.08

21 Claims

1. A semiconductor integrated circuit device provided on a semiconductor chip substrate, said device comprising:

- first semiconductor transistor-circuit means, for receiving a first input voltage and determining a logical level of said first input voltage;

second semiconductor transistor-circuit means, for receiving a second input voltage and determining a logical level of said second input voltage; and
voltage-generating means connected to said first semiconductor transistor-circuit means by elongated wiring lines, for receiving a power-supply voltage and constantly gen-



erating different voltages lower than said power-supply voltage, said different voltages being supplied as first and second semiconductor transistor-circuit means, respectively, and said voltage-generating means including resistive elements connected in series and having nodes at which said first and second reference voltages are generated.

4,875,196

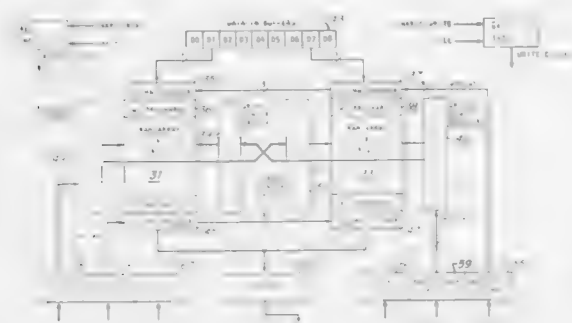
METHOD OF OPERATING DATA BUFFER APPARATUS
Dieter W. Spaderna, Aloha, Oreg., and Jeffrey L. Miller, Vancouver, Wash., assignors to Sharp Microelectronic Technology, Inc., Vancouver, Wash.

Filed Sep. 8, 1987, Ser. No. 93,969

Int. Cl.⁴ G11C 8/00, 7/00

U.S. Cl. 365—238

4 Claims



1. A method of operating a plurality of arrays for dual-ported randomly-accessible memory cells having read and write word lines and read and write bit lines per memory cell to which a data signal is written and from which a data signal is read by precharging of bit lines during an interval, and in response to control signal applied to a word line thereof during another interval, where the memory cells have the associated write word lines and the read word lines arranged in consecutive rows and have the associated read bit lines and the write bit lines arranged in columns in each array, the method comprising the steps of:

applying write word line control signals to all of the memory

cells arranged in a selected row in one of the arrays during one write interval;
precharging during said one write interval the write bit lines of the memory cells arranged in another of the arrays while control signal for said write word lines is absent from all of the memory cells in said another array;
writing data signals to the memory cells arranged in selected columns within said one array along the selected row by accessing a number of the columns of memory cells in said one array during said one write interval for writing data signal therein;
applying write word line control signals to all of the memory cells arranged in a selected row in said another of the arrays during another write interval;
precharging during said another write interval the write bit lines of the memory cells arranged in said one of the arrays while control signal for the write word lines is absent from all of the memory cells in said one of the arrays;
writing data signals to the memory cells arranged in selected columns within said another array along the selected row by accessing a number of the columns of memory cells in said another array during said another write interval for writing data signals therein;
applying read word line control signals to all of the memory cells arranged in a selected row in said one of the arrays during one read interval that is independent of said one and said another write intervals;
precharging during said one read interval the read bit lines of the memory cells arranged in another of the arrays while control signal for said read word lines is absent from all of the memory cells in said another array;
reading data signals from the memory cells arranged in selected columns within said one array along the selected row by accessing a number of the columns of memory cells in said one array during said one read interval for reading data signals therein;
applying said read word line control signals to all of the memory cells arranged in a selected row in said another of the arrays during another read interval that is independent of said one and said another write intervals;
precharging during said another read interval the read bit lines of the memory cells arranged in said one of the arrays while control signal for said read word lines is absent from all of the memory cells in said one of the arrays; and
reading data signals from the memory cells arranged in selected columns within said another array along the selected row by accessing a number of the columns of memory cells in said another array during said another read interval for reading the data signals therein.

4,875,197

METHOD AND APPARATUS FOR DETERMINING PROPAGATION VELOCITIES OF ELASTIC WAVES IN A BOREHOLE

Elke Rietsch, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Jan. 31, 1983, Ser. No. 462,169

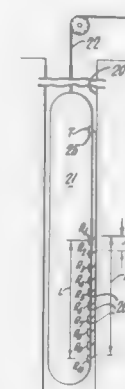
Int. Cl.⁴ G01V 1/40

U.S. Cl. 367—32

5 Claims

1. Method of determining propagation velocities of a plurality of different elastic waves in a borehole, comprising generating said elastic waves at a single frequency at a location in said borehole, receiving signals from said elastic waves at a plurality of locations spaced at predetermined distances from said generating location, digitally multiplexing said signals at a scan rate that is high relative to said frequency, recording said multiplexed signals, and analyzing said recorded multiplexed signals to determine the wave lengths of said different elastic waves by measuring

each whereby said propagation velocity of each different elastic wave is determined from the fundamental relation-



ship $v=f\lambda$ where v is velocity f is frequency and λ is wave length.

4,875,198

INTRUSION DETECTION APPARATUS

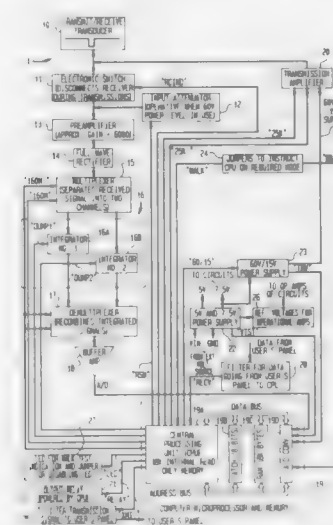
Arie Ariav, Kochav Michael, Israel, assignor to I.D. Tech Ltd., Israel

Filed Oct. 7, 1988, Ser. No. 255,119

Int. Cl.⁴ G08B 13/18

U.S. Cl. 367—93

37 Claims



1. An intrusion detection apparatus, comprising:
(A) means including an antenna for transmitting spaced pulses of radiation energy of a given frequency throughout a region to be protected;
(B) means for receiving radiation energy reflected from the protected region, said reflected radiation energy being received between adjacent spaced pulses in the form of an AC analog signal at said given frequency, the peaks and valleys of which signal vary in amplitude with time;
(C) means for allocating a portion of the time occurring between transmitted pulses into a plurality of time segments each of which segments is long enough to correspond to at least one cycle of said analog signal;
(D) means for integrating the portion of the signal in each of said time segments to arrive at an integral value for each of said segments;
(E) means for converting said integral values into corresponding digital values;

(F) means for storing said digital values in memory;
(G) means for comparing the stored digital values obtained from the reflected energy of a first transmitted pulse with the corresponding digital values obtained from the reflected energy of an adjacent second transmitted pulse;
(H) means for storing the absolute differences obtained between corresponding integral values for each of said time segments; and,
(I) means responsive to predetermined changes in said absolute differences for a predetermined number of time segments for initiating an intrusion signal in said apparatus.

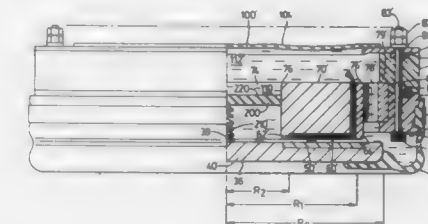
4,875,199

DEEP WATER TRANSIENT SOUND GENERATOR
Roger W. Hutchins, 88 Duplex Avenue, Toronto, Ontario, Canada (M5P 2A4)

Continuation-in-part of Ser. No. 904,435, Sep. 9, 1986, abandoned. This application Aug. 4, 1988, Ser. No. 228,151
Int. Cl.⁴ H04R 15/00

U.S. Cl. 367—175

8 Claims



1. An underwater pulse generator capable of generating large amplitude pulses and having input powers in the range of 100,000 to 1,000,000 watts, said generator comprising:

- (1) a coil;
 - (2) a support body defining a rear support for said coil; said support body having a large central hole and one or more relatively smaller holes arranged about the periphery of the coil carrying support of the support body;
 - (3) a piston;
 - (4) a driver carried by said piston;
 - (5) a resilient piston seal between said support body and said piston;
 - (6) a resilient rear diaphragm at the rear of said support body, said resilient piston seal and said resilient rear diaphragm defining, in combination with said piston and said support body, a watertight pressure transfer space at the rear of said piston;
 - (7) a substantially incompressible pressure transfer liquid located within said pressure transfer space;
 - (8) means for energizing said coil to rapidly displace said driver, and thereby said piston to a forward position; and
 - (9) a spring located between said piston and said support body for restoring said piston to a normal position;
- and when said generator is in use, said pressure transfer liquid flowing at subsonic velocity during said rapid displacement of said piston from said coil upon said coil being energized, said pressure transfer liquid, in combination with said spring critically dampening said piston upon said piston returning to said normal position.

4,875,200

ILLUMINATING BEZEL

John T. Tillery, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 1, 1988, Ser. No. 265,446

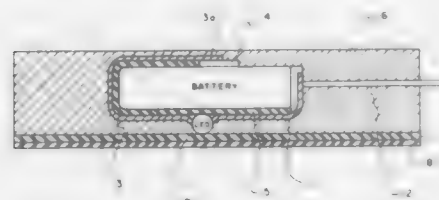
Int. Cl.⁴ G04B 19/30

U.S. Cl. 368—67

3 Claims

1. A stick-on illuminating bezel for a meter, gauge or the like

having a scale, dial, or face covered by a crystal, said bezel including the series connection of a wafer battery, a pressure switch, and a light-emitting diode, all encapsulated in an elastomeric covering transparent on at least a portion covering said light-emitting diode, a transparent pressure-sensitive adhesive on said portion, and



a peelable protective layer on said pressure-sensitive adhesive, whereby said layer is peeled from said pressure-sensitive layer in order that said device may be adhered to said crystal, and whereby said bezel has an area which is small with respect to the area of said crystal.

4,875,201

ELECTRONIC PULSE TIME MEASUREMENT APPARATUS

David T. Dalzell, Shiplake, England, assignor to Logic Replacement Technology, Limited, Berkshire, England

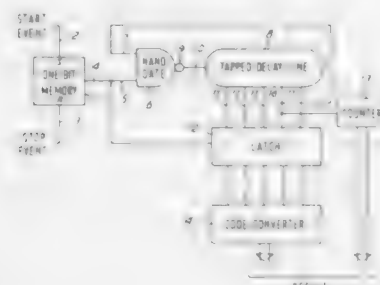
Filed Jul. 21, 1988, Ser. No. 222,413

Claims priority, application United Kingdom, Jul. 21, 1987, 8717172

Int. Cl. G04F 8/00

U.S. Cl. 368-120

12 Claims



1. Time measurement apparatus comprising:

- a delay line having an input tap and a plurality of further taps,
- a latch associated with each of the further taps of the delay line,
- an inverting AND gate having an output connected to the input tap of the delay line,
- means for connecting an input signal capable of indicating at least first and second conditions, to a first input of the AND gate,
- means connecting a later tap of the delay line with a second input of the inverting AND gate, thereby to cause oscillation of the delay line in the presence of the said first condition at the first input of the inverting AND gate,
- a counter for counting the said oscillations of the delay line,
- means for causing each of the latches to operate simultaneously on application of the second signal condition to the first input of the inverting AND gate, and
- means for deriving from the value stored in the counter and the pattern stored in the latches the duration of the first condition of the input signal.

4,875,202

DISK-TYPE STORAGE MEDIUM RECORDING/REPRODUCING APPARATUS

Toshikazu Kodo, Neyagawa, and Shinichi Tanaka, Kyoto, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

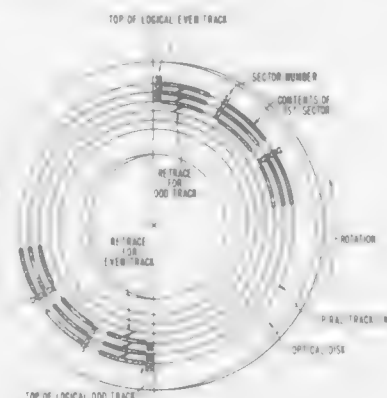
Filed Feb. 27, 1987, Ser. No. 20,036

Claims priority, application Japan, Mar. 7, 1986, 61-51146

Int. Cl. G11B 17/22

U.S. Cl. 369-32

8 Claims



1. An information recording/reproducing apparatus comprising:

- a disk-type storage medium having a spiral track each one turn of which has a predetermined number of sectors, wherein said spiral track is divided into a plurality of subtracks each containing therein a smaller number of said sectors than said predetermined number, each sector in each subtrack having an identifier area for storing a track address showing an address of said each subtrack and a sector address showing an address of each said sector in said each subtrack;
- a rotating means for rotating said storage medium;
- a head for writing information data into said storage medium and reading recorded data from said storage medium;
- a head moving means for moving said head so as to traverse said spiral track, said head moving means normally moving said head in a forward direction so that said head traces said spiral track to write information data into or read recorded data from said storage medium; and
- a track jump control means for controlling said head moving means to execute a track jump for moving said head to jump in a backward direction after tracing a desired subtrack to trace again said desired subtrack.

4,875,203

TRACKING SERVO SIGNAL GENERATING DEVICE FOR AN OPTICAL DISC

Yoshinari Takamura, Osaka; Kazuaki Obara, Kadoma, and Michiyoshi Nagashima, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jan. 13, 1987, Ser. No. 2,952

Claims priority, application Japan, Jan. 16, 1986, 61-6704

Int. Cl. G11B 7/00

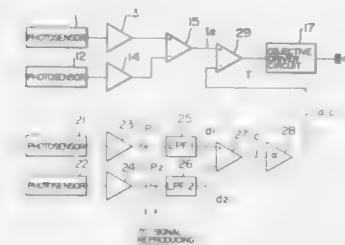
U.S. Cl. 369-46

2 Claims

1. An apparatus for reproducing information recorded on an optical disk having a plurality of V grooves each of said V grooves being formed by two sloped surfaces, with each of the sloped surfaces forming an information track, said apparatus comprising:

- a tracking control circuit comprising:
- a bisplit photosensor for detecting reflected light from a controlling laser beam projected onto one of said V grooves;

means for forming a difference of the outputs of said bisplit photosensor to produce a tracking error signal; a pair of information reproducing photosensors for respectively receiving reflected reproduction laser light from a pair of tracks of one of said V grooves which is irradiated by a pair of reproducing laser beams, said reproducing laser beams being respectively provided at the center of two slopes forming a V groove when the controlling laser beam is positioned at the center of the same V groove; a pair of preamplifiers respectively connected to the outputs of said pair of information reproducing photosensors for producing a pair of track information reproduction signals;



a pair of low pass filters respectively connected to outputs of said preamplifiers for extracting a low frequency component from each of said reproduction signals; a first subtractor connected to the outputs of said filters for determining a difference in a low-frequency component of the filter outputs and for producing a correction signal; a second subtractor for subtracting said correction signal from said tracking error signal to form a corrected tracking error signal; and means for controlling the tracking of the reproducing laser beams in accordance with said corrected tracking error signal.

4,875,204

METHOD OF ERASING INFORMATION

Vyacheslav V. Petrov, Kiev; Nikolai V. Gorshkov, Moscow; Alexandr A. Antonov, Kiev; Alexandr P. Tokar, Kiev; Andrei A. Krjuchin, Kiev, and Semen M. Shanoilo, Kiev, all of U.S.S.R., assignors to Institut Problem Modelirovaniya V Energetike Akademii Nauk Ukrainskoi SSR, Kiev, U.S.S.R. PCT No. PCT/SU87/00020, § 371 Date Oct. 6, 1987, § 102(e) Date Oct. 6, 1987, PCT Pub. No. WO87/04842, PCT Pub. Date Aug. 13, 1987

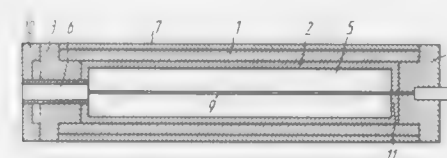
PCT Filed Feb. 5, 1987, Ser. No. 134,786

Claims priority, application U.S.S.R., Feb. 7, 1986, 3134138

Int. Cl. G11B 7/00

U.S. Cl. 369-100

2 Claims



1. A method for erasing information recorded on an optical information carrier having a recording layer (2) comprising the steps of exposing the optical information carrier to external action by heating said optical carrier, the optical information carrier being provided with an air-tight internal space (5) having a recording layer (2) applied to the inner surface thereof; filling said air-tight space (5) with gas inert in relation to the material of the recording layer (2) and to the material of the optical information carrier under a pressure selected from

a range from 10 to 10³ kPa; and, after the heating process is discontinued, regenerating the recording layer (2).

4,875,205

CROSSTALK REDUCTION IN UNSHIELDED TWISTED-PAIR LINES

Fred G. Huang, Folsom, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 84,960, Aug. 13, 1987, abandoned. This application Dec. 23, 1988, Ser. No. 291,375

Int. Cl. H04J 15/00

U.S. Cl. 370-6

4 Claims



1. In a network including a first transceiver and two or more second transceivers, each connected to said first transceiver by unshielded twisted-pair wires, said first transceiver receiving from at least one of said second transceivers a sequence of signals and retransmitting said sequence to other said second transceivers, said second transceiver transmitting said sequences at a predetermined second voltage level, said first transceiver retransmitting said sequence at a predetermined first voltage level; a method for reducing crosstalk comprising the steps:

- (a) receiving by said first transceiver a sequence of signals from one of said second transceivers; and
- (b) retransmitting by said first transceiver said sequence at said first voltage level, having a level different than said second voltage level.

4,875,206

HIGH BANDWIDTH INTERLEAVED BUFFER MEMORY AND CONTROL

Robert K. Nichols, Glen Ellyn, and Gary A. Roediger, Downers Grove, both of Ill., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Mar. 31, 1988, Ser. No. 175,541

Int. Cl. H04Q 11/04; H04J 3/02

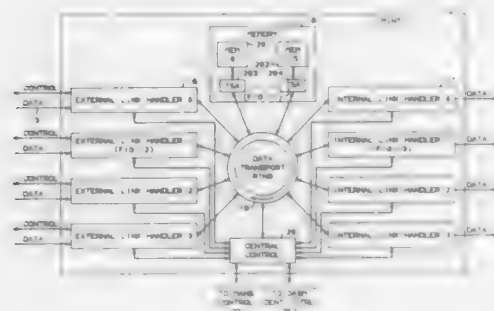
U.S. Cl. 370-85.15

7 Claims

1. A method communicating between a plurality of memory modules each having a memory controller and at least one data link controller over a synchronous data ring, comprising the steps of:

- assigning to each combination, of a memory controller and a data link controller, at least one time slot of said synchro-

nous data ring interconnecting said plurality of memory controllers and said at least one data link controller; and



transmitting data between a memory controller and a data link controller on the time slot assigned for that combination.

4,875,207

A DATA PROCESSING NETWORK WITH CHORDAL RING FACTOR NETWORK

Robert A. H. Van Twist, Franciscus P. M. Hopmans, and Eddy A. M. Odijk, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

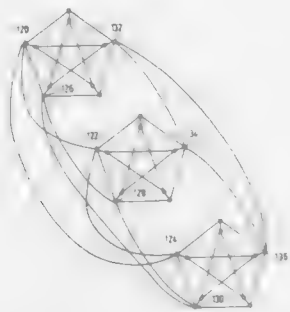
Filed Jan. 27, 1987, Ser. No. 7,155

Claims priority, application Netherlands, Jan. 30, 1986, 860011H

Int. Cl. H04L 11/00

U.S. Cl. 370—85.12

8 Claims



1. A data processing network of degree $G \geq 4$ comprising: at least 32 data processing stations, each station connected by bidirectional communications lines to a maximum of G other stations in order to exchange information; said stations arranged as a product network of at least two factor networks;
- a first one of said factor networks arranged as a chordal ring of degree 4 including at least $N \geq 5$ of said stations and characterized by a step size S such that $2 \leq S \leq (N-1)/2$; and
- a second one of said factor networks comprising at least two stations.

4,875,208

TRANSMISSION METHOD FOR CONTROL INFORMATION IN COMMUNICATION NETWORK

Koshi Furukashi, Yamato; Satoshi Miyazaki, Sagami; Masakazu Furuya, Kawasaki; Tatsuo Kawatani, Yokohama; Shinichi Konyama, Iwatsuka; and Jiro Kashio, Kawasaki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

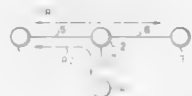
Filed Jan. 26, 1988, Ser. No. 148,532

Claims priority, application Japan, Mar. 6, 1987, 62-50029

Int. Cl. H04J 3/24

U.S. Cl. 370—94.1

7 Claims



1. A method for transmitting control information in a communication network having a plurality of nodes comprising: a first step of sending out from a message source node a first control message including a destination node discriminator and a source node discriminator for establishing a communication route between a message destination node and the message source node to an information link determined in accordance with said destination node discriminator;
- a second step of operating a relay node on said communication route having received said first control message to set route flag means corresponding to the communication route defined by the source node discriminator and destination node discriminator of said first control message, at a first state which indicates that the route from said source node to said relay node has been established, and to relay said first control message to an information link determined in accordance with said communication route; and
- a third step of operating said relay node when said relay node detects that the condition of the information link connected to said relay node has changed, to send out a second control message for informing an adjacent node of the change in condition of said communication route detected by the relay node if said route flag means corresponding to the communication route composed partially of said information link indicates said first state.

4,875,209

TRANSIENT AND INTERMITTENT FAULT INSERTION

James K. Mathews, Jr., Northborough; Craig A. Chancellor, Upton; and H. Frank Howes, Berlin, all of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Apr. 4, 1988, Ser. No. 177,286

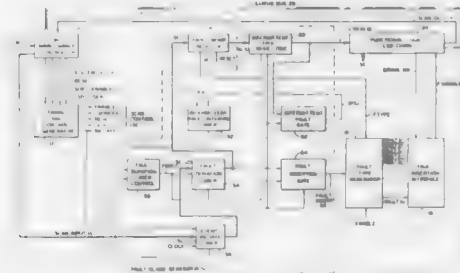
Int. Cl. G06F 11/00

U.S. Cl. 371—3

46 Claims

1. In an integrated circuit having a plurality of logic arranged for internal logic states to be held in serially accessed registers which are observable and controllable, fault insertion circuitry resident in said integrated circuit comprising: means for generating a plurality of fault classes having a first input for receiving scan path data words and a first output coupled to an input of said serially accessed registers, said

fault classes comprising a permanent fault, a transient fault and intermittent faults; means for storing a fault word of said data words having a serial input, a serial output and a parallel output, said serial input being coupled to a second output of said fault classes generating means and said serial output being coupled to a second input of said fault classes generating means; and



fault type generating means, coupled between said parallel output of said fault word storing means and said plurality of logic, for generating a fault type specified by said fault word for a time duration in accordance with a third output of said fault classes generating means.

4,875,210

AUTOMATIC CIRCUIT TESTER CONTROL SYSTEM

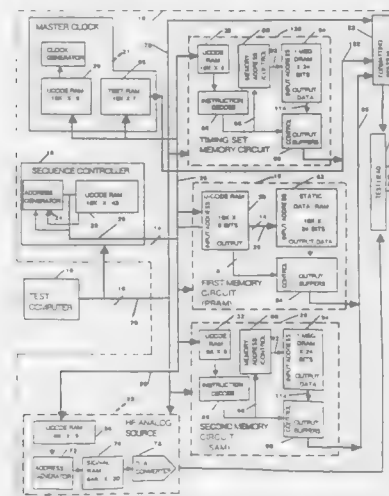
John L. Russo, Norwood, and Robert H. Van der Kloot, Medford, both of Mass., assignors to Teradyne, Inc., Boston, Mass.

Filed Jan. 6, 1988, Ser. No. 141,202

Int. Cl. G01R 31/28

U.S. Cl. 371—27

24 Claims



1. Apparatus for providing high speed control of digital test patterns in automatic test equipment, said apparatus comprising: a first memory circuit including a data random access memory (RAM) storing data of nonsequential vectors, said data RAM having a first storage capacity, a second memory circuit including a sequential data memory storing blocks of data of sequential vectors, said sequential memory having more storage capacity than said first storage capacity, a formatter for receiving data from said data RAM or said sequential data memory and using the data to provide inputs to a circuit under test, a sequence controller controlling said first and second mem-

ory circuits for selectively routing data from said data RAM or said sequential data memory to said formatter, a state address bus connected to said first memory circuit, said second memory circuit and said sequence controller, and a sequence address generator, said sequence address generator providing address information to said first memory circuit, said second memory circuit and said sequence controller via said state address bus.

4,875,211

GALOIS FIELD ARITHMETIC LOGIC UNIT

Katsumi Mural, Kyoto, and Makoto Usui, Suita, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

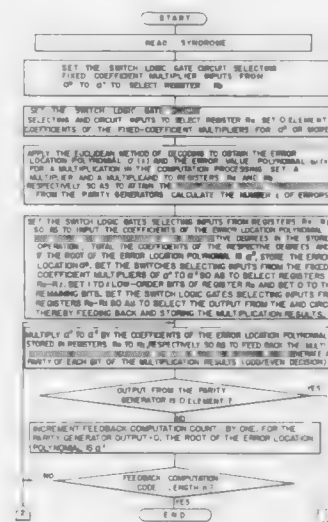
Filed Dec. 8, 1987, Ser. No. 130,159

Claims priority, application Japan, Dec. 10, 1986, 61-294031; Jun. 18, 1987, 62-151861; Jun. 18, 1987, 62-151863

Int. Cl. G06F 11/10

U.S. Cl. 371—40.1

26 Claims



1. A Galois field arithmetic logic unit comprising: a group of memory elements having first storing means for storing a coefficient value of each degree of an error location polynomial with a maximum degree of t for Reed-Solomon codes of which each code word includes elements of a Galois field $GF(2^r)$ and for storing values of intermediate computation results associated with at least $(t+1)$ symbols for each degree obtained through substitution of location values to said error location polynomial; means for storing said coefficient values in said memory elements;
- a group of fixed coefficient multipliers including r multipliers for multiplying in a common fashion an arbitrary first 1-symbol input by powers of a primitive element α of said Galois field $GF(2^r)$ ranging from a power of 0 thereof to a power of $(r-1)$ thereof, namely, by r fixed coefficients from α^0 to α^{r-1} or for multiplying the values stored in said group of memory elements of $(t+1)$ symbols of which the number is equal to at most r by fixed coefficients from α^0 to α^t ;
- first means for changing over said r fixed coefficients ranging from α^0 to α^{r-1} to said fixed coefficients of the 0 element in said Galois field $GF(2^r)$ in association with bits ranging from 0-th bit relative to a least-significant bit to an $(r-1)$ -th bit respectively of an arbitrary second 1-symbol input in a binary representation;
- means for supplying inputs of said r multipliers with results of a change-over selection effected on inputs thereto

including said arbitrary first symbol and values of outputs from said group of memory elements;
a group of r odd/even decision means for attaining an Exclusive-OR for each component of a binary vector of r symbols obtained as results from said r multipliers so as to obtain a 1-symbol results;
means for detecting whether or not the symbol outputted from said group of odd/even decision means is a 0 element; and
means for feeding back the $(t+1)$ symbols produced from said r multipliers to said group of memory elements so as to store said symbols therein.

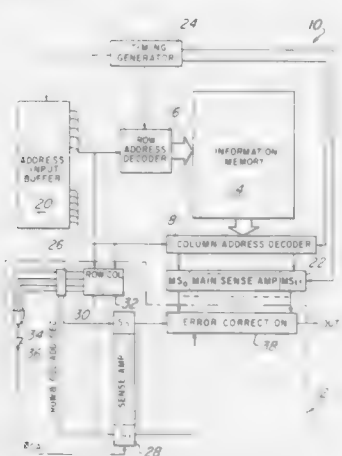
4,875,212

MEMORY DEVICE WITH INTEGRATED ERROR DETECTION AND CORRECTION

Masashi Hashimoto, Miho, Japan, assignor to Texas Instruments Incorporated, Dallas, Tex.
Continuation of Ser. No. 912,027, Sep. 25, 1986, abandoned. This application Feb. 13, 1989, Ser. No. 310,496
Claims priority, application Japan, Oct. 8, 1985, 60-225739
Int. Cl.⁴ G06F 11/10

U.S. Cl. 371—40.2

6 Claims



1. A semiconductor memory device comprising:
a first memory array having stored therein a plurality of data words each comprising a predetermined number of information bits;
an integrated error detection and correction circuit including a second memory array having stored therein a plurality of bits generated in accordance with a predefined error detect/correct code, the second memory array being programmable to create error detection and correction data on the basis of which bits in error in said first memory array are to be detected and corrected;
information detecting circuitry associated with said first memory array to detect information bits read from said first memory array, the information detecting circuitry comprising a plurality of information detecting units, said plurality being equal in number to the predetermined number of information bits;
error detecting circuitry associated with said second memory array to detect each error bit read from said first memory array and provided by said information detecting circuitry, the error detecting circuitry comprising a plurality of error detection and correction data detecting units, the plurality of error detection and correction data detecting units being equal in number to said plurality of information detecting units and each unit being operative to produce an error signal in response to an erroneous information bit read from said first memory array through said information detecting circuitry, and
an error correction circuit operatively intervening between

said information detecting circuitry and said error detection and correction data detecting units to invert the logic state of each erroneous information bit read from said first memory array through said information detecting circuitry.

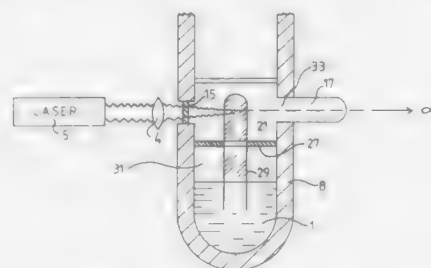
4,875,213

METHOD AND APPARATUS FOR GENERATING COHERENT BOSONS

Shui-Yin Lo, Sherman Oaks, Calif., assignor to Apricot S.A., Luxembourg, Luxembourg
Filed Oct. 23, 1987, Ser. No. 112,842
Int. Cl.⁴ H01S 3/30

U.S. Cl. 372—5

38 Claims



1. The method of producing a coherent boson beam having mass, comprising the steps of:
providing matter comprised of bosons, said matter having a density and temperature such that some of said bosons are at their lowest energy levels; and
causing coherent light to be incident on said bosons such that a coherent boson beam having mass is produced, said beam having spatial temporal coherence.

4,875,214

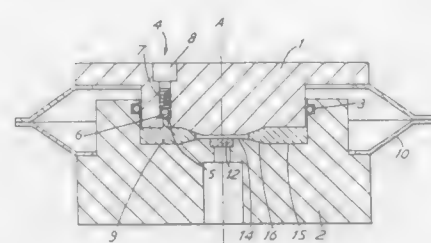
X-RAY LASER

William Denne, The Lane House, 10B Church St., Great Shelford, England
PCT No. PCT/GB86/00480, § 371 Date Jun. 2, 1987, § 102(e)
Date Jun. 2, 1987, PCT Pub. No. WO87/00981, PCT Pub. Date Feb. 12, 1987
PCT Filed Aug. 8, 1986, Ser. No. 40,773
Claims priority, application United Kingdom, Aug. 8, 1985, 2519877

U.S. Cl. 372—5

Int. Cl.⁴ H01S 3/30

10 Claims



1. An X-ray laser comprising a rigid structure confining a substantially incompressible fluent medium, said medium surrounding a substantially cylindrical cavity of residual vapour of said medium, said rigid structure including spaced rigid surfaces intersected by an axis of the cylindrical cavity and constraining the fluent medium therebetween, means for causing violent collapse of the cavity to form an extremely hot dense plasma of said medium along said axis, the formation of said plasma causing intense thermal X-ray emission, said emission pumping energy into said medium to effect an X-ray inversion within an elongated volume along said axis, said axis being defined by the axis of the cylindrical cavity.

X-ray inversion causing super-radiant x-ray emission along said axis.

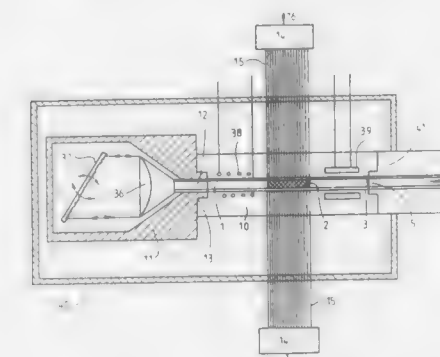
4,875,215

FIBRE COMMUNICATION LASER SYSTEM

John L. Hughes, Melbourne, Australia, assignor to Australian Electro Optics Pty. Ltd., Melbourne, Australia
Filed Aug. 12, 1988, Ser. No. 231,512
Int. Cl.⁴ H01S 3/30

U.S. Cl. 372—6

10 Claims



1. A modular optical communications system interconnecting, sectionally doped, laser oscillator and laser amplifier modules, said laser oscillator module consisting of a short length of single mode optical fibre optically polished at both ends, on which are laser beam reflectors, and sectionally doped with lasing ions which are optically excited said fibre length being embedded in a moulded sheath whilst the said amplifier module comprising a complete long-haul section of optical fibre cable with the core of the optical fibre within said cable being doped in sections along the cable to form a series of laser repeaters which are optically excited said cable having two or more optical fibre links embedded in a moulded, transparent sheath, itself sheathed for long life protection from its environment.

4,875,216

BURIED WAVEGUIDE WINDOW REGIONS FOR IMPROVED PERFORMANCE SEMICONDUCTOR LASERS AND OTHER OPTO-ELECTRONIC APPLICATIONS

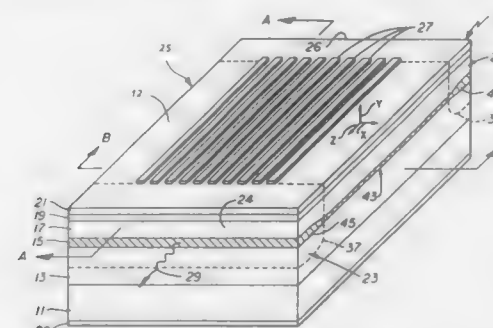
Robert L. Thornton, East Palo Alto, Calif., and Robert D. Burnham, Wheaton, Ill., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 30, 1987, Ser. No. 126,546

Int. Cl.⁴ H01S 3/19

U.S. Cl. 372—45

6 Claims



1. In a buried planar passive waveguide structure formed in a plurality of semiconductor heterostructure layers, one of said layers within said structure having a lower energy bandgap than layers immediately adjacent thereto, said structure comprising a transparent single mode waveguide in said one layer formed by impurity induced disordering in combination with

said immediately adjacent layers creating a longitudinal waveguide along at least a portion of said one layer having the highest refractive index at its core with diminishing refractive index from its core into adjacent layers.

4,875,217

LASER DIODE ARRAY WITH LATERAL COUPLING

Franz Kappeler, Puchheim; Thomas Wolf, Munich, and Bernhard Stegmüller, Augsburg, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

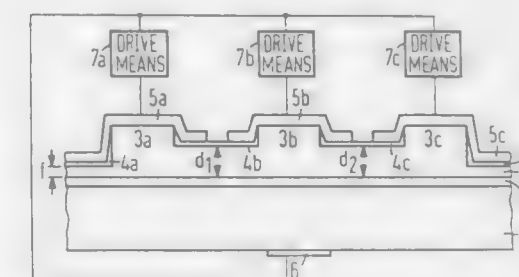
Filed May 20, 1988, Ser. No. 196,387

Claims priority, application Fed. Rep. of Germany, May 22, 1987, 3717383

Int. Cl.⁴ H01S 3/19

U.S. Cl. 372—50

11 Claims



1. A laser diode array in a component for lateral coupling of laser emissions, comprising:

a substrate of doped semiconductor material of a first conductive type;
an active layer on said substrate and means for providing a resonant cavity in said active layer and operable to generate a laser emission;
a cover layer of doped semiconductor material of a second conductive type over said active layer,
at least two ridges formed in said cover layer, said at least two ridges being allocated to corresponding laser stripes of said array, said cover layer being of a thickness in a region between two adjacent ones of said ridges so that a lateral coupling of said laser stripes occurs;
oxide layers on said cover layer in regions between outer upper edges of outer ones of said at least two ridges and edges of said component;
a contact on each of at least two ridges, said contacts being separate from one another between said ridges to enable said laser stripes to be separately driven;
a cooperating contact on a free surface of said substrate; and
said component having a layer structure outside a region occupied by said at least two ridges and their interspaces so that a wave guidance effect occurs at sides of said array.

4,875,218

THIN-FILM COATED WAVEGUIDE LASER

Akihito Hongo; Tsuneo Shiota, both of Ibaraki; Shigeo Nishida, Miyagi; Mitsunobu Miyagi, Miyagi, and Yoshihiko Wagatsuma, Miyagi, all of Japan, assignors to Hitachi Cable Ltd., Tokyo, Japan

Filed Mar. 7, 1986, Ser. No. 837,120

Claims priority, application Japan, May 29, 1985, 60-115837; Nov. 21, 1985, 60-262270

Int. Cl.⁴ H01S 3/03, 3/097

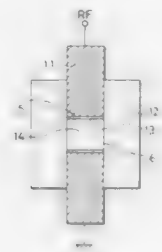
U.S. Cl. 372—64

11 Claims

1. A waveguide laser having a hollow waveguide defined by opposing metal electrodes and dielectric or lossy materials insulating said metal electrodes from each other, wherein the improvement comprises:

thin first films provided on opposed surfaces of said metal electrodes, said thin first films being made of a material

whose absorption loss at an oscillation wavelength of said



laser is low, wherein a thickness t of said thin films satisfies:

$$t = \frac{\lambda q}{4\sqrt{n^2 - 1}}$$

where n is a refractive index of said thin first film, λ is an oscillation wavelength of said laser, and q is an odd positive integer.

4,875,219

PHASE-CONJUGATE RESONATOR

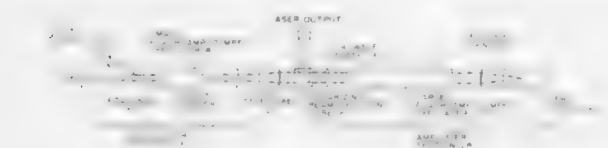
Stephen D. Russell, Starkville, Miss., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 28, 1988, Ser. No. 276,981

Int. Cl.⁴ H01S 3/30, 3/23

U.S. Cl. 372-92

6 Claims



1. A phase-conjugate resonator, comprising: an oscillator for generating and oscillating light, said oscillator having a partially reflective outcoupler for transmitting a part of said light; an amplifier for receiving transmitted light from said oscillator outcoupler, said amplifier having a stimulated Brillouin Scattering cell to function as a phase conjugate mirror; a beam expansion means between said oscillator and said amplifier; combination of a polarizing beam splitting cube and a $\frac{1}{4}$ -wave plate between said beam expansion means and said amplifier for transmitting said light from said expansion means to said amplifier, for outcoupling useful light output from said resonator, and for directing a portion of light from said amplifier back to said oscillator as feedback; and said oscillator further comprising a first flashlamp-pumped dye laser for generating and amplifying light, a reflecting mirror to reflect said light, and means for polarizing and selectively adjusting linewidth of said light.

4,875,220

LASER TUBE FOR POLARIZED LASER EMISSION

Haas Krueger, Munich, and Wolfgang Welsch, Baldham, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Nov. 2, 1988, Ser. No. 265,923

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1987, 3737624

Int. Cl.⁴ H01S 3/08, 3/22, 3/03

U.S. Cl. 372-107

19 Claims

1. In a laser tube for use in a laser, the improvement comprising:

two laser mirrors;
means for integrally connecting said laser mirrors to a laser

tube to form a housing, said connecting means including a metal flange connecting one of said mirrors to said laser tube; and

at least one means for polarizing said laser emission, said polarizing means comprising at least one polarizing layer



arranged on one of said laser mirrors, said polarizing layer being produced by oblique evaporation and serving as both a reflective layer and a polarizing layer, on said one laser mirror, said oblique evaporation being carried out at an angle of at least 80 degrees to a surface normal of said mirror to produce said surface.

4,875,221

SPREAD SPECTRUM RECEIVER

Maasaharu Mori, Tokyo, Japan, assignor to Clarion Co., Ltd., Tokyo, Japan

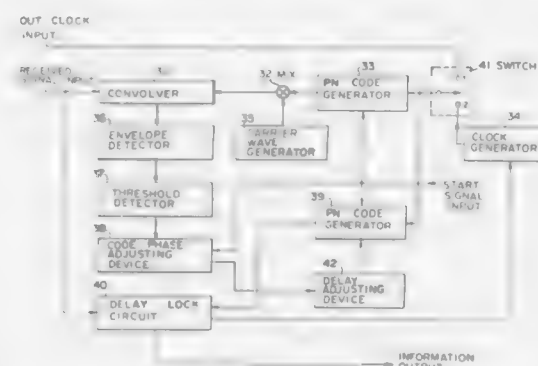
Filed Oct. 9, 1987, Ser. No. 107,373

Claims priority, application Japan, Oct. 14, 1986, 61-243595

Int. Cl.⁴ H04K 1/00

U.S. Cl. 375-1

14 Claims



1. A spread spectrum receiver, comprising: code generator means for generating a reference pseudo noise code and a further pseudo noise code; first correlating means which includes a convolver for producing a first correlation output signal in response to said reference pseudo noise code and a received signal containing pseudo noise; second correlating means for producing a second correlation output signal in response to said received signal and said further pseudo noise code and for synchronizing the phase of a clock used to produce said further pseudo noise code with the phase of a clock used to produce said pseudo noise contained in said received signal; code phase adjuster means for generating an output signal which causes said code generator means to adjust the phase of said further pseudo noise code by an amount which is a function of a time interval from the start of said reference pseudo noise code to said first correlation output signal; and delay adjuster means for delaying said output signal of said code phase adjuster means by a time delay which is adjustable.

4,875,222

INFORMATION SIGNAL TRANSMISSION SYSTEM BY PREDICTIVE DIFFERENTIAL CODING

Motokazu Kashiida, Tokyo, and Toshiyuki Masui, Kanagawa, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 745,307, Jan. 14, 1985, abandoned.

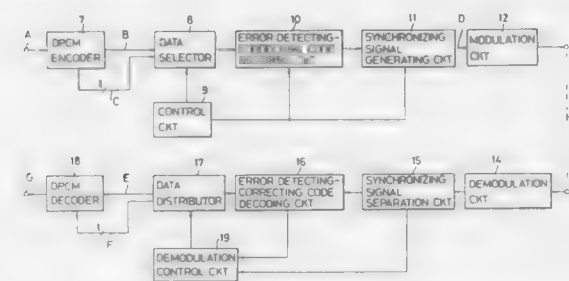
This application Oct. 15, 1986, Ser. No. 919,545

Claims priority, application Japan, Jan. 28, 1984, 59-133909; Jan. 28, 1984, 59-133910

Int. Cl.⁴ H04B 14/06

U.S. Cl. 375-26

20 Claims



1. An information signal transmission system by predictive differential coding, comprising:

- predictive differential coding means arranged to receive information codes according to digital values of the information signal, and arranged to produce difference codes according to differential values between the information codes and predictive codes for the information codes, said predictive differential coding means producing each of the difference codes by using a "k" number, where $(k \geq 2)$, of the information codes;
- code sequence forming means for forming a code sequence which includes a plurality of code groups each of which includes an "m" number, where $(m \geq k)$, of the difference codes and the "k" number of the information codes used for producing one of the "m" number of the difference codes; and
- transmission means for transmitting said code sequence.

4,875,223

TWISTED PAIR ADAPTER

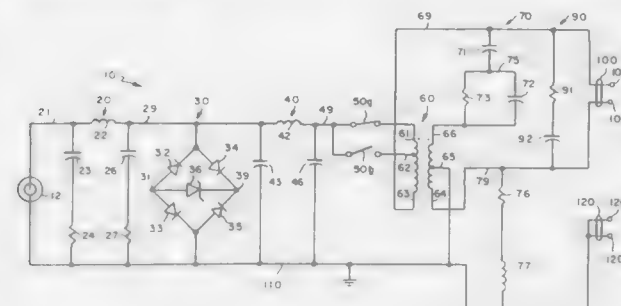
Robert A. Curtis, Marlboro, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed Sep. 8, 1987, Ser. No. 93,974

Int. Cl.⁴ H04B 3/00; H04L 25/00

U.S. Cl. 375-36

18 Claims



1. An adapter for enabling high frequency data signals to be transmitted over a twisted pair cable, the adapter having first and second adapter terminals, and third and fourth adapter terminals, the adapter comprising:

- A network, for blocking passage of low-frequency, direct current (DC) components of the data signals, and for passing high-frequency, alternating current (AC) components of the data signals; and

B. a transformer, having

- a primary winding with upper and lower terminals, the upper primary terminal connected to the first adapter terminal, the lower primary terminal connected to the third adapter terminal, the primary winding providing a path for the low frequency, direct current (DC) components of the data signals between the first and third adapter terminals; and
- a secondary winding with an intermediate tap forming upper and lower windings, and providing in-phase and opposite-phase high frequency alternating current (AC) components of the data signals at upper and lower secondary terminals, respectively, the intermediate tap connected to the second adapter terminal, the upper secondary terminal coupled to the third adapter terminal through the network, to pass the in-phase AC components between the upper secondary terminal and the third adapter terminal, and to block passage of the DC components via the secondary winding to the fourth adapter terminal, and the lower secondary terminal connected to the fourth adapter terminal, to pass the opposite-phase AC components between the lower secondary terminal and the fourth adapter terminal.

4,875,224

ASYNCHRONOUS COMMUNICATION SYSTEMS

Hugo R. Simpson, Stevenage, England, assignor to British Aerospace plc, London, England

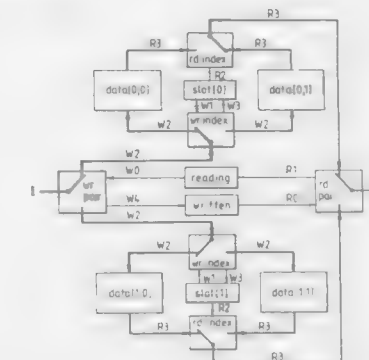
Filed May 18, 1988, Ser. No. 195,247

Claims priority, application United Kingdom, May 21, 1987, 87/111W1

Int. Cl.⁴ H04L 25/36

U.S. Cl. 375-118

13 Claims



6. In an asynchronous communication system comprising memory means, slot means formed in said memory means, data writing means, an input operatively connected to said data writing means, data reading means, and an output operatively connected to said data reading means,

the improvement wherein said slot means comprise a first and second pairs of slots,

said data writing means include write pair selector means adapted to select one of said first and second pairs of slots and first and second write slot selector means operatively connected to said write pair selector means and adapted to select one slot of a respective pair of slots, and

said data reading means include read pair selector means adapted to select one of said first and second pairs of slots and first and second read slot selector means operatively connected to said read pair selector means and adapted to select one slot of a respective pair of slots, said system being adapted to transmit asynchronously fresh coherent data from said input to said output via said memory means.

4,875,225

X-RAY VIDEO SYSTEM AND METHOD FOR THE TRANSELLUMINATION OF AN EXAMINATION SUBJECT

Michael Hunold, Ottweiler, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

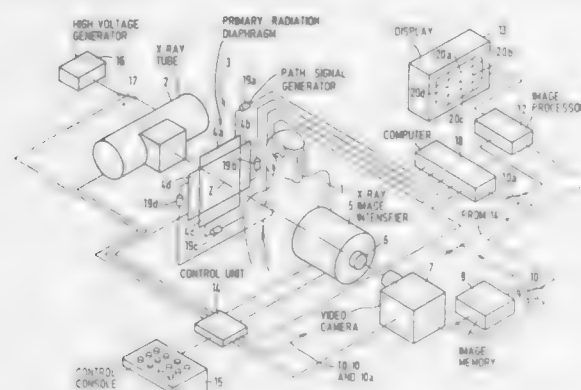
Filed Feb. 1, 1988, Ser. No. 150,846

Claims priority, application Fed. Rep. of Germany, Feb. 16, 1987, 3704859

Int. Cl.⁴ A61B 6/06

U.S. Cl. 378—99

13 Claims



1. An x-ray diagnostic system for examining a patient comprising:

- means for generating a transillumination image of said patient using an x-ray beam having a central ray;
- means for storing said transillumination image;
- diaphragm means for gating said x-ray beam having a plurality of diaphragm plates each moveable relative to said central ray;
- means for generating a signal corresponding to the position of a diaphragm plate in said plurality of diaphragm plates relative to said central ray;
- means for visually displaying the stored transillumination image; and
- means for generating a mark corresponding to the said diaphragm plate from said signal and for mixing said mark into said stored transillumination image at a location in said stored transillumination image corresponding to the position of said diaphragm plate for simultaneous visual display with said stored transillumination image on said means for displaying.

4,875,226

X-RAY MACHINE

Donald B. Plewes, Rochester, N.Y., assignor to University of Rochester, Rochester, N.Y.

Filed Apr. 21, 1988, Ser. No. 184,210

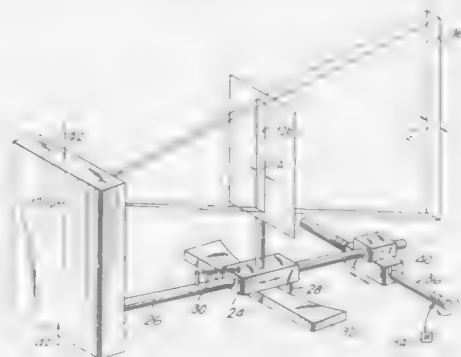
Int. Cl.⁴ G21K 5/10

U.S. Cl. 378—146

10 Claims

7. A method comprising: scanning an object position with a scanning x-ray beam; and

varying the cross-section of said scanning x-ray beam during the scan to keep substantially constant the beam footprint



on an image plane which receives said beam after said beam passes through said object position.

4,875,227

ANTI-SCATTER GRID SYSTEM

Remo J. Rossi, and John Grady, both of 300 Foster St., Littleton, Colo. 80140

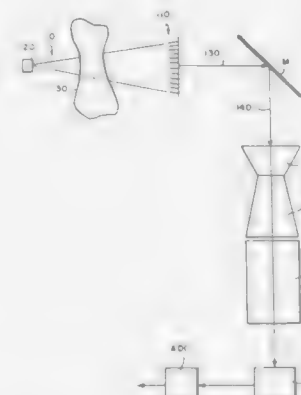
Continuation of Ser. No. 805,870, Dec. 6, 1986. This application Sep. 30, 1988, Ser. No. 252,380

The portion of the term of this patent subsequent to May 9, 2006, has been disclaimed.

Int. Cl.⁴ G21K 1/00

U.S. Cl. 378—154

14 Claims



- 8. A method of reconstructing a primary X-ray image of a subject which partially absorbs and partially transmits scattered and unscattered X-ray photons, comprising the steps of: projecting a beam of X-ray photons at and through the subject to be examined;
- aligning an X-ray photon sensitive detector behind the subject to detect the X-ray photons transmitted through the subject;
- filtering the scattered X-ray photons transmitted through the subject with a grid means disposed between the subject and the detector, the grid means including filtration strips having a strip density of between one and three strips per inch and a strip height of between one and five inches and obstructing less than about fourteen percent of the unscattered X-ray photons transmitted through the subject from reaching the detector;
- recording an analog image of the subject from the X-ray photons detected by the detector, the image recorded from photons transmitted through the subject and the grid means and to the detector;
- converting the analog image to a digital array of data representative of the analog image; and

reconstructing the image into a complete image of unscattered photons as if unobstructed by the grid means.

4,875,228

X-RAY GANTRY

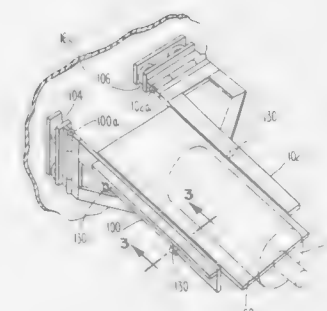
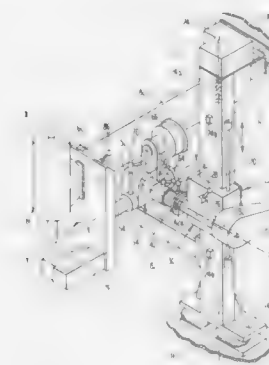
David Archer, Ontario, Canada, assignor to Davru Manufacturing Ltd., Mallorytown, Canada

Filed Jul. 12, 1988, Ser. No. 218,157

Int. Cl.⁴ G01N 23/18; G62D 39/00

U.S. Cl. 378—197

20 Claims



1. A gantry apparatus for positively supporting an x-ray device while permitting adjustment of the position of the device with respect to a patient to be examined, comprising:

- a standard fixed with respect to a mounting structure, and defining a path of movement along a first z-axis;
- a first carriage means, movable with respect to said standard along said z-axis, and lockable to said standard;
- a horizontal arm, fixed to said first carriage means and defining a second path of movement along a second x-axis orthogonal to said first z-axis;
- second carriage means, movable with respect to said standard along said x-axis, and defining a third transverse y-axis of motion orthogonal to said x- and z-axes;
- a transverse arm, mounted to said second carriage means and extending along said y-axis;
- a support plate means mounted to said transverse arm for movement along said y-axis and comprising means for supporting the x-ray device; and
- caging arm means comprising plural caging arms extending from plural points fixed with respect to said mounting structure to said support plate means, said caging arm means being releasably lockable to said support plate means while said support plate means is in a defined home position.

4,875,229

VEHICLE TELEPHONE WITH CALL ANSWERING AND RECORDING MEANS

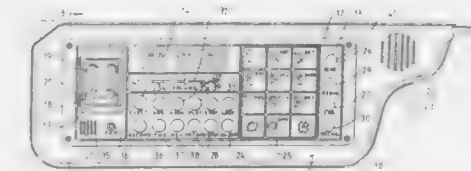
Anthony P. Palett, Farmington Hills, Mich., and A. Gil Spear Jr., Vero Beach, Fla., assignors to Anthony P. Palett, Farmington Hills, Mich.

Filed Jan. 11, 1989, Ser. No. 295,958

Int. Cl.⁴ H04M 1/02

U.S. Cl. 379—58

8 Claims



1. A unitary vehicle sun visor and telephone apparatus with telephone call answering and recording means adapted to be operated by an occupant of a motor vehicle, said unitary apparatus being positioned ahead of the occupant and having a panel with first and second oppositely disposed faces mounted for rotation about an axis, said panel being selectively adjustable to a position whereat said first surface is in confronting relationship to said occupant for shading the occupant and to another position whereat said first surface is in concealed relationship to said occupant; telephone means mounted in said panel for transmitting and receiving messages to and from said occupant; telephone answering means mounted in said panel and cooperating with said telephone means to answer telephone calls when the vehicle is unoccupied; recording means mounted in said panel and cooperating with said telephone means to record incoming telephone messages when said vehicle is occupied or unoccupied; a face plate mounted on one of said surfaces of said panel; and controls mounted in said face plate for operating said telephone and said call answering and recording means.

4,875,230

CELLULAR TELEPHONE UNIT HAVING MULTIPLE MEMORY LOCATION COMMAND LANGUAGE

Kevin B. Blair, Spring, Tex., assignor to GTE Mobilnet Incorporated, Houston, Tex.

Filed Jul. 25, 1988, Ser. No. 223,864

Int. Cl.⁴ H04Q 7/04

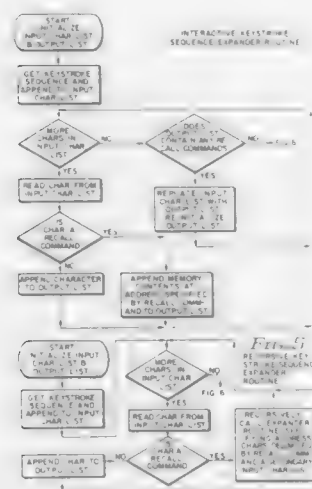
U.S. Cl. 379—63

4 Claims

1. A cellular telephone unit comprising: an addressable memory having one or more memory locations;

- a keypad on which keystrokes can be entered;
- memory addressing circuitry, connected to said keypad and to said memory, for selectively storing one or more keystrokes as the contents of a specified said memory location in response to a STORE keystroke command sequence entered on said keypad;
- recognition circuitry for recognizing zero or more subsequences of keystrokes, within a keystroke sequence comprising one or more keystrokes entered on said keypad, as recall commands, each said recall command specifying a corresponding said memory location;
- expansion circuitry for expanding each said recall command by substituting the keystroke contents of the correspond-

ing said memory location into said keystroke sequence in place of the recall command, repeatedly until said key-



stroke sequence comprises a final expanded keystroke sequence containing no recall commands.

4,875,231

RADIO TELEPHONE SYSTEM

Toshihiro Hara; Akio Yotsutani; Ryoji Kawasaki, all of Tokyo; Kazuyuki Tate, Aichi; Syoji Huse, and Koji Ono, both of Tokyo, all of Japan, assignors to NEC Corporation; Nippon Telegraph & Telephone Corp., both of Tokyo and Kabushiki Kaisha Toshiba, Kanagawa, all of Japan

Filed Oct. 27, 1987, Ser. No. 112,928

Claims priority, application Japan, Oct. 30, 1986, 61-258748

Int. Cl.⁴ H04M 11/00

U.S. Cl. 379-61

5 Claims



1. A multi-access radio telephone system having a base station connected to a telephone exchanger and a plurality of mobile stations connected to said base station through radio channels including a control channel and a predetermined number of communication channels, said base station comprising:
 - a transmitter/receiver for receiving a control signal through said control channel and for transmitting/receiving a communication signal through a given one of the predetermined number of communication channels;
 - a receiver for receiving a communication signal through a given one of the predetermined number of communication channels to detect a vacant one of the predetermined number of communication channels and for receiving the control signal to monitor a calling signal received from a given one of said plurality of mobile stations through the control channel, respectively; and
 - control means for performing connection control and communication control such that, in a first mode, said receiver receives the communications signal to detect a vacant communication channel

while said transmitter/receiver receives the control signal to monitor the calling signal transmitted from said given mobile station through the control channel, and in a second mode, said receiver receives the control signal to monitor a calling signal while said transmitter/receiver is busy communicating with said mobile station.

4,875,232

TELEPHONE POWER DISTRIBUTION AND ISOLATION SYSTEM

Mark P. Shumway, 230 W. 2950 South, Salt Lake City, Utah 84115

Filed Jun. 30, 1988, Ser. No. 213,910

Int. Cl.⁴ H04M 19/08

U.S. Cl. 379-413

1 Claim



1. A telephone power isolation system comprising a housing having a top face; at least one transformer having an AC input winding and a plurality of output windings, each said transformer extending through the top face; a telephone connector having a two pin pair extending through the top face; electrical connector means including a fuse connecting one side of each output winding to one pin receptacle of said two pin pair and each said face extending through the top face; electrical connector means connecting the other end of each output winding to the other pin receptacle of the two pin pair; an LED adjacent each fuse, with each said LED being electrically connected to the electrical connector means connecting the other end of each output winding to the other pin receptacle and arranged to turn on upon breaking of the circuit through said adjacent fuse and extending through the top face; means carried by the top face to releasably secure a cable connected to the telephone pin connector, and means including a pair of adjustably interconnectable flexible straps; and each of said transformers and its associated fuses and LED's being group together through the top face and independently grouped from each other transformer and its associated fuses and LED's.

4,875,233

HEADSET CONSTRUCTION AND METHOD OF MAKING SAME

Robert L. Derhaag, 1364 Calle Crucero, San Marcos, Calif. 92069, and David B. Rose, 1827 Drescher St., San Diego, Calif. 92111

Filed Oct. 16, 1987, Ser. No. 109,460

Int. Cl.⁴ H04M 1/05

U.S. Cl. 379-430

26 Claims

1. A headset for fitting and engaging a user's crown and temple, for positioning a speaker opposite the user's ear, and for retaining a microphone in front of the user's mouth, comprising:
 - an arcuate headband for fitting and overlying the user's crown, said headband being composed of a thermoplastic rubber material;

an earpiece assembly being secured to one end of said headband for engaging the user's ear; a temple piece being secured to the opposed end of said headband for engaging the user's temple; means for positioning the microphone selectively in front of the user's mouth; said headband having an integral unitary molded structure, and including an inner soft member for engaging the user's crown, and an outer resilient member for rigidifying said inner soft member, and preventing breakage or malfunctioning of said headband; and

speaker interface module, and a slip ring connector for providing continuous electrical contact between said speaker interface module, and said microphone interface module.

4,875,234

TELEPHONE

Joerg Tragatschnig, Zell am See-Thumersbach, Austria, assignor to Porsche Design GmbH, Zell am See, Austria

Filed Jan. 8, 1987, Ser. No. 1,288

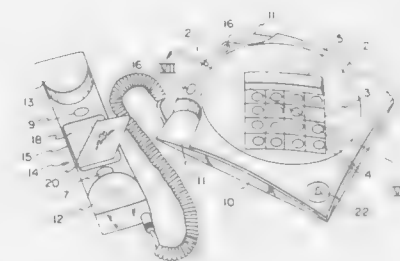
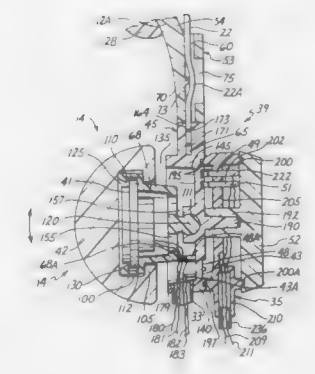
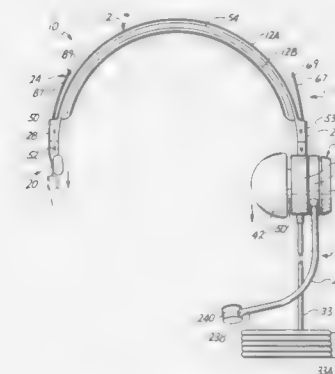
Claims priority, application Fed. Rep. of Germany, Jan. 14, 1986, 3600015

The portion of the term of this patent subsequent to Nov. 10, 2004, has been disclaimed.

Int. Cl.⁴ H04M 1/23

U.S. Cl. 379-434

3 Claims



said earpiece assembly including an earmuff for engaging the user's ear, a speaker holder for retaining the speaker adjustably against the user's ear, a speaker interface module connected rotatably to said speaker holder, and which is further connected adjustably to said headband, and a microphone interface module connected rotatably to said

1. A telephone comprising a housing having a rectangular bottom surface, vertically extending lateral walls, and a cover surface, a circular panel portion pivotally mounted on said cover surface, and a key block mounted on said panel portion, said cover surface of said housing, said panel portion, and said key block being contoured to substantially form a segment of a sphere; a telephone handset having an earpiece and a mouthpiece and a middle portion connecting said earpiece and said mouthpiece, said middle portion of said handset having an inner surface and including a hinged cover provided with a phone number register on the inner side thereof, said cover surface having synclinal depressions in two neighboring corners thereof for respectively receiving said earpiece and said mouthpiece of said handset on resting of said handset on said housing; said middle portion of said handset being spherically curved so that the inside surface thereof rests against said cover surface of said housing when said handset is disposed therein with said earpiece and said mouthpiece thereof respectively received in said synclinal depressions.

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DESIGN PATENTS

GRANTED OCT. 17, 1989

ERRATA

For		
CLASS		PATENT NO.
D08-001	304,086
D28-054	304,101

DESIGNS

OCTOBER 17, 1989

303,995

NURSING SHAWL

Rodger S. Dameron, 2408 Maxwell, Midland, Tex. 79705
Filed Mar. 7, 1987, Ser. No. 46,864
Term of patent 14 years

U.S. Cl. D2—225



303,998

CARRYING CASE

Sydney V. Davis, Neponset, N.Y., assignor to Ve-Alite Plastic Corporation, Brooklyn, N.Y.
Filed Jul. 25, 1986, Ser. No. 889,361
Term of patent 14 years

U.S. Cl. D3—73



303,996

SHOE SOLE

Craig L. Feller, Tigard, Oreg., assignor to Avia Group International, Inc., Portland, Oreg.
Filed Feb. 1, 1989, Ser. No. 304,833
Term of patent 14 years

U.S. Cl. D2—320



303,999

COMBINED EARRING DISPLAY AND STORAGE CASE

Maria Hansson, 331 Joan St., Ronkonkoma, N.Y. 11779
Division of Ser. No. 195,432, May 16, 1988, which is a continuation of Ser. No. 892,385, Jul. 31, 1986. This application
Sep. 7, 1988, Ser. No. 241,545
Term of patent 14 years

U.S. Cl. D3—75



303,997

KEY-RING

Claude Grossiord, Annecy, France, assignor to S. T. Dupont, Paris Cedex, France
Filed Jun. 4, 1986, Ser. No. 870,687
Claims priority, application France, Dec. 19, 1985, 856074
Term of patent 14 years

U.S. Cl. D3—61



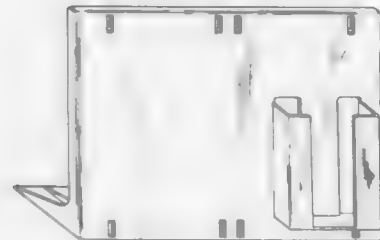
304,000

DISPLAY STAND FOR LITERATURE

Terry A. Turbeville, 440 S. 5th St., Louisville, Ky. 40202
 Filed Aug. 1, 1986, Ser. No. 892,094

Term of patent 14 years

U.S. Cl. D6—310



304,002

TELEPHONE ENCLOSURE

John W. Nichols, and Stevens Van Pinkerton, Jr., both of St. Joseph, Mo., assignors to Acoustics Development Corporation, St. Joseph, Mo.

Filed Jul. 14, 1987, Ser. No. 73,417

Term of patent 14 years

U.S. Cl. D6—421

304,001

ARMCHAIR

Raymond Grosfillex, Arbest, 01107 Oyonnax, France

Filed Jul. 23, 1986, Ser. No. 888,420

Claims priority, application France, Jan. 24, 1986, 86 860,343

The portion of the term of this patent subsequent to Apr. 4, 2003,

has been disclaimed.

Term of patent 14 years

U.S. Cl. D6—379



304,003

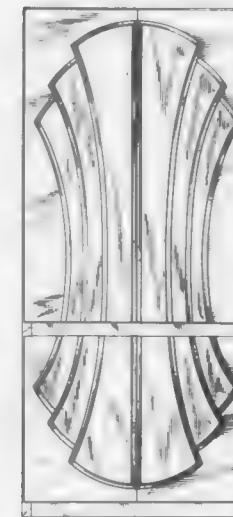
ARMOIRE

Albert Azzolina, 4 Catalpa Ln., Valley Stream, N.Y. 11581

Filed May 28, 1987, Ser. No. 55,741

Term of patent 14 years

U.S. Cl. D6—446



304,004

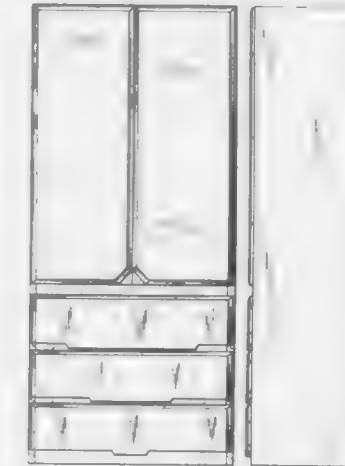
ARMOIRE

Albert Azzolina, 4 Catalpa Ln., Valley Stream, N.Y. 11581

Filed May 28, 1987, Ser. No. 55,767

Term of patent 14 years

U.S. Cl. D6—446



304,005

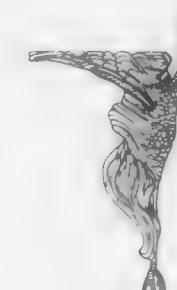
TABLE LEG

Mary J. Reid, Sheboygan, Wis., assignor to Kohler Co., Kohler, Wis.

Filed Jan. 13, 1987, Ser. No. 2,912

Term of patent 14 years

U.S. Cl. D6—497

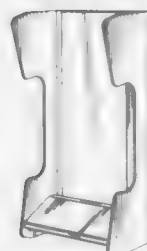


304,006
TELEPHONE ENCLOSURE

John W. Nichols, and Stevens Van Pinkerton, Jr., both of St. Joseph, Mo., assigns to Acoustics Development Corporation, St. Joseph, Mo.

Filed Jul. 15, 1987, Ser. No. 73,426
Term of patent 14 years

U.S. Cl. D6—553

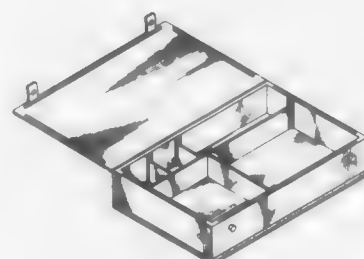
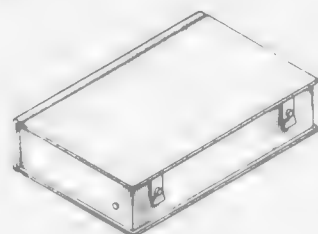


304,008
LUNCH BOX

John Hornung, 1231 Farrington Dr., La Habra, Calif. 90631
Continuation-in-part of Ser. No. 132,104, Dec. 14, 1987, abandoned, which is a continuation-in-part of Ser. No. 893,795, Aug. 6, 1986, abandoned. This application Oct. 19, 1988, Ser. No. 259,630

Term of patent 14 years

U.S. Cl. D7—76

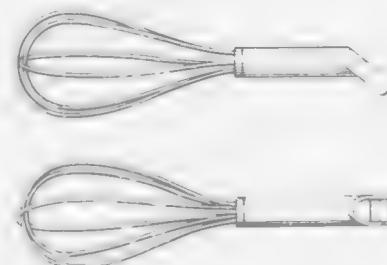


304,009
WHISK FOR THE PREPARATION OF CAKES, PIES AND THE LIKE

Bruno Gecchelin, Milan, Italy, assignor to Fratelli Guzzini S.p.A., Recanati, Italy

Filed Nov. 19, 1986, Ser. No. 932,900
Claims priority, application Italy, May 23, 1986, 21970/86[U]
Term of patent 14 years

U.S. Cl. D7—103

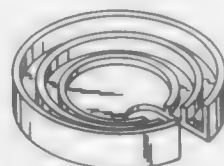


304,007
CUP HOLDER WITH SLOT FOR CUP HANDLE

John R. Davis, c/o Don Compton, 3 Laquinta Ct., Pace, Fla. 32181

Filed Jan. 12, 1987, Ser. No. 60,843
Term of patent 14 years

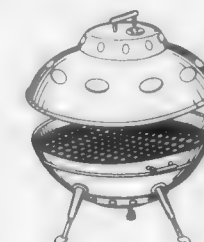
U.S. Cl. D7—70



304,010
BARBEQUE GRILL

Tsai G. Chuan, P.O. Box 705, Taipei, Taiwan
Filed Apr. 24, 1986, Ser. No. 857,599

Term of patent 14 years
U.S. Cl. D7—332

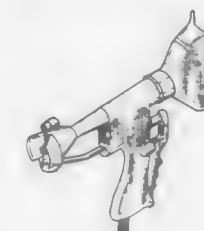


304,011
HEAT GUN

Joseph A. Seraphin, and James E. Talbot, both of Springfield, Pa., assigns to Film Applicators of North America, Springfield, Pa.

Filed Aug. 15, 1986, Ser. No. 896,984
Term of patent 14 years

U.S. Cl. D8—29.1



304,013
WEDGE CLAMP HOUSING FOR A DOWNRIGGER FISHING ASSEMBLY

Sam V. McCue, 805 Holly, Conlee Dam, Wash. 99116
Continuation of Ser. No. 76,997, Jul. 20, 1987, which is a continuation of Ser. No. 846,933, Apr. 1, 1986, abandoned. This application Mar. 14, 1989, Ser. No. 323,552

Term of patent 14 years
U.S. Cl. D8—396

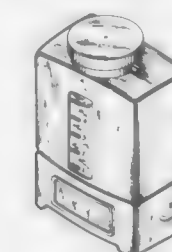


304,014
PAINT CONTAINER

Mark E. O'Connell, Cedar Grove, Wis., assignor to Thomas Industries Inc., Sheboygan, Wis.

Filed Nov. 5, 1986, Ser. No. 927,418
Term of patent 14 years

U.S. Cl. D9—372

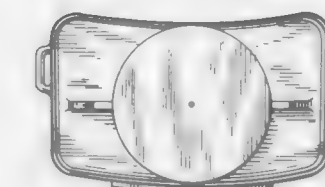
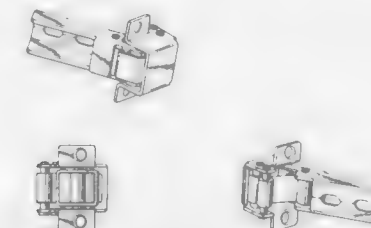


304,012
HINGE

Yoshinori Masuda, Tokyo, Japan, assignor to Kabushiki Kaisha Murakoshi Seiko, Tokyo, Japan

Filed Dec. 6, 1988, Ser. No. 280,730
Claims priority, application Japan, Jun. 16, 1988, 63-23958
Term of patent 14 years

U.S. Cl. D8—323



304,015
BOTTLE

Ronald G. Cramer, Racine County, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.

Filed Feb. 14, 1986, Ser. No. 833,454

Term of patent 14 years

U.S. Cl. D9—389

304,017
ARTICLE CARRIER BLANK

James R. Oliff, Austell, Ga., assignor to The Mead Corporation, Dayton, Ohio

Filed Jan. 30, 1987, Ser. No. 9,405

Term of patent 14 years

U.S. Cl. D9—433



304,016

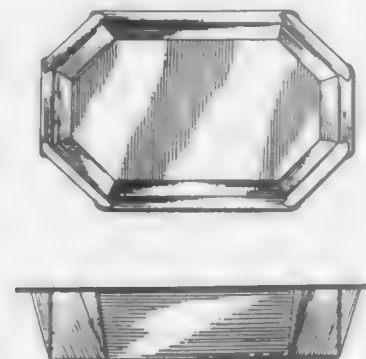
TUB FOR PACKAGING FOOD OR THE LIKE

Hampton H. Forbes, Jr., Newark, Del., assignor to Westvaco Corporation, New York, N.Y.

Filed Mar. 13, 1986, Ser. No. 844,727

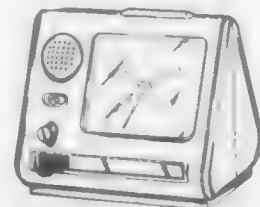
Term of patent 14 years

U.S. Cl. D9—425



304,018
ALARM CLOCK WITH VOICE RECORDER
Hidekatsu Nomizu, Yoshida, Japan, assignor to TWIN BIRD Industrial Company Limited, Japan
Filed Nov. 25, 1986, Ser. No. 934,926
Term of patent 14 years

U.S. Cl. D10—2

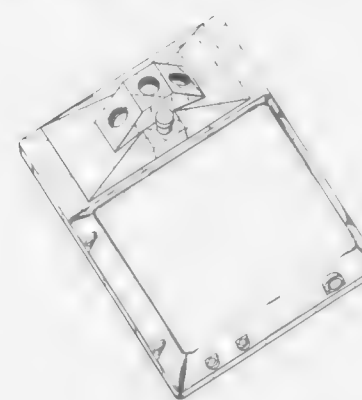


304,019
COMBINED MOTION SENSOR AND MOUNTING FOR
ADJUSTABLE FLOOD LIGHTS
John P. Carsello, Telford, Pa., assignor to The Lamson & Sessions Co., Cleveland, Ohio

Filed Feb. 24, 1986, Ser. No. 835,325

Term of patent 14 years

U.S. Cl. D10—106



304,022
POT FOR PLANTS
Morton White, No. Kingstown, R.I., assignor to New England AG Tech, Inc., Cranston, R.I.

Filed May 26, 1987, Ser. No. 54,882

Term of patent 14 years

U.S. Cl. D11—155

304,020
EXPANSION BRACELET

Murray L. Cowan, Norwood, Mass., assignor to Textron, Inc.

Filed Jul. 20, 1987, Ser. No. 77,401

Term of patent 14 years

U.S. Cl. D11—25



304,021
SIMULATED FLOWER WITH INFLATED BLOSSOM
Robert Shives, and Jeny Shives, both of 327 S. Union St., Sparta, Mich. 49345

Filed Oct. 30, 1986, Ser. No. 925,147

Term of patent 14 years

U.S. Cl. D11—117



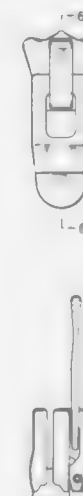
304,023
FASTENER
Hiroo Minami, Uozu, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Filed Aug. 11, 1987, Ser. No. 83,961

Claims priority, application Japan, Apr. 3, 1987, 62-12901

Term of patent 14 years

U.S. Cl. D11—221



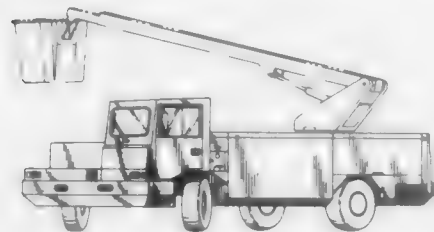
304,024

AIRCRAFT DEICER VEHICLE

Paul D. Eckstedt, San Jose, Calif., and Thomas W. Whitmire, Winter Park, Fla., assignors to FMC Corporation, Chicago, Ill.

Filed Apr. 25, 1986, Ser. No. 857,573
Term of patent 14 years

U.S. Cl. D12-14



304,027

ELECTRICAL CONNECTOR PLUG

Shuichi Matsuzaki, Tokyo, Japan, assignor to Hirose Electric Co., Ltd., Tokyo, Japan

Filed Feb. 24, 1987, Ser. No. 18,181
Claims priority, application Japan, Sep. 10, 1986, 61-35712
Term of patent 14 years

U.S. Cl. D13-24



304,025

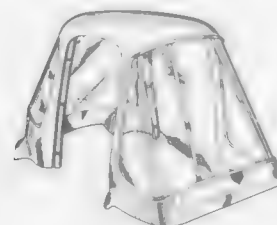
CANOPY FOR A MOTOR VEHICLE

Kim T. Bolvary, 6 Cowan Place, Safety Bay, Australia, assignor to Kim Tibor Bolvary, Safety Bay, Australia

Filed Feb. 24, 1986, Ser. No. 835,319

Claims priority, application Australia, Aug. 27, 1985, 2396/85
Term of patent 14 years

U.S. Cl. D12-156



304,026

ELECTRICAL CONNECTOR PLUG

Shuichi Matsuzaki, Tokyo, Japan, assignor to Hirose Electric Co., Ltd., Tokyo, Japan

Filed Feb. 24, 1987, Ser. No. 18,182
Claims priority, application Japan, Sep. 10, 1986, 61-35711
Term of patent 14 years

U.S. Cl. D13-24



304,026

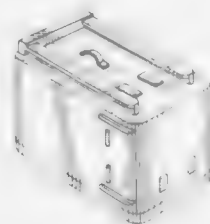
BATTERY PACK FOR ELECTRONIC BAR CODE READER

Donna E. Goodner, and Jamshid Naderi, both of Charlotte, N.C., assignors to Hand Held Products, Inc., Charlotte, N.C.

Filed Sep. 30, 1988, Ser. No. 252,355

Term of patent 14 years

U.S. Cl. D13-8



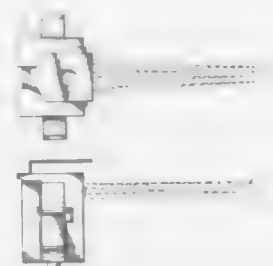
304,029

ELECTRICAL CONNECTOR PLUG

Shuichi Matsuzaki, Tokyo, Japan, assignor to Hirose Electric Co., Ltd., Tokyo, Japan

Filed Feb. 24, 1987, Ser. No. 18,183
Claims priority, application Japan, Sep. 10, 1986, 61-35710
Term of patent 14 years

U.S. Cl. D13-24



304,030

FLUORESCENT LAMP ADAPTER BASE

Usman U. Vakil, Diamond Bar, Calif., assignor to Lights Of America, Inc., Walnut, Calif.

Filed Oct. 5, 1987, Ser. No. 104,414
Term of patent 14 years

U.S. Cl. D13-25



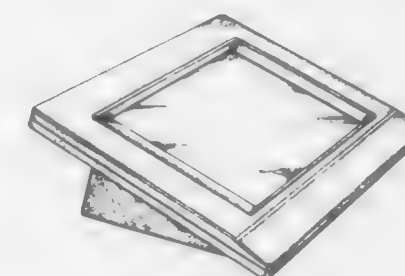
304,032

COMPUTER DISPLAY

Irwin M. Fine, Aberdeen, N.J., and David A. Harms, Glen Ellyn, Ill., assignors to American Telephone and Telegraph Company, New York, N.Y. and AT&T Information Systems Inc., Morristown, N.J.

Filed Apr. 13, 1987, Ser. No. 38,274
Term of patent 14 years

U.S. Cl. D14-113



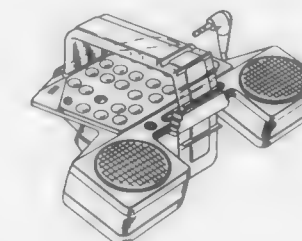
304,033

COMBINED RADIO SUPPORT AND SPEAKERS FOR BICYCLES AND THE LIKE

Sergio E. Villanueva, and Xavier R. Villanueva, both of San Ysidro, Calif., assignors to Novi, Inc., San Diego, Calif.

Filed Oct. 28, 1986, Ser. No. 924,588
Term of patent 14 years

U.S. Cl. D14-224



304,031

CASSETTE FOR A VIDEO TAPE RECORDER

Kenji Nishiyama, Nara; Hanji Takahashi, Hyogo, and Yoshitomo Itakura, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 16, 1986, Ser. No. 919,927

Claims priority, application Japan, Jun. 23, 1986, 61-24223
Term of patent 14 years

U.S. Cl. D14-121



304,034

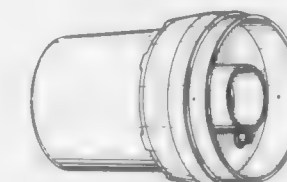
CONVERTER FOR A SATELLITE RECEIVING ANTENNA

Sinzi Nagaoka, Fukaya, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 26, 1986, Ser. No. 833,048

Claims priority, application Japan, Aug. 27, 1985, 60-35896
Term of patent 14 years

U.S. Cl. D14-231



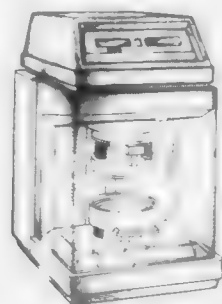
304,035

BADGE MAKING MACHINE

Anstin H. Munson, Waukegan, and Daniel R. Bullis, Jr., Madison, both of Wis., assignors to Badge-A-Minit, Ltd., LaSalle, Ill.

Filed Jun. 3, 1987, Ser. No. 57,839
Term of patent 14 years

U.S. Cl. D15—122



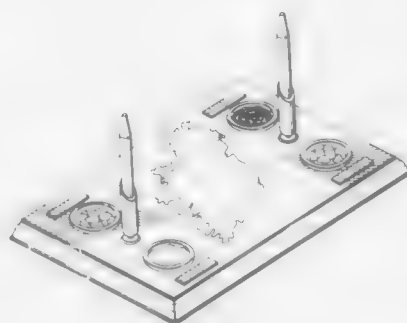
304,038

DESK SET

David Janson, Richenbachstrasse 176, 6430 Schwyz, Switzerland

Filed May 15, 1986, Ser. No. 863,477
Term of patent 14 years

U.S. Cl. D19—82



FLUIDIC POWER ACTUATOR

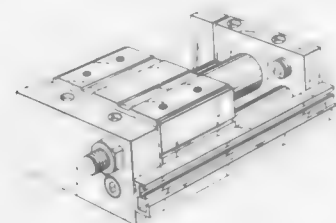
Michikazu Miyamoto, Soka, Japan, assignor to SMC Corporation, Tokyo, Japan

Filed Jul. 18, 1986, Ser. No. 886,680

Claims priority, application Japan, Jan. 20, 1986, 61-1813

Term of patent 14 years

U.S. Cl. D15—199



304,037

SLIDE VIEWER

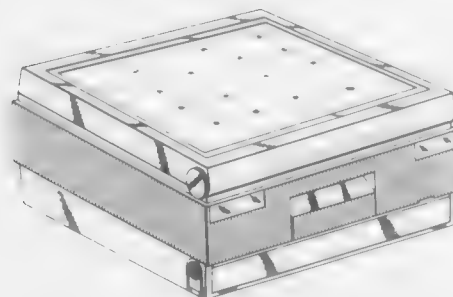
Udo M. Geisler, Munich, Fed. Rep. of Germany, assignor to OSRAM Gesellschaft mit beschränkter Haftung, Munich, Fed. Rep. of Germany

Filed Jun. 6, 1986, Ser. No. 872,374

Claims priority, application Fed. Rep. of Germany, Jan. 24, 1986, 16501

Term of patent 14 years

U.S. Cl. D16—229



304,039

RAILROAD WARNING SIGN

Robert D. Henderson, 12806 Castle Rd., Louisville, Ky. 40272, and Robert L. Poore, Jr., 1537 Walter Ave., Louisville, Ky.

MIXIN

Filed Dec. 23, 1986, Ser. No. 945,328

Term of patent 14 years

U.S. Cl. D20—10



304,040

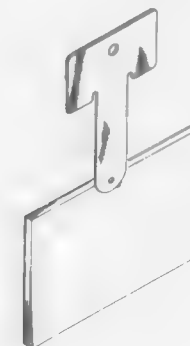
DISPENSER/MOUNT FOR INFORMATIONAL SHEETS

James L. Thal, Plymouth, Minn., assignor to Bureau of Engraving, Inc., Minneapolis, Minn.

Filed Mar. 7, 1986, Ser. No. 842,041

Term of patent 14 years

U.S. Cl. D20—22



304,041

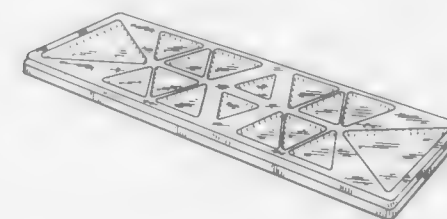
GAME BOARD

Marlene F. Meeker, 1802 Regal Ln., Greensboro, N.C. 27410, and John M. Baynes, 2607 E. Wendover Ave., Greensboro, N.C. 27405

Filed Jul. 31, 1986, Ser. No. 891,331

Term of patent 14 years

U.S. Cl. D21—20



304,043

WHEEL HOLDER ELEMENT FOR A TOY AIRCRAFT

Erik P. Tapdrup, Virum, Denmark, assignor to Interlego A.G., Baar, Switzerland

Filed Dec. 2, 1987, Ser. No. 128,525

Term of patent 14 years

U.S. Cl. D21—91



304,044

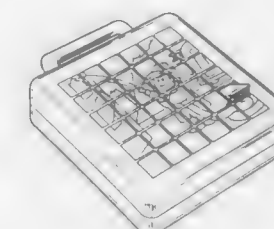
TURNING PICTURES PLAYBOX

Elliot A. Rudell, 2215 W. 237th St., Torrance, Calif. 90501, and Joseph S. Cernansky, Lomita, Calif., assignors to Elliot A. Rudell, Torrance, Calif.

Filed Apr. 7, 1986, Ser. No. 850,398

Term of patent 14 years

U.S. Cl. D21—104



304,042

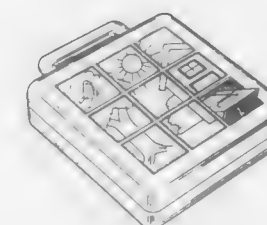
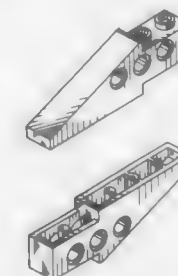
PROFILE ELEMENT (REAR) FOR A TOY AIRCRAFT WING

Ole V. Poulsen, Vejle, Denmark, assignor to Interlego A.G., Baar, Switzerland

Filed Dec. 2, 1987, Ser. No. 127,886

Term of patent 14 years

U.S. Cl. D21—91



304,043

WIRE PUZZLE

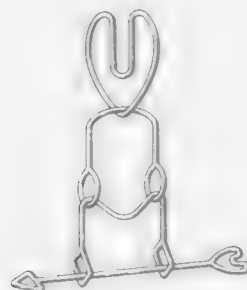
Saburo Hasegawa, 17-4, Higashigou 5-Chome, Arakawa-Ku, Tokyo, Japan

Filed Jun. 15, 1987, Ser. No. 61,405

Claims priority, application Japan, Dec. 23, 1986, 61-50835

Term of patent 14 years

U.S. Cl. D21-106



304,048

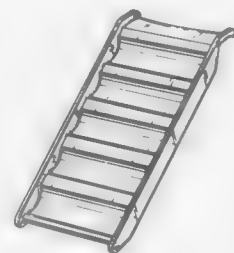
TOY RAMP OR THE LIKE

Lawrence O. Freese, Providence, R.I., assignor to Dart Industries Inc., Deerfield, Ill.

Filed Jul. 16, 1986, Ser. No. 887,009

Term of patent 14 years

U.S. Cl. D21-109



304,046

EXTERNALLY CURVED TOY WALL ELEMENT

Jens N. Knudsen, Billund, Denmark, assignor to Interlego A.G., Baar, Switzerland

Filed Dec. 2, 1987, Ser. No. 127,882

Term of patent 14 years

U.S. Cl. D21-108



304,049

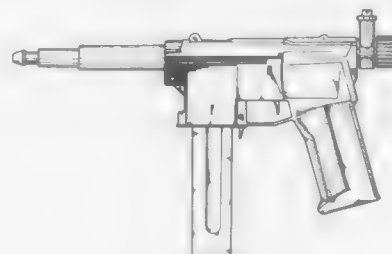
TOY WATER GUN WITH EXTENSIBLE NOZZLE

Fu-Kuei Lee, P.O. Box 10780, Taipei 10099, Taiwan

Filed Nov. 19, 1987, Ser. No. 122,663

Term of patent 14 years

U.S. Cl. D21-147



304,047

TOY ROTOR ELEMENT

Erling T. Dideriksen, Billund, Denmark, assignor to Interlego A.G., Baar, Switzerland

Filed Dec. 2, 1987, Ser. No. 128,489

Term of patent 14 years

U.S. Cl. D21-108



304,050

FINGER PUPPET

Jacqueline B. Dickens, 965 Havensport Dr., Cincinnati, Ohio 45240

Filed Oct. 28, 1986, Ser. No. 924,492

Term of patent 14 years

U.S. Cl. D21-153



304,051

FINGER PUPPET

Jacqueline B. Dickens, 965 Havensport Dr., Cincinnati, Ohio 45240

Filed Oct. 28, 1986, Ser. No. 924,493

Term of patent 14 years

U.S. Cl. D21-153



304,054

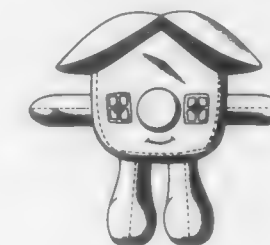
HOUSE SCULPTURE TOY FIGURE

John B. Van Meter, Rte. 5, Edgemont Rd., Maysville, Ky. 41056

Filed Sep. 22, 1986, Ser. No. 910,191

Term of patent 14 years

U.S. Cl. D21-155



304,052

FINGER PUPPET

Jacqueline B. Dickens, 965 Havensport Dr., Cincinnati, Ohio 45240

Filed Oct. 28, 1986, Ser. No. 924,584

Term of patent 14 years

U.S. Cl. D21-153



304,053

TOY ANIMAL

Henry Neville, Lane Cove, Australia, assignor to Down Under Orphans Pty. Limited, North Sydney, Australia

Filed Aug. 18, 1986, Ser. No. 897,771

Claims priority, application Australia, Feb. 19, 1986, 4239/86

Term of patent 14 years

U.S. Cl. D21-159



304,053

FINGER PUPPET

Jacqueline B. Dickens, 965 Havensport Dr., Cincinnati, Ohio 45240

Filed Oct. 28, 1986, Ser. No. 924,585

Term of patent 14 years

U.S. Cl. D21-153



304,056

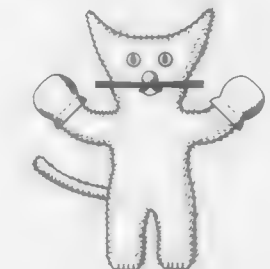
TOY KITTEN FIGURE

Jane P. Seifert, 46 Princeton Ct., Cheektowaga, N.Y. 14225

Filed Aug. 28, 1986, Ser. No. 901,458

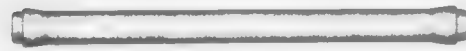
Term of patent 14 years

U.S. Cl. D21-163



304,057
EXERCISE ROD

Timothy H. Cooper, 420 Linden St., Laguna Beach, Calif. 92651
Filed Feb. 9, 1987, Ser. No. 12,782
Term of patent 14 years
U.S. Cl. D21—191



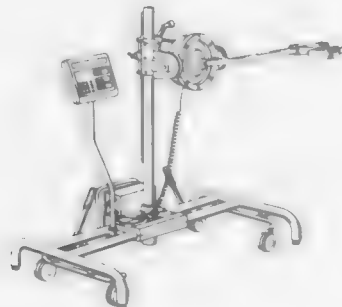
304,060
GOLF PUTTER HEAD

Paul L. Smith, 33723 Five Mile Rd. #202, Livonia, Mich. 48150
Filed Aug. 25, 1986, Ser. No. 899,628
Term of patent 14 years
U.S. Cl. D21—217



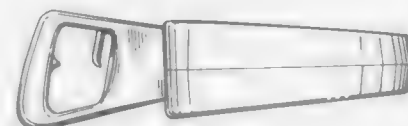
304,058
SHOULDER AND ARM EXERCISE MACHINE

Robert B. Carlson, Bloomington, and Fredrick D. Wucherpfening, both of Bloomington, Minn., assignors to The Toro Company, Minneapolis, Minn.
Filed Apr. 23, 1987, Ser. No. 41,577
Term of patent 14 years
U.S. Cl. D21—195



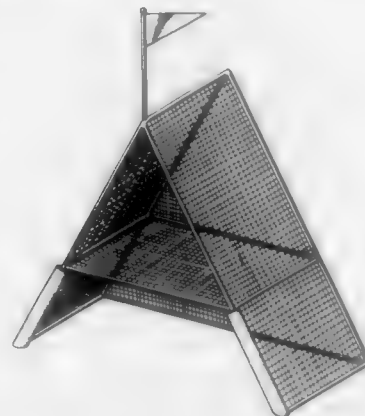
304,061
WATER SKI HANDLE

Leon Raiter, St. Cloud, Minn.; John Mor, Vernon, Canada, and Devlin Hunt, Brainerd, Minn., assignors to Ski-free Marine, Inc., Calgary, Canada
Filed Sep. 18, 1986, Ser. No. 909,087
Term of patent 14 years
U.S. Cl. D21—230



304,059
PYRAMID BALL GOAL POST

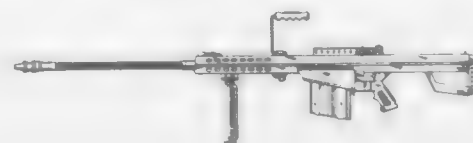
Moon H. Hong, 1640 Overland Dr., San Mateo, Calif. 94403
Filed Feb. 3, 1987, Ser. No. 15,125
Term of patent 14 years
U.S. Cl. D21—200



304,062

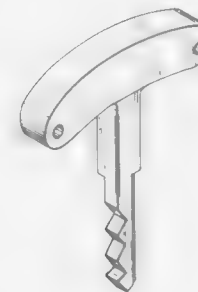
SEMI-AUTOMATIC RIFLE

Ronnie G. Barrett, P.O. Box 1077, Murfreesboro, Tenn. 37130
Filed Nov. 27, 1987, Ser. No. 126,295
Term of patent 14 years
U.S. Cl. D22—103



304,063
SELF DEFENSE WEAPON OR SIMILAR ARTICLE

Oscar R. Story, and Carol A. Story, both of 700 Richards Lake Rd., Fort Collins, Colo. 80524
Filed Jun. 26, 1987, Ser. No. 66,652
Term of patent 14 years
U.S. Cl. D22—117



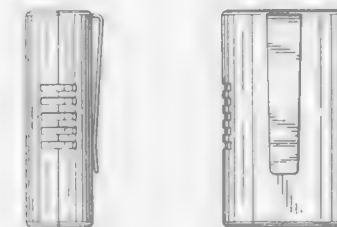
304,066
FISHING LURE

Kenneth R. Bates, 1119 Chatham Heights, Martinville, Va. 24112
Filed Jul. 27, 1987, Ser. No. 78,061
Term of patent 14 years
U.S. Cl. D22—129



304,064
INSECT REPELLER

John S. Yuen, Kowloon, Hong Kong, assignor to John Manufacturing Limited, Kowloon, Hong Kong
Filed Aug. 14, 1986, Ser. No. 896,222
Claims priority, application United Kingdom, Mar. 4, 1986, 1032615
Term of patent 14 years
U.S. Cl. D22—120



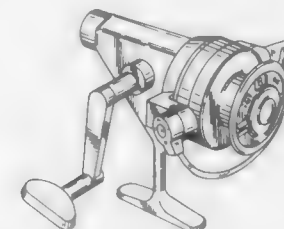
304,067
FISHING HOOK AND SWIVEL HOLDER

Gary P. Ward, 4655 SW. 165th St., Beaverton, Ore. 97007
Filed Apr. 26, 1988, Ser. No. 187,091
Term of patent 14 years
U.S. Cl. D22—149



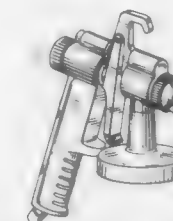
304,065
FISHING REEL

Robert E. Haynes, Foley, Ala., assignor to Lew Childre & Sons, Inc., Foley, Ala.
Continuation of Ser. No. 760,665, Jul. 30, 1985, abandoned. This application Dec. 19, 1988, Ser. No. 287,594
Term of patent 14 years
U.S. Cl. D22—141



304,068
COMBINED SPRAY GUN AND CLOSURE CAP

Walter B. Herbst, Evanston, Ill., assignor to Thomas Industries, Inc., Sheboygan, Wis.
Filed Jun. 8, 1987, Ser. No. 59,265
Term of patent 14 years
U.S. Cl. D23—226



304,068

FAUCET HANDLE

Andreas Haug, Altensteig, and Thomas Schönherr, Egenhausen, both of Fed. Rep. of Germany, assignors to Hans Grohe GmbH & Co. KG, Fed. Rep. of Germany

Filed Mar. 16, 1987, Ser. No. 25,863

Claims priority, application Fed. Rep. of Germany, Sep. 18, 1986, MR12680E

Term of patent 14 years

U.S. Cl. D23-243



304,071

FAUCET HANDLE

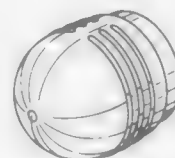
Andreas Haug, Altensteig, and Thomas Schönherr, Egenhausen, both of Fed. Rep. of Germany, assignors to Hans Grohe GmbH & Co. KG, Fed. Rep. of Germany

Filed Mar. 16, 1987, Ser. No. 25,861

Claims priority, application Fed. Rep. of Germany, Sep. 18, 1986, MR12680E

Term of patent 14 years

U.S. Cl. D23-250



304,072

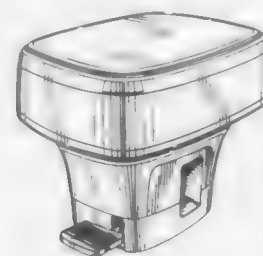
TOILET

John M. Stewart, Park, Canada, assignor to Sanitation Equipment Limited, Concord, Canada

Filed Oct. 14, 1986, Ser. No. 918,423

Term of patent 14 years

U.S. Cl. D23-295



304,070

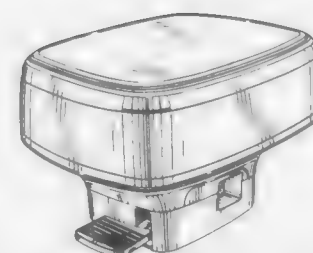
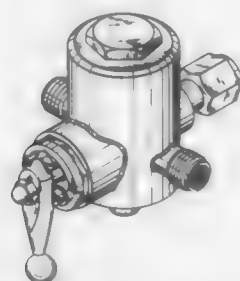
SHUT-OFF VALVE FOR SPECIALTY GASES

Richard E. Hughes, 821 Loma Dr., Hermosa Beach, Calif. 90254

Filed Mar. 17, 1986, Ser. No. 844,766

Term of patent 14 years

U.S. Cl. D23-245



304,073

HOUSING FOR A CEILING MOUNTED AIR CONDITIONER

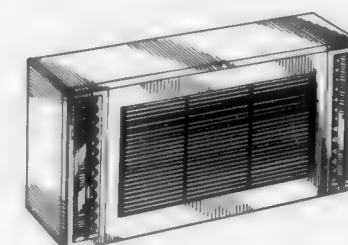
Hideyuki Ikeda, and Shigeru Saito, both of Kamakura, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 26, 1986, Ser. No. 879,187

Claims priority, application Japan, Jan. 16, 1986, 61-1089

Term of patent 14 years

U.S. Cl. D23-351



304,075

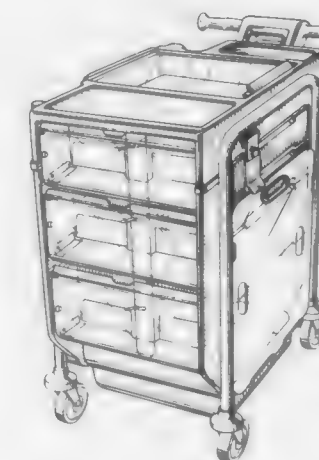
EMERGENCY MEDICAL CRASH CART

Robert J. Welch, Dallas, Pa., assignor to InterMetro Industries Corporation, Wilkes-Barre, Pa.

Filed Feb. 4, 1987, Ser. No. 10,650

Term of patent 14 years

U.S. Cl. D24-1.1



304,074

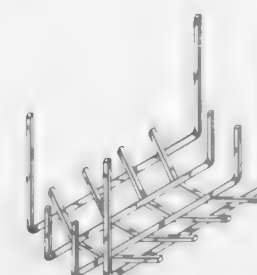
SUSPENDED FIREPLACE GRATE

John W. Moroney, Glendora, Calif., assignor to Superior Fireplace Company, Fullerton, Calif.

Filed Jan. 24, 1986, Ser. No. 822,041

Term of patent 14 years

U.S. Cl. D23-398



304,076

WATER JET TEETH CLEANER

Michael J. Primiano, 4540 SW. Dogwood Dr., Lake Oswego, Oreg. 97035

Filed Oct. 5, 1987, Ser. No. 104,307

Term of patent 14 years

U.S. Cl. D24-15

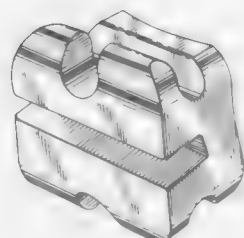
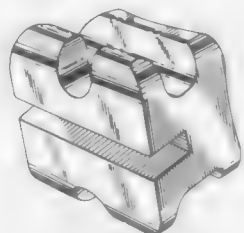


304,077

ORTHODONTIC BRACKET

Jirina V. Pospisil, Moorovia, Calif., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Mar. 4, 1987, Ser. No. 21,868
Term of patent 14 years

U.S. Cl. D24—16



304,079

FLASHBACK STRUCTURE FOR A CATHETER HAVING A TRANSPARENT COVER

Richard H. McFarlane, Geneva, Ill., assignor to Taut, Inc., Geneva, Ill.

Filed Jul. 31, 1987, Ser. No. 80,376
Term of patent 14 years

U.S. Cl. D24—54



304,080

URINE COLLECTOR ATTACHMENT PAD

Lee & Smith; Paul H. Haniff, Barrington, and John J. Newton, Jr., Palatine, both of Ill., assignors to Sage Products, Inc., Cary, Ill.

Filed Aug. 5, 1987, Ser. No. 82,065
Term of patent 14 years

U.S. Cl. D24—54



304,078

OPTICAL ZONE MARKER

Ronald P. Jensen, 1612 Golf Club Dr., Glendale, Calif. 91206
Filed May 4, 1987, Ser. No. 45,637
Term of patent 14 years

U.S. Cl. D24—26

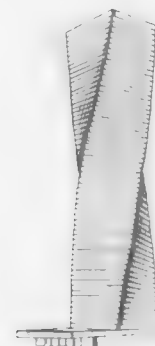


304,081

MULTI-STORIED BUILDING

Rada Vero, 345 E. 80th St., New York, N.Y. 10021
Filed Aug. 25, 1986, Ser. No. 900,346
Term of patent 14 years

U.S. Cl. D25—5

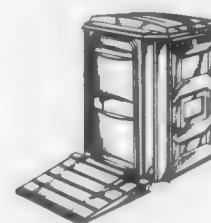


304,082

OUTDOOR TOILET CABANA

George W. Harding, Clearwater, Fla., assignor to Poly-John Enterprises Corp., Whiting, Ind.
Filed Feb. 9, 1987, Ser. No. 12,676
Term of patent 14 years

U.S. Cl. D25—16

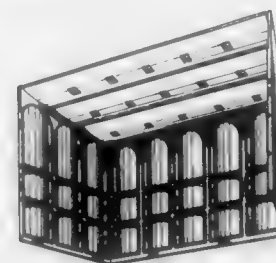


304,083

BAND SHELL

James F. Jenné, Palos Verdes Estates, Calif., assignor to Wenger Corporation, Owatonna, Minn.
Filed Feb. 13, 1987, Ser. No. 14,527
Term of patent 14 years

U.S. Cl. D25—58

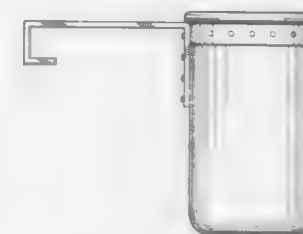


304,084

LADDER CADDY

Kenneth H. Meng, 19750 Sheldon Rd., Brook Park, Ohio 44142
Filed Jul. 7, 1988, Ser. No. 216,259
Term of patent 14 years

U.S. Cl. D25—68

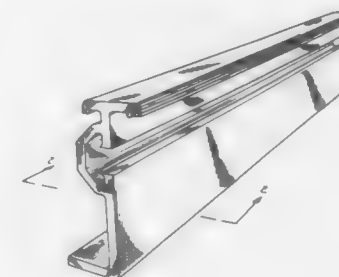


304,085

EXTRUSION FOR USE IN THE CONSTRUCTION OF A FLOOR OF A MOTOR LORRY

Philip K. Hockney, Smithfield, Australia, assignor to Hockney Pty. Limited, New South Wales, Australia
Filed Feb. 10, 1986, Ser. No. 828,025
Claims priority, application Australia, Sep. 19, 1984, 8946/84
Term of patent 14 years

U.S. Cl. D25—119

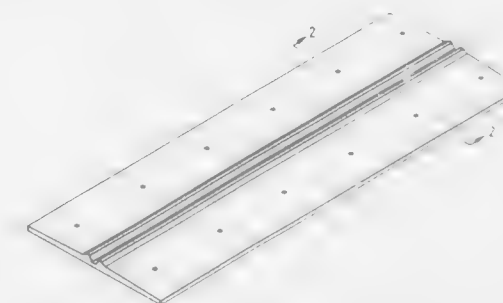


304,086

FENCE RUNNER

Stephen R. Eads, 6113 Woodcrest Dr., Tuscaloosa, Ala. 35405
Filed Sep. 23, 1987, Ser. No. 99,994
Term of patent 14 years

U.S. Cl. D8—1



304,087

COMPACT FLUORESCENT LAMP

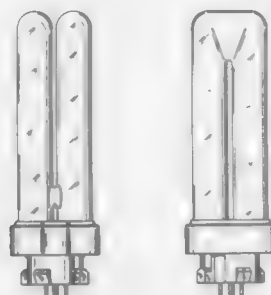
Horst Porembski, Munich, and Michael Kappler, Friedberg, both of Fed. Rep. of Germany, assignors to OSRAM GmbH, Munich, Fed. Rep. of Germany

Filed Feb. 9, 1987, Ser. No. 12,204

Claims priority, application Fed. Rep. of Germany, Aug. 21, 1986, 007384

Term of patent 14 years

U.S. Cl. D26—3



304,090

MULTI-FUNCTION LANTERN

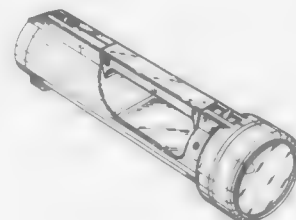
Yin C. A. Wan, Hong Kong, Hong Kong, assignor to Fee Tat Plastic Factory Limited, Aberdeen, Hong Kong

Filed Jan. 5, 1987, Ser. No. 957

Claims priority, application United Kingdom, Oct. 13, 1986, 1037338

Term of patent 14 years

U.S. Cl. D26—42



304,088

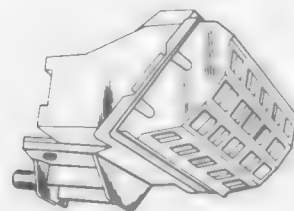
DOOR OPERATED CONVENIENCE LIGHT FOR STORAGE AREAS

David A. Kelley, Marshall; Delbert J. Corkins, Battle Creek, and Robert S. Hileman, Marshall, all of Mich., assignors to Progressive Dynamics, Inc., Marshall, Mich.

Filed Oct. 24, 1986, Ser. No. 923,730

Term of patent 14 years

U.S. Cl. D26—24



304,091

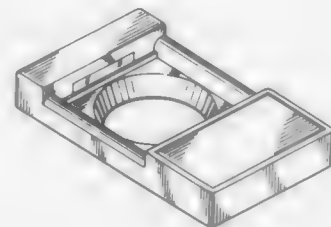
LOCK ILLUMINATOR

Dennis E. Fuller, 26586 Windsor Ave., Elkhart, Ind. 46514

Filed Aug. 20, 1986, Ser. No. 898,109

Term of patent 14 years

U.S. Cl. D26—72



304,089

MULTI-FUNCTION LANTERN

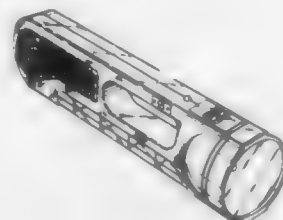
Yin C. A. Wan, Kowloon, Hong Kong, assignor to Fee Tat Plastic Factory Limited, Aberdeen, Hong Kong

Filed Jan. 5, 1987, Ser. No. 956

Claims priority, application United Kingdom, Oct. 13, 1986, 1037337

Term of patent 14 years

U.S. Cl. D26—42



304,092

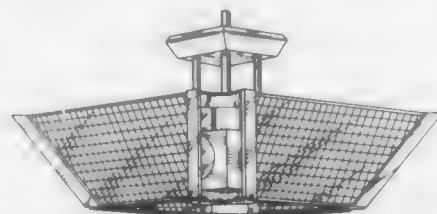
LIGHT FIXTURE

Fredrick R. Glassman, 9170 La Alba Dr., Whittier, Calif. 90603

Filed Jan. 7, 1987, Ser. No. 1,091

Term of patent 14 years

U.S. Cl. D26—85



304,093

LAMP

Alfred Holter, Frederik Hendrik Plantsoen 94, 3e 1052 XX Amsterdam, Netherlands

Filed Sep. 26, 1986, Ser. No. 912,813

Claims priority, application Benelux, Jan. 7, 1986, 61235-01/02

Term of patent 14 years

U.S. Cl. D26—94



304,095

MASCARA APPLICATOR CONTAINER

Ellen Gavin, Atlantic Highlands, N.J., assignor to L'Oreal S.A., Paris, France

Filed Mar. 27, 1987, Ser. No. 31,507

Term of patent 14 years

U.S. Cl. D28—7



304,094

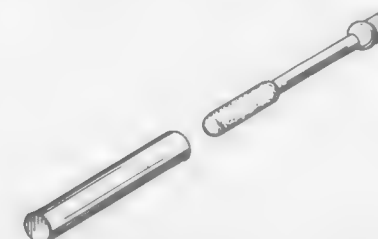
DISPOSABLE COSMETIC APPLICATOR AND CONTAINER THEREOF

Robert A. Bennett, Easton, Conn., assignor to R. J. S. Industries, Inc., Marlboro, N.J.

Filed Dec. 9, 1986, Ser. No. 939,455

Term of patent 14 years

U.S. Cl. D28—7



304,096

WALL MOUNTED HAIR DRYER

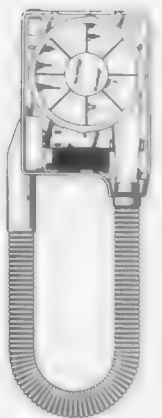
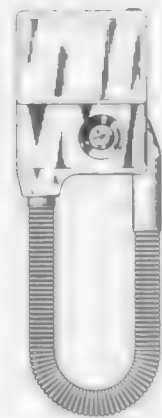
Roland Nithardt, Yverdon-les-Bains, Switzerland, assignor to Elite S.R.L., Italy

Filed Apr. 13, 1987, Ser. No. 37,567

Claims priority, application Int'l Pat. Institute, Oct. 14, 1986, DM/007,625

Term of patent 14 years

U.S. Cl. D28—12



304,098

COMPACT

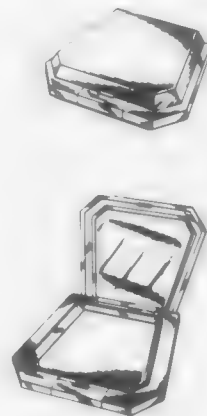
Joel Desgrappes, Paris, France, assignor to Albion Cosmetics Co., Ltd., Japan

Filed Apr. 17, 1987, Ser. No. 40,200

Claims priority, application Japan, Jan. 13, 1987, 62-582

Term of patent 14 years

U.S. Cl. D28—78



304,099

COSMETIC CASE

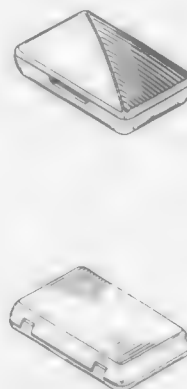
Karens Bakic, Varese, Italy, assignor to Cosmede Anstalt, Vaduz, Liechtenstein

Filed Nov. 14, 1986, Ser. No. 930,860

Claims priority, application Fed. Rep. of Germany, May 15, 1986, URA 652/86

Term of patent 14 years

U.S. Cl. D28—83



304,097

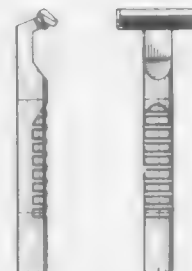
RAZOR OR SIMILAR ARTICLE

Giampiero Bonori, Bologna, Italy, assignor to Joren Marketing Ltd., Zurich, Switzerland

Filed Nov. 21, 1986, Ser. No. 942,462

Term of patent 14 years

U.S. Cl. D28—46



304,100

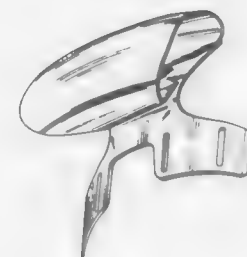
BELT ATTACHED UMPIRE HAND PROTECTOR

Ronald N. Brown, 4195 S. Oneida, Denver, Colo. 80237

Filed Oct. 17, 1986, Ser. No. 920,850

Term of patent 14 years

U.S. Cl. D29—20



304,102

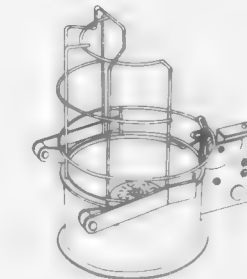
SOLID DETERGENT DISPENSER

Haresh C. Lakhan, Eagan; Lawrence W. Switala, Minneapolis, and Kim J. Ashton, Vadnais Heights, all of Minn., assignors to Ecolab Inc., St. Paul, Minn.

Filed Apr. 30, 1987, Ser. No. 44,552

Term of patent 14 years

U.S. Cl. D32—1



304,101

HAND DRYER

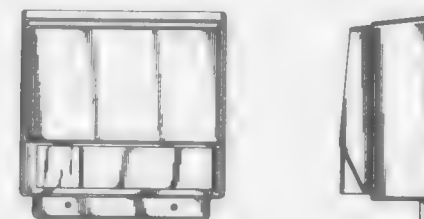
Joseph R. Mango, Midlothian, Ill., assignor to World Dryer Division of Specialty Equipment Companies, Inc., Berkeley, Ill.

Filed Apr. 18, 1986, Ser. No. 855,778

The portion of the term of this patent subsequent to Aug. 15, 2006, has been disclaimed.

Term of patent 14 years

U.S. Cl. D28—54.1



304,103

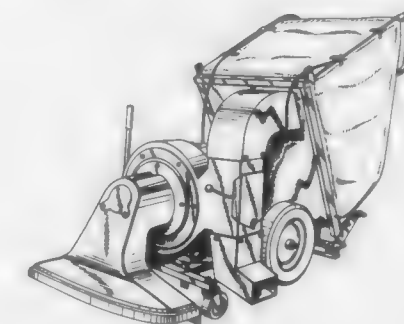
VACUUM-BLOWER UNIT

Walter F. Ruhl, Greenville, Ohio; Jeffrey A. Steed, Union City, Ind., and James M. Weaver, Greenville, Ohio, assignors to Lambert Corporation, Ohio

Filed Oct. 19, 1987, Ser. No. 109,682

Term of patent 14 years

U.S. Cl. D32—15



304,104

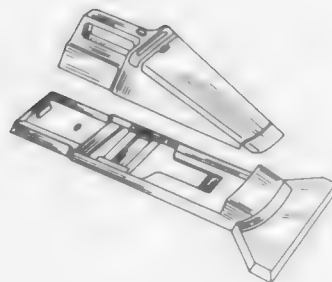
CORDLESS VACUUM CLEANER

Gerhard Busalt, Biblis, and Franz A. Stitzner, Offenbach am Main, both of Fed. Rep. of Germany, assignors to Rowenta-Werke GmbH, Offenbach am Main, Fed. Rep. of Germany
Filed Dec. 4, 1986, Ser. No. 938,138

Claims priority, application Fed. Rep. of Germany, Jun. 11, 1985, 5MR10681

Term of patent 14 years

U.S. Cl. D32—18



304,105

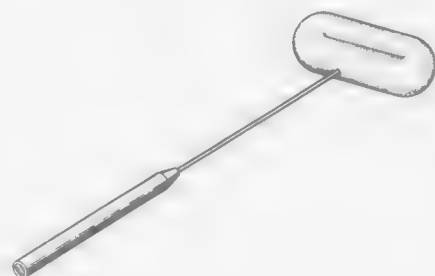
CLEANING TOOL FOR CEILING FAN BLADES

Michael J. Dobson, Rte. 15, Box 190; James P. Kelley, Rte. 14, Box 458, both of Gadsden, Ala. 35903, and Michael E. Wilcutt, Rte. 1, Box 483, Gadsden, Ala. 35901

Filed Jan. 27, 1987, Ser. No. 7,437

Term of patent 14 years

U.S. Cl. D32—40



304,105

SPRAY-TYPE, VACUUM CLEANER

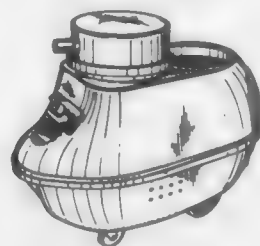
Tom A. McAllister, Mississauga; John S. McAllister, Pickering, and William R. Bonnar, Whitby, all of Canada, assignors to American Home Products Corporation, New York, N.Y.

Filed Oct. 26, 1987, Ser. No. 113,805

Claims priority, application Canada, May 5, 1987, 05-05-87-4

Term of patent 14 years

U.S. Cl. D32—21



304,107

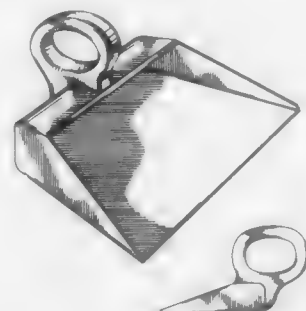
DUSTPAN

Donald R. Noggle, 329 Bay St., Harbor Springs, Mich. 49741

Filed Mar. 6, 1987, Ser. No. 23,472

Term of patent 14 years

U.S. Cl. D32—74



304,108

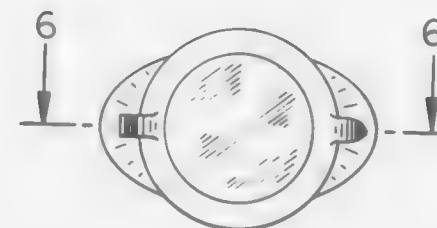
COMBINED SHIRT POCKET CUSPIDOR AND ASHTRAY**OR SIMILAR ARTICLE**

Mark R. Lange, 3624 Hwy. 3, Dickinson, Tex. 77539

Filed Oct. 27, 1986, Ser. No. 923,742

Term of patent 14 years

U.S. Cl. D34—2



304,110

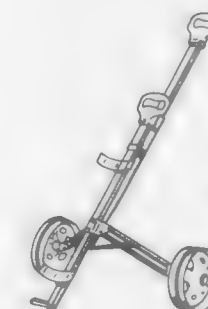
GOLF CART

Fu H. Yang, No. 158-1, 3rd Floor, Chao-chou St., Taipei, Taiwan

Filed Jan. 14, 1987, Ser. No. 3,228

Term of patent 14 years

U.S. Cl. D34—15



304,111

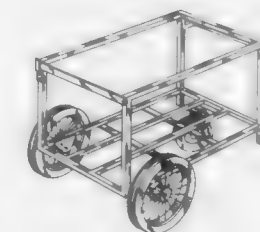
REFUSE CONTAINER CART

Joseph Mehalick, 612 Seaside Dr., Graham, N.C. 27253

Filed Nov. 20, 1987, Ser. No. 123,664

Term of patent 14 years

U.S. Cl. D34—18



304,109

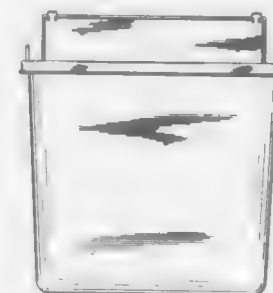
DISPOSAL CONTAINER FOR SHARP ARTICLES OR THE LIKE

Paul H. Hanft, Barrington, Ill., assignor to Sage Products, Inc., Cary, Ill.

Filed Oct. 16, 1986, Ser. No. 919,776

Term of patent 14 years

U.S. Cl. D34—7



304,112

CART FOR USE AS STAND OR WORK STATION TABLE

Peter D. Betton, Belair, Australia, assignor to Micro-Shuttle

Australia Pty. Ltd., Marleston, Australia

Filed Nov. 24, 1986, Ser. No. 934,418

Claims priority, application Australia, Jul. 30, 1986, 6108/86

Term of patent 14 years

U.S. Cl. D34—21



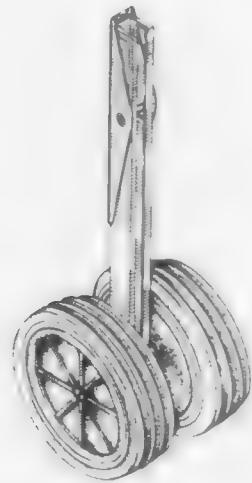
304,113
BOAT CARRIER

Malcolm P. Smith, 22 Delaware Road, Ermington, New South Wales, Australia (2115)

Filed Mar. 3, 1987, Ser. No. 21,025

Term of patent 14 years

U.S. Cl. D34—24



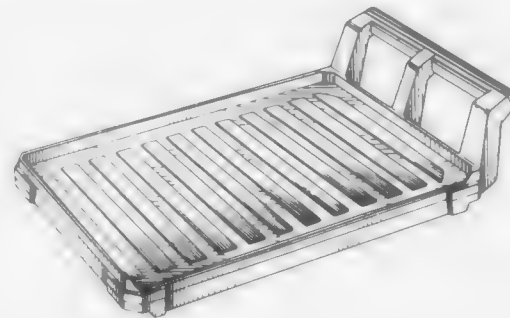
304,115
TOP SHELF FOR A MODULAR CART

Robert J. Cohn, Dallas, Pa., assignor to InterMetro Industries Corporation, Wilkes-Barre, Pa.

Filed Sep. 18, 1987, Ser. No. 98,030

Term of patent 14 years

U.S. Cl. D34—27



304,116
VENTILATING COVER FOR CONTAINER

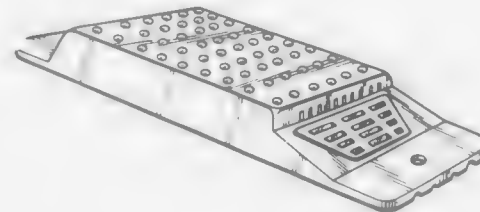
Seo Y. Jun, 1-1205, Hongail Apartment, 79 Samsung-Dong, Kangnam-Ku, Seoul, D.P.R. of Korea

Filed Jan. 27, 1986, Ser. No. 823,040

Claims priority, application D.P.R. of Korea, Sep. 23, 1985, 13525/1985

Term of patent 14 years

U.S. Cl. D34—28



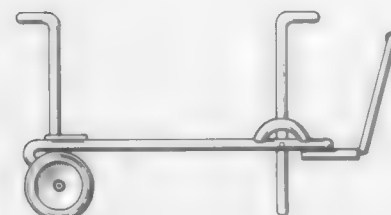
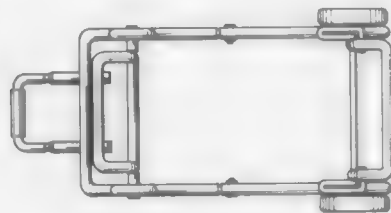
304,114
ICE CHEST CARRIER

Mark A. David, 513A Water's Edge, Newport News, Va. 23606

Filed Aug. 10, 1987, Ser. No. 83,298

Term of patent 14 years

U.S. Cl. D34—24



304,117
ELEVATING WORKING PLATFORM

Mitsuhiko Kishi, Tochigi Prefecture, Japan, assignor to Hikoma Mfg. Co., Ltd., Tochigi Prefecture, Japan

Filed Feb. 24, 1987, Ser. No. 18,124

Term of patent 14 years

U.S. Cl. D34—28



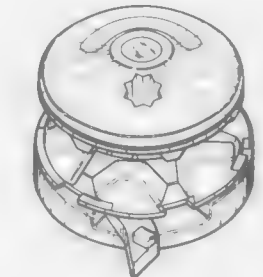
304,119
MARINE WINDLASS

Gordon M. Lyall, Glasgow, and Philip F. McCarron, Paisley, both of Great Britain, assignors to Simpson-Laurence Limited, Glasgow, Scotland

Filed Feb. 14, 1986, Ser. No. 829,806

Term of patent 14 years

U.S. Cl. D34—33



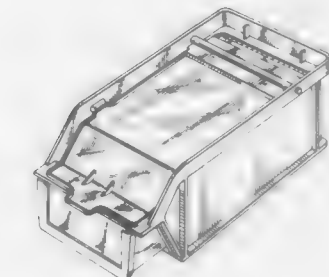
304,120
LIDDED STORAGE BIN

Larry W. Buchanan, Bramalea, and Ray A. Gargarella, Brampton, both of Canada, assignors to Buckhorn Material Handling Group, Inc., Milford, Ohio

Filed Jan. 7, 1987, Ser. No. 1,109

Term of patent 14 years

U.S. Cl. D34—40



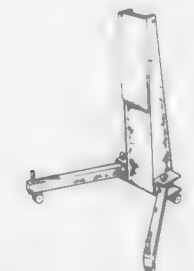
304,118
AUTOMOBILE HARDTOP STORAGE RACK

Phillip J. Saoke, Atlanta, and Frank B. Golley, Decatur, both of Ga., assignors to Atlanta Motoring Accessories, Inc., Norcross, Ga.

Filed Sep. 25, 1986, Ser. No. 811,631

Term of patent 14 years

U.S. Cl. D34—31



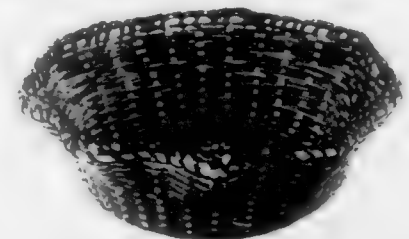
304,121
BOWL

Liwayway J. Gabayno, Capalinga, Philippines, assignor to Decra-Stone, Inc., Prior Lake, Minn.

Filed Dec. 9, 1986, Ser. No. 939,896

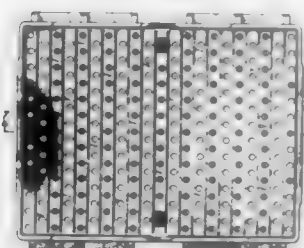
Term of patent 14 years

U.S. Cl. D34—42



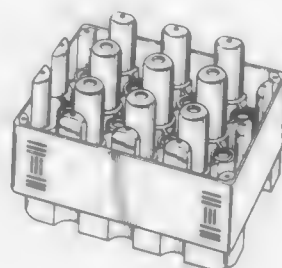
304,122 TOTE BOX

Norman W. Pontbriand, Jr., Wallingford, Conn., assignor to United Technologies Corporation, Hartford, Conn.
Filed Jun. 22, 1987, Ser. No. 65,192
Term of patent 14 years
U.S. Cl. D34—43



304,123 CRATE

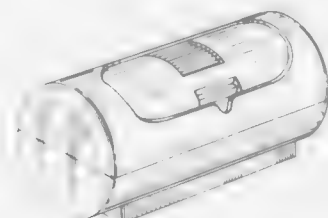
Michael J. Warwick, Randburg, South Africa, assignor to South African Polymer Holdings (Proprietary), Limited, Marshalltown, South Africa
Filed Jan. 21, 1986, Ser. No. 821,065
Claims priority, application South Africa, Jul. 23, 1985, 85/0652
Term of patent 14 years
U.S. Cl. D34—46



304,124

ROLL TOP COIN HOLDER FOR AN AUTOMOBILE DASH

Marc R. Iacovelli, Miami, Fla., assignor to Rally Accessories, Inc., Miami, Fla.
Filed May 7, 1986, Ser. No. 860,769
Term of patent 14 years
U.S. Cl. D99—34



LIST OF PATENTEEES

TO WHOM

PATENTS WERE ISSUED ON THE 17TH DAY OF OCTOBER, 1989

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

- A. Ahlstrom Osakeyhtio: See—
Ruottu, Seppo, 4,874,584, Cl. 422-145.000.
A. Ahlstrom Corporation: See—
Rantanen, Veikko O., 4,874,656, Cl. 428-216.000.
A-Bee Syndicate, Inc.: See—
Spitzer, Charles M.; and Siegel, Paul F., 4,874,209, Cl. 312-250.000.
A. E. Staley Manufacturing Company: See—
Hartman, Guy J., 4,874,625, Cl. 426-533.000.
A. Nattermann & Cie. GmbH: See—
Hager, Jorg; Ghyczy, Miklos; Feyen, Vincent; Imberge, Paul; Brandenburg, Ulrich; and Wilperath, Peter, 4,874,553, Cl. 260-403.000.
Abbott Laboratories: See—
Becker, Wallace E., 4,874,614, Cl. 424-465.000.
Katz, Leonard; Tuan, James; and McAlpine, James B., 4,874,748, Cl. 514-29.000.
Abe, Hidetoshi: See—
Nonomura, Tsutomu; and Abe, Hidetoshi, 4,873,924, Cl. 101-146.000.
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Abe, Masayoshi: See—
Takagaki, Hidetsugu; Abe, Masayoshi; Watanabe, Michihiro; Takeuchi, Kazuyuki; Nakaniishi, Shigenori; Nakata, Yuuko; and Yamazaki, Keiji, 4,874,855, Cl. 540-3.000.
Abe, Naoto: See—
Shimokoriyama, Makoto; Yamashita, Shinichi; Abe, Naoto; Kashida, Motokazu; Takei, Masahiro; and Takahashi, Koji, 4,875,090, Cl. 358-12.000.
Abe, Yohji: See—
Ando, Yoshiko; Noda, Yasushi; and Abe, Yohji, 4,875,119, Cl. 360-105.000.
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Iimura, Seiji; Abe, Yoshio; Okumura, Jun; Naito, Takayuki; and Kamachi, Hajime, 4,874,856, Cl. 540-222.000.
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Abiko, Yasushi: See—
Kobayashi, Setsuo; Nakazawa, Tsugio; Yoshie, Yasumasa; Abiko, Yasushi; and Kameda, Kinya, 4,874,772, Cl. 514-341.000.
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Yamanishi, Eiichi; Abuyama, Yasuo; and Someya, Akihiko, 4,875,092, Cl. 358-75.000.
Achor, Donald P.: See—
Walker, Raymond M.; Achor, Donald P.; Baumgarten, Robert W.; and Bogard, Ralph B., 4,873,751, Cl. 29-156.80B.
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Zimbone, Paul J., 4,874,154, Cl. 267-140.400.
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Adair, Paul C., to Mead Corporation, The. Photocurable composition containing a photoreducible dye a thiol and an N,N'-dialkylaniline. 4,874,685, Cl. 430-138.000.
Adams, Kenneth D., to SSMC Inc. Stepper driven stitch patterning mechanism for sewing machines using spiral cam groove and follower. 4,873,932, Cl. 112-443.000.
Adams, Leonard G.: See—
Ellison, Larry J.; and Smelcer, John R., 4,873,779, Cl. 42-101.000.
Adams, William S., Jr.: See—
Newman, Harold L.; Adams, William S., Jr.; and Boyden, Brace, 4,874,521, Cl. 210-639.000.
Adir Et Cie: See—
Peglion, Jean L.; Poignant, Jean C.; and Vian, Joel, 4,874,878, Cl. 549-463.000.
Adler, Alfons: See—
Kule, Engelbert; and Adler, Alfons, 4,874,874, Cl. 548-544.000.
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Frenkel, Robert L.; Derks, Christopher S.; and Armstrong, Donald L., 4,874,079, Cl. 198-436.000.
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Advanced Explosives Gesellschaft b.R.: See—
Bankamer, Vinzenz; and Zeman, Gerhard, 4,874,441, Cl. 149-42.000.
Advanced Micro-Matrix, Inc.: See—
Michalchik, Michael, 4,874,549, Cl. 252-511.000.
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Baker, Rodney C., 4,874,753, Cl. 514-89.000.
AEG-Elotherm GmbH: See—
Matthes, Hans G., 4,875,150, Cl. 363-51.000.
AFC, Inc.: See—
Fingerson, Conrad F.; Carlson, Dennis L.; Nelson, Bruce A.; and Eickhoff, Robert D., 4,874,180, Cl. 273-416.000.
Affeldt, Karl-Heinz; and Hantel, Ulrich, to Robert Bosch GmbH. Vasometric test apparatus for testing blood supply to the toe of a patient. 4,873,988, Cl. 128-687.000.
Agostina, Enrico; Castro, Sergio; and Zazzetta, Alessandro, to Emichem Elastomeri S.p.A. Block copolymer and process for preparing it. 4,874,821, Cl. 525-271.000.
Ahmed, Bashir M.: See—
Donovan, Joseph C.; and Ahmed, Bashir M., 4,874,673, Cl. 428-463.000.
Aho, Kenneth A.; Melby, Jeffrey J.; and Miller, Richard A., to Minnesota Mining and Manufacturing Company. Back-lit display. 4,874,228, Cl. 350-345.000.
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Garg, Diwaker; Klucher, Beth A.; Dyer, Paul N.; Kidd, Richard W.; and Ceccarelli, Christopher, 4,874,642, Cl. 427-249.000.
Kuphal, Jeffrey A.; Robeson, Lloyd M.; and Weber, James J., 4,874,030, Cl. 164-34.000.
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Kojima, Fumio; Tachiiri, Yoshihisa; and Kato, Yoshihisa, 4,874,174, Cl. 285-82.000.
Nishii, Michiharu; Ando, Masamoto; and Tada, Yoshihiko, 4,874,207, Cl. 303-52.000.
Ochiai, Hironori; Suzuki, Etsuo; and Ikuta, Kazuo, 4,874,202, Cl. 296-222.000.
Aisin Takaoka Limited: See—
Oono, Toshio, 4,874,064, Cl. 188-70.00R.
Ajinomoto Co., Inc.: See—
Higuchi, Ryoichi; Sakurai, Takao; Yokota, Tadahiko; Mikami, Naoko; Yamamoto, Eri; and Takeuchi, Koji, 4,874,542, Cl. 252-299.610.
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Yatsu, Tadao; and Akana, Yoshinori, 4,874,647, Cl. 428-35.700.
Akasu, Hiroyuki: See—
Okamoto, Takehiko; Ohmory, Akio; Sueoka, Akinori; Kawata, Ichiro; and Akasu, Hiroyuki, 4,874,522, Cl. 210-645.000.
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Aki, Shinji: See—
Ueda, Hiraki; Miyamoto, Hisashi; Aki, Shinji; and Otsuka, Tatsuya, 4,874,764, Cl. 514-254.000.
Akiba, Shigeyuki: See—
Utaka, Katsuyuki; Sakai, Kazuo; Matsushima, Yuichi; and Akiba, Shigeyuki, 4,874,216, Cl. 350-96.190.
Akira, Mizusawa; and Kurihara, Kazumasa, to Nifco Inc. Filter for fuel tank. 4,874,510, Cl. 210-172.000.
Akiyama, Kazunori: See—
Takamatsu, Junichi; and Akiyama, Kazunori, 4,875,077, Cl. 355-212.000.
Akmese, Kemal. Dome structure. 4,873,796, Cl. 52-80.000.
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Davis, Robert B.; Kramer, Charles E.; and Barlow, Sandra K., 4,874,660, Cl. 428-234.000.
Alcatel N.V.: See—
Boniort, Jean-Yves; and Leboucq, Jacques, 4,874,415, Cl. 65-3.110.
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Larson, Paul A.; Aldrich, Dale J.; and Berman, Jody R., 4,874,669, Cl. 428-416.000.
Aldrich, Paul E.; Duncia, John Jonas V.; and Pierce, Michael E., to Du Pont de Nemours, E. I., and Company. Tetrazole intermediates to antihypertensive compounds. 4,874,867, Cl. 548-101.000.
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Sigai, A. Gary; Lapatovich, Walter P.; and Alexander, Michael N., 4,874,984, Cl. 313-486.000.
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Nilsson, Bo, 4,874,039, Cl. 165-78.000.
Allen, David T.: See—
Edelen, Stephen A.; Allen, David T.; and Zylman, Bill E., 4,873,881, Cl. 74-336.00R.

Allen, Richard B.; Gibbs, William E.; and Hans, Lynn M., to General Electric Company. Expandable thermoplastic resin beads. 4,874,796, Cl. 521-59.000.

Allied-Signal Inc.: See—
Dittlinger, Richard J., 4,873,889, Cl. 74-579.00R.
Marshall, Robert M., 4,874,663, Cl. 428-272.000.
Tang, Raymond R., 4,874,016, Cl. 137-826.000.

Alseptor, Joshua, to Bell Communications Research, Inc. Neuro-morphic learning networks. 4,874,963, Cl. 307-201.000.

Altshuler, John H.: See—
Miller, Curtis H.; Arenberg, I. Kaufman; and Altshuler, John H., 4,874,368, Cl. 604-82.000.

Aluminum Company of America: See—
Sawtell, Ralph R.; Bretz, Philip E.; and Jensen, Craig L., 4,874,440, Cl. 148-437.000.

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Wong, Patrick S. L.; Theeuwes, Felix; and Eckenhoff, James B., 4,874,388, Cl. 604-891.100.

Amano, Itaru: See—
Ichikawa, Katumi; Amano, Itaru; Hujieda, Yasuhiko; Misumi, Shikao; Hukumura, Seisuke; and Miyauchi, Hideo, 4,874,303, Cl. 425-28.100.

Amdahl Corporation: See—
Cary, Richard W.; and Guyon, Richard D., 4,875,159, Cl. 364-200.000.

Amedei, Giuseppe; and Tornatore, Giovanni, to Fiatgeotech-Tecnologie per la terra S.p.A. Gearbox with electronically-controlled hydraulic clutches, for agricultural tractors and similar vehicles. 4,873,880, Cl. 74-336.00R.

American Brush Corporation: See—
Mayne, James K., 4,874,087, Cl. 206-362.400.

American Combustion, Inc.: See—
Gitman, Gregory M., 4,874,311, Cl. 432-13.000.

American Cynamid Company: See—
Huffman, K. Robert, 4,874,539, Cl. 252-174.240.
Kimpura, Masaomi; Kawai, Kaiji; and Tobe, Yukiya, 4,874,425, Cl. 71-121.000.

American Display Inc.: See—
Hoffart, Andrew B., 4,873,776, Cl. 40-572.000.

American Glass and Metal Corporation: See—
Jeschke, Fred G., 4,873,806, Cl. 52-235.000.

American Home Products Corp.: See—
Pincus, David H., 4,874,695, Cl. 435-19.000.

American Maplan Corporation: See—
Gearhart, Kenton, 4,874,306, Cl. 425-192.00R.

American Sterilizer Company: See—
Dyke, Denis G., 4,874,090, Cl. 206-439.000.

American Tech Manufacturing Corp.: See—
Linker, Frank V.; and Linker, Frank V., Jr., 4,874,075, Cl. 193-39.000.

American Telephone and Telegraph Company, AT&T Bell Laboratories: See—
Nichols, Robert K.; and Roediger, Gary A., 4,875,206, Cl. 370-85.150.

American Telephone and Telegraph Company, AT&T Bell Laboratories: See—
Arroyo, Candido J.; and Patel, Parbhuhai D., 4,874,219, Cl. 350-96.230.
Escobar, Carlos, 4,875,037, Cl. 340-825.010.
Graf, Hans P.; and Howard, Richard E., 4,875,183, Cl. 364-807.000.
Pfeiffer, Loren N.; and West, Kenneth W., 4,873,833, Cl. 62-55.500.

American Telephone and Telegraph Company, AT&T Technologies Inc.: See—
Elliott, William A.; Greene, Richard A.; Kennedy, Robert P.; Poe, Robert P., Jr.; and Steece, William H., 4,873,762, Cl. 29-809.000.

Ameron, Inc.: See—
Hajovsky, Robert J., 4,874,548, Cl. 252-511.000.

Amoco Corporation: See—
Joseph, Earl M.; Pritchard, Robert J.; and Sufi, Arshad H., 4,874,043, Cl. 166-272.000.

AMP Incorporated: See—
Bakermans, Johannes C. W., 4,874,338, Cl. 439-851.000.
Bowen, Terry P.; Harms, Sherry J.; and Hoffer, John C., 4,874,218, Cl. 350-96.200.
Dola, Frank P.; Feldman, Steven; and Erwin, John K., 4,874,322, Cl. 439-210.000.
Korsunsky, Iosif; Foreman, Gerald L.; and Bateman, Steven P., 4,873,761, Cl. 29-741.000.
Marsh, Edward K., 4,874,336, Cl. 439-607.000.
Paukovits, Edward J., Jr.; and Wright, Susan E., 4,874,337, Cl. 439-609.000.
Reed, Carl G., 4,874,333, Cl. 439-514.000.
Werner, Walter M., 4,873,765, Cl. 29-876.000.

Andersen, James K.; and Hikes, Carl L., to Westinghouse Electric Corp. Underwater electrical connector. 4,874,324, Cl. 439-271.000.

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Ryan, Thomas W., III; Maymar, Milan J.; and Anderson, Orin M., 4,873,947, Cl. 123-78.00C.

Ando, Katsutoshi; and Ogawa, Yo, to Toray Industries. Electret fiber sheet and method of producing same. 4,874,659, Cl. 428-221.000.

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Nishii, Michiharu; Ando, Masamoto; and Tada, Yoshihiko, 4,874,207, Cl. 303-52.000.

Ando, Takao: See—
Yoshikumi, Chikao; Ohmura, Yoshio; Hirose, Fumio; Ikuzawa, Masanori; Matsunaga, Kenichi; Fujii, Takayoshi; Ohhara, Minoru; and Ando, Takao, 4,874,750, Cl. 514-42.000.

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Andrews, Richard J.: See—
Greeves, Godfrey; Potter, James C.; Andrews, Richard J.; and Harris, Kenneth M., 4,874,301, Cl. 417-462.000.

Andrews, Rodger F.: See—
Tack, Robert D.; Andrews, Rodger F.; and Ayres, Sally J., 4,874,394, Cl. 44-70.000.

Andrews, William H.; Brothers, Virginia M.; Files, James G.; Kuhn, Irene; McCaman, Michael T.; Paul, Leland S.; Sias, Stacey R.; Gore, Thomas C.; Newman, Karel Z., Jr.; and Tedesco, John L., to Solvay & Cie, S.A. DNA encoding an antigenic protein derived from *Eimeria tenella* and vaccines for prevention of coccidiosis caused by *Eimeria tenella*. 4,874,705, Cl. 435-252.330.

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Anthony P. Palett: See—
Palett, Anthony P.; and Spear Jr., A. Gil, 4,875,229, Cl. 379-58.000.

Antoni, Patricia A.; Nolan, Timothy J.; Hayes, Thomas J.; Arneson, Theodore R.; and Coleman, Jerry E., to Packaging Corporation of America. Serving tray and cover therefor. 4,874,083, Cl. 206-45.320.

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Petrov, Vyacheslav V.; Gorskikh, Nikolai V.; Antonov, Alexandr A.; Tokar, Alexandr P.; Krjuchin, Andrei A.; and Shanoilo, Semen M., 4,875,204, Cl. 369-100.000.

Anvil Cases, Inc.: See—
Thompson, Marvin W.; Jennings, Timothy C.; Scott, James A.; Phenice, Ronald W.; Murphy, Margaret H.; Nakash, Gabriel D.; Biggers, James R.; Boudreau, Lynnee M.; and Curiel Contreras, Jorge H., 4,874,266, Cl. 403-407.100.

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Idenawa, Hiroyuki; Mochimaru, Hideaki; Kanda, Hajime; Makita, Nobuhiro; Tanaka, Yoshiaki; Yagisita, Takahiro; Yamaki, Takanori; Motohashi, Takeshi; Miyamoto, Masayoshi; Ishizu, Hisao; Sagawa, Yasuhiro; Kanno, Tadaaki; Sankoda, Tomoo; Hosokawa, Hiroshi; Aoki, Hideo; Suzuki, Takami; Takada, Hiromi; and Shimazaki, Toshio, 4,875,063, Cl. 346-160.100.

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Aoki, Riichirou: See—
Egawa, Hidemitsu; Aoki, Riichirou; and Okumura, Katsuya, 4,875,088, Cl. 357-67.000.

Aoki, Takatoshi: See—
Fujiyoshi, Yoshihiro; Aoki, Takatoshi; and Urata, Yasuhiro, 4,873,949, Cl. 123-90.120.

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Matsui, Masataka; Aono, Toshiaki; Tanimoto, Yoshio; Nakahama, Tadami; and Yamane, Takakazu, 4,874,639, Cl. 427-240.000.

Aono, Yasuhiro, to Nikon Corporation. Zoom lens. 4,874,231, Cl. 350-427.000.

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Sato, Masahiko; Konuma, Toshimitsu; Odaka, Seiichi; Yamaguchi, Toshiharu; Watanabe, Toshio; Aoyagi, Osamu; Tabata, Kaoru; Isigaki, Chizuru; Sakayori, Hiroyuki; Kobayashi, Ippei; Osabe, Akio; and Yamazaki, Shunpei, 4,874,461, Cl. 156-633.000.

Applause, Inc.: See—
Chiavetta, Sebastiano R.; and De Guglielmi, Giorgio, 4,874,163, Cl. 272-53.200.

Apple Computer, Inc.: See—
Ashkin, Peter B.; and Clark, Michael, 4,875,158, Cl. 364-200.000.

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Coy, Bruce H.; and Yuen, Raymond C., 4,874,970, Cl. 307-475.000.

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Lo, Shui-Yin, 4,875,213, Cl. 372-5.000.

APTI, Inc.: See—
Lowther, Frank E., 4,873,928, Cl. 102-323.000.

Arant, Gene W.: See—
Gotman, Alexander S., 4,874,275, Cl. 411-5.000.

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Armstrong, Richard J.; and Granzotto, Robert, 4,874,143, Cl. 242-198.000.

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Argiriadis, Nikos. Mechanism for separating the closed pistachio nuts from the open pistachio nuts of aegina and rotten legumes. 4,874,097, Cl. 209-616.000.

Ariav, Arie, to I.D. Tech Ltd. Intrusion detection apparatus. 4,875,198, Cl. 367-93.000.

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Guscott, John K.; Stelmack, Gerard G.; and Boulos, Charles A., 4,875,029, Cl. 340-567.000.

Arit, Dieter; Schwartz, Ulrich; Brandt, Hans-Walter; Arit, Wolfgang; and Nickel, Andreas, to Bayer Aktiengesellschaft. Separation of diastereomers by extractive distillation. 4,874,473, Cl. 203-1.000.

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Armco Inc.: See—
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Armstrong, Donald L.: See—
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Ginter, David J., 4,874,455, Cl. 156-397.000.

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Antoni, Patricia A.; Nolan, Timothy J.; Hayes, Thomas J.; Arneson, Theodore R.; and Coleman, Jerry E., 4,874,083, Cl. 206-45.320.

Arnett, Daniel W. Spare tire lock for truck-trailer wheels. 4,873,851, Cl. 70-259.000.

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Arnold, Jimmie D. Self-propelled trench shoring machine. 4,874,271, Cl. 405-283.000.

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Arnott, John; and Kaga, Gary, to Ontario Limited. Napkin holder. 4,874,099, Cl. 211-50.000.

Arns, Christopher L.: See—
Frederick, Warren P.; Steele, Sarah L.; Rhodes, David D.; and Arns, Christopher L., 4,874,365, Cl. 604-54.000.

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Stoehr, Herbert M., 4,873,901, Cl. 81-9.510.

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Vetter, Udo J., 4,874,381, Cl. 604-191.000.

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Asahi Denka Kogyo Kabushiki Kaisha: See—
Maruzeni, Shoji; Matsumoto, Wataru; and Yasuda, Nozomi, 4,874,699, Cl. 435-135.000.

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Yamagata, Masakazu, 4,874,220, Cl. 350-96.260.

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Yamamoto, Isamu; and Asaida, Takashi, 4,875,098, Cl. 358-213.160.

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Masuda, Koji; Suemitsu, Yuji; and Asano, Kazuo, 4,875,060, Cl. 346-155.000.

Asayama, Yoshiaki: See—
Ueyama, Yoshiji; and Asayama, Yoshiaki, 4,873,957, Cl. 123-399.000.

Asea Brown Boveri AB: See—
Sobel, Jarl, 4,873,874, Cl. 73-862.360.

Ashe, Bonnie M.; and Fletcher, Daniel S., to Merck & Co., Inc. Anti-inflammatory and antidegenerative compounds isolated from L-681,512. 4,874,755, Cl. 514-179.000.

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Krieche, Anthony J.; and Wissel, Herbert L., 4,874,432, Cl. 106-273.100.

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Mackay, Craig D., 4,874,492, Cl. 204-182.800.

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Koze, Jeffrey T.; and Miller, Anton J., 4,874,463, Cl. 156-645.000.

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Auchus, Ricard J.: See—
Covey, Douglas F.; and Auchus, Ricard J., 4,874,891, Cl. 560-256.000.

Auer, Robert T., to Buddy L. Corporation. Delayed action flashlight. 4,875,147, Cl. 362-205.000.

Auerbach, Seymour. Three-dimensional puzzle. 4,874,176, Cl. 273-157.00R.

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Freidank, Michael; Coym, Jurgen; and Schubert, Axel, 4,873,970, Cl. 128-202.220.

Auping B.V.: See—
Savenije, Franciscus G., 4,873,737, Cl. 5-453.000.

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Navarrini, Walter; and Desmarteu, Darryl D., 4,874,875, Cl. 548-959.000.

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Johns, Ken; Re, Alberto; and Bargigia, Gianangelo, 4,874,842, Cl. 528-494.000.

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Hughes, John L., 4,875,215, Cl. 372-6.000.

Austria Metall Aktiengesellschaft: See—
Bertha, Josef, 4,874,429, Cl. 75-118.00R.

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Avery, Bennett W.; and Engel, William K., to Caterpillar Inc. Balanced free-planet drive mechanism. 4,873,894, Cl. 74-785.000.

AVK Filtertechnik GmbH: See—
Esch, Hans W., 4,874,517, Cl. 210-493.500.

Ayres, Sally J.: See—
Tack, Robert D.; Andrews, Rodger F.; and Ayres, Sally J., 4,874,394, Cl. 44-70.000.

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Borowski, Horst; Kausch, Erwin; Rittershaus, Erhard; Rudolph, Gert; and Schneider, Werner, 4,874,004, Cl. 131-364.000.

B. F. Goodrich Company, The: See—
Cinadr, Bernard F., 4,874,823, Cl. 525-329.200.
Magistro, Angelo J., 4,874,858, Cl. 544-196.000.
Rundo, John R., 4,873,803, Cl. 52-202.000.

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Gravisse, Philippe; Duchateau, Jacques; and Perron, Maurice, 4,874,188, Cl. 283-89.000.

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Fry, John J.; Robertson, John W., Jr.; and Bastjanic, Edward, 4,875,000, Cl. 318-798.000.

Back, Gerhard; and Beffa, Fabio, to Ciba-Geigy Corporation. Asymmetrical polyazo chromium complex dyes comprising resorcinol as a coupling component. 4,874,848, Cl. 534-684.000.

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Heppke, Gerd; Scherowsky, Gunter; Bahr, Christian; and Lehmann, Lutz, 4,874,545, Cl. 522-299.610.

Bahr, Dennis E.: See—
Monson, Mark B.; Blandino, Thomas P.; Bahr, Dennis E.; and Post, Kendall E., 4,875,019, Cl. 330-302.000.

- Bahr Technologies, Inc.: See—
Monson, Mark B.; Blandino, Thomas P.; Bahr, Dennis E.; and Post, Kendall E., 4,875,019, Cl. 330-302.000.
- Bai, Monty W.; and Huhmann, Douglas J., to Motorola, Inc. Mechanical field effect transistor sensor. 4,873,871, Cl. 73-777.000.
- Baines, Patrick A., to Venture Packaging, Inc. Bag with carrying handle for containing merchandise. 4,874,256, Cl. 383-21.000.
- Baker Cammins Pharmaceuticals, Inc.: See—
Hsiao, Charles, 4,874,613, Cl. 424-458.000.
- Baker, David S.: See—
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- Baker, Rodney C., to AECI Limited. Insecticidal composition. 4,874,753, Cl. 514-89.000.
- Bakermans, Johannes C. W., to AMP Incorporated. Receptacle box terminal with improved contact area. 4,874,338, Cl. 439-851.000.
- Ball, James R., and Barnard, Delbert J., to Cello Bag Company, Inc. Top gusset bag with integral handle. 4,874,255, Cl. 383-8.000.
- Bandiera, Angelo: See—
Teillauchet, Eric; and Bandiera, Angelo, 4,873,885, Cl. 74-520.000.
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Chang, Stephen S.; Bao, Yongde; and Pelura, Timothy J., 4,874,629, Cl. 426-601.000.
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- Bargigia, Gianangelo: See—
Johns, Ken; Re, Alberto; and Bargigia, Gianangelo, 4,874,842, Cl. 528-494.000.
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Heisey, Raymond K., Jr.; Barker, W. David; Mariano, Arturo C.; and Thurman, Vernon L., 4,873,808, Cl. 52-478.000.
- Barlow, Sandra K.: See—
Davis, Robert B.; Kramer, Charles E.; and Barlow, Sandra K., 4,874,660, Cl. 428-234.000.
- Barnard, Delbert J.: See—
Ball, James R.; and Barnard, Delbert J., 4,874,255, Cl. 383-8.000.
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- Barr, John D.: See—
Taylor, Malcolm R.; Barr, John D.; and Smart, John R., 4,873,895, Cl. 76-108.00A.
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Henley, Francois G.; Choi, Hee-June; Kratzer, Dean J.; and Barr, Maurice R., 4,875,006, Cl. 324-158.00R.
- Barry, David W.: See—
Rideout, Janet L.; Barry, David W.; Lehrman, Sandra N.; St. Clair, Martha H.; and Furman, Phillip A., 4,874,609, Cl. 424-85.400.
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Cooper, Bryan, 4,874,701, Cl. 435-147.000.
- Fischer, Rolf; Merger, Franz; and Goeck, Hans-Juergen, 4,874,889, Cl. 560-205.000.
- Hoelderich, Wolfgang; Hupfer, Leopold; and Schneider, Kurt, 4,874,899, Cl. 568-386.000.
- Wambeck, Ludwig; and Fischer, Martin, 4,874,865, Cl. 546-243.000.
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McMahon, Paul; Chung, Tai-Shung; and Ying, Lincoln, 4,874,563, Cl. 264-29.200.
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Fry, John J.; Robertson, John W., Jr.; and Bastjanic, Edward, 4,875,000, Cl. 318-798.000.
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Korsunsky, Iosif; Foreman, Gerald L.; and Bateman, Steven P., 4,873,761, Cl. 29-741.000.
- Bates, Howard M., to CALPAC Incorporated. Folding corrugated board carton. 4,874,125, Cl. 229-132.000.
- Bates, Mitchell G. Hidden hook artificial lure. 4,873,781, Cl. 43-35.000.
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- Battelle Development Corporation: See—
Lee, Siu-Leung, 4,874,520, Cl. 210-635.000.
- Batterman, Eric P.: See—
Chandler, Donald G.; Batterman, Eric P.; and Shah, Govind, 4,874,936, Cl. 235-494.000.
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Walker, Raymond M.; Achor, Donald P.; Baumgarten, Robert W.; and Bogard, Ralph B., 4,873,751, Cl. 29-156.80B.
- Baxter International Inc.: See—
Zdeb, Brian; Pearson, Steve; and Slater, Glenn L., 4,874,366, Cl. 804-36.000.
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Frederick, Warren P.; Steele, Sarah L.; Rhodes, David D.; and Arms, Christopher L., 4,874,365, Cl. 604-54.000.
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- Sutherland, Karl M.; and Jenuasita, Matthew, 4,874,581, Cl. 422-46.000.
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Arit, Dieter; Schwartz, Ulrich; Brandt, Hans-Walter; Arit, Wolfgang; and Nickel, Andreas, 4,874,473, Cl. 203-1.000.
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- Gallenkamp, Bernd; Gunther, Andreas; Mohrmann, Karl-Heinrich; and Schmidt, Thomas, 4,874,860, Cl. 544-221.000.
- Haas, Peter; Sommerfeld, Claus-Dieter; and Weber, Hans-Ulrich, 4,874,797, Cl. 521-167.000.
- Hammerschmidt, Erich; and Blank, Heinz U., 4,874,892, Cl. 562-409.000.
- Harms, Wolfgang, 4,874,857, Cl. 544-75.000.
- Jabs, Gert; and Richartz, Adolf, 4,874,832, Cl. 528-60.000.
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- Beach, Kerry B.: See—
Harsch, Curtis L.; and Beach, Kerry B., 4,875,176, Cl. 364-557.000.
- Beacham, Lowrie M., III; LeBlanc, Harry S.; and Freeman, George A., to Burroughs Wellcome Co. Antibacterial treatment. 4,874,751, Cl. 514-50.000.
- Beall, Gary W.: See—
Elliott, Donald R.; and Beall, Gary W., 4,874,728, Cl. 501-148.000.
- Beall, George H.; Pierson, Joseph E.; and Quinn, Candace J., to Corning Incorporated. Alkali zinc aluminophosphate glass-ceramics. 4,874,724, Cl. 501-10.000.
- Beam, Don E.: See—
Lyons, Dale R.; and Beam, Don E., 4,873,850, Cl. 70-85.000.
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Malhi, Satwinder D. S.; Shen, Chi-Cheong; Bean, Kenneth E.; and Chang, Peng-Heng, 4,875,086, Cl. 357-54.000.
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Lopez, Benjamin L.; Beard, Steven A.; and Phillips, Kirby, 4,874,299, Cl. 417-413.000.
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McManus, Paul A.; and Beaton, Robert J., 4,875,032, Cl. 340-703.000.
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- Becker, William. Corrugated cardboard heat exchanger. 4,874,042, Cl. 165-166.000.
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Piran, Uri, 4,874,710, Cl. 436-518.000.
- Bednarz, George A.; Smith, Reginald W.; Roeding, Gretchen W.; and Test, Howard R., to Texas Instruments Incorporated. Process of packaging a semiconductor device with reduced stress forces. 4,874,722, Cl. 437-209.000.
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Back, Gerhard; and Beffa, Fabio, 4,874,848, Cl. 534-684.000.
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Urban, Joseph J., Jr.; Henderson, Norman; and Behe, Anthony J., 4,874,605, Cl. 424-78.000.
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Ziegler, Horst; and Behlen, Horst, 4,874,252, Cl. 374-117.000.
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Heimerl, Albert; Brammer, Hans-Adolf; and Hofeditz, Wolfgang, 4,874,370, Cl. 604-93.000.
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Overdijk, Dik R.; Bolder, Antonius J. J.; Beirens, Leopold C. M.; and Van Rens, Piet C. J., 4,874,982, Cl. 313-440.000.
- Bekedam, Martin. Jet spray atmospheric deaerator. 4,874,406, Cl. 55-198.000.
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Alspector, Joshua, 4,874,963, Cl. 307-201.000.
- Bell, Malcolm R.: See—
D'Ambra, Thomas E.; and Bell, Malcolm R., 4,874,761, Cl. 514-235.200.
- Beloit Corporation: See—
Pulkowski, Jeffrey H.; Macklem, Elizabeth A.; and Busker, L. H., 4,874,469, Cl. 162-359.000.
- Skaugen, Borgeir, 4,874,470, Cl. 162-360.100.
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- Benson, David J.; and Burroughs, James A., to Honeywell Inc. Closed loop adaptive raster deflection signal generator. 4,874,992, Cl. 315-387.000.
- Bentley, Andrew C.: See—
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- Berg, Klaus: See—
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- Bergstrom, Hans R., to Car-O-Liner Company. Lifting arrangement in vehicle chassis straightening benches. 4,873,861, Cl. 72-457.000.
- Berlanga, Jose M. C.: See—
Brana, Miguel F.; Berlanga, Jose M. C.; Keilhauer, Gerhard; and Schlick, Erich, 4,874,863, Cl. 540-99.000.
- Berman, Jody R.: See—
Larson, Paul A.; Aldrich, Dale J.; and Berman, Jody R., 4,874,669, Cl. 428-416.000.
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Matthews, Bernard T.; Joll, David J.; and Ziauddin, Hameed M., 4,874,623, Cl. 426-272.000.
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Shroot, Braham; Eustache, Jacques; Bernardon, Jean-Michel; and Nedoncelle, Philippe, 4,874,747, Cl. 514-23.000.
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- Bertsch, Peter: See—
Pruitt, Gerald R.; and Bertsch, Peter, 4,873,913, Cl. 92-158.000.
- Berzon, Evgeny J.: See—
Minuhin, Vadim B.; Berzon, Evgeny J.; and VonDeylen, Vernon F., 4,875,108, Cl. 360-51.000.
- Best Lock Corporation: See—
Foshee, William R., 4,873,853, Cl. 70-452.000.
- Bezard, Jean-Jacques; Feppon, Philippe; and Rodionoff, Pierre, to Jaeger. Device for detection of extraneous substances through a wall and a system for aiding the driving of automobiles or airplanes. 4,874,242, Cl. 356-341.000.
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Rock, Erich; and Brustle, Klaus, 4,874,212, Cl. 312-330.100.
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Auer, Robert T., 4,875,147, Cl. 362-205.000.
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Linke, Thomas A.; Dandan, Issa R.; Livingston, Troy W.; and Wilkerson, Alan W., 4,873,792, Cl. 51-165.800.
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Rapp, Louis N., 4,874,979, Cl. 310-328.000.
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Thornton, Robert L.; and Burnham, Robert D., 4,875,216, Cl. 372-45.000.
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Hollander, Jan, 4,874,652, Cl. 428-137.000.
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King, David E., 4,873,856, Cl. 72-121.000.
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 Bergstrom, Hans R., 4,873,861, Cl. 72-457.000.
 Caracciolo, Louis D. Ozonization of containers. 4,874,435, Cl. 134-22.180.
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 Andra, Rainer; Kurr, Klaus; Ullrich, Gunter; and Dorge, Udo, 4,873,887, Cl. 74-573.00F.
 Carlson, Dennis L.: See—
 Fingerson, Conrad F.; Carlson, Dennis L.; Nelson, Bruce A.; and Eickhoff, Robert D., 4,874,180, Cl. 273-416.000.
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 Voorhis, Roger J.; and Palmer, John M., 4,873,838, Cl. 62-207.000.
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 Carter, Duane E.: See—
 Jucha, Rhet B.; Carter, Duane E.; Davis, Cecil J.; and Crank, Sue E., 4,874,723, Cl. 437-245.000.
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 Casio Computer Co., Ltd.: See—
 Umeda, Osamu; Nakakusa, Tohru; Sato, Makoto; and Shimazaki, Tatsuo, 4,875,064, Cl. 353-78.000.
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 Daggett, Kenneth E.; Onaga, Eimei M.; Casler, Richard J., Jr.; and Johnson, Richard A., 4,874,997, Cl. 318-568.100.
 Case, Pierre; and Chasseguet, Gustave, to Valeo. Torsional damper device comprising two coaxial parts cooperating with circumferentially acting springs. 4,874,350, Cl. 464-68.000.
 Castenmiller, Wilhelmus A. M.; Chesters, Allan K.; and Ernsting, Peter B., to Lever Brothers Company. Edible plastic product. 4,874,626, Cl. 426-564.000.
 Caterpillar Inc.: See—
 Avery, Bennett W.; and Engel, William K., 4,873,894, Cl. 74-785.000.
 Purcell, Robert J.; and Farris, Robert R., 4,874,052, Cl. 180-9.100.
 CCM S.r.l.: See—
 Crispoldi, Antonio; Moriconi, Andrea; and Chiappafreddo, Mario, 4,874,595, Cl. 423-397.000.
 Coccodrilli, Christopher: See—
 Garg, Diwaker; Klueber, Beth A.; Dyer, Paul N.; Kidd, Richard W.; and Coccodrilli, Christopher, 4,874,642, Cl. 427-249.000.
 Cello Bag Company, Inc.: See—
 Ball, James R.; and Barnard, Delbert J., 4,874,255, Cl. 383-8.000.
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 Willemotte, Stephan, 4,874,471, Cl. 164-437.000.
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 Shroot, Brahm; Eustache, Jacques; Bernardon, Jean-Michel; and Nedoncelle, Philippe, 4,874,747, Cl. 514-23.000.
 Cermak, Jan: See—
 Vitovec, Jaroslav; Cermak, Jan; and Smolik, Jiri, 4,874,409, Cl. 55-267.000.
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 Nelson, Loren D.; and Cerni, Todd A., 4,874,572, Cl. 376-256.000.
 Ceska, Gary W., to Sartomer Company, Inc. Method of protecting or reconditioning a surface with a polymer concrete. 4,874,675, Cl. 428-521.000.
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 Kabatek, Jan; and Dittl, Pavel, 4,874,249, Cl. 366-339.000.
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 Vitovec, Jaroslav; Cermak, Jan; and Smolik, Jiri, 4,874,409, Cl. 55-267.000.
 Wichterle, Otto, 4,874,234, Cl. 351-161.000.
 CFC Fabrication Corporation: See—
 Shook, Hal C.; and Holland, Carmon D., 4,873,738, Cl. 14-1.000.
 Chak, Alexander: See—
 Chak, Maryan; and Chak, Alexander, 4,874,496, Cl. 204-229.000.
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 Yousefieh, Raymond; Chakraborty, Utpal; Magnien, Ernest; Desai, Rohit; and Lee, Thomas D.-Y., 4,874,769, Cl. 514-314.000.
 Chancellor, Craig A.: See—
 Mathewes, James K., Jr.; Chancellor, Craig A.; and Howes, H. Frank, 4,875,209, Cl. 371-3.000.
 Chandler, Donald G.; Batterman, Eric P.; and Shah, Govind, to United Parcel Service of America, Inc. Hexagonal, information encoding article, process and system. 4,874,936, Cl. 235-494.000.
 Chandler, Howard, to Quadra Logic Technologies Inc. Membrane-supported immunoassays. 4,874,691, Cl. 435-7.000.
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 Chang, Peng-Heng: See—
 Malhi, Satwinder D. S.; Shen, Chi-Cheong; Bean, Kenneth E.; and Chang, Peng-Heng, 4,875,086, Cl. 357-54.000.
 Chang, Stephen S.; Bao, Yongde; and Pelura, Timothy J. Purification of fish oil. 4,874,629, Cl. 426-601.000.
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 Bishop, Robert P.; Sabetti, Anthony J.; and Charboneau, Thomas, 4,875,135, Cl. 361-283.000.
 Chasseguet, Gustave: See—
 Case, Pierre; and Chasseguet, Gustave, 4,874,350, Cl. 464-68.000.
 Chau, C. C.; and Im, Jang-hi, to Dow Chemical Company. The Process of making a porous membrane. 4,874,568, Cl. 264-49.000.
 Chen, Loren: See—
 Peterson, David; Chen, Loren; and Iliff, Robert J., 4,874,537, Cl. 252-99.000.
 Chene, Alain, to Rhone-Poulenc Agrochimie S.A. Process for the preparation of aryloxybenzoic acids containing a sulfonamide group. 4,874,846, Cl. 534-560.000.
 Chern, Shyh. Ratchetless reversible wrench. 4,873,898, Cl. 81-59.100.
 Chesters, Allan K.: See—
 Castenmiller, Wilhelmus A. M.; Chesters, Allan K.; and Ernsting, Peter B., 4,874,626, Cl. 426-564.000.
 Chevallier, Yvonick, to Rhone-Poulenc Specialites Chimiques. Silica with a high oil absorption capability and a controlled primary structure and process for the production thereof. 4,874,594, Cl. 423-335.000.
 Cheysson, Francois; and Migozzi, Jean-Blaise, to Thomson-CSF. Clear holographic helmet visor and process of producing same. 4,874,214, Cl. 350-3.700.
 Chiappafreddo, Mario: See—
 Crispoldi, Antonio; Moriconi, Andrea; and Chiappafreddo, Mario, 4,874,595, Cl. 423-397.000.
 Chiavetta, Sebastiano R.; and De Guglielmi, Giorgio, to Applause, Inc.; and Jockline, S R L. Rocking toy. 4,874,163, Cl. 272-53.200.
 Chiba, Shigeru. Ultrasonic cell-destroyer. 4,874,137, Cl. 241-301.000.
 Chikamasa, Hiroshi: See—
 Komatsu, Kazunori; Chikamasa, Hiroshi; and Sato, Tsunehiko, 4,874,633, Cl. 427-48.000.
 Chikaoka, Yasuji: See—
 Sakaida, Atsuo; Chikaoka, Yasuji; Imoto, Yasuo; Iriguchi, Akira; and Ikezaki, Yoshiyuki, 4,874,978, Cl. 310-328.000.
 Chikuma, Isamu; Shimada, Satoru; and Eda, Hiroshi, to Nippon Seiko Kabushiki Kaisha. Four-wheel steering apparatus of a vehicle. 4,874,183, Cl. 280-91.000.
 Chisso Corporation: See—
 Miya, Shinya; Harada, Masato; Mise, Takaya; and Yamazaki, Hiroshi, 4,874,880, Cl. 556-53.000.
 Yoshida, Naoyuki; Kitano, Kint; and Ogawa, Tetsuya, 4,874,546, Cl. 252-299.610.
 Chiu, Shui W. Sleep-preventing alarm device. 4,875,030, Cl. 340-575.000.
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 Wakabayashi, Ataru; Umehara, Yohichi; Morie, Satsuki; Kuwahara, Ikuro; and Okada, Yoshimi, 4,874,483, Cl. 204-94.000.

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 Henley, Francois G.; Choi, Hee-June; Kratzer, Dean J.; and Barr, Maurice R., 4,875,006, Cl. 324-158.00R.
 Chollock, Ronald S.: See—
 McMeekin, James H.; Lerch, Alan E.; Chollock, Ronald S.; and Weddock, James F., 4,874,940, Cl. 250-223.00B.
 Chou, An-Chuan. Warning triangle. 4,875,028, Cl. 340-473.000.
 Christensen, Ronald J.: See—
 Steimel, Lyle H.; and Christensen, Ronald J., 4,874,541, Cl. 252-178.000.
 Christiansen, Margot H.: See—
 Lauritzen, Ann M.; Baker, David S.; Christiansen, Margot H.; Johnson, Beamon M.; and Schuren, John G., 4,874,879, Cl. 549-536.000.
 Christiansen, Torben F.; and Kokholm, Finn, to Radiometer A/S. Membrane for an electrochemical measuring electrode device. 4,874,501, Cl. 204-415.000.
 Christner, Angelika: See—
 Hofmann, Ingrid; Mutschler, Ernst; and Christner, Angelika, 4,874,763, Cl. 514-249.000.
 Chromatic Paint Corporation: See—
 Valasek, Raymond J., 4,874,108, Cl. 220-93.000.
 Chrysler Motors Corporation: See—
 Klein, Frank H.; Selby, Steven F.; and Klueger, Sigmund, 4,874,110, Cl. 220-241.000.
 Moulds, Julie M., 4,874,098, Cl. 211-13.000.
 Murray, Theodore L., 4,873,837, Cl. 62-199.000.
 Chu, Ming Y. W.: See—
 Calabresi, Paul; Wiemann, Michael C.; and Chu, Ming Y. W., 4,874,602, Cl. 424-10.000.
 Chung, Cliff, to Prospects Corp. Automatic motor vehicle visor system. 4,874,938, Cl. 250-203.00R.
 Chung, Tai-Shung: See—
 McMahon, Paul; Chung, Tai-Shung; and Ying, Lincoln, 4,874,563, Cl. 264-29.200.
 Cianci, Flavio: See—
 Rescaldi, Carlo; Ricci, Rizziero; Scazzosi, Adriano; and Cianci, Flavio, 4,874,474, Cl. 203-18.000.
 Ciba-Geigy Corporation: See—
 Back, Gerhard; and Beffa, Fabio, 4,874,848, Cl. 534-684.000.
 Back, Gerhard; Beffa, Fabio; Schlesinger, Ulrich; and Puntener, Alois, 4,874,849, Cl. 534-696.000.
 Farooq, Saleem, 4,874,778, Cl. 514-403.000.
 Grade, Reinhardt; and Thomas, Brian M., 4,874,526, Cl. 210-697.000.
 Mulhaupt, Rolf; and Simon, Hubert, 4,874,805, Cl. 524-188.000.
 Oxenius, Rudiger; Burgi, Ernst; Arnold, Vladimir; and Rakoczi, Ferenc, 4,874,847, Cl. 534-565.000.
 Reinert, Gerhard, 4,874,391, Cl. 8-442.000.
 Stegmann, Werner; Meier, Hans R.; Evans, Samuel; Martin, Roger; and Luisoli, Reto, 4,874,885, Cl. 560-15.000.
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 Cintas Corporation: See—
 Milton, David W., 4,873,878, Cl. 73-865.800.
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 Morris, David L.; Filip, Mihail; D'Amelio, Frank D.; Esposito, Dominick G.; and Quint, Robert H., 4,874,364, Cl. 604-35.000.
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 Rossi, John J., 4,874,853, Cl. 536-27.000.
 Ciunaga, Massimo. Screw driving device. 4,873,900, Cl. 81-436.000.
 Cla-Val Co.: See—
 Ensign, Harold W., 4,874,531, Cl. 210-744.000.
 Clamens, Serge: See—
 Teissier, Remy; and Clamens, Serge, 4,874,859, Cl. 544-221.000.
 Clarion Co., Ltd.: See—
 Mori, Masaharu, 4,875,221, Cl. 375-1.000.
 Clark, Gary E., to Parker, Wade; and Heywood, Richard G. Stroller apparatus for juvenile car seat. 4,874,182, Cl. 280-30.000.
 Clark, Michael: See—
 Ashkin, Peter B.; and Clark, Michael, 4,875,158, Cl. 364-200.000.
 Clarke, Leslie T., to Pilkington PLC. Shielding panel. 4,874,903, Cl. 174-35.00MS.
 Clarkson, Carroll E.: See—
 Collins, Arthur R.; and Clarkson, Carroll E., 4,874,297, Cl. 417-265.000.
 Clauser, John F. Rotation, acceleration, and gravity sensors using quantum-mechanical matter-wave interferometry with neutral atoms and molecules. 4,874,942, Cl. 250-251.000.
 Clayton, Charles H. Straight hole drilling method and assembly. 4,874,045, Cl. 175-57.000.
 Clements, Thomas W.: See—
 Fallon, Merton R.; and Clements, Thomas W., 4,874,116, Cl. 222-399.000.
 Cleveland, Gary D. Miter saw utility stand. 4,874,025, Cl. 144-287.000.
 Clifford & Snell Limited: See—
 Bennett, Brian S.; and Smith, David, 4,873,933, Cl. 441-36.000.
 Clipper, Robert B.: See—
 Bubeck, Robert A.; Clipper, Robert B.; and Henton, David E., 4,874,815, Cl. 525-71.000.
 Clorox Company, The: See—
 Peterson, David; Chen, Loren; and Iliff, Robert J., 4,874,537, Cl. 252-99.000.
 Coal Industry (Patents) Limited: See—
 Brown, Douglas W., 4,874,512, Cl. 210-225.000.
 Coccodrilli, Gus D., Jr.: See—
 Boyle, Peter C.; Steffen, Daniel G.; Melton, John L.; Coccodrilli, Gus D., Jr.; and Nagy, Michael A., 4,874,606, Cl. 426-74.000.
 Cochran, Faith E.; Smith, Michael J.; and Litvay, John D., to Kimberly-Clark Corporation. Tissue products containing sliced fibers. 4,874,465, Cl. 162-111.000.
 Codling, Daryl O., to Colt Industries Inc. Fail-safe idle bypass system. 4,873,954, Cl. 123-339.000.
 Cohen, Leslie A.: See—
 Hallden-Abberton, Michael P.; Cohen, Leslie A.; and Wood, Robert S., 4,874,824, Cl. 525-379.000.
 Colanzi, Franco; and Vignotto, Angelo, to Riv-SKF Officine di Villar Perosa S.p.A. Seal for bearings. 4,874,261, Cl. 384-484.000.
 Coldren, Larry A.; and Skidmore, Jay A., to University of California, The Regents of the Low damage-producing, anisotropic, chemically enhanced etching method and apparatus. 4,874,459, Cl. 156-643.000.
 Cole, Jack H., to Conoco Inc. Downhole orbital seismic source. 4,874,061, Cl. 181-106.000.
 Cole, Kenneth C.: See—
 Cielo, Paolo; Krappz, Jean-Claude; Cole, Kenneth C.; and Vaudreuil, Ghislain, 4,874,948, Cl. 250-341.000.
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 Colegrove, George T.; and Lindroth, Thomas A., to Merck & Co., Inc. Low viscosity heteropolysaccharides. 4,874,854, Cl. 536-114.000.
 Coleman, Jerry E.: See—
 Antoni, Patricia A.; Nolan, Timothy J.; Hayes, Thomas J.; Arneson, Theodore R.; and Coleman, Jerry E., 4,874,083, Cl. 206-45.320.
 Coleman, Richard D.: See—
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 Collier, William R. Climate control apparatus. 4,874,127, Cl. 236-49.500.
 Collins, Arthur R.; and Clarkson, Carroll E. Radial pump. 4,874,297, Cl. 417-265.000.
 Collins, David: See—
 Trumbull, Douglas; Collins, David; Smith, Wayne; and Spieldinger, Robert, 4,874,162, Cl. 272-18.000.
 Collins, Marcus H.; and Diech, Ronald W., to Eaton Corporation. Clutch and brake rapid exhaust manifold. 4,874,068, Cl. 192-18.00A.
 Collins, Scott D.: See—
 Smith, Rosemary L.; and Collins, Scott D., 4,874,499, Cl. 204-403.000.
 Colt Industries Inc.: See—
 Codling, Daryl O., 4,873,954, Cl. 123-339.000.
 McAuliffe, Lawrence, Jr., 4,873,955, Cl. 123-339.000.
 Columbia Manufacturing Corporation: See—
 Riegelman, Harry, 4,873,741, Cl. 16-105.000.
 Colvert, James H., to Texaco Inc. Bubble cap assembly in an ebullated bed reactor. 4,874,583, Cl. 422-143.000.
 Comben, Richard H.; Gilman, Byron L.; and Shturman, Leonid, to Medilase, Inc. Control handle. 4,874,371, Cl. 604-95.000.
 Combustion Engineering, Inc.: See—
 Crick, David L.; and Hayes, James K., 4,874,041, Cl. 165-162.000.
 Kiesche, Eric A.; and Crabtree, Samuel B., 4,873,753, Cl. 29-157.30R.
 Commodore-Amiga, Inc.: See—
 Miner, Jay G.; Dean, Dave; Decuir, Joseph C.; Nicholson, Ronald H.; and Tanaka, Akio, 4,874,164, Cl. 273-1.00E.
 Comolli, Alfred G.: See—
 MacArthur, James B.; Comolli, Alfred G.; and McLean, Joseph B., 4,874,506, Cl. 208-413.000.
 Compagnie Europenne Du Zirconium Cezus: See—
 Brun, Pierre, 4,874,559, Cl. 261-67.000.
 Comper, Lucia; and Ferrari, Francesco, to Montedipe S.p.A. Cutting device for high-temperature granulation of thermoplastic polymers. 4,874,307, Cl. 425-311.000.
 Conlon, Edward J.: See—
 Prabhu, Ashok N.; Hang, Kenneth W.; and Conlon, Edward J., 4,874,550, Cl. 252-512.000.
 Connor, David T.: See—
 Carethers, Mary E.; Centenko, Waczeslaw A.; Connor, David T.; Johnson, Elizabeth A.; Kiely, John S.; Schwender, Charles F.; Sircar, Jagadish C.; Sorenson, Roderick J.; Unangst, Paul C.; and Bruns, Robert F., 4,874,758, Cl. 514-226.500.
 Conoco Inc.: See—
 Cole, Jack H., 4,874,061, Cl. 181-106.000.
 Conroy, Francis; Flahavan, John; and Flahavan, Edward, to Food and Cereal Research Limited. Process for manufacturing a reconstitutable cereal. 4,874,624, Cl. 426-457.000.
 Cook, John L. Can holder. 4,874,109, Cl. 220-94.00R.
 Cook, Leonard C. Method to control the discharge of effluent. 4,875,178, Cl. 364-578.000.
 Cooley, William U.: See—
 Paton, Eric R.; and Cooley, William U., 4,874,120, Cl. 224-266.000.
 Cooper, Bryan, to BASF Aktiengesellschaft. Preparation of coniferylaldehyde by a microorganism. 4,874,701, Cl. 435-147.000.
 Cooper, Lyndon F.: See—
 Featherstone, John D. B.; Cooper, Lyndon F.; Myers, Michael L.; and Nelson, Dennis G. A., 4,874,315, Cl. 433-215.000.

- Corday, Debbie J.: See—
Lynch, Carol J.; and Corday, Debbie J., 4,874,028, Cl. 160-332.000.
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Hillstead, Richard A., 4,874,378, Cl. 604-167.000.
- Cork, William H., to Prism Technology, Inc. System for optically interrogating liquid samples and for withdrawing selected sample portions. 4,873,875, Cl. 73-863.010.
- Cornette, Henri: See—
Arnao-Munoz, Jose L.; and Cornette, Henri, 4,874,107, Cl. 220-30.000.
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Beall, George H.; Pierona, Joseph E.; and Quinn, Candace J., 4,874,724, Cl. 501-10.000.
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Wehrhach, Georg, 4,874,115, Cl. 222-386.000.
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Chakraborty, Asok; Urlaub, Herbert; Grof, Franz; and Cosack, Klaus, 4,874,513, Cl. 210-321.840.
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- Cousin, Michael J., to Mead Corporation. The. Tall oil neutrals to protect plants from insects and the like. 4,874,610, Cl. 424-196.100.
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- Cox, Terry L. Master cylinder pressure-retaining vehicular anti-theft brake locking mechanism. 4,873,824, Cl. 60-545.000.
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- Crabtree, Samuel B.: See—
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- Crown Crafts, Inc.: See—
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Voss, David L.; DeCamp, Howard S.; and Culp, Gordon W., 4,874,930, Cl. 219-522.000.
- Cummins Engine Company, Inc.: See—
Hixon, Charles E., 4,874,047, Cl. 175-369.000.
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- Cuscher, Casper. Disengagable ring fitting for a toilet. 4,873,730, Cl. 4-252.00R.
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- Dainippon Ink and Chemicals, Inc.: See—
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- D'Ambra, Thomas E.; and Bell, Malcolm R., to Sterling Drug Inc. 4-arylcarbonyl-1-[(4-morpholinyl)-lower-alkyl]-1H-indoles. 4,874,761, Cl. 514-235.200.
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- Danieli, Guido. Flexible endoscope. 4,873,965, Cl. 128-6.000.
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Weil, George, 4,874,003, Cl. 134-111.000.
- Davis, Cecil J.: See—
Jucha, Rhett B.; Carter, Duane E.; Davis, Cecil J.; and Crank, Sue E., 4,874,723, Cl. 437-245.000.
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Harris, Arthur, 4,873,877, Cl. 73-864.160.
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Newgard, Kent W.; and Gordon, Mark G., 4,874,377, Cl. 604-167.000.
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Piscaer, Petrus J. C., 4,873,916, Cl. 99-289.00R.
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Miner, Jay G.; Dean, Dave; Decuir, Joseph C.; Nicholson, Ronald H.; and Tanaka, Akio, 4,874,164, Cl. 273-1.00E.
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- DeCamp, Howard S.: See—
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Decker, John A., Jr.; Decker, Linda M.; and Halford, Christopher J., 4,873,907, Cl. 84-291.000.
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Miner, Jay G.; Dean, Dave; Decuir, Joseph C.; Nicholson, Ronald H.; and Tanaka, Akio, 4,874,164, Cl. 273-1.00E.
- Dedole, Pascal: See—
Guerendel, Philippe; Naville, Charles; Laurent, Jean; and Dedole, Pascal, 4,874,060, Cl. 181-102.000.
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Frimmel, James J., Jr.; Ouellette, Thomas; and Deglin, Richard N., 4,875,157, Cl. 364-200.000.
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Ooma, Leo A. A.; and Degryse, Anne-Dominique A. Y., 4,874,766, Cl. 514-258.000.
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Chiavetta, Sebastiano R.; and De Guglielmi, Giorgio, 4,874,163, Cl. 272-53.200.
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Dankowski, Manfred; and Hofen, Willi, 4,874,556, Cl. 562-2.000.
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- Delpech, Guy; and Garnier, Gilles, to U.S. Philips Corporation. Support for printed circuit boards. 4,875,140, Cl. 361-412.000.
- Delta International Machinery Corp.: See—
Luttmer, David J.; Panian, Thomas L.; Wixey, Barry D.; and Wilson, Raymond L., 4,873,770, Cl. 33-706.000.
- Den Boef, Arie J., to U.S. Philips Corp. Arrangement for optically measuring a distance between a surface and a reference plane. 4,874,246, Cl. 356-375.000.
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- Derks, Christopher S.: See—
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- Desai, Rohit: See—
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- DeSanti, Raymond J., to Brintec Corporation. Fiber optic faceplate assembly. 4,874,904, Cl. 174-53.000.
- Desecki, Vince: See—
Kulle, Lee; Desecki, Vince; and Hess, John M., III, 4,874,369, Cl. 484-16.00R.
- Desmarteau, Darryl D.: See—
Navarrini, Walter; and Desmarteau, Darryl D., 4,874,875, Cl. 548-959.000.
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Ishak, Maher; and Schwartz, Alexander, 4,874,478, Cl. 204-16.000.
- Diatec Polymers: See—
Sortwell, Edwin T.; Slovinsky, Manuel; and Mikkelsen, Alan R., 4,874,588, Cl. 422-269.000.
- Dickenson, Wilk A. Electrically heated hose assembly for conveying electrically conductive liquids. 4,874,925, Cl. 249-301.000.
- Dickstein, Heidi L.; Hiraoka, Hiroyuki; and Lee, James H., to International Business Machines Corporation. Thin film magnetic heads with thermally crosslinked insulation. 4,875,124, Cl. 360-126.000.
- DIEHL GmbH & Co.: See—
Rudenaer, Werner, 4,873,927, Cl. 102-269.000.
- Diesch, Ronald W.: See—
Collins, Marcus H.; and Diesch, Ronald W., 4,874,068, Cl. 192-18.00A.
- Dietrich, Demus: See—
Yong, Bak G.; Petra, Barth; Dietrich, Demus; Detlev, Joachim; Kampa, Barbara; Kohler, Saskia; Mohr, Kristine; Paschke, Reinhard; Pelzl, Gerhard; Rosenfeld, Ulrich; Schafer, Wolfgang; Scherf, Klaus-Dieter; Tschirke, Carsten; Weissflog, Wolfgang; and Zschke, Horst, 4,874,544, Cl. 252-299.610.
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Brown, John F., III, 4,875,160, Cl. 364-200.000.
- Curtis, Robert A., 4,875,223, Cl. 375-36.000.
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Carr, F. Patrick; Dillard, Robert D.; and McCullough, Doris E., 4,874,777, Cl. 514-381.000.
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Klitsner, Daniel B., 4,874,342, Cl. 446-168.000.
- Ditl, Pavel: See—
Kabatek, Jan; and Ditl, Pavel, 4,874,249, Cl. 366-339.000.
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Mikhlin, Josef A.; Capes, C. Edward; Divanji, Hareesh S.; and Coleman, Richard D., 4,874,393, Cl. 44-20.000.
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Fencil, Laura E.; Metz, Charles E.; and Doi, Kunio, 4,875,165, Cl. 364-413.220.
- Dola, Frank P.; Feldman, Steven; and Erwin, John K., to AMP Incorporated. Surface applied wiring apparatus. 4,874,322, Cl. 439-210.000.
- Donnelly, Leroy C.: See—
Atlas, George N.; Donnelly, Leroy C.; Urban, Donald P.; Perkins, James M.; and Wilson, Timothy C., 4,874,308, Cl. 425-544.000.
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- Donzia, Byron A. Impact absorbing composites and their production. 4,874,640, Cl. 427-421.000.
- Dorge, Udo: See—
Andra, Rainer; Kurr, Klaus; Ullrich, Gunter; and Dorge, Udo, 4,873,887, Cl. 74-573.00F.
- Dornish, John M.: See—
Borretzen, Bernt; Larsen, Rolf O.; Pettersen, Erik O.; Dornish, John M.; and Oftebro, Rolf, 4,874,780, Cl. 514-452.000.
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Bubeck, Robert A.; Clipper, Robert B.; and Henton, David E., 4,874,815, Cl. 525-71.000.
- Chau, C. C.; and Im, Jang-hi, 4,874,568, Cl. 264-49.000.
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DiSapio, Alfred J.; Pfister, William R.; and Sheeran, Mary A., 4,874,129, Cl. 239-36.000.
- Fey, Kenneth C.; Freiberg, Alan L.; and Price, John G., 4,874,431, Cl. 106-2.000.
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- Downey, Ernest L. Replacement disc. 4,874,389, Cl. 623-17.000.
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- Drent, Eit, to Shell Oil Company. Catalyst compositions and processes for polymerizing carbon monoxide and olefinically unsaturated hydrocarbons. 4,874,736, Cl. 502-165.000.

- Dresser Industries, Inc.: See—
Kloeb, Thomas R.; and Wislon, Berhl E., 4,874,726, Cl. 301-124.000.
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Legault, Clayton M., 4,874,390, Cl. 8-149.100.
- DuBois Chemicals, Inc.: See—
Steinle, Lyle H.; and Christensen, Ronald J., 4,874,541, Cl. 252-178.000.
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Gravisse, Philippe; Duchateau, Jacques; and Perron, Maurice, 4,874,188, Cl. 283-89.000.
- Duerselen, Roderich: See—
Reiche, Dieter; Thuerk, Matthias; and Duerselen, Roderich, 4,874,677, Cl. 428-605.000.
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- Dumas, William V.: See—
Kara, Bradley R.; Foust, Donald F.; and Dumas, William V., 4,874,635, Cl. 427-96.000.
- Duncia, John Jonas V.: See—
Aldrich, Paul E.; Duncia, John Jonas V.; and Pierce, Michael E., 4,874,867, Cl. 548-101.000.
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Haines, Robert C., 4,874,570, Cl. 264-154.000.
- Duma, Charlton; Bremner, Robert J.; and Meng, Sen Y., to Rockwell International Corporation. Multiple discharge cylindrical pump collector. 4,874,575, Cl. 376-404.000.
- Dunn, Joseph, Jr.: See—
Huang, Leeyuan; Koupal, Lawrence; Dunn, Joseph, Jr.; Liesch, Jerrold M.; Hensens, Otto; and Woodruff, H. Boyd, 4,874,745, Cl. 514-18.000.
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Van Wijngaarden, Ineke; Kruse, Cornelis; Van Der Heyden, Johannes A. M.; and Tulp, Martinus T. M., 4,874,770, Cl. 514-326.000.
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Aldrich, Paul E.; Duncia, John Jonas V.; and Pierce, Michael E., 4,874,867, Cl. 548-101.000.
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- McKinney, Ronald J.; and Osborne, Robert B., 4,874,884, Cl. 518-118.000.
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Drane, John H., 4,875,146, Cl. 362-202.000.
- Durbia, Richard D.; Lukens, Jean H.; Uchytel, Thomas F.; and Rhodhamel, Nicholas, to Wisconsin Alumni Research Foundation. Manufacture and use of tagetitoxin. 4,874,319, Cl. 439-108.000.
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Loughrin, Thomas D., 4,874,621, Cl. 426-124.000.
- Dyer, Paul N.: See—
Garg, Diwaker; Klueber, Beth A.; Dyer, Paul N.; Kidd, Richard W.; and Coccarelli, Christopher, 4,874,642, Cl. 427-249.000.
- Dyke, Denis G., to American Sterilizer Company. Self-seal sterilization pouch. 4,874,090, Cl. 206-439.000.
- Dysarz, Edward D. Semi submersible device and method of transporting a marine superstructure and placing it onto or removing it from a marine structure. 4,874,269, Cl. 405-209.000.
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Stoppazzini, Benito, 4,873,845, Cl. 66-126.00R.
- E. R. Squibb and Sons, Inc.: See—
Heaketh, Mark L., 4,874,380, Cl. 604-180.000.
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Munroe, Ronald G., 4,874,332, Cl. 439-462.000.
- Easterly, Robert W.: See—
Bridges, Mark E.; Easterly, Robert W.; and Fredlund, John R., 4,875,103, Cl. 358-214.000.
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Featherstone, John D. B.; Cooper, Lyndon F.; Myers, Michael L.; and Nelson, Dennis G. A., 4,874,315, Cl. 433-215.000.
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Goodrich, Raymond P., Jr.; Williams, Christine M.; Franco, Ro-
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Fey, Kenneth C.; Freiberg, Alan L.; and Price, John G., 4,874,431,
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Hiraishi, Shigetoshi; Koike, Naomasa; Kondo, Kazuyoshi; and
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Wiest, Peter P.; and Fuchs, Hubert, 4,874,362, Cl. 604-26.000.
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Moteki, Eiji, 4,875,114, Cl. 360-77.080.
- Ohawa, Masahiro; and Yonezawa, Eiichi, 4,874,976, Cl.
310-268.000.
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Abe, Kunihiko, 4,873,958, Cl. 123-424.000.
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Itabashi, Masamichi, 4,874,687, Cl. 430-446.000.
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Cl. 427-130.000.
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Nobuyuki, 4,874,686, Cl. 430-272.000.
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Cl. 430-548.000.
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Masuda, Koji; Suemitsu, Yuji; and Asano, Kazuo, 4,875,060, Cl.
346-155.000.
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Takanori; and Kuwano, Yukinori, 4,874,646, Cl. 428-34.100.
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Yoshikumi, Chikao; Ohmura, Yoshio; Hirose, Fumio; Ikuzawa,
Masanori; Matsunaga, Kenichi; Fujii, Takayoshi; Ohhara,
Minoru; and Ando, Takao, 4,874,750, Cl. 514-42.000.
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Fujishiro, Nobuo, 4,874,403, Cl. 55-55.000.
- Fujitsu Limited: See—
Fink, Mathias, 4,873,869, Cl. 73-626.000.
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Kitasagami, Hiroo; Sugimoto, Masahiro; Tamada, Haruo; and
Emori, Shinji, 4,875,087, Cl. 357-71.000.
- Ueno, Katsunobu; and Hataishi, Osamu, 4,875,085, Cl. 357-34.000.
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Leonard, Vurnen; Kato, Arthur K.; Ohmori, Kiyoshi; Fujiwara,
Keisuke; and Soda, Yutaka, 4,875,128, Cl. 360-133.000.
- Fujiwara, Kenichi: See—
Wakabayashi, Makoto; Fujiwara, Kenichi; and Hayashi, Hideo,
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Cl. 123-90.120.
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Shozo; Fukumoto, Takashi; Endo, Zenichiro; and Shinbo, Kat-
sutoshi, 4,874,574, Cl. 376-333.000.
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Oshita, Masahide; Isai, Masaaki; and Fukunaka, Toshiaki,
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Masuda, Isao; Fukuoka, Takashi; and Kobayashi, Fujio, 4,873,946,
Cl. 123-65.00D.
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Martha H.; and Furman, Phillip A., 4,874,609, Cl. 424-85.400.
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Kiyohito, to Nippon Tungsten Co., Ltd. High-density sintered article
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Furuya, Masakazu: See—
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Nishizawa, Minoru, 4,874,458, Cl. 156-607.000.

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Harris, Thomas R.; and Galloway, Robert L., Jr., 4,874,949, Cl. 250-343.000.

Galloway, Terry R., to Thermolytic Decomposer. Hazardous waste reactor system. 4,874,587, Cl. 422-189.000.

Gallup, Darrell L.: See—
Featherstone, John L.; Spang, S. Timothy; Newell, David G.; and Gallup, Darrell L., 4,874,529, Cl. 210-713.000.

Galvanetto, Francois: See—
Spiess, Hansruedi; and Galvanetto, Francois, 4,873,795, Cl. 72-20.000.

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Garavaglia, Carlo: See—
Menconi, Augusto; Camaggi, Giovanni; Gozzo, Franco; Mirena, Luigi; and Garavaglia, Carlo, 4,874,786, Cl. 514-528.000.

Gardette, Jean-Luc: See—
Arnaud, Rene; Gardette, Jean-Luc; and Lemaire, Jacques, 4,874,952, Cl. 250-455.100.

Gardner, Geno P. Adjustable spacer device. 4,874,189, Cl. 285-39.000.

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Garg, Kailash C.: See—
Walter, Jeffrey A.; Garg, Kailash C.; and Rowan, Joseph C., 4,875,026, Cl. 333-251.000.

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Delpech, Guy; and Garnier, Gilles, 4,875,140, Cl. 361-412.000.

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English, George J.; Rothwell, Harold L., Jr.; and Garrity, Donald F., Jr., 4,874,988, Cl. 313-620.000.

Garthwaite, Steven C., to Brunswick Corporation. Connecting rod with polymeric coated sideface. 4,873,951, Cl. 123-196.00W.

Gartland, Robert J.: See—
Boon, Wyndham; Gartland, Robert J.; and Pesata, Patrick J., Jr., 4,874,670, Cl. 428-423.900.

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Berry, Mark D.; Tan, Robert J.; and Garver, Robert V., 4,875,022, Cl. 333-20.000.

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Wallner, Barbara P.; Pepinsky, R. Blake; and Garwin, Jeffrey L., 4,874,743, Cl. 514-12.000.

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Lavoie, Patrick J., 4,874,445, Cl. 156-64.000.

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Cang, John N.; Gast, Joseph R.; Henaley, John J.; and Waldheim, Christian M., 4,874,290, Cl. 415-173.400.

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Geisinger, William R.: See—
Brühl, J. D.; and Geisinger, William R., 4,873,863, Cl. 73-49.200.

Geiver, S.A.: See—
Martorell, D. Aurelio T., 4,873,820, Cl. 56-340.100.

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General Dynamics Land Systems, Inc.: See—
Suchocki, Anthony J., 4,873,911, Cl. 89-34.000.

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Allen, Richard B.; Gibbs, William E.; and Hans, Lynn M., 4,874,796, Cl. 521-59.000.

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Prabhu, Ashok N.; Hang, Kenneth W.; and Conlon, Edward J., 4,874,550, Cl. 252-512.000.

Thompson, Robert A., 4,873,855, Cl. 72-53.000.

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Boyle, Peter C.; Steffen, Daniel G.; Melton, John L.; Coccodrilli, Gus D., Jr.; and Nagy, Michael A., 4,874,606, Cl. 426-74.000.

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Newman, Alec T.; Bentley, Andrew C.; King, Christine A.; MacMahon, Alistair J.; Tansey, Robert W.; and Gibbs, Andrew R., 4,873,915, Cl. 99-289.00R.

General Mills, Inc.: See—
Seaborne, Jonathan; and Egbert, David C., 4,874,618, Cl. 426-76.000.

General Motors Corporation: See—
Bensing, Gregory L.; Gladd, Joseph H.; and Yurtin, John A., 4,874,325, Cl. 439-272.000.

Chandley, George D., 4,874,029, Cl. 164-34.000.

Lederman, Frederick E., 4,874,069, Cl. 192-45.000.

White, Charles R., 4,874,071, Cl. 192-58.00B.

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Montagu, Jean I., 4,874,215, Cl. 350-6.600.

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Engle, Thomas H., 4,874,065, Cl. 188-265.000.

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Foreman, Michael R.; Hadermann, Albert F.; and Trippe, Jerry C., 4,874,528, Cl. 210-705.000.

Gensheimer, Valentin: See—
Simeth, Claus; and Gensheimer, Valentin, 4,873,926, Cl. 101-409.000.

Gentili, Fred: See—
Walsh, David J.; Loughed, William M.; Gentili, Fred; and Fazl, Mahmood, 4,873,975, Cl. 128-334.00R.

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Hughes, David W.; Feeney, Robert K.; and Hertling, David R., 4,874,711, Cl. 437-8.000.

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Kussel, Willy; and Frank, Reiner, 4,874,335, Cl. 439-589.000.

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Brimhall, Owen D.; Peterson, Stephen C.; Kotlyar, Oleg; and Ghoosh Roy, Dilip N., 4,874,358, Cl. 494-37.000.

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Hager, Jorg; Ghyczy, Miklos; Feyen, Vincent; Imberge, Paul; Brandenburg, Ulrich; and Wilperath, Peter, 4,874,553, Cl. 260-403.000.

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Newman, Alec T.; Bentley, Andrew C.; King, Christine A.; MacMahon, Alistair J.; Tansey, Robert W.; and Gibbs, Andrew R., 4,873,915, Cl. 99-289.00R.

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Gilman, Byron L.: See—
Comben, Richard H.; Gilman, Byron L.; and Shturman, Leonid, 4,874,371, Cl. 604-95.000.

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Leonardo, Covi; Giorgio, Bacioli; and Raffaele, Degli E., 4,874,619, Cl. 426-94.000.

Girardin, Ronald E. Horse racing game. 4,874,177, Cl. 273-246.000.

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Bensing, Gregory L.; Gladd, Joseph H.; and Yurtin, John A., 4,874,325, Cl. 439-272.000.

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Brazdil, James F., Jr.; Glaser, Linda C.; and Toft, Mark A., 4,874,738, Cl. 502-209.000.

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Glenn, Michael I.: See—
Archer, Timothy H. V.; Bowman, Randy; and Glenn, Michael I., 4,875,054, Cl. 346-1.100.

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Sorensen, James L.; Yarbrow, Mark D.; and Glockner, Charles A., 4,874,534, Cl. 210-803.000.

Glory Kogyo Kabushiki Kaisha: See—
Kanayama, Yutaka, 4,875,172, Cl. 364-513.000.

Godlew, David P.: See—
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Goff, Frederick: See—
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Gold, Raymond; and Roberts, James H. Solid-state track recorder dosimetry device to measure absolute reaction rates and neutron fluence as a function of time. 4,874,951, Cl. 250-472.100.

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Goldberg, Jay R.; and Hillegas, Donald V., to Medical Engineering Corporation. Ureteral stent system. 4,874,360, Cl. 604-8.000.

Golden, Michael D. Electrical outlet positioner. 4,874,334, Cl. 439-538.000.

Goldman, Geri I. Strainer pot with whistling spout. 4,873,918, Cl. 99-403.000.

Goldstein, Harvey R.; and Haddad, Edward N., Jr., to Pioneer Consolidated Corp. Truck cover having an improved telescopic arm assembly. 4,874,196, Cl. 296-98.000.

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Gomi, Fukuo: See—
Ito, Tomohito; Isomura, Renichi; Hirai, Hidetoshi; and Gomi, Fukuo, 4,874,495, Cl. 204-212.000.

Gonner, Winfried, to Perkin-Elmer Corporation. The Apparatus for examination of heats of transformation of material samples. 4,874,250, Cl. 374-43.000.

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Goodson, Thomas A.; and Truelove, Ronald D. Lock protector. 4,873,849, Cl. 70-54.000.

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Boon, Wyndham; Gartland, Robert J.; and Pesata, Patrick J., Jr., 4,874,670, Cl. 428-423.900.

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Newgard, Kent W.; and Gordon, Mark G., 4,874,377, Cl. 604-167.000.

Gore, Thomas C.: See—
Andrews, William H.; Brothers, Virginia M.; Files, James G.; Kuhn, Irene; McCaman, Michael T.; Paul, Leland S.; Sias, Stacey R.; Gore, Thomas C.; Newman, Karel Z., Jr.; and Tedesco, John L., 4,874,705, Cl. 435-252.330.

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Fischer, Rolf; Merger, Franz; and Gosch, Hans-Juergen, 4,874,889, Cl. 560-205.000.

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Jackson, Richard A., 4,875,097, Cl. 358-180.000.

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Green, Lloyd C., to Heat-Fab, Inc. Flue gas conduit connector. 4,874,191, Cl. 285-332.300.

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Roje, Alexandre; and Grehier, Alain, 4,873,835, Cl. 62-93.000.

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Grieb, Hubert, to MTU Motoren-und Turbinen-Union Munchen GmbH. Variable-geometry turbocompressor. 4,874,287, Cl. 415-149.200.

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Grimm, Frank W., to Zenith Electronics Corporation. Component mounting process for printed circuit boards. 4,873,764, Cl. 29-830.000.

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Roberts, Joseph E.; and Griswold, William A., Jr., 4,874,152, Cl. 254-264.000.

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- Groo, Dora: See—
Lapis, Erzsébet; Toth, Edit; Kiss, Bela; Torley, Jozsef; Palosi, Eva; Hajdu, Istvan; Szporay, Laszlo; Groo, Dora; and Laszlovsky, Istvan, 4,874,765, Cl. 514-255.000.
- Groschens, Pierre, to Laineire de Picardie. Fusible textile product and method of manufacture. 4,874,655, Cl. 428-198.000.
- Grosschadl, Werner: See—
Klammer, Josef; and Grosschadl, Werner, 4,874,104, Cl. 220-4.00B.
- Grosz, Charles T.; Seipp III, Edwin A.; Sun, Rickson; and Yurchenco, James R., to Taurus Holdings, Inc. Paper sheets binding system. 4,874,186, Cl. 281-28.000.
- Grube, Gerhard: See—
Kaplan, Horst; and Grube, Gerhard, 4,874,076, Cl. 198-370.000.
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- Grumman Aerospace Corporation: See—
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- GTE Laboratories Incorporated: See—
Sigai, A. Gary; Lapatovich, Walter P.; and Alexander, Michael N., 4,874,984, Cl. 313-486.000.
- GTE Mobilnet Incorporated: See—
Blair, Kevin B., 4,875,230, Cl. 379-63.000.
- GTE Products Corporation: See—
English, George J.; Rothwell, Harold L., Jr.; and Garrity, Donald F., Jr., 4,874,988, Cl. 313-620.000.
- GTE Valeron Corporation: See—
Van Sickle, Richard G.; and Bour, George, 4,873,768, Cl. 33-178.00R.
- Guanciale, Gary. Apparatus for improving efficiency and consistency of a drag race car. 4,873,891, Cl. 74-625.000.
- Gudermuth, Clyde S., Jr., to EBSO Industries, Inc. Swivel tail articulated fishing lure. 4,873,782, Cl. 43-42.150.
- Guerendel, Philippe; Naville, Charles; Laurent, Jean; and Dedole, Pascal, to Institut Français du Pétrole & Compagnie Générale de Géophysique. Device for receiving sound waves in a well. 4,874,060, Cl. 181-102.000.
- Guigan, Jean. Device for dispensing a predetermined quantity of a liquid. 4,874,114, Cl. 222-168.000.
- Gunter, S. R., to Newell Co. Universal display bracket. 4,874,148, Cl. 248-225.00.
- Günther, Andreas: See—
Gallenkamp, Bernd; Günther, Andreas; Mohrmann, Karl-Heinrich; and Schmidt, Thomas, 4,874,860, Cl. 544-221.000.
- Günther, Wolfgang H. H.; Leone, Ronald E.; and Przyklek, Rosemary, to Eastman Kodak Company. Photographically useful chalcogenazoles, chalcogenazolinols, and chalcogenazolinium and chalcogenazolinol salts. 4,874,866, Cl. 548-100.000.
- Guscott, John K.; Stelmack, Gerard G.; and Boulos, Charles A., to Aritech Corporation. Suppressed transient uniform detection sensitivity pir detector. 4,875,029, Cl. 340-567.000.
- Guthrie Canadian Investments Limited: See—
Burke, Patrick E., 4,874,916, Cl. 219-10.750.
- Gutman, Robert F.; and Mignin, Robert, to United Technologies Automotive, Inc. Vehicular display view control system. 4,874,224, Cl. 350-174.000.
- Gutzwiller, H. Leslie. Modified centrifugal airfoil fan wheel. 4,874,293, Cl. 416-184.000.
- Guyon, Richard D.: See—
Cary, Richard W.; and Guyon, Richard D., 4,875,159, Cl. 544-200.000.
- Haa, Peter; Sommerfeld, Claus-Dieter; and Weber, Hans-Ulrich, to Bayer Aktiengesellschaft. Oligoureia polyols, polyether polyols produced from them and the use of these polyols in the isocyanate polyaddition process. 4,874,797, Cl. 521-167.000.
- Haase, Peter; Kosikowski, Thomas; and Steger, Horst, to Schering Aktiengesellschaft. Method and device for feeding plate shaped objects into and from suspension frames of an installation for chemical treatment in baths, particularly in electroplating baths installation. 4,874,479, Cl. 204-27.000.
- Habara, Hideaki: See—
Sugimori, Teruhiko; Suzuki, Fumio; Habara, Hideaki; and Inada, Hiromasa, 4,874,841, Cl. 528-491.000.
- Hack, J. Roy, Jr. Emergency fuel system apparatus. 4,874,013, Cl. 137-571.000.
- Hadano, Yoshikazu; Tsunoda, Eiji; and Kajigaya, Ichiro, to Electric Power Research Institute. Steam turbine plant. 4,873,827, Cl. 214-611.000.
- Haddad, Edward N., Jr.: See—
Goldstein, Harvey R.; and Haddad, Edward N., Jr., 4,874,196, Cl. 296-98.000.
- Hadermann, Albert F.: See—
Foreman, Michael R.; Hadermann, Albert F.; and Trippe, Jerry C., 4,874,528, Cl. 210-705.000.
- Hagemeyer, Friedrich-Wilhelm, to Siemens Aktiengesellschaft. Method of apparatus for realizing a logical operation by modifying a flow of energy. 4,875,181, Cl. 364-716.000.
- Hagen, Uwe; and Redler, Udo, to Siemens Aktiengesellschaft. Multi-part neutral electrode for an hf surgical instrument. 4,873,973, Cl. 128-303.130.
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- Hager, Jorg; Ghyczy, Miklos; Feyen, Vincent; Imberge, Paul; Brandenburg, Ulrich; and Wilperath, Peter, to A. Nattermann & Cie. GmbH. Aqueous phospholipid solutions containing a solubilizing agent. 4,874,553, Cl. 260-403.000.
- Haghi, Mohammad-Reza; and Boutros, Bertrand, to U.S. Philips Corporation. Method of and device for estimating motion in a sequence of pictures. 4,875,094, Cl. 358-105.000.
- Hailey, Robert W. Heating and handling system for objects. 4,874,312, Cl. 432-122.000.
- Haines, Robert C., to Dunlop Limited. Method of making a games racket. 4,874,570, Cl. 264-154.000.
- Hajdu, Istvan: See—
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- Hajovsky, Robert J., to Ameron, Inc. Conductive adhesive. 4,874,548, Cl. 252-511.000.
- Hakamada, Ichiro: See—
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- Halbritter, Guenter: See—
Kiss, Akos; Kleinschmit, Peter; Hanich, Juergen; Halbritter, Guenter; and Horst, Jenny, 4,874,433, Cl. 106-450.000.
- Halford, Christopher J.: See—
Decker, John A., Jr.; Decker, Linda M.; and Halford, Christopher J., 4,873,907, Cl. 84-291.000.
- Hall, Charles E.: See—
Bogese, Stephen B., II; and Hall, Charles E., 4,874,330, Cl. 439-418.000.
- Hall, Ralph F.: See—
Gleason, John G.; Hall, Ralph F.; Ku, Thomas W.; and Perchonock, Carl D., 4,874,792, Cl. 514-570.000.
- Hallam, Donald E.; Popper, Peter; Staunton, Harold F.; Taylor, Robert E.; and Yngve, Paul W., to Du Pont de Nemours, E. I., and Company. Apparatus and process for forming alternate twist plied yarn. 4,873,821, Cl. 57-293.000.
- Halden-Abbott, Michael P.; Cohen, Leslie A.; and Wood, Robert S., to Rohm and Haas Company. Process for manufacturing low-acid, glutaric-anhydride-containing copolymers. 4,874,824, Cl. 525-379.000.
- Halliburton Logging Services, Inc.: See—
Ip, Matthew, 4,874,327, Cl. 439-275.000.
- Hallihan, Timothy J.: See—
Russell, Frank S.; and Hallihan, Timothy J., 4,873,854, Cl. 72-12.000.
- Halpern, Donald F.; and Robin, Mark L., to BOC, Inc. Process for the production of polyfluorinated ethers. 4,874,901, Cl. 568-683.000.
- Hamada, Takao; Tsuchiya, Nobuo; Inatani, Toshihiro; Katayama, Eiji; Koitabashi, Toshimitsu; Okabe, Kyoji; Sumito, Mitsuo; and Takada, Yoshiyasu, to Kawasaki Steel Corporation. Methods for melting and refining a powdery ore containing metal oxides. 4,874,427, Cl. 75-26.000.
- Hamada, Yuuji: See—
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- Hamauchi, Shigeki; Ohtsuka, Yasuhiro; Motohiro, Tomoyoshi; Taga, Yasunori; and Ishii, Masahiko, to Toyota Jidosha Kabushiki Kaisha; and Kabushiki Kaisha Toyota Chuo Kenkyusho. Birefringent plate and manufacturing method for the same. 4,874,664, Cl. 428-325.000.
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- Hamamatsu Photonics Kabushiki Kaisha: See—
Koishi, Musubu; Mizushima, Yoshihiko; and Kan, Hirofumi, 4,875,093, Cl. 358-83.000.
- Hamasaki, Masaharu: See—
Yonemoto, Kazuya; Kagawa, Yoshiaki; Ishikawa, Kikue; Suzuki, Tomoyuki; and Hamasaki, Masaharu, 4,875,100, Cl. 358-213.190.
- Hamasaki, Naotaka; Kawamura, Hiroaki; Ohtsu, Norio; Nakakoshi, Ichiro; Ataka, Kikuo; Oomori, Kiyosi; and Kouno, Masahiko, to Ube Industries, Ltd. Process for preparing monosodium phosphoenolpyruvate. 4,874,882, Cl. 558-131.000.
- Hamilton Standard Controls, Inc.: See—
Bornstein, Norman S., 4,874,430, Cl. 75-234.000.
- Hammerschmidt, Erich; and Blank, Heinz U., to Bayer Aktiengesellschaft. Process for the preparation of 6-hydroxynaphthalene-1-carboxylic from 1-aminomethylnaphthalene-6-sulphonic acid. 4,874,892, Cl. 562-409.000.
- Hang, Kenneth W.: See—
Prabhu, Ashok N.; Hang, Kenneth W.; and Conlon, Edward J., 4,874,550, Cl. 252-512.000.
- Hanich, Juergen: See—
Kiss, Akos; Kleinschmit, Peter; Hanich, Juergen; Halbritter, Guenter; and Horst, Jenny, 4,874,433, Cl. 106-450.000.
- Hanna, Khalil. Micro-surgical instrument for use as gripper of scissors. 4,873,979, Cl. 128-354.000.
- Hannaford, Billy H.: See—
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Allen, Richard B.; Gibbs, William E.; and Hans, Lynn M., 4,874,796, Cl. 521-59.000.

- Hansen, James R.: See—
Gaynor, Dennis A.; and Hansen, James R., 4,874,622, Cl. 426-135.000.
- Hanson, Robert L., to Minnesota Mining and Manufacturing Company. Record/not record latch for recording cassette. 4,875,109, Cl. 104-431.000.
- Hansson, Birger: See—
Hultberg, Sten; and Hansson, Birger, 4,873,925, Cl. 101-147.000.
- Hantel, Ulrich: See—
Affeldt, Karl-Heinz; and Hantel, Ulrich, 4,873,988, Cl. 128-687.000.
- Hanulik, Jozef, to RecyTec S.A. Process for the recycling of electrical batteries, assembled printed circuit boards and electronic components. 4,874,486, Cl. 204-140.000.
- Hara, Toshihiro; Yotsutani, Akio; Kawasaki, Ryoji; Tate, Kazuyuki; Huse, Syoji; and Ono, Koji, to NEC Corporation; Nippon Telegraph & Telephone Corp.; and Kabushiki Kaisha Toshiba. Radio telephone system. 4,875,231, Cl. 379-61.000.
- Harada, Jiro, to Harada Kogyo Kabushiki Kaisha. Drive control device for an electrically-driven extending and retracting antenna. 4,875,053, Cl. 343-903.000.
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Harada, Jiro, 4,875,053, Cl. 343-903.000.
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- Harada, Nozomu: See—
Endo, Yukio; and Harada, Nozomu, 4,875,101, Cl. 358-213.190.
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- Harbison, Barry B.: See—
Vacha, Lubos J. B.; Schultz, Peter C.; Moynihan, Cornelius T.; Raychadhuri, Satyabrata; Cadien, Ken C.; Harbison, Barry B.; and Mossadegh, Reza, 4,874,222, Cl. 350-96.340.
- Harbor Branch Oceanographic Institution, Inc.: See—
Munro, Murray H. G.; Perry, Nigel B.; and Blunt, John W., 4,874,767, Cl. 514-278.000.
- Hardin, Bengt Y.: See—
Karlsson, Hakan I.; Lundqvist, Inge J.; Hardin, Bengt Y.; and Ostman, Thomas L., 4,874,467, Cl. 162-198.000.
- Harfst, Michael D., to Blount, Inc. Saw chain with wear link. 4,873,903, Cl. 83-830.000.
- Harlowe, William W.: See—
Wilson, Wilfred W.; Polemenakos, Sotiros C.; Potter, J. Larry; Mangold, Donald J.; Harlowe, William W.; and Schlameus, Herman W., 4,874,611, Cl. 424-410.000.
- Harms, Frank M.; Tripp, Victor; and Wells, Thomas B., to Lifeblood Advanced Blood Bank Systems, Inc. Apparatus for the rapid microwave thawing of cryopreserved blood, blood components, and tissue. 4,874,915, Cl. 219-10.55F.
- Harms, Louis C., to United Technologies Automotive, Inc. Electrically controlled pressure relief valve system and method. 4,873,817, Cl. 56-10.000.
- Harms, Sherry J.: See—
Bowen, Terry P.; Harms, Sherry J.; and Hoffer, John C., 4,874,218, Cl. 350-96.200.
- Harms, Wolfgang, to Bayer Aktiengesellschaft. Aminoalkoxytriphendioxazine dyestuffs useful for dyeing and printing hydroxyl- and amino-containing materials. 4,874,857, Cl. 544-75.000.
- Harrell, Julia E.: See—
Sapp, William M.; and Harrell, Julia E., 4,873,736, Cl. 5-434.000.
- Harris, Arthur, to Davis Meditech. Precision liquid handling apparatus. 4,873,877, Cl. 73-864.160.
- Harris, Charles C. Method of making a shrink wrap package. 4,873,814, Cl. 53-442.000.
- Harris, Kenneth M.: See—
Greeves, Godfrey; Potter, James C.; Andrews, Richard J.; and Harris, Kenneth M., 4,874,301, Cl. 417-462.000.
- Harris, Thomas R.; and Galloway, Robert L., Jr., to Vanderbilt University. Method of measuring lung vascular function and transcapillary transport by the use of nonradioactive markers. 4,874,949, Cl. 250-343.000.
- Harsch, Curtis L.; and Beach, Kerry B., to Harsch, Curtis L. Method and apparatus for measuring surface temperatures. 4,875,176, Cl. 364-557.000.
- Hart Chemical Limited: See—
Kanluen, Ratana; and Licht, Brigitte H., 4,874,827, Cl. 526-214.000.
- Harth, Hubert: See—
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- Hartman, Guy J., to A. E. Staley Manufacturing Company. Flavoring material possessing fermented soy sauce characteristics. 4,874,625, Cl. 426-533.000.
- Hartmann & Lammle GmbH & Co. KG: See—
Schulze, Eckehart, 4,873,912, Cl. 91-389.000.
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- Hasegawa, Akira, to Olympus Optical Co., Ltd. Imaging optical system. 4,874,232, Cl. 350-427.000.
- Hashimoto, Masashi, to Texas Instruments Incorporated. Memory device with integrated error detection and correction. 4,875,212, Cl. 371-40.200.
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- Hasircoglu, Alexander W., to Du Pont de Nemours, E. I., and Company. Terminal lead shielding for headers and connectors. 4,874,319, Cl. 439-108.000.
- Hasumoto, Toshiharu; Kashiwada, Kunio; Konishi, Minoru; and Fujishiro, Nobuo, to Showa Denko Kabushiki Kaisha. Process for treating waste gases containing trichlorotrifluoroethane and apparatus therefor. 4,874,403, Cl. 55-55.000.
- Hata, Hiroyoshi: See—
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- Hataishi, Osamu: See—
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- Hatamura, Yotaro. Die casting controlling method. 4,874,032, Cl. 164-457.000.
- Hatanaka, Koji; Maruta, Kenji; and Suwabe, Hirohisa, to Jidosha Kiki Co., Ltd.; and Hitachi Metals, Ltd. Glow plug for diesel engine with a U-shaped sialon ceramic heater. 4,874,923, Cl. 219-270.000.
- Hathorn, Jack L.: See—
Scheier, Donald J.; and Hathorn, Jack L., 4,873,746, Cl. 17-11.000.
- Hattori, Akimasa: See—
Makita, Kensuke; Hattori, Akimasa; and Tanaka, Katsuto, 4,874,462, Cl. 156-635.000.
- Hattori, Yutaka, to Yokohama Rubber Co., Ltd., The. Method of removing toner from a rotating drum in a xerographic copying machine using a vibrating blade. 4,875,070, Cl. 355-299.000.
- Haughton, Victor M.: See—
Lindemann, Peer; and Haughton, Victor M., 4,874,382, Cl. 604-195.000.
- Haver & Boecker: See—
Mittelbach, Helmut, 4,873,816, Cl. 53-573.000.
- Hawkins, Irvin F., Jr. Needle guide assembly. 4,874,376, Cl. 604-165.000.
- Hawkins, Mark R.: See—
Goodwin, Dennis L.; Hawkins, Mark R.; Johnson, Wayne L.; Olsen, Ange; and Robinson, McDonald, 4,874,464, Cl. 156-646.000.
- Hayakawa, Fujio: See—
Ito, Toshiyasu; Minoura, Jun; Mori, Takaaki; Takahashi, Shigeyuki; Kato, Mamoru; Shimada, Junichi; and Hayakawa, Fujio, 4,874,229, Cl. 350-357.000.
- Hayami, Hiroshi: See—
Sugisawa, Ko; Matsumura, Yasushi; Okamoto, Hidefumi; and Hayami, Hiroshi, 4,874,580, Cl. 422-25.000.
- Hayashi, Hideo: See—
Wakabayashi, Makoto; Fujiwara, Kenichi; and Hayashi, Hideo, 4,874,836, Cl. 528-185.000.
- Hayashi, Shigeyuki: See—
Sangyoji, Kazuo; Sakai, Jun; Hayashi, Shigeyuki; Suzuki, Makoto; and Kimura, Yasuo, 4,875,074, Cl. 355-27.000.
- Hayes, James K.: See—
Crick, David L.; and Hayes, James K., 4,874,041, Cl. 165-162.000.
- Hayes, Thomas J.: See—
Antoni, Patricia A.; Nolan, Timothy J.; Hayes, Thomas J.; Arneson, Theodore R.; and Coleman, Jerry E., 4,874,083, Cl. 206-45.320.
- Hazelton, Donald R.; and Hodgson, William J., Jr., to Exxon Chemical Patents, Inc. Melt blown nonwoven web from fiber comprising an elastomer. 4,874,447, Cl. 156-167.000.
- Heat-Fab, Inc.: See—
Green, Lloyd C., 4,874,191, Cl. 285-332.300.
- Hediger, Edwin A.; Ng, Yee S.; and Pham, Hieu, to Eastman Kodak Company. Modular optical printhead for hard copy printers. 4,875,057, Cl. 346-107.00R.
- Heher, Werner: See—
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- Heid, Edmund. Steerable kite. 4,874,146, Cl. 244-153.00R.
- Heidt, Thomas; and Wickstead, James C., to Wickstead, James C. Camcorder. 4,875,107, Cl. 360-9.100.
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Rasmussen, Jerald K.; Heilmann, Steven M.; Krepski, Larry R.; and Moren, Dean M., 4,874,822, Cl. 525-279.000.
- Heimerl, Albert; Brammer, Hans-Adolf; and Hofeditz, Wolfgang, to Beiersdorf Aktiengesellschaft. Adapter device for irrigating the intestine. 4,874,370, Cl. 604-93.000.
- Heinze, Otto, to Jugo-Import-Export-Anstalt. Segmental formwork for round structures. 4,874,150, Cl. 249-18.000.
- Heisey, Raymond K., Jr.; Barker, W. David; Mariano, Arturo C.; and Thurnau, Vernon L., to Butler Manufacturing Company. Spacer block for standing seam roof. 4,873,808, Cl. 52-478.000.
- Heisey, William L.: See—
Armstrong, Richard J.; and Granzotto, Robert, 4,874,143, Cl. 242-198.000.
- Heitman, Jurgen, to Robert Bosch GmbH. Method and apparatus for concealing errors in reproduced digital signals utilizing fir filter. 4,875,106, Cl. 358-314.000.
- Heitz, Walter L., to Shell Oil Company. Coal gasification process. 4,874,397, Cl. 48-210.000.
- Helix Technology Corporation: See—
Pruitt, Gerald R.; and Bertsch, Peter, 4,873,913, Cl. 92-158.000.
- Heller, Cletas, to Heller Triangle Spring Co. Multi-compartment refuse container. 4,874,111, Cl. 220-404.000.

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Heller, Cletas, 4,874,111, Cl. 220-404.000.
- Henderson, Eric A., to Sundstrand Corporation. Electrical power generating system having parallel generator control. 4,874,961, Cl. 307-87.000.
- Henderson, Norman: See—
Urban, Joseph J., Jr.; Henderson, Norman; and Behe, Anthony J., 4,874,605, Cl. 424-78.000.
- Henderson, Tommy L. Mechanical roping dummy. 4,874,179, Cl. 273-338.000.
- Hendrickson, Donald W. Screen and flow regulator assembly. 4,874,017, Cl. 138-45.000.
- Henkel Corporation: See—
Donovana, Joseph C.; and Ahmed, Bashir M., 4,874,673, Cl. 428-463.000.
- Sonoda, Sakae; Hetsugi, Kouji; Sawasaki, Yoshihiko; Kaburagi, Kouji; and Matsushima, Yasunobu, 4,874,480, Cl. 204-56.100.
- Henkel France S.A.: See—
Freal-Saison, Jean-Michel, 4,874,498, Cl. 204-400.000.
- Henkel Kommanditgesellschaft auf Aktien: See—
Lange, Fritz; Busch, Peter; and Thiele, Klaus, 4,874,554, Cl. 260-404.000.
- Richtler, Hans-Joachim; Kreutzer, Udo; Carduck, Franz-Josef; Koester, Klaus; and Harth, Hubert, 4,874,552, Cl. 260-400.000.
- Schmid, Karl-Heinz; Penninger, Josef; and Moeller, Hinrich, 4,874,579, Cl. 422-16.000.
- Uphues, Guenter; Ploog, Uwe; and Bischof, Klaudia, 4,874,883, Cl. 558-150.000.
- Henley, Alvera S. Vehicle passenger seat for handicapped persons. 4,874,203, Cl. 297-250.000.
- Henley, Francois G.; Choi, Hee-June; Kratzer, Dean J.; and Barr, Maurice R., to Photon Dynamics, Inc. Ultra-high-speed digital test system using electro-optic signal sampling. 4,875,006, Cl. 324-158.000.
- Hennenfent, Douglas J.: See—
Vadnaia, Timothy W.; and Hennenfent, Douglas J., 4,874,922, Cl. 219-243.000.
- Hensens, Otto: See—
Huang, Leeyuan; Koupal, Lawrence; Dunn, Joseph, Jr.; Liesch, Jerrold M.; Hensens, Otto; and Woodruff, H. Boyd, 4,874,745, Cl. 514-18.000.
- Hensley, John J.: See—
Cang, John N.; Gast, Joseph R.; Hensley, John J.; and Waldheim, Christian M., 4,874,290, Cl. 415-173.400.
- Henton, David E.: See—
Bubeck, Robert A.; Clipper, Robert B.; and Henton, David E., 4,874,815, Cl. 525-71.000.
- Henzi, Beat, to Sandoz Ltd. Monoazo dyes having a substituted 1,4-phenylene coupling component radical having one C₈₋₁₄ alkyl group or moiety. 4,874,392, Cl. 8-662.000.
- Heppke, Gerd; Scherowsky, Gunter; Bahr, Christian; and Lehmann, Lutz, to Hoechst Aktiengesellschaft. Chiral esters of α -substituted phenylalkanoic acids and mesogenic hydroxy compounds, and their use as a doping substance in liquid crystal phases. 4,874,545, Cl. 252-299.610.
- Herbst, Joseph A.; Owen, Hartley; and Schipper, Paul H., to Mobil Oil Corporation. Multiple riser fluidized catalytic cracking process employing a mixed catalyst. 4,874,503, Cl. 208-67.000.
- Hercules Incorporated: See—
Lukacs, Alexander, III, 4,874,828, Cl. 526-262.000.
- Herrmann, Albert L. Low power, leakage current switching circuit. 4,874,962, Cl. 307-116.000.
- Herrmann, Donald C. Universal heat exchanger. 4,874,040, Cl. 165-122.000.
- Hertling, David R.: See—
Hughes, David W.; Feeney, Robert K.; and Hertling, David R., 4,874,711, Cl. 437-8.000.
- Hertlich, Friedrich R., to Digital Equipment Corporation. Brushless DC motor. 4,874,975, Cl. 310-186.000.
- Herwig, Lewis F. Adjustable stringplate mounting means for a grand piano. 4,873,906, Cl. 84-184.000.
- Hesketh, Mark L., to E. R. Squibb and Sons, Inc. Catheter retaining device. 4,874,380, Cl. 604-180.000.
- Hess, John M., III: See—
Kulle, Lee; Deacock, Vince; and Hess, John M., III, 4,874,369, Cl. 804-36.000.
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Sonoda, Sakae; Hetsugi, Kouji; Sawasaki, Yoshihiko; Kaburagi, Kouji; and Matsushima, Yasunobu, 4,874,480, Cl. 204-56.100.
- Heubel, Thomas W.: See—
Moran, John P.; Gilson, Richard W.; and Heubel, Thomas W., 4,874,385, Cl. 604-208.000.
- Heuschen, Jean M.: See—
Lee, Gm F., Jr.; Heuschen, Jean M.; and Van Der Meer, Roelof, 4,874,810, Cl. 524-505.000.
- Heuschkel, Uwe. Method and device for producing shaped objects from thermoplastic plastics. 4,874,566, Cl. 264-40.200.
- Hewlett-Packard Company: See—
Huang, Fred G., 4,875,205, Cl. 370-6.000.
- Hunt, Thomas J.; Miller, James G.; Thomas, Lewis J., III; Melton, Hewlett E., Jr.; and Shoup, Thomas A., 4,873,984, Cl. 128-60.070.
- Heywood, Richard G.: See—
Clark, Gary E., 4,874,182, Cl. 280-30.000.
- Higashi, Kazumi; and Noda, Yuzuru, to Nitto Electric Industrial Co., Ltd. Colorless transparent polyimide shaped article and process for producing the same. 4,874,834, Cl. 528-176.000.
- Higashi, Tatsuji: See—
Urabe, Yoshihiko; Higashi, Tatsuji; Takahashi, Hiroshi; and Kita, Nobuyuki, 4,874,686, Cl. 430-272.000.
- Highe, Albert: See—
Reed, James P.; Masia, Michael; and Highe, Albert, 4,874,487, Cl. 204-147.000.
- Higuchi, Ryoichi; Sakurai, Takao; Yokota, Tadahiko; Mikami, Naoko; Yamamoto, Eri; and Takeuchi, Koji, to Ajinomoto Co., Inc. Phenylpyrimidine liquid crystal compounds and liquid crystal compositions containing the same. 4,874,542, Cl. 252-299.610.
- Higuchi, Tadaaki: See—
Kawanishi, Shozo; and Higuchi, Tadaaki, 4,874,048, Cl. 177-25.180.
- Hikes, Carl L.: See—
Andersen, James K.; and Hikes, Carl L., 4,874,324, Cl. 439-271.000.
- Hildebrandt, Gunter: See—
Gehrt, Heinz H.; Hildebrandt, Gunter; and Rehfeldt, Karl-Heinz, 4,874,966, Cl. 307-291.000.
- Hill, Francis V.; and Crosswhite, Lola E., to Sorrento Engineer, Inc. Method of making flame resistant polyimide foam insulation and the resulting insulation. 4,874,648, Cl. 428-35.900.
- Hillard, Devere D. Apparatus and method for simulating the game of golf. 4,874,167, Cl. 273-14.000.
- Hillegass, Donald V.: See—
Goldberg, Jay R.; and Hillegass, Donald V., 4,874,360, Cl. 604-8.000.
- Hillstead, Richard A., to Cordis Corporation. Catheter sheath introducer. 4,874,378, Cl. 604-167.000.
- Hilton Davis Co.: See—
Kannan, Ramamurthi, 4,874,894, Cl. 564-93.000.
- Hirai, Hidetoshi: See—
Ito, Tomohito; Isomura, Renichi; Hirai, Hidetoshi; and Gomi, Fukuo, 4,874,495, Cl. 204-212.000.
- Hiraishi, Shigetoshi; Koike, Naomasa; Kondo, Kazuyoshi; and Fuchigami, Mitsuru, to Mitsubishi Paper Mills, Ltd. Thermosensitive recording material. 4,874,740, Cl. 503-201.000.
- Hirano, Tsumoru: See—
Yamanouchi, Junichi; Ono, Shigetoshi; Hirano, Tsumoru; Watanabe, Toshiyuki; Sakai, Nobuo; and Miyahashi, Keiji, 4,874,689, Cl. 430-548.000.
- Hiraoka, Hiroyuki: See—
Dickstein, Heidi L.; Hiraoka, Hiroyuki; and Lee, James H., 4,875,124, Cl. 360-126.000.
- Hirata, Kiminori: See—
Ogura, Tomoyuki; Kawamura, Yasuo; Ishii, Shigeru; Baba, Masatoshi; Taniguchi, Masakazu; Hirose, Masayoshi; Hirata, Kiminori; and Ochiai, Yoshinori, 4,874,861, Cl. 544-229.000.
- Hirata, Kimio; and Saito, Yasuo, to Toshiba Monofrax Co., Ltd. Refractory unit for a heat regenerator. 4,874,034, Cl. 165-9.100.
- Hirayama Setsubi Kabushiki Kaisha: See—
Hirayama, Shoji, 4,873,914, Cl. 98-31.600.
- Hirayama, Shoji, to Hirayama Setsubi Kabushiki Kaisha. Clean room system and unit for the same clean room system. 4,873,914, Cl. 98-31.600.
- Hirose, Fumio: See—
Yoshikumi, Chikao; Ohmura, Yoshio; Hirose, Fumio; Ikuzawa, Masanori; Matsunaga, Kenichi; Fujii, Takayoshi; Ohhara, Minoru; and Ando, Takao, 4,874,750, Cl. 514-42.000.
- Hirose, Masayoshi: See—
Ogura, Tomoyuki; Kawamura, Yasuo; Ishii, Shigeru; Baba, Masatoshi; Taniguchi, Masakazu; Hirose, Masayoshi; Hirata, Kiminori; and Ochiai, Yoshinori, 4,874,861, Cl. 544-229.000.
- Hirose, Noboru: See—
Yamane, Hisaaki; and Hirose, Noboru, 4,873,756, Cl. 29-568.000.
- Hirose, Takashi: See—
Yanagida, Kouichi; Kano, Shinichiro; Gotou, Takeshi; and Hirose, Takashi, 4,874,062, Cl. 181-250.000.
- Hirota, Minoru: See—
Matsukawa, Hideki; Masuyama, Takeshi; Hirota, Minoru; Wakahata, Yasuo; Itoh, Masahiro; and Harada, Shinji, 4,874,227, Cl. 350-334.000.
- Hisaki, Masakazu; Kashima, Kenichi; Sakamoto, Yasuhiko; Hojo, Masakazu; Katayama, Osamu; and Hata, Hiroyoshi, to Nippon Shoji Kabushiki Kaisha. 3-Aminocarbonyl-1,4-dihydropyridine-5-carboxylic acid compounds, and pharmaceutical composition containing the same. 4,874,773, Cl. 514-355.000.
- Hitachi Cable Ltd.: See—
Hongo, Akihito; Shiota, Tsuneo; Nishida, Shigeo; Miyagi, Mitsunobu; and Wagatsuma, Yoshihiko, 4,875,218, Cl. 372-64.000.
- Hitachi, Ltd.: See—
Baba, Shiro, 4,875,047, Cl. 341-155.000.
- Furuhashi, Koshi; Miyazaki, Satoshi; Furuya, Masakazu; Kawatani, Tatsu; Kouyama, Sinichi; and Kashio, Jiro, 4,875,208, Cl. 370-94.100.
- Igarashi, Takao; Sugawara, Satoshi; Yoshimoto, Yuichiro; Saito, Shozo; Fukumoto, Takashi; Endo, Zenichiro; and Shinbo, Katsutoshi, 4,874,574, Cl. 376-333.000.
- Kamifuji, Hiroshi; Tanabe, Yoshiyuki; and Morita, Kiyomi, 4,873,960, Cl. 123-480.000.
- Kato, Yoshiaki, 4,874,944, Cl. 250-288.000.
- Kazama, Saburo; and Tamura, Akira, 4,875,110, Cl. 360-64.000.
- Kimura, Hiroshi; Naito, Shotaro; Miyashita, Kunio; Noto, Yasuo; Sugiura, Noboru; Takahashi, Tadashi; Yamamura, Hirohisa;

- Yamashita, Seizi; Kawamata, Syoichi; Tajima, Fumio; and Horikoshi, Shigeru, 4,874,053, Cl. 180-79.100.
- Kuwabara, Takao; and Takahashi, Kazuo, 4,874,999, Cl. 118-410.000.
- Maeda, Akira; Sano, Koichi; Yokoyama, Tetsuo; Koizumi, Hideaki; and Mizuno, Hirotsugu, 4,875,012, Cl. 324-309.000.
- Matsumoto, Tetsuo, 4,875,192, Cl. 365-193.000.
- Murakami, Yoshiki; Yamamoto, Etsuji; Yabusaki, Masao; and Kohno, Hideki, 4,875,013, Cl. 324-318.000.
- Sakurai, Shigeo; Umezawa, Sadao; Usami, Saburo; Miyata, Hiroshi; Toriya, Hajime; Tsubouchi, Kuniyoshi; and Kaneko, Ryoichi, 4,875,170, Cl. 364-507.000.
- Shimizu, Toshihiko; Hotta, Masao; and Maio, Kenji, 4,875,048, Cl. 341-156.000.
- Tokisue, Hiromitsu; Tsumaki, Nobuo; and Koike, Toshifumi, 4,874,273, Cl. 406-88.000.
- Yokosawa, Koichi; Yamamoto, Etsuji; Nakane, Hideaki; Yabusaki, Masao; and Ogura, Yukiko, 4,875,010, Cl. 324-248.000.
- Hitachi Maxell, Ltd.: See—
Asada, Seichi; Sueyoshi, Toshinobu; and Miyake, Akira, 4,874,668, Cl. 428-403.000.
- Tanaka, Yoshito; and Umezawashi, Nobuhiro, 4,875,121, Cl. 340-129.000.
- Hitachi Metals, Ltd.: See—
Hatanaka, Koji; Maruta, Kenji; and Suwabe, Hirohisa, 4,874,923, Cl. 219-270.000.
- Shibata, Ryoichi; and Kasakoshi, Toshiyuki, 4,874,927, Cl. 219-469.000.
- Hitomi, Yasuhiro, to Shimano Industrial Company Limited. Fishing reel. 4,874,140, Cl. 242-223.000.
- Hixon, Charles E., to Cummins Engine Company, Inc. Method and apparatus for retaining roller cone of drill bit. 4,874,047, Cl. 175-369.000.
- Hochstrasser, Denis P., to Bio-Rad Laboratories, Inc. Pre-cast gel systems for two-dimensional electrophoresis. 4,874,490, Cl. 204-182.100.
- Hodgson, Peter C. Slow release berley. 4,874,607, Cl. 424-84.000.
- Hodgson, William J., Jr.: See—
Hazelton, Donald R.; and Hodgson, William J., Jr., 4,874,447, Cl. 156-167.000.
- Hoechst Aktiengesellschaft: See—
Deasy, Patrick B., 4,874,612, Cl. 424-425.000.
- Heppke, Gerd; Scherowsky, Gunter; Bahr, Christian; and Lehmann, Lutz, 4,874,545, Cl. 252-299.610.
- Kruse, Alfred; Siegemund, Gunter; and Schwertfeger, Werner, 4,874,557, Cl. 562-851.000.
- Hoechst Celanese: See—
Watts, Michael P. C.; Perera, Thiloma I.; Myers, David W.; Ozarski, Robert G.; Schipper, John F.; and Tan, Raul V., 4,874,240, Cl. 563-73.000.
- Hoechst-Roussel Pharmaceuticals Inc.: See—
Urban, Joseph J., Jr.; Henderson, Norman; and Behe, Anthony J., 4,874,605, Cl. 424-78.000.
- Hoelderich, Wolfgang; Hupfer, Leopold; and Schneider, Kurt, to BASF Aktiengesellschaft. Preparation of unsaturated and saturated ketones. 4,874,899, Cl. 568-386.000.
- Hofeditz, Wolfgang: See—
Heimerl, Albert; Brammer, Hans-Adolf; and Hofeditz, Wolfgang, 4,874,370, Cl. 604-93.000.
- Hofen, Willi: See—
Dankowski, Manfred; and Hofen, Willi, 4,874,556, Cl. 562-2.000.
- Hofer, Gerald: See—
Fehlmann, Wolfgang; Hofer, Gerald; Junger, Dieter; Karle, Anton; and Laufer, Helmut, 4,873,956, Cl. 123-357.000.
- Hoffart, Andrew B., to American Display Inc. Hinged illuminated sign. 4,873,776, Cl. 40-572.000.
- Hoffer, John C.: See—
Bowen, Terry P.; Harma, Sherry J.; and Hoffer, John C., 4,874,218, Cl. 350-96.200.
- Hofmann, Ingrid; Mutschler, Ernst; and Christner, Angelika, to Roehm GmbH Chemische Fabrik. Pharmaceutically efficacious pteridine derivatives. 4,874,763, Cl. 514-249.000.
- Hojo, Masakazu: See—
Hisaki, Masakazu; Kashima, Kenichi; Sakamoto, Yasuhiko; Hojo, Masakazu; Katayama, Osamu; and Hata, Hiroyoshi, 4,874,773, Cl. 514-355.000.
- Holland, Carmon D.: See—
Shook, Hal C.; and Holland, Carmon D., 4,873,738, Cl. 14-1.000.
- Hollander, Jan, to B.V. Asphalt-en Chemische Fabrieken Smid and Hollander. Perforated roofing material and a method of manufacturing the same. 4,874,652, Cl. 428-137.000.
- Hollis Jr, Ralph L., to International Business Machines Corporation. Magnetically levitated fine motion robot wrist with programmable compliance. 4,874,998, Cl. 318-568.210.
- Holmes, Harlan K.; Moore, Thomas C., Jr.; and Fantl, Andrew J., to United States of America, National Aeronautics and Space Administration; and Virginia Commonwealth University. Circumferential pressure probe. 4,873,990, Cl. 128-748.000.
- Holmsen, Theodore W.: See—
Kieschick, William A.; Secor, Jacob; and Holmsen, Theodore W., 4,874,421, Cl. 71-9.00H.
- Homan, Donald A. Marine toilet deodorant dispenser. 4,873,727, Cl. 4-226.000.
- Hombberger, Heinrich; Timm, Jurgen; and Rodriques, Pedro, to Swiss Aluminium Ltd. Aluminium alloy for superplastic forming. 4,874,578, Cl. 420-541.000.
- Honda Giken Kogyo Kabushiki Kaisha: See—
Fujiyoshi, Yoshihiro; Aoki, Takatoshi; and Urata, Yasuhiro, 4,873,949, Cl. 123-90.120.
- Honda, Hajime. Surface tensiometer and concentration controlling device. 4,874,426, Cl. 73-64.400.
- Honda, Toshio: See—
Kametani, Tetsuji; and Honda, Toshio, 4,874,551, Cl. 260-397.100.
- Honders, Anthonie; Horstik, Alfred J.; and Van Eyden, Gerbrand J. M., to Shell Internationale Research Maatschappij B.V. Process for the electrolytic production of non-metals. 4,874,482, Cl. 204-60.000.
- Honeyman, Henry W., III. Locking system for securing valuables. 4,873,848, Cl. 70-14.000.
- Honeywell Inc.: See—
Benason, David J.; and Burroughs, James A., 4,874,992, Cl. 315-387.000.
- Hongo, Akihito; Shiota, Tsuneo; Nishida, Shigeo; Miyagi, Mitsunobu; and Wagatsuma, Yoshihiko, to Hitachi Cable Ltd. Thin-film coated waveguide laser. 4,875,218, Cl. 372-64.000.
- Hons, Douglas A., to Eastman Kodak Company. Mechanism for accurately mounting an electronic light emitting printhead assembly. 4,875,153, Cl. 346-155.000.
- Hope Sexton: See—
Strausser, Richard A., 4,874,084, Cl. 206-231.000.
- Hopmans, Franciscus P. M.: See—
Van Twist, Robert A. H.; Hopmans, Franciscus P. M.; and Odijk, Eddy A. M., 4,875,207, Cl. 370-85.120.
- Hopper, Emil: See—
Doet, Martin H.; Hopper, Emil; Melas, Constantin M.; and Provanek, Lionel D., 4,875,112, Cl. 360-65.000.
- Horaguchi, Yoichi: See—
Ueda, Masashi; Horaguchi, Yoichi; and Sakakibara, Kenji, 4,875,073, Cl. 355-27.000.
- Hori, Kenji: See—
Sugimura, Tuyooshi; Hori, Kenji; and Oba, Kiyoyuki, 4,873,917, Cl. 99-355.000.
- Horibe, Isao: See—
Takeda, Ken'ichi; and Horibe, Isao, 4,874,898, Cl. 568-369.000.
- Horikoshi, Shigeru: See—
Kimura, Hiroshi; Naito, Shotaro; Miyashita, Kunio; Noto, Yasuo; Sugiura, Noboru; Takahashi, Tadashi; Yamamura, Hirohisa; Yamashita, Seizi; Kawamata, Syoichi; Tajima, Fumio; and Horikoshi, Shigeru, 4,874,053, Cl. 180-79.100.
- Horsfield, Edward A.: See—
Wood, Ian A.; and Horsfield, Edward A., 4,874,573, Cl. 376-272.000.
- Horst, Jenny: See—
Kiss, Akos; Kleinschmit, Peter; Hanich, Juergen; Halbritter, Guenter; and Horst, Jenny, 4,874,433, Cl. 106-450.000.
- Horstik, Alfred J.: See—
Honders, Anthonie; Horstik, Alfred J.; and Van Eyden, Gerbrand J. M., 4,874,482, Cl. 204-60.000.
- Hoishi, Junji: See—
Wakita, Saburo; and Hoishi, Junji, 4,874,577, Cl. 420-417.000.
- Hoishide, Fumitoshi: See—
Yamamoto, Shinobu; Hoishide, Fumitoshi; Takeuchi, Michikazu; Kotani, Shou; and Yasuda, Sumihiro, 4,874,924, Cl. 219-274.000.
- Hosiden Electronics Co., Ltd.: See—
Kakuta, Toshio; and Nagano, Hiroyuki, 4,874,912, Cl. 200-16.00D.
- Hosokawa, Hiroshi: See—
Idenawa, Hiroyuki; Mochimaru, Hideaki; Kanda, Hajime; Makita, Nobuhiro; Tanaka, Yoshiaki; Yagisita, Takahiro; Yamaki, Takanori; Motohashi, Takeshi; Miyamoto, Masayoshi; Ishizu, Hisao; Sagawa, Yasuhiro; Kanno, Tadaaki; Sankoda, Tomoo; Hosokawa, Hiroshi; Aoki, Hideo; Suzuki, Takami; Takeda, Hiromi; and Shimazaki, Toshio, 4,875,063, Cl. 346-160.100.
- Hotta, Masao: See—
Shimizu, Toshihiko; Hotta, Masao; and Maio, Kenji, 4,875,048, Cl. 341-156.000.
- Houjiyo, Hisao: See—
Nakagawa, Yoshitomo; Kaito, Takashi; Houjiyo, Hisao; and Yamamoto, Masahiro, 4,874,632, Cl. 427-41.000.
- House, David W.; and Scott, Ray V., Jr., to UOP. Room-temperature-cured polyurethanes and polyureas. 4,874,831, Cl. 528-48.000.
- House Food Industrial Company Limited: See—
Sugawara, Ko; Matsumura, Yasushi; Okamoto, Hidefumi; and Hayami, Hiroshi, 4,874,580, Cl. 422-25.000.
- House Food Industries, Co.: See—
Sengoku, Koji; and Nagatome, Yoshiaki, 4,874,630, Cl. 428-434.000.
- Houser, Philip H., to Proctor-Silex, Inc. Toaster oven/broiler with continuously energized indicator. 4,874,929, Cl. 219-506.000.
- Howard, Richard E.: See—
Graf, Hans P.; and Howard, Richard E., 4,875,183, Cl. 364-807.000.
- Howes, H. Frank: See—
Mathewes, James K., Jr.; Chancellor, Craig A.; and Howes, H. Frank, 4,875,209, Cl. 371-3.000.
- HRI, Inc.: See—
MacArthur, James B.; Comolli, Alfred G.; and McLean, Joseph B., 4,874,506, Cl. 208-413.000.
- Hsiao, Charles, to Baker Cummins Pharmaceuticals, Inc. Taste concealing pharmaceutical dosage unit. 4,874,613, Cl. 424-458.000.
- Hsu, Shing-Wang. Coupling member for securing a drilling head to the rotatable rod of a pneumatic tool body. 4,874,181, Cl. 279-1.00A.
- Huang, Chialang; and Vernice, Gerald G., to BOC, Inc. Method for the preparation of fluoromethyl 1,1,1,3,3,3-hexafluoro-2-propyl ether. 4,874,902, Cl. 568-683.000.

- Huang, Fred G., to Hewlett-Packard Company. Crosstalk reduction in unshielded twisted-pair lines. 4,875,205, Cl. 370-6.000.
- Huang, Leeyuan; Koupel, Lawrence; Dunn, Joseph, Jr.; Liesch, Jerrold M.; Hensens, Otto; and Woodruff, H. Boyd, to Merck & Co., Inc. Renin-inhibitory pepstatin phenyl derivatives. 4,874,745, Cl. 514-18.000.
- Huang, Tien-Tsai. Pressure gauge with a movable interior scale. 4,873,864, Cl. 73-146.800.
- Huard, Jeff, to National Semiconductor Corporation. ESD low resistance input structure. 4,875,130, Cl. 361-56.000.
- Hubbell Incorporated: See—
Schnell, Kenneth R.; and Kesler, Gregory J., 4,874,905, Cl. 174-67.000.
- Huber, Otto L.: See—
Magidson, Mark; and Huber, Otto L., 4,873,972, Cl. 128-206.120.
- Hudson Valley Metal Works, Inc.: See—
Anderson, Dean H.; and Tomann, Mark M., 4,875,052, Cl. 343-882.000.
- Huebsch, Donald L. Method and apparatus for removal of bone cement. 4,873,969, Cl. 128-92.00R.
- Huels Aktiengesellschaft: See—
Seipenbusch, Reinhold, 4,874,700, Cl. 435-145.000.
- Huffman, K. Robert, to American Cyanamid Company. Carboxy hydroxamic acid polymers and their use as detergent additives. 4,874,539, Cl. 252-174.240.
- Hughes Aircraft Company: See—
Dehne, Axel G., 4,873,831, Cl. 62-6.000.
- Oldham, Susan L.; Elias, William E.; Bigus, Stephen J.; and Lau, Kreiser S. Y., 4,874,643, Cl. 427-340.000.
- O'Meara, Thomas R., 4,874,223, Cl. 350-163.000.
- Hughes, David W.; Feeney, Robert K.; and Hertling, David R., to Georgia Tech Research Corporation. Method for altering characteristics of active semiconductor devices. 4,874,711, Cl. 437-8.000.
- Hughes, John L., to Australian Electro Optics Pty. Ltd. Fibre communication laser system. 4,875,215, Cl. 372-6.000.
- Huhmann, Douglas J.: See—
Bai, Monty W.; and Huhmann, Douglas J., 4,873,871, Cl. 73-777.000.
- Huhn, Karl, to Wacker-Chemie GmbH. Process for impregnating organic fibers. 4,874,662, Cl. 428-266.000.
- Hujeda, Yasuhiko: See—
Ichikawa, Katumi; Amano, Itaru; Hujeda, Yasuhiko; Misumi, Shikao; Hukumura, Seisuke; and Miyauchi, Hideo, 4,874,303, Cl. 425-28.100.
- Hukumura, Seisuke: See—
Ichikawa, Katumi; Amano, Itaru; Hujeda, Yasuhiko; Misumi, Shikao; Hukumura, Seisuke; and Miyauchi, Hideo, 4,874,303, Cl. 425-28.100.
- Hull, Alan. Lift-tab container opener. 4,873,896, Cl. 81-3.270.
- Hultberg, Sten; and Hansson, Birger, to Jimek International AB. Spray nozzle and valve assembly. 4,873,925, Cl. 101-147.000.
- Humphrey, Thomas. Stringed musical instrument. 4,873,909, Cl. 84-293.000.
- Humphries, Darrel V.: See—
Lo, Ying-Cheng; and Humphries, Darrel V., 4,874,657, Cl. 428-220.000.
- Hung, Paul L. K.; and Tseng, Kenneth K. S., to M&T Chemicals Inc. Aqueous alkaline developable, UV curable urethane acrylate compounds and compositions useful for forming liquid 100 percent solids, solvent-free solder mask coatings. 4,874,799, Cl. 522-96.000.
- Hunold, Michael, to Siemens Aktiengesellschaft. X-ray video system and method for the transillumination of an examination subject. 4,875,225, Cl. 378-99.000.
- Hunt, Thomas J.; Miller, James G.; Thomas, Lewis J., III; Melton, Hewlett E., Jr.; and Shoup, Thomas A., to Hewlett-Packard Company. Techniques for calculating ultrasonic integrated backscatter using frequency or time domain techniques. 4,873,984, Cl. 128-660.070.
- Hupfer, Leopold: See—
Hoelderich, Wolfgang; Hupfer, Leopold; and Schneider, Kurt, 4,874,899, Cl. 568-386.000.
- Hurd, Marvin G. Groove cutter for concrete bores. 4,874,046, Cl. 175-292.000.
- Hurley, Irvin H., Jr., to Tilcon Tomasso. Front dispensing truck with vertically and horizontally swingable screw conveyor. 4,874,283, Cl. 414-504.000.
- Huse, Syoji: See—
Hara, Toshihiro; Yotsutani, Akio; Kawasaki, Ryooji; Tate, Kazuyuki; Huse, Syoji; and Ono, Koji, 4,875,231, Cl. 379-61.000.
- Hutchins, Roger W. Deep water transient sound generator. 4,875,199, Cl. 367-175.000.
- Huth, Andreas; Sauer, Gerhard; and Wachtel, Helmut, to Schering Aktiengesellschaft. 1,2-disubstituted ergolines useful for producing central antipainergic or α_2 -receptor-blocking activity. 4,874,768, Cl. 514-288.000.
- Huwelmann, Helmut: See—
Tetenborg, Konrad; Eschmann, Heinz; and Huwelmann, Helmut, 4,873,815, Cl. 53-570.000.
- Hwang, Yu-Tsang G., to Republic Electronics Company. Miniature digital computer circuit for determining values of combined varying quantities. 4,875,182, Cl. 364-732.000.
- Hyon, Suong-Hyu; and Ikada, Yoshito, to Biomaterials Universe, Inc. Method of molding a polyvinyl alcohol contact lens. 4,874,562, Cl. 264-1.400.
- I.D. Tech Ltd.: See—
Ariav, Arie, 4,875,198, Cl. 367-93.000.
- IBP, Inc.: See—
Couture, William F., 4,873,749, Cl. 17-50.000.
- Ichihara, Isao: See—
Yamada, Ichiji; Inuzuka, Yutake; Ichihara, Isao; Murakami, Michiyuki; Suzuki, George; Yanahashi, Ryou; and Kondo, Takeshi, 4,873,884, Cl. 74-473.00P.
- Ichikawa, Katumi; Amano, Itaru; Hujeda, Yasuhiko; Misumi, Shikao; Hukumura, Seisuke; and Miyauchi, Hideo, to Kabushiki Kaisha Kobe Seiko Sho. Tire vulcanizing press. 4,874,303, Cl. 425-28.100.
- Ichikoh Industries Limited: See—
Fujiki, Hiroyuki; Michiura, Yoshiharu; and Inoue, Kiyoshi, 4,874,645, Cl. 428-31.000.
- Ichinomiya, Yutaka: See—
Funaki, Masaki; Kunihiro, Koki; and Ichinomiya, Yutaka, 4,874,654, Cl. 428-192.000.
- ICI Americas Inc.: See—
Woolard, Frank X., 4,874,422, Cl. 71-95.000.
- Woolard, Frank X., 4,874,873, Cl. 548-540.000.
- Ide, Mitsuteru: See—
Mine, Kazuhiro; Sanada, Kei; and Ide, Mitsuteru, 4,874,980, Cl. 310-328.000.
- Idemitsu Petrochemical Co., Ltd.: See—
Wakabayashi, Makoto; Fujiwara, Kenichi; and Hayashi, Hideo, 4,874,836, Cl. 528-185.000.
- Idenawa, Hiroyuki; Mochimaru, Hideaki; Kanda, Hajime; Makita, Nobuhiro; Tanaka, Yoshiaki; Yagisita, Takahiro; Yamaki, Takanori; Motohashi, Takeshi; Miyamoto, Masayoshi; Ishizu, Hisao; Sagawa, Yasuhiro; Kanno, Tadaaki; Sankoda, Tomoo; Hosokawa, Hiroshi; Aoki, Hideo; Suzuki, Takami; Takada, Hiromi; and Shimazaki, Toshio, to Ricoh Company, Ltd. Electrostatic recording apparatus. 4,875,063, Cl. 346-160.100.
- Igarashi, Takao; Sugawara, Satoshi; Yoshimoto, Yuichiro; Saito, Shozo; Fukumoto, Takashi; Endo, Zenichiro; and Shinbo, Katsutoshi, to Hitachi, Ltd. Control rod. 4,874,574, Cl. 376-333.000.
- Iguchi, Tatsuya, to Nifco, Inc. Fastener. 4,874,276, Cl. 411-48.000.
- Iida Industry Co., Ltd.: See—
Kitoh, Osamu; and Ohashi, Masahiko, 4,874,650, Cl. 428-68.000.
- Iida, Katsumi: See—
Ezaki, Hiroshi; Kobayashi, Yoneji; and Iida, Katsumi, 4,874,171, Cl. 273-77.00A.
- Iimura, Seiji; Abe, Yoshio; Okumura, Jun; Naito, Takayuki; and Kamachi, Hajime, to Bristol-Myers Company. 3-(substituted)propenyl-7-(aminothiazolylacetamido) cep-3-em-4-carboxylic acids and esters thereof. 4,874,856, Cl. 540-222.000.
- Ikada, Yoshito: See—
Hyon, Suong-Hyu; and Ikada, Yoshito, 4,874,562, Cl. 264-1.400.
- Ikebe, Tsuguo: See—
Tahara, Tetsuya; Ikebe, Tsuguo; Hakamada, Ichiro; and Yaoka, Osamu, 4,874,759, Cl. 514-232.500.
- Ikegami, Eitaro: See—
Minamisawa, Tsuyoshi; Endo, Katsunori; Ikegami, Eitaro; and Nezu, Shigeru, 4,874,800, Cl. 523-205.000.
- Ikehata, Toshihiko: See—
Koshiba, Nobuharu; Ikehata, Toshihiko; and Takata, Kenichi, 4,874,680, Cl. 429-197.000.
- Ikemoto, Isao: See—
Sootome, Sumitoshi; Mizutani, Morikazu; Ikemoto, Isao; Kanemitsu, Shinji; Kitajima, Hajime; and Onoda, Shigeyoshi, 4,875,075, Cl. 355-50.000.
- Ikezaki, Yoshiyuki: See—
Sakaida, Atsuo; Chikaoka, Yasuji; Imoto, Yasuo; Iriguchi, Akira; and Ikezaki, Yoshiyuki, 4,874,978, Cl. 310-328.000.
- Ikuta, Kazuo: See—
Ochiai, Hironori; Suzuki, Etsuo; and Ikuta, Kazuo, 4,874,202, Cl. 296-222.000.
- Ikuzawa, Masanori: See—
Yoshikumi, Chikao; Ohmura, Yoshio; Hirose, Fumio; Ikuzawa, Masanori; Matsunaga, Kenichi; Fujii, Takayoshi; Ohhara, Minoru; and Ando, Takao, 4,874,750, Cl. 514-42.000.
- Iliff, Robert J.: See—
Peterson, David; Chen, Loren; and Iliff, Robert J., 4,874,537, Cl. 252-99.000.
- Im, Jang-hi: See—
Chau, C. C.; and Im, Jang-hi, 4,874,568, Cl. 264-49.000.
- Imada, Isuke: See—
Terao, Shinji; Okazaki, Hisayoshi; and Imada, Isuke, 4,874,752, Cl. 536-55.200.
- Imamura, Makoto; and Miyamoto, Ryouichi, to Kabushiki Kaisha Toshiba. Film carrier and a method for manufacturing a semiconductor device utilizing the same. 4,874,086, Cl. 206-330.000.
- Imaoka, Shinichi: See—
Nishimoto, Yoshiro; Yoneda, Yasuji; Imaoka, Shinichi; Nakai, Yasuhide; Nakase, Akimitsu; Onishi, Yoshihiko; Tachibana, Hiroyuki; Inoue, Takayoshi; Kusaka, Takuya; Takamatsu, Hiroyuki; Tojo, Shigeki; Kajikawa, Hiroshi; and Nishimura, Kozo, 4,874,939, Cl. 250-211.00J.
- Imberge, Paul: See—
Hager, Jorg; Ghyczy, Miklos; Feyen, Vincent; Imberge, Paul; Brandenburg, Ulrich; and Wilperath, Peter, 4,874,553, Cl. 260-403.000.
- Imi-Tech Corporation: See—
Ferro, Gregory A., 4,874,452, Cl. 156-308.600.
- Imoto, Yasuo: See—
Sakaida, Atsuo; Chikaoka, Yasuji; Imoto, Yasuo; Iriguchi, Akira; and Ikezaki, Yoshiyuki, 4,874,978, Cl. 310-328.000.

- Impris Technology Incorporated: See—
Vadnais, Timothy W.; and Hennenfent, Douglas J., 4,874,922, Cl. 219-243.000.
- Imreg, Inc.: See—
Gottlieb, A. Arthur, 4,874,608, Cl. 424-85.100.
- Inaba, Tsutomu: See—
Kobayashi, Norihide; Inaba, Tsutomu; Kimura, Tadaaki; and Sugihara, Masahiro, 4,874,302, Cl. 418-55.000.
- Inada, Hiromasa: See—
Sugimori, Teruhiko; Suzuki, Fumio; Habara, Hideaki; and Inada, Hiromasa, 4,874,841, Cl. 528-491.000.
- Inagaki, Hiromichi, to Nihon Tokkyo Kanri Company Limited. Method of forming a closed filled bag, a bag construction and an apparatus for forming the bag. 4,874,257, Cl. 383-63.000.
- Inatani, Toshihiro: See—
Hamada, Takao; Tsuchiya, Nobuo; Inatani, Toshihiro; Katayama, Eiji; Koitabashi, Toshimitsu; Okabe, Kyoji; Sumito, Mitsuo; and Takada, Yoshiyasu, 4,874,427, Cl. 75-26.000.
- Ince, Gordon R., to James Howden & Company Limited. Tunnel boring machine. 4,874,267, Cl. 405-142.000.
- Indiana University Foundation: See—
Fife, Wilmer K.; and Zhang, Zhi-Dong, 4,874,558, Cl. 562-894.000.
- Indikon Company, Inc.: See—
Gins, Haskell, 4,875,007, Cl. 324-207.000.
- Ing, C. Olivetti & C., S.p.A.: See—
Furno, Franco; and Biondi, Luigi, 4,875,035, Cl. 340-731.000.
- Ink Company, The: See—
McKelvey, John L., 4,874,515, Cl. 210-360.100.
- Inomata, Masachi: See—
Uetugi, Mitsuki; Inomata, Masachi; and Komine, Isamu, 4,874,955, Cl. 250-550.000.
- Inoue, Kiyoshi: See—
Fujiki, Hiroyuki; Michiura, Yoshiharu; and Inoue, Kiyoshi, 4,874,645, Cl. 428-31.000.
- Inoue, Takayoshi: See—
Nishimoto, Yoshiro; Yoneda, Yasuji; Imaoka, Shinichi; Nakai, Yasuhide; Nakase, Akimitsu; Onishi, Yoshihiko; Tachibana, Hiroyuki; Inoue, Takayoshi; Kusaka, Takuya; Takamatsu, Hiroyuki; Tojo, Shigeki; Kajikawa, Hiroshi; and Nishimura, Kozo, 4,874,939, Cl. 250-211.00J.
- Inoue, Yasuo, to Mitsubishi Denki Kabushiki Kaisha. Method for forming SOI film. 4,874,718, Cl. 437-62.000.
- Inoue, Yukihiro: See—
Washizuka, Isamu; Inoue, Yukihiro; and Okajima, Yoshio, 4,875,036, Cl. 340-784.000.
- Input/Output, Inc.: See—
Carroll, Paul E.; James, Roy W., III; Bowen, Charles K.; and Smith, Gillan C., 4,875,166, Cl. 364-421.000.
- Inskip, Harold K.; and Waggoner, Marion G., to Du Pont de Nemours, E. I., and Company. Compositions of imidized acrylic polymers and polyamides. 4,874,817, Cl. 525-183.000.
- Institut Francais du Pétrole: See—
Rojey, Alexandre; and Grehier, Alain, 4,873,835, Cl. 62-93.000.
- Institut Francais du Pétrole & Compagnie Generale de Geophysique: See—
Guereudel, Philippe; Naville, Charles; Laurent, Jean; and Dedole, Pascal, 4,874,060, Cl. 181-102.000.
- Institut Francais du Pétrole et Geomechanique: See—
Le Dail, Jean-Claude; and Marchand, Jean-Claude, 4,874,328, Cl. 439-278.000.
- Institut Problem Modelirovania V Energetike Akademii Nauk Ukrainskoi SSR: See—
Petrov, Vyacheslav V.; Gorshkov, Nikolai V.; Antonov, Alexandr A.; Tokar, Alexandr P.; Krjuchin, Andrei A.; and Shanoilo, Semen M., 4,875,204, Cl. 369-100.000.
- Institute for Industrial Research and Standards: See—
Carroll, Francis A., 4,874,210, Cl. 312-257.100.
- Institute of Molecular Biology, Inc.: See—
Antoniades, Harry N.; and Lynch, Samuel E., 4,874,746, Cl. 514-21.000.
- Institute of Physical & Chemical Research, The: See—
Miya, Shinya; Harada, Masato; Mise, Takaya; and Yamazaki, Hiroshi, 4,874,880, Cl. 556-53.000.
- Intel Corporation: See—
Jungroth, Owen W., 4,875,188, Cl. 365-185.000.
- Mulder, Theodor; and Swartz, Ronald W., 4,875,191, Cl. 365-189.010.
- International Business Machines Corporation: See—
Dickstein, Heidi L.; Hirooka, Hiroyuki; and Lee, James H., 4,875,124, Cl. 360-126.000.
- Dost, Martin H.; Hopner, Emil; Melas, Constantin M.; and Provaček, Lionel D., 4,875,112, Cl. 360-65.000.
- Ferriter, Kate M.; and Mathis, Robert B., 4,875,162, Cl. 364-401.000.
- Hollis Jr, Ralph L., 4,874,998, Cl. 318-568.210.
- Iskiyan, James L.; Legvold, Vernon J.; Leung, Peter L. H.; and Martin, Guy E., 4,875,155, Cl. 364-200.000.
- Oka, Yoshinobu; and Sato, Koichi, 4,874,931, Cl. 235-379.000.
- Scott, John Campbell; and Shattuck, Meredith D., 4,874,682, Cl. 430-59.000.
- International Medical Innovators, Inc.: See—
Nunez, Chris E., 4,874,384, Cl. 604-198.000.
- International Paper Box Machine Co., Inc.: See—
Labombard, Raymond A.; and Tremblay, Robert A., 4,873,813, Cl. 53-438.000.
- International Telesystems Corporation: See—
Frimmel, James J., Jr.; Ouellette, Thomas; and Deglin, Richard N., 4,875,157, Cl. 364-200.000.
- Inuzuka, Yutake: See—
Yamada, Ichiji; Inuzuka, Yutake; Ichihara, Isao; Murakami, Michiyuki; Suzuki, George; Yanahashi, Ryou; and Kondo, Takeshi, 4,873,884, Cl. 74-473.00P.
- Ionescu, Alexandru D.: See—
Borcea, Nicky; and Ionescu, Alexandru D., 4,874,194, Cl. 254-88.000.
- Iowa State University Research Foundation, Inc.: See—
Synovec, Robert E.; and Yueng, Edward S., 4,875,169, Cl. 364-497.000.
- Ip, Matthew, to Halliburton Logging Services, Inc. Universal cable head for a multiconductor logging cable. 4,874,327, Cl. 439-275.000.
- Iqbal, Muhammad, to Kohler Co. Diverter valve and vacuum breaker usable therewith. 4,874,006, Cl. 137-119.000.
- Irace, Joseph F.: See—
Mendenhall, Abraham H.; Irace, Joseph F.; and Skudrzyk, Joseph, 4,874,620, Cl. 426-113.000.
- Iriguchi, Akira: See—
Sakaida, Atsuo; Chikaoka, Yasuji; Imoto, Yasuo; Iriguchi, Akira; and Ikezaki, Yoshiyuki, 4,874,978, Cl. 310-328.000.
- Isai, Masaaki: See—
Oshita, Masahide; Isai, Masaaki; and Fukunaka, Toshiaki, 4,874,438, Cl. 148-400.000.
- Iseki Food Engineering Kabushiki Kaisha: See—
Sugimura, Tutoshi; Hori, Kenji; and Oba, Kiyoyuki, 4,873,917, Cl. 99-355.000.
- Ishak, Maher; and Schwartz, Alexander, to Diabrase International Ltd. Method of forming a flexible abrasive. 4,874,478, Cl. 204-16.000.
- Ishida, Toshinobu: See—
Kousai, Tadashi; Ishida, Toshinobu; and Moriuchi, Yousuke, 4,874,374, Cl. 604-164.000.
- Ishida, Tsutomu: See—
Sasaki, Saburo; Ishida, Tsutomu; and Yamamoto, Kenji, 4,874,957, Cl. 250-578.000.
- Ishihara, Nobuhiro: See—
Asano, Hiroaki; Tsujiuchi, Toshio; Yoneda, Takao; Ishihara, Nobuhiro; Maruyama, Toshio; and Ohta, Norio, 4,873,793, Cl. 51-165.710.
- Ishii, Hiroaki, to Omron Tateisi Electronics Co. Electronic cash register system with faster access time to price look-up file. 4,875,163, Cl. 364-405.000.
- Ishii, Masahiko: See—
Hamaguchi, Shigeki; Ohtsuka, Yasuhiro; Motohiro, Tomoyoshi; Taga, Yasunori; and Ishii, Masahiko, 4,874,664, Cl. 428-325.000.
- Ishii, Shigeru: See—
Ogura, Tomoyuki; Kawamura, Yasuo; Ishii, Shigeru; Baba, Masatoshi; Taniguchi, Masakazu; Hirose, Masayoshi; Hirata, Kiminori; and Ochiai, Yoshinori, 4,874,861, Cl. 544-229.000.
- Ishikawa, Kikue: See—
Yonemoto, Kazuya; Kagawa, Yoshiaki; Ishikawa, Kikue; Suzuki, Tomoyuki; and Hamasaki, Masaharu, 4,875,100, Cl. 358-213.190.
- Ishikawa, Norio, to Mitsubishi Denki K.K. Printed circuit board. 4,874,907, Cl. 174-68.500.
- Ishikawa, Toyoyuki; Kaneko, Toshio; Endo, Shuichi; Ogata, Yoshihiro; and Takaya, Toshihiko, to Ricoh Company, Ltd. Image developing device. 4,873,940, Cl. 118-651.000.
- Ishikawajima-Harima Heavy Industries Co., Ltd.: See—
Watanabe, Naoto; Tanaka, Akira; Matsumoto, Takayuki; Ohmura, Yutaka; and Kojima, Hisao, 4,873,760, Cl. 29-714.000.
- Ishioka, Hiroshi: See—
Yamamoto, Shosaku; Kakinuma, Kazuo; Ishioka, Hiroshi; Sodeyama, Fumio; Mayumi, Junji; and Maruta, Riehiro, 4,874,818, Cl. 525-183.000.
- Ishizu, Hisao: See—
Idenawa, Hiroyuki; Mochimaru, Hideaki; Kanda, Hajime; Makita, Nobuhiro; Tanaka, Yoshiaki; Yagisita, Takahiro; Yamaki, Takanori; Motohashi, Takeshi; Miyamoto, Masayoshi; Ishizu, Hisao; Sagawa, Yasuhiro; Kanno, Tadaaki; Sankoda, Tomoo; Hosokawa, Hiroshi; Aoki, Hideo; Suzuki, Takami; Takada, Hiromi; and Shimazaki, Toshio, 4,875,063, Cl. 346-160.100.
- Isigaki, Chizuru: See—
Sato, Masahiko; Konuma, Toshimitsu; Odaka, Seiichi; Yamaguchi, Toshiharu; Watanabe, Toshio; Aoyagi, Osamu; Tabata, Kaoru; Isigaki, Chizuru; Sakayori, Hiroyuki; Kobayashi, Ippei; Osebe, Akio; and Yamazaki, Shunpei, 4,874,461, Cl. 156-633.000.
- Iskiyan, James L.; Legvold, Vernon J.; Leung, Peter L. H.; and Martin, Guy E., to International Business Machines Corporation. Peripheral subsystem having read/write cache with record access. 4,875,155, Cl. 364-200.000.
- Isomura, Renichi: See—
Ito, Tomohito; Isomura, Renichi; Hirai, Hidetoshi; and Gomi, Fukuo, 4,874,495, Cl. 204-212.000.
- Itabashi, Masamichi, to Fuji Photo Film Co., Ltd. Method for forming an image. 4,874,687, Cl. 430-446.000.
- Itaro Horiuchi & Co., Ltd.: See—
Kametani, Tetsuji; and Honda, Toshio, 4,874,551, Cl. 260-397.100.
- Ito, Haruyuki; and Matsumoto, Akio, to Toto Ltd. Porous mold for pressure slip casting. 4,874,304, Cl. 425-84.000.
- Ito, Tomohito; Isomura, Renichi; Hirai, Hidetoshi; and Gomi, Fukuo, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Apparatus for producing a fiber aggregate. 4,874,495, Cl. 204-212.000.

Ito, Tohiyasu; Minoura, Jun; Mori, Takaaki; Takahashi, Shigeyuki; Kato, Mamoru; Shimada, Junichi; and Hayakawa, Fujio, to Toyoda Gosei Co., Ltd. Planar dimmer. 4,874,229, Cl. 350-357.000.

Itoh, Kenji: See—
Yamazaki, Shunpei; Itoh, Kenji; and Nagayama, Susumu, 4,874,920, Cl. 219-121.850.

Itoh, Masahiro: See—
Matsukawa, Hideki; Masuyama, Takeshi; Hirota, Minoru; Wakahata, Yasuo; Itoh, Masahiro; and Harada, Shinji, 4,874,227, Cl. 350-334.000.

Itoh, Munechiko: See—
Sakamoto, Takaaki; Itoh, Munechiko; and Maeda, Shuji, 4,874,826, Cl. 525-534.000.

ITT Gilfillan, a division of ITT Corporation: See—
Rathi, Dev D., 4,875,050, Cl. 342-195.000.

Ivankovich, Anthony K.: See—
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Iverson, Ralph, to Whittaker Corporation. Strain relief and connector-cable assembly bearing the same. 4,874,331, Cl. 439-449.000.

Iwata, Mitsuru: See—
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Jaba, Gert; and Richartz, Adolf, to Bayer Aktiengesellschaft. Microcapsules having polyurethane walls. 4,874,832, Cl. 528-60.000.

Jackson, Patrick; H. Continuously variable belt-drive transmission. 4,874,351, Cl. 474-49.000.

Jackson, Richard A., to Grass Valley Group, Inc., The. Perspective processing of a video signal. 4,875,097, Cl. 358-180.000.

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Jager: See—
Bezard, Jean-Jacques; Feppon, Philippe; and Rodionoff, Pierre, 4,874,242, Cl. 356-341.000.

Jaffe, Kenneth: See—
Sheridan, Michael; and Jaffe, Kenneth, 4,873,876, Cl. 73-863.860.

James Burn International Ltd.: See—
Jones, Leonard W. N., 4,873,858, Cl. 72-312.000.

James Howden & Company Limited: See—
Ince, Gordon R., 4,874,267, Cl. 405-142.000.

James L. Day Co., Inc.: See—
Day, James L., 4,873,873, Cl. 73-861.630.

James, Roy W., III: See—
Carroll, Paul E.; James, Roy W., III; Bowen, Charles K.; and Smith, Gillan C., 4,875,166, Cl. 364-421.000.

Janes, Norman F.: See—
Elliott, Michael; Janes, Norman F.; and Khambay, Bhupinder P. S., 4,874,781, Cl. 514-463.000.

Janney, David F. Cantilevered integral airfoil method. 4,874,031, Cl. 164-76.100.

Janssen, Adrian P., to STC PLC. Light source and detector packages. 4,874,217, Cl. 350-96.200.

Janssen, Alexander P. Disposable bags. 4,873,919, Cl. 99-403.000.

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Ooms, Leo A. A.; and Degryse, Anne-Dominique A. Y., 4,874,766, Cl. 514-258.000.

Jarman, Thomas B., to Renishaw plc. Datuming of analogue measurement probes. 4,875,177, Cl. 364-559.000.

Jasinski, Leon: See—
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Jeffs, David H.: See—
Jesop, Paul M.; and Jeffs, David H., 4,874,102, Cl. 215-273.000.

Jelich, Klaus; Gayer, Herbert; Kramer, Wolfgang; Santel, Hans-Joachim; Schmidt, Robert R.; and Strang, Harry, to Bayer Aktiengesellschaft. Herbicidal agents. 4,874,424, Cl. 71-105.000.

Jenes, John A. Positive displacement engine compounded with a gas turbine engine. 4,873,825, Cl. 60-606.000.

Jeney, Josef, to Maschinenfabrik Andritz Aktiengesellschaft. Process for the purification of waste gases containing hydrochloric acid and sulphur dioxide. 4,874,591, Cl. 423-240.000.

Jennings, Timothy C.: See—
Thompson, Marvin W.; Jennings, Timothy C.; Scott, James A.; Phenice, Ronald W.; Murphy, Margaret H.; Nakash, Gabriel D.; Biggers, James R.; Boudreau, Lynnlee M.; and Curiel Contreras, Jorge H., 4,874,266, Cl. 403-407.100.

Jensen, Craig L.: See—
Sawtell, Ralph R.; Bretz, Philip E.; and Jensen, Craig L., 4,874,440, Cl. 148-437.000.

Jenson, William M.: See—
Grant, Robert W.; and Jenson, William M., 4,874,014, Cl. 137-606.000.

Jenusaitia, Matthew: See—
Sutherland, Karl M.; and Jenusaitia, Matthew, 4,874,581, Cl. 422-46.000.

Jeol Ltd.: See—
Ohi, Kimio, 4,874,945, Cl. 250-306.000.

Jeschke, Fred G., to American Glass and Metal Corporation. Flexible splice for metal frame members in a curtain wall. 4,873,806, Cl. 52-235.000.

Jesop, Paul M.; and Jeffs, David H., to Multi-Technology Inc. Medical fail safe releasable locks and/or seals for capped disposable centrifuge containers, cryogenic vials and the like. 4,874,102, Cl. 215-273.000.

Jidosha Kiki Co., Ltd.: See—
Hatanaka, Koji; Maruta, Kenzi; and Suwabe, Hirohisa, 4,874,923, Cl. 219-270.000.

Jimek International AB: See—
Hultberg, Sten; and Hansson, Birger, 4,873,925, Cl. 101-147.000.

Jira, Alfred: See—
Daubenbuchel, Werner; and Jira, Alfred, 4,874,649, Cl. 428-36.500.

Joannou, Kyriacos; Wilson, Kenneth; and Lowry, Alan B., to Pericom Corporation. Tape head cleaner cartridge. 4,875,125, Cl. 360-128.000.

Job, Robert C., to Shell Oil Company. Silicate-modified magnesium alkoxide polymerization catalysts. 4,874,737, Cl. 502-171.000.

Jockline, S. R. L.: See—
Chiavetta, Sebastiano R.; and De Guglielmi, Giorgio, 4,874,163, Cl. 272-53.200.

Johansson, Ronald C., to Minnesota Mining and Manufacturing Company. Wiring harness. 4,874,908, Cl. 174-72.00A.

Johns Hopkins University, Med School, The: See—
Payne, Donna W.; and Talalay, Paul, 4,874,696, Cl. 435-26.000.

Johns, Ken; Re, Alberto; and Bargigia, Gianangelo, to Ausimont S.p.A. Process for curing thermosetting resins by means of a liquid heat transmitter. 4,874,842, Cl. 528-494.000.

Johns, Ken W. E.; Briggs, Stuart; and Flabbi, Luciano, to Montedison S.p.A. Process for carrying out the soldering of electronic components on a support. 4,874,124, Cl. 228-180.100.

Johnson, Arthur F.; and Sackett, Robert L., to RCM Industries Corporation. Economic recovery and utilization of boiler flue gas pollutants. 4,874,585, Cl. 422-171.000.

Johnson, Beamon M.: See—
Lauritzen, Ann M.; Baker, David S.; Christiansen, Margot H.; Johnson, Beamon M.; and Schuren, John G., 4,874,879, Cl. 549-536.000.

Johnson, Elizabeth A.: See—
Carethers, Mary E.; Centenka, Waczeslaw A.; Connor, David T.; Johnson, Elizabeth A.; Kiely, John S.; Schwender, Charles F.; Sircar, Jagadish C.; Sorenson, Roderick J.; Unangst, Paul C.; and Bruns, Robert F., 4,874,758, Cl. 514-226.500.

Johnson & Johnson Patient Care, Inc.: See—
Joyner, Danny W., 4,873,998, Cl. 128-879.000.

Johnson, Leonard E., Jr., to L. E. Johnson Products, Inc. Door hinge. 4,873,744, Cl. 16-247.000.

Johnson, Richard A.: See—
Daggett, Kenneth E.; Onaga, Eimei M.; Casler, Richard J., Jr.; and Johnson, Richard A., 4,874,997, Cl. 318-568.100.

Johnson, Robert B.; and Smith, Robert P., to K & R Equipment, Incorporated. Method and apparatus for automatically opening bags. 4,874,354, Cl. 493-101.000.

Johnson, Wayne L.: See—
Goodwin, Dennis L.; Hawkins, Mark R.; Johnson, Wayne L.; Olsen, Aage; and Robinson, McDonald, 4,874,464, Cl. 156-646.000.

Johnston, Lonnie E., to Crawford Fitting Company. Swaging tool having indicating means. 4,873,755, Cl. 29-237.000.

Johnston, Robert H. Power saw. 4,873,766, Cl. 30-166.100.

Joll, David J.: See—
Matthews, Bernard T.; Joll, David J.; and Ziauddin, Hameed M., 4,874,623, Cl. 426-272.000.

Jones, Leonard W. N., to James Burn International Ltd. Manufacture of wire binding elements. 4,873,858, Cl. 72-312.000.

Jones, Marvin E.: See—
Reed, John F.; and Jones, Marvin E., 4,874,399, Cl. 55-2.000.

Jones, R. A. & Co. Inc.: See—
Greenwell, Joseph D., 4,874,067, Cl. 192-4.00R.

Joseph, Earl M.; Pritchard, Robert J.; and Sufi, Arshad H., to Amoco Corporation. Method of producing viscous oil from subterranean formations. 4,874,043, Cl. 166-272.000.

Joyner, Danny W., to Johnson & Johnson Patient Care, Inc. Surgical hand protector system. 4,873,998, Cl. 128-879.000.

Ju, Shiaw: See—
Cozewith, Charles; Ju, Shiaw; and Verstrate, Gary W., 4,874,820, Cl. 525-240.000.

Jucha, Rhett B.; Carter, Duane E.; Davis, Cecil J.; and Crank, Sue E., to Texas Instruments Incorporated. Selective etching of tungsten by remote and in situ plasma generation. 4,874,723, Cl. 437-245.000.

Judge, John L., to Magni Systems, Inc. Multi-standard vectoroscope. 4,875,089, Cl. 358-10.000.

Jugo-Import-Export-Anstalt: See—
Heinze, Otto, 4,874,150, Cl. 249-18.000.

Julius Blum Gesellschaft M.B.H.: See—
Rock, Erich; and Brustle, Klaus, 4,874,212, Cl. 312-330.100.

Jung, Rolf; Buss, Albert; and Buchmann, Winfried, to Krauss u. Reichert GmbH & Co. KG Spezialmaschinenfabrik. Method for minimizing material utilization during spreading of a material web. 4,874,157, Cl. 270-30.000.

Jung, Sang H.; and Kim, Seung K., to Lucky, Ltd. Process for the preparation of pyrethroid type ester compounds. 4,874,887, Cl. 560-124.000.

Junger, Dieter: See—
Fehlmann, Wolfgang; Hofer, Gerald; Junger, Dieter; Karle, Anton; and Laufer, Helmut, 4,873,956, Cl. 123-357.000.

Jungroth, Owen W., to Intel Corporation. Voltage margining circuit for flash eeprom. 4,875,188, Cl. 365-185.000.

Jury, Egon, to Metallgesellschaft Aktiengesellschaft. Method of and apparatus for removing gaseous pollutants from exhaust gases. 4,874,400, Cl. 55-8.000.

K & R Equipment, Incorporated: See—
Johnson, Robert B.; and Smith, Robert P., 4,874,354, Cl. 493-101.000.

Kabatek, Jan; and Dittl, Pavel, to Ceske vysoké uceni Technicke, rektorat. Arrangement for continuous mixing of liquids. 4,874,249, Cl. 366-339.000.

Kaburagi, Kouji: See—
Sonoda, Sakae; Hetsugi, Kouji; Sawasaki, Yoshihiko; Kaburagi, Kouji; and Matsushima, Yasunobu, 4,874,480, Cl. 204-56.100.

Kabushiki Kaisha Daikin Seisakusho: See—
Ohkubo, Masahiro, 4,873,892, Cl. 74-710.500.

Kabushiki Kaisha Horiken: See—
Sugimura, Tutoshi; Mori, Kenji; and Oba, Kiyoyuki, 4,873,917, Cl. 99-355.000.

Kabushiki Kaisha Isaki Kaihatsu Koki: See—
Akesaka, Toshio, 4,874,268, Cl. 405-184.000.

Kabushiki Kaisha Kobe Seiko Sho: See—
Ichikawa, Katsumi; Amano, Itaru; Hujieda, Yasuhiko; Misumi, Shikao; Hukumura, Seisuke; and Miyauchi, Hideo, 4,874,303, Cl. 425-28.100.

Nishimoto, Yoshiro; Yoneda, Yasuji; Imaoka, Shinichi; Nakai, Yasuhide; Nakae, Akimitsu; Onishi, Yoshihiko; Tachibana, Hiroyuki; Inoue, Takayoshi; Kusaka, Takuya; Takamatsu, Hiroyuki; Tojyo, Shigeki; Kajikawa, Hiroshi; and Nishimura, Kozo, 4,874,939, Cl. 250-211.001.

Kabushiki Kaisha Murakoshi Seiko: See—
Toyama, Hiroaki, 4,873,743, Cl. 16-237.000.

Kabushiki Kaisha Nippon Conlux: See—
Kobayashi, Osamu; Yukimoto, Koji; and Mikami, Mitsugu, 4,874,347, Cl. 453-5.000.

Kabushiki Kaisha Toshiba: See—
Egawa, Hidemitsu; Aoki, Riehiro; and Okumura, Katsuya, 4,875,088, Cl. 357-67.000.

Endo, Yukio; and Harada, Nozomu, 4,875,101, Cl. 358-213.190.

Hara, Toshihiro; Yotsutani, Akio; Kawasaki, Ryoji; Tate, Kazuyuki; Huse, Syoji; and Ono, Koji, 4,875,231, Cl. 379-61.000.

Imamura, Makoto; and Miyamoto, Ryoichi, 4,874,086, Cl. 206-330.000.

Kato, Toshihiro; Shindo, Masamichi; and Fukasawa, Yoshihito, 4,874,956, Cl. 250-560.000.

Kurosawa, Kei, 4,874,719, Cl. 437-195.000.

Momodomi, Masaki; and Sakui, Koji, 4,875,195, Cl. 365-230.080.

Nakahara, Jiro; Ueshin, Akito; and Okajima, Shiro, 4,874,934, Cl. 235-492.000.

Nakajima, Hirotaka, 4,873,985, Cl. 128-661.090.

Okamoto, Tsuguhiko, 4,874,937, Cl. 250-203.00R.

Sakazaki, Yoshihisa, 4,875,017, Cl. 329-336.000.

Satou, Takeo; and Shimizu, Yasuhiko, 4,874,444, Cl. 156-64.000.

Yamanishi, Eiichi; Abuyama, Yasuo; and Someya, Akihiko, 4,875,092, Cl. 358-75.000.

Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: See—
Ito, Tomohito; Isomura, Renichi; Hirai, Hidetoshi; and Gomi, Fukuio, 4,874,495, Cl. 204-212.000.

Kabushiki Kaisha Toyota Chuo Kenkyusho: See—
Hamaguchi, Shigeki; Ohtsuka, Yasuhiro; Motohiro, Tomoyoshi; Taga, Yasuori; and Ishii, Masahiko, 4,874,664, Cl. 428-325.000.

Kabushiki Kaisha Yamahiro: See—
Kawashita, Fukunosuke, 4,874,278, Cl. 411-386.000.

Kadow, John F.: See—
Vyas, Dolatrai M.; Saulnier, Mark G.; and Kadow, John F., 4,874,851, Cl. 536-17.200.

Kaga, Gary: See—
Arnott, John; and Kaga, Gary, 4,874,099, Cl. 211-50.000.

Kagawa, Yoshiaki: See—
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Kagei, Kengo: See—
Ueda, Kouichiro; Tanaka, Satoru; Kunii, Toshinobu; Kagei, Kengo; Sato, Tadashi; Ono, Hideki; Ohtsuka, Issei; Kawase, Mayumi; Ohgoh, Toshiharu; and Wakabayashi, Tsuneo, 4,874,869, Cl. 548-309.000.

Kaiser, Steven W.: See—
Olson, Kurt D.; and Kaiser, Steven W., 4,874,896, Cl. 564-479.000.

Kaiser, Thomas A.: See—
Binder, John J.; and Kaiser, Thomas A., 4,873,937, Cl. 118-44.000.

Kaito, Yoshikazu; and Yamagishi, Takashi, to Nippon Sheet Glass Co., Ltd. Ion exchange processing method of glass. 4,874,414, Cl. 65-20.130.

Kaito, Takashi: See—
Nakagawa, Yoshitomo; Kaito, Takashi; Houjyo, Hisao; and Yamamoto, Masahiro, 4,874,632, Cl. 427-41.000.

Kajigaya, Ichiro: See—
Hadano, Yoshikazu; Tsunoda, Eiji; and Kajigaya, Ichiro, 4,873,827, Cl. 60-646.000.

Kajikawa, Hiroshi: See—
Nishimoto, Yoshiro; Yoneda, Yasuji; Imaoka, Shinichi; Nakai, Yasuhide; Nakae, Akimitsu; Onishi, Yoshihiko; Tachibana, Hiroyuki; Inoue, Takayoshi; Kusaka, Takuya; Takamatsu,

Hiroyuki; Tojyo, Shigeki; Kajikawa, Hiroshi; and Nishimura, Kozo, 4,874,939, Cl. 250-211.001.

Kajima Corporation: See—
Ochi, Tatsuyuki; Tanaka, Nobuo; and Mio, Kohei, 4,874,238, Cl. 356-1.000.

Kakinuma, Kazuo: See—
Yamamoto, Shosaku; Kakinuma, Kazuo; Ishioka, Hiroshi; Sodeyama, Fumio; Mayumi, Junji; and Maruta, Riehiro, 4,874,818, Cl. 525-183.000.

Kakuta, Toshio; and Nagano, Hiroyuki, to Hosiden Electronics Co., Ltd. Hook switch. 4,874,912, Cl. 200-16.00D.

Kamachi, Hajime: See—
Iimura, Seiji; Abe, Yoshio; Okumura, Jun; Naito, Takayuki; and Kamachi, Hajime, 4,874,856, Cl. 540-222.000.

Kameda, Kinya: See—
Kobayashi, Setsuo; Nakazawa, Taiguo; Yoshie, Yasumasa; Abiko, Yasushi; and Kameda, Kinya, 4,874,772, Cl. 514-341.000.

Kamegaya, Shigeru: See—
Muranaka, Shigeo; Ohkawa, Kouzaburo; Yokoyama, Junichi; Matayoshi, Yutaka; and Kamegaya, Shigeru, 4,873,953, Cl. 123-308.000.

Kametani, Tetsuji; and Honda, Toshio, to Itaro Horiuchi & Co., Ltd. 8-lactone derivatives and process of preparing same. 4,874,551, Cl. 260-397.100.

Kamifuji, Hiroshi; Tanabe, Yoshiyuki; and Morita, Kiyomi, to Hitachi, Ltd. Electronically-controlled fuel injection system for internal combustion engines. 4,873,960, Cl. 123-480.000.

Kamiya, Masaaki: See—
Namiki, Masayuki; Gouda, Masanori; and Kamiya, Masaaki, 4,875,011, Cl. 324-251.000.

Kamon, Kouichi, to Ricoh Company, Ltd. Document sheet position detecting device for image forming apparatus. 4,875,104, Cl. 358-400.000.

Kamon, Yoshiyuki; Ogiwara, Akira; and Nageno, Koji, to Sony Corporation. Connector apparatus. 4,874,316, Cl. 439-39.000.

Kampa, Barbara: See—
Yong, Bak G.; Petra, Barth; Dietrich, Demus; Detlev, Joachim; Kampa, Barbara; Kohler, Saskia; Mohr, Kristine; Paschke, Reinhard; Pelzl, Gerhard; Rosenfeld, Ulrich; Schafer, Wolfgang; Scherf, Klaus-Dieter; Tachirke, Carsten; Weissflog, Wolfgang; and Zschke, Horst, 4,874,544, Cl. 252-299.610.

Kan, Hirofumi: See—
Koishi, Musubu; Mizushima, Yoshihiko; and Kan, Hirofumi, 4,875,093, Cl. 358-83.000.

Kan, Toshiya: See—
Tanaka, Masato; and Kan, Toshiya, 4,874,993, Cl. 318-254.000.

Kanayama, Yutaka, to Kanayama, Yutaka; and Glory Kogyo Kabushiki Kaisha. Locomotion-command method for mobile robots. 4,875,172, Cl. 364-513.000.

Kanda, Hajime: See—
Idenawa, Hiroyuki; Mochimaru, Hideaki; Kanda, Hajime; Makita, Nobuhiro; Tanaka, Yoshiaki; Yagisita, Takahiro; Yamaki, Takanori; Motohashi, Takeshi; Miyamoto, Masayoshi; Ishizu, Hisao; Sagawa, Yasuhiro; Kanno, Tadaaki; Sankoda, Tomoo; Hosokawa, Hiroshi; Aoki, Hideo; Suzuki, Takami; Takada, Hiromi; and Shimazaki, Toshio, 4,875,063, Cl. 346-160.100.

Kaneko, Ryoichi: See—
Sakurai, Shigeo; Umezawa, Sadao; Usami, Saburo; Miyata, Hiroshi; Toriya, Hajime; Tsubouchi, Kuniyoshi; and Kaneko, Ryoichi, 4,875,170, Cl. 364-507.000.

Kaneko, Takaoki: See—
Fukuta, Kenji; Kaneko, Takaoki; and Takahashi, Yoshinobu, 4,874,453, Cl. 156-345.000.

Kaneko, Toshio: See—
Ishikawa, Toyoyi; Kaneko, Toshio; Endo, Shuichi; Ogata, Yoshihiro; and Takaya, Toshihiko, 4,873,940, Cl. 118-651.000.

Kaneko, Yasutoshi: See—
Murakami, Kazuo; Kaneko, Yasutoshi; and Tamaki, Takasi, 4,873,905, Cl. 84-20.000.

Kanemitsu, Shinji: See—
Sootome, Sumitoshi; Mizutani, Morikazu; Ikemoto, Isao; Kanemitsu, Shinji; Kitajima, Hajime; and Onoda, Shigeyoshi, 4,875,075, Cl. 355-50.000.

Kang, Hyun S.: See—
Kim, Myung S.; Kang, Hyun S.; Lim, Soon K.; and Park, Hee K., 4,874,712, Cl. 437-31.000.

Kang, Sung S., to Gold Star Co., Ltd. Adjustable audio control-eraser and tape guide assembly for a cassette tape video tape recorder. 4,875,123, Cl. 360-109.000.

Kanlun, Ratana; and Licht, Brigitte H., to Hart Chemical Limited. Production of highly-dispersible water-soluble polymers. 4,874,827, Cl. 526-214.000.

Kannan, Ramamurthi, to Hilton Davis Co. Process for the production of benzenesulfonamides. 4,874,894, Cl. 564-93.000.

Kanno, Tadaaki: See—
Idenawa, Hiroyuki; Mochimaru, Hideaki; Kanda, Hajime; Makita, Nobuhiro; Tanaka, Yoshiaki; Yagisita, Takahiro; Yamaki, Takanori; Motohashi, Takeshi; Miyamoto, Masayoshi; Ishizu, Hisao; Sagawa, Yasuhiro; Kanno, Tadaaki; Sankoda, Tomoo; Hosokawa, Hiroshi; Aoki, Hideo; Suzuki, Takami; Takada, Hiromi; and Shimazaki, Toshio, 4,875,063, Cl. 346-160.100.

Kano, Shinichiro: See—
Yanagida, Kouichi; Kano, Shinichiro; Gotou, Takeshi; and Hirose, Takashi, 4,874,062, Cl. 181-250.000.

Kanter, John E. Soft animal toys. 4,874,344, Cl. 446-268.000.

Kanto Jidosha Kogyo Kabushiki Kaisha: See—
Ochiai, Hirotsu; Suzuki, Etsuo; and Ikuta, Kazuo, 4,874,202, Cl. 296-111.000.

Kanzaki, Hisao; and Ohba, Hisao, to Fuji Photo Film Co., Ltd. Processing apparatus. 4,875,067, Cl. 354-325.000.

Kapich, D. Davorin. Inlet guide vane assembly. 4,874,288, Cl. 415-150.000.

Kaplan, Horst; and Grube, Gerhard, to Otto Hansel GmbH. Device for transferring packages. 4,874,076, Cl. 198-370.000.

Kappeler, Franz; Wolf, Thomas; and Stegmüller, Bernhard, to Siemens Aktiengesellschaft. Laser diode array with lateral coupling. 4,875,217, Cl. 372-50.000.

Karas, Bradley R.; Foust, Donald F.; and Dumas, William V., to General Electric Company. Method for removing residual precious metal catalyst from the surface of metal-plated plastics. 4,874,635, Cl. 427-96.000.

Karg, Thomas A. Oil well pump control. 4,874,294, Cl. 417-12.000.

Karle, Anton: See—
Fehlmann, Wolfgang; Hofer, Gerald; Junger, Dieter; Karle, Anton; and Laufer, Helmut, 4,873,956, Cl. 123-357.000.

Karlsson, Hakan I.; Lundqvist, Inge J.; Hardin, Bengt Y.; and Ostman, Thomas L., to Svenska Traforskningsinstitutet. Method of controlling cross profile of properties of paper web. 4,874,467, Cl. 162-198.000.

Karsner, Grant G.: See—
Bartilucci, Mark P.; Karsner, Grant G.; and Tracy, William J., III, 4,874,505, Cl. 208-131.000.

Kasai, Isao, to Matsushita Electric Industrial Co., Ltd. A heating apparatus for automatically distinguishing the condition of food to be reheated. 4,874,928, Cl. 219-492.000.

Kasai, Tetsuji: See—
Minami, Syuji; Kawamoto, Keiji; Kasai, Tetsuji; Kuroiwa, Toshiaki; and Todo, Akira, 4,874,808, Cl. 524-291.000.

Kasai, Tomoaki; and Sekiguchi, Seizo, to Yoshida Kogyo K. K. Apparatus for dyeing a fabric material. 4,873,847, Cl. 68-178.000.

Kasakoshi, Toshiyuki: See—
Shibata, Ryoichi; and Kasakoshi, Toshiyuki, 4,874,927, Cl. 219-492.000.

Kasegawa, Norimichi, to Toyota Jidosha Kabushiki Kaisha. Control device for differential limiting mechanisms of four-wheel drive car. 4,874,059, Cl. 180-249.000.

Kasei Optonix Limited: See—
Hase, Takashi; and Yoshida, Hidemi, 4,874,985, Cl. 313-487.000.

Kashida, Motokazu; and Masui, Toshiyuki, to Canon Kabushiki Kaisha. Information signal transmission system by predictive differential coding. 4,875,222, Cl. 375-26.000.

Kashida, Motokazu: See—
Shimokoriyama, Makoto; Yamashita, Shinichi; Abe, Naoto; Kashida, Motokazu; Takei, Masahiro; and Takahashi, Koji, 4,875,090, Cl. 358-12.000.

Kashima, Kenichi: See—
Hisaki, Masakazu; Kashima, Kenichi; Sakamoto, Yasuhiko; Hojo, Masakazu; Katayama, Osamu; and Hata, Hiroyoshi, 4,874,773, Cl. 514-355.000.

Kashio, Jiro: See—
Furuhashi, Koshi; Miyazaki, Satoshi; Furuya, Masakazu; Kawatobi, Tatsuo; Kouyama, Sinichi; and Kashio, Jiro, 4,875,208, Cl. 370-94.100.

Kashiwa, Norio: See—
Kioka, Mamoru; and Kashiwa, Norio, 4,874,734, Cl. 502-104.000.

Kashiwada, Ken; Muto, Tadanobu; and Sasaki, Tetsuo, to Shinwa Sangyo Co., Ltd. Heat exchanger for cooling tower. 4,874,035, Cl. 165-38.000.

Kashiwada, Kunio: See—
Hasumoto, Toshiharu; Kashiwada, Kunio; Konishi, Minoru; and Fujishiro, Nobuo, 4,874,403, Cl. 55-55.000.

Kasica, James J.: See—
Eden, James L.; Kasica, James J.; and Zallie, James P., 4,874,628, Cl. 426-578.000.

Katayama, Eiji: See—
Hamada, Takao; Tsuchiya, Nobuo; Inatani, Toshihiro; Katayama, Eiji; Koitabashi, Toshimitsu; Okabe, Kyoji; Sumito, Mitsuo; and Takada, Yoshiyasu, 4,874,427, Cl. 75-26.000.

Katayama, Osamu: See—
Hisaki, Masakazu; Kashima, Kenichi; Sakamoto, Yasuhiko; Hojo, Masakazu; Katayama, Osamu; and Hata, Hiroyoshi, 4,874,773, Cl. 514-355.000.

Kato, Arthur K.: See—
Leonard, Vurnen; Kato, Arthur K.; Ohmori, Kiyoshi; Fujiwara, Keisuke; and Soda, Yutaka, 4,875,128, Cl. 360-133.000.

Kato, Kiyotaka; and Oshima, Michitaka, to Mitsubishi Denki Kabushiki Kaisha. Graphics input apparatus. 4,875,033, Cl. 340-706.000.

Kato, Mamoru: See—
Ito, Toshiyasu; Minoura, Jun; Mori, Takaaki; Takahashi, Shigeyuki; Kato, Mamoru; Shimada, Junichi; and Hayakawa, Fujio, 4,874,229, Cl. 350-357.000.

Kato, Masaaki; Uno, Tetsuya; Kobayashi, Masao; and Osuga, Naoto, to Mitsubishi Rayon Co., Ltd. Process for the production of deuterated methyl acrylate or deuterated methyl methacrylate. 4,874,890, Cl. 180-305.000.

Kato, Masanori: See—
Ogata, Takashi; Kato, Masanori; Kawasumi, Yoshio; Tominaga, Chikara; and Tanaka, Kanji, 4,874,436, Cl. 148-2.000.

Kato, Takeo: See—
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Kato, Yoshiaki, to Hitachi, Ltd. Mass spectrometer. 4,874,944, Cl. 250-288.000.

Kato, Yoshihisa: See—
Kojima, Fumio; Tachiiri, Yoshikazu; and Kato, Yoshihisa, 4,874,174, Cl. 285-82.000.

Katsumata, Ryoichi: See—
Ozaki, Akio; Katsumata, Ryoichi; and Oka, Tetsuo, 4,874,698, Cl. 435-108.000.

Katz, David H., to Lidak Biopharmaceuticals. Inflammatory disease treatment. 4,874,794, Cl. 514-724.000.

Katz, Elena: See—
Scott, Raymond P. W.; and Katz, Elena, 4,873,862, Cl. 73-23.100.

Katz, Joseph, to California Institute of Technology. Method for generation of tunable far infrared radiation from two-dimensional plasmons. 4,874,953, Cl. 250-493.100.

Katz, Leonard; Tuan, James; and McAlpine, James B., to Abbott Laboratories. Cloning vectors for streptomycetes and use thereof in macroide antibiotic production. 4,874,748, Cl. 514-29.000.

Kauffman, Thomas F.: See—
Brady, Francis X.; and Kauffman, Thomas F., 4,874,804, Cl. 524-100.000.

Kausch, Erwin: See—
Borowski, Horst; Kausch, Erwin; Rittershaus, Erhard; Rudolph, Gert; and Schneider, Werner, 4,874,004, Cl. 131-364.000.

Kawai, Kaiji: See—
Kimpura, Masaomi; Kawai, Kaiji; and Tobe, Yukiya, 4,874,425, Cl. 71-121.000.

Kawai, Osamu; and Mizumura, Shunji, to Nippon Seiko Kabushiki Kaisha. Passive seat belt device. 4,874,995, Cl. 318-484.000.

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Kimura, Hiroshi; Naito, Shotaro; Miyashita, Kunio; Noto, Yasuo; Sugiura, Noboru; Takahashi, Tadashi; Yamamura, Hirohisa; Yamashita, Seizi; Kawamata, Syoichi; Tajima, Fumio; and Horikoshi, Shigeru, 4,874,053, Cl. 180-79.100.

Kawamoto, Keiji: See—
Minami, Syuji; Kawamoto, Keiji; Kasai, Tetsuji; Kuroiwa, Toshiaki; and Todo, Akira, 4,874,808, Cl. 524-291.000.

Kawamura, Hirotaka: See—
Hamasaki, Naotaka; Kawamura, Hirotaka; Ohtsu, Norio; Nakakoshi, Ichiro; Ataka, Kikuo; Oomori, Kiyosi; and Kouno, Masahiko, 4,874,882, Cl. 558-131.000.

Kawamura, Mitsuyoshi: See—
Narita, Yoshinori; and Kawamura, Mitsuyoshi, 4,873,952, Cl. 123-270.000.

Kawamura, Takeyoshi, to Sanki Electronic Industry Co., Ltd. Simulating static electricity discharges. 4,875,133, Cl. 361-230.000.

Kawamura, Yasuo: See—
Ogura, Tomoyuki; Kawamura, Yasuo; Ishii, Shigeru; Baba, Masatoshi; Taniguchi, Masakazu; Hirose, Masayoshi; Hirata, Kiminori; and Ochiai, Yoshinori, 4,874,861, Cl. 544-229.000.

Kawanishi, Shozo; and Higuchi, Tadashi, to Yamato Scale Company, Limited. Loading and weighing structure for combination weighing machine. 4,874,048, Cl. 177-25.180.

Kawasaki Jukogyo Kabushiki Kaisha: See—
Tamba, Shinichi; and Miyake, Hitomi, 4,873,945, Cl. 123-55.00R.

Kawasaki, Ryoji: See—
Hara, Toshihiro; Yotsutani, Akio; Kawasaki, Ryoji; Tate, Kazuyuki; Huse, Syoji; and Ono, Koji, 4,875,231, Cl. 379-61.000.

Kawasaki Steel Corporation: See—
Hamada, Takao; Tsuchiya, Nobuo; Inatani, Toshihiro; Katayama, Eiji; Koitabashi, Toshimitsu; Okabe, Kyoji; Sumito, Mitsuo; and Takada, Yoshiyasu, 4,874,427, Cl. 75-26.000.

Kawasaki, Tsutomu; and Kobayashi, Wataru, to Koken Co., Ltd. Apatite chromatography column system. 4,874,511, Cl. 210-198.200.

Kawase, Mayumi: See—
Ueda, Kouichiro; Tanaka, Satoru; Kunii, Toshinobu; Kagei, Kengo; Sato, Tadashi; Ono, Hideki; Ohtsuka, Issei; Kawase, Mayumi; Ohgoh, Toshiharu; and Wakabayashi, Tsuneo, 4,874,869, Cl. 548-309.000.

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Kay, Nathan; McNab, Donald W.; and Moya, Edward J., to Photofinish Cosmetics Inc. Manually-operated fluid dispenser and associated closure cap. 4,874,117, Cl. 222-487.000.

Kay, Peter D.; and McDonald, Keith, to Tioxide Group PLC. Emulsion paint. 4,874,806, Cl. 524-204.000.

Kaymaram, Farid, to Magnetic Peripherals Inc. Reducing harmful runout in a rigid magnetic disk through use of shims. 4,875,118, Cl. 360-99.120.

Kazama, Saburo; and Tamura, Akira, to Hitachi Ltd. Rotary head apparatus with motor magnet and yoke surrounding motor stator coil. 4,875,110, Cl. 360-64.000.

Kazmerski, Lawrence L., to United States of America, Energy. Method and apparatus for analyzing the internal chemistry and compositional variations of materials and devices. 4,874,946, Cl. 250-309.000.

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Kee, Howard; and Goff, Frederick, 4,874,049, Cl. 177-59.000.

Kee, Howard; and Goff, Frederick, to Kee Equipment and Engineering. Automatic weighing method and apparatus. 4,874,049, Cl. 177-59.000.

Keely, Stanley L.: See—
Crawford, Thomas C.; Keely, Stanley L.; Larson, David L.; Lombardino, Joseph G.; and Maciejko, James J., 4,874,757, Cl. 514-226.500.

Keep, Gerald T., to Eastman Kodak Company. Reinforced polyesters, article thereof and method of making low warpage articles. 4,874,809, Cl. 524-449.000.

Keibler-Thompson Corporation: See—
Mancuso, Matthew A., 4,874,274, Cl. 409-300.000.

Keilhauer, Gerhard: See—
Brana, Miguel F.; Berlanga, Jose M. C.; Keilhauer, Gerhard; and Schlick, Erich, 4,874,863, Cl. 540-99.000.

Keiper Recaro GmbH & Company: See—
Walk, Hansjorg, 4,874,204, Cl. 297-362.000.

Kemter, Heinz: See—
Frenzel, Bertram; Grenzendorfer, Dietmar; Kemter, Heinz; Wunsch, Wolfgang; and Zeisberg, Peter, 4,873,844, Cl. 66-84.00A.

Kendall Company, The: See—
Doheny, Anthony J., 4,874,665, Cl. 428-345.000.

Kennedy, Christopher R.: See—
Kuzzyk, Jack A.; and Kennedy, Christopher R., 4,874,569, Cl. 264-60.000.

Kennedy, Robert P.: See—
Elliott, William A.; Greene, Richard A.; Kennedy, Robert P.; Poe, Robert P., Jr.; and Steece, William H., 4,873,762, Cl. 29-809.000.

Keritsis, Gus D.: See—
Tamol, Ronald A.; Nepomuceno, Jose G.; Keritsis, Gus D.; Burnett, George H.; Thesing, Richard A.; Winterson, Warren D.; and Nichols, Walter A., 4,874,000, Cl. 131-375.000.

Kerr-McGee Chemical Corporation: See—
Owen, S. Hudson, 4,874,128, Cl. 238-355.000.

Riggs, Olen L., Jr., 4,874,434, Cl. 134-3.000.

Kersey, Alan D., to Sachs/Freeman Associates, Inc. Method and apparatus for increasing the unambiguous sensing range in an interferometric fiber gyroscope. 4,874,244, Cl. 356-350.000.

Kershaw, Jacqueline A., to Shell Oil Company. Composition containing epoxy resin and alkyl hindered polyaromatic diamine and monoaromatic amine curing agents. 4,874,833, Cl. 528-90.000.

Kesler, Gregory J.: See—
Schnell, Kenneth R.; and Kesler, Gregory J., 4,874,905, Cl. 174-65.00R.

Kettenring, Gunther, to Max-Planck-Gesellschaft zur Foerderung der Wissenschaften e.V. Rotary transmission device for a plurality of cables between two restrictedly rotatable structures. 4,874,138, Cl. 242-54.00R.

Kewin, Daniel. Tubular core assemblies for rolls of paper or other sheet material. 4,874,139, Cl. 242-68.600.

Key, Kenneth W. Pipe joint gland reinforcing structure. 4,874,192, Cl. 285-337.000.

Khambay, Bhupinder P. S.: See—
Elliott, Michael; Jones, Norman F.; and Khambay, Bhupinder P. S., 4,874,781, Cl. 514-463.000.

Khatri, Hiralal N.: See—
Fleming, Michael P.; Schloemer, George C.; and Khatri, Hiralal N., 4,874,871, Cl. 548-543.000.

Fleming, Michael P.; Khatri, Hiralal N.; and Schloemer, George C., 4,874,872, Cl. 548-531.000.

Kidd, Richard W.: See—
Garg, Diwaker; Klucher, Beth A.; Dyer, Paul N.; Kidd, Richard W.; and Ceccarelli, Christopher, 4,874,642, Cl. 427-249.000.

Kido, Shigeru: See—
Saitoh, Izumi; Kido, Shigeru; Sasaki, Yoshio; and Shinohara, Syuichiro, 4,874,830, Cl. 526-318.400.

Kiely, John S.: See—
Carethers, Mary E.; Centenon, Wiczeslaw A.; Connor, David T.; Johnson, Elizabeth A.; Kiely, John S.; Schwender, Charles F.; Sircar, Jagadish C.; Sorenson, Roderick J.; Unangst, Paul C.; and Bruna, Robert F., 4,874,758, Cl. 514-226.500.

Kiesche, Eric A.; and Crabtree, Samuel B., to Combustion Engineering, Inc. Control system for a rotation station for remotely installing a mechanical tube plug. 4,873,753, Cl. 29-157.30R.

Kihara, Taku: See—
Ohta, Yoshiyuki; and Kihara, Taku, 4,875,044, Cl. 341-87.000.

Kijima, Takao; and Edahiro, Takeshi, to Mazda Motor Corporation. Vehicle suspension supporting construction. 4,874,185, Cl. 280-690.000.

Kikuchi, Makoto; Mori, Shinsaku; Nikawa, Yoshio; and Terakawa, Takashige, to Tokyo Keiki Co., Ltd. Heating apparatus for hyperthermia. 4,873,995, Cl. 128-804.000.

Kim, Myung S.; Kang, Hyun S.; Lim, Soon K.; and Park, Hee K., to Samsung Semiconductor & Telecommunication Co., Ltd. Fabrication method of bipolar transistor. 4,874,712, Cl. 437-31.000.

Kim, Seung K.: See—
Jung, Sang H.; and Kim, Seung K., 4,874,887, Cl. 560-124.000.

Kimberly-Clark Corporation: See—
Cochrane, Faith E.; Smith, Michael J.; and Litvay, John D., 4,874,465, Cl. 162-111.000.

Kimizu, Ryuichi, to Omron Tateisi Electronics Co. Card authorization terminal. 4,874,932, Cl. 235-379.000.

Kimpura, Masaomi; Kawai, Kaiji; and Tobe, Yukiya, to American Cyanamid Company. Stable aqueous suspension concentrate compositions. 4,874,425, Cl. 71-121.000.

Kimura, Akinori; and Yoda, Akira, to Fuji Photo Film Co., Ltd. Method of and apparatus for developing electrophotographic film using liquid developer. 4,875,080, Cl. 355-246.000.

Kimura, Hiroshi; Naito, Shotaro; Miyashita, Kunio; Noto, Yasuo; Sugiura, Noboru; Takahashi, Tadashi; Yamamura, Hirohisa; Yamashita, Seizi; Kawamata, Syoichi; Tajima, Fumio; and Horikoshi, Shigeru, to Hitachi, Ltd. Torque detecting apparatus. 4,874,053, Cl. 180-79.100.

Kimura, Kiyoshi; Ueda, Fusao; and Tamura, Masaru, to Nippon Shinyaku Co., Ltd. 2-amino-4-nicotinoylamino-6-aryl-s-triazines as nootropic agents. 4,874,762, Cl. 514-242.000.

Kimura, Mitsuru; and Nakakita, Shoji, to NEC Corporation. Method of manufacturing a multichip package with increased adhesive strength. 4,874,721, Cl. 437-209.000.

Kimura, Tadashi: See—
Kobayashi, Norihide; Inaba, Tsutomu; Kimura, Tadashi; and Sugihara, Masahiro, 4,874,302, Cl. 418-55.000.

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Sangyoji, Kazuo; Sakai, Jun; Hayashi, Shigeyuki; Suzuki, Makoto; and Kimura, Yasuo, 4,875,074, Cl. 355-27.000.

Kinast, Robert A.: See—
Andros, Andrew A.; Campana, Thomas J., Jr.; Thelen, Gary F.; and Kinast, Robert A., 4,875,039, Cl. 340-825.440.

King, Christine A.: See—
Newman, Alec T.; Bentley, Andrew C.; King, Christine A.; McMahon, Alistair J.; Tansley, Robert W.; and Gibbs, Andrew R., 4,873,915, Cl. 99-289.00R.

King, David E., to C & D Engineering Company. Knurling machine and the like. 4,873,856, Cl. 72-121.000.

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Kioka, Mamoru; and Kashiwa, Norio, to Mitsui Petrochemical Industries, Ltd. Process for producing solid catalyst for polymerization of olefins. 4,874,734, Cl. 502-104.000.

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Masuda, Isao; Fukuoka, Takashi; and Kobayashi, Fujio, 4,873,946, Cl. 123-65.00PD.

Masuda, Yoshihiko; and Murakosi, Masanobu, 4,874,437, Cl. 148-150.000.

Kipling, Kent K., to Firestone Tire & Rubber Company, The. Method for applying elastomeric material onto a drum. 4,874,443, Cl. 156-64.000.

Kiriya, Syunichi: See—
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Kirkland, Joseph J.; and Kohler, Jurgen, to Du Pont de Nemours, E. I., and Company. Porous silica microspheres having a silanol enriched surface. 4,874,518, Cl. 210-502.100.

Kishishita, Ryutaro. Slot machine. 4,874,173, Cl. 273-143.00R.

Kiss, Akos; Kleinschmidt, Peter; Hanich, Juergen; Halbritter, Guenter; and Horst, Jenny, to Degussa Aktiengesellschaft. Methods of preparing encapsulated pigments. 4,874,433, Cl. 106-450.000.

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Urabe, Yoshihiko; Higashi, Tetsuji; Takahashi, Hiroshi; and Kita, Nobuyuki, 4,874,686, Cl. 430-272.000.

Kitagawa, Tooru: See—
Sakai, Shunji; Kitagawa, Tooru; Suzuki, Kunikazu; and Watanabe, Naohiro, 4,875,099, Cl. 358-213.110.

Kitahira, Takashi: See—
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Kitajima, Hajime: See—
Sootome, Sumitoshi; Mizutani, Morikazu; Ikemoto, Isao; Kanc-mitsu, Shinji; Kitajima, Hajime; and Onoda, Shigeyoshi, 4,875,075, Cl. 355-50.000.

Kitano, Kisei: See—
Yoshida, Naoyuki; Kitano, Kisei; and Ogawa, Tetsuya, 4,874,546, Cl. 252-299.610.

Kitasagami, Hiroo: See—
Miyachi, Akira; Nishimoto, Hiroshi; Okiyama, Tadashi; Kitasagami, Hiroo; Sugimoto, Masahiro; Tamada, Haruo; and Emori, Shinji, 4,875,087, Cl. 357-71.000.

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Kinomura, Keisuke; Kitazawa, Sadaya; Takata, Yasushi; and Sakakibara, Toshiyuki, 4,874,852, Cl. 536-18.600.

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Kittle, Paul A., to Rusmar Incorporated. Method of providing a barrier between a substrate and the atmosphere and compositions therefor. 4,874,641, Cl. 427-244.000.

Klammer, Josef; and Grosschadl, Werner. Hot water storage tank. 4,874,104, Cl. 220-4.00B.

Klazinga, Aan H., to Shell Oil Company. Process for the preparation of modified zeolites. 4,874,729, Cl. 502-61.000.

Krupp Kauter Maschinenbau GmbH: See—
Daubenbuechel, Werner; and Jira, Alfred, 4,874,649, Cl. 428-36.500.
Kruze, Alfred; Siegmund, Gunter; and Schwertfeger, Werner, to Hoechst Aktiengesellschaft. Process for the preparation of perfluorinated carbonyl fluoride. 4,874,557, Cl. 562-851.000.
Kruze, Cornelia: See—
Van Vlietgarden, Ineke; Kruze, Cornelia; Van Der Heyden, Johannes A. M.; and Tulp, Martinus T. M., 4,874,770, Cl. 514-326.000.
Ku, Thomas W.: See—
Olsson, John G.; Hall, Ralph F.; Ku, Thomas W.; and Perchonnock, Carl D., 4,874,792, Cl. 514-570.000.
Kuan Technology, Ltd.: See—
Decker, John A., Jr.; Decker, Linda M.; and Halford, Christopher J., 4,873,907, Cl. 84-291.000.
Kubo, Eiichi; Nagaoka, Koichi; Miyahara, Yoshiki; Kiriya, Syunichi; and Mishima, Yasunobu, to Unitika Ltd. Polyolefinic biconstituent fiber and nonwoven fabric produced therefrom. 4,874,666, Cl. 428-398.000.
Kubo, Hiroyoshi: See—
Takahashi, Kazuo; and Kubo, Hiroyoshi, 4,874,954, Cl. 253-548.000.
Kubodera, Takayuki; Nakamura, Shizuo; Onizawa, Masanori; Shiroshta, Hirotsuka; Mochizuki, Eiichi; Tsujimura, Masao; Aotsu, To-shikatsu; and Morooka, Takayoshi, to Kyocera Corporation. Camera. 4,875,065, Cl. 354-82.000.
Kubota Ltd.: See—
Yamada, Kiichiro, 4,873,944, Cl. 123-41.570.
Kuenzly, John D.: See—
Egenes, Andrea L. F.; and Kuenzly, John D., 4,873,930, Cl. 110-345.000.
Kuhn, Irene: See—
Andrews, William H.; Brothers, Virginia M.; Files, James G.; Kuhn, Irene; McCaman, Michael T.; Paul, Leland S.; Sias, Stacey R.; Gore, Thomas C.; Newman, Karel Z., Jr.; and Tedesco, John L., 4,874,705, Cl. 435-252.330.
Kuisma, Heikki, to Vaisala Oy. Pressure sensor construction and method for its fabrication. 4,875,134, Cl. 261-282.000.
Kukke, Gopal S., to Pioneer Industries, Division of Core Industries, Inc. Drywall frame compression anchor assembly and frame. 4,873,804, Cl. 52-217.000.
Kule, Engelbert; and Adler, Alfons, to Bayer Aktiengesellschaft. Preparation of 3-sulphenylmaleimides. 4,874,874, Cl. 548-544.000.
Kulle, Lee; Desceci, Vince; and Hess, John M., III, to Baxter International Inc. Self-priming injection site with check valve. 4,874,369, Cl. 604-86.000.
Kuna, Wayne A., to Marvin Glass & Associates. Skill action game with a tiltable housing and an alarm producing disturbance sensor. 4,874,166, Cl. 273-1.0GC.
Kunihiro, Koki: See—
Funaki, Masaaki; Kunihiro, Koki; and Ichinomiya, Yutaka, 4,874,654, Cl. 428-192.000.
Kunii, Toshinobu: See—
Ueda, Kouichiro; Tanaka, Satoru; Kunii, Toshinobu; Kagei, Kengo; Sato, Tadashi; Ono, Hideki; Ohtsuka, Issei; Kawase, Mayumi; Ohgoh, Toshiharuo; and Wakabayashi, Tsuneo, 4,874,869, Cl. 548-309.000.
Kuo, Pao-Kuang: See—
Thomas, Robert L.; Kuo, Pao-Kuang; and Favro, Lawrence D., 4,874,251, Cl. 374-45.000.
Kuphal, Jeffrey A.; Robeson, Lloyd M.; and Weber, James J., to Air Products and Chemicals, Inc. Blends of poly(propylene carbonate) and poly(methyl methacrylate) and their use in decomposition molding. 4,874,030, Cl. 164-34.000.
Kuraray Co., Ltd.: See—
Okamoto, Takehiko; Ohmory, Akio; Sueoka, Akinori; Kawata, Ichiro; and Akasu, Yukihiro, 4,874,522, Cl. 210-645.000.
Kurata, Yoshiaki: See—
Watanabe, Hideo; and Kurata, Yoshiaki, 4,874,247, Cl. 356-402.000.
Kureha Kagaku Kogyo Kabushiki Kaisha: See—
Yoshikumi, Chikao; Ohmura, Yoshio; Hirose, Fumio; Ikuzawa, Masanori; Matsunaga, Kenichi; Fujii, Takayoshi; Ohhara, Minoru; and Ando, Takao, 4,874,750, Cl. 514-42.000.
Kurematsu, Masayuki: See—
Kobayashi, Kazuhiro; Kurematsu, Masayuki; Koboshi, Shigeharu; Goto, Nobutaka; and Takabayashi, Naoki, 4,874,530, Cl. 210-718.000.
Kurihara, Kazumasa: See—
Akira, Mizusawa; and Kurihara, Kazumasa, 4,874,510, Cl. 210-172.000.
Kuroiwa, Toshiaki: See—
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Kurosaki, Makoto, to Yamaha Corporation. Drum foot pedal apparatus. 4,873,910, Cl. 84-422.100.
Kurosawa, Kei, to Kabushiki Kaisha Toshiba. Method for manufacturing an electrical connection between conductor levels. 4,874,719, Cl. 437-195.000.
Kurr, Klaus: See—
Andra, Rainer; Kurr, Klaus; Ullrich, Gunter; and Dorge, Udo, 4,873,887, Cl. 74-573.00F.
Kusaka, Takuya: See—
Nishimoto, Yoshiro; Yoneda, Yasuji; Imaoka, Shinichi; Nakai, Yasuhide; Nakae, Akimitsu; Onishi, Yoshihiko; Tachibana, Hiroyuki; Inoue, Takayoshi; Kusaka, Takuya; Takamatsu,

- Hiroyniki; Tojyo, Shigeki; Kajikawa, Hiroshi; and Nishimura, Kozo, 4,874,939, Cl. 250-211.00J
- Kusan, Inc.: See—
Lo, Ying-Cheng; and Humphries, Darral V., 4,874,657, Cl. 428-220.000.
- Kushibe, Yuki; and Sato, Hiroshi, to Mitsubishi Jukogyo Kabushiki Kaisha. Die clamping apparatus. 4,874,309, Cl. 425-589.000.
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- Kuster, Hans-Werner; Radermacher, Herbert; and Vanaschen, Luc, to Saint-Gobain Vitrage "Les Miroirs". Blow box for glass tempering. 4,874,418, Cl. 65-348.000.
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Blattler, Ernst, 4,873,830, Cl. 62-3.300.
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Flork, Michel, 4,874,893, Cl. 562-443.000.
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Thonneller, Jean-Yves, 4,874,413, Cl. 62-23.000.
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Fleer, Ernst O.; Landgraf, Hermann; and Schwarz, Werner, 4,874,314, Cl. 433-129.000.
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Schwerdtel, Ernst; and Lang, Hans-Jorg, 4,874,022, Cl. 141-165.000.
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Sigai, A. Gary; Lapovich, Walter P.; and Alexander, Michael N., 4,874,984, Cl. 313-486.000.
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Crawford, Thomas C.; Keely, Stanley L.; Larson, David L.; Lombardino, Joseph G.; and Maciejko, James J., 4,874,757, Cl. 514-226.500.
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Rozanski, Robert D.; Medlock, James R., III; and Larson, Stephen F., 4,875,137, Cl. 361-331.000.
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Fehlmann, Wolfgang; Hofer, Gerald; Junger, Dieter; Karle, Anton; and Laufer, Helmut, 4,873,956, Cl. 123-357.000.
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Guerendel, Philippe; Naville, Charles; Laurent, Jean; and Dedole, Pascal, 4,874,060, Cl. 181-102.000.
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Sachtler, J. W. Adriaan; and Lawson, R. Joe, 4,874,731, Cl. 502-66.000.
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Freed, Herbert D.; and Leach, Dennis, 4,874,320, Cl. 439-115.000.
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Beacham, Lowrie M., III; LeBlanc, Harry S.; and Freeman, George A., 4,874,751, Cl. 514-50.000.
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Boniot, Jean-Yves; and Leboucq, Jacques, 4,874,415, Cl. 65-3.110.
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Velke, David C., Sr.; Maraden, George P.; and Leffingwell, Burton C., 4,874,909, Cl. 174-845.000.
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Foell, Helmut; and Lehmann, Volker, 4,874,484, Cl. 204-129.300.
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Frommelt, John A.; and Lenz, Kenneth, 4,873,800, Cl. 52-173.0DS.
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Gunther, Wolfgang H. H.; Leone, Ronald E.; and Przyklek, Rosemary, 4,874,866, Cl. 548-100.000.
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Iskiyan, James L.; Legvold, Vernon J.; Leung, Peter L. H.; and Martin, Guy E., 4,875,155, Cl. 364-200.000.
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Anger, Wilhelm; and Leuzinger, Christoph, 4,873,994, Cl. 128-774.000.
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Slezak, Arnold; and Levy, Lloyd, 4,875,117, Cl. 360-98.010.
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Makula, Marie-France; and Liautaud, Jacques, 4,874,708, Cl. 435-272.000.
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Karlue, Ratana; and Licht, Brigitte H., 4,874,827, Cl. 526-214.000.
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Katz, David H., 4,874,794, Cl. 514-724.000.
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Lopez, Benjamin L.; Beard, Steven A.; and Phillips, Kirby, 4,874,299, Cl. 417-413.000.
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Adachi, Kuniaki; Tamai, Hideo; and Sadai, Masanao, 4,874,791, Cl. 514-558.000.
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Cringle, Stephen J., 4,874,237, Cl. 351-221.000.
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Ulm, John G., 4,874,023, Cl. 141-346.000.
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Cochrane, Faith E.; Smith, Michael J.; and Litvay, John D., 4,874,465, Cl. 162-111.000.
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Greenwald, Richard B.; Liu, Chung-Tsing; and McDonnell, James A., 4,874,540, Cl. 252-174.240.
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Linke, Thomas A.; Dandan, Issa R.; Livingston, Troy W.; and Wilkerson, Alan W., 4,873,792, Cl. 51-165.800.
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Callaghan, Ian C.; and Livsey, Ian, 4,874,535, Cl. 252-8.552.
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Dalzell, David T., 4,875,201, Cl. 368-120.000.
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Crawford, Thomas C.; Keely, Stanley L.; Larson, David L.; Lombardino, Joseph G.; and Maciejko, James J., 4,874,757, Cl. 514-226.500.
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McGhee, Welbourne D.; and Campbell, John W., 4,873,783, Cl. 43-42.240.
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Walsh, David J.; Loughheed, William M.; Gentili, Fred; and Fazl, Mahmood, 4,873,975, Cl. 128-334.00R.
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Joannou, Kyriacos; Wilson, Kenneth; and Lowry, Alan B., 4,875,125, Cl. 360-128.000.
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Niedringhaus, Joyce C.; and Lowry, Michael L., 4,874,428, Cl. 75-30.000.
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Jung, Sang H.; and Kim, Seung K., 4,874,887, Cl. 560-124.000.
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Laing, Karsten A.; Ludin, Ludwig; and Laing, Johannes N., 4,874,300, Cl. 411-420.000.
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Schwerdtel, Ernst; and Lang, Hans-Jorg, 4,874,022, Cl. 141-165.000.
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Stegmann, Werner; Meier, Hans R.; Evans, Samuel; Martin, Roger; and Luisoli, Reto, 4,874,885, Cl. 560-15.000.
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Lukens, Jean H.: See—
Durbini, Richard D.; Lukens, Jean H.; Uchytel, Thomas F.; and Rhodohamel, Nicholas, 4,874,706, Cl. 435-253.300.

Lundqvist, Inge J.: See—
Karlsson, Hakan I.; Lundqvist, Inge J.; Hardin, Bengt Y.; and Ostman, Thomas L., 4,874,467, Cl. 162-198.000.

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Lutz, Robert G.: See—
George, Eric R.; Lutz, Robert G.; and Smutny, Edgar J., 4,874,819, Cl. 525-185.000.

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Lynch, David L.; and Quesnel, Guy C., to Northern Telecom Limited. Variable gain encoder apparatus and method. 4,875,045, Cl. 341-139.000.

Lynch, Samuel E.: See—
Antonides, Harry N.; and Lynch, Samuel E., 4,874,746, Cl. 514-21.000.

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M&T Chemicals Inc.: See—
Hung, Paul L. K.; and Tseng, Kenneth K. S., 4,874,799, Cl. 522-96.000.

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Crawford, Thomas C.; Keely, Stanley L.; Larson, David L.; Lombardino, Joseph G.; and Maciejko, James J., 4,874,757, Cl. 514-226.500.

Mackay, Craig D., to Astromed Limited. Analysis of samples by electrophoresis using a charge coupled device. 4,874,492, Cl. 204-182.800.

Macklem, Elizabeth A.: See—
Pulkowski, Jeffrey H.; Macklem, Elizabeth A.; and Busker, L. H., 4,874,469, Cl. 162-359.000.

MacMahon, Alistair J.: See—
Newman, Alec T.; Bentley, Andrew C.; King, Christine A.; MacMahon, Alistair J.; Tansley, Robert W.; and Gibbs, Andrew R., 4,873,915, Cl. 99-289.00R.

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Maeda, Hiroshi: See—
Matsuda, Tsukasa; Ui, Kazuo; and Maeda, Hiroshi, 4,874,089, Cl. 206-397.000.

Maeda, Shuji: See—
Sakamoto, Takaaki; Itoh, Munchiko; and Maeda, Shuji, 4,874,826, Cl. 525-534.000.

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Sorensen, James L.; Yarbrow, Mark D.; and Glockner, Charles A., 4,874,534, Cl. 210-803.000.

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Richeson, William E.; and Erickson, Frederick L., 4,873,948, Cl. 123-90.110.

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Kaynaman, Farid, 4,875,118, Cl. 360-99.120.

Minuhin, Vadim B.; Berson, Evgeny J.; and VonDeylen, Vernon F., 4,875,108, Cl. 360-51.000.

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Fritz, Alan J., 4,874,508, Cl. 209-214.000.

Magni Systems, Inc.: See—
Judge, John L., 4,875,089, Cl. 358-10.000.

Magnien, Ernest: See—
Youssefieh, Raymond; Chakraborty, Utpal; Magnien, Ernest; Desai, Rohit; and Lee, Thomas D-Y., 4,874,769, Cl. 514-314.000.

Maher, Jack, deceased (by Maher, Molly Veronica, Robert James Maher, co-executors), to Rivate Pty. Limited. Steam treatment of crops. 4,873,772, Cl. 34-60.000.

Maher, Molly Veronica, Robert James Maher, co-executors: See—
Maher, Jack, deceased, 4,873,772, Cl. 34-60.000.

Mainardi, Bruno; and Vivian, Domenico, to Nuova Sme S.p.A. Double selectable delivery pump. 4,874,298, Cl. 417-315.000.

Maio, Kenji: See—
Shimizu, Toshihiko; Hotta, Masao; and Maio, Kenji, 4,875,048, Cl. 341-156.000.

Makita, Kensuke; Hattori, Akimasa; and Tanaka, Katsuto, to Central Glass Company, Limited. Method of forming patterned film on substrate surface by using metal alkoxide sol. 4,874,462, Cl. 156-635.000.

Makita, Nobuhiro: See—
Idenawa, Hiroyuki; Mochimaru, Hideaki; Kanda, Hajime; Makita, Nobuhiro; Tanaka, Yoshiaki; Yagisita, Takahiro; Yamaki, Takanori; Motohashi, Takeshi; Miyamoto, Masayoshi; Ishizu, Hisao; Sagawa, Yasuhiro; Kanno, Tadaaki; Sankoda, Tomoo; Hosokawa, Hiroshi; Aoki, Hideo; Suzuki, Takami; Takada, Hiromi; and Shimazaki, Toshio, 4,875,063, Cl. 346-160.100.

Makiyama, Hiroyuki: See—
Murasaki, Sadanobu; and Makiyama, Hiroyuki, 4,874,161, Cl. 271-265.000.

Makula, Marie-France; and Liautaud, Jacques. Process for the preparation of intra-venously administered gamma-globulins and the gamma-globulins obtained. 4,874,708, Cl. 435-272.000.

Malhi, Satwinder D. S.; Shen, Chi-Cheong; Bean, Kenneth E.; and Chang, Peng-Heng, to Texas Instruments Incorporated. Silicon-on-insulator integrated circuits and method. 4,875,086, Cl. 357-54.000.

Mallard Products, Inc.: See—
Vellie, Wallace W., 4,874,012, Cl. 137-557.000.

MAN Poland Druckmaschinen AG: See—
Simeth, Claus; and Gensheimer, Valentin, 4,873,926, Cl. 101-409.000.

Mancuso, Matthew A., to Keibler-Thompson Corporation. Apparatus for removing dross ridges from the sides and ends of a metal workpiece. 4,874,274, Cl. 409-300.000.

Mangold, Donald J.: See—
Wilson, Wilfred W.; Polemenakos, Sotiros C.; Potter, J. Larry; Mangold, Donald J.; Harlowe, William W.; and Schlammeus, Herman W., 4,874,611, Cl. 424-410.000.

Manning, Douglas E. Hydraulic press platen support. 4,873,923, Cl. 100-258.00R.

Manterola, Maria De La Paloma M.: See—
Sanchez-Robles, Francisco B.; and Manterola, Maria De La Paloma M., 4,874,131, Cl. 239-307.000.

Maor, Barak, to Grumman Aerospace Corporation. Variable attenuator having voltage variable FET resistor with chosen resistance-voltage relationship. 4,875,023, Cl. 333-81.00R.

Maramed Precision Corporation: See—
Finneston, Alan; Burkhalter, William E.; Reyes, Franklin; and Latta, Loren L., 4,873,968, Cl. 128-87.00R.

Marathon Oil Company: See—
Luetzelbach, Wayne E., 4,874,248, Cl. 366-307.000.

Marchand, Jean-Claude: See—
Le Dall, Jean-Claude; and Marchand, Jean-Claude, 4,874,328, Cl. 439-278.000.

Mariano, Arturo C.: See—
Heisey, Raymond K., Jr.; Barker, W. David; Mariano, Arturo C.; and Thurnau, Vernon L., 4,873,808, Cl. 52-478.000.

Marino, Frank J., to Marino Technologies, Inc. Bulk cargo container with inner liner. 4,874,258, Cl. 383-111.000.

Marino Technologies, Inc.: See—
Marino, Frank J., 4,874,258, Cl. 383-111.000.

Maritano, Mauro: See—
Fiore, Leonardo; Motroni, Giuseppe; and Maritano, Mauro, 4,874,838, Cl. 528-408.000.

Markova, John, to UOP. Purification of fluid streams containing mercury. 4,874,525, Cl. 210-673.000.

Markpoint System AB: See—
Vonasek, Jiri, 4,875,058, Cl. 346-140.00R.

Marolda, Victor J., Jr., to United States of America, Navy. Elastomeric electrical isolation membrane. 4,874,326, Cl. 439-273.000.

Marpam International, Inc.: See—
Edwards, Bryant, 4,874,367, Cl. 604-72.000.

Marsden, George P.: See—
Velke, David C., Sr.; Marsden, George P.; and Leffingwell, Burton C., 4,874,909, Cl. 174-845.000.

Marsh, Edward K., to AMP Incorporated. Shielded electrical connector for printed circuit board mounting. 4,874,336, Cl. 439-607.000.

Marshall, Lyman R., to Scherer Healthcare Ltd. Surgical drape. 4,873,997, Cl. 128-849.000.

Marshall, Robert M., to Allied-Signal Inc. Overfinish for abrasion resistant zero twist fabric. 4,874,663, Cl. 428-272.000.

Martin, Anthony N., to United Technologies Corporation. Engine speed control apparatus. 4,875,168, Cl. 364-431.010.

Martin, Charles L., to Raychem Corporation. Heat-recoverable composition coupling device. 4,874,193, Cl. 285-369.000.

Martin Engineering Company: See—
Swinderman, Robert T., 4,874,082, Cl. 198-836.000.

Martin, Guy E.: See—
Iskiyan, James L.; Legvold, Vernon J.; Leung, Peter L. H.; and Martin, Guy E., 4,875,155, Cl. 364-200.000.

Martin, Roger: See—
Stegmann, Werner; Meier, Hans R.; Evans, Samuel; Martin, Roger; and Luisoli, Reto, 4,874,885, Cl. 560-15.000.

Martorell, D. Aurelio T., to Geiver, S.A. Portable vibrating apparatus for the collection of fruits. 4,873,820, Cl. 56-340.100.

Maruta, Kenzi: See—
Hatanaka, Koji; Maruta, Kenzi; and Suwabe, Hirohisa, 4,874,923, Cl. 219-270.000.

Maruta, Riichiro: See—
Yamamoto, Shosaku; Kakinuma, Kazuo; Ishioka, Hiroshi; Sodeyama, Fumio; Mayumi, Junji; and Maruta, Riichiro, 4,874,818, Cl. 525-183.000.

Maruyama, Toshio: See—
Asano, Hiroaki; Tsujiuchi, Toshio; Yoneda, Takao; Ishihara, Nobuhiko; Maruyama, Toshio; and Ohta, Norio, 4,873,793, Cl. 51-165.710.

Maruzen Petrochemical Co., Ltd.: See—
Tsuchitani, Masatoshi; and Naito, Sakae, 4,874,502, Cl. 208-45.000.

Maruzeni, Shoji; Matsumoto, Wataru; and Yasuda, Nozomi, to Asahi Denka Kogyo Kabushiki Kaisha. Reaction method for transesterifying fats and oils. 4,874,699, Cl. 435-135.000.

Marvin Glass & Associates: See—
Kuna, Wayne A., 4,874,166, Cl. 273-1.0GC.

Marx, Jean: See—
Egee, Michel; Dartois, Robert; Marx, Jean; Merienne, Etienne; Regalia, Marcel; Poplimont, Philippe; and Van Schel, Etienne, 4,875,175, Cl. 364-551.010.

Maschinenfabrik Andritz Actiengesellschaft: See—
Jeney, Josef, 4,874,591, Cl. 423-240.000.

Schachnig, Johann; and Petschauer, Franz, 4,874,468, Cl. 162-300.000.

Masco Corporation of Indiana: See—
PICKERELL, Daniel A.; Schrock, Donald C.; and Turner, Larry G., 4,874,009, Cl. 137-454.600.

Mashiko, Toshihisa: See—
Yamada, Shin-ichi; Goto, Takao; Mashiko, Toshihisa; Kogi, Kentaro; Oguchi, Yukiko; and Narita, Senichi, 4,874,760, Cl. 514-234.200.

Masia, Michael: See—
Reed, James P.; Masia, Michael; and Highe, Albert, 4,874,487, Cl. 204-147.000.

Maslanka, Daniel C.: See—
Daniels, Steven D.; Maslanka, Daniel C.; and Morse, John E., 4,875,122, Cl. 360-109.000.

Massachusetts Institute of Technology: See—
Saito, Haruo; Kranz, David M.; Eisen, Herman N.; and Tonegawa, Susumu, 4,874,845, Cl. 530-395.000.

Smith, Rosemary L.; and Collins, Scott D., 4,874,499, Cl. 204-403.000.

Masuda, Isao; Fukuoaka, Takashi; and Kobayashi, Fujio, to Kioritz Corporation. Two-cycle internal combustion engine. 4,873,946, Cl. 123-65.0PD.

Masuda, Kazuaki, to Canon Kabushiki Kaisha. With a liquid supply path having disposed therein a filler providing partial flow blockage that varies upstream of the discharge orifice. 4,875,059, Cl. 346-140.00R.

Masuda, Kenji, to Sanden Corporation. Heating and air conditioning system for a forklift. 4,874,036, Cl. 165-42.000.

Masuda, Koji; Suemitsu, Yuji; and Asano, Kazuo, to Fuji Xerox Co., Ltd. Discharge head for an electrostatic recording device. 4,875,060, Cl. 346-153.000.

Masuda, Yoshihiko; and Murakosi, Masanobu, to Kioritz Corporation. Method of adjusting hardness of metallic material. 4,874,437, Cl. 148-150.000.

Masui, Toshiyuki: See—
Kashida, Motokazu; and Masui, Toshiyuki, 4,875,222, Cl. 375-26.000.

Masunaga, Katsuro: See—
Shiomi, Yasushi; Matsuzaki, Tokuo; and Masunaga, Katsuro, 4,874,888, Cl. 560-204.000.

Masuo, Yoshihisa, to Omron Tateisi Electronics Co. Method of making a thermometer probe. 4,873,758, Cl. 29-612.000.

Masuyama, Takeshi: See—
Matsukawa, Hideki; Masuyama, Takeshi; Hirota, Minoru; Wakahata, Yasuo; Itoh, Masahiro; and Harada, Shinji, 4,874,227, Cl. 350-334.000.

Matayoshi, Yutaka: See—
Muranaka, Shigeo; Ohkawa, Kouzaburo; Yokoyama, Junichi; Matayoshi, Yutaka; and Kamegaya, Shigeru, 4,873,953, Cl. 123-308.000.

Mathews, James K., Jr.; Chancellor, Craig A.; and Howes, H. Frank, to Raytheon Company. Transient and intermittent fault insertion. 4,875,209, Cl. 371-3.000.

Mathis, Robert B.: See—
Fertter, Kate M.; and Mathis, Robert B., 4,875,162, Cl. 364-401.000.

Matrozza, Mark A.: See—
Boudreaux, Donald P.; Matrozza, Mark A.; and Leverone, Marianne F., 4,874,704, Cl. 435-252.900.

Matsuda, Tsukasa; Ui, Kazuo; and Maeda, Hiroshi, to Fuji Photo Film Co., Ltd. Light-tight cassette. 4,874,089, Cl. 206-397.000.

Matsui, Masataka; Aono, Toshiaki; Tanimoto, Yoshio; Nakahama, Tadami; and Yamane, Takakazu, to Mazda Motor Corporation. Coating method in coating line and coating apparatus therefor. 4,874,639, Cl. 427-240.000.

Matsukawa, Hideki; Masuyama, Takeshi; Hirota, Minoru; Wakahata, Yasuo; Itoh, Masahiro; and Harada, Shinji, to Matsushita Electric Industrial Co., Ltd. Large-sized liquid crystal display. 4,874,227, Cl. 350-334.000.

Matsumoto, Akio: See—
Ito, Haruyuki; and Matsumoto, Akio, 4,874,304, Cl. 425-84.000.

Matsumoto, Shuichi; and Murakami, Hitomi, to Kokusai Denshin Denwa Kabushiki Kaisha. Noise-shaping predictive coding system. 4,875,095, Cl. 358-133.000.

Matsumoto, Takayuki: See—
Watanabe, Naoto; Tanaka, Akira; Matsumoto, Takayuki; Ohmura, Yutaka; and Kojima, Hisao, 4,873,760, Cl. 29-714.000.

Matsumoto, Tetsuo, to Hitachi, Ltd. Semiconductor memory with an improved nibble mode arrangement. 4,875,192, Cl. 365-193.000.

Matsumoto, Wataru: See—
Maruzeni, Shoji; Matsumoto, Wataru; and Yasuda, Nozomi, 4,874,699, Cl. 435-135.000.

Matsumura, Yasushi: See—
Sugisawa, Ko; Matsumura, Yasushi; Okamoto, Hidefumi; and Hayami, Hiroshi, 4,874,580, Cl. 422-25.000.

Matsunaga, Kenichi: See—
Yoshikumi, Chikao; Ohmura, Yoshio; Hirose, Fumio; Ikuzawa, Masanori; Matsunaga, Kenichi; Fujii, Takayoshi; Ohhara, Minoru; and Ando, Takao, 4,874,750, Cl. 514-42.000.

Matsunaga, Nobuyuki: See—
Endo, Toshihiko; and Matsunaga, Nobuyuki, 4,874,807, Cl. 524-267.000.

Matsuoka, Ken; and Yamazaki, Masanobu, to Fuji Kiko Company, Limited. Grooved pulley and manufacturing method therefor. 4,874,353, Cl. 474-168.000.

Matsuoka, Morito; and Ono, Ken'ichi, to Nippon Telegraph and Telephone Corporation. Thin film forming apparatus. 4,874,497, Cl. 204-298.000.

Matsushima, Yasunobu: See—
Sonoda, Sakae; Hetsugi, Kouji; Sawasaki, Yoshihiko; Kaburagi, Kouji; and Matsushima, Yasunobu, 4,874,480, Cl. 204-56.100.

Matsushima, Yuichi: See—
Utake, Katsuyuki; Sakai, Kazuo; Matsushima, Yuichi; and Akiba, Shigeyuki, 4,874,216, Cl. 350-96.190.

Matsushita Electric Industrial Co., Ltd.: See—
Fukui, Masahiro, 4,875,139, Cl. 361-410.000.

Kasai, Isao, 4,874,928, Cl. 219-492.000.

Kodo, Toshiyuki; and Tanaka, Shinichi, 4,875,202, Cl. 369-32.000.

Koshiba, Nobuharu; Ikechata, Toshihiko; and Takata, Kenichi, 4,874,680, Cl. 429-197.000.

Matsukawa, Hideki; Masuyama, Takeshi; Hirota, Minoru; Wakahata, Yasuo; Itoh, Masahiro; and Harada, Shinji, 4,874,227, Cl. 350-334.000.

Murai, Katsumi; and Usui, Makoto, 4,875,211, Cl. 371-40.100.

Takamura, Yoshinari; Obara, Kazuaki; and Nagashima, Michiyoshi, 4,875,203, Cl. 369-46.000.

Matsushita Electric Works, Ltd.: See—
Sakamoto, Takaaki; Itoh, Munchiko; and Maeda, Shuji, 4,874,826, Cl. 525-534.000.

Matsushita, Takashi; and Yanai, Genzo, to Sanden Corporation. Method and arrangement for securing a pulley to a rotor in an electromagnetic clutch. 4,874,973, Cl. 310-78.000.

Matsuyama, Jiro, to Mitsubishi Denki Kabushiki Kaisha. Viscosity damper. 4,873,888, Cl. 74-574.000.

Matsuzaki, Tokuo: See—
Shiomi, Yasushi; Matsuzaki, Tokuo; and Masunaga, Katsuro, 4,874,888, Cl. 560-204.000.

Mattei, Vittorio: See—
Ringdahl, Ulf; and Mattei, Vittorio, 4,874,021, Cl. 141-85.000.

Mattel, Inc.: See—
Rosenthal, Doren, 4,874,343, Cl. 446-175.000.

Matthea, Hans G., to AEG-Eltherm GmbH. Parallel oscillatory circuit frequency converter with safety circuit. 4,875,150, Cl. 363-51.000.

Matthews, Bernard T.; Joll, David J.; and Ziauddin, Hameed M., to Bernard Matthews plc. Method for making a coextruded meat product. 4,874,623, Cl. 426-272.000.

Matuska, David G.; and Ferris, Donald L., to United States of America, Army. Apparatus for damping helicopter rotor blade oscillations. 4,874,292, Cl. 416-140.000.

Maurer, Donald D., to Empi, Inc. Vaginal stimulator for controlling urinary incontinence in women. 4,873,996, Cl. 128-844.000.

Max-Planck-Gesellschaft zur Förderung der Wissenschaften e.V.: See—
Kettenring, Gunther, 4,874,138, Cl. 242-54.00R.

Maymar, Milan J.: See—
Ryan, Thomas W., III; Maymar, Milan J.; and Anderson, Orin M., 4,873,947, Cl. 123-78.00C.

Mayne, James K., to American Brush Corporation. Paint brush holder. 4,874,087, Cl. 206-362.400.

Mayumi, Junji: See—
Yamamoto, Shosaku; Kakinuma, Kazuo; Ishioka, Hiroshi; Sodeyama, Fumio; Mayumi, Junji; and Maruta, Riichiro, 4,874,818, Cl. 525-183.000.

Mazda Motor Corporation: See—
Kijima, Takao; and Edahiro, Takeshi, 4,874,185, Cl. 280-690.000.

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Tanaka, Hideki, 4,873,961, Cl. 123-564.000.

Watanabe, Kenichi, 4,874,054, Cl. 180-140.000.

Yamamoto, Takeshi, 4,874,199, Cl. 296-192.000.

Mazurek, Tadeusz L. Adjustable ratchet wrench for keyed shafts. 4,873,899, Cl. 81-63.000.

McAlpine, James B.: See—
Katz, Leonard; Tuan, James; and McAlpine, James B., 4,874,748, Cl. 514-29.000.

McArthur, William; and Soukup, Thomas M. Non-reusable syringe. 4,874,372, Cl. 604-110.000.

McAuliffe, Lawrence, Jr., to Colt Industries Inc. Idle air flow shutoff valve. 4,873,955, Cl. 123-339.000.

- McCabe, Raphaela: See—
Steinberg, Joseph; and McCabe, Raphaela, 4,874,165, Cl. 273-1.0GC.
- McCall, Jones; McClure, Tom; and Monroe, Letcher. Two by one twill weave for an impression fabric. 4,874,263, Cl. 400-241.300.
- McCann, Michael T.: See—
Andrews, William H.; Brothers, Virginia M.; Files, James G.; Kuhn, Irene; McCann, Michael T.; Paul, Leland S.; Sias, Stacey R.; Gore, Thomas C.; Newman, Karel Z., Jr.; and Tedesco, John L., 4,874,705, Cl. 435-252.330.
- McCann, James D.; Young, Lawrence R.; and Brandon, John M., to Eastman Kodak Company. Simplified multicolor fluid system for continuous ink jet printer. 4,875,055, Cl. 346-75.000.
- McCauley, Archie N.: See—
Stierman, Roger J.; McCauley, Archie N.; and Zart, Robert C., 4,874,476, Cl. 204-15.000.
- McClung, James A.: See—
Bulso, Joseph D., Jr.; and McClung, James A., 4,873,859, Cl. 72-336.000.
- McClure, Richard J., to Eastman Kodak Company. Apparatus and method for precise tape guiding in a magnetic tape transport. 4,875,127, Cl. 360-130.210.
- McClure, Tom: See—
McCall, Jones; McClure, Tom; and Monroe, Letcher, 4,874,263, Cl. 400-241.300.
- McConnell, Ronald E.: See—
Lafreniere, Dennis R.; and McConnell, Ronald E., 4,874,348, Cl. 453-50.000.
- McCoy, Joseph R., to United States of America, Air Force. High lead density vacuum feedthrough. 4,874,910, Cl. 174-152.0GM.
- McCullough, Doris E.: See—
Carr, F. Patrick; Dillard, Robert D.; and McCullough, Doris E., 4,874,777, Cl. 514-381.000.
- McDantim, Inc.: See—
Fallon, Merton R.; and Clements, Thomas W., 4,874,116, Cl. 222-399.000.
- McDavid, James M., to Texas Instruments Incorporated. Method of making a metal-gate MOS VLSI device. 4,874,720, Cl. 437-203.000.
- McDonald, Keith: See—
Kay, Peter D.; and McDonald, Keith, 4,874,806, Cl. 524-204.000.
- McDonald, Kevin. License plate lenses. 4,874,226, Cl. 350-319.000.
- McDonell, James A.: See—
Greenwald, Richard B.; Liu, Chung-Tsing; and McDonell, James A., 4,874,540, Cl. 252-174.240.
- McEwen, Albert R.; and Forrest, William J. Core sample box. 4,874,091, Cl. 206-443.000.
- McGahee, Welbourne D.; and Campbell, John W., to Loop-A-Line, Inc. Side stepper worms with hook pocket. 4,873,783, Cl. 43-42.240.
- McGill, Paul E.; and Pitigliano, Frank J., to Somerset Technologies, Inc. Accumulator extrusion head for producing striped parisons. 4,874,305, Cl. 425-131.100.
- McInerney Incorporated: See—
Curth, Gary, 4,873,823, Cl. 60-293.000.
- McKelvey, John L., to Ink Company, The. Ink reclamation system. 4,874,515, Cl. 210-360.100.
- McKenzie, Donald E.: See—
Gay, Richard L.; and McKenzie, Donald E., 4,874,599, Cl. 423-490.000.
- McKinney, Ronald J.; and Osborne, Robert B., to Du Pont de Nemours, E. I., and Company. Promoter synergism in pentenenitrile hydrocyanation. 4,874,884, Cl. 558-338.000.
- McLaughlin, David F.; and Stoltz, Richard A., to Westinghouse Electric Corp. Molten salt extractive distillation process for zirconium-hafnium separation. 4,874,475, Cl. 203-51.000.
- McLean, Joseph B.: See—
MacArthur, James B.; Comolli, Alfred G.; and McLean, Joseph B., 4,874,506, Cl. 208-413.000.
- McLeod, H. C. Briquets for smoke seasoning food products. 4,874,396, Cl. 44-589.000.
- McMahon, Paul; Chung, Tai-Shung; and Ying, Lincoln, to BASF Structural Materials Inc. Process for preparing tows from composite fiber blends. 4,874,563, Cl. 264-29.200.
- McManus, Paul A.; and Beaton, Robert J. Method and apparatus for processing colorimetric parameters of a color sample. 4,875,032, Cl. 340-703.000.
- McMeekin, James H.; Lerch, Alan E.; Chollock, Ronald S.; and Westdock, James F., to Brockway, Inc. (N.Y.). Method and apparatus for inspection of a transparent container. 4,874,940, Cl. 250-223.00B.
- McNab, Donald W.: See—
Kay, Nathan; McNab, Donald W.; and Moya, Edward J., 4,874,117, Cl. 222-487.000.
- McNaughton, R. David. Syringe shield. 4,874,383, Cl. 604-198.000.
- McNeil-PC, Inc.: See—
Swieringa, Morris K., 4,874,457, Cl. 156-474.000.
- McPherson, Daniel W.; Fowler, Joanna S.; and Wolf, Alfred P., to United States of America, Energy. No-carrier-added [¹¹¹C]putrescine. 4,874,600, Cl. 424-1.100.
- McPherson, Walter K.; and Blaker, James L., to TRC, Inc. Redundant signal device for auto crash testing. 4,873,867, Cl. 73-493.000.
- Mead Corporation, The: See—
Adair, Paul C., 4,874,685, Cl. 430-138.000.
- Cousin, Michael J., 4,874,610, Cl. 424-196.100.
- Gottschalk, Peter, 4,874,450, Cl. 156-275.500.
- Meade, Christopher J. M.: See—
Bonjoukian, Rosanne; Meade, Christopher J. M.; Mihelich, Edward D.; and Phillips, Michael L., 4,874,782, Cl. 514-473.000.
- Meadows, William H., to National Semiconductor Corporation. High speed CMOS comparator with hysteresis. 4,874,969, Cl. 307-355.000.
- Mechanical Technology Incorporated: See—
Dhar, Manmohan, 4,873,826, Cl. 60-641.140.
- Medical Dynamics, Inc.: See—
Bayne, Irman D., 4,873,992, Cl. 128-756.000.
- Medical Engineering Corporation: See—
Goldberg, Jay R.; and Hillegass, Donald V., 4,874,360, Cl. 104-4.000.
- Medice Chem.-Pharm. Fabrik Putter GmbH & Co.: See—
Paradies, Heinrich H., 4,874,850, Cl. 536-3.000.
- Medilase, Inc.: See—
Comben, Richard H.; Gilman, Byron L.; and Shurman, Leonid, 4,874,371, Cl. 604-95.000.
- Medlock, James R., III: See—
Rozanski, Robert D.; Medlock, James R., III; and Larson, Stephen F., 4,875,137, Cl. 361-331.000.
- Megaw, John H. P. C.: See—
Brandsen, Antony S.; Megaw, John H. P. C.; Terry, Malcolm J.; and Ward, Brooke A., 4,874,919, Cl. 219-121.680.
- Meier, Hans R.: See—
Stegmann, Werner; Meier, Hans R.; Evans, Samuel; Martin, Roger; and Luisoli, Reto, 4,874,885, Cl. 560-15.000.
- Melas, Constantin M.: See—
Dost, Martin H.; Hopner, Emil; Melas, Constantin M.; and Prova-zek, Lionel D., 4,875,112, Cl. 360-65.000.
- Melby, Jeffrey J.: See—
Aho, Kenneth A.; Melby, Jeffrey J.; and Miller, Richard A., 4,874,228, Cl. 350-345.000.
- Melton, Hewlett E., Jr.: See—
Hunt, Thomas J.; Miller, James G.; Thomas, Lewis J., III; Melton, Hewlett E., Jr.; and Shoup, Thomas A., 4,873,984, Cl. 128-660.070.
- Melton, John L.: See—
Boyle, Peter C.; Steffen, Daniel G.; Melton, John L.; Coccodrilli, Gus D., Jr.; and Nagy, Michael A., 4,874,606, Cl. 426-74.000.
- Menconi, Augusto; Camaggi, Giovanni; Gozzo, Franco; Mirena, Luigi; and Garavaglia, Carlo, to Montedison S.p.A. Cyanacetamido-derivatives having a fungicidal activity. 4,874,786, Cl. 514-528.000.
- Mendenhall, Abraham H.; Irace, Joseph F.; and Skudrzyk, Joseph, to Packaging Concepts, Inc. Microwavable package incorporating controlled venting. 4,874,620, Cl. 426-113.000.
- Meng, Sen Y.: See—
Dunn, Charlton; Bremner, Robert J.; and Meng, Sen Y., 4,874,575, Cl. 376-404.000.
- Menn, Roger; Brunel, Christian; and Pecile, Dario. Trichromatic electroluminescent matrix screen, and method of manufacture. 4,874,986, Cl. 313-505.000.
- Mercer, Roger W.: See—
Mercer, Roger W., II; and Mercer, Roger W., 4,874,123, Cl. 227-147.000.
- Mercer, Roger W., II; and Mercer, Roger W. Gutter installation tool. 4,874,123, Cl. 227-147.000.
- Merk & Co., Inc.: See—
Ashe, Bonnie M.; and Fletcher, Daniel S., 4,874,755, Cl. 514-179.000.
- Colegrove, George T.; and Lindroth, Thomas A., 4,874,423, Cl. 71-95.000.
- Colegrove, George T.; and Lindroth, Thomas A., 4,874,854, Cl. 536-114.000.
- Flanagan, Richard J., 4,874,601, Cl. 424-1.100.
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- Reifferscheid, Karl J., 4,874,576, Cl. 420-22.000.
- Metallogal AG: See—
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- Froelich, Harold E.; and Fosien, Floyd L., 4,874,122, Cl. 227-19.000.
- Hanson, Robert L., 4,875,109, Cl. 360-60.000.
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- Johansson, Ronald C., 4,874,908, Cl. 174-72.00A.
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- Rasmussen, Jerald K.; Heilmann, Steven M.; Krepski, Larry R.; and Moren, Dean M., 4,874,822, Cl. 525-279.000.
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- Mio, Kohei: See—
Ochi, Tatsuyuki; Tanaka, Nobuo; and Mio, Kohei, 4,874,238, Cl. 356-1.000.
- Mirena, Luigi: See—
Menconi, Augusto; Camaggi, Giovanni; Gozzo, Franco; Mirena, Luigi; and Garavaglia, Carlo, 4,874,786, Cl. 514-528.000.
- Mise, Takaya: See—
Miya, Shinya; Harada, Masato; Mise, Takaya; and Yamazaki, Hiro-shi, 4,874,880, Cl. 556-53.000.
- Mishima, Yasunobu: See—
Kubo, Eiichi; Nagaoka, Koichi; Miyahara, Yoshiki; Kiriya-ma, Syunichi; and Mishima, Yasunobu, 4,874,666, Cl. 428-398.000.
- Misumi, Kiyohito: See—
Furukawa, Mitsuhiro; Kitahira, Takashi; Tanaka, Sakae; and Misumi, Kiyohito, 4,874,725, Cl. 501-89.000.
- Misumi, Shikao: See—
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Takamatsu, Junichi; and Akiyama, Kazunori, 4,875,077, Cl. 355-212.000.
- Mitchell, Maurice E. Microcomputer with disconnected, open, inde-pendent, bimemory architecture, allowing large interacting, intercon-nected multi-microcomputer parallel systems accomodating multiple levels of programmer defined heirarchy. 4,875,154, Cl. 364-206.000.
- Mitchell, Peter W. D., to Union Camp Corporation. Preparation of pseudoionones. 4,874,900, Cl. 568-390.000.
- Mitsubishi Denki K.K.: See—
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- Mitsubishi Denki Kabushiki Kaisha: See—
Inoue, Yasuo, 4,874,718, Cl. 437-62.000.
- Kato, Kiyotaka; and Oshima, Michitaka, 4,875,033, Cl. 340-706.000.
- Kobayashi, Norihide; Inaba, Tsutomu; Kimura, Tadashi; and Sugihara, Masahiro, 4,874,302, Cl. 418-55.000.
- Matsuyama, Jiro, 4,873,888, Cl. 74-574.000.
- Ueyama, Yoshiji; and Asayama, Yoshiaki, 4,873,957, Cl. 123-399.000.
- Mitsubishi Jukogyo Kabushiki Kaisha: See—
Kushibe, Yuki; and Sato, Hiroshi, 4,874,309, Cl. 425-589.000.
- Mitsubishi Kinzoku Kabushiki Kaisha: See—
Akutsu, Hidetoshi, 4,874,439, Cl. 148-433.000.
- Wakita, Saburo; and Hoshi, Junji, 4,874,577, Cl. 420-417.000.
- Mitsubishi Paper Mills, Ltd.: See—
Hiraiishi, Shigetoshi; Koike, Naomasa; Kondo, Kazuyoshi; and Fuchigami, Mitsuru, 4,874,740, Cl. 503-201.000.

Mitsubishi Petrochemical Co., Ltd.: See—
Oda, Kyoko; Takahashi, Kunisasa; and Seo, Iwao, 4,874,598, Cl. 421-598.000.

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Kato, Masaki; Uno, Tetsuya; Kobayashi, Masao; and Onaga, Naoto, 4,874,890, Cl. 560-205.000.

Suginori, Teruhiko; Suzuki, Fumio; Habara, Hideaki; and Inada, Hiromasa, 4,874,841, Cl. 528-491.000.

Mitsui Petrochemical Industries, Inc.: See—
Yama, Tadao; and Akana, Yoshinori, 4,874,647, Cl. 428-35.700.

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Kioke, Mamoru; and Kashiwa, Norio, 4,874,734, Cl. 502-104.000.

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Miyabayashi, Takeshi; to Brother Kogyo Kabushiki Kaisha. Method of making thin film magnetic recording medium, 4,874,637, Cl. 427-131.000.

Miyagawa Kasei Industry Co., Ltd.: See—
Miyagawa, Shiro, 4,874,679, Cl. 429-91.000.

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Miyagi, Mitsunobu: See—
Hongo, Akihito; Shiota, Tsuneo; Nishida, Shigeo; Miyagi, Mitsunobu; and Wagatsuma, Yoshihiko, 4,875,218, Cl. 372-64.000.

Miyahara, Yoshiki: See—
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Miyake, Akira: See—
Asada, Seiji; Sueyoshi, Toshinobu; and Miyake, Akira, 4,874,668, Cl. 428-403.000.

Miyake, Hitomi: See—
Tamba, Shinichi; and Miyake, Hitomi, 4,873,945, Cl. 123-55.00R.

Miyake, Nobuhiko: See—
Sato, Imao; Miyake, Nobuhiko; and Nishida, Souji, 4,874,259, Cl. 384-445.000.

Miyazawa, Tsuneo, to Toyota Jidosha Kabushiki Kaisha. Coolant outlet element for use in cooling system of internal combustion engine, 4,874,254, Cl. 374-208.000.

Miyamoto, Hisashi: See—
Ueda, Hiraki; Miyamoto, Hisashi; Aki, Shinji; and Otsuka, Tatsuya, 4,874,764, Cl. 514-254.000.

Miyamoto, Masayoshi: See—
Ikenawa, Hiroyuki; Mochimaru, Hideaki; Kanda, Hajime; Makita, Nobuhiko; Tanaka, Yoshiaki; Yagisita, Takahiro; Yamaki, Takahiro; Motohashi, Takeshi; Miyamoto, Masayoshi; Ishizu, Hisao; Sagawa, Yasuhiro; Kanno, Tadaaki; Sankoda, Tomoo; Hosokawa, Hiroshi; Aoki, Hideo; Suzuki, Takami; Takada, Hiromi; and Shimazaki, Toshio, 4,875,063, Cl. 346-160.100.

Miyamoto, Ryouichi: See—
Imamura, Makoto; and Miyamoto, Ryouichi, 4,874,086, Cl. 338-100.000.

Miyashita, Kunio: See—
Kimura, Hiroshi; Naito, Shotaro; Miyashita, Kunio; Noto, Yasuo; Sugura, Noboru; Takahashi, Tadashi; Yamamura, Hirohisa; Yamashita, Seizi; Kawamata, Syoichi; Tajima, Fumio; and Horikoshi, Shigeru, 4,874,053, Cl. 180-79.100.

Miyata, Hiroshi: See—
Sakurai, Shigeo; Umezawa, Sadao; Usami, Saburo; Miyata, Hiroshi; Toriya, Hajime; Tsubouchi, Kuniyoshi; and Kaneko, Ryoichi, 4,875,170, Cl. 364-507.000.

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Miyuchi, Hideo: See—
Ichikawa, Katumi; Amano, Itaru; Hujieda, Yasuhiko; Misumi, Shikao; Hukumura, Seisuke; and Miyuchi, Hideo, 4,874,303, Cl. 425-28.100.

Miyuchi, Shizuya; and Wada, Kiyoshi, to Koito Seisakusho Co., Ltd. Headlight for vehicle, 4,875,141, Cl. 362-61.000.

Miyazaki, Satochi: See—
Furuhashi, Koshi; Miyazaki, Satochi; Furuya, Masakazu; Kawasobi, Tatsuo; Koyama, Sinichi; and Kashio, Jiro, 4,875,208, Cl. 370-94.100.

Mizumura, Shunji: See—
Kawai, Osamu; and Mizumura, Shunji, 4,874,995, Cl. 318-484.000.

Mizuno, Hirotaka: See—
Maceda, Akira; Sano, Koichi; Yokoyama, Tetsuo; Koizumi, Hideaki; and Mizuno, Hirotaka, 4,875,012, Cl. 324-309.000.

Mizushima, Yoshihiko: See—
Koishi, Musubu; Mizushima, Yoshihiko; and Kan, Hirofumi, 4,875,093, Cl. 358-83.000.

Mizutani, Morikazu: See—
Sootome, Sumitoshi; Mizutani, Morikazu; Ikemoto, Isao; Kanemitsu, Shinji; Kitajima, Hajime; and Onoda, Shigeyoshi, 4,875,075, Cl. 355-50.000.

Moak, Jonathan E.: See—
Reisch, William A., III; and Moak, Jonathan E., 4,875,078, Cl. 355-246.000.

Mobay Corporation: See—
Lundy, Charles E.; Krishnan, Sivaram; and Reinert, Gerard E., 4,874,802, Cl. 524-94.000.

Mobil Oil Corporation: See—
Bartolucci, Mark P.; Karner, Grant G.; and Tracy, William J., III, 4,874,505, Cl. 208-131.000.

Herbst, Joseph A.; Owen, Hartley; and Schipper, Paul H., 4,874,503, Cl. 208-67.000.

von Ballmoos, Roland; and Ryan, Francis X., 4,874,504, Cl. 208-111.000.

Mochimaru, Hideaki: See—
Ikenawa, Hiroyuki; Mochimaru, Hideaki; Kanda, Hajime; Makita, Nobuhiko; Tanaka, Yoshiaki; Yagisita, Takahiro; Yamaki, Takahiro; Motohashi, Takeshi; Miyamoto, Masayoshi; Ishizu, Hisao; Sagawa, Yasuhiro; Kanno, Tadaaki; Sankoda, Tomoo; Hosokawa, Hiroshi; Aoki, Hideo; Suzuki, Takami; Takada, Hiromi; and Shimazaki, Toshio, 4,875,063, Cl. 346-160.100.

Mochizuki, Eiichi: See—
Kubodera, Takayuki; Nakamura, Shizuo; Onizawa, Masanori; Shirohata, Hirotaka; Mochizuki, Eiichi; Tsujimura, Masao; Atsuta, Toshikatsu; and Morooka, Takayoshi, 4,875,065, Cl. 354-81.000.

Moeller, Hinrich: See—
Schmid, Karl-Heinz; Penninger, Josef; and Moeller, Hinrich, 4,874,579, Cl. 422-16.000.

Mohan, Robert J.; and O'Neil, Walter K., to Eaton Corporation. Viscous fan drive control with integrated speed sensor, 4,874,072, Cl. 692-34.000.

Mohr, Kristine: See—
Yong, Bak G.; Petra, Barth; Dietrich, Demus; Detlev, Joachim; Kampa, Barbara; Kohler, Saskia; Mohr, Kristine; Paschke, Reinhard; Peitz, Gerhard; Rosenfeld, Ulrich; Schafer, Wolfgang; Scherf, Klaus-Dieter; Tschirke, Carsten; Weisflog, Wolfgang; and Zschke, Horst, 4,874,544, Cl. 252-299.610.

Mohrmann, Karl-Heinrich: See—
Gallenkamp, Bernd; Gunther, Andreas; Mohrmann, Karl-Heinrich; and Schmidt, Thomas, 4,874,860, Cl. 544-221.000.

Mol, Vernon J., III: See—
Mulder, Merle W.; and Mol, Vernon J., III, 4,874,112, Cl. 221-1.000.

Moldex/Metric Products, Inc.: See—
Magidson, Mark; and Huber, Otto L., 4,873,972, Cl. 128-206.120.

Moll, Maurice M.: See—
Ellsworth, Daniel L.; and Moll, Maurice M., 4,875,151, Cl. 363-127.000.

Momiyama, Yoshiharu: See—
Maeno, Mikihiro; Ohta, Yukio; Momiyama, Yoshiharu; Ono, Hisao; Takahata, Katsumasa; Ozono, Kazuyuki; Shimizu, Makoto; and Yamamoto, Mikio, 4,874,159, Cl. 271-171.000.

Momodori, Masaki; and Sakai, Koji, to Kabushiki Kaisha Toshiba. Semiconductor device with a reference voltage generator, 4,875,195, Cl. 365-230.080.

Monfort, Jean-Jacques. Processing system for a gambling game, 4,875,164, Cl. 364-412.000.

Monroe, Letcher: See—
McCall, Jones; McClure, Tom; and Monroe, Letcher, 4,874,263, Cl. 400-241.300.

Monsanto Company: See—
Cartier, George E.; and Farmer, Peter H., 4,874,814, Cl. 525-61.000.

Schwier, Chris E.; and Wu, Wan C., 4,874,829, Cl. 526-262.000.

Monsan, Mark B.; Blandino, Thomas P.; Bahr, Dennis E.; and Post, Kendall E., to Bahr Technologies, Inc. Receiver preamplifier with tuned circuit adapted for Loran reception, 4,875,019, Cl. 330-302.000.

Montagu, Jean L., to General Scanning, Inc. Tunable resonant mechanical system, 4,874,215, Cl. 350-6.000.

Montedipe S.p.A.: See—
Comper, Lucia; and Ferrari, Francesco, 4,874,307, Cl. 425-311.000.

Montedison S.p.A.: See—
Fiore, Leonardo; Motroni, Giuseppe; and Maritano, Mauro, 4,874,838, Cl. 528-408.000.

Johas, Ken W. E.; Briggs, Stuart; and Flabbi, Luciano, 4,874,124, Cl. 228-180.100.

Menconi, Augusto; Camaggi, Giovanni; Gozzo, Franco; Mirena, Luigi; and Garavaglia, Carlo, 4,874,786, Cl. 514-528.000.

Montefiore Hospital Association of Western Pennsylvania: See—
Stanko, Ronald T., 4,874,790, Cl. 514-557.000.

Monti, Marco M.: See—
Daniele, Vincenzo; Monti, Marco M.; Taliereio, Michele; and Capocelli, Piero, 4,875,020, Cl. 330-307.000.

Montoya, Wayne; and Reamey, Robert H., to Raychem Corporation. Stabilization of poly(arylene ether ketones), 4,874,839, Cl. 528-480.000.

Moore, James G. Collapsible electric guitar, 4,873,908, Cl. 84-291.000.

Moore, Thomas C., Jr.: See—
Holmes, Harlan K.; Moore, Thomas C., Jr.; and Fantl, Andrew J., 4,873,990, Cl. 128-748.000.

Moran, John P.; Gilson, Richard W.; and Heubel, Thomas W., to Sherwood Medical Company. Plunger lock device, 4,874,385, Cl. 804-208.000.

Moren, Dean M.: See—
Rasmussen, Jerald K.; Heilmann, Steven M.; Krepski, Larry R.; and Moren, Dean M., 4,874,822, Cl. 525-279.000.

Mori, Masaharu, to Clarion Co., Ltd. Spread spectrum receiver, 4,875,221, Cl. 375-1.000.

Mori, Shinsaku: See—
Kikuchi, Makoto; Mori, Shinsaku; Nikawa, Yoshio; and Terakawa, Takahige, 4,873,995, Cl. 128-804.000.

Mori, Takaaki: See—
Ito, Toshitsugu; Minoura, Jun; Mori, Takaaki; Takahashi, Shigeyuki; Kato, Mamoru; Shimada, Junichi; and Hayakawa, Fujio, 4,874,229, Cl. 350-357.000.

Mori, Yoshiteru: See—
Ohnishi, Kazuyuki; Mori, Yoshiteru; and Okuda, Masakiyo, 4,875,072, Cl. 355-23.000.

Moriconi, Andrea: See—
Crispoldi, Antonio; Moriconi, Andrea; and Chiappafreddo, Mario, 4,874,595, Cl. 423-397.000.

Morie, Satsuki: See—
Wakabayashi, Ataru; Umehara, Yoshichi; Morie, Satsuki; Kuwahara, Ikuro; and Okada, Yoshimi, 4,874,483, Cl. 204-94.000.

Morita, Kiyomi: See—
Kamifuji, Hiroshi; Tanabe, Yoshiyuki; and Morita, Kiyomi, 4,875,960, Cl. 123-480.000.

Moriuchi, Yousuke: See—
Kousai, Tadashi; Ishida, Toshinobu; and Moriuchi, Yousuke, 4,874,374, Cl. 604-164.000.

Moriya, Tomoyuki: See—
Suzuki, Takami; Tataru, Yoshikuni; and Moriya, Tomoyuki, 4,874,264, Cl. 400-335.000.

Morooka, Takayoshi: See—
Kubodera, Takayuki; Nakamura, Shizuo; Onizawa, Masanori; Shirohata, Hirotaka; Mochizuki, Eiichi; Tsujimura, Masao; Atsuta, Toshikatsu; and Morooka, Takayoshi, 4,875,065, Cl. 354-82.000.

Morris, David L.; Filip, Mihail; D'Amelio, Frank D.; Esposito, Dominick G.; and Quint, Robert H., to Circon Corporation. Inspection instrument channel separator and pressure neutralizing device, 4,874,364, Cl. 604-35.000.

Morrison, Judith A. Examination garment, 4,873,982, Cl. 128-630.000.

Morrison Textile Machinery Company: See—
Talbert, James E., Jr., 4,873,846, Cl. 68-5.00E.

Morse, John E.: See—
Daniels, Steven D.; Maalanka, Daniel C.; and Morse, John E., 4,875,122, Cl. 360-109.000.

Mossadegh, Reza: See—
Vacha, Lubos J. B.; Schultz, Peter C.; Moynihan, Cornelius T.; Raychaudhuri, Satyabrata; Cadien, Ken C.; Harbison, Barry B.; and Mossadegh, Reza, 4,874,222, Cl. 350-96.340.

Moteki, Eiji, to Fuji Electric Company Ltd. System for detecting a reference track on a disk surface in a disc storage unit, 4,875,114, Cl. 360-77.080.

Motohashi, Takeshi: See—
Ikenawa, Hiroyuki; Mochimaru, Hideaki; Kanda, Hajime; Makita, Nobuhiko; Tanaka, Yoshiaki; Yagisita, Takahiro; Yamaki, Takahiro; Motohashi, Takeshi; Miyamoto, Masayoshi; Ishizu, Hisao; Sagawa, Yasuhiro; Kanno, Tadaaki; Sankoda, Tomoo; Hosokawa, Hiroshi; Aoki, Hideo; Suzuki, Takami; Takada, Hiromi; and Shimazaki, Toshio, 4,875,063, Cl. 346-160.100.

Motohiro, Tomoyoshi: See—
Hamaguchi, Shigeki; Ohtsuka, Yasuhiro; Motohiro, Tomoyoshi; Taga, Yasunori; and Ishii, Masahiko, 4,874,664, Cl. 428-325.000.

Motorola, Inc.: See—
Bai, Monty W.; and Huhmann, Douglas J., 4,873,871, Cl. 73-777.000.

Siwiak, Kazimierz; Jasinski, Leon; and Steel, Francis R., 4,875,038, Cl. 340-825.440.

Motroni, Giuseppe: See—
Fiore, Leonardo; Motroni, Giuseppe; and Maritano, Mauro, 4,874,838, Cl. 528-408.000.

Moulds, Julie M., to Chrysler Motors Corporation. Shipping rack for vehicle air dams, 4,874,098, Cl. 211-13.000.

Moya, Edward J.: See—
Kay, Nathan; McNab, Donald W.; and Moya, Edward J., 4,874,117, Cl. 222-487.000.

Moynihan, Cornelius T.: See—
Vacha, Lubos J. B.; Schultz, Peter C.; Moynihan, Cornelius T.; Raychaudhuri, Satyabrata; Cadien, Ken C.; Harbison, Barry B.; and Mossadegh, Reza, 4,874,222, Cl. 350-96.340.

Moynihan, Patrick B. Compressor attachment for portable drill, 4,874,296, Cl. 417-234.000.

MRE Corporation: See—
Ferguson, Hugo S., 4,874,644, Cl. 148-12.00R.

Mrozik, Helmut, to Merck & Co., Inc. 4"-Deoxy-4-N-methylamino avermectin Bla/Bib, 4,874,749, Cl. 514-30.000.

MTU Motoren-und Turbinen-Union Munchen GmbH: See—
Grieb, Hubert, 4,874,287, Cl. 415-149.200.

Mulder, Merle W.; and Mol, Vernon J., III. Filter dispenser, 4,874,112, Cl. 221-1.000.

Mulder, Theodor; and Swartz, Ronald W., to Intel Corporation. Integrated read and programming row driver, 4,875,191, Cl. 365-189.010.

Mulhaupt, Rolf; and Simon, Hubert, to Ciba-Geigy Corporation. Novel oxazolidinone, 4,874,805, Cl. 524-188.000.

Muller-Beckmann, Bernd: See—
Mertens, Alfred; von der Saal, Wolfgang; Berger, Herbert; Muller-Beckmann, Bernd; and Strein, Klaus, 4,874,756, Cl. 514-212.000.

Muller, Gunter; Nagel, Rolf; and Stahl, Jurg, to Metallogal AG. Single-component polyurethane coating mass, 4,874,812, Cl. 524-712.000.

Muller, Heinz, to Reifenhauer GmbH & Co. Maschinenfabrik. Apparatus for calendaring plastic web extruded from a slot die, 4,874,571, Cl. 264-175.000.

Multi-Technology Inc.: See—
Jessop, Paul M.; and Jeffs, David H., 4,874,102, Cl. 215-273.000.

Multinorm B.V.: See—
Wondergem, Jan, 4,874,130, Cl. 239-63.000.

Munro, Murray H. G.; Perry, Nigel B.; and Blunt, John W., to Harbor Branch Oceanographic Institution, Inc. Discorhabdin D, compositions containing same and methods of preparation and use thereof, 4,874,767, Cl. 514-278.000.

Munroe, Ronald G., to Eagle Electric Manufacturing Co., Inc. Electrical plugs and connectors with automatic cord clamps, 4,874,332, Cl. 439-462.000.

Murai, Katsumi; and Usui, Makoto, to Matsushita Electric Industrial Co., Ltd. Galois field arithmetic logic unit, 4,875,211, Cl. 371-40.100.

Murakami, Hideo, to Ryobi, Ltd. Bail for spinning reel, 4,874,144, Cl. 242-235.000.

Murakami, Hitomi: See—
Matsumoto, Shuichi; and Murakami, Hitomi, 4,875,095, Cl. 358-133.000.

Murakami, Kazuo; Kaneko, Yasutoshi; and Tamaki, Takasi, to Yamaha Corporation. Automatic player piano, 4,873,905, Cl. 84-20.000.

Murakami, Michiyuki: See—
Yamada, Ichiji; Inuzuka, Yutake; Ichihara, Isao; Murakami, Michiyuki; Suzuki, George; Yanahashi, Ryou; and Kondo, Takashi, 4,873,884, Cl. 74-473.00P.

Murakami, Yoshiki; Yamamoto, Etsuji; Yabuuchi, Masao; and Kohno, Hideki, to Hitachi, Ltd. High-frequency coil for nuclear magnetic imaging, 4,875,013, Cl. 324-318.000.

Murakosi, Masanobu: See—
Masuda, Yoshihiko; and Murakosi, Masanobu, 4,874,437, Cl. 148-130.000.

Muranaka, Shigeo; Ohkawa, Kouzaburo; Yokoyama, Junichi; Matayoshi, Yutaka; and Kamegaya, Shigeru, to Nissan Motor Co., Ltd. Induction port arrangement for internal combustion engine having multiple inlet valves per combustion chamber, 4,873,953, Cl. 123-308.000.

Muraaki, Sadanobu; and Makiyama, Hiroyuki, to Minolta Camera Kabushiki Kaisha. Sheet transporting apparatus, 4,874,161, Cl. 271-265.000.

Murashige, Shinichi: See—
Nakamura, Hideaki; Shimamori, Tamotsu; and Murashige, Shinichi, 4,875,016, Cl. 328-26.000.

Murata Manufacturing Co., Ltd.: See—
Sano, Harunobu; Sakabe, Yukio; and Nishioka, Goro, 4,875,136, Cl. 361-321.000.

Murotani, Tatsunori, to NEC Corporation. Semiconductor memory device with protection cells, 4,875,194, Cl. 365-210.000.

Murphy, Margaret H.: See—
Thompson, Marvin W.; Jennings, Timothy C.; Scott, James A.; Phenice, Ronald W.; Murphy, Margaret H.; Nakash, Gabriel D.; Biggers, James R.; Boudreau, Lynlee M.; and Curiel Contreras, Jorge H., 4,874,266, Cl. 403-407.100.

Murray, Theodore L., to Chrysler Motors Corporation. Dual evaporator air conditioner, 4,873,837, Cl. 62-199.000.

Muto, Tadanobu: See—
Kashiwada, Ken; Muto, Tadanobu; and Sasaki, Tetsuo, 4,874,035, Cl. 165-38.000.

Mutschler, Ernst: See—
Hofmann, Ingrid; Mutschler, Ernst; and Christner, Angelika, 4,874,763, Cl. 514-249.000.

Myers, David W.: See—
Watts, Michael P. C.; Perera, Thiloma I.; Myers, David W.; Ozarski, Robert G.; Schipper, John F.; and Tan, Raul V., 4,874,240, Cl. 356-73.000.

Myers, Michael L.: See—
Featherstone, John D. B.; Cooper, Lyndon F.; Myers, Michael L.; and Nelson, Dennis G. A., 4,874,315, Cl. 433-215.000.

Myers, Terry N.: See—
Baron, Arthur L.; Myers, Terry N.; and Wicher, Jerome, 4,874,803, Cl. 524-94.000.

Naganawa, Kazutomo: See—
Oku, Seiji; Shimamura, Tooru; Naganawa, Kazutomo; and Tanamura, Toshiya, 4,875,042, Cl. 340-870.170.

Nagano, Hiroyuki: See—
Kakuta, Toshio; and Nagano, Hiroyuki, 4,874,912, Cl. 200-16.00D.

Nagano, Masashi, to Shimano Industrial Company Limited. Pedal for a bicycle, 4,873,890, Cl. 74-594.400.

Nagaoka, Koichi: See—
Kubo, Eiichi; Nagaoka, Koichi; Miyahara, Yoshiki; Kiriya, Syunichi; and Mishima, Yasunobu, 4,874,666, Cl. 428-398.000.

Nagasaki, Tatsuo: See—
Yamada, Hidetoshi; and Nagasaki, Tatsuo, 4,875,091, Cl. 358-42.000.

Nagashima, Michiyoshi: See—
Takamura, Yoshinari; Obara, Kazuaki; and Nagashima, Michiyoshi, 4,875,203, Cl. 369-46.000.

Nagatome, Yoshiaki: See—
Sengoku, Koji; and Nagatome, Yoshiaki, 4,874,630, Cl. 426-634.000.

Nagayama, Susumu: See—
Yamazaki, Shunpei; Itoh, Kenji; and Nagayama, Susumu, 4,874,920, Cl. 219-121.850.

Nagel, Rolf: See—
Muller, Gunter; Nagel, Rolf; and Stahl, Jurg, 4,874,812, Cl. 524-712.000.

Nageno, Koji: See—
Kamon, Yoshiyuki; Ogiwara, Akira; and Nageno, Koji, 4,874,316, Cl. 439-39.000.

Nagl, Michael: See—
Papst, Gero; and Nagl, Michael, 4,874,037, Cl. 165-47.000.

Nagy, Michael A.: See—
Boyle, Peter C.; Steffen, Daniel G.; Melton, John L.; Coccodrilli, Gus D., Jr.; and Nagy, Michael A., 4,874,606, Cl. 426-74.000.

Naito, Genpei, to Nissan Motor Company, Limited. Driving force distribution control system for a 4 wheel drive vehicle. 4,874,056, Cl. 180-233.000.

Naito, Sakae: See—
Tsachitani, Masatoshi; and Naito, Sakae, 4,874,502, Cl. 208-45.000.

Naito, Shotaro: See—
Kimura, Hiroshi; Naito, Shotaro; Miyashita, Kunio; Noto, Yasuo; Sugiura, Noboru; Takahashi, Tadashi; Yamamura, Hirohisa; Yamashita, Seizi; Kawamata, Syoichi; Tajima, Fumio; and Horikoshi, Shigeru, 4,874,053, Cl. 180-79.100.

Naito, Takayuki: See—
Iimura, Seiji; Abe, Yoshio; Okumura, Jun; Naito, Takayuki; and Kamachi, Hajime, 4,874,856, Cl. 540-222.000.

Nakagawa, Yoshitomo; and Yamaoka, Takehiro, to Seiko Instruments Inc. Method and apparatus for modifying patterned film. 4,874,460, Cl. 156-626.000.

Nakagawa, Yoshitomo; Kaito, Takashi; Houjyo, Hisao; and Yamamoto, Masahiro, to Seiko Instruments, Inc. Process for forming pattern film. 4,874,632, Cl. 427-41.000.

Nakahama, Tadamitsu: See—
Matsui, Masataka; Aono, Toshiaki; Tanimoto, Yoshio; Nakahama, Tadamitsu; and Yamane, Takakazu, 4,874,639, Cl. 427-240.000.

Nakahara, Hiromi: See—
Okita, Tsutomu; Nakahara, Hiromi; and Ogawa, Hiroshi, 4,874,636, Cl. 427-130.000.

Nakahara, Jiro; Ueshin, Akito; and Okajima, Shiro, to Kabushiki Kaisha Toshiba. IC card which displays embossed information to prevent counterfeiting. 4,874,934, Cl. 235-492.000.

Nakai, Yasuhide: See—
Nishimoto, Yoshiro; Yoneda, Yasuji; Imaoka, Shinichi; Nakai, Yasuhide; Nakae, Akimitsu; Onishi, Yoshihiko; Tachibana, Hiroyuki; Inoue, Takayoshi; Kusaka, Takuya; Takamatsu, Hiroyuki; Tojo, Shigeki; Kajikawa, Hiroshi; and Nishimura, Kozo, 4,874,939, Cl. 250-211.000.

Nakajima, Akio, to Minolta Camera Kabushiki Kaisha. Image enlarging method and device. 4,875,173, Cl. 364-518.000.

Nakajima, Hirotaka, to Kabushiki Kaisha Toshiba. Ultrasonic imaging apparatus utilizing doppler flow metering. 4,873,985, Cl. 128-661.090.

Nakajima, Hisashi: See—
Terada, Michimasa; and Nakajima, Hisashi, 4,875,005, Cl. 324-158.00F.

Nakakita, Shoji: See—
Kimura, Mitsuru; and Nakakita, Shoji, 4,874,721, Cl. 437-209.000.

Nakakoshi, Ichiro: See—
Hamasaki, Naotaka; Kawamura, Hirotaka; Ohtsu, Norio; Nakakoshi, Ichiro; Ataka, Kikuo; Omori, Kiyosi; and Kouno, Masahiko, 4,874,882, Cl. 558-131.000.

Nakakusu, Tohru: See—
Umeda, Osamu; Nakakusu, Tohru; Sato, Makoto; and Shimazaki, Tatsuo, 4,875,064, Cl. 353-78.000.

Nakamichi Corporation: See—
Nakamichi, Niro, 4,875,126, Cl. 360-130.230.

Nakamichi, Niro, to Nakamichi Corporation. Stationary tape guide for a magnetic tape recorder. 4,875,126, Cl. 360-130.230.

Nakamura, Hideaki; Shimamori, Tamotsu; and Murashige, Shinichi, to Omron Tateisi Electronics Company. Transducer and related circuitry. 4,875,016, Cl. 328-26.000.

Nakamura, Kikuo, to Sigma, Incorporated. Reel tare fixing device and reel. 4,874,172, Cl. 273-143.00R.

Nakamura, Shigeo: See—
Yokoi, Takashi; and Nakamura, Shigeo, 4,874,262, Cl. 400-216.100.

Nakamura, Shizuo: See—
Kubodera, Takayuki; Nakamura, Shizuo; Onizawa, Masanori; Shirohata, Hirotaka; Mochizuki, Eiichi; Tsujimura, Masao; Autsu, Toshikatsu; and Morooka, Takayoshi, 4,875,065, Cl. 354-82.000.

Nakane, Hideaki: See—
Yokosawa, Koichi; Yamamoto, Etsuji; Nakane, Hideaki; Yabusaki, Masao; and Ogura, Yukiko, 4,875,010, Cl. 324-248.000.

Nakanishi, Shigenori: See—
Takagaki, Hidetsugu; Abe, Masayoshi; Watanabe, Michihiro; Takeuchi, Kazuyuki; Nakanishi, Shigenori; Nakata, Yuuko; and Yamazaki, Keiji, 4,874,855, Cl. 540-3.000.

Nakash, Gabriel D.: See—
Thompson, Marvin W.; Jennings, Timothy C.; Scott, James A.; Phenice, Ronald W.; Murphy, Margaret H.; Nakash, Gabriel D.; Biggers, James R.; Boudreau, Lynlee M.; and Curiel Contreras, Jorge H., 4,874,266, Cl. 403-407.100.

Nakata, Jitsuo: See—
Shino, Masami; Takano, Hideaki; Nakata, Jitsuo; and Noro, Katsumiko, 4,874,592, Cl. 423-262.000.

Nakata, Yuuko: See—
Takagaki, Hidetsugu; Abe, Masayoshi; Watanabe, Michihiro; Takeuchi, Kazuyuki; Nakanishi, Shigenori; Nakata, Yuuko; and Yamazaki, Keiji, 4,874,855, Cl. 540-3.000.

Nakae, Akimitsu: See—
Nishimoto, Yoshiro; Yoneda, Yasuji; Imaoka, Shinichi; Nakai, Yasuhide; Nakae, Akimitsu; Onishi, Yoshihiko; Tachibana, Hiroyuki; Inoue, Takayoshi; Kusaka, Takuya; Takamatsu, Hiroyuki; Tojo, Shigeki; Kajikawa, Hiroshi; and Nishimura, Kozo, 4,874,939, Cl. 250-211.000.

Nakazawa, Teugio: See—
Kobayashi, Setsuo; Nakazawa, Teugio; Yoshie, Yasumasa; Abiko, Yasushi; and Kameda, Kinya, 4,874,772, Cl. 514-341.000.

Nalco Chemical Company: See—
Meyer, George R., 4,874,395, Cl. 44-71.000.

Nalco, Carolyn A., 4,874,466, Cl. 162-164.300.

Namiki, Masayuki; Gouda, Masanori; and Kamiya, Masaaki, to Seiko Instruments Inc. Magnetic sensor using integrated silicon Hall effect elements formed on the (100) plane of a silicon substrate. 4,875,011, Cl. 324-251.000.

Narita, Senichi: See—
Yamada, Shin-ichi; Goto, Takao; Mashiko, Toshihisa; Kogi, Kentaro; Oguchi, Yukiko; and Narita, Senichi, 4,874,760, Cl. 514-234.200.

Narita, Yoshinori; and Kawamura, Mitsuyoshi, to NGK Spark Plug Co., Ltd. Engine cylinder head with precombustion chambers using porous ceramics insert. 4,873,952, Cl. 123-270.000.

Narula, Dipak, to Dow Corning Corporation. Bi-modal silicone emulsions, silicone emulsification process and emulsions therefrom. 4,874,547, Cl. 252-312.000.

Nasu, Tetsuji; and Shiina, Jun, to Nissan Motor co., Ltd. Modular vehicle body. 4,874,200, Cl. 296-197.000.

National Electronics Warranty Corporation: See—
Schaufeld, Fredrick, 4,874,187, Cl. 283-70.000.

National Research Development Corporation: See—
Elliott, Michael; Jones, Norman F.; and Khambay, Bhupinder P. S., 4,874,781, Cl. 514-463.000.

National Semiconductor Corporation: See—
Huard, Jeff, 4,875,130, Cl. 361-56.000.

Meadows, William H., 4,874,969, Cl. 307-355.000.

National Starch and Chemical Corporation: See—
Brady, Francis X.; and Kauffman, Thomas F., 4,874,804, Cl. 524-100.000.

Eden, James L.; Kasica, James J.; and Zallie, James P., 4,874,628, Cl. 426-578.000.

Navarrini, Walter; and Desmarieu, Darryl D., to Ausimont S.r.l. Perfluoro-amino-oxaziridines. 4,874,875, Cl. 548-959.000.

Naville, Charles: See—
Guerendel, Philippe; Naville, Charles; Laurent, Jean; and Dedole, Pascal, 4,874,060, Cl. 181-102.000.

Navistar International Transportation Corp.: See—
Dannenbergh, Robert D., 4,875,041, Cl. 340-870.130.

NCR Corporation: See—
Ellsworth, Daniel L.; and Moll, Maurice M., 4,875,151, Cl. 363-127.000.

Gioia, Samuel C., 4,874,713, Cl. 437-34.000.

Lyons, Dale R.; and Beam, Don E., 4,873,850, Cl. 70-85.000.

Porter, Warren W., 4,873,832, Cl. 62-49.200.

NEC Corporation: See—
Hara, Toshihiro; Yotsutani, Akio; Kawasaki, Ryoji; Tate, Kazuyuki; Huse, Syoji; and Ono, Koji, 4,875,231, Cl. 379-61.000.

Kimura, Mitsuru; and Nakakita, Shoji, 4,874,721, Cl. 437-209.000.

Mine, Kazuhiro; Sanada, Kei; and Ide, Mitsuteru, 4,874,980, Cl. 310-328.000.

Murotani, Tatsunori, 4,875,194, Cl. 365-210.000.

Obara, Takashi, 4,875,189, Cl. 365-189.040.

Segawa, Machio, 4,875,193, Cl. 365-207.000.

Sonetaka, Noriyoshi, 4,875,021, Cl. 331-78.000.

Tohyama, Shigeru, 4,875,084, Cl. 357-30.000.

Yoshida, Yasuharu, 4,875,049, Cl. 341-159.000.

Nedelec, Lucien: See—
Nique, Francois; Nedelec, Lucien; Bouton, Marie-Madeleine; and Philibert, Daniel, 4,874,754, Cl. 514-178.000.

Nedoncelle, Philippe: See—
Shroot, Braham; Eustache, Jacques; Bernardon, Jean-Michel; and Nedoncelle, Philippe, 4,874,747, Cl. 514-23.000.

Negoro, Toshihito: See—
Takagi, Katsumi; Negoro, Toshihito; and Tamagawa, Itaru, 4,873,931, Cl. 112-121.110.

Nellums, Richard A.; and Braun, Eugene R., to Eaton Corporation. Control for AMT system start from stop operation. 4,874,070, Cl. 192-0.052.

Nelson, Bruce A.: See—
Fingerson, Conrad F.; Carlson, Dennis L.; Nelson, Bruce A.; and Eickhoff, Robert D., 4,874,180, Cl. 273-416.000.

Nelson, Dennis G. A.: See—
Featherstone, John D. B.; Cooper, Lyndon F.; Myers, Michael L.; and Nelson, Dennis G. A., 4,874,315, Cl. 433-215.000.

Nelson, Linda H.; Avakian, Roger W.; and Factor, Arnold, to General Electric Company. Enhancing color stability to sterilizing radiation of polymer compositions. 4,874,783, Cl. 524-482.000.

Nelson, Loren D.; and Cerni, Todd A., to Ophir Corporation. Method of and apparatus for measuring vapor density. 4,874,572, Cl. 376-256.000.

Nepomuceno, Jose G.: See—
Tamol, Ronald A.; Nepomuceno, Jose G.; Keritsis, Gus D.; Burnett, George H.; Thesing, Richard A.; Winterson, Warren D.; and Nichols, Walter A., 4,874,000, Cl. 131-375.000.

Neppl, Franz; and Schwabe, Ulrich, to Siemens Aktiengesellschaft. Semiconductor circuit containing integrated bipolar and MOS transistors on a chip and method of producing same. 4,874,717, Cl. 437-59.000.

Nesse, Knut O., to Elopek Systems AG. Method in the production of a container, or a container blank, respectively, and a device for use with said method. 4,874,355, Cl. 493-148.000.

Neumann, Guenter J.: See—
Butterfield, Roger P.; Neumann, Guenter J.; and Wykstra, Curt A., 4,873,879, Cl. 74-689.000.

Neumiller, Phillip J.: See—
Eter, Robert M.; and Neumiller, Phillip J., 4,874,672, Cl. 428-457.000.

New, James Truitt, Jr. Kit for transporting all terrain vehicles. 4,874,284, Cl. 414-537.000.

Newell Co.: See—
Gunter, S. R., 4,874,148, Cl. 248-225.200.

Newell, David G.: See—
Featherstone, John L.; Spang, S. Timothy; Newell, David G.; and Gallup, Darrell L., 4,874,529, Cl. 210-713.000.

Newgard, Kent W.; and Gordon, Mark G., to Davis Newgard Revocable Family Living Trust, a part interest. Self-occluding intravascular cannula assembly. 4,874,377, Cl. 604-167.000.

Newman, Alec T.; Bentley, Andrew C.; King, Christine A.; MacMahon, Alistair J.; Tansley, Robert W.; and Gibbs, Andrew R., to General Foods Limited. Beverage preparing machines. 4,873,915, Cl. 99-289.00R.

Newman, Harold L.; Adams, William S., Jr.; and Boyden, Brace, to Boise Cascade Corporation. Pulp mill effluent color removal process. 4,874,521, Cl. 210-639.000.

Newman, Karel Z., Jr.: See—
Andrews, William H.; Brothers, Virginia M.; Files, James G.; Kuhn, Irene; McCaman, Michael T.; Paul, Leland S.; Sias, Stacey R.; Gore, Thomas C.; Newman, Karel Z., Jr.; and Tedesco, John L., 4,874,705, Cl. 435-252.330.

Neyret, Guy. Fork for the fixation of a cylinder lock plug. 4,873,852, Cl. 70-451.000.

Nezu, Shigeru: See—
Minamisawa, Tsuyoshi; Endo, Katsunori; Ikegami, Eitaro; and Nezu, Shigeru, 4,874,800, Cl. 523-205.000.

Ng, Yee S.: See—
Hediger, Edwin A.; Ng, Yee S.; and Pham, Hieu, 4,875,057, Cl. 346-107.00R.

NGK Insulators, Ltd.: See—
Kondo, Kuniharu, 4,874,516, Cl. 210-490.000.

Oda, Isao; and Soma, Takao, 4,874,674, Cl. 428-469.000.

NGK Spark Plug Co., Ltd.: See—
Narita, Yoshinori; and Kawamura, Mitsuyoshi, 4,873,952, Cl. 123-270.000.

Ohya, Kanji; Tsunooka, Tsutomu; Ogura, Koji; Ozeki, Hirofumi; and Yamamoto, Takashi, 4,874,727, Cl. 501-134.000.

Nguyen, Hoa T.: See—
Lapis, Athanasios I.; Findley, Marshall E.; and Nguyen, Hoa T., 4,874,524, Cl. 210-672.000.

Nicholas Marchiani Chatelain, Marie L.; and Pellini, Jean-Pierre. Rapid warmer for blood and blood products. 4,874,033, Cl. 165-1.000.

Nichols, Robert K.; and Roediger, Gary A., to American Telephone and Telegraph Company, AT&T Bell Laboratories. High bandwidth interleaved buffer memory and control. 4,875,206, Cl. 370-85.150.

Nichols, Walter A.: See—
Tamol, Ronald A.; Nepomuceno, Jose G.; Keritsis, Gus D.; Burnett, George H.; Thesing, Richard A.; Winterson, Warren D.; and Nichols, Walter A., 4,874,000, Cl. 131-375.000.

Nichols, Walter G. Foldable utility cabinet. 4,874,211, Cl. 312-269.000.

Nicholson, Ronald H.: See—
Miner, Jay G.; Dean, Dave; Decuir, Joseph C.; Nicholson, Ronald H.; and Tanaka, Akio, 4,874,164, Cl. 273-1.00E.

Nickel, Andreas: See—
Arlt, Dieter; Schwartz, Ulrich; Brandt, Hans-Walter; Arlt, Wolfgang; and Nickel, Andreas, 4,874,473, Cl. 203-1.000.

Nicolet Instrument Corporation: See—
Spencer, Robert B., 4,874,943, Cl. 250-281.000.

Niedringhaus, Joyce C.; and Lowry, Michael L., to Armco Inc. Fluidizing a lime-silica slag. 4,874,428, Cl. 75-30.000.

Nifco Inc.: See—
Akira, Mizusawa; and Kurihara, Kazumasa, 4,874,510, Cl. 210-172.000.

Iguchi, Tatsuya, 4,874,276, Cl. 411-48.000.

Nihon Den-etsu Keiki Co., Ltd.: See—
Kondo, Kenshi, 4,874,081, Cl. 198-803.900.

Nihon Sinku Gijutsu Kabusiki Kaisha: See—
Okubo, Osamu; Kato, Takeo; and Tsushima, Tetsuro, 4,874,918, Cl. 219-85.110.

Nihon Tokkyo Kanri Company Limited: See—
Inagaki, Hiromichi, 4,874,257, Cl. 383-63.000.

Nikawa, Yoshio: See—
Kikuchi, Makoto; Mori, Shinsaku; Nikawa, Yoshio; and Terakawa, Takashige, 4,873,995, Cl. 128-804.000.

Nikon Corporation: See—
Aono, Yasuhiro, 4,874,231, Cl. 350-427.000.

Nilsen, Ole K. Electronic ballast unit with integral light sensor and circuit. 4,874,989, Cl. 315-151.000.

Nilsen, Bo, to Alfa-Laval Thermal AB. Plate heat exchanger. 4,874,039, Cl. 165-78.000.

Nippon Fine Chemical Co., Ltd.: See—
Kinomura, Keisuke; Kitazawa, Sadaya; Takata, Yasushi; and Sakakibara, Toshiyuki, 4,874,852, Cl. 536-18.600.

Nippon Mining Co., Ltd.: See—
Ogata, Takashi; Kato, Masanori; Kawasumi, Yoshio; Tominaga, Chikara; and Tanaka, Kanji, 4,874,436, Cl. 148-2.000.

Nippon Oil and Fats Co., Ltd.: See—
Yamamoto, Shosaku; Kakinuma, Kazuo; Ishioka, Hiroshi; Sodeyama, Fumio; Mayumi, Junji; and Maruta, Riichiro, 4,874,818, Cl. 525-183.000.

Nippon Seiko Kabushiki Kaisha: See—
Chikuma, Isamu; Shimada, Satoru; and Eda, Hiroshi, 4,874,183, Cl. 280-91.000.

Kawai, Osamu, and Mizumura, Shunji, 4,874,995, Cl. 318-484.000.

Sato, Isao; Miyake, Nobuhiko; and Nishida, Souji, 4,874,259, Cl. 384-445.000.

Tagawa, Kenichi, 4,874,073, Cl. 192-98.000.

Nippon Sheet Glass Co., Ltd.: See—
Funaki, Masaaki; Kunihiro, Koki; and Ichinomiya, Yutaka, 4,874,654, Cl. 428-192.000.

Kaite, Yoshikazu; and Yamagishi, Takashi, 4,874,414, Cl. 65-20.130.

Nippon Shinyaku Co., Ltd.: See—
Kimura, Kiyoshi; Ueda, Fusao; and Tamura, Masaru, 4,874,762, Cl. 514-242.000.

Ushimaru, Koichi; Hamakawa, Tomoaki; and Koga, Tomio, 4,874,774, Cl. 514-356.000.

Nippon Shoji Kabushiki Kaisha: See—
Hisaki, Masakazu; Kishima, Kenichi; Sakamoto, Yasuhiko; Hojo, Masakazu; Katayama, Osamu; and Hata, Hiroyoshi, 4,874,773, Cl. 514-355.000.

Nippon Telegraph & Telephone Corp.: See—
Hara, Toshihiro; Yotsutani, Akio; Kawasaki, Ryoji; Tate, Kazuyuki; Huse, Syoji; and Ono, Koji, 4,875,231, Cl. 379-61.000.

Matsuoka, Morito; and Ono, Ken'ichi, 4,874,497, Cl. 204-298.000.

Nippon Tungsten Co., Ltd.: See—
Furukawa, Mitsuhiko; Kitahira, Takashi; Tanaka, Sakae; and Misumi, Kiyohito, 4,874,725, Cl. 501-89.000.

Nipponendo Co., Ltd.: See—
Okubo, Osamu; Kato, Takeo; and Tsushima, Tetsuro, 4,874,918, Cl. 219-85.110.

Nique, Francois; Nedelec, Lucien; Bouton, Marie-Madeleine; and Philibert, Daniel, to Roussel Uclaf. Novel 19-nor-steroids. 4,874,754, Cl. 514-178.000.

Nishida, Shigeo: See—
Hongo, Akihito; Shiota, Tsuneo; Nishida, Shigeo; Miyagi, Mitsunobu; and Wagatsuma, Yoshihiko, 4,875,218, Cl. 372-64.000.

Nishida, Souji: See—
Sato, Isao; Miyake, Nobuhiko; and Nishida, Souji, 4,874,259, Cl. 384-445.000.

Nishii, Michiharu; Ando, Masamoto; and Tada, Yoshihiko, to Aisin Seiki Kabushiki Kaisha. Hydraulic braking system for an automotive vehicle. 4,874,207, Cl. 303-52.000.

Nishimoto, Hiroshi: See—
Miyachi, Akira; Nishimoto, Hiroshi; Okiyama, Tadashi; Kitasagami, Hiroo; Sugimoto, Masahiro; Tamada, Haruo; and Emori, Shinji, 4,875,087, Cl. 357-71.000.

Nishimoto, Yoshiro; Yoneda, Yasuji; Imaoka, Shinichi; Nakai, Yasuhide; Nakae, Akimitsu; Onishi, Yoshihiko; Tachibana, Hiroyuki; Inoue, Takayoshi; Kusaka, Takuya; Takamatsu, Hiroyuki; Tojo, Shigeki; Kajikawa, Hiroshi; and Nishimura, Kozo, to Kabushiki Kaisha Kobe Seiko Sho. Method and apparatus for detecting position/variance of input light using linear and quadratic outputs. 4,874,939, Cl. 250-211.000.

Nishimura, Kozo: See—
Nishimoto, Yoshiro; Yoneda, Yasuji; Imaoka, Shinichi; Nakai, Yasuhide; Nakae, Akimitsu; Onishi, Yoshihiko; Tachibana, Hiroyuki; Inoue, Takayoshi; Kusaka, Takuya; Takamatsu, Hiroyuki; Tojo, Shigeki; Kajikawa, Hiroshi; and Nishimura, Kozo, 4,874,939, Cl. 250-211.000.

Nishioka, Goro: See—
Sano, Harunobu; Sakabe, Yukio; and Nishioka, Goro, 4,875,136, Cl. 361-321.000.

Nishizawa, Minoru, to Gakei Electric Works Co., Ltd. Single crystal growing method having improved melt control. 4,874,458, Cl. 156-607.000.

Nissan Chemical Industries, Ltd.: See—
Ogura, Tomoyuki; Kawamura, Yasuo; Ishii, Shigeru; Baba, Masatoshi; Taniguchi, Masakazu; Hirose, Masayoshi; Hirata, Kiminori; and Ochiai, Yoshinori, 4,874,861, Cl. 544-229.000.

Nissan Motor Co., Ltd.: See—
Fujiki, Hiroyuki; Michiura, Yoshiharu; and Inoue, Kiyoshi, 4,874,645, Cl. 428-31.000.

Muranaka, Shigeo; Ohkawa, Kouzaburo; Yokoyama, Junichi; Matayoshi, Yutaka; and Kamegaya, Shigeru, 4,873,953, Cl. 123-308.000.

Naito, Genpei, 4,874,056, Cl. 180-233.000.

Nasu, Tetsuji; and Shiina, Jun, 4,874,200, Cl. 296-197.000.

Takai, Ryoji, 4,874,651, Cl. 428-81.000.

Nissin Chemical Co., Ltd.: See—
Saitoh, Izumi; Kido, Shigeru; Sasaki, Yoshio; and Shinohara, Syuichi, 4,874,830, Cl. 526-318.400.

Nitto Electric Industrial Co., Ltd.: See—
Higashi, Kazumi; and Noda, Yuzuru, 4,874,834, Cl. 528-176.000.

Nixdorf Computer AG: See—
Brockmann, Werner, 4,874,968, Cl. 307-303.000.

NKK Corporation: See—
Uesugi, Mitsuaki; Inomata, Masaichi; and Komine, Isamu, 4,874,955, Cl. 250-550.000.

Noda, Masayuki: See—
Takahashi, Kiyoshi; and Noda, Masayuki, 4,875,120, Cl. 360-106.000.

- Noda, Yasushi: See—
Ando, Yasuhiko; Noda, Yasushi; and Abe, Yohji, 4,875,119, Cl. 360-105.000.
- Noda, Yuzuru: See—
Higashi, Kazumi; and Noda, Yuzuru, 4,874,834, Cl. 528-176.000.
- Nogami, Akira: See—
Shirai, Miyuki; and Nogami, Akira, 4,874,683, Cl. 430-114.000.
- Nolan, Timothy J.: See—
Antoni, Patricia A.; Nolan, Timothy J.; Hayes, Thomas J.; Arneson, Theodore R.; and Coleman, Jerry E., 4,874,083, Cl. 206-45.320.
- Nonomura, Tsutomu; and Abe, Hidetoshi, to Toyo Ink Manufacturing Co., Ltd. Flat-bed press and flat-bed printing method, 4,873,924, Cl. 101-146.000.
- Nordlund, James J.; and Rheins, Lawrence A., to University of Cincinnati. Method of using melanocyte stimulating hormone as dermatitis treatment, 4,874,744, Cl. 514-13.000.
- Nordson Corporation: See—
Binder, John J.; and Kaiser, Thomas A., 4,873,937, Cl. 118-44.000.
Boger, Bentley J.; and Petrecca, Peter J., 4,874,431, Cl. 156-291.000.
- Norimatsu, Takashi, to Yamaha Corporation. Electronic musical instrument having playing and parameter adjustment modes, 4,873,904, Cl. 84-722.000.
- Noro, Katsuhiko: See—
Shino, Masami; Takano, Hideaki; Nakata, Jitsuo; and Noro, Katsuhiko, 4,874,592, Cl. 423-262.000.
- Norsk Hydro a.s.: See—
Borretzen, Bernt; Larsen, Rolf O.; Pettersen, Erik O.; Dornish, John M.; and Oftebro, Rolf, 4,874,780, Cl. 514-452.000.
- North American Philips Corporation: See—
Lorenzen, David M., 4,875,008, Cl. 324-208.000.
- North American Philips Corporation, Signetics Division: See—
Fletcher, Thomas D., 4,874,971, Cl. 307-405.000.
- North Carolina State University: See—
Palmour, John W., 4,875,083, Cl. 357-23.600.
- Northern Telecom Limited: See—
Lynch, David L.; and Quessel, Guy C., 4,875,045, Cl. 341-139.000.
- Norton Company: See—
Szymanski, Thomas; and Turner, Stephen M., 4,874,586, Cl. 422-177.000.
- Noto, Yasuo: See—
Kimura, Hiroshi; Naito, Shotaro; Miyashita, Kunio; Noto, Yasuo; Sugura, Noboru; Takahashi, Tadashi; Yamamura, Hirohisa; Yamashita, Seizi; Kawamata, Syoichi; Tajima, Fumio; and Horikoshi, Shigeru, 4,874,053, Cl. 180-79.100.
- Nouvelette Ice Cream Corporation: See—
Greig, Donald G.; and Bonneau, Edward L., III, 4,874,627, Cl. 428-361.000.
- Novation Design Ltd.: See—
Ziegler, James T., 4,874,341, Cl. 446-109.000.
- Novosel, David: See—
Campardo, Giovanni; and Novosel, David, 4,874,965, Cl. 307-272.300.
- Nowack, William C., to Richmond Bank. Paint spray booth and filter therefor, 4,874,412, Cl. 55-385.100.
- Nowak, Thomas E.; Smith, Edward J.; and Vassiliou, Eustathios, to Vassilio, Eustathios. Wall fastener and method of fabrication, 4,874,277, Cl. 411-61.000.
- Nu-Tech Systems, Inc.: See—
Burch, Elward K., 4,873,759, Cl. 29-700.000.
- Nunez, Chris E., to International Medical Innovators, Inc. Needle safety guard, 4,874,384, Cl. 604-198.000.
- Nuova Sme S.p.A.: See—
Mainardi, Bruno; and Vivian, Domenico, 4,874,298, Cl. 417-315.000.
- Nusselder, Frederik B.: See—
Grobecker, Hermann; Heber, Werner; Zielasek, Adelbert; and Nusselder, Frederik B., 4,874,085, Cl. 206-309.000.
- Oba, Kiyoyuki: See—
Sugimura, Teyoshi; Hori, Kenji; and Oba, Kiyoyuki, 4,873,917, Cl. 99-355.000.
- Obagi, Zein E. Method for healing damaged skin, 4,874,361, Cl. 604-30.000.
- Obara, Kazuaki: See—
Takamura, Yoshinari; Obara, Kazuaki; and Nagashima, Michiyoshi, 4,875,203, Cl. 369-46.000.
- Obara, Takashi, to NEC Corporation. Random access memory device with nibble mode operation, 4,875,189, Cl. 365-189.040.
- O'Boyle, Matthew, to STA-SET Corporation. Fluid dispensing device, 4,874,386, Cl. 604-246.000.
- O'Brien, R. N.; and Santhanam, K. S. V., to University of Victoria. Bilayer electronically conductive polymers and process for their production, 4,874,735, Cl. 502-159.000.
- Occidental Chemical Corporation: See—
O'Reilly, Neil J.; and Lin, Henry C., 4,874,876, Cl. 549-49.000.
- Ochi, Tatsuyuki; Tanaka, Nobuo; and Mio, Kohel, to Kajima Corporation. Method and device for measurement with laser beam, 4,874,238, Cl. 356-1.000.
- Ochiai, Hironori; Suzuki, Etsuo; and Ikuta, Kazuo, to Aisin Seiki Kabushiki Kaisha; and Kanto Jidosha Kogyo Kabushiki Kaisha. Sliding type sunroof lift down device, 4,874,202, Cl. 296-222.000.
- Ochiai, Yoshinori: See—
Ogura, Tomoyuki; Kawamura, Yasuo; Ishii, Shigeru; Baba, Masatoshi; Taniguchi, Masakazu; Hirose, Masayoshi; Hirata, Kiminori; and Ochiai, Yoshinori, 4,874,861, Cl. 544-229.000.
- Oda, Isao; and Soma, Takao, to NGK Insulators, Ltd. Metal-ceramic composite bodies, 4,874,674, Cl. 428-469.000.
- Oda, Kyoko; Takahashi, Kunimasa; and Seo, Iwao, to Mitsubishi Petrochemical Co., Ltd. Process for producing perovskite-type oxides of the ABO₃ type, 4,874,598, Cl. 423-598.000.
- Odaka, Kentaro; Fukami, Tadashi; and Ozaki, Shinya, to Sony Corporation. Apparatus for reproducing a digital signal, 4,875,111, Cl. 360-64.000.
- Odaka, Seiichi: See—
Sato, Masahiko; Konuma, Toshimitsu; Odaka, Seiichi; Yamaguchi, Toshiharu; Watanabe, Toshio; Aoyagi, Osamu; Tabata, Kaoru; Isigaki, Chizuru; Sakayori, Hiroyuki; Kobayashi, Ippei; Osabe, Akio; and Yamazaki, Shunpei, 4,874,461, Cl. 156-633.000.
- O'Dea, Kevin J., to Pitney Bowes Inc. Envelope flap moistener, 4,873,941, Cl. 118-669.000.
- Odijk, Eddy A. M.: See—
Van Twist, Robert A. H.; Hopmans, Franciscus P. M.; and Odijk, Eddy A. M., 4,875,207, Cl. 370-85.120.
- Oftebro, Rolf: See—
Borretzen, Bernt; Larsen, Rolf O.; Pettersen, Erik O.; Dornish, John M.; and Oftebro, Rolf, 4,874,780, Cl. 514-452.000.
- Ogata, Takashi; Kato, Masanori; Kawasumi, Yoshio; Tominaga, Chikara; and Tanaka, Kanji, to Nippon Mining Co., Ltd. Method for producing high purity electrolytic copper, 4,874,436, Cl. 148-2.000.
- Ogata, Yoshihiro: See—
Ishikawa, Toyoji; Kaneko, Toshio; Endo, Shuichi; Ogata, Yoshihiro; and Takaya, Toshihiko, 4,873,940, Cl. 118-651.000.
- Ogawa, Hiroshi: See—
Okita, Tsutomu; Nakahara, Hiromi; and Ogawa, Hiroshi, 4,874,636, Cl. 427-130.000.
- Ogawa, Tetsuya: See—
Yoshida, Naoyuki; Kitano, Kisei; and Ogawa, Tetsuya, 4,874,546, Cl. 252-299.610.
- Ogawa, Yo: See—
Ando, Katsutoshi; and Ogawa, Yo, 4,874,659, Cl. 428-221.000.
- Ogiwara, Akira: See—
Kamon, Yoshiyuki; Ogiwara, Akira; and Nageno, Koji, 4,874,316, Cl. 439-39.000.
- Oguchi, Yukiko: See—
Yamada, Shin-ichi; Goto, Takao; Mashiko, Toshihisa; Kogi, Kentaro; Oguchi, Yukiko; and Narita, Senichi, 4,874,760, Cl. 514-234.200.
- Ogura, Koji: See—
Ohya, Kanji; Tsunooka, Tsutomu; Ogura, Koji; Ozeki, Hirofumi; and Yamamoto, Takashi, 4,874,727, Cl. 501-134.000.
- Ogura, Tomoyuki; Kawamura, Yasuo; Ishii, Shigeru; Baba, Masatoshi; Taniguchi, Masakazu; Hirose, Masayoshi; Hirata, Kiminori; and Ochiai, Yoshinori, to Nissan Chemical Industries, Ltd. Pyridazine derivatives, preparation thereof, and insecticidal, acaricidal, nematocidal, fungicidal compositions, 4,874,861, Cl. 544-229.000.
- Ogura, Yukiko: See—
Yokosawa, Koichi; Yamamoto, Etsuji; Nakane, Hideaki; Yabusaki, Masao; and Ogura, Yukiko, 4,875,010, Cl. 324-248.000.
- Ohashi, Kazuhito, to Canon Kabushiki Kaisha. Video signal processing device, 4,875,105, Cl. 358-310.000.
- Ohashi, Masahiko: See—
Kitoh, Osamu; and Ohashi, Masahiko, 4,874,650, Cl. 428-68.000.
- Ohba, Hisao: See—
Kanzaki, Hisao; and Ohba, Hisao, 4,875,067, Cl. 354-325.000.
- Ohgoh, Toshiharu: See—
Ueda, Kouichiro; Tanaka, Satoru; Kunii, Toshinobu; Kagei, Kengo; Sato, Tadashi; Ono, Hideki; Ohtsuka, Issei; Kawase, Mayumi; Ohgoh, Toshiharu; and Wakabayashi, Tsuneo, 4,874,869, Cl. 548-309.000.
- Ohhara, Minoru: See—
Yoshikumi, Chikao; Ohmura, Yoshio; Hirose, Fumio; Ikuzawa, Masanori; Matsunaga, Kenichi; Fujii, Takayoshi; Ohhara, Minoru; and Ando, Takao, 4,874,750, Cl. 514-42.000.
- Ohi, Kimio, to Jeol Ltd. Electron microscope equipped with scanning tunneling microscope, 4,874,945, Cl. 250-306.000.
- Ohi, Satoshi: See—
Yamamoto, Shinobu; Okada, Kunihiro; Ohi, Satoshi; Oyama, Shiro; and Takei, Yasuharu, 4,874,787, Cl. 514-531.125.
- Ohkawa, Kouzaburo: See—
Muranaka, Shigeo; Ohkawa, Kouzaburo; Yokoyama, Junichi; Matayoshi, Yutaka; and Kamegaya, Shigeru, 4,873,953, Cl. 123-308.000.
- Ohkubo, Masahiro, to Kabushiki Kaisha Daikin Seisakusho. Power transfer device, 4,873,892, Cl. 74-710.500.
- Ohmi, Tadashi. Semiconductor manufacturing apparatus, 4,874,494, Cl. 204-192.120.
- Ohmori, Kiyoshi: See—
Leonard, Vurnen; Kato, Arthur K.; Ohmori, Kiyoshi; Fujiwara, Keisuke; and Soda, Yutaka, 4,875,128, Cl. 360-133.000.
- Ohmori, Akio: See—
Okamoto, Takehiko; Ohmori, Akio; Sueoka, Akinori; Kawata, Ichiro; and Akasu, Hiroyuki, 4,874,522, Cl. 210-645.000.
- Ohmura, Yoshio: See—
Yoshikumi, Chikao; Ohmura, Yoshio; Hirose, Fumio; Ikuzawa, Masanori; Matsunaga, Kenichi; Fujii, Takayoshi; Ohhara, Minoru; and Ando, Takao, 4,874,750, Cl. 514-42.000.
- Ohmura, Yutaka: See—
Watanabe, Naoto; Tanaka, Akira; Matsumoto, Takayuki; Ohmura, Yutaka; and Kojima, Hisao, 4,873,760, Cl. 29-714.000.

- Ohnishi, Kazuyuki; Mori, Yoshiteru; and Okuda, Masakiyo, to Sharp Kabushiki Kaisha. Automatic document feeder, 4,875,072, Cl. 113-21.000.
- Ohnishi, Kazuyuki; Mori, Yoshiteru; and Okuda, Masakiyo, 4,875,072, Cl. 355-23.000.
- Okamura, Jun: See—
Imura, Seiji; Abe, Yoshio; Okumura, Jun; Naito, Takayuki; and Kamachi, Hajime, 4,874,856, Cl. 540-222.000.
- Okumura, Katsuya: See—
Egawa, Hidemitsu; Aoki, Riichiro; and Okumura, Katsuya, 4,875,088, Cl. 357-67.000.
- Oldham, Susan L.; Elias, William E.; Bigus, Stephen J.; and Lau, Kreiser S. Y., to Hughes Aircraft Company. Aromatic silane polymer coatings, 4,874,643, Cl. 427-340.000.
- Olin Hunt Specialty Products Inc.: See—
Pendleton, Phillip, 4,874,477, Cl. 204-15.000.
- Olive, Corinne: See—
Egea, Noel; and Olive, Corinne, 4,874,241, Cl. 356-238.000.
- Olivensbaum, James E., to Tideland Signal Corporation. Antenna grounding system, 4,875,132, Cl. 361-117.000.
- Olodort, Robert; Micalizzi, Charles; Cambrozzi, Louis; and Turchik, Randy, to Print Things. Instant label printer for host computer, 4,875,174, Cl. 364-519.000.
- Olson, Aage: See—
Goodwin, Dennis L.; Hawkins, Mark R.; Johnson, Wayne L.; Olson, Aage; and Robinson, McDonald, 4,874,464, Cl. 156-646.000.
- Olson, Kurt D.; and Kaiser, Steven W., to UOP. Process for the production of alkylamines, 4,874,896, Cl. 564-479.000.
- Olympus Optical Co., Ltd.: See—
Hasegawa, Akira, 4,874,232, Cl. 350-427.000.
- Yamada, Hidetoshi; and Nagasaki, Tatsuo, 4,875,091, Cl. 358-42.000.
- O'Meara, Thomas R., to Hughes Aircraft Company. Optical notch filter for discriminating against coherent radiation, 4,874,223, Cl. 350-163.000.
- Omron Tateisi Electronics Co.: See—
Ishii, Hiroaki, 4,875,163, Cl. 364-405.000.
Kimizu, Ryuzichi, 4,874,932, Cl. 235-379.000.
Masuo, Yoshihisa, 4,873,758, Cl. 29-612.000.
Nakamura, Hideaki; Shimamori, Tamotsu; and Murahige, Shini-chi, 4,875,016, Cl. 328-26.000.
- Oku, Seiji; Shimamura, Tooru; Naganawa, Kazutomo; and Tanamura, Toshiya, 4,875,042, Cl. 340-870.170.
- Yamakawa, Takeshi, 4,875,184, Cl. 364-807.000.
- Onaga, Eimei M.: See—
Daggett, Kenneth E.; Onaga, Eimei M.; Casler, Richard J., Jr.; and Johnson, Richard A., 4,874,997, Cl. 318-568.100.
- One Up, Inc.: See—
Volkert, John K., 4,874,356, Cl. 493-335.000.
- O'Neil, Walter K.: See—
Mohan, Robert J.; and O'Neil, Walter K., 4,874,072, Cl. 192-58.000.
- Onishi, Yoshihiko: See—
Nishimoto, Yoshiro; Yoneda, Yasuji; Imaoka, Shinichi; Nakai, Yasuhide; Nakase, Akimitsu; Onishi, Yoshihiko; Tachibana, Hiroyuki; Inoue, Takayoshi; Kusaka, Takuya; Takamatsu, Hiroyuki; Tojyo, Shigeki; Kajikawa, Hiroshi; and Nishimura, Kozo, 4,874,939, Cl. 250-211.000.
- Onizawa, Masanori: See—
Kubodera, Takayuki; Nakamura, Shizuo; Onizawa, Masanori; Shirohita, Hirotsugu; Mochizuki, Eiichi; Tsujimura, Masao; Atsuta, Toshikatsu; and Morooka, Takayoshi, 4,875,065, Cl. 354-82.000.
- Ono, Hideki: See—
Ueda, Kouichiro; Tanaka, Satoru; Kunii, Toshinobu; Kagei, Kengo; Sato, Tadashi; Ono, Hideki; Ohtsuka, Issei; Kawase, Mayumi; Ohgoh, Toshiharu; and Wakabayashi, Tsuneo, 4,874,869, Cl. 548-309.000.
- Ono, Hisao: See—
Maeno, Mikihiko; Ohta, Yukio; Momiyama, Yoshiharu; Ono, Hisao; Takahata, Katsumasa; Ozono, Kazuyuki; Shimizu, Makoto; and Yamamoto, Mikio, 4,874,159, Cl. 271-171.000.
- Ono, Ken'ichi: See—
Matsuoka, Morito; and Ono, Ken'ichi, 4,874,497, Cl. 204-298.000.
- Ono, Koji: See—
Hara, Toshihiro; Yotsutani, Akio; Kawasaki, Ryoji; Tate, Kazuyuki; Huse, Syoji; and Ono, Koji, 4,875,231, Cl. 379-61.000.
- Ono, Shigetoshi: See—
Yamanouchi, Junichi; Ono, Shigetoshi; Hirano, Tsutomu; Watanabe, Toshiyuki; Sakai, Nobuo; and Mihayashi, Keiji, 4,874,689, Cl. 430-548.000.
- Ono, Takeshi, to Canon Kabushiki Kaisha. Thermal recording apparatus with variably controlled energization of the heating elements thereof, 4,875,056, Cl. 346-76.0PH.
- Onoda, Shigeyoshi: See—
Sootome, Sumitoshi; Mizutani, Morikazu; Ikemoto, Isao; Kanemitsu, Shinji; Kitajima, Hajime; and Onoda, Shigeyoshi, 4,875,075, Cl. 355-50.000.
- Ontario Limited: See—
Arnott, John; and Kaga, Gary, 4,874,099, Cl. 211-50.000.
- Oomori, Kiyosi: See—
Hamasaki, Naotaka; Kawamura, Hirotsugu; Ohta, Norio; Nakakoshi, Ichiro; Ataka, Kikuo; Oomori, Kiyosi; and Kouno, Masahiko, 4,874,882, Cl. 558-131.000.
- Ooms, Leo A. A.; and Degryse, Anne-Dominique A. Y., to Janssen Pharmaceutica N.V. Method of promoting wound-healing, 4,874,766, Cl. 514-258.000.
- Ohtani, Kazuyuki; Mori, Yoshiteru; and Okuda, Masakiyo, to Sharp Kabushiki Kaisha. Automatic document feeder, 4,875,072, Cl. 113-21.000.
- Ohtsawa, Masahiro; and Yonezawa, Eiichi, to Fuji Electric Co., Ltd. Spindle motor for driving discs, 4,874,976, Cl. 310-268.000.
- Ohtsawa, Seiichi, to Pioneer Electronic Corporation. Fibre-type light wavelength conversion device, 4,874,221, Cl. 350-96.290.
- Ohta, Norio: See—
Asano, Hiroaki; Tsujinchi, Toshio; Yoneda, Takao; Ishihara, Nobuhiro; Maruyama, Toshio; and Ohta, Norio, 4,873,793, Cl. 51-165.710.
- Ohta, Yoshiyuki; and Kihara, Taka, to Sony Corporation. Digital limiting circuit, 4,875,044, Cl. 341-87.000.
- Ohta, Yukio: See—
Maeno, Mikihiko; Ohta, Yukio; Momiyama, Yoshiharu; Ono, Hisao; Takahata, Katsumasa; Ozono, Kazuyuki; Shimizu, Makoto; and Yamamoto, Mikio, 4,874,159, Cl. 271-171.000.
- Ohtsu, Norio: See—
Hamasaki, Naotaka; Kawamura, Hirotsugu; Ohta, Norio; Nakakoshi, Ichiro; Ataka, Kikuo; Oomori, Kiyosi; and Kouno, Masahiko, 4,874,882, Cl. 558-131.000.
- Ohtsuka, Issei: See—
Ueda, Kouichiro; Tanaka, Satoru; Kunii, Toshinobu; Kagei, Kengo; Sato, Tadashi; Ono, Hideki; Ohtsuka, Issei; Kawase, Mayumi; Ohgoh, Toshiharu; and Wakabayashi, Tsuneo, 4,874,869, Cl. 548-309.000.
- Ohtsuka, Yasuhiro: See—
Hamaguchi, Shigeki; Ohtsuka, Yasuhiro; Motohiro, Tomoyoshi; Taga, Yasunori; and Ishii, Masahiko, 4,874,664, Cl. 428-325.000.
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- Oka, Tetsuo: See—
Ozaki, Akio; Katsumata, Ryoichi; and Oka, Tetsuo, 4,874,698, Cl. 435-108.000.
- Oka, Yoshinobu; and Sato, Koichi, to International Business Machines Corp. Method for automatic bill handling and bill container used therefor, 4,874,931, Cl. 235-379.000.
- Okabe, Kyoji: See—
Hamada, Takao; Tsuchiya, Nobuo; Inatani, Toshihiro; Katayama, Eiji; Koitabashi, Toshimitsu; Okabe, Kyoji; Sumito, Mitsuo; and Takada, Yoshiyasu, 4,874,427, Cl. 75-26.000.
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Yamamoto, Shinobu; Okada, Kunihiro; Ohi, Satoshi; Oyama, Shiro; and Takei, Yasuharu, 4,874,787, Cl. 514-531.125.
- Okada, Yoshimi: See—
Wakabayashi, Ataru; Umehara, Yohichi; Morie, Satsuki; Kuwahara, Ikuro; and Okada, Yoshimi, 4,874,483, Cl. 204-94.000.
- Okajima, Shiro: See—
Nakahara, Jiro; Uehara, Akito; and Okajima, Shiro, 4,874,934, Cl. 235-492.000.
- Okajima, Yoshio: See—
Washizuka, Isamu; Inoue, Yukihiko; and Okajima, Yoshio, 4,875,036, Cl. 340-784.000.
- Okamoto, Hidefumi: See—
Sugisawa, Ko; Matsumura, Yasushi; Okamoto, Hidefumi; and Hayami, Hiroaki, 4,874,580, Cl. 422-25.000.
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Sasaki, Yoshiyuki; and Okamoto, Tetsuo, 4,874,658, Cl. 428-220.000.
- Okamoto, Tsuguhiko, to Kabushiki Kaisha Toshiba. Digital sun sensor, 4,874,937, Cl. 250-203.00R.
- Okawa, Tadashi: See—
Suzuki, Toshio; and Okawa, Tadashi, 4,874,881, Cl. 556-453.000.
- Okazaki, Hisayoshi: See—
Terao, Shinji; Okazaki, Hisayoshi; and Imada, Isuke, 4,874,752, Cl. 536-55.200.
- Oki Electric Industry Co., Ltd.: See—
Aoki, Kazuo; and Tachibana, Sadao, 4,874,913, Cl. 200-314.000.
Maeno, Mikihiko; Ohta, Yukio; Momiyama, Yoshiharu; Ono, Hisao; Takahata, Katsumasa; Ozono, Kazuyuki; Shimizu, Makoto; and Yamamoto, Mikio, 4,874,159, Cl. 271-171.000.
Sakai, Shunji; Kitagawa, Tohru; Suzuki, Kunikazu; and Watanabe, Naohiro, 4,875,099, Cl. 358-213.110.
Tanagawa, Kouji; and Yoshida, Tomoaki, 4,875,156, Cl. 164-200.000.
- Okita, Tsutomu; Nakahara, Hiromi; and Ogawa, Hiroshi, to Fuji Photo Film Co., Ltd. Method for preparing magnetic recording medium, 4,874,636, Cl. 427-130.000.
- Okiyama, Tadashi: See—
Miyauchi, Akira; Nishimoto, Hiroshi; Okiyama, Tadashi; Kitagawa, Hiroo; Sugimoto, Masahiro; Tamada, Haruo; and Emori, Shinji, 4,875,087, Cl. 357-71.000.
- Oku, Seiji; Shimamura, Tooru; Naganawa, Kazutomo; and Tanamura, Toshiya, to Omron Tateisi Electronics Co. Multi channel temperature controller utilizing electronic multiplexer, 4,875,042, Cl. 340-870.170.
- Okubo, Osamu; Kato, Takeo; and Tsushima, Tetsuro, to Nihon Sinku Gijutsu Kabushiki Kaisha; and Nippondenso Co., Ltd. Vacuum brazing apparatus, 4,874,918, Cl. 219-85.110.

Oono, Toshio, to Aisin Takaoka Limited. Brake apparatus for automotive vehicle. 4,874,064, Cl. 188-70.00R.
 Ophir Corporation: See—
 Nelson, Loren D.; and Cerni, Todd A., 4,874,572, Cl. 376-256.000.
 Optical Technologies, Inc.: See—
 Einzig, Robert E., 4,873,989, Cl. 128-692.000.
 Orange Water & Sewer Authority: See—
 Williamson, Ronald E., 4,874,519, Cl. 210-605.000.
 O'Reilly, Neil J.; and Lin, Henry C., to Occidental Chemical Corporation. Process for the preparation of 2-(2-thienyl)-ethylamine and derivatives thereof. 4,874,876, Cl. 549-49.000.
 Orikasa, Taro; Sumi, Sigeo; and Taguchi, Hiroshi, to Somar Corporation. Pallet stocker apparatus for printer. 4,874,282, Cl. 414-416.000.
 Ortho Pharmaceutical Corporation: See—
 Russell, Ronald K., 4,874,771, Cl. 514-331.000.
 Ory, Raymond J.; and Smeltzer, Paul. Tray and tool holder adaptable to stepladders. 4,874,147, Cl. 248-210.000.
 Osabe, Akio: See—
 Sato, Masahiko; Konuma, Toshimitsu; Odaka, Seiichi; Yamaguchi, Toshiharu; Watanabe, Toshio; Aoyagi, Osamu; Tabata, Kaoru; Isigaki, Chizuru; Sakayori, Hiroyuki; Kobayashi, Ippei; Osabe, Akio; and Yamazaki, Shunpei, 4,874,461, Cl. 156-633.000.
 Osborne, Robert B.: See—
 McKinney, Ronald J.; and Osborne, Robert B., 4,874,884, Cl. 558-338.000.
 O'Shannessy, Daniel J. Proteins bound to a marker or solid phase support matrix using a hydrazone linkage. 4,874,813, Cl. 525-54.100.
 Oshima, Michitaka: See—
 Kato, Kiyotaka; and Oshima, Michitaka, 4,875,033, Cl. 340-706.000.
 Oshita, Masahide; Isai, Masaki; and Fukunaka, Toshiaki, to Toyo Communication Equipment Co., Ltd. Intermetallic compound semiconductor thin film and method of manufacturing same. 4,874,438, Cl. 148-400.000.
 Ostman, Thomas L.: See—
 Karlsson, Hakan I.; Lundqvist, Inge J.; Hardin, Bengt Y.; and Ostman, Thomas L., 4,874,467, Cl. 162-198.000.
 Osuga, Naoto: See—
 Kato, Masaki; Uno, Tetsuya; Kobayashi, Masao; and Osuga, Naoto, 4,874,890, Cl. 560-205.000.
 Otogawa, Takaaki: See—
 Madiou, Marc J.; and Otogawa, Takaaki, 4,874,500, Cl. 204-412.000.
 Otis Elevator Company: See—
 Taylor, Kenneth D., 4,874,063, Cl. 187-130.000.
 Otsuka Pharmaceutical Company, Limited: See—
 Ueda, Hiraiki; Miyamoto, Hisashi; Aki, Shinji; and Otsuka, Tatsuya, 4,874,764, Cl. 514-254.000.
 Otsuka, Tatsuya: See—
 Ueda, Hiraiki; Miyamoto, Hisashi; Aki, Shinji; and Otsuka, Tatsuya, 4,874,764, Cl. 514-254.000.
 Otto Hansel GmbH: See—
 Kaplan, Horst; and Grube, Gerhard, 4,874,076, Cl. 198-370.000.
 Ouellette, Thomas: See—
 Frimmel, James J., Jr.; Ouellette, Thomas; and Deglin, Richard N., 4,875,157, Cl. 364-200.000.
 Output Technology Corporation: See—
 Rubinshtein, Bernard, 4,874,121, Cl. 226-74.000.
 Overby, Kenneth W., to La-Man Corporation. Liquid drain assembly. 4,874,408, Cl. 55-218.000.
 Overdijk, Dirk R.; Bolder, Antonius J. J.; Beirens, Leopold C. M.; and Van Rens, Piet C. J., to U.S. Philips Corporation. Display device with adjustable deflection unit. 4,874,982, Cl. 313-440.000.
 Owen, Hartley: See—
 Herbst, Joseph A.; Owen, Hartley; and Schipper, Paul H., 4,874,503, Cl. 208-67.000.
 Owen, S. Hudson, to Kerr-McGee Chemical Corporation. Rail-tie fastening assembly. 4,874,128, Cl. 238-355.000.
 Owens-Corning Fiberglass Corporation: See—
 Bershas, James P.; and Tobias, Russell H., 4,874,837, Cl. 528-291.000.
 Oxenius, Rudiger; Burgi, Ernst; Arnold, Vladimir; and Rakoczi, Ferenc, to Ciba-Geigy Corporation. Process for the diazotisation of primary aromatic amines which are sparingly soluble in water. 4,874,847, Cl. 534-565.000.
 Oxidyne Corporation: See—
 Timas, James A., 4,874,560, Cl. 261-76.000.
 Oy Stille Ab: See—
 Gabran, Clas, 4,874,379, Cl. 604-168.000.
 Oyama, Shiro: See—
 Yamamoto, Shinobu; Okada, Kunihiko; Ohi, Satoshi; Oyama, Shiro; and Takai, Yasuharu, 4,874,787, Cl. 514-531.125.
 Ozaki, Akio; Katsumata, Yoichi; and Oka, Tetsuo, to Kyowa Hakko Kogyo Co., Ltd. Process for producing tryptophan. 4,874,698, Cl. 435-108.000.
 Ozaki, Shinya: See—
 Odaka, Kentaro; Fukami, Tadashi; and Ozaki, Shinya, 4,875,111, Cl. 360-64.000.
 Ozarski, Robert G.: See—
 Watta, Michael P. C.; Perera, Thiloma I.; Myers, David W.; Ozarski, Robert G.; Schipper, John F.; and Tan, Raul V., 4,874,240, Cl. 356-73.000.
 Ozawa, Takashi; and Kobayashi, Hidetoshi, to Fuji Photo Film Co., Ltd. Silver halide photographic materials comprising specific organic solvents. 4,874,688, Cl. 430-546.000.
 Ozeki, Hirofumi: See—
 Ohya, Kanji; Tsunooka, Tsutomu; Ogura, Koji; Ozeki, Hirofumi; and Yamamoto, Takashi, 4,874,727, Cl. 501-134.000.

Ozono, Kazuyuki: See—
 Maeno, Mikihiro; Ohta, Yukio; Momiyama, Yoshiharu; Ono, Hisao; Takahata, Katsumasa; Ozono, Kazuyuki; Shimizu, Makoto; and Yamamoto, Mikio, 4,874,159, Cl. 271-171.000.
 Packaging Concepts, Inc.: See—
 Mendenhall, Abraham H.; Irace, Joseph F.; and Skudrzyk, Joseph, 4,874,620, Cl. 426-113.000.
 Packaging Corporation of America: See—
 Antoni, Patricia A.; Nolan, Timothy J.; Hayes, Thomas J.; Arneson, Theodore R.; and Coleman, Jerry E., 4,874,083, Cl. 206-45.320.
 Palett, Anthony P.; and Spear Jr., A. Gil, to Anthony P. Palett. Vehicle telephone with call answering and recording means. 4,875,229, Cl. 379-58.000.
 Palmer, John M.: See—
 Voorhis, Roger J.; and Palmer, John M., 4,873,838, Cl. 62-207.000.
 Palmieri, Thomas: See—
 Meserol, Peter M.; and Palmieri, Thomas, 4,873,993, Cl. 128-760.000.
 Palmour, John W., to North Carolina State University. Metal-insulator-semiconductor capacitor formed on silicon carbide. 4,875,083, Cl. 357-23.600.
 Palosi, Eva: See—
 Lapis, Erzsébet; Toth, Edit; Kiss, Bela; Torley, Jozsef; Palosi, Eva; Hajdu, Istvan; Szporny, Laszlo; Groo, Dora; and Laszlovsky, Istvan, 4,874,765, Cl. 514-255.000.
 Pan, Ju-Don T., to Microelectronics and Computer Technology Corporation. Method of deposition of metal into cavities on a substrate. 4,874,493, Cl. 204-192.110.
 Panesar, Lakhbir S.: See—
 Law, David J. C.; and Panesar, Lakhbir S., 4,873,959, Cl. 123-458.000.
 Panex Corporation: See—
 Delatorre, Leroy C., 4,873,870, Cl. 73-733.000.
 Panian, Thomas L.: See—
 Luttmer, David J.; Panian, Thomas L.; Wixey, Barry D.; and Wilson, Raymond L., 4,873,770, Cl. 33-706.000.
 Paper Converting Machine GmbH: See—
 Meyer, Dieter, 4,874,078, Cl. 198-409.000.
 Papst, Gero; and Nagl, Michael, to Korf Engineering GmbH; and Voest-Alpine Aktiengesellschaft. Apparatus for cooling a hot product gas. 4,874,037, Cl. 165-47.000.
 Paradies, Heinrich H., to Medice Chem.-Pharm. Fabrik Putter GmbH & Co. Pharmaceutical preparations. 4,874,850, Cl. 536-3.000.
 Park, Hee K.: See—
 Kim, Myung S.; Kang, Hyun S.; Lim, Soon K.; and Park, Hee K., 4,874,712, Cl. 437-31.000.
 Parker, Wade: See—
 Clark, Gary E., 4,874,182, Cl. 280-30.000.
 Parlante, John K. Pistol holster with limiting swing clutch. 4,874,118, Cl. 224-198.000.
 Parriah, Timothy L., to Eaton Corporation. Electrical reversing switch. 4,874,911, Cl. 200-6.00R.
 Paschke, Reinhard: See—
 Yong, Bak G.; Petra, Barth; Dietrich, Demus; Detlev, Joachim; Kampa, Barbara; Kohler, Saskia; Mohr, Kristine; Paschke, Reinhard; Pelzl, Gerhard; Rosenfeld, Ulrich; Schafer, Wolfgang; Scherf, Klaus-Dieter; Tschirke, Carsten; Weissflog, Wolfgang; and Zschke, Horst, 4,874,544, Cl. 252-299.610.
 Patel, Parbhuhai D.: See—
 Arroyo, Candido J.; and Patel, Parbhuhai D., 4,874,219, Cl. 350-96.230.
 Paterson, James L., to Texas Instruments Incorporated. Read only memory with improved channel length control and method of forming. 4,874,715, Cl. 437-43.000.
 Paton, Eric R.; and Cooley, William U. Cargo transporting carrier. 4,874,120, Cl. 224-266.000.
 Patriquin, Douglas R.: See—
 Spillman, William B., Jr.; Rudd, Robert E., III; Ellinger, Sylvester M.; Patriquin, Douglas R.; and Kline, Bruce R., 4,874,245, Cl. 356-364.000.
 Paukovits, Edward J., Jr.; and Wright, Susan E., to AMP Incorporated. Method of mounting a replaceable EMI spring strip. 4,874,337, Cl. 439-609.000.
 Paul, Harold J. Ceiling tile hold down clip. 4,873,809, Cl. 52-489.000.
 Paul, Leland S.: See—
 Andrews, William H.; Brothers, Virginia M.; Files, James G.; Kuhn, Irene; McCaman, Michael T.; Paul, Leland S.; Sias, Stacey R.; Gore, Thomas C.; Newman, Karel Z., Jr.; and Tedesco, John L., 4,874,705, Cl. 435-252.330.
 Pavel, Wilfried, to Wilfried Pavel Maschinenbau. Clothing article packaging machine. 4,873,812, Cl. 53-241.000.
 Pavie, Claude: See—
 Bergerioux, Jean-Marcel; Pavie, Claude; and Plent, Christian, 4,874,281, Cl. 414-285.000.
 Pawlik, Robert S.; and Rasch, Kenneth R., to Xerox Corporation. Integrated fuser connector and alignment member. 4,875,068, Cl. 355-286.000.
 Payne, Donna W.; and Talalay, Paul, to Johns Hopkins University. Med School. The novel bacterium inducible to produce unique steroid-transforming enzymes: preparation and applications thereof. 4,874,696, Cl. 435-26.000.
 Payre, Didier; Crozat, Georges; and Spinner, Bernard, to Societe Nationale Elf Aquitaine. Three-phase heat pump. 4,873,842, Cl. 62-480.000.

Pearson, Steve: See—
 Zdeb, Brian; Pearson, Steve; and Slater, Glenn L., 4,874,366, Cl. 604-56.000.
 Pecile, Dario: See—
 Menn, Roger; Brunel, Christian; and Pecile, Dario, 4,874,986, Cl. 313-505.000.
 Pegasus Sewing Machine Mfg. Co., Ltd.: See—
 Takagi, Katsumi; Negoro, Toshihito; and Tamagawa, Itaru, 4,873,931, Cl. 112-121.110.
 Peglion, Jean L.; Poignant, Jean C.; and Vian, Joel, to Adir Et Cie. Certain dihydrobenzofuran butanoic and pentanoic acid derivatives. 4,874,878, Cl. 549-462.000.
 Pelikan Aktiengesellschaft: See—
 Borchers, Jürgen; and Bubolz, Petra, 4,874,811, Cl. 524-516.000.
 Pellini, Jean-Pierre: See—
 Nicholas Marchiani Chatelain, Marie L.; and Pellini, Jean-Pierre, 4,874,033, Cl. 165-1.000.
 Pelura, Timothy J.: See—
 Chang, Stephen S.; Bao, Yongde; and Pelura, Timothy J., 4,874,629, Cl. 426-601.000.
 Pelzl, Gerhard: See—
 Yong, Bak G.; Petra, Barth; Dietrich, Demus; Detlev, Joachim; Kampa, Barbara; Kohler, Saskia; Mohr, Kristine; Paschke, Reinhard; Pelzl, Gerhard; Rosenfeld, Ulrich; Schafer, Wolfgang; Scherf, Klaus-Dieter; Tschirke, Carsten; Weissflog, Wolfgang; and Zschke, Horst, 4,874,544, Cl. 252-299.610.
 Pendleton, Phillip, to Olin Hunt Specialty Products Inc. Process for preparing the through hole walls of a printed wiring board for electroplating. 4,874,477, Cl. 204-15.000.
 Penninger, Josef: See—
 Schmid, Karl-Heinz; Penninger, Josef; and Moeller, Hinrich, 4,874,579, Cl. 422-16.000.
 Pennwalt Corporation: See—
 Baron, Arthur L.; Myers, Terry N.; and Wicher, Jerome, 4,874,803, Cl. 524-94.000.
 Pepinsky, R. Blake: See—
 Wallner, Barbara P.; Pepinsky, R. Blake; and Garwin, Jeffrey L., 4,874,743, Cl. 514-12.000.
 Perchonock, Carl D.: See—
 Gleason, John G.; Hall, Ralph F.; Ku, Thomas W.; and Perchonock, Carl D., 4,874,792, Cl. 514-570.000.
 Perera, Thiloma I.: See—
 Watta, Michael P. C.; Perera, Thiloma I.; Myers, David W.; Ozarski, Robert G.; Schipper, John F.; and Tan, Raul V., 4,874,240, Cl. 356-73.000.
 Perez, Roberto. Trauma stretcher. 4,873,732, Cl. 5-81.00B.
 Pericomp Corporation: See—
 Joannou, Kyriacos; Wilson, Kenneth; and Lowry, Alan B., 4,875,125, Cl. 360-128.000.
 Perkin-Elmer Corporation, The: See—
 Gonner, Winfried, 4,874,250, Cl. 374-43.000.
 Scott, Raymond P. W.; and Katz, Elena, 4,873,862, Cl. 73-23.100.
 Perkins, James M.: See—
 Atlas, George N.; Donnally, Leroy C.; Urban, Donald P.; Perkins, James M.; and Wilson, Timothy C., 4,874,308, Cl. 425-544.000.
 Perkins, Warren E. Method and means for dispensing respiring gases by effecting a known displacement. 4,873,971, Cl. 128-201.230.
 Permy, Alfred: See—
 Pierre, Andre; Batlleu, Francois; Brosselard, Jean-Pierre; Permy, Alfred; Pirot, Francois-Xavier; and Spirkovitch, Serge, 4,873,868, Cl. 73-517.00R.
 Perren, Benno. Apparatus for continuously measuring the turbidity of a fluid. 4,874,243, Cl. 356-342.000.
 Perron, Maurice: See—
 Gravis, Philippe; Duchateau, Jacques; and Perron, Maurice, 4,874,188, Cl. 283-89.000.
 Perry, Nigel B.: See—
 Munro, Murray H. G.; Perry, Nigel B.; and Blunt, John W., 4,874,767, Cl. 514-278.000.
 Perry, Paul D.: See—
 DeJong, Allan W.; and Perry, Paul D., 4,874,010, Cl. 137-484.400.
 Personal Diagnostics, Inc.: See—
 Meserol, Peter M.; and Palmieri, Thomas, 4,873,993, Cl. 128-760.000.
 Pesata, Patrick J., Jr.: See—
 Boon, Wyndham; Gartland, Robert J.; and Pesata, Patrick J., Jr., 4,874,670, Cl. 428-423.900.
 Peterson, David; Chen, Loren; and Iliff, Robert J., to Clorox Company. The Stable liquid nonaqueous detergent compositions. 4,874,537, Cl. 252-99.000.
 Peterson, Stephen C.: See—
 Brimhall, Owen D.; Peterson, Stephen C.; Kotlyar, Oleg; and Ghosh Roy, Dilip N., 4,874,358, Cl. 494-37.000.
 Petra, Barth: See—
 Yong, Bak G.; Petra, Barth; Dietrich, Demus; Detlev, Joachim; Kampa, Barbara; Kohler, Saskia; Mohr, Kristine; Paschke, Reinhard; Pelzl, Gerhard; Rosenfeld, Ulrich; Schafer, Wolfgang; Scherf, Klaus-Dieter; Tschirke, Carsten; Weissflog, Wolfgang; and Zschke, Horst, 4,874,544, Cl. 252-299.610.
 Petrecca, Peter J.: See—
 Boger, Bentley J.; and Petrecca, Peter J., 4,874,451, Cl. 156-291.000.
 Petron, Terry L. Disk shaped fishing line bobber. 4,873,784, Cl. 43-44.950.
 Petrov, Vyachislav V.; Gorshkov, Nikolai V.; Antonov, Alexandr A.; Tokar, Alexandr P.; Krjuchin, Andrei A.; and Shanoilo, Semen M., to Institut Problem Modelirovani V Energetike Akademii Nauk Uk-

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 Petschauer, Franz: See—
 Schaschnigg, Johann; and Petschauer, Franz, 4,874,468, Cl. 162-300.000.
 Pettersen, Erik O.: See—
 Borretzen, Bernt; Larsen, Rolf O.; Pettersen, Erik O.; Dornish, John M.; and Oftebro, Rolf, 4,874,780, Cl. 514-452.000.
 Pfaffle, Ernst, to Sickinger Company. Semi-automatic binder. 4,874,279, Cl. 412-39.000.
 Pfeiffer, Loren N.; and West, Kenneth W., to American Telephone Telegraph Company, AT&T Bell Laboratories. Apparatus comprising a high-vacuum chamber. 4,873,833, Cl. 62-55.500.
 Pfister, William R.: See—
 DiSapio, Alfred J.; Pfister, William R.; and Sheeran, Mary A., 4,874,129, Cl. 239-36.000.
 Pfizer Inc.: See—
 Crawford, Thomas C.; Keely, Stanley L.; Larson, David L.; Lombardino, Joseph G.; and Maciejko, James J., 4,874,757, Cl. 514-226.500.
 Schnur, Rodney C.; and Fliri, Anton F. J., 4,874,864, Cl. 546-153.000.
 Urban, Frank J., 4,874,877, Cl. 549-66.000.
 Pham, Hieu: See—
 Hediger, Edwin A.; Ng, Yee S.; and Pham, Hieu, 4,875,057, Cl. 346-107.00R.
 Pharmacia AB: See—
 Stalberg, Ralph I., 4,874,491, Cl. 204-182.800.
 Pharo, Daniel A. Clam-like packaging system. 4,874,093, Cl. 206-522.000.
 Phenicie, Ronald W.: See—
 Thompson, Marvin W.; Jennings, Timothy C.; Scott, James A.; Phenicie, Ronald W.; Murphy, Margaret H.; Nakash, Gabriel D.; Biggers, James R.; Boudreau, Lynne M.; and Curiel Contreras, Jorge H., 4,874,266, Cl. 403-407.100.
 Philibert, Daniel: See—
 Nique, Francois; Nedelec, Lucien; Bouton, Marie-Madeleine; and Philibert, Daniel, 4,874,754, Cl. 514-178.000.
 Philip Morris Incorporated: See—
 Tamol, Ronald A.; Nepomuceno, Jose G.; Keritsis, Gus D.; Burnett, George H.; Thesing, Richard A.; Winteroon, Warren D.; and Nichols, Walter A., 4,874,000, Cl. 131-375.000.
 Phillips, Kirby: See—
 Lopez, Benjamin L.; Beard, Steven A.; and Phillips, Kirby, 4,874,299, Cl. 417-413.000.
 Phillips, Michael L.: See—
 Bonjouklian, Rosanne; Meade, Christopher J. M.; Mihelich, Edward D.; and Phillips, Michael L., 4,874,782, Cl. 514-473.000.
 Photofinish Cosmetics Inc.: See—
 Kay, Nathan; McNab, Donald W.; and Moya, Edward J., 4,874,117, Cl. 222-487.000.
 Photon Dynamics, Inc.: See—
 Henley, Francois G.; Choi, Hee-June; Kratzer, Dean J.; and Barr, Maurice R., 4,875,006, Cl. 324-158.00R.
 Piane Caterers, Inc.: See—
 Piane, Robert A., Sr., 4,873,921, Cl. 99-422.000.
 Piane, Robert A., Sr., to Piane Caterers, Inc. Multiple unit wok apparatus. 4,873,921, Cl. 99-422.000.
 Picano N.V.: See—
 Van Bogaert, Philippe; and Vandenbroucke, Andre, 4,874,018, Cl. 139-1.00E.
 Picciariello, Matteo: See—
 Volonta, Piero; and Picciariello, Matteo, 4,873,763, Cl. 29-825.000.
 Pickrell, Daniel A.; Schrock, Donald C.; and Turner, Larry G., to Masco Corporation of Indiana. Anti-seizing cap ring. 4,874,009, Cl. 137-454.600.
 Pierce, Michael E.: See—
 Aldrich, Paul E.; Duncia, John Jonas V.; and Pierce, Michael E., 4,874,867, Cl. 548-101.000.
 Pierre, Andre; Batlleu, Francois; Brosselard, Jean-Pierre; Permy, Alfred; Pirot, Francois-Xavier; and Spirkovitch, Serge, to Metravit R.D.S. Force measurement sensor integrated on silicon, and a method of manufacture. 4,873,868, Cl. 73-517.00R.
 Pierson, Joseph E.: See—
 Beall, George H.; Pierson, Joseph E.; and Quinn, Candace J., 4,874,724, Cl. 501-10.000.
 Pilkington PLC: See—
 Clarke, Leslie T., 4,874,903, Cl. 174-35.00S.
 Pillsbury Company, The: See—
 Weimer, John R., 4,874,917, Cl. 219-10.55M.
 Pincus, David H., to American Home Products Corp. Rapid identification of yeast and other fungal microorganisms by enzyme detection. 4,874,695, Cl. 435-19.000.
 Pioneer Consolidated Corp.: See—
 Goldstein, Harvey R.; and Haddad, Edward N., Jr., 4,874,196, Cl. 296-98.000.
 Pioneer Electronic Corporation: See—
 Ohsawa, Seiichi, 4,874,221, Cl. 350-96.290.
 Yokosawa, Seiichi, 4,875,115, Cl. 360-77.150.
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- Pitigliano, Frank J.: See—
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O'Dea, Kevin J., 4,873,941, Cl. 118-669.000.
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Blume, Carl R., Jr., 4,875,186, Cl. 364-900.000.
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Arnaud-Munoz, Jose L.; and Cornette, Henri, 4,874,107, Cl. 220-20.000.
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Houser, Philip H., 4,874,929, Cl. 219-506.000.
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Chuang, Cliff, 4,874,938, Cl. 250-203.00R.
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Chandler, Howard, 4,874,691, Cl. 435-7.000.
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Dahowski, Donald E., 4,873,802, Cl. 52-184.000.
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Beall, George H.; Pierson, Joseph E.; and Quinn, Candace J., 4,874,724, Cl. 501-10.000.
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Morris, David L.; Filip, Mihail; D'Amelio, Frank D.; Esposito, Dominick G.; and Quint, Robert H., 4,874,364, Cl. 604-35.000.
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Kregness, Glen R.; and Quinton, Walter L., 4,875,180, Cl. 364-715.030.
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Christiansen, Torben F.; and Kokholm, Finn, 4,874,501, Cl. 204-415.000.
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Leonardo, Covi; Giorgio, Bacialli; and Raffaele, Degli E., 4,874,619, Cl. 426-94.000.
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Oxenius, Rudiger; Burgi, Ernst; Arnold, Vladimir; and Rakoczi, Ferenc, 4,874,847, Cl. 534-565.000.
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Becker, Paul, 4,874,840, Cl. 528-480.000.
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Mathews, James K., Jr.; Chancellor, Craig A.; and Howes, H. Frank, 4,875,209, Cl. 371-3.000.
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Johnson, Arthur F.; and Sackett, Robert L., 4,874,585, Cl. 422-171.000.
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Johns, Ken; Re, Alberto; and Bargigia, Gianangelo, 4,874,842, Cl. 528-494.000.
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Sanner, Medford D., 4,874,933, Cl. 235-470.000.
- RecyTec S.A.: See—
Hanulik, Jozef, 4,874,486, Cl. 204-140.000.
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Bulao, Joseph D., Jr.; and McClung, James A., 4,873,859, Cl. 72-336.000.
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Egan, Philip D., 4,874,272, Cl. 405-284.000.
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Fiers, Walter C.; and Remaut, Rene Erik, 4,874,702, Cl. 435-172.000.
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Andre, Venant, 4,873,883, Cl. 74-473.00R.
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Hwang, Yu-Tsang G., 4,875,182, Cl. 364-732.000.
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Nordlund, James J.; and Rheins, Lawrence A., 4,874,744, Cl. 514-13.000.
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Frederick, Warren P.; Steele, Sarah L.; Rhodes, David D.; and Arms, Christopher L., 4,874,365, Cl. 604-54.000.
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Chene, Alain, 4,874,846, Cl. 534-560.000.
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Chevallier, Yvonick, 4,874,594, Cl. 423-335.000.
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Rescaili, Carlo; Ricci, Rizziero; Scazzosi, Adriano; and Cianci, Flavio, 4,874,474, Cl. 203-18.000.
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Jabs, Gert; and Richartz, Adolf, 4,874,832, Cl. 528-60.000.
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Nowack, William C., 4,874,412, Cl. 55-385.100.
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Bisajji, Takashi; Sawayama, Noboru; and Yoo, Hideo, 4,875,079, Cl. 355-246.000.
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Sasaki, Saburo; Ishida, Tsutomu; and Yamamoto, Kenji, 4,874,957, Cl. 250-578.000.
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Wagener, Hans; and Zachrei, Jürgen, 4,874,321, Cl. 439-119.000.

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Colanzi, Franco; and Vignotto, Angelo, 4,874,261, Cl. 384-484.000.

Riyate Pty. Limited: See—

Maier, Jack, deceased, 4,873,772, Cl. 34-60.000.

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Boyer, John D., 4,874,184, Cl. 280-423.100.

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Affeldt, Karl-Heinz; and Hantel, Ulrich, 4,873,988, Cl. 128-687.000.

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Roberts, James H.: See—

Gold, Raymond; and Roberts, James H., 4,874,951, Cl. 250-472.100.

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Kuphal, Jeffrey A.; Robeson, Lloyd M.; and Weber, James J., 4,874,030, Cl. 164-34.000.

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Halpera, Donald F.; and Robin, Mark L., 4,874,901, Cl. 568-621.000.

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Gandy, Samuel E.; and Greengard, Paul, 4,874,694, Cl. 435-15.000.

Rockwell International Corporation: See—

Dunn, Charlton; Bremner, Robert J.; and Meng, Sen Y., 4,874,575, Cl. 376-404.000.

Gay, Richard L.; and McKenzie, Donald E., 4,874,599, Cl. 421-491.000.

Prentice, Robert J., 4,874,145, Cl. 244-53.00B.

Rodionoff, Pierre: See—

Bezdard, Jean-Jacques; Feppon, Philippe; and Rodionoff, Pierre, 4,874,242, Cl. 356-341.000.

Rodrigues, Pedro: See—

Hombberger, Heinrich; Timm, Jürgen; and Rodrigues, Pedro, 4,874,578, Cl. 420-541.000.

Roe, Derrick I.; Rozman, Christopher J.; and Recker, Bradley J., to Sundstrand Corporation. Control for producing a low magnitude voltage at the output of a PWM inverter. 4,875,148, Cl. 363-41.000.

Roe, Derrick I.: See—

Rozman, Christopher J.; Roe, Derrick I.; and Recker, Bradley J., 4,875,149, Cl. 363-41.000.

Roediger, Gary A.: See—

Nichols, Robert K.; and Roediger, Gary A., 4,875,206, Cl. 370-85.150.

Roeding, Gretchen W.: See—

Bednarz, George A.; Smith, Reginald W.; Roeding, Gretchen W.; and Test, Howard R., 4,874,722, Cl. 437-209.000.

Roehm GmbH Chemische Fabrik: See—

Hofmann, Ingrid; Mutschler, Ernst; and Christner, Angelika, 4,874,763, Cl. 514-249.000.

Rogers, Randall R.: See—

Lopatin, George; Yen, Larry Y.; and Rogers, Randall R., 4,874,567, Cl. 264-45.100.

Rohm and Haas Company: See—

Hallden-Abbott, Michael P.; Cohen, Leslie A.; and Wood, Robert S., 4,874,824, Cl. 525-379.000.

Rojey, Alexandre; and Grehier, Alain, to Institut Français du Pétrole. Process for the simultaneous exchange of heat and matter through a porous wall. 4,873,835, Cl. 62-93.000.

Roller, Traugott, to Daimler-Benz Aktiengesellschaft. Cover strip for the lower edge of a bonded windscreen of a motor car. 4,874,198, Cl. 296-192.000.

Rongen, Engelbertus: See—

van der Eijk, Bart; van de Wiel, Johannes N.; Rongen, Engelbertus; and Wulms, Christian J. G. H., 4,874,987, Cl. 313-525.000.

Rorer Pharmaceutical Corporation: See—

Youssefyeh, Raymond; Chakraborty, Utpal; Magnien, Ernest; Desai, Rohit; and Lee, Thomas D-Y, 4,874,769, Cl. 514-314.000.

Rose, David B.: See—

Derhaag, Robert L.; and Rose, David B., 4,875,233, Cl. 379-430.000.

Rosenfeld, Ulrich: See—

Yong, Bak G.; Petra, Barth; Dietrich, Demus; Detlev, Joachim; Kampa, Barbara; Kohler, Saskia; Mohr, Kristine; Paschke, Reinhard; Pelz, Gerhard; Rosenfeld, Ulrich; Schafer, Wolfgang; Scherf, Klaus-Dieter; Tschirke, Carsten; Weisflog, Wolfgang; and Zschke, Horst, 4,874,544, Cl. 252-299.610.

Rosenthal, Bruce C., to Kohler General Corporation. Multiple head woodworking apparatus with automated head positioning apparatus. 4,874,996, Cl. 318-567.000.

Rosenthal, Doren, to Mattel, Inc. Toy detection and signaling circuit. 4,874,343, Cl. 446-175.000.

Rossi, John J., to City of Hope. Synthetic oligonucleotides useful in diagnosis of chronic myelogenous leukemia. 4,874,853, Cl. 536-27.000.

Rossi, Remo J.; and Grady, John. Anti-scatter grid system. 4,875,227, Cl. 378-154.000.

Rothwell, Harold L., Jr.: See—

English, George J.; Rothwell, Harold L., Jr.; and Garrity, Donald F., Jr., 4,874,988, Cl. 313-620.000.

Roussel Uclaf: See—

Nique, Francois; Nedelec, Lucien; Bouton, Marie-Madeleine; and Philibert, Daniel, 4,874,754, Cl. 514-178.000.

Rowan, Joseph C.: See—

Walter, Jeffrey A.; Garg, Kailash C.; and Rowan, Joseph C., 4,875,026, Cl. 333-251.000.

Rowland, Bobby A.: See—

Watkins, Clinton E.; and Rowland, Bobby A., 4,874,442, Cl. 156-48.000.

Rozanski, Robert D.; Medlock, James R., III; and Larson, Stephen F., to L.E.A. Dynatech. Uniform current and voltage distribution device. 4,875,137, Cl. 361-331.000.

Rozman, Christopher J.; Roe, Derrick I.; and Recker, Bradley J., to Sundstrand Corporation. Phase separation control. 4,875,149, Cl. 363-41.000.

Rozman, Christopher J.: See—

Roe, Derrick I.; Rozman, Christopher J.; and Recker, Bradley J., 4,875,148, Cl. 363-41.000.

Rubinshtein, Bernard, to Output Technology Corporation. Web feed tractor belt assembly. 4,874,121, Cl. 226-74.000.

Rudd, Robert E., III: See—

Spillman, William B., Jr.; Rudd, Robert E., III; Ellinger, Sylvester M.; Patriquin, Douglas R.; and Kline, Bruce R., 4,874,245, Cl. 356-364.000.

Rudener, Werner, to DIEHL GmbH & Co. Pyrotechnic fuse for projectiles, rockets, bomblets and mines. 4,873,927, Cl. 102-269.000.

Rudolph, Gert: See—

Borowski, Horst; Kausch, Erwin; Rittershaus, Erhard; Rudolph, Gert; and Schneider, Werner, 4,874,004, Cl. 131-364.000.

Rundo, John R., to B.F. Goodrich Company, The. Insulating a window pane. 4,873,803, Cl. 52-202.000.

Ruottu, Seppo, to A. Ahlstrom Osakeyhtio. Fluidized bed reactor. 4,874,584, Cl. 422-145.000.

Ruskin, Thomas R. Touch controlled multiple position lamp. 4,874,991, Cl. 315-362.000.

Rusmar Incorporated: See—

Kittle, Paul A., 4,874,641, Cl. 427-244.000.

Russell, Frank S.; and Hallihan, Timothy J., to Sleeper & Hartley Corp. Computer controlled coiling machine. 4,873,854, Cl. 72-12.000.

Russell, Ronald K., to Ortho Pharmaceutical Corporation. Ethanesulfonamide derivatives. 4,874,771, Cl. 514-331.000.

Russell, Stephen D., to United States of America, Army. Phase-conjugate resonator. 4,875,219, Cl. 372-92.000.

Russo, John L.; and Van der Kloot, Robert H., to Teradyne, Inc. Automatic circuit tester control system. 4,875,210, Cl. 371-27.000.

Ryan, Francis X.: See—

von Ballmoos, Roland; and Ryan, Francis X., 4,874,504, Cl. 208-111.000.

Ryan, Thomas W., III; Maymar, Milan J.; and Anderson, Orin M., to Southwest Research Institute. Variable compression ratio direct injection engine. 4,873,947, Cl. 123-78.000.

Rydeen, Robert J., to R. J. Rydeen & Associates. Stressed skin post and beam building construction system. 4,873,797, Cl. 52-93.000.

Ryobi, Ltd.: See—

Murakami, Hideo, 4,874,144, Cl. 242-235.000.

S. C. Johnson & Son, Inc.: See—

Etter, Robert M.; and Neumiller, Phillip J., 4,874,672, Cl. 428-457.000.

Sramek, John A., 4,874,604, Cl. 424-47.000.

S.U.I. Corporation: See—

Ilberstein, Ilan, 4,874,066, Cl. 188-280.000.

Se etti, Anthony J.: See—

Bishop, Robert P.; Sabetti, Anthony J.; and Charboneau, Thomas, 4,875,135, Cl. 361-283.000.

Sachs/Freeman Associates, Inc.: See—

Kersey, Alan D., 4,874,244, Cl. 356-350.000.

Sachtler, J. W. Adriaan; and Lawson, R. Joe, to UOP. Catalyst for the isomerization of aromatics. 4,874,731, Cl. 502-66.000.

Sackett, Robert L.: See—

Johnson, Arthur F.; and Sackett, Robert L., 4,874,585, Cl. 422-171.000.

Sadai, Masanao: See—

Adachi, Kuniaki; Tamai, Hideo; and Sadai, Masanao, 4,874,791, Cl. 514-558.000.

SAES Getters S.p.A.: See—

Bratz, V. David, 4,874,339, Cl. 445-28.000.

Safranek, Edward J., to F & B Mfg. Co. High efficiency electrical alternator system. 4,873,962, Cl. 123-599.000.

Safranek, Edward J., to F & B Mfg. Co. Stator assembly having coil bobbins with retaining clips. 4,874,977, Cl. 310-269.000.

Sagawa, Yasuhiro: See—

Idenawa, Hiroyuki; Mochimaru, Hideaki; Kanda, Hajime; Makita, Nobuhiro; Tanaka, Yoshiaki; Yagisita, Takahiro; Yamaki, Takanori; Motohashi, Takeshi; Miyamoto, Masayoshi; Ishizu, Hisao; Sagawa, Yasuhiro; Kanno, Tadaaki; Sankoda, Tomoo; Hosokawa, Hiroshi; Aoki, Hideo; Suzuki, Takami; Takada, Hiromi; and Shimazaki, Toshio, 4,875,063, Cl. 346-160.100.

St. Clair, Martha H.: See—

Rideout, Janet L.; Barry, David W.; Lehrman, Sandra N.; St. Clair, Martha H.; and Furman, Philip A., 4,874,609, Cl. 424-85.400.

Saint-Gobain Vitreux "Les Miroirs": See—

Kuster, Hans-Werner; Radermacher, Herbert; and Vanaschen, Luc, 4,874,418, Cl. 65-348.000.

Saito, Haruo; Kranz, David M.; Eisen, Herman N.; and Toneyawa, Susumu, to Massachusetts Institute of Technology. T lymphocyte receptor subunit. 4,874,845, Cl. 530-395.000.

Saito, Shozo: See—

Igarashi, Takao; Sugawara, Satoaki; Yoshimoto, Yuichiro; Saito, Shozo; Fukumoto, Takashi; Endo, Zenichiro; and Shinbo, Katsutoshi, 4,874,574, Cl. 376-333.000.

Saito, Yasuo: See—

Hirata, Kimio; and Saito, Yasuo, 4,874,034, Cl. 165-9.100.

Saitoh, Izumi; Kido, Shigeru; Sasaki, Yoshio; and Shinohara, Syuichiro, to Shionogi & Co., Ltd.; and Nissin Chemical Co., Ltd. Acrylic copolymer and skin protective. 4,874,830, Cl. 526-318.400.

Sakabe, Yukio: See—

Sano, Harunobu; Sakabe, Yukio; and Nishioka, Goro, 4,875,136, Cl. 361-321.000.

Sakai, Jun: See—

Sangyoji, Kazuo; Sakai, Jun; Hayashi, Shigeyuki; Suzuki, Makoto; and Kimura, Yasuo, 4,875,074, Cl. 355-27.000.

Sakai, Kazuo: See—

Utaka, Katsuyuki; Sakai, Kazuo; Matsushima, Yuichi; and Akiba, Shigeyuki, 4,874,216, Cl. 350-96.190.

Sakai, Nobuo: See—

Yamanouchi, Junichi; Ono, Shigetoshi; Hirano, Tsumoru; Watanabe, Toshiyuki; Sakai, Nobuo; and Mihayashi, Keiji, 4,874,689, Cl. 430-548.000.

Sakai, Shunji; Kitagawa, Tohru; Suzuki, Kunikazu; and Watanabe, Naohiro, to Oki Electric Industry Co., Ltd. Device for merging plural sensor outputs onto a single conductor. 4,875,099, Cl. 358-213.110.

Sakaida, Atsuo; Chikaoka, Yasuji; Imoto, Yasuo; Iriguchi, Akira; and Ikezaki, Yoshiyuki, to Brother Kogyo Kabushiki Kaisha. Device for magnifying displacement of piezoelectric element or the like and method of producing same. 4,874,978, Cl. 310-328.000.

Sakakibara, Kenji: See—

Ueda, Masashi; Horaguchi, Yoichi; and Sakakibara, Kenji, 4,875,073, Cl. 355-27.000.

Sakakibara, Toshiyuki: See—

Kinomura, Keisuke; Kitazawa, Sadaya; Takata, Yasushi; and Sakakibara, Toshiyuki, 4,874,852, Cl. 536-18.600.

Sakamoto, Hideo; and Tsugita, Hiroshi, to Sharp Kabushiki Kaisha. Method of testing semiconductor wafers. 4,875,002, Cl. 324-73.00R.

Sakamoto, Takaaki; Itoh, Munehiko; and Maeda, Shuji, to Matsushita Electric Works, Ltd. Method of preparing polyphenylene oxide composition and laminates using such compositions. 4,874,826, Cl. 525-534.000.

Sakamoto, Yasuhiko: See—

Hisaki, Masakazu; Kashima, Kenichi; Sakamoto, Yasuhiko; Hojo, Masakazu; Katayama, Osamu; and Hata, Hiroyoshi, 4,874,773, Cl. 514-355.000.

Sakano, Yukio, to Ricoh Company, Ltd. Two-dimensional memory unit having a 2d array of individually addressable blocks each having a 2d array of cells. 4,875,190, Cl. 365-189.040.

Sakata, Masakazu: See—

Tsujino, Yoshiyuki; Hamada, Yuuji; Sakata, Masakazu; Fujii, Takanori; and Kuwano, Yukinori, 4,874,646, Cl. 428-34.100.

Sakayori, Hiroyuki: See—

Sato, Masahiko; Konuma, Toshimitsu; Odate, Seiichi; Yamaguchi, Toshiharu; Watanabe, Toshio; Aoyagi, Osamu; Tabata, Kaoru; Isigaki, Chizuru; Sakayori, Hiroyuki; Kobayashi, Ipeei; Osabe, Akio; and Yamazaki, Shunpei, 4,874,461, Cl. 156-633.000.

Sakazaki, Yoshihisa, to Kabushiki Kaisha Toshiba. Digital FM demodulating apparatus. 4,875,017, Cl. 329-336.000.

Sakui, Koji: See—

Momodomi, Masaki; and Sakui, Koji, 4,875,195, Cl. 365-230.080.

Sakurai, Shigeo; Umezawa, Sadao; Usami, Saburo; Miyata, Hiroshi; Toriya, Hajime; Tsubouchi, Kuniyoshi; and Kaneko, Ryoichi, to Hitachi, Ltd. Method and apparatus for estimating life expectancy of mechanical structures. 4,875,170, Cl. 364-507.000.

Sakurai, Takao: See—

Higuchi, Ryoichi; Sakurai, Takao; Yokota, Tadahiko; Mikami, Naoko; Yamamoto, Eri; and Takeuchi, Koji, 4,874,542, Cl. 252-299.610.

Sales S.p.A.: See—

Tessera-Chiesa, Emilio, 4,874,096, Cl. 206-621.000.

Sampath, Barbara A.; and Schenk, Richard C., to Xerox Corporation. Sheet edge detector. 4,874,958, Cl. 355-309.000.

Sampson, Thomas J. Tire wheel and wheel cover spray shield and kit. 4,874,206, Cl. 301-37.00R.

Samsung Semiconductor & Telecommunication Co., Ltd.: See—

Kim, Myung S.; Kang, Hyun S.; Lim, Soon K.; and Park, Hee K., 4,874,712, Cl. 437-31.000.

Sanada, Kei: See—

Mine, Kazuhiro; Sanada, Kei; and Ide, Mitsuteru, 4,874,980, Cl. 310-328.000.

Sanchez-Robles, Francisco B.; and Manterola, Maria De La Paloma M. Color dosification/application machine. 4,874,131, Cl. 239-307.000.

Sanden Corporation: See—

Kobayashi, Hideto; and Terauchi, Kiyoshi, 4,874,295, Cl. 417-222.000.

Masuda, Kenji, 4,874,036, Cl. 165-42.000.

Matsushita, Takashi; and Yanai, Genzo, 4,874,973, Cl. 310-78.000.

Sander, Rainald: See—

Leipold, Ludwig; Sander, Rainald; Tihanyi, Jenoe; and Weber, Roland, 4,875,131, Cl. 361-103.000.

Sanders, Steven B. Electric heating load management control. 4,874,926, Cl. 219-486.000.

Sandoz Ltd.: See—

Henzi, Beat, 4,874,392, Cl. 8-662.000.

Sangyoji, Kazuo; Sakai, Jun; Hayashi, Shigeyuki; Suzuki, Makoto; and Kimura, Yasuo, to Brother Kogyo Kabushiki Kaisha. Image recording apparatus. 4,875,074, Cl. 355-27.000.

Sanki Electronic Industry Co., Ltd.: See—

Kawamura, Takeyoshi, 4,875,133, Cl. 361-230.000.

Sankoda, Tomoo: See—

Idenawa, Hiroyuki; Mochimaru, Hideaki; Kanda, Hajime; Makita, Nobuhiro; Tanaka, Yoshiaki; Yagisita, Takahiro; Yamaki, Takanori; Motohashi, Takeshi; Miyamoto, Masayoshi; Ishizu, Hisao; Sagawa, Yasuhiro; Kanno, Tadaaki; Sankoda, Tomoo; Hosokawa, Hiroshi; Aoki, Hideo; Suzuki, Takami; Takada, Hiromi; and Shimazaki, Toshio, 4,875,063, Cl. 346-160.100.

Sanner, Medford D., to Recognition Equipment Incorporated. Ambient illumination bar code reader. 4,874,933, Cl. 235-470.000.

Sano, Harunobu; Sakabe, Yukio; and Nishioka, Goro, to Murata Manufacturing Co., Ltd. Ceramic capacitor and method of manufacturing the same. 4,875,136, Cl. 361-321.000.

Sano, Koichi: See—

Maeda, Akira; Sano, Koichi; Yokoyama, Tetsuo; Koizumi, Hideaki; and Mizuno, Hirotsugu, 4,875,012, Cl. 324-309.000.

Santel, Hans-Joachim: See—

Jelich, Klaus; Gayer, Herbert; Kramer, Wolfgang; Santel, Hans-Joachim; Schmidt, Robert R.; and Strang, Harry, 4,874,424, Cl. 71-105.000.

Wroblowski, Heinz-Jürgen; Kluth, Joachim; Tietjen, Klaus-Günther; Santel, Hans-Joachim; Schmidt, Robert R.; and Strang, Harry, 4,874,420, Cl. 71-93.000.

Santhanam, K. S. V.: See—

O'Brien, R. N.; and Santhanam, K. S. V., 4,874,735, Cl. 502-159.000.

Sanyo Electric Co., Ltd.: See—

Tsujino, Yoshiyuki; Hamada, Yuuji; Sakata, Masakazu; Fujii, Takanori; and Kuwano, Yukinori, 4,874,646, Cl. 428-34.100.

Sapp, William M.; and Harrell, Julia E., to Crown Crafts, Inc. Pillow structure. 4,873,736, Cl. 5-434.000.

Sartomer Company, Inc.: See—

Ceska, Gary W., 4,874,675, Cl. 428-521.000.

Sasaki, Saburo; Ishida, Tsutomu; and Yamamoto, Kenji, to Ricoh Company, Ltd.; and Ricoh Research Institute of General Electronics. Contact type image sensor. 4,874,957, Cl. 250-578.000.

Sasaki, Tetsuo: See—

Kashiwada, Ken; Muto, Tadanobu; and Sasaki, Tetsuo, 4,874,035, Cl. 165-38.000.

Sasaki, Yoshio: See—

Saitoh, Izumi; Kido, Shigeru; Sasaki, Yoshio; and Shinohara, Syuichiro, 4,874,830, Cl. 526-318.400.

Sasaki, Yoshiyuki; and Okamoto, Tetsuo, to Teijin Limited. Synthetic filament-reinforced polymer material sheet and process for producing the same. 4,874,658, Cl. 428-220.000.

Sato, Hiroshi: See—

Kushibe, Yuki; and Sato, Hiroshi, 4,874,309, Cl. 425-589.000.

Sato, Isao; Miyake, Nobuhiko; and Nishida, Souji, to Nippon Seiko Kabushiki Kaisha. Bearing device assembly. 4,874,259, Cl. 184-443.000.

Sato, Koichi: See—
Oka, Yoshinobu; and Sato, Koichi, 4,874,931, Cl. 235-379.000.

Sato, Makoto: See—
Umeda, Osamu; Nakakura, Tohru; Sato, Makoto; and Shimazaki, Tatsuo, 4,875,064, Cl. 353-78.000.

Sato, Masahiko; Konuma, Toshimitsu; Odaka, Seiichi; Yamaguchi, Toshiharu; Watanabe, Toshio; Aoyagi, Osamu; Tabata, Kaoru; Isigaki, Chizuru; Sakayori, Hiroyuki; Kobayashi, Ipppei; Osabe, Akio; and Yamazaki, Shunpei, to Semiconductor Energy Laboratory Co., Ltd. Method for manufacturing liquid crystal device with spacers formed by photolithography. 4,874,461, Cl. 156-633.000.

Sato, Tadashi: See—
Ueda, Kouichiro; Tanaka, Satoru; Kunii, Toshinobu; Kagei, Kengo; Sato, Tadashi; Ono, Hideki; Ohtsuka, Issei; Kawase, Mayumi; Ohgoh, Toshiharu; and Wakabayashi, Tsuneo, 4,874,869, Cl. 548-309.000.

Sato, Takamori, to Shimizu Construction Co., Ltd. Apparatus for suppressing vibration of structure. 4,873,798, Cl. 52-167.00F.

Sato, Tsunehiko: See—
Komatsu, Kazunori; Chikamasa, Hiroshi; and Sato, Tsunehiko, 4,874,633, Cl. 427-48.000.

Satou, Takeo; and Shimizu, Yasuhiko, to Kabushiki Kaisha Toshiba. Die-bonding method and apparatus therefor. 4,874,444, Cl. 156-64.000.

Sauer, Gerhard: See—
Huth, Andreas; Sauer, Gerhard; and Wachtel, Helmut, 4,874,768, Cl. 514-288.000.

Sauer, Joe D.: See—
Smith, Kim R.; Borland, James E.; and Sauer, Joe D., 4,874,784, Cl. 514-517.000.
Smith, Kim R.; Borland, James E.; and Sauer, Joe D., 4,874,785, Cl. 514-526.000.
Smith, Kim R.; Borland, James E.; and Sauer, Joe D., 4,874,788, Cl. 514-534.000.
Smith, Kim R.; Borland, James E.; and Sauer, Joe D., 4,874,789, Cl. 514-551.000.

Saulnier, Mark G.: See—
Vyna, Dolatrai M.; Saulnier, Mark G.; and Kadow, John F., 4,874,851, Cl. 536-17.000.

Sevensiepe, Francisco G., to Auping B.V. Fluid filled mattress with height measuring and control devices. 4,873,737, Cl. 5-453.000.

Savino, Carolyn A., to Nalco Chemical Company. Paper making filler composition and method. 4,874,466, Cl. 162-164.300.

Sawasaki, Yoshihiko: See—
Sonoda, Sakae; Hetsugi, Kouji; Sawasaki, Yoshihiko; Kaburagi, Kouji; and Matsushima, Yasunobu, 4,874,480, Cl. 204-56.100.

Sawayama, Noboru: See—
Bisajji, Takashi; Sawayama, Noboru; and Yoo, Hideo, 4,875,079, Cl. 355-246.000.

Sawtell, Ralph R.; Bretz, Philip E.; and Jensen, Craig L., to Aluminum Company of America. Superplastic aluminum products and alloys. 4,874,440, Cl. 148-437.000.

Sazhin, Alexandr D.: See—
Dzjuban, Vitaly S.; Sazhin, Alexandr D.; Zhitnikov, Valery K.; and Konoplyanko, Anatoly I., 4,875,040, Cl. 340-825.060.

Sbschnigg, Johann; and Petachauer, Franz, to Maschinenfabrik Andritz Aktiengesellschaft. Apparatus for the liquid treatment of a fibrous board between two endless foraminous belts or wires. 4,874,468, Cl. 162-300.000.

Scaglietti, Oscar, to Ferrari Engineering S.p.A. Support and guide structure for the windows of a motor vehicle body. 4,874,201, Cl. 296-201.000.

Scazzosi, Adriano: See—
Rescilli, Carlo; Ricci, Rizziero; Scazzosi, Adriano; and Cianci, Flavio, 4,874,474, Cl. 203-18.000.

Schaefer, Helmut: See—
Schaefer, Philipp; and Schaefer, Helmut, 4,874,449, Cl. 156-246.000.

Schaefer, Philipp; and Schaefer, Helmut, to Schaefer, Philipp. Process for dressing a substantially flat substrate such as split leather or a textile material. 4,874,449, Cl. 156-246.000.

Schafer, Wolfgang: See—
Yong, Bak G.; Petra, Barth; Dietrich, Demus; Detlev, Joachim; Kampa, Barbara; Kohler, Saskia; Mohr, Kristine; Paschke, Reinhard; Peitzl, Gerhard; Rosenfeld, Ulrich; Schafer, Wolfgang; Scherf, Klaus-Dieter; Tschirke, Carsten; Weisflog, Wolfgang; and Zaehcke, Horst, 4,874,544, Cl. 252-299.610.

Schaldach, Max, to Mess-und Therapiegeräte GbmH & Co. Heart pacemaker. 4,873,980, Cl. 128-419.000.

Schaulfeld, Fredrick, to National Electronics Warranty Corporation. Insurance form packet. 4,874,187, Cl. 283-70.000.

Scheier, Donald J.; and Hathorn, Jack L., to Simon-Johnson Company. Method and apparatus for removing breast meat from poultry carcass. 4,873,746, Cl. 17-11.000.

Schenk, Richard C.: See—
Sampath, Barbara A.; and Schenk, Richard C., 4,874,958, Cl. 355-309.000.

Scherer Healthcare Ltd.: See—
Marshall, Lyman R., 4,873,997, Cl. 128-849.000.

Scherf, Klaus-Dieter: See—
Yong, Bak G.; Petra, Barth; Dietrich, Demus; Detlev, Joachim; Kampa, Barbara; Kohler, Saskia; Mohr, Kristine; Paschke, Reinhard; Peitzl, Gerhard; Rosenfeld, Ulrich; Schafer, Wolfgang;

Scherf, Klaus-Dieter; Tschirke, Carsten; Weisflog, Wolfgang; and Zaehcke, Horst, 4,874,544, Cl. 252-299.610.

Scherling Aktiengesellschaft: See—
Hasse, Peter; Kosikowski, Thomas; and Steger, Horst, 4,874,479, Cl. 204-17.000.

Huth, Andreas; Sauer, Gerhard; and Wachtel, Helmut, 4,874,768, Cl. 514-288.000.

Schirmacher, Manfred, 4,874,015, Cl. 137-637.050.

Scherowaky, Gunter: See—
Heppke, Gerd; Scherowaky, Gunter; Bahr, Christian; and Lehmann, Lutz, 4,874,545, Cl. 252-299.610.

Schipper, John F.: See—
Watts, Michael P. C.; Perera, Thiloma I.; Myers, David W.; Ozarski, Robert G.; Schipper, John F.; and Tan, Raul V., 4,874,240, Cl. 356-73.000.

Schipper, Paul H.: See—
Herbst, Joseph A.; Owen, Hartley; and Schipper, Paul H., 4,874,503, Cl. 208-67.000.

Schirmacher, Manfred, to Schering Aktiengesellschaft. Monitoring system. 4,874,015, Cl. 137-637.050.

Schlammeus, Herman W.: See—
Wilson, Wilfred W.; Polemenakos, Sotiros C.; Potter, J. Larry; Mangold, Donald J.; Harlowe, William W.; and Schlammeus, Herman W., 4,874,611, Cl. 424-410.000.

Schleicher & Schuell GmbH: See—
Chakraborty, Asok; Urlaub, Herbert; Grof, Franz; and Cosack, Klaus, 4,874,513, Cl. 210-321.840.

Schlesinger, Ulrich: See—
Back, Gerhard; Beffa, Fabic; Schlesinger, Ulrich; and Puntener, Alois, 4,874,849, Cl. 534-696.000.

Schlick, Erich: See—
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Sato, Masahiko; Konuma, Toshimitsu; Odaka, Seiichi; Yamaguchi, Toshiharu; Watanabe, Toshio; Aoyagi, Osamu; Tabata, Kaoru; Isigaki, Chizuru; Sakayori, Hiroyuki; Kobayashi, Ipppei; Osabe, Akio; and Yamazaki, Shunpei, 4,874,461, Cl. 156-633.000.

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Lindemann, Peer; and Houghton, Victor M., 4,874,382, Cl. 604-195.000.

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Daniele, Vincenzo; Monti, Marco M.; Talierecio, Michele; and Capocelli, Piero, 4,875,020, Cl. 330-307.000.

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Chandler, Donald G.; Batterman, Eric P.; and Shah, Govind, 4,874,936, Cl. 235-494.000.

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Gordon, Alan J.; and Billington, Donald G., 4,874,582, Cl. 422-102.000.

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Bradshaw, William; and Shepard, Robert, 4,873,841, Cl. 62-239.000.

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Nasu, Tetsuji; and Shina, Jun, 4,874,200, Cl. 296-197.000.

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Hitomi, Yasuhiro, 4,874,140, Cl. 242-223.000.
Nagano, Masashi, 4,873,890, Cl. 74-594.400.
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- Shimazaki, Toshio: See—
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Sato, Takanori, 4,873,798, Cl. 52-167.0DF.
- Shimizu, Makoto: See—
Maeno, Mikihiko; Ohta, Yukio; Momiyama, Yoshiharu; Ono, Hisao; Takahata, Katsumasa; Ozono, Kazuyuki; Shimizu, Makoto; and Yamamoto, Mikio, 4,874,159, Cl. 271-171.000.
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- Shimizu, Yasuhiro: See—
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- Shimokoriyama, Makoto; Yamashita, Shinichi; Abe, Naoto; Kashida, Motokazu; Takei, Masahiro; and Takahashi, Koji, to Canon Kabushiki Kaisha. Information data transmission system, 4,875,090, Cl. 358-12.000.
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Tahara, Kazutoki; and Egawa, Toshihiko, 4,874,671, Cl. 428-447.000.
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- Shionogi and Co., Ltd. Patent Department: See—
Takeda, Ken'ichi; and Horibe, Isao, 4,874,898, Cl. 568-369.000.
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- Shiota, Tsuneo: See—
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Sugimura, Keijiro; Sugimoto, Shunjiro; and Shirasawa, Hounai, 4,874,697, Cl. 435-68.000.
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- Shook, Hal C.; and Holland, Carmon D., to CFC Fabrication Corporation. Apparatus for stripping concrete forms from bridge structures, 4,873,738, Cl. 14-1.000.
- Shotey, Michael J. Plug enclosing outlet cover, 4,874,906, Cl. 174-67.000.
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Hunt, Thomas J.; Miller, James G.; Thomas, Lewis J., III; Melton, Hewlett E., Jr.; and Shoup, Thomas A., 4,873,984, Cl. 128-660.070.
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Hasumoto, Toshiharu; Kashiwada, Kunio; Konishi, Minoru; and Fujishiro, Nobuo, 4,874,403, Cl. 55-55.000.
- Showscan Film Corporation: See—
Trumbull, Douglas; Collins, David; Smith, Wayne; and Spieldiner, Robert, 4,874,162, Cl. 272-18.000.
- Shroot, Abraham; Eustache, Jacques; Bernardon, Jean-Michel; and Nedoncelle, Philippe, to Centre International de Recherches Dermatologiques (CIRD). Polycyclic heterocyclic compounds, a process

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Pfaffle, Ernst, 4,874,279, Cl. 412-39.000.

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Draxelmayer, Dieter, 4,875,018, Cl. 330-288.000.

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DeJong, Allan W.; and Perry, Paul D., 4,874,010, Cl. 137-484.400.

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Buoli, Carlo, 4,875,025, Cl. 333-230.000.

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Sigma, Incorporated: See—
Nakamura, Kikuo, 4,874,172, Cl. 273-143.00R.

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Warych, Hans, 4,874,095, Cl. 206-586.000.

Silberstein, Ilan, to S.U.I. Corporation. Variable flow shock absorber and method, 4,874,066, Cl. 188-280.000.

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Burke, Gary R., 4,875,003, Cl. 324-73.00R.

Simeth, Claus; and Gensheimer, Valentin, to MAN Poland Druckmaschinen AG. Clamping gripper with resultant force through contact point, 4,873,926, Cl. 101-409.000.

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Spillman Jr., William B., 4,874,941, Cl. 250-237.00G.

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Carethers, Mary E.; Centenko, Waczeslaw A.; Connor, David T.; Johnson, Elizabeth A.; Kiely, John S.; Schwender, Charles F.; Sircar, Jagadish C.; Sorenson, Roderick J.; Unangst, Paul C.; and Bruns, Robert F., 4,874,758, Cl. 514-226.500.

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Mendenhall, Abraham H.; Irace, Joseph F.; and Skudrzyk, Joseph, 4,874,620, Cl. 426-113.000.

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Zdeb, Brian; Pearson, Steve; and Slater, Glenn L., 4,874,366, Cl. 604-56.000.

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Russell, Frank S.; and Hallihan, Timothy J., 4,873,854, Cl. 72-12.000.
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- Smagula, Billie T. Belt holder, 4,874,100, Cl. 211-60.100.
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- Smiley, David L.: See—
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- Smith, Carolyn M., to British Telecommunications, plc. Processing apparatus for generating flow charts, 4,875,187, Cl. 364-900.000.
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- Smith, Edward J.: See—
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Baer, Ralph H.; Curran, Kenneth J.; and Smith, Jay, III, 4,875,096, Cl. 358-143.000.
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- Smith, Reginald W.: See—
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- Smith, Robert P.: See—
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- Smith, Roger M. Hydromechanical all wheel drive, 4,874,057, Cl. 180-242.000.
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- Smith, Wayne: See—
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- Smithkline Beckman Corporation: See—
Gleason, John G.; Hall, Ralph F.; Ku, Thomas W.; and Perchonock, Carl D., 4,874,792, Cl. 514-570.000.
- Smolik, Jiri: See—
Vitovec, Jaroslav; Cermak, Jan; and Smolik, Jiri, 4,874,409, Cl. 55-267.000.
- Smutny, Edgar J.: See—
George, Eric R.; Lutz, Robert G.; and Smutny, Edgar J., 4,874,819, Cl. 525-185.000.
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Bergerieux, Jean-Marcel; Pavie, Claude; and Plent, Christian, 4,874,281, Cl. 414-285.000.
- Societe Chimique des Charbonnages: See—
Teissier, Remy; and Clamens, Serge, 4,874,859, Cl. 544-221.000.
- Societe Compagnie Generale Textile Cogeten: See—
Egea, Noel; and Olive, Corinne, 4,874,241, Cl. 356-238.000.
- Societe Nationale Elf Aquitaine: See—
Payre, Didier; Crozat, Georges; and Spinner, Bernard, 4,873,842, Cl. 62-480.000.
- Societe Nouvelle D'Exploitation La Calhene: See—
Teillauchet, Eric; and Bandiera, Angelo, 4,873,885, Cl. 74-520.000.
- Soda, Yutaka: See—
Leonard, Vurnen; Kato, Arthur K.; Ohmori, Kiyoshi; Fujiwara, Keisuke; and Soda, Yutaka, 4,875,128, Cl. 360-133.000.
- Sodeyama, Fumio: See—
Yamamoto, Shosaku; Kakinuma, Kazuo; Ishioka, Hiroshi; Sodeyama, Fumio; Mayumi, Junji; and Maruta, Riichiro, 4,874,818, Cl. 525-183.000.
- Soga, Akihiro: See—
Izumitani, Masayoshi; and Soga, Akihiro, 4,873,811, Cl. 53-138.00A.
- Sola USA, Inc.: See—
Spector, David P., 4,874,561, Cl. 264-1.100.
- Solar Turbines Incorporated: See—
Cang, John N.; Gast, Joseph R.; Hensley, John J.; and Waldheim, Christian M., 4,874,290, Cl. 415-173.400.
- Sole, Pedro, to United Brands Company. Banana processing, 4,874,617, Cl. 426-49.000.
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- Soma, Takao: See—
Oda, Isao; and Soma, Takao, 4,874,674, Cl. 428-469.000.
- Somar Corporation: See—
Orikasa, Terno; Sumi, Sigeo; and Taguchi, Hiroshi, 4,874,282, Cl. 414-416.000.
- Somatics, Inc.: See—
Abrams, Richard; and Swartz, Conrad M., 4,873,981, Cl. 128-419.00S.
- Somerset Technologies, Inc.: See—
McGill, Paul E.; and Pitigliano, Frank J., 4,874,305, Cl. 425-131.100.
- Someya, Akihiko: See—
Yamanishi, Eiichi; Abuyama, Yasuo; and Someya, Akihiko, 4,875,092, Cl. 358-75.000.
- Sommerfeld, Claus-Dieter: See—
Haas, Peter; Sommerfeld, Claus-Dieter; and Weber, Hans-Ulrich, 4,874,797, Cl. 521-167.000.
- Sonetaka, Noriyoshi, to NEC Corporation. Pseudo-noise sequence generator, 4,875,021, Cl. 331-78.000.
- Sonoda, Sakae; Hetsugi, Kouji; Sawasaki, Yoshihiko; Kaburagi, Kouji; and Matsushima, Yasunobu, to Henkel Corporation. Process for treatment of titanium and titanium alloys, 4,874,480, Cl. 204-56.100.
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- Kondo, Tetsuya, 4,874,964, Cl. 307-270.000.
- Leonard, Vurnen; Kato, Arthur K.; Ohmori, Kiyoshi; Fujiwara, Keisuke; and Soda, Yutaka, 4,875,128, Cl. 360-133.000.
- Odaka, Kentaro; Fukami, Tadashi; and Ozaki, Shinya, 4,875,111, Cl. 360-64.000.
- Ohta, Yoshiyuki; and Kihara, Taku, 4,875,044, Cl. 341-87.000.
- Takahashi, Kiyoshi; and Noda, Masayuki, 4,875,120, Cl. 360-106.000.
- Tanaka, Masato; and Kan, Toshiya, 4,874,993, Cl. 318-254.000.
- Yamamoto, Isamu; and Asada, Takashi, 4,875,098, Cl. 358-213.160.
- Yonemoto, Kazuya; Kagawa, Yoshiaki; Ishikawa, Kikue; Suzuki, Tomoyuki; and Hamasaki, Masaharu, 4,875,100, Cl. 358-213.190.
- Sootome, Sumitoshi; Mizutani, Morikazu; Ikemoto, Isao; Kanemitsu, Shinji; Kitajima, Hajime; and Onoda, Shigeo, to Canon Kabushiki Kaisha. Image reading device and image forming apparatus having same, 4,875,075, Cl. 355-50.000.
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- Sorenson, Roderick J.: See—
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Hill, Francis V.; and Crosswhite, Lola E., 4,874,648, Cl. 428-35.900.
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McArthur, William; and Soukup, Thomas M., 4,874,372, Cl. 604-110.000.
- Southard, Robert C. Press fit gun cradle for firearm maintenance and repair, 4,873,777, Cl. 42-94.000.
- Southwest Research Institute: See—
Ryan, Thomas W., III; Maymar, Milan J.; and Anderson, Orin M., 4,873,947, Cl. 123-78.00C.
- Southwire Company: See—
Watkins, Clinton E.; and Rowland, Bobby A., 4,874,442, Cl. 156-48.000.
- Spaderna, Dieter W.; and Miller, Jeffrey L., to Sharp Microelectronic Technology, Inc. Method of operating data buffer apparatus, 4,875,196, Cl. 365-238.000.
- Spang, S. Timothy: See—
Featherstone, John L.; Spang, S. Timothy; Newell, David G.; and Gallup, Darrell L., 4,874,529, Cl. 210-713.000.

Spear Jr., A. Gil: See—
Palett, Anthony P.; and Spear Jr., A. Gil, 4,875,229, Cl. 379-58.000.
Spector, David P., to Sola USA, Inc. Method for designing parametric molding apparatus. 4,874,561, Cl. 264-1.100.
Spector, Donald. Bicycle safety lights. 4,875,142, Cl. 362-72.000.
Spectra-Physics, Inc.: See—
Volter, Curt V., 4,873,843, Cl. 62-51.100.
SpecTran Corporation: See—
Vacha, Labon J. B.; Schultz, Peter C.; Moynihan, Cornelius T.; Raychaudhuri, Satyabrata; Cadieu, Ken C.; Harbison, Barry B.; and Moaddeghe, Reza, 4,874,222, Cl. 350-96.340.
Spencer, Arthur T., to Flexicon Systems Limited. Mounting arrangement for a chip carrier. 4,874,318, Cl. 439-71.000.
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Spencer Turbine Company, The: See—
Poor, James C., 4,874,410, Cl. 55-276.000.
Spieldiener, Robert: See—
Trumbull, Douglas; Collins, David; Smith, Wayne; and Spieldiener, Robert, 4,874,162, Cl. 272-18.000.
Spies, Hansruedi; and Galvanetto, Francois; to Von Roll, AG. Covering for a ground opening. 4,873,795, Cl. 52-20.000.
Spillman Jr., William B., to Simmonds Precision Products, Inc. Optical displacement sensor with a multi-period grating. 4,874,941, Cl. 250-237.000.
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Spindt, Charles A., to SRI International. Automatically focusing field emission electrode. 4,874,981, Cl. 313-309.000.
Spinner, Bernard: See—
Payre, Didier; Crozat, Georges; and Spinner, Bernard, 4,873,842, Cl. 62-480.000.
Spinner, Georg. Waveguide twist. 4,875,027, Cl. 333-254.000.
Spirkovitch, Serge: See—
Pierre, Andre; Batlleu, Francois; Brosselard, Jean-Pierre; Pernuy, Alfred; Piot, Francois-Xavier; and Spirkovitch, Serge, 4,873,868, Cl. 73-517.000.
Spitzer, Charles M.; and Siegel, Paul F., to A-Bee Syndicate, Inc. Rolling drawer. 4,874,209, Cl. 312-250.000.
Square D Company: See—
Cybela, Jeffrey J., 4,874,960, Cl. 307-64.000.
Sramek, John A., to S. C. Johnson & Son, Inc. Hairspray with improved adhesion/removability upon washing. 4,874,604, Cl. 424-47.000.
SRI International: See—
Madou, Marc J.; and Otagawa, Takaaki, 4,874,500, Cl. 204-412.000.
Spindt, Charles A., 4,874,981, Cl. 313-309.000.
SSMC Inc.: See—
Adams, Kenneth D., 4,873,932, Cl. 112-443.000.
STA-SET Corporation: See—
O'Boyle, Matthew, 4,874,386, Cl. 604-246.000.
Stackpole Corporation, The: See—
Engle, George M., 4,873,942, Cl. 118-728.000.
Stahli, Jurg: See—
Muller, Gunter; Nagel, Rolf; and Stahli, Jurg, 4,874,812, Cl. 524-712.000.
Stalberg, Ralph I., to Pharmacia AB. Method of supplying buffer solutions to electrophoretic separation procedures. 4,874,491, Cl. 204-182.800.
Standard Oil Company, The: See—
Brazdil, James F., Jr.; Glaser, Linda C.; and Toft, Mark A., 4,874,738, Cl. 502-209.000.
Staniulis, Mark T., and Risch, Alan P., to UOP. Catalytic reduction of nitrogen oxides. 4,874,590, Cl. 423-239.000.
Stanko, Ronald T., to Montefiore Hospital Association of Western Pennsylvania. Method for improving the glucose metabolism of an animal having diabetic tendencies. 4,874,790, Cl. 514-557.000.
Stauffer Chemical Company: See—
Roberts, Austin K.; Trainer, William E.; and Biederman, David L., 4,874,593, Cl. 423-322.000.
Staunton, Harold F.: See—
Hallam, Donald E.; Popper, Peter; Staunton, Harold F.; Taylor, Robert E.; and Yngve, Paul W., 4,873,821, Cl. 57-293.000.
STC PLC: See—
Janssen, Adrian P., 4,874,217, Cl. 350-96.200.
Steece, William H.: See—
Elliott, William A.; Greene, Richard A.; Kennedy, Robert P.; Poe, Robert P., Jr.; and Steece, William H., 4,873,762, Cl. 29-809.000.
Steel, Francis R.: See—
Siwiak, Kazimierz; Jasinski, Leon; and Steel, Francis R., 4,875,038, Cl. 340-825.440.
Steele, David F., to United Kingdom Atomic Energy Authority. Method for the treatment of waste matter. 4,874,485, Cl. 204-130.000.
Steele, Sarah L.: See—
Frederick, Warren P.; Steele, Sarah L.; Rhodes, David D.; and Arns, Christopher L., 4,874,365, Cl. 604-54.000.
Steffen, Daniel G.: See—
Boyle, Peter C.; Steffen, Daniel G.; Melton, John L.; Coccodrilli, Gus D., Jr.; and Nagy, Michael A., 4,874,606, Cl. 426-74.000.
Steger, Horst: See—
Haase, Peter; Kosikowski, Thomas; and Steger, Horst, 4,874,479, Cl. 204-27.000.
Stegmann, Werner; Meier, Hans R.; Evans, Samuel; Martin, Roger; and Luisoli, Reto, to Ciba-Geigy Corporation. Process for the preparation of mercaptomethylphenols. 4,874,885, Cl. 560-15.000.

Stegmueller, Bernhard: See—
Kappeler, Franz; Wolf, Thomas; and Stegmueller, Bernhard, 4,875,217, Cl. 372-50.000.
Steimel, Lyle H.; and Christensen, Ronald J., to DuBois Chemicals, Inc. All-in-one boiler water treatment composition. 4,874,541, Cl. 252-178.000.
Steinberg, Joseph; and McCabe, Raphaela. Executive balls. 4,874,165, Cl. 273-1.0GC.
Steiner, Paul A.: See—
Brownie, James M.; and Steiner, Paul A., 4,874,661, Cl. 428-246.000.
Steinert, Rosa M. Cigarette holder. 4,873,999, Cl. 131-259.000.
Stelmack, Gerard G.: See—
Guscott, John K.; Stelmack, Gerard G.; and Boulos, Charles A., 4,875,029, Cl. 340-567.000.
Sterling Drug Inc.: See—
D'Ambra, Thomas E.; and Bell, Malcolm R., 4,874,761, Cl. 514-235.200.
Sterling, Roastain F.: See—
Strickland, Wilbur C., Jr.; and Sterling, Roastain F., 4,874,536, Cl. 252-90.000.
Stierman, Roger J.; McCauley, Archie N.; and Zart, Robert C., to Texas Instruments Incorporated. Fixture for plating tall contact bumps on integrated circuit. 4,874,476, Cl. 204-15.000.
Stipanovic, Arthur J.: See—
Robison, Peter D.; and Stipanovic, Arthur J., 4,874,044, Cl. 166-275.000.
Stipp, M. R. Gun bore cleaning apparatus. 4,873,778, Cl. 42-95.000.
Stoehr, Herbert M., to Artos Engineering Company. Apparatus for cutting and stripping insulation from wire segments having different gauge conductors. 4,873,901, Cl. 81-9.510.
Stoltz, Richard A.: See—
McLaughlin, David F.; and Stoltz, Richard A., 4,874,475, Cl. 203-51.000.
Stoppazzini, Benito, to E.M.M. Emiliana Macchine Maglieria S.r.l. Device for supporting the thread guide of an automatic flat knitting machine. 4,873,845, Cl. 66-126.00R.
Stott, Herbert L.: See—
Strasser, Thomas F.; and Stott, Herbert L., 4,874,050, Cl. 177-134.000.
Strang, Harry: See—
Jelich, Klaus; Gayer, Herbert; Kramer, Wolfgang; Santel, Hans-Joachim; Schmidt, Robert R.; and Strang, Harry, 4,874,424, Cl. 71-105.000.
Wroblowsky, Heinz-Jurgen; Kluth, Joachim; Tietjen, Klaus-Gunther; Santel, Hans-Joachim; Schmidt, Robert R.; and Strang, Harry, 4,874,420, Cl. 71-93.000.
Strasser, Thomas F.; and Stott, Herbert L., to Fairbanks Inc. Portable deck truck scale. 4,874,050, Cl. 177-134.000.
Strausser, Richard A., to Hope Sexton. Color coding device, kit of components thereof, and methods of constructing and utilizing same. 4,874,084, Cl. 206-231.000.
Strein, Klaus: See—
Mertens, Alfred; von der Saal, Wolfgang; Berger, Herbert; Muller-Beckmann, Bernd; and Strein, Klaus, 4,874,756, Cl. 514-212.000.
Strickland, Wilbur C., Jr.; and Sterling, Roastain F., to Procter & Gamble Company, The. Synthetic surfactant cakes with magnesium chloride. 4,874,536, Cl. 252-90.000.
Suchocki, Anthony J., to General Dynamics Land Systems, Inc. Double loop ammunition magazine of compact construction. 4,873,911, Cl. 89-34.000.
Such, Yoon-Gi. Manufacturing method of the gas-flow valve nozzle of a lighter. 4,873,752, Cl. 29-157.00C.
Suda, Shigeyuki, to Canon Kabushiki Kaisha. Zoom lens with a variable power lens element. 4,874,230, Cl. 350-423.000.
Sudani, Kiyoshi; and Sunami, Yoshihiko, to Sumitomo Metal Industries, Ltd. Molding process and device therefor. 4,874,564, Cl. 264-24.700.
Suemitsu, Yuji: See—
Masuda, Koji; Suemitsu, Yuji; and Asano, Kazuo, 4,875,060, Cl. 346-155.000.
Sueoka, Akinori: See—
Okamoto, Takehiko; Ohmori, Akio; Sueoka, Akinori; Kawata, Ichiro; and Akasu, Hiroyuki, 4,874,522, Cl. 210-645.000.
Sueyoshi, Toshinobu: See—
Asada, Seiichi; Sueyoshi, Toshinobu; and Miyake, Akira, 4,874,668, Cl. 428-403.000.
Sufi, Arshad H.: See—
Joseph, Earl M.; Pritchard, Robert J.; and Sufi, Arshad H., 4,874,043, Cl. 166-272.000.
Sugawara, Satoshi: See—
Igarashi, Takao; Sugawara, Satoshi; Yoshimoto, Yuichiro; Saito, Shozo; Fukumoto, Takashi; Endo, Zenichiro; and Shinbo, Katsutoshi, 4,874,574, Cl. 376-333.000.
Sugihara, Masahiro: See—
Kobayashi, Norihide; Inaba, Tsutomu; Kimura, Tadashi; and Sugihara, Masahiro, 4,874,302, Cl. 418-55.000.
Sugimori, Teruhiko; Suzuki, Fumio; Habara, Hideaki; and Inada, Hiromasa, to Mitsubishi Rayon Co., Ltd. Particulate polymer and preparation process thereof. 4,874,841, Cl. 528-491.000.
Sugimoto, Masahiro: See—
Miyachi, Akira; Nishimoto, Hiroshi; Okiyama, Tadashi; Kitagami, Hiroo; Sugimoto, Masahiro; Tamada, Haruo; and Emori, Shinji, 4,875,087, Cl. 357-71.000.
Sugimura, Keiji: See—
Sugimura, Keiji; Sugimoto, Shunjiro; and Shirasawa, Hounai, 4,874,697, Cl. 435-68.000.

Sugimura, Keiji; Sugimoto, Shunjiro; and Shirasawa, Hounai, to Sunatry Limited. Novel Host *e. coli* and use thereof. 4,874,697, Cl. 831-82.000.
Sugimura, Tuyoaki; Hori, Kenji; and Oba, Kiyoyuki, to Iseki Food Engineering Kabushiki Kaisha; and Kabushiki Kaisha Horiken. Apparatus for continuously cooking rice by steaming. 4,873,917, Cl. 99-355.000.
Sugisawa, Ko; Matsumura, Yasuaki; Okamoto, Hidefumi; and Hayami, Hiroshi, to House Food Industrial Company Limited. Pressure-controlling method. 4,874,580, Cl. 422-25.000.
Sugiura, Noboru: See—
Kimura, Hiroshi; Naito, Shotaro; Miyashita, Kunio; Noto, Yasuo; Sugiura, Noboru; Takahashi, Tadashi; Yamamura, Hirohisa; Yamashita, Seizi; Kawamata, Syoichi; Tajima, Fumio; and Horikoshi, Shigeru, 4,874,053, Cl. 180-79.100.
Sumi, Sigeo: See—
Orikasa, Teruo; Sumi, Sigeo; and Taguchi, Hiroshi, 4,874,282, Cl. 414-416.000.
Sumito, Mitsuo: See—
Hamada, Takao; Tsuchiya, Nobuo; Inatani, Toshihiro; Katayama, Eiji; Koitabashi, Toshimitsu; Okabe, Kyoji; Sumito, Mitsuo; and Takada, Yoshiyasu, 4,874,427, Cl. 75-26.000.
Sumitomo Chemical Company, Limited: See—
Yamamoto, Shinobu; Okada, Kunihiko; Ohi, Satoshi; Oyama, Shiro; and Taki, Yasuharu, 4,874,787, Cl. 514-531.125.
Sumitomo Electric Industries, Ltd.: See—
Fujioka, Hideaki; and Takata, Koji, 4,875,171, Cl. 364-508.000.
Sumitomo Metal Industries, Ltd.: See—
Sudani, Kiyoshi; and Sunami, Yoshihiko, 4,874,564, Cl. 264-24.700.
Sun, Rickson: See—
Grosz III, Charles T.; Seipp III, Edwin A.; Sun, Rickson; and Yurchenco, James R., 4,874,186, Cl. 281-28.000.
Sunami, Yoshihiko: See—
Sudani, Kiyoshi; and Sunami, Yoshihiko, 4,874,564, Cl. 264-24.700.
Sundholm, Goran. Apparatus for flushing a piping system. 4,874,002, Cl. 134-111.000.
Sundstrand Corporation: See—
Bansal, Madan L.; and Byrd, William A., 4,874,972, Cl. 310-57.000.
Henderson, Eric A., 4,874,961, Cl. 307-87.000.
Reynolds, David W., 4,874,190, Cl. 285-158.000.
Roe, Derrick I.; Rozman, Christopher J.; and Recker, Bradley J., 4,875,148, Cl. 363-41.000.
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Suntory Limited: See—
Sugimura, Keiji; Sugimoto, Shunjiro; and Shirasawa, Hounai, 4,874,697, Cl. 435-68.000.
Sutherland, Jeffrey L. Knee orthosis. 4,873,967, Cl. 128-80.00C.
Sutherland, Karl M.; and Jenuaita, Matthew, to Baxter International Inc. O₂/CO₂ control in blood oxygenators. 4,874,581, Cl. 422-46.000.
Suwabe, Hirohisa: See—
Hatanaka, Koji; Maruta, Kenji; and Suwabe, Hirohisa, 4,874,923, Cl. 219-270.000.
Suzuki, Akiyoshi: See—
Torigoe, Makoto; and Suzuki, Akiyoshi, 4,875,076, Cl. 355-53.000.
Suzuki, Etsuo: See—
Ochiai, Hironori; Suzuki, Etsuo; and Ikuta, Kazuo, 4,874,202, Cl. 296-222.000.
Suzuki, Fumio: See—
Sugimori, Teruhiko; Suzuki, Fumio; Habara, Hideaki; and Inada, Hiromasa, 4,874,841, Cl. 528-491.000.
Suzuki, George: See—
Yamada, Ichiji; Inuzuka, Yutake; Ichihara, Isao; Murakami, Michiyuki; Suzuki, George; Yanahashi, Ryuu; and Kondo, Takeshi, 4,873,884, Cl. 74-473.00P.
Suzuki, Kunikazu: See—
Sakai, Shunji; Kitagawa, Tohru; Suzuki, Kunikazu; and Watanabe, Naohiro, 4,875,099, Cl. 358-213.110.
Suzuki, Makoto: See—
Sangyoji, Kazuo; Sakai, Jun; Hayashi, Shigeyuki; Suzuki, Makoto; and Kimura, Yasuo, 4,875,074, Cl. 355-27.000.
Suzuki, Tadasu, to Tsubakimoto Chain Co. Fluidic tensioner. 4,874,352, Cl. 474-110.000.
Suzuki, Takami; Tataru, Yoshikuni; and Moriya, Tomoyuki, to Ricoh Company, Ltd. Selective magnetic attachment of a print head to a drive belt. 4,874,264, Cl. 400-335.000.
Suzuki, Takami: See—
Idenawa, Hiroyuki; Mochimaru, Hideaki; Kanda, Hajime; Makita, Nobuhiko; Tanaka, Yoshiaki; Yagisita, Takahiro; Yamaki, Takanori; Motohashi, Takeshi; Miyamoto, Masayoshi; Ishizu, Hisao; Sagawa, Yasuhiro; Kanno, Tadaaki; Sankoda, Tomoo; Hosokawa, Hiroshi; Aoki, Hideo; Suzuki, Takami; Takada, Hiromi; and Shimazaki, Toshio, 4,875,063, Cl. 346-160.100.
Suzuki, Tetsuro; Yoshikawa, Masao; and Kojima, Akio, to Ricoh Company, Ltd. N,N'-diphenylbenzidine polymer and method of producing the same. 4,874,481, Cl. 204-59.00R.
Suzuki, Tomoyuki: See—
Yonemoto, Kazuya; Kagawa, Yoshiaki; Ishikawa, Kikue; Suzuki, Tomoyuki; and Hamaseki, Masaharu, 4,875,100, Cl. 358-213.190.
Suzuki, Toshio; and Okawa, Tadashi, to Toray Silicone Company, Ltd. Method for producing a polydiorganosiloxane having a pendent alkenyl radical at its molecular center. 4,874,881, Cl. 556-453.000.
Svenska Traforkningsinstitutet: See—
Karlsson, Hakan I.; Lundqvist, Inge J.; Hardin, Bengt Y.; and Ostman, Thomas L., 4,874,467, Cl. 162-198.000.

Swartz, Conrad M.: See—
Abrams, Richard; and Swartz, Conrad M., 4,873,981, Cl. 128-819.000.
Swartz, Ronald W.: See—
Mulder, Theodor; and Swartz, Ronald W., 4,875,191, Cl. 365-189.010.
SwedSteam AB: See—
Gilliusson, Rolf, 4,873,840, Cl. 62-238.600.
Swieringa, Morris K., to McNeil-PC, Inc. Web corrugating apparatus. 4,874,457, Cl. 156-474.000.
Swinderman, Robert T., to Martin Engineering Company. Conveyor skirt board, clamp and mounting arrangement. 4,874,062, Cl. 194-836.000.
Swiss Aluminium Ltd.: See—
Homberger, Heinrich; Timm, Jurgen; and Rodriguez, Pedro, 4,874,578, Cl. 420-541.000.
Switchcraft, Inc.: See—
Lau, Frederick L., 4,874,317, Cl. 439-54.000.
Synovec, Robert E.; and Yuceng, Edward S., to Iowa State University Research Foundation, Inc. Method for improving the limit of detection in a data signal. 4,875,169, Cl. 364-497.000.
Syntex (U.S.A.) Inc.: See—
Fleming, Michael P.; Schloemer, George C.; and Khatri, Hiralal N., 4,874,871, Cl. 548-543.000.
Fleming, Michael P.; Khatri, Hiralal N.; and Schloemer, George C., 4,874,872, Cl. 548-531.000.
Synthetic Blood Corporation: See—
Ecanow, Charles S.; and Ecanow, Bernard, 4,874,742, Cl. 514-2.000.
Szporay, Laszlo: See—
Lapin, Erzsébet; Toth, Edit; Kiss, Bela; Torley, Jozsef; Palosi, Eva; Hajdu, Istvan; Szporay, Laszlo; Groo, Dora; and Laszlovsky, Istvan, 4,874,765, Cl. 514-255.000.
Szymanski, Thomas; and Turner, Stephen M., to Norton Company. Raghouse bag design for simultaneous particulate capture and chemical reaction. 4,874,586, Cl. 422-177.000.
Tabata, Kaoru: See—
Sato, Masahiko; Konuma, Toshimitsu; Odaka, Seiichi; Yamaguchi, Toshiharu; Watanabe, Toshio; Aoyagi, Osamu; Tabata, Kaoru; Isigaki, Chizuru; Sakayori, Hiroyuki; Kobayashi, Ippai; Osabe, Akio; and Yamazaki, Shunpei, 4,874,461, Cl. 156-633.000.
Tachi-S Co., Ltd.: See—
Urai, Muneharu, 4,874,448, Cl. 156-196.000.
Tachibana, Hiroyuki: See—
Nishimoto, Yoshiro; Yoneda, Yasuji; Imasaka, Shinichi; Nakai, Yasuhide; Nakae, Akimitsu; Onishi, Yoshihiko; Tachibana, Hiroyuki; Inoue, Takayoshi; Kusaka, Takuya; Takamatsu, Hiroyuki; Tojo, Shigei; Kajikawa, Hiroshi; and Nishimura, Kozo, 4,874,939, Cl. 250-211.001.
Tachibana, Sadao: See—
Aoki, Kazuo; and Tachibana, Sadao, 4,874,913, Cl. 200-314.000.
Tachiiri, Yoshikazu: See—
Kojima, Fumio; Tachiiri, Yoshikazu; and Kato, Yoshihisa, 4,874,174, Cl. 285-82.000.
Tack, Robert D.; Andrews, Rodger F.; and Ayres, Sally J., to Exxon Chemical Patents Inc. Crude oil and fuel oil compositions. 4,874,394, Cl. 44-70.000.
Tada, Yoshihiko: See—
Nishii, Michiharu; Ando, Masamoto; and Tada, Yoshihiko, 4,874,207, Cl. 303-52.000.
Taga, Yasunori: See—
Hamaguchi, Shigeki; Ohtsuka, Yasuhiro; Motohiro, Tomoyoshi; Taga, Yasunori; and Ishii, Masahiko, 4,874,664, Cl. 428-325.000.
Tagawa, Kenichi, to Nippon Seiko Kabushiki Kaisha. Clutch release bearing device. 4,874,073, Cl. 192-98.000.
Taguchi, Hiroshi: See—
Orikasa, Teruo; Sumi, Sigeo; and Taguchi, Hiroshi, 4,874,282, Cl. 414-416.000.
Tahara, Kazutoki; and Egawa, Toshihiko, to Shin-Etsu Polymer Co., Ltd. Heat-resistant anti-glare screen. 4,874,671, Cl. 428-447.000.
Tahara, Tetsuya; Ikebe, Tsuguo; Hakamada, Ichiro; and Yoka, Osamu, to Yoshitomi Pharmaceutical Industries, Ltd. 5-Hydroxyindole-3-carboxylic acid amide compounds, pharmaceutical compositions and use. 4,874,759, Cl. 514-232.500.
Tajima, Fumio: See—
Kimura, Hiroshi; Naito, Shotaro; Miyashita, Kunio; Noto, Yasuo; Sugiura, Noboru; Takahashi, Tadashi; Yamamura, Hirohisa; Yamashita, Seizi; Kawamata, Syoichi; Tajima, Fumio; and Horikoshi, Shigeru, 4,874,053, Cl. 180-79.100.
Takabayashi, Naoki: See—
Kobayashi, Kazuhiro; Kurematsu, Masayuki; Koboshi, Shigeharu; Goto, Nobutaka; and Takabayashi, Naoki, 4,874,530, Cl. 210-718.000.
Takada, Hiromi: See—
Idenawa, Hiroyuki; Mochimaru, Hideaki; Kanda, Hajime; Makita, Nobuhiko; Tanaka, Yoshiaki; Yagisita, Takahiro; Yamaki, Takanori; Motohashi, Takeshi; Miyamoto, Masayoshi; Ishizu, Hisao; Sagawa, Yasuhiro; Kanno, Tadaaki; Sankoda, Tomoo; Hosokawa, Hiroshi; Aoki, Hideo; Suzuki, Takami; Takada, Hiromi; and Shimazaki, Toshio, 4,875,063, Cl. 346-160.100.
Takada, Yoshiyasu: See—
Hamada, Takao; Tsuchiya, Nobuo; Inatani, Toshihiro; Katayama, Eiji; Koitabashi, Toshimitsu; Okabe, Kyoji; Sumito, Mitsuo; and Takada, Yoshiyasu, 4,874,427, Cl. 75-26.000.
Takada, Yusaku; and Takada, Kenji, to Canon Kabushiki Kaisha. Anti-fouling device for sheet gripper. 4,875,069, Cl. 355-271.000.

Takagaki, Hidetsugu; Abe, Masayoshi; Watanabe, Michihiro; Takeuchi, Kazuyuki; Nakanishi, Shigenori; Nakata, Yuuko; and Yamazaki, Keiji, to Dainippon Ink and Chemicals, Inc. Steroid compounds and process of preparing the same. 4,874,855, Cl. 540-3.000.

Takagi, Katsumasa, to Koyo Disposable Goods Company. Vacuum drum apparatus for providing sanitary articles. 4,874,456, Cl. 156-471.000.

Takagi, Katsumi; Negoro, Toshihito; and Tamagawa, Itaru, to Pegasus Sewing Machine Mfg. Co., Ltd. Programmed thread regulating apparatus for a sewing machine. 4,873,931, Cl. 112-121.110.

Takahashi, Hiroshi: See—
Urabe, Yoshihiko; Higashi, Tatsuji; Takahashi, Hiroshi; and Kita, Nobuyuki, 4,874,686, Cl. 430-272.000.

Takahashi, Kazuo; and Kubo, Hiroyoshi, to Canon Kabushiki Kaisha. Projection exposure apparatus. 4,874,954, Cl. 250-548.000.

Takahashi, Kazuo: See—
Kuwabara, Takao; and Takahashi, Kazuo, 4,874,999, Cl. 318-610.000.

Takahashi, Kiyoshi; and Noda, Masayuki, to Sony Corporation. Head driving apparatus with coarse and fine adjustments. 4,875,120, Cl. 360-106.000.

Takahashi, Koji: See—
Shimokoriyama, Makoto; Yamashita, Shinichi; Abe, Naoto; Kashida, Motokazu; Takei, Masahiro; and Takahashi, Koji, 4,875,090, Cl. 358-12.000.

Takahashi, Shigeyuki: See—
Ito, Toshiyasu; Minoura, Jun; Mori, Takaaki; Takahashi, Shigeyuki; Kato, Mamoru; Shimada, Junichi; and Hayakawa, Fujio, 4,874,229, Cl. 350-357.000.

Takahashi, Tadashi: See—
Kimura, Hiroshi; Naito, Shotaro; Miyashita, Kunio; Noto, Yasuo; Sugura, Noboru; Takahashi, Tadashi; Yamamura, Hirohisa; Yamashita, Seizi; Kawamata, Syouichi; Tajima, Fumio; and Horiokoshi, Shigeru, 4,874,053, Cl. 180-79.100.

Takahashi, Yoshinobu: See—
Fukuta, Kenji; Kaneko, Takaaki; and Takahashi, Yoshinobu, 4,874,453, Cl. 156-345.000.

Takahasi, Kunimasa: See—
Oda, Kyoko; Takahasi, Kunimasa; and Seo, Iwao, 4,874,598, Cl. 423-598.000.

Takahata, Katsumasa: See—
Mazeno, Mikihiro; Ohta, Yukio; Momiyama, Yoshiharu; Ono, Hideo; Takahata, Katsumasa; Ozono, Kazuyuki; Shimizu, Makoto; and Yamamoto, Mikio, 4,874,159, Cl. 271-171.000.

Takai, Ryoji, to Nissan Motor Co., Ltd. End structure for synthetic resin member. 4,874,651, Cl. 428-81.000.

Takamatsu, Hiroyuki: See—
Nishimoto, Yoshiro; Yoneda, Yasuji; Imaoka, Shinichi; Nakai, Yasuhide; Nakae, Akimitsu; Onishi, Yoshihiko; Tachibana, Hiroyuki; Inoue, Takayoshi; Kusaka, Takuya; Takamatsu, Hiroyuki; Tojo, Shigeki; Kajikawa, Hiroshi; and Nishimura, Koza, 4,874,939, Cl. 250-211.000.

Takamatsu, Junichi; and Akiyama, Kazunori, to Mita Industrial Co., Ltd. Image-forming machine. 4,875,077, Cl. 355-212.000.

Takamura, Yoshinari; Obara, Kazuaki; and Nagashima, Michiyoshi, to Matsushita Electric Industrial Co., Ltd. Tracking servo signal generating device for an optical disc. 4,875,203, Cl. 369-46.000.

Takano, Hideaki: See—
Shino, Masami; Takano, Hideaki; Nakata, Jitsuo; and Noro, Katsumiko, 4,874,592, Cl. 423-262.000.

Takata, Kenichi: See—
Koshiba, Nobuharu; Ikehata, Toshihiko; and Takata, Kenichi, 4,874,680, Cl. 429-197.000.

Takata, Koji: See—
Fujioka, Hideaki; and Takata, Koji, 4,875,171, Cl. 364-508.000.

Takata, Yasushi: See—
Kinomura, Keisuke; Kitazawa, Sadaya; Takata, Yasushi; and Sakakibara, Toshiyuki, 4,874,852, Cl. 536-18.600.

Takaya, Toshihiko: See—
Ishikawa, Toyoyuki; Kaneko, Toshio; Endo, Shuichi; Ogata, Yoshihiro; and Takaya, Toshihiko, 4,873,940, Cl. 118-651.000.

Takeda Chemical Industries, Ltd.: See—
Terao, Shinji; Okazaki, Hisayoshi; and Imada, Isuke, 4,874,752, Cl. 536-55.200.

Takeda, Kenichi; and Horibe, Isao, to Shionogi and Co., Ltd. Patent Department. Novel substituted anthrasteroid derivatives. 4,874,898, Cl. 568-369.000.

Takeda, Kenji: See—
Takada, Yusaku; and Takeda, Kenji, 4,875,069, Cl. 355-271.000.

Takei, Masahiro: See—
Shimokoriyama, Makoto; Yamashita, Shinichi; Abe, Naoto; Kashida, Motokazu; Takei, Masahiro; and Takahashi, Koji, 4,875,090, Cl. 358-12.000.

Takei, Yasuharu: See—
Yamamoto, Shinobu; Okada, Kunihiro; Ohi, Satoishi; Oyama, Shiro; and Takei, Yasuharu, 4,874,787, Cl. 514-531.125.

Takeuchi, Kazuyuki: See—
Takagaki, Hidetsugu; Abe, Masayoshi; Watanabe, Michihiro; Takeuchi, Kazuyuki; Nakanishi, Shigenori; Nakata, Yuuko; and Yamazaki, Keiji, 4,874,855, Cl. 540-3.000.

Takeuchi, Koji: See—
Higuchi, Ryoichi; Sakurai, Takao; Yokota, Tadahiko; Mikami, Naoko; Yamamoto, Eri; and Takeuchi, Koji, 4,874,542, Cl. 252-299.610.

Takeuchi, Michikazu: See—
Yamamoto, Shinobu; Hoshide, Fumitoshi; Takeuchi, Michikazu; Kotani, Shou; and Yasuda, Sumihiro, 4,874,924, Cl. 219-274.000.

Talalay, Anselm; and Borsvold, Herbert H., to Laudy, Roger; and U.S. Printcraft. Decal transfer device. 4,874,454, Cl. 156-359.000.

Talalay, Paul: See—
Payne, Donna W.; and Talalay, Paul, 4,874,696, Cl. 435-26.000.

Talbert, James E., Jr., to Morrison Textile Machinery Company. Textile steaming apparatus. 4,873,846, Cl. 68-5.00E.

Taliervo, Michele: See—
Daniele, Vincenzo; Monti, Marco M.; Taliervo, Michele; and Capocelli, Piero, 4,875,020, Cl. 330-307.000.

Tamada, Haruo: See—
Miyauchi, Akira; Nishimoto, Hiroshi; Okiyama, Tadashi; Kitagami, Hiroo; Sugimoto, Masahiro; Tamada, Haruo; and Emori, Shinji, 4,875,087, Cl. 357-71.000.

Tamagawa, Itaru: See—
Takagi, Katsumi; Negoro, Toshihito; and Tamagawa, Itaru, 4,873,931, Cl. 112-121.110.

Tamai, Hideo: See—
Adachi, Kuniaki; Tamai, Hideo; and Sadai, Masanao, 4,874,791, Cl. 514-558.000.

Tamaki, Takasi: See—
Murakami, Kazuo; Kaneko, Yasutoshi; and Tamaki, Takasi, 4,873,905, Cl. 84-20.000.

Tamba, Shinichi; and Miyake, Hitomi, to Kawasaki Jukogyo Kabushiki Kaisha. Cylinder block construction for V-type engines. 4,873,945, Cl. 123-55.00R.

Tamol, Ronald A.; Nepomuceno, Jose G.; Keritsis, Gus D.; Burnett, George H.; Thesing, Richard A.; Winterson, Warren D.; and Nichols, Walter A., to Philip Morris Incorporated. Method and apparatus for drying and cooling extruded tobacco-containing material. 4,874,000, Cl. 131-375.000.

Tamura, Akira: See—
Kazama, Saburo; and Tamura, Akira, 4,875,110, Cl. 360-64.000.

Tamura, Masaru: See—
Kimura, Kiyoshi; Ueda, Fusao; and Tamura, Masaru, 4,874,762, Cl. 514-242.000.

Tamura, Shuichi, to Canon Kabushiki Kaisha. Distance measuring device. 4,874,239, Cl. 356-4.000.

Tan, Raul V.: See—
Watts, Michael P. C.; Perera, Thiloma I.; Myers, David W.; Ozarski, Robert G.; Schipper, John F.; and Tan, Raul V., 4,874,240, Cl. 356-73.000.

Tan, Robert J.: See—
Berry, Mark D.; Tan, Robert J.; and Garver, Robert V., 4,875,022, Cl. 333-20.000.

Tanabe, Yoshiyuki: See—
Kamifuji, Hiroshi; Tanabe, Yoshiyuki; and Morita, Kiyomi, 4,873,960, Cl. 123-480.000.

Tanagawa, Kouji; and Yoshida, Tomoaki, to Oki Electric Industry Co., Ltd. Computer having a protection device to selectively block incorrect control signals. 4,875,156, Cl. 364-200.000.

Tanaka, Akio: See—
Miner, Jay G.; Dean, Dave; Decuir, Joseph C.; Nicholson, Ronald H.; and Tanaka, Akio, 4,874,164, Cl. 273-1.00E.

Tanaka, Akira: See—
Watanabe, Naoto; Tanaka, Akira; Matsumoto, Takayuki; Ohmura, Yutaka; and Kojima, Hisao, 4,873,760, Cl. 29-714.000.

Tanaka, Hideki, to Mazda Motor Corporation. Air-fuel ratio control for supercharged automobile engine. 4,873,961, Cl. 123-564.000.

Tanaka, Kanji: See—
Ogata, Takashi; Kato, Masanori; Kawasumi, Yoshio; Tominaga, Chikara; and Tanaka, Kanji, 4,874,436, Cl. 148-2.000.

Tanaka, Katsuo: See—
Makita, Kensuke; Hattori, Akimasa; and Tanaka, Katsuo, 4,874,462, Cl. 156-635.000.

Tanaka, Masato; and Kan, Toshiya, to Sony Corporation. Sensorless brushless motor. 4,874,993, Cl. 318-254.000.

Tanaka, Nobuo: See—
Ochi, Tatsuyuki; Tanaka, Nobuo; and Mio, Kohei, 4,874,238, Cl. 356-1.000.

Tanaka, Sakae: See—
Furukawa, Mitsuhiro; Kitahira, Takashi; Tanaka, Sakae; and Misumi, Kiyohito, 4,874,725, Cl. 501-89.000.

Tanaka, Satoru: See—
Ueda, Kouichiro; Tanaka, Satoru; Kunii, Toshinobu; Kagei, Kengo; Sato, Tadashi; Ono, Hideki; Ohtsuka, Issei; Kawase, Mayumi; Ohgoh, Toshiharu; and Wakabayashi, Tsuneo, 4,874,869, Cl. 548-309.000.

Tanaka, Shinichi: See—
Kodo, Toshiyuki; and Tanaka, Shinichi, 4,875,202, Cl. 369-32.000.

Tanaka, Yoshiaki: See—
Idenawa, Hiroyuki; Mochimaru, Hideaki; Kanda, Hajime; Makita, Nobuhiro; Tanaka, Yoshiaki; Yagisita, Takahiro; Yamaki, Takanori; Motohashi, Takeshi; Miyamoto, Masayoshi; Ishizu, Hisao; Sagawa, Yasuhiro; Kanno, Tadaaki; Sankoda, Tomoo; Hosokawa, Hiroshi; Aoki, Hideo; Suzuki, Takami; Takada, Hiromi; and Shimazaki, Toshio, 4,875,063, Cl. 346-160.100.

Tanaka, Yoshito; and Umebayashi, Nobuhiro, to Hitachi Maxell, Ltd. Magnetic head supporting device. 4,875,121, Cl. 360-129.000.

Tanamura, Toshiya: See—
Oku, Seiji; Shimamura, Tooru; Naganawa, Kazutomo; and Tanamura, Toshiya, 4,875,042, Cl. 340-870.170.

Tanashin Denki Co., Ltd.: See—
Arata, Tadao, 4,875,113, Cl. 360-74.200.

Taniguchi, Masakazu: See—
Ogura, Tomoyuki; Kawamura, Yasuo; Ishii, Shigeru; Baba, Masatoshi; Taniguchi, Masakazu; Hirose, Masayoshi; Hirata, Kiminori; and Ochiai, Yoshinori, 4,874,861, Cl. 544-229.000.

Tanimoto, Yoshio: See—
Matsui, Masataka; Aono, Toshiaki; Tanimoto, Yoshio; Nakahama, Tadami; and Yamane, Takakazu, 4,874,639, Cl. 427-240.000.

Tansley, Robert W.: See—
Newman, Alec T.; Bentley, Andrew C.; King, Christine A.; MacMahon, Alistair J.; Tansley, Robert W.; and Gibbs, Andrew R., 4,873,915, Cl. 99-289.00R.

Tapia, Ray. Cap assembly. 4,873,726, Cl. 2-195.000.

Tatara, Yoshikuni: See—
Suzuki, Takami; Tatara, Yoshikuni; and Moriya, Tomoyuki, 4,874,264, Cl. 400-335.000.

Tate, Kazuyuki: See—
Hara, Toshihiro; Yotsutani, Akio; Kawasaki, Ryoji; Tate, Kazuyuki; Huse, Syoji; and Ono, Koji, 4,875,231, Cl. 379-61.000.

Taurus Holdings, Inc.: See—
Groszwith III, Charles T.; Seipp III, Edwin A.; Sun, Rickson; and Yurchenko, James R., 4,874,186, Cl. 281-28.000.

Taylor, Julian S. Restrictor valve flow passage pop-up wear indicator. 4,874,007, Cl. 137-312.000.

Taylor, Kenneth D., to Otis Elevator Company. Portable elevator traffic pattern monitoring system. 4,874,063, Cl. 187-130.000.

Taylor, Malcolm R.; Barr, John D.; and Smart, John R., to Reed Tool Company Limited. Manufacture of rotary drill bits. 4,873,895, Cl. 76-108.00A.

Taylor, Robert E.: See—
Hallam, Donald E.; Popper, Peter; Staunton, Harold F.; Taylor, Robert E.; and Yngve, Paul W., 4,873,821, Cl. 57-293.000.

TDK Corporation: See—
Yamamoto, Shinobu; Hoshide, Fumitoshi; Takeuchi, Michikazu; Kotani, Shou; and Yasuda, Sumihiro, 4,874,924, Cl. 219-274.000.

Teac Corporation: See—
Ando, Yoshiko; Noda, Yasushi; and Abe, Yohji, 4,875,119, Cl. 360-105.000.

Yasuda, Kazuhiko; and Wada, Sumio, 4,875,116, Cl. 360-78.110.

Tecnocentro S.r.l.: See—
Crispoldi, Antonio; Moriconi, Andrea; and Chiappafreddo, Mario, 4,874,595, Cl. 423-397.000.

Tedesco, John L.: See—
Andrews, William H.; Brothers, Virginia M.; Files, James G.; Kuhn, Irene; McCaman, Michael T.; Paul, Leland S.; Sias, Stacey R.; Gore, Thomas C.; Newman, Karel Z., Jr.; and Tedesco, John L., 4,874,705, Cl. 435-252.330.

Teijin Limited: See—
Sasaki, Yoshiyuki; and Okamoto, Tetsuo, 4,874,658, Cl. 428-220.000.

Teillauch, Eric; and Bandiera, Angelo, to Societe Nouvelle D'Exploitation La Calhene. Device for the disconnectable coupling of a toggle joint to a telemanipulator slave arm. 4,873,885, Cl. 74-520.000.

Teissier, Remy; and Clamens, Serge, to Societe Chimique des Charbonnages. Di-bis(hydroxypropyl) cyanuric acid, tri-substituted derivatives thereof and a process for their preparation. 4,874,859, Cl. 544-221.000.

Telefind Corp.: See—
Andros, Andrew A.; Campana, Thomas J., Jr.; Thelen, Gary F.; and Kinast, Robert A., 4,875,039, Cl. 340-825.440.

Tensor, Inc.: See—
Roberts, George F.; and Walters, Philip H., 4,875,014, Cl. 324-326.000.

Terada, Michimasa; and Nakajima, Hisashi, to Tokyo Electron Limited. Mechanism for turning over a test head of a wafer probing machine. 4,875,005, Cl. 324-158.00F.

Teradyne, Inc.: See—
Russo, John L.; and Van der Kloot, Robert H., 4,875,210, Cl. 371-27.000.

Terakawa, Takashi: See—
Kikuchi, Makoto; Mori, Shinaku; Nikawa, Yoshio; and Terakawa, Takashi, 4,873,995, Cl. 128-804.000.

Terao, Shinji; Okazaki, Hisayoshi; and Imada, Isuke, to Takeda Chemical Industries, Ltd. Benzoinquinone derivatives and production thereof. 4,874,752, Cl. 536-55.200.

Terauchi, Kiyoshi: See—
Kobayashi, Hideto; and Terauchi, Kiyoshi, 4,874,295, Cl. 417-222.000.

Terry, Malcolm J.: See—
Bransden, Antony S.; Megaw, John H. P. C.; Terry, Malcolm J.; and Ward, Brooke A., 4,874,919, Cl. 219-121.680.

Terumo Kabushiki Kaisha: See—
Kousai, Tadashi; Ishida, Toshinobu; and Moriuchi, Yousuke, 4,874,374, Cl. 604-164.000.

Tesera-Chiesa, Emilio, to Sales S.p.A. Sealed packet with an adhesive strip for opening and reclosing. 4,874,096, Cl. 206-621.000.

Test, Howard R.: See—
Bednarz, George A.; Smith, Reginald W.; Roeding, Gretchen W.; and Test, Howard R., 4,874,722, Cl. 437-209.000.

Tetenborg, Konrad; Echmann, Heinz; and Huwelmann, Helmut, to Windmoller & Holscher. Apparatus for filling and closing sacks which are open at one end. 4,873,815, Cl. 53-570.000.

Tetra Dev-Co.: See—
Ringdahl, Ulf; and Mattei, Vittorio, 4,874,021, Cl. 141-85.000.

Tetra Werke Dr.rer.nat. U. Baensch GmbH: See—
Bock, Eberhard, 4,874,707, Cl. 435-253.600.

Tetreault, Andre. Valve box. 4,874,103, Cl. 220-4.00C.

Texaco Inc.: See—
Colvert, James H., 4,874,583, Cl. 422-143.000.

Rietsch, Elke, 4,875,197, Cl. 367-32.000.

Robison, Peter D.; and Stipanovic, Arthur J., 4,874,044, Cl. 166-275.000.

Texas Instrument Incorporated: See—
Rao, Kalipatnam V., 4,874,716, Cl. 437-43.000.

Texas Instruments Incorporated: See—
Bednarz, George A.; Smith, Reginald W.; Roeding, Gretchen W.; and Test, Howard R., 4,874,722, Cl. 437-209.000.

Bishop, Robert P.; Sabetti, Anthony J.; and Charboneau, Thomas, 4,875,135, Cl. 361-283.000.

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- Tioxide Group PLC: See—
Kay, Peter D.; and McDonald, Keith, 4,874,806, Cl. 524-204.000.
- Titmas, James A., to Oxidyne Corporation. Apparatus for effecting selected patterns of fluid flow, 4,874,560, Cl. 261-76.000.
- Toa Eiyo, Ltd.: See—
Yamada, Shin-ichi; Goto, Takao; Mashiko, Toshihisa; Kogi, Kentaro; Oguchi, Yukiko; and Narita, Senichi, 4,874,760, Cl. 514-234.000.
- Tobe, Yukiya: See—
Kimpura, Masaomi; Kawai, Kaiji; and Tobe, Yukiya, 4,874,425, Cl. 71-121.000.
- Tobias, Russell H.: See—
Bernhas, James P.; and Tobias, Russell H., 4,874,837, Cl. 525-291.000.
- Todo, Akira: See—
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- Toft, Mark A.: See—
Brazil, James F., Jr.; Glaeser, Linda C.; and Toft, Mark A., 4,874,738, Cl. 502-209.000.
- Tohyama, Shigeru, to NEC Corporation. Optoelectric transducer, 4,875,084, Cl. 357-30.000.
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- Tokar, Alexander P.: See—
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- Tokise, Hiromitsu; Tsumaki, Nobuo; and Koike, Toshifumi, to Hitachi, Ltd. Apparatus for holding and/or conveying articles by fluid, 4,874,273, Cl. 406-88.000.
- Tokyo Electron Limited: See—
Terada, Michimasa; and Nakajima, Hisashi, 4,875,005, Cl. 324-158.000.
- Tokyo Keiki Co., Ltd.: See—
Kikuchi, Makoto; Mori, Shinsaku; Nikawa, Yoshio; and Terakawa, Takahige, 4,873,995, Cl. 128-804.000.
- Tomann, Mark M.: See—
Anderson, Dean H.; and Tomann, Mark M., 4,875,052, Cl. 343-882.000.
- Tominaga, Chikara: See—
Ogata, Takashi; Kato, Masanori; Kawasumi, Yoshio; Tominaga, Chikara; and Tanaka, Kanji, 4,874,436, Cl. 148-2.000.
- Tonegawa, Susumu: See—
Saito, Haruo; Kranz, David M.; Eisen, Herman N.; and Tonegawa, Susumu, 4,874,845, Cl. 530-395.000.
- Toray Industries: See—
Ando, Katsutoshi; and Ogawa, Yo, 4,874,659, Cl. 428-221.000.
- Toray Silicone Company, Ltd.: See—
Suzuki, Toshio; and Okawa, Tadashi, 4,874,881, Cl. 556-453.000.
- Torigoe, Makoto; and Suzuki, Akiyoshi, to Canon Kabushiki Kaisha. Exposure apparatus, 4,875,076, Cl. 355-53.000.
- Toriya, Hajime: See—
Sakurai, Shigeo; Umezawa, Sadao; Usami, Saburo; Miyata, Hiroshi; Toriya, Hajime; Tsubouchi, Kuniyoshi; and Kaneko, Ryoichi, 4,875,170, Cl. 364-507.000.
- Torley, Jozsef: See—
Lapis, Erzebet; Toth, Edit; Kis, Bela; Torley, Jozsef; Palosi, Eva; Hajdu, Istvan; Szpony, Laszlo; Groo, Dora; and Laszlovsky, Istvan, 4,874,765, Cl. 514-255.000.
- Tornatore, Giovanni: See—
Amedei, Giuseppe; and Tornatore, Giovanni, 4,873,880, Cl. 74-158.000.
- Torrington Company, The: See—
Podhajski, Stephen T., 4,874,260, Cl. 384-470.000.
- Toshiba Monofax Co., Ltd.: See—
Hirata, Kimio; and Saito, Yasuo, 4,874,034, Cl. 165-9.100.
- Toth, Edit: See—
Lapis, Erzebet; Toth, Edit; Kis, Bela; Torley, Jozsef; Palosi, Eva; Hajdu, Istvan; Szpony, Laszlo; Groo, Dora; and Laszlovsky, Istvan, 4,874,765, Cl. 514-255.000.
- Toto Ltd.: See—
Ito, Haruyuki; and Matsumoto, Akio, 4,874,304, Cl. 425-84.000.
- Toyama, Hiroaki, to Kabushiki Kaisha Murakoshi Seiko. Hinge, 4,873,743, Cl. 16-237.000.
- Toyocommunication Equipment Co., Ltd.: See—
Oshita, Masahide; Imai, Masaki; and Fukunaka, Toshiaki, 4,874,438, Cl. 148-400.000.
- Toyo Ink Manufacturing Co., Ltd.: See—
Nonomura, Tsutomu; and Abe, Hidetoshi, 4,873,924, Cl. 101-146.000.
- Toyota Gosei Co., Ltd.: See—
Ito, Toshiyasu; Minoura, Jun; Mori, Takaaki; Takahashi, Shigeyuki; Kato, Mamoru; Shimada, Junichi; and Hayakawa, Fujio, 4,874,229, Cl. 350-357.000.
- Toyota-Koki Kabushiki-Kaisha: See—
Asano, Hiroaki; Tsujiuchi, Toshio; Yoneda, Takao; Ishihara, Nobuhiro; Maruyama, Toshio; and Ohta, Norio, 4,873,793, Cl. 51-165.710.
- Toyota Jidosha Kabushiki Kaisha: See—
Yamada, Ichiji; Inuzuka, Yutake; Ichihara, Isao; Murakami, Michiyuki; Suzuki, George; Yanahashi, Ryou; and Kondo, Takeshi, 4,873,884, Cl. 74-473.000.
- Toyota Jidosha Kabushiki Kaisha: See—
Fukuta, Kenji; Kaneko, Takaoki; and Takahashi, Yoshinobu, 4,874,453, Cl. 156-345.000.
- Hamaguchi, Shigeki; Ohtsuka, Yasuhiro; Motohiro, Tomoyoshi; Taga, Yasunori; and Ishii, Masahiko, 4,874,664, Cl. 428-325.000.
- Kasegawa, Norimichi, 4,874,059, Cl. 180-249.000.
- Kitoh, Osamu; and Ohashi, Masahiko, 4,874,650, Cl. 428-68.000.
- Kojima, Fumio; Tachiiri, Yoshikazu; and Kato, Yoshihisa, 4,874,174, Cl. 285-82.000.
- Miyamaru, Tsuneo, 4,874,254, Cl. 374-208.000.
- Tracy, Richard J. Attachment for slide fastener slider pull tab, 4,873,750, Cl. 24-429.000.
- Tracy, William J., III: See—
Bartilucci, Mark P.; Karner, Grant G.; and Tracy, William J., III, 4,874,505, Cl. 208-131.000.
- Tragatschnig, Joerg, to Porsche Design GmbH. Telephone, 4,875,234, Cl. 379-434.000.
- Trainer, William E.: See—
Roberts, Austin K.; Trainer, William E.; and Biederman, David L., 4,874,593, Cl. 423-322.000.
- TRC, Inc.: See—
McPherson, Walter K.; and Blaker, James L., 4,873,867, Cl. 73-493.000.
- Tremblay, Robert A.: See—
Labombard, Raymond A.; and Tremblay, Robert A., 4,873,813, Cl. 53-438.000.
- Tripp, Victor: See—
Harna, Frank M.; Tripp, Victor; and Wells, Thomas B., 4,874,915, Cl. 219-10.55F.
- Tripp, Jerry C.: See—
Foreman, Michael R.; Hadernann, Albert F.; and Tripp, Jerry C., 4,874,528, Cl. 210-705.000.
- Troxler Electronic Laboratories, Inc.: See—
Regimand, Ali, 4,874,950, Cl. 250-390.040.
- Truelove, Ronald D.: See—
Goodson, Thomas A.; and Truelove, Ronald D., 4,873,849, Cl. 76-58.000.
- Trumbull, Douglas; Collins, David; Smith, Wayne; and Spieldiener, Robert, to Showcan Film Corporation. Motion picture amusement ride, 4,874,162, Cl. 272-18.000.
- TRW Inc.: See—
Egenase, Andrea L. F.; and Kuenzly, John D., 4,873,930, Cl. 110-345.000.
- Tschirke, Carsten: See—
Yong, Bak G.; Petra, Barth; Dietrich, Demus; Detlev, Joachim; Kampa, Barbara; Kohler, Seakia; Mohr, Kristine; Paschke, Reinhard; Pelzl, Gerhard; Rosenfeld, Ulrich; Schafer, Wolfgang; Scherf, Klaus-Dieter; Tschirke, Carsten; Weissflog, Wolfgang; and Zschake, Horst, 4,874,544, Cl. 252-299.610.
- Tsang, Kenneth K. S.: See—
Hung, Paul L. K.; and Tsang, Kenneth K. S., 4,874,799, Cl. 322-98.000.
- Tsang, Raymond R., to Allied-Signal Inc. Method for improving signal-to-noise ratios in fluidic circuits and apparatus adapted for use there-with, 4,874,016, Cl. 137-826.000.
- Tsubakimoto Chain Co.: See—
Suzuki, Tadasu, 4,874,352, Cl. 474-110.000.
- Yaguchi, Akio; and Kyoo, Takatsugu, 4,874,077, Cl. 198-408.000.
- Tsubouchi, Kuniyoshi: See—
Sakurai, Shigeo; Umezawa, Sadao; Usami, Saburo; Miyata, Hiroshi; Toriya, Hajime; Tsubouchi, Kuniyoshi; and Kaneko, Ryoichi, 4,875,170, Cl. 364-507.000.
- Tsuchitani, Masatoshi; and Naito, Sakae, to Maruzen Petrochemical Co., Ltd. Method of purifying coal tars for use in the production of carbon products, 4,874,502, Cl. 208-45.000.
- Tsuchiya, Nobuo: See—
Hamada, Takao; Tsuchiya, Nobuo; Inatani, Toshihiro; Katayama, Eiji; Koitabashi, Toshimitsu; Okabe, Kyoji; Sumito, Mitsuo; and Takada, Yoshiyasu, 4,874,427, Cl. 75-26.000.
- Tsuda Industries, Co., Ltd.: See—
Yamada, Ichiji; Inuzuka, Yutake; Ichihara, Isao; Murakami, Michiyuki; Suzuki, George; Yanahashi, Ryou; and Kondo, Takeshi, 4,873,884, Cl. 74-473.000.
- Tsugita, Hiroshi: See—
Sakamoto, Hideo; and Tsugita, Hiroshi, 4,875,002, Cl. 324-73.00R.
- Tsujimura, Masao: See—
Kubodera, Takayuki; Nakamura, Shizuo; Onizawa, Masanori; Shirohita, Hirotsuka; Mochizuki, Eiichi; Tsujimura, Masao; Atsuta, Toshikatsu; and Morooka, Takayoshi, 4,875,065, Cl. 354-82.000.
- Tsujino, Yoshikazu; Hamada, Yuuji; Sakata, Masakazu; Fujii, Takanori; and Kuwano, Yukinori, to Sanyo Electric Co., Ltd. Ultrafine tube and method for its production, 4,874,646, Cl. 428-34.100.
- Tsujiuchi, Toshio: See—
Asano, Hiroaki; Tsujiuchi, Toshio; Yoneda, Takao; Ishihara, Nobuhiro; Maruyama, Toshio; and Ohta, Norio, 4,873,793, Cl. 51-165.710.
- Tsumaki, Nobuo: See—
Tokise, Hiromitsu; Tsumaki, Nobuo; and Koike, Toshifumi, 4,874,273, Cl. 406-88.000.

- Tsunoda, Eiji: See—
Hadano, Yoshikazu; Tsunoda, Eiji; and Kajigaya, Ichiro, 4,873,827, Cl. 60-646.000.
- Tsunooka, Tsutomu: See—
Ohya, Kanji; Tsunooka, Tsutomu; Ogura, Koji; Ozeki, Hirofumi; and Yamamoto, Takashi, 4,874,727, Cl. 501-134.000.
- Tsushima, Tetsuro: See—
Okubo, Osamu; Kato, Takeo; and Tsushima, Tetsuro, 4,874,918, Cl. 219-85.110.
- Tuan, James: See—
Katz, Leonard; Tuan, James; and McAlpine, James B., 4,874,748, Cl. 514-29.000.
- Tulp, Martinus T. M.: See—
Van Wijngaarden, Ineke; Kruse, Cornelis; Van Der Heyden, Johannes A. M.; and Tulp, Martinus T. M., 4,874,770, Cl. 514-326.000.
- Turchik, Randy: See—
Oldort, Robert; Micalizzi, Charles; Cambruzzi, Louis; and Turchik, Randy, 4,875,174, Cl. 364-519.000.
- Turner, Anthony L., to Turner International (Engineering) Limited. Laterally adjustable mower, 4,873,818, Cl. 56-10.800.
- Turner International (Engineering) Limited: See—
Turner, Anthony L., 4,873,818, Cl. 56-10.800.
- Turner, Larry G.: See—
Pickett, Daniel A.; Schrock, Donald C.; and Turner, Larry G., 4,874,009, Cl. 137-454.600.
- Turner, Stephen M.: See—
Szymanski, Thomas; and Turner, Stephen M., 4,874,586, Cl. 422-177.000.
- Ube Industries, Ltd.: See—
Hamasaki, Naotaka; Kawamura, Hirotsuka; Ohtsu, Norio; Nakakoshi, Ichiro; Ataka, Kikuo; Oomori, Kiyosi; and Kouno, Masahiko, 4,874,882, Cl. 558-131.000.
- Shiomi, Yasushi; Matsuzaki, Tokuo; and Masunaga, Katsuro, 4,874,888, Cl. 560-204.000.
- Uchytel, Thomas F.: See—
Durbine, Richard D.; Lukens, Jean H.; Uchytel, Thomas F.; and Rhodehamel, Nicholas, 4,874,706, Cl. 435-253.300.
- Ueda, Fusao: See—
Kimura, Kiyoshi; Ueda, Fusao; and Tamura, Masaru, 4,874,762, Cl. 514-242.000.
- Ueda, Hiroaki; Miyamoto, Hisashi; Aki, Shinji; and Otsuka, Tatsuya, to Otsuka Pharmaceutical Company, Limited. Benzoheterocyclic compounds, 4,874,764, Cl. 514-254.000.
- Ueda, Kouichiro; Tanaka, Satoru; Kunii, Toshinobu; Kagei, Kengo; Sato, Tadashi; Ono, Hideki; Ohtsuka, Issei; Kawase, Mayumi; Ohgoh, Toshiharu; and Wakabayashi, Tsuneo, to Eisai Co., Ltd. Hydanotin derivatives and medicines containing the same, 4,874,869, Cl. 548-309.000.
- Ueda, Masashi; Horaguchi, Yoichi; and Sakakibara, Kenji, to Brother Kogyo Kabushiki Kaisha. Color picture image recording apparatus capable of adjusting color tone in the copy sheet, 4,875,073, Cl. 355-27.000.
- Ueno, Katsunobu; and Hataishi, Osamu, to Fujitsu Limited. Semiconductor device with shallow n-type region with arsenic or antimony and phosphorus, 4,875,085, Cl. 357-34.000.
- Ueshin, Akito: See—
Nakahara, Jiro; Ueshin, Akito; and Okajima, Shiro, 4,874,934, Cl. 235-492.000.
- Uesugi, Mitsuaki; Inomata, Masachi; and Komine, Isamu, to NKK Corporation. Method and apparatus for measuring a three-dimensional curved surface shape, 4,874,955, Cl. 250-550.000.
- Ueyama, Yoshiji; and Asayama, Yoshiaki, to Mitsubishi Denki Kabushiki Kaisha. Throttle valve control apparatus, 4,873,957, Cl. 123-399.000.
- Ui, Kazuo: See—
Matsuda, Tsukasa; Ui, Kazuo; and Maeda, Hiroshi, 4,874,089, Cl. 206-397.000.
- Ullrich, Gunter: See—
Andra, Rainer; Kurr, Klaus; Ullrich, Gunter; and Dorge, Udo, 4,873,887, Cl. 74-573.00F.
- Ulm, John G., to Liqui-Box Corporation. Decap dispensing system for water cooler bottles, 4,874,023, Cl. 141-346.000.
- Umebayashi, Nobuhiro: See—
Tanaka, Yoshito; and Umebayashi, Nobuhiro, 4,875,121, Cl. 360-129.000.
- Umeda, Osamu; Nakakusu, Tooru; Sato, Makoto; and Shimazaki, Tatsuo, to Casio Computer Co., Ltd. Projector apparatus with mirror means, 4,875,064, Cl. 353-78.000.
- Umehara, Yohichi: See—
Wakabayashi, Ataru; Umehara, Yohichi; Morie, Satsuki; Kuwahara, Ikuro; and Okada, Yoshimi, 4,874,483, Cl. 204-94.000.
- Umezawa, Sadao: See—
Sakurai, Shigeo; Umezawa, Sadao; Usami, Saburo; Miyata, Hiroshi; Toriya, Hajime; Tsubouchi, Kuniyoshi; and Kaneko, Ryoichi, 4,875,170, Cl. 364-507.000.
- Umholtz, Franklin G. Combined egg poacher and serving plate, 4,873,922, Cl. 99-426.000.
- Unangst, Paul C.: See—
Carethers, Mary E.; Centenko, Waczeslaw A.; Connor, David T.; Johnson, Elizabeth A.; Kiely, John S.; Schwender, Charles F.; Sircar, Jagdish C.; Sorenson, Roderick J.; Unangst, Paul C.; and Bruns, Robert F., 4,874,758, Cl. 514-226.500.
- Unimation, Inc.: See—
Daggett, Kenneth E.; Onaga, Eimei M.; Casler, Richard J., Jr.; and Johnson, Richard A., 4,874,997, Cl. 318-568.100.
- Union Camp Corporation: See—
Mitchell, Peter W. D., 4,874,900, Cl. 568-390.000.
- Union Carbide Corporation: See—
Koleske, Joseph V.; and Kwiatkowski, George T., 4,874,798, Cl. 522-31.000.
- Union Oil Company of California: See—
Featherstone, John L.; Spang, S. Timothy; Newell, David G.; and Gallup, Darrell L., 4,874,529, Cl. 210-713.000.
- Unisys Corporation: See—
Kregness, Glen R.; and Quinton, Walter L., 4,875,180, Cl. 364-715.030.
- Lahti, Archie E., 4,875,161, Cl. 364-200.000.
- United Brands Company: See—
Sole, Pedro, 4,874,617, Cl. 426-49.000.
- United Catalyst Inc.: See—
Elliott, Donald R.; and Beall, Gary W., 4,874,728, Cl. 501-148.000.
- United Kingdom Atomic Energy Authority: See—
Steele, David F., 4,874,485, Cl. 204-130.000.
- United Parcel Service of America, Inc.: See—
Chandler, Donald G.; Batterman, Eric P.; and Shah, Govind, 4,874,936, Cl. 235-494.000.
- United States of America
Air Force: See—
McCoy, Joseph R., 4,874,910, Cl. 174-152.0GM.
- Shurtliff, Jeffrey L.; and Thomas, Michael E., 4,873,794, Cl. 51-227.00R.
- Smith, Leroy H., Jr.; and Wilcox, Donald E., 4,874,289, Cl. 415-150.000.
- Army: See—
Berry, Mark D.; Tan, Robert J.; and Garver, Robert V., 4,875,022, Cl. 333-20.000.
- Boyd, Phillip R., 4,875,004, Cl. 324-158.00D.
- Matsuoka, David G.; and Ferris, Donald L., 4,874,292, Cl. 416-140.000.
- Russell, Stephen D., 4,875,219, Cl. 372-92.000.
- Tillery, John T., 4,875,200, Cl. 368-67.000.
- Energy: See—
Kazmerski, Lawrence L., 4,874,946, Cl. 250-309.000.
- McPherson, Daniel W.; Fowler, Joanna S.; and Wolf, Alfred P., 4,874,600, Cl. 424-1.100.
- National Aeronautics and Space Administration: See—
Holmes, Harlan K.; Moore, Thomas C., Jr.; and Fantl, Andrew J., 4,873,990, Cl. 128-748.000.
- Navy: See—
Marolda, Victor J., Jr., 4,874,326, Cl. 439-273.000.
- U.S. Philips Corporation: See—
Delpech, Guy; and Garnier, Gilles, 4,875,140, Cl. 361-412.000.
- Den Boef, Arie J., 4,874,246, Cl. 356-375.000.
- Easton, Brian C.; and Whiffin, Peter A. C., 4,874,634, Cl. 427-54.100.
- Fink, Mathias, 4,873,869, Cl. 73-626.000.
- Gehrt, Heinz H.; Hildebrandt, Gunter; and Rehfeldt, Karl-Heinz, 4,874,966, Cl. 307-291.000.
- Haghi, Mohammad-Reza; and Boutros, Bertrand, 4,875,094, Cl. 358-105.000.
- Koster, Marinus P.; Bouwens, Henricus J. J.; Van Tartwijk, Anton A. J.; and De Peuter, Willem L. G., 4,874,286, Cl. 414-744.500.
- Overdijk, Dik R.; Bolder, Antonius J. J.; Beirens, Leopold C. M.; and Van Rens, Piet C. J., 4,874,982, Cl. 313-440.000.
- Sluyterman, Albertus A. S., 4,874,983, Cl. 313-440.000.
- van der Eijk, Bart; van de Wiel, Johannes N.; Rongen, Engelbertus; and Wulms, Christian J. G. H., 4,874,987, Cl. 313-525.000.
- Van Twist, Robert A. H.; Hopmans, Franciscus P. M.; and Odijk, Eddy A. M., 4,875,207, Cl. 370-85.120.
- U.S. Printcraft: See—
Talalay, Anselm; and Borsvold, Herbert H., 4,874,454, Cl. 156-359.000.
- United Technologies Automotive, Inc.: See—
Gutman, Robert F.; and Migrin, Robert, 4,874,224, Cl. 350-174.000.
- Harna, Louis C., 4,873,817, Cl. 56-10.200.
- United Technologies Corporation: See—
Cusack, Michael D., 4,875,138, Cl. 174-52.400.
- Martin, Anthony N., 4,875,168, Cl. 364-431.010.
- Walker, Raymond M.; Achor, Donald P.; Baumgarten, Robert W.; and Bogard, Ralph B., 4,873,751, Cl. 29-156.80B.
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- Universal Plastics Incorporated: See—
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- Universite De Clermont II, Laboratoire De Photochimie: See—
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- Universite de Reims Champagne-Ardenne: See—
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- University of California, The Regents of the: See—
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- University of Chicago: See—
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- University of Cincinnati: See—
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Murai, Katsumi; and Usui, Makoto, 4,875,211, Cl. 371-40.100.

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Nowak, Thomas E.; Smith, Edward J.; and Vassiliou, Eustathios, 4,874,277, Cl. 411-61.000.

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Reiche, Dieter; Thuerk, Matthias; and Duerselen, Roderich, 4,874,677, Cl. 428-605.000.

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Yong, Bak G.; Petra, Barth; Dietrich, Demus; Detlev, Joachim; Kampa, Barbara; Kohler, Saskia; Mohr, Kristine; Paschke, Reinhard; Pelz, Gerhard; Rosenfeld, Ulrich; Schafer, Wolfgang; Scherf, Klaus-Dieter; Tschirke, Carsten; Weissflog, Wolfgang; and Zschke, Horst, 4,874,544, Cl. 252-299.610.

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Snauwaert, Paul E. M.; Vergote, Geert R. J.; and Witdoek, Daniel C., 4,874,411, Cl. 55-290.000.

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Huang, Chialang; and Vernice, Gerald G., 4,874,902, Cl. 426-43.000.

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Colanzi, Franco; and Vignotto, Angelo, 4,874,261, Cl. 384-484.000.

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Bogese, Stephen B., II; and Hall, Charles E., 4,874,330, Cl. 439-418.000.

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Kwoka, Georg, 4,874,058, Cl. 180-248.000.

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Evyan, John J.; and Booth, Orville D., 4,873,748, Cl. 17-49.000.
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Vivian, Domenico: See—
Mainardi, Bruno; and Vivian, Domenico, 4,874,298, Cl. 417-315.000.

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Mertens, Alfred; von der Saal, Wolfgang; Berger, Herbert; Muller-Beckmann, Bernd; and Strein, Klaus, 4,874,756, Cl. 514-212.000.

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Minuhin, Vadim B.; Berzon, Evgeny J.; and VonDeylen, Vernon F., 4,875,108, Cl. 360-51.000.

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Ziegler, Horst; and Behlen, Horst, 4,874,252, Cl. 374-117.000.

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Minhas, Bhupender S., 4,874,405, Cl. 55-158.000.

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Huth, Andreas; Sauer, Gerhard; and Wachtel, Helmut, 4,874,768, Cl. 514-288.000.

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Eck, Herbert; Fleischmann, Gerald; Prasse, Alfred; and Kolbig, Kunigunde, 4,874,638, Cl. 427-222.000.

Huhn, Karl, 4,874,662, Cl. 428-266.000.

Wada, Kiyoshi: See—
Miyachi, Shizuya; and Wada, Kiyoshi, 4,875,141, Cl. 362-61.000.

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Yasuda, Kazuhiko; and Wada, Sumio, 4,875,116, Cl. 360-78.110.

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Inskip, Harold K.; and Waggoner, Marion G., 4,874,817, Cl. 525-183.000.

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Quisenberry, Tony M.; and Wahlenmeier, Fred E., 4,874,103, Cl. 220-1.00T.

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Matsukawa, Hideki; Masuyama, Takeshi; Hirota, Minoru; Wakabata, Yasuo; Itoh, Masahiro; and Harada, Shinji, 4,874,227, Cl. 350-334.000.

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Cang, John N.; Gast, Joseph R.; Hensley, John J.; and Waldhelm, Christian M., 4,874,290, Cl. 415-173.400.

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Walsh, David J.; Loughheed, William M.; Gentili, Fred; and Fazl, Mahmood, 4,873,975, Cl. 128-334.00R.

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Walters, Philip H.: See—
Roberts, George F.; and Walters, Philip H., 4,875,014, Cl. 324-326.000.

Wambach, Ludwig; and Fischer, Martin, to BASF Aktiengesellschaft. Preparation of substituted lactams, 4,874,865, Cl. 546-243.000.

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Ward, Brooke A.: See—
Brandsen, Antony S.; Megaw, John H. P. C.; Terry, Malcolm J.; and Ward, Brooke A., 4,874,919, Cl. 219-121.680.

Ward, Michael L.: See—
Ward, Billy W.; and Ward, Michael L., 4,874,947, Cl. 250-309.000.

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Carethers, Mary E.; Centenko, Waczeslaw A.; Connor, David T.; Johnson, Elizabeth A.; Kiely, John S.; Schwender, Charles F.; Sircar, Jagadish C.; Sorenson, Roderick J.; Unangst, Paul C.; and Bruns, Robert F., 4,874,758, Cl. 514-226.500.

Sircar, Jagadish C.; Brungardt, Catherine R.; and Schwender, Charles F., 4,874,862, Cl. 544-276.000.

Warning, Theodore A.: See—
Boze, Ronald A.; and Warning, Theodore A., 4,874,533, Cl. 210-778.000.

Warych, Hans, to Signode System GmbH. Edge protector and method of making same, 4,874,095, Cl. 206-586.000.

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Covey, Douglas F.; and Auchus, Ricard J., 4,874,891, Cl. 560-256.000.

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Watanabe, Michihiro: See—
Takagaki, Hidetsugu; Abe, Masayoshi; Watanabe, Michihiro; Takeuchi, Kazuyuki; Nakanishi, Shigenori; Nakata, Yuuko; and Yamazaki, Keiji, 4,874,855, Cl. 540-3.000.

Watanabe, Naohiro: See—
Sakai, Shunji; Kitagawa, Tohru; Suzuki, Kunikazu; and Watanabe, Naohiro, 4,875,099, Cl. 358-213.110.

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- Watta, Michael P. C.; Perera, Thiloma I.; Myers, David W.; Ozaraki, Robert G.; Schipper, John F.; and Tan, Raul V., to Hoechst Celanese. Characterization of semiconductor resist material during processing. 4,874,240, Cl. 356-73.000.
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Dewberry, Larry S.; and Schlipp, Richard H., 4,873,747, Cl. 17-11.10R.
- Wayne State University: See—
Thomas, Robert L.; Kuo, Pao-Kuang; and Favro, Lawrence D., 4,874,251, Cl. 374-45.000.
- Weber, Hans-Ulrich: See—
Hass, Peter; Sommerfeld, Claus-Dieter; and Weber, Hans-Ulrich, 4,874,797, Cl. 521-167.000.
- Weber, James J.: See—
Kuphal, Jeffrey A.; Robeson, Lloyd M.; and Weber, James J., 4,874,030, Cl. 164-34.000.
- Weber, Roland: See—
Leipold, Ludwig; Sander, Rainald; Tihanyi, Jenoe; and Weber, Roland, 4,875,131, Cl. 361-103.000.
- Webster, David R. Pulp refining apparatus. 4,874,136, Cl. 241-251.000.
- Webster, John A. Stereoscopic viewing system and method. 4,874,235, Cl. 351-201.000.
- Wechsler, Lawrence I. Float for fluid measurements. 4,873,872, Cl. 73-861.570.
- Wehnert, Wolfgang: See—
Dujardin, Ralf; Ebert, Wolfgang; Meyer, Rolf-Volker; Berg, Klaus; Grigo, Ulrich; and Wehnert, Wolfgang, 4,874,816, Cl. 525-146.000.
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- Weimer, John R., to Pillsbury Company, The. Microwave food product and method of manufacture. 4,874,917, Cl. 219-10.55M.
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- Werner, Walter M., to AMP Incorporated. Method of making an electrical connector. 4,873,765, Cl. 29-876.000.
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- West, Kenneth W.: See—
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- Westerberg, Roger K.: See—
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- Gisoni, Gregory A.; and Forker, James M., 4,875,043, Cl. 341-22.000.
- McLaughlin, David F.; and Stoltz, Richard A., 4,874,475, Cl. 203-51.000.
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- Whitlock, David R. Separating constituents of a mixture of particles. 4,874,507, Cl. 209-11.000.
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- Wien, Thomas J. Solid waste processing facility and process. 4,874,134, Cl. 241-19.000.
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- William H. Takahashi: See—
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- Williams, Sam. Device for unlocking car doors. 4,873,897, Cl. 81-15.900.
- Williamson, Anthony R. Steam power plant. 4,873,829, Cl. 60-670.000.
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- Wilson, Kenneth: See—
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- Wilson, Raymond L.: See—
Luttmer, David J.; Panian, Thomas L.; Wizey, Barry D.; and Wilson, Raymond L., 4,873,770, Cl. 33-706.000.
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Atlas, George N.; Donnally, Leroy C.; Urban, Donald P.; Perkins, James M.; and Wilson, Timothy C., 4,874,308, Cl. 425-544.000.
- Wilson, Wilfred W.; Polemenakos, Sotiros C.; Potter, J. Larry; Mangold, Donald J.; Harlowe, William W.; and Schlameus, Herman W., to Dow Chemical Company, The. Microencapsulated ant bait. 4,874,611, Cl. 424-410.000.
- Windmoller & Holscher: See—
Tetenborg, Konrad; Eschmann, Heinz; and Huwelmann, Helmut, 4,873,815, Cl. 53-570.000.
- Winfield Corporation: See—
Quisenberry, Tony M.; and Wahlenmeier, Fred E., 4,874,103, Cl. 220-1.00T.
- Winter, Robert W. Tool pack apparatus. 4,874,119, Cl. 224-202.000.
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- Winters, R. Edward, to Advanced Biomedical Devices, Inc. Steerable guidewire for vascular system. 4,873,983, Cl. 128-657.000.
- Winters, William L. Method and apparatus for sealing and protecting loading dock doorways. 4,873,801, Cl. 52-173.0DS.
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Kleeb, Thomas R.; and Wishon, Berhl E., 4,874,726, Cl. 501-124.000.
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Kriech, Anthony J.; and Wissel, Herbert L., 4,874,432, Cl. 106-273.100.
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Shaw, David T.; Witanachchi, Sarath; and Kwok, Hoi-Sing, 4,874,741, Cl. 505-1.000.
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- Witecki, Frank J. Pusher unit. 4,873,929, Cl. 104-172.300.

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McPherson, Daniel W.; Fowler, Joanna S.; and Wolf, Alfred P., 4,874,600, Cl. 424-1.100.
- Wolf, Thomas: See—
Kappeler, Franz; Wolf, Thomas; and Stegmüller, Bernhard, 4,875,217, Cl. 372-50.000.
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Hallden-Abbott, Michael P.; Cohen, Leslie A.; and Wood, Robert S., 4,874,824, Cl. 525-379.000.
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- Worley, Shelby D., to PPG Industries, Inc. Method for decontamination of toxic chemical agents. 4,874,532, Cl. 210-755.000.
- Worrall, Dayer. Vehicle window screen assembly. 4,874,026, Cl. 160-23.100.
- Wright, Robert L., to Creative Athletic Products and Services, Inc. Ball catching trainer. 4,874,168, Cl. 273-26.00C.
- Wright, Susan E.: See—
Paukovits, Edward J., Jr.; and Wright, Susan E., 4,874,337, Cl. 439-609.000.
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- Wu, Lung-chi, to Campbell Soup Company. Substrate for growing shiitake mushrooms. 4,874,419, Cl. 71-5.000.
- Wu, Wan C.: See—
Schwier, Chris E.; and Wu, Wan C., 4,874,829, Cl. 526-262.000.
- Wu, Yao-Yu. Motor with an auto output adjusting device. 4,874,974, Cl. 310-112.000.
- Wulms, Christian J. G. H.: See—
van der Eijk, Bart; van de Wiel, Johannes N.; Rongen, Engelbertus; and Wulms, Christian J. G. H., 4,874,987, Cl. 313-525.000.
- Wunsch, Wolfgang: See—
Frenzel, Bertram; Grenzendorfer, Dietmar; Kemter, Heinz; Wunsch, Wolfgang; and Zeisberg, Peter, 4,873,844, Cl. 66-84.00A.
- Wust, Robert, to Schnyder & Cie. Slide gauge. 4,873,771, Cl. 33-802.000.
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Goffe, William L.; and Schram, Joseph G., 4,875,081, Cl. 355-303.000.
- Pawlik, Robert S.; and Rasch, Kenneth R., 4,875,068, Cl. 355-286.000.
- Sampath, Barbara A.; and Schenk, Richard C., 4,874,958, Cl. 355-309.000.
- Thornton, Robert L.; and Burnham, Robert D., 4,875,216, Cl. 372-45.000.
- Waibel, Helmut K., 4,874,265, Cl. 400-357.000.
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Deane, Peter, 4,874,967, Cl. 307-296.800.
- Yabusaki, Masao: See—
Murakami, Yoshiki; Yamamoto, Etsuji; Yabusaki, Masao; and Kohno, Hideki, 4,875,013, Cl. 324-318.000.
- Yokosawa, Koichi; Yamamoto, Etsuji; Nakane, Hideaki; Yabusaki, Masao; and Ogura, Yukiko, 4,875,010, Cl. 324-248.000.
- Yagisita, Takahiro: See—
Idenawa, Hiroyuki; Mochimaru, Hideaki; Kanda, Hajime; Makita, Nobuhiro; Tanaka, Yoshiaki; Yagisita, Takahiro; Yamaki, Takanori; Motohashi, Takeshi; Miyamoto, Masayoshi; Ishizu, Hisao; Sagawa, Yasuhiro; Kanno, Tadaaki; Sankoda, Tomoo; Hosokawa, Hiroshi; Aoki, Hideo; Suzuki, Takami; Takada, Hiromi; and Shimazaki, Toshio, 4,875,063, Cl. 346-160.100.
- Yaguchi, Akio; and Kyoo, Takatsugu, to Tsubakimoto Chain Co. Device for transferring a lithographic plate. 4,874,077, Cl. 198-408.000.
- Yale University: See—
Crabtree, Robert H.; and Brown, Stephen H., 4,874,488, Cl. 204-157.150.
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- Yamada, Ichiji; Inuzuka, Yutake; Ichihara, Issa; Murakami, Michiyuki; Suzuki, George; Yanahashi, Ryou; and Kondo, Takeshi, to Toyota Jidosha Kabushiki Kaisha; and Tsuda Industries, Co., Ltd. Apparatus for supporting shift lever for transmission. 4,873,884, Cl. 74-473.00P.
- Yamada, Kiichiro, to Kubota Ltd. Partially liquid-cooled type forced air-cooling system for internal combustion engine. 4,873,944, Cl. 123-41.570.
- Yamada, Shin-ichi; Goto, Takao; Mashiko, Toshihisa; Kogi, Kentaro; Oguchi, Yukiko; and Narita, Senichi, to Toa Eiyo, Ltd. 4,7-dihydroisothiazolo(5,4-b)pyridine derivatives and cardiovascular treating agents containing said derivatives. 4,874,760, Cl. 514-234.200.
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- Yamagishi, Takashi: See—
Kaite, Yoshikazu; and Yamagishi, Takashi, 4,874,414, Cl. 65-20.130.
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Sato, Masahiko; Konuma, Toshimitsu; Odaka, Seiichi; Yamaguchi, Toshiharu; Watanabe, Toshio; Aoyagi, Osamu; Tabata, Kaoru; Isigaki, Chizuru; Sakayori, Hiroyuki; Kobayashi, Ipppei; Osabe, Akio; and Yamazaki, Shunpei, 4,874,461, Cl. 156-633.000.
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Kurosaki, Makoto, 4,873,910, Cl. 84-422.100.
- Murakami, Kazuo; Kaneko, Yasutoshi; and Tamaki, Takasi, 4,873,905, Cl. 84-20.000.
- Norimatsu, Takashi, 4,873,904, Cl. 84-722.000.
- Yamakawa, Takeshi, to Omron Tateisi Electronics Co. Fuzzy logic computers and circuits. 4,875,184, Cl. 364-807.000.
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Idenawa, Hiroyuki; Mochimaru, Hideaki; Kanda, Hajime; Makita, Nobuhiro; Tanaka, Yoshiaki; Yagisita, Takahiro; Yamaki, Takanori; Motohashi, Takeshi; Miyamoto, Masayoshi; Ishizu, Hisao; Sagawa, Yasuhiro; Kanno, Tadaaki; Sankoda, Tomoo; Hosokawa, Hiroshi; Aoki, Hideo; Suzuki, Takami; Takami, Takada; Hiromi; and Shimazaki, Toshio, 4,875,063, Cl. 346-160.100.
- Yamamoto, Eri: See—
Higuchi, Ryoichi; Sakurai, Takao; Yokota, Tadahiko; Mikami, Naoko; Yamamoto, Eri; and Takeuchi, Koji, 4,874,542, Cl. 252-299.610.
- Yamamoto, Etsuji: See—
Murakami, Yoshiki; Yamamoto, Etsuji; Yabusaki, Masao; and Kohno, Hideki, 4,875,013, Cl. 324-318.000.
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- Yamamoto, Kazushi, to Sharp Kabushiki Kaisha. Paper cartridge with paper aligning means. 4,874,160, Cl. 271-227.000.
- Yamamoto, Kenji: See—
Sasaki, Saburo; Ishida, Tsutomu; and Yamamoto, Kenji, 4,874,957, Cl. 250-578.000.
- Yamamoto, Masahiro: See—
Nakagawa, Yoshitomo; Kaito, Takashi; Houjyo, Hisao; and Yamamoto, Masahiro, 4,874,632, Cl. 427-41.000.
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Maeno, Mikihiko; Ohta, Yukio; Momiyama, Yoshiharu; Ono, Hisao; Takahata, Katsumasa; Ozono, Kazuyuki; Shimizu, Makoto; and Yamamoto, Mikio, 4,874,159, Cl. 271-171.000.
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- Yamamoto, Shinobu; Hoshide, Fumitoshi; Takeuchi, Michikazu; Kotani, Shou; and Yasuda, Sumihiro, to TDK Corporation. PTC heating device. 4,874,924, Cl. 219-274.000.
- Yamamoto, Shosaku; Kakinuma, Kazuo; Ishioka, Hiroshi; Sodeyama, Fumio; Mayumi, Junji; and Maruta, Riichiro, to Nippon Oil and Fats Co., Ltd. Primer compositions. 4,874,818, Cl. 525-183.000.
- Yamamoto, Soichiro, to Fuji Photo Film Co., Ltd. Light-sensitive material containing silver halide, reducing agent and polymerizable compound in microcapsules separately sensitized. 4,874,684, Cl. 430-138.000.
- Yamamoto, Takashi: See—
Ohta, Kanji; Tsunooka, Tsutomu; Ogura, Koji; Ozeki, Hirofumi; and Yamamoto, Takashi, 4,874,727, Cl. 501-134.000.
- Yamamoto, Takeshi, to Mazda Motor Corporation. Power-driven cow for an automotive vehicle. 4,874,199, Cl. 296-192.000.
- Yamamura, Hirohisa: See—
Kimura, Hiroshi; Naito, Shotaro; Miyashita, Kunio; Noto, Yasuo; Sugiura, Noboru; Takahashi, Tadashi; Yamamura, Hirohisa; Yamashita, Seizi; Kawamata, Syoichi; Tajima, Fumio; and Horikoshi, Shigeru, 4,874,053, Cl. 180-79.100.
- Yamane, Hisaaki; and Hirose, Noboru, to Brother Kogyo Kabushiki Kaisha. Machine tool. 4,873,756, Cl. 29-568.000.
- Yamane, Takakazu: See—
Matsui, Masataka; Aono, Toshiaki; Tanimoto, Yoshio; Nakahama, Tadamitsu; and Yamane, Takakazu, 4,874,639, Cl. 427-240.000.
- Yamanishi, Eiichi; Abuyama, Yasuo; and Someya, Akihiko, to Kabushiki Kaisha Toshiba. Image forming apparatus with positioning-mark forming function. 4,875,092, Cl. 358-75.000.
- Yamanouchi, Junichi; Ono, Shigetoshi; Hirano, Tsumoru; Watanabe, Toshiyuki; Sakai, Nobuo; and Mihayashi, Keiji, to Fuji Photo Film Co., Ltd. Silver halide color photographic material. 4,874,689, Cl. 430-548.000.
- Yamaoka, Takehiro: See—
Nakagawa, Yoshitomo; and Yamaoka, Takehiro, 4,874,460, Cl. 156-626.000.
- Yamashita, Seizi: See—
Kimura, Hiroshi; Naito, Shotaro; Miyashita, Kunio; Noto, Yasuo; Sugiura, Noboru; Takahashi, Tadashi; Yamamura, Hirohisa;

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- Yamashita, Shinichi: See—
Shimokoriyama, Makoto; Yamashita, Shinichi; Abe, Naoto; Kashida, Motokazu; Takei, Masahiro; and Takahashi, Koji, 4,875,090, Cl. 358-12.000.
- Yamato Scale Company, Limited: See—
Kawanishi, Shozo; and Higuchi, Tadashi, 4,874,048, Cl. 177-25.180.
- Yamazaki, Hiroshi: See—
Miya, Shinya; Harada, Masato; Misc, Takaya; and Yamazaki, Hiroshi, 4,874,880, Cl. 556-53.000.
- Yamazaki, Keiji: See—
Takagaki, Hidetsugu; Abe, Masayoshi; Watanabe, Michihiro; Takeuchi, Kazuyuki; Nakanishi, Shigenori; Nakata, Yuuko; and Yamazaki, Keiji, 4,874,855, Cl. 540-3.000.
- Yamazaki, Masanobu: See—
Matsuoka, Ken; and Yamazaki, Masanobu, 4,874,353, Cl. 474-168.000.
- Yamazaki, Shunpei; Itoh, Kenji; and Nagayama, Susumu, to Semiconductor Energy Laboratory Co., Ltd. Electronic device manufacturing method, 4,874,920, Cl. 219-121.850.
- Yamazaki, Shunpei: See—
Sato, Masahiko; Konuma, Toshimitsu; Odaka, Seichi; Yamaguchi, Toshiharu; Watanabe, Toshio; Aoyagi, Osamu; Tabata, Kaoru; Isigaki, Chizuru; Sakayori, Hiroyuki; Kobayashi, Ipei; Osabe, Akio; and Yamazaki, Shunpei, 4,874,461, Cl. 156-633.000.
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- Yanagida, Kouichi; Kano, Shinichi; Gotou, Takeshi; and Hirose, Takashi, to Kojima Press Industry Co., Ltd. Muffler, 4,874,062, Cl. 181-250.000.
- Yanahashi, Ryou: See—
Yamada, Ichiji; Inuzuka, Yutake; Ichihara, Isao; Murakami, Michiyuki; Suzuki, George; Yanahashi, Ryou; and Kondo, Takeshi, 4,873,884, Cl. 74-473.00P.
- Yanai, Genzo: See—
Matsushita, Takashi; and Yanai, Genzo, 4,874,973, Cl. 310-78.000.
- Yang, Chen-Shi. Vacuum frying and oil separating device, 4,873,920, Cl. 99-409.000.
- Yaoka, Osamu: See—
Tahara, Tetsuya; Ikebe, Tsuguo; Hakamada, Ichiro; and Yaoka, Osamu, 4,874,759, Cl. 514-232.500.
- Yarbro, Mark D.: See—
Sorensen, James L.; Yarbro, Mark D.; and Glockner, Charles A., 4,874,534, Cl. 210-803.000.
- Yason S.r.l.: See—
Quadro, Giuseppe, 4,874,776, Cl. 514-365.000.
- Yasuda, Kazuhiko; and Wada, Sumio, to Teac Corporation. Transducer position control system for data transfer apparatus employing disklike record media, 4,875,116, Cl. 360-78.110.
- Yasuda, Nozomi: See—
Maruzeni, Shoji; Matsumoto, Wataru; and Yasuda, Nozomi, 4,874,699, Cl. 435-135.000.
- Yasuda, Sumihiko: See—
Yamamoto, Shinobu; Hoshida, Fumitoshi; Takeuchi, Michikazu; Kotani, Shou; and Yasuda, Sumihiko, 4,874,924, Cl. 219-274.000.
- Yatsu, Tadao; and Akana, Yoshinori, to Mitsui Petrochemical Industries, Inc. Polyester composition, molded polyester laminate and use thereof, 4,874,647, Cl. 428-35.700.
- Yen, Larry Y.: See—
Lopatin, George; Yen, Larry Y.; and Rogers, Randall R., 4,874,567, Cl. 264-45.100.
- Yesair, David W. Composition for delivery of orally administered drugs and other substances, 4,874,795, Cl. 514-725.000.
- Ying, Lincoln: See—
McMahon, Paul; Chung, Tai-Shung; and Ying, Lincoln, 4,874,563, Cl. 264-29.200.
- Yngve, Paul W.: See—
Hallam, Donald E.; Popper, Peter; Staunton, Harold F.; Taylor, Robert E.; and Yngve, Paul W., 4,873,821, Cl. 57-293.000.
- Yoda, Akira: See—
Kimura, Akinori; and Yoda, Akira, 4,875,080, Cl. 355-246.000.
- Yokohama Rubber Co., Ltd., The: See—
Hattori, Yutaka, 4,875,070, Cl. 355-299.000.
- Yokoi, Takeshi; and Nakamura, Shigeo, to Brother Kogyo Kabushiki Kaisha. Printer having pivotable ribbon guide, 4,874,262, Cl. 400-216.100.
- Yokokawa, Kiyoshi; and Koya, Kazuo, to Shin-Etsu Chemical Co., Ltd. Base material of optical fibers and a method for the preparation thereof, 4,874,416, Cl. 65-3.120.
- Yokosawa, Koichi; Yamamoto, Etsuji; Nakane, Hideaki; Yabusaki, Masao; and Ogura, Yukiko, to Hitachi, Ltd. Circuit for detecting AC magnetic field due to magnetic resonance with a variable resistance for noise suppression, 4,875,010, Cl. 324-248.000.
- Yokosawa, Seichi, to Pioneer Electronic Corporation. Digital signal tape recording/reproducing apparatus with improved servo control, 4,875,115, Cl. 360-77.150.
- Yokota, Tadahiko: See—
Higuchi, Ryoichi; Sakurai, Takao; Yokota, Tadahiko; Mikami, Naoko; Yamamoto, Eri; and Takeuchi, Koji, 4,874,542, Cl. 252-299.610.
- Yokoyama, Junichi: See—
Muranaka, Shigeo; Ohkawa, Kouzaburo; Yokoyama, Junichi; Matayoshi, Yutaka; and Kamegaya, Shigeru, 4,873,953, Cl. 123-308.000.
- Yokoyama, Tetsuo: See—
Maeda, Akira; Sano, Koichi; Yokoyama, Tetsuo; Koizumi, Hideaki; and Mizuno, Hirotaka, 4,875,012, Cl. 324-309.000.
- Yoneda, Takao: See—
Asano, Hiroaki; Tsujiuchi, Toshio; Yoneda, Takao; Ishihara, Nobuhiro; Maruyama, Toshio; and Ohta, Norio, 4,873,793, Cl. 51-165.710.
- Yoneda, Yasuji: See—
Nishimoto, Yoshiro; Yoneda, Yasuji; Imaoka, Shinichi; Nakai, Yasuhide; Nakae, Akimitsu; Onishi, Yoshihiko; Tachibana, Hiroyuki; Inoue, Takayoshi; Kusaka, Takuya; Takamatsu, Hiroyuki; Tojyo, Shigeki; Kajikawa, Hiroshi; and Nishimura, Kozo, 4,874,939, Cl. 250-211.00J.
- Yonemoto, Kazuya; Kagawa, Yoshiaki; Ishikawa, Kikue; Suzuki, Tomoyuki; and Hamasaki, Masaharu, to Sony Corporation. Electronic shutter for a CCD image sensor, 4,875,100, Cl. 358-213.190.
- Yonezawa, Eiichi: See—
Ohsawa, Masahiro; and Yonezawa, Eiichi, 4,874,976, Cl. 310-268.000.
- Yong, Bak G.; Petra, Barth; Dietrich, Demus; Detlev, Joachim; Kampa, Barbara; Kohler, Saskia; Mohr, Kristine; Paschke, Reinhard; Pelzl, Gerhard; Rosenfeld, Ulrich; Schafer, Wolfgang; Scherf, Klaus-Dieter; Tschirake, Carsten; Weissflog, Wolfgang; and Zschke, Horst, to VEB Werk fuer Fernsehelektronik im VEB Kombinat Mikroelektronik. Ferroelectric liquid crystals, 4,874,544, Cl. 252-299.610.
- Yoo, Hideo: See—
Bisaji, Takashi; Sawayama, Noboru; and Yoo, Hideo, 4,875,079, Cl. 355-246.000.
- Yoshida, Hidemi: See—
Hase, Takashi; and Yoshida, Hidemi, 4,874,985, Cl. 313-487.000.
- Yoshida, Katumi: See—
Yamamoto, Hiroshi; Yoshida, Shigeru; and Yoshida, Katumi, 4,874,233, Cl. 350-429.000.
- Yoshida Kogyo K. K.: See—
Kasai, Tomoaki; and Sekiguchi, Seizo, 4,873,847, Cl. 68-178.000.
- Yoshida, Naoyuki; Kitano, Kisei; and Ogawa, Tetsuya, to Chisso Corporation. Phenylpyrimidinecarboxylate derivative, 4,874,546, Cl. 252-299.610.
- Yoshida, Shigeru: See—
Yamamoto, Hiroshi; Yoshida, Shigeru; and Yoshida, Katumi, 4,874,233, Cl. 350-429.000.
- Yoshida, Tetsushi, to Casio Computer Co., Ltd. Liquid crystal composition, 4,874,543, Cl. 252-299.610.
- Yoshida, Tomoaki: See—
Tanagawa, Kouji; and Yoshida, Tomoaki, 4,875,156, Cl. 364-200.000.
- Yoshida, Yasuharu, to NEC Corporation. Automatic level control circuit for an ad convertor, 4,875,049, Cl. 341-159.000.
- Yoshie, Yasumasa: See—
Kobayashi, Setsuo; Nakazawa, Tsugio; Yoshie, Yasumasa; Abiko, Yasushi; and Kameda, Kinya, 4,874,772, Cl. 514-341.000.
- Yoshikawa, Masao: See—
Suzuki, Tetsuro; Yoshikawa, Masao; and Kojima, Akio, 4,874,481, Cl. 204-59.00R.
- Yoshikumi, Chikao; Ohmura, Yoshio; Hirose, Fumio; Ikuzawa, Masanori; Matsunaga, Kenichi; Fujii, Takayoshi; Ohhara, Minoru; and Ando, Takao, to Kureha Kagaku Kogyo Kabushiki Kaisha. Pharmaceutical composition containing a derivative of para-amino-benzoic acid as an active ingredient, 4,874,750, Cl. 514-42.000.
- Yoshimoto, Yuichiro: See—
Igarashi, Takao; Sugawara, Satoshi; Yoshimoto, Yuichiro; Saito, Shozo; Fukumoto, Takashi; Endo, Zenichiro; and Shinbo, Katsutoshi, 4,874,574, Cl. 376-333.000.
- Yoshitomi Pharmaceutical Industries, Ltd.: See—
Tahara, Tetsuya; Ikebe, Tsuguo; Hakamada, Ichiro; and Yaoka, Osamu, 4,874,759, Cl. 514-232.500.
- Yotsutani, Akio: See—
Hara, Toshihiro; Yotsutani, Akio; Kawasaki, Ryoji; Tate, Kazuyuki; Huse, Syoji; and Ono, Koji, 4,875,231, Cl. 379-61.000.
- Young, Lawrence R.: See—
McCann, James D.; Young, Lawrence R.; and Brandon, John M., 4,875,055, Cl. 346-75.000.
- Younger, Thomas L., to Data Card Corporation. Smart card apparatus and method of programming same, 4,874,935, Cl. 235-492.000.
- Yousefeyeh, Raymond; Chakraborty, Utpal; Magnien, Ernest; Desai, Rohit; and Lee, Thomas D-Y, to Rorer Pharmaceutical Corporation. Quinoliny ether or thioether tetrazoles as agents for the treatment of hypersensitive ailments, 4,874,769, Cl. 514-314.070.
- Yu, Kuang-Shih. Socket assembly, 4,874,329, Cl. 439-409.000.
- Yuen, Raymond C.: See—
Coy, Bruce H.; and Yuen, Raymond C., 4,874,970, Cl. 307-475.000.
- Yueng, Edward S.: See—
Synovec, Robert E.; and Yueng, Edward S., 4,875,169, Cl. 364-497.000.
- Yukimoto, Koji: See—
Kobayashi, Osamu; Yukimoto, Koji; and Mikami, Mitsugu, 4,874,347, Cl. 453-5.000.
- Yurchenco, James R.: See—
Grosz III, Charles T.; Seipp III, Edwin A.; Sun, Rickson; and Yurchenco, James R., 4,874,186, Cl. 281-28.000.
- Yurtin, John A.: See—
Bensing, Gregory L.; Gladd, Joseph H.; and Yurtin, John A., 4,874,325, Cl. 439-272.000.
- Zachrei, Jurgen: See—
Wagner, Hans; and Zachrei, Jurgen, 4,874,321, Cl. 439-119.000.

- Zallie, James P.: See—
Eden, James L.; Kasica, James J.; and Zallie, James P., 4,874,628, Cl. 426-578.000.
- Zalut, Gregory J. Tamper evident cap, 4,874,101, Cl. 215-251.000.
- Zart, Robert C.: See—
Stierman, Roger J.; McCauley, Archie N.; and Zart, Robert C., 4,874,476, Cl. 204-15.000.
- Zaschke, Horst: See—
Yong, Bak G.; Petra, Barth; Dietrich, Demus; Detlev, Joachim; Kampa, Barbara; Kohler, Saskia; Mohr, Kristine; Paschke, Reinhard; Pelzl, Gerhard; Rosenfeld, Ulrich; Schafer, Wolfgang; Scherf, Klaus-Dieter; Tschirake, Carsten; Weissflog, Wolfgang; and Zschke, Horst, 4,874,544, Cl. 252-299.610.
- Zazzetta, Alessandro: See—
Agostini, Enrico; Cusiro, Sergio; and Zazzetta, Alessandro, 4,874,821, Cl. 525-271.000.
- Zdeb, Brian; Pearson, Steve; and Slater, Glenn L., to Baxter International Inc. Housing enabling passive mixing of a beneficial agent with a diluent, 4,874,366, Cl. 604-56.000.
- Zech, Ronald G., to Ektelon. String clamp for racquet stringing machine, 4,874,170, Cl. 273-73.00A.
- Zeisberg, Peter: See—
Frenzel, Bertram; Grenzendorfer, Dietmar; Kemter, Heinz; Wunsch, Wolfgang; and Zeisberg, Peter, 4,873,844, Cl. 66-84.00A.
- Zeman, Gerhard: See—
Bankhamer, Vinzenz; and Zeman, Gerhard, 4,874,441, Cl. 149-42.000.
- Zenith Electronics Corporation: See—
Grimm, Frank W., 4,873,764, Cl. 29-830.000.
- Zhang, Zhi-Dong: See—
Fife, Wilmer K.; and Zhang, Zhi-Dong, 4,874,558, Cl. 562-894.000.
- Zhitnikov, Valery K.: See—
Dzjuban, Vitaly S.; Sazhin, Alexandr D.; Zhitnikov, Valery K.; and Konoplyanko, Anatoly I., 4,875,040, Cl. 340-825.060.
- Ziauddin, Habeeb M.: See—
Matthews, Bernard T.; Joll, David J.; and Ziauddin, Habeeb M., 4,874,623, Cl. 426-272.000.
- Ziegler, Horst; and Behlen, Horst, to W. C. Heraeus GmbH. Electronic thermometer, 4,874,252, Cl. 374-117.000.
- Ziegler, James T., to Novation Design Ltd. Folding polygonal toy construction element, 4,874,341, Cl. 446-109.000.
- Zielasek, Adelbert: See—
Grobecker, Hermann; Heber, Werner; Zielasek, Adelbert; and Nusselder, Frederik B., 4,874,085, Cl. 206-309.000.
- Zimbone, Paul J., to Acushnet Company. Encapsulated spring assembly for reclining furniture, 4,874,154, Cl. 267-140.400.
- Zylman, Bill E.: See—
Edelen, Stephen A.; Allen, David T.; and Zylman, Bill E., 4,873,881, Cl. 74-336.00R.

LIST OF REISSUE PATENTEEES

TO WHOM

PATENTS WERE ISSUED ON THE 17TH DAY OF OCTOBER, 1989

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

- Aluminum Company of America: See—
Sanders, Robert E., Jr.; and Petit, Jocelyn I., Re. 33,092, Cl. 148-12.70A.
- Berguer, Ramon, to Lunax Corporation. Isothermic protective boot. Re. 33,090, Cl. 36-9.00R.
- Gancy, Alan B. Magnesium calcium acetate products, and process for their manufacture. Re. 33,095, Cl. 252-70.000.
- Helitune Limited: See—
Moir, Christopher I., Re. 33,097, Cl. 250-561.000.
- Hitachi, Ltd.: See—
Maruyama, Eiichi; Ishioka, Sachio; Imamura, Yoshinori; Matsubara, Hirokazu; Shimomoto, Yasuharu; Horigome, Shinkichi; and Taniguchi, Yoshio, Re. 33,094, Cl. 430-57.000.
- Horigome, Shinkichi: See—
Maruyama, Eiichi; Ishioka, Sachio; Imamura, Yoshinori; Matsubara, Hirokazu; Shimomoto, Yasuharu; Horigome, Shinkichi; and Taniguchi, Yoshio, Re. 33,094, Cl. 430-57.000.
- Imamura, Yoshinori: See—
Maruyama, Eiichi; Ishioka, Sachio; Imamura, Yoshinori; Matsubara, Hirokazu; Shimomoto, Yasuharu; Horigome, Shinkichi; and Taniguchi, Yoshio, Re. 33,094, Cl. 430-57.000.
- Ishioka, Sachio: See—
Maruyama, Eiichi; Ishioka, Sachio; Imamura, Yoshinori; Matsubara, Hirokazu; Shimomoto, Yasuharu; Horigome, Shinkichi; and Taniguchi, Yoshio, Re. 33,094, Cl. 430-57.000.
- Iwamatsu, Seiichi, to Seiko Epson Corporation. Semiconductor substrate. Re. 33,096, Cl. 428-156.000.
- Johnson & Johnson Consumer Products, Inc.: See—
Schiraldi, Michael T.; Perl, Martin M.; and Rubin, Howard, Re. 33,093, Cl. 424-676.000.
- Lunax Corporation: See—
Berguer, Ramon, Re. 33,090, Cl. 36-9.00R.
- Maruyama, Eiichi; Ishioka, Sachio; Imamura, Yoshinori; Matsubara, Hirokazu; Shimomoto, Yasuharu; Horigome, Shinkichi; and Taniguchi, Yoshio, Re. 33,094, Cl. 430-57.000.
- chi, Yoshio, to Hitachi, Ltd. Electrophotographic member with alpha-si layers. Re. 33,094, Cl. 430-57.000.
- Matsubara, Hirokazu: See—
Maruyama, Eiichi; Ishioka, Sachio; Imamura, Yoshinori; Matsubara, Hirokazu; Shimomoto, Yasuharu; Horigome, Shinkichi; and Taniguchi, Yoshio, Re. 33,094, Cl. 430-57.000.
- Moir, Christopher I., to Helitune Limited. Position detector. Re. 33,097, Cl. 250-561.000.
- Perl, Martin M.: See—
Schiraldi, Michael T.; Perl, Martin M.; and Rubin, Howard, Re. 33,093, Cl. 424-676.000.
- Petit, Jocelyn I.: See—
Sanders, Robert E., Jr.; and Petit, Jocelyn I., Re. 33,092, Cl. 148-12.70A.
- Rubin, Howard: See—
Schiraldi, Michael T.; Perl, Martin M.; and Rubin, Howard, Re. 33,093, Cl. 424-676.000.
- Sanders, Robert E., Jr.; and Petit, Jocelyn I., to Aluminum Company of America. High strength weldable aluminum base alloy product and method of making same. Re. 33,092, Cl. 148-12.70A.
- Schiraldi, Michael T.; Perl, Martin M.; and Rubin, Howard, to Johnson & Johnson Consumer Products, Inc. Bioadhesive extruded film for intra-oral drug delivery and process. Re. 33,093, Cl. 424-676.000.
- Schlusser, Erich J., to Weber-Stephen Products Co. Ash disposal damper for barbecue kettle. Re. 33,091, Cl. 126-9.00B.
- Seiko Epson Corporation: See—
Iwamatsu, Seiichi, Re. 33,096, Cl. 428-156.000.
- Shimomoto, Yasuharu: See—
Maruyama, Eiichi; Ishioka, Sachio; Imamura, Yoshinori; Matsubara, Hirokazu; Shimomoto, Yasuharu; Horigome, Shinkichi; and Taniguchi, Yoshio, Re. 33,094, Cl. 430-57.000.
- Taniguchi, Yoshio: See—
Maruyama, Eiichi; Ishioka, Sachio; Imamura, Yoshinori; Matsubara, Hirokazu; Shimomoto, Yasuharu; Horigome, Shinkichi; and Taniguchi, Yoshio, Re. 33,094, Cl. 430-57.000.
- Weber-Stephen Products Co.: See—
Schlusser, Erich J., Re. 33,091, Cl. 126-9.00B.

LIST OF REEXAMINATION PATENTEEES

TO WHOM

CERTIFICATES WERE ISSUED

- Bonner, William F.: See—
Brouns, Richard A.; Buel, James L.; and Bonner, William F., B1 4,376,598, Cl. 405-258.000.
- Brouns, Richard A.; Buel, James L.; and Bonner, William F., to United States of America. Energy. In-situ vitrification of soil. B1 4,376,598, 10-17-89, Cl. 405-258.000.
- Buel, James L.: See—
Brouns, Richard A.; Buel, James L.; and Bonner, William F., B1 4,376,598, Cl. 405-258.000.
- Gruener, Heiko, to Plasmainvent AG. Vacuum plasma coating apparatus. B1 4,596,718, 10-17-89, Cl. 427-34.000.
- Ichinomiya, Yoshiaki: See—
Takenouchi, Tomoo; Ichinomiya, Yoshiaki; and Iwanami, Yoshiyuki, B1 4,617,052, Cl. 420-129.000.
- Iwanami, Yoshiyuki: See—
Takenouchi, Tomoo; Ichinomiya, Yoshiaki; and Iwanami, Yoshiyuki, B1 4,617,052, Cl. 420-129.000.
- Plasmainvent AG: See—
Gruener, Heiko, B1 4,596,718, Cl. 427-34.000.
- Scott Paper Co.: See—
Urion, Kenard E., B1 8,273,843, Cl. D9-339.000.
- Takenouchi, Tomoo; Ichinomiya, Yoshiaki; and Iwanami, Yoshiyuki. Process for preparing a mother alloy for making amorphous metal. B1 4,617,052, 10-17-89, Cl. 420-129.000.
- United States of America Energy: See—
Brouns, Richard A.; Buel, James L.; and Bonner, William F., B1 4,376,598, Cl. 405-258.000.
- Urion, Kenard E., to Scott Paper Co. Container body. B1 8,273,843, 10-17-89, Cl. D9-339.000.

LIST OF DESIGN PATENTEEES

- Acoustics Development Corporation: See—
Nichols, John W.; and Van Pinkerton, Stevens, Jr., 304,002, Cl. D6-421.000.
- Nichols, John W.; and Van Pinkerton, Stevens, Jr., 304,006, Cl. D6-553.000.
- Albion Cosmetics Co., Ltd.: See—
Desgrappes, Joel, 304,098, Cl. D28-78.000.
- American Home Products Corporation: See—
McAllister, Tom A.; McAllister, John S.; and Bonnar, William R., 304,105, Cl. D32-21.000.
- American Telephone and Telegraph Company: See—
Fine, Irwin M.; and Harms, David A., 304,032, Cl. D14-113.000.
- Ashton, Kim J.: See—
Lakhan, Hareesh C.; Switala, Lawrence W.; and Ashton, Kim J., 304,102, Cl. D32-1.000.
- AT&T Information Systems Inc.: See—
Fine, Irwin M.; and Harms, David A., 304,032, Cl. D14-113.000.
- Atlanta Motoring Accessories, Inc.: See—
Snook, Phillip J.; and Golley, Frank B., 304,118, Cl. D34-31.000.
- Avia Group International, Inc.: See—
Feller, Craig L., 303,996, Cl. D2-320.000.
- Azzolina, Albert. Armoire. 304,003, 10-17-89, Cl. D6-446.000.
- Azzolina, Albert. Armoire. 304,004, 10-17-89, Cl. D6-446.000.
- Badge-A-Minit, Ltd.: See—
Munson, Austin H.; and Bullis, Daniel R., Jr., 304,035, Cl. D15-122.000.
- Bakic, Karena, to Cosmede Anstalt. Cosmetic case. 304,099, 10-17-89, Cl. D28-83.000.
- Barrett, Ronnie G. Semi-automatic rifle. 304,062, 10-17-89, Cl. D22-103.000.
- Bates, Kenneth R. Fishing lure. 304,066, 10-17-89, Cl. D22-129.000.
- Baynes, John M.: See—
Meeker, Marlene F.; and Baynes, John M., 304,041, Cl. D21-20.000.
- Bennett, Robert A., to R. J. S. Industries, Inc. Disposable cosmetic applicator and container thereof. 304,094, 10-17-89, Cl. D28-7.000.
- Bettes, Peter D., to Micro-Shuttle Australia Pty. Ltd. Cart for use as stand or work station table. 304,112, 10-17-89, Cl. D34-21.000.
- Bolvary, Kim T., to Bolvary, Kim Tibor. Canopy for a motor vehicle. 304,025, 10-17-89, Cl. D12-156.000.
- Bolvary, Kim Tibor: See—
Bolvary, Kim T., 304,025, Cl. D12-156.000.
- Bonnar, William R.: See—
McAllister, Tom A.; McAllister, John S.; and Bonnar, William R., 304,105, Cl. D32-21.000.
- Bonori, Giampiero, to Joren Marketing Ltd. Razor or similar article. 304,097, 10-17-89, Cl. D28-46.000.
- Brown, Ronald N. Belt attached umpire hand protector. 304,100, 10-17-89, Cl. D29-20.000.
- Buchanan, Larry W.; and Gargarella, Ray A., to Buckhorn Material Handling Group, Inc. Lidded storage bin. 304,120, 10-17-89, Cl. D34-40.000.
- Buckhorn Material Handling Group, Inc.: See—
Buchanan, Larry W.; and Gargarella, Ray A., 304,120, Cl. D34-40.000.
- Bullis, Daniel R., Jr.: See—
Munson, Austin H.; and Bullis, Daniel R., Jr., 304,035, Cl. D15-122.000.
- Bureau of Engraving, Inc.: See—
Thul, James L., 304,040, Cl. D20-22.000.
- Busalt, Gerhard; and Stutzer, Franz A., to Rowenta-Werke GmbH. Cordless vacuum cleaner. 304,104, 10-17-89, Cl. D32-18.000.
- Carlson, Robert B.; and Wucherpfenning, Fredrick D., to Toro Company, The. Shoulder and arm exercise machine. 304,058, 10-17-89, Cl. D21-195.000.
- Carrello, John P., to Lamson & Sessions Co., The. Combined motion sensor and mounting for adjustable flood lights. 304,019, 10-17-89, Cl. D10-106.000.
- Cernansky, Joseph S.: See—
Rudell, Elliot A.; and Cernansky, Joseph S., 304,044, Cl. D21-114.000.
- Chuan, Tsai G. Barbecue grill. 304,010, 10-17-89, Cl. D7-332.000.
- Cohn, Robert J., to InterMetro Industries Corporation. Top shelf for a modular cart. 304,115, 10-17-89, Cl. D34-27.000.
- Cooper, Timothy H. Exercise rod. 304,057, 10-17-89, Cl. D21-191.000.
- Corkins, Delbert J.: See—
Kelley, David A.; Corkins, Delbert J.; and Hileman, Robert S., 304,088, Cl. D26-24.000.
- Cosmede Anstalt: See—
Bakic, Karena, 304,099, Cl. D28-83.000.
- Cowan, Murray L., to Textron, Inc. Expansion bracelet. 304,020, 10-17-89, Cl. D11-25.000.
- Cramer, Ronald G., to S. C. Johnson & Son, Inc. Bottle. 304,015, 10-17-89, Cl. D9-389.000.
- Dameron, Roger S. Nursing shawl. 303,995, 10-17-89, Cl. D2-225.000.
- Freese, Lawrence O., 304,048, Cl. D21-109.000.
- David, Mark A. Ice chest carrier. 304,114, 10-17-89, Cl. D34-24.000.
- Davis, John R. Cup holder with slot for cup handle. 304,007, 10-17-89, Cl. D7-70.000.
- Davis, Sydney V., to Ve-Alite Plastic Corporation. Carrying case. 303,998, 10-17-89, Cl. D3-73.000.
- Decra-Stone, Inc.: See—
Gabayno, Liwayway J., 304,121, Cl. D34-42.000.
- Desgrappes, Joel, to Albion Cosmetics Co., Ltd. Compact. 304,098, 10-17-89, Cl. D28-78.000.
- Dickens, Jacqueline B. Finger puppet. 304,050, 10-17-89, Cl. D21-153.000.
- Dickens, Jacqueline B. Finger puppet. 304,051, 10-17-89, Cl. D21-153.000.
- Dickens, Jacqueline B. Finger puppet. 304,052, 10-17-89, Cl. D21-153.000.
- Dickens, Jacqueline B. Finger puppet. 304,053, 10-17-89, Cl. D21-153.000.
- Dideriksen, Erling T., to Interlego A.G. Toy rotor element. 304,047, 10-17-89, Cl. D21-108.000.
- Dobson, Michael J.; Kelley, James P.; and Wilcutt, Michael E. Cleaning tool for ceiling fan blades. 304,106, 10-17-89, Cl. D32-40.000.
- Down Under Orphans Pty. Limited: See—
Neville, Henry, 304,055, Cl. D21-159.000.
- Eada, Stephen R. Fence runner. 304,086, 10-17-89, Cl. D8-1.000.
- Eckstedt, Paul D.; and Whitmire, Thomas W., to FMC Corporation. Aircraft deicer vehicle. 304,024, 10-17-89, Cl. D12-14.000.
- Ecolab Inc.: See—
Lakhan, Hareesh C.; Switala, Lawrence W.; and Ashton, Kim J., 304,102, Cl. D32-1.000.
- Elite S.R.I.: See—
Nithardt, Roland, 304,096, Cl. D28-12.000.
- Fee Tat Plastic Factory Limited: See—
Wan, Yiu C. A., 304,089, Cl. D26-42.000.
- Wan, Yiu C. A., 304,090, Cl. D26-42.000.
- Feller, Craig L., to Avia Group International, Inc. Shoe sole. 303,996, 10-17-89, Cl. D2-320.000.
- Film Applicators of North America: See—
Seraphin, Joseph A.; and Talbot, James E., 304,011, Cl. D8-29.100.
- Fine, Irwin M.; and Harms, David A., to American Telephone and Telegraph Company; and AT&T Information Systems Inc. Computer display. 304,032, 10-17-89, Cl. D14-113.000.
- FMC Corporation: See—
Eckstedt, Paul D.; and Whitmire, Thomas W., 304,024, Cl. D12-14.000.
- Forbes, Hampton H., Jr., to Westvaco Corporation. Tub for packaging food or the like. 304,016, 10-17-89, Cl. D9-425.000.
- Fratelli Guzzini S.p.A.: See—
Geochelin, Bruno, 304,009, Cl. D7-103.000.
- Freese, Lawrence O., to Dart Industries Inc. Toy ramp or the like. 304,048, 10-17-89, Cl. D21-109.000.
- Fuller, Dennis E. Lock illuminator. 304,091, 10-17-89, Cl. D26-72.000.
- Gabayno, Liwayway J., to Decra-Stone, Inc. Bowl. 304,121, 10-17-89, Cl. D34-42.000.
- Gargarella, Ray A.: See—
Buchanan, Larry W.; and Gargarella, Ray A., 304,120, Cl. D34-40.000.
- Gavin, Ellen, to L'Oreal S.A. Mascara applicator container. 304,095, 10-17-89, Cl. D28-7.000.
- Geochelin, Bruno, to Fratelli Guzzini S.p.A. Whisk for the preparation of cakes, pies and the like. 304,009, 10-17-89, Cl. D7-103.000.
- Geisler, Udo M., to OSRAM Gesellschaft mit beschränkter Haftung. Slide viewer. 304,037, 10-17-89, Cl. D16-229.000.
- Glassman, Fredrick R. Light fixture. 304,092, 10-17-89, Cl. D26-85.000.
- Golley, Frank B.: See—
Snook, Phillip J.; and Golley, Frank B., 304,118, Cl. D34-31.000.
- Goodner, Donna E.; and Naderi, Jamahid, to Hand Held Products, Inc. Battery pack for electronic bar code reader. 304,026, 10-17-89, Cl. D13-8.000.
- Groffillex, Raymond. Armchair. 304,001, 10-17-89, Cl. D6-379.000.
- Grossiord, Claude, to S. T. Dupont. Key-ring. 303,997, 10-17-89, Cl. D3-61.000.
- Hand Held Products, Inc.: See—
Goodner, Donna E.; and Naderi, Jamahid, 304,026, Cl. D13-8.000.
- Haniff, Paul H., to Sage Products, Inc. Disposal container for sharp articles or the like. 304,109, 10-17-89, Cl. D34-7.000.
- Haniff, Paul H.: See—
Lee & Smith; Haniff, Paul H.; and Newton, John J., Jr., 304,080, Cl. D24-54.000.
- Hans Grohe GmbH & Co. KG: See—
Haug, Andreas; and Schonherr, Thomas, 304,069, Cl. D23-243.000.
- Haug, Andreas; and Schonherr, Thomas, 304,071, Cl. D23-250.000.
- Hansson, Maria. Combined earring display and storage case. 303,999, 10-17-89, Cl. D3-75.000.
- Harding, George W., to Poly-John Enterprises Corp. Outdoor toilet cabana. 304,082, 10-17-89, Cl. D25-16.000.
- Harms, David A.: See—
Fine, Irwin M.; and Harms, David A., 304,032, Cl. D14-113.000.
- Hasegawa, Saburo. Wire puzzle. 304,045, 10-17-89, Cl. D21-106.000.
- Haug, Andreas; and Schonherr, Thomas, to Hans Grohe GmbH & Co. KG. Faucet handle. 304,069, 10-17-89, Cl. D23-243.000.
- Haug, Andreas; and Schonherr, Thomas, to Hans Grohe GmbH & Co. KG. Faucet handle. 304,071, 10-17-89, Cl. D23-250.000.
- Haynes, Robert E., to Lew Childre & Sons, Inc. Fishing reel. 304,065, 10-17-89, Cl. D22-141.000.
- Henderson, Robert D.; and Poore, Robert L., Jr. Railroad warning sign. 304,039, 10-17-89, Cl. D20-10.000.

- Herbst, Walter B., to Thomas Industries, Inc. Combined spray gun and closure cap. 304,068, 10-17-89, Cl. D23-226.000.
 Hikoma Mfg. Co., Ltd.: See—
 Kishi, Mitsuhiro, 304,117, Cl. D34-28.000.
 Hileman, Robert S.: See—
 Kelley, David A.; Corkins, Delbert J.; and Hileman, Robert S., 304,088, Cl. D26-24.000.
 Hirose Electric Co., Ltd.: See—
 Matsuzaki, Shuichi, 304,027, Cl. D13-24.000.
 Matsuzaki, Shuichi, 304,028, Cl. D13-24.000.
 Matsuzaki, Shuichi, 304,029, Cl. D13-24.000.
 Hockney, Philip K., to Hockney Pty. Limited. Extrusion for use in the construction of a floor of a motor lorry. 304,085, 10-17-89, Cl. D25-119.000.
 Hockney Pty. Limited: See—
 Hockney, Philip K., 304,085, Cl. D25-119.000.
 Holter, Alfred. Lamp. 304,093, 10-17-89, Cl. D26-94.000.
 Hong, Moon H. Pyramid ball goal post. 304,059, 10-17-89, Cl. D21-33.000.
 Hornung, John. Lunch box. 304,008, 10-17-89, Cl. D7-76.000.
 Hughes, Richard E. Shut-off valve for specialty gases. 304,070, 10-17-89, Cl. D23-245.000.
 Hunt, Devlin: See—
 Raiter, Leon; Mor, John; and Hunt, Devlin, 304,061, Cl. D21-230.000.
 Iacovelli, Marc R., to Rally Accessories, Inc. Roll top coin holder for an automobile dash. 304,124, 10-17-89, Cl. D99-34.000.
 Ikeda, Hideyuki; and Saito, Shigeru, to Mitsubishi Denki Kabushiki Kaisha. Housing for a ceiling mounted air conditioner. 304,073, 10-17-89, Cl. D23-351.000.
 Interlego A.G.: See—
 Diderksen, Erling T., 304,047, Cl. D21-108.000.
 Knudsen, Jens N., 304,046, Cl. D21-108.000.
 Poulsen, Ole V., 304,042, Cl. D21-91.000.
 Tapdrup, Erik P., 304,043, Cl. D21-91.000.
 InterMetro Industries Corporation: See—
 Cohn, Robert J., 304,115, Cl. D34-27.000.
 Welch, Robert J., 304,075, Cl. D24-1.100.
 Itakura, Yoshitomo: See—
 Nishiyama, Kenji; Takahashi, Hanji; and Itakura, Yoshitomo, 304,031, Cl. D14-121.000.
 Janson, David. Desk set. 304,038, 10-17-89, Cl. D19-82.000.
 Jenne, James F., to Wenger Corporation. Band shell. 304,083, 10-17-89, Cl. D25-58.000.
 Jensen, Ronald P. Optical zone marker. 304,078, 10-17-89, Cl. D24-26.000.
 John Manufacturing Limited: See—
 Yuen, John S., 304,064, Cl. D22-120.000.
 Joren Marketing Ltd.: See—
 Bonori, Giampiero, 304,097, Cl. D28-46.000.
 Jun, Seo Y. Ventilating cover for container. 304,116, 10-17-89, Cl. D34-28.000.
 Kabushiki Kaisha Murakoshi Seiko: See—
 Masuda, Yoshinori, 304,012, Cl. D8-323.000.
 Kabushiki Kaisha Toshiba: See—
 Nagaoka, Sinzi, 304,034, Cl. D14-231.000.
 Kappler, Michael: See—
 Forembaki, Horst; and Kappler, Michael, 304,087, Cl. D26-3.000.
 Kelley, David A.; Corkins, Delbert J.; and Hileman, Robert S., to Progressive Dynamics, Inc. Door operated convenience light for storage areas. 304,088, 10-17-89, Cl. D26-24.000.
 Kelley, James P.: See—
 Dobson, Michael J.; Kelley, James P.; and Wilcutt, Michael E., 304,106, Cl. D32-40.000.
 Kishi, Mitsuhiro, to Hikoma Mfg. Co., Ltd. Elevating working platform. 304,117, 10-17-89, Cl. D34-28.000.
 Knudsen, Jens N., to Interlego A.G. Externally curved toy wall element. 304,046, 10-17-89, Cl. D21-108.000.
 Kohler Co.: See—
 Reid, Mary J., 304,005, Cl. D6-497.000.
 Lakhani, Hareesh C.; Switala, Lawrence W.; and Ashton, Kim J., to Ecobal Inc. Solid detergent dispenser. 304,102, 10-17-89, Cl. D32-1.000.
 Lambert Corporation: See—
 Ruhl, Walter F.; Steed, Jeffrey A.; and Weaver, James M., 304,103, Cl. D32-15.000.
 Lamson & Sessions Co., The: See—
 Carsello, John P., 304,019, Cl. D10-106.000.
 Lange, Mark R. Combined shirt pocket cuspidor and ashtray or similar article. 304,108, 10-17-89, Cl. D34-2.000.
 Lee, Fu-Kuei. Toy water gun with extensible nozzle. 304,049, 10-17-89, Cl. D21-147.000.
 Lee & Smith, Haniff, Paul H.; and Newton, John J., Jr., to Sage Products, Inc. Urine collector attachment pad. 304,080, 10-17-89, Cl. D24-54.000.
 Lew Childre & Sons, Inc.: See—
 Haynes, Robert E., 304,065, Cl. D22-141.000.
 Lights Of America, Inc.: See—
 Vakili, Usman U., 304,030, Cl. D13-25.000.
 L'Oreal S.A.: See—
 Gavin, Ellen, 304,095, Cl. D28-7.000.
 Lyall, Gordon M.; and McCarron, Philip F., to Simpson-Laurence Limited. Marine windlass. 304,119, 10-17-89, Cl. D34-33.000.
 Mango, Joseph R., to World Dryer Division of Specialty Equipment Companies, Inc. Hand dryer. 304,101, 10-17-89, Cl. D28-54.100.

- Masuda, Yoshinori, to Kabushiki Kaisha Murakoshi Seiko. Hinge. 304,012, 10-17-89, Cl. D8-323.000.
 Matsushita Electric Industrial Co., Ltd.: See—
 Nishiyama, Kenji; Takahashi, Hanji; and Itakura, Yoshitomo, 304,031, Cl. D14-121.000.
 Matsuzaki, Shuichi, to Hirose Electric Co., Ltd. Electrical connector plug. 304,027, 10-17-89, Cl. D13-24.000.
 Matsuzaki, Shuichi, to Hirose Electric Co., Ltd. Electrical connector plug. 304,028, 10-17-89, Cl. D13-24.000.
 Matsuzaki, Shuichi, to Hirose Electric Co., Ltd. Electrical connector plug. 304,029, 10-17-89, Cl. D13-24.000.
 McAllister, John S.: See—
 McAllister, Tom A.; McAllister, John S.; and Bonnar, William R., 304,105, Cl. D32-21.000.
 McAllister, Tom A.; McAllister, John S.; and Bonnar, William R., to American Home Products Corporation. Spray-type, vacuum cleaner. 304,105, 10-17-89, Cl. D32-21.000.
 McCarron, Philip F.: See—
 Lyall, Gordon M.; and McCarron, Philip F., 304,119, Cl. D34-33.000.
 McCue, Sam V. Wedge clamp housing for a downrigger fishing assembly. 304,013, 10-17-89, Cl. D8-396.000.
 McFarlane, Richard H., to Taut, Inc. Flashback structure for a catheter having a transparent cover. 304,079, 10-17-89, Cl. D24-54.000.
 Mead Corporation, The: See—
 Oliff, James R., 304,017, Cl. D9-433.000.
 Meeker, Marlene F.; and Baynes, John M. Game board. 304,041, 10-17-89, Cl. D21-20.000.
 Mehalick, Joseph. Refuse container cart. 304,111, 10-17-89, Cl. D34-18.000.
 Meng, Kenneth H. Ladder caddy. 304,084, 10-17-89, Cl. D25-68.000.
 Micro-Shuttle Australia Pty. Ltd.: See—
 Bettess, Peter D., 304,112, Cl. D34-21.000.
 Minami, Hiroo, to Yoshida Kogyo K.K. Fastener. 304,023, 10-17-89, Cl. D11-221.000.
 Minnesota Mining and Manufacturing Company: See—
 Pospisil, Jirina V., 304,077, Cl. D24-16.000.
 Mitsubishi Denki Kabushiki Kaisha: See—
 Ikeda, Hideyuki; and Saito, Shigeru, 304,073, Cl. D23-351.000.
 Miyamoto, Michikazu, to SMC Corporation. Fluidic power actuator. 304,036, 10-17-89, Cl. D15-199.000.
 Mor, John: See—
 Raiter, Leon; Mor, John; and Hunt, Devlin, 304,061, Cl. D21-230.000.
 Moroney, John W., to Superior Fireplace Company. Suspended fireplace grate. 304,074, 10-17-89, Cl. D23-398.000.
 Munson, Austin H.; and Bullis, Daniel R., Jr., to Badge-A-Minit, Ltd. Badge making machine. 304,035, 10-17-89, Cl. D15-122.000.
 Naderi, Jamshid: See—
 Goodner, Donna E.; and Naderi, Jamshid, 304,026, Cl. D13-8.000.
 Nagaoka, Sinzi, to Kabushiki Kaisha Toshiba. Converter for a satellite receiving antenna. 304,034, 10-17-89, Cl. D14-231.000.
 Neville, Henry, to Down Under Orphans Pty. Limited. Toy animal. 304,055, 10-17-89, Cl. D21-159.000.
 New England AG Tech, Inc.: See—
 White, Morton, 304,022, Cl. D11-155.000.
 Newton, John J., Jr.: See—
 Lee & Smith, Haniff, Paul H.; and Newton, John J., Jr., 304,080, Cl. D24-54.000.
 Nichols, John W.; and Van Pinkerton, Stevens, Jr., to Acoustics Development Corporation. Telephone enclosure. 304,002, 10-17-89, Cl. D6-421.000.
 Nichols, John W.; and Van Pinkerton, Stevens, Jr., to Acoustics Development Corporation. Telephone enclosure. 304,006, 10-17-89, Cl. D6-553.000.
 Nishiyama, Kenji; Takahashi, Hanji; and Itakura, Yoshitomo, to Matsushita Electric Industrial Co., Ltd. Cassette for a video tape recorder. 304,031, 10-17-89, Cl. D14-121.000.
 Nithardt, Roland, to Elite S.R.I. Wall mounted hair dryer. 304,096, 10-17-89, Cl. D28-12.000.
 Noggle, Donald R. Dustpan. 304,107, 10-17-89, Cl. D32-74.000.
 Nomizu, Hidekatsu, to TWIN BIRD Industrial Company Limited. Alarm clock with voice recorder. 304,018, 10-17-89, Cl. D10-2.000.
 Novi, Inc.: See—
 Villanueva, Sergio E.; and Villanueva, Xavier R., 304,033, Cl. D14-224.000.
 O'Connell, Mark E., to Thomas Industries Inc. Paint container. 304,014, 10-17-89, Cl. D9-372.000.
 Oliff, James R., to Mead Corporation, The. Article carrier blank. 304,017, 10-17-89, Cl. D9-433.000.
 OSRAM Gesellschaft mit beschränkter Haftung: See—
 Geissler, Udo M., 304,037, Cl. D16-229.000.
 OSRAM GmbH: See—
 Forembaki, Horst; and Kappler, Michael, 304,087, Cl. D26-3.000.
 Poly-John Enterprises Corp.: See—
 Harding, George W., 304,082, Cl. D25-16.000.
 Pontbriand, Norman W., Jr., to United Technologies Corporation. Tote box. 304,122, 10-17-89, Cl. D34-43.000.
 Poore, Robert L., Jr.: See—
 Henderson, Robert D.; and Poore, Robert L., Jr., 304,039, Cl. D20-10.000.
 Forembaki, Horst; and Kappler, Michael, to OSRAM GmbH. Compact fluorescent lamp. 304,087, 10-17-89, Cl. D26-3.000.
 Pospisil, Jirina V., to Minnesota Mining and Manufacturing Company. Orthodontic bracket. 304,077, 10-17-89, Cl. D24-16.000.

- Poulsen, Ole V., to Interlego A.G. Profile element (rear) for a toy aircraft wing. 304,042, 10-17-89, Cl. D21-91.000.
 Primiano, Michael J. Water jet teeth cleaner. 304,076, 10-17-89, Cl. D24-15.000.
 Progressive Dynamics, Inc.: See—
 Kelley, David A.; Corkins, Delbert J.; and Hileman, Robert S., 304,088, Cl. D26-24.000.
 R. J. S. Industries, Inc.: See—
 Bennett, Robert A., 304,094, Cl. D28-7.000.
 Raiter, Leon; Mor, John; and Hunt, Devlin, to Ski-free Marine, Inc. Water ski handle. 304,061, 10-17-89, Cl. D21-230.000.
 Rally Accessories, Inc.: See—
 Iacovelli, Marc R., 304,124, Cl. D99-34.000.
 Reid, Mary J., to Kohler Co. Table leg. 304,005, 10-17-89, Cl. D6-497.000.
 Rowenta-Werke GmbH: See—
 Busalt, Gerhard; and Stutzer, Franz A., 304,104, Cl. D32-18.000.
 Rudell, Elliot A.; and Cernansky, Joseph S., to Rudell, Elliot A. Turning pictures playbox. 304,044, 10-17-89, Cl. D21-104.000.
 Ruhl, Walter F.; Steed, Jeffrey A.; and Weaver, James M., to Lambert Corporation. Vacuum-blower unit. 304,103, 10-17-89, Cl. D32-15.000.
 S. C. Johnson & Son, Inc.: See—
 Cramer, Ronald G., 304,015, Cl. D9-389.000.
 S. T. Dupont: See—
 Grossiord, Claude, 303,997, Cl. D3-61.000.
 Sage Products, Inc.: See—
 Haniff, Paul H., 304,109, Cl. D34-7.000.
 Lee & Smith, Haniff, Paul H.; and Newton, John J., Jr., 304,080, Cl. D24-54.000.
 Saito, Shigeru: See—
 Ikeda, Hideyuki; and Saito, Shigeru, 304,073, Cl. D23-351.000.
 Sanitation Equipment Limited: See—
 Stewart, John M., 304,072, Cl. D23-295.000.
 Schonherr, Thomas: See—
 Haug, Andreas; and Schonherr, Thomas, 304,069, Cl. D23-243.000.
 Haug, Andreas; and Schonherr, Thomas, 304,071, Cl. D23-250.000.
 Seifert, Jane P. Toy kitten figure. 304,056, 10-17-89, Cl. D21-163.000.
 Seraphin, Joseph A.; and Talbot, James E., to Film Applicators of North America. Heat gun. 304,011, 10-17-89, Cl. D8-29.100.
 Shives, Jeny: See—
 Shives, Robert; and Shives, Jeny, 304,021, Cl. D11-117.000.
 Shives, Robert; and Shives, Jeny. Simulated flower with inflated blossom. 304,021, 10-17-89, Cl. D11-117.000.
 Simpson-Laurence Limited: See—
 Lyall, Gordon M.; and McCarron, Philip F., 304,119, Cl. D34-33.000.
 Ski-free Marine, Inc.: See—
 Raiter, Leon; Mor, John; and Hunt, Devlin, 304,061, Cl. D21-230.000.
 SMC Corporation: See—
 Miyamoto, Michikazu, 304,036, Cl. D15-199.000.
 Smith, Malcolm P. Boat carrier. 304,113, 10-17-89, Cl. D34-24.000.
 Smith, Paul L. Golf putter head. 304,060, 10-17-89, Cl. D21-217.000.
 Snoke, Phillip J.; and Golley, Frank B., to Atlanta Motoring Accessories, Inc. Automobile hardtop storage rack. 304,118, 10-17-89, Cl. D34-31.000.
 South African Polymer Holdings (Proprietary), Limited: See—
 Warwick, Michael J., 304,123, Cl. D34-46.000.
 Steed, Jeffrey A.: See—
 Ruhl, Walter F.; Steed, Jeffrey A.; and Weaver, James M., 304,103, Cl. D32-15.000.
 Stewart, John M., to Sanitation Equipment Limited. Toilet. 304,072, 10-17-89, Cl. D23-295.000.
 Story, Carol A.: See—
 Story, Oscar R.; and Story, Carol A., 304,063, Cl. D22-117.000.
 Story, Oscar R.; and Story, Carol A. Self defense weapon or similar article. 304,063, 10-17-89, Cl. D22-117.000.
 Stutzer, Franz A.: See—
 Busalt, Gerhard; and Stutzer, Franz A., 304,104, Cl. D32-18.000.
 Superior Fireplace Company: See—
 Moroney, John W., 304,074, Cl. D23-398.000.
 Switala, Lawrence W.: See—
 Lakhani, Hareesh C.; Switala, Lawrence W.; and Ashton, Kim J., 304,102, Cl. D32-1.000.

- Takahashi, Hanji: See—
 Nishiyama, Kenji; Takahashi, Hanji; and Itakura, Yoshitomo, 304,031, Cl. D14-121.000.
 Talbot, James E.: See—
 Seraphin, Joseph A.; and Talbot, James E., 304,011, Cl. D8-29.100.
 Tapdrup, Erik P., to Interlego A.G. Wheel holder element for a toy aircraft. 304,043, 10-17-89, Cl. D21-91.000.
 Taut, Inc.: See—
 McFarlane, Richard H., 304,079, Cl. D24-54.000.
 Textron, Inc.: See—
 Cowan, Murray L., 304,020, Cl. D11-25.000.
 Thomas Industries, Inc.: See—
 Herbst, Walter B., 304,068, Cl. D23-226.000.
 O'Connell, Mark E., 304,014, Cl. D9-372.000.
 Thul, James L., to Bureau of Engraving, Inc. Dispenser/mount for informational sheets. 304,040, 10-17-89, Cl. D20-22.000.
 Toro Company, The: See—
 Carlson, Robert B.; and Wucherpfenning, Fredrick D., 304,058, Cl. D21-195.000.
 Turbeville, Terry A. Display stand for literature. 304,000, 10-17-89, Cl. D6-310.000.
 TWIN BIRD Industrial Company Limited: See—
 Nomizu, Hidekatsu, 304,018, Cl. D10-2.000.
 United Technologies Corporation: See—
 Pontbriand, Norman W., Jr., 304,122, Cl. D34-43.000.
 Vakili, Usman U., to Lights Of America, Inc. Fluorescent lamp adapter base. 304,030, 10-17-89, Cl. D13-25.000.
 Van Meter, John B. House sculpture toy figure. 304,054, 10-17-89, Cl. D21-155.000.
 Van Pinkerton, Stevens, Jr.: See—
 Nichols, John W.; and Van Pinkerton, Stevens, Jr., 304,002, Cl. D6-421.000.
 Nichols, John W.; and Van Pinkerton, Stevens, Jr., 304,006, Cl. D6-553.000.
 Ve-Alite Plastic Corporation: See—
 Davis, Sydney V., 303,998, Cl. D3-73.000.
 Vero, Radu. Multi-storied building. 304,081, 10-17-89, Cl. D25-5.000.
 Villanueva, Sergio E.; and Villanueva, Xavier R., to Novi, Inc. Combined radio support and speakers for bicycles and the like. 304,033, 10-17-89, Cl. D14-224.000.
 Villanueva, Xavier R.: See—
 Villanueva, Sergio E.; and Villanueva, Xavier R., 304,033, Cl. D14-224.000.
 Wan, Yiu C. A., to Fee Tat Plastic Factory Limited. Multi-function lantern. 304,089, 10-17-89, Cl. D26-42.000.
 Wan, Yiu C. A., to Fee Tat Plastic Factory Limited. Multi-function lantern. 304,090, 10-17-89, Cl. D26-42.000.
 Ward, Gary P. Fishing hook and swivel holder. 304,067, 10-17-89, Cl. D22-149.000.
 Warwick, Michael J., to South African Polymer Holdings (Proprietary), Limited. Crate. 304,123, 10-17-89, Cl. D34-46.000.
 Weaver, James M.: See—
 Ruhl, Walter F.; Steed, Jeffrey A.; and Weaver, James M., 304,103, Cl. D32-15.000.
 Welch, Robert J., to InterMetro Industries Corporation. Emergency medical crash cart. 304,075, 10-17-89, Cl. D24-1.100.
 Wenger Corporation: See—
 Jenne, James F., 304,083, Cl. D25-58.000.
 Westvaco Corporation: See—
 Forbes, Hampton H., Jr., 304,016, Cl. D9-425.000.
 White, Morton, to New England AG Tech, Inc. Pot for plants. 304,022, 10-17-89, Cl. D11-155.000.
 Whitmire, Thomas W.: See—
 Eckstedt, Paul D.; and Whitmire, Thomas W., 304,024, Cl. D12-14.000.
 Wilcutt, Michael E.: See—
 Dobson, Michael J.; Kelley, James P.; and Wilcutt, Michael E., 304,106, Cl. D32-40.000.
 World Dryer Division of Specialty Equipment Companies, Inc.: See—
 Mango, Joseph R., 304,101, Cl. D28-54.100.
 Wucherpfenning, Fredrick D.: See—
 Carlson, Robert B.; and Wucherpfenning, Fredrick D., 304,058, Cl. D21-195.000.
 Yang, Fu H. Golf cart. 304,110, 10-17-89, Cl. D34-15.000.
 Yoshida Kogyo K.K.: See—
 Minami, Hiroo, 304,023, Cl. D11-221.000.
 Yuen, John S., to John Manufacturing Limited. Insect repeller. 304,064, 10-17-89, Cl. D22-120.000.

LIST OF PLANT PATENTEEES

Barberet-Maiolino, Nicole; and Blanc, Henri, to Etablissements Barberet et Blanc, Laboratoire de Physiologie Vegetale. Spray carnation named Loubankir. 7,047, 10-17-89, Cl. 71.000.

Barberet-Maiolino, Nicole; and Blanc, Henri, to Etablissements Barberet et Blanc Laboratoire de Physiologie Vegetale. Spray carnation named Londuci. 7,048, 10-17-89, Cl. 73.000.

Blanc, Henri: See—
Barberet-Maiolino, Nicole; and Blanc, Henri, 7,047, Cl. 71.000.
Barberet-Maiolino, Nicole; and Blanc, Henri, 7,048, Cl. 73.000.
Etablissements Barberet et Blanc, Laboratoire de Physiologie Vegetale: See—
Barberet-Maiolino, Nicole; and Blanc, Henri, 7,047, Cl. 71.000.
Etablissements Barberet et Blanc Laboratoire de Physiologie Vegetale: See—
Barberet-Maiolino, Nicole; and Blanc, Henri, 7,048, Cl. 73.000.

PI 68

CLASSIFICATION OF PATENTS

ISSUED OCTOBER 17, 1989

NOTE.—First number, class; second number, subclass; third number, patent number

195	4,873,725	101	4,873,779	178	4,873,829	710.5	4,873,892	728	4,873,942	637.05	4,874,015
	4,873,726					752 B	4,873,893			826	4,874,016
						785	4,873,894				

CLASSIFICATION OF PATENTS

35 MS	4,874,903	45.32	4,874,083	266	4,874,120	512	4,874,550	362	4,874,204	473	4,875,028	341	4,874,242	513	4,875,172	470	4,874,260	484	4,874,261	196.1	4,874,609	335	4,874,356
52.4	4,875,138	231	4,874,084	74	4,874,121	264	4,874,152	379	4,874,205	477	4,875,029	342	4,874,243	518	4,875,173	471	4,874,262	196.2	4,874,610	196.2	4,874,610	26	4,874,357
53	4,874,904	231	4,874,085	19	4,874,122	397.1	4,874,551	379	4,874,206	477	4,875,030	350	4,874,244	519	4,875,174	472	4,874,263	196.3	4,874,611	196.3	4,874,611	27	4,874,358
54	4,874,905	231	4,874,086	147	4,874,123	400	4,874,552	52	4,874,207	477	4,875,031	351	4,874,245	520	4,875,175	473	4,874,264	196.4	4,874,612	196.4	4,874,612	10	4,874,724
55	4,874,906	231	4,874,087	180.1	4,874,124	403	4,874,553	116	4,874,208	477	4,875,032	352	4,874,246	521	4,875,176	474	4,874,265	196.5	4,874,613	196.5	4,874,613	89	4,874,725
56	4,874,907	231	4,874,088	132	4,874,125	404	4,874,554	87	4,874,209	477	4,875,033	353	4,874,247	522	4,875,177	475	4,874,266	196.6	4,874,614	196.6	4,874,614	124	4,874,726
57	4,874,908	231	4,874,089	160.2	4,874,126	405	4,874,555	116	4,874,210	477	4,875,034	354	4,874,248	523	4,875,178	476	4,874,267	196.7	4,874,615	196.7	4,874,615	134	4,874,727
58	4,874,909	231	4,874,090	379	4,874,127	406	4,874,556	201	4,874,211	477	4,875,035	355	4,874,249	524	4,875,179	477	4,874,268	196.8	4,874,616	196.8	4,874,616	148	4,874,728
59	4,874,910	231	4,874,091	379	4,874,128	407	4,874,557	272.3	4,874,212	477	4,875,036	356	4,874,250	525	4,875,180	478	4,874,269	196.9	4,874,617	196.9	4,874,617	61	4,874,729
60	4,874,911	231	4,874,092	470	4,874,129	408	4,874,558	291	4,874,213	477	4,875,037	357	4,874,251	526	4,875,181	479	4,874,270	197.0	4,874,618	197.0	4,874,618	66	4,874,730
61	4,874,912	231	4,874,093	492	4,874,130	409	4,874,559	291	4,874,214	477	4,875,038	358	4,874,252	527	4,875,182	480	4,874,271	197.1	4,874,619	197.1	4,874,619	74	4,874,731
62	4,874,913	231	4,874,094	492	4,874,131	410	4,874,560	291	4,874,215	477	4,875,039	359	4,874,253	528	4,875,183	481	4,874,272	197.2	4,874,620	197.2	4,874,620	104	4,874,732
63	4,874,914	231	4,874,095	492	4,874,132	411	4,874,561	291	4,874,216	477	4,875,040	360	4,874,254	529	4,875,184	482	4,874,273	197.3	4,874,621	197.3	4,874,621	139	4,874,733
64	4,874,915	231	4,874,096	492	4,874,133	412	4,874,562	291	4,874,217	477	4,875,041	361	4,874,255	530	4,875,185	483	4,874,274	197.4	4,874,622	197.4	4,874,622	155	4,874,734
65	4,874,916	231	4,874,097	492	4,874,134	413	4,874,563	291	4,874,218	477	4,875,042	362	4,874,256	531	4,875,186	484	4,874,275	197.5	4,874,623	197.5	4,874,623	165	4,874,735
66	4,874,917	231	4,874,098	492	4,874,135	414	4,874,564	291	4,874,219	477	4,875,043	363	4,874,257	532	4,875,187	485	4,874,276	197.6	4,874,624	197.6	4,874,624	171	4,874,736
67	4,874,918	231	4,874,099	492	4,874,136	415	4,874,565	291	4,874,220	477	4,875,044	364	4,874,258	533	4,875,188	486	4,874,277	197.7	4,874,625	197.7	4,874,625	188	4,874,737
68	4,874,919	231	4,874,100	492	4,874,137	416	4,874,566	291	4,874,221	477	4,875,045	365	4,874,259	534	4,875,189	487	4,874,278	197.8	4,874,626	197.8	4,874,626	209	4,874,738
69	4,874,920	231	4,874,101	492	4,874,138	417	4,874,567	291	4,874,222	477	4,875,046	366	4,874,260	535	4,875,190	488	4,874,279	197.9	4,874,627	197.9	4,874,627	218	4,874,739
70	4,874,921	231	4,874,102	492	4,874,139	418	4,874,568	291	4,874,223	477	4,875,047	367	4,874,261	536	4,875,191	489	4,874,280	198.0	4,874,628	198.0	4,874,628	229	4,874,740
71	4,874,922	231	4,874,103	492	4,874,140	419	4,874,569	291	4,874,224	477	4,875,048	368	4,874,262	537	4,875,192	490	4,874,281	198.1	4,874,629	198.1	4,874,629	240	4,874,741
72	4,874,923	231	4,874,104	492	4,874,141	420	4,874,570	291	4,874,225	477	4,875,049	369	4,874,263	538	4,875,193	491	4,874,282	198.2	4,874,630	198.2	4,874,630	251	4,874,742
73	4,874,924	231	4,874,105	492	4,874,142	421	4,874,571	291	4,874,226	477	4,875,050	370	4,874,264	539	4,875,194	492	4,874,283	198.3	4,874,631	198.3	4,874,631	262	4,874,743
74	4,874,925	231	4,874,106	492	4,874,143	422	4,874,572	291	4,874,227	477	4,875,051	371	4,874,265	540	4,875,195	493	4,874,284	198.4	4,874,632	198.4	4,874,632	273	4,874,744
75	4,874,926	231	4,874,107	492	4,874,144	423	4,874,573	291	4,874,228	477	4,875,052	372	4,874,266	541	4,875,196	494	4,874,285	198.5	4,874,633	198.5	4,874,633	284	4,874,745
76	4,874,927	231	4,874,108	492	4,874,145	424	4,874,574	291	4,874,229	477	4,875,053	373	4,874,267	542	4,875,197	495	4,874,286	198.6	4,874,634	198.6	4,874,634	295	4,874,746
77	4,874,928	231	4,874,109	492	4,874,146	425	4,874,575	291	4,874,230	477	4,875,054	374	4,874,268	543	4,875,198	496	4,874,287	198.7	4,874,635	198.7	4,874,635	306	4,874,747
78	4,874,929	231	4,874,110	492	4,874,147	426	4,874,576	291	4,874,231	477	4,875,055	375	4,874,269	544	4,875,199	497	4,874,288	198.8	4,874,636	198.8	4,874,636	317	4,874,748
79	4,874,930	231	4,874,111	492	4,874,148	427	4,874,577	291	4,874,232	477	4,875,056	376	4,874,270	545	4,875,200	498	4,874,289	198.9	4,874,637	198.9	4,874,637	328	4,874,749
80	4,874,931	231	4,874,112	492	4,874,149	428	4,874,578	291	4,874,233	477	4,875,057	377	4,874,271	546	4,875,201	499	4,874,290	199.0	4,874,638	199.0	4,874,638	339	4,874,750
81	4,874,932	231	4,874,113	492	4,874,150	429	4,874,579	291	4,874,234	477	4,875,058	378	4,874,272	547	4,875,202	500	4,874,291	199.1	4,874,639	199.1	4,874,639	350	4,874,751
82	4,874,933	231	4,874,114	492	4,874,151	430	4,874,580	291	4,874,235	477	4,875,059	379	4,874,273	548	4,875,203	501	4,874,292	199.2	4,874,640	199.2	4,874,640	361	4,874,752
83	4,874,934	231	4,874,115	492	4,874,152	431	4,874,581	291	4,874,236	477	4,875,060	380	4,874,274	549	4,875,204	502	4,874,293	199.3	4,874,641	199.3	4,874,641	372	4,874,753
84	4,874,935	231	4,874,116	492	4,874,153	432	4,874,582	291	4,874,237	477	4,875,061	381	4,874,275	550	4,875,205	503	4,874,294	199.4	4,874,642	199.4	4,874,642	383	4,874,754
85	4,874,936	231	4,874,117	492	4,874,154	433	4,874,583	291	4,874,238	477	4,875,062	382	4,874,276	551	4,875,206	504	4,874,295	199.5	4,874,643	199.5	4,874,643	394	4,874,755
86	4,874,937	231	4,874,118	492	4,874,155	434	4,874,584	291	4,874,239	477	4,875,063	383	4,874,277	552	4,875,207	505	4,874,296	199.6	4,874,644	199.6	4,874,644	405	4,874,756
87	4,874,938	231	4,874,119	492	4,874,156	435	4,874,585	291	4,874,240	477	4,875,064	384	4,874,278	553	4,875,208	506	4,874,297	199.7	4,874,645	199.7	4,874,645	416	4,874,757
88	4,874,939	231	4,874,120	492	4,874,157	436	4,874,586	291	4,874,241	477	4,875,065	385	4,874,279	554	4,875,209	507	4,874,298	199.8	4,874,646	199.8	4,874,646	427	4,874,758
89	4,874,940	231	4,874,121	492	4,874,158	437	4,874,587	291	4,874,242	477	4,875,066	386	4,874,280	555	4,875,210	508	4,874,299	199.9	4,874,647	199.9	4,874,647	438	4,874,759
90	4,874,941	231	4,874,122	492	4,874,159	438	4,874,588	291	4,874,243	477	4,875,067	387	4,874,281	556	4,875,211	509	4,874,300	200.0	4,874,648	200.0	4,874,648	449	4,874,760
91	4,874,942	231	4,874,123	492	4,874,160	439	4,874,589	291	4,874,244	477	4,875,068	388	4,874,282	557	4,875,212	510	4,874,301	200.1	4,874,649	200.1	4,874,649	460	4,874,761
92	4,874,943	231	4,874,124	492	4,874,161	440	4,874,590	291	4,874,245	477	4,875,069	389	4,874,283	558	4,875,213	511	4,874,302	200.2	4,874,650	200.2	4,874,650	471	4,874,762
93	4,874,944	231	4,874,125	492	4,874,162	441	4,874,591	291	4,874,246	477	4,875,070	390	4,874,284	559	4,875,214	512	4,874,303	200.3	4,874,651	200.3	4,874,651	482	4,874,763
94	4,874,945	231	4,874,126	492	4,874,163	442	4,874,592	291	4,874,247	477	4,875,071	391	4,874,285	560	4,875,215	513	4,874,304	200.4	4,874,652	200.4	4,874,652	493	4,874,764
95	4,874,946	231	4,874,127	492	4,874,164	443	4,874,593	291	4,874,248	477	4,875,072	392	4,874,286	561	4,875,216	514	4,874,305	200.5	4,874,653	200.5	4,874,653	504	4,874,765

CLASSIFICATION OF PATENTS

4,874,783	60	4,874,832	55.2	4,874,752	54.1	4,874,871	CLASS 107	4,874,365
4,874,810	176	4,874,833	114	4,874,854	54.2	4,874,874	4,874,366	
4,874,811	179	4,874,834	CLASS 108	4,874,855	54.3	4,874,875	4,874,367	
4,874,812	185	4,874,835	99	4,874,856	54.4	4,874,876	4,874,368	
4,874,813	291	4,874,836	222	4,874,857	54.5	4,874,877	4,874,369	
4,874,814	480	4,874,837	CLASS 109	4,874,858	54.6	4,874,878	4,874,370	
4,874,815	481	4,874,838	75	4,874,859	54.7	4,874,879	4,874,371	
4,874,816	482	4,874,839	196	4,874,860	54.8	4,874,880	4,874,372	
4,874,817	483	4,874,840	221	4,874,861	54.9	4,874,881	4,874,373	
4,874,818	484	4,874,841	229	4,874,862	55.0	4,874,882	4,874,374	
4,874,819	485	4,874,842	276	4,874,863	55.1	4,874,883	4,874,375	
4,874,820	317	4,874,843	153	4,874,864	55.2	4,874,884	4,874,376	
4,874,821	331	4,874,844	243	4,874,865	55.3	4,874,885	4,874,377	
4,874,822	332	4,874,845	CLASS 110	4,874,866	55.4	4,874,886	4,874,378	
4,874,823	560	4,874,846	101	4,874,867	55.5	4,874,887	4,874,379	
4,874,824	561	4,874,847	110	4,874,868	55.6	4,874,888	4,874,380	
4,874,825	562	4,874,848	124	4,874,869	55.7	4,874,889	4,874,381	
4,874,826	563	4,874,849	204	4,874,870	55.8	4,874,890	4,874,382	
4,874,827	564	4,874,850	CLASS 111	4,874,871	55.9	4,874,891	4,874,383	
4,874,828	565	4,874,851	15	4,874,872	56.0	4,874,892	4,874,384	
4,874,829	566	4,874,852	124	4,874,873	56.1	4,874,893	4,874,385	
4,874,830	567	4,874,853	204	4,874,874	56.2	4,874,894	4,874,386	
4,874,831	568	4,874,854	CLASS 112	4,874,875	56.3	4,874,895	4,874,387	
	569	4,874,855	15	4,874,876	56.4	4,874,896	4,874,388	
	570	4,874,856	124	4,874,877	56.5	4,874,897	4,874,389	
	571	4,874,857	204	4,874,878	56.6	4,874,898		
	572	4,874,858	CLASS 113	4,874,879	56.7	4,874,899		
	573	4,874,859	15	4,874,880	56.8	4,874,900		
	574	4,874,860	124	4,874,881	56.9	4,874,901		
	575	4,874,861	204	4,874,882	57.0	4,874,902		
	576	4,874,862	CLASS 114	4,874,883	57.1	4,874,903		
	577	4,874,863	15	4,874,884	57.2	4,874,904		
	578	4,874,864	124	4,874,885	57.3	4,874,905		
	579	4,874,865	204	4,874,886	57.4	4,874,906		
	580	4,874,866	CLASS 115	4,874,887	57.5	4,874,907		
	581	4,874,867	15	4,874,888	57.6	4,874,908		
	582	4,874,868	124	4,874,889	57.7	4,874,909		
	583	4,874,869	204	4,874,890	57.8	4,874,910		
	584	4,874,870	CLASS 116	4,874,891	57.9	4,874,911		
	585	4,874,871	15	4,874,892	58.0	4,874,912		
	586	4,874,872	124	4,874,893	58.1	4,874,913		
	587	4,874,873	204	4,874,894	58.2	4,874,914		
	588	4,874,874	CLASS 117	4,874,895	58.3	4,874,915		
	589	4,874,875	15	4,874,896	58.4	4,874,916		
	590	4,874,876	124	4,874,897	58.5	4,874,917		
	591	4,874,877	204	4,874,898	58.6	4,874,918		
	592	4,874,878	CLASS 118	4,874,899	58.7	4,874,919		
	593	4,874,879	15	4,874,900	58.8	4,874,920		
	594	4,874,880	124	4,874,901	58.9	4,874,921		
	595	4,874,881	204	4,874,902	59.0	4,874,922		
	596	4,874,882	CLASS 119	4,874,903	59.1	4,874,923		
	597	4,874,883	15	4,874,904	59.2	4,874,924		
	598	4,874,884	124	4,874,905	59.3	4,874,925		
	599	4,874,885	204	4,874,906	59.4	4,874,926		
	600	4,874,886	CLASS 120	4,874,907	59.5	4,874,927		
	601	4,874,887	15	4,874,908	59.6	4,874,928		
	602	4,874,888	124	4,874,909	59.7	4,874,929		
	603	4,874,889	204	4,874,910	59.8	4,874,930		
	604	4,874,890	CLASS 121	4,874,911	59.9	4,874,931		
	605	4,874,891	15	4,874,912	60.0	4,874,932		
	606	4,874,892	124	4,874,913	60.1	4,874,933		
	607	4,874,893	204	4,874,914	60.2	4,874,934		
	608	4,874,894	CLASS 122	4,874,915	60.3	4,874,935		
	609	4,874,895	15	4,874,916	60.4	4,874,936		
	610	4,874,896	124	4,874,917	60.5	4,874,937		
	611	4,874,897	204	4,874,918	60.6	4,874,938		
	612	4,874,898	CLASS 123	4,874,919	60.7	4,874,939		
	613	4,874,899	15	4,874,920	60.8	4,874,940		
	614	4,874,900	124	4,874,921	60.9	4,874,941		
	615	4,874,901	204	4,874,922	61.0	4,874,942		
	616	4,874,902	CLASS 124	4,874,923	61.1	4,874,943		
	617	4,874,903	15	4,874,924	61.2	4,874,944		
	618	4,874,904	124	4,874,925	61.3	4,874,945		
	619	4,874,905	204	4,874,926	61.4	4,874,946		
	620	4,874,906	CLASS 125	4,874,927	61.5	4,874,947		
	621	4,874,907	15	4,874,928	61.6	4,874,948		
	622	4,874,908	124	4,874,929	61.7	4,874,949		
	623	4,874,909	204	4,874,930	61.8	4,874,950		
	624	4,874,910	CLASS 126	4,874,931	61.9	4,874,951		
	625	4,874,911	15	4,874,932	62.0	4,874,952		
	626	4,874,912	124	4,874,933	62.1	4,874,953		
	627	4,874,913	204	4,874,934	62.2	4,874,954		
	628	4,874,914	CLASS 127	4,874,935	62.3	4,874,955		
	629	4,874,915	15	4,874,936	62.4	4,874,956		
	630	4,874,916	124	4,874,937	62.5	4,874,957		
	631	4,874,917	204	4,874,938	62.6	4,874,958		
	632	4,874,918	CLASS 128	4,874,939	62.7	4,874,959		
	633	4,874,919	15	4,874,940	62.8	4,874,960		
	634	4,874,920	124	4,874,941	62.9	4,874,961		
	635	4,874,921	204	4,874,942	63.0	4,874,962		
	636	4,874,922	CLASS 129	4,874,943	63.1	4,874,963		
	637	4,874,923	15	4,874,944	63.2	4,874,964		
	638	4,874,924	124	4,874,945	63.3	4,874,965		
	639	4,874,925	204	4,874,946	63.4	4,874,966		
	640	4,874,926	CLASS 130	4,874,947	63.5	4,874,967		
	641	4,874,927	15	4,874,948	63.6	4,874,968		
	642	4,874,928	124	4,874,949	63.7	4,874,969		
	643	4,874,929	204	4,874,950	63.8	4,874,970		
	644	4,874,930	CLASS 131	4,874,951	63.9	4,874,971		
	645	4,874,931	15	4,874,952	64.0	4,874,972		
	646	4,874,932	124	4,874,953	64.1	4,874,973		
	647	4,874,933	204	4,874,954	64.2	4,874,974		
	648	4,874,934	CLASS 132	4,874,955	64.3	4,874,975		
	649	4,874,935	15	4,874,956	64.4	4,874,976		
	650	4,874,936	124	4,874,957	64.5	4,874,977		
	651	4,874,937	204	4,874,958	64.6	4,874,978		
	652	4,874,938	CLASS 133	4,874,959	64.7	4,874,979		
	653	4,874,939	15	4,874,960	64.8	4,874,980		
	654	4,874,940	124	4,874,961	64.9	4,874,981		
	655	4,874,941	204	4,874,962	65.0	4,874,982		
	656	4,874,942	CLASS 134	4,874,963	65.1	4,874,983		
	657	4,874,943	15	4,874,964	65.2	4,874,984		
	658	4,874,944	124	4,874,965	65.3	4,874,985		
	659	4,874,945	204	4,874,966	65.4	4,874,986		
	660	4,874,946	CLASS 135	4,874,967	65.5	4,874,987		
	661	4,874,947	15	4,874,968	65.6	4,874,988		
	662	4,874,948	124	4,874,969	65.7	4,874,989		
	663	4,874,949	204	4,874,970	65.8	4,874,990		
	664	4,874,950	CLASS 136	4,874,971	65.9	4,874,991		
	665	4,874,951	15	4,874,972	66.0	4,874,992		
	666	4,874,952	124	4,874,973	66.1	4,874,993		
	667	4,874,953	204	4,874,974	66.2	4,874,994		
	668	4,874,954	CLASS 137	4,874,975	66.3	4,874,995		
	669	4,874,955	15	4,874,976	66.4	4,874,996		
	670	4,874,956	124	4,874,977	66.5	4,874,997		
	671	4,874,957	204	4,874,978	66.6	4,874,998		
	672	4,874,958	CLASS 138	4,874,979	66.7	4,874,999		
	673	4,874,959	15	4,874,980	66.8	4,875,000		
	674	4,874,960	124	4,874,981	66.9	4,875,001		
	675	4,874,961	204	4,874,982	67.0	4,875,002		
	676	4,874,962	CLASS 139	4,874,983	67.1	4,875,003		
	677	4,874,963	15	4,874,984	67.2	4,875,004		
	678	4,874,964	124	4,874,985	67.3	4,875,005		
	679	4,874,965	204	4,874,986	67.4	4,875,006		
	680	4,874,966	CLASS 140	4,874,987	67.5	4,875,007		
	681	4,874,967	15	4,874,988	67.6	4,875,008		
	682	4,874,968	124	4,874,989	67.7	4,875,009		
	683	4,874,969	204	4,874,990	67.8	4,875,010		
	684	4,874,970	CLASS 141	4,874,991	67.9	4,875,011		
	685	4,874,971	15	4,874,992	68.0	4,875,012		
	686	4,874,972	124	4,874,993	68.1	4,875,013		
	687	4,874,973	204	4,874,994	68.2	4,875,014		
	688	4,874,974	CLASS 142	4,874,995	68.3	4,875,015		
	689	4,874,975	15	4,874,996	68.4	4,875,016		
	690	4,874,976	124	4,874,997	68.5	4,875,017		
	691							

4,874,558		4,875,223		4,873,993		4,874,979		4,873,770		4,874,716
4,874,703		4,875,227		4,874,305		4,874,998		4,873,802		4,874,720
4,874,775	26 :	Re.33,090		4,874,435		4,875,052		4,873,805		4,874,722
4,874,777		4,873,768		4,874,447		4,875,057		4,873,998		4,874,723
4,874,782		4,873,789		4,874,477		4,875,062		4,874,030		4,874,737
4,874,783		4,873,806		4,874,503		4,875,068		4,874,075		4,874,801
4,874,843		4,873,823		4,874,504		4,875,078		4,874,090		4,874,819
4,874,905		4,873,865		4,874,505		4,875,081		4,874,111		4,874,825
4,875,041		4,873,881		4,874,506		4,875,103		4,874,135		4,874,833
4,873,800	19 :	4,873,882		4,874,550		4,875,122		4,874,218		4,874,879
4,873,819		4,873,899		4,874,563		4,875,153		4,874,274		4,874,925
4,874,168		4,873,911		4,874,596		4,875,182		4,874,293		4,874,933
4,874,190		4,873,954		4,874,606		4,875,226		4,874,294		4,874,969
4,875,066		4,873,955		4,874,620		4,873,997		4,874,319		4,875,014
4,875,169		4,873,963		4,874,628		4,874,019		4,874,337		4,875,039
4,874,088	20 :	4,874,027		4,874,629		4,874,203		4,874,338		4,875,086
4,874,306		4,874,057		4,874,745		4,874,256		4,874,457		4,875,132
4,874,067	21 :	4,874,071		4,874,749		4,874,263		4,874,463		4,875,166
4,874,728		4,874,072		4,874,755		4,874,333		4,874,475		4,875,167
4,874,793		4,874,074		4,874,769		4,874,336		4,874,527		4,875,197
4,874,894		4,874,084		4,874,771		4,874,404		4,874,605		4,875,230
4,874,521	22 :	4,874,098		4,874,792		4,874,519		4,874,641	49 :	4,873,794
4,874,528		4,874,101		4,874,799		4,874,609		4,874,642		4,873,986
4,874,533		4,874,112		4,874,804		4,874,751		4,874,673		4,874,026
4,874,608		4,874,205		4,874,820		4,874,911		4,874,675		4,874,102
4,874,784		4,874,224		4,874,900		4,874,950		4,874,678		4,874,358
4,874,785		4,874,251		4,874,901		4,875,083		4,874,726		4,874,971
4,874,788		4,874,359		4,874,902		4,875,015		4,874,790		4,875,015
4,874,789		4,874,431		4,874,936		4,873,762		4,874,802		4,875,232
4,873,742	24 :	4,874,547		4,874,963		4,873,803		4,874,824	50 :	4,874,245
4,874,176		4,874,568		4,875,023		4,873,837		4,874,870		4,874,921
4,874,296		4,874,667		4,875,037		4,873,850		4,874,940		4,874,941
4,874,324		4,874,815		4,875,107		4,873,859		4,874,997	51 :	4,873,769
4,874,405		4,874,862		4,875,142		4,873,867		4,875,043		4,873,919
4,874,600		4,875,229		4,875,183		4,873,875		4,875,144		4,873,989
4,874,696	27 :	4,873,780		8,273,843		4,873,878		4,875,147		4,873,990
4,874,813		4,873,784	35 :	4,873,788		4,873,937		4,875,178		4,874,000
4,875,004		4,873,996	36 :	Re.33,095		4,874,023		4,873,848		4,874,123
4,875,022		4,873,014		4,873,728		4,874,068		4,874,446		4,874,175
4,873,732	25 :	4,874,122		4,873,754		4,874,069		4,874,602		4,874,244
4,873,757		4,874,180		4,873,786		4,874,226		4,874,846	45 :	4,874,272
4,873,843		4,874,228		4,873,790		4,874,289		4,873,774	47 :	4,874,330
4,873,854		4,873,368		4,873,826		4,874,325		4,873,779		4,874,345
4,873,913		4,874,371		4,873,838		4,874,349		4,873,801		4,874,387
4,873,966		4,873,399		4,873,839		4,874,419		4,873,856		4,874,663
4,873,983		4,874,508		4,873,855		4,874,428		4,873,897		4,874,909
4,874,025		4,873,540		4,873,872		4,874,443		4,873,923		4,875,176
4,874,051		4,874,618		4,873,873		4,874,450		4,874,041		4,875,200
4,874,087		4,874,631		4,873,879		4,874,454		4,874,809	53 :	4,873,787
4,874,154		4,874,822		4,873,891		4,874,520		4,874,949		4,873,896
4,874,191		4,874,908		4,873,909		4,874,536		4,874,949		4,874,121
4,874,196		4,874,917		4,873,918		4,874,541		4,873,731		4,874,121
4,874,213		4,874,922		4,873,999		4,874,541		4,873,749		4,874,235
4,874,215		4,874,935		4,874,044		4,874,586		4,873,778		4,874,255
4,874,222		4,875,108		4,874,065		4,874,610		4,873,824		4,874,779
4,874,225		4,875,109		4,874,118		4,874,621		4,873,829		4,874,951
4,874,253		4,875,128		4,874,125		4,874,670		4,873,834		4,875,130
4,874,375		4,875,161		4,874,165		4,874,685		4,873,870		4,376,598
4,874,499		4,875,180		4,874,209		4,874,738		4,873,900	54 :	4,873,741
4,874,507		4,874,050		4,874,310		4,874,744		4,873,928		4,873,935
4,874,567		4,875,219		4,874,315		4,874,758		4,873,947		4,874,313
4,874,660	29 :	4,873,746		4,874,351		4,874,823		4,873,964		4,874,798
4,874,665		4,873,775		4,874,407		4,874,837		4,873,977		4,874,896
4,874,710		4,873,781		4,874,472		4,874,858		4,874,045	55 :	4,873,901
4,874,743		4,873,808		4,874,496		4,874,868		4,874,047		4,873,943
4,874,746		4,873,814		4,874,525		4,874,929		4,874,092		4,873,951
4,874,795		4,874,094		4,874,590		4,875,000		4,874,100		4,874,006
4,874,796		4,874,151		4,874,617		4,875,054		4,874,103		4,874,042
4,874,814		4,874,182		4,874,635		4,875,055		4,874,113		4,874,128
4,874,829		4,874,385		4,874,644		4,873,849		4,874,179		4,874,158
4,874,845		4,874,524		4,874,692		4,873,851		4,874,269		4,874,382
4,874,904		4,874,891		4,874,694		4,874,007		4,874,284		4,874,412
4,874,938	32 :	4,874,514		4,874,695		4,874,043		4,874,327		4,874,465
4,874,947	33 :	4,874,724		4,874,724		4,874,061		4,874,340		4,874,469
4,874,984		4,873,813		4,874,732		4,874,297		4,874,386		4,874,470
4,874,988		4,873,984		4,874,733		4,874,434		4,874,395		4,874,604
4,874,991		4,874,029		4,874,741		4,873,903		4,874,476		4,874,614
4,875,007		4,874,509		4,874,761		4,874,108		4,874,493		4,874,672
4,875,029		4,874,565		4,874,803		4,874,357		4,874,548		4,874,706
4,875,118		4,875,096		4,874,810		4,875,032		4,874,560		4,874,943
4,875,125	34 :	Re.33,093		4,874,835		4,875,034		4,874,583		4,874,959
4,875,135		4,873,735		4,874,866		4,875,089		4,874,611		4,874,960
4,875,160		4,873,804		4,874,876		4,875,196		4,874,640		4,874,996
4,875,186		4,873,833		4,874,910		Re.33,092		4,874,669		4,875,009
4,875,209		4,873,876		4,874,926		4,873,761		4,874,714		4,875,019
4,875,210		4,873,932		4,874,958		4,873,765		4,874,715		4,875,149

DESIGN PATENTS

01 :	304,065		304,083		304,100		304,102		304,050		304,115
	304,086		304,092		304,101		304,002		304,051		304,022
	304,106	08 :	304,063		304,109		304,006		304,052	44 :	304,048
06 :	304,008		304,100		304,091		304,032		304,053	47 :	304,062
	304,024	09 :	304,094		304,000		304,095		304,060	48 :	303,995
	304,030		304,122		304,039		303,998		304,084		304,108
	304,033	10 :	304,016		304,054		303,999		304,103	51 :	304,066
	304,044	12 :	304,007		304,020		304,003		303,996		304,114
	304,057		304,082		304,021		304,004		304,067	53 :	304,013
	304,059		304,124		304,088		304,056		304,076	55 :	304,005
	304,070	13 :	304,017		304,107		304,081		304,011		304,014
	304,074		304,118		304,040		304,026		304,019		304,015
	304,077	17 :	304,068		304,058		304,041		304,075		304,035
	304,078		304,079		304,061		304,111				

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Donald J. Quigg, *Commissioner*

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OFFICIAL GAZETTE

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UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

October 24, 1989



PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

OFFICIAL GAZETTE of the
UNITED STATES PATENT AND TRADEMARK OFFICE

October 24, 1989

Volume 1107

Number 4

CONTENTS

	Page
Patent and Trademark Office Notices	
Patent Cooperation Treaty (PCT) Information	1107 OG 70
Notice of Maintenance Fees Payable	1107 OG 70
Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees	1107 OG 71
Reissue Applications Filed	1107 OG 72
Requests for Reexaminations Filed	1107 OG 73
Service by Publication	1107 OG 73
Registration to Practice	1107 OG 73
Patent Certificates of Correction	1107 OG 75
Special Boxes for Mail	1107 OG 76
Reference Collections of U.S. Patents Available for Public Use in	
Patent Depository Libraries	1107 OG 77
Condition of Patent Applications	1107 OG 79
Reexaminations	1599
Reissue Patents Granted (33,098)	1601
Plant Patents Granted (7,049)	1603
Patents Granted	
General and Mechanical (4,875,235)	1605
Chemical (4,875,900)	1835
Electrical (4,876,413)	1983
Design Patents Granted (304,125)	2101
Index of Patentees	PI 1
Indices of Reissue, Reexamination and Design Plant Patentees	PI 64
Classification of	
Patents (Including Reissues and Reexaminations)	PI 69
Designs, and Plants Applications	PI 72
Geographical Index of Residence of Inventors	
Patents (Including Reissues and Reexaminations)	PI 73
Designs and Plant Applications	PI 74
Change of Address Form and Subscription Order Form	Back Page

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1107 O.G. 5 on Oct. 3, 1989.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 5 on Sept. 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2 on July 7, 1987 and at 1091 O.G. 2 on June 7, 1988.

The search fee of the European Patent Office was changed due to a difference in the exchange rate of the U.S. dollar in relation to the German Mark as of Sept. 1, 1989, and was announced in the *Official Gazette* at 1105 O.G. 36 on Aug. 15, 1989.

International PCT fees were changed on June 1, 1989 due to a difference in the exchange rate of the U.S. dollar in relation to the Swiss Franc and were announced in the *Official Gazette* at 1102 O.G. 90 on May 30, 1989.

Certain domestic PCT fees and charges for International Search and Preliminary Examination have been changed effective Apr. 17, 1989 and were announced in the *Official Gazette* at 1100 O.G. 24 on Mar. 7, 1989.

The current schedule of PCT fees (in U.S. dollars) is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
—No corresponding prior U.S. national application filed	550.00
—Corresponding prior U.S. national application filed	380.00
—Supplemental search fee, per additional invention	150.00
European Patent Office as ISA	1040.00
Preliminary examination fee	
USPTO as International Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as ISA	400.00
—Additional examination fee, per additional invention	130.00
—ISA not the USPTO	600.00
—Additional examination fee, per additional invention	200.00
International fees	
Basic fee	436.00
Basic Supplemental fee (for each page over 30)	9.00
Designation fee per country or region for the first 10 national or regional offices	106.00
Designation fee for 11th and subsequent designations	No Charge
Handling fee	134.00

U.S. National Stage fees

	Small Entity	Regular
USPTO was IPEA	165.00	330.00
USPTO was ISA but not IPEA	185.00	370.00
USPTO was neither ISA nor IPEA	250.00	500.00

USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(2) to (4)	25.00	50.00
—For each independent claim in excess of 3	18.00	36.00
—For each claim in excess of 20	6.00	12.00
—For each application containing a multiple dependent claim	60.00	120.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39.1	60.00	120.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39.1	30.00	30.00

Sept. 12, 1989.

DONALD J. QUIGG,
Assistant Secretary and Commissioner
of Patents and Trademarks.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on application filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Apr. 17, 1989. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the patent.

Attention is drawn to the patents which were issued on October 21, 1986, for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,617,684 through 4,619,002
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on October 19, 1982 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,354,279 through 4,355,423
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months and seven years and six months are set forth in 37 CFR 1.20(e), (f), (h) and (i), as amended effective Apr. 17, 1989, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or

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U. S. PATENT AND TRADEMARK OFFICE

1107 OG 71

after after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant	4,532,690	06/444,351	08/06/85
	4,532,705	06/571,066	08/06/85
	4,532,714	06/525,207	08/06/85
	4,532,717	06/516,924	08/06/85
"(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant	4,532,722	06/546,823	08/06/85
	4,532,734	06/573,855	08/06/85
	4,532,737	06/450,197	08/06/85
	4,532,741	06/644,546	08/06/85
	4,532,765	06/605,476	08/06/85
	4,532,768	06/468,635	08/06/85
"(h) For maintaining an original or reissue patent except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:	4,532,769	06/646,962	08/06/85
	4,532,783	06/433,981	08/06/85
	4,532,784	06/483,538	08/06/85
	4,532,789	06/506,583	08/06/85
	4,532,796	06/548,939	08/06/85
By a small entity (\$1.9(f))	4,532,797	06/563,890	08/06/85
By other than a small entity	4,532,812	06/509,520	08/06/85
	4,532,815	06/564,619	08/06/85
"(i) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant:	4,532,826	06/486,784	08/06/85
	4,532,831	06/647,467	08/06/85
	4,532,834	06/346,003	08/06/85
	4,532,839	06/564,817	08/06/85
	4,532,844	06/600,262	08/06/85
	4,532,850	06/515,651	08/06/85
By a small entity (\$1.9(f))	4,532,852	06/516,556	08/06/85
By other than a small entity	4,532,857	06/564,092	08/06/85
	4,532,860	06/571,688	08/06/85
	4,532,861	06/603,714	08/06/85
	4,532,867	06/511,602	08/06/85
	4,532,868	06/564,209	08/06/85
	4,532,872	06/682,442	08/06/85
	4,532,878	06/568,616	08/06/85
"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982	4,532,879	06/594,086	08/06/85
	4,532,899	06/506,983	08/06/85
	4,532,911	06/548,658	08/06/85
	4,532,912	06/599,588	08/06/85
	4,532,916	06/473,203	08/06/85
	4,532,917	06/653,923	08/06/85
	4,532,936	06/295,073	08/06/85
"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:	4,532,938	06/491,607	08/06/85
	4,532,948	06/581,728	08/06/85
	4,532,961	06/443,704	08/06/85
	4,532,965	06/528,119	08/06/85
	4,532,967	06/511,106	08/06/85
	4,532,972	06/652,227	08/06/85
By a small entity (\$1.9(f))	4,532,977	06/434,620	08/06/85
By other than a small entity	4,532,987	06/581,794	08/06/85
	4,562,989	06/353,394	08/06/85
"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been unavoidable	4,532,999	06/474,668	08/06/85
	4,533,010	06/436,276	08/06/85
	4,533,013	06/509,377	08/06/85
	4,533,014	06/431,209	08/06/85
	4,533,018	06/511,483	08/06/85
	4,533,019	06/604,527	08/06/85
	4,533,021	06/551,930	08/06/85
	4,533,023	06/503,990	08/06/85
	4,533,025	06/692,328	08/06/85
	4,533,029	06/540,355	08/06/85
	4,533,032	06/443,839	08/06/85
	4,533,038	06/399,801	08/06/85
	4,533,051	06/607,233	08/06/85
	4,533,063	06/534,455	08/06/85
	4,533,065	06/307,833	08/06/85
	4,533,072	06/416,843	08/06/85
	4,533,077	06/451,922	08/06/85
	4,533,084	06/485,527	08/06/85
	4,533,085	06/518,749	08/06/85
	4,533,091	06/608,701	08/06/85
	4,533,097	06/512,798	08/06/85
	4,533,103	06/356,388	08/06/85
	4,533,108	06/542,614	08/06/85
	4,533,111	06/428,528	08/06/85
	4,533,117	06/464,811	08/06/85
	4,533,121	06/348,970	08/06/85
4,532,656	06/512,599	08/06/85	4,533,129
4,532,668	06/544,532	08/06/85	4,533,131
4,532,687	06/489,673	08/06/85	4,533,139
4,532,689	06/428,168	08/06/85	4,533,142
			06/529,349

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED AUGUST 6, 1989 DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,532,656	06/512,599	08/06/85
4,532,668	06/544,532	08/06/85
4,532,687	06/489,673	08/06/85
4,532,689	06/428,168	08/06/85

Patent Number	Serial Number	Issue Date
4,533,145	06/643,245	08/06/85
4,533,146	06/493,958	08/06/85
4,533,150	06/486,850	08/06/85
4,533,151	06/488,142	08/06/85
4,533,162	06/474,407	08/06/85
4,533,163	06/506,619	08/06/85
4,533,170	06/510,676	08/06/85
4,533,183	06/533,078	08/06/85
4,533,185	06/569,061	08/06/85
4,533,200	06/391,211	08/06/85
4,533,202	06/537,069	08/06/85
4,533,223	06/373,631	08/06/85
4,533,224	06/448,494	08/06/85
4,533,226	06/471,635	08/06/85
4,533,227	06/599,772	08/06/85
4,533,237	06/628,802	08/06/85
4,533,240	06/404,517	08/06/85
4,533,253	06/415,447	08/06/85
4,533,258	06/626,585	08/06/85
4,533,260	06/578,655	08/06/85
4,533,268	06/647,865	08/06/85
4,533,271	06/541,156	08/06/85
4,533,275	06/278,240	08/06/85
4,533,277	06/376,946	08/06/85
4,533,288	06/403,054	08/06/85
4,533,289	06/386,256	08/06/85
4,533,293	06/452,022	08/06/85
4,533,300	06/620,898	08/06/85
4,533,301	06/650,998	08/06/85
4,533,304	06/603,892	08/06/85
4,533,306	06/546,857	08/06/85
4,533,307	06/574,357	08/06/85
4,533,311	06/578,572	08/06/85
4,533,322	06/578,278	08/06/85
4,533,324	06/577,783	08/06/85
4,533,330	06/524,355	08/06/85
4,533,336	06/490,235	08/06/85
4,533,351	06/371,969	08/06/85
4,533,360	06/554,492	08/06/85
4,533,379	06/504,349	08/06/85
4,533,380	06/667,507	08/06/85
4,533,396	06/548,840	08/06/85
4,533,421	06/603,760	08/06/85
4,533,438	06/562,504	08/06/85
4,533,451	06/615,437	08/06/85
4,533,452	06/509,585	08/06/85
4,533,487	06/654,902	08/06/85
4,533,491	06/496,679	08/06/85
4,533,492	06/578,626	08/06/85
4,533,495	06/456,075	08/06/85
4,533,516	06/395,283	08/06/85
4,533,522	06/539,614	08/06/85
4,533,526	06/451,674	08/06/85
4,533,544	06/593,525	08/06/85

NOTIFICATION OF ACCEPTANCE OF DELAYED PAYMENT OF MAINTENANCE FEE (35 U.S.C. 41(c); 37 CFR 1.378)

The patent(s) listed below are considered as not having expired but are subject to the conditions set forth in 35 U.S.C. 41(c)(2), in view of the Petition to Accept Late Payment of the maintenance fees which has been GRANTED BY THE COMMISSIONER OF PATENTS AND TRADEMARKS, as provided for under 35 U.S.C. 41(c)(1) and 37 CFR 1.378.

Patent No	Serial No.	Patent Date	Application Filing Date	Delayed Payment Acceptance Date
4,454,913	06/222,537	06/19/84	01/05/81	09/21/89
4,480,416	06/437,462	11/06/84	10/28/82	09/21/89
4,507,965	06/422,749	04/02/85	09/24/82	09/21/89
4,512,662	06/281,226	04/23/85	07/06/81	09/21/89
4,512,737	06/496,970	04/23/85	05/23/83	09/21/89

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.111(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining

Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

4,198,451, Re. S. N. 405,280, Filed Sept. 7, 1989, Cl. 428/36.

MARKER LAYUP, Dick E. Johnston, Owner of Record: *Inventor*, Attorney or Agent: William H. Maxwell, Ex. Gp.: 158

4,509,147, Re. S. N. 359,684, Filed May 31, 1989, Cl. 365/190, HIGH SPEED SEMICONDUCTOR MEMORY DEVICE HAVING A HIGH GAIN SENSE AMPLIFIER, Nobuyoshi Tanimura et al., Owner of Record: *Hitachi Ltd. & Hitachi Microcomputer Engineering Ltd., Tokyo, Japan*, Attorney or Agent: Gregory E. Montone, Ex. Gp.: 233

4,547,240, Re. S. N. 405,092, Filed Sept. 6, 1989 Cl. 156, METHOD OF FABRICATING AN ELECTRICAL CONNECTOR, Richard J. Feeny et al., Owner of Record: *FTZ Industries Inc., Simpsonville, S.C.*, Attorney or Agent: John B. Hardaway III, Ex. Gp.: 326

4,643,143, Re. S. N. 406,081, Filed Sept. 12, 1989, Cl. 123/90, VALVE DRIVING MEANS FOR V-TYPE ENGINE OF VEHICLE, Kazuo Uchiyama et al., Owner of Record: *Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan*, Attorney or Agent: Ernest A. Beutler, Ex. Gp.: 343

4,673,834, Re. S. N. 368,192, Filed June 16, 1989, Cl. 310/71, ENAMELLED WIRE CONNECTION FOR CIRCUIT BOARDS, Guenter Wrobel, Owner of Record: *Papst-Motoren GmbH & Company*, Attorney or Agent: Phillip H. Watt, Ex. Gp.: 212

4,679,780, Re. S. N. 380,838, Filed July 14, 1989, Cl. 267/177, SPRING COMPRESSOR WITH LATCHABLE LOCKING DEVICE, Kenneth D. Kloster, Owner of Record: *Inventor*, Attorney or Agent: Mark J. Sobanski, Ex. Gp.: 314

4,726,398, Re. S. N. 408,159, Filed Sept. 6, 1989, Cl. 137/625.5, HIGH SPEED, HIGH TEMPERATURE THREE-WAY VALVE FOR SWITCHING HIGH PRESSURE FLUIDS UNDER LOW PRESSURE CONTROL, Robert D. Barree, Owner of Record: *Marathon Oil Company, Findlay, Ohio*, Attorney or Agent: Jack E. Ebel, Ex. Gp.: 347

4,763,343, Re. S. N. 404,918, Filed Sept. 8, 1989, Cl. 378/110, METHOD AND STRUCTURE FOR OPTIMIZING RADIOGRAPHIC QUALITY BY CONTROLLING X-RAY TUBE VOLTAGE, CURRENT FOCAL SPOT, Nicola E. Yanaki, Owner of Record: *Inventor*, Attorney or Agent: Edel M Young, Ex. Gp.: 256

4,770,698, Re. S. N. 406,063, Filed Sept. 12, 1989, Cl. 75/77, METHOD FOR MAKING LOW ALPHA COUNT LEAD, John A. Dunlop et al., Owner of Record: *Cominco Ltd., Vancouver, Canada*, Attorney or Agent: Neil F. Markva, Ex. Gp.: 111

4,775,513, Re. S. N. 404,853, Filed Sept. 8, 1989, Cl. 422/61, WATER TREATMENT AND SOIL TESTING, Colin E. Marks, Owner of Record: *Wilkinson & Simpson Ltd., Tyne & Wear, England*, Attorney or Agent: Charles B. Rodman, Ex. Gp.: 181

4,794,936, Re. S. N. 405,744, Filed Sept. 11, 1989, Cl. 132/320, COSMETIC SAMPLER, Linda Zango, Owner of Record: *Inventor*, Attorney or Agent: Bernard X. McGready, Ex. Gp.: 333

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.111(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

4,079,028, Reexam. No. 90/001,846, Requested Sept. 19, 1989, Cl. 260/29.6, POLYURETHANE THICKENERS IN LATEX COMPOSITIONS, William D. Emmons, et al., Owner of Record: *Rohm & Haas, Co., Philadelphia, Pa.*, Attorney or

Agent: Unknown, Ex. Gp.: 126, Requester: Burns, Doane, Swecker & Mathis, Alexandria, Va.

4,213,163, Reexam. No. 90/001,844, Requested Sept. 12, 1989, Cl. 360/35.1, VIDEO-TAPE RECORDING, Jerome H. Lemelson, Owner of Record: *Jerome H. Lemelson, Princeton, N.J.*, Attorney or Agent: Unknown, Ex. Gp.: 230, Requester: Epson America Inc., Torrance, Calif.

4,438,842, Reexam. No. 90/001,847, Requested Sept. 25, 1989, Cl. 198/838, SLIDE CONVEYOR WITH SIDE STABILIZER, R. L. Alldredge, et al., Owner of Record: *R. L. Alldredge, et al., Denver, Colo.*, Attorney or Agent: Unknown, Ex. Gp.: 310, Requester: Hydroginetics Corp., Arvada, Colo.

4,480,214, Reexam. No. 90/001,845, Requested Sept. 19, 1989, Cl. 315/290, STARTER CIRCUIT FOR GASEOUS DISCHARGE LAMP, Gregory L. Sodini, Owner of Record: *ITT Corp., New York, N.Y.*, Attorney or Agent: Unknown, Ex. Gp.: 260, Requester: Hubbel Inc., Orange Conn.

Service by Publication

A petition to cancel the registration identified below having been filed, and while a notice of such proceeding is being sent by certified mail to registrant at an address supplied by petitioner, namely, 944 Fourth Street, Los Angeles, Calif., the Patent and Trademark Office is not certain whether this is, in fact, registrant's present address. Accordingly, notice is hereby given that unless the registrant listed herein, its assigns or legal representatives shall enter an appearance within thirty days from the date of this publication, or within forty days from receipt of the notice sent by certified mail, the cancellation will be proceeded with as in the case of default.

Feldman Lighting Company, Los Angeles, Calif., Reg. No. 903,406 for the mark "MARQUEE", Canc. No. 17,729.

ERMA S. BROWN
Administrator of the Trademark Trial
and Appeal Board
For JEFFREY M. SAMUELS
Assistant Commissioner for Trademarks

REGISTRATION TO PRACTICE

The following list contains the names of persons applying for registration to practice before the United States Patent and Trademark Office. These persons have been given provisional recognition pursuant to 37 CFR 10.9(a) to prepare and prosecute patent applications before the Office. Final approval for registration is subject to establishing to the satisfaction of the Director of the Office of Enrollment and Discipline that the person seeking registration is of good moral character and repute. [37 CFR 10.7(a)]. Accordingly, any information tending to affect the eligibility of any of the following applicants on moral, ethical, or other grounds should be furnished the Director, Office of Enrollment and Discipline on or before November 24, 1989:

Anderson, Philip E., 10019 Latimer Ct., Fairfax, Va. 22032
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Brody, Christopher W., 703 King St., Alexandria, Va. 22314
Bussan, Matthew J., 5901 Mt. Eagle Dr., Alexandria, Va. 22303
Chwang, Tek Ling, 9922 Chimney Hill La., Dallas, Tex. 75243
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Yorks, Ben J., 4750 Kester Ave., #3, Sherman Oaks, Calif. 91403
Zenger, Todd E., 2818 Wainwright Rd., Salt Lake City, Utah 84109

Sept. 27, 1989

CAMERON WEIFFENBACH,
*Director of Enrollment
and Discipline*

PATENT NOTICES

Certificates of Correction For Week of October 24, 1989

B1. 4,168,315	4,774,536	4,798,350	4,814,998
4,259,680	4,776,319	4,798,597	4,816,167
4,461,199	4,776,714	4,798,849	4,816,759
4,578,800	4,777,143	4,798,939	4,817,033
4,597,667	4,777,276	4,799,293	4,817,268
4,605,321	4,777,425	4,799,568	4,817,691
4,610,916	4,777,615	4,800,619	4,817,770
4,661,002	4,777,913	4,800,979	4,818,176
4,665,062	4,778,165	4,801,296	4,818,226
4,670,343	4,779,418	4,801,597	4,818,656
4,715,388	4,780,049	4,801,616	4,818,905
4,720,560	4,781,727	4,801,770	4,818,928
4,746,770	4,783,603	4,801,888	4,819,209
4,749,477	4,783,671	4,802,195	4,819,452
4,751,269	4,784,735	4,802,484	4,819,584
4,752,588	4,785,249	4,804,051	4,819,954
4,753,902	4,785,437	4,804,961	4,820,320
4,757,069	4,786,641	4,805,108	4,821,201
4,759,508	4,787,785	4,805,304	4,821,461
4,759,632	4,788,153	4,807,024	4,822,247
4,759,917	4,788,365	4,807,399	4,824,814
4,760,596	4,789,221	4,807,558	4,825,325
4,761,520	4,790,024	4,807,708	4,827,264
4,762,925	4,791,571	4,807,958	4,827,482
4,763,782	4,792,524	4,808,249	4,827,638
4,765,099	4,793,052	4,809,009	4,828,526
4,766,381	4,793,438	4,810,203	4,829,060
4,767,824	4,793,722	4,810,332	4,829,840
4,769,293	4,793,941	4,810,340	4,830,103
4,771,778	4,794,306	4,811,361	4,830,227
4,772,822	4,794,609	4,811,530	4,830,343
4,773,384	4,795,270	4,811,578	4,832,051
4,773,827	4,796,092	4,812,266	4,833,544
4,773,966	4,796,359	4,812,277	4,836,792
4,774,255	4,796,567	4,812,312	4,839,049
4,774,305	4,797,095	4,813,671	

SPECIAL BOXES FOR MAIL

Special PTO mail box numbers should be used to allow forwarding of particular types of mail to the appropriate areas as quickly as possible. Such mail is forwarded directly to the appropriate area without being opened. Only the specified type of document should be placed in an envelope addressed to one of these boxes. If any documents other than the specified type identified for each box are addressed to that box, they will be delayed in reaching the appropriate area for which they are intended.

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Box Issue Fee	All communications following the receipt of a PTOL-85, "Notice of Allowance and Issue Fee Due," and prior to the issuance of a patent should be addressed to Box Issue Fee, unless advised to the contrary. Assignments are the exception. Assignments should be submitted in a separate envelope and not be sent to Box Issue.
Box M. Fee	Correspondence related to a patent that is subject to the payment of a maintenance fee.
Box Non Fee	Non-fee amendments to patent applications. (Use Box AF for responses after final rejection.)
Box OED	Mail for the Office of Enrollment and Discipline.
Box Pat. Ext.	Applications for patent term extension.
Box PCT	Mail related to applications filed under the Patent Cooperation Treaty.
Box Reexam	Mail related to Reexamination.
Box SN	For fee and petitions under 37 CFR 1.182 to obtain date received and/or serial number for patent application prior to the Office's standard notification (return post card or the official "Filing Receipt," "Notice to File Missing Parts," or "Notice of Incomplete Application").
PATENT APPLICATION	New patent application and associated papers and fees.
TRADEMARK APPLICATION	New trademark application and associated papers and fees.
Box Assignments	All assignment documents except those filed in new patent applications.

Reference Collection of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries (PDLs), receive current issues of U.S. Patents and maintain collections of earlier-issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections, which are organized in patent number sequence, are available for use by the public free of charge. Each of the PDLs, in addition, offers supplemental reference publications of the U.S. Patent Classification System, including the *Manual of Classification*, *Index to the U.S. Patent Classification*, *Classification Definitions*, and provides technical staff assistance in their use to aid the public, in gaining effective access to information contained in patents. CASSIS (Classification And Search Support Information System); which provides direct, on-line access to Patent and Trademark Office data, is available at all PDLs. Facilities for making paper copies of patents from either microfilm or paper collections are generally provided for a fee.

Since there are variations in the scope of patent collections among the PDLs and in their hours of service to the public, anyone contemplating use of the patents at a particular library is urged to contact that library, in advance, about its collection and hours in order to avert possible inconvenience.

State	Name of Library	Telephone Contact
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	Birmingham Public Library	(205) 226-3680
Alaska	Anchorage: Z. J. Loussac Public Library	(907) 261-2916
Arizona	Tempe: Noble Library, Arizona State University	(602) 965-7607
Arkansas	Little Rock: Arkansas State Library	(501) 682-2053
California	Los Angeles Public Library	(213) 612-3273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale Patent Clearinghouse	(408) 730-7290
Colorado	Denver Public Library	(303) 571-2347
Connecticut	New Haven: Science Park Library	(203) 786-5447
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Dist. of Columbia	Washington: Howard University Libraries	(202) 636-5060
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	Miami-Dade Public Library	(305) 375-2665
	Orlando: University of Central Florida Libraries	(407) 275-2562
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 269-2865
	Springfield: Illinois State Library	(217) 782-5430
Indiana	Indianapolis-Marion County Public Library	(317) 269-1741
Iowa	Des Moines: State Library of Iowa	(515) 281-4118
Kentucky	Louisville Free Public Library	(502) 561-8617
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
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Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4281
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New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7782
	Piscataway: Library of Science and Medicine, Rutgers University	(201) 932-2895
New Mexico	Albuquerque: University of New Mexico General Library	(505) 277-4412
New York	Albany: New York State Library	(518) 473-4636
	Buffalo and Erie County Public Library	(716) 858-7101
	New York Public Library (The Research Libraries)	(212) 714-8529
North Carolina	Raleigh: D.H. Hill Library, North Carolina State University	(919) 737-3280
Ohio	Cincinnati and Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 292-6175
	Toledo/Lucas County Public Library	(419) 259-5212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 744-7086
Oregon	Salem: Oregon State University	(503) 378-4239
Pennsylvania	Philadelphia, The Free Library of	(215) 686-5331
	Pittsburgh, Carnegie Library of	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 455-8027
South Carolina	Charleston: Medical University of South Carolina Library	(803) 792-2371
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
	Nashville: Stevenson Science Library, Vanderbilt University	(615) 322-2775

Reference Collection of U. S. Patents Available for Public Use in Patent Depository Libraries—(continued)

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Washington	Madison: Kurt F. Wendt Library, University of Wisconsin	(608) 262-6845
Wisconsin	Madison	(608) 262-6845
	Milwaukee Public Library	(414) 278-3247

PATENT EXAMINING CORPS

JAMES E. DENNY, Acting Assistant Commissioner
STEPHEN G. KUNIN, Acting Deputy Assistant Commissioner
CONDITION OF PATENT APPLICATIONS AS OF September 23, 1989

PATENT EXAMINING GROUPS

Actual Filing Date of Oldest
New Case Awaiting Action

CHEMICAL EXAMINING GROUPS

GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY.
AND ENGINEERING, GROUP 110—D. E. TALBERT, Director.....5-26-87
ORGANIC CHEMISTRY GROUP 120—S. N. ZAHARNA, Director.....6-16-87
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—
R. F. WHITE, Director.....4-15-87
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND
COMPOSITIONS, GROUP 150—J. O. THOMAS, Director.....5-14-87
BIOTECHNOLOGY, GROUP 180—J. E. KITTLE, Director.....7-30-86

ELECTRICAL EXAMINING GROUPS

INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—D. G. Kelly,
Director.....5-4-87
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director.....2-26-87
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—G. GOLDBERG, Director.....5-28-87
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M.
BLIX, Director.....5-27-88
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ,
Director.....8-18-87
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260
S. LEVY, Acting Director.....7-2-87
DESIGN, GROUP 290—K. L. CAGE, Director.....2-6-86

MECHANICAL EXAMINING GROUPS

HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director.....1-12-88
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—N. GODICI, Acting Director.....4-13-88
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION,
GROUP 330—J. J. LOVE, Director.....4-20-87
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—C. CROYLE, Acting Director.....2-26-88
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—
A. L. SMITH, Director.....1-3-89

Expiration of patents: The patents within the range of numbers indicated below expire during September 1989, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents	Numbers 3,688,314 to 3,694,813 inclusive
Plant Patents	None

REEXAMINATIONS

OCTOBER 24, 1989

Matter enclosed in heavy brackets [] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B2 3,415,374 (1145th)
METHOD AND APPARATUS FOR VORTICAL SEPARATION OF SOLIDS
 Nils A. I. Wikdahl, Djursholm, Sweden, assignor to Noss Company
 Reexamination Request No. 90/001,670, Dec. 15, 1988.
 Reexamination Certificate for Patent No. 3,415,374, issued Dec. 10, 1988, Ser. No. 398,496, Sep. 23, 1964.
 Reexamination Certificate B1 3,415,374, issued Dec. 27, 1988.
 Filed Dec. 15, 1988, Ser. No. 398,496
 Int. Cl.⁴ B04C 9/00

U.S. Cl. 209—211

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1-14 is confirmed.

1. A method of separating a suspension into a light fraction and a heavy fraction in a hydrocyclone separator assemblage including a plurality of hydrocyclone separators disposed in several superimposed layers and with their geometric axes in an at least substantially horizontal orientation, each of said separators including an elongate chamber of circular cross-section having at one end a first outlet for the discharge of light fraction into a first receptacle common to all separators and at the other end a second outlet for the discharge of heavy fraction into a second receptacle also common to all separators, said assemblage further including conduits for discharging the light fraction and the heavy fraction from the first and the second receptacle respectively, and a common suspension supply container for feeding suspension in tangential direction into said chamber of the separators, said method comprising the steps of discharging under pressure the heavy fraction into said second receptacle when the separator assemblage is in operation, and controlling the discharge of the light fraction and the heavy fraction from said first and second receptacles respectively so as to maintain the operational levels of the light fraction and the heavy fraction respectively in said receptacles at least at substantially the same height and above said heavy fraction outlets of the hydrocyclone separators in the uppermost one of said layers.

B1 4,246,033 (1146th)
ARRANGEMENT FOR APPLYING WRITTEN OR DRAWN INFORMATION ONTO IMAGE CARRIERS FOR OVERHEAD PROJECTION
 Rene von Wartburg, Rhine, Switzerland, assignor to Pelikan AG, Hanover, Fed. Rep. of Germany
 Reexamination Request No. 90/001,467, Mar. 2, 1988.
 Reexamination Certificate for Patent No. 4,246,033, issued Jan. 20, 1981, Ser. No. 847,114, Oct. 31, 1977.
 Filed Mar. 2, 1988, Ser. No. 847,114
 Claims priority, application Switzerland, Nov. 23, 1976, 14716/76
 Int. Cl.⁴ C09D 11/00, 11/04, 11/16
 U.S. Cl. 106—23

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1-7 are cancelled.

New claim 8 is added and determined to be patentable. ps
 [6. The combination as defined in claim 1 wherein the color producing the material is a blue compound and the colorless material is effective to react with the blue compound to form a yellow color.]

B1 4,510,193 (1147th)
FILTER SHEET MATERIAL
 Hubert Blücher, Freytagstrasse 45; Hanso von Blücher, Sohnstrasse 58, both of, D-4000 Düsseldorf, and Ernest de Ruiter, Höhenstrasse 57a, D-5090 Leverkusen 3, all of Fed. Rep. of Germany
 Reexamination Request No. 90/001,730, Mar. 13, 1989.
 Reexamination Certificate for Patent No. 4,510,193, issued Apr. 9, 1985, Ser. No. 496,742, May 20, 1983.
 Filed Mar. 13, 1989, Ser. No. 496,742
 Claims priority, application Fed. Rep. of Germany, Feb. 9, 1983, 3304349
 Int. Cl.⁴ B32B 3/16, 27/14
 U.S. Cl. 428—196

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claim 2 is cancelled.

Claim 1 is determined to be patentable as amended.

Claims 3-15 and 16, dependent on an amended claim, are determined to be patentable.

1. A filter sheet material comprising an air-permeable textile material, an adhesive uniformly covering about 20 to 80% of the surface of the textile, the applied adhesive having a height of about 0.05 to 0.5 mm and a diameter or width of about 0.1 to 5 mm, and about 10 to 250 g/m² of activated carbon adsorber particles anchored to the textile by the adhesive, the carbon particles having an internal surface of at least about 600 m²/g and a diameter of at least about 0.1 mm, the adhesive being a masked isocyanate prepolymer which is crosslinked to form a polyurethane by means of a crosslinking agent for the isocyanate after spreading the carbon particles on the textile material with the applied adhesive.

B1 4,588,627 (1148th)
DEFLECTOR FOR VEHICLE BODY COMPONENTS
 Robert A. Isaksen, Chardon; David E. Frappier, Chagrin Falls, and Wallace R. Jones, Waite Hill Village, all of Ohio, assignors to The Excello Specialty Company, Ohio
 Reexamination Request No. 90/001,532, Jun. 20, 1988.
 Reexamination Certificate for Patent No. 4,588,627, issued May 13, 1986, Ser. No. 606,900, May 3, 1984.
 Continuation-in-part of Ser. No. 415,228, Sep. 7, 1982, Pat. No. 4,469,732. This application Jun. 20, 1988, Ser. No. 606,900
 The portion of the term of this patent subsequent to Sep. 4, 2001, has been disclaimed.
 Int. Cl.⁴ B32B 3/02, 3/10
 U.S. Cl. 428—80

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 21-28 is confirmed.

Claims 1-20, 29-34 are cancelled.

21. A reusable deflector for application to the inner panel of a vehicle door to prevent water or dust and the like from

entering the vehicle body or coating the inner door trim panel, the deflector comprising:

a flat and flexible sheet of a plastic material having a peripheral shape generally matching the peripheral configuration of the inner panel of the vehicle door, said sheet having top, bottom and opposing side edges; permanently tacky pressure-sensitive adhesive bonded to a first face of said sheet, said layer being disposed in strips generally along said edges; at least one tab provided along said bottom edge adapted to be inserted into a slot in an associated inner door panel; and, a strip of plastic material having an adhesive coated face temporarily secured to said sheet in a first storage position and adapted to be secured to said sheet in a second position over said one tab when said one tab is inserted into a slot in an associated inner door panel.

B1 4,607,518 (1149th)

FORGING PRESS OF UNDERFLOOR DESIGN

Hans A. Schubert, Düsseldorf, and Klaus Schulze, Monchen-Gladbach, both of Fed. Rep. of Germany, assignors to SMS Hanselrer Maschinenfabrik GmbH

Reexamination Request No. 90/001,752, Apr. 17, 1989.

Reexamination Certificate for Patent No. 4,607,518, issued Aug. 26, 1986, Ser. No. 746,323, Jun. 19, 1985.

Filed Apr. 17, 1989, Ser. No. 746,323

Claims priority, application Fed. Rep. of Germany, Jun. 19, 1984, 3422644

Int. Cl.⁴ B21J 9/12

U.S. Cl. 72-453.12

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1-11 are determined to be patentable as amended.

1. [A] In a forging press of underfloor design comprising a static platen, a travelling frame formed by an upper travelling crosshead, a lower travelling crosshead and columns inter-connecting the [said] travelling crossheads, a guide shaft connected to and depending from the platen and acting as a guide for the lower travelling crosshead, at least one working piston-cylinder unit acting between the [platen] platen and the lower travelling crosshead for exerting forging pressure, and retraction piston-cylinder units acting between the [platen] platen and the upper travelling crosshead for retracting the travelling frame, [characterised in that] the improvement wherein the guide shaft is [made] hollow [and serves as the] to provide the cylinder [for the working piston] of [the] said working piston-cylinder unit, the lower travelling crosshead is provided with an aperture which encircles the hollow guide shaft and through which the hollow guide shaft extends downwardly, said lower travelling crosshead is guided on [the] said hollow guide shaft, the lower travelling crosshead has a lower end, a bridge member is provided on said lower end of the lower travelling crosshead spanning said aperture, and the working piston of the working piston-cylinder unit is guided in [the] said cylinder [cavity] of [the] said hollow guide shaft and is supported on [the lower travelling crosshead] said bridge member by means of ball and socket joints and a thrust rod interposed between said ball-and-socket joints.

REISSUES

OCTOBER 24, 1989

Matter enclosed in heavy brackets [] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 33,096

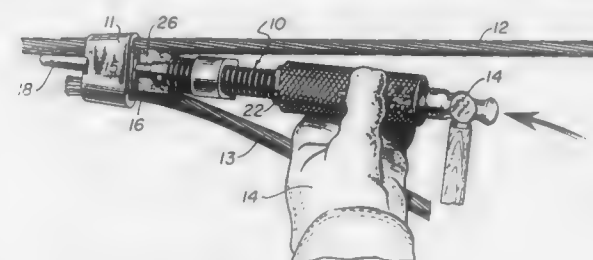
EXPLOSIVELY-OPERATED TOOL

Warren A. Center, Alton Bay, N.H., assignor to Burndy Corporation, Norwalk, Conn.
Original No. 4,722,189, dated Feb. 2, 1988, Ser. No. 914,332, Oct. 2, 1986. Application for reissue Mar. 14, 1989, Ser. No. 323,429

Int. Cl.⁴ F01B 29/08; F02N 13/00

U.S. Cl. 60-635

23 Claims



22. Explosive cartridge, comprising:

- an elongated shell case having a longitudinal main bore opening on one end and a communicating smaller bore opening on the other end,
- a bushing having a cylindrical portion at one end slidable in the smaller bore and a second cylindrical portion at the other end slidable in the longitudinal main bore, the bushing having a coaxial bore extending through it,
- a power cell having a cylindrical main body fitting snugly in the coaxial bore of the bushing and a radial flange at one end to engage the other end of the bushing, the power cell having internal explosive material and primer that is actuated at the said one end of the cell having the flange, and
- a piston slidably carried in the main bore and having a recess facing the bushing and the power cell.

Re. 33,099

DENTAL CROWN, COPING AND METHOD

Itzhak Shohar, 50 Shlomo Hamelich St., Tel Aviv, and Aharon Whiteman, 13 Ji Perez St., Petach Tikvah, both of Israel
Original No. 4,459,112, dated Jul. 10, 1984, Ser. No. 414,415, Sep. 2, 1982. Application for reissue Jun. 4, 1986, Ser. No. 870,427

Int. Cl.⁴ A61C 5/08

U.S. Cl. 433-222.1

20 Claims



1. A [jacket] dental crown comprising a composite body [including] formed from a thin foil of high fusing temperature metal having a surface geometry conforming to a die to which it has been adapted [with the foil having at least a minimum of three folded over pleats with each pleat forming a triangular like flap in the unfolded position,] a thin coating of a [noble] gold based noble metal composition superimposed over one surface of said [thin metal foil and disposed beneath the folded

over pleats] high fusing temperature metal with said composite body having a plurality of folded over sections which radially extend from an axis through the center of the foil in a symmetrical arrangement about the center of the foil and a relatively thick outer coating of a dental veneering material.

Re. 33,100

DENTAL COMPOSITIONS INCORPORATING GLASS IONOMERS

Robert L. Ibsen, Santa Maria; William R. Glace, Orcutt, and Donald R. Pacropia, Santa Maria, all of Calif., assignors to DEN-MAT Corporation, Santa Maria, Calif.

Original No. 4,738,722, dated Apr. 19, 1988, Ser. No. 907,577, Sep. 15, 1986. Application for reissue Jun. 29, 1988, Ser. No. 212,951

Int. Cl.⁴ A61K 6/06; C08L 33/02

U.S. Cl. 106-35

7 Claims

1. A buffered glass ionomer cement for dental use, including in combination, a mixture of
(A)(1) a fine particle, 5-10 microns, powder consisting essentially by weight

silica	20-30%
boron oxide	1-10%
aluminum oxide	10-20%
aluminum fluoride	1-10%
calcium fluoride	30-40%
phosphorus pentoxide	[1-5%] 1-10 %
ammonium fluoride	[1-10%] 1-5%

said powder being obtained from glass resulting from the fusing together of said silica, boron oxide, aluminum oxide, aluminum fluoride, calcium fluoride, phosphorus pentoxide, and ammonium fluoride, then fritting and ball milling to the fine particle size, 5-10 micron, powder, and
(2) five to twenty percent of the weight of (1) of powdered zinc oxide and zero to ten percent of powdered titanium dioxide, added to said powder (1) and mixed therewith only after said fritting and ball milling, and
(B) a liquid component comprising, by weight
(1) 100-80% by weight of polyacrylic acid of low molecular weight, 40% solution in water and
(2) 0-20% of d-tartaric acid,
said powder component (A) and said liquid component (B) being mixed together in a ratio of from 1:1 to 5:3 by weight.

Re. 33,101

METHOD OF FORMING THE PRIMARY CORE OF A PRESTRESSED CONCRETE PIPE

Vito Nenna, P.O. Box 377, Pittstown, N.J. 08867

Original No. 4,600,548, dated Jul. 15, 1986, Ser. No. 457,009, Jan. 10, 1983. Application for reissue Apr. 21, 1988, Ser. No. 184,181

Int. Cl.⁴ B28B 1/10; B29C 39/12

U.S. Cl. 264-71

10 Claims

1. A method of forming [an adherent concrete lining on the inside surface of a cylindrical metal pipe and an adherent concrete casing about the outside surface of the metal sleeve] the primary core of a prestressed concrete pipe comprising the steps of:

- positioning a cylindrical metal sleeve having a substantially fluid impervious side wall and a predetermined height in substantially vertical and coaxial relationship within a cylindrical mold having substantially the same height as

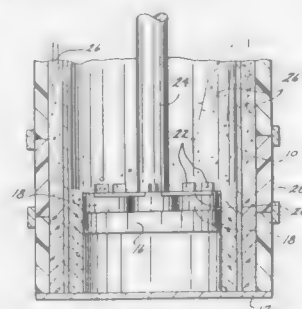
the metal sleeve such that the outer surface of the metal sleeve is spaced from the inner surface of the mold;

(b) supplying concrete to the space between the outer surface of the metal sleeve and the inner surface of the mold while vibrating the mold to compress the concrete therebetween to form an adherent concrete casing about the outer surface of the metal sleeve;

(c) simultaneously with step (b), supplying a zero slump concrete to the interior of the metal sleeve;

(d) simultaneously with step (b), radially compressing the concrete in the metal sleeve against the inner surface

thereof to form a concrete lining along the length of the inner surface of the metal sleeve; and



(e) removing the metal sleeve having the inner concrete lining and the outer concrete casing from the mold.

PLANT PATENTS

GRANTED OCTOBER 24, 1989

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

7,049

NECTARINE TREE (SUMMER BRIGHT)

Norman G. Bradford, 11875 E. Savana Rd., and Lowell G. Bradford, 12439 E. Savana Rd., both of Le Grand, Calif. 95333

Filed Dec. 12, 1988, Ser. No. 283,819

Int. Cl.⁴ A01H 5/00

U.S. Cl. Plt.—41

1 Claim

1. A new and distinct mid-seasonal ripening variety of clingstone nectarine tree, substantially as illustrated and described, which most nearly resembles the Summer Diamond (U.S. Pat. No. P.P. 5,654) nectarine variety by producing fruit that is nearly full red in color and very firm in texture, but is distinguished from and an improvement on that variety by having fruit that ripens 5 days earlier, that is clingstone instead of freestone, and that is much sweeter in flavor, a valuable asset in today's marketplace.

7,050

NECTARINE TREE (DIAMOND JEWEL)

Norman G. Bradford, 11875 E. Savana Rd., and Lowell G. Bradford, 12439 E. Savana Rd., both of Le Grand, Calif. 95333

Filed Dec. 12, 1988, Ser. No. 283,820

Int. Cl.⁴ A01H 5/00

U.S. Cl. Plt.—41

1 Claim

1. A new and distinct early ripening variety of clingstone nectarine tree, substantially as illustrated and described, which most nearly resembles the May Diamond (U.S. Plant Pat. No. 5,454) nectarine variety by producing fruit that is full red in color, ripens in early June, and is very firm in texture, but is distinguished from and an improvement on that variety by having fruit that is clingstone instead of freestone and that is much sweeter in flavor, both being valuable assets in today's marketplace.

PATENTS

GRANTED OCT. 24, 1989

ERRATA

For CLASS	See PATENT NO.
180-233	4,875,698
297-181	4,875,732
376-146	4,875,945
071-090	4,876,044
260-397	4,876,045
008-111	4,876,046
562-041	4,876,047
556-415	4,876,337
514-570	4,876,366
219-010	4,876,423
361-540	4,876,451
342-383	4,876,489
360-104	4,876,623
358-056	4,876,721
428-645	4,877,696
428-034	4,877,705
548-336	4,877,801
525-146	4,877,813
252-344	4,877,842
544-227	4,877,873
528-272	4,877,922
219-381	4,877,990
371-005	4,878,049
367-137	4,878,210
374-166	4,878,226

PATENTS

GRANTED OCTOBER 24, 1989

GENERAL AND MECHANICAL

4,875,235

WELDER'S MASK WITH BREATH CONTROLLED EYE SHIELD

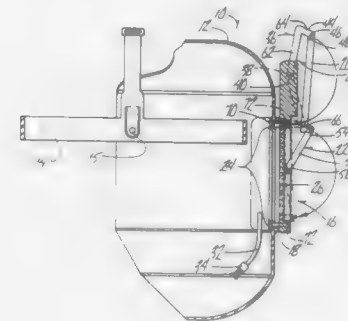
Thomas E. Kuhlman, R.R. 7748, Spirit Lake, Iowa 51360

Filed Jul. 27, 1988, Ser. No. 224,667

Int. Cl.⁴ A61F 9/06

U.S. Cl. 2—8

19 Claims



1. A welder's mask having a breath controlled eye shield which is efficient in size, weight, and operation comprising:
 - a mask housing having a viewing opening and means for mounting the mask housing upon the head of a user;
 - a modular, self-contained breath controlled eye shield means, having mounting means for adaptable and removable positioning on the mask housing and viewing opening, and including;
 - a welder's eye shield being movable between a closed position sealing and covering the viewing opening and an open position uncovering the viewing opening in the mask housing;
 - a motor means having a drive-shaft and being mounted in the eye shield means and operatively connectable to a power source mounted in the eye shield means, the motor means having connective linkage means attached between the eye shield and the motor means, drive-shaft of the motor means being operable in the first and second rotational directions to move the connective linkage means to correspondingly move the eye shield to any resting position between and including the open and closed positions;
 - a switch means operatively connected to the motor means for controlling operation of the motor means in the first and second rotational directions for the drive-shaft, said switch means comprising:
 - enclosed chamber means including first and second apertures;
 - a hose connected in fluid communication to the first aperture;
 - a resilient diaphragm sealing and covering the second aperture;
 - an electrically conductive element, external of the enclosed chamber means, movable between first and second conducting positions;
 - a stem, external of the enclosed chamber means, connected between the electrically conductive element and the diaphragm;
 - so that when exhaled air from the user is introduced into the hose, the pressure inside the air chamber increases and flexes the diaphragm outwardly causing the stem to push

the electrically conductive element towards the first conducting position, and inhaling causes a reduction in air pressure in the air chamber in turn causing inward flexing of the diaphragm, the stem pulling the electrically conductive element towards the second conducting position, the change of the conductive element between the first and second conducting positions electrically switching the operation of the motor means between the first and second rotational directions.

4,875,236

SWIM SUIT CONSTRUCTION

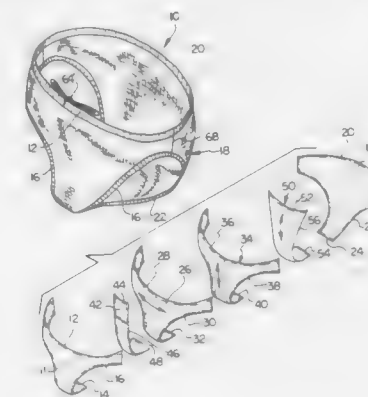
Nancy V. Boynton, 5814 Vestavia Dr., Houston, Tex. 77069

Filed Nov. 5, 1987, Ser. No. 117,488

Int. Cl.⁴ A41D 7/00; A61F 5/40

U.S. Cl. 2—67

7 Claims



1. A brief-type garment for securely supporting a person while allowing freedom of movement, comprising:
 - a front outer shell of a stretch fabric stretchable in at least one direction, having an upper edge, side edges, and a lower edge;
 - a first liner of one-way horizontally stretchable fabric having the same general shape as said front outer shell, said first liner being attached to said front outer shell along the upper edge, side edges, and bottom edge thereof;
 - an outer support member of one-way horizontally stretchable fabric having upper, lower, and side edges attached at least along the upper edge and lower edge of said outer shell and first liner;
 - a second liner of one-way vertically stretchable material having the same general shape as said outer shell attached to said outer shell and first liner along said top edge, side edges, and bottom edge thereof; and
 - a rear outer shell having an upper edge, side edges, and a bottom edge, said rear shell being attached to said side edges and bottom edges of said front outer shell and said first liner.

4,875,237

JACKET FOR DISPLAYING INFORMATION

Stephen Cohen, 1532 15th Ave. W., Seattle, Wash. 98119

Filed May 31, 1988, Ser. No. 200,434

Int. Cl.⁴ A41D 1/02

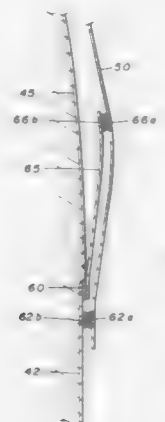
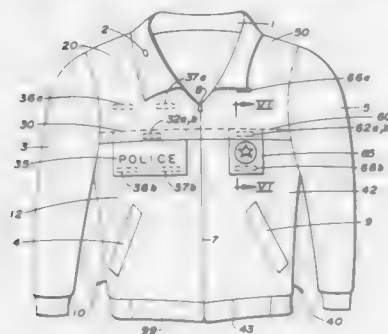
U.S. Cl. 2—94

3 Claims

1. A jacket having an attached collar and sleeves, comprising:
 - (a) a pair of front panels attached to a waistband and to a shoulder seam, each said front panel further comprising an upper front panel, a lower front panel, and a front vent

panel, said upper front panel interconnected to said lower front panel along a first front panel seam, said front vent panel having an inside surface and an upper edge attached to said shoulder seam and two said edges attached to said collar and said sleeve and a lower edge which extends over and releasably engages said upper front panel, said front vent panel overlaying said upper front panel, whereby an accessible, upward-extending vent pocket is formed; and

(b) a rear panel attached to said waistband and to said pair of front panels at said shoulder seam, said rear panel further comprising an upper rear panel and a lower rear panel and a rear vent panel, said upper rear panel interconnected to said lower rear panel along a rear panel seam, said rear vent panel having an inside surface and an upper edge



attached to said shoulder seam, two side seams attached to said sleeves and a detachable lower edge which extends downwardly over said rear panel seam, said rear vent panel overlaying said upper rear panel, whereby an accessible, upward-extending vent pocket is formed; and

(c) at least one rectangular informational display means having an attached edge and a detachable edge, said attached edge being attached to said front panel seam; and (d) a hook and loop connector attaching said detachable edge of said informational display means to said inside surface of said front vent panel, whereby said jacket may be easily converted from a conventionally appearing jacket to a jacket with exposed informational display means by detaching said informational display means at said hook and loop connector and extending said informational display means downwardly from said vent pocket.

4,875,238

MUSICAL GARMENT

Ruth Solomon, 500 Kingsridge Dr., Ballwin, Mo. 63011, and Harvey J. Rosenberg, 217 S. Green Trails, Chesterfield, Mo. 63017

Filed Sep. 15, 1988, Ser. No. 244,872
Int. Cl. A41B 1/02

U.S. Cl. 2-115

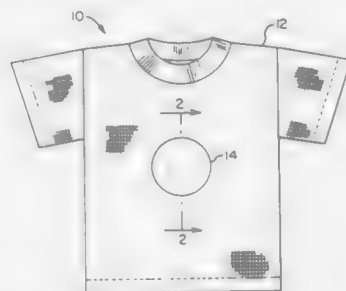
4 Claims

1. A garment capable of playing a musical tune comprising a garment having incorporated into its fabric a musical element

comprising a memory chip, a battery and a speaker, wherein said element plays a musical tune when depressed;

said garment being a garment selected from the group consisting of T-shirt, sweat shirt, sweat pants, pants, sweater, jersey, shorts and socks;

said garment being machine washable such that said musical



element maintains operability after said garment is washed; and

wherein said machine washable feature of said garment is obtained by maintaining said musical element in the interior of a machine washable pouch, and wherein said machine washable pouch is sewn into the fabric of said garment.

4,875,239

PRE-TIED NECKTIE

John A. Patterson, Jr., 204 College Ave., Fruitland Pk., Fla. 32731

Filed Aug. 9, 1988, Ser. No. 230,306
Int. Cl. A41D 25/02, 25/14

U.S. Cl. 2-152 R

14 Claims



1. A necktie knot support assembly for supporting a fabric pre-tied necktie for wearing about a user's neck, said assembly comprising:

a main body member having a pair of rearwardly and opposite sidewise directed wings connected by a central curved bridging wall, and shaped to determine the formation of a knot of said necktie;

a support strap having ends and a central portion;

means located on said body member for engaging said central portion of said strap to align said strap with said body member so that said ends of said strap extend respectively outwardly from said body member in alignment with said wings; and

means located on said ends for releasably securing said ends to one another about said user's neck.

4,875,240

PANTS CONSTRUCTION AND ASSOCIATED METHOD

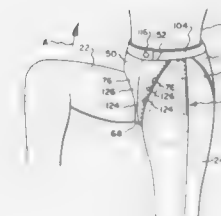
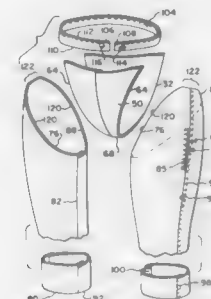
Joseph B. Barrett, 192 Moore Ave., Kenmore, N.Y. 14217

Filed Jan. 5, 1988, Ser. No. 141,116

Int. Cl. A41D 1/06, 27/20

U.S. Cl. 2-227

18 Claims



1. A pair of pants comprising:

panel means for covering the front and back lower portion of a wearer's torso, said panel means including a symmetrical hourglass shaped panel which, when placed in a planar, spread condition, defines two relatively broad edges at opposite ends thereof and a pair of curved generally C-shaped side edges extending between said broad end edges, said side edges being arranged relative to one another so that the Cs thereof open generally away from one another and so that a neck region is defined about midway between the broad edges, said hourglass-shaped panel being positionable about the wearer's torso when the pants are operatively worn so that said neck region is arranged beneath the wearer's crotch, one of said broad edges is arranged in front of the wearer and generally along the wearer's waistline and the other of said broad edges is arranged in back of the wearer and generally along the wearer's waistline;

a pair of leg sections each including a tube-like portion defining an upper endless edge for encircling a corresponding one of the wearer's legs adjacent the top thereof, each of said endless upper edges being joined to a corresponding one of said C-shaped edges and along the entire length thereof to operatively join said leg section to said panel means; and

waistband means extending along both of said broad edges of said panel means and along a portion of each of said upper endless edges of said leg sections and including connecting means so that said pants fit around the waist of the wearer.

16. A method of constructing a pair of pants comprising the steps of:

providing panel means for covering the front and back lower portion of the wearer's torso including a symmetrical hourglass-shaped panel which, when in a planar, spread condition, defines two relatively broad parallel edges at opposite ends thereof and a pair of curved generally C-shaped side edges extending between said broad edges, said side edges being arranged relative to one another

other so that the Cs thereof open generally away from one another and so that a neck region is defined substantially midway between the broad edges;

providing a pair of leg sections each including a tube-like portion defining an endless upper edge for encircling a corresponding one of the legs adjacent the top thereof; joining each of said endless upper edges of said leg sections to a one corresponding one of said C-shaped edges of said panel means and along the entire length of the corresponding C-shaped edges to operatively join said leg sections to said panel means and so that when said pants are operatively worn, said neck region is arranged beneath the wearer's crotch, one of said broad edges is arranged in said front of the wearer and generally along the wearer's waistline and the other of said broad edges is arranged in back of the wearer and generally along the wearer's waistline; and

providing waistband means extending along both of said broad edges of said panel means and along a portion of each of said upper endless edges of said leg sections and including connecting means so that said pants fit around the waist of the wearer.

4,875,241

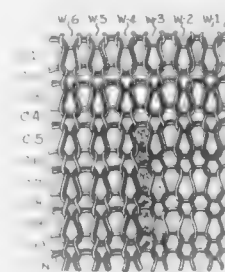
PANTYHOSE WITH PANTY HAVING COTTON CHARACTERISTICS

George A. G. Browder, Jr., Germantown, Tenn., and David W. Grant, Grenada, Miss., assignors to Esmark Apparel, Inc., New York, N.Y.

Filed Oct. 14, 1988, Ser. No. 257,840
Int. Cl. A41B 11/04

U.S. Cl. 2-409

8 Claims



1. A panty hose including sheer legs and a relatively heavier and more opaque panty portion, said panty portion including the feel and moisture absorbing characteristics of cotton and comprising successive courses formed of adjacent wales of stitch loops, alternate single courses of said panty portion being knit of a thermoplastic yarn and a cotton yarn in plated relationship with said thermoplastic yarn, and intervening single courses of said panty portion being knit of a thermoplastic yarn and a spandex yarn in plated relationship with said thermoplastic yarn, said cotton yarn providing the feel and moisture absorbing characteristics of cotton to said panty portion and said spandex yarn providing stretchability to said panty portion.

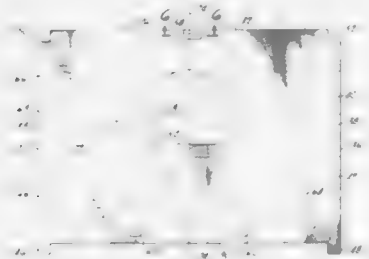
4,875,242

COMPACT TOILET SEAT COVER

Leonard N. Albrecht, Irvine, and Steven R. Burke, Huntington Beach, both of Calif., assignors to Alvin S. Haining and Katherine R. Haining, both of Mission Viejo, Calif.
Continuation-in-part of Ser. No. 112,866, Oct. 23, 1987, abandoned. This application Nov. 4, 1987, Ser. No. 116,857
Int. Cl.⁴ A47K 13/16

U.S. Cl. 4-243

16 Claims



1. A disposable paper cover for conventional toilet seats, the cover comprising:

(a) a composite paper sheet which disintegrates when immersed in water sufficiently that it may be flushed in the toilet without creating problems with the toilet pumping or with any conventional septic tank connected with the plumbing, the paper sheet being of generally rectangular configuration, of adequate size to cover the toilet seat, and having an opening formed centrally therein for general registration with the toilet opening defined by the conventional toilet seat;

(b) said composite paper sheet including a top layer of creped paper emboss laminated with a bottom layer of flat machine finished or machine glazed finished paper, whereby to preserve the structural strength of the sheet while enhancing its weight and its self-stability on the toilet seat without substantial interference with its disintegration in water; said rectangular sheet having rear and forward margins and lateral margins extending therebetween;

(c) adhesive means disposed on the bottom layer of paper proximate the rear margin and centrally between the lateral margins of the sheet for releasably anchoring the sheet to the rear portion of the conventional toilet seat; and,

(d) said composite sheet being folded into a compact configuration, in which:

(1) the adhesive means is exposed for application to the rear portion of the toilet seat; and,

(2) the forward margin of the composite sheet is accessible for

(A) grasping with the hands at locations proximate the lateral margins of the sheet, and

(B) pulling against the anchor provided by said adhesive and separating the hands,

(C) with folds being configured to unfold upon such pulling followed by such separation thereby to extend the sheet over the toilet seat with the bottom layer in contact with the toilet seat and the top layer thereof exposed for direct contact with the body of the user;

(3) whereby, to facilitate the deployment of the sheet on the toilet seat without requiring direct contact between the user's hands and the toilet seat.

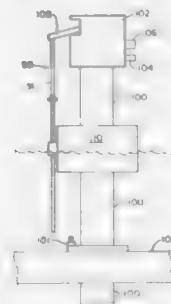
4,875,243

TOILET APPARATUS WITH AUTOMATIC SELF-CLEANING MEANS

Ben C. Willeman, III, Oklahoma City, Okla., assignor to Willeman Industries, Inc., Oklahoma City, Okla.
Continuation-in-part of Ser. No. 147,873, Jan. 25, 1988, and Ser. No. 874,667, Jun. 16, 1986, Pat. No. 4,745,639. This application May 5, 1988, Ser. No. 190,343
Int. Cl.⁴ E03D 5/04; A47K 13/00

U.S. Cl. 4-662

3 Claims



1. A toilet apparatus comprising a bowl, a holding tank in communication with said bowl by fluid communication means, a seat member connected to said bowl and adapted to overlie a rim portion of said bowl, a cover member connected to said bowl and adapted to overlie said seat member, at least one of said seat and cover members having channel means therein and hole means extending from said channel means to an undersurface thereof to facilitate passage of fluid from said holding tank, through said fluid communication means and through said channel and hole means, a flotation body disposed in said holding tank, said fluid communication means being operative in response to manual manipulation of a flushing activator to empty fluid in said holding tank into said bowl, said flotation body being adapted to move with movement of fluid level in said holding tank, a manifold disposed in said holding tank, a fluid supply pipe connected to said holding tank, and in communication with said manifold valve and conduit means disposed on said apparatus and operable by descending movement of said flotation body relative to said manifold to activate flow of fluid from said fluid supply pipe, through said manifold, to said channel and hole means, a first switch means disposed in the path of said flotation body and engageable by said flotation body in said descending movement, said first switch means being adapted to operate said valve and conduit means to stop said flow of fluid to said channel and hole means and direct flow of fluid to refilling said holding tank, said flotation body being adapted to rise with said fluid in said holding tank to disengage from said switch and to activate said manifold to close off flow of fluid from said supply pipe.

4,875,244

SOFA BED CONSTRUCTION

Gilles Tremblay, Quebec, Canada, assignor to Futonair Quebec, Inc., Quebec, Canada

Filed Mar. 18, 1988, Ser. No. 170,287

Claims priority, application Canada, Mar. 27, 1987, 533191

Int. Cl.⁴ A47C 17/16

U.S. Cl. 5-37 R

1 Claim

1. A wooden furniture frame adaptable to be converted between sofa and bed positions, comprising:

a substantially rectangular back piece means having opposed first side segments connected by opposed upper and lower cross bars, said first side segments having extension segments which extend beyond a lower cross bar;

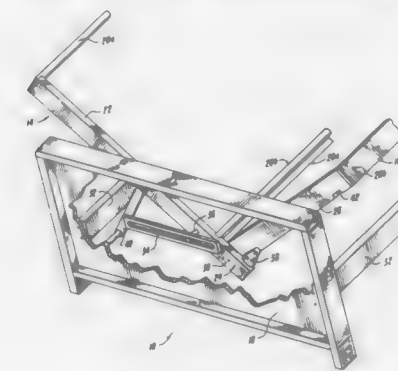
a rectangular seat piece means having opposed second side segments connected by opposed forward and rearward cross bars, the rearward portion of the second side segments being positioned within and pivotally hinged to the extension segments of the back piece means;

opposed armrest stand means connected by support frame means to support said back support frame and said seat support frame;

dowel means extending from the first side segments of the back support frame;

elongate, horizontally disposed groove means, attached to an interior portion of said armrest stand means for slidably receiving said dowel means;

block means pivotally secured to the outer surfaces of said second side segments of the seat piece means, having a base portion and being adapted to engage a top surface of said extension segment with said base portion when said



seat piece means is pivotally raised to a predetermined height;

said block means comprising a substantially triangular member which is pivotable about a point adjacent an apex of said back means, and is freely rotatable such that its base portion normally faces downwardly under the influence of gravitational force when the frame is in either its sofa or bed position; and

a notch means in the forward cross bar of said seat piece means, said notch being adapted to interlock with a portion of said frame means to secure said furniture frame in the sofa position.

4,875,245

BED CLOTHES

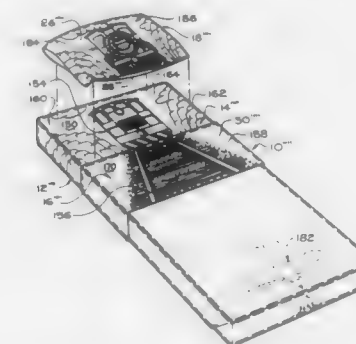
Richard A. Isola, Bloomfield Hills, Mich., assignor to Habitation, Bloomfield Hills, Mich.

Continuation of Ser. No. 524,116, Aug. 18, 1983, abandoned, which is a continuation of Ser. No. 218,064, Dec. 19, 1980, abandoned. This application Jul. 25, 1988, Ser. No. 223,685

Int. Cl.⁴ A47G 9/02

U.S. Cl. 5-482

29 Claims



1. In combination with a bed or similar type of apparatus having a covering element disposed thereupon and a head portion at one end thereof and a foot portion at the opposite

end thereof, and adapted to have a pillow-like device placed at the head portion thereof,

a bed sheet adapted to overlie said bed and be arranged at least in part beneath said covering element and comprising first and second areas adapted to be selectively alternately oriented adjacent the head and foot portions of the bed, said sheet having said first area printed with a first graphic illustration depicting a first subject matter and a second area printed with a second graphic illustration depicting a second subject matter, different from the first subject matter, whereby when said sheet is disposed on the bed with said second area adjacent said head portion and the covering element disposed in overlying relation with respect to said first area so that only said second area of said bed sheet is exposed, the visual impression is given that said bed sheet depicts solely said second subject matter, and when said bed sheet is disposed on the bed with said first area adjacent said head portion and the covering element disposed in overlying relation with respect to said second area so that only said first area of said bed sheet is exposed, the visual impression is given that said bed sheet depicts solely said first subject matter, and

a pillowcase element having first and second sides and adapted to receive the pillow-like device therewithin, said first side having means depicting a subject matter which cooperates with said first subject matter depicted on said first area of said bed sheet, and said second side having means depicting a second different subject matter which cooperates with said second subject matter depicted on said second area of said bed sheet.

4,875,246

SURFACE TREATING DEVICE

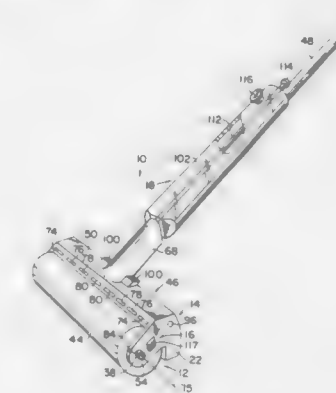
Francis W. MacGregor, Simsbury, Conn., assignor to Quad Research, Inc., Avon, Conn.

Filed Jul. 22, 1988, Ser. No. 223,221

Int. Cl.⁴ A47L 11/29

U.S. Cl. 15-98

21 Claims

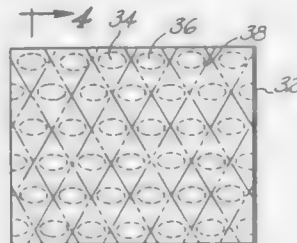


1. A power operated surface treating device comprising a handle assembly, a generally cylindrical roller, means supporting said roller on said handle assembly for rotation about its axis and relative to said handle assembly, drive means for rotating said roller about said axis and relative to said handle assembly and including a motor supported within said roller and having a fixed part and a rotatable part, one of said parts comprising said fixed part and said rotatable part being connected to said handle assembly and the other of said parts being connected to said roller, a power supply source wholly contained within said roller, and switching means on said surface treating device for connecting said power supply source to said motor to energize said motor.

4,875,247

DISPOSABLE TOOTH CLEANING & POLISHING APPARATUS

Skip Berg, P. O. Drawer 725, Venice, Fla. 34282
Continuation of Ser. No. 83,028, Aug. 7, 1987, abandoned. This application Jan. 20, 1989, Ser. No. 371,689
Int. Cl.⁴ A61C 17/00
U.S. Cl. 15—104.94 13 Claims



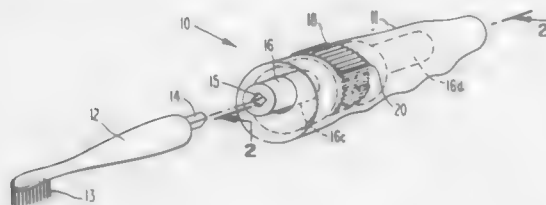
1. A disposable tooth cleaning and polishing product for manually cleaning tooth surfaces and for stimulating gums comprising:

- a single, unfolded sheet of very thin, flexible textured material having a first surface and a second surface and being substantially insoluble in water and oral cavity juices;
- said first surface textured to remove plaque, food residue, and oral cavity acids from tooth surfaces by manually rubbing said sheet material with finger pressure against the tooth surfaces;
- said second surface textured to remain in non-sliding friction contact against a user's fingertip.

4,875,248

ADJUSTABLE TOOTHBRUSH

Steven Kent, Stockport, England, assignor to Colgate-Palmolive Company, Piscataway, N.J.
Filed Mar. 23, 1988, Ser. No. 172,033
Int. Cl.⁴ A46B 7/02; B25G 1/06
U.S. Cl. 15—143 R 6 Claims

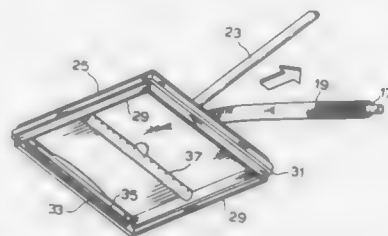


1. An adjustable toothbrush comprising a handle, a shaft mounted for rotation within said handle and having a portion extending beyond the handle terminating in a brush head having bristles thereon, said handle having a chamber in the interior thereof, said handle having an opening to its outer surface and communicating with said chamber, said shaft passing through said chamber, deformable material in said chamber surrounding a portion of said shaft, said deformable material having a ring gear thereon extending to the outer surface of said deformable material, said ring gear being accessible through said opening, gear teeth fixed to said handle within said chamber for meshing engagement with said ring gear, said ring gear being engageable with said gear teeth upon application of pressure on said ring gear through said opening, said ring gear being engageable with said gear teeth to prevent rotation of said shaft.

4,875,249

CARPET REPAIR STEAM SYSTEM

David S. Collier, 3985 Garnetwood Chase, Mississauga, Ontario, Canada (L4W 2H3)
Filed May 11, 1988, Ser. No. 192,703
Int. Cl.⁴ B08B 3/00
U.S. Cl. 15—398 12 Claims

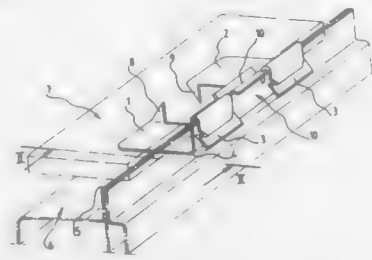


1. A steam system for repairing bent carpet fibres, said steam system comprising a steam generator and an application tool having a head with a steam chamber fed by said steam generator, said steam chamber being defined by a downwardly opening shroud supporting said tool and trapping the steam at the carpet fibres immediately beneath said shroud to provide an oven-like effect for resetting of the carpet fibres from a bent to an unbent position, said head of said application tool further including fibre lifting means for lifting the fibres to the unbent position after having been relaxed by the steam.

4,875,250

CLAMP FOR FASTENING A CARPET ON A FLOOR

René Chaintreuil, Audincourt, France, assignor to Automobiles Peugeot and Automobiles Citroën, both of Paris, France
Filed Oct. 18, 1988, Ser. No. 259,512
Claims priority, application France, Oct. 20, 1987, 87 14460
Int. Cl.⁴ A47G 27/04
U.S. Cl. 16—4 8 Claims



1. A clamp for fastening an element such as a carpet or the like onto a surface such as a vehicle floor, comprising a first portion folded back on itself and adapted to be clipped onto an edge forming a flange and a second portion, connected to the first portion, adapted to retain said element onto said surface, wherein the improvement comprises said second portion being connected at right angles to the first portion and said second portion including at least two members spaced or offset from each other in both a first plane and in a second plane substantially perpendicular to said first plane and said members being connected to each other through a bridging portion.

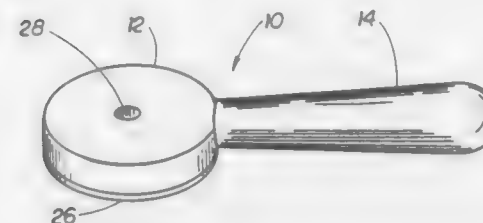
4,875,251

TOILET SEAT HANDLE OF UNITARY CONSTRUCTION

James T. Hazard, 311 Fairmeade Rd., Louisville, Ky. 40207
Filed Dec. 22, 1988, Ser. No. 288,480
Int. Cl.⁴ A47K 13/10
U.S. Cl. 16—111 R 8 Claims

1. A toilet seat handle device for attachment to a toilet seat as an aid to raising and lowering the toilet seat comprising: a cylindrical base portion with upper and lower planar sur-

faces configured so as to fit with said upper planar surface against the bottom side of the toilet seat; means for attaching the base portion to the bottom side of the toilet seat; and, a cylindrical handle portion unitarily constructed with said base portion so as to have a first end affixed to a circumferential surface of said base portion, and a second end ex-

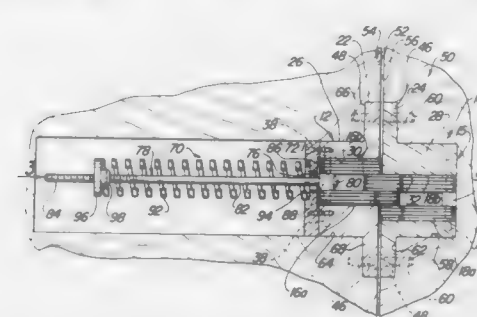


tending radially outward from said base portion, such that when the base portion is attached to the toilet seat, the handle portion extends outwardly beyond the outside periphery of the toilet seat, said handle portion having a diameter at its first end substantially equal to a distance between the two planar surfaces of said base portion, said handle portion including a coating of material that glows so that the handle portion is visible in the dark.

4,875,252

SELF-CLOSING INVISIBLE HINGE WITH SELECTIVELY VARIABLE CLOSING FORCE

Donald R. Falconer, Swanton, Ohio, and James C. Smeddon, Hillsdale, Mich., assignors to Universal Industrial Products, a Division of Core Industries, Inc., Pioneer, Ohio
Filed Jul. 5, 1988, Ser. No. 215,240
Int. Cl.⁴ E05D 7/00; E05F 1/12
U.S. Cl. 16—288 11 Claims



3. In a door connected to an associated wall by a hinge structure for swinging movement relative to the wall and adapted to be moved between closed and open positions, the invention comprising:

- a self-closing invisible hinge for supporting the door to the wall for swinging movement between the closed and open positions and for urging and returning the door to its closed position from its open position,
- said self-closing invisible hinge comprising a pair of hinge bodies,
- each of said hinge bodies having a mounting plate and an extension portion extending inwardly from said mounting plate,
- each said hinge bodies having an opening extending through, said opening having upper and lower surfaces and a side surface, a pair of upper and lower guide slots located in said upper and lower surfaces,
- link means connected to said hinge bodies for permitting swinging movement of said hinge bodies relative to each

other and hence swinging movement of the door relative to the wall between its closed and open positions, fastening means operatively connected with said mounting plates for connecting said hinge bodies to the door and the wall,

said link means comprising a first pair of link members and a second pair of link members, each of said link members having a generally triangular shape defined by leg portions extending divergently from the apexes of said triangular shape,

a pivot pin pivotally connecting said first and second pairs of link members together generally at their apexes with said first pair of link members being alternately interleaved with said second pair of link members, one of the ends of said first pair of link members being located in said opening in one of said hinge bodies and being pivotally held there by a first pivot pin,

one of the ends of said second pair of link members being located in said opening in the other of said hinge bodies and being pivotally held there by a second pivot pin,

the opposite ends of said first pair of link members being connected together by a first guide pin having opposite ends located in said upper and lower guide slots in one of said hinge members, said first guide pin having an enlarged intermediate portion located between said first and second link members at said opposite ends of said first pair of link members,

the opposite ends of said second pair of link members being connected together by a second guide pin having opposite ends located in said upper and lower guide slots in the other of said hinge members,

a coil spring member of generally uniform diameter and having one end operative against said extension body portion of said one of said hinge bodies,

an adjustment rod having an elongated shank portion extending through a first opening through said enlarged intermediate portion and extending through said opening in said one of said hinge bodies and extending generally concentrically with said coil spring, said adjustment rod having an enlarged head portion at one end larger than said first opening and adapted to engage said intermediate portion,

said shank being threaded at its opposite end portion, a retainer member located at the opposite end of said coil spring and adapted to engage said opposite end, said retainer member having a threaded bore adapted to threadably engage said threaded end portion of said shank,

said spring member adapted to provide a bias between said first and second link members and said hinge bodies to provide a bias urging said hinge bodies to the closed position,

said enlarged head having an irregular surface adapted to be engageable whereby an operator can manually thread said shank more or less into said threaded bore of said retainer member, whereby the bias of said spring member relative to said first and second pairs of link members and said hinge bodies can be selectively varied by the operator, said enlarged head being accessible to the operator when said hinge bodies are in the open position whereby the selective adjustment can be made externally of the door and wall.

4,875,253

PROCESS FOR STUNNING LIVESTOCK

Elbert Lambooy, Veenendaal, Netherlands, assignor to Stichting Instituut Voor Veeteeltkundig Onderzoek "Schoonoord", Am Zeist, Netherlands

Filed Sep. 2, 1988, Ser. No. 240,755
Claims priority, application Netherlands, Sep. 7, 1987, #702114

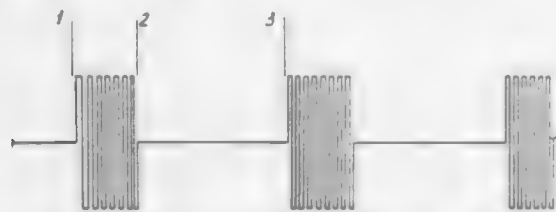
Int. Cl.⁴ A22B 3/00

U.S. Cl. 17—1 E

8 Claims

1. In a process for stunning livestock, in particular pigs,

comprising administering to the animal to be stunned, through electrodes, a brief low frequency electrical current surge the improvement comprising:



administering a stunning current surge prior to sticking the animal, followed by an intermittent current surge, the frequency of which is at least a thousand times the frequency of the stunning current surge.

4,875,254

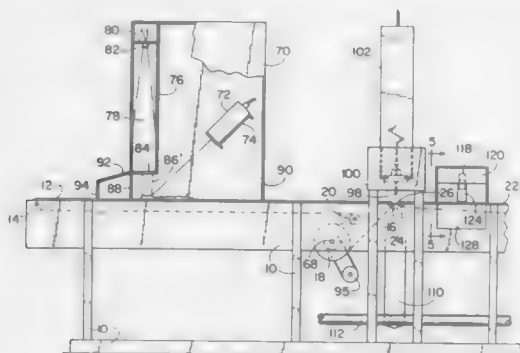
METHOD AND APPARATUS FOR AUTOMATICALLY CUTTING FOOD PRODUCTS TO PREDETERMINED WEIGHT OR SHAPE

Norman A. Rudy, Renton, and James S. Tomlin, Seattle, both of Wash., assignors to Design Systems, Inc., Seattle, Wash.
Filed Mar. 22, 1988, Ser. No. 171,774

Int. Cl.⁴ A22C 25/14

U.S. Cl. 17-61

20 Claims



1. Apparatus for cutting food and like products to desired reduced sizes, comprising:

- (a) a frame,
- (b) elongated conveyor means on the frame for moving the product from an infeed end to an outfeed end,
- (c) means on the frame for determining the dimensions of product as it moves on the conveyor means, and
- (d) at least one line-type cutter on the frame movable transversely of the conveyor means and having a cutting edge disposed on a line extending through the working stretch of the conveyor means for cutting products moving on the conveyor means along lines predetermined to reduce the product to desired size.

4,875,255

FISH SCALING APPARATUS AND PROCESS

George W. Kent, Jr., 3522 Hampton Hwy., Hampton, Va. 23666
Filed Nov. 30, 1988, Ser. No. 277,692

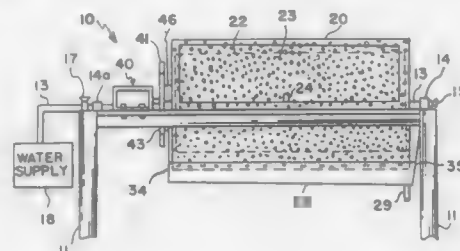
Int. Cl.⁴ A22C 25/02

U.S. Cl. 17-64

10 Claims

- 1. A fish scaling apparatus comprising in combination:
 - (a) a support stand,
 - (b) an inner and an outer hollow elongated drum disposed in spaced concentric relationship and supported by said support stand,
 - (c) an access door in said outer drum for loading and unloading a quantity of fish in the space between said inner and said outer drum,

- (d) an axle extending along the common axis through said drums,
- (e) means for rotating said pair of drums about said axle,
- (f) a plurality of dimpled perforations provided through the sidewall of each said inner and said outer drum,
- (g) said dimpled perforations on said inner drum being directed toward the exterior surface thereof and provided with rough edge surfaces directed toward the interior surface of said outer drum,



- (h) said dimpled perforations on said outer drum being directed toward the interior surface thereof and provided with rough edge surfaces directed toward the exterior surface of said inner drum, and
- (i) means connecting said inner and said outer drums whereby said inner and said outer drums rotate as a unit, whereby, as said drums are rotated the fish disposed between said drums move against the rough edge surfaces on both said drums and are scaled thereby.

4,875,256

METHOD AND APPARATUS FOR REPLACING EMPTY SLIVER CANS WITH FULL SLIVER CANS IN A DRAW FRAME

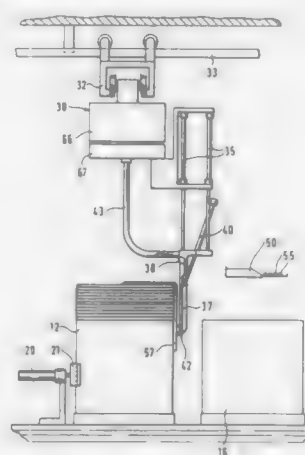
Siegfried Gunkinger, Heiningen, Fed. Rep. of Germany, assignor to Zinser Textilmaschinen GmbH, Fed. Rep. of Germany
Filed Jul. 27, 1988, Ser. No. 224,998

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1987, 3725265

Int. Cl.⁴ D04H 11/00

U.S. Cl. 19-159 A

27 Claims



- 1. A method for replacing empty sliver cans with full sliver cans in a draw frame in which a plurality of slivers are fed from cans for processing in the draw frame, said method comprising positioning a full sliver can in readiness for replacing a can being emptied by the draw frame, and with an end of sliver exposed from the full can, positioning a movable carriage at the full can, grasping the exposed end of sliver with a gripper carried on the carriage and placing the grasped sliver end into the draw frame by manipulating the gripper, and shifting the full can into sliver feeding position and the empty can out of sliver feeding position.

4,875,257

TACK BUTTON AND METHOD OF MAKING THE SAME

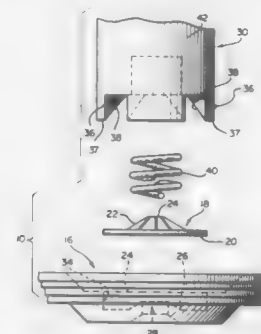
Robert E. Anderson, Roselle, and Michael L. Baritz, Highland Park, both of Ill., assignors to Handy Button Machine Company, Melrose Park, Ill.

Filed Jun. 8, 1988, Ser. No. 204,169

Int. Cl.⁴ A44B 1/18

U.S. Cl. 24-90 B

10 Claims



1. A tack retaining back support structure for securement to a front button shell of a decorative tack button, comprising:

- (1) a plastic support member integrally molded and including an annular body having an open central recess and a bottom wall formed below the recess and having a through-aperture opening into said recess, said body further having an interior wall extending inwardly from said bottom wall toward said recess; and
- (2) a tack retainer member inserted into said recess and supported on said button wall, and having a retainer aperture, aligned with said through aperture for receiving a tack shank therethrough and for peripherally gripping and retaining said shank, said interior wall having at least a portion of the plastic thereof deformed radially inwardly against said retainer member to clamp said retainer member against said bottom wall.

4,875,258

GAS- AND LIQUID-TIGHT FASTENER

Hans J. Goedecke, Gabriel-von-Seidl-Strasse 2a, D-8022 Gruenwald, Fed. Rep. of Germany

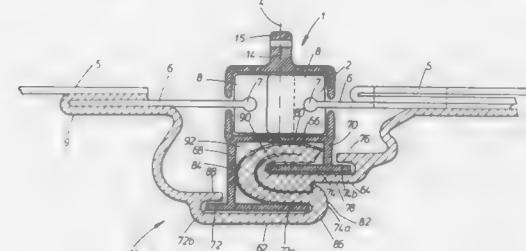
Filed Jan. 7, 1988, Ser. No. 141,624

Claims priority, application Fed. Rep. of Germany, Jan. 8, 1987, 3700427

Int. Cl.⁴ A44B 19/32

U.S. Cl. 24-389

51 Claims



1. A gas-tight and liquid-tight fastener for connecting two contiguous edge portions of a material wall of an object to be sealed, said material wall including first and second material layers fixedly connected to each other, the fastener comprising:

- a zipper for joining the first layer of material;
- a sealing slide fastener for joining the second layer of material;

said zipper and said sealing slide fastener being formed as a unitary slider member; and means for actuating said unitary slider member, wherein said means for actuating simultaneously opens said zipper and said sealing slide fastener when actuated in a first direction and simultaneously closes said zipper and said sealing slide fastener when actuated in a second direction, thereby simultaneously separating the two contiguous edge portions of the sealing wall or joining them into tight locking engagement with each other, respectively.

4,875,259

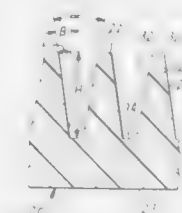
INTERMESHABLE ARTICLE

Roger H. Appeldorn, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Continuation of Ser. No. 904,358, Sep. 8, 1986, abandoned. This application Mar. 24, 1988, Ser. No. 172,631

Int. Cl.⁴ A44B 1/00

U.S. Cl. 24-576

23 Claims



- 1. An intermeshable article, comprising a member having at least one major surface at least a portion of that surface being a structured surface; said structure surface including a plurality of solid tapered elements, each element having at least one side inclined relative to a common plane at an angle sufficient to form a taper such that each element may mesh with at least one corresponding element when brought into contact with said corresponding element and adhere thereto at least partially because of the frictional force of adherence of said contacting sides and wherein the tangent of the half angle of the tapered sides of the elements is no greater than the coefficient of friction of the material of the contacting surfaces.

4,875,260

APPARATUS FOR THE PRESETTABLE CALENDERING OF TUBULAR KNITTED FABRIC

Gino D. Vecchia, Santorso, Italy, assignor to Sperotto Rimar S.p.A., Zane, Italy

Filed Jun. 17, 1987, Ser. No. 63,172

Claims priority, application Italy, Jun. 17, 1986, 20812 A/86; Jun. 17, 1986, 22296 B/86; Nov. 28, 1986, 23886 B/86

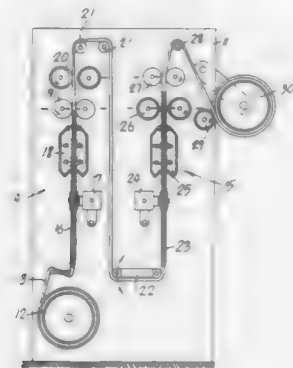
Int. Cl.⁴ D06C 5/00, 25/00

U.S. Cl. 26-81

13 Claims

- 1. Apparatus for calendering tubular knitted fabric comprising a support frame, means for feeding tubular knitted fabric in vertically upwards direction along said frame, expander means on said frame for stretching the tubular knitted fabric as the fabric is advanced along said frame, a steaming chamber on said frame above the expander means through which the stretched tubular fabric is fed, a first pair of calendering cylinders on said frame downstream of the steaming chamber for calendering the fabric after the fabric has left the steaming chamber, a second pair of calendering cylinders downstream of the first pair and through which the fabric is advanced, one of said pairs of calendering cylinders having polished surfaces

and the other pair of calendaring cylinders having a coating of textile material thereon for imparting different finishing effects



4,875,261

BACK-UP ROLL IN A ROLLING MILL

Masahiro Nishida, Osaka, Japan, assignor to Koyo Seiko Co., Ltd., Osaka, Japan

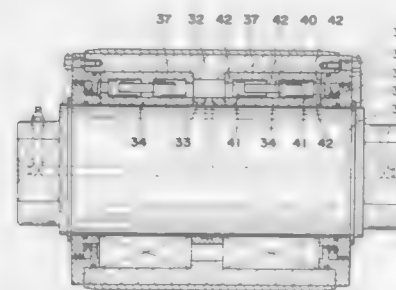
Filed Oct. 17, 1988, Ser. No. 258,858

Claims priority, application Japan, Oct. 28, 1987, 62-165228

Int. Cl.⁴ B21B 27/00

U.S. Cl. 29—116.1

8 Claims



1. A back-up roll in a rolling mill comprising: a roll shaft of the back-up roll of the rolling mill; an outer casing disposed outside the roll shaft; multiple cylindrical rollers fit circumferentially between the roll shaft and the outer casing; and a tapered roller bearing which is provided between the roll shaft and outer casing and juxtaposed to said cylindrical rollers, and which receives a thrust load acting on said cylindrical rollers, wherein said tapered roller bearing is composed of an inner ring fit to an outside of said roll shaft, an outer ring fixed to an inside of said outer casing and in contact with ends of said cylindrical rollers, and multiple tapered rollers fit between the inner and outer rings.

4,875,262

PROCESS FOR MANUFACTURING A GRAIN CHILL ROLLER

Gilbert F. DeGrave, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 23, 1988, Ser. No. 248,469

Int. Cl.⁴ C25D 5/48, 7/00

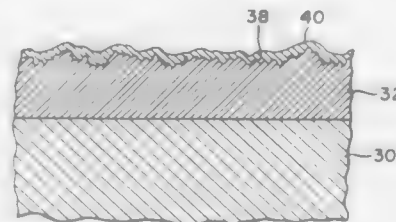
U.S. Cl. 29—121.8

6 Claims

1. A manufacturing process for preparing a surface of a roller for use in a thermoplastic embossing process, the process comprising the steps of:

electroplating a layer of copper onto the surface of a roller, abrasively blasting the surface of the copper layer with glass

beads to create a surface texture with hemispherical down features having a substantially uniform depth, abrasively blasting the copper surface with particles of silicon dioxide to modify the pattern formed during the step of blasting with glass beads and create a textured surface, and



bright nickel electroplating the blasted surface to a depth that results in a leveling of the down pattern of the surface without eliminating the down pattern in order to avoid a high gloss surface in the surface formed during the thermoplastic embossing process.

4,875,263

METHOD OF MANUFACTURING A DYNAMIC PRESSURE TYPE SLIDE BEARING

Kyozaburo Furumura, Ninomiya, Japan, assignor to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

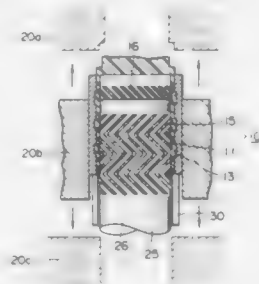
Division of Ser. No. 15,785, Feb. 17, 1987, abandoned. This

application Jul. 5, 1988, Ser. No. 215,031

Int. Cl.⁴ B21D 53/10

U.S. Cl. 29—149.5 S

14 Claims



1. A method of manufacturing a dynamic pressure type slide bearing, the bearing comprising an outer cylindrical member and an inner cylindrical member having been formed on the inner peripheral face thereof with a plurality of grooves for generating dynamic pressure and fixedly joined to the inner peripheral face of the outer cylindrical member, the method comprises the steps of:

inserting the outer cylindrical member, having previously been applied with a joining means, into an outer mould, injecting melted moulding material of synthetic resin into an annular gap defined between an inner mould and the outer cylindrical member, the outer cylindrical member having been inserted into the outer mould, the outer peripheral face of the inner mould having a plurality of projecting ridges corresponding to the grooves for generating dynamic pressure;

solidifying the injected moulding material to form the inner cylindrical member, the inner cylindrical member being fixedly joined to the outer cylindrical member during the solidifying, the inner cylindrical member expanding away from the inner mould during the solidifying, the inner cylindrical member and the outer cylindrical member constituting a composite slide bearing having an integrally joined laminated construction; and removing the composite slide bearing from both the outer

mould and inner mould by axially moving the composite slide bearing away from the inner mould and the outer mould.

4,875,264

METHOD FOR PRODUCING DIES FOR EXTRUDING HONEYCOMB STRUCTURES

Satoru Inoue, Aichi, and Shoji Futamura, Kawasaki, both of Japan, assignors to NGK Insulators, Ltd. and Hoden Seimitsu, both of Nagoya, Japan

Division of Ser. No. 84,027, Aug. 11, 1987, Pat. No. 4,830,598.

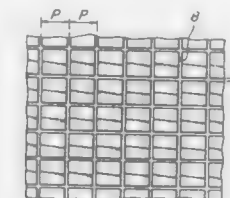
This application Feb. 28, 1989, Ser. No. 316,641

Claims priority, application Japan, Aug. 14, 1986, 61-190744

Int. Cl.⁴ B23P 9/00

U.S. Cl. 29—163.6

8 Claims



1. A method of producing honeycomb structural forming dies comprising:

providing a steel base body having a first coefficient of thermal expansion, a first surface and a second surface; machining said body to form a desired shape; forming a matrix of preliminary slits in said first surface and perpendicular thereto such that said matrix substantially corresponds to that of a honeycomb structure subsequently formed from said die; providing a plurality of wear-resistant super hard alloy plates having a second coefficient of thermal expansion which is different from said first coefficient of thermal expansion, said plates having a given size and four side edge faces; placing a bonding layer on said first surface of said steel die base body; placing said plates on said bonding layer; bonding said plates to said steel die base body, via the bonding layer, to form a bonded article, said bonding being performed by a high temperature welding technique, whereby a plurality of gaps are formed between said super hard alloy plates due to the different in coefficients of thermal expansion between said steel die base body and said plates; cooling the bonded article to room temperature, whereby a portion of said preliminary slits are dimensionally altered so as to facilitate an expansion and contraction of said bonded article due to the different coefficients of thermal expansion between said steel die base body and said wear-resistant super hard alloy plates;

forming a matrix of forming channels in said bonded article perpendicular to said first surface, said matrix of forming channels being formed through said wear-resistant super hard alloy plates and said bonding layer, into the matrix of said preliminary slits in said steel die base body to form a final matrix in said bonded article; and forming opening holes in said second surface of said steel die base body and perpendicular thereto to result in a honeycomb structure forming die, said opening holes communicating with said forming channels of said final matrix; whereby said honeycomb structure forming die is substantially free of any internal strain due to the different coefficients of thermal expansion between the steel die base body and the wear-resistant super hard alloy plates.

forming a matrix of forming channels in said bonded article perpendicular to said first surface, said matrix of forming channels being formed through said wear-resistant super hard alloy plates and said bonding layer, into the matrix of said preliminary slits in said steel die base body to form a final matrix in said bonded article; and forming opening holes in said second surface of said steel die base body and perpendicular thereto to result in a honeycomb structure forming die, said opening holes communicating with said forming channels of said final matrix; whereby said honeycomb structure forming die is substantially free of any internal strain due to the different coefficients of thermal expansion between the steel die base body and the wear-resistant super hard alloy plates.

forming a matrix of forming channels in said bonded article perpendicular to said first surface, said matrix of forming channels being formed through said wear-resistant super hard alloy plates and said bonding layer, into the matrix of said preliminary slits in said steel die base body to form a final matrix in said bonded article; and forming opening holes in said second surface of said steel die base body and perpendicular thereto to result in a honeycomb structure forming die, said opening holes communicating with said forming channels of said final matrix; whereby said honeycomb structure forming die is substantially free of any internal strain due to the different coefficients of thermal expansion between the steel die base body and the wear-resistant super hard alloy plates.

4,875,265

INJECTION NEEDLE-DETACHING DEVICE

Toshiki Yoshida, Osaka, Japan, assignor to Nishio Corporation, Osaka, Japan

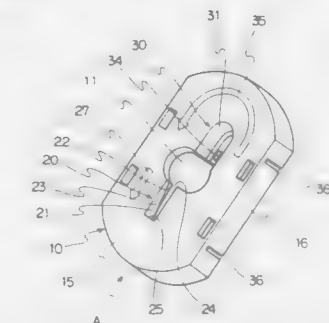
Filed Nov. 4, 1988, Ser. No. 267,480

Claims priority, application Japan, Dec. 14, 1987, 62-189702

Int. Cl.⁴ B65D 25/00

U.S. Cl. 29—240

4 Claims



1. A device for detaching an injection needle from a syringe comprising:

a plate-like member, a first opening provided in the plate-like member for inserting an injection needle attached to a syringe, a first needle-detaching means for detaching a slip type needle, and a second needle-detaching means for detaching a screw type needle, said first opening having a size larger than the largest part of said needle, said first needle-detaching means comprising a second opening extending laterally from said first opening, and a sliding portion provided on each of both sides of said second opening, said second opening having a width larger than the diameter of the nozzle of said syringe and smaller than the diameter of the hub of said needle, each of said sliding portions having a side wall defining said second opening, each of said side walls having, at the entrance of the second opening from said first opening, a thickness smaller than a distance between the root of the nozzle of said syringe and the bottom end of the hub of said needle when the needle is being attached to said syringe, each of said side walls being made gradually thicker toward the closed end of said second opening, the maximum thickness of each of said side walls being larger than said distance, said second needle-detaching means comprising a third opening extending laterally from said first opening, said third opening having a portion having such a size that the hub of said needle is capable of being inserted thereinto, said portion being provided with a projection for preventing the hub of said needle from turning when the syringe is turned.

4,875,266

RELEASABLE HIGH TORQUE FASTENER

Ronald W. Batten, 5618 White Ct., Torrance, Calif. 90503

Continuation-in-part of Ser. No. 802,425, Nov. 27, 1985, Pat. No. 4,737,059. This application Jul. 13, 1987, Ser. No. 72,438

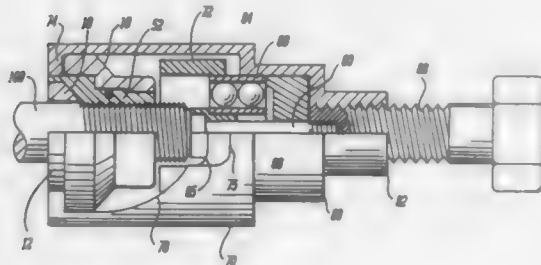
Int. Cl.⁴ B23P 19/04

U.S. Cl. 29—263

12 Claims

1. A releasable multiple part fastener which comprises: (a) a first part comprising an internally threaded slotted body having:

- (1) a base and at least one reduced diameter neck of a lesser diameter;
- (2) at least one axial slot extending axially through the body of said fastener and at least one additional axial slot extending substantially, but not entirely, through the body of said fastener, subdividing said body into at least two segments and
- (3) at least one, non-circular surfaced, torque transmitting external wall on each of said segments and



b. a second part comprising a retainer ring surrounding said slotted body and having:

- (1) a first annular bottom recess in open communication with a second annular of reduced diameter recess of reduced diameter to receive said slotted body; and
- (2) a torque transmitting section comprising an internal wall with a non-circular surface of a contour to mate with the non-circular surfaced, torque transmitting external wall of each said fastener segment and in hoop stress bearing relationship thereto.

4,875,267

MEANS FOR ASSEMBLING BOARDS

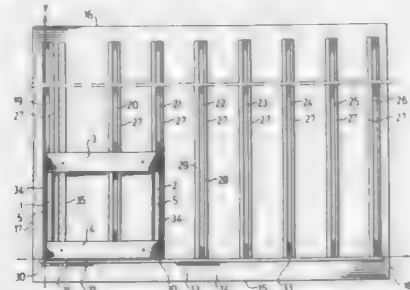
Olle Berg, Diderman, Järna, Sweden
PCT No. PCT/SE86/00584, § 371 Date Jun. 27, 1988, § 102(e)
Date Jun. 27, 1988, PCT Pub. No. WO87/04286, PCT Pub.
Date Jul. 16, 1987

PCT Filed Dec. 22, 1986, Ser. No. 213,613

Claims priority, application Sweden, Dec. 27, 1985, 8506135-6
Int. Cl.⁴ B23P 11/00

U.S. Cl. 29—281.3

9 Claims



1. A means for assembling rectangular display boards of varying, predetermined sizes, and of the type comprising two sign element holders (1, 2) determining the height of the display board, one or more back elements (3, 4) determining the width of the display board and arranged to be rigidly connected to flat outer surfaces (5) of the sign element holders (1, 2), and sign elements the end portions of which being arranged to be inserted into corresponding grooves in the sign element holders, said holders having a shank (8) with a foot portion (9) protruding from the shank, said assembling means comprising: a static fixture comprising a plate (14) which is larger than the largest predetermined size of the display boards to be assembled, and which has means defining a plurality of parallel grooves (19 to 26) to receive the foot portions (9) of the sign element holders (1, 2) without friction or play, the grooves (19 to 26) being arranged in a coordinate system with a first groove

(19) located on the y-axis and the remaining grooves (20 to 26) being arranged with predetermined distances from the first groove with increasing x-values corresponding to predetermined widths of display boards, and the grooves (19 to 26) starting from the x-axis with which one end of a sign element holder (1, 2) placed in a groove is to coincide during assembly, said grooves (19 to 26) being sufficiently long to receive sign element holders (1, 2) of varying lengths corresponding to predetermined heights of display boards.

4,875,268

APPARATUS FOR MOUNTING ARTICLES OF CLOTHING TO A PRINTING PALLET

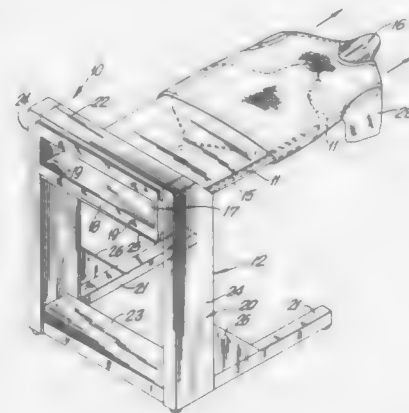
Sandor Szarka, Franklin Lakes, N.J., assignor to Precision Screen Machines, Inc., Hawthorne, N.J.

Filed Dec. 12, 1988, Ser. No. 283,466

Int. Cl.⁴ B23Q 1/02

U.S. Cl. 29—283

6 Claims



1. An apparatus for mounting articles of clothing onto a printing pallet comprising: a pallet sleeve adapted to receive said articles to be mounted, said sleeve being provided with means for engaging said pallet so as to guide said pallet into the interior of said sleeve; and the means for supporting said sleeve in a position which facilitates the mounting of said articles onto said sleeve and the transfer of said articles from said sleeve to said pallet by removing said pallet from the interior of said sleeve.

4,875,269

UNDERLIFT ATTACHMENT FOR TOW TRUCKS

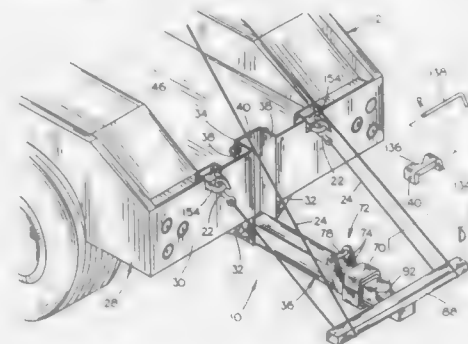
Larry L. Crist, West Highway 33, Crete, Neb. 68333

Filed May 10, 1988, Ser. No. 192,153

Int. Cl.⁴ B60P 3/12

U.S. Cl. 29—401.1

2 Claims



1. A method for attaching a vehicle-towing underlift to a tow truck, comprising the steps of: providing a vehicle towing underlift attachment, including:

a generally vertically-oriented channel member having a

pair of side walls and a rearward wall, and having upper and lower ends;

a boom arm pivotally mounted at one end to the lower end of said channel member, and mounted to pivot between a storage position, wherein said boom arm is received between the side walls of the channel member and abutting the rearward wall of the channel member such that said boom arm is received within said channel member flush with the edges of the side walls, and a pivotable operable position projecting outwardly from said channel member; said boom arm including a tubular housing member, an operable extendable arm telescoping therefrom, and means connected between said tubular housing member and said extendable arm for extending and retracting said extendable arm with respect to said tubular housing member;

said extendable arm of said boom arm further including a cross bar member pivotally and removably mounted on said extendable arm, for movement about an axis generally perpendicular to longitudinal axis of said extendable arm; and bracket means selectively, removably connected to each end of said cross bar for selective connection to a vehicle to be towed;

providing a tow truck, having: a boom connected to the tow truck housing; an operable winch mounted on said housing; a hook member attached to a tow cable journaled over said boom and connected to said winch; and a generally flat, vertical tailboard;

cutting a vertical slot in the tailboard and housing of said tow truck to a depth equal to the depth of said pocket of said underlift attachment;

affixing said pocket portion in said slot with the side walls flush with the tailboard and the upper end flush with the upper edge of the tailboard;

mounting said electrohydraulic pump to said tow housing;

and electrically connecting said electrohydraulic pump and said switch means to the battery of the tow truck.

4,875,270

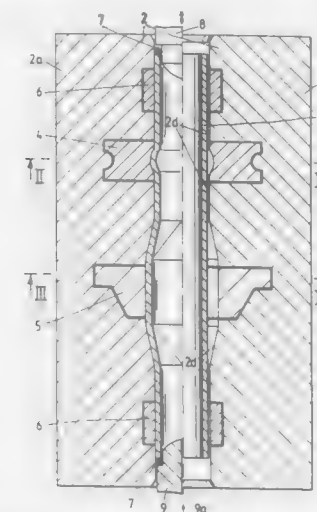
METHOD OF SECURING PARTS TO A HOLLOW MEMBER

Herbert Krips, Bochum, and Miroslav Podhorsky, Ratingen, both of Fed. Rep. of Germany, assignors to Balcke-Dürr Aktiengesellschaft, Fed. Rep. of Germany
Continuation of Ser. No. 82,037, Aug. 5, 1987, abandoned. This application Mar. 15, 1989, Ser. No. 325,068

Claims priority, application Fed. Rep. of Germany, Aug. 12, 1986, 3627258; European Pat. Off., Jan. 27, 1987, 87101122.7
Int. Cl.⁴ B23P 17/00, 11/02; B21D 39/00

U.S. Cl. 29—421.1

3 Claims



1. In a method of securing one or more parts, each of which

is provided with an opening and at least one of which is a cam or other drive element able to transmit torque, to a hollow member, whereby in the starting state, the inner diameter of the opening of said parts is greater than the outer diameter of the surface provided on said hollow member for securing said part, and whereby said parts are placed supported via support surfaces of a matrix in the prescribed position along segments on said hollow member prior to the securing operation, the improvement therewith comprising in sequence the steps of:

prior to placing said parts on said hollow member, producing a temperature difference by heating said parts and/or by cooling said hollow member;

placing said parts subjected to said temperature differences on said hollow member; and supporting the outer surfaces of said parts as well as the regions of said hollow member disposed between said parts via the support surfaces of said matrix; and

securing each of said parts to said hollow member by widening and expanding the securing regions of said hollow member, and followed by a subsequent shrink fitting of said parts onto said hollow member as a consequence of allowing temperature equalization to occur.

4,875,271

METHOD FOR PRODUCING THERMOPLASTIC FRAMES FOR FENESTRATION

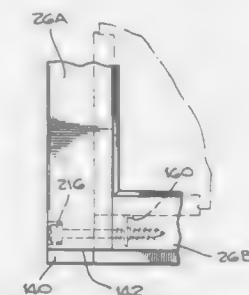
John H. Collier, Whittier, and Donald N. Littleton, Riverside, both of Calif., assignors to D. G. Shelter Products Co., City of Industry, Calif.

Filed Jul. 27, 1988, Ser. No. 225,057

Int. Cl.⁴ B23P 11/00, 19/04

U.S. Cl. 29—432

8 Claims



1. In a method of preparing a thermoplastic material for use in fenestration including the steps of:

cutting elongated extruded stock of thermoplastic material to approximate length;

placing cut stock pieces on a conveyor so that the longitudinal axes of the cut stock pieces are transverse to the direction of travel of the conveyor;

providing an oven through which the conveyor transports said stock pieces;

heating the stock to a selected temperature uniformly throughout its cross-sectional thickness to provide softness to the thermoplastic material;

drilling a hole at a selected location in said stock;

and driving a fastener member having a hole into said stock in selected relation to said stock hole by forcing said fastener member into said softened thermoplastic material to a pre-selected depth so that the fastener hole is coaxial with said stock hole.

4,875,272

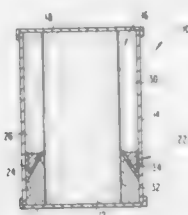
METHOD OF MAKING SPACED-WALL APPLIANCE WITH A SEALING AND INSULATING DEVICE BETWEEN SAID WALLS

Thomas E. Nelson, 2407 Gretchen La., Anchorage, Ky. 40223
Filed Jul. 7, 1988, Ser. No. 216,384

Int. Cl.⁴ B23P 11/02, 19/04; B21D 39/00

U.S. Cl. 29—451

11 Claims



1. A method of assembling an appliance having a first wall surface spaced from a second wall surface defining a space therebetween comprising the steps of:

forming an insulation and sealing device comprising means defining an open topped trough having side walls converging in a downwardly direction away from the open top fabricated of a flexible material, the width of the trough across the open top being at least approximately equal to the width of the space between the first and second wall, and a resilient insulating material in the open topped trough exposed at the open top of the trough; positioning the insulation and sealing device in contact with the first wall with the converging side walls of the insulation and sealing device directed along the first wall; and moving the first wall in the direction of the taper of the converging side walls of the insulation and sealing device to a position overlaying the second wall in spaced apart juxtaposition with the second wall such that the insulation and sealing device is in contact with the second wall creating a seal across the space.

4,875,273

METHOD FOR ASSEMBLING ASSOCIATED COMPONENTS

Yasuhiro Yamamoto, Sayama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

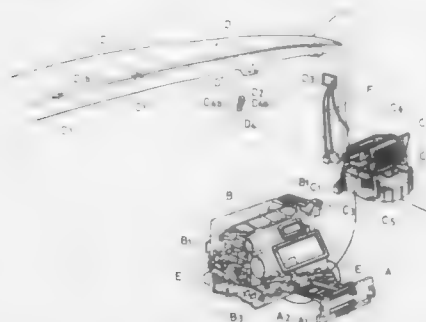
Filed Dec. 28, 1988, Ser. No. 291,030

Claims priority, application Japan, Dec. 29, 1987, 62-335207; Dec. 29, 1987, 62-335209

Int. Cl.⁴ B23Q 3/00

U.S. Cl. 29—467

2 Claims



1. A method for assembling a plurality of associated components which are associated with one another through wiring materials to an article comprising setting the associated components on a common set jig to have a predetermined mutual positional relationship with one another; connection wiring between said components by the wiring materials; grasping the

components on a common assembling robot while they are kept held in said predetermined mutual positional relationship, said common assembling robot comprising a robot arm and a plurality of assembling jigs mounted on the arm to hold these associated components; and moving and operating assembling robot to assemble the components to the article at predetermined fixing spots thereof.

4,875,274

METHOD OF CUTTING METAL STUD AND BENDING AND SECURING SAME TO FORM ANGEL MEMBER

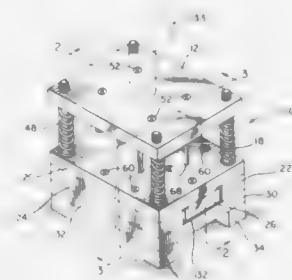
Larry L. Foster, P.O. Box 1283, Modesto, Calif. 95353
Division of Ser. No. 30,237, May 19, 1988, Pat. No. 4,787,283.

This application May 19, 1988, Ser. No. 195,808

Int. Cl.⁴ B23P 11/00

U.S. Cl. 29—525.1

8 Claims



1. The method of forming an angle framing member from an elongated channel-shaped stud including generally parallel first and second longitudinal side flanges interconnected by a longitudinal web extending therebetween and from those opposite longitudinal margins said flanges are supported, said method including:

A. Cutting away a predetermined length of said first side flange to form an opening therethrough extending longitudinally of said stud and having opposite ends and a longitudinal mid-point spaced apart along the longitudinal extent of said stud;

B. Making a narrow transverse cut through said web extending from the longitudinal margin of said web corresponding to said first side flange and to a point immediately adjacent said second side flange and with the end of said transverse cut adjacent said second side flange spaced along said stud from said longitudinal mid-point of said opening;

C. Relatively angularly displacing the portions of said stud on opposite sides of said transverse cut about an axis normal to said web and substantially contained within said second side flange to positions with the portions of said web, disposed on opposite sides of said transverse cut, overlap engaged with each other and the portion of said first side flange defining one end of said opening abuttingly engaged with the outer surface of said first side flange spaced therealong from the other end of said opening, and;

D. Securing the overlap engaged portions of said web together.

4,875,275

NOVEL AUTOMATIC TOOL CHANGER

James Hutchinson, Doylestown, Pa.; Brian Hoffman, Somerville, N.J., and Steven Pollack, Washington Crossing, Pa., assignors to Megamotion Incorporated, Princeton, N.J.

Filed Dec. 7, 1987, Ser. No. 129,454

Int. Cl.⁴ B23Q 41/00, 5/34, 31/10

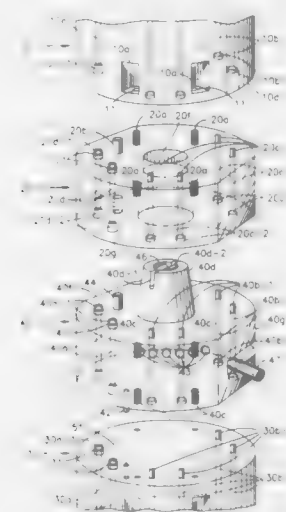
U.S. Cl. 29—568

29 Claims

1. Tool changing means for automatically coupling and decoupling first and second members comprising a first flange

adapted to be coupled to one of said first and second members and a second flange adapted to be coupled to the remaining one of said first and second members;

said first flange having a tapered opening and stationary coupling means extending across said tapered opening; said second flange having a tapered projection adapted to be inserted into said tapered opening; said tapered projection having radially aligned slots for receiving said coupling means;



locking means arranged for movement within said tapered projection and having a receiving portion for receiving said coupling means; and

said locking means being movable to a first position causing said coupling means to draw said tapered projection into intimate contact and a second position for releasing said coupling

4,875,276

METHOD OF PRODUCING MAGNETIC HEAD DEVICE

Ryu Yunokuchi; Shinichi Omori, and Masao Ohkita, all of Furukawa, Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

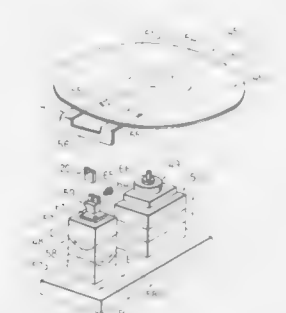
Filed Mar. 22, 1989, Ser. No. 327,223

Claims priority, application Japan, Jun. 17, 1988, 63-148182

Int. Cl.⁴ G11B 5/42

U.S. Cl. 29—603

1 Claim



1. A method of producing a magnetic head with use of a mounting jig which comprises a head projection amount setting member having a flat portion adapted to contact an upper surface of a vacuum generating member formed with a vacuum generating recess and having a recessed portion recessed from said flat portion by a predetermined depth corresponding to a projection amount of a magnetic head to be projected from a substantially central through-hole of said vacuum generating member; a presser member mounted on a side of said flat

portion of said head projection amount setting member and provided with presser pawls for holding said vacuum generating member and pressing the same against said flat portion of said head projection amount setting member; an inclination adjusting member for adjusting parallelism of said magnetic head; and a height adjusting member connected to said presser member and said head projection amount setting member for adjusting a vertical position of said head projection amount setting member with respect to said magnetic head; said method comprising the steps of:

mounting said magnetic head to said inclination adjusting member;

contacting said magnetic head with said recessed portion of said head projection amount setting member;

applying light to an upper surface of said magnetic head via said head projection amount setting member under a contact condition of said magnetic head with said recessed portion to generate interference fringes;

adjusting said inclination adjusting member in accordance with said interference fringes to adjust the parallelism of said magnetic head;

mounting said vacuum generating member to said presser pawls of said presser member;

inserting said magnetic head into said through-hole of said vacuum generating member;

contacting again said magnetic head and said vacuum generating member with said recessed portion and said flat portion of said head projection amount setting member, respectively;

applying again light to said magnetic head and said vacuum generating member via said head projection amount setting member to generate interference fringes;

adjusting again said inclination adjusting member in accordance with said interference fringes to adjust the parallelism of said magnetic head and said vacuum generating member; and

fixing said magnetic head to said vacuum generating member.

4,875,277

FORMED METAL CORE BLOCKING METHOD

Richard W. Martin, Versailles; John L. Fisher, Lexington; William R. Fortenberry, Versailles; Randall L. Schlake, Lexington; Ronald F. Dornbrock; James D. Richerson, both of Versailles, and Kenneth E. Marrett, Sr., Lebanon, all of Ky., assignors to Kuhlman Corporation, Troy, Mich.

Division of Ser. No. 906,855, Sep. 12, 1986, Pat. No. 4,833,435.

This application Oct. 12, 1988, Ser. No. 256,883

Int. Cl.⁴ H01F 7/06

U.S. Cl. 29—606

21 Claims

1. A method for manufacturing a toroidal transformer core blocking, for use with a toroidal transformer of the type having at least two coil assemblies surrounding a toroidal core and providing therebetween a pair of wedge-shaped spaces, comprising the following steps:

creating first and second identically formed steel members, each of said members having a pair of U-shaped coil-engaging faces with inner legs, outer legs and bights, the inner legs joined by a center web; and

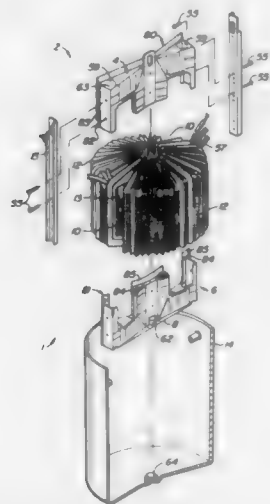
joining the members to form a butterfly-shaped core blocking with first and second wedge-shaped structures sized to fit within the wedge-shaped spaces of the transformer.

19. A method for blocking a toroidal transformer of the type having at least two coil assemblies surrounding a toroidal core and providing therebetween a pair of wedge-shaped spaces, comprising the following steps:

creating first and second identically formed steel members, each of said members having a pair of U-shaped coil-engaging faces with inner legs, outer legs and bights, the inner legs joined by a center web;

joining the members to form a butterfly-shaped core blocking with first and second wedge-shaped structures sized to fit within the wedge-shaped spaces of the transformer;

positioning a top core blocking and bottom core blocking on either side of the transformer with the outer ends of the outer legs opposed; and



thereafter securing the top and bottom core blockings to one another.

4,875,278

METHOD OF MAKING AN ELECTRICAL SWITCH

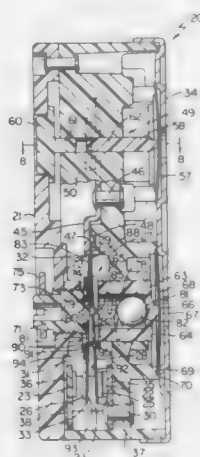
Harold A. McIntosh, Crestline, Calif., assignor to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 885,865, Jul. 15, 1986, Pat. No. 4,736,514, which is a division of Ser. No. 694,350, Jan. 24, 1985, Pat. No. 4,633,211. This application Jan. 19, 1988, Ser. No. 145,053. The portion of the term of this patent subsequent to Dec. 30, 2003, has been disclaimed.

Int. Cl.⁴ H01H 11/00

U.S. Cl. 29—622

2 Claims



1. In a method of making an electrical switch construction, said method comprising the steps of providing a support means, disposing a fixed contact to be carried by said support means, disposing a switch blade to be carried by said support means and have a movable contact, disposing a bimetallic snap disc to be carried by said support means for controlling movement of said switch blade relative to said fixed contact in response to temperature setting means carried by said support means for selecting the temperature of operation of said disc for moving said movable contact out of contact with said fixed contact, forming said temperature setting means to comprise a substantially cup-shaped plunger means having an open end for engaging said blade and a closed end engaging said snap disc,

forming said temperature setting means to have a spring means operatively associated with said plunger means to urge said plunger means into engagement with said snap disc, forming said temperature setting means to have adjusting means for adjusting the force of said spring means that urges said plunger means into said engagement, forming said spring means to have opposed ends one of which is operatively interconnected to said plunger means and the other of which engages said adjusting means, the improvement comprising the steps of disposing said one end of said spring means in said open end of said plunger means, forming said spring means to comprise a coiled compression spring, disposing a ball in said open end of said plunger means so as to engage against said closed end of said plunger means, and seating said one end of said spring means on said ball whereby said ball operatively interconnects said spring means to said plunger means.

4,875,279

DIE ATTACH PICKUP TOOLS

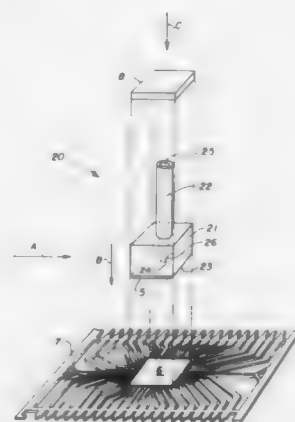
Byron C. Sakladis, Chadds Ford, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 88,141, Aug. 21, 1987, abandoned, which is a continuation-in-part of Ser. No. 31,793, Mar. 30, 1987, abandoned. This application Feb. 22, 1988, Ser. No. 158,729

Int. Cl.⁴ H05K 13/04

U.S. Cl. 29—740

10 Claims



1. A die attach pickup tool for picking up a flexible ribbon shaped die attach having a thickness in a range of about 25 to 125 micrometers, an elastic modulus in the range of about 500 to 7,500 N/mm² at 23° C. and a first surface area from a first station, transferring the die attach to a heated bond site and depositing the die attach on the bond site, the tool comprising:

a face for contacting the die attach, the face having a second surface area of at least about 1.27 mm square and a hole;

passage means connected to the hole for providing a vacuum through the hole,

such that when each point of the first surface area is in contact with a point of the second surface area or adjacent the hole then, upon turning on the vacuum source, the tool is adapted to pickup and transfer the die attach and, upon turning the vacuum source off, the tool is adapted to deposit the die attach, the picking up, transferring and depositing all occurring while said die attach is in a substantially flat position.

4,875,280

VEHICLE ASSEMBLY LINE

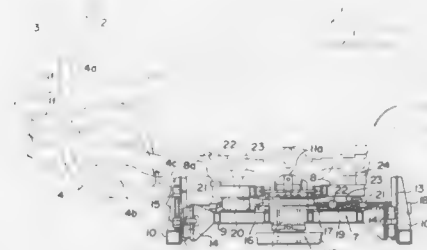
Toyohiko Fujioka, and Hideki Takeshima, both of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Continuation-in-part of Ser. No. 3,816, Jan. 16, 1987, abandoned. This application Nov. 17, 1988, Ser. No. 273,722. Claims priority, application Japan, Jan. 17, 1986, 61-7602

Int. Cl.⁴ B23P 21/00

U.S. Cl. 29—783

6 Claims



1. A vehicle assembly line including a conveying means which a vehicle body is conveyed from station to station comprising:

a hanger operatively connected to said conveying means, said hanger comprising a suspended portion disposed at an upper portion thereof by which said hanger is suspended from said conveying means, an arm portion extending downward from said suspended portion, and a support portion disposed at an end of said arm portion for horizontally supporting a vehicle body from the lower side thereof, said arm portion passes alongside a portion of a transverse side of the vehicle body when carried by said hanger thereby interfering with access to the portion of the vehicle body for working thereon;

a first working area in which a vehicle body is conveyed while oriented in a first fore-aft direction including at least one station whereat operations are performed on an area of the vehicle body that is not interfered with by said arm portion of said hanger;

a vehicle body reversing means located after said first working area, for reversing the fore-aft orientation of the vehicle body with respect to said hanger to a second fore-aft direction, said reversing means adapted to reverse the vehicle body about a vertical axis thereof, whereby the portion of the vehicle body that was interfered with while oriented in the first fore-aft direction by said arm portion of said hanger is moved to a non-interfering position and a portion of the area of the vehicle body not interfered with in said first fore-aft position is moved to a position interfered with by said arm portion while oriented in the second fore-aft direction; and

a secondary working area in which the vehicle body is conveyed while oriented in the second fore-aft direction including at least one station in which operations are performed on the area of the vehicle body that is not interfered with by said arm portion of said hanger and that was previously interfered with by said arm portion in the first fore-aft direction of the vehicle body.

4,875,281

METHOD OF FABRICATING A PRINTHEAD

Joseph J. Bakewell, Boxford, Mass., assignor to Dynamics Research Corporation, Wilmington, Mass.

Division of Ser. No. 163,365, Mar. 2, 1988. This application Nov. 28, 1988, Ser. No. 276,865

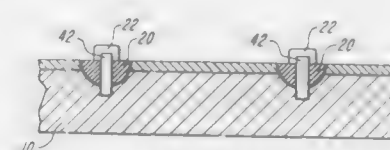
Int. Cl.⁴ H01R 43/00

U.S. Cl. 29—825

9 Claims

1. A method of fabricating a printhead, comprising the steps of:

forming at least one indentation in a conductive sheet along a writing edge of the sheet;



filling the indentation with a dielectric material; and depositing a plurality of electrodes over the dielectric-filled indentation to form a row of electrodes along the writing edge.

4,875,282

METHOD OF MAKING MULTILAYER PRINTED CIRCUIT BOARD

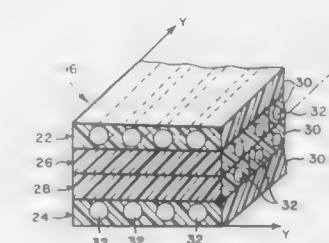
Joseph D. Leibowitz, Calver City, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Division of Ser. No. 98,260, Sep. 18, 1987, Pat. No. 4,814,945. This application Nov. 7, 1988, Ser. No. 268,127

Int. Cl.⁴ H05K 3/36

U.S. Cl. 29—830

16 Claims



1. A method for fabricating a multilayer printed circuit board, comprising the steps of:

forming a plurality of layers of a composite material by lay-up of an aramid fiber tape, each composite layer including a plurality of layers of the aramid fiber tape; plating at least one side of some of the composite layers with a layer of copper; etching the copper layers with predefined circuit patterns;

laminating the composite layers with insulating adhesive layers to form a printed circuit board having a coefficient of thermal expansion that is approximately equal to that of the electrical components to be mounted on the circuit board.

4,875,283

METHOD FOR MANUFACTURING PRINTED CIRCUIT BOARDS

James A. Johnston, 29 Castle Hill Rd., Windham, N.H. 03087

Division of Ser. No. 929,753, Nov. 13, 1986, abandoned. This application Aug. 25, 1988, Ser. No. 202,096

Int. Cl.⁴ H05K 3/36

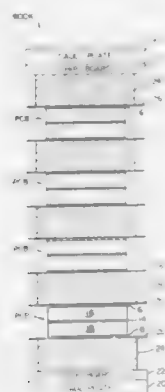
U.S. Cl. 29—830

2 Claims

1. A method of making laminated printed circuit boards of the type having outer conductive metallic layers and at least one inner dielectric layer containing heat curable resin comprising the steps of:

assembling a multi-layer book of circuit boards, one on top of another in a press lay-up, placing a dual purpose separator-release sheet formed of aluminum and coated on both sides with a siloxane

polymer in engagement with each outer metallic layer of a board, subjecting the laid-up book to heat and pressure to cure the heat curable resin separating at least one cured board from the book, retaining the separator-release sheets in engagement with the outer metallic layers of the separated board and



drilling conductor lead holes in the board with the separator-release sheets attached, whereby the separator-release sheets serve to prevent the heat curable resin from contaminating adjacent boards in the curing process and serve as drill entry and drill back up material in the drilling process.

4,875,384

PROCESS FOR PRODUCING A PACKAGE FOR PACKING SEMICONDUCTOR DEVICES

Kiyoshi Ogata; Yasunori Ando; Eiji Kamijo, and Noriaki Matsumura, all of Kyoto, Japan, assignors to Nissin Electric Company, Ltd., Kyoto, Japan

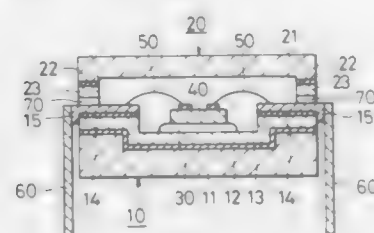
Division of Ser. No. 48,357, May 11, 1987. This application Mar. 14, 1988, Ser. No. 168,056

Claims priority, application Japan, May 9, 1986, 61-107402; May 9, 1986, 61-107403; May 9, 1986, 61-107404

Int. Cl.⁴ H05K 3/02

U.S. Cl. 29—830

2 Claims



1. A process of providing interconnections of metal layers in the production of a laminated substrate comprising thin metal layers and electrically insulating thin ceramic layers, comprising:

- a first step of evaporating a metal on a first surface of at least one of said thin ceramic layers while in a vacuum with a mask being disposed on said surface of said ceramic layer;
 - a second step of forming an alloyed area in said ceramic layer by heating said evaporated metal to diffuse said metal into and through said thin ceramic layer to reach a second surface of said ceramic layer; and
 - a third step of forming one of said thin metal layers on said first surface of said ceramic layer,
- so as to create an electrical connection between said one of said thin metal layers and another of said thin metal layers

disposed on said second surface of said one of said thin ceramic layers.

4,875,285

APPARATUS AND METHOD FOR EQUIPPING PRINTED CIRCUIT BOARDS WITH COMPONENTS

Franz Haan, Bruchsal, and Lothar Hock, Berlin, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

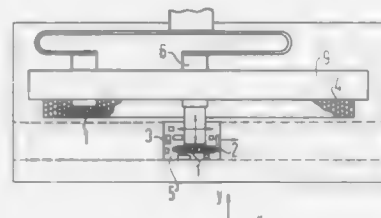
Filed Nov. 10, 1988, Ser. No. 269,359

Claims priority, application Fed. Rep. of Germany, Nov. 10, 1987, 3738152

Int. Cl.⁴ H05K 3/30; B23P 19/00

U.S. Cl. 29—832

7 Claims



1. A method for equipping printed circuit boards (5) with components (3) using an equipping apparatus having a rotatable equipping head with a plurality of pickup tools, comprising the steps of:

- collecting components (3) from delivery units (4) by means of said equipping head;
- subsequently equipping a printed circuit board (5) with these components (3);
- said delivery units (4) and said printed circuit board (5) being stationary at different locations;
- moving said equipping head to locations adjacent said delivery units and adjacent said circuit board at the time of collecting or equipping, respectively;
- providing at least one processing station adjacent said equipping head;
- rotating said head to provide a clocked passage of said components past said at least one processing station;
- and processing said components which are collected while they are in position on said multiple equipping head by use of said at least one processing station when said multiple equipping head has been rotated to bring said components into association with said one or more processing stations

5. Apparatus for equipping printed circuit boards (5) with components (3), particularly in automatic SMD equipping units, comprising, in combination;

- at least one rotatable multiple equipping head (1) having a plurality of pick-up tools for components (3);
- at least one annular device carrier (7) arranged around said multiple equipping head (1) and having processing stations (8) secured thereto;
- means for mounting one or more of said multiple equipping heads (1) on a carriage (6), whereby the multiple equipping head (1) together with the apparatus device carrier (7) are displaceable and positionable in X and Y directions.

4,875,286

APPARATUS AND METHOD OF MANUFACTURING ELECTRICAL CABLING SYSTEMS

Sergio Leandria, Femouillet, and Jose Moly, Gratecourt, both of France, assignors to Precision Mecanique Labinal, Bois D'Arcy, France

Continuation of Ser. No. 941,320, Dec. 15, 1986, abandoned.

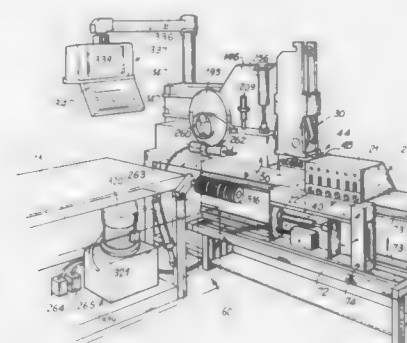
This application Jul. 25, 1988, Ser. No. 225,670

Claims priority, application France, Mar. 19, 1986, 86 3927

Int. Cl.⁴ H01R 43/00; B23P 19/00

U.S. Cl. 29—872

53 Claims



1. A method for manufacturing bundles of electrical cabling systems, wherein said systems comprise a plurality of main conductors and a plurality of secondary conductors, wherein said main conductors comprise a conductor core, an insulating sheath having a plurality of ends, and connection elements connected to said plurality of ends, wherein said connection elements comprise box elements comprising either male plugs or female sockets adapted to engage complementary elements, wherein said secondary conductors comprise a conductor core and an insulating sheath, wherein said core of each of said plurality of main conductors and said plurality of secondary conductors is mounted in said sheath, wherein said method comprises the steps of:

- (a) stripping an intermediate portion of at least one main conductor;
- (b) stripping at least one secondary conductor in the general vicinity of at least one of the ends of said at least one secondary conductor;
- (c) positioning said stripped portions of said main and secondary conductors against one another tightly;
- (d) mounting a thimble on said two stripped portions; and
- (e) mounting a band of cold-deformable insulating material on said thimble.

8. An apparatus for manufacturing bundles of electrical cabling systems, wherein said cabling systems comprise at least one main conductor having a plurality of ends and at least one secondary conductor having a plurality of ends, wherein said main conductor comprises a conductor core, an insulating sheath surrounding each of said at least one main conductor and an insulating sheath surrounding each of said at least one secondary conductor except for a portion in the general vicinity of at least one of the ends of said secondary conductor thereby creating a stripped portion of said secondary conductor, and connection elements connected to said plurality of ends, wherein said connection elements comprise box elements comprising either male plugs or female sockets adapted to engage complementary elements, wherein said at least one secondary conductor comprises a conductor core and an insulating sheath, wherein said conductor core is mounted in said insulating sheath, wherein said apparatus comprises:

- (a) means for stripping said insulating sheath from an intermediate portion of at least one main conductor;
- (b) means for positioning the stripped portions of said at least one main conductor and said at least one secondary conductor tightly against one another to produce a splice, said means for positioning being operatively associated in said

apparatus with said means for stripping for operation subsequent thereto;

(c) means for mounting a thimble on said two stripped portions at said splice, said means for mounting a thimble being operatively associated in said apparatus with said means for positioning for operation subsequent thereto;

(d) means for mounting a band of cold-deformable insulating material on said thimble, said means for mounting a band being operatively associated in said apparatus with said means for mounting a thimble for operation subsequent thereto.

4,875,287

SHAVING ARTICLES LUBRICIOUS WHEN WET AND COMPOSITIONS THEREFOR

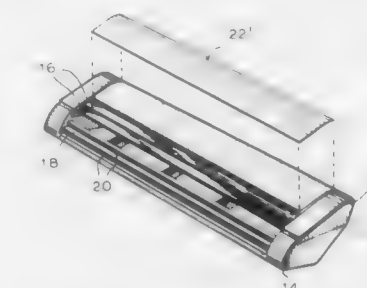
Walter S. Creasy, Bridgewater, and Donald H. Lorenz, Basking Ridge, both of N.J., assignors to Hydromer, Inc., Whitehouse, N.J.

Filed Nov. 14, 1986, Ser. No. 931,399

Int. Cl.⁴ B26B 21/44

U.S. Cl. 30—34.01

28 Claims



1. A shaving article comprising at least one blade, a blade support and a skin-engaging portion adjacent a shaving edge of said blade, said skin-engaging portion provided with a hydrogel comprising a water soluble polymer rendered insoluble so as to prevent dissolution of the polymer, whereby the coefficient of friction of said skin-engaging portion is reduced in the presence of water.

4,875,288

SHAVING DEVICE

Robert A. Trotta, Pembroke, and Jeffrey C. Cerier, Franklin, both of Mass., assignors to The Gillette Company, Boston, Mass.

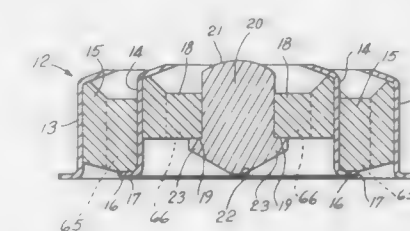
Filed Sep. 2, 1987, Ser. No. 92,264

The portion of the term of this patent subsequent to Feb. 28, 2006, has been disclaimed.

Int. Cl.⁴ B26B 21/00

U.S. Cl. 30—49

35 Claims



1. A shaving system of the wet shave type comprising: a plurality of razor blades, each of said razor blades having

a generally tubular upstanding wall of a predetermined height and defining a central aperture, said wall having an upper and lower end, each of said razor blades having an integrally formed, inwardly facing flange on said upper end, the inner edge of each of said inwardly facing flanges having an annular sharpened cutting edge, each of said razor blades having integral outwardly facing flange structure for controlling the vertical position of each of said razor blades; and

a top member having an upper and lower face and having a thickness less than the height of said upstanding wall of each of said razor blades, said top member including an array of spaced apertures, each said aperture having a shape generally corresponding to the outer surface of said tubular upstanding wall of a razor blade, one of said razor blades disposed in each of said apertures of said top member for vertical movement relative thereto, said top member including surface structure that cooperates with said integral outwardly facing flange structure of each of said razor blades to control relative vertical movement between each of said razor blades and said top member in response to shaving forces.

4,875,200

CHISEL FOR REMOVING DAMAGED BOLTS, NUTS AND SCREWS

Denzil C. Poling, Rte. 6, Box 80, Hagerstown, Md. 21740
Filed Apr. 4, 1988, Ser. No. 177,145
Int. Cl.⁴ B26B 3/00

U.S. Cl. 30—167

21 Claims



1. A device for rotationally disengaging a first threaded member from a second threaded member engaged therewith, comprising a chisel having at one end thereof a cutting edge for cutting into and penetrating a surface of the first threaded member, the chisel further including a first chisel face, one side of which is defined by said cutting edge, and a stop face positioned away from the cutting edge wherein said stop face meets the first chisel face and is continuous with said first chisel face, said first chisel face being disposed between the stop face and the cutting edge, the stop face being at an angle with respect to said first chisel face of about 90 degrees or less, said cutting edge having a width that is about equal to or greater than the distance between said stop face and said cutting edge, the stop face preventing further penetration of the cutting edge into the first threaded member beyond the stop face so as to provide for application of rotational force to the first threaded member by the chisel without further penetration of the cutting edge into the first threaded member.

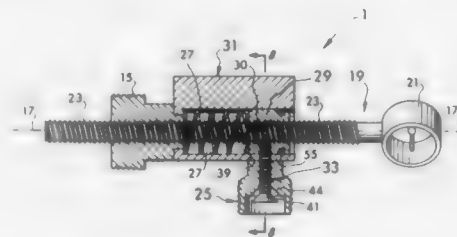
4,875,290

WINDAGE LOCKING APPARATUS FOR AN ARCHERY BOW SIGHT

Jack A. Finch, Broken Arrow, Okla., assignor to ACCRA Manufacturing Co., Broken Arrow, Okla.
Filed Aug. 1, 1988, Ser. No. 226,945
Int. Cl.⁴ F41G 1/46

U.S. Cl. 33—265

19 Claims



1. In an archery bow sight having:
an aperture member with a sighting portion and an elongated threaded portion with said elongated threaded portion extending along a first axis away from the sighting portion,

a barrel member extending about said first axis and about at least a section of the elongated threaded portion of said aperture member, said barrel member having a first threaded bore therethrough extending along said first axis, said first threaded bore of said barrel member and the threaded portion of said aperture member having mating threads wherein said the threaded portion of said aperture member can be screwed relative to said barrel member about said first axis into the first threaded bore of said barrel member, and

a body member extending about said first axis, said body member having a first bore therethrough extending along said first axis, said body member also extending about at least a section of said barrel member and said section of the threaded portion of said aperture member, the improvement including:

common means for preventing movement of said aperture member, barrel member, and body member relative to each other about and along said first axis, said common means including a single, threaded set screw, a second bore in said body member, a second threaded bore in said barrel member, and a locking knob with a threaded bore, said second bore in said body member and said second threaded bore in said barrel member extending substantially radially outwardly of said first axis and having at least portions thereof aligned with each other to receive said set screw therein, the threads of said set screw, second bore in said barrel member, and bore of said locking knob all mating wherein said single set screw can be screwed through said aligned portions of said second bores in said body and barrel members to a first position abutting the threaded portion of said aperture member and extending through said aligned portions of said second bores of said barrel and body members to prevent movement of said aperture member, barrel member, and body member relative to each other about said first axis, said set screw in said first position protruding outwardly of said body member relative to said first axis wherein said locking knob can be screwed onto the portion of the set screw protruding outwardly of the body member and selectively tightened thereon in a first rotational direction to a locking position to draw said barrel member into frictional contact with said body member to prevent movement of said barrel member and aperture member along said first axis relative to said body member.

4,875,291

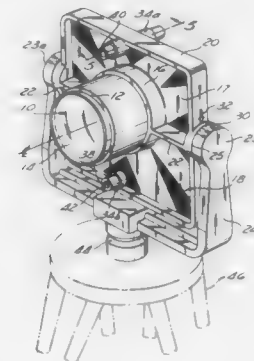
ROTATING REFLECTOR PRISM AND TARGET

Kenneth L. Panique, Orange, and Jeffrey B. Frank, Santa Ana, both of Calif., assignors to Omni Optical Products, Inc., Santa Ana, Calif.

Continuation-in-part of Ser. No. 28,615, Mar. 20, 1987, abandoned. This application Apr. 28, 1988, Ser. No. 187,089
Int. Cl.⁴ G01C 15/06; G02B 7/18

U.S. Cl. 33—293

22 Claims



1. A combined sighting target and bracket for receiving a retro-reflecting device for use in conjunction with remotely located electronic distance measuring instruments, comprising:
means for receiving a retro-reflecting device to position an optical axis of said retro-reflecting device along a predetermined axis;

a target, connected to said receiving means, for coarse alignment of an incident beam of energy, said target being oriented substantially perpendicular to said predetermined axis; and

first rotational means for rotating said target and said receiving means simultaneously in elevation, said rotational means allowing 360° rotation when a retro-reflective device is positioned in said receiving means.

4,875,292

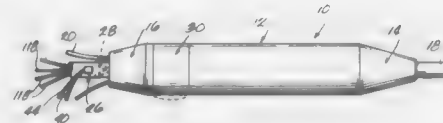
CONTROL SYSTEM FOR EARTH BORING TOOL

Paul N. Gibson, Saluda, S.C., assignor to Ronald L. McFarlane, Buffalo Grove, Ill.

Filed Apr. 8, 1986, Ser. No. 849,537
Int. Cl.⁴ E21B 47/02

U.S. Cl. 33—304

19 Claims



1. A monitor/control system for an earth boring tool to determine the spatial orientation of said tool at a remote location and to adjust the path thereof to maintain a predetermined course, said system comprising:

(a) vertical position detector means for ascertaining the elevation of a moving boring tool relative to a desired course, including a sensor head for operative engagement with said tool, pressure sensor means for developing a signal representative of a pressure differential existing at said sensor head, and a closed fluid circuit communicating between said sensor head and said sensor means;

(b) horizontal position detector means for ascertaining the azimuth of said tool relative to said course, including magnetic resolver means in operative engagement with

said tool for developing a signal representative of a localized flux differential in an ambient magnetic field; and,
(c) path correction means secured to said tool for adjusting its route relative to said course, including deflection means for bearing against the bore hole created by said moving tool.

4,875,293

GOLF CLUB MEASURING DEVICE

Peter D. Wakefield, Gerrards Cross, England, assignor to Del-field Precision Engineering Limited, Southall, England

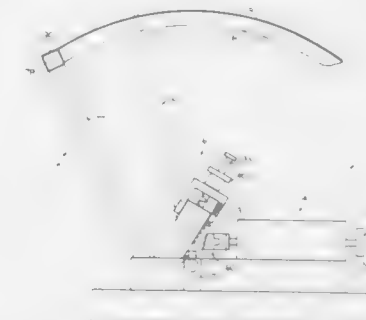
Filed Nov. 16, 1987, Ser. No. 121,348

Claims priority, application United Kingdom, Nov. 17, 1986, 8627418

Int. Cl.⁴ G01B 5/24

U.S. Cl. 33—508

4 Claims



1. A golf club measuring device comprising clamping means for releasably retaining a head of a golf club in a fixed reference position and measuring means for determining the inclination of the shaft of the golf club relative to the head, wherein the clamping means comprises a first movable jaw to urge a striking face of the club head against first reference means and a second jaw movable to urge a sole of the club head against second reference means, third reference means for abutment against a part of a hosel of a golf club when the head of the latter is retained in its fixed reference position, and mounting means for mounting the third reference means in either of two positions on opposite sides of the other reference means.

4,875,294

GAUGE FOR DETERMINING DEPTH OF CUT IN KEYS AND THE LIKE

Robert C. Jefferson, 1209 E. 2nd Ave., Lenoir City, Tenn. 37771
Filed Dec. 19, 1988, Ser. No. 286,260

Int. Cl.⁴ G01B 5/20

U.S. Cl. 33—539

19 Claims



1. A gauging device for the rapid and accurate measurement of the depth of cut in keys, which comprises:
a yoke member having first and second substantially parallel

leg members and a back member, said leg members and said back member defining a C-shaped opening;
 an anvil member carried by said second leg member, said anvil member having a flat surface directed toward said first leg member, said flat surface being a reference point for said gauge;
 a reciprocable and non-rotating spindle member carried by said first leg member, said spindle member having an axis oriented perpendicularly to said flat surface of said anvil member, said spindle member having a first end and a distal end;
 a displacement measuring means attached to said first end of said spindle member, said displacement measuring means providing visual readout of axial displacement of said spindle member from said reference point;
 a tip member threadably secured to said distal end of said spindle member for selective contact with said flat surface of said anvil member to zero said gauge and selective contact with the cut of the key being measured to axially displace said spindle member; and
 means to bias said tip member toward said flat surface of said anvil member.

4,875,295

DROP-WEIGHT MATERIAL LEVEL INDICATOR

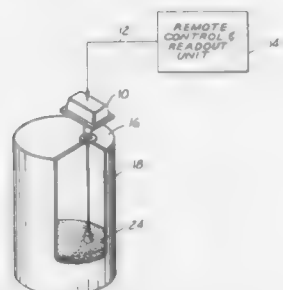
Phillip P. Fleckenstein, Port Huron, Mich., assignor to Silomaster, Inc., Port Huron, Mich.

Filed Jul. 11, 1988, Ser. No. 217,695

Int. Cl.⁴ G01F 23/04

U.S. Cl. 33—720

8 Claims



1. A drop-weight material level indicator comprising: support means adapted to be mounted above a material surface whose level is to be sensed; a spool mounted on said support means to rotate about a fixed spool axis; a drop line attached at one end to said spool and having a drop weight suspended from the other end; a motor rotationally coupled to said spool selectively for winding and unwinding said drop line on said spool; an arm mounted on said support means to pivot about a fixed pivot axis; spring means coupled to said arm and to said support means for biasing said arm to pivot in one direction; a first idler pulley freely rotatably carried by an end of said arm remote from said lever axis; a second idler pulley freely rotatably carried by said support means, said drop line being trained from said spool over said first and second idler pulleys such that tension in said drop line urges said arm to pivot in a second direction opposite to said one direction against force of said spring means; level sensing means including means responsive to rotation of said second pulley for indicating material level; and means responsive to motion of said arm about said pivot axis for sensing rupture of said drop line.

4,875,296

ANATOMICAL MEASURING DEVICE

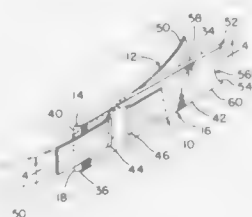
John P. Holzmeister, and June Holzmeister, both of 9810 Blomberg St. SW., Olympia, Wash. 98502

Continuation of Ser. No. 285,998, Jul. 23, 1981, abandoned. This application Oct. 3, 1983, Ser. No. 538,537

Int. Cl.⁴ G01B 3/10

U.S. Cl. 33—770

2 Claims



1. An anatomical measuring device primarily used for determining the circumferential size of a body portion, yet being used also for more readily determining inseam lengths and other linear lengths, the latter use being similar to the use of a conventional tape, comprising:

- a finger held handle having a commencing transverse tapered zero measurement end, and a terminating guiding end, an inside planar surface for placement toward a person's body, an outside planar surface for placement away from a person's body, a first transverse slot spaced from the zero measurement end through which a free end of a measuring tape after encircling a body portion and passing over the zero measurement end, may be inserted, commencing from the outside planar surface, and a second transverse slot, spaced from the first transverse slot, through which a free end of the measuring tape may be inserted, after passing through the first transverse slot and along the inside planar surface, commencing from the inside planar surface and thereafter passed over the outside planar surface and drawn in alignment with a finger held handle, until a wanted loop size of a measuring tape is reached about a body portion, and thereafter this loop size about a body portion is maintained by the restraint, which is created by the friction developed, as portions of a measuring tape are then closely positioned through the first and second transverse slots and along the inside planar surface between these spaced transverse slots; and
- a measuring tape having a zero end secured in transverse alignment with the transverse tapered zero measurement end of the finger held handle, adjacent the inside planar surface of the finger held handle, and a free end for directly creating an encircling portion of the tape around a body portion, and the free end for passing directly over the transverse tapered zero measurement end after encircling a body portion, and then for insertion, commencing from the outside planar surface of the finger held handle, through the first transverse slot spaced from the zero measurement end, and continuing for passing closely adjacent the inside planar surface, until reaching the second transverse slot, spaced from the first transverse slot, and continuing for insertion through the second transverse slot, and then continuing along the outside planar surface until reaching and passing the terminating end of the finger held handle, and remaining pullable until an encircling dimension around a body portion is finally determined, and then remaining stationary under the friction force, while the measurement is easily read, where the portions of the tape pass over the zero measurement ends of both the measuring tape and the finger held handle, so the size measurement being sought is easily observed in respect to the transverse portion of the measuring tape, then located in transverse alignment with both these respective zero measurement ends of the measuring tape and the finger handle.

4,875,297

DEVICE FOR TREATING A MATERIAL WEB

Heinz-Michael Zaoral, Königsbrunn, Fed. Rep. of Germany, assignor to Schwabische Huttenwerke GmbH, Postfach, Fed. Rep. of Germany

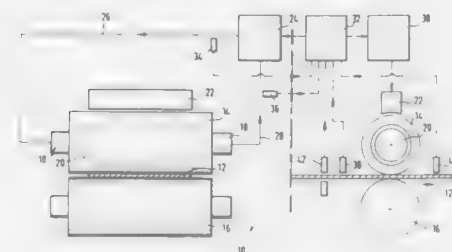
Filed Jun. 15, 1988, Ser. No. 206,679

Claims priority, application Fed. Rep. of Germany, Jun. 16, 1987, 3720132

Int. Cl.⁴ F26B 19/00

U.S. Cl. 34—48

18 Claims



1. A device for treating a material web, comprising:
- a heating roller, said heating roller including means for introducing heat carrier fluid into the interior of said heating roller at a controlled temperature;
 - a counter roller, proximate said heating roller, defining a material web path therebetween;
 - a heat source, proximate said heating roller adapted to heat the surface of said heating roller; and
 - a control means adapted to control the temperature difference between the interior and the surface of said heating roller.

4,875,298

PREHEATER FOR CLOTHES DRYER

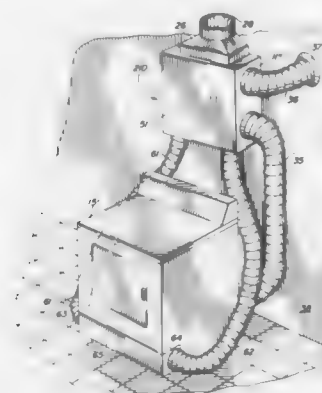
Robert L. Wright, 1113 Quintuplet Dr., Casselberry, Fla. 32707

Filed Oct. 14, 1988, Ser. No. 258,011

Int. Cl.⁴ F26B 19/00

U.S. Cl. 34—86

16 Claims



1. In an air intake preheater for a clothes dryer or the like, in which hot, moisture-laden air exhausted from the dryer is used to preheat fresh, ambient air drawn into the dryer, the preheater having a first conduit connected for flowing the exhausted air from the dryer to a discharge point, and a second conduit connected for flowing the ambient air, in heat exchange relationship with the exhausted air flowed through the first conduit, from a source of ambient air to the dryer, the first and second conduits communicating in air flow relationship through the dryer, the improvement comprising:

the first conduit being directed through the second conduit along a looping path that provides first and second transverse crossings in series in opposite directions of the air flow in the first conduit relative to the air flow in the second conduit.

4,875,299

SKI BOOT

Michel Mabboux, Seynod; Jean-Louis De Marchi, St. Jorioz, and Fabrice Legon, Seynod, all of France, assignors to Salomon S. A., Annecy Cedex, France

Continuation of Ser. No. 931,104, Nov. 17, 1986, abandoned.

This application Jul. 26, 1988, Ser. No. 224,278

Claims priority, application France, Nov. 15, 1985, 85 16911

Int. Cl.⁴ A43B 5/04

U.S. Cl. 36—117

32 Claims



1. Ski boot of the type comprising a shell base on which is articulated an upper which, during forward flexion, contacts said shell base with its front lower edge, said front lower edge comprising a movable abutment for transmission of forces which is displaceable transversely from one side of the front lower edge to at least its middle portion located at the instep, said abutment having the form of a cursor, wherein said cursor is constituted by:

- a body having at least one lateral rail cooperating with a corresponding groove of said front lower edge, and in which a movable locking means moves perpendicularly to said rail in one of corresponding recessed housings provided in the front lower edge; and
- a push means moving perpendicularly to the movement of said locking means and cooperating with the latter by means of a ramp means so that every displacement of said push element acts on said locking means, said locking means comprising a detent held by elastic means against a surface arranged in said push means.

4,875,300

TRACK SHOE WITH A DETACHABLE SPIKE PLATE BY THE USE OF PLASTIC SPIKES

Michael Kazz, 931 N. Norris, Tucson, Ariz. 85719-4948

Filed Aug. 5, 1988, Ser. No. 228,732

Int. Cl.⁴ A43B 5/00

U.S. Cl. 36—134

14 Claims U.S. Cl. 40—610



10. A track shoe having an outsole comprised of a synthetic material that has a low coefficient of thermal expansion, the outsole having a plurality of threaded openings therein; a plurality of spikes mounted in the threaded openings; a spike plate mounted adjacent the outsole, the spike plate having threaded holes therein aligned with the openings in the outsole such that the spikes are engaged with both the spike plate and the outsole; and the outsole being formed of a synthetic material with a Shore A hardness of 50 to 90 and containing projections for aligning the outsole with the spike plate for its attachment with spikes.

4,875,301

CYLINDRICAL APPARATUS FOR HOLDING TABLE SKIRTING FOR WRINKLE REMOVAL

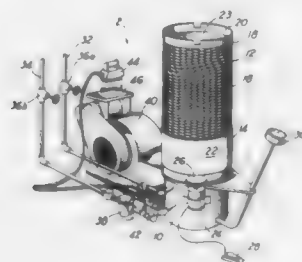
Charles A. Adams, 3760 Sherbrook Ct., College Park, Ga. 30349

Filed Sep. 15, 1988, Ser. No. 244,282

Int. Cl.⁴ D06F 69/00, 73/00

U.S. Cl. 38—14

12 Claims



1. An apparatus for removing wrinkles from a table skirt comprising:

- (a) a vertically oriented cylinder capable of holding a table skirt and being porous along a portion of its length;
- (b) means for rotating said cylinder whereby a table skirt may be wound around said cylinder in an overlapping manner;
- (c) a flange provided on the upper portion of said cylinder;
- (d) clipping means capable of clipping said table skirt to said flange and around said cylinder in an overlapping manner as said cylinder rotates; and
- (e) means for delivering steam from an outside source through said porous portion of said cylinder for removing the wrinkles from said wound table skirt.

4,875,302

COLLAPSIBLE DISPLAY SIGN

Alfred A. Noffsinger, 73-271 Haystack Rd., Palm Desert, Calif. 92260

Filed Apr. 7, 1988, Ser. No. 178,597

Int. Cl.⁴ G09F 15/10

14 Claims U.S. Cl. 40—610

13 Claims



1. A portable and foldable sign apparatus, comprising:
- a first support frame member;
 - a second support frame member;
 - said first and second support frame members being hinged together so as to be positioned between a closed folded position and an open extended position;
 - a slidable frame member slidably engaged with said first and second support frame members, whereby the positioning of said slidable frame member controls the positioning of said first and second support frame members;
 - biasing means attached to said first and second support frame members engageable with said slidable frame member, whereby said support frame members are held in a relatively fixed closed or open position with respect to said slidable frame member.

4,875,303

MUZZLELOADING POWDER AND PROJECTILE TOOL

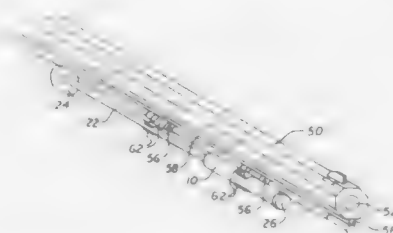
William R. DeWeert, 1560 Dammeron Valley Dr., E., and Frank Manning, 2153 Dammeron Valley Dr., E., both of Dammeron Valley, Utah 84783

Filed Mar. 25, 1988, Ser. No. 173,549

Int. Cl.⁴ F41C 27/00

U.S. Cl. 42—90

10 Claims



1. A firearm attachable, muzzleloading reloading tool comprising:

- an end cap for closing an end of a body, said end cap being attached frictionally upon said body which is cylindrically tubular and axially elongated and is of sufficient size circumferentially and of such axial length so as to provide for the containment telescopically within of an inner sleeve which is a cylindrical tubular member that contains a powder projectile propellant and a type of projectile;
- a cylindrical bushing of such diameter so as to be slideably inserted into an end of said body, such cylindrical bushing

being longitudinally sufficient in length as to provide for an annular groove circumferentially located on said bushing; said bushing containing a cylindrical hole longitudinally axial in said bushing located at a median on the diametral axial ends of said bushing; said bushing being contained frictionally within said body by a compressive tension retaining clip, which is compressively contained on said body, said compressive tension retaining clip being accessed to said bushing through a retaining clip slot aperture; a plunger shaft being cylindrical and axially longitudinal, the end of said plunger shaft contained within said body is flared, the flare being of sufficient size to prohibit retraction of said plunger shaft axially through said hole in said bushing; and said plunger shaft insertingly attached to a hole in a handle at the diametrically opposite end of said flare, said attachment facilitated by a vinculum bonding.

4,875,304

THUMB CONTROLLED FISHING LINE, CASTING DEVICE

Arthur J. Hansen, 34 Charles St., B-4, Westwood, N.J. 07675

Filed Mar. 28, 1989, Ser. No. 329,443

Int. Cl.⁴ A01K 87/00

U.S. Cl. 43—25

1 Claim



1. A combination fishing rod, fishing reel, fishing line, and a thumb controlled casting means comprising:
- a fishing rod, reel, and line mounted thereon;
 - a thumb controlled fishing line casting means comprising: a tubular means having a longitudinal opening along a bottom portion for mounting snugly upon a foregrip of said fishing rod;
 - said casting means further comprising: a ridge portion running longitudinally from a raised position, at one end of said casting means top portion, to a lowered position at one other end;
 - whereby, said casting means mounted on said foregrip said rod is operated by: first, placing said line along said ridge and placing ones thumb upon said ridge and line, and second, casting said rod wherein said line will slide out from under ones thumb and thus releasing said line from said thumb controlled casting means.

4,875,305

SLOWLY DISSOLVING FISHING LURE ATTACHMENT WITH SCENT MIXTURE

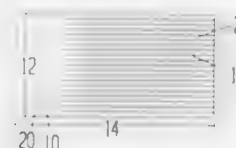
John O. Bridges, 525 W. Ash St., Fullerton, Calif. 92632

Filed Feb. 17, 1989, Ser. No. 311,748

Int. Cl.⁴ A01K 85/00

U.S. Cl. 43—42.06

12 Claims



1. A fishing lure which comprises a body have the property of a slow dissolution rate in water and containing a fish attractant embedded within said body so that when said body dissolves in a body of water, said fish attractant is released into said water wherein said body is formed of polyvinyl alcohol having a limited rate of water dissolution.

4,875,306

DOOR APPARATUS

Mitsuru Itoh, No. 2-6, Inohama 3-chome, Chiba-shi, Chiba-ken, Japan

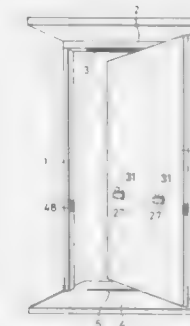
Filed Jun. 23, 1988, Ser. No. 210,694

Claims priority, application Japan, Dec. 21, 1987, 62-323453

Int. Cl.⁴ E05D 15/56

U.S. Cl. 49—208

1 Claim



1. A door apparatus, comprising:
- two posts vertically fitted onto a sidewall of an entrance;
 - a beam disposed within a proximity of an upper end portion of said two posts, said beam having a U-shaped longitudinal sectional shape and equipped on a bottom plate thereof with an elongated hole having a predetermined length in a longitudinal direction;
 - a substantially rectangular upper guide plate disposed at an upper part of said beam, wherein said upper guide plate has a lower surface, a linear support shaft guide groove on said lower surface having a direction and a length substantially equal to said elongated hole of said beam, and a piece guide groove formed on said lower surface by superposing two strips of stirrup-like grooves having a linear portion in such a manner that the linear portion of each of said stirrup-like grooves faces each of said posts;
 - a floor plate fitted in the proximity of a lower end portion of said posts, and wherein said floor plate has an elongated hole having a direction and a length substantially equal to those of said elongated hole of said beam;
 - a rectangular lower guide plate fitted to a lower portion of said floor plate, and wherein said lower guide plate has an upper surface, a plurality of piece guide grooves on said upper surface, each piece guide groove has substantially the same shape as that of said piece guide groove of said upper guide plate and a lower support shaft guide groove on said upper surface having substantially the same shape as that of said upper support shaft guide groove;
 - upper and lower support shafts fixed to the center of a hollow door and disposed between said two posts in the transverse direction of said door;
 - said upper support shaft being hollow and inserted through said elongated hole of said beam and supported by said beam in such a manner as to be movable while being rotated along said elongated hole of said beam;
 - piece elevation levers each having a support frame fixed at right angles to an upper end of said upper support shaft in parallel with said door, said piece elevation levers being fitted rotatably in the vertical direction to the center of said support frame in the longitudinal direction thereof;
 - two member pieces fitted to outer end portions of said piece elevation levers and fitted into said piece guide grooves of

said upper guide plate when said member pieces rise, wherein said lower support shaft being inserted into said elongated plate of said floor plate;

a piece support plate fixed vertically to a lower end portion of said lower support shaft in parallel with said door;

other pieces fitted pivotally to outer end portions of said piece support plate and fitted into said piece guide grooves of said lower guide plate;

a knob mechanism which comprises:

a shaft member having an axial elongated groove on an apex thereof, wherein said shaft member penetrates through said door in the longitudinal direction;

cylindrical cover means for supporting an end portion of said shaft member, said cylindrical cover means being fixed to the same front or rear position of said door and equipped with an elongated hole in an axial direction on the apex thereof;

slide plates, each being slidably fitted between an inner surface of said cylindrical cover means and an upper surface of said shaft member, each slide plate being equipped with a projection extending vertically at an inner end thereof and having a semi-circular sectional shape;

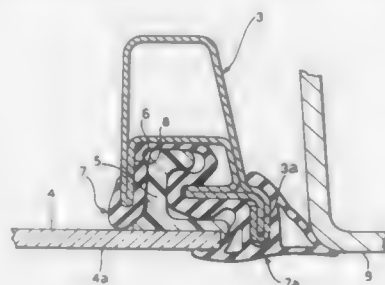
other slide plates, each being equipped at an outer end thereof with a ring which is fitted, from outside to said shaft member and at an inner end thereof, with a projection extending vertically, and having a main body portion which has a semi-circular sectional shape and slides along a lower surface of said shaft member, wherein said projection is more inward than said projection of said slide plate;

operation plates, each having a portion which has a semi-circular sectional shape and enters between said two slide plates, and slides along said shaft member; and

operation rods, each being fitted at the lower end portion thereof into said key groove of said shaft member while penetrating longitudinally through said portion of said operation plate having a semi-circular sectional shape, each of said operation rods being equipped at an upper end portion thereof with a knob projection from said elongated hole of said cylindrical cover,

wherein when said knob of said knob mechanism is pushed, said piece elevation lever connected to said pushed knob rotates and said member piece at the outer end portion of said piece elevation lever rotated by said pushed knob fits into said piece guide groove of said upper guide plate, and when said knob is pulled, said piece elevation lever connected to said pulled knob rotates and said member piece at the outer end portion of said piece elevation lever rotated by said pulled knob fits into said piece guide groove of said upper guide plate.

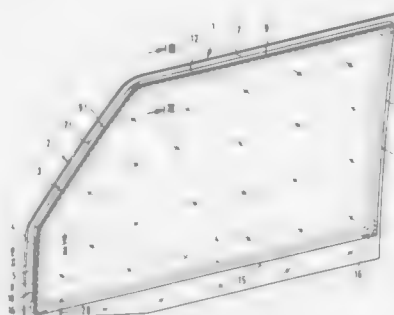
formed in a weather strip (7) fixed to the window frame (3) and having an auxiliary portion (7a) which serves both as the seal



between the glass (4) and the door frame (3) and as the seal between the door frame (3) and the body of the motor vehicle.

4,875,300
ADJUSTABLE INSULATING GLASS WINDOW
 Dieter Peetz, Aachen; Peter Scheeren, Monschau; Hans-Peter Siemonsen, Aachen; Ralf Reinicke, Köln; Lothar Witting, Neunkirchen-seelscheid, and Aloisius Schafhausen, Troisdorf, all of Fed. Rep. of Germany, assignors to Saint-Gobain Vitrage, Courbevoie, France
 Filed Jan. 27, 1988, Ser. No. 148,823
 Claims priority, application Fed. Rep. of Germany, Jan. 28, 1987, 3702402

Int. Cl.⁴ E06B 3/00
 U.S. Cl. 49—501 46 Claims

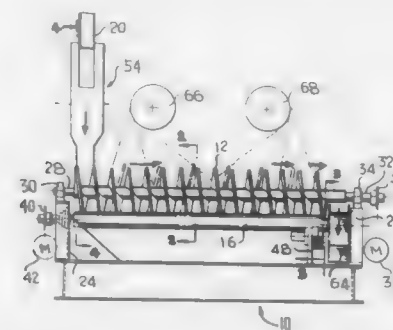


1. An insulating glass window comprising first and second glass sheets, a profile strip and a bonding strand separating and bonding the two glass sheets to one another and sealing an intermediate air space, characterized in that said bonding strand is located inward relative to peripheral edge surfaces of the two glass sheets thereby forming a groove into which said profile strip is placed, said profile strip having at least one projection element directed toward said bonding strand and partially inserted into and anchored in said strand, and capable of maintaining an external periphery surface of said profile strip in flush relation with the peripheral edge surface of at least one of said glass sheets.

4,875,309
DISC CLEANER
 William W. Long, III, Hagerstown, Md., assignor to Pangborn Corporation, Hagerstown, Md.
 Filed Dec. 17, 1987, Ser. No. 134,092
 Int. Cl.⁴ B24C 3/14

U.S. Cl. 51—419 15 Claims
 1. A feed unit for use in an abrasive cleaner machine for circular generally plate-like workpieces, said feed unit comprising two parallel support shafts equally transversely spaced

relative to and parallel to an axis for supporting and rotating a single row of workpieces about said axis, first drive means connected to said support shafts for rotating said support shafts to effect rotation of workpieces seated thereon, two parallel screw type conveyors equally transversely spaced parallel to said axis and above said support shafts for receiving work-



pieces seated on said support shafts and advancing such workpieces along said single row, second drive means connected to said screw type conveyors for rotating said screw type conveyors to move workpieces along said support shafts, said first and second drive means being independent of one another wherein speed of rotation of a workpiece is independent of advance rate of a workpiece.

4,875,310
MODULAR BUILDING
 Ernest P. Shaughnessy, 507 14th Ave. North, Nampa, Id. 83605
 Continuation-in-part of Ser. No. 190,467, May 5, 1988, abandoned. This application May 1, 1989, Ser. No. 346,313
 Int. Cl.⁴ E04B 1/32

U.S. Cl. 52—81 2 Claims



1. A ten sided polyhedron building structure for automated continuous production and manufacture which comprises:

three small right handed trapezoidal shaped side panels each having a top inclined edge of length T and a pair of parallel side edges, right hand edge of length Y and left hand edge of length Z, where Y is greater than Z and where said right and left hand edges are separated by a given width, say w;

three small left handed trapezoidal shaped side panels each having a top inclined edge of length T and a pair of parallel side edges, left hand edge of length Y and right hand edge of length Z, where Y is greater than Z and where said right and left hand edges are separated by said given width w;

two large right handed trapezoidal shaped side panels each having a top inclined edge of length t, where t is less than T, and a pair of parallel side edges, right hand edge of length X and left hand edge of length Y, where X is greater than Y and where said right and left edges are separated by said given width;

to large left handed trapezoidal shaped side panels each having a top inclined edge of length t and a pair of parallel side edges, left hand edge of length X and right hand edge

of length Y, where said right and left edges are separated by said given width say w;

said side panels being vertically oriented wherein

a first small right handed trapezoidal shaped side panel is joined along its right edge to the left hand edge of a first large right handed trapezoidal shaped side panel such that said first small right handed trapezoidal shaped side panel and said first large right handed trapezoidal shaped side panel form a 144° dihedral angle there between;

wherein a first large left handed trapezoidal shaped side panel is joined along its left hand edge to the right hand edge of said first large right handed trapezoidal shaped side panel to form a 144° dihedral angle there between;

wherein a first small left handed trapezoidal shaped side panel is joined along its left hand edge to the right hand edge of said first large left handed trapezoidal shaped side panel to form a 144° dihedral angle there between;

wherein a second small right handed trapezoidal shaped side panel is joined along its left hand edge to the right hand edge of said first small left handed trapezoidal shaped side panel to form a 144° dihedral angle there between;

wherein a second large right handed trapezoidal shaped side panel is joined along its left hand edge to the right hand edge of said second small right handed trapezoidal shaped side panel to form a 144° dihedral angle there between;

said third small right handed trapezoidal shaped side panel and along its right edge to the left edge of said first small right handed trapezoidal shaped side panel to form a ten sided enclosure having interior dihedral angles of 144°;

two right handed trapezoidal shaped closure panels each having a top inclined edge of length T and a bottom inclined edge of length t and a pair of parallel side edges, right hand edge of length V and left hand edge of length T, where V is greater than T and where said right and left edges are separated by said given width;

two left handed trapezoidal shaped closure panels each having a top inclined edge of length T and a bottom inclined edge of length t and a pair of parallel side edges, left hand edge of length V and right hand edge of length T, where said right and left edges are separated by said given width;

four rhombus shaped closure panels each having four equal length edges of length T and a pair of major interior face angles and a pair of minor interior face angles;

said closure panels being attached to said side panels wherein

a first rhombus shaped closure panel is attached along a first and a second edge to the top inclined edges of said first small right handed trapezoidal shaped side panel and of said third small left handed trapezoidal shaped closure panel;

a first right handed trapezoidal shaped closure panel is attached along its bottom inclined edge to the top inclined edge of said first large right handed trapezoidal shaped side panel and further along its left hand edge to a third edge of said first rhombus shaped closure panel;

a first left handed trapezoidal shaped closure panel is attached along its bottom inclined edge to the top inclined edge of said first large left handed trapezoidal shaped side panel and further along its left hand edge to the right hand edge of said first right handed trapezoidal shaped closure panel;

a second rhombus shaped closure panel is attached along a first and a second edge to the top inclined edges of said second small left handed trapezoidal shaped closure panel and said second small right handed trapezoidal shaped side panel and further along its fourth edge to the right hand edge of said first left handed trapezoidal shaped closure panel;

a second right handed trapezoidal shaped closure panel is attached along its bottom inclined edge to the top inclined edge of said second large right handed trapezoi-

dal side panel and along its left hand edge to a third edge of said second rhombus shaped closure panel and further attached along its top inclined edge to the top inclined edge of said first left handed trapezoidal closure panel;

a second left handed trapezoidal closure panel is attached along its bottom inclined edge to the top inclined edge of said second large left handed trapezoidal shaped side panel and along its left hand edge to the right hand edge of said second right handed trapezoidal shaped closure panel;

a third rhombus shaped closure panel is attached along a first and a second edge to the top inclined edges of said second small left handed trapezoidal shaped side panel and said second small right handed trapezoidal shaped side panel and further along a third edge to the right hand edge of said second left handed trapezoidal shaped closure panel;

a fourth rhombus shaped closure panel is attached along its first and second edges to the top inclined edges of said second left handed trapezoidal shaped closure panel and said first right handed trapezoidal shaped closure panel respectively, and further along its third and fourth edges to the third fourth edges of said first and third rhombus shaped closure panels.

4,875,311

BEAM CONSTRUCTION

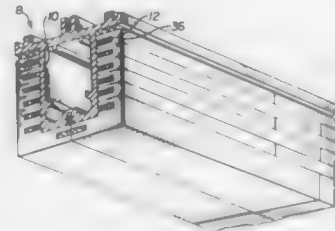
Leo J. Meyers, Pittsburgh, Pa., assignor to Sun Room Designs, Inc., Youngwood, Pa.

Filed Apr. 20, 1988, Ser. No. 183,972

Int. Cl.⁴ E04B 7/02; E04C 3/36

U.S. Cl. 52—90

35 Claims



1. In a structure such as a sun room, solar room, greenhouse, or the like, a framework for supporting a panel-like comprising: at least two spaced-apart beam members for supporting said panel-like member therebetween, each of said beam members comprising:

an elongated core member having two sides, each said side having an outer surface,

a plurality of spaced-apart projections arranged on said outer surface of said each side, each said projection extending generally coextensively with said core member and laterally outwardly on said each outer surface of said core member, and

a plurality of planks on said each side of said core member, each said plank having a lateral open channel adapted to receive one of said projections for mounting of said each plank, and said each plank abutting an adjacent plank to generally enclose said core member,

said plurality of planks having different lengths,

said each projection carrying a number of said planks to form a single row, and said plurality of projections forming several adjacent rows of said planks on said each side of said core member, whereby said planks of a respective row are staggered relative to said planks of an adjacent row.

4,875,312 WALL PANELLING FOR ALTERING THE ACOUSTIC PROPERTIES OF A WALL

Karl-Günter Schwartz, Worms, Fed. Rep. of Germany, assignor to G & H Montage, Ludwigshafen, Fed. Rep. of Germany

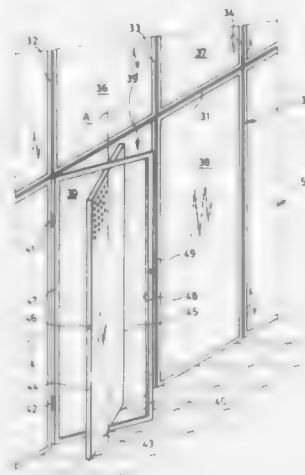
Filed Feb. 5, 1988, Ser. No. 152,825

Claims priority, application Fed. Rep. of Germany, Mar. 4, 1987, 3706984

Int. Cl.⁴ E04B 1/82

U.S. Cl. 52—144

6 Claims



1. A wall panelling for altering the acoustic properties of a wall, comprising said wall panelling being mounted adjacent said wall, a plurality of frames disposed within said wall panelling and adapted to be pivoted relative to said wall panelling about an axis extending along one edge thereof to swing an opposite edge thereof away from said wall, wall elements being substantially plate-shaped and mounted each in one said frame for rotation of at least 180 degrees relative to and independent of rotation of said frame about a predetermined axis, and each said wall element having front and rear faces with different acoustic absorption and reflection properties on said front and rear faces.

4,875,313

DEVICE FOR SUPPRESSING VIBRATION OF STRUCTURE

Takanori Sato, Tokyo, Japan, assignor to Shimizu Construction Co., Ltd., Tokyo, Japan

Filed May 20, 1988, Ser. No. 196,325

Claims priority, application Japan, Nov. 17, 1987, 62-290231

Int. Cl.⁴ E02D 27/34

U.S. Cl. 52—167 DF

17 Claims



1. A device for suppressing vibration of a structure, comprising:

a tank having an open central area, and being disposed on the structure, said tank having a circumferential and radial direction with respect to said open central area;

a liquid, contained in the tank, for suppressing vibration of

the structure, the amount of the liquid being such that the natural period of the liquid is substantially equal to the natural period of the structure, said liquid being allowed to vibrate in a horizontal direction; and

means, disposed within the tank, for damping the vibration of the liquid, the damping means being of a net construction and having a vertical section which includes a plurality of portions, each said portion extending in a direction intersecting said horizontal direction and at least one of said portions extending transverse to both said circumferential and radial directions.

4,875,314

CONNECTION SYSTEM FOR PREVENTING UPLIFT OF SHEAR WALLS

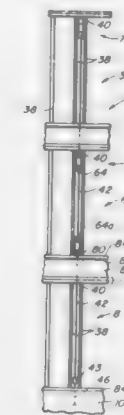
Kenneth T. Bollen, 4 Allemand La., San Anselmo, Calif. 94960

Filed Jan. 6, 1987, Ser. No. 707

Int. Cl.⁴ E04H 9/02

U.S. Cl. 52—167 R

16 Claims



1. For use in a wood framed building of the type including a foundation and first and second levels supported on the foundation, the first and second levels including top and bottom pairs of vertical frame members, horizontal plate members connecting the upper ends of said vertical frame members at both said first and second levels, and sheathing means fixed to said members forming vertical shear walls, said shear walls including upper and lower ends, each of the levels separated by a floor, the floor comprising floor framing, a connecting system for preventing the uplifting of said shear walls from said foundation due to lateral loads induced into the building, the system comprising:

foundation anchor means secured to the foundation and generally vertically aligned with the anchor means; and

a first upper anchor means having coupling means at both ends and a bearing member base plate at its lower end supported on the horizontal plate member of said first building level;

a second upper anchor means vertically aligned with said first upper anchor means and having a bearing base plate member at its lower end supported on the horizontal plate of said second building level;

tie rods means located between vertically aligned pairs of vertical frame members for tensively coupling said first and second upper anchor means to one another and to said foundation anchor, whereby vertical uplift loads induced by lateral forces transferred into the first and second level shear walls are transferred to their respective anchor means which in turn transfer the vertical uplift loads to the foundation through the tie rod means and the foundation anchor.

4,875,315

FRAME FOR SUPPORTING STAIRS OR THE LIKE

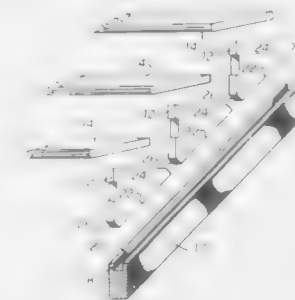
Vénérand R. Champagne, 8720, des Mille-Isoles, Laval, Quebec, Canada (H0A 1G0)

Filed Jun. 13, 1988, Ser. No. 205,831

Int. Cl.⁴ E04F 11/10, 11/12, 11/14

U.S. Cl. 52—189

9 Claims



1. A frame for supporting a platform, a staircase or the like comprising:

at least two spaced longitudinal beams, each beam having a longitudinal groove centrally located on its upper surface, each of said grooves having a flat rectilinear bottom surface and a uniform width defined by flat, parallel internal walls,

a platform section and a pair of spaced truss beams secured to and under said platform, said truss beams having a flat rectilinear bottom surface across their width, and a uniform width defined by parallel, flat sidewalls, the distance between the said truss beams corresponding to the distance between the longitudinal beams, the full width of said truss beams corresponding to the width of said grooves to allow the truss beams to fittingly slide both downwardly into said grooves and longitudinally along the grooves, the height of said truss beams being greater than the depth of said grooves, the bottom of said truss beams being adapted to rest in the bottom of the grooves while maintaining the platform spaced from the upper surface of the longitudinal beams.

4,875,316

COMBINATION METAL AND WOOD WINDOW FRAME ASSEMBLY

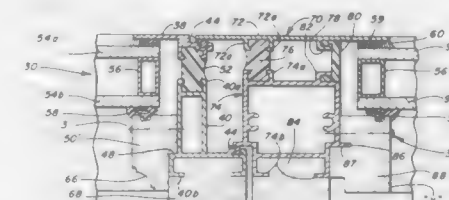
Bernard A. Johnston, 3026 Fairfield Ave., Downers Grove, Ill. 60511

Filed Mar. 27, 1987, Ser. No. 31,527

Int. Cl.⁴ E06B 1/04

U.S. Cl. 52—204

6 Claims



1. A combination metal and wood window frame assembly having exterior and interior faces, comprising:

a plurality of frame members constituting the rails and stiles of the window frame assembly, each frame member including two metal frame elements, a thermal break member rigidly interconnecting said metal frame elements, and a wooden frame element extending towards the interior face of said frame assembly;

deep-key interconnection means carried respectively by said metal frame member and by said wooden frame element

and cooperable with one another to provide a rigid interlock connection of said wooden frame element with said metal frame member; and

a second wooden frame element which is rigidly deep-key interconnected to at least one of said metal frame elements for providing an interior wooden aesthetic covering to said metal frame member as well as for providing structural rigidity to the overall combination metal and wood window frame assembly.

4,875,317

MOLDED VENT

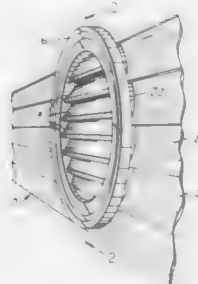
John R. Logan, R.R. #3, Dunn Road, and Donald C. Wickens, Box 4, Bluewater Beach, R.R. #1, both of, Harrow, Ontario NOR 1G0, Canada

Filed Feb. 26, 1988, Ser. No. 161,194

Int. Cl.⁴ E06B 3/00; B29C 17/04

U.S. Cl. 52—208

2 Claims



2. A combination including an architectural component adapted to be inserted into an opening formed in an exterior wall of thin-walled metal or plastic siding, comprising:

an exterior wall of thin-walled siding, said siding having an opening formed therein, edges of said siding being defined at the inner periphery of said opening;

a one-piece, vacuum-formed plastic frame portion forming a complete perimeter for the component, said frame portion including a back side adapted to face inward toward the interior of the building and a front side adapted to be exposed to view from the exterior of the building, said frame portion including a laterally outwardly projecting nailing flange on said back side, and said frame portion further including an undercut portion surrounding the complete perimeter of said frame portion, said undercut portion being located between said nailing flange and said front side and being recessed laterally inwardly from the laterally outer edges of both said nailing flange and said front side, thereby to form a peripheral pocket into which the siding edges which define the exterior wall opening can be received, said edges being essentially concealed from view by said front side of said frame portion; and said exterior wall having an upper and a lower portion, said frame portion having a plurality of louvers extending thereacross, said louvers being parallel to each other.

4,875,318

PLASTIC BUILDING PRODUCT

Richard J. MacLeod, Milford, and Charles E. Schiedegger, Metamora, both of Mich., assignors to Tapco Products Company, Inc., Detroit, Mich.

Filed May 10, 1988, Ser. No. 192,237

Int. Cl.⁴ E06B 1/04

U.S. Cl. 52—211

21 Claims

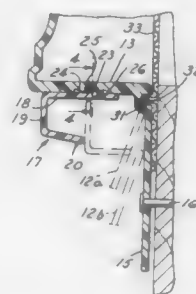
1. A plastic building product for use on walls of a building having an outer and inner surface to provide a louver or opening wherein siding on said outer surface abuts the product comprising

a one-piece plastic body having an integral central portion defining a louver or opening,

an integral continuous peripheral wall circumscribing the louver or opening,

an integral flange extending laterally from the peripheral wall for fastening the body to said outer surface, and

a removable plastic flange member telescoped over the peripheral wall of the body and including a continuous axial wall and an integral laterally extending continuous



flange adapted to overlie portions of abutting siding or the like,

the flange and the peripheral wall including interengaging means for selectively positioning the flange member at predetermined distances with respect to the flange on the body to accommodate siding of varying thicknesses, said interengaging means being provided at circumferentially spaced positions along said continuous peripheral wall and continuous flange.

4,875,319

SEISMIC CONSTRUCTION SYSTEM

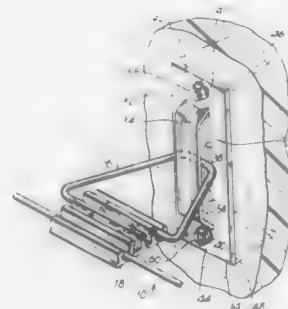
Ronald P. Hohmann, Syosset, N.Y., assignor to Hohmann & Barnard, Inc., Hauppauge, N.Y.

Filed Jan. 13, 1988, Ser. No. 205,673

Int. Cl.⁴ E04B 1/16

U.S. Cl. 52—383

43 Claims



1. A seismic construction system comprising a plurality of support members secured with respect to each other and forming the frame of an edifice,

at least one barrier layer means disposed in abutting engagement with the outer surface portion of selected ones of said support members,

at least one veneer anchor member disposed in proximate relationship with the front surface of said barrier layer

said veneer anchor member comprising a plate member, a projecting bar member, and end members, means for fixedly securing said projecting bar member to said plate member in a manner to form a slot therebetween,

a wall tie member having a first end portion and a second

end portion, said first end portion being positionally disposed in the slot between said plate member and said projecting bar member of said veneer anchor member, a clip member comprising, a base member, said base member including

first and second attachment means formed thereon,

said second end portion of said wall tie member being secured to said first attachment means of said clip member, wire reinforcing means secured to said second attachment means of said clip member,

an outer wythe assembly, and said second end portion of said wall tie member, said clip member, and said wall reinforcing means being positionally securable along the longitudinal dimension of said outer wythe assembly, to thereby secure said wall tie member and said wire reinforcement means with respect to said outer wythe assembly.

4,875,320

ROOF INSULATION SUPPORT SYSTEM

Julian G. Sparkes, P.O. Box 1293, Lebanon, Tenn. 37087

Filed May 26, 1988, Ser. No. 199,017

Int. Cl.⁴ E04B 1/74

U.S. Cl. 52—406

6 Claims



1. In an insulated roof support structure having a plurality of elongated, parallel, transversely spaced purlins, each purlin having a vertical web and an elongated horizontal bottom flange, and insulation layer material occupying the spaces between said webs, an insulation support system comprising:

(a) an elongated channel-shaped support bar including a bottom wall having a width substantially equal to the width of the bottom flange of each purlin, and a pair of opposed upward projecting side walls,

(b) an elongated insulation strip of a width substantially equal to the width of said bottom flange of each purlin received coextensively within said channel-shaped support bar,

(c) a plurality of transverse support straps, each transverse support strap extending transversely beneath said purlin bottom flange and above said insulation strip,

(d) fastener means securing said support bar, said insulation strip, said transverse strap and said bottom flange together, so that said support bar extends co-extensively with said bottom flange, and said support bar and said insulation strip clamp and hold said transverse support strap against the bottom surface of said bottom flange,

(e) a plurality of longitudinal support straps, each said longitudinal support strap extending longitudinally substantially midway between a pair of adjacent purlins, and

(f) said longitudinal support straps and said transverse support straps supporting said insulation layer material between said purlins.

4,875,321

ROOFING SHINGLES

Nicholas J. Rohner, Delhi, N.Y. 13753

Filed Sep. 2, 1988, Ser. No. 239,941

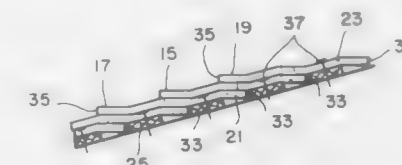
Int. Cl.⁴ E04D 1/28

U.S. Cl. 52—553

7 Claims

1. A pair of coordinated roofing shingles for use in covering a roof by placing a series of rows of overlapping shingles on the roof, said pair of coordinated roofing shingles comprising: a full-size shingle including a flat sheet of weather-resistant

material having a front side exposed to the weather and a rear side which is placed against the roof and having a rectangular shape with two minor edges and two major edges, the major edges of the full-size shingle being approximately three times the length of the minor edges, said full-size shingle further including a backing strip of weather-resistant material substantially of rectangular shape and having a thickness substantially equal to the thickness of the flat sheet of weather-resistant material and being affixed to the rear side of the full-size shingle and being located substantially parallel to the two major edges, and substantially equally spaced between the two minor edges with a length less than the length of the two major edges; and



a half-size shingle including a flat sheet of weather-resistant material having a front side exposed to the weather and a rear side which is placed against the roof, and having a rectangular shape with two minor edges and two major edges, the major edges of the half-size shingle being approximately one and one-half times the length of the minor edges of the full-size shingle, the minor edges of both the half-size shingle and the full-size shingle being substantially the same, said half-size shingle further including a backing strip substantially of rectangular shape and having a thickness substantially equal to the thickness of the flat sheet of weather-resistant material and being affixed to the rear side of the flat sheet of weather-resistant material and being located parallel to the two major edges and extending substantially the entire length of the major edges between the two minor edges.

4,875,322

PROCESS FOR THE INSULATION OF EXISTING BUILDING FACADES AND PREFABRICATED PANEL TO BE USED IN APPLYING SAID PROCESS

Costantino Rozzi, Ascoli Piceno, Italy, assignor to R.E.I.N. S.p.A., Italy

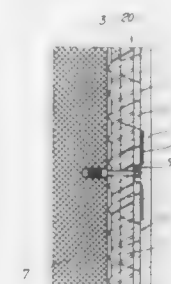
Filed Nov. 20, 1987, Ser. No. 123,173

Claims priority, application Italy, Dec. 12, 1986, 22672 A/86

Int. Cl.⁴ E04B 1/38

U.S. Cl. 52—746

5 Claims



1. Process for the insulation of existing building facades comprising the steps of covering the facade with flat prefabricated panels consisting of a three-dimensional metal grating partially embedded in a layer of foamed plastic material and placing a surface layer of said foamed plastic material, said

surface layer covering and extending beyond a corresponding face of said grating, next to the facade, fixing said prefabricated panels to said facade, and completion of the coating with plastic of a thickness such as to incorporate and cover externally said metal grating.

4,875,323

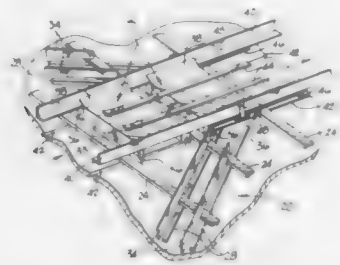
PACKAGING MACHINE JAMMING DETECTOR

Jimmy R. Craighead, West Monroe, La., assignor to Manville Corporation, Denver, Colo.

Filed Feb. 9, 1988, Ser. No. 154,669
Int. Cl.⁴ B65B 21/08, 57/16

U.S. Cl. 53-48

18 Claims



1. In a machine for packaging articles in a sleeve-type carrier; means for moving open-ended carrier sleeves downstream of the machine;
- article loading means comprising means for moving a plurality of articles into each carrier sleeve through the opposite open ends thereof; and
- means separate and downstream from said article loading means actuated by articles being forced outwardly through an open end of a carrier sleeve for automatically detecting an article jam inside the carrier sleeve and stopping the operation of the machine.

4,875,324

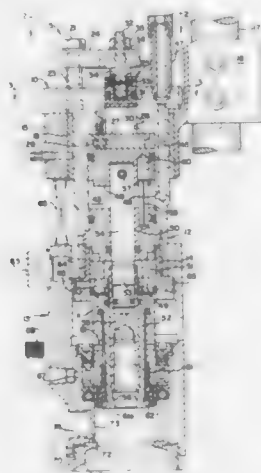
LOW PRESSURE CAP LIFT WITH HYDRAULIC RETURN

Donald E. Cohrs, Davenport, Iowa, assignor to The Kartridg Pak Co., Davenport, Iowa

Filed Nov. 3, 1988, Ser. No. 266,507
Int. Cl.⁴ B65B 31/06, 31/02, 3/10

U.S. Cl. 53-88

21 Claims



1. In a crimping head for use in introducing fluid under pressure into the mouth of an open container provided with an unsecured closure and thereafter crimping the closure to said

mouth comprising, an upper cylinder closed at its upper and lower ends and having flange means which can rest on a support sleeve in which it is vertically reciprocal, a piston operable in said upper cylinder, a lower cylinder attached to said lower end of said upper cylinder and depending co-axially therefrom, a hollow collet co-axially mounted in said lower cylinder, plunger means attached at its upper end to said piston and extending downwardly through a bore in said lower end of said upper cylinder and into said collet for distending the bottom end of said collet, a container-engaging bell surrounding said lower cylinder and the lower end of said upper cylinder and reciprocal with respect to said lower cylinder and said lower end of said upper cylinder, said bell and said lower cylinder having cooperating transverse vacuum-transmitting passageways arranged to register only when said bell occupies a particular vertical position relative to said lower cylinder to thereby establish vacuum communication through said bell and said lower cylinder into an annular clearance region that encircles said collet internally of said lower cylinder and which region opens downwardly into the lower end of said bell for communication with said container, said bell having a second passageway for admitting fluid under pressure into the lower portion of said bell and into a said container engaged by said bell, said upper cylinder having a passageway communicating from its exterior into its interior at a location above said piston and a second passageway communicating from its exterior into its interior below said piston, and all the above-mentioned elements of said head except said bell being collectively vertically reciprocal as a unit between raised and lower positions with respect to said bell when the latter stationarily engages a said container and being collectively lifted with respect to said container-engaging bell and said support sleeve when fluid under sufficient pressure is admitted into said bell through said second passageway, and means for lowering said collectively lifted elements of said crimping head as a unit against the upward lifting force of pressurized fluid retained in the lower portion of said bell comprising, cylinder means carried by said closed upper end of said upper cylinder, fixed piston means operable within said cylinder means, and means fixedly supporting said fixed piston means from said support sleeve at an elevation whereby a closed space forms within said cylinder means under said fixed piston means when said collectively liftable elements are in their said lowered position, said closed space being appreciably reduced when said collectively liftable elements are in their said lifted positions, said cylinder means having passageway means whereby fluid under pressure may be admitted to said reduced space to lower said cylinders means and said collectively lifted elements to an elevation wherein said collect has crimping engagement with a said closure seated on said container mouth.

4,875,325

DEVICE FOR TRANSFERRING AND APPLYING SEALING BANDS

Antonio Gamberini, Bologna, and Marco Brizzi, Zola Predosa, both of Italy, assignors to G.D. Società per Azioni, Bologna, Italy

Filed Apr. 19, 1988, Ser. No. 183,656

Claims priority, application Italy, May 8, 1987, 3468 A/87
Int. Cl.⁴ B65B 41/06, 11/08, 41/16

U.S. Cl. 53-137

6 Claims

1. A device for transferring and applying elongated sealing bands to a line feeding substantially parallelepiped packets, comprising:

means for guiding and feeding said bands in the direction of their longitudinal dimension,

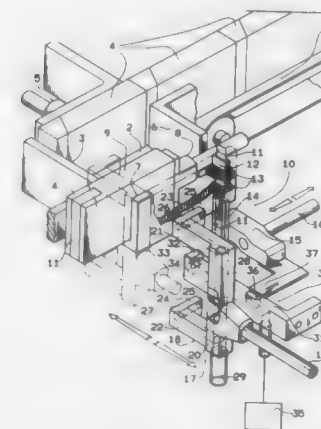
a pocket receiving said bands at the exit end of said guide and feed means,

a withdrawal element for said bands which is arranged to engage each longitudinal end of each said band within said pocket for withdrawal of said band from said pocket,

drive means arranged to impart to said withdrawal element

and to said pocket a movement of mutual retreat and approach,

means for transferring said withdrawal element to a position of application of said bands which is located on the line feeding said packets, and



an auxiliary withdrawal element for engaging, inside said pocket, said band between said longitudinal ends at the same time said withdrawal element engages the two ends of said band to assist in the withdrawal of said band from said pocket.

4,875,326

SOFT CHEWING GUM WRAPPING MACHINE AND METHOD

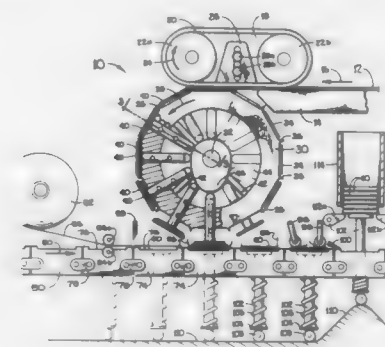
Anthony P. Piano, Sparta, N.J., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed Mar. 17, 1988, Ser. No. 169,521

Int. Cl.⁴ B65B 11/00, 35/28, 47/04

U.S. Cl. 53-435

14 Claims



14. A method for wrapping soft chewing gum comprising the steps of:

- (a) Cutting said gum into relatively thin rectangular shaped pieces having opposite flat sides with edges therebetween;
- (b) Transporting said gum to a wrapping position;
- (c) Positioning a wrapper over a nest having a flat bottom;
- (d) Urging said shaped piece into said nest at said wrapping position with one of said flat sides placed against said flat bottom to locate a portion of said wrapper therebetween;
- (e) Folding said wrapper around said shaped piece of gum; and
- (f) Wherein said shaped pieces are transported to a wrapping position one at a time and wherein the transporting means and said nests move within the same vertical plane.

4,875,327

CONTAINER FILLING APPARATUS AND METHOD

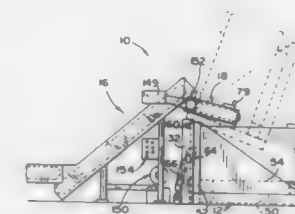
Daniel R. Wilde, Sparta, Mich., assignor to Applied Material Handling, Inc., Bailey, Mich.

Filed Nov. 29, 1988, Ser. No. 277,642

Int. Cl.⁴ B65B 5/10, 39/14, 57/12, 43/42

U.S. Cl. 53-475

30 Claims



24. A method of filling a container with product, comprising:

- providing a parts container;
- providing a parts conveyor with a discharge end;
- first raising said parts container and lowering said discharge end;
- conveying parts from said parts conveyor to said parts container;
- second lowering said parts container while substantially maintaining the height of said discharge end, and continuing conveying parts from said parts conveyor to said parts container;
- third lowering said parts container while raising said discharge end, and continuing conveying parts from said parts conveyor to said parts container.

4,875,328

PACKAGING MACHINE FOR MULTI-SHEET COMPRESSIBLE PAPER PRODUCTS, SUCH AS PAPER TOWELS, TOILET PAPER ROLLS AND THE LIKE

Dieter Meyer, Ludwigshafen, Fed. Rep. of Germany, assignor to Paper Converting Machine GmbH, Schifferstadt, Fed. Rep. of Germany

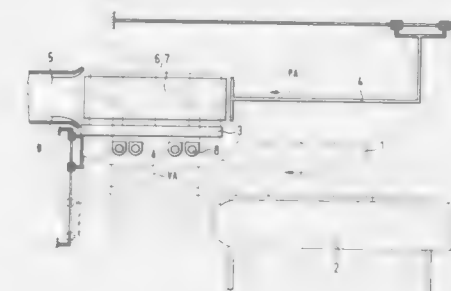
Filed May 6, 1988, Ser. No. 191,038

Claims priority, application Fed. Rep. of Germany, May 14, 1987, 3716147

Int. Cl.⁴ B65B 1/24, 13/20, 39/06, 63/02

U.S. Cl. 53-529

20 Claims



1. Packaging machine for packaging a plurality of compressible products (1) such as multisheet paper products, for example kitchen towel rolls, toilet paper, in a foil bag (B) having an essentially vertically reciprocable platform movable between a lower and an upper position;
- transport means (2) loading a group of products on the platform when the platform is at the lower position;
- insertion means (4) inserting the products into the bag (B) when the platform is in an upper position by pushing the products into the bag,

comprising means for laterally compressing the products prior to being introduced into the bag including laterally movable side walls (6, 7) located adjacent the reciprocable platform;
means (6a, 7a, 6b, 7b, 9, 10) for moving said side walls towards said products on the platform during raising movement of the platform from the lower to the upper position, thereby laterally compressing the compressible products on the platform simultaneously with raising of said products located on the platform; and
means (9, 10, 38; 11, 12) coupled to the side walls for adjusting the position of the side walls with respect to said products during said raising movement and to determine the final position of the side walls with respect to the products at the end of the raising movement with respect to at least one of: spacing of said side walls; angle of inclination of the side walls.

4,875,329

WRAPPING MACHINE, PARTICULARLY FOR BLISTER PACKS AND THE LIKE, WITH SYNCHRONIZED PLURAL DRIVING MEANS

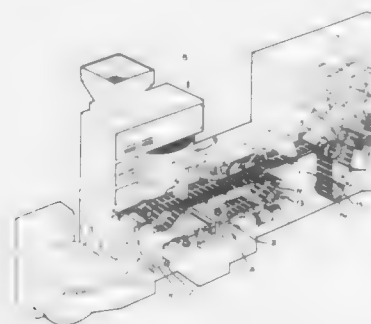
Carlo A. Miselli, Castel San Pietro Terme, Italy, assignor to I.M.A. - Industrie Macchine Automatiche S.p.A., Ozzano Emilia, Italy

Filed Nov. 2, 1987, Ser. No. 116,485

Claims priority, application Italy, Dec. 29, 1986, 3625 A/86
Int. Cl.⁴ B65B 11/50, 57/00

U.S. Cl. 53—559

5 Claims



1. A machine for producing and packaging blister packs, comprising:
means defining a transport path and having a first motor operatively connected for intermittent operations along an upstream segment of said path and a second motor operatively connected for continuous operations along a downstream segment of said path;
stamping means along said upstream segment for stamping blisters from a continuous thermoplastic strip intermittently advance by drive of said first motor along said path;
a station for feeding products to be packed into said blisters at a location downstream of said stamping means along said upstream segment;
sealing means for applying a closure strip to said thermoplastic strip at a location downstream of said station along said path to seal said blisters and form a continuous strip of blister packs from said closure and thermoplastic strips;
separating means downstream of said sealing means along said path driven by said second motor for separating said blister packs from said continuous strip of blister packs at a location along said downstream segment;
packaging means downstream of said separating means along said downstream segment of said path for packaging said blister packs in containers;
a device operatively connected to said second motor for establishing a desired speed of said second motor, whereby said second motor constitutes a leader motor; and
a respective encoder connected to each of said motors gen-

erating respective incremental pulses representing rotation of the respective motors;
a converter connected to receive the respective pulses of the encoder connected to said second motor for converting a frequency of the received pulses into an analog signal proportional to a speed of the leader motor;
a comparator connected to receive the pulses from both of said encoders, said converter and said comparator having outputs; and
a driver connected to said first motor for energizing same so as to constitute said first motor as a follower motor, said outputs being connected to said driver to synchronize said follower motor with said leader motor.

4,875,330

ALIGNABLE COTTON CONVEYING STRUCTURE FOR A TRANSVERSELY MOVABLE ROW UNIT

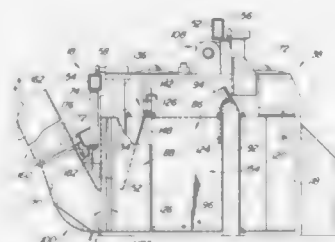
Timothy A. Deutsch, Newton; Joel M. Schreiner, and Steve H. McBee, both of Ankeny, all of Iowa, assignors to Deere & Company, Moline, Ill.

Filed Mar. 29, 1988, Ser. No. 175,809

Int. Cl.⁴ A01D 46/16

U.S. Cl. 56—41

19 Claims



1. In a cotton harvester having a frame supported on ground wheels for forward movement over a field with parallel rows of cotton plants, a cotton basket, a row unit support structure mounted at the forward end of the frame, a plurality of row harvesting units including spindle means for removing cotton from the plants and doffer means for doffing the cotton from the spindles, means for supporting the row harvesting units on the support structure including means for moving at least one of the row units transversely from a rowharvesting position to an access position for providing access to the row units for servicing, conveying structure for receiving cotton from the row units and directing the cotton to the basket, said conveying structure including a first conveying portion having an outlet, and means connecting the first conveying portion to said at least one of the row units for movement transversely therewith, a second conveying portion located downstream of the first conveying portion and supported independently of the first conveying portion, the first conveying portion moving out of cotton conveying relationship with respect to the second conveying portion as the row unit is moved to the access position, said second conveying portion including an inlet adapted for moving into cotton conveying relationship with the outlet of the first conveying portion when the row unit is moved from the access position to the row-harvesting position.

4,875,331

PRODUCT RECEIVING ARRANGEMENT FOR AGRICULTURAL MACHINES, ESPECIALLY FOR SELF-PROPELLING HARVESTER THRESHERS

Heinrich Ostrup, and Josef Hegger, both of Harzewinkel, Fed. Rep. of Germany, assignors to CLAAS OHG, Fed. Rep. of Germany

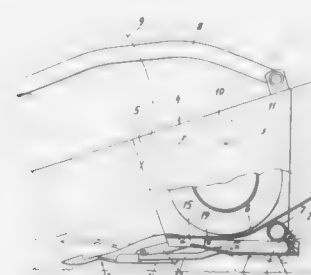
Filed Jan. 30, 1988, Ser. No. 213,614

Claims priority, application Fed. Rep. of Germany, Jul. 4, 1987, 3722143

Int. Cl.⁴ A01D 34/04

U.S. Cl. 56—208

10 Claims



1. A liftable and lowerable product receiving arrangement for agricultural machines, especially for self-propelling harvester threshers, comprising a cutting mechanism platform having a front end; a flexible cutting bar mounted pivotally on said front end of said cutting mechanism platform and extending substantially in a horizontal plane; sliding skids arranged to support said cutting bar in a height-displaceable manner relative to said cutting mechanism platform; and supporting skids connected to said cutting mechanism platform and arranged behind said flexible cutting bar as considered in a transporting direction and at least in its both lateral end regions, said supporting skids having lower limits extending at most at a height of one of said cutter bar and said sliding skids, said supporting skids being separate from and independent of said sliding skids.

4,875,332

HAY MAKING MACHINE

Jerome Aron, Bouxwiller, France, assignor to Kuhn, S.A., Saverne Cedex, France

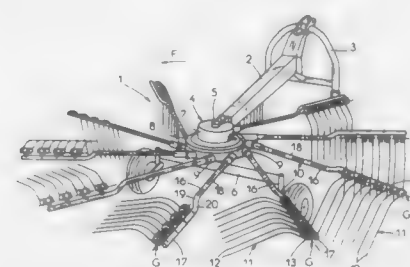
Filed Mar. 30, 1988, Ser. No. 175,222

Claims priority, application France, Apr. 1, 1987, 87 04672

Int. Cl.⁴ A01D 78/12

U.S. Cl. 56—377

7 Claims



1. A hay making machine comprising a beam carrying at least one raker wheel having:
(a) a central causing comprising a stationary upper part and a mobile lower part;
(b) a plurality of tool-carrying arms projecting from said mobile part in an at least approximately horizontal array, each one of said plurality of tool-carrying arms comprising an inside part having a longitudinal axis of rotation and an outside part; and

(c) at least one work tool mounted on said outside part of each one of said plurality of tool-carrying arms,
(d) wherein said outside part of each one of said plurality of tool-carrying arms is offset in relation to the longitudinal axis of rotation of the corresponding inside part of said each one of said plurality of tool-carrying arms towards the side opposite the one on which said work tools are located, so that the center of gravity of each set comprising one of said outside parts and the associated at least one work tool is located at least approximately on the longitudinal axis of rotation of the inside part of said each one of said plurality of tool-carrying arms.

4,875,333

PLASTIC TRAVELLER FOR RING SPINNING MACHINERY

Yuzuru Nakano, Takarazuka, Japan, assignor to Kansai Juyo Hyogo, Kogyo Company Limited, Hyogo, Japan

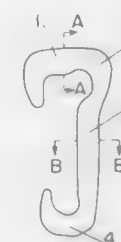
Filed Oct. 27, 1988, Ser. No. 263,248

Claims priority, application Japan, Nov. 6, 1987, 62-281396

Int. Cl.⁴ D01H 7/60

U.S. Cl. 57—125

5 Claims



1. A resin traveller for spinning machinery made mainly of nylon 4-6, having a crystalline structure of 0.5–4 μm in the size of spherulites and 35–55% (DSC method) in the degree of crystallinity, and having a thermal deformation temperature of 200°–285° C. under a load of 18.6 kg/cm².

4,875,334

SPINDLE CONSTRUCTION FOR MOUNTING ARRANGEMENTS FOR SPINNING MACHINE ROTORS

Zdenek Rajsigl, and Frantisek Kriz, both of Brno, Czechoslovakia, assignors to Zavody na výrobu lozisk, Povazska Bystrica, Brno, Czechoslovakia

Filed Nov. 17, 1988, Ser. No. 272,277

Claims priority, application Czechoslovakia, Nov. 19, 1987, PV8316-87

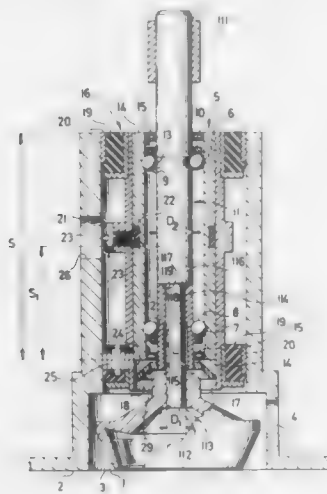
Int. Cl.⁴ D01H 7/882, 7/10; F16C 19/08, 33/80

U.S. Cl. 57—406

10 Claims

1. A spindle, particularly for a mounting arrangement of spinning rotor within the spinning housing of a spinning machine, said spindle comprising an outer sleeve with races for two ball rows arranged in cages, a shaft provided with races and having an external end portion adapted to be driven by driving means and an internal end portion adapted for the mounting arrangement of the spinning rotor as well as a seal for sealing the annular gap, a plurality of balls arranged between the outer sleeve and the shaft, the shaft comprising a dynamically elastic portion and a supporting sleeve including an internal recess, said spindle further comprising an intermediate sleeve for fixing the outer sleeve and including an internal wall having a cylindrical orifice therein, a plurality of resilient damping elements with an outer supporting sleeve adapted for mounting within the spinning housing, a labyrinth seal disposed in the space between the spinning rotor and the front side of the outer sleeve, said labyrinth seal including a labyrinth knife separating the rotor space within the spinning housing from a compensation space between the labyrinth seal and the front side of the outer sleeve, interconnected through an

air-aspiration orifice with a space external of the spinning housing, said shaft, including said dynamically elastic portion and said supporting sleeve including said internal recess, also comprising a fastening surface defining a cylindrical bore, and at least one said race for an inner row of said balls, said supporting sleeve constituting at least a part of a dynamically rigid



portion of the shaft, the dynamically elastic portion of the shaft being limited by the length thereof between the beginning of the hub of the spinning rotor and a transition area between the internal recess of the supporting sleeve and fastening surface at which the dynamically rigid portion begins, and said transition area is provided in the first half of the length of the outer sleeve laterally adjacent to said inner ball row.

4,875,335

APPARATUS AND METHOD FOR TREATING AN EXHAUST GAS FROM A DIESEL ENGINE

Yoshimasa Arai, Chiba; Satoshi Eamito, Tokyo, and Noriyuki Oda, Chiba, all of Japan, assignors to Asahi Glass Company, Ltd., Tokyo, Japan

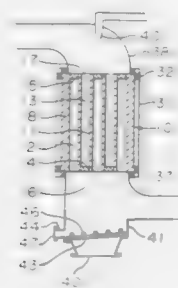
Filed Sep. 23, 1988, Ser. No. 247,929

Claims priority, application Japan, Sep. 25, 1987, 62-238913

Int. Cl.⁴ F01N 3/02

U.S. Cl. 60—274

20 Claims



1. In an apparatus for treating an exhaust gas from a diesel engine, including a filter unit in an exhaust gas passage for the diesel engine, the filter unit having a honeycomb structure wherein a plurality of cells are divided by cell walls having a filtration function and extend in the same direction as one another, predetermined cells being closed at one end, and the remaining cells being closed at the other end; the improvement comprising:

back washing gas flow generating means for generating a gas flow at appropriate intervals so as to pass through the cell

walls in the direction opposite to the flow of the exhaust gas flow, and
a recollecting unit for particulates, which is provided in the exhaust gas passage at a position upstream to the filter unit.

4,875,336

EXHAUST GAS EMISSION CONTROL DEVICE FOR DIESEL ENGINE

Kotaro Hayashi, Susono; Sumio Ito, Gotenba, and Kiyoshi Kobashi, Mishima, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

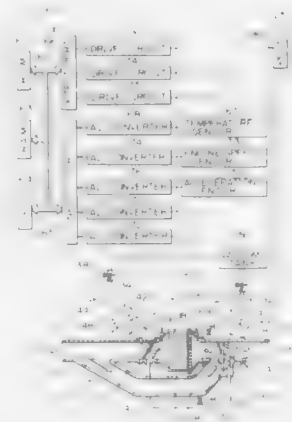
Filed Dec. 28, 1988, Ser. No. 291,274

Claims priority, application Japan, Jan. 12, 1988, 63-001708; Mar. 18, 1988, 63-063655

Int. Cl.⁴ F01N 3/02

U.S. Cl. 60—286

15 Claims



1. An exhaust gas emission control device for a Diesel engine having an exhaust passage for discharging exhaust gas to the atmosphere, said device comprising:

a filter provided in the exhaust passage for trapping particles in the exhaust gas;

heater means provided near said filter to ignite particles accumulated on said filter when regenerating said filter;

first passage means connecting a first connecting portion located upstream of said filter to a second connecting portion located downstream of said filter;

second passage means connecting a third connecting portion located upstream of said filter to a fourth connecting portion located downstream of said filter;

a single first valve provided in an upstream portion of said filter;

a single second valve provided in a downstream portion of said filter; and

control means for controlling said first and second valves, said control means controlling said first and second valves in

such a manner that, when it is determined that a regeneration of said filter is not to be carried out, at least one of said first valve and said second valve closes said first and second passage means at at least one of said first and third connecting portion and said second and fourth connecting portion, and said first and second valves open the exhaust passage, whereby exhaust gas flows through said filter and said heater means, and when it is determined that a regeneration of said filter is to be carried out, said first valve closes the exhaust passage between said first connecting portion and said third connecting portion, and said second valve is open to a predetermined degree, so that exhaust gas flows into said first passage means, and a part of the exhaust gas flowing via said first passage means flows through said heater means, said filter, and said second passage means.

4,875,337

CONSTRUCTION MACHINE DUAL-DUMP HYDRAULIC CIRCUIT WITH PILOTED ARM-BOOM CYLINDER SUPPLY PRIORITY SWITCHING VALVES

Genroku Sagiyama, Ibaraki; Toichi Hirata, Ushiku, and Shintchi Setoh, Ibaraki, all of Japan, assignors to Hitachi Construction Machinery Co., Ltd., Tokyo, Japan

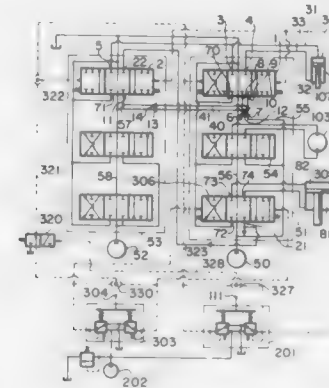
Filed Sep. 28, 1987, Ser. No. 101,427

Claims priority, application Japan, Sep. 27, 1986, 61-227116

Int. Cl.⁴ F15B 13/09, 13/06; E02F 3/32

U.S. Cl. 60—421

7 Claims



1. A hydraulic circuit for a construction machine comprising:

an actuator for working machine;

an actuator for working element;

first and second hydraulic pumps;

first and third directional control valves connected to said

first hydraulic pump, said first directional control valve controlling an operation of said actuator for working machine and said third directional control valve controlling an operation of said actuator for working element;

a second directional control valve connected to said second hydraulic pump, said second directional control valve including a neutral position at which a communication between said second hydraulic pump and a first output port of said second directional control valve is blocked and a communication between said actuator for working machine and a reservoir is blocked, one changed position at which said communication between said second hydraulic pump and said first output port is allowed and said communication between said actuator for working machine and the reservoir is blocked and another changed position at which said communication between said second hydraulic pump and said first output port is blocked and said communication between said actuator for working machine and the reservoir is allowed;

first pilot operating means for controlling operation of said first and second directional control valves;

second pilot operating means for controlling an operation of said third directional control valve and for shifting said second directional control valve to said one changed position;

first hydraulic fluid joining means for joining hydraulic fluid of said second hydraulic pump with hydraulic fluid of said first hydraulic pump, said first hydraulic joining means connecting said first output port of said second directional control valve to an input side of said third directional control valve;

second hydraulic fluid joining means for joining the hydraulic fluid of said second hydraulic pump with the hydraulic fluid of said first hydraulic pump, said second joining means connecting an input side of said second directional control valve to an input side of said first directional control valve; and

priority control means for, when a signal of said first pilot operating means is issued, preventing a signal of said

second pilot operating means from being applied to said second directional control valve, said priority control means including a first passageway for leading the signal of said second pilot operating means to said second directional control valve, a device interposed in said first passageway for closing said first passageway when the signal of said first pilot operating means is received and a second passageway interconnecting between said device and said first pilot operating means to lead to said device the signal of said first pilot operating means to close said first passageway;

whereby said actuator for working element is actuated by the hydraulic fluid from the first and second hydraulic pumps joined by said first hydraulic fluid joining means when only said second pilot operating means is operated and

said actuator for working machine is actuated by the hydraulic fluid from the first and second hydraulic pumps joined by said second hydraulic fluid joining means when only said first pilot operating means is operated and also when said first and second pilot operating means are operated at the same time.

4,875,338

HYDRAULIC BRAKE BOOSTER ARRANGEMENT WITH PARALLEL MASTER CYLINDERS AND COMMON HOUSING FOR PIVOTABLE ROCKER

Heinz Leiber, Oberkochen, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

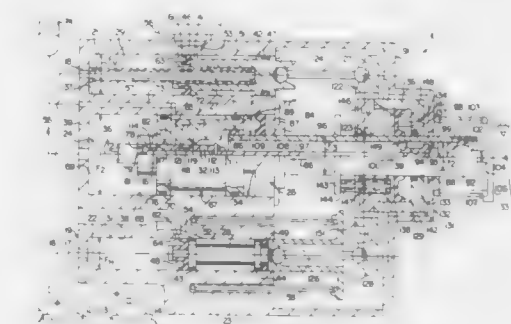
Filed Dec. 30, 1987, Ser. No. 139,385

Claims priority, application Fed. Rep. of Germany, Jan. 13, 1987, 3700697

Int. Cl.⁴ B60T 13/12, 15/02

U.S. Cl. 60—550

9 Claims



1. Brake unit for controlling the brake pressures in the wheel brakes of a road vehicle equipped with a hydraulic dual-circuit brake system via a hydraulic brake booster, said brake unit including:

two static master cylinders in a common unit housing with a brake-booster brake valve for supplying an outlet pressure proportional to the pedal force from an outlet pressure space to the wheel brakes, each of said master cylinders are assigned to one of the two brake circuits and each have a master piston, the master piston is displaceable in its outlet-pressure space to increase therein in response to an increased pressure caused by actuation of said brake booster valve, an actuating member displaceable as a result of pedal actuation and being supportable on the master piston, wherein in the event of a failure of an auxiliary pressure source of the brake booster, the master pistons are displaceable solely as a result of a control force exerted by the driver via said pedal actuation displacing the actuating member;

a brake booster including a drive piston and cylinder which

can be subjected to a boost pressure in proportion to the outlet pressure of the brake valve and which brake booster piston effects the boosting of the actuating forces taking effect on the master pistons by transmitting to the drive cylinder the boost pressure and by having actuating forces generated by the drive cylinder connected to the master pistons through a rocker which jointly displaces both drive pistons and which is pivotable about an axis perpendicular to a longitudinal axis of the drive cylinder and which has rocker arms which engage the master pistons of the two master cylinders via supporting members in a torque-compensated manner to provide for the displacement thereof;

a compensating cylinder which is moved jointly with movement of the drive piston and which is subjected to the outlet pressure of the brake valve, a compensating piston of said compensating cylinder is displaceable relative to the drive piston and has a piston surface larger than a piston surface of the drive piston, and wherein the boost pressure at the drive is connected to the compensating cylinder to apply a force to the compensating piston in a same direction as the force resulting from the subjection of the drive cylinder to pressure by the brake booster valve and which is exerted on the drive piston, relative movements of the compensating piston in relation to the drive piston being limited by a stop connected fixedly to the drive piston, and wherein relative movements of the compensating piston in relation to the drive piston is limited to a distance, within which each master piston of the master cylinders are displaceable out of a basic position where the outlet-pressure spaces communicate with a brake fluid storage tank of the brake system, to another position where the outlet pressure spaces of the master cylinders are shut off relative to the brake fluid storage tank and any further displacement of the master pistons leads tank and any pressure build-up in the outlet pressure spaces connected to the wheel brakes.

4,875,339

COMBUSTION CHAMBER LINER INSERT

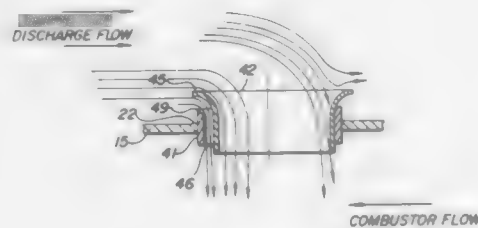
Neil S. Rasmussen, Loveland; Li-Chieh Szema, West Chester, both of Ohio, and Nesim Abuaf, Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Nov. 27, 1987, Ser. No. 126,041

Int. Cl. F23R 3/04

U.S. Cl. 60—757

8 Claims



1. A gas turbine combustion system combustor liner comprising in combination:

- a tubular wall combustor liner having a closed end and an opposite open end,
- said liner having axially spaced circumferential rows of circular apertures in the tubular wall thereof,
- and a film cooled insert in some of said circular apertures in said liner, said insert comprising:
 - a first short cylindrical sleeve member having an O.D. appropriate for insertion in said circular apertures in said liner,
 - a second sleeve member having a cylindrical section at its inner end and a coterminal radially outwardly flared section at the other end,
 - said second sleeve member being inserted and posi-

tioned axially in said first sleeve member in eccentric relationship thereto so that said second sleeve member comes into radial contact with said first sleeve member to define a radially crescent shaped but axially directed flow passage between said first and second sleeve members.

- said radially flared section of said second sleeve member defining an annular lip surrounding said sleeve member with the plane of said lip perpendicular to the longitudinal axis of said second sleeve,
- said cylindrical section of said second sleeve member having an O.D. less than the I.D. of said first cylindrical sleeve member, and
- joining means joining said sleeves to each other at their eccentric contact juncture.

4,875,340

NON-CONTAMINATING FLOW VISUALIZATION SYSTEM

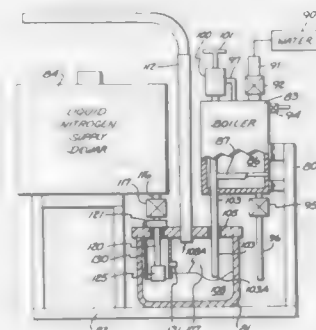
Benjamin Y. H. Liu, North Oaks, and James W. Ramsey, Golden Valley, both of Minn., assignors to Regents of the University of Minnesota, Minneapolis, Minn.

Continuation-in-part of Ser. No. 8,871, Jan. 29, 1987, Pat. No. 4,771,608. This application Sep. 19, 1988, Ser. No. 246,354

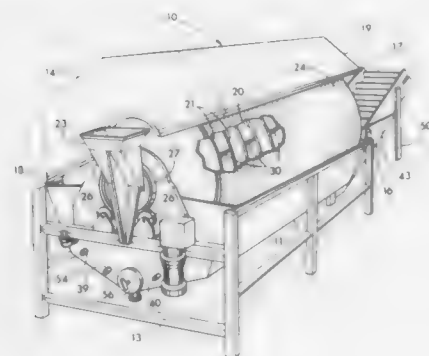
Int. Cl. F17C 0/2

U.S. Cl. 62—50.2

19 Claims



(d) a plurality of lifting baffles, each of which extends substantially radially inwardly from the perforate cylinder and between two adjacent flights of the auger, so that



when the auger and cylinder rotate, the baffles carry the food product sidewardly and lift the food product upwardly out of the water, and then allow the food product to tumble back into the water.

4,875,345

HIGH-PERFORMANCE AIR-CONDITIONING INSTALLATION FOR AIRCRAFT

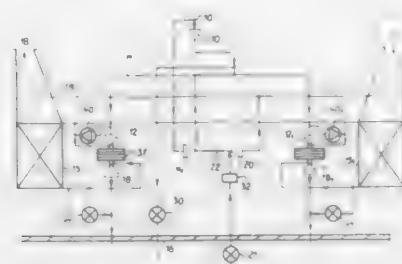
Jacques Signoret, Toulouse, France, assignor to ABG Semca, Toulouse, France

Filed Jan. 15, 1988, Ser. No. 144,155

Claims priority, application France, Jan. 16, 1987, 87 00453
Int. Cl.⁴ F25D 9/00

U.S. Cl. 62-402

11 Claims



1. An air conditioning installation for an aircraft including: expansion turbine means coupled to a passenger cabin exhaust and from said passenger cabin of said aircraft for producing air at a temperature lower than air external to said aircraft, cooling means for cooling air to be introduced into said passenger cabin, said cooling means including a heat exchanger cooled by air external to said aircraft, and means for mixing said air produced by said expansion turbine means with said external air supplied to said heat exchanger.

4,875,346

TWO-STAGE SORPTION TYPE CRYOGENIC REFRIGERATOR INCLUDING HEAT REGENERATION SYSTEM

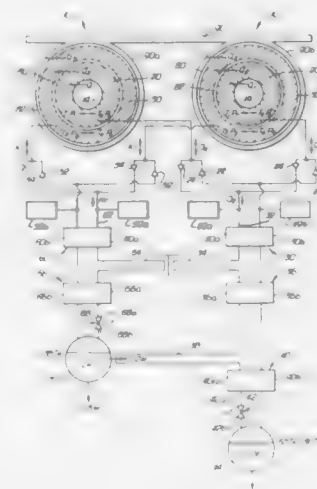
Jack A. Jones, Los Angeles; Liang-Chi Wen, La Canada, and Steven Bard, Northridge, all of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jan. 31, 1989, Ser. No. 304,149

Int. Cl.⁴ F25B 1/00

U.S. Cl. 62-467

19 Claims



1. A two-stage sorption cryogenic refrigeration system adapted for use with a first refrigerant and a second refrigerant comprising:

(a) a first container comprising:

(1) a first pressurization chamber and a second pressurization chamber, the first pressurization chamber being disposed within the second pressurization chamber and the first pressurization chamber containing a first sorbent material for sorbing the first refrigerant, the second pressurization chamber containing a second sorbent material for sorbing the second refrigerant;

(2) means for heating the first pressurization chamber to thereby desorb the first refrigerant thereby generating a high pressure flow thereof;

(3) means for thermally coupling the first and second pressurization chambers; wherein heat from the first pressurization chamber heats the second pressurization chamber to thereby desorb the second refrigerant thereby generating a high pressure flow thereof;

(4) means for cooling the second pressurization chamber.

(b) first expansion means coupled to the first pressurization chamber for expanding the high pressure flow of the first refrigerant generated by the first pressurization chamber;

(c) second expansion means coupled to the second pressurization chamber for expanding the high pressure flow of the second refrigerant generated by the second pressurization chamber to provide precooling of the first refrigerant.

4,875,347

METHOD OF ACTUATION OF NEEDLE SELECTION LATCHES OF A KNITTING MACHINE, AND A DEVICE FOR PERFORMING THE METHOD

Jacque Vermot-Gand, Porly, Switzerland; Rémi Cottenceau, Viry, France, and Erwin Zuercher, Le Lignon, Switzerland, assignors to Sipra Patententwicklung- und Beteiligungs-gesellschaft mbH, Albstadt, Fed. Rep. of Germany

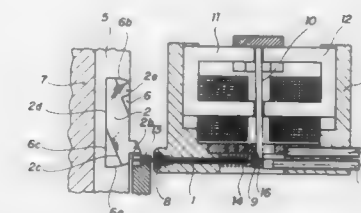
Filed Dec. 1, 1988, Ser. No. 278,339

Claims priority, application Switzerland, Dec. 4, 1987, 4745/87

Int. Cl.⁴ D04B 9/10

U.S. Cl. 66-219

14 Claims



1. A method of actuating needle selection latches in a knitting machine, said latches being movable between two end positions, comprising the steps of:

applying an elastic impact to a surface of a latch to be selected thereby moving said latch from a said end position into engagement with a cam,

and effecting relative movement of said cam and latch thereby moving said latch into the other said end positions.

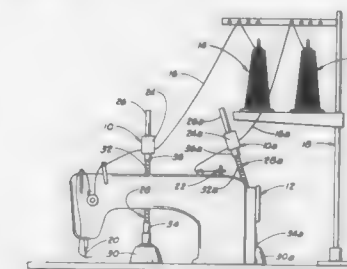
4,875,348

THREAD DYEING APPARATUS AND METHOD
Earl Kinnebrew, II, and Paul D. Palmer, Sr., both of Edmond, Okla., assignors to Rhema Enterprises, Inc., Edmond, Okla.
Continuation-in-part of Ser. No. 55,413, May 27, 1987. This application Apr. 19, 1988, Ser. No. 183,687

Int. Cl.⁴ D06B 1/12

U.S. Cl. 68-200

10 Claims



1. A dye applying apparatus for applying a dyeing liquid to a thread, comprising:

a marker comprising a marker container having an upper end and a lower end with a marker opening extending a distance therethrough intersecting the lower end thereof, a transorb material being disposed within the marker opening and a nib with a portion of the nib being disposed in the transorb material and the nib extending a distance out from the open end of the marker container terminating with a tip end, dyeing liquid being disposed in the marker opening and being transferred through the transorb material to the nib, a slit being formed in the tip end of the nib with a slit extending a distance through the nib, the slit being sized to accommodate a portion of the thread extending through the slit with portions of the nib formed by the slit being disposed generally adjacent the portions of

the thread extending through the slit, the dye liquid being applied to the thread via the nib;

a support housing having a thread opening extending through a portion thereof, the thread opening being sized for receiving a thread so that the thread is movable there-through, the support housing having a housing opening extending a distance through the support housing with a portion of the housing opening intersecting the thread opening, and wherein a portion of the marker is defined further as being supportable in the housing opening so nib is disposed within the housing opening, the thread being disposed in the slit in the nib as the thread is moved through the thread opening for applying dye to the thread; and

a support stand having opposite ends with one end being adapted to be removably connectable to the support housing for supporting the support housing.

4,875,349

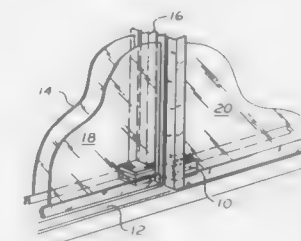
DEVICE FOR LOCKING DOUBLE SLIDING DOORS
Mario D. Girard, 2959, Mandeville, Longueuil, Quebec, Canada (J4L/4G8)

Filed Aug. 11, 1988, Ser. No. 230,914

Int. Cl.⁴ E05B 65/08

U.S. Cl. 70-95

9 Claims



1. A device for locking adjacent sliding doors of double sliding doors in their closed position, each adjacent sliding door being provided with a jamb spaced from each other by a distance (E), said jambs overlapping over a length (F) to define a double check space when said adjacent doors are closed; said device comprising a set of at least two superposed and separable plates, each plate having a thickness smaller than said distance (E) to allow each plate to be individually slid edgewise and subsequently disposed flatwise, each of said plates having a shank portion and a pair of opposite tongue portions orthogonally extending sideways in opposite directions at each end of the shank and substantially corresponding to said double check space, whereby one of said tongues has a contoured surface adapted to abut against one of said jambs and the other of said tongues has a contoured surface adapted to abut against the other of said jambs to prevent the sliding of said adjacent doors, and locking means adapted to extend through said plates while superposed and disposed flatwise for preventing the edgewise rotation of said plates.

4,875,350

PUSH LOCK ACTUABLE ANTI-THEFT VEHICLE DEVICE

James H. Faust, Hoffman Estates, Ill., assignor to ABC Auto Alarms, Inc., Elk Grove Village, Ill.

Filed Aug. 4, 1988, Ser. No. 228,336

Int. Cl.⁴ B60R 25/04; E05B 65/19

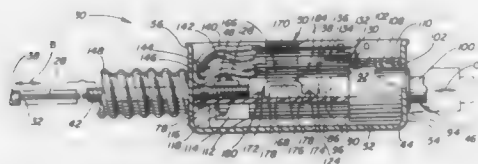
U.S. Cl. 70-241

12 Claims

1. A push lock actuable anti-theft vehicle device for a vehicle having a hood comprising:

coupling means for coupling the hood to said vehicle secured within an engine compartment of the vehicle and

having a first locked position and a second unlocked position;
a cable secured at one end to said coupling means, said cable being manipulable to lock and unlock said coupling means;
push lock means for manipulating said cable to lock and unlock said coupling means coupled to the other end of said cable, said push lock means being manually operable between a first position wherein said cable is manipulated to lock said coupling means and wherein said push lock means are keyed and are operable by a key to a second position wherein said cable is manipulated to unlock said coupling means, said push lock means including an en-



agement member having at least two operating positions provided by movement of said push lock means between said first and second positions; and
electrical contact means for opening and closing at least two desired electrical circuits, said contact means being in communication with said engagement member of said push lock means to operate said electrical contact means upon movement of said push lock means between said first and second positions so that when said engagement member is positioned in one of said at least two operating positions it opens a first of said at least two circuits and closes a second of said circuits and when said engagement member is positioned in the other operating position it closes said first circuit and opens said second circuit.

4,875,351

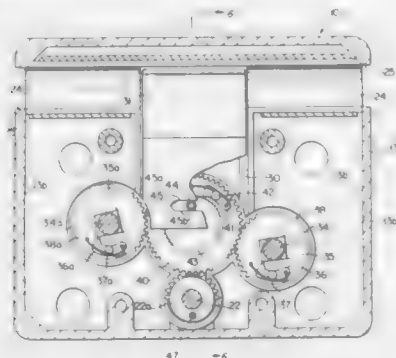
ELECTRONIC TIME LOCK

Walter R. Evans, Lancaster; Joseph M. Remenick, Nicholasville; Thomas E. Jasper, Bryantsville, and Wayne W. Ballard, Nicholasville, all of Ky., assignors to Sargent & Greenleaf, Inc., Nicholasville, Ky.

Filed Aug. 19, 1988, Ser. No. 234,562
Int. Cl.⁴ E05B 43/00

U.S. Cl. 70-271

16 Claims



1. An electronic time lock for bank vault doors and the like having a door bolting mechanism including a snubber bar, the time lock comprising a lock case in the form of a generally rectangular box having parallel vertical front and rear walls; in a use position and enclosing side, top and bottom walls defining a mechanism chamber, an intermediate vertical partition located in said chamber between said front and rear walls, said rear wall and intermediate partition having means defining cylindrical guide bores for reciprocating movement of the snubber bar therein and said side walls having holes aligned

therewith for receiving the snubber bar therethrough, a pair of electric motors arranged in side-by-side relation carried by said intermediate partition, a blocking member in said case movable between blocking and release positions relative to said guide bores for blocking the snubber bar against movement to an unlocking position for the door bolting mechanism and releasing the snubber bar for movement to an unlocking position, main gear means having a drive formation driven thereby coactive with shoulder formations on said blocking member for moving the blocking member between said blocking and release positions responsive to rotation of the main gear means, a pair of drive trains coupled to and driven by the respective drive motors for driving the main gear means from either of said drive motors to shift the blocking member between said blocking and release positions, a printed circuit board having a solid state visible display strip thereon for displaying programmed instructions and information regarding the state of the time lock, the front wall of said lock case having a window therein aligned with said display strip for viewing of the displayed information therethrough, a plurality of electrical switch program buttons carried by said front wall of said lock case, a plurality of position sensors sensing the position of said blocking member and for sensing the position of the snubber bar in said guide bores, and electronic circuitry on said printed circuit board including microprocessor means interconnected with said program buttons and said electric motors and sensor means for activating the electric motors in accordance with predetermined time lock programs.

4,875,352

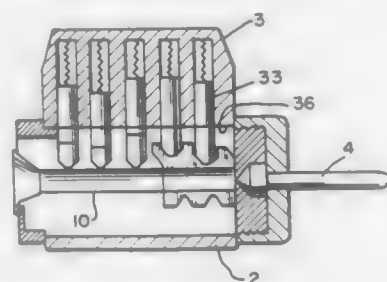
CONSTRUCTION KEYING

Jon M. Smallegan, San Mateo, and Richard R. Bettger, San Francisco, both of Calif., assignors to Schlage Lock Company, San Francisco, Calif.

Filed May 11, 1987, Ser. No. 48,441
Int. Cl.⁴ E05B 19/08

U.S. Cl. 70-395

4 Claims



1. A substantially solid construction key insert for changing the combination of a cylindrical lock comprising: means for combining a first plurality of cylindrical lock pin tumblers; guide means for accommodating entrance of a construction key to a keyway accessing said first plurality of pin tumblers and a second plurality of pin tumblers; means for connecting said means for combining and said guide means for effecting insertion and removal of said means for combining; and said means for connecting cohabits said keyway with a modified key section for combining said second plurality of pin tumblers of a construction key in side by side relationship about a plane parallel to the plane of the longitudinal axis of said cylindrical lock pin tumblers during operation of the lock.

4,875,353

METHOD AND APPARATUS FOR MANUFACTURING CURVED PIPE

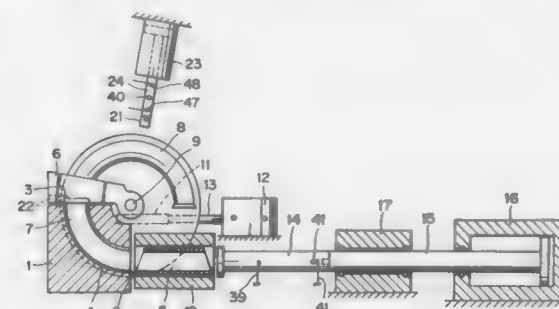
Toehio Kaneko, Kanagawa, Japan, assignor to Kabushiki Kaisha Asahi Kinzoku Kogyo, Kawasaki, Japan

Filed Nov. 1, 1988, Ser. No. 265,487

Int. Cl.⁴ B21D 7/08, 9/12

U.S. Cl. 72-133

4 Claims



1. A curved pipe manufacturing method comprising the steps of:

- (1) providing a fixed die having a curved cavity, an entrance opening and an exit opening contained therein, said curved cavity being formed in a circular arc and extending from said entrance opening to said exit opening;
- (b) providing a movable block having a curved mandrel attached to one side thereof;
- (3) inserting the curved mandrel into the curved cavity of the fixed die through the exit opening therein and forming a curved annular chamber inside said cavity;
- (4) pressing a work with a presser rod through said entrance opening into said curved annular chamber to form a curved pipe;
- (5) moving the movable block so as to extract the mandrel and the curved pipe from said exit opening;
- (6) inserting a retaining pin into a groove provided in the movable block for restraining a tip end of the curved pipe;
- (7) further moving the movable block so as to extract the mandrel and the curved pipe from said exit opening, said curved pipe being restrained from movement by said retaining pin; and
- (8) recovering said curved pipe.

4,875,354

MACHINE FOR ADJUSTABLE LONGITUDINAL CORRUGATING OF SHEET MATERIALS

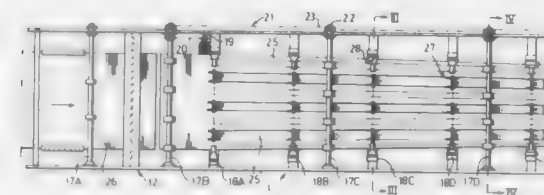
Trond Nilsen, Engerjordet 19, 1310 Blokken, and Erling C. Normann, Bjorketan 6, 7650 Verdal, both of Norway
PCT No. PCT/NOR/00007, § 371 Date Oct. 13, 1987, § 102(e)
Date Oct. 13, 1987, PCT Pub. No. WO87/04375, PCT Pub. Date Jul. 30, 1987

PCT Filed Jan. 16, 1987, Ser. No. 104,011

Claims priority, application Norway, Jan. 17, 1986, 860156
Int. Cl.⁴ B21D 13/04

U.S. Cl. 72-180

10 Claims



1. A machine for adjustable longitudinal corrugating of sheet materials, particularly of metal, with stepwise bending over free-running rollers and counter-rollers, so that alternating longitudinal convex and concave corrugations are formed with

the convex corrugations establishing ridges and the concave corrugations establishing grooves, characterized in that

- (1) at each profiling step there are sets of upward and downward free-running forming rollers, these forming rollers have means to be individually adjusted to vary the distance between the corrugations,
- (2) at least one set of drive rollers are located with corresponding counter-rollers between an upstream and downstream profiling step, said drive rollers in each set are mounted on a common drive shaft and the counter-rollers are mounted on a free-wheeling shaft with the drive rollers and counter rollers arranged to only feed said corrugated sheet material, said forming roller sets and said drive roller sets are arranged alternately along said machine, the drive rollers and counter-rollers can be adjusted laterally to vary the distance between the corrugations,
- (3) all forming rollers which correspond to a ridge or groove lie in the same plane, points of contact between the sheet material and the forming rollers that form grooves, or ridges respectively, lie in a curved plane, the points of contact between the drive rollers and the sheet material lie in a common horizontal plane, and
- (4) the forming rollers are arranged in pairs with a common free-running shaft, the forming rollers are equipped with an attachment means which permits location in any selected lateral position on a transverse beam which is part of each profiling step.

4,875,355

MANUFACTURE OF WIRE BINDING ELEMENTS

Leonard W. N. Jones, Hindhead, Great Britain, assignor to James Burn International Ltd., Great Britain

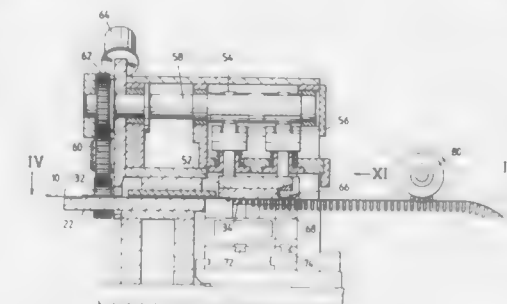
Filed May 19, 1988, Ser. No. 196,015

Claims priority, application United Kingdom, May 22, 1987, #712148

Int. Cl.⁴ B21F 45/16

U.S. Cl. 72-306

12 Claims



1. A binding strip forming machine comprising rotary feed means for feeding a multi-prong binding strip into a forming station in response to rotation of said rotary feed means, arresting means connected with said rotary feed means for arresting the feed of successive prongs in said forming station, these successive prongs being so arrested for at least one-eighth of each revolution of said rotary feed means, and forming means located at said forming station for forming successive prongs of said binding strip into a desired configuration, said forming means being operative during that at least one-eighth of each revolution of said rotary feed means when said arresting means is arresting the feed of said binding strip.

4,875,356

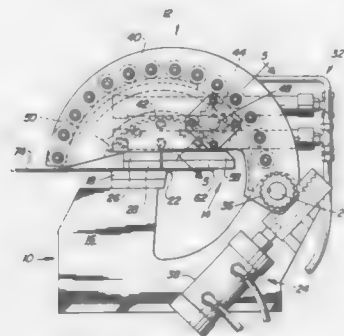
MATERIAL FABRICATING MECHANISM

Peter W. Boardman, St. Catharines, and Daniel G. McCombs, Welland, both of Canada, assignors to Deere & Company, Moline, Ill.

Filed Aug. 23, 1988, Ser. No. 235,132
Int. Cl.⁴ B21D 5/04

U.S. Cl. 72-321

43 Claims



1. Mechanism for bending material including: a material supporting member having a first clamping surface with an elongated edge; clamping means carried on the supporting member and horizontally spaced from the first clamping surface, including a second clamping surface, adapted for swinging movement towards and away from the first clamping surface; a bending means including a bending surface carried by said clamping means and swingably movable therewith, moveable through an arc relative to the edge of the first clamping surface to bend said material about said edge; whereby the material can be clamped between the first and second clamping surfaces when the clamping means is moved towards the first surface and is subsequently bent by the bending surface as it is moved through an arc.

4,875,357

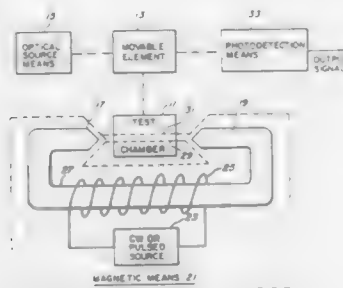
OPTICAL PARAMAGNETIC/DIAMAGNETIC GAS SENSOR

Thomas G. Giallorenzi, Springfield, Va., assignor to United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 10, 1988, Ser. No. 154,565
Int. Cl.⁴ G01R 33/12; G01N 27/74

U.S. Cl. 73-27 A

29 Claims



1. An apparatus for measuring the concentration of a paramagnetic or diamagnetic gas in a gaseous mixture, said apparatus comprising: a chamber adapted to contain a gaseous mixture to be measured for the amount of a paramagnetic or diamagnetic gas in said mixture; a reflective movable element coupled to said chamber; a reflector;

- optical source means for providing light to said movable element, said optical source means including: an optical source for producing an input beam; an optical coupler having first and second input ports and first and second output ports, said optical coupler being responsive to the application of said input beam to said first input port for providing substantially equal first and second incident beams at said first and second output ports, respectively; a first light path for passing said first incident beam to said movable element for reflection therefrom and for passing said reflected first incident beam to said first output port with a phase indicative of the distance that said movable element is displaced; a second light path for passing said second incident beam to said reflector for reflection therefrom and for passing said reflected second incident beam to said second output port with a reference phase, said optical coupler being responsive to said reflected first and second incident beams for developing at said second input port a light signal having an intensity proportional to the phase relationship between said reflected first and second incident beams; magnetic means for developing a magnetic field across said chamber, said paramagnetic or diamagnetic gas in said chamber being responsive to the application of said magnetic field across said chamber for causing said movable element to be displaced by a distance proportional to the concentration of said paramagnetic or diamagnetic gas in said mixture; and photodetection means for receiving a light signal from said movable element, said light signal having a characteristic indicative of the distance that said movable element is displaced, said photodetection means being responsive to said light signal for providing an output signal having an amplitude proportional to the concentration of said paramagnetic or diamagnetic gas in said gaseous mixture, said photodetection means including a photodetector responsive to said light signal for developing an electrical signal that has an amplitude proportional to the concentration of paramagnetic or diamagnetic gas in said gaseous mixture.

4,875,358

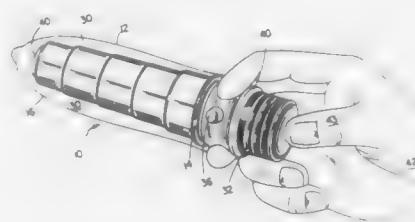
PREPARATION OF CONDOMS BY THE USER

Stephen A. Marsh, Watertown, Mass., and Robert W. Young, Locust Valley, N.Y., assignors to Stephan Marsh, Waltham, Mass.

Filed May 21, 1987, Ser. No. 53,203
Int. Cl.⁴ G01M 3/26

U.S. Cl. 73-40

22 Claims



1. A device for preparation of a condom, the condom comprising an elongated, generally cylindrical membrane which is closed at one end and terminates at an annular ring at the other end, said device defining a circular surface adapted to receive said annular ring in sealing or retaining relationship and further adapted to define, with said membrane, a chamber, and further defining an elongated, generally cylindrical form which is adapted to extend from said circular surface

into said tubular membrane, said form adapted to support said condom to enable it to be rolled upon itself into compact form after being subjected to said inflating condition, said form being collapsible when not in use, and gas inflation means for creating an inflating condition in said chamber.

4,875,359

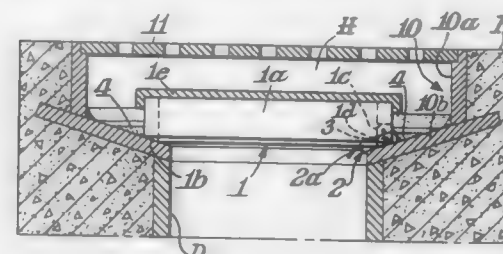
ATTACHMENT RING FOR A LIQUID LEAKAGE SENSOR USED IN DRAIN OPENINGS

Jyuji Akiba, Saitama, Japan, assignor to Junkosha Co., Ltd., Japan

Filed Oct. 13, 1988, Ser. No. 257,317
Claims priority, application Japan, Oct. 16, 1987, 62-157
Int. Cl.⁴ G01M 3/00

U.S. Cl. 73-40

1 Claim



1. An attachment ring for a liquid leakage sensor used in drain openings comprising a cylindrical ring for installation in said drain opening, said ring having a top and bottom end, said ring extending over the entire circumference of the discharge of the drain opening when installed, said ring having a relatively small liquid-collecting opening in the bottom end of said cylindrical ring, and a liquid leak detecting sensor installed in said liquid-collecting opening, whereby, a liquid leak which flows into said drain is dammed by said attachment ring and channelled to flow into said liquid-collecting opening and to said sensor, thereby substantially reducing the time which would otherwise be required to detect said leak.

4,875,360

METHOD AND DEVICE FOR CHECKING FILTERS

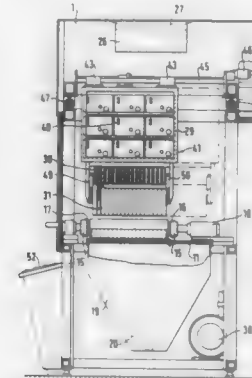
Wolf Ziemer, Berlin, Fed. Rep. of Germany, assignor to Fläkt AB, Nacka, Sweden

Filed May 2, 1988, Ser. No. 189,240
Claims priority, application Fed. Rep. of Germany, May 7, 1987, 3715214

U.S. Cl. 73-40.7

Int. Cl.⁴ G01M 3/20

20 Claims



1. Method for checking filters for permeability, in particular for the presence of leaky or other faulty zones which have increased permeability in comparison with other filter regions

for particles to be filtered from an air or gas flow, in which method: air or gas charged with said particles is applied to one surface of the filter; the opposite surface of the filter is scanned with an indicator system for indicating the penetration of particles by regional scanning performed by means of a plurality of suction nozzles, operating simultaneously, each scanning a given zone of the filter surface in a region; upon entry of a particle flow into each suction nozzle, a measuring device arranged beyond the flow path is separately influenced by the particle flow for each given zone within said scanned region; and the result for each zone within said scanned region emitting a particle flow is separately indicated.

4,875,361

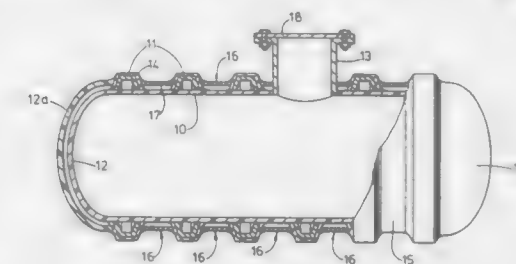
DOUBLE WALLED STORAGE TANKS WITH COMMON RIB SUPPORTS

Bruce R. Sharp, 4090 Rose Hill Ave., Cincinnati, Ohio 45229
Filed Jul. 5, 1988, Ser. No. 186,190

Int. Cl.⁴ G01M 3/00

U.S. Cl. 73-49.2

26 Claims



1. A method of building a double walled ribbed storage tank system wherein an inner tank and an outer tank utilize a common set of support ribs for strength, comprising the steps of: (a) forming a cylindrical-shaped inner tank having spaced support ribs on the outer surface of said inner tank; and (b) forming an outer wall comprised of a series of sections which are at least partially separated from the inner tank's walls between each set of spaced support ribs, each section of said outer wall bonded to the side walls of the support ribs at a distance less than about 90% of the height of the support ribs such that the ribs protrude from the outer surface of the storage tank system, wherein each section of the outer wall and the inner tank derive their strength from said support ribs so as to withstand external and internal load forces and wherein the outer wall sections act as a secondary containment means to contain any liquid which may leak from the inner tank.

4,875,362

METHOD AND APPARATUS FOR MEASURING THE VISCOSITY OF A MEDIUM

Bengt Skallen, Saffle, Sweden, assignor to Ear-Control Kalle AB, Sweden

Filed Apr. 9, 1986, Ser. No. 849,761
Claims priority, application Sweden, Apr. 17, 1985, 8501892
The portion of the term of this patent subsequent to Jul. 7, 2004, has been disclaimed.

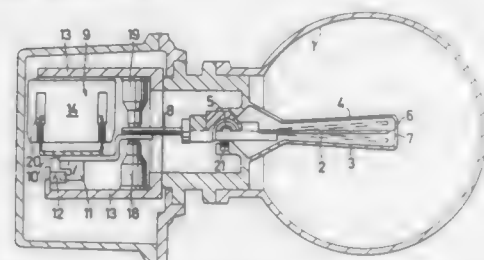
Int. Cl.⁴ G01N 11/16

U.S. Cl. 73-54

25 Claims

1. A method for measuring the viscosity of a medium with the aid of a pivotally suspended blade which extends into the medium and pivots between first and second end positions, said method comprising the steps of: alternately and intermittently pivoting said blade between said first and second end positions by alternately applying constant but opposite forces to said blade, whereby the time it takes for said blade to move between said first and

second end positions varies as a function of the viscosity of said medium; and



measuring the speed at which said blade moves between said first and second end positions, said speed being a function of the viscosity of said medium.

4,875,363

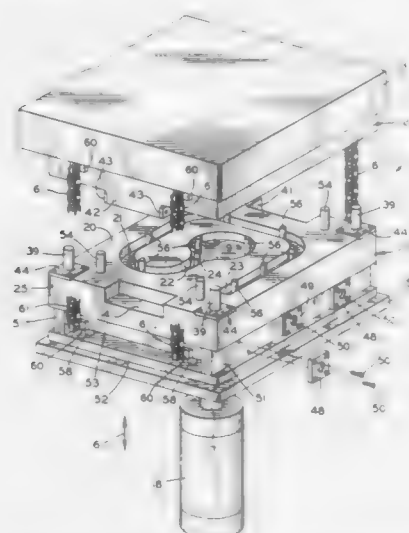
APPARATUS AND METHOD FOR TESTING FLOW CHARACTERISTICS OF MOLDING COMPOUNDS
Murti Hinduja; Mark L. Thompson, and John R. Spriggs, all of Fremont, Ohio, assignors to Sterling Engineered Products Inc., Maumee, Ohio

Filed Aug. 4, 1988, Ser. No. 228,373

Int. Cl.⁴ G01N 11/04

U.S. Cl. 73—56

17 Claims



1. An apparatus for testing the flow characteristics of molding compounds comprising:

- a first mold portion having a generally circular cavity and a channel depression extending therefrom formed in a surface thereof;
- a second mold portion having a generally circular raised area and a raised channel area extending therefrom formed on a surface thereof, said raised circular and channel areas being complementary to said cavity and channel depression, respectively;
- means for moving said mold portions relative to one another, movement in a direction to separate said surfaces permitting a sample of material to be placed between said surfaces and movement in an opposite direction engaging said circular raised area with said cavity and engaging said raised channel area with said channel depression thereby applying pressure to the sample material causing the sample material to flow in said channel depression;
- a plurality of scribe marks formed in a wall of said channel depression for indicating a flow characteristic of the sample material; and
- means responsive to movement in a direction to separate said

surfaces for removing the sample material from said cavity and said channel depression.

4,875,364

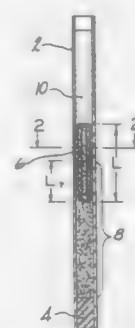
METHOD FOR MEASURING HEMOGLOBIN
Robert A. Levine, 31 Pilgrim La., Guilford, Conn. 06437, and Stephen C. Wardlaw, 191 N. Cove Rd., Old Saybrook, Conn. 06478

Continuation of Ser. No. 170,771, Mar. 21, 1988, Pat. No. 4,843,869. This application Apr. 5, 1989, Ser. No. 333,265

Int. Cl.⁴ B01D 21/26; A61B 5/14

U.S. Cl. 73—61.1 R

1 Claim



1. A method for measuring the hemoglobin concentration of the red blood cells in a sample of whole anti-coagulated blood, said method comprising the steps of:

- (a) providing a transparent tube;
- (b) drawing a sample of the blood into the tube;
- (c) positioning a float member in the tube in the blood sample, said float member being made from a material which will float in the red blood cell layer of the blood sample when the tube is centrifuged with the blood sample and float member disposed therein;
- (d) centrifuging the blood sample, float member, and tube to cause layering out of the red blood cells, white blood cells, and plasma, according to their respective densities;
- (e) measuring the length of a portion of the float member which is submerged below the top of the red blood cell layer; and
- (f) calculating the hemoglobin concentration as a function of the float member length which is submerged below the top of the red blood cell layer.

4,875,365

METHOD AND APPARATUS FOR MEASURING CUTTING FORCES OF MACHINE TOOL
John W. Powell, Raleigh, N.C., and Ted R. Massa, Latrobe, Pa., assignors to Kennametal Inc., Latrobe, Pa.

Filed Sep. 29, 1988, Ser. No. 251,155

Int. Cl.⁴ G01L 5/16

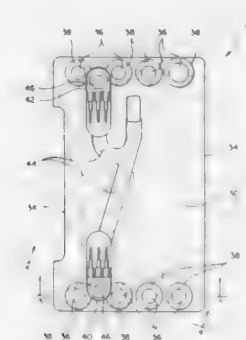
U.S. Cl. 73—104

20 Claims

1. A plate-type force transducer for measuring cutting forces in a bolted joint of a machine tool comprising:

- (a) a plate having first and second sides;
- (b) a series of bolt openings formed in the plate for receiving bolts that permit the plate to be secured within the joint;
- (c) raised force shunting pads formed about the bolt openings on both sides of the plate and elevated relative to the sides of the plate such that when the plate forms a part of the joint the raised force shunting pads actually engage adjacent bearing surfaces of the joint while the sides of the plate are at least slightly spaced from the adjacent bearing surfaces of the joint;
- (d) at least one load cell cavity formed in the plate closely adjacent at least one bolt opening;

(e) a load cell mounted in the cavity and having a loading surface raised slightly above the surface of the raised force



shunting pads such that the load cell is appropriately pre-loaded but not overloaded.

4,875,366

APPARATUS AND METHOD FOR THE FIELD MEASUREMENT OF BEARING LUBRICANT AND SEAL INTEGRITY TESTING

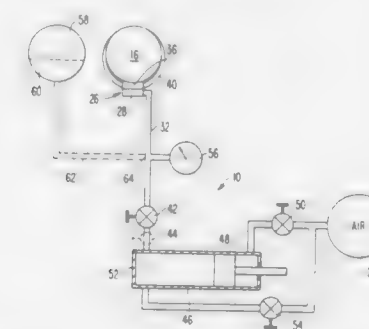
John K. Keeler, Silver Spring; Robert J. McCown, Seabrook, both of Md., and John J. Shia, Richmond, Va., assignors to ENSCO, Inc., Springfield, Va.

Filed Jul. 20, 1988, Ser. No. 221,597

Int. Cl.⁴ G01M 19/00

U.S. Cl. 73—118.1

18 Claims



1. A method for the field measurement of bearing lubricant in a test bearing which includes:

- obtaining a control pressure value indicative of the pressure which would be generated by injecting a controlled vehicle of air or gas into the test bearing with the test bearing containing an allowable amount of lubricant at the existing ambient temperature and atmospheric pressure,
- injecting the same controlled volume of air or gas into the test bearing, and
- subsequently obtaining a test pressure value resulting from the injection of the controlled volume of air or gas into the test bearing.

4,875,367

STEERING TORQUE DETECTING DEVICE

Mitsuharu Morishita; Shinichi Kohge; Tadayuki Hara; Yasuaki Hata, and Hisato Umemaru, all of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

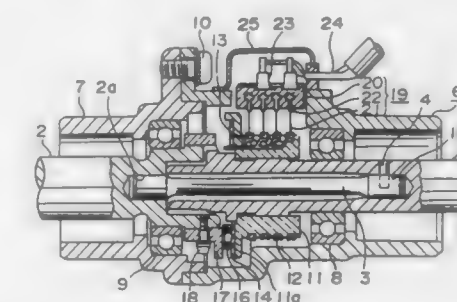
Division of Ser. No. 177,085, Apr. 4, 1988, Pat. No. 4,838,074. This application Oct. 20, 1988, Ser. No. 260,298

Claims priority, application Japan, Apr. 6, 1987, 62-52839 [U]; Apr. 6, 1987, 62-52840 [U]; Apr. 22, 1987, 62-61811 [U]; Apr. 22, 1987, 62-61812 [U]

Int. Cl.⁴ G01M 17/06

U.S. Cl. 73—118.1

3 Claims



1. A steering torque detecting device, comprising:
a steering shaft having an input shaft and an output shaft,
a torsion bar provided between said input shaft and said output shaft,
a torque detecting unit for converting a quantity of torsion produced in said torsion bar into an electric output,
an electricity collecting unit comprising a slip ring holder having a flange at one end portion thereof, a plurality of slip rings and brushes which receive said electric output and supply electric power from an outer power source, a plurality of bearings for supporting said input and output shafts on substantially the same axial line, and housing means for supporting said bearings, a terminal block to which said brushes are mounted, a through capacitor interposed between said terminal block and a drawing wire for communicating detection signals outside; and
a potentiometer attached to said flange of said slip ring holder.

4,875,368

PRESSURE SENSOR SYSTEM

Leroy C. Delatorre, Sugar Land, Tex., assignor to Panex Corporation, Sugar Land, Tex.

Division of Ser. No. 102,020, Sep. 8, 1987. This application Dec. 22, 1988, Ser. No. 288,308

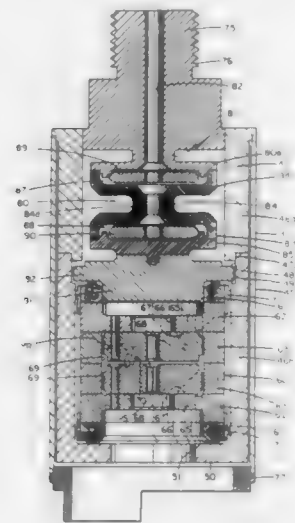
Int. Cl.⁴ G01L 7/06, 9/12

U.S. Cl. 73—151

16 Claims

14. A measurement system for use in a downhole well tool for sensing pressure data including well tool housing means adapted for passage through a well bore to a well depth for sensing well pressure data; said well tool housing means including an outer housing means constructed from load supporting materials and including interconnected sections, said interconnected sections having hollow interiors for containing instrumentation for use in sensing well pressure data; one of said sections including first and second tubular outer housing members interconnected by a ring member and where said first tubular outer member is constructed and arranged to enclose electrical components; a tubular inner support housing member disposed within said second tubular outer housing member where said second outer housing member is connected at a terminal end to a terminal end of said second tubular outer housing member, said inner support housing member having an inwardly directed flange portion at an opposite terminal end, said inner support housing member being separated

from the inner wall of said second outer housing member by an annular space;
bellows means and measurement transducer means disposed within said inner support housing member with said transducer means including a quartz material under compression and with said bellows means attached at a terminal



end to said inner support housing member so that fluid under pressure applied to the interior of said bellows means produces a displacement of said quartz material as a function of pressure; and
means for providing fluid access from the exterior of said well tool to the interior of said bellows means.

4,875,369

PRESSURE SENSOR SYSTEM

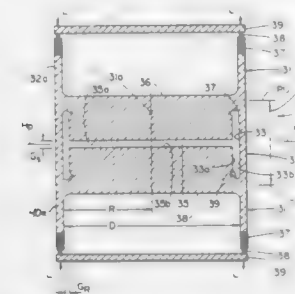
Leroy C. Delatorre, Sugar Land, Tex., assignor to Panex Corporation, Sugar Land, Tex.

PCT No. PCT/US87/02285, § 371 Date Sep. 8, 1987, § 102(e) Date Sep. 8, 1987, PCT Pub. No. WO89/02512, PCT Pub. Date Mar. 23, 1989

PCT Filed Sep. 8, 1987, Ser. No. 102,020
Int. Cl. E21B 47/00

U.S. Cl. 73—151

19 Claims



1. A transducer for measuring the displacement of an elastic support member under compression as a function of an applied compressive force comprising:

a support member constructed of a material which responds to forces to be measured with repeatable elastic characteristics and which responds to changes in temperature within a range of operating temperatures with retraceable characteristics and which has a low temperature coefficient of expansion;
said support member having a first set of first facing surfaces defining a first spacing gap where said first facing surfaces

are displaceable relative to one another as a function of compression of said support member;
first capacitor plate means on said first facing surfaces for deriving a first capacitance measurement as a function of displacement of said first facing surfaces;
said support member having a second set of second facing surfaces defining a second spacing gap located transversely relative to said first spacing gap in said support member; and
second capacitor plate means on said second facing surfaces for deriving a second capacitance measurement as a function of displacement of said second facing surfaces where said first and second capacitance measurements are interrelated functions of the temperature of said support member and where said first and second capacitance measurements are interrelated functions of the displacement of said first facing surfaces and said second facing surfaces.

4,875,370

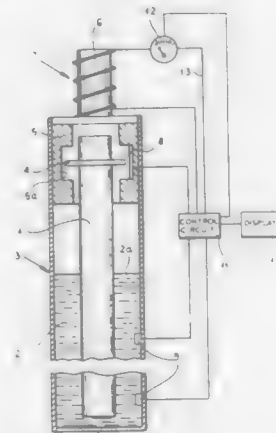
APPARATUS FOR MEASURING THE CONTENTS OF A TANK

Martin Spitzer, Weikendorf, Austria, assignor to Witronic Elektronische Geräte Gesellschaft M.B.H., Vienna, Austria
Filed Feb. 7, 1989, Ser. No. 307,652

Claims priority, application Austria, Feb. 8, 1988, 256/88
Int. Cl. G01F 23/62, 23/30

U.S. Cl. 73—309

9 Claims



1. An apparatus for measuring a quantity of liquid in a tank, comprising:

an upright rod extending into said liquid in said tank whereby a buoyancy force applied by said liquid to said rod varies as a level of said liquid in said tank varies;
an electromagnet juxtaposed with a magnetically attractable portion of said rod and electrically energizable to support said rod magnetically in said tank;

an electrical control circuit connected with said electromagnet for supplying electrical current to said electromagnet;
a position sensor responsive to the position of said rod in said tank and controlling said circuit whereby the electrical current supplied by said circuit to said electromagnet is varied to maintain a predetermined position of said rod as said level of said liquid in said tank varies; and
indicator means coupled to said circuit and responsive to the magnitude of the electrical current supplied to said electromagnet for indicating said level and hence the quantity of liquid in said tank.

9. A method of measuring a quantity of liquid in a tank, comprising the steps of:

(a) disposing an upright rod in said tank so as to extend into the liquid therein whereby a buoyancy force applied by said liquid to said rod varies as a level of said liquid in said tank varies;
(b) energizing an electromagnet juxtaposed with a magnetically

cally attractable portion of said rod with an electric current to support said rod magnetically in said tank;
(c) controlling said electrical current to maintain a predetermined position of said rod in said tank whereby the electrical current supplied to said electromagnet is varied as said level of said liquid in said tank varies; and
(d) measuring the magnitude of the electrical current supplied to said electromagnet for indicating said level and hence the quantity of liquid in said tank.

4,875,371

DETERMINING IMPURITIES IN SAMPLES

Josef Gronseld, Toenavorst; Hatto Jacobi, Dueseldorf, and Hans-Jürgen Büchmann, Moers, all of Fed. Rep. of Germany, assignors to Mannesmann AG, Dueseldorf, Fed. Rep. of Germany

Filed Jul. 15, 1988, Ser. No. 219,764

Claims priority, application Fed. Rep. of Germany, Jul. 22, 1987, 3724627; Oct. 23, 1987, 3736389

Int. Cl. G01N 29/04

U.S. Cl. 73—598

15 Claims



1. Method for making a sample for ascertaining impurities in metal products, particularly steel products made by continuous casting, comprising the steps of:

cutting a preparatory sample from the object to be tested which has at least a ten-fold thickness of the sample thickness for comfortably providing ultrasonic testing;
the thickness dimension of said preliminary sample extends in a plane parallel to the direction of casting and/or to the main direction of immediately preceding deforming, there being plane parallel cutting surfaces at right angles to said thickness dimension;
heating said preliminary sample to a comparatively high deforming temperature; and
deforming that sample by reducing said preliminary sample transversally to the thickness dimension to a desired sample thickness.

4,875,372

ECHO CANCELLATION SYSTEM

Dennis H. Gilbert, Renton, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed May 3, 1988, Ser. No. 189,898

Int. Cl. G01N 29/04

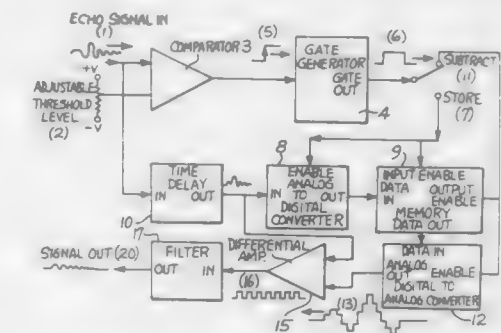
U.S. Cl. 73—614

2 Claims

1. In an ultrasonic inspection system, the method of detecting flaws near the surface of an inspected part including the steps of:

storing in memory, a signal representative of a surface echo, and then,
subtracting in a differential amplifier the signal representative of said surface echo from a signal representative of the

inspected part thereby effecting cancellation of said signal representative of a surface echo and enabling detection of



weaker signals representative of echoes from defects near the surface of the inspected part to be detected.

4,875,373

TEMPERATURE COMPENSATED FIBER OPTIC VIBRATION SENSOR

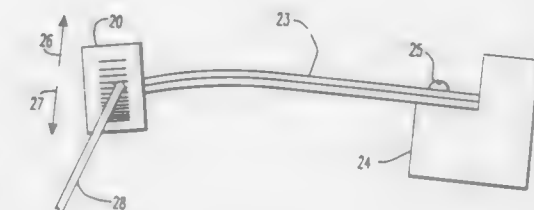
Michael Twerdochlib, Oviedo, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 25, 1988, Ser. No. 223,307

Int. Cl. G01D 5/34

U.S. Cl. 73—655

13 Claims



10. In a vibration sensor of the type which includes a grid supported on a support structure for oscillatory motion in the path of a light beam, the improvement wherein:

said support structure comprises a temperature responsive positioning means operable to position said grid with respect to the path of the light beam in dependence upon the temperature; and
said sensor comprises a graded density pattern of light modification means disposed on said grid.

4,875,374

MULTIPLE AXIS VIBRATION TEST PLATFORM

George T. Pinaon, Huntsville, Ala., assignor to The Boeing Company, Seattle, Wash.

Filed May 3, 1988, Ser. No. 189,719

Int. Cl. B06B 3/00

U.S. Cl. 73—663

14 Claims

1. A multi-axis vibration test platform, comprising:
a test platform having a top surface, a bottom surface, side walls, and end walls, said platform being simultaneously movable along selected ones of first, second, and third

axes of vibration which intersect at a center of said test platform;
 a plurality of actuator arms having first and second ends;
 a plurality of rotatable drive shafts and means for independently rotating each of said drive shafts;
 first means, including eccentrically coupled ball joints, for connecting said first end of each said actuator arm to a respective one of said plurality of drive shafts to reciprocate each said actuator arm along a respective one of said axes in accordance with the eccentricity of said eccentrically coupled ball joint as said respective drive shaft is rotated;
 second means, including concentrically coupled ball joints, for connecting said second end of each said actuator arm to a respective one of said bottom surface, side walls, and end walls of said test platform, said concentrically mounted ball joints permitting out of axis rotation of said actuator arms relative to said test platform.

4,875,375

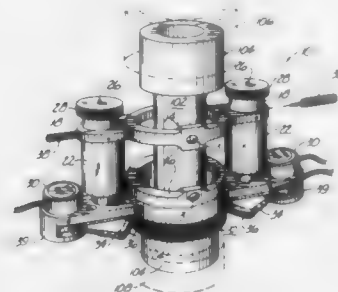
AXIAL-TORSIONAL EXTENSOMETER

Han-Chin Wu, and Zhiyong Xu, both of Iowa City, Iowa, assignors to University of Iowa Research Foundation, Iowa City, Iowa

Filed Mar. 3, 1989, Ser. No. 318,547
 Int. Cl.⁴ G01N 3/00

U.S. Cl. 73-795

10 Claims



1. An axial-torsional extensometer for measuring deformation of a specimen subjected to combined axial-torsional loading conditions, said specimen including ends and an intermediate gage section, said extensometer comprising:
 means for applying axial and torsional forces to the ends of said specimen;
 a first holder plate;
 a first set ring attached to said first holder plate, said first set ring including means for securing said first set ring to said specimen at a first axial location;
 a first guide tube attached to said first holder plate and disposed laterally of said first set ring;
 a second holder plate;
 a second set ring rotatably attached to said second holder plate, said second set ring including means for securing said second set ring to said specimen at a second axial location axially spaced from said first axial location, the axial spacing of said first and second set rings defining the length of said gage section of said specimen;
 a second guide tube attached to said second holder plate and disposed laterally of said second set ring, said second guide tube being disposed to engage said first guide tube to secure said first and second holder plates in radial alignment;
 axial measuring means operably attached to said first and

second guide tubes for measuring the axial deformation of said specimen;
 torsional measuring means operably attached to said second holder plate for measuring the torsional deformation of said specimen.

4,875,376

GUIDED-BEND TEST APPARATUS

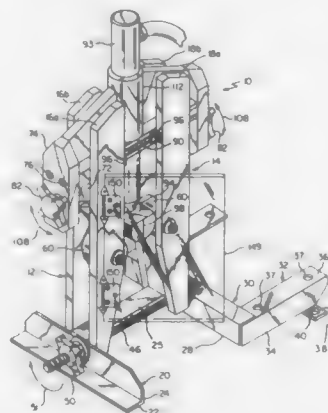
Glenn N. Fischer, Fischer Engineering Co., 7595 E. Singer Rd., Dayton, Ohio 45424

Filed Jan. 13, 1988, Ser. No. 205,980

Int. Cl.⁴ G01N 3/20

U.S. Cl. 73-852

8 Claims



1. Guided-bend test apparatus comprising:
 opposed pairs of spaced, vertically extending legs,
 roller means supported intermediate upper and lower ends of said pairs of vertically extending legs,
 bracket means fixed to each of said pairs of legs above said roller means and adjacent upper ends of said legs and including substantially horizontally disposed portions,
 cylinder ram holder base means bridging said opposed pairs of vertically extending legs and supported by and slidably engaging said horizontally disposed portions of said bracket means, and
 means interconnecting said cylinder ram holder base means and said bracket means for effecting relative sliding movement therebetween, whereby the apparatus is used to carry out a guided-bend test.

4,875,377

FLOWMETERS

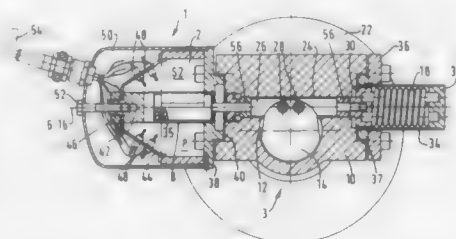
Robert A. Robertson, Hereford, United Kingdom, assignor to Spirax Sarco Limited, United Kingdom

Filed Oct. 30, 1987, Ser. No. 115,054

Int. Cl.⁴ G01F 1/22

U.S. Cl. 73-861.02

6 Claims



1. A flowmeter comprising:

a body;
 a flow passage provided in the body;
 a first sensor comprising a flow rate transducer adapted to provide a signal which is dependent upon the flow rate through the flow passage;
 a second sensor comprising a temperature sensor for providing a signal that is dependent upon the temperature of fluid flowing in the flow passage; and
 process means for receiving the signals from the first and second sensors and for deriving from those signals an output signal representing the true mass flow rate of the fluid flowing;
 the flow rate transducer comprising:
 a stationary ferromagnetic outer ring mounted on the body;
 a ferromagnetic inner core which is rotatable relatively to the outer ring about an axis;
 a primary coil and a plurality of secondary coils mounted on the outer ring, the coils being spaced apart from one another about the axis, the primary coil being coupled to the secondary coils through two separate magnetic paths each including the outer ring and the inner core, and the coils being disposed so that relative rotation of the inner core varies the relative magnetic coupling between the primary coil and the respective secondary coils thereby to provide a signal that is dependent upon the position of the inner core;
 a flap disposed in the flow passage of the flowmeter so as to be movable against a bias by fluid flowing through the flow passage, the flap being coupled to the inner core so as to rotate the inner core relatively to the outer ring upon movement of the flap; and
 a tubular enclosure accommodating, and coaxial with, the core, the enclosure being plugged at one end and sealed at the other end with respect to the body, the enclosure being open at this other end to the flow passage but otherwise sealed so that the core is hermetically sealed from the outer ring.

4,875,378

PRESSURE SENSOR WITH A FERROELECTRIC LIQUID CRYSTAL LAYER

Shunpei Yamazaki, Tokyo, and Akira Mase, Atsugi, both of Japan, assignors to Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan

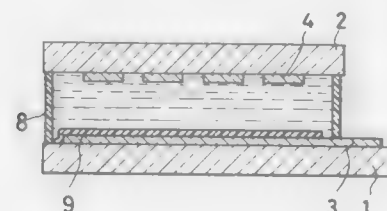
Filed Jan. 29, 1988, Ser. No. 150,150

Claims priority, application Japan, Feb. 19, 1987, 62-37566

Int. Cl.⁴ G01L 5/16, 1/16; H01L 41/18

U.S. Cl. 73-862.04

6 Claims



2. A pressure sensor comprising:
 a pair of substrates;
 a ferroelectric liquid crystal layer interposed between said pair of substrates;
 a plurality of column electrodes and one or more row electrode arranged on the opposed insides of said substrates in a matrix form; and
 a detecting means connected with said column and row electrodes for detecting the piezoelectric voltage produced between particular column and row electrodes.

4,875,379

APPARATUS FOR MEASURING THE TORQUE OF AN OPERATING SHAFT

Ulrich Rohs, Roomstr. 11, D-5160 Dueren, and Herbert Meuter, An der Weingass 24, D-5100 Aachen, both of Fed. Rep. of Germany

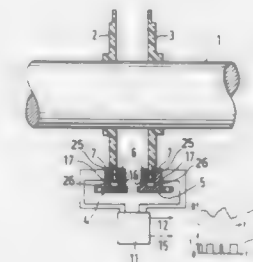
Filed Oct. 27, 1988, Ser. No. 263,064

Claims priority, application Fed. Rep. of Germany, Oct. 28, 1987, 3736533

Int. Cl.⁴ G01L 3/10

U.S. Cl. 73-862.34

9 Claims



1. A device for measuring the torque of a rotating shaft comprising:
 a first measuring disk having two concentric graduated circular areas mounted on the rotating shaft for rotation therewith;
 a second measuring disk having two concentric graduated circular areas, mounted on said shaft for rotation therewith axially spaced from said first measuring disk along the shaft;
 a multiplicity of pulse generators evenly distributed around said two concentric graduated circular areas on each of said first and second measuring disks, the number of said multiplicity of pulse generators being different on every concentric circular area on said first and second measuring disks;
 emitters associated with a first side of each said first and second measuring disks for emitting energy onto said multiplicity of pulse generators;
 receivers associated with a second side of each of said first and second measuring disks for receiving the energy transmitted by said pulse generators, said receivers generating voltage pulses; and
 an electronic comparator for comparing the voltage pulses produced by said receiver associated with said first and second disks.

4,875,380

CORRUGATED JACKET FOR MOLTEN METAL SAMPLER

Joseph J. Boron, Medina, Ohio, assignor to Midwest Instrument Co., Inc., Hartland, Wis.

Filed Dec. 22, 1987, Ser. No. 136,849

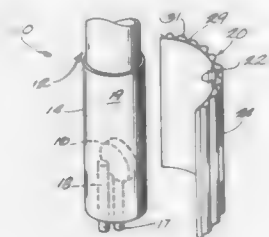
Int. Cl.⁴ G01N 1/12

U.S. Cl. 73-864.58

3 Claims

1. An immersion vehicle for studying the properties of molten metal including a vehicle body for supporting analysis apparatus and a handle for manipulating the vehicle body in molten metal, the improvement wherein said body is provided with channel means arranged along the exterior of the body to afford release of gas caused by reaction of the vehicle body with the molten metal above the immersion line in the molten metal to minimize splashing of molten metal and to protect the vehicle body and wherein said channel means comprises a

wrap of corrugated board having sequential alternate peaks and valleys in which the peaks define channels which direct



the gas caused by the reaction of the vehicle body with the molten metal above the molten metal surface.

4,875,381

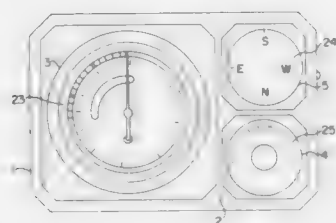
MOUNTING CONTAINER FOR MEASURING INSTRUMENTS

Toshikazu Yama, 8-15, Ooyama-cho, Shibuya-ku, Tokyo, Japan
Filed Feb. 22, 1988, Ser. No. 158,765

Int. Cl. G01D 11/30, 11/24

U.S. Cl. 73-866.3

6 Claims



1. A mounting container for housing therein a plurality of measuring instruments each comprising a case body, the mounting container comprising:

- fitting openings formed in an upper bottom of a shallow upper case with a lower bottom thereof opened;
- an insertion hole formed by cutting through a part of a side of a shallow lower case with a top thereof opened;
- projections formed along a side surface of said insertion hole;
- said upper case and lower case arranged to engage with each other such that the respective open surface of said cases face each other and the cases can be attached and detached;
- an outer engaging bore formed in the lower case near one side of a lower bottom of said lower case, and inner engaging bores formed in the lower case closer to the center of the lower bottom of said lower case;
- a case body small in comparison to the size of any of the case bodies of the housed measuring instruments inserted into said insertion hole via projecting portions which fit into projections provided along side surfaces of said insertion hole of said lower case; and
- a hinge fitting comprising first and second pieces coupled by a pin, said first piece of said hinge fitting having projections which are inserted into said outer engaging bore and inner engaging bore, said second piece of said hinge fitting being a little longer than said first piece.

4,875,382

STEPPING DRIVE

Anton Becker, Aachen, Fed. Rep. of Germany, and Felix Kramer, Friedlisberg, Switzerland, assignors to Elpatronic AG, Zug, Switzerland

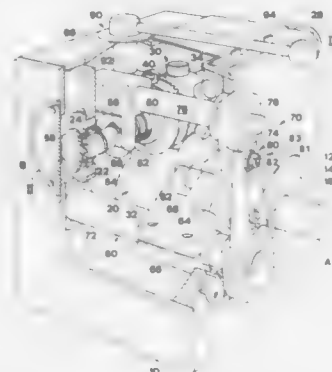
Filed Feb. 4, 1988, Ser. No. 152,074

Claims priority, application Switzerland, Mar. 20, 1987, 01074/87

Int. Cl. F16H 27/04; F16D 43/20

U.S. Cl. 74-84 R

11 Claims



1. A stepping drive having a first rotary member which can be driven by a driving shaft, a second rotary member by which a driven shaft can be driven, the two rotary members being in an engaged relationship whereby a continuous rotation of the first rotary member can be converted to an intermittent rotation of the second rotary member, characterized in that one of the two rotary members is connected to the associated shaft by a clutch, associated with the clutch is a retaining member which exerts a retaining force acting in the engagement sense thereon, and associated with one of the shafts is a control device operatively connected with the retaining member and controlling the retaining force as a function of the angular position of rotation of said one of the shafts.

4,875,383

DUAL RATIO TRANSMISSION SHIFTER ASSEMBLY WITH NEUTRAL SAFETY SWITCH

James L. Holman, Wauseon, and George A. Willford, Toledo, both of Ohio, assignors to Dana Corporation, Toledo, Ohio

Filed Feb. 23, 1989, Ser. No. 314,456

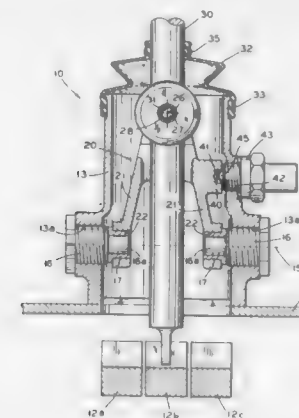
Int. Cl. B60K 20/00; F16H 3/02

U.S. Cl. 74-473 R

11 Claims

1. A shift assembly for a transmission having a plurality of movable shift rails comprising:
 - a hollow tower having a lower end connected to the transmission;
 - a yoke mounted within said tower for pivoting movement relative thereto about a first axis; and
 - a shift lever mounted on said yoke for pivoting movement relative thereto about a second axis, said second axis being disposed above said first axis, said shift lever extending into cooperation with the shift rails, said shift lever being

movable about said second axis for selecting one of the shift rails for movement and being movable with said yoke



about said first axis for moving the selected one of the shift rails.

4,875,384

THROTTLE LEVER MECHANISM

Koji Hirayama, Ome, and Fumihiko Aiyama, Musashimurayama, both of Japan, assignors to Kioritz Corporation, Tokyo, Japan

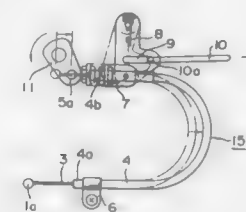
Filed Nov. 13, 1987, Ser. No. 119,928

Claims priority, application Japan, Nov. 14, 1986, 61-174887

Int. Cl. F16C 1/10

U.S. Cl. 74-500.5

2 Claims



1. A throttle lever mechanism for use in a machine comprising:

- a wire cable arranged in a curved manner having a first end and a second end, said first end connected to a throttle valve opening and closing member of a carburetor;
- a first throttle lever for operation by one-hand of an operator, said second end being connected to said first throttle lever;
- an outer tube covering said wire cable having a first end portion and a second end portion, said first end portion being held in a stationary manner;
- a link member having an elongated slot formed therein and being rotatably supported on a machine body, said second end portion of said outer tube being coupled to said link member;
- a second throttle lever for operation by the other hand of the operator;
- a connecting rod movable within the elongated slot and connecting said link member to said second throttle lever, and
- wherein when either of said first and second throttle levers is released from the respective hand of the operator said first end of said wire cable is returned to a first position and the throttle valve opening and closing member is returned to a home position such that an engine of the machine is returned to an idling condition.

4,875,385

CONTROL PEDAL APPARATUS FOR A MOTOR VEHICLE

Gabriel M. Sitria, 6127 Orchard Lake Rd., Apt. 104, West Bloomfield, Mich. 48033

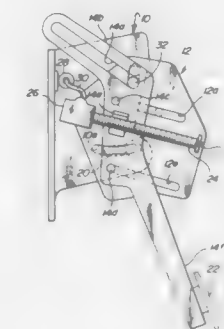
Continuation of Ser. No. 897,197, Aug. 18, 1986, abandoned.

This application Apr. 25, 1988, Ser. No. 188,122

Int. Cl. G05G 1/14

U.S. Cl. 74-512

18 Claims



1. A control pedal apparatus for a motor vehicle comprising:
 - (A) a mounting bracket adapted to be mounted on a fixed structure of the vehicle;
 - (B) a pedal assembly including an elongated pedal arm and an adjacent member;
 - (C) pivot means mounting the upper end of said pedal assembly for pivotal movement on said bracket about a pivot axis;
 - (D) a pedal pad mounted on the lower end of said pedal arm;
 - (E) attachment means on said adjutor member defining an attachment point for attachment of a control member for operation of a control system of the vehicle in response to pivotal movement of said pedal assembly upon the application of operator pressure to said pedal pad;
 - (F) a pair of pins on said pedal arm spaced longitudinally along the length of said pedal arm;
 - (G) a pair of parallel tracks on said adjutor member respectively slidably receiving said pins;
 - (H) a nut carried by said pedal arm at a location therealong between said pins; and
 - (I) a screw positioned between said tracks and extending generally in a direction of said tracks, threadably engaging said nut, and operative in response to rotation of said screw to cause said pins to slide in said tracks to slidably adjust said pedal arm on said adjutor member so as to selectively move said pedal pad relative to said bracket without moving said attachment point relative to said bracket.

4,875,386

HANDLEGRIP CRUISE ASSIST DEVICE

Daryl E. Dickerson, P.O. Box 1222, Grants Pass, Ore. 97526
Filed Jan. 5, 1989, Ser. No. 361,990

Int. Cl. B62K 21/12, 21/26

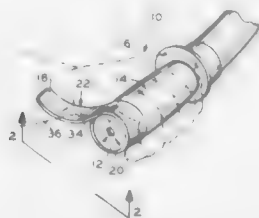
U.S. Cl. 74-551.9

2 Claims

1. A handlegrip cruise assist device, in combination with a rotatable throttle handlegrip having a return-to-idle bias, as found on motorcycles and the like, the handlegrip cruise assist device comprising:

an elongated, stiff, resilient member having a lever segment and a circular segment, which are formed as a single piece; the circular segment being formed into a circular shape having a slightly smaller diameter than an outer end of the throttle handlegrip and which terminates before the circular shape closes, with a variable gap remaining, so that downward pressure on the lever segment reduces the gap and the diameter of the circular segment thereby tightening the encircling grip and upward pressure on the lever

segment increases the gap and diameter of the circular segment thereby loosening the encircling grip to readily permit rotation of the cruise assist device with respect to the the handlegrip for rapid and simple adjustment of the position of the device on the throttle handlegrip; the lever segment extending from the circular segment and



tangentially from the throttle handlegrip towards the operator; wherein downward pressure from the palm heel of the operator's hand and adjoining wrist area against the lever segment serves to overcome said return-to-idle bias and thus maintain the position of the rotatable throttle handlegrip at the desired throttle setting.

4,875,387

LIGHTENED STEERING WHEEL, IN PARTICULAR FOR A MOTOR VEHICLE, PRODUCED FROM STAMPABLE, REINFORCED, SYNTHETIC MATERIALS AND PROCESS FOR THE MANUFACTURE THEREOF
Christian Henique, Delle, France, assignor to Equipments Et Composants Pour L'Industrie Automobile, Audincourt, France

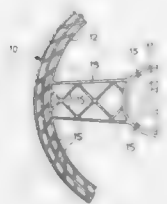
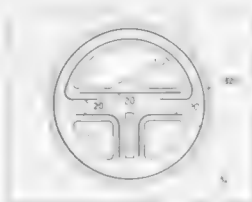
Filed Sep. 23, 1988, Ser. No. 248,073

Claims priority, application France, Sep. 25, 1987, 87 13323

Int. Cl.⁴ B62D 1/04

U.S. Cl. 74—552

10 Claims



1. Lightened steering wheel, particularly for a motor vehicle, comprising, inter alia, a central hub (11), a peripheral rim (12), and at least one approximately radial branch (13) connecting said hub and said rim, characterized in that at least said rim and branch are made from blanks of at least one stampable, synthetic material charged with long fibres which are uninterrupted in each blank, said blanks being made only of said stampable synthetic material charged with said long fibres.

4,875,388
DEVICE OF THE CRANK CONNECTING ROD TYPE, IN PARTICULAR FOR CONTROLLING A VENTILATION LOUVER IN AN AUTOMOBILE HEATING OR AIR CONDITIONING UNIT

Jean F. Bouvot, Dampierre, France, assignor to VALEO, Paris, France

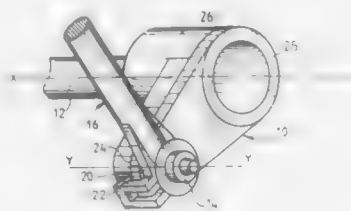
Filed Aug. 30, 1988, Ser. No. 238,101

Claims priority, application France, Sep. 10, 1987, 87 12571

Int. Cl.⁴ G05G 1/00; B60H 1/00

U.S. Cl. 74—579 R

10 Claims



1. A device of the crank connecting rod type, including a crank arm (10) capable of being mounted to swivel about an axis (X—X) and provided with a pivot (14) having a pivot axis (Y—Y), and a connecting rod (16), said connecting rod (16) being pivotally received on said pivot and including an extension (18) which is parallel to the axis of the pivot (14) and is extended, beyond a connecting rod bearing face (20) between the connecting rod and pivot, by a radial tooth (22) arranged to remain in engagement with a rim (24), defined on said crank arm about said pivot, in any operating position of the connecting rod, said extension (18) comprising a first leg (96₁, 96₂) extending from the connecting rod (16) perpendicular to the axis of the pivot (14), and a second leg (98₁, 98₂) at right angles to the first leg, said extension being elastically deformable, to permit the spacing apart of the radial tooth (22) with respect to the axis (Y—Y) of the pivot (14) during the mounting of the connecting rod (16) and crank (10), to allow the passage at the rim (24) of the crank arm and the return of the radial tooth (22) to its initial position of repose to engage the rim (24) and be clipped thereon.

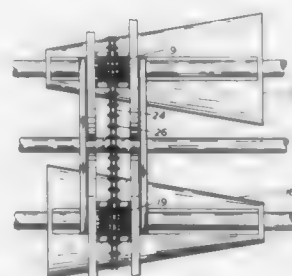
4,875,389

CHAIN DRIVEN, CONTINUOUSLY INFINITE VARIABLE SPEED TRANSMISSION SYSTEM
Frank Fragnito, 11 Holmes Ave., North Babylon, N.Y. 11703
Continuation-in-part of Ser. No. 468,324, Mar. 23, 1983, Pat. No.

Int. Cl.⁴ F16H 9/26

U.S. Cl. 74—689

8 Claims



6. A chain driven continuously variable speed transmission system comprising frame means, input driving means for rotation within said frame means, a first conical gear coupled to said input driving means, a second conical gear having its longitudinal axis parallel to the longitudinal axis of said first

conical gear and lying in the same plane as that of said first conical gear with the end of the second conical gear having the largest diameter positioned in relative proximity to the end of said first conical gear having the smallest diameter, and the end of said second conical gear having the smallest diameter positioned proximate to the end of the first conical gear having the largest diameter, a continuous flexible chain having pins extending therefrom and encircling said first and second gears and being driven by said first conical gear to drive said second conical gear, a plurality of flexible chain receiving means comprising spiral gears within said first and second conical gears engaged by said pins extending from said flexible chain and an output shaft coupled to said second conical gear for transmitting power to a load.

4,875,390

SHIFT CONTROL DEVICE FOR HYDROSTATIC CONTINUOUSLY VARIABLE TRANSMISSION

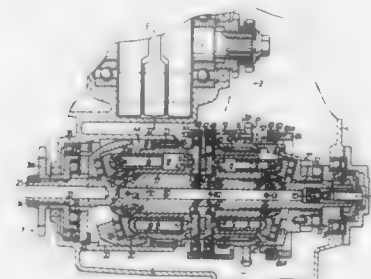
Tsutomu Hayashi; Masae Katoh, both of Tokyo; Nobuyuki Yakigaya, Chiba; Kazuhiko Nakamura, Kanagawa; Yoshihiro Yoshida; Yoshihiro Nakajima, both of Tokyo; Mitsuru Saito, Tokyo, and Akio Kobayashi, Saitama, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 20, 1987, Ser. No. 28,528

Claims priority, application Japan, Mar. 24, 1986, 61-65484; Apr. 8, 1986, 61-80812

Int. Cl.⁴ F16H 47/04

U.S. Cl. 74—731

24 Claims



1. A shift control device in a hydrostatic continuously variable transmission in which a hydraulic closed circuit is formed between a swash plate type hydraulic pump and a swash plate type hydraulic motor, and a swash plate holder for supporting a motor swash plate of the hydraulic motor is tiltably supported on a stationary structure through a trunnion shaft fixedly mounted to said swash plate holder, wherein a drive shaft of a reversible electric motor is connected to the trunnion shaft through a reduction device which is constructed so as to transmit rotation of said electric motor to said trunnion shaft at a reduced speed but to be brought into a locked state when receiving a reverse load from said trunnion shaft, and means is provided to control the operation of said reversible electric motor, said control means being capable of selectively assuming a first state in which said electric motor is controlled according to a load of an engine associated with said transmission and a second state in which said electric motor is controlled according to a shift ratio of said transmission.

4,875,391

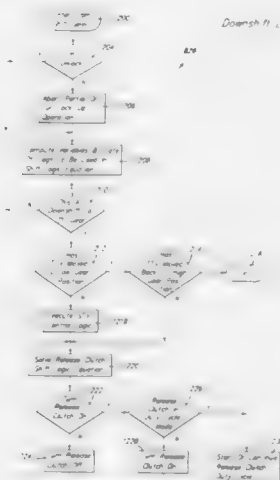
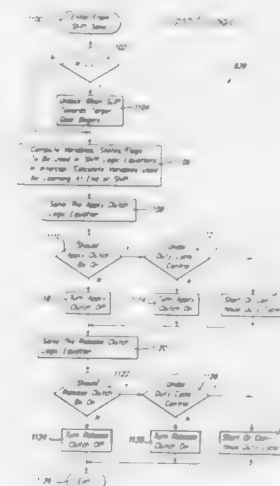
ELECTRONICALLY-CONTROLLED, ADAPTIVE AUTOMATIC TRANSMISSION SYSTEM
Maurice B. Leising, Clawson; Howard L. Benford, Bloomfield Hills, and Gerald L. Holbrook, Rochester Hills, all of Mich., assignors to Chrysler Motors Corporation, Highland Park, Mich.

Filed Apr. 29, 1988, Ser. No. 187,772

Int. Cl.⁴ B60K 41/06

U.S. Cl. 74—866

6 Claims



1. In an automatic transmission having a plurality of gears for transmitting power from a prime mover to a load device over desired ranges of torque and speed, and an assembly of friction elements, with hydraulic fluid associated with the operation of the friction elements, the friction elements for selectively disengaging and engaging the gears from the prime mover, a control system for controlling the selection and engagement of the gears, comprising:
means for sensing the input and output speeds of the transmission;
means for sensing the power demand on the prime mover;
means for providing an indication of an operator selected mode of operation for the transmission;
means for controlling the flow of hydraulic fluid associated with the operation of the friction elements; and
electronic controller means for controlling the actuation of

the means for controlling the flow of hydraulic fluid to regulate the application and release of pressure to and from the friction elements in response to signals from the means for sensing the input and output speeds of the transmission, the means for sensing the power demand on the prime move, and the means for providing an indication of an operated selected mode of operation for the transmission, the controller means for controlling the actuation of the means for controlling the flow of hydraulic fluid by making adjustments to a duty cycle of the means for controlling the flow of hydraulic fluid such that the adjustments are made continuously in a real time, closed loop manner for causing the transmission to follow a set of predetermined shift schedules.

4,875,392

MANUAL VALVE IN AN AUTOMATIC TRANSMISSION
Yoshinari Kawayama, Tokoname; Fumitomo Yokoyama, Anjo, and Masakatsu Miura, Kariya, all of Japan, assignors to Aisin-Warner Kabushiki Kaisha, Aichi, Japan
PCT No. PCT/JP87/00453, § 371 Date Mar. 1, 1988, § 102(e) Date Mar. 1, 1988, PCT Pub. No. WO88/00303, PCT Pub. Date Jan. 14, 1988

PCT Filed Jun. 30, 1987, Ser. No. 172,724

Claims priority, application Japan, Jul. 1, 1986, 61-154694
Int. Cl.⁴ B60K 41/16

U.S. Cl. 74—967

4 Claims

1. A manual valve for an automatic transmission, comprising:

a valve body having a valve bore therein;
a plurality of forward running ports for delivering fluid for forward running of said transmission, a reverse running port for delivering fluid for reverse running of said transmission, and a single line pressure application port for supplying fluid at line pressure, all of said ports opening into said bore, and a drain opening out of said bore; and
a spool having recesses therein for connecting said ports to and disconnecting said ports from each other;
said reverse running port and said forward running ports and said drain all being positioned in the same axial direction along said valve bore from said single line pressure application port, and said forward running ports being along a peripheral portion of said valve bore which is substantially on the circumferentially opposite side of said valve bore from said reverse running port and said single line pressure application port; and

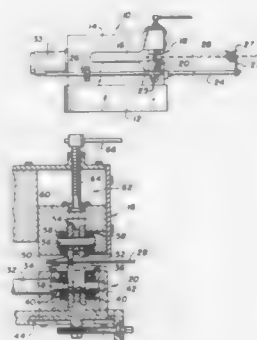
said spool having a reduced diameter portion forming a first fluid chamber connecting said single line pressure application port and said forward running ports in the various positions of said spool for forward running of said transmission, a second fluid chamber defining recess along a circumferential portion of said spool opposed to said single line pressure applying port and said reverse running port for connecting said reverse running port and said single line pressure application port in the reverse running position of said spool and connecting said reverse running port and said drain in the running positions of said spool, and a drain chamber defining recess along a circumferential portion of said spool opposed to said forward running ports for connecting said forward running ports to said drain in the positions of the spool other than positions in which the respective forward running ports are connected with said single line pressure application port through said first fluid chamber.

4,875,393 APPARATUS FOR TENSIONING AND DEFORMING SAW BLADES

Christopher Williams, South Burnaby, Canada, assignor to Williams & White Machine Shop, Burnaby, Canada
Filed May 2, 1989, Ser. No. 346,438
Int. Cl.⁴ B23D 63/18

U.S. Cl. 76—27

6 Claims



1. Apparatus for tensioning and deforming saw blades comprising:

Support means for supporting a saw blade and permitting movement of the saw blade in the face plane of the saw blade;

a first pair of rolls mounted for rotation on a single axle with a spacer therebetween, one roll having a larger diameter than the other roll, and both rolls having convex peripheral surfaces, the first pair of rolls positioned to engage one face of the saw blade;

a second pair of rolls, substantially the same in difference in diameter, width and spacing the first pair of rolls mounted for rotation on a single axle substantially parallel to the axle for the first pair of rolls, the second pair of rolls positioned to engage on the opposite face of the saw blade directly opposite the first pair of rolls;

means to move at least one of the axles for the first pair of rolls and the second pair of rolls axially relative to the saw blade and to each other, and

means to move at least one of the pairs of rolls perpendicular to the face of the saw blade to apply pressure to the saw blade between the first pair of rolls and the second pair of rolls.

4,875,394

CHAMPAGNE BOTTLE OPENER

Cleveland B. Crudgington, Jr., 222 N. Myrtle Ave., Monrovia, Calif. 91016

Continuation-in-part of Ser. No. 786,545, Oct. 11, 1985, abandoned. This application Jun. 19, 1986, Ser. No. 895,204

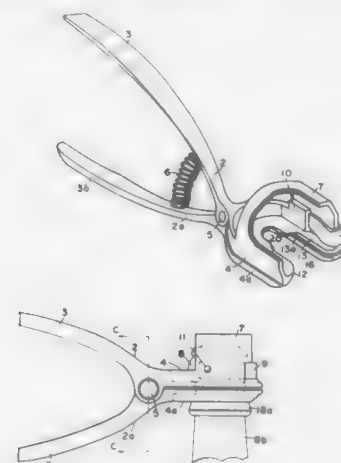
Int. Cl.⁴ B67B 7/02

U.S. Cl. 81—3.06

14 Claims

1. In an extractor for extracting a mushroom shaped stopper from the neck of a sparkling beverage bottle, there being an upwardly presented shoulder on said neck, there being a downwardly presented and openly accessible shoulder on said stopper, and said extractor comprising a pair of levers which are pivotally interconnected, each lever defining a handle at one end thereof and a bifurcated jaw having a first recess at the opposite end thereof, wherein one jaw is located above the other, and each of said jaws is adapted to encircle, at least partially, the bottle's neck, such that the lower jaw is adapted to make contact with said upwardly presented shoulder on at least two locations, and the upper jaw includes a stopper re-

taining means and is adapted to make contact with said downwardly presented shoulder on at least two locations, with said handles being spring-loaded and positioned relative to one another so that the squeezing together of said pair of handles results in the separation of said jaws, urging said lower jaw against said upwardly presented shoulder and urging said upper jaw against said downwardly presented shoulder, and with force sufficient to lift said stopper relative to said neck, the improvement which comprises:



a generally U-shaped second recess within the interior of each of said bifurcated jaws wherein said extractor can be repositioned with both of said second recesses encircling, at least in part, the stem of a partially lifted stopper, thereby enabling said lower jaw to rest directly of top of said bottle and said upper jaw to gain increased accessibility to said stopper's downwardly presented shoulder means.

4,875,395

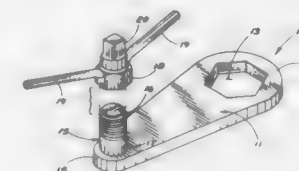
DUAL WHEEL LUG NUT TOOL

Isaac Alvarez, 3000 Airline Hwy., Hollister, Calif. 95023
Filed Aug. 10, 1988, Ser. No. 230,519

Int. Cl.⁴ B25B 9/00

U.S. Cl. 81—13

6 Claims



1. A dual wheel lug nut tool for securement of a first internally threaded lug nut relative to a second internally and externally threaded elongate lug nut to an automotive wheel rim wherein said wheel rim includes a plurality of radially spaced openings for receiving a plurality of said second nuts there-through, said tool comprising

an elongate body including a top and bottom planar surface, and

a wrench opening means for securement of said first lug nut orthogonally directed through a first end of said body, and an exteriorly threaded boss member orthogonally and inte-

grally directed outwardly of the top surface of said elongate body, and
an interiorly threaded nut means formed with complementary threads relative to said boss member for selective threaded securement to said boss member.

4,875,396

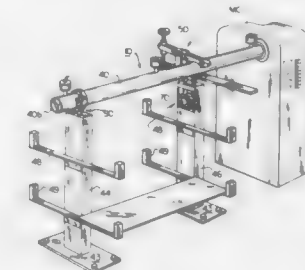
APPARATUS FOR FEEDING BAR STOCK TO A MACHINING OPERATION

Thomas Gathings, 4094 Maple Ave., Burlington, N.C. 27215
Filed Mar. 21, 1988, Ser. No. 170,163

Int. Cl.⁴ B23B 13/00

U.S. Cl. 82—124

6 Claims



1. An apparatus for feeding bar stock to the automatic feed mechanism of a CNC machine center of the type which has a feed orifice through which bar stock is advanced to the cutting head and wherein said feed orifice has an inlet end through which the bar stock is inserted into the orifice, and an outlet end from which the bar stock leaves the feed orifice and enters the cutting head; said apparatus for feeding bar stock comprising:

(a) a first, internal stock retaining sleeve removably inserted within said feed orifice of the CNC machine center; said first retaining sleeve being comprised of:

(i) at least one master bushing for controlling the bar stock at a point immediately preceding, and as the stock enters, the cutting head; said master bushing having a generally tubular configuration and being positioned in said feed orifice at or near the cutting head; said master bushing having an outer diameter substantially equivalent to the inner diameter of said feed orifice, and an inner diameter substantially equivalent to the outer diameter of the bar stock being cut;

(ii) a prescribed length of rigid, tubular material mounted against and abutting one end of said master bushing such that said tubing extends from said master bushing to said inlet end of said feed orifice, and the opposite end of said bushing is adjacent said orifice outlet; said tubing having an inner diameter somewhat greater than the outer diameter of the bar stock to eliminate drag during the cutting operation;

(b) a second stock retaining sleeve supported exteriorly of the machine center for supplying bar stock to said feed orifice inlet; said second retaining sleeve being comprised of:

(i) at least two bushings having a tubular configuration and being connected in spaced relationship to each other by at least one cylindrical connecting tube;

(ii) each of said bushings having an inner diameter substantially equivalent to the outer diameter of the bar stock being cut, and said connecting tube having an inner diameter slightly greater than that of the bar stock so that the connecting tube abuts the ends of the bushings, to reduce drag during the turning and cutting operation;

(c) means for supporting said second retaining sleeve in abutting relationship to said feed orifice inlet, during use; whereby the bar stock is fed through said second retaining

sleeve into said feed orifice, exiting through said orifice outlet to the cutting head; and whereby the turning and cutting speed is increased substantially due to elimination of vibration and whipping effect on the bar stock by the close fit of the stock within said bushings.

4,875,397

PRESET QUICK CHANGE TOOLING FOR A RECESS CUTTING ATTACHMENT

Boris Berdichevsky, Wilmette, Ill., assignor to Sloan Valve Co., Franklin Park, Ill.

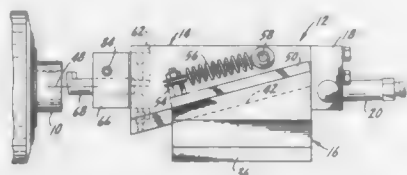
Continuation of Ser. No. 124,176, Nov. 23, 1967, abandoned.

This application Feb. 13, 1989, Ser. No. 312,362

Int. Cl.⁴ B23B 29/00

U.S. Cl. 82-60

3 Claims



1. A recess attachment with preset quick change tooling for use on a multiple spindle automatic machine including:

- a base formed and adapted to be mounted at a work station on an automatic machine, said base being movable in a defined direction during a machining operation and having a slide mounting surface in a plane forming a small acute angle with said direction of movement;
- a slide positioned on said slide mounting surface, spring means attached to said base and slide and inhibiting relative movement therebetween, said slide having a nest with a pair of mutually perpendicular surfaces forming two slides thereof;
- a tool holder removably positioned in said nest and firm against said mutually perpendicular surfaces, an adjustment member positioned on said tool holder and a cooperating stop on an additional side of said slide nest, said tool holder having a tool receiving opening and means for fastening a cutting tool therein, said cutting tool being preset on said tool holder prior to the mounting of said tool holder in said nest;
- clamping means mounted on said tool holder for holding said tool holder against said mutually perpendicular slide nest surfaces, said clamping means including a pair of differential screws adjustably mounted on said slide and having clamps threadably mounted thereon, said tool holder having a cam surface cooperating with said clamps, turning of said differential screws causing said tool holder to be urged simultaneously toward both of said mutually perpendicular surfaces;
- said base and slide moving in unison to a precutting position, further movement of said base relative to said slide causing said slide and the cutting tool mounted thereon to move in a direction generally perpendicular to base movement to cut a recess in a workpiece.

4,875,398

RETRACTABLE DUST CONTROL HOOD AND GUARD FOR ROTARY TABLE SAW

James M. Taylor, Plano, and Gary M. Karner, Allen, both of Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jan. 15, 1988, Ser. No. 144,349

Int. Cl.⁴ B27G 19/02; B27B 5/22

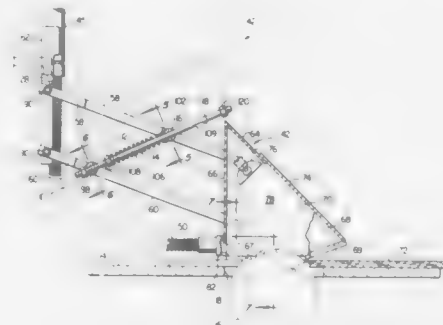
U.S. Cl. 83-100

9 Claims

9. A dust control hood apparatus for a rotary table saw and the like, said table saw including a generally flat table support surface and a cutting blade extending from said support surface

for engagement with a workpiece to be cut and supported on said support surface, said hood apparatus including:

- a generally tubular support member disposed spaced from said support surface;
- a dust control hood characterized by a generally box-like member having an open side facing said support surface and opposed walls defining an interior space for collecting and evacuating dust from the vicinity of said cutting blade;
- flexible conduit means connected to said hood and to said support member for withdrawing air from said interior space with dust entrained therein for evacuating dust generated by said cutting blade during the operation of said cutting blade; and



hood support means interconnected said hood and said support member comprising spaced apart pairs of parallel-gram link members pivotally connected to said support member and to said hood at opposite ends of said link members, respectively, shaft means disposed between and connected to said link members of each pair, respectively, and said shaft means being spaced apart, elongated rod means extending between and connected to one of said shaft means and slidably supported by the other of said shaft means, and adjustable spring means disposed along said rod means and between said shaft means for urging said support means to counteract the weight of said hood when said hood is in a working position.

4,875,399

MITER BOX ATTACHMENT FOR CUTTING CROWN MOULDINGS AND THE LIKE

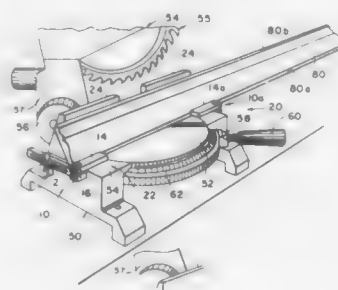
William D. Scott, 10795 Dalzell, Traverse City, Mich. 49684, and James J. Swartout, 5663 County Rd. 616 E., Cedar, Mich. 49621

Filed Jun. 23, 1988, Ser. No. 210,571

Int. Cl.⁴ B27B 27/06; B23Q 3/00

U.S. Cl. 83-468.3

16 Claims



1. A motorized miter box for cutting compound miters comprising:

a horizontal table having a planar surface for supporting a workpiece;

a fence extending upwardly from said table to provide a registration surface for a workpiece supported on said table;

a saw for cutting a workpiece supported on said table and registered against said fence;

a pair of jigs mounted at opposite edge portions of said table, each of said jigs including a body and a registration block pivotally secured to said body, said body being located below said upper surface of said table, said registration block being pivotable between a storage position wherein said registration block is also located below said upper surface of said table and an operative position wherein said registration block rests on said upper surface to define a distance between said registration block and said fence so that a workpiece can be held in cocked position between said registration block and said fence; and

mounting means for mounting each of said jig bodies below said upper surface of said table, said mounting means permitting relative movement between said jig body and said table so that said registration block can be moved toward and away from said fence, whereby the distance between said registration blocks and said fence is adjustable.

4,875,401

MOUTHPIECE PLATES OF FLUTE-TYPE WIND INSTRUMENTS

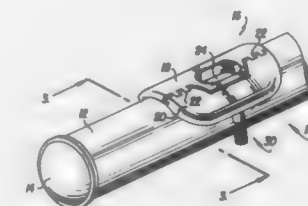
J. Charles Calbreath, 2008 Cloverdale Ave., Winston-Salem, N.C. 27103

Filed Aug. 31, 1988, Ser. No. 238,469

Int. Cl.⁴ G10D 7/02

U.S. Cl. 84-384

16 Claims



1. In a musical instrument of the flute-type comprising a headjoint with a longitudinal axis, said headjoint having a blow hole and an arcuate mouthpiece plate surrounding said blow hole, the improvement comprising at least a portion of said mouthpiece plate being movable relative to said headjoint and means connected between said headjoint and the movable portion of said mouthpiece plate for adjusting the position of said movable portion whereby adjustment of said movable portion aids the user of said instrument to establish optimum embouchure.

4,875,400

ELECTRONIC MUSICAL INSTRUMENT WITH TOUCH RESPONSE FUNCTION

Hiroko Okuda, and Makoto Takenaka, both of Tokyo, Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

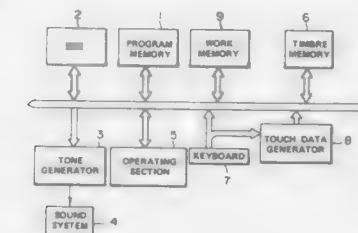
Filed May 26, 1988, Ser. No. 199,116

Claims priority, application Japan, May 29, 1987, 62-82620[U]; May 29, 1987, 62-82622[U]; May 29, 1987, 62-82624[U]

Int. Cl.⁴ G10H 1/053, 1/18

U.S. Cl. 84-626

9 Claims



1. An electronic musical instrument with a touch response function for synthesizing a plurality of tone waveform data from a plurality of tone waveform generating means for generation of musical tone, said instrument comprising:

manually operating means for generating a touch state when it is operated manually;

touch data preparing means for detecting the touch state of said manually operating means to generate touch data;

touch response data preparing means for preparing a plurality of touch response data based on said touch data;

designation means for enabling a player of the electronic musical instrument to designate one of said plurality of tone waveform generating means; and

weighting means for weighting said tone waveform data obtained from each of said plurality of tone waveform generating means in response to the respective designated one of said plurality of touch response data.

4,875,402

RECOIL BRAKE FOR A GUN HAVING A HEAT EQUALIZATION AND INDICATION DEVICE

Josef Metz, Neuss, Fed. Rep. of Germany, assignor to Rheinmetall GmbH, Düsseldorf, Fed. Rep. of Germany

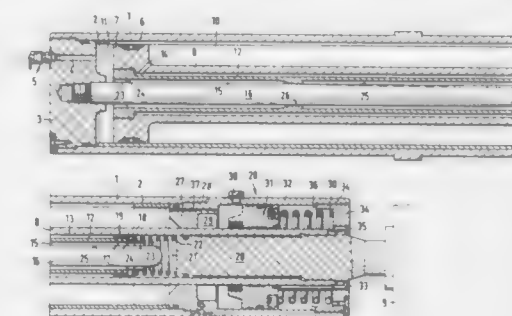
Filed Aug. 11, 1988, Ser. No. 231,007

Claims priority, application Fed. Rep. of Germany, Aug. 27, 1987, 3728532

Int. Cl.⁴ F41F 19/02; F16F 9/10

U.S. Cl. 89-43.01

5 Claims



1. In a recoil brake for a gun, including a brake cylinder adapted to be filled with hydraulic fluid and having opposite first and second ends;

a piston slidably received in the brake cylinder; said piston separating an inner volume of said brake cylinder into a brake chamber and an equalizing chamber;

a piston rod affixed to said piston and extending axially through said brake chamber towards said second end and being arranged for connection to a breechblock of the gun at said second end;

a first throttle passage maintaining hydraulic communication between said brake chamber and said equalizing chamber for effecting a throttled flow of hydraulic fluid therebetween upon movement of the piston; and

a heat equalization and indication device having a heat

equalization chamber; means defining a second throttle passage maintaining hydraulic communication between said brake chamber and said heat equalization chamber; a heat equalization piston slidably disposed in said heat equalization chamber and being exposed to a pressure of hydraulic fluid situated in the heat equalization chamber and a spring connected to the great equalization piston for urging said heat equalization piston into said heat equalization chamber; and an indicator element coupled with said heat equalization piston;

the improvement wherein

said heat equalization and indication device is a self-contained, modular unit releasably connected to said second end of said brake cylinder and forming an axial extension thereof; said heat equalization and indication device further comprising an impact plate bounding said heat equalization chamber in said heat equalization device and said brake chamber in said brake cylinder; said second throttle passage being provided in said impact plate.

4,875,403

VARIABLE DISPLACEMENT PORT PLATE

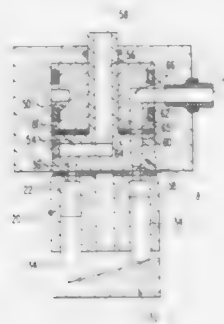
Mark S. Strome, and Richard W. Reynolds, both of Rockford, Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Oct. 18, 1988, Ser. No. 259,322

Int. Cl.⁴ F04B 1/30

U.S. Cl. 91—482

14 Claims



1. A hydraulic apparatus comprising:

(a) a rotatable cylinder block having a plurality of cylinders with each cylinder containing a piston which reciprocates in the cylinder to define a volume which is filled with hydraulic fluid as the piston reciprocates in conjunction with rotation of the block;

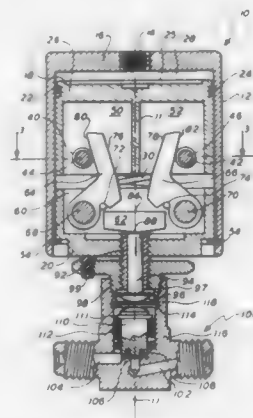
(b) a port plate having a body with a first surface which rotatably engages the cylinder block and a second surface which rotatably engages a fixed surface, the first surface having a high pressure arcuate port and a low pressure arcuate port with each port being radially disposed with respect to a center of the body and the ports being separated by a pair of arcs, the ports intercepting openings of the cylinders as the cylinder block rotates, the body being rotatable in first and second directions to vary a volume of hydraulic fluid taken into the cylinders from a minimum through a maximum for rotation in either direction with a maximum angle subtended by rotation in either direction being greater than an angle subtended by the high pressure arcuate port; and

(c) a first passage extending through the port plate from the high pressure arcuate port to a second arcuate port in the second surface which faces the fixed surface and which subtends an angle defined with respect to the center of the body at least as large as the maximum angle and is in fluid communication with a port in the fixed surface of the port plate throughout an angle at least as large as the maximum angle.

4,875,404
COMPACT FLUID POWERED ACTUATOR
Lewis L. Aldridge, Morris Plains, N.J., assignor to Ewal Manufacturing Co., Inc., Belleville, N.J.
Filed Jul. 5, 1988, Ser. No. 215,776
Int. Cl.⁴ F01B 9/00

U.S. Cl. 92—130 A

13 Claims



1. A fluid actuator comprising:

a cylindrical housing having a base;
a piston slidably mounted in said housing and defining a fluid chamber;
means for permitting pressurized fluid to be applied to said chamber;

a stored-energy element mounted in said housing between said piston and said base, said element having an increase in energy storage when fluid pressure in said fluid chamber moves said piston toward said base and having a reduction in energy storage and forcing said piston to move away from said base when fluid pressure in said fluid chamber is reduced;

an output shaft having one end slidably extending from said housing through said base;

a lever pivotally mounted on said base and having a first arm and a second arm shorter than said first arm; and
means coupling said first arm to said piston and said second arm to another end of said output shaft for forceably moving said shaft in a direction toward said one end in response to movements of said piston away from said base.

4,875,405

SEALING DEVICE

Bruno Bernhardt, Reutlingen, and Heinrich Kodzierski, Wernigen, both of Fed. Rep. of Germany, assignors to WABCO Westinghouse Steuerungstechnik GmbH, Hanover, Fed. Rep. of Germany

Filed Jul. 15, 1987, Ser. No. 73,592

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1986, 3623928

Int. Cl.⁴ F16J 1/06

U.S. Cl. 92—194

24 Claims

1. A sealing apparatus for sealing two longitudinal extending machine components which can slide relative to and against one another longitudinally, a first of such two machine components having a sliding surface along which a second of such two machine components slides longitudinally to define a sliding motion, said sealing apparatus comprising:

(a) a plastic sealing element having low friction and relatively low elasticity secured to said second machine component;

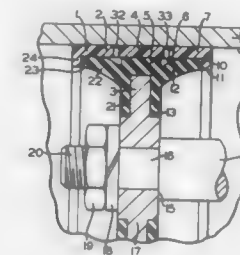
(b) an elastic support member positioned intermediate said plastic sealing element and said second machine component to exert a force on at least a portion of said plastic sealing element which slides along said sliding surface of

said first machine component and to provide support for said plastic sealing element, said elastic support member having an elasticity in cross-section at least in a plane perpendicular to said sliding surface on said first machine component;

(c) at least a portion of said plastic sealing element which slides along said sliding surface on said first machine component encircles said elastic support member in a direction of said sliding motion;

(d) mounting protrusions integral with and extending from said plastic sealing element and extending in cross-section in a plane substantially perpendicular to said sliding surface on said first machine component to engage corresponding support surfaces of said elastic support member, said corresponding support surfaces are oriented in cross-section in a plane substantially perpendicular to said mounting protrusions;

(e) an outer dimension of said corresponding support surfaces, measured in a direction of said sliding motion, is greater than a distance between said mounting protrusions



of said plastic sealing element when said plastic sealing element and said elastic support member are in an unmounted condition;

(f) said portion of said plastic sealing element, which slides along said sliding surface on said first machine component, includes a predetermined prestress exerted by said corresponding support surfaces on said mounting protrusions in the direction of said sliding motion of said sliding surface, on said first machine component at least in an area of said mounting protrusions; and

(g) said elastic support member includes sleeve-shaped protrusions extending substantially in said direction of said sliding motion and carrying said plastic sealing element and an end of each sleeve-shaped protrusion forming a respective support surface of said elastic support member and said elastic support member further includes a means positioned to engage adjacent each end of said sleeve-shaped protrusions and said second machine component for providing elastic cushioning for said sleeve-shaped protrusions.

4,875,406

DEVICE FOR DETECTING DIFFERENT POLLUTANTS IN GAS STREAMS

Heinz Hölter, Beisenstrasse 39-41, 4390 Gladbeck; Heinrich Igelbüscher, Gladbeck; Heinrich Gresch, Dortmund-Wickede; Heribert Dewert, Gladbeck, and Peter Burggräf, Bochum, all of Fed. Rep. of Germany, assignors to Heinz Hölter, Gladbeck, Fed. Rep. of Germany

PCT No. PCT/EP87/00411, § 371 Date Mar. 25, 1988, § 102(e) Date Mar. 25, 1988, PCT Pub. No. WO88/01057, PCT Pub. Date Feb. 11, 1988

PCT Filed Jul. 29, 1987, Ser. No. 177,549

Claims priority, application Fed. Rep. of Germany, Aug. 2, 1986, 3626277; Nov. 28, 1986, 3640734

Int. Cl.⁴ B60H 1/28

U.S. Cl. 98—201

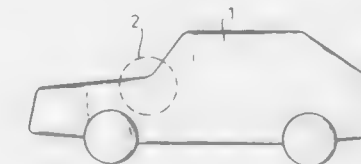
4 Claims

1. A device for the detection of various pollutants in a gas

stream supplied to motor vehicle cabins or operator protection cabins comprising:

at least one semiconductor gas sensor;

a means for alternately exposing said gas stream to be evaluated to said sensor; and



a microprocessor functioning to correct, with the aid of a correction factor, pollutant values measured by said semiconductor gas sensor, said correction factor being related to an average value of temperature and humidity.

4,875,407

STERILIZING METHOD FOR TREATMENT OF FRESH FRUITS AND APPARATUS USED FOR THE METHOD

Jitsuo Inagaki, 71, Kamiyashiki, Oaza Itsumiki, Itsumikicho, Hazugun, Aichi, Japan

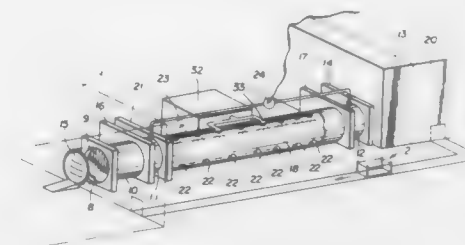
Division of Ser. No. 214,513, Jul. 1, 1988. This application Dec.

30, 1988, Ser. No. 292,302

Int. Cl.⁴ A23L 3/00, 3/26

U.S. Cl. 99—451

3 Claims



1. An apparatus for conducting a sterilizing treatment of fresh fruit, said apparatus comprising a far infrared irradiation chamber containing and a curved heat radiation surface, means for transferring fruit from said irradiation chamber to a saturated steam chamber, said saturated steam chamber maintaining the far infrared irradiated fruit at a predetermined temperature for a predetermined period of time, a mechanism for reducing pressure of said saturated steam chamber, a nozzle for introducing steam in a steam jet into said steam chamber, and means for controlling said steam jet by automatically opening the nozzle when the temperature of said steam chamber has fallen under a predetermined level or when the pressure of the steam chamber has fallen under the saturated steam pressure.

4,875,408

BEVERAGE MAKER FOR USE IN AUTOMOTIVE VEHICLES

Frank C. McGee, 1930 Port Dunleith, Newport Beach, Calif. 92660

Filed Feb. 27, 1989, Ser. No. 315,828

Int. Cl.⁴ A47J 31/00

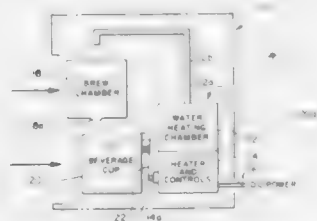
U.S. Cl. 99—283

11 Claims

1. In a beverage maker system for installation and use in automotive vehicles including: a water heating chamber including means for receiving a quantity of water; means for heating said water chamber and the water contained therein; a beverage-brewing chamber including beverage making material in a quantity sufficient when acted upon by hot water to make one cup of hot beverage and aperture means for dispens-

ing hot beverage from said chamber; conduit means for directing the flow of heated water from said water chamber to said beverage-brewing chamber; means for initiating and controlling the heating of water in said water chamber to a predetermined temperature and for controlling the flow of heated water through said conduit means to said beverage-brewing chamber; and a beverage drinking cup positionable within said beverage maker system for receiving hot beverage dispensed from the beverage-brewing chamber, an improved beverage-brewing chamber comprising:

- (a) an upper brewing chamber area for receiving heated water from the water heater chamber via said conduit
- (b) a disposable brew basket within a lower brewing chamber area, said brew basket including a central top opening for receiving heated water from said upper chamber, a bottom wall having a multiplicity of fluid flow perforations, and a filter-like pouch located within said brew



basket and containing said beverage making material, the bottom wall of said brew basket includes closure means for seating in and closing the aperture means for dispensing hot beverage from the beverage-brewing chamber; and

- (c) shape-memory alloy members of initially reduced height located within said lower brewing chamber area below said brew basket, positioned around the closure means of said brew basket, and in contact with the bottom wall thereof, said shape-memory members being expandable in height upon being heated to a predetermined temperature by hot beverage flowing from the fluid flow perforations in the bottom wall of said brew basket whereby said bottom wall is lifted by said members and the closure means thereof is unseated from the aperture means of said beverage-brewing chamber thereby permitting the flow of hot beverage from said chamber to said beverage drinking cup.

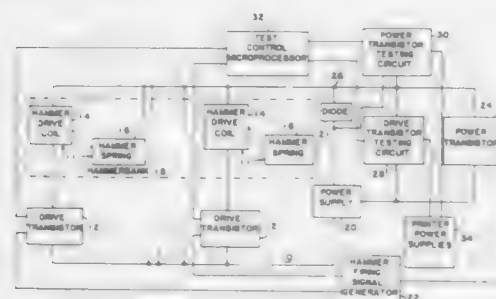
4,875,400

MAGNETIC PRINT HAMMER ACTUATOR PROTECTION CIRCUIT

David C. Condon, Mission Viejo, and David M. Stumfall, Santa Ana, both of Calif., assignors to Printronix, Inc., Irvine, Calif.
Filed Jul. 1, 1987, Ser. No. 68,345
Int. Cl. B41J 9/38

U.S. Cl. 101-93.29

14 Claims



1. In a printer having a common power transistor, a circuit

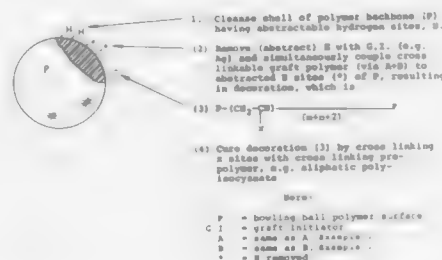
for detecting a failure condition of the common power transistor comprising means for sensing conductivity of the common power transistor and means for signaling a failure condition when the common power transistor is switched off and at the same time begins to conduct at a level signifying abnormal operation, the printer including a plurality of drive transistors for driving a plurality of print hammer actuators and the common power transistor being coupled to provide rapid current rise in each of the drive transistors when the drive transistors are switched on.

4,875,410

DECORATING BOWLING BALLS

Andrew J. Lee, Hopkinsville, Ky.; Mohan L. Sanduja, Flushing, N.Y.; Kenneth Sugathan, Piscataway, N.J.; Felicia Dragnea, Forest Hills, and Carl Horowitz, Brooklyn, both of N.Y., assignors to Ebonite International, Inc., Hopkinsville, Ky.
Filed Jan. 25, 1988, Ser. No. 148,002
Int. Cl. B41F 17/00; B41M 1/10; B44C 1/16; B05D 3/12
U.S. Cl. 101-170

2 Claims



2. A method of decorating a bowling ball, the ball having an outer shell selected from the group consisting of rubber, polyester and polyurethane each presenting in its molecular structure active hydrogens capable of undergoing abstraction for graft polymerization at vacated hydrogen sites, comprising the steps of:

- (I) applying to a plate, having the decoration for the ball, a polymeric decorating composition which will graft to the surface of the ball and comprising parts A, B and C; part A containing a graft monomer with cross-linkable sites and a graft prepolymer with cross-linkable sites in a solvent therefor;
- part B containing a cross-linker and solvent therefor for cross-linking said cross-linkable sites;
- part C containing a graft initiator in the form of metal ions to abstract said active hydrogen sites and transform the abstracted sites into free radical sites to which the monomer and prepolymer of part A couple covalently in a monomer-prepolymer chain;
- (II) lifting the decoration composition, in decorative form, from the plate and transferring the so lifted decoration to the ball; and
- (III) exposing the ball bearing the transferred decoration to infrared or ultraviolet light to complete cross-linking, cure and graft bonding of the decoration resulting in a (1) cross-linked graft polymer which is (2) covalently coupled by graft polymerization to said free radical sites.

4,875,411

HANDOM LOTTO MARKER

Lanny Turner, 72 Bedford St., New York, N.Y. 10014
Continuation of Ser. No. 229,562, Aug. 5, 1988, abandoned. This application Mar. 16, 1989, Ser. No. 325,076
Int. Cl. B41K 1/42

U.S. Cl. 101-333

22 Claims

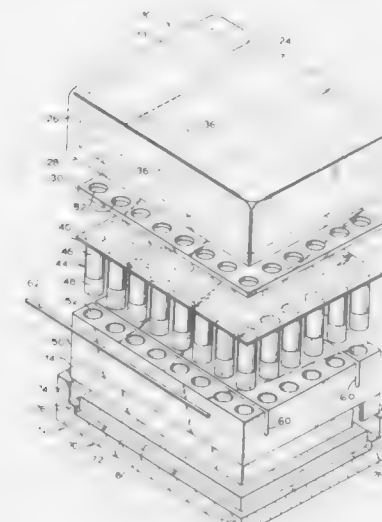
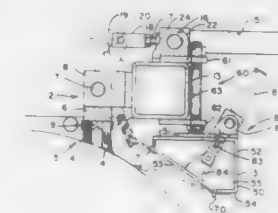
1. Portable hand-operated mechanical apparatus for making a random wager selection, comprising:

- (A) means for generating a substantially random first pat-

tern, said generating means including a cage, cage-biasing means, and a plurality of balls, said cage being moveable between a vertically extended normal configuration enabling random horizontal movement of said balls within said cage and a vertically collapsed printing configuration fixing said balls against horizontal movement within said cage and forcing said balls downwardly, said cage-biasing means biasing said cage to its vertically extended normal configuration and thereby permitting said balls to assume the first pattern after said cage is randomly shaken; and

(B) means for marking a wagering sheet with printing in a second pattern essentially the same as said first pattern and constituting a wager selection, said marking means including a plurality of independently selectable marking elements independently moveable between inoperative and operative positions and element-biasing means, said mark-

mounted to said press, said brush means including at least one brush mounted for movement between at least a first position where said brush is in contact with said blanket cylinder and second position where said brush is remote from said blanket cylinder, means for moving said brush between said first and said second positions; means for mounting said brush to said



press including means for adjusting the position of said brush with respect to said blanket cylinder; and means for receiving and automatically removing debris from said brush when said brush is moved to said second position, said last mentioned means including vacuum means for receiving debris from said brush.

4,875,413

APPARATUS FOR PERFORATING WELLS

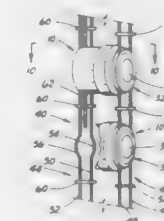
Glenn B. Christopher, Ft. Worth, and Jerry D. Motley, Arlington, both of Tex., assignors to Jet Research Center, Inc., Mansfield, Tex.

Filed Nov. 30, 1988, Ser. No. 278,695

Int. Cl. F42B 1/02; E21B 43/119

U.S. Cl. 102-307

20 Claims



ing elements in said inoperative position being longitudinally elevated and said marking elements in said operative position being longitudinally depressed, said element-biasing means biasing said marking elements to their inoperative position;

said apparatus additionally including a downwardly extending lip for maintaining said marking elements in said inoperative position spaced above the sheet while enabling said marking elements in said operative position to engage the sheet; whereby downward movement of said balls as a result of the movement of said cage to its vertically collapsed printing configuration operatively vertically depresses the marking elements vertically aligned with said balls to their operative positions, a vertical alignment of one of said balls and one of said marking elements being required for said one marking element to mark the sheet.

4,875,412

PRINTING PRESS BLANKET CLEANER

Norman D. Wright, 101 Cardinal Dr., Belleville, Ill. 62221; Gary C. Glanzner, 5083 Towne Center Dr., St. Louis, Mo. 63128, and John A. Signorelli, 12334 E. Inlet Ridge, Maryland Heights, Mo. 63043

Filed May 20, 1988, Ser. No. 197,036

The portion of the term of this patent subsequent to May 26, 2004, has been disclaimed.

Int. Cl. B41L 41/00; A47L 13/52

U.S. Cl. 101-425

10 Claims

1. In an offset printing press having a blanket cylinder adapted to rotate about a longitudinal axis, the improvement which comprises a dry mechanical blanket cleaner system for removing dust and lint from said blanket cylinder during an uninterrupted course of a press run, said blanket cleaner system including a normally non-rotating brush means operatively

1. Apparatus for perforating a subterranean formation penetrated by a well bore comprising:

a shaped charge having a discharge end and an ignition end, the ignition end including an extension providing cavities for containing opposed portions of a pair of wires of a wire carrier and a passage for connecting detonation initiating means thereto;

a cap sealingly attached to said shaped charge over the discharge end thereof, said cap including a threaded extension whereby said cap and shaped charge can optionally be threadedly attached to a complementary threaded opening in a metal strip carrier and held at a desired position within said well bore thereby; and

a wire carrier adapter nut threadedly attached to said threaded cap extension, said adapter nut providing cavities for containing opposed portions of an additional pair

of wires whereby said cap and said shaped charge can be attached to a four-wire carrier and held at a desired position within said well bore thereby.

4,875,414

EXPLOSIVE CHARGE WITH A PROJECTILE-FORMING METALLIC INSERT

Hansjörg Stadler, Rüchtersdorf, and Klaus von Lahr, Lauf, both of Fed. Rep. of Germany, assignors to Diehl GmbH & Co., Nuremberg, Fed. Rep. of Germany

Filed Feb. 3, 1988, Ser. No. 151,713

Claims priority, application Fed. Rep. of Germany, Feb. 20, 1987, 3705381

Int. Cl.⁴ F42B 1/00

U.S. Cl. 102—307

7 Claims



1. Explosive charge with a projectile-forming metallic insert, said insert essentially having the shape of a spherically-curved dish, said insert being a body constituted from a single-crystal possessing an orientation of the crystal axes in a prescribed direction, said orientation being selected from the group consisting of [100] and [111] as shown in FIG. 3.

4,875,415

ROTARY JACK ASSEMBLY FOR A CRANE

Heki Kazuaki, Kobe, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

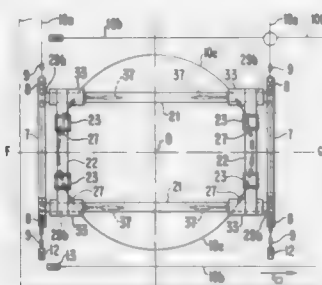
Continuation of Ser. No. 888,434, Jul. 23, 1986, abandoned. This application Jun. 29, 1988, Ser. No. 213,473

Claims priority, application Japan, Oct. 28, 1985, 60-164104

Int. Cl.⁴ B61J 1/02; B61B 13/12

U.S. Cl. 104—35

2 Claims



1. A rotary jack assembly for supporting a crane comprising:
a substantially horizontal frame assembly, said frame assembly including a first and a second pair of elongated spaced opposed substantially parallel frames, said first and second pairs of frames being substantially perpendicular to each other and intersecting each other at respective fixed intersections, said first pair of frames being an upper pair of frames, said second pair of frames being a lower pair of frames, and said second pair of frames being disposed below said first pair of frames and being fixedly attached to said first pair of frames at said fixed intersections, and;
a plurality of wheel frames for supporting said frame assembly being attached to the underside of each one of opposed frames of said first pair of frames and second pairs of frames, and each one of said plurality of wheel frames

being spaced from each one of said fixed intersections of said first and second pairs of frames;
means for vertically shifting said frame assembly relative to said plurality of wheel frames, said means for vertically shifting being attached to each of said plurality of wheel frames, and said means for vertically shifting being attached to said frame assembly on said first pair of frames;
a plurality of crane supporting arms for supporting a crane thereon, said plurality of crane supporting arms being located at opposite ends of said frame assembly, and being relatively movable to said frame assembly;
means for attaching said plurality of crane supporting arms to said frame assembly on said second pair of frames to which said plurality of wheel frames is not attached, and for horizontally shifting each arm of said plurality of crane supporting arms outwardly of said frame assembly, said means for attaching and horizontally shifting being separate from and horizontally spaced from said means for vertically shifting said frame assembly; and
each said crane supporting arm being separate from and horizontally spaced from each said means for vertically shifting said frame assembly relative to said plurality of wheel frames.

4,875,416

ENDLESS PATH STORAGE CAROUSEL WITH SELECTIVE DISCHARGE

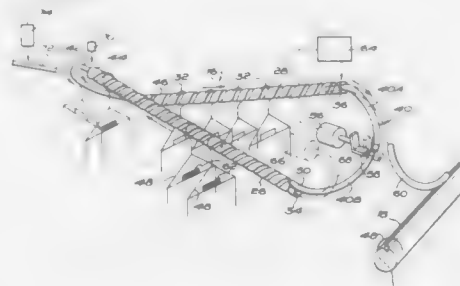
Edward Duce, West Yorkshire, England, assignor to Stockrail Ltd., West Yorkshire, England

Filed Jan. 19, 1988, Ser. No. 145,360

Int. Cl.⁴ B61B 13/00

U.S. Cl. 104—167

8 Claims



1. A live storage carousel comprising:
(a) means defining an endless path along which suspension hangers are supported and moved,
(b) a scroll conveyor forming part of said endless path and having an upper end and a lower end,
(c) means for driving the carousel so that the hangers are driven from the lower end to the upper end of said scroll conveyor,
(d) gravity return means forming part of said endless path and extending from said upper end of said scroll conveyor, and
(e) selectively operable discharge means forming part of said gravity return means for selectively discharging said hangers out of the endless path and from the carousel dependent upon the operation of said discharge means as the hangers travel on said gravity return means.

4,875,417

END STRUCTURE FOR RAILWAY CAR

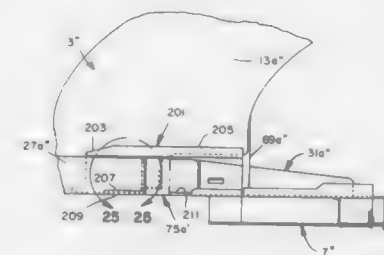
John W. Coulborn, St. Louis County, and John A. Krug, St. Charles County, both of Mo., assignors to ACF Industries, Incorporated, Earth City, Mo.

Continuation-in-part of Ser. No. 792,215, Oct. 28, 1985, Pat. No. 4,696,238. This application Aug. 21, 1987, Ser. No. 87,781

Int. Cl.⁴ B61D 7/00, 17/00

U.S. Cl. 105—248

5 Claims



1. In an end structure for a railway car, said railway car having a car body, the latter having side sheets, said end structure comprising a center stub still located generally along the longitudinal centerline of the railway car, a side sill at each side of the car extending longitudinally thereof along both sides of the car body in spaced transverse relation to center stub sill for carrying longitudinal loads from one end of the car to the other, and a side sill extension extending diagonally between an end of a respective said side sill and said center stub sill for carrying substantially all of the horizontal, longitudinal loads between said side sill and said center stub sill, wherein the improvement comprises: a connector casting between the outer end of the side sill and the inner end of the side sill extension, each of said side sills having a cutout in the lower portion thereof adjacent the outer ends of the side sill, said cutout being of sufficient size so as to facilitate welding of the inner surfaces of the side sills to the side sheets and of the side sill to said connector casting.

4,875,418

SET OF COMPONENTS FOR CONSTRUCTING FURNITURE PIECES

Ernst Moeckl, Stuttgart; Jörg Stumpf, Wernau; Walter Hardt, Paderborn, and Hermann Döinghaus, Delbrück, all of Fed. Rep. of Germany, assignors to Nixdorf Computer AG, Paderborn, Fed. Rep. of Germany

Continuation of Ser. No. 23,435, Mar. 9, 1987, abandoned. This application Oct. 14, 1988, Ser. No. 258,078

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1986, 8606663; Oct. 16, 1986, 3635108

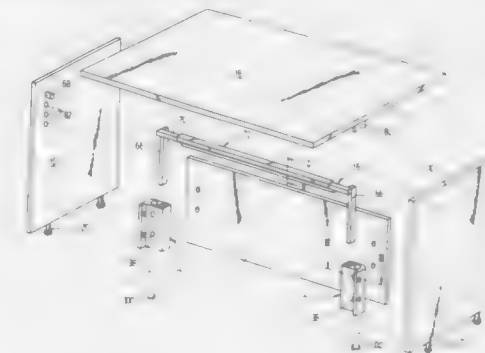
Int. Cl.⁴ A47B 35/00

U.S. Cl. 108—50

13 Claims

1. A construction set for furniture pieces, said construction set comprising:
a connecting element having a longitudinal axis;
a first part and a second part, each of said first and second parts having inner and outer faces;
said connecting element being constructed as to be connected in a predetermined arrangement to said first and to said second parts along each of said first and second part inner faces to hold said first and second parts in assembly with one another and with said connecting element;
said first part when said connecting element is connected to said first and second parts in said predetermined arrangement being spaced from said inner surface of said second part to define a slot therebetween and portions of said inner face of said first and second parts together with a portion of said connecting element defining a channel extending along said longitudinal axis and communicating with said slot;
said channel being accessible from the outer faces of each of

said first and second parts to allow a cable to be placed into said channel by moving such cable laterally of itself from a position in front of said outer faces to a position behind said inner faces of said first and second parts;
said connecting element being a corner connecting element with two flanges each containing flat fastening faces extending parallel to said longitudinal axis of said connecting element and arranged at an angle to one another;
said first and second parts are respectively connected adjacent their said inner faces to said fastening faces of said connecting element;



4,875,419

COLLAPSIBLE PAPERBOARD PALLET

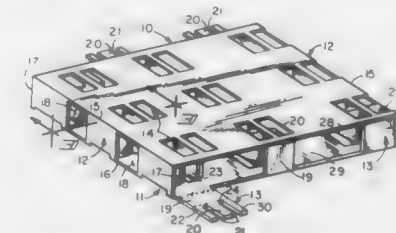
Catherine Helton, and Tim Wright, both of P.O. Box 1407, Pasco, Wash. 99301

Filed Sep. 19, 1988, Ser. No. 245,575

Int. Cl.⁴ B65D 19/12

U.S. Cl. 108—56.1

9 Claims



mechanically interconnected with its tabs in surface adjacency and each pillar set being parallel to all other pillar sets; and
fastening means for releasably maintaining the pallet in an erected rectilinear mode.

4,875,420

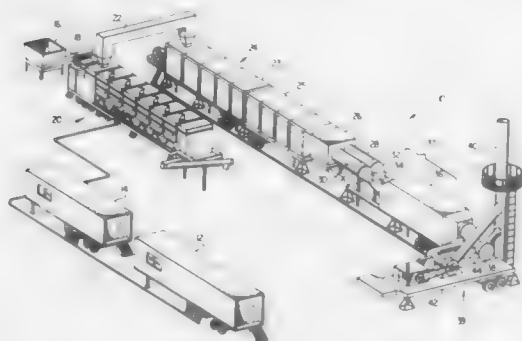
MOBILE HAZARDOUS WASTE TREATMENT SYSTEM
George H. Hay, Dallas, and Jeffrey P. Bleke, Arlington, both of Tex., assignors to Infrared Waste Technology, Inc., San Francisco, Calif.

Continuation of Ser. No. 93,295, Sep. 4, 1987, abandoned. This application Jul. 20, 1988, Ser. No. 222,323

Int. Cl. F23G 7/00

U.S. Cl. 110-215

14 Claims



1. A mobile waste treatment system, comprising:
a primary combustion chamber for receiving and burning waste material, said primary combustion chamber independently mounting on a first road transportable unit;
a secondary combustion chamber for further burning said waste material, said second combustion chamber interconnectable with said primary combustion chamber, said second combustion chamber independently mounted on a second road transportable unit; and
a scrubber section for finally processing said waste material, said scrubber section interconnectable with said secondary combustion chamber, said scrubber section independently mounted on a third road transportable unit;
said first, second, and third road transportable units each comprising a trailer having a skid section:
wherein said first road transportable unit trailer further comprises a support structure for supporting said primary combustion chamber on said skid section, said support structure fixably attached to said skid section and adjustably attached to said primary combustion chamber.

4,875,421

SEEDING IMPLEMENT WITH A COMBINATION TRANSPORT-DRIVE WHEEL

Howard C. Hadley, Des Moines, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Mar. 25, 1988, Ser. No. 172,825

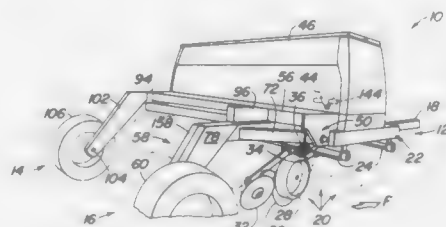
Int. Cl. A01C 19/04

U.S. Cl. 111-200

13 Claims

1. A seeding implement adapted to be towed forwardly over the ground, comprising:
a main frame extending transversely to the forward direction and having outermost ends;
a material hopper supported by the main frame;
first and second trailing ground-engaging wheels;
means for supporting the main frame on the wheels, including means for connecting the wheels to the main frame in trailing relationship to the main frame inwardly of the outermost ends;
tool assemblies connected to the main frame and movable

with respect thereto between downwardly biased ground-engaging positions and upper transport positions;
drivable metering structure for metering material from the hopper to the tool assemblies;
meter drive structure operably connecting the metering structure and the first ground-engaging wheel for driving the metering structure at a rate proportional to the forward speed of the implement;
wherein said means for connecting the wheels to the main frame includes means for fixedly supporting the second wheel at a preselected vertical location relative to the main frame, a fore-and-aft extending wheel frame, means



pivotaly connecting the forward end of the wheel frame to the main frame for free rocking of the wheel frame relative to the main frame and the second wheel about a first axis extending transversely to the forward direction, means rotatably supporting the first wheel from the aft end of the wheel frame, said wheel frame freely rockable about the first axis from an uppermost transport position to a range of field-working positions below the transport position to maintain contact between the first wheel and the ground at all times when the tool assemblies are in the ground-engaging position to thereby provide consistent drive from the first wheel to the metering structure.

4,875,422

REDUCED HEIGHT SEWING MACHINE WITH A ARCUATELY SWINGING NEEDLE BAR ARM

Hitoshi Ishikawa, Nishio, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Aichi, Japan

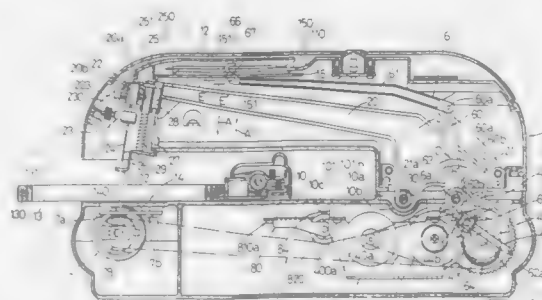
Filed May 6, 1988, Ser. No. 191,005

Claims priority, application Japan, May 15, 1987, 62-119879; May 16, 1987, 62-119267

Int. Cl. D05B 3/02, 1/00

U.S. Cl. 112-258

8 Claims



1. A sewing machine comprising:
a bed housing having a needle penetrating hole at one end thereof;
an arm housing rising from the other end of said bed housing and extending to said one end of said bed housing over said bed housing;
a needle bar arm rotatably held in said arm housing and having a needle at a front end thereof;

a swing shaft in said bed housing for rotatably holding said needle bar arm disposed in a substantially horizontal direction, an axis of said swing shaft being disposed at a height substantially identical with a height of a top surface of a throat plate having a needle penetrating hole and held on said bed housing; and
a drive unit for swinging said needle bar arm with respect to the bed housing, said drive unit being accommodated in said bed housing.

4,875,423

OVEREDGE STITCH SEAM

Roberto Conti, Milan, Italy, assignor to Conti Comptex S.p.A., Italy

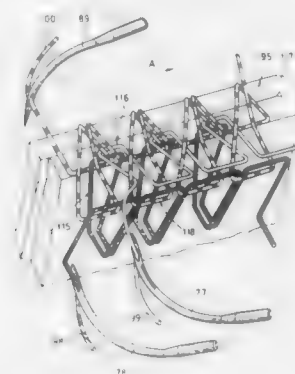
Filed Jul. 21, 1987, Ser. No. 76,163

Claims priority, application Italy, Jul. 28, 1986, 21280 A/86

Int. Cl. D05B 93/00

U.S. Cl. 112-438

5 Claims



1. An overedge stitch seam, comprising:
a workpiece having a edge, a needle entry side and a needle exit side;
first and second needle threads entering said workpiece at distinct needle thread entry points on said needle entry side and formed into first and second loops arranged within said workpiece at a distance from said edge; and
a looper thread formed into third loops, said first and second loops being formed together and always passing together through said third loops, said third loops arranged at said needle entry side being oriented transversely relative to said edge, each of said first and second loops extending from said needle exit side and interlooping with one of said third loops extending to downstream needle thread entry points at said needle entry side, said needle thread entry points and said first and second loops starting therefrom being staggered relative to each other parallel to said edge;
whereby each of said third loops receiving said first and second loops is fixed to said workpiece by one of said first and second loops if the other of said first and second loops is broken.

4,875,424

SAILBOARD CONSTRUCTION

Donald C. Baldwin, Hood River, Oreg., assignor to Gorge Technology, Inc., Hood River, Oreg.

Division of Ser. No. 98,708, Sep. 18, 1987, Pat. No. 4,774,901, which is a continuation of Ser. No. 827,242, Feb. 6, 1986, abandoned. This application Apr. 11, 1988, Ser. No. 180,336

Int. Cl. B63H 9/08; B63B 35/82

U.S. Cl. 114-39.2

9 Claims

1. In a sailboard which includes a first member which is releasably secured to a second member so as to assemble the sailboard for use, the first member having a first hollow end section, the first end section including a first wall which de-

fines a hollow interior of the first end section and which defines a first opening leading to the interior of the first end section, the first wall having at least one catch receiving opening, the second member having a hollow second end section, the second end section including a second wall which defines the hollow interior of the second end section and which is sized for insertion through the first opening into the interior of the first end section, latching means for releasably securing the first member to the second member upon insertion of the second end section into the first end section, the latching means including at least one catch means sized smaller than the catch receiving opening, the catch means being carried by the second end section and comprising means movable from a first retracted position in which the catch means does not project substantially from the outer surface of the second wall to a second latching position in which the catch means projects outwardly beyond the outer surface of the second wall, the



latching means also including biasing means for biasing the catch means from the retracted position to the latching position whereby the catch means moves to the latching position and into the catch receiving opening and releasably secures the first and second members together when the second end section is inserted into the first end section and the catch means is aligned with the catch receiving opening, and latch actuator means carried by the second member and positioned outside of that portion of the second end section which is inserted into the first end section, the latch actuator means being coupled to the latching means for selectively moving the catch means from the latching position to the retracted position to thereby selectively release the second member from the first member, and further including a universal pivot and a mast mounting cup connected to the universal pivot, a mast means comprising a mast or a mast extension, the first member comprising the mast means and the second member comprising the cup.

4,875,425

HULL FORMS

Erbil H. Serter, 34, Chemin du Pommier, CH-1218 Grand-Saconnex, Switzerland

Filed Nov. 25, 1987, Ser. No. 125,176

Claims priority, application European Pat. Off., Nov. 26, 1986, 86307123.5

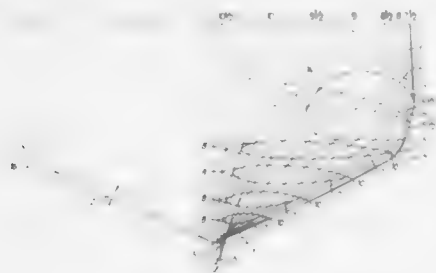
Int. Cl. B63H 5/08

U.S. Cl. 114-56

9 Claims

1. A deep-Vee based hull form constructed and arranged for use in a displacement mode, the hull having side walls, a bow, and a bilge, the hull form having a datum line disposed proximate to the bilge of the hull, the bow having a plurality of horizontal cross-sections, the horizontal cross-sections being generally parallel to the datum line, the hull form comprising at least one lateral groove at each side of the bow section, the hull having a deadrise angle of at least 20 degrees, said bow

section being extended below the datum line of the hull in a streamlined teardrop configuration, each horizontal cross-section



tion of the bow disposed downwardly from the datum line being progressively smaller.

4,875,426

FLOAT ATTACHMENT FOR WATERCRAFTS

Katsumasa Soga, Kobe, and Kazuo Matsutani, Akashi, both of Japan, assignors to Kawasaki Jukogyo Koshuiki Kaisha, Japan

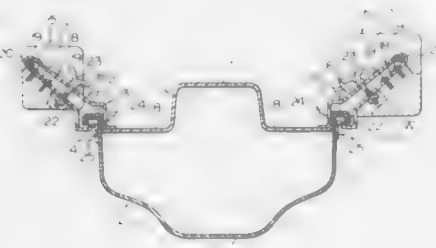
Filed Jan. 12, 1988, Ser. No. 143,113

Claims priority, application Japan, Jan. 16, 1987, 62-4480[U]

Int. Cl.⁴ B63B 43/14

U.S. Cl. 114—123

2 Claims



1. A float attachment for a small-sized watercraft having a deck, a hull including sides of the watercraft, and a bar handle, comprising:

flange portions formed at a junction between said deck and said hull;

at least one clamp comprising a hinge, a pair of clamp arms rockably connected to each other by said hinge, and means for closing said clamp arms; and

at least one float attached to said at least one clamp in such a manner that when the float is mounted on the watercraft by said at least one clamp the float provides buoyant support when the watercraft is mounted by a rider but the whole float is positioned above the water level during running of the watercraft without change in the relative positions of the watercraft and the float.

4,875,427

BOAT FENDERS WITH INTERNAL ROPE STORAGE CAPACITY

Rano J. Harris, Jr., Baton Rouge, La., assignor to Romar Technologies, Inc., Baton Rouge, La.

Filed Dec. 5, 1988, Ser. No. 279,516

Int. Cl.⁴ B63B 59/02

U.S. Cl. 114—219

12 Claims

1. A boat fender for suspension from a rope alongside the hull of a craft from a hitching device located on the craft for protection of the hull on contact thereof with a mooring site, which comprises

a body constituted of an enclosing wall providing an object

of three-dimensional shape, the external surface of which can contact said mooring site for protection of the hull,



a chamber located within the confines of the enclosing wall of said body for containment and storage of the suspending rope when the boat fender is not in use.

4,875,428

MOTORIZED OUTRIGGER DRIVE

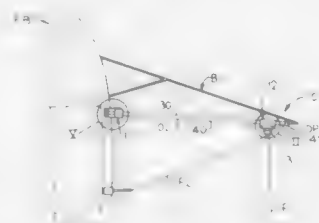
Ronald D. Schleich; Merrill H. Armstrong; Stafford J. Vallery, and Harold S. Durham, all of Stuart, Fla., assignors to Armstrong International, Inc., Three Rivers, Mich.

Filed Jan. 5, 1988, Ser. No. 141,020

Int. Cl.⁴ B63B 35/14

U.S. Cl. 114—255

24 Claims



12. A motorized outrigger drive for an outrigger of a fishing boat, the outrigger being of the kind having a boom fixedly cantilevered laterally outboard from the side of the boat for releasably trailing a fishing line from a point laterally spaced outboard from the side of the boat and thereby to minimize risk of tangling fishing lines when simultaneously trolling with several fishing lines, said outrigger drive comprising:

an outrigger line;

an outboard line direction changing means at the free end portion of said boom;

motorized drive means fixed with respect to said boat and boom and actuable for reversibly feeding said outrigger line around said outboard line direction changing means; traveller means carried on said outrigger line and having means of supporting a fishing line release, said motorized drive means comprising a mounting base arranged for fixed mounting on said boat, an intermediate base swivel mounted on said mounting base, a drive pulley driven by said motor means, and means defining a pair of line guide ports

adjacent to said drive pulley for guiding said outrigger line thereto.

4,875,429

BRAKING DEVICE FOR A CAPSULE AT THE END OF A TRAJECTORY

Charles N. Murray, and Michel R. Jamet, both of Ispra, Italy, assignors to European Economic Community, Luxembourg, Luxembourg

Filed Jan. 29, 1988, Ser. No. 213,200

Claims priority, application Luxembourg, Jan. 29, 1987, 86933

Int. Cl.⁴ B63B 35/00

U.S. Cl. 114—331

7 Claims



1. A submarine braking device for slowing down a capsule at the end of fast movement, this capsule gliding by gravity along a guiding cable which passes through an axial guiding channel of the capsule before hitting said device which is situated at the lower end of this cable, characterized by the fact that it comprises a series of disks (6 to 9) which are each fixed coaxially on said cable (3) by individual squeezing means (11, 12) authorizing a gliding of these disks on the cable, if an axial impact threshold is exceeded, and that the end of the cable (16) is attached to a shock-absorbing cylinder (13) which cooperates with a piston (14) fixed to the cable by means (15) similar to the disk squeezing means, so that the piston penetrates into the cylinder under the impact of the adjacent disk (8), the wall of the cylinder (13) having a plurality of holes (17), the diameter of which decreases towards the bottom of the cylinder.

4,875,430

BOAT BUILDING METHOD USING MODULAR PROPULSION SYSTEM

William L. Strois, Pembroke Park, Fla., assignor to Copeland-Strois Enterprises, Inc., Jefferson, La.

Filed Apr. 19, 1988, Ser. No. 183,235

Int. Cl.⁴ B63H 23/08

U.S. Cl. 114—355

16 Claims



9. An assembly for use in constructing an engine-powered propeller-driven water craft, said assembly comprising: a propeller shaft;

a support strut, including a base, for supporting said propeller shaft; and

a main casting, adapted to be integrally incorporated in the hull of a water craft, comprising an elongate substantially flat base portion, a first recessed pocket formed in said base portion having an aperture therein through which said propeller shaft extends; a further recessed pocket formed in said base portion for receiving the base of said support strut therein, and

a thrust bearing assembly connected to said propeller shaft and disposed wholly within said first pocket so to be located above the keel line of the water craft in which the main casting is adapted to be incorporated and connected to said first pocket so that thrust is transmitted through the main casting to the hull of the water craft in which the main casting is incorporated.

4,875,431

WIND DEFLECTOR

Ronald F. Dobosz, 8710 Washington St., Omaha, Nebr. 68127, assignor to John R. Boro and Ronald F. Dobosz, both of Omaha, Nebr.

Filed Aug. 26, 1988, Ser. No. 237,235

Int. Cl.⁴ G09F 17/00

U.S. Cl. 116—173

4 Claims



1. In combination:
a cylindrical vehicle aerial projecting vertically from a vehicle;
a generally planar pennant having forward and rearward ends;
said pennant having its forward end wrapped around a portion of said aerial such that said pennant is positioned in a vertical plane extending horizontally;
a wind reflector removably mounted on said aerial on the forward end of said pennant, so as to removably hold said pennant on said aerial;
said wind deflector including a vertically-oriented elongated body having upper and lower ends and a forward portion and rearward portion;
said deflector body including a pair of walls diverging rearwardly;
resilient rubber bracket means mounted on the rearward portion of said deflector and extending longitudinally along said body, said bracket means having a longitudinal slot therein adapted to snap-fit onto said aerial;
said deflector having a vertical length at least as great as the vertical height of said pennant;
said deflector walls located so as to deflect wind around the forward end of said pennant.

4,875,432

VOLLEYBALL SCOREBOARD

Joseph D. Cohen, P.O. Box 292401, Lewisville, Tex. 75029-2401, and Hyman H. Cohen, 120 DeMont East No. 309, Little Canada, Minn. 55117

Filed Oct. 17, 1988, Ser. No. 258,798

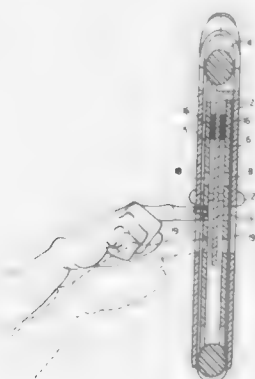
Int. Cl.⁴ A63B 71/06

U.S. Cl. 116—223

15 Claims

1. A game scoring device, which comprises:
a housing having opposed substantially transparent faces,

each of said faces having thereon a plurality of score indicia, and each of said faces having an access opening; and a pair of indicator panels rotatably mounted in said housing between said faces, each of said indicator panels



having thereon a score indicator, and each of said indicator panels having therein plurality of holes registerable with said access openings to permit said panels to be moved with respect to said housing.

4,875,433

ILLUMINATION METER DIAL DEVICE

Sakae Tsukamoto, Shizuoka, Japan, assignor to Yazaki Corporation, Japan

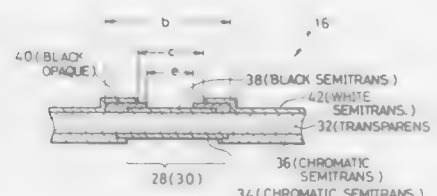
Filed Oct. 7, 1988, Ser. No. 255,024

Claims priority, application Japan, Oct. 12, 1987, 62-155728[U]

Int. Cl.⁴ G01D 13/18

U.S. Cl. 116—335

4 Claims



1. A dial device for an illumination meter, for indicating marks formed on a dial plate by illuminating the dial plate by a lamp from inside, comprising:

- a transparent base plate;
- a black semitransparent layer coated on said transparent base plate so as to form a mark;
- a black opaque layer coated so as to cover a margin and an outer periphery of the mark formed by said black semitransparent layer; and
- a white semitransparent layer coated so as to cover a margin of said black opaque layer and all over the dial plate except the mark.

4,875,434 APPARATUS FOR COATING A SUBSTRATE WITH A COATING MATERIAL

Taro Maejima, Toshio Yada, Michinari Tsutsumi, Tsuyoshi Tabuchi, Takeshi Terazono, and Masaru Aoki, all of Amagasaki City, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

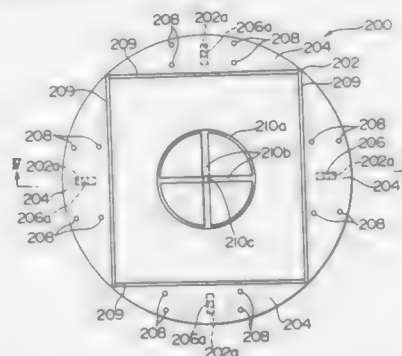
Filed Apr. 1, 1988, Ser. No. 176,864

Claims priority, application Japan, Apr. 2, 1987, 62-82109; Apr. 20, 1987, 62-59814

Int. Cl.⁴ B05C 1/02, 3/09, 7/06

U.S. Cl. 118—52

7 Claims



1. An apparatus for coating a substrate with a coating material comprising:
 - means for applying a coating material to a substrate having a flat surface and a non-circular periphery, the coating being applied to the flat surface;
 - a support table;
 - mounting means for fixedly mounting the substrate having a flat surface and a non-circular periphery on said support table;
 - drive means for rotating said support table;
 - a plurality of shaping members slidably mounted on and sliding along said support table for engaging the non-circular periphery of the substrate mounted on said support table and for thereby forming, together with the non-circular substrate, a circularly shaped surface;
 - biasing means provided for biasing said slidably mounted shaping members into contact with the non-circular periphery of the substrate mounted on said support table; and
 - level adjusting means for adjusting the levels of the slidable shaping members relative to said support table so that said shaping members are flush with the flat surface of the substrate mounted on said support table.

4,875,435

FLUIDIZED BED DRYER/GRANULATOR

Chaur-Ming Jan, Randolph, N.J., and Mark E. Oehling, Stroudsburg, Pa., assignors to Warner-Lambert Company, Ann Arbor, Mich.

Filed Feb. 24, 1988, Ser. No. 159,805

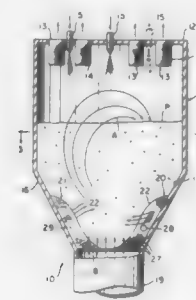
Int. Cl.⁴ B05C 19/02

U.S. Cl. 118—62

8 Claims

1. A fluidized bed apparatus for drying particles, comprising:
 - a chamber having a top wall, a side wall and a bottom wall; an axial air inlet in the bottom wall communicating with the interior of the chamber for directing an axial flow of air upwardly through the chamber; and
 - at least one stationary removable lateral air inlet housing resting in said chamber on at least one of said side wall and bottom wall of the chamber and having a perforated side wall facing tangentially to the side wall of the chamber for discharging a flow of air into the chamber in a direction tangential to the chamber side wall, the axial and lateral air flows interacting to produce a swirling or orbital motion for suspending and circulating said particles in a three-dimensional rotational path in the interior of the

chamber for thorough admixing and drying of the particles, said removable lateral air inlet housing being capable



of being simply lifted out of said chamber to quickly and easily adapt the apparatus to use in other processes.

4,875,436

WASTE HEAT RECOVERY SYSTEM

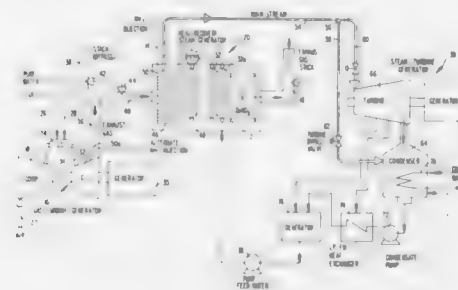
Edward M. Smith, Wyncote, Pa., and Richard C. Cornelison, Hiram, Ohio, assignors to W. R. Grace & Co.-Conn., New York, N.Y.

Continuation-in-part of Ser. No. 154,144, Feb. 9, 1988, abandoned. This application May 23, 1988, Ser. No. 197,530

Int. Cl.⁴ F22D 1/00

U.S. Cl. 122—7 R

16 Claims



1. A waste heat recovery system comprising in combination:
 - (a) a conduit for conveying an exhaust gas stream;
 - (b) a boiler assembly connected to said conduit including a heat recovery steam generator through which said exhaust gas is flowed, and characterized by a high temperature steam tube heat exchanger and, at a downstream location relative thereto, a water-tube boiler;
 - (c) an ammonia gas injector for injecting ammonia gas into the exhaust gas stream and located upstream of the water-tube boiler in juxtaposition to the exhaust gas source; and
 - (d) a low temperature selective catalytic reduction unit located downstream of the water-tube boiler.

4,875,437

APPARATUS FOR CONTROLLING THE FLOW OF COOLING FLUID IN AN ENGINE

Andre Cook, and Jean P. Chamot, both of Arpaçon, France, assignors to Procédés Vernet, Arpaçon Cedex, France

Filed Dec. 3, 1987, Ser. No. 128,438

Int. Cl.⁴ F01P 7/16

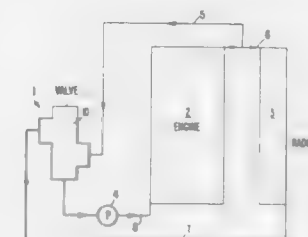
U.S. Cl. 123—411

24 Claims

1. Apparatus for controlling the flow of cooling fluid in a cooling system for an internal combustion engine, wherein the cooling system includes a circulating pump, a first flow path from the engine through a heat exchanger and back to the

engine and a second, bypass flow path from an outlet of the engine to an inlet of the engine, comprising:

- a thermostatic valve having a body defining a chamber;
- a first port into said chamber, said first port being in communication with the heat exchanger;
- a second port into said chamber, said second port being in communication with the engine;
- means for controlling fluid flow through said first and second ports, said fluid flow controlling means comprising at least one valve element moveable from a position closed with respect to one of said ports to control the flow through said first and second ports; and



- means for operating said fluid flow control means, said operating means comprising a first thermostatic element mounted in said chamber and connected to said valve element, said first thermostatic element being responsive to the temperature of fluid in said chamber to move said valve element relative to said ports, and a second thermostatic element connected to said first thermostatic element, said second thermostatic element operable independent of said first thermostatic element and being responsive to parameters other than and independent of the temperature of fluid in said chamber to open said valve element and, thereby, vary the operation of said fluid flow controlling means.

4,875,438

METHOD OF CONTROLLING COMPOSITE INTAKE MANIFOLD SYSTEM FOR INTERNAL COMBUSTION ENGINE

Shigeru Suzuki, Tokorozawa, and Shinichi Shimida, Utsunomiya, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 5, 1987, Ser. No. 117,695

Claims priority, application Japan, Nov. 5, 1986, 61-262031

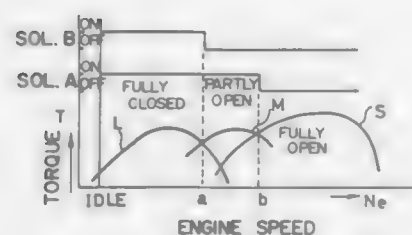
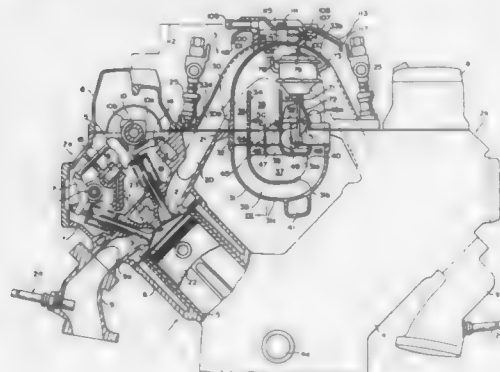
Int. Cl.⁴ F02B 3/00

U.S. Cl. 123—52 MB

15 Claims

1. A method of controlling a composite intake manifold system for supplying intake air to an internal combustion engine, said composite intake manifold system including an intake distribution chamber coupled to a throttle valve disposed upstream thereof in a direction in which said intake air flows, longer and shorter intake pipes extending from said intake distribution chamber, bypass valves disposed in said shorter intake pipes, respectively, said longer and shorter intake pipes being joined into intake passages downstream of said bypass valves in said direction, said intake passages being adapted to be connected to respective cylinders of the internal combustion engine, said method comprising the steps of:

adjusting the amount of the intake air to flow into said intake distribution chamber with said throttle valve; and



controlling said bypass valves to be selectively fully closed, partly opened, and fully opened according to operating conditions of said internal combustion engine.

4,875,439

MARINE PROPULSION SYSTEM WITH FUEL LINE COOLER

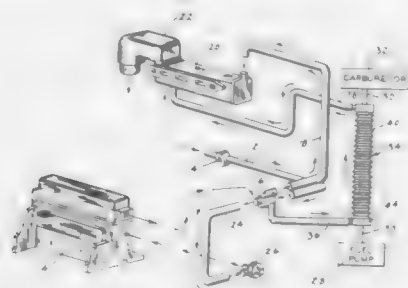
Steven L. Widmer, Oshkosh, Wis.; Gerald F. Neisen, Merritt Island, Fla.; Jeffrey P. Ruhake, Fond du Lac, Wis.; Thomas J. Steffen, Fond du Lac, Wis.; and Brian S. Buchholz, North Fond du Lac, Wis., assignors to Brunswick Corporation, Skokie, Ill.

Division of Ser. No. 204,631, Jan. 9, 1988, which is a division of Ser. No. 2,309, Jan. 9, 1987, Pat. No. 4,768,492. This application Mar. 14, 1989, Ser. No. 324,253

Int. Cl.⁴ F02M 31/20

U.S. Cl. 123—341

11 Claims



1. In a marine propulsion system having a water-cooled internal combustion engine in a heat-retentive compartment, and including a fuel line in said compartment supplying fuel for combustion by said engine, fuel line cooler means in said compartment in heat transfer relation with said fuel line and having an inlet communicating with a source of cooling water and having an outlet for discharging water, wherein said fuel line

cooler comprises a water hose and clamp means clamping said water hose into heat transfer relation with said fuel line, wherein said clamp means comprises heat transfer material and mounts said fuel line and said water hose in spaced relation separated by said heat transfer material.

4,875,440

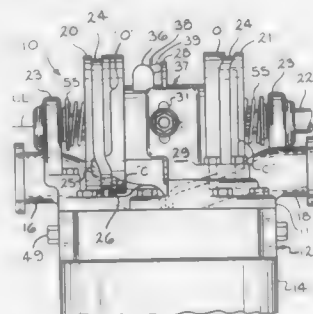
VALVE CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINES

Stephen J. Kaptur, 1841 Dority Blvd., Toledo, Ohio 43615
Filed Dec. 9, 1988, Ser. No. 281,662

Int. Cl.⁴ F01L 7/08

U.S. Cl. 123—81 B

5 Claims



1. A valve control system for an internal combustion engine, said system comprising a primary control and a secondary control for modifying the operation of the primary control, said primary control comprising:

a camshaft journaled for rotation in camshaft brackets, intake and exhaust cylindrical cams mounted on, for rotation with, the camshaft, said cams including cam channels, valve pin means, connectable to valves in the associated engine, for cooperating with the cam channels in said cylindrical cams to translate rotation of the cylindrical cams into a pattern of controlled reciprocation of the valves and

timing belt means for imparting rotation to the camshaft from a rotatable part of the engine, said secondary system comprising control plate means adjustably mounted between said cylindrical cams,

rocker arm means mounted on said camshaft for rotation therewith, said last named means including a contact leg and a driver leg, said contact leg being positioned to selectively contact said control plate means during rotation of said camshaft, wherein such contact displaces said driver leg of said rocker arm means, and

at least one driver positioned between said driver leg and one of said cylindrical cams, said driver being operable, when the driver leg is in contact therewith, to transmit displacement of the driver leg to one of said cylindrical cams thereby modifying the pattern of controlled reciprocation of at least one of the valves.

4,875,441

ENHANCED EFFICIENCY VALVE ACTUATOR

William E. Richeson, and Frederick L. Erickson, both of Fort Wayne, Ind., assignors to Magnavox Government and Industrial Electronics Company, Fort Wayne, Ind.

Filed Jan. 6, 1989, Ser. No. 294,728

Int. Cl.⁴ F01L 9/02

U.S. Cl. 123—90.13

23 Claims

1. A bistable electronically controlled fluid powered transducer having a first member reciprocative in a housing along an axis between first and second positions;

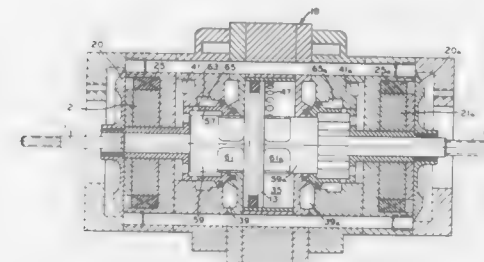
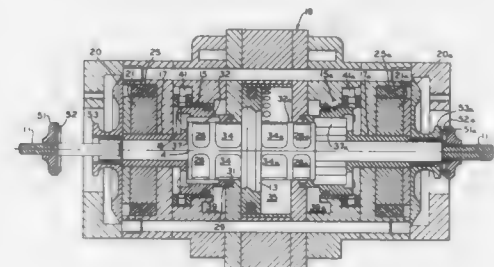
a control valve reciprocative in said housing along said axis

between open and closed positions and having first and second opposite surfaces;

magnetic latching means comprising a permanent magnet for closing and holding said control valve in its closed position;

electromagnetic means for temporarily neutralizing the effect of said magnetic latching means to release the control valve to move from the closed position towards the open position;

fluid pressure means comprising a fluid pressure source for providing fluid pressure to said valve to move said valve toward said open valve position against the holding force of said permanent magnet;

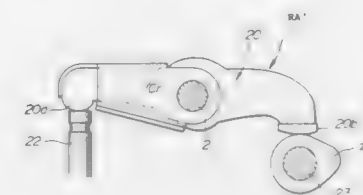
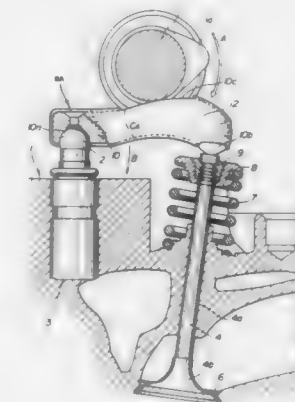


means to energize said electromagnetic means to provide an electric pulse to said electromagnetic means to temporarily neutralize the effect of said permanent magnet so that said control valve can move in said one direction under fluid pressure from said source;

each of said member and said valve having first and second opposite axial ends;

said member first axial end carrying a valve end engaging abutment for abutting said valve first axial end to urge said valve towards said closed position during travel of said member towards said first position thereby damping the motion of said first member and providing impetus to said valve towards said closed position.

a main body section made of ceramics and having an outer surface; and



a protective member section made of a ductile material and covering said outer surface of said main body section.

4,875,443

START CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE

Ryuichi Sano, Ooba, and Shigenori Isomura, Kariya, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

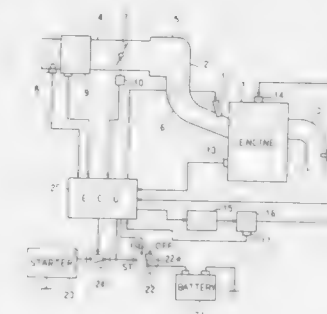
Filed Feb. 10, 1988, Ser. No. 154,373

Claims priority, application Japan, Feb. 17, 1987, 62-34239

Int. Cl.⁴ F02D 41/06

U.S. Cl. 123—179 G

7 Claims



1. A start control system for an internal combustion engine comprising:

fuel injection means for injecting fuel into said engine when activated;

starter means for cranking said engine when energized;

command means for generating a command instructing initiation of operation of said engine;

first control means for initiating activation of said fuel injection means in response to said command from said command means so that a predetermined pre-start fuel (TAU)

4,875,442

CERAMIC ROCKER ARM

Shigeaki Akao, and Masato Taniguchi, both of Aichi, Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya, Japan

Filed Dec. 22, 1988, Ser. No. 288,128

Claims priority, application Japan, Dec. 24, 1987, 62-196253[U]

Int. Cl.⁴ F01L 1/18

U.S. Cl. 123—90.39

6 Claims

1. A rocker arm for an internal combustion engine, comprising:

is injected thereby, wherein said first control means determines an amount of said pre-start fuel in dependence on said temperature of said engine and decreasingly corrects said amount of pre-start fuel as a number of pre-start fuel injection previously attained increases; and second control means for disabling energization of said starter means until said pre-start fuel injected by said fuel injection means starts to vaporize, wherein said second control means determines a delay period (TD) in dependence on a temperature (THW) of said engine in response to said command from said command means and initiates energization of said starter means when the determined delay period elapses from said command from said command means so that said pre-start fuel is taken into said engine after being vaporized during said delay period.

4,875,444

SWIRL CHAMBER FOR DIESEL ENGINES AND THE LIKE

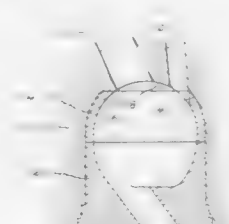
Hirofumi Tsuchida, Yokosuka; Toshiaki Tanaka, Fujisawa; Akira Oyama, Yomo, and Sumio Hirao, Yokohama, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan
Filed Jul. 28, 1988, Ser. No. 225,188

Claims priority, application Japan, Jul. 29, 1987, 62-116404[U]

Int. Cl.⁴ F02B 3/00, 75/98

U.S. Cl. 123—270

8 Claims



1. In a swirl chamber type internal combustion engine a thermally insulating member disposed in a recess formed in a metallic cylinder head, said insulating member including a cavity which defines a portion of said swirl chamber; means defining an aperture in said insulating member; and means defining a metallic projection which fits into said aperture, said projection including first and second bores, said first and second bores being arranged to receive first and second devices.

4,875,445

COMBUSTION CHAMBER OF A SUB-CHAMBER TYPE INTERNAL COMBUSTION ENGINE

Koji Imoto; Mataji Tateishi; Tadao Omura, all of Nagasaki; Kunihiko Nakajima, Mukou; Motoyuki Maekawa, Kyoto; Moritake Matsuyama, Kyoto, and Hiroki Tamura, Kyoto, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha and Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Feb. 24, 1988, Ser. No. 159,942

Claims priority, application Japan, Mar. 13, 1987, 62-56916

Int. Cl.⁴ F02B 19/18

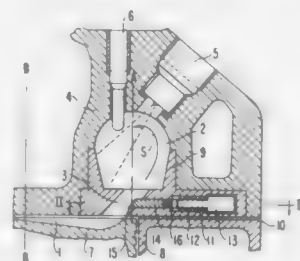
U.S. Cl. 123—292

8 Claims

1. A combustion chamber of a sub-chamber type internal combustion engine, comprising:

a sub-chamber port communicating a main combustion

chamber with a subsidiary combustion chamber formed within a cylinder head;
a space portion formed in a cylinder head member on a side of a sub-chamber port wall located farthest from a cylinder center line on a cross-sectional plane of said sub-chamber port defined as a plane including a center line of the subsidiary combustion chamber and a center line of a cylinder, said space portion opening into said sub-chamber port;



- an expansible/contractible tube contained within said space portion;
- a sub-chamber port control rod connected to said expansible/contractible tube and slidably extending into said space portion; and
- a working substance sealingly filled into said expansible/contractible tube and having the characteristic of undergoing large expansion and contraction in response to temperature variations.

4,875,446

SYSTEM AND METHOD FOR CONTROLLING AN ENGINE IDLING SPEED FOR AN INTERNAL COMBUSTION ENGINE

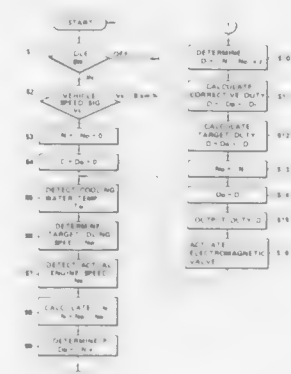
Toshikazu Nemoto, and Shinsuke Nakazawa, both of Kanagawa, Japan, assignors to Nissan Motor Company, Limited, Japan
Filed Mar. 31, 1988, Ser. No. 177,913

Claims priority, application Japan, Apr. 9, 1987, 62-85680

Int. Cl.⁴ F02M 3/12

U.S. Cl. 123—339

16 Claims



1. A system for controlling an engine idling speed for an internal combustion engine, comprising:
 - (a) first means for detecting an engine operating condition, the first means including a first sensor for detecting an engine speed and a second sensor for detecting an engine coolant temperature;
 - (b) second means for determining whether the engine falls in an engine idling condition on the basis of the engine operating condition;
 - (c) third means for controlling a fluid flow quantity passing through a bypass passage installed in an intake passage of

the engine when the engine falls in the engine idling state on the basis of an input signal having a controlled duty ratio, the duty ratio having a feedback control proportional coefficient and a feedback control integration coefficient and being varied according to the engine coolant temperature, so that the engine speed detected by the sensor coincides with a target engine speed determined according to the engine operating condition; the third means having an electromagnetic valve installed in the bypass passage for opening and closing the bypass according to the input signal having the duty ratio determined according to the engine operating condition; and (d) fourth means for varying the fluid flow quantity characteristic of the third means according to the engine operating condition, the fourth means having fifth means for heating a coil portion of the electromagnetic valve to a temperature which coincides with the engine coolant temperature so that the fluid flow quantity characteristic of the electromagnetic valve is varied according to the engine cooling water temperature representing the engine operating condition.

4,875,447

METHOD AND APPARATUS FOR CONTROLLING THE SOLENOID CURRENT OF A SOLENOID VALVE WHICH CONTROLS THE AMOUNT OF SUCTION OF AIR IN AN INTERNAL COMBUSTION ENGINE

Takeo Kinchi, and Hidetoshi Sakurai, both of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 920,544, Oct. 20, 1986, abandoned.

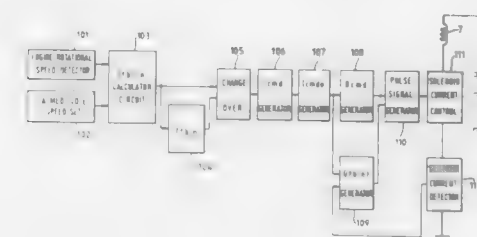
This application Mar. 31, 1988, Ser. No. 178,807

Claims priority, application Japan, Oct. 21, 1985, 60-233356; Oct. 21, 1985, 60-233361

Int. Cl.⁴ F02D 41/16

U.S. Cl. 123—339

5 Claims



1. A method of controlling a solenoid current of a solenoid valve which controls the amount of suction air of an internal combustion engine, said control valve being a proportionally controllable valve whose opening degree can be controlled in proportion to supply current, said method comprising the steps of:

detecting engine rotational speed;
setting an aimed idling speed corresponding to a predetermined idling speed;
calculating a feedback control valve as a function of a deviation signal between said engine rotational speed and said predetermined idling speed;
calculating a solenoid current control value based upon the feedback control valve;
determining a corrected solenoid current control value as a function of the solenoid current control value, the function being for converting from the solenoid current control value to the corrected solenoid current control value to make the opening degree of said control valve proportional to said solenoid opening degree control value;
determining a pulse duration signal as a function of the corrected solenoid current control value, the function being for converting from the corrected solenoid current control value to an output current of a driving circuit to make input-output characteristics in the driving circuit of

the solenoid valve proportional to the corrected solenoid current control value; and
controlling said solenoid, current as a function of said, pulse duration signal.

4,875,448

CYCLIC RESPONDING ELECTRONIC SPEED GOVERNOR

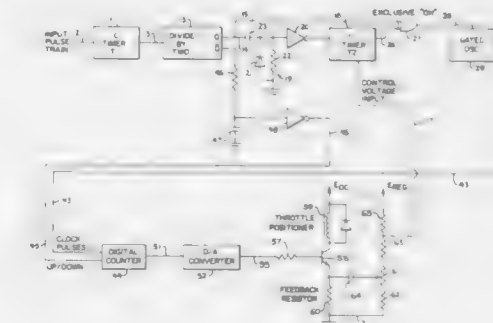
Richard A. Dykstra, Cedar Grove, Wis., assignor to Briggs & Stratton Corporation, Wauwatosa, Wis.

Filed Sep. 23, 1988, Ser. No. 249,341

Int. Cl.⁴ F02D 41/16; B60K 31/00

U.S. Cl. 123—352

24 Claims



1. An electronic speed governor system, comprising:
 - signal input means for producing a source input signal indicative of actual speed;
 - control means responsive to said source input signal and a control input signal for producing a control output signal indicative of a desired speed;
 - comparator means for comparing said source input signal with said control output signal to produce an error signal proportional to the difference between said source input signal and said control output signal;
 - oscillator means responsive to said error signal for producing a timing signal proportional to said error signal;
 - counter means responsive to said timing signal and said source input signal for producing a continuous counter output signal; and
 - actuator means responsive to said continuous counter output signal for adjusting said actual speed.

4,875,449

ARRANGEMENT FOR PREVENTION OF TROUBLESOME LOAD CHANGE SHOCKS IN AN INTERNAL COMBUSTION ENGINE SERVING TO PROPEL A VEHICLE

Karl-Martin Krümer, Wolfsburg, and Richard Dorenkamp, Isenbüttel, both of Fed. Rep. of Germany, assignors to Volkswagen AG, Wolfsburg, Fed. Rep. of Germany

Filed Oct. 19, 1988, Ser. No. 259,971

Claims priority, application Fed. Rep. of Germany, Nov. 20, 1987, 3739361

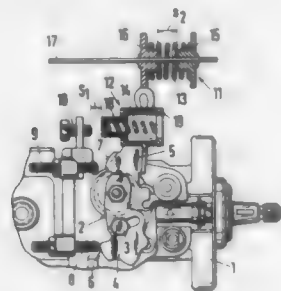
Int. Cl.⁴ F02D 11/04

U.S. Cl. 123—400

5 Claims

1. Apparatus for preventing troublesome load change shocks in an internal combustion engine for driving a vehicle comprising a power control element, adjustment lever means for the power control element, engine power control means delivering commands for said power control element, first spring means operationally positioned between the engine power control means and the adjustment lever means, and second spring means stronger than the first spring means and operationally positioned between the adjustment lever means and a stop member, whereby the adjustment lever means is first moved

from an idling position by motion of the engine power control means, then remains stationary during further movement of the



engine power control means, and then moves again during still further movement of the engine power control means.

4,875,450

IGNITION TIMING CONTROLLING DEVICE FOR AN INTERNAL COMBUSTION ENGINE

Haruhiko Yoshikawa, Niiza, and Makoto Kawai, Tokorozawa, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

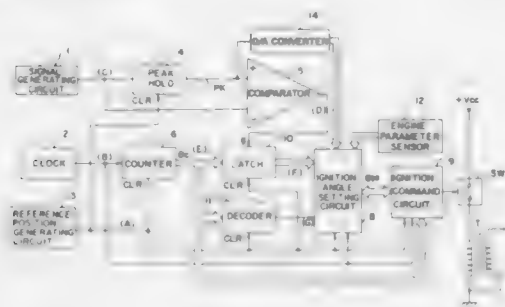
Filed Jan. 13, 1988, Ser. No. 143,333

Claims priority, application Japan, Jan. 13, 1987, 62-5638; Jan. 16, 1987, 62-7627

Int. Cl.⁴ F02P 5/145

U.S. Cl. 123-425

9 Claims



1. An ignition timing controlling device for an internal combustion engine comprising:

- a reference position signal generating means for generating a reference position signal each time the rotational angular position of a crank of an internal combustion engine reaches a reference angular position;
 - a pressure indicating signal generating means for generating a pressure indicating signal indicative of an internal pressure of a combustion chamber of said engine;
 - a peak detecting means for generating a pressure indicating peak value, a position signal indicative of a maximum peak value and a position of the pressure indicating signal after generation of a reference position signal until generation of a next reference position signal; and
 - an ignition instructing means for instructing ignition at an ignition angle corresponding to the pressure indicating peak value and the position signal;
- said ignition instructing means delivers an ignition instruction at an ignition timing depending upon a history of change of the pressure indicating peak position while the rate of change of the pressure indicating peak value is low; said ignition instructing means delivers an ignition instruction at an ignition timing independent of the pressure indicating peak position when said engine is operating at a low speed and the rate of change of the pressure indicating peak value is high.

4,875,451

DIESEL TUNE UP METHOD

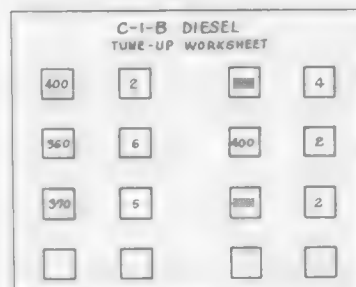
Robert J. Evasick, and Edward J. Evasick, both of 337 E. San Ysidro Blvd., Unit "E", San Ysidro, Calif. 92073

Filed Jul. 14, 1988, Ser. No. 218,942

Int. Cl.⁴ F02M 61/14

U.S. Cl. 123-435

5 Claims



1. A method of improving the performance of a multi-cylindered diesel engine having unit injectors by tuning, comprising the following steps:

- measuring the non-combustion compressions of a plurality of the cylinders of said diesel engine and noting the relative compressions of the cylinders relative to one another; and
- selecting and installing fuel injectors of differing flow rates, with the particular flow rate of each injector being so installed, being inversely related to the relative compression of the cylinder into which it is being installed, such that cylinders having relatively low compression are fitted with injectors having relatively high flow rates and vice-versa.

4,875,452

FUEL CONTROL APPARATUS FOR AN INTERNAL COMBUSTION ENGINE

Toshihiro Hara; Takanori Fujimoto, and Ikuro Mura, all of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

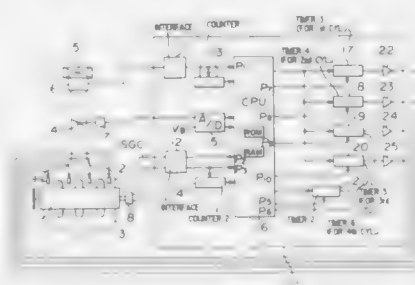
Filed Jun. 30, 1988, Ser. No. 214,056

Claims priority, application Japan, Jul. 6, 1987, 62-169084; Jul. 14, 1987, 62-176291; Jul. 22, 1987, 62-184154

Int. Cl.⁴ F02D 41/18, 41/06; F02M 51/00

U.S. Cl. 123-488

5 Claims



1. A fuel control apparatus for an internal combustion engine comprising a crank angle sensor producing a crank angle signal at a predetermined crank angle in said engine, an intake air quantity detecting means for detecting the quantity of intake air sucked in the engine, an injector for injecting fuel to an engine cylinder, and a control means for actuating the injector at a driving time in response to the quantity of intake air and at a timing determined by the crank angle signal, said fuel control apparatus being characterized by comprising a

period calculating means for calculating the next period on the basis of the previous period and the present period in the crank angle signal and an injection-initiating time control means for controlling time to actuate the injector in accordance with the next period of the crank angle signal.

4,875,453

AIR-FUEL RATIO CONTROL SYSTEM FOR AN ENGINE

Kunihoro Abe, Higashimurayama, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

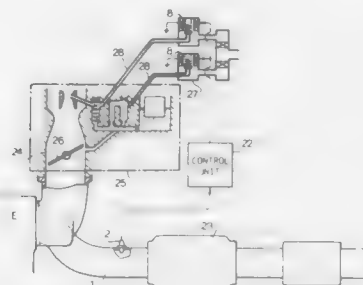
Filed Mar. 18, 1988, Ser. No. 170,441

Claims priority, application Japan, Mar. 23, 1987, 62-069563

Int. Cl.⁴ F02M 39/00

U.S. Cl. 123-440

7 Claims



1. In an air-fuel ratio control system for an engine, having an exhaust gas sensor for sensing concentration of content of exhaust gases of the engine providing an output of the exhaust gas sensor dependent on the concentration, an actuator for controlling air-fuel ratio of mixture to be supplied to the engine, a feedback control system responsive to the output of the exhaust gas sensor for operating the actuator to control the air-fuel ratio dependent on the output of the exhaust gas sensor, the feedback control system including peak value producing means for producing an upper peak value signal and representing an upper peak value a lower peak value signal, first reference value providing means responsive to the upper and lower peak value signals for providing a reference value, a comparator for comparing the output of the exhaust gas sensor with the reference value for producing an error signal, and a driving circuit responsive to the error signal for operating the actuator, the improvement in the air-fuel ratio control system comprising:

- a limiter including a second reference value providing means for representing a maximum voltage which varies in accordance with the reference value and which is higher than the upper peak value, said reference value constituting a first reference value and said maximum voltage constituting a second reference value;
- said limiter is provided between the exhaust gas sensor and the peak value producing means for cutting off a part of voltage exceeding said second reference value to prevent an abnormal voltage from entering the peak value producing means;
- the limiter includes at least one zener diode connected to an input of the peak value producing means;
- said zener diode is provided for reverse-biasing to cut off said voltage exceeding said second reference value; and
- said limiter preventing the upper peak value from exceeding said second reference value.

4,875,454

SUPERCHARGING APPARATUS FOR AN INTERNAL COMBUSTION ENGINE

Haruo Okimoto, and Seiji Tashima, both of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

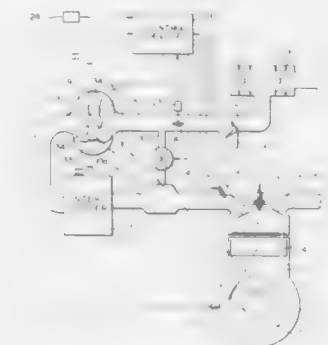
Filed Jan. 13, 1988, Ser. No. 143,627

Claims priority, application Japan, Feb. 17, 1987, 62-33913

Int. Cl.⁴ F02B 33/38

U.S. Cl. 123-559.3

11 Claims



1. A supercharging apparatus for an internal combustion engine comprising:

- supercharger means to be disposed in an intake passage means of the engine;
- mechanical transmission means for driving the supercharger from the engine at a speed proportional to the engine speed;
- said mechanical transmission means including a stepwise variable transmission having a plurality of gear stages and one-way clutch means for interrupting the driving relationship between a lower gear stage and an input to the lower gear stage during shift-up operation; and
- control means for shifting the stepwise transmission;
- said control means having a plurality of shift change patterns which determine a suitable gear ratio of the stepwise transmission according to engine driving conditions, each of which is different from one another in the engine driving conditions where the stepwise transmission is shifted from a predetermined gear ratio to another predetermined gear ratio.

4,875,455

AUTOMOBILE EXHAUST GAS RECIRCULATING SYSTEM

Noboru Hashimoto; Mitsuo Hitomi; Koji Onishi; Yoshikuni Yada, all of Hiroshima; Hidetoshi Nobumoto, Higashihiroshima, and Makoto Hotate, Kure, all of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

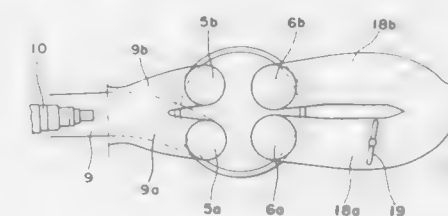
Filed Apr. 12, 1988, Ser. No. 180,781

Claims priority, application Japan, Apr. 28, 1987, 62-107112; Jul. 27, 1987, 62-185492

Int. Cl.⁴ F02M 25/06; F01L 1/26; F02B 75/40

U.S. Cl. 123-568

11 Claims



1. An exhaust gas recirculating system of a combustion

engine having at least one cylinder including a combustion chamber communicating with a source of combustible air-fuel mixture through at least one intake port adapted to be selectively closed and opened for effecting the interruption and admission of the supply of the combustible mixture into the combustion chamber, the combustion chamber also communicating with an exhaust system through first and second exhaust ports both adapted to be selectively opened and closed, said exhaust gas recirculating system comprising:

an intake valve operatively associated with the intake port for selectively opening and closing the intake port;
first and second exhaust valves operatively associated with the first and the second exhaust ports, respectively, for selectively closing and opening the first and second exhaust ports in a manner generally opposite to the manner in which the intake valve opens and closes the intake port, said first exhaust valve being operable to completely close the first exhaust port subsequent to the complete closure of the second exhaust port by the second exhaust valve;
an exhaust passage extending between the first exhaust port and the exhaust system;
an exhaust shutter means operatively associated with the exhaust passage for selectively opening and closing the exhaust passage

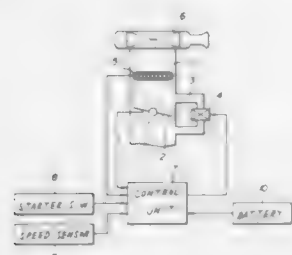
sensor means for sensing the load imposed on the engine and the speed at which the engine is operating; and
control means for determining the operating condition of the engine based on the load and speed thereof,
and said control means operatively connected to said shutter means for controlling said shutter means to close the exhaust passage when the engine is operating at a relatively low speed under a relatively low load, and when the engine is operating at a relatively high speed under a relatively high load, and to partially open the exhaust passage a predetermined amount when the engine is operating at a relatively medium speed under a relatively medium load to regulate the amount of exhaust gases remaining in the cylinder when the engine is operating at a relatively medium speed under a relatively medium load.

SELF-DIAGNOSIS SYSTEM FOR AUXILIARY AIR CONTROL SYSTEM OF INTERNAL COMBUSTION ENGINE

Naoki Tomisawa, Gumma, Japan, assignor to Japan Electronic Control Systems Company Limited, Isezaki, Japan
Filed Feb. 8, 1989, Ser. No. 307,466
Int. Cl.⁴ F02D 9/00, 41/18

U.S. Cl. 123—585

20 Claims



1. A self-diagnosis system for an auxiliary air control system of an internal combustion engine having an auxiliary air control valve, provided in an auxiliary air passage which bypasses a throttle valve of an air intake system of said engine, for controlling the amount of air inducted through said auxiliary air passage, comprising:

first means for detecting the amount of air inducted through a main air intake passage of said engine;
second means comparing the amount of air detected by said first means while said throttle valve is fully closed with a value calculated according to the opening angle command

signal for said auxiliary air control valve, said second means judging that said auxiliary air control system is malfunctioning if said intake air amount detected by said first means is larger than said calculated value.

4,875,457 APPARATUS AND METHOD FOR PROTECTING ENGINE ELECTRONICS FROM RADIO FREQUENCY INTERFERENCE

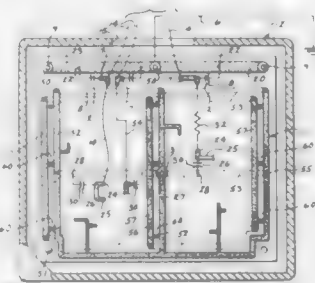
Arthur O. Fitzner, Fond du Lac, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Aug. 16, 1988, Ser. No. 232,798

Int. Cl.⁴ H04B 1/10; F02P 15/00

U.S. Cl. 123—633

15 Claims



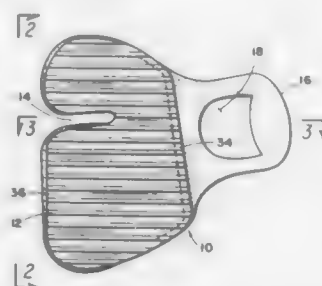
1. In an electronic control module including electronic circuit means, a metal housing and external conductors extending through the housing and having electrical connections to the circuit means, a system for suppressing RFI signals induced in the conductors and entering the electronic module via the conductors comprising:

an external ground connection to the housing;
first RFI voltage shunt means connecting each conductor to the housing closely adjacent its entry through the housing;
second RFI voltage shunt means connecting each conductor to the ground network for the circuit means closely adjacent the connection of the conductor to the circuit means; and
a single ground connection between the housing and the ground network for the circuit means.

4,875,458
SHOOTING TAB
Lloyd L. Young, Rte. 2, E. Hiway 50, Sedalia, Mo. 65301
Filed Jan. 11, 1989, Ser. No. 297,135
Int. Cl.⁴ F41B 5/00

U.S. Cl. 124—35 A

9 Claims



4. A shooting tab for use with a bow having a string for shooting an arrow which comprises:
a finger loop with a finger hole;
a tab facing secured to said finger loop, said tab facing having an arrow notch having a longitudinal axis therein, said

facing having a front and a back, said front contacting said string when said shooting tab is used, said front having parallel ribs which are essentially parallel to said longitudinal axis of said arrow notch.

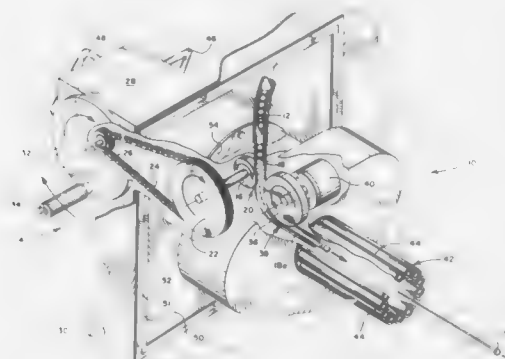
4,875,459
GATTLING-LIKE GUN
Daniel N. Van Elderen, Los Altos Hills, and Gerald J. Lichac, Santa Cruz, both of Calif., assignors to 501 Atari Games, Milpitas, Calif.

Filed Sep. 11, 1987, Ser. No. 95,746

Int. Cl.⁴ F41B 1/00

U.S. Cl. 124—49

3 Claims



1. A gun for propelling a plurality of projectiles at a predetermined rate, comprising:

means having a projectile feed inlet and feed outlet for propelling a projectile received in said inlet through said outlet;

supply means providing serially a plurality of projectiles; feeder means coupled between said supply means and said propelling means for receiving serially a plurality of projectiles from said supply means and feeding them individually and serially into the projectile feed inlet, said feeder means being manually controllable to vary the rate projectiles are fed into said feed inlet, wherein said feeder means includes a manually rotatable crank means, wherein the rate of object feed is proportional to the rate of crank means rotation, and wherein said feeder means includes a pinch roller forming a first nip region disposed to receive projectiles from said supply means and drivingly coupled to said crank means, whereby rotation of said crank means rotates said pinch roller; and

said propelling means being coupled to said feeder means downstream of said pinch roller and including a second pinch roller forming a second nip region and motor means for rotating said second pinch roller at a predetermined speed.

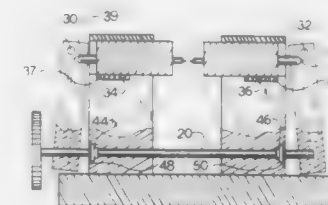
4,875,460
GRINDING WHEEL DRESSING APPARATUS
John Stevenson, 781 E. Golfview Dr., Roselle, Ill. 60172
Filed Sep. 12, 1988, Ser. No. 242,631
Int. Cl.⁴ B24B 53/00

U.S. Cl. 125—11 DF

9 Claims

1. An apparatus for dressing grinding wheels comprising:
a base support;
first and second tower members affixed to said base support;
first and second end lever members pivotally mounted proximate their upper extremities to said first and second tower members respectively;
screw means arranged to extend through said tower members and to engage the lower extremities of said end lever members, whereby selective rotation of said screw means

causes responsive pivotal movement of said end lever members; and
first and second slide members each having a working extremity and a control extremity, arranged to carry abrasion means on said working extremity for dressing of the grinding wheel, said slide members being mounted for



reciprocal motion within said first and second tower members respectively, and being positioned to contact said first and second end lever members respectively at their control extremities proximate said pivots of said end lever members, whereby pivotal movement of said end lever members causes controlled responsive movement of said slide members.

4,875,461 AUTOMATIC DENDRITIC SILICON WEB SEPARATION MACHINE

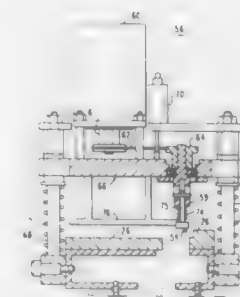
Kristen T. Schara, Wilkesburg; David B. Kulik, Jeannette, and Scott E. McIlvaine, Acme, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 1, 1988, Ser. No. 176,558

Int. Cl.⁴ B28D 1/32

U.S. Cl. 125—23 R

15 Claims



1. A machine for automatically cutting a dendritic silicon web into pieces of predetermined length, comprising:
first work station means for scribing the web to define a web piece of predetermined length;
second work station means for placing an identifying mark on said web piece and for breaking off said web piece along said scribing; and
means for advancing the web by said predetermined length through said first and second work stations.

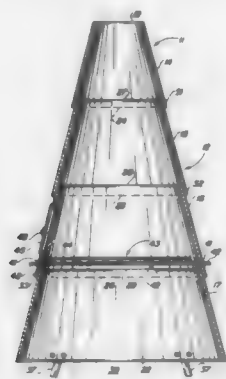
4,875,462
CAMPFIRE SMOKESTACK
Monroe A. Armstrong, and Marty A. Armstrong, both of Star Rte. 1, Box 15-A, Weston, Colo. 81091
Filed Oct. 3, 1988, Ser. No. 251,731
Int. Cl.⁴ F24C 1/16, 15/08, 15/16

U.S. Cl. 126—29

12 Claims

1. A smokestack for use with a campfire and comprising:
an elongated tube means having an open bottom end for receiving smoke emanating from a campfire and an open top end for releasing the smoke into the atmosphere, said tube means comprising a plurality of tube sections distrib-

uted along a longitudinal axis of said tube means and having ends joined to form a composite tube;
a base means for supporting said tube means with said open bottom end thereof directly above a campfire and defining openings that provide substantially unobstructed physical and visual access thereto thereby permitting both visual enjoyment of and addition of firewood to the campfire;



a cooking grate means for supporting food and disposed within said elongated tube means;
a door means defined in one of said tube sections for providing access to said grate means; and
a plurality of rods, each extending through substantially horizontally aligned holes in one of said tube sections, and wherein said rods removably support said grate means.

4,875,463

STOVE TOP ADAPTER

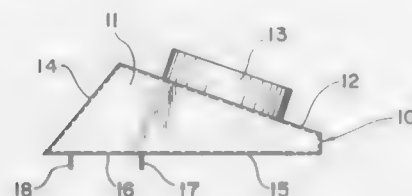
James O. Washington, P.O. Box 2926, Huntington, W. Va. 25721

Filed May 9, 1989, Ser. No. 349,218

Int. Cl.⁴ F24C 1/14

U.S. Cl. 126—80

4 Claims



1. In a stove top adapter, a hollow member of quadrilateral configuration in cross-section having an inclined first top wall, an inclined second top wall attached at an upper end thereof to said first top wall, and an essentially horizontal bottom wall attached to said inclined second top wall at a lower end thereof, an opening in said bottom wall, said adapter being constructed and arranged to sit on top of an exhaust opening of a stove so that said opening in said bottom wall registers with said exhaust opening, and a collar extending directly from said first inclined top wall of said adapter at an essentially normal direction therefrom and constructed and arranged to extend upwardly from said first inclined top wall in a direction that is oblique to said essentially horizontal bottom wall.

4,875,464

CLEAN BURNING GAS LOG BURNER SYSTEM

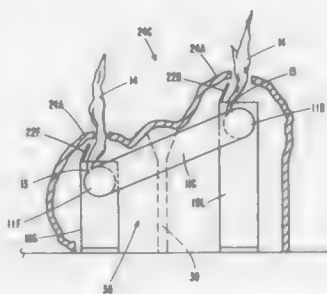
Ronald J. Shimek, 8944 W. 154 St., Prior Lake, Minn. 55372, and Daniel C. Shimek, 5260 W. 132nd St., Apple Valley, Minn. 55124

Filed Aug. 18, 1988, Ser. No. 233,461

Int. Cl.⁴ F24C 3/04

U.S. Cl. 126—92 R

20 Claims



1. A decorative gas log burning system, comprising:
decorative gas log means,
openings in said decorative gas log means to permit gas flames to appear as being emitted from the gas log means,
gas burner means mounted below said gas log means for producing large decorative gas flames directed unrestrained through said openings in said gas log means,
shield means mounted over said gas burner means,
said shield means having a pair of substantially vertical walls arranged on opposite sides of said gas burner means,
horizontal openings in said shield means opposite the openings in said gas log means for permitting said decorative flames to escape from said shield means, and
said shield means having a horizontal section connecting said vertical walls for restricting flames from said gas burner means to said openings in said gas shield means and said gas log means.

4,875,465

HIGH EFFICIENCY SUBMERSIBLE CHAMBER WATER HEATER

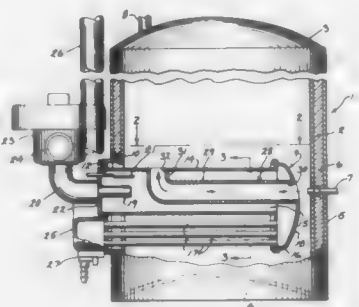
David W. Kramer, Milwaukee, Wis., assignor to A. O. Smith Corporation, Milwaukee, Wis.

Filed May 16, 1988, Ser. No. 195,285

Int. Cl.⁴ A47J 27/00

U.S. Cl. 126—391

7 Claims



1. In a water heating apparatus, a tank to contain water to be heated, a hollow member disposed within the tank in contact with said water and defining a combustion chamber, burner means for burning a combustible mixture of fuel and air and having an outlet disposed in said combustion chamber, discharge means for discharging products of combustion from said chamber, and conduit means extending through said com-

bustion chamber and having a pair of ends communicating with the interior of said tank, the interior of said conduit means being disposed out of communication with said combustion chamber and being constructed and arranged so that water from the tank will flow by convection through said conduit means, a portion of said conduit means being disposed in spaced direct alignment with said outlet, said portion being constructed and arranged to deflect said products of combustion outwardly toward the wall of said combustion chamber.

4,875,466

SOLAR HEATING DISC

Stephen Sloninger, 13176 Fenton, Sylmar, Calif. 91342

Continuation-in-part of Ser. No. 97,172, Sep. 16, 1987,

abandoned. This application Oct. 24, 1988, Ser. No. 265,336

Int. Cl.⁴ F24J 3/02

U.S. Cl. 126—415

2 Claims



1. A submersible solar heating apparatus for a unitary construction, including:

- A dome-shaped unitary construction device comprised of polyethylene having a specific density ranging from 0.9202 to 0.9500 grams per cubic centimeter for collecting and transmitting through its mass solar energy for heating the water adjacent to said device, said device adapted to be deployed in the water so that a substantial portion thereof is immersed in the water and only the apex portion of said device is maintained above the water's surface; and
- a channel section integrally formed with and along the periphery of said device to stabilize said device in the water.

4,875,467

SUPPORT AND MANEUVERING APPARATUS FOR SOLAR ENERGY RECEIVERS

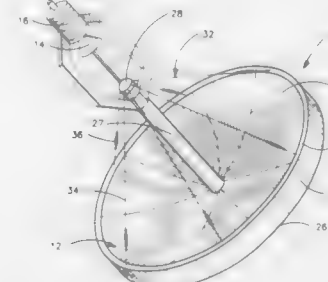
Lawrence M. Murphy, Littleton, Colo., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jul. 28, 1988, Ser. No. 225,444

Int. Cl.⁴ F24J 2/38

U.S. Cl. 126—424

19 Claims



1. Support and maneuvering apparatus for solar energy receiving means for receiving and concentrating solar energy and having a central axis extending through the center thereof, said apparatus comprising:

- frame means for mounting the perimeter of said solar energy receiving means and having front and rear perimeter edges;
- a support member extending along the central axis of said receiving means and having a base end passing through

the center portion of said receiving means and an outer distal end adapted for carrying solar energy receiving and conversion means;

first variable tension means interconnecting the distal end of said support member with said frame means and second variable tension means for interconnecting the base end of said support member with said frame means, said first and second variable tension means providing stiffening for said support member and said frame means and assisting in the alignment of said frame means to optimize the optical efficiency of said solar energy receiving means; and wherein said frame means comprises a pair of spaced stretched membranes mounted integrally therewith for receiving said solar energy, a position and tension of a first one of said pair of spaced stretched membranes being maintained by said first variable tension means, and a position and tension of the remaining stretched membrane being maintained by said second variable tension means;
a rotatable base member;
connecting means extending from said base member for pivotable attachment to said frame means at spaced positions therealong; and
elevation means connected to said receiving means for selectively pivoting said receiving means about an axis defined between the attachment positions of said connecting means.

4,875,468

ELASTOMER-EPTFE BIOPSY CHANNEL

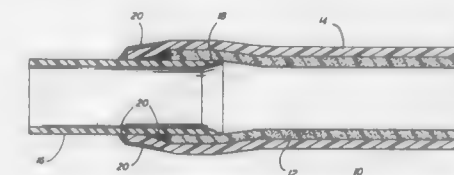
Allan I. Krauter, Syracuse, and Robert L. Vivenzio, Auburn, both of N.Y., assignors to Welch Allyn, Inc., Skaneateles Falls, N.Y.

Filed Dec. 23, 1988, Ser. No. 289,324

Int. Cl.⁴ A61B 1/00

U.S. Cl. 128—3

7 Claims



1. A flexible channel which is liquid impervious comprising a tubular inner liner of a flexible expanded polytetrafluoroethylene, having a predetermined inside diameter and outside diameter; and
a tubular outer sleeve of an elastomer, having a free inside diameter smaller than the outside diameter of the inner tube, and stretch fit over said inner liner.

4,875,469

CONTINUOUS PASSIVE MOTION DEVICES AND METHODS

Arthur H. Brook, Rolling Hills Estates; Peter J. Carian, Inglewood; Leonard Katzin, Beverly Hills; Edmund E. Landsinger, Torrance; James D. Moore, Rancho Palos Verdes; Leah D. Rotter, Los Angeles, and Stanley Schreiber, Marina Del Rey, all of Calif., assignors to Innovative Medical Engineering, Inc., Hawthorne, Calif.

Filed Jun. 13, 1988, Ser. No. 206,269

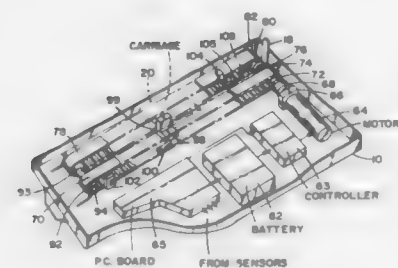
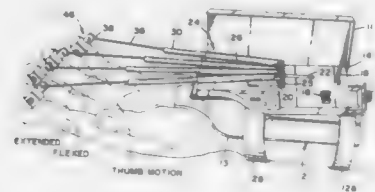
Int. Cl.⁴ A61H 1/02

U.S. Cl. 128—26

23 Claims

5. A system for providing continuous passive motion of at least one of the fingers of the hand comprising:
a support for securing the system to the region of the wrist;
a housing rigidly coupled to the support for containing a drive mechanism, the housing including rigidly mounted motor means, battery means for energizing the motor

means, and controller means for varying the excitation of the motor means in speed and direction;
 a pair of belt drives coupled to the housing, and movable with respect thereto, a first of the belt drives being coupled to the motor means by clutch means and a second of the belt drives being directly coupled to the motor means; carriage means being slidably mounted on the housing and coupled to the first belt drive, the first and second belt drives and the carriage means being movable along a predetermined axis generally parallel to the direction of desired finger movement;
 adjustable elongated means pivotally coupled to the carriage means and extending therefrom in the direction of



4,875,471 DEVICE FOR CORRECTING DEFORMITIES OF THE SPINE

Carlos Lea Plaza, Montevideo, Uruguay, assignor to Codespi Corporation, Fla.
 Continuation-in-part of Ser. No. 17,050, Feb. 20, 1987, Pat. No. 4,738,251. This application Mar. 14, 1988, Ser. No. 167,914. The portion of the term of this patent subsequent to Apr. 19, 2005, has been disclaimed.
 Int. Cl.⁴ A61B 17/56

U.S. Cl. 128—69

4 Claims

the finger tips parallel to the predetermined axis, and each of the adjustable elongated means including means for gripping a finger, such that motion of the motor means may be coupled to the adjustable elongated means so as to manipulate each gripped finger;
 sensors means for sensing an anterior limit position of the second belt drive;
 and wherein the controller means includes means for driving the motor means in reversing directions such that the belt drives move together between the anterior and posterior limit positions sensed by the sensor means when the clutch means is engaged so as to define a region of manipulation for each gripped finger.

4,875,470 RECIPROCATING ROLLING MASSAGER WITH VARYING PRESSURE AND VARYING WHEEL PLACEMENT

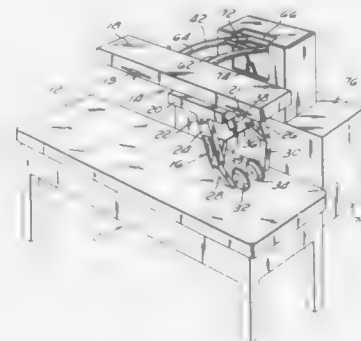
Cris A. Cotone, 5706 Buena Vista Ter., Eagle Rock, Calif. 90042
 Filed Apr. 20, 1988, Ser. No. 183,787
 Int. Cl.⁴ A61H 15/00, 9/00

U.S. Cl. 128—57

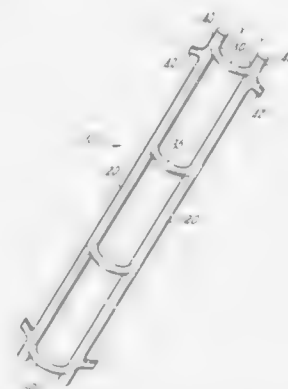
15 Claims

1. A device for massaging an anatomical portion of the body, said device comprising:
 a body supporting surface;
 an axially reciprocable carriage means positioned generally above said body supporting surface and operative to reciprocate axially relative thereto;
 a massaging assembly attached to and extending downwardly from said carriage means, said massaging assembly including at least one body contacting means operative to exert pressure upon a body portion positioned upon said body supporting surface while reciprocating axially in conjunction with said carriage means;
 at least one pressure sensing limit switch operatively associated with the body contacting means, said body contact-

ing means being downwardly biased at a desired maximum pressure limit such that when said maximum pressure limit is exceeded by the device, the downward bias-



ing of the body contacting means will be overcome so as to thereby result in closure of said at least one pressure sensing limit switch.



1. A device for stabilizing and correcting deformations of the spine being surgically mountable over the vertebrae and said correction includes bringing the spine back to its center line de-rotated, comprising:

- A. two elongated rigid members parallel to each other and each member having two ends;
- B. two curved rigid members rigidly mounted to said elongated members so that said elongated members are kept in a spaced apart relationship from each other and said elongated and curved members form a rigid rectangular frame and said curved rigid members mounted at a point slightly separated from said ends;
- C. two hook members mounted on the outer periphery of said elongated members substantially towards the ends of said elongated members and adjacent to where said curved member is mounted on said elongated member;
- D. a curved spacer member having a curved shape and rigidly mounted between said elongated members thereby

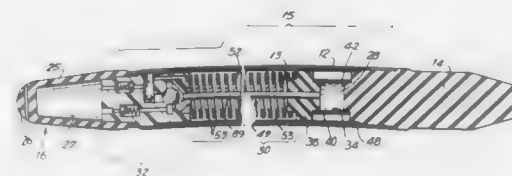
reinforcing the structural integrity of said frame, said curved rigid members and said curved spacer member being smoothly curved for the entirety of their extent between said elongated members;
 E. wire means for tying said device to the vertebrae by using said hook members and said ends of said elongated members as anchorage points.

4,875,472 FLAT COIL SPRING PENILE PROSTHESIS

Dezso K. Levins, Bloomington, Minn., assignor to American Medical Systems, Inc., Minnetonka, Minn.
 Filed Dec. 10, 1987, Ser. No. 131,364
 Int. Cl.⁴ A61F 2/26

U.S. Cl. 128—79

9 Claims



1. A penile prosthesis comprising:
 at least one cylinder within at least one corpus cavernosum of the penis, said cylinder(s) having a distal portion for mounting in the distal portion of said penis and a proximal portion for mounting in the proximal portion of said penis;
 at least one flat coil spring contained in a spring section of said cylinder(s), said spring section lying substantially at or distal to the junction of said distal and said proximal portion of said cylinder(s); and
 means for reversibly compressing and relaxing said flat coil spring such that said cylinder(s) can be reversibly changed between a rigid and a flaccid state.

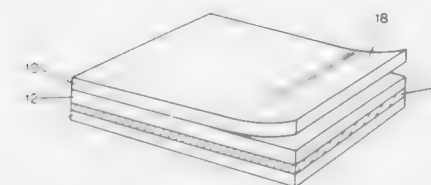
4,875,473 MULTI-LAYER WOUND DRESSING HAVING OXYGEN PERMEABLE AND OXYGEN IMPERMEABLE LAYERS

Oscar M. Alvarez, East Brunswick, N.J., assignor to Bioderm, Inc., N.J.

Filed Apr. 3, 1986, Ser. No. 847,934
 Int. Cl.⁴ A61F 13/00, 15/00

U.S. Cl. 128—155

9 Claims



1. A multi-layer wound dressing comprising:
 (a) an outer layer of a continuous film material having low-oxygen permeability and capable of creating a hypoxic environment thereunder;
 (b) an inner layer of an oxygen permeable continuous film material sized to entirely cover a wound said outer layer being affixed to one side of the inner layer; and
 (c) an adhesive applied to at least a part of the other side of the inner layer, said adhesive being such that when the dressing is applied the adhesion of the inner layer to skin is greater than the adhesion of the inner layer to the outer layer.

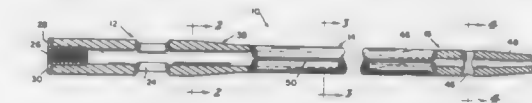
4,875,474 VARIABLE WALL THICKNESS INTERLOCKING INTRAMEDULLARY NAIL

Robert Border, Bourbon, Ind., assignor to Biomet, Inc., Warsaw, Ind.

Filed Jan. 29, 1988, Ser. No. 150,025
 Int. Cl.⁴ A61B 17/58

U.S. Cl. 128—92 Y

7 Claims



1. An intramedullary nail, comprising a proximal portion, a distal portion and an intermediate portion between the proximal and distal portions, and having at least one opening extending transversely through at least one of said proximal and distal portions, said nail being formed of a unitary piece of elongate material of tubular cross-section having variations in wall thickness along its length, wherein the wall thicknesses of the proximal and distal portions are substantially greater than the wall thickness of the intermediate portion.

4,875,475 DEVICE FOR TREATING A BONE

Pierre-André Comte, Pully; Hans Schürch, Titterten, both of Switzerland, and Gebhard Ritter, Mainz-Finthen, Fed. Rep. of Germany, assignors to Synthes (U.S.A.), Paoli, Pa.

Filed Dec. 2, 1985, Ser. No. 803,953

Claims priority, application Switzerland, Nov. 30, 1984, 5720/84

Int. Cl.⁴ A61F 5/04

U.S. Cl. 128—924 Y

22 Claims



1. Device for treating a bone having a fracture, said device comprising an elongated intramedullary nail having a longitudinal axis for insertion into the medulla of the bone across the bone fracture, said nail having a hollow first terminal segment at one end and a second terminal segment at the other end and a longitudinal slot in the first terminal segment for receiving a retaining member extending generally transverse to the longitudinal axis, a hole in the second terminal segment for receiving a retaining member generally transverse to the longitudinal axis, and an adjusting member within said hollow first terminal segment for applying a force axially of the nail to a retaining member inserted in said slot in said first terminal segment, said first terminal segment having an internal thread and said adjusting member having an external thread to engage the internal thread of said first terminal segment, and a tool engaging

means on said adjusting member for rotating said adjusting member to advance said adjusting member axially of the nail.

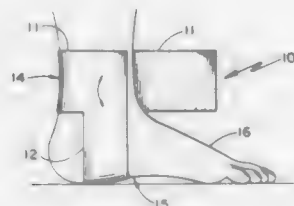
said sensor being held in said cavity means only by said sealing rim means so as to cause said sensor to be in firm

4,875,476 ANKLE SUPPORT BANDAGE FOR PREVENTION OF ANKLE INJURY

Mario C. Garcia, West St. Paul, Minn., assignor to Prevent Products, Inc., St. Louis Park, Minn.
Continuation-in-part of Ser. No. 936,454, Dec. 1, 1986, abandoned. This application Feb. 23, 1988, Ser. No. 158,559
Int. Cl.⁴ A61F 13/00

U.S. Cl. 128—157

4 Claims



1. Adhesive-backed tape means for providing temporary support to the ankle of a human and comprising:

- a generally "L"-shaped support bandage of two wide generally elongated strips of adhesive-backed tape fixedly arranged in generally right angular relationship, one to the other and with said adhesive backing being substantially uniform and extending across the entire extent of said two elongated strips;
- means for adhesively securing a first of said wide strips beneath the arch of the foot of the patient, and with each end, including the free end thereof, extending to and covering a portion of the ankle; and
- means for adhesively securing the other of said wide elongated strips about the ankle so as to overlie said free end and adhesively bond said free end onto the ankle of the patient.

4,875,477 PROTECTIVE MASK HAVING A BUILT-IN SENSOR FOR MONITORING VITAL FUNCTIONS

Christine Waschke, Lübeck; Lothar Töpfer, Ratingen, and Alfred Rath, Hamberge, all of Fed. Rep. of Germany, assignors to Drägerwerk Aktiengesellschaft, Lübeck, Fed. Rep. of Germany

Filed Jan. 27, 1988, Ser. No. 211,966

Claims priority, application Fed. Rep. of Germany, Jul. 23, 1987, 3724336

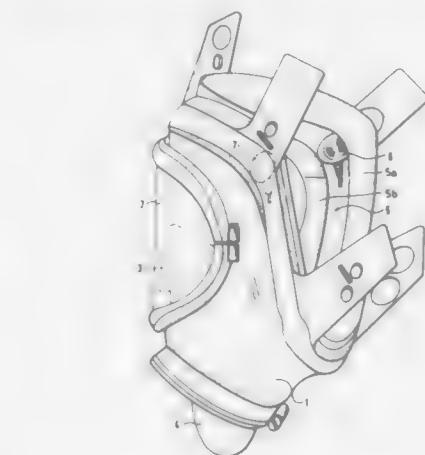
Int. Cl.⁴ A62B 18/02, 18/08; A61B 5/02

U.S. Cl. 128—206.21

4 Claims

1. Arrangement for monitoring vital functions, the arrangement comprising:

- a breathing protective mask having an inner surface facing a wearer thereof;
- a sensor for sensing a vital function of the wearer when held in contact engagement with the head of the wearer;
- said mask having sealing rim means for defining an uninterrupted seal with the head of the wearer of said mask;
- cavity means disposed completely within said sealing rim means so as to ensure the integrity of said seal; and
- said cavity means being formed in said sealing rim means and



contact engagement with the head of the wearer when the mask is worn.

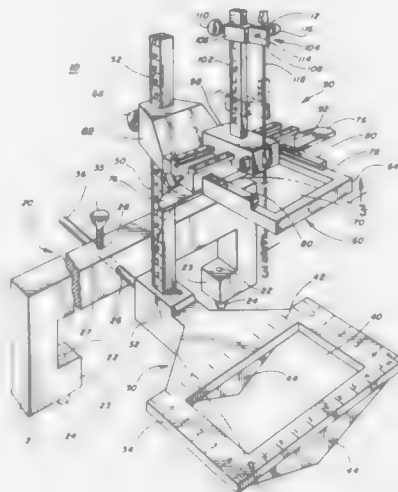
4,875,478 PORTABLE COMPRESSION GRID & NEEDLE HOLDER

Harry H. Chen, 215 E. Chicago Ave., Chicago, Ill. 60611
Continuation of Ser. No. 36,870, Apr. 10, 1987, abandoned. This application Apr. 5, 1989, Ser. No. 333,760

Int. Cl.⁴ A61B 6/00

U.S. Cl. 128—303 B

21 Claims



1. A portable compression apparatus for radiologically and graphically locating breast lesions along three dimensional coordinates to facilitate cytological examination and treatment thereof, comprising:

- means for mounting said apparatus on the film cassette holder plate of a dedicated mammography unit,
- a top radiolucent compression plate having a cut-out area and a first rectilinear grid scale around the periphery of said cut-out area,
- a bottom radiolucent support plate having a second rectilinear grid scale around the periphery thereof, said bottom plate being rotatably and removably connected to said mounting means,
- first means for supporting said top plate and for adjustably positioning said top and bottom plates one relative to the other on either side of said breast; said first and second grid scales constructed and arranged to enable formation

of corresponding grid scales on the resulting radiograph, which corresponding grid scales, in conjunction with the representation of the lesion also on said radiograph facilitate subsequent direct graphical representation of the location of said lesion relative to said coordinates within said breast,

a needle holder and guide assembly adapted to hold a needle for inserting the tip thereof into the lesion, said assembly being adjustable in its position relative to the lesion to enable accurate and reliable insertion of said tip,

means providing support and guidance for said needle along two spaced points of the needle to prevent deflection thereof during insertion of said needle tip,

said needle holder assembly including first parallel rails on said top plate having calibrations thereon for adjusting the position of said assembly in the Y direction, a first sliding base mounted transversely on said first rails, said first base having second parallel rails mounted longitudinally thereon and having calibrations thereon for adjusting the position of said assembly in the X direction; a second sliding base mounted transversely on said second rails, and second base having a rod extending vertically therefrom, said rod having calibrations and a slidable needle holder thereon, said calibrations and slidable needle holder for adjusting the position of said assembly in the Z direction; said second sliding base including a releasable bushing having a lumen through which said needle extends, said bushing and said slidable needle holder providing support and guidance for said needle, said second base and said needle holder also permitting release of said needle from said apparatus while maintaining said needle tip at said location.

4,875,479 SUTURAL MATERIAL

Sergei I. Belykh; Anatoly B. Davydov, both of Moscow; Anatoly D. Moschensky, Malakhovka; Nikolai N. Kanshin; Igor I. Kovalenko, both of Moscow; Jury B. Kirillov, Ryazan; Genady I. Osipov, and Rustam I. Utyamyshev, both of Moscow, all of U.S.S.R., assignors to Vsesojuzny Nauchno-Issledovatel'skiy Ispytatelny Institut Meditsinskoi Tekhniki, Moscow, U.S.S.R.

PCT No. PCT/SU86/00072, § 371 Date Feb. 19, 1988, § 102(e) Date Feb. 19, 1988, PCT Pub. No. WO88/00062, PCT Pub. Date Jan. 14, 1988

PCT Filed Jul. 4, 1986, Ser. No. 191,149

Int. Cl.⁴ F24C 15/16

U.S. Cl. 128—335.5

2 Claims

1. A suture material comprising a base thread of a bioresolvable polymer having deposited thereon a coating comprising a mixture of at least one antimicrobial preparation and a copolymer of N-vinylpyrrolidone with at least one composition selected from the group consisting of alkylacrylate and alkylmethacrylate the coating having a period of biodestruction shorter than the period of biodestruction of the base, and wherein the thickness of coating being equal to 0.1 to 1.0 of the base thread thickness.

4,875,480 DEVICE FOR TRANSLUMINAL IMPLANTATION

Christian Imbert, Preverenges, Switzerland, assignor to Medivent S.A., Lausanne, Switzerland

Filed Sep. 25, 1987, Ser. No. 100,784

Claims priority, application Sweden, Sep. 30, 1986, 8604145 The portion of the term of this patent subsequent to Mar. 22, 2005, has been disclaimed.

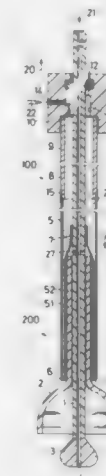
Int. Cl.⁴ A61M 25/00

U.S. Cl. 128—343

20 Claims

1. A device for implantation by insertion into a difficulty accessible location of a substantially tubular, radially expandable prosthesis, including in combination said radially expandable prosthesis surrounding and concentric with a flexible probe and means for maintaining said prosthesis in a radially

contracted state and for releasing said expandable prosthesis in the difficulty accessible location, said means for maintaining and releasing the prosthesis comprising a hose concentrically surrounding said probe and radially surrounding the prosthesis to form a compartment therefor with one end of the hose being



connected to the probe, wherein the probe has a central axial channel enabling supply of a liquid flushing medium at one end and the probe is provided with at least one radial aperture opening into a compartment of the prosthesis to enable flushing of the prosthesis compartment to remove gases therefrom before implantation of the prosthesis.

4,875,481 CATHETER WITH COILED WIRE ATTACHMENT

Sheryl W. Higgins, Plantation, Fla., assignor to Cordis Corporation, Miami Lakes, Fla.

Filed Jul. 1, 1988, Ser. No. 214,171

Int. Cl.⁴ A61M 29/02

U.S. Cl. 128—344

13 Claims



1. In a catheter having a longitudinally extending steering wire therein and a catheter hub positioned on an end of said catheter, the improvement comprising, in combination: said hub defining a bore, said wire defining a generally straight portion comprising most of the length of said wire and a coiled end unitary with said straight portion and positioned within said bore and secured to said hub, whereby fluids can flow through said bore and coiled wire end to and from said catheter.

4,875,482 FLEXIBLE GRASPING DEVICE

Robert J. Hariri; Jamshid B. G. Ghajar, and Fathali Ghahremani-Ghajar, all of New York, N.Y., assignors to Neurodynamics, Inc., New York, N.Y.

Filed Jun. 21, 1988, Ser. No. 209,434

Int. Cl.⁴ A61B 17/42

U.S. Cl. 128—352

25 Claims

1. An obstetric device for the tractive delivery of a fetus comprising: an elongated cylindrical net-like structure having a plurality of interconnected threads defining a plurality of openings; a resilient, constrictable and expandable guide member at-

the duty cycle and amplitude of the compressional wave energy of at least one of said transducers in an inverse manner.

4,875,488

SYSTEM FOR MEASURING THE VOLUME OF A PART OF A HUMAN BODY

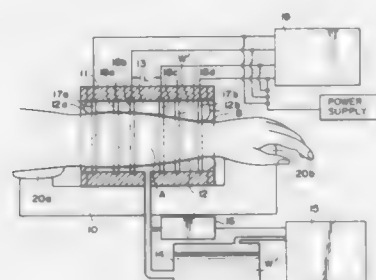
Hideaki Shimazu, Tokyo; Hiroshi Ito, Kokubunji, and Kenichi Yamakoshi, Hokkaido, all of Japan, assignors to Takashi Inoue and Kabushiki Kaisha Nihon M.D.M., both of Tokyo, Japan

Filed May 2, 1988, Ser. No. 188,997

Claims priority, application Japan, May 13, 1987, 62-116335
Int. Cl.⁴ A61B 5/02

U.S. Cl. 128—694

9 Claims



1. A system for measuring the volume of a part of a human body, comprising:
an outer tube made of a rigid insulation material;
an inner tube made of a flexible insulation material and secured to an interior wall portion of said outer tube at both ends thereof so as to form a tubular portion therein which defines an annular watertight chamber between said interior wall portion of said outer tube and an interior wall portion of said inner tube;
a plurality of electrodes provided upon said interior wall portion of said outer tube at locations spaced along an axial direction of said system;
electrically conductive liquid provided within said watertight chamber;
means for conducting current through said conductive liquid by means of a first pair of said axially spaced electrodes selected from said plurality of electrodes provided upon said interior wall portion of said outer tube; and
means for detecting voltage across a second pair of said axially spaced electrodes selected from said plurality of electrodes provided upon said interior wall portion of said outer tube, whereby when said part of a human body is inserted within said tubular portion of said inner tube and compresses part of said flexible inner tube and said electrically conductive liquid provided within said watertight chamber thereof, an impedance change in said electrically conductive liquid, indicative of said volume of said part of a human body to be measured, can be determined by said voltage detecting means from said voltage across said second pair of axially spaced electrodes.

4,875,489

EXTENDABLE GUIDEWIRE

Kirsten L. Menner, Belmont; Robert M. Abrahams, Mountain View, and Ray R. Beitella, Santa Clara, all of Calif., assignors to Advanced Cardiovascular Systems, Inc., Mountain View, Calif.

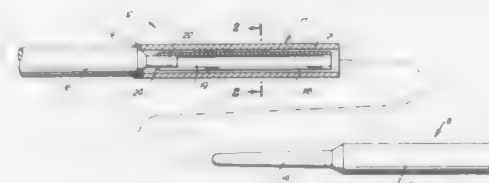
Filed Aug. 14, 1987, Ser. No. 86,102
Int. Cl.⁴ A61B 5/00

U.S. Cl. 128—772

5 Claims

1. An extendable guidewire system adapted for use within a patient's vasculature comprising:
a first guidewire section having secured at one end thereof

an expandable inner tubular portion with a longitudinal slot therein and an outer tubular member surrounding the inner tubular portion which restricts the expansion of the inner member; and
a second guidewire section having a male end portion which



is adapted to be inserted into the tubular portion of the first guidewire section with the longitudinal slot therein to expand the slotted tubular portion and which has a diametrical dimension larger than the diameter of the slotted tubular member and thereby detachably securing the two wire sections together.

4,875,490

INTRAVAGINAL DEVICE

Roberto Quiroz, 341 Lacerno La., El Paso, Tex. 79917

Filed Sep. 6, 1988, Ser. No. 240,805

Int. Cl.⁴ A61F 13/00

U.S. Cl. 128—830

8 Claims



1. An intravaginal device comprising an elongated and elastic closed bag, one end of said bag fitting into the female vagina and covering the surface of the vagina during sexual intercourse, a second end of the said elongated, elastic bag being the size and shape of a standard condom, said second end initially extending outside of the vagina and its exterior surface and covering the penis as it enters the vagina.

4,875,491

CONDOM-HOLDER DEVICE

Tony Parrone, 3604 67th St., Kenosha, Wis. 53140

Filed Mar. 23, 1988, Ser. No. 172,284

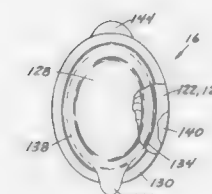
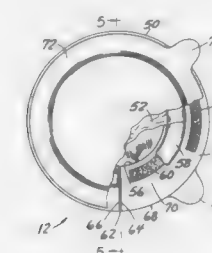
Int. Cl.⁴ A61F 5/44

U.S. Cl. 128—844

7 Claims

1. A condom-holder device of the type having a condom extendible to cover the male organ comprising:
an unextended condom having a gathered annular portion;
a pair of walls which define a space therebetween containing the unextended condom and have substantially aligned annular edges, at least a portion of one of the walls being removable from the other wall to open said condom-containing space;
means attaching the aligned annular edges of the walls to enclose said space;
body-securement adhesive along the aligned annular edges in position about said space for securement to the human body within manual reach; and

means to removably cover said body-securement adhesive prior to securement to the human body,



whereby the condom may be reached and applied to the male organ with one hand without substantial interruption of activity.

4,875,492

WASHABLE AND CONTOURED NURSING PADS

Debra J. Mitchell, 1052 Windjammer Cir., Foster City, Calif. 94404, and Cheryl L. Ranzan, 1073 Laurie Ave., San Jose, Calif. 95125

Filed May 5, 1988, Ser. No. 190,666

Int. Cl.⁴ A61F 13/14

U.S. Cl. 128—890

1 Claim



1. A washable and contoured nursing pad comprising a lace outer layer of a polyester lace with a rough side of the lace facing outward to prevent slipping inside the wearer's bra, a waterproof second layer which is comprised of a polyester tricot that is coated with 2.5 to 4 millimeters of opaque polyvinylchloride, a fluid absorbent third layer which is comprised of an 8 to 10 ounce needle punched felt blend of rayon and polyester, and a soft, and a comfortable inner layer adapted to be against the skin which is comprised of brushed polyester flannel and has a wicking quality which draws fluid through to the needle punched absorbent layer.

4,875,493

DEVICE FOR FEEDING STREAMS OF TOBACCO ON TO A CIGARETTE MANUFACTURING MACHINE

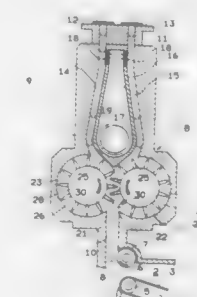
Riccardo Mattel, and Franco Ghini, both of Bologna, Italy, assignors to G. D. Società Per Azioni, Bologna, Italy

Filed Oct. 12, 1988, Ser. No. 256,711

Claims priority, application Italy, Oct. 20, 1987, 3660 A/87
Int. Cl.⁴ A24C 5/14

U.S. Cl. 131—84.1

8 Claims



1. A device for feeding streams of tobacco on to a cigarette manufacturing machine (1), said device (9) comprising an up-flow input duct (10), two up-flow output channels (14, 15), a chamber (22) connecting the top end of said input duct (10) to the bottom end of each said output channel (14, 15), and a device (A or B) for dividing the input tobacco stream flowing up said input duct (10) into two output streams, and feeding each said output stream to a respective said output channel (14, 15); characterised by the fact that said separating device (A or B) comprises two conveyors (26, 27) in the vicinity of said chamber (22), each located between the top end of said input duct (10) and the bottom end of a respective said output channel (14, 15); both said conveyors (26, 27) presenting tobacco transporting means (29 or 30) substantially closing off the top end of said input duct (10), and travelling in the same direction and at substantially the same speed as the tobacco flowing up said input duct (10).

4,875,494

METHOD OF AND APPARATUS FOR MAKING A ROD OF FIBROUS MATERIAL

Wolfgang Siems, Hamburg, Fed. Rep. of Germany, assignor to Körber, Hamburg, Fed. Rep. of Germany

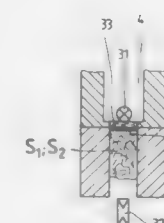
Filed Feb. 5, 1988, Ser. No. 152,951

Claims priority, application Fed. Rep. of Germany, Feb. 21, 1987, 3705576

Int. Cl.⁴ A24C 5/14, 5/39

U.S. Cl. 131—84.1

31 Claims



1. A method of converting into a rod a surplus-containing stream of fibrous material wherein the quantity of surplus fluctuates, comprising the steps of forming signals each having at least one variable characteristic which is indicative of fluctuations of the surplus in a portion of the stream; regulating the quantity of the surplus in the stream as a function of said variable characteristics of the signals including increasing the

quantity of surplus when the fluctuations increase and reducing the quantity of surplus when the fluctuations decrease; and thereafter removing the surplus from the stream.

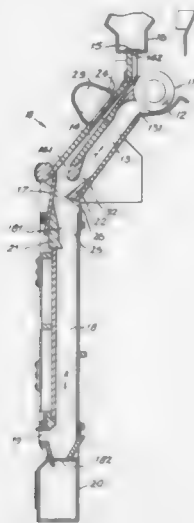
4,875,493

SEPARATION OF LIGHT PARTICLES FROM HEAVY PARTICLES IN A STREAM OF PARTICULATE MATTER
Jack C. Whelton, Richmond, Va., assignor to Philip Morris Incorporated, New York, N.Y.

Filed Aug. 14, 1987, Ser. No. 85,868
Int. Cl.⁴ A24C 5/39

U.S. Cl. 131-110

7 Claims



1. Apparatus for separating heavy particles from light particles in a stream of particulate matter, said apparatus comprising:

- a first elongated chamber into which said stream containing said light and heavy particles is introduced and in which said stream travels generally in the direction of gravity, said first elongated chamber having a first end and a second end;
- a second elongated chamber in which said light particles travel against the direction of gravity and from which said heavy particles are substantially absent, said second elongated chamber having a first end and a second end;
- a third elongated chamber in which said heavy particles and a first portion of said light particles travel generally in the direction of gravity and in which a second portion of said light particles travels against the direction of gravity, said third elongated chamber having a first end and a second end;
- a fourth chamber at which said second end of said first elongated chamber, said first end of said second elongated chamber, and said first end of said third elongated chamber communicate with one another; and means adjacent said second end of said third elongated chamber for providing a stream of fluid in said chamber, said stream for fluid being accelerated against the direction of gravity, such that particles in said third chamber are subject to acceleration by said stream of fluid against the direction of gravity at substantially all times during their passage through said third chamber; whereby: said stream of fluid causes reversal of the momentum of a third portion of said light particles exiting said first elongated chamber into said fourth chamber such that said third portion of said light particles enters said first end of said second elongated chamber, and causes reversal of the momentum of substantially all of said first portion of said light particles as said first portion of said light particles travels toward said second end of said third elongated chamber such that substantially all of said first portion of

said light particles become said second portion and travel toward said fourth chamber and into said second elongated chamber, said heavy particles exiting said second end of said third elongated chamber beyond said fluid stream providing means.

4,875,496

ORAL HYGIENE TOOL

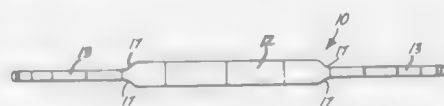
Israel Prabhudas, Box 1173, Fort St. James, B.C., Canada (V0J 1P0)

Filed Jun. 30, 1988, Ser. No. 213,635

Int. Cl.⁴ A61C 15/00

U.S. Cl. 132-329

1 Claim



1. An oral hygiene tool apparatus comprising, an elongate arcuate flexible strip of uniform thickness formed of memory retentive material, and said strip formed with a central blade of a first width positioned centrally of said arcuate flexible strip, and a handle of a plurality of handles integrally formed to said blade on each end of said blade, and each of said handle blending into said blade by means of a convex transitional surface to eliminate projections on said apparatus and minimize injury to a tongue when said apparatus is pulled over said tongue, and wherein said arcuate flexible strip is formed with a continuous convex upper surface and a continuous concave lower surface, and wherein each handle is of equal length, and wherein the uniform thickness of said strip is defined between said upper and lower surfaces, and wherein opposed parallel side surfaces of said blade and opposed parallel side surfaces of said handle and said surfaces of said blade are orthogonally oriented relative to said upper and lower surfaces, and wherein said side surfaces of said handle are of a lesser width than said side surfaces of said blade, and wherein said flexible strip is accommodated within a cavity of a toothbrush, said cavity is of a thickness equal to said thickness of said arcuate flexible strip, and wherein said strip further includes a first tip of a width greater than said width of said blade and said first tip is equal to said width of said cavity, and wherein said strip is formed with a second strip integrally secured to a distal terminal end of said strip opposed to said first tip wherein said second tip is of a width greater than said first tip and of a width equal to a width defined by said toothbrush to present a grasping surface externally positioned of said cavity.

4,875,497

CAPACITANCE LIQUID LEVEL SENSING AND TOUCH CONTROL SYSTEM

Ralph T. Worthington, 4733 Mt. St. Helena Ct., San Diego, Calif. 92117

Filed Apr. 23, 1984, Ser. No. 602,763

Int. Cl.⁴ G01F 23/26; F16K 31/02

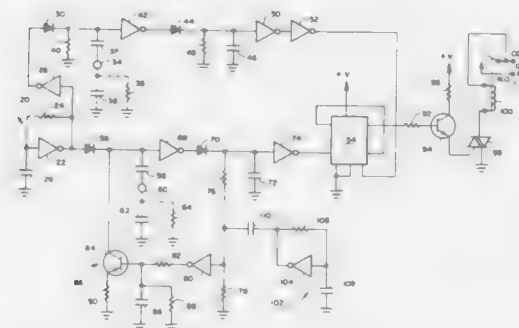
U.S. Cl. 137-2

33 Claims

16. A method of sensing the volume of a conductive liquid having some isolation from ground and a capacitance to ground in accordance with its volume, comprising the steps of cyclically charging the liquid a predetermined amount and then discharging the liquid for a substantially fixed period of time through an impedance, the liquid being discharged by an amount in accordance with its capacitance to ground; sensing

the amount of discharge of the liquid; and generating an indicator signal having a value in accordance with the sensed amount

becomes hardened in place into an integral and monolithic solid body.



of discharge of the liquid, and therefore in accordance with the volume of the liquid.

4,875,498

IRRIGATION MANAGER SYSTEM WITH ZONE MOISTURE CONTROL

T. Arthur Andrews, 1600 E. Lamar Blvd., #112, and D. Glenn Gibson, 1908 E. Randol Mill, #208, both of Arlington, Tex. 76011

Filed May 2, 1989, Ser. No. 345,902

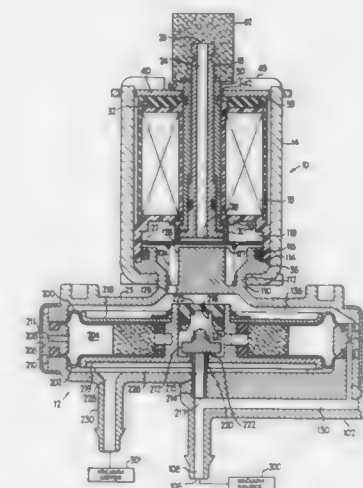
Int. Cl.⁴ A01G 25/16

U.S. Cl. 137-78.3

17 Claims



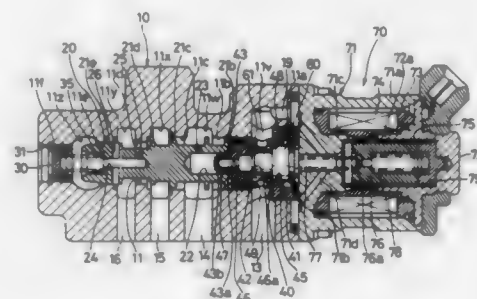
1. Moisture manager apparatus for independently managing the amount of moisture in respective zones of earth included within a plot of land being irrigated, said apparatus comprising:
 - (a) a monolithic electrical earth resistance detection body installed within the earth in a designated zone, said body being hermetically sealed against intrusion of liquids and air;
 - (b) said body having two electrical detection electrodes mounted to extend out of said body into intimate contact within the earth;
 - (c) said body having a first pair of electrical input connectors connected to receive AC electrical power from a central controller connected to control other said bodies in other said designated zones;
 - (d) said body having a second pair of electrical output connectors connected to supply electrical AC voltage to irrigating valve means;
 - (e) said body including a bipolar electrical resistance detection circuit means mounted on a printed circuit base and connected to said detection electrodes and to said input connectors, said detection circuit means being adapted to oscillate at frequencies governed by a fixed reference resistor and a varying resistance detected through the earth between said detection electrodes, said varying resistance being a function of water present in said earth;
 - (f) said body containing a switch relay means mounted on said base and connected to said integrated circuit and operative in response to the output of said detection circuit to open and to close said switch relay;
 - (g) said body being formed of a heat-hardenable liquid plastic poured in and around said detection electrodes, said input connectors, said output connectors, said integrated circuit, and said switch relay wherein the liquid plastic



1. An electromechanical valve apparatus comprising:
 - an electrical winding defining a central flux axis;
 - a magnetic flux circuit defining a flux path comprising a plurality of adjacent magnetic segments, including a generally cylindrical center segment which defines a fluid passage of predetermined cross sectional area aligned with said flux axis, and outer segment, and an end segment adjacent a first end of said fluid passage, at least one of said segments being physically translatable within said valve apparatus along said flux path relative to an adjacent segment to adjust the portion of one of said segments that is in said flux path and the extent of an air gap between the translatable segment and the adjacent segment;
 - an annular non-magnetic seat member having a central opening aligned with, and disposed near the other end of, the fluid passage;
 - magnetic closure means comprising one of said segments and positioned adjacent the non-magnetic seat to define a fluid opening, said fluid opening being substantially less than said cross sectional area for operating positions of said closure means;
 - means defining a cylindrical guide adjacent said non-magnetic seat member to receive said magnetic closure means and to constrain the motion thereof substantially parallel to the longitudinal axis of said fluid passage between a position against said annular non-magnetic seat member and a position displaced therefrom;
 - means defining a fluid chamber communicating with said fluid passage through said fluid opening and enclosing said closure means;
 - fluid conduit means having a first end extending from said chamber whereby a differential fluid pressure can be applied between said other end of said fluid passage and the other end of said fluid conduit means; and
 - means for accessing the relative pressure in said chamber,

said closure means forming a part of said flux circuit such that fluid flow urged by a predetermined pressure difference through the fluid passage and seat member central opening and against the closure means can be modulated by varying the energization level of the electrical winding, translation of the adjustable segment along said flux path being effective to vary the portion of one of said segments in said flux path and the air gap distance and thus vary the reluctance of the flux circuit, to correspondingly adjust the response of the valve assembly for a given energization level of the electrical winding to provide a given pressure difference.

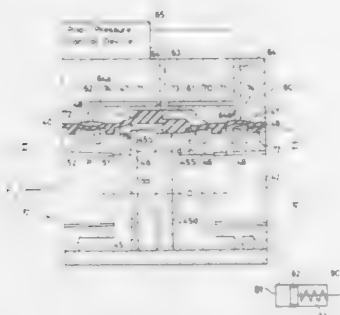
4,875,501
ELECTROMAGNETIC PROPORTIONAL CONTROL VALVE APPARATUS
Kenji Ichihashi, and Jun-ichi Yasuma, both of Higashimatsuyama, Japan, assignors to Diesel Kiki Co., Ltd., Tokyo, Japan
Filed Apr. 4, 1989, Ser. No. 333,081
Claims priority, application Japan, Apr. 20, 1988, 63-52185[U]
Int. Cl.⁴ F15B 13/043
U.S. Cl. 137—625.64 6 Claims



1. An electromagnetic proportional control valve apparatus comprising:

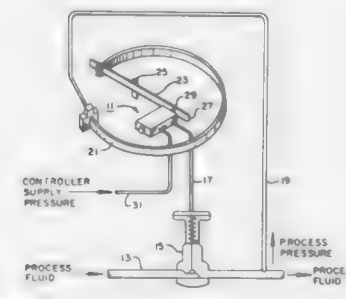
- a valve body having a guide bore extending straight, and a supply port, a control port and a discharge port which communicate with said guide bore;
- a spool accommodated in said guide bore in said valve body for axial sliding movement in said guide bore, wherein said spool has a pair of land sections spaced axially from each other, wherein one of said pair of land sections controls communication between said supply port and said control port in accordance with a position of said spool, while the other land section controls communication between said control port and said discharge port, and wherein said spool has an axially extending axial bore formed in one end face of said spool, and first restricting bore means through which said axial bore communicates with said supply port;
- a valve seat element arranged in facing relation to said one end face of said spool to close said guide bore, said valve seat element being formed with a projecting portion at one end face of said valve seat element which is opposed to said spool, said projecting portion being inserted in said axial bore in said spool, wherein a restricting passage is defined between an outer peripheral surface of said projecting portion and an inner peripheral surface of said axial bore in said spool, wherein said valve seat element has an axially extending valve bore, and second restricting bore means formed in a forward part of said projecting portion, said valve bore having one end thereof communicating with said axial bore through said second restricting bore means, wherein the other end of said valve bore has a peripheral edge serving as a valve seat, wherein a fluid accumulating chamber is defined between said one end face of said spool and said one end face of said valve seat element, said fluid accumulating chamber being arranged about said projecting portion of said valve seat element, and wherein said fluid accumulating chamber communicates with said axial bore in said spool through said restricting passage defined between said projecting portion and said spool;
- a pilot valve arranged in facing relation to said valve seat; and
- electromagnetic drive means arranged at one end of said valve body for controlling said pilot valve.

4,875,500
DIAPHRAGM TYPE OF PILOT OPERATED DIRECTIONAL CONTROL VALVE
Ryose Arizumi, Urawa; Masakuni Katsuma; Shoji Sada, both of Ohmiya; Toshikazu Aoki, Kawagoe; Takashi Ejiri; Masao Kojima, both of Tokyo, and Mitsunori Hoshi, Ohmiya, all of Japan, assignors to Fujikura Rubber Ltd., Tokyo, Japan
Division of Ser. No. 50,110, May 15, 1987, Pat. No. 4,744,388.
This application Mar. 16, 1988, Ser. No. 169,236
Claims priority, application Japan, May 19, 1986, 61-114360; May 28, 1986, 61-80863; Sep. 30, 1986, 61-232933
The portion of the term of this patent subsequent to May 17, 2005, has been disclaimed.
Int. Cl.⁴ F15B 13/042
U.S. Cl. 137—596.18 2 Claims



1. A diaphragm type of pilot pressure operated directional control valve, comprising a pair of opposed passage block and control block, and a diaphragm held between the passage block and the control block, said passage block having a plurality of passages opening into the end face of the passage block located adjacent to the control block and defining an annular valve seat, said control block having pilot pressure passages opposed to the valve seat and connected to a pilot pressure source to exert a pilot pressure on the face of the diaphragm located adjacent to the control block said diaphragm having a center valve portion and an annular valve portion around the center valve portion, said center valve portion and said annular valve portion being independently subjected to the pilot pressure to selectively control fluid connection between said plurality of passages.

4,875,502
FLAPPER ACTUATED PILOT VALVE
James Romano, Longview, Tex., assignor to Con-Tech Industries, Inc., Shreveport, La.
Filed Oct. 6, 1988, Ser. No. 255,343
Int. Cl.⁴ G05D 16/00; F16K 11/04
U.S. Cl. 137—627.5 5 Claims



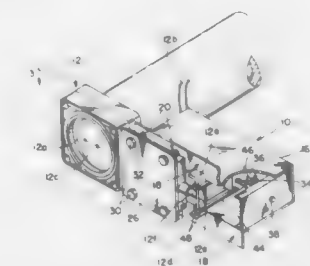
1. An improved flapper actuated pilot valve, comprising: a valve body having an upper chamber, a lower chamber, and a gas passage which communicates said lower chamber, by means of a gas passage opening, with said upper chamber; a gas inlet which communicates with said lower chamber for supplying control gas pressure to said valve and a gas outlet in said upper chamber for allowing the flow of control gas pressure from said valve; a poppet having a stepped cylindrical shape including a lower end of a greater relative external diameter joined to a mid region of lesser relative external diameter than said lower end, said junction of said lower end and said mid region forming a primary sealing surface for contacting said gas passage opening into said lower chamber to seal off said lower chamber from said upper chamber, said mid region being joined to an upper end of lesser relative external diameter than said mid region, said junction of said mid region and said upper end forming a secondary sealing surface, said primary sealing surface presenting a greater sealing area than said secondary sealing surface, and wherein said upper end of said poppet extends into said upper chamber; a flapper element having a lower sealing surface adapted to contact the secondary sealing surface of said poppet and having an upper portion which extends through an opening in said valve body for contacting said flapper, said flapper element having an interior bore which runs from said lower sealing surface thereof to an exhaust port for exhausting control gas pressure from said upper chamber, the secondary sealing surface of said poppet serving to block the escape of control gas pressure when said secondary sealing surface contacts said flapper element lower sealing surface; wherein said flapper element is guided within said upper chamber by a pressure activated cupped seal; and wherein said cupped seal has inner and outer circumferential wall portions which define a central opening for said flapper element, said cupped seal also having an integral gasket portion which extends outwardly in transverse fashion from said outer circumferential wall portion.

4,875,503
STOP FOR COMPRESSOR PLATE VALVE
Werner Heger, Lehrte; Manfred Kramer, Barsinghausen, and Heinrich Schlosserzyk, Wennigsen, all of Fed. Rep. of Germany, assignors to WABCO Westinghouse Fahrzeugbremsen GmbH, Hanover, Fed. Rep. of Germany
Filed Apr. 29, 1988, Ser. No. 190,565
Claims priority, application Fed. Rep. of Germany, Jun. 30, 1987, 3721464
Int. Cl.⁴ F16K 15/14
U.S. Cl. 137—856 17 Claims



1. A stop apparatus for a plate valve of a fluid compressor equipped with a valve plate, one side of said valve plate being fastened and a free end of said valve plate being movable against a component of said fluid compressor, said stop apparatus comprising a pin engageable with and inserted into a cavity formed in said component in a stopping area, said pin being inserted into said cavity in such a way that at least one portion of a length of said pin serves as a stop for said valve plate, said pin being more resistant against wear than said component engageable with said pin.

4,875,504
RECREATIONAL VEHICLE GATE VALVE ACTUATOR
Walter P. Nicholson, 1543 Hayden View Dr., Coeur D'Alene, Id. 83814
Filed Dec. 8, 1988, Ser. No. 282,433
Int. Cl.⁴ A01G 25/09
U.S. Cl. 137—899 6 Claims



1. A retrofit electromechanical valve actuator for the remote operation of a manually operable tank drain valve installed on a recreational vehicle, the drain valve having a linearly sliding gate with an open and a closed position at the extremes of its travel and a manually operable valve handle attached thereto which slides in a linear, bidirectional manner to move the sliding gate between its open and closed positions, the actuator comprising: a housing; attachment means for removably securing the housing to the drain valve; a drive shaft rotatably supported by the housing and having a threaded drive shaft portion; a reversible electric drive motor selectively powered to produce clockwise or counterclockwise rotational drive, and unpowered to place it in a stationary, disabled state, the motor being mechanically engaged with the drive shaft to impart rotational drive thereto and supported by the housing; an actuator fork having a threaded base threadably received on the threaded drive shaft portion and bidirectionally and

linearly movable along the drive shaft in response to rotation thereof, and a plurality of prongs attached to the base and configured to receive the valve handle thereamong and communicate the bidirectional linear motion of the traveling base to the valve handle in response to rotation of the drive shaft, the prongs being selectively detachable from the valve handle;

limit switch means for detecting movement of the threaded base to one of a pair of maximum desired excursion positions of a desired range of travel, the maximum excursion positions corresponding to the open and closed positions of the drain valve, and further for disabling the drive motor upon the threaded base's reaching one of the maximum excursion positions to prevent movement of the actuator fork beyond the desired range; and

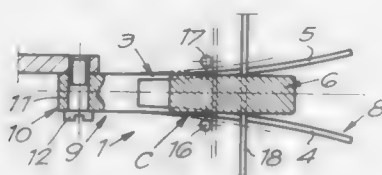
a control switch positionable remote from the drain valve for connecting and disconnecting electrical energy to the drive motor with the desired polarity to selectively cause the drive motor to produce clockwise or counterclockwise rotational drive.

4,875,505 THREAD CLAMP

Denis Moeneclacy, Westrozebeke-Stades; Lucien Coopman, Zonnebeke, and Johnny Victor, Langemark, all of Belgium, assignors to Picanol N.V., Belgium
Filed Mar. 18, 1988, Ser. No. 170,011
Claims priority, application Belgium, Apr. 2, 1987, 8700341
Int. Cl.⁴ D03D 47/27

U.S. Cl. 139—448

12 Claims



12. A thread clamp, comprising:

a first jaw having two spring arms that each have first and second ends, said first ends being fixed with respect to each other, and said second ends diverging from each other when said thread clamp is closed, wherein said spring arms bend elastically away from and towards each other perpendicularly to the plane in which the thread clamp opens and closes;

a second jaw that operates in conjunction with the first jaw; an elastic device that serves to press the first and second jaws together; and

two stops for preventing a thread from moving in at least one direction, wherein said two stops are located on opposite sides of the jaws.

4,875,506 YARN BRAKE FOR A WEFT YARN

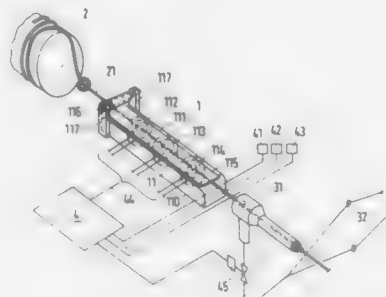
Lorant Gacsay, Zurich, and Beat Meierhofer, Jona, both of Switzerland, assignors to Sulzer Brothers Limited, Winterthur, Switzerland
Filed May 12, 1988, Ser. No. 193,346
Claims priority, application Switzerland, May 27, 1987, 02057/87

U.S. Cl. 139—450

24 Claims

1. A yarn brake for a weft yarn comprising an elongated rigid brake element; a flexible strip-like brake element of at least partly ferromagnetic material disposed opposite said rigid brake element

to receive a length of weft yarn longitudinally therebetween; and



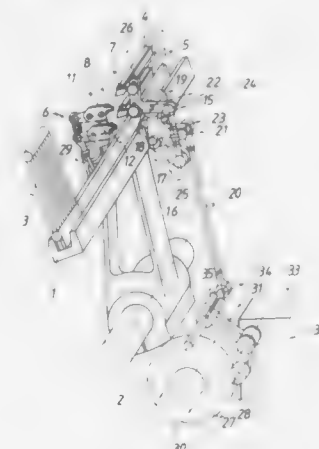
a magnet means for selectively moving said flexible brake element towards said rigid brake element to brake a weft yarn therebetween.

4,875,507 PROCESS AND APPARATUS FOR GUIDING THE WEFT THREADS IN WEAVING LOOMS

Johnny Debaes, Wevelgem, Belgium, assignor to N.V. Michel Van De Wiele, Kortrijk-Marke, Belgium
Filed Dec. 7, 1987, Ser. No. 129,164
Claims priority, application Belgium, Dec. 30, 1986, 906,126
Int. Cl.⁴ D03D 47/34

U.S. Cl. 139—450

11 Claims



1. A process for guiding weft threads in a loom, characterized in that the weft threads are shifted relative to a moving lay of the loom over three consecutive positions, which coincide with various positions of the weft thread insertion during weaving.

further characterized in that weft guiding elements are located at a height of weft cutting devices of the loom and at a position where weft insertion means leave with new ends of the weft threads, wherein the guiding elements move by means of a drive of the weaving loom;

wherein the three consecutive positions are:

a carry position, in which the weft threads extend between clamping devices of cutters into eyes of guiding elements; followed by an insertion position, in which the weft threads are drawn from the clamping devices and are inserted into sheds, while the weft guiding elements move downward toward the lay while the weft threads are being pulled through the sheds,

followed by a beat-up position in which the weft threads are held in a virtually straight line, virtually parallel to a reed and are moved into weft cutting devices at the moment that the reed is in its beat-up position; and

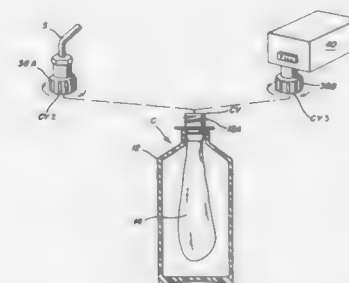
after completing this sequence of positions, the weft threads are shifted back to the carry position and the process starts again.

4,875,508 BEVERAGE CONTAINER SUITABLE FOR USE IN OUTER SPACE

Robert W. Burke, II, Stone Mountain; Albert J. Cohen, Jr., Roswell; William S. Credle, Jr., Stone Mountain; Ashis S. Gupta, Marietta, and Richard H. Heeman, Atlanta, all of Ga., assignors to The Coca-Cola Company, Atlanta, Ga.
Division of Ser. No. 623,701, Jun. 22, 1985, abandoned. This application Sep. 25, 1985, Ser. No. 779,840
Int. Cl.⁴ B65B 3/00

U.S. Cl. 141—2

6 Claims



1. A method for filling a container with a carbonated beverage in the zero gravity conditions of outer space without the creation of a headspace and for dispensing said carbonated beverage therefrom directly into a consumer's mouth, comprising the steps of:

- providing an expandable chamber in the container having means for normally biasing the expandable chamber to a minimal volume, said expandable chamber having an outlet opening with a normally closed valve therein;
 - connecting the outlet opening in operative association with a beverage filling device;
 - opening the valve to fill the expandable volume chamber from the minimal volume to a maximum volume against the force of the means for biasing;
 - removing the beverage filling device from operative association with the outlet opening;
 - connecting the outlet opening to a straw assembly; and
 - opening the valve to permit the dispensing of the carbonated beverage through the straw assembly into the consumer's mouth;
- whereby essentially no headspace is formed in the carbonated beverage during either the filling of the container or the dispensing of the beverage therefrom.

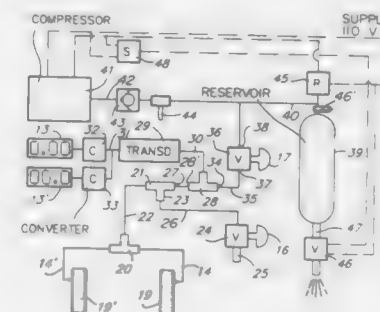
4,875,509
AIR PUMP PRESSURE CONTROL SYSTEM FOR INFLATING PAIRS OF AUTOMOTIVE TIRES
Jean Da Silva, Le Gardeur, Canada, assignor to E.R.C.D. Industries Inc., Montreal, Canada
Filed Feb. 16, 1988, Ser. No. 156,444
Int. Cl.⁴ B60C 23/10

U.S. Cl. 141—38

3 Claims

1. An air pressure control system for verifying and adjusting air pressure simultaneously in a pair of vehicle tires, said system comprising a pair of air conduits having valve connectors at a free end thereof for connecting said conduits to a respective one of a pair of vehicle tires, said conduits being interconnected together at a junction to equilibrate air pressure in said pair of tires, an air pressure reservoir having air under pressure stored therein, a compressor feeding said reservoir, said compressor being operated by a pressure switch connected to said reservoir when air pressure in said reservoir drops below a predetermined level, a purge valve connected to said reservoir

to evacuate water condensate within said reservoir, said purge valve being operated momentarily by switch means connected to said compressor actuated each time said compressor is operated, valve means connecting said air pressure reservoir to said junction in an inflating mode to inflate said tires and to evacuate air from said tires in a deflating mode, said valve means being comprised of a first normally closed valve interconnected between said junction and said pressure reservoir to direct air pressure to said junction and both said tires of said pair of tires, and a second normally closed valve intercon-

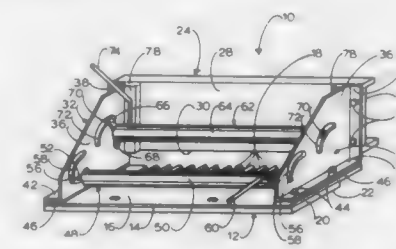


connected between said junction and outside atmosphere to evacuate air from said junction and said pair of tires, and pressure sensing means in the form of a transducer and connected to a conduit between said first and second valves, connected in association with said valve means and said junction to convert pressure sensed at said junction into an electrical signal to be representative of the air pressure equilibrated between said pair of tires, display means connected to said transducer to visually indicate said equilibrated pressure at said junction to determine if said valve means should be actuated and in which mode it should be placed at.

4,875,510
DOVETAIL MACHINE
John H. Muellers, 1540 Hastings Crescent, SE., Calgary, Alberta, Canada T2G 4E1
Filed Feb. 21, 1989, Ser. No. 312,176
Int. Cl.⁴ B27M 3/00

U.S. Cl. 144—145 A

17 Claims



1. A dovetailing jig for use with a fixed dovetailing bit projecting from a bench surface, said jig comprising:

a base having a flat bottom surface for supporting the jig on the bench surface, a flat top surface for supporting a first work piece and a plurality of notches spaced along a back edge of the base for guiding the jig onto the bit as the jig slides on the bench surface;

a back having a flat front surface and a bottom edge; means securing the back to the base with the flat front surface of the back perpendicular to the top surface of the base for supporting a second work piece, and with the bottom edge spaced above the top surface of the base;

a base clamp comprising a first elongated member positioned above and parallel to the top surface of the base and means mounting the first elongated member for selective move-

ment towards and away from the top surface thereby selectively to hold the first work piece on the top surface; a back clamp comprising a second elongated member positioned in front of and parallel to the front surface and means mounting the second elongated member for selective movement towards and away from the front surface thereby selectively holding the second work piece on the front surface.

4,875,511

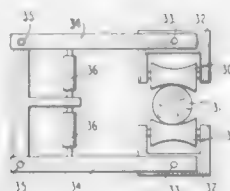
APPARATUS FOR REMOVING BARK FROM LOGS
Robin Wingate-Hill, Curtin, and Bernard M. Hadaway, Highett, both of Australia, assignors to Commonwealth Scientific and Industrial Research Organisation, Australia
Filed Dec. 10, 1987, Ser. No. 131,485

Claims priority, application Australia, Dec. 10, 1986, PH9431; Oct. 20, 1987, P14967

Int. Cl.⁴ B27L 1/00; B27M 1/02

U.S. Cl. 144—208 R

7 Claims



1. Apparatus for removing bark from a log comprising:
 - (a) at least two pairs of rollers, each roller having a concave outer surface support means for mounting the rollers of each pair of rollers for rotation about respective axes of rotation disposed parallel to each other and spaced apart laterally at an angle relative to the axes of rotation of each other pair of rollers; each pair of rollers defining an aperture through which a log may pass, each said aperture being located on a linear path for said log through the apparatus;
 - (b) respective biasing means operatively connected to each pair of rollers for resiliently biasing at least one roller of each pair of rollers towards the other roller in its pair of rollers to apply pressure to the bark of the log; and
 - (c) cutting means for cutting through the bark during the passage of the log between the pairs of rollers.

4,875,512

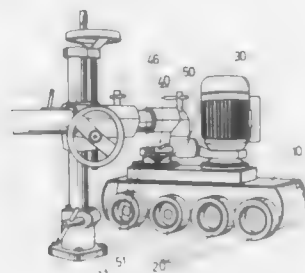
FEEDER HAVING A SPEED CHANGE MECHANISM WITH A GRADUATED THREADED-SHAFT PROTECTOR
Chin-Chi Lin, No. 88, Lane 539, San Fong Rd., Fong Yuan, Taiwan

Filed Feb. 9, 1989, Ser. No. 309,595

Int. Cl.⁴ B27B 25/00; B27C 1/12

U.S. Cl. 144—246 E

1 Claim



1. A feeder used on traditional wood-working machines, said feeder comprising a roller seat in which a plurality of convey-

ing rollers are mounted, a motor mounted on said roller seat for driving said conveying rollers to rotate at a certain speed, and a speed change device mounted in said roller seat, said speed change device comprising a threaded control shaft which has one end thereof protruding out from said roller seat, and an adjusting knob having a bottom side connected with said end of said threaded control shaft for changing the rotating speed of said conveying rollers by manually rotating said adjusting knob, wherein the improvement is characterized in that said protruding end of said threaded control shaft is surrounded by a sleeve member fixed on said roller seat at one end thereof and protruding into an annular groove extended along said bottom side of said adjusting knob so as to protect said protruding end of said threaded control shaft from the accumulation foreign matter, said sleeve member having predetermined graduation marks scaled on an outer surface thereof to show the rotating speed of said conveying rollers when said adjusting knob is rotated downwards and upwards.

4,875,513

PORTABLE WORK BENCH

Stephen R. Skarsten, Welwyn, Great Britain, assignor to Skilten Tools Limited, Hertfordshire, United Kingdom

PCT No. PCT/GB87/00501, § 371 Date Apr. 8, 1988, § 102(e) Date Apr. 8, 1988, PCT Pub. No. WO88/00514, PCT Pub. Date Jan. 28, 1988

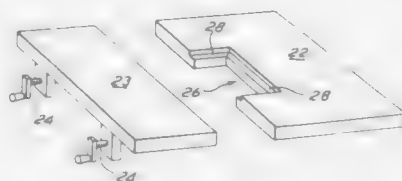
PCT Filed Jul. 15, 1987, Ser. No. 183,154

Claims priority, application United Kingdom, Jul. 15, 1987, 861771H

Int. Cl.⁴ B27C 9/00

U.S. Cl. 144—286 R

7 Claims



1. A work bench top assembly comprising a bench top adapted for mounting on a supporting structure and having an aperture therein; a removable cover plate receivable in the aperture to define with the bench top a substantially continuous working surface and an insert plate receivable in the aperture in substitution for the cover plate, the insert plate having a tool opening; and mounting means for mounting a power tool element of the power tool extends through the tool opening for operations upon a work piece supported on the bench top, wherein the bench top is formed of two separable parts abutting at a join line, said aperture being positioned as to open to said join line.

4,875,514

WOOD SPLITTING METHOD AND APPARATUS

Graham Hollister, Jr., P.O. Box 218, Genoa, Nev. 89411

Filed Oct. 24, 1988, Ser. No. 261,637

Int. Cl.⁴ B27L 7/00; B27M 1/08

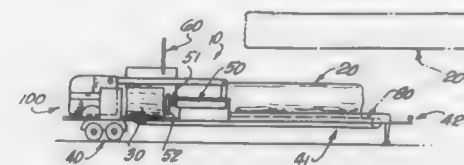
U.S. Cl. 144—367

5 Claims

1. The method of cutting firewood from a large log comprising: (1) moving a log along the bed of a trailer toward a log; (2) Cutting a predetermined length of the log; (3) moving the predetermined length of the log into a position between a multiple splitting device and a first hydraulic ram; (4) activating said hydraulic ram so as to push said cut portion of log through the multiple cutting device thus splitting the log into a multiplicity of relatively evenly shaped rectangular pieces of

wood; (5) withdrawing the ram to be in position to receive a second cut portion of log; and (6) advancing a second hydraulic ram through the first hydraulic ram so as to force the last portion of the log through the cutting device before the second log portion is cut.

4. An apparatus for cutting firewood from large logs comprising a multiplicity of cutting blades defining a multiplicity of rectangular shaped cutting edges; means to support said multiplicity of rectangular cutting edges on a frame; means associated with said frame to push a log section of wood against said cutting edges, which cutting edges are wedged shaped and



staggered with relation to each other so as to aid in expelling the wood being forced past them in that the staggering of the blades and the wedge shape causes an exfoliation effect with the wood being forced past the cutting edges as uniformly shaped rectangular pieces and wherein the means to push the log section against the cutting edges comprising a hydraulic ram consisting of a cylinder, a first cylinder rod which is hollow and in turn takes the hydraulic pressure when the hollow rod has reached its full extension and a second cylinder rod within the first cylinder rod which advances forward against a smaller portion of the center of said log section.

4,875,515

SLEEVE-MOUNTED SPIKE FITTED ON A VEHICLE TIRE

Erkki Savanto, Porvoo, Finland, assignor to Neste Oy, Finland
PCT No. PCT/FI88/00017, § 371 Date Oct. 25, 1988, § 102(e)

Date Oct. 25, 1988, PCT Pub. No. WO88/06538, PCT Pub. Date Sep. 7, 1988

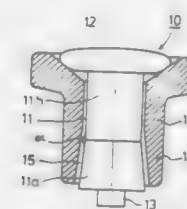
PCT Filed Feb. 8, 1988, Ser. No. 267,129

Claims priority, application Finland, Feb. 27, 1987, 870681

Int. Cl.⁴ B60C 11/16

U.S. Cl. 152—210

12 Claims



1. A sleeve-mounted spike (10;20;30;40;50) fitted on a vehicle tire comprising a rivet (11;21;31;41;51), a head, (12;22;32;42;52), a tip (13;23;33;43;53) and a sleeve (14;24;34;44;54), characterized in that the part (11a;21a; 31a;41a;51a) of the rivet towards the tip and the part (11b;21b;31b;41b;51b) of the rivet towards the head subtend an angle (α) having a magnitude in the range from 150 to 179 degrees, whereby between the rivet (11;21;31;41;51) and the sleeve (14;24;34;44;54) no rectilinear contact is established, with the result that when the rivet (11;21;31;41;51) is urged against the sleeve (14;24;34;44;54) in vehicle acceleration, braking or sidestepping situations a greater force is required to push the rivet (11;21;31;41;51) into the tire, however without arresting the movement of the rivet (11;21;31;41;51) within the sleeve (14;24;34;44;54).

4,875,516

VENETIAN BLIND CONTROL

Norbert Marocco, 46 Pennygrams Ct., Woodbridge, Ontario, Canada

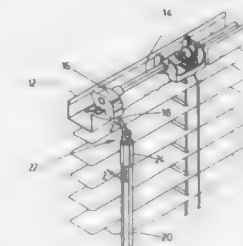
Filed Jul. 28, 1988, Ser. No. 225,148

Claims priority, application Canada, Feb. 29, 1988, 560140

Int. Cl.⁴ E06B 9/38

U.S. Cl. 160—178.1

17 Claims



1. A clutch assembly for use in association with a venetian blind of the type having a blind control and a control rod for operating said control and swingable joint means interconnecting said control rod and said blind control, said clutch assembly comprising:

a drive member adapted to be connected to said control rod; a driven member adapted to be connected to said swingable joint means; first engagement means on said drive member; second engagement means on said driven member, said first and second engagement means being adapted to cooperate to transmit rotation of said control rod to said swingable joint means, and, releasable means in one of said first and second engagement means responsive to over-rotation of said control rod to discontinue transmission of said rotation to said swingable joint means.

4,875,517

METHOD OF PRODUCING SALT CORES FOR USE IN DIE CASTING

Raymond J. Donahue, Fond du Lac; Terrance M. Cleary, Allenton; Frederick M. Hansenstein, Oshkosh, and Daniel H. Marcella, Appleton, all of Wis., assignors to Brunswick Corporation, Skokie, Ill.

Filed May 1, 1989, Ser. No. 346,164

Int. Cl.⁴ B22C 9/10; B22D 29/00

U.S. Cl. 164—34

12 Claims

1. A method of producing a salt core for high pressure die casting, comprising the steps of preparing a pattern of an evaporable foam material having a configuration identically proportional to the salt core to be produced, positioning the pattern in a mold and surrounding the pattern with an unbonded flowable inert finely divided material, contacting the pattern with a molten salt to vaporize the pattern with the vapor being trapped within the interstices of the flowable material and said molten salt filling the void created by vaporization of the pattern to produce a salt core having a configuration identically proportional to said pattern, and removing the salt core from the mold.

6. A method of producing a cast metal part, comprising the steps of preparing a pattern of an evaporable foam pattern having a configuration identically proportional to a salt core to be produced, positioning the pattern in a mold and surrounding the pattern with a flowable unbonded inert finely divided material, contacting the pattern with molten salt to vaporize the pattern, with the vapor being trapped in the interstices of the flowable material and the salt filling the void created by vaporization of the pattern to provide a solidified salt core having a configuration identically proportional to said pattern, positioning the salt core in a metal die with the core spaced from the

die to provide a die cavity, introducing a molten metal having a melting point less than the melting point of said salt core into the die cavity to provide a cast metal part, and dissolving the salt core from the cast metal part.

4,875,518

METHOD OF AND APPARATUS FOR LOW-PRESSURE CASTING OF LIGHT METAL ALLOY

Takeshi Imura; Katsuhiko Ando; Shigemitsu Nakabayashi, and Maki Hirose, all of Sayama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

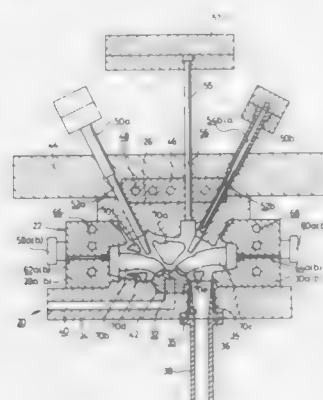
Filed Aug. 17, 1988, Ser. No. 233,144

Claims priority, application Japan, Aug. 21, 1987, 62-207777; Aug. 21, 1987, 62-207779

Int. Cl.⁴ B22D 18/04

U.S. Cl. 164—119

20 Claims



1. A method of low-pressure casting of a light metal alloy, comprising the steps of:

- applying a fluid pressure on the surface of a light metal alloy stored in a closed container to introduce the light metal alloy from the closed container through a transfer tube and a sprue into a mold cavity defined in a mold assembly;
- bringing the introduced molten metal alloy into contact with molds of said mold assembly which comprise metallic material having different thermal conductivities, respectively; and
- controlling a time in which the molten metal alloy is solidified with said molds to produce a casting.

4,875,519

METHOD OF MANUFACTURING HOLLOW BILLET AND APPARATUS THEREFOR

Yoh Ishii, Oyama; Masami Abe, Tochigi; Yuhzoh Harada, Oyama; Atsumi Takasugi, Oyama, and Kazumi Kato, Oyama, all of Japan, assignors to Furukawa Aluminum Co., Ltd., Tokyo, Japan

Filed Apr. 25, 1988, Ser. No. 185,436

Claims priority, application Japan, Apr. 30, 1987, 62-107749

Int. Cl.⁴ B22D 11/04

U.S. Cl. 164—465

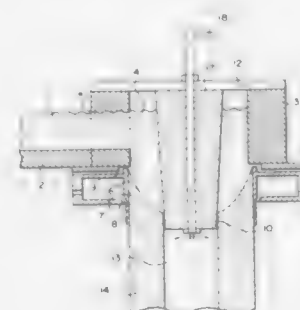
6 Claims

1. A apparatus for manufacturing a hollow billet, said apparatus comprising:

- a vertical semi-continuous casting mold including an upper refractory heat-insulating portion, a lower cooling portion, a lubricant supply port formed between the cooling portion and the heat-insulating portion, and a molten metal storing portion surrounded by the heat-insulating portion;
- a solid core disposed at a central portion of the molten metal storing portion; and
- a through-hole formed in said solid core for supplying an inert gas to the interior of the hollow billet in the vicinity of said mold.

4. A method of manufacturing a hollow billet, comprising the steps of:

- disposing a solid core at a central portion of a molten metal storing portion surrounded by an upper refractory heat-insulating portion of a vertical semi-continuous casting mold comprising the heat-insulating portion, a lower cooling portion, and a lubricant supply port formed between the heat-insulating portion and the cooling portion, a lower portion of the solid core or the entire solid core consisting of graphite, and the core being positioned such that a distal portion of the solid core is dipped in the



- molten metal storing portion, so that the distal portion of the solid core is projected from the solidifying portion cooled by the lower cooling portion;
- horizontally supplying, from one direction, a molten metal to the molten metal storing portion;
- filling a hollow portion of the solidified distal portion with an inert gas supplied through a through-hole formed in the solid core; and
- casting the molten metal, with cooling being provided by the cooling portion, and an inner diameter of the solidified distal portion of the molten metal being controlled by the distal portion of the solid core.

4,875,520

DESICCANT HEAT DEVICE

Donald F. Steele, Cohasset, Mass.; Lawrence C. Hoagland, Center Harbor, N.H.; Christopher Kyriacos, Cohasset, and Peter Tolan, Scituate, both of Mass., assignors to Airxchange, Inc., Rockland, Mass.

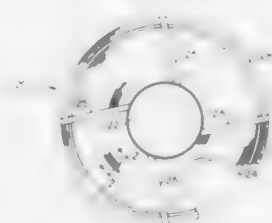
Continuation of Ser. No. 790,198, Oct. 22, 1985, abandoned.

This application Jul. 8, 1988, Ser. No. 219,834

Int. Cl.⁴ F28D 19/00; B01D 53/06

U.S. Cl. 165—10

17 Claims



1. A desiccant regenerative heat exchange device comprising at least one plastic surface coated with finely comminuted particles of dry desiccant bound to said at least one plastic surface as a consequence of dissolving to a minor depth using a selected solvent at least the portion of said at least one plastic surface contacting said particles.

4,875,521

ELECTRIC FAN ASSEMBLY FOR OVER-THE-ROAD TRUCKS

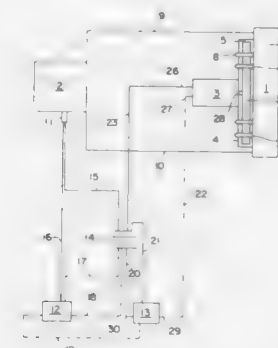
Roger Clemente, 1799 Vauxhall Rd., Union, N.J. 07083

Filed Feb. 27, 1987, Ser. No. 19,693

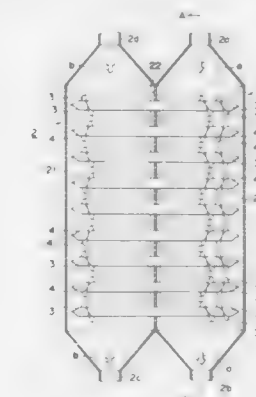
Int. Cl.⁴ F01P 7/02

U.S. Cl. 165—39

8 Claims



the heat pipes exposed to a relatively hotter gas flow in the hot gas flow duct are of carbon steel, while those exposed to a



relatively less hot gas flow in the hot gas flow duct are of stainless steel.

1. The combination of an over-the-road truck having an internal combustion engine of at least 200 hp and having a heat transfer assembly for cooling an intermediate heat transfer fluid for said internal combustion engine, said heat transfer assembly comprising exclusively an electric fan assembly to operate only when necessary to cool said heat transfer assembly and consisting of an electric motor including a shaft having an axial flow fan mounted thereon, and further comprising:

- a support means for attaching said electric motor to said heat exchanger;
- a battery for driving said electric motor; and
- a switch means to control starting and stopping of said electric motor, said electric motor having a minimum wattage calculated by the empirical equation:

$$W = 1.75E$$

wherein:

W=wattage of electric motor, and

E=Horsepower of said internal combustion engine said heat transfer assembly having a core size determined by the empirical equation:

$$R = 3E$$

wherein:

R=core size (in²)

and said axial flow fan for said heat transfer assembly providing for air flow determined by the equation:

$$C = 22.5E$$

wherein:

C=air flow (CFM).

4,875,522

HEAT PIPE HEAT EXCHANGER

Hajime Noda, Yokohama; Kuniyoshi Sato, Tokyo, and Junji Sotani, Yokohama, all of Japan, assignors to Furukawa Electric Co., Ltd., Tokyo, Japan

Filed Apr. 18, 1989, Ser. No. 340,059

Claims priority, application Japan, Apr. 20, 1988, 63-97561

Int. Cl.⁴ F28D 15/02; F28G 13/00

U.S. Cl. 165—104.14

7 Claims

7. A heat pipe heat exchanger of claim 2 in which the tube of

PIPELINE SERVICING TOOL

Edward T. Thornburrow, West Yorkshire, England, assignor to Cameron Iron Works USA, Inc., Houston, Tex.

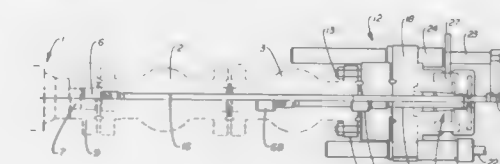
Filed Oct. 12, 1988, Ser. No. 256,454

Claims priority, application United Kingdom, Dec. 24, 1987, 8730103

Int. Cl.⁴ E21B 23/00, 33/068

U.S. Cl. 166—77

7 Claims



1. A pipeline servicing tool comprising:
- a fixed crosshead which can be mounted axially aligned on the end of a pipeline such as a wellhead spool outlet and having a bore therethrough,
 - a rod positioned within said fixed crosshead bore and being axially slidable and rotatable therein,
 - gripping means in the fixed crosshead for holding the rod against axial movement,
 - a movable crosshead connected to the fixed crosshead with fluid pressure operable drive means for advancing and retracting the moving crosshead in the axial direction of the rod, and at least one or more rod extension piece, the rod and the extension being securely connectable end-to-end in axial alignment for longitudinal and rotational movement within said fixed crosshead bore,
 - safety stop means on the fixed crosshead, movable into position closely behind the rear end of one of the rod, and the rod extension when connected to the rod, to block the rearward path of movement of the rod in event of failure of the gripping means to hold the rod or its extension.

4,875,524

CASING CENTRALIZER

Billie J. Bradley, Richard L. Giroux, and Allen T. Joyce, all of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Sep. 29, 1988, Ser. No. 250,900
Int. Cl.⁴ E21B 17/10

U.S. Cl. 166—241



1. A semi-rigid centralizer for use in a well installed on conduit members therein, said centralizer comprising:

a tubular housing having a longitudinal axis and a circumferential direction thereabout installed on a conduit member of said conduit members in said well;

a first plurality of spring retainers secured to the outer portion of a first end portion of the tubular housing, each spring retainer of the first plurality of spring retainers being formed as a T shaped member having a stem portion and a crossbar portion wherein a portion of the stem portion of the T shaped member is secured to the tubular housing substantially in the direction of the longitudinal axis of the tubular housing and wherein portions of the crossbar portion of the T shaped member are secured substantially in a circumferential direction of the housing;

a second plurality of spring retainers secured to the outer portion of another end portion of the tubular housing, each spring retainer of the second plurality of spring retainers being formed as a T shaped member having a stem portion and a crossbar portion wherein a portion of the stem portion of the T shaped member is secured to the tubular housing substantially in the direction of the longitudinal axis of the tubular housing and wherein portions of the crossbar portion of the T shaped member are secured substantially in a circumferential direction of the tubular housing, and

a plurality of elongated centralizer spring members, each centralizer spring member of the plurality of elongated centralizer spring members having one end thereof secured by a spring retainer of the first plurality of spring retainers wherein a portion of the stem portion and the crossbar portion of each T shaped member overlying a portion of one end of each centralizer spring and another end thereof secured by a spring retainer of the second plurality of spring retainers wherein a portion of the stem portion and the crossbar portion of each T shaped member overlying a portion of the another end of each centralizer spring.

4,875,525

CONSOLIDATED PROPPANT PACK FOR PRODUCING FORMATIONS

Michael L. Mann, Dallas, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Mar. 3, 1989, Ser. No. 318,867
Int. Cl.⁴ E21B 43/02, 43/267

U.S. Cl. 166—280 12 Claims

1. A method for forming a porous, consolidated proppant pack at or in a producing formation in an earthen well, said method comprising:

mixing both proppants which have been coated with an unset consolidating material and particles of a dissolvable material into a carrier liquid;

flowing said carrier fluid with said proppants and said particles entrained therein down said well to said formation; allowing said proppants and said particles to remain at rest until said consolidating material on said proppants sets and consolidates to form said porous consolidated proppant pack; and

dissolving said particles of said dissolvable material after said proppant pack has been consolidated to thereby increase the porosity and hence, the permeability of said pack.

12. A porous, consolidated proppant pack in an earthen well, said pack being formed by:

mixing both proppants which have been coated with an unset consolidating material and particles of a dissolvable material into a carrier liquid;

flowing said carrier fluid with said proppants and said particles entrained therein down said well;

allowing said proppants and said particles to remain at rest until said consolidating material on said proppants sets and consolidates to form said porous consolidated proppant pack; and

dissolving said particles of said dissolvable material after said proppant pack has been consolidated to thereby increase the porosity and hence, the permeability of said pack.

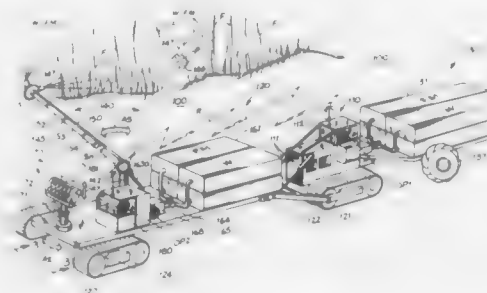
4,875,526

ROUGH TERRAIN, LARGE WATER VOLUME, TRACK DRIVEN FIREFIGHTING APPARATUS AND METHOD

Vincent P. Latino, and Sandra L. Latino, both of 6001 S. Park Ave., Space #11, Tucson, Ariz. 85706

Filed Dec. 9, 1988, Ser. No. 283,151
Int. Cl.⁴ A62C 27/06, 27/08, 27/30

U.S. Cl. 169—24 19 Claims



10. A firefighting apparatus for use in fighting fires in remote, rough terrain, said firefighting apparatus comprising:

(a) a motorized tracked vehicle;

(b) a front platform means, said front platform means being pushed by said motorized tracked vehicle and being adapted with a cab member for housing controls and protecting an operator from fire dangers, steerable track means for guiding said platform means by said operator, tank means for storing a large volume of fire extinguishing substance, hose system means connected to said tank means, multi-directionally adjustable fire extinguishing substance delivery means connected to said hose system

for delivering said fire extinguishing substance to a fire being fought; and

(c) a rear platform means adapted with a plurality of wheel members for use on terrain having hot ash materials, hitch means for being drawn by said motorized tracked vehicle, reserve tank means for storing reserve volume of said fire extinguishing substance and a fire extinguishing substance transfer system for delivering said fire extinguishing substance forwardly to said hose system means.

4,875,527

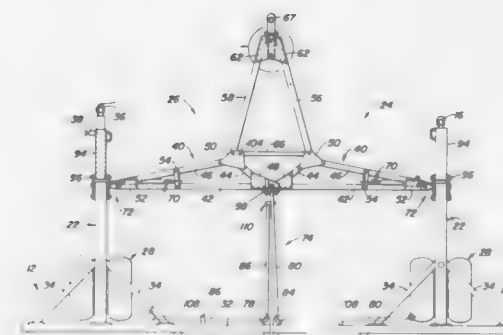
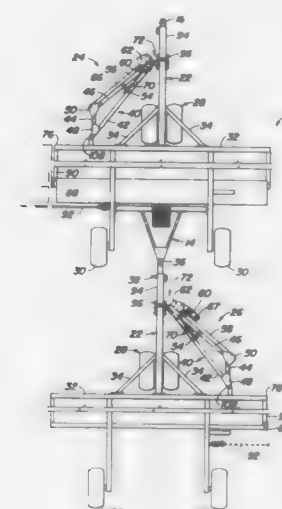
DUAL IMPLEMENT HITCH ASSEMBLY

Daniel M. Foley, Pleasant Hill; Michael D. Snyder, and John D. Long, both of Ankeny, all of Iowa, assignors to Deere & Company, Moline, Ill.

Filed Sep. 8, 1988, Ser. No. 241,668
Int. Cl.⁴ A01B 63/00

U.S. Cl. 172—248

8 Claims



1. A dual implement hitch assembly for coupling first and second rigid horizontal frames for side-by-side field operation, each frame having a fore-and-aft extending rigid drawbar, the hitch assembly comprising:

first hitch structure carried to the left side of the first drawbar and a second hitch structure carried to the right side of the second drawbar, each hitch structure including a triangularly-shaped member having first, second and third corners, the first corner being pivotally connected to the drawbar; an elongated member pivotally connected at one of its ends to the second corner; means connectable to a traction vehicle carried by one of the

elongated members at its end opposite its connection with the triangularly-shaped member;

and means for connecting the two hitch structures together including coupling means for connecting the second corners of the triangularly-shaped members together and for joining the third corners of the triangularly-shaped members together, said connecting means also adapted to join the elongated members together at their ends opposite their respective connections to a second corner.

4,875,528

TORQUE CONTROL ACTUATOR

Clyde D. Thackston, Columbia, S.C., assignor to Allen-Bradley Company, Inc., Columbia, S.C.

Filed Feb. 13, 1989, Ser. No. 310,277
Int. Cl.⁴ B25B 23/14

U.S. Cl. 173—12

8 Claims



1. A torque control actuator, comprising:

a clutch including:

(a) an input shaft adapted to be rotatively driven by a prime mover;

(b) an output shaft adapted to rotatively drive a work-piece; and

(c) means connecting the input shaft to the output shaft to rotationally drive the output shaft in response to rotation of the input shaft below a first predetermined torque, said means allowing the output shaft to slip relative to the input shaft above the predetermined torque;

first rotary engagement means coupled to the output shaft to rotate with the output shaft;

second rotary engagement means axially slidable relative to the first rotary engagement means into and out of engagement with said first means, said second means having a cam surface defined thereon, said cam surface having a ledge facing axially away from the first means, a leg portion extending from an end of the ledge toward the first means and an inclined return portion axially opposed from the leg and ledge and extending axially away from the leg and ledge from an angular position of the leg to the angular position of an ledge;

cam means rotatively driven at the speed of said input shaft, said cam means being connected to the second rotary engagement means so as to cam on the cam surface of the second rotary engagement means;

an axially moveable control for effecting a desired operation; means for translating axial movements of the cam means to the control;

means biasing the cam means, the second rotational engagement means, the translating means and the control to an initial position in which the second rotary engagement means is out of engagement with the first rotary engagement means; and

releasable means for axially moving the control, the translating means, the cam means and the second rotary engage-

ment means against the force of the biasing means in response to operation of the prime mover;

wherein:

- (a) upon initial operation of the prime mover below the first predetermined torque exerted on the workpiece, the moving means urges the control, the translation means, the cam means and the second rotary engagement means from an initial axial position to a second axial position, said axial movement causing said cam means to abut the ledge of the cam surface and thereby engage the first and second rotary engagement means so that both said engagement means rotate with the output shaft;
- (b) at operating torques at least as great as the first predetermined torque the output shaft slips relative to the input shaft and the cam means cams off the ledge into the leg to move axially relative to the second rotary engagement means to a third axial position, said axial movement allowing the control to move to a corresponding third axial position; and
- (c) release of the moving means allows the biasing means to return the cam means, second rotary engagement means, translation means and control to the initial position, whereupon the cam means cams on the return portion of the cam surface to angularly align the cam means with the ledge of the cam surface in the initial position.

4,875,529

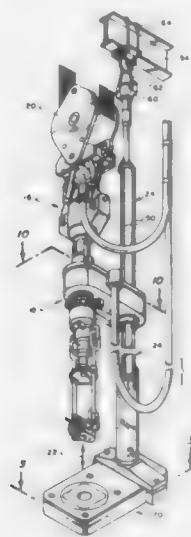
ALTERNATE FORMS OF, SIDE DRIVE DRILLING
Stephen B. Wetzel, Ventura; Gregory A. Goris, Oxnard, and Igor Krasnov, Port Hueneme, all of Calif., assignors to Varco International, Inc., Orange, Calif.

Continuation of Ser. No. 820,776, Jan. 21, 1986, abandoned. This application Dec. 11, 1987, Ser. No. 133,174

Int. Cl. E21B 3/00

U.S. Cl. 173-163

15 Claims



1. In a rail-less system for drilling oil and gas wells, having drilling means, a platform with an opening through which drilling operations may be conducted, and a derrick on said platform centered over said opening, the improvement comprising:

- drive means located at the platform, an elongated rod means whose top end is tethered on said derrick and whose bottom end is connected to be rotated by said drive means but is otherwise unconnected to said derrick, said elongated rod being parallel to the center of said opening and center line of said derrick, said driven means responsive to the torque applied to said elon-

gated rod by said drive means and movable vertically on said elongated rod means to apply torque to said drill means whereby drilling operations may be carried out through said opening,

said driven means including first rotatable means connected to said elongated rod means but otherwise unconnected to said derrick and a second rotatable means connected to said first rotatable means with the drive ratio of substantially 1:1 to avoid excessive deflections of said drilling means and eliminate the need for rails on said derrick and such that the diameters of said first rotatable means and said second rotatable means are equal and the direction of rotation is the same between the two rotatable means, and wherein said drive means located at the platform includes: a first drive means and a rotary table, said first drive means being connected to and rotatable by said rotary table, and a second driven means connected to and rotatable by said first drive means and connected to said elongated rod

4,875,530

AUTOMATIC DRILLING SYSTEM

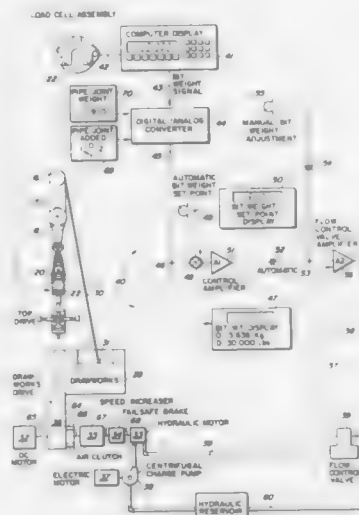
Tommy S. Frink, Tulsa; Lowell M. Reed, Oklahoma City, both of Okla.; Dwayne V. Cochran, Midland, and Will L. McNair, Sugarland, both of Tex., assignors to Parker Technology, Inc., Odessa, Tex.

Continuation of Ser. No. 100,567, Sep. 24, 1987, abandoned. This application Mar. 24, 1989, Ser. No. 328,774

Int. Cl. E21B 44/00; B66D 5/20, 5/26

U.S. Cl. 175-27

22 Claims



1. In a drilling operation wherein a drilling rig supports a drill string by a cable spooled onto a drawworks drum, a drawworks motor connected to rotate said drum for spooling and unspooling the cable and thereby lifting and lowering a drill string, a drawworks brake for braking the drum, and means for rotating a drill string which has a drill bit at the bottom thereof for penetrating a formation while fluid flows through a swivel located at the upper end of the drill string and through the string downhole to the bit; the method of controlling the weight on bit comprising the following steps:

- (1) weighing the drill string while the drill string is suspended within the borehole with the bit off bottom and generating a signal which is proportional to the drill string weight;
- (2) selecting an optimum value for the weight on bit as the bit is rotated while making hole;
- (3) modifying the signal of step (1) by combining said selected value of step (2) therewith to thereby provide a

signal representative of the drill string weight required to achieve the weight on bit of step (2);

- (4) treating the resultant signal obtained in step (3) to provide a control signal which is proportional to the drill string weight required to achieve the weight on bit of step (2);
- (5) continuously supporting the drill string during a drilling operation by applying a variable rotational force on said drawworks drum by connecting a motor means to be rotated by the drawworks drum as the drum unspools cable therefrom; and, applying power to said motor means to drive said motor means in opposition to the unspooling of the drawworks drum; and,
- (6) controlling the torque that said motor means applies to resist rotation of said drum by applying power to said motor means in proportion to said control signal of step (4) to thereby cause the motor means to apply a rotational force to the drum that continually approaches a constant weight on bit which is equal to the selected value of step (2).

14. A drilling rig having a top drive unit comprised of an electric motor connected to rotate the upper end of a drill string; a bit at the lower end of the string; a swivel supports the motor; drilling fluid flows through said swivel, and continues through a rotating hollow shaft of said motor; said swivel is supported from a traveling block which in turn is supported by a plurality of cable strands from a crown block, one end of the cable being rove about a drawworks drum so that rotation of the drum changes the elevation of the string; whereby as the tension in the cable is reduced the string is lowered and the bit engages and penetrates a formation;

first motor means for rotating said drum to thereby lift and lower said traveling block whereupon said swivel, electric motor, drill string and bit are lifted uphole and lowered downhole;

a second motor means connected to be rotated by unspooling of said drawworks drum; said second motor means applies a rotational force to said drawworks drum that is opposed to unspooling of said drawworks drum; said second motor means resists unspooling of the drawworks drum in proportion to the power delivered to said second motor means;

means weighing said drill string while the bit is off bottom and converting the weight measurement into a signal proportional thereto; means selecting a weight on bit, and converting the weight on bit selection into a signal proportional thereto; the weight on bit being a fraction of the drill string weight;

means combining the drill string weight signal and the selected weight on bit signal to provide an operating signal representative of the tension that must be effected in the cable in order to achieve said weight on bit;

and means controlling the power delivered to said second motor means in proportion to the magnitude of said operating signal to continually adjust the rotational force of the second motor means and thereby adjust the weight on bit to a value substantially equal to said selected value of the weight on bit.

4,875,531

CORE DRILLING TOOL WITH DIRECT DRIVE

Johann Biehl, Kirchheim/Teck, and Alfred Osterlag, Celle, both of Fed. Rep. of Germany, assignors to Eastman Christensen Company, Salt Lake City, Utah

Filed Jan. 25, 1988, Ser. No. 148,676

Claims priority, application Fed. Rep. of Germany, Jan. 23, 1987, 3701914

Int. Cl. E21B 25/02

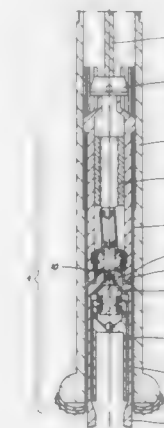
U.S. Cl. 175-250

8 Claims

1. A direct drive core drilling tool comprising: an outer pipe adapted at its upper end to be connected to a drilling shaft;

a core drilling appliance reciprocally mountable within said outer pipe, said core drilling appliance comprising:

- (a) a core barrel adapted at its lower end to carry a drill bit, and
- (b) an inner pipe mounted within said core barrel for reciprocal movement therewith and in rotatable relation therewith, and adapted at its lower end to receive a core entering the core barrel; and



a mud motor positionable within the outer pipe in an axially moveable relation, said mud motor coupled to the upper end of the core barrel to rotate the core barrel, and operable in response to drilling fluid, or mud, passed down through the drill shaft and into the core drilling appliance; said mud motor and said core drilling appliance each comprising reaction faces responsive to liquid pressure to produce a downward axial feed force acting on both the motor and the core drilling appliance.

4,875,532

ROLLER DRILL BIT HAVING RADIAL-THRUST PILOT BUSHING INCORPORATING ANTI-GALLING MATERIAL

James W. Langford, Jr., Red Oak, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Sep. 19, 1988, Ser. No. 246,513

Int. Cl. B21D 53/10; E21B 10/22; F16C 33/12, 33/24

U.S. Cl. 175-371

25 Claims



9. In a rotary earth drilling bit, the combination comprising: a body portion adapted to be connected to a rotary drill member and having a downwardly depending arm member;

a cylindrical cutter spindle extending from said arm member and having a stepped configuration providing an enlarged journal section which is stepped down to provide an annular shoulder and a reduced pilot pin projecting from said annular shoulder;

a roller cutter rotatably mounted on said spindle and having an enlarged rearward bearing recess receiving said journal section and a reduced forward bearing recess receiving said pilot pin and defining with said enlarged recess an

annular thrust face corresponding generally to said spindle annular shoulder;

a journal sleeve bushing in the enlarged bearing recess of said roller cutter and receiving said enlarged journal section of said spindle in a radial load bearing relationship, the inner surface of said journal bushing incorporating an anti-galling material; and

a pilot bushing secured in said roller cutter against rotational movement relative thereto and having a sleeve portion extending into said reduced forward recess and an integral annular rim portion extending outwardly from said sleeve portion over said thrust face, the outer surface of said rim portion contacting said spindle shoulder in a thrust load bearing relationship and the inner surface of said sleeve portion receiving said pilot pin in a radial load bearing relationship, said inner sleeve surface and said outer rim surface incorporating an anti-galling material.

4,875,533

AUTOMATIC WEIGHT DETECTING DEVICE

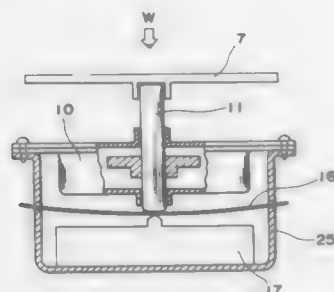
Makoto Mihara, Nara; Masanobu Inoue, Yamatokoriyama; Kenzo Ohji, Ikoma, and Shuji Ito, Shiki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Jul. 8, 1988, Ser. No. 216,497

Claims priority, application Japan, Jul. 13, 1987, 62-174097; Jul. 13, 1987, 62-174098

Int. Cl.⁴ G01G 19/52, 3/14

U.S. Cl. 177-144

12 Claims



1. A weight detecting device, comprising:

- a plate for receiving an object to be measured;
- a rotatable shaft supporting said plate and movable a predetermined amount along a thrust axis of said rotatable shaft;
- a leaf spring receiving and supporting a lower end of said rotatable shaft, said leaf spring movable in the direction of said thrust axis of said rotatable shaft at the point on said leaf spring supporting said lower end of said rotatable shaft, said leaf spring having opposite ends;
- a support means for horizontally supporting said opposite ends of said leaf spring;
- a load detecting means disposed below said leaf spring for detecting a composite load of said object on said plate, via said rotatable shaft and said leaf spring, and the stress on said leaf spring, and for outputting an electrical signal corresponding to said composite load; and
- a weight detecting circuit for detecting the weight of said object from said electrical signal of said load detecting means.

4,875,534
WEIGHING APPARATUS WITH IMPROVED
ELECTROMAGNETIC LOAD COMPENSATION

Peter Kunz, Gossau, Switzerland, assignor to Mettler Instruments AG, Greifensee, Switzerland

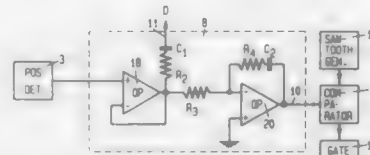
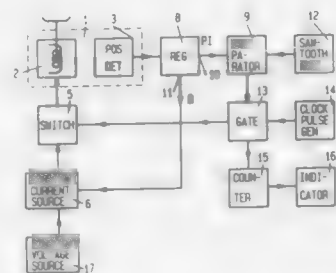
Filed May 19, 1989, Ser. No. 354,017

Claims priority, application Switzerland, Jun. 14, 1988, 1175/88

Int. Cl.⁴ G01G 7/00

U.S. Cl. 177-212

5 Claims



1. Weighing apparatus of the electromagnetic load compensation type, comprising:

- (a) load receiving means connected for movement relative to a fixed support;
- (b) electromagnetic means (2) including means establishing a stationary magnetic field relative to said fixed support, and a coil arranged in said field and connected with said load receiving means;
- (c) means operable in response to the application of a load to be measured to said load receiving means for supplying compensation current to said coil to virtually maintain said load receiving means in an initial position relative to said support, said current supplying means including:
 - (1) position detector means (3) for generating a position signal responsive to the position of said load receiving means relative to said support;
 - (2) regulating means (8) responsive to said position signal for generating a regulating signal including proportional (P), integral (I) and differential (D) components;
 - (3) means (6) supplying constant direct current;
 - (4) switch means (5) connecting said constant current supply means with said electromagnetic means; and
 - (5) means responsive to the proportional (P) and integral (I) components of said regulating signal for periodically operating said switch means between conducting and non-conducting conditions to supply current to said electromagnetic means;
- (d) means (6) responsive to the differential component (D) of said regulating signal for controlling said constant current means to modulate the amplitude of the constant current;
- (e) indicator means (16) for indicating the magnitude of the applied load as a function of the compensation current supplied to said electromagnetic means.

4,875,535

VEHICLE DRIVE

Robert H. Parker, Esher, England, assignor to Autokraft Limited, Weybridge, England

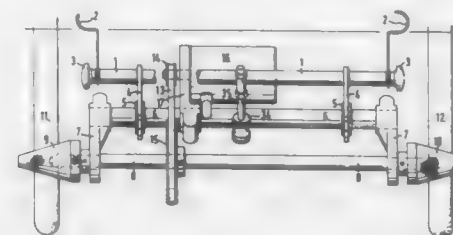
Filed Oct. 1, 1987, Ser. No. 103,138

Claims priority, application United Kingdom, Oct. 2, 1986, 8613710

Int. Cl.⁴ B62D 11/02; A61G 5/04

U.S. Cl. 180-6.2

7 Claims



1. Apparatus for driving and steering a wheeled vehicle comprising an oppositely-directed pair of rotary friction-drive cones mounted to extend each respectively across the periphery of one of a pair of vehicle road wheels, means for transmitting drive to the cones in frictional driving contact each with the periphery of its respective road wheel, and steering means for simultaneously moving the cones in one axial direction or the other so as to control the cone diameter at which each respective cone contacts its road wheel and thus control the speed of either road wheel relative to the other.

4,875,536

CONTROL DEVICE FOR OPERATING A MOTOR
VEHICLE

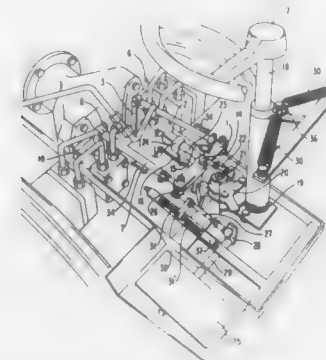
Niko K. Saur, Roigheim, and Wolfgang Brouner, Nendenau-Kressbach, both of Fed. Rep. of Germany, assignors to Agrar-Werke GmbH, Möckmühl, Fed. Rep. of Germany
Filed Jul. 20, 1988, Ser. No. 221,997

Claims priority, application Fed. Rep. of Germany, Jul. 20, 1987, 3723965

Int. Cl.⁴ B62D 6/00

U.S. Cl. 180-6.32

12 Claims



1. A control device for operating a vehicle; comprising running gears arranged at each side of the vehicle; driving means cooperating with said running gears for allowing the latter to be driven separately of each other, said driving means including a control member for each of said running gears; a pair of user-actuated members; and connecting means for operatively linking said user-actuated members to said control members, said connecting means including an actuating element connected to said control members, said actuating element being rotatable about a

rotational axis and movable in a direction perpendicular to said rotational axis, each of said user-actuated members being operatively connected to said actuating element so that an adjustment of one of said user-actuated members causes a translational motion of said actuating element and a displacement of said control members in a same direction as said actuating element, and an adjustment of said other user-actuated member causes a rotation of said actuating element and a displacement of said control members in a direction opposite to each other.

4,875,537

DISPOSABLE OIL ABSORBENT DRIP PAD ASSEMBLY
FOR A VEHICLE

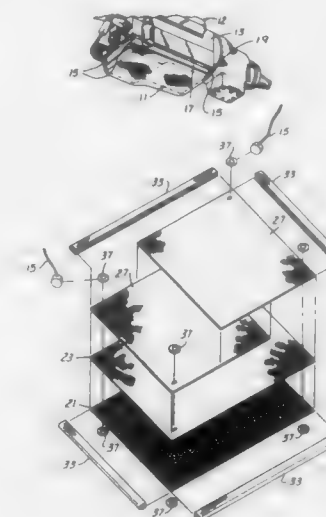
Anthony H. Garatz, Mt. Clemens, and William M. Ronne, Sterling Heights, both of Mich., assignors to Garon Corp., Mt. Clemens, Mich.

Filed May 5, 1988, Ser. No. 190,390

Int. Cl.⁴ B62D 25/20

U.S. Cl. 180-69.1

15 Claims



1. A disposable oil-absorbent drip pad assembly adapted for suspension under the bottom of a vehicle to collect oil, grease and hydraulic fluids, comprising:

- a bottom layer of a metallic screen material;
- an intermediate layer of insulating material overlying and engaging the bottom layer;
- a top layer of oil-absorbent material overlying and engaging the intermediate layer;
- said layers each having outer peripheries;
- means peripherally securing and interconnecting said layers throughout their peripheries;
- apertured mount means extending through portions of the assembled layers adapted to receive fasteners for suspending the pad assembly from a vehicle;
- each of said bottom, intermediate and top layers being generally planar and thus having two main axes, a first being defined as longitudinal and the second being defined as transverse; and
- said top layer consisting of a pair of longitudinally overlapped top layer elements, said elements being overlapped over a portion of their longitudinal extents thus defining overlapped areas, and laterally spaced transverse stitching interconnecting a longitudinal end portion of each top layer element with a longitudinally intermediate portion of the other top layer element.

4,875,531

REDUCED SIZE TRANSMISSION TUNNEL IN AN AUTOMOBILE AND A METHOD FOR THE SAME
Gordon Hodgson, Thornhill; Douglas G. Broadhead, Scarborough, and David J. Parent, Mississauga, all of Canada, assignors to AHA Automotive Technologies Corporation, Brampton, Canada

Filed Mar. 15, 1988, Ser. No. 168,366
Int. Cl.⁴ B60K 23/00

U.S. Cl. 180—379

18 Claims



1. A rear wheel driven passenger automobile having an under hung carriage, an engine located at a front end, a transmission unit, a rear passenger compartment having a floor and a rear passenger seat and the automobile including:

- a segmented drive shaft having at least three elements for transmitting rotation from the transmission unit to the rear wheels and including;
- a first element connected between an output shaft of the transmission unit and a second element, the first element being inclined downwardly from front to back;
- a second element connected between the first element and third element and being generally parallel to and below the floor;
- a third element connected between the second element and a pinion of a rear differential, the third element being located substantially below the rear passenger seat;
- a substantially flat floor located in front of the rear passenger seat and including a transmission tunnel of reduced size the transmission tunnel having a flat upper surface sloping, side surfaces and flat lower surfaces;
- means for supporting the segmented drive shaft in place below the floor, the supporting means comprising at least one hanger member fixed to the underside of the automobile, and having bearing means therein; and
- reinforcing means for reinforcing the automobile between the front and rear wheels, the reinforcing means comprising two reinforced floor panels being secured on either side of said transmission tunnel to said flat lower surfaces.

4,875,539

ELECTRIC POWER STEERING CONTROL SYSTEM
Toshimi Abukawa, Hitachi; Kazuo Tahara, Hitachi; Katsuji Murumoto, Hitachi; Toshiyuki Koterazawa, Hitachi; Mitsuyuki Homba, Katsuta; Tadashi Takahashi; Shuichi Takamatsu, both of Hitachi; Hisatugu Ishikura, Katsuta; Hiroshisa Yamamura, Hitachi; Tora Tatsuzaki, Funabashi; Tsutomu Ohmae, Hitachi; Toshiaki Okuyama, Ibaraki; Seizi Yamashita, Katsuta; Shigeki Saito, Katsuta, and Masato Sakai, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Automotive Engineering Co., Ltd., Katsuta, both of Japan

Filed Mar. 31, 1988, Ser. No. 176,151
Claims priority, application Japan, Mar. 31, 1987, 62-78194; Aug. 12, 1987, 62-199748

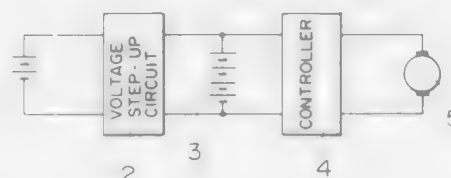
Int. Cl.⁴ B62D 5/04

U.S. Cl. 180—79.1

20 Claims

1. An electric power steering control system comprising an electric motor which provides an assisting force for a steering system of a vehicle through a reduction gear; a torque sensor which is fitted on a steering shaft for detecting the steering torque; a controller which controls the input to said motor in

accordance with the output of said torque sensor; a battery which supplies power to said controller; and a voltage step-up



means which is connected to said battery for driving said motor at a voltage higher than the voltage of said battery.

4,875,540

ELECTRIC POWER STEERING SYSTEM
Saitohiro Oshita; Toyohiko Mouri, and Tsutomu Takahashi, all of Ohta, Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 6, 1988, Ser. No. 203,302
Claims priority, application Japan, Jun. 9, 1987, 62-143808
Int. Cl.⁴ B62D 5/04, 6/02

U.S. Cl. 180—79.1

14 Claims



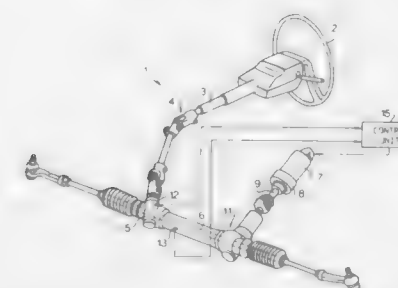
1. An electric power steering system for a motor vehicle, comprising
 - a motor operatively connected to a steering system for reducing steering effort,
 - a vehicle speed sensor for producing a vehicle speed signal,
 - a torsion torque sensor provided for detecting torsion torque which is generated in the steering system during a steering operation,
 - assist means responsive to an output signal of the torsion torque sensor for producing an assist signal,
 - driving means responsive to the assist signal for producing a signal for driving the motor,
 - a steering angle sensor provided for detecting steering angle of a steering wheel for producing a steering angle signal,
 - first means responsive to said vehicle speed signal and said steering angle signal for producing a lateral acceleration signal dependent on lateral acceleration exerted on the motor vehicle while said vehicle speed signal is lower than a predetermined value,
 - second means responsive to the lateral acceleration signal for producing a first return torque signal dependent on the lateral acceleration, and
 - third means for adding the first return torque signal to the assist signal to operate the motor dependent on the first return torque signal via said driving means to return the steering wheel, so as to prevent returning delay of the steering wheel at turning of a corner under high lateral acceleration.

4,875,541

ELECTRIC POWER STEERING SYSTEM
Saitohiro Oshita; Toyohiko Mouri; Tsutomu Takahashi, all of Ohta, and Shinji Iton, Oomama, all of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan
Filed Jun. 6, 1988, Ser. No. 203,286
Claims priority, application Japan, Jun. 8, 1987, 62-143865
Int. Cl.⁴ B62D 5/04, 6/02

U.S. Cl. 180—79.1

2 Claims



1. In an electric power steering system having a motor operatively connected to a steering system for reducing steering effort, a torsion torque sensor provided for detecting torsion torque generating in the steering system in steering operation, assist means responsive to an output signal of the torsion torque sensor for producing an assist signal, driving means responsive to the assist signal for producing a signal for driving the motor to turn a steering wheel, a steering angle sensor provided for detecting steering angle of the steering wheel and for producing a steering angle signal, return means responsive to the steering angle signal for operating the motor to return the steering wheel, the improvement comprising:

- the assist means including first hysteresis providing means having a first dead zone and for producing the assist signal when the output signal of the torsion torque sensor exceeds the first dead zone; and wherein
- said first hysteresis providing means has a hysteresis providing range and the first dead zone is moved within the hysteresis providing range when the output signal exceeds the first dead zone.

4,875,542

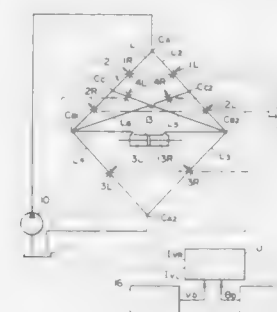
HYDRAULIC SYSTEM FOR VARIABLE ASSIST POWER STEERING SYSTEM

Koh Uchida, Sagamihara; Takashi Kurihara, Atsugi, and Makoto Miyoshi, Kawasaki, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jun. 29, 1988, Ser. No. 213,022
Claims priority, application Japan, Jun. 29, 1987, 62-161576
Int. Cl.⁴ B62D 5/083

U.S. Cl. 180—142

11 Claims



1. A variable assist power steering system for a vehicle including a steering wheel, a pump, a reservoir, a power cylinder adapted to be connected to a steering linkage, the power

cylinder defining two chambers, comprising:

a control valve including valve elements relatively displaceable in response to a first predetermined variable in the form of a steering torque applied by the steering wheel to define therebetween two parallel fluid flow paths connected between the pump and the reservoir to produce a pressure differential between the two chambers of the power cylinder in response to said first predetermined variable, said two parallel fluid flow paths including connections communicating with the two chambers of the power cylinder, respectively, each of said two parallel fluid flow paths being divided into an upstream section and a downstream section with respect to said connection thereof;

each of said upstream and downstream sections of said two parallel fluid flow paths including a main variable flow restrictor having an orifice area variable with said first predetermined variable;

wherein

one of said upstream and downstream sections of each of said two parallel fluid flow paths includes an additional variable flow restrictor having an orifice area variable with said first predetermined variable and arranged in series with that one of said main variable flow restrictors which is included by said one section, said additional variable flow restrictor and said one main variable flow restrictor being disposed on the same side from one of said connections such that said additional variable flow orifice is disposed less far from said one connection than said one main variable flow restrictor is;

a pair of bypass paths, each having one end communicating with one of said two parallel fluid flow paths at said connection of said one parallel fluid flow path and an opposite end communicating with the other of said two parallel fluid flow paths at a portion which is disposed more far from said connection of said the other parallel fluid flow path than said additional variable flow restrictor is but less far from said connection of said the other parallel fluid flow path than said main variable flow restrictor is;

each of said bypass paths has arranged therein at least one variable flow orifice valve which has an orifice area variable in a different manner from the manner of variation the orifice areas of said main and additional variable flow restrictors.

4,875,543

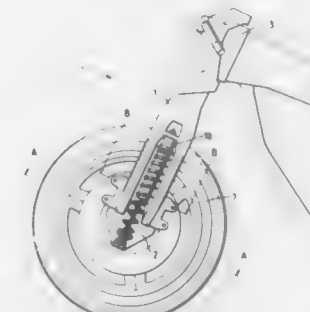
FRONT WHEEL SUSPENSION FOR MOTORCYCLES
Adrianus H. I. Verkuyl, Malden, Netherlands, assignor to Willem Peters, Weert, Netherlands

Filed Jun. 3, 1988, Ser. No. 202,202
Claims priority, application Netherlands, Jun. 12, 1987, #701M64

Int. Cl.⁴ B62K 25/04

U.S. Cl. 180—219

21 Claims



1. Front wheel suspension system for motorcycles comprising

ing elements which are spring-mounted with respect to each other and are connected to the front wheel at one end and to the ball-head of the motorcycle on the other end, said suspension system characterised in having a spring-mounted element which is constituted by a single support arm, which arm is connected to the ball-head of the motorcycle and extends along only one side of the frontwheel and said support arm is provided with guide means and on the side adjacent the wheel being provided with a shift piece, to which shift piece is rotatably connected a shaft for the front wheel, said shift piece also being provided with guide means, the guide means of said support arm and of said shift piece cooperating with each other, spring means and a shock damper means connected on one end to the frontwheel through the shift piece and on the other end to the support arm; said shift piece being provided with a groovelike chamber opening at the side thereof opposite from the front wheel shaft, in which chamber a pair of guide ways are formed symmetrically of the front wheel shaft, said guide ways cooperating with a pair of guide ways formed on the outside of the support arm.

4,875,544

TRANSDUCER FOR INDUCING SEISMIC SIGNALS INTO AN ELASTIC MEDIUM

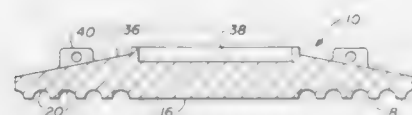
Tom P. Althart, Plano, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Feb. 2, 1989, Ser. No. 306,633

Int. Cl.⁴ G01V 1/047

U.S. Cl. 181-113

1 Claim



1. In a transducer for inducing seismic waves into an elastic medium, including a coupling member adapted to couple energy of such transducer into said medium, the improvement comprising:

- a plurality of discrete cleat members projecting from a lower surface of said coupling member, each said cleat member having lateral sides including arcuate portions generally tangent to said sides and to said lower surface of the coupling member, each said cleat member being truncated to provide a ground engaging surface disposed in a plane substantially parallel to said lower surface; and
- a centrally-located, ground-engaging portion projecting from said lower surface and surrounded by said cleat members, said ground-engaging portion including a ground-engaging surface disposed in substantially the same plane as the ground-engaging surfaces on said cleat members, lateral sides including arcuate portions generally tangent to said lateral sides and to said lower surface on said coupling member, said ground-engaging surface on said ground-engaging portion being substantially greater in area than the ground-engaging surface on any of said cleat members, whereby the elastic medium is compressed preventing movement of said coupling member and directing the transducer force into the elastic medium to produce the seismic waves.

4,875,545

EXTERNAL BUBBLE-SUPPRESSION METHOD AND APPARATUS

Adrien P. Pasconet, 8925 Lipan, Houston, Tex. 77063

Continuation-in-part of Ser. No. 703,342, Feb. 20, 1985, abandoned. This application Nov. 6, 1987, Ser. No. 118,430

Int. Cl.⁴ G01V 1/04

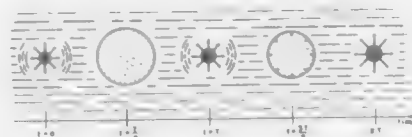
U.S. Cl. 181-115

20 Claims

1. A method for substantially reducing a pressure pulse

generated by a body of water having a first radial motion, the method comprising:

- impulsively deflecting said first radial motion into an axial motion by the generation of a second radial motion, said first and second radial motions being substantially of op-



posite phase and having a substantially similar maximum displacement, the centers of said radial motion being separated by a distance substantially between one and two times the maximum displacement of said first radial motion.

4,875,546

LOUDSPEAKER WITH ACOUSTIC BAND-PASS FILTER

Palo Kruun, Somerville, Mass., assignor to Teledyne Industries, Inc., Los Angeles, Calif.

Filed Jan. 2, 1988, Ser. No. 201,539

Int. Cl.⁴ A05K 5/00

U.S. Cl. 181-160

24 Claims



1. A loudspeaker comprising:

- enclosure means for enclosing an acoustically-reflective chamber;
- barrier means coupled to said enclosure means for dividing said chamber into first and second acoustically-reflective subchambers, said barrier means comprising an opening;
- electro-acoustical transducer means, mounted relative to said opening, for causing air enclosed in said first and second subchambers to vibrate acoustically in response to an electrical input signal, said transducer means comprising a vibratable diaphragm;
- first acoustic energy radiating means for enclosing a first acoustic mass of air acoustically coupling said first subchamber with said second subchamber;
- second acoustic energy radiating means for enclosing a second acoustic mass of air acoustically coupling said second subchamber with an atmosphere outside said enclosure means;
- said first subchamber and said first acoustic energy radiating means being configured so that air enclosed in said first subchamber resonates acoustically with said first acoustic mass of air at a first acoustic resonant frequency so as to provide a first acoustic impedance which impedes excursions of said diaphragm;
- said second subchamber and said second acoustic energy radiating means being configured so that air enclosed in said second subchamber resonates acoustically with said second acoustic mass of air at a second resonant frequency so as to provide a second acoustic impedance which impedes transmission of acoustic vibrations of frequencies higher than said second resonant frequency from said second subchamber to said outside atmosphere through said second acoustic mass of air.

4,875,547

PORTABLE CONVEYOR SYSTEM WITH TELESCOPIC BOOM ASSEMBLY AND LOAD CARRYING APPARATUS

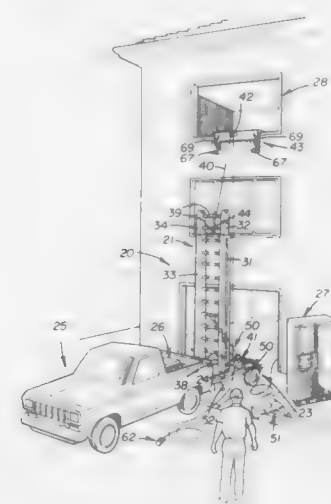
Philip T. Hanthorn, 1409 Carl Ave., Vallejo, Calif. 94590

Continuation-in-part of Ser. No. 75,410, Jul. 20, 1987, Pat. No. 4,793,437. This application Dec. 2, 1988, Ser. No. 278,809

Int. Cl.⁴ E06C 5/04; B66B 9/20

U.S. Cl. 182-102

19 Claims



1. A portable conveyor system comprising

- a boom assembly comprising a pair of extensible and retractable telescopic booms positioned in side-by-side relationship and a plurality of longitudinally spaced rungs interconnected between said booms to define a series of vertically spaced and horizontally disposed supporting surfaces,
- support means having lower ends of said booms mounted thereon to extend said boom assembly upwardly and forwardly from said support means, and
- a mobile primary load carrier means mounted for movement on the supporting surfaces of said rungs, said primary load carrier means including
- a frame,
- a load-carrying primary platform pivotally mounted on said frame,
- first adjustment means for selectively pivoting said primary platform to an acute angle relative to said frame,
- a hitch mounted forwardly on said frame for attachment to a cable of a winch, and
- second adjustment means for selectively moving said hitch vertically relative to said frame to control the disposition of said load carrier on the supporting surfaces of said rungs.

4,875,548

JUMP RESCUE APPARATUS

Peter Lornbach, Schwerstrasse 59, 5650 Solingen 1, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 861,060, May 8, 1986, abandoned. This application Nov. 24, 1987, Ser. No. 129,384. Claims priority, application Fed. Rep. of Germany, May 9, 1985, 3516676

Int. Cl.⁴ F16K 17/36

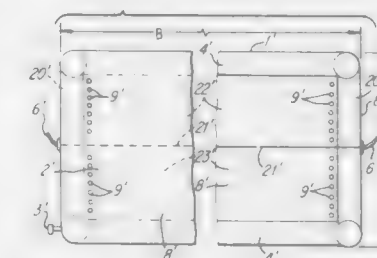
U.S. Cl. 182-137

1 Claim

- 1. A jump rescue apparatus, comprising the improvement in combination therewith including:
- a pneumatic framework made of inflatable tubes; and
- a flexible and substantially inextensible tensioned fabric covering that extends around said pneumatic framework of inflatable tubes disposed below said covering which is supported thereby, with said covering having a pre-tensioned jump surface onto which a person who is to be

rescued can jump safely, and with said pre-tensioned jump surface including edges and being supported only along the edges by said pneumatic framework in a tensioned condition; and with an approximately quadratic outline of said jump surface there is a ratio relationship of the height to the width of the apparatus within a range of approximately 1:1.7 to 1:2.5, preferably amounting to 1:2;

said pneumatic framework of inflatable tubes having a starting configuration and being elastically yieldingly deformable to accommodate a person jumping onto said pre-tensioned jump surface for energy dissipation in such a way that the person who is jumping is received in an elastically soft manner rather than in a spring-like manner, and after said person is no longer on said pre-tensioned jump surface, said pneumatic framework of inflatable tubes being adapted automatically and independently to return said covering that is reset rapidly to the starting configuration and returned substantially back to the position it had prior to the time the person jumped onto said pre-tensioned jump surface to allow use thereof again as quickly as possible to rescue another person; said tensioned fabric covering being provided with at least one air-passage means embodied particularly as flow-restriction means provided for air through-passage in a flow-throttling operation although open reciprocally irrespective of whether air is to flow in or out in connection with said pneumatic framework of inflatable tubes to obtain combination effect of said pneumatic framework via support only along edges coupled with said air-passage means, said air-passage means only being located in corner regions of the apparatus;



in a state of rest, said covering being provided with surfaces that are supported under pre-tension by said framework, said jump surface of said covering being provided with peripheral edges, and said framework includes elements that contact said covering at least in the region of said peripheral edges of said jump surface;

said covering being provided with corners, and said elements of said framework contact said corners, said covering having a bottom surface opposite said jump surface thereof, with both said bottom surface and said jump surface being respectively provided with peripheral edges; said inflatable tube framework includes at least one continuous closed frame, with at least one of said jump surface and said bottom surface having its peripheral edges adjacent one of said closed frames, one of said closed frames being located along said peripheral edges of said jump surface; said framework further including narrow support members for supporting said last-mentioned closed frame;

said air-passage means including a plurality of small openings for allowing air to leave said covering; all of said inflatable tubes being interconnected, and an air inlet valve that communicates with one of said tubes and is disposed remote from said jump surface; said inflatable tubes of said framework being effective practically exclusively in the edge region of said jump surface in such a way that the center of the latter is more yielding than the edge region thereof;

said air-passage means being embodied particularly as flow-restriction means open reciprocally irrespective of whether air is to flow in or out in connection with said pneumatic framework; said air-passage means being holes having a diameter in a range of 40 mm to 80 mm, preferably 60 mm, and for each cubic meter of air content volume of the apparatus there being a range of four to seven holes being provided therewith, said air-passage means only being located in corner regions of the apparatus;

said air-passage means being located at least on one side of supports located in corner regions of the apparatus;

said air-passage means being arranged in vertically extending rows one above the other; and

a hollow space inside the apparatus that is subdivided by a partition wall extending transversely and practically air impermeable, said partition wall being located at substantially half the height level of the apparatus overall, whereby such hollow space is subdivided into two chambers formed on opposite sides of said partition wall and having holes of equal number arranged as said air-passage means of each of said two chambers; and

said transversely extending partition wall having edges securely connected with side walls of said apparatus and further including handles arranged and fastened externally at said connection locations between the transversely extending wall with respect to said side walls of the apparatus.

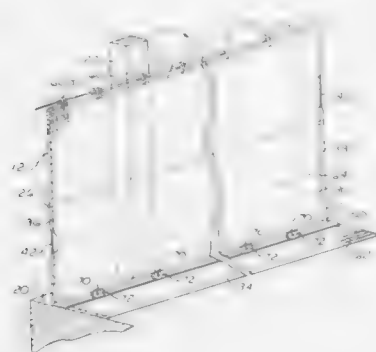
4,875,549

DEBRIS BARRIER

David S. Denny, Middle Haddam; Edward C. R. Metzger, Deep River; John Rexroad, Old Saybrook, and William Glynn, West Suffield, all of Conn., assignors to SINCO, Inc., East Hampton, Conn.

Continuation of Ser. No. 174,006, Mar. 28, 1988, Pat. No. 4,815,562. This application Mar. 27, 1989, Ser. No. 328,627
Int. Cl.⁴ E04G 21/32

U.S. Cl. 182—138



1. A debris barrier system for high rise construction projects adapted for installation in connection with a safety cable suspended at a generally uniform height above a floor slab along at least a portion of the perimeter vicinity thereof comprising:

a flexible netting having a first border portion and a second transversely spaced border edge separated by a distance greater than said height;

clip means for connecting said netting to said cable at longitudinally spaced locations along said netting to suspend said netting so as to form a flexible vertical panel and a flap horizontally positionable on said floor slab;

a flexible anchoring strip spaced from said first border portion a distance approximately equal to the cable height and extending longitudinally along said netting; and

fastener means for fastening said netting to said floor slab at longitudinally spaced positions along said flexible anchoring strip.

4,875,550

GAFF

James J. Rullo, Elmira, N.Y., assignor to Buckingham Manufacturing Company, Inc., Binghamton, N.Y.

Filed Dec. 13, 1988, Ser. No. 283,683
Int. Cl.⁴ A63B 27/00

U.S. Cl. 182—221

14 Claims



1. A gaff for use with, and attachment to, a leg iron, that is characterized by improved penetration into pole or tree materials, said gaff comprising:

a gaff body having a forward penetrating section and a rearward section for attaching said body to said leg iron, said forward penetrating section including in sequential order, a means defining a point of penetration followed by a first relief section, thereafter followed by a first expansion section, followed by a second relief section, said point of penetration and said expansion section causing a compression in the pole or tree materials during the penetration of said gaff body into said pole or tree materials, and said subsequent relief sections allowing said compressed materials to decompress as said gaff body continues to penetrate the pole or tree.

4,875,551

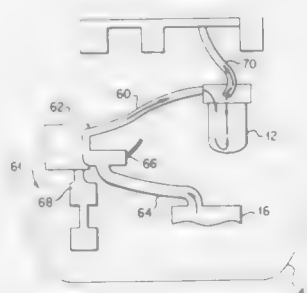
PRE-LUBRICANT OIL PRESSURE ADAPTER

John F. Lulich, Pittsburgh, Pa., assignor to R. P. M. Industries, Washington, Pa.

Filed Oct. 13, 1987, Ser. No. 108,161
Int. Cl.⁴ F01M 11/03

U.S. Cl. 184—6.3

10 Claims



1. An apparatus for providing oil and oil pressure to an engine having an oil system before the engine engages comprising:

an oil filter;

an oil pump for pumping oil and raising the oil pressure in the engine;

a linkage having at least one linkage chamber for linking the oil filter and the oil pump so oil pumped by the oil pump is provided only to the oil filter via the linkage chamber which fluidically connects the oil pump and the oil filter, said linkage also linking the oil filter and the engine oil system at a first location, said linkage having at least a first opening and a second opening, said second opening allowing oil to pass from the engine oil system to the oil filter to be filtered;

an O-ring assembly that has a channel, said O-ring assembly being mounted in the engine and connecting the engine oil system at the first location with the linkage by way of the first opening so oil that has been filtered by the oil filter passes through the channel of the O-ring assembly into the engine oil system;

means for starting the pump and engine;

means for delaying the starting of the engine until there is oil pressure in the engine oil system, said delay means disengaging the pump after the engine engages, said delay means electrically connected to the starting means; and

supply means for fluidically connecting the oil pump to the engine oil system at a second location.

4,875,552

MODULAR ELEVATOR CAB CONSTRUCTION

Stephen W. Smith; Gilbert E. Londeen, both of Arkansas City, and Christopher Lair, Wichita, all of Kans., assignors to Montgomery Elevator Company, Moline, Ill.

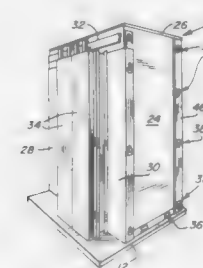
Division of Ser. No. 891,532, Jul. 29, 1986, Pat. No. 4,779,707.

This application Jul. 1, 1988, Ser. No. 214,479

Int. Cl.⁴ B66B 9/00; E04B 1/38

U.S. Cl. 187—1 R

1 Claim



1. A modular elevator cab construction for assembly onto a platform of an elevator stile substantially from within the area of the cab, comprising:

a rear wall panel and two side wall panels, including support means projecting from one of the wall panels at a juncture between the rear wall panel and each of the side wall panels; and

complementary interengaging hanger means on backsides of adjacent panels for assembling the panels in proper right-angular juxtaposition, the hanger means including a plurality of sets of receptacle means and complementary hanger members, the receptacle means of each set being on one of the support means and the adjacent panel and the respective hanger member of each set being on the other of the support means and the adjacent panel at each said juncture, wherein said support means comprise angle plates with a first arm secured to an outer surface of a panel and a second arm lying outside an outer surface of an adjacent panel, said receptacle means comprise apertures in the support means, and said hanger members are located on the backside of said adjacent panel and comprise spring hooks for positioning in the apertures, the spring hooks being spring loaded in a direction perpendicular to a plane including the adjacent panel.

4,875,553

MODULAR ELEVATOR CAB CONSTRUCTION

Stephen W. Smith; Gilbert E. Londeen, both of Arkansas City, and Christopher Lair, Wichita, all of Kans., assignors to Montgomery Elevator Company, Moline, Ill.

Division of Ser. No. 891,532, Jul. 29, 1986, Pat. No. 4,779,707.

This application Jul. 1, 1988, Ser. No. 214,478

Int. Cl.⁴ B66B 11/02; E04B 5/52

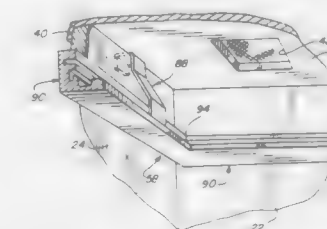
U.S. Cl. 187—1 R

5 Claims

1. A modular elevator cab construction for assembly onto a

platform of an elevator cage substantially from within the area of the cab, comprising:

a plurality of wall panels bounding at least a portion of the cab area, the wall panels having top edges;



support means for supporting a drop ceiling of the elevator cab; and

means for hanging the drop ceiling support means from the top edges of said wall panels.

4,875,554

DYNAMIC SELECTION OF ELEVATOR CALL ASSIGNMENT SCAN DIRECTION

Robert C. MacDonald, W. Caldwell, N.J., and Elsa Abrego, Manhattan, N.Y., assignors to Inventio AG, Hergiswil, Switzerland

Filed Aug. 31, 1988, Ser. No. 238,941

Int. Cl.⁴ B66B 1/18

U.S. Cl. 187—124

8 Claims



1. A method for assigning up and down hall calls registered from floors of a building to a plurality of elevator cars which travel in up and down directions in the building to collectively provide elevator service, comprising the steps of:

determining the number (UPCOUNT) of elevator cars providing elevator service in the up travel direction,

determining the number (DNCOUNT) of elevator cars providing elevator service in the down travel direction,

and selecting a sequence for assigning up and down hall calls in response to a predetermined relationship between UPCOUNT and DNCOUNT.

4,875,555

PATIENT LIFTING DEVICE

Jan A. Johansson, Braks; Jan I. Jönsson, Moheda, and Björn T. Lindström, Stockholm, all of Sweden, assignors to Aktiebolaget Electrolux, Stockholm, Sweden

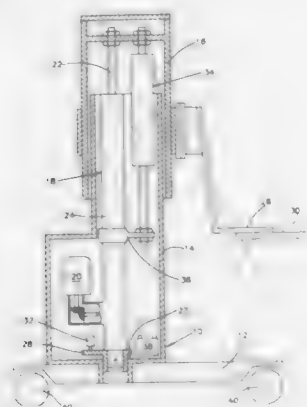
Filed Nov. 27, 1987, Ser. No. 126,024

Claims priority, application Sweden, Dec. 29, 1986, 8605592

Int. Cl.⁴ B66B 9/20; A61G 7/10

U.S. Cl. 187—9 R

3 Claims



1. A patient lifting device comprising a lower part having a base and a lower column portion, an upper part having an upper column portion, a lifting platform, means connecting said platform to said upper column portion whereby said platform is elevated and lowered relative to said lower column portion, an electrically driven and rectilinearly extendable jack having a top part and a bottom part, said jack being mounted between said column portions to selectively raise and lower said upper column portion with said platform, one part of said jack being fixed to one of said column portions, the other part of said jack being anchored with limited axial play to the other said column portion thereby permitting an axial relative movement of said jack at said anchoring place when the jack continues to retract after the platform upon lowering has been stopped by an obstacle, means utilizing said relative movement to interrupt electrical current to said jack thereby stopping it, and a gas spring arranged in parallel to work in tandem with said jack to reduce the working load on said jack by pre-loading the jack, with one end of said gas spring being fixed to said part of said jack which is anchored with limited axial play and the other end of said gas spring being fixed relative to the other part of said jack.

4,875,556

BRAKE ARRANGEMENT

Steven Shaw, Stuttgart, and Elmar Weiss, Würzburg, both of Fed. Rep. of Germany, assignors to Dr. Ing H.c.F. Porsche Aktiengesellschaft, Weissach, Fed. Rep. of Germany

Filed Nov. 14, 1988, Ser. No. 270,689

Claims priority, application Fed. Rep. of Germany, Nov. 14, 1987, 3738764

Int. Cl.⁴ F16D 65/20

U.S. Cl. 188—72.4

7 Claims

1. A brake arrangement for a disk brake of a vehicle comprising:

- brake caliper means;
- brake pad means guided in the brake caliper means on both sides of a brake disk;
- hydraulically actuated actuating piston means operatively connected with the brake pad means and having a bore in a piston end face facing an oppositely disposed brake pad surface of the brake pad means, the bore having both circumferential and bottom surfaces; and
- an insert member having a body portion retained in the bore with both radial and axial play with respect to the inner circumferential and bottom surfaces of the bore and a

flange covering the piston end face of the actuating piston means, an inner circumferential surface of the flange being in frictional connection with the piston end face of the actuating piston means and an outer surface of the flange



being in frictional connection with the oppositely disposed brake pad surface of the brake pad means, the insert member consisting of a metal having a relatively high specific weight.

4,875,557

BRAKE PLAY RESETTING DEVICE

Faust Hagin; Hans Drewitz, and Manfred Krenner, all of Munich, Fed. Rep. of Germany, assignors to MAN Nutzfahrzeuge GmbH, Munich, Fed. Rep. of Germany

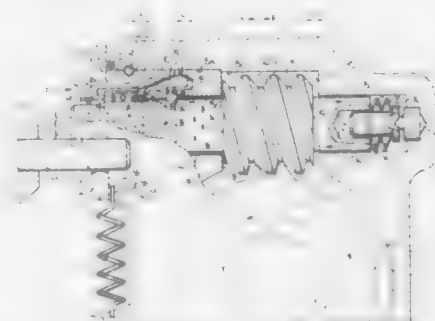
Filed Dec. 15, 1988, Ser. No. 285,197

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1987, 3743206

Int. Cl.⁴ F16D 65/56

U.S. Cl. 188—79.55

16 Claims



1. In a brake play resetting device for a braking mechanism in which an actuator moves an adjusting means during a braking operation to apply contact between brake linings and a member to be braked, and releases the adjusting means for return to its initial position after the braking operation is completed, the adjusting means having a setting shaft drivingly engaged with a drive wheel adapted to apply brake force to the brake linings, said setting shaft being axially displaceable between axially spaced abutments, unidirectional coupling means for rotating said setting shaft to reduce play between the linings and the member to be braked when said play exceeds a determined amount, and spring means acting on said shaft for yielding when a predetermined braking pressure is exceeded to permit displacement of the setting shaft between said abutments, the improvement wherein said unidirectional coupling means comprises a setting member displaceably supported by

the adjusting means, abutment means positioned for being contacted by said setting member upon movement of the adjusting means during a braking operation, a turnable conical coupling member in driving engagement with said setting shaft and axially displaceable between a first position in coupled engagement with said setting member and a second position released from the setting member, and means for preventing turning of the coupling member during a part of the axial displacement movement of the setting shaft between said abutments to cause a relative slip of the driving engagement between the setting shaft and the coupling member and thus further to cause a small increase in the play between the brake linings and the member to be braked.

4,875,558

SAFETY BRAKE FOR ESCALATORS

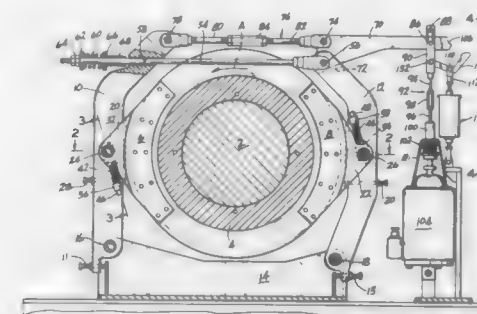
Dietmar Berkhan, Neustadt, and Martin Mehler, Nienstaedt, both of Fed. Rep. of Germany, assignors to Otis Elevator Company, Farmington, Conn.

Filed Mar. 16, 1989, Ser. No. 324,078

Int. Cl.⁴ B60T 13/04

U.S. Cl. 188—171

12 Claims



1. For use in controlling rotation of a shaft, a braking assembly of the type having a brake disk fixed to the shaft; brake shoes straddling the brake disk and mounted on respective brake levers; and a connecting rod and spring assembly interconnecting said brake levers for biasing said brake shoes toward said brake disk, the improvement comprising:

- (a) a control lever connected to each of said brake levers for controlling movement of said brake levers toward and away from said brake disk;
- (b) sear means for engaging said control lever to releasably hold the latter in a brake-off position wherein said brake shoes are held away from engagement with said brake disk;
- (c) spring means for biasing said sear means away from engagement with said control lever; and
- (d) actuator means operable to selectively resist said spring means to enable said sear means to retain said control lever in said brake-off position, whereby disabling of said actuator means enables said spring means to move said sear means out of engagement with said control lever to allow said brake shoes to engage said brake disk stopping rotation of the shaft.

4,875,559

TREAD BRAKE UNIT

Keith W. Langley, Bath, and Jack Washbourn, Axminster, both of England, assignors to Westinghouse Brake & Signal Holdings Ltd., Chipperham, England

Filed Jan. 23, 1989, Ser. No. 300,107

Claims priority, application United Kingdom, Jan. 27, 1988, 8801701

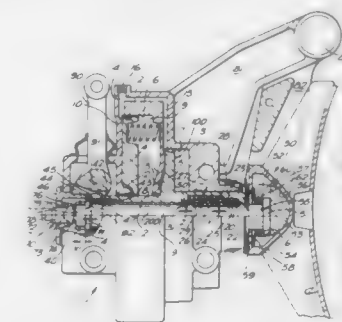
Int. Cl.⁴ F16D 65/32, 65/66

U.S. Cl. 188—203

6 Claims

1. A tread-brake unit comprising, as a unitary structure, a brake shoe for engagement with the tread of a vehicle wheel,

a brake actuator having an output member via which the brake shoe can, firstly, be moved into engagement with the wheel tread and, thereafter, a braking force generated by the actuator can be transmitted to the brake shoe, and a slack adjuster by which clearance between the brake shoe and the wheel tread, in the "released" condition of the unit, can be maintained substantially constant, the slack adjuster having a pair of fast-threaded nuts, each such nut being threadably engaged with and rotatable on the output member of the actuator, wherein



the actuator includes a piston of non-circular peripheral configuration that is within a cylinder of the actuator that has a complementary-shaped internal wall whereby the piston is non-rotatable with respect to but is slidable in the cylinder, a piston rod rotationally fast with the piston being of tubular form, and the slack adjuster including securing means for non-rotatably and releasably securing one of the nuts to the tubular piston rod thereby to prevent rotation of this nut relative to the output member.

4,875,560

DAMPING FORCE ADJUSTABLE HYDRAULIC SHOCK ABSORBER

Tomio Imaizumi, Kanagawa, Japan, assignor to Tokico Ltd., Kanagawa, Japan

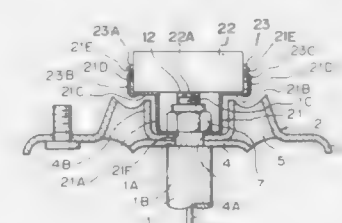
Filed Sep. 17, 1987, Ser. No. 98,055

Claims priority, application Japan, Sep. 19, 1986, 61-143531[U]; Sep. 20, 1986, 61-144872[U]

Int. Cl.⁴ F16F 5/00, 9/00, 9/46; F16B 2/20

U.S. Cl. 188—319

3 Claims



1. A damping force adjustable hydraulic shock absorber assembly comprising:

- a piston rod to be projected from a cylinder of a shock absorber;
- an actuator for adjusting the level of damping force in the shock absorber, said actuator having a bottom portion and an axially extending outer peripheral portion;
- a casing including a bottom portion secured to the projecting end portion of said piston rod, a first rising portion which extends upward from the outer peripheral edge of said bottom portion, a flange portion which extends outward from the upper end of said rising portion, said bottom portion of said actuator being placed on said flange

portion, and a second rising portion which extends upward from the outer edge of said flange portion, said second rising portion receiving at least a part of the outer peripheral portion of said actuator to prevent horizontal movement of said actuator;

said second rising portion of said casing including at least one retaining portion which is resiliently deformable in a radial direction of said casing and having a projection projecting inwardly thereof;

said actuator being provided on the outer periphery thereof with a ring-shaped engaging member projecting outwardly from said outer periphery;

said engaging member being engageable with said retaining portion by engagement of said projection of said retaining portion with an upper edge of said ring-shaped engaging member to retain said actuator on said flange portion of said casing while preventing upward movement of said actuator relative to said flange portion; and

said retaining portion and said engaging member being formed such that, as said actuator is pressed into said casing, said retaining portion is first deformed outwardly so that said projection is resiliently moved outwardly over said ring-shaped engaging member and then moves back inwardly when said projection passes said upper edge of said engaging member so that said projection engages with said upper edge.

4,875,561

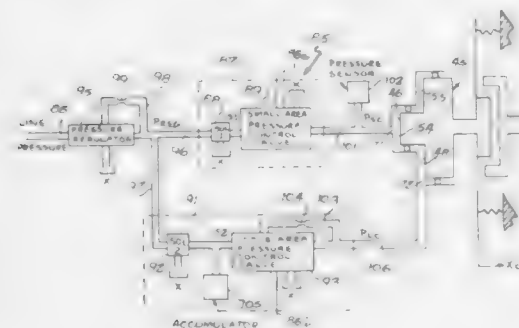
DUAL CLUTCH APPLICATION AREA AND CONTROL
Karl F. Schneider; William J. Haley, both of Ithaca, N.Y., and Alan L. Miller, Chicago, Ill., assignors to Borg-Warner Automotive, Inc., Troy, Mich.

Filed Oct. 9, 1987, Ser. No. 107,143

Int. Cl.⁴ B60K 41/02; F16D 25/14

U.S. Cl. 192—0.033

14 Claims



1. A clutch assembly for actuation of a transmission for an engine having a relatively high torque at low output speed, comprising a dual area clutch having a single apply piston in which is incorporated a small apply area and a large apply area, separate sources of hydraulic pressure for the small apply area and the large apply area, and a control arrangement for controlling the two separate sources of hydraulic pressure to the single apply piston to initially apply pressure to the small apply area followed by application of a second pressure of a higher value to the large apply area.

4,875,562

LOCK-UP DAMPER FOR TORQUE CONVERTER
Shinji Fujimoto, Neyagawa, Japan, assignor to Kabushiki Kaisha Daikin Seisakusho, Osaka, Japan

Filed Jan. 28, 1988, Ser. No. 149,305

Claims priority, application Japan, Feb. 16, 1987, 62-21649[U]

Int. Cl.⁴ F16D 3/50; F16H 45/02

U.S. Cl. 192—3.28

4 Claims

1. A lock-up damper for a torque converter having a turbine wheel, said lock-up damper being disposed between an input side housing of said torque converter and said turbine wheel,

said lock-up damper having a retaining plate fastened to a piston plate of said lock-up damper, said piston plate having a facing pressable in an axial direction into engagement with said housing and having torsion springs, torsion spring outside holders formed on an outer peripheral end of said piston plate, torsion spring inside holders facing said outside holders from a radially internal side and formed on an outer peripheral end of



said retaining plate, said torsion springs each being held by said outside and inside holders from the radially external and internal sides of said springs, projections mating with the rotational direction ends of said torsion springs formed on the outer peripheral ends of said retaining and piston plates, respectively, a driven plate of said turbine wheel mated with one rotation-direction end of said torsion springs, said torsion springs being freely compressible between said projections.

4,875,563

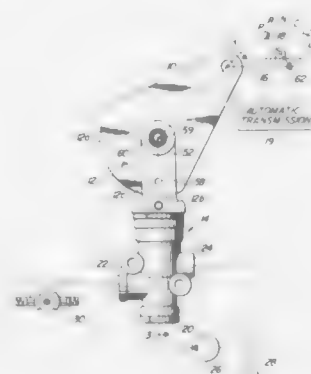
SHIFT LEVER ACTIVATED PARKING BRAKE
Scott A. Larson, Waterloo, Iowa, and Duane R. Johnson, Wellington, Ohio, assignors to Deere & Company, Moline, Ill.

Filed Jan. 19, 1988, Ser. No. 145,343

Int. Cl.⁴ B60K 41/26

U.S. Cl. 192—4 A

4 Claims



1. A system for activating and de-activating a parking brake, comprising:

- a spring-activated, hydraulically de-activated parking brake;
- a valve having a first position connecting said brake to a source of pressurized fluid to deactivate said brake and a second position draining fluid from said brake to activate said brake, said valve being biased towards said second position, and said valve comprising:
 - (i) a valve body having a central bore formed therein;
 - (ii) a spool in said valve body separating said central bore into first and second chambers, said spool having a

passage formed therein for connecting said chambers when said valve is in said second position, said passage being blocked off by walls of said bore when said valve is in said first position;

(iii) a first port connecting said first chamber to a drain for hydraulic fluid;

(iv) a second port connecting said second chamber to said source of pressurized fluid; and

(v) a third port connecting said second chamber to said brake;

cam follower means for controlling the position of said valve;

a cam having a cam surface for controlling the position of said cam follower means;

cam support means for holding said cam in a predetermined position relative to said valve, whereby said cam follower and cam surface are precisely positioned;

an automatic transmission having a PARK position and at least one other position;

a gear shift lever for moving said automatic transmission between said PARK position and said at least one other position; and

a mechanical linkage interconnecting said gear shift lever and said cam, whereby movement of said gear shift lever causes proportional movement of said cam, said cam surface being shaped to cause said cam follower to move said valve to said second position when said gear shift lever is moved to said PARK position, and to said first position when said gear shift lever is moved to any other position.

4. A method of assembling a system for activating and de-activating a parking brake having:

- a spring-activated, hydraulically de-activated parking brake;
- a valve having a first position connecting said brake to a source of pressurized fluid to deactivate said brake and a second position draining fluid from said brake to activate said brake, said valve being biased towards said second position;
- cam follower means for controlling the position of said valve;
- a cam having a cam surface for controlling the position of said cam follower means;
- cam support means for holding said cam in a predetermined position relative to said valve, whereby said cam follower and cam surface are precisely positioned;
- an automatic transmission having a PARK position and at least one other position;
- a gear shift lever for moving said automatic transmission between said PARK position and said at least one other position; and
- a mechanical linkage interconnecting said gear shift lever and said cam, whereby movement of said gear shift lever causes proportional movement of said cam, said cam surface being shaped to cause said cam follower to move said valve to said second position when said gear shift lever is moved to said PARK position, and to said first position when said gear shift lever is moved to any other position;

the method comprising:

- forming a first alignment bore in said cam support means;
- forming a second alignment bore in said cam at a position therein such that when said first and second alignment bores are aligned, said cam is in a position corresponding to a predetermined position of said gear shift lever;
- aligning said alignment bores and inserting a pin therethrough to hold said cam and cam support in fixed positions relative to each other;
- placing said gear shift lever in said predetermined position;
- adjusting a length of said mechanical linkage to the appropriate length to interconnect said cam and said gear shift lever while in said positions, and interconnecting the same; and
- removing said pin from said bores.

4,875,564

SPRAY CLUTCH WITH A DOUBLE CAGE
Hermann Leitz, Heidelberg; Erich Kray, Ofterheim, and Rudolf Kohler, Sandhausen, all of Fed. Rep. of Germany, assignors to Borg-Warner Automotive GmbH, Fed. Rep. of Germany

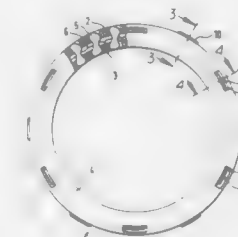
Filed May 17, 1988, Ser. No. 194,747

Claims priority, application European Pat. Off., May 20, 1987, 87107317.7

Int. Cl.⁴ F16D 15/00, 41/07

U.S. Cl. 192—45.1

18 Claims



1. A one-way sprag clutch having a double cage between inner and outer races including an outer cage ring and an inner cage ring each cage ring having opposite sides, the improvement comprising that the inner cage ring is formed of metal and the outer cage ring is formed of plastic.

4,875,565

COUPLING WITH TWO CLUTCHES, ESPECIALLY FOR LOOMS

Erminio Depoli, Crema, Italy, assignor to Baruffaldi S.p.A., San Donato Milanese, Italy

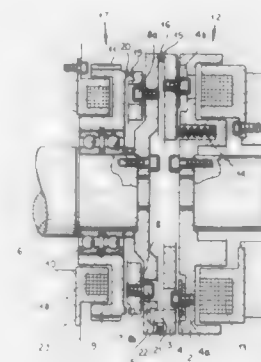
Filed Mar. 9, 1988, Ser. No. 165,790

Claims priority, application Italy, Dec. 30, 1987, 23268 A/87

Int. Cl.⁴ D03D 51/02; F16D 27/12

U.S. Cl. 192—48.2

6 Claims



1. A coupling apparatus, especially for a loom, said apparatus comprising:

- a housing;
- a driving shaft mounted in said housing and rotatable about an axis of rotation;
- a driven shaft coaxial with said driving shaft, said driven shaft being mounted in said housing and being formed with a flange extending radially therefrom, said driving and driven shafts extending oppositely beyond said housing and being aligned;
- a first clutch, said first clutch being formed with a first rotor coaxial with said driving shaft and rigidly connected thereto, said first rotor being provided with a first annular groove,

a first annular electromagnet rigidly attached to said housing for producing electromagnetic force, said first electromagnet having an end spaced from said housing and inner and outer sides, said first electromagnet being received by said first annular groove and enclosing said inner and outer sides and said end of said first electromagnet, so that said first rotor and said first electromagnet define an air gap of a constant width all along said sides and said end, and

an axially movable first annular armature rotatably fixed on said first rotor, said first annular armature being coaxial with said driving shaft and being connected by a first annular resilient means with said first rotor for providing continuous torsional connection of said first armature with said first rotor;

a second clutch provided with a second rotor coaxial with said driven shaft, said second rotor being rotatably mounted on but axially fixed on said driven shaft and being formed with a second annular groove, said second clutch including:

a second electromagnet fixedly attached to said housing, said second electromagnet being received in said second annular groove and having an end and inner and outer sides enclosed by said second annular groove so that said inner and outer sides and said end of said second electromagnet define another air gap of a constant width with said second rotor, and

a second annular armature axially shiftable between said second rotor and said flange and coaxial with said driven shaft, said second armature being keyed on said flange, said second armature being provided with second annular resilient means connecting said flange with said second armature, so that said second armature shifts axially without play upon the energizing said second electromagnet;

coupling means on said axially movable first armature, said second armature, said flange and said second rotor for successive engaging - disengaging operations therebetween, so that upon energization of said first electromagnet, said axially movable first armature is disengaged from said flange, disengaging said driving and said driven shafts and upon energization of said second electromagnet said second armature is connected to said second rotor for reversed independent rotation of said driven shaft.

4,875,566

GEAR SYNCHRONIZER MECHANISM

Masaki Imai, Shozo Okuda, and Masaki Hosono, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

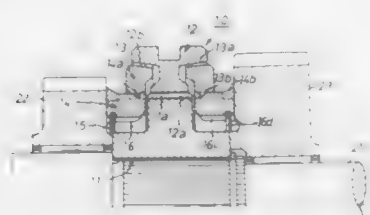
Filed Dec. 16, 1987, Ser. No. 134,069

Claims priority, application Japan, Dec. 16, 1986, 61-299710; Dec. 17, 1986, 61-300718; Dec. 19, 1986, 61-196632; Dec. 19, 1986, 61-196633

Int. Cl.⁴ F16D 23/06

U.S. Cl. 192—53 F

6 Claims



1. A gear synchronizer mechanism comprising a gear member rotatable on a transmission shaft and having a cylindrical hub portion formed with external spline teeth, a hub member formed with external spline teeth and being mounted on said shaft for rotation therewith, a clutch sleeve formed at one side

thereof with an internal conical surface and at an inner periphery thereof with internal spline teeth in continual engagement with the external spline teeth of said hub member and being axially shiftable on said hub member to be engaged at the internal spline teeth thereof with the external spline teeth of said cylindrical hub portion, and a synchronizer ring formed with an external conical surface for frictional engagement with the internal conical surface of said clutch sleeve and being axially movable on said cylindrical hub portion to establish synchronization between said shaft and said gear member when engaged with said clutch sleeve, said synchronizer ring being formed at an inner periphery thereof with a plurality of circumferentially spaced internal radial projections, said cylindrical hub portion of said gear member being formed at an inner periphery thereof with an annular groove and having a plurality of circumferentially equally spaced radial grooves defined therein, each of which receives therein a corresponding radially movable key element, said key elements being supported by a radially contractible annular spring disposed within the annular groove of said cylindrical hub portion and resiliently engaged with said synchronizer ring under the biasing force of said spring in such a manner as to restrict axial movement of said synchronizer ring in shifting operation of said clutch sleeve, each of said key elements being formed with a transverse recess which receives a said internal radial projection of said synchronizer ring to restrict axial movement of said synchronizer ring under the biasing force of said spring.

4,875,567

COIN VALIDATION DEVICE

Stephen Fitton, Firwood Park, United Kingdom, assignor to Neo Electronics Limited, Oldham, United Kingdom
PCT No. PCT/GB86/00658, § 371 Date Aug. 17, 1987, § 102(e)
Date Aug. 17, 1987, PCT Pub. No. WO87/02809, PCT Pub. Date May 7, 1987

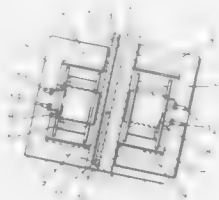
PCT Filed Oct. 24, 1986, Ser. No. 76,208

Claims priority, application United Kingdom, Oct. 30, 1985, 8526686

Int. Cl.⁴ G07D 5/08

U.S. Cl. 194—318

8 Claims



1. A coin validation device comprising
a channel along which a coin to be validated is caused to pass, the channel defining a first axis, and
a pair of magnetic cores located on opposite sides of the channel and at the same position along the length of the channel so that a coin to be validated will pass therebetween, the cores being of substantially the same size and each being E-shaped so as to define a central leg and two outer legs extending towards the corresponding legs of the other core in a direction substantially parallel to a second axis,
the central leg of one core supporting an exciting coil, and
the central leg of the other core supporting a detector coil, characterized in that
the channel is limited at one edge by a surface that in use is

inclined to the horizontal so as to define a predetermined inclined path down which the coin is caused to roll, the outer legs of each core are spaced apart in a direction perpendicular to the length of the channel along a third axis, the first, second and third axis being mutually perpendicular, and
one outer leg of each core is located adjacent the said one edge of the channel.

4,875,568

ESCALATOR HANDRAIL DRIVE

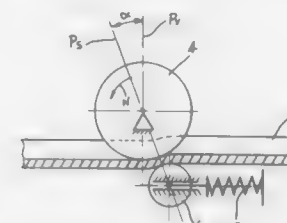
Dietrich E. Hermann, Vechelde, and Ralf Holzhauser, Wetter, both of Fed. Rep. of Germany, assignors to Otis Elevator Company, Farmington, Conn.

Filed Jan. 5, 1989, Ser. No. 294,532

Int. Cl.⁴ B65G 15/00

U.S. Cl. 198—335

6 Claims



1. A device for moving a handrail component of a people conveying assembly, said device comprising:
(a) a powered driving roller for contacting one surface of said handrail to impart a driving force thereto resulting from rotation of said driving roller about its axis;
(b) a contact pressure roller for contacting another surface of said handrail opposite said one surface thereof, said pressure roller being rotatable about its axis and operable to bias said handrail against said driving roller; and
(c) spring means for biasing said contact pressure roller toward said driving roller, said spring means biasing said axis of said contact pressure roller in a plane substantially parallel to planes containing said handrail, and in a direction which is opposite to the direction of movement of said handrail.

4,875,569

CONCRETE DELIVERY SYSTEM

Robert F. Oury, Gilberts, and Joseph Gallione, Naperville, both of Ill., assignors to Rotec Industries, Inc., Elmhurst, Ill.

Filed Apr. 14, 1988, Ser. No. 181,735

Int. Cl.⁴ B65G 47/44

U.S. Cl. 198—36 D

8 Claims

1. Apparatus for delivering concrete to two spaced deposition points comprising:
a funnel-shaped hopper having a conical side wall, a pair of opposed outlet openings in the hopper wall at the lower end thereof,
two doors each slidably mounted on said hopper wall adjacent each said outlet openings,
actuating means for moving said doors from fully closed to fully open positions for metering the volume of concrete discharged from said openings,
separate conveyor means disposed below each of said openings for carrying concrete from the hopper to spaced deposition points,
an inclined rotatable chute disposed above said hopper for discharging concrete into said funnel-shaped hopper, said inclined rotatable chute being tilted at an angle from

the vertical so as to deposit the concrete evenly on the conical side wall of said funnel-shaped hopper as said



chute rotates and a means for rotating said rotatable chute.

4,875,570

APPARATUS FOR TRANSFERRING A LITHOGRAPHIC PLATE

Takatsugu Kyoo, Iruma, Japan, assignor to Tsubakimoto Chain Co., Japan

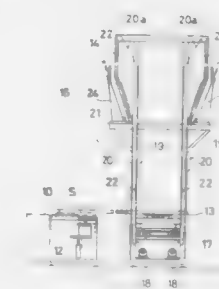
Filed May 2, 1988, Ser. No. 189,425

Claims priority, application Japan, Jul. 30, 1987, 62-115844[U]

Int. Cl.⁴ B65G 15/10

U.S. Cl. 198—408

6 Claims



1. Apparatus for transferring a lithographic plate (S) from a horizontal conveyor (10) to an overhead conveyor (14), comprising:
elevating means (19) continuously driven in one direction around an endless vertical path and having a pair of hooks (22) for engaging a folded end portion (S1) of the lithographic plate at laterally spaced locations to support the lithographic plate between said hooks for movement with the elevating means;
an obliquely disposed plate bed (24) adjacent a descending portion along a path of the elevating means for receiving the plate as it descends with the elevating means, the path being obliquely disposed adjacent the plate bed; and,
means (23) adjacent the plate bed for guiding the hooks laterally outwardly of the lithographic plate as the hooks descend along the obliquely disposed path, thereby releasing said lithographic plate and depositing the plate on the plate bed.

4,875,571

UNLOADING METHOD AND APPARATUS FOR A CABLE FINISHING SYSTEM

Helmuth Kolodziej, Mainstal, Fed. Rep. of Germany, assignor to Statomat-Globe Maschinenfabrik GmbH, Niederdorfelden, Fed. Rep. of Germany

Filed Dec. 18, 1987, Ser. No. 134,799

Claims priority, application Fed. Rep. of Germany, Dec. 18, 1986, 3643201

Int. Cl.⁴ B65G 47/26

U.S. Cl. 198—431

9 Claims



1. An unloading method for positioning a cable on a depository of a cable finishing system, characterized in the steps of: grasping a finished cable at a predetermined point on the cable, said point being determined by the location of a transfer device with respect to first and second conveyors for conveying said cable, pulling said cable over a depository, said depository having a surface with a discontinuity therein arranged in an axial direction of the cable for accommodating a loop in said cable, feeding a predetermined section of the cable into the discontinuity, and releasing the grasped cable point in a predetermined position.

4,875,572

TRAY TRANSFER DEVICE

Masaharu Kiriake, Uji, Japan, assignor to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

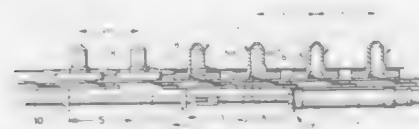
Filed Sep. 16, 1987, Ser. No. 97,449

Claims priority, application Japan, Sep. 20, 1986, 61-222544

Int. Cl.⁴ B65G 25/08

U.S. Cl. 198—744

19 Claims



1. A tray transfer device, comprising a sliding member provided along a feeding path for trays and is mounted for reciprocal movement by a distance equal to a predetermined pitch in the tray feeding direction, tray engaging members located on said sliding member by a pitch substantially equal to the predetermined pitch such that the trays may be pitch fed at a time by said engaging members, and tray abutting members spaced apart by a pitch substantially equal to the predetermined pitch and arranged to abut trays in the feeding path, each of said tray abutting members having a first abutting portion arranged to abut a tray and hinder movement of the tray in a first direction, each of said tray abutting members having a second abutting portion arranged to abut a tray and hinder movement of the tray in a second direction opposite to the first direction, wherein trays fed by said sliding member and tray engaging members are maintained at a pitch substantially equal to the predetermined pitch by the first and second abutting portions of said tray abutting members.

4,875,573

WHEEL TURN AND HANGER BRACKET ASSEMBLY THEREFOR

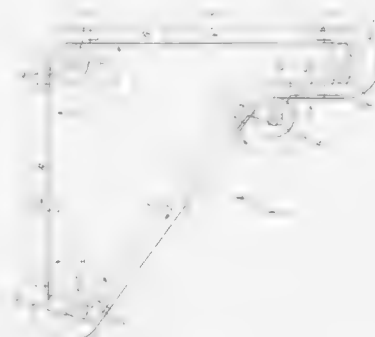
John A. Wiseman, Lynchburg, Va., assignor to Simplimatic Engineering Company, Lynchburg, Va.

Filed Jul. 11, 1988, Ser. No. 217,467

Int. Cl.⁴ B65G 21/16

U.S. Cl. 198—831

6 Claims



1. A wheel turn bracket assembly for an article conveying system for coupling inbound and outbound tracks of a moving surface conveyor to inbound and outbound sides respectively of a wheel turn at an angle between said tracks that can be adjustably selected depending upon the angle of the desired turn, said wheel turn including a wheel rotatable about an axle to guide at least a section of said moving surface through said turn along a turn centerline concentric with said wheel, said bracket assembly comprising a pair of substantially identical, L-shaped bracket members, each said bracket member having a first leg with a length approximately corresponding to the radius of said wheel and forming a bore therein adjacent one end of said first leg for receiving said axle, said bore being sized to mate with said axle in a rotatable relationship, each said bracket member further having a second leg formed at approximately a right angle to said first leg, said second leg having means for coupling to an end of one of said tracks, the first leg length being such that when said bore is positioned around said axle and said track end is coupled to said second leg, said track end is positioned adjacent said wheel in substantial alignment with the turn centerline at said point and the centerline of said track is aligned with the centerline of said turn, said pair of brackets being positionable with one bracket in a first orientation and the second bracket in a flipped orientation with said bores thereof aligned to fit around said axle and extend said second legs of said brackets outwardly on opposite sides of the turn to receive said inbound and outbound tracks in approximate alignment with the centerline of said turn, the bracket member pair being rotatably adjustable independent of each other around said axle to provide a selected angle between said inbound and outbound tracks.

4,875,574

INFUSION PACKAGE

Barbara E. Travers, 11 Meadow View Dr., Esmond, R.I. 02917

Filed Feb. 24, 1989, Ser. No. 315,089

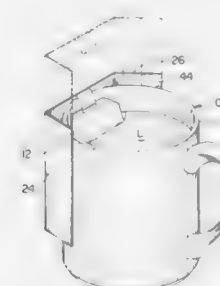
Int. Cl.⁴ B65D 29/04

U.S. Cl. 206—0.5

9 Claims

1. An infusion package for a tea bag and the like, comprising an outer cover of flexible sheet, said sheet including a main central panel having opposed side and top and bottom edges and a pair of adjacent side panels having inner and outer edges hingedly attached by means of said side panel inner edges to said central panel along the side edges thereof, said panels each having inner and outer surfaces, a porous bag containing beverage infusion material hingedly attached at an upper portion thereof to said central panel for positioning against and gener-

ally within the planar extent of the inner surface of said central panel when said package is in a closed storage position, said side panels adapted to swing to a partial overlapping position with respect to each other with their respective inner surfaces superposed with respect to the central panel inner surface in said close position, and means for holding said package in said



closed position, said side panels adapted to swing outwardly from said central panel to an open use position wherein said package may be positioned on the outside surface of a cup with said infusion bag extending over the rim thereof and into said cup with at least portions of the inner surfaces of said side panels contacting the outer cup surface to support said package with respect thereto.

4,875,575

POUCHED LAUNDRY WASH ACTIVE DISPENSER FOR IMPROVED SOLUBILITY

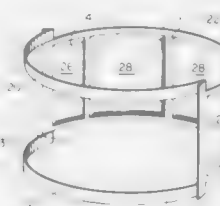
Stephen W. Snyder; Craig C. Monsell; Russell R. Driver, and Carol S. Puckett, all of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 148,451, Jan. 26, 1988, abandoned. This application Aug. 26, 1988, Ser. No. 237,243

Int. Cl.⁴ D06F 39/02

U.S. Cl. 206—0.5

6 Claims



1. A disposable dispenser for dispensing a laundry active into an automatic central post agitator washing machine wash period water, said dispenser comprising:

- A. at least one container pouch made with a water-permeable, water-insoluble substrate;
- B. a soluble laundry active contained by said pouch; and
- C. a fastening means integral with said pouch and forming at least one loop to fasten said pouch to the automatic washing machine central post agitator;

whereby said pouch is restrained to an area near said central post agitator and in said wash period water for controlled release of said laundry active into said wash period water.

4,875,576

MIXING KIT

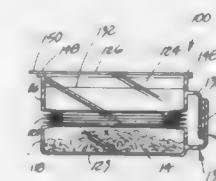
Lee A. Torggrimson, 9450 Singletree La., Missoula, Mont. 59803, and Louis M. Chinake, 2412 Glen Dr., Missoula, Mont. 59801

Filed Feb. 5, 1988, Ser. No. 152,898

Int. Cl.⁴ B65D 25/08, 77/00

U.S. Cl. 206—219

8 Claims



1. A mixing kit comprising:
 - a predetermined volume of a first mixture component, the first mixture component being substantially non-gaseous and adapted for combination with a second mixture component comprised of liquid in a predetermined mixture ratio; and
 - an enclosure retaining the volume of the first mixture component, the enclosure comprising:
 - a first portion, the first portion having an enclosure opening;
 - sealing means for covering the opening;
 - a second portion spaced from the first portion;
 - a third portion, the third portion being positioned between and joined to the first and second portions and expandable from a collapsed position to an expanded position; the first, second and third portions defining a predetermined condensed enclosure volume which retains the volume of the first mixture component; and
 - The first, second and third portions defining a predetermined expanded enclosure mixture volume, the mixture volume being sufficient to retain the volume of the first mixture component plus a volume of the second mixture component in the predetermined ratio relative to the first mixture component; and
 - a fourth portion, the fourth portion being flexible and having one end connected to the exterior of the first portion and a second end connected to the exterior of the second portion, said fourth portion being expandable in response to the expansion of the third portion from a collapsed state to an expanded state in which the fourth portion in the expanded state forms a handle to enable a user to grasp the formed handle and support the mixing kit in the expanded positions to facilitate the mixture of the second mixture component with the first mixture component.

4,875,577

MULTICHAMBER CONTAINER

Bodo Hilderbrandt, Riedstadt, and Franz Steigerwald, Griesheim, both of Fed. Rep. of Germany, assignors to Wella Aktiengesellschaft, Darmstadt, Fed. Rep. of Germany

PCT No. PCT/EP87/00508, § 371 Date Apr. 14, 1988, § 102(e)

Date Apr. 14, 1988, PCT Pub. No. WO88/01973, PCT Pub.

Date Mar. 24, 1988

PCT Filed Sep. 9, 1987, Ser. No. 208,299

Claims priority, application Fed. Rep. of Germany, Sep. 12, 1986, 3631133

Int. Cl.⁴ B65D 25/08

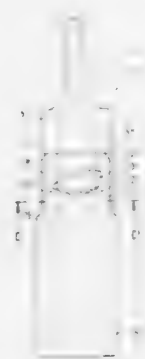
U.S. Cl. 206—219

19 Claims

1. In a multichamber container having no compressed gas therein and comprising an outer container and an inner container each containing a pourable substance wherein said substances are to be kept separate but to be extracted from said multichamber container as a mixture of said, said substances

being combined inside said multichamber container, the improvement comprising

- (a) said outer container having an upper side; a rotatable cap; and a catch joint, said upper side of said outer container being connected to said rotatable cap with positive locking by said catch joint;
- (b) said inner container having an open end at an upper side thereof, said cap having an inner side, said open end at said upper side of said inner container being connected to said inner side of said cap with positive locking and in a nonrotational and axially detachable manner;



- (c) an outer wall of said inner container having two diametrically opposed projections, each of said projections having a radial, oblique plane on upper sides thereof; and
- (d) an inner wall of said outer container having two diametrically opposed projections, each of said projections having a horizontally oriented plane on undersides thereof, said projections being formed in such a way that said projections come to communicate with one another by an axial turning of said cap to cause said inner container to be axially detachable from said cap; said cap being provided with a sealable extraction canal.

4,875,578

CONTAINER FOR RECORD CARRIERS

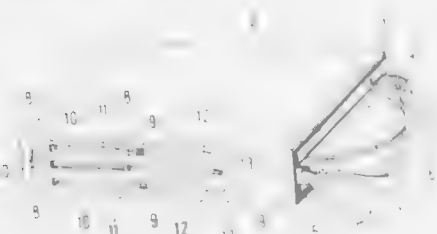
Wolfgang Nehl, Waldachtal/Tumlingen, Fed. Rep. of Germany, assignor to Fischerwerke Artur Fischer GmbH & Co. KG, Waldachtal/Tumlingen, Fed. Rep. of Germany
Filed Aug. 17, 1988, Ser. No. 233,275

Claims priority, application Fed. Rep. of Germany, Aug. 22, 1987, 3728113

Int. Cl.⁴ B65D 85/57

U.S. Cl. 206—309

11 Claims



1. A container for record carriers, such as magnetic band cassettes, sound or image plates, compact discs and the like, comprising a housing having lateral walls provided with longitudinal guides, said housing also having an open front end; at least one supporting element arranged in said housing; at least one slider arranged for receiving a record carrier and movable in said housing to a withdrawal position, said slider having lateral pins engaging in said longitudinal guides of said lateral walls of said housing, said longitudinal guides having at least one partial region provided an inclined guiding surface formed

so that before reaching said withdrawal position a respective one of said pins slides along a respective one of said inclined guiding surfaces so as to press said slider against said supporting element.

4,875,579

PORTABLE CONTAINER ASSEMBLY FOR CONTAINING GOLF ACCESSORIES

Seung W. Tak, 42 Auburn Rd., West Hartford, Conn. 06119
Filed Jul. 27, 1988, Ser. No. 224,676

Int. Cl.⁴ A63B 57/00, 55/02

U.S. Cl. 206—315.1

11 Claims



1. A portable container for accommodating golf accessories, which is capable of being attached to a golf bag which comprises:

- a body member, said body member defining a first elongated chamber, a second elongated chamber, a third elongated chamber, and a fourth elongated chamber disposed therein,
- a golf ball holding cylinder disposed in said first elongated chamber,
- golf ball holding means operatively provided at a lower end of the golf ball holding cylinder for holding golf balls within the golf ball holding cylinder or selectively releasing the golf balls from said golf ball holding cylinder, one by one,
- a golf tee holding cylinder disposed in said second elongated chamber, said golf tee holding cylinder being provided with a collar at each end thereof, said collars including means for holding and selectively removing golf tees from said golf tee holding cylinder, one by one,
- a golf marking pencil holding cylinder disposed in said third elongated chamber, said golf marking pencil holding cylinder being provided with a collar cap at a top end thereof, said collar cap including means for gripping said golf marking pencil,
- a drink can jar disposed in said fourth elongated chamber for holding drink cans, said drink can jar being provided with an outer cap and an inner cap connected to a rigid lifting member for lifting the drink cans, one by one,
- a body member cap attached to said body member, said body member cap including large and small circular apertures for receiving said golf ball holding cylinder and said golf tee holding cylinder, respectively,
- a digital watch disposed at a top of said outer cap, and attaching means for attaching or detaching said portable container to said golf bag.

4,875,580

COMPRESSOR SHIPPING PACKAGE

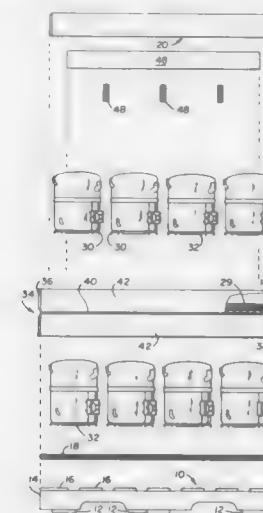
Hugh C. Stringer, Bristol, and Larry D. Montgomery, Glade Spring, both of Va., assignors to Bristol Compressors, Inc., Bristol, Va.

Filed Feb. 21, 1989, Ser. No. 312,869

Int. Cl.⁴ B65D 85/62, 81/02

U.S. Cl. 206—319

7 Claims



1. A shipping package for individual product units or the like, adapted for use with a substantially planar shipping pallet, said package comprising base pad means and at least one middle pad means, each of which pad means has a substantially planar corrugated board member having one or more upper and lower plies, at least one of said upper plies having a plurality of individual cut-outs opening at the top surface of said member, each cut-out being shaped to receive lower portions of an individual product unit in a substantially confining manner for preventing lateral movement thereof, each said middle pad means having strengthening wall means peripherally surrounding said board member and oriented normal to the plane thereof, said wall means extending a substantial distance on each side of said plane for maintaining the planar character of said member against substantial distortion forces, a plurality of units positioned on each said pad means in said cut-outs with each said middle pad means positioned on the tops of underlying units, and cap means overlying the uppermost plurality of product units.

4,875,581

STATIC DISSIPATIVE ELASTOMERIC COATING FOR ELECTRONIC PACKAGING COMPONENTS

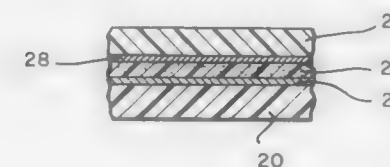
Robert Ray, Auburn, Me.; Robert A. Neal, R.F.D. 1, Wales Rd., Sabattus, Me. 04280; John R. Jaran, Waterbury, and Tim Parker, Southbury, both of Conn., assignors to Robert B. Ray and Robert A. Neal, both of Green, Me.

Filed Mar. 19, 1985, Ser. No. 713,420

Int. Cl.⁴ B61D 73/02

U.S. Cl. 206—328

4 Claims



1. An outer surface, static dissipative transparent elastomeric coating which is applied over a conductive, transparent layer of an electronic packaging composite, characterized by being

static dissipative with a surface resistivity in a range between 8 to 10 ohms per square.

4,875,582

CARRIER ASSEMBLY AND METHOD OF MANUFACTURING SAME

James E. Finney, Aldershot, United Kingdom, and Weldon L. Brubaker, Lisle, Ill., assignors to Molex Incorporated, Lisle, Ill.

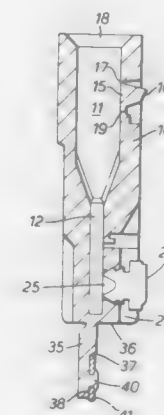
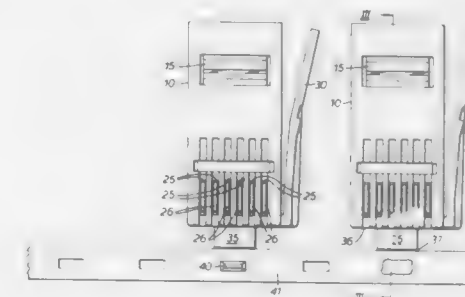
Filed May 25, 1984, Ser. No. 613,949

Claims priority, application United Kingdom, Jun. 3, 1983, 15211

Int. Cl.⁴ B65D 73/02

U.S. Cl. 206—330

5 Claims



1. A carrier assembly including a generally continuous carrier strip and a plurality of molded articles secured thereto, each article having a body and a tag integrally molded with the body extending outwardly therefrom secured to said strip, the improvement comprising:

- said carrier strip being made of flexible material that is separate from said article and including a plurality of spaced apart holes formed therein; and
- a projection integrally formed on said tag and received through a hole in an interengaging fashion; whereby said carrier assembly is capable of being wound on a reel.

4,875,583

NEEDLE CAP REPLACEMENT DEVICE

Jerry L. Nosanchuk, 31130 Sunset, Franklin, Mich. 48025

Filed Jun. 6, 1988, Ser. No. 202,396

Int. Cl.⁴ B65D 83/10

U.S. Cl. 206—365

8 Claims

1. A needle cap replacement device for use during a medical procedure comprising:

- a block having a top surface and a bottom surface, a back surface, opposed side surfaces, at least one frontal surface, having at least one rounded recess, wherein the recess has

a diameter and a depth for receipt and retention of a needle cap,



wherein at least one hole having a diameter large enough to receive a syringe and needle, is formed through to the exterior of the block, forming a disposal chamber for the syringe and needle.

4,875,584

CONTAINER FOR MAGNETIC TAPE CASSETTES

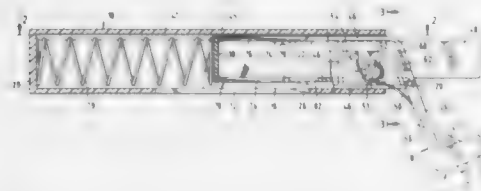
Peter Ackeret, Kunsnacht, Switzerland, assignor to IDN Inventions and Development of Novelties AG, Chur, Switzerland
Filed Dec. 21, 1988, Ser. No. 287,874

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1987, 3743481

Int. Cl.⁴ B65D 85/672

U.S. Cl. 206—387

15 Claims



1. A container for accommodation of magnetic tape cassettes which exhibit, on a large face thereof, two circular recesses of identical size, said recesses being offset with respect to a plane of symmetry by a distance less than the recess diameter, said container comprising a substantially brick-shaped housing which has an open narrow side, the container further comprising transporter means for displacing a cassette received in the housing from an inner storage position into an outer removal position in which a portion of said cassette extends beyond said open housing side by an amount sufficient to permit grasping of the cassette, wherein the container includes at least one arresting member adapted to engage, depending upon the insertion direction of the cassette, respectively into the one or the other of said recesses, said arresting member being deflectable in a direction transverse to said large face upon insertion or withdrawal of a cassette.

4,875,585

CARTON HAVING A HORIZONTAL OBJECT HOLDING PANEL AND BLANK

Richard G. Kadleck, Berea, and William W. Nowak, Broadview Heights, both of Ohio, assignors to The Shelby Paper Box Co., Westlake, Ohio

Continuation-in-part of Ser. No. 140,158, Dec. 31, 1987, abandoned, which is a division of Ser. No. 897,498, Aug. 18, 1986, Pat. No. 4,735,314. This application Mar. 10, 1988, Ser. No. 166,532

Int. Cl.⁴ B65D 85/44, 5/06

U.S. Cl. 206—426

8 Claims

1. A folded carton for drinking glasses or similar objects formed from a sheet of paperboard material and comprising: horizontal and vertical panels forming a sleeve having op-

posed open ends for insertion and removal of said objects, said horizontal panels forming a top and bottom of said sleeve and said vertical panels forming outer side walls of said sleeve;

a separator panel in said sleeve extending between said horizontal panels to define adjacent interior compartments; and

an object holding panel extending continuously, as a single piece formed from said paperboard material, between opposite ends connected to said outer side walls, having a horizontal portion extending through the plane of said separator panel, and being formed integrally with said separator panel along a horizontal line at which said object holding panel intersects the plane of said separator panel.

6. In a foldable blank for construction of a carton for drinking glasses or similar objects comprising a sheet having panel folding lines defining distinct planar panels pivotal with respect to one another about said panel folding lines, the improvement comprising: at least one of said panels having first and second ends and an internal folding line extending across a portion thereof; and an object holding panel having a first section defined by a first cut line extending on one side of said internal folding line and a second section defined by a pair of second cut lines extending on the other side of said internal folding line, said second cut lines extending from said internal



folding line to said second end, said second section of said object holding panel extending from said internal folding line between said second cut lines and beyond said second end, said object holding panel being rotatable out of the plane of said one panel about said internal folding line into a rotated position wherein said first and second sections extend from said internal folding line on opposite sides of said plane.

7. A foldable blank sheet for construction of a carton for drinking glasses or similar objects comprising:

an elongated sheet having laterally extending folding lines defining successive planar panels along the length of said sheet, said panels comprising, in longitudinal succession a top panel, a first side panel, a bottom panel, a second side panel, a bridging panel, a separator panel, and a glue flap; said glue flap being interrupted in its width across said blank sheet by a pair of cut lines extending across said glue flap; said separator panel including an internal folding line extending laterally across a portion thereof, and an object holding panel defined in part by a first section of said separator panel cut out on one side of said internal folding line and in part by a second section of said separator panel cut out on the other side of said internal folding line and extending longitudinally between said cut lines in said glue flap, said object holding panel being rotatable as a whole out of the plane of said separator panel about said internal folding line with said first and second sections thereby being disposed on opposite sides of said plane.

4,875,586

MULTIPACK WITH TOP PANEL KEEL

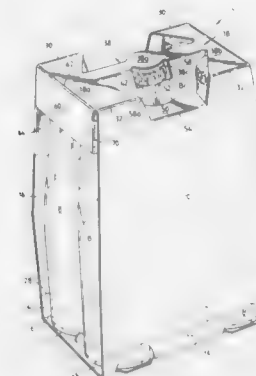
Jean Channasadas, Brassioux, France, assignor to The Mead Corporation, Dayton, Ohio

Filed Mar. 6, 1989, Ser. No. 319,032

Int. Cl.⁴ B65D 71/00

U.S. Cl. 206—427

7 Claims



1. A carton for accommodating a plurality of articles such as bottles arranged in a group including at least four bottles arranged in at least two parallel rows and a center bottle disposed intermediate said rows, said carton comprising:

a top panel, base panel means and spaced side wall panels interconnected and hinged to opposite side edges of said top panel and said base panel means; and

locking and separating means provided at least in part by said top panel and having portions thereof displaced out of the plane of said top panel, for holding said central bottle centrally of said group while maintaining the relative spacing of adjacent bottles in said group.

4,875,587

EASY OPEN SHRINKABLE LAMINATE

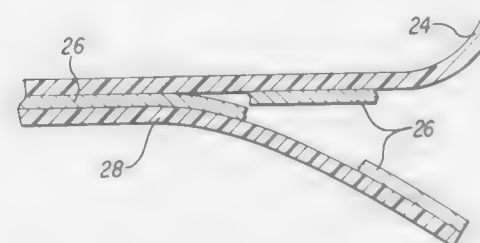
Cedric M. Lulham, Gray Court; George D. Wofford, Woodruff; John G. Bradfute, Greer, and Steven G. Friedrich, both of Greer, all of S.C., assignors to W. R. Grace & Co.-Conn., Duncan, S.C.

Continuation of Ser. No. 912,674, Sep. 25, 1986, Pat. No. 4,729,476, which is a continuation of Ser. No. 703,645, Feb. 21, 1985, abandoned. This application Mar. 3, 1988, Ser. No. 163,449

Int. Cl.⁴ B65D 75/26

U.S. Cl. 206—484

6 Claims



1. An easy to open package comprising:

(a) first and second webs having an article positioned therebetween;

(b) each web having a self-welding sealant layer on one of its surfaces, said self-welding surfaces being adhered to each other around at least a portion of the periphery of said article;

(c) said sealant layers being further sealed to each other in a

fusion seal around the article thereby enclosing said article;

(d) the bond between the sealant layer and the layer adjacent to it in the second web being weaker in the fusion seal area than the adhesion between the two sealant layers whereby when self-welded portions of the webs are peeled apart and the peeling action reaches the fusion seal area the sealant layer of the second web will tear out in the fusion seal area thus permitting access to the article.

6. A method of making an easy to open package comprising the steps:

(a) providing first and second webs having an article positioned therebetween with each web having a sealant layer on one of its surfaces; the sealant layer of the first web comprising a blend of ethylene/vinyl-acetate copolymer and an ionomer, and the sealing layer of the second web comprising an ionomer having a thickness between 0.2 and 0.3 mils;

(b) positioning the sealant layers of each web in fact-to-face relationship to each other with one web superimposed over the other so that the edges along a side of each web terminate approximately congruently thereby providing web edges along at least one side of the article which may be gripped and peeled apart;

(c) sealing said sealant layers to each other with heat and pressure to form a fusion seal, said seal being located between said one edge and the article, the bond between the sealant layer and the layer adjacent to it in the second web being weaker in the fusion seal area than the adhesion between the two sealant layers whereby when the webs are peeled apart the sealant layer of the second web will tear out in the fusion seal area thus permitting access to the article.

4,875,588

METHOD AND APPARATUS FOR UNLOADING SLIDE PROJECTOR TRAYS

Owen L. Lamb, Los Gatos, Calif., assignor to Slide Management Systems, Inc., Los Gatos, Calif.

Filed May 26, 1987, Ser. No. 54,383

Int. Cl.⁴ B07C 5/00

U.S. Cl. 209—3.3

20 Claims

1. A slide tray unloader comprising:

a slide magazine, said magazine being constructed so as to hold slides therein in a stack, with one slide stacked upon another;

a slide gate;

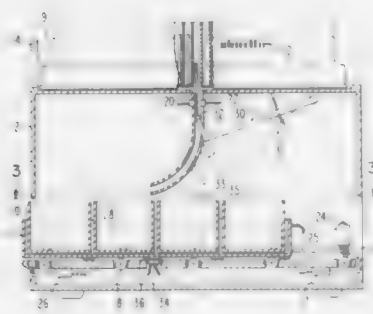
first means for holding said slide magazine below said slide gate;

and

second means for holding a tray having a plurality of compartments therein about said slide gate such that one of said compartments coincides with said slide gate;

means at said slide gate for transporting a slide from said selected one compartment of said tray such that said slide

is reorientated from said vertical position to a horizontal position to thereby drop said slide into said magazine; and,



means for advancing said tray to position a particular compartment to coincide with said slide gate.

4,875,589

MONITORING SYSTEM

Paul D. Lacey, Portsmouth, and Anthony Martin, Fareham, both of England, assignors to De La Rue Systems, Ltd., England

Filed Feb. 23, 1988, Ser. No. 159,218

Claims priority, application United Kingdom, Feb. 24, 1987, NTOM169

Int. Cl.⁴ B07C 5/342; G06K 9/82

U.S. Cl. 209—534

13 Claims



10. Apparatus for storing articles, the apparatus comprising: a transport system; a diverter assembly to which articles are conveyed by said transport system; an article monitoring system for monitoring at least one characteristic of articles fed by said transport system towards said diverter assembly, said article monitoring system including: a plurality of sensor assemblies, each sensor assembly includ-

ing a sensor for sensing a respective characteristic of an article and for generating a corresponding first signal; and processing means for applying respective predetermined algorithms to each said first signal to generate respective values therefrom, for comparing said respective values with respective predetermined thresholds to generate second, binary signals indicating the relationship of each values with said corresponding threshold, and for comparing said second signals with a set of predetermined second signals corresponding to a known type of article to generate a third signal indicating the relationship between the second signals and the set of predetermined second signals, and

said apparatus further including control means to causes said diverter assembly guide articles in a direction selected in accordance with said third signal from said processing means.

4,875,590

FOLDABLE DISPLAY

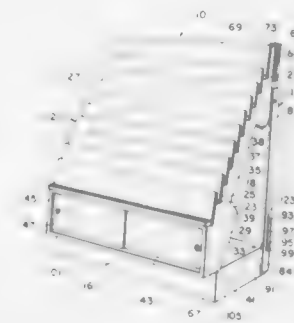
Gregory G. Martin, East Jordan, and Thomas J. Nook, Grand Haven, both of Mich., assignors to Harbor Industries, Grand Haven, Mich.

Filed Nov. 9, 1987, Ser. No. 118,859

Int. Cl.⁴ A47F 7/00

U.S. Cl. 211—55

9 Claims



1. A collapsible display assembly which is adjustable between an open display position and a flat storage position, wherein said assembly comprises:

a rack member adapted to support items for display thereon in said display position, said rack member having an upper end, a lower end and a side extending between said ends; at least one leg having first and second opposite ends, said first end being pivotally connected to said rack member adjacent the upper end thereof;

a base having a forward edge and a rearward edge, said base being pivotally connected to said second end of said leg at said rearward edge and means for adjustably positioning said rearward edge along said leg such that said base underlies and supports said rack member and said leg in said open display position with said lower end of said rack member resting on said base adjacent said forward edge, and wherein said base is received between said rack member and said leg in said flat storage position; and

releasable latch means for coupling said base and said rack member in said display position and which permits said rack member and said base to be manually detached without the use of tools when in said flat storage position.

4,875,591

MARKING BOARD IMPLEMENT HOLDER

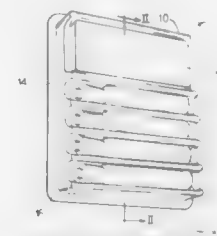
Jerome J. Mikesell, Chicago, Ill., assignor to M. Manufacturing Services, Inc., Chicago, Ill.

Continuation of Ser. No. 939,180, Dec. 8, 1986, abandoned. This application Aug. 31, 1988, Ser. No. 238,992

Int. Cl.⁴ A47F 7/00

U.S. Cl. 211—69.1

1 Claim U.S. Cl. 211—88



1. A holder for releasably holding first and a plurality of second marking board implements each of which has a length and predetermined cross-sectional dimensions, comprising: a one-piece molded plastic structure including a planar rectangular peripheral flange;

adhesive strips affixed to said flange for mounting said holder to a support;

peel-off strips on and protecting said adhesive strips;

an outer wall extending a predetermined distance from and perpendicular to the plane of said peripheral flange, said outer wall comprising first and second parallel, spaced outer wall sections and third and fourth parallel spaced outer wall sections perpendicular to said first and second outer wall sections;

an inner wall extending between and connected to said first, second, third and fourth outer wall sections;

said inner wall comprising first, second and third inner wall sections extending parallel to said first outer wall section, said third inner wall section connecting said first and second inner wall sections and together therewith forming a first cavity for receiving the first marking board implement, said first and second inner wall sections extending convergent towards one another in the direction of said third inner wall section to provide a snug fit for the first marking board implement and dimensioned to prevent easy removal of the first marking board implement;

a plurality of fourth inner wall sections, extending parallel to one another and serially connected together between said second inner wall section and said second outer wall section, each of said fourth inner wall sections forming a cavity for receiving a respective second marking board implement and being substantially of U-shaped cross-section and including resilient portions spaced less than the predetermined cross-sectional dimensions of the second marking board implements for yieldable bypassing of the respective second marking board implement, said fourth inner wall sections being dimensioned to provide depths for each of the cavities which together with said resilient portions prevents easy removal of a respective second marking board implement; and

end portions connecting said third and fourth outer wall portions to said inner wall at locations adjacent the marking board cavities and at distances less than said predetermined distance from said peripheral flange to provide access to and easy removal of the marking board implement and wherein said pressure relief means comprises: at least one hole through said third wall section.

4,875,592

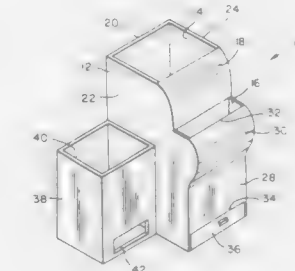
DRYING RACK AND RECEPTACLE FOR TOWELS AND WASH CLOTHS

George W. Waller, Rte. 13, 190 Strickland Rd., Alpharetta, Ga. 30201

Filed Oct. 18, 1988, Ser. No. 259,335

Int. Cl.⁴ A47F 5/08

16 Claims



1. A drying rack for wet cloths such as towels and wash cloths, said rack comprising:

(a) a first enclosure having a front wall, a rear wall, and a pair of opposed side walls, said enclosure including a pair of axially spaced, substantially horizontally disposed enclosure openings;

(b) a convexly curved, generally upwardly facing drying surface positioned between the openings of the enclosure for supporting a wet cloth for drying said curved drying surface extending between said side walls with the lateral edges of said drying surface being coextensive with the adjacent edges of said side walls, said drying surface further defining a portion of the front wall of said enclosure between said openings, thereby providing a relatively large area for said surface; and

(c) water collection means positioned below the drying surface for catching and collecting water that drips from wet cloths lying on the drying surface, said water collection means being in the form of a drip container that is below said openings and is laterally slidably movable relative to said enclosure.

4,875,593

HANGING SHOWER CADDY

Larry J. Trimble, 1625 S. Main St., St. Martinville, La. 70582

Filed Feb. 26, 1988, Ser. No. 161,147

Int. Cl.⁴ A47F 5/08

U.S. Cl. 211—95

7 Claims

1. A side wall mounted shower caddy apparatus for holding bath articles such as soap, razors and the like comprising:

a. a top cap;

b. a mid-section cabinet for holding bath articles;

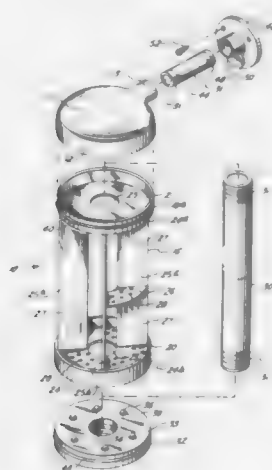
c. a bottom cap;

d. means connecting to the top cap and defining the sole supporting member for securing the cabinet to a side wall so that bath articles carried by the cabinet do not fall upon the bather;

e. means for rotating the mid-section cabinet with respect to the top and bottom caps so that bath articles may be conveniently selected from the cabinet;

f. means for connecting the top cap, mid-section cabinet and bottom cap together in substantially vertical alignment, wherein there is a central bore in the top cap, mid-section cabinet and bottom cap through which extends a vertical rod which is rigidly secured to the top cap and the bottom cap, and a vertical, downwardly extending rim on the top cap provides an annular groove extending around the circumference of the interior surface of the rim, and the mid-section cabinet includes upper and lower opposing plates bound circumferentially by a pair of retainer rings, including an upper retainer ring having a tongue around

an exterior surface for mating with the annular groove of the interior surface of the rim of the cap, the retainer ring of the lower plate having an annular groove extending



around the circumference of its interior surface, and the bottom cap having a tongue around its exterior surface for mating with the annular groove of the interior surface of the retainer ring of the lower plate.

4,875,594

CLOSURE CAP

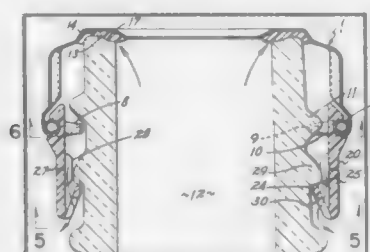
Charles S. Ochs, Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio

Filed Dec. 16, 1988, Ser. No. 285,651

Int. Cl.⁴ B65D 41/48

U.S. Cl. 215-252

18 Claims



1. In a closure cap for sealing a container and having a metal shell with a cover and a depending skirt with a plurality of circumferentially spaced lugs projecting inwardly therefrom for engaging fastening means on a container the improvement which comprises a plastic insert band attached to and extending downwardly from said skirt having a tamper indicating portion defined by a line of weakness comprising container engaging locking means extending inwardly and upwardly from its lower edge.

4,875,595

STORAGE ENCLOSURE

N. L. Van Valkenburg, 624 Maalhardt Ave., Oxnard, Calif. 93030

Filed Jul. 11, 1988, Ser. No. 217,399

Int. Cl.⁴ B65D 81/00

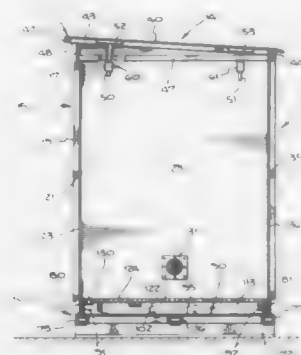
U.S. Cl. 220-1.5

13 Claims

7. A storage enclosure for storing containers of hazardous material and providing for a secondary containment of any spills or leakage of materials from said containers, said enclosure having a base, a containment pan, side and rear walls, a front wall having at least one front door and a roof, wherein:

said base includes a plurality of support beams providing a plurality of spaced support upper surfaces and a plurality of side beams providing a plurality of side surfaces extending vertically upwardly of said support surfaces, said support surfaces and side surfaces together providing a support framework for receiving and supporting said containment pan whereby portions of the pan are visible through spaces between said support surfaces;

said side and rear walls are each fabrications of tubular steel wall frames each having a single sheet steel wall panel secured thereto;



said roof is a fabrication of a tubular steel roof frame and a single sheet roof panel; wherein said roof panel rests upon upper portions of said side frames; a plurality of retention posts are provided on said roof frame, each such post depending therefrom; and a plurality of apertured blocks are provided on said wall panels and aligned individually to and receiving individual ones of said posts in a friction fit connection whereby said roof panel can separate upwardly of said side frames when internal pressure within said enclosure over comes said friction fit of said posts and apertured blocks.

4,875,596

FLEXIBLE VESSEL

Jürgen Lohse, Norderstedter Str. 88 A, D-2359 Henstedt-Ulzburg, Fed. Rep. of Germany

PCT No. PCT/EP87/00400, § 371 Date Mar. 22, 1988, § 102(e) Date Mar. 22, 1988, PCT Pub. No. WO88/00913, PCT Pub. Date Feb. 11, 1988

PCT Filed Jul. 22, 1987, Ser. No. 177,546

Claims priority, application Fed. Rep. of Germany, Jul. 25, 1986, 3625224

Int. Cl.⁴ B65D 88/16

U.S. Cl. 220-403

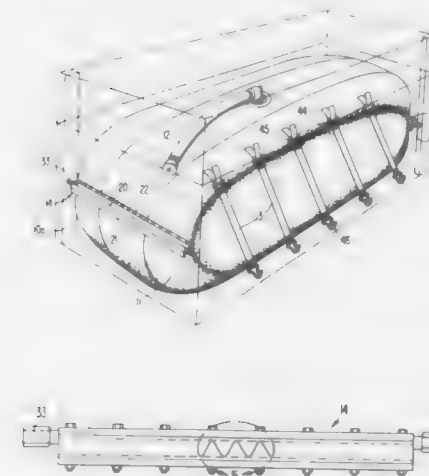
21 Claims

1. Apparatus for holding goods comprising:

a flexible vessel comprising a tube having two tube ends and adapted to receive the goods, the vessel having at least one opening for filling and discharging the goods, the vessel being made of one of an elastomeric material and a thermoplastic material; and

a clamp attached to each of said tube ends, each clamp defining a length, at least one of the clamps having an

extension part movable with respect to the rest of the clamp to extend the length of the clamp, said clamp hav-



ing the extension part being adapted for attachment under compression between parts of a container.

4,875,597

CONVENIENCE PACKAGING

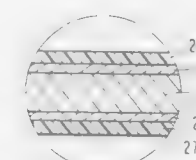
William T. Saunders, Weirton, W. Va., assignor to Weirton Steel Corporation, Weirton, W. Va.

Filed Dec. 2, 1988, Ser. No. 279,403

Int. Cl.⁴ B65D 1/14, 25/34

U.S. Cl. 220-458

20 Claims



1. A one-piece rigid sheet metal substrate can body for shipping and storing comestibles which can be safely used for heating such contents in a microwave oven and which is suitable for serving and consuming such contents directly therefrom,

such can body being shaped solely by draw processing from flat rolled sheet metal substrate precoated with organic coating and draw lubricant on both its planar surfaces, and consisting of a closed bottom wall, a unitary sidewall, and a unitary transition zone interconnecting such bottom wall and sidewall,

each coated with organic coating on interior and exterior surfaces thereof,

such sidewall defining an open end for such can body which is oppositely disposed in relation to such bottom wall along a centrally located axis which is perpendicular to the plane of such bottom wall and open end,

such sidewall being symmetrically disposed in relation to such axis,

such sidewall including

at least three sidewall portions defining differing cross-sectional areas as projected onto a plane which is perpendicularly transverse to such axis than a similar projection of such closed bottom wall, with

the sidewall portion defining the largest cross-sectional area being contiguous to such open end of the can body, and, with

sidewall portions defining progressively smaller cross-sectional areas being disposed toward such closed bottom wall of the can body such that the sidewall portion defining the smallest cross-sectional area is interconnected to such bottom wall by such transition zone,

such transition zone when projected onto a plane which is perpendicularly transverse to the centrally located axis defines an area which is at least about 20% of the cross-sectional area of a similar projection of the cross-sectional area of such sidewall portion which is interconnected with such bottom wall,

such sidewall portions defining differing cross-sectional areas being joined to adjacent portions of the one-piece can body by transition zones which are curvilinear in cross-sectional configuration as projected onto a longitudinal cross-sectional plane which includes such centrally located axis, and, in which

such open end cross-sectional area extends to about 40% larger than such closed bottom wall cross-sectional area, and

the minimum cross-sectional dimension measured in a lateral plane which is perpendicularly transverse to such central axis at such open end is at least about four inches.

4. An integral package comprising

(A) a one-piece rigid sheet metal substrate can body having a closed bottom wall,

a unitary sidewall defining an open end for such can body, and

a unitary transition zone interconnecting such bottom wall and sidewall;

such can body being shaped entirely by draw processing of flat rolled sheet metal substrate precoated in flat rolled form on both its surfaces with organic coating and draw lubricant,

such can body presenting such organic coating on both interior and exterior surfaces thereof,

such sidewall being symmetrically disposed about a centrally located axis which extends in perpendicular relationship to the plane of such bottom wall and such open end,

a transition zone being curvilinear in a heightwise-oriented cross-sectional plane which includes such centrally located axis,

such sidewall including at least three sidewall portions defining different cross-sectional areas than such bottom wall, with

the sidewall portion defining the largest cross-sectional area being contiguous to such open end of the can body, with remaining sidewall portions defining smaller cross-sectional areas being disposed with such progressively smaller cross-sectional areas extending toward such closed bottom wall,

with no interior sidewall portion of the can body defining a larger cross-sectional area than such larger cross-sectional area portion located at such open end of the can body; and, in which

such sidewall portions defining differing cross-sectional

areas being joined to adjacent portions of the one-piece can body by transition zones which are curvilinear as projected onto a cross-sectional plane which includes such centrally located axis;

(B) a non-unitary end closure for sealing such open end of the can body, and

(C) means joining sheet metal substrate at such open end of the can body to such end closure to seal such open end of the can body.

19. Method for fabricating a rigid sheet metal substrate can body for a convenience package providing for shipment and storage of comestibles without freezing, heating of such contents by microwave after opening, and serving and/or eating of heated comestibles directly from such can body comprising providing a rigid sheet metal substrate selected from the group consisting of flat-rolled steel of about 55 to about 110#bb and flat-rolled aluminum of a thickness gage between about 0.007" and about 0.012",

forming a one-piece can body from such metal substrate entirely by draw processing,

such can body being symmetrically disposed about a central longitudinal axis,

such can body having a sidewall defining an open end at one axial end of the can body for introducing or removing comestibles,

a closed bottom wall at the remaining axial end of the can body,

a unitary, curvilinear, transition zone interconnecting such sidewall and closed bottomwall,

such sidewall including at least three portions which define differing lateral cross-sectional areas as measured in a plane which is perpendicularly transverse to such central axis, with

the portion defining the larger cross-sectional area being formed during a final redraw operation and located contiguous to such open end of the can body,

the portion defining the smallest cross-sectional area during a first redraw operation and interconnected with such closed bottom wall of the can body, and with

all such sidewall portions being interconnected at each respective longitudinal end with a next adjacent sidewall portion of the can body by a unitary interconnecting, curvilinear-cross section transition zone of diminishing cross-sectional area in approaching such bottom-wall, and

with the interior sidewall portions of the can body defining progressively smaller cross-sectional areas in moving from such open end of the can body to such bottom wall.

4,875,598

VENDING MACHINE FOR VENDING ONE-AT-A-TIME MERCHANDISE ARTICLES OF A PLURALITY OF SIMILAR SUCH MERCHANDISE OBJECTS, EACH OF A SUBSTANTIALLY RECTANGULAR PARALLELOPIPED SHAPE, SUCH AS A NEWSPAPER, MAGAZINE, OR THE LIKE

Frank L. Dahl, 5248 W. 119th Pl., Inglewood, Calif. 90304
Continuation-in-part of Ser. No. 906,134, Sep. 11, 1986, Pat. No. 4,756,448. This application Jul. 5, 1988, Ser. No. 215,045

The portion of the term of this patent subsequent to Jul. 12, 2005, has been disclaimed.
Int. Cl. G07F 11/14

U.S. Cl. 221-4

19 Claims

1. A novel vending machine for sequentially and selectively dispensing and vending each one of a plurality of substantially similarly shaped, flat, merchandise objects in an object-size-adjustable manner, comprising: a hollow housing defining therein an enclosure having a predetermined length dimension, a predetermined transversely perpendicular width dimension and a predetermined depth dimension perpendicular to both said length dimension and said width dimension, whereby to cause said enclosure to include a merchandise-storage portion of substantially parallelepiped shape and of a selected length, width, and depth such as to be large enough for interior storage of a plurality of depth-direction stacked similar merchan-

dise objects, each of a similar substantially flat configuration, each having a predetermined length and width substantially less than the corresponding length and width dimension of said hollow enclosure, and each having a depth and thickness dimension which is only a small fraction of the depth dimension of said hollow enclosure, thereby providing for the depth-direction stacked superimposition of a plurality of such similar merchandise objects within said enclosure in depth-direction stacked relationship with the length and width dimension of each such merchandise object lying in a transverse plane; a transverse substantially flat supporting platform or table cooperable to receive said plurality of similar depth-direction stacked transversely oriented merchandise objects thereon within said hollow enclosure and being provided with an opposite-to-depth-direction directed biasing spring means cooperable with said transverse supporting platform or table and also cooperable with a fixed connection point thereof relative to the interior of said housing means for normally forcing said stacked plurality of similar merchandise objects in the biased opposite-to-depth direction substantially perpendicular to the transverse orientation of each of said merchandise objects; controllably adjustable stop means positioned in a manner spaced from said supporting platform or table and with an adjustable spaced relationship therebetween in an opposite-to-said depth direction manner such as to allow a desired number of stacked merchandise objects to be positioned between said supporting platform or table and said spaced stop means; separator means positioned within said hollow enclosure and transversely adjacent to a merchandise-dispensing region defined



between said supporting platform or table and said spaced stop means whereby to be immediately transversely adjacent to such a stacked assembly of said merchandise objects and displaced in said depth direction by a distance corresponding to the depth and thickness dimension of one of such merchandise objects and controllably manually extendible from a normal at-rest position into a manually caused activation position with said separator means being forced between an end one only of such a plurality of stacked merchandise objects whereby to cause an end one of said merchandise objects to be effectively segregated from the remainder of the stacked merchandise objects to the end one of said merchandise object is in a condition to be manually removed from the hollow enclosure; said separator means comprising a transversely substantially flat separator knife-blade lying in a transverse plane parallel to a similar plane of stacking substantially coincident with a merchandise-object-supporting upper surface of said supporting platform or table, and having an effectively pointed substantially spear-shaped knife-blade leading edge as seen in plan view adjacent to, effectively facing, and directed toward said merchandise-storage portion of said enclosure for direction toward a plurality of depth-direction stacked similar merchandise objects adapted to be so-positioned therein; a manually openable access door carried by said housing means and provided with controllably openable locking means normally locking said access door in closed relationship with respect to said housing means; and merchandise object anti-drag means for effectively counteracting and neutralizing any tendency for translator movement of said separator knife blade of said sepa-

rator means to apply a corresponding frictional translatory dragging movement to the upper surface of a merchandise object immediately below a top merchandise object being vended and just below said separator knife blade of said separator means.

4,875,599

CARD CASE WITH POWERED DISPENSER

John E. Tuttle, 3605 Arctic Blvd. No. 167, Anchorage, Ak. 99503,

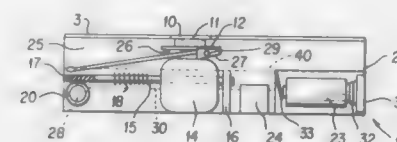
and Sheldon M. Ewing, P.O. Box 870187, Wasilla, Ak. 99687

Filed Jun. 14, 1988, Ser. No. 206,438

Int. Cl. B65G 59/00; B65H 1/08, 3/00; G07F 11/16

U.S. Cl. 221-231

10 Claims



1. A motorized card case for dispensing business cards and the like comprising:

- (a) a lower case having a front, said front having a dispensing slot, a bottom, a grate, fixedly attached within said lower case, above said bottom, said grate forming a lower card platform on which a stack of cards are placed, four sides, and having an open top;
- (b) a lid, hingably attached to the top of said lower case;
- (c) motor means installed within said lower case;
- (d) drive means connected to said motor means such that said drive means are positioned within said case to propel a card from said lower case through said dispensing slot and out of said device;
- (e) actuating means, fixedly installed within said lower case, to engage said motor means;
- (f) power supply means, fixedly installed within said lower case, to power said motor means; and
- (g) a pressure ball hingably mounted in said lower case to restrain the stack of cards.

4,875,600

DEVICE FOR DOSING AND DISPENSING A FLUID PRODUCT TO BE DEPOSITED FREELY IN THE MOBILE ENCLOSURE OF A MACHINE

Martial D'Hooghe, Vitrolles; Claude Perrette, Reims, and Pierre Goffinet, Marseille Cedex, all of France, assignors to Union Generale De Savonnerie, Marseille, France

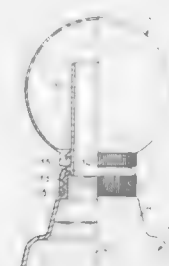
Filed Mar. 3, 1988, Ser. No. 163,624

Claims priority, application France, Mar. 4, 1987, 87 02942

Int. Cl. B65B 3/04

U.S. Cl. 222-52

24 Claims



1. In a device for receiving a predetermined dose of a fluid and for subsequently dispensing said dose when said device is tossed about, for example, within the tub of a washing machine, said device comprising:

- a hollow receiving housing open at one end;
- a hollow substantially tubular shaped member, at least an

intermediate portion of said tubular member extending into said receiving housing and being surrounded by and secured to the open end of said receiving housing;

one end of said hollow tubular member extending into said receiving housing and lying a spaced distance inward from the closed end of said receiving housing opposite the open end of said housing;

the opposite free end of said tubular member extending beyond the opening in said receiving housing being adapted to be releasably secured to the dispensing opening of a container containing a fluid whereby, when said dispensing container is turned upside down, the free end of the tubular member extending into said receiving housing substantially determines the level of the liquid dispensed into said receiving housing and whereby when said receiving housing is turned substantially 180° from the liquid dose receiving position, the predetermined dispensed dose of liquid is contained within a hollow annular region defined by the interior surface of said receiving housing adjacent the open end of said receiving housing and the external surface of said hollow tubular member extending into said receiving housing.

4,875,601

NOZZLE FOR DISPENSING INCREMENTS OF FLOWABLE PRODUCT

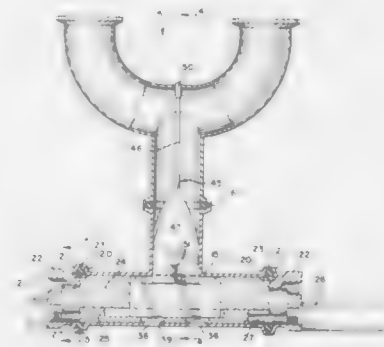
Gary F. Roberts, Colona, Ill., and Rick A. Meeker, Davenport, Iowa, assignors to The Kartridg Pak Co., Davenport, Iowa

Filed Aug. 1, 1988, Ser. No. 226,615

Int. Cl. P67D 5/60, 5/06

U.S. Cl. 222-145

13 Claims



1. A nozzle for dispensing predetermined increments of a flowable mixture of solids in a fluid comprising, a nozzle body in the form of an inverted tee pipe fitting having at least one nozzle-outlet opening in its underside and located inwardly from the ends of the horizontal leg, a stationary plug occupying the upper-half and also a portion of the bottom-half of the interior of said horizontal leg, a slide occupying this remaining space in said interior bottom-half not occupied by said plug and shuttles between an "open" position and a "close" position and having a slide-discharge opening therein for and which registers with each one of said nozzle-outlet openings when said slide is in its said "open" position, and said slide closing each said nozzle-outlet opening when in its said "close" position, and means operatively connected with said slide for shuttling it between its said "open" and "close" positions, and said plug having an elongated vertical opening therethrough overlying and registering with said one or more nozzle-outlet openings and said one or more slide-discharge openings when said slide is in its said "open" position.

4,875,602

SELF-CONTAINED LIQUID DISPENSING DEVICE

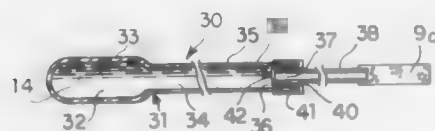
Robert Chickering, Corona Del Mar, Calif., and William A. Barabino, North Reading, Mass., assignors to Triad Direct Incorporated, Placentia, Calif.

Filed Jan. 15, 1988, Ser. No. 206,726

Int. Cl.⁴ B65D 37/00

U.S. Cl. 222—187

10 Claims



1. A liquid dispensing device comprising:
a squeezable elongated cylindrical bulb adapted to be compressed between two fingers of a user and provided with a cavity adapted to contain a liquid desired to be dispensed,
said bulb having an axial extent defining a length substantially greater than the diameter of said bulb,
an elongated bulb shaft having a forward end and an axial bore therethrough communicating with said bulb cavity, said bulb shaft defining an axial extent having a length no less than that of said bulb axial extent with said bulb shaft bore defining a diameter substantially less than that of said bulb cavity,
an elongated tip shaft having rearward and forward ends and provided with a central bore,
said bulb shaft and tip shaft each having a substantially constant configuration throughout their respective lengths,
an applicator tip supported upon said tip shaft forward end, said tip comprising a disparate form adapted to receive and retain liquid for direct transfer to another member,
said bulb shaft and tip shaft of differing diameters and concentrically joined to one another,
normally fluid-tight means intermediate said bulb cavity and said tip shaft rearward end, said fluid-tight means including a rupturable closure-seal member initially transversely spanning said bulb shaft bore and isolating liquid within said bulb from said tip shaft bore, said closure-seal member including an integral flange sealingly joining an end of said bulb shaft to said tip shaft rearward end whereby, upon squeezing of said bulb by a user's fingers, pressure is applied to liquid within said bulb cavity, causing a rupture of said closure-seal member and advancement of the liquid within said bulb cavity through said bulb shaft bore and said tip shaft bore and thence to said applicator tip.

4,875,603

METERED DISPENSING CAP FOR TUBES

Jack Weinstein, Manchester Township, Ocean County, N.J., assignor to Primary Delivery Systems, Inc., Annandale, N.J.

Filed Jan. 26, 1989, Ser. No. 302,339

Int. Cl.⁴ B67D 5/06

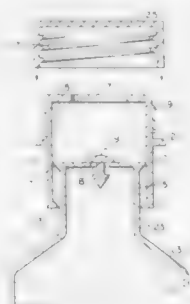
U.S. Cl. 222—205

19 Claims

1. A metered dispensing cap system for containers, which comprises:

- a base element attachable to the neck of a squeezable container having a sidewall portion and a top, and having an opening in said top for outflow of a material from a squeezable container into a meter element;
- a one-way valve located in said opening of said base element, permitting flow of material from a squeezable container through said opening and preventing backflow of material back into said container;
- a meter element having a sidewall portion and a top, and having an opening in said top for dispensing of material from said meter element, wherein the sidewall portion is slightly larger than and has the same cross-sectional shape

as the sidewall portion of said base element, wherein said sidewall portion of said meter element is higher than and located about and encompasses the sidewall portion of said base, and wherein said meter element is vertically slidable along the sidewall portion of said base element, with an upward position whereby the meter element has a predetermined volume for receiving material from the



opening at the top of said base element upon squeezing a squeezable container and a downward position whereby the top of the meter element becomes biased toward the top of the base element so as to dispense a metered amount of material through the opening at the top of said meter element; and
(d) means for closing and opening the opening in the top of said metered element.

4,875,604

DISPENSER FOR PASTE-LIKE PRODUCTS

Joachim Czech, Jahnstrasse 19, D-8402 Donaustauf, Fed. Rep. of Germany

Continuation of Ser. No. 2,800, Jan. 13, 1987, abandoned. This application Oct. 3, 1988, Ser. No. 253,956

Claims priority, application Fed. Rep. of Germany, Jan. 17, 1986, 3601311

Int. Cl.⁴ G01F 11/00

U.S. Cl. 222—257

19 Claims



1. A dispenser for paste-like products comprising a cylindrical container for storing a supply of paste-like products to be dispensed, said cylindrical container including a bottom portion having a slidable follower piston and upper portion having a dispensing means for dispensing the paste-like product, said dispensing means comprising:

- a first non-return valve (16) provided in an upper partition wall of the cylindrical container for controlling communication between the interior of the container and a pump chamber through a first opening (12) formed in said partition wall (11);
- a guide sleeve arrangement (6) surrounding said first opening (12) and having first non-return valve (16) hingedly connected thereto, said guide sleeve arrangement extending upwardly from said partition wall to define circumferentially said pump chamber (24), said guide sleeve arrangement (6) having inner and outer circumfer-

ential guide sleeves, said first non-return valve being hingedly connected to said inner guide sleeve;

- a cup-shaped actuator cap (7) having a peripheral downwardly projecting outer wall portion and an inner tubular section (19), the latter forming a discharge channel having a laterally outwardly opening outlet passage, wherein:
 - said outer wall portion of the actuator cap (7) is slidably engaged with the outer circumferential guide sleeve of the guide sleeve arrangement (6), both being provided with co-operating stop projections (26, 27) to limit axial upward movement of the actuator cap (7);
 - said outer guide sleeve being integral with said upper partition wall of said container, and providing an upper radially outwardly projecting rim portion (25) spaced from the stop projection (26) of the guide sleeve arrangement (6) to establish a circumferential guide surface engaging an inner cylindrical guide surface of the outer wall portion of the actuator cap;
 - said tubular section of the actuator cap having a downwardly extending portion having a diameter greater than that of said laterally opening outlet passage and supporting a dispensing piston (22) to keep the piston (22) slidably engaged with said inner circumferential guide sleeve of said guide sleeve arrangement (6), thereby defining a space forming the pump chamber (24);
 - said dispensing piston (22) having a second opening (29) in register with the tubular section of the actuator cap (7);
 - said second opening (29) being controlled by a second non-return valve means (3) for controlling communication between the pump chamber upstream thereof and the discharge channel of the actuator cap downstream thereof; and
- a return spring (32) extending between a stationary portion of the inner guide sleeve and the actuator cap (7) to bias said actuator cap (7) into a rest position.

4,875,605

PRESSURIZED METERING DISPENSER

Terence E. Weston, Woodbridge, United Kingdom, assignor to Microvol Limited, Ipswich, England

PCT No. PCT/GB87/00909, § 371 Date Jul. 26, 1988, § 102(e) Date Jul. 26, 1988, PCT Pub. No. WO88/04638, PCT Pub. Date Jan. 30, 1988

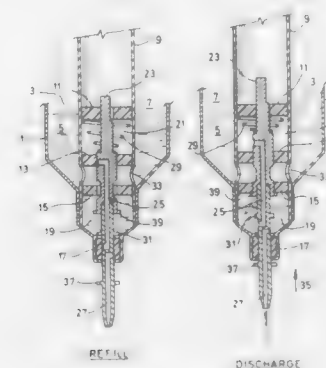
PCT Filed Dec. 16, 1987, Ser. No. 224,949

Claims priority, application United Kingdom, Dec. 17, 1986, 8630100; Mar. 6, 1987, 8704639

Int. Cl.⁴ B65D 83/00

U.S. Cl. 222—402.24

9 Claims



1. A pressurized metering dispenser comprising a main reservoir, a liquid metering chamber and a gas holding chamber, arranged so that if the main reservoir is charged with a liquid and a pressurising gas and the dispenser is held in its position of use, the liquid metering chamber will normally be sealed from

the environment and be in communication with the main reservoir to receive liquid therefrom and the gas holding chamber will normally be in communication with the main reservoir to receive gas therefrom, and during actuation of the dispenser the liquid metering chamber and the gas holding chamber pass through an intermediate state in which the liquid metering chamber is sealed from the external environment and from the main reservoir and the gas holding chamber is sealed from the main reservoir, and a final state in which the liquid metering chamber is open to the environment and the two chambers are in communication with each other but each sealed from the main reservoir.

4,875,606

REFRACTORY VALVE BODY AND SLIDING CLOSURE UNIT INCORPORATING THE SAME

Werner Keller, Steinhausen, Switzerland, assignor to Stopinc Aktiengesellschaft, Baar, Switzerland

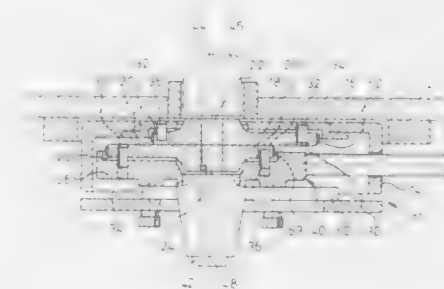
Filed Mar. 28, 1985, Ser. No. 717,295

Claims priority, application Switzerland, Apr. 13, 1984, 1858/84

Int. Cl.⁴ B67D 3/00; B22D 41/08

U.S. Cl. 222—600

39 Claims



22. A refractory valve body for use as a stationary or as a sliding valve member of a sliding closure unit for controlling the discharge of molten material from a vessel, said valve body comprising:

- a discharge opening for use in discharging molten material; at least one elongated groove; and
- at least one bore hole centered on a longitudinal axis of said groove extending in the direction of elongation thereof, said hole being separate from and not connected to said groove.

4,875,607

AUTOMATIC DETERGENT DISPENSER APPARATUS HAVING SYNCHRONOUS MOTOR DRIVE

Fumio Torita, Nagoya; Naotaka Ikeda, Yokohama; Kimihiko Nakamura, Seto; Katsuharu Matsuo, Nishikasugai; Tomio Hotta, Kuwana, and Yoshiyuki Makino, Nagoya, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 2, 1987, Ser. No. 127,960

Claims priority, application Japan, Mar. 14, 1987, 62-59694

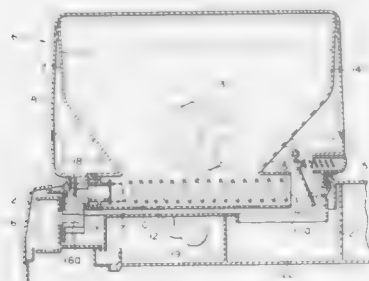
Int. Cl.⁴ B67D 5/06; G01F 11/00

U.S. Cl. 222—643

8 Claims

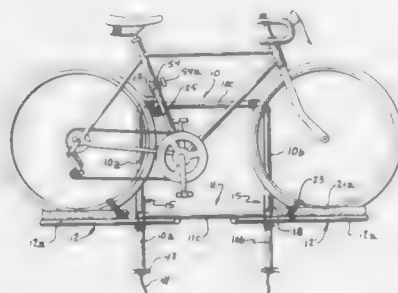
1. An automatic detergent dispenser apparatus comprising: cleanser feeding means, having a cleanser housing portion for storing a cleanser therein, a cleanser feeding member for feeding said cleanser stored in said cleanser housing portion, and a synchronous motor for driving said cleanser feeding member for feeding an amount of cleanser corresponding to a number of revolutions of said synchronous motor; cleanser feeding amount-setting means for setting a target amount of cleanser desired to be fed from said cleanser feeding means;

driving means for selectively applying an AC source voltage from an AC power source to said synchronous motor; frequency determining means for determining a frequency of the AC source voltage; counting means for counting a number of cycles of the AC source voltage beginning at a time when the AC source voltage is first applied to said synchronous motor; driving time-setting means receiving said target amount of cleanser, for setting a driving time corresponding to said target amount in units of frequencies of the AC source voltage;



reference cycle number-setting means for setting a total number of cycles of the AC source voltage which corresponds to the driving time set by said driving time setting means, in units of frequencies of the AC source voltage; and motor control means for comparing a count output from said counting means with the total cycle number from said reference cycle number-setting means which corresponds to a determination result from said frequency determining means and for controlling said driving means to stop application of the AC source voltage to said synchronous motor when the count and the total cycle number coincide with each other.

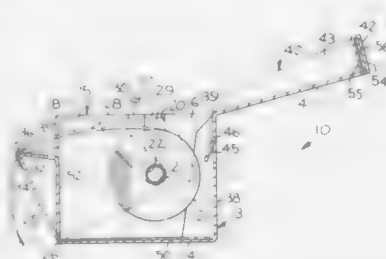
4,875,608
VEHICLE MOUNTED FOLDABLE BICYCLE CARRIER
John W. Graber, Stoughton, Wis., assignor to Graber Products, Inc., Madison, Wis.
Filed Jun. 21, 1988, Ser. No. 209,363
Int. Cl.⁴ B60R 9/10
U.S. Cl. 224—42.03 B 16 Claims



1. A foldable bicycle carrier for mounting on a vehicle comprising, a generally upright main frame having means for mounting the main frame on a vehicle at a rear end thereof, an auxiliary frame including first and second spaced side members each having one end swingably mounted on the main frame for movement about a horizontal axis between a folded position extending upwardly from said one end alongside said main frame and an erected position extending rearwardly from said one end, first and second bicycle support means respectively pivotally attached to the first and second side members for movement about an axis generally paralleling the associated

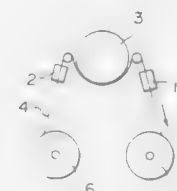
side member between a folded position in which the first and second bicycle support means extend from the associated side member in a direction toward the other side member into overlapping relation and an erected position in which the first and second bicycle support means extend generally horizontally from the associated side member in a direction away from the other side member, at least one bicycle wheel receiving channel on each of the first and second bicycle support means, said wheel receiving channels extending generally horizontally and opening upwardly for supportably receiving the wheels of a bicycle when the first and second bicycle support means are in said erected position, and bicycle stabilizer means mounted on the main frame for engaging a bicycle at a location above said bicycle wheel receiving channels.

4,875,609
DISC DISPENSER
Jerome E. Elder, Blaine, and Nancy L. Mosman, Saint Fridley, both of Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.
Filed Mar. 4, 1988, Ser. No. 164,389
Int. Cl.⁴ B26F 3/02
U.S. Cl. 225—13 16 Claims



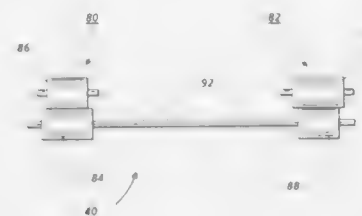
1. A dispenser for concatenated pressure sensitive adhesive coated abrasive discs disposed in a supply roll around a core having a through opening, said dispenser comprising:
a corrugated fiberboard container having a bottom wall, opposite side walls projecting generally at right angles from opposite edges of said bottom wall and each having inner and outer layers, a front edge, and a top edge, said inner layers of said side walls having aligned slots extending from said top edges to inner ends positioned generally central of said side walls and having support edges defining the inner ends of said slots;
a shaft extending between the outer layers of said side walls and having ends supported on said support edges, said shaft being adapted to extend through and support the core for rotation around said shaft;
said container also having a front wall having a bottom edge pivotally mounted on said bottom wall, projecting along the front edges of said side walls, having opposite edges each adjacent one of said side walls, and having retaining members attached at the opposite edges of said front wall and each projecting between the layers of a different one of said side walls, said front wall being pivotable relative to said side walls between a storage position with said front wall disposed generally at a right angle relative to said bottom wall, and a dispense position with said front wall disposed at an obtuse angle relative to said bottom wall, and said retaining members having retaining portions spaced from the slots in the inner layers of said side walls when said front wall is in said storage position, and projecting across said slots and engaging portions of said shaft adjacent the top edges of said side walls to help retain said shaft against the support edges when said front wall is in said dispense position.

4,875,610
METHOD OF AND SYSTEM FOR DRIVING MAGNETIC TAPE
Tatsuji Kitamoto, Kanagawa; Katsuya Yokoyama, and Takuji Sekiguchi, both of Tokyo, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa and Nippon Hoso Kyokai, Tokyo, both of Japan
Filed May 20, 1988, Ser. No. 196,522
Claims priority, application Japan, May 22, 1987, 62-125581; May 22, 1987, 62-125582; May 22, 1987, 62-125583
Int. Cl.⁴ B65H 20/36
U.S. Cl. 226—10 21 Claims



1. A method of driving a magnetic tape comprising steps of generating a unidirectional traveling-surface-wave by ultrasonic oscillation on a surface of a first oscillator, and pressing the surface of the oscillator a surface of the magnetic tape, thereby running the tape in the direction opposite to the traveling d of said surface-wave.

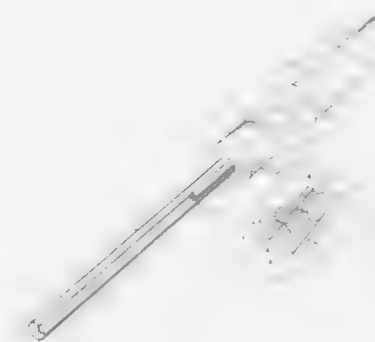
4,875,611
ROLL MEDIA FEED ROLL SYSTEM
Raymond E. Poehlein, Fairport, and Franklin S. Reese, Victor, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.
Filed Dec. 10, 1987, Ser. No. 131,066
Int. Cl.⁴ B65H 20/02
U.S. Cl. 226—186 3 Claims



1. A feed roll system for feeding web media from a supply source along a feed path, the system including
a first and second drive roll pair, in horizontal, axial alignment along the feed path, said first drive roll pair including a hard, high friction drive roll in compressive relationship with an elastomer-covered idler roll, the first roll pair forming a first nip area therebetween, said second drive roll pair being axially spaced from said first drive roll pair and including an elastomer-covered, high friction drive roll in compressive relationship with a hard roller, the second roll pair forming a second nip area therebetween, whereby said first drive roll pair controls the media velocity

through said first nip area and said second roll pair adjusts its drive velocity through said second nip area to match that of said first drive pair.

4,875,612
GUIDED HAMMER
Lawrence L. Lee, 3776 Martha St., San Diego, Calif. 92117
Filed Aug. 5, 1988, Ser. No. 228,976
Int. Cl.⁴ B25L 7/00
U.S. Cl. 227—147 11 Claims



1. An improved impact apparatus of the type in which an impact member delivers an impact to a work piece; an elongated guide means confines the motion of said impact member to within a predetermined path; an input means receives input movement, said input movement being received as an input force along an input axis causing the input means to move at an input velocity; and a speed multiplying means transmits the input movement to said impact member as an output force along an output axis, causing the impact member to move at an output velocity which is faster than said input velocity; wherein the improvement comprises:
a guide means having a longitudinal groove of uniform cross-section near its operative position, an impact member having an impact face that fills the cross-sectional area of the groove such that any work piece that has been placed into said groove will be struck by said impact face.
2. An improved impact apparatus of the type in which an impact member delivers an impact to a work piece; an elongated guide means confines motion of said impact member to within a predetermined path; an input means receives input movement, said input movement being received as an input force along an input axis causing said input means to move at an input velocity; and a speed multiplying means transmits the input movement to said impact member as an output force along an output axis, causing the impact member to move at an output velocity which is faster than said input velocity; said speed multiplying means comprising a plurality of rack and pinion gears; wherein the improvement comprises:
at least two pinion gears centered around at least two separate axes to enable at least two rack gears to be positioned on the same side of the pinion gears.

4,875,613

APPARATUS FOR MANUFACTURING A LAMINAR BOND

Franz Kloucek, Wettingen; Per-Olof Larsson, Nussbaumen, and Ernst Vogt, Remigen, all of Switzerland, assignors to BBC Brown Boveri AG, Baden, Switzerland
Division of Ser. No. 168,396, Mar. 15, 1988, Pat. No. 4,832,253.

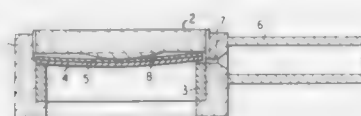
This application Mar. 16, 1989, Ser. No. 324,016

Claims priority, application Switzerland, Apr. 3, 1987, 1287/87

Int. Cl.⁴ B23K 37/04

U.S. Cl. 228—44.3

2 Claims



1. Apparatus for bonding two wafer members having different coefficients of thermal expansion comprising

- (a) an essentially ring-shaped housing (1) of a material of low thermal expansion;
- (b) said housing supporting at a first end a ring-shaped thermal expansion element (3) of a material of higher thermal expansion mounted concentrically in the housing (1), which supports the wafer arrangement on one side at the wafer edge; and
- (c) said housing threadedly supporting at its other end a screw closure (2) located opposite the thermal expansion element (3), which presses against the wafer arrangement supported on the thermal expansion element (3) with a central pressure nose (8) mounted in its interior.

4,875,614

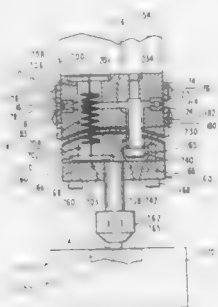
ALIGNMENT DEVICE

Thomas M. Cipolla, Hopewell Junction; Raymond R. Horton, Dover Plains, both of N.Y.; Philip Murphy, New Fairfield, Conn., and Michael J. Palmer, Walden, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Oct. 31, 1988, Ser. No. 264,713

Int. Cl.⁴ B23K 20/02

U.S. Cl. 228—5.5

28 Claims



1. An apparatus for adjusting the orientation of a first surface of a first body to be substantially against a second surface of a second body when said first surface is pressed against said second surface, said apparatus comprising:

- a support for said first body;
- means for pressing said first surface against said second surface;
- means for movably mounting said first surface by curved surfaces to said support, permitting rotation of said first surface about a first axis and a second axis, so that when said support is moved to press said first surface against said second surface, said first surface rotates about said

first and second axis, resulting in said first surface being substantially against said second surface; and
said first axis and said second axis are substantially fixed in orientation and position with respect to said support as said first surface rotates.

4,875,615

VAPOR PLUG FOR TEMPORARILY SEALING OR PLUGGING A PIPELINE

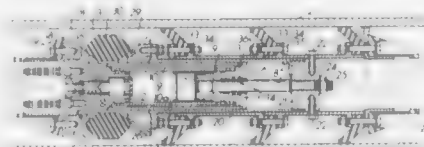
Donald D. Savard, Edmonton, Canada, assignor to Interprovincial Pipe Line Company, Edmonton, Canada

Filed Mar. 6, 1989, Ser. No. 319,169

Int. Cl.⁴ B23K 37/00

U.S. Cl. 228—119

4 Claims



1. A vapor plug, adapted to be inserted into the open end of a pipeline and actuated to expand radially to seal the bore of the pipeline, said plug further being adapted to contract in response to the application of pressure through the bore of the pipeline, comprising:

- a cylinder forming a chamber and having a fluid-tight piston positioned to work therein;
- first passage means for injecting fluid into one end of the chamber and second passage means for removing fluid from the other end of the chamber;
- means forming a third passage for enabling fluid to move from one end of the cylinder chamber to the other;
- a valve, in communication with the bore of the pipeline and adapted to control fluid flow through the third passage, said valve being operative to be moved from a closed mode, in which fluid is blocked from moving through the third passage, and an open mode, in which fluid may move through the third passage, thereby freeing the piston for axial movement in the chamber, said valve being adapted to be moved from the closed mode to the open mode in response to the application of pressure in the bore of the pipeline;
- an elastic resilient seal ring carried by the cylinder and extending in a generally vertical plane, said ring being adapted, when expanded radially, to seal against the inner surface of the pipeline wall;
- means, connected with the cylinder piston, for radially expanding the seal ring; and
- normally closed valve means operative to close the ends of the first and second passage means to lock fluid in the cylinder, whereby the piston may be fixed in the ring-expanded mode, when the valve is in the closed mode; said seal ring being operative, when the valve is in the open mode, to contract, whereby the plug may be pumped down the pipeline.

4,875,616

METHOD OF PRODUCING A HIGH TEMPERATURE, HIGH STRENGTH BOND BETWEEN A CERAMIC SHAPE AND METAL SHAPE

Richard D. Nixdorf, Knox County, Tenn., assignor to America Matrix, Inc., Knoxville, Tenn.

Filed Aug. 10, 1988, Ser. No. 230,452

Int. Cl.⁴ B23K 20/00; B22D 19/04, 19/14

U.S. Cl. 228—120

9 Claims

1. A method for producing a high temperature, high strength bond between a ceramic body and a metal substrate, which comprises the steps of:

producing a volume of consolidated particulate single crystals of a selected shape of a composition matching said ceramic body, said particulate shape selected from whiskers, fibers, platelets and sponges;
sintering said volume of consolidated single crystal particulate shapes to form a high strength preform;
grinding a first surface of said preform to a contour to substantially conform to a selected surface of said ceramic body;
grinding an opposite face of said preform to substantially conform to a selected surface of said metal substrate;
coating said selected surface of said ceramic body with a ceramic slip formed from fine ceramic particles, of a com-

percent gold-tin alloy body, placing said at least 80 weight percent gold-tin alloy body between said first and second gold layers, and bonding said at least 80 weight percent gold-tin alloy body to said first and second gold layer by heating said at least 80 weight percent gold-tin alloy body and said first and second gold layers to a temperature sufficient to bond said at least 80 weight percent gold-tin alloy body and said first and second gold layers together to provide the bonding structure in which said at least 80 weight percent gold-tin alloy body is gold enriched and a portion of said first and second gold layers remain unalloyed.

4,875,618

WIRE STACKED BONDING METHOD

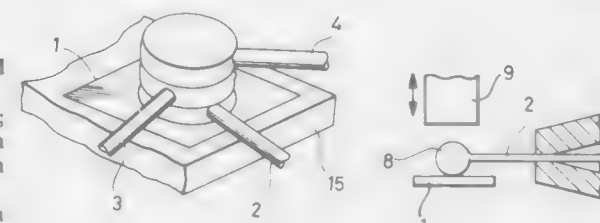
Hiroshi Hasegawa, Kanagawa; Koichi Sugimoto, Hiratsuka; Takeshi Yano, Yokohama; Tositada Netsu, Hatano; Mitsukiyo Tani, Odawara, and Tosaku Kojima, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Oct. 27, 1987, Ser. No. 112,943

Claims priority, application Japan, Oct. 31, 1986, 61-258232

Int. Cl.⁴ H01L 21/60

U.S. Cl. 228—179

9 Claims



1. A wire stacked bonding method wherein ends of a plurality of wires are stacked on a bonding pad which comprises a first series of steps including:

- a step of melting an end of one wire of a plurality of wires to form a ball at the end of the wire;
 - a step of positioning the ball on a planar surface of the bonding pad with the wire extending in parallel with the planar surface; and
 - a step of heating and pressing the ball to form the ball into a first disc-like form and to bond the first disc-like form to said bonding pad;
- followed by a second series of steps including:
- a step of heating an end of another wire of said plurality of wires to form a ball at the end of the other wire;
 - a step of positioning the ball at the end of the other wire on an exposed surface of the first disc-like form with the other wire extending in parallel with the surface of the bonding pad;
 - a step of heating and pressing the ball to form a second disc-like form and to bond the second disc-like form onto the surface of the first disc-like form bonded to the bonding pad thereby forming a stack of the disc-like forms bonded onto the bonding pad.

4,875,619

BRAZING OF INK JET PRINT HEAD COMPONENTS USING THIN LAYERS OF BRAZE MATERIAL

Jeffrey J. Anderson, 12540 SW. Edgewood, Portland, Ore. 97225, and John S. Moore, 15087 NW. Oakmont Loop, Beaverton, Ore. 97005

Filed Sep. 1, 1988, Ser. No. 239,587

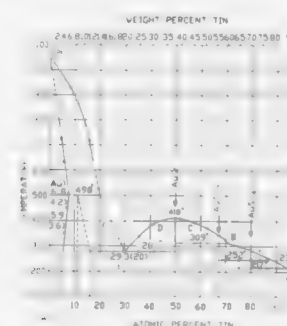
Int. Cl.⁴ B23K 20/00

U.S. Cl. 228—190

14 Claims

1. A method for making a gold-tin alloy bonding structure for an integrated circuit chip having a plurality of bonding pads, which comprises forming a first layer of gold on a substrate carrier, forming a second gold layer on said integrated circuit chip, forming an at least 80 weight percent gold-tin alloy body on at least one of said first and second gold layers, said first and second gold layers each having a thickness of at least about 5 percent of a thickness of said at least 80 weight

1. A method of bonding a first surface of a first metal component of an ink jet print head having at least a first preformed aperture to a second surface of a second metal component of the ink jet print head having at least a second preformed aperture, the first and second components being of materials having the same or similar coefficients of thermal expansion, the first



fore said discharge amount increases beyond a predetermined set value.

4,875,625

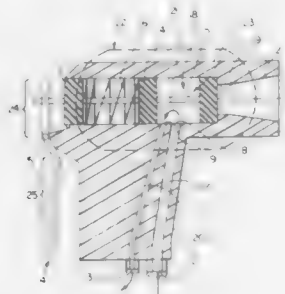
CONSTANT FLOW DEIONIZED WATER SPRAY GUN
Bruce A. Jones, Hopkinton, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed Oct. 9, 1987, Ser. No. 107,620

Int. Cl.⁴ B05B 9/00

U.S. Cl. 239—124

9 Claims



1. A spray gun comprising:

A. barrel means including a generally cylindrical sidewall defining a bore and having a forward open discharge end, inlet means through said sidewall adapted to permit a fluid to enter said barrel means, and outlet means through said sidewall situated generally rearwardly from said inlet means; and

B. actuator means including sealing means situated in said bore and configured to sealingly engage said sidewall of said barrel means and means for moving said sealing means between an on position forward of said inlet means and an off position between said inlet means and said outlet means, so that when said sealing means is in said off position fluid flowing into said bore through said inlet means flows out said outlet means, and when said sealing means is in said on position fluid flowing into said bore through said inlet means flows out said discharge end of said bore.

4,875,626

PISTON-POWERED DISPENSING SYSTEM

James E. Buhler, Waterford; James R. Crapser, Caledonia; Allen D. Miller, Mount Pleasant, and Mark E. Wefler, Caledonia, all of Wis., assignors to S. C. Johnson & Son, Inc., Racine, Wis.

Continuation-in-part of Ser. No. 153,737, Feb. 8, 1988, Pat. No. 4,767,059. This application Aug. 29, 1988, Ser. No. 238,026. The portion of the term of this patent subsequent to Aug. 30, 2005, has been disclaimed.

Int. Cl.⁴ B05B 7/24

U.S. Cl. 239—314

4 Claims



4. A piston-powered dispensing system comprising:

an apertured base;
a hollow cylinder defining a longitudinal axis, the cylinder carrying the base at one end portion thereof and further defining a hollow neck at the opposite end portion thereof;

an apertured piston defining a circumferential portion that is slidably engageable with the hollow cylinder substantially along the length of an inner surface thereof and disposed

in the cylinder for dividing the cylinder into at least two chambers;

an orificed overcap carried by the cylinder and rotatable about the longitudinal axis relative thereto, the overcap defining a fluid-mixing region and a throat that is slidably engageable with an inner surface portion of the cylinder neck;

an elongated fluid passageway means carried by the overcap and disposed through the piston aperture in a fluid-tight manner;

a hollow extension, slidably engageable with the inner surface portion of the cylinder neck and carried by the overcap throat, whereby rotation of one of the overcap and cylinder relative to the other about the longitudinal axis thus causes movement along the longitudinal axis of the cylinder neck relative to both of the extension and overcap throat;

first valve means carried by the base for controllably affecting flow of a pressurized fluid from a pressurized-fluid source into the fluid passageway means and into one of the two cylinder chambers;

second valve means carried by the fluid passageway means and abuttingly engaging the first valve means for controllably affecting flow of the pressurized fluid through the fluid passageway means; and

third valve means provided by said movement along the longitudinal axis of the cylinder neck relative to both of the extension and overcap throat, for controllably affecting flow between an other one of the two cylinder chambers and the fluid-mixing region, whereby said movement of said one of the overcap throat and cylinder neck relative to said other along the longitudinal axis simultaneously causes the first and second valve means to co-act in such a manner as to controllably affect flow of the pressurized fluid from the pressurized-fluid source into and through the fluid passageway means and into said one of the two cylinder chambers.

4,875,627

FREE PASSAGE NOZZLE

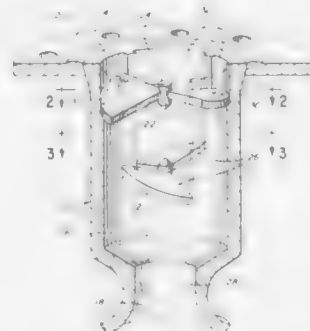
John W. Coulston, Winfield, Ill., and David C. Huffman, Merrimack, N.H., assignors to Lechler, Inc., St. Charles, Ill.

Filed Jul. 8, 1988, Ser. No. 216,640

Int. Cl.⁴ B05B 1/34, 1/26

U.S. Cl. 239—466

6 Claims



1. A solid-cone spray nozzle for liquids comprising

a shell defining a cylindrical interior space having an ingress opening at one end and a reducing wall at the other end having therein a central orifice,

said shell having therein a pair of opposed flow-directing vanes extending from the shell wall into said interior space toward the axis thereof,

each said vane being pitched so as to deflect the flow of liquid impinging thereupon into a helical path in the same

rotative direction about the axis of said space to induce a vortex in the through-flowing liquid,

said cylindrical space having on both sides of said opposed vanes an unobstructed cross-sectional area comprising approximately a quadrant of the cross-section of said cylindrical space, and capable of circumscribing a circle of the diameter of said orifice, and

a second pair of opposed flow-direction vanes sized like those of the first-mentioned pair and having the same orientation with respect to each other and to said cylindrical space but being rotatively displaced a quarter-turn from said first-mentioned pair and axially spaced therefrom a minimum distance equal to the diameter of said orifice.

4,875,628

METHOD AND APPARATUS FOR CRUSHING BRITTLE MATERIAL FOR GRINDING

Osbert Knobloch, Rheda-Wiedenbrück, and Manfred Müller, Ennigerloh, both of Fed. Rep. of Germany, assignors to Krupp Polysius AG, Fed. Rep. of Germany

Filed May 6, 1988, Ser. No. 191,077

Claims priority, application Fed. Rep. of Germany, May 27, 1987, 3717975

Int. Cl.⁴ B02C 23/12

U.S. Cl. 241—24

16 Claims



1. The method of crushing fresh brittle material to prepare said material for grinding, said fresh material having a moisture content higher than a critical value above which satisfactory crushing is inhibited, said method comprising:

(a) pre-mixing selected proportions of said fresh brittle material in a pre-mixing stage with selected proportions of at least partially processed other material having a moisture content sufficiently lower than that of said fresh material to reduce the moisture content of all the resultant pre-mixed material to a value no greater than said critical value;

(b) crushing said pre-mixed material; and

(c) thereafter disagglomerating, drying, and classifying said crushed pre-mixed material in a selected sequence.

4,875,629

PARTICLE PULVERIZER INJECTION NOZZLE

Kenneth A. Brors, New Brighton, Minn., assignor to Air Powder Systems, Hastings, Minn.

Filed Sep. 2, 1988, Ser. No. 240,841

Int. Cl.⁴ B02C 19/06

U.S. Cl. 241—39

14 Claims

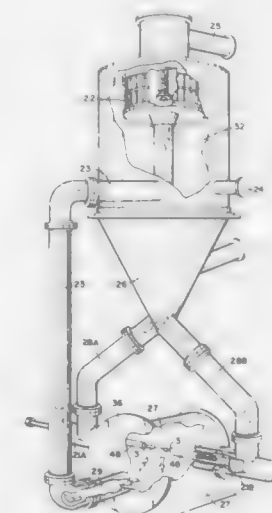
1. An injector for projecting solid material in an impact pulverizer, said injector comprising:

(a) nozzle member having a central conduit with an inlet end and an outlet end, said nozzle member including a nozzle tip proximate said outlet end;

(b) means for circulating solid particles to said inlet end of said conduit;

(c) a barrel positioned proximate said outlet end of said conduit and being in axial alignment with said conduit, said barrel being in horizontal alignment and having a barrel diameter larger than the diameter of said conduit;

(d) a circumferential air passage surrounding said nozzle member, said air passage having an inlet end and an outlet end, said inlet end including an inlet aperture, said outlet end being in fluid communication with said barrel, wherein said air passage has an inner surface an outer surface, each having an angle of taper with respect to



horizontal, said outer surface having a first and second angles of taper, the intersection of which forms a throat in said air passage, said first angle of taper extending substantially all of the length of said air passage and causing said air passage to converge and said outer surface having a second angle of taper between the throat and its intersection with the horizontal wall of said barrel which causes said air passage to diverge, said second angle of taper being approximately fifteen degrees; and

(e) means for supplying a motive fluid through said inlet aperture so as to direct the fluid tangentially into said air passage.

4,875,630

LEAF VACUUM AND SHREDDER

William P. Carlson, P.O. Box 2325, Kailua-Kona, Hi. 96745

Filed Oct. 11, 1988, Ser. No. 255,325

Int. Cl.⁴ B02C 13/28

U.S. Cl. 241—56

8 Claims

1. A comminuting apparatus including:

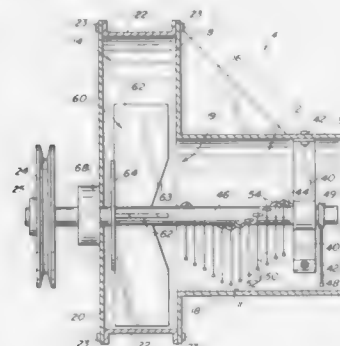
a rotatable drive shaft having a circumference;

means for driving the shaft;

means for sucking air and matter to be comminuted past the shaft;

a plurality of mounting pivots, the mounting pivots affixed

to the circumference of the shaft on a line of helical configuration; and



a plurality of loose stiff metal wire whips moveably affixed to the mounting pivots.

4,875,631

WEAR PROTECTION CHIPPER DISC

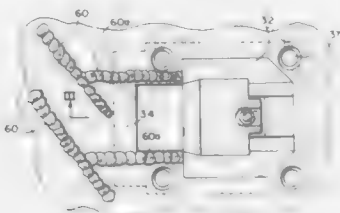
Gary M. Bardos, Mt. Pleasant, Mich., assignor to Recycling Systems, Inc., Winn, Mich.

Filed Jan. 23, 1989, Ser. No. 300,049

Int. Cl.⁴ B27C 7/12

U.S. Cl. 241—92

14 Claims



1. A chipper for wood material such as stumps, chunks of wood, roots, limbs, old lumber and the like, comprising: a rotational chipping disc having a periphery and an axis of rotation and adapted to be driven in one rotational direction; a support for material to be advanced to said disc; said rotational disc having a front face normal to said axis, and a series of knife mounting pockets in said disc for mounting knives to extend axially from said front face, diagonally at an acute angle toward said direction of disc rotation, and having chip passage slots extending through said disc adjacent said pockets; hardened deflector protrusions on said disc front face, projecting axially therefrom, and offset from said pockets toward said direction of rotation, and said protrusions being of a material having a hardness sufficiently greater than that of said disc that said protrusions inhibit wear of said disc at said chip passage slots.

4,875,632
WEB DIVIDING AND REWINDING MACHINE AND METHOD FOR REMOVING REWIND ROLLS THEREFROM

Hiroshi Kataoka, Iyomishima, Japan, assignor to Kataoka Machine Co., Ltd., Ehime, Japan

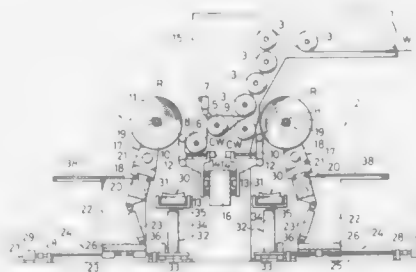
Filed Apr. 7, 1988, Ser. No. 178,561

Claims priority, application Japan, Apr. 9, 1987, 62-88534; Sep. 4, 1987, 62-221309

Int. Cl.⁴ B65H 17/12

U.S. Cl. 242—56.2

1 Claim



1. A web dividing and rewinding machine comprising a front section and a rear section which are similar construction and operate in a similar manner, a plurality of slitters for dividing a wide web into a plurality of elongated longitudinal sub-webs, a plurality of pairs of rewind core supporting arms mounted on a core holder arranged in each of the front and rear sections, a rewind core supported on each pair of the rewind core supporting arms for rewinding said sub-web thereon, said rewind core being rotated in contact with a contact roller, means for moving said rewind core supporting means in a longitudinal direction of said web, and a pair of carrying apparatus, each of which includes a conveyor for transferring the rewind rolls wound on the rewind core in the longitudinal direction of the central axis of the roll and an elevator for moving up and down the conveyor, each said carrying apparatus being arranged in a space between the front and rear sections and installed at the under side of said rewind core holder for removing rewind rolls from the machine.

4,875,633

PAPER SPLICING DEVICE

Selji Mochizuki, Hachiohji, and Fumiya Kato, Fussa, both of Japan, assignors to Toppan Moore Company, Ltd., Tokyo, Japan

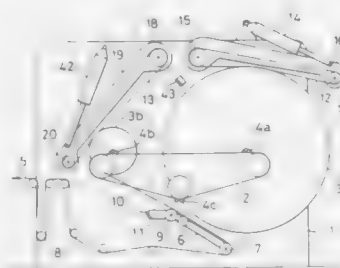
Filed Mar. 29, 1988, Ser. No. 174,610

Claims priority, application Japan, Mar. 31, 1987, 62-47829[U]

Int. Cl.⁴ B65H 19/16

U.S. Cl. 242—58.3

2 Claims



1. A paper splicing device for splicing paper of a preceding to a succeeding paper roll having a tuning mechanism for tuning paper delivery speed of the succeeding paper roll to that of the preceding paper roll from which paper is fed while

rotated, wherein a start portion of the paper of the succeeding paper roll is adhered to the paper of the preceding paper roll while peripheral speeds of said preceding and succeeding paper rolls are tuned to each other, said paper splicing device being characterized in that said timing mechanism is provided with connection means for connecting a first rotor rotating in contact with a peripheral surface of the preceding paper roll and a second rotor rotating in contact with a peripheral surface of the succeeding paper roll to a single driving source, said connection means transmitting a driving force to the first rotor from the driving source, and a tuning control section connected to the second rotor from a connection system by said connection means through an electromagnetic powder clutch capable of varying the driving so that a rotary peripheral speed of said second rotor rotating in contact with the peripheral surface of said succeeding paper roll can be gradually tuned to a rotary peripheral speed of said first rotor rotating in contact with the peripheral surface of said preceding paper roll.

4,875,634

PAPER TAPE ROLL CONTROL UNIT

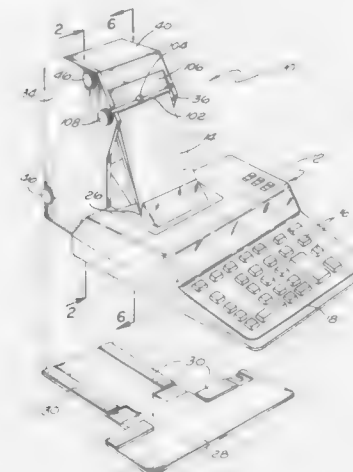
Theodore Lapadakis, 9827 Mason Ave., Chatsworth, Calif.

Filed Jul. 25, 1988, Ser. No. 223,782

Int. Cl.⁴ B65H 16/06

U.S. Cl. 242—67.3 R

13 Claims



1. A paper tape control unit adapted for use with a business machine or the like having means for drawing and using an elongated strip of paper tape, and then for discharging the paper tape, said control unit comprising: a control unit housing; a supply reel carrying a roll of paper tape in elongated strip form for supply to the business machine; a take-up reel for rewinding of the paper tape discharged from the machine; means for supporting said supply and take-up reels for rotation within said housing, said supply reel being positioned for drawing of the paper tape thereon into association with the business machine by operation of said drawing means for use of the paper tape by the business machine, said supply reel being rotatably driven by said drawing means as the paper tape is drawn from said supply reel, and said take-up reel being positioned for rewinding thereonto of the paper tape used by said business machine; drive means coupled to the take-up reel to rotatably drive said take-up reel for rewinding of the paper tape thereonto; and means for intermittently activating said drive means to rewind the paper tape in an intermittent manner, said means for intermittently activating said drive means including switch means for energizing said drive means and means carried by said supply reel for movement therewith, said

means carried by said supply wheel being engageable with said switch means for intermittently energizing said drive means in response to supply reel rotation.

4,875,635

PROGRAMMED RATIO MECHANICAL TRANSMISSION

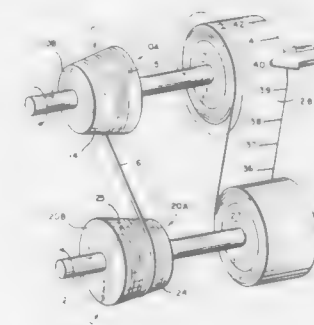
Edward L. Steltzer, Westboro, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed Oct. 2, 1987, Ser. No. 104,814

Int. Cl.⁴ B65H 18/10, 23/04

U.S. Cl. 242—67.3 R

14 Claims



1. A system for transporting a web between first and second reels while maintaining tension in the web, said system comprising:

first and second rotatable frustoconical drums, mechanically coupled to said first and second reels, respectively, and mounted inversely to each other so that the wide end of each drum is juxtaposed with the narrow end of the other; a cable mechanically linking said drums which is attached near the wide end of the first drum, wound partly around that drum, wound partly around the second drum in the same manner, and then attached at a point near the wide end of the second drum, said cable comprising an elastic material; and tensioning means, said tensioning means including said cable, for maintaining tension in the web and cable, wherein the cable and web are mounted such that they move in the opposite directions, whereby as the cable is unwound from a drum the web is enwound onto the associated reel.

4,875,636

NON-RETURNABLE NEWSPRINT CARRIER SYSTEM

Daniel D. Kewin, Brantford, Canada, assignor to Sonoco Products Company, Hartsville, S.C.

Filed Nov. 12, 1987, Ser. No. 119,519

Int. Cl.⁴ B65D 85/67

U.S. Cl. 242—68.6

12 Claims



1. A non-returnable newsprint carrier system adapted for winding of newsprint, shipping and storing of newsprint and mounting in reels of offset printing presses on stub shafts having a predetermined non-cylindrical outside surface configuration and profile for unwinding of newsprint, and characterized by eliminating the need for return to the newsprint manufacturer, increasing core crush resistance during shipping and

storing, and reducing roll vibration during unwinding in the printing press; said system comprising:

an elongate tubular core of predetermined dimensions for winding of newsprint thereon to form a roll of newsprint and having opposite end portions without metal end caps thereon and defining inside surfaces for receiving there-within the reel stub shafts to mount the roll of newsprint in the offset printing press, said inside surfaces of said opposite end portions of said tubular core having predetermined non-cylindrical configuration, profile and dimensions for being adapted to be mounted on complementary portions of the outside surfaces of the reel stub shafts of the offset printing press so that said tubular core will be adapted to have a full profile fit in surface-to-surface contact over substantially the entire surface area of the reel stub shafts received within said core, said non-cylindrical configuration comprising means for reducing roll vibration during unwinding of the newsprint in the offset printing press; and

core plugs for being inserted into the end portions of said tubular core after winding of the newsprint roll and during shipping and storage to prevent damage to the end portions of said tubular core and to the newsprint roll, each of said core plugs comprising a solid body without holes or grooves therein, having a generally circular cross-sectional configuration, being formed of wood, plastic or the like crush-resistant material, and having an outside surface area of substantially the same non-cylindrical configuration, profile and dimensions as said inside surfaces of said opposite end portions of said tubular core for being positioned therewithin and a circumferential lip area at the end of said tubular core for suitable engagement or gripping to remove said core plugs from said tubular core.

4,875,637

FILM CASSETTE

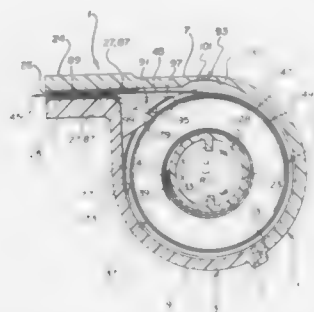
David E. Beach, Stowe, Vt., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 12, 1989, Ser. No. 296,467

Int. Cl.⁴ G03B 17/26

U.S. Cl. 242—71.1

6 Claims



1. An improved film cassette wherein a film spool having a filmstrip coiled about it is rotatable in an unwinding direction to automatically advance a leader portion of said filmstrip along a film passage slit to the outside of the cassette shell and is rotatable in a rewinding direction to wind said leader portion to the inside of said shell at least until a leading end of the leader portion is positioned inward of said slit, and wherein the improvement comprises:

said cassette shell includes first integral guide means, protruding from an inner circumferential wall of the shell to a predetermined location proximate said film passage slit and an outmost convolution of said filmstrip, for guiding said leading end of the leader portion between the inner wall and said outmost convolution to prevent the leading end from entering the slit, and second integral guide

means for guiding said leading end directly to said first integral guide means in response to rotation of said film spool in the unwinding direction anytime after the leading end has been wound inward of said slit, whereby said leading end will be prevented from entering the slit.

4,875,638

FILM CASSETTE

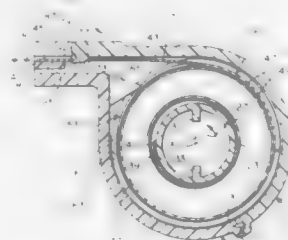
Donald M. Harvey, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 12, 1989, Ser. No. 296,558

Int. Cl.⁴ G03B 17/26

U.S. Cl. 242—71.1

9 Claims



1. An improved film cassette wherein a film spool having a filmstrip coiled about it is rotatable to advance said filmstrip through a film passage slit to the outside of the cassette shell and to return the filmstrip through said film passage slit to the inside of said cassette shell, and wherein the improvement comprises:

film securement means disposed along said film passage slit for engaging a leader portion of said filmstrip when the filmstrip is returned to the inside of said cassette shell; film support means located proximate said film securement means for supporting said filmstrip within range of the film securement means to permit the securement means to engage said leader portion; and a trailing portion of said filmstrip, remote from said leader portion, being configured to enable the filmstrip to fall away from said film support means to move out of range of said film securement means when the filmstrip is advanced sufficiently from said cassette shell to position said trailing portion at the film support means, whereby said film securement means cannot engage said leader portion when said filmstrip is returned to the inside of said cassette shell.

4,875,639

DEPTH SETTING DEVICE FOR A SPINNING REEL

John A. Zarcher, Tulsa, Okla., assignor to Zebco Corporation, Tulsa, Okla.

Filed Jul. 26, 1988, Ser. No. 224,577

Int. Cl.⁴ A01K 89/01

U.S. Cl. 242—309

12 Claims

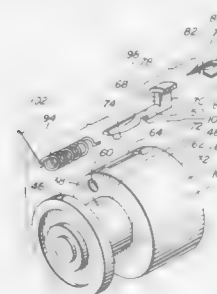
1. A line-carrying spool assembly for a fishing reel having an axially spaced front and rear, a housing and a bail assembly having first and second bail ears and first and second bail arms carrying a bail and movably mounted to the bail ears, said line-carrying spool assembly comprising:

a spool having
(a) a hub with a central axis and an annular surface around which line can be wound; and
(b) first and second flanges spaced axially in a fore and aft direction with respect to said hub and extending radially outwardly from said annular hub surface, said first and second flanges and annular hub surface cooperatively bounding a line storage space,

there further being an annular skirt extending axially rearwardly from one of said first and second flanges;
first means for mounting the bail assembly to the housing for rotation relative to the housing so that the bail assembly directs line on to the spool as the bail assembly is rotated; a line depth setting pin having an elongate body and an operating arm to manually effect movement of said line depth setting pin;

second means for mounting the line depth setting pin to the spool for movement relative to the spool between (a) an operative position wherein the line depth setting pin extends through said line storage space between the first and second flanges radially outwardly of the annular hub surface and (b) a retracted position wherein substantially the entire line depth setting pin resides outside of the spool storage space,

said second mounting means including a bore through one of



said first and second flanges within which said line depth setting pin is guided axially with respect to the spool between said operative and retracted positions, said second mounting means including means on said skirt in addition to said bore for guiding axial movement of said line depth setting pin between said operative and retracted positions,

said operating arm on the line depth setting pin axially coinciding with the bail ears and residing radially inside of said bail ears; and

means for selectively maintaining the line depth setting pin in each of the operative and retracted positions, said line depth setting pin in said operative position blocking the paying out of line wrapped on the spool hub and positioned so that line being retrieved on the spool wraps around the line depth setting pin,

said pin in said operative position being axially forwardly of the pin in said retracted position.

4,875,640

TAPE CARTRIDGE

Hikaru Mizutani, Mino, Japan, assignor to Hitachi Maxell, Ltd., Osaka, Japan

Filed May 12, 1988, Ser. No. 193,071

Claims priority, application Japan, May 13, 1987, 62-116133

Int. Cl.⁴ G11B 23/087

U.S. Cl. 242—198

3 Claims

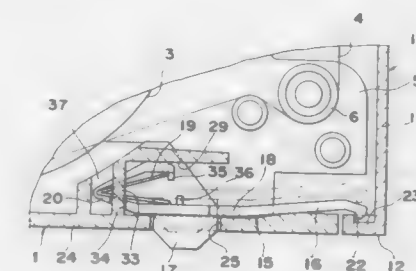
1. A tape cartridge comprising:
a case body (1) having a front lid (10) in the front portion thereof said front lid having an engaging recess (23) formed therein;

lock means (15) accommodated in a side wall (24) of said case body (1) in a space within said case body juxtapositioned to a front tape guide roller in front of a corresponding tape reel, said lock means (15) comprising a lock plate body (18) having a lock tip (16) detachably engaged with said engaging recess (23) defined in said front lid (10);

a release member (17) which projects outside through a window defined in said side wall (24) for pressuring said lock means (15);

guide means for guiding and holding said lock means (15) so that said lock tip (16) may move in a direction parallel

with the thickness of said side wall (24) throughout the movement from a locked state in which the free end tip portion of said lock means (15) is engaged with said engaging recess (23) to an unlocked state in which the free end



tip portion of said lock means (15) is detached from said engaging recess (23); and
a spring member (19) for pressing said lock means (15) towards a locked state.

4,875,641

SCREW FOR INSEPARABLY JOINING CASSETTE MEMBERS

Katsuo Endo, and Masahiro Makino, both of Miyagi, Japan, assignors to Sony Corporation, Tokyo, Japan

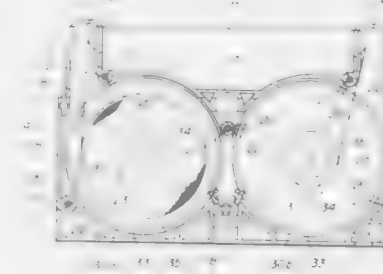
Filed Apr. 8, 1988, Ser. No. 179,310

Claims priority, application Japan, Apr. 11, 1987, 62-055249[U]

Int. Cl.⁴ G11B 23/04; F16B 25/00, 39/30

U.S. Cl. 242—199

21 Claims



20. A tape cassette incorporating a screw, comprising:
a case composed of an upper half and lower half said lower half having a hole formed therein, and said upper half having a concave area; and
a screw having a shaft, a head integrally formed on an end of said shaft, a thread portion and a plurality of barbed-like projections, said barbed-like projections formed distally to said head on a portion of said shaft and each said projection being frusto-conical in shape having a sharp outer edge with each edge being independent and in non-spiral mutual relationship, said thread portion being formed on an upper end of the shaft of said screw proximal said head, and said plurality of barbed-like projections being formed on a lower portion thereof, said upper half and said lower half of said case being joined by said screw.

4,875,642

LIGHT AIRCRAFT WITH PARACHUTE WING

John P. P. Flynn, Hereford, England, assignor to Powerchute Systems International Inc., Hereford, England

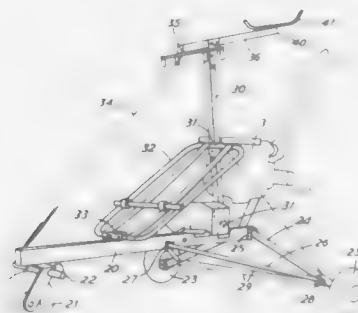
Filed Feb. 16, 1988, Ser. No. 153,677

Claims priority, application United Kingdom, Feb. 13, 1987, 8703299

Int. Cl.⁴ B64C 39/00

U.S. Cl. 244—13

3 Claims



1. A light aircraft carriage for use with a parachute-wing attached to the carriage by support lines, the carriage being foldable from a running condition to a stowing condition and comprising:

- a base strut having a fore and an aft;
- a front wheel mounted beneath the base strut substantially near the fore end thereof;
- a pair of rear wheels;
- a wheel strut for each rear wheel extending between the respective wheel and a respective side of the base strut at the aft end remote from the front wheel;
- a tie bar for each rear wheel extending from the wheel end of a respective wheel strut to the base strut at a point intermediate its ends;
- a pivoted joint at one end of each tie bar and a detachable fixture at the other end;
- a universally pivoted joint at the base strut end of each wheel strut;
- one or more tie cables connected between the wheel ends of the wheel struts so as to make an "A" shape therewith in the running condition;
- an upright strut having a top, a base, a fore and an aft, pivotally mounted at its base towards the aft of the base strut so as to be foldable along the base strut in the stowing condition and be upstanding from the base strut in the running condition;
- a pair of lateral tie cables connected between the wheel ends of the wheel struts and an intermediate position on the upright strut so as to give lateral stability to the upright strut;
- a seat frame extending in the running condition, between intermediate positions on the base strut and the upright strut and being detachably fixed at one of said positions and pivoted at the other;
- a forward tie cable connected between the front of the base strut and the top of the upright strut;
- a mounting for an engine at the rear of the upright strut;
- a support bracket at the top of the upright strut for attaching support lines of the parachute-wing.

4,875,643

STARTER ARRANGEMENT FOR A HELICOPTER

Staas Gietzen, Leonberg; Hans Weiner, Mühlacker; Klaus Hain, Leonberg; August Hofbauer, Pforzheim, and Juergen Hawener, Möglingen, all of Fed. Rep. of Germany, assignors to Dr. Ing. h.c.F. Porsche AG, Stuttgart, Fed. Rep. of Germany

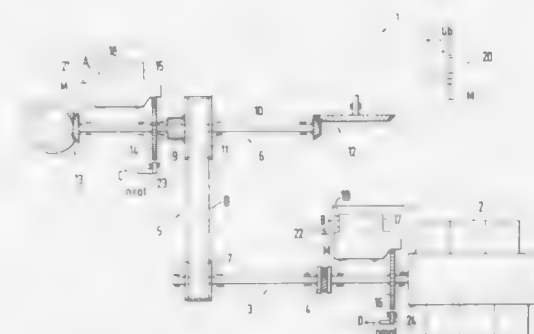
Filed Sep. 21, 1988, Ser. No. 247,335

Claims priority, application Fed. Rep. of Germany, Oct. 26, 1987, 3736110

Int. Cl.⁴ B64D 31/02

U.S. Cl. 244—53 A

18 Claims



1. A starter arrangement for a helicopter driven by means of a reciprocating piston internal combustion engine, comprising at least one override clutch means arranged in a drive connection means between the internal combustion engine and a rotor drive means, said override clutch means being operable to disconnect the drive connection means as soon as the output rotational speed of the override clutch means which is identical with the rotor drive rotational speed is higher than the input rotational speed which is proportional to the internal combustion engine rotational speed, separate first and second starter means for the rotor drive means and the internal combustion engine, and further means operable in a first phase of a starting operation to initially accelerate the rotor drive means by means of the first starter means to a synchronous rotational speed and upon reaching the synchronous rotational speed in a subsequent second phase, for starting the internal combustion engine by means of the second starter means, and the internal combustion engine taking over the drive of the rotor as soon as its rotational speed exceeds a value at which the override clutch means establishes the power connection between the internal combustion engine and the rotor drive means.

4,875,644

ELECTRO-REPULSIVE SEPARATION SYSTEM FOR DEICING

Lowell J. Adams, North Canton; Steven C. Simshauser, Akron; Nathan Pisarski, Stow, and Norbert A. Weisend, Jr., Cuyahoga Falls, all of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Oct. 14, 1988, Ser. No. 258,279

Int. Cl.⁴ B64D 15/00

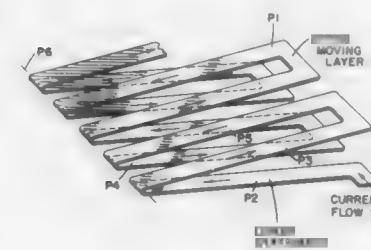
U.S. Cl. 244—134 R

75 Claims

1. Deicing apparatus comprising a first sheet-like array of a plurality of first electrically conductive members electrically insulated from one another in parallel spaced-apart relationship,

and a second sheet-like array of a plurality of second electrically conductive members electrically insulated from one another in parallel spaced-apart relationship, said electrically conductive members being electrically interconnected so that any electrical current flowing in the electrically conductive members flows in the same direction in adjacent first electrically conductive members and also flows in adjacent second electrically conductive

members in a direction opposite to the flow in said first electrically conductive members, thereby producing an electroexpulsive separation force between said first and second electrically conductive members which produces a separation between said first and second electrically conductive members,



said first sheet-like array being coextensive with and superposed proximate to said second sheet-like array so that said first and second electrically conductive members are substantially parallel.

4,875,645

MODULAR CARGO CONVEYOR AND RESTRAINT SYSTEM FOR AIRCRAFT

Jack P. Courter, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

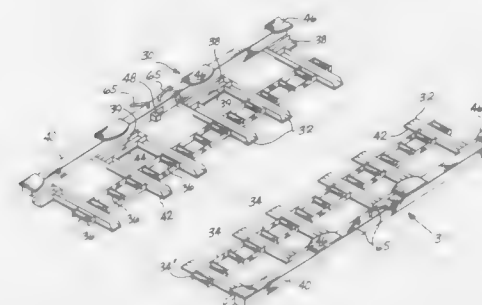
Division of Ser. No. 69,518, Jul. 2, 1987, Pat. No. 4,824,050.

This application Nov. 14, 1988, Ser. No. 272,128

Int. Cl.⁴ B64C 1/20; B64D 9/00

U.S. Cl. 244—137.1

12 Claims



1. In an aircraft compartment of the type having a floor and a plurality of anchor fittings mounted in the floor, a cargo conveyor and restraint system comprising a plurality of sections each of which includes a plurality of laterally extending, longitudinally aligned bearing beams for distributing cargo loads over the floor; a plurality of roller trays secured to and extending longitudinally between the bearing beams; at least one tie-down support beam laterally offset from the roller trays and secured to and extending longitudinally between adjacent bearing beams, said support beam including means for securing the section to the anchor fittings; and restraint means for restraining horizontal and vertical movement of cargo units positioned on the section.

4,875,646

AIRCRAFT NAVIGATION SYSTEMS

Nigel Browning, Uckfield; Arthur C. Fry, Woking; Robert L. H. Malpass, Ashford; Brian Matthews, Frimley Green, and Michael S. Peters, Finchampstead, all of England, assignors to British Aerospace Public Limited Company, London, England

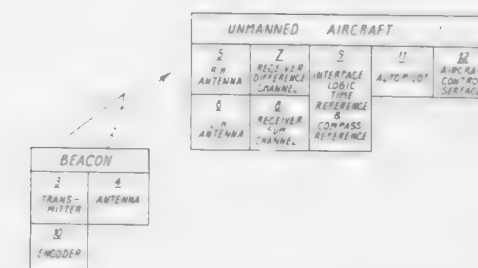
Filed Jul. 17, 1978, Ser. No. 926,975

Claims priority, application United Kingdom, Jul. 23, 1977, 31044

Int. Cl.⁴ B64C 13/20

U.S. Cl. 244—190

17 Claims



1. A navigation system for an aircraft fitted with an autopilot, the system comprising:

at least one ground-based transmitter transmitting a first signal;

receiver means for receiving the first signal, the receiver means being mounted in the aircraft and including two antennae oriented such that their polar diagrams overlap and are inclined with respect to the fore-and-aft axis of the aircraft;

means for deriving an error signal and a distance signal from the signals generated by the antennae in response to the first signal from the transmitter, the error signal being indicative of an angular difference between a heading of the aircraft and a heading of the transmitter relative to the aircraft, the error signal also being applicable to the autopilot to align the heading of the aircraft with the heading of the transmitter, the distance signal being representative of a distance of the aircraft from the transmitter and being derived by a summing device which sums amplitudes of the signals generated by the two antennae, the amplitudes being an indication of the distance between the aircraft and the transmitter; and

means responsive to the distance signal for initiating a turn maneuver of the aircraft such that the aircraft will continually fly back and forth over the transmitter, the turn-initiating means being a threshold device initiating a turn of the aircraft by generating a turn command signal to the autopilot when the distance signal falls below a predetermined value.

4,875,647

CABLE TIE

Akira Takagi; Hirotsugu Oyaizu; Nobutsu Takahashi, and Kiyotaka Kume, all of Okazaki, Japan, assignors to Daiwa Kasei Kogyo Kabushiki Kaisha, Okazaki, Japan

Filed Apr. 21, 1988, Ser. No. 184,586

Claims priority, application Japan, Apr. 24, 1987, 62-63330[U]; Apr. 24, 1987, 62-63331[U]; May 28, 1987, 62-81787[U]

Int. Cl.⁴ F16L 3/08

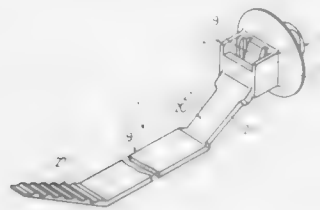
U.S. Cl. 248—74.3

5 Claims

1. A cable tie adapted to be tightened around a bundle of wires or the like by a tensioning device and fixed to a tie mounting hole of a vehicle body or the like, said cable comprising:

a longitudinally elongate strap having opposed surfaces, said strap being flexible and of a substantially fixed length, a

series of teeth formed on and extending longitudinally on one surface thereof;
said strap having a longitudinally elongate linearly extending band portion with opposed first and second ends, a strap connecting portion integral with said band portion at said first end, and a strap leading end portion integral with said band portion at said second end;
a buckle integrally connected to said strap connecting portion remote from said band portion, said buckle having means defining an aperture therethrough generally perpendicular to the longitudinal extent of said strap for receiving said strap, a pawl disposed within said aperture



and adapted to engage one of said teeth of said strap when said strap is looped around a bundle, and a locking leg integrally connected to said buckle and extending in a direction opposite to the direction in which said strap extends for engagement within a mounting hole;
the improvement wherein, when said cable tie is in a relaxed state prior to engagement around a bundle, said strap connecting portion extends longitudinally beyond and at an angle laterally relative to the longitudinal extent of said strap band portion with said buckle positioned at a predetermined location spaced both laterally and longitudinally from said strap band portion by said connecting portion.

4,875,648

ASSEMBLY COMPRISING ROLLING MEANS AND SLIDEWAYS, AND LIGHTING APPARATUS COMPRISING SUCH AN ASSEMBLY

Mannel Guarnori, Chene-Bourg, Switzerland, assignor to Roland Racine, Thonex, Switzerland

Filed Apr. 1, 1988, Ser. No. 176,745

Claims priority, application Switzerland, Apr. 1, 1987, 1243/87

Int. Cl.⁴ A47G 29/00

U.S. Cl. 248—125

1 Claim



1. Assembly comprising rolling means and two parallel guiding slideways, characterized by the fact that the slideways are constituted by elements of which at least the confronting external walls are cylindrical, the radius of the cylindrical wall of one of these elements being greater than that of the other, and by the fact that the rolling device comprises a rotation axle perpendicular to the plane of the two slideways and mounted for movement in parallelism thereto, a central roller freely rotatably mounted on said axle and whose diameter is such that

it will be in rolling contact with the slideway having the cylindrical wall of smaller radius, but out of contact with the other slideway, and two outer rollers mounted freely rotatably on said axle on each side of the central roller, and whose peripheral internal surface has a concave groove in rolling contact with the slideway having the cylindrical wall of greater radius but out of contact with the other slideway.

4,875,649

SUPPORT STAND

Robert Bendig, Jr., 425 Merrimac, No. D-103, Costa Mesa, Calif. 92626

Filed Jul. 18, 1988, Ser. No. 220,173

Int. Cl.⁴ A47G 23/02

U.S. Cl. 248—153

7 Claims



1. A support stand comprising:

a pair of rigid wires, each such wire bent to form the top and sides of a horizontally disposed trapezoid, the trapezoid sides extending integrally into respective generally vertical legs, the respective trapezoid tops of said wires being affixed to each other to form a unitary member having a stable elevated support surface, wherein said affixed trapezoid tops form a centrally located portion of said elevated surface and said trapezoid sides form a plurality of diagonal portions of said elevated surface, each such diagonal portion extending radially from said centrally located portion.

4,875,650

CURTAIN SUPPORTING BRACKET

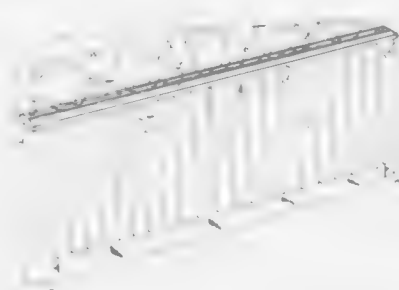
Jeffrey W. Goodell, 12375 Mount Jefferson Terrace, Apt. #10-G, Lake Oswego, Oreg. 97035

Filed Jun. 27, 1988, Ser. No. 211,854

Int. Cl.⁴ A47H 1/10

U.S. Cl. 248—261

2 Claims



1. A curtain supporting bracket of horizontally elongate shape for lengthwise wall attachment above a window, said bracket having a rear wall extending horizontally the length of the bracket for surficial abutment with a room wall, a top wall, an inclined surface coterminous with the top wall and partially defining a recess extending the length of the bracket, said

inclined surface adapted to be bored at intervals therealong to receive wall penetrating fasteners for anchoring the bracket to the room wall, said bracket having a bottom wall defining a lengthwise disposed recessed area extending the length of the bracket for the concealed reception of a curtain supporting track.

4,875,651

TRANSDUCER MOUNTING DEVICE

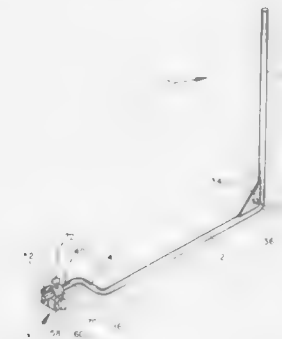
Dennis D. Wergin, and Antone L. Wergin, both of 3955 W. Arby Ave., Las Vegas, Nev. 89118

Filed Dec. 6, 1988, Ser. No. 280,668

Int. Cl.⁴ E04G 3/00

U.S. Cl. 248—286

15 Claims



1. A transducer mounting device comprising a bar including:

- (a) a horizontal arm portion,
- (b) a vertical arm portion integrally joined to a first end of the horizontal arm portion,
- (c) a horizontal offset member integrally joined to a second end of the horizontal arm portion,
- (d) a horizontal extension finger integrally joined to the offset member and generally coplanar therewith, and
- (e) bracket means for rotatably securing the extension finger to the frame of an operating table.

4,875,652

OIL SQUIRT WITH WALL HOLDER

Gerhard R. Boese, Waldweg 11, 2000 Oststeinbek 2; Michael Lienow, Jahnstrasse 64, 2085 Quickborn; Bernd Spiegel, Saarburger Ring 10 - 12, 6800 Mannheim 71, and Bernd O. Kruse, Ludwigstr. 63, 3430 Wittenhausen 6, all of Fed. Rep. of Germany

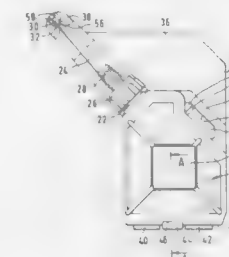
Filed Feb. 22, 1989, Ser. No. 313,494

Claims priority, application Fed. Rep. of Germany, Feb. 29, 1988, 8802650; Oct. 26, 1988, 8813422

Int. Cl.⁴ B65D 25/00; B67D 5/00; F01M 11/00

U.S. Cl. 248—311.2

10 Claims



1. An oil squirt mountable, in a predetermined supporting position, to a wall holder and provided with a flexibly bendable nose, characterized in that provided on the wall holder (16) at the point (at 38) where the nose tip (24) is located in the sup-

porting position of the oil squirt (10), is a closure cap (38, 54, 64) sealing the nose tip (24) of the oil squirt (10), from which cap the nose tip (24) is withdrawable when removing the oil squirt (10) from the wall holder (16).

4,875,653

SUPPORT SYSTEMS AND APPARATUS FOR SUSPENDING AND RESUSPENDING ARTICLES AT SELECTED HEIGHT POSITIONS

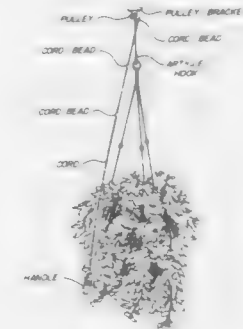
Donald P. Connolly, 4590 Kensington Rd., Milford, Mich. 48042

Filed Oct. 19, 1988, Ser. No. 260,014

Int. Cl.⁴ B66D 1/36

U.S. Cl. 248—332

18 Claims



1. In an article suspension system, an article hook for raising, lowering and suspending an article on a cord at selected positions of static and dynamic suspension, said system including a pulley comprising a pulley wheel and a pulley holder, and a cord having first and second opposed ends joining and extending between the hook and a handle and being adapted to be hung in a first position of static suspension over the top of the pulley with one cord section reaching therebelow to the article hook for holding an article suspended by the hook and with another cord section reaching therebelow in suspension to the handle by means of which handle the suspended article can be raised and lowered with respect to the pulley wheel,

said article hook having a generally planar C-shape terminating in vertically spaced apart upper and lower C-end hook portions, said lower C-end hook portion being adapted for hanging said article thereon, said handle comprising a handle hook and said upper C-end article hook portion being configured as a proximal hook attached to the handle hook in depending hooking relation therewith for the purpose of maintaining an article in static suspension.

4,875,654

MAGNETIC PICTURE RETAINER

Michel Chandonnet, and Luc Chandonnet, both of Ste Foy, Canada, assignors to Yvon Chandonnet, Terrebonne, Canada

Filed Dec. 29, 1987, Ser. No. 139,011

Int. Cl.⁴ A47F 7/14

U.S. Cl. 248—467

4 Claims

1. A device for mounting a picture on a supporting structure, said device comprising: first and second magnetically attracting members, said first member being adapted to be mounted to said supporting structure and said second member being adapted to be mounted to said picture, wherein said first member includes:

- a back-plate adapted to be mounted to said supporting structure;
- a permanent magnet having an annular shape;

a centrally located pin extending slightly beyond the frontal face of said permanent magnet; and

said second member having a seat adapted to receive said pin when said members are engaged for preventing said members from sliding relative to each other.

4,875,655

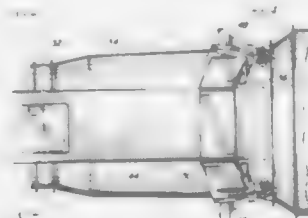
VIBRATION ISOLATING ENGINE MOUNT

Stanley I. Bader; Lawrence Butler, both of Cincinnati, and Peter W. Dawes, Madeira, all of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Mar. 13, 1987, Ser. No. 25,541
Int. Cl.⁴ B64D 27/18

U.S. Cl. 248-557

7 Claims



1. An aircraft engine suspension system for mounting an engine to a supporting frame by mounts arranged in first and second parallel spaced mounting planes transverse to a longitudinal axis of the engine, the supporting frame being parallel to the engine axis, said suspension system comprising:

- (a) first and second circumferentially displaced vibration isolation mounts positioned in the second mounting plane and coupling the engine to the supporting frame, each of said first and second mounts being oriented for providing radial and axial stiffness and vibration damping between the engine and supporting frame without tangential support over a predetermined range of circumferential motion of the engine; and
- (b) a third vibration isolation mount positioned in the first mounting plane and coupling the engine to the supporting frame, said third mount being oriented for providing radial and tangential stiffness and vibration damping between the engine and supporting frame without axial support over a predetermined range of axial motion of the engine, each of said first, second and third mounts providing support forces vectorially resolvable into mutually perpendicular vector forces such that the suspension system is statically and dynamically determinant.

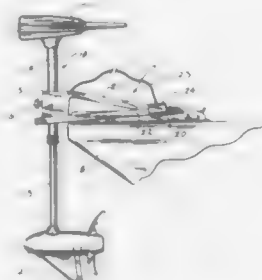
4,875,656
STOWABLE PULL HANDLE FOR ELECTRIC TROLLING MOTOR SUPPORT APPARATUS

Robert H. Boede, Omro, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Jan. 30, 1988, Ser. No. 213,692
Int. Cl.⁴ F16M 13/00

U.S. Cl. 248-642

8 Claims



1. In a deck mounted electric trolling motor including a pivotal motor support apparatus mounting the motor for movement between an operative position and a horizontal stowed position on the deck, the support apparatus including a support base attached to the deck, pivot arms pivotally interconnecting the motor and the base, and an operating cord attached at one end to the pivotal interconnection between the motor and the pivot arms to facilitate manual lowering of the motor to its operative position and retraction of the motor to its stowed position, an improved operating cord handle comprising:

- a manually engageable body;
- said operating cord attached at its other end to the body; and
- a slot in the body receiving and frictionally engaging the edge of one of said pivot arms and demountably securing the handle to said arm in a fixed position in either the operative or stowed position of the motor.

4,875,657

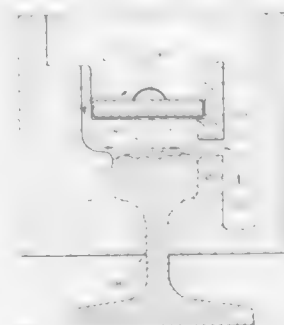
RAIL REPAIRING METHOD AND APPARATUS

Ronald H. Moller, and Alan K. Batty, both of New South Wales, Australia, assignors to Thermit Australia Pty. Limited, New South Wales, Australia

Filed May 27, 1988, Ser. No. 199,663
Claims priority, application Australia, May 28, 1987, PI 2197
Int. Cl.⁴ B22D 19/10

U.S. Cl. 249-86

6 Claims



1. A mould to aid in the repair of a rail head of a rail, said mould including a pair of mould parts to be removably applied to the rail head so as to generally surround a damaged portion

of the rail head, said mould pair co-operating to define a cavity extending through the mould and within which the damaged portion is located, said cavity extending between a pair of side openings and including a bottom opening generally closed by the rail, and dam means defining an upper limit of the cavity to determine the quantity of molten metal that may be retained within the cavity together with said rail head, with excess molten metal being allowed to pass over said dam means.

4,875,658

ELECTROMAGNETIC VALVE

Yoshiro Asai, Kyoto, Japan, assignor to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

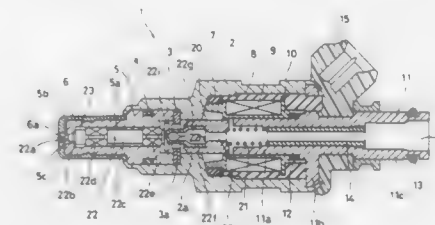
Filed Oct. 6, 1987, Ser. No. 106,612

Claims priority, application Japan, Oct. 8, 1986, 61-0238086; Oct. 8, 1986, 61-0238087

Int. Cl.⁴ F16K 31/06

U.S. Cl. 129.21

13 Claims



1. An electromagnetic valve which is disposed in a fluid passage to open or close said passage, said valve comprising: a housing; a solenoid disposed in said housing; a guide member disposed in said housing and having a guide hole; a plunger disposed between said solenoid and said guide member and responsive to energization of said solenoid; and a valve member, slidably fitted in said guide hole of said guide member and coupled to said plunger, for opening and closing said fluid passage in accordance with an energization state of said solenoid; said plunger being made of a magnetic material, and of said guide member and said valve member, at least said valve member being made of a non-magnetic high-magnesium austenitic steel containing 7.8% to 24.5% manganese and having an outer surface thereof subjected to a plasma nitriding process.

4,875,659

SERVO-VALVE

Carl H. Häfele, Werner-von-Siemens-Strasse, 4052 Korarchenbroich 1, and Manfred Weyand, Korarchenbroich, both of Fed. Rep. of Germany, assignors to Sempell Aktiengesellschaft and Carl Heinz Häfele, both of, Fed. Rep. of Germany

Filed Sep. 13, 1988, Ser. No. 243,847

Claims priority, application Fed. Rep. of Germany, Sep. 20, 1987, 3731664

Int. Cl.⁴ F16K 39/02

U.S. Cl. 251-282

8 Claims

1. A servo-valve for use in steam systems with a housing in which a valve seat is formed between an intake and an outlet, with a seal supported by a valve stem and cooperating with the valve seat, and with a servomotor acting on the valve stem, wherein a compensating motor is connected to an end section of the valve stem lying at a distance from the seal, the working space of said compensating motor being connected to the valve intake and its active pressure-loaded area being selected, in relation to the active area of the seal defined by the valve seat, in such a way that the force produced by the compensating motor is opposed to the existing force exerted on the seal by

the low medium, and is in terms of magnitude preferably equal to or only slightly smaller or greater than the latter force, and

wherein the working space of the compensating motor is connected to the valve intake by a condensate tube.

4,875,660

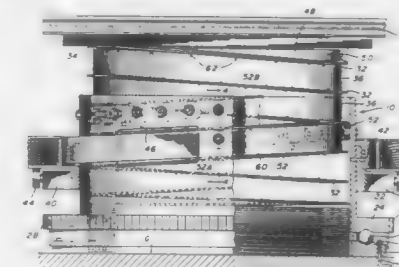
PUSH ACTUATOR

Pierre Gagnon, 5637 Wilderton Avenue, Montreal, Canada H3T 1S1, and Pierre Laforest, 1945 de Bruxelles Street, Montreal, Canada H1L 5Z5

Continuation-in-part of Ser. No. 151,650, Feb. 2, 1988, abandoned. This application Feb. 6, 1989, Ser. No. 306,410
Int. Cl.⁴ B66F 3/08

U.S. Cl. 254-1

17 Claims



1. A telescopic tube comprising a first annular band wound in helical form about a central axis with its turns transversely normal to said central axis and capable of taking a retracted stacked position with its turns resting flat against one another, and an extended position with its turns spaced from one another in the direction of said central axis, a second band wound on itself, with its turns transversely parallel to said central axis, and capable of taking a retracted, spiral position with its turns nested within one another and an extended position with its turns forming a helix around said central axis and generally equally radially spaced therefrom to form a tube, said first and second bands, when in retracted position, in respective locations so as to clear each other, spacer means to successively space the turns of said first band, driving means to cause relative rotation of said first band and of said spacer means about said central axis, and guide means to insert the turns of the second band between the spaced turns of the first band, with the edges of the turns of the second band bearing against the turns of the first band, the second band thus forming a spacer for the turns of the first band.

4,875,661

METHOD FOR PULLING MULTIPLE RUNS OF FIBER OPTIC CABLE

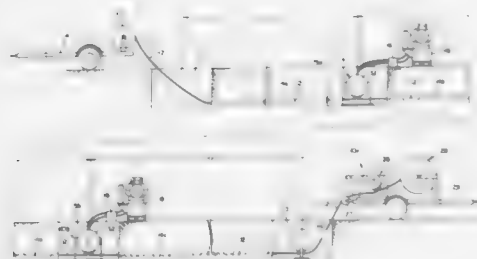
Ralph C. Langston, 13588 SE. 152nd Ave., Clackamas, Oreg. 97015

Continuation-in-part of Ser. No. 56,490, Jun. 1, 1987, Pat. No. 4,757,976, which is a continuation-in-part of Ser. No. 818,117, Jan. 10, 1986, Pat. No. 4,699,705, which is a division of Ser. No. 648,757, Sep. 7, 1984, Pat. No. 4,576,362. This application Jul. 18, 1988, Ser. No. 220,699

Int. Cl.⁴ H02G 1/08

U.S. Cl. 254—134.3 FT

20 Claims



1. A method for installing multiple long runs of fiber optic cable in a common conduit having an entry at one end and an exit at an opposite end, the method comprising:

- providing at least one intermediate access point spaced between the entrance and exit to divide the length of the conduit into segments, each segment having a length such that a pulling tension applied to each cable sufficient to pull the cable through each conduit segment is less than a predetermined tension at which the fiber optic cable could be damaged;
 - placing at least two continuous long runs of fiber optic cable at the conduit entry;
 - placing an intermediate capstan winch at each intermediate access point and an end pulling winch at the conduit exit, for pulling the cable through each segment of the conduit, the capstan winch including a flanged capstan wheel having a circumferential cable engagement surface;
 - extending a pull rope from the conduit entry through the conduit via the intermediate access point to the conduit exit;
 - connecting one end of the pull rope to a lead end of each of the fiber optic cables and an opposite end thereof to the end pulling winch;
 - winding at least one wrap of an intermediate portion of the pull rope around the capstan wheel at the intermediate access point; and
 - simultaneously operating each winch to pull the rope and thereby the cables through the conduit;
- the cables and capstan wheels being mutually sized so that the circumferential cable engagement surface has a width that exceeds the product of the number of cables times the diameter of the cables times the number of wraps of the pull rope by a predetermined margin so that the cables can wrap simultaneously a predetermined number of times around each capstan wheel without overlapping as the cables pass each intermediate access point.

4,875,662

METHOD AND APPARATUS FOR RELINING BLAST FURNACE

James D. Head; Edward F. Burns; William A. Schleizer, all of Valparaiso; C. Douglas White, Chesterton, and Dennis L. Gentry, Cedar Lake, all of Ind., assignors to BMI, Inc., Carnegie, Pa.

Division of Ser. No. 924,405, Oct. 29, 1986, Pat. No. 4,793,595. This application Oct. 28, 1988, Ser. No. 266,371

Int. Cl.⁴ C21B 13/00, 15/00

U.S. Cl. 266—44

24 Claims



1. A method of spraying material upon at least a portion, that requires spraying, of a wall of a refractory body extending upward from a mantle and having a plurality of circumferentially spaced windows extending through said wall at a level above said mantle, each said window being opposite a different portion of said interior surface, said method comprising:

- selecting one of said plurality of circumferentially spaced windows, said selected window having a sill,
- extending an elongated pipe through said selected window into the interior of said refractory body with the interior open end of said elongated pipe facing a part of said portion of said interior surface opposite said selected window and an exterior portion of said pipe extending outside said refractory body,
- pivotaly supporting said pipe relative to said sill of said selected window to allow said pipe to pivot about two angularly related axes normal to the length of said pipe where said pipe intersects said sill of said selected window,
- supplying material to be sprayed to said exterior portion of said pipe,
- applying air under pressure to said exterior portion of said pipe to propel said material to be sprayed through said pipe open end in a direction generally perpendicular to a first part of said portion of said interior surface to impinge on a first part of said portion of said interior surface facing said interior open end of said pipe, and
- pivoting said pipe about at least one of said angularly related axes while continuing said supplying and applying steps to propel said material onto a different part of said portion of said interior surface in a direction generally perpendicular to a first part of said portion of said interior surface and adjacent to said first part until said parts of said portion that require spraying are sprayed.

4,875,663

CLOSURE DEVICE WITH CLEANING OF A POURING HOLE

Guy Forestier, Saint-Rambert, France, assignor to Clecim, Courbevoie, France

Filed Jun. 13, 1988, Ser. No. 205,886

Claims priority, application France, Jun. 11, 1987, 87 08157

Int. Cl.⁴ F27B 03/08

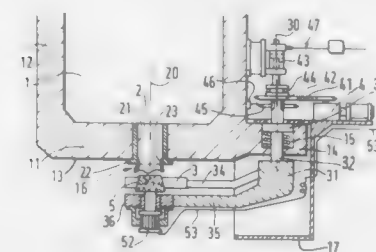
U.S. Cl. 266—272

10 Claims

1. Device for cleaning and closing a pouring hole (2) having a vertical axis (20), said pouring hole being provided in a base (11) of a container (1) containing molten metal, said pouring hole being delimited by a refractory cladding (21) a periphery

of which forms a seating (22) on a lower surface (13) of said base (11) of said container (1), said molten metal forming, after pouring, a solidified residue extending on a periphery of said seating (22), said cleaning and closing device comprising

- (a) a maneuvering arm (31) mounted for rotation about an axis (30) parallel to said vertical axis; (2) of said pouring hole and comprising first and second branches (34, 35) extending radially from said axis of rotation (30) and having the same length;
- (b) a closure flap (3) mounted at a free end of said first branch (34) of said maneuvering arm and a cleaning member (5) mounted at a free end of said second branch (35) of said maneuvering arm;
- (c) means (4) for rotating said maneuvering arm (31) about its vertical axis for controlling horizontal displacement of said closure flap (3) and of said cleaning member (5) from a stand-by position along a trajectory passing through said axis (20) of said pouring hole (2) to a lower maneuvering level below that of said base (11) and for stopping said maneuvering arm in two different angular positions, respectively a cleaning position in which said cleaning mem-



bers are centered on said axis of said pouring hole (2) and a closing position in which said closure flap (3) is centered on said axis of said pouring hole (2); and

- (d) lowering means (43) and raising means (15) for controlling vertical displacement of said maneuvering arm (31) and for determining positioning of said arm (31) at a lower maneuvering level, an adjustable intermediate cleaning level, and an upper closing level, respectively;
- (e) said rotating means (4) and said means for controlling vertical displacement (43, 15) of said maneuvering arm (31) being associated for determining successively:
 - (i) rotation of said maneuvering arm (31) at said lower level and stoppage of said arm in said cleaning position;
 - (ii) raising of said cleaning member at said adjustable intermediate level for removing said residue and cleaning said seating;
 - (iii) returning of said arm (31) to said lower level and the rotation and stoppage of said arm (31) in said closing position; and
 - (iv) raising of said closure flap to said upper level to apply it to said seating (22).

4,875,664

VIBRATION ATTENUATION

Alan F. Moore, Burbage, England, assignor to Dunlop Limited a British Company, United Kingdom

Filed Mar. 31, 1987, Ser. No. 32,505

Claims priority, application United Kingdom, Apr. 4, 1986, 86 0429

Int. Cl.⁴ F16F 9/08, 9/43

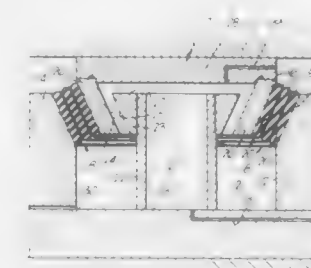
U.S. Cl. 267—140.1

12 Claims

1. An anti-vibration mounting comprising: a rigid fluid container having an opening; a rigid support member for closing at least a part of said opening; confronting surfaces defined respectively by said container and support member; elastomeric bearing means arranged to accommodate relative movement of the fluid container and support member

in a direction towards and away from one another and relative movement in a plane perpendicular to said direction;

said elastomeric bearing means comprising at least one element of elastomeric material arranged as flexible seal means to extend between said confronting surfaces of the fluid container and rigid support member thereby to form a fluid chamber within the anti-vibration mounting; said fluid chamber containing in part a quantity of liquid and in part a quantity of gas;



fail-safe retention means provided within said chamber and arranged to prevent undue relative separation of the fluid container and rigid support member;

liquid supply means for the flow of liquid to and from said chamber, and

gas supply means for the flow of gas to and from said chamber, said liquid and gas supply means being independent of one another whereby the quantities of said liquid and gas within the chamber may be varied independently by flow through said supply means.

4,875,665

ACCUMULATOR

Eiji Kato, Kariya; Masanori Kadotani; Yoshikazu Sakaguchi, both of Anjo; Seitoku Kubo; Kunihiro Iwatsuki, both of Toyota; Hiroji Taniguchi, Toyota, and Yoshihara Harada, Toyota, all of Japan, assignors to Aisin AW Co. Ltd., Anjo and Toyota Jidosha Kabushiki Kaisha, Toyota, both of Japan

Filed May 20, 1988, Ser. No. 196,417

Claims priority, application Japan, Jul. 28, 1987, 62-188521

Int. Cl.⁴ F15B 1/053; F16L 55/04

U.S. Cl. 267—170

7 Claims

1. An accumulator comprising:

- a cylinder,
- pressing means situated in the cylinder,
- a piston slidably situated inside the cylinder, said pressing means being located at one side of the piston to urge the piston outwardly, said piston having a hole at a side opposite to the pressing means, said hole having an opening, a large diameter section at a bottom of the hole, a small diameter section adjacent the large diameter section, and a steep tapered surface extending from the small diameter section to the large diameter section so that the diameter of the hole gradually enlarges,
- a spring assembly situated in the hole and having a retaining

member to be disposed in the large diameter section and a coil spring fixed to the retaining member at one end thereof, and

a snap ring having a size larger than the size of the small diameter section of the hole so that when the snap ring is installed in the large diameter section, the snap ring engages the steep tapered surface and expands along the steep tapered surface, expansion force of the snap ring urging the retaining member to be firmly fixed to the bottom of the hole.

4,875,666

CLAMP FOR HOLDING WORK PIECES IN THE FORMATION OF TRUSSES

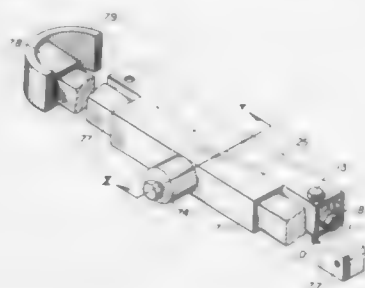
Leonard P. Hain, P.O. Box 238, Rescue, Calif. 95672

Filed Jun. 30, 1987, Ser. No. 68,021

Int. Cl.⁴ B25B 1/10

U.S. Cl. 269—37

9 Claims



1. A clamp device for holding workpieces in the formation of trusses, wherein the workpieces are supported on a substantially horizontal work surface, and wherein the work surface is provided with a plurality of openings, said clamp device comprising:

a body having a guideway formed thereon;

a bar slidably received in the guideway;

means for locking the bar in the guideway in a selected position;

the bar having a first end provided with a workpiece engaging means;

a plurality of keying elements carried on the body and adapted to be received in a corresponding plurality of openings in the work surface, thereby keying the clamp device to the work surface, and at least one of the keying elements being adjustably carried on the body such that the clamp device may be conveniently keyed to a selected plurality of openings in the work surface for clamping versatility, and such that a plurality of clamp devices may rigidly retain the workpieces while the workpieces are joined together;

wherein the means for locking the bar in the guideway comprises:

a cap of substantially annular configuration attached to the guideway;

the cap further having an end wall having a threaded opening therein;

a threaded bolt provided with threads complementary to the pitch of threads in the opening of the cap so that the bolt can be advanced in a direction transverse to the longitudinal axis of the bar;

the cap further supporting a puck having a necked down portion which can frictionally contact the bar with sufficient clearance being provided so that the magnitude of frictional contact of the puck can be adjusted by means of the bolt; and

a washer having spring characteristics further being interposed between the bolt and the puck, such that, when locked, the bar remains in place against usual forces applied from any direction.

4,875,667 APPARATUS FOR CLAMPING A TEMPLATE TO A WORKPIECE

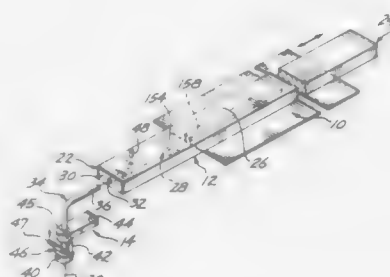
Randal D. Schafer, 15713-35th Ave. West, Lynnwood, Wash. 98147

Filed Feb. 1, 1988, Ser. No. 150,772

Int. Cl.⁴ B23Q 3/02

U.S. Cl. 269—91

6 Claims



1. An apparatus for clamping templates or the like to a work surface of a support member, the support member having a lower surface opposed to the work surface and an edge extending between the work surface and the lower surface, the apparatus comprising:

an elongate bar having a top surface, a first end and a second end, said bottom surface having a planar configuration; and,

bracing means for bracing the first end of the bar on the work surface, the first end of the bar being rigidly attached to the bracing means, said bracing means includes a ledge having a ledge surface shaped so as to engage the lower surface of the support member and adjustment means for varying the distance between the ledge surface and the bottom surface of the bar, such that said distance can be adjusted to be less than the distance between the lower surface at the edge of the support member and the top of the template;

whereby when the apparatus is positioned on the support member on which the template and the workpiece are positioned, the template and the workpiece are between said bar and the work surface, said ledge surface releasably engages said lower surface of said support member and the template and the workpiece can be clamped to the work surface by pushing down on said second end of said bar.

4,875,668

HIGH SPEED SHEET FOLDER AND PRESSER FOR AUTOMATED MAILING SYSTEMS

Rudolf A. Spyra, Tucson, Ariz., assignor to Computer Output Processors and Engineering, Inc., Tucson, Ariz.

Filed Apr. 28, 1988, Ser. No. 187,084

Int. Cl.⁴ B42C 1/00

U.S. Cl. 270—45

21 Claims



1. A mail processing machine which includes a generally planar table having an upper surface for supportingly engaging the lower surface of the sheets comprising individual mailings to be processed by said machine, a conveyor unit having upper and lower runs disposed beneath said table, a plurality of spaced apart means each extending above said table upper

surface and adapted to engage the trailing edge of an individual mailing comprised of an array of superimposed flat sheets, and an intermittent drive for advancing said engaging means in a given direction so as to move said individual mailings downstream of said machine along the plane of said table, said processing machine further including a folding station having means overlying a portion of said table upper surface and adapted to engage the upper surface upstream portion of said array of sheets, a folder bar extending transversely of said given direction, said folder bar having a surface portion normally lying beneath and engaging a part of the lower surface of the downstream part of said stack, said bar being accurately movable to a position overlying said upstream portion of said array to impart a fold to said array about an imaginary line lying between said trailing edge and the leading edge of said array, a creasing element movable from a position generally coplanar with said upper table surface to a position thereabove to crease said array by engaging its upper and lower surfaces with said creaser element and folder bar respectively, and a pressing roller assembly comprising a pair of opposed pressing rollers having exterior surface portions adapted, in the use of the machine, to engage the respective upper and lower surfaces of said array of sheets passing along said table and through the nip between said rollers, each of said rollers having associated therewith its own drive mechanism, and means for insuring synchronous operation of said drive mechanisms, whereby the peripheral velocity of said rollers comprising said pair is the same, said pair of rollers being movable with respect to each other but normally urged together by resilient means so as to apply a desired degree of pressing force to such array of sheets passing there between.

4,875,669

SIGNATURE GATHERING MACHINES

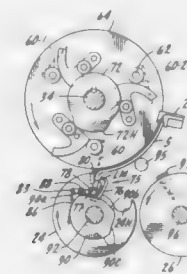
William B. McCain, Hinsdale, and George D. Higgins, Orland Park, both of Ill., assignors to McCain Manufacturing Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 100,273, Sep. 23, 1987, abandoned. This application Sep. 16, 1988, Ser. No. 246,910

Int. Cl.⁴ B65H 39/02

U.S. Cl. 270—54

15 Claims



1. Cyclically operable signature gathering machine having a supply station from which folded signatures, each with a folded backbone and two sheets or legs extended therefrom, of which one sheet is longer to present an extended free margin beyond that of the shorter sheet, are to be extracted one by one by capturing the backbone of each by extracting grippers on a cyclically rotating extracting cylinder, said cylinder being defined by at least a pair of spaced discs, whereafter the captured signature is released from the extracting cylinder in the course of one turn and the two legs of the released signature opened respectively by gripper means on a pair of opening cylinders which then in turn release the opened signature to a signature gatherer, characterized by wipers supported by and between said discs for rotary movement cyclically therewith, said wipers being pivotally supported for movement from a retracted position within the perimeter of the discs to an actuated position slightly beyond the perimeter to forcefully displace the free margins of the released signature toward the path of the gripper means of one of the opening cylinders,

means to oscillate the wipers, and means cyclically to time oscillation of the wipers so that the wipers are in actuated position to force the free margins of the released signature toward the gripper means on said one of the opening cylinders at the time those gripper means are being presented to the free margins of the released signature.

4,875,670

FLOATING IDLER WHEEL ARM ASSEMBLY FOR A DOCUMENT TRANSPORT

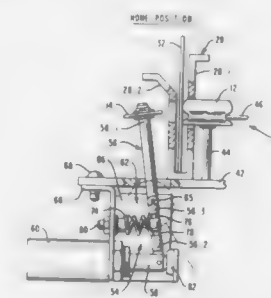
Borge Petersen, Elmira, and William P. Groot, Waterloo, both of Canada, assignors to NCR Corporation, Dayton, Ohio

Filed Nov. 17, 1988, Ser. No. 272,602

Int. Cl.⁴ B65H 5/06

U.S. Cl. 271—265

20 Claims



1. An assembly for feeding documents comprising:

a frame;

a document track mounted on said frame;

a feed wheel mounted on one side of said document track, and drive means for rotating said feed wheel;

an idler wheel; and

moving means for moving said idler wheel between active and inactive positions with respect to said feed wheel;

said moving means comprising:

an arm having first and second ends and a pivot area therebetween, with said idler wheel being rotatably mounted on said first end;

mounting means for mounting said arm at said pivot area to enable said pivot area to move in opposed directions along a line which is substantially perpendicular to said document track while pivoting on said mounting means;

resilient means for biasing said idler wheel towards said inactive position; and

an actuator for moving said idler wheel towards said active position against the bias of said resilient means when said actuator is energized.

4,875,671

TRANSPORTING AND SORTING SYSTEM FOR A FLEXIBLE WORKPIECE

David G. Sherburne, Ontario, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 20, 1988, Ser. No. 197,006

Int. Cl.⁴ B65H 29/60, 39/11

U.S. Cl. 271—302

5 Claims

1. Apparatus for distributing a flexible workpiece to a selected holder, the apparatus comprising:

a. flexible first belt means;

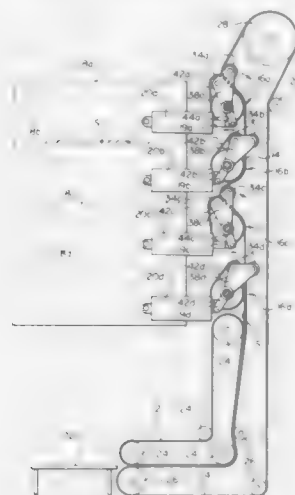
b. means for supporting the first belt means in a manner such that the first belt means has a main axis which is aligned generally in a first direction;

c. means for driving said first belt means in said first direction;

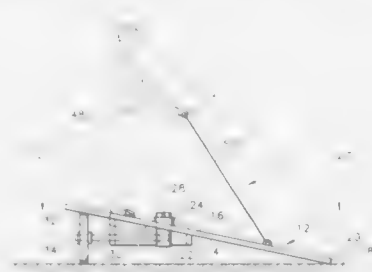
d. a plurality of distribution means positioned successively along and adjacent to said first belt means, each distribution means including second belt means for sandwiching a workpiece between the first belt means and the second

belt means for transportation of the workpiece, each distribution means further including means for engaging a portion of the first belt means;

c. moving means associated with each of said distribution means for moving the associated distribution means from a first position, where a main axis of the second belt means is aligned generally in the first direction, to a second position where the main axis of the second belt means is aligned generally in a second direction which leads to an associated holder, the moving means simultaneously causing the engaging means of the associated distribution means to displace the engaged portion of the first belt means toward the associated holder such that a portion of the first belt means is aligned generally in the second direction, whereby a workpiece sandwiched between the



first side of said platform and being movable thereupon; said platform further contacting the surface;
d. an arm linked to said turnable member and post;



e. means for supporting the user on said second side of said platform.

4,875,673

AQUATIC EXERCISE DEVICE

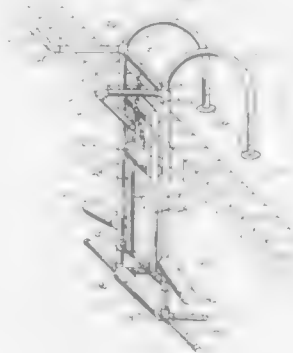
Curtis Erickson, Palm City, Fla., assignor to 501 Hydrosplash Enterprises, Inc., Palm City, Fla.

Filed Nov. 27, 1987, Ser. No. 126,470

Int. Cl.⁴ A63B 31/00, 3/00; E04H 3/18

U.S. Cl. 272-71

5 Claims



displaced portion of the first belt means and the second belt means can be transported to the associated holder;

f. means for actuating the moving means associated with a selected distribution means to move said selected distribution means from said first position to said second position in order to transport a workpiece sandwiched between the first belt means and the second belt means of said selected distribution means to a holder associated with said selected distribution means, and for simultaneously actuating moving means associated with another distribution means to synchronously move said other distribution means from the second position to said first position in order to allow displacement of said first belt means by the selected distribution means while maintaining a constant tension on said first belt means.

4,875,672

SWING BOARD TOY

W. Ted Armstrong, P.O. Box 40962, San Francisco, Calif. 94140

Filed Sep. 12, 1988, Ser. No. 242,593

Int. Cl.⁴ A63B 23/04; A63G 1/20

U.S. Cl. 272-33 R

4 Claims

1. A toy for use on a surface comprising:
a. a platform having a first side and a second opposite side;
b. a post extending through said platform to said second side thereof, said post further including means for holding a portion of said post to said second side of said platform, said post being movable relative to said platform;
c. a turnable member, said turnable member bearing on said

1. An aquatic exercise apparatus for swimming pool use, at least in part below the pool water, comprising main frame means having upper and lower portions, upper supporting means and lower supporting means operatively connected with said main frame means, a first pair of canted arms projecting generally laterally outwards from said main frame means, a second pair of arms projecting generally outward from the uppermost portion of said main frame means, an exercise platform means pivotally attached to the lower portion of said main frame means, said upper and lower support means, main frame means, first and second pairs of arms and said exercise platform means all provided with internal steel reinforcing means; adjustment means for positioning said exercise platform means in any position from vertical to ninety degrees therefrom said main frame means; said upper supporting means formed integral with and extending from said main frame means in an arcuate configuration and terminating with a pair of legs which are permanently securable to the pool decking.

4,875,674

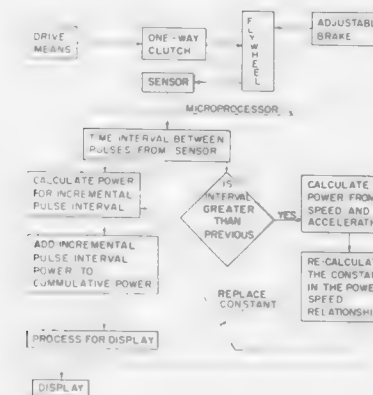
ENERGY ABSORBING MEANS WITH SELF CALIBRATING MONITOR

Peter D. Dreissigacker, Stowe, and Richard A. Dreissigacker, Morrisville, both of Vt., assignors to Concept II, Inc., Morrisville, Vt.

Continuation-in-part of Ser. No. 14,234, Feb. 12, 1987, abandoned. This application Aug. 12, 1988, Ser. No. 231,679
Int. Cl.⁴ A63B 21/22; G01L 25/00

U.S. Cl. 272-72

3 Claims



1. An energy absorbing means with self-calibrating monitor for exercise, comprising:
a frame;
at least one rotating member with a known moment of inertia rotatably journaled in said frame;
brake means for applying variable resistance to said rotating member;
means for driving said rotating member for allowing the human operator to initiate the action of said rotating member by using said drive means;
said drive means is connected to said rotating member by clutch means;
said clutch means has release means to allow said rotating member to be disengaged from said drive means;
means for measuring angular velocity of said rotating member;
calculating means for computing the power dissipation of said brake means by use of a predetermined formula relating power and said angular velocity;
means for periodically calibrating said formula by alternatively calculating the power during the disengagement of said rotating member from said drive means; and
using said alternative calculation to recalibrate said formula.

4,875,675

SKIPPIING TOY AND METHOD OF PLAYING SAME
Avi Arad, Westport, Conn., and Melvin R. Kennedy, New York, N.Y., assignors to Tiger Electronics, Inc., Vernon Hills, Ill.

Filed Feb. 28, 1989, Ser. No. 316,860

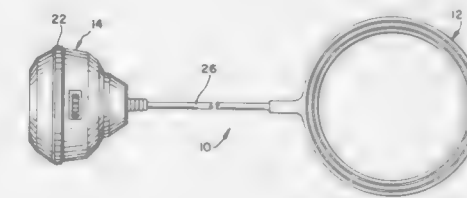
Int. Cl.⁴ A63H 5/20

U.S. Cl. 272-74

12 Claims

1. A toy adapted to be rotatably swung in a generally horizontal path about a person's ankle, said toy comprising:
a collar adapted to fit around an ankle region of the person playing with the toy;
a drum adapted to engage a ground surface during play;
elongated means for interconnecting said collar and drum, and extending along a generally straight line during play, and permitting said drum to revolve about said generally straight line while the drum contacts a ground surface, said elongated means being of predetermined length and directing said drum in a rotary path about the ankle of the player while simultaneously permitting said drum to revolve about said generally straight line and
means carried by said drum for counting and visually dis-

playing the number of successive rotations of said toy about the ankle of the player as a function of a predetermined



mined number of revolutions of said drum about said generally straight line.

4,875,676

WEIGHT LIFTING MACHINE FOR SAFE FREE-BAR BENCH PRESS EXERCISING

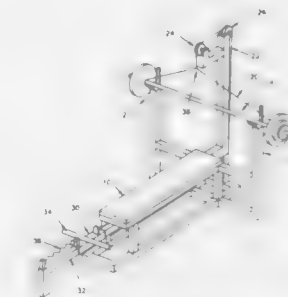
Karl A. Zimmer, 36652 Chester, Avon, Ohio 44011-1046

Continuation-in-part of Ser. No. 72,675, Apr. 13, 1987, abandoned. This application Jul. 18, 1988, Ser. No. 220,517

Int. Cl.⁴ A63B 13/00

U.S. Cl. 272-123

12 Claims



1. An apparatus for training weightlifters in performing the weight-lifting exercise commonly known as the standard bench press, which exercise is correctly executed by an exerciser while in a supine position on a substantially horizontal bench generally supporting the head and torso of the exerciser with his feet resting on the floor, said apparatus comprising means defining a weight-lifting station comprising:

- a substantially horizontal bench capable of supporting the head and torso of the exerciser;
- a weight bar having selected exercise weights removably attached thereto;
- a track and a guided sled device captively and slidably mounted on said track and in operative position adjacent the feet of said supine-positioned exerciser and beyond the end of said bench proximal to exerciser's feet, said feet normally resting on the floor to provide balancing support for the exerciser;
- a flexible elongated connecting means connecting said weight bar through at least one overhead guide means and through other guide means to said sled device;
- and foot-engaging means mounted on said sled device in close proximity to the floor such that said foot engaging means may be engaged at said exerciser's option at any time during exercising use of said apparatus without the need to lift his heels from the floor and thereby to lose said balancing support in effecting such engagement; whereby said weight bar, normally lifted by a pushing force exerted by the arms of said exerciser, may additionally be lifted by a pulling force exerted by said cable, which pulling force is generated by said exerciser's applying a second pushing force on said sled with his feet.

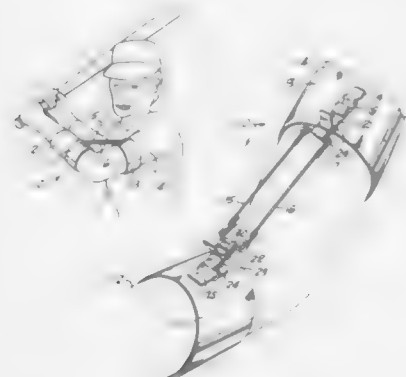
4,875,677

LEAD ARM STRAP FOR BASEBALL HITTERS

Albert G. Tetroun, 1541 Conejo Ln., Fullerton, Calif. 92632
 Filed Aug. 3, 1987, Ser. No. 80,768
 Int. Cl.⁴ A61B 69/40

U.S. Cl. 273—26 C

6 Claims



1. A training aid for baseball hitters to assist in keeping a batter's lead arm flexed in a hitting stance, said aid comprising:
 a first cuff attached to a batter's lead arm forearm, said cuff having quick connect and disconnect attachment means around the forearm;
 a second cuff attached to a batter's lead arm upper arm, said cuff having quick connect and disconnect attachment means around the upper arm; and
 elastic strap means affixed between said first cuff and said second cuff by attachment means, said elastic strap means being of an unstretched length and stiffness to hold a batter's lead arm in a generally "L" shaped position when the cuffs are attached around the batter's forearm and upper arm, and when the arm is in a substantially relaxed state but having sufficient elasticity to permit the lead arm to be straightened during a swing without discomfort, said elastic strap means being attached only between that portion of the cuff which is positioned around the inner part of the batter's lead arm so that the lead arm tends to be restrained upon extension.

4,875,678

BALL RETRIEVAL SYSTEM

Hermon R. Sawyer, P.O. Box 60344, Palo Alto, Calif. 94306
 Filed Apr. 28, 1988, Ser. No. 187,451
 Int. Cl.⁴ A63B 61/00

U.S. Cl. 273—30

14 Claims



1. In combination: a table tennis table, a ball receptor positioned near one end of the table, a ball receiving channel extending peripherally around an area in which the table is located, means for conveying table tennis balls along the channel toward a transfer point, and means for conveying table tennis balls from the transfer point to the receptor.

4,875,679

TENNIS RACKET

Pierre A. Movillat; Yves Piegay, and Gilles D. Gardin, all of Voiron, France, assignors to Societe SKIS ROSSIGNOL S.A., Voiron, France

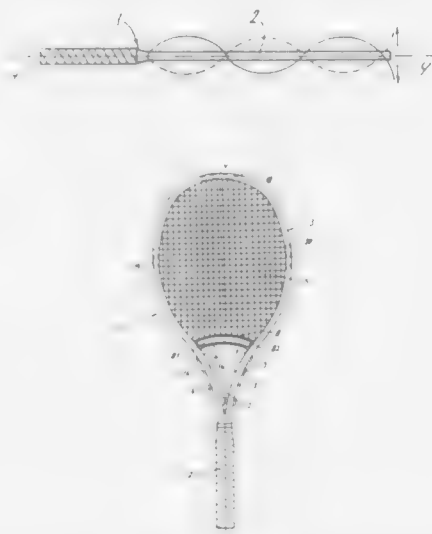
Filed Dec. 17, 1987, Ser. No. 134,148

Claims priority, application France, Dec. 22, 1986, 86 18458

Int. Cl.⁴ A63B 49/02

U.S. Cl. 273—73 R

21 Claims



1. A ball game racket comprising at least one vibration damping element added to the structure of the racket, said vibration damping element positioned locally on the racket on a relatively small surface of the racket and in at least one predetermined zone of the racket;
 said element being of the stress plate type associated with a viscoelastic material intended to be shear-stressed and mounted integrally on the outside of the racket wherein each damping system consists of a plate made of a first material and a second material;
 said first material being a viscoelastic material having a damping coefficient of at least 0.5 in a temperature range of from 10° to 30° C. and for frequencies ranging from 0 to 1000 Hz;
 said first material glued by vulcanization onto a rigid plate forming said second material;
 said second material having a modulus which is very high relative to that of the viscoelastic material;
 said plate located at the maximum of the zone of curvature corresponding to one of the three first vibratory modes of bending of the racket.

4,875,680

MINIATURE GOLF GAME APPARATUS

Douglas P. Gross, Rte. 1, Box 567, Cross Plains, Tenn. 37049
 Filed Aug. 15, 1988, Ser. No. 232,161
 Int. Cl.⁴ A63F 7/06

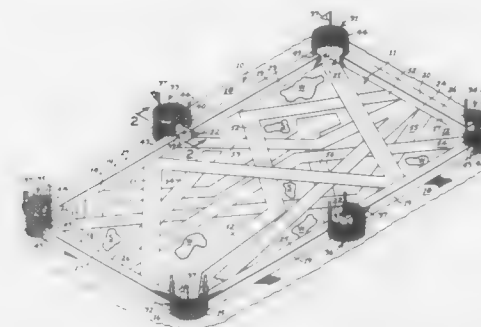
U.S. Cl. 273—87 B

4 Claims

1. A miniature golf game apparatus adapted to be played with a movable playing piece and a stick member for propelling the playing piece, in a first mode on a rectangular pool table having marginal bumper rails encompassing a flat table surface and having side and corner pockets, and in a second mode on a flat floor surface, comprising:

- a rectangular mat of substantially the same size as the flat table surface of a pool table upon which said mat lies in a flat operative position in a first golf playing mode,
- said mat having a playing surface, a back surface, and a marginal edge,

- said mat being made of a flexible material sufficient to permit said mat to be coiled from said operative position into a roll in an inoperative position,
- a plurality of elongated bumper rails having opposite ends and adapted to extend in spaced end-to-end relationship along said marginal edge to encompass said mat in said flat operative position in a second golf playing mode on a flat floor surface and to define pocket spaces between adjacent ends of said bumper rails,
- a pocket member for each pocket space comprising a semi-flexible wall member having opposite end portions adapted to span a corresponding pocket space and having a bottom edge portion resting upon said flat floor surface in said second mode,



- securing means for detachably connecting each end portion of said wall member to an adjacent end portion of a corresponding opposed bumper rail to hold said corresponding pocket member in a closed position spanning said corresponding pocket space to retain a movable playing piece in said pocket space,
- said playing surface comprising a plurality of golf course routes having a starting end portion and an opposite terminal end portion terminating at a corresponding pocket space when said mat and said bumper rails are in their operative positions in said second mode, and terminating in said pockets in said pool table when said mat is in said operative position upon said table surface in said first mode.

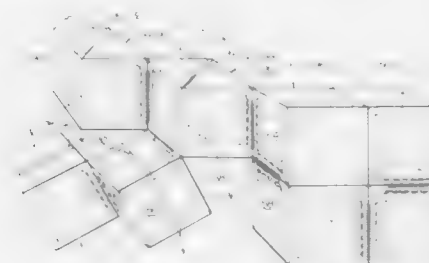
4,875,681

HINGEDLY CONNECTED CUBICAL PRISMS AMUSEMENT AND DISPLAY DEVICE

Arie Ofir, 12 Hebron Rd., Jerusalem, Israel 93542
 Filed May 26, 1988, Ser. No. 199,029
 Claims priority, application Israel, Feb. 29, 1988, 85585
 Int. Cl.⁴ A63F 9/08

U.S. Cl. 273—155

11 Claims



- An amusement and display device comprising:
 a plurality of cubical prism elements including a first, a second, a third, a fourth, a fifth element, and a sixth element,

ment, each element having a plurality of edges and faces;
 hinging means for interconnecting the cubical prisms and including:

- a first hinge connected between an edge of said first element and a first edge of the second element;
- a second hinge connected between a second edge of said second element and a first edge of said third element, said first and second edges of said second element being disposed along a common face of said second element;
- a third hinge connected between a second edge of said third element and an edge of said fourth element, said first and second edges of said third element being disposed along different faces;
- a fourth hinge disposed between a third edge of said second element and a first edge of said fifth element, said third edge being disposed along a different face from said common face of said second element; and
- a fifth hinge connected between a second edge of said fifth element and a first edge of said sixth element, said first and second edges of said fifth element being disposed along a common face.

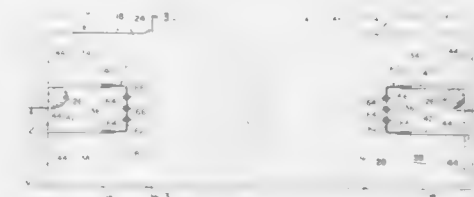
4,875,682

PRACTICE PUTTING GAME

Michael Paolillo, 80 Parkview Dr., Searingtown, N.Y. 11040
 Filed Nov. 4, 1988, Ser. No. 267,392
 Int. Cl.⁴ A63B 67/02, 69/36

U.S. Cl. 273—176 F

12 Claims



- A practice putting game comprising:
 a rigid base of predetermined width and length having a top putting surface, a bottom surface for contact with a support surface and first and second ends; and
 a receptacle contacting each of said first and second ends of the rigid base and having a width generally equal to said predetermined width of said rigid base, each of said receptacles having at least three compartments open toward said respective first and second ends of said rigid base, a said receptacle having a top surface adjacent to said top putting surface of said rigid base.

4,875,683

GOLF CLUB SWING IMPROVEMENT APPARATUS

Edward F. Wellman, 3920 Ellsworth Ave., and Francis J. Michaels, 220 Vivian Dr., both of, Munhall, Pa. 15120
 Filed Jul. 12, 1988, Ser. No. 217,634
 Int. Cl.⁴ A63B 69/36; A43B 5/00

U.S. Cl. 273—187 B

6 Claims

- Apparatus for improving the golf club swing of a person comprising a member which is adapted to be removably inserted inside a shoe of and underlie the foot of the person which is opposite the direction of the swing of the golf club and which has a perimeter contour which is generally the same shape as the perimeter contour of the foot of the person with only an outer forward portion of said member having an increased cross-sectional thickness to elevate only the outer

forward portion of the foot of the person with said member being constructed of a slightly compressible material to limit

swing of a player to stand on said platform and swing at a ball approximately at said support and articulation means.

4,875,685

GOLF PRACTICE APPARATUS

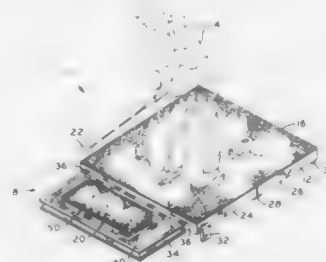
Kedric L. Ballinger, 1337 W. Till Rd., and Robert A. Dornbush, Sr., 1411 Rabus Dr., both of Fort Wayne, Ind. 46825

Filed Apr. 1, 1988, Ser. No. 177,533

Int. Cl.⁴ A63B 69/36, 57/00

U.S. Cl. 273—195 B

17 Claims



the amount of compression of said member when said member is elevating the outer forward portion of the foot of the person.

4,875,684

ORIENTABLE PLATFORM, IN PARTICULAR FOR TRAINING IN GOLF

Jacques Benilan, 151 Boulevard Haussmann, 75008 Paris, France

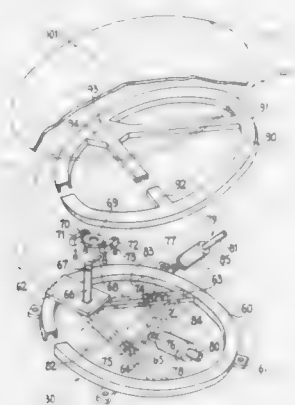
Filed Jan. 20, 1988, Ser. No. 146,204

Claims priority, application France, Jan. 20, 1987, 87 00588

Int. Cl.⁴ A63B 69/36

U.S. Cl. 273—195 B

29 Claims



1. A training or exercising device, in particular for the practice of golf wherein a player practices a golf swing in a swing direction, said device comprising:

- a fixed stand;
- an orientable platform above said fixed stand for supporting a player, said platform including a movable stand;
- support and articulation means between said fixed stand and said platform for defining a point about which the orientation of said platform relative to said fixed stand may be changed by articulation, said support and articulation means comprising a post having a lower part connected to said fixed stand and an upper part and a universal joint interconnecting said upper part of said post and said movable stand;
- two actuating jacks, between said fixed stand and said platform, forming means for varying the inclination of said platform about said point relative to said fixed stand;
- ball joints connecting said two jacks respectively to said fixed stand and to said movable stand;
- said support and articulation means and said two jacks being disposed substantially at respective apices of an equilateral triangle having a center located substantially at the center of said platform; and
- said two jacks being positioned relative to said support and articulation means such that a line extending between said two jacks extends approximately parallel to a direction of

12. A golf practice apparatus for simulating the response of natural turf to the impact of a golf club head during a conventional golf club swing, said apparatus comprising:

- a main frame;
- an inner frame having a forward end and a rearward end, said inner frame disposed within said main frame, said inner frame carrying an upper surface, the rearward end being pivotally and slidingly connected to said main frame, the forward end being pivotally connected to said main frame via a hinge arm extending downwardly from said inner frame; and
- means for biasing said inner frame rearwardly with respect to said main frame such that the rearward end of said inner frame translates forwardly and the forward end of said inner frame translates initially forwardly and then downwardly in a generally arcuate path when the upper surface is impacted by said golf club head.

4,875,686

ELECTRONIC BINGO GAMES SYSTEM NETWORK AND COMPONENTS THEREFOR

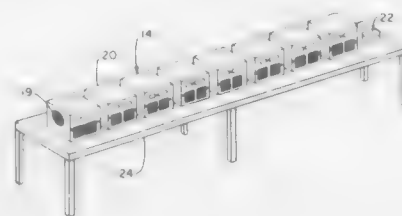
Herbert Timms, Caixa Postal 1322 Campinas, Sao Paulo, Brazil

Filed Nov. 13, 1987, Ser. No. 120,373

Int. Cl.⁴ A63F 3/06

U.S. Cl. 273—237

8 Claims



1. An electronic bingo game system network comprising in combination:

- a master control station circuit;
 - table relay station circuits, and
 - a cashier station circuit,
- said station circuits being electronically interconnected, wherein said master control station circuit includes means to sequentially select random bingo game numbers as well as means to transmit signals representing said numbers to said player station circuits through said table station cir-

cuits, and wherein said player table station circuits have electronically programmed visual display means representing bingo cards with uniquely numbered bingo matrices, said player table station circuits also having means to transmit through said table station circuits to said master control station circuit the amount of wagers placed by the insertion of coins or tokens and means to operate controls associated with said player table station circuits, as well as means to indicate the first completion of a pre-determined winning pattern of said selected numbers, said master control station circuit also having means to verify the occurrence of said completions, means wherein said means to indicated the first completion of said winning pattern will automatically be transmitted to said means to verify the occurrence of said completion, to calculate the winnings due therefor on a pyramidal basis, as well as means to determine the status of players' accounts, and means to transmit totals due players to said cashier circuit upon operation of said means to operate controls associated with said player table station circuits by a player.

4,875,687

THREE DIMENSIONAL GAME

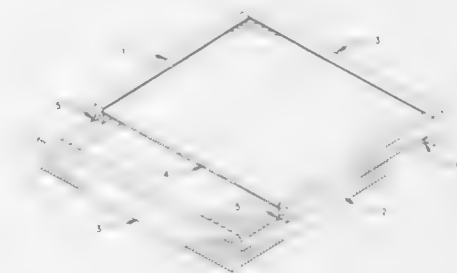
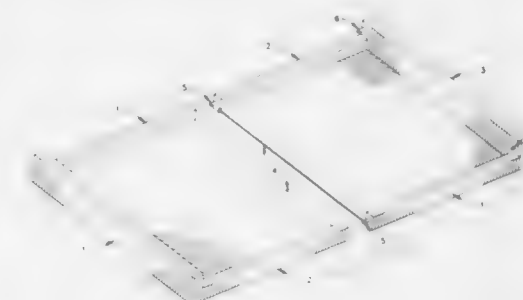
Bruce F. Alsip, Bainbridge Island, Wash., assignor to Alsip & Company, Bainbridge Island, Wash.

Continuation of Ser. No. 183,887, Apr. 20, 1988, This application Oct. 31, 1988, Ser. No. 265,256

Int. Cl.⁴ A63F 3/00, 3/06

U.S. Cl. 273—241

3 Claims



such that the fourth sides of each planar member abut one another and the planar members are coplanar said identical sections form a game board, in combination with first fastening means for securely connecting said sections in the game board position, said game board apparatus being convertible to a game carrying case when the two identical sections are unconnected and oriented such that when the first section is stackably placed on top of the second section, the extended wall surface of the first section abuts the fourth side of the second section planar member and the extended wall surface of the second section abuts the fourth side of the first section planar member simultaneously, and second fastening means for securely connecting said sections in the carrying case position.

4,875,689

BALLS FOR TARGET GAMES

Yuh-Chong Lin, 902 Chaparral Dr., Walnut, Calif. 91789

Filed Mar. 9, 1989, Ser. No. 321,105

Int. Cl.⁴ A63B 65/00

U.S. Cl. 273—346

27 Claims

- 1. A ball with a first interengaging fabric surface for detachment and adherence to a second target interengaging fabric surface, said ball comprising:
- a hollow spherical wall having a radial thickness and a spherical outer surface,
- at least one strip of material having thereon the first interengaging fabric surface, attached to the spherical surface of the ball and having at least one curved portion, and
- attachment means on the ball for securement of the at least one strip thereto,
- said attachment means comprising at least one radially extend-

4,875,688

CONVERTIBLE GAME CARRYING CASE

Mark A. Whaley, 1919 Parkers Mill Rd., Lexington, Ky. 40504

Filed Jan. 22, 1988, Ser. No. 109,918

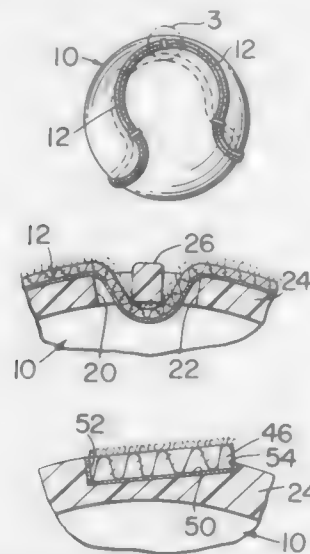
Int. Cl.⁴ A63F 3/00; B65D 85/20, 6/00

U.S. Cl. 273—285

4 Claims

- 1. A game board apparatus comprising two identical sections

ing opening in the ball wall, said opening having opposite edge walls and being sized and adapted for extension there-



through of portions of the strip for engagement with at least one wall portion to secure the strip to the ball.

4,875,690

SEAL DEVICE FOR RECIPROCATING PUMP

Nobuo Tojo, Mobara, Japan, assignor to Maruyama Mfg. Co. Inc., Tokyo, Japan

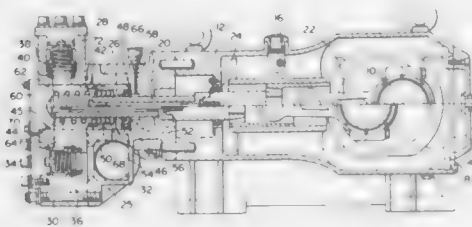
Filed Apr. 5, 1988, Ser. No. 177,954

Claims priority, application Japan, Apr. 17, 1987, 62-92972

Int. Cl.⁴ F16J 15/18

U.S. Cl. 277-12

15 Claims



1. A sealing device for a reciprocating pump of the type having a pump housing provided with a bore formed therein, said bore having at its one end an opening through which it communicates with the exterior of said pump housing while the other end receives a reciprocating member, said sealing device comprising:

- a seal case received within said bore;
- a first sealing member positioned on an inner periphery of said seal case and having an inner peripheral surface adapted to be slidably contacted by an outer peripheral surface of said reciprocating member;
- a second sealing member positioned on an inner periphery of said seal case and having an inner peripheral surface adapted to be slidably contacted by the outer peripheral surface of said reciprocating member and being spaced a predetermined distance from said first sealing member;
- a closure removably attached to said pump housing so as to close said opening on said one end of said bore; and
- a coiled compression spring loaded between said closure and either one of said seal case and said first sealing member for retaining said seal case and said first sealing member within said bore.

4,875,691

RADIAL SEAL

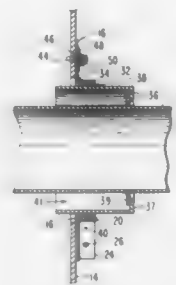
Cesar U. Kosi, Garden Grove, Calif., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 5, 1988, Ser. No. 152,726

Int. Cl.⁴ F16J 15/00

U.S. Cl. 277-147

5 Claims



1. A radial seal for use in connection with a cylindrical rotatable member passing through a stationary member comprising:

- a collar mounted around said rotatable member and spaced therefrom to form a space between said collar and said rotatable member, said collar having an end wall fixedly secured to said rotatable member and said space being sealed at one end thereof by said end wall;
- a circular floating shoe surrounding said collar in sealing engagement therewith and mounted to said stationary member;
- said shoe comprising a plurality of arcuate segments resiliently connected together around said rotatable member in sealing engagement therewith, said segments being circumferentially spaced apart;
- a lap plate mounted at one end of each said segment to overlap an end of an adjacent segment to completely seal the circumferential spaces between adjacent segments;
- a cable surrounding a substantial portion of said shoe to restrict outward movement thereof.

4,875,692

CONICALLY-SHAPED CORRUGATED SEAL

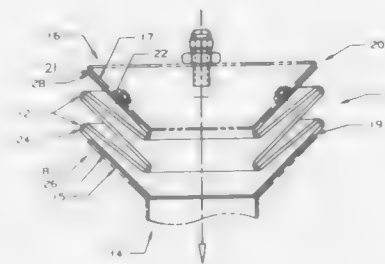
Michael J. Connor, Wichita, Kans., assignor to The Boeing Company, Seattle, Wash.

Filed Oct. 20, 1987, Ser. No. 110,431

Int. Cl.⁴ F16J 3/04, 15/52; F16L 51/02

U.S. Cl. 277-212 FB

13 Claims



1. A seal for connecting first and second relatively moveable structures and for conducting fluid from said second structure to said first structure, said seal comprising:

- a continuous wall having first and second opposed ends and defining an axial conduit, said wall being corrugated axially to define a plurality of circumferential folds, said folds being disposed at an angle to the axis of said conduit and

defining at the first end a frusto-conical exterior surface adapted for sealing contact with the first structure and at the second end a frusto-conical interior surface adapted for sealing contact with the second structure, the angle of said folds sloping normally and continuously toward said first end to prevent an accumulation of the fluid in said circumferential folds as the fluid flows from said second structure to said first structure.

4,875,693

ARBOR ASSEMBLY

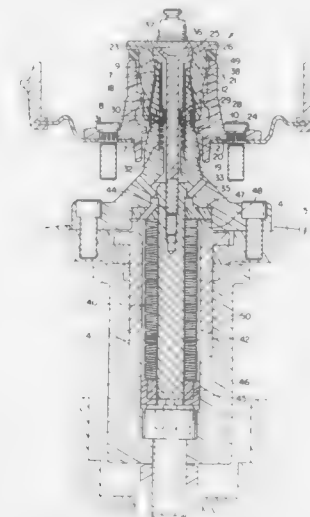
Ronald R. Nowak, North Royalton, and Carl F. Cherko, Euclid, both of Ohio, assignors to Oerlikon Metch Corporation, Cleveland, Ohio

Filed Aug. 31, 1988, Ser. No. 238,578

Int. Cl.⁴ B23B 31/40

U.S. Cl. 279-2 R

35 Claims



1. An arbor assembly comprising a first arbor section, a second arbor section removably mountable on said first arbor section, said arbor sections having matching sets of longitudinally spaced apart internal and external cylindrical pilot surfaces thereon for concentrically locating said second arbor section on said first arbor section, said pilot surfaces on said arbor sections being spaced apart the same distance so that said pilot surfaces on said arbor sections will start to engage each other at the same time during assembly of said second arbor section on said first arbor section, and means for concentrically locating and clamping a workpiece between said arbor sections.

4,875,694

MECHANICS CREEPER APPARATUS

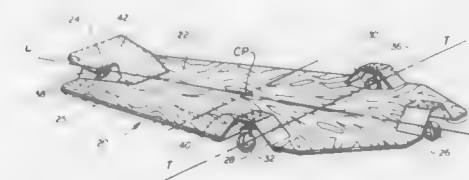
Jerry O. Hamrick, 4987 Northlawn Dr., San Jose, Calif. 95130

Filed Feb. 11, 1985, Ser. No. 700,530

Int. Cl.⁴ B25H 5/00

U.S. Cl. 280-32.6

12 Claims



1. An improved creeper apparatus, comprising: means forming a generally horizontal platform having a longitudinal support axis and axis of symmetry extending

from a head end thereof to a foot end thereof, and a transverse support axis extending across the said longitudinal axis at a point between a central point along the longitudinal axis and said foot end; and caster means disposed along said longitudinal support axis at said foot end and said head end, and along said transverse support axis at one side and the other side of said platform, whereby said platform may be easily moved in any horizontal direction by the application of corresponding horizontal forces thereto.

4,875,695

CHILD SEAT FOR OVER-THE-COUNTER SHOPPING CART

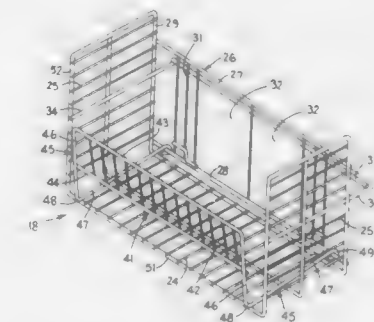
Ronald L. Bedge, Mt. Laurel, N.J., and Michael Pejakovich, Ceresco, Mich., assignors to United Steel & Wire Company, Battle Creek, Mich.

Filed Jun. 8, 1988, Ser. No. 204,187

Int. Cl.⁴ B62B 3/08

U.S. Cl. 280-33,993

4 Claims



1. In an over-the-counter shopping cart having a wheel-supported base, an elevated frame positioned upwardly a substantial distance above said base and rigidly joined thereto by an upright structure which joins to said base adjacent the rearward end thereof, an upwardly-opening basket mounted on said elevated frame, said basket having a rear baby seat assembly which includes a bottom wall fixed to said elevated frame and a pair of generally upright side walls projecting upwardly from opposite sides of said bottom wall and a rear wall which projects upwardly from said bottom wall and is rigidly joined between said side walls, said rear wall having a pair of side-wardly-spaced leg-hole openings extending therethrough, said rear wall having a top rod member extending therealong and defining the upper edge thereof, said rear wall also having a lower rod member extending generally parallel with said top rod member and being disposed below said leg openings, the improvement comprising a one-piece unitary back rest arrangement associated with the baby seat assembly, said unitary back rest arrangement being swingably moveable between (1) in use position wherein it functions as a back rest and projects upwardly from the bottom wall in forwardly spaced relationship from said rear wall and (2) a storage position wherein it projects rearwardly over the top of said rear wall, said unitary back rest arrangement including a back rest wall which extends generally transversely between said side walls and has opposite ends thereof rigidly joined to a pair of generally parallel L-shaped support arms which are side-wardly spaced apart and disposed closely adjacent the respective side walls, each said L-shaped support arm including a first cantilevered leg which adjacent its free end is pivotally supported on said lower rod member, said first leg adjacent its forward end being rigidly joined to a second leg which extends approximately perpendicularly with respect to said first leg, said back rest wall being rigidly joined between said second legs and including upper and lower support rods which extend generally parallel with one another and have opposite ends thereof rigidly joined to said first legs.

idly joined to said second legs, said lower support rod being spaced upwardly a substantial distance from the point of intersection of said first and second legs so as to be spaced upwardly a substantial distance above the bottom wall when the unitary back rest arrangement is in said use position, said support arms bearing directly against said bottom wall when the unitary back rest arrangement is in said use position so that the back rest wall projects upwardly relative to said bottom wall, said first legs defining a unitary opening which extends transversely therebetween and into and through which objects supported on said bottom wall of said baby basket assembly pass as said unitary back rest arrangement is moved between said use and storage positions, said unitary opening extending substantially from said free ends of said first legs to said forward ends thereof.

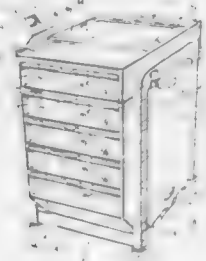
4,875,696

CASTER DIRECTION-LOCKING MECHANISM FOR MOBILE CART

Robert J. Welch, Dallas; Albert Kolvites, Mountaintop, and Robert M. White, Conyngham, all of Pa., assignors to Inter-Metro Industries Corporation, Wilkes-Barre, Pa.
Continuation of Ser. No. 901,055, Aug. 26, 1986, abandoned.
This application Sep. 12, 1988, Ser. No. 243,212
Int. Cl.⁴ B62B 5/04

U.S. Cl. 280—47.34

21 Claims



1. A cart having a first end and a second end, said cart comprising:

at least three casters supporting said cart for rolling movement, a first two of said casters being adjacent each other and supporting said cart in the region of said first end, and at least one other of said casters supporting said cart in the region of said second end, each said caster including a wheel rotatable about a horizontal axis and being mounted with said cart for swiveling movement about a generally vertical axis;

first locking means selectively operable to lock one of said first two casters against said swiveling movement when said one of first two caster swivels to a first predetermined position relative to said first end of said cart;

second locking means selectively operable, independently of locking of said one caster by said first locking means, to lock the second of said first two casters against swiveling movement when said second caster swivels to a second predetermined position relative to said first end of said cart, with the horizontal axes of said first two casters in generally mutually parallel, substantially collinear relation;

means for interconnecting and simultaneously enabling said first locking means and said second locking means independently to lock said one caster and said second caster when they respectively swivel to said first predetermined position and to said second predetermined position;

handle means, for steering said cart, mounted at said first end; and
actuator means associated with said handle means for actuating said interconnecting and enabling means thereby operating said first locking means and said second locking means to selectively lock and unlock said one and said second of said first two casters against said swiveling movement.

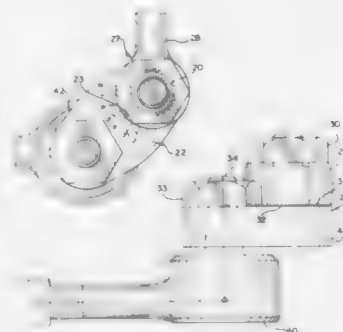
4,875,697

VARIABLE WHEELBASE LENGTH STEERING LINKAGE

Arden O. Miller, Fort Wayne, Ind., assignor to Navistar International Transportation Corp., Chicago, Ill.
Filed Dec. 2, 1988, Ser. No. 279,486
Int. Cl.⁴ B62D 7/16

U.S. Cl. 280—95.1

15 Claims



1. A steering mechanism comprising a steering knuckle assembly adaptable for connection to a wheel spindle including a steering knuckle arm, an adaptor link adjustably connected to said steering knuckle arm to form said steering knuckle assembly, a tie rod pivotally connected to said steering knuckle assembly, indexing means on said link and arm to indicate the positional relationship therebetween for operation with a selected one of a range of vehicle wheelbases.

4,875,698

POWER TRANSMITTING SYSTEM FOR A FOUR-WHEEL DRIVE VEHICLE

Shintaro Uchiyama, Tokorozawa, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan
Filed Feb. 10, 1988, Ser. No. 154,744
Claims priority, application Japan, Feb. 19, 1987, 62-36628
Int. Cl.⁴ B60K 17/34

U.S. Cl. 180—233

8 Claims

1. A power transmitting system for a four-wheel drive vehicle having an engine, and a transmission for transmitting power of the engine to main driving wheels of the vehicle, the power transmitting system comprising:

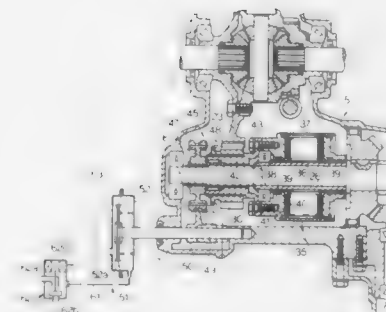
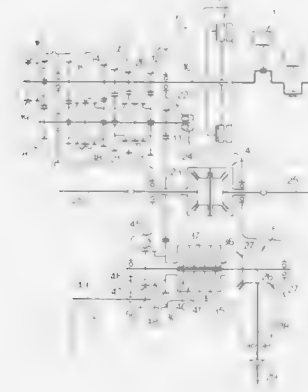
a viscous coupling for transmitting the power therethrough to auxiliary driving wheels of the vehicle;

a lock device provided for locking said viscous coupling to directly transmit the power to the auxiliary driving wheels;

detector means for detecting driving conditions of the vehicle and for producing driving condition signals;

calculator means for calculating driving torque of the power transmitting system based on the driving condition signals; comparator means for comparing the calculated driving torque with a predetermined driving torque and for producing an output signal when the calculated driving torque exceeds the predetermined driving torque; and
an actuator means responsive to said output signal for operating said lock device to lock the viscous coupling;

said calculator means calculates the driving torque as engine torque multiplied by the gear ratio of the transmission



multiplied by a final reduction gear ratio divided by a constant for effective radius of tires.

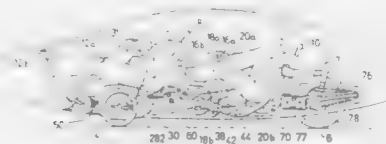
4,875,699

HUMAN POWERED VEHICLES AND MECHANISMS PARTICULARLY USEFUL THEREIN

Shmuel Levavi, Keren Kayemet L'Yisrael Street 18,, Givatayim, Israel
Division of Ser. No. 809,387, Dec. 16, 1985, Pat. No. 4,708,356.
This application Aug. 20, 1987, Ser. No. 87,368
Int. Cl.⁴ B62M 9/00, 11/00

U.S. Cl. 280—236

24 Claims



1. A human powered vehicle including a drive comprising foot pedals for propelling said vehicle, said drive further comprising:

a stepped variable transmission including a plurality of gears selectively made operative to vary the transmission in a plurality of distinct steps to provide a selected gear ratio; a continuously variable transmission continuously variable within a selected gear ratio to provide a selected transmission ratio;

and manual control means for manually controlling both said stepped variable transmission and said continuously variable transmission.

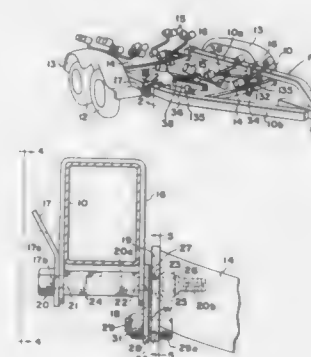
4,875,700

BOAT TRAILERS

George E. Monroe, Pinconning, Mich., assignor to Magline, Inc., Pinconning, Mich.
Filed May 31, 1988, Ser. No. 200,544
Int. Cl.⁴ B60D 3/10

U.S. Cl. 280—414.1

9 Claims



1. In a boat trailer frame having a tongue with transversely spaced longitudinal frame members having convergent front portions fixed to said tongue and parallel rear portions; wheels supporting the rear portions for travel behind a towing vehicle; and a cross rail spanning said parallel portions and carrying sets of boat hull engaging members arranged to conform to the shape of the hulls of boats to be transported; the improvement wherein:

- a longitudinal frame member enveloping hanger is mounted on each longitudinal frame member and is slidable longitudinally thereon when in released condition;
- cross rail mounting and hanger securing means for mounting the ends of said cross rail and releasably securing said hangers in a longitudinal position;
- said cross rail mounting and hanger securing means including transversely extending pivot means carried by said hangers and mounting said ends of said cross rail for pivoting movement in a fore and aft direction relative to said hangers and longitudinal frame members;
- pivot restricting stop means interacts between said hangers and cross rail to limit the arc of fore and aft pivot of said cross rail; and
- said stop means comprising a plate fixed to the end of each cross rail; a plate secured to each hanger transversely opposite each plate; and projection and slot means interacting between each of said hanger and stop means plates portions to provide only a predetermined arc of travel.

4,875,701

BOAT TRAILER HULL AND KEEL SUPPORTING ASSEMBLY

Byron L. Godbersen, Lake LaJunc Estates, Ida Grove, Iowa 51445

Filed Dec. 21, 1988, Ser. No. 287,170
Int. Cl.⁴ B60P 3/10

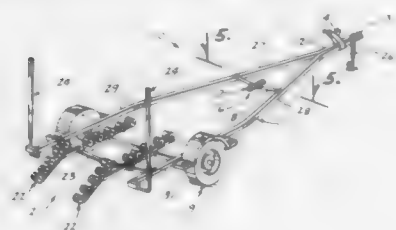
U.S. Cl. 280—414.1

5 Claims

1. Boat hull and keel supporting assembly for use with a boat trailer having a frame including a pair of frame members extended rearwardly from a tongue connection, said supporting means comprising:

a cross member secured to and extended transversely between the frame members;
hull supporting means mounted on said cross member and extended transversely therebetween;
keel supporting means pivotally mounted on said cross member and extended normal thereto for movement about a transverse axis, said keel supporting means having open-

ings formed therein for removing foreign material from the boat keel engaged thereby; and further wherein said keel supporting means includes at least one element engageable with the boat keel and hav-



ing a plurality of longitudinally spaced and aligned slots formed therein, whereby foreign material is removed from the boat keel upon engagement by the said one element, which foreign material falls through the said slots.

4,875,702

METHOD OF PRODUCING SKIS AND SKI

Franz Scherubl, Radstadt, Austria, assignor to Atomic Skifabrik Alois Rohrmoser, Austria

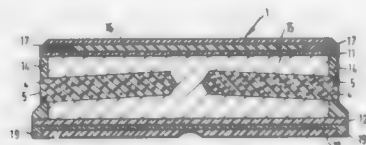
Filed Jul. 13, 1988, Ser. No. 218,651

Claims priority, application Austria, Jul. 23, 1987, 1866/87

Int. Cl.⁴ A63C 5/12

U.S. Cl. 280—602

16 Claims



1. A method of providing individualized vibration absorption properties to a mass produced ski in the concluding stages of its production, said ski having a core extending in the longitudinal direction of the ski, a running surface, and side walls; said method comprising the steps of:

manufacturing the ski to its essentially completed state, and thereafter;

introducing bores in the ski extending from at least one side wall into the core, said bores being generally straight and lying at a constant angle of at least 30° to the longitudinal direction of the ski, said bores terminating in one of the core and the opposite side wall of said ski, the extension of the bores in the core being completely surrounded by the core; and

filling the bores with a vibration damping material, the number and configuration of said bores and the properties of said material providing the individualized vibration absorption properties to the ski.

4,875,703

DOUBLE LINK TYPE SUSPENSION INCLUDING A STABILIZER BAR

Takuya Murakami, Atsugi, Japan, assignor to Nissan Motor Co., Ltd., Yokohama City, Japan

Filed Dec. 15, 1987, Ser. No. 133,470

Claims priority, application Japan, Dec. 16, 1986, 61-193391[U]

Int. Cl.⁴ B60G 3/06

U.S. Cl. 280—665

23 Claims

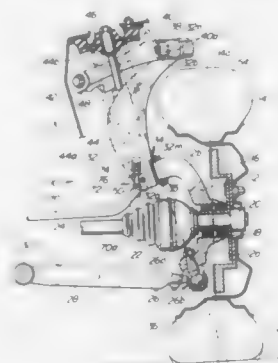
1. A double link type suspension system for the body of a vehicle comprising:

a knuckle for rotatably supporting a wheel of the vehicle; a lower control arm having a first end section movably connected to a lower section of said knuckle by a first

joint, and a second end section movably connected to a side of the vehicle body;

an extension member having a first end section relatively movably connected to an upper section of said knuckle, said extension member being relatively rotatable to said knuckle around a straight line passing through said first joint;

an upper control arm having a first end section movably connected to a second end section of said extension mem-



ber, and a second end section connected to the side of the vehicle body;

a shock absorber disposed extending between the side of the vehicle body and the side of said wheel, a first end section of said shock absorber being connected to the side of the vehicle body and a second end section of said shock absorber being connected to said extension member; and a stabilizer bar having an end section connected to said extension member.

4,875,704

FRONT WHEEL SUSPENSION STABILIZER MOUNTING STRUCTURE

Kenji Tomosada, Higashihiroshima; Toshiro Kondo, Hatsukachi; Tadanobu Yamamoto, Higashihiroshima, and Hiroshi Hashino, Hiroshima, all of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

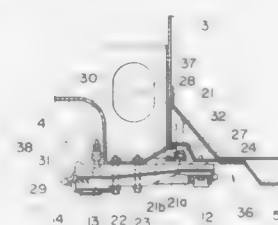
Filed Apr. 13, 1988, Ser. No. 181,614

Claims priority, application Japan, Apr. 13, 1987, 62-91499

Int. Cl.⁴ G60G 11/50; B62D 21/11

U.S. Cl. 280—695

17 Claims



1. A front wheel suspension on a front car body comprising left and right suspension arms which are connected by a stabilizer bar so as to transmit twisting force caused by either one of said suspension arms to the other suspension arm, said front wheel suspension further comprising:

left and right supporting means connected to respective one ends of said left and right suspension arms for rotatably supporting left and right front wheels, respectively; left and right coupling means fastened to an under surface of a frame member of the front car body for pivotally mounting said left and right suspension arms through pivot

means connected between the coupling means and the suspension arms; and said stabilizer bar of which outer bar ends are bent forwardly and fastened to said left and right suspension arms, respectively, extending over an upper surface of each said coupling means and passing through spaces formed between said coupling means and an upwardly bent part of said frame member of front car body.

4,875,705

AUTOMOBILE REAR SUSPENSION STRUCTURE

Toshihide Koyama, Aki, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan

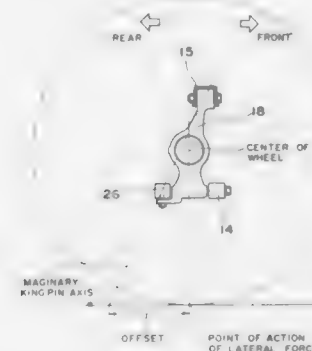
Filed Apr. 14, 1988, Ser. No. 181,422

Claims priority, application Japan, Apr. 14, 1987, 62-92642

Int. Cl.⁴ B60G 3/18

U.S. Cl. 280—697

21 Claims



1. Rear suspension structure of an automotive vehicle having rear wheels and a vehicle body including a front end and a rear end, said structure comprising:

a rear wheel support supporting a said rear wheel of the vehicle,

said wheel support including an upper end portion, a front lower end portion disposed below said upper end portion, and a rear lower end portion disposed below said upper end portion and rearwardly of said front lower end portion, with respect to the vehicle body;

an H-shaped lower control arm having two outer end portions respectively connected to the lower end portions of said rear wheel support, and front and rear inner end portions disposed inwardly of said two outer end portions with respect to the width of the vehicle body and connected to the vehicle body in a manner which allows said lower control arm to pivot relative to the vehicle body,

a rubber bush pivotally connecting one of the outer end portions of said lower control arm and the front lower end portion of said rear wheel support,

a ball joint pivotally connecting the other of said outer end portions and the rear lower end portion of said rear wheel support;

an A-shaped upper control arm having an outer end portion pivotally connected to the upper end portion of said rear wheel support, and front and rear inner end portions disposed inwardly of the outer end portion of said upper control arm with respect to the width of the vehicle body and connected to the vehicle body in a manner which allows said upper control arm to pivot relative to the vehicle body; and

a damper unit disposed rearwardly of said upper control arm with respect to the vehicle body, said unit including an upper end portion connected to the vehicle body, and a lower end portion connected to one of said lower control arm and said wheel support at a location disposed below the location at which the outer end

portion of said upper control arm is connected to the upper end portion of said rear wheel support.

4,875,706

HYDROPNEUMATIC SUSPENSION UNIT FOR WHEELED VEHICLES, PARTICULARLY CROSS-COUNTRY VEHICLES

Philippe Joseph, Carpentras, and Jean Michel Perrochat, Montrouge, both of France, assignors to S.A.M.M. - Societe d'Applications des Machines Motrices, Bievres, France

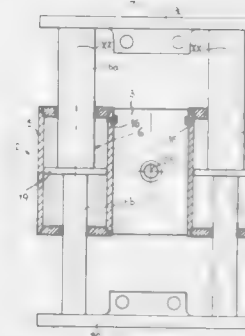
Filed Sep. 6, 1988, Ser. No. 240,297

Claims priority, application France, Sep. 10, 1987, 87 12567

Int. Cl.⁴ B60G 11/30

U.S. Cl. 280—708

5 Claims



1. Hydropneumatic suspension unit for a wheeled vehicle, characterized in that: it comprises two hydropneumatic jacks (2) each being mounted on one side of an associated wheel (1) and forming a closed hydraulic circuit; each jack comprises a first member (6 or 5), adapted to be fixed to a chassis of the vehicle, and a second member (5 or 6) slidably mounted on the first member and having means at two opposite end portions thereof for guiding the sliding movement of said second member; and the two second sliding members (5 or 6) are rigidly connected together and mechanically fastened to the corresponding wheel (1).

4,875,707

COMBINED CRAYON AND COLORING BOOK HOLDER

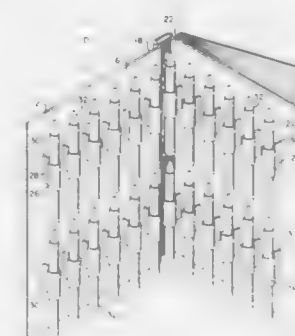
Knute R. Krom, 1360 New Loudon Rd., Cohoes, N.Y. 12047

Filed May 27, 1988, Ser. No. 199,309

Int. Cl.⁴ B42D 3/00, 3/12; A45C 11/34; B43K 25/00

U.S. Cl. 281—30

5 Claims



1. A book-like receptacle for crayons comprising: a front cover and back cover secured to each other, each cover having inner and outer surfaces;

a plurality of cylinders for holding crayons secured to the inner surfaces of the said front and back covers; said front cover cylinders and back cover cylinders spaced apart from adjacent cylinders on the same cover, the distance between adjacent cylinders on the same cover being slightly less than the diameter of a cylinder such that when adjacent cylinders are full and the book is closed the cylinders will be in interdigital-type registry, adjacent front and back cylinders interlocking, and securing the book in the closed position.

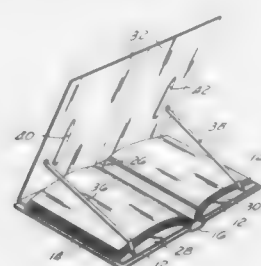
4,875,708 BOOK SHADE

Gerald F. Sremba; Patricia M. Sremba, both of 18281 Fernando Cir., Villa Park, Calif. 92667, and James P. Sullivan, Orange, Calif., assignors to Gerald F. Sremba and Patricia M. Sremba, both of Villa Park, Calif.

Filed Oct. 13, 1987, Ser. No. 107,984
Int. Cl.⁴ B42D 3/00, 9/00; A45C 9/00

U.S. Cl. 281—45

3 Claims



1. A book shade for holding an open book having a plurality of pages, and shading the pages from incident light, comprising:

a top cover and bottom cover rotatably connected together adjacent a first edge of the covers, the covers being sized substantially the same as an open book of predetermined dimensions when the covers are substantially parallel to one another in a closed position; and positioning means for holding the top cover in at least one selected position at an acute angle with respect to the bottom cover in order to block light incident on the pages of an open book placed between the covers; and resilient retaining means connected to said bottom cover for retaining the pages of a book placed on said bottom cover open at selectable pages by resiliently urging a portion of the open book against the bottom cover when said top cover is at an acute angle with respect to the bottom cover.

4,875,709

CONTROLLED LEAK PATH

James E. Carroll, 8356 Main St., and Steven R. Zillig, Box 348, 8828 Main St., both of Williamsville, N.Y. 14221

Filed Feb. 26, 1988, Ser. No. 161,193

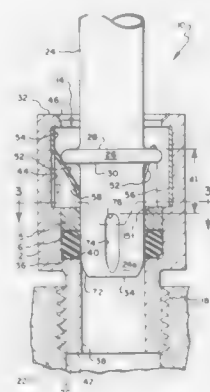
Int. Cl.⁴ F16L 55/00

U.S. Cl. 285—14

4 Claims

1. A fluid coupling assembly including a body provided with a first bore extending inwardly from one side of the body, an annular seal disposed within the bore, and a resilient retainer disposed between said one side of the body and the seal, the retainer including a plurality of prongs extending radially inwardly and towards the seal; the coupling further including a fluid line having a rigid tubular end portion with a radially outwardly extending flange disposed away from a terminal end of the end portion, characterized in that the coupling further comprises a controlled leak path disposed on the tubular end portion of the fluid line between the terminal end and the flange, the controlled leak path being so dimensioned that fluid may leak between the end portion and the seal when the end

portion is not fully assembled within the body, but fluid will not leak between the end portion and the seal when the end



portion is fully assembled within the body with the prongs engaging the flange to prevent the withdrawal of the end portion.

4,875,710

ABRASIVE THREADED FIBERGLASS PIPE JOINT

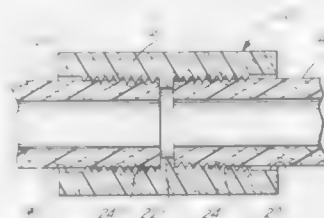
Hector P. Mercado, Wichita Falls, Tex., assignor to Ameron, Inc., Monterey Park, Calif.

Filed Jan. 25, 1988, Ser. No. 147,526

Int. Cl.⁴ F16L 35/00

U.S. Cl. 285—24

13 Claims



1. A fitting for attachment to a length of pipe having an internal and an external surface, comprising:

a sleeve member having an internal and an external surface and at least one end separating these surfaces; and self tapping threads comprised of a grit and resin mixture and provided in at least a portion of one of the surfaces of the sleeve member for engaging at least a portion of one of the surfaces of the length of pipe when the fitting is attached to the length of pipe, said threads adapted to abrade material from and thereby form threads in the portion of the pipe surface engaged during attachment.

4,875,711

SLENDER TUBE CONNECTOR

Ikuo Watanabe, Susono, Japan, assignor to Usui Kokusai Sangyo Kaisha Ltd., Sunto, Japan

Filed Apr. 25, 1988, Ser. No. 185,447

Int. Cl.⁴ F16L 55/00

U.S. Cl. 285—45

6 Claims

1. A connector for connecting a slender tube having a forward connecting end and an outwardly bulging wall generally adjacent the forward connecting end, said connector comprising:

a socket member having opposed leading and trailing ends, the leading end of the socket member being engaged on the slender tube rearwardly of and generally adjacent to the outwardly bulging wall, said socket member further

comprising a plurality of free walls extending rearwardly and elastically outwardly from the cylindrical wall to define the trailing end of the socket member, the free walls being in spaced relationship to the slender tube, said free walls having at least one land on an outer circumferential portion thereof;

a connector body having opposed leading and trailing ends with a stepped connecting bore extending therebetween, a connecting portion being defined generally at the leading end of the connector body, the stepped connecting bore extending through the connector body and having an annular groove formed therein, the trailing end of the connector body being engaged over the forward connecting end of the tube and over the leading end of the socket member such that the annular groove of the connector body engages the land of the socket member, and such that the trailing end of the connector body is disposed forwardly of the trailing end of the socket member; and

plate and is extended radially inside said retaining hole is attached to an end of a metallic bellows, and the other end of said



bellows is attached to a metallic ring which is attached to a circumferential part in an upper part of said first ceramic tube.

4,875,713

INTERNALLY COATED TUBULAR SYSTEM

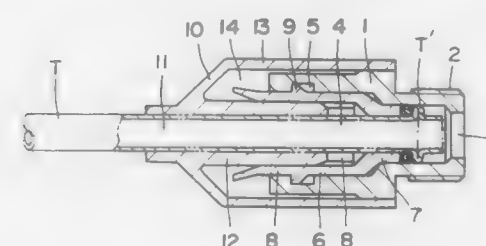
Kenneth J. Carstensen, 4540 N. 44th St. No. 70, Phoenix, Ariz. 85018, assignor to Kenneth J. Carstensen, Phoenix, Ariz.

Continuation of Ser. No. 779,636, Sep. 24, 1985, abandoned. This application Mar. 17, 1988, Ser. No. 171,157

Int. Cl.⁴ F16L 58/10

U.S. Cl. 285—55

6 Claims



an integrally formed elastic cap member having an inner cylindrical wall engaging the slender tube, the inner cylindrical wall having a leading portion disposed intermediate the tube and the free walls of said socket member, the inner cylindrical wall further having a trailing portion disposed rearwardly of the socket member, an outer cylindrical wall extending integrally from the trailing portion of the inner cylindrical wall, said outer cylindrical wall extending forwardly over the trailing ends of the socket member and the connector body, whereby the outer cylindrical wall of the elastic cap covers and protects the socket member and the connector body, and whereby the inner cylindrical wall of the cap member prevents the free walls of the socket member from deflecting inwardly and out of engagement with the annular groove of the connector body.

4,875,712

JOINT STRUCTURE FOR A TUBE SUPPORT PLATE AND A TUBE

Noriyuki Oda, Chiba; Tetsuo Takehara, Yokohama; Katsumi Higashi, Iruma, and Keiji Muramatsu, Ichikawa, all of Japan, assignors to Asahi Glass Company, Ltd., Tokyo, Japan Division of Ser. No. 167,115, Mar. 11, 1988, Pat. No. 4,838,581, which is a division of Ser. No. 825,642, Feb. 3, 1986, Pat. No. 4,753,457. This application Mar. 14, 1989, Ser. No. 323,416

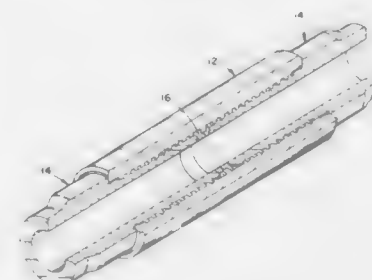
Claims priority, application Japan, Feb. 5, 1985, 60-19323; Feb. 25, 1985, 60-25903; May 28, 1985, 60-113123

Int. Cl.⁴ F16L 59/16

U.S. Cl. 285—47

10 Claims

1. A joint structure used for a hot gas system and having two ceramic tubes extending in the longitudinal direction, characterized in that said two ceramic tubes are vertically arranged with their axes aligned so that they pass through a retaining hole formed in a tube support plate made of metal which is cooled by cooling medium from the inside; an upper end portion of the first ceramic tube and a lower end portion of the second ceramic tube are respectively arranged in said retaining hole; a metallic flange which is attached to said tube support



1. A coupling assembly for joining tubular goods, comprising:

a pair of tubular elements to be coupled together, each of said tubular elements terminating at nose ends, reference shoulders disposed on said elements and spaced from said nose ends, a plurality of male threads disposed on said elements between said nose ends and said reference shoulders;

a coupling collar for coupling said pair of tubular elements, said collar and said elements comprising a coupled assembly, said collar including female threads selected to threadedly receive said male threads and hold said tubular elements in coaxial alignment, said collar having an axial length selected for axial ends of said collar to abut said reference shoulders and maintain said nose ends in opposing spaced apart relation of predetermined distance; opposing surfaces of said nose ends and said collar defining a circumferential groove;

a seal ring sized to be received within said groove, opposing surfaces of said ring and said coupled assembly defining an interface in which a gas may collect, said ring disposed between said interface and an interior of said coupled assembly;

normally closed apertures connecting said interface and said interior in normally closed gas flow communication, said apertures responsive to a pressure drop within said interior to open said gas flow communication to thereby relieve a pressure differential between said interface and

said interior, said apertures including at least one aperture extending through a radial dimension of said seal ring and connecting said interface and said interior in gas flow communication, said ring selected to have an axial dimension greater than said predetermined distance, said ring disposed within said circumferential groove with said nose ends urging against said ring, aperture defining surfaces of said ring resiliently deformed into face-to-face aperture closing contact in at least partial response to said urging, said ring further selected for pressure of a gas within said interface to act against said urging to open said aperture in response to a pressure drop within said interior.

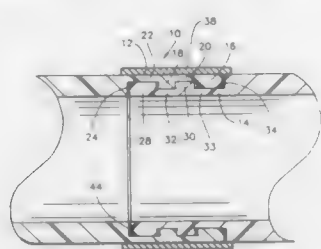
4,875,714

PLASTIC PIPE WITH LOCKING INTEGRAL END CONNECTION

Leonard E. Lee, St. Louis, Mo., assignor to Mid-Continent Pipe & Supply Company, Inc., Fenton, Mo.
Continuation-in-part of Ser. No. 69,895, Jul. 6, 1987, Pat. No. 4,779,902. This application Sep. 28, 1988, Ser. No. 250,390
The portion of the term of this patent subsequent to Oct. 25, 2005, has been disclaimed.
Int. Cl.⁴ F16L 47/00

U.S. Cl. 285—86

24 Claims



1. Plastic pipe having an integral end connection comprising a pair of female and male integral end connections for adjacent lengths of pipe adapted to be press-fitted together to form a locked end connection with said adjacent lengths of pipe, said female end connection comprising a plurality of discrete interior circumferentially extending radial, circular, uniform diameter ribs and plurality of discrete interior circumferentially extending radial, circular, uniform diameter grooves bordering said ribs, said male end connection comprising a plurality of corresponding discrete exterior circumferentially extending radial, circular, uniform diameter ribs and a plurality of discrete exterior circumferentially extending radial, circular uniform diameter grooves bordering said last named ribs, said male and female end connections being adapted to be axially press-fitted together to distend said female end connection and compress said male end connection until a mating relation of the ribs and grooves in said end connections is obtained, said ribs and said grooves having an axially extending wedge shape portion having a greater axial width than the remainder of the respective ribs and grooves from which they extend, said wedge shape portion extending exteriorly in an axial direction from a side of the grooves to provide a locking fit to resist separation.

4,875,715

QUICK CONNECT CONNECTOR

Robert D. Denany, Jr., Lapeer, and Duane J. Ponthriand, Rochester, both of Mich., assignors to ITT Corporation, New York, N.Y.

Filed Apr. 22, 1988, Ser. No. 185,012
Int. Cl.⁴ F16L 55/00

U.S. Cl. 285—87

15 Claims

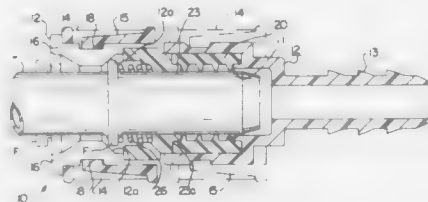
1. A quick connect connector comprising, in combination: a connector housing having a first and second ends and a receiving portion fixedly provided therein, said housing

having a fixedly mounted and radially deflectable retaining portion thereon;

a first chamber in said housing between said first and second ends and a sealing member therein;

a retaining collar slidably mounted on said housing between said first and second ends of said housing, said collar having at least one fixedly mounted and radially deflectable locking portion thereon;

said radially deflectable retaining portion being adapted to engagingly contact a flange portion on a connection member inserted in said housing when said retaining portion is deflected to retain said connection member in locked position relative to and in sealing engagement with said



sealing member between said retaining portion and said first end of said housing;

said radially deflectable locking portion being received within and adapted to engage said receiving portion fixedly provided in said housing to lock said collar relative to said housing when said collar is moved into a corresponding position wherein said collar maintains said retaining portion in engagement with the member to prevent removal of the member from said connector housing when said collar is locked at said corresponding position; and,

means for resiliently urging the member outwardly of said housing and the flange against said engaged retaining portion.

4,875,716

JOINTED PIPE CONNECTION, PARTICULARLY FOR AUTOMOTIVE EXHAUST PIPES

Wilfried Winzen, Pforzheim, and Manfred Wünschmann, Neuburg, both of Fed. Rep. of Germany, assignors to Witzemann GmbH Metallschlauch-Fabrik Pforzheim, Pforzheim, Fed. Rep. of Germany

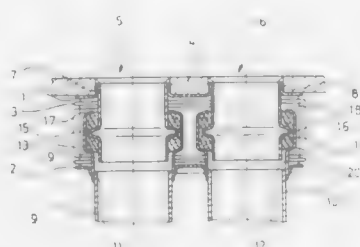
Filed Feb. 10, 1987, Ser. No. 12,847

Claims priority, application Fed. Rep. of Germany, Mar. 29, 1986, 3610684

Int. Cl.⁴ F16C 27/10

U.S. Cl. 285—137.1

25 Claims



1. Jointed flexible connection for two approximately axially aligned, mutually axially movable pipes, particularly exhaust pipes (4,9,10,101,137,138; 102,139,140) of a motor vehicle, having

at least one flexible, generally cylindrical, gas-tight, and temperature-resistant metal bellows conduit element

(3,103) having a pair of ends, each of which is connected, at least indirectly, by welding to a respective one of said mutually movable pipes, thereby preventing gas leaks at said connection, and

means for connecting the pipes (9,10,101; 102) together in a load-bearing but angularly flexible and elastically damped manner, including

a support (11,12,105,145,146) secured to one of said pipes (9,10,102,139,140),

an inner protective tube (7,8,104,141,142) which defines a flow path for a flowing medium (5,6) passing from one of said pipes to another of said mutually axially movable pipes, the protective tube being disposed inside the bellows conduit element (3,103) and being connected to one of said pipes (9,10,101,138; 102,139), and

at least one resilient support pad (13,14,109,143,144) interposed radially between said inner protective tube and said support member (11,12,105,145,146),

wherein, in accordance with the invention, said inner protective tube and said support member are respectively connected to different ones of said two mutually axially movable pipes;

the inner protective tube (7,8; 104; 114; 127,128; 141,142; 156) has a free portion of its length which engages with said at least one resilient support pad (13,14; 109; 121, 133, 143, 144, 160); and

said resilient support pad is annular, is radially contained by said support member (11, 12; 105, 116, 130, 145, 146, 157), and axially engages against at least one of said inner protective tube (7,8 . . .) and said support member.

4,875,717

END CONNECTORS FOR FILAMENT WOUND TUBES

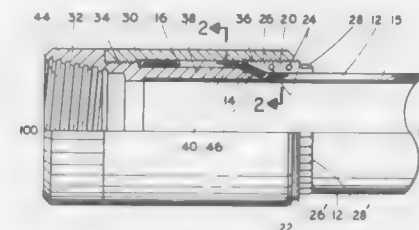
Frederick J. Policelli, Salt Lake City, Utah, assignor to Hercules Incorporated, Wilmington, Del.

Filed Feb. 17, 1987, Ser. No. 15,825

Int. Cl.⁴ F16L 39/02

U.S. Cl. 285—149

6 Claims



1. A hollow, connecting tube having a longitudinal axis that extends centrally within said tube along the length thereof, said tube comprising:

a filament wound tubular body having a longitudinal axis that is coincident with said tube axis, said tubular body having (a) an internally contoured end section for transmission of torque around said tube axis, a body section and a ramp section that is between said end section and said body section wherein filaments of said tubular body are of high strength and extend from said end section through said ramp section to a location within said body section remote from said ramp section, (b) inner dimensions that are larger in said end and ramp sections than in said body section, said ramp section having inner dimensions increasing along said longitudinal axis toward said end section and (c) outer dimensions that are larger in said end and ramp sections than in said body section, said ramp section having outer dimensions increasing along said longitudinal axis toward said end section;

a ring having (a) an outer surface with a threaded portion and a gripping portion and (b) an inner surface with a sliding portion and a ramp portion, said sliding portion being beneath that part of said threaded portion adjacent said gripping portion and said ramp portion being beneath that

portion of said threaded portion remote from said gripping portion;

a cylindrical coupling having inner dimensions corresponding substantially to said inner dimensions of said filament wound tubular body and comprising an integral combination of (a) an externally contoured insertable portion adapted to fit within said tubular body beneath said end and ramp sections, wherein said externally contoured insertable portion is contoured to mate with said end and ramp sections within the contours thereof, (b) an end portion adapted for connection of said tube to another through coupling means carried integrally by said end portion and (c) a middle portion between said insertable and end portions along said tube axis, said middle portion having a threaded portion around an outer surface thereof, said threaded portion having an outer dimension that is greater than said inner dimensions of said end section;

a sleeve having (a) a first integrally threaded end that is adapted to thread to said cylindrical coupling around said threads of said middle portion thereof, (b) a second integrally threaded end adapted to thread to said ring around said threaded portion thereof and (c) a smooth middle portion between said first and second threaded ends and adapted to slide over said end section of said tubular body.

4,875,718

SWIVEL CONNECTOR FOR PREVENTING KINKING OF FLEXIBLE MEDICAL HOSES

Robert E. Marken, 21495 Bear Creek Rd., Bend, Oreg. 97701

Filed Dec. 2, 1988, Ser. No. 279,048

Int. Cl.⁴ A61M 15/00; F16L 27/04, 31/00, 47/00

U.S. Cl. 285—175

5 Claims



1. A swivel connector for preventing the kinking of a fluid hose, such as an oxygen hose, comprising:

(A) a ball member assembly which includes

(i) a first hose having an end, a sleeve having a bore defined therethrough for accommodating said first hose, said first hose end being located in said ball member assembly,

(ii) a hose retaining means in said sleeve securely holding said first hose in place in said sleeve,

(iii) a ball affixed to one end of said sleeve and spaced from said hose retaining means and having a bore defined diametrically therethrough to have ends defined in an outer surface of said ball, said ball bore being aligned with and fluidically joined to said sleeve bore and being sized to accommodate said first hose therethrough, said first hose being mounted in said sleeve by said hose retaining means to extend through one of said bore ends and to have said hose end spaced from another end of said bore and located inside said ball bore; and

(B) a socket member assembly which includes

(i) a second hose having an end, and a sleeve having (a) a first portion with a bore defined therethrough, an annular hose supporting gland mounted in said sleeve first portion to accommodate and grasp said second hose, said second hose end being located in said first

portion, said annular gland having a cutout portion defined therein and having an annular opening that is sized so that said second hose is permitted to move therethrough in one direction while said gland prevents said second hose from backsliding therethrough in a second direction that is opposite to said one direction,

- (b) a sleeve second portion with a bore defined therethrough, said sleeve second portion having an inner diameter that is approximately the same as the outer diameter of said second hose to snugly accommodate said second hose and being smaller in diameter than said first sleeve portion bore, and being joined to one end of said first sleeve portion to define a shoulder, with said annular gland being spaced from said shoulder,
- (c) a second hose retaining means in said sleeve second portion holding said second hose in said sleeve second portion, and
- (ii) a socket mounted on one end of said second sleeve first portion and having a hole defined therein which is sized to be larger than said ball member assembly sleeve and located to accommodate said ball member assembly sleeve when said ball is received in said socket, said socket being sized to essentially completely surround said ball;
- (C) said second hose retaining means holding said second hose in a position that has the end of said second hose spaced from said socket, with said sleeve second portion being larger than said second hose, said second sleeve, said gland and said ball forming a chamber in which said second hose end is located.

4,875,719

UNIVERSAL HOSE CONNECTOR

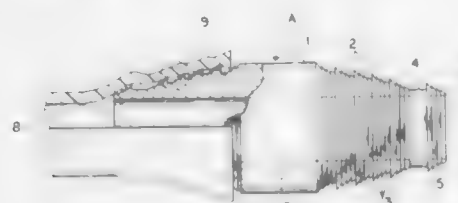
Christopher J. Mylett, 15502 Wandering Trail, Friendswood, Tex. 77546

Filed Jan. 26, 1989, Ser. No. 301,974

Int. Cl.⁴ F16L 33/00

U.S. Cl. 285—239

2 Claims



1. A coupling device for joining in a fluid-tight manner respective ends of two resilient tubing members, comprising: an elongated cylindrical element having opposite end walls and provided with a central axially extending bore; said element including a medial enlarged section defining the maximum diameter of said element; a plurality of sets of outwardly directed major annular projections extending from said element intermediate said medial enlarged section and each said opposite end wall; each major projection including an inclined outer face intersecting with a substantially radial inner face to provide an outermost circular edge; said major projections progressively decreasing in diameter in a direction from said medial section toward said end wall, but not extending to said end wall; each said major projection outer face having retaining means and sealing means;
- a resilient tubing member force-fitted past each said end wall toward said medial section and stretched an increasing degree as said tubing member is forced toward said medial section, with said outer edges and said retaining means and

sealing means providing a biting fluid-tight engagement with said tubing member;

a cylindrical planar extension adjacent each of said end walls; and

an outermost single major projection outer face disposed between said cylindrical planar extension and said end wall having retaining means;

whereby force applied to said resilient tubing member increases biting engagement between said tubing member and said outermost major projection and reduces tensile force on remaining said projections.

4,875,720

FLUID COUPLING

Takeya Sasa; Yoshikazu Kobayashi, and Reichi Makishima, all of Tokyo, Japan, assignors to Nitto Kohki Co., Ltd., Tokyo, Japan

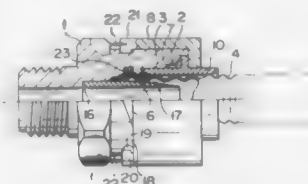
Filed Nov. 8, 1988, Ser. No. 268,863

Claims priority, application Japan, Nov. 10, 1987, 62-171799[U]

Int. Cl.⁴ F16L 33/26

U.S. Cl. 285—249

10 Claims



1. A fitting for a metallic flexible, corrugated pipe, comprising:
- a tubular main body having first and second ends;
- a pipe insertion section formed in said tubular main body at said first end, said pipe insertion section including a large-diameter portion, and a small-diameter portion continuous with the large-diameter portion and located further inside the large-diameter portion;
- a ring-shaped engaging member movably held by the large-diameter portion and movable toward the small-diameter portion, said engaging member being expansible or compressible and engaging with a root portion of a cylindrical, outer peripheral surface of the flexible pipe inserted in to said tubular main body when said engaging member is compressed;
- a sleeve fitted around an outer peripheral surface of said tubular main body and movable in an axial direction;
- a tubular pressing member, provided in said sleeve, for enclosing the flexible pipe, said pressing member having an outer circumference engaged with said sleeve and being permitted to advance toward the small-diameter portion when said pressing member is located in said tubular main body; and
- an annular metallic seal means which is tightly pressed against one of a distal end face, an outer surface and an inner surface of said pipe, to thereby seal said pipe, when said pipe is moved into said main body while being engaged with said engaging member.

4,875,721

LATCH ASSEMBLY FOR DOOR OR WINDOW OF MICROWAVE RANGE

Kenzo Okamoto, Osaka, and Fumihiko Kitada, Neyagawa, both of Japan, assignors to Imanishi Kinzoku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Nov. 10, 1988, Ser. No. 269,675

Int. Cl.⁴ F05C 9/00

U.S. Cl. 292—29

8 Claims



1. In a latch assembly for a cabinet door or window of an upright-type microwave range provided with an outer casing and a cavity or cooking cabinet contained in said outer casing, said cabinet door being pivotally mounted on a front portion or door-opening frame of said outer casing while provided with a pivotal hook member which is engaged with a dog projection of a hook housing mounted in said door-opening frame of said outer casing,

the improvement wherein: said door-opening frame is fixedly mounted on a peripheral portion of said cooking cabinet said door-opening frame is fixedly mounted and a hook-operating lever is pivotally mounted on said door-opening frame having a lower-end portion said rod is slidably mounted one end of a hook-operating rod the other end of which is brought into contact with said pivotal hook member of said cabinet door, said hook-operating rod being normally biased at its retracted position by a spring means; and an upper-end portion of said hook-operating lever is brought into contact with a push pin portion which is integrally formed with a push button in a projecting manner, said push button being mounted in a control panel of the microwave range in a retractable manner.

4,875,722

EXIT DEVICE ACTUATOR AND DOGGER

Theodore H. Miller, deceased, late of New Britain, Conn. (by Cecelia B. Miller, executrix), and Ronald S. Slusarski, Berlin, Conn., assignors to Emhart Industries, Inc., Farmington, Conn.

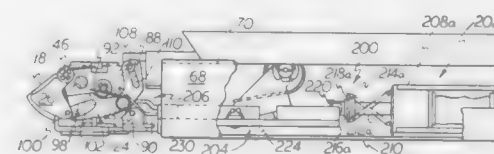
Division of Ser. No. 902,907, Sep. 2, 1986, Pat. No. 4,801,163.

This application Oct. 3, 1988, Ser. No. 252,837

Int. Cl.⁴ E05B 65/10

U.S. Cl. 292—92

6 Claims



1. In an exit device comprising a latch bolt supported for pivotal movement about a first axis between projected and retracted positions, a deadlocking lever supported for pivotal

movement about a second axis generally parallel to the first axis between a locking position and a non-locking position and having a blocker engagable with an associated portion of said latch bolt when said latch bolt is in its projected position and said deadlocking lever is in its locking position for deadlocking said latch bolt in its projected position, the improvement comprising:

a solenoid having a plunger movable along a third axis between first and second end positions, said third axis being substantially perpendicular to said first and second

first linkage means coupled between said deadlocking lever and said solenoid for translating longitudinal motion of said plunger of said solenoid to pivotal motion of said deadlocking lever,

second linkage means coupled between said solenoid plunger and said latch bolt for translating longitudinal motion of said solenoid plunger to pivotal motion of said latch bolt so that when said solenoid plunger is moved to said first end position, said deadlocking lever is pivoted to its non-locking position and said latch bolt is pivoted to its retracted position, the movement of said deadlocking lever from its locking position to its non-locking position causes the first linkage means to move a first distance, and the movement of said latch bolt from its extended position to its retracted position causes the second linkage means to move a second distance, with said second distance being greater than the first distance, and

said first linkage means comprises means for slipping itself relative to said second linkage means during movement of said plunger to said first end position to accommodate for the movement differential between the first and second linkage means.

4,875,723

CLOSURE LATCH

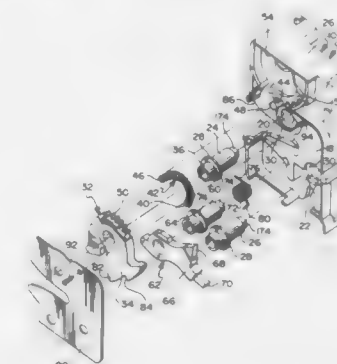
David E. Compeau, Mt. Clemens; Mark Manuel, Sterling Heights, and Lloyd W. Rogers, Jr., Utica, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 3, 1988, Ser. No. 163,503

Int. Cl.⁴ E05C 3/26

U.S. Cl. 292—201

11 Claims



1. A closure latch comprising, in combination, a latch frame, a latch bolt mounted on one side of the latch frame for movement between latched and unlatched positions, a latch operator mounted on the one side of the latch frame and movable to a latch bolt release position to control movement of the latch bolt to unlatched position, an actuating means controlling the latch operator and including, an actuator mounted on the other side of the latch frame for movement between neutral and operating positions, means on the actuator extending to the one side of the latch frame for engagement with the latch operator to move the latch operator to release position concurrently with movement of the actuator to operating position, driven

means, means mounting the driven means on the other side of the latch frame for movement between neutral and driving positions, resilient means locating and driven means in the neutral position and resisting movement thereof to the driving position, power operated driving means for moving the driven means from the neutral position to the driving position, and means on the driven means engageable with the actuator for moving the actuator to the operating position upon movement of the driven means to the driving position, the resilient means returning the driven means to the neutral position upon cessation of operation of the power operated driving means.

4,875,724

HOOD LATCH MECHANISM

Herbert Gruber, Markham, Canada, assignor to Magna International Inc., Markham, Canada

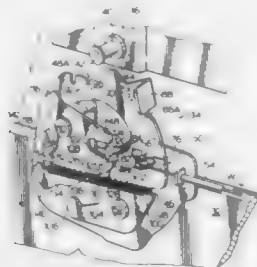
Filed Oct. 26, 1987, Ser. No. 112,478

Claims priority, application Canada, Oct. 29, 1986, 521738

Int. Cl.⁴ E05C 3/26

U.S. Cl. 292-216

52 Claims



1. A latch mechanism comprising a mounting plate carrying a slot having a mouth, a pivotably-biased pawl mechanism comprising a top arm and bottom arm and centrally disposed detent, a ratchet mechanism biased for rotation carrying a notch having a mouth, a detent on one side of the notch for engaging the detent of the pawl mechanism for precluding the rotation of the ratchet mechanism, the mouth of the notch of the ratchet mechanism for aligning with the mouth of the slot for both receiving a striker, and stop means to stop the rotation of the ratchet mechanism when the mouth of the notch is aligned with the mouth of the slot to prevent over-rotation of the ratchet mechanism, the ratchet mechanism arranged for guiding the striker to proximate the bottom of the slot so that the detent of the pawl engages the detent of the ratchet mechanism precluding the ratchet mechanism from rotating to release the striker, the arm on the top of the pawl mechanism normally positioned over the slot and being precluded from movement away from the slot unless the mouth of the notch and mouth of the slot are both directed towards the top arm and whereby if the mouths of the notch and slot are not aligned but the striker is proximate the mouths of the notch and slot and the ratchet mechanism has not engaged the stop means but is proximate thereto, movement of the pawl mechanism away from the ratchet mechanism causes the portion of the ratchet mechanism remote the notch to be engaged by the bottom arm of the pawl mechanism and align the mouth of the notch with the mouth of the slot, and when aligned, a clearance is provided between the bottom arm and portion of the ratchet mechanism remote the notch to permit the top arm to be pivoted away from over the slot, and whereby when the arm on the top of the pawl mechanism is pivoted from over the slot and rotation is attempted of the ratchet mechanism, the ratchet mechanism attempts to cause the arm on top of the pawl mechanism to be pivoted to a position over the slot thereby preventing accidental release of the striker.

4,875,725

WOVEN-WIRE GATE LOCK

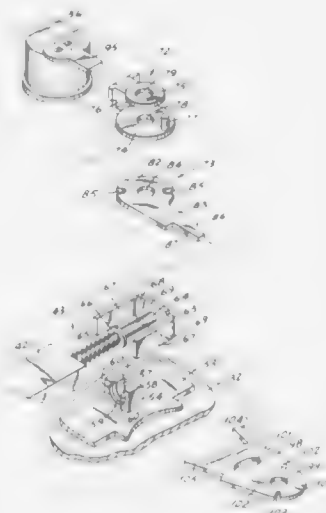
George R. Marks, 19, The Hamlocks, Roslyn Estates, N.Y. 11576

Filed Dec. 28, 1987, Ser. No. 138,133

Int. Cl.⁴ E05B 15/04

U.S. Cl. 292-244

13 Claims



1. A woven-wire gate lock comprising:

- a housing having a faceplate, a wall projecting from the faceplate and substantially surrounding the interior of the housing, and a removable cover for closing the housing,
- a stationary bracket within the housing projecting from the faceplate, the bracket presenting two opposite surfaces each having a ledge spaced from and facing the faceplate, and the bracket having an endface remote from the faceplate,
- a cutout in the bracket terminating at the endface so that the cutout is open at the endface,
- a latch projecting from the housing and movable with respect to the housing between latched and unlatched positions, the latch being reversible so that it can project from the housing in either of two opposite directions,
- a rod carried by the latch, the rod being accommodated within the cutout in the bracket, the rod being insertable into and removable from the cutout through the opening of the cutout at the bracket endface,
- manually-manipulable means carried by the housing for initiating movement of the latch from its latched position to this unlatched position,
- a spring constantly urging the latch toward its latched position, and
- a member engageable with the bracket in a location between the faceplate and either of the two ledges, the ledge with which the member cooperates preventing movement of the latch in a direction away from the faceplate, and the spring maintaining the engagement between the member and the bracket,

whereby the latch is prevented from accidentally falling out of the housing when the housing cover is removed and the housing is open.

4,875,726

COMPENSATING ESCUTCHEON PLATE FOR CAR DOOR

Wolfgang Thau, Concord, Canada, assignor to Magna International Inc., Markham, Canada

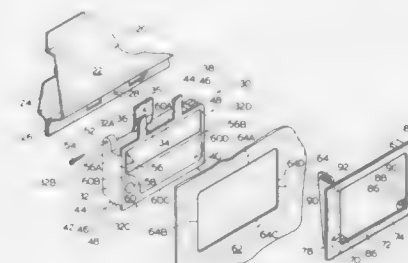
Filed Nov. 17, 1987, Ser. No. 122,133

Claims priority, application Canada, Dec. 3, 1986, 524487

Int. Cl.⁴ E05C 21/00

U.S. Cl. 292-337

12 Claims



1. A compensating escutcheon plate assembly having length, height and depth, the compensating escutcheon plate assembly comprising a continuous peripheral annular flange presenting an outer annular surface on one side and a back surface on the other side, the peripheral annular flange surrounding a central opening through the escutcheon plate, the flange having a continuous outer peripheral edge and a continuous inner peripheral edge surrounding the central opening, the back of the flange for engaging exterior door panel material of a vehicle door surrounding an opening in the panel provided through the exterior door panel for mounting a handle carrying assembly carrying a handle for opening and closing the door, formations carried on the compensating escutcheon plate assembly for positioning and fastening the compensating escutcheon plate assembly to complementary formations carried on a handle carrying assembly for causing the back surface of the peripheral flange to abut an exterior door panel material surrounding the opening through which the handle carrying assembly is mounted, the formations carried on the escutcheon plate assembly carrying means for engaging and being secured to complementary means carried on the complementary formations, both said last aforementioned means being secureable together to permit the positioning of the length of the peripheral flange at different positions relative to the door handle assembly when the two are mounted together for use and to permit the escutcheon plate to be mounted at various depths relative to the handle assembly when the back surface of the peripheral flange engages the exterior door panel material thereby providing a compensating escutcheon plate to close any openings between the material surrounding the aperture provided in the exterior door panel through which access is provided to the handle and the assembly carrying the handle to compensate for the irregularities in the manufacture of the assembly and exterior door panel and changes caused by the environment in which the exterior door panel of the vehicle door is located (for example, contraction and expansion due to temperature changes).

4,875,727

COVERING ELEMENT FOR MULTILOCK FITTING FASTENED TO A DOOR, WINDOW OR THE LIKE

Jean-Jacques Kautt, Strasbourg, France, assignor to Ferco International, Sarrebourg, France

Filed Dec. 14, 1987, Ser. No. 132,363

Claims priority, application France, Dec. 24, 1986, 86 18472

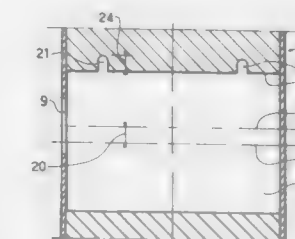
Int. Cl.⁴ E05C 21/00

U.S. Cl. 292-337

11 Claims

1. A cover member for a multilock fitting adapted to be used with a structure including a fixed frame, a movable frame and a jamb with an edge, said multilock fitting comprising a plurality of blocks and a plurality of locking bolts, said cover mem-

ber comprising a tubular member of rectangular section having a relatively short side and a relatively long side, said relatively short side including a plurality of first apertures permitting passage of said plurality of locking bolts through said relatively short side and positionable so as to be coplanar with said edge of said jamb and said relatively long side covering said plurality of blocks and wherein said relatively long side comprises a plurality of second apertures having median planes, which



plurality of second apertures permit passage of said plurality of blocks through said relatively long side, wherein said tubular member is vertically movable relative to said blocks and wherein said plurality of first apertures have axes spaced a predetermined distance from said median planes of said plurality of second apertures, said predetermined distance being equal to the extent of vertical movability of said tubular member relative to said plurality of blocks.

4,875,728

BUMPER FACIA ATTACHMENT STRUCTURE

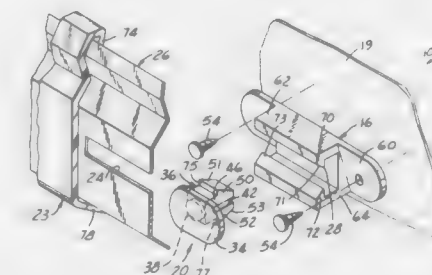
David F. Copp, Dryden, and Stephen J. Wojciechowski, Sterling Heights, both of Mich., assignors to Chrysler Motors Corporation, Highland Park, Mich.

Filed Sep. 16, 1988, Ser. No. 245,232

Int. Cl.⁴ B60R 19/02, 19/24

U.S. Cl. 293-126

3 Claims



1. Attachment structure for securing the end pieces of a vehicle bumper facia to a vehicle body, the vehicle bumper facia being of the type fabricated of a flexible plastic material and including an elongated central portion, the vehicle body including a structural bumper member, said central portion being attached to the structural bumper member, a facia end piece extending from each end of the central portion longitudinally of the vehicle body, a fastener fabricated of a flexible material secured to the inner face of each end piece, each fastener including a stem which extends toward the vehicle body, the stems being bifurcated and each stem defining a pair of spaced apart flexible tanga, each tang terminating in an enlarged portion, an elongated retainer clip fabricated of flexible material mounted on each side of the vehicle body in a position oppositely disposed from one of the stems, each retainer clip being generally C-shaped in cross-section and including a back wall, upper and lower side walls extending outwardly therefrom and downwardly and upwardly extending lips on the outer edges of the respective upper and lower side walls, the lower and upper edges of, respectively, the

upper and lower lips being spaced apart to define an elongated open ended slot, the fasteners being engaged with the retainer clips by forcing the stems into the slots with initial flexing of the tangs together and flexing of the upper and lower side walls of the retainer clip apart to permit passage of the enlarged portions through the slots with subsequent springing of the tangs apart and the side walls together, the enlarged portions thereafter engaging the inner surfaces of the lips to prevent withdrawal thereof through the slots, the retainer clips being positioned with respect to the end pieces and fasteners when the end pieces are secured in place by the fasteners to permit disengagement of the fasteners from the retainer clips by flexing the end pieces and sliding the fasteners past the open ends of the slots of the retainers clips which are closest to the central portion of the vehicle bumper fascia.

4,875,729

APPARATUS FOR PACKAGING WASTE MATERIAL

Joel S. Peck, 434 E. 70th St., #3A, New York, N.Y. 10021

Filed Feb. 5, 1988, Ser. No. 152,911

Int. Cl.⁴ A01K 29/00; E01H 1/12

U.S. Cl. 294-1.3

14 Claims



9. A device for packaging waste material in a bag in a rapid and reliable manner, with a minimum of handling, and without the need to contaminate the open end of the bag with waste material during the packaging procedure, said device comprising:

- a bag having an open end, a closed end, a first surface, a second surface, a central portion spaced from the open end of the bag, and a periphery;
- a frame defining an open area and located at least partially within the bag with the first surface of the bag directed inwardly towards the frame, the second surface of the bag directed outwardly away from the frame, and the central portion of the bag in registration with the open area of the frame; and
- means to invert the bag as the bag is removed from the frame after waste material has been positioned on the central portion of the second surface of the bag so that when the bag is free of the frame the first surface is directed outwardly, the second surface is directed inwardly, and the waste material is inside the bag adjacent the second surface of the bag.

4,875,730

TRUCK BED LOAD ORGANIZER AND STABILIZER APPARATUS

Kendall W. Justice, 7727 W. Mulberry, Phoenix, Ariz. 85033

Filed Oct. 11, 1988, Ser. No. 255,999

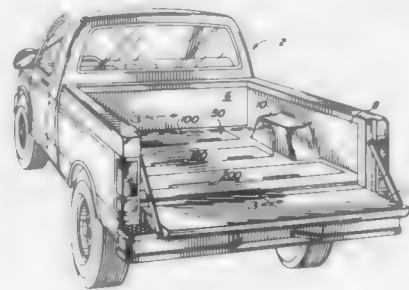
Int. Cl.⁴ B60P 3/34

U.S. Cl. 296-37.3

6 Claims

1. Apparatus for organizing and stabilizing a load on a truck bed, comprising, in combination:
- base means disposed on the truck bed for supporting a plurality of panels;
 - a plurality of cutout portions in the base means;
 - panel means disposed in the plurality of cutout portions,

including a plurality of panels disposed in the plurality of cutout portions and pivotable from a down position aligned with the base means to an up position generally



perpendicular to the base means for organizing and stabilizing the load; and
first hinge means at the cutout portions, and each panel of the plurality of panels is secured to the first hinge means.

4,875,731

COMBINATION PICK-UP TRUCK BED LINER AND CAMPER TOP

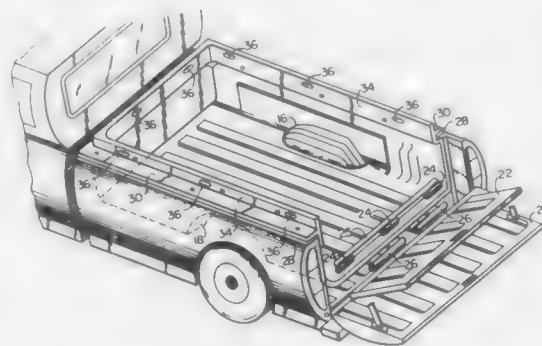
Samantha L. Ruiz, 684 Robinson Dr., Prescott, Ariz. 86301

Filed Jun. 27, 1988, Ser. No. 211,855

Int. Cl.⁴ B62D 33/02

U.S. Cl. 296-37.2

7 Claims



1. An article of manufacture, comprising:
- a truck bed lining means that protectively overlies a truck bed and that conforms to the configuration and dimension of said truck bed;
 - said truck bed lining means being releasably secured in overlying relation to said truck bed;
 - said truck bed lining means forming a camper top means when released from its overlying relation to said truck bed, inverted and secured in enclosing relation to said truck bed; and
 - a closure member hingedly connected to said truck bed lining means, said closure member cooperating with a tailgate means of a truck to enclosed a bed area of said truck when said truck bed lining means is in its inverted, camper top means-providing position.

4,875,732

CHAIR CONSTRUCTION

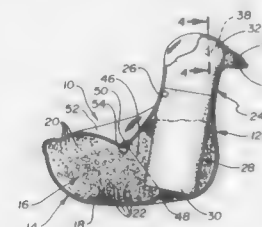
Anthony D. Miller, 2103 Emerson Ave. South, Minneapolis, Minn. 55405

Continuation of Ser. No. 46,658, May 4, 1987, abandoned. This application Jul. 20, 1988, Ser. No. 221,899

Int. Cl.⁴ A63G 9/10

U.S. Cl. 297-181

11 Claims



1. A chair, comprising:
- a flexible envelope having a first portion defining a reservoir therewithin, and a second portion disposed proximate a periphery of said first portion wherein said second portion can be extended upward from said first portion, an interior of said second portion communicating with said reservoir;
 - a generally elongated member received in said second portion of said envelope and having a base extending downwardly into said reservoir; and
 - a quantity of fill occupying said reservoir and having said base of said elongated member immersed therein, said fill surrounding at least a lower portion of said base and having a consistency and a density such that it will tend to maintain said pillar-like member at a constant angle relative to a surface on which the chair is positioned when torqueing force, less than of a threshold amount, is applied thereto, yet will permit angular adjustment of said pillar-like member relative to the surface on which the chair is positioned when torqueing force applied to said pillar-like member exceeds the threshold amount.

4,875,733

VEHICLE REAR BODY STRUCTURE

Hiroyuki Chado; Tatsuo Maeda, both of Hiroshima, and Mitsuo Nakano, Kure, all of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Mar. 9, 1988, Ser. No. 166,099

Claims priority, application Japan, Mar. 10, 1987, 62-54417; Mar. 12, 1987, 62-57607

Int. Cl.⁴ B62D 25/02, 25/08

U.S. Cl. 296-195

1 Claim



1. A vehicle rear body structure including a rear inner panel having a bulged portion extending longitudinally, a first reinforcement panel extending longitudinally along the bulged portion and joined with an inner side surface of the rear inner panel to form a belt line reinforcement structure of a closed

cross-section, a second reinforcement panel having an arcuate configuration and joined with the inner side surface of the rear inner panel at a lower end portion and joined with the first reinforcement panel at an upper end portion so that a space is formed under a tire housing flange formed at a lower end portion of the second reinforcement for receiving a rear wheel, and the rear inner panel, the first and second reinforcement panels being joined to form a tire housing reinforcement structure of a closed cross-section which extends forwardly to a side sill structure which forms a lower side frame structure of the body structure and extends rearwardly to a lower flange portion of the rear inner panel formed at a rear end portion thereof.

4,875,734

AUTOMOTIVE SEAT

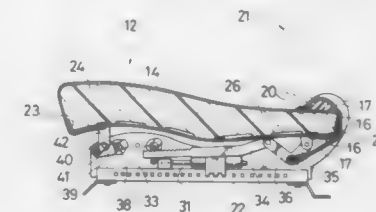
Sho Yokoyama, Akishima, Japan, assignor to Tachi-S Co., Ltd., Tokyo, Japan

Filed Dec. 30, 1987, Ser. No. 139,784

Int. Cl.⁴ A47C 3/00

U.S. Cl. 297-284

6 Claims



1. An automotive seat comprising a seat cushion raisable and lowerable vertically by a lifter with respect to brackets integrally mounted to slide rails and a seat back fixed at a constant height, wherein an expandable and contractible resilient member is disposed at a position on the upper surface of said seat cushion to which the lower end portion of said seat back faces, and said resilient member is covered by a cover so as to close a spacing between said seat cushion and said seat back.

4,875,735

SEATBACK RECLINER MECHANISM

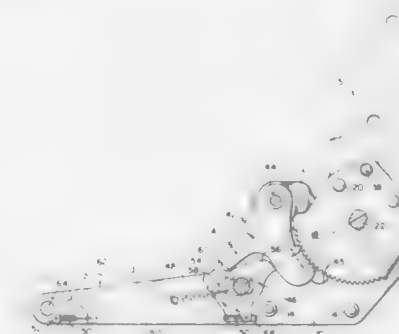
George A. Moyer, 70355 Hilltop La., Union, Mich. 49130, and Chung L. Chang, 15737 Garfield Ave., No. 17, Paramount, Calif. 90723

Filed Mar. 30, 1984, Ser. No. 595,473

Int. Cl.⁴ B60N 1/06

U.S. Cl. 297-367

16 Claims



1. A hinge fitting for a reclining vehicle seat structure comprising:
fixed support means;

a seatback support member pivotally connected to said fixed support means by a first pivot means for movement from an upright position rearwardly through a range of rearwardly inclined positions;

a locking member pivotally connected to said fixed support means by a second pivot means for fixing said seat back support member in adjusted position throughout the range of rearwardly inclined positions;

lock actuating means for moving said locking member to a locking and to an unlocking position, said locking means including a cam pivotally connected to said fixed support means by a third pivot means, said cam having a first cam arm engageable with said locking member to cam said locking member into said locking position, said cam having a second cam arm engageable with said locking member to cam said locking member into said unlocking position;

said lock actuating means including anti-unlocking means for preventing movement of said locking member out of said locking position in response to forces applied to said seatback support member; and

said anti-unlocking means including a camming surface on said first said cam arm which engages said locking member at an engagement point when said locking member is in said locking position such that a force acting perpendicularly at said engagement point tends to pivot said cam such that said first cam arm urges said locking member towards said locking position.

4,875,736

METHOD FOR THE PRODUCTION OF MOTOR VEHICLE SEATS AND SEATS OBTAINED BY THIS METHOD

Silvio Brambilla, Grugliasco, Italy, assignor to SICAM S.p.A., Turin, Italy

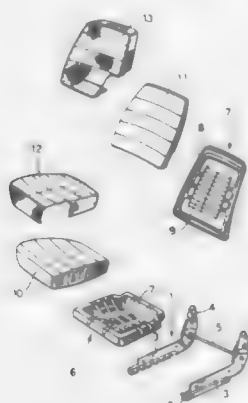
Filed Sep. 14, 1988, Ser. No. 244,235

Claims priority, application Italy, Sep. 14, 1987, 67780

Int. Cl.⁴ A47C 7/00

U.S. Cl. 297—440

5 Claims



1. A method for the production of motor vehicle seats comprising:

- providing a plurality of different first seat sub-units having a main frame provided with a plurality of different seat adjustment mechanisms, each including at least a longitudinal guide device and a backrest adjustment device;
- providing a plurality of different second sub-units each including a squab frame and different adjustment mechanisms;
- providing a plurality of different third sub-units each including a backrest frame and different adjustment mechanisms;
- providing a plurality of different fourth and fifth sub-units constituted respectively by the padding adapted to be

secured to said squab frame and said backrest frame and respective outer coverings for the padding;

selecting a specific sub-unit from each of said first through fifth sub-units; and

assembling the selected sub-units into a motor vehicle seat.

4,875,737

DISASSEMBLABLE CORRUGATED BOARD BACKED CHAIR

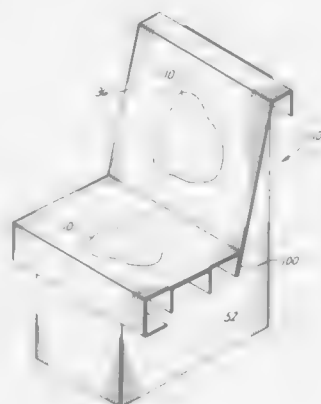
Alfonso Cardenas, Pico Rivera, Calif., assignor to Sunclipse, Inc., Montebello, Calif.

Filed Oct. 5, 1988, Ser. No. 253,494

Int. Cl.⁴ A47C 7/00

U.S. Cl. 297—442

13 Claims



9. A corrugated board chair comprising:

A. A corrugated board sheet formed into a box-like configuration with a front panel, said front panel having an upper edge and being transversely slotted below said edge two side panels and a rear panel, each panel having upper and lower edges and opened at its top and bottom to define a cavity rectangular in horizontal cross-section, the rear panel and edge portions of each side panel connected to the rear panel being higher than the upper edges of the remainder of the portions of the side panels, said higher side panel edges being joined to said lower upper side edge panel portions by angular intermediate edge portions, each of said lower side edges being slotted transversely at two locations spaced from each other and from the front panel, and further being transversely slotted at the point where said lower edge meets the said angular intermediate edge;

said front panel being transversely slotted below its upper edge, and slotting being extended into the side panels;

B. A corrugated board channel member, said channel member being inverted to present downwardly extending edges and disposed transversely to, and seated on, said side panels with the edges of said channel member extending into the spaced apart slots in the upper edges of said side panels; and

C. A corrugated board seat and back panel, said panel being of a width greater than the distance between said two side panel edges when the corrugated board sheet is in its box-like configuration and having one end inserted into said front panel slotting and its extensions into the side panels, being bent 90 degrees to extend up over the upper edge of the front panel and further similarly bent to lay on the upper edges of the lower side panels edge portions, and on said channel member; being further bent back upon itself for insertion into the slotting where the angular intermediate edges join the said lower side panel edge portions, and further laid over the angular intermediate edges to extend up over the higher side panel edges for securing thereon.

4,875,738

ARM-SUPPORTED CUTTING ROLL WITH EFFECTIVE LENGTH PIVOTALLY ADJUSTABLE ALONG MINING FACE

Alfred Zitz, Zeltweg, and Erich Brandl, Grosslobming, both of Austria, assignors to Voest-Alpine Maschinenbau Gesellschaft m.b.H., Linz, Austria

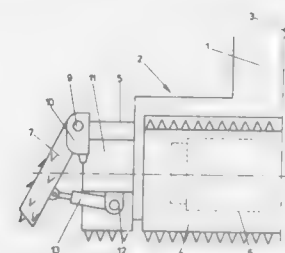
Filed Oct. 25, 1988, Ser. No. 261,893

Claims priority, application Austria, Oct. 29, 1987, 2856/87

Int. Cl.⁴ F21C 27/24

U.S. Cl. 299—80

5 Claims



1. An arm-supported cutting roll having an effective length which is adjustable along a mining face, comprising:

an axially elongated cutting roll having two opposite ends; an arm mounting said cutting roll for rotation about a longitudinal axis of said cutting roll;

said cutting roll having a plurality of cutting tools provided on a radially outer peripheral surface thereof having tips disposed for engagement, in use, with a mining face for cutting material from the mining face as the cutting roll is rotated about said axis;

means providing a swivel joint on said cutting roll, near one end thereof, said swivel joint being located closer to said longitudinal axis than are said tips of said cutting tools, said swivel joint providing a pivot axis which extends crosswise of an imaginary plane containing said longitudinal axis;

a tool carrier mounted to said swivel joint for pivotal movement about said pivot axis between a retracted position in which said tool carrier effectively extends said cutting roll axially by a first, lesser amount, and an extended position in which said tool carrier effectively extends said cutting roll axially by a second, greater amount;

means for operating said swivel joint for pivoting said tool carrier about said pivot axis to a desired position delimited by said retracted position and said extended position;

at least one cutting roll provided externally on said tool carrier, having a tip disposed for engagement, in use, with the mining face for cutting material from the mining face as the cutting roll, and thereby the tool carrier is rotated about said axis.

4,875,739

INDEPENDENT CONTINUAL QUICK SERVICE VALVE DEVICE

James E. Hart, Trafford, and Edward W. Gaughan, Irwin, both of Pa., assignors to American Standard Inc., Wilmerding, Pa.

Filed Jan. 17, 1989, Ser. No. 297,721

Int. Cl.⁴ B60T 15/42

U.S. Cl. 303—33

13 Claims

1. For use in an automatic fluid pressure brake system for a railway vehicle, a continual quick service valve device for providing a local venting of fluid pressure carried in a trainline brake pipe comprising:

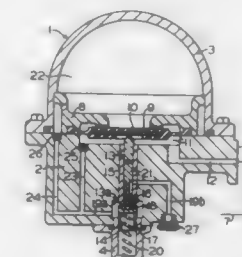
- (a) a control piston delineating a control chamber on one side thereof connected to said brake pipe and a quick service reference chamber on the opposite side thereof;
- (b) a first passage between said control chamber and said

reference chamber via which said reference chamber is charged with fluid pressure from said brake pipe;

(c) an exhaust passage having a connection with said first passage at a location intermediate said control chamber and said reference chamber;

(d) valve means in said exhaust passage for normally interrupting venting of said first passage in a deactuated condition of said control piston and for establishing venting of said first passage in an actuated condition of said control piston;

(e) first choke means in said first passage between said reference chamber and said connection of said exhaust passage with said first passage for restricting the backflow of fluid



pressure from said reference chamber in response to an external reduction of said brake pipe fluid pressure to thereby establish an actuating pressure differential across said control piston and, accordingly effect said actuated condition thereof, whereby the fluid under pressure in said control chamber and the fluid under pressure in said reference chamber are concurrently vented locally via said exhaust passage; and

(f) second choke means in said first passage between said control chamber and said connection of said exhaust passage with said first passage for controlling the rate at which said brake pipe pressure is vented locally from said control chamber.

4,875,740

BRAKING DEVICE FOR USE IN A MOTOR VEHICLE

Toshio Takayama, Kanagawa, Japan, assignor to Tokico, Ltd., Japan

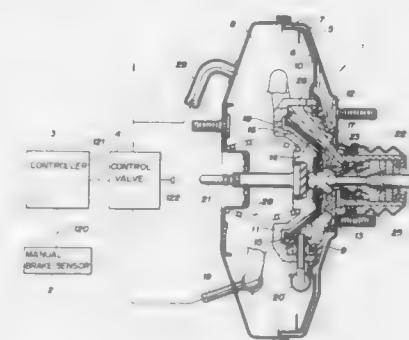
Continuation of Ser. No. 13,420, Feb. 11, 1987, abandoned. This application Jan. 17, 1989, Ser. No. 298,314

Claims priority, application Japan, Feb. 20, 1986, 61-33531; Feb. 20, 1986, 61-23307[U]; Apr. 18, 1986, 61-58307

Int. Cl.⁴ B60T 15/04, 8/86; F15B 13/10

U.S. Cl. 303—50

4 Claims



1. A braking device for use in a motor vehicle comprising: a vacuum motor having a casing;

a power piston displaceably mounted in the casing through a diaphragm to partition the interior of the casing into a

constant pressure chamber and a variable pressure chamber and displaceable by the pressure difference between the two chambers;

an input rod adapted to be connected to a brake pedal;

a valve mechanism disposed in the power piston for controlling the pressure in the variable pressure chamber in response to force applied to the input rod;

a control valve connected to the vacuum motor for controlling the pressure in the variable pressure chamber independently from said valve mechanism, said control valve being electrically controllable for generating an output for controlling the pressure in the variable pressure chamber which is proportional to the current applied to the control valve;

a controller for controlling the current applied to said control valve;

a manual actuator for controlling said controller in response to an input applied to said manual actuator; and

a sensor for detecting the amount of the input applied to said actuator and for sending an output corresponding to the amount of the input detected by said sensor to said controller;

said controller including determining means for determining whether the amount detected by the sensor is on an increasing gradient or on a decreasing gradient and for generating signals corresponding to said determination, and control means for controlling the current to be applied to said control valve in response to the signals from said determining means for causing the current corresponding to the amount of input detected by the sensor as being on an increasing gradient and the current corresponding to the amount of input detected by the sensor as being on a decreasing gradient to be proportional respectively to the amount of the input applied to the manual actuator, and also for causing said current corresponding to an increasing gradient input and said current corresponding to a decreasing gradient input to be different from each other by a predetermined value with respect to the amount of the input applied to the actuator.

4,875,741

ANTI-SKID BRAKING CONTROL SYSTEM FOR USE ON MOTOR VEHICLE

Takashi Ozawa, Gifu; Hitoshi Tanaka, Oobu; Takahiro Goshima, Gifu, and Kozi Takagi, Takahama, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

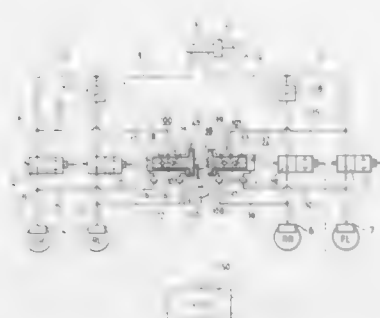
Filed Feb. 1, 1989, Ser. No. 304,595

Claims priority, application Japan, Feb. 2, 1988, 63-23304

Int. Cl.⁴ B60T 8/40

U.S. Cl. 303—116

12 Claims



1. An anti-skid braking control system for use on a motor vehicle having first and second wheels, comprising:

a master cylinder;

first and second wheel cylinders for braking the first and second wheels, respectively, with a braking medium pressure transmitted from said master cylinder;

first and second solenoid-operated valves disposed in pipes

interconnecting said master cylinder and said first and second wheel cylinders, respectively, for selectively providing communication between said master cylinder and said first and second wheel cylinders through said pipes; first and second pumps connected to said pipes, respectively, for delivering a braking medium from downstream portions of said pipes which are disposed downstream of said first and second solenoid-operated valves with respect to the direction in which the braking medium pressure is transmitted from said master cylinder to said first and second wheel cylinders, to upstream portions of said pipes which are disposed upstream of said first and second solenoid-operated valves with respect to said direction;

said first and second pumps comprising a common housing, a common plunger slidably disposed in said common housing and reciprocally movable therein, and first and second pressure varying chambers defined by said plunger independently of each other and having respective volumes variable in response to reciprocating movement of said common plunger, said first and second pressure varying chambers having inlet ports, respectively, connected directly to said downstream portions of said pipes.

4,875,742

SOLENOID OPERATED HYDRAULIC CONTROL VALVE

Michael J. Hawker, Lincoln, England, assignor to Clayton Dewandre Co. Ltd., Lincoln, England

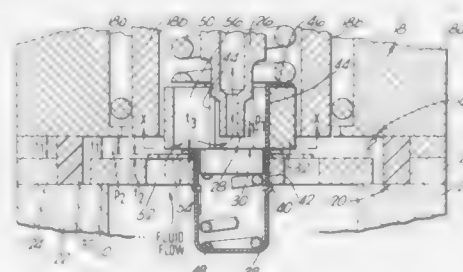
Filed Apr. 22, 1988, Ser. No. 184,738

Claims priority, application United Kingdom, Apr. 23, 1987, 8709615

Int. Cl.⁴ B60T 15/02; F16K 31/02

U.S. Cl. 303—119

14 Claims



1. A solenoid-operated control valve, said control valve comprising a valve element and a valve seat, each having a flat surface, each said flat surface being co-operable to control a flow of fluid through said valve, wherein at least a portion of a solenoid armature has opposed parallel surfaces and is disposed within a gap defined between parallel faces for movement axially within said gap to operate said valve, wherein said flat surface of said valve seat is disposed in a plane of one of said parallel faces, and wherein one of said parallel faces is a face of a solenoid stator, a first spacing means whose thickness determines a magnetic reach of said armature, a second spacing means disposed in said gap to intervene between said armature and said face of said solenoid stator and whose thickness determines an energized gap between said armature and said stator when said solenoid is energized, and a third spacing means whose thickness defines a distance between said valve element face and one of said armature surfaces to produce excess travel of said valve element relative to said armature travel, whereby wear or erosion of one of said valve element and said valve seat is compensated.

4,875,743

RECORDING MEDIA STORAGE APPARATUS

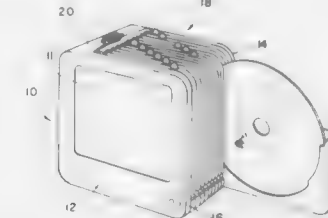
Anthony Gelardi, Cape Porpoise, Me.; Alan Lowry, Canton, Mass., and Craig Lovecky, Old Orchard Beach, Me., assignors to Shape Inc., Biddeford, Me.

Filed Jul. 5, 1988, Ser. No. 215,357

Int. Cl.⁴ A47B 81/06

U.S. Cl. 312—13

36 Claims



1. An apparatus for storing a plurality of disc-shaped recording media, each having an outer circumferential edge, comprising:

portable housing means for securely housing and portably transporting the plurality of disc-shaped recording media; holder means, pivotally connected to the housing, for holding the plurality of disc-shaped recording media by the outer circumferential edges thereof the holder means including a plurality of thin substantially C-shaped lever members formed of a flexible material, each having an inner circumferential surface for holding a disc-shaped recording media thereon, and each circumferential surface having a radius substantially equal to a radius of the disc-shaped recording media and a recording media insertion diameter smaller than the diameter of the disc-shaped recording media wherein the C-shaped lever member acts as a spring and flexes open when the disc-shaped recording media is inserted and securely holds the media therein upon insertion;

pivot means, disposed within the housing, for pivotally moving the holder means into and out of the housing; and lock means for locking the holder means in the housing.

4,875,744

PARTS ORGANIZER

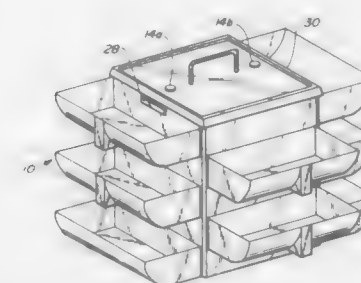
Ulrich Wettstein, 1281 Andersen Dr., San Rafael, Calif. 94901

Filed Feb. 23, 1988, Ser. No. 159,271

Int. Cl.⁴ A47B 49/00

U.S. Cl. 312—266

2 Claims



1. A parts organizer having a plurality of walls bearing vertically spaced trays, said walls operatively connected to interleaf said trays and form a closed unitary structure when in a closed position, said trays having an upwardly curved lower surface, the improvement comprising:

a structural foot portion located generally in the center of said trays and extending from said curved lower surface, wherein said foot portion provides a barrier to and pre-

vents migration of parts between the trays interleaved immediately below said foot.

4,875,745

LATCH FOR COOLER

Arthur W. Trulaske, Chesterfield, Mo., assignor to True Manufacturing Co., Inc., O'Fallon, Mo.

Filed Feb. 23, 1988, Ser. No. 159,383

Int. Cl.⁴ A47B 95/00

U.S. Cl. 312—298

8 Claims



1. In a cooler having two or more doors mounted to a housing of the cooler, the doors being vertically arranged and separately openable and closable and each having an inner face, an improvement comprising conversion apparatus for converting the multiple doors to a single door, the conversion apparatus including a sealing means comprising a multiple channel base element affixed to the inner face of each door and extending around the periphery thereof to form a seal between the door and the housing when the door is closed; and, latch means attachable to the sealing means of one door and the sealing means of an adjacent door to form a rigid connection therebetween whereby the doors operate in unison.

4,875,746

DRAWER ASSEMBLY

Erich Röck, Höchst, and Klaus Brüstle, Lauterbach, both of Austria, assignors to Julius Blum Gesellschaft m.b.H., Höchst, Austria

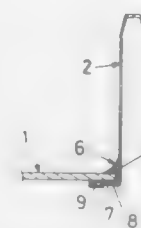
Filed Feb. 10, 1988, Ser. No. 154,215

Claims priority, application Austria, Mar. 5, 1987, 495/87

Int. Cl.⁴ A47B 88/00

U.S. Cl. 312—330.1

5 Claims



1. In a drawer assembly including a bottom plate and metal side walls on each of opposite sides of said bottom plate, each said side wall having a Z-shaped profile including upper and lower horizontal flanges, said bottom plate being positioned on said lower horizontal flanges of said side walls, and sealing members separate from said side walls, each said sealing member covering a gap between said bottom plate and a respective said side wall, the improvement wherein each said sealing member comprises:

a U-shaped configuration embracing the respective side of said bottom plate and positioned between said bottom plate and the respective said side wall, said U-shaped configuration including a horizontal flange positioned between said bottom plate and said lower horizontal flange of said respective side wall, said horizontal flange

of said sealing member having a free end defining a recess into which is fitted said lower horizontal flange of said respective side wall.

4,875,747 DRAWER

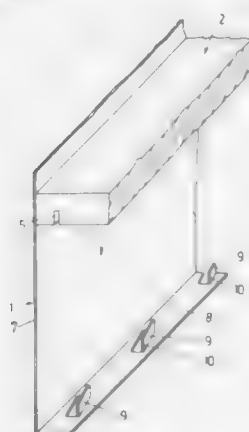
Helmut Hollenstein, Lustenau, Austria, assignor to Julius Blum Gesellschaft m.b.H., Höchst, Austria

Filed Nov. 17, 1988, Ser. No. 272,248

Claims priority, application Austria, Dec. 24, 1987, 3431/87
Int. Cl.⁴ A47B 88/00

U.S. Cl. 312—330.1

5 Claims



1. A drawer comprising:
metal side walls having vertical flanges which form lateral limitations of said drawer, each said side wall having at a lower part thereof a respective horizontal flange;
a bottom plate abutting on said horizontal flanges, said bottom plate having parallel lateral edges and a pair of longitudinal grooves extending parallel to said lateral edges; and
said horizontal flanges having extending therefrom a plurality of flaps extending into said grooves, said flaps extending obliquely to the longitudinal direction of said grooves, such that opposite end edges of each said flap are pressed into respective spaced walls of said bottom plate that define the respective said groove.

4,875,748

POLYGON MIRROR

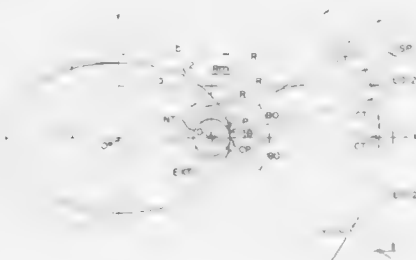
Yasuo Matsumoto, Numazu; Kazunori Murakami; Tomonori Ikumi, both of Shizuoka, and Yasuo Iwafune, Tokyo, all of Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Jul. 1, 1988, Ser. No. 214,605

Claims priority, application Japan, Jul. 6, 1987, 62-168029
Int. Cl.⁴ G02B 26/10

U.S. Cl. 350—6.8

16 Claims



1. A polygon mirror comprising a plurality of elliptic convex surfaces functioning as light reflection surfaces and each hav-

ing substantially the same shape as the maximum curvature portion of an ellipse having a long axis b and a short axis c , said elliptic convex surfaces being uniformly arranged on the circumference of an inscribed circle whose center is set on said long axis b , whose radius is R_m , and which is in contact with the maximum curvature portion of said ellipse.

4,875,749

MECHANISM FOR POSITIONING THE LIGHT-RECEIVING END OF AN OPTICAL CONDUCTOR CABLE AT THE FOCAL POSITION OF A LENS

Kei Mori, 3-16-3-501, Kaminoge, Setagaya-ku, Tokyo, and Inao Kosugi, Tokyo, both of Japan, assignors to Kei Mori, Tokyo, Japan

Filed Aug. 29, 1988, Ser. No. 238,023

Claims priority, application Japan, Dec. 28, 1987, 62-334062
Int. Cl.⁴ G02B 6/32

U.S. Cl. 350—96.18

12 Claims



1. A mechanism for positioning the light-receiving end of an optical conductor means at the focal point of a lens comprising a frame means, a lens mounted on said frame means, a holding member mounted on said frame means, said holding member having inner and outer longitudinal ends and an elongated passageway extending between said inner and outer longitudinal ends, said inner end extending into said frame means, an optical conductor means having a longitudinal end portion disposed in said passageway, said optical conductor means having a light-receiving end extending into said frame means and facing said lens such that said light-receiving end receives light rays from said lens, said longitudinal end portion of said optical conductor means having a constant outer diameter along its longitudinal length, positioning means on said optical conductor means having an outer diameter greater than said outer diameter of said longitudinal end portion of said optical conductor means, said outer longitudinal end of said holding member having threaded means thereon, a cap nut mounted on said threaded means, said cap nut having a slit for receiving said optical conductor means such that said cap nut can be slipped over said optical conductor means to a position to engage said threaded means, said cap nut having a transverse wall which is perpendicular to the axis of said elongated passageway and which engages said positioning means on said optical conductor means as said cap nut is threaded on to said threaded means such that said positioning means is disposed between said transverse wall and said outer longitudinal end of said holding member and said cap nut thereby secures said optical conductor means to said holder member with the axial thickness of said positioning means determining the spacing between the light-receiving end of said optical conductor means and said lens.

4,875,750

OPTOELECTRONIC COUPLING ELEMENT AND METHOD FOR ITS MANUFACTURE

Werner Spaeth, Holzkirchen; Guenther Waitl, Regensburg; Werner Kuhlmann, Munich; Hans-Ludwig Althaus, Lappersdorf; Rolf Birkmann, Leber; Waltraud Klos, Regensburg, and Axel Schubert, Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

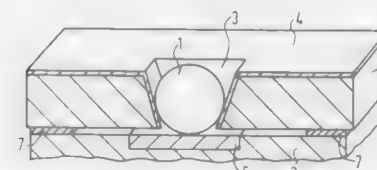
Filed Feb. 2, 1988, Ser. No. 151,372

Claims priority, application Fed. Rep. of Germany, Feb. 25, 1987, 3706103

Int. Cl.⁴ G12B 6/32

U.S. Cl. 350—96.18

6 Claims



1. An optoelectronic coupling element comprising:
a light wave guide;
a first carrier chip including a semiconductor light transducer;
a microlens for optically coupling the light wave guide and the semiconductor light transducer, wherein the microlens is a spherical lens;
a second silicon carrier chip defining a truncated pyramid-shaped lens receptacle, wherein the first carrier chip is fixed to the second carrier chip such that the semiconductor light transducer is adjacent to the microlens, and the lens receptacle is anisotropically etched into the second carrier chip; and
glass solder means for fixing the microlens in the lens receptacle.

4,875,751

LOW LOSS PHOTO PLOTTER IMAGING SYSTEM

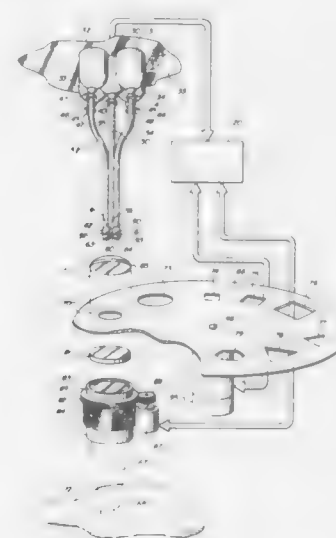
Bruce H. Ostermeier, Fairfield, Calif., assignor to AM International Corporation, Chicago, Ill.

Filed Jul. 20, 1987, Ser. No. 75,443

Int. Cl.⁴ G02B 6/32

U.S. Cl. 350—96.18

24 Claims



1. For use in a photoplotter in which a source of imaging

light beam is supported upon a movable carriage and is directed to a photosensitive media to expose a latent image thereon, an imaging system operative without a shutter mechanism providing a light beam having rapid rise and fall times relative to carriage motion, said imaging system comprising:
a plurality of light emitting diodes each capable of producing a light output turned on and off solely by applied electrical signals;
a fiber-optic link having a first end optically coupled to said plurality of light emitting diodes and a second end;
lens means optically coupled to said second end of said fiber optic link; and
aperture means, interposed between said second end of said fiber optic link and said lens means, including an opaque member defining a light transparent aperture.

4,875,752

OPTICAL SEMICONDUCTOR MODULE USING DUMMY FERRULE

Akinobu Suzuki, Kamakura, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

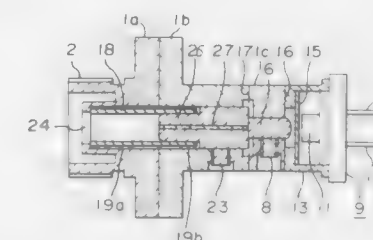
Filed Feb. 12, 1988, Ser. No. 155,517

Claims priority, application Japan, Feb. 13, 1987, 62-19527; Mar. 5, 1987, 62-32127

Int. Cl.⁴ G02B 6/36

U.S. Cl. 350—96.2

5 Claims



1. An optical semiconductor module comprising an optical semiconductor assembly having a light transmitting aperture, a housing having a joint surface at its one end to be joined to said optical semiconductor assembly, an outer male screw portion and a first hole means for receiving an optical fiber supporter at its other end, a lens held in a second hole means formed in said housing so as to be in communicative alignment with said light transmitting aperture and said first hole means, characterized by comprising a slitted sleeve placed in a hole communicated with said first hole means and a dummy ferrule placed in said communicated hole of said housing, with an axially extending central bore for passing light, which is placed between said first hole means and said lens so that one end portion of said dummy ferrule is inserted in said slitted sleeve so as to be in contact with said optical fiber supporter when it is fitted.

4,875,753

FIBER OPTIC CONNECTORS

Vasilios E. Kalomiris, 20 Line Rd., Holmdel, N.J. 07733

Filed Jul. 2, 1986, Ser. No. 880,511

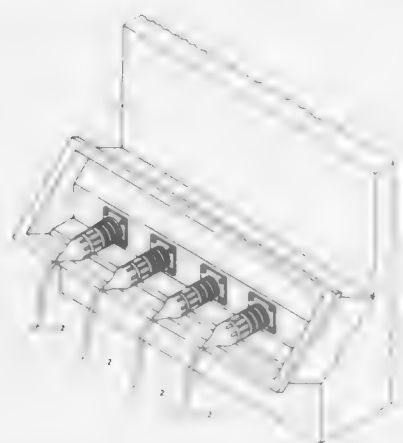
Int. Cl.⁴ G02B 6/36

U.S. Cl. 350—96.20

12 Claims

12. In combination, equipment means providing electronic messages of various predetermined types and classifications, a plurality of fiber optic cables for carrying respective messages between said equipment means and one or more remote locations, said equipment means having a plurality of output ports to which said fiber optic cables are respectively connected, each fiber optic cable having at least two optical fibers and a separate and individual connector assembly at each end thereof, each connector assembly of a given cable having the very same keying insert end plug with an end face configura-

tion that is unique to said given cable, said end face configuration having one or more sections that are axially recessed with respect to one or more other sections thereof, the plurality of cables having unique keying insert end plugs in their respective connector assemblies different from those of the other connector assemblies, each of said plurality of output ports having a bulkhead connector assembly with a keying insert end plug of



end face configuration that is unique to a given output port, each bulkhead assembly keying insert being of a different end face configuration from those of the other bulkhead assembly keying inserts, each bulkhead connector assembly having a keying insert which is identical to the keying insert of a selected cable so that each bulkhead connector assembly matches and mates with one, and only one, cable connector assembly.

4,875,754

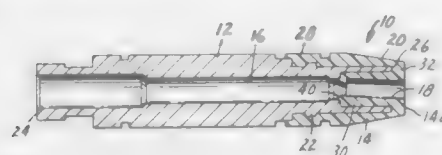
OPTICAL FIBER CONNECTOR

Ram A. Rao, Middletown; Mogens Kofod, Howell; Julius P. Schamper, and George Gallotti, both of Edison, all of N.J., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Aug. 28, 1987, Ser. No. 90,790
Int. Cl.⁴ G02B 6/38

U.S. Cl. 350—96.20

28 Claims



1. An optical fiber connector, comprising:

- (a) an elongate plug support member having an interior bore extending between opposed first and second ends thereof;
- (b) a plug circumscribing a portion of said plug support member adjacent said second end thereof, extending therewithin and also being longitudinally outward of said second end, said plug defining an interior bore extending therethrough into communication with said plug support member bore; and
- (c) an insert disposed in said plug interior bore and successively radially circumscribed by said plug and said plug support member, said insert defining an interior passage for receiving an optical fiber and centering same with respect to said plug interior bore.

4,875,755

FIBER OPTIC CONNECTOR ASSEMBLY AND METHOD OF MAKING SAME

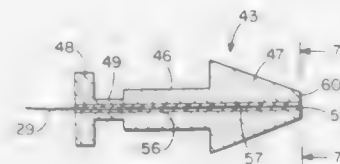
John A. Borgos; Francis Bradac, both of St. Paul; Daniel J. Haumschild, Coon Rapids; Timothy Johnson, New Brighton, all of Minn., and Rebecca Lee, Albuquerque, N. Mex., assignors to TSI Incorporated, St. Paul, Minn.

Division of Ser. No. 907,086, Sep. 15, 1986, Pat. No. 4,772,081.
This application Aug. 1, 1988, Ser. No. 226,825

Int. Cl.⁴ G02B 6/36

U.S. Cl. 350—96.20

14 Claims



1. An optical fiber connector assembly for coupling an optical fiber cable having at least one optical fiber to a support associated with means for transmitting or receiving light comprising: a housing, means releasably connecting said housing to said support to hold said housing in engagement therewith, said housing having means to connect an optical fiber cable thereto and passage means for accommodating an optical fiber of said cable, ferrule means mounted on said housing for supporting the optical fiber, said ferrule means including a head having a cone-shaped outer surface, a flat forward end, and a longitudinal hole through said head open to said forward end, said optical fiber extended through said hole, means in said hole securing the optical fiber to said ferrule means to fix the position of the optical fiber relative to the ferrule means, said optical fiber having an end polished smooth and flush with said flat forward end of the head, said cone-shaped outer surface of the head being precision ground after the optical fiber has been secured to the ferrule means to concentrically locate said cone-shaped outer surface of the head about said end of the optical fiber, and receptacle means having a cone shaped recess complementary in size and shape to the cone-shaped outer surface of the head, said cone-shaped recess being aligned with and open to a means for transmitting or receiving light, said head being located in said cone-shaped recess with said cone-shaped outer surface of the head cooperating with the cone-shaped recess to locate the end of the optical fiber in precise radial alignment with said means for transmitting or receiving light.

11. A method of making a ferrule for an optical fiber connector assembly, said ferrule having a head with a forward end and conical outer surface, and an optical fiber longitudinally secured to said ferrule, said fiber having an end flush with said forward end comprising: forming a longitudinal hole through the center of the ferrule, locating an optical fiber in said longitudinal hole, securing said fiber to the ferrule, polishing the end of the optical fiber until it is smooth and flush with a forward end of the head, and grinding the conical outer surface of the head to concentrically locate said conical outer surface of the head about said end of the optical fiber.

4,875,756

FRESNEL LENS APPARATUS FOR OPTICALLY COUPLING A PLURALITY OF DATA CHANNELS

Marvin F. Ester, Oakfield, and Arnold W. Langershausen, West Henrietta, both of N.Y., assignors to Eastman Kodak Co., Rochester, N.Y.

Filed Sep. 27, 1988, Ser. No. 249,819

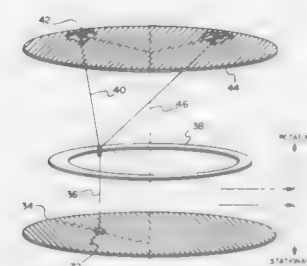
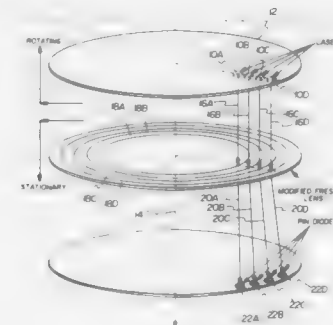
Int. Cl.⁴ G02B 6/36

U.S. Cl. 350—96.20

6 Claims

1. Optical data signal apparatus comprising: an optical data signal transmitter, an optical data signal receiver, and means

for mounting said transmitter and said receiver for relative rotation with respect to one another about a rotational axis in a plane which is perpendicular to said rotational axis, wherein said transmitter and said receiver are axially spaced from one another and each of which is radially spaced from said axis; and



a substantially planar, fresnel optical coupling element which is spaced from and located between said transmitter and said receiver, which has a central axis coincident with said rotational axis and which causes a collimated optical data signal, which is transmitted by said transmitter along a first path to said element, to be focused along a second path to said receiver.

4,875,757

OPTICAL CABLE

Johannes Greveling, Saskatoon, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Continuation-in-part of Ser. No. 877,064, Jun. 23, 1986, Pat. No. 4,763,982. This application May 20, 1988, Ser. No. 196,525

Int. Cl.⁴ G02B 6/44

U.S. Cl. 350—96.23

6 Claims



1. An optical cable having a plurality of optical fibers, a cable jacket and a tubular cable tensile strength member surrounding the plurality of fibers as a group, the tubular cable tensile strength member comprising a plurality of glass filaments with gaps between adjacent filaments filled by a rigid material holding the filaments in their relative positions in which the filaments extend side-by-side longitudinally of the cable, the glass filaments occupying more volume of the tube than is occupied by the rigid material, and the cable jacket extruded onto and contacting the tensile strength member with tensile strength member having an inner diameter greater than

the combined diameters of the fibers of the group whereby each fiber is radially movable within the tube.

4,875,758

PLASTIC-COATED OPTICAL TRANSMISSION FIBER AND AN ESTIMATING METHOD THEREOF

Shigeo Masuda, and Toshifumi Hosoya, both of Kanagawa, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

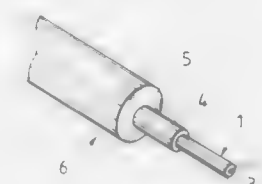
Filed Dec. 28, 1988, Ser. No. 291,292

Claims priority, application Japan, Dec. 28, 1987, 62-334265; Jan. 8, 1988, 63-3021

Int. Cl.⁴ G02B 5/172

U.S. Cl. 350—96.30

5 Claims



1. An optical transmission line, comprising:

- a glass fiber; and
- a coating of an organic matter covering said glass fiber, said glass fiber and said coating of said organic matter being in sufficiently close contact that the lower limit of temperature at which a dynamic loss ($\tan \delta$) begins to indicate 0.05 or more is not higher than 60° C. when dynamic viscoelasticity is measured in a manner so that dynamic vibrations are applied to one end and stress is detected at the other end of said optical-transmission fiber.

4,875,759

OPTICAL FIBER AND METHOD OF PRODUCING THE SAME

Kazufumi Ogawa, Hirakata, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

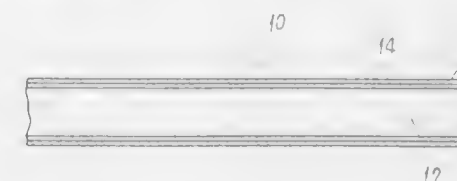
Division of Ser. No. 799,452, Nov. 18, 1985, abandoned. This application Feb. 16, 1988, Ser. No. 158,111

Claims priority, application Japan, Nov. 19, 1984, 59-243676

Int. Cl.⁴ G02B 6/00

U.S. Cl. 350—96.34

11 Claims



1. An optical fiber comprising:

- a core;
- a clad formed on said core; and
- a protection layer formed on said clad, said protection layer being a monomolecular film of a silane surface active agent of the formula $\text{CH}_2=\text{CH}-(\text{CH}_2)_n-\text{SiCl}_3$ in which n is an integer.

4,875,760

REFLECTIVE PRISM ASSEMBLY

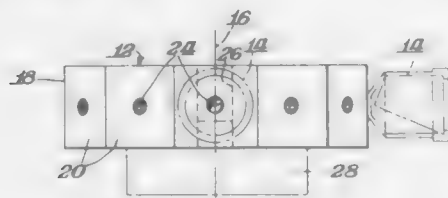
John H. Youngren, and David J. Youngren, both of 4516 Abbott Ave., Robbinsdale North, Minn. 55422

Filed May 13, 1988, Ser. No. 193,892

Int. Cl.⁴ G02B 5/122, 7/18

U.S. Cl. 350—102

18 Claims



1. A 360° reflective prism assembly comprising a generally plate-like mounting member having a central vertical axis and a peripheral surface portion defining an outer horizontal boundary of the mounting member, the peripheral surface portion of the plate-like mounting member including at least ten flat vertical faces equally angularly spaced from each other around the mounting member, and a plurality of equally spaced apart reflecting prisms arranged around the mounting member, one prism releasably attached to each flat face.

4,875,761

LIGHT CURTAIN APPARATUS

Günter Fetzner, Gundelfingen, Fed. Rep. of Germany, assignor to Erwin Sick GmbH Optik-Elektronik, Waldkirch, Fed. Rep. of Germany

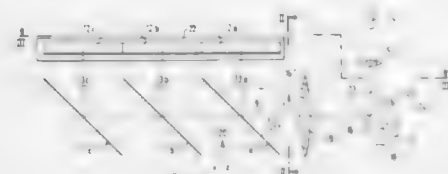
Filed Oct. 15, 1987, Ser. No. 109,131

Claims priority, application Fed. Rep. of Germany, Oct. 16, 1986, 3635271

Int. Cl.⁴ G02B 26/10

U.S. Cl. 350—171

4 Claims



1. In a three dimensional cartesian space having mutually orthogonal x, y and z directions, a light curtain apparatus for generating a relatively broad, relatively thin light curtain, lying in a single plane, from a relatively narrow, relatively thick light curtain, and for directing said generated light curtain through a monitored region, the apparatus comprising:

means for projecting a light curtain in the x direction, said light curtain having a width extending in the z direction and a thickness extending in the y direction;

a plurality of strip mirrors, arranged one strip mirror behind another in the x direction at an angle to the x direction, each strip mirror being laterally displaced in the y direction relative to a preceding strip mirror, each strip mirror reflecting a full width of the projected light curtain but only a portion of the thickness thereof through an angle of substantially 90 degrees into said z direction, forming thereby a plurality of reflected light curtain portions arranged in a row extending in the x direction, each said reflected light curtain portion being laterally displaced in the y direction relative to a preceding reflected light curtain portion, a total width of a row of reflected light curtain portions in the z direction corresponding to a width of said projected light curtain multiplied by the number of said strip mirrors;

a plurality of strip-like deflecting mirrors, each said deflecting mirrors extending in the x direction;

a respective strip-like deflecting mirror being associated with each said strip mirrors;

said strip-like deflecting mirrors being arranged in planes parallel to one another and displaced in the y direction in the manner of said strip mirrors, said strip-like deflecting mirrors having no displacement in the z direction;

each said deflecting mirror having a normal to its surface, each said normal forming a respective angle of 45 degrees with the z direction, and in a plane parallel to a plane defined by said y and z directions; and

whereby said deflecting mirrors deflect individual reflected light curtain incident thereon, which are displaced in accordance with the displacement of the first said strip mirrors, into a common plane parallel to a plane defined by the x and y directions, for transmission through said monitoring region as said relatively broad and relatively thin light curtain, thereby eliminating displacement of the reflected light curtains resulting from said lateral displacement of said first strip mirrors.

4,875,762

PHOTOCHROMIC-ELECTROCHROMIC INTERCALATION COMPOUND

Chuzo Kato, and Kazuyuki Kuroda, both of Tokyo, Japan, assignors to Osaka Yuki Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Apr. 8, 1988, Ser. No. 179,321

Claims priority, application Japan, Apr. 8, 1987, 62-84622

Int. Cl.⁴ G02F 1/17

U.S. Cl. 350—357

6 Claims

1. A photochromic-electrochromic intercalation compound synthesized by intercalating an organic compound exhibiting photochromism and electrochromism in combination with an electron donor between crystal layers of a natural clayish material.

4,875,763

VIDEO PROJECTOR LENS SYSTEM

Kazuo Yamakawa, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

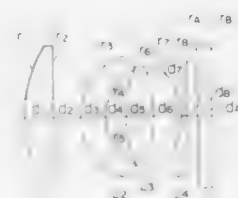
Filed Dec. 4, 1986, Ser. No. 937,968

Claims priority, application Japan, Dec. 11, 1985, 60-279923

Int. Cl.⁴ G02B 13/18

U.S. Cl. 350—432

10 Claims



1. A lens system for projecting onto a screen a video image formed on a face plate of a cathode ray tube comprising, from the screen side to the tube side;

a first positive lens having a screen side convex surface;

a second negative meniscus lens having a screen side convex surface;

a third bi-convex lens made of a glass material; and

a fourth negative lens having a screen side concave surface; wherein the lens system includes at least one aspheric surface and fulfills the following condition;

$$|f_2/f| > 8$$

$$f_2/f_3 < -6$$

wherein:

f represents a focal length of the whole lens system;

f_2 represents a focal length of the second lens; and

r_3 represents a radius of curvature of the screen side surface of the second lens.

4,875,764

ASSEMBLY FOR CORRECTION OF DISTORTIONS OF A MIRROR

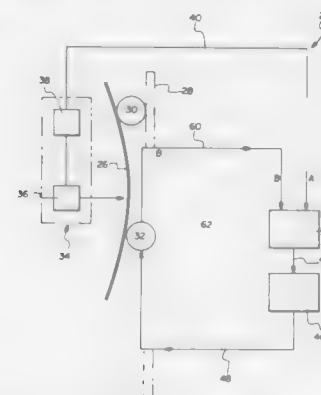
Philip F. Marino, Rochester, and Donald E. Vandenberg, Brockport, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 29, 1988, Ser. No. 225,901

Int. Cl.⁴ G02B 7/18

U.S. Cl. 350—611

24 Claims



1. An assembly comprising:

(a) a base structure;

(b) a mirror;

(c) at least one position actuator for positioning the mirror with respect to the base structure; and

(d) at least one force actuator, each of which force actuators can generate a desired controlled force for application to the mirror, and wherein each force actuator comprises a closed feedback loop that closes around the force actuator, so that, in response to a disturbance to the force actuator, the feedback loop maintains the desired controlled force.

4,875,765

METHOD FOR CORRECTION OF DISTORTIONS OF A MIRROR

Donald E. Vandenberg, Brockport; Donald A. Jacques, Pittsford, and William E. Schaffer, Spencerport, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 29, 1988, Ser. No. 226,339

Int. Cl.⁴ G02B 5/10, 7/18

U.S. Cl. 350—611

6 Claims

1. A method for providing corrections of mirror aberrations, the method comprising the steps of:

(a) applying a first force matrix $[F_W]$ to the mirror for introducing first deformations that act to cancel out a global mirror aberration;(b) forming a non-singular correction matrix CM comprising at least one column vector, wherein a column vector is dedicated to the global mirror aberration and includes at least one matrix element that carries information on the global mirror aberration, and at least one matrix element that carries information on undesired mirror aberrations induced by applying the first force matrix $[F_W]$;(c) forming a participation factor $[PF]$ matrix by inverting

the correction matrix, for eliminating the undesired mirror aberrations; and

ABERRATION	FUNCTIONAL	ABERRATION
DEFINITION	DEFINITION	DEFINITION
1. FOCUS	0.0000	0.0
2. SPHERICAL	0.0000	0.0
3. COMA	0.0000	0.0
4. ASTIGMATISM	0.0000	0.0
5. FIELD CURVATURE	0.0000	0.0
6. DISTORTION	0.0000	0.0
7. CHROMATIC	0.0000	0.0
8. SECONDARY SPECTRUM	0.0000	0.0
9. TERTIARY SPECTRUM	0.0000	0.0
10. FOURTH SPECTRUM	0.0000	0.0
11. FIFTH SPECTRUM	0.0000	0.0
12. SIXTH SPECTRUM	0.0000	0.0
13. SEVENTH SPECTRUM	0.0000	0.0
14. EIGHTH SPECTRUM	0.0000	0.0
15. NINTH SPECTRUM	0.0000	0.0
16. TENTH SPECTRUM	0.0000	0.0
17. ELEVENTH SPECTRUM	0.0000	0.0
18. TWELFTH SPECTRUM	0.0000	0.0
19. THIRTEENTH SPECTRUM	0.0000	0.0
20. FOURTEENTH SPECTRUM	0.0000	0.0
21. FIFTEENTH SPECTRUM	0.0000	0.0
22. SIXTEENTH SPECTRUM	0.0000	0.0
23. SEVENTEENTH SPECTRUM	0.0000	0.0
24. EIGHTEENTH SPECTRUM	0.0000	0.0
25. NINETEENTH SPECTRUM	0.0000	0.0
26. TWENTIETH SPECTRUM	0.0000	0.0
27. TWENTYFIRST SPECTRUM	0.0000	0.0
28. TWENTYSECOND SPECTRUM	0.0000	0.0
29. TWENTYTHIRD SPECTRUM	0.0000	0.0
30. TWENTYFOURTH SPECTRUM	0.0000	0.0
31. TWENTYFIFTH SPECTRUM	0.0000	0.0
32. TWENTYSIXTH SPECTRUM	0.0000	0.0
33. TWENTYSEVENTH SPECTRUM	0.0000	0.0
34. TWENTYEIGHTH SPECTRUM	0.0000	0.0
35. TWENTYNINTH SPECTRUM	0.0000	0.0
36. THIRTIETH SPECTRUM	0.0000	0.0
37. THIRTYFIRST SPECTRUM	0.0000	0.0
38. THIRTYSECOND SPECTRUM	0.0000	0.0
39. THIRTYTHIRD SPECTRUM	0.0000	0.0
40. THIRTYFOURTH SPECTRUM	0.0000	0.0
41. THIRTYFIFTH SPECTRUM	0.0000	0.0
42. THIRTYSIXTH SPECTRUM	0.0000	0.0
43. THIRTYSEVENTH SPECTRUM	0.0000	0.0
44. THIRTYEIGHTH SPECTRUM	0.0000	0.0
45. THIRTYNINTH SPECTRUM	0.0000	0.0
46. FORTIETH SPECTRUM	0.0000	0.0
47. FORTYFIRST SPECTRUM	0.0000	0.0
48. FORTYSECOND SPECTRUM	0.0000	0.0
49. FORTYTHIRD SPECTRUM	0.0000	0.0
50. FORTYFOURTH SPECTRUM	0.0000	0.0
51. FORTYFIFTH SPECTRUM	0.0000	0.0
52. FORTYSIXTH SPECTRUM	0.0000	0.0
53. FORTYSEVENTH SPECTRUM	0.0000	0.0
54. FORTYEIGHTH SPECTRUM	0.0000	0.0
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68. SIXTYSECOND SPECTRUM	0.0000	0.0
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70. SIXTYFOURTH SPECTRUM	0.0000	0.0
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73. SIXTYSEVENTH SPECTRUM	0.0000	0.0
74. SIXTYEIGHTH SPECTRUM	0.0000	0.0
75. SIXTYNINTH SPECTRUM	0.0000	0.0
76. SEVENTIETH SPECTRUM	0.0000	0.0
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78. SEVENTYSECOND SPECTRUM	0.0000	0.0
79. SEVENTYTHIRD SPECTRUM	0.0000	0.0
80. SEVENTYFOURTH SPECTRUM	0.0000	0.0
81. SEVENTYFIFTH SPECTRUM	0.0000	0.0
82. SEVENTYSIXTH SPECTRUM	0.0000	0.0
83. SEVENTYSEVENTH SPECTRUM	0.0000	0.0
84. SEVENTYEIGHTH SPECTRUM	0.0000	0.0
85. SEVENTYNINTH SPECTRUM	0.0000	0.0
86. EIGHTIETH SPECTRUM	0.0000	0.0
87. EIGHTYFIRST SPECTRUM	0.0000	0.0
88. EIGHTYSECOND SPECTRUM	0.0000	0.0
89. EIGHTYTHIRD SPECTRUM	0.0000	0.0
90. EIGHTYFOURTH SPECTRUM	0.0000	0.0
91. EIGHTYFIFTH SPECTRUM	0.0000	0.0
92. EIGHTYSIXTH SPECTRUM	0.0000	0.0
93. EIGHTYSEVENTH SPECTRUM	0.0000	0.0
94. EIGHTYEIGHTH SPECTRUM	0.0000	0.0
95. EIGHTYNINTH SPECTRUM	0.0000	0.0
96. NINETYETH SPECTRUM	0.0000	0.0
97. NINETYFIRST SPECTRUM	0.0000	0.0
98. NINETYSECOND SPECTRUM	0.0000	0.0
99. NINETYTHIRD SPECTRUM	0.0000	0.0
100. NINETYFOURTH SPECTRUM	0.0000	0.0
101. NINETYFIFTH SPECTRUM	0.0000	0.0
102. NINETYSIXTH SPECTRUM	0.0000	0.0
103. NINETYSEVENTH SPECTRUM	0.0000	0.0
104. NINETYEIGHTH SPECTRUM	0.0000	0.0
105. NINETYNINTH SPECTRUM	0.0000	0.0
106. HUNDRETH SPECTRUM	0.0000	0.0

(d) generating a product matrix $[PF][F_W] = [F_W]'$, for producing a second force matrix $[F_W]'$ for applying to the mirror second deformations.

4,875,766

FIBER REINFORCED PLASTIC REFLECTOR

Hisayo Shimodaira; Toshio Ono, both of Sagamihara; Keizo Miyawaki, and Tatsuya Hamaguchi, both of Amagasaki, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Jul. 8, 1987, Ser. No. 71,209

Claims priority, application Japan, Jul. 18, 1986, 61-169153; Aug. 8, 1986, 61-186438; Aug. 8, 1986, 61-186439; Oct. 3, 1986, 61-235695; Oct. 3, 1986, 61-235696; Oct. 3, 1986, 61-235697

Int. Cl.⁴ G02B 5/08, 7/18

U.S. Cl. 350—641

9 Claims



1. A fiber reinforced plastic reflector comprising:

a core which is made of an isotropic material with respect to mechanical and thermal properties selected from a uniform foamed metal having a density of 0.1–1.0 g/cm³, uniform porous glass having a density of 0.05–1.0 g/cm³, and a uniform porous ceramic having a density of 0.3–1.0 g/cm³;

two fiber reinforced plastic plates which are secured to opposite sides of the said core; and

a reflecting film which is formed atop the outer surface of one of said fiber reinforced plastic plates;

said core and said plastic plates having a linear thermal expansion coefficient of $\leq 1 \times 10^{-5}/^\circ\text{C}$. and providing a lightweight reflector not subject to significant thermal deformation.

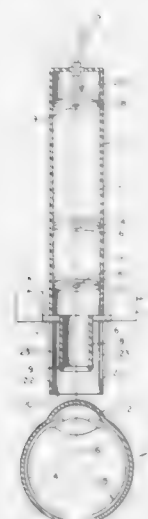
4,875,767

APPARATUS AND METHODS FOR MARKING THE VISUAL CENTER OF THE CORNEA OF A HUMAN EYE
Kenneth W. Wright, 1375 Pasqualito Dr., San Marino, Calif. 91108

Filed Mar. 3, 1988, Ser. No. 163,799
Int. Cl.⁴ A61B 3/10, 3/02

U.S. Cl. 351—212

14 Claims



1. An apparatus for identifying and marking the visual center of a cornea of a user includes cylindrical tube means, said tube being open at one end, and having inside said tube, sighting means positioned for permitting said user looking into the device to align the fovea and visual axis of his eye with said sighting means, and means coaxial with said tube means for marking said visual center on the epithelium of said cornea.

4,875,768

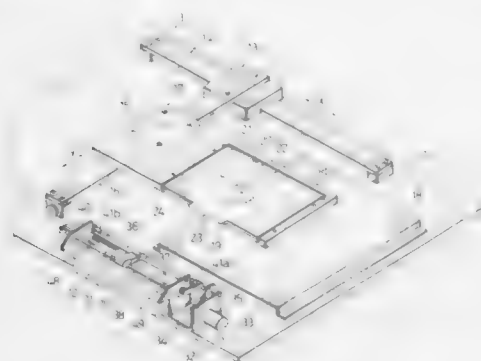
MICROFICHE READING APPARATUS
Hideoaki Hirasawa, and Nobuo Ueda, both of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan
Filed Apr. 1, 1988, Ser. No. 176,755

Claims priority, application Japan, Apr. 3, 1987, 62-83377; Apr. 3, 1987, 62-83379

Int. Cl.⁴ G03B 23/08

U.S. Cl. 353—27 A

20 Claims



1. A microfilm retrieving apparatus for retrieving a desired frame from a plurality of frames recorded on a microfilm, comprising:

optical means including a light source and a projecting lens for projecting micro-images of the frames;
microfilm support means for supporting the microfilm and movable longitudinally and transversely on a plane

substantially perpendicular to a projecting optical path of said optical means;

drive means for moving said support means;

read means for reading coded information which includes index information indicative of an address of an index frame on the microfilm and other information relating to a format of the microfilm, said coded information being provided in a region outside the micro-images on the microfilm;

command generating means for generating an index command; and

control means for controlling said drive means in accordance with the format information read by said read means for retrieving the desired frames on the projecting optical path, wherein said control means retrieves the index frame of the microfilm on the projecting optical path in response to said index command.

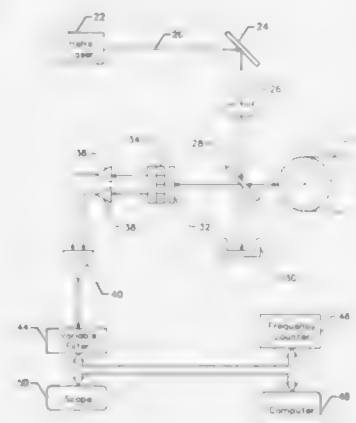
4,875,769

VELOCIMETER FOR A PRINTING PRESS WEB
Randolph S. Lineberger, Newbury Park, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jan. 22, 1988, Ser. No. 146,945
Int. Cl.⁴ G01P 3/36; G01N 21/86

U.S. Cl. 356—28

8 Claims



1. A velocimeter for a printing press web, comprising:

a source of coherent light positioned to reflect light off a printing press web;

a laser bandpass filter positioned to receive the light reflected off the web;

a linear photodetector array positioned to detect web motion using a speckle pattern produced by the filtered light, the individual photodetectors being differentially connected;

photodetector electronics for receiving the outputs of the photodetector array and for providing amplified and buffered outputs;

a differential amplifier for receiving the outputs of the photodetector electronics and for providing an amplified differenced output;

a variable filter which receives the amplified differenced output and provides a filtered output, the variable filter having a bandpass center frequency and bandwidth which can be varied;

a frequency counter which receives the filtered output and provides an output which is related to the frequency of the filtered output; and

means coupled to the variable filter and to the frequency counter for controlling the bandpass center frequency and bandwidth to provide a substantially linear response of web velocity vs counter frequency.

4,875,770

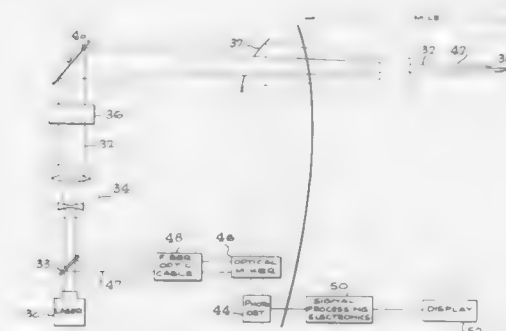
WIND SHEAR DETECTOR

Philip L. Rogers, Granada Hills, Calif., and Milton Rogers, Baltimore, Md., assignors to Lockheed Corporation, Calabasas, Calif.

Filed Mar. 23, 1987, Ser. No. 28,840
Int. Cl.⁴ G01C 3/08

U.S. Cl. 356—28.5

13 Claims



1. A wind velocity gradient detection system comprising: means for generating a beam of radiant energy; an optical system coupled to said beam for directing a first portion of said beam over multiple predetermined distances to a scatterer of radiant energy; multiple means coupled to said beam for conducting a second portion of said beam through a polarization medium, each of said multiple means having a length substantially matching one of said multiple predetermined distances; means for mixing said second portion with said radiant energy reflected by said scatterer; and means coupled to said means for measuring a component of the velocity of said scatterer.

4,875,771

METHOD FOR ASSESSING DIAMOND QUALITY
Heather J. Bowley, Staines, and Donald L. Gerrard, West Ewell, both of England, assignors to The British Petroleum Company p.l.c., London, United Kingdom

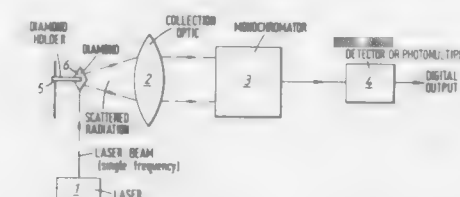
PCT No. PCT/GB86/00784, § 371 Date Aug. 6, 1987, § 102(e) Date Aug. 6, 1987, PCT Pub. No. WO87/03963, PCT Pub. Date Jul. 2, 1987

PCT Filed Dec. 19, 1986, Ser. No. 91,065

Int. Cl.⁴ G01J 3/44; G01N 21/65, 21/87

U.S. Cl. 356—30

11 Claims



1. A method for assessing diamonds of differing quality comprising the steps:

(a) calibrating a laser Raman spectrometer with diamonds of known quality characteristics, said spectrometer having a source of laser radiation, means for holding a diamond in a fixed orientation so that it may be irradiated with said radiation, and means for monitoring the intensity of scattered Raman radiation from said diamond, said calibration for each diamond of known quality characteristics comprising the steps: holding said diamond in a fixed orientation in said spectrometer, irradiating said diamond with

laser radiation, and monitoring the intensity of scattered Raman radiation from said diamond,
(b) holding a diamond of unknown quality characteristic in a fixed orientation in said spectrometer,
(c) irradiating said diamond of unknown quality characteristics with laser radiation of known frequency and intensity from said source of laser radiation,
(d) monitoring the intensity of scattered Raman radiation from said diamond of unknown quality characteristics for one or more orientations of said diamond, and
(e) comparing the intensity of said scattered Raman radiation from said diamond of unknown quality characteristics with the intensities for said diamonds of known quality characteristics.

4,875,772

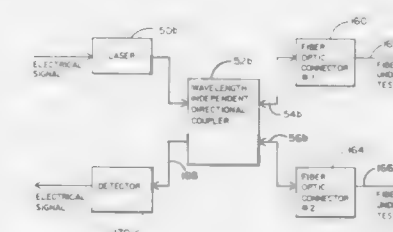
REMOTELY CONTROLLED OPTICAL TIME DOMAIN REFLECTOMETER SERVING A PLURALITY OF FIBER OPTIC CABLES

John R. Gentile, Frankfort, N.Y., assignor to Laser Precision Corporation, Utica, N.Y.

Filed Oct. 4, 1988, Ser. No. 253,088
Int. Cl.⁴ G01N 21/88

U.S. Cl. 356—73.1

11 Claims



11. The method of using a single optical time domain reflectometer to monitor faults in a plurality of fiber optic cables, which comprises:

including first and second fiber optic test strands in separate cables;
the first test strand being longer than the second test strand;
sending a laser signal through a directional coupler simultaneously into the first and second test strands;
directing the returning reflections through the directional coupler to a detector;
summing the returning reflections from the two test strands to provide a display graph of the summed reflections; and
if a fault occurs in either the first or second test strand, determining from their summed display whether the fault is in the first or second test strand.

4,875,773

OPTICAL SYSTEM FOR A MULTIDETECTOR ARRAY SPECTROGRAPH

Richard Burns, Webster, James Defendorf, Rochester, Edward King, Fairport, and Cornelius McCarthy, Pittsford, all of N.Y., assignors to Milton Roy Company, St. Petersburg, Fla.

Filed May 6, 1988, Ser. No. 191,262

Int. Cl.⁴ G01J 3/18

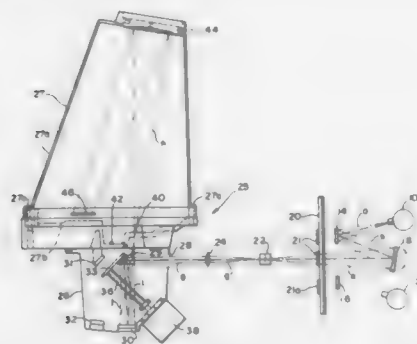
U.S. Cl. 356—328

32 Claims

1. An instrument for analyzing intensity variation as a function of wavelength of light, comprising:

a plurality of entry ports, each said entry port corresponding to a wavelength range of light;
detector means sensitive to said wavelength ranges of said light for producing a signal indicative of light intensity;
dispersing and focusing means optically coupled to said detector means for dispersing light emerging from said plural entry ports by wavelength and focusing said dispersed wavelengths onto said detector means, the position of said entry ports relative to said dispersing and focusing

means effecting optimum focus of the specific wavelength range of light for each said entry port at said detector means; and



means for selectively directing wavelength ranges of said light to said entry port corresponding to a wavelength range of light and for delivering light to a selected entry port position optically with respect to intensity, orientation and said wavelength range of said light.

4,875,774

APPARATUS AND METHOD FOR DETERMINING RING LASER GYROSCOPE PHASE AT TURNAROUND

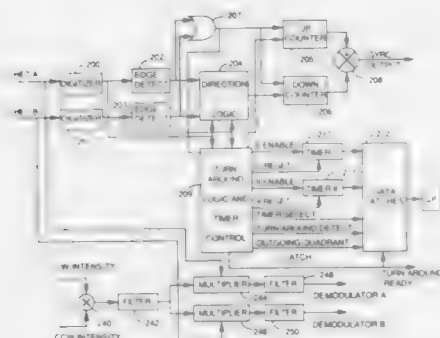
Daniel A. Tazartes, Beverly Hills; John G. Mark, Pasadena, and Anthony Matthews, Calabasas, all of Calif., assignors to Litton Systems, Inc., Beverly Hills, Calif.

Filed May 2, 1988, Ser. No. 189,047

Int. Cl.⁴ G01C 19/64

U.S. Cl. 356—350

18 Claims



1. A system for compensating for turnaround phase errors in measurements of rotations with a dithered ring laser gyroscope that includes a frame having a cavity therein for guiding a pair of counterpropagating light beams and means for producing a pair of heterodyne signals that are processed to determine an angle of rotation, comprising:

- means for determining the direction of rotation of the frame;
- means for detecting turnarounds in direction of rotation of the frame;
- means for determining the heterodyne phase at each turnaround;
- means for determining the heterodyne phase acceleration at each turnaround;
- means for determining the amplitude of backscattered light in the cavity;
- means for determining the phase of backscattered light in the cavity; and
- means for calculating a phase correction to compensate for turnaround-induced errors in measurements of phase differences between the two beams using the equation

$$\psi = -D \sqrt{\frac{2\pi}{\alpha_0}} \sin \left(\psi_0 + \phi \pm \frac{\pi}{4} \right),$$

where D =backscattered light amplitude, α_0 =heterodyne phase acceleration at turnaround, ψ_0 =heterodyne phase at turnaround, and ϕ =phase of backscattered light.

4,875,775

RECIPROCALLY SWITCHED FOUR MODULATOR SYSTEM

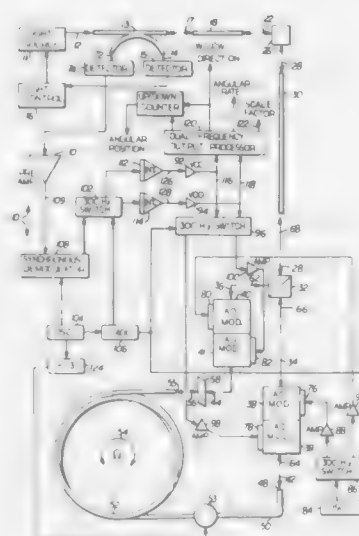
Ronald J. Michal, Orange; Eric Udd, Huntington Beach, and Richard F. Cahill, El Toro, all of Calif., assignors to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Aug. 20, 1984, Ser. No. 642,144

Int. Cl.⁴ G01B 9/02; G01N 21/41

U.S. Cl. 356—350

50 Claims



1. A modulator assembly for modulating first and second light beams counterpropagating in a light conduit, said assembly including:

a first frequency shifting modulator pair having:

- first and second modulators;
- a first end for receiving the first light beam; and
- a second end facing the light conduit;

a second frequency shifting modulator pair having:

- third and fourth modulators;
- a first end for receiving the second light beam; and
- a second end facing the light conduit;

first oscillator means connected to apply as the frequency shifting input a first oscillator signal alternately between said first modulator of said first frequency shifting modulator pair and said third modulator of said second frequency shifting modulator pair;

second oscillator means connected to switch a second oscillator signal as the frequency shifting input to said fourth modulator of said second frequency shifting modulator pair when said first oscillator means are applying said first oscillator signal to said first modulator of said first frequency shifting modulator pair; and

third oscillator means connected to switch a third oscillator signal as the frequency shifting input to said second modulator of said first frequency shifting modulator pair when said first oscillator means are applying said first oscillator signal to said third modulator of said second frequency shifting modulator pair.

4,875,776

ELECTRO-OPTICAL INSPECTION

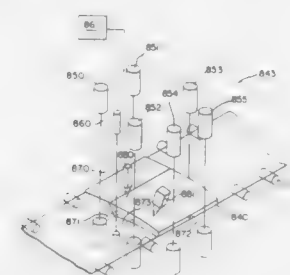
Timothy R. Pryor, Tecumseh, Canada, assignor to Diffracto Ltd., Windsor, Canada

Continuation of Ser. No. 815,270, Dec. 24, 1985, abandoned, which is a continuation of Ser. No. 531,216, Aug. 26, 1983, abandoned, which is a division of Ser. No. 269,614, Jun. 2, 1981, Pat. No. 4,576,482, which is a continuation of Ser. No. 73,226, Sep. 3, 1979, abandoned. This application May 5, 1987, Ser. No. 49,501

Int. Cl.⁴ G01B 11/00; B07C 5/10

U.S. Cl. 356—372

5 Claims



1. Apparatus for inspecting a workpiece comprising: electro-optical sensor means for sensing the positions of a plurality of edge portions of a workpiece in an inspection location, said electro-optical sensor means comprising: light source means for illuminating a plurality of edge portions of a workpiece in said inspection location; lens means for forming an image of each of said illuminated edge portions; and a plurality of photosensitive arrays, each array comprising a plurality of light sensitive elements capable of producing an electrical signal in response to light incident thereon, each array being positioned to receive an image of a respective illuminated edge portion of a workpiece;

means for analyzing the signals from said light sensitive elements to determine a dimension of said workpiece; and further sensor means for determining the position of a workpiece in said inspection location, said further sensor means comprising

light source means for illuminating a plurality of known portions of a workpiece in said inspection location, lens means for forming an image of each of said illuminated known portions and a plurality of photosensitive arrays, each array comprising a plurality of light sensitive elements capable of producing a signal in response to light incident thereon, each of said arrays being positioned to receive an image of a respective illuminated known portion of said workpiece in said inspection location, and means for analyzing the signals from said light sensitive elements of said further sensor means to determine the position of a workpiece in said inspection location.

4,875,777

OFF-AXIS HIGH ACCURACY STRUCTURED LIGHT PROFILER

Kevin G. Harding, Ann Arbor, Mich., assignor to Industrial Technology Institute, Ann Arbor, Mich.

Filed Sep. 30, 1987, Ser. No. 103,497

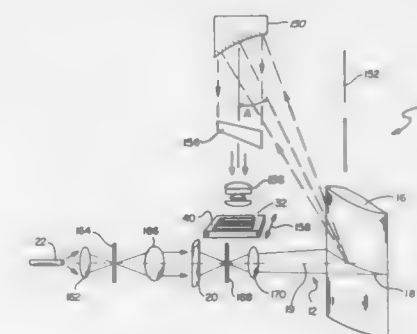
Int. Cl.⁴ G01B 11/24

U.S. Cl. 356—376

12 Claims

1. An optical gauging system for evaluating the surface shape of a workpiece along a cross-section comprising: illumination means for projecting a sheet of light onto said workpiece along an illumination optical axis, viewing means for imaging said sheet of light on said workpiece having an optical axis perpendicular to said illumination optical axis and the plane defined by said sheet of light, and wherein rays of light from said workpiece sur-

face illuminated by said sheet of light are received by said viewing means off axis with respect to said viewing means optical axis such that none of said rays are directed along said viewing means optical axis whereby said sheet of light



lies within a single depth-of-field plane of said viewing means, said viewing means including an off axis concave mirror, and detector means for sensing the image of said sheet of light on said workpiece formed by said viewing means.

4,875,778

LEAD INSPECTION SYSTEM FOR SURFACE-MOUNTED CIRCUIT PACKAGES

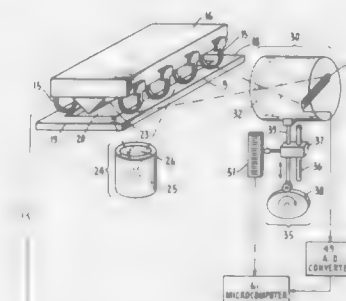
Richard J. Laebbe, 6179 Paso Los Cerritos, San Jose, Calif. 95120, and H. Kenneth Hopkins, 114 Rollingwood Dr., Boulder Creek, Calif. 95006

Continuation-in-part of Ser. No. 153,764, Feb. 8, 1987. This application Apr. 25, 1988, Ser. No. 185,838

Int. Cl.⁴ G01B 11/00

U.S. Cl. 356—394

24 Claims



1. A process for inspecting leads on circuit packages of the surface-mounted type, comprising the steps of: positioning a circuit package for inspection on a generally horizontal reference surface having at least one horizontal reference edge; illuminating the package to produce sharp optical contrast at the edges and contact ends of the leads; moving a horizontally-arranged linear array of photosensitive elements in a direction substantially perpendicular to the reference edge; operating the horizontally-arranged linear array of photosensitive elements to provide a series of one-dimensional scans horizontally across the leads; and analyzing signal information obtained from the horizontal scans to detect and measure selected geometrical properties of the inspected leads.

4,875,779

LEAD INSPECTION SYSTEM FOR SURFACE-MOUNTED CIRCUIT PACKAGES

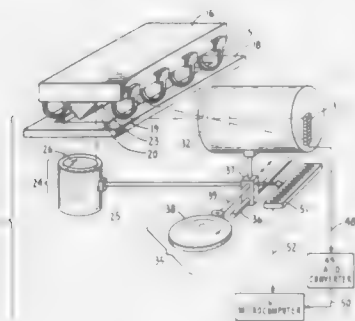
Richard J. Laebbe, 6179 Paso Los Cerritos, San Jose, Calif. 95120, and H. Kenneth Hopkins, 114 Rollingwood Dr., Boulder Creek, Calif. 95006

Filed Feb. 8, 1988, Ser. No. 153,764

Int. Cl.⁴ G01B 11/00

U.S. Cl. 356—394

29 Claims



1. A process for inspecting leads on circuit packages of the surface-mounted type, comprising the steps of: positioning a circuit package for inspection on a generally horizontal reference surface having a reference edge that parallels the surface; providing illumination of the package leads to produce sharp-contrast at the edges and contact ends of the leads; moving a vertically-arranged linear array of photosensitive elements parallel to the reference edge; operating the array of photosensitive elements to provide a series of one-dimensional optical samples vertically along the leads; and analyzing signal information obtained from the optical samples to detect and measure selected geometrical properties of the inspected leads.

4,875,780

METHOD AND APPARATUS FOR INSPECTING RETICLES

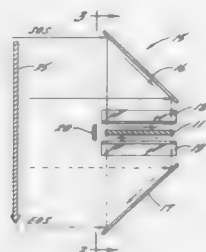
Kevin E. Moran, Belmont; Michael L. Smith, Matthews, and Ernest R. Lippard, III, Charlotte, all of N.C., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 25, 1988, Ser. No. 160,194

Int. Cl.⁴ G01N 21/47

U.S. Cl. 356—446

46 Claims



1. A laser scanning system for inspecting opposite surfaces of a workpiece, said system comprising means for transporting a workpiece along a material path, laser light generating means for generating a laser light beam, scan generating means arranged to receive said laser light beam and to repeatedly scan the laser light beam along a predetermined scan path, a timing sensor positioned in said scan path to sense the laser light beam crossing the position of said timing sensor, means positioned in said scan path for receiving said laser light beam and for divid-

ing said laser light beam into a first sweeping inspection scan oriented toward one side of said material path and a second sweeping inspection scan oriented toward the opposite side of said material path, means arranged to receive each of said first and second sweeping inspection scans and to direct the same at a low angle of incidence to said material path, and means arranged adjacent said opposite sides of said material path for collecting light reflected from a workpiece in said material path.

4,875,781

PAINT MIXING PAINT CONTAINER

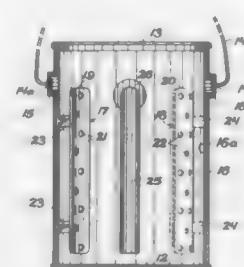
Jack C. Raska, 29249 32 Mile Rd., Richmond, Mich. 48062

Filed May 19, 1988, Ser. No. 196,054

Int. Cl.⁴ B01F 9/10

U.S. Cl. 366—130

6 Claims



1. A paint container for the mixing of paint contained within the container comprising, a cylindrical container having an interior surface and including a removable overlying lid, the container further including a continuous vertical wall integrally secured to a floor parallel to said lid, and a handle means including two terminal ends pivotally secured to the vertical wall of said container, and a plurality of arcuate vane means integrally secured to the interior surface of said container means for operative cooperation with rotary motion of said handle means for mixing of paint within said container, and wherein said handle means is formed as an arcuate handle terminating in respective orthogonal ends secured to said container at diametrically opposed positions, and wherein said vane means include two arcuate vanes of a height less than that of said wall of said paint container secured to the interior surface defined by said vertical wall, and wherein each of said vanes terminate in upper terminal ends aligned with said handle ends, and lower terminal ends of each of said vanes terminate at a position above said floor, and wherein each of said vanes defines an arcuate configuration equal to that of the radius of curvature of the cylindrical wall of said paint container.

4,875,782

AUTOMATED TEMPERATURE PROBE APPARATUS AND METHOD

Steve A. Fox, Hickory, N.C., assignor to Normag Corporation, Hickory, N.C.

Filed Jan. 25, 1988, Ser. No. 147,525

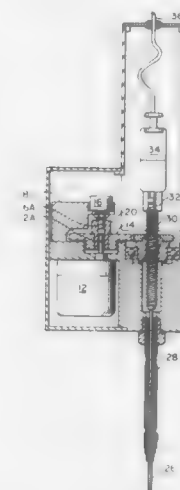
Int. Cl.⁴ G01K 7/04, 13/02

U.S. Cl. 374—148

14 Claims

1. An automated temperature probe for accurately determining by temperature measurements the temperature profile of a viscous material flow by traversing at least a portion of the

flow and determining the temperature and corresponding position at a plurality of locations therein, comprising: an elongated linearly movable temperature probe for selected insertion into said material flow; motor means operatively connected with said temperature probe for imparting linear movement thereto;



position sensing means operatively connected to said temperature probe for determining the relative position of said probe during said linear movement thereof; and remote control means electrically connected to said temperature probe for selectively actuating said probe and providing a temperature profile comprising temperature and corresponding position data provided by said probe movement.

4,875,783

TEMPERATURE TRANSDUCER FOR KYZ PULSE RECORDER

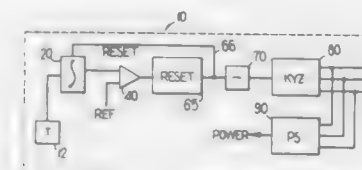
Scott C. Swanson, Roswell, Ga., assignor to Sangamo Weston, Inc., Norcross, Ga.

Filed Apr. 22, 1987, Ser. No. 41,274

Int. Cl.⁴ G01K 7/00

U.S. Cl. 374—170

10 Claims



7. A temperature transducer for a data recorder, said data recorder including KYZ pulse input means, comprising: a temperature sensitive element responsive to temperature for providing a temperature signal output corresponding to temperature; integrating means for integrating said temperature signal over a predetermined time period and for providing an integrated output; comparator means responsive to said integrated output for providing integrator reset pulses at a frequency related to temperature at said temperature sensitive element, said integrating means being responsive to each of said reset pulses for resetting for a subsequent integration; pulse divider means responsive to said reset pulses for dividing the frequency of said reset pulses to a frequency corresponding to the input requirements of said data recorder; KYZ output means for providing said frequency divided

reset pulses a KYZ pulses to the KYZ input of said data recorder; and power supply means connected to said KYZ input of said data recorder for providing power to said temperature sensitive element, said integrating means, said comparator means, said pulse divider means, and said KYZ output

means.

4,875,784

DIVIDED SLIDE BEARING

Karl Just, Friedrichshafen, Fed. Rep. of Germany, assignor to MTU Motoren- und Turbinen-Union Friedrichshafen GmbH, Friedrichshafen, Fed. Rep. of Germany

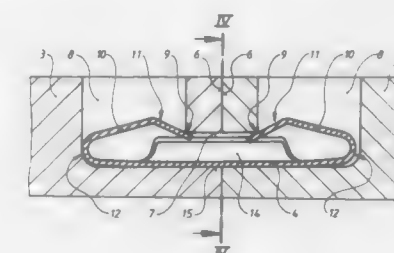
Filed Jan. 26, 1989, Ser. No. 302,304

Claims priority, application Fed. Rep. of Germany, Jan. 27, 1988, 3802275

Int. Cl.⁴ F16C 17/02

U.S. Cl. 384—273

2 Claims



1. A split slide bearing, comprising two bearing shell halves held together during the installation by clamp means made from a springy flat material, the bearing shell halves being provided with separating surfaces abutting at one another and with hollow spaces starting from the separating surfaces which extend substantially perpendicularly to the separating surfaces, the clamp means which extend over the separating surfaces and are springily supported in the hollow spaces being arranged in said hollow spaces, the clamp means coming into form-locking abutment with edges within clamp areas adapted to be overcome by pressure in two directions, the edges resulting from the intersection of holes extending substantially transversely to the direction of the hollow pieces, the hollow spaces as also the holes extending transversely thereto being constructed as groove-shaped filled-out parts and the clamp means made from a unitary material part including each two bow-shaped legs bent to a side toward one another, said legs having inwardly inclined sections in the end areas, the clamp means being supported on their bottom side in the hollow spaces, and with the bearing shell halves placed one against the other abutting springily supported in both end areas at the straight edges of the intersection area which are disposed facing the same, and the clamp means with a unilateral seating in one bearing shell half abutting axially pressed against the hollow space wall within the area of the bend of the legs.

4,875,785

THRUST BEARING WITH A MAGNETIC FIELD DETECTOR

Alfred J. Santos, Canton; Frederick A. Cook, Jr., West Hartford; Scott M. Duncan, Avon, and John Moseley, Norfolk, all of Conn., assignors to The Torrington Company, Torrington, Conn.

Continuation of Ser. No. 120,406, Nov. 13, 1987, abandoned.

This application Feb. 23, 1989, Ser. No. 325,035

Int. Cl.⁴ F16C 19/30

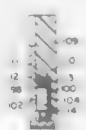
U.S. Cl. 394—448

7 Claims

1. A thrust bearing comprising: a first thrust plate; a second thrust plate relatively rotatable with respect to the first thrust plate; means on the first thrust plate for permanently providing

a magnetic field; an annular detector support; and at least one detector on the annular detector support for detecting the magnetic field.

7. In combination: first and second annular thrust plates relatively rotatable with respect to one another with axially aligned spaced roller raceways; rollers in the space between the raceways; a plurality of permanently magnetized magnetic pole segments about the entire circumference of a radial por-



tion of the first thrust plate, each segment having a North pole and a South pole, with the segments being arranged so that each pole is between two poles of opposite polarity; an annular member having a radial surface facing the permanently magnetized magnetic pole segments on the first thrust plate; and at least one magnetic field detector mounted on said radial surface of the annular member facing said permanently magnetized magnetic pole segments.

4,875,786

SNAP-RING WITH PIN RELEASE SEAL

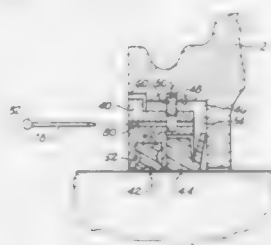
Gary DeWachter, Greenville, S.C., assignor to Reliance Electric Company, Greenville, S.C.

Filed Dec. 29, 1988, Ser. No. 291,634

Int. Cl.⁴ F16C 33/78

U.S. Cl. 384—482

7 Claims



1. In a sealing system for a bearing having a housing with an interior chamber therein for receiving a shaft to be sealed, a bearing assembly arranged within the chamber and having bearing elements extending radially relative to the shaft and supporting the same for rotation, the housing being formed with an opening having a cylindrical surface formed with an annular groove concentric with the axis of the shaft to be supported therein, the improvement comprising:

an annular sealing device arranged within the opening concentric with the cylindrical surface,

an annular carrier member encircling the shaft adapted to be positioned within the opening for holding said sealing

device in sealing position between the shaft and the bearing housing,

said carrier member having a flexible snap-ring adapted to be flexed inwardly during positioning of said carrier member within the opening and to extend into the annular groove in the cylindrical surface when in its unflexed condition,

means mounted in said carrier member and engageable with snap-ring for holding the same in flexed condition during said positioning of said carrier member within the opening and to release said snap-ring after said carrier is within the opening to permit said snap-ring to assume its unflexed condition.

4,875,787

BEARING BUSHING FOR UNIVERSAL JOINT PINS

Bernhard Bauer, Wulflingerstrasse 13, 8728 Haasfurt, and Herbert Dobhan, Schleifweg 22, 8722 Bergheimfeld, both of Fed. Rep. of Germany

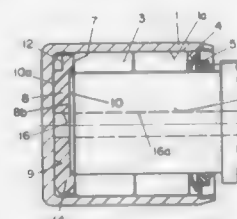
Filed Jun. 28, 1988, Ser. No. 212,865

Claims priority, application Fed. Rep. of Germany, Jul. 3, 1987, 8709201[U]

Int. Cl.⁴ F16C 19/22, 21/00, 33/58

U.S. Cl. 384—548

5 Claims



1. A bearing bushing for universal joint pins comprising: a thrust washer made of plastic disposed on a bottom surface of the bearing bushing having a contact surface for a plurality of cylindrical rollers and for a universal joint pin, a plurality of circumferentially spaced first recesses on a side surface of the thrust washer facing away from the cylindrical rollers, said first recesses having an axial depth equal to about half the thrust washer axial thickness, and said first recesses being distributed around the periphery of the thrust washer adjacent the outer peripheral edge thereof and extending radially inwardly from the outer peripheral surface of the thrust washer approximately the length of the contact surface of the thrust washer and cylindrical roller, two adjacent first recesses forming a centrally located, radially directed projection around the periphery of the thrust washer and a series of radially directed shallow second recesses in the opposite side surface of the thrust washer defining lubricant pockets.

4,875,788

POSTAGE METER PRINTWHEEL SETTING APPARATUS

Donatas V. Gaslunas, Carmel, N.Y.; Paul R. Sette, Hamden, and Anthony Storace, Norwalk, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Dec. 21, 1987, Ser. No. 136,084

Int. Cl.⁴ B41J 1/52, 7/32

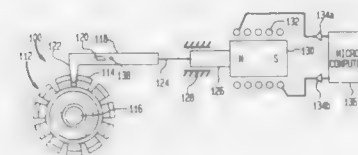
U.S. Cl. 400—163.1

4 Claims

1. A printwheel selection apparatus comprising: a picker link, said picker link having a picker cam mounted thereon and having a tooth operative for engaging slots on a rotatable printwheel;

a voice coil motor, said voice coil motor comprising a coil and a magnet arranged within the coil, said magnet being guided for linear reciprocating motion within the coil;

a flexible link connecting said picker link to the voice coil magnet and a cam stud fixed in relation to said rotatable printwheel and said voice coil motor, said picker cam being cammed about said cam stud by the reciprocating motion of the magnet for causing the tooth of said picker



link to engage one of said slots and to rotate said printwheel as said voice coil magnet moves in one direction and to disengage and to return to a position for again advancing the printwheel when the magnet moves in the opposite direction.

4,875,789

INK RIBBON CASSETTE WITH SLIDABLE RIBBON GUIDE

Hiroyuki Sato, Tokyo, Japan, assignor to Seikosha Co., Ltd., Japan

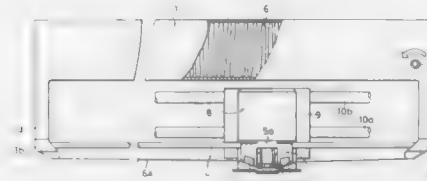
Filed Dec. 21, 1987, Ser. No. 135,842

Claims priority, application Japan, Dec. 19, 1986, 61-195517[U]

Int. Cl.⁴ B41J 32/02

U.S. Cl. 400—196.1

20 Claims



1. An ink ribbon cassette for use with a printer having a reciprocable printing head which reciprocates along an axis during use of the printer, the ink ribbon cassette comprising: a cassette case having a pair of arms extending outwardly therefrom in opposed spaced-apart relationship, the arms having openings therein; an ink ribbon disposed to undergo lengthwise movement within the cassette case with a portion thereof slidably extending through the openings and bridging the space between the arms to define an exposed ribbon portion; a guide shaft supported by the cassette case and extending substantially parallel to the axis of reciprocation of the printing head; a ribbon guide slideable along the guide shaft and slidably engaging with the exposed ribbon portion, the ribbon guide having means directly slidably engageable with the printing head to enable the ribbon guide to undergo vertical displacement relative to the printing head and to follow the reciprocal movement of the printing head; and restricting means carried by the ribbon guide for restricting vertical displacement of the exposed ribbon portion relative to the cassette case while allowing lengthwise sliding movement of the exposed ribbon portion relative to the ribbon guide to thereby prevent slackening of the exposed ribbon portion.

4,875,790

PRINTING DEVICE HAVING GEAR CONNECTED MULTIPLE FEED PATHS

Yoshiyuki Karube, Toshimasa Hayakawa, and Yasunari Yoshida, all of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Tama, Japan

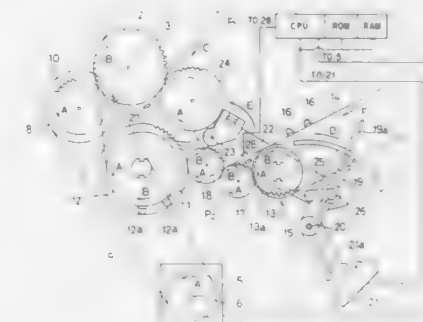
Filed Nov. 10, 1987, Ser. No. 119,054

Claims priority, application Japan, Nov. 10, 1986, 61-267079

Int. Cl.⁴ B41J 11/48

U.S. Cl. 400—605

8 Claims



1. A printing device having gear connected multiple feed paths wherein a cut-form printing sheet and a serial form printing sheet may be selectively brought into use which comprises

a platen for supporting the selected one of said cut-form printing sheet and said serial form printing sheet in its printing position;

first gear means coupled to and rotated with said platen;

tractor means for feeding said serial form printing sheet to its printing position;

second gear means coupled to said tractor means;

idler gear means displaceable in a direction perpendicular to an axial direction of said second gear means between a first position where said idler gear means engages said first gear means and disengages from said second gear means, and a second position, where said idler gear means engages both said first and second gear means;

displacing means for displacing said idler gear means between its first and second positions;

driving means for rotating said platen;

first sensing means for detecting the position of said idler gear means;

second sensing means for detecting the presence of said serial form printing sheet to be fed by said tractor means;

mal-operation detecting means for detecting the inadvertent displacement of said idler gear means by monitoring the results of said first sensing means and second sensing means to determine if said idler gear means has been shifted from said second position to said first position and then back to said second position while said second sensing means detects the presence of a serial form printing sheet; and

control means for controlling said driving means to rotate said platen by a predetermined amount sufficient to offset any rotation of the platen caused by the engagement or disengagement of the idler gear means and the second gear means so as to reposition said idler gear means by said predetermined amount upon detection of the inadvertent displacement of said idler gear means.

4,875,791

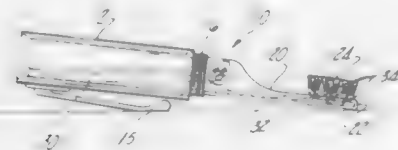
LIQUID DISPENSING BRUSH

Shawky A. Hassan, 1146 S. Linden Rd., Flint, Mich. 48504
Filed Feb. 3, 1984, Ser. No. 576,919

Int. Cl.⁴ A46B 11/04, 17/04

U.S. Cl. 401—176

16 Claims



1. A liquid dispensing brush comprising: an elongated arm having a longitudinal passage formed therein, said arm having first and second ends; a plurality of bristles secured adjacent to said first end of said arm; a fluid outlet formed in said arm adjacent said bristles, in fluid communication with said passage; a fluid reservoir attached to said second end of said arm, in fluid communication with said passage, said reservoir having a predetermined volume; and means for positioning said brush such that said outlet is below said reservoir; wherein said brush further comprises a fluid disposed in said reservoir, wherein said fluid flows only by gravity from said reservoir to said outlet.

4,875,792

BRUSH DEVICE CONTAINING CARRIER MEDIA

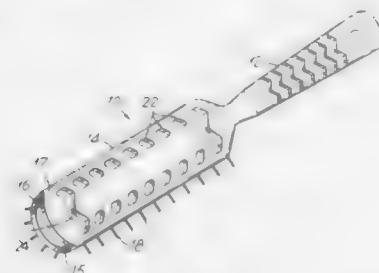
Larry J. Canada, Granite City, Ill., assignor to Sekine Corporation, New York, N.Y.

Filed Aug. 17, 1987, Ser. No. 85,759

Int. Cl.⁴ A45D 20/52; A46B 11/04

U.S. Cl. 401—283

10 Claims



1. A brush for grooming hair and dispensing a treatment substance contained in a carrier material provided therein, the brush comprising: a handle portion and a body portion integrally attached to the handle portion, said body portion having an elongated cavity formed therein which is permanently closed at a rear end of said cavity adjacent the handle portion, said cavity being coextensive with the body portion and adapted for receiving an absorbent structure, said body portion having an upper and a lower side and a plurality of spaced transverse openings extending through the upper and lower sides of the body portion between the cavity and the surrounding ambient air; a plurality of bristles attached at spaced locations to the body portion lower side between said transverse openings, said bristles being provided in spaced transverse rows having a zig-zag alignment pattern substantially conforming to the body portion shape between said openings to facilitate lateral movement of hair strands while being groomed; and an elongated absorbent structure removably provided

within said elongated cavity in at least the body portion, said absorbent structure containing a treatment substance vaporizable at 70°–180° F. temperature, whereby the treatment substance contained in the elongated absorbent structure can evaporate and effectively contact the hair while strands of hair are moved laterally back and forth by the bristles during use of the brush for grooming the hair.

4,875,793

NOTEBOOK BINDER/LABEL HOLDER

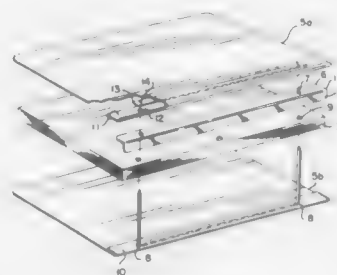
William C. Deem, 15 Highview, P.O. Box 397, Jacksonville, Ill. 62681

Filed Jun. 1, 1987, Ser. No. 56,243

Int. Cl.⁴ B42F 3/00, 13/40; B42D 3/18

U.S. Cl. 402—3

3 Claims



1. A label holder or rigid support device for paperboard binders having two covers and paper sheets retained by metal binding strips and fastening means said label device being formed of rigid sheet material and having a flat label portion to bear against substantially the entire length of the rear edges of said paper sheets, said label device also having an integral substantially flat securing flange extending rearwardly from the label portion in a plane disposed at an angle of ninety degrees from the plane of the label portion and engaging on the top sheets of the binder with the label portion pointed toward the back of the binder or on the bottom sheets of the binder with the flat securing flange pointed toward the front of the binder, said flange defining openings through which said metal binding strips pass for securing said label device to the sheets and said fastening means.

4,875,794

PRELOADED STEERING BALL JOINT ASSEMBLY AND METHOD

Karl O. Kern, Jr., Reminderville, Ohio, assignor to Dana Corporation, Toledo, Ohio

Filed Dec. 23, 1987, Ser. No. 137,393

Int. Cl.⁴ F16C 11/06

U.S. Cl. 403—132

9 Claims

1. In a preloaded ball joint assembly adapted for use in a vehicular steering link, said joint assembly including a ball and a shaft integrally fixed to said ball, a ball housing defining a longitudinal axis, said housing having first and second openings aligned with said axis, said first opening containing a circumferential housing lip, said first opening also containing an internal circumferentially extending shoulder adjacent said lip circumferentially housing said second opening defining a passageway for said shaft, said housing defining an internal ball socket cavity containing first and second opposed bearing seats defining a lubrication chamber therebetween and about said ball, each bearing seat comprising a semi-spherical member formed of a low surface friction material, said second bearing seat containing an opening for passage of said shaft, said second bearing seat being positioned against said second opening of said housing to accommodate said shaft, said ball socket cavity containing a metal disc and a compressed elastomer disc

4,875,796

PRESS-FIT SPLINED CONNECTION

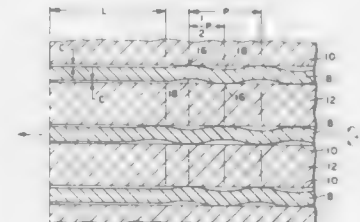
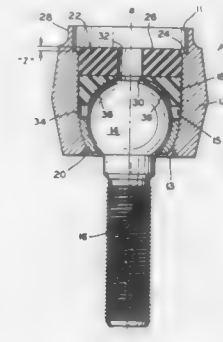
Eric L. Storm, Bowling Green, Ky., assignor to Eaton Corporation, Cleveland, Ohio

Filed Nov. 23, 1987, Ser. No. 124,199

Int. Cl.⁴ B25G 3/28

U.S. Cl. 403—359

15 Claims



juxtaposed against said metal disc, said elastomer disc being urged against the first bearing seat by said metal disc, said metal disc retained tightly against said compressed elastomer disc by said circumferential housing lip; an improvement comprising in combination (1) said elastomer disc being formed in-situ by insert molding, wherein molten elastomer is forced into said socket cavity, and (2) said first bearing seat being formed with a circumferential barrier lip which is dimensioned

for an interference fit with said ball socket cavity, said circumferential barrier lip comprising an angled side wall extending in a direction toward said elastomer disc, said circumferential barrier lip adapted for expanding radially outwardly against said socket cavity under pressure of said molten elastomer, whereby during insert molding of said elastomer disc, said circumferential barrier lip is effective to prevent entry of molten elastomer into said lubrication chamber.

1. A press-fit splined connection between a first rotary member having at least one elongate groove and a second rotary member having at least one elongate tooth operative to register with and be slidably received within the groove to provide the splined connection between the first and second members, said press-fit provided by the groove having opposite side walls that are substantially straight and at least a portion of the opposite side walls of the tooth having respective sinusoidal wave configurations of at least one period along its length providing at least two convex surfaces that respectively impinge upon the opposite side walls of the groove with sufficient interference to provide the press-fit between the first or second members.

4,875,795

STRUCTURAL CONNECTOR UTILIZING TABBED SUPPORT SUBSTRUCTURE

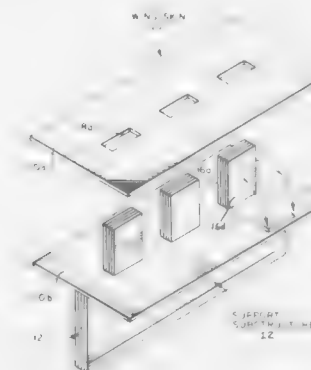
Robert E. Anderson, Huntington Station, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Dec. 11, 1987, Ser. No. 131,700

Int. Cl.⁴ F16B 1/00

U.S. Cl. 403—279

10 Claims



1. A joint connecting first and second structural members comprising: a first structural member having multiple plies each having at least a tab extending from a shoulder portion, the tab being juxtaposed on corresponding tabs of other plies; a second structural member having multiple plies and an opening formed therein for receiving the tabs and enabling the second structural member to abut the shoulder portion of the first structural member; wherein pairs of tabs are folded against respective plies of the second structural member to interleave the first and second structural members into connecting relationship.

4,875,797

PARKING SPACE GUARD

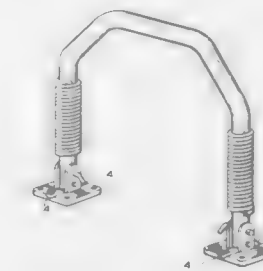
Klaus Hartwig, Toronto, Canada, assignor to Kaymar-Park-guard Inc., Toronto, Canada

Filed Jun. 14, 1988, Ser. No. 207,116

Int. Cl.⁴ E01F 9/00

U.S. Cl. 404—9

2 Claims



1. A parking space guard comprising a base for anchoring said guard to a supporting surface and a blocker movable from a down access to an up blocking position, said base comprising a mounting plate with a pair of upstanding arms between which said blocker is pivotally and lockably secured, said arms being forwardly open for raising and lowering said blocker, said base further including a forwardly extending channel in which said blocker lies when in the down position for lowering the outer end of said blocker to ground level, said mounting plate being recessed immediately beneath said blocker for clearance of the lower end of said blocker past said mounting plate while lowering to the down position.

4,875,798

RETROREFLECTIVE PAVEMENT MARKER

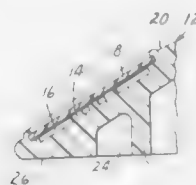
David C. May, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jan. 30, 1988, Ser. No. 213,781

Int. Cl.⁴ E01F 9/06

U.S. Cl. 404—12

11 Claims



1. Raised pavement marker comprising a substantially rigid body having a bottom surface, at least one sloped face, septa projecting from said sloped face, and a plastic cube-corner reflector, having at least 500 cube-corner elements per cm² formed by intersecting sets of parallel grooves, bonded to the septa to provide a plurality of cells beneath the reflector, the depth of which is sufficient that cube corners of the reflector between the septa do not contact the body when the pavement marker is adhered to a roadway and subjected to vehicular impact, said pavement marker being characterized by:

the exposed face of the reflector forming an angle of from 15° to 45° to the surface of the roadway and the overall thickness of the cube corner reflector being less than 2 mm.

4,875,799

TRAFFIC LANE MARKING DEVICE

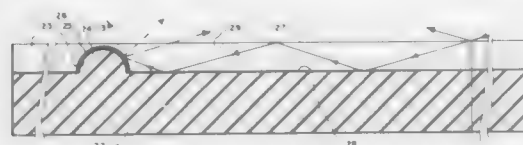
George M. Harrison, 320 Salem Dr. (Apt. H), Vermillion, Ohio 44089

Filed Sep. 6, 1988, Ser. No. 240,623

Int. Cl.⁴ E01F 9/06

U.S. Cl. 404—12

13 Claims



1. A night-visible traffic marking device for installation embedded into aircraft landing strips, vehicle roadways and the like, comprising:

a generally planar plate member of transparent material installed with its upper surface flush with the traffic contacting surface;

at least one night-visible object upstanding within the plate member to provide a substantial vertical profile from the point of view from an oncoming vehicle, the side of said object facing the vehicle being curved and including material selected to be highly visible when impinged upon by light from said vehicle.

4,875,800

TEMPORARY SUPPORT SURFACES FOR USE ON MUDDY OR MARSHY LAND AREAS

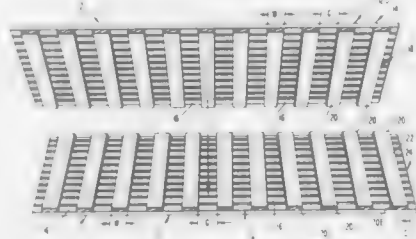
Gary D. Hicks, Sugarland, Tex., assignor to Way Construction, Inc., Stowell, Tex.

Filed Jan. 22, 1988, Ser. No. 147,300

Int. Cl.⁴ E01C 5/14, 9/08

U.S. Cl. 404—35

19 Claims



1. A temporary support structure for use on muddy or marshy land areas, said support structure comprising:

a plurality of panels, each panel including a rigid first tier and a second tier disposed in superimposed relation to said first tier, said second tier comprising a row of rigid boards arranged in side-by-side relationship and fixedly connected to said first tier, at least some of said boards spaced apart to define locking gaps therebetween, said boards being connected to said first tier of solely its respective panel so that said panels define separately movable units, a first plurality of said panels positioned to define a lower layer of panels in which said first tier thereof rests upon the ground and said row of boards thereof extends upwardly to define lower locking boards,

a second plurality of said panels positioned to define an upper layer of panels disposed upon said lower layer of panels, said panels of said upper layer arranged such that said first tiers thereof face upwardly to define a working surface, and said rows of boards thereof extend downwardly to define upper locking boards disposed parallel to said lower locking boards, said first tiers of successively arranged panels of said upper layer being disposed in substantially end-to-end relationship, said upper locking boards disposed loosely in said locking gaps defined between said lower locking boards, said lower locking boards disposed loosely in said locking gaps defined between said upper locking boards.

16. A method of forming a temporary support structure to define a working surface on muddy or marshy land areas, said method comprising the steps of:

providing a plurality of panels, each of which panels including a first tier and a second tier disposed in superimposed relation to said first tier, said second tier comprising a row of rigid boards arranged in side-by-side relationship and fixedly connected to said first tier, at least some of said boards spaced apart to define locking gaps therebetween, arranging a first plurality of said panels as a lower layer of panels in which said first tier thereof rests upon the ground and said row of boards thereof faces upwardly to define lower locking boards, and

arranging a second plurality of said panels as an upper layer of upper panels disposed upon said lower layer of lower panels, such that:

said first tier of said upper panels faces upwardly to define a working surface, and said rows of boards thereof face downwardly to define upper locking boards disposed parallel to said lower locking boards, and said first tiers of successively arranged panels of said upper layer disposed in substantially end-to-end relationship, said upper locking boards are disposed loosely in said locking gaps defined between said lower locking

boards, said lower locking boards disposed loosely in said locking gaps defined between said upper boards.

4,875,801

EXPANSION JOINT BRACE AND ALIGNER

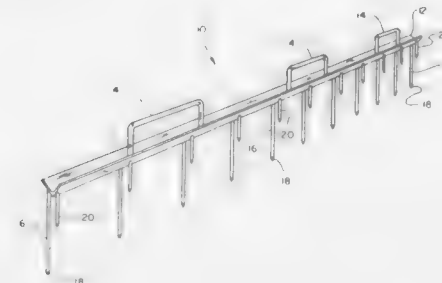
Anthony Montrym, 1333 Woodpath, Florissant, Mo. 63031

Filed May 11, 1988, Ser. No. 193,243

Int. Cl.⁴ E01C 11/02

U.S. Cl. 404—48

3 Claims



1. A concrete expansion joint aligner for supporting and aligning an expansion joint which may be removed after poured concrete adjacent to the expansion joint begins to harden while leaving the expansion joint in place comprising:

a unitary construction, said unitary construction being comprised of

an elongated base plate having a plurality of ground pegs and a plurality of aligning pegs permanently attached thereto and projecting from said elongated base plate in a substantially perpendicular relationship with respect to said base plate wherein a row of said aligning pegs is substantially parallel with a row of said ground pegs,

the space defined by and between said ground pegs and said aligning pegs being adapted to retain an expansion joint in place while fresh concrete is poured against at least one side of said expansion joint, and wherein said ground pegs extend further from said base plate than said aligning pegs.

3. A process for pouring fresh concrete in a continuous strip with periodic expansion joints in place in said continuous strip comprising putting in place opposite continuous sidewalls to confine said fresh concrete,

putting in place a unitary construction concrete expansion joint aligner between said parallel side walls in transverse relationship therewith by placing said concrete expansion joint in the interstices between a series of ground pegs and a series of aligning pegs both fixedly attached to an elongated base plate in perpendicular relationship thereto,

thereafter, placing said unitary construction expansion joint aligner confining said expansion joint by driving said ground pegs into the ground to a distance sufficient to align the top of said expansion joint with said side walls, pouring fresh concrete against both sides of said expansion joint held in place by said expansion joint aligner, after said concrete becomes partially cured, removing said unitary construction expansion joint aligner while leaving said expansion joint in place to define abutting sections of poured concrete.

4,875,802

INSTALLATIONAL CONCRETE JOINT INSERT AND METHOD OF PREVENTING EDGE SPALLING

Samuel A. Face, III, Newport News, Va., assignor to The Edward W. Face Co., Inc., Norfolk, Va.

Filed Sep. 7, 1988, Ser. No. 241,420

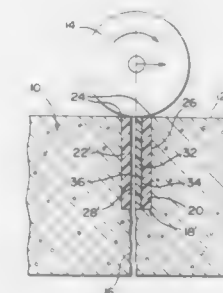
Int. Cl.⁴ E01C 11/08

U.S. Cl. 404—67

18 Claims

1. A method of preventing spalling of a concrete surface at edges of bonding interfaces defining expansion spaces occupied by fillers having a tensile strength resisting formation

therein of stress-induced cracks, the steps of: placing inserts into said expansion spaces extending from the concrete surface; spacing opposite sides of the inserts throughout from the bonding interfaces; and bonding the fillers during installation within



the spaces at said bonding interfaces with greater adhesions than at said sides of each of the inserts; whereby the stress-induced cracks are directed during formation along said sides of the inserts in spaced relation to said edges at the concrete surface.

4,875,803

BLOCK-FORMED REVETMENT SYSTEM FOR CONTROLLING SOIL EROSION

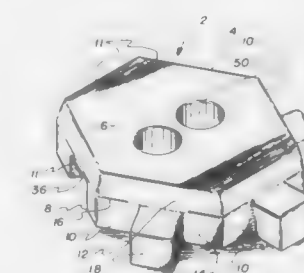
Michael J. Scales, 4905 Windwood Dr., Doraville, Ga. 30360

Filed Jul. 18, 1988, Ser. No. 220,078

Int. Cl.⁴ E02B 3/12

U.S. Cl. 405—16

36 Claims



35. A revetment block for being coupled with other similar blocks to form a flexible revetment mat for controlling erosion of soil, comprising:

a grid having a top surface, a bottom surface, and six side surfaces, each said side surface comprising an upper side surface and a lower side surface which form a common continuous edge between the top surface and the bottom surface of said grid, wherein said upper side surface slopes inwardly from the common edge to the top surface of said grid, and said lower side surface is more vertical than said upper side surface and wherein a tongue extends from each of three adjacent said side surfaces, each tongue having a height and width less than the total height and width of said grid, and wherein each of said side surfaces which has no tongue has a receiving cavity having a top wall and sidewalls, said cavity being of a size sufficient to receive and allow limited vertical and horizontal movement of tongues from other blocks within said cavity.

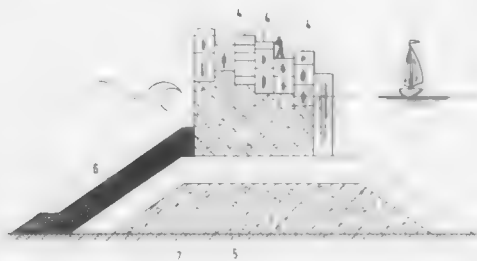
4,875,804

QUADRANGULAR STEPPED MOSAIC BREAKWATER
 Pedro S. Borea, Vegafría 1, T 1, Madrid, Spain E 28035
 Continuation-in-part of Ser. No. 923,678, Oct. 26, 1986, Pat. No. 4,801,220, which is a continuation-in-part of Ser. No. 861,139, May 8, 1986, which is a continuation-in-part of Ser. No. 786,840, Oct. 11, 1985, abandoned. This application Dec. 24, 1986, Ser. No. 946,446

Claims priority, application Spain, Dec. 28, 1985, 291366
 Int. Cl.⁴ E02B 3/06

U.S. Cl. 405—31

1 Claim



1. A breakwater comprising

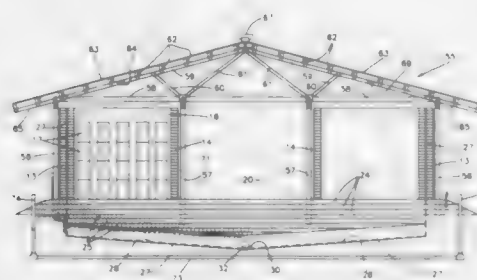
(A) a base having a vertically-fixed upper surface; and
 (B) an interlocking plurality of vertically-oriented, water-impermeable elements of substantially identical, generally quadrangular cross-section, said elements being mounted on said base, disposed in a monolithic horizontally-extending fascine and defining a vertically stepped mosaic crown; each of said elements commencing at said base and terminating in said crown, including at least one substantially planar vertically-extending side defining a key and at least one other substantially planar vertically-extending side defining a complementary key-receiving keyway, and sharing with another of said elements at least one contiguous interlocked side, said at least one and at least one other substantially planar vertically-extending sides being essentially planar and vertical except for said key and keyway, respectively, said key and keyway extending no more than one third of their respective sides, said interlocking plurality of elements defining a barrier through which water cannot flow.

4,875,805

TOXIC WASTE STORAGE FACILITY
 Robert Gross, 175 Drennen Rd., Orlando, Fla. 32806
 Filed Sep. 6, 1988, Ser. No. 240,527
 Int. Cl.⁴ B09B 3/00

U.S. Cl. 405—128

9 Claims



1. A toxic waste storage facility comprising:

a plurality of contiguous above-ground storage cells, each of the storage cells defined by substantially vertical walls constructed from separate compacted earth blocks, the walls enclosing each of the storage cells and isolating each storage cell from each adjacent storage cell, each of the

storage cells having a floor of compacted layers of clay with an impervious plastic liner beneath the layers of clay; a plurality of liquid storage containers stacked in each of the storage cells, each of the containers containing toxic waste; and
 clay filler located within the walls of the storage cells and filling the space around the containers.

4,875,806

NODE INTERSECTION BETWEEN COLUMNS AND PONTOON MEMBERS AT A TENDON-MOORED PLATFORM

Kaj Lindberg, Mölndal; Gerry Steen, Gothenburg, and Elon Germundson, Torlanda, all of Sweden, assignors to Gota-verken Arendal AB, Gothenburg, Sweden

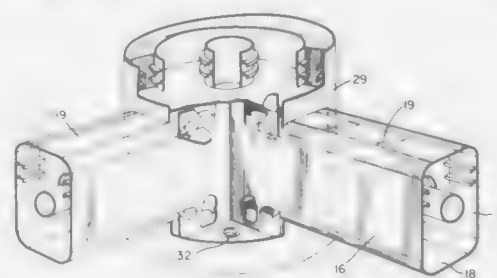
Filed Mar. 15, 1988, Ser. No. 168,356

Claims priority, application Sweden, Mar. 20, 1987, 8701162

Int. Cl.⁴ E02D 5/54

U.S. Cl. 405—224

6 Claims



1. A tendon-moored semisubmersible offshore platform comprising:

columns;
 pontoon members interconnected into a foursided frame via said columns, said pontoon members being defined by vertical side walls, a horizontal deck, and a horizontal bottom skin; and
 at least one node intersection which includes vertical bulkheads that intersect continuations of said vertical sidewalls within lower ends of said columns.

4,875,807

METHOD AND MEANS FOR BASEMENT CONSTRUCTION

Jen-Jui Liu, No. 253, Chueh-Min Rd., San-Min District, Kaohsiung, Taiwan

Filed May 17, 1988, Ser. No. 195,686

Int. Cl.⁴ E02D 5/00

U.S. Cl. 405—229

9 Claims

1. A method and means for basement construction comprising the steps of:

- excavating a continuous side wall trench according to the construction requirement at a situs of a basement;
- preparing a plurality of reinforcement structures, each having a plurality of projecting steel rods horizontally provided in rows at an upper portion and a lower portion on one side thereof;
- preparing a plurality of baffle plates each having a plurality of orifices formed in rows therein for being detachably fixed to each one of the reinforcement structures at the lower portion thereof with the projecting steel rods of each reinforcement structure extending out of the orifices of each baffle plate;
- detachably installing a plurality of pushing jacks on a back side of each baffle plate, and placing the reinforcement structures, together with the baffle plates and the pushing jacks, in the continuous side wall trench and starting the pushing jacks so as to drive the baffle plate forward to be abutted on the ground with the projecting

4,875,809

METHOD FOR STABILIZING CLAY MINERALS DURING OIL EXPLOITATION BY STEAM INJECTION

Géza Csajtai, 3 Bozso K. u., Szolnok; Sándor Doloschall, 21/B Varoskúti út, Budapest; Gyula Milley, 53 Somogyi B. u., Nagykanizsa; Miklós Kristóf, 4 Kleber J. u., Szolnok; Tibor Pál, 16 Beke út, Nagykanizsa; Dániel Rácz, 47/B Filler u., Budapest II, and Béla Tóth, 4 Lowy S. u., Szentendre, all of Hungary

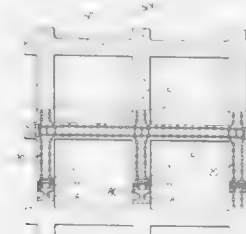
Continuation-in-part of Ser. No. 900,782, Aug. 27, 1986, abandoned. This application Apr. 28, 1988, Ser. No. 187,376

Claims priority, application Hungary, Aug. 24, 1985, 3262/85
 Int. Cl.⁴ E02D 3/12

U.S. Cl. 405—263

10 Claims

1. A process for stabilizing a reservoir rock having a layer structure of 2:1 containing clays, said process comprising introducing into said rocks a solution of cations having a coordination number 12 and having a hydrated ion diameter of 0.13 to 0.1 nm.



(f) vertically positioning an H-member against each open section of the trough devices to closely seal up the continuous side wall trench thereat; so that, by grouting over the reinforcement structures in the closed continuous side wall trench, a strong and shockproof basement side wall will be effectively accomplished.

4,875,810

APPARATUS FOR CONTROLLING FINE PARTICLE FLOW

Yuji Chiba, Atsugi; Kenji Ando, Kawasaki; Masao Sagata, Yokohama; Hiroyuki Sagata, Atsugi; Toshiaki Kimura, Sagami-hara, and Kuniji Osabe, Tama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 920,437, Oct. 29, 1986, abandoned.

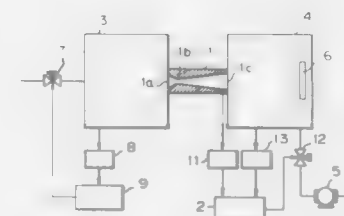
This application Mar. 20, 1989, Ser. No. 325,021

Claims priority, application Japan, Oct. 21, 1985, 60-233561;
 Oct. 21, 1985, 60-233562

Int. Cl.⁴ C23C 13/08

U.S. Cl. 406—14

12 Claims



1. An apparatus for blowing fine particles, on a substrate, comprising:

a convergent-divergent nozzle having an outlet through which fine particles are blown on the substrate;
 means for sensing pressure at the outlet of said nozzle and pressure downstream from said nozzle; and
 a controller for controlling feeding of a gas to said nozzle and/or discharge of the gas downstream from said nozzle based on a comparison of the pressure at the outlet of said nozzle and the pressure downstream from said nozzle in such a manner that a stable beam of the fine particle flows from said nozzle.

4,875,811

APPARATUS AND METHOD FOR TRANSPORTING AND UNLOADING CONTAINERS

Ronald G. Merrett, and Oscar Eakin, Jr., both of Houston, Tex., assignors to Intermodal Container Systems, Harris County, Tex.

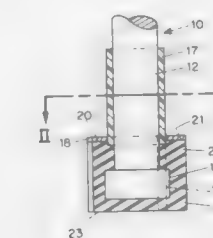
Continuation of Ser. No. 10,010, Feb. 2, 1987, abandoned, which is a continuation-in-part of Ser. No. 871,692, Jun. 6, 1986, abandoned. This application Jan. 25, 1989, Ser. No. 301,985

Int. Cl.⁴ B65G 53/46; B60P 1/16

U.S. Cl. 406—39

48 Claims

19. A highway trailer for the gravity unloading of particulate lading from a detachable intermodal container of around



1. A vibration damping anchor system including:

an elongate shaft,
 an enlarged head on said shaft,
 vibration damping means surrounding the head and preventing the head from resting against the bottom or sides of an opening receiving the anchor system, and
 means for covering a length of said elongate shaft and extending away from the vibration damping means to permit movement of the shaft therein.

twenty (20) feet in length removably supported on the highway trailer, the lading being adapted for gravity discharge through a bottom discharge opening adjacent a rear end door of the container, said highway trailer having:

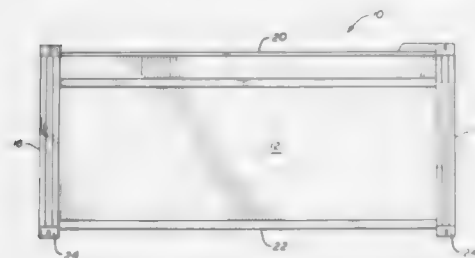
an elongate body having a pair of horizontally spaced rear axles thereon with associated rear wheels and a pair of longitudinally extending support members supported on said rear wheels;

an elongate container support frame mounted over said support members and adapted to releasably support a removable container thereon;

means mounting the rear end of said container support frame for pivotal movement relative to said elongate body along a horizontal axis spaced horizontally rearward of the rear end of said container;

power means connected between said body and the front end of said container support frame for raising said front end about said pivotal mounting means for tilting said container support frame and container thereon relative to said body for gravity unloading of the container;

a rotary valve on said elongate body at a position spaced rearwardly of and below the pivotal mounting of said container support frame and the rear end of the container;



means mounting the rotary valve between the longitudinally extending support members at a horizontal location between the rear wheels of the body and the pivotal mounting of the container support frame;

a throttle valve adapted for mounting on the container support frame adjacent the bottom discharge opening in said container;

means on the container support frame for positioning the throttle valve with the discharge opening;

means to manually adjust the opening of said throttle valve to control the gravity flow of lading from the container upon tilting of the container support frame beyond the angle of repose of the lading;

a flexible lading conduit detachably connected between the throttle valve and the rotary valve extending from the rotary valve at an angle with respect to the horizontal when said container support frame is tilted beyond the angle of repose of the lading sufficient to provide a desired gravity flow of the lading to the rotary valve for a relatively fast gravity unloading of the lading from the container; and

a pneumatic hopper beneath the rotary valve to receive the lading from the rotary valve for pneumatic unloading.

4,875,812

CUTTING TOOL EMPLOYING A DOUBLE PIN RETENTION ASSEMBLY

Sazzadal Haque, Troy; Thomas O. Floyd, Sterling Heights; Nick Savas, Dearborn, and Walter H. Kelm, Mt. Clemens, all of Mich., assignors to Carboly Inc., Warren, Mich.

Continuation-in-part of Ser. No. 936,275, Dec. 1, 1988, abandoned. This application Apr. 11, 1988, Ser. No. 180,242 Int. Cl. B23B 29/04, 29/12

U.S. Cl. 407-104

8 Claims

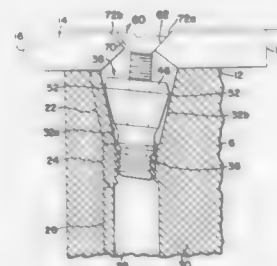
1. A cutting tool comprising:

(a) a cutting insert having a first axial hole;

(b) a cutter body comprising a recess at one end including a

base and at least one shoulder connected to the base for supporting the cutting insert, and a second axial hole alignable with the first axial hole and extending from the recess into at least a portion of the cutter body, wherein the second axial hole comprises an upper portion and a lower portion containing means for reversibly locking therein a primary retention pin at an angle with respect to the axis of the lower portion, said upper portion comprising an inwardly tapered wall extending from the recess thereby forming a conical-shaped section having a longitudinal axis offset from the axis of the lower portion;

(c) a primary retention pin adapted to be reversibly locked in the second axial of the cutter body at said angle and comprising a third axial hole extending through at least a portion of the primary retention pin, means in said third axial hole for reversibly locking a secondary retention pin therein, and a body having a top end and a bottom end and



an inwardly tapered side surface, at least a portion of the side surface adapted to engage the inwardly tapered wall of the upper portion of the second axial hole, said primary retention pin being movable from a first position therein the longitudinal axis of the primary retention pin is substantially parallel to the axis of the lower portion of the second axial hole, to a second position wherein said longitudinal axis is angled with respect to the axis of the lower portion of the second axial hole in the direction of the shoulder of the recess; and

(d) A secondary retention pin adapted to be inserted through the first axial hole of the cutting insert and into the third axial hole in the primary retention pin and comprising means in conjunction with the third axial hole for reversibly locking the secondary retention pin therein and means for exerting pressure against the cutting insert in the direction of the recess and the shoulder of the recess.

4,875,813

WHEEL CHOCK

Donald L. Moyer, 5753 N. 90th St., Omaha, Nebr. 68134, and Thomas O. Allred, 10311 Adams St., Omaha, Nebr. 68127

Filed Dec. 6, 1988, Ser. No. 280,350

Int. Cl. B61D 3/18; B60P 3/07

U.S. Cl. 410-9

23 Claims



1. A wheel chock for use on a motor vehicle transporter for releasable attachment to an elongated restraining element affixed to the transporter and having a pair of upright walls, at least one of which contains a longitudinal series of uniformly spaced and sized holes, the chock comprising:

a. an elongated, monolithic body formed with a central ridge

wall flanked by a pair of downward sloping, wheel-engaging side wall portions arranged symmetrically with respect to the ridge wall, and with a transverse, open bottom recess adapted to receive the restraining element and bounded at one side by a transverse web; and

b. a pair of locking pins fixed to the body, projecting into the transverse recess from the transverse web, and being arranged to engage in alternate holes in the restraining element;

c. the recess containing an unobstructed space beyond the ends of the pins slightly wider than the restraining element, whereby the body may be placed on that element from above and then shifted in the direction of its length to bring the pins into engagement with said holes, and

d. the body being tiltable in both horizontal and vertical planes with respect to the restraining element when the pins are engaged in said openings, but the magnitude of such tilting being limited by the margins of the recess so that at least one of the pins always remains engaged in its associated hole.

4,875,814

INTERMODAL CAGED FLATBED FOR EFFICIENT CONTAINERIZED CARGO HANDLING

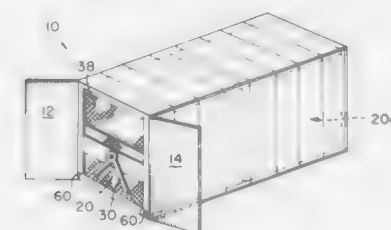
Raymond N. Weller, 1421 Weylon Ave., Norfolk, Va. 23509

Filed Dec. 18, 1987, Ser. No. 134,984

Int. Cl. B60P 1/00, 7/13

U.S. Cl. 410-66

13 Claims



1. An intermodal caged flatbed for cargo handling in cooperative association with any conventional box-like freight shipping container comprising,

a floor for receiving and supporting cargo and having a front, rear, and opposite sides,

a perimetrical cage, said cage including apertured panels around said floor, and having door means extending the full length of a said side,

said floor and cage having overall external dimensions defining a size generally closely receivable in height and width within a said freight shipping container,

expandable pressure means mounted on at least two opposing longitudinally extending sides of said cage flatbed for securing said flatbed within a said container irrespective of slightly varying internal dimensions of any particular said container within which said flatbed is received,

and means for expanding each said pressure means between and into engagement with a respective external side of said caged flatbed and a respective adjacent internal wall of a said container to firmly position one with respect to the other.

4,875,815

BLIND FASTENER

Ronald W. Phillips, II, Mogadore, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Mar. 17, 1988, Ser. No. 169,532

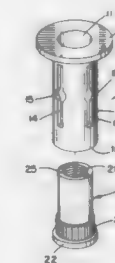
Int. Cl. F16B 13/04, 13/06

U.S. Cl. 411-38

4 Claims

1. A blind fastener having a head and tubular body which is integral with said head, said tubular body having a thin walled portion along its length to facilitate the outward protrusion as

by an upsetting action to engage the blind surface to which such fastener is attached, the end portion of said tubular body remote from said head having an annular edge, a sleeve frictionally journaled in said tubular body, said sleeve having an internal upper threaded portion, said upper portion of said sleeve having an upper edge that is substantially below said head of said fastener, the outside diameter of said sleeve being slightly greater diameter than inside diameter of upper portion



of said tubular body to provide an interference fit between said upper portion of said tubular body and said upper portion of said sleeve upon upsetting of said tubular body as said sleeve moves into interference fitting with said upper portion of said tubular body, said sleeve having a closed lower end portion, said end portion having a flange abuttingly engaging said annular edge to facilitate the upsetting of said tubular body, and the lower end portion of said sleeve secured to the lower end portion of said tubular body.

4,875,816

CAGED FASTENER

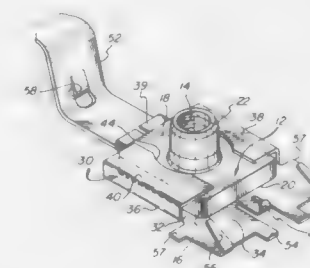
Francis C. Peterson, Woodbury, Conn., assignor to Buell Industries, Inc., Waterbury, Conn.

Filed Oct. 31, 1988, Ser. No. 264,612

Int. Cl. F16B 27/00, 37/00

U.S. Cl. 411-104

9 Claims



1. A caged fastener, comprising:

a fastener body having connecting means therein;

cage means for encaging said fastener body, said cage means providing a limited range of movement of said fastener body in at least one direction, and having apertures sized and adapted to allow access to said bore within the range of movement of said fastener body; and

holding members extending from said cage means, said holding members being sized and adapted to frictionally fit against surfaces for mounting said caged fastener, said holding members comprising at least one spring member which extends from at least one end of said cage means, and at least one lateral strut extending from said cage means generally perpendicularly to said spring member.

4,875,817

SEALED WELD NUT

Hiroaki Suzumura; Yuji Okamoto, both of Toyota, and Iaso Suenaki, Aichi, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

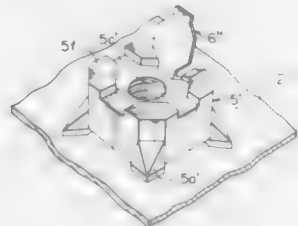
Filed Jul. 7, 1987, Ser. No. 70,822

Claims priority, application Japan, Jul. 11, 1986, 61-163047; Jul. 14, 1986, 61-165283; Jul. 14, 1986, 61-165286; Jul. 26, 1986, 61-176097

Int. Cl.⁴ F16B 37/06, 37/14

U.S. Cl. 411-171

2 Claims



1. A sealed weld nut comprising:

a nut body having an axial through-bore along a center axis thereof, said nut body having first and second axial ends, and said through-bore having an inner wall surface; a threaded portion provided on at least a part of said inner wall surface; weld portions provided at the first axial end of said nut body; a plurality of projections provided at the second axial end of said nut body and spaced around said through-bore; and a separate plate-like sealing member provided at said second axial end of said nut body for preventing foreign material from passing into said through-bore at said second axial end, said plate-like member having a movable portion capable of covering and uncovering said through-bore so as to close and open said through-bore, a stationary portion, and a flexible portion connecting said movable and stationary portions, said stationary portion being fixed between projections at said second axial end.

4,875,818

SCREW HAVING A SEALING WASHER

Ernest W. Reinwall, McHenry, Ill., assignor to Elco Industries, Inc., Rockford, Ill.

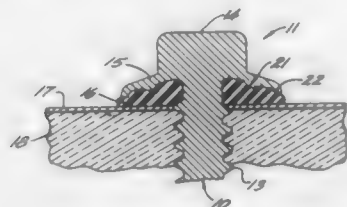
Continuation of Ser. No. 556,555, Nov. 30, 1983, abandoned.

This application Aug. 27, 1985, Ser. No. 770,294

Int. Cl.⁴ F16B 33/00

U.S. Cl. 411-369

2 Claims



1. A fastener adapted to be driven into a workpiece and comprising an elongated and externally threaded shank, a head of generally circular cross-section integral with one end of said shank and generally coaxial with the shank, the underside of said head being concave, an annular flange depending from the outer periphery of said head and disposed at an angle relative to the underside of the head, the underside of said head being substantially frustoconical across substantially the entire span extending from the inner periphery of said flange to the outer periphery of said shank, a washer made of resiliently compressible material encircling said shank and disposed beneath said head to be compressed between the head and the workpiece

when the fastener is driven into the workpiece, the diameter of the uncompressed washer being less than the inside diameter of said flange, said washer having at least one generally planar end disposed in a radial plane prior to initial compression of the washer, the outer peripheral portion of said one end of said washer engaging an outer peripheral portion of the frustoconical underside of said head just prior to initial compression of said washer with such engagement causing the remaining portion of said one end of said washer to be spaced axially from the frustoconical underside of said head whereby a space is defined between the washer and the underside of said head, and a single annular rib projecting downwardly from the underside of said head and into said space to divide said space into a single inner cavity and a single outer cavity, said rib being coaxial with and spaced radially outwardly from said shank so as to engage said one end of said washer between the inner and outer peripheral portions thereof, said rib having inner and outer sides respectively facing inwardly toward and outwardly from said shank and each inclined at an acute angle relative to a plane disposed transversely of said shank whereby driving of the fastener into the workpiece causes said rib to exert a force effecting a sealing circle between the washer and the workpiece and at the same time causes said inner side of said rib to urge the compressible material at the inner peripheral portion of said washer inwardly into engagement with said shank with some of such compressible material flowing into and substantially filling said inner cavity, driving of said fastener also causing the outer side of said rib to urge the compressible material at the outer peripheral portion of said washer outwardly into engagement with said flange with some of such compressible material flowing into and substantially filling said outer cavity.

4,875,819

WHEEL LOCK SYSTEM APPARATUS

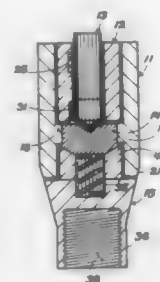
Kevin Wilkinson, 2050 S. Ridgewood Ave. #C-24, S. Daytona Beach, Fla. 32019

Filed Oct. 11, 1988, Ser. No. 255,955

Int. Cl.⁴ F16B 37/08, 41/00

U.S. Cl. 411-432

2 Claims



1. A wheel lock apparatus for selective threaded securement to a threaded boss comprising in combination, an outer hexagonal main body means for selective interlocking securement to a wheel mount member wherein said wheel mount member is formed with a threaded bore axially aligned with said main body means for securement to said threaded boss, and reciprocating latch means axially aligned within said wheel mount means in a retracted first position to disengage said main body means from said wheel mount member and wherein said reciprocating latch means is resiliently biased to a second extended position to interlock said hexagonal main body means to said wheel mount member, and an elongate main body formed with vertical exterior surface flats for enabling securement thereabout by a torquing instrument, and an elongate positioning cylinder mounted within said main body wherein said positioning cylinder includes a recess

formed at a lowermost portion thereof receiving a transverse bolt;

said transverse bolt integrally formed to an elongate lock bolt means reciprocatably mounted within said positioning cylinder for securement of said lock bolt means in said positioning cylinder, and

a wheel mount member fixedly and spacedly secured relative to said positioning cylinder for securement to said threaded boss, and

a latch member positionable in an extended position wherein said lock bolt is in said first position to interlock said main body to said wheel mount, and

said latch member positionable in a retracted position when said transverse bolt is oriented below said recess to disengage said wheel mount relative to said main body when said lock bolt is in said second position, and

wherein said main body is formed with a plurality of annular ribs extending within an interior bore and projecting beyond an interior surface defined by said interior bore wherein said ribs are provided with a plurality of diametrically opposed gaps to accept said latch member in said extended position and accept said transverse bolt in said first position, and

wherein said transverse bolt is positioned to overlie the extensible and retractable latch member and said recess of said positioning cylinder is aligned with and underlying a lock bolt recess for selectively receiving a latch mounted within said lock bolt, and

wherein said lock bolt is formed with a forward conical nose positionable within a conical recess formed in said latch member, and

wherein said latch member is formed with a central cylindrical body and a plurality of diametrically opposed wings extending from said cylindrical body positionable between said ribs, and

wherein said wheel mount is formed with a plurality of annular projections extending above a top surface of said wheel mount member and formed with a diametrically opposed slot for accepting said latch member in said retracted position, and

wherein a spring is positioned underlying said latch member and positioned within a blind bore formed to an upper surface of said wheel mount and axially with an underlying threaded bore for securement to said threaded boss, and

wherein said wheel mount is formed with a lower cylindrical exterior surface and an upper conical surface, and said upper conical surface is aligned with a lower tapered nose formed to said lower portion of said main body, and wherein a plurality of threaded rods are securable within aligned and opposed threaded bores formed within said annular projections of said wheel mount and confronting bores formed within said positioning cylinder to spatially align and position said positioning cylinder relative said wheel mount.

4,875,820

CONVERTIBLE GRAIN BIN SWEEP UNLOADER

Henry P. Lepp, and Herman P. Lepp, both of P.O. Box 113, Rivers, Manitoba, Canada R0K 1X0

Filed Mar. 30, 1988, Ser. No. 175,346

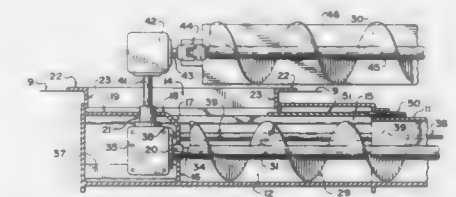
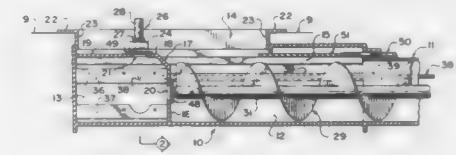
Int. Cl.⁴ B65G 65/46

U.S. Cl. 414-306

23 Claims

1. In an apparatus for discharging bulk material through a central bottom outlet opening of a storage bin, said outlet opening being connected by a discharge sleeve, adapted to contain a discharge conveyor, to a discharge port, said outlet opening having mounting means for a sweep conveyor within said bin, the improvement wherein said mounting means com-

prises first means to mount a sweep conveyor having drive means independent of said discharge conveyor and second



means to mount gearing means drivably connecting said discharge conveyor to a sweep conveyor.

4,875,821

FRONT END LOADING ENCLOSED SEMI TRAILER

David D. Oren, 1270 Payne Ave., St. Paul, Minn. 55101

Continuation of Ser. No. 880,706, Jul. 1, 1986, abandoned. This application Apr. 20, 1988, Ser. No. 185,320

Int. Cl.⁴ B60P 1/28

U.S. Cl. 414-481

7 Claims



1. A substantially enclosed semi trailer, comprising:

(a) hitch means proximate a front end of the semi trailer for interconnection to and support by a tractor at the front end of the semi trailer;

(b) wheel assembly means for supporting a back end of the trailer above the surface of the ground;

(c) extensible jack means disposed proximate the front end of the semi trailer for raising and lowering the front end of the semi trailer;

(d) door means at the front end of the semi trailer for allowing entrance into the semi trailer, whereby when lowered, the semi trailer can be loaded from the front end; and

(e) landing gear means for supporting the front end of the semi trailer above the surface of the ground.

4,875,822

QUICK-COUPLE L-BAR SLEEVE ASSEMBLY FOR WHEEL LIFT

Ronald R. Nespor, Sharpsville, Pa., assignor to Chevron, Inc., Mercer, Pa.

Filed Jun. 9, 1988, Ser. No. 204,454

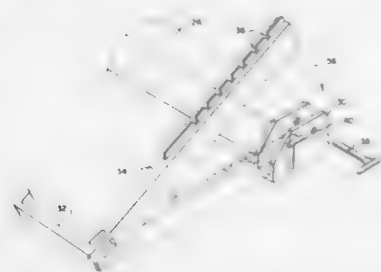
Int. Cl.⁴ B60P 3/12

U.S. Cl. 414-563

5 Claims

1. In a wheel lift assembly comprising oppositely extending telescopic wheel support sleeves, wheel support cradles attached to the outer ends of said sleeves, each of said cradles having connector arm means for securing said cradles to the outer ends of said sleeves so that

said sleeves and said cradles cooperate to retain and support the wheels of a towed vehicle, open top shoe means at the outer end of each of said sleeves, each of said open top shoe means including a bottom wall for receiving said connector arm means and a pair of side walls secured to and extending upwardly from said bottom wall,



said side walls positioned in spaced relation to form an opening for allowing the end of said connector arm means nearest to said shoe means to enter said shoe means through said opening by swinging downwardly in an arc extending from a position above said shoe means into said shoe means and onto said bottom wall, and locking means for locking said connector arm means within said shoe means.

4,875,823

ROBOT APPARATUS

Genzo Fuse, Hiroshi Miwa, and Yoshinobu Kawasaki, all of Sayama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

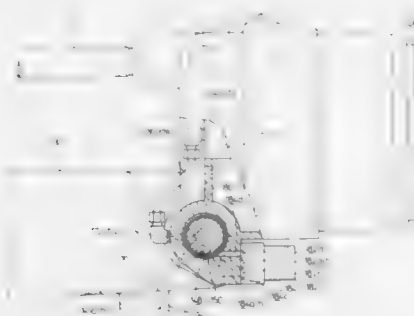
Filed Nov. 6, 1987, Ser. No. 117,229

Claims priority, application Japan, Nov. 8, 1986, 61-266157; Nov. 20, 1986, 61-277611; Nov. 25, 1986, 61-180598[U]

Int. Cl.⁴ B25J 5/02, 17/00

U.S. Cl. 414—735

20 Claims



1. A robot apparatus comprising:
a robot including an attachment member;
an arm swingably mounted on said attachment member;
a wrist mechanism mounted on said arm;
a connecting member interconnecting said attachment member and said wrist mechanism; and
a running mechanism for displacing said robot in a prescribed direction;
said connecting member including an actuator and a link coupled thereto for displacing said wrist mechanism with said actuator, wherein said wrist mechanism includes a bracket coupled to said arm, rotative drive source disposed in said bracket, a rotatable body rotatable by said rotative drive source, and a support shaft by which said bracket is supported on said arm, said support shaft and said bracket having fluid passages defined therein for

supplying fluid under pressure to actuate said rotative drive source.

4,875,824

WAFER TRANSFER APPARATUS

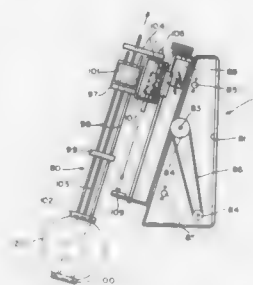
Rolf Moe, Alameda; David J. Corriea, Hayward, and John E. Premann, Fremont, all of Calif., assignors to Blorner Enterprises, Inc., Hayward, Calif.

Filed Feb. 1, 1988, Ser. No. 150,784

Int. Cl.⁴ B65G 65/02, 49/04

U.S. Cl. 414—751

3 Claims



1. A transfer mechanism for a plurality of thin round wafers comprising a base, a first screw having a first axis mounted for rotation in said base, a first motor for driving said first screw in either direction,
a first housing having a first nut mating with said first screw and reciprocable relative to said base along said first axis, a second screw having a second axis perpendicular to said first axis mounted for rotation in said first housing, a second motor for driving said second screw in either direction,
a second housing having a second nut mating with said second screw and reciprocable relative to said first housing along said second axis,
at least one lift device fixed to said second housing at its proximal end and having a distal end comprising grip means on said distal end for detachably gripping sequentially each individual wafer for individually moving each said wafer along said second axis and then moving each individual wafer along said first axis, each said lift device comprising a first rod, first clamp means for clamping the proximal end of said first rod relative to said second housing, first guide means fixed to the distal end of said first rod and wafer grip means spaced up from said first guide means, a second rod connected to said wafer grip means and parallel to and slidable relative to said first rod, second guide means for maintaining said rods in parallelism, a third rod fixed for movement with said second rod, third guide means in said second housing for said third rod and a stop on said first housing engageable with said third rod when said second housing approaches its maximum movement along said second axis to move said grip means away from said first guide means to release a wafer.

4,875,825

METHOD FOR AUTOMATED CASSETTE HANDLING
Barclay J. Tallia, Palo Alto; John S. Bailey, Sunnyvale; D. R. Gunawardena, Union City, and Ulrich Kaempf, Los Altos, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Division of Ser. No. 72,181, Jul. 9, 1987, which is a continuation of Ser. No. 759,013, Jul. 24, 1985, Pat. No. 4,705,444. This application Nov. 10, 1987, Ser. No. 119,356

Int. Cl.⁴ B65G 65/02

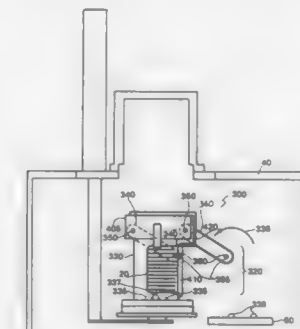
U.S. Cl. 414—786

6 Claims

1. A method for automatically transporting integrated circuit wafers held in a wafer cassette within a canopy, said

canopy coupled to a piece of integrated circuit processing equipment, said method comprising the steps of:

- (a) placing the cassette on an interface port handle of an interface port of the canopy;
- (b) actuating a switch coupled to a controller;
- (c) lowering the cassette on the interface port handle into the canopy;
- (d) positioning a cassette handler into conjunction with the cassette;
- (e) gripping the cassette with a gripper coupled to the cassette handler;



- (f) swinging a wafer depressor partially mounted on an upper portion of and cantilevered from the cassette handler to push and retain wafers within the cassette;
- (g) swinging the cassette handler in a substantially constant plane with respect to the canopy to transport the cassette from the interface port handler to a processing equipment cassette handler without significantly changing the planar orientation of the cassette with respect to the canopy;
- (h) swinging the wafer depressor to release the wafers within the cassette; and
- (i) ungripping the cassette, wherein the steps (c) through (i) are performed under the control of a controller without operator intervention.

4,875,826

PITOT PUMP ASSEMBLY FOR A ROTATING FLUID MANAGEMENT DEVICE

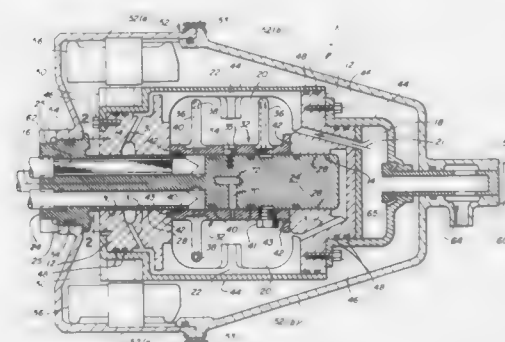
John Readman, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Jul. 26, 1988, Ser. No. 224,344

Int. Cl.⁴ F04D 1/12

U.S. Cl. 415—89

10 Claims



8. A pitot pump comprising;
a rotating drum including a bore, said rotating drum having a cavity between its two axial ends in which fluid is received, said rotating drum having at least one radially extending opening;
a shaft inserted within the bore of said rotating drum and

axially supported therein, said shaft including a fluid passage extending throughout a portion of its axial length, said shaft having one or more sealing and bearing surfaces between said shaft and rotating drum;
a unitary pitot sub-assembly disposed within said cavity of said rotating drum, said pitot sub-assembly inserted through said radial opening of said rotating drum, said pitot assembly having one or more radially extending pitot tubes, said tube(s) having an opening to receive fluid from within said cavity of said rotating drum;
means on said rotating drum and rotatable therewith for sealing said opening; and
an outer housing secured to said stationary shaft, said housing encasing said rotating drum.

4,875,827

FLUID PUMP AND METHOD FOR MAKING THE SAME
Alois Gschwendt, Neubulach; Horst Krüger, Sulzfeld, and Bernhard Schleifer, Kuerbach, all of Fed. Rep. of Germany, assignors to Flax Geräte GmbH, Stuttgart, Fed. Rep. of Germany

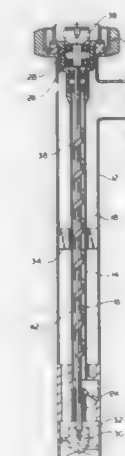
Filed Dec. 24, 1987, Ser. No. 137,768

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1986, 3644515; Aug. 12, 1987, 3726794

Int. Cl.⁴ F04D 13/08

U.S. Cl. 415—111

22 Claims



15. A fluid pump, said pump comprising:
a pump housing;
a drive shaft rotatably mounted within said pump housing;
a bearing support member mounted within said pump housing and fitted over said drive shaft;
at least one helical shaped bearing seated between said drive shaft and said bearing support member for supporting said drive shaft within said support member and for permitting the rotation of said drive shaft therein, said helical shaped bearing defining an exterior helical surface and an interior helical surface, the tension within said helical bearing urging said exterior helical surface against said support member to prevent movement of said helical bearing relative to said support member, said helical shaped bearing further defining a generally helical space between said drive shaft and said support tube; and
propeller means mounted to said drive shaft for propelling fluid upon rotation of said drive shaft.

4,875,828

TURBO-ENGINE HAVING MEANS FOR CONTROLLING THE RADIAL GAP

Franz Willkop, Munich; Gerhard Zahring, Worthsee; Robert Rutsch, Karlsruhe; Joachim Popp, Dachau, and John Eberhard, Munich, all of Fed. Rep. of Germany, assignors to MTU Motoren- und Turbinen-Union München GmbH, Munich, Fed. Rep. of Germany
Continuation of Ser. No. 936,584, Dec. 22, 1986, abandoned.
This application Jan. 23, 1989, Ser. No. 281,531
Claims priority, application Fed. Rep. of Germany, Mar. 14, 1985, 3509193

Int. Cl.⁴ F01D 5/08

U.S. Cl. 415—173.4

8 Claims



1. A thermal turbo-engine comprising a rotor which rotates about an axis of rotation and includes a plurality of axially spaced rows of rotor blades, an outer casing, an inner casing connected to said outer casing and including a plurality of axially spaced annular shell elements surrounding the rotor, a plurality of annular supports juxtaposed in alternation between adjacent shell elements, each support carrying a run-in layer facing a respective row of rotor blades, means detachably connecting the shell elements and the supports to one another, said shell elements each including opposite radial flanges, said supports each including a radial web engaged between the flanges of adjacent shell elements, a plurality of stators disposed between respective adjacent supports, each stator including a stator vane and a foot, the foot of each stator being held and supported between the adjacent supports with the respective radial web disposed between the radial flanges of adjacent shell elements, said radial web of each of said supports and the adjacent radial flanges of said shell elements forming a respective substantial mass which is aligned outside and around each row of rotor blades to resist thermal deformation and maintain constant minimized gaps formed between each row of rotor blades and its respective run-in layer over the operating range of the engine, fastening elements detachably connecting said shell elements and supports together and annular cover rings covering said shell elements to isolate the shell elements from fluid removed from fluid flowing in the engine, said inner casing defining removal ports for said fluid flowing in the engine, which ports lead to passages formed between respective cover rings and adjacent selected ones of said radial webs, and heat barrier layers on said cover rings and said ones of the radial webs which form said passages.

4,875,829

MARINE PROPELLER

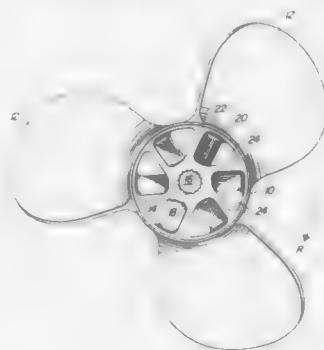
Gerbrig W. Van der Woude, Rock Island, Ill., assignor to Van Der Woude Plastic Corporation, Moline, Ill.
Filed Aug. 31, 1988, Ser. No. 239,495
Int. Cl.⁴ B63H 1/20

U.S. Cl. 416—2

2 Claims

1. A marine propeller drivable by a power source including an internal combustion engine and a drive shaft, the propeller being of unitary, one-piece molded construction of lightweight, rigid, high-strength, non-metallic material having a unitary central structure in the form of a nave centered on the axis of rotation of the propeller and including an integral, coaxial hub, an integral annular wall concentrically and spacedly surrounding the hub and a plurality of qui-angularly spaced apart spokes extending between and integral with the hub and the interior surface of the annular wall and providing

a like plurality of fore-and-aft engine-exhaust passages, the hub having an axially central opening for axis-wise mounting or dismounting from the shaft and including shaft-engaging splines integral with the hub and configured and dimensioned



to shear in response to overloads on the propeller of a predetermined value below the load level at which the power source would be damaged, and a plurality of propeller blades integral with and radiating from the outer surface of the annular wall.

4,875,830

FLANGED LADDER SEAL

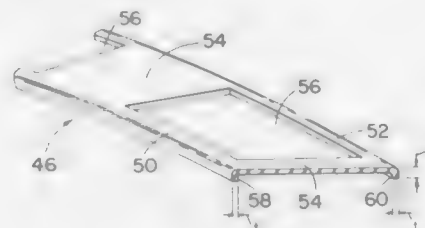
Edmund D. Trossell, Tolland, and Robert F. Kaspro, Wethersfield, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jul. 18, 1985, Ser. No. 756,462

Int. Cl.⁴ F01D 5/30

U.S. Cl. 416—215

3 Claims



1. A gas turbine engine rotor assembly comprising:
- (a) an annular rotor disk having a rim and a blade retaining slot extending circumferentially about said rim, said disk having an axis, and said slot having a base and opposed, axially spaced apart sidewalls;
 - (b) a plurality of rotor blades arranged in a circumferential row about said disk rim, each blade having a blade root disposed within said slot and a platform spaced radially outwardly of said root, said platforms of adjacent blades having an axially extending gap therebetween, each platform having a radially inwardly facing underside surface inclined radially outwardly in opposite axial directions away from said root, said underside surface radially spaced from said rim so as to define a circumferentially extending gap therebetween; and
 - (c) an annular ladder seal disposed radially inwardly of said blade platforms and between said platforms and said slot base, said seal having a pair of axially spaced apart, circumferentially extending strips and a plurality of circumferentially spaced apart crossbars extending axially from one strip to the other and integral with both strips, each strip having a circumferential, radially inwardly extending flange axially adjacent to one of said slot sidewalls, wherein said seal is adapted to bend due to centrifugal forces during engine operation such that each of said crossbars contacts said underside surfaces of adjacent

blade platforms to seal said gap extending axially between said platforms, and each flange moves radially outwardly as well as axially and contacts its respective slot sidewall to seal said gap extending circumferentially between said rim and said platform underside surfaces.

4,875,831

COMPRESSOR ROTOR BLADE HAVING A TIP WITH ASYMMETRIC LIPS

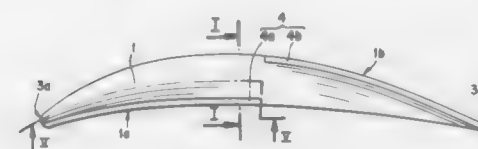
Jean Y. L. Fetiveau, Soisy sur Seine, France, assignor to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation "SNECMA", Paris, France

Filed Nov. 18, 1988, Ser. No. 972,730

Claims priority, application France, Nov. 19, 1987, 87 15981
Int. Cl.⁴ F04D 29/38

U.S. Cl. 416—228

4 Claims



1. A compressor rotor blade wherein the tip of said blade is provided with at least one discontinuous sealing lip, said lip consisting of two half lips which are arranged one at each side of said blade in an asymmetrical manner with respect to a transverse sectional plane of said blade tip, wherein a first one of said two half lips is located on the concave side of said blade and extends from the leading edge of said blade to the vicinity of the median plane perpendicular to the chord of said blade, and a second one of said half lips is located on the convex side of said blade and extends from said median plane to the trailing edge of said blade.

4,875,832

PRESSURE CONTROL VALVE FOR VARIABLE DISPLACEMENT SWASH PLATE TYPE COMPRESSOR

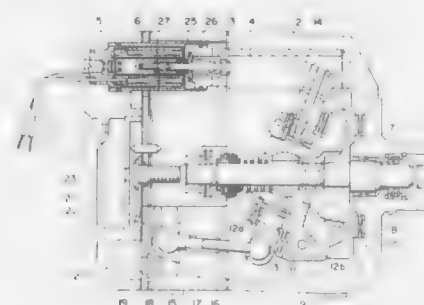
Nobuhiko Suzuki, Konan, and Tetuya Aoki, Setagaya, both of Japan, assignors to Diesel Kiki Co., Ltd. and Fujikoki Manufacturing Co., Ltd., both of Tokyo, Japan

Filed Dec. 19, 1988, Ser. No. 286,121

Claims priority, application Japan, Dec. 28, 1987, 62-336641
Int. Cl.⁴ F04B 1/26; F16K 31/02

U.S. Cl. 417—222

2 Claims



1. A pressure control valve for a variable displacement swash plate-type compressor, comprising:
- a valve case including a first connection hole for communicating with a crank chamber and a second connection hole for communicating with an intake chamber;
 - an end cap secured to said valve case;
 - a valve element disposed within said valve case and movable along an axis for adjusting the degree of communication between said first and said second connection holes;
 - a valve seat for engagement with said valve element, said

valve seat being mounted on said valve case for adjustment along said axis;

- a solenoid for controlling the movement of said valve element, said solenoid including:
- an electromagnetic coil disposed within said case;
- a stator connected to said coil and including a through-hole one end of said stator having a substantially planar surface disposed substantially normal to said axis;
- armature means mounted for reciprocation with respect to said coil, at least a portion of a front end of said armature means having a substantially planar surface disposed normal to said axis and confronting said one end of said stator, a rear end of said armature means being loosely received with radial clearance in said end cap;
- a biasing spring extending between said rear end of said armature means and said end cap for biasing said armature means toward said stator;
- a stem secured to said valve element at a front end of said stem and extending through said through-hole, a rear end of said stem contacting said armature means; and
- a bellows for displacing said valve element along said axis in response to the pressure in said intake chamber, said bellows including a first end connected to said stem and a second end connected to said valve case, the interior of said bellows communicating with the atmosphere to equalize the pressure within said bellows.

4,875,833

PUMPING OF HIGH VISCOSITY MATERIALS

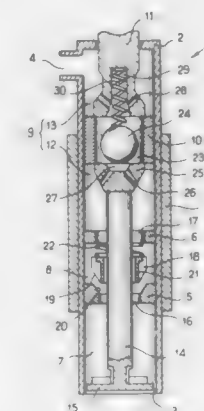
Michel Canaud, Paris, and Philippe Dewitte, Thouroutte, both of France, assignors to Saint-Gobain Vitrage, Courbevoie, France

Filed Feb. 20, 1987, Ser. No. 19,378

Claims priority, application France, Feb. 20, 1986, 86 02344;
Jan. 22, 1987, 87 00709; Jan. 22, 1987, 87 00710
Int. Cl.⁴ F04B 5/00, 21/00

U.S. Cl. 417—259

23 Claims



1. A reciprocating vane pump for thick materials having a viscosity greater than 35,000 poises, comprising:
- a pump body having a material inlet and a material outlet;
 - a piston slidably positioned in said pump body;
 - a rod fixed to said piston and extending therefrom along the length of said pump body to said material inlet;
 - a vane fixed to a distal end of said rod at said material inlet;
 - at least two partitions spaced along the length of said pump body to separate the interior of said pump body into a plurality of stages, said partitions having ports for permitting passage of said rod, said ports each having a clearance with respect to said rod large enough to permit free passage of the material therepast; and
 - check valves associated with at least one of said ports and with said piston for permitting material flow only from said inlet to said outlet, said check valves each providing

a clearance, when open, sufficient to permit free passage of the material therepast, whereby material is pumped from said inlet to said outlet by reciprocation of said piston in said pump body, wherein said check valve associated with said at least one port comprises a ring shaped valve member surrounding said rod with a diametrical clearance of between 1 and 2.5 mm and having a bronze bearing surface for guiding said rod.

4,875,834

WOBBLE PLATE TYPE COMPRESSOR WITH VARIABLE DISPLACEMENT MECHANISM

Tomo Higuchi; Kiyoshi Terauchi, both of Iseaki; Kazuhiko Takai, Masahashi; Sei Kikuchi, and Hideto Kobayashi, both of Iseaki, all of Japan, assignors to Sanden Corporation, Gunma, Japan

Filed Feb. 19, 1988, Ser. No. 157,782

Claims priority, application Japan, Feb. 19, 1987, 62-36443; Feb. 19, 1987, 62-36444

Int. Cl.⁴ F04B 1/14

U.S. Cl. 417—269

10 Claims

1. In a wobble plate type compressor with a variable displacement mechanism, said compressor comprising a compressor housing having a cylinder block provided with a plurality of cylinders and a crank chamber adjacent said cylinder block, a piston slidably fitted within each of said cylinders, a drive shaft rotatably supported in said housing, a rotor fixed on said drive shaft and further connected to a variably inclined plate, a wobble plate adjacent said inclined plate with each of said plurality of pistons coupled at one end with said wobble plate, rotational motion of said inclined plate converted into nutational motion of said wobble plate, and a rotation preventing mechanism to prevent rotational motion of said wobble plate, the improvement comprising:

said rotation preventing mechanism comprising a guide plate having an upper surface extending within said crank chamber and a cylindrical block disposed within a hole formed in an extended portion of said wobble plate, said cylindrical block including a vertical groove formed therein and extending to an upper interior surface of said cylindrical block, said groove slidably fitted on said guide plate, said rotation preventing mechanism also including retaining means for retaining said cylindrical block in said hole such that said upper interior surface of said groove does not contact said upper surface of said guide plate.

4,875,835

VARIABLE DISPLACEMENT COMPRESSOR

Nobuyuki Nakajima; Kenichi Inomata; Masaya Morita; Toshio Yamaguchi, and Kazuo Eitai, all of Konan, Japan, assignors to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Nov. 15, 1988, Ser. No. 271,303

Claims priority, application Japan, Dec. 24, 1987, 62-327658

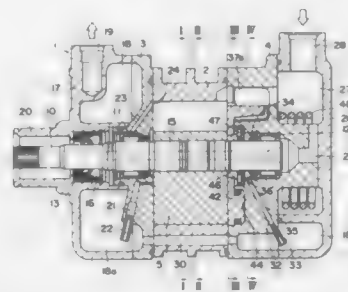
Int. Cl.⁴ F04B 49/02; F04C 29/08

U.S. Cl. 417—295

4 Claims

1. A variable displacement compressor, comprising: a compressor cylinder having opposite sides; a pair of side blocks, one said side block connected to each

opposite side of said compressor cylinder to thereby define a cylinder chamber inside said compressor cylinder; a rotor, rotatably disposed in said cylinder chamber, having thereon a plurality of radially movable sliding vanes; said compressor cylinder, said rotor, said side blocks and said plurality of vanes together defining a plurality of variable volume compression chambers varying in volume with rotation of said rotor in said cylinder chamber; a pair of heads, one said head attached to a respective said side block; displacement adjustment means incorporated in a first said side block and its respective head for controlling the compression starting timing in said plurality of compression chambers; said first side block having a first oil sump for retaining therein a lubricating oil;



a second oil sump for retaining oil therein exposed to a high pressure output of said compression chambers; a connection passage in said compressor cylinder connecting said first and second oil sumps to thereby maintain said oil in said first oil sump under a high pressure; a shaft supporting said rotor, said shaft having a first end supported by said first side block; said first side block having a bearing chamber therein extending circumferentially about the outer peripheral surface of said shaft; a lubrication oil supply passage means in said first side block connecting said first oil sump with said displacement adjustment means, said lubrication oil supply passage means comprising said bearing chamber and an oil passage in said first side block interconnecting said first oil sump and said bearing chamber.

4,875,836

SELF-SUCKING PUMP APPARATUS FOR LIQUIDS

Paul Zehnder, Birmenstorf, Switzerland; Hans-Ulrich Niklaus, Windisch, Switzerland; Engelbert Schmiedl, Rohrdorf, Switzerland, and Franz Patri, Frankfurt am Main, Fed. Rep. of Germany, assignors to K. Rütchi AG, Brugg, Switzerland

Filed Jan. 11, 1988, Ser. No. 141,807

Claims priority, application Switzerland, Jan. 15, 1987, 132/87

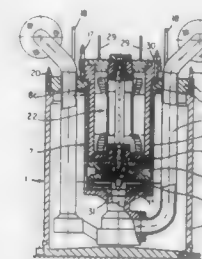
Int. Cl.⁴ F04B 17/00

U.S. Cl. 417—360

5 Claims

1. A self-sucking pump apparatus for liquids, comprising: a pump containing a motor part; said pump being constructed as a structural unit incorporating said motor part; a suction device constructed as a structural unit; said suction device defining a hollow compartment bounded by a first wall for housing said structural unit inclusive of said motor part of said pump; self-centering connection means for interconnecting in a self-centering manner said suction device and said structural unit inclusive of said motor part of said pump in the hollow compartment of the suction device; connecting means for engagement by remotely controlled manipulation means for releasably connecting said struc-

tural unit inclusive of said motor part of said pump with said suction device; said structural unit of said pump containing assembly means for engagement by remotely controlled mounting means for selectively inserting or removing in substantially coaxial manner said structural unit of said pump into and out of said hollow compartment of said suction device; a closable pressure container bounded by a second wall for receiving said suction device; connecting means for engagement by remotely controlled manipulator means for releasably connecting said suction device with said closable pressure container; said suction device containing assembly means for engagement by remotely controlled mounting means for selectively inserting or removing in substantially coaxial manner said suction device into or out of said closable pressure container;



said suction device further containing an infeed line for conducting fluid to be pumped to said pump and a discharge line for conducting pumped fluid away from said pump; closing means for closing said closable pressure container in the inserted state of said structural unit of said pump and said suction device in said closable pressure container; said discharge and infeed lines extending through said closing means in a sealed relationship; said structural unit of said pump, said suction device bounded by said first wall and said closable pressure container bounded by said second wall constituting, when inserted into one another, a self-contained structural unit which is substantially hermetically closed on all sides except for said infeed line and said discharge line and which self-contained structural unit encloses said motor part of said pump.

4,875,837

TWO-FLOW-PASSAGE TYPE EXHAUST GAS DRIVEN TURBO-CHARGER

Saburo Usami, Hitachi; Kyotchi Uchiyama, Kashiwa, and Satoshi Suzuki, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 8, 1986, Ser. No. 904,401

Claims priority, application Japan, Sep. 18, 1985, 60-204258

Int. Cl.⁴ F04B 17/00

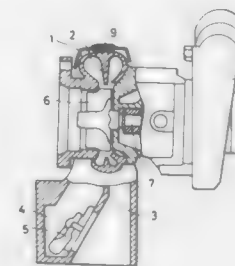
U.S. Cl. 417—407

11 Claims

1. A two-flow-passage type exhaust gas driven turbo-charger comprising:

a turbine casing having a scroll portion into which a high temperature exhaust gas flows; an annular partition provided in said scroll portion of said turbine casing and extending radially inwardly from a root portion at an inner surface of said scroll portion to a free end portion to radially divide said scroll portion into two parts to thereby form two flow passages for high temperature exhaust gas; a radial flow type turbine wheel disposed in said turbine casing and driven by a high-temperature exhaust gas introduced therein through said scroll portion;

a compressor connected to said turbine wheel and driven by said turbine wheel so as to supercharge an engine; an outer surface of a portion of said turbine casing from which said partition extends radially inwardly is covered



with a heat-insulating material so that a heat release from the outer surface of said portion of said turbine casing is reduced thereby reducing a temperature differential between said root portion and said free end portion of said partition.

4,875,838

SCROLL COMPRESSOR WITH ORBITING SCROLL MEMBER BIASED BY OIL PRESSURE

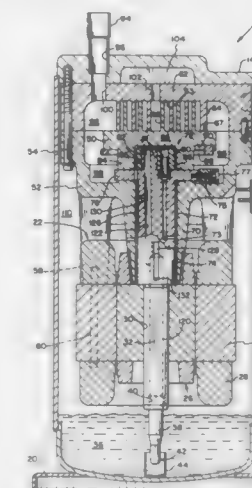
Hubert Richardson, Jr., Brooklyn, Mich., assignor to Tecumseh Products Company, Tecumseh, Mich.

Filed May 12, 1988, Ser. No. 193,398

Int. Cl.⁴ F04C 18/04, 27/00, 29/02

U.S. Cl. 418—55

18 Claims



1. A scroll-type compressor for compressing refrigerant fluid, comprising: a hermetically sealed housing including therein a discharge pressure chamber at discharge pressure and a suction pressure chamber at suction pressure; an oil sump within said discharge pressure chamber; suction inlet means for conveying refrigerant from outside of said housing to said suction pressure chamber; discharge outlet means for conveying refrigerant from said discharge pressure chamber to outside of said housing; a fixed scroll member within said housing including an involute fixed wrap element; an orbiting scroll member having a top surface and a bottom surface, said orbiting scroll member including an involute orbiting wrap element on said top surface, said fixed and orbiting scroll members being generally axially aligned and having an interface therebetween whereat said fixed and orbiting wraps are intermeshed, a radially outer portion of said interface communicating with said suction

pressure chamber and a radially inner portion of said interface communicating with said discharge pressure chamber, said orbiting scroll member being adapted to orbit with respect to said fixed scroll member such that refrigerant entering said interface at said radially outer portion is compressed and subsequently discharged at said radially inner portion;

drive means for causing said orbiting scroll to orbit; axial compliance means for applying a net axial force on said bottom surface of said orbiting scroll member toward said fixed scroll member, said compliance means comprising means for exposing a radially outer portion of said bottom surface to said suction pressure chamber and a radially inner portion of said bottom surface to oil from said oil sump, said oil from said oil sump being at substantially discharge pressure; and seal means for substantially sealing between said radially outer portion exposed to said suction pressure chamber and said radially inner portion exposed to said oil from said oil sump, whereby said seal means establishes an interface between a radially inner, oil-filled chamber and a radially outer gaseous chamber.

4,875,839

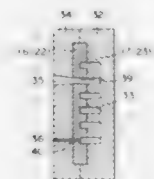
SCROLL MEMBER FOR USE IN A POSITIVE DISPLACEMENT DEVICE, AND A METHOD FOR MANUFACTURING THE SAME

Hirotsugu Sakata, Chigasaki; Hiroaki Murasaki, Yokohama; Makoto Hayano, Tokyo; Hitoshi Hattori; Naoya Morozumi, both of Yokohama; Kouichi Yoneyama, Chigasaki; Isao Suzuki, Tokyo; Junji Sone, Yokohama, and Shigemi Nagatomo, Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 18, 1988, Ser. No. 170,354

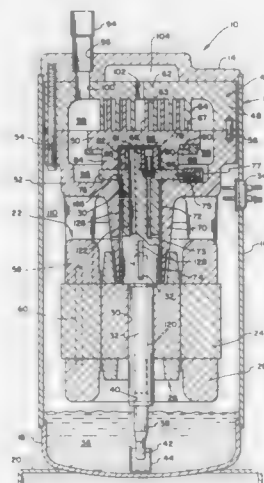
Claims priority, application Japan, Mar. 20, 1987, 62-64316; Sep. 30, 1987, 62-243993; Dec. 4, 1987, 62-305721

Int. Cl.⁴ F01C 1/04; F04C 18/04; B28B 1/24, 7/18
U.S. Cl. 418—55 19 Claims



1. A scroll member comprising: an end plate having a spiroidal groove on one side thereof, and a through-hole communicating with the groove; and a resin wrap joined to the groove of the end plate so as to protrude from the surface of the end plate, said wrap being formed by molding, and said through-hole and said groove being filled with part of said wrap.

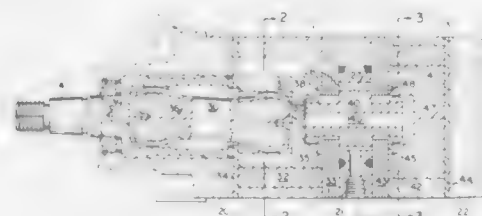
4,875,840
COMPRESSOR LUBRICATION SYSTEM WITH VENT
William C. Johnson, Onsted; Hubert Richardson, Jr., Brooklyn, and Thomas R. Barito, Tecumseh, all of Mich., assignors to Tecumseh Products Company, Tecumseh, Mich.
Filed May 12, 1988, Ser. No. 193,548
Int. Cl.⁴ F04C 18/04, 29/02; F01M 11/02
U.S. Cl. 418—55 22 Claims



1. A hermetic compressor, comprising: a housing; an oil sump within said housing; compressor means within said housing for compressing refrigerant fluid, said compressor means including a drive input comprising a bearing; a rotatable crankshaft having a first end portion disposed within said oil sump and a second opposite end portion rotatably journaled within said bearing, said crankshaft including a first generally axial oil passageway in fluid communication with said oil sump and extending the length of said crankshaft through said first and second end portions thereof; pump means, operable upon rotation of said crankshaft, for pumping oil from said oil sump through said first oil passageway; and vent means, including a second generally axial oil passageway extending through said second end portion of said crankshaft, for returning oil pumped through said first oil passageway back to said oil sump, said first oil passageway being in fluid communication with said second oil passageway.

4,875,841

STAGGERED ROTOR GEROTOR DEVICE
Hollis N. White, Jr., 243 Pyle Ln., Hopkinsville, Ky. 42240
Continuation of Ser. No. 77,869, Jul. 27, 1987, abandoned. This application Feb. 1, 1989, Ser. No. 304,924
Int. Cl.⁴ F03C 2/08
U.S. Cl. 418—60 17 Claims

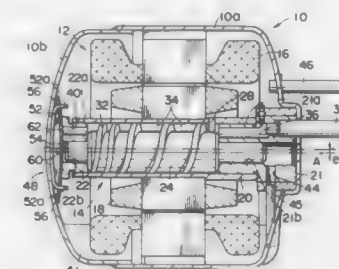


1. In a device having two drive shaft connected gerotor

structures, each having a rotor oriented with a certain fixed neutral phase relationship in respect to its stator, the improvement of the neutral phase relationship of one gerotor structure occurring at a different time than the neutral phase relationship of the other gerotor structure to smooth the linearity of the output torque of the device.

4,875,842

AXIAL FLOW FLUID COMPRESSOR
Toshikatsu Iida, Yokohama; Takayoshi Fujiwara, Kawasaki, and Tetsuo Fukuda, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Sep. 9, 1988, Ser. No. 242,217
Claims priority, application Japan, Sep. 10, 1987, 62-227320; Jan. 5, 1988, 63-494
Int. Cl.⁴ F04B 39/00
U.S. Cl. 418—220 17 Claims

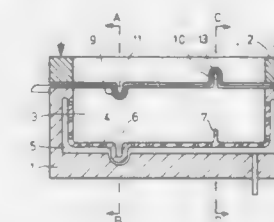


1. A fluid compressor comprising: a cylinder having a suction-side end and a discharge-side end; a columnar rotating body located in the cylinder to extend in the axial direction thereof and be eccentric thereto, and rotatable relative to the cylinder while part of the rotating body is in contact with the inner peripheral surface of the cylinder, said rotating body having a spiral groove on the outer peripheral surface thereof, said groove having pitches narrowed gradually with a distance from the suction-side end to the discharge-side end of the cylinder; a spiral blade fitted in the groove to be slidable, substantially in the radial direction of the rotating body, having an outer surface in tight contact with the inner peripheral surface of the cylinder, and dividing the space between the inner peripheral surface of the cylinder and the outer peripheral surface of the rotating body into a plurality of operating chambers; a pair of bearings for rotatably supporting both ends of the cylinder and rotatably supporting corresponding ends of the rotating body so as to hold the rotating body at a predetermined position with respect to the cylinder; drive means for relatively rotating the cylinder and the rotating body so as to sequentially transporting a fluid, which is drawn into the cylinder from the suction-side end thereof, toward the discharge-side side of the cylinder through the operating chambers; a closed case for housing said constituent members; and support means for supporting one of said bearings so as to be movable in the radial direction of the cylinder relative to the case.

4,875,843

VACUUM MOLD FOR MANUFACTURING CUSHIONS WITH BACK-FOAMED COVERS

Volker Onnenberg, Wiehl, and Günter Möllmann, Hagen, both of Fed. Rep. of Germany, assignors to Fritsche-Möllmann GmbH & Co., Lotte and Bayer Aktiengesellschaft, Leverkusen, both of, Fed. Rep. of Germany
Filed Sep. 13, 1988, Ser. No. 243,868
Claims priority, application Fed. Rep. of Germany, Sep. 23, 1987, 3731994
Int. Cl.⁴ B29C 45/14; B32B 5/18
U.S. Cl. 425—4 R 4 Claims

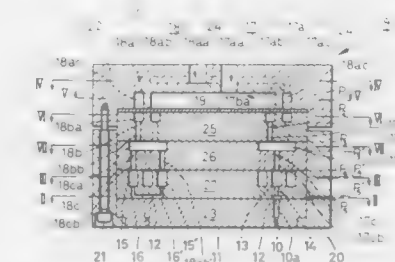


1. A vacuum mold for manufacturing a cushion with a back-foamed cover, said mold comprising an upper mold half and a lower mold half, said lower mold half comprising a mold cavity having longitudinal contours and being connected to a vacuum source such that when a vacuum is applied, said cover is pulled into said cavity, wherein said cavity is surrounded by a rim, said rim having contours thereon running the same direction as the contours in said mold cavity, and wherein a tenter is associated with said rim, said tenter having negative contours corresponding to the contours on said rim, and wherein said tenter is adapted to hold down said cover on said rim while at the same time allowing said cover to slide upon application of vacuum to said cavity.

4,875,844

SPINNERET ASSEMBLY FOR SHEATH-CORE TYPE COMPOSITE FIBERS

Sadaaki Nakajima, and Taiju Terakawa, both of Shiga, Japan, assignors to Chisso Corporation, Osaka, Japan
Filed Feb. 15, 1989, Ser. No. 310,585
Claims priority, application Japan, Feb. 17, 1988, 63-32789
Int. Cl.⁴ D01D 4/06
U.S. Cl. 425—131.5 4 Claims



1. A sheath-core type composite spinneret assembly (9) comprising in combination: (1) an annular array of multiple spinning holes (10) which are provided at least in one row and open on a spinning plane (11) of said spinneret assembly (9); (2) a spinning-stock-solutions-combining-passage (12) in the form of an endless annulus, which is of a shallow depth and provided on its spinning-stock-solution-feeding-side of said spinning holes (10) and in parallel with said spinning plane (11) per one row of said array of said spinning holes (10), and on which inlets (10a) of said spinning holes (10) are open,

- (3) a single core-component-stock-solution-distributing-passages (13) in the annular form arranged along said spinning-stock-solutions-combining-passages (12) on its spinning-stock-solution-feeding-side; core-component-stock-solution-outlet-passages (14) provided to guide a core-component-stock-solution from said core-component-stock-solution-distributing-passages (13) to said spinning-stock-solutions-combining-passages (12) and open in said spinning-stock-solutions-combining-passages (12) at positions located coaxially with respect to said spinning holes (10); two sheath-component-stock-solution-distributing-passages (15, 15'), both in the annular form, arranged in parallel with said spinning plane (11) with said core-component-stock-solution-distributing-passages (13) being sandwiched therebetween; and sheath-component-stock-solution-outlet-passages (16, 16') provided to guide a sheath-component-stock-solution from said sheath-component-stock-solution-distributing-passages (15, 15') to said spinning-stock-solutions-combining-passages (12) and respectively open on both side edges of said spinning-stock-solutions-combining-passages (12) at positions located substantially in the middle of the adjacent inlets (10a) of said holes (10), and
- (4) a core-component-stock-solution-feeding-passages (17) and a sheath-component-stock-solution-feeding-passages (18) provided to individually feed said core- and sheath-component-stock-solution to said core-component-stock-solution-distributing-passages (13) and said sheath-component-stock-solution-distributing-passages (15, 15').

4,875,845 INJECTION NOZZLE FOR AN INJECTION MOLDING MACHINE

Hiroshi Hara, Fumabashi, and Hiroyoshi Sames, Chiba, both of Japan, assignors to Sumitomo Heavy Industries, Ltd., Tokyo, Japan

PCT No. PCT/JP88/00312, § 371 Date Nov. 28, 1988, § 102(e) Date Nov. 28, 1988, PCT Pub. No. WO88/07446, PCT Pub. Date Oct. 6, 1988

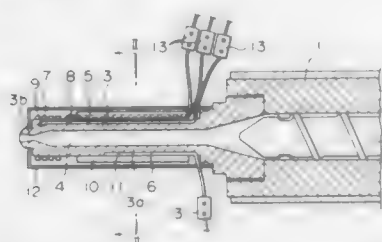
PCT Filed Mar. 29, 1988, Ser. No. 298,609

Claims priority, application Japan, Mar. 31, 1987, 62-46691; Aug. 7, 1987, 62-120347

Int. Cl.⁴ B29C 45/78

U.S. Cl. 425-143

3 Claims



1. An injection nozzle for an injection molding machine having a nozzle body protruding from a front end of a heating cylinder thereof, said injection nozzle comprising a plurality of electric heating members each member surrounding a different nozzle body section of said nozzle body and longitudinally arranged side by side, a plurality of temperature detecting members, each of said temperature detecting members detecting the temperature of each respective nozzle body section surrounded by a respective heating member, and a control mechanism for individually controlling said plurality of heating members in accordance with the detected temperatures of said temperature detecting members.

4,875,846 SPINNING APPARATUS

Helmut Reinhold, Petersbergstrasse 5, 5200 Siegburg/Kaldanien, Fed. Rep. of Germany

PCT No. PCT/DE86/00467, § 371 Date Aug. 28, 1987, § 102(e) Date Aug. 28, 1987, PCT Pub. No. WO87/03017, PCT Pub. Date May 21, 1987

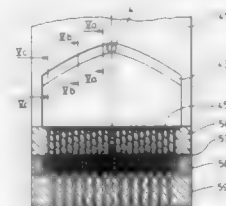
PCT Filed Nov. 14, 1986, Ser. No. 86,081

Claims priority, application Fed. Rep. of Germany, Nov. 16, 1985, 3540757

Int. Cl.⁴ B29C 47/12

U.S. Cl. 425-186

16 Claims



1. Spinning apparatus for the production of monofilament yarn comprising:

- a spinning tool having means defining a channel section for receiving polymer melt and
- flow channel means, interconnected between said channel section and a group of nozzles, for widening the flow of polymer melt, said flow channel means having, at least in an upper part thereof, increased cross-sectional area in the direction of polymer flow from the channel section toward the group of nozzles.

4,875,847 TWIN-SCREW EXTRUDER HAVING RESPECTIVE CONICAL NOSE SCREW SECTIONS

LaVon G. Wenger, Bobbie W. Hauck, and Timothy R. Hartter, all of Sabetha, Kans., assignors to Wenger Manufacturing, Inc., Sabetha, Kans.

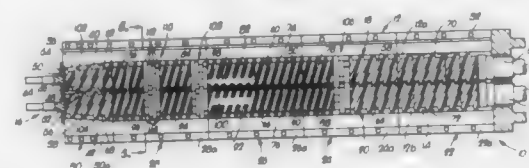
Continuation of Ser. No. 165,460, Mar. 2, 1988, abandoned, which is a continuation of Ser. No. 794,252, Oct. 30, 1985, abandoned, which is a continuation of Ser. No. 603,195, Apr. 23, 1984, abandoned. This application Jan. 17, 1989, Ser. No.

298,863

Int. Cl.⁴ B29C 47/40

U.S. Cl. 425-204

8 Claims



1. An extruder, comprising:
an elongated barrel presenting an inlet end and an outlet end, a material inlet adjacent said inlet end thereof and a pair of separate, generally tubular, juxtaposed head sections proximal to said outlet end of the barrel and defining respective chambers separated by a central wall, each of said outlet end head sections being of decreasing cross-sectional area

along the length thereof, said outlet end head sections serving to divide and receive material passing through said barrel, said elongated barrel having an outer surface that is imperforate between the outlet end head section and the outlet end of the barrel;

- a pair of elongated, juxtaposed, axially rotatable flighted screws positioned within said barrel for moving material therethrough, each of said screws including an elongated, flighted, generally frustoconical outlet end screw section of decreasing cross-sectional area along the length of the outlet end screw section which is substantially complementary with a corresponding one of said outlet end sections, each of said outlet end screw sections having a rearward margin and a forward margin, the length of each of said outlet end screw sections being greater than the greatest diameter of the outlet end screw section,

each of said outlet end screw sections having a peripheral helical flighting portion extending forwardly from said rearward margin of the outlet end screw section, each of said flighting portions intermeshing with the flighting portion of the other outlet end screw section by a predetermined depth of intermesh which progressively decreases the flighting portions extending forwardly from the rearward margins of said end screw sections until the flighting portions completely separate from each other at a point spaced rearwardly from said outlet end of said barrel,

each of said outlet end screw sections extending into and being substantially complementarily received by a corresponding outlet end head section for providing a bearing-type support for each of said flighted screws by virtue of passage of material into and through said head sections, and into surrounding relationship to the outlet end screw sections, during operation of said extruder;

restricted orifice die structure; and
means mounting said die structure adjacent the outlet end of said barrel and in a spaced apart relationship to the forward margins of said outlet end section, the spacing between said outlet end section forward margins and said die structure being less than the length of one of said generally frustoconical outlet end sections.

4,875,848 INJECTION MOLDING HEATED GATE INSERT AND METHOD

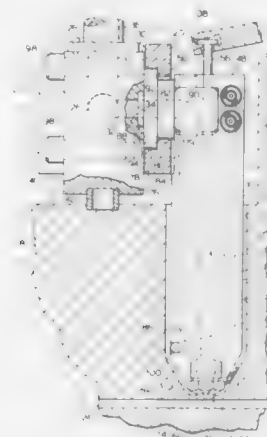
Jobst U. Gellert, 7A Prince Street, Georgetown, Canada L7G 2X1

Filed Feb. 29, 1988, Ser. No. 162,296

Int. Cl.⁴ B29C 45/20, 45/72

U.S. Cl. 425-549

6 Claims



1. An elongated injection molding nozzle with a forward end, a rear end and gate insert member removably seated in the forward end of the nozzle, the nozzle having a melt channel

extending to a central mouth at the forward end of the nozzle and an integral electrical heating, the gate insert member comprising:

- (a) a cylindrical rear portion extending to a rear end of the gate insert member shaped for removable insertion into the forward end of the nozzle a nose portion extending to a forward end of the gate insert member, and an intermediate portion extending between the rear portion and the nose portion,
- (b) a central melt bore extending axially through the gate insert member from an inlet at the rear end to an outlet at the forward end, and
- (c) an electrical heating element having a helical portion and a terminal portion, the terminal portion extending to connect to a lead from an external power source, the helical portion being integrally embedded in the gate insert member to extend around the melt bore through the gate insert member.

4,875,849 RUBBER SHAPING MACHINE

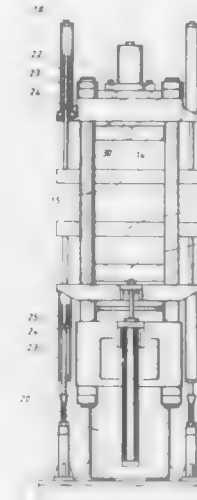
Jin S. Huang, and Jin L. Huang, both of No. 1, Lan Tsun Rd., Lan Tsun Li, Feng Yuan, Taichung Hsien, Taiwan

Filed Mar. 14, 1988, Ser. No. 167,776

Int. Cl.⁴ B29C 45/67

U.S. Cl. 425-589

5 Claims



1. A rubber shaping machine comprising:
a mold frame;
an upper mold mounted on said mold frame;
an upper middle mold vertically movably mounted on said mold frame and under said upper mold;
a lower middle mold vertically movably mounted on said mold frame and under said upper middle mold;
a lower mold vertically movably mounted on said mold frame and under said lower middle mold;
a main oil cylinder capable of pushing said lower mold upwards;
two auxiliary oil cylinders having their respective spindles connected to two opposite sides of said lower mold and capable of pushing it upwards;
a feeding tube;
a storing barrel connected to and receiving a rubber material from said feeding tube; and
an injection head device mounted on said storing barrel for injecting said rubber material into a space between said upper and lower molds.

4,875,850
GAS BURNER OF THE BLOWN AIR AND PREMIXTURE TYPE

Francois Cagnon, Paris; Denis Di Paola, Argenteuil; Georges Anstray, Villemecense, and André Vinchon, Paris, all of France, assignors to Gaz de France, Paris, France
Filed Nov. 2, 1987, Ser. No. 115,728

Claims priority, application France, Nov. 7, 1986, 86 15556
Int. Cl.⁴ F23C 5/08

U.S. Cl. 431—8

1 Claim



1. A method of lighting a pilot burner for a main burner, said pilot having a premixing chamber with separate inlets for air and combustible gas, and a metallic flame-stabilizing grille through which a mixture of air and combustible gas is introduced into a combustion chamber of said main burner, said method comprising:

feeding air and combustible gas through said inlets into said premixing chamber at a ratio of air:combustible gas less than the stoichiometric ratio thereof and passing the resulting sub-stoichiometric mixture through said grille into said combustion chamber;

feeding a mixture of air and combustible gas directly into said combustion chamber of said main burner of a ratio of air:combustible gas sufficiently greater than the stoichiometric ratio thereof to provide a stoichiometric mixture of the gases fed directly into said combustion chamber and of the gases fed through said flame-stabilizing grille, and directing toward said grille at least a portion of the mixture of gases which were directly fed into said combustion chamber; and

igniting the mixture of air and combustible gas which passes through said grille from said premixing chamber.

4,875,851
STEADY STATE FUEL BURNER ASSEMBLY FOR A HEAT EXCHANGER AND METHOD OF OPERATING SAME

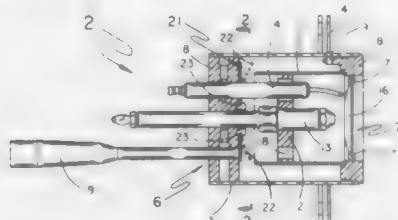
Paul A. Mutchler, St. Louis County, Mo., assignor to Engineered Air Systems, Inc., St. Louis, Mo.

Filed Aug. 29, 1988, Ser. No. 237,445

Int. Cl.⁴ F23N 3/02

U.S. Cl. 431—6

19 Claims



1. In combination with a steady state normally continuous, even flow fuel burner assembly for a heat exchanger of a space heater comprising:

a burner duct having an upstream inlet end and a downstream outlet end, said inlet end being adapted to be con-

nected to a source of normally continuous, even flow combustion air and said outlet end being adapted to accommodate a burner flame wall proximate thereto;

spaced fuel outlet and igniter means selectively positioned in said burner duct to introduce a continuous, even flow of fuel to ignite with said combustion air to provide a flame wall proximate said outlet end; and

valve control means cooperating with said upstream inlet end of said burner duct, said valve control means opening during start-up operations and being adaptable only upon initial high explosive pressures created by the ignition of said fuel with said combustion air to throttle said upstream inlet of said burner duct to reduce the further introduction of combustion air until the initial products of combustions are exhausted to lower the pressure within said burner duct to a preselected lower pressure level to permit said valve control means to open said upstream inlet of said burner assembly operations for continuous, even flow of further unthrottled combustion air to said burner duct to maintain a normal steady state flame wall free of pulsations proximate said outlet end of said burner duct.

15. A method of operating a steady state normally continuous, even flow fuel burner assembly for a heat exchanger of a space heater comprising:

introducing fuel and combustion air into a burner assembly to provide an atomized mixture and initially igniting the mixture to provide a flame wall proximate said burner assembly;

automatically throttling the initial introduction of said combustion air into said burner assembly only in instant response to preselectively high explosive start-up pressures within said burner assembly resulting from said initial ignition; and

introducing further combustion air in normally continuous, even flow into said burner assembly in accordance with exhaustion of said ignited gases from said burner assembly to provide a preselectively lower pressure within said burner assembly to maintain a normal steady state flame wall free of pulsations.

4,875,852
LAMP DEVICE

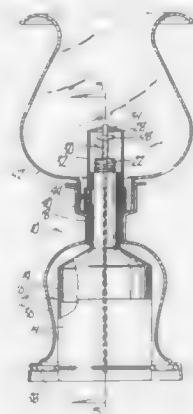
Robert C. Ferren, 602 Fifth Ave. South, Altoona, Iowa 50009

Filed Apr. 1, 1988, Ser. No. 176,721

Int. Cl.⁴ F23D 3/18

U.S. Cl. 431—324

10 Claims



1. A lamp device comprising:

a fuel reservoir, said reservoir comprising a bottom cup means and a metal top, said cup means being of translucent plastic material and having a bottom, a continuous side wall, and an open top, said metal top closing said open top and extending upwardly therefrom and terminating in a reduced diameter portion;

a wick extending downwardly through said metal top into said fuel reservoir;
a shell means having an open top and bottom, and side wall removably secured to and surrounding said fuel reservoir so that said fuel reservoir may be removed through the bottom of said shell;
said bottom of said fuel reservoir being visually accessible whereby when said fuel reservoir is removed through the bottom of said shell, any fluid in said reservoir is visible through the bottom of said fuel reservoir.

4,875,853
METHOD AND APPARATUS FOR CHARRING MATERIAL

Jacques Mage, 233 Rue Paul Doumer, 78510 Triel/Seine, France

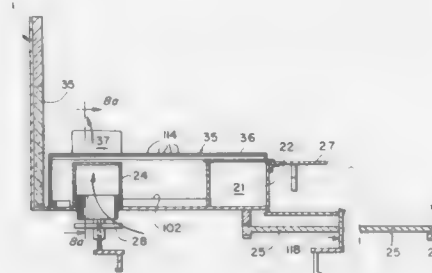
Continuation of Ser. No. 850,234, Apr. 11, 1986, abandoned.

This application Jan. 23, 1989, Ser. No. 300,703

Int. Cl.⁴ F27D 1/08

U.S. Cl. 432—100

17 Claims



1. An oven for charring material comprising:

- a container having a top and a bottom;
- a hearth for supporting the material to be charred spaced above said bottom;
- said bottom having means for discharging said charred material there through;
- said oven having means for admitting air through said bottom into the oven above said hearth through a path closed from space defined between said hearth and spaced bottom;
- means for permitting gases to flow from above said hearth to space defined between said hearth and said bottom separate from said means for admitting air;
- a means for exhausting gases from the space defined between said hearth and said bottom;
- a flue connected to the means for exhausting gases for directing said gases away from said oven.

4,875,854
MINIATURE FORGE

Leslie M. Emery, 1901 SW. Childs Rd., Lake Oswego, Ore. 97034

Filed Mar. 22, 1988, Ser. No. 171,763

Int. Cl.⁴ F24J 3/00

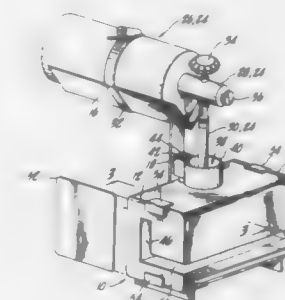
U.S. Cl. 432—120

7 Claims

1. A miniature forge structure, small in size and light in weight so as to allow portability, comprising:

- a forge body;
- a fuel tank carriage securely mounted to a vertical bar which is slidably connected to said forge body;
- a torch assembly secured to said fuel tank carriage, said torch assembly generating heat vertically downward into the interior of said forge body through a burner hole located in the top of said forge body;
- an L-shaped cavity located within said forge body running from end to end which focuses the heat of the torch on a selected area of the object to be heated and shaped, said L-shaped cavity having edges curved inward in order to

allow heat to reach the underside of the metal being heated;



a curved cavity contained within said forge body located directly below said burner hole.

4,875,855
TOOL

David Beckett, 27 Erleigh Road, Reading RG1 5LU, Berkshire, England

Filed Nov. 23, 1987, Ser. No. 123,888

Claims priority, application United Kingdom, Nov. 25, 1986, 8628091

Int. Cl.⁴ A61G 7/00

U.S. Cl. 433—3

11 Claims



1. A tool for manipulating a dental ligature to secure an archwire to a bracket on a tooth, said dental ligature having a loop portion and a pair of end portions extending away from said loop portion, said tool comprising:

a shaft having an end forming an abutment, the dental ligature being positionable, in use, with the loop portion thereof projecting around and beyond said end of the shaft for placement over the archwire and around the bracket; a ligature carriage carried by the shaft and secured against rotation relative to said shaft, said carriage being freely longitudinally slidable along said shaft in at least one direction; and

ligature mounting means on the carriage for receiving the end portions of the dental ligature when the ligature is positioned with the loop portion around and beyond said end of the shaft, said ligature mounting means securing the end portions of the dental ligature to the carriage against movement relative to the carriage;

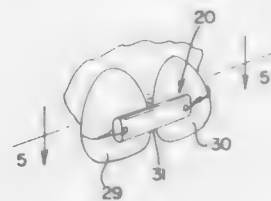
the ligature carriage being initially longitudinally slidable along the shaft away from said end of the shaft to shorten the loop portion and draw said end of the shaft toward the archwire and bracket, said ligature carriage being thereafter drawn by the ligature toward said end of the shaft, upon subsequent rotation of the entire tool, by the shortening of the loop portion as the ligature is twisted to secure the archwire to the bracket.

4,875,856
**ORTHODONTIC APPLIANCE FOR CLOSING SPACES
 AND CORRECTING MALOCCLUSION**
 Stephen M. Greenmark, 2901 S. Bayshore Dr., Coconut Grove,
 Fla. 33133

Continuation-in-part of Ser. No. 122,904, Nov. 19, 1987,
 abandoned. This application Aug. 23, 1988, Ser. No. 235,318
 Int. Cl.⁴ A61C 7/00

U.S. Cl. 433—18

23 Claims



1. An orthodontic appliance for closing a space between two adjacent and substantially aligned teeth comprising, a bar of elastomeric material, and ligature wire means attached to said bar for securing the appliance to the teeth, said bar adapted to be disposed generally mesiodistally across the labial or buccal faces of the teeth and over the space therebetween, and said ligature wire means extending around the teeth and attached to opposite ends of said bar and being under tension to stretch said bar and produce a force to urge said teeth toward each other to close the space.

4,875,857
**METHOD FOR RECONSTRUCTION OF TEETH IN AN
 UPPER JAW**
 Dietmar Kabein-Messenburg, Rodetal 36, 3406 Bovenden; Ge-
 org Meyer, Emilienstr. 11, 3400 Gottingen, and Wolfram
 Bücking, Buchweg 14, 7968 Wangen, all of Fed. Rep. of Ger-
 many

Continuation of Ser. No. 935,453, Nov. 26, 1986, abandoned.
 This application Aug. 1, 1988, Ser. No. 227,485
 Claims priority, application Fed. Rep. of Germany, Nov. 29,
 1985, 3542177

Int. Cl.⁴ A61C 11/00

U.S. Cl. 433—56

31 Claims

1. A method of reconstructing front teeth in an upper jaw, comprising in combination the steps of:
 mounting model impressions of the upper and lower jaw without at least one front tooth to be reconstructed in their natural condyles in an articulator;
 defining points of contact of the upper jaw front teeth with corresponding lower jaw front teeth in said model impressions;
 scanning an existing tool in the model impression of a jaw to obtain a protrusive contour curve of said existing tooth in a sagittal plane thereof; and
 transferring said protrusive contour curve of the existing tooth to said at least one front tooth to be reconstructed in

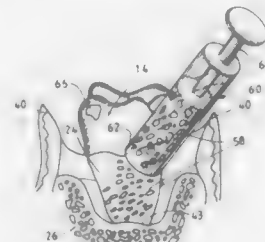
the sagittal plane by a copying tool starting from said points of contact of the upper jaw front teeth with the corresponding lower jaw front teeth to form a palatal concavely curved surface of said front tooth to be reconstructed and model said front tooth.

4,875,858
**METHOD AND COMPOSITION FOR DETECTING
 DENTIN**
 Steven R. Jefferies, Milford, and Chin-Teh Huang, Dover, both
 of Del., assignors to Dentply Research & Development Corp.,
 Milford, Del.

Filed Jul. 21, 1988, Ser. No. 222,686
 Int. Cl.⁴ A61C 5/00, 5/04

U.S. Cl. 433—226

6 Claims



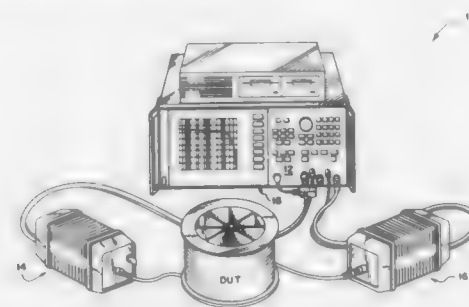
1. A method of repairing a tooth using a composite filling material, comprising the steps of:
 (a) preparing a tooth cavity for receiving a composite filling material;
 (b) applying a dentin stain to said tooth revealing the relative locations of dentin and enamel wherein said dentin stain stains said dentin while not affecting said enamel;
 (c) etching the enamel while avoiding contacting the stained dentin with etching composition;
 (d) removing the stain from the dentin using a bleaching agent; and
 (e) filling the cavity with composite filling material.

4,875,859
**METHOD AND APPARATUS FOR GUIDING A USER
 DURING SETUP OF A SIGNAL MEASUREMENT
 SYSTEM**
 Roger W. Wong, Hugo Vifian, and Michael G. Hart, all of Santa
 Rosa, Calif., assignors to Hewlett-Packard Company, Palo
 Alto, Calif.

Filed Jan. 13, 1988, Ser. No. 143,775
 Int. Cl.⁴ G09B 7/00

U.S. Cl. 434—214

20 Claims



1. A method for guiding a user during initiation of a measurement on a device by a signal measurement system, comprising the steps of:
 providing a device physically connectable to the signal measurement system; and
 providing signal measurement system guided assistance to a user of the signal measurement system for at least one

measurement, including instructions to the user for selecting the at least one measurement and instructing the user how to physically connect the device to the signal measurement system for performing the selected measurement.

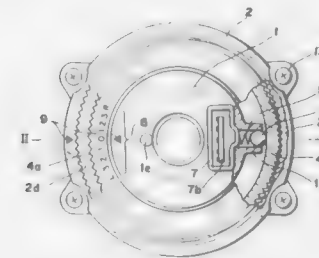
4,875,860
**ELECTRICAL CONNECTING APPARATUS FOR
 STEERING WHEEL AND STEERING COLUMN**
 Masaru Suzuki, Aichi, Japan, assignor to Kabushiki Kaisha
 Tokai Rika Denki Seisakusho, Aichi, Japan

Filed Nov. 3, 1988, Ser. No. 266,579
 Claims priority, application Japan, Nov. 9, 1987, 62-170918[U]

U.S. Cl. 439—15

Int. Cl.⁴ H01R 35/04

5 Claims



1. In the apparatus for connecting wiring on a steering wheel to wiring on a steering column for use in an automotive vehicle, which includes a case assembly having a stationary casing fixed to the steering column and a rotor member rotatably disposed in said casing, said rotor member being rotatable together with the steering wheel, and a coil-shaped cable member accommodated in a space formed between said casings and said rotor member of said case assembly, wherein said cable member is made of a flexible material and is coiled to follow the movement of the steering wheel, one end of said cable member being fitted to said casing and the other end fitted to said rotor member, respectively, the improvement comprising:

- an internal gear fixed to said casing concentrically with said rotor member;
- a ring-shaped gear member having a plurality of gear teeth on its outer periphery, the number of teeth being at least one tooth less than that of said internal gear and which are engaged with said internal gear, said ring-shaped gear member being movably arranged inside said internal gear and free from said casing and said rotor member;
- bias means for biasing said ring-shaped gear member against said internal gear so that said gear member may engage said internal gear, said bias means being fitted to said rotor member; and
- indication means arranged on a surface of said ring-shaped gear member for cooperating with a mating mark which is provided for on at least one of said casing and said rotor member.

4,875,861
MASS INTERCONNECT SYSTEM
 Roy E. Pennington, Loveland, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.
 Division of Ser. No. 44,084, Apr. 29, 1987, Pat. No. 4,804,335,
 This application Nov. 9, 1988, Ser. No. 269,277
 Int. Cl.⁴ H01R 9/09, 13/64

U.S. Cl. 439—79

8 Claims

1. An interconnect module for supporting at least one terminal block of the type including a bank of electrical connectors and a plurality of electrical conductors secured to said electrical connectors, wherein said interconnect module is adapted to interface said bank of electrical connectors with electrical leads on a printed circuit card positioned at the opening of a mainframe card cage; wherein said interconnect module comprises:

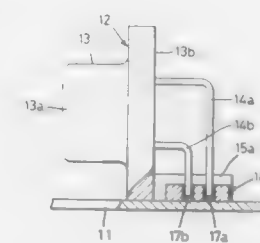
- (a) a frame member including a front face, said frame member being adapted to support said terminal block in a manner such that said bank of electrical connectors is accessible at said front face of said frame; and
- (b) retention means carried by said frame for retaining said terminal block in said frame; wherein said front face includes a plurality of apertures; wherein said module further comprises latch means associated with said apertures; wherein said latch means is adapted to releasably engage support members carried by a frame assembly on said mainframe card cage when said support members are inserted into said apertures.

4,875,862
SURFACE MOUNTABLE CONNECTOR
 Yukio Sakamoto, Takeshi Tanabe, Iwao Fukutani, and Toshio
 Hori, all of Nagakakyō, Japan, assignors to Murata Manufacturing Co., Ltd., Kyoto, Japan

Continuation-in-part of Ser. No. 242,417, Sep. 9, 1988,
 abandoned. This application Dec. 21, 1988, Ser. No. 287,085
 Claims priority, application Japan, Sep. 9, 1987, 62-137971;
 Dec. 21, 1987, 62-194182; Dec. 21, 1987, 62-194183
 Int. Cl.⁴ H01B 9/09

U.S. Cl. 439—79

10 Claims



1. A surface mountable connector comprising:
 a connector housing;
 a plurality of connector pins projecting from the rear surface of said connector housing; and
 a connector pin holder having a plurality of through holes therein through which said connector pins are inserted on one face thereof, and being spaced the same as the pitch of said connector pins, and having on at least the outer surface thereof a plurality of conductive patterns corresponding to said through holes respectively and extending from said through holes to the opposite face of said connector pin holder, the tips of said connector pins in said through holes being in electrical connection with the respective conductive patterns.

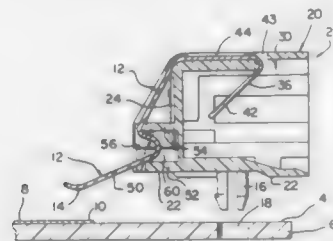
4,875,863

ELECTRICAL DEVICE HAVING IMPROVED LEADS FOR SURFACE MOUNTING ON A CIRCUIT BOARD Carl G. Reed, Clemmons, N.C., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Apr. 11, 1988, Ser. No. 179,697
 Int. Cl.⁴ H01R 9/09

U.S. Cl. 439—79

22 Claims



1. An electrical device which is intended to be surface mounted on a circuit board surface, the device comprising an insulating body having a mounting surface which is opposed to, and proximate to, the circuit board surface when the device is mounted on the circuit board surface, a side surface which extends transversely of the mounting surface, and a plurality of spaced apart leads which extend from the side surface, each of the leads having an adjacent portion which is adjacent to the side surface and an end portion which extends away from the side surface, the end portions having contact portions which are connected to circuit board conductors when the device is mounted on the circuit board surface, the device being characterized in that:

the side surface has locating stop portions and each lead has a lead locating portion which adjoins its end portion, the lead locating portions being resiliently biased against the locating stop portions when in the unconnected condition of the device, whereby, the lead locating portions are coplanar by virtue of their being against the locating stop portions, and the end portions are maintained in coplanar aligned relationship by the lead locating portions.

4,875,864

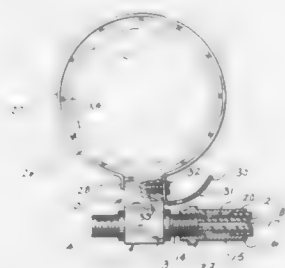
GROUND CLAMP FOR COAXIAL CABLE JUNCTION HILICK

Marvin J. Campbell, 4904 W. Vliet St., Milwaukee, Wis. 53208
 Filed Mar. 13, 1989, Ser. No. 322,613

Int. Cl.⁴ H01R 4/66, 17/04

U.S. Cl. 439—100

9 Claims



1. An assembly for mounting, interconnecting, and grounding a pair of terminated coaxial cable sections to a tubular grounding member comprising:

a coaxial cable junction block including a pair of connectors adapted to receive and electromechanically interconnect the terminated ends of the coaxial cable sections;
 adjustable strap means attached to the junction block and adapted to substantially encircle the grounding member for clamping the block thereto;
 said adjustable strap means including one end portion fixedly

attached to the junction block and another end portion adjustable with respect to the fixed end and the junction block; and,
 threaded fastening means for adjustably connecting the ends of the strap means to effect the clamping of the assembly to the tubular grounding member.

4,875,865

COAXIAL PRINTED CIRCUIT BOARD CONNECTOR Henry W. Demler, Jr., Lebanon, Pa.; Frank P. Dola, Hudson, Fla.; David J. Kimmel, Clearwater, Fla., and Thomas J. Sotolongo, Clearwater Beach, Fla., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jul. 15, 1988, Ser. No. 220,141
 Int. Cl.⁴ H01R 4/66

U.S. Cl. 439—101

18 Claims



13. An electrical connector for interconnecting a plurality of electrical contacts, the connector comprising a conductive plate having a plurality of apertures, each said aperture having means for engaging a single contact, said engaging means comprising tabs having edges defined by slits, the tabs deflecting when said contacts are inserted therein, wherein said tabs of different said apertures extend from opposite sides of the said conductive plate, contacts being insertable into the said plate apertures from opposite sides.

4,875,866

LIGHT BULB SOCKET

Arnold F. Winant, 87 Susquehanna Ave., Great Neck, N.Y. 11021

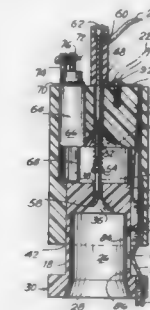
Filed Aug. 29, 1988, Ser. No. 237,130
 Int. Cl.⁴ H01R 13/44

U.S. Cl. 439—140

7 Claims

1. An improved light socket for use with light bulbs having a base including a first, central electrical contact and a mounting thread forming a second electrical contact, said socket comprising a frame and a cup adapted to accept the bulb base mounted for longitudinal motion within said frame between a first extended position and a second retracted position, first means operatively joined to said cup for establishing electrical contact with the bulb and second means operatively joined to said cup for retaining said bulb in said cup, said first and second means being engaged with said bulb when said cup is in the second retracted position and disengaged from said bulb when said cup is in the first, extended position, wherein said first means comprise first and second electrical contacts mounted to said frame, said first electrical contact extending coaxially with the direction of cup travel through an aperture in the bottom of said cup, said first contact projecting through the bottom of

said cup for contact with said central contact of the bulb when said cup is in the retracted position, said second electrical



contact projecting through the side of said cup when said cup is in the retracted position for contact with the mounting thread contact of the bulb.

4,875,867

EXTENSION HANDLE FOR A CIRCUIT BOARD INJECTOR/EJECTOR MECHANISM

Kee K. Hoo, Vancouver, Wash., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Jan. 26, 1989, Ser. No. 302,841
 Int. Cl.⁴ H01R 13/62

U.S. Cl. 439—157

18 Claims



1. An injector/ejector mechanism for urging a circuit board plug-in module into and out of a card cage mainframe comprising:

a first handle segment rotatably connected to a front panel of the plug-in module, the first handle segment having a bearing end and a passage formed within the segment and extending outwardly from the front panel opposite the bearing end; and

a second handle segment having a gripping member normal to an extension member, the extension member slidably mating with the passage in the first handle segment, the second handle segment movable with respect to the first handle segment from a first position wherein the extension member is within the passage to a second position wherein a portion of the extension member is exposed outside the passage providing additional mechanical advantage at the bearing end when pressure is applied to the gripping member for urging the circuit board module into and out of the mainframe during rotation of the injector/ejector mechanism.

4,875,868

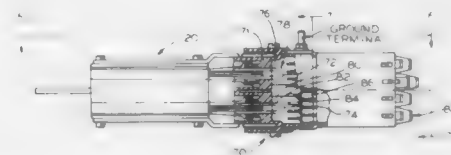
ELECTRICALLY PROTECTED CONNECTOR FOR TELEPHONE DISTRIBUTION FRAMES

Casimir Z. Cwirzen, Arlington Heights, and Albert Kupferchmidt, Highland Park, both of Ill., assignors to Northern Telecom Limited, Canada

Filed Aug. 5, 1988, Ser. No. 229,124
 Int. Cl.⁴ H01R 29/00

U.S. Cl. 439—188

19 Claims



1. A protection system for a telephone distribution frame for interconnecting inside and outside lines and having at least one set of contacts individually associated with each line connected thereto, said system comprising an interface module means which may be connected to said set of contacts, said module including contacts with a geometry which is selected to complete a desired make/break sequence of circuit connections when said module is plugged into or removed from said set of contacts, means on said module for receiving a further module containing electronic circuitry protecting equipment, means within said distribution frame for connecting said further module to said line, and means within said module for continuously applying ground to outside lines while enabling an isolation of inside lines from said outside lines.

4,875,869

BACKPLANE WITH ASSOCIATED HANDLING MEANS Johannes Bruen, Erlangen, and Hans-Peter Latusek, Fench, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

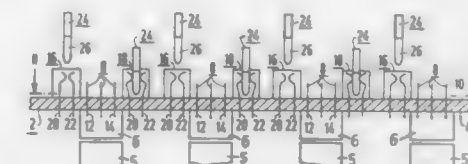
Filed Mar. 18, 1988, Ser. No. 170,146

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1987, 3709113

Int. Cl.⁴ H01R 9/22, 13/70

U.S. Cl. 439—189

5 Claims



1. A backplane for a subrack having modules, comprising:
 a least one bus having at least one bus line;
 a plurality of socket connectors arranged in parallel next to each other on a side of the backplane facing the modules, each socket connector having at least one bus contact pin;
 spring contact for each bus contact pin of each socket connector of said at least one bus disposed on a side of the backplane that faces away from the modules, each spring contact having first and second resilient contact pins, said first contact pin of each spring contact being adjacent the bus contact pin of each socket connector and electrically connectable to a corresponding contact pin, said second contact pin of each spring contact being electrically connected with said at least one contact bus line; and
 handling means for controlling the electrical connection of said first and second spring contact connections of each spring contact.

4,875,871

ARTICLE FOR PROTECTING A SUBSTRATE

Judy Hardy, Swindon, England, and Kenneth Wallington, Cl-
rencoaster, United Kingdom, assignors to Raychem Limited,
Swindon, England

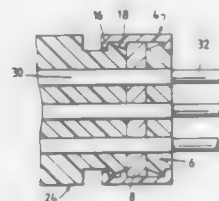
Filed Jul. 18, 1988, Ser. No. 220,184

Claims priority, application United Kingdom, Jul. 16, 1987,
8716814; Sep. 23, 1987, 8722434

Int. Cl.⁴ H01R 4/60

U.S. Cl. 439—204

17 Claims



1. An article for protecting a multiconductor connector having a plurality of contact holes therein for receiving a plurality of contact pins, the article comprising:

- (a) an open container having a base and sides and;
- (b) within the container a continuous layer of gel having a cone penetration value within the range of from 30 to 400 (10⁻¹ mm), wherein:

the sides of the open container can be secured in use in first and second positions relative to the multiconductor connector and the base of the open container is adjacent to the gel layer and allows passage of said contact pins and trailing wires therethrough but substantially prevents egress of the gel from the container, wherein at least when the container is secured in the said second position relative to the container the gel is compressed.

4,875,871

MODULAR ELECTRICAL CONDUCTOR SYSTEM

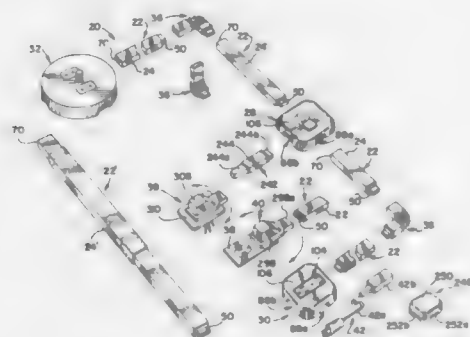
Donald J. Booty, Sr., Frankfort, Ill., and Donald J. Booty, Jr.,
Munster, Ind., assignors to National Service Industries, Inc.,
Atlanta, Ga.

Filed Nov. 9, 1984, Ser. No. 670,322

Int. Cl.⁴ H01R 25/00

U.S. Cl. 439—209

31 Claims



1. A modular electrical conductor system for electric circuit wiring, comprising:

- at least one elongated substantially closed modular carrier member having opposite ends and a plurality of electrical conductors extending longitudinally therethrough,
- a male end connector affixed to one end of said carrier member and defining a plurality of shielded male conductor contacts selectively electrically connected to said electrical conductors within said carrier member,
- a female end connector affixed to the other end of said

carrier member and defining a plurality of shielded female conductor contacts selectively electrically connected to said electrical conductors within said carrier member, said male and female end connectors being adapted for mating cooperation with similar female and male connectors, respectively.

- at least one modular electrical element which includes a modular low profile base housing having a generally polygonal plan configuration defining a plurality of side surfaces, said modular housing defining at least one male connector site at a selected one of said side surfaces and having a plurality of shielded male conductor contacts adapted for electrical plug-in connection with a female end connector on said carrier member, and defining at least one female connector site at another of said side surfaces and having a plurality of shielded female conductor contacts adapted for electrical plug-in connection with a male end connector on said carrier member, and a plurality of electrical conductors supported by said base housing so as to terminate at said connector sites, and
- a low profile cover member adapted to be releasably mounted on said base housing and having side walls adapted to overlie said side surfaces of said base housing, each of said side walls having a recess formed therein enabling access to the corresponding connector site, whereby one or more of said carrier members may be selectively electrically connected in plug-in fashion to each other and to one or more of said modular elements to establish an electric circuit.

4,875,872

TELEPHONE CONNECTOR

Masanori Tanaka, Osaka, Japan, assignor to Hosiden Electron-
ics Co., Ltd., Osaka, Japan

Filed Oct. 26, 1988, Ser. No. 262,643

Claims priority, application Japan, Nov. 4, 1987, 62-
169112[U]

Int. Cl.⁴ H01R 4/50

U.S. Cl. 439—344

7 Claims

- 1. A telephone connector comprising:
- a connector body fabricated of a resinous material and having terminal housing holes formed therein, said connector body having a pair of opposite side surfaces and front and back surfaces, said side surfaces respectively having side grooves therein extending in a front-to-back direction of said connector body;
- terminals housed in said terminal housing holes, each of said terminals having a resilient contact portion at one end thereof; and
- a substantially U-shaped metal cover having a pair of spaced opposite sides which respectively include inwardly extending marginal portions that are fitted into said side grooves of said connector body, whereby said U-shaped metal cover defines three sides of a plug receiving hole and the fourth side of said plug receiving hole is defined by said connector body, said spaced opposite sides of said U-shaped metal cover also having stoppers extending inwardly at the rear end of said metal cover into abutment with said back surface of said connector body, and the front end of said metal cover further having engaging pieces extending respectively from said spaced opposite sides of said U-shaped metal cover into engagement with said front surface of said connector body.

4,875,873

MULTI-TERMINAL CONNECTOR

Shigeo Ishizaka, and Kazutoshi Kuzuno, both of Shimizu,
Japan, assignors to Yazaki Corporation, Tokyo, Japan

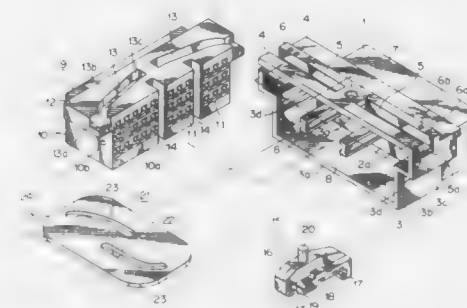
Filed Dec. 7, 1988, Ser. No. 280,805

Claims priority, application Japan, Dec. 9, 1987, 62-309386

Int. Cl.⁴ H01R 4/50

U.S. Cl. 439—347

8 Claims



- 1. A multi-terminal connector comprising:
- a female housing having a plurality of male terminals stored therein;
- a male housing having a plurality of female terminals stored therein;
- a plurality of guide rails, at least two of which are connected to each other by a connecting portion provided with an axis hole at a center portion thereof on a longer side edge wall of an enlarged body portion of said female housing, said guide rails intersecting at right angles to the axes of said male terminals;
- a pair of sliders with each slider slidably engageable with said guide rails and having a pin projecting upwardly from a top surface and a cam follower projecting downwardly from a lower portion thereof;
- a pair of longitudinally aligned slots formed between said at least two guide rails with said connected center portion for permitting each of said cam followers to extend there-through;
- a pair of cam tracks arranged in an outer surface of said male housing and symmetrically extending rearward in a diagonal direction from the lateral ends thereof to receive said respective cam followers extending through said slots; and
- a rotary actuator plate provided with two symmetrical grooves provided around a pin projecting downwardly from a center portion thereof and adapted to be attached to said rail connecting portion by insertion of said pin through said axis hole.

4,875,874

ELECTRICAL CONNECTOR SECURING ARRANGEMENT

John F. Windsor, Jr., 4501 Raymar Dr., Orlando, Fla. 32809

Filed Nov. 3, 1988, Ser. No. 266,826

Int. Cl.⁴ H01R 13/62

U.S. Cl. 439—364

10 Claims

- 1. An electrical connector securing arrangement for use upon the female socket of an extension cord, to prevent the unintentional separation from the socket of a male plug that has been interfitted therewith, said electrical connector securing arrangement comprising a socket having thereon a pivotally mounted rotatable latch member, rotatable between extreme positions that are more than 180 degrees apart, and a specially configured compatible male plug utilized with said socket, said rotatable latch member having a raised and shaped central locking portion able to releasably engage a portion of said plug when said rotatable latch member is in an extended position of its rotation, and thus effectively prevent undesired separation of said socket and plug when interfitted, said central locking

portion of said rotatable latch member having the ability to be towed unobtrusively on a certain recessed and shielded part of the body of said socket when said socket and said plug have been separated, and said rotatable latch member has been



moved to an extreme or retracted position of its rotation, the stowing of said rotatable latch member in said recessed and shielded location on said socket serving to prevent same from becoming snagged on a nearby object.

4,875,875

FIELD TERMINABLE MODULAR CONNECTOR

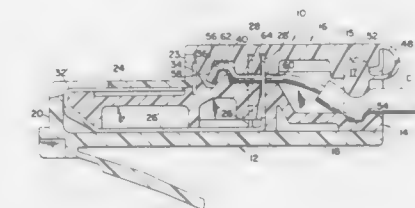
Lee A. Archer, Asheville, and Kenneth W. Brownell, Jr., Mar-
ion, both of N.C., assignors to Britec Corporation, William-
mantic, Conn.

Filed Sep. 28, 1987, Ser. No. 101,570

Int. Cl.⁴ H01R 4/24

U.S. Cl. 439—401

24 Claims



- 1. A field terminable modular connector for terminating an electrical cable having a plurality of insulated electrical conductors and comprising an assembly of connector sections, a plurality of insulation displacement contacts supported by one of said connector sections, stuffing means for setting each of said insulated electrical conductors of a cable to be terminated in insulated displacing engagement with an associated one of said insulation displacement contacts in response to movement of another of said connector sections into assembled relation with said one connector section, shearing means for trimming free end portions of the insulated conductors in response to movement of said other connector section into assembled relation to said one connector section and including a shearing blade mounted on one of said conductor sections, reflecting means for kinking the trimmed free end portions of said insulated electrical conductors to move the trimmed free ends thereof away from said shearing blade and for gripping and holding the trimmed free end portions of the insulated electrical conductors in spaced relation to said shearing blade and in fixed position relative to said modular connector in response to movement of said other connector section into assembled relation to said one connector section, and cable strain relief means for gripping and holding an associated portion of the electrical cable in fixed position relative to an associated one of said connector sections before said other connector section is moved into assembled relation to said one connector section and including a strain relief member and means for effective snap-together assembly between said strain

relief member and said associated one of said connector sections.

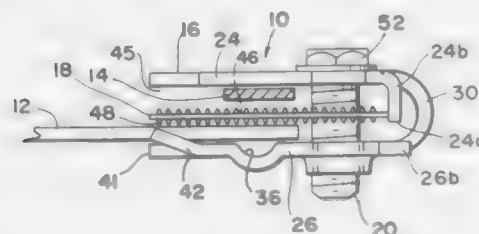
4,875,876

ELECTRICAL CONNECTOR FOR OVERLAPPED CONDUCTORS

Francis A. O'Loughlin, Scotch Plains, N.J., assignor to Thomas & Betts Corporation, Bridgewater, N.J.
Filed Aug. 31, 1988, Ser. No. 239,107
Int. Cl.⁴ H01R 4/38

U.S. Cl. 439-431

12 Claims



1. An electrical connector for connecting a pair of conductors, comprising:

a connector body including:

a first conductive planar member, a second conductive planar member and a deformable hinge which is narrow relative to the width of said planar members and which connects said first and second planar members and places said planar members in a substantially parallel relationship, said first and second planar members defining therebetween a passageway for accommodating said conductors in transverse overlapped relationship; and progressive urging means for progressively urging said first and second planar members toward one another for placing said overlapped conductors in electrical engagement, said hinge being deformable in a direction away from said passageway upon said urging of said first and second planar members to maintain said first and second planar members in a mutually parallel relationship.

4,875,877

DISCRETE CABLE ASSEMBLY

David S. Fleak, Palmyra; Keith S. Koegel, Harrisburg; William B. Long, Camp Hill; Stanford C. Moist, Jr., Hummelstown, and Warren D. Nauman, Elizabethtown, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.
Filed Sep. 12, 1988, Ser. No. 243,385
Int. Cl.⁴ H01R 9/07

U.S. Cl. 439-497

18 Claims

1. An electrical connector for connection to ground wires and signal wires of at least one corresponding cable comprising: conductive signal contacts having wire connecting portions for connection to corresponding signal wires, and wire connecting portions of a corresponding ground bus for connection to corresponding ground wires, wherein the improvement comprises:

a unitary lead frame joins the ground bus and the signal contacts prior to selected ones of the signal contacts being detached from the ground bus,
an insulative housing block assembled over the lead frame prior to selected ones of the single contacts being detached from the ground bus,
the wire connecting portions appear at first openings in the housing block, and
means on the lead frame appear at additional openings in the housing block for detaching the signal contacts individually

ally from the ground bus, whereby the selected ones of the signal contacts are constructed for being de-

tached from the ground bus and at least one signal contact is constructed to remain joined to the ground bus.

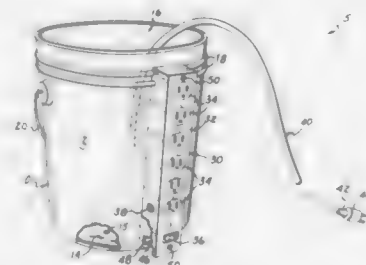
4,875,878

EXTENSION CORD/TOOL CARRIER

Robert R. Meyer, Cincinnati, Ohio, assignor to Meyer Flooring Inc., Cincinnati, Ohio
Filed Nov. 16, 1988, Ser. No. 272,221
Int. Cl.⁴ H01R 13/73

U.S. Cl. 439-501

10 Claims



1. An extension cord/tool carrier comprising:

a bucket having a vertical sidewall to define a cavity adapted to receive a length of electrical cord and a plurality of hand tools therein through an open top formed at one end of the bucket cavity;
a row of electrical plug receptacles fixedly mounted to the sidewall of the cavity;
a length of electrical cord receivable within the bucket cavity, the cord being electrically coupled at a first end to the receptacles and at a second end to a plug member whereby the bucket provides a container for transporting the cord therein, the receptacles thereon and selected tools which a user places therein through the open top and whereby the plug member and a length of the cord may be selectively removed from the bucket through the open top for connection to a source of electrical supply so as to provide power at the receptacles.

4,875,879

CORD RETAINER FOR A PORTABLE ELECTRIC TOOL

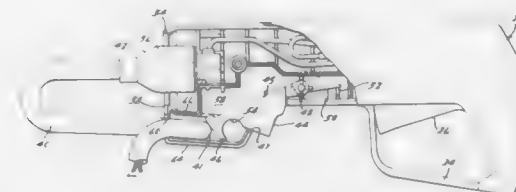
Roderick F. Buayen, Westminster, and Donald W. Zarwelle, Lutherville, both of Md., assignors to Black & Decker Inc., Newark, Del.

Filed May 11, 1988, Ser. No. 193,028

Int. Cl.⁴ H01R 13/72

U.S. Cl. 439-501

68 Claims



1. A portable electric power tool comprising a motor, electrical connector means electrically connected to the motor and adapted for electrical connection to one end of a power cord, a housing having a first opening which communicates with a cavity formed in said housing that is adapted to receive a loop of said cord when inserted through said first opening, and a cord retaining member mounted within said cavity and movable between a first position wherein a portion of said retaining member is positioned between the apex of said loop of cord and said first opening whereby said cord is secured against withdrawal from said housing, and a second position wherein said portion of said cord retaining member is removed from between the apex of said loop of cord and said first opening thereby permitting said loop of cord to be withdrawn from said housing.

4,875,880

MODULAR FACEPLATE SYSTEM

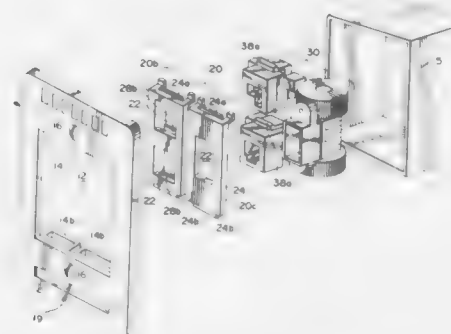
Glenn S. Welch, Lynnfield; Stephen Fidrych, Boxboro; Michael Romm, Brighton, and Bernie J. Maurer, Melrose, all of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Jul. 21, 1988, Ser. No. 222,500

Int. Cl.⁴ H01R 13/60

U.S. Cl. 439-536

16 Claims



1. A modular faceplate system comprising:

a faceplate having an elongated primary frame opening formed therein;
a plurality of secondary support members interchangeably mounted on said faceplate in said primary frame opening, at least one of said secondary support members having at least one secondary frame opening formed therein;
a plurality of modules, one of said modules supported in each said secondary frame opening and at least one module supporting an electrical device.

4,875,881

COMMUNICATION BOX ASSEMBLY

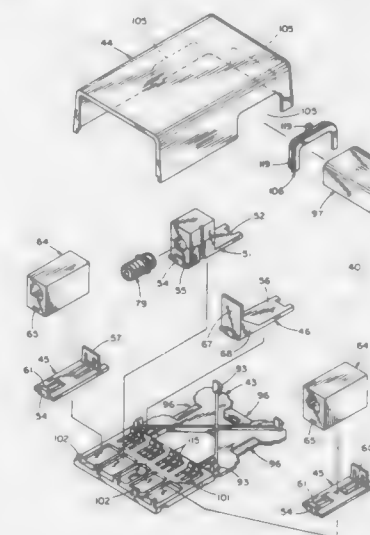
Jack E. Caveny, Hinsdale; John J. Bulanda, New Lenox; Richard L. Fischer, Lisle; Andrew J. Stroede, Tinley Park, and Donald C. Wiecek, Tinley Park, all of Ill., assignors to Panduit Corp., Tinley Park, Ill.

Filed Apr. 8, 1988, Ser. No. 179,157

Int. Cl.⁴ H01R 13/73

U.S. Cl. 439-535

15 Claims



9. A communication box assembly, comprising:
a base;

at least one connector; and

a connector mounting means formed in the surface of the base for mounting the connector in one of a plurality of identical juxtaposed connector mounting positions such that a first operative end of the connector is positioned adjacent an outer edge of the base for connection with office service cables and a second operative end of the connector is presented inwardly for connection within the assembly to a central system service cable, the connector mounting means including a plurality of independently releasable connector latches disposed opposite to and in direct correspondence with a plurality of connector trapping lugs, wherein the connector includes positioning means formed in an edge of the connector for engaging corresponding adjacent connector trapping lugs on the base and for centering the connector with respect to the lugs, and a latch slot in an edge opposite the positioning means, the latch slot shaped to engage a corresponding latch and center the connector with respect to the latch.

4,875,882

SPLASH GUARD FOR OUTBOARD MOTOR

Cheryl A. Plitt, 3075 Hwy. F, Redgranite, Wis. 54970, and James C. Dutcher, 5085 Burr Oak Rd., Oshkosh, Wis. 54904

Filed Aug. 30, 1988, Ser. No. 238,753

Int. Cl.⁴ B63H 1/18

U.S. Cl. 440-66

19 Claims

1. In a marine drive having a propulsion assembly including an upper unit housing an engine, a lower unit including a gearcase carrying a propeller, said gearcase includes an anti-ventilation plate above said propeller and a spray plate spaced above said anti-ventilation plate, and a drive shaft housing mounted between the gearcase and upper unit and carrying a drive shaft for drivingly interconnecting the engine and propeller, and a transom bracket assembly positioned forwardly of said propulsion assembly for supporting the propulsion assembly from a transom of a boat, a splash guard for diverting water

away from the propulsion and bracket assemblies during operation of the boat, comprising:

a substantially U-shaped deflector member mounted between said anti-ventilation plate and said spray plate, said deflector member having a head portion and a body portion extending rearwardly of said head portion, said head portion including a leading edge spaced forwardly of said



gearcase and a trailing edge disposed adjacent said gearcase, and said body portion including a pair of rearwardly extending spaced apart fin members disposed on opposite sides of said gearcase each fin member having an inner edge disposed adjacent said gearcase and an outer edge spaced outwardly of said gearcase; and mounting means for removably mounting said deflector member on said gearcase.

4,875,883

LATCH ASSEMBLY FOR RELEASABLY SECURING COWL SECTIONS OF AN OUTBOARD MOTOR

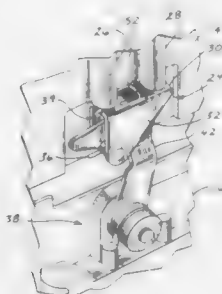
Gordon C. Slattery, Omro, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Jul. 14, 1988, Ser. No. 219,081

Int. Cl.⁴ B63H 21/26

U.S. Cl. 440-77

12 Claims



1. For an outboard motor or the like having a power head enclosed by first and second cowl sections, wherein a compressible seal is provided at a joint formed between said first and second cowl sections, a latch assembly for releasably securing said first and second cowl sections together, comprising:

catch means connected to one of said cowl sections; latch means movably connected to the other of said cowl sections, said latch means being movable between an engaging position in which said latch means engages said catch means for securing said cowl sections together during normal operation and providing compression to said compressible seal and a disengaging position in which said latch means and said catch means are disengaged, wherein further compression of said compressible seal when said latch means is in its engaging position causes

movement of said latch means out of engagement with said catch means so as to be movable toward its disengaging position; and
retainer means for engaging said latch means during movement of said latch means out of engagement with said catch means when said latch means is in its engaging position, so as to prevent said latch means from moving to its disengaging position.

4,875,884

MARINE PROPULSION DEVICE WITH THRU-TRANSON ENGINE OIL DRAIN SYSTEM

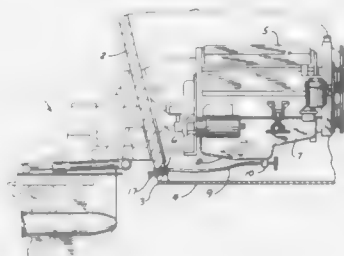
Gary L. Meisenburg, Fond du Lac, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Nov. 23, 1988, Ser. No. 276,378

Int. Cl.⁴ B63H 21/38

U.S. Cl. 440-88

4 Claims



1. In a marine propulsion device, the combination comprising:

- a boat (3) having a transom (2) at its stern end,
- a marine internal combustion engine (5) disposed inboard of said boat,
- an oil pan (7) mounted to said engine,
- and means (9-11) for draining oil by gravity from said oil pan and through said transom to the exterior of said boat.

4,875,885

ENGINE NOISE SIMULATING DEVICE FOR A BICYCLE

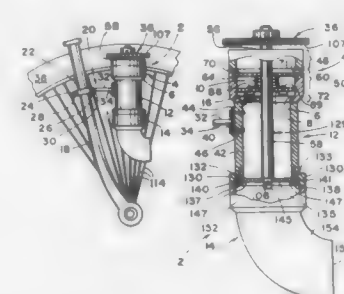
Horton Johnson, 186 Hazel Ave., Highland Park, Ill. 60035

Filed Oct. 15, 1987, Ser. No. 108,687

Int. Cl.⁴ A63H 5/00; B60Q 5/00

U.S. Cl. 446-189

24 Claims



1. A noisemaker for bicycles and the like comprising:
- a housing including a shoulder;
 - a resonator plate seated in said housing on said shoulder;
 - spring means for resiliently biasing said plate against said shoulder;
 - a resonator chamber extending from said shoulder, away from said housing;
 - drive and cam means for periodically raising said plate above said shoulder against the resilient bias of said spring means and for releasing said plate for movement back into

contact with said shoulder, whereby a surface-engaging noise and air compression noise are directed into said resonator chamber to simulate the sound commonly associated with a vehicle engine, said drive and cam means including a drive shaft rotatably mounted on said housing, a drive wheel fixed to said shaft, and a cam fixed to said shaft and engageable with said plate upon rotation of said shaft.

4,875,886

HULA DOLL HAVING COMPOUND MOTIONS

Rak M. Sung, 225 Kaulani Ave., Apartment 505, Honolulu, HI. 96818

Filed Sep. 20, 1988, Ser. No. 246,691

Int. Cl.⁴ A63H 13/04, 3/28

U.S. Cl. 446-298

12 Claims



1. A hula doll, comprising:

- a base;
- a support column which is rotatably connected to and supported by said base;
- a doll body pivotally connected to said support column, said doll body including a pair of arms which are rotatably connected to said doll body;
- means for pivotably moving said doll body about a pivot which is supported by said support column, said means for pivotably moving said doll body about said pivot including a linkage arm and means for moving one end of said linkage arm in a generally reciprocatory motion, said linkage arm having another end connected to said body;
- means for rotating said support column relative to said base;
- and
- means for pivoting said arms relative to said doll body.

4,875,887

MOBILE TOY

Giuseppe Maestri, 19 Leighton Ave., Clinton, Mass. 01510

Filed Jul. 20, 1988, Ser. No. 221,675

Int. Cl.⁴ A63H 11/00

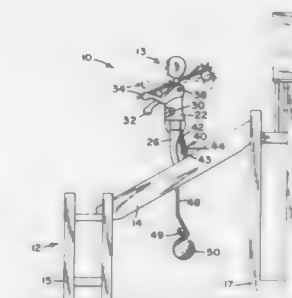
U.S. Cl. 446-314

5 Claims

1. A toy comprising:

- a supporting base which is adapted to rest on a horizontal surface,
- an inclined ramp which is mounted on said supporting base, said ramp having a continuous zig-zag slot which extends along an axis which is at an angle to the horizontal when said supporting base rests on a horizontal surface, said slot constituting first and second alternating short portions, each of said first portions extending downwardly at an angle to said axis toward one side of said axis and each of said second short portions extending downwardly at an angle to said axis toward the opposite side of said axis, and
- a figure which comprises:

- a body having a longitudinal axis which is normally vertical,
- a pair of spaced legs which are mounted to said body and which extend downwardly from said body to said ramp on opposite sides of said slot,
- a tail which is fixed to said body and which extends downwardly and rearwardly from the body into said slot,
- an appendage which is fixed to said body and which extends downwardly from the body between said legs to said slot, said appendage having a lower free end,
- an elongated connector which extends through said slot, said connector having an upper end which is connected to the lower end of said appendage, and a lower end which extends below said slot, and



- a counterweight which is attached to the lower end of said connector so that said counterweight and said connector form a pendulum having a focal point at the lower free end of said appendage, wherein the swinging of said pendulum in a vertical plane which is transverse to a horizontal axis which is vertically aligned with the axis of said slot causes said body to oscillate from side to side within said plane while said tail moves progressively from one short portion said slot to the next lower short portion said slot, thereby causing said body to partially rotate about its longitudinal axis in one direction and then in the opposite direction for each oscillation of said body, thereby advancing each of said legs alternately forwardly down said ramp to enable said figure to advance progressively down said ramp.

4,875,888

EYE CONSTRUCTION FOR TOY DOLL

Thomas J. Harvey, 64 Floral Park Blvd., Pawtucket, R.I. 02861

Filed Sep. 23, 1988, Ser. No. 249,419

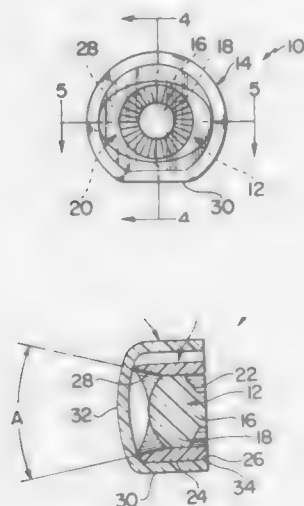
Int. Cl.⁴ A63H 3/38

U.S. Cl. 446-392

7 Claims

1. An eye construction comprising means simulating substantially circular concentric pupil and iris portions of an eye; a white portion encircling said iris portion, said white portion including a concave white portion surface which extends forwardly from the perimeter of said iris portion, opposite portions of said white portion surface diverging in their outward extents, the opposite side portions of said white portion surface diverging at greater angles than the opposite top and bottom portions of said white portion surface; and a rounded dome-shaped, transparent cover portion on said white portion covering the forwardly facing portions of said white portion,

said iris portion and said pupil portion, said cover being spaced forwardly from said iris portion and said pupil portion, and an



annular portion extending from the perimeter of said dome-shaped portion surrounding said white portion.

4,875,889

COMBINE CROP MATERIAL FLOW ADJUSTMENT SYSTEM

Paul Hagerer, Fritz Glaser, Josef W. Klimmer, and Reinhard Kunze, all of Zweibrücken, Fed. Rep. of Germany, assignors to Deere & Company, Moline, Ill.

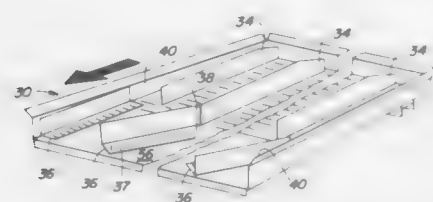
Filed Oct. 5, 1988, Ser. No. 253,834

Claims priority, application Fed. Rep. of Germany, Oct. 5, 1987, 3733619

Int. Cl.⁴ A01F 12/00, 12/46

U.S. Cl. 460—1

6 Claims



1. In a combine having a main separator body with opposite lateral side walls, a threshing and separating means mounted within the combine between the opposite side walls, and a generally horizontal conveyor means adapted to receive crop material from the threshing and separating means and deliver it to a cleaning means that separates grain from other crop material, the conveyor means including a generally horizontal grain pan having opposite sides adjacent the opposite side walls of the combine and a generally horizontal grain pan floor extending between the opposite sides of the grain pan, the improvement comprising:

a plurality of generally upright, fore-and-aft extending adjustable guide vanes pivotally connected to the grain pan floor and adjustable between first and second positions wherein they deflect crop material on the conveyor means toward one or the other of the opposite sides of the combine;

adjusting means connected to the adjustable vanes for swinging the vanes between their first and second positions

in response to shifting of the adjusting means between first and second positions and including a generally horizontal, transverse member mounted below the grain pan floor for lateral adjustment relative thereto, and vertical pins extending upwardly from the transverse member through the floor and connected to the vanes;

electrically actuated motor means operatively connected to the adjusting means for shifting the adjusting means between its first and second positions in response to actuation of the motor means;

a pair of sensing means respectively mounted on the combine adjacent the opposite sides of the combine body and operative to generate an electric signal in response to a parameter of the crop material adjacent the respective side of the combine; and

control means responsive to the signals from the sensor means for controlling the supply of electric power to the motor means, so that the motor means shifts the adjusting member and the adjustable vanes attached thereto between their opposite positions to deflect crop material toward one side of the combine or the other in response to a difference in the signals generated by the sensing means.

4,875,890

FEED PLATE ASSEMBLY FOR AXIAL FLOW COMBINE

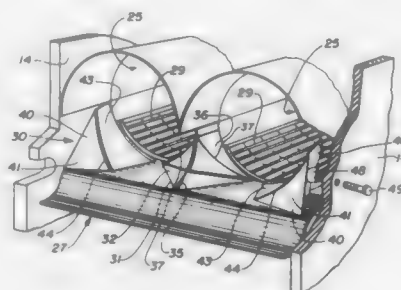
Edwin O. Margerum, Paradise, Pa., and Russell W. Strong, Brugge, Belgium, assignors to Ford New Holland, Inc., New Holland, Pa.

Filed Feb. 29, 1988, Ser. No. 161,525

Int. Cl.⁴ A01F 7/06

U.S. Cl. 460—68

7 Claims



1. In a combine harvester having a frame; a pair of longitudinally extending axial flow threshing and separating rotors rotatably supported on said frame each said rotor including a forward auger section and a rearward threshing and separating section; an elevator pivotally mounted on said frame forwardly of said rotors and operable to deliver crop material to said auger sections of said rotors for subsequent conveyance thereof to the respective said threshing and separating sections; and a feed plate supported on said frame between said elevator and said rotors to direct the flow of crop material from said elevator to said auger sections of said rotors, an improved feed plate comprising:

a divider member positioned between said rotors, said divider member having a first surface adjacent said elevator and extending therefrom upwardly and rearwardly toward said rotors and a longitudinally extending dividing line at the transverse center of said divider member to symmetrically divide said first surface such that said first surface slopes inwardly toward the corresponding said rotor from said dividing line, said first surface joining a first arcuate surface concentric with the axis of rotation of each respective said rotor, the junction between said first surface and said first arcuate surface forming a first jointure line extending downwardly and rearwardly relative to the axis of rotation of the rotors, to direct the flow of crop material outwardly away from said dividing line and

4,875,892

STEPLESSLY VARIABLE TRANSMISSION CONTROL FOR AUTOMOTIVE VEHICLE

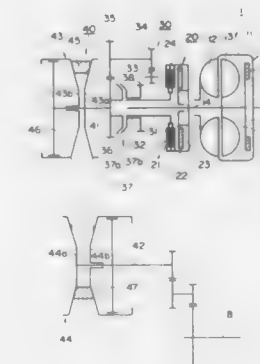
Yutaka Sueda, Hiroshima, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan

Filed Jan. 19, 1989, Ser. No. 298,971

Claims priority, application Japan, Jan. 19, 1988, 63-10433 Int. Cl.⁴ F16H 11/04

U.S. Cl. 474—17

13 Claims



1. A steplessly variable transmission for automotive vehicles comprising:

transmission means steplessly variable in speed ratio which has a pair of pulleys variable in effective diameter and coupled to each other with endless belt means, one of said pair of pulleys being in association with an vehicle engine and the other being in association with a drive line; speed ratio control means for varying the speed ratio of the transmission means according to speed ratio change schedules of a target engine speed relative to a vehicle speed depending upon load conditions of the vehicle engine, and

drive mode changing means for changing said steplessly variable transmission in operation between a power drive mode suitable for powerful driving and an economy drive mode suitable for fuel economy driving and changing said speed ratio change schedules to different patterns suitable for said power drive mode and a pattern suitable for said economy drive mode according to the change of drive mode; and

said speed ratio change schedules at a maximum and a minimum engine load being identical between said power drive and economy drive modes, and, between said maximum and minimum engine loads, changing the ratio of change of said target engine speed relative to change of engine load at a relatively high ratio of change within a range of relatively low engine loads for said power drive mode and within a range of relatively high engine loads for said economy drive mode and at a relatively low ratio within a range of relatively high engine loads for said power drive mode and within a range of relatively low engine loads for said economy drive mode.

12. A method of steplessly varying the ratio of speed of an automotive vehicle transmission comprising the steps of:

providing a pair of pulleys variable in effective diameter and coupled to each other with endless belt means, one of said pair of pulleys being in association with a vehicle engine and the other being in association with a drive line, said transmission being changeable in operation between a power drive mode suitable for powerful driving and an economy drive mode suitable for fuel economy driving, determining an operating drive mode in which said automotive vehicle transmission is operated; calculating a target engine speed on predetermined speed ratio change schedules of a target engine speed relative to a vehicle speed for one of said power drive mode and said

4,875,891

SEPARATING GRATE FOR A GRAIN HARVESTER

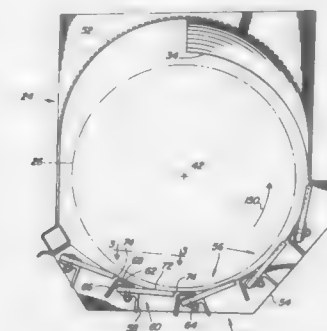
Reed J. Turner, East Moline, Ill.; Loren W. Peters, Bettendorf, Iowa; John E. Wilson, Coal Valley, and Robert E. Bennett, Moline, both of Ill., assignors to Deere & Company, Moline, Ill.

Continuation of Ser. No. 22,293, Mar. 2, 1987, abandoned. This application Aug. 5, 1988, Ser. No. 229,784

Int. Cl.⁴ A01F 12/24

U.S. Cl. 460—110

34 Claims



1. In a crop material separator in which a rotor having an axis and direction of rotation about the axis is at least partially wrapped by a concave so as to define a crop material processing zone between the concave and the rotor, the concave having a generally arcuate internal surface and comprising:

an array of circumferentially spaced, axially extending finger bar assemblies, each assembly including a plurality of generally circumferentially downstream extending fingers each having a finger tip and all fingers of a given assembly extending in the same general direction, the finger bar assemblies together defining the generally arcuate internal surface of the concave, and each finger bar assembly lying generally within the arcuate surface, but at least some of the finger bar assemblies being angled with respect to the arcuate surface so that, also with respect to the arcuate surface, the finger tips of the fingers of said some of the finger bar assemblies are radially offset with respect to the opposite ends of said fingers and said fingertips are spaced from the finger bar assembly immediately downstream of it.

economy drive mode according to said operating drive mode, said speed ratio change schedules being different depending upon engine loads and the operating drive mode in which said automotive vehicle transmission is operated;

detecting an actual engine speed;

calculating a speed difference between said target engine speed and said actual engine speed;

calculating a duty cycle at which duty solenoid valve means is controlled to change a pilot pressure for control valve means so as to change said one of said pair of pulleys in effective diameter according to the calculated speed difference.

4,875,893

CONTINUOUS SPEED VARIATOR WITH EXPANDING PULLEYS

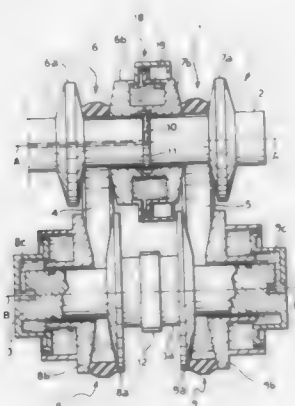
Dante Giacosa, Turin, Italy, assignor to Fiat Auto S.p.A., Turin, Italy

Filed Sep. 23, 1988, Ser. No. 248,015

Claims priority, application Italy, Sep. 23, 1987, 67809 A/87
Int. Cl.⁴ F16H 11/02

U.S. Cl. 474—28

4 Claims



1. A continuous speed variator with expandable pulleys comprising a driving shaft, a driven shaft disposed parallel to said driving shaft, first and second expandable drive pulleys located on said first shaft, each of said first and second pulleys having a fixed half-pulley and a movable half-pulley movable relative to said fixed half-pulley with the movable half-pulleys of said drive pulleys being disposed between said fixed half-pulleys and forming parts of a single expandable and contractible body which is freely supported on said first shaft for movement between said fixed half-pulleys, first and second expandable driven pulleys located on said second shaft, first and second driving belts entrained about said first drive and driven pulleys and said second drive and driven pulleys respectively and hydraulic means for causing displacement of said movable half-pulleys for causing displacement of said movable half-pulleys for continuous variation of the speed ratio.

4,875,894

CONTINUOUSLY VARIABLE TRANSMISSION

Paul L. Clark, 3315 Marble Tor., Colorado Springs, Colo. 80906

Filed Sep. 7, 1988, Ser. No. 241,268

Int. Cl.⁴ F16H 55/52

U.S. Cl. 474—49

26 Claims

1. A continuously variable transmission comprising:

a. An input shaft rotatable by application of an input torque;

b. An input rotary assembly of variable diameter, comprising a plurality of input contact pads arranged in a circular configuration and in a common plane, which input contact pads may expand outward or move inward to vary the diameter of the input rotary assembly, connected to the input shaft so that the input contact pads are urged out-

ward to increase the diameter of the input rotary assembly by the input torque applied to the input shaft, and so that the input contact pads are caused to rotate by rotation of the input shaft;

c. An output rotary assembly of variable diameter, comprising a plurality of output contact pads arranged in a circular configuration and in a common plane, which output contact pads may expand outward or move inward to vary the diameter of the output rotary assembly;

d. An output shaft to which a load is applied, connected to the output rotary assembly so that the output shaft is



caused to rotate by rotation of the output rotary assembly,

e. Coupling means to provide mechanical coupling from the input rotary assembly to the output rotary assembly, wherein said coupling means comprises a coupling ring encircling the input rotary assembly and the output rotary assembly, contacting the input rotary assembly so that the coupling ring is caused to rotate as the input contact pads rotate, and contacting the output rotary assembly so that the output rotary assembly is caused to rotate as the coupling ring rotates, which coupling ring couples the input torque and the load.

4,875,895

BUFFING APPARATUS FOR BOOK-FOLD CARTON; AND METHOD

James A. Donnay, Maplewood; Van E. Jensen, Jr., Stillwater, and Bryon S. Krusel, St. Paul, all of Minn., assignors to Minnesota Mining and Manufacturing, St. Paul, Minn.

Filed Mar. 16, 1988, Ser. No. 168,896

Int. Cl.⁴ B31B 1/72

U.S. Cl. 493—117

34 Claims

33. A method of buffing lead and rear depending tails of tape against a bottom side of a carton moving in a first plane; said method including the steps of:

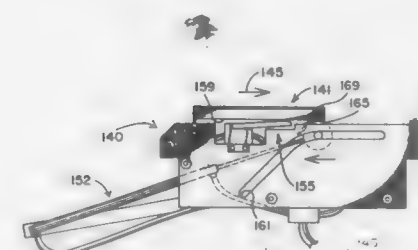
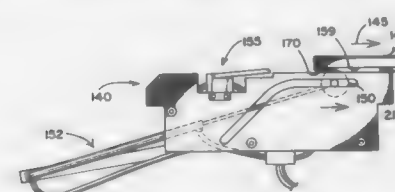
(a) providing a buffing member;

(b) moving said buffing member along a first path of motion against the lead tail to buff same against the bottom side of the carton and then to retract the buffing member beneath the rear tail;

(c) following said step (b), passing the carton at least partially over the retracted buffing member; and

(d) following said step (c), moving said buffing member

along a second path of motion upwardly toward the rear tape tail to buff same against the carton bottom side;



(i) said first and second paths of motion comprising identical, but opposite, paths of motion.

4,875,896

NEEDLE DISPOSAL DEVICE AND METHOD FOR PREVENTING ACCIDENTAL CONTACT WITH A NEEDLE

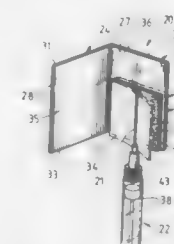
Sharon L. Kurtz, 335 Ballantrae La., Houston, Tex. 77015

Filed Aug. 29, 1988, Ser. No. 237,326

Int. Cl.⁴ A61M 5/00

U.S. Cl. 604—187

28 Claims



1. A disposal device for a needle which is adapted for use in a hypodermic syringe, or other sharp medical device, comprising:

at least two planar members, each planar member having front and back surfaces, and top edge, bottom edge, and side edge surfaces and formed of a material able to withstand accidental piercing contact with the needle;

the two planar members being fixedly connected together along a side edge surface of each planar member;

first means for securing the needle to the front surface of one of the planar members wherein the first securing means is an adhesive material disposed on the front surface of one of the planar members and the needle contacts the adhesive material; and

second means for securing together the front surfaces of the planar members upon one of the planar members being moved into contact with the other planar member, whereby the needle may be first associated with the first securing means, and a planar member is then moved to engage the second securing means to fixedly sandwich the needle between the planar members.

4,875,897

CATHETER ASSEMBLY

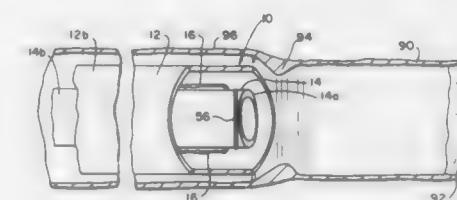
Garrett Lee, Sacramento County, Calif., assignor to Regents of University of California, Berkeley, Calif.

Continuation of Ser. No. 63,699, Jun. 12, 1981, abandoned, which is a continuation of Ser. No. 913,639, Sep. 30, 1986, abandoned, which is a continuation of Ser. No. 778,278, Sep. 18, 1985, abandoned, which is a continuation of Ser. No. 326,221, Dec. 1, 1981, abandoned. This application Apr. 6, 1988, Ser. No. 180,728

Int. Cl.⁴ A61M 25/00

U.S. Cl. 604—283

31 Claims



1. A catheter assembly, comprising:

an outer catheter for insertion into a body channel, said outer catheter having distal and proximal ends;

an inner catheter positionable within said outer catheter and having a distal end that is extendable toward the distal end of said outer catheter;

an inflatable means affixed to the outer surface of at least one of said catheters for forming a seal at the interior walls of the body channel;

optical fibers extending through a portion of said inner catheter for illuminating and viewing the area in front of the distal end of said inner catheter; and

means for positioning said optical fibers relative to the axis of said outer catheter.

4,875,898

INCONTINENCE DEVICE FOR WOMEN

Thomas G. Eakin, 965 Upper Newtownards Rd., Dundonald, Belfast BT16 0RL, Northern Ireland

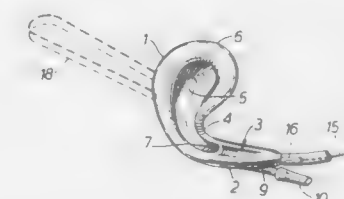
Continuation of Ser. No. 65,162, Jun. 19, 1987, abandoned, which is a continuation of Ser. No. 741,667, May 24, 1985, abandoned. This application Feb. 6, 1989, Ser. No. 307,235

Claims priority, application United Kingdom, Sep. 27, 1983, 8325848; Sep. 27, 1983, 8325847; Sep. 18, 1984, 8423591

Int. Cl.⁴ A61F 5/44

U.S. Cl. 604—331

10 Claims



1. An incontinence device for use by females, the device comprising:

a forward-extending, substantially rigid internal leg having a distal end, the internal leg having a forward-facing first curved surface so dimensioned as to conform to or contact the anterior vaginal wall of the female using the device and having a free end for positioning within the vagina;

a U-shaped bight portion connected to the internal leg, the U-shaped bight portion having a curved surface being dimensioned to span the urethral orifice of the female using the device while being in close proximity therewith;

an external leg connected at an acute angle with the internal leg by the U-shaped bight portion to define therewith a generally J-shaped structure with the external leg so dimensioned as to conform to the mons veneris of the female using the device; and

a further, substantially rigid internal leg means connected to the device at the U-shaped bight portion and extending rearwardly from a surface thereof at a substantially fixed right angle to the forwardly extending internal leg and spaced from the distal end of the internal leg towards the cervix of the female using the device, the further leg assisting in retaining the device in position without the necessity of external securing means.

4,875,899

FILTER SYSTEM WITH AN INCORPORATED GAS ESCAPE OPENING, INTENDED TO BE FITTED IN ARTIFICIAL ANUS DRAINAGE BAGS DURING THEIR MANUFACTURE

Henri Holtermann, Jean De Luz, France, assignor to Laboratoires Biotrol, Paris, France

Filed May 6, 1988, Ser. No. 191,019

Claims priority, application France, May 14, 1987, 87 96797
Int. Cl.⁴ A61F 5/44

U.S. Cl. 604—333

12 Claims

1. A substantially flat elongated gas filter system suitable for incorporation within and as part of an artificial anus drainage bag, the gas filter system having two ends, two sides, two

faces, a central permeable core sheet impregnated with adsorbent active material and surrounded by gas impermeable protective plastic material which is in direct contact with the central permeable core sheet throughout its entire length, and



at least one gas escape opening in the protective plastic material on one of the faces, the two ends being free from the gas impermeable plastic material and thus comprising further gas escape openings.

4,875,900

METHOD OF TREATING LEATHER

Vir B. Singh, 6, Rutland Gate, Madras-600008; Kanniah N. G. K. Moorthy, 29, North Railway Station Road, Thiruvotthiyur; Madras-600019; Pushpendar K. Kaushik, L-42/K, Bharthi Dasan Colony, K.K. Nagar, Madras-600078, and Hariharan Sankarasub-Ramanian, 2A Bala Krishna Naicken Street, West Mambalam, Madras-600033, all of India

Filed Sep. 22, 1987, Ser. No. 99,780

Int. Cl.⁴ C14C 3/06

U.S. Cl. 8—94.27

6 Claims

1. An improved process for the chemical treatment of animal skins and hides to obtain leather by tanning, rechroming, retanning and dyeing, each of said steps of tanning, rechroming, retanning and dyeing being carried out in the presence of its respective treating liquor the improved process comprising preparing an aqueous dispersion of microcrystalline polymer and adding the prepared aqueous dispersion to the treating liquor such that at least one of said steps of tanning, rechroming, retanning and dyeing is carried out in the presence of the respective liquor with said aqueous dispersion added thereto to improve chrome absorption, said microcrystalline polymer having particles of size up to 2 microns and selected from a polyamide or polyester and maintaining a pH level between 2 to 8.

4,875,901

TREATING FIBROUS POLYAMIDE ARTICLES

George L. Payet, St. Paul, and John C. Chang, New Brighton, both of Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Continuation of Ser. No. 201,381, Jun. 1, 1988, abandoned, which is a continuation of Ser. No. 918,376, Oct. 14, 1986, abandoned. This application Feb. 21, 1989, Ser. No. 314,234

Int. Cl.⁴ D06M 3/30; B32B 3/02

U.S. Cl. 8—115.56

19 Claims

1. A method for providing fibrous polyamide materials with stain resistance comprising contacting the fibrous polyamide materials with an aqueous solution comprising a normally solid, water-soluble, partially sulfonated novolak resin, which comprises the condensation product of at least one phenolic compound and an aldehyde, and a water-soluble magnesium salt at a pH in the range of from 2 to 12.

11. A fibrous polyamide material treated according to the method of claim 1.

4,875,902

ALKYL DERIVATIVES OF HYDROQUINONE AS ANTIOXIDANTS IN OXIDATION DYEING COMPOSITIONS

Jean F. Grollier, Paris, and Jean Cotteret, Franconville, both of France, assignors to L'Oreal, Paris, France

Continuation of Ser. No. 389,473, Jun. 17, 1982, abandoned.

This application Oct. 16, 1987, Ser. No. 110,107

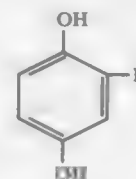
Claims priority, application France, Jun. 18, 1981, 81 12058

Int. Cl.⁴ A61K 7/13

U.S. Cl. 8—406

18 Claims

1. A dyeing composition which contains at least one oxidation dyestuff precursor and, as antioxidant, at least one compound corresponding to the formula:



in which R denotes a linear or branched alkyl group having 1 to 4 carbon atoms, said antioxidant present in an amount sufficient to prevent premature oxidation of the dye composition.

4,875,903

MONOAZO COMPOUNDS CONTAINING A 2-SULFOPHENYL DIAZO COMPONENT RADICAL AND A 1-HYDROXY-NAPHTHALENE-SULFONIC OR DISULFONIC ACID COUPLING COMPONENT RADICAL AND TWO SUBSTITUTED 1,3,5-TRIAZINE RINGS

Reinhard Pedrazzi, Allschwil, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Filed Jun. 5, 1987, Ser. No. 58,434

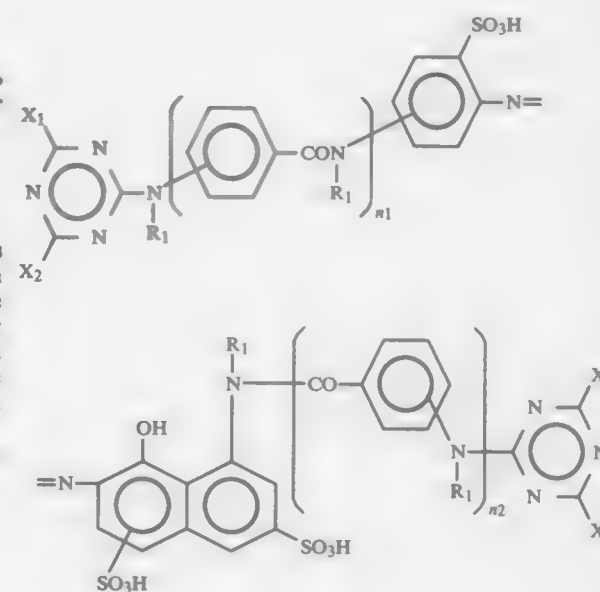
Claims priority, application Fed. Rep. of Germany, Jun. 7, 1986, 3619198

Int. Cl.⁴ C09B 29/01, 29/036, 29/20, 29/22

U.S. Cl. 8—640

19 Claims

1. A compound of the formula



or an internal or external salt thereof, wherein

each R₁ is independently hydrogen, C₁-alkyl or C₁-alkoxy monosubstituted by hydroxy halo, cyano or C₁-alkoxy, each of X₁ and X₃ is independently halo, hydroxy, C₁-alkyl, C₁-alkoxy, phenyl, phenoxy, amino or an aliphatic, cycloaliphatic, aromatic or heterocyclic amino group, each of X₂ and X₄ is independently an aliphatic, cycloaliphatic, aromatic or heterocyclic amino group containing at least one protonatable nitrogen atom or quaternary ammonium group, and

(i) each of n₁ and n₂ is independently 0 or 1, with the proviso that n₁+n₂ is 1 or 2,

wherein each halo is independently fluoro, chloro or bromo, with the provisos that (1) the total number of basic and cationic groups present as X₁-X₄ equals or exceeds the number of sulfo groups, (2) the hydroxy or alkoxy group of each hydroxy- or alkoxy-substituted alkyl group or alkylene radical attached to a nitrogen atom is bound to a carbon atom other than the C₁-atom, and (3) the hydroxy groups of each alkylene radical substituted by two hydroxy groups are attached to different carbon atoms, or a mixture of such compounds or salts.

4,875,904

COFFEE BEAN ROASTER

Harald Munk, Stockelsdorf, Fed. Rep. of Germany, assignor to NOVOPACK Maschinenbau GmbH, Fed. Rep. of Germany

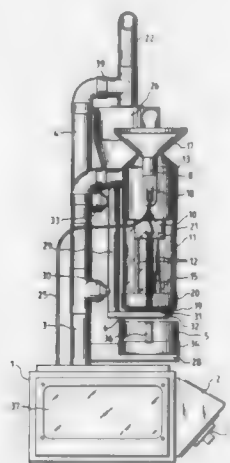
Filed Apr. 28, 1988, Ser. No. 187,314

Claims priority, application Fed. Rep. of Germany, Apr. 28, 1987, 3714594

Int. Cl.⁴ F26B 11/12

U.S. Cl. 34—67

22 Claims



1. A coffee bean roaster for small quantities, with a vertically directed cylindrical roasting chamber (11), a fan (35) for supplying air to the roasting chamber (11) for the swirling of coffee beans introduced into the roasting chamber, a suction port (6) for sucking up supply air and a supply-air conduit (3) connected to the suction port, an exhaust-air port (22) which is preceded by a separator device (26) for coffee bean residues transported together with the exhaust air, and a heating device (10) in the supply-air conduit, wherein the hot air blown into the roasting chamber (11) from above is supplied off-center via at least two blowing-in conduits (12) which are directed towards the bottom (19) of the roasting chamber and of which the blowing-out direction relative to the roasting-chamber axis is set at a respective equidirectional oblique angle of up to 30° in the tangential direction of the roasting chamber, whereby continuous circulation of the coffee beans occurs during roasting.

4,875,905

METHOD OF PREPARING A HIGH HEATING VALUE FUEL PRODUCT

Robin Somerville, Galveston, Tex., and Liang-Tsang Fan, Manhattan, Kans., assignors to Solidwaste Technology, L.P., Manhattan, Kans.

Filed Nov. 14, 1988, Ser. No. 270,040

Int. Cl.⁴ C10L 5/40

U.S. Cl. 44—589

20 Claims

1. A method of preparing a high heating value fuel product comprising the steps of:
blending a high heating value waste material with a cellulosic material;
mixing an organic reagent to the blended mixture of said waste material and said cellulosic material, said organic reagent being a mixture having a 4–15 weight percent of a chemical selected from the group consisting of: triethylene glycol, diethylene glycol, and glycerin propylene glycol;
introducing a pozzolanic agent to the blended mixture for controlling the rate of solidification; and
forming said blended mixture into a form suitable for handling.

7. The method of claim 1, said mixture of said organic reagent further comprising:
a 20–32 weight percent calcium chloride solution.

13. A method of preparing a fuel product comprising the steps of:

blending a mixture of an organic hazardous waste stream with a cellulosic material;
mixing a cross-linking reagent to said mixture, said cross-linking reagent being a chemical selected from the group consisting of: triethylene glycol, diethylene glycol, and glycerin propylene glycol;
blending said mixture and said cross-linking reagent such that cross-linking occurs with organics contained within; and
forming said blended mixture into a form suitable for handling.

4,875,906

PARTIAL OXIDATION OF LOW HEATING VALUE HAZARDOUS WASTE PETROLEUM PRODUCTS

Howard L. Apel, Ontario, Calif., assignor to Texaco Inc., White Plains, N.Y.

Filed Nov. 10, 1988, Ser. No. 269,326

Int. Cl.⁴ C10J 3/46

U.S. Cl. 48—197 R

11 Claims

1. A partial oxidation process comprising:
(1) mixing together low heating value liquid hydrocarbonaceous and/or solid carbonaceous hazardous waste materials from the production, refining and marketing of petroleum products with additional water when needed and about 0.3 to 2.0 wt. % of an anionic surface active agent to produce a stable pumpable aqueous mixture having a solids content in the range of up to about 70 wt. %;
(2) mixing together a solid carbonaceous fuel selected from the group consisting of coal, petroleum coke, asphalt, tar sands, and mixtures thereof with water and from about 0.02 to 1.00 wt. % of an anionic surface active agent to produce a stable pumpable aqueous slurry having a solids content in the range of about 50 to 70 wt. %;
(3) mixing together from about 4 to 19 parts by weight of the mixture from (2) per part by weight of the mixture from (1) to provide a stable pumpable final blend aqueous slurry having a solids content in the range of about 50 to 70 wt. %; and
(4) reacting the final blend aqueous slurry from (3) in a free-flow unobstructed refractory lined partial oxidation reaction zone with a free-oxygen containing gas in a reducing atmosphere at a temperature in the range of about 1900° to 3000° F. and a pressure in the range of about 2 to 250 atmosphere to produce a hot raw effluent gas stream comprising H₂+CO.

4,875,907

THERMALLY STABLE DIAMOND ABRASIVE COMPACT BODY

Cornelius Phaal, Glade Cottage, St. Anne's Glade, Bagshot, Surrey, GU195EF, England, and Richard P. Burnand, 39 Constantia Ave., Alan Manor, Johannesburg, Transvaal, South Africa

Filed Sep. 23, 1987, Ser. No. 100,113

Claims priority, application South Africa, Sep. 24, 1986, 86/7280

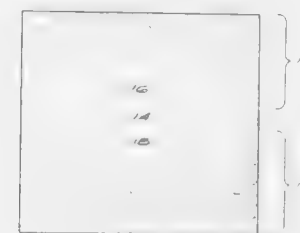
Int. Cl.⁴ B24D 3/02

U.S. Cl. 51—293

4 Claims

1. A method of making a composite diamond abrasive compact comprising a thermally stable diamond compact bonded to a cemented carbide substrate including the steps of forming an unbonded assembly comprising a thermally stable diamond compact comprising a mass of diamond particles containing substantial diamond-to-diamond bonding to form a coherent, skeletal mass and a second phase uniformly distributed through the diamond mass, a cemented carbide substrate and a layer of

nickel or a nickel-rich alloy between the compact and substrate, placing the unbonded assembly in the reaction zone of a high pressure/high temperature apparatus, subjecting the unbonded assembly to a temperature of at least 1000° C. and



simultaneously a pressure of at least 30 kilobars for a time sufficient to cause bonding to occur between the compact and substrate and removing the composite diamond abrasive compact from the reaction zone.

4,875,908

PROCESS FOR SELECTIVELY SEPARATING GASEOUS MIXTURES CONTAINING WATER VAPOR

Hiroyasu Kikukawa, 348-7 Otani, Okayama-shi; Elji Shimoda, 17-24 3-chome, Naka-cho, Musashino-shi; Mari Sakai, 64-8 Akoda, Okayama-shi, and Fumiko Kitada, 67-13, Nagaoka, Okayama-shi, all of Japan

Filed Jan. 26, 1989, Ser. No. 302,439

Claims priority, application Japan, Jan. 27, 1988, 63-16199

Int. Cl.⁴ B01D 53/22

U.S. Cl. 55—16

20 Claims

1. A process for selectively separating water vapor from a multiple component gaseous mixture, said process comprising passing a multicomponent gaseous mixture including water vapor along and in contact with a membrane which is selectively permeable to water vapor and wherein the water vapor permeation rate Q_{H_2O} is greater than 30 Nm³/m²·hr·atm at 25° C. and the ratio of Q_{H_2O} to the permeation rate Q_G of the gas to be separated from said water vapor, i.e., Q_{H_2O}/Q_G , is greater than 10,000.

4,875,909

METHOD FOR RECOVERY OF ETHYLENE OXIDE

Yukihiko Kakimoto; Masayuki Sawada; Yoshiaki Kajimoto, all of Yokohama, and Isamu Kiguchi, deceased, late of Zushi, all of Japan (by Kuniko Kiguchi, legal representative), assignors to Nippon Shokubai Kagaku Kogyo Co., Ltd., Osaka, Japan and Atochem, Paris, France

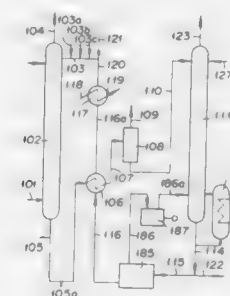
Continuation-in-part of Ser. No. 878,113, Jun. 25, 1986, abandoned. This application Dec. 1, 1987, Ser. No. 127,488

Claims priority, application Japan, Jun. 27, 1985, 60-139175; Jul. 4, 1985, 60-145850

Int. Cl.⁴ B01D 53/14

U.S. Cl. 55—40

21 Claims



1. In a method for the recovery of ethylene oxide, compris-

ing the steps of introducing the gas resulting from catalytic gas-phase oxidation of ethylene with a molecular oxygen-containing gas said resultant gas containing ethylene oxide into an absorber and leading said gas into counterflow contact therein with an aqueous absorbent liquid,

recycling part of the residual gas emanating from the top of said absorber to the reactor or said oxidation step of ethylene, introducing an ethylene oxide-containing bottom liquid of said absorber to an ethylene oxide stripper, heating the bottom of said ethylene oxide stripper with a heating medium,

causing said stripper to liberate a volatile component containing ethylene oxide as a volatile fraction via the top thereof,

forwarding said volatile component to a condenser to condense therein a condensate containing ethylene oxide and water,

leaving uncondensed vapour, recycling the condensate to the said stripper and passing the said uncondensed vapour to a dehydrator to separate water therefrom,

separating the volatile components from said dehydrator in a light ends stripper to yield ethylene oxide, subjecting the ethylene oxide produced to purification in an ethylene oxide refiner, and

forwarding part of the liquid withdrawn from the bottom of said stripper to said absorber to be used as an absorbent liquid again, the improvement comprising

introducing the volatile component from said stripper having 0.3 to 0.6 Kg/cm² G of a top pressure and 85° to 120° C. of a temperature to a heating zone of said ethylene oxide refiner,

then passing it into a condenser to form a condensate, and recirculating said condensate to the said ethylene oxide stripper, while circulating the uncondensed vapour therefrom to a dehydrator,

subjecting the aqueous liquid having not more than 0.5 ppm of ethylene oxide content withdrawn from the bottom of said stripper to a flashing treatment in a flash tank thereby separating said liquid into a vapour-phase part and an aqueous liquid phase part,

introducing said vapour-phase part in a compressed state into the bottom of said stripper; and
introducing said liquid phase as a heat source into a heating means for said ethylene oxide refiner after preheating a liquid which is fed from the bottom of said ethylene oxide absorber to said ethylene oxide stripper, and then recycling said aqueous liquid-phase part into said absorber as an absorbent liquid for use in said absorber.

4,875,910

FILTER FOR REMOVING CANCER CAUSING COMPOUNDS FROM EXHAUST FUMES

Jacques Dunnigan, and Hugues Menard, both of Sherbrooke, Canada, assignors to L'Institut De L'Amiante, Montreal, Canada

Filed Jun. 27, 1985, Ser. No. 749,565

Int. Cl.⁴ B01D 53/04

U.S. Cl. 55—74

2 Claims

1. A method for scrubbing an industrial exhaust material which comprises causing said exhaust materials to flow through a bed of dry porous pellets consisting of a mixture of natural magnesium silicate selected from short chrysotile asbestos fibers, attapulgite and mixtures thereof with a cementitious clay binder, the latter representing from 1 to 20% by weight of the dry pellets, whereby substantially all the particulate and gaseous pollutants present in the exhaust material are adsorbed by the dry porous pellets.

4,875,911

APPARATUS FOR SEPARATING GASEOUS MIXTURES

Shinji Mizuno, Kan; Hideo Kawata, Kanagai; Kazuyoshi Hanazawa, Nozaki; Tatsunori Aoyama, Ichimiya, and Yoshinori Ogasawara, Kanagai, all of Japan, assignors to CKD Kabushiki Kaisha, Aichi, Japan

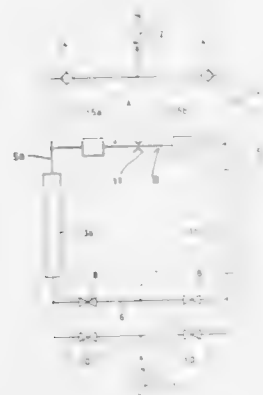
Filed Jul. 13, 1987, Ser. No. 73,956

Claims priority, application Japan, Jul. 22, 1986, 61-172572; May 7, 1987, 62-111171; May 7, 1987, 62-111172; May 7, 1987, 62-48001

Int. Cl.⁴ B01D 53/04

U.S. Cl. 55-162

3 Claims



1. Apparatus for separating gaseous mixtures comprising a pair of main conduits, each having an associated main separator vessel packed with adsorbent or absorbent material functioning as separating material, the main separator vessels being arranged in parallel with each other with inlet sides of the respective main conduits being connected to a common feed port while outlet sides of the respective main conduits are connected to a common discharge port, said main conduits being interconnected on their discharge sides by a bypass conduit including a stationary or variable throttle means, wherein pressurized unprocessed gaseous mixture consisting of two or more different components fed through the feed port is introduced alternately into the respective main conduits at predetermined time intervals by operating a plurality of switching valves provided in the respective main conduits, there being a separating cycle during which the unprocessed gaseous mixture is fed into one of the main separator vessels to remove one or more components thereof to produce a processed gaseous mixture which is discharged through the discharge port, there further being a regenerating cycle during which the processed gaseous mixture is partially introduced into the bypass conduit, then pressure-reduced through the throttle means interposed in this bypass conduit and the processed gaseous mixture is concentration-reduced and introduced into the other main separator vessel so as to remove the quantity of components previously adsorbed or absorbed by the separating material present in the separator vessel and thereby to regenerate the separating material, wherein the separating and regenerating cycles may be alternately repeated, the apparatus further comprising regeneration promoting separator vessels in the bypass conduit up- and downstream of the throttle means, respectively, the regeneration promoting separator vessels further packed with adsorbent or absorbent material thereby reducing the concentration of the components still remaining in the processed gaseous mixture flowing through the bypass conduit.

4,875,912

SCENTED FURNACE FILTER

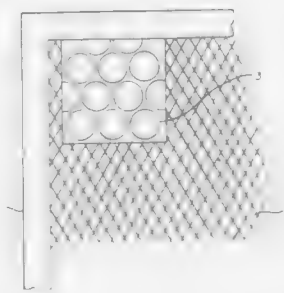
Thomas L. Palmer, 800 E. Beas St., Apt. L2, Washington, Pa. 15301

Filed Feb. 5, 1988, Ser. No. 152,882

Int. Cl.⁴ A61L 9/04

U.S. Cl. 55-279

1 Claim



1. In combination with a filter mounted in a frame for use in a household furnace for mounting in the cold air return of said furnace, a cut-out portion in said filter, a relatively small packet of scented material inserted into and filling the entire area of said cut-out portion, said packet being sealed by a rear cover and a front cover for said scented material having a substantially triangular tear tab for progressively exposing at least a portion of said scented material to enable selective exposure of only the front portion of said scented material, said tear tab being so located on said front cover as to expose only a portion of the scented material, leaving uncovered a surrounding portion of the exposed area so that such surrounding portion serves as a reservoir for supplying scented material to replace that which is discharged from said cut-out portion so as to lengthen the life of the scented material.

4,875,913

APPARATUS FOR CLEANING CORRUGATED FILTER ELEMENTS

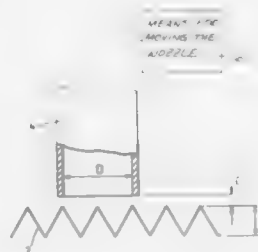
Ytshak Barzua, Petach Tikva, Israel, assignor to Filtration Water Filters For Agriculture and Industry, Ltd., Herzlia, Israel

Continuation-in-part of Ser. No. 733,736, May 14, 1985, Pat. No. 4,780,151. This application Jul. 7, 1988, Ser. No. 216,181

Int. Cl.⁴ B01D 46/04, 29/06

U.S. Cl. 55-294

2 Claims



1. Apparatus comprising:

- a corrugated filter element having apices of height E, a corrugated density F, and an open filter fraction G;
- a suction nozzle having an inside cross-sectional area A, an inside circumference B, and a maximum width D in a direction perpendicular to the orientations of the corrugations;
- means for moving the nozzle over the filter element while maintaining the nozzle a distance C above the apices of said filter elements, wherein:

$$C \leq [A(k_1 - k_2)F \times G] - D \times E / B$$

where:

$$F = \frac{\text{length of filter portion when stretched flat}}{\text{length, across corrugations, of same portion in corrugated state}}$$

$$G = \frac{\text{total area of openings in element}}{\text{total filter element surface}}$$

$$1.5 \leq k_1 \leq 2.5 \text{ and } 0.8 \leq k_2 \leq 1.0.$$

4,875,914

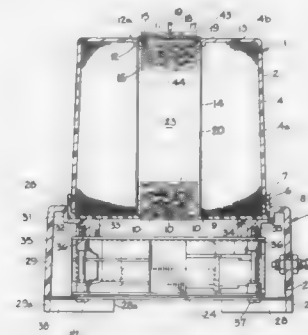
GAS & ODOR ADSORBING UNIT

Wallace Wireman, 113 Park Ave., Walton, Boone Cty., Ky. 41094

Filed Mar. 20, 1989, Ser. No. 326,192

Int. Cl.⁴ B11D 53/04

U.S. Cl. 55-389



1. An adsorber for removing gasses and odors from the ambient atmosphere, said adsorber comprising a cannister containing a bed of molecular beads constituting a molecular sieve, at least one tubular passage extending through said molecular sieve and being connected to the ambient atmosphere at opposite ends of said cannister, said passage being defined by a peripheral foraminous wall, said molecular sieve being exposed to said ambient atmosphere only at said foraminous wall and means to cause a flow of said ambient atmosphere to pass through said tubular passage, whereby gasses, odors and a minimum of moisture is adsorbed by said molecular sieve from said ambient atmosphere passing through said passage.

4,875,915

METHOD AND APPARATUS FOR TRANSFERRING ENERGY AND MASS

Uwe Rockenfeller, 1453 Rawhide Rd., Boulder City, Nev. 89005

Division of Ser. No. 115,820, Nov. 2, 1987, Pat. No. 4,822,391.

This application Jan. 11, 1989, Ser. No. 296,188

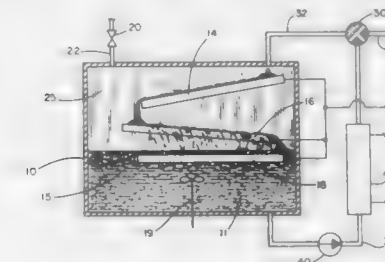
Int. Cl.⁴ F25D 5/00

U.S. Cl. 62-4

22 Claims

- Method of transferring and recovering energy comprising
- (a) forming a slurry of a liquid selected from the group consisting of long chain alcohols, ethers, glycols, glycol ethers, sebecates, phthalates, aldehydes and ketones and a solid sorbate which does not dissolve in said liquid and is capable of forming a solid/gas compound with a gaseous refrigerant,
- (b) mixing said gaseous refrigerant with said slurry whereby said gas forms a solid/gas compound with said solid sorbate, and

(c) exposing the slurry mixture of step (b) to a heat exchange surface whereby the energy from the formation of said



solid/gas compound is transferred to said heat exchange surface.

4,875,916

METHODS OF ADJUSTING THE CONFIGURATION OF OPTICAL SUBSTRATES

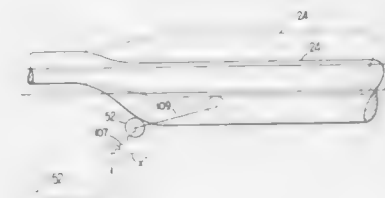
Gary L. Baltzer, Brian Lynch, both of Norcross, and William D. O'Brien, Jr., Lilburn, all of Ga., assignors to American Telephone and Telegraph Company, AT&T Technologies, Inc., Berkeley Heights, N.J.

Continuation of Ser. No. 928,436, Nov. 7, 1986, abandoned. This application Sep. 22, 1988, Ser. No. 247,984

Int. Cl.⁴ C03B 37/025, 37/012

U.S. Cl. 65-2

7 Claims



1. A method of straightening optical glass substrates from which optical fiber is to be drawn, the method being effective notwithstanding differing diameters among successive substrates to be straightened by said method, said method including the steps of:

- supporting end portions of an elongated optical glass, substantially circular substrate so that said substrate is capable of rotation about an axis of rotation which extends through the end portions thereof;
- causing the substrate to be turned rotatably about the axis of rotation, the rotating of a substrate which is not substantially straight causing portions of the substrate to be at a greater radial distance from the axis of rotation than are other portions of the substrate;
- moving a force-applying contact means which will subsequently engage the substrate and which is effective to straighten the substrate for causing the substrate to be disposed concentrically about the axis of rotation, said movement being in a forward direction parallel to the axis of rotation; while
- heating successive increments of length of the substrate in a manner to cause the substrate to be capable of being straightened by the force-applying means by causing the temperature of the increments of the substrate to be sufficiently high to allow straightening of each increment of the substrate upon continuous engagement of the force-applying means with the periphery of said each increment of the substrate while rotating for a predetermined time which will insure circularity of each said increment, causing the force-applying means to be moved continuously inwardly toward the axis of rotation to a reference point

spaced outside the largest expected radial distance which distance is measured from the axis of rotation to an outer surface of the substrate and then to be moved, in a first mode of contact, in incremental steps of forward and then inward movement toward the axis of rotation until a portion of the substrate and the force-applying means engage each other along a portion of the circumference; as the rotation of said substrate causes a portion of said substrate which is at a lesser distance from the axis of rotation than a preceding adjacent portion of the substrate to move away from said force applying contact means, causing the force-applying means to be moved further gradually and incrementally forward and inward in a second mode of contact toward the axis of rotation in incremental steps which are substantially less than the steps of the first mode until the force-applying means has remained in continuous engagement with a predetermined portion of the periphery of an increment of length of the rotating substrate which is sufficient to insure that the increment of length of the substrate is disposed concentrically about the axis of rotation; and

cooling the force-applying means to establish a setting of the glass of the successive increments of length of the substrate after said successive increments of length have been straightened;

wherein said force-applying contact means comprises a member having a solid portion of said member in physical contact with said substrate to effect the engaging of the substrate.

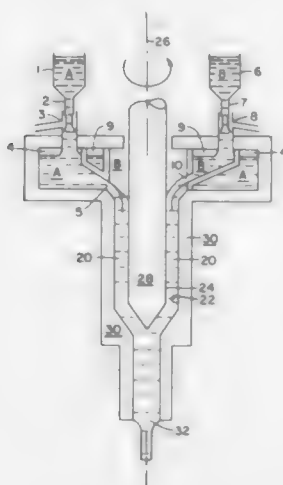
4,875,917

METHOD FOR MAKING A LAYERED GLASS ARTICLE
William P. Lentz, deceased, late of Addison, N.Y. (by Cornelia V. Lentz, executrix), assignor to Corning Incorporated, Corning, N.Y.

Division of Ser. No. 925,787, Oct. 31, 1986, Pat. No. 4,784,679. This application Mar. 25, 1988, Ser. No. 173,725

The portion of the term of this patent subsequent to Nov. 15, 2005, has been disclaimed.

Int. Cl.⁴ C03C 25/02; C03B 5/26, 7/14; B29D 11/00
U.S. Cl. 65—3.11 8 Claims



1. A method for the continuous manufacture of a glass article having a preselected refractive index profile which comprises the steps of:

- providing a mixing zone for the hear mixing of molten glass, the mixing zone including an annular gap between opposing, closed surfaces, at least one of which surfaces is a curved axisymmetric surface which can be rotated with respect to the opposing surface about a rotation axis coinciding with its axis of symmetry,
- introducing into the mixing zone a composite molten

glass feed stream, the composite feed stream comprising two or more component streams of differing composition, the component streams being geometrically distributed within the composite stream entering the mixing zone such that the relative proportions of at least two of the component streams varies both as a function of angular position about the axis of rotation and as a function of radial distance from the axis of rotation;

(c) rotationally moving the curved axisymmetric surface with respect to the other surface while in contact with the composite feed stream for a time sufficient to obtain circumferential mixing of the composite feed stream and spiral layering of at least two of the component streams about the axis of rotation, but insufficient to cause radial glass redistribution and homogenization of the feed stream across the annular gap; and

(d) withdrawing the mixed composed glass feed stream from the mixing zone and cooling the glass to a solid glass article.

4,875,918

METHOD OF MANUFACTURING FIBER PREFORM FOR SINGLE-MODE FIBERS

Futoshi Mizutani; Takeshi Kyogoku; Tatsuo Saitoh, and Shigeki Endoh, all of Kanagawa, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 70,001, Jul. 6, 1987, abandoned. This application Dec. 19, 1988, Ser. No. 289,399

Claims priority, application Japan, Jul. 3, 1986, 61-155021
Int. Cl.⁴ C03B 37/018 6 Claims



1. A method of manufacturing a glass fiber preform, comprising the steps of:

preparing a starting material of a glass rod provided with an outer coating made at least partially of quartz glass containing chlorine and a core made at least partially of quartz glass containing a component for increasing a refractive index of said quartz glass;

introducing a quartz glass raw material containing silicon and a gas containing chlorine simultaneously into a burner;

performing a flame hydrolysis reaction on said quartz glass raw material containing silicon and said gas containing chlorine to form quartz glass soot, such that said as containing chlorine is dispersed homogeneously within said quartz glass soot;

blowing said quartz glass soot to said starting material to obtain a complex of said quartz glass soot and said glass rod; and

heating and fusing said complex to collapse said complex so as to remove bubbles from said complex.

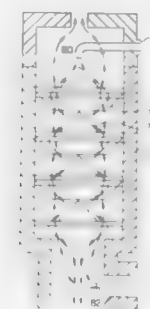
4,875,919

DIRECT CONTACT RAINING BED COUNTERFLOW CULLET PREHEATER AND METHOD FOR USING
Robert DeSaro, Acton; Edward F. Doyle, Dedham; Christopher I. Metcalfe, East Walpole, and Keith D. Petch, Lexington, all of Mass., assignors to Gas Research Institute, Chicago, Ill.

Filed Apr. 13, 1988, Ser. No. 186,989

Int. Cl.⁴ C03B 3/00, 5/00

U.S. Cl. 65—27 17 Claims



1. A method of preheating cullet for use in a glass furnace comprising:

- introducing cullet into a preheater near the top thereof;
- allowing glass cullet to fall downward through the preheater to form a raining bed while hot gases are introduced near the bottom of the preheater and allowed to flow upward to directly contact the cullet to thereby heat the cullet to temperature below the agglomeration temperature of said cullet but above 700° F.;
- controlling the residence time of the cullet in the preheater by deterring the cullet's fall through the preheater with a series of deflectors arranged within the preheater;

- introducing the heated cullet into a furnace containing molten glass.

4,875,920

ION-EXCHANGEABLE PHOSPHATE GLASS COMPOSITIONS AND STRENGTHENED OPTICAL QUALITY GLASS ARTICLES

John D. Myers, Hilton Head Island, S.C., assignor to Kigre, Inc., Hilton Head Island, S.C.

Filed Dec. 4, 1987, Ser. No. 128,676

Int. Cl.⁴ C03C 21/00

U.S. Cl. 65—30.14 13 Claims

1. A method for making a thermal shock-resistant phosphate glass article comprising the steps of:

forming an optical phosphate glass article consisting essentially of approximately 50 to 70 mole percent P₂O₅, approximately 5 to 30 mole percent Li₂O, approximately 5 to 25 mole percent MO, wherein M is selected from the group consisting of Be, Mg, Ca, Sr, Ba and Zn and combinations thereof; and

approximately 5 to 25 mole percent X₂O₃ where X is selected from the group consisting of Al, Y, La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb and Lu and combinations thereof;

at a temperature below the annealing temperature of said optical phosphate glass article, contacting the surface of said optical phosphate glass article with a salt bath, said salt bath containing ionic radii larger than the ionic radius of an ion of lithium;

diffusing said selected ions into the surface of said optical phosphate glass article such that said selected ions replace lithium ions in said phosphate glass article to create a compressive surface layer of said phosphate glass article such that said phosphate glass article has increased thermal shock resistance.

4,875,921

BACTERIAL AGRICULTURAL INOCULANTS
Alan Pasa, Middleton, Wis., assignor to Agracetus Corporation, Middleton, Wis.

Continuation of Ser. No. 727,029, Apr. 25, 1985, abandoned. This application Jun. 26, 1987, Ser. No. 67,428

Int. Cl.⁴ C05F 11/08

U.S. Cl. 71—7 7 Claims

5. An inoculant for legume seeds, consisting essentially of a mixture of dry, dormant but viable Rhizobium bacteria together with a porous, chemically inert perlite carrier, wherein the bacteria-carrier mixture has been air-dried to a substantially moisture-free state and the weight ratio, pre-drying, of concentrated bacteria suspension to dry carrier is in the range of about 0.5–1.5, and the bacteria is present in the mixture at a density in excess of 10⁹ bacteria per gram.

4,875,922

PYRIMIDINE DERIVATIVES

Raymond Elliott, Lower Earley, nr. Reading; David A. Griffin, Wokingham, and Raymond S. Gairns, Whitefield, all of England, assignors to Imperial Chemical Industries PLC, London, England

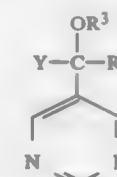
Filed Dec. 15, 1987, Ser. No. 133,450

Claims priority, application United Kingdom, Dec. 23, 1986, 8630824; Jul. 3, 1987, 8715684

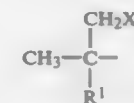
Int. Cl.⁴ A01N 43/54; A61K 31/505; C07D 239/26

U.S. Cl. 71—76 11 Claims

1. A pyrimidine derivative having the formula (I):



and stereoisomers thereof, wherein Y is cyclopropyl optionally substituted by lower alkyl or halogen or 1-methylcyclopropyl optionally substituted by lower alkyl or halogen or Y is the group:



wherein R¹ is hydrogen or methyl; X is hydrogen or halogen; R² is an alkyl, cycloalkyl, cycloalkylalkyl or alkylcycloalkyl group, each of said groups having a total of from 4 to 8 carbon atoms, said alkyl group being optionally substituted by halogen, and said cycloalkyl, cycloalkylalkyl or alkylcycloalkyl groups being optionally substituted by halogen or, in the cycloalkyl ring, by lower alkyl; or R² is an alkenyl, cycloalkenyl, cycloalkenylalkyl, or alkylcycloalkenyl group, each of said groups having a total of from 4 to 8 carbon atoms, said alkenyl group being optionally substituted by halogen, and said cycloalkenyl, cycloalkenylalkyl or alkylcycloalkenyl groups being optionally substituted by halogen or, in the cycloalkenyl ring, by lower alkyl; or R² is an alkynyl group having a total of from 4 to 8 carbon atoms optionally substituted by halogen; and R³ is hydrogen, an alkyl group having from 1 to 4 carbon atoms, an alkenyl group having from 3 to 4 carbon atoms or an alkynyl group having from 3 to 4 carbon atoms; and agrochemically acceptable salts and esters.

10. A plant growth regulating composition comprising a plant growth regulating amount of a pyrimidine derivative according to claim 1 and an agrochemically acceptable carrier or diluent.

4,875,923

N-PYRIDINYLSULFONYL-N'-PYRIMIDINYLURES
Rolf Schurter, Binningen; Willy Meyer, and Werner Föry, both of Riehen, all of Switzerland, assigns to Ciba-Geigy Corporation, Ardsley, N.Y.

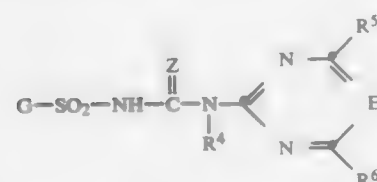
Continuation-in-part of Ser. No. 719,614, Apr. 3, 1985. This application Oct. 26, 1987, Ser. No. 114,993
Claims priority, application Switzerland, Apr. 11, 1984, 1621/84

Int. Cl.⁴ C07D 401/12; A01N 43/54

U.S. Cl. 71—92

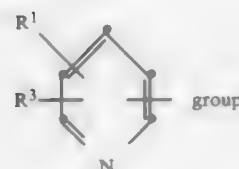
14 Claims

1. A sulfonylurea of formula I

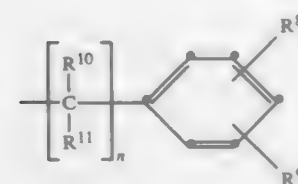


wherein

E is the methine bridge,
Z is oxygen or sulfur,
R⁴ is hydrogen or C₁-C₄alkyl,
R⁵ and R⁶ are each independently hydrogen, halogen, C₁-C₄alkyl, C₁-C₄haloalkyl, C₁-C₄alkoxy, C₁-C₄haloalkoxy, C₁-C₄alkylthio, C₃-C₆dialkoxyalkyl, C₁-C₄haloalkylthio, C₂-C₄alkoxyalkyl, C₃-C₆cycloalkyl or —NR¹²R¹³,
G is a



R¹ is hydrogen, halogen, nitro, C₁-C₄alkyl, C₁-C₄alkoxy, trifluoromethyl, trifluoromethoxy, difluoromethoxy, C₁-C₄alkyl carbonyl or —COOR¹⁴,
R² is a



group,

n is 0, 1 or 2,

R⁸ is hydrogen, C₁-C₄alkyl, C₁-C₄alkoxy, halogen, C₁-C₄haloalkyl, nitro, —COOR¹⁴, C₁-C₄haloalkoxy, —O—CR¹⁵R¹⁶—COOR¹⁴ or —O—CR¹⁵R¹⁶—CN,
R⁹ is hydrogen, halogen, C₁-C₄alkyl, C₁-C₄alkoxy, C₂-C₄alkoxyalkyl or C₂-C₄alkoxyalkoxy,
R¹⁰ and R¹¹ are each independently hydrogen or C₁-C₄alkyl,
R¹² and R¹³ are each independently hydrogen or C₁-C₄alkyl,
R¹⁴ is hydrogen, C₁-C₄alkyl, C₂-C₄alkenyl, C₃-C₄alkynyl, or is C₁-C₄alkyl which is substituted by C₁-C₄alkoxy, halogen or phenyl, and
R¹⁵ and R¹⁶ are each independently hydrogen or C₁-C₄alkyl, or a salt thereof.

4,875,924

CINNOLINE DERIVATIVE, PROCESS FOR PREPARING THE SAME AND HERBICIDAL COMPOSITION CONTAINING THE SAME

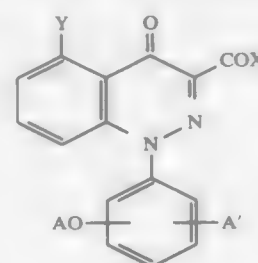
Maasato Mizutani, Toyonaka; Masao Shirohita, Nishinomiya; Masaharu Sakaki; Hiroki Okuda, both of Toyonaka, and Nobuaki Mito, Takarazuka, all of Japan, assigns to Sumitomo Chemical Company, Limited, Osaka, Japan
Filed Dec. 24, 1987, Ser. No. 137,626

Claims priority, application Japan, Dec. 25, 1986, 61-309981
Int. Cl.⁴ C07D 237/28; A01N 43/58

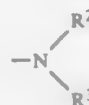
U.S. Cl. 71—92

7 Claims

1. A cinnoline derivative having the formula (I):



in which

X is —OH, —O—M⁺, —OR¹ or

wherein

M⁺ is an alkali metal cation, an alkaline earth metal cation or



in which R⁴, R⁵ and R⁶ are the same or different and each is hydrogen atom, C₁-C₆ alkyl, C₃-C₄ alkenyl, C₃-C₄ alkynyl, C₃-C₈ cycloalkyl, benzyl or phenyl; R¹ is C₁-C₉ alkyl, C₃-C₆ alkenyl, C₃-C₄ alkynyl, C₁-C₃ alkoxy (C₁-C₄) alkyl, C₃-C₈ cycloalkyl, benzyl or phenyl; and R² and R³ are the same or different and each is hydrogen, C₁-C₆ alkyl, C₃-C₄ alkenyl, C₃-C₄ alkynyl, C₃-C₈ cycloalkyl, benzyl in which at most two hydrogen atoms at the α-position thereof may be substituted by methyl, C₂-C₃ hydroxyalkyl or phenyl in which at most three of hydrogen atoms thereof may be substituted by the same or different C₁-C₂ alkyl;

Y is fluorine, chlorine, bromine, trifluoromethyl, C₁-C₆ alkoxy or C₁-C₂ alkyl;
A is CF₃, CHF₂, CF₂Cl, CF₂Br, CF₂CHF₂, CH₂CF₃, CF₂CHCl₂, CFCICHFCI, CF₂CHFCl or CF₂CHFCl;
A' is hydrogen, fluorine, chlorine or bromine.

4,875,925

HERBICIDAL METHOD USING DIFLUFENICAN
Richard H. Hewett, Thaxted, and Brian M. Lascombe, Chelmsford, both of England, assigns to May & Baker Limited, Dagenham, England

Filed Jul. 17, 1987, Ser. No. 74,578

Claims priority, application United Kingdom, Jul. 21, 1986, 8617740

Int. Cl.⁴ H01N 43/40

U.S. Cl. 71—94

5 Claims

1. A method of controlling the growth of *Galium aparine* at

a locus which comprises applying to the locus an effective amount of (a) pendimethalin and (b) diflufenican, which is N-(2,4-difluorophenyl)-2-(3-trifluoromethylphenoxy)nicotinamide, wherein the ratio of (a) to (b) is from 20:1 to 4:1 by weight.

4,875,926

3-FLUOROPYRIDYL-2-OXY-PHENOXY DERIVATIVES HAVING HERBICIDAL ACTIVITY

Rolf Schurter, Binningen, and Peter J. Diel, Riehen, both of Switzerland, assigns to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 844,407, Mar. 26, 1986, Pat. No. 4,740,235. This application Feb. 1, 1988, Ser. No. 150,680

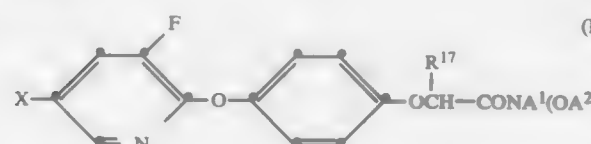
Claims priority, application Switzerland, Apr. 1, 1985, 1401/85

Int. Cl.⁴ C07D 213/56; A01N 43/40

U.S. Cl. 71—94

7 Claims

1. A 3-fluoropyridyl-2-oxy-phenoxy derivative of the formula Ic



wherein X is chlorine, A² is methyl, ethyl, C₃-C₄-alkenyl or C₃-C₄-chloroalkenyl, A¹ is hydrogen or methyl and R¹⁷ is methyl.

4,875,927

FORMULATION PROCESS

Tharwat F. Tadros, Wokingham, England, assignor to Imperial Chemical Industries PLC, London, England

Filed Jan. 13, 1988, Ser. No. 143,348

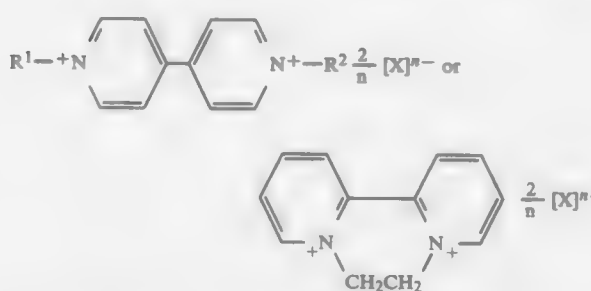
Claims priority, application United Kingdom, Jan. 13, 1987, 8700654

Int. Cl.⁴ H01N 25/32

U.S. Cl. 71—94

7 Claims

1. A concentrated herbicidal composition comprising 75 grams or more per liter of a herbicidal bipyridylum diquaternary salt of the formula:



wherein R₁ and R₂, which may be the same or different each stand for an alkyl or alkanyl radical of 1 to 4 carbon atoms, which may be substituted by a hydroxy, carboxy, alkoxy, alkylcarbonyl, alkoxy carbonyl, carbamoyl or N-alkyl-substituted carbamoyl radical or a halogen atom; [X]ⁿ⁻ represents an anion and n is 1, 2, 3 or 4; the said composition having a reduced oral toxicity towards mammals as compared with compositions consisting of a concentrated aqueous solution of a herbicidal bipyridylum diquaternary salt, the said compositions being prepared by a process comprising as a first step agitating an aqueous solution of a herbicidal bipyridylum diquaternary salt with an oil and a first emulsifier having a low HLB value to give a first emulsion comprising droplets of herbicidal bipyridylum diquaternary salt solution dispersed in a continuous oil phase, and as a second step, agitating the first

emulsion with water and a second emulsifier having a high HLB value to give a second emulsion comprising droplets of the first emulsion dispersed in a continuous aqueous phase, and wherein the water used to prepare the second emulsion contains a solute in sufficient concentration to bring the continuous aqueous phase into substantial osmotic balance with the aqueous solution of the herbicidal bipyridylum diquaternary salt.

4,875,928

SUBSTITUTED

AZOLYL-CYCLOPROPYL-AZOLYLMETHYL-CARBINOL DERIVATIVES

Erik Regel, Wuppertal; Klaus Böckmann, Cologne; Karl H. Büchel, Burscheid; Klaus Lürsen, Bergisch-Gladbach; Wilhelm Brandes, Leichlingen; Jörg Kozme, Cologne, and Paul Reinecke, Leverkusen, all of Fed. Rep. of Germany, assigns to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 28, 1985, Ser. No. 792,069

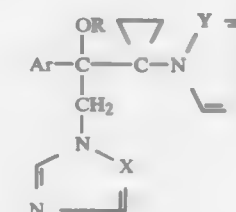
Claims priority, application Fed. Rep. of Germany, Nov. 2, 1984, 3440117

Int. Cl.⁴ A01N 43/653, 43/64; C07D 249/08, 233/60

U.S. Cl. 71—92

13 Claims

1. A substituted azolylcyclopropylazolylmethyl-carbinol derivative of the formula



Ar is phenyl optionally substituted by halogen; alkyl, alkoxy and alkylthio, each having 1 to 4 carbon atoms; halogeno-alkyl, halogenoalkoxy and halogenoalkylthio, each having 1 or 2 carbon atoms and 1 to 5 identical or different halogen atoms; and/or phenyl and phenoxy, each of which is optionally substituted by alkyl having 1 or 2 carbon atoms and/or halogen; or is naphthyl, or is furyl, thienyl, pyridinyl or pyrimidinyl, each of which is optionally substituted by the above-mentioned phenyl substituents;

R is hydrogen, alkyl having 1 to 4 carbon atoms, alkenyl or alkynyl, each having 2 to 4 carbon atoms, trialkylsilyl having 1 to 4 carbon atoms in each alkyl part, alkylcarbonyl having 1 to 4 carbon atoms in the alkyl part, and/or phenylalkyl which has 1 or 2 carbon atoms in the alkyl part and optionally substituted by those phenyl substituents already mentioned in the case of Ar, and
X and Y each independently is a nitrogen atom or a CH group,

or an addition product thereof with an acid or metal salt.

4,875,929

AQUEOUS SUSPENSION CONCENTRATE COMPOSITIONS

Leonard J. Morgan, and Mark Bell, both of Fareham, England, assigns to American Cyanamid Company, Stamford, Conn. Continuation-in-part of Ser. No. 867,107, May 23, 1986, abandoned. This application May 7, 1987, Ser. No. 45,458

The portion of the term of this patent subsequent to Oct. 3, 2006, has been disclaimed.

Int. Cl.⁴ A01N 33/08

U.S. Cl. 71—121

12 Claims

1. An aqueous suspension concentrate composition comprising, on a weight to volume basis: about 5.0% to 50.0% solid

pendimethalin; about 3.0% to 30.0% nonpesticidal coformulants; and about 20.0% to 92.0% water.

4,875,930

CYCLOHEXANE DERIVATIVES HAVING PLANT GROWTH REGULATING ACTIVITIES AND APPLICATIONS THEREOF

Masafumi Matsuzawa; Hiroshi Hokari; Shoji Kusano, all of 132, Ojima, Fukuro-cho, Iwata-gun, Shizuoka-ken; Takeshige Miyazawa, and Yasufumi Toyokawa, both of 1809, Kamo, Kikugawa-cho, Ogasa-gun, Shizuoka-ken, all of Japan
Continuation of Ser. No. 854,879, Apr. 21, 1986, abandoned.

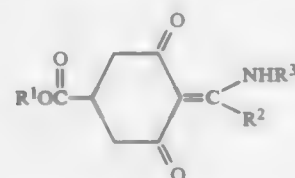
This application Apr. 26, 1988, Ser. No. 186,663
Claims priority, application Japan, Apr. 26, 1985, 60-90675; Mar. 18, 1986, 61-59986

Int. Cl.⁴ A01N 37/00; C07C 69/74

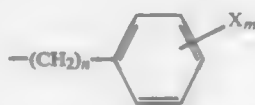
U.S. Cl. 71-106

19 Claims

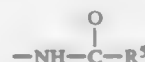
1. A compound of formula (I)



wherein R¹ is a hydrogen atom or a lower alkyl group; R² is a lower alkyl group; R³ is a hydrogen atom, an alkyl group of 1-6 carbon atoms, an alkenyl group of 1-6 carbon atoms, a hydroxyalkyl group of 1-6 carbon atoms, a cycloalkyl group of 3-6 carbon atoms, an aminoalkyl group of 1-6 carbon atoms, an N-alkylaminoalkyl group of 1-6 carbon atoms, an N,N-di-alkylaminoalkyl group of 1-6 carbon atoms, an alkoxy-carbonylalkyl group of 1-6 carbon atoms, a group of the formula -(CH₂)_n-R⁴ where R⁴ is a lower alkoxy group, a lower alkylthio group, a benzylthio group, an anilino group, 1 is 2 or 3, a group of the formula



where X is a halogen atom, a lower alkyl group, a lower alkoxy group, a phenoxy group or an alkoxy-carbonylalkoxy group of 1-6 carbon atoms, m is zero or 1 and n is an integer of zero to 2, inclusive, a group of the formula -CH₂-R⁵ where R⁵ is a group of the formula



where R⁵ is as defined above; and a salt of said compound.

4,875,931

PARTS TRANSFER SYSTEM HAVING THREE ORTHOGONAL MOVEMENT AXES WHEREIN THE PART LIFTING AND LOWERING MECHANISM MOVING ALONG THE THIRD AXIS IS ACTUATED BY THE MOTION OF THE GRIPPERS IN CLOSING AND OPENING ALONG THE FIRST AXIS

Luciano T. S. Monteiro, Sao Caetano do Sul, Brazil, assignor to Prody Engenharia E Comercio Ltda, S. Caetano Do Sul, Brazil

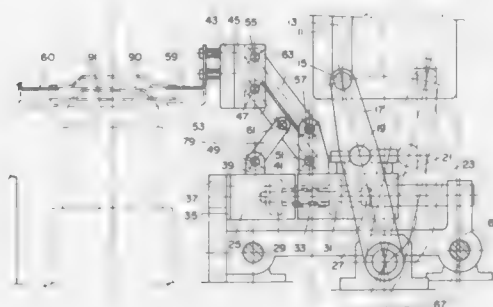
PCT No. PCT/BR88/00004, § 371 Date Sep. 8, 1988, § 102(e) Date Sep. 8, 1988, PCT Pub. No. WO88/07419, PCT Pub. Date Oct. 6, 1988

PCT Filed Mar. 18, 1988, Ser. No. 266,637

Claims priority, application Brazil, Mar. 24, 1987, PI8701734 Int. Cl.⁴ B21J 13/08

U.S. Cl. 72-405

5 Claims



1. In a system for transferring parts between work stations and having part gripper means movable along three orthogonal axes, the first being the opening and closing movement of the gripper means, the second being the transfer movement of the gripper means between stations, and the third being the lifting and lowering movement of the gripper means at a station, the improvement comprising:

mechanism connected to said gripper means for effecting opening and closing movements thereof along said first axis and lifting and lowering movements thereof along said third axis, including:

cam-driven first part means guided for linear movement; second part means guided for linear movement with said first part means;

lost-motion means connecting said parts;

means urging said parts to move linearly apart;

stop means for stopping movement of said second part means while said first part means continues to move linearly in a direction to close said gripper means;

lever means connected between said first and second part means and said gripper means to effect cessation of closing movement thereof and effect lifting movement thereof along said third axis while said second part means is stopped and effect lowering movement of said gripper means while said first part means moves in the opposite direction until said second part means moves therewith and then effect opening movement of said gripper means.

4,875,932

APPARATUS FOR MEASURING A FLOW RATE

Yoshichika Uchiyama, Hino, and Atsushi Tsuchiya, Hachioji, both of Japan, assignors to Cosmo Instruments Co., Ltd., Tokyo, Japan

Filed Dec. 16, 1988, Ser. No. 285,798

Claims priority, application Japan, May 26, 1988, 63-129882 Int. Cl.⁴ G01F 5/00

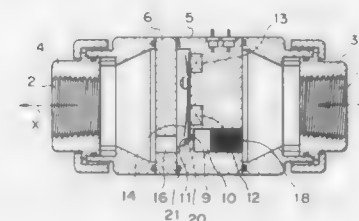
U.S. Cl. 73-202

5 Claims

1. An apparatus for measuring a flow rate of a fluid comprising:

(a) a body having an inlet and an outlet

- (b) a by-pass passage defined between said inlet and said outlet inside said body and forming a part of a flow passage through which said fluid flows for allowing a first portion of said fluid to flow therethrough, a flow rate of said first portion of said fluid being not measured,
- (c) a measurement passage defined between said inlet and said outlet inside said body, forming another part of said flow passage for allowing a second portion of said fluid to flow therethrough and including a measurement hole and an introducing hole, said introducing hole being disposed on an upstream side of said measurement hole and having an opening area larger than that of said measurement hole for introducing said second portion of said fluid to said measurement hole, a flow rate of said second portion of said fluid being measured,



- (d) a plurality of first fine tubes disposed in said by-pass passage for straightening a flow of said first portion of said fluid passing through said by-pass passage,
- (e) a plurality of second fine tubes disposed in said introducing hole for straightening a flow of said second portion of said fluid passing through said introducing hole,
- (f) a flexible cantilever-shaped pressure-receiving plate disposed on a downstream side of said measurement hole in such a manner as to face a flow of said second portion of said fluid from said measurement hole and thus intersect substantially orthogonally said flow from said measurement hole at one end thereof and fixed to said body at the other end thereof, and
- (g) a deflection detector for measuring an amount of deflection of said pressure-receiving plate.

4,875,933

MELTING METHOD FOR PRODUCING LOW CHROMIUM CORROSION RESISTANT AND HIGH DAMPING CAPACITY FE-MN-AL-C BASED ALLOYS

Chi-Meen Wan, New Canaan, assignor to Fancy Steel Corporation, Pittsburgh, Pa.

Filed Jul. 8, 1988, Ser. No. 218,695

Int. Cl.⁴ C21D 1/74; C22C 38/04

U.S. Cl. 75-10.17

12 Claims

1. The melting method for producing a (of the said) Fe-Mn-Al-C alloy which comprises melting ferromanganese and steel scrap in an arc furnace, adjusting the carbon content of the resulting melt to be not more than about 1.4% by oxygen blowing, melting aluminum in a separate furnace, mixing the molten metals in a furnace and then pouring molten metal mixture into a ladle for further mixing by blowing with a non-oxidizing gas to obtain a homogeneous composition, and tapping the resulting Fe-Mn-Al-C melt.

4,875,934

METHOD OF DEOXIDIZING MOLTEN FERROUS METALS

Glenn Canfield, 303 Ramblewood Pl., Longview, Tex. 75601-3055

Division of Ser. No. 140,125, Dec. 31, 1987, Pat. No. 4,801,328.

This application Oct. 24, 1988, Ser. No. 261,842

Int. Cl.⁴ C21C 7/02

U.S. Cl. 75-58

13 Claims

1. A method of deoxidizing molten ferrous metal confined

within a container open above the surface of the ferrous metal, comprising the steps of:

preparing a deoxidizing agent, in the form of billets of any convenient size and shape, each billet having a core of material chemically non-reactive with the ferrous metal to be deoxidized and which has a density greater than the density of metallic aluminum, and having one or more discrete layers of metallic aluminum substantially surrounding said core; and

introducing one or more billets of said deoxidizing agent into the molten ferrous metal to be deoxidized by gravitationally induced free fall from any convenient point above the surface of said molten ferrous metal and allowing each said billet unconstrained movement relative to said molten ferrous metal, whereby said metallic aluminum substantially surrounding said core of each billet of said deoxidizing agent is brought into contact with said molten ferrous metal to achieve deoxidation thereof.

4,875,935

ANIONIC ACRYLAMIDE POLYMERS AS COPPER ORE AGGLOMERATION AIDS

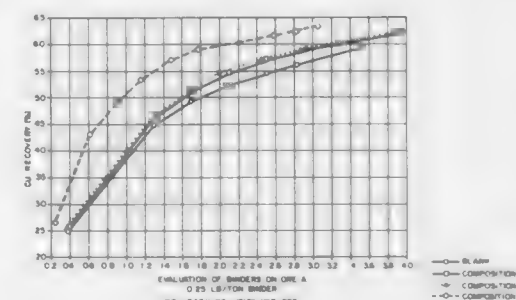
Anthony E. Gross, St. Charles, and Jacqueline L. Bonin, Oak Park, both of Ill., assignors to Nalco Chemical Company, Naperville, Ill.

Filed Nov. 4, 1988, Ser. No. 267,134

Int. Cl.⁴ C22B 15/08

U.S. Cl. 75-117

5 Claims



1. An improved method for extracting copper from copper minerals by heap leaching with dilute sulfuric acid which comprises agglomerating the copper minerals prior to their being formed into a heap with an agglomerating agent comprising an anionic acrylamide polymer which contains at least five mole percent of carboxylate or sulfonate groups and has a molecular weight of at least 100,000, and then leaching copper from said copper minerals by heap leaching with dilute sulfuric acid, collecting the copper-rich leachate, and recovering copper therefrom.

4,875,936

CONVERSION OF LETTERPRESS TO OFFSET PRINTING

Carl J. Hermack, Gulfport, Fla., assignor to Publishers Equipment Corporation, Carrollton, Tex.

Division of Ser. No. 747,383, Jun. 21, 1985, Pat. No. 4,677,911, which is a continuation of Ser. No. 473,967, Mar. 10, 1983, abandoned, which is a continuation-in-part of Ser. No. 209,222, Nov. 24, 1980, abandoned, which is a continuation-in-part of Ser. No. 175,126, Aug. 4, 1980, abandoned, which is a continuation-in-part of Ser. No. 122,908, Feb. 20, 1980, abandoned. This application Jul. 1, 1987, Ser. No. 68,663

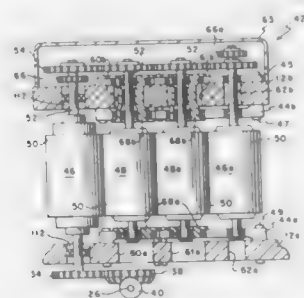
Int. Cl.⁴ B41F 5/06, 5/22

U.S. Cl. 101-218

10 Claims

1. In an offset press unit having a main frame defining a pair of spaced apart walls having bores therein, a pair of plate cylinders disposed within said frame and rotatably supported

in spaced apart relation, and a pair of blanket cylinders disposed within said frame, each rotatably supported for rolling contact with the other and with one of said plate cylinders, external support means on only one of said walls and secured thereto, including at least one cylinder supporting bearing entirely outside the main frame, internal support means secured to at least the other of said walls and including at least one cylinder supporting bearing entirely inside the main frame, and one of said cylinders rotatably supported by said cylinder supporting bearings, said rotatably supported cylinder being supported at one end only by said at least one bearing of said



internal support means and at the other end by at least said bearing of said external support means, wherein said internal support means includes separate support means secured to each of said walls, each said separate support means including at least one bearing entirely inside the main frame, said rotatably supported cylinder being supported at one end only by said at least one bearing of one of said separate support means of said internal support means and at the other end by at least one bearing of the other of said support means of said internal support means and also by said at least one bearing of said external support means.

4,875,937

CEMENTITIOUS COMPOSITION

Robert F. Viles, Cardworth, Great Britain, assignor to Fosroc International Limited, Birmingham, England
Filed Oct. 21, 1988, Ser. No. 260,976

Claims priority, application United Kingdom, Oct. 29, 1987, 87 2538

Int. Cl.⁴ C04B 7/32, 11/06

U.S. Cl. 106—104

14 Claims

1. A dry cementitious composition for admixture with water to form a rapid setting and hardening material, the composition comprising:

high alumina cement making up from about 10% to about 50% of the composition,
calcium sulphate in the form of beta anhydrite present in an amount of at least 11.4%,
aluminum sulphate in a proportion of from about 1% to about 13% by weight relative to the high alumina cement,
a source of free lime in a proportion of from about 3% to about 9% by weight relative to the high alumina cement,
a reactive filler making up at least 10% by weight of the composition,
whereby ettringite is formed on hydration and the hydrated material is durable.

4,875,938

METHOD OF MAKING A MORTAR BINDER AND PRODUCT

Norman V. Filbert, Bay City, Box 19-22, Stevensville, Md.
Filed Nov. 16, 1987, Ser. No. 120,939

Int. Cl.⁴ C04B 2/04, 2/10

U.S. Cl. 106—120

10 Claims

1. The method of making a cementitious binder for use in mortars comprising heating marine shell material to about

2100° to 2350° F.; allowing said shell material to cool to ambient temperature; mixing water with the cooled shell material in the ratio of about one part of water by volume to about five parts of shell material by volume; allowing said mixture to spontaneously heat; and monitoring the heat level of said mixture until it commences to cool and as it cools is converted into a dry, substantially white, powdery material substantially of the consistency of talcum powder in readiness for use as a binder in mortar.

4,875,939

PRECOMBUSTION CHAMBER CONSTRUCTION FOR AN INTERNAL COMBUSTION ENGINE

Yasuhiro Miyakawa, and Minoru Machida, both of Nagoya, Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan

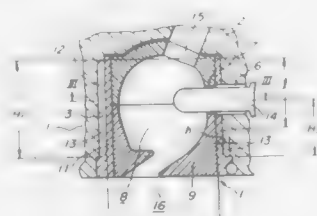
Filed Sep. 8, 1988, Ser. No. 241,899

Claims priority, application Japan, Sep. 14, 1987, 62-139324[U]

Int. Cl.⁴ F02B 19/16

U.S. Cl. 123—271

4 Claims



1. A ceramic precombustion chamber construction for an internal combustion engine, comprising:

a precombustion chamber formed by a ceramic body to be inserted into a precombustion chamber receiving cavity of a metal cylinder head, said ceramic body having a glow-plug receiving aperture; and

a metal sleeve fitted on an outer circumference of said ceramic body and having a plurality of projections on an outer circumferential surface thereof, one of said projections being formed with a glow-plug receiving aperture which communicates with a glow-plug receiving aperture formed in said ceramic body;

wherein said precombustion chamber receiving cavity of said metal cylinder head communicates with glow-plug receiving apertures provided in said metal cylinder head, metal sleeve and ceramic body, and an inner circumferential surface of said precombustion chamber receiving cavity of said metal cylinder head forms thermal insulating spaces with said projections provided on the outer circumferential surface of said metal sleeve.

4,875,940

MASSECUTE SUPERSATURATION MONITOR

David J. Radford, Maidstone, South Africa, assignor to The Tongaat-Hulett Group Limited, Mount Edgecombe, South Africa

Continuation of Ser. No. 724,847, Apr. 18, 1985, abandoned.

This application Feb. 25, 1988, Ser. No. 161,301

Claims priority, application South Africa, Apr. 19, 1984, 84/2976

Int. Cl.⁴ B01J 2/00

U.S. Cl. 127—2

1 Claim

1. Apparatus for controlling the supersaturation of a mother liquor and the crystal content of massecuite comprising:

(a) probe means adapted to continuously measure both the series resistance and the series capacitance of the massecuite, said probe means being located in a vacuum pan at a zone of vigorous circulation;

(b) a voltage divider including a resistor in series with a series tuning circuit and said probe means, said voltage

divider being supplied with a signal in the radio frequency range to create an output signal;

(c) converter means for converting the output signal from the voltage divider to a suitable signal to be used by control instruments;

(d) calibration means for calibrating the output signal from the voltage divider;

(e) first control means to continuously keep the probe and tuning circuit in resonance;

(f) measuring means to measure both the impedance of the probe and tuning circuit at resonance and changes in capacitance necessary to keep the circuits in resonance;

(g) calibrating means to calibrate the probe and tuning circuits such that the absolute values of massecuite resistance and capacitance can be measured; and

(h) second control means to derive optimum signals for control of crystal content, and mother liquor Brix using the calibrated probe output signals.

4,875,941

DEACTIVATION OF REACTIVE ORGANOMETALLIC CONTAMINATED EQUIPMENT

Andrzej M. Piotrowski, Houston, and Joseph J. Ligi, LaPorte, both of Tex., assignors to Texas Alkyls, Inc., Deer Park, Tex.
Filed Mar. 10, 1988, Ser. No. 166,338

Int. Cl.⁴ B08B 5/00

U.S. Cl. 134—11

6 Claims

1. A method for the treatment of organometallic-contaminated equipment which comprises treating the equipment with gaseous carbon dioxide so as to react with organometallic compounds contaminating the equipment.

4,875,942

METHOD OF CLEANING RESIDUAL DYE MATERIAL FROM ROLLERS OF A TEXTILE FABRIC DRYING OVEN

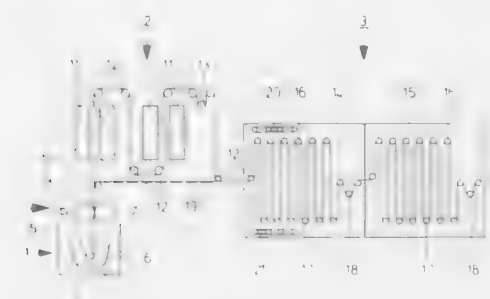
Kurt van Wersch, Wegberg; Helge Friesberg, Monchen-Gladbach, and Peter Mevissen, Erkelenz, all of Fed. Rep. of Germany, assignors to A. Monforts GmbH & Co., Fed. Rep. of Germany
Filed Jul. 29, 1988, Ser. No. 226,284

Claims priority, application Fed. Rep. of Germany, Jul. 31, 1987, 3725419

Int. Cl.⁴ B08B 1/02

U.S. Cl. 134—15

10 Claims



1. A method of cleaning residual dye material from rollers of a textile fabric drying oven during passage of a traveling cloth lead therethrough, said method comprising applying a cleaning material to said traveling cloth lead in advance of the oven and rotating rollers to be cleaned at a surface speed different from the surface speed of the cloth lead to cause a cleaning action of the cloth lead against the rollers.

4,875,943

FLEXIBLE PHOTOVOLTAIC DEVICE

Yoshihiro Hamakawa, Kawanishi; Yoshihisa Tawada; Kazumori Tsuge, both of Kobe, and Masanobu Izumina, Omiya, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

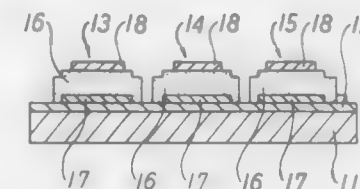
Division of Ser. No. 835,717, Mar. 3, 1986, Pat. No. 4,773,942, which is a division of Ser. No. 439,627, Nov. 4, 1982, Pat. No. 4,612,409. This application Jan. 6, 1988, Ser. No. 202,608

Claims priority, application Japan, Nov. 4, 1981, 56-177685; Dec. 15, 1981, 56-203155; Dec. 28, 1981, 56-213119; Apr. 9, 1982, 57-60109

Int. Cl.⁴ H01L 31/06, 27/14

U.S. Cl. 136—244

10 Claims



1. A photovoltaic device comprising a substrate including a metal foil and an overlying electric insulating thin film having an electric conductivity of not more than about 10^{-7} ($\Omega \cdot \text{cm}$)⁻¹ during light impingement, and a photovoltaic device body of a non-single-crystal semiconductor, the device body being formed over said electric insulating thin film, and said electric insulating thin film being a layer of an inorganic material having a thickness of 100 angstroms to 20 μm selected from the group consisting of amorphous $\text{Si}_{(1-x-y)}\text{C}_x\text{N}_y$ and amorphous $\text{Si}_{(1-x-y)}\text{C}_x\text{N}_y$, their hydrides and their fluorides.

10. The device of claim 1, wherein said substrate is provided with a plurality of photovoltaic device bodies on the electric insulating thin film to give a plurality of generating zones, said generating zones being connected in series to each other.

4,875,944

AMORPHOUS PHOTOELECTRIC CONVERTING DEVICE

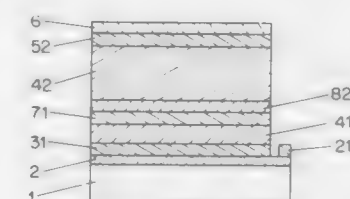
Takashi Yoshida, Kanagawa, Japan, assignor to Fuji Electric Corporate Research and Development, Ltd., Japan
Filed Sep. 9, 1988, Ser. No. 242,887

Claims priority, application Japan, Sep. 17, 1987, 62-233422

Int. Cl.⁴ H01C 31/06

U.S. Cl. 136—249

7 Claims



1. An amorphous photoelectric converting device comprising a plurality of photovoltaic elements laminated one on top of the other, each of said elements comprising a p-type layer, an i-type layer, and an n-type layer and having a p-i-n structure with the n-type layer and p-type layer of consecutive elements being adjacent to one another, wherein the adjacent n-type layers and p-type layers of consecutive elements comprise microcrystalline silicon and the remaining layers comprise amorphous silicon, and wherein said p-type layers of microcrystalline silicon are doped with boron, at a concentration ranging from 3×10^{20} to 2×10^{21} atoms/cm³.

4,875,945

PROCESS FOR CLEANING THE EXHAUST GAS OF A FUSION REACTOR

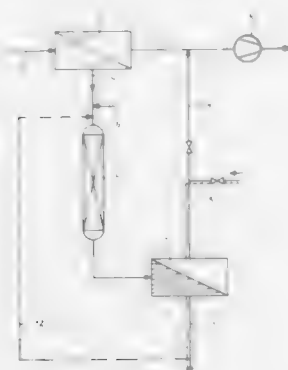
Ralf-Dieter Penzhorn, Bruchsal, Fed. Rep. of Germany, and Hiroshi Yoshida, Tokai, Japan, assignors to Kernforschungszentrum Karlsruhe GmbH, Fed. Rep. of Germany
Filed Sep. 19, 1988, Ser. No. 246,233

Claims priority, application Fed. Rep. of Germany, Sep. 18, 1987, 3731385

Int. Cl.⁴ G21B 1/00

U.S. Cl. 376—146

3 Claims



1. Process for cleaning an exhaust gas from a fusion reactor of exhaust gas components containing heavy hydrogen, the heavy hydrogen components of the exhaust gas being (i) at least one elemental heavy hydrogen isotope selected from deuterium and tritium and (ii) impurities containing the heavy hydrogen isotope deuterium and/or tritium in chemically bound form, the impurities being at least hydrocarbon and water vapor, the exhaust gas further containing carbon monoxide as an impurity, wherein the heavy hydrogen is released from its chemically bound form, and the released heavy hydrogen and the at least one elemental heavy hydrogen isotope (i) are separated from the exhaust gas and returned into the fuel cycle, comprising:

- bringing the exhaust gas into a palladium/silver permeator operating at a temperature below 450° C. to decompose into its elements any ammonia in the exhaust gas and to separate the exhaust gas into a first stream containing a major fraction of the elemental heavy hydrogen (i) and elemental heavy hydrogen formed by any decomposition of ammonia and a residual gas stream containing the impurities;
- adding carbon monoxide to the residual gas stream if the carbon monoxide/water ratio is less than 1.5 to bring the carbon monoxide/water ratio in the residual gas stream to ≥ 1.5 ;
- reacting the water vapor in the residual gas stream with the carbon monoxide at a carbon monoxide/water ratio of ≥ 1.5 at 150° to 200° C. on a $\text{CuO}/\text{Cr}_2\text{O}_3/\text{ZnO}$ catalyst to produce quantitatively hydrogen and carbon dioxide;
- passing the resulting gas stream from step (c) either into a palladium/silver permeator containing a nickel/aluminum oxide-bulk catalyst or into a nickel catalyst bed followed by a palladium/silver permeator in order to split up the hydrocarbon into its elements and to separate the hydrogen in its elemental form from the remaining gas to form a decontaminated residual gas stream which does not contain any hydrogen and a hydrogen gas stream which contains elemental hydrogen, and
- combining the hydrogen gas stream containing elemental hydrogen separated in step (d) with the first stream containing the major fraction of hydrogen separated in step (a).

4,875,946

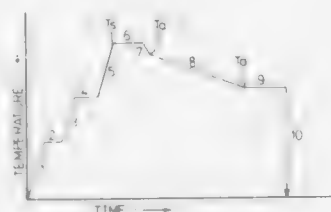
PROCESS FOR PRODUCING RARE EARTH-COBALT PERMANENT MAGNET

Shiang-Jinn Huh, Taipei; Swe-Kai Chen; Fu-Teh Jin, both of Kaohsiung, and Li-Kou Chen, Taipei, all of Taiwan, assignors to Industrial Technology Research Institute, Chung, Taiwan
Filed Feb. 2, 1988, Ser. No. 153,503

Int. Cl.⁴ H01F 1/02

U.S. Cl. 148—103

7 Claims



1. A heat-treatment process for producing $(\text{Sm}_x\text{Pr}_{1-x})\text{Co}$ permanent magnets having a remanence of at least 9000 Gauss, an intrinsic coercivity of at least 15,000 Oersted, and a maximum energy product of at least 19.0×10^6 Gauss Oersted comprising the steps of:

- compacting a $(\text{Sm}_x\text{Pr}_{1-x})\text{Co}_x$ powder, wherein y is from 4.6 to 5.0 and x is greater than 0.3 and less than or equal to 1, in a magnetic field; sintering said compacted powder at a temperature between 1000° C. and 1200° C. for thirty minutes to one hour;
- cooling said sintered alloy powder compact from said sintering temperature to a first cooling temperature in the range of about 920° C. to 1180° C. at a rate greater than 10° C./minute;
- cooling said sintered alloy powder compact immediately from said first cooling temperature to a second cooling temperature in the range of about 870° C. to 930° C. at a rate no greater than 10° C./minute;
- isothermally annealing said sintered alloy powder compact at said second cooling temperature for 1 to 10 hours;
- cooling said sintered alloy powder compact from said annealing temperature to a third cooling temperature in the range of about 280° C. to 320° C. at a rate greater than 40° C./minute; and
- cooling said sintered alloy immediately from said third cooling temperature to room temperature as soon as possible.

4,875,947

METHOD FOR PRODUCING GRAIN-ORIENTED ELECTRICAL STEEL SHEET HAVING METALLIC LUSTER AND EXCELLENT PUNCHING PROPERTY

Hisanobu Nakayama; Osamu Tanaka; Hiromichi Yasumoto; Seichi Senoo; Yuzichi Zaizen, and Kouji Yamashiki, all of Kitakyushu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan
Filed Aug. 31, 1988, Ser. No. 239,191

Claims priority, application Japan, Aug. 31, 1987, 62-215224; Aug. 31, 1987, 62-215225; Aug. 2, 1988, 63-193297

Int. Cl.⁴ H01F 1/04

U.S. Cl. 148—113

4 Claims

1. A method for producing grain-oriented electrical steel sheet having metallic luster and excellent punching property comprising the steps of decarbonization annealing, at a temperature of 800° to 850° C. and in an atmosphere whose rate of oxidation $\text{PH}_2\text{O}/\text{PH}_2$ is 0.25 to 0.55, a grain-oriented electrical steel sheet which has been cold rolled to a final thickness, coating the sheet with an annealing separator consisting of 100 parts by weight of magnesia blended with 2 to 40 parts of one or more chlorides of members selected from the group consist-

ing of Li, Na, K, Rb, Ca, Ba, Mg, and Sr, and finish annealing the sheet.

4,875,948

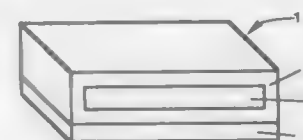
COMBUSTIBLE DELAY BARRIERS

Venatesh R. P. Verneker, 8652 Concord Dr., Jessup, Md. 20794
Continuation-in-part of Ser. No. 36,660, Apr. 10, 1987, Pat. No. 4,824,495. This application Apr. 8, 1988, Ser. No. 179,325

Int. Cl.⁴ C06B 45/14

U.S. Cl. 149—15

13 Claims



1. A delay barrier comprising a combustible layer containing a mixture of fuel and oxidizer, a polymeric layer encompassing said combustible layer, and at least one metal layer disposed adjacent to a surface of the polymeric layer not in contact with the combustible layer.

4,875,949

INSENSITIVE BINDER FOR PROPELLANTS AND EXPLOSIVES

Indu B. Mishra, Churchillville, and Lawrence J. Vande Kieft, Bel Air, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed May 18, 1988, Ser. No. 195,974

Int. Cl.⁴ C06B 45/10

U.S. Cl. 149—19.3

12 Claims

1. A novel polymer binder for explosives composed of poly (2-methyl-5-vinyl tetrazole), and a second polymer, of about 30%–50% by weight of the blend, selected from the group consisting of polyethylene glycol, polyvinyl acetate, polyvinyl alcohol, polymethyl methacrylate, polyvinylidene chloride and polyvinylidene fluoride.

4,875,950

EXPLOSIVE COMPOSITION

Kevin H. Waldo, Mt Thorley, and Daniel A. Wason, Singleton, both of Australia, assignors to CBS Explosives Pty Limited, New South Wales, Australia
Filed Jun. 9, 1988, Ser. No. 204,370

Claims priority, application Australia, Jun. 10, 1987, PI2386; Nov. 18, 1987, PI5547

Int. Cl.⁴ C06G 45/02

U.S. Cl. 149—21

17 Claims

1. A dry mix explosive composition including a bulking agent, comprising from 1–20% (by weight) of a fibrous vegetable protein additive, said bulking agent having a bulk density of from 0.1–0.6 grams per cubic centimeter and said explosive composition having a bulk density of from 0.5–1.1 grams per cubic centimeter.

4,875,951

CHEMICAL FOAMING OF EMULSION EXPLOSIVE COMPOSITIONS

David W. Prest, Southport, England, and William J. Yorke, Quebec, Canada, assignors to Imperial Chemical Industries PLC, London, England
Filed Feb. 2, 1989, Ser. No. 305,463

Claims priority, application United Kingdom, Feb. 2, 1988, 22795

Int. Cl.⁴ D03D 23/00; C06B 45/00

U.S. Cl. 149—109.6

5 Claims

1. In a method of chemically foaming an emulsion explosive comprised of oxidizer salt, carbonaceous fuel, water and emulsifier wherein a gas generating material is admixed with the

said emulsion explosive to react therein with the evolution of gas to foam the said emulsion explosive, the said gas generating material comprises a water-in-oil emulsion of an aqueous solution of sodium nitrite, a carbonaceous liquid and an emulsifier.

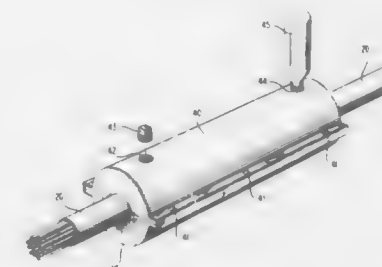
4,875,952

FORCED ENCAPSULATION MEANS FOR A CABLE
Francis J. Mullin, Chamblee, and William C. Reed, Lilburn, both of Ga., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.
Continuation of Ser. No. 90,437, Aug. 26, 1987, abandoned, which is a continuation of Ser. No. 619,266, Jun. 11, 1984, abandoned. This application Feb. 8, 1988, Ser. No. 150,480

Int. Cl.⁴ H01B 13/06

U.S. Cl. 156—48

11 Claims



6. A method of enclosing a portion of at least one cable comprising

- forming expandable containment means around at least the portion of the cable, the containment means being secured to the cable and being adapted for receiving therein a liquid encapsulant;
- surrounding the containment means with substantially rigid outer enclosure means; and
- introducing a quantity of the liquid encapsulant into the containment means, the encapsulant being of a type whose viscosity increases with time until the encapsulant is no longer a liquid at room temperature; characterized in that the method further comprises
- pressurizing the encapsulant in the containment means to a first pressurize that is greater than ambient pressure, with the outer enclosure substantially restraining expansion of the containment means, and maintaining the liquid encapsulant under a pressure above ambient pressure for a time such that at least a part of the quantity of encapsulant is no longer a liquid at room temperature; and
- introducing the liquid encapsulant into the containment means through encapsulant-introduction means that are of a type that permits further introduction of liquid encapsulant into the containment means after introduction and pressurization of the quantity of liquid encapsulant.

4,875,953

IMPRESSION PRINTING PROCESS FOR ANIMALS AND CHILDREN

Christopher A. Lloyd, P.O. Box 59, Twin Peaks, Calif. 92391
Filed Nov. 30, 1988, Ser. No. 278,672

Int. Cl.⁴ B32B 31/00; B44C 1/17

U.S. Cl. 156—62

10 Claims



1. A process of transferring a printing medium from a printing medium coated member to a flexible receiving substrate

whereby an animal or child can create a unique impression print without coming into contact with the printing medium, comprising the following steps:

- coating a member with a printing medium;
- providing said flexible receiving substrate physically separated from the printing coated member by a supporting means comprising a frame, to maintain a physical separation between said receiving substrate and said printing coated member;
- selectively pressing areas of said flexible receiving substrate to stretch it and bring the substrate into print medium transfer contact with said printing coated member to transfer the printing medium in the areas to said receiving substrate.

4,875,954

METHOD AND APPARATUS FOR MANUFACTURING CARPET

Colin Griffiths, Llanvane, and William G. Walker, Newport, both of Wales, assignors to Ebonwood Limited, Cardiff, Wales
Filed Feb. 29, 1988, Ser. No. 160,350

Claims priority, application United Kingdom, Feb. 28, 1987, 1704780

Int. Cl.⁴ B32B 31/08, 31/12

U.S. Cl. 156—64

6 Claims



1. A carpet manufacturing method comprising providing respective webs of material to form an upper layer and a base layer respectively, advancing and bringing together the webs into superimposed relationship, applying a hot-melt adhesive between the layers by means of at least one nozzle delivering the adhesive in an aerated diffuse spray pattern, immediately before the webs are brought together, and subsequently pressing the webs together and cooling them to cause them to adhere together.

4,875,955

METHOD AND APPARATUS FOR PREVENTING INSTALLATION IN AN AUTOMOBILE BODY OF A GLASS WINDOW PANEL HAVING OVERCURED ADHESIVE THEREON

Hiroshi Fujii, Hirashima, Japan, assignor to Mazda Motor Manufacturing (USA) Corporation, Flat Rock, Mich.
Filed Aug. 31, 1988, Ser. No. 238,818

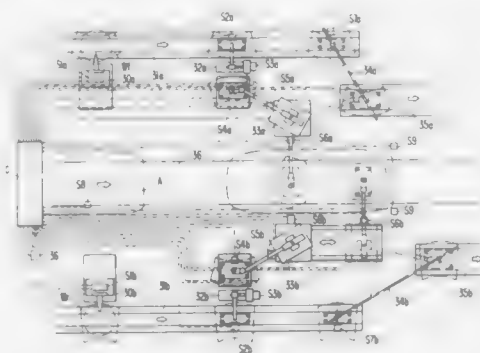
Int. Cl.⁴ B23Q 17/00; B05B 15/10

U.S. Cl. 156—64

20 Claims

1. An apparatus for supplying and installing at least one glass window panel in an automobile body, comprising:
at least one conveyor means for supporting and conveying at least one glass window panel along a feed path;
at least one means along the feed path for applying adhesive to the glass window panel;
at least one transfer means downstream of the adhesive applying means for removing the glass window panel from the conveyor means and transferring the glass win-

dow panel to a position at which the glass window panel can be attached to an automobile body by being bonded thereto with the adhesive applied to the glass window panel by the adhesive applying means; and
control means including preventing means for preventing attachment of the glass window panel to the automobile body when the adhesive applied to the glass window panel has cured to at least a predetermined amount the control means including command means for controlling operation of the transfer means so that a glass window panel having adhesive thereon which has cured to at least the predetermined amount can be prevented from being



applied to the automobile body by preventing the transfer means from removing the glass window panel from the conveyor means, the preventing mean including timer means for outputting a first signal to the command means indicating when adhesive applied to the glass window panel has cured to at least the predetermined amount, the timer means including a timer which can be preset to a plurality of reference curing times, each of the reference curing times corresponding to a different adhesive curing condition selected from the group consisting of temperature of air exposed to the curing adhesive and humidity of air exposed to the curing adhesive.

4,875,956

METHOD OF BONDING PLASTICS

Tom S. Brackett, New Britain, Conn., assignor to Integrated Fluidics, Inc., Plainville, Conn.

Filed Oct. 6, 1987, Ser. No. 105,607

Int. Cl.⁴ B32B 31/12

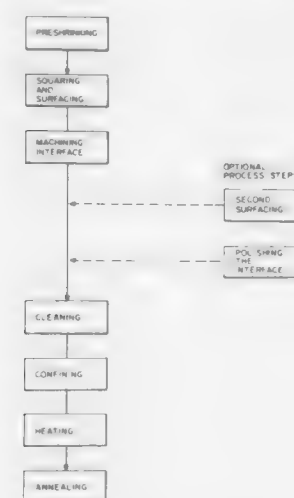
U.S. Cl. 156—84

6 Claims

1. A method of producing a fluidic module from at least two pieces of acrylic material having an intermolecular bonded interface comprising the steps of:

- heating in an absence of physical deformation to preshrink the acrylic pieces to obtain dimensional stability,
- machining a first interface surface on the first piece and machining a second interface surface on the second surface, the interface surfaces conforming in shape to each other,
- machining at least one fluidic passageway in the first interface surface,
- removing burrs from the interface surface having the fluidic passageway,
- polishing both interface surfaces,
- assembling the pieces with the polished interface surfaces in contact with each other,
- confining all external surfaces of the pieces against expansion, and
- applying heat to the assembled pieces in an absence of

externally applied pressure to induce their expansion against their confinement to cause transmigration of mole-



cules from one interface surface to another to bond the pieces together.

4,875,957

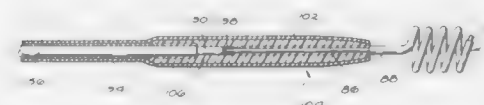
METHOD OF CONNECTING A NON-CONTAMINATING FLUID HEATING ELEMENT TO A POWER SOURCE

David R. Etheridge, 1733 Hiawatha Dr., Glendale, Calif. 91208
Continuation of Ser. No. 913,505, Sep. 29, 1986, Pat. No. 4,756,281. This application Jan. 30, 1988, Ser. No. 214,323

Int. Cl.⁴ B32B 31/26

U.S. Cl. 156—85

10 Claims



1. A method for forming a corrosion-resistant seal about a connection between a lead wire and a heating element for immersion within a purified fluid heating system, the steps comprising:

- providing a resistance heating element which is covered with a layer of corrosion-resistant thermoplastic material;
- providing a lead wire having at least a portion covered with a jacket of corrosion-resistant thermoplastic material;
- forming an electrically conductive, low resistance connection between the heating element and the lead wire, wherein the connection is adjacent the jackets of corrosion-resistant thermoplastic material;
- placing a sleeve of corrosion-resistant thermoplastic material about the connection between the heating element and the lead wire so that the sleeve overlaps at least portions of the jackets of corrosion-resistant thermoplastic material;
- placing a thermocouple between the sleeve and the heating element;
- surrounding the sleeve with thermally activated shrink tubing;
- heating the thermoplastic materials surrounding the connection between the lead wire and the heating element; and
- heating the shrink tubing, causing it to squeeze and fuse the thermoplastic materials together, such fusion creating a hermetic seal surrounding the connection between the lead wire and the heating element.

4,875,958

METHOD OF MAKING MOLDED SANITARYWARE ARTICLES WITH LIGHT TRANSMITTING PANEL

Masayuki Kurokawa, Tokyo, Japan, assignor to American Standard Inc., New York, N.Y.

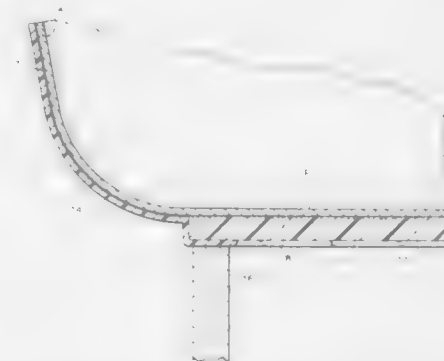
Division of Ser. No. 5,814, Jan. 21, 1987, abandoned. This application Feb. 12, 1988, Ser. No. 155,407

Claims priority, application United Kingdom, Jan. 23, 1986, 1501617

Int. Cl.⁴ B32B 31/04; B05D 1/32

U.S. Cl. 156—108

7 Claims



1. A method for making a molded article of sanitaryware comprising:

- providing a sheet of light-transmitting plastic material and forming said material on a mold to produce a molded unreinforced shell in the shape of an article of sanitaryware of the type having a sump which is defined by side walls and a bottom wall having a drain opening therein;
- applying a mask to at least a portion of one of said walls of said shell intended, in the finished article, to form a light-transmitting area;
- coating the remaining shell area to make it effectively opaque; and
- removing said mask to provide said at least one light-transmitting area and bonding a rigid panel of a light-transmitting plastic material in overlying relation to the outer surface of said light-transmitting area of said shell, thereby forming a support for said area.

4,875,959

TIRE FORMING METHOD AND APPARATUS

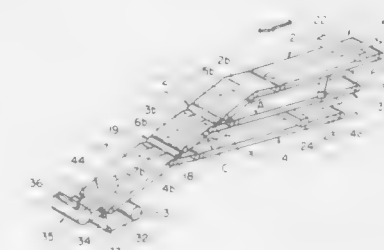
Yuzo Kumagai, Tokyo, Japan, assignor to Bridgestone Corporation, Tokyo, Japan

Filed Sep. 24, 1987, Ser. No. 100,658

Claims priority, application Japan, Sep. 24, 1986, 61-225336
Int. Cl.⁴ B29D 30/06

U.S. Cl. 156—123

3 Claims



1. A tire forming method comprising the steps of; conveying on separate conveyors first and second different tire forming

members, said tire forming members having plural oblique reinforcing cords;

cutting said first and second different tire forming members to predetermined lengths and parallel to said oblique reinforcing cords while being conveyed on said separate conveyors;

after cutting, conveying said first and second tire forming members overlapping each other with leading portions thereof aligned in a substantially parallel, co-planar relation to each other, and with the leading portion of said second tire forming member being longitudinally displaced further downstream than that of said first tire forming member and then at a downstream point combining the leading portion of said first tire forming member upon said second tire forming member to form a pair of tire forming members with leading edge portions shifted longitudinally; wherein the leading portions of said tire forming members remain in substantially the same plane before and after said combining;

overlapping and combining said pair of tire forming members thus cut upon a third tire forming member with the leading portion of the third tire forming member shifted further downstream than said pair of tire forming members so that said pair of tire forming members are flush with said third tire forming member with said first, second and third tire forming member thus cut and combined being conveyed on a common conveyor, and winding said member assembly thus formed on a winding roller.

4,875,960

APPARATUS AND METHOD FOR MANUFACTURING TUBULAR MEMBER

Tsutomu Shinomiya; Eiichi Yoshino, both of Sapporo; Chihiro Maki, Saitama; Hitoshi Tojima, Kasukabe; Sadamu Izai, Iwatsuki; Akio Nakata, Ageo, and Michiya Tamura, Iwatsuki, all of Japan, assignors to Hokkai Can Co., Ltd., Tokyo, Japan

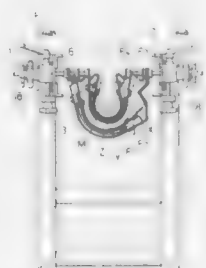
Filed Mar. 14, 1988, Ser. No. 167,863

Claims priority, application Japan, Mar. 14, 1987, 62-57963; Mar. 23, 1987, 62-65813; Apr. 30, 1987, 62-104795; Jul. 3, 1987, 62-101777

Int. Cl.⁴ B29D 23/10

U.S. Cl. 156-203

10 Claims



1. An apparatus for manufacturing a tubular member by continuously supplying a plurality of elongate flexible webs while positionally displacing the webs in overlapping relation with side edges thereof arranged in a staircase configuration, progressively bending the webs along a mandrel, bonding the webs with adhesive layers interposed therebetween to form a tubular member, and joining the displaced side edges to complete the tubular member, said apparatus comprising: a device for continuously supplying the webs in mutually spaced-apart relation while longitudinally tensioning the webs; a plurality of resilient support plate members disposed respectively for the webs and arranged to lie along the lower surfaces of the webs transversely thereof, said support plate members having opposite ends positioned adjacent opposite side edges of the webs; a mandrel; devices supporting said opposite ends of the support plate members for moving said opposite ends vertically and

toward and away from each other, said devices being capable of moving said opposite ends of the support plate members toward each other to curve the support plate members about an outer peripheral surface of said mandrel; and a positioning arrangement having a pair of guide members mounted on an inner surface of each of said support plate members for engaging opposite side edges of one of the webs.

4,875,961

HEAT-SENSITIVE TRANSFER MEDIUM

Hitoshi Oike, and Motoshige Yanagimachi, both of Kyoto, Japan, assignors to Oike Industrial Co., Ltd., Kyoto, Japan

Filed Oct. 7, 1987, Ser. No. 105,283

Claims priority, application Japan, Oct. 7, 1986, 61-238748; Oct. 14, 1986, 61-244735; Feb. 16, 1987, 62-32984

Int. Cl.⁴ B41M 5/26

U.S. Cl. 156-234

31 Claims

1. A heat-sensitive transfer medium for use in a printing method in which a heat transfer layer, provided on one surface of a support, is brought into contact with a receiving medium and localized areas of an ink layer are heated by means of a thermal head which is brought into contact with the other surface of the support, thereby transferring the heating areas of the transfer layer onto a receiving medium thereby forming printed images thereon, said transfer medium comprising a support and a transfer layer comprising at least a non-flowable, opaque ink layer, a metal deposition layer and an adhesive layer, said three layers being provided in that order from the support side of the medium, said transfer layer being capable of being transferred onto a receiving medium so that the localized areas of said layer that are heated by means of a thermal head are selectively transferred to form non-metallic printed images on the receiving medium said ink layer comprising a resin and a coloring agent and being substantially non-flowable under the transfer conditions, said metal deposition layer acting as a shading layer in the printed images.

4,875,962

METHOD FOR LAYING A SHEET OF MATERIAL ON A SURFACE

Colin J. Breakspear, Langport, England, assignor to Westland Group plc, England

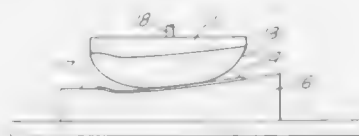
Filed Dec. 2, 1987, Ser. No. 127,420

Claims priority, application United Kingdom, Dec. 8, 1986, 2479287

Int. Cl.⁴ B32B 31/00; B28B 7/32

U.S. Cl. 156-245

6 Claims



1. A method for laying a sheet of pre-impregnated fibre-reinforced material onto a moulding surface, comprising the steps of:

providing an inflatable transfer tool having a flexible diaphragm attached to a periphery of the transfer tool, picking up the sheet of pre-impregnated fibre-reinforced material on an external face of the flexible diaphragm, locating the transfer tool so that said sheet is in contact with the moulding surface with diaphragm deflated, inflating the flexible diaphragm whereby a substantially uniform pressure is applied to force the sheet into contact with the moulding surface, withdrawing the transfer tool from the moulding surface while maintaining the diaphragm inflated to cause the diaphragm to stretch under influence of the inflating pres-

sure so as to take up a varying curved shape as the transfer tool is withdrawn from the moulding surface whereby the diaphragm is peeled gradually from the external face of the sheet of material inwardly from its outer edge region, and removing the transfer tool from the sheet of material.

4,875,963

PROCESS FOR PREPARING A TRANSFER METALLIZATION FILM

Klaus Paschke, Homburg-Reiskirchen; Guenther Crass, Taunusstein-Wehen, and Peter Dieter, Hallgarten, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 910,614, Sep. 23, 1986, abandoned. This application Jul. 18, 1988, Ser. No. 220,931

Claims priority, application Fed. Rep. of Germany, Sep. 27, 1983, 3334398

Int. Cl.⁴ B05D 3/06; B32B 31/00

U.S. Cl. 156-249

16 Claims

1. A process for preparing a transfer metallization film which is subsequently, metallized on one side, comprising the steps of: subjecting a film web having a first and second side and being comprised of predominantly propylene homopolymer to an electric corona discharge treatment on a first side of said only of said film web by guiding said film web over an electrode and subjecting said film web to electric corona discharge treatment by means of at least one counterelectrode on said first side of said film web facing said counterelectrodes; and subsequently metallizing the second side of the film web.

4,875,964

LIQUID MIXTURES BASED ON ETHYLENE POLYMERS, A PROCESS FOR PRODUCING THEM AND A COATING OR BONDING PROCESS IN WHICH THEY ARE USED

Hert Marins, Aubigny En Artois, France, assignor to Societe Chimique Des Charbonnages S.A., France

PCT No. PCT/FR86/00146, § 371 Date Dec. 16, 1986, § 102(e) Date Dec. 16, 1986, PCT Pub. No. WO86/06398, PCT Pub. Date Nov. 6, 1986

PCT Filed Apr. 29, 1986, Ser. No. 942,384

Claims priority, application France, May 2, 1985, 85 06646

Int. Cl.⁴ C09J 5/00

U.S. Cl. 156-327

13 Claims

1. A process for bonding two substrates by means of an adhesive, characterized in that the adhesive is a liquid mixture consisting essentially of at least one ethylene polymer (A) and at least one solvent (B), wherein:

- the ethylene polymer (A) comprises at least one terpolymer with a flow index of between 2 and 500 dg/min, the terpolymer consisting essentially of: from 83-95.7 mol% of units derived from ethylene, from 4-15 mol% of units derived from at least one alkylacrylate or alkyl methacrylate, the alkyl group containing 1 to 6 carbon atoms, and from 0.3 to 2 mol% of units derived from maleic anhydride,
- the solvent (B) is chosen from aliphatic, alicyclic and aromatic hydrocarbons containing from 5 to 12 carbon atoms, esters and chlorinated solvents.

APPARATUS FOR FOLDING AND SEALING DOCUMENTS

Joseph H. Marzullo, Danbury, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

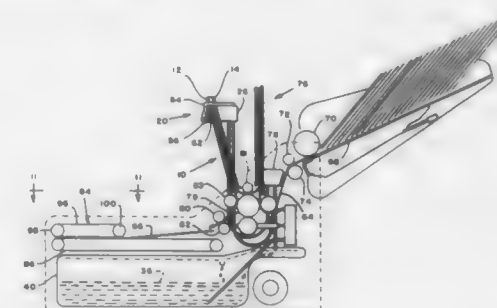
Filed Oct. 30, 1987, Ser. No. 115,220

The portion of the term of this patent subsequent to Jan. 24, 2000, has been disclaimed.

Int. Cl.⁴ B31F 1/00

U.S. Cl. 156-442.1

7 Claims



1. Apparatus for folding and sealing serially a supply of documents into envelopes, each of said documents having a leading edge and containing a water-activated adhesive on a portion thereof, comprising:

- a hopper for storing a supply of said documents;
- first means for applying moisture to a portion of the documents;
- a pair of folding rollers for imparting a fold to said documents, said folding rollers defining a nip therebetween;
- a buckle chute for stopping the leading edge of said documents and causing said documents to enter the nip of said folding rollers, said buckle chute having one open end thereof;
- second means mounted on said buckle chute for applying moisture to an interior portion of said documents;
- a pair of ironing rollers located downstream of said folding rollers for maximizing adhesive contact of said documents; and
- conveying/curing means located downstream of said ironing rollers for holding said envelopes together during transport prior to their release for further processing.

4,875,965

PRESSURE TRANSFER PLATE ASSEMBLY FOR A HEAT BONDING APPARATUS

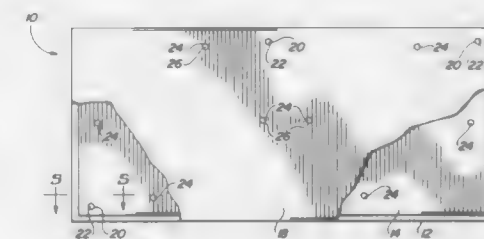
Louis S. Perko, Rancho Cucamonga, Calif., assignor to General Dynamics Corp., Pomona Div., Pomona, Calif.

Filed Sep. 12, 1988, Ser. No. 242,580

Int. Cl.⁴ B30B 7/00, 15/00; B23Q 3/18

U.S. Cl. 156-580

15 Claims



1. A pressure transfer plate assembly for use in a printed wiring board and flex harness heat bonding apparatus, comprising:

- a bottom plate having a first plurality of holes therethrough

- in a first predetermined pattern of locations and a second plurality of holes therethrough in a second predetermined pattern of locations, each of said second plurality of holes being internally threaded over a portion thereof;
- a plurality of plug inserts having flat, parallel top and bottom surfaces, fitted into said first plurality of holes in said bottom plate, each said insert having a recess in said top surface;
- a plurality of workpiece locating pins, each said pin having a base portion and an elongated body, with said base portion having been fitted into said recess of one of said plurality of inserts;
- a plurality of quick-replacement plate alignment pins, each said quick-replacement pin having a head portion at one end thereof and a threaded portion at another end thereof, with said threaded portion having been screwed into one of said second plurality of holes in said bottom plate;
- a top plate having a plurality of holes therethrough corresponding to said predetermined patterns of holes in said bottom plate, with said workpiece locating pins and said quick-replacement plate alignment pins extending into said holes in said top plate; and
- a plurality of thin liners, each said liner having a plurality of holes therethrough corresponding to said predetermined patterns of holes in said bottom plate, said liners being disposed between said top and bottom plates to separate distinct assembled workpieces during heat bonding.

4,875,967

METHOD FOR GROWING A SINGLE CRYSTAL OF CUBIC BORON NITRIDE SEMICONDUCTOR AND METHOD FOR FORMING A P-N JUNCTION THEREOF, AND LIGHT EMITTING ELEMENT

Osamu Mishima; Shinobu Yamaoka; Osamu Fukunaga; Junzo Tanaka, and Koh Era, all of Tsukuba, Japan, assignors to National Institute for Research in Inorganic Materials, Tsukuba, Japan

Filed Mar. 7, 1988, Ser. No. 164,898

Claims priority, application Japan, May 1, 1987, 62-109523; May 1, 1987, 62-109524

Int. Cl.⁴ C30B 9/04, 19/02, 29/38

U.S. Cl. 156—605

11 Claims



1. A method for growing a single crystal of cubic boron nitride semiconductor in a growing container sealed under high pressure and high temperature conditions, which comprises dissolving in a dopant-containing boron nitride solvent a boron nitride starting material placed at a high temperature zone in the growing container, and providing a temperature gradient to the solvent so that the temperature dependence of the solubility is utilized to let the single crystal form and grow at a low temperature zone in the growing container, the amount of the dopant present being effective to provide for a specific resistance of from 1 to $10^5 \Omega \cdot \text{cm}$.

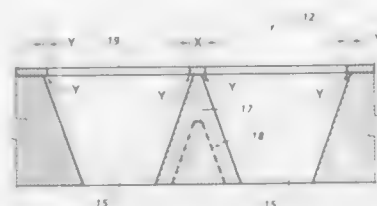
4,875,968 METHOD OF FABRICATING INK JET PRINTHEADS

James F. O'Neill, Penfield; Donald J. Drake, Rochester, and William G. Hawkins, Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Feb. 2, 1989, Ser. No. 305,046

Int. Cl.⁴ H01L 21/306; B44C 1/22; C03C 15/00, 25/06
U.S. Cl. 156—633

9 Claims



1. An improved method of fabricating a thermal ink jet printhead of the type produced by the mating of an anisotropically etched silicon substrate containing ink flow directing recesses with a substrate having heating elements and addressing electrodes, so that selective application of electrical pulses to the heating elements expel ink droplets from the printhead, wherein the improved method comprises the steps of:

- (a) patterning an etch resistant material on one surface of a (100) silicon substrate to form at least two sets of vias therein having predetermined sizes, shapes, and predetermined spacing therebetween, said predetermined spacing permitting selected complete undercutting by an anisotropic etchant within a predetermined etching time period; and
- (b) anisotropically etching the patterned silicon substrate with the patterned etch resistant material for said predetermined time period to form at least two sets of separate recesses, each recess being separated from each other by a wall, the surfaces of said walls being {111} crystal planes of the silicon substrate, whereby certain predetermined separately etched recesses in one of said sets are selectively placed into communication with each other by the selective undercutting of their common wall, while the remainder of the undercut walls provide strengthening reinforcement to the printhead, so that larger printheads may be fabricated which are more robust without relinquishing resolution or reducing tolerances.

4,875,969

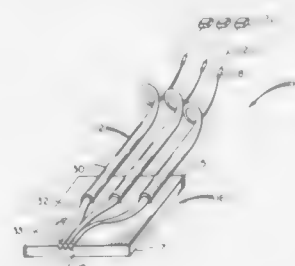
METHOD OF MAKING A FIBER OPTIC ARRAY

Kevin Hsu, Atlanta, Ga.; Srinivas T. Rao, Los Gatos, Calif., and Joseph Y. Kaukainen, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 7, 1988, Ser. No. 254,756

Int. Cl.⁴ H01L 21/306; B44C 1/22; C03C 15/00, 25/06
U.S. Cl. 156—633

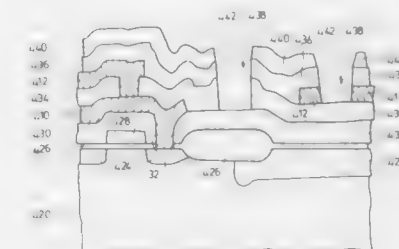
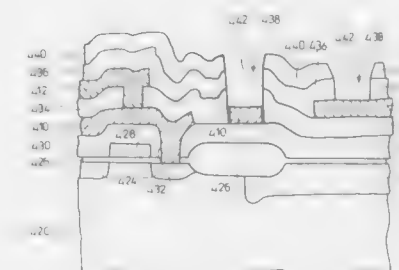
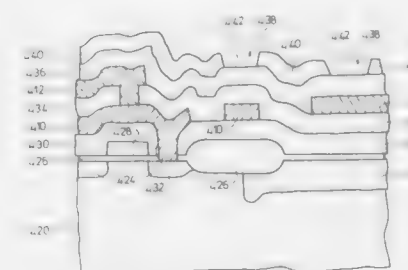
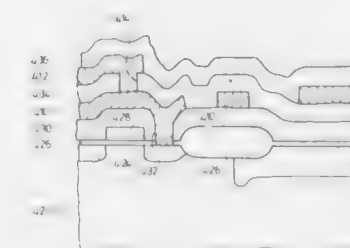
7 Claims



1. A method of making a fiber optic array comprising the steps of:

- forming a plurality of grooves in a substrate, said grooves extending to a first end of the substrate;
- removing a portion of cladding from one end of a plurality of optical fibers to form fibers in which said one end has cladding of a reduced outside dimension relative to the outside dimension of the cladding at an opposite end of the fibers;
- placing said fibers in said grooves such that all of the fibers extend in generally the same direction, the ends of the fibers having the reduced dimension being placed in grooves adjacent said first end of said substrate; and
- cementing the fibers in the grooves.

providing an integrated circuit gate array blank having at least a first metal layer and a second metal layer formed over said first metal layer and separated therefrom by an insulator, said first and second metal layers including



portions arranged for selectable removal to provide desired customization of said integrated circuit blank; and thereafter etching at least said first metal layer to customize said integrated circuit gate array blank.

4,875,970

METHOD OF FORMING RECESSED PROFILE ON FERRITE SINGLE CRYSTAL BY CHEMICAL ETCHING

Fuminori Takeya, Nagoya; Naoya Fukuda, Aichi, and Miki Suzuki, Nagoya, all of Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan

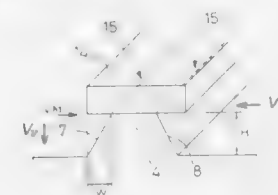
Filed Dec. 29, 1988, Ser. No. 291,648

Claims priority, application Japan, Mar. 29, 1988, 63-75744

Int. Cl.⁴ B44C 1/22; C03C 15/00, 25/06

U.S. Cl. 156—645

15 Claims



1. A method of forming a recessed portion on a surface of a Mn-Zn ferrite single crystal, said recessed portion having a predetermined cross sectional profile and at least one straight ridge each of which defines a boundary in said profile, comprising the steps of:

- forming an etching mask on the surface of said ferrite single crystal, so as to provide said recessed portion by etching such that said at least one straight ridge lies in a (100) or (110) plane of said ferrite single crystal which is perpendicular to said surface; and
- exposing said ferrite single crystal with said etching mask to an aqueous solution which substantially consists of water, the balance consisting principally of phosphoric acid, thereby chemically etching said surface of the ferrite single crystal, to produce said recessed portion such that an inclined surface is formed so as to extend parallel to said straight ridge and such that said straight ridge defines an edge of said inclined surface.

4,875,971

FABRICATION OF CUSTOMIZED INTEGRATED CIRCUITS

Zvi Orbach, and Meir I. Janai, both of Haifa, Israel, assignors to Elron Electronic Industries, Ltd., Haifa, Israel

Filed Mar. 23, 1988, Ser. No. 172,235

Claims priority, application Israel, Apr. 5, 1987, 82113

Int. Cl.⁴ B44C 1/22; C23F 1/02; C03C 15/00; H01L 21/306

U.S. Cl. 156—644

50 Claims

1. A technique for production of customized integrated circuit gate arrays comprising the steps of:

4,875,972 HYDROGEN PEROXIDE COMPOSITIONS CONTAINING A SUBSTITUTED OXYBENZENE COMPOUND

Rodney K. Williams, Stacy; Bruce A. Bohnen, Roseville, and Kurt E. Heikkila, Circle Pines, all of Minn., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 27, 1988, Ser. No. 224,802

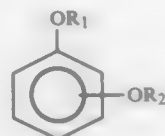
Int. Cl.⁴ C09G 13/06; C23G 1/18

U.S. Cl. 156—664

6 Claims

1. A stabilized hydrogen peroxide composition comprising hydrogen peroxide and a substituted oxybenzene compound

which is soluble in hydrogen peroxide wherein the compound is of the formula



wherein R₁ and R₂ independently are a C₁ and C₁₂ straight or branched alkyl chain group.

4,875,973

HYDROGEN PEROXIDE COMPOSITIONS CONTAINING A SUBSTITUTED AMINOBENZALDEHYDE

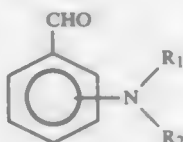
Kurt E. Heikkila, Circle Pines; Rodney K. Williams, Stacy, and Bruce A. Bohnen, Roseville, all of Minn., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 27, 1988, Ser. No. 224,801
Int. Cl.⁴ C09G 13/06; C23G 1/18

U.S. Cl. 156-664

6 Claims

1. A stabilized hydrogen peroxide composition comprising hydrogen peroxide and a substituted aminobenzaldehyde compound which is soluble in hydrogen peroxide wherein the compound is of the formula:



and each R₁ and R₂ is independently of the other C₁₋₁₂ linear or branched chain alkyl group or a C₅ or C₆ saturated or unsaturated cyclic group.

4,875,974

ABSORBENT VEGETABLE MATERIAL AND PROCESS FOR MAKING SAME

Thomas F. Rich, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 522,873, Aug. 11, 1983, abandoned.

This application Jan. 20, 1988, Ser. No. 146,059

Int. Cl.⁴ D21C 5/00

U.S. Cl. 162-10

9 Claims

1. An absorbent material derived from a vegetable material containing at least about 15% pectin, said absorbent material comprising:

- from about 15% to about 60% pectin, said pectin having a degree of esterification of from about 1% to about 45%, and from 18.5% to about 50% of the pectin being in the form of a divalent metal salt;
- from about 15% to about 80% of a material selected from the group consisting of cellulose, hemicellulose, lignin and mixtures thereof;
- from 0% to about 1% chloroform soluble lipids;
- from 0% to about 10% non-lipid organic materials extractable in a mixture of chloroform, methanol and water, said mixture having a volume ratio chloroform:methanol:water of 20:4:1; and
- from 0% to about 6% water-soluble metal salts.

4,875,975

DEVICE FOR DRAWING AN ENDLESS BELT INTO A PAPER MAKING MACHINE

Christian Schiel, Heidenheim, Fed. Rep. of Germany, assignor to J. M. Voith GmbH, Fed. Rep. of Germany

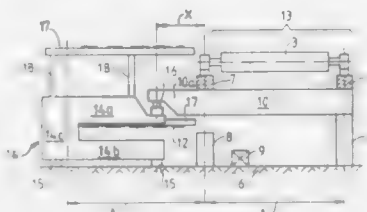
Filed Nov. 4, 1988, Ser. No. 267,183

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1987, 3737584

Int. Cl.⁴ D21F 1/24

U.S. Cl. 162-273

17 Claims



1. A device for enabling the drawing in of an endless belt into a machine, comprising:

a frame for the machine, the machine frame having a draw-in side onto and over and past which the belt is drawn in and an opposite side toward which the belt is moved as the belt is drawn in;

a plurality of rolls supported at the frame between the slides of the frame over which the endless belt travels;

at the draw-in side of the frame, a support for the frame; and the frame having a roll supporting part which is supported on the frame support; the frame support being changeable for providing an open region along the height of the frame support through which the endless belt may be drawn in over the frame;

the frame having at least one cantilever piece which extends beyond the frame support at the draw-in side and extends beyond the draw-in side of the frame for a first distance;

an auxiliary support located at the draw-in side of the frame and being relatively moveable with respect to the frame; the auxiliary support including means for supporting the belt that is to be drawn-in off the auxiliary support and onto the frame between the sides of the frame; the auxiliary support further comprising a cantilever arm having a free end that extends toward the draw-in side of the machine frame for a second distance; the length of the cantilever arm of the auxiliary support and the length of the cantilever piece of the frame are respectively selected such that with the auxiliary support placed at the draw-in side of the frame, the cantilever arm of the auxiliary support is positioned for and includes means for providing support to the cantilever piece of the frame during the draw-in of the belt off the auxiliary support onto the frame; the auxiliary support being emplaceable next to the draw-in side of the frame for the cantilever arm to provide support to the cantilever piece and being removable away from the draw-in of the frame;

the device being dimensioned such that the sum of the first and second distances approximates the length of the width of the frame between the sides thereof.

4,875,976

TRANSFER APPARATUS FROM PRESS SECTION TO DRYING SECTION

Gregory L. Wedel, Beloit, Wis., assignor to Beloit Corporation, Beloit, Wis.

Filed Sep. 27, 1988, Ser. No. 249,798

Int. Cl.⁴ D21F 11/00; F26B 13/10

U.S. Cl. 162-306

2 Claims

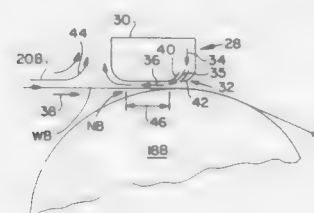
1. A transfer apparatus for transferring a web from a press

section to a first dryer of a dryer section, said apparatus comprising:

a lead-in roll disposed closely adjacent to the press section; a felt having a direction of movement and extending around said lead-in roll and from said lead-in roll to the first dryer such that the web extends in an open draw from the press section to said lead-in roll and is thereafter supported by and beneath said felt towards a dryer nip defined between said felt and the first dryer;

vacuum generating means disposed adjacent to said dryer nip such that the web and said felt are disposed between said means and the first dryer, the web being disposed between said felt and the first dryer, said means inducing a partial vacuum adjacent to said nip between said felt and the web so that wrinkling and breakage of the web as the web approaches said nip is inhibited;

said vacuum generating means being a blow box which defines a slot that extends in a cross-machine direction across the width of said felt structured so that air flows from within said blow box through said slot in a direction



substantially parallel to and opposite to the direction of movement of said felt for inducing said partial vacuum between said felt and the web;

said partial vacuum being induced from said nip to a distance upstream relative to said nip within the range 4 to 10 inches;

said slot having a first and a second lip, said first lip having a curved configuration such that air within said blow box flows in a direction initially radially towards the first dryer and then curves in a direction to follow said first lip due to the Coanda effect and thereafter follows a direction substantially parallel to and opposite to the direction of movement of said felt so that a partial vacuum is generated between said blow box and said felt which in turn induces said partial vacuum between said felt and the web; and said flow of air in a direction parallel and opposite to the direction of movement of said felt deflecting boundary layer air that follows said felt from said lead-in roll towards said blow box thereby augmenting said partial vacuum induced between said felt and the web in the vicinity of said nip.

4,875,977

HORIZONTAL TWIN WIRE MACHINE WITH VERTICALLY ADJUSTABLE OPEN ROLL AND DEFLECTOR BLADE

Richard W. Creagan, Kirkland, and Alan J. Nicol, St. Lazare, both of Canada, assignors to The Black Clawson Company, Middletown, Ohio

Continuation-in-part of Ser. No. 39,500, Apr. 17, 1987, Pat. No. 4,724,047. This application Jan. 15, 1988, Ser. No. 144,842

The portion of the term of this patent subsequent to Jul. 30, 2002, has been disclaimed.

Int. Cl.⁴ D21F 1/36, 1/00

U.S. Cl. 162-300

19 Claims

1. Apparatus for forming paper which includes a main frame, means mounted on said frame for supporting a generally horizontal run of a primary endless forming wire, which run has an upstream end and a downstream end, and means for delivering a flow of paper making stock to said upstream end of said wire run for drainage therethrough to form a paper

sheet thereon while traveling thereon toward the other end of said run, comprising:

(a) a supplemental frame assembly mounted above said main frame,

(b) means including an upstream roll and a downstream roll mounted in spaced relation on said frame assembly above said primary wire run and supporting a run of a top endless forming wire above said primary wire run,

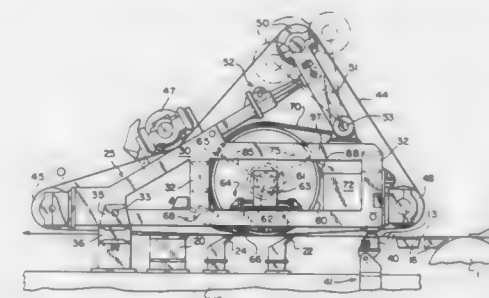
(c) a pair of wire deflectors positioned below and in supporting relation with said primary wire run and in spaced relation with each other lengthwise of said main frame wherein they define a gap therebetween across which said primary wire run travels,

(d) a third roll having an open face mounted for rotation within the loop of said top wire between said upstream and downstream rolls and with the vertical center line thereof intermediate said pair of primary wire deflectors to receive and guide a run of said top wire directly from said upstream roll,

(e) means for driving said top wire and said third roll in the same direction as said primary wire,

(f) a top wire deflector blade mounted within said top wire loop and having an edge thereof positioned to engage said top wire at a location within said gap spaced between the vertical center line of said third roll and the downstream one of said pair of primary wire deflectors,

(g) means for adjusting the vertical positions of said third roll with respect to said main frame over a range which includes positions of the lower periphery thereof that are



below a horizontal plane defined by said primary wire deflectors said adjusting means being structured and arranged such that said third roll will guide said top wire run downwardly from said upstream roll into such converging relation with said primary wire run that said primary and top wire runs define a wedge zone leading to and immediately upstream from the surface of said third roll and having the apex thereof located in said gap,

(h) means for adjusting said top wire deflector blade with respect to said main frame and with respect to said third roll over a vertical range which includes positions thereof that are at lower levels than said horizontal plane defined by said primary wire deflectors to vary the pressure exerted by said blade on the converged wires traveling from said third roll to said downstream one of said pair of wire deflectors,

(i) a shield mounted in upwardly extending relation from said top wire deflector blade and in facing and enclosing relation with a predetermined portion of said third roll,

(j) the relative dimensions and positioning of said shield and said third roll establishing a partial channel therebetween having a lower end thereof positioned to receive liquid directed upwardly from the inner surface of said top wire by said top wire deflector blade whereby such liquid is guided by said shield around said portion of the outer surface of said roll faced by said shield and is discharged centrifugally from an upper end of said channel, and

(k) means defining a receptacle for receiving liquid discharged from the upper end of said channel.

4,875,978

VEHICLE FOUR WHEEL DRIVE SYSTEM

Manabu Hiketa, Hiroshima, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan

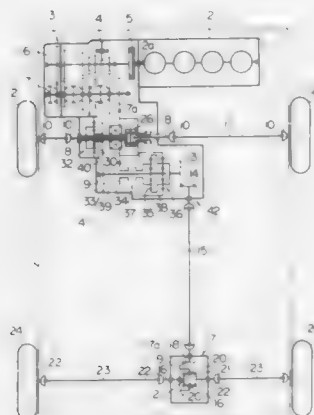
Filed Aug. 18, 1987, Ser. No. 86,479

Claims priority, application Japan, Aug. 20, 1986, 61-194940

Int. Cl.⁴ B60K 17/344

U.S. Cl. 180-248

8 Claims



1. A motor vehicle having a body, front and rear wheels respectively provided in front and rear portions of the body,
- a power transmitting mechanism including transmission means having an input member and an output member arranged in a transverse direction of the body,
- first drive axle means arranged in a transverse direction of the body and connected with one of the front and rear wheels for transmitting a rotation to said one of the front and rear wheels,
- second drive axle means arranged in a transverse direction of the body and connected with the other of the front and rear wheels for transmitting a rotation to said other of the front and rear wheels,
- a transfer shaft arranged to extend in a transverse direction of the body and provided with torque splitting means for transmitting a driving torque from the transmission means to said first and second drive axle means with a predetermined torque splitting ratio,
- said torque splitting means including a plurality of inter-axle differential gear mechanisms having different torque splitting ratios and selecting means for selectively operating one of said differential gear mechanisms to establish a desired torque splitting ratio between the first and second drive axle means,
- said transfer shaft being located adjacent to said first drive axle means,
- said first drive axle means carrying an idle gear which is in engagement with an output member of said transmission means and an input member of said torque splitting means,
- said idle gear being of a larger diameter than said input member of said torque splitting means so that rotation speed is increased between said idle gear and said input member of the torque splitting means.

4,875,979

TREATMENT OF PETROLEUM COKE TO INHIBIT COKE PUFFING

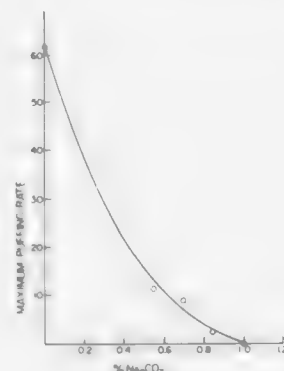
Thomas H. Orac, Strongsville; Herbert C. Quandt, Lakewood, and David R. Ball, Bay Village, all of Ohio, assignors to Union Carbide Corporation, Danbury, Conn.

Filed Mar. 7, 1988, Ser. No. 164,749

Int. Cl.⁴ C10B 57/00; C01B 31/04

U.S. Cl. 201-5

23 Claims



1. A process for treating high sulfur petroleum coke particles which comprises:
 - reacting said petroleum coke particles in the absence of a binder with a compound containing an alkali metal selected from the group consisting of sodium and potassium at an elevated temperature above that at which said compound begins to react with carbon but below the temperature at which said coke particles would begin to puff in the absence of said compound;
 - maintaining said coke particles and said compound at said elevated temperature for a sufficient period of time to permit the reaction to proceed and to allow products of the reaction to penetrate said coke particles and form a sodium or potassium-containing deposit throughout the mass of said particles; and
 - cooling the so-treated coke particles.

4,875,980

METHOD FOR SEPARATING AND CONCENTRATING AN ORGANIC COMPONENT FROM AN AQUEOUS SOLUTION CONTAINING SAME

Masajiro Arita, Tokyo, and Yukinobu Sugimoto, Yokohama, both of Japan, assignors to Mitsubishi Rayon Engineering Co., Ltd. and Mitsubishi Rayon Co., Ltd., both of Tokyo, Japan

Filed Aug. 26, 1987, Ser. No. 89,448

Claims priority, application Japan, Sep. 2, 1986, 61-206238

Int. Cl.⁴ B01D 13/00

U.S. Cl. 203-14

19 Claims



1. A method for separating and concentrating an organic

component having a lower boiling point than water from an aqueous solution containing said organic component, which comprises the steps of:

- (i) contacting said aqueous solution containing said organic component having a lower boiling point than water with a major surface of a hydrophobic porous membrane;
- (ii) exposing another major surface of said hydrophobic porous membrane opposite to said aqueous solution to a vacuum to obtain a first vapor having a higher concentration of said organic component than said aqueous solution;
- (iii) liquifying said first vapor to obtain a first concentrated solution having a higher concentration of said organic component when said aqueous solution;
- (iv) contacting said first concentrated solution with a major surface of a hydrophobic nonporous membrane; and
- (v) exposing another major surface of said hydrophobic nonporous membrane opposite to said first concentrated solution to a vacuum to obtain a second vapor having a higher concentration of said organic component than said first vapor.

4,875,981

OXYGEN ANALYZING METHOD AND DEVICE

Jun Usami, Aichi; Akinobu Hattori, Yokkaichi, and Yuichi Sasaki, Nagoya, all of Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan

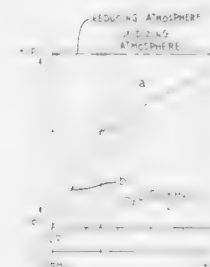
Filed Apr. 6, 1987, Ser. No. 34,903

Claims priority, application Japan, Apr. 9, 1986, 61-81577

Int. Cl.⁴ G01N 27/58

U.S. Cl. 204-1 T

7 Claims



1. An oxygen analyzing method for determining a positive or negative oxygen concentration of a measurement gas which changes at random between an oxidizing atmosphere and a reducing atmosphere, comprising the steps of:
 - providing an electrochemical oxygen sensing cell wherein an electromotive force is induced according to the principle of an oxygen concentration cell, between a measuring electrode exposed to said measurement gas, and a reference electrode exposed to a reference gas;
 - providing an electrochemical oxygen pumping cell adapted to effect an electrochemical oxygen pumping action for controlling an atmosphere adjacent to said measuring electrode of said sensing cell;
 - providing a heater which cooperates with said sensing and pumping cells to form an integral laminar oxygen sensing element, and which is energized to heat said sensing and pumping cells;
 - controlling said heater so as to maintain an operating temperature of said sensing and pumping cells within a range of 700°-960° C.;
 - producing a pump control signal for controlling a pumping current to be applied to said pumping cell, to control the atmosphere adjacent to said measuring electrode so that said electromotive force induced between said measuring and reference electrodes is equal to a predetermined level;
 - converting the controlling pumping current or the produced pump control signal, into an oxygen concentration signal whose level is held within one of a positive range and a negative range, said converting being performed accord-

ing to a stored predetermined relationship between a value said pumping current or said pump control signal and said level of said oxygen concentration signal, said predetermined relationship consisting of a first relationship between a positive value of said pumping current or pump control signal and said positive or negative range of said level of the oxygen concentration signal, and a second relationship between a negative value of said pumping current or pump control signal and said positive or negative range of said level of the oxygen concentration signal, said second relationship being determined according to the equation $-O_2 = (CO + H_2)/2$, wherein $-O_2$ represents the oxygen concentration of said measurement gas, and CO and H_2 represent known concentration values of a simulation atmosphere, said oxygen concentration signal representing said positive oxygen concentration of said measurement gas where the measurement gas is in a state of said oxidizing atmosphere, or said negative oxygen concentration of said measurement gas where the measurement gas is in a state of said reducing atmosphere.

5. An oxygen analyzing device for determining a positive or negative oxygen concentration of a measurement gas which changes at random between an oxidizing atmosphere and a reducing atmosphere, comprising:

an electrochemical oxygen sensing element including (a) an electrochemical oxygen sensing cell having a measuring electrode exposed to said measurement gas, and a reference electrode exposed to a reference gas, wherein an electromotive force is induced between said measuring and reference electrodes, according to the principle of an oxygen concentration cell, (b) an electrochemical oxygen pumping cell operable to effect an electrochemical oxygen pumping action for controlling an atmosphere adjacent to said measuring electrode of said sensing cell, (c) diffusion-resistance means through which said measurement gas diffuses toward said measuring electrode, under a predetermined diffusion resistance, and (d) a heater for heating said sensing and pumping cells;

a heater controller for controlling said heater so as to maintain an operating temperature of said sensing and pumping cells within a range of 700°-960° C.;

a pumping-current controller which produces a pump control signal for controlling a pumping current to be applied to said pumping cell, to control the atmosphere adjacent to said measuring electrode so that said electromotive force induced between said measuring and reference electrodes is equal to a predetermined level;

a converter for converting the controlled pumping current or the produced pump control signal, into an oxygen concentration signal whose level is held within one of a positive range and a negative range, said oxygen concentration signal representing said positive oxygen concentration of said measurement gas where the measurement gas is in a state of said oxidizing atmosphere, or said negative oxygen concentration of said measurement gas where the measurement gas is in a state of said reducing atmosphere;

and

said converter including means for storing a predetermined relationship between a value of said pumping current or said pump control signal and said level of said oxygen concentration signal, said predetermined relationship consisting of a first relationship between a positive value of said pumping current or pump control signal and said positive or negative range of said level of the oxygen concentration signal, and a second relationship between a negative value of said pumping current or pump control signal and said positive or negative range of said level of the oxygen concentration signal, said second relationship being determined according to the equation $-O_2 = (CO + H_2)/2$, wherein $-O_2$ represents the oxygen concentration of said measurement gas, and CO and H_2 represent known concentration values of a simulation atmosphere.

4,875,981

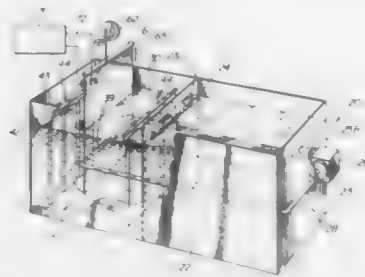
PLATING HIGH ASPECT RATIO HOLES IN CIRCUIT BOARDS

Larry N. Velle, El Toro, Calif., assignor to Velle Circuits, Inc., Costa Mesa, Calif.

Filed Feb. 6, 1987, Ser. No. 11,887
Int. Cl.⁴ C25D 5/02, 17/00

U.S. Cl. 204—14

26 Claims



1. A product by process comprising an electrically-conductive coating on a printed circuit substrate of dielectric material, said substrate having therein high aspect ratio holes plated to an essentially uniform thickness by the process steps of:

- precoating a thin, uniform electrically-conductive layer over the surface of said dielectric printed circuit substrate;
- energizing said precoated printed circuit substrate with a plating current;
- submerging said energized substrate in an electrolyte bath;
- submerging manifolds in said electrolyte bath such that the manifolds are spaced and offset from one another;
- connecting each of the manifolds to a negative pressure source; and
- vacuum washing opposite sides of the printed circuit substrate in order to suction the electrolyte through the high aspect ratio holes in the substrate; and
- moving the substrate relative to and between said spaced and offset manifolds while the suction of the offset manifolds is drawing the electrolyte through the high aspect ratio holes and thereby plating the holes to an essentially uniform amount.

4,875,983

PROCESS FOR CONTINUOUS ELECTRODEPOSITION OF CHROMIUM METAL AND CHROMIUM OXIDE ON METAL SURFACES

Santa Alota; Vincenzo Ferrari; Massimo Memmi; Leonardo Pacelli, and Susanna Ramundo, all of Rome, Italy, assignors to Centro Sviluppo Materiali SpA, Rome, Italy

Filed May 17, 1988, Ser. No. 195,958

Claims priority, application Italy, May 13, 1987, 47918 A/87
Int. Cl.⁴ C25D 3/06, 7/06

U.S. Cl. 204—28

9 Claims

1. Process for continuous electrodeposition of chromium metal and trivalent chromium oxide on metal surfaces, in which a continuous metal body is continuously immersed in an electrolyte, that is strongly acid due to the presence of chromic acid, contained in at least one electrolytic cell in which said metal body acts as cathode, characterized in that said metal body is subjected to an electrolytic cathodic treatment comprising at least three successive pulses of current with a density of at least 50 A/dm², while it is immersed in said electrolyte that has a pH of less than 3 and a velocity of over 0.5 m/s.

4,875,984

METHOD FOR MANUFACTURING ELECTROLYTICALLY CHROMATED STEEL SHEET

Hiroki Iwasa; Toyofumi Watanabe, and Hirohide Furuya, all of Tokyo, Japan, assignors to NKK Corporation, Tokyo, Japan

Filed Feb. 10, 1989, Ser. No. 309,683

Claims priority, application Japan, Feb. 27, 1988, 63-45419

Int. Cl.⁴ C25D 11/38

U.S. Cl. 204—56.1

3 Claims

1. A method for manufacturing an electrolytically chromated steel sheet, comprising the steps of:

anodically treating a steel sheet at a current density of from 0.3 to 20 coulomb/dm² in an acidic aqueous electrolyte containing at least one of chromic anhydride, chromate and bichromate, to form a hydrated chromium oxide film having numerous holes and numerous thin portions over the entire area of at least one surface of said steel sheet; and then

cathodically treating said anodically treated steel sheet in an acidic aqueous electrolytic chromating solution to form on said at least one surface of said steel sheet a chromate film comprising a metallic chromium layer as a lower layer having thereon numerous granular projections corresponding to said numerous holes and said numerous thin portions, and a hydrated chromium oxide layer as an upper layer formed on said metallic chromium layer.

4,875,985

METHOD AND APPARATUS FOR PRODUCING TITANIUM

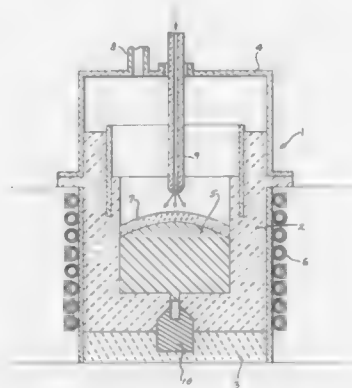
Raymond J. Donahue, Foad da Lac; William G. Hesterberg, Rosendale, and Terrance M. Cleary, Allenton, all of Wis., assignors to Brunswick Corporation, Skokie, Ill.

Filed Oct. 14, 1988, Ser. No. 258,035

Int. Cl.⁴ C25C 3/28

U.S. Cl. 204—64 T

27 Claims



1. A method of producing titanium, comprising the steps of heating a quantity of titanium to a temperature above the melting point thereof to produce a melt, providing a layer of a slag containing an ionized titanium compound and slag constituents on the top of said melt, heating said slag to a molten state by direct current plasma arc heating with said melt being

anodic, and reversing the polarity of said plasma arc heating with said melt being cathodic to reduce said titanium compound at the interface between said slag and said melt to produce titanium, said titanium being combined with said melt.

thereby forming said alumina film layer charged in said groove.

4,875,988

ELECTROLYTIC CELL

Pedro J. Aragon, 306 Highpoint Dr., Wadsworth, Ohio 44281
Filed Aug. 5, 1988, Ser. No. 229,603Int. Cl.⁴ C25B 9/00, 11/03, 13/06, 13/08

U.S. Cl. 204—265

12 Claims



1. An improved electrolytic cell of the type having a catholyte compartment, an anolyte compartment, a flat cathode electrode, a flat anode electrode, and a separator located between the anode and the cathode electrodes, wherein the improvement comprises:

- a separation chamber located at the top and being an integral part of said anolyte compartment crossing a separator plane between said anode and cathode compartments to occupy a space available over said catholyte compartment and being flush to a plane of a back surface of said catholyte compartment to separate gas produced during the electrolysis from expent anolyte solution, and having at least one outlet for removal of anodic gases produced during electrolysis, and at least one inlet for receiving gases originated from outside of said electrolytic cell.

4,875,987

GROOVED MAGNETIC SUBSTRATES AND METHOD FOR PRODUCING THE SAME

Toshiaki Wada, Takatsuki; Yoshiaki Katsuyama, Muro, and Junichi Nakaoka, Amagasaki, all of Japan, assignors to Sumitomo Special Metals, Co., Ltd., Osaka, Japan

Division of Ser. No. 888,873, Jul. 24, 1986, Pat. No. 4,777,074.

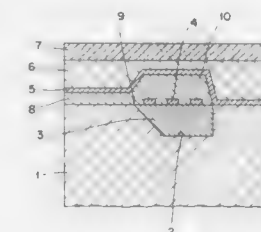
This application Jun. 29, 1988, Ser. No. 213,234

Claims priority, application Japan, Aug. 12, 1985, 60-177430; Aug. 26, 1985, 60-188175

Int. Cl.⁴ G11B 5/42; C23C 14/34

U.S. Cl. 204—192.15

12 Claims



1. A method for producing grooved magnetic substrate including the steps of:

- depositing alumina particles into at least one parallel groove having a ratio of depth (d)/width (w) of 1 or lower defined in a surface of a magnetic substrate by means of sputtering to form an alumina film layer which fills the groove under the conditions that said alumina film layer has a Knoop hardness of 600 kg/mm² to 1200 kg/mm² which is equal to or higher than the magnetic substrate, and
- applying precision machining to the thus deposited alumina film until said groove is exposed and a step-like surface irregularity of said substrate relative to said alumina film layer reaches 200 Å or lower is obtained,

4,875,989

WAFER PROCESSING APPARATUS

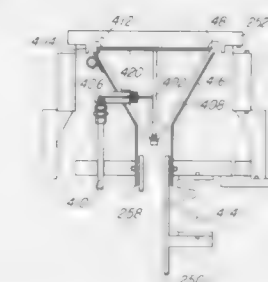
Cecil J. Davis, Greenville; Robert T. Matthews; Lee M. Loewenstein, both of Plano; Joe V. Abernathy, Wylie, and Timothy A. Wooldridge, Richardson, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 5, 1988, Ser. No. 283,036

Int. Cl.⁴ C23C 14/34; C23F 1/02

U.S. Cl. 204—298

18 Claims



1. An apparatus for processing of wafers comprising:

- a vacuum processing chamber;
- a wafer support within said vacuum processing chamber, said wafer support being capable of supporting a wafer;
- an edge directing gas distribution device comprising a

funnel-shaped distributor and a conical baffle concentrically positioned within said distributor to form an annulus for selectively directing the flow of process gases toward the circumference of the wafer;

(d) a device for generating free radicals which is remote from said processing chamber and supplying the free radicals to the gas flow direction device;

(e) a heating device within said vacuum processing chamber, whereby photoresist beads near the edge of the wafer can be selectively etched away.

4,875,990

OXYGEN CONCENTRATION MEASURING DEVICE

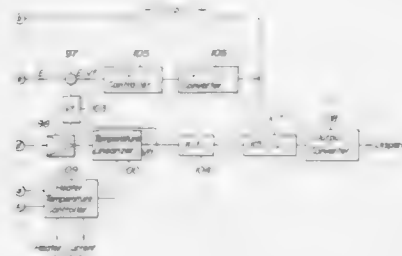
Toru Kodachi, Nagoya, and Jun Usami, Aichi, both of Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan
Filed Aug. 24, 1987, Ser. No. 88,276

Claims priority, application Japan, Aug. 28, 1986, 61-202382; Aug. 28, 1986, 61-202383; Aug. 28, 1986, 61-202384; Sep. 4, 1986, 61-206681; Sep. 4, 1986, 61-206682; Sep. 4, 1986, 61-206683; Sep. 4, 1986, 61-206684; Sep. 4, 1986, 61-206685; Sep. 4, 1986, 61-206687

Int. Cl. G01N 27/46

U.S. Cl. 204—408

15 Claims



1. An industrial oxygen concentration measuring device for determining an oxygen concentration of a measurement gas, comprising:

- a detecting portion comprising a unitary body formed from a plurality of laminated plate members including an oxygen sensing element comprising an oxygen concentration cell made of solid electrolyte, a temperature detecting member and a heater; and
- a temperature operational processing unit having temperature compensation operation means for compensating a setting voltage, to which an electromotive force generated by said oxygen concentration cell is compared, for variations in temperature of said detecting portion at temperatures above 600° C., said temperature of said detecting portion being determined by an output signal obtained from said temperature detecting member.

4,875,991

TWO-CATALYST HYDROCRACKING PROCESS

Simon G. Kukes, Jeffrey T. Miller, both of Naperville, and Louis C. Gutberlet, Wheaton, all of Ill., assignors to Amoco Corporation, Chicago, Ill.

Filed Mar. 27, 1989, Ser. No. 328,576

Int. Cl. C10G 65/10

U.S. Cl. 208—59

19 Claims

1. A process for hydrocracking a hydrocarbon feedstock with hydrogen at hydrocracking conversion conditions in a plurality of reaction zones in series which comprises:

- (a) contacting said feedstock in a first reaction zone with a first reaction zone catalyst comprising a hydrogenation component consisting essentially of a nickel component and a tungsten component deposited on a support component consisting essentially of an alumina component and a crystalline molecular sieve component; and
- (b) contacting the effluent from said first reaction zone in a second reaction zone with a second reaction zone catalyst

comprising a hydrogenation component consisting essentially of a molybdenum component deposited on a support component consisting essentially of an alumina component and a crystalline molecular sieve component.

4,875,992

PROCESS FOR THE PRODUCTION OF HIGH DENSITY JET FUEL FROM FUSED MULTI-RING AROMATICS AND HYDROAROMATICS

Glen P. Hammer, Baton Rouge, La., assignor to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Dec. 18, 1987, Ser. No. 134,798

Int. Cl. C10G 45/50

U.S. Cl. 208—89

16 Claims

1. A process for the production of high density jet fuel which comprises,

- (A) contracting with hydrogen, in a first stage, a feed comprising (a) sulfur-containing compounds, nitrogen-containing compounds, or mixtures thereof, and (b) at least about 60 percent, based on the total weight of the feed, of liquid hydrocarbon compounds inclusive of fused two-ring aromatic hydrocarbons, hydrogenated fused two-ring aromatic hydrocarbons, or mixtures thereof, over a catalyst which contains one or more of a Group VIB or Group VIII metal, or both Group VIB and Group VIII metals, or compound thereof, at hydrotreating conditions sufficient to hydrodesulfurize or hydrodenitrogenate, or both hydrodesulfurize and hydrodenitrogenate, said feed;
- (B) separating and removing sulfur or nitrogen, or both sulfur and nitrogen, from the product of said first stage to produce a liquid product which contains no more than about 20 wppm sulfur, or no more than about 5 wppm nitrogen;
- (C) contacting, in a second stage, the liquid product from step (B) with hydrogen, over a fluorinated Group VIII metal-on-alumina catalyst to hydrogenate said fused two-ring aromatic hydrocarbons or hydrogenated fused two-ring hydrocarbons of said feed to selectively hydrogenate said aromatic or hydroaromatic hydrocarbons to naphthenes without conversion to lower boiling, lower molecular weight hydrocarbons of the liquid product of step (B) in excess of about 5 percent, based on the weight of said liquid product of step (B);
- (D) withdrawing from said second stage a volume of product, based on the product of said first stage fed into second stage, above about 95 percent; and
- (E) separating from the product of said second stage hydrogenation reaction a high density jet fuel having a gravity ranging between about 25 API and 35 API, and an aromatic concentration below about 50 percent, based on the total weight of said jet fuel.

4,875,993

PROCESS AND APPARATUS FOR THE CATALYTIC CRACKING OF HYDROCARBON CHARGES

Jean-Louis Manleau, Marly-le-Roi; Jean-Bernard Sigaud, Vaucluse; Bernard Chapotel, Paris, all of France, and Leonard Seglin, New York, N.Y., assignors to Compagnie de Raffinage et de Distribution Total France, Paris, France

Filed Apr. 26, 1988, Ser. No. 186,396

Int. Cl. C10G 11/18

U.S. Cl. 208—113

9 Claims

1. A process for the catalytic cracking in a fluidized bed of a hydrocarbon charge comprising:

- contacting the charge and grains of a cracking catalyst, in ascending or descending flow in a tubular reactor, to crack the charge and give a spent catalyst with coke deposited thereon;
- separating, by ballistic means, the spent catalyst and the cracked charge in a separation zone containing a dilute fluidized phase located above a dense fluidized bed;
- mixing in said separation zone spent catalyst with grains of

an at least partially regenerated catalyst which has a temperature exceeding that of the spent catalyst, and which grains are distributed in said separation zone substantially homogeneously in the dilute fluidized phase above the dense fluidized bed and between the ballistic means and an upper surface of the dense fluidized bed;

stripping the spent catalyst in the dense fluidized bed by means of a fluid injected counter-current into the spent catalyst to give a stripped catalyst;

regenerating the stripped catalyst in a regeneration zone under conditions effective to result in combustion of the coke deposited thereon to give a regenerated catalyst; and recycling the regenerated catalyst to feed the reactor.

4,875,994

PROCESS AND APPARATUS FOR CATALYTIC CRACKING OF RESIDUAL OILS

James H. Haddad, 45 Van Wyck Dr., Princeton Junction, N.J. 08550; Hartley Owen, 5 Riverview Ter., Belle Mead, N.J. 08502, and Klaus W. Schatz, 136 Rolling Hill Rd., Skillman, N.J. 08549

Filed Jan. 10, 1988, Ser. No. 206,243

Int. Cl. C10G 11/18; B01J 38/34

U.S. Cl. 208—113

12 Claims

1. A process for the catalytic cracking of a heavy, metals laden hydrocarbonaceous feed by contacting a hot regenerated catalyst stream with the feed in a base of riser reactor, cracking the feed in the riser reactor at catalytic cracking conditions to form cracked products and coked catalyst containing metals, separating the coked catalyst from cracked products, stripping the coked catalyst with steam and regenerating the steam stripped catalyst regenerator with an oxygen-containing gas to form hot regenerated catalyst, characterized by:

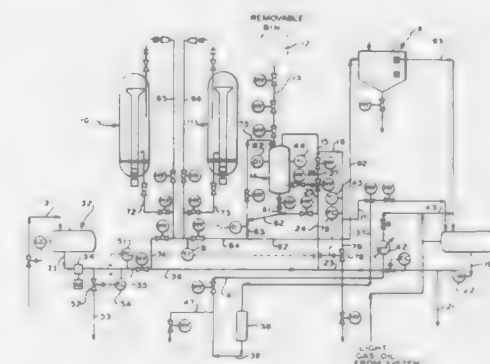
- (a) using a mixture of fluidizable catalytic cracking catalyst and a demetallizing additive, which mixture is resolvable by elutriation;
- (b) demetallizing the feed by contacting the feed in the base of the riser reactor with the demetallizing additive and removing a majority of the metals and some coke from the feed to produce a coked additive containing a majority of the metals content of the feed and a demetallized feed;
- (c) cracking the demetallized feed in the riser reactor with the hot regenerated cracking catalyst and discharging from the riser reactor cracked products and a mixture of coked cracking catalyst and coked additive;
- (d) regenerating the mixture in a first stage regenerator having a base, at least one inlet for coked catalyst and additive, an upper outlet and a lower outlet by adding the mixture to the first stage regenerator, contacting the mixture with an oxygen-containing gas at coke combustion conditions, segregating by elutriation a dense phase fluidized bed with an increased concentration of demetallizing additive, relative to the mixture discharged from the riser, to form a dense phase fluidized bed of regenerated demetallizing additive with a reduced coke content and partially regenerated catalytic cracking catalyst;
- (e) removing from the lower outlet of the first stage regenerator a regenerated demetallizing additive and recycling it to the base of the riser reactor;
- (f) removing from the upper outlet of the first stage regenerator the partially regenerated catalytic cracking catalyst and discharging it into a second stage regenerator;
- (g) regenerating the partially regenerated catalytic cracking catalyst with an oxygen containing gas in the second stage regenerator to produce regenerated catalytic cracking catalyst;
- (h) recycling regenerated catalytic cracking catalyst from the second stage regenerator to the riser reactor.

4,875,995
SOLID ADDITION AND WITHDRAWAL
Roger P. Van Driessen, Titusville; William R. Adams, Upper Montclair; Mario Baldassarri, Paramus; John Caspers, Basking Ridge, all of N.J., and Harold Trimble, Grove, Tex., assignors to Lummins Crest, Inc., Bloomfield, N.J.
Division of Ser. No. 811,491, Dec. 20, 1985, Pat. No. 4,744,887.
This application Feb. 8, 1988, Ser. No. 153,347

U.S. Cl. 208—152

Int. Cl. C10G 35/00

9 Claims



- 1. A catalyst withdrawal for withdrawing solids from at least one reactor comprising:
- at least one reactor;
- a catalyst withdrawal vessel;
- first conduit means for withdrawing a first stream comprising a reactor liquid and a solid from said at least one reactor;
- second conduit means for supplying a second stream comprising a transport liquid;
- third conduit means connected to the first and second conduit means and to the vessel, for combining said first stream with said second stream for introduction into the vessel;
- fourth conduit means for withdrawing a mixture of reaction liquid and transport liquid and transport liquid from the vessel;
- flow control means for controlling the flow of combined reaction liquid and transport liquid; and
- temperature sensing and control means for sensing the temperature in one of the third or fourth conduit means, said temperature sensing and control means being operatively connected to and controlling the flow control means to adjust flow of combined reaction liquid and transport liquid to maintain a set temperature in one of the third or fourth conduit means and thereby maintain a desired rate of withdrawal of the first stream.

4,875,996

METHOD FOR LIQUID FEED DISPERSION IN FLUID CATALYTIC CRACKING SYSTEMS

C. Richard Hale, San Rafael; Desmond F. King, El Sobrante; Frederick A. Pettersen, Novato, and Cathleen A. Shargay, Pleasant Hill, all of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 834,410, Feb. 28, 1986, abandoned.

This application Feb. 3, 1988, Ser. No. 153,478

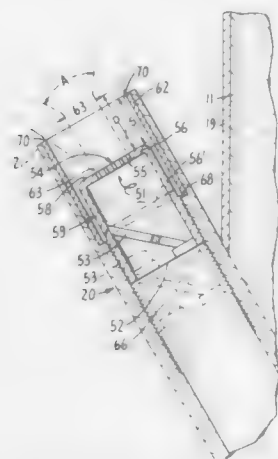
Int. Cl. C10G 11/18

U.S. Cl. 208—157

13 Claims

1. A method for liquid feed dispersion in fluid catalytic hydrocarbon cracking systems wherein heated catalyst is circulated through a riser reactor tube for contact with a liquid hydrocarbon feed, said liquid feed optionally including water or steam forming a part of said feed to improve atomization and/or vaporization by reducing the hydrocarbon partial pressure of said feed, comprising the steps of:

introducing said liquid hydrocarbon feed as an unconfined single-liquid phase stream into said riser reactor tube to contact a stream of heated catalyst particles flowing there-through by first imparting to said single-liquid phase stream free vortical rotation about its axis of flow, said vortical rotation being imparted solely by flow of said single-liquid phase stream through a cylindrical chamber positioned in line with and as a cylindrical extension of a conduit supplying said feed to said riser reactor; passing said single-phase liquid hydrocarbon feed stream during said free vortical rotation through a square-edged orifice having a diameter less than the diameter of said chamber and having a throat substantially shorter than said orifice diameter; maintaining the hydraulic pressure of said single-phase liquid stream flowing through said square-edged orifice to retain a generally cylindrical form of the vena contracta induced in said stream by free flow thereof through said square-



edged orifice for discharge into said riser reactor tube before dispersion solely by said vortical flow induced in said feed stream into a substantially uniform conical mist of liquid drops for contact with said stream of heated catalyst particles; concentrically surrounding said square-edged orifice and the vena contracta of said feed stream within a protective pipe over the length of the induced vena contracta and up to said uniform conical mist for dispersion of said liquid feed stream flowing from said orifice so that the discharged liquid disperses in said riser reactor tube without impingement against the inside of said protective pipe; and shielding at least the inner surface of said protective pipe and said nozzle against eddy currents of catalyst particles that may be created in the annular space between said protective pipe and said vena contracta of said feed stream to prevent catalyst erosion of said orifice and the inner surface of said pipe.

4,875,997

PROCESS FOR TREATING HYDROCARBONS CONTAINING MERCAPTANS

Virgil Langford, Great Falls, Mont., assignor to Montana Refining Company, Black Eagle, Mont.

Filed Nov. 17, 1988, Ser. No. 272,614
Int. Cl.⁴ C10G 19/02, 19/08

U.S. Cl. 208—235 36 Claims

1. A process for treating hydrocarbon streams containing mercaptans comprising the steps of:
(a) contacting a first mercaptan-containing hydrocarbon stream with a first aqueous alkaline solution stream to form a mercaptide-rich aqueous alkaline solution stream and a reduced-mercaptan hydrocarbon stream;
(b) combining said mercaptide-rich aqueous alkaline solution

stream with a second mercaptan-containing hydrocarbon stream and with oxygen to form a first mixture;
(c) oxidizing said mixture to form a second mixture of hydrocarbon, disulfides and aqueous alkaline solution; and
(d) separating said second mixture into a disulfide-containing hydrocarbon stream and a regenerated aqueous alkaline solution stream;
whereby said second hydrocarbon stream is sweetened and said mercaptide-rich aqueous alkaline solution is regenerated simultaneously in the same step.

4,875,998

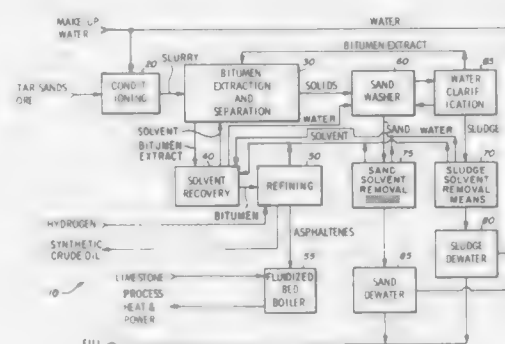
HOT WATER BITUMEN EXTRACTION PROCESS

John S. Readall, Albuquerque, N. Mex., assignor to Solv-Ex Corporation, Albuquerque, N. Mex.

Continuation-in-part of Ser. No. 930,018, Nov. 7, 1986, abandoned, which is a continuation of Ser. No. 757,677, Jul. 22, 1985, abandoned. This application Feb. 18, 1988, Ser. No. 137,489

Int. Cl.⁴ C10G 1/00
U.S. Cl. 208—390

15 Claims



1. A method of extracting bitumen oils from tar-sands ore comprising the steps of:

- a. an initial conditioning step comprising crushing tar-sands ore to yield solid particles of a maximum size required by a log washer conditioner in a second conditioning step;
- b. said second conditioning step comprising mixing said crushed solid particles with hot water, while excluding air and solvent therefrom to form a slurry of said solid particles and water, and agitating said slurry using a mechanical agitation means comprising said log washer conditioner;
- c. a bitumen extraction step comprising dissolving a quantity of bitumen oils from said slurry by adding a quantity of bitumen extract and a solvent, and allowing said solid particles and said bitumen oils to contact said bitumen extract and said solvent in said slurry for a time period whereby substantially all of said bitumen oils dissolve in said solvent;
- d. a bitumen separation step comprising separating said slurry into a bitumen extract phase comprising said bitumen oils, fines and water in said solvent and a wet solids component comprising sand, fines and water, using density separation means;
- e. a solvent recovery step comprising stripping and recovering said solvent and water from said bitumen extract phase for reuse in the method, thereby producing said bitumen oils free of said solvent and water;
- f. a sand washing and water clarification step comprising separating said wet solids component into a wet sand component, water, bitumen extract and a sludge component and recovering said water;
- g. a sand solvent recovery step comprising removing said solvent from said wet sand component to yield said solvent, wet sand and water; and

- h. a sludge solvent recovery step comprising removing said solvent from said sludge component to yield said solvent, sludge and water.

4,875,999

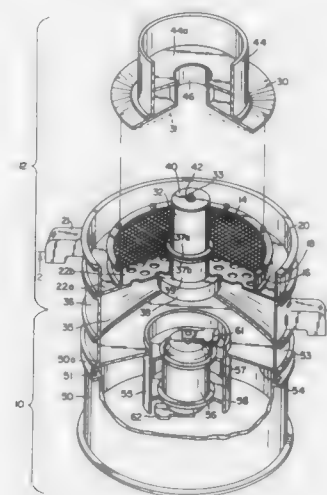
APPARATUS AND METHOD OF CLASSIFYING PARTICLES

William J. Haight, Pleasantville, N.Y., assignor to Mineral Recovery Corporation, Pleasantville, N.Y.

Continuation of Ser. No. 868,154, May 22, 1986, abandoned, which is a continuation of Ser. No. 616,782, Jan. 1, 1984, abandoned, which is a continuation of Ser. No. 475,960, Mar. 16, 1983, abandoned. This application Jul. 21, 1987, Ser. No. 77,049
Int. Cl.⁴ B07B 13/00

U.S. Cl. 209—245

26 Claims



1. In an apparatus for classifying particles and having a screen for separating undersized particles from a mass of particles carried thereby, the apparatus having means for imparting gyratory motion to the screen, said motion having a laterally eccentric component and a repetitive vertical component for fluidizing and resulting in directions of flow of particles on the screen and providing a radially directed throw, the improvement comprising:

- a lid overlying the screen, said lid defining with said screen a classification chamber and providing a reaction surface for contacting active particles in said chamber, said chamber having an exit for oversized particles located along the circumference of said apparatus; and
means for introducing particles into said chamber at a portion thereof located radially distant from said exit, and means for dispersing introduced particles across the surface of the screen toward said exit in a direction opposite to the direction of said throw.

4,876,000

POSTAL STAMP PROCESS, APPARATUS, AND METERING DEVICE, THEREFOR

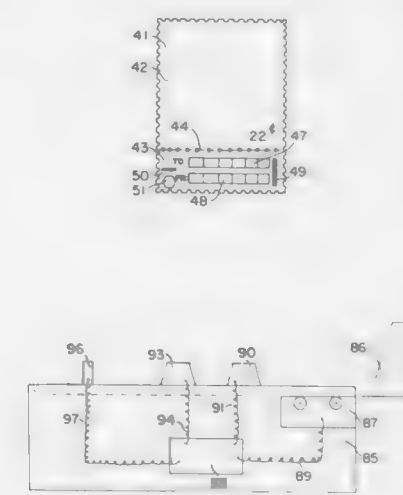
Ameer G. Mikhail, 2103 Windom Ct., Bel Air, Md. 21014
Continuation-in-part of Ser. No. 819,298, Jan. 16, 1986, Pat. No. 4,715,622. This application Aug. 28, 1987, Ser. No. 90,839

Int. Cl.⁴ B07C 5/00
U.S. Cl. 209—584

2 Claims

1. A mail sorting process for sorting mail, each mail piece having thereon at least one postal stamp, each postal stamp having at least two surfaces at least one of which is ungummed, said stamp being formed of at least two separate pieces, one piece of said stamp containing on its ungummed surface some markings that may define the attributes of said stamp, another piece of said stamp containing on its ungummed surface indicia for entering with a tool special codes identifying both the

origination and destination mailing centers where such entering can be detected and read by a scanning device, the same piece of said stamp having at least one distinct marking printed for use as a reference frame to alert said scanning device in determining the location and orientation of said special codes of each of said origination and said destination mailing centers, said same piece of said stamp having a different marking printed thereon which defines the monetary value of said stamp, said marking being detectable and readable by either said scanning device or by a similar scanning device, the process comprising the steps of: triggering the scanning device of a scanning machine by the reference frame markings printed on the stamps affixed on a mail piece to be sorted in association with both the origination and destination identifier codes,



reading identifier codes at any orientation angle and the postal monetary value marking printed on each stamp by another scanning device, storing the read information temporarily in said machine, adding up the total monetary value of said stamps, storing this added up monetary value temporarily, calculating the postal distance between two read origination and destination codes based on preset tables, weighing the mail piece and storing the weight value temporarily, computing the postage fee value by employing the postal distance and the measured weight and storing said values temporarily, comparing the read total postage value affixed to said mail piece to the required postage fee value as compared earlier, and marking the mail piece before routing to a special container for further special processing if the comparison indicates that postage is due.

4,876,001

APPARATUS FOR USE WITH A POOL CLEANER

Carl F. W. Supra, Raanburg, South Africa, assignor to Liberty Pool Products S.A., Switzerland

Filed Apr. 6, 1987, Ser. No. 34,986

Claims priority, application South Africa, Apr. 4, 1986, 86/2501; Apr. 23, 1986, 86/3024

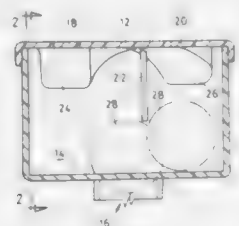
Int. Cl.⁴ E04H 3/20

U.S. Cl. 210—123

12 Claims

1. Apparatus for use with a swimming pool cleaner, which includes a housing which defines a chamber, a first opening which is formed through a wall of the housing to the chamber and which is adapted to be connected to a water suction source, first and second inlets including at least a second opening which is formed through the wall of the housing to the chamber and which permits water flow into the chamber, and a valve means for alternately sealing the first opening and

leaving the first opening unsealed, each time water commences to flow from the second to the first opening, respectively,



said valve means including a buoyant body and means for drawing the buoyant body to the first opening by water flow and for causing the body to rise away from the first opening when the water flow ceases.

4,876,002

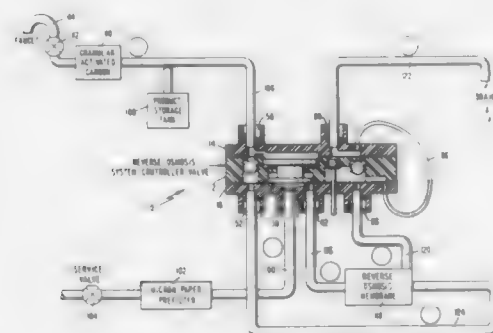
REVERSE OSMOSIS WATER PURIFICATION UNIT

John D. Marshall, and Thomas N. McInnis, both of Montgomery, Ala., assignors to Schlumberger Industries, Inc., Atlanta, Ga.
Filed Jan. 13, 1988, Ser. No. 205,751

Int. Cl. 4 B01D 13/00

U.S. Cl. 210-136

19 Claims



15. A control valve mechanism for a reverse osmosis water purifying system comprising:

- (a) a body plate having a pair of substantially parallel planar surfaces; an upper housing plate having at least one planar surface; a lower housing plate having at least one planar surface; said body plate and upper and lower housing plates being assembled together in sandwich fashion with their planar surfaces in facing disposition;

- (b) first valve means within said sandwiched plates; said first valve means comprising:

- (i) piston means having an upper piston end of a first diameter, a lower piston end of a second smaller diameter and an intermediate piston portion of still smaller diameter joining the piston ends; said piston ends and intermediate portion being coaxially aligned on an axis substantially perpendicular to said planar surfaces;

- (ii) a first cylindrical cavity in said body plate receiving said upper piston end for reciprocable motion therein; a second cylindrical cavity in said body plate coaxial with said first cavity receiving said lower piston end for reciprocable motion therein; and a third cylindrical cavity in said body plate coaxial with and connecting said first and second cavities and receiving said intermediate piston portion for reciprocable motion therein; said piston ends having end surfaces which are substantially parallel to said planar surfaces; spring means disposed between said upper piston end and the floor of said first cavity in said body plate; said

spring means urging said piston assembly towards said upper housing plate;

- (iii) said housing plate having a cylindrical cavity overlying said first cavity in said body plate and being of substantially the same diameter and coaxially aligned therewith;

- (iv) said lower housing plate having a cylindrical cavity underlying said second cavity in said body plate and being of substantially the same diameter and coaxially aligned therewith;

- (v) said cylindrical cavity in said lower housing plate having a floor generally perpendicular to the axis of said cylindrical cavity;

- (vi) a circular rib extending upward from said floor to the substantially planar surface of said lower housing plate;

- (vii) said lower housing plate having a first port providing communication with said cylindrical cavity within the periphery of said rib and a second port providing communication with said cylindrical cavity outside the periphery of said rib;

- (c) second valving means within said sandwiched plates comprising:

- (i) first check ball means carried by said body plate within a cylindrical check ball cavity having an axis substantially parallel to the axis of said piston assembly;

- (ii) a port in said upper housing plate communicating with said cylindrical check ball cavity in said body plate;

- (iii) a port in said lower housing plate communicating with said cylindrical check ball cavity in said body plate;

- (iv) said upper housing plate having passage means extending from said port communicating with said cylindrical check ball cavity in said body plate; said passage means providing communication between said port and said cylindrical cavity in said upper housing plate overlying said first cavity in said body plate;

- (d) third valve means within said sandwiched plates comprising:

- (i) second check ball means carried by said body plate in a cylindrical check ball cavity having an axis substantially parallel to the axis of said piston assembly;

- (ii) port means in said lower housing plate communicating with said cylindrical check ball cavity in said body plate;

- (iii) said lower housing plate having a first tube port therein communicating with said cylindrical check ball cavity in said body plate;

- (iv) said upper housing plate having an effluent cavity therein facing said body plate and having a second tube port connected to said effluent cavity;

- (e) fourth valve means within said sandwiched plates comprising:

- (i) a flush valve including a rectilinear operating member extending through an aperture in said lower housing plate; a plug end mounted at the upper end of said operating member and received in a cylindrical flush cavity in said body plate for reciprocating motion into and out of said cavity; said body plate having passage means interconnecting said flush cavity and said cylindrical check ball cavity for said second check ball means.

4,876,003

ENCASED POOL CHEMICAL TABLET WITH DOMED ENDS

John M. Casberg, Cheshire, Conn., assignor to Olin Corporation, Cheshire, Conn.

Filed May 9, 1988, Ser. No. 191,640

Int. Cl. 4 C02F 1/76

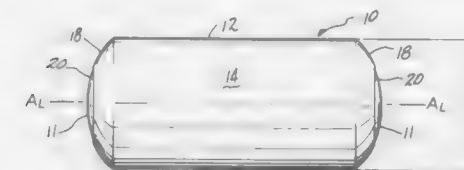
U.S. Cl. 210-169

19 Claims

1. A halogen compound containing chemical tablet for dissolution in a surrounding body of water comprising in combination:

- (a) an elongate halogen containing tablet of a length longer than its thickness, the tablet having an elongate central section connecting two opposing obliquely tapered ends along a longitudinal axis; and

- (b) an elongate tablet shell encasing the tablet having an elongate central section connecting two opposing obliquely tapered ends, the ends each having an opening



therein centered on the longitudinal axis of the tablet and forming an inwardly sloping and an obliquely angled junction with the shell's elongate central section, the tablet shell fitting securely about the tablet.

4,876,004

TOPOLOGICAL SEPARATOR

Abraham Verhoeff, Toronto, Canada, assignor to Shell Canada Limited, Toronto, Canada and Shell Explorer Limited, Houston, Tex.

Continuation of Ser. No. 274,930, Jun. 18, 1981, abandoned, which is a continuation of Ser. No. 111,493, Jan. 10, 1980, abandoned. This application May 16, 1988, Ser. No. 196,801

Int. Cl. 4 E02B 3/20

U.S. Cl. 210-170

2 Claims



1. Apparatus for collecting a floating pollutant on a liquid surface comprising a weir dam having an upstream side and a sloped downstream side; a first pollutant impermeable baffle closely adjacent to the downstream side of the weir dam; a pool of liquid on the downstream side of said weir dam, said baffle partly extending into the top of the pool of liquid; means for flowing the pollutant and liquid over the weir dam, said baffle partly extending into the top of the pool of liquid; means for flowing the pollutant and liquid over the weir dam, then between the sloped downstream side of the weir dam and the pollutant impermeable baffle and into the pool; a second pollutant impermeable baffle extending into the top of the pool downstream of the first baffle and functionable to collect pollutant between the two baffles; a second weir dam having sloped upstream and downstream sides and being located downstream of the second baffle, the top of the second weir dam being below the top of the first weir dam; and the two dams having a contoured bottom therebetween.

4,876,005

HIGH PRESSURE COLUMN ASSEMBLY FOR A LIQUID CHROMATOGRAPHY SYSTEM

William G. America, Danbury, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Continuation of Ser. No. 155,394, Feb. 12, 1988, abandoned.

This application Dec. 8, 1988, Ser. No. 281,374

Int. Cl. 4 B01D 15/08

U.S. Cl. 210-198.2

9 Claims

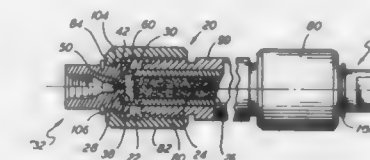
1. In combination in a liquid chromatography column assembly including a hollow cylindrical separation column containing a packing material constituting the stationary phase, a liquid permeable discoid frit mounted at each end of the column for retaining the packing material, and a cylindrical hous-

ing enveloping the column, a column coupling assembly for each end of said column, comprising:

- a tubular coupler member having at one end a concentric radially outwardly extending annular flange disposed coaxially with said column and with the front face of the flange in confronting relation to the end of said column, said front face containing a concentric annular groove radially disposed to be in apposition to the end of said column and the outermost circumferential portion of said discoid frit;

an annular gasket member disposed in said groove and projecting beyond said face of the flange;

a cylindrical collar member having an inwardly extending radial flange at one end, disposed in coaxial relation to said coupler member and said housing, the inwardly extending



radial flange of said collar member and outwardly extending annular flange of said coupler member having radial dimensions such as to place the respective back faces of said flanges in apposition, the inner diameter of the collar member flange being sufficient to accommodate passage of said tubular coupler member except for the outwardly extending flange thereof; and

means for threadedly coupling said collar member to the end of said housing member, whereby rotation of the collar in one direction relative to the housing member produces axial relative displacement therebetween with concomitant engagement of said apposing flange back faces toward each other and compression of said gasket against the end of said column and circumferential portion of said frit without substantial rotational displacement of said gasket relative to said column end.

4,876,006

HOLLOW FIBER FILTER DEVICE

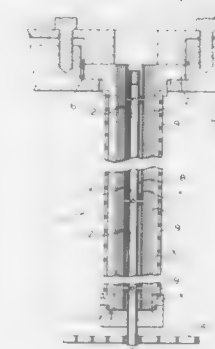
Kazuo Ohkubo, Tadamas Hayashi, and Hiroshi Nagai, all of Tokyo, Japan, assignors to Ebara Corporation, Tokyo, Japan
Continuation of Ser. No. 915,232, Oct. 3, 1986, abandoned. This application Apr. 19, 1988, Ser. No. 186,707

Claims priority, application Japan, Oct. 8, 1985, 60-222860; Oct. 24, 1985, 60-236402

Int. Cl. 4 B01D 13/00

U.S. Cl. 210-321.69

10 Claims



1. A hollow fiber filter device comprising:
a filter casing, a separating plate extending across said casing

for separating the casing into a filtering chamber defined on one side of said plate and a filtered liquid chamber on the other side of said plate, an inlet port extending through said filter casing and in communication with said filtering chamber, and an outlet port extending through said filter casing and in communication with said filtered liquid chamber;

a plurality of filter modules each extending from said separating plate into said filtering chamber, each of said filter modules comprising a fiber bundle plate supported on said separating plate, a plurality of elongated hollow fibers connected to and extending from said fiber bundle plate into said filtering chamber, said fibers having respective open first ends open to said filtered liquid chamber and respective open second ends opposite said first ends, a space forming means enclosing said second ends of said fibers and spaced therefrom for establishing a space open to said second ends that is sealed from said filtering chamber, a single pipe operatively connected to said fiber bundle plate and extending through a central portion of said plurality of fibers and between said fibers bundle plate and said space forming means for placing said space in communication with said filtered liquid chamber, and an air pipe extending through said single pipe; an air injection pipe in said filtering chamber for introducing air into said filtering chamber; an air distributor plate disposed in said filtering chamber between said modules and said air injection pipe for distributing the air introduced into said filtering chamber by said air injection pipe over an area at which said modules are disposed; and said air pipe having a closed first end, an open second end extending through said space forming means and through said air distributor plate, and plural air injection nozzles extending through and open at the exterior of said single pipe.

4,876,007

PLATE-TYPE FILTER CARTRIDGE WITH INTERNAL SUPPORT

Kyotchi Naruo, Sumio Ohtani, Masahiro Etoh, Masao Tsuruta, Ikuro Moriya, Masanori Ishiguro, and Akira Matsumoto, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

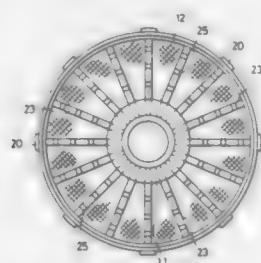
Filed Aug. 28, 1987, Ser. No. 90,474

Claims priority, application Japan, Aug. 28, 1986, 61-200179; Sep. 17, 1986, 61-217302; Sep. 17, 1986, 61-217304

Int. Cl.⁴ B01D 29/34

U.S. Cl. 210—339

7 Claims



1. A plate-type filter cartridge comprising at least one plate-type filtration unit, said filtration unit comprising: an internal support; a pair of filtration membranes disposed at upper and lower portions of said internal support such that said internal support extends in between said pair of filtration membranes; and a pair of first netty members formed from fibrous material provided respectively between and contacting said internal support and respective ones of said filtration membranes for holding said filtration membranes to thus form

said filtration unit, wherein said internal support comprises a central cylindrical member, an outer rim and a plurality of spokes integral with said cylindrical member and said outer rim and extending in the radial direction of said filtration unit between said cylindrical member and said outer rim.

4,876,008

SIEVE PLATE

Tim Tilkkanen, Benalmadena, Spain, assignor to Panel International Ltd. p.l.c., London, England

Filed Oct. 6, 1988, Ser. No. 254,043

Int. Cl.⁴ B01D 39/10

U.S. Cl. 210—493

1 Claim



2. A sieve plate adapted to be placed across a flow of slurry and defining downstream and upstream sides, said sieve plate comprising a sheet of metal formed with a plurality of spaced relatively broad grooves on the downstream side, the thickness of the sheet measured from a bottom surface of said groove to the upstream side of the plate being about 1 mm, the sheet also being formed with a plurality of elongate slots through the sheet at the bottom surface of the grooves, the slots being of a width of about 0.05 to 1 mm, the slots being arranged in a zig-zag fashion in the individual grooves.

4,876,009

TETRAKIS-AMIDO HIGH FLUX MEMBRANES

Scott B. McCray, Bend, Oreg., assignor to Bend Research, Inc., Bend, Oreg.

Filed Oct. 21, 1988, Ser. No. 260,585

Int. Cl.⁴ B01D 13/00, 13/01

U.S. Cl. 210—500.33

8 Claims

1. A composite reverse osmosis membrane comprising a microporous polymeric support and the polyamide reaction product of a tetrakis-aminomethyl compound of the formula $C-NHMe)_4$ with an aromatic polyacylhalide of the formula $Ar-COX)_n$ where Me is methyl, Ar is aryl, X is halide and n is 2 or 3.

4,876,010

WASTE TREATMENT CLEANER APPARATUS

Dana Riddle, 230 Pineland Dr., Smyrna, Ga. 30082

Filed Oct. 3, 1988, Ser. No. 252,117

Int. Cl.⁴ B01D 23/00

U.S. Cl. 210—525

12 Claims

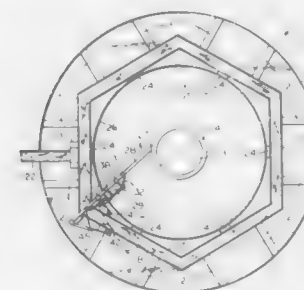
1. For use in a settling tank having a substantially cylindrical outer wall, a centrally located rotatable member, an effluent channel having a plurality of surfaces with said channel being concentrically located with respect to the rotatable member between the rotatable member and the outer wall and drain means for the channel; cleaning means for cleaning at least one of the surfaces of the channel comprising:

- a sweep arm affixed to the rotatable member at one end and extending toward the outer wall of the tank along a longitudinal axis, said sweep arm having a distal end located adjacent the outer wall;
- a first cleaning member mounted on said sweep arm and extending toward the channel surface to be cleaned;

biasing means for maintaining a portion of said cleaning member in contact with the surface to be cleaned during rotation of the rotatable member;

said first cleaning member comprising a cleaner arm pivotally mounted at one end to said sweep arm and a scrubbing member mounted to the distal end of said cleaner arm, said scrubbing member being maintained in contact with the surface to be cleaned by said biasing means;

said cleaner arm being pivotally mounted to said sweep arm by a clamp member adapted to move about the said longitudinal axis of said sweep arm.



member mounted to the distal end of said cleaner arm, said scrubbing member being maintained in contact with the surface to be cleaned by said biasing means;

said cleaner arm being pivotally mounted to said sweep arm by a clamp member adapted to move about the said longitudinal axis of said sweep arm.

4,876,011

OIL RECOVERY APPARATUS

Peter Betts, Prior Lake, and Darrell D. Jahn, Shakopee, both of, assignors to Donaldson Company, Inc., Minneapolis, Minn.

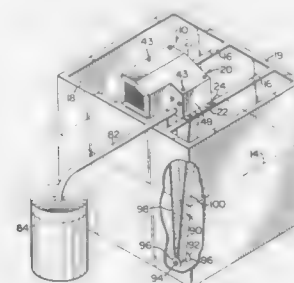
Continuation of Ser. No. 866,140, May 22, 1986, abandoned.

This application May 17, 1988, Ser. No. 196,758

Int. Cl.⁴ C02F 1/40

U.S. Cl. 210—526

12 Claims



1. An apparatus for skimming oil from the surface of a liquid, said apparatus comprising:

- an endless belt of hydrophobic non-absorbent material formed from a plurality of densely packed loops from the loop portion of a hook and loop type fastener;
- support means for supporting a first portion of said belt above said liquid;
- submersion means for submersing a second portion of said belt within said liquid;
- drive means for urging said belt to travel about said support means and said submersion means with said support means and said submersion means dividing said belt into two runs including a first run moving from said support means to said submersion means and a second run moving from said submersion means to said support means with said oil captured on said second run;
- means for separating said captured oil from said second run above said liquid; and
- means for collecting said separated oil.

4,876,012

HOLLOW FIBRE FILTER CARTRIDGE AND HEADER

Clinton V. Kopp, Castle Hill; Dennis Roberts, Berowra Heights; Bruce G. Biltott, Annandale, and Victor White, Lane Cove, all of Australia, assignors to Memtec Limited, Parramatta, Australia

PCT No. PCT/AU87/00309, § 371 Date May 6, 1988, § 102(e)

Date May 6, 1988, PCT Pub. No. WO88/01895, PCT Pub.

Date Mar. 24, 1988

PCT Filed Sep. 10, 1987, Ser. No. 236,671

Claims priority, application Australia, Sep. 12, 1986, PH7971

Int. Cl.⁴ B01D 13/00

U.S. Cl. 210—644

31 Claims



1. A filter unit comprising:

- (i) an elongated open-ended casing having transfer ports adjacent each end thereof to provide fluid communication between the outside and inside of the casing;
- (ii) a bundle of hollow, porous, polymeric fibres within the casing;
- (iii) a first plug at one end of the casing in which one end of the bundle of fibres is embedded whereby the plug prevents flow of fluid out said one end of the casing other than through the lumens of the fibres;
- (iv) means for preventing substantial flow of fluid out of said casing other than through the lumens of said fibres within said casing and which includes a second plug closing the other end of the casing for preventing the flow of feed through the end of the casing;
- (v) a first transfer header at said one end of the casing and including:
 - (a) a body portion that encloses said one end of the casing;
 - (b) a feed passageway extending through said first header having an inlet at one end for receiving feed to be treated, an outlet at the other end adapted to be connected to the inlet of the feed passageway of an adjacent first header and a discharge port for delivering feed to the casing;
 - (c) an inlet chamber in fluid communication with the discharge port of the feed passageway and the transfer port at said one end of the casing;
 - (d) an outlet chamber for receiving filtrate from the open ends of the fibre lumens, and;
 - (e) a filtrate passageway extending through said first header having a receiving port for receiving filtrate from the outlet chamber, an outlet at one end for discharging filtrate and an inlet at the other end adapted to be connected to the outlet of the filtrate passageway of an adjacent first header;
- (vi) a second transfer header at the other end of the casing and including:
 - (a) a body portion that encloses said other end of the casing;

- (b) an outlet chamber for receiving treated feed from the transfer port at said other end of the casing, and,
- (c) a treated feed passageway extending through said second header having a receiving port for receiving treated feed from the outlet chamber, an outlet at one end for discharging treated feed and an inlet at the other end adapted to be connected to the outlet of the feed passageway of an adjacent second header.
23. A bank of filter units wherein each filter unit comprises:
- an elongated open-ended casing having transfer ports adjacent each end thereof to provide fluid communication between the outside and inside of the casing,
 - a bundle of hollow, porous, polymeric fibres within the casing,
 - a first plug at one end of the casing in which one end of the bundle of fibres is embedded whereby the plug prevents flow of fluid out said one end of the casing other than through the lumens of the fibres,
 - means for preventing substantial flow of fluid out of said casing other than through the lumens of said fibres within said casing and which includes a second plug closing the other end of the casing for preventing the flow of feed through the end of the casing,
 - a first transfer header at said one end of the casing and including:
 - a body portion that encloses said one end of the casing,
 - a feed passageway extending through said first header having an inlet at one end for receiving feed to be treated, an outlet at the other end adapted to be connected to the inlet of the feed passageway of an adjacent first header and a discharge port for delivering feed to the casing,
 - an inlet chamber in fluid communication with the discharge port of the feed passageway and the transfer port at said one end of the casing,
 - an outlet chamber for receiving filtrate from the open ends of the fibre lumens, and,
 - a filtrate passageway extending through said first header having a receiving port for receiving filtrate from the outlet chamber, an outlet at one end for discharging filtrate and an inlet at the other end adapted to be connected to the outlet of the filtrate passageway of an adjacent first header,
 - a second transfer header at the other end of the casing and including:
 - a body portion that encloses said other end of the casing,
 - an outlet chamber for receiving treated feed from the transfer port at said other end of the casing, and,
 - a treated feed passageway extending through said second header having a receiving port for receiving treated feed from the outlet chamber, an outlet at one end for discharging treated feed and an inlet at the other end adapted to be connected to the outlet of the feed passageway of an adjacent first header and the filters are connected together by said headers so that the feed passageways and filtrate passageways are connected in series whereby each filter may be supplied from the one source of feed with a portion of the feed being introduced into the inlet chamber of each filter, the filtrate from each filter is directed to the interconnected filtrate passageways and the treated feed from each filter is directed to the interconnected treated feed passageways.
27. A method of operating a filter unit which utilizes fibre lumens and which comprises:
- draining the fibre lumens of filtrate,
 - terminating the feed flow with feed remaining on the feed side of the filter and applying gas to the lumens to pressurize the filter,
 - releasing the pressure on the feed side of the filter while maintaining the gas pressure and while there is no flow of feed,
 - resuming flow of feed and maintaining gas pressure in

- the lumens to carry substantially all of the accumulated detritus out of the filter,
- removing the gas pressure from the filtrate side of the filter and filtrate allowed to refill the lumens, and
 - pressurizing the filter so as to replace the gas in the pores of the membrane with liquid.

4,876,013

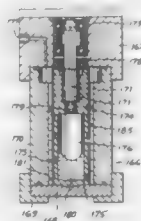
SMALL VOLUME ROTARY FILTER

Ioiaf Schmidt, Brooklyn, and Mario Badiali, Bronx, both of N.Y., assignors to Membrex Incorporated, Garfield, N.J.
Division of Ser. No. 61,007, Jun. 10, 1987, Pat. No. 4,790,942, which is a continuation of Ser. No. 684,304, Dec. 20, 1984, abandoned, which is a continuation-in-part of Ser. No. 563,319, Dec. 20, 1983, abandoned. This application Feb. 26, 1988, Ser. No. 160,693

Int. Cl.⁴ B01D 13/00

U.S. Cl. 210—650

19 Claims



1. A rotary vertical filtration device for separating small volumes of liquid into permeate and concentrate portions, the concentrate not filtered by the end of separation being the retentate, said device having a very small minimum retentate volume and no bottom dynamic seal and comprising:

- a rotor member having a top portion, an essentially cylindrical or conical outer wall, a vertical longitudinal central axis of rotation, and a bottom wall through which permeate cannot be removed;
- a housing with an essentially cylindrical or conical having a top, a side, and a bottom defined by (i) a top housing member, (ii) an essentially cylindrical or conical housing inner wall larger in diameter than the rotor member, and (iii) a bottom housing member, the rotor member being rotatably connected to the housing and being within the cylindrical or conical cavity, the cavity having a vertical longitudinal axis substantially parallel to the longitudinal axis of the rotor member, the essentially cylindrical or conical housing inner wall corresponding to and being closely spaced from the corresponding portion of the cylindrical or conical outer wall of the rotor member to define an essentially cylindrical or conical narrow gap between said inner and outer walls;
- a filter that allows permeate to pass through it mounted on the cylindrical or conical outer wall of the rotor member or on the cylindrical or conical inner wall of the housing, the filter having a filtration area whose lower extent is very close to the bottom housing member to minimize the minimum retentate volume of the cavity, which retentate cannot be filtered because that minimum volume is below the lower extent of the filtration area;
- entry means to allow liquid to enter the gap; and
- means to rotate the rotor member so that the calculated Taylor number for liquid in the gap is greater than about 40.

4,876,014

METHOD AND APPARATUS FOR PRODUCING ULTRAPURE WATER

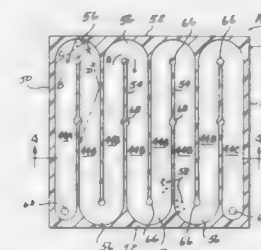
William S. Mason, Warren, Mich., assignor to Water Systems Development Corporation, Fraser, Mich.

Filed Mar. 21, 1988, Ser. No. 170,948

Int. Cl.⁴ C02F 9/00

U.S. Cl. 210—668

16 Claims



1. A method for purifying aqueous media comprising the steps of:

- orienting the aqueous media in a steady stream;
- introducing the stream sequentially into a plurality of purification zones, the purification zones containing granular purification media contained in fixed beds and a plurality of stream-deflecting, turbulence inducing elements disposed therein;
- contacting the turbulent aqueous stream to be purified with activated carbon contained within at least the first purification zone; and then
- contacting the turbulent aqueous stream with a plurality of ion exchange resins, the total ion exchange resin comprising from about 40 to about 80% of an anionic exchange resin, from about 20 to about 60% of the ion exchange resin being a cationic exchange resin and the remainder being a mixed cationic-anionic ion exchange resin.

4,876,015

METHOD AND APPARATUS FOR RECLAIMING USED HYDRAULIC FLUID

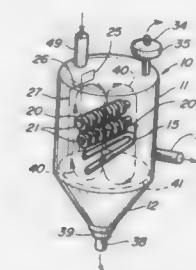
Kenneth D. McKibben, Defiance, Ohio, assignor to CMI International, Inc., Southfield, Mich.

Filed Aug. 19, 1988, Ser. No. 233,734

Int. Cl.⁴ B03C 1/30

U.S. Cl. 210—695

16 Claims



1. A method for reclaiming oil by removing therefrom foreign materials including water, sludge, dirt, metal particles and other foreign materials, comprising:

- providing a vertically axed tank whose upper portion forms a circulation chamber and whose lower portion forms a settling bowl;
- placing a batch of oil to be reclaimed into the tank;
- applying low-temperature heat to the oil in a heat zone extending transversely of the tank and located near the bottom of the tank upper portion;

maintaining the tank lower portion at a lower temperature than the heat zone;

circulating the heated oil in a generally vertical, closed loop path, upwardly from the heat zone towards the top of the tank upper portion and downwardly towards the heat zone by the application of said heat to the oil;

subjecting the circulating fluid within the tank upper portion to a magnetic field arranged within the tank above the heat zone and formed by magnets for attracting and immobilizing ferrous metal particles carried by the oil, so as to remove such particles from the oil;

permitting foreign particles mixed into the oil to settle, by gravity, downwardly into the tank lower portion while the oil is circulated within the tank upper portion;

pumping the oil from the tank upper portion after a predetermined period of circulation therein; and

draining the tank lower portion from its bottom from time to time, but at a time when the tank upper portion has been pumped out for removing oil and foreign material accumulated in the tank lower portion.

4,876,016

METHOD OF CONTROLLING THE SEPARATION EFFICIENCY OF A HYDROCYCLONE

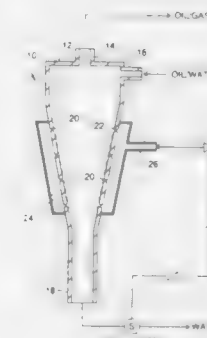
Grant A. Young, Tulsa; William D. Wakley, Broken Arrow, and Steven L. Andrews, Tulsa, all of Okla., assignors to Amoco Corporation, Chicago, Ill.

Filed Jun. 27, 1988, Ser. No. 211,539

Int. Cl.⁴ C02F 1/38; B01D 17/038; B04C 5/18, 11/00

U.S. Cl. 210—739

9 Claims



1. A method of controlling the quantity of a first liquid being discharged with a denser second liquid from a hydrocyclone, the hydrocyclone including a conical body with an upper liquid mixture inlet, a drive fluid inlet spaced below the liquid mixture inlet, an upper overflow outlet for discharge of the first liquid in the drive fluid, and a lower underflow outlet for discharge of the second liquid, the method comprising:

- monitoring the quantity of the first liquid being discharged with the second liquid from the lower underflow outlet; and
- if the monitored quantity of the first liquid being discharged with the second liquid is outside prescribed limits, then varying the quantity of the drive fluid introduced into the conical body to minimize the quantity of the first liquid being discharged with the second liquid from the lower underflow outlet.

4,876,017

USE OF POLYALPHAOLEFIN IN DOWNHOLE DRILLING

David O. Trahan, Rte. 2, Box 2210, Abbeville, La. 70510, and Michael B. Faulk, Rte. 2, Box 92, Kaplan, La. 70548
Filed Jan. 19, 1988, Ser. No. 145,149

Int. Cl.⁴ C09K 7/06, 7/02; E21B 31/03

U.S. Cl. 252-8.51 9 Claims

1. A drilling fluid composition of matter for lubricating drill pipe during drilling, the composition of matter comprising:

- (a) a water base mud system; and
(b) a polyalphaolefin and emulsifier added to the water base mud system as a liquid with the polyalphaolefin in a 2 to 10 centistoke viscosity range.

2. A process for unsticking drill pipe when employing a water base mud system, where the drill pipe has become stuck against a formation due to differential pressure between the formation and the drill pipe, the process comprising the following steps:

- (a) locating a point downhole where the drill pipe has become stuck against the formation;
(b) combining a liquid polyalphaolefin in a 2 to 10 centistoke viscosity range with an emulsifier; and
(c) introducing a certain volume of the liquid polyalphaolefin-emulsifier combination downhole to the depth of the point of the stuck pipe and in a quantity sufficient to unstuck the pipe.

4,876,018

USE OF ORGANIC FLUORO-CHEMICAL COMPOUNDS WITH OLEOPHOBIC AND HYDROPHOBIC GROUPS IN ASPHALTENIC CRUDE OILS AS VISCOSITY REDUCING AGENTS

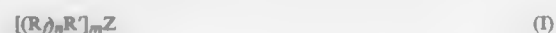
Athanasios Karydas, Brooklyna, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 892,213, Jul. 31, 1986, Pat. No. 4,769,160. This application Jan. 19, 1988, Ser. No. 145,434. The portion of the term of this patent subsequent to Aug. 30, 2005, has been disclaimed.

Int. Cl.⁴ E21B 37/06, 43/22; F17D 1/17

U.S. Cl. 252-8.551 10 Claims

3. A method of reducing the viscosity of an asphaltenic crude oil comprising incorporating into said crude oil an effective viscosity reducing amount of an oil soluble organic compound of the formula



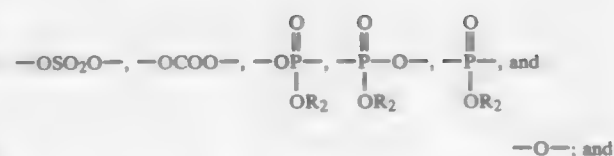
wherein

n is an integer of 1-3;

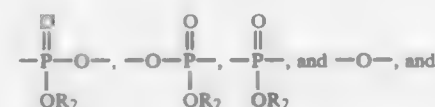
m is an integer of 1-5000;

R_f is an inert, stable, oleophobic and hydrophobic fluoroaliphatic group having about 4 to about 20 carbon atoms;R' is a direct bond or an organic linking group having a valency of n+1 and is covalently bonded to both R_f and Z, and (a) when n is 1 R' is selected from

- (i) -C₁-C₈ alkylene-, -phenylene-, -C₁-C₈alkylene-R₁-C₁-alkylene-, -C₃-C₈ alkylene-R₁-, -C₁-C₈alkylene-R₁'-, -R₁-C₁-alkylene-, -R₁-C₁-alkylene-R₁'-, -R₁-, -R₁-phenylene-, -R₁-phenylene-R₁'-, -R₁-phenylene-C₁-alkylene-, and -phenylene-R₁- wherein in each case, said alkylene is straight, or branched, or cyclic and in each case said alkylene and phenylene are independently unsubstituted or substituted by hydroxy, halo, nitro, carboxy, C₁-alkoxy, amino, C₁-alkanyl, C₁-carbalkoxy, C₁-alkanyloxy, or C₁-alkanoylamino and said R₁ and R₁' are each independently selected from -NR₂-, -CO-, -N(R₂)CO-, -CON(R₂)-, -N(R₂)COO-, -OOCN(R₂)-, -S-, -SO-, -SO₂-, -N(R₂)SO₂-, -SO₂N(R₂)-, -N(R₂)CON(R₂)-, -COO-, -OOC-, -SO₂O-, -OSO₂-,

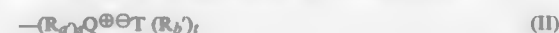


R₁' is selected from -NR₂-, -CO-, -N(R₂)CO-, -CON(R₂)-, -NR₂COO-, -OOCN(R₂)-, -S-, -SO-, -SO₂-, -N(R₂)SO₂-, -SO₂N(R₂)-, -N(R₂)CON(R₂)-, -COO-, -SO₂O-, -OSO₂-, -OSO₂O-, -OOCO-,

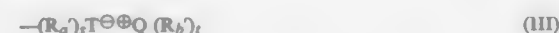


R₂ is H, C₁-6 alkyl which is unsubstituted or substituted by C₁-6 alkoxy, halo, hydroxy, carboxy, C₁-C₆ carbalkoxy, C₁-6 alkanoylamino, or C₁-6 alkanoyloxy; or the nitrogen to which R₂ is attached is quaternized by further being bound to R₃ which R₃ is H, C₁-6 alkyl hydroxy-, C₁-6 alkyl, C₁-6 alkoxy-, C₁-6 alkanoyloxy, or C₁-6 carbalkoxy, the charge of the quaternized nitrogen being balanced by an anion; and

(ii) an ionically bridged group of the formulae



or



wherein

R_a' is -C₁-8 alkylene-, -phenylene-, -C₃-8 alkylene -R₁-C₁-8 alkylene-, -R₁-C₃-8 alkylene-, -R₁-phenylene-, or -R₁-phenylene-C₁-8 alkylene-; R_b' is -C₁-8 alkylene-, -phenylene-, -C₁-8 alkylene -R₁- C₁-8 alkylene-, -C₁-8 alkylene-R₁-, -phenylene-R₁-, or -C₁-8 alkylene-phenylene-R₁-. S and T are each independently zero or 1; and within said R_a' and R_b', said alkylene and phenylene groups are unsubstituted or substituted by hydroxy, halo, nitro, carboxy, C₁-6 alkoxy, amino, C₁-6 alkanoyl, C₁-6 carbalkoxy, C₁-6 alkanoyloxy, or C₁-6 alkanoylamino;

T is a phenolic hydroxyl residue, carboxy, a sulfoxy, a sulfato, or a phosphono group; and

Q is -N(R₂)₂R₃;

(b) when n is 2, R' is selected from the trivalent analogs of the groups within (a) above and further selected from C₁-2 alkylene-OOC- which is unsubstituted or substituted by hydroxy, halo, nitro, carboxy, C₁-6 alkoxy, amino, C₁-6 alkanoyl, C₁-6 carbalkoxy, C₁-6 alkanoyloxy, or C₁-6 alkanoylamino and still further selected from radicals of the formula



where u, v, and w are independently 0 or 1 and R₀ is alkanetriyl, arenetriyl, or aralkanetriyl, each having up to 18 carbon atoms and each being uninterrupted or interrupted by -O-, -S-, or -N(R₂)-; and

(c) when n is 3, R' is selected from the tetravalent analogs of the groups within (b) above; and

Z is a hydrocarbyl containing residue having a valency of n and is sufficiently oleophilic so as to impart an oil solubility to said compounds of at least 10 parts per million by weight of said asphaltenic crude oil.

4,876,019

INTERNAL MOLD RELEASE COMPOSITIONS

Louis W. Meyer, James A. Vanderhider, and Robert Carswell, all of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 466,826, Feb. 16, 1983, abandoned. This application Jan. 12, 1984, Ser. No. 570,141. Int. Cl.⁴ C10M 105/58; C08K 5/09; C08L 75/04, 75/02

U.S. Cl. 252-32.5 32 Claims

1. An internal and mold release composition which comprises

- (A) at least 1% by weight of said composition of at least one metal salt of an organic material containing at least one carboxylic acid group or mixture of such materials; wherein said metal is selected from Groups I-B, II-B, III-, IV-B, V-B, VI-B, VII-B or VIII-B of the Periodic Table of the Elements, Sn, Pb, Sb or Bi and wherein said organic material contains at least one terminal or pendant saturated or unsaturated aliphatic hydrocarbon chain containing at least about 7 carbon atoms;

(B) a material resulting from animating a material prepared by reacting an initiator compound having from 2 to about 4 reactive hydrogen atoms with propylene oxide, a combination thereof in any order or a mixture thereof, said product having an average molecular weight of from about 200 to about 6000; an aromatic diamine selected from the group consisting of 1-methyl-3,5-diethyl-2,4-diaminobenzene, 1-methyl-3,5-diethyl-2,6-diaminobenzene, 3,5,3',5'-tetraisopropyl-4,4'-diaminophenylmethane, and 2,4-bis(para-amino-benzyl)aniline; or mixtures thereof; and

(C) at least one organic material containing at least one carboxylic acid group, phosphorus-containing acid group or boron-containing acid group or mixture of such materials; wherein said organic material contains a siloxane chain or contains at least one terminal or pendant saturated or unsaturated aliphatic hydrocarbon chain containing at least about 7 carbon atoms.

6. An internal mold release composition which comprises

(A) at least 1% by weight of said composition of at least one metal salt of an organic material containing at least one carboxylic acid group or mixture of such materials; wherein said metal is selected from Groups I-B, II-B, III-A, IV-B, V-B, VI-B, VII-B or VIII-B of the Periodic Table of the Elements, Sn, Pb, Sb or Bi and wherein said organic material contains at least one terminal or pendant saturated or unsaturated aliphatic hydrocarbon chain containing at least about 7 carbon atoms;

(B) a material resulting from animating a material prepared by reacting an initiator compound having from 2 to about 4 reactive hydrogen atoms with propylene oxide, a combination thereof in any order or a mixture thereof, said product having an average molecular weight of from about 200 to about 6000; an aromatic diamine selected from the group consisting of 1-methyl-3,5-diethyl-2,4-diaminobenzene, 1-methyl-3,5-diethyl-2,6-diaminobenzene, 3,5,3',5'-tetraisopropyl-4,4'-diaminophenylmethane, and a 2,4-bis(para-amino-benzyl)aniline; or mixtures thereof; and said composition being devoid of

(C) at least one organic material containing at least one carboxylic acid group, phosphorus-containing acid group or boron-containing acid group or mixture of such materials; wherein said organic material contains a siloxane chain or contains at least one terminal or pendant saturated or unsaturated aliphatic hydrocarbon chain containing at least about 7 carbon atoms.

4,876,020

LUBRICATING OIL COMPOSITION

Arie Van Zon, and Brian Coleman, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Jun. 21, 1988, Ser. No. 209,607

Claims priority, application United Kingdom, Jun. 25, 1987, #711922

Int. Cl.⁴ C10M 129/50, 129/54

U.S. Cl. 252-40.5 18 Claims

1. A lubricating oil composition comprising hydrocarbon oil or ester or mixtures thereof as a lubricating base oil, one or more overbased alkaline earth metal salts of an aromatic carboxylic acid effective to improve the detergent properties of the composition and an effective amount of a stabilizing agent which is selected from polyalkoxylated alcohol, having a molecular weight of 150-1500.

4,876,021

LUBRICATING OIL COMPOSITIONS CONTAINING ANTI-WEAR/ANTI-CORROSION

Sean P. O'Connor, Beverley, England, assignor to BP Chemicals Limited, London, England

PCT No. PCT/GB88/00023, § 371 Date Aug. 26, 1988, § 102(e) Date Aug. 26, 1988, PCT Pub. No. WO88/05459, PCT Pub. Date Jul. 28, 1988

PCT Filed Jan. 14, 1988, Ser. No. 238,336

Claims priority, application United Kingdom, Jan. 15, 1987, #700234

Int. Cl.⁴ C10M 135/26, 135/22

U.S. Cl. 252-48.2 9 Claims

1. A finished lubricating oil composition comprising a lubricating oil base stock and an extreme pressure/antiwear improving amount of a bisacyl- or bisaroyldisulphide.

4,876,022

METHOD FOR PREPARING FERROMAGNETIC IRON OXIDE PARTICLES

Nobuo Yamazaki, and Tatsuji Kitamoto, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 10, 1986, Ser. No. 928,487

Claims priority, application Japan, Nov. 8, 1985, 60-249018

Int. Cl.⁴ C04B 35/26

U.S. Cl. 252-62.56 5 Claims

1. A method for preparing ferromagnetic iron oxide particles comprising the steps of depositing Co-ferrite fine particles onto the surface of acicular iron oxyhydroxide particles and then dehydrating, reducing, and oxidizing said acicular iron oxyhydroxide having said Co-ferrite fine particles deposited thereon.

4,876,023

LAUNDRY PRODUCTS

Haydn G. W. Dickenson, and David H. Huntington, both of Newcastle upon Tyne, England, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed May 17, 1988, Ser. No. 195,062

Claims priority, application United Kingdom, May 23, 1987, #712285

Int. Cl.⁴ C11D 17/00

U.S. Cl. 252-90 7 Claims

1. A laundry product which consisting of a particulate laundry composition releasably contained within a closed, single- or multi-compartment sachet having a frangible seal, the sachet being formed of a water-insoluble, calender-bonded or calender-finished non-woven bonded substrate material which is a thermo-bonded fibrous or filamentous substrate wherein the fibers or filaments are of polyester or a polyester core bonded with a polyethylene sheath.

4,876,024

ENZYMATIC DETERGENT ADDITIVE, A DETERGENT, AND A WASHING METHOD
 Michio Enomoto, Tokyo, Japan, and Steen Rillinggaard, Ballerup, Denmark, assigns to Novo Industri A/S, Novo Alle, Denmark

Filed Aug. 6, 1986, Ser. No. 893,879

Claims priority, application Denmark, Aug. 7, 1985, 3588/85
 Int. Cl.⁴ C11D 3/386; C12N 9/20

U.S. Cl. 252—174.12

11 Claims

1. A lipolytic enzymatic detergent additive in the form of a non-dusting granulate or a stabilized liquid, the active enzyme component of which is a lipase produced by a lipase producing strain of *Pseudomonas cepacia* said lipase being characterized by a pH activity optimum within the pH range of pH 5.75–7.0 and by being thermally stable at 60° C.

2. A detergent composition containing therein a lipolytic enzymatic additive, the enzyme component of which is a lipase produced by a lipase producing strain of *Pseudomonas cepacia*, said lipase being characterized by a pH activity optimum within the pH range of pH 5.75–7.0 and by being thermally stable at 60° C.

4,876,025

COMPOSITION TO ABSORB MERCURY

Richard H. Roydhouse, Vancouver, Canada, assignor to EPS Environmental Protection Systems Limited, Vancouver, Canada

Continuation of Ser. No. 914,805, Oct. 3, 1986, abandoned. This application May 6, 1988, Ser. No. 191,724

Int. Cl.⁴ C09K 3/32

U.S. Cl. 252—182.32

6 Claims

1. A composition to absorb mercury vapor and to suppress the formation of mercury vapor, the composition being free of thiosulfate and consisting essentially of:

- (a) an iodide of a cation; and
- (b) a polyhydric alcohol, the iodide and the polyhydric alcohol being present in amounts sufficient to suppress the formation of and absorb mercury vapor.

4,876,026

OPTICALLY ACTIVE-2-METHYLBUTYRATE AND MATERIALS USING THE SAME

Shinichi Saito; Hiromichi Inoue; Kazutoshi Miyazawa; Kouji Ohno, and Makoto Ushioda, all of Kanagawa, Japan, assignors to Chisso Corporation, Osaka, Japan

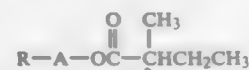
Filed Dec. 15, 1987, Ser. No. 134,295

Claims priority, application Japan, Dec. 26, 1986, 61-313308
 Int. Cl.⁴ G02F 1/13; C09K 19/34; C07D 239/02, 211.72, 211.84

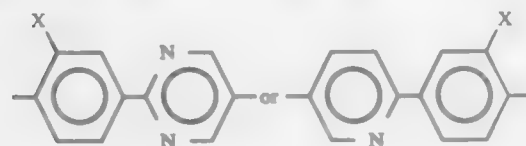
U.S. Cl. 252—299.61

5 Claims

1. An optically active-2-methylbutyrate expressed by the formula



wherein R represents a linear or branched chain alkyl group or alkoxy group, each of 4 to 12 carbon atoms; A represents



wherein X represents F or H; and * indicates an optically active carbon atom.

4,876,027

OPTICALLY ACTIVE COMPOSITION, MESOMORPHIC COMPOUND AND LIQUID CRYSTAL DEVICE

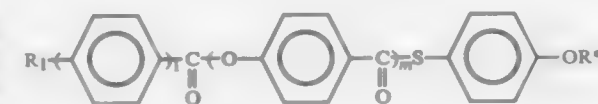
Kazuo Yoshinaga, Machida; Kazuharu Katagiri, Tama; Toyoko Kobayashi, Kawasaki, and Kenji Shinjo, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
 Continuation of Ser. No. 900,712, Aug. 27, 1986, abandoned.
 This application Jan. 27, 1989, Ser. No. 302,145

Claims priority, application Japan, Sep. 4, 1985, 60-193831;
 Dec. 19, 1985, 60-284240

Int. Cl.⁴ G02F 1/13; C09K 19/20, 19/12, 19/06; C07C 153/07
 U.S. Cl. 252—299.65

38 Claims

1. A mesomorphic compound represented by the following formula:



wherein R₁ is an alkyl group having 6–12 carbon atoms, R* is an alkyl group having 4–12 carbon atoms including an asymmetric carbon atom, l is 1 or 2, and m is 0 or 1.

4,876,028

CHIRAL ARYL-2,3-EPOXYALKYL-ETHERS AND THE CORRESPONDING THIO COMPOUNDS THEREOF, AND THE USE THEREOF AS DOPES IN LIQUID-CRYSTAL PHASES

Wolfgang Hemmerling, Salzburg; Hans-Rolf Dübel, Hofheim am Taunus; Ingrid Müller, Hofheim am Taunus; Dieter Ohlendorf, Liederbach, and Rainer Wingen, Hattersheim am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

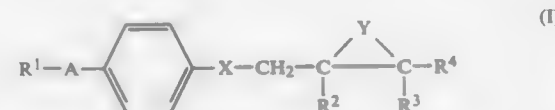
Filed Oct. 2, 1987, Ser. No. 104,350

Claims priority, application Fed. Rep. of Germany, Oct. 6, 1986, 3633968

Int. Cl.⁴ C07D 239/02, 241/00; C09K 19/34; G02F 1/13
 U.S. Cl. 252—299.61

10 Claims

1. A chiral compound of the formula (I)



wherein

R¹ is straight-chain or branched (C₁–C₁₂) alkyl, where one or two non-neighboring CH₂ groups may be replaced by O and/or S atoms,

A is diazine-2,5-diyl or diazine-3,6-diyl,

X and Y are O and/or S, and

R², R³ and R⁴, independently of one another are H, straight-chain (C₁–C₁₀)alkyl or branched (C₃–C₁₀)alkyl, where R², R³ and R⁴ are not simultaneously H.

5. A twistable liquid-crystal mixture comprising at least one chiral compound of the formula (I) as claimed in claim 1 and a compound having nematic, cholesteric or tilted smectic phase

4,876,029

SUBSTITUTED AND UNSUBSTITUTED RING-BRIDGED PARA-OLIGOPHENYLENE UV LASER DYES

Hans Güsten, Speyer; Hans-Joachim Ache, Karlsruhe; Monika Rinke, Eggenstein-Leopoldshafen, and Hermann O. Wirth, Bensheim, all of Fed. Rep. of Germany, assignors to Kernforschungszentrum Karlsruhe Gesellschaft mit Beschränkter Haftung, Karlsruhe, Fed. Rep. of Germany

Filed Nov. 23, 1984, Ser. No. 674,403

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1984, 3408028

Int. Cl.⁴ C09K 11/06

U.S. Cl. 252—301.17

18 Claims

1. A laser dye capable of stimulated coherent emission in the range below 400 nm comprising ring-bridged p-oligophenylenes having at least 4 and no more than 8 phenyl groups, and having at least one bridge between two adjacent phenyl groups but no more than one bridge between any two adjacent phenyl groups.

4,876,031

PARTIAL OXIDATION PROCESS

Mitri S. Najjar, Hopewell Junction, and Roger J. Corbeels, Wappingers Falls, both of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Continuation-in-part of Ser. No. 51,982, May 19, 1987, Pat. No. 4,826,627. This application Feb. 29, 1988, Ser. No. 161,581

Int. Cl.⁴ C10J 3/46

U.S. Cl. 252—373

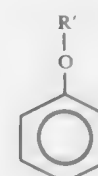
33 Claims

1. A process for the production of gaseous mixtures comprising H₂+CO by the partial oxidation of a feedstock comprising a low silicon-containing heavy liquid hydrocarbonaceous fuel having a nickel and vanadium-containing ash, or a low-silicon containing petroleum coke having a nickel and vanadium-containing ash, or mixtures thereof; and said feedstock includes a minimum of 0.1 wt. % of sulfur, and less than about 350 parts per million of silicon; and said ash includes a minimum of 1.0 wt. % vanadium, and a minimum of 1.0 wt. % of nickel; said process comprising:

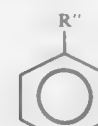
(1) mixing together an iron-containing additive with said feedstock; wherein the weight ratio of iron-containing additive to ash in the reaction zone in (2) is in the range of about 0.1–10.0 to 1.0, and there is at least 2 parts by weight of iron for each part by weight of vanadium;

(2) reacting said mixture from (1) at a temperature in the range of about 2100° F. to 3000° F. and at a pressure in the range of about 2 to 250 atmosphere in a free-flow vertical refractory lined partial oxidation zone with a free-oxygen containing gas in the presence of a temperature moderator and in a reducing atmosphere to produce a hot raw effluent gas stream comprising H₂+CO and entrained molten slag; wherein said refractory lining comprises in weight percent: MgO 85 to 98, Fe₂O₃ 0.03 to 3.0; Al₂O₃ 0.02 to 2.0, CaO 0.1 to 10 and SiO₂ 0.02 to 2.0; and where in said reaction zone a first portion of the said iron-containing additive combines with at least a portion of the nickel, iron and sulfur constituents found in the feedstock and refractory components to produce a first liquid phase washing agent substantially comprising in wt. % iron about 40 to 80; nickel about 0.1 to 5; and sulfur about 10 to 32; and optionally a minor amount of at least one element selected from the group consisting of Al, Ca, V, Si, Ti, Mg, Mn, Na, K and mixtures thereof; a second portion of said iron-containing additive combines with at least a portion of the silicon, aluminum, calcium, sodium and/or potassium, and iron constituents found in the feedstock and refractory components to produce a second liquid phase washing agent substantially comprising in wt. %: iron about 5 to 40; magnesium about 0.01 to 2.0; aluminum about 5 to 20; silicon about 20 to 50; calcium about 1.0 to 35; and sodium and/or potassium about 0.01 to 5; and wherein the first and second liquid phase washing agents collect and transport at least a portion of the vanadium-containing oxide laths and spinels and other ash and refractory components out of the reaction zone as said molten slag, and said molten slag combines with a portion of said refractory in the amount of about 0.001 to 2.0 wt. % of the weight of said iron-containing additive to produce localized vanadium-containing spinels and substantially no interlocking laths; and

(3) separating nongaseous materials from said hot raw effluent gas stream.



where R' is a hydroxyalkyl of from 1 to 4 carbon atoms and phenylalkanol which are represented by the formula



where R'' is an alkanol of from 1 to 6 carbon atoms and admixtures thereof present in the quantity of about 4–7 weight percent.

Z groups per molecule, wherein Z is a monovalent organic moiety containing at least one acryl-functional radical which is capable of reacting with said —NHR' radical, said acryl-functional radical being selected from the group consisting of acryloxy, methacryloxy and acrylamide radicals, at least one of (i) and (ii) having an average of more than two of said X groups and said Z groups, respectively, per molecule; and (II) curing said organopolysiloxane composition by a Michael-type addition reaction until it is converted to a solid state.

4,876,040

TWO-STAGE PROCESS FOR PREPARING AROMATIC POLYAMIDE FIBER

Ho J. Park, Seoul; Moo S. Rhim; Hak M. Kim, both of Kumi; Da H. Kim, Daegu; Seog C. Yoo, Kwangwon; Sang H. Kim, Seoul; Sa Ng B. Park, Gumi; Iak S. Han, Kyungsan; Jong T. Park, and Si M. Kim, both of Daegu, all of Rep. of Korea, assignors to Kolon Industries, Inc., Seoul, Rep. of Korea

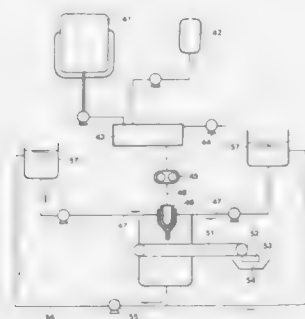
Filed Mar. 10, 1987, Ser. No. 24,173

Claims priority, application Rep. of Korea, May 15, 1986, 86-3826; May 15, 1986, 86-3827; Jul. 23, 1986, 86-5983; Jul. 23, 1986, 86-5984

Int. Cl.⁴ D01D 5/26; D01F 6/60

U.S. Cl. 264—14

21 Claims



1. A process for preparing aromatic polyamide in the form of fiber which process comprises:

- preparing a mixture by adding equivalent moles of an aromatic diamine and an aromatic diacidchloride reactant to a first solvent which is an amide polymerization solvent containing an inorganic salt;
- dissolving said diamine and said diacidchloride in said polymerization solvent;
- effecting a partial polymerization at a low temperature of the dissolved reactants to form an optically anisotropic liquid crystalline prepolymer dope having an amount of polymer and an inherent viscosity suitable for forming fibers therefrom;
- continuously spinning said prepolymer dope into a second solvent which is a polymerization accelerating-precipitation solvent under a spin stretch factor of 1 to 4; and
- obtaining aromatic polyamide fibers free of a crystal defect layer perpendicular to the fiber axis and having a high strength and a high degree of molecular orientation.

4,876,041

METHOD FOR FUSION JOINING PLASTIC PIPE

Reinhard Hanselka, Danville, Calif., assignor to Georg Fischer AG, Schaffhausen, Switzerland

Continuation of Ser. No. 919,238, Oct. 14, 1986, abandoned.

This application Sep. 14, 1988, Ser. No. 245,929

Int. Cl.⁴ B29C 65/02, 57/08, 51/10

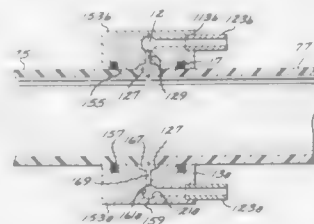
U.S. Cl. 264—25

10 Claims

1. A method for fusion joining first and second thermoplastic

piping system component connection ends, comprising the steps of:

- providing first and second thermoplastic piping system component connection ends respectively having substantially square cut terminal edges;
- securing the connection ends in axial and circumferential alignment with their edges in abutment forming an interface;
- heating a melt region in the proximity of the interface of the



first and second piping system component connection ends at least to the material softening point of the thermoplastic material of the melt region; and vacuummetrically inducing outward translation of the melted material of the melt region; and cooling the translated material of the melt region at least to below the material softening point of the melt region, whereby the first and second thermoplastic piping system component connection ends are fusion joined with a smooth inside surface at the interface thereof.

4,876,042

MOLDING PROCESSING USING A REPRODUCIBLE MOLDING DIE

Hiroyuki Imataki; Mizuho Hiraoka, both of Kawasaki; Tomoyuki Tamura, Yokohama, and Tetsuya Satoh, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

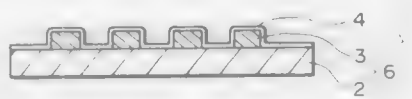
Filed Dec. 22, 1988, Ser. No. 288,456

Claims priority, application Japan, Dec. 28, 1987, 62-334993; Dec. 29, 1987, 62-336066

Int. Cl.⁴ B29C 43/36

U.S. Cl. 264—39

6 Claims



1. A molding process, comprising: providing a reproducible molding die comprising a base structure having an evenness pattern, and a cleaning layer disposed on the surface of the base structure having said unevenness pattern; molding a product by means of said molding die, while leaving molding residue on the molding die; and removing said cleaning layer together with the residue from the molding die while substantially retaining said unevenness pattern of the base structure.

4,876,043

HOPPER TRANSPORT FOR INJECTION MOLDING

Richard A. Hall, Sr., Rte. 1, Box 24AC, LaCenter, Wash. 98629

Filed Aug. 23, 1988, Ser. No. 235,433

Int. Cl.⁴ B29C 45/18

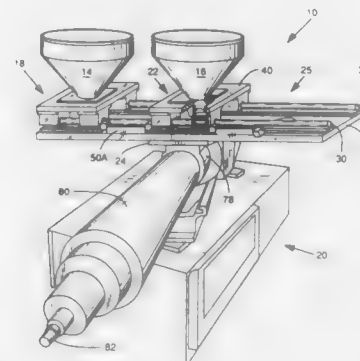
U.S. Cl. 264—39

8 Claims

1. A method of feeding polymeric raw materials from a pair

of hoppers into an input opening of an injection molding machine, the method comprising the steps of:

- providing an elongate track over the machine upon which each of the hoppers is supported in an upright position for manual sliding movement along the track longitudinal axis independently of the other hopper;
- loading raw material into the first hopper;
- positioning the first hopper over the input opening to allow material to flow from the first hopper into the input open-



ing to provide raw material for a first injection molding job; actuating the machine to commence the first job; while the first job proceeds, positioning the second hopper at a standby position for loading; and while the first job proceeds, loading the second hopper with raw material to prepare for commencing a second job thereby minimizing machine down-time after completion of the first job.

4,876,044

THIA DIAZOLE COMPOUNDS AND METHODS OF USE

Tony Cebalo, 7244 Sondridge Cir., Indianapolis, Ind. 46205, and Robert E. Buntrock, 546 N. Webster St., Naperville, Ill. 60540

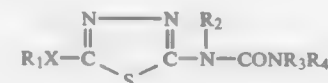
Filed Oct. 2, 1969, Ser. No. 863,338

Int. Cl.⁴ A01N 43/82; C07D 285/12

U.S. Cl. 71—90

16 Claims

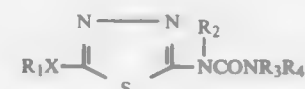
1. Compounds having the formula:



wherein

X is a SO₂ radical;
R₁ is a lower alkyl radical having from 1 to 4 carbon atoms;
R₂ is a lower alkyl radical having from 1 to 4 carbon atoms;
R₃ is a lower alkyl radical having from 1 to 4 carbon atoms or an alkoxy radical having from 1 to 4 carbon atoms, and
R₄ is hydrogen or a lower alkyl radical having from 1 to 4 carbon atoms.

8. A herbicidal composition containing an agriculturally acceptable carrier and at least one compound having the formula:



[A]

wherein

X is a SO₂ radical;
R₁ is a lower alkyl radical having from 1 to 4 carbon atoms;
R₂ is a lower alkyl radical having from 1 to 4 carbon atoms;

R₃ is a lower alkyl radical having from 1 to 4 carbon atom or an alkoxy radical having from 1 to 4 carbon atoms, and
R₄ is hydrogen or a lower alkyl radical having from 1 to 4 carbon atoms.

4,876,045

PROCESS FOR THE PREPARATION OF METHYLENE DERIVATIVES OF ANDROSTA-1,4-DIENE-3,17-DIONE

Antonio Longo, and Paolo Lombardi, both of Milan, Italy, assignors to Farmitalia Carlo Erba S.r.l., Milan, Italy

Filed Sep. 12, 1988, Ser. No. 242,854

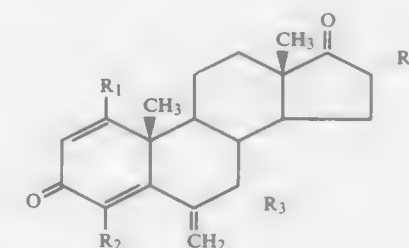
Claims priority, application United Kingdom, Sep. 11, 1987, 8711383

Int. Cl.⁴ C07J 1/00

U.S. Cl. 260—397.3

4 Claims

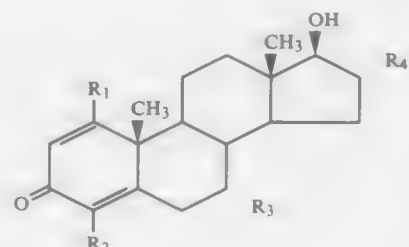
1. A process for the preparation of a compound of formula (I)



(I)

wherein

each of R₁ and R₃, independently, is hydrogen or C₁—C₆ alkyl;
R₂ is hydrogen, halogen or C₁—C₆ alkyl; and
R₄ is hydrogen or fluorine;
the process comprising reacting a compound of formula (II)



(II)

wherein

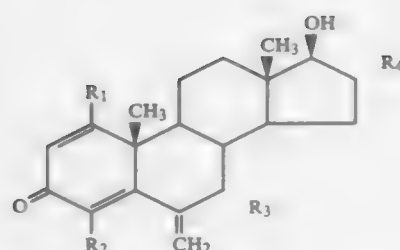
R₁, R₂, R₃ and R₄ are as defined above, with a formaldehyde source and an amine of formula (III), or a salt thereof,



(III)

wherein

each R group, which may be the same or different, is lower alkyl, so as to obtain a compound of formula (IV)



wherein

R₁, R₂, R₃ and R₄ are as defined above, and oxidizing a compound of formula (IV) thus obtained, by methods known per se.

4,876,046

SUBSTITUTED GLUTARIC AND ADIPIC DIPEROXYACIDS

Allen D. Clunas, Fairfield, and Eugene P. Gosselink, Cincinnati, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 80,142, Jul. 29, 1987, abandoned, which is a continuation of Ser. No. 744,597, Jan. 14, 1985, abandoned.

This application May 11, 1989, Ser. No. 353,182

Int. Cl.⁴ C07C 179/00

U.S. Cl. 8—111

3 Claims

1. β -n-hexyldiperoxyadipic acid.

4,876,047

PROCESS FOR PRODUCING SULPHONIC ACID

Gerald Bean, David Farrar, both of Bradford, and Peter Fleisher, Bingley, all of United Kingdom, assignors to Allied Colloids Limited, England

Continuation of Ser. No. 901,968, Aug. 29, 1986, abandoned, which is a continuation of Ser. No. 758,728, Jul. 25, 1985, abandoned. This application Dec. 17, 1987, Ser. No. 136,428

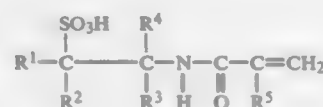
Claims priority, application United Kingdom, Jul. 27, 1984, 1419207

Int. Cl.⁴ C07C 143/16

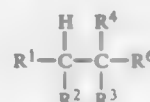
U.S. Cl. 562—41

12 Claims

1. A process for making a compound of Formula I



wherein R₃ and R₄ are independently selected from C₁₋₅ alkyl, substituted aryl, unsubstituted aryl and aralkyl having from 6 to 12 carbon atoms in total, R₁ and R₂ are selected from the same values as R₃ and R₄ and hydrogen, and R₅ is hydrogen or C₁₋₅ alkyl from a nitrile of formula H₂C=C(R⁵)CN where R⁵ is hydrogen or C₁₋₅ alkyl and a sulphonating agent characterized in that the process comprises reacting below 20° C. a compound of Formula II



with the sulphonating agent in the substantial absence of water and with the nitrile and hydrolyzing the product by reaction 30° C. with added water to produce the compound of Formula I wherein R⁶ selected from the group consisting of hydroxy, alkoxy, acyloxy, halogen, sulphate, aryloxy and aralkoxy.

(IV) **PURIFICATION OF ALKANESULFONYL CHLORIDES**
David M. Gardner, Worcester Township, Montgomery County, Pa.; Gregory A. Whetson, Logan Township, Gloucester County, N.J., and Martin Nosowitz, Easttown Township, Chester County, Pa., assignors to Penwalt Corporation, Philadelphia, Pa.

Filed Dec. 12, 1988, Ser. No. 283,113

Int. Cl.⁴ C07C 143/70

U.S. Cl. 260—543 R

8 Claims

1. A process for removing odorous and color-forming impurities from alkanesulfonyl chlorides comprising contacting said alkanesulfonyl chlorides with an ozone-containing gas at a temperature ranging from about 0° C. to about 100° C. for a time sufficient to reduce odorous and color-forming impurities therein.

4,876,049

METHOD FOR PREPARING MOLDED ARTICLES OF ULTRA-HIGH MOLECULAR WEIGHT POLYETHYLENE

Takeo Aoyama, Yokohama; Tetsuo Imai, Kawasaki; Junichi Hattori, Yokohama, and Mikio Uehara, Tokyo, all of Japan, assignors to Nippon Petrochemicals Co., Ltd., Japan

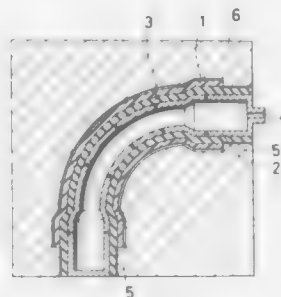
Filed Nov. 19, 1986, Ser. No. 932,918

Claims priority, application Japan, Nov. 21, 1985, 60-261874; Dec. 12, 1985, 60-280084; Dec. 12, 1985, 60-280085

Int. Cl.⁴ C08J 9/26; B29C 67/14, 51/28

U.S. Cl. 264—49

15 Claims



1. A method for preparing a molded hollow article of an ultra-high molecular weight polyethylene comprising the steps of providing a mold having a deformable member; positioning a porous sheet of said ultra-high molecular weight polyethylene about said deformable member; applying heat and deforming said deformable member with sufficient pressure to thereby cause said sheet to adhere closely to said mold, whereby said sheet is melted and densified.

6. The method according to claim 1 wherein said porous sheet is prepared by compounding solvent-soluble components with ultra-high molecular weight polyethylene and thereafter removing solvent-soluble components by extraction.

4,876,050

PROCESS FOR DRY FIBER WINDING AND IMPREGNATING OF PROJECTILES

Jack Horton, Marina del Rey, Calif., assignor to Murdock, Inc., Compton, Calif.

Continuation-in-part of Ser. No. 748,337, Jun. 24, 1985, abandoned. This application Oct. 5, 1987, Ser. No. 105,653

Int. Cl.⁴ B29C 35/02, 45/02, 45/14

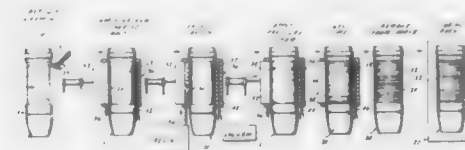
U.S. Cl. 264—102

9 Claims

1. A process for making a projectile which is impregnated with resin after winding with fibers in the absence of resin comprising:

providing a projectile for winding with dry fibers in the absence of resin;
providing dry fibers for winding in the absence of resin which are selected from the group consisting of glass,

polyester, carbon, aramid, hybrids of carbon-aramid, hybrids of aramid-glass, hybrids of aramid-glass-carbon, and hybrids of carbon-glass and combinations thereof;
winding at least a portion of said projectile with dry fibers in the absence of resin;
providing a mold;
providing means for opening and closing the mold;
providing means for heating said mold;
providing vacuum means to said mold;
placing the dry fiber wound portion of said projectile into the mold;
closing said mold;
applying a vacuum to said mold;
providing a resin;



pressure injecting said resin into said mold to impregnate the fibers with the resin;
heating the mold to a temperature and for a time sufficient to cure the resin to the gel stage;
applying said vacuum to said mold prior to and during said pressure injection and heating steps of said process;
keeping said projectile within said mold for a time sufficient to cure the resin just to the gel stage whereby the object can be removed from said mold without disturbing the surface;
opening said mold;
removing said projectile from said mold; and
allowing the resin to complete its cure.

4,876,051

APPARATUS AND METHOD FOR EXTRUDING AND EXPANDING POLYTETRAFLUOROETHYLENE TUBING AND THE PRODUCTS PRODUCED THEREBY

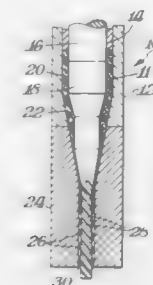
Michael L. Campbell; Benjamin G. Williams; Rob G. Riffle, and Charles E. Biggerstaff, all of Flagstaff, Ariz., assignors to W. L. Gore & Associates, Inc., Newark, Del.

Division of Ser. No. 930,411, Nov. 13, 1986. This application Dec. 17, 1987, Ser. No. 134,045

Int. Cl.⁴ B29C 47/20

U.S. Cl. 264—127

18 Claims



1. A process for extrusion and expansion of PTFE tubing comprising extruding a preformed billet of a mixture of coagulated dispersion of PTFE and liquid lubricant through an extruder comprising a hollow, cylindrical barrel containing a mandrel centrally positioned within said barrel, said barrel having a resin supply region, a tapered region leading from said supply region to an annular outflow region comprising an external, hollow, circular die having positioned centrally therein the circularly cylindrical tip of said mandrel, the tip and die forming an annulus, said tip and die both having at least one groove in the surface thereof, said grooves being oriented

helically with respect to the longitudinal axis of said tip and die, the pitch of said helical groove in said tip being oriented opposite the pitch of said helical groove in said die, the apparatus including a ram capable of reciprocation within said barrel and surrounding said mandrel, forcing said PTFE through said annulus, thereby producing extruded, unsintered tubing having at least one helically oriented ridge on at least one surface thereof, followed by removing said lubricant from said extruded tubing, and then expanding said extruded tubing, after the removal of liquid lubricant, by stretching said unsintered tubing longitudinally and maintaining said tubing at a temperature between about 35° C. and the crystalline melt point of said PTFE during said stretching.

4,876,052

METHOD OF EXTRUDING AND COMPRESSION MOLDING A MULTILAYERED ARTICLE

Muneki Yamada, Fujisawa, and Kiyoshi Kawaguchi, Yokohama, both of Japan, assignors to Toyo Seikan Kaisha, Ltd., Tokyo, Japan

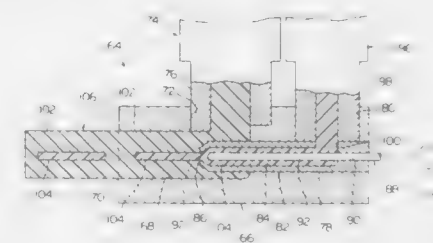
Division of Ser. No. 9,974, Feb. 2, 1987. This application Jun. 20, 1988, Ser. No. 208,488

Claims priority, application Japan, Feb. 10, 1986, 61-25832

Int. Cl.⁴ B29C 47/02

U.S. Cl. 264—148

7 Claims



1. A method for producing a compression-molded article having a multilayer structure comprising a first resin layer molded from a first synthetic resin and a second resin layer molded from a second synthetic resin and wherein the first and second resin layers are dissimilar and the first resin layer substantially surrounds the entire second resin layer, said method comprising the steps of:

introducing the first synthetic resin into a main extrusion flow passage, permitting the first synthetic resin to flow in a heated, molten state in the main extrusion flow passage, intermittently extruding the second synthetic resin in a heated, molten state into the main extrusion flow passage to provide extruded second synthetic resin which is substantially surrounded, in the main extrusion flow passage, by the first synthetic resin, extruding the second synthetic resin and the first synthetic resin from an extrusion opening in the main extrusion flow passage to provide extruded second and first synthetic resins forming a composite plastic material comprising the second synthetic resin substantially surrounded by the first synthetic resin and, compression-molding the composite plastic material to mold the first resin layer from the first synthetic resin and the second resin layer from the second synthetic resin.

4,876,053

PROCESS OF MOLDING A COMPONENT OF A SOLE UNIT FOR FOOTWEAR

Edward J. Norton, Boxford; Craig F. Fram, Haverhill; Kenneth W. Graham, Wakefield, all of Mass., and James A. Smith, St. Louis Park, Minn., assignors to New Balance Athletic Shoe, Inc., Boston, Mass.

Continuation of Ser. No. 897,903, Aug. 19, 1988, abandoned, which is a division of Ser. No. 848,197, Apr. 4, 1986, Pat. No. 4,730,402. This application Jul. 26, 1988, Ser. No. 224,247

Int. Cl.⁴ A43B 10/00

U.S. Cl. 264—255

5 Claims



1. The process of molding a component of a sole unit for an athletic shoe comprising the steps of supporting a core of a first plastic material having a first hardness (Shore A) in a cavity of a mold, said core defining an integral part of said component and being of a size to extend within a heel region toward the forefoot region of the same, supporting at least one rigid plug member within said cavity juxtaposed and in partially surrounding relation to said core, said at least one plug member serving the function of a dummy plug to prevent a build up of an injected plastic material within regions then occupied by said at least one plug member, injecting a second plastic material into said cavity to fill said cavity to form a shell around said core, at least partially curing said injected plastic injecting a third plastic material which upon curing forms a second resilient plastic material having a second hardness (Shore A) greater than that of the material of said core into said cavity to fill the area heretofore occupied by said plug that said third plastic material forms a set of posts including a lateral post on one side of said core and a medial post on the other said of said core with both posts extending along said core from the heel region, and such that the inner surface of at least one of said posts partially describes the interior outline of said core, and such that the upper surface of at least one of said posts corresponds to an upper surface of said component.

4,876,054

CONCRETE FORMING METHOD

Paul Goodwin, Mississauga, Canada, assignor to Perma Tubes Ltd., Raleigh, N.C.

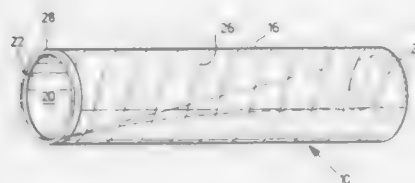
Continuation of Ser. No. 853,375, Apr. 15, 1986, abandoned, which is a continuation of Ser. No. 698,115, Feb. 4, 1985, abandoned, which is a division of Ser. No. 583,165, Feb. 24, 1984, Pat. No. 4,595,168. This application Feb. 24, 1988, Ser. No. 161,294

Claims priority, application Canada, Feb. 20, 1984, 447831

Int. Cl.⁴ B28B 1/00

U.S. Cl. 264—333

2 Claims



1. A method of fabricating a concrete column with a form

having a helical wound construction without forming helical lines on or staining the column, comprising the steps of:

providing a rigid elongated concrete column forming tube having an inside, generally-cylindrical wall defining an enclosure that has a preselected inside circumferential dimension and into which concrete can be poured and allowed to harden into a concrete column, said concrete column forming tube of a type comprising helically wound layers of paper sheet material defining a marking pattern transferrable to said column;

providing a discrete sheet of a flexible resilient and water impermeable material having a width dimension between opposite lateral edges which corresponds to said preselected inside circumferential dimension of the rigid elongated concrete column forming tube, and having a thickness to preclude form lines corresponding to the helical marking pattern of the rigid elongated concrete column forming tube from forming on a hardened concrete column formed thereby;

bending the sheet onto itself such that the lateral edges of the sheet in the bent condition are adjacent each other in butting relationship with two folds projecting outwardly therefrom;

interconnecting the lateral edges of the sheet in such a way as to seal the butting lateral edges to form a discrete, substantially water impermeable liner;

bending the discrete liner to permit insertion into the rigid elongated concrete column forming tube;

inserting the bent discrete liner into the rigid elongated concrete column forming tube;

causing the discrete liner to expand in the concrete column forming tube such that the outside surface of the liner is everywhere in pressing engagement against and lines the inside wall of the rigid elongated concrete column forming tube without being bonded thereto; and

pouring concrete into the disposable concrete column forming tube with inserted liner to form a concrete column of a type without undesirable helical form lines caused by the helical pattern of the concrete column forming tube, and without staining caused by water reabsorption back through the concrete column forming tube onto the concrete column formed by the tube.

4,876,055

SHAPING OF SYNTACTIC FOAM

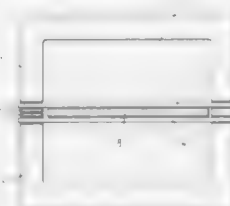
James B. Cattanaach, Middlesbrough, England, assignor to Imperial Chemical Industries PLC, London, England

Filed Feb. 1, 1988, Ser. No. 151,283

Int. Cl.⁴ B29C 51/28, 47/06, 67/16

U.S. Cl. 264—512

8 Claims



1. A method of forming a shaped article of preformed, thermoplastic, syntactic foam material of hollow microspheres in a thermoplastic polymer matrix comprising:

(a) contacting at least one source of the preformed syntactic foam with a plastically deformable diaphragm member;

(b) heating the assembled foam and diaphragm member to a temperature above the softening point of the thermoplastic polymer matrix;

(c) applying differential pressure across the assembled foam and diaphragm member to cause the foamed material to conform to a desired shape; and

(d) allowing the shaped foam to cool to a temperature below said softening point whereby the foam retains the desired shape.

4,876,056

FLOW MEASUREMENT

Colin G. Clayton, Tregarora, and Ramon Spackman, Didcot, both of United Kingdom, assignors to United Kingdom Atomic Energy Authority, London, England

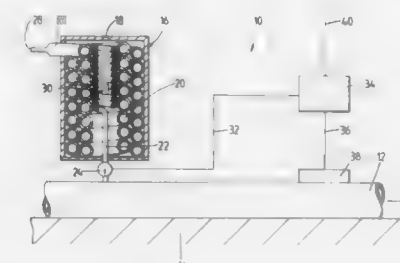
Filed Nov. 9, 1987, Ser. No. 117,831

Claims priority, application United Kingdom, Nov. 24, 1986, 8528055

Int. Cl.⁴ G21G 1/06; G21H 5/00

U.S. Cl. 376—152

2 Claims



1. A method for measuring the flow of a fluid in a duct having at least a length thereof immersed in a saline sea, the method comprising locating a container adjacent to said duct with said container having an inlet communicating with said sea to allow ingress, as a test fluid, of sea water from said sea, causing said test fluid to enter said container, storing said test fluid in said container, irradiating said test fluid in said container with neutrons so as to generate atoms of a predetermined radioactive nuclide in said test fluid, injecting at spaced time intervals a sample of the irradiated test fluid from said container into said duct, detecting, at a location spaced apart along said duct from the location at which the injection takes place, radiation emitted by said predetermined radioactive atoms, and determining, from the elapsed time between the injection of the test fluid and the detection of the radiation, the flow rate of the fluid.

4,876,057

CONTROL PROCESS FOR A NUCLEAR REACTOR

Patrice Bernard, Venelles; Laurent Sauvage; Henri Girard, both of Pertuis, and Jean-Pierre Ferrero, Aix en Provence, all of France, assignors to Commissariat a L'Energie Atomique, Paris, France

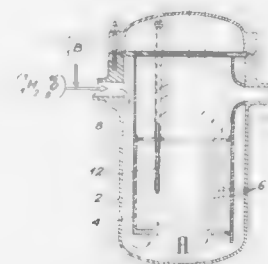
Filed Apr. 13, 1988, Ser. No. 181,043

Claims priority, application France, Apr. 24, 1987, 87 05824

Int. Cl.⁴ G21C 7/36

U.S. Cl. 376—216

15 Claims



1. Process for the control of a nuclear reactor having a core containing fissile material assemblies, the fission of the nuclei of

said materials being brought about by interactions with neutrons and producing in turn neutrons, said nuclear reactor also having a means for regulating the neutron flux in the reactor core and the power given off by said reactor core, said regulating means comprising at least one assembly of control rods displaceable in said reactor core, said process being characterized in that:

(A) iteratively there is a determination of the neutron fluxes $\phi(j,g)$ for each zone or mesh j $1 \leq j \leq J$ of a group of meshes corresponding to the volume of the reactor core and for each velocity group g $1 \leq g \leq G$ of a plurality of velocity groups for the neutrons; and the numbers of neutrons or sources $S(j)$ emitted by each mesh j , $1 \leq j \leq J$, per volume and time unit, the determination of said values consisting of repeating the following sequence of operations until said values converge:

(a) calculation of the first components of the neutron flux $\phi^0(j,g)$, $1 \leq j \leq J$ as a function of the predetermined coupling matrixes $[\psi g]$ $1 \leq g \leq G$ and sources $S(j)$, each element $\psi g(j,k)$, $1 \leq k \leq K$ and $1 \leq j \leq J$ expressing for neutrons of the velocity group g $1 \leq g \leq G$, the coupling between the mesh j and the adjacent meshes k corresponding to predetermined interaction probabilities of the neutrons with the fissile materials of the core for each mesh j , $1 \leq j \leq J$,

(b) calculation of the real interaction probabilities of the neutrons in the core as a function of physical parameters describing the state of the core,

(c) calculation of second neutron flux components $\phi^1(j,g)$, $1 \leq j \leq J$ as a function of the neutron fluxes $\phi^0(j,g)$ of the predetermined interaction probabilities of the neutrons in the core and the real interaction probabilities of the neutrons in the core,

(d) calculation of the neutron fluxes $\phi(j,g)$ in each mesh j , as the sum of the first and second neutron flux components,

(e) calculation of the new sources $NS(j)$, $1 \leq j \leq J$ associated with each neutron flux $\phi(j,g)$ and new values of sources $S(j)$ by the relation:

$$S(j) = \frac{NS(j)}{\sum_{j=1}^J NS(j)}$$

(f) calculation of the powers $P(j)$ emitted in each mesh j as a function of the total power P emitted and the sources $S(j)$,

(B) the regulating means is controlled as a function of the neutron fluxes $\phi(j,g)$ and powers $P(j)$.

4,876,058

NUCLEAR POWER GENERATING STATION EQUIPMENT QUALIFICATION METHOD AND APPARATUS

Arnold H. Fero, New Kensington; Lawrence M. Potochnik, Washington Township, Westmoreland County; Ronald W. Rilling, Penn Hills, and Kenneth F. Semethy, North Versailles Township, Allegheny County, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 5, 1987, Ser. No. 104,733

Int. Cl.⁴ G21C 17/00

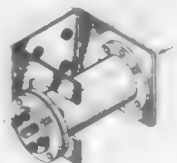
U.S. Cl. 376—247

26 Claims

26. In a nuclear power plant having an object piece of qualified equipment exposed to gamma and beta radiation, as well as thermal transients from a service temperature, apparatus for monitoring the object piece to project its ability for extensions of its qualified life, comprising:

passive means for detecting a total integrated dose of radiation received by the object piece, said passive detection means comprising first dosimetry means exposed only to gamma rays for measuring a gamma ray dose, and, a second dosimetry means separate and distinct from said

first dosimetry means, said second dosimetry means for measuring a beta ray dose;
means for determining a thermal history of the object piece comprising first monitor means for determining a peak temperature experienced by the object piece and second monitor means for determining an integrated thermal



exposure to the object piece, said determining means being separate and distinct from said first dosimetry means and said second dosimetry means; and
means for housing said passive detection means and said means for determining said thermal history in close proximity to the object piece.

4,876,059

TEMPERATURE MEASUREMENT

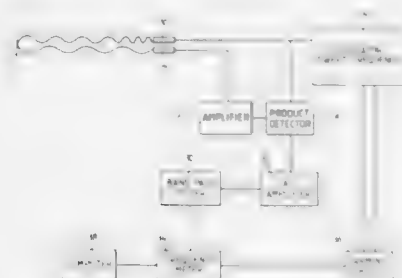
Peter J. Conroy, Warrington, United Kingdom, assignor to United Kingdom Atomic Energy Authority, London, England
Filed Jul. 18, 1988, Ser. No. 219,783

Claims priority, application United Kingdom, Aug. 6, 1987, 171,844

Int. Cl.⁴ G21C 17/02; G01K 11/24

U.S. Cl. 376-247

6 Claims



6. In combination, a nuclear reactor comprising a core having sub-assemblies containing nuclear fuel, and apparatus for measuring temperature at different localized zones within a fluid medium comprising:

- transmitter means located remotely from said zones for transmitting signals in the form of continuous wave, high frequency stress wave energy through said fluid medium towards reflector targets associated with said zones, the reflector targets respectively being structural parts at the tops of said sub-assemblies and having known relative positions;
- means for controlling the transmitter means to effect progressive change of the transmitted signal frequency;
- a reference signal source for producing a reference signal whose frequency is related to that of the transmitted signal and undergoes progressive change at the same rate as the latter;
- receiver means for receiving the reflected signals emanating from the reflector targets;
- means for multiplicatively combining each received

signal with the reference signal to produce for each target a difference frequency output; and
(f) means for analysing said difference frequency outputs to derive values for the temperatures prevailing at locations between adjacent reflector targets.

4,876,060

CONTROL BLADE FOR NUCLEAR REACTOR

Ritsuo Yoshioka; Makoto Ueda, both of Yokohama; Yoichi Motora, Tokyo, and Mitsuhiro Nakamura, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

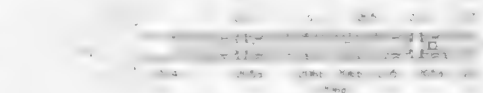
Filed Jun. 30, 1987, Ser. No. 68,190

Claims priority, application Japan, Jun. 30, 1986, 61-151567; Feb. 12, 1987, 62-28339; Feb. 12, 1987, 62-28340; Mar. 4, 1987, 62-47677; Mar. 10, 1987, 62-54986; Mar. 31, 1987, 62-78171

Int. Cl.⁴ G21C 7/10

U.S. Cl. 376-333

23 Claims



- A control blade for use in nuclear reactors comprising: an upper structure means; a lower structure means; a central tie rod means for connecting integrally said upper and lower structure means together, having radial projections so as to exhibit a substantially cross-shaped cross-section; a sheath plate means having a substantially U-shaped cross-section and secured to the end of each projection of said central tie rod means; and neutron absorber means charged in each of said sheath plate means; said neutron absorber means being divided into a plurality of neutron absorber elements along the axis of said central tie rod means, each neutron absorber element being composed of a pair of neutron absorber plates or sheets spaced from and opposing each other; a supporting spacer means disposed for supporting said opposing neutron absorber plates; and a water gap for guiding the flow of a moderator defined between said neutron absorber plates, wherein said supporting spacer means comprises a plurality of supporting spacers disposed between said opposing neutron absorber plates, each of said supporting spacers including a spacing portion engaging with inner surfaces of said opposing neutron absorber plates and supporting portions projecting from centers of both ends of the spacing portions, said opposing neutron absorber plates being provided with holes in such a manner that said supporting portions of said spacers loosely penetrate said holes of said absorber plates and are secured to walls of said sheath plate means.

4,876,061

RESILIENTLY LOADED LATERAL SUPPORTS FOR CANTILEVER-MOUNTED ROD GUIDES OF A PRESSURIZED WATER REACTOR

Douglas E. Ekereth, Plum Boro, and Luciano Veronesi, O'Hara Township, Allegheny County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 926,301, Nov. 3, 1986, abandoned. This application Aug. 24, 1988, Ser. No. 236,291

Int. Cl.⁴ G21C 5/02

U.S. Cl. 376-353

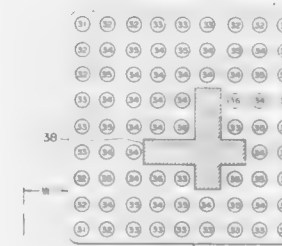
25 Claims

- A resiliently loaded top end support for each of plural rod guides disposed in closely spaced, parallel axial relationship within the inner barrel assembly of a pressurized water reactor vessel, the inner barrel assembly occupying a central

portion of the vessel and being of a vertical height extending from a first plate of lower elevation to a second plate of higher elevation within the vessel, said second plate being moveable axially into and out of assembled relationship with the inner barrel assembly, each said rod guide having a thin sidewall portion of elongated configuration and being of an axial length corresponding substantially to the vertical height of said inner barrel assembly and being mounted at the lower end thereof to the first plate and accommodating in axial, sliding relationship therewithin plural, respectively associated rod clusters, said resiliently loaded top end support comprising, for each said rod guide:

- a mount having an exterior surface and upper and lower ends, and adapted for being secured at the upper end thereof to the lower surface of the second plate and depending axially downwardly therefrom and defining an alignment axis for a corresponding said rod guide within the inner barrel assembly;
- an axially extending sleeve having an interior surface and

assembly being within the range of 0.07 to 0.11, and said area A_M being 75% or more of the total area of the fuel lattice units



in which none of said fuel rods is arranged, but said moderating rod is arranged.

4,876,063

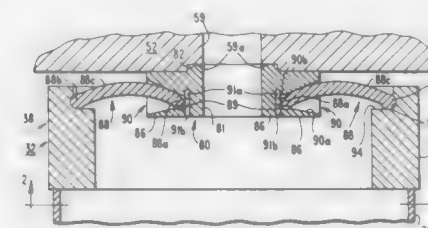
DOUBLED WATER ROD FOR 9 BY 9 FUEL BUNDLE
Eric B. Johansson, San Jose, Calif., assignor to General Electric Company, San Jose, Calif.

Filed Mar. 17, 1988, Ser. No. 169,546

Int. Cl.⁴ G21C 3/32

U.S. Cl. 376-444

5 Claims



upper and lower ends, affixed at the lower end thereof to the upper end of the associated thin sidewall of said rod guide and of an axial length sufficient to dispose the upper end of said sleeve closely adjacent to but displaced from the lower surface of the second plate when in the assembled relationship;

means for releasably interconnecting said sleeve and said mount, said releasably interconnecting means, in the assembled relationship, directly producing resilient lateral loading, substantially perpendicular to the alignment axis, between said mount and said sleeve for maintaining said sleeve and associated rod guide aligned with said alignment axis; and

the upper end of the sleeve receiving the lower end of the mount in substantially coaxial, telescoping relationship with the respective exterior and interior surfaces thereof in spaced, juxtaposed relationship and with the releasable interconnecting means extending between the said, respective exterior and interior surfaces thereof for directly producing said resilient lateral loading therebetween.

4,876,062

FUEL ASSEMBLY

Motoo Aoyama, Hitachi; Yasunori Bessho, Mito; Sadao Uchikawa, Katsuta; Renzo Takeda, Kawasaki, and Yoshihiko Ishii, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 24, 1988, Ser. No. 172,418

Claims priority, application Japan, Mar. 25, 1987, 62-68873

Int. Cl.⁴ G21C 3/32

U.S. Cl. 376-444

11 Claims

- A fuel assembly comprising a plurality of fuel rods and a moderating rod containing a moderator and disposed at a generally central portion, of said fuel assembly, the ratio A_M/A_C of the area A_M of a moderator region in said moderating rod in the cross-sectional plane in which said moderator is present to the area A_C of the coolant passages in said fuel

1. An improved fuel assembly including a lower tie-plate, an upper tie-plate, a square sectioned channel connecting said lower and upper tie-plate in fluid tight relation whereby fluid entering said lower tie-plate is discharged out said upper tie-plate, fuel rods each containing fissionable material there-within, said fuel rods being held at said upper and lower tie-plates in a 9 by 9 array of rows and columns with all fuel rods having the same diameter; a plurality of spacers placed between said fuel rods for maintaining said fuel rods in spaced apart relation between said upper and lower tie-plates; said fuel rods in said 9 by 9 array having three said fuel rods removed from the middle row and two said fuel rods removed from each row on either side of said middle row to create a vacated interstitial volume defined by the absence of said removed fuel rods, the removal of said fuel rods at each row on either side displaced towards adjacent corners of said 9 by 9 array;

a pair of water rods for placement in the vacated interstitial volume, said water rods each including vertically extending cylindrical wall portions extending across approximately 270° of arc around a generally cylindrical form of said water rods and a truncating vertically extending cord wall being disposed in a flat planar vertically extending disposition between the two ends of said cylindrical wall

portion of said water rods whereby said cord wall of said water rods imparts a generally "D" cross-section to said water rod, said water rods each being placed in back-to-back relation in said fuel bundle at said vacated spatial interval, said rods confronted at their respective flat cord walls whereby said vacated interstitial volume is filled with said water to provide improved water moderation of said nuclear reaction at said fuel bundle.

4,876,064

CORROSION RESISTANT ZIRCONIUM ALLOYS CONTAINING BISMUTH

Dale F. Taylor, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.
Continuation of Ser. No. 41,508, Apr. 23, 1987, abandoned. This application Jan. 28, 1988, Ser. No. 212,460
Int. Cl.⁴ C22C 16/00

U.S. Cl. 420-422 23 Claims
1. A corrosion-resistant alloy consisting essentially of 0.5 to 2.5 weight percent of bismuth, 0.5-1.0 weight percent of a solute composed of a member selected from the group consisting of molybdenum, tellurium, niobium and mixtures thereof; and the balance zirconium.

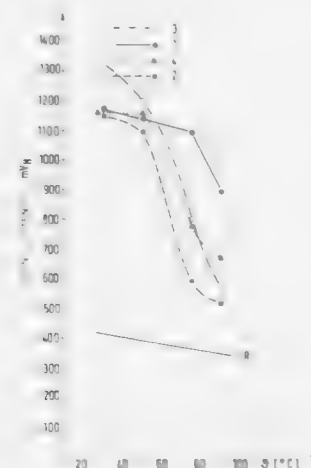
4,876,065

CORROSION-RESISTING FE-NI-CR ALLOY

Manfred Rockel, Friedrichsdorf; Ernst Wallis, Eschborn; Michael Köhler, Iserlohn; Ulrich Heubner, Werdohl, and Rolf Kirchheiner, Iserlohn, all of Fed. Rep. of Germany, assignors to VDM Nickel-Technologie Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed May 19, 1988, Ser. No. 196,034
Claims priority, application Fed. Rep. of Germany, May 19, 1987, 3716665

Int. Cl.⁴ C22C 30/00 16 Claims
U.S. Cl. 420-582

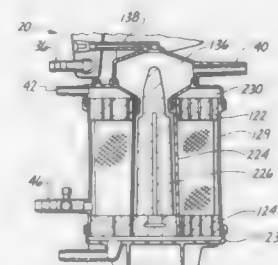


1. An alloy consisting essentially of: 30 to 32% nickel; 26 to 28% chromium; 0.5 to 1.5% copper; 6 to 7% molybdenum; up to 2% manganese; up to 1.0% silicon, up to 0.2% aluminum, up to 0.03% carbon; 0.10 to 0.25% nitrogen; balance iron.

INTEGRATED MEMBRANE OXYGENATOR, HEAT EXCHANGER AND RESERVOIR

Richard L. Bringham, San Clemente; Lucas S. Gordon, Laguna Beach, and Karl E. Mosch, Irvine, all of Calif., assignors to Baxter International Inc., Deerfield, Ill.
Division of Ser. No. 885,207, Jul. 14, 1986, Pat. No. 4,698,207.
This application Jul. 14, 1987, Ser. No. 73,261
Int. Cl.⁴ A61M 1/16

U.S. Cl. 422-46 3 Claims



1. A blood oxygenator comprising:
a vertically disposed, elongated housing defining an internal chamber;
gas-permeable and liquid-impermeable membrane means mounted in said housing internal chamber, said membrane means being arranged to define separate blood and gas flow paths through said housing;
blood inlet and outlet means associated with said housing and formed to communicate with and direct blood through the blood flow path;
gas inlet means and gas outlet means associated with the housing and formed to communicate with and direct gas through the gas flow path;
means situated in an upper portion of said internal chamber which defines a substantially cylindrical compartment in said upper portion between said blood inlet means and said blood flow path, said compartment having a substantial horizontal component and being vertically oriented in said upper portion and communicating with a plurality of openings in said membrane to said blood flow path;
said blood inlet means defining a blood passageway which communicates with said compartment and is arranged with respect to said compartment to direct incoming blood tangentially into said compartment;
said compartment being dimensioned to promote a swirling non-vortex flow in said blood entering said compartment; and
a vent associated with said compartment which is positioned to allow for the discharge of gas from said compartment.

4,876,067

MULTILAYER TEST STRIP DEVICE WITH A DISSOLVABLE REAGENT LAYER

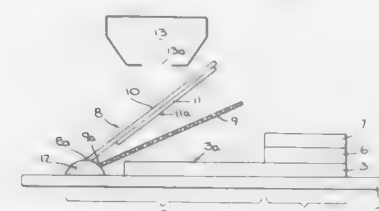
Ulfert Deneke, Rimbach-Zotzenbach; Rolf Nagel, Bürrstadt; Anselm Rothe, Birkenau, and Helmut Freitag, Weinheim, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Filed Aug. 25, 1987, Ser. No. 89,352
Claims priority, application Fed. Rep. of Germany, Sep. 12, 1986, 3630999

Int. Cl.⁴ G01N 21/77 19 Claims
U.S. Cl. 422-56

1. A device for analytical determination of a component in a liquid sample, comprising a first carrier layer having applied thereto a liquid absorbing layer, and a separate second movable carrier having applied thereto a dissolvable reagent-containing layer which is not in initial contact with said first carrier layer, said first carrier layer attached at a point to said second layer as a flap, wherein at least one of said first carrier layer and said

second carrier layer is transparent, said liquid absorbing layer not in initial contact with said second carrier layer and said liquid absorbing layer comprising material which absorbs said reagent-containing layer when said reagent-containing layer is



dissolved by contact with a liquid contained in said liquid absorbing layer, said first carrier layer being positioned in said device to permit contact between said liquid absorbing layer and said reagent-containing layer by applying pressure to one of said carrier layers.

4,876,068

TEST KIT FOR COLORIMETRIC ANALYSIS

Henry B. Castaneda, Woodbridge, Va., assignor to Chemetrics, Inc., Calverton, Va.

Filed Mar. 3, 1989, Ser. No. 318,903
Int. Cl.⁴ G01N 31/02, 31/22
U.S. Cl. 422-58 5 Claims



1. A portable test kit useful in the field for colorimetric analysis of trace levels of a dithizonate complexing metal cation in an aqueous sample, said kit comprising
at least one storage tube and lid member assembly, said at least one assembly comprising a storage tube having a conically-shaped end, and being of sufficient volumetric size to serve as a vessel for formation and extraction of an extractable, metal cation-dithizonate complex, and said at least one storage tube and lid member assembly containing a unit dose amount of dithizone in solid form
a closed container containing in biphasic liquid form, an organic extractant for said metal cation-dithizonate complex, and an aqueous phase containing accessory test reagents for providing appropriate selectivity, said extractant being of greater density than water and being provided in a volume that provides an at least about 10:1 volume ratio of said aqueous sample to said organic extractant;
a sealed, evacuated container means for capturing a portion of a layer formed by colored, dithizonate complex-containing, organic extractant, upon accessing the vacuum in said evacuated container means;
a hollow tubular body having an end constructed so as to form an air-tight sealing relationship with said evacuated container means and, when said evacuated container means and said hollow tubular body are in said air-tight

sealing relationship, said combination thereof being open to the ambient atmosphere only at another end of said hollow tubular body; and
means for providing analysis of the color of said captured layer portion.

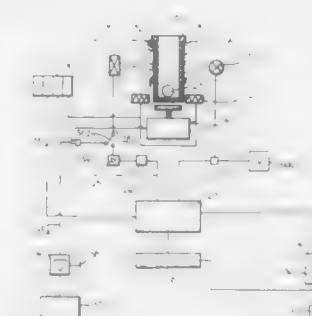
4,876,069

BLOOD CLOTTING TIME MEASURING APPARATUS

Siegfried Jochimsen, Falckstrasse 19, DE-2300, Kiel, Fed. Rep. of Germany

Continuation of Ser. No. 483,950, Mar. 8, 1983, abandoned. This application Oct. 27, 1986, Ser. No. 924,155
Claims priority, application Fed. Rep. of Germany, Jul. 11, 1981, 3127560; Nov. 19, 1981, 3145692
Int. Cl.⁴ G01N 21/59, 33/86

U.S. Cl. 422-73 12 Claims



1. Apparatus for measuring blood clotting time; said apparatus being suitable for use with a measuring cell having a bottom, the measuring cell containing a blood sample, the clotting time of which is to be measured; said apparatus comprising:
temperature controlled support means having means defining at least one measuring channel, said measuring channel being capable of receiving the measuring cell containing the blood sample;
magnetic stirring means mounted in said support means proximate to said means defining said measuring channel, said magnetic stirring means including a metal ball positionable at the bottom of the measuring cell when the cell is inserted in said channel, said magnetic stirring means further including a magnetic drive means proximate said means defining said measuring channel, said magnetic drive means being operable to rotate said ball in a circular path about the bottom of the measuring cell;
photo optical turbidity detection means having a light source and a light detector forming a photo optical path containing the measuring cell when the cell is inserted in the channel, said light source being of a type such that, in lower portions of its operating voltage range, a given change in operating voltage results in a greater change in light output than in upper portions of its operating range, said light detector being connected through transmission signal adjustment means to a measured value means having two threshold value limiting means;
voltage supply means for supplying an operating voltage to said light source which is at least half the rated voltage of said source;
computer means coupled to said measured value means; and
display means coupled to said measured value means for displaying visually perceptible information.

4,876,070

AIR BLOWER APPARATUS

Hitooshi Tsukahara; Keiko Kurokawa; Toshimitsu Tsukui, and Toshitake Nagai, all of Gunma, Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

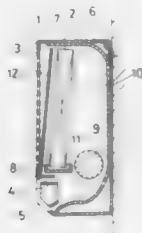
Filed Nov. 6, 1987, Ser. No. 118,272

Claims priority, application Japan, Nov. 6, 1986, 61-264300

Int. Cl.⁴ A62B 11/00

U.S. Cl. 422-122

17 Claims



1. In an air blower apparatus for conditioning a room, said apparatus including a fan, a fan casing, a suction grill, a discharge grill and an air filter, at least one of which is a synthetic resin component which comes in contact with an air flow, the improvement comprising:

at least one synthetic resin component molded from polypropylene resin, to which at least one antimicrobial agent selected from the group consisting of diphenylethers, N-haloalkylthio compounds, benzimidazoles, organic arsine compounds and metal alumino-silicate hydrate is mixed prior to molding of said components.

4,876,071

MIXING APPARATUS FOR SYNTHETIC RESIN WITH MULTIPLE RESIN COMPONENTS

Kenichi Toda, and Tetsuhiro Hori, both of Okazaki, Japan, assignors to Kabushiki Kaisha Polyurethane Engineering, Tokyo, Japan

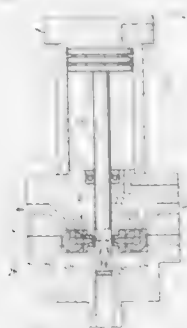
Filed Sep. 18, 1987, Ser. No. 97,786

Claims priority, application Japan, Jun. 25, 1987, 62-158494

Int. Cl.⁴ B01F 5/04, 15/02

U.S. Cl. 422-133

6 Claims



1. A mixing apparatus for resin components comprising:
a body having a through bore and a plurality of inlet ports for introducing resin components into a mixing chamber portion of said bore;
a cleaning member mounted for reciprocal movement in said bore to displace said resin components from said mixing chamber to an outlet port of said bore;
a pair of diametrically opposed passages extending through said body and intersecting said through bore between said inlet ports and said outlet port of said through bore;
a flow varying member slidably mounted in one of said passages for movement between a retracted position and a

forward position, said flow varying member having an end portion which is aligned with said bore in said retracted position and located internally of the other said passage in the forward position,

a chamber block slidably mounted in the other said passage for movement between a forward position and a retracted position, said chamber block having an end portion which defines a part of said through bore in said forward position and partially defines a flow varying chamber in said retracted position, and

a key member fixed in the other said passage and dividing the other said passage into at least one smaller restriction

whereby said flow varying member in said forward position closes said through bore to movement of said resin components and said end portion of said flow varying member cooperates with said end portion of said chamber block to provide a laterally displaced flow varying chamber accessible in the other said passage through said restriction passage for movement of said resin components from said mixing chamber to said outlet of said bore.

4,876,072

CATALYTIC CONVERTER WITH SCREEN ENCLOSURE HOLDING PELLETS UNDER TENSION

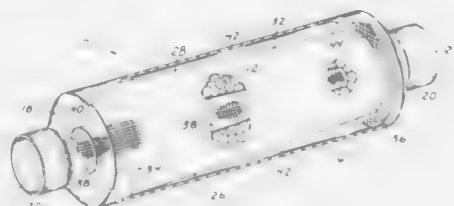
Edward T. Cheeki, 4747 Highway H, Franksville, Wis. 53126

Filed May 16, 1988, Ser. No. 194,334

Int. Cl.⁴ F01N 3/10

U.S. Cl. 422-179

15 Claims



1. In a catalytic converter of the type with a body of pellets in a housing, the improvement comprising an enclosure within the housing made of resilient screen, the screen enclosure compressing the body of pellets such that the pellets are held firmly in place under tension.

4,876,073

RADIONUCLIDE GENERATOR

David Issachar; Jacob Trumper, both of Rehovot, and Shmuel Abrashkin, Tel Aviv, all of Israel, assignors to State of Israel, Prime Minister's Office Israel Atomic Energy Commission, Soreq Nuclear Research Center, Yavne, Israel

Continuation of Ser. No. 752,912, Jul. 8, 1985, abandoned. This application Dec. 18, 1987, Ser. No. 139,078

Claims priority, application Israel, Jul. 6, 1984, 72321

Int. Cl.⁴ G21G 4/08; C01G 55/00

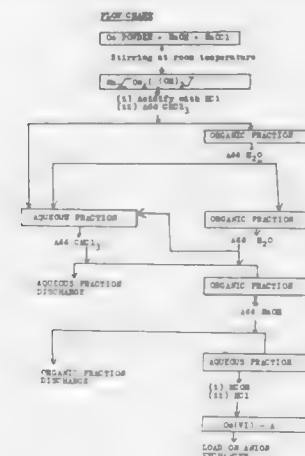
U.S. Cl. 423-2

9 Claims

1. A generator of short-lived radionuclides, comprising a column containing a silica gel support impregnated with a long chain quaternary ammonium ion exchange agent having the formula $(R_3N^+CH_3)Cl^-$ wherein the R group is C_8-C_{12} alkyl or at least one of the R groups is phenyl and the remaining groups are C_8-C_{10} alkyl, a complex of a parent radionuclide ^{191}Os being sorbed on said support in an amount sufficient to maintain the parent radionuclide in steady state equilibrium with its short-lived daughter radionuclide ^{191m}Ir , said complex having been produced by:

dissolving radioactive osmium metal in a hypochlorite/hydroxide solution;
acidifying the mixture;
extracting OsO_4 with an organic solvent;

washing the organic phase;
adding an aqueous base to complex and extract the osmium from the organic phase;
adding a reducing agent and acidifying the mixture to form



an osmium complex selected from the group consisting of $Na_2(OsO_2Cl_4)$ and $Na_2(OsO_2(OH)_2Cl_2)$; the daughter radionuclides being selectively eluted from the column by elution with physiological saline having a pH of about 1.

4,876,074

METHOD FOR SEPARATING ZINC OUT OF A HOT GAS CONTAINING ZINC VAPOUR

Bengt O. Gustafsson, Falun, and Nils B. Johansson, Hofors, both of Sweden, assignors to SKF Plasma Technologies AB, Hofors, Sweden

Filed Sep. 16, 1988, Ser. No. 245,424

Claims priority, application Sweden, Oct. 12, 1987, 8703930; Mar. 23, 1988, 8801058

Int. Cl.⁴ B01D 47/00, 19/00

U.S. Cl. 423-210.5

9 Claims

1. A method for separating zinc from a hot gas containing zinc vapour, the gas being conducted through a gas cooler where the zinc vapour is condensed on a flow of liquid lead which is recirculated and cooled for separation of the zinc, wherein heat from a lead flow coming from said gas cooler is transmitted to a chamber from which lead is introduced into said gas cooler; wherein the lead flow from the gas cooler is cooled to a temperature at which the concentration of zinc exceeds the solubility of zinc in the lead so that zinc is precipitated and the precipitated zinc is separated by density; and wherein the cooled lead flow, low in zinc, is transferred to said chamber to be heated by heated lead transmitted thereto, and the lead flow heated in the way is introduced into said gas cooler, thus acquiring a zinc saturation solubility in excess of its zinc content.

4,876,075

REMOVAL OF H_2S FROM GAS STREAMS

David A. Van Kleeck, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Oct. 17, 1988, Ser. No. 258,425

Int. Cl.⁴ C01B 17/16, 31/20

U.S. Cl. 423-226

11 Claims

1. A process for the removal of H_2S from a sour gaseous stream comprising
(a) intimately cocurrently contacting the sour gaseous stream in said first contacting zone with an upwardly flowing aqueous reactant solution containing solubilized ferric chelate and solubilized ferrous chelate, at a temperature below the melting point of sulfur, at a sufficient ratio to gas ratio and conditions effective to convert H_2S to

sulfur and inhibit sulfur deposition, and producing an upwardly flowing continuous liquid phase mixture comprising sour gas dispersed in an aqueous reactant solution as the continuous phase;

(b) passing the continuous liquid phase mixture from step (a) through a plurality of enclosed contacting sections in serial flow communication in a second zone, under conditions to convert H_2S to sulfur and at a temperature below the melting point of sulfur, the first contacting section of said second contacting zone comprising a plurality of discrete sulfur deposition resistant channels, each discrete channel providing a diverted flow path for the continuous liquid phase mixture through the section, such that continuous liquid phase mixture is directed at least initially at an angle acute to that of the direction of flow of the continuous liquid phase mixture entering the section; the second contacting section through which the continuous liquid phase mixture is passed comprising a plurality of discrete sulfur deposition resistant channels, each discrete channel providing a diverted flow path for the continuous liquid phase mixture through the section, such that the continuous liquid phase mixture is directed at least initially at an angle acute to that of the direction of flow of the continuous liquid phase mixture entering the section; and producing a gas in reactant continuous liquid phase mixture containing solid sulfur in said second contacting zone;

(c) separating the gas having reduced H_2S content from the gas in reactant solution mixture reduced in content of solubilized ferric chelate produced in step (b).

4,876,076

PROCESS OF DESULFURIZATION

James D. Colley, Austin, Tex., assignor to Tampa Electric Company, Tampa, Fla.

Filed Feb. 10, 1988, Ser. No. 154,946

Int. Cl.⁴ C01B 17/00

U.S. Cl. 423-242

2 Claims



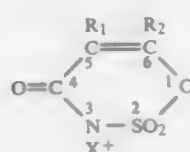
1. In a process for the desulfurization of flue gas utilizing limestone as absorbent in a double loop system, wherein the flue gas is introduced into a quenching zone for contact with a first slurry of said limestone, and thereafter passes to an absorbing zone for further contact with a second slurry of said limestone, the said second slurry being supplied from a mixing zone into which water and limestone are charged, said first slurry being supplied from the solids rich stream from a solid-liquid separator which is supplied from said mixing zone, and wherein air is introduced into said quenching zone to convert the calcium sulfite present therein to gypsum, the improvement which comprises supplying air to said mixing zone to convert calcium sulfite therein to larger gypsum crystals which are preferentially separated into said first slurry.

wherein R₁ is hydrogen or a 2-hydroxyethyl group in a cosmetically acceptable vehicle.

4,876,085 COSMETIC COMPOSITION CONTAINING OXATHIAZINONES

Jean F. Grollier, and Chantal Pourcadier, both of Paris, France, assignors to L'Oreal, Paris, France
Continuation of Ser. No. 608,910, May 10, 1984, abandoned.
This application May 19, 1986, Ser. No. 864,573
Claims priority, application Luxembourg, May 11, 1983, 84000

Int. Cl.⁴ A61K 7/06, 7/07, 7/42, 9/12
U.S. Cl. 424—47 46 Claims
1. A cosmetic composition suitable for treating greasy hair or skin, which comprises, in a cosmetically acceptable vehicle, from about 0.05% to 20% by weight of at least one oxathiazinone derivative of the formula:



in which

R₁ denotes hydrogen or an alkyl radical having from 1 to 4 carbon atoms;
R₂ denotes an alkyl radical having from 1 to 4 carbon atoms;
X denotes an alkali metal; and
at least one cosmetic adjuvant selected from the group consisting of non-ionic, anionic, cationic, and amphoteric surface active agents and mixtures thereof, thickeners, cosmetic polymers, preservatives, sequestering agents, foam synergistic agents, foam stabilizers, sun filters, colourants, pigments, fatty alcohols, waxes, humectants and perfumes.

4,876,086 INJECTABLE COMPOSITIONS OF AMOXYCILLIN TRIHYDRATE

John S. Dowrick, Littlehampton, England, assignor to Beecham Group p.l.c., England
Continuation of Ser. No. 822,842, Jan. 27, 1986, abandoned, which is a continuation of Ser. No. 679,916, Dec. 10, 1984, abandoned, which is a continuation of Ser. No. 432,924, Oct. 5, 1982, abandoned, which is a continuation of Ser. No. 156,363, Jun. 4, 1980, abandoned, which is a continuation of Ser. No. 949,241, Oct. 6, 1978, abandoned, which is a continuation of Ser. No. 748,696, Dec. 8, 1976, abandoned, and a continuation-in-part of Ser. No. 661,370, Feb. 25, 1976, abandoned, and a continuation-in-part of Ser. No. 661,372, Feb. 25, 1976, abandoned. This application Sep. 17, 1987, Ser. No. 98,326
Claims priority, application United Kingdom, Mar. 7, 1975, 09515

Int. Cl.⁴ H61K 31/79, 31/43
U.S. Cl. 424—80 7 Claims
1. An antibacterial pharmaceutical composition providing prolonged effective antibiotic blood level, said composition comprising amoxycillin trihydrate in the form of fine particles of an average diameter of from 2μ to 20μ at least 95% of which have diameters of between 0.5μ and 50μ and which fine particles are coated with a dispersing agent consisting of polyvinylpyrrolidone and lecithin, the ratio of amoxycillin trihydrate to said dispersing agent being about 50:1, the ratio of polyvinylpyrrolidone to lecithin being about 5:1, said composition being in the form of a powder which may be constituted to a sterile, injectable suspension of amoxycillin trihydrate formed upon the addition of a pharmaceutically acceptable aqueous vehicle

to a said composition and which suspension has enhanced stability and a pH in the range of 5.5.

4,876,087 USE OF N,N-DIETHYL-M-TOLUAMIDE AND/OR THE ETHYL ESTER OF 2-METHYL-3-PENTENOIC ACID AS MOSQUITO ATTRACTANTS

Richard A. Wilson, Westfield, N.J.; Jerry F. Butler, Gainesville, Fla.; Donald Withycombe, Lincroft, N.J.; Braja D. Mookherjee, Holmdel, N.J.; Ira Katz, West Long Branch, N.J., and Kenneth R. Schrankel, Tinton Falls, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y. and The University of Florida, Gainesville, Fla.

Continuation of Ser. No. 26,978, Mar. 17, 1987, abandoned. This application Jun. 30, 1988, Ser. No. 213,681
The portion of the term of this patent subsequent to Feb. 28, 2006, has been disclaimed.

Int. Cl.⁴ A01N 25/00, 37/02, 37/18
U.S. Cl. 424—84 3 Claims
1. A method of attracting Culicidae to an insect trap comprising the step of exposing the environment surrounding said trap to an insect attractant-containing polymer which consists of a mixture of a polymer and from about 1% up to about 45% by weight of said polymer of a composition of matter selected from the group consisting of:

- N,N-diethyl-m-toluamide; and
- an effective Culicidae attracting mixture of N,N-diethyl-m-toluamide and the ethyl ester of 2-methyl-3-pentenoic acid

said polymer being compatible with said composition of matter.

4,876,088 GAMMA-GLOBULIN INJECTABLE SOLUTIONS CONTAINING SORBITOL

Yutaka Hirao; Kazuo Takechi, both of Osaka; Katuhiro Uriyu, Nara, and Yabiro Uemura, Osaka, all of Japan, assignors to Green Cross Corporation, Osaka, Japan

Filed Feb. 5, 1988, Ser. No. 152,217
Claims priority, application Japan, Feb. 6, 1987, 62-27031
Int. Cl.⁴ A61K 39/395; C08L 89/00
U.S. Cl. 424—85.8 5 Claims
1. An intravenously injectable solution of chemically unmodified gamma-globulin having a complete molecular structure, said solution containing sorbitol in a concentration of from 1 to 20% by weight per volume as a stabilizer and having a low electrical conductivity and a pH of about 5.5±0.2, said solution having an electrical conductivity of not higher than 1 mmho as measured at 8° C.

4,876,089 FELINE LEUKEMIA VIRUS PROTEIN VACCINES

Paul Luciw, Emeryville; Deborah L. Parkes, Oakland, and Gary A. Van Nest, El Sobrante, all of Calif., assignors to Chiron Corporation, Emeryville, Calif.

Continuation of Ser. No. 647,966, Sep. 6, 1984, abandoned. This application Aug. 14, 1987, Ser. No. 87,954
Int. Cl.⁴ A61K 37/02 13 Claims
1. A polypeptide capable of inducing an immune response to produce antibodies specific for feline leukemia virus (FeLV) envelope glycoprotein, said polypeptide having been produced in a unicellular microorganism host and having the glycosylation pattern imposed by said unicellular host.

4,876,090 SYSTEMIC INSECT REPELLENT COMPOSITION AND METHOD

Richard Weisler, 8690 N.W. 56th St., Coral Springs, Fla. 33065
Filed Sep. 21, 1987, Ser. No. 98,686
Int. Cl.⁴ A61K 35/78, 31/51

U.S. Cl. 424—195.1 11 Claims
1. A nutritional dietary supplement which, when ingested at regular intervals of about every 12 hours, affords essentially continuous protection of mammals from infestation by fleas and ticks, said supplement consisting essentially of an insect repellent effective amount of a mixture of aneurine and allium sativum, the relative proportion of aneurine to allium sativum in such mixture being at least about 1:20.

4,876,091 GYPSUM-BASED INSECTICIDE PELLETS AND METHOD OF MANUFACTURE

John L. Clarke, Jr., 402 Fairbank Rd., Riverside, Ill. 60546
Continuation-in-part of Ser. No. 125,150, Nov. 25, 1987, which is a continuation-in-part of Ser. No. 904,905, Sep. 8, 1986, abandoned. This application Nov. 18, 1988, Ser. No. 273,206
Int. Cl.⁴ A01N 25/00, 63/00; A01M 1/20

U.S. Cl. 424—421 10 Claims
1. A machine distributable gypsum-based pesticide product which is non-porous and substantially without internal or external voids and in which the gypsum is a solid formed by the bonding of plaster of paris and water which includes, prior to formation of the solid, by weight, no more than the minimum water required for substantial hydration of the plaster of paris, approximately 5 percent of a pesticide, with the balance plaster of paris, the pesticide, water and plaster of paris being generally uniformly mixed to provide for generally uniform release of the pesticide over the life of the product, the product, after setting, having essentially no free water in that substantially all water is absorbed in the chemical reaction between the plaster of Paris and water, the product having a maximum surface area of on the order of about 180 mm², and a maximum weight of on the order of about 0.3 gram.

4,876,092 SHEET-SHAPED ADHESIVE PREPARATION APPLICABLE TO ORAL CAVITY

Tadafumi Mizobuchi; Akihito Ohji, both of Kagawa; Seichi Sakoh, Anan, and Yasuyoshi Murguruma, Kagawa, all of Japan, assignors to Teikoku Seiyaku Kabushiki Kaisha, Kagawa, Japan
Filed Jan. 30, 1987, Ser. No. 8,771
Claims priority, application Japan, Feb. 1, 1986, 61-020468
Int. Cl.⁴ A61K 13/00; B32B 23/04

U.S. Cl. 424—435 16 Claims

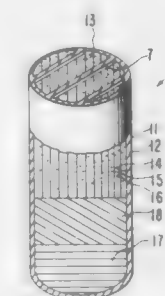


1. A sheet-shaped adhesive pharmaceutical preparation capable of adhering within the oral cavity which comprises an adhesive layer containing as essential components a carboxyvinyl polymer, a water-soluble methacrylic copolymer, a polyhydric alcohol and a pharmaceutically active agent, and a water-impermeable and water-insoluble carrier layer containing as essential components a pharmaceutically acceptable water-insoluble, film-forming high molecular weight compound and a plasticizer, wherein the ingredients of the adhesive layer are substantially released from one side of the sheet-shaped preparation whereby the ingredients are absorbed through the mucous membrane, or teethridge to which it is adhered.

4,876,093 DISPENSER WITH DISPERSING MEMBER FOR DELIVERING BENEFICIAL AGENT

Felix Theeuwes, Los Altos, and Patrick S. L. Wong, Hayward, both of Calif., assignors to ALZA Corporation, Palo Alto, Calif.
Filed Jul. 2, 1987, Ser. No. 69,148
The portion of the term of this patent subsequent to Apr. 25, 2006, has been disclaimed.
Int. Cl.⁴ A61K 9/22; A61M 31/00

U.S. Cl. 424—438 21 Claims

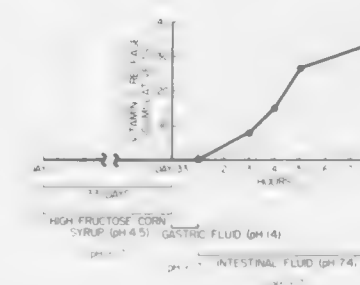


1. A dispenser for administering a beneficial agent formulation to an animal environment of use, the dispenser comprising: (a) a wall that surrounds and defines an internal lumen, the wall comprising at least in part a semipermeable composition that is permeable to the passage of fluid and is substantially impermeable to the passage of a beneficial agent; (b) carrier means in the lumen for administering a beneficial agent to the animal environment of use, said carrier means substantially maintaining its physical and chemical integrity while in the lumen of the dispenser; (c) a beneficial agent in the carrier means for administering a beneficial agent; (d) pushing means for occupying an increasing amount of space in the lumen for pushing the carrier means comprising the beneficial agent from the dispenser; and, (e) a mouth in the dispenser comprising means for breaking the carrier means from a first size to a second size as the carrier means leaves the dispenser.

4,876,094 CONTROLLED RELEASE LIQUID DOSAGE FORMULATION

Ben F. Benton, Centerburg, and David L. Gardner, Bellville, both of Ohio, assignors to Battelle Development Corporation, Columbus, Ohio
Continuation-in-part of Ser. No. 570,469, Jan. 13, 1984, abandoned. This application Jul. 14, 1986, Ser. No. 884,167
Int. Cl.⁴ A61K 47/00

U.S. Cl. 424—491 4 Claims



1. A drinkable liquid suspension of solid dosage forms con-

sisting of dual coated theophylline cores in an acidic carrier liquid comprising:

cores of not more than 1400 microns in diameter consisting of a solid binding material and a therapeutically active substance,

dual coatings consisting of a first coating and a second coating over said cores for retarding release of the therapeutically active substance to the acidic carrier liquid and for permitting release in an alkaline environment,

the first coating comprising an ingestible fat having a melting point of 101° F. or less, the first coating comprising 4.8 to 17.7% by weight of the total weight of the dosage forms,

the second coating comprising zein, the second coating comprising 2.3 to 10% by weight of the total weight of the dosage forms,

a carrier liquid for suspending the dosage forms, the carrier liquid having a pH < 5 and comprising a viscous aqueous solution of a sugar.

4,876,095

CHEWING GUM COMPOSITION AND METHOD OF MAKING SAME

Robert K. Yang, Randolph, N.J., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed May 20, 1986, Ser. No. 865,509

Int. Cl. A23G 3/30

U.S. Cl. 426—3

8 Claims

1. A method of preparing a gum base composition in the absence of rosin esters or terpene components, which comprises:

heating said elastomer to a compatibilization temperature of about 220° C. to about 250° C. under low shear dissociating forces,

adding a high melting point compatibilization component consisting essentially of a wax having a melting point of about 130° F. to about 250° F. (121° C.) under conditions of mastication, temperature and low shear mixing until a substantially homogeneous plastic mass is formed, and introducing a resin component under continued low shear mixing and mildly elevated temperature until said resin and said elastomer form a substantially homogeneous plastic mass.

4,876,096

RICE SYRUP SWEETENER

Cheryl R. Mitchell; Pat R. Mitchell, both of Manteca, Calif., and William A. Mitchell, Shelburne, Vt., assignors to California Natural Products, Manteca, Calif.

Division of Ser. No. 856,504, Apr. 28, 1986, Pat. No. 4,756,912. This application Mar. 29, 1988, Ser. No. 174,598

The portion of the term of this patent subsequent to Jul. 12, 2005, has been disclaimed.

Int. Cl. A23L 1/09, 1/05

U.S. Cl. 426—28

15 Claims

1. A rice syrup sweetener product formed by a method comprising the steps of

selecting as a starting material a whole grain rice and dividing it into particles of reduced size,

liquifying the whole grain rice particles with an alpha-amylase enzyme in an aqueous medium substantially free from protease, in an amount and for a period of time sufficient to form a liquid slurry,

treating the liquid slurry with a glucosidase enzyme in a saccharification step in an amount and for a period of time less than about three hours for yielding a saccharification product having a glucose content of about 5 to 70% solids,

clarifying the saccharification product to remove substantially all rice fiber to form a partially clarified product, and concentrating the partially clarified product to produce the rice syrup sweetener product having a protein content on

a dry-weight basis of less than about 3.5%, the product being colloidal or non-filtrable.

4,876,097

COMPOSITIONS FOR COATING FEEDING STUFF ADDITIVES INTENDED FOR RUMINANTS AND FEEDING STUFF ADDITIVES THUS COATED

Pierre Autant; Andre Cartillier, both of Commeny, and Raymond Pigeon, Francheville, all of France, assignors to Rhone-Poulenc Sante, Courbevoie, France

Continuation of Ser. No. 810,778, Dec. 19, 1985, abandoned.

This application Sep. 2, 1987, Ser. No. 93,137

Claims priority, application France, Dec. 20, 1984, 84-19520; Dec. 20, 1984, 84-19521

Int. Cl. A23K 1/00

U.S. Cl. 426—74

11 Claims

1. A composition suitable for coating a biologically active substance, which is stable at a pH greater than or equal to 5 and which permits the release of the biologically active substance at a pH less than or equal to 3.5, which composition comprises:

40 to 95% by weight of a film-forming, waterinsoluble binding agent which possesses controlled hydrophilicity and which may be slightly sensitive to pH variations, the said binding agent being selected from the group consisting of a combination of a water-insoluble filmforming cellulose derivative and an agent for controlling the hydrophilic/hydrophobic balance selected from the group consisting of polyols in a weight ratio of cellulose derivative to polyol of from 1:1 to 1.5:1; zein; and a combination of zein and an agent for controlling the hydrophilic/hydrophobic balance selected from the group consisting of water-insoluble cellulose derivative in a weight ratio of 2:1 to 10:1;

and 60 to 5% by weight of a pH sensitive substance selected from the group consisting of a polymer or copolymer containing at least one basic amino group and having a nitrogen content between 2 and 14% selected from the group consisting of amino derivatives of cellulose, polymers of amino derivatives of acrylic and methacrylic acids, copolymers of styrene with a vinylpyridine, and chitosan.

4,876,098

METHOD OF ROLLING DOUGH

Eugen Morgenthaler, Kirchberg, Switzerland, assignor to Seewer AG, Burgdorf, Switzerland

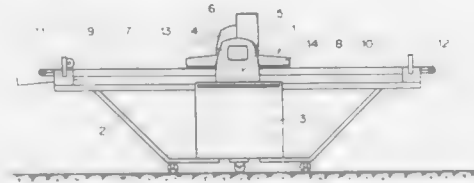
Filed Nov. 24, 1987, Ser. No. 124,882

Claims priority, application Fed. Rep. of Germany, Dec. 3, 1986, 3641286

Int. Cl. A21C 3/02

U.S. Cl. 426—231

3 Claims



1. In a process for rolling out a strip of dough, comprising the steps of passing the strip of dough on a dough-conveyor belt between a fixed dough roller and a movable dough roller a plurality of times, and after each pass of the strip of dough to be rolled out between the rollers moving the movable dough roller a specific distance toward the fixed dough roller by means of a controllable adjusting means so that the roller gap between the dough rollers decreases after each pass of the strip of dough, the improvement comprising controlling the adjusting means by a programmable circuitry and reducing the ratio

of one roller spacing to the next smaller roller spacing after at least one of said passing steps as the roller spacing decreases during the dough rolling process.

4,876,099

PROCESS FOR POPPING WILD RICE

Robert J. MacGregor; Darlene M. MacGregor, and Arnold Lueck, all of Aitkin, Minn., assignors to MacGregor Wild Rice Co., Aitkin, Minn.

Filed Jul. 25, 1988, Ser. No. 223,608

Int. Cl. A21D 6/00

U.S. Cl. 426—242

4 Claims

1. A process for puffing wild rice comprising:

- (a) curing and parching the wild rice in a roasting oven to reduce its moisture content to a level of 4% to 12% by weight;
- (b) scarifying the wild rice to remove the outer shell and bran from the kernels of the wild rice;
- (c) grouping the wild rice by length and width so as to achieve a uniform size in each group;
- (d) depositing the groups of wild rice separately on a heating surface and exposing the wild rice in each group to heat the wild rice to 500–800 degrees Fahrenheit so that the moisture in the wild rice expands, causing the wild rice to puff;
- (e) removing the wild rice from the heating surface after it has popped to avoid scorching; and
- (f) permitting the wild rice to cool.

4,876,100

METHOD FOR PRODUCING MILK WITH A LOWERED BACTERIAL CONTENT

Sune Holm, deceased, late of Lund (Ingrid Birgitta Elisabet, née Jansson, Eva Christina Holm, Claes Frederick Holm, executors); Rolf Malmberg, Lund, and Kjell Svensson, S. Sandby, all of Sweden, assignors to Alfa-Laval Food and Dairy Engineering AB, Tumba, Sweden

Continuation-in-part of Ser. No. 857,745, Apr. 22, 1986, abandoned. This application Jun. 13, 1988, Ser. No. 206,126

Claims priority, application Sweden, Sep. 11, 1984, 8404545

Int. Cl. A23C 1/00

U.S. Cl. 426—491

9 Claims

1. A method for treating raw milk to produce treated milk having a lower bacterial content than the raw milk, in which raw milk is first divided by centrifugal separation into a fraction consisting of cream and a fraction consisting of skim milk, comprising the further steps of: (a) subjecting the skim milk fraction to microfiltration by passing the skim milk fraction through a microfilter having a retaining membrane surface, the pores in said microfilter having an average diameter of at least about 0.8 μ and less than about 2.0 μ , to yield a permeate which consists of skim milk with a lower fat globular, protein and bacterial content than the skim milk fraction, in which the microfiltration is carried out by directing the skim milk through a circulation path comprising the microfilter, at which the skim milk is directed to flow in a cross-flow filtration path, which is generally parallel with the retaining membrane surface during the microfiltration, (b) separating from the retaining membrane surface a retentate which consists of skim milk with a higher fat globular, protein and bacterial content than the skim milk fraction, (c) sterilizing the retentate, and (d) separately recovering the retentate, permeate and cream fractions.

4,876,101

SNACK FOOD INGREDIENT AND METHOD FOR MAKING SAME

Miles J. Willard, 229 North Loyd Cir., Idaho Falls, Id. 83402

Continuation of Ser. No. 883,519, Jul. 8, 1982, Pat. No.

4,756,920. This application Jun. 24, 1988, Ser. No. 210,878

The portion of the term of this patent subsequent to May 24, 2005, has been disclaimed.

Int. Cl. A21D 10/00

U.S. Cl. 426—549

5 Claims

1. A continuous process for producing a fried snack food, comprising the steps of:

- a. grinding dry cereal grain kernels such that a major portion of the ground cereal grain passes through a U.S. No. 20 mesh screen and is retained upon a U.S. No. 100 mesh screen;
- b. uniformly hydrating the ground cereal grain with water to form a grain/water slurry having a moisture content of from about 40% to about 70% water;
- c. uniformly gelatinizing substantially all of the starch in the grain/water slurry by cooking the grain/water slurry at a temperature above the gelatinization temperature of starch to form a gel;
- d. cooling the gel such that a major portion of the gelatinized starch therein is set back;
- e. mixing the cooled gelatinized ground grain with dry snack food ingredients to form a dough;
- f. forming the dough into individual snack food pieces; and
- g. frying the individual snack food pieces;

4,876,102

POTATO BASED DOUGH CONTAINING HIGHLY PECTINATED CELLULOSIC FIBERS

Robert D. Feeney, Hawthorne, N.J.; Robert L. Prosser; Joseph McGrady, both of Cincinnati, Ohio, and Raymond L. Niehoff, West Chester, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Dec. 30, 1987, Ser. No. 139,527

Int. Cl. A23L 1/217

U.S. Cl. 426—550

22 Claims

1. An improved potato based dough comprising:

- (a) 20% to 50% potato component based on dried potato weight, wherein said potato component has been adjusted to a reducing sugar content of from 0% to about 5%; an iodine index of from about 0.1 to about 6; and a lipid content defined by the relationship $Y = AX^{0.40}$, where Y is the lipid content of the dough in percent by weight of dehydrated potatoes, A has a value less than or equal to 2.70, and X is the dehydrated potato iodine index which ranges from about 0.01 to about 6; and
- (b) 25% to 55% water; wherein said improvement comprises the including in said dough of from about 3% to about 20% of a fibrous cellulosic material, said cellulosic material having a water absorbency of between about 2 g water/g fiber and 25 g water/g fiber and having a pectin content of at least about 15%, said cellulosic material being derived from citrus whole peel, citrus albedo, citrus juice vesicle solids, citrus rag, dried citrus pulp, sugar beet pulp, apples, or mixtures thereof.

4,876,103

PROCESS FOR MAKING MEAT PRODUCTS CONTAINING A KONJAC MANNAN GEL

Ikuo Kawano; Tsuyoshi Takiguchi; Norihisa Kimura; Yohel Yanagisawa, all of Gunma; Tokaji Ashimi, and Hiroyuki Yoshino, both of Tokyo, all of Japan, assignors to Governor of Gunma-ken, Maebashi and Nakamura Co., Ltd., Tokyo, both of Japan

Filed Oct. 29, 1987, Ser. No. 114,674

Claims priority, application Japan, Oct. 9, 1987, 62-255289
Int. Cl.⁴ A23L 1/314, 1/317

U.S. Cl. 426—574

8 Claims

1. A method for making a process meat product comprising the steps of: adding konjac powder to cold water under agitation to form a mixture, said konjac powder being added to said cold water in a weight ratio of 1:50 to 1:60; allowing the mixture to stand and be converted into a uniform paste; adding a coagulant to the paste, said coagulant consisting of a mixture of calcium hydroxide, sodium carbonate and potassium carbonate; steaming the paste for a time sufficient to coagulate the paste and form a konjac mannan gel; providing a meat; dividing the meat and konjac mannan gel into fine pieces while mixing said meat and konjac mannan gel; shaping the fine pieces into a shaped product; and thermally treating the shaped product.

4,876,104

METHOD FOR PREPARING AND PRESERVING FRESH PASTA

Michael McGuire, Elmhurst; Ralph DiGiacomo, Palisades; Marcia Palmer, Nanuet, and Louis Liggett, Brooklyn, all of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed Dec. 22, 1987, Ser. No. 136,892

Int. Cl.⁴ A23L 1/162

U.S. Cl. 426—57

11 Claims

1. A process for preparing and preserving fresh pasta which maintains its freshness for up to 120 days without lowering the moisture to levels which prohibit growth of organisms which cause deterioration, comprising the steps of:

- preparing a uniform blend comprising flour and whole eggs having a moisture content of up to 30%;
- conditioning the uniform blend by compacting some to form a sheet of dough having a thickness of at least 0.03 inches;
- cutting the sheeted dough into a desired shape or form;
- subjecting the cut dough to dry heat for a time ranging from 10 seconds to 60 seconds and at a temperature ranging from 35° F. to about 425° to lower the moisture and partially dry the external surface of the compacted cut dough;
- contacting the cut dough with steam for a time and at a temperature sufficient to pasteurize said cut dough;
- cooling the pasteurized dough to a temperature of between about 30° F. and about 50° F.;
- packaging the cooled pasteurized dough in a modified atmosphere environment; and
- storing the packaged product for extended periods of time at temperatures ranging from about 40° F. to 50° F.

4,876,105

GELLAN GUM/GELATIN BLENDS

Carol L. Wolf, Solana Beach; William M. LaVelle, and Ross C. Clark, both of San Diego, all of Calif., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Jan. 9, 1988, Ser. No. 204,449

Int. Cl.⁴ A23L 1/06, 1/04

U.S. Cl. 426—573

7 Claims

1. A blend of gellan gum and gelatin in the with ratios of 1:20 to 1:50.

4,876,106

HIGHLY VERSATILE COMPREHENSIVE NUTRITIONAL COMPOSITION

Gail J. Sabatura, 38 Deanna Dr., Somerville, N.J. 08876
Continuation-in-part of Ser. No. 833,832, Feb. 28, 1986, abandoned, which is a continuation-in-part of Ser. No. 713,735, Mar. 20, 1985, abandoned. This application Nov. 30, 1987, Ser. No. 126,388

Int. Cl.⁴ A23C 21/00

U.S. Cl. 426—583

12 Claims

1. A comprehensive and versatile nutritional composition suitable for making varieties of food products including hot and cold drink, shakes, puddings, frozen bars, soups, salad dressings, dips, souffles and vegetables, said composition, comprising a separately maintained base mix and a separately maintained flavoring mix with an amount of said base mix being sufficient to provide an adequate amount of proteins, for a low calorie diet, said base mix including at least one dairy based constituent to provide bulk and flavor and further comprising a whey protein concentrate and at least one caseinate product having a low flavor profile, said flavoring mix including at least one flavoring agent said base mix or flavoring mix or both having thickening properties with said base mix and flavoring mix being highly water soluble and said base mix and flavoring mix being brought together in the presence of a sufficient quantity of water just prior to use, said varieties of food products being dependent upon the flavoring agent, amount of water, temperature and method of making.

4,876,107

SUBSTITUTE MILK FAT COMPOSITIONS

David M. King, Billerica, and Frederick B. Padley, Bedford, both of England, assignors to Unilever Patent Holdings BV, Rotterdam, Netherlands

Continuation of Ser. No. 884,931, Jul. 14, 1986, abandoned. This application Apr. 4, 1988, Ser. No. 178,880

Claims priority, application United Kingdom, Jul. 12, 1985, 8517677

Int. Cl.⁴ A23C 11/00

U.S. Cl. 426—601

10 Claims

1. A rearranged vegetable fat composition consisting essentially of a mixture of glycerides of unbranched and even-numbered fatty acids residues of which at least half in the 2-position are palmitic acid residues and in which those in the 1- and 3-positions are randomly distributed between these positions and consist essentially of unsaturated C₁₆ and C₁₈ fatty acid residues and no more saturated fatty acid residues than in the 2-position.

4,876,108

METHOD OF USING FAST PYROLYSIS LIQUIDS AS LIQUID SMOKE

Gary Underwood, Manitowoc, Wis., and Robert G. Graham, Nepean, Canada, assignors to Ensyn Engineering Associates Inc., Ontario, Canada

Filed Nov. 12, 1987, Ser. No. 119,673

Int. Cl.⁴ A23L 1/221

U.S. Cl. 426—650

17 Claims

1. A process of making an aqueous wood smoke flavored solution for use in foodstuffs comprising:

- heating in the absence of oxygen ground wood or cellulose to between 400° C. and 650° C. within 1.0 second;
- maintaining the said wood or cellulose together with the pyrolysis products produced from the said wood or cellulose between 400° C. and 650° C. for between 0.03 and 2.0 seconds;
- reducing the temperature of the pyrolysis products to below 350° C. within 0.6 seconds thereby obtaining a liquid extract;
- separating and collecting the liquid extract of the said pyrolysis products;
- diluting the said liquid extract with water to achieve a

partial phase separation and to obtain an aqueous wood smoke flavored solution having a benzo(a)pyrene concentration of less than 1.0 ppb and a browning index to phenol concentration greater than 8.9 to 1 and a ratio of hydroxyacetaldehyde to acetal greater than 5.5 to 1.

4,876,109

SOLUBLE COVERING FOR CARDIAC PACING ELECTRODE

David W. Mayer, Bloomington; Byron L. Gilman, Plymouth; Susan M. Walgren, Shoreview, and June M. Berglund, Forest Lake, all of Minn., assignors to Cardiac Pacemakers, Inc., St. Paul, Minn.

Division of Ser. No. 37,684, Apr. 13, 1987, Pat. No. 4,827,940.
This application Nov. 18, 1988, Ser. No. 272,912

Int. Cl.⁴ A01N 1/02; B05D 1/18, 3/02

U.S. Cl. 427—2

3 Claims

1. A process for coating a fixation element of a body implantable electrode, including the steps of:

- selecting a biocompatible, non-pyrogenic material soluble in bodily fluids and having a melting point substantially above normal body temperature, and heating said material to a temperature slightly above its melting point;
- dipping a fixation element of a body implantable electrode into a solution of said material maintained at said temperature;
- removing said fixation member, along with an initial portion of said material adhering to said fixation member, from said solution and permitting them to cool a sufficient time to allow said first portion to at least partially solidify;
- dipping said fixation member and material portion, after said cooling, into said solution for a time sufficient to permit a subsequent portion of said material to adhere to said initial portion; and
- removing said fixation member, initial portion and subsequent portion from said solution, and permitting them to cool to an ambient temperature.

4,876,110

ELECTROSURGICAL KNIFE

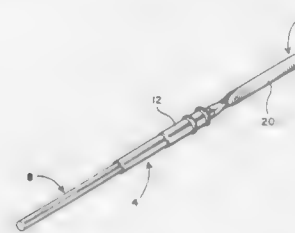
G. Marsden Blanch, Sandy, Utah, assignor to American Medical Products, Inc., Murray, Utah

Division of Ser. No. 17,876, Feb. 24, 1987. This application Aug. 10, 1987, Ser. No. 83,245

Int. Cl.⁴ A01N 1/02; B05D 1/36, 7/00; B21K 11/00

U.S. Cl. 427—2

6 Claims



1. A method of fabricating an electrosurgical knife for use with a source of radio-frequency energy in cutting and cauterizing tissue, said method comprising

- providing an elongate stainless steel blade having a cutting edge at one end thereof, with the other end being coupleable to an energy source,
- abrading at least a portion of the surface of the blade,
- applying a first coat of primer material by dipping, to at least the cutting edge of the blade,
- baking the first coat,
- abrading the surface of the first coat,
- applying a second coat of non-stick material over the first coat by dipping, wherein the second coat is Teflon product 455-119, and

(b) baking the second coat.

4,876,111

METHOD FOR DEPOSITING A PRIMER OR SEALER OF PROGRAMMED COLOR ON AN OBJECT

Daniel Guyonard, Lamorlaye; Gérald Torrez, Liancourt; Jean-Michel Lambour, Pont-Sainte-Maxence, and Claude Arrivens, Argent-sur-Saône, all of France, assignors to B.A.S.F. Peintures & Encres S.A., France

Filed Oct. 6, 1987, Ser. No. 106,556

Claims priority, application France, Oct. 6, 1986, 86 13892

Int. Cl.⁴ B05D 1/06, 1/34

U.S. Cl. 427—31

7 Claims

1. A method of depositing by projection or spraying using a projection or spray device a primer or sealer of programmed color on an object comprising feeding independently to the projection or spray device a neutral primer base and at least one mono- or poly-pigmented paste said base and said paste being fed in such a manner as to cause them to be mixed in the device simultaneously while being projected or sprayed on said object, whereby said neutral primer base and said pigmented paste are mixed in order to constitute said primer at substantially the moment the primer is deposited on said object.

4,876,112

PROCESS FOR FORMING METALLIC PATTERNED FILM

Takashi Kaito, and Tatsuya Adachi, both of Tokyo, Japan, assignors to Seiko Instruments Inc., Japan

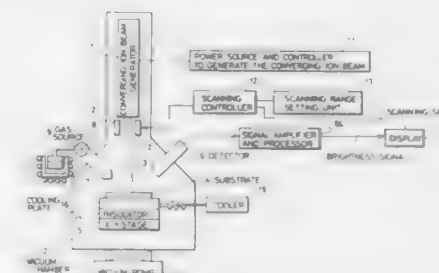
Filed Mar. 27, 1987, Ser. No. 31,946

Claims priority, application Japan, May 29, 1986, 61-124146

Int. Cl.⁴ B05D 3/06

U.S. Cl. 427—38

22 Claims



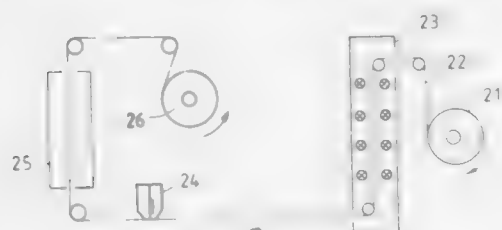
1. A process for forming a new wiring path on a semiconductor device, comprising: providing a semiconductor device having a designated area on which a new wiring path is to be formed; forming a layer of decomposable carbonyl metal compound composed of carbonyl and metal components on the designated area of the semiconductor device by directing a vapor stream of decomposable carbonyl metal compound onto the designated area; and converting the layer of decomposable carbonyl metal compound into a new wiring path on the designated area of the semiconductor device by irradiating the layer with a focused ion beam to decompose the carbonyl metal compound layer into a gaseous carbonyl component which dissipates and a solid metal component which deposits as the new wiring path on the semiconductor device.

4,876,113 METHOD FOR PRODUCING MAGNETIC RECORDING MEDIA

Tadaaki Yasunaga, and Koji Senazawa, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed May 12, 1988, Ser. No. 192,531
Claims priority, application Japan, May 15, 1987, 62-118521
Int. Cl.⁴ B05D 3/06

U.S. Cl. 427-39

17 Claims



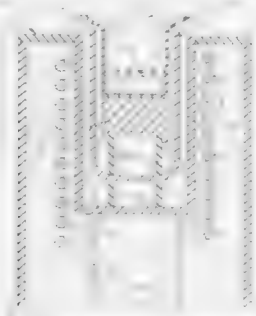
1. A method for producing a magnetic recording medium comprising the steps of: forming a magnetic metal thin film on at least one side of a nonmagnetic substrate; exposing a surface of said thin film to a glow discharge atmosphere; and immediately forming a protective lubricant layer on said thin film.

4,876,114 PROCESS FOR THE SELF FRACTIONATION DEPOSITION OF A METALLIC LAYER ON A WORKPIECE

Richard R. Phinney, South Hero, and David C. Strippe, Waterbury Center, both of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.
Division of Ser. No. 100,068, Sep. 23, 1987, Pat. No. 4,791,261.
This application Aug. 29, 1988, Ser. No. 237,193
Int. Cl.⁴ B05D 3/02; C23C 16/06

U.S. Cl. 427-45.1

6 Claims



6. A process for the self-fractionation deposition of a metallic layer on a workpiece consisting of the steps of: depositing a body of copper in a molybdenum crucible which body is less than five-eighths of the volume of the crucible, shielding the workpiece from the crucible with a removable shield, applying RF power to the crucible to heat the body of copper contained therein to a stable temperature of about 1200° C., increasing the RF power applied to the crucible and the body of copper, to increase the temperature of the charge about 1900° C., lowering the power level applied to the device to lower the temperature of the body of copper to 1510° C., and removing the shield from between the crucible and the

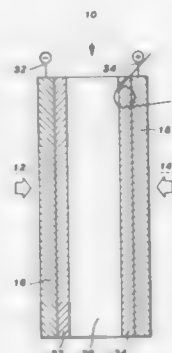
workpiece to permit evaporant from the body of copper to coat the workpiece.

4,876,115 ELECTRODE ASSEMBLY FOR USE IN A SOLID POLYMER ELECTROLYTE FUEL CELL

Ian D. Raistrick, Los Alamos, N. Mex., assignor to United States Department of Energy, Washington, D.C.
Division of Ser. No. 9,843, Jan. 30, 1987, abandoned. This application Mar. 3, 1988, Ser. No. 163,672
Int. Cl.⁴ H01M 4/86

U.S. Cl. 427-115

4 Claims



1. A method for treating porous gas diffusion electrodes having a catalyst loading less than 0.50 mg per square centimeter supported on carbon particles defining catalytic sites within said electrode for effective use with a solid polymer electrolyte membrane, comprising the steps of:

forming a solution containing a proton conductive material selected from a group consisting of a perfluorocarbon copolymer and ruthenium dioxide at a dilution effective for said proton conductive material to deposit adjacent said catalytic sites within said electrode; and dispersing said solution over said electrode in a manner effective for said proton conductive material to penetrate to within said electrode adjacent said catalytic sites.

4,876,116 METAL CONDUCTORS WITH IMPROVED SOLDERABILITY

Ashok K. Mehan, Union City, and Hans E. Lank, Menlo Park, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Filed Sep. 11, 1986, Ser. No. 906,355
Int. Cl.⁴ B05D 5/12

U.S. Cl. 427-118

17 Claims

1. A method of making an insulated metal wire having improved retention of solderability on storage, which method comprises

(1) applying a solution of a surface active agent in a liquid carrier to the surface of the wire; and
(2) after step (1), surrounding the wire with a layer of a polymeric insulating composition, the layer being formed by melt extrusion of a polymeric insulating composition around and against the surface of the wire carrying the surface active agent or by wrapping a tape of a polymeric insulating composition around and against the surface of the wire carrying the surface active agent;

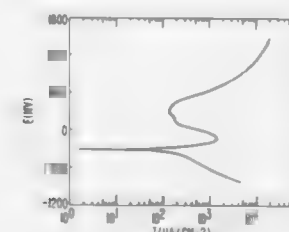
the surface active agent and the conditions of the method being such that the insulated wire has improved retention of solderability on storage.

4,876,117 METHOD AND COATING TRANSITION METAL OXIDE ON THIN FILM MAGNETIC DISKS

Jonathan G. Bornstein, Mountain View, Calif., assignor to Domain Technology, Milpitas, Calif.
Filed Feb. 4, 1988, Ser. No. 152,119
Int. Cl.⁴ B05D 5/12

U.S. Cl. 427-130

13 Claims



1. A method for forming a protective coating over the surface of a magnetic recording disk, said method comprising: applying a uniform layer of a liquid metal oxide precursor solution over the surface of the magnetic recording disk, said metal being selected from the group consisting of Groups IVB, VB and VIB of the Periodic Table and aluminum, indium, and tin; and heating the layer on the disk to a temperature in the range from about 100° to 300° C. for a sufficient time to convert the precursor to a hardened layer of the corresponding metal oxide.

4,876,118 NEGATIVE CORRECTION OF GRAVURE PRINTING PLATES

Guenter Wallbillich, Neustadt, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Mar. 25, 1988, Ser. No. 174,359

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1987, 3710145

Int. Cl.⁴ B32B 35/00

U.S. Cl. 427-142

13 Claims

1. A method for the negative correction of gravure printing plates by filling undesirable depressions in the printing layer of the gravure printing plate with a correcting agent, wherein the correcting agent used is a pasty material which is viscoplastic at room temperature and is based on a dispersion of a solid, highly fluorinated olefin polymer powder in an inert, sparingly volatile, chemically stable, highly heat stable, organic dispersing liquid having a boiling point above 150° C.

4,876,119 METHOD OF COATING A NITRIDE CERAMIC MEMBER

Hiromitsu Takeda; Masako Nakahashi; Makoto Shirokane, and Tatsuo Yamazaki, all of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 11, 1988, Ser. No. 167,237

Claims priority, application Japan, Mar. 13, 1987, 62-56850; Mar. 13, 1987, 62-58103; Mar. 13, 1987, 62-58104

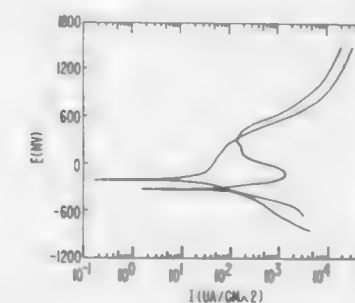
Int. Cl.⁴ C23C 16/00

U.S. Cl. 427-250

18 Claims

1. A method of coating a nitride ceramic member, comprising the steps of: activating a surface of said nitride ceramic member by subjecting the member to a high temperature in a vacuum; and bringing a metal vapor, which is reactable with an element present in the nitride ceramic member, into contact with

the activated surface of the nitride ceramic member to form a layer thereon comprised of a reaction product of an



element present in the nitride ceramic member and the metal vapor, on the activated surface.

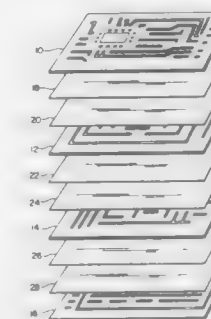
4,876,120 TAILORABLE MULTI-LAYER PRINTED WIRING BOARDS OF CONTROLLED COEFFICIENT OF THERMAL EXPANSION

Robert E. Belke, Clay; Louis Zakraysek, Cicero, and Walter O. Pillar, New Hartford, all of N.Y., assignors to General Electric Company, Coshocton, Ohio

Filed Apr. 21, 1987, Ser. No. 40,981

Int. Cl.⁴ C09K 19/00; B32B 15/04; H01B 5/00; H05K 1/00
U.S. Cl. 428-1

27 Claims



1. In a multi-layer printed wiring board (MLPWB) made from laminates with bonding sheets therebetween, the improvement which comprises at least one layer thereof formed from a liquid crystalline polymer selected from the group consisting of poly(para-phenylene benzobisthiazole), poly(para-phenylene benzobisoxazole), poly(2,5-benzothiazole), poly(2,5-benzoxazole), and mixtures thereof.

4,876,121 COSMETIC ARTIFICIAL NAILS

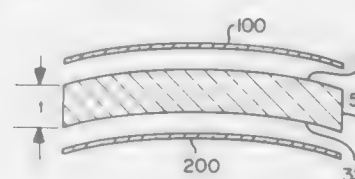
Allen L. Cohen, 10010 Walsham Ct., Richmond, Va. 23233

Filed Sep. 30, 1988, Ser. No. 252,262

Int. Cl.⁴ A01N 1/00

U.S. Cl. 428-15

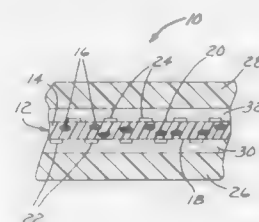
41 Claims



1. An artificial fingernail or toenail wherein such is useful for superposition on a natural fingernail or toenail and comprises: (a) a primary substrate layer, forming the nail bed, that is

- transparent or partially transparent and has an upper surface and a lower surface, said surfaces separated by the physical thickness of the substrate material itself, said thickness functioning to allow for a parallax effect;
- (b) a first grid pattern layer having a first grid pattern therein containing opaque or partially opaque regions within said first pattern, said first grid pattern layer superposed on the lower surface of the primary substrate layer; and
- (c) a second grid pattern layer having a second grid pattern therein containing transparent or partially transparent regions within said second pattern, said second grid pattern layer superposed on the upper surface of the primary substrate layer.

one vinyl alcohol monomeric unit and said second copolymer being sufficiently incompatible with said first copolymer to



form two phases within said film, one of said phases being continuous.

4,876,122

PACKAGE CAPABLE OF PREVENTING FOAM FORMATION, METHOD OF MANUFACTURING SUCH A PACKAGE, AND ANTI-FOAMING AGENT
Martin Hellsten, Ödsmål, Sweden, assignor to Berol Kemi AB, Stenungsund, Sweden

Filed Mar. 22, 1988, Ser. No. 171,745

Claims priority, application Sweden, Apr. 6, 1987, 8701429
Int. Cl.⁴ B65D 85/72; D21H 1/40

U.S. Cl. 428—34.1

14 Claims

1. A package capable of preventing foam formation when being filled with liquid aqueous products, characterized in that at least a part of the inner side of the material forming the package is coated with an anti-foaming agent comprising an anti-foaming, water-insoluble compound encapsulated in crystalline urea.

4. The package as claimed in claim 1, wherein the anti-foaming, water-insoluble compound is of the general formula



wherein R is a hydrocarbon group having 1–30 carbon atoms, hydrogen or a group of the formula $R_1(A_3)_{n_3}$ wherein R_1 is hydrogen or a hydrocarbon group having 1–30 carbon atoms, A_3 is an alkenoxy group having 2–4 carbon atoms, n_3 is 0 to 30, X is —O—,



or —S—, A_1 and A_2 are each an alkenoxy group having 2–4 carbon atoms, n_1 and n_2 are each 0 to 100, m is 1–4, n_1 , n_2 , n_3 and m being so selected that the number of alkenoxy groups is from 15 to 120.

4,876,123

TAMPER INDICATING TAPE AND DELAMINATING FILM THEREFOR

Raymond R. Rivera, Cottage Grove; Stephen B. VanVleet, Woodbury, and Shari J. Wilson, Minneapolis, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jun. 27, 1988, Ser. No. 212,412

Int. Cl.⁴ B32B 7/10

U.S. Cl. 428—34.2

19 Claims

1. A light transmissive film derived from a composition comprising 50 to 85 parts per weight of a first copolymer comprising at least one moiety derived from at least one olefinic monomeric unit and 50 to 15 parts by weight of a second copolymer comprising at least one moiety derived from at least

4,876,124

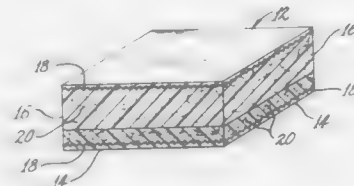
UNDERGROUND TANK

Barry J. Dallam, Montgomery, Tex., assignor to Owens-Corning Fiberglass Corporation, Toledo, Ohio
Continuation of Ser. No. 914,977, Oct. 3, 1986, abandoned. This application Jun. 16, 1988, Ser. No. 208,333

Int. Cl.⁴ B65D 90/02; B65G 5/00

U.S. Cl. 428—34.5

11 Claims



1. A storage tank particularly adapted for use underground and having a composite wall consisting of a first layer of a non-hydrolyzable resin, a second layer of a first glass fiber mat, a third layer of a non-hydrolyzable resin reinforced with chopped glass strands, a fourth layer of a resin resistant to corrosion by gasoline or alcohol, and reinforced with chopped glass strands, a fifth layer of a second glass fiber mat, and a sixth layer of a resin resistant to corrosion by gasoline and alcohol.

4,876,125

GUSSET BAG FOR PHOTOGRAPHIC PHOTOSENSITIVE MATERIALS

Mutsuo Akao; Hiroyuki Osanni, and Koji Inoue, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

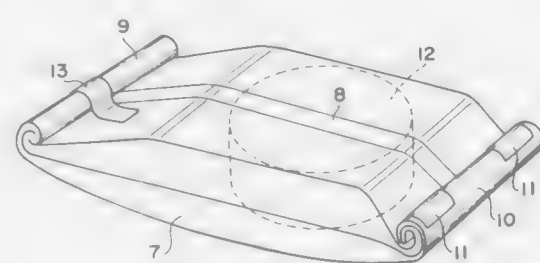
Filed Jul. 22, 1988, Ser. No. 222,783

Claims priority, application Japan, Jul. 22, 1987, 62-181188

Int. Cl.⁴ B65D 85/00; B32B 27/04

U.S. Cl. 428—35.2

3 Claims



1. A single-sheet gusset bag of laminate construction for photographic photosensitive materials comprising a laminated

sheet of which the inner surface layer is a light-shielding polyolefin resin film layer and the outer surface layer is a heat-resistant flexible sheet layer, and having a bottom seal portion fixed by a hot-melt adhesive having a softening point determined by ring and ball method of 75 to 115 C of which the coating amount of the hot melt adhesive in the center portion of the bottom seal portion of said gusset bag is less than the coating amount of the side portion of the bottom seal portion of said gusset bag.

4,876,126

MEDICAL INSTRUMENT AND METHOD FOR MAKING
Naoto Takemura, and Susumu Tanabe, both of Fujinomiya, Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 11,441, Feb. 5, 1987, abandoned, which is a continuation of Ser. No. 741,226, Jun. 4, 1985, abandoned.

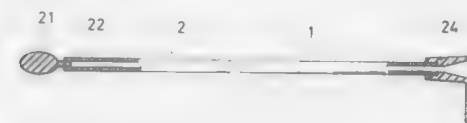
This application Sep. 1, 1988, Ser. No. 240,365

Claims priority, application Japan, Jun. 4, 1984, 59-114267; Aug. 7, 1984, 59-165455

Int. Cl.⁴ A61F 5/42; A61M 25/00

U.S. Cl. 428—35.7

26 Claims



1. A medical instrument comprising:

a substrate inherently having a reactive functional group on a surface thereof;

a water soluble polymer selected from the class consisting of a cellulose polymer, a maleic anhydride polymer, and a water soluble nylon, or a derivative thereof, said water soluble polymer being covalently bonded with said reactive functional group, said surface exhibiting lubricity when wetted with aqueous fluid.

4,876,127

METHOD OF BLOW MOLDING POLYAMIDES

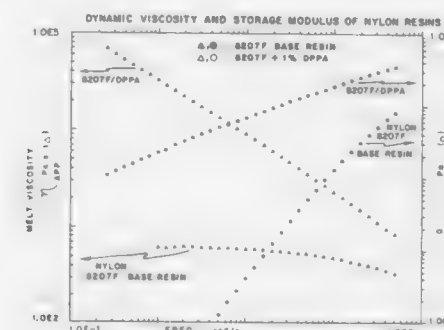
Yash P. Khanna, Cedar Knolls; Himangshu R. Bhattacharjee, Randolph; Rakesh Kumar, Budd Lake; Jon I. Williams, Montclair, and John P. Sibilia, Livingston, all of N.J., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Nov. 9, 1988, Ser. No. 269,030

Int. Cl.⁴ B27N 5/02

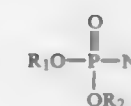
U.S. Cl. 428—35.7

20 Claims



1. A process for blow molding polyamides which comprises the steps of:

(a) forming a molten mixture of one or more polyamides and an effective amount of one or more aryl phosphoryl azide compounds of the formula:



wherein:

R_1 is selected from the group consisting of phenyl or phenyl substituted with one or more substituents which are inert under process conditions; and

R_2 is selected from the group consisting of alkyl, haloalkyl, nitroalkyl, hydrogen, a metal or non-metal cation or R_1 substituents;

(b) placing said molten mixture into a mold having a predetermined configuration;

(c) introducing gas into said mold to form a hollow molten mixture preform having the configuration of said mold; and

(d) cooling said molten preform to form a hollow article having the configuration of said mold.

4,876,128

STITCHBONDED NONWOVEN FABRIC

Dimitri P. Zafiroglu, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 31, 1989, Ser. No. 331,136

Int. Cl.⁴ B32B 3/06

U.S. Cl. 428—102

6 Claims

1. An improved stitchbonded fabric having a nonwoven fibrous layer and spaced apart rows of stitches with a row spacing in the range of 2 to 10 rows per centimeter formed by a stitching yarn that amounts to 2 to 20 percent of the total weight of the fabric, the improvement comprising the fibrous layer being composed of bonded fibers, 10 the stitch spacing within each row being in the range of 1 to 7 stitches/cm and the fabric having a specific volume of at least 16 cubic centimeters per gram and an extensibility in the direction of the stitching in the range of 10 to 75%.

4,876,129

PACKAGING MATERIAL FOR PHOTOGRAPHIC PHOTOSENSITIVE MATERIALS

Mutsuo Akao, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 22, 1987, Ser. No. 64,654

Claims priority, application Japan, Jun. 23, 1986, 61-144758; Jun. 23, 1986, 61-144759

The portion of the term of this patent subsequent to Oct. 20, 2004, has been disclaimed.

Int. Cl.⁴ B29D 22/00

U.S. Cl. 428—359

6 Claims



1. A packaging material for photographic photosensitive materials which comprises a multiple layer light-shielding film which is simultaneously coextruded in the absence of a support, said film comprising an inner layer which is a heat-sealing layer containing 30 to 99.49 wt. % of linear low density polyethylene resin, 0.5 to 10 wt. % of carbon black and 0.01 to 1 wt. % of a lubricant, and having a static friction coefficient of 0.12 to 0.37 and an outer layer formed of a thermoplastic resin having a static friction coefficient of 0.19 or more and which is greater than said inner layer by 0.05 or more, and having a

binding strength of 10 g/15 mm width or more between the layers of said coextruded multiple layer film.

4,876,130

BITUMINOUS COMPOSITION AND USE THEREOF AS COLD-APPLICABLE SELF-ADHESIVE COMPOUND
Willem C. Voak, and Gerrit van Gooswilligen, both of CM Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Aug. 25, 1986, Ser. No. 899,856

Claims priority, application United Kingdom, Mar. 20, 1986, 8505413

Int. Cl.⁴ B32B 11/02, 11/10, 27/20; C08L 95/00

U.S. Cl. 428—40 10 Claims

1. A bituminous composition comprising:
 - (a) from 99 to 85%w of a mixture of:
 - (1) 45 to 99.8%w of a bituminous component having a penetration of at least 800 dmm and a viscosity within the range of 2000 to 8000 poise as determined by ASTM D 2171;
 - (2) 0.1 to 30%w of a lithium salt of a C₁₀₋₄₀ fatty acid or hydroxy fatty acid;
 - (3) 0.1 to 25%w of an elastomer; and
 - (b) from 1 to 15%w of an amorphous silica filler.
7. A protective membrane which contains a layer of protective material and an adhesive layer of the composition according to claim 1.

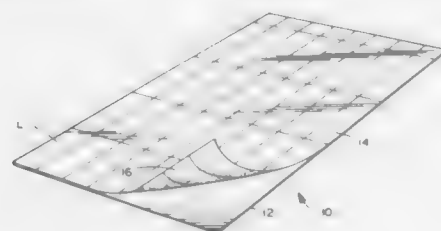
4,876,131

CONTINUOUS FORM WITH RELEASABLE LABEL
Robert E. Ashby, Quakertown, Pa., and Walter G. Greig, Lewistown, N.Y., assignors to Moore Business Forms, Inc., Grand Island, N.Y.

Continuation-in-part of Ser. No. 153,946, Feb. 9, 1988, abandoned. This application Aug. 18, 1988, Ser. No. 233,373

Int. Cl.⁴ B32B 3/10, 7/06

U.S. Cl. 428—42 9 Claims



1. A continuous form paper product, comprising:
 - a continuous form carrier sheet formed of paper uncoated with a release type coating on its opposite sides and per se suitable for processing through business machines;
 - first and second sets of a plurality of forms each, said first and second sets of forms being disposed on opposite sides of said carrier sheet, respectively; and
 - transfer adhesive means disposed between said carrier sheet and said first set of forms on one side of said sheet and between said carrier sheet and said second set of forms on the opposite side of said sheet for releasably securing said carrier sheet and said form sets one to the other whereby, upon removal of the forms from the opposite sides of said carrier sheet, the carrier sheet per se may be processed through business machines.

4,876,132

METHOD AND APPARATUS FOR INSTALLING AUTOMOBILE GLAZING

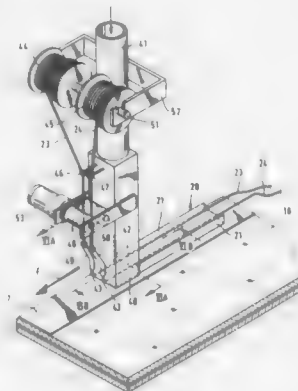
Heinz Kunert, Cologne, Fed. Rep. of Germany, assignor to Saint-Gobain Vitrage, Courbevoie, France

Filed Jul. 8, 1988, Ser. No. 216,926

Claims priority, application Fed. Rep. of Germany, Jul. 9, 1987, 3722657

Int. Cl.⁴ E06B 7/00

U.S. Cl. 428—43 16 Claims



9. An automobile glazing intended for direct gluing comprising on its edge a profile bead (20), in which at least two flexible wires (23, 24, 25, 26, 27, 28, 29) are located at different positions in said bead with ends that exit laterally from said bead, said wires being adapted to shear different parts of said bead, whereby by pulling successively on the ends of said wires, said wires are used to shear said bead.

4,876,133

OPTICAL DATA RECORDING SYSTEM AND METHOD OF PRODUCTION OF RECORDING MEDIUM

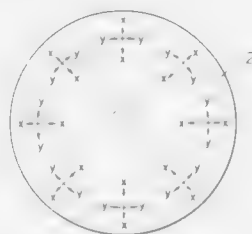
Toshinori Sugiyama, Ibaraki; Tetsuro Ikegaki, Tokushima; Mitsuru Shimizu, and Yoshitane Tuburaya, both of Toride, all of Japan, assignors to Hitachi Maxell, Ltd., Ibaraki, Japan

Filed Nov. 12, 1987, Ser. No. 119,471

Claims priority, application Japan, Nov. 14, 1986, 61-269905; Dec. 12, 1986, 61-294983

Int. Cl.⁴ B32B 3/02; G11B 5/66

U.S. Cl. 428—64 16 Claims



1. An optical data recording medium comprising a transparent substrate, and a selected one of a recording film and a reflection film on one side of the transparent substrate for recording and/or reproducing data by radiating a light beam on said selected one of the recording film and the reflection film, wherein a given principal dielectric axis of the transparent substrate is set in regular manner within ± 5 degrees of at least a selected one of the directions parallel, perpendicular and 45 degrees to a scanning direction of the light beam.

4,876,134

LAMINATED PANEL HAVING A STAINLESS STEEL FOIL CORE AND A PROCESS FOR PRODUCING THE PANEL

Yoshiro Saitoh, Nishinomiya, and Takashi Tatsumi, Moriyama, both of Japan, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Oct. 5, 1987, Ser. No. 105,071

Claims priority, application Japan, Oct. 6, 1986, 61-237738; Oct. 6, 1986, 61-237739; Oct. 13, 1986, 61-242336; Oct. 30, 1986, 61-259592; Nov. 8, 1986, 61-265835

Int. Cl.⁴ B32B 3/00

U.S. Cl. 428—73 12 Claims



1. A stainless steel foil core for use in a laminated panel which consists of
 - a plurality of strips of stainless steel foil, each of said strips being bent in a repeating outward and inward pattern along a plurality of parallel lines extending perpendicular to the length of said strips, the bending step forming rectangular-like depressions in the strips defined by the plurality of lines which are parallel to one another;
 - adhesive material interposed between said strips at spaced intervals along the length of said strips so as to bond said plural strips together at said spaced intervals, said bonded strips defining a plurality of cells each having an equal number of sides.

4,876,135

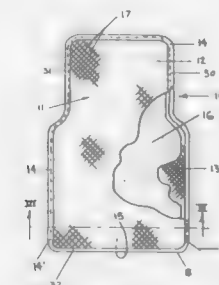
FLOOR MAT WITH DISPOSABLE ABSORBENT PAD

Blair McIntosh, P.O. Box 69, Waterville, Quebec, Canada

Continuation-in-part of Ser. No. 934,497, Nov. 24, 1986. This application Dec. 14, 1987, Ser. No. 133,646

Int. Cl.⁴ B47G 27/02; B32B 1/06

U.S. Cl. 428—74 13 Claims



1. A floor mat comprising a jacket member formed by a pair of opposed sheets secured to each other along a predetermined peripheral edge portion to define a throat opening in an unsecured edge portion of said opposed sheets for access to the area therebetween, at least a top one of said sheets being formed of a non-absorbing, strong, water-resistant material having a plurality of openings therein for the passage of solid and liquid foreign matter, and an insert sheet of absorbent material disclosed between said opposed sheets through said mouth opening for the retention of said foreign matter disposed thereon through said openings in said top sheet, said insert sheet having at least a top surface thereof formed with embossments to trap foreign matter and arrest the flow of liquids deposited thereon through said openings, said insert sheet being constructed of a reinforced, highly-absorbent material having a bottom surface coated with a water-resistant material, said top sheet having an outer surface supported and separated over (a) said top surface of said insert sheet to protect said top surface of said absorbent sheet from being damaged by the feet of a person when applied

to said outer surface and further to prevent objects resting on said outer surface from becoming soiled by liquids disposed spaced below said outer surface and resting on said top surface of said absorbent material.

4,876,136

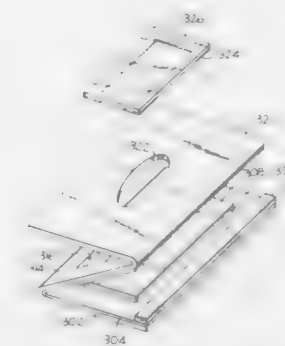
LIPSTICK SAMPLING DEVICE

Robert W. H. Chang, Roseville, Minn., and Keith E. Relyea, St. Joseph Township, St. Croix County, Wis., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jun. 22, 1987, Ser. No. 64,862

Int. Cl.⁴ B32B 3/04; A45D 40/00

U.S. Cl. 428—130 19 Claims



1. A multilayered structure for sampling cosmetic compositions containing at least 5% by weight of emollients or waxes, said structure comprising a carrier sheet, a window sheet and a cover sheet, said carrier sheet having a portion of at least one surface thereof with a coating of said cosmetic composition thereon, said window sheet having a hole therein which exposes at least a portion of said coating of cosmetic composition, and said cover sheet covering said hole in said window sheet wherein said carrier sheet, window sheet and cover sheet are portions of the same sheet formed by two folds of said same sheet to form a Z cross section.

4,876,137

POLYETHYLENE NAPHTHALATE FILM FOR HIGH-DENSITY MAGNETIC RECORDING MEDIA OF FLOPPY DISK

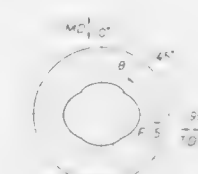
Shigeo Utsumi, Yokohama, Japan, assignor to Diafoil Company, Limited, Tokyo, Japan

Continuation-in-part of Ser. No. 941,837, Dec. 15, 1986, abandoned. This application Sep. 18, 1987, Ser. No. 98,319

Claims priority, application Japan, Dec. 17, 1985, 60-283843

Int. Cl.⁴ G11B 5/64

U.S. Cl. 428—141 11 Claims



1. A biaxially oriented three-layered polyethylene naphthalate film of not less than 30 μ m in thickness for high-density magnetic recording media of floppy disks, which comprises a polyethylene naphthalate intermediate layer and two polyethylene naphthalate surface layer containing 0.01 to 1 wt. % inactive fine particles having a primary particle diameter of

0.001 to 1.5 μm , and has a tensile stress at 5% elongation in the range of 13 to 21 kg/mm^2 in any direction on the film, a Young's modulus in the range of 500 to 800 kg/mm^2 in any direction on the film, a heat shrinkage of less than 2.5% in any direction, a center line average roughness R_a of not more than 0.012 μm and not more than 10 coarse protuberances of not lower than 1.08 μm high per 25 cm^2 , and each of the deviations of said tensile stresses at 5% elongation, Young's moduli and heat shrinkages is not more than 20%.

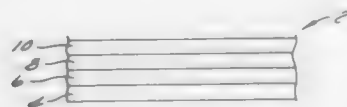
4,876,138

SYNTHETIC LEATHER-LIKE MATERIAL

Linda F. Bailey, Dong Hill Rd., Island, Ky. 42350
Filed Mar. 1, 1988, Ser. No. 162,810

Int. Cl. B32B 27/02, 27/08, 00/12, 00/30

U.S. Cl. 428—172



1. A synthetic leather-like material, comprising:
A. a woven fabric base;
B. an acrylic paint layer in contact with the fabric base;
C. a clear polymer layer over the paint layer; and
D. a silicone layer over the clear polymer layer.

4,876,139

FILM FOR PRINT LAMINATES AND THERMOCOMPRESSOR BONDING PROCESS THEREFOR

Takeshi Yamamoto; Kunio Kondo; Hiroshi Yoshimura; Yoshihiro Wada, and Fusao Wada, all of Shiga, Japan, assignors to Gunze Kabushiki Kaisha, Kyoto, Japan

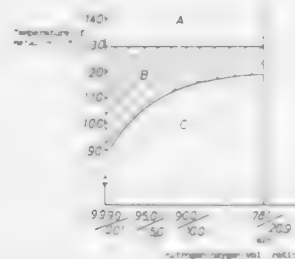
PCT No. PCT/JP87/00197, § 371 Date Oct. 30, 1987, § 102(e) Date Oct. 30, 1987, PCT Pub. No. WO87/06188, PCT Pub. Date Oct. 22, 1987

PCT Filed Mar. 30, 1987, Ser. No. 143,135

Claims priority, application Japan, Apr. 10, 1986, 61-83147
Int. Cl. B32B 3/00, 5/16

U.S. Cl. 428—200

10 Claims



1. A film for print laminate use with absence of darkening or color change of a print upon lamination thereon, said film being bondable to a print by thermocompression and which comprises a film substrate and a heat-sensitive adhesive resin layer, said adhesive resin layer being chemically composed of polyethylene, an ethylene copolymer containing at least 70 wt. % of ethylene or a mixture of polymers at least 70 wt. % in total ethylene content, and being surface-treated by corona discharge in a nitrogen gas atmosphere having an oxygen concentration of less than 20.9 vol. %, wherein the improvement comprises the random incorporation of a finely divided white material into said adhesive resin layer in an amount of 0.2

to 3 wt. %, said finely divided white material having a mean particle size of 0.2 to 20 microns.

4,876,140

LAMINATE CONDUCTING PLASTIC

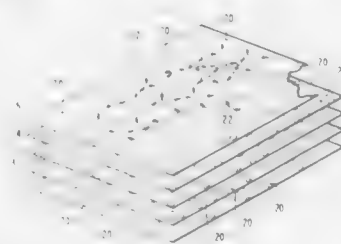
John Quackenbush, Hoover, Ala., assignor to FBK International Corporation, Birmingham, Ala.

Filed Jan. 24, 1987, Ser. No. 66,617

Int. Cl. B32B 5/16; H01G 4/08

U.S. Cl. 428—216

12 Claims



1. An article of multi-layered structure comprising a plastic resin including a multitude of particles dispersed in it, said resin being formed into a plurality of sublayers, each having a thickness on the order of thousandths of an inch or less and the particle size being about equal to the thickness of said sublayer or less to position the particles dispersed in each sublayer therein in close proximity to those dispersed in adjacent sublayers to provide relatively high electrically conducting paths through the particles in said plurality of sublayers.

4,876,141

DOUBLE LAYER PAVEMENT MARKING SHEET MATERIAL

Sadao Kobayashi, Chiba; Yuji Ishihara, Tochigi; Katsuyuki Sato, Tochigi, and Kouichi Ijichi, Tochigi, all of Japan, assignors to Seibulite International Kabushiki Kaisha, Tokyo, Japan

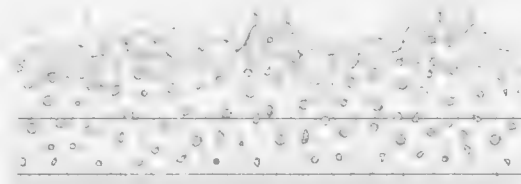
Filed Jul. 8, 1988, Ser. No. 216,827

Claims priority, application Japan, Jul. 17, 1987, 62-178558

Int. Cl. B32B 7/02, 5/16

U.S. Cl. 428—217

3 Claims



1. A double layer pavement marking sheet material comprising a base sheet made of rubber or synthetic resin in which a multiplicity of glass microspheres are embedded, said base sheet comprising:
an upper layer in which said glass microspheres are embedded in such a manner that a multiplicity thereof are partially exposed from the surface of the base sheet; and
a lower layer being softer and less restorable than the upper layer and having hardness within a range of 30°–75° and restoration rate of 50% or less.

4,876,142

FLUID RESISTANT COATING COMPOSITION

Alessandro Piccirillo, Yonkers, N.Y., assignor to Magic Stuff, Inc., Yonkers, N.Y.

Division of Ser. No. 40,012, Apr. 17, 1987, Pat. No. 4,845,144.

This application Apr. 5, 1989, Ser. No. 333,372

Int. Cl. D03D 3/00

U.S. Cl. 428—224

21 Claims

1. A flexible coated product which comprises:
(1) a coating composition comprising
(a) from about 1–2 parts by volume of a liquid latex polymer suspension of a blend of polyvinyl acetate/acrylic resin esters dispersed in an aqueous solvent to impart an increased level of flexibility to said composition;
(b) from about 3–4 parts by volume of an acrylic emulsion to serve as a film-forming binder for said composition;
(c) from about 1–2 parts by volume of a powdered gypsum-based compound to impart a required degree of strength and durability to said coating composition and to absorb substantially a major portion of said aqueous solvent which comprises said liquid latex polymer suspension; and
(d) from about 1–3 parts by volume of a glue to bond together said polymer suspension, said acrylic emulsion and said powdered, gypsum-based compound and to facilitate adhesion of said coating composition to a substrate to which said coating composition is to be applied; and
(2) a reinforcing material, wherein said coating composition is applied to said substrate to form a flexible coated product.

4,876,143

ROD MATERIAL

Minoru Sugita; Teruyuki Nakatsuji; Tadashi Fujisaki; Minoru Sawaide; Noboru Ishikawa, and Yasuo Inada, all of Tokyo, Japan, assignors to Shimizu Construction Co., Ltd., Tokyo; Dainihon Glass Industry Co., Ltd., Sagami-hara and Kyojin Rope Manufacturing Co., Ltd., Kuki, all of Japan

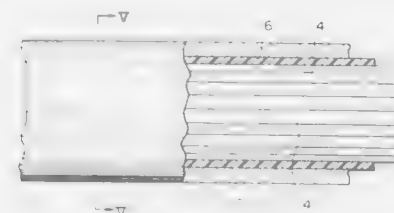
Filed Jul. 3, 1986, Ser. No. 881,697

Claims priority, application Japan, Jul. 5, 1985, 60-148010

Int. Cl. D02G 3/00

U.S. Cl. 428—294

17 Claims



1. A rod material for use as a building material, comprising: an elongated matrix formed of a synthetic resin in which is embedded a plurality of first elongated textile elements and a plurality of second elongated textile elements all mutually parallel to each other along the length of the rod, each of said first elements being composed of a plurality of yarns braided together and said second elements having a lower breaking elongation rate than said first elements.

4,876,144

SINGLE CRYSTAL THIN FILM

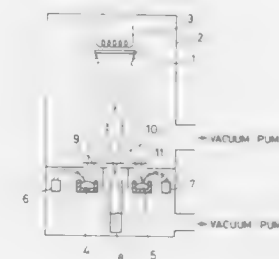
Kenzo Sasa; Kazumasa Takagi; Toshio Kobayashi, all of Ni-shitama; Takaharu Takayama, Hachioji, and Norio Ohta, Iruma, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Oct. 22, 1987, Ser. No. 111,283

Claims priority, application Japan, Oct. 22, 1986, 61-249625

Int. Cl. G11B 7/24; B32B 9/00

U.S. Cl. 428—336

12 Claims



1. A single crystal thin film of a Heusler alloy having a magneto-optical effect and a crystalline structure of an MgAgAs type, wherein said thin film is a single crystal formed in at least one layer on a single crystal substrate.

4,876,145

PLATED RESIN ARTICLE

Tetsuro Maeda; Fukuaki Wada; Susumu Ohoka, and Akihiro Okamoto, all of Chiba, Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 700,222, Feb. 11, 1985, Pat. No. 4,732,807.

This application Jul. 10, 1987, Ser. No. 71,954

Claims priority, application Japan, Feb. 9, 1984, 59-22647

Int. Cl. B32B 15/06, 15/08, 27/08

U.S. Cl. 428—327

2 Claims

1. A metal plated resin article formed by subjecting to wet metal plating a molded article formed of a transparent resin mixture comprising (A) 16 to 96% by weight of a graft copolymer produced by grafting onto a conjugated diene rubber, a vinyl cyanide monomer and an aromatic vinyl monomer, said graft copolymer containing 25 to 62.5% by weight of said rubber, and (B) 4 to 84% by weight of vinyl cyanide/aromatic vinyl compound copolymer resin, wherein said graft copolymer constitutes from 10 to 24% by weight of the conjugated diene rubber, based on the total weight of the transparent resin mixture, and has a weight average particle of 150 μm or less, and the copolymer of a vinyl cyanide monomer and an aromatic vinyl monomer is present as a continuous resin phase, said continuous resin phase copolymer not containing a component having an ester bond.

4,876,146

ANTI-FOGGING MULTILAYERED FILM AND BAG PRODUCED THEREFROM FOR PACKAGING VEGETABLES AND FRUITS

Tsutomu Isaka, and Saburo Ohta, both of Iinayama, Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka, Japan

Filed Apr. 29, 1987, Ser. No. 43,959

Claims priority, application Japan, May 1, 1986, 61-101741;

Jul. 8, 1986, 61-160529; Jul. 8, 1986, 61-160530

Int. Cl. B32B 27/08

U.S. Cl. 428—347

8 Claims

1. A biaxially oriented anti-fogging, multi-layered film comprising a base layer and at least one surface layer containing an anti-fogging agent, said film having a water vapour transmission of 15 to 200 $\text{g}/\text{m}^2\cdot 24\text{ hr}\cdot 40^\circ\text{C}$., an oxygen permeability of 3,000 to 35,000 $\text{cc}/\text{m}^2\cdot 24\text{ hr}\cdot \text{atm}\cdot 20^\circ\text{C}\cdot 90\%\text{RH}$, and a carbon dioxide permeability of 12,000 to 130,000 $\text{cc}/\text{m}^2\cdot 24\text{ hr}\cdot \text{atm}\cdot 20^\circ\text{C}\cdot 90\%\text{RH}$, said anti-fogging surface layer having heat sealing

properties such that the film shows a side welding seal strength of at least 3.0 kg-cm/15 mm when side welding seal is carried out at 270° C., and at least one surface layer of said film shows



ing an anti-fogging property when exposed to two cycles of temperature rise and drop between 20° C. and 40° C., the temperature rises and drops occurring at 6 hour intervals.

4,876,147

CABLE INSULATION BASED ON ETHYLENE POLYMERS HAVING HIGH RESISTANCE TO THE FORMATION OF WATER TREES

Johannes Schlag; Ernst Koehnlein; Peter Bauer, all of Ludwigshafen; Ludwig Koessler, Gruenstadt, and Alfred F. Hausz, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Mar. 5, 1987, Ser. No. 22,137

Claims priority, application Fed. Rep. of Germany, Mar. 8, 1986, 3607757

Int. Cl.⁴ B32B 27/28, 15/08; C08L 53/02, 23/04

U.S. Cl. 428—379 5 Claims

1. A cable having a cable insulation having high resistance to the formation or growth of water trees and high aging resistance and consisting of an ethylene polymer having a melt flow index of from 0.2 to 10 g/10 min and densities of from 0.890 to 0.934 g/cm³ and from 2 to 10 percent by weight, based on the ethylene polymer, of a styrene copolymer and conventional additives selected from the group consisting of antioxidants, flameproofing agents, cross-linking assistants and cross-linking agents, wherein the styrene copolymer is a styrene/diene copolymer in which not less than 90% of the olefinic double bonds have been hydrogenated.

4,876,148

CERAMIC BODIES HAVING A PLURALITY OF STRESS ZONES

Anil V. Virkar, Salt Lake City, Utah, assignor to Ceramtec, Inc., Salt Lake City, Utah

Continuation-in-part of Ser. No. 792,480, Oct. 29, 1985, Pat. No. 4,677,009, which is a continuation-in-part of Ser. No. 665,912, Oct. 29, 1984, Pat. No. 4,656,071. This application Jan. 30, 1987, Ser. No. 68,445

Int. Cl.⁴ B32B 17/00; D02G 3/00

U.S. Cl. 428—384 7 Claims

1. A green crystalline ceramic body having at least two compositional zones comprising:

- a first substantially continuous compositional layer composed of sinterable ceramic particles; and
- a second substantially continuous compositional layer substantially coextensive and contiguous with said first layer wherein a substantial portion of the particles in said second layer have the same composition as those of the first layer and additionally a significant content of a ceramic fiber or whisker having a lower coefficient of thermal expansion than the sinterable particles of said first layer, thereby, upon sintering and cooling, occasioning a compressive stress in said second layer and a tensile stress in said first layer.

4,876,149

MAGNETIC RECORDING MEDIA AND A METHOD USING A STABLE FLUID REACTIVE DISPERSION IN PREPARING MAGNETIC RECORDING MEDIA

Roopram Ramharack, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jul. 31, 1986, Ser. No. 892,248

The portion of the term of this patent subsequent to Jun. 6, 2006, has been disclaimed.

Int. Cl.⁴ G11B 5/70

U.S. Cl. 428—425.9 17 Claims

1. A magnetic recording medium, having a magnetizable layer and selected from tapes and diskettes comprising a flexible, non-magnetic support base having two opposing major surfaces wherein said magnetizable layer or a non-magnetizable layer on at least a portion of at least one of said major surfaces is comprised of a finely divided particulate solid and a crosslinked binder mixture thereof, which crosslinked binder mixture is comprised of:

- (1) at least about 5 weight percent of a hard component dispersing polymer having a degree of polymerization greater than 100 comprised of units derived from:
 - (i) one or more vinyl aromatic monomers and one or more ethylenically unsaturated monomers having aliphatic hydroxyl functionality, or
 - (ii) one or more vinyl aromatic monomers having hydroxyl functionality,
 which polymer is crosslinked into said binder; and
- (2) a soft-component contributing polymer which is a multi-hydroxyl-functional polyurethane; the weight ratio of hard-component contributing polymers to soft-component contributing polymers ranging from about 1:4 to 4:1.

4,876,150

LANGMUIR BLODGETT FILMS

Gilbert W. Smith, Worcester; Mervyn F. Daniel, Chester; John W. Barton, and Norman M. Ratcliffe, both of Bristol, England, assignors to The Secretary of State for Defence in Her Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, Sole of Whitehall, United Kingdom

PCT No. PCT/GB86/00371, § 371 Date Apr. 20, 1987, § 102(e)

Date Apr. 20, 1987, PCT Pub. No. WO87/00347, PCT Pub. Date Jan. 15, 1987

PCT Filed Jun. 25, 1986, Ser. No. 22,801

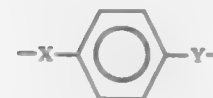
Claims priority, application United Kingdom, Jun. 28, 1985, 231648

Int. Cl.⁴ B32B 9/04

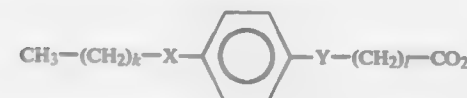
U.S. Cl. 428—411.1 13 Claims



1. A Langmuir-Blodgett (LB) film of ABAB structure composed of a combination of compounds A and B which are different and which are selected from the group consisting of: AB combinations wherein A has the formula E-C-F and B has the formula E¹-C¹-F¹, wherein E and E¹ are independently CH₃(CH₂)_i—where i is 2–20, F and F¹ are independently —(CH₂)_j—COZ wherein j is 1–10 and Z is —OH, C_{1–6} alkyl or NR¹R² wherein R¹ and R² are independently H or C_{1–6} alkyl, C and C¹ are independently



where X and Y are each independently selected from the group consisting of =NH, =NR³, =CO, =CH.CN, =CHONO, =CH(Halogen), —COO—, —OOC—, =CH(ONO)—CO—NH—, —CO—NR⁴ and —O— where R³ is C_{1–4} alkyl and R⁴ is C_{1–6} alkyl; AB combinations wherein A is a long chain alkyl amine having the structure C_nH_{2n+1}—NH₂ where n is 16–26, and B is a long chain fatty acid having the structure R⁵(CH₂)_mCOOH where R⁵ is selected from the group consisting of CH₃ and CH₂=CH and where m is 16–26; AB combinations wherein A is a long chain alkyl amine having the structure C_nH_{2n+1}—NH₂ where n is 16–26 and B is a compound of general structure:



in which K is 2–20, l is 0 to 10, and X, Y and Z are as defined above; and AB combinations wherein A is a long chain carboxylic acid of the formula R⁵(CH₂)_mCOOH where R⁵ and m are as defined above and B is a compound of the formula:



where K, is 2–20 l, X, Y and Z are as defined above.

4,876,151

BUILDING MATERIAL AND METHOD OF PRODUCING THE BUILDING MATERIAL

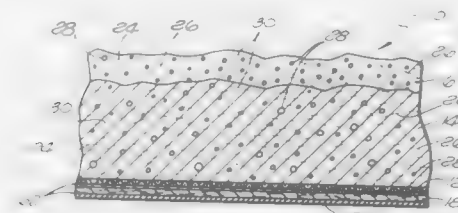
Howard R. Eichen, Ventura, Calif., assignor to Treestone Corporation, Ventura, Calif.

Continuation of Ser. No. 166,966, Mar. 11, 1988, abandoned.

This application Feb. 27, 1989, Ser. No. 315,543

Int. Cl.⁴ B32B 13/02, 13/04

U.S. Cl. 428—446 51 Claims



1. In combination in a building material, a first layer including a cured mixture of cellulose fibers, sand and cement, each of the cellulose fibers and the sand constituting approximately twenty percent (20%) by weight in the cured mixture and the cement constituting the remainder of the mixture, and
- a second layer integral with the first layer and including a cured mixture of sand, cellulose fibers and cement, the same constituting approximately thirty five percent (35%) by weight in the mixture and the cellulose fibers constituting approximately five percent (5%) by weight in the

mixture and the cement constituting the remainder of the mixture.

4,876,152

WATER-PROOFING COMPOSITION

Hyung H. Kang, Northbrook, Ill., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 28, 1988, Ser. No. 173,843

Int. Cl.⁴ B32B 9/04, 13/00; C14C 9/00

U.S. Cl. 428—447 24 Claims

1. A composition comprising the reaction product of: (a) a linear polysiloxane containing at least 1 percent of alkyl hydrogen siloxy groups, which polysiloxane may be represented by the following formula:



wherein R is a C_{1–5} alkyl, R' is hydrogen or R, x has an average value of from 0 to 1000, and y has an average value of from 1 to 500, and

(b) a C_{7–30} alkenyl succinic anhydride, the mole ratio of alkenyl succinic anhydride to alkyl hydrogen siloxy groups in the polysiloxane being such that the reaction product is substantially depleted of alkyl hydrogen siloxy groups.

24. Masonry containing a water repellent coating of the composition of claim 1.

4,876,153

PROCESS FOR THE PREPARATION OF CYANATE RESIN-BASED PREPREGS AND FILMS WHICH MAINTAIN THEIR TACK

Bradley S. Thorfinnson, Orange, Calif., assignor to BASF Corporation, Parsippany, N.J.

Continuation-in-part of Ser. No. 36,781, Apr. 9, 1987, abandoned. This application Feb. 29, 1988, Ser. No. 161,753

Int. Cl.⁴ B32B 9/04; D04H 1/00; D03D 15/00; C09J 7/02

U.S. Cl. 428—447 28 Claims

1. A multiple layer composition comprising: (a) a first layer of heat-curable resin which comprises a cyanate-functional resin;

(b) at least a second layer which is a silicone coated release film removably adherent to said cyanate-functional resin layer;

wherein said silicone coating contains an amount of residual metal catalyst which is effective to cause no greater than a 2.5-fold increase in said heat-curable resin viscosity after storage of said composition at room temperature for one week.

4,876,154

COMPOSITE WOOD STRUCTURES BONDED BY POLY(VINYL ACETATE) EMULSION ADHESIVES CONTAINING AN ALKOXYLANE

Gerald L. Witucki, and Edwin P. Plueddemann, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

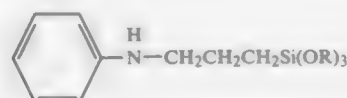
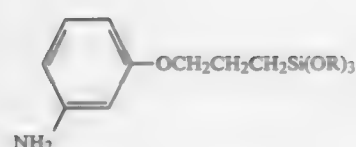
Division of Ser. No. 125,438, Nov. 25, 1988, Pat. No. 4,818,779. This application Sep. 26, 1988, Ser. No. 249,061

Int. Cl.⁴ B32B 9/04

U.S. Cl. 428—447 13 Claims

1. A composite wood structure bonded by a composition comprising:

- (i) a water-borne emulsion adhesive based on a poly(vinyl acetate) resin; and
- (ii) an adhesion promoter consisting essentially of at least one alkoxy silane selected from



in which R is independently selected from alkyl or alkoxyalkyl radicals having 1-4 carbon atoms, and from about 1 to 80% by weight of a plasticizer for said poly(vinyl acetate) resin, wherein said alkoxyalkyl constitutes from about 0.5 to 5.0 percent by weight of said composition.

4,876,155

POLYESTER FILM

Klaus Thoesse, and Karl-Heinz Jung, both of Wiesbaden, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Dec. 15, 1987, Ser. No. 133,486

Claims priority, application Fed. Rep. of Germany, Dec. 16, 1986, 3642848

Int. Cl.⁴ B32B 27/08, 27/36

U.S. Cl. 428—480

13 Claims

1. A biaxially stretch-oriented and heat-set polyester film having, on at least one surface, a coating comprising a copolyester, containing sulfonate groups, wherein said coating further comprises an antistatically effective amount of at least one salt derived from an amino acid or a protein hydrolysate.

4,876,156

FILM AND SHEET CAPABLE OF FORMING RETORTABLE AND EASY-OPEN PACKAGINGS

Charles C. Hwo, Sugarland, Tex., assignor to Shell Oil Company, Houston, Tex.

Division of Ser. No. 49,903, May 15, 1987. This application Dec. 16, 1988, Ser. No. 285,567

Int. Cl.⁴ B32B 27/08

U.S. Cl. 428—516

4 Claims

1. A laminar structure comprising a polypropylene substrate to which is bonded by extrusion lamination a film or sheet which is capable of forming peel seals, comprising a mixture containing:

from about 5 percent by weight to about 25 percent by weight of an ethylenic homopolymer or copolymer selected from the group consisting of linear low density polyethylene (LLDPE), low density polyethylene (LDPE), medium density polyethylene (MDPE), ethylene vinyl acetate copolymer (EVA), ethylene-methyl acrylate copolymer (EMA), ethylene-ethyl acrylate copolymer (EEA), ethylene-butyl acrylate copolymer (EBA), and high density polyethylene (HDPE);

from about 50 percent by weight to about 75 percent by weight of the butene-1 homopolymer or copolymer; and from about 25 percent by weight to about 45 percent by weight of propylene homopolymer or copolymer.

4,876,157
PROCESS FOR PRODUCING A TOOTHBRUSH AND A TOOTHBRUSH BLANK FOR USE IN THE PROCESS

Rolf Barman, Olav Kyrresgt.45, N-5000 Bergen, Norway

PCT No. PCT/NO86/00037, § 371 Date Jan. 25, 1988, § 102(e) Date Jan. 25, 1988, PCT Pub. No. WO87/07123, PCT Pub. Date Dec. 3, 1987

PCT Filed May 30, 1986, Ser. No. 153,821

Int. Cl.⁴ B29B 7/00; A46B 9/04

U.S. Cl. 428—542.8

6 Claims



1. A toothbrush blank comprising a handle; a pair of head portions integrally mounted on said handle; a narrowed hinge-forming transition portion having a V-shaped cavity on one side between said head portions to permit bending of said head portions into angular relation to each other; and a plurality of rows of bores in said one side for receiving bristles in each head portion.

4,876,158

PISTON RING HAVING A WEAR RESISTANT SURFACE LAYER

Toru Onuki, Junichi Sagawa, Tamotsu Watanabe, all of Kashiwazaki, and Toshio Yoshimitsu, Oyama, all of Japan, assignors to Kabushikikaisha Riken and Kabushiki Kaisha Komatsu Seisakusho, both of Tokyo, Japan

Filed Mar. 18, 1988, Ser. No. 169,706

Claims priority, application Japan, Mar. 20, 1987, 62-66795

Int. Cl.⁴ B22F 5/02

U.S. Cl. 428—565

2 Claims



1. A piston ring having a wear resistant surface layer consisting essentially of 40 to 70 wt. % cobalt or cobalt base alloy as a binder, and the balance being substantially a powder of chromium trioxide (Cr₂O₃).

4,876,159

MAGNETROPTICAL RECORDING MEDIA AND METHOD OF PREPARING THEM

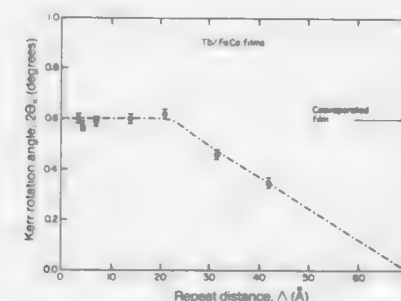
Sung-Chul Shin, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 14, 1988, Ser. No. 168,104

Int. Cl.⁴ B32B 5/00

U.S. Cl. 428—607

11 Claims



1. A method for producing magneto-optical recording media which comprises evaporating a rare earth metal and a transition metal and sequentially depositing the rare earth and transition metals on a substrate at a maximum repeat distance of 21 angstroms to form a nonhomogeneous, non-layered mixed film.

4,876,160

ORGANIC COMPOSITE-PLATED STEEL SHEET

Yoshio Shindou, Motoo Kabeya, Takashi Shimazu, and Fumio Yamazaki, all of Kimita, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Jun. 29, 1988, Ser. No. 213,070

Int. Cl.⁴ B32B 15/08

U.S. Cl. 428—623

12 Claims

1. A steel sheet having an organic composite plating layer which comprises a steel sheet plated with zinc, aluminum or zinc base composite alloy as a substrate, a first layer of insoluble chromate film of 5% or less in content of water-soluble matter formed on the surface of said substrate at a coverage of 10-150 mg/m² in terms of total chromium content and a second layer from a coating composition having the following composition coated at a thickness of 0.3-5 μm as a solid content film on said first layer:

- (A) a bisphenol type epoxy resin having terminal epoxy groups and having a number-average molecular weight of 300-100,000 in an amount of 30% by weight or more based on solid content in the coating composition,
- (B) at least one curing agent selected from the group consisting of a polyisocyanate compound and a block polyisocyanate compound at a weight ratio to solid content in the epoxy resin of 1/10-20/10,
- (C) fumed silica having an average particle size of 0.1-100 mμ in an amount of 5-50% by weight based on solid content in the coating composition, and
- (D) a ketone organic solvent in an amount of 40% by weight or more of the coating composition, and the solid content in the coating composition being 10-50% by weight.

4,876,161

PHOSPHOR AND RADIATION IMAGE STORAGE PANEL

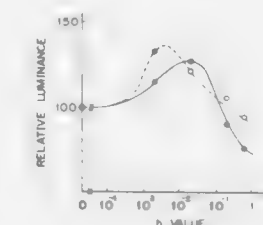
Kenji Takahashi, Takashi Nakamura, and Yuichi Hosoi, all of Kaisei, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 47,594, May 11, 1987, abandoned, which is a continuation of Ser. No. 727,972, Apr. 26, 1985, abandoned. This application Sep. 2, 1988, Ser. No. 240,457 Claims priority, application Japan, Apr. 26, 1984, 59-84358; Apr. 26, 1984, 59-84359

Int. Cl.⁴ C09K 11/61

U.S. Cl. 428—691

13 Claims

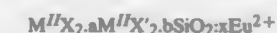


7. A divalent europium activated alkaline earth metal halide phosphor having the formula (I):



in which M^{II} is at least one alkaline earth metal selected from the group consisting of Ba, Sr and Ca; each of X and X' is at least one halogen selected from the group consisting of Cl, Br and I, and X≠X'; and a, b and x are numbers satisfying the conditions of 0.1 ≤ a ≤ 10.0, 2 × 10⁻² ≤ b ≤ 5 × 10⁻² and 0 < x ≤ 0.2, respectively.

8. A divalent europium activated alkaline earth metal halide phosphor having the formula (II):



in which M^{II} is at least one alkaline earth metal selected from the group consisting of Ba, Sr and Ca; each of X and X' is at least one halogen selected from the group consisting of Cl, Br and I, and X≠X'; and a, b and x are numbers satisfying the conditions of 0.1 ≤ a ≤ 10.0, 10⁻⁴ ≤ b ≤ 2 × 10⁻¹ and 0 < x ≤ 0.2, respectively.

4,876,162

FUEL CELL WITH INTEGRAL CONDUIT MEANS FOR STATICALLY REMOVING LIQUID PRODUCT WATER

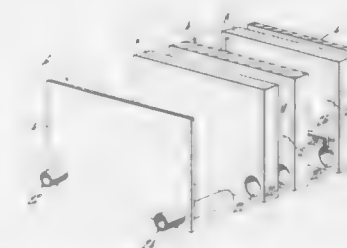
McElroy James F., Suffield, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Continuation of Ser. No. 176,520, Apr. 1, 1988, abandoned. This application Sep. 12, 1988, Ser. No. 244,533

Int. Cl.⁴ H01M 8/04

U.S. Cl. 429—13

5 Claims



1. A fuel cell comprising an anode, an electrolyte, a cathode, a cathode chamber and a means for removing static product water from the cathode chamber characterized in that the means for static product water removal comprises a wick

positioned at the base of and extending at least substantially the entire length of the cathode chamber, said wick being in contact with at least one exhaust manifold structure exiting the cathode chamber wherein said manifold structure contains a conduit structure which is permeable to liquid but impermeable to gas at gas pressures below the "bubble pressure, P" of the conduit structure where the "bubble pressure, P" is related to the pore size of the structure by the relationship

$$P = \frac{2 \text{ (surface tension)}}{\text{(pore radius for nominally circular pores)}}$$

4,876,163

GENERATOR CONFIGURATION FOR SOLID OXIDE FUEL CELLS

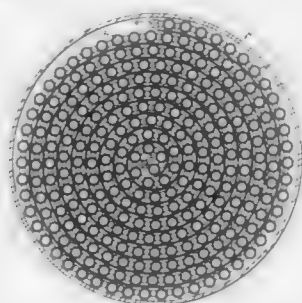
Philip Reichner, Plum Boro, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 18, 1987, Ser. No. 135,190

Int. Cl.⁴ H01M 8/10

U.S. Cl. 429—30

28 Claims



1. In a solid oxide fuel cell generator having a multiplicity of electrically connected solid oxide fuel cells, where a fuel gas is passed over one side of said cells and a gaseous source of oxygen is passed over the other side of said cells, whereby said fuel is consumed and heat and electricity are generated, the improvement which comprises said cells being disposed in the configuration of a spiral.

4,876,164

PROCESS FOR MANUFACTURING A PHOTOMASK

Yaichiro Watake; Tatsuo Okamoto, and Shuichi Matsuda, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 819,102, Jan. 15, 1986, abandoned. This application Jul. 17, 1987, Ser. No. 75,297

Claims priority, application Japan, Jan. 28, 1985, 60-16203

Int. Cl.⁴ G03F 1/00

U.S. Cl. 430—5

7 Claims



1. A process for manufacturing a photomask comprising the steps of:
preparing a substantially transparent glass substrate;
forming a metal silicide film opaque to visible light on said

transparent glass substrate, said metal silicide film being selected from the group consisting of one of a silicide film of molybdenum and tungsten;
applying a resist on said metal silicide film;
providing a mask pattern by light or electron beam, followed by a developing process;
etching away at least an exposed portion of said metal silicide film by means of a dry etching process.

4,876,165

LIGHT FILTERS FOR MICROELECTRONICS

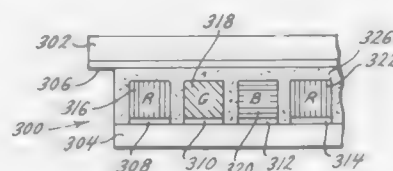
Terry L. Brewer, Rolla; Dan W. Hawley, St. James; James E. Lamb; William J. Latham, both of Rolla, and Lynn K. Stichnotte, Cuba, all of Mo., assignors to Brewer Science, Inc., Rolla, Mo.

Continuation-in-part of Ser. No. 431,798, Sep. 30, 1982, abandoned, which is a continuation-in-part of Ser. No. 638,258, Aug. 6, 1984, which is a continuation-in-part of Ser. No. 825,855, Feb. 4, 1986, Pat. No. 4,822,718. This application Jan. 12, 1987, Ser. No. 2,107

Int. Cl.⁴ G03F 7/26

U.S. Cl. 430—7

15 Claims



1. In a process of making microelectronic color filter elements by microphotolithography, the improvement comprising, applying a layer of a substantially non-particulate filter coating material to a filter substrate, the filter coating material including a vehicle and a soluble dye incorporation therein, the soluble dye being heat stable and in combination with the vehicle being effective to produce a high color resolution, applying a photoresist to the layer of the filter coating material on the filter substrate, photographically imaging and developing the photoresist, the filter coating material imaging and developing with the photoresist, curing the color element to substantially insolubilize the color element, the cured filter element containing the stable dye being effective to consistently transmit and resolve colored light, the cured filter element containing the stable dye having a high electrical resistivity and a high dielectric strength.

4,876,166

COLOR FILTER ARRAY

Ronald W. Wake, Hilton; Sibylle L. Reithel, Ontario, and Hugh G. McGuckin, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 19, 1988, Ser. No. 195,917

Int. Cl.⁴ G03C 1/71, 7/10

U.S. Cl. 430—7

4 Claims

1. A color filter array comprising:
a first layer having a first mordant of a first polarity and a color dye of a second, opposite polarity, and
a second layer having a second mordant of a second polarity and a color dye of the first polarity to thereby prevent cross-dyeing.

4,876,167

COLOR FILTER ARRAY CONTAINING A PHOTOCROSSLINKED POLYMERIC MORDANT

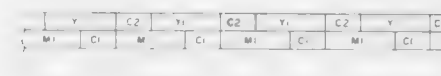
Robert A. Snow, Pittsford; Hugh G. McGuckin, Rochester; Ignazio S. Ponticello, Pittsford; Robert C. Daly, Rochester; Laurel J. Pace, Rochester; Sandra K. Fischer, Rochester, and Michael J. Hanrahan, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 20, 1987, Ser. No. 87,486

Int. Cl.⁴ G03C 7/12, 1/71

U.S. Cl. 430—7

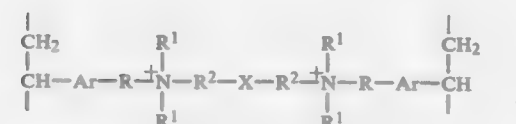
16 Claims



1. A color filter array comprised of interlaid sets of laterally displaced first, second, and third additive primary filters, characterized in that

said sets of filters are comprised of two discrete bottom layers, one bottom layer containing a first subtractive primary dye forming a bottom layer of said first and second filters and a second bottom layer containing a second subtractive primary dye forming a bottom layer of said third filters and

said sets of filters being formed of two discrete overlying layers, one overlying layer containing said second subtractive primary dye forming an overlying layer of said first filters and a second overlying layer containing a third subtractive primary dye forming an overlying layer of said second and third filters, at least one of said bottom and overlying layers being of controlled thickness and containing a single subtractive primary anionic dye and a cationic vinyl polymer mordant containing crosslinking repeating units of the formula:



wherein, independently in each occurrence,

Ar is an aromatic linking group,

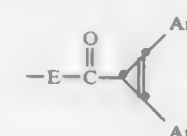
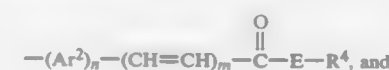
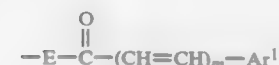
R is a methylene group,

R¹ is a lower alkyl group,

R² is a divalent linking group,

X is a [1,3-cyclobutylene] crosslinking group photogenerated by the addition reaction of two X¹ groups,

X¹ is chosen from the group consisting of



Ar¹ is an aromatic moiety;

Ar² is a divalent aromatic moiety;

E is an oxy or imino moiety;

m is 1 or 2;

n is 0 or 1;

R⁴ is a terminal hydrocarbon group; and

Z represents one or more charge balancing counter ions.

4,876,168

PHOTOSENSITIVE MEMBER COMPRISING CHARGE GENERATING LAYER AND CHARGE TRANSPORTING LAYER COMPRISING AMORPHOUS CARBON CONTAINING CHALCOGEN OR TRANSITION METAL

Hideo Hotomi; Izumi Osawa; Syuji Iino; Isao Doi, and Masanori Fujiwara, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jun. 24, 1988, Ser. No. 210,788

Claims priority, application Japan, Jun. 26, 1987, 62-159953; Jun. 26, 1987, 62-159954

Int. Cl.⁴ G03G 5/085

U.S. Cl. 430—58

3 Claims

1. A photosensitive member comprising:
an electrically conductive substrate;
a charge generating layer; and
a charge transporting layer comprising amorphous carbon containing hydrogen in an amount in an amount of about 0.1 to about 67 atomic % based on the combined amount of hydrogen and carbon, said charge transporting layer containing about 0.1 to about 10 atomic % of chalcogen atoms or transition metal elements based on all the constituent atoms in the layer.

4,876,169

TONER COMPOSITIONS WITH RELEASE ADDITIVES

Robert J. Gruber, Pittsford, N.Y.; Raymond A. Yourd, III, Cleveland Heights, Ohio; Shadi L. Malhotra, Mississauga, Canada; Robert A. Nelson, Webster, N.Y.; Carol A. Fox, Fairport, N.Y., and Thomas R. Hoffend, Webster, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 24, 1988, Ser. No. 261,661

Int. Cl.⁴ G03G 9/08

U.S. Cl. 430—110

31 Claims

1. A toner composition for utilization in electrophotographic imaging systems wherein release management devices are avoided, which compositions are comprised of pigment particles and resin particles comprised of a polyester with siloxane block segments therein, which polyester has incorporated therein silicone release fluid additives.

4,876,170

LIGHT-SENSITIVE MATERIAL COMPRISING LIGHT-SENSITIVE LAYER CONTAINING MICROCAPSULES PROVIDED ON SPECIFIC PAPER SUPPORT

Shigehisa Tamagawa, Shizuoka; Masayuki Kuroishi, Kanagawa, and Tetsuro Fuchizawa, Shizuoka, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 22, 1987, Ser. No. 136,575

Claims priority, application Japan, Dec. 22, 1986, 61-307206; Apr. 6, 1987, 62-84113

Int. Cl.⁴ G03C 1/87, 1/72

U.S. Cl. 430—138

22 Claims

1. A light-sensitive material comprising a light-sensitive layer containing silver halide, a reducing agent and an ethylenically unsaturated polymerizable compound provided on a paper support, wherein the paper support employs a base paper sheet having:

such a distribution of formation that the total coefficient of variation relating to the distribution curve of laser beam transmittance is not more than 15%, said distribution curve of laser beam transmittance being obtained by helium-neon laser scanning;

such a distribution of fiber length that the amount of residual pulp on 24 mesh screen and on 42 mesh screen is in the

range of 30 to 60 weight % based on the total amount of the pulp contained in the base paper sheet; and a density in the range of 0.85 to 1.10 g/m².

4,876,171

SILVER SALT DIFFUSION TRANSFER WITH COMPLEXING COMPOUND

Hiroyuki Hirai, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 12, 1988, Ser. No. 155,470

Claims priority, application Japan, Feb. 13, 1987, 62-31184

Int. Cl.⁴ G03C 5/54

U.S. Cl. 430—203

13 Claims

1. A method for forming an image, comprising imagewise exposing a silver halide photosensitive material and subjecting a photographic material comprising said silver halide photosensitive material and an image-receiving material to a silver salt diffusion transfer process in the presence of a reducing agent, a physical development nucleus, and a complexing compound capable of complexing reaction with a silver ion in the presence of water and/or a hydrophilic thermal solvent as a medium wherein said complexing compound is selected from aromatic heterocyclic compounds having at least one —COOM and containing one nitrogen atom in their ring wherein M is selected from the class consisting of an alkali metal, a guanidine, an amidine, and quaternary ammonium.

13. The image forming method of claim 1 which further comprises heating the photographic material during the silver salt diffusion transfer process.

4,876,172

IMAGING METHOD EMPLOYING PHOTOADHESIVE MICROPARTICLES

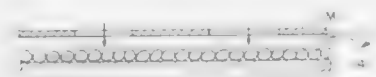
Gary F. Hillenbrand, Springboro, Ohio, assignor to The Mead Corporation, Dayton, Ohio

Filed May 20, 1987, Ser. No. 52,520

Int. Cl.⁴ G03C 1/46, 1/72, 5/40

U.S. Cl. 430—253

12 Claims



1. A process for forming images which comprises:

- forming a continuous layer of photosensitive microparticles, said microparticles being formed from a material which becomes tacky upon exposure to actinic radiation;
- image-wise exposing said layer to actinic radiation such that said microparticle become tacky in the exposed areas;
- assembling said layer with a receiver sheet, and
- transferring said microparticles to said receiver sheet in the exposed areas.

4,876,173

PHOTOPOLYMERIZABLE COMPOSITION ON POLYETHYLENE TEREPHTHALATE FILM SUPPORT

Kazuo Maemoto, Kanagawa; Masayuki Iwasaki; Minoru Maeda, both of Shizuoka, and Yoshimasa Aotani, Kanagawa, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 42,550, Apr. 21, 1987, abandoned,

which is a continuation-in-part of Ser. No. 824,343, Jan. 23, 1986, abandoned. This application Sep. 2, 1988, Ser. No. 240,455

Claims priority, application Japan, Jan. 23, 1985, 60-10271

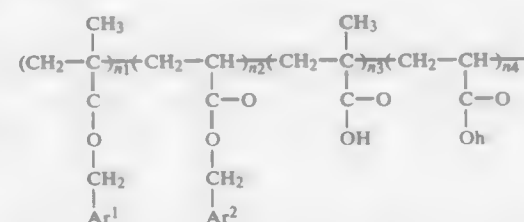
Int. Cl.⁴ G03C 1/76

U.S. Cl. 430—271

14 Claims

1. A photopolymerizable photoresist composition in the form of a sheet or roll on a transparent polyethylene terephthalate releasable film support, consisting essentially of (A) an addition polymerizable unsaturated compound having at

least two ethylenically unsaturated double bonds per molecule in an amount of from 7.5 to 55% by weight, (B), a photopolymerization initiator in an amount of from 0.1 to 10% by weight, and (C) a binder in an amount of 20 to 80% by weight, wherein said binder consists essentially of a copolymer represented by formula (I)



wherein Ar¹ and Ar² each represent a substituted or unsubstituted phenyl group; and n₁, n₂, n₃, and n₄ each represents a mol % of the respective repeating units set forth in formula (I), wherein n₁ is from 0 to about 70; n₂ is from 0 to about 70; n₃ is from about 5 to 50; and n₄ is from about 5 to 50; provided that n₁ and n₂ are not 0 at the same time, the sum of n₁ and n₂ is from about 20 to 70, the sum of n₃ and n₄ is from about 30 to 80, wherein said copolymer has a weight average molecular weight of from 10,000 to 500,000.

4,876,174

METHOD OF PROCESSING SILVER HALIDE COLOR PHOTOSENSITIVE MATERIAL USING DEVELOPER COMPRISING DIALKYL HYDROXYLAMINE AND NO BENZYL ALCOHOL

Takatoshi Ishikawa, and Morio Yagihara, both of Minami-Ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-Ashigara, Japan

Filed Jun. 18, 1987, Ser. No. 63,469

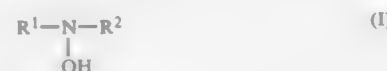
Claims priority, application Japan, Jun. 24, 1986, 61-147822

Int. Cl.⁴ G03C 7/30

U.S. Cl. 430—380

15 Claims

1. A method of processing a silver halide color photosensitive material comprising, processing an exposed silver halide color photosensitive material having at least one emulsion layer containing a silver halide having a chlorine content of at least 80 molar % based on the total halogens with a color developer which is substantially free of benzyl alcohol, said color developer (i) having a pH of about 9 to about 11, (ii) containing sulfites in an amount ranging from about 0 to about 5 g/l, (iii) containing an aromatic primary amine color developing agent, and (iv) containing a dialkylhydroxylamine of the following general formula (I):



wherein R¹ and R² each represent an unsubstituted or substituted alkyl group or an unsubstituted or substituted alkenyl group or R¹ and R² may form a hetero ring together with nitrogen atom.

4,876,175

DYE SENSITIZED PHOTOGRAPHIC IMAGING SYSTEMS

Chin H. Chen, Fairport, N.Y.; John L. Fox, Baltimore, Md.; Donald P. Specht, and Samir Y. Farid, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 9, 1988, Ser. No. 191,947

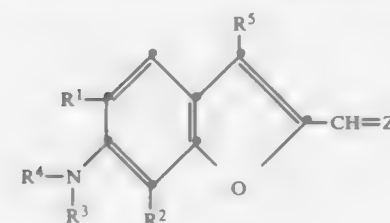
Int. Cl.⁴ G03C 1/72

U.S. Cl. 430—281

26 Claims

1. A photographic imaging system comprised of

a hardenable organic component containing ethylenic unsaturation sites and cointiators for ethylenic addition comprised of an activator and, a photosensitizer which satisfies the formula:



where

Z represents the atoms providing an electron withdrawing —C(O)— or —SO₂— group;
R¹, R², and R⁵ each independently represent hydrogen, alkyl, or aryl;
R³ and R⁴ each independently represent alkyl; or
at least one of the substituent pairs represented by R¹ and R⁴, R² and R³, and R³ and R⁴ complete a 5 or 6 membered ring.

4,876,176

METHOD FOR FABRICATING QUASI-MONOLITHIC INTEGRATED CIRCUITS

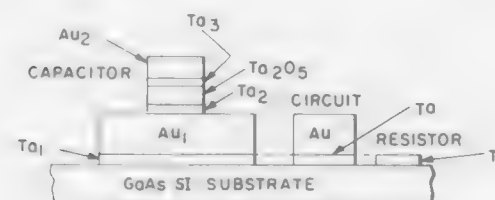
Joseph A. Calviello, Kings Park; Paul R. Bie, Commack, and Ronald J. Pomian, Dix Hills, all of N.Y., assignors to Eaton Corporation, Cleveland, Ohio

Filed Apr. 20, 1987, Ser. No. 40,416

Int. Cl.⁴ G03C 5/00

U.S. Cl. 430—311

9 Claims



1. A method for producing a quasi-monolithic integrated circuit comprising the steps of:

- enclosing a substrate in an environmentally isolated chamber;
- producing over a substantial portion of a surface of the substrate at least five superimposed layers of metals and oxides, wherein said metals include at least one from the group tantalum, molybdenum, tungsten, and gold, and wherein said oxides include at least one from the group of oxides of tantalum, molybdenum, and tungsten;
- removing the circuit from said chamber;
- sequentially processing patterned areas of said layers substantially from the exposed top layer downward, to define and produce circuit elements forming a partially complete integrated circuit, by processes including photolithography; and
- bonding active circuit elements to the partial circuit to complete the fabrication of the quasi-monolithic circuit.

4,876,177

PROCESS FOR PRODUCING PRINTED CIRCUIT BOARD

Haruo Akahoshi, Hitachi; Kanji Murakami, Mito; Mineo Kawamoto; Akio Tadokoro, both of Hitachi, and Toyofusa Yoshimura, Ibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

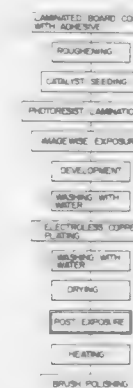
Filed Sep. 8, 1987, Ser. No. 95,921

Claims priority, application Japan, Sep. 5, 1986, 61-207788

Int. Cl.⁴ B05D 5/12; G03L 5/00

U.S. Cl. 430—313

34 Claims



1. A process for producing a printed circuit board, which comprises the steps of:

- forming a layer comprising a photosensitive resin composition on an insulating substrate having on its surface an adhesive layer adherent to a metal being subsequently plated thereon;
- exposing said layer comprising a photosensitive resin composition to an actinic radiation in a manner so as to form on said layer a negative pattern of a conductor circuit pattern and to semicure said negative pattern to an extent sufficient to keep it from erosion by a plating solution;
- developing by dissolving away with a solvent the uncured areas not exposed to said actinic radiation, thereby to form a plating resist from the semicured areas of said negative pattern;
- chemically plating said conductor circuit pattern areas not covered with said plating resist, thereby to form a conductor circuit; and
- carrying out a curing treatment to cure completely said plating resist by exposing to actinic radiation.

4,876,178

ELECTROCONDUCTIVE FILM SYSTEM FOR AIRCRAFT WINDOWS

David L. Voss, Van Nuys; Howard S. DeCamp, Northridge, and Gordon W. Culp, Van Nuys, all of Calif., assignors to Sierra Corporation, Sylmar, Calif.

Continuation of Ser. No. 904,033, Sep. 4, 1986, abandoned, which is a division of Ser. No. 529,975, Sep. 7, 1983, Pat. No. 4,707,586, which is a continuation-in-part of Ser. No. 262,494, May 11, 1981, abandoned. This application Sep. 30, 1988, Ser. No. 253,377

Int. Cl.⁴ G03C 5/00

U.S. Cl. 430—314

40 Claims

1. A method for forming a plurality of spaced apart electroconductive metal film runs on the surface of a transparent substrate, the method comprising the steps of:

- forming a transparent polymer basecoat on a surface of a transparent substrate;
- depositing a quantity of electroconductive metal onto the transparent polymer basecoat surface to thereby form a metal strike coat;
- masking a portion of the metal strike coat so that un-

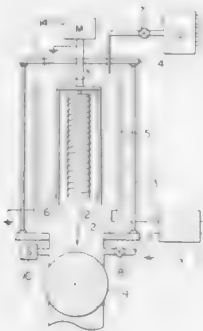
4,876,185

ALUMINUM SUPPORT FOR A PHOTOCONDUCTIVE MEMBER

Yasuyuki Matsumoto, Toride; Keiichi Mura, Kashiwa; Tadaji Fukuda, Yokohama, and Kyosuke Ogawa, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan Division of Ser. No. 873,444, Jun. 6, 1986, Pat. No. 4,702,981, which is a continuation of Ser. No. 599,522, Apr. 12, 1984, abandoned. This application Jul. 9, 1987, Ser. No. 71,648 Claims priority, application Japan, Apr. 18, 1983, 58-67029

Int. Cl.⁴ B21H 1/18; B32B 15/20

U.S. Cl. 430—580



1. In an electrophotographic support for a hydrogenated and/or halogenated amorphous silicon member, which support is mirror-finished employing a cutting tool, said support being subject to generation of failures on the surface thereof due to cutting resistance caused by the presence of hard spots therein, the improvement which comprises an aluminum alloy with a Fe content of 2000 ppm by weight or less, said support being a cylinder having reduced numbers of hard spots and enhanced resistance to surface defects upon mirror-finish.

4,876,186

DETECTION AND DIFFERENTIATION OF COXIELLA BURNETII IN BIOLOGICAL FLUIDS

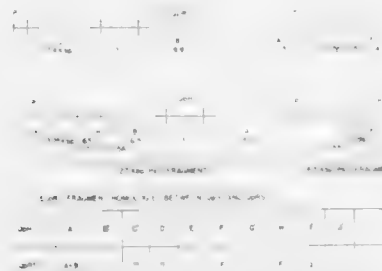
Marvin E. Frazier, Richland, Wash.; Louis P. Mallavia, Moscow, Id.; Oswald G. Baca, Albuquerque, N. Mex., and James E. Samuel, Pullman, Wash., assignors to Battelle Development Corporation, Columbus, Ohio

Filed Nov. 5, 1985, Ser. No. 795,207

Int. Cl.⁴ C12Q 1/68; C07H 15/12

U.S. Cl. 435—6

21 Claims



1. A method for detecting the presence of strains of *C. burnetii* that are capable of causing chronic disease, comprising:

treating cells contained within a biological sample to expose cellular DNA;

hybridizing the cellular DNA with a labeled DNA probe containing DNA sequences that specifically recognize *C. burnetii* DNA of strains associated with the capacity to cause chronic disease, the DNA sequences derived from a

plasmid isolated from the Q177 Priscilla strain of *C. burnetii*; and detecting the hybridized, labeled DNA probe and therefrom determining the presence of strains of *C. burnetii* capable of causing chronic disease.

4,876,187

NUCLEIC ACID COMPOSITIONS WITH SCISSION LINKAGE USEFUL FOR DETECTING NUCLEIC ACID SEQUENCES

Peter Duck, Robert Bender, both of Ottawa; William Crosby, Saskatoon, and John G. Robertson, L'Ange Gardien, all of Canada, assignors to Meigenics, Inc., Columbia, Md.

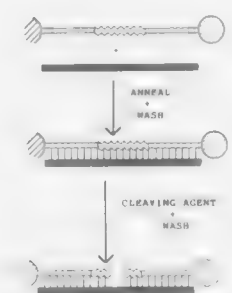
Filed Dec. 5, 1985, Ser. No. 805,279

Int. Cl.⁴ C12Q 1/68; C12P 19/34; C07H 19/06; G01N 33/566

U.S. Cl. 435—6

53 Claims

— DNA TARGET SEQUENCE
— DNA PROBE SEQUENCE
— DNA NONTARGET SEQUENCE



21. A composition comprising the structure:



wherein NA_1 and NA_2 are nucleic acid sequences; wherein S is a scission linkage which is capable of being cleaved or disrupted without cleaving or disrupting the nucleic acid sequences of NA_1 or NA_2 or of a target nucleic acid sequence capable of hybridizing to the NA_1 and NA_2 sequences, or to the NA_1 and NA_2 sequences and the scission linkage of said composition, wherein if the scission linkage is a nucleic acid sequence it is RNA when both NA_1 and NA_2 are DNA sequences, or the scission linkage is DNA when both NA_1 and NA_2 are RNA sequences;

wherein n is an integer from 1 to 4;

wherein the solid lines represent chemical bonds;

wherein X is a solid support;

wherein L is a chemical entity which links NA_1 to the solid support; and

wherein M is a marker.

4,876,188

NOVEL IMMUNOCHEMICAL METHOD FOR ASSAYING STABLE GLYCOSYLATED HEMOGLOBIN

Richard Smith, Del Mar; Peta-Maree Lamb, San Diego; Linda K. Curtiss, San Diego, and Joseph Witztum, San Diego, all of Calif., assignors to Scripps Clinic and Research Foundation, La Jolla, Calif.

Filed Nov. 18, 1986, Ser. No. 932,442

Int. Cl.⁴ G01N 33/53, 33/72

U.S. Cl. 435—7

14 Claims

1. A method of assaying the amount of stable glucosylated hemoglobin in a glucosylated hemoglobin-containing sample comprising the steps of:

- admixing said sample with a phthalic acid solution having a pH value of about 3 to about 6, at a ratio of at least about 1.5 millimoles of said acid per milligram of hemoglobin to form an acid reaction admixture;
- maintaining said acid reaction admixture for a predetermined time period at a temperature above about 0 degrees C. to about 37 degrees C. sufficient to remove the labile glucosylated hemoglobin present, while maintaining the stable glucosylated hemoglobin present in the original sample;
- admixing said acid reaction admixture with a water-compatible borohydride reductant at a ratio of at least about 0.015 moles of borohydride per milligram of hemoglobin to form a reduction reaction admixture;
- maintaining said reduction reaction admixture for a predetermined time period at a temperature above about 0 degrees C. to about 37 degrees C. sufficient to form glucitolysine-hemoglobin;
- separating said glucitolysine-hemoglobin from any unreacted borohydride to form isolated glucitolysine-hemoglobin;
- admixing said isolated glucitolysine-hemoglobin with glucitolysine-specific antibody molecules or antibody combining site-containing portions thereof to form an immunoreaction admixture;
- maintaining said immunoreaction admixture under biological assay conditions for a time period sufficient for the antibody molecules or antibody combining site-containing portions thereto to immunologically bind to said glucitolysine-hemoglobin to form an immunoreactant; and
- determining the amount of immunoreactant that formed in the maintained immunoreaction admixture and thereby the amount of stable glucosylated hemoglobin in said sample.

4,876,189

PROCESS FOR THE QUANTIFICATION OF CELL POPULATIONS OR SUBPOPULATIONS AND A REAGENT SUITABLE THEREFOR

Hartmut Schetter, Munich; Josef Endl, Gilling, and Winfried Albert, Pahl, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany Filed Nov. 5, 1986, Ser. No. 927,803

Claims priority, application Fed. Rep. of Germany, Nov. 19, 1985, 3541033

Int. Cl.⁴ G01N 33/545, 33/547, 33/552, 33/577

U.S. Cl. 435—7

11 Claims

1. A process for the determination of the number of cells in a cell population or a cell subpopulation in a sample, comprising:

- providing a sample of cells;
- incubating said sample of cells with labelled antibodies specific to cell surface antigens of a cell population or a cell subpopulation under conditions favorable to a reaction between said cell surface antigens and said labelled antibodies, whereby the labelled antibodies complex with the cell surface antigens;
- providing a standard mixture of particles having a known particle concentration, said standard mixture of particles having a sedimentation behavior similar to the cells to be determined, a first portion of said mixture of particles comprising particles carrying a non-specific antibody and a second portion of said mixture of particles carrying molecules directed specifically against the labeled antibodies or a part thereof;
- incubating said standard mixture of particles with another portion of the labeled antibodies under conditions similar to conditions as the incubation of said sample in step (2), whereby the labeled antibodies complex with said second portions of said mixture of particles;
- separating the cells from the labeled antibodies that do not complex with the cell surface antigens;
- separating the particles from labeled antibodies that do not complex with the second portion of the mixture of particles;

- measuring the amount of labeling present on the separated cells and present on the separated particles; and
- determining the number of cells by comparing a value obtained by measuring the label on said cells with value obtained by measuring label attached to said mixture of particles.

4,876,190

PERIDININ-CHLOROPHYLL COMPLEX AS FLUORESCENT LABEL

Diether J. Recktenwald, Cupertino, Calif., assignor to Becton Dickinson & Company, Franklin Lakes, N.J.

Filed Oct. 21, 1987, Ser. No. 111,209

Int. Cl.⁴ G01N 21/77, 33/533

U.S. Cl. 435—7

10 Claims

1. In a diagnostic assay employing as a reagent a fluorescent compound conjugated to a member of a specific binding pair, wherein said pair comprises two biochemical molecules that bind specifically to each other and said diagnostic assay comprises a step in which the conjugated member of the specific binding pair binds to the other member of the specific binding pair, the improvement wherein said fluorescent compound is a peridinin-chloro-phyll-protein complex.

4,876,191

IMMOBILIZATION OF BIOLOGICALLY ACTIVE SUBSTANCES WITH CARRIER BOND ANTIBODY

Zeev Hollander, Herzlia; Beki Salomon, Herzlia Pituach, and Ephraim Katchalski-Katzir, Rehovot, all of Israel, assignors to Ramot University Authority for Applied Research and Industrial Development Ltd., Tel-Aviv, Israel

Filed Jul. 14, 1986, Ser. No. 885,155

Claims priority, application Israel, Jul. 17, 1985, 75828

Int. Cl.⁴ G01N 33/573, 33/543; C12P 1/00; C12N 11/00

U.S. Cl. 435—7

8 Claims

1. A composition which selectively binds a predetermined enzyme or isoenzyme which comprises the structure A-B-C wherein

A is a water-insoluble carrier,

B is a polyclonal anti-mouse antibody against the Fc region of monoclonal antibody C,

C is a monoclonal mouse immunoglobulin antibody having an Fc region which binds only to a predetermined enzyme or isoenzyme by an immunochemical bond and becomes attached to the enzyme or isoenzyme at a specific site which does not impair the catalytic activity of the enzyme or isoenzyme,

B being linked to A by a chemical covalent bond, and

C being attached to B by an immunochemical bond.

4,876,192

DETECTION OF ANTIBODIES AGAINST A CHORIONIC GONADOTROPIN-LIKE SUBSTANCE

Donald E. Weder, Highland, Ill., and Tzu T. Chi, Anaheim, Calif., assignors to Seven W. Enterprises, Inc., Highland, Ill. Continuation-in-part of Ser. No. 778,847, Sep. 23, 1985, abandoned. This application Oct. 22, 1987, Ser. No. 112,473

Int. Cl.⁴ C12Q 1/42; G01N 33/53

U.S. Cl. 435—21

26 Claims

1. A method of screening for a condition characterized by an elevated level of first antibodies against a chorionic gonadotropin-like substance, in a first subject other than domestic poultry, comprising:

contacting a first test specimen from the first subject with chorionic gonadotropin-like substance immobilized on a solid phase, under conditions permitting first antibody-chorionic gonadotropin-like substance binding; removing unbound specimen components from the solid phase; contacting a plurality of second antibodies, each comprising an immunological conjugate of the first antibody, with the

solid phase, under conditions permitting second antibody/first antibody binding;
removing unbound second antibodies from the solid phase;
observing the presence of chorionic gonadotropin-like substance/first antibody/second antibody complex, if any, on the solid phase.

4,876,193

DETERMINATION OF SUPPRESSOR FUNCTIONAL RESERVE

A. Arthur Gottlieb, New Orleans, La., assignor to Imreg, Inc. (Delaware corporation), New Orleans, La.

Filed Feb. 24, 1986, Ser. No. 832,016

Int. Cl.⁴ C12Q 1/02; C12N 5/00

U.S. Cl. 435—29 20 Claims

1. A method of determining a human or animal test subject's immune response, comprising:

- (1) preparing a peripheral blood lymphocyte population from a blood sample taken from said test subject, thereby providing a first preparation;
- (2) exposing a plurality of portions of said first preparation to a means for activating suppressor cells and to different predetermined concentrations of amplifier, wherein one of said portions is exposed to no amplifier, thereby providing a control level, said portions providing a second preparation;
- (3) culturing said second preparation, thereby producing a first culture;
- (4) exposing said first culture to a means for preventing cell division, and thereafter removing any residual amount of said means from said culture, thereby producing a non-proliferating culture;
- (5) combining a further portion of a peripheral blood lymphocyte population with said nonproliferating culture, thereby providing a responder preparation;
- (6) exposing said responder preparation to a means for inducing a cell proliferation immune response, thereby producing a third preparation;
- (7) culturing said third preparation, thereby producing a second culture; and
- (8) determining an immune response index in said second culture.

4,876,194

PROTEIN L AND SUBFRAGMENTS THEREOF, WITH IMMUNOGLOBULIN BINDING ACTIVITY, A PROCESS FOR PREPARING THEREOF, REAGENT KIT, PHARMACEUTICAL COMPOSITION AND A PEPTOCOCCUS MAGNUS STRAIN

Lars Björck, Södra Sandby; Mats Erntell, and Erling Myhre, both of Lund, all of Sweden, assignors to Hightech Receptor AB, Malmö, Sweden

Filed Jul. 22, 1986, Ser. No. 887,926

Int. Cl.⁴ C12P 21/00

U.S. Cl. 435—68 14 Claims

12. A pure culture of a microorganism selected from the group consisting of *Peptococcus magnus* strain 312, ATCC No. 53516, and mutants thereof.

4,876,195

PROCESS FOR PRODUCING 2-KETO-D-GLUCARIC ACID

Hideo Shirafuji, Nagaokakyō; Takamasa Yamaguchi, Suita, and Ikao Nogami, Nagaokakyō, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Dec. 19, 1986, Ser. No. 946,504

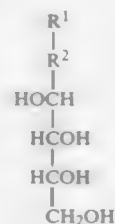
Claims priority, application Japan, Dec. 26, 1985, 60-294577

Int. Cl.⁴ C07D 307/62; A23L 3/34

U.S. Cl. 435—137 8 Claims

1. A process for producing 2-keto-D-glucaric acid which

comprises contacting a compound shown by the formula expressed as the chain structure



wherein R¹ is —CHO, —CH₂OH or COOH and R² is



with a bacterium belonging to the genus *Pseudogluconobacter* and being capable of oxidizing said compound, or processed matters thereof in a medium, producing and accumulating 2-keto-D-glucaric acid and then recovering the same.

4,876,196

METHOD OF CONTINUOUSLY PRODUCING ETHANOL FROM SUGAR-CONTAINING SUBSTRATES

Wolfgang Salzbrunn, Neustadt; Eva Steiner, Korneuburg; Wilfried Wöhler, Bad Vöslau, and Otto Meixner, Vienna, all of Austria, assignors to Vogelbusch Gesellschaft m.b.H., Austria

Continuation of Ser. No. 783,923, Oct. 3, 1985, abandoned. This application Jan. 27, 1988, Ser. No. 149,955

Claims priority, application Austria, Oct. 18, 1984, A 3318/84

Int. Cl.⁴ G12P 7/06, 7/14

U.S. Cl. 435—161 7 Claims

1. A method of continuously producing ethanol from sugar-containing substrates comprising fermentation of the sugar in said substrates by a flocculating strain of *Zymomonas mobilis* cells under anaerobic conditions, the method consisting essentially of:

- flowing a fermentation medium comprising said substrates and said *Zymomonas mobilis* cells through at least three fermentation stages of a fermentation system without preceding sterilization;
- maintaining a concentration of at least 4% by volume of ethanol and a pH of about 5 in each of said fermentation stages;
- maintaining a residence time of said fermentation medium in said fermentation stages of up to about 3 h., corresponding to a dilution rate of said fermentation medium in said fermentation stages of at least about 1/h⁻¹;
- separating the *Zymomonas mobilis* cells after the final fermentation stage by sedimentation to form ethanol-containing substrates, and recycling said *Zymomonas mobilis* cells into the first fermentation stage; and
- removing said ethanol-containing substrates separated from said *Zymomonas mobilis* cells.

4,876,197

EUKARYOTIC REGULATABLE TRANSCRIPTION

Rae Lyn Burke, San Francisco; Steven Rosenberg, Oakland; Jeffrey R. Shuster, Walnut Creek; Patricia A. Tekamp-Olson, and Pablo D. T. Valenzuela, both of San Francisco, all of Calif., assignors to Chiron Corporation, Emeryville, Calif.

Continuation-in-part of Ser. No. 468,589, Feb. 22, 1983, abandoned, and a continuation-in-part of Ser. No. 609,540, May 11, 1984. This application Jul. 29, 1985, Ser. No. 760,197

Int. Cl.⁴ C12P 15/00, 21/00, 2/1; C12N 7/00

U.S. Cl. 435—172.3 14 Claims

1. A DNA construct comprising in order of transcription a

first transcription regulatory region obtained from one of the yeast genes *ADR3*, the regulatory region of *PHO5*, or the regions regulated by *GAL4*, which provides for inducible transcriptional regulation; a second transcriptional initiation region from the yeast *GAPDH* gene of FIG. 2 and a terminator region.

4,876,198

METHOD FOR PRODUCTION OF AN ENZYME GRANULATE

Erik K. Markussen, Værløse, Denmark, assignor to Novo Industri A/S, Bagsvaerd, Denmark

Filed Aug. 19, 1988, Ser. No. 234,180

Claims priority, application Denmark, Aug. 21, 1987, 4355/87

Int. Cl.⁴ C12N 9/00

U.S. Cl. 435—183 8 Claims

1. In a process for production of an enzyme granulate which comprises granulating an enzyme composition comprising enzyme, filler, binder, and from 1.5–40% by weight thereof of cellulose or artificial fibers, the enzyme added to the granulating process being in solution or suspension, and wherein the granulate product particles are separated into a middle fraction containing particles of the desired size interval, a small size fraction containing particles smaller than the desired size interval, and a large size fraction containing particles larger than the desired size interval with said small size and large size fractions being recirculated to the granulating process, the improvement which comprises:

- recirculating the particles of said small size fraction without grinding of same, and
- grinding the particles of said large size fraction then recirculating same, the particles of said large size fraction being ground so that the recirculated particles as a whole exhibit a cumulative particle size distribution curve of the same general shape as the cumulative particle size distribution curve of the aforesaid granulate product particles.

4,876,199

HYBRIDOMAS PRODUCING MONOCLONAL ANTIBODIES TO MONO-, DI-, AND TRIFUCOSYLATED TYPE 2 CHAIN

Sen-Itiroh Hakamori, Mercer Island, Wash., assignor to Fred Hutchinson Cancer Research Center, Seattle, Wash.

Filed Apr. 4, 1985, Ser. No. 728,821

Int. Cl.⁴ C12N 5/00; C07K 15/04

U.S. Cl. 530—387 7 Claims

1. A hybridoma cell line producing a monoclonal antibody capable of specifically binding with a fucosylated type 2 chain structure selected from the group consisting of III³V-³Fuc₂NLc₆ and III³V³VII³Fuc₃NLc₈ but not specifically binding with III³FucNLc₄, V³FucNLc₆, III³FucNLc₆, or VI²FucNLc₆.

5. A hybridoma cell line capable of producing a monoclonal antibody specifically binding with fucosylated type 2 chain structure III³V³VII³Fuc₃NLc₈ but not specifically binding with any of III³FucNLc₄, III³FucNLc₆, and VI²FucNLc₆.

4,876,200

NEW STRAINS OF PSEUDOMONAS PUTIDA

John A. Schofield; Peter R. Betteridge; George Ryback, all of Sittingbourne, and Philip J. Geary, Ashford, all of England, assignors to Shell Oil Company, Houston, Tex.

Filed Jul. 1, 1987, Ser. No. 68,493

Claims priority, application United Kingdom, Jul. 8, 1986, 8616612; Jul. 8, 1986, 8616613

Int. Cl.⁴ C12P 7/22; C12R 1/40

U.S. Cl. 435—253.3 1 Claim

1. A biological pure culture of *Pseudomonas putida* NCIB 12190.

4,876,201

METHOD FOR BIODEGRADING PCBs

Donna L. Bedard, Latham, and Michael J. Brennan, Jr., Ballston Lake, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 855,274, Apr. 24, 1986. This application Feb. 27, 1989, Ser. No. 316,194

Int. Cl.⁴ C12N 1/20; C12R 1/05; C02F 3/00, 1/68

U.S. Cl. 435—262 8 Claims

1. A method for biodegrading halogenated organic waste comprising PCB congeners having up to five or more chlorine atoms per molecule, which comprises treating the halogenated organic waste under aerobic conditions with an effective amount of a biologically pure culture of *Alcaligenes eutrophus* NRRLB-15940.

4,876,202

CHIMERIC PLASMIDS

Hiromi Ishiwa, Kodaira; Harue Shibahara, Nishitama; Masahiko Mutai, Higashiyama, and Nobuo Tsuchida, Yokohama, all of Japan, assignors to Kabushiki Kaisha Yakult Honsha, Tokyo, Japan

Continuation-in-part of Ser. No. 574,180, Jan. 24, 1984, abandoned, and a continuation-in-part of Ser. No. 737,038, May 22, 1985, abandoned. This application Nov. 18, 1987, Ser. No. 125,396

Claims priority, application Japan, Jan. 24, 1983, 58-9740; Jun. 8, 1983, 58-103196; Aug. 31, 1983, 58-159345; Jan. 10, 1984, 59-2361; May 24, 1984, 59-105411

Int. Cl.⁴ C12N 7/00, 15/00; C07H 15/12

U.S. Cl. 435—320 6 Claims

1. A chimeric plasmid denoted pHY460 comprising:
 - (a) a tetracycline resistance gene of plasmid pAMa1 and a first DNA replication origin of plasmid pAMa1, said tetracycline resistance gene being operable as a marker gene in strains of both *Escherichia coli* and *Bacillus subtilis* and said first DNA replication origin being operable in strains of *Bacillus subtilis*;
 - (b) an ampicillin resistance gene and a second DNA replication origin, both separated from a vector pACYC177, said ampicillin resistance gene being operable as a marker gene solely in strains of *Escherichia coli* and said second DNA replication origin being operable in strains of *Escherichia coli*;
 - (c) a unique restriction and cleavage site for the restriction enzyme Ball within said tetracycline resistance gene;
 - (d) a unique restriction and cleavage site for the restriction enzyme BglI within said ampicillin resistance gene; and
 - (e) a unique restriction and cleavage site for the restriction enzyme PstI within said ampicillin resistance gene,
 wherein the approximate molecular weight of said chimeric plasmid is 4.6 Md and the cleavage map of the plasmid is as shown in FIG. 7 of the Drawings.

4,876,203

METHOD OF PERFORMING MEDICAL ANALYSIS ON A LIQUID SAMPLE USING AT LEAST ONE DRY REAGENT, AND APPARATUS FOR THE METHOD

Jean Guigan, 9, rue Jean Mermoz, 75008 Paris, France

Filed Oct. 22, 1985, Ser. No. 790,021

Claims priority, application France, Oct. 26, 1984, 84 16448

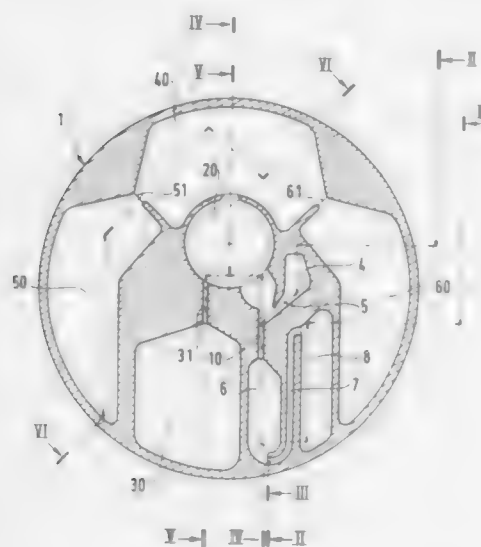
The portion of the term of this patent subsequent to May 10, 2005, has been disclaimed.

Int. Cl.⁴ G01N 21/07

U.S. Cl. 436—45 6 Claims

1. A method of performing medical analysis on a liquid sample using at least one dry reagent together with a diluent, using a container having internal compartments including: a storage chamber for said liquid sample connected via a capillary duct to one end of a calibrated cell whose other end is connected via a capillary duct to an overflow chamber;

a storage chamber for said liquid diluent;
 a pouring chamber, a capillary duct connected at one end to said pouring chamber and on the other end to said calibrated cell, a capillary duct connected at one end to said pouring chamber and at the other end to said diluent storage chamber, and a further capillary duct connected at one end to said pouring chamber and at the other end with a first reaction chamber suitable for containing a dry reagent; and
 two reaction chambers suitable for containing dry reagents situated on either side of said first reaction chamber, and connected via capillary ducts having different angular orientations;
 a lid for closing said container fitted both with a sample storing receptacle connected directly with said sample storage chamber and situated thereabove, and with a removable stopper which penetrates into said pouring chamber to close the ends of said capillary ducts leading thereto; and
 means provided for mounting said container on the turntable of a centrifuge with the axis of the container offset from the axis of the turntable for rotation of the container about said container axis to a plurality of different predeter-



mined positions relative to the turntable and through a given angle to permit selective alignment of a given capillary duct with the direction of centrifuging force resulting from turntable rotation;

said method comprising the steps of:

providing a liquid diluent initially in said diluent storage chamber and dry reagents in respective ones of said reaction chambers;

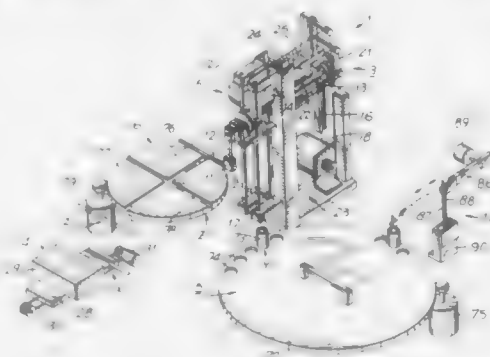
inserting said sample into the sample storing receptacle and then flowing said sample under gravity into said sample storage chamber, removing said stopper, mounting said container on said centrifuge turntable, operating said turntable and performing a plurality of successive centrifuging operations, while setting the angular position of the container on each occasion from among said predetermined angular positions as a function of the orientation of the capillary duct concerned relative to the direction of centrifugal force in such a manner as to cause said sample to pass successively via said capillary ducts from said sample storage chamber into said calibrated cell, then into said pouring chamber, and then into said first reaction chamber, and subsequently into each of the other reaction chambers.

4,876,204 METHOD AND APPARATUS OF AUTOMATIC CONTINUOUS ANALYSIS USING ANALYTICAL IMPLEMENT

Kazushige Inoue, Ibaraki; Hiroshi Yamamoto, Uji; Hiroshi Hyodo, Kyoto, and Shinichi Kishimoto, Kuze, all of Japan, assigns to Kabushiki Kaisha Kyoto Daiichi Kagaku, Kyoto, Japan

Filed Oct. 1, 1985, Ser. No. 782,356
 Claims priority, application Japan, Oct. 11, 1984, 59-213592; Nov. 5, 1984, 58-232678

Int. Cl.⁴ G01N 35/04
 U.S. Cl. 436-46 13 Claims



1. An automatic continuous analysis method using an analytical implement having a reagent section, comprising: a transfer process and a measuring process, said transfer process including the steps of supplying analytical implements one by one from an automatic supply device, holding each analytical implement supplied by the automatic supply device by an analytical-implement automatic handling device, moving each analytical implement to a position above a sample vessel which is successively brought into a specified position where each analytical implement is to be dipped into the sample vessel, dipping each analytical implement in a sample solution in the sample vessel and pulling it up after a specified time, moving each implement above a reaction turntable and setting it on the reaction turntable and releasing each analytical implement from the analytical-implement automatic handling device, said measuring processing including the step of automatically measuring, after a specified time, light reflectance of the reagent section of each analytic implement.

4,876,205 ELECTROCHEMICAL ASSAY FOR HAEMOGLOBIN

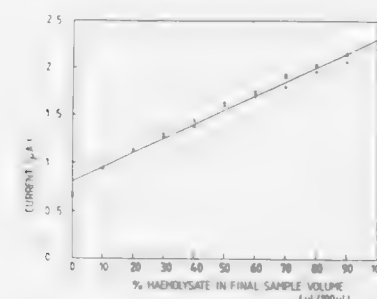
Monika J. Green, Buckinghamshire, and Roger J. Lias, Oxon, both of Great Britain, assigns to Medisense, Inc., Cambridge, Mass.

Filed Aug. 12, 1987, Ser. No. 84,983
 Claims priority, application United Kingdom, Aug. 12, 1986, 8619527

Int. Cl.⁴ G01N 27/56, 33/49
 U.S. Cl. 436-66 8 Claims

1. A method for the assay of haemoglobin in blood comprising contacting the blood with a sufficient amount of a ferricya-

nide so that haemoglobin in the blood is reacted therewith and the haemoglobin is electrochemically assayed by monitoring



the current change produced on reduction of the ferricyanide by the hemoglobin.

4,876,206 METHODS FOR DETECTING RARE EARTH MINERALS

Wayne L. Sayer, 4213 Canal Cir., Las Vegas, Nev. 89122

Filed Feb. 10, 1989, Ser. No. 309,422

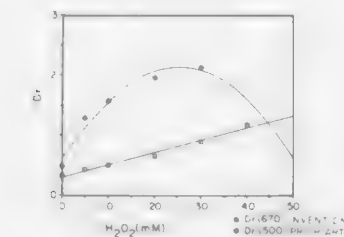
Int. Cl.⁴ G01N 33/20 51 Claims

1. A method for detecting rare earth minerals in the field comprising the steps of:
 (a) obtaining an ore sample to be tested for the presence of rare earth minerals;
 (b) mixing the ore sample with a basic reagent to form a mixture;
 (c) treating the mixture with a halide acid;
 (d) allowing the mixture to react and dry; and
 (e) examining the ore sample under a shortwave ultraviolet light for fluorescence of a red-orange color.

4,876,207 COMPOSITIONS FOR THE DETECTION OF HIGH LEVELS OF HYDROGEN PEROXIDE

Arthur R. Mack, II, Penn Yan, and John W. H. Sutherland, Jr., Rochester, both of N.Y., assigns to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 16, 1988, Ser. No. 156,129
 Int. Cl.⁴ G01N 33/00 14 Claims



4. A method for determining hydrogen peroxide levels in aqueous solution having a pH comprising the steps of:
 (a) adjusting the pH of the aqueous solution between 5 and 10;
 (b) providing a peroxidase active material;
 (c) providing a composition comprising 1,10-phenanthroline and 1,7-dihydroxynaphthalene;
 (d) combining (a), (b) and (c) to form a dye; and
 (e) determining the hydrogen peroxide level photometrically from the dye.

4,876,208 DIFFRACTION IMMUNOASSAY APPARATUS AND METHOD

Eric K. Gustafson, Palo Alto; Rick Trebino, Livermore, and John Lee, Cupertino, all of Calif., assigns to Yellowstone Diagnostics Corporation, Sunnyvale, Calif.

Filed Jan. 30, 1987, Ser. No. 9,177
 Int. Cl.⁴ G01N 33/545 9 Claims

U.S. Cl. 436-531



1. A diffraction immunoassay plate for use in a light diffraction immunoassay comprising a surface selected from the group consisting of polysilicon and crystalline silicon surfaces having on said surface, a biological diffraction grating design of lines of active binding reagent.

6. A diffraction binding assay method for determining the presence or quantity of an analyte in an aqueous sample comprising

(a) contacting a diffraction binding assay surface with the sample for time sufficient to permit conjugation of binding reagent and analyte, the diffraction binding assay surface being selected from the group consisting of polysilicon and single crystalline silicon surfaces having on said surface, a light disturbing design of substantially non-light disturbing binding reagent thereon, the binding reagent being selected to bind selectively with the analyte;
 (b) separating the surface from the sample; and
 (c) illuminating the diffraction binding assay surface with light from a light source, and determining the light diffraction by the diffraction binding assay surface.

4,876,209 METHOD OF MAKING AVALANCHE PHOTODIODE

Stephen R. Forrest, Torrance, Calif., assignor to U.S.C., Los Angeles, Calif.

Division of Ser. No. 141,320, Jan. 6, 1987, Pat. No. 4,857,982.

This application May 12, 1989, Ser. No. 351,063
 Int. Cl.⁴ H01L 21/76 3 Claims

1. A method of manufacturing an avalanche photodiode, comprising the steps of:
 epitaxially depositing a buffer region of a first semiconductor material over a substrate;
 epitaxially depositing a ternary absorption region of a second semiconductor material, doped with an impurity of a first conductivity type over said buffer region;
 epitaxially depositing a multiplication region, composed of said first semiconductor material and doped with an impurity of said first conductivity type except at its upper surface (where said multiplication region is doped with a low concentration of an impurity of said first conductivity type), over said ternary absorption region;
 depositing a first diffusion barrier film over said multiplication region, defining by photolithography a diffusion window using a positive resist;
 diffusing and doping said upper surface of said multiplication region with an impurity of a second conductivity type in a central region of said upper surface of the multiplication region;
 diffusing and doping a plurality of concentric rings on said upper surface surrounding said central region, said rings composed of the same material and conductivity type as said central region;
 depositing a second diffusion barrier film over said first barrier film, for protecting said upper surface of said

multiplication region and confining said central region to the center of said diffusion window;
thermally depositing a metal alloy as a conductivity contact for said central region; said contact not connected to said concentric rings;
whereby said avalanche photodiode is complete which has an edge junction breakdown barrier to enhance the gain of said photodiode.

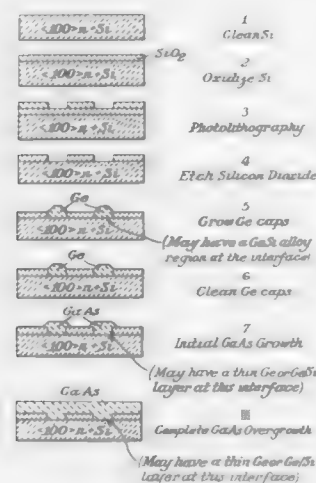
4,876,210

SOLUTION GROWTH OF LATTICE MISMATCHED AND SOLUBILITY MISMATCHED HETEROSTRUCTURES
Allen M. Barnett, Newark, Del., and John C. Zolper, Glen Rock, N.J., assignors to The University of Delaware, Newark, Del. Continuation of Ser. No. 44,151, Apr. 30, 1987, abandoned. This application Mar. 4, 1988, Ser. No. 163,897

Int. Cl.⁴ H01L 31/18, 21/208

U.S. Cl. 437-5

14 Claims



1. In a method of making semiconductor structures by solution growth of heterostructure layers wherein a heterostructure capping layer is solution grown on a substrate and is subsequently at least partially removed by dissolution during solution growth of a second, different heterostructure layer, the improvement comprising preparation of the substrate surface by the solution grown heterostructure capping layer to facilitate solution growth of the second heterostructure layer.

4,876,211

METHOD FOR FABRICATING VARACTOR DIODES USING ION IMPLANTATION

Hilda Kanber, Rolling Hills Estates, and James C. Chen, Torrance, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Aug. 9, 1988, Ser. No. 230,093

Int. Cl.⁴ H01L 29/93

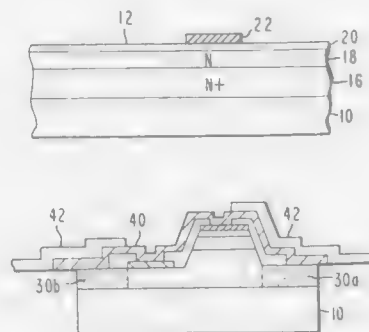
U.S. Cl. 437-22

17 Claims

1. A method for manufacturing semiconductor structures having varactor profiles having deep N⁺ type conductivity layers including the steps of:

providing a semi-insulating substrate of III-V semiconductor material having an essentially flat major surface;
implanting first silicon ions through said major surface of said substrate at an energy level in the range of from about 5 to 7 MeV and of a dose of from about 1×10^{14} to 1×10^{15} ions/cm²;
implanting second silicon ions through said major surface of said substrate at an energy level less than the energy level of said first implanting step and in the range of from about

3 to 5 MeV and of a dose of from about 1×10^{14} to 1×10^{15} ions/cm²;



implanting sulfur ions through said major surface of said substrate at an energy level of from about 5 to 7 MeV and a dose of from about 1×10^{14} to 1×10^{15} ions/cm², thereby providing a deeply buried N⁺ type conductivity layer.

4,876,212

PROCESS FOR FABRICATING COMPLIMENTARY SEMICONDUCTOR DEVICES HAVING PEDESTAL STRUCTURES

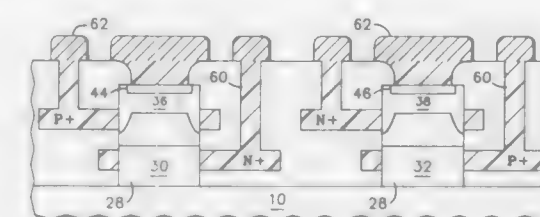
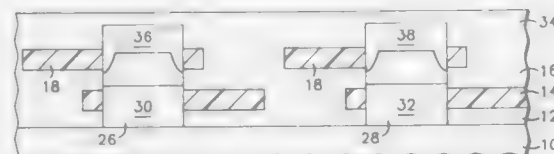
Daniel N. Koury, Ithaca, N.Y., assignor to Motorola Inc., Schaumburg, Ill.

Filed Oct. 1, 1987, Ser. No. 103,321

Int. Cl.⁴ H01L 21/265, 21/20

U.S. Cl. 437-34

24 Claims



1. A process for fabricating complimentary semiconductor devices having pedestal structures comprising the steps of:
providing a first substrate;
forming a first dielectric layer on said first substrate;
forming a first polysilicon layer on said first dielectric layer;
patterning and etching said first polysilicon layer in a predetermined manner;
doping said first polysilicon layer with a plurality of conductivity types;

forming a second dielectric layer on said first polysilicon layer;
forming a second polysilicon layer on said second dielectric layer;
patterning and etching said second polysilicon layer in a predetermined manner;
doping said second polysilicon layer with a plurality of conductivity types;
forming a third dielectric layer on said second polysilicon layer;
patterning and forming a plurality of openings through said first, second and third dielectric layers and said first and second polysilicon layers, said openings extending from said first substrate;
forming epitaxial regions in said openings; and
forming a plurality of contact openings extending to said first polysilicon layer, said second polysilicon layer and said epitaxial regions.

4,876,213

SALICIDED SOURCE/DRAIN STRUCTURE

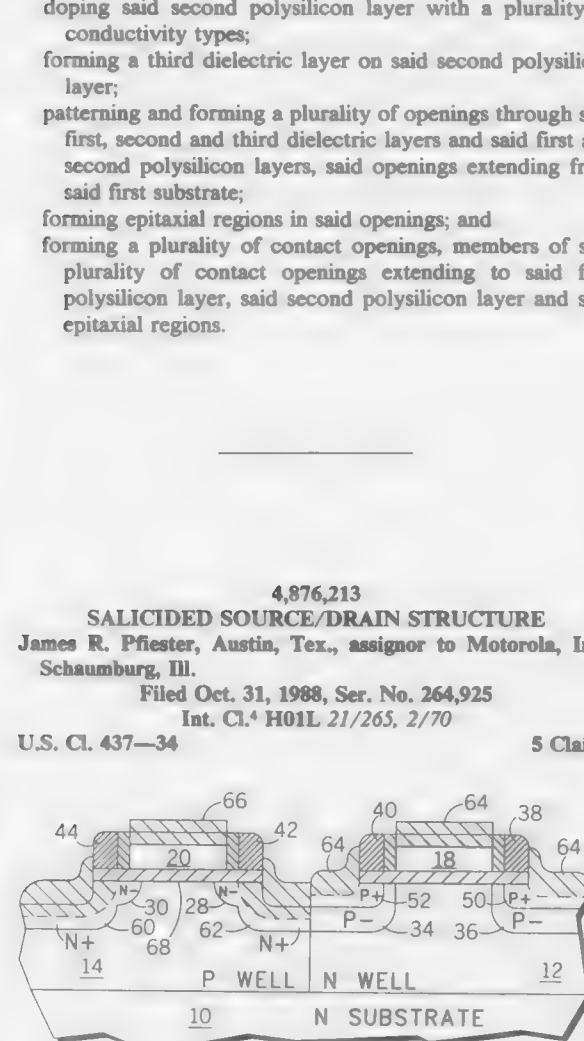
James R. Pfister, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 31, 1988, Ser. No. 264,925

Int. Cl.⁴ H01L 21/265, 2/70

U.S. Cl. 437-34

5 Claims



1. A process for fabricating a CMOS device comprising the steps of:

providing a silicon substrate having first and second surface regions of first and second conductivity type, respectively;
providing first and second polycrystalline silicon gate electrodes overlying said first and second surface regions;
forming source and drain regions of second and first conductivity type, respectively, self aligned with said first and second gate electrodes;
forming sidewall spacers on the edges of each of said gate electrodes;
introducing impurities of said first conductivity type into said first and second surface regions using said sidewall spacers as masking elements;
removing said impurities of said first conductivity type from said surface region of said first conductivity type by over-etching of said substrate surface;
selectively introducing impurities of second conductivity type into said surface region of said first conductivity type using said sidewall spacers as masking elements; and
forming silicide regions on said first and second surface regions using said sidewall spacers as silicide masks.

METHOD FOR FABRICATING AN ISOLATION REGION IN A SEMICONDUCTOR SUBSTRATE

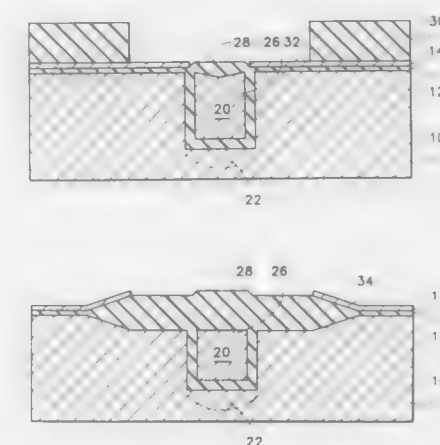
Tadanori Yamaguchi, Hillsboro; Evan Patton; Eric Lane, both of Portland, and Simon Yu, Beaverton, all of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Jun. 2, 1988, Ser. No. 201,491

Int. Cl.⁴ H01L 21/265, 21/76

U.S. Cl. 437-038

18 Claims



1. A method for fabricating an isolation region in a semiconductor substrate comprising the steps of:
forming antiinsulating layer on said substrate;
forming a mask layer on said insulating layer;
forming a trench in said mask layer, said insulating layer and said substrate;
oxidizing an inner surface of said trench to extend said insulating layer into said trench;
filling a portion of said trench with semiconductor material; initially oxidizing an upper surface of said semiconductor material to extend said insulating layer over said trench;
removing portions of said mask layer to expose portions of said insulating layer adjacent said trench; and
further oxidizing said upper surface of said semiconductor material and portions of said substrate adjacent said trench.

4,876,215

METHOD OF MAKING A STATIC RAM CELL WITH TRENCH PULL-DOWN TRANSISTORS AND BURIED-LAYER GROUND PLATE

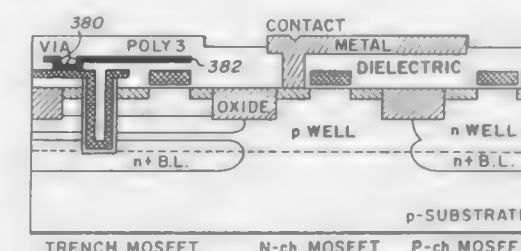
Fu-Chieh Hsu, Cupertino, Calif., assignor to Integrated Device Technology, Inc., Santa Clara, Calif.

Division of Ser. No. 69,168, Jul. 2, 1987. This application Aug. 23, 1988, Ser. No. 236,209

Int. Cl.⁴ H01L 21/425, 21/38

U.S. Cl. 437-60

5 Claims



1. In a method of fabricating a SRAM cell, of the type wherein p-well regions, active island regions, conductive layers, loads, interconnections, insulators, contact hole openings, metal line definitions, and passivations are all formed on

an epitaxial silicon layer, the improvement comprising in combination the steps of:

- forming an isolated, buried, n+ layer on a p- substrate;
- growing the epitaxial silicon layer on said substrate;
- forming p- well regions in said grown epitaxial silicon layer;
- forming active island regions in said grown epitaxial silicon layer;
- performing a pull-down transistor threshold voltage adjustment;
- masking for trench formation;
- etching at least one trench into said grown epitaxial silicon layer so that the bottom of said trench is inside said buried layer;
- forming a dielectric in said trench; and
- forming a conductive layer as a gate electrode for a trench transistor.

4,876,216

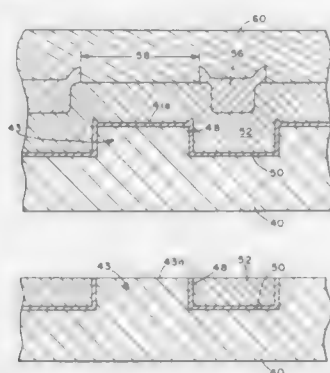
SEMICONDUCTOR INTEGRATED CIRCUIT MANUFACTURING PROCESS PROVIDING OXIDE-FILLED TRENCH ISOLATION OF CIRCUIT DEVICES

Eric Tobias, and Chau-Shiong A. Chen, both of San Diego, Calif., assignors to Applied Micro Circuits Corporation, San Diego, Calif.

Filed Mar. 7, 1988, Ser. No. 164,556
Int. Cl.⁴ H01L 21/314

U.S. Cl. 437-67

5 Claims



1. In a process for manufacturing an integrated circuit device on a semiconductor substrate, an improvement for isolating individual circuit elements in said device, comprising the steps of:

- forming a device area having an upper surface on a surface of said substrate by a trenching process which forms a trench adjacent said device area, said trench having a side surface which extends to said device area;
- forming a relatively thin insulating layer of oxide covering said device area upper surface, said trench side surface and the floor surface of said trench;
- applying, over said thin insulating layer, an insulating layer of crystalline dielectric material which is relatively thicker than said thin insulating layer and which fills said trench at least to the level of said device area upper surface;
- applying a first layer of photoresist over said thicker insulating layer and photolithographically removing the portion of said first layer which overlies said device area;
- applying a relatively planar second layer of photoresist over said first layer of photoresist; and
- removing said second layer, said first layer and said relatively thicker insulating layer by means of a removal process in which removal proceeds toward said substrate surface from said second layer and which removes the photoresists of said first and second layers, the oxide of said relatively thin layer and the crystalline dielectric material at substantially the same removal rate, and ceasing said removing when said removal process has pro-

gressed to the point at which the level of said device area is reached and said device area is exposed.

4,876,217

METHOD OF FORMING SEMICONDUCTOR STRUCTURE ISOLATION REGIONS

Peter J. Zdebel, Mesa, Ariz., assignor to Motorola Inc., Schaumburg, Ill.

Filed Mar. 24, 1988, Ser. No. 173,482
Int. Cl.⁴ H01L 21/76

U.S. Cl. 437-67

7 Claims

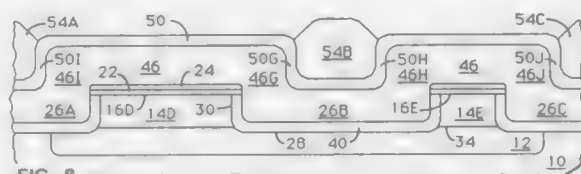


FIG. 8

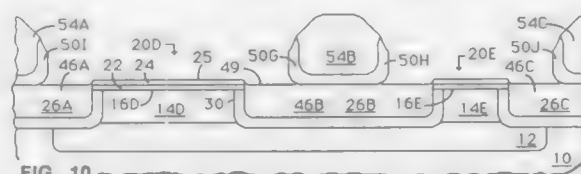


FIG. 10

1. A process for forming one or more dielectric isolation regions for a semiconductor device, comprising:

- providing a semiconductor substrate having a principal surface;
- forming on the principal surface a first mask resistant to etching of the substrate and having one or more openings with edges extending to the surface where the dielectric isolation regions are desired;
- etching the substrate through the openings to form a trench extending into the substrate from the surface wherein the trench has a bottom spaced a vertical first distance from the surface and sidewalls located under the first mask a lateral second distance from the edges of the openings;
- forming a first dielectric on the bottom and sidewalls of the trench having an outer surface on the trench sidewalls substantially aligned with the mask edges and a first thickness less than the first distance;
- forming a second dielectric on the first dielectric and having a second thickness equal or greater than the first distance minus the first thickness;
- providing a second mask over the second dielectric having one or more closed regions corresponding to the openings of the first mask and located laterally within the openings of the first mask and laterally smaller than the first openings by at least the second thickness;
- removing at least a first portion of the second dielectric layer above the first mask while leaving at least a second portion of the second dielectric layer substantially filling the trench; and
- removing the second mask.

4,876,218

METHOD OF GROWING GAAS FILMS ON SI OR GAAS SUBSTRATES USING ALE

Markus Pessa; Harry Asonen; Jukka Varrio, and Arto Saloketve, all of Tampere, Finland, assignors to Oy Nokia Ab, Helsinki, Finland

Filed Sep. 26, 1988, Ser. No. 248,845
Claims priority, application Finland, Sep. 29, 1987, 874260
Int. Cl.⁴ H01L 21/20, 21/203

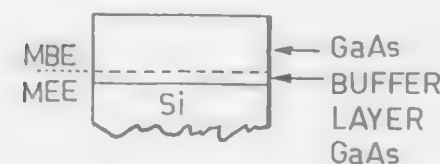
U.S. Cl. 437-107

3 Claims

1. A molecular beam epitaxy method of growing a GaAs film on the surface of a Si or GaAs substrate by exposing the growing surface of the substrate in a vacuum to at least one

vapour beam containing the Ga elementary component of the GaAs compound, and to at least one vapour beam containing the As elementary component of the GaAs compound, characterized by the steps of

- (A) growing a GaAs buffer layer on the substrate by alternately applying the elements of the GaAs compound to the surface of a substrate heated to a first temperature one atom layer at a time, whereby in the formation of each



atom layer the growing surface is exposed to a vapour beam containing one elementary component of the GaAs compound only; and

- (B) subsequently heating the substrate to a second temperature higher than the first temperature, and growing another GaAs layer on the buffer layer by applying both of the elementary components of the GaAs compound simultaneously.

4,876,219

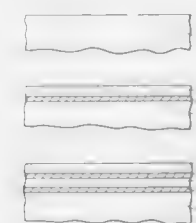
METHOD OF FORMING A HETEROEPIITAXIAL SEMICONDUCTOR THIN FILM USING AMORPHOUS BUFFER LAYERS

Takashi Eshita, Inagi; Fumitake Mieno; Yuji Furumura, both of Kawasaki, and Takuya Watanabe, Sagami, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 3, 1989, Ser. No. 318,638
Claims priority, application Japan, Mar. 4, 1988, 63-49652
Int. Cl.⁴ H01L 21/20

U.S. Cl. 437-126

8 Claims



1. A method of forming a semiconductor thin layer on a silicon substrate comprising the steps of depositing a first amorphous layer of a compound semiconductor on said silicon substrate, and growing a first epitaxial layer of the compound semiconductor on said amorphous layer, characterized in that said method further comprises the steps of: after said epitaxial growth step, depositing a second amorphous layer of the compound semiconductor on said first epitaxial layer, and growing a second epitaxial layer of the compound semiconductor on said second amorphous layer.

4,876,220

METHOD OF MAKING PROGRAMMABLE LOW IMPEDANCE INTERCONNECT DIODE ELEMENT

Amr M. Mohsen, Saratoga; Esmat Z. Hamdy, Fremont, and John L. McCollum, Saratoga, all of Calif., assignors to Actel Corporation, Sunnyvale, Calif.

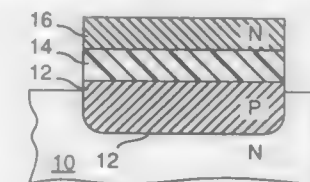
Division of Ser. No. 864,038, May 16, 1986. This application Nov. 13, 1987, Ser. No. 104,404
Int. Cl.⁴ H01L 21/22, 21/465

U.S. Cl. 437-170

4 Claims

1. In a semiconductor structure including a first region of semiconductor material of a first conductivity type, an insulat-

ing material over said first region, said insulating layer including a first region of silicon dioxide, a second region of silicon nitride over said first region, and a third layer of silicon dioxide over said second region, a second region of semiconductor material of a second conductivity type over said insulating layer, a method of creating a diode including the step of:



applying a voltage between said first and second regions for a time sufficient to create a controlled radius filament of material from at least one of said first or second regions through said insulating material to form a diode.

4,876,221

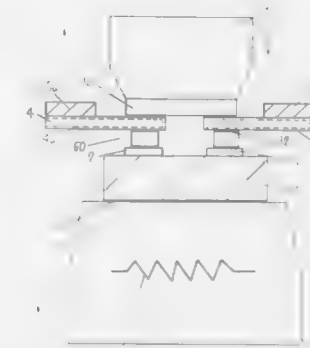
BONDING METHOD

Kenzo Hatada, Katano, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 3, 1988, Ser. No. 191,023
Int. Cl.⁴ H01L 21/60

U.S. Cl. 437-212

2 Claims



1. A method for bonding one of the principal opposite faces of a flat connecting lead to an electrode on one of the principal opposite surfaces of a semiconductor element by means of a metal bump already bonded to said one principal face of the lead or to said electrode, comprising:

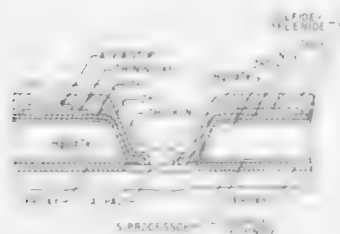
- supporting the opposite principal surface of the semiconductor element on a supporting tool which is capable of heating the semiconductor element;
- positioning the flat connecting lead with the one principal opposite face opposed to the electrode on the semiconductor element with the metal bump therebetween;
- providing a jig having a lead engaging face thereon and having at least the lead engaging face of a heat resistant heat insulating material which is other than a material which will alloy with the material of the connecting lead;
- positioning said lead engaging face opposite the other of the principal opposite face of the connecting lead;
- moving said jig and said supporting tool toward each other to bring the lead engaging face of the jig into contact with the other of the principal opposite face of the connecting lead and to press the metal bump into pressure contact between the electrode and the semiconductor element while at the same time heating said supporting tool to a temperature sufficient to heat the opposite principal surface of the semiconductor element to a temperature higher than the one principal opposite surfaces of the semiconductor element for bonding the metal bump to the electrode or the lead.

4,876,222

SEMICONDUCTOR PASSIVATION

Joseph D. Luttmer, Richardson, and D. Dawn Little, Eales, both of Tex., assignors to Texas Instrument Incorporated, Dallas, Tex.

Division of Ser. No. 101,056, Sep. 25, 1987, abandoned. This application Sep. 28, 1988, Ser. No. 251,950
Int. Cl.⁴ H01L 21/00, 21/02, 21/306, 21/31
U.S. Cl. 437—225 4 Claims



1. A method of passivating a $Hg_{1-x}Cd_xTe$ substrate, comprising the step of:

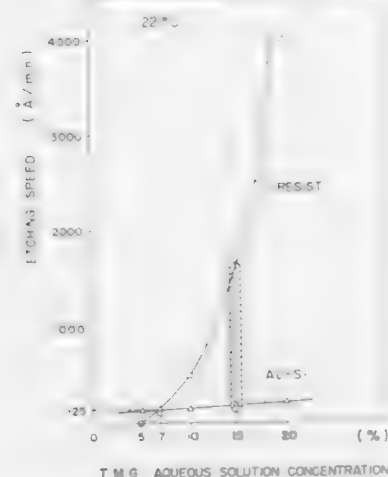
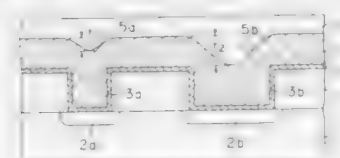
- (a) growing a passivating layer on said substrate by chemical reaction in the absence of an applied electrochemical current in a solution containing ions from the group consisting of polysulfide, polyselenide, and a combination of the two.

4,876,223

METHOD OF MANUFACTURING SEMICONDUCTOR DEVICES

Takashi Yoda, and Tohru Watanabe, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Oct. 20, 1988, Ser. No. 260,300

Claims priority, application Japan, Oct. 21, 1987, 62-265943
Int. Cl.⁴ H01L 21/00, 21/02, 21/306, 21/465
U.S. Cl. 437—228 9 Claims



1. A method of manufacturing a semiconductor device comprising the steps of:
forming an insulating film on a semiconductor substrate;

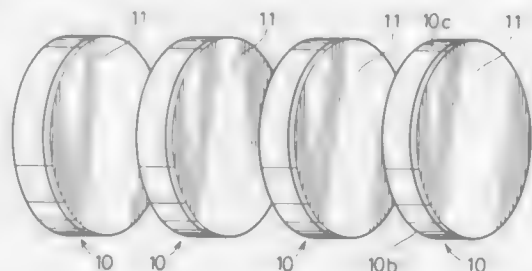
forming a recess such as a contact hole, wiring trench or the like in said insulating film;
forming a wiring material film on said insulating film and said recess to fill said wiring material at least within said recess;
coating a coating film on the surface of said wiring material film in a manner to make the surface of said coating film flat;
etching said coating film and said wiring material film sequentially, by using tetra-methyl-guanidine having the same etching speed with respect to said coating film and said wiring material film, to leave said wiring material film only within said recess and remove said wiring material film on said insulating film, in such a manner that the upper surface of said wiring material film left unetched within said recess is made substantially flush with the upper surface of said insulation film, and is made substantially flat; and
forming another wiring material film on said wiring material film and said insulation film to obtain electric connection between said other wiring material film and said wiring material film.

4,876,224

SILICON WAFER FOR A SEMICONDUCTOR SUBSTRATE AND THE METHOD FOR MAKING THE SAME

Kenji Kusakabe, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 30, 1988, Ser. No. 213,495
Claims priority, application Japan, Jun. 30, 1987, 62-164354
Int. Cl.⁴ H01L 21/324 7 Claims



1. A method for manufacturing a silicon wafer for a semiconductor substrate comprising the steps of:
forming a polycrystalline silicon layer on the entire surface of a silicon wafer body of a silicon wafer,
etching and removing that portion of the polycrystalline silicon layer which is formed on the side surface of the silicon wafer body, and
polishing and removing the polycrystalline silicon layer on the front surface of the silicon wafer body.

4,876,225

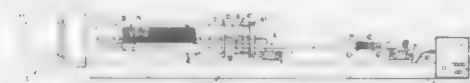
CANTILEVERED DIFFUSION CHAMBER ATMOSPHERIC LOADING SYSTEM AND METHOD

Edward A. Wagner, Alamo, and Harold C. Guiver, Benlomond, both of Calif., assignors to Berkeley Quartz Lab, Inc., Pleasanton, Calif.

Continuation of Ser. No. 51,844, May 18, 1987, abandoned. This application Dec. 9, 1988, Ser. No. 282,384
Int. Cl.⁴ F16B 39/24; F27D 3/00, 5/00
U.S. Cl. 437—248 10 Claims

1. A method of moving articles into and out of an open end of a processing chamber, comprising the steps of:
loading the articles onto an elongated cantilevered support outside of said processing chamber,
providing relative motion between a cantilevered enclosure

that surrounds said support and the elongated support such that the articles are surrounded by the enclosure, moving the support and enclosure together into an end of the processing chamber in a manner that said enclosure is sealed against an open end of the processing chamber, providing relative motion between the elongated support and the enclosure such that the articles are positioned outside of said enclosure while within said processing chamber, conducting the processing of the articles within the processing chamber with the articles positioned outside of said



enclosure, said processing including heating of the articles,
after such processing, providing relative motion between the elongated support and the enclosure in a manner to reposition the articles within said enclosure,
removing the article support and enclosure together from said end of the processing chamber, and
providing relative motion between the elongated support and the enclosure such that the articles are positioned outside of said enclosure, whereby the processed articles may be unloaded off of the support.

4,876,226

SILICON CARBIDE SINTERING

Ricardo I. Fuentes, 2022 Renee Dr., Eagle Pass, Tex. 78852
Filed Jan. 12, 1987, Ser. No. 2,106
Int. Cl.⁴ C04B 35/46 22 Claims

1. A pressureless liquid phase sintering method for increasing the density of silicon carbide comprising the steps of:
adding alumina and at least 0.1% by weight of a calcia catalyst to said silicon carbide to form a sintering composition,
said sintering composition being substantially free of rare earth oxides; and
heating said composition at a sintering temperature sufficient to form a liquid phase comprising aluminum oxycarbides for promoting the densification of said sample, the amount of said calcia catalyst being sufficient to cause the amount and rate of formation of said liquid phase to be greater than that produced using said alumina alone.
21. A pressureless sintering method for increasing the density of silicon carbide comprising the steps of:
adding at least one aluminum oxycarbide to said silicon carbide to form a sintering composition,
said sintering composition being substantially free of rare earth oxides; and
sintering said composition at a temperature sufficient to increase said density of said silicon carbide.

4,876,227

REACTION SINTERED BORIDE-OXIDE-SILICON NITRIDE FOR CERAMIC CUTTING TOOLS

Thomas P. DeAngelis, Big Flats, N.Y., assignor to Corning Incorporated, Corning, N.Y.

Continuation of Ser. No. 886,925, Jul. 18, 1986, abandoned, which is a continuation-in-part of Ser. No. 853,897, Apr. 21, 1986, abandoned. This application Aug. 24, 1988, Ser. No. 235,977
Int. Cl.⁴ C04B 35/58 16 Claims

1. A ceramic composition consisting essentially of a dense homogeneous sintered body whose composition is selected from:
(a) composition A consisting essentially of a dense homogeneous sintered body consisting on a mole percent basis, of

2 to 53% silicon nitride, where some or all of the silicon nitride is present as a separate phase or in solid solution with aluminum oxide as silicon-aluminum-oxynitride, and about 10 to 61% boride phase or phases of one or both of the elements Ti and Zr, and 37 to 88% oxide phase or phases of one or more of the elements of groups 3a, 4a, 3b, including lanthanide and actinide series elements, 4b, 5b, 6b and 8 of the periodic chart; and mixtures of any of the foregoing, or

(b) composition B consisting essentially of a dense homogeneous sintered body consisting, on a mole percent basis, of 5 to 48% silicon nitride, where some or all of the silicon nitride is present as a separate phase or in solid solution with aluminum oxide as silicon-aluminum-oxynitride, and about 37 to 80% boride phase or phases of one or both of the elements Ti and Zr, and 15 to 25% oxide phase or phases of one or more of the elements of groups 3a, 4a, 3b, including lanthanide and actinide series elements, 5b, 6b, and 8 of the periodic table; and mixtures of the foregoing.

4,876,228

ZEOLITE MODIFICATIONS

Clarence D. Chang, Princeton; Cynthia T-W Chu, Pennington; Pochen Chu, West Deptford; Ralph M. Dessau, Edison; William E. Garwood, Haddonfield; Guenter H. Kuehl, Cherry Hill; Joseph N. Miale, Lawrenceville, and David S. Shihabi, Pennington, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 24,904, Mar. 12, 1987, abandoned, which is a continuation of Ser. No. 724,370, Apr. 17, 1985, abandoned, which is a continuation-in-part of Ser. No. 631,687, Jul. 16, 1984, Pat. No. 4,559,315, which is a continuation-in-part of Ser. No. 465,987, Feb. 14, 1983, Pat. No. 4,513,091, said Ser. No. 724,370, is a continuation-in-part of Ser. No. 555,118, Nov. 25, 1983, Pat. No. 4,550,092, which is a division of Ser. No. 317,037, Nov. 21, 1981, Pat. No. 4,435,516. This application Feb. 25, 1988, Ser. No. 163,191
Int. Cl.⁴ B01J 29/28 9 Claims

1. A method for modifying a calcined unbound porous crystalline high silica content inorganic solid comprising a calcined aluminosilicate having a silica to alumina ratio of at least about 70 and having a predetermined ion-exchange capacity after calcining, said solid being further characterized by the presence of extractable silica, which method comprises:
contacting in the absence of added organic nitrogen, organic phosphorus compound, or activating metal oxide, said porous solid with liquid water containing alkali metal cation, and anions selected from the group consisting of carbonate and nitrate, at a pH from about 7 to 12 and for from less than about one hour to 100 hours at a temperature up to 370° C.;
and recovering a crystalline solid having an ion-exchange capacity greater than said porous crystalline high silica-content inorganic solid.

4,876,229

CATALYST COMPOSITION FOR POLYMERIZING OLEFINS OF NARROW MOLECULAR WEIGHT DISTRIBUTION AND POLYMERIZATION THEREWITH

Allan B. Furtek, Warren, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed May 31, 1988, Ser. No. 200,403
Int. Cl.⁴ C08P 4/64 62 Claims

1. In a process of preparing a supported olefin polymerization catalyst composition comprising a transition metal or a compound thereof and a catalyst activator, an improvement comprising using such a support that the catalyst composition has an average pore diameter of about 20 to about 300 Angstroms at a substantially constant particle size, so that the span

of the particle size distribution of the catalyst is less than about 0.5.

4,876,230

MAGNESIUM ALKOXIDE POLYMERIZATION CATALYST BY BOILING IN ORGANIC SOLVENTS
Robert C. Job, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Sep. 6, 1988, Ser. No. 240,600
Int. Cl.⁴ C08F 4/64

U.S. Cl. 502—171

6 Claims

1. A process for improving the morphology and/or productivity of a polymerization catalyst formed from a magnesium alkoxide with bound alcohol, which comprises treating said magnesium alkoxide with an unreactive solvent at or above the temperature at which the alcohol dissociates from the alkoxide prior to subjecting said magnesium alkoxide to metathesis.

4,876,231

PROCESS FOR PREPARING CRYSTALLINE MALACHITE

Joseph M. Fremont, Glen Mills, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 7, 1988, Ser. No. 241,263
Int. Cl.⁴ B01J 27/232, 35/08

U.S. Cl. 502—174

6 Claims

1. In a process for preparing agglomerates of spheroidal masses of malachite crystals, which crystals comprise 1-7%, by weight, of bismuth oxycarbonate and 0.5-3.5%, by weight (calculated as SiO₂), of silicic acid from a copper salt, a bismuth salt, and silicic acid, in which the process comprises:

- forming amorphous gel-like hydrated copper carbonate by bringing together, in aqueous solution, with agitation, at a temperature of about 45°-55° C. and at a pH of 5.5-7.5, maintained with an alkali metal carbonate or an alkali metal bicarbonate, about 30-60% by volume of the total amount of the copper salt, the bismuth salt and the silicic acid required to form the malachite and to provide the specified amounts of bismuth oxycarbonate and silicic acid;
- holding the mass of (a) without agitation at a temperature of about 45°-55° C. until masses of malachite crystals form; and then
- maintaining the resulting slurry at a temperature of 45°-55° C. and at a pH of 5.5-7.5 with an alkali metal carbonate or an alkali metal bicarbonate while adding, with agitation, the remainder of the required amount of copper salt, bismuth salt and silicic acid to form the agglomerates, the improvement comprising:
 - substituting an alkali metal silicate for silicic acid in step (a), and dividing the starting materials into a first ingredient stream comprising a mixture of the alkali metal silicate and the carbonate or the bicarbonate, and a second ingredient stream comprising the copper salt and the bismuth salt; and
 - in step (c), adding the remaining starting materials to the slurry of step (b) by first mixing the ingredient streams to achieve a pH in the range of 5.5-7.5 and then adding the mixture to the slurry.

4,876,232

SUPPORTED HETEROPOLYCYCLIC COMPOUNDS IN THE SEPARATION AND REMOVAL OF LATE TRANSITION METALS

Aaron Barkatt, Silver Spring, Md., assignor to Pedro B. Macedo, Bethesda and Theodore A. Litovitz, Annapolis, both of, Md.

Filed Sep. 28, 1987, Ser. No. 101,920

Int. Cl.⁴ B01J 20/20, 20/22; C01G 55/00; C02F 1/42

U.S. Cl. 502—417

2 Claims

1. A composition comprising an activated carbon or charcoal porous support having interconnected pores, and characterized in that its internal surface contains a phenanthroline

moiety in a concentration of at least about 0.1% by dry weight relative to said support.

4,876,233

RECORDING MATERIAL

Keiso Saeki; Shojiro Sano; Katsumi Matsuoka; Masanobu Takashima, and Ken Iwakura, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

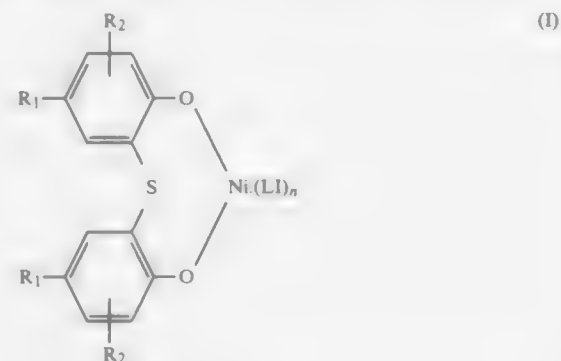
Continuation-in-part of Ser. No. 158,468, Feb. 22, 1988, abandoned. This application Dec. 15, 1988, Ser. No. 287,524
Claims priority, application Japan, Feb. 20, 1987, 62-37404; Mar. 13, 1987, 62-58514

Int. Cl.⁴ B41M 5/16, 5/18

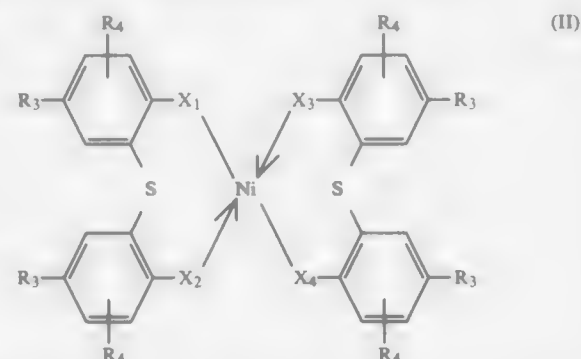
U.S. Cl. 503—209

10 Claims

1. A recording material comprising a support having provided thereon a color developer and microcapsules containing a substantially colorless color former, wherein said microcapsules further contain at least one of nickel compounds represented by formula (I)



wherein R₁ and R₂ each represent a hydrogen atom, an alkyl group, an alkoxy group, an aryloxy group, an aryl group, a halogen atom, a cyano group or a nitro group; LI represents an organic ligand which is bonded to the nickel ion via a hetero atom to form a complex; and n represents 0, 1 or 2, and nickel compounds represented by formula (II)



wherein R₃ and R₄ each represents a hydrogen atom, an alkyl group, an alkoxy group, an aryloxy group, an aryl group or a halogen atom; X₁ and X₂ each represents an oxygen atom or a sulfur atom; and X₃ and X₄ each represents a hydroxyl group or a mercapto group.

4,876,234

THERMALLY-TRANSFERABLE FLUORESCENT OXAZOLES

Richard P. Henzel, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 31, 1988, Ser. No. 238,655
Int. Cl.⁴ B41M 5/035, 5/26

U.S. Cl. 503—227

18 Claims

7. In a process of forming a transfer image comprising imagewise-heating a donor element comprising a support having on one side thereof a layer comprising a material dispersed in a polymeric binder, and on the other side thereof a slipping layer comprising a lubricant, and transferring an image to a receiving element to form said transfer image, the improvement wherein said material is a fluorescent oxazole compound.

4,876,235

DYE-RECEIVING ELEMENT CONTAINING SPACER BEADS IN A LASER-INDUCED THERMAL DYE TRANSFER

Charles D. DeBoer, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 12, 1988, Ser. No. 282,706
Int. Cl.⁴ B41M 5/035, 5/26

U.S. Cl. 503—227

20 Claims

8. In a process of forming a laser-induced thermal dye transfer image comprising

- imagewise-heating by means of a laser a dye-donor element comprising a support having thereon a dye layer and an infrared-absorbing material, and
- transferring a dye image to a dye-receiving layer of a dye-receiving element to form said laser-induced thermal dye transfer image, the improvement wherein said dye-receiving element comprises a support having thereon spacer beads of such particle size and concentration that effective contact between said dye-receiving element and said dye-donor element is prevented during transfer of said laser-induced thermal dye transfer image, said spacer beads being located either in said dye-receiving layer or in a layer thereover.

4,876,236

MATERIAL FOR INCREASING DYE TRANSFER EFFICIENCY IN DYE-DONOR ELEMENTS USED IN THERMAL DYE TRANSFER

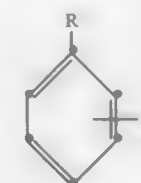
Noel R. Vanier, Rochester, and Kin K. Lum, Webster, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 129,037, Dec. 4, 1987, abandoned. This application Jul. 19, 1988, Ser. No. 221,151
Int. Cl.⁴ B41M 5/035, 5/26

U.S. Cl. 503—227

20 Claims

8. In a process of forming a dye transfer image comprising imagewise-heating a dye-donor element comprising a support having on one side thereof a dye layer comprising a dye dispersed in a polymeric binder and transferring a dye image to a dye-receiving element to form said dye transfer image, the improvement wherein said polymeric binder comprises a mixed cellulose ester and said dye-donor element contains a colorless, nonpolymeric material for increasing dye transfer efficiency having the following formula:



wherein both R groups represent —CO₂J or —O₂CJ and are located either ortho or meta to each other; and each J independently represents a substituted or unsubstituted phenyl group, or a substituted or unsubstituted carbomonoicyclic or carbobi-

cyclic ring having from 5 to about 12 carbon atoms, with the proviso that when either or both of J is substituted, then the total number of substituent carbon atoms in each J group is 8 or less.

4,876,237

THERMALLY-TRANSFERABLE FLUORESCENT 7-AMINOCOUMARINS

Gary W. Byers, and Derek D. Chapman, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 31, 1988, Ser. No. 238,653
Int. Cl.⁴ B41M 5/035, 5/26

U.S. Cl. 503—227

15 Claims

8. In a process of forming a transfer image comprising imagewise-heating a donor element comprising a support having on one side thereof a layer comprising a material dispersed in a polymeric binder, and on the other side thereof a slipping layer comprising a lubricant, and transferring an image to a receiving element to form said transfer image, the improvement wherein said material is a fluorescent 7-aminocoumarin compound.

4,876,238

INCREASING DYE TRANSFER EFFICIENT IN DYE-DONOR ELEMENTS USED IN THERMAL DYE TRANSFER

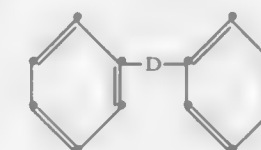
Noel R. Vanier, Rochester, and Kin K. Lum, Webster, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 129,037, Dec. 4, 1987, abandoned. This application Jul. 19, 1988, Ser. No. 221,150
Int. Cl.⁴ B41M 5/035, 5/26

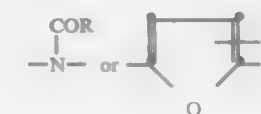
U.S. Cl. 503—227

20 Claims

8. In a process of forming a dye transfer image comprising imagewise-heating a dye-donor element comprising a support having on one side thereof a dye layer comprising a dye dispersed in a polymeric binder and transferring a dye image to a dye-receiving element to form said dye transfer image, the improvement wherein said dye-donor element contains a colorless, nonpolymeric material for increasing dye transfer efficiency having the following formula:



wherein D is —CO—, —SO₂NR—, —CONR—, —C—, —CHR—CO—,



wherein R is H or a substituted or unsubstituted alkyl group having from 1 to about 6 carbon atoms.

4,876,246
BENZO[A]PHENOTHIAZINES AND
HYDRO-DERIVATIVES FOR INHIBITING
LEUKOTRIENE BIOSYNTHESIS

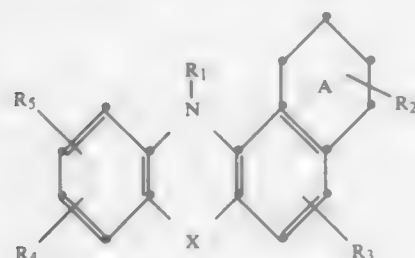
Yvan Guindon, Clémence Bizard; Yves Girard; Cheuk K. Lan, both of Pierrefonds; Rejean Fortin, Montreal; Joshua Rokach, Laval, and Christiane Yonkim, Montreal, all of Canada, assignors to Merck Frost Canada, Inc., Kirkland, Canada. Continuation of Ser. No. 871,342, Jan. 6, 1986, abandoned, which is a division of Ser. No. 716,878, Mar. 28, 1985, Pat. No. 4,611,056, which is a continuation-in-part of Ser. No. 654,994, Sep. 26, 1984, abandoned, which is a continuation-in-part of Ser. No. 539,215, Oct. 5, 1983, abandoned. This application Apr. 20, 1988, Ser. No. 183,944

Int. Cl.⁴ A61K 31/54, 31/535, 31/675

U.S. Cl. 514—80

14 Claims

1. A pharmaceutical composition for inhibiting leukotriene biosynthesis or action in mammals, which is a tablet, elixir, emulsion, injectable solution, capsule, aerosol spray, controlled release patch, thixotropic formulation, powder, suppository, cachet, or injectable suspension, containing a pharmaceutically-acceptable carrier and an effective amount of a compound having the formula (I):



wherein:

X is O, S, SO or SO₂;

R₁ is H; C₁ to C₆-alkyl; C₁ to C₆-acyl; C₁ to C₆-aminoacyl; C₁ to C₆-acyloxy-C₁ to C₆-alkyl; C₁ to C₆-alkoxy-C₁ to C₆-alkyl;



or



wherein the substituents of substituted phenyl are as defined below among the definitions of R₁₅; carbamoyl;



SO₂-C₆H₄-p-CH₃; SO₂CH₃; or R₁ is an acyl group, such that R₁-OH is an essential amino acid;

R₂, R₃, R₄ and R₅, all of which may be positioned anywhere on the structure, are independently selected from:

- (1) hydrogen;
- (2) alkyl having 1 to 6 carbon atoms;
- (3) alkenyl having 2 to 6 carbon atoms;
- (4) -(CH₂)_nM, wherein n is 0 to 6 and M is
 - (a) OR₁₅, where R₁₅ is as defined below;
 - (b) F, Cl, Br or I;
 - (c) CF₃;
 - (d) SR₁₅ where R₁₅ is H; C₁ to C₆-alkoxy-C₁ to C₆-alkyl; C₁ to C₆-acyloxy-C₁ to C₆-alkyl; C₁ to C₆-alkyl; benzyl; -(CH₂)_nCOOR₆, wherein n is 0 to 6; CN; formyl; C₁ to C₄-perfluoroalkyl; CH₂-R₁₂, wherein

R₁₂ is C₁ to C₅-alkyldimethylamino or phenyl; phenyl; substituted phenyl, wherein the substituents are C₁ to C₃-alkyl, Cl, F, Br, I, CN, CF₃, COOR₆, CH₂COOR₆, (CH₂)_pNR₈R₉ where p is 0 to 2, C₁ to C₃-alkoxy or OH;

(e) phenyl or substituted phenyl, wherein substituted phenyl is as defined in the definition of R₁₅;

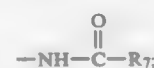
(f) COOR₆;

(g)



(h) tetrazole;

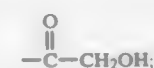
(i)



(j) -NR₈R₉;

(k) -NHSO₂R₁₀ wherein R₁₀ is OH, C₁ to C₆-alkyl, C₁ to C₆-alkoxy, or phenyl;

(l)



(m) -SOR₁₁ wherein R₁₁ is C₁ to C₆-alkyl; phenyl; substituted phenyl, where substituted phenyl is as defined in the definition of R₁₅; (CH₂)_mCOOR₆ wherein m is 1 to 6; CN; formyl or perfluoro-C₁ to C₄-alkyl;

(n) -CONR₈R₉;

(o) -SO₂NR₈R₉;

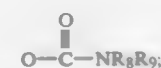
(p) -SO₂R₁₃, wherein R₁₃ is OH; C₁ to C₆-alkyl; H; phenyl; substituted phenyl, wherein substituted phenyl is as defined in the definition of R₁₅; (CH₂)_mCOOR₆ wherein m is 1 to 6; CN; formyl or perfluoro-C₁ to C₄-alkyl;

(q) NO₂;

(r)



(s)



(t) -CN;

(u) -OPO(OR₆)₂; or

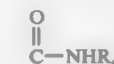
(v) -OR₆, wherein R₆ is H; C₁ to C₅-alkyl; C₁ to C₅-acyl; C₁ to C₆-alkoxy-C₁ to C₆-alkyl; C₁ to C₆-acyloxy-C₁ to C₆-alkyl; C₁ to C₄-aminoacyl; carbamoyl;



or



wherein substituted phenyl is as defined in the definition of R₁₅;



where R_c is C₁ to C₄-alkyl;



where R_d is C₁ to C₄-alkyl or C₁ to C₆-acyloxy-C₁ to C₆-alkyl; or is a structure such that -OR_d is an ester of an essential amino acid; and

(5) -(CHR₆)_qCOOR₆, where q is 0 to 4; where each R₆ is independently H, phenyl or C₁ to C₆-alkyl; each R₇ is C₁ to C₆-alkyl, benzyl, phenyl or C₁ to C₆-acyloxy-C₁ to C₆-alkyl; each R₈ and each R₉ is independently H, phenyl or substituted phenyl, where substituted phenyl is as defined in the definition of R₁₅; or C₁ to C₄-alkyl; each R₁₄ is independently H, (CH₂)_qCOOR₆ wherein q is 0 to 4, C₁ to C₆-alkyl, C₁ to C₆-alkoxy, C₁ to C₆-acyloxy-C₁ to C₆-alkoxy, phenyl or substituted phenyl wherein substituted phenyl is as defined in the definition of R₁₅; C₁ to C₆-aminoalkyl, or R₁₄ is such that R₁₄CO₂H is an essential amino acid; and | represents single or double bonds; and pharmaceutically-acceptable salts thereof.

4,876,247

METHYLENEDIPHOSPHONIC ACID DERIVATIVES,
AND ANTIRHEUMATIC PHARMACEUTICAL
COMPOSITION IN WHICH THEY ARE PRESENT AND
METHODS OF USING SAME

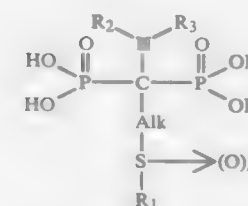
Alain Barbier, St-Clement la Riviere; Jean-Claude Brelere, Montpellier, and Georges Garcia, St-Gely-du-Fesc, all of France, assignors to Sanofi, Paris, France

Continuation of Ser. No. 919,571, Oct. 15, 1986, abandoned, which is a continuation of Ser. No. 691,893, Jan. 16, 1985, abandoned. This application Oct. 30, 1987, Ser. No. 115,615 Claims priority, application France, Jan. 26, 1984, 8401214 Int. Cl.⁴ C07F 9/38, 9/58, 9/65; A61K 31/44

U.S. Cl. 514—89

8 Claims

1. A methylenediphosphonic acid derivative of the formula:



wherein:

R₁ represents C₅-C₇ cycloalkyl, phenyl unsubstituted or monosubstituted or polysubstituted by a member selected from amongst halogen, C₁-C₆ alkyl or trifluoromethyl; or pyridyl

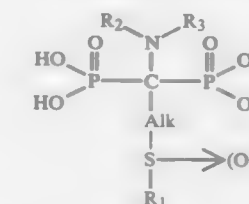
Alk denotes linear or branched C₁-C₆ alkylene; R₂ represents hydrogen, C₁-C₆ alkyl or -CONH₂; R₃ represents hydrogen, C₁-C₆ alkyl, benzyl or phenyl unsubstituted or substituted by a member selected from amongst chlorine or methyl;

R₂ and R₃, taken together, represent (CH₂)_m, in which m is 4 or 5; and

n is 0, 1 or 2; and salts thereof with pharmaceutically acceptable inorganic or organic bases.

4. A method for the treatment of rheumatism or rheumatoid

polyarthritis which comprises administering to an animal in need thereof an antirheumatic effective amount of methylenediphosphonic acid derivative of the formula:



wherein:

R₁ represents C₁-C₆ alkyl or C₅-C₇ cycloalkyl; or R₁ represents phenyl unsubstituted or monosubstituted or polysubstituted by halogen, C₁-C₆ alkyl or trifluoromethyl, or pyridyl;

Alk denotes linear or branched C₁-C₆ alkylene;

R₂ represents hydrogen, C₁-C₆ alkyl or -CONH₂;

R₃ represents hydrogen, C₁-C₆ alkyl, benzyl or phenyl unsubstituted or substituted by a member selected from amongst chlorine or methyl;

R₂ and R₃, taken together, represents (CH₂)_m, in which m is 4 or 5; and

n is 0, 1 or 2;

and salts thereof with pharmaceutically acceptable inorganic or organic bases.

4,876,248

ANTI-INFLAMMATORY PRODUCTS DERIVED FROM
METHYLENE-DIPHOSPHONIC ACID, AND PROCESS
FOR THEIR PREPARATION

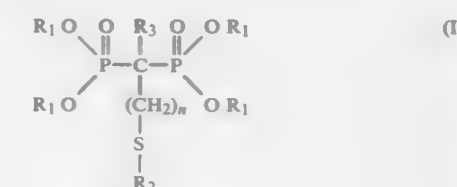
Jean C. Brelere; Xavier Emonds-Alt, both of Montpellier, and Georges Garcia, Saint-Gely-du-Fesc, all of France, assignors to Sanofi, Paris, France

Division of Ser. No. 858,573, Apr. 24, 1986, Pat. No. 4,746,654, which is a continuation of Ser. No. 518,427, Jul. 29, 1983, abandoned. This application Mar. 7, 1988, Ser. No. 165,080 Claims priority, application France, Jul. 29, 1982, 82 13250 Int. Cl.⁴ A61K 31/66; C07F 9/38

U.S. Cl. 514—108

5 Claims

1. A methylene-diphosphonic acid compound having the formula:



in which:

R₁ is hydrogen or a straight or branched lower alkyl group having from 1 to 4 carbon atoms,

R₂ is a phenyl group which is or is substituted one or more times by halogen, a nitro group, a lower alkyl group, a lower alkoxy group, trifluoromethyl, an NH₂ group, a COOH group;

R₃ is hydrogen or a hydroxyl group; and

n is an integer between 0 and 10, with the proviso that n cannot be 0 if R₃ is OH, and with the further proviso that: R₂ is different from the group having the formula

1H-pyrrol-2-yl, 4-quinolyl, 4-pyridinyl methyl iodide, dimethylaminophenyl or N-acetyl-N-methylaminophenyl; R₄ is hydrogen or alkyl(C₁-C₃); and R₅ is hydrogen or alkyl(C₁-C₃); and the pharmacologically acceptable acid-addition salts thereof.

4,876,253

TRISUBSTITUTED 1,3,5-TRIAZINE-2,4,6-TRIONES

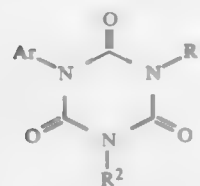
Wolfgang Führer, Cologne; Engelbert Kühle, Bergisch Gladbach; Alfons Adler, Cologne, and Gerd Hünasler, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany
Continuation-in-part of Ser. No. 118,110, Nov. 5, 1987, which is a continuation-in-part of Ser. No. 50,981, May 15, 1987, abandoned. This application Apr. 18, 1988, Ser. No. 182,554
Claims priority, application Fed. Rep. of Germany, Jun. 3, 1986, 3618662

Int. Cl.⁴ C07D 251/34; A01N 43/66

U.S. Cl. 514-241

11 Claims

1. A method of combating fungi which comprises applying to such fungi or to a fungus habitat a fungicidally effective amount of a trisubstituted 1,3,5-triazine-2,4,6-trione of the formula



in which

Ar represents phenyl, which is optionally mono-, di-, tri-, tetra- or pentasubstituted by identical or different substituents from the group comprising halogen, alkyl with 1 to 4 carbon atoms, halogenoalkyl with 1 to 4 carbon atoms and 1 to 5 identical or different halogen atoms, alkoxy with 1 to 4 carbon atoms, halogenoalkoxy with 1 to 4 carbon atoms and 1 to 5 identical or different halogen atoms, alkythio with 1 to 4 carbon atoms, and halogenoalkylthio with 1 to 4 carbon atoms and 1 to 5 identical or different halogen atoms, or represents halogenosulphonyl, or represents dialkylamino with identical or different straight-chain or branched alkyl radicals with in each case 1 to 4 carbon atoms and nitro,

R¹ represents straight-chain or branched alkyl which has 1 to 12 carbon atoms and is optionally mono- or polysubstituted by identical or different substituents from the group comprising halogen, alkoxy with 1 to 3 carbon atoms, halogenoalkoxy with 1 to 2 carbon atoms and 1 to 5 identical or different halogen atoms, alkylthio with 1 to 3 carbon atoms, halogenoalkylthio with 1 to 2 carbon atoms and 1 to 5 identical or different halogen atoms, which can likewise be mono-, di-, tri-, tetra- or pentasubstituted by identical or different substituents from the group comprising halogen, alkyl with 1 to 4 carbon atoms, alkoxy with 1 to 3 carbon atoms, halogenoalkoxy with 1 to 2 carbon atoms and 1 to 5 identical or different halogen atoms, alkylthio with 1 to 3 carbon atoms and halogenoalkylthio with 1 to 2 carbon atoms and 1 to 5 identical or different halogen atoms, and

R² represents alkyl with 1 to 4 carbon atoms, alkenyl with 3 to 5 carbon atoms, alkinyl with 3 to 5 carbon atoms, alkoxyalkyl with in each case 1 to 3 carbon atoms in the alkoxy part and in the alkyl part, alkylthioalkyl with in each case 1 to 3 carbon atoms in the alkylthio part and in the alkyl part or alkoxyalkylthio with 1 to 3 carbon atoms in the alkoxy part and 2 or 3 carbon atoms in the alkyl part, or represents cyanoalkyl with 1 to 5 carbon atoms in the alkyl part, with the provisos that (a) when Ar is unsubstituted phenyl R¹ and R² are not alkyl or alkenyl, and (b) when Ar is phenyl

substituted by 1 or 2 halogen, lower alkyl, nitro, lower alkoxy-carbonyloxy or lower monoalkylcarbonyloxy radicals R¹ and R² are not identical alkyl radicals.

4,876,254

CIRCULATION-ACTIVE SUBSTITUTED 5-NITRO-1,4-DIHYDROPYRIDINES

Gerhard Franckowiak, Wuppertal; Michael Kayser, Leverkusen; Matthias Schramm, Cologne, all of Fed. Rep. of Germany; Günther Thomas, Arese, Italy; Rainer Gross, Wuppertal, Fed. Rep. of Germany; Elisabeth Perzborn, Wuppertal, Fed. Rep. of Germany, and Friedel Seuter, Wuppertal, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 8, 1988, Ser. No. 179,102

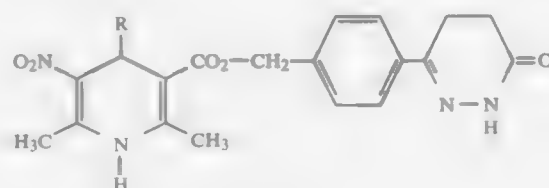
Claims priority, application Fed. Rep. of Germany, Apr. 11, 1987, 3712249

Int. Cl.⁴ C07D 401/12; A61K 31/50

U.S. Cl. 514-252

13 Claims

1. A 5-nitro-1,4-dihydropyridine of the formula



in which

R represents phenyl or naphthyl, which can be mono- to tetrasubstituted by identical or different substituents from the series comprising fluorine, chlorine, bromine, nitro, cyano, C₁-C₄-alkyl, C₁-C₄-alkoxy, C₁-C₄-alkylthio, trifluoromethyl, trifluoromethoxy, difluoromethoxy, trifluoromethylthio and benzyloxy or benzylthio optionally substituted by nitro, fluorine, chlorine, bromine, trifluoromethyl, methyl or methoxy, or represents a heterocycle from the series thienyl, furyl, pyridyl, pyrimidyl, quinolyl, benzoxadiazolyl or thiochromenyl, optionally mono- to trisubstituted by methyl, fluorine, chlorine, bromine or phenyl, or represents straight-chain, branched or cyclic alkyl with up to 12 carbon atoms,

or a physiologically acceptable salt thereof.

4,876,255

SUBSTITUTED 1,4-DIHYDROPYRIDINES FOR CONTROL OF CIRCULATION AND THROMBOSES

Gerhard Franckowiak; Ulrich Rosentreter; Elisabeth Perzborn; Friedel Seuter, all of Wuppertal; Michael Kayser, Leverkusen, all of Fed. Rep. of Germany, and Günther Thomas, Arese, Italy, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 7, 1988, Ser. No. 178,710

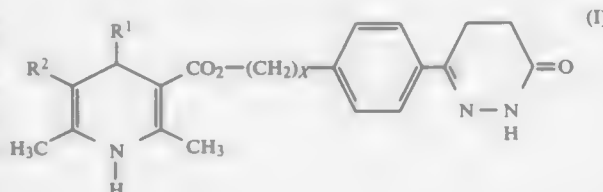
Claims priority, application Fed. Rep. of Germany, Apr. 11, 1987, 3712371

Int. Cl.⁴ C07D 401/12; A61K 31/50

U.S. Cl. 514-252

12 Claims

1. A 1,4-dihydropyridine of the formula

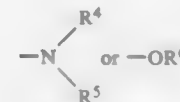


in which

R¹ represents phenyl or naphthyl, which may be mono- or independently di- or tri- substituted by fluorine, chlorine, bromine, nitro, cyano, C₁-C₄-alkyl, C₁-C₄-alkoxy, C₁-C₄-alkylthio, trifluoromethyl, trifluoromethoxy, difluoromethoxy, trifluoromethylthio, benzylthio or benzyloxy which is optionally substituted by nitro, fluorine, chlorine, bromine, trifluoromethyl, methyl or methoxy, or represents an optionally methyl-, fluorine-, chlorine-, bromine- or phenylsubstituted heterocycle from the series thienyl, furyl, pyridyl, pyrimidyl, quinolyl, benzoxadiazolyl or thiochromenyl, or represents straight-chain or branched, optionally fluorine-, chlorine- bromine- or pyridyl- substituted alkyl with up to 4 carbon atoms, R² represents cyano or a group of the formula

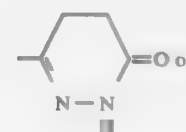


wherein R³ represents straight-chain, branched or cyclic alkyl with up to 6 carbon atoms, or represents a group of the formula

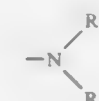


where

R⁴ and R⁵ are identical or different and represent hydrogen, C₁-C₄-alkyl or phenyl, and R⁶ represents hydrogen or represents straight-chain or branched alkyl with up to 8 carbon atoms, which can be substituted by up to 7 fluorine atoms, or by chlorine, bromine, cyano, hydroxyl, C₁-C₆-alkoxy, pyridyl, phenoxy or by phenyl which is optionally substituted by fluorine, chlorine, bromine, nitro, cyano, trifluoromethyl, C₁-C₂-alkyl, C₁-C₂-alkoxy or a group of the formula



by a group of the formula



where

R⁷ and R⁸ are identical or different and represent hydrogen, C₁-C₄-alkyl, phenyl, benzyl or acetyl, or R⁷ and R⁸ together form a 5- or 7-membered ring, which optionally contains sulphur or oxygen as a further hetero atom, and X represents a number from 0 to 5, or a physiologically acceptable salt thereof.

4,876,256

ALKYLPIPERAZINYL PYRIDINES AS HYPOGLYCEMIC AGENTS

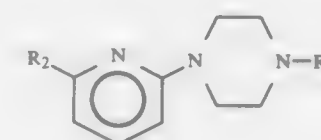
Malcolm M. Com, Freehold, and Richard L. Tolman, Warren, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.
Filed Apr. 29, 1988, Ser. No. 188,246

Int. Cl.⁴ A61K 31/495, 31/44; C07D 401/04

U.S. Cl. 514-252

5 Claims

1. A composition useful for the treatment of diabetes or obesity with associated insulin resistance which comprises a inert carrier and a therapeutically effective amount of a compound having the formula (I):



(I)

wherein:

R₁ = C₁-alkyl, C₂-alkenyl, or C₂-alkynyl;R₂ = H, C₁-alkyl, C₂-alkenyl, or C₂-alkynyl.

4,876,257

6-SUBSTITUTED PURINYL PIPERAZINE DERIVATIVES USEFUL AS CARDIOTONIC AND ANTIARRHYTHMIC AGENTS

Zoltan G. Hajos, Princeton; Ramesh M. Kanojia, Somerville, and Jeffery B. Prens, Rocky Hill, all of N.J., assignors to Ortho Pharmaceutical Corporation, Raritan, N.J.

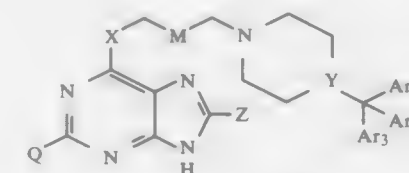
Filed Mar. 3, 1988, Ser. No. 163,487

Int. Cl.⁴ A61K 31/52; C07D 473/02

U.S. Cl. 514-253

24 Claims

1. A compound of the formula



wherein X is selected from S, O, NH, NR₁, wherein R₁ is C₁-4- lower alkyl;

M is selected from CH₂, CHOH, CHOCOR₂ and CHOR₂ wherein R₂ is selected from straight or branched chain C₁-C₈- lower alkyl, phenyl and substituted phenyl wherein the substituent is C₁-C₄- lower alkoxy, CF₃, halo and C₁-C₄- lower alkyl, NO₂ and CN;

Y is N(CH₂)_n— wherein n is 0-4 or C≡;

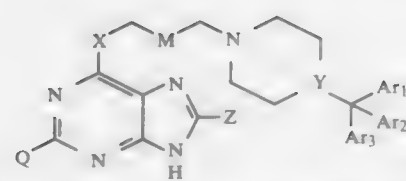
Ar₁, Ar₂ and Ar₃ are independently selected from hydrogen, C₁-C₄- lower alkyl, phenyl, substituted phenyl wherein the substituent is C₁-C₄- lower alkyl, C₁-C₄- lower alkoxy, CF₃, halo and perhalo, NO₂ and CN; naphthyl, pyridyl and thienyl; provided that when X is NH or NR₁ and Y is N, Ar₁ and Ar₂ are other than hydrogen

Z is selected from H, CN, CO₂R₃ wherein R₃ is H or C₁-C₄- lower alkyl; C₁-C₄- lower alkyl, halogen and OH;

R is selected from H, C₁-C₄- lower alkyl; cyclopentyl, cyclohexyl, benzyl, C₂-C₆- lower alkenyl, C₂-C₆- lower alkynyl, tetrahydropyranyl and tetrahydrofuranyl;

Q is selected from halo, amino, C₁-C₄- lower alkyl and OH; and the optically active isomers thereof; provided that at least one of Ar₁, Ar₂ and Ar₃ is aromatic and when Y is C≡, only Ar₁ and Ar₂ are present.

21. A method for treating heart disease which comprising administering an effective amount of a compound of claim 1 of the formula



wherein X is selected from S, O, NH, NR₁ wherein R₁ is C₁₋₄ lower alkyl; M is selected from CH₂, CHOH, CHOCOR₂ and CHOR₂ wherein R₂ is selected from straight or branched chain C₁₋₆ lower alkyl, phenyl and substituted phenyl wherein the substituent is C₁₋₄ lower alkoxy, CF₃, halo, NO₂, CN and C₁₋₄ lower alkyl; Y is N(CH₂)_n wherein n is 0-4 or C≡; Ar₁, Ar₂ and Ar₃ are independently selected from hydrogen, C₁₋₄ lower alkyl, phenyl, substituted phenyl wherein the substituent is C₁₋₄ lower alkyl, C₁₋₄ lower alkoxy, CF₃, halo and perhalo, NO₂ and CN; naphthyl, pyridyl and thienyl; provided that when X is NH or NR₁ and Y is N, Ar₁ and Ar₂ are other than hydrogen;

Z is selected from H, CN, CO₂R₃ wherein R₃ is H or C₁₋₄ lower alkyl; C₁₋₄ lower alkyl, halogen and OH;

R is selected from H, C₁₋₄ lower alkyl; cyclopentyl, cyclohexyl, benzyl, C₂₋₆ lower alkenyl, C₂₋₆ lower alkynyl, tetrahydropyranyl and tetrahydrofuranyl;

Q is selected from halo, amino, C₁₋₄ lower alkyl and OH; and the optically active isomers thereof; provided that at least one of Ar₁, Ar₂ and Ar₃ is aromatic and when Y is C≡, only Ar₁ and Ar₂ are present.

4,876,258

BIPHENYLYL COMPOUNDS

Wilhelm Kump, Biel-Benken, and Peter Traxler, Schönenbuch, both of, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.
Filed Aug. 1, 1988, Ser. No. 226,487

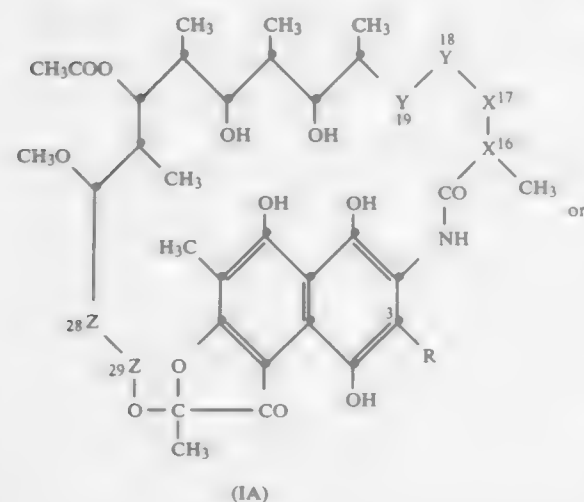
Claims priority, application Switzerland, Aug. 13, 1987, 3124/87

Int. Cl.⁴ A61K 31/495; C07D 405/14

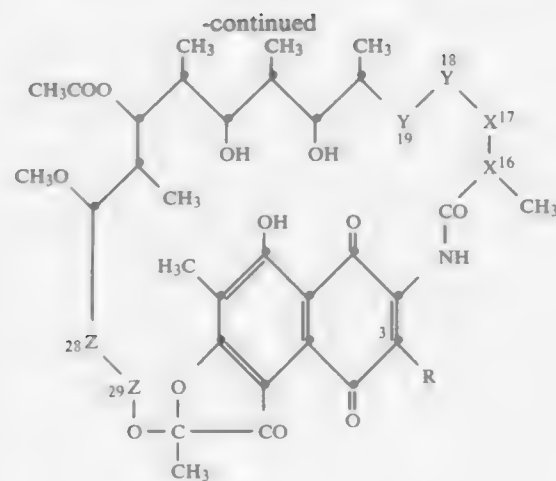
U.S. Cl. 514-254

12 Claims

1. Rifamycin derivative of the formula

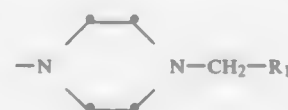


(IA)



(IB)

wherein R is a radical of the formula



(IC)

in which R₁ is an unsubstituted or is substituted biphenyl radical, or is substituted by lower alkyl, lower alkoxy, or by halogen and wherein X-X, Y-Y and Z-Z are each vinylene of the formula CH=CH, or wherein X-X and Y-Y are each ethylene of the formula CH₂-CH₂ and Z-Z is ethylene or vinylene, and a salt of such compounds.

12. A therapeutic method for the treatment of bacterial disease or viral diseases caused by type C retroviruses which comprises administering to a warm-blooded animal, included humans, an effective dose of a compound defined in claim 1 or a pharmaceutically acceptable salt thereof.

4,876,259

3,3-DISUBSTITUTED INDOLINES

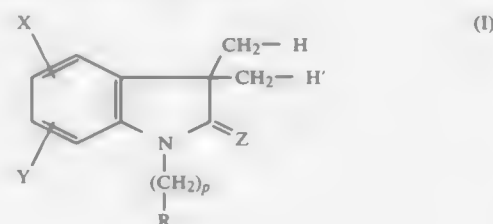
Melvyn J. Myers, and Victor J. Nickolson, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 944,953, Jan. 5, 1987, Pat. No. 4,760,043, which is a continuation-in-part of Ser. No. 850,015, Apr. 10, 1986, abandoned. This application Dec. 7, 1987, Ser. No. 129,150

Int. Cl.⁴ A61K 31/50, 31/505; C07D 403/06, 403/14
U.S. Cl. 514-256

33 Claims

1. A compound having the formula:

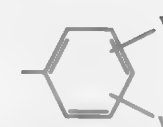


(I)

wherein:

p is 0 or 1;

Z is O or S;

R is C₁₋₁₀ alkyl, C₃₋₈ cycloalkyl, 2-pyridyl, 3-pyridyl, 4-pyridyl, or

V, W, X and Y independently are H, halo, C₁₋₃ alkyl, OR¹, NO₂, CF₃, CN or NR¹R²; R¹ and R² independently are H or C₁₋₃ alkyl; one of

- H and - H'

is a 6-membered heterocyclic aromatic ring having two nitrogen atoms as a part of the ring selected from the group pyrazine, pyrimidine or pyridazine and the other is a 6-membered heterocyclic aromatic ring having one or two nitrogen atoms as a part of the ring selected from the group pyridine, pyrazine, pyrimidine or pyridazine, each optionally substituted with one substituent selected from the group C₁₋₃ alkyl, halo, OR¹ or NR¹R², said heterocyclic rings attached by a ring carbon atom; or an N-oxide or pharmaceutically suitable acid addition salt thereof.

23. A method for the treatment of cognitive or neurological dysfunction in a mammal comprising administering to the mammal a therapeutically effective amount of a compound of claim 1.

4,876,260

OXATHIOLANES

Abraham Fisher, Holon, and Ishai Karton, Ness-Ziona, both of Israel, assignors to State of Israel, Israel Institute of Biological Research, Israel

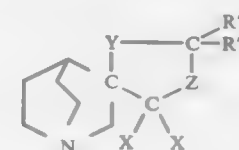
Continuation-in-part of Ser. No. 114,473, Oct. 28, 1987, abandoned. This application May 2, 1988, Ser. No. 189,210

Int. Cl.⁴ A61K 31/395; C07D 497/20

U.S. Cl. 514-278

43 Claims

1. A compound of the formula (I)



and geometrical isomers, enantiomers, diastereoisomers, racemates and acid addition salts thereof, wherein one of Y and Z is O and the other is S(=O)_n; n is 0, 1 or 2; R' and R'' are each selected from the group consisting of hydrogen, lower alkyl, lower alkenyl, lower alkynyl, hydroxy lower alkyl, amino lower alkyl, C₃₋₇ cycloalkyl, phenyl, diphenyl methylol, and lower alkyl substituted by one or two phenyl groups, provided that at least R' or R'' is other than hydrogen; and each X is hydrogen, or when Y is O and Z is S(=O)_n simultaneously, then each X may also be selected from the group consisting of deuterium and tritium, and provided further that when each X is hydrogen, Y is O and Z is S simultaneously, then at least one of R' and R'' is selected from the group consisting of lower alkenyl, lower alkynyl, cyclopropyl, cyclobutyl, cycloheptyl, hydroxy lower alkyl and amino lower alkyl.

9. A pharmaceutical composition for use in treating diseases of the central nervous system in mammals, which comprises an effective central nervous system treating amount of at least one member of the group consisting of compounds of the formula (I) as depicted in claim 1, and geometrical isomers, enantiomers, diastereoisomers and racemates thereof, wherein one of Y and Z is O and the other is S(=O)_n; n is 0, 1 or 2; R' and R'' are each selected from the group consisting of hydrogen, lower alkyl, lower alkenyl, lower alkynyl, hydroxy lower

alkyl, amino lower alkyl, C₃₋₇ cycloalkyl, phenyl, diphenyl methylol, and lower alkyl substituted by one or two phenyl groups, provided that at least R' or R'' is other than hydrogen; and each X is hydrogen, or when Y is O and Z is S(=O)_n simultaneously, then each X may also be selected from the group consisting of deuterium and tritium, and provided further that when each X is hydrogen, Y is O and Z is S simultaneously, then at least one of R' and R'' is selected from the group consisting of lower alkenyl, lower alkynyl, cyclopropyl, cyclobutyl, cycloheptyl, hydroxy lower alkyl and amino lower alkyl, and pharmaceutically compatible acid addition salts thereof, together with an inert carrier or diluent.

4,876,261

SUBSTITUTED TETRAHYDROISOQUINOLINE COMPOUNDS AND COMPOSITION CONTAINING THEM

Akihiro Tanaka, 3-17-14-304, Asahicho, Nerima-Ku, Tokyo, Japan 176; Takashi Fujikura, 3-17, Shirahata 4-chrome, Urawa-shi, Saitama, Japan 336; Ryuji Tsuzuki, 2-4, Maenochi 1-chrome Itabashi-ku, Tokyo, Japan; 174 Masaki Yokota, 84, Nakazato, Yono-shi, Saitama, Japan 338, and Takeyuki Yatsu, 3-16-1, Hasune, Itabashi-ku, Tokyo, Japan 174

Filed Mar. 25, 1988, Ser. No. 173,376

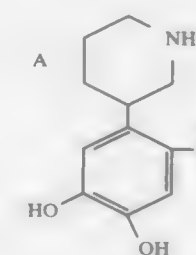
Claims priority, application Japan, Mar. 27, 1987, 62-75437; May 25, 1987, 62-129368; Aug. 10, 1987, 62-200562; Aug. 10, 1987, 62-200563; Sep. 9, 1987, 62-226184; Sep. 10, 1987, 62-227398; Sep. 29, 1987, 62-247590; Oct. 7, 1987, 62-254012

Int. Cl.⁴ A61K 31/47; C07D 217/16

U.S. Cl. 514-307

8 Claims

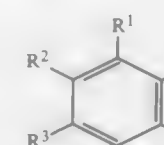
1. A compound of the Formula (I):



(I)

wherein

represents the formula



wherein

R¹ is hydrogen, lower alkyl, hydroxyl, halogen, amino or lower acylamino;

R² is hydrogen, lower alkyl, hydroxyl, amino or lower alkyl-sulfonylamino;

R³ is hydrogen, lower alkyl or hydroxyl;

R is hydrogen or halogen, with the proviso that when R¹ is other than lower alkyl, there is no case that all of R², R³ and R are hydrogens; or

a salt thereof.

5. A pharmaceutical composition useful for dilating nephrovascular tracts, said composition comprised of from about 50 to about 1,000 milligrams of the compound of claim 1 and a pharmaceutically acceptable carrier.

4,876,262

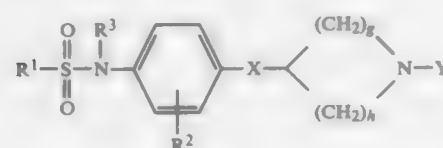
PIPERIDINE DERIVATIVE AND PHARMACEUTICAL COMPOSITION CONTAINING THE SAME

Hiroshi Onuma, Niihari; Motozuke Yamanaka, Abiko; Kazutoshi Miyake, Ushiku; Tomonori Hoshiko, Tsuchiura; Norio Minami, Niihari; Tadao Shoji, Inashiki; Yoshiharu Daiku, Niihari; Kohji Sawada, Toride, and Kenichi Nomoto, Tsuchiura, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan
Filed Feb. 18, 1987, Ser. No. 16,035

Claims priority, application Japan, Feb. 26, 1986, 61-39270
Int. Cl.⁴ A61K 31/40, 31/44, 31/445, 31/495

U.S. Cl. 514-318 29 Claims

1. A compound having the formula



in which R¹ is lower alkyl or tolyl; R² is hydrogen, hydroxyl, lower alkoxy or lower alkyl; R³ is hydrogen, lower alkyl, lower alkenyl, cycloalkyl or cycloalkylalkyl, X is —CO—, —CH₂— or —CHOH—; g is an integer of 1, 2 or 3, h is an integer of 1, 2 or 3, with the provision that the sum of g plus h is the integer 3 or 4; Y is —A—B, wherein A is (1) —(CH₂)_n— wherein n is an integer of 1 to 5, (2) straight chain alkylene having 1 to 5 carbon atoms in the chain and substituted with lower alkyl, phenyl or hydroxyl, (3) straight-chain alkenylene having 2 to 5 carbon atoms, (4) —(CH₂)_k—S— wherein k is an integer of 2 to 5, or (5) —(CH₂)_pCO— wherein p is an integer of 1 to 4, and B is



wherein R⁶ is hydrogen lower alkyl, lower alkoxy, cyano, imidazolyl, hydroxyl or halogen, or a pharmacologically acceptable salt thereof.

26. A method for treating or preventing the arrhythmia which comprises administering to a patient who requires such treatment a therapeutically acceptable amount of the compound defined in claim 1 or a pharmacologically acceptable salt thereof.

4,876,263

PESTICIDAL NITRO-SUBSTITUTED HETEROCYCLIC COMPOUNDS

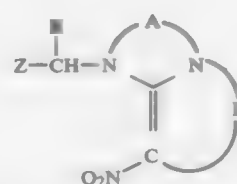
Kozo Shiohara, Kanagawa; Shinichi Tsuboi, Tokyo; Shoko Sasaki, Tokyo; Koichi Moriya, Tokyo; Yumi Hattori, Tokyo, and Kazuhiko Shibuya, Tokyo, all of Japan, assignors to Nihon Tokushu Noyaku Seizo K.K., Tokyo, Japan
Filed Jan. 17, 1988, Ser. No. 208,421

Claims priority, application Japan, Jan. 26, 1987, 62-157528
Int. Cl.⁴ C07D 487/04; A01N 43/50

U.S. Cl. 514-338 6 Claims

1. A nitro-substituted heterocyclic compound of the formula

(I)



wherein R is hydrogen or alkyl,

Z is C₆-C₁₀ aryl, or a 5 to 6-membered heterocyclic group containing 1 to 2 hetero atoms selected from the group consisting of O, S and N, at least one of which is a nitrogen atom, and said aryl and heterocyclic group is unsubstituted or substituted respectively by a one member selected from the group consisting of halogen, C₁-C₄ alkyl, C₁-C₄ alkoxy, C₁-C₄ haloalkyl, C₁-C₄ alkylthio, C₁-C₄ haloalkoxy, C₁-C₄ haloalkylthio, nitro and cyano,

A is unsubstituted ethylene or ethylene substituted by methyl, or, and

B stands for 2 carbon atoms of a heterocyclic ring which is formed, together with the adjacent C-atom and N-atom and is unsubstituted or substituted by at least one substituent selected from the group consisting of halogen, C₁-C₆ alkyl, C₁-C₄ alkoxy, alkoxycarbonyl having 1 to 4 carbon atoms in the alkoxy part, unsubstituted or substituted C₆-C₁₀ aryl, keto, imino, phenoxy, C₁-C₄ alkoxythio, alkoxycarbonylimino having 1 to 4 carbon atoms in the alkoxy part, phenoxycarbonylimino, benzoylimino, benzyl, cyano, thioketo, hydroxy and C₁-C₂ alkylidene.

5. A method for combating harmful pests comprising applying to said pests and/or their habitat a pesticidally effective amount of at least one nitro-substituted heterocyclic compound according to claim 1.

4,876,264

PYRIDINE DERIVATIVES AND THEIR USE AS FUNGICIDES

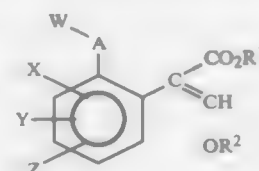
Vivienne M. Anthony, Maidenhead; John M. Clough, Marlow; Paul DeFraine, Wokingham, and Christopher R. A. Godfrey, Bracknell, all of England, assignors to Imperial Chemical Industries PLC, London, England
Filed Apr. 17, 1987, Ser. No. 39,450

Claims priority, application United Kingdom, Apr. 17, 1986, 8609457; Jan. 22, 1987, 8701395

Int. Cl.⁴ A01N 43/40; C07D 213/70, 213/71

U.S. Cl. 514-345 5 Claims

1. A compound having the formula (I):



and stereoisomers thereof, wherein W is an unsubstituted pyridyl group linked to A by one of its ring carbon atoms; A is S(O)_n wherein n is 0, 1 or 2; X, Y and Z, which are the same or different, are hydrogen or halogen atoms, or hydroxy, C₁-6 alkyl (optionally substituted with one or more of hydroxy, halogen, C₁-4 alkoxy), C₂-6 alkenyl (optionally substituted with phenyl), C₂-6 alkynyl, C₁-4 alkoxy, phenyl, phenoxy, phenyl(C₁-4)alkyl, phenyl(C₁-4)alkoxy, C₁-6 alkanoyloxy, benzoyloxy, amino, C₁-4 alkylamino, di(C₁-4)alkylamino, C₁-6 alkanoylamino, nitro, cyano, —CO₂R¹, —CONR⁴R⁵, —COR⁶ or —S(O)_mR⁷ (wherein m is 0, 1 or 2) groups, the alkyl moieties of any of the foregoing groups being optionally substituted with one or more of hydroxy, halogen or C₁-4 alkoxy, the phenyl moieties of any of the foregoing groups being optionally substituted with one or more of halogen,

hydroxy, C₁-4 alkyl, C₁-4 alkoxy, halo(C₁-4)alkyl, C₁-4 alkylthio, C₁-4 alkoxy(C₁-4)alkyl, C₃-6 cycloalkyl, C₃-6 cycloalkyl(C₁-4)alkyl, phenyl, phenoxy, phenyl(C₁-4)alkyl, phenyl(C₁-4)alkoxy, phenoxy(C₁-4)alkyl, C₁-6 alkanoyloxy, benzoyloxy, cyano, thiocyanato, nitro, —NR¹R², —NHCOR¹, —NHCONR¹R², —CONR¹R², —COOR¹, —OSO₂R¹, —SO₂R¹, —COR¹, —CR¹=NR², or —N=CR¹R² in which R¹ and R² are independently hydrogen, C₁-4 alkyl, C₁-4 alkoxy, C₁-4 alkylthio, C₃-6 cycloalkyl, C₃-6 cycloalkyl(C₁-4)alkyl, phenyl or benzyl, the phenyl or benzyl groups being optionally substituted with halogen, C₁-4 alkyl or C₁-4 alkoxy; R¹ and R² which are the same or different are C₁-4 alkyl optionally substituted by halogen; and R³, R⁴, R⁵ and R⁶, which are the same or different, are hydrogen atoms, C₁-6 alkyl, C₃-6 cycloalkyl, C₃-6 cycloalkyl(C₁-6)alkyl, C₂-6 alkenyl, C₂-6 alkynyl, phenyl or phenyl(C₁-6)alkyl in which the phenyl and alkyl moieties are optionally substituted as defined above.

5. A method of combating fungi which comprises applying to plants or seeds, or to their locus, a compound according to claim 1.

4,876,265

PROCESS AND COMPOSITIONS FOR CONTROLLING MITES PARASITIZING ON HONEY BEES

Wolfgang Schmid, Biel-Benken, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 80,251, Jul. 27, 1987, abandoned, which is a continuation of Ser. No. 686,165, Dec. 24, 1984, abandoned, which is a continuation of Ser. No. 597,888, Apr. 9, 1984, abandoned. This application Nov. 23, 1988, Ser. No. 275,254

Claims priority, application Switzerland, Apr. 14, 1983, 2002/83

Int. Cl.⁴ A01N 43/78 17 Claims

U.S. Cl. 514-370 17 Claims

1. A process for controlling mites parasitizing on honeybees, which comprises administering a miticidally effective amount of 2-(2,4-dimethylphenylimino)-3-methylthiazoline or an acid addition salt thereof to said bees.

4,876,266

1-ARALKYL-2-MERCAPTOIMIDAZOLINES AS DBH INHIBITORS

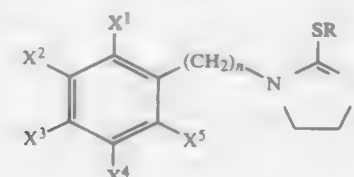
Lawrence I. Kruse, Tewin; Thomas B. Leonard, Letchworth, both of England, and Stephen T. Ross, Berwyn, Pa., assignors to SmithKline Beckman Corporation, Philadelphia, Pa.

Filed Dec. 31, 1987, Ser. No. 140,053

Int. Cl.⁴ A61K 31/415; C07D 233/42

U.S. Cl. 514-392 15 Claims

1. A compound of the formula:



in which:

n is 1 to 5;

X¹ to X⁵ are any accessible combination of hydrogen, halogen, C₁-6 alkyl, C₁-4 alkoxy, cyano, nitro, SONH₂, SO₂CH₃, SO₂CH₂F, SO₂CHF₂, SO₂CF₃, CF₃, CHO, OH, CH₂OH, CO₂H, or CO₂C_pH_{p+1} wherein p is 1 to 4; R is hydrogen, C₁-4 alkyl or (CH₂)_m—CO₂R¹; m is 0 to 5; and

R¹ is H or C₁-4 alkyl; or a pharmaceutically acceptable salt thereof, provided that when n is 1 to 5 and X¹ to X⁵ are all hydrogen, R is not hydrogen.

10. A method of inhibiting DBH activity in a subject which

comprises administering to a subject an effective amount of a compound as claimed in claim 1.

4,876,267

5-AMINOSULPHORYL SUBSTITUTED INDOLE DERIVATIVES

Darko Butina, Arlessey; Michael D. Dowle, Ware; David E. Bays, Ware, and Colin F. Webb, Royston, all of England, assignors to Glaxo Group Limited, London, England

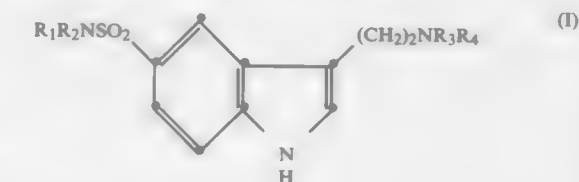
Filed Jun. 26, 1987, Ser. No. 66,498

Claims priority, application United Kingdom, Jun. 26, 1986, 8615599

Int. Cl.⁴ A61K 31/40; C07D 209/16

U.S. Cl. 514-415 2 Claims

1. A method of treating a patient suffering from or susceptible to migraine which comprises administering to the patient an effective amount of a compound having a formula (I)



wherein

R₁ represents a hydrogen atom, A C₁-6 alkyl or C₃-6 alkenyl group; R₂ represents a hydrogen atom, C₁-3 alkyl, C₃-6 alkenyl, C₃-7 cycloalkyl, phenyl, phen(C₁-4)alkyl in which the phenyl ring alone or as part of phen(C₁-4)alkyl is unsubstituted or substituted by a halogen atom, C₁-3 alkyl, C₁-3 alkoxy, hydroxyl, or by a group NR^aR^b, or CONR^aR^b, wherein R^a and R^b, which may be the same or different, each represents a hydrogen atom or C₁-3 alkyl; R₃ and R₄, which may be the same or different each represents a hydrogen atom, C₁-3 alkyl or 2-propenyl; or a physiologically acceptable salt or hydrate thereof.

4,876,268

ANTIVIRAL COMPOUNDS AND USE THEREOF

Francis J. Koszyk, Chicago; Richard A. Partis, Evanston, and Richard A. Mueller, Glenview, all of Ill., assignors to G. D. Searle & Co., Skokie, Ill.

Filed Nov. 3, 1988, Ser. No. 266,718

Int. Cl.⁴ C07D 207/12; A61K 31/40

U.S. Cl. 514-425 5 Claims

1. Acylated derivatives of 1,4-dideoxy-1,4-imino-L-arabinitol and their N-alkyl and N-hydroxyalkyl derivatives in which all the free hydroxyl groups are acylated with acyl groups having from one to six carbon atoms and in which the N-alkyl substituents in the N-alkyl and N-hydroxyalkyl derivatives contain from one to fourteen carbon atoms.

5. The method of inhibiting virus by treating a patient with a virally inhibitory effective amount of an acylated derivative of claim 1.

4,876,269

BENOZ-FUSED CYCLOALKANE TRANS-1,2-DIAMINE DERIVATIVES

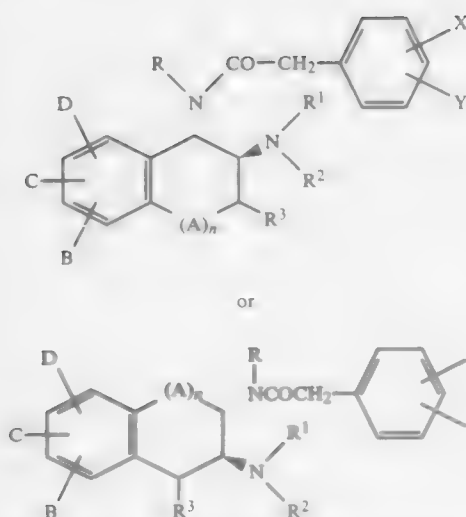
Penio Pennev, Chadds Ford, Pa.; Parthasarathi Rajagopalan, and Richard M. Scribner, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 905,543, Sep. 10, 1986, abandoned. This application Jul. 16, 1987, Ser. No. 71,028

Int. Cl.⁴ A61K 31/40; C07D 295/06

U.S. Cl. 514-429 64 Claims

1. A compound having the formula:



(I)

consisting of H, OH, OR¹³, NHR¹³, and NR₂¹³; or a stable N-oxide or a pharmaceutically acceptable salt thereof.

4,876,270

PESTICIDAL DIPHENYLETHYLENE DERIVATIVES
Hans-Rudolf Waespe, Allschwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Feb. 10, 1988, Ser. No. 154,661

Claims priority, application Switzerland, Feb. 13, 1987, 533/87; Jan. 14, 1988, 122/88

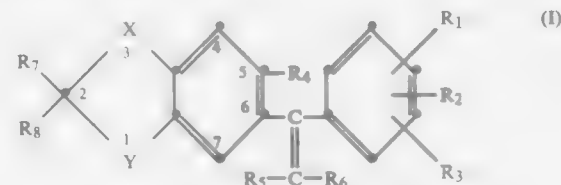
Int. Cl.⁴ A01N 43/32, 43/30; C07D 327/04

U.S. Cl. 514-439

24 Claims

1. A compound of formula I

(II)



(I)

in which

R₁ and R₄ independently of one another each represents hydrogen, hydroxy, C₁-C₃-alkyl, C₁-C₃-alkoxy, C₁-C₃-alkoxy substituted by from 1 to 7 halogen atoms, alkox-yalkoxy having a total of from 2 to 6 carbon atoms, C₃-C₅-alkenyloxy or C₃-C₅-alkynyloxy;

R₂ and R₃ independently of one another each represents hydrogen, halogen, C₁-C₃-alkyl, C₁-C₃-alkoxy or nitro; or

R₁ and R₂ and adjacent and together represent a radical —O—CH₂—O— or —O—CH₂—CH₂—O—;

R₅ and R₆ independently of one another each represents hydrogen, halogen or methyl;

R₇ and R₈ independently of one another each represents hydrogen, methyl or ethyl; and

X and Y independently of one another each represents —O— or —S—.

19. A pesticidal composition which comprises as active ingredient a compound of formula I according to claim 1 together with a pesticidally suitable carrier or other adjuvant.

4,876,271

SUBSTITUTED

THIENO[3,2-B]THIOPHENE-2-SULFONAMIDES AS TOPICALLY ACTIVE CARBONIC ANHYDRASE INHIBITORS

George D. Hartman, Lansdale, and John D. Prugh, Chalfont, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

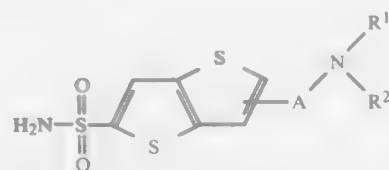
Filed Dec. 20, 1988, Ser. No. 286,822

Int. Cl.⁴ C07D 495/04; A61K 31/38

U.S. Cl. 514-443

10 Claims

1. A compound of the structural formula:



or ophthalmologically or pharmaceutically acceptable salt thereof, wherein

A is C₁-8 alkylene, either straight or branched chain and either unsubstituted or substituted with C₁-3 alkoxy or hydroxy;

R₁ and R₂ are independently selected from:

(i) hydrogen;

wherein for the enantiomers and racemic mixtures n is 0 or 1:

A is

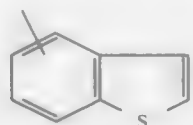


or, —CH₂CH₂;

B, C and D independently are selected from the group consisting of H, OH, OCOR⁵, OCH₂CH₂OR⁵, OR⁶, R⁶, CH₂OR⁶, CH₂COR⁷, Cl, F, Br, I, NH₂, NHR⁸, NR⁸R⁹, SH, SR⁶, CH₂SR⁶ and OC(S)N(CH₃)₂; or two of B, C and D when on adjacent carbon atoms taken together form a fused benzo ring;

X and Y independently are selected from the group consisting of H, OCH₃, Cl, F, Br, I, NO₂, CF₃, CN, SO₂R¹⁰, and SO₂CF₃ or;

X and Y taken together with the benzene ring form



R and R¹ independently are selected from the group consisting of H, and alkyl of 1 to 3 carbon atoms;

R₂ is H; alkyl of 1 to 6 carbon atoms; CH₂CF₃; alkenyl-methyl of 3 to 6 carbon atoms; hydroxyalkylmethyl of 2 to 5 carbon atoms; cycloalkyl of 3 to 6 carbon atoms; cyclopropylmethyl; cyclobutylmethyl, or phenylalkyl of 7 to 9 carbon atoms; or R₂ can be taken together with R¹ and the nitrogen to which they are attached to be 1-azetidiny; 1-pyrrolidinyl optionally substituted at the 3-position by OH, alkyl of 1 to 3 carbon atoms, alkoxy of 1 to 3 carbon atoms or alkanoyloxy of 1 to 3 carbon atoms; 1-piperazinyl optionally substituted at the 4-position by alkyl of 1 to 3 carbon atoms; 1-morpholino; 2,5-dihydro-1H-pyrrol-1-yl; 3-azabicyclohexan-3-yl; or 3-azabicycloheptan-3-yl;

R³ is H, but if n is 1 and A is CH₂, R³ may also be CH₃, CH₂OH, CHO or COR¹¹;

R⁴ is H, alkyl of 1 to 3 carbon atoms, —CH₂OH, —CHO, or COR¹²;

R⁵ is alkyl of 1 to 6 carbon atoms, phenyl, or mono-substituted phenyl where said substituent is an alkyl of 1 to 6 carbon atoms;

R⁶, R⁸, R⁹, R¹⁰, and R¹³ are independently an alkyl group of 1 to 3 carbon atoms; and

R⁷, R¹¹ and R¹² independently are selected from the group

(2) C₁₋₆ alkyl, either unsubstituted or substituted with one or more of the following:

- (a) C₁₋₃ alkoxy;
- (b) C₃₋₆ cycloalkyl;
- (c) hydroxy;
- (d) halo;
- (e) C₁₋₃ alkanol;
- (f) C₁₋₃ alkoxy-C₁₋₃ alkanol;
- (g) C₁₋₃ alkoxy-(C₂₋₄ alkoxy)_n (wherein n=1-6)
- (h) —S(O)_n—C₁₋₃ alkyl (wherein n=0-2); or
- (i) —NR₃R₄, wherein R³ and R⁴ are independently selected from:
 - (i) hydrogen;
 - (ii) C₁₋₃ alkyl, either unsubstituted or substituted with one or more of C₁₋₃ alkoxy or hydroxy;
 - (iii) C₁₋₃ alkoxy-C₁₋₃ alkyl; or
 - (iv) C₁₋₃ alkanol;

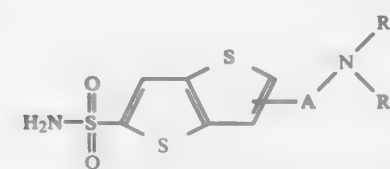
(3)



wherein R⁵ is C₁₋₄ alkyl, either straight or branched chain and either unsubstituted or substituted with one or more of C₁₋₃ alkoxy, or hydroxy; or

(4) taken together with the nitrogen atom to which they are attached form a heterocycle selected from the group, piperidino, morpholino, piperazino, N-C₁₋₂ alkyl piperazino, thiomorpholino, thiomorpholine-S-oxide and thiomorpholine-S,S-dioxide.

9. A method of treating glaucoma and elevated intraocular pressure which comprises topical ocular application to a patient in need of such treatment of an effective intraocular pressure lowering amount of a compound with structural formula:



or an ophthalmologically acceptable salt thereof, wherein A, R₁ and R₂ are as defined in claim 1.

4,876,272

MONO- AND DIEPOXIDE DERIVATIVES OF LL-F28249 COMPOUNDS

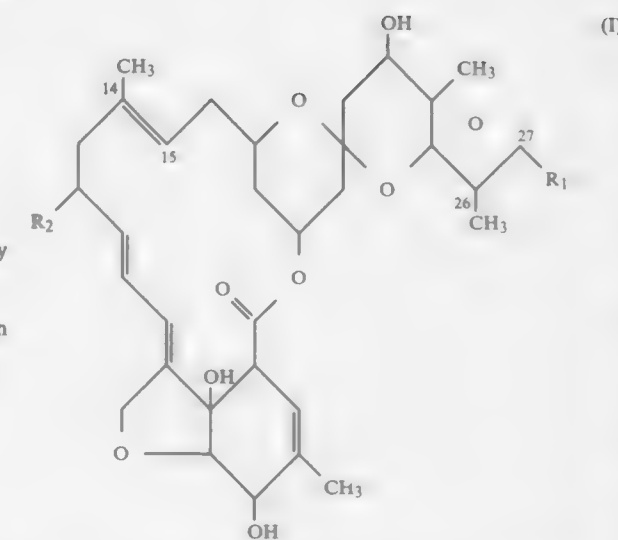
Goro Asato, Titusville, and Susan Y. Tamura, Hamilton Sq., both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Mar. 6, 1987, Ser. No. 22,849

Int. Cl.⁴ A61K 35/66

U.S. Cl. 514-450

1. A compound represented by formula (I),



(I)

wherein R₁ is methyl or isopropyl; and R₂ is hydrogen, methyl or ethyl.

4,876,273

ANTIBIOTIC A80577 AND PROCESS FOR ITS PRODUCTION

Robert L. Hamill, Greenwood, and Raymond C. Yao, Carmel, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

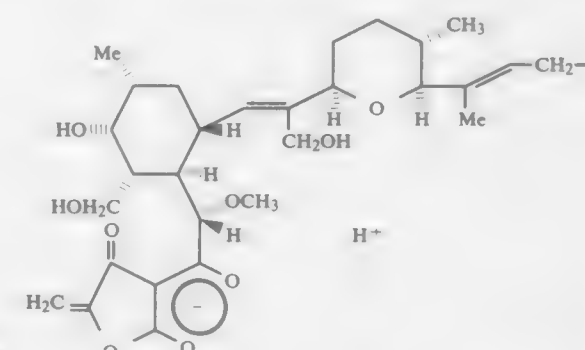
Continuation-in-part of Ser. No. 85,039, Aug. 13, 1987, abandoned. This application Jul. 18, 1988, Ser. No. 220,650

Int. Cl.⁴ A61K 31/35, 31/365; C07D 309/06

U.S. Cl. 514-451

13 Claims

1. Antibiotic A80577 which has the formula



9 Claims an acyl ester or alkyl ether derivative of A80577, or a salt of A80577 or of said ester or ether derivative.

4,876,274

NEW CLASS OF PESTICIDES COMPRISING
1,4-BIS-SUBSTITUTED-2,6,7-TRIOXABICYCLO(2.2.2)OC-
TANESChristopher J. Palmer, Ipswich, England, and John E. Casida,
Berkeley, Calif., assignors to The Regents of the University of
California, Berkeley, Calif.Continuation of Ser. No. 692,818, Jan. 23, 1985, abandoned,
which is a continuation-in-part of Ser. No. 575,843, Jan. 30,
1984, abandoned. This application Aug. 27, 1986, Ser. No.

502,083

Int. Cl.⁴ A01N 43/32, 51/00

U.S. Cl. 514-452

20 Claims

1. A pesticidal composition, comprising:
a compound having a formula



wherein R and X are each organic substituents, said compound having the characteristic of exhibiting an LD₅₀ for pesticidal activity against *Musca domestica*, *Periplaneta americana*, the mosquito larvae, the black bean aphid, the German cockroach or the milkweed bug, in micrograms of compound per gram of body weight of *Musca domestica*, *Periplaneta americana*, the mosquito larvae, the black bean aphid, the German cockroach or the milkweed bug, of no more than about 400.

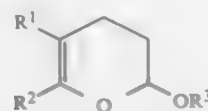
4,876,275

3,4-DIHYDRO-2H-PYRANS USEFUL AS PESTICIDES
Walter Himmele, Walldorf; Hans Theobald, Limburgerhof;
Franz Merger, Frankenthal; Ernst Hofmann, Ludwigshafen;
Christoph Kuenast, Otterstadt, and Peter Hofmeister, Neu-
stadt, all of Fed. Rep. of Germany, assignors to BASF Aktien-
gesellschaft, Ludwigshafen, Fed. Rep. of Germany
Filed Apr. 1, 1988, Ser. No. 176,700Claims priority, application Fed. Rep. of Germany, Apr. 3,
1987, 3711269Int. Cl.⁴ A01N 43/16; C07D 309/30

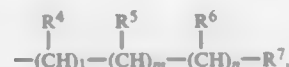
U.S. Cl. 514-452

6 Claims

1. A 3,4-Dihydro-2H-pyran of the formula



where R¹ is C₄-C₂₀-alkyl, C₄-C₂₀-alkoxyalkyl, phenyl or C₇-C₂₀-phenylalkyl, or is phenyl or C₇-C₂₀-phenylalkyl which bears from one to three substituents selected from the group consisting of halogen, C₁-C₈-alkyl, C₁-C₈-haloalkyl, C₁-C₈-alkoxy or C₁-C₈-haloalkoxy, R² is hydrogen or C₁-C₄-alkyl, R³ is the radical



where R⁴, R⁵ and R⁶ are hydrogen or C₁-C₄-alkyl, R⁷ is phenyl or benzoyl, or phenyl or benzoyl bearing from one to three substituents selected from the group consisting of halogen, C₁-C₈-alkyl, C₈-alkyl, C₁-C₈-haloalkyl, C₁-C₈-alkoxy and C₁-C₈-haloalkoxy, or a five- or six-membered heterocycle containing one or two oxygen atoms and which is either unsubstituted or substituted by one to three C₁-C₈-alkyl groups or one C₃-C₆-spirocycloalkyl, and l, m and n are 0 or 1.

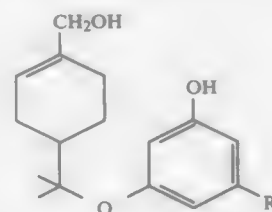
4,876,276

(3S,4S)-7-HYDROXY-Δ⁶-TETRAHYDROCANNABINOLS
Raphael Mechoulam; Jeffery J. Feigenbaum, both of Jerusalem;
Naphtali Lander, Tel-Aviv, all of Israel, and Morris Srebnik,
Lafayette, Ind., assignors to Yissum Research Development
Co. of The Hebrew University of Jerusalem, Jerusalem, Israel
Filed Oct. 26, 1987, Ser. No. 112,705Claims priority, application Israel, Oct. 24, 1986, 80411
Int. Cl.⁴ A61K 31/35; C07D 311/80

U.S. Cl. 514-454

10 Claims

1. A compound having the (3S,4S) configuration, which is essentially free of the (3R,4R) enantiomer, of the formula:



wherein R is selected from:

- a straight or branched alkyl of 6 to 12 carbon atoms;
- a group —O—R', where R' is straight or branched alkyl to 5 to 9 carbon atoms, or a straight or branched alkyl substituted at the terminal carbon atom by a phenyl group;
- a group —(CH₂)_n—O—alkyl, where n is an integer of from 1 to 7 and the alkyl group contains 1 to 5 carbon atoms, wherein at least one of the —OH group can be esterified to provide an ester group having from 1 to 5 carbon atoms.

4,876,277

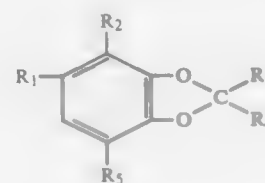
ANTIMICROBIAL/ANTIFUNGAL COMPOSITIONS
Basil A. Burke, Palo Alto, Calif., and Muralidharan G. Nair,
East Lansing, Mich., assignors to Plant Cell Research Institute,
Inc., Dublin, Calif.
Filed May 29, 1987, Ser. No. 55,737Int. Cl.⁴ C07D 317/64, 317/46

U.S. Cl. 514-465

18 Claims

1. An antimicrobial composition comprising in operative combination:

- at least one 4,5-substituted-2,3-alkylidenedioxy-1-olefinic benzene;
- said 4,5-substituted-2,3-alkylidenedioxy-1-olefinic benzene being selected from the group consisting of compounds of the formula:



wherein R₁ and R₂ may be the same or different and are selected from OH and C₁-C₅ alkoxy (—OR) groups, R₃ and R₄ are selected from H and C₁-C₅ alkyl, alkenyl and alkynyl groups, and R₅ is selected from C₃-C₇ alkyl, alkenyl and alkynyl groups, and R₅ is not allyl when R₁ is methoxy, R₂ is OH or methoxy, and R₃ and R₄ are each H;

- a plant-compatible carrier material;
- said 4,5-substituted-2,3-alkylidenedioxy-1-olefinic benzene being present in association with said carrier material to form a composition; and
- said 4,5-substituted-2,3-alkylidenedioxy-1-olefinic benzene being present in said composition in an amount sufficient to impart anti-microbial properties thereto, and said

carrier material being present as the major component of said composition.

4,876,278

ZINC GLYCEROLATE COMPLEX AND ADDITIONS FOR
PHARMACEUTICAL APPLICATIONSReginald M. Taylor, Hawthorn, and Alan J. Brock, North Ade-
laide, both of Australia, assignors to Glyzinc Pharmaceuticals
Limited, Perth, AustraliaContinuation of Ser. No. 56,483, Apr. 23, 1987, abandoned. This
application Dec. 1, 1988, Ser. No. 278,338Int. Cl.⁴ A61K 31/315; 514 844, 494

U.S. Cl. 514-494

4 Claims

1. A method for the treatment of gastric bleeding or ulceration comprising orally or parenterally administering to a human an effective amount of a zinc glycerolate complex (C₃H₆O₃Zn) comprising plate-like crystals.

4,876,279

ANTIHYPERCHOLESTEROLEMIC COMPOUNDS
Ta J. Lee; William F. Hoffman, both of Lansdale, and Clarence
S. Rooney, Worcester, all of Pa., assignors to Merck & Co.,
Inc., Rahway, N.J.

Division of Ser. No. 859,525, May 5, 1986, Pat. No. 4,766,145.

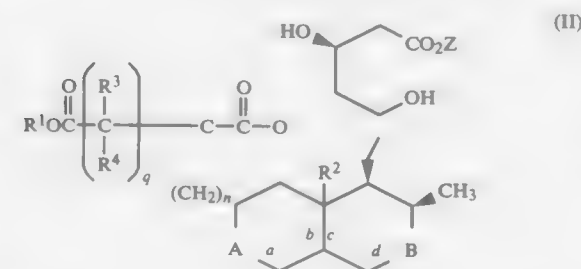
This application May 26, 1988, Ser. No. 199,829

Int. Cl.⁴ C07C 69/74; A61K 31/19, 31/215

U.S. Cl. 514-510

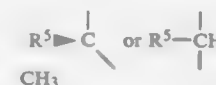
16 Claims

1. A compound represented by the following general structural formula (II):



wherein:

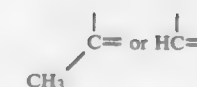
- q is 0 to 5;
n is 2 to 7;
R¹ is C₁₋₆ alkyl,
R² is hydrogen or hydroxy;
R³ and R⁴ independently are hydrogen, C₁₋₃ alkyl, C₃₋₇ cycloalkyl, phenyl or phenyl substituted with X and Y and when q is 2 to 5, each of the R³s and R⁴s are independently hydrogen, C₁₋₃ alkyl, C₃₋₇ cycloalkyl or only one of the R³s and R⁴s is phenyl or substituted phenyl;
A is



in which R⁵ is hydrogen or hydroxy;
B is



- in which R⁶ is hydrogen or hydroxy;
a, b, c and d represent single bonds, one of a, b, c or d represents a double bond or both a and c or both b and d represent double bonds, provided that when a is a double bond, A is



and when d is a double bond,



X and Y independently are hydrogen, halogen, trifluoromethyl, C₁₋₃ alkyl, nitro, cyano or a group selected from:
(a) R⁷O(CH₂)_m in which m is 0 to 3 and R⁷ is hydrogen, C₁₋₃ alkyl or hydroxy-C₂₋₃ alkyl;
(b)



in which R⁸ is hydrogen, C₁₋₃ alkyl, hydroxy-C₂₋₃ alkyl, phenyl, naphthyl, amino-C₁₋₃ alkyl, C₁₋₃ alkylamino-C₁₋₃ alkyl, di(C₁₋₃ alkyl)amino-C₁₋₃ alkyl, hydroxy-C₂₋₃ alkylamino-C₁₋₃ alkyl or di(hydroxy-C₂₋₃ alkyl)amino-C₁₋₃ alkyl;
(c)



in which R⁹ is hydrogen, C₁₋₃ alkyl, hydroxy-C₁₋₃ alkyl, C₁₋₃ alkoxy-C₁₋₃ alkyl, phenyl or naphthyl;
(d) R¹⁰R¹¹N(CH₂)_m,



in which R¹⁰ and R¹¹ independently are hydrogen, C₁₋₃ alkyl, hydroxy-C₂₋₃ alkyl or together with the nitrogen atom to which they are attached form a heterocycle group selected from piperidinyl, pyrrolidinyl, piperazinyl, morpholinyl or thiomorpholinyl;

(e) R¹²S(O)_p(CH₂)_m in which p is 0 to 2 and R¹² is hydrogen, C₁₋₃ alkyl, amino, C₁₋₃ alkylamino or di(C₁₋₃ alkyl)amino;
Z is hydrogen, C₁₋₅ alkyl or C₁₋₅ alkyl substituted with a group selected from phenyl, dimethylamino or acetylaminomino; or

a pharmaceutically acceptable salt of a compound of the formula (II) in which Z is hydrogen.

4,876,280

ARYLCYCLOHEXANE AND ARYLCYCLOHEXENE
ANALOGS OF MEVALONOLACTONE DERIVATIVES
AND THEIR USERobert E. Damon, II, Wharton, N.J., assignor to Sandoz Pharm.
Corp., E. Hanover, N.J.

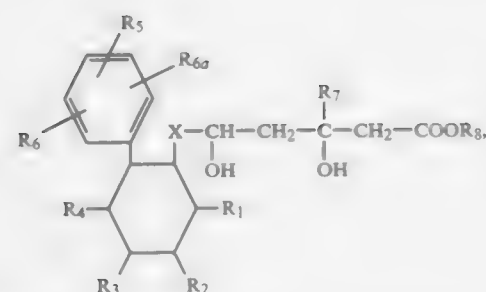
Filed Mar. 10, 1988, Ser. No. 166,356

Int. Cl.⁴ A61K 31/19, 31/215

U.S. Cl. 514-510

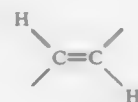
13 Claims

1. A compound of the formula



wherein

R₁ is hydrogen, C₁₋₃alkyl, n-butyl, i-butyl or t-butyl,
R₂ is hydrogen or C₁₋₃alkyl,
R₃ is hydrogen or C₁₋₃alkyl,
R₄ is hydrogen, C₁₋₃alkyl, n-butyl, i-butyl or t-butyl,
R₅ is hydrogen, C₁₋₃alkyl, n-butyl, i-butyl, t-butyl, C₁₋₃alkoxy, n-butoxy, i-butoxy, fluoro, chloro, trifluoromethyl, phenoxy or benzyloxy,
R₆ is hydrogen, C₁₋₃alkyl, C₁₋₃alkoxy, fluoro, chloro, trifluoromethyl, phenoxy or benzyloxy, with the provisos that not more than one of R₅ and R₆ is trifluoromethyl, not more than one of R₅ and R₆ is phenoxy, and not more than one of R₅ and R₆ is benzyloxy, or
R₅ and R₆ are attached to adjacent carbon atoms and taken together form a radical of the formula $-\text{CH}=\text{CH}-\text{CH}=\text{CH}-$,
R_{6a} is hydrogen, C₁₋₃alkyl, fluoro or chloro,
R₇ is hydrogen or C₁₋₃alkyl,
R₈ is hydrogen, R₉ or M, wherein R₉ is a physiologically acceptable ester group, and
M is a cation,
X is $-\text{CH}_2\text{CH}_2-$ or



and the broken line represents a double (π) bond or two hydrogen atoms (one on each carbon atom).

4,876,281

ANTIFUNGAL AGENTS

Susumu Yoshida; Shizutoshi Nakagawa; Tsuyoshi Ushiroguchi; Hiromichi Matsuura, and Akira Yazaki, all of Koda, Japan, assignors to Wakunaga Seryaku Kabushiki Kaisha, Osaka, Japan

Filed Sep. 4, 1987, Ser. No. 93,001

Claims priority, application Japan, Sep. 5, 1986, 61-208902
Int. Cl.⁴ A61K 31/60

U.S. Cl. 514-517

8 Claims

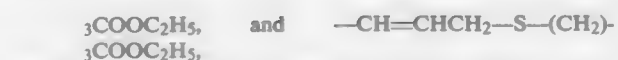
1. An antifungal agent comprising as an effective component a polysulfide compound represented by the formula



(A)

wherein

R₁ is CH_3- , $\text{CH}_2=\text{CHCH}_2-$ or $\text{C}_2\text{H}_5\text{OCO}(\text{CH}_2)_3-$,
p is an integer 1 or 2, and
R₂ is $-\text{S}-\text{CH}_2\text{CH}=\text{CH}_2$ or $-\text{CH}_2\text{CH}(\text{H})-\text{CH}(\text{H})-\text{S}-\text{S}(\text{O})_r-\text{R}_3$
in which
 $-\text{CH}_2\text{CH}(\text{H})-\text{CH}(\text{H})-$ is $-\text{CH}_2\text{CH}_2\text{CH}_2-$ or $-\text{CH}_2\text{CH}=\text{CH}-$,
q is an integer 0 or 1, r is integer from 0 to 2, and R₃ is selected from the group consisting of alkyl having 1 to 6 carbon atoms, benzyl,
 $-\text{CH}_2\text{CH}=\text{CH}_2$, $-\text{CH}_2\text{CH}=\text{CHCH}_3$, $-(\text{CH}_2)-$



with the proviso that p is 2 when R₁ is $\text{CH}_2=\text{CHCH}_2-$, R₂ is $-\text{CH}_2\text{CH}(\text{H})-\text{CH}(\text{H})-\text{S}-\text{S}(\text{O})_r-\text{R}_3$ in which $-\text{CH}_2\text{CH}(\text{H})-\text{CH}(\text{H})-$ is $-\text{CH}_2\text{CH}=\text{CH}-$, q is 1, r is 0 and R₃ is $-\text{CH}_2\text{CH}=\text{CH}_2$, and
a carrier therefor, the antifungal agent being for combating pathogenic fungus selected from the group consisting of Candida and Aspergillus.

4,876,282

1-PHENYLALKYLAMINES AS SELECTIVE SEROTONIN UPTAKE INHIBITORS

David W. Robertson, Greenwood, and David T. Wong, Indianapolis, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

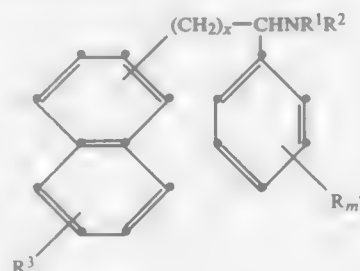
Filed Nov. 25, 1987, Ser. No. 125,110

Int. Cl.⁴ A61K 31/207

U.S. Cl. 514-554

19 Claims

1. A compound of the formula



wherein:

each of R¹ and R² independently is hydrogen or methyl;
R³ is hydrogen, halo, C₁₋₄alkyl, C₁₋₃alkoxy or trifluoromethyl;
each R⁴ independently is hydrogen, halo, C₁₋₄alkyl, C₁₋₃alkoxy or trifluoromethyl;
m is 1 or 2;
x is 2-5; or
a pharmaceutically acceptable acid addition salt thereof.

4,876,283

ANTISNORING AGENT

Dietrich Reichert, Can d'en Pol, Sta. Eulalia d.R., Ibiza, Spain
Division of Ser. No. 47,560, Apr. 27, 1987, which is a continuation of Ser. No. 609,287, May 11, 1984, abandoned. This application Mar. 20, 1989, Ser. No. 325,684

Claims priority, application Fed. Rep. of Germany, May 13, 1983, 3317530; May 13, 1983, 3317538

Int. Cl.⁴ A61K 31/195, 31/135

U.S. Cl. 514-562

4 Claims

1. A method for substantially reducing or eliminating snoring in humans, comprising the step of orally administering to humans afflicted with snoring, a composition containing a therapeutically effective amount of bromohexim in a dose of from 30 to 100 mg in a suitable carrier.

4,876,284

1-ALKYL-2-AMINOTETRALIN DERIVATIVES

Folke L. E. Arvidsson, Uppsala; Per A. E. Carlsson, Gothenburg; Ulf A. Hackzell, Uppsala; John S. M. Hjorth, Gothenburg; Anette M. Johansson, Uppsala, and Per L. Lindberg, Askim, all of Sweden, assignors to Per Arvid Emil Carlsson, Gothenburg, Sweden

Continuation of Ser. No. 16,447, Feb. 23, 1987, which is a continuation of Ser. No. 610,241, May 14, 1984, which is a continuation of Ser. No. 374,769, May 4, 1982, abandoned. This application Jan. 11, 1988, Ser. No. 143,260

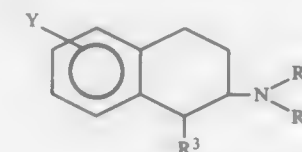
Claims priority, application Sweden, May 8, 1981, 8102908

Int. Cl.⁴ C07C 87/64, 87/28

U.S. Cl. 514-657

25 Claims

1. A compound of the formula



wherein R³ the NR¹R² group are in a cis-position to each other and wherein Y is in position 5 and is OH, or R⁶O, whereby and R⁶ is an allyl or benzyl group; R¹ is hydrogen or an alkyl group having 1-3 carbon atoms; R² is an alkyl group having 1-6 carbon atoms, a phenylalkyl- or m-hydroxyphenylalkyl group with 2-4 carbon atoms in the alkyl part, or an alkenyl group with 3-6 carbon atoms other than 1-alkenyl, and R³ is an alkyl group having 1-3 carbon atoms, as the base or a pharmaceutically acceptable acid addition salt thereof.

4,876,285

VINYL FLUORIDES AND PESTICIDAL USES

Clinton J. Peake, Trenton, N.J., assignor to FMC Corporation, Philadelphia, Pa.

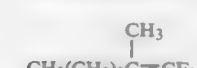
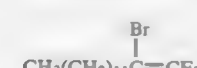
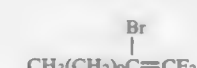
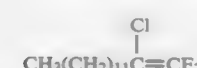
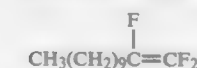
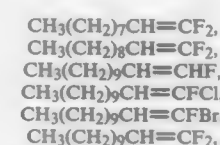
Filed Mar. 2, 1987, Ser. No. 18,768

Int. Cl.⁴ A01N 29/02

U.S. Cl. 514-746

7 Claims

1. A method of controlling nematodes, which comprises applying to the locus where control is desired a nematocidal effective amount of a vinyl fluoride compound selected from the group consisting of



4,876,286

PROCESS FOR THE PRODUCTION OF METHANOL AND A COMPOSITION SUITABLE FOR USE AS A CATALYST IN SAID PROCESS

Swan T. Sie; Eit Drent, and Willem W. Jager, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex. Division of Ser. No. 175,026, Mar. 30, 1988, Pat. No. 4,812,433.

This application Nov. 14, 1988, Ser. No. 270,599

Claims priority, application United Kingdom, Apr. 3, 1987, 87/00000

Int. Cl.⁴ C07C 27/06, 31/06

U.S. Cl. 518-700

21 Claims

1. A process for the production of methanol which comprises the following consecutive steps:

Step 1: Preparing a catalytic system by combining the following components:

Component (a): a nickel salt,
Component (b): a hydride selected from the group consisting of a hydride of an alkali metal, a hydride of an alkaline earth metal, and a mixture thereof, and
Component (c): an ester of formic acid which originates from an external source, and allowing the combined components (a), (b) and (c) to react; and

Step 2: Contacting a gaseous mixture comprising carbon monoxide and hydrogen with the catalytic system prepared in step 1.

4,876,287
SELECTIVE ION-COMPLEXING MEDIA FOR THE REMOVAL OF METAL-ION CONTAMINANTS FROM PLATING BATHS

Walter C. Babcock, and Dwayne T. Priesen, both of Bend, Oreg., assignors to Bend Research, Inc., Bend, Oreg.
 Division of Ser. No. 642,419, Aug. 20, 1984, Pat. No. 4,702,838.
 This application Nov. 10, 1986, Ser. No. 929,005

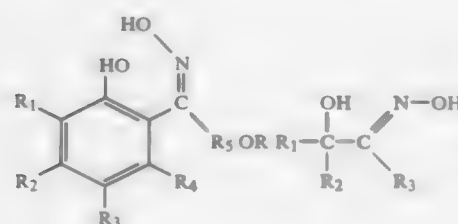
The portion of the term of this patent subsequent to Nov. 11, 2003, has been disclaimed.

Int. Cl.⁴ C08D 5/20

U.S. Cl. 521—28

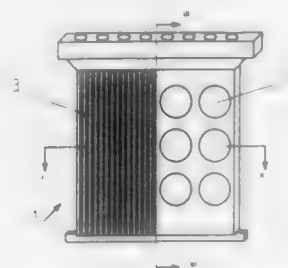
18 Claims

1. An ion-complexing gel selective to copper ions in a copper ion- and nickel ion-containing solution comprising a hydrophobic nonporous polymer plasticized and swollen with a hydroxyoxime complexing agent of the formula



wherein R₁ is selected from hydrogen, alkyl, aryl and CH=N—OH; and R₂, R₃, R₄ and R₅ are selected from hydrogen, alkyl and aryl.

said second component comprising micropores having a pore size of up to 0.1 μm, said micropores and said macropores



providing immobilization sites for the absorption of microorganisms.

4,876,289
HYDROPHILIZED POROUS MEMBRANE AND PRODUCTION PROCESS THEREOF

Hajime Itoh, Hiroshima, and Kazutami Mitani, Ohtake, both of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan
 Filed Jul. 1, 1988, Ser. No. 214,473

Int. Cl.⁴ C08J 9/04

U.S. Cl. 521—54

4 Claims

1. A hydrophilized porous membrane, wherein a crosslinked hydrophilic polymer composed principally of diacetone acrylamide is physically held on at least a part of the pore walls of a starting porous membrane of a polyolefin which has been rendered porous by a stretching technique.

4,876,290
MICROENCAPSULATION BY INTERFACIAL POLYADDITION

Gilbert Vivant, Lyon, France, assignor to Rhone-Poulenc Chimie, Courbevoie, France

Filed Feb. 11, 1988, Ser. No. 154,357

Claims priority, application France, Feb. 11, 1987, 87 01899

Int. Cl.⁴ B01J 13/02

U.S. Cl. 521—76

14 Claims

1. A process for the production of microcapsules, comprising emulsifying a hydrophobic organic liquid which includes an aliphatic diisocyanate and an isocyanurate ring trimer of an aliphatic diisocyanate, in an essentially aqueous liquid containing a protective colloid, a surfactant, or both, wherein the weight ratio of aliphatic diisocyanate/trimer ranges from 0.05/1 to 0.70/1 and the surface tension between the aqueous phase and the hydrophobic organic phase ranges from 0 to 20 mN/m, and then forming microcapsules by interfacially reacting a polyamine with the emulsion which results, thereby constituting polyurea walls of said microcapsules by polyaddition.

4,876,291
MINERAL FILLER FIRE RETARDANT COMPOSITION AND METHOD

Anthony J. Dallavia, Jr., Marietta; Susan Vande Ven, Marietta, and Bobby E. Smith, Ranger, all of Ga., assignors to J.M. Huber Corporation, Rumson, N.J.

Division of Ser. No. 236,064, Aug. 24, 1988. This application May 19, 1989, Ser. No. 354,532

Int. Cl.⁴ C08K 9/00; C08J 9/04

U.S. Cl. 521—124

15 Claims

1. A particulate fire retardant compositions comprising: a particulate alumina trihydrate mineral filler; and a polymeric material formed from a polyfunctional isocyanate, said polymeric material being present in an amount sufficient to coat said particulate filler without substantially agglomerating said particulate filler, said particulate

filler containing an initiator in an amount sufficient to effect reaction polymerization of said polyfunctional isocyanate.

4,876,292
ISOCYANATE REACTIVE MIXTURE AND THE USE THEREOF IN THE MANUFACTURE OF FLEXIBLE POLYURETHANE FOAMS

Charles M. Milliren, Coraopolis, Pa., assignor to Mobay Corporation, Pittsburgh, Pa.

Filed Oct. 6, 1988, Ser. No. 254,326

Int. Cl.⁴ C08G 18/32

U.S. Cl. 521—159

8 Claims

1. A flexible foam prepared by reacting:
 (A) from more than 0 to up to 3 parts by weight per 100 parts by weight of components (B) and (C) of an amine of the formula:



where R is a C₃ to C₁₀ straight or branched alkylene group, or a C₄ to C₁₅ alicyclic group,
 (B) from 0 to 30% by weight of a polyoxyalkylene polyamine having a molecular weight of from about 400 to about 5000 and containing from 2 to 3 primary amino groups, and
 (C) from 70 to 100% by weight of one or more polyether polyhydroxyl compounds having hydroxyl functionalities of from 2 to 3 and molecular weights of from about 1000 to about 10,000, the percents by weight of components (B) and (C) totalling 100%; and
 (D) a polymethylene poly phenyl isocyanate) containing from about 40 to about 85% by weight of methylenebis(phenyl isocyanate) and/or a prepolymer of such isocyanate, said prepolymer having an isocyanate content of from about 15 to about 30% by weight, in the presence of (E) a blowing agent, at an isocyanate index of from 60 to 140.

4,876,293
TEXTILE ADHESIVES COMPRISING A LATEX BINDER CONSISTING ESSENTIALLY OF STYRENE, BUTADIENE, AND MONOESTER OF MALEIC OR FUMARIC ACID

Cronin Rebecca L. Durney, Newark, Del.; Rutherford W. Scott, Concord, and James F. Campbell, Cornelius, both of N.C., assignors to Reichhold Chemicals, Inc., White Plains, N.Y.

Filed Jul. 18, 1988, Ser. No. 220,588

Int. Cl.⁴ C08K 3/26; C08F 220/10, 222/16; C08L 33/04

U.S. Cl. 523—122

17 Claims

1. A latex textile binder composition consisting essentially of:

- (a) about 2 to 90 weight % styrene;
- (b) about 15 to 98 weight % butadiene;
- (c) about 0.1 to 10 weight % of a monoester of maleic or fumaric acid having the following structure:



wherein R is a C₁ to C₁₂ alkyl group, and wherein said composition has a viscosity of about 8,000 to 15,000 centipoise.

4,876,294
FOUNDRY BINDER SYSTEMS BASED UPON ACRYLATED EPOXY RESINS AND EPOXY RESINS
 H. Randall Shriver, Gahanna; William R. Dunnivant, Worthington, both of Ohio, and Bruce A. Gruber, Emmaus, Pa., assignors to Ashland Oil, Inc., Ashland, Ky.

Filed Sep. 13, 1988, Ser. No. 243,672

Int. Cl.⁴ C08K 3/36; B22C 9/02

U.S. Cl. 523—139

14 Claims

1. A foundry binder system which will cure in the presence of sulfur dioxide comprising as separate components:
 (a) a blend of an acrylated epoxy resin and a monoester solvent; and
 (b) an oxidizing agent; and a blend of an epoxy resin and an aromatic hydrocarbon solvent which is part of component (a), (b), or both.

4,876,295
FLEXIBLE THERMOPLASTIC EPOXY RESIN AND COATINGS PREPARED THEREFROM

Michael B. Cavitt, Lake Jackson, and David J. Duncan, Freeport, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 24,748, Mar. 11, 1987, Pat. No. 4,755,542.

This application Apr. 18, 1988, Ser. No. 182,803

Int. Cl.⁴ C08L 63/10; C08F 283/10

U.S. Cl. 523—172

24 Claims

1. A thermally stable, flexible thermoplastic epoxy resin resulting from

- (A) reacting, in the presence of an effective quantity of a catalyst for effecting the reaction between a vicinal epoxide and an aromatic hydroxyl group, a mixture comprising
 - (1) at least one aromatic based epoxy resin having an average of more than 1 but not more than about 2.1 vicinal epoxy groups per molecule;
 - (2) at least one aliphatic based epoxy resin having an average of more than 1 but not more than about 2.1 vicinal epoxy groups per molecule;
 - (3) at least one material having an average of more than 1 but not more than about 2 phenolic hydroxyl groups per molecule;

wherein components (1) and (2) are employed in quantities such that from about 90 to about 99.6 percent of the vicinal epoxy groups are contributed by the aromatic based epoxy resin and from about 10 to about 0.4 percent of the vicinal epoxy groups are contributed by the aliphatic based epoxy resin; and wherein component (3) is employed in quantities such that the resultant product has an epoxide equivalent weight of from about 1600 to about 2500, calculated on the basis that the aromatic groups contained therein are free of substituent groups even if they do in fact contain substituent groups;

- (B) reacting, in the presence of an effective quantity of a catalyst for reacting a vicinal epoxide group with a carboxylic acid group, the product resulting from (A) with
 - (4) at least one aromatic or aliphatic monocarboxylic acid in a quantity which provides a ratio of moles of component (4) per epoxide group contained in component (1) of from about 0.033:1 to about 0.2:1;

- (C) reacting, in the presence of an effective quantity of a catalyst for effecting the reaction between a vicinal epoxide group and a group selected from —OH, —SH, —COOH or —CO—O—CO— groups, the product resulting from (B) with a mixture comprising

- (5) an aromatic based epoxy resin having an average of more than 1 but not more than about 2.1 vicinal epoxy groups per molecule and an epoxide equivalent weight of not greater than about 225, suitably not greater than about 200, more suitably not greater than about 195, calculated on the basis of the aromatic groups being free of substituent groups whether or not they do in fact contain substituent groups; and
- (6) a reactive material having only one group per mole-

cule which is reactive with a vicinal epoxy group selected from —OH, —SH, —COOH or —CO—O—CO— groups;

wherein component (5) is employed in an amount which provides a ratio of vicinal epoxy groups from component (5) to the combined amount epoxy groups contained in components (1) and (2) of from about 0.42:1 to about 0.48:1; and component (6) is employed in an amount which provides from about 0.87 to about 1 group reactive with a vicinal epoxy group per combined vicinal epoxy group contained in the product from (B) and component (5); and

(D) reacting, in the presence of an effective quantity of a catalyst for effecting the reaction between a vicinal epoxy group and a carboxyl group, the product resulting from (C) with

(7) a carboxyl terminated elastomer in an amount which provides a ratio of carboxyl groups per vicinal epoxy group contained in components (1) and (2) of from about 0.0028:1 to about 0.03:1;

with the proviso that the combined quantity of groups reactive with an epoxide group from components (3), (4), (6) and (7) cannot exceed the combined quantity of epoxide groups contained in components (1), (2) and (5) and.

4,876,296

METHOD AND COMPOSITION FOR CONTROLLED THICKENING OF THERMOSETTING RESINS USING MICROENCAPSULATED THICKENERS

J. Stanley Miller, North Haven, Conn., and Thomas J. Bowles, Dayton, Ohio, assignors to Olin Corporation, Cheshire, Conn.
Filed Apr. 27, 1987, Ser. No. 43,055

Int. Cl.⁴ C08K 9/00; B01J 13/02; B05D 7/00; B32B 5/16
U.S. Cl. 523—200 3 Claims

1. A composition comprising at least one unsaturated polyester, at least one thermoplastic low-profile additive, at least one binder selected from the group consisting of reinforcing agents, fillers, and combinations thereof, at least one microencapsulated thickener, and a catalyst selected from the group consisting of peroxyesters, peroxyketones, peroxyketals, and mixtures thereof, and wherein said microencapsulated thickener comprises microcapsules having a capsule shell of at least one thermoplastic polymer and a capsule core containing a thickener selected from the group consisting of magnesium oxide, magnesium hydroxide, calcium oxide, calcium hydroxide, and combinations thereof, and wherein said capsule shells comprise a thermoplastic polymer selected from the group consisting of polyethylene, polystyrene, cellulose acetate butyrate, and combinations thereof, and wherein said microcapsules have a particle size of between about 5 and about 30 microns, said low-profile additive being a polyurethane oligomer having a molecular weight of between about 10,000 and about 30,000.

4,876,297

METHOD OF PRODUCING MIXTURES OF RUBBER OR RUBBER-LIKE MATERIAL, AND CARBON BLACK

Julius Peter, Tiergartenstr. 107, D-3000 Hannover 71, Fed. Rep. of Germany

Filed Jul. 15, 1988, Ser. No. 219,459

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1987, 3723533

Int. Cl.⁴ C08L 21/22; C08K 3/04; C08J 3/20

U.S. Cl. 523—351 13 Claims

1. A method of producing a mixture that contains elastomeric material, and carbon black, said method including the steps of:

adding to said elastomeric material a portion only of the intended total quantity of carbon black;

thereupon preheating the above in a high-frequency alternating field; and subsequently

adding-in the remainder of the intended total quantity of carbon black.

4,876,298

EPOXY RESIN COMPOSITION

Kunio Itoh, and Toshio Shiobara, both of Annaka, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Jun. 2, 1988, Ser. No. 201,439

Claims priority, application Japan, Jun. 3, 1987, 62-139447

Int. Cl.⁴ C08K 3/36; C08L 83/10, 63/04, 63/00

U.S. Cl. 523—433 8 Claims

1. An epoxy resin composition comprising an epoxy resin, a curing agent for said epoxy resin, and a modified polymer obtained by reaction between an aromatic polymer and a member selected from the group consisting of monomers, oligomers and polymers each having at least one fluorine atom in one molecule.

4,876,299

OXALANILIDES USEFUL AS U.V. ABSORBERS

Lajos Ávár, Biel-Benken, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

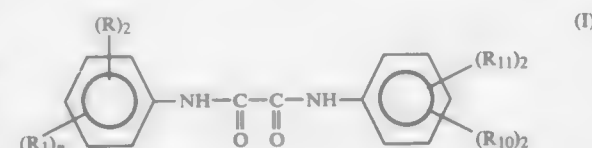
Filed Apr. 1, 1987, Ser. No. 32,672

Claims priority, application United Kingdom, Apr. 4, 1986, 8608315

Int. Cl.⁴ C07D 211/56; C07C 103/147; C08K 5/34, 5/20

U.S. Cl. 524—99 13 Claims

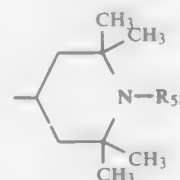
1. A compound of formula I



in which each R independently, is hydrogen, C₁-alkyl, C₁-alkoxy or halogen or both groups R are attached to carbon atoms in a position ortho to one another and together with the carbon atoms to which they are attached form a cyclopentylene or cyclohexylene group;

n is 1 or 2;

R₁ is —OCH₂—CO—X—R₄ where X is —O— or —N(R₃)—; R₄ is



R₃ is hydrogen or C₁-alkyl; and R₅ is hydrogen, oxygen, C₁-alkyl or —CO—R₆; R₆ is C₁-alkyl, phenyl, —CO—OC₁-alkyl or —NR₇R₈; R₇ is hydrogen, C₁-12alkyl; C₅-cycloalkyl, phenyl or C₁-12alkyl phenyl;

R₈ is hydrogen or C₁-12alkyl; each R₁₀ independently is selected from hydrogen, halogen C₁-alkyl, C₂-alkenyl, C₁-alkoxy, phenoxy, phenyl, phenylC₁-alkyl or C₁-alkyl phenyl; and

each R₁₁ independently is a significance of R₁₀ or R₁; or both groups R₁₁ are hydrogen and both groups R₁₀ are attached to carbon atoms ortho to one another and together with the carbon atoms to which they are attached form a carbocyclic or heterocyclic group.

4,876,300

POLYOLEFIN COMPOSITIONS STABILIZED WITH LONG CHAIN N,N-DIALKYLHYDROXYLAMINES

Raymond Seltzer, New City; Ramanathan Ravichandran, Yonkers, and Ambelal R. Patel, Ardsley, all of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 30, 1987, Ser. No. 139,408

The portion of the term of this patent subsequent to May 20, 2003, has been disclaimed.

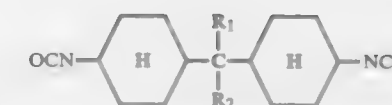
Int. Cl.⁴ C08K 5/32

U.S. Cl. 524—100 31 Claims

1. A stabilized composition which comprises
(a) a saturated polyolefin or mixture thereof, and
(b) a stabilizing amount of a long chain N,N-dialkylhydroxylamine of the formula



wherein T₁ and T₂ are independently alkyl of 16 to 18 carbon atoms.



wherein R₁, R₂ and R₃ may be the same or different and represent hydrogen or a straight-chain or branched aliphatic hydrocarbon radical having from 1 to 4 carbon atoms,

(E) about 2 to 9% by weight of an aliphatic diisocyanate or cycloaliphatic diisocyanate other than (D) and

(F) about 0.2 to 4.0% by weight of a polyamine having an average functionality 222 and wherein the aqueous composition additionally contains in physical admixture an alkoxylated dimethyl-polysiloxane having 40 to 150 alkoxy groups and a water-soluble polyethylene oxide derivative.

4,876,303

MINERAL-OIL-FREE ENCAPSULANT COMPOSITION

John T. Chapin, Norcross, Ga., and Raffaele A. Sabia, Marlboro, N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Division of Ser. No. 117,919, Nov. 6, 1987, Pat. No. 4,849,579, which is a continuation of Ser. No. 924,123, Oct. 30, 1986, abandoned, which is a continuation of Ser. No. 728,465, May 1, 1985, abandoned, which is a continuation-in-part of Ser. No. 621,083, Jun. 15, 1984, abandoned. This application Mar. 21, 1989, Ser. No. 326,347

Int. Cl.⁴ C08K 5/09

U.S. Cl. 524—296 9 Claims

1. A mineral-oil-free composition consisting essentially of
(i) 20–60% by weight of a polyurethane formed from at least one isocyanate and at least one polyol, with the balance consisting of ester plasticizer; or

(ii) 20–60% by weight of a polyurethane formed from at least one isocyanate and at least one polyol, with the balance consisting of ester plasticizer and an additive selected from the group consisting of catalysts, fungicides, antioxidants, and mixtures thereof.

4,876,304

POLYVINYL CHLORIDE COMPOSITIONS PLASTICIZED WITH COPOLYESTERS

William J. Mertz, Cincinnati, and Robert J. Braun, Batavia, both of Ohio, assignors to National Distillers and Chemical Corp., Cincinnati, Ohio

Division of Ser. No. 41,503, Apr. 23, 1987, Pat. No. 4,824,990, which is a continuation-in-part of Ser. No. 863,634, May 15, 1986, abandoned. This application Jan. 9, 1989, Ser. No. 294,636

Int. Cl.⁴ C08K 5/11

U.S. Cl. 524—314 17 Claims

1. A polymer composition comprising a polyvinyl chloride homopolymer or polyvinyl chloride copolymer and 30 to 150 parts by weight, per 100 parts resin, of an improved copolyester plasticizer having an average molecular weight of 500 to 2000 and 100° F. kinematic viscosity of 600 to 2000 centistokes obtained by the reaction of (a) a mixture of a benzene dicarboxylic acid, anhydride or methyl ester thereof and an aliphatic saturated dicarboxylic acid having from 5 to 12 carbon atoms or methyl ester thereof, said benzene dicarboxylic acid, anhydride or methyl ester being present in an amount from 40 to 60 equivalent percent, based on the total acid equivalents, (b) a mixture of neopentyl glycol and ethylene glycol, said neopentyl glycol being present in an amount from 30 to 60 equivalent percent, based on the total alcohol equivalents, and said ethylene glycol being present in an amount from about 30 to 60 equivalent percent, based on the total alcohol equivalents, and (c) an aliphatic saturated monofunctional alcohol having from 6 to 13 carbon atoms or an aliphatic saturated monocarboxylic acid having from 6 to 13 carbon atoms or methyl ester thereof, said aliphatic saturated monofunctional alcohol or aliphatic

4,876,302

POLYURETHANE DISPERSIONS AND THE USE THEREOF AS FINISHING AGENTS

Klaus Noll, Cologne; Wilhelm Thoma, Leverkusen; Klaus Nachtkamp, Cologne; Walter Schröder, Leverkusen, and Josef Pedain, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 54,650, May 27, 1987, abandoned, which is a continuation-in-part of Ser. No. 939,648, Dec. 9, 1986, abandoned, which is a continuation-in-part of Ser. No. 727,049, Apr. 25, 1985, abandoned. This application Dec. 15, 1988, Ser. No. 284,970

Claims priority, application Fed. Rep. of Germany, May 10, 1984, 3417265

Int. Cl.⁴ C08K 5/54, 5/06; C08L 75/04, 75/12

U.S. Cl. 524—267 15 Claims

1. An aqueous coating composition based on polyurethane-ureas and having a solids content of about 10 to 70%, said polyurethane-ureas comprising the reaction product of
(A) about 35 to 55% by weight of a polyester diol having a molecular weight of about 500 to 5000,
(B) about 6 to 15% by weight of a low molecular weight diol having from 2 to 10 carbon atoms
(C) about 1.5 to 15% by weight of an anionic group-containing and/or a non-ionic hydrophilic polyoxyethylene unit-containing mono- or poly-functional compound with the proviso that any compound which satisfies the requirements of component (C) by containing an anionic group or a non-ionic hydrophilic polyoxyethylene unit is included as component (C) and not as a part of components (A), (B), (D), (E), or (F),
(D) about 25 to 45% by weight of a diisocyanate corresponding to the formula

saturated monocarboxylic acid being present in an amount from 8 to 30 equivalent percent, based on the total equivalents of alcohol or acid.

4,876,305

OXIDATION RESISTANT COMPOSITIONS FOR USE WITH RARE EARTH MAGNETS

Anthony M. Mazany, Broadview Heights, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio
Filed Dec. 14, 1987, Ser. No. 132,890
Int. Cl.⁴ C08K 3/00

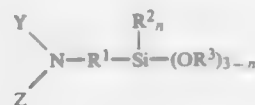
U.S. Cl. 524—401

18 Claims

1. An oxidation resistant composition for a rare earth magnet or magnet material, comprising:

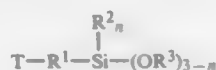
an oxidation resistant coating composition cured in the presence of a rare earth magnet or magnet material, said coating composition comprising:

- (1) an amino containing silane,
 - (2) an epoxy silane, and
 - (3) an epoxy resin,
- said amino containing silane being an aminosilane or a polyaminosilane having the formula



wherein said R¹ group has from 1 to 30 carbon atoms, wherein said R¹ group is an aliphatic, an aromatic, or combinations thereof, wherein n is 1 or 0, wherein R² and R³, independently, is an aliphatic, an aromatic, or combinations thereof having from 1 to 20 carbon atoms, wherein Y and Z independently is a hydrogen atom, an aminoalkyl group, a polyaminoalkyl group, an aryl group, an alkylalkoxysilane group, or an aminoalkylalkoxysilane group wherein said alkyl group has from 1 to 12 carbon atoms and said alkoxy group has from 1 to 6 carbon atoms,

wherein said epoxy silane compound has the formula



wherein said R¹ group has from 1 to 30 carbon atoms, wherein said R¹ group is an aliphatic, an aromatic, or combinations thereof, wherein n is 1 or 0, wherein R² and R³, independently, is an aliphatic, an aromatic, or combinations thereof having from 1 to 20 carbon atoms, and wherein T is an epoxycyclohexyl group, a glycidoxy group, or an alkyl derivative thereof, and

the amount of said amino containing silane and said epoxy silane in said coating composition each being from about 5 to about 70 parts by weight per 100 parts by weight of said coating composition, and the amount of said epoxy compound being from about 5 parts to about 90 parts by weight per 100 parts by weight of said coating composition.

4,876,306

PROCESS FOR PREPARING A THERMOPLASTIC RESIN

Satoshi Kurokawa, Iwakuni; Suehiro Tayama, Ohtake, and Fumio Sato, Abiko, all of Japan, assignors to Mitsubishi Rayon Company, Ltd., Tokyo, Japan

Filed Mar. 14, 1988, Ser. No. 167,953

Claims priority, application Japan, Mar. 16, 1987, 62-60484

Int. Cl.⁴ C08K 3/30; C08F 2/00

U.S. Cl. 524—423

6 Claims

1. A process for preparing a thermoplastic resin, which comprises polymerizing a monomer mixture containing at least 80% by weight of at least one member selected from the group

consisting of an alkyl methacrylate, an alkyl acrylate, an aromatic vinyl compound, acrylonitrile, methacrylonitrile and butadiene by using as an emulsifier a compound having a group of the formula —PO₃M₂ or —PO₂M wherein M is an alkali metal or an alkaline earth metal, to form a latex, and contacting the latex with an aqueous magnesium sulfate solution having a concentration of from 0.1 to 30% by weight.

4,876,307

POLYMER PROCESSING

Robert C. Allen, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Division of Ser. No. 107,192, Oct. 13, 1987, Pat. No. 4,761,453.

This application Mar. 18, 1988, Ser. No. 170,593

Int. Cl.⁴ C08J 0/00

U.S. Cl. 524—612

9 Claims

1. A method of improving the thermal processability of a linear alternating polymer of carbon monoxide and at least one ethylenically unsaturated hydrocarbon which comprises saturating said polymer with water at the melting point of the substantially saturated polymer but at a temperature below the melting point of the polymer.

4,876,308

POLYURETHANE ADHESIVE FOR A SURFACE TREATMENT-FREE FIBER REINFORCED PLASTIC

Earl G. Melby, Uniontown, and H. William Cocain, Cayahoga Falls, both of Ohio, assignors to GenCorp Inc., Akron, Ohio

Filed Feb. 18, 1988, Ser. No. 158,005

Int. Cl.⁴ C08L 75/04

U.S. Cl. 524—780

21 Claims

1. A two component urethane adhesive, comprising:
a urethane prepolymer component and a curative component, said urethane prepolymer component made from a hydroxyl terminated intermediate and a polyisocyanate, the amount of said polyisocyanate being an equivalent excess of at least 2.0 based upon the hydroxyl terminated intermediate so that said prepolymer component has free NCO groups, said curative component comprising a nitrogen-free polyether polyol having OH groups, a nitrogen-free polyester polyol having OH groups, a nitrogen-free low molecular weight polyol, or combinations thereof and a primary polyamine, the amount of said polyol curative being such that the equivalent ratio of said free NCO groups to said OH groups and NH groups of said curative is from about 1.2 to about 2.0, the two component urethane adhesive being capable of bonding to a surface treatment-free plastic, fiber reinforced plastic, or metal.

4,876,309

ENHANCING COLOR STABILITY TO STERILIZING RADIATION OF POLYMER COMPOSITIONS

Linda H. Nelson, Evansville, Ind.; Roger W. Avakian, Brasschaat, Belgium, and Arnold Factor, Scotia, N.Y., assignors to General Electric Company, Pittsfield, Mass.

Division of Ser. No. 769,277, Aug. 26, 1985, abandoned, which is a continuation-in-part of Ser. No. 579,103, Feb. 10, 1984,

abandoned. This application Dec. 22, 1987, Ser. No. 136,682

Int. Cl.⁴ C08K 5/15

U.S. Cl. 524—109

21 Claims

1. A composition comprising an aromatic carbonate polymer in admixture with an effective amount of a stabilizing pyran compound effective to inhibit yellowing upon exposure to sterilizing radiation wherein said pyran compound is 3,4-dihydro-2-ethoxy-2H-pyran.

8. A composition comprising an aromatic carbonate polymer in admixture with an effective amount of a stabilizing pyran compound effective to inhibit yellowing upon exposure to sterilizing radiation wherein said stabilizing pyran compound is selected from the group consisting of hydrogenated pyran, nonhydrogenated pyran, substituted pyran and unsubstituted

pyran wherein said substituted groups on the substituted pyran are selected from the group consisting of alkyl, aryl, alkoxy, and aryloxy, said substituted groups being positioned on any carbon atom in the pyran ring.

4,876,310

HYDROCARBON RESIN/POLYPHENYLENE ETHER COMBLIKE POLYMERS, METHODS OF PRODUCING THESE POLYMERS, AND THEIR MIXTURES WITH POLYPHENYLENE ETHERS

Martin Bartmann, Recklinghausen, Fed. Rep. of Germany, assignor to Hüls Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Feb. 28, 1986, Ser. No. 834,423

Claims priority, application Fed. Rep. of Germany, Mar. 14, 1985, 3509093

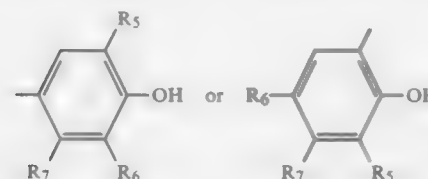
Int. Cl.⁴ C08F 16/12, 71/04

U.S. Cl. 525—149

23 Claims

1. A method for preparing a modified polyphenylene ether polymer, comprising:

- (1) combining (1a) an ortho-substituted phenol, (1b) a copper amine oxidative coupling catalyst, and (1c) a hydrocarbon resin having at least one side group of the formulae



wherein R₇ is independently a hydrogen atom and R₅, R₆ and R₇ are each independently a halogen atom, a phenyl group, or a C₁₋₆-n-alkyl group, and wherein the hydrocarbon resin is (i) an ethylene-propylene-unconjugated diene terpolymer or a polyalkylene and (ii) contains at most 20 carbon-carbon double bonds per 100 carbon-carbon bonds; and

- (2) obtaining a mixture of a polyphenylene ether and a hydrocarbon resin/polyphenylene ether comblike polymer.

4,876,311

OPAQUE SYNTHETIC RESINS

Jürgen Hennig, Darmstadt; Heinz Vetter, Rosdorf, and Manfred Munzer, Bensheim, all of Fed. Rep. of Germany, assignors to Rohm GmbH Chemische Fabrik, Darmstadt, Fed. Rep. of Germany

Continuation of Ser. No. 893,808, Aug. 6, 1986, abandoned. This application Mar. 1, 1988, Ser. No. 166,726

Claims priority, application Fed. Rep. of Germany, Aug. 6, 1985, 3528165

Int. Cl.⁴ C08L 33/06, 69/00

U.S. Cl. 525—229

3 Claims

1. An opaque synthetic resin comprising (a) a polymer matrix selected from the group consisting of polystyrene, polyvinyl chloride, polyvinyl acetate, polycarbonate, polyolefins and acrylic resins and (b) cross-linked beads wherein

said cross-linked beads are prepared by bead polymerization in aqueous media, isolated from said aqueous media and then added to said polymer matrix in an extruder, said polymer matrix being in a molten state, and extruded to produce said opaque synthetic resin, wherein said polymer matrix comprises 1-30 wt.% of said cross-linked beads relative to said polymer matrix and wherein said cross-linked beads consist essentially of 9.9-59.9 wt.% styrene, 90-40 wt.% methylmethacrylate, and 0.1-20 wt.% of at least one cross-linking monomer, and wherein the refractive index of said bead polymer is higher than the refractive index of said polymer matrix, and wherein the average size of said cross-linked beads is within the range of 5-50 microns.

4,876,312

PROCESS FOR PREPARING RUBBER-MODIFIED STYRENIC POLYMER COMPOSITIONS CONTAINING HYDROPEROXIDE DERIVATIVES OF RUBBERY POLYMERS

Bernard J. Meister, Auburn; Craig D. Dryzga, Bay City, and Li C. Tien, Midland, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 23, 1987, Ser. No. 28,856

Int. Cl.⁴ C08F 4/34, 4/36, 279/04, 291/18

U.S. Cl. 525—263

5 Claims

1. In a process wherein a rigid phase polymer is prepared by polymerization solution of one or more free radically polymerizable monomers in the presence of a hydroperoxidized rubbery intermediate, the improvement wherein the phase inversion and particle sizing is conducted in a well stirred back-mixed reactor operating under essentially homogeneous conditions at a solids content of from about 30 to about 75 percent by weight, and by use of a feed stream having an initial rubber content based on monomer content of from about 5 to about 12 percent by weight.

4,876,313

GRAFTED CORE-SHELL POLYMER COMPOSITIONS USING POLYFUNCTIONAL COMPOUNDS

Dennis P. Lorah, Lansdale, Pa., assignor to Rohm and Haas Company

Filed Aug. 29, 1986, Ser. No. 902,264

Int. Cl.⁴ C08F 265/06, 2/24

U.S. Cl. 525—281

23 Claims

1. A composition comprising a core-shell polymer having an alkali-insoluble polymer core and an alkali-soluble polymer shell, wherein said core and said shell have been substantially chemically grafted together, said shell and said core being prepared sequentially by emulsion polymerization, and said shell is polymerized from a mixture of monomers comprising about 10 to about 60% by weight acid-containing or anhydride-containing unsaturated monomer wherein the ratio of said core to said shell is about 85:15 to about 15:85, said core having a weight average molecular weight of greater than about 8,000 and said shell having a weight average molecular weight of about 5,000 to about 100,000 as determined by gel permeation chromatography.

4,876,314

HYDROGENATION PROCESS

Ronald J. Hoxmeier, Houston, and Lynn H. Slauch, Cypress, both of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Nov. 9, 1988, Ser. No. 269,034

Int. Cl.⁴ C08F 8/04

U.S. Cl. 525—338

12 Claims

1. A process for selectively hydrogenating a polymer comprising ethylenic unsaturation and cyano groups comprising the steps of:

- (a) contacting a polymer comprising ethylenic unsaturation and cyano groups with hydrogen in a first suitable solvent and in the presence of a catalyst prepared by combining one or more palladium compounds with one or more alkylaluminum compounds in a second suitable solvent, which second suitable solvent may be the same or different from said first suitable solvent;
- (b) maintaining the contact in step (a) for a sufficient period of time to permit conversion of at least a portion of the ethylenic unsaturation contained in said polymer; and
- (c) recovering an at least partially hydrogenated polymer.

4,876,315

PROCESS FOR VULCANIZING SATURATED ELASTOMERS WITH HALOGEN CURE SITES

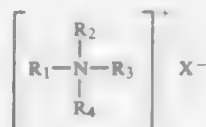
John M. Hoyt, Cincinnati, and Steven D. Blazey, Akron, both of Ohio, assignors to National Distillers and Chemical Corporation, New York, N.Y.

Division of Ser. No. 938,667, Dec. 5, 1986, abandoned. This application Jun. 6, 1988, Ser. No. 221,241
Int. Cl.⁴ C08F 8/34

U.S. Cl. 525—346

5 Claims

1. A process for vulcanizing a saturated elastomer having active halogen-containing cure sites selected from the group consisting of copolymers of ethylene and a vinyl ester of from 3 to 6 carbon atoms and having active halogen-containing cure sites incorporated therein by polymerizing a vinyl monomer containing said halogen-containing group or by chemically modifying the copolymer by reacting a portion of the ester groups with a halogen-containing reagent and poly(ethyl acrylate) or a copolymer of ethyl acrylate with n-butyl acrylate and having active halogen-containing cure sites incorporated therein by copolymerizing or terpolymerizing a vinyl monomer containing said halogen-containing group which comprises combining said elastomer with 0.05 to 2.5 sulfur and 0.05 to 7 phr quaternary ammonium salt corresponding to the formula



wherein R₁, R₂, R₃ and R₄ are hydrocarbon radicals having from 1 to 18 carbon atoms and X⁻ is Cl⁻, Br⁻, I⁻, HSO₄⁻, or H₂PO₄⁻ and heating said mixture at a temperature from about 100° C. to about 250° C. to effect vulcanization.

4,876,316

HIGH TEMPERATURE MAGNET WIRE BOND COAT POLYAMIDE/ALDEHYDE/AROMATIC ALCOHOL REACTION PRODUCT

Francois A. Lavallee, Fort Wayne, Ind., assignor to Essex Group, Inc., Fort Wayne, Ind.

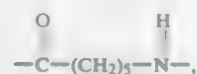
Division of Ser. No. 78,441, Jul. 27, 1987, abandoned. This application Mar. 24, 1988, Ser. No. 173,336
Int. Cl.⁴ C08G 69/50

U.S. Cl. 525—427

11 Claims

1. A magnet wire bondcoat consisting essentially of the polyamide reaction product of:

(1) a polyamide having recurring units of the formula



(2) R—CHO wherein R is an aliphatic moiety, and

(3) an aromatic alcohol selected from the group consisting of phenols, cresols or alkylated phenols.

4,876,317

AMIDE-UREA COPOLYMER AND PROCESS FOR THE PREPARATION THEREOF

Kenneth P. Blackmon, Mobile, Ala.; Donald C. Clagett, Pittsfield, Mass.; Daniel W. Fox, Pittsfield, Mass.; Louis M. Maresca, Pittsfield, Mass., and Sheldon J. Shafer, Phoenix, Ariz., assignors to General Electric Company, Pittsfield, Mass.

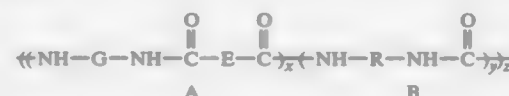
Filed Dec. 30, 1987, Ser. No. 139,482

Int. Cl.⁴ C08G 69/48, 71/02

U.S. Cl. 525—433

7 Claims

1. A block copolymer having recurring units of the general formula:



comprising segments of repeating units A and segments of repeating units B wherein units A comprise from about 1 to about 99 percent by weight of said copolymer and units B comprise from about 99 to about 1 percent by weight of said copolymer, where E is selected from (1) divalent alkylene, arylene, cycloalkylene, arylalkylene, alkylarylene groups of from 2 to 30 carbon atoms or a mixture of any of the foregoing, or (2) substituted with at least one chlorine, bromine, fluorine, nitro, nitrile, alkylene of from 1 to 6 carbon atoms, alkoxy of from 1 to 6 carbon atoms or aryl of from 6 to 20 carbon atoms; G is selected from (1) divalent alkylene, arylene, cycloalkylene, arylalkylene or alkylarylene groups of from about 2 to about 30 carbon atoms or a mixture of any of the foregoing, or (2) interrupted with alkylene, arylene, carbonyl, ether, imino or sulfur-containing groups, or (3) interrupted with alkylene, arylene, carbonyl, ether, imino or sulfur-containing groups substituted with at least one of chlorine, bromine, fluorine, nitro, nitrile, alkylene of from 1 to 6 carbon atoms, alkoxy of from 1 to 6 carbon atoms or arylene of from 6 to 20 carbon atoms; R is as defined for G and x, y and z are each integers of 1 to 100,000.

4,876,318

ORGANOALUMINUM COUPLING AGENTS AND FILLED POLYMER COMPOSITIONS THEREOF

Dennis B. Malpass, LaPorte, Tex.; Kelly B. Triplett, Stamford, Conn., and Andrzej M. Plotrowski, Thorawood, N.Y., assignors to Texas Alkyls, Inc., Deer Park, Tex.

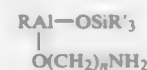
Filed Jul. 19, 1988, Ser. No. 221,390

Int. Cl.⁴ C08K 5/56; C07F 7/10, 5/06

U.S. Cl. 525—446

8 Claims

1. Compounds of the formula



where R is alkyl, R' is independently selected from alkyl and aryl, and n ranges from 1–8.

4. A filled polymer comprising a polymer substrate, filler, and a compound as claimed in claim 1 as a coupling agent.

4,876,319

SYNTHETIC RESIN COMPOSITION, SUBSTRATE MATERIAL FOR PRINTED CIRCUIT BOARDS AND METHOD OF MANUFACTURING A SYNTHETIC RESIN COMPOSITION

Johannes M. M. Simons, Sittard, Netherlands, assignor to U.S. Philips Corp., New York, N.Y.

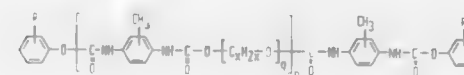
Filed Jun. 22, 1987, Ser. No. 64,359

Claims priority, application Netherlands, Jul. 14, 1986, 840,129

Int. Cl.⁴ C08F 283/04; C08L 61/00

U.S. Cl. 525—456

9 Claims



1. A method of manufacturing a synthetic resin composition which comprises an interpolymer of a phenol-formaldehyde resin and polyurethane which comprises reacting a phenol and a formaldehyde-producing compound in the presence of a polyurethane and a basic catalyst.

4,876,320

PROCESS FOR REDUCING SHEETING DURING POLYMERIZATION OF ALPHA-OLEFINS

Bernard D. Fulka, Victoria, Tex.; Steven P. Sawin; Collin D. Aikman, both of Charleston, W. Va., and John M. Jenkins, III, South Charleston, W. Va., assignors to Union Carbide Chemicals and Plastics Company Inc., Danbury, Conn.

Division of Ser. No. 730,958, May 6, 1985, Pat. No. 4,792,592, which is a continuation of Ser. No. 650,571, Sep. 14, 1984, Pat. No. 4,532,311, which is a continuation of Ser. No. 247,990, Mar. 26, 1981, abandoned. This application Sep. 20, 1988, Ser. No. 246,623

The portion of the term of this patent subsequent to Jul. 30, 2002, has been disclaimed.

Int. Cl.⁴ G08F 2/34

U.S. Cl. 526—62

10 Claims

1. In method for polymerization of one or more alpha-olefins in a gas fluidized bed reactor in the presence of a catalyst prone to cause sheeting, the improvement which comprises maintaining the static electric charge in said reactor at the site of possible sheet formation below static voltage levels which could otherwise cause sheet formation.

4,876,321

PREPARATION OF ALPHA-OLEFIN POLYMERS OF RELATIVELY NARROW MOLECULAR WEIGHT DISTRIBUTION

Frederick Y. Lo, Yanbu Al Sinayah, Saudi Arabia; Thomas E. Nowlin, Somerset, and Margaret M. Wu, Belle Mead, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 815,845, Jan. 3, 1986, Pat. No. 4,668,650. This application Feb. 20, 1987, Ser. No. 17,285

Int. Cl.⁴ C08F 4/02, 10/02

U.S. Cl. 526—129

34 Claims

1. A process for preparing a polymer of at least one C₂–C₁₀ alpha-olefin, the polymer having a density of 0.94 g/cc or less, comprising conducting the polymerization in the presence of a catalyst prepared by a process comprising the steps of:

(i) contacting a solid, porous carrier having reactive OH groups with an ether containing at least one organomagnesium composition having the empirical formula:



where R and R' are the same or different C₁–C₁₂ hydrocarbyl groups, provided that R' may also be a halogen and n is 0, 1, or 2, the number of moles of said organomagnesium composition being in excess of the number of

moles of said OH groups on said carrier, whereby said organomagnesium composition is reacted with said OH groups on said carrier;

(ii) removing said ether, whereby a supported magnesium (Mg) composition in the form of a solid powder is formed;

(iii) drying said solid powder, without washing or rinsing thereof, until it comprises not more than about 6% by weight of the ether;

(iv) contacting the product of step (iii) with at least one hydrocarbyl alcohol of the formula R''OH wherein R'' is a C₁–C₁₀ alkyl, alkenyl, aryl, alkaryl or aralkyl group;

(v) contacting the product of step (iv) with a titanium compound soluble in a non-polar solvent, the number of moles of said titanium compound being such that the molar ratio of titanium (Ti) to magnesium (Mg) is about 0.3 to about 0.9, both the Ti and Mg being calculated as elemental metals, said supported magnesium composition being substantially insoluble in said non-polar solvent, whereby a reacted form of titanium which is insoluble in said non-polar solvent becomes supported on said carrier;

(vi) removing said non-polar solvent without washing or rinsing of the product of step (v); and

(vii) activating the product of the step (vi) with a catalyst activator containing compounds of Group IB, IIA, IIB, IIIB or IVB of the Periodic Chart of the Elements.

4,876,322

IRRADIATION CROSS-LINKABLE THERMOSTABLE POLYMER SYSTEM, FOR MICROELECTRONIC APPLICATIONS

Klaus Budde, Unterhaching; Friedrich Koch, Munich, and Ferdinand Quella, Neubiberg, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

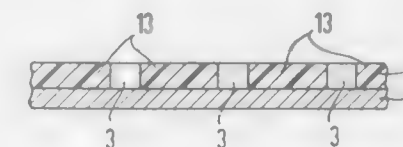
Division of Ser. No. 762,513, Aug. 5, 1985, Pat. No. 4,732,843. This application Sep. 4, 1987, Ser. No. 93,212

Claims priority, application Fed. Rep. of Germany, Aug. 10, 1984, 3429606

Int. Cl.⁴ C08F 14/18

U.S. Cl. 526—242

1 Claim



1. A method for manufacturing a thermostable polymer system cross-linkable by irradiation which is used for manufacturing microelectronic circuits with multilayer wiring comprising the steps of:

(A) reacting an irradiation sensitive acid chloride of at least one acid selected from the group consisting of cinnamic acid, acrylic acid, and methacrylic acid, with a linear fluorinated oligomer having at least two reactive and groups for the reaction with the acid chloride, and

(B) reacting a resulting product with at least one irradiation sensitive ester of said acid and a multifunctional alcohol by irradiation, whereby the mole ratio of said resulting product to said ester is at least about 10:1.

4,876,323

α -SUBSTITUTED ACRYLIC ACID ESTERS, THEIR POLYMERS AND METHOD OF SYNTHESIZING SAME
James F. Engel; Thomas J. Byerley, and Howard W. Christie, all of Jackson County, Mo., assigns to Midwest Research Institute, Kansas City, Mo.

Continuation of Ser. No. 583,678, Feb. 27, 1984, Pat. No. 4,704,466. This application Jun. 11, 1987, Ser. No. 60,527
Int. Cl.⁴ C08F 126/00

U.S. Cl. 526—310

11 Claims

1. A composition comprising: the product of copolymerization of N-vinyl-2-pyrrolidone and R- α -isocyanatoacrylate where R is selected from the group consisting of C₁ to C₅ alkyls and benzyl.

4,876,324

HIGH MOLECULAR WEIGHT ORTHO CRESOL-NOVOLAK RESINS AND PROCESS FOR THE PREPARATION THEREOF USING ALCOHOLIC OR ACIDIC ORGANIC SOLVENTS

Yoshitomo Nakano, and Masumi Kada, both of Mie, Japan, assigns to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

Division of Ser. No. 741,138, Jun. 4, 1985, abandoned. This application May 13, 1987, Ser. No. 49,335

Claims priority, application Japan, Jun. 8, 1984, 59-116510
Int. Cl.⁴ C08G 8/12

U.S. Cl. 528—142

11 Claims

1. A process for preparing a high molecular weight cresol-novolak resin having a softening point of 30° C. or higher, consisting essentially of polycondensing orthocresol or a mixture of orthocresol and paracresol with an aldehyde compound or a derivative thereof in a solvent selected from the group consisting of C₃₋₁₂ aliphatic monoalcohols, C₃₋₆ monohydric glycol ethers and benzyl alcohol, in the presence of a protonic acid catalyst.

4,876,325

POLYIMIDE RESIN FROM BIS-IMIDE, POLYPHENOL AND DICYANDIAMIDE

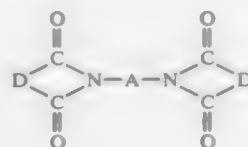
Larry D. Olson, Viroqua, and Eugene P. Pallardy, Jr., La Crosse, both of Wis., assigns to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Apr. 28, 1988, Ser. No. 187,158
Int. Cl.⁴ C08G 73/10

U.S. Cl. 528—170

14 Claims

1. A thermosetting resin composition substantially free of a polymerization catalyst consisting essentially of:
(a) a bisimide having the formula:



where:

A represents alkylene radicals having 1 to 20 carbon atoms, cycloalkylene radicals having 4 to 40 carbon atoms, heterocyclic radicals containing at least one of O, S, and N, phenylene or polycyclic aromatic radicals.

D represents divalent radicals containing a carbon-carbon double bond

(b) a polyphenol;

(c) dicyandiamide, where the weights of (a), (b), and (c) are 80 to 98%/1 to 10%/and 0.1 to 10%, respectively, based on the total weight of (a), (b), and (c).

4,876,326

SOLID STATE POLYMERIZATION OF POLYESTER PREPOLYMERS

Verne R. Rinehart, McArthur, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 30,319, Mar. 26, 1987, Pat. No. 4,755,587. This application Mar. 11, 1988, Ser. No. 161,312
The portion of the term of this patent subsequent to Jul. 5, 2005, has been disclaimed.

Int. Cl.⁴ C08G 63/02

U.S. Cl. 528—272

24 Claims

1. In a process for solid state polymerizing a polyester prepolymer into a high molecular weight polyester resin at an elevated temperature, the improvement which comprises utilizing a polyester prepolymer which is in the form of porous pills, wherein the porous pills were made by compacting a powder or the polyester prepolymer having a particle size of less than about 841 microns; wherein the elevated temperature is within the range of about 507° C. below the sticking temperature of the polyester prepolymer up to but not including the sticking temperature of the polyester prepolymer.

4,876,327

AROMATIC POLYESTER

Bindert K. Vriesema, Sittard, Netherlands, and Francesco Miniaci, Geak, Belgium, assigns to Stamicarbon B.V., Geleen, Netherlands

Filed May 11, 1988, Ser. No. 192,626

Claims priority, application Netherlands, May 13, 1987, 8701133

Int. Cl.⁴ C08G 63/60

U.S. Cl. 528—173

12 Claims

1. An aromatic polyester having liquid crystalline properties and a reduced melting temperature, characterized in that the polyester comprises (1) repeating aromatic units having at least one oxo group in the polymer chain linkage, said aromatic units containing at least one aromatic ring consisting of carbon atoms, and (2) repeating heterocyclic units, said heterocyclic units having two carbonyl groups and being linked to said aromatic units through a carboxylic ester linkage, and said heterocyclic units being derived from pyridine, pyrrole, thiophene or furan dicarboxylic acids and esters thereof.

4,876,328

POLYAMIDE COMPOSITION

Hyman R. Labowitz, Rolling Hills Estates, Calif., and Clyde H. Sheppard, Bellevue, Wash., assigns to The Boeing Company, Seattle, Wash.

Continuation-in-part of Ser. No. 51,884, May 18, 1987, which is a continuation-in-part of Ser. No. 865,228, May 20, 1986, which is a division of Ser. No. 865,228, May 20, 1986, which is a continuation-in-part of Ser. No. 781,847, Sep. 30, 1985. This application Jun. 12, 1987, Ser. No. 61,938
Int. Cl.⁴ C08G 69/26

U.S. Cl. 528—322

51 Claims

1. A composition of matter, comprising a compound selected from the group consisting of:
E—CONH—P—NHCO—_m—E;
E—NHCO—Q—CONH—_m—E;

Ar—_n;Ar—_n;Ar—_n;Ar—_n;Ar—_n orAr—_n;

wherein m is a small integer;

Ar is an aromatic moiety;

n is 3 or 4;

E is a crosslinkable end cap monomer for improving solvent resistance of the cured oligomer in an advanced composite selected from the group consisting of:

4,876,329

POLYIMIDE POLYMERS AND COPOLYMERS USING 3,5-DIAMINOBENZOTRIFLUORIDE

Wellong L. Chiang; Douglas E. Fjare, and Neal R. Nowicki, all of Naperville, Ill., assigns to Amoco Corporation, Chicago, Ill.

Filed Jun. 28, 1988, Ser. No. 212,508

Int. Cl.⁴ C08G 69/26

U.S. Cl. 528—353

8 Claims

1. A partially soluble, film-forming polyimide or copolyimide made from 3,5-diaminobenzotrifluoride.

4,876,330

COLORLESS TRANSPARENT POLYIMIDE SHAPED ARTICLE AND PROCESS FOR PRODUCING THE SAME
Kazumi Higashi, and Yuzuru Noda, both of Osaka, Japan, assigns to Nitto Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 10, 1986, Ser. No. 837,987

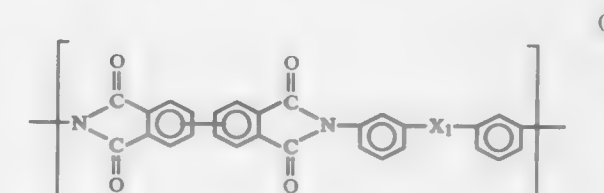
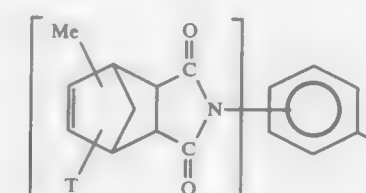
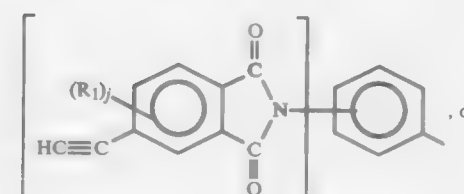
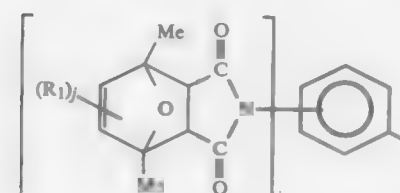
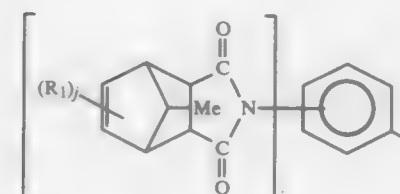
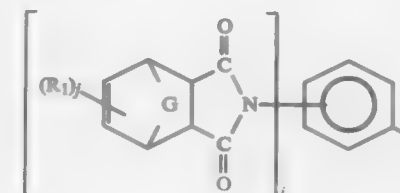
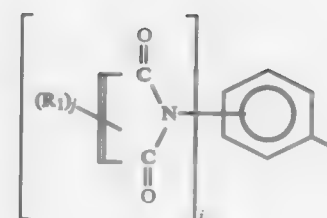
Claims priority, application Japan, Mar. 10, 1985, 60-46943; Jul. 11, 1985, 60-152990; Jan. 18, 1986, 61-8386

Int. Cl.⁴ C08G 69/26

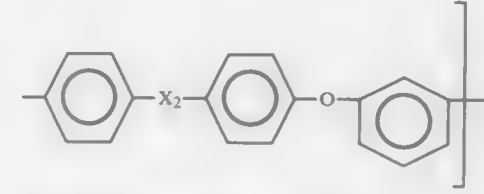
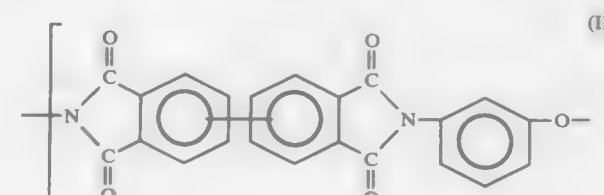
U.S. Cl. 528—353

17 Claims

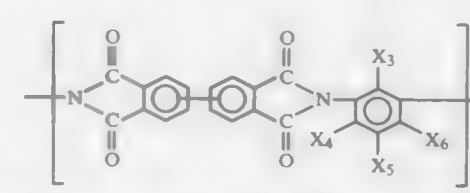
1. A colorless transparent polyimide shaped article comprising as a main component at least one recurring unit selected from the group consisting of a recurring unit of the formula (I)



wherein X₁ represents O, S, SO₂, CH₂, CF₂, C(CH₃)₂, C(CF₃)₂ or CO;
a recurring unit of the formula (II)



wherein X₂ represents SO₂, C(CH₃)₂ or C(CF₃)₂;
a recurring unit of the formula (III)



wherein X₃, X₄, X₅ and X₆ which may be the same or different

R₁ is lower alkyl, lower alkoxy, aryl, aryloxy, substituted alkyl, substituted aryl, halogen, or mixtures thereof;

j is 0, 1, or 2;

i is 1 or 2;

Me is methyl;

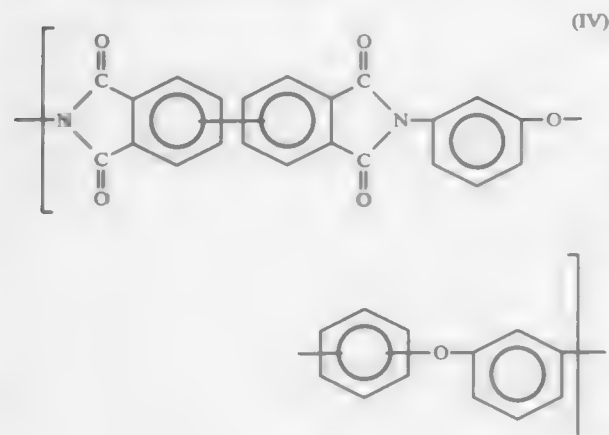
G is —CH₂—, —O—, —S—, or —SO₂—;

T is allyl or methallyl;

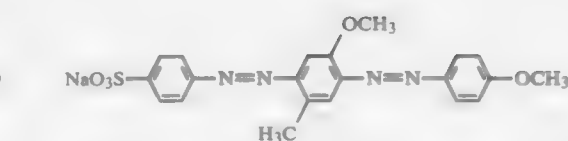
P is a linear, aromatic, organic, divalent residue of a diamine; and

Q is a linear, aromatic, organic, divalent residue of a diacid halide or dicarboxylic acid.

each represents H, F, Cl, CH₃, C₂H₅, NO₂ or CF₃; and a recurring unit of the formula (IV)



(IV)



displaying Debye-Scherrer X-ray diffraction pattern reflections representative of d-spacings (Å) as follows: 13.6(medium), 5.2(very strong), 4.9(very strong), 4.8(strong), 4.7(strong), 4.55(medium), 4.4(medium), 4.35(medium), 3.8(very strong), 3.7(medium), 2.95(very strong).

4,876,334

TRIAZINYL REACTIVE DYES IN WHICH THE TRIAZINYL IS FURTHER SUBSTITUTED WITH A REACTIVE RADICAL

Athanasios Tzikas, Pratteln, and Paul Herzig, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

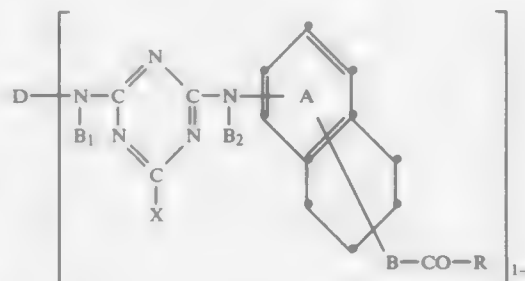
Filed Feb. 1, 1988, Ser. No. 150,695

Claims priority, application Switzerland, Feb. 6, 1987, 445/87
Int. Cl.⁴ C09B 62/02, 62/04, 62/443, 62/503

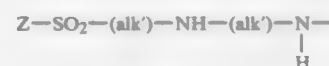
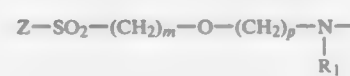
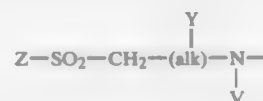
U.S. Cl. 534—632

29 Claims

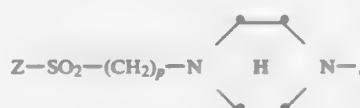
1. A reactive dye of the formula



in which D is the radical of a monoazo, polyazo, metal complex azo, anthraquinone, phthalocyanine, formazane, azomethine, dioxazine, phenazine, stilbene, triphenylmethane, xanthene, thioxanthone, nitroaryl, naphthoquinone, pyrenequinone or perylenetetracarboxylic dye, B₁ and B₂ are independently of each other hydrogen or C₁-C₄-alkyl which is unsubstituted or is further substituted by halogen, hydroxyl, cyano, C₁-C₄-alkoxy, C₁-C₄-alkoxy-carbonyl, carboxyl, sulfamoyl, sulfo or sulfato, X is fluorine, chlorine, bromine, sulfo, C₁-C₄-alkylsulfonyl or phenylsulfonyl, B is —CH₂n or —O—CH₂n, n is 1 to 6, R is



or



4,876,331

COPOLYESTER AND PROCESS FOR PRODUCING THE SAME

Yoshiharu Doi, Yokohama, Japan, assignor to Mitsubishi Kasei Corporation, Tokyo, Japan

Filed Aug. 10, 1988, Ser. No. 230,461

Claims priority, application Japan, Aug. 13, 1987, 62-204537; Aug. 18, 1987, 62-204538; Dec. 15, 1987, 62-316446; Mar. 2, 1988, 63-49015; Jul. 18, 1988, 63-178448

Int. Cl.⁴ C08G 63/02; C08H 5/00

U.S. Cl. 528—361

4 Claims

1. A copolyester comprising a 3-hydroxybutyrate unit and one selected from the group consisting of (1) a 3-hydroxyvalerate unit and a 5-hydroxyvalerate unit, (2) a 4-hydroxybutyrate unit and (3) a 4-hydroxybutyrate unit and a 3-hydroxyvalerate unit, the intrinsic viscosity of said copolyester being in the range of 0.4 to 10.0 dl/g in chloroform at 30° C.

4,876,332

POLYPEPTIDES WITH TYPE IV COLLAGEN ACTIVITY

Effie C. Tsilibary, and Leo T. Furcht, both of Minneapolis, Minn., assignors to Regents of the University of Minnesota, Minneapolis, Minn.

Filed Oct. 8, 1987, Ser. No. 106,858

Int. Cl.⁴ C07K 7/06, 7/08

U.S. Cl. 530—326

4 Claims

1. A composition consisting essentially of a polypeptide of the formula:

met-phe-lys-lys-pro-thr-pro-ser-thr-leu-lys-ala-gly-leu-arg,
thr-ala-gly-ser-cys-leu-arg-lys-phe-ser-thr met,
asn-pro-leu-cys-pro-gly-thr-lys-ile-leu,
or mixtures thereof.

4,876,333

β-CRYSTALLINE MODIFICATION OF DIASAZO ACID DYESTUFF

Alfred Hoehener, and Roy E. Smith, both of Toms River, N.J., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Oct. 15, 1985, Ser. No. 787,354

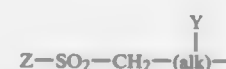
Int. Cl.⁴ C09B 67/24, 67/48, 67/54; D06P 1/39

U.S. Cl. 534—575

3 Claims

1. The β-crystalline form of the dyestuff of the formula

Z is β-sulfatoethyl, β-thiosulfatoethyl, β-phosphatoethyl, β-acetoxyethyl, β-haloethyl or vinyl, alk is alkylene having 1 to 6 carbon atoms or a branched isomer thereof, Y is hydrogen, chlorine, bromine, fluorine, hydroxyl, sulfato, alkanoyloxy of up to 4 carbon atoms, cyano, carboxyl, C₁-C₅-alkoxy-carbonyl, carbamoyl, or —SO₂—Z, in which Z is as defined above, V is hydrogen of C₁-C₄-alkyl which is unsubstituted or is substituted by carboxyl, sulfo, sulfamoyl, N-(C₁-C₂-alkyl)-sulfamoyl, N,N-di-(C₁-C₂-alkyl)-sulfamoyl, C₁-C₂-alkoxy, halogen or hydroxyl, or



in which Z, alk and Y are as defined above, R₁ is hydrogen or C₁-C₆-alkyl, the alk's are independently of each other polymethylene radicals having 2 to 6 carbon atoms or branched isomers thereof, m is 1 to 6, p is 1 to 6, and q is 1 to 6, and the benzene or naphthalene radical A is unsubstituted or substituted by C₁-C₄-alkyl, C₁-C₄-alkoxy, alkanoylamino having up to 8 carbon atoms, benzoylamino, amino, C₁-C₄-alkylamino, phenylamino, N,N-di-(β-hydroxyethyl)-amino, N,N-di-(β-sulfatoethyl)-amino, sulfobenzylamino, N,N-disulfobenzylamino, C₁-C₄-alkoxy-carbonyl, C₁-C₄-alkylsulfonyl, trifluoromethyl, nitro, cyano, halogen, carbamoyl, N-C₁-C₄-alkyl-carbamoyl sulfamoyl, N-C₁-C₄-alkyl-sulfamoyl, N-β-hydroxyethylsulfamoyl, N,N-di-(β-hydroxyethyl)-sulfamoyl, N-phenylsulfamoyl, ureido, hydroxyl, carboxyl, sulfomethyl or sulfo.

4,876,335

POLY-LABELLED OLIGONUCLEOTIDE DERIVATIVE

Atsuo Yamane; Tatsuro Kawasoe; Noriko Tsukumo, and Kenichi Miyoshi, all of Hiroshima, Japan, assignors to Wakunaga Seiyaku Kabushiki Kaisha, Osaka, Japan

Filed Jun. 30, 1987, Ser. No. 67,798

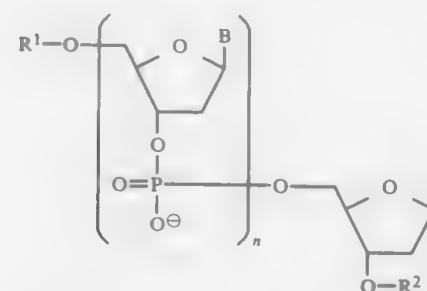
Claims priority, application Japan, Jun. 30, 1986, 61-153343

Int. Cl.⁴ C07H 19/10, 19/20

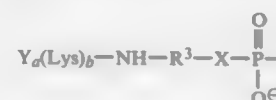
U.S. Cl. 536—27

21 Claims

1. A poly-labelled oligonucleotide derivative represented by the following formula [I]:



wherein: either one of R¹ and R² is a group represented by the formula [II] shown below and the other is a hydrogen atom or a phosphate group, or both of R¹ and R² are groups represented by the formula [II] shown below; n is a natural number from 6 to 200; and B is nucleotide base selected from the group consisting of adenine, thymine, cytosine and guanine;



wherein: a is a natural number from 2 to 50 and b is a natural number from 1 to 50, with b+1 ≤ a; R³ is an alkylene group having 2 to 20 carbon atoms; X represents an oxygen atom or an imino group; (Lys)_b represents a lysine moiety when b=1 and a polylysine moiety when b=2 to 50, wherein said polylysine is a polymerization product of lysine through the reaction

4,876,336

AMPHOTERIC STARCHES AND PROCESS FOR THEIR PREPARATION

Daniel B. Solarek, Bridgewater; Teresa A. Dirschel, N. Plainfield; Henry R. Hernandez, Bridgewater, and Wadym Jarowenko, Green Brook, all of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Continuation-in-part of Ser. No. 896,546, Aug. 13, 1986, abandoned. This application May 18, 1987, Ser. No. 50,649
Int. Cl.⁴ C08B 31/02, 33/02, 35/02

U.S. Cl. 536—109

15 Claims

1. A process for preparing an amphoteric starch derivative which comprises:

- providing an aqueous slurry of a non-degraded starch derivative containing tertiary amino or quaternary ammonium cationic substituent groups having a D.S. of from about 0.010 to 0.080,
- adjusting the pH level of the slurry to about pH 5.5–8.5,
- adding to the aqueous starch slurry a phosphate salt selected from the group consisting of tripolyphosphate, hexametaphosphate, and pyrophosphate alkali metal salts, while maintaining the pH level at 5.5–8.5,
- filtering the slurry,
- drying the resultant cake to a moisture of 9.0% or below,
- heat reacting the dried starch at a temperature of about 110°–140° C. for a period of 0.1 to 4.0 hours, and
- recovering the amphoteric starch derivative, wherein the resultant starch derivative has a bound phosphorus content of at least 0.12%, a viscosity of at least 800 cps, and a ratio of anionic to cationic groups of from about 0.12 to 0.55.

4,876,337

METHOD AND APPARATUS FOR THE PREPARATION OF CYANOALKYL-ALKOXY-SILANES

Hartwig Rauleder; Claus-Dietrich Seiler, both of Rheinfelden, and Hans-Joachim Vahlensieck, Wehr, all of Fed. Rep. of Germany, assignors to Huels Troisdorf AG, Troisdorf, Fed. Rep. of Germany

Filed Dec. 2, 1988, Ser. No. 278,736

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1987, 3744211

Int. Cl.⁴ C07F 7/10

U.S. Cl. 556—415

2 Claims

1. In a method of preparing a cyanoalkyl-alkoxysilane by reacting a chloroalkyl-alkoxysilane with an alkali cyanide or an alkaline earth metal cyanide in a solvent, separating the alkali metal chloride thus produced and removing the solvent and the cyanoalkyl-alkoxysilane by distillation, the improvement of performing all of the process steps in a single apparatus and, after the reaction is performed, first distilling the solvent out of the apparatus through a column connected thereto, then distilling most of the cyanoalkyl-alkoxysilane out of the apparatus through the same column and subsequently the rest of the cyanoalkyl-alkoxysilane while bypassing the column, until a dry alkali metal chloride or alkaline earth metal chloride is obtained in the apparatus, and removing the dry chloride from the apparatus through a lock.

4,876,338

SYNTHESIS OF AZETIDINONES USING CUCL

Donald Hoa, Verona; Yee-Shing Wong, Clifton; Dinesh Gala, East Brunswick, and Martin Steinman, Livingston, all of N.J., assignors to Schering Corporation, Kenilworth, N.J.
Division of Ser. No. 887,394, Jul. 21, 1986, Pat. No. 4,767,853.
This application Jun. 7, 1988, Ser. No. 203,385
Int. Cl.⁴ C07D 705/08

U.S. Cl. 540—357

3 Claims

1. A process for producing 1-(allyloxycarbonyl)-methyl-3-(1-hydroxyethyl)-4-beta-naphthoxy-(thiocarbonyl)thio-2-azetidinone or stereoisomers thereof, comprising the steps:

- reacting 3,7-dioxo-6-(1-protected hydroxyethyl)-2-(1-methylethylidene)-4-thia-1-azabicyclo[3.2.0]heptane with oxygen and cuprous chloride in the presence of methanol;
- reacting the compound produced in step (a) with ozone;
- reacting the compound produced in step (b) with ammonium hydroxide;
- reacting the compound produced in step (c) with allyl-iodoacetate;
- removing the hydroxy protecting group from the compound produced in step (d) with an acid;
- reacting the compound produced in step (e) with zinc and a mineral acid;
- reacting the compound produced in step (f) with O-2-naphthalenylcarbonochloridothioate;
- recovering the resulting 1-(allyloxycarbonyl)methyl-3-(1-hydroxyethyl)-4-beta-naphthoxy-(thiocarbonyl)thio-2-azetidinone.

4,876,339

PROCESS FOR SYNTHESIS OF AZACYCLOALKANE-2,2-DIPHOSPHONIC ACIDS

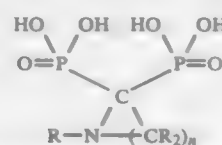
Helmuth Blum, Duesseldorf, and Siglinde Hemmann, Meerbusch, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany
Filed Mar. 10, 1989, Ser. No. 322,328
Claims priority, application Fed. Rep. of Germany, Mar. 11, 1989, 3908074

Int. Cl.⁴ C07F 9/30

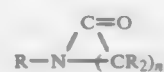
U.S. Cl. 540—450

20 Claims

1. A process for the preparation of azacycloalkane-2,2-diphosphonic acids of the general formula I:



where R means a hydrogen or a lower alkyl radical with from 1 to 3 carbon atoms, and n means an integer between 3 and 11, or of a water soluble salt of an acid of formula I, said process comprising reacting a lactam of the general formula II:



where R and n have the same meanings as for formula (I), with a phosphorus trihalide and phosphonic acid in the presence of water in an inert reaction medium that has the chemical structure of an adduct of ethanol with an average of from about 1 to about 20 moles of ethylene oxide or propylene oxide per mole of ethanol.

4,876,340

BENZAZECINE DERIVATIVES FOR COGNITIVE AND MEMORY FUNCTIONS

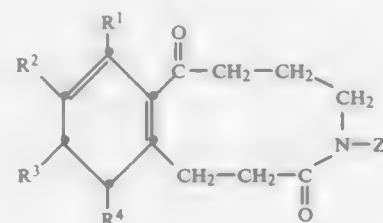
Werner Aschwanden, Ettingen; René Imhof, Gifp-Oberfrick, both of Switzerland; Roland Jakob, Inslingen, Fed. Rep. of Germany, and Emilio Kybarz, Reinach, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.
Division of Ser. No. 121,987, Nov. 18, 1987, Pat. No. 4,749,791, which is a division of Ser. No. 5,712, Jan. 21, 1987, Pat. No. 4,732,979. This application Feb. 11, 1988, Ser. No. 154,760
Claims priority, application Switzerland, Jan. 23, 1986, 333,766

Int. Cl.⁴ C07D 227/08, 227/087

U.S. Cl. 540—461

6 Claims

1. A compound of the formula



III

wherein R¹ and R² are independently hydrogen or chlorine, R³ is hydrogen, fluorine, chlorine, bromine or methoxy, R⁴ is hydrogen, chlorine or methoxy and Z is a readily cleavable alkanoyl, aroyl or aryl-alkanoyl residue derived from a carboxylic acid by removal of the hydroxy group but which is not acetyl, propionyl, benzoyl, chlorobenzoyl, methoxybenzoyl or phenylacetyl.

4,876,341

PROCESS FOR THE PREPARATION OF 6-METHYL-3,4-DIHYDRO-1,2,3-OXATHIAZIN-4-ONE 2,2-DIOXIDE

(I) Joachim Schütz, Hofheim am Taunus, and Otto E. Schweikert, Kelkheim, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 890,491, Jul. 25, 1986, abandoned. This application Aug. 2, 1988, Ser. No. 227,465
Claims priority, application Fed. Rep. of Germany, Jul. 29, 1985, 3527070

Int. Cl.⁴ C07D 291/06

U.S. Cl. 544—2

20 Claims

- A process for the preparation of 6-methyl-3,4-dihydro-1,2,3-oxathiazin-4-one 2,2-dioxide which comprises ring closure of acetoacetamide-N-sulfonic acid or one of its salts dissolved in an equimolar amount to 20-fold molar excess of SO₃ at a temperature of from -70° C. to +175° C. in a reactor within a reactor hold-up time not exceeding 10 minutes after which the ring closure product is passed on out of the reactor or, in the case where more than the equimolar amount of SO₃ is used, the SO₃ adduct of the ring closure product is passed on for hydrolysis, to yield the 6-methyl-3,4-dihydro-1,2,3-oxathiazin-4-one 2,2-dioxide.

4,876,342

OXAZINE COMPOUNDS SUBSTITUTED BY ONE OR MORE BASIC GROUPS AND PREPARATION THEREOF

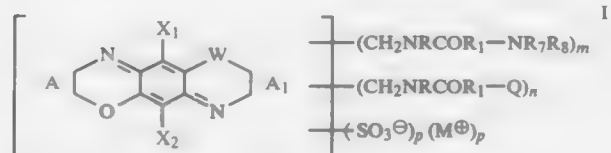
Reinhard Pedrazzi, Allschwil, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland
Continuation of Ser. No. 41,893, Apr. 23, 1987, abandoned, which is a continuation-in-part of Ser. No. 791,190, Oct. 25, 1985, abandoned. This application May 26, 1988, Ser. No. 199,211

Claims priority, application Fed. Rep. of Germany, Oct. 25, 1984, 3449095; Jun. 7, 1985, 3520399
Int. Cl.⁴ C07D 498/22; C09B 19/00

U.S. Cl. 544—14

21 Claims

1. A compound of formula I,



and acid addition salts thereof, in which

W is O or S,
each of X₁ and X₂ is independently hydrogen, halogen, cyano, C₁-alkyl, C₁-alkoxy, phenyl or phenylamino, which phenyl ring of the latter two groups is unsubstituted or substituted by one to three groups selected from halogen, C₁-alkyl and C₁-alkoxy; —NHCOR₉, —CONR₁₀R₁₁, —COOR₁₂ or —OCOR₁₃.

R₉ is C₁-alkyl, phenyl or phenyl substituted by one or two groups selected from halogen, C₁-alkyl and C₁-alkoxy, R₁₀ is hydrogen, C₁-alkyl, cyclohexyl, phenyl-C₁-alkyl, unsubstituted phenyl or phenyl monosubstituted by chlorine, methyl or methoxy,

R₁₁ is hydrogen, C₁-alkyl, cyclohexyl, phenyl or phenyl-C₁-alkyl,

R₁₂ is hydrogen, C₁-alkyl or cyclohexyl,

R₁₃ is C₁-alkyl or cyclohexyl,

each of the rings A and A₁, independently, signifies a fused ring system containing one to four 4- to 8-membered carbocyclic and/or heterocyclic rings which may be further substituted,

each R is independently hydrogen or C₁-alkyl, each R₁ is independently C₁-alkylene or C₂-alkenylene, each Q is independently halogen, —NR₂R₃ or —NR₄R₅R₆ An⁺,

An⁺ is a non-chromophoric anion,

M⁺ is hydrogen or a non-chromophoric cation,

each of m and n is independently a number of from 1 to 4, with the proviso that 2 ≤ m + n ≤ 6,

p is a number of from 0 to 1,

R₂ is C₁-12alkyl, —Alk—Y in which —Alk— is a C₂-6alkylene group which may be interrupted by —O— or —NR— and which may be further substituted by OH or —NRR, and Y is OH or —NR₂R₃; unsubstituted C₅-8cycloalkyl or C₅-8cycloalkyl substituted by one to three C₁-alkyl groups; phenyl or phenyl-C₁-alkyl in which each phenyl ring is unsubstituted or substituted by one to three groups selected from halogen, C₁-alkyl and C₁-alkoxy,

R₃ is hydrogen, C₁-12alkyl, C₂-4alkyl monosubstituted by hydroxy, unsubstituted C₅-8cycloalkyl or C₅-8cycloalkyl substituted by one to three C₁-alkyl groups,

R₄ has one of the significances of R₂,

R₅ has one of the significances of R₃ except hydrogen, and R₆ is NH₂, C₁-12alkyl, C₂-4alkyl monosubstituted by hydroxy, or is phenyl-C₁-alkyl, or

R₂ and R₃ or R₄ and R₅, together with the N-atom to which they are attached, form a 5- or 6-membered saturated or unsaturated ring which contains one to three hetero atoms and is further unsubstituted or substituted by one to three

groups selected from C₁-alkyl and C₂-4alkyl monosubstituted by hydroxy or amino, or

R₄, R₅ and R₆, together with the N-atom to which they are attached, form a pyridinium group which is unsubstituted or substituted by one or two C₁-alkyl groups,

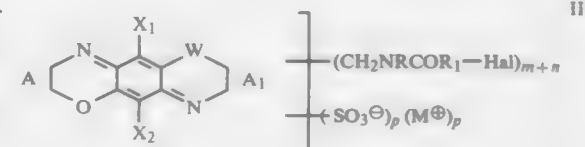
each of R₇ and R₈ is independently C₁-12alkyl, C₂-4alkyl monosubstituted by hydroxy, or C₅-8cycloalkyl which is unsubstituted or substituted by one to three C₁-alkyl groups, or

R₇ and R₈, together with the N-atom to which they are attached, form a 5- or 6-membered saturated or unsaturated ring which contains one to three hetero atoms and is further unsubstituted or substituted by one to three groups selected from C₁-alkyl or C₂-4alkyl monosubstituted by hydroxy or amino,

R₂' is hydrogen or has one of the non-cyclic or cyclic significances of R₂ except —Alk—Y, and

R₃' has one of the non-cyclic or cyclic significances of R₃; with the proviso that in a compound of formula I Q is different from —NR₇R₈.

17. A process for the preparation of a compound of formula I defined in claim 1, comprising reacting per mol of a compound of formula II,



in which A, A₁, W, X₁, X₂, R, R₁, M, m, n and p are as defined in claim 1, and Hal is halogen, m mols of a compound of formula III,

HNR₇R₈

III

in which R₇ and R₈ are as defined in claim 1, and optionally n or n₁ mols of a compound of formula IV or V

HNR₂R₃

IV

NR₄R₅R₆

V

in which R₂ to R₆ are as defined in claim 1, and n₁ is less than n, provided that when n mols of a compound of formula IV are employed, a compound of formula III and a compound of formula IV are different from each other,

whereby in a step (a) m=1 mol of a compound of formula III is reacted at a maximum temperature of 40° C. and in an alkaline pH range below 11;

and, if necessary, in a subsequent step (b) m-1 mols of a compound of formula III and optionally n or n₁ mols of a compound of formula IV or V are reacted in an alkaline pH range of approximately pH 11 and in a temperature range of from 45°-80° C.

4,876,343

PROCESS FOR STATINE AND STATINE ANALOGS

John C. Hodges, and Sylvester Klutchko, both of Ann Arbor, Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Jun. 15, 1988, Ser. No. 207,341

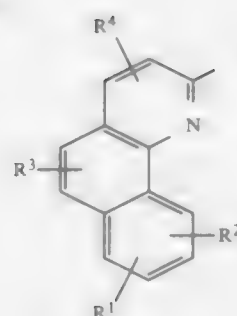
Int. Cl.⁴ C07B 43/04

U.S. Cl. 544—168

15 Claims

1. A process for the preparation of a compound of formula I

-continued



wherein R^1 , R^2 , R^{10} and R^{11} independently of one another are each hydrogen, fluorine, bromine, chlorine, CN, CF_3 , nitro, C_1 - C_4 -alkyl, C_1 - C_4 -alkoxy, or phenyl which is unsubstituted or is substituted by fluorine, bromine, chlorine, C_1 - C_4 -alkyl, C_1 - C_4 -alkoxy, CN, CF_3 or NO_2 , only one nitro group being present per radical D.

4,876,348

PROCESS FOR MAKING 3-CYANOPYRIDINE

Robert DiCosimo, Shaker Heights; James D. Burrington, Richmond Heights, and Dev D. Suresh, Macedonia, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio
Filed Oct. 29, 1985, Ser. No. 792,421

Int. Cl.⁴ C07D 213/57, 213/133

U.S. Cl. 546—252

6 Claims

1. A process for making 3-cyanopyridine which comprises the following steps:

- (1) reacting 2-methylglutaronitrile in a known reaction by heating said nitrile in the vapor phase in admixture with 5–30 moles of hydrogen gas while in contact with a Pt or Pd catalyst to produce a mixture containing 3-methylpyridine and lesser amounts of 3-methylpiperidine wherein the molar ratio of the former to the latter is at least 3:1;
- (2) separating the normally liquid effluent from step (1) from the gaseous components of the effluent;
- (3) reacting in a reaction zone normally liquid effluent from step 1 containing 3-methylpyridine and 3-methylpiperidine, together with NH_3 and molecular oxygen, while in vapor phase contact with a solid catalyst which is a complex oxide having the elements and the amounts thereof indicated by the empirical formula



wherein

M is one or any number more of Sb, Fe, W, Cu, K, Cs, B, Te, Sn, Mn, Nb, U, Bi and Cr and

a=0.1–3,

b=0.1–6,

a+b=at least 1.5,

c=12,

d=0–4, and

x is a number sufficient to satisfy the valence requirements of other elements present, under the reaction conditions suitable for ammoxidizing 3-methylpyridine over such catalyst, wherein the feed initially contacting the catalyst in said reaction zone contains a molar ratio of 3-methylpyridine to 3-methylpiperidine of at least 3:1, thereby producing said 3-cyanopyridine.

4,876,349
TETRAHYDRONAPHTHALENE AND INDANE
DERIVATIVES

Michael Klaus, Weil am Rhein, and Ekkehard Weiss, Inzlingen, both of Fed. Rep. of Germany, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Jul. 10, 1987, Ser. No. 72,075

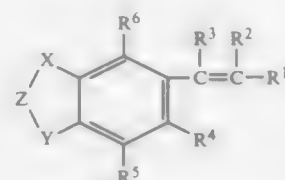
Claims priority, application Switzerland, Jul. 15, 1986, 8626/86

Int. Cl.⁴ C07D 213/00

U.S. Cl. 546—350

11 Claims

1. A compound of the formula



wherein X and Y are independently $-CH_2-$ or $>C(CH_3)_2$; Z is $-CHR^8-$ or $-CHR^8-CHR^8-$; R^1 is pyridyl, unsubstituted; R^2 and R^3 are independently hydrogen, lower-alkyl, trifluoromethyl or halogen and one of R^2 and R^3 is always trifluoromethyl or lower-alkyl; R^4 and R^5 are independently hydrogen, alkyl, alkoxy or halogen; R^6 is hydrogen, lower-alkyl or a residue $-OR^7$; R^7 is hydrogen, lower-alkyl or acyl; R^8 is hydrogen or lower-alkyl; and R^7 and R^8 can be the same or different from one another.

4,876,350

PROCESS FOR THE PRODUCTION OF (+) BIOTIN

John McGarrity, and Leander Tenned, both of Visp, Switzerland, assignors to Lonza Ltd., Gampel/Valais, Switzerland

Filed Dec. 16, 1987, Ser. No. 134,210

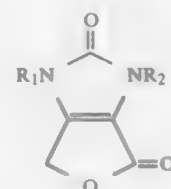
Claims priority, application Switzerland, Oct. 18, 1986, 8621/86

Int. Cl.⁴ C07D 231/00

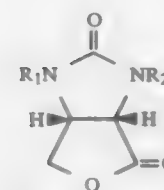
U.S. Cl. 548—110

17 Claims

1. Process for the production of (+) biotin, comprising catalytically hydrogenating a compound of the formula:



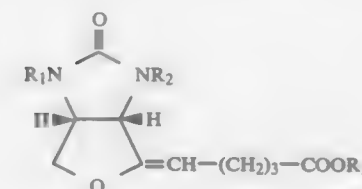
wherein R_1 is an (R)- or (S)-1-phenylalkyl group, an (R)- or (S)-1-alkoxycarbonyl-1-phenylmethyl group or an (R)- or (S)-1-aryloxycarbonyl-1-phenylmethyl group, and R_2 is hydrogen, a substituted or unsubstituted alkanoyl group, an unsubstituted or a substituted benzoyl group, a substituted or an unsubstituted benzyl group, an alkoxy carbonyl group, an aryloxy carbonyl group, an aryloxyalkyl group, an alkoxyalkyl group, a pyranil group, an unsubstituted or substituted benzenesulfonyl group, an alkylsulfonyl group, a diarylphosphinyl group, a dialkoxylphosphinyl group or a trialkylsilyl group, with hydrogen, separating the desired diastereomer of the formula:



if R_2 is H, introducing a protective group by reaction with aliphatic or aromatic acid chlorides, aliphatic or aromatic carboxylic acid anhydrides, haloformic acid alkyl esters, benzyl halides, 1-alkoxyalkyl halides, enol ethers, aromatic or aliphatic sulfonic acid halides, diarylphosphinic acid halides, phosphoric acid dialkyl ester chlorides, trialkylsilyl halides or trialkylsilyl acetamides, converting the diastereomer by a further reaction with a thiocarboxylic acid salt derivative into the corresponding thiolactone, reacting the corresponding thiolactone with a Grignard reagent and subsequently splitting off of water or with a compound of the formula:



wherein R_3 is H or alkyl with 1 to 4 C atoms and X is a halogen atom, in the presence of a base to a compound of the formula:



where R_3 has the above-mentioned meaning, catalytically hydrogenating said compound and then converting said catalytically-hydrogenated compound into (+) biotin by cleavage of the protective groups.

4,876,351

PROCESS FOR THE SEPARATION OF A MIXTURE OF "SYN" AND "ANTI" OXIME ISOMERS

Colin Robinson, Allinthalwaite; David T. Eastlick, Grange-over-Sands, and Audrey J. Bowness, Haverthwaite, all of England, assignors to Glaxo Group Limited, London, England

Division of Ser. No. 648,382, Sep. 7, 1984, Pat. No. 4,717,768.

This application Oct. 30, 1987, Ser. No. 114,841

Claims priority, application United Kingdom, Sep. 9, 1983, 8324182

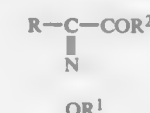
The portion of the term of this patent subsequent to Jan. 5, 2005, has been disclaimed.

Int. Cl.⁴ C07D 277/30, 285/12

U.S. Cl. 548—204

11 Claims

1. A method for separating a mixture of syn and anti oxime isomers, one from the other, of a compound formula



or salt or solvate thereof which comprises absorbing said mixed oxime isomers onto a non-functional macroreticular absorption resin, and eluting said resin to yield at least one eluate fraction containing one of said isomers substantially free of the other of said isomers; wherein R is selected from the group consisting of carbocyclic groups, heterocyclic groups and C_1 - C_6 alkyl groups; said carbocyclic groups having 5–12 carbon atoms; said heterocyclic groups possessing 5 or 6 ring members and containing from 1 to 4 heteroatoms selected from

the group consisting of sulphur, nitrogen and oxygen; R^1 represents a C_3 - 10 aryl or C_3 - 10 aralkyl group or an aliphatic group selected from C_1 - 6 alkyl, C_3 - 7 cycloalkyl, C_4 - 10 cycloalkylalkyl, C_2 - 6 alkenyl and C_4 - 7 cycloalkenyl, wherein each of the above R^1 groups may be optionally substituted by a free or blocked carboxy, carbamoyl, cyano or protected or unprotected amino group; and R^2 represents a hydroxy group or a blocked hydroxy group.

4,876,352

PRESSURIZED FLUORINATION OF HYDROXY ALKYL GROUPS

Doris P. Schumacher, Florham Park; Jon E. Clark, Highland Park, and Bruce L. Murphy, Glen Ridge, all of N.J., assignors to Schering Corporation, Kenilworth, N.J.

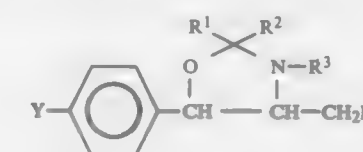
Filed Sep. 14, 1988, Ser. No. 244,210

Int. Cl.⁴ C07D 263/10

U.S. Cl. 548—232

13 Claims

1. A process for preparing compounds of the formula



wherein

Y is hydrogen, nitro, methylthio, methylsulfoxy, or methylsulfonyl;

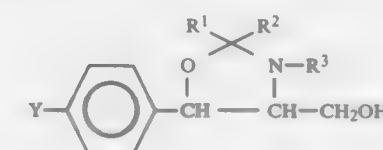
R^1 is alkyl, haloalkyl, cycloalkyl, alkenyl, alkynyl, alkoxy, aralkyl, aralkenyl, aryl, aromatic heterocyclic;

R^2 is hydrogen, alkyl, haloalkyl, cycloalkyl, alkenyl, alkynyl, alkoxy, aralkyl, aralkenyl, aryl, aromatic heterocyclic;

R^1 together with R^2 is an oxygen atom;

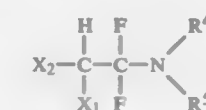
R^3 is hydrogen; and

R^2 together with R^3 is a covalent bond, with an α , α -difluoroalkylamine fluorinating agent of the formula III which comprises treating under pressure a compound of the formula



wherein

Y and R are defined hereinabove, with an α , α -difluoroalkylamine fluorinating agent of the formula III



wherein

X_1 is chlorine or fluorine,

X_2 is chlorine, fluorine or trifluoromethyl

R^4 and R^5 taken individually are loweralkyl, and

R^4 and R^5 taken together with the attached nitrogen atom represent the residue of a heterocyclic radical contain five to seven ring atoms.

4,876,353

PROCESS FOR THE PREPARATION OF OPTICALLY ACTIVE 2-HYDROXYETHYL-AZOLE DERIVATIVES
Udo Krantz, Leverkusen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany
Filed Jan. 25, 1988, Ser. No. 147,415

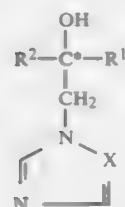
Claims priority, application Fed. Rep. of Germany, Feb. 3, 1987, 3703082

Int. Cl.⁴ C07D 249/12, 233/60

U.S. Cl. 548—262

9 Claims

1. A process for the preparation of an optically active 2-hydroxyethyl-azole derivative of the formula



in which

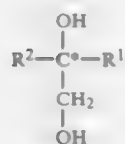
R¹ represents alkyl having 1 to 6 carbon atoms, cycloalkyl having 3 to 8 carbon atoms which is optionally monosubstituted, disubstituted or trisubstituted by alkyl having 1 to 4 carbon atoms and/or halogen, the substituents being identical or different, cycloalkylalkyl which has 3 to 8 carbon atoms in the cycloalkyl part and 1 to 4 carbon atoms in the alkyl part and which is optionally monosubstituted, disubstituted or trisubstituted by alkyl having 1 to 4 carbon atoms and/or halogen, the substituents being identical or different, or phenyl which is optionally monosubstituted, disubstituted or trisubstituted by alkyl having 1 to 6 carbon atoms, halogen, halogenoalkyl having 1 to 2 carbon atoms and 1 to 5 halogen atoms, nitro and/or hydroxyl the substituents being identical or different,

R² represents straight-chain or branched alkyl having 1 to 8 carbon atoms, alkynyl having 3 to 8 carbon atoms, cycloalkyl having 3 to 8 carbon atoms, cycloalkylalkyl having 3 to 8 carbon atoms in the cycloalkyl part and 1 to 4 carbon atoms in the alkyl part, benzyl which is optionally monosubstituted, disubstituted or trisubstituted in the phenyl part by alkyl having 1 to 4 carbon atoms and/or halogen, the substituents being identical or different, or the radicals of the formulae —CH₂CH₂—R³, —CH₂—O—R³, —C≡C—R³ or —CH₂—CH=CH—R⁴, where

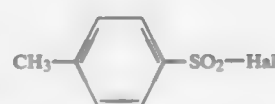
R³ represents phenyl which is optionally monosubstituted, disubstituted or trisubstituted by alkyl having 1 to 4 carbon atoms, alkoxy having 1 to 4 carbon atoms, halogen and/or phenyl, the substituents being identical or different, and

R⁴ represents hydrogen or phenyl which is optionally monosubstituted, disubstituted or trisubstituted by alkyl having 1 to 4 carbon atoms, alkoxy having 1 to 4 carbon atoms, halogen and/or phenyl, the substituents being identical or different, and

X represents a nitrogen atom or a CH group, comprising (a) in a first stage, reacting an optically active diol of the formula



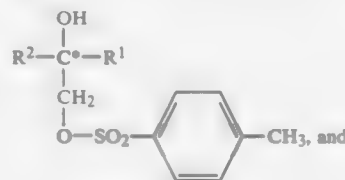
with a tosyl halide of the formula



(III)

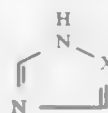
in which

Hal represents chlorine or bromine, in the presence of an acid-binding agent, thereby to produce a tosylate of the formula



(IV)

(b) in a second stage reacting the tosylate with an azole of the formula



(V)

in the presence of an acid-binding agent.

4,876,354

ARYLMETHYL AZOLES AND THEIR SALTS, PROCESSES FOR THEIR PREPARATION, AGENTS WHICH CONTAIN THESE COMPOUNDS, AND THEIR USE

Herbert Siegel, Hofheim am Taunus; Klaus-Dieter Kampe, Bad Soden am Taunus; Hans G. Alpermann, Königstein; Hermann J. Gerhards, Hofheim am Taunus; Patricia Usinger, Eppstein; Ulrich Schacht, Hofheim am Taunus; Margret Leven, Kelkheim; Wolfgang Raether, Dreieich; Walter Dittmar, Hofheim am Taunus, and Burkhard Sachse, Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany
Continuation of Ser. No. 23,710, Mar. 9, 1987, abandoned, Continuation-in-part of Ser. No. 909,598, Sep. 22, 1986. This application May 3, 1988, Ser. No. 191,756

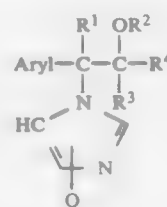
Claims priority, application Fed. Rep. of Germany, Sep. 23, 1985, 3533824; Nov. 23, 1985, 3541429; Aug. 14, 1986, 3627656; Aug. 22, 1986, 3628545

Int. Cl.⁴ C07D 233/64, 295/04, 251/20

U.S. Cl. 548—341

8 Claims

1. A compound of the formula I



in which aryl denotes a radical

4,876,355

POWDERED IMIDAZOLINE PRODUCT AND METHOD FOR PRODUCING SAME

Leonard Hughes; James G. Fuller, both of Dublin, and Gary W. Earl, Bexley, all of Ohio, assignors to Sherex Chemical Company, Inc., Dublin, Ohio

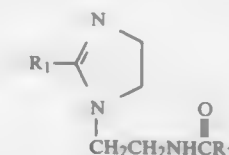
Filed Oct. 21, 1988, Ser. No. 278,200

Int. Cl.⁴ C07D 233/18

U.S. Cl. 548—352

10 Claims

6. A method for making a stable, free-flow particulate imidazoline product of the structure:



where R₁ and R₂ independently are a saturated C₁₂–C₂₂ alkyl group, which comprises condensing and cyclizing a fatty acid or ester and a polyamine; and rapidly cooling the molten, cyclized, solvent-free product to a particulate form.

4,876,356

NAPHTHOLACTAM DYES AND OPTICAL RECORDING MEDIUM CONTAINING THESE DYES

Matthias Dost, Mannheim; Peter Neumann, Wiesloch; Ernst Schefczik, Ludwigshafen; Heidi Benthack-Thoms, Limburgerhof; Helmut Barzynski, Bad Dürkheim; Klaus-Dieter Schomann, Ludwigshafen; Harald Kuppelmaier, Heidelberg, and Eberhard Koester, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Mar. 12, 1987, Ser. No. 24,988

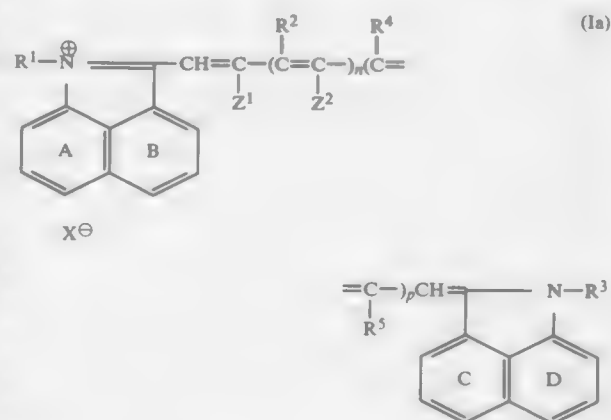
Claims priority, application Fed. Rep. of Germany, Mar. 12, 1986, 3608214

Int. Cl.⁴ C07D 209/90, 409/04

U.S. Cl. 548—419

3 Claims

1. A naphtholactam dye of the formula Ia



where

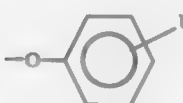
R¹ and R³ are identical or different and independently of one another are each C₄–C₂₀-alkyl which may be interrupted by ether oxygen or each are benzyl, 2-phenylethyl or C₃ or C₆-cycloalkyl

R², R⁴ and R⁵ are identical or different and independently of one another are each hydrogen, C₁–C₄-alkyl, C₅–C₆-cycloalkyl, phenyl, alkoxy, carbonyl in which alkoxy is C₁–C₄-carboxyalkyl in which alkyl is methyl or ethyl, hydroxyl, chlorine or bromine,

n is 0 or 1,

p, independently of n, is 0, 1 or 2,

or a 1- or 2-naphthyl radical which is unsubstituted or substituted by U and/or a substituent V, where X denotes H, (C₁–C₄)-alkyl, phenyl, fluorine, chlorine, bromine, hydroxyl, (C₁–C₄)-alkoxy,



(C₁–C₄)-alkylthio, —NR⁵, in which the radicals R⁵ - identical or different - denote (C₁–C₄)-alkyl or together with the nitrogen atom denote a pyrrolidine, piperidine or morpholine radical, or X denotes CF₃ or a benzyloxy group which is unsubstituted or carries one or two substituents in the phenyl radical, the substituents being identical or different and denote fluorine, chlorine, OCH₃, OC₂H₅ or (C₁–C₃)-alkyl,

Y denotes H, (C₁–C₄)-alkyl, fluorine, chlorine, bromine, (C₁–C₄)-alkoxy or (C₁–C₄)-alkylthio, or

X and Y together in the 2,3- or 3,4-position denote a —(CH₂)_n—chain, in which L=3 or 4, —OCH₂CH₂— or —O—CH₂—O—,

W denotes H, CH₃ or OCH₃,

V denotes (C₁–C₄)-alkyl, phenyl, fluorine, chlorine, bromine, hydroxyl, (C₁–C₄)-alkoxy, (C₁–C₄)-alkylthio, —NR⁵, in which R⁵ denotes (C₁–C₄)-alkyl or together with the nitrogen atom denotes a pyrrolidine, piperidine or morpholine radical, benzyloxy or CF₃, and

U denotes CH₃, F, Cl or OCH₃,

R¹ and Q denote H or (C₁–C₄)-alkyl,

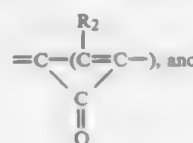
R² denotes H, (C₁–C₄)-alkyl, (C₃–C₅)-alkenyl or (C₃–C₅)-alkynyl,

R³ and R⁴ together denote a —(CH₂)_n—chain which is unsubstituted or substituted by (C₁–C₄)-alkyl, OCH₃ or phenyl, in which n=2–11; a corresponding hydrocarbon chain containing a double bond, or a —(CH₂)_m—chain which is unsubstituted or substituted by (C₁–C₄)-alkyl, OCH₃, CH₂OCH₃ or phenyl and is bridged singly or multiply, in which m=4 or 5 and in which the bridge or bridges contain a total of 1 to 5 bridge carbon atoms, and the bridge carbon atoms in turn may be bridged and in which the bridge or bridges contain no C—C double bonds or not more than one C—C double bond, and its physiologically tolerated acid addition salts and its stereoisomers and optically active enantiomers.

6. A pharmaceutical composition having an antimycotic action which contains a pharmaceutically effective amount of a compound of the formula I as claimed in claim 1 together with a pharmaceutically suitable carrier.

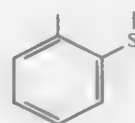
8. A pharmaceutical composition having an antidepressant action, which contains an effective amount of a compound I as claimed in claim 1 together with a pharmaceutically suitable carrier.

Z^1 and Z^2 are each hydrogen or, where n is 1, may together form an unsubstituted or C_1 - C_4 -alkyl-substituted C_2 - or C_3 -alkylene chain or together with the moiety to which they are attached from the radical



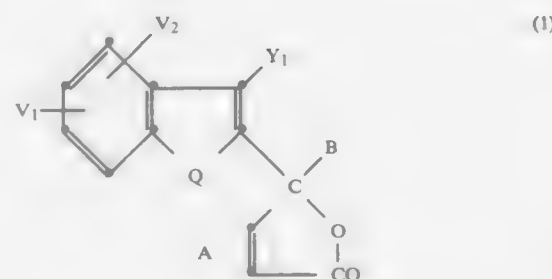
X^\ominus is an anion, and

the rings A, B, C and D are unsubstituted or substituted by methyl, ethyl, phenyl, C_1 - C_4 -alkoxy, C_1 - C_6 -alkylthio, cyano, dialkylamino in which each alkyl is methyl or ethyl, chlorine, bromine, hydroxysulfonyl, phenylthio or the radical,

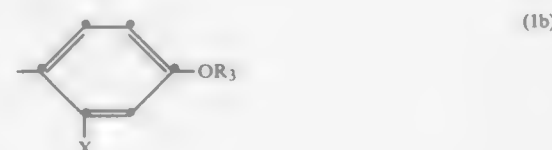
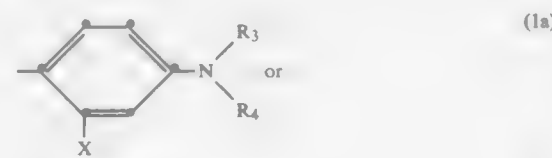


with the proviso that if

- at least one of the rings A, B, C or D are unsubstituted or substituted by chlorine, bromine, C_1 - C_4 -alkoxy, dialkylamino in which each alkyl is methyl or ethyl, n and p are not simultaneously 0,
- at least one of the rings A, B, C or D are unsubstituted or substituted by chlorine, bromine, C_1 - C_4 -alkoxy, dialkylamino in which each alkyl is methyl or ethyl, n is 1, p is 0 and Z^1 and Z^2 are each hydrogen, R^2 is not hydrogen,
- at least one of the rings A, B, C or D are unsubstituted or substituted by chlorine, bromine, C_1 - C_4 -alkoxy, dialkylamino in which each alkyl is methyl or ethyl, n is 0 and p is 1 or 2, R^4 and R^5 are not simultaneously hydrogen, and
- at least one of the rings A, B, C or D are unsubstituted or substituted by chlorine, bromine, C_1 - C_4 -alkoxy, dialkylamino in which each alkyl is methyl or ethyl, n and p are each 1 and Z^1 and Z^2 are each hydrogen, one or more of the radicals R^2 , R^4 and R^5 is not hydrogen.



in which V_1 and V_2 are each, independently of the other, hydrogen, halogen, lower alkyl, lower alkoxy, (lower alkoxy)-carbonyl or $-NR_1R_2$, at least one of the radicals V_1 and V_2 being lower alkoxy or $-NR_1R_2$, A is an unsubstituted or halogen-, cyano-, nitro-, (lower alkyl)-, (lower alkoxy)-, (lower alkyl)thio-, (lower alkyl)amino- or di(lower alkyl)amino-substituted benzene, naphthalene, pyridine, quinoline, pyrazine or quinoxaline ring, B is a substituted phenyl radical of the formula



Q is



R_1 , R_2 , R_3 and R_4 are each, independently of the others, hydrogen, unsubstituted or halogen-, hydroxy-, cyano- or (lower alkoxy)-substituted alkyl having at most 12 carbon atoms, cycloalkyl having 5 to 10 carbon atoms or unsubstituted or halogen-, cyano-, (lower alkyl)- or (lower alkoxy)ring-substituted phenalkyl or phenyl, or the substituent pairs (R_1 and R_2) and (R_3 and R_4) are each, independently of each other, together with the nitrogen atom joining them a five- or six-membered, heterocyclic radical, Y_1 is hydrogen, lower alkyl, cycloalkyl, phenalkyl or phenyl, Z_2 is hydrogen, unsubstituted or halogen-, hydroxyl-, cyano- or (lower alkoxy)-substituted alkyl having at most 12 carbon atoms, acyl having 1 to 12 carbon atoms or unsubstituted or halogen-, cyano-, (lower alkyl)- or (lower alkoxy)-substituted benzyl, X is hydrogen, halogen, lower alkyl, C_1 - C_{12} -alkoxy, C_1 - C_{12} -acyloxy, benzyl, phenyl, benzyloxy, phenyloxy, halogen-, cyano-, (lower alkyl)- or (lower alkoxy)-substituted benzyl or benzyloxy, or the group $-NT_1T_2$, T_1 and T_2 are each, independently of the other, hydrogen, lower alkyl, cycloalkyl, unsubstituted or halogen-, cyano-, (lower alkyl) or (lower alkoxy)-substituted benzyl or acyl having 1 to 12 carbon atoms and T_1 is also unsubstituted or halogen-, cyano-, (lower alkyl)- or (lower alkoxy)-substituted phenyl.

4,876,357

CHROMOGENIC PHTHALIDES AND AZAPHTHALIDES
Rox Pfaff, Rheinfelden, and Davor Bedekovic, Biel-Benken, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Oct. 26, 1987, Ser. No. 113,840

Claims priority, application Switzerland, Oct. 28, 1986, 4268/86; Jan. 5, 1987, 2148/87

Int. Cl. C07D 405/02

U.S. Cl. 548-463

9 Claims

1. A chromogenic phthalide or azaphthalide of the formula

4,876,358

OXYETHYLENE BISMALEIMIDE DERIVATIVES
David C. Alexander, Austin, Tex., assignor to Texaco Inc., White Plains, N.Y.

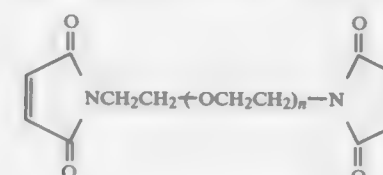
Filed Nov. 25, 1987, Ser. No. 125,086

Int. Cl. C07D 207/452

U.S. Cl. 548-521

1 Claim

1. A liquid bismaleimidoaspartimide prepolymer comprising 60 to 90 weight percent bismaleimide of the formula:



wherein $n=2$ and 10 to 40 weight percent triethylene glycol diamine.

4,876,360

1-THIOCARBAMYL METHYLPYRROLIDINE-2-THIONE, PROCESS FOR PREPARING

Vladimir G. Granik, Konakovsky proezd, 19, kv. 64., Moscow; Tatyana V. Stezhko, ulitsa Severnaya, 8, kv. 30, oblast, Odintsovo, Moskovskaya; Robert G. Gushkov, ulitsa Gorkogo, 43, kv. 90., Moscow; Mikhail D. Mashkovsky, Leninskoprospekt, 75a, kv. 55., Moscow; Lidia F. Roachina, Rostovskaya naberezhnaya, 3, kv. 135., Moscow; Antonina I. Polezhaeva, ulitsa 13 Parkovaya, 25, korpus 1, kv. 6., Moscow; Roza B. Parimbetova, ulitsa 1. Babushkina, 3, kv. 217., Moscow; Jury G. Bobkov, ulitsa Letnaya, 33, korpus 1, kv. 7., Moscow; Alexander S. Losev, ulitsa Bekhtereva, 7, korpus 1, kv. 42., Moscow, and Irina A. Ivanova, Volokolamskoe shosse, 14, kv. 41., Moscow, all of U.S.S.R.

Division of Ser. No. 198,999, Apr. 4, 1988, Pat. No. 4,839,380.

This application Apr. 5, 1989, Ser. No. 333,349

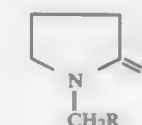
Claims priority, application U.S.S.R., Mar. 23, 1984, 3714493

Int. Cl. C07D 207/24

U.S. Cl. 548-550

3 Claims

1. A process for producing 1-thiocarbamylmethylpyrrolidine-2-thione, which comprises reacting a derivative of pyrrolidone-2 of the general formula:



wherein R is nitrile or carbamyl with phosphorus pentasulphide in an inert non-polar solvent at a temperature above room temperature, followed by treatment of the resulting precipitate with water upon boiling and isolation of the desired product.

4,876,361

PROCESS FOR THE PRODUCTION OF THIOPHENES FROM ALPHA-METHYLENE KETONES IN THE SINGLE-STAGE PROCESS AND NEW ORTHO-FUSED THIOPHENES PRODUCED BY MEANS OF THE PROCESS

Clara-D. Czogalla, Feldkirchen-Westerham, Fed. Rep. of Germany, assignor to Rita von der Haar-Czogalla, Feldkirchen-Westerham, Fed. Rep. of Germany

Filed Dec. 7, 1987, Ser. No. 129,701

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1986, 3443961

Int. Cl. C07D 333/50

U.S. Cl. 549-41

22 Claims

1. A process for the production of a thiophene or b.d.-ortho-fused thiophene, comprising: reacting an α -methylene ketone in a polar solvent with bromine to form a 2-bromo-1-ketone, separating the solvent out, directly reacting the formed 2-bromo-1-ketone with a sulphurising agent in a solvent to form a reaction product, and isolating the formed reaction product.

4,876,362

PROCESS FOR THE PREPARATION OF THIENYLETHYLAMINES

Joël Radisson, Toulouse, and Emile Braye, Anterive, both of France, assignors to Sanofi, Paris, France

Filed Dec. 11, 1987, Ser. No. 132,070

Claims priority, application France, Dec. 23, 1986, 8618101

Int. Cl. C07D 409/00, 333/12

U.S. Cl. 549-59

7 Claims

1. A process for the preparation of thienylethylamines of the formula $R-NH-R'$, in which R represents



and R' represents H or the radical R, comprising subjecting a solution of a thienyl-acetonitrile of the formula



to a hydrogenation in the presence of a Raney nickel catalyst and a mineral or organic base, at a pressure between 10^5 and 10^7 Pa, and at a temperature between 15°C . and 80°C .

4,876,363

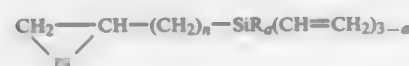
EPOXY-CONTAINING ORGANIC SILICON COMPOUNDS

Yuichi Funahashi, Junichiro Watanabe, Kiyoshi Takeda, and Makoto Matsumoto, all of Ohta, Japan, assignors to Toshiba Silicone Co., Ltd., Japan

Filed Aug. 30, 1988, Ser. No. 238,720

Claims priority, application Japan, Sep. 11, 1987, 62-226404 Int. Cl.⁴ C07D 303/04

U.S. Cl. 549—215 4 Claims
1. An epoxy-containing organic silicon compound represented by general formula (I):



wherein R, which may be the same or different, represents a monovalent hydrocarbon group free from an aliphatic unsaturated bond which is selected from the group consisting of an alkyl group, a cycloalkyl group, an aryl group and an aralkyl group having up to 9 carbon atoms; a represents 1 or 2; and n represents an integer of 2 to 6.

4,876,364

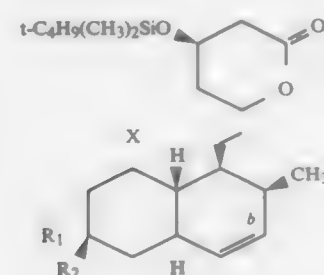
HYDROGENATION PROCESS FOR THE FORMATION OF 4A,5-DIHYDRO HMG-COA REDUCTASE INHIBITORS

Ann D. Schuda, New Providence; Thomas R. Verhoeven, Cranford, and Ichiro Shinkai, Westfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Sep. 3, 1987, Ser. No. 92,802

The portion of the term of this patent subsequent to Sep. 5, 2006, has been disclaimed.
Int. Cl.⁴ C07D 309/30

U.S. Cl. 549—214 18 Claims
1. A process for the preparation of a compound of structural formula (III):

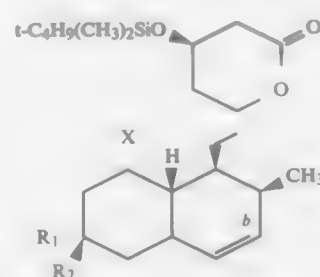


wherein:
X is OH, NH₂ or OR; where R is C₁-alkyl, C₃-cycloalkyl,

phenylC₁-alkyl, or substituted phenylC₁-alkyl in which the substituent is halogen, CN, or CF₃;
R₁ is H or CH₃ or CH₂OSi(Me)₂-C₄H₉ or OSi(Me)₂-C₄H₉;

R₂ is H or CH₂OSi(Me)₂-C₄H₉ or OSi(Me)₂-C₄H₉; provided that when R₁ or R₂ is CH₂OSi(Me)₂-C₄H₉ the other is H; and one and only one of R₁ and R₂ can be OSi(Me)₂-C₄H₉; and

b is a double bond or a single bond; which comprises:
contacting a compound of structural formula (II)



with 1,5-cyclooctadiene(pyridine)(tricyclohexyl-phosphine)iridium(I)hexafluorophosphate or norbornadiene-1,4-bis(diphenylphosphino)butane rhodium(I)hexafluoroborate; in an alcoholic solvent, under hydrogen gas pressure.

4,876,365

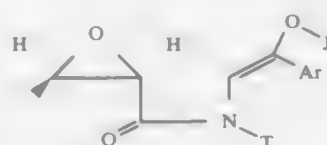
INTERMEDIATE COMPOUNDS FOR PREPARING PENEMS AND CARBAPENEMS

Michael P. Kirkup, Somerset, and Stuart W. McCombie, Caldwell, both of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Filed Dec. 5, 1988, Ser. No. 279,751

Int. Cl.⁴ C07D 303/02

U.S. Cl. 549—215 9 Claims
1. A compound represented by the formula



wherein
J is —SiR¹R²R³;
R¹, R² and R³ independently represent lower alkyl or phenyl;
T is hydrogen, or a blocking group T', which is —CH₂OR⁴ (wherein R⁴ is alkyl or phenyl), 2-alkenyl, phenyl, phenyl-alkyl, or phenyl substituted with alkyl, alkoxy or halogen;
Ar is phenyl or phenyl substituted with nitro, alkyl, alkoxy, or halo.

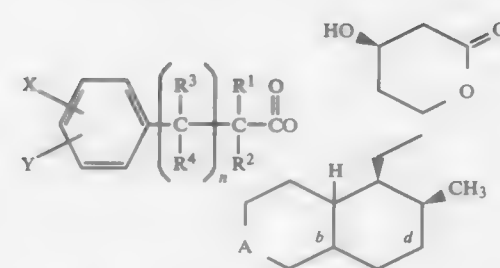
4,876,366

ANTIHYPERCHOLESTEROLEMIC COMPOUNDS
William F. Hoffman, Ta J. Lee, Robert L. Smith, all of Lansdale, and Clarence S. Rooney, Worcester, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

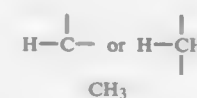
Continuation-in-part of Ser. No. 859,534, May 5, 1986, abandoned. This application Jan. 10, 1988, Ser. No. 205,407

Int. Cl.⁴ A61K 31/365; C07D 309/30

U.S. Cl. 514—570 22 Claims
1. A compound represented by the following general structural formula (I):



wherein:
n is 0 to 2;
R¹ is C₁-alkyl;
R₂ is hydrogen or C₁-alkyl;
each of the R³s and R⁴s are independently selected from hydrogen or C₁-alkyl;
X and Y independently are hydrogen, trifluoromethyl, hydroxy, C₁-alkyl thiomethyl, hydroxy methyl, or aminomethyl, provided that both X and Y are not hydrogen;
A is



and
b and d represent single bonds, or both b and d represent double bonds.

4,876,367

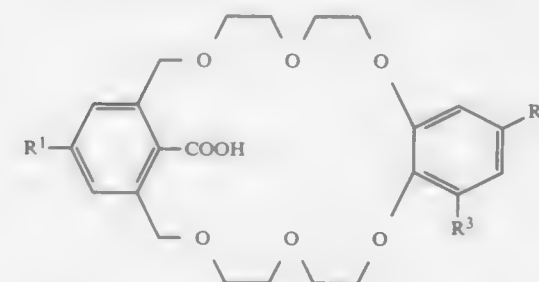
MACROCYCLIC POLYETHER CARBOXYLIC ACIDS
Frank J. Urban, Waterford, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 916,676, Sep. 4, 1986, Pat. No. 4,777,270.

This application Sep. 6, 1988, Ser. No. 241,169

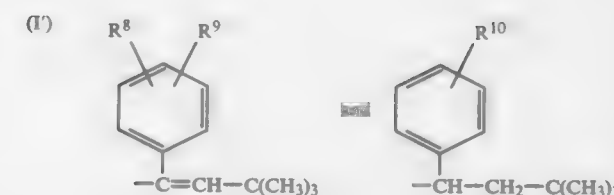
Int. Cl.⁴ C07D 323/00

U.S. Cl. 549—349 10 Claims
1. A macrocyclic polyether compound of formula



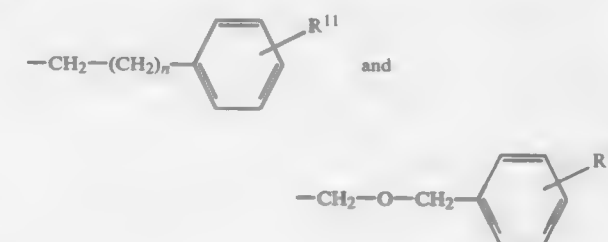
and the pharmaceutically-acceptable base salts thereof, wherein:

R¹ is selected from the group consisting of hydrogen and t-butyl;
R² is selected from the group consisting of hydrogen, alkyl having 1 to 14 carbons, cycloalkyl having 5 to 8 carbons, phenyl, alkylphenyl having 1 to 4 carbons in said alkyl, 1-adamantyl, —C(R⁷)=CH—C(CH₃)₃,

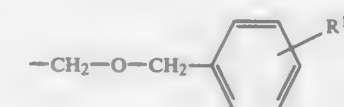


wherein R⁷ is hydrogen or alkyl having 1 to 8 carbons; R⁸ and R⁹ when taken separately are each hydrogen, alkyl having 1 to 3 carbons, alkoxy having 1 to 3 carbons or alkylthio having 1 to 3 carbons; R⁸ and R⁹ when taken together with the carbons to which they are attached form a fused benzo ring; and R¹⁰ is hydrogen, alkyl having 1 to 3 carbons, alkoxy having 1 to 3 carbons or alkylthio having 1 to 3 carbons;

R³ is selected from the group consisting of hydrogen, alkyl having 1 to 8 carbons, hydroxymethyl, methoxymethyl,



wherein R¹¹ is hydrogen, alkyl having 1 to 3 carbons, fluoro or chloro; R¹² is hydrogen, alkyl having 1 to 3 carbons or alkylthio having 1 to 3 carbons; and n is an integer from 0 to 3; provided that when R³ is said



R² must be t-octyl.

4,876,368

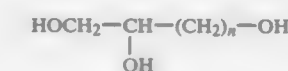
PRODUCTION OF MONOHYDROXY MONOCYCLIC ACETALS AND THEIR ESTERS

Jerry A. Broussard, Summit, N.J.; Wayne C. Fuqua, Boulder, Colo., and James H. George, Portland, Tex., assignors to Hoechst Celanese Corporation, Bridgewater, N.J.

Filed May 24, 1988, Ser. No. 197,936

Int. Cl.⁴ C07D 319/06, 317/20, 321/06

U.S. Cl. 549—374 12 Claims
3. A process comprising reacting a composition comprising a trihydroxy alcohol selected from the group consisting of trimethylolpropane, trimethylolethane and compounds of the formula:



where n is 1 to 4, with an aldehyde having the formula:



where R' is hydrogen, C₁-C₃ alkyl, or C₁-C₃ halogenated alkyl, to produce a monohydroxy monocyclic acetal and at least one heavier condensation product having a higher molecular

weight and higher boiling point than said monohydroxy monocyclic acetal, separating said monohydroxy monocyclic acetal from said heavier condensation product, and subjecting at least part of said heavier condensation product to acetal formation conditions to produce an additional amount of said monohydroxy monocyclic acetal.

4,876,369

PROCESS FOR SYNTHESIZING CHROMANES

Richard Barner, Witterswil, and Josef Hübscher, Nunningen, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Aug. 23, 1988, Ser. No. 235,257

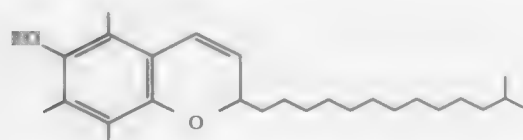
Claims priority, application Switzerland, Aug. 25, 1987, 3244/87

Int. Cl.⁴ C07D 311/70

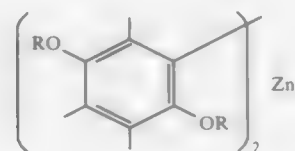
U.S. Cl. 549—411

8 Claims

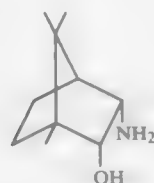
1. A process for preparing a compound of the formula



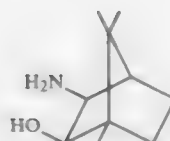
wherein OR forms a hydrolyzable ether group, comprising reacting phytanal with a metal organic compound of the formula



wherein R is as above in the presence of a chiral catalyst of the formula



or



4,876,370

1,3,5-NONATRIENE DERIVATIVES, THEIR PREPARATION AND THEIR USE

Lucette Duhamel, and Pierre Duhamel, both of Mont Saint Aignan, France, assignors to Rhone-Poulenc Sante, Antony, France

Filed Sep. 19, 1988, Ser. No. 245,920

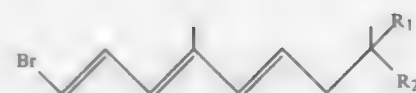
Claims priority, application France, Sep. 22, 1987, 87 13055

Int. Cl.⁴ C07D 317/16; C07C 47/21, 43/303

U.S. Cl. 549—455

2 Claims

1. A 1,3,5-nonatriene derivative of the formula:



in which either R₁ and R₂, together with the carbon atom to which they are linked, form a carbonyl group or R₁ and R₂ each denote an alkoxy radical of 1 to 4 carbon atoms or R₁ and R₂ together form an alkylendioxy radical.

4,876,371

PROCESS OF PRODUCING GLYCIDYL ETHERS OF MONOHYDRIC OR POLYHYDRIC PHENOLS

Iko Ito; Yoshiaki Toyoshima, both of Ehime; Hisao Takagishi, Kyoto, and Tsutomu Takahashi, Ehime, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan
Continuation of Ser. No. 650,465, Sep. 14, 1984, abandoned, which is a continuation-in-part of Ser. No. 489,296, Apr. 28, 1983, abandoned. This application May 29, 1987, Ser. No. 56,319
Claims priority, application Japan, Apr. 28, 1982, 57-71838; Apr. 28, 1982, 57-71839

Int. Cl.⁴ C07D 301/28

U.S. Cl. 549—517

1 Claim

1. A process of producing glycidyl ethers of monohydric or polyhydric phenols which comprises:

mixing a monohydric or polyhydric phenol, dioxane or diethoxyethane, and epichlorohydrin, wherein the amount of dioxane or diethoxyethane is in the range of 10 to 100 parts by weight per 100 parts by weight of epichlorohydrin, and the amount of epichlorohydrin is in the range of 2.5 to 20 mols per mol of the phenolic hydroxy group, gradually adding to the mixture an aqueous solution of an alkali metal hydroxide in an amount in the range of 0.9 to 1.1 mols per mol of the phenolic hydroxyl group and subjecting to azeotropic distillation water, dioxane or diethoxyethane, and epichlorohydrin at a temperature of about 56° C. to about 72° C. and a pressure of about 150 mmHg to about 250 mmHg,

maintaining the water content of the mixture in the range of from 0.2 to 2.5 wt%, followed by liquefaction of the distillate to be divided into an aqueous layer and an organic layer, and circulating the organic layer to the mixture whereas eliminating the aqueous layer.

4,876,372

METHOD FOR PREPARING EPICHLOROHYDRINS

Takehisa Nakanishi, Takaishi; Eizi Koga, Izumi, and Isao Fukada, Takaishi, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Filed Apr. 13, 1988, Ser. No. 181,181

Claims priority, application Japan, Apr. 16, 1987, 62-91899; Feb. 4, 1988, 63-22730

Int. Cl.⁴ C07D 301/19

U.S. Cl. 549—529

8 Claims

1. A method for preparing epichlorohydrins, which comprises:

reacting a 2-alkylallyl chloride, wherein the alkyl substituent contains from 1 to 3 carbon atoms, with an alkyl hydroperoxide in the presence of a catalyst having titanium atoms bound to a silicon dioxide carrier via oxygen atoms and having at least three but not more than 6 silanol groups per square nanometer of the carrier, said catalyst having been heat treated at a temperature ranging from 100° C. to 250° C.

4,876,373
METHOD OF MANUFACTURING ORGANOPOLYSILOXANE HAVING TERMINAL ALKENYL GROUPS

Tadashi Okawa, and Toshio Suzuki, both of Chiba, Japan, assignors to Toray Silicone Company, Ltd., Tokyo, Japan
Filed Aug. 31, 1988, Ser. No. 242,237

Claims priority, application Japan, Aug. 31, 1987, 62-217293; Apr. 28, 1988, 63-107345

Int. Cl.⁴ C07F 7/08

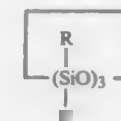
U.S. Cl. 556—453

7 Claims

1. A method of manufacturing an organopolysiloxane having terminal alkenyl groups as represented by the formula



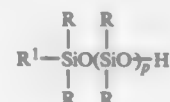
comprising polymerizing a cyclic trisiloxane with the formula



using as a polymerization initiator an alkali metal salt of an organosilane or organopolysiloxane as represented by the formula



in the presence or absence of a molecular weight regulator which is an organosilane or organopolysiloxane as represented by the formula



and then terminating the reaction,

wherein R¹ represents an alkenyl group, R represents a single-charge hydrocarbon group or single-charge halogenated hydrocarbon group of the same or different types, A represents an alkali metal, m is 0 or an integer of 1 or above, p is 0 or an integer of 1 or above and may be equal to or different from the value of m, B represents a hydrogen atom or a single-charge group selected from among terminal ending groups, and n meets the conditions of n>m+3, and the molar ratio of the polymer initiator and the molecular weight regulator are in a range of 100:0 to 0.1:100.

4,876,374

PROCESS FOR MANUFACTURING AMIDES

Paul E. Adams, and Darryl W. Kinzer, both of Willoughby Hills, Ohio, assignors to The Lubrizol Corporation, Wickliffe, Ohio
Filed May 22, 1987, Ser. No. 54,172

Int. Cl.⁴ C07F 9/40

U.S. Cl. 558—109

9 Claims

1. A process for producing amide compounds comprising the steps of:
reacting an aqueous acrylamide (I) and a phosphorus-con-

taining acid having the following general structural formula: (II)



wherein R is hydrocarbyl and X₁ and X₂ are independently selected from the group consisting of sulfur and oxygen, the reacting being carried out by concomitantly combining substantially stoichiometrically equal amounts of acrylamide present in the aqueous acrylamide (I) and phosphorus-containing acid (II); and obtaining a reaction product in the form of an amide having the following general structural formula: (III)



wherein R is hydrocarbyl, R₁ and R₂ are independently hydrogen or methyl and X₁ and X₂ are independently selected from the group consisting of sulfur and oxygen.

4,876,375

NORBORNYL DITHIOCARBAMATES

William Y. Lam, Ballwin, Mo., assignor to Ethyl Petroleum Additives, Inc., St. Louis, Mo.

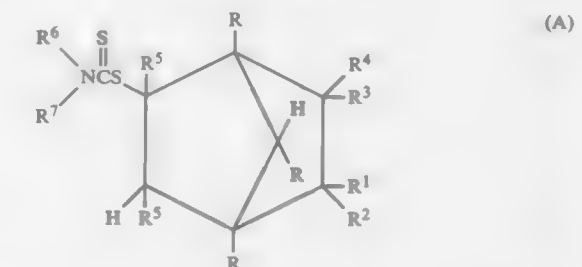
Filed May 2, 1988, Ser. No. 189,101

Int. Cl.⁴ C07C 155/08

U.S. Cl. 558—235

4 Claims

1. Compounds having the formula:



wherein:

- each of R, R² and R⁴ when taken singly is a hydrogen atom, an alkyl group containing from 1 to 15 carbon atoms, an aryl group consisting of a benzene or a naphthalene group containing from 6 to 15 carbon atoms or a cycloalkyl group containing from 4 to 10 carbon atoms;
- each of R¹ and R³ when taken singly is a hydrogen atom, an alkyl group containing from 1 to 15 carbon atoms; an aryl group consisting of a benzene or a naphthalene group containing from 6 to 15 carbon atoms; a cycloalkyl group containing from 4 to 10 carbon atoms or an alkenyl group containing from 2 to 10 carbon atoms or R¹ or R³ taken together form the group —CHYCY— in which Y is a hydrogen atom or a methyl group or R¹ together with R² form an alkylidene group containing from 1 to 6 carbon atoms;
- R⁵ is a hydrogen atom or an alkyl group containing from 1 to 15 carbon atoms;
- R⁶ is an organic radical selected from an alkyl group, an alkenyl group, an aryl group or an aralkyl group in which the alkyl or alkenyl groups contain up to 32 carbon atoms and the aryl or aralkyl groups are selected from benzene and naphthalene groups which contain up to 15 carbon atoms each; and
- R⁷ hydrogen or an organic radical selected from an alkyl group or alkenyl group, an aryl or aralkyl group in which the alkyl or alkenyl groups contain up to 32 carbon atoms

and the aryl or aralkyl groups are selected from benzene and naphthalene groups which contain up to 15 carbon atoms each.

4,876,376

PROCESS FOR THE HALOGENATION, NITRATION AND FLUORINATION OF AROMATIC DERIVATIVES
Michael Desbois, Rillieux, and Camille Disdier, Lyons, both of France, assignors to Rhone-Poulenc Specialites Chimiques, Courbevoie, France

Continuation of Ser. No. 874,831, Jun. 16, 1986, abandoned, which is a continuation of Ser. No. 623,464, Jun. 22, 1984, abandoned. This application Dec. 15, 1987, Ser. No. 134,539
Claims priority, application France, Jun. 23, 1983, 83 10371
Int. Cl.⁴ C07C 148/00, 118/00, 76/02

U.S. Cl. 558—412

21 Claims

1. A process for the halogenation, nitration and fluorination of an aromatic compound corresponding to the formula:



in which:

Ar is a monocyclic or polycyclic aromatic radical which may contain at least one substituent other than said $-(\text{ACX}_1\text{X}_2\text{Y})$ group(s);

A is a covalent bond, oxygen or sulfur;

X₁ and X₂, which are identical or different, are a halogen; Y is selected from the group consisting of hydrogen, a halogen and an optionally halogenated alkyl chain having 1 to 3 carbon atoms;

wherein the halogens corresponding to X₁, X₂ and Y are identical or different, but at least one of them is other than fluorine; and

n is equal to 1 or 2;

comprising the step of reacting, in the substantial absence of a halogenation or nitration catalyst other than liquid hydrofluoric acid, the aromatic compound simultaneously or successively with a halogen and a nitrating agent, in liquid hydrofluoric acid for a time sufficient to effect halogenation and nitration of the aromatic ring of said aromatic compound and to effect halogen-fluorine exchange on said $-(\text{ACX}_1\text{X}_2\text{Y})$ group(s);

with the proviso that when A is oxygen or sulfur, the halogen-fluorine exchange occurs on the carbon atom located in the alpha-position to either the oxygen or sulfur atom.

4,876,377

ALKYLATION OF AROMATIC AMINES WITH OLEFINS ON PARTIALLY DEALUMINATED ZEOLITES

Rakesh Agrawal; Steven R. Anvil, both of Allentown, Pa., and Michel Deeba, North Brunswick, N.J., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Continuation-in-part of Ser. No. 796,465, Nov. 8, 1985, Pat. No. 4,740,620, and a continuation-in-part of Ser. No. 848,000, Apr. 2, 1986, abandoned. This application Mar. 22, 1988, Ser. No. 171,602

The portion of the term of this patent subsequent to Apr. 26, 2005, has been disclaimed.

Int. Cl.⁴ C07C 87/452

U.S. Cl. 558—416

19 Claims

1. In a process for producing an alkylated aromatic amine by contacting an aromatic amine with an olefin in the presence of a zeolitic catalyst system, the improvement wherein enhanced activity and selectivity to ortho-alkylated amine product is obtained which comprises contacting the aromatic amine and olefin with a highly acidic zeolite having an acidity factor such that at least 0.3 mm ammonia are irreversibly absorbed at 200° C. per gram of catalyst for 2 hours and which has been partially dealuminated in an amount sufficient to remove at least 10% by weight by the original alumina from the zeolite.

4,876,378

RECOVERY OF DIALKYL NAPHTHALENE-2,6-DICARBOXYLATES FROM NAPHTHALENE-2,6-DICARBOXYLIC ACID-CONTAINING POLYESTERS

Dale E. Van Sickle, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 23, 1988, Ser. No. 197,232

Int. Cl.⁴ C07C 67/60, 69/76

U.S. Cl. 560—78

22 Claims

1. A process for the formation of dialkyl naphthalene-2,6-dicarboxylates from a polymer or polymer mixture containing poly(alkylene naphthalene-2,6-dicarboxylate), said process comprising heating a mixture comprising:

- said polymer or polymer mixture,
 - at least one alcohol having 1 to 5 carbon atoms or a diol having 1 to 5 carbon atoms, and
 - at least one transesterification catalyst,
- wherein said heating is carried out under suitable conditions of temperature and pressure for a time sufficient to at least partially alcoholize said mixture.

4,876,379

OXIDATIVE ALKOXYCARBONYLATION OF AMINES AND AMINE DERIVATIVES

Carl A. Udovich, Joliet, Ill., assignor to Amoco Corporation, Chicago, Ill.

Continuation of Ser. No. 101,126, Sep. 21, 1987, abandoned. This application Nov. 9, 1988, Ser. No. 269,237

Int. Cl.⁴ C07C 125/073

U.S. Cl. 560—158

8 Claims

1. In an elevated temperature and pressure process for making a carbamate by carbonylating a substance selected from the group consisting of phenylene or tolylene diamine, phenylene or tolylene diformamide, phenylene or tolylene diurea, phenylene or tolylene dihydrazine, and compounds of formula $\text{R}(\text{NHCOH})_2$, wherein R is an alkylene group, $-\text{CH}_2)_x$, in which x runs between two and six, with carbon monoxide in the presence of a C₁ to C₃ alkanol, an oxygen transfer agent, and a catalyst comprising a palladium compound, the improvement which uses pyridine N-oxide as said oxygen-transfer agent.

4,876,380

COLOR REDUCTION OF POLYMERIC ISOCYANATES VIA MULTIPLE SOLVENT FRACTIONATION

Lao-Jer Chen, and Steven B. Lowenkron, both of Houston, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Aug. 31, 1988, Ser. No. 239,082

Int. Cl.⁴ C07C 143/00

U.S. Cl. 560—352

16 Claims

1. A process for extracting a crude organic polyisocyanate obtained from the phosgenation of a precursor organic polyamine to form a purified fraction and a residual fraction said process comprising:

- extracting said crude polyisocyanate in a first extractor with a solvent pair comprising at least one first solvent capable of solubilizing substantially all of said crude polyisocyanate and at least one second solvent capable of solubilizing all but the high boiling higher polymeric components present in said crude polyisocyanate thereby forming a first top layer comprising said second solvent and a first bottom layer comprising said first solvent;
- passing said first bottom layer, optionally through an evaporator, to a second extractor;
- extracting said first bottom layer in said second extractor with said solvent pair set forth above thereby forming a second top and second bottom layers;
- passing said second top layer through an evaporator to recover said second solvent as overhead and said purified fraction as residue; and
- passing said second bottom layer, optionally through an

evaporator, and in combination with said first top layer to an evaporator to recover said second solvent, and, optionally, said first solvent as overhead and said residual fraction as residue.

4,876,381

NAPHTHALENE DERIVATIVES POSSESSING A RETINOID-TYPE ACTION, PROCESSES FOR THEIR PREPARATION, AND MEDICINAL AND COSMETIC COMPOSITIONS CONTAINING THESE DERIVATIVES

Gérard Lang, Saint Gratien; Jean Maignan, Tremblay les Gonesse; Serge Forestier, Claye-Souilly; Serge Restle, Aulnay sous Bois; Alain Lagrange, Chatou, and Braham Shroot, Antibes, all of France, assignors to L'Oreal, Paris, France

Filed Aug. 18, 1987, Ser. No. 86,934

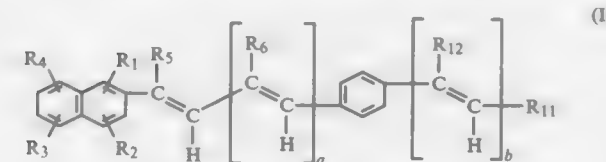
Claims priority, application Luxembourg, Sep. 28, 1984, 85558

Int. Cl.⁴ C07C 67/76

U.S. Cl. 560—56

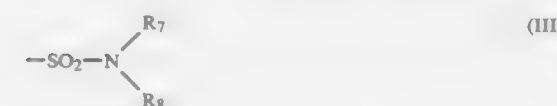
29 Claims

1. A compound corresponding to the general formula (II)

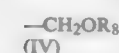


or an isomer or salt thereof, in which formula:

- a and b are independently 0 or 1,
R₁, R₂, R₃ and R₄, which may be present on one or other of the rings or on both simultaneously, independently represent a hydrogen atom, a linear or branched C₁-C₆-alkyl radical or a C₁-C₆-alkoxy radical,
R₅ represents a C₁-C₆-alkyl radical,
R₅ and R₁₂ independently represent a hydrogen atom or a C₁-C₆-alkyl radical, with the proviso that R₅ cannot represent hydrogen if a=b=0 and
R₁₁ represents a $-\text{COR}_9$ group, in which R₉ represents
(a) a hydrogen atom, a C₁-C₆-alkyl radical, an amino radical, an optionally substituted arylamino radical or optionally substituted benzylamino radical, a heterocyclic amino radical, a C₁-C₆-alkylamino radical, or a di(C₁-C₆)alkylamino radical, the alkyl chains of said alkylamino or dialkylamino radicals being optionally substituted by one or more hydroxyl groups and/or contain a chain hetero-atom, the group $-\text{COR}_9$, where it is an amide group, moreover optionally being the amide group of an amino acid or glucosamine, or
(b) an OR₁₀ radical, where R₁₀ represents a hydrogen atom, a C₁-C₆-alkyl radical, a monohydroxy or polyhydroxy-C₂-C₆-alkyl radical or a substituted or unsubstituted aryl or benzyl radical, or OR₁₀ is derived from a sugar of formula R₁₀OH, and
R₁₁ can also, if b=0, represent a hydroxyl radical, a C₁-C₄-alkoxy radical, a C₁-C₆-alkyl radical, a C₁-C₆-alkylthio radical, a C₁-C₆-alkylsulphanyl radical, a C₁-C₆-alkylsulphonyl radical or a sulphonamide radical of the formula (III)



where R₇ represents a C₁-C₆-alkyl radical and R₈ either a hydrogen atom or a C₁-C₆-alkyl radical, and R₁₁ can also represent a radical of the formula (IV)



in which formula R₈ is as defined above.

4,876,382

PROCESS FOR MAKING FLUOROBENZOIC ACID FLUOROPHENYLESTERS

Yasunobu Nishimura, Kamifukuoka, and Toshikazu Kawai, Kawagoe, both of Japan, assignors to Central Glass Company, Limited, Ube, Japan

Filed Jan. 13, 1988, Ser. No. 143,636

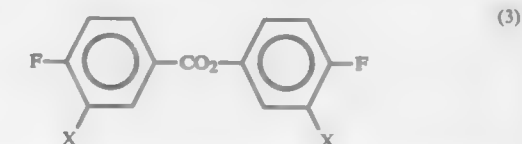
Claims priority, application Japan, Jan. 30, 1987, 62-18507; Jan. 30, 1987, 62-18508

Int. Cl.⁴ C07C 69/76

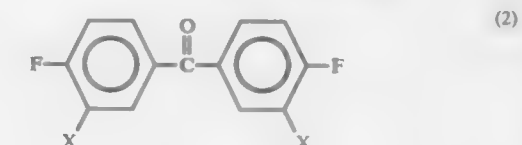
U.S. Cl. 560—109

4 Claims

1. A method of preparing a fluorophenyl fluorbenzoate represented by the formula (3),



wherein X is F or Cl, comprising oxidizing a fluorobenzophenone represented by the formula (2) in an organic solvent by using trifluoroacetic acid and hydrogen peroxide,



wherein X is F or Cl;

wherein at least 1 mol of trifluoroacetic acid is used per mole of the fluorobenzophenone to be oxidized; and wherein the oxidation of the fluorobenzophenone is carried out at a temperature not higher than 50° C.

4,876,383

AMINO ACID DERIVATIVES, THEIR PRODUCTION AND USE IN PREPARING CARBAPENEM AND CARBAPENAM COMPOUNDS

Shigeo Nozoe, and Tomihisa Ohta, both of Sendai, Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

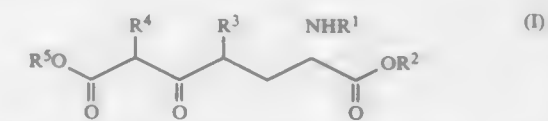
Filed Sep. 11, 1987, Ser. No. 95,445

Claims priority, application Japan, Sep. 12, 1986, 61-215093
Int. Cl.⁴ C07C 101/34

U.S. Cl. 560—163

6 Claims

1. An amino acid derivative of formula (I) and having the (S)-configuration in the α-position relative to the amino group,



wherein R¹ is an N-protecting organic group capable of being removed under reducing conditions, R² and R³ are, independently, hydrogen or a carboxylic-protecting group, R³ is hydrogen, C₁₋₃ alkyl, hydroxyl, methoxy or acetoxy, R⁴ is methyl, ethyl, i-propyl, benzyl or a CH₃CR⁶(OR⁷)-organic group in which R⁶ is hydrogen or methyl and R⁷ is hydrogen or a hydroxyl-protecting group.

4,876,384

RADIATION-HARDENABLE DILUENTS

Francis A. Higbie, Bound Brook, N.J.; Robert A. Lieberman, Naperville, Ill., and Ira M. Rose, Millburn, N.J., assignors to Diamond Shamrock Chemicals Co., Dallas, Tex.

Continuation-in-part of Ser. No. 725,801, Apr. 22, 1985, abandoned, and a continuation-in-part of Ser. No. 797,483, Nov. 13, 1985, abandoned. This application Apr. 8, 1986, Ser. No. 849,301

Int. Cl.⁴ C07C 69/52

U.S. Cl. 560—224

8 Claims

1. A lower alkyl ether acrylate which is mono-methoxy, ethoxylated neopentyl glycol monoacrylate having an average of about two moles of ethylene oxide.

4,876,385

BATCH OR SEMICONTINUOUS PSEUDOCUMENE OXIDATION AND CATALYST RECOVERY AND RECYCLE

Neal R. Nowicki, St. Charles, and Donald E. Thomka, Romeoville, both of Ill., assignors to Amoco Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 790,379, Oct. 23, 1985, Pat. No. 4,769,488, which is a continuation-in-part of Ser. No. 565,915, Dec. 27, 1983, abandoned. This application Mar. 25, 1988, Ser. No. 173,711

The portion of the term of this patent subsequent to Sep. 6, 2005, has been disclaimed.

Int. Cl.⁴ C07C 51/265

U.S. Cl. 562—414

6 Claims

1. A process for producing trimellitic acid by the liquid-phase oxidation of pseudocumene in a batch process with an oxygen-containing gas in a solvent at an elevated temperature and pressure and in the presence of an oxidation catalyst comprising cobalt, manganese, and bromine components to produce an oxidation reactor effluent wherein weight ratio of said solvent to said pseudocumene is in the range of from about 19:1 to about 3:1 at a minimum reactor pressure which maintains a substantial liquid phase of said pseudocumene and at least 70 percent of said solvent, and said solvent is selected from the group consisting of any C₂—C₆ fatty acid and water, and mixtures thereof, the improvement in combination therewith comprising at least a portion of the cobalt and manganese catalyst components initially contacted with the pseudocumene and oxygen-containing gas is in the form of recovered oxalate salts of cobalt and manganese and wherein these salts have been obtained from the addition of solid oxalic acid, metal oxalates, or solutions thereof to said reactor effluent and recovering these salts by high temperature physical separation conducted at a temperature of about 250° F. to about 375° F. prior to separating trimellitic acid product cake from mother liquor wherein the metal oxalates are preheated at a temperature of about 400° F. to about 500° F. in the reaction solvent prior to recycle to the liquid-phase oxidation.

4,876,386

PROCESS FOR THE OXIDATION OF DI- OR TRIMETHYLBENZENES IN THE PRESENCE OF COBALT AND MANGANESE FROM OXIDATION RESIDUE INCINERATOR ASH

Juergen K. Holzhauser, Naperville; Dennis J. Michalak, Warrenville, and Wayne P. Schammel, Naperville, all of Ill., assignors to Amoco Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 62,965, Jun. 17, 1987, Pat. No. 4,786,621. This application May 26, 1988, Ser. No. 199,022

Int. Cl.⁴ C07C 51/265

U.S. Cl. 562—414

19 Claims

1. A process for the oxidation of di- or trimethylbenzenes with molecular oxygen under liquid-phase conditions in the presence of a recovered and recycled cobalt and manganese catalyst, which has been recovered by heating oxidation incinerator ash in the presence of acetic acid and a reducing agent wherein the weight ratio of acetic acid to said oxidation incin-

erator ash is from about 1:1 to about 50:1, and the ratio of electrons which the reducing agent can deliver to atoms of the cobalt plus manganese in the oxidation incinerator ash is from about 0.1:1 to about 4:1 at about the boiling point of the acetic acid at atmospheric pressure and recovering the cobalt and manganese in liquid solution as the metal acetic acid salt, wherein the oxidation is carried out at a temperature of from about 100° C. to about 250° C.

4,876,387

PROCESS FOR PREPARING 2,4,5-TRIFLUOROBENZOIC ACID

Deanne M. Nowak, Depew, and Henry C. Lin, Grand Island, both of N.Y., assignors to Occidental Chemical Corporation, Niagara Falls, N.Y.

Filed Feb. 27, 1989, Ser. No. 315,763

Int. Cl.⁴ C02C 63/04

U.S. Cl. 562—493

5 Claims

1. A process for preparing 2,4,5-trifluorobenzoic acid, said process comprising the steps of:

- reacting 4,5-difluoroanthranilic acid with a mineral acid to form the corresponding amine salt;
- converting said amine salt to the corresponding diazonium tetrafluoroborate; and
- heating said tetrafluoroborate to cause decomposition of it to 2,4,5-trifluorobenzoic acid.

4,876,388

METHOD FOR THE PURIFICATION OF TRIFURALINE

Guido Ravetta, Milan, Italy, assignor to I.P.I.C.I. S.p.A., Novate, Italy

Continuation of Ser. No. 892,384, Jul. 31, 1986, abandoned. This application May 20, 1988, Ser. No. 196,880

Int. Cl.⁴ C07C 85/26

U.S. Cl. 564—437

8 Claims

1. A method of purifying trifluralin, which comprises: passing saturated steam at a temperature of from 105° to 110° C. through the trifluralin, kept in the liquid state at a temperature of from 50° to 110° C., the pressure being regulated so as to avoid substantial condensation of the steam in the reactor;

continuing the emission of steam until a quantity of steam corresponding to from 1 to 4 times the weight of the trifluralin has been passed through the liquid trifluralin; and

recovering the purified trifluralin after the removal of any aqueous phase which may have formed during the treatment with the steam.

4,876,389

PROCESS FOR THE PRODUCTION OF ORGANIC POLYSULPHIDES AND CATALYST SYSTEM FOR ITS USE

Henri Gogora, Billere, and Yves Darche, Orthez, both of France, assignors to Societe Nationale Elf Aquitaine (Production), Courbevoie, France

Filed Nov. 27, 1987, Ser. No. 126,008

Claims priority, application France, Nov. 28, 1986, 86 16615

Int. Cl.⁴ C07C 148/00

U.S. Cl. 568—26

19 Claims

1. A process for the production of organic polysulphides of the type R—S_n—R, where R is a hydrocarbon group and n a number from 2 to 8, by heating one or more mercaptans with sulphur, in the presence of a catalyst, said catalyst being obtained by condensing one molar equivalent of a mercaptan with 1 to 20 molar equivalents of an alkylene oxide in the presence of 0.01 to 11.5 molar equivalent of an alkaline base.

4,876,390

PROCESS FOR SEPARATING DICHLORODIPHENYLSULFONE ISOMERS

Beth McCulloch, Barrington, Ill., assignor to UOP, Des Plaines, Ill.

Filed Aug. 19, 1988, Ser. No. 233,706

Int. Cl.⁴ C07C 147/06

U.S. Cl. 568—34

9 Claims

1. A process for separating an isomer of dichlorodiphenylsulfone from a feed mixture containing 4,4'-dichlorodiphenylsulfone and at least one other isomer thereof, which comprises contacting at adsorption conditions said mixture with an adsorbent comprising a type Y or type X zeolite having cations selected from Group IA or IIA metals and ammonium at exchangeable cation sites, adsorbing said other isomers to the substantial exclusion of said 4,4'-dichlorodiphenylsulfone, removing the nonadsorbed 4,4'-dichlorodiphenylsulfone from contact with said adsorbent as raffinate product and thereafter desorbing said other isomers by desorption at desorption conditions with a desorbent comprising an aliphatic alcohol having 4-8 carbon atoms.

4,876,391

PROCESS FOR PREPARATION AND PURIFICATION OF BISPHENOLS

Gaylord M. Kissinger, Evansville, Ind., assignor to General Electric Company, Mt. Vernon, Ind.

Filed Sep. 15, 1988, Ser. No. 244,370

Int. Cl.⁴ C07C 37/68, 37/86, 39/16

U.S. Cl. 568—724

6 Claims

1. A process which comprises

- contacting an excess of phenol with acetone in the presence of an acidic ion exchange resin catalyst;
- recovering thereafter a stream from the acidic ion exchange resin catalyst including bisphenol-A, unreacted phenol, isomer of bisphenol-A and acid impurities derived from the acidic ion exchange resin catalyst;
- removing a major portion of bisphenol-A from the stream of (b);
- separating the stream including phenol, a small portion of bisphenol-A, isomers of bisphenol-A, and acidic impurities derived from the acidic ion exchange resin catalyst into a major stream and a minor stream by volume;
- introducing into the minor stream created at step (d) sufficient quantities of a tetraorganoammonium borohydride to effectively offset the acidic impurities derived from the acidic ion exchange resin catalyst; and
- recovering from the small stream desirable dihydric phenol.

4,876,392

PROCESS FOR PREPARATION OF KEYSTONES BY OXIDATION OF SECONDARY ALCOHOLS USING A TRIMETALLIC CATALYST COMPRISING MOLYBDENUM, RHENIUM AND A GROUP VIII NOBLE METAL

Chuen Y. Yeh, Edison, and Charles Savini, Warren, both of N.J., assignors to Exxon Research & Engineering Company, Florham Park, N.J.

Division of Ser. No. 776,228, Sep. 16, 1985, Pat. No. 4,737,482, which is a division of Ser. No. 516,901, Jul. 25, 1983, Pat. No. 4,560,803, which is a continuation-in-part of Ser. No. 420,626, Sep. 21, 1982, abandoned. This application Mar. 28, 1988, Ser. No. 174,126

The portion of the term of this patent subsequent to Mar. 10, 2004, has been disclaimed.

Int. Cl.⁴ C07C 45/00, 45/50

U.S. Cl. 568—404

7 Claims

1. A process for preparing ketones which comprises contacting a secondary aliphatic alcohol in the gaseous phase with water vapor and molecular oxygen in a reaction zone contain-

ing a non-halide catalyst to form the ketone corresponding to said alcohol said catalyst having been prepared by the steps of:

- impregnating a thermally decomposable molybdenum compound on a catalyst support, and drying and calcining said impregnated catalyst;
- impregnating the solids contained in step (a) with a thermally decomposable rhenium compound or complex and drying and calcining the thus-produced solids impregnated with molybdenum and rhenium;
- further impregnating the solids obtained in step (b) with at least one thermally decomposable compound or complex of a Group VIII noble metal, and said noble metal-impregnated solids are dried and calcined, thereby forming a trimetallic supported catalyst comprising molybdenum, rhenium and a Group VIII noble metal, wherein each said drying and calcining step is conducted in the presence of air; and
- contacting the trimetallic supported catalyst obtained in step (c) with hydrogelsulfide to convert the oxide catalyst to the sulfide form, said supported catalyst consisting essentially of from about 0.1 to 10 wt. % of said rhenium (calculated as elemental rhenium); from about 1 to 30 wt. % of molybdenum (calculated as the elemental metal); and from about 0.001 to 5 wt. % of said Group VIII noble metal (calculated as the Group VIII noble metal).

4,876,393

β-FLUOROACYL-β-HALO VINYL ALKYL ETHERS

Hans-Georg Heine, and Pieter Ooms, both of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 5, 1988, Ser. No. 190,781

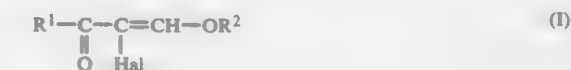
Claims priority, application Fed. Rep. of Germany, May 12, 1987, 3715704

Int. Cl.⁴ C07C 49/227

U.S. Cl. 568—415

3 Claims

1. A β-fluoroacyl-β-halogenovinyl alkyl ether of the formula



in which

R¹ is a fluoroalkyl or chlorofluoroalkyl group having 1 to 9 carbon atoms,
Hal is a halogen atom, and
R² is an alkyl group having 1 to 7 carbon atoms.

4,876,394

PROCESS FOR THE PRODUCTION OF METHYL TERT-ALKYL ETHERS

Moez M. Nagji, Stamford, Conn., and Robert E. Trabac, Ridge-wood, N.J., assignors to UOP, Des Plaines, Ill.

Continuation-in-part of Ser. No. 204,301, Jun. 9, 1988, Pat. No. 4,814,517. This application Jun. 29, 1988, Ser. No. 213,238

Int. Cl.⁴ C07L 41/06

U.S. Cl. 568—697

6 Claims

1. A cyclic process for preparing methyl tert-alkyl ether which comprises the steps of

- contacting and reacting in a reaction zone and in the liquid phase a reaction mixture formed by combining a stream consisting essentially of hydrocarbons having from 4 to 5 carbon atoms and containing at least some proportion of an isoalkylene having from 4 to 5 carbon atoms with methanol to form a reaction product comprising methyl tert-alkyl ether, at least 50 ppm (w) unreacted methanol, unreacted C₄—C₅ hydrocarbons and at least 5 ppm (w) dimethyl ether;
- isolating at least 99 percent (v) of the methyl tert-alkyl ether from the reaction product;
- treating the residual portion of the reaction product

containing both dimethyl ether and methanol by passing said residual portion through a first adsorption zone containing an adsorbent for both methanol and dimethyl ether whereby at least 95 weight percent of the methanol present is adsorbed and the weight ratio of adsorbed dimethyl ether to adsorbed methanol is at least 0.05 and a substantially methanol-free effluent is obtained which comprises non-adsorbed C₄-C₅ hydrocarbons and dimethyl ether;

(d) passing the effluent from step (c) through a second adsorption zone containing a selective adsorbent for dimethyl ether and recovering a hydrocarbon effluent;

(e) periodically regenerating the first adsorption zone by passing therethrough a purge fluid, and recycling the desorbed methanol and dimethyl ether to the said reaction zone;

(f) repeating the process of step (a) to produce additional methyl tert-alkyl ether and a reduced proportion of dimethyl ether with respect to the initial reaction in said reaction zone.

4,876,395

PROCESS FOR COLOR STABILIZATION OF BISPHENOL-A

Gaylord M. Kissinger, Evansville, Ind., assignor to General Electric Company, Mt. Vernon, Ind.

Filed Jul. 11, 1988, Ser. No. 217,722

Int. Cl.⁴ C07C 39/12

U.S. Cl. 568-728

11 Claims

1. A process which comprises
 - (a) contacting an excess of phenol with acetone in the presence of an acidic ion exchange resin catalyst;
 - (b) recovering thereafter a stream from an acidic ion exchange resin catalyst, said stream including bisphenol-A unreacted phenol, isomers of bisphenol-A and acid impurities derived from the acidic ion exchange resin catalyst;
 - (c) removing a major portion of the bisphenol-A from the stream of (b);
 - (d) adding to the bisphenol-A effective quantities of a Group II-a metal or transition metal of oxidation number +2 carbonate to color stabilize the bisphenol-A;
 - (e) recovering the solid bisphenol-A and the metal carbonate.

4,876,396

SELECTIVE CHLORINATION OF PHENOLS

Jean-Claude LeBlanc, Grenoble, and Serge Rattou, Villefontaine, both of France, assignors to Rhone-Poulenc Specialites Chimiques, Courbevoie, France

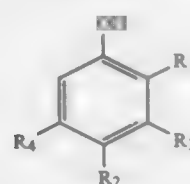
Continuation-in-part of Ser. No. 909,177, Sep. 19, 1986, abandoned. This application Jul. 28, 1987, Ser. No. 78,771
Claims priority, application France, Sep. 19, 1985, 85 14093; European Pat. Off., Sep. 3, 1986, 86.420221.3

Int. Cl.⁴ C07C 37/62, 39/24

U.S. Cl. 568-779

13 Claims

1. A process for the selective chlorination, at a position ortho to a hydroxyl group thereof, of a phenolic compound having the general formula (I):



in which R₂ is hydrogen, an alkyl radical having from 1 to 4 carbon atoms, an alkoxy radical having from 1 to 4 carbon atoms, an acyloxy radical having from 2 to 4 carbon atoms, an acyl radical having from 2 to 4 carbon atoms, a carboxyl radical, an ester radical —COOR₅, wherein R₅ is a straight or branched chain alkyl radical having from 1 to 4 carbon atoms, a nitrile radical, an —OH radical, or a —CHO radical; R₁ is

hydrogen or one of the substituents R₂; and R₃ and R₄, which may be identical or different, are each hydrogen or one of the substituents R₂; comprising reacting said compound (I) with gaseous chlorine, in a solvent free, molten reaction medium and at a temperature no greater than about 150° C., in the presence of a catalytically effective amount of a primary, secondary or tertiary amine.

4,876,397

METHOD FOR PRODUCTION OF PHENOL/ACETONE FROM CUMENE HYDROPEROXIDE

John F. Knifton, and Neal J. Grice, both of Austin, Tex., assignors to Texaco Chemical Company, White Plains, N.Y.

Filed Oct. 24, 1988, Ser. No. 261,819

Int. Cl.⁴ C07C 37/08, 45/53

U.S. Cl. 568-798

13 Claims

1. In a method for cosynthesis of phenol and acetone by acid-catalyzed decomposition over a catalyst, the improvement comprising reacting cumene hydroperoxide over a heterogeneous catalyst consisting of a compound from the group consisting of fluorophosphoric acids and hydrogen fluorides on an inert support at a temperature of about 20° C. to 150° C. and a pressure of from zero to 1000 psig.

4,876,398

PREPARATION OF ORTHO-ALKYLATED PHENOLS IN THE PRESENCE OF A CATALYST PREPARED BY CO-PRECIPITATION PROCESS

Trong-Guang Lin, Hsinchu; Ling-Wen Ho; An-Nan Ko, both of Taipei, and Yeong-Ju Perag, Miaoli, all of Taiwan, assignors to China Petrochemical Development Corporation, Taipei, Taiwan

Filed Jan. 10, 1988, Ser. No. 206,834

Int. Cl.⁴ C07C 37/16, 37/00

U.S. Cl. 568-804

9 Claims

1. A process for preparing an ortho-alkylated phenol by a vapor phase catalytic reaction at 200°-500° C. by reacting a vapor phenol compound selected from phenol, ortho-cresol and a mixture of phenol mixed with ortho-cresol and a vapor alcohol selected from methanol

cyclohexanol or an alkyl alcohol having more than ten carbon atoms, in the presence of a catalyst containing magnesium oxide and manganese oxide, of which the catalyst is prepared by first forming a coprecipitate of magnesium and manganese salt, said coprecipitate being then filtered, water-washed and calcined at 250°-600° C. for 1-4 hours for forming the catalyst consisting of magnesium oxide and manganese oxide having an atomic ratio of Mg/Mn of 100:100 to 100:1, the improvement which comprises:

- said coprecipitate of magnesium and manganese salt being prepared by treating an alkali in an aqueous solution having soluble magnesium ion and soluble manganese ion to obtain said coprecipitate of magnesium and manganese salt with respect to the alkali added.

4,876,399

TAXOLS, THEIR PREPARATION AND INTERMEDIATES THEREOF

Robert A. Holton, Tallahassee, Fla.; Rouh-Rong Juo, North Billerica, Mass., and Richard Lowenthal, Tallahassee, Fla., assignors to Research Corporation Technologies, Inc., Tucson, Ariz.

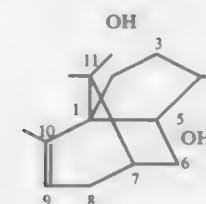
Filed Nov. 2, 1987, Ser. No. 115,665

Int. Cl.⁴ C07C 35/37

U.S. Cl. 568-817

3 Claims

1. A diol of the formula:



4,876,400

PROCESS FOR PRODUCING VITAMIN A OR ITS CARBOXYLIC ACID ESTERS, AND INTERMEDIATE COMPOUNDS USEFUL FOR THE PROCESS

Junzo Otera, Okayama City, Japan; Tadakatsu Mandai, Ithaca, N.Y., and Mikio Kawada, Okayama City, Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Division of Ser. No. 804,252, Dec. 3, 1985, Pat. No. 4,825,006.

This application Jul. 5, 1988, Ser. No. 215,167

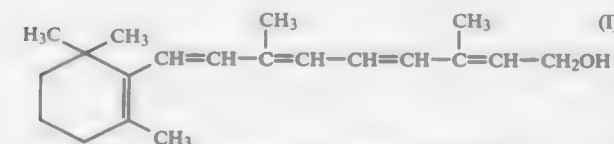
Claims priority, application Japan, Jan. 10, 1985, 60-2964; Mar. 1, 1985, 60-41667; Oct. 11, 1985, 60-227549; Oct. 11, 1985, 60-227550; Oct. 16, 1985, 60-232073; Oct. 16, 1985, 60-232074

Int. Cl.⁴ C07C 35/18

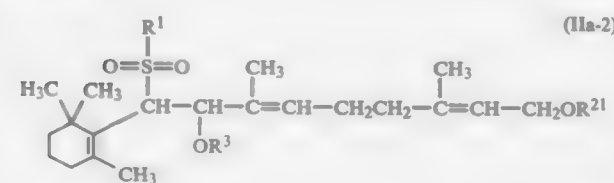
U.S. Cl. 568-824

8 Claims

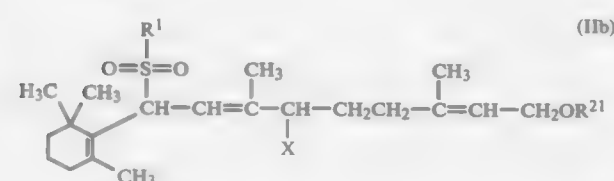
1. A process for producing vitamin A represented by the formula



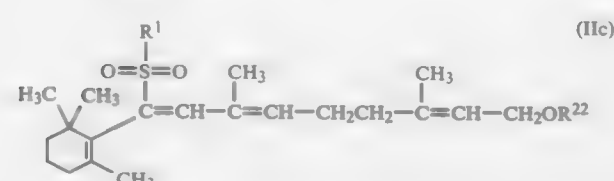
which comprises treating a compound represented by the formula



(IIa-2)



(IIb)



(IIc)

wherein R¹ represents an aryl group which may be substituted, R²¹ and R²² each represent a hydrogen atom or a lower alkanoyl group, R³ represents an acetal-type protective group for a hydroxyl group, and X represents a halogen atom, with a base, selected from the group consisting of lower alkoxides of potassium and potassium hydroxide, in a solvent selected from the group consisting of aliphatic hydrocarbons and aromatic hydrocarbons, thereby producing vitamin A substantially maintaining the stereochemistry of the starting compound.

4,876,401

PROCESS FOR THE PREPARATION OF ALKANEDIOLS

Eit Drent, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Mar. 9, 1989, Ser. No. 321,247

Claims priority, application United Kingdom, Mar. 18, 1988, 8806526

Int. Cl.⁴ C07C 29/17, 31/20

U.S. Cl. 568-861

21 Claims

1. A process for the preparation of alkanediols which comprises the reacting: (a) a monoalkynically and/or monoalkenically unsaturated diol, wherein the alcohol groups are separated by at least two carbon atoms, which carbon atoms form the alkynic and/or alkenic unsaturated entity respectively, and (b) hydrogen, in the presence of a palladium compound which is at least partially soluble in the reaction medium and a base.

4,876,402

IMPROVED ALDEHYDE HYDROGENATION PROCESS

John E. Logsdon, Houston; Richard A. Loke, Santa Fe, both of Tex.; Jay S. Merriam, Louisville, Ky., and Richard W. Voight, Houston, Tex., assignors to Union Carbide Chemicals and Plastics Company Inc., Danbury, Conn.

Division of Ser. No. 926,129, Nov. 3, 1986, Pat. No. 4,762,817.

This application Apr. 26, 1988, Ser. No. 186,431

Int. Cl.⁴ C07C 29/14

U.S. Cl. 568-881

10 Claims

1. In a heterogeneous vapor phase process for producing an alcohol by contacting a mixture of a vapor stream of the corresponding aldehyde and a hydrogen-containing gas with a solid hydrogenation catalyst the improvement comprising employing as said hydrogenation catalyst a reduced precursor catalyst composition which consists essentially of a mixture of reduced copper oxide-zinc oxide impregnated with a selectivity improving amount of a selectivity enhancer selected from the group consisting of

- (a) potassium in an amount of between about 0.5 and 3.5 percent by weight based on the weight of copper oxide and zinc oxide in the precursor catalyst composition before its reduction;
- (b) a transition metal selectivity enhancer selected from the group consisting of nickel, cobalt and mixtures thereof in the amount of between about 0.5 and 5.0 percent by weight based on the weight of copper oxide and zinc oxide in the precursor catalyst composition before its reduction; and
- (c) a selectivity enhancer comprising the combination of
 - (i) an alkali metal selectivity enhancer selected from the group consisting of sodium, potassium, lithium, cesium, and mixtures thereof, in an amount of between about 0.05 and 7.0 percent by weight based on the weight of copper oxide and zinc oxide in said precursor catalyst composition before its reduction; and
 - (ii) a transition metal selectivity enhancer selected from the group consisting of nickel, cobalt, and mixtures thereof, in an amount of between about 0.5 and 5.0 percent by weight based on the weight of copper oxide and zinc oxide in the precursor catalyst composition before its reduction.

4,876,403

PROCESS FOR THE RECOVERY OF ALCOHOLS USING A PERFLUORINATED IONOMER MEMBRANE

Abraham D. Cohen, Sarnia, Canada; William D. Diana, Belle Mead, and James J. Baiel, Morris Plains, both of N.J., assignors to Exxon Chemical Patents Inc., Linden, N.J.

Continuation of Ser. No. 9,794, Feb. 2, 1987, abandoned. This application Mar. 7, 1989, Ser. No. 320,903

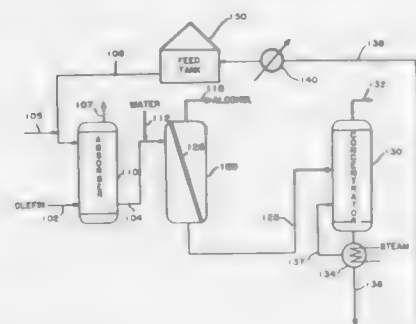
Int. Cl.⁴ C07C 29/76, 31/10, 31/12

U.S. Cl. 568-913

36 Claims

1. Process for the separation of alcohol from a feed mixture comprising alcohol, water and acid, which process comprises

contacting the mixture against a first side of a perfluorinated ionomer membrane and withdrawing at a second side of the membrane a permeate comprising alcohol in increased concen-



tration relative to the feed, wherein an aqueous acid solution is recovered to the first side of the membrane, said solution being substantially depleted of alcohol.

4,876,404

PREPARATION OF DICHLOROTRIFLUOROMETHYLTOLUENES INCLUDING NOVEL ISOMERS

Takeshi Kondo, Sayama; Toshikazu Kawai, Kawagoe, and Hideki Oshio, Omiya, all of Japan, assignors to Central Glass Company, Limited, Ube, Japan

Filed Aug. 11, 1987, Ser. No. 84,019

Claims priority, application Japan, Aug. 13, 1986, 61-188575; Apr. 30, 1987, 62-106570

Int. Cl.⁴ C07C 17/20, 17/24, 17/32, 21/24

U.S. Cl. 570—145

6 Claims

1. A method preparing a dichlorotrifluoromethyltoluene, comprising the steps of:

reacting a dichlorotoluene with carbon tetrachloride in 1,2-dichloroethane in the presence of an aluminum halide to thereby obtain crude dichlorotrifluoromethyltoluene; and then

reacting said crude dichlorotrifluoromethyltoluene with hydrogen fluoride.

4,876,405

PROCESS FOR PREPARING FLUOROETHYLENES AND CHLOROFLUORO-ETHYLENES FROM CHLOROFLUOROETHANES

Claudio Gervasutti, Mestre-Venezia, Italy, assignor to Ausimont S.p.A., Milan, Italy

Filed Jul. 13, 1987, Ser. No. 72,641

Claims priority, application Italy, Jul. 18, 1986, 21171 A/86 Int. Cl.⁴ C07C 17/24, 21/18

U.S. Cl. 570—156

2 Claims

1. A process for the selective dehalogenation of chloro-fluoroethanes selected from the group consisting of 1,2-difluoro-tetrachloroethane and 1,1-difluorotetrachloroethane and mixtures thereof in gas phase to fluoroethylenes and chloro-fluoroethylenes containing at least one hydrogen atom, comprising reacting hydrogen in one step with the chloro-fluoroethanes at a temperature ranging from 200° C. to 400° C. with a molar ratio of hydrogen to the chloro-fluoroethane ranging from 2 to 5, in the presence of a hydrogenation catalyst selected from palladium and nickel.

4,876,406

PROCESS FOR GASEOUS PHASE FLUORINATION OF ALIPHATIC CHLORINATED OR CHLOROFLUORINATED HYDROCARBONS

Louis Foulletier, Oullins, France, assignor to PCUK-Produits Chimiques Ugine Kuhlmann, Courbevoie, France

Continuation of Ser. No. 429,081, Sep. 30, 1982, abandoned, which is a division of Ser. No. 324,438, Nov. 24, 1981, abandoned. This application Nov. 8, 1984, Ser. No. 669,404 Claims priority, application France, Dec. 29, 1980, 80 27662 Int. Cl.⁴ C07C 17/20, 17/09

U.S. Cl. 570—165

9 Claims

1. A gaseous phase fluorination process which comprises contacting aliphatic chlorinated or chloro-fluorinated hydrocarbons with hydrofluoric acid in the presence of a catalyst in a fluidized bed reactor, said catalyst consisting essentially of a mixed chromium and aluminum phosphate precipitate having:

- a specific surface area greater than about 200 m²/g, but less than about 1,000 m²/g,
- a surface area of a pores of 40 to 50 Å in radius which is greater than about 5 m²/g, but less than about 150 m²/g,
- a surface area of pores equal to or above 250 Å in radius which is greater than about 2 m²/g, but less than about 60 m²/g, and
- a chromium content between about 0.1 and 3 moles per liter.

4,876,407

PROCESS FOR PRODUCING 2,3 DICHLOROBUTADIENE-1,3

Akihiko Okuda; Yukinori Totake, and Hideki Matsumura, all of Ohmi, Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 527,507, Aug. 29, 1983, abandoned, which is a continuation of Ser. No. 318,407, Nov. 5, 1981, abandoned. This application Jan. 11, 1985, Ser. No. 743,273 Claims priority, application Japan, Nov. 27, 1980, 55-166970

Int. Cl.⁴ C07C 17/24, 17/34, 21/20

U.S. Cl. 570—239

11 Claims



1. A process for producing 2,3-dichlorobutadiene-1,3 which comprises (i) continuously reacting a mixture of 1,2,3-trichlorobutene-3, a water miscible solvent, an alkali metal hydroxide and water in a reactor; (ii) discharging the resulting 2,3-dichlorobutadiene-1,3, most of said water miscible solvent and a part of the unreacted 1,2,3-trichlorobutene-3 and water in a vapor phase from said reactor by evaporation just after the reaction; (iii) feeding said vapor phase into a distillation column to distillate 2,3-dichlorobutadiene-1,3 and said water miscible solvent from the top; (iv) extracting the distillate with water to separate 2,3-dichlorobutadiene-1,3 from said water miscible solvent; (v) recycling at least 1,2,3-trichlorobutene-3 solution discharged from the bottom, into said reactor; (vi) feeding a mixture of the unreacted 1,2,3-trichlorobutene-3, said water miscible solvent and alkali metal chloride and water discharged from said reactor, into an evaporator to evaporate the unreacted 1,2,3-trichlorobutene-3 and said water miscible solvent; (vii) condensing said vapor into an upper layer and a

lower layer condensate; (viii) recycling said lower layer condensate containing mainly 1,2,3-trichlorobutene-3, into said reactor; (ix) feeding said upper layer condensate containing said water miscible solvent and said water miscible solvent extracted with water in step (iv) into a methanol concentration tower; and (x) recycling said water miscible solvent distilled from the top, into said reactor.

4,876,408

ALKYLATION PROCESS USING A CATALYST HAVING AN INCREASED SELECTIVITY FOR MONOALKYLATION

Charles T. Ratcliffe, La Habra, and John W. Ward, Yorba Linda, both of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Division of Ser. No. 943,911, Dec. 19, 1986, Pat. No. 4,798,816. This application Oct. 3, 1988, Ser. No. 251,752

Int. Cl.⁴ C07C 2/68

U.S. Cl. 585—467

26 Claims

1. A process for alkylating an aromatic compound to form an alkylated aromatic which comprises contacting said aromatic compound with an alkylating agent under alkylation conditions in the presence of a treated alkylation catalyst having an increased selectivity for monoalkylation produced by the process comprising:

- depositing carbonaceous material on an alkylation catalyst which comprises (1) a molecular sieve having catalytic activity for alkylation, said molecular sieve being selected from the group consisting of Y zeolites, fluorinated Y zeolites and zeolite beta, and (2) a porous, inorganic refractory oxide, said alkylation catalyst being substantially devoid of hydrogenation metal components, in such a manner as to suppress the alkylation activity of said catalyst; and
- contacting the carbon-containing catalyst particles formed in step (a) with a gaseous oxidizing agent at an elevated temperature to remove at least a portion of said carbonaceous material so as to increase the selectivity of said alkylation catalyst for monoalkylation by at least 1.0 percentage point and thereby produce said treated alkylation catalyst.

4,876,409

THIN BED COFEE REACTORS FOR METHANE CONVERSION

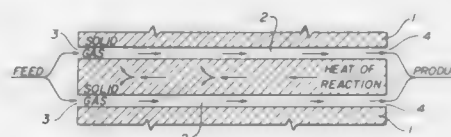
David W. Leyshon, West Chester, and Robert A. Bader, Overbrook Hills, both of Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 31,496, Mar. 30, 1987. This application Mar. 4, 1988, Ser. No. 158,128

Int. Cl.⁴ C07C 2/00

U.S. Cl. 585—500

7 Claims



1. A method for the oxidative conversion reaction of methane to higher hydrocarbon products and coproduct water wherein a gas mixture comprising methane and a gaseous oxidant is contacted with a solid contact agent in a thin adiabatic reactor bed at reaction conditions, comprising the steps of:

- initially heating the gas mixture to reaction temperature, causing an exothermic reaction in the thin adiabatic reactor bed;
- thereafter passing the said gas mixture at a temperature at least 100° C. less than reaction temperature into said thin adiabatic reactor bed and heating the gas mixture to reac-

tion temperature by conductive flow of heat generated by said exothermic reaction axially through said bed counter-current to the flow of said mixture; and

(3) removing a reaction mixture containing said higher hydrocarbons from said bed.

4,876,410

CATALYST SUPPORT, AND CATALYST FOR OLEFIN DIMERIZATION

Warren M. Ewert; Donald H. Kubicek, both of Bartlesville, and Charles A. Drake, Nowata, all of Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 112,802, Oct. 23, 1987, Pat. No. 4,810,688. This application Nov. 14, 1988, Ser. No. 271,135

Int. Cl.⁴ C07C 2/24

U.S. Cl. 585—516

17 Claims

1. A dimerization process comprising contacting at least one olefin under dimerization conditions with a catalyst comprising:

zeolite EU-2, in its acid form, having a molar composition expressed by the formula:

$0.5 \text{ to } 1.5 \text{ R}_2\text{O} : \text{Y}_2\text{O}_3 : \text{at least } 70 \text{ XO}_2 : 0 \text{ to } 100 \text{ H}_2\text{O}$,
wherein R is hydrogen, Y is one or more of aluminum, iron, gallium or boron, and X is silicon and/or germanium and

having an X-ray pattern substantially as set out in Table I as determined by standard technique using copper K α radiation under conversion conditions.

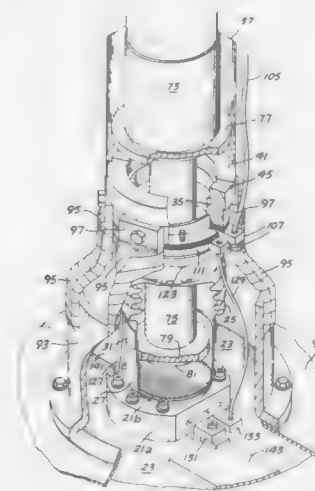
4,876,413
EFFICIENT THERMAL JOINTS FOR CONNECTING CURRENT LEADS TO A CRYOCOOLER
Mark E. Vermilyea, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jul. 5, 1988, Ser. No. 215,131

Int. Cl.⁴ F25B 19/00

U.S. Cl. 174—15.4

1 Claim



1. A thermally efficient, electrically insulating joint operable at liquid nitrogen temperatures and below connecting a current lead to a cryocooler heat station comprising:

- clamping means;
- two indium sheets;
- a ceramic spacer wherein said ceramic material is selected from the group consisting of alumina and beryllia, said spacer having two faces situated opposite one another, each one of said indium sheets contacting a respective one of said faces, said ceramic spacer with the indium sheets on either face situated between the current lead and the cryocooler heat station, said clamping means urging said cryocooler heat station and the lead together with sufficient force to cause said indium sheets to conform to the surfaces with which they are in contact.

4,876,414
ELECTRICAL SERVICE FITTINGS AND SERVICE SYSTEM INCLUDING SAME
Ruben R. Johnson, 3609 West Castile Ct., Peoria, Ill. 61615

Filed Mar. 23, 1989, Ser. No. 327,793

Int. Cl.⁴ H02G 3/04

U.S. Cl. 174—81

18 Claims



1. A service entrance fitting for receiving electrical cable from the exterior thereof and for channeling the cable to a conduit, comprising:

- a dome-shaped hood having a mouth for passing the cable

ELECTRICAL

from the exterior into the service entrance fitting, and an integral depending hollow neck for interfacing with a top of the conduit to position the hood in covering relation over the top of the conduit; and

an apertured separator yoke nestingly positionable in the mouth of the hood and having an integral depending hollow neck telescoped over the depending hollow neck of the hood whereby the separator yoke can be readily manipulated in a telescoping direction as well as in a swiveling direction relative to the hood to facilitate feeding the cable into the entrance fitting.

6. A service pass through and distribution fitting for electrical cable channelled through a conduit, comprising:

a dome-shaped hood having a side opening mouth, an integral upwardly projecting hollow neck and an integral downwardly projecting hollow neck, the necks providing interfacing with opposed ends of the conduit, and whereby electrical cable can pass directly through the hollow necks of the fitting and the electrical cable can be distributed out through the side opening mouth of the fitting; and

an apertured separator yoke nestingly positionable in the mouth of the hood.

12. A service system for receiving and distributing electrical cable, comprising:

conduit means having an upper head end and a lower meter end;

a service entrance fitting for coupling to the head end of the conduit means for receiving electrical cable from the exterior thereof and for channeling the cable to the conduit means, including a dome-shaped hood having a mouth for passing the cable from the exterior into the service entrance fitting, and an apertured separator yoke nestingly positionable in the mouth of the hood;

a service pass through and distribution fitting coupled in the conduit means intermediate the ends thereof, including a dome-shaped hood having a side opening mouth and pass through aperture means whereby electrical cable can directly pass through the hood, and an apertured separator yoke nestingly positionable in the mouth of the hood;

and wherein the apertured separator yoke for both the service entrance fitting and the service pass through and distribution fitting are common components of substantially similar construction.

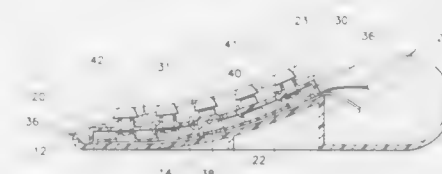
4,876,415
LOW COST KEYBOARD WITH KEY TOPS DEFINING SURFACE OF CURVED PROFILE
Kevin F. Clancy, El Paso, Tex., assignor to Honeywell, Inc., Minneapolis, Minn.

Filed Mar. 31, 1988, Ser. No. 175,556

Int. Cl.⁴ H01H 9/00, 13/70

U.S. Cl. 200—5 A

12 Claims



9. A keyboard comprising:

a base with a concave upper surface thereon, the upper surface being curved about an axis;

a membrane switch assembly overlaying the concave surface on said base, said switch assembly forming a plurality of rows of switches, the rows being generally parallel with said axis, the switches being individually actuatable by exerting force on the switch assembly at the switch location;

an array of resilient frustoconical boots overlaying said switch assembly and arranged in a plurality of rows so that a boot is substantially aligned with each switch location, each boot having a large open end adjacent said switch assembly and a small closed end of which the inner surface contacts the switch assembly when the boot is depressed;

a key holder plate having an array of key guide apertures therethrough and arranged in a plurality of rows so that a key guide aperture is substantially aligned with each switch location, said key holder plate being substantially rigid along the rows of key guide apertures and having graduated flexibility transverse to the rows of key guide apertures, with the area of maximum stiffness located between the outer rows;

a plurality of keys mounted in the key guide apertures for movement toward and away from said base, the outer surfaces of the small ends of said boots abutting said keys so as to bias them away from said base; and

snap retaining means for securing said key holder plate to said base in a concave profile about said axis, said snap retaining means including a plurality of fasteners spaced along the area of maximum stiffness of said key holder plate for restraining said key holder toward said base.

4,876,416

MULTIPLE POSITION ROTARY SWITCH

Leo R. Frantz, Lakewood; Alfred Bauer, Parma; Matthew H. Koran, Olmsted Township, Cuyahoga County, and Jack Becker, South Euclid, all of Ohio, assignors to Actron Manufacturing Company, Cleveland, Ohio

Filed Feb. 3, 1989, Ser. No. 306,536

Int. Cl.⁴ H01H 19/58

U.S. Cl. 200—11 R

21 Claims



14. An electrical device having a separate multiple position rotary switch comprising an annular cup which serves as a housing for said switch and which receives a knob therein, said knob being retained within said cup by a circuit board which is removably secured to said cup, said cup including an annular race against which said knob rotates and an upstanding cylindrical sidewall, said circuit board comprising a first major surface having a circuit formed thereon and a second major surface, said circuit board being removably secured to said cup such that said first surface of said circuit board is located between said knob and said second surface of said circuit board, said race including a plurality of spaced arcuate protrusions which form multiple peaks and valleys along said race, said knob comprising a cylindrical disk having along one surface a handle and along an opposite surface a protruding rim, said rim including a first pair of diametrically opposed upstanding platforms and a second pair of diametrically opposed upstanding platforms, said first pair of platforms being of sufficient size that upon rotation of said knob said first pair of platforms glide along the peaks of said arcuate protrusions of said race, said second pair of platforms each including a socket

for receiving a spring and a ball bearing, said bearing being located on top of said spring such that said ball is sandwiched between said spring and said race, said spring providing a biasing force which retains said bearing against said race such that as said knob is rotated said bearing aligns itself in said valleys of said race thereby mechanically stabilizing said knob in preselected positions and between said preselected positions said bearing is received within said socket so as to allow said bearing to glide over said protrusions of said race, said knob including along said opposite end thereof a plurality of wiping members which rotate with said knob and selectively close said circuit formed on said first surface of said circuit board as said knob is rotated to said preselected positions, said circuit board further including openings along said second surface thereof which are electrically connected to said circuit formed on said first surface thereof, said circuit board further including a plurality of upstanding pins extending from said openings of said circuit board for electrically connecting said switch to a mother circuit board of said electrical device.

15. An electrical device as set forth in claim 14 wherein said circuit board of said switch is removably secured to said cup by a plurality of inwardly protruding flexible barbed ears extending from said cup, said flexible barbed ears being capable of deflecting out of position during the alignment of said circuit board upon said cup and also capable of returning to an un-deflected position such that said barbed ears engage said circuit board upon proper placement of said circuit board upon said cup thereby securely retaining said circuit board upon said cup.

16. An electrical device as set forth in claim 15 wherein said cup includes a plurality of outwardly protruding barbed ears which attach the switch to said mother circuit board.

4,876,417

COMBINED HIGH VOLTAGE CONNECTING AND GROUNDING SWITCH

Detlev Niederhufner; Goenter Hahn, and Andrzej Baczynski, all of Berlin, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

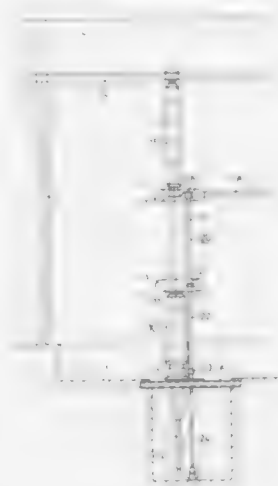
Filed Jan. 23, 1989, Ser. No. 300,674

Claims priority, application Fed. Rep. of Germany, Jan. 25, 1988, 3802394

Int. Cl.⁴ H01H 31/00

U.S. Cl. 200—48 V

6 Claims



1. A high voltage disconnecting and grounding switch having a support structure and vertical switching movement comprising:

- a first contact adapted to have a high voltage potential;
- a connection contact connectable with the first contact wherein the first contact and the connection contact are

arranged on the support structure vertically one above the other; a grounding contact connectable with the connection contact wherein the connection contact and the grounding contact are arranged on the support structure vertically one above the other; and a vertically translatable switch rod movably mounted to the support structure between closed and open circuit positions, the rod including a conductive section and a nonconductive section, wherein the conductive section connects the first contact and the connection contact when the switch is in the closed position and the conductive section connects the connection contact and the grounding contact when the switch is in the open circuit position.

4,876,418

DEVICE FOR RENDERING CONTACTORS ELECTRICALLY AND MECHANICALLY INOPERATIVE

Bernard Fournier, Le Plessis Bouchard, France, assignor to La Telemecanique Electrique, France

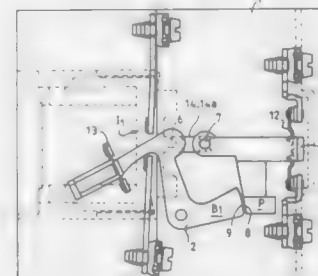
Filed Jun. 24, 1988, Ser. No. 211,017

Claims priority, application France, Jun. 26, 1987, 87 09341

Int. Cl.⁴ H01H 9/24

U.S. Cl. 200—50 C

7 Claims



1. An interlocking device for rendering electrically and mechanically inoperative one or the other of two contactors each having an actuating member, said device of the type comprising:

- i- a flat case with first and second opposite parallel front walls, spaced a small distance apart and each having a central region and, first and second opposite sidewalls which extend in planes substantially perpendicular to the first and second front walls, said case having a fixed pin and being adapted for being mounted between the two contactors disposed side by side;
- ii- first and second movement take-offs adapted for respectively coupling with the actuating member of the respective contactors through substantially coaxial apertures provided in the central regions of the first and second front walls respectively, each of said first and second movement take-offs being movable between first and second positions corresponding respectively to the work position and the rest position of the contactor with which it is associated;
- iii- first and second mobile elements providing reciprocal inoperativeness, driven respectively by said first and second movement take-offs, said mobile elements having a travel distance such that when the first movement take-off is in its first position, the first mobile element prevents movement of the second movement take-off to its first position and conversely;
- iv- first and second switch devices respectively comprising first and second pairs of fixed contacts, connected respectively by first and second conductor means to first and second input connection elements and to first and second output connection elements, and first and second mobile contact elements respectively actuated by said second and first mobile elements, said first and second input connection elements being mounted on said first sidewall of the case whereas said

first and second output connection elements are mounted on the second sidewall, and said first and second switch devices form with the input and output connection elements which are associated therewith as well as with the corresponding conductor means, first and second through current lines, which do not cross inside the case and are directed transversely with respect to said sidewalls.

4,876,419

TWO-DIMENSIONAL ELECTRIC CONDUCTOR DESIGNED TO FUNCTION AS AN ELECTRIC SWITCH

Paolo Lodini, Turin, Italy, assignor to Leda Logarithmic Electrical Devices for Automation S.r.l., Turin, Italy

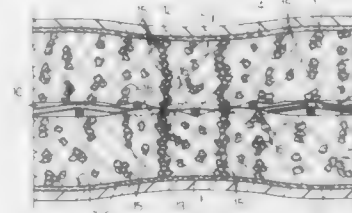
Continuation-in-part of Ser. No. 145,612, Jan. 19, 1988. This application Jun. 2, 1988, Ser. No. 201,598

Claims priority, application Italy, Jun. 2, 1987, 67473 A/87

Int. Cl.⁴ H01H 3/14

U.S. Cl. 200—86 R

7 Claims



1. A two-dimensional electric conductor comprising a first and a second electric conducting element, each in the shape of at least a portion of a flat plate, at least one resilient electric conducting element in the shape of a flat plate and arranged in stacked relationship with said first and second conducting elements, and a spacer element formed from electrically-insulating material and also arranged in stacked relationship with said conducting elements, said spacer element being faced to a surface of said at least one resilient conducting element so as to partially shield said surface; the structure of the material from which said at least one resilient electric conducting element is formed comprising a supporting matrix formed from flexible, electrically-insulating material and particles of electrically-conductive material scattered in a random, substantially uniform manner inside cells in said matrix; said cells communicating at least partially with one another and being at least partially larger in size than the respective particles of electrically-conductive material housed inside the same, so that said at least one resilient electric conducting element is able to selectively assume, in response to a localized pressure exerted on a portion of said conductor, a first, unwarped shape in which said surface of at least one said resilient conducting element is kept spaced apart from at least one of the other conducting elements of the conductor by said spacer element, and a second, warped shape in which said surface of at least one said resilient conducting element contacts, through said spacer element, at least one of the other conducting elements of the conductor, so as to complete an electrical circuit with said first and second conductors.

4,876,420

CONTINUOUS FLEXIBLE ELECTRIC CONDUCTOR CAPABLE OF FUNCTIONING AS AN ELECTRIC SWITCH

Paolo Lodini, Turin, Italy, assignor to LEDA Logarithmic Electrical Devices for Automation S.r.l., Turin, Italy

Filed Jun. 2, 1988, Ser. No. 201,489

Claims priority, application Italy, Jun. 2, 1987, 472 A/87

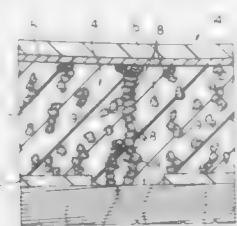
Int. Cl.⁴ H01H 3/14

U.S. Cl. 200—86 R

4 Claims

1. A continuous, flexible electric conductor, characterised

by the fact that it comprises a first elongated electric conducting element; a spacer element formed from insulating material and placed over the surface of the said first conducting element, so as to shield all but given portions of the said surface; a second tubular electric conducting element placed over the outside of the said spacer element; a third tubular electric conducting element placed over the outside of the said second element; and a tubular insulating sheath placed over the out-



side of the said third conducting element; the structure of the said second conducting element comprising a supporting matrix formed from flexible electrically-insulating material and particles of electrically-conductive material scattered in random, substantially uniform manner inside cells on the said matrix; said cells communicating at least partially with one another, and being at least partially larger in size than the respective particles of said electrically-conductive material housed inside the same.

4,876,421

ASBESTOS-FREE ARC-CONFINING INSULATING STRUCTURE

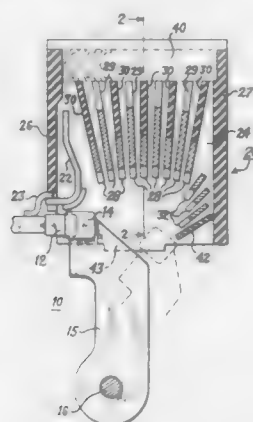
Richard Miller, Devon, Pa., and John E. Zupko, Marlton, N.J., assignors to General Electric Company, King of Prussia, Pa.

Filed Jul. 19, 1988, Ser. No. 221,093

Int. Cl.⁴ H01H 33/08

U.S. Cl. 200—144 C

12 Claims



1. Arc-confining structure for an electric circuit interrupter comprising a portion with a surface that is exposed to an electric arc, said portion being constructed of an electric insulating material that is the thermosetting reaction product of the constituents of a mixture consisting essentially of the following constituents in the following percentages by weight of the mixture:

- (a) 25 to 55 percent granular high-forsterite olivine, (b) 20 to 50 percent of a second granular constituent consisting essentially of silica sand, and (c) 15 to 28 percent phosphoric acid;

which mixture, after mixing of its constituents, is molded under heat and pressure to form a partially-cured molded piece, which piece at least in part serves as said portion of the circuit interrupter; said piece, after molding, being baked to substantially complete curing thereof; and said piece having a surface

region that provides the arc-exposed surface of said circuit interrupter portion, said surface region having a zone that is flange treated at a sufficiently high temperature to convert the material of said zone to a surface glaze.

4,876,422

WATERPROOF SWITCH

Nobuyoshi Kanezawa, Kaashiwa, Japan, assignor to Uchiya Termostat Co., Misato, Japan

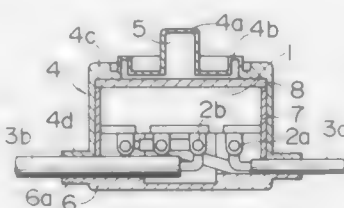
Filed Apr. 26, 1988, Ser. No. 186,133

Claims priority, application Japan, Jan. 25, 1988, 63-7915[U]

Int. Cl.⁴ H01H 9/04

U.S. Cl. 200—302.1

1 Claim



1. A waterproof switch including a switch mechanism having an operation portion, a plurality of leads connected to said switch mechanism, a waterproof housing having an external shape substantially corresponding to that of the switch mechanism, characterized in that said waterproof housing is composed of deformable material and comprises a first housing member and a second housing member, and each of said leads is enclosed in a sheath made of the same deformable material as said housing, said leads having essentially circular outer peripheries, said first housing member comprising a first part having an external shape substantially corresponding to that of said operation portion of said switch mechanism and a second part with grooves having a cross section substantially corresponding to a semi-circle of said essentially circular outer periphery of said leads, said second housing member having a grooved part with grooves having a cross section substantially corresponding to the rest of the semi-circle of said essentially circular outer periphery of the leads, said leads being inserted between said first and second housing members and unified in watertight relationship with heat or adhesion, and the operation portion of the switch mechanism being constructed and arranged to be handled from outside of said first part of the first housing member, a holding member, the operation portion of the switch mechanism penetrating the holding member, said holding member being disposed between said first housing member, said switch mechanism and said first housing member, said holding member including a frame portion and two deformable wave-formed portions having convex parts, concave parts and ends, said holding member being fixed to the frame portion at the ends of said deformable wave-formed portions, the latter being constructed and arranged in parallel and opposed relation to each other with their convex parts and concave parts of each said wave-formed portion facing corresponding convex parts and concave parts of said other of said wave-formed portions to form at least one pair of adjacent wide holes and a narrow path interconnecting said adjacent wide holes of said pair, said wide holes and said narrow path extending longitudinally between said wave-formed portions, the operation portion of the switch mechanism being inserted into one of said wide holes, said narrow path being narrower than said operation portion of the switch mechanism, said deformable portions deforming when said operation portion passes from one of said wide holes to said adjacent wide hole through said narrow path.

4,876,423

LOCALIZED MICROWAVE RADIATION HEATING

Laurence E. Tighe, Milford, and Tim Parker, Shrewsbury, both of Mass., assignors to Dennison Manufacturing Company, Framingham, Mass.

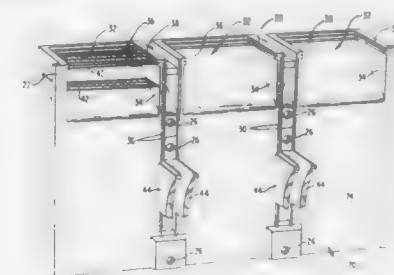
Continuation-in-part of Ser. No. 194,260, May 16, 1988. This application Jan. 31, 1989, Ser. No. 304,734

Int. Cl.⁴ H05B 6/64

U.S. Cl. 219—10.55 E

20 Claims

contact being coupled to the means for contact opening and closing.



the barrier being formed integrally with a means for facilitating gas venting from within the housing.

4,876,425

LIGHT SWITCH AND OUTLET GUARD

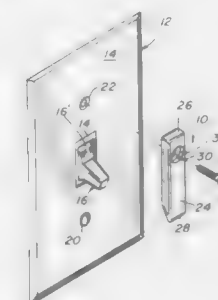
Robert Woskow, 16801 Severo Pl., Encino, Calif. 91436

Filed Jun. 8, 1988, Ser. No. 204,217

Int. Cl.⁴ H01H 3/20

U.S. Cl. 200—43.16

12 Claims



1. A microwave susceptor medium which can be coated or selectively printed on a substrate for controlled conversion of microwave radiation to heat without causing arcing during use comprising:

- a fluid medium comprising a heat resistant polymeric binder and a filler comprising metallic and semiconductor substances dispersed in said fluid medium; wherein said metallic and semiconductor substances are in particulate form, said susceptor having the property that it is heated to a temperature of at least 375° F. within about 4 minutes when exposed to microwave radiation at 700 watts power output.

4,876,424

BARRIER WITH A VENTING SCHEME FOR A CIRCUIT BREAKER

David A. Leone; Clifford A. Buxton, both of Lawrenceville, and W. Dale Robbins, Snellville, all of Ga., assignors to Siemens Energy & Automation, Inc., Alpharetta, Ga.

Filed Sep. 19, 1988, Ser. No. 246,484

Int. Cl.⁴ H01H 9/30

U.S. Cl. 200—306

7 Claims

1. A circuit breaker comprising:
a housing including a first molded portion and a second molded portion, wherein the portions define a seam when joined; and
a barrier support within the housing between the portions at the seam,
the barrier and the first molded portion being adapted to enclose a means for contact opening and closing such that the means is substantially isolated from the contacts,
the barrier and the second molded portion being adapted to enclose a first contact and a second contact, the first

1. A guard for a wall-mounted light switch, which guard prevents access in one state thereof and allows access in another state thereof, comprising:

- a main elongated portion having a first end portion and a second end portion, said first end portion having a through-opening formed therein;
said main elongated portion having a front surface face facing forward an interior of a room when said main elongated portion is connected to a wall plate of a light switch, and a rear surface face facing toward the wall when the main elongated portion is connected to the wall plate;
said second end portion defining an end-edge surface, whereby a mounting screw of a light switch mounts the main elongated portion to the wall plate of the light switch via said through-opening, said main elongated portion being pivotal about the mounting screw in order to be positionable in an operated, protective state thereof and a non-operated state thereof;
said main elongated portion further comprising a rearwardly projecting bead in direct alignment with said through-opening, said bead projecting from said rear surface face of said main elongated portion, whereby said bead may project into a mounting hole of the wall plate of the light switch, the mounting screw passing through said through-opening and said bead, said bead adding structural integrity to said main elongated portion and providing a seat during the pivoting thereof.

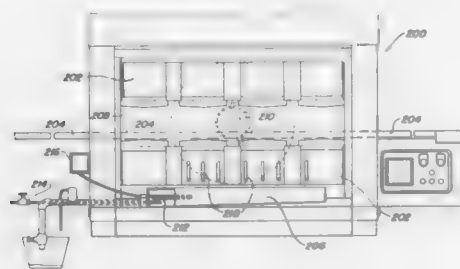
4,876,426

METHOD AND APPARATUS FOR WATER VAPOR CONTROL IN CONVECTION OVENS

Donald P. Smith, 2051 Valley View Ln., Dallas, Tex. 75234
Continuation of Ser. No. 29,323, Mar. 23, 1987, abandoned, which is a continuation of Ser. No. 689,654, Jan. 8, 1985, abandoned, which is a continuation-in-part of Ser. No. 407,943, Aug. 13, 1982, Pat. No. 4,492,839. This application Sep. 29, 1988, Ser. No. 253,314
Int. Cl.⁴ H05B 6/78

U.S. Cl. 219—10.55 A

21 Claims



1. A method for controlling the water vapor content of recirculating air in a conveyerized convection oven for food products, said method comprising the steps of: controlling the temperature of said recirculating air at or above the desired temperature for food products exiting said oven; forming first jets of said recirculating air; directing said first jets at the surface of liquid in a reservoir maintained at a temperature below the temperature of said recirculating air, but above the temperature of food products entering said oven, to maintain the water vapor content below the saturation point of the recirculating air; forming second jets of recirculating air; and directing said second jets toward the surface of a food product moved by a conveyor, such that moisture carried by said second jets condenses onto the surface of a food product to provide rapid initial heating and such that the second jets controllably evaporate moisture from the surface of the food product and remove a moist boundary layer of air after the temperature of the food product increases to accelerate the rate of heat transfer between the recirculating air and the food product while preventing excessive drying of the food product.

4,876,427

LOCKING, DOUBLE-LAYERED MICROWAVE PACKAGE

Duane R. Mode, Bloomington, Minn., assignor to Waldorf Corporation, St. Paul, Minn.
Filed Mar. 25, 1988, Ser. No. 173,308

Int. Cl.⁴ H05B 6/80

U.S. Cl. 219—10.55 E

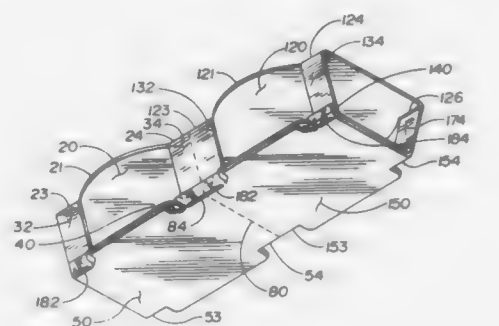
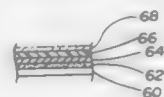
12 Claims

1. A package for holding and microwave cooking of food comprising two or more food holding units, each having the shape of a generally rectangular box with opposed, open ends and comprising:

- a first panel having a microwave absorbing heating surface facing the interior of said package;
- a second panel located opposite, spaced from and substantially parallel to said first panel and having a microwave absorbing heating surface facing the interior of said package; and
- a pair of substantially parallel side wall panels approximately equal height connecting said first panel and said second panel, each said side wall panel having an opening between its ends,

wherein each food holding unit has the same orientation as the

others and is joined to at least one adjacent food holding unit at a weakened separation line that encircles the package in a



4,876,428

TRAY OR PAN FOR BAKING BATTER-BASED FOOD PRODUCTS IN MICROWAVE OVENS

Robert J. Petcavich, 4816 Marlborough St., San Diego, Calif.

[REDACTED]

Division of Ser. No. 89,508, Aug. 26, 1987. This application Nov.

15, 1988, Ser. No. 271,537

Int. Cl.⁴ H05B 6/80

U.S. Cl. 219—10.55 E

7 Claims



1. In combination:

- a microwave transparent open top pan having bottom and side walls substantially free of sharp corners;
- a non-frozen, unbaked batter of batter-based food product in said pan;
- a microwave oven within which the batter containing pan is supported for baking of said batter,
- said microwave oven having an interior bottom wall supporting the batter containing pan and klystron for applying microwave energy to the batter in said pan at frequency having a wavelength in inches equal to λ ;
- said bottom and side walls of said pan confining the batter in said pan within predetermined length, width and depth dimensions, each of which dimensions is a multiple of a quarter wavelength $\lambda/4$ of the applied microwave energy; and
- microwave transparent thermal spacer means between the bottom wall of said oven and the bottom of said pan for spacing the batter in the pan from the interior wall of the oven.

4,876,429

DEVICE FOR RETAINING TOOLS OR WORKPIECES HAVING A CYLINDRICAL SHAFT

René Büchler, Oberburen, Switzerland, assignor to Buchler B-Set AG, Flawil, Switzerland

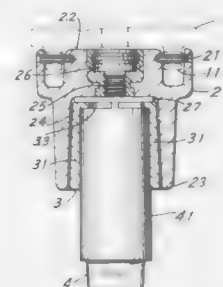
Filed Feb. 16, 1988, Ser. No. 156,497

Claims priority, application Fed. Rep. of Germany, Feb. 25, 1987, 3706123

Int. Cl.⁴ B23K 1/12

U.S. Cl. 219—69.15

14 Claims



1. A coupling device for connecting a shaft of one member, particularly of a tool or a workpiece, to another member, particularly a machine tool of a die sinking erosion machine, the coupling device comprising a first coupling member receiving said shaft and a second coupling member which is anchored to said another member, said second coupling member including a conical recess which converges in a direction from a mouth thereof toward a coupling face between said first and second coupling member, said first coupling member including a taper sleeve subdivided along a periphery thereof into at least two portions engaging in assembly said shaft, said taper sleeve having an outer conical surface adapted to the conical recess of said second coupling member and an interior adapted to an outline of said shaft whereby when said taper sleeve is pressed into said second coupling member, said outer conical surface cooperates with said recess to retain said shaft in the coupling device.

4,876,430

PREWELD TEST METHOD

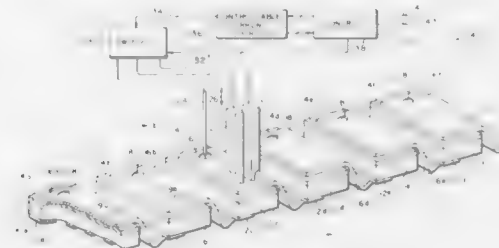
Roman Herschitz, Alexander Bogorad, both of Plainsboro, and Robert N. Harhigh, Trenton, all of N.J., assignors to General Electric Company, East Windsor, N.J.

Filed Jul. 25, 1988, Ser. No. 223,497

Int. Cl.⁴ B23K 11/24

U.S. Cl. 219—110

16 Claims



1. A method for welding together two sheets of electrically conductive material, comprising the steps of: placing a first side of a first sheet of electrically conductive material in contact with a first side of a second sheet of electrically conductive material in a region to be welded; applying first and second electrodes to a second side of said first sheet straddling said region to be welded;

applying a third electrode to said second sheet adjacent said region to be welded; measuring the electrical resistance between at least one of said first and second electrodes and said third electrode; comparing said electrical resistance with a predetermined value; if said electrical resistance is below said predetermined value, applying electrical welding energy between said first and second electrodes; if said electrical resistance exceeds said predetermined value, cleaning said first and second electrical sheets about said region to be welded and repeating said sheet placing, electrode applying, measuring, comparing and applying steps.

4,876,431

MICROPROCESSOR WELDER CONTROLLER

Douglas J. Livingston, Wilmot Flat, N.H., assignor to Black & Webster, Inc., Waltham, Mass.

Filed May 23, 1988, Ser. No. 197,158

Int. Cl.⁴ B23K 11/24

U.S. Cl. 219—110

33 Claims



1. A microprocessor welding system controller for controlling the welding of a workpiece comprising: p1 switching means for selectively applying power to welding transformer; and

a single chip microcomputer means for controlling the power delivered to said welding transformer by said switching means to set the power level of said welding transformer, said single chip microcomputer including: means for setting the time to reach said power level; means for setting the time said power level is maintained; means for setting the time to decrease the power level of said welding transformer to zero; and means for controlling the polarity of the first half cycle of the power to said welding transformer.

4,876,432

METHOD FOR CONTROLLING A PENETRATION BEAD

Yuji Sugitani, Yoshikazu Sato, and Yasuhiko Nishi, all of Tokyo, Japan, assignors to NKK Corporation, Tokyo, Japan

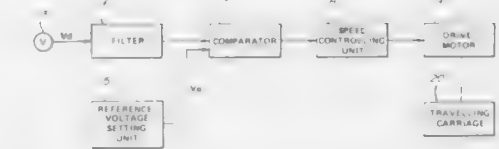
Filed Jun. 27, 1988, Ser. No. 211,963

Claims priority, application Japan, Jul. 10, 1987, 62-171194

Int. Cl.⁴ B23K 9/12

U.S. Cl. 219—124.32

15 Claims



1. A method for controlling a penetration bead, in an automatic one-side gas shielded arc welding process wherein a

backing material is adhered to the back of a pair of work pieces along a weld line and the welding is effected automatically from the surface side of the work pieces, comprising:

putting an electrically conductive material on a surface of said backing material for forming a penetration bead in a longitudinal direction of said weld line, said electrically conductive material being a material selected from the group consisting of a metallic foil tape, a metallic net and a metallic wire;

detecting a voltage between the work pieces and said electrically conductive material during the welding; and controlling the detected voltage so as to have a voltage equal to a predetermined reference voltage value.

4,876,433

INVERTER CONTROLLED-TYPE POWER SOURCE FOR ARC WELDING

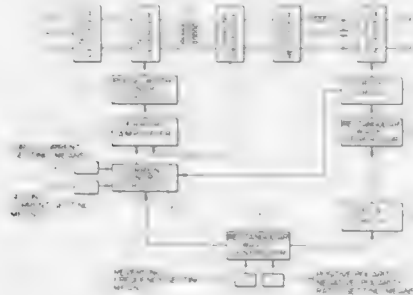
Takayuki Kashima, Fujisawa; Akira Sakabe, Urawa, and Yoshifumi Yamanaka, Hokkaido, all of Japan, assignors to Hitachi Seiko, Ltd., Tokyo, Japan

Filed Jan. 29, 1988, Ser. No. 213,140

Int. Cl.⁴ B23K 9/09

U.S. Cl. 219—130.51

7 Claims



3. A power source for arc welding comprising: first frequency converting means including a first rectifier for converting a first low-frequency AC voltage to a DC voltage, and a first inverter for converting said DC voltage to a second AC voltage; a transformer for converting said second AC voltage to a third AC voltage suitable for welding; second frequency converting means including a second rectifier for converting said third AC voltage to a DC voltage, and a second inverter for converting said rectified DC voltage to a controlled AC voltage; means for applying said controlled AC voltage generated from said second frequency converting means to materials to be welded together to apply a welding current thereto; means for selectively setting the magnitude of said welding current to either of a first set value suitable for the welding of said materials and a second set value suitable for positively reversing the polarity of said welding current; means for controlling the operation of said welding current setting means to select said second set value during the polarity reversal of said welding current; and means for inhibiting, at the time of reversing the polarity of the output current from said second inverter, the polarity reversal of said output current when said output current is in excess of a predetermined upper limit value.

4,876,434 CURING COATINGS OF A MOISTURE-CURABLE COMPOSITION

Raymond Hanson, Rearsby; Malcolm Tillyard, Leicester, and Christopher M. Allen, Loughborough, all of United Kingdom, assignors to British United Shoe Machinery Limited, Leicester, England

Division of Ser. No. 859,987, Apr. 9, 1986, Pat. No. 4,780,335.

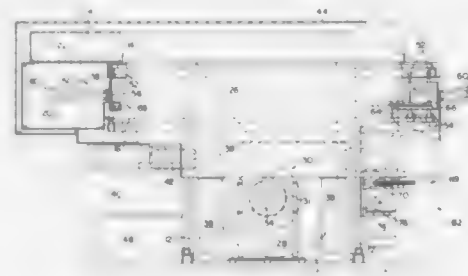
This application Jul. 15, 1988, Ser. No. 219,451

Claims priority, application United Kingdom, Sep. 4, 1984, 8422334

Int. Cl.⁴ F27B 9/10, 9/18

U.S. Cl. 219—215

10 Claims



1. Apparatus for curing a coating of a moisture-curable composition applied to the bottoms of shoes comprising: a chamber; a substantially enclosed plenum overlying said chamber and having a bottom wall common with the top wall of said chamber; conveyor means by which shoes are conveyed, bottom uppermost through said chamber; means for supplying a continuous stream of air to said plenum, said bottom wall having an array of apertures extending over substantially the whole length of said chamber and opening into the top of said chamber whereby air supplied therethrough directly impinges on the bottom of a shoe being conveyed by said conveyor means through said chamber; said apertures further comprising means for heating the air; and means for supplying a controlled amount of steam to the air, prior to entry of the air into said plenum said conveyor means comprising an endless track and a plurality of carriages, movable along said track, for supporting shoes bottom uppermost, each said carriage having a pair of projecting support means between which the crown of a shoe last can be received for supporting the shoe bottom uppermost, said support means being mounted on said carriage for height-wise adjustment thereon.

4,876,435

SANITARY HAND DRYER

Junior F. Hawkins, 3120 W. 16th, Wichita, Kans. 67203

Filed Jan. 13, 1988, Ser. No. 143,332

Int. Cl.⁴ H05B 1/02

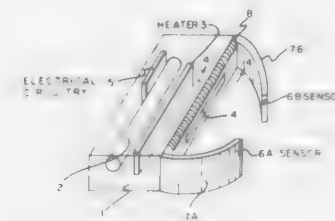
U.S. Cl. 219—364

5 Claims

1. A sanitary hand dryer comprising: a housing having a box-like structure defined by a top, a pair of sides secured to the top, and an upright face secured normally to the top and to the pair of sides, said upright face having a structure defining a longitudinal opening where through warm air can pass; a blower means disposed in said housing for blowing air; a heating coil means disposed in said housing in proximity to said blower means; an electronic circuitry means electrically connected to said heating coil means and to said blower means in order to energize said blower means and said housing coil means

such that the blower means blows air over the heating coil means to heat the same and discharge warm air through said longitudinal opening, said electronic circuitry means comprises a light sensor means;

a top vane air deflector means secured to said housing at the securing point where said top secures normally to said face and extending over said longitudinal opening to deflect warm air passing through said longitudinal opening; and



a pair of opposed side vane air deflector means secured to said housing at the securing point where said upright front secures normally to said pair of sides for deflecting warm air, and each of said opposed side vane air deflector means has an arcuate shape and terminates in an end and said light sensor means comprises a first light sensor means mounted on the end of one of said side vane air deflector means, and a second light sensor means mounted on the end of the other side vane air deflector means.

4,876,436

PTC AIR HEATER EMPLOYING TRIANGULAR PTC HEATING ELEMENTS

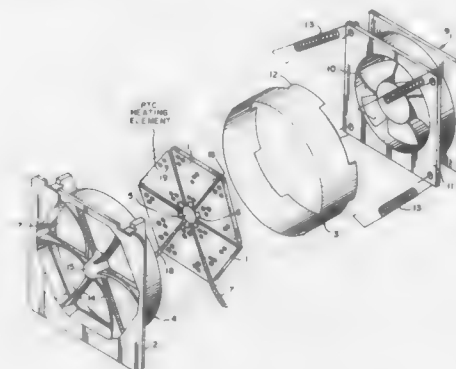
Mason G. Ide, Gorham, Me.; Noel L. W. Lawrence, London, Canada, and Lee Prager, Raymond, Me., assignors to GTE Products Corporation, Stamford, Conn.

Filed Jul. 27, 1988, Ser. No. 224,638

Int. Cl.⁴ H05B 1/02, 3/06; F24H 3/04

U.S. Cl. 219—370

7 Claims



1. An air heater comprising: six triangular PTC heating elements co-planarily disposed within a circular shroud; an apex of each triangular PTC heating element being adjacent a common central point; the sides of the six triangular PTC heating elements, which are opposite the apexes adjacent a common central point, forming a hexagon; the area occupied by the six triangular PTC heating elements being greater than 78% of the cross sectional area of the circular shroud; each PTC element having a multiplicity of holes therethrough; means for forcing air within the shroud through the holes in the PTC elements to be heated when the PTC elements are electrically energized; and means for electrically energizing the PTC elements.

4,876,437

SOLDERING APPARATUS

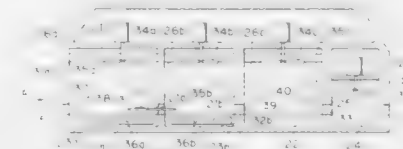
Kenshi Kondo, Tokyo, Japan, assignor to Nihon Den-Netzu Keiki Co., Ltd., Tokyo, Japan

Filed Jul. 14, 1988, Ser. No. 218,872

Int. Cl.⁴ B23K 3/00

U.S. Cl. 219—388

6 Claims



1. An apparatus for soldering printed circuit boards having electric parts temporarily mounted thereon with solder preforms, comprising:

an axially elongated housing member; conveying means providing a path along which the printed circuit boards are conveyed through said housing member in the direction parallel to the axis of said housing member;

one or more transversely extending partition means provided within said housing member for partitioning the inside space thereof into axially aligned reflowing chamber and one or more preheated chambers, with said reflowing chamber being located downstream of said one or more preheating chambers with respect to the direction of the travel of said printed circuit boards through said housing member;

an aperture provided in each of said transversely extending partition means to permit the printed circuit boards to pass therethrough;

a pair of spaced apart vertical partitions extending axially within each of said preheating chambers and said reflowing chamber for partitioning same into two, outer, air flow channels and a center space;

upper and lower openings provided in each of said vertical partitions so that the air flow channels of each chamber are in fluid communication with the corresponding center space;

first heating means disposed in the center space of each of said preheating chambers and reflowing chamber for heating the air in said center space, so that the printed circuit boards are preheated with the heated air during their passage through said chamber;

second heating means disposed within said reflowing chamber for causing the solder preforms of the printed circuit boards to reflow during their passage through said reflowing chamber, said second heating means being one or more reflector type infrared radiation lamps;

fan means provided in the center space of each of said preheating chambers and reflowing chamber to cause the air in said chamber to circulate through said center space and said air flow channels; and

flow control plates provided in the center space of each of said preheating chambers and reflowing chamber and positioned between the fan and the path of travel of the printed circuit boards for controlling the flow of the circulating air through said center space so as to uniformly heat the printed circuit boards.

4,876,440
CONTROL OF THE POWER TO THE HEATER AND THE SPEED OF MOVEMENT OF A CRYSTAL ROD BY CONTROL OF THE CRYSTAL ROD DIAMETER
 Masataka Watanabe, Nakakubiki; Nobuhiro Ohhara, and Kenichi Taguchi, both of Joetsu, all of Japan, assignors to Shin-Etsu Handotai Co., Ltd., Tokyo, Japan

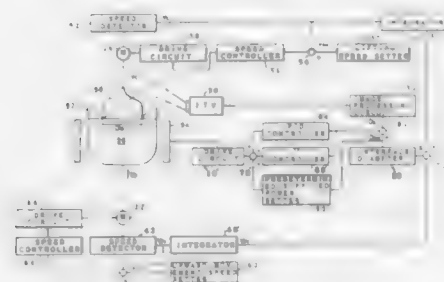
Filed Jan. 3, 1988, Ser. No. 203,441

Claims priority, application Japan, Jan. 5, 1987, 62-141019

Int. Cl.⁴ H05B 1/02

U.S. Cl. 219—497

30 Claims



1. A diameter controller for crystallization based on the FZ or CZ method, comprising:

setting means to output a predetermined value in response to a first detected value of a quantity relating to a crystal grown from a melt;

first control means for performing one PI control action in response to a difference between a second detected value of a quantity relating to a diameter of said crystal and a desired value of said second detected value;

second control means for outputting a value proportional to double time-integral of said difference in response to said difference;

superposition means for outputting a value of representing a linear combination of the output of said setting means, the output of said first control means and the output of said second control means;

final control means for controlling, in response to the output from said superposition means, power supplied to a heating device for melting a raw material so as to limit said difference towards zero.

4,876,439

PTC DEVICES

Atsushi Nagahori, Ibaraki, Japan, assignor to Nippon Mektron, Ltd., Tokyo, Japan

Division of Ser. No. 19,159, Feb. 26, 1987, Pat. No. 4,769,901.

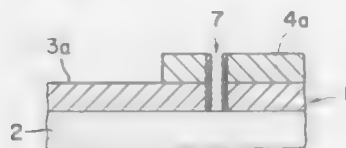
This application Jul. 18, 1988, Ser. No. 220,169

Claims priority, application Japan, Mar. 31, 1986, 61-73726

Int. Cl.⁴ H05B 3/08

U.S. Cl. 219—541

6 Claims



1. A PTC device comprising at least two electrode plates, a PTC composition disposed between and electrically connected to the electrode plates, and a lead plate joined to the surface of each of the electrode plates, wherein said PTC device has at least one through hole penetrating through at least one of said electrode plate and corresponding lead plate.

4,876,440
ELECTRICAL DEVICES COMPRISING CONDUCTIVE POLYMER COMPOSITIONS

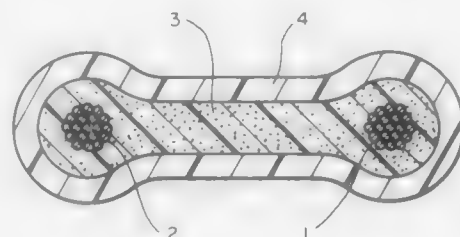
Hundi P. Kamath, Foster City, and Jeffrey C. Leder, Redwood City, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Continuation of Ser. No. 799,293, Nov. 20, 1985, abandoned, which is a continuation of Ser. No. 545,724, Oct. 26, 1983, abandoned, which is a continuation of Ser. No. 251,910, Mar. 27, 1979, Pat. No. 4,426,339, which is a continuation of Ser. No. 24,369, Mar. 27, 1979, abandoned, which is a continuation of Ser. No. 750,149, Dec. 13, 1976, abandoned. This application Feb. 7, 1989, Ser. No. 309,005

Int. Cl.⁴ H05B 3/10

U.S. Cl. 219—548

35 Claims



1. An electrical device which has improved resistance stability under service conditions, which comprises two elongate electrodes, each of said electrodes being surrounded by and being in direct physical and electrical contact with a melt-extruded, electrically conductive polymer composition which

(a) has a resistivity at 70° F. of less than 50,000 ohm.cm, and

(b) comprises an organic polymer having dispersed therein a finely divided conductive filler,

and in which device, when said electrodes are connected to a source of electrical power, current passes between the electrodes through the conductive polymer composition; wherein each of said electrodes has been surrounded and contacted by the conductive polymer composition by a process which comprises

(1) heating a thermoplastic electrically conductive polymer composition to a temperature above its melting point, said composition comprising an organic polymer having dispersed therein a finely divided conductive filler;

(2) heating each electrode, in the absence of the conductive polymer composition, to a temperature above the melting point of the conductive polymer composition; and

(3) melt-extruding the molten conductive polymer composition prepared in step (1) over and into direct physical and electrical contact with the electrodes which have been heated in step (2), while each of the electrodes is at a temperature above the melting point of the conductive polymer composition, thereby forming an elongate extrudate of the electrically conductive composition with the electrodes embedded therein and in direct physical contact with the conductive polymer composition;

said conductive polymer composition being such that if steps (1), (2) and (3) are carried out, and the extrudate is allowed to cool without taking any measures to reduce the resistivity of the extruded composition, the cooled composition has a resistivity at 70° F. of less than 50,000 ohm.cm; whereby the contact resistance between the electrodes and the conductive polymer composition in contact therewith is reduced.

4,876,441
CARD-LIKE ELECTRONIC APPARATUS
 Kazuya Hara; Takao Inoue, both of Tokyo, and Hiroyasu Bito, Oome, all of Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

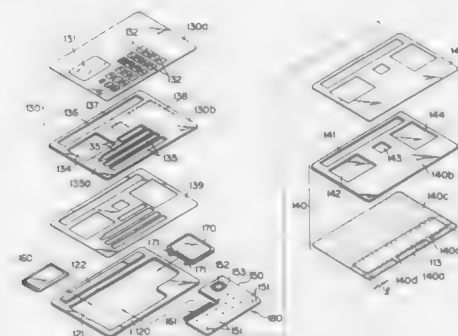
Continuation-in-part of Ser. No. 711,422, Mar. 13, 1985. This application Sep. 29, 1987, Ser. No. 102,575

Claims priority, application Japan, Mar. 27, 1984, 59-43975; Aug. 15, 1984, 59-124608; Oct. 3, 1986, 61-235745; Nov. 19, 1986, 61-176633[U]; Nov. 27, 1986, 61-181089[U]; Nov. 29, 1986, 61-182800[U]; Dec. 4, 1986, 61-186130[U]

Int. Cl.⁴ G06K 19/02

U.S. Cl. 235—488

22 Claims



1. A card-like electronic apparatus comprising: electronic device means;

case means made of a press-treatable material having an accommodation section to accommodate said electronic device means and a projecting portion of a uniform thickness for formation of an embossment;

a cover, located on one surface of said case means in which said electronic device means is accommodated; and supporting member means situated on the other surface of said case means and having a cutaway portion in which said projecting portion is fit.

4,876,442

LASER CONTROL CIRCUIT

Masaya Fukushima, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

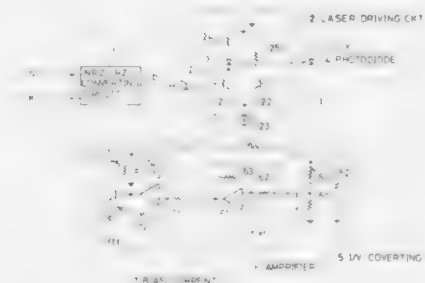
Filed Oct. 31, 1988, Ser. No. 264,570

Claims priority, application Japan, Oct. 30, 1987, 62-273585

Int. Cl.⁴ G01J 1/32

U.S. Cl. 250—205

4 Claims



1. A laser control circuit responsive to an electrical modulating signal, wherein part of the optical output power of a semiconductor laser is detected and converted into an electric signal for controlling a bias current to be supplied to said laser, said laser control circuit comprising:

laser driving means for intensity-modulating said laser in response to said electrical modulating signal;

a light receiving element for receiving part of the output

light of said laser and outputting a current corresponding to the optical power of said output light received; current/voltage converting means for converting said output current from said light receiving element into a voltage at a prescribed current/voltage converting efficiency A(T), said converting efficiency A(T) having a positive temperature coefficient with respect to the temperature in the vicinity of said laser; and control means for so controlling said bias current so as to keep constant said voltage provided by said current/voltage converting means.

4,876,443

PHOTOCELL, HAVING INCLINED PLATE CATHODE
 Josef Beucher, Hochstadt, Fed. Rep. of Germany, assignor to GTE Sylvania Licht GmbH, Erlangen, Fed. Rep. of Germany

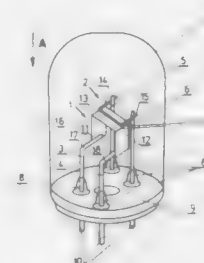
Filed May 13, 1988, Ser. No. 193,962

Claims priority, application Fed. Rep. of Germany, May 13, 1987, 3715924

Int. Cl.⁴ H01J 40/14

U.S. Cl. 250—211 R

8 Claims



1. A photocell, in particular for detecting U.V. radiation, comprising a plate cathode (1), an anode (2) and lead-in and lead-off lines (3, 4, 5, 6) respectively, which are sealed in a glass envelope, the plate cathode (1) consisting of a sheet metal strip (13) which, at its ends (20, 21), is connected to said lead-in lines (3, 4), while said anode (2) consists of a wire (16) which, at its ends (14, 15), is connected to the lead-off lines (5, 6) and which is arranged on the plate cathode side facing the radiation to be detected, substantially parallel to said plate cathode and spaced apart a distance (d) from the latter, characterized in that the plane of the sheet metal strip (13) constituting the cathode (1) is disposed at an angle of inclination with respect to the longitudinal axis (19, FIG. 3) of the glass envelope (7).

4,876,444

PROTECTION FROM EXTRANEEOUS LIGHT FOR LIGHT GUIDED VEHICLE

Bruce F. Field, Minneapolis, Minn., assignor to Tennant Company, Minneapolis, Minn.

Filed Mar. 7, 1988, Ser. No. 164,880

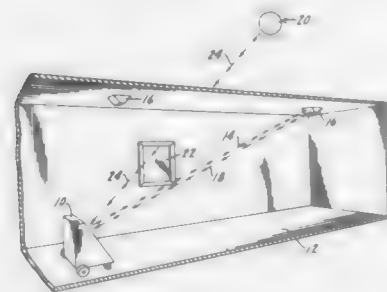
Int. Cl.⁴ H01J 40/14

U.S. Cl. 250—214 AL

9 Claims

1. A laser beam detecting device for use in conjunction with one or more retroreflective targets, comprising a transmitter for emitting a laser beam, scanning means for traversing said emitted laser beam through a scanning plane, a receiver for detecting a laser beam reflected from one of said targets and converting it to an output signal, a photodetector mounted adjacent the receiver such that extraneous light striking the receiver only from a direction parallel to said scanning plane will also strike the photodetector, the photodetector producing a signal indicating the amount of extraneous light striking

the device, and comparing means for comparing the photodetector signal to a predetermined threshold and generating an interrupt signal for overriding the output signal of the receiver when the threshold is exceeded.



interrupt signal for overriding the output signal of the receiver when the threshold is exceeded.

4,876,445

INTRUSION DETECTION DEVICE WITH EXTENDED FIELD OF VIEW

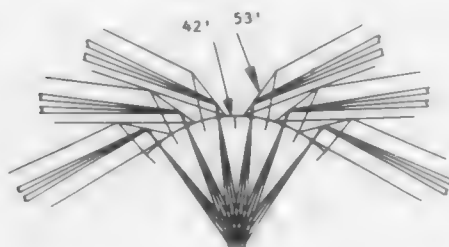
Richard L. McMaster, Pittsford, N.Y., assignor to Nvtek Security Products, Inc., Fairport, N.Y.

Filed May 16, 1988, Ser. No. 194,335

Int. Cl.⁴ G01V 9/04

U.S. Cl. 250—221

8 Claims



2. An intrusion detection device with an optically extended field of view, said device comprising:

- a segmented lens system arranged to concentrate radiation onto the sensing means from each of a plurality of discrete fields of view extending over a predetermined arc; and
- reflecting means within the field of view of each of a plurality of said lens segments for gathering radiation approaching said device from beyond said predetermined arc and for reflecting the gathered radiation onto said lens system at angles within the associated lens segment, the field of view of said reflecting means being greater than 180 degrees.

4,876,446

OPTICAL SENSOR WITH OPTICAL INTERCONNECTION BOARD

Yoshiaki Kambe, Yoshihiko Okuda, Atsuyuki Hirono, Akira Nagaoka, and Takayasu Ito, all of Kadoma, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Jan. 29, 1988, Ser. No. 150,385

Claims priority, application Japan, Feb. 6, 1987, 62-26755; Feb. 24, 1987, 62-41006; Jul. 15, 1987, 62-176256

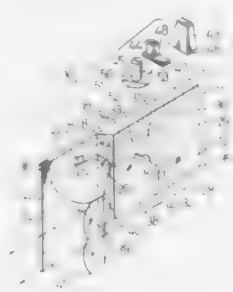
Int. Cl.⁴ G01V 9/04; H01J 5/16

U.S. Cl. 250—221

18 Claims

1. An optical sensor comprising means for projecting light to a detection area, means for receiving light reflected from an object present in said detection area, a sensor function setting means capable of energizing said light projecting means, a signal processing means for processing output signals from said light receiving means to discriminate the presence of said

object and for providing an object detection signal, and an optical interconnection board including optical wave guides



respectively interconnecting said light projecting means, said light receiving means, said sensor function setting means and said signal processing means with one another.

4,876,447

FIBER OPTIC ACCELEROMETER USING CLOSED FEEDBACK RELATION TO VARY PATHLENGTH

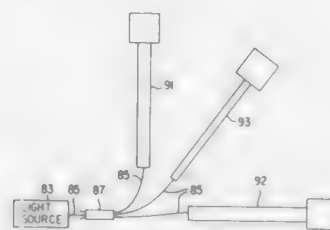
Kevin M. Killian, Hackensack, N.J., assignor to Allied-Signal Inc., Morris County, Morris Township, N.J.

Filed Aug. 6, 1987, Ser. No. 82,258

Int. Cl.⁴ H01J 5/16; G01D 5/34

U.S. Cl. 250—227

11 Claims



1. Accelerometer in which a proof mass is suspended by a cantilever beam, and deflection of the beam is proportional to acceleration, characterized by:

- (a) two light paths, the light paths being rendered unequal in length by the deflection of the beam, the light paths merging at least one end;
- (b) a light source connected to the light paths;
- (c) photodetection means responsive to light in the merged light paths and sensitive to changes in the character of light as a result of said unequal pathlengths; and
- (d) a feedback loop including first means in one of the light paths and second means connected to the first means and to the photodetection means, said first means varying the length of the one light path to equalize the length of the two light paths which have been rendered unequal by the acceleration, said second means applying a signal to the first means commensurate with said acceleration.

4,876,448

OPTICAL SYSTEM FOR MOTION COMPENSATION OF LINE SCANNERS

Horst Laucht, Bruckmühl, and Jürgen Euskirchen, Waidhofen, both of Fed. Rep. of Germany, assignors to Messerschmitt-Bölkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 879,125, May 21, 1986, abandoned.

This application Oct. 17, 1988, Ser. No. 259,479

Claims priority, application Fed. Rep. of Germany, Sep. 21, 1984, 3434794

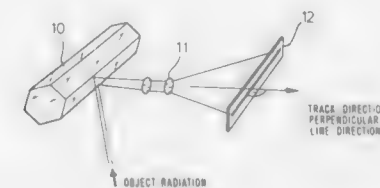
Int. Cl.⁴ G02B 26/10

U.S. Cl. 250—234

3 Claims

1. An optical system for motion compensation of a line

scanner to improve resolution in at least one spectral channel, the system having a motion of its own or being arranged on a moving observation platform, the system comprising optical means for directing light along an optical path from a radiation source to at least one detector and further comprising a multi-



faced prism, said prism disposed in the optical path and rotating about a central axis thereof at a predetermined rotational speed in a direction opposed to the direction of the platform or the system motion for increasing the integration time for imaging the radiation source on the detector.

4,876,449

RESERVOIR EVALUATION USING PARTITIONING TRACER

Burton M. Casad, and Preston L. Gant, both of Ponca City, Okla., assignors to Conoco Inc., Ponca City, Okla.

Filed May 12, 1988, Ser. No. 193,471

Int. Cl.⁴ G01V 5/00

U.S. Cl. 250—259

10 Claims

1. A method of obtaining information about a watered-out oil reservoir comprising:

- (a) injecting into a first well (1) a partitioning radioactive tracer material having a first gamma ray emission spectrum, and (2) a water-soluble non-partitioning radioactive tracer material having a different gamma ray emission spectrum; and
- (b) periodically logging a second well spaced from said injection well to detect arrival of and amount of said tracer materials.

4,876,450

CRYOSONDE FOR WELL LOGGING TOOL

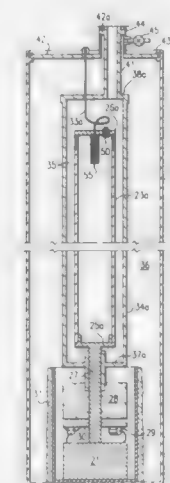
Melvin G. Montgomery, Plano, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jul. 26, 1988, Ser. No. 224,511

Int. Cl.⁴ G01V 5/00

U.S. Cl. 250—261

6 Claims



1. A cryosonde comprising:

a housing;
a germanium crystal in said housing; and
a means for cooling said crystal comprising:
a refrigerant chamber in said housing in thermal communication with said crystal;
means to fill said chamber with a refrigerant; and
rupture means in communication with the interior of said chamber adapted to rupture at a pressure less than the pressure required to rupture said chamber.

4,876,451

ALUMINUM SOLID ELECTROLYTIC CAPACITOR AND MANUFACTURING METHOD THEREOF

Hironosuke Ikeda, Hirakata; Tadashi Ezaki; Kakushiyon Yoshida, both of Saga; Rikizon Yamaguchi, Taku, and Kazuhiro Suenaga, Saga, all of Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi and Sanyo Industry Co., Ltd., Saga, both of, Japan

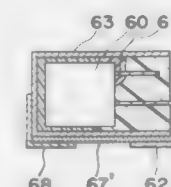
Filed Aug. 4, 1988, Ser. No. 228,098

Claims priority, application Japan, Aug. 5, 1987, 62-196130; Aug. 8, 1987, 62-198938; Nov. 30, 1987, 62-302797; Dec. 3, 1987, 62-184767[U]; Dec. 14, 1987, 62-315753; Dec. 16, 1987, 62-319311

Int. Cl.⁴ H01G 9/06

U.S. Cl. 361—540

31 Claims



1. An aluminum solid electrolytic capacitor, comprising:
an anode aluminum foil having an oxide film formed on a surface thereof, a cathode aluminum foil and carbonized separators for separating said anode and cathode aluminum foils, the two foils and the separators being wound to form a capacitor element, the distance between the two foils in the capacitor element to be determined by the thickness of separator being kept at a value between ten to sixty micrometers, solid manganese nitrate electrolyte being formed between the two foils by the thermal decomposition of electrolytic solution impregnated in the capacitor element.

4,876,452

RADIATION IMAGE READ-OUT APPARATUS

Kazuo Horikawa, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 3, 1984, Ser. No. 677,446

Claims priority, application Japan, Dec. 5, 1983, 58-229570

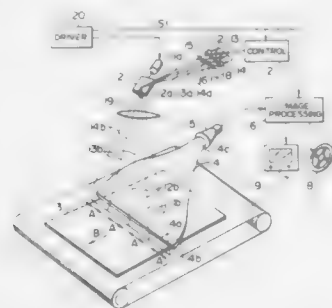
Int. Cl.⁴ G03C 5/16

U.S. Cl. 250—327.2

7 Claims

1. A radiation image read-out apparatus comprising:
(i) a plurality of stimulating ray sources,
(ii) a single light deflecting means for receiving beams of stimulating rays emitted by said stimulating ray sources and for making said beams of stimulating rays impinge on different portions of a stimutable phosphor sheet carrying a radiation image stored therein so that said different portions of said stimutable phosphor sheet are scanned by said beams of stimulating rays in a main scanning direction, each of said beams traversing a respective one of said different portions,
(iii) a stimulating ray source drive control means for pulse-wise turning on said stimulating ray sources at timings deviated from each other,

- (iv) a sub-scanning means for moving said stimuable phosphor sheet with respect to said beams of stimulating rays in a sub-scanning direction approximately normal to the main scanning direction;
- (v) a single light guide member having a light input face



extending in the main scanning direction close to a scanning line in the main scanning direction, said light guide member guiding light entering from said light input face up to a light output face thereof, and

(vi) a photodetector connected with said light output face of said light guide member.

4,876,453

METHOD AND APPARATUS FOR CALIBRATING AN IMAGING SENSOR

Michael P. Wirick, Los Angeles, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

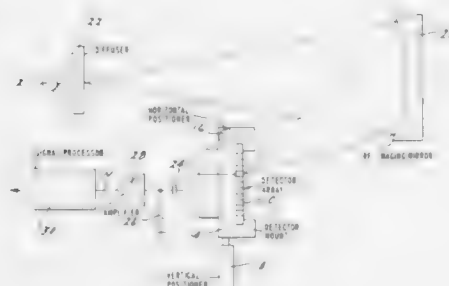
Filed Feb. 19, 1986, Ser. No. 830,788

The portion of the term of this patent subsequent to Oct. 10, 2006, has been disclaimed.

Int. Cl.⁴ H01L 31/00

U.S. Cl. 250—332

24 Claims



1. An imaging sensor for scanning a thermal image comprising:

- a first set of elemental detectors operable to receive a portion of said thermal image during a first portion of a calibration cycle;
- a second set of elemental detectors operable to receive said portion of said thermal image during a second portion of said calibration cycle; and
- means for calibrating said first and second sets of elemental detectors by directly comparing the outputs of said first set of elemental detectors during said first portion of said calibration cycle with the outputs of said second set of elemental detectors during said second portion of said calibration cycle so that the relative responses between said first and second plurality of elemental detectors may be determined.

4,876,454

RADIATION DETECTOR

Peter H. Burgess, Oxfordshire, England, assignor to National Radiological Protection Board, Oxfordshire, England

PCT No. PCT/GB87/00148, § 371 Date Oct. 15, 1987, § 102(e) Date Oct. 15, 1987, PCT Pub. No. WO87/05403, PCT Pub. Date Sep. 11, 1987

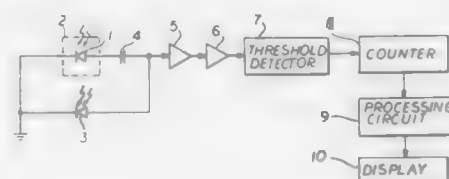
PCT Filed Mar. 3, 1987, Ser. No. 138,372

Claims priority, application United Kingdom, Mar. 5, 1986, 8605394

Int. Cl.⁴ G01T 1/02; H01L 31/00

U.S. Cl. 250—370.14

9 Claims



1. A radiation detector for generating pulses in response to incident radiation characterised by two PIN photodiodes (1,3) each disposed to operate in a self biasing mode, one of the diodes having an effective sensitive area substantially larger than that of the other and the larger area diode being provided with means (2) for attenuating radiation incident thereon, and means (5) for combining the output of each diode.

4,876,455

FIBER OPTIC SOLDER JOINT INSPECTION SYSTEM

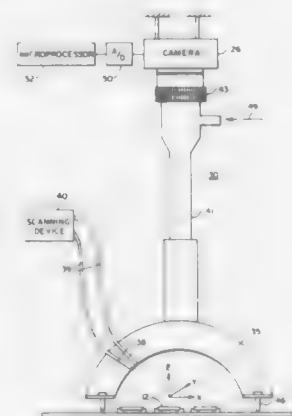
Arthur C. Sanderson, Williamstown, Mass.; Lee E. Weiss, and Shree K. Nayar, both of Pittsburgh, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 25, 1988, Ser. No. 160,562

Int. Cl.⁴ G01N 21/86

U.S. Cl. 250—560

17 Claims



1. A method for determining the shape of an object having a specular surface comprising the steps of:

- (a) projecting sequentially toward the object the light from each of a plurality of point light sources which are arranged in a fixed configuration about a common site at which the object is placed for inspection;
- (b) viewing the object at the common site to detect light patterns caused by the reflections of light of each point light source from the object surface;
- (c) interpreting the light patterns to determine the surface orientation of points on the object surface; and
- (d) reconstructing the object surface profile using the surface orientations of points on the object.

4,876,456

METHOD OF AND APPARATUS FOR DETECTING PRESENCE OR ABSENCE OF PHOTOSENSITIVE OBJECT AT A PRESCRIBED POSITION

Koichi Isono, and Ikuro Shio, both of Hikone, Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan

Filed Dec. 21, 1987, Ser. No. 136,488

Claims priority, application Japan, Dec. 19, 1986, 61-304735

Int. Cl.⁴ G03D 13/00

U.S. Cl. 250—561

9 Claims



1. An apparatus for optically detecting a photosensitive object having photosensitive material carried along a prescribed path at a prescribed position along said path, said apparatus comprising:

- light emitting means facing said prescribed position;
- first power supply means for supplying pulsed power to said light emitting means thereby to activate said light emitting means to emit pulsed light, an activation time and an activation interval of said pulsed power being determined to satisfy such a condition that an accumulated exposure value in each portion on said photosensitive object is less than a critical exposure value of said photosensitive material depending on a photosensitive character of said photosensitive material when said pulsed light is applied to said photosensitive object being moved;
- second power supply means for supplying continuous power to said light emitting means thereby to activate said light emitting means to emit continuous light;
- selection means for selectively enabling one of said first and second power supply means in response to an externally supplied selection signal thereby to activate said light emitting means selectively to emit one of said pulsed light and said continuous light; and
- light receiving means facing said prescribed position for receiving light emitted from said light emitting means thereby to generate a photosensitive object detection signal indicating whether or not said photosensitive object is present at said prescribed position.

4,876,457

METHOD AND APPARATUS FOR DIFFERENTIATING A PLANAR TEXTURED SURFACE FROM A SURROUNDING BACKGROUND

Chinmoy B. Bose, Green Brook, N.J., assignor to American Telephone and Telegraph Company, New York, N.Y.

Filed Oct. 31, 1988, Ser. No. 264,709

Int. Cl.⁴ G01N 21/88

U.S. Cl. 250—563

13 Claims

1. A method for differentiating between a textured, planar surface and a background region surrounding the surface comprising the steps of:

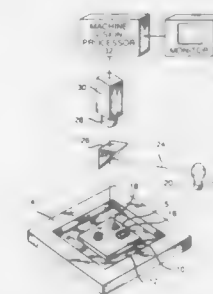
illuminating both the textured, planar surface and the surrounding background region by directing light thereat so the light strikes the surface substantially normal to the plane thereof;

capturing the image of the textured planar surface and the

surrounding background region with an image-acquisition device which is positioned to sense the light reflected from the background region and the surface substantially normal to the plane of the surface thereof such that only the textured planar surface appears in focus within the captured image;

determining the intensity of each of a plurality of small areas (pixels) within the captured image;

determining the intensity gradient for each pixel;



creating a gradient image by assigning to each pixel within the captured image an intensity value according to its intensity gradient; and

binarizing the gradient image by causing each pixel therein to appear bright or dark, depending on whether the intensity gradient established for each pixel is above or below a predetermined threshold, respectively, thereby eliminating the background region from the captured image.

4,876,458

APPARATUS FOR MEASURING PARTICLES IN LIQUID

Kazuo Takeda, Kokubunji; Yoshitoshi Ito, Ome; Noriaki Honma, and Chusuke Munakata, both of Nishitama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 29, 1988, Ser. No. 250,615

Claims priority, application Japan, Oct. 2, 1987, 62-247927; Jul. 18, 1988, 63-177158

Int. Cl.⁴ G01N 15/06

U.S. Cl. 250—574

7 Claims



1. An apparatus for measuring particles in a liquid the apparatus comprising:

- a sample liquid supply means for allowing the sample liquid to flow out from a nozzle into a gas in a stream;
- a light radiation means for radiating light into an sample liquid stream coaxially with the axis of the stream; and
- a scattering light detection means for collecting rays of light scattered by particles contained in a sample liquid stream at a point outside and by the side of the sample liquid stream and then detecting the collected light rays.

4,876,459

TOGGLING SPEAKERSWITCH

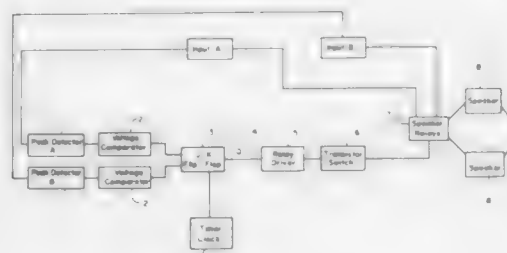
Thomas P. Flock, Box 236, Rte. 2, Murphysboro, Ill. 62966

Filed Nov. 14, 1988, Ser. No. 270,769

Int. Cl.⁴ H02J 1/00

U.S. Cl. 307-11

8 Claims



1. An electronic circuit for switching speakers, comprising:
 - (a) a first peak detector circuit connected to a first voltage comparator which sends a first signal to a J-K flip-flop;
 - (b) a second peak detector circuit connected to a second voltage comparator which sends a second signal to a J-K flip-flop;
 - (c) a timer circuit connected to said J-K flip-flop;
 - (d) a J-K flip-flop which toggles between said first and second signals and has an output Q;
 - (e) a relay driver which receives said output Q and switches between said first and second signals according to the output Q and which drives speaker relays and speakers.

4,876,460

UNINTERRUPTED POWER SUPPLY

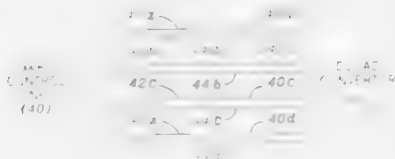
Ronald W. Johnson, Laguna Hills, Calif., assignor to Intellipower, Inc., Laguna Hills, Calif.

Filed Mar. 27, 1989, Ser. No. 329,194

Int. Cl.⁴ H02J 9/06; H02M 5/45

U.S. Cl. 307-64

18 Claims



1. A continuous uninterruptible power supply (UPS) having microprocessor controlled switching circuitry, comprising:
 - a regulator circuit for receiving an AC input line signal and for generating a regulated DC signal therefrom;
 - a DC/AC converter connected to said regulator for receiving said regulated DC signal and generating an output AC signal therefrom; and

ing said regulated DC signal and generating an output AC signal therefrom; and

a microprocessor controller connected to said DC/AC converter for controlling the operation thereof, said microprocessor being connected to said DC/AC converter by a plurality of signal line pairs, each of said pairs including a control line and a return line, said control line and said return line being disposed in close proximity such that signals induced in said control line are also induced in said return line.

4,876,461

SELF-REFERENCING CAPACITIVE KEY CELL STRUCTURE AND SWITCHCORE MATRICES FORMED THEREFROM

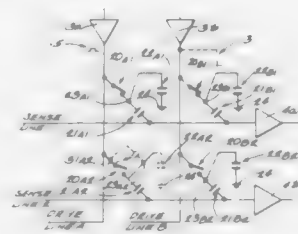
Norman G. Gratke, Elm Grove, Wis., assignor to W. H. Brady Co., Milwaukee, Wis.

Filed Feb. 23, 1989, Ser. No. 314,721

Int. Cl.⁴ H03K 17/975; H01H 35/00

U.S. Cl. 307-116

10 Claims



1. In a capacitive key cell of the type including a contact switch in series with a key cell capacitor for use in a matrix of similar capacitive key cells, the improvement wherein each key cell further includes an intracell coactive loading capacitor connected between a low impedance source of constant voltage and the junction of the contact switch with the key cell capacitor.

6. A membrane switchcore comprising:

- a plurality of drive lines;
- one or more sense lines;
- a ground line;
- a plurality of key cells, each key cell being connected to the ground line and to a unique combination of one drive line and one sense line, in which at least one sense line is connected to two or more of said plurality of key cells, and in which each key cell includes: a contact switch, with one end of the contact switch being connected to one drive line, and the other

end of the contact switch being connected to a floating junction point, the contact switch having a high impedance open state and a low impedance closed state; actuating means for changing the contact switch between the open and closed states;

a key cell capacitor, with one end of the key cell capacitor being connected to said at least one sense line, and the other end of the key cell capacitor being connected to the floating junction point; and

an intracell coactive loading capacitor connected between the floating junction point and the ground line;

wherein when an interrogating pulse is applied to one of the drive lines connected to a first key cell on said at least one sense line, the remainder of the key cells on said at least one sense line, other than the first key cell, provide substantial loading for said at least one sense line, regardless of the state of the contact switches in said remainder of key cells.

4,876,462

CONTROL CIRCUIT FOR MULTIPURPOSE INPUT TERMINAL

Hiroyuki Kobatake, and Toshikatsu Jinbo, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

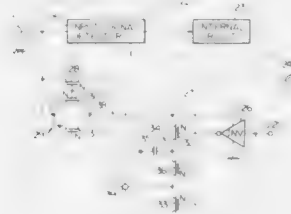
Filed May 31, 1988, Ser. No. 200,103

Claims priority, application Japan, May 29, 1987, 62-136895

Int. Cl.⁴ H03K 17/56, 17/60

U.S. Cl. 307-246

12 Claims



1. A control circuit for a multipurpose input terminal incorporated in an integrated circuit, said multipurpose input terminal being supplied with an input signal or an electric power different in voltage level from the input signal, comprising:
 - (a) an input signal detecting circuit operative to detect said input signal appearing at said multipurpose input terminal for relaying the input signal to an internal circuit;

- (b) a first gate transistor responsive to a first control signal for providing a conduction path between said multipurpose input terminal and an output node and having a threshold voltage;
- (c) a charge-pump circuit carrying out a bootstrap operation in the presence of said electric power for producing said first control signal higher in voltage level than said electric power by at least the threshold voltage of said first gate transistor, said charge-pump circuit including a series combination of a second gate transistor, at least one bootstrap circuit and a third gate transistor coupled between a power node and a reference voltage source;
- (d) a transferring circuit operative to supply said power node with said electric power used for said bootstrap operation; and
- (e) control means responsive to a second control signal shifting between first and second levels for controlling said second and third gate transistors, said control means complementarily making said second and third gate transistors conductive and non-conductive, respectively, thereby allowing said first gate transistor to be conductive in the presence of said second control signal of the first level and to be non-conductive in the presence of said second control signal of the second level.

4,876,463

DUTY CYCLE CONTROLLER FOR HORIZONTAL SYNCHRONIZATION SIGNALS IN A TELEVISION RECEIVER

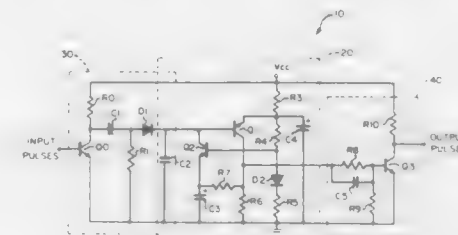
Robert L. Lyle, Knoxville, Tenn., assignor to North American Philips Corporation, New York, N.Y.

Filed Apr. 20, 1988, Ser. No. 183,964

Int. Cl.⁴ H03K 5/04, 17/56, 4/08; H04N 5/08

U.S. Cl. 307-265

36 Claims



1. A pulse generator of controllable duty cycle having a pulse input and providing a pulsed output of controllable duty cycle, comprising:
 - (a) a duty cycle control loop comprising, a comparator means having an output coupled to said controllable duty cycle pulsed output, a duty cycle detector means coupled to said comparator means for detecting the duty cycle of the output of said comparator means, a duty cycle control means for setting said duty cycle of said output of said comparator means to a desired value, and an error feedback means coupled to said duty cycle control means, said duty cycle detector means, and said comparator means; and

- (b) an edge trigger means for triggering a change in state of said comparator means in response to an edge of said input pulse.

4,876,464

SAMPLED DATA CIRCUIT

Michael J. Gay, Coppet, Switzerland, assignor to Motorola Inc., Schaumburg, Del.

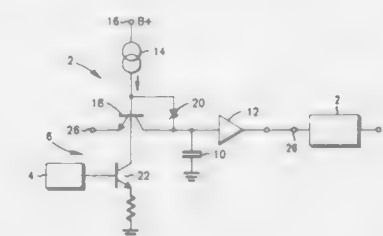
Filed Mar. 18, 1988, Ser. No. 169,922

Claims priority, application United Kingdom, Mar. 19, 1987, #704597

Int. Cl.⁴ G11C 27/02

U.S. Cl. 307-353

6 Claims



1. A sampled data circuit having two or more serially connected sampled data stages each comprising switching means and storage means; and clock means for applying to the switching means of consecutive stages clock signals for sequentially moving sampled data between consecutive stages, said clock signals having respectively first and second signal levels at which high and low currents respectively are drawn by individual stages, wherein the clock signals also have a third level intermediate the first and second levels which is occupied simultaneously by the first and second clock signals, at which the switching means act in the same manner as at the first level and at which a current substantially less than the high current is drawn by individual stages.

4,876,465

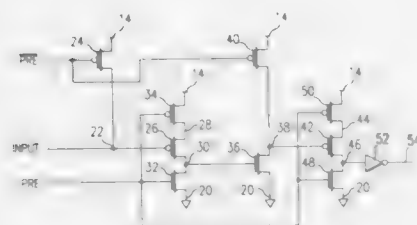
DYNAMIC CMOS BUFFER FOR LOW CURRENT SWITCHING

William J. Podkova, and Clark R. Williams, both of Plano, Tex., assignors to Dallas Semiconductor Corporation, Dallas, Tex.

Filed Jan. 17, 1988, Ser. No. 208,287
Int. Cl.⁴ H03K 17/16, 19/094, 3/01

U.S. Cl. 307—443

15 Claims



1. A gate circuit for buffering a low slew rate input signal with minimum power drain, comprising:

- an input node;
- a first capacitive node;
- a second capacitive node;
- precharge means for operating during a precharge cycle to pull the second capacitive node to a low reference voltage to allow said second capacitive node to float when not in the precharge node, said input node disposed at a logic high during said precharge cycle and said second capacitive node pulled to a high reference voltage when not operating in said precharge cycle;
- switch means operative during said precharge cycle to isolate said first and second capacitive nodes and in a switching mode to connect said first and second capacitive nodes together;
- said switch means operating in the switching mode when said input node falls below a predetermined threshold voltage; and
- means for interfacing said second capacitive node to an output node;
- wherein the slew rate of the output node is a function of the rate with which said second capacitive node is pulled from said low reference voltage to said high reference voltage during the switching cycle;
- wherein said precharge means comprises:
 - a P-channel transistor having the source-to-drain path thereof connected between said high reference voltage and said first capacitive node;
 - an N-channel transistor having the source-to-drain path thereof connected between said second capacitive node and said low reference voltage;
 - the gates of said P-channel and N-channel transistors being connected together and to a precharge clock which operates at a high logic voltage in the precharge cycle and a low logic voltage in the switching mode; and
 - a P-channel transistor having the source-to-drain path thereof connected between said input node and said high reference voltage and the gate thereof connected to a logic low during said precharge cycle and to a logic high during said switching mode to pull said input node to a logic high during said precharge cycle.

4,876,466

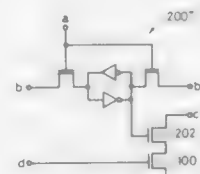
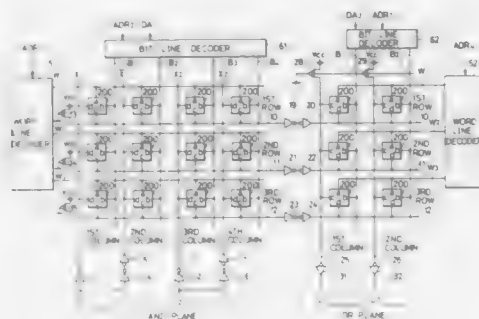
PROGRAMMABLE LOGIC ARRAY HAVING A CHANGEABLE LOGIC STRUCTURE

Harufusa Kondou, and Hiroshi Kuranaga, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 10, 1988, Ser. No. 269,763
Claims priority, application Japan, Nov. 20, 1987, 62-294557
Int. Cl.⁴ G06F 7/38; H03K 19/094

U.S. Cl. 307—465

13 Claims



- 1. A programmable logic array (PLA) comprising:
 - a plurality of input signal lines each including a first input line for directly transmitting an input signal and a second input line for transmitting an inverted input signal;
 - a plurality of output signal lines crossing said input signal lines;
 - a plurality of programmable logic array cells at intersections of said plurality of input signal lines and said plurality of output signal lines, said programmable logic array cells forming an AND plane, each of said cells being programmable and commonly provided to a pair of said first input signal lines and said second input signal lines; and
 - addressing means for selecting particular ones of said programmable logic array cells, wherein each said programmable logic array cell comprises
 - (a) a random access memory for storing external data when selected by said addressing means, said memory being rewritable during operation of said PLA while carrying out a predetermined logic function for changing said function,
 - (b) switching means which are opened or closed, selectively, by outputs of said memory means, and
 - (c) PLA programming devices controlled by said switching means and connected to corresponding ones of said input signal lines and said output signal lines;
- wherein said PLA is alterably programmable by data stored in said memory means.

4,876,467

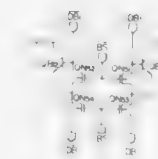
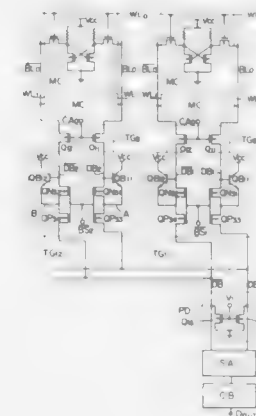
TRANSFER CIRCUIT FOR SIGNAL LINES

Atsuo Koshizuka, Kamifukuoka, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 28, 1988, Ser. No. 291,031
Claims priority, application Japan, Jan. 11, 1988, 63-2531
Int. Cl.⁴ H03K 17/60, 17/687

U.S. Cl. 307—570

9 Claims



1. A transfer circuit for controlling a signal transfer between a first signal line and a second signal line in response to a control signal comprising:

- a first MIS transistor including a first electrode connected to the first signal line, a second electrode, and a gate electrode;
 - a second MIS transistor including a first electrode connected to the second electrode of the first MIS transistor, a second electrode connected to the second signal line, and a gate electrode; and
 - a bipolar transistor including a base electrode connected to the first signal line, a first electrode connected to a power supply line, and a second electrode connected to the first electrode of the second MIS transistor;
- the gate electrodes of the first MIS transistor and the second MIS transistor being controlled in response to the control signal such that the first MIS transistor and the second MIS transistor operate in a complementary manner.

4,876,468

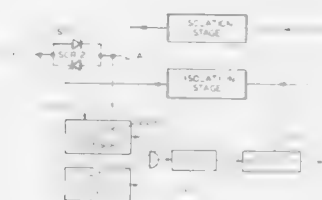
THYRISTOR DRIVER TURN-OFF CIRCUIT

James T. Libert, Waukegan, Wis., assignor to Square D Company, Palatine, Ill.

Filed Oct. 16, 1986, Ser. No. 919,914
Int. Cl.⁴ F21V 33/00

U.S. Cl. 307—643

15 Claims



- 1. A gate drive circuit for a thyristor comprising:
 - means for supplying current to a gate electrode of said thyristor;
 - means for generating a timing signal to initiate conduction of said thyristor;
 - means, responsive to a voltage from cathode to anode of said thyristor, for generating a "voltage level" signal when said voltage from cathode to anode of said thyristor is reduced by conduction of said thyristor; and,
 - means, responsive to said "means for generating a timing signal" and said "means for generating a voltage level signal", for commanding said "means for supplying current to a gate electrode" to supply current to said gate electrode of said thyristor and for commanding said "means for supplying current to a gate electrode" to cease supplying current to said gate electrode of said thyristor at a predetermined time interval following generation of a voltage level signal by said "means for generating a voltage level signal", said predetermined time interval being chosen to be of sufficient duration to permit conduction of said thyristor to reach a stable value before current flow to said gate electrode of said thyristor ceases.

4,876,469

ROTOR OF A CRYOGENIC DYNAMOELECTRIC MACHINE

Garri M. Khutoretsky; Jury G. Tjurin; Vladimir D. Varshavsky; Galina A. Zagorodnaya, and Vladimir M. Fridman, all of Leningrad, U.S.S.R., assignors to Leningradskoe Proizvodstvennoe Elektromashinostroitelnoe Obiedeniye "Electrosila" Imeni S.M. Kirova, Leningrad, U.S.S.R.

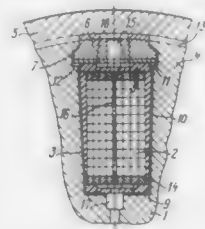
Filed May 6, 1988, Ser. No. 191,161
Claims priority, application U.S.S.R., May 14, 1987, 4245147
Int. Cl.⁴ H02K 9/20, 1/20

U.S. Cl. 310—52

1 Claim

- 1. A rotor of a cryogenic dynamoelectric machine, comprising:
 - a superconducting field winding including a plurality of coils;
 - a supporting structure having radial slots therein, each of said radial slots accommodating one of said coils, said supporting structure further including teeth disposed between said radial slots, each of said radial slots having two side walls, said side walls provided with opposed axial grooves therein;

wedges for pressing said coils in a radial direction in said slots; and
 an annular shroud embracing said supporting structure to hold said coils and said wedges in said slots;
 each of said wedges being fitted into the opposed axial grooves in one of said radial slots and having an outer surface which faces said annular shroud and an inner surface which faces the axis of the rotor;
 each of said teeth having an outer surface facing said annular shroud;
 said outer surface of each of said wedges projecting in a radial direction beyond said outer surface of each of said teeth arranged adjacent to this wedge;
 said annular shroud being fitted with a radial interference on



the outer surfaces of said wedges with a first radial clearance being formed between said shroud and said outer surfaces of said teeth;
 a second radial clearance being formed between said inner surface of each of said wedges and the opposite surface of each of said axial grooves of said slot wherein this wedge is fitted;
 the magnitude of each of said first and second radial clearances being no less than that of the radial interference of said shroud;
 whereby, on cooling the rotor, loosening of said coils in said slots caused by the difference between the value of a temperature coefficient of linear expansion of the materials of said supporting structure and said field winding is eliminated.

4,876,470

GAS-COOLED ELECTRIC MACHINE

Marino Geller, Flalisbach, Switzerland, assignor to BBC Brown Boveri AG, Baden, Switzerland

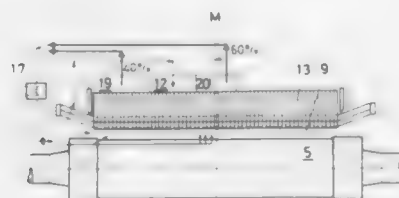
Filed Jan. 14, 1988, Ser. No. 144,046

Claims priority, application Fed. Rep. of Germany, Feb. 6, 1987, 3703594

Int. Cl.⁴ H02K 9/00

U.S. Cl. 310—59

7 Claims



1. An electric machine comprising:
 a housing, a rotor, and a stator having a laminated body disposed in said housing, said stator having indirectly cooled stator winding conductors disposed in grooves on an inside circumference of said stator;
 the laminated body of said stator comprising stacks of laminations grouped in packages of laminations separated at intervals to define radial ducts;
 the radial ducts forming radially extending cooling slits, said cooling slits connecting annular air-gap cavities located at the inside circumference of said laminated stator

body to chambers which are situated between an outside circumference of the laminated stator body and the housing;

said chambers comprising cold-gas chambers from which cold cooling gas is forced into associated first air gap cavities of said laminated stator body and hot gas chambers into which heated cooling gas flows from second air gap cavities of said laminated stator body in a radially outward direction, one of said hot gas chambers being located at one end of said machine, another of said hot gas chambers being located at a central section of said machine;

cooling means which supply the cooling gas being located at least at one end of said machine, said cooling means supplying cooling gas as cold gas to the cold-gas chambers and extracting heated cooling gas from the hot gas chambers, said supply of cooling gas being cooled by at least one of said cooling means;

wherein cooling gas lines connect said hot-gas chambers to said cooling means, said hot-gas chamber located at the central section of the machine having at least one separate cooling gas line which circumvents said hot-gas chamber located at one end of the machine and said cold gas chambers and establishes a direct connection between said hot-gas chamber located at the central section of the machine and the cooler, each of said cold gas chambers being connected by additional cooling gas lines to a discharge area of one of said cooling means located at one end of said machine, said additional cooling gas lines passing through said warm gas chamber located at one end of the machine.

4,876,471

MAGNETIC DRIVE COUPLER WITH CONSTANT TORQUE INDEPENDENT OF OUTPUT SLIPPAGE

Gilles Lacour, Belley, France, assignor to L'Eclairage Electrique Moderne, Belley, France

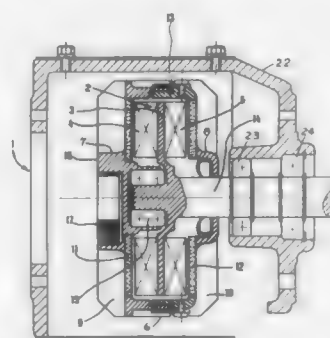
Filed Nov. 24, 1987, Ser. No. 124,504

Claims priority, application France, Nov. 25, 1986, 86 16947

Int. Cl.⁴ H02K 49/04

U.S. Cl. 310—105

17 Claims



1. A magnetic coupler for transferring rotary power between a drive and a load with substantially constant torque independent of load slippage comprising: an inductive sub-unit (2) having a plurality of poles (4,5), an induced sub-unit (6) having one or more hysteresis plates (11,12), said poles and plates being mounted in confrontational relationship for relative rotary motion with respect to each other, said one or more plates being at least partly made of a molded compound containing magnetic particles embedded therein, said particles having a maximum dimension less than $\frac{1}{2}$ of the width of said poles, said particles being dispersed in 25 to 60% by volume of an electrically insulated binder, said hysteresis plates being in a heat conductive relationship with cooling elements (9,10) attached to the induced sub-unit.

4,876,472

FIVE-PHASE DC MOTOR WITH NON-OVERLAPPING ARMATURE WINDINGS

Manabu Shiraki, and Norimitsu Hirano, both of Kanagawa, Japan, assignors to Shicoh Engineering Co., Ltd., Kanagawa, Japan and M. Gottlieb Assoc., Chicago, Ill.

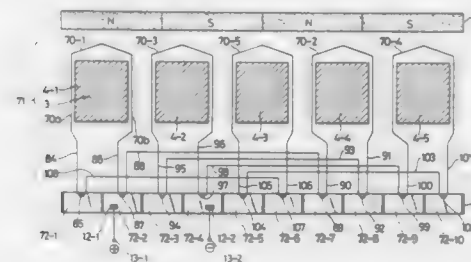
Filed May 25, 1988, Ser. No. 198,747

Claims priority, application Japan, Sep. 30, 1987, 62-243577

Int. Cl.⁴ H02K 23/26

U.S. Cl. 30—198

4 Claims



1. A 5-phase dc motor, comprising a stator including a field magnet having four alternate north and south magnetic poles of an equal angular width, a rotor including a rotor armature core having five rotor pole shoes formed at equal angular intervals thereon, said rotor pole shoes including a first rotor pole shoe formed at a position of about $\pi/5$ radians in electrical angle, a being 0, a second rotor pole shoe formed at a position spaced by an angular distance of about $2\pi/5$ radians in electrical angle from said first rotor pole shoe, c being 1, a third rotor pole shoe formed at a position spaced by an angular distance of about $4\pi/5$ radians in electrical angle from said first rotor pole shoe, d being 2, a fourth rotor pole shoe formed at a position spaced by an angular distance of about $6\pi/5$ radians in electrical angle from said first rotor pole shoe, e being 3, and a fifth rotor pole shoe formed at a position spaced by an angular distance of about $8\pi/5$ radians in electrical angle from said first rotor pole shoe, e being 4, said rotor further including a commutator composed of ten commutator segments, first to tenth provided successively in an adjacent relationship on said rotor, a first brush connected to a positive power source terminal, a second brush connected to a negative power source terminal, said first and second brushes being disposed in a spaced relationship by an angular distance of 90° mechanical and for sliding contact with said commutator, and a conductor electrically connected to the first commutator segment and wound around said first rotor pole shoe to form an armature winding for the first phase, said conductor being introduced from said armature winding for the first phase to the second commutator segment to establish electric connection to the second commutator segment and further along an end face of said rotor armature core to the seventh commutator segment at the same phase position as the second commutator segment to establish electric connection to the seventh commutator segment, said conductor from the seventh commutator segment being further wound around said fourth rotor pole shoe formed at the position spaced by the angular distance of about $4\pi/5$ radians in electrical angle from said first rotor pole shoe to form an armature winding for the second phase, said conductor being introduced from said armature winding for the second phase to the eighth commutator segment to establish electric connection to the eighth commutator segment and further along the end face of said rotor armature core to the third commutator segment at the same phase positions as the third commutator segment to establish electric connection to the third commutator segment, said conductor from the third commutator segment being further wound around said second rotor pole shoe formed at the position spaced by the angular distance of about $2\pi/5$ radians in electrical angle from said first rotor pole shoe to form an armature winding for the third phase, said conductor being introduced from said

armature winding for the third phase to the fourth commutator segment to establish electric connection to the fourth commutator segment and further along the end face of said rotor armature core to the ninth commutator segment at the same phase position as the fourth commutator segment to establish electric connection to the ninth commutator segment, said conductor from the ninth commutator segment being further wound around said fifth rotor pole shoe formed at the position spaced by the angular distance of about $\pi/5$ radians in electrical angle from said first rotor pole shoe to form an armature winding for the fourth phase, said conductor being introduced from said armature winding for the fourth phase to the tenth commutator segment to establish electric connection to the tenth commutator segment and further along the end face of said rotor armature core to the fifth commutator segment at the same phase position as the tenth commutator segment to establish electric connection to the fifth commutator segment, said conductor from the fifth commutator segment being further wound around said third rotor pole shoe formed at the position spaced by the angular distance of about $\pi/5$ radians in electrical angle from said first rotor pole shoe to form an armature winding for the fifth phase, said conductor being introduced from said armature winding for the fifth phase to the sixth commutator segment to establish electric connection to the sixth commutator segment and further along the end face of said rotor armature core to the first commutator segment at the same phase position as the sixth commutator segment to establish electric connection to the first commutator segment.

4,876,473

ARMATURE

Tohshinori Tanaka; Shigekazu Miyazaki, and Akira Morishita, all of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

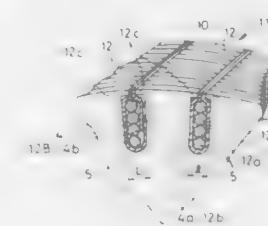
Filed Jul. 20, 1988, Ser. No. 221,823

Claims priority, application Japan, Jul. 20, 1987, 62-110931[U]; Aug. 27, 1987, 62-213298; Sep. 22, 1987, 62-238104

Int. Cl.⁴ H02K 1/00

U.S. Cl. 310—216

6 Claims



1. An armature comprising:
 a core-sheet lamination assembly comprising a plurality of laminated disk-shaped core sheets, a plurality of first slots and at least one second slot of larger width than said first slots being formed in an axial direction of said disk-shaped core-sheets, each of said core-sheets having a plurality of first radial apertures and at least one second radial aperture of larger width than said first aperture at regular intervals in a circumference thereof;
 an insulation paper which is fitted in said first slots and said at least one second slot, wrapping end parts of said insulation paper overlapping each other in said second slot; and
 a plurality of multi-layered coils which are mounted in said first slots and said second slot, each of said coils comprising a single turn per layer.

4,876,474 COMMUTATOR

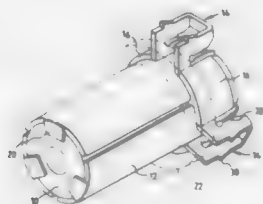
Patrick S.-C. Wang, and Roger F. Baines, both of Repulse Bay, Hong Kong, assignors to Johnson Electric Industrial Manufacturing, Limited, Chaiwan, Hong Kong
Continuation of Ser. No. 79,017, Jul. 29, 1987, abandoned. This application Sep. 9, 1988, Ser. No. 244,612

Claims priority, application United Kingdom, Dec. 11, 1986, 8629624; Mar. 16, 1987, 8706162; Mar. 30, 1987, 8707543

Int. Cl.⁴ H02K 13/04

U.S. Cl. 310—236

14 Claims



1. A rotatable pre-assembled commutator assembly, for connection to a rotatable armature of an electric motor having a winding including connector portion, said commutator assembly consisting essentially of:

a commutator base;

a plurality of commutator segments carried by said base and means securing said segments to said base;

on each said segment, a terminal integral therewith, each said terminal having, extending inwardly of said terminal from a side thereof, a slot which has an open end at said terminal side and is adapted to straddle and grip a respective said winding connector portion;

whereby said commutator assembly is connectable to said armature winding by relative bodily movement of said commutator assembly and said armature for engaging all said terminal slots over respective winding connector portions.

4,876,475

BRUSH HOLDER WITH PLASTIC CUP TO RETAIN BIASING SPRING

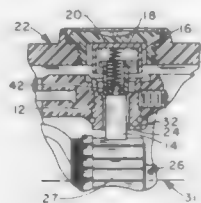
Richard A. Smith, Chippewa Falls, Wis., assignor to Sunbeam Corporation, Downers Grove, Ill.

Filed Apr. 28, 1988, Ser. No. 187,149

Int. Cl.⁴ H02K 13/00

U.S. Cl. 310—239

18 Claims



1. A brush assembly for use in a commutator type electrical machine comprising:

an elongated carbon brush having a rectangular cross section and terminating at one end in a shouldered portion surrounding a lengthwise extending protuberance;

a brush guide having a passageway within which said brush is received, said passageway being formed to guide said brush for lengthwise rectilinear movement and to restrain said brush from rotary movement;

a coil spring;

means for mounting said coil spring in a compressed condition with one end received on said protuberance and

positioned to urge said brush outwardly from said passageway;

a spring retainer which is tubular in shape to receive said one end and a portion of said coil spring, said retainer having an open end and a partially closed end;

an opening formed in said partially closed end of said retainer being large enough to receive said brush protuberance but too small to permit said one end of said coil spring to pass therethrough, said spring retainer being slidable within said passageway; and

an enlargement on said open end forming a stop to limit sliding movement of said retainer, in said guide, said sliding movement of said retainer permitting said coil spring to urge said brush outwardly from said passageway until said brush is substantially worn at which time said spring retainer arrests further movement of said one end of said spring and said brush.

4,876,476

CHIP TYPE PIEZOELECTRIC DEVICE

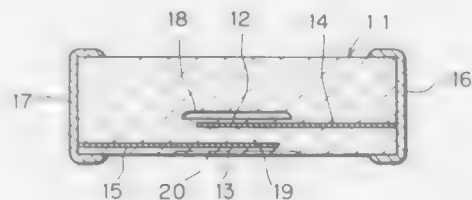
Toshihiko Kittaka, Akira Ando, and Yukio Sakabe, all of Kyoto, Japan, assignors to Murata Manufacturing Co., Ltd., Japan
Filed May 2, 1988, Ser. No. 189,150

Claims priority, application Japan, Apr. 30, 1987, 62-108121

Int. Cl.⁴ H01L 41/08

U.S. Cl. 310—320

7 Claims



1. A chip type piezoelectric device comprising:

an element body formed of cofired ceramic material and having a predetermined thickness defined by first and second main surfaces;

at least a pair of first and second excitation electrodes opposed to each other and spaced apart in the direction of the thickness of said element body with a portion of said element body interposed therebetween;

at least said portion of said element body interposed between said first and second excitation electrodes having piezoelectric characteristics, said portion thereby being a vibrating portion which is excitable by said first and second excitation electrodes;

at least said first excitation electrode being positioned in the interior of said element body; and

said element body having a cavity formed therein only on the side of said first excitation electrode toward said first main surface, and outside said vibrating portion; wherein said first and second excitation electrodes are shifted to one side toward said second main surface in the direction of the thickness of said element body.

4,876,477

COLOR TELEVISION DISPLAY TUBE

Johannes A. G. De Deugd, and Josephus J. van Moorsel, both of Groenewoudseweg 1, Eindhoven, Netherlands

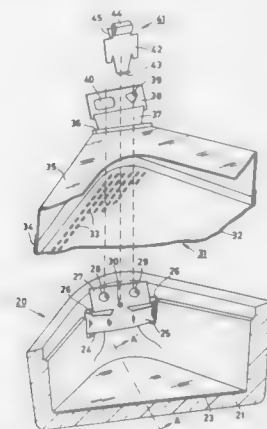
Continuation-in-part of Ser. No. 642,743, Aug. 20, 1984, abandoned, which is a continuation of Ser. No. 536,225, Sep. 27, 1983, abandoned, which is a continuation of Ser. No. 270,285, Jun. 4, 1981, abandoned. This application Dec. 23, 1987, Ser. No. 137,050

Claims priority, application Netherlands, Jun. 23, 1980, 80034611

Int. Cl.⁴ H01J 29/07

U.S. Cl. 313—404

19 Claims



1. A color display tube comprising an envelope including a substantially rectangular display window, a substantially rectangular color selection electrode having four corner parts and means for mounting the color selection electrode to the display window, said means comprising:

(a) four supporting members, each attached to a respective corner of the display window; and

(b) four carrier members, each attached to a respective corner part of the color selection electrode, each carrier member including:

(1) a flat resilient element, and

(2) means for securing the flat resilient element to a respective one of the supporting members;

at least one of the flat resilient elements having a portion thereof affixed to a respective corner part of the rectangular color selection electrode by means of a single connection having a sufficiently small cross-sectional area in a first plane parallel to said portion to permit mutual rotation of the flat resilient element and the respective corner part of the color selection electrode in planes parallel to said first plane, to compensate for any rotational misalignment of the flat resilient element and the respective supporting member in a second plane parallel to the first plane.

4,876,478

CATHODE RAY TUBE APPARATUS WITH IMPROVED DEFLECTION UNIT

Katsuo Morohashi, Saitama; Jiro Shimokobe, Fukaya, and Taketoshi Shimomura, Iesaki, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 15, 1988, Ser. No. 168,201

Claims priority, application Japan, Mar. 16, 1987, 62-58913; Mar. 17, 1987, 62-59982

Int. Cl.⁴ H01J 29/56, 29/76

U.S. Cl. 313—413

4 Claims

1. A color cathode ray tube apparatus comprising:

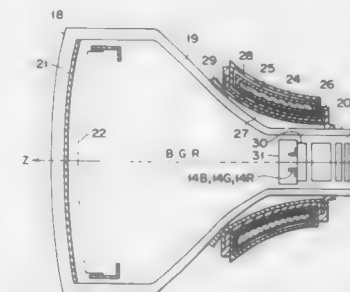
an evacuated envelope having tube axis Z;

a phosphor screen formed in said envelope, tube axis Z passing through a center of said phosphor screen, and said

phosphor screen having horizontal and vertical axes X and Y orthogonal to tube axis Z;

an electron gun assembly which is an in-line type electron gun assembly, arranged in said evacuated envelope, for emitting a central beam, and side beams, toward said phosphor screen, the electron means being landed on said phosphor screen to cause said phosphor screen to emit light rays; and

deflection magnetic field generating means, arranged outside said evacuated envelope, for generating horizontal and vertical deflection magnetic fields inside said envelope so



as to horizontally and vertically deflect the electron beams and scan said phosphor screen with the electron beams, the horizontal deflection magnetic field including a main deflection magnetic field having a barrel-shaped distribution and an auxiliary deflection magnetic field, said main deflection magnetic field including a first vertical component formed in the envelope so as to be symmetrical about a Y-Z plane including Y- and Z-axes and extend along the Y-axis, said auxiliary deflection magnetic field being substantially antisymmetric about the Y-Z plane including the Y- and Z-axes and mainly composed of a second vertical component.

4,876,479

DEFLECTION YOKE FOR A COLOR CATHODE RAY TUBE

Akira Kawabata; Yoshikazu Terasaki; Takaaki Inoue, and Hidenori Takita, all of Nagakakyō, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

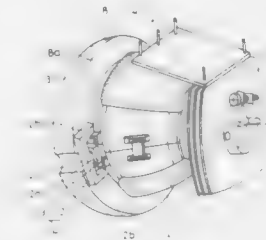
Filed May 24, 1988, Ser. No. 197,952

Claims priority, application Japan, May 25, 1987, 62-127828; May 27, 1987, 62-134270; May 28, 1987, 62-135731; Jun. 7, 1987, 62-170127

Int. Cl.⁴ H01F 3/00, 7/06

U.S. Cl. 313—440

23 Claims



1. A deflection yoke for a cathode ray tube having a funnel section and a neck section, said deflection yoke being mounted on the cathode ray tube at a location corresponding to the boundary between the funnel and neck sections, which deflection yoke comprises:

a generally tubular core;

a first deflection coil assembly including a pair of first deflec-

tion coils wound on the core and arranged in symmetrical relationship with each other with respect to the longitudinal axis of the core, said first deflection coil assembly being operable to deflect electron beams, traveling from an electron gun assembly towards a phosphor-coated screen region in a horizontal direction;

a second deflection coil assembly generally toroidally wound on the core and operable to deflect the electron beams in a vertical direction;

a pair of magnetic members mounted on the core in opposition to each other and positioned on a horizontal axis perpendicular to the longitudinal axis of the core while spaced 180° from each other about the longitudinal axis of the core, each of said magnetic members being constituted by a generally elongated body having at least two legs, said two legs being spaced from each other in a vertical direction and protruding from the elongated body; and

magnetizing means for each magnetic member for developing predetermined poles in the legs of each of the magnetic members, thereby developing a magnetic deflection force to deflect the electron beams deflected by the first and second deflection coil assembly and traveling towards any one of the four corner areas of the phosphor-coated screen region in a direction away from the horizontal axis while minimizing the magnetic deflection force in the horizontal direction in the vicinity of the horizontal axis.

4,876,480

LOW-COST, SELF-POLISHED COLOR CRT FLAT FACEPLATE

Kazimir Palac, deceased, late of Carpentersville, Ill. (by Phyllis J. Palac, heir); by Judith A. Palac, heir, East Lansing, Mich.; by Donald T. Palac, heir, North Ridgeville, Ohio, and by Susan M. Palac, heir, River Forest, Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

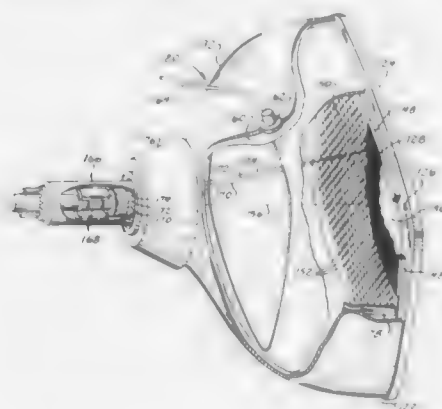
Continuation of Ser. No. 947,787, Dec. 30, 1986, abandoned.

This application Jan. 24, 1988, Ser. No. 212,111

Int. Cl. H01J 29/86

U.S. Cl. 313-477 R

5 Claims



1. A low cost color CRT front assembly for mounting to and positioning around a forward edge of a funnel having an open front, said assembly comprising:

a self-polished flat faceplate having a float glass composition, wherein said float glass flat faceplate is characterized as having first and second spaced optically smooth surfaces formed without grinding or polishing of said faceplate and a peripheral edge portion with the forward edge of the funnel coupled in a sealed manner to the first surface of said flat faceplate about the peripheral edge portion thereof, and wherein the peripheral edge portion of said flat faceplate extends beyond the funnel's periphery to facilitate secure mounting of said flat faceplate on the funnel and eliminate the requirement for precisely match-

ing the size of said flat faceplate with the dimensions of the front of the funnel;

a phosphor screen deposited upon a first surface of said faceplate;

a metal foil shadow mask; and

support means for affixing said shadow mask to said flat faceplate and for maintaining said shadow mask in a stretched condition under high tension.

4,876,481

ELECTROLUMINESCENT ELEMENT

Yuji Taniguchi, Furukawa, and Masaru Banja, Miyagi, both of Japan, assignors to Alps Electric Co., Ltd., Japan

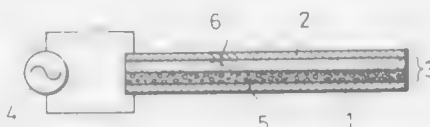
Filed Aug. 4, 1988, Ser. No. 228,665

Claims priority, application Japan, Nov. 30, 1987, 62-180992[U]

Int. Cl. H01J 1/62

U.S. Cl. 313-502

6 Claims



1. An electroluminescent element comprising:

a transparent electrode, an opposed electrode, and a luminous layer interposed between said transparent electrode and said opposed electrode, said luminous layer being composed of a phosphor layer and a dielectric layer, so that application of an electric field across the two electrodes causes the luminous layer to glow,

wherein said phosphor layer contains a cyanoethyl resin as the binder resin and said dielectric layer contains a powder of ferroelectric substance dispersed in a mixture of two fluoroplastics, a first of which is solid at normal temperature and a second of which is liquid at normal temperature.

4,876,482

HALOGEN CYCLE INCANDESCENT LAMP STRUCTURE

Karl Stadler, Adelschlag-Ochsenfeld, Fed. Rep. of Germany, assignor to Patent-Treuhand-Gesellschaft für elektrische Glühlampen, Munich, Fed. Rep. of Germany

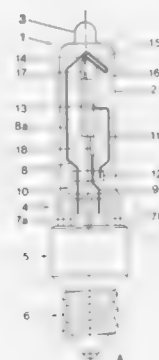
Filed Nov. 14, 1988, Ser. No. 272,214

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1987, 8716797

Int. Cl. H01K 1/18

U.S. Cl. 313-579

11 Claims



1. A halogen cycle incandescent lamp having

a base (5);

a closed, essentially cylindrical bulb (2) extending from a

near end portion close to the base to a remote end portion and defining a lamp axis (A);

an axially extending filament (13) having a near filament end close to the base and a remote filament end;

a filament mount (10) including

first and second lead-in conductors (8, 9), and

a cross element (12) retaining said lead-in conductors in position in the bulb;

the first lead-in conductor (8) extending from the cross element toward the remote end portion of the bulb and having a longitudinal portion (8a) extending along an inner wall of the bulb to retain the remote end of the filament;

a pinch or press seal (4) secured in the base and connecting the mount with external current conductors, and wherein, in accordance with the invention,

the first lead-in conductor (8), at approximately the level of the remote end of the filament, is bent in essentially inverted V or roof or arch form defining a first leg (14) extending upwardly from the longitudinal portion to an apex of the inverted essentially V or arch shape, and a second leg (15) extending downwardly from the apex;

said first lead-in conductor being further formed with a reentrant portion (16) integral with the second leg (15) and extending towards the lamp axis (A) and having a terminal end which is bent in a direction of the axis of the lamp,

said first and second legs spanning diametrically almost across the diameter of the bulb without touching the inner wall of the bulb, and said first and second legs (14, 15) and said reentrant portion (16) and said longitudinal portion (8a) all being located in a common plane.

4,876,483

ARC LAMP WITH SURFACE ARC RESISTANT BARRIER

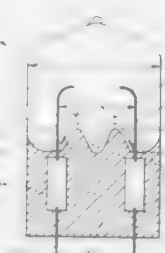
David A. Cox, Lexington, Ky., assignor to GTE Products Corporation, Danvers, Mass.

Filed May 26, 1988, Ser. No. 199,233

Int. Cl. H01J 61/10, 61/30

U.S. Cl. 313-634

6 Claims



1. An arc discharge lamp with a surface arc resistant barrier comprising:

(a) an envelope formed of a nonconductive radiant energy transmissive material defining by an interior surface an enclosed volume with an included fill gas,

(b) two arc discharge electrodes generally side by side having root portions positioned in and separated only by nonconductive material, and emerging from the interior surface defining an electrode separation distance and projecting for a distance into the enclosed volume,

(c) two electrode connections leading from the exterior of the envelope to electrically join the two respective electrodes, and

(d) at least two dielectric barriers formed along the interior surface of the envelope and between the electrode roots and extending into the enclosed volume for a distance less than the electrode projection distance thereby establishing a dielectric barrier between the electrodes.

4,876,484

REMOTE VIDEO INTERCONNECT AND METHOD

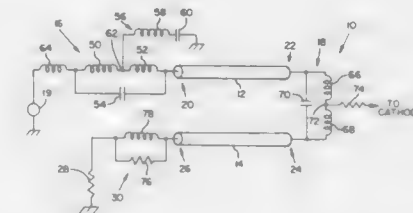
Roy O. Mitchell, Hillsboro; Milton D. Klandt, Beaverton, and Kathleen F. M. Ullom, West Linn, all of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Continuation of Ser. No. 904,076, Sep. 5, 1986, abandoned. This application Aug. 15, 1988, Ser. No. 241,812

Int. Cl. H05B 41/14; H03H 7/38

U.S. Cl. 315-94

11 Claims



1. A cathode drive circuit for driving a cathode of a cathode ray tube from a signal source over a wide range of frequencies comprising:

a first transmission line having an input, an output and a characteristic impedance;

a second transmission line spaced apart from the first transmission line, the second transmission line having an input, an output and a characteristic impedance;

terminating means for terminating the output of the second transmission line with a load matching the characteristic impedance of said second transmission line;

impedance matching means coupling the output of the first transmission line, the cathode of the cathode ray tube and the input of the second transmission line, for:

providing a signal from the output of the first transmission line to the cathode;

providing across the output of the first transmission line an impedance equal to the characteristic impedance of said first transmission line; and

providing across the input of the second transmission line an impedance equal to the characteristic impedance of said second transmission line;

whereby reflections within the cathode drive circuit are substantially avoided.

4,876,485

BALLAST FOR IONIC CONDUCTION LAMPS

Leslie Z. Fox, 2712 Colby Ave., West Los Angeles, Calif. 90064

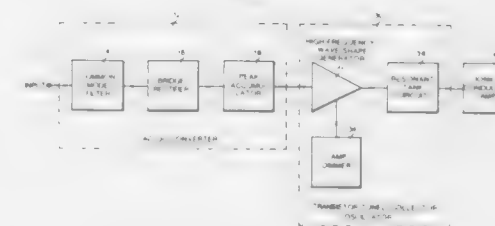
PCT No. PCT/US86/00285, § 371 Date Sep. 17, 1987, § 102(e) Date Sep. 17, 1987, PCT Pub. No. WO87/04889, PCT Pub. Date Aug. 13, 1987

PCT Filed Feb. 10, 1986, Ser. No. 132,946

Int. Cl. H05B 41/14, 41/38

U.S. Cl. 315-244

18 Claims



1. An improved ballast for ionic conduction lamps comprising:

(a) an electrical power supply,

(b) means for generating a high frequency electrical signal

where said generating means is powered by said power supply, and
(c) a phosphor coated ionic conduction lamp connected to the high frequency electrical signal from said generating means where the signal excites the phosphor causing said lamp to ignite and illuminate.

4,876,486

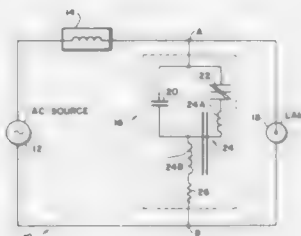
TWO-LEAD STARTER CIRCUIT FOR A GASEOUS DISCHARGE LAMP

Fernando A. Joaquin, Skokie, Ill., assignor to Advance Transformer Co., Chicago, Ill.

Filed Dec. 30, 1987, Ser. No. 139,688
Int. Cl.⁴ H05B 41/14

U.S. Cl. 315—290

2 Claims



1. A two-lead starter circuit for a gaseous discharge lamp, of the type having first and second leads connected in parallel with said lamp during operation, said starter circuit comprising a capacitor, a bilateral voltage-sensitive switch, a pulse transformer having a primary winding and a step-up secondary winding, and a resistor, said bilateral voltage-sensitive switch being connected in series with the primary winding of said pulse transformer, said capacitor being connected in parallel with the series combination of said bilateral voltage-sensitive switch and said primary winding to form a series-parallel circuit, said step-up secondary winding being connected in series with said resistor, and the series combination of said secondary winding and said resistor being connected in series with said series-parallel circuit between said first and second leads.

4,876,487

LOW VOLTAGE ILLUMINATING LAMP SET WITH PROGRAMMABLE OUTPUT FOR GARDEN USE

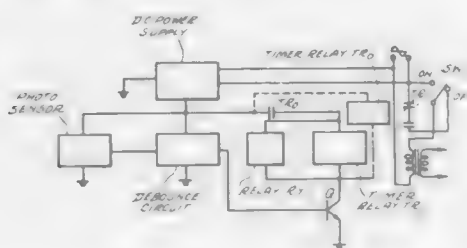
Jerry S. C. Yang, 5-1 Tay Pyng St., Shi Hwu Jenn, Jang Huah Shiann, Taiwan

Continuation of Ser. No. 850,552, Apr. 11, 1986, abandoned, which is a division of Ser. No. 377,170, May 11, 1982, Pat. No. 4,593,234. This application Jan. 20, 1988, Ser. No. 208,801. The portion of the term of this patent subsequent to Jan. 3, 2003, has been disclaimed.

Int. Cl.⁴ H02B 1/08

U.S. Cl. 315—362

15 Claims



1. An apparatus for controlling at least one illuminating lamp comprising:
illuminating lamp means for producing an illumination in response to an illuminating signal applied thereto;
light sensing means for generating a first output signal when

an ambient illumination level has fallen below a predetermined level;

RC circuit means, coupled to said first output signal, for charging with a predetermined time constant when said first output signal is produced, to produce a charging signal indicative of an amount of charge;
zener diode means, coupled to said charging signal, for conducting only when a voltage of said charging signal exceeds a threshold, said zener diode means producing a second output signal as a result of said conducting, said second output thereby being produced at a predetermined time after said first output signal is produced; and
switching means for supplying said illuminating signal to said illuminating lamp means, when said second output signal is generated by said zener diode means, and said first output signal is also present.

4,876,488

RASTER ROTATION CIRCUIT

Geoffrey E. Gentile, Hammonton, N.J., assignor to The Boeing Company, Seattle, Wash.

Filed Sep. 30, 1987, Ser. No. 102,676
Int. Cl.⁴ H01J 29/52; G06F 15/626; G09G 1/06
U.S. Cl. 315—378

4 Claims



1. A system for rotating images on a raster display unit by electronically rotating, via digital computation, deflection circuits of the raster display unit to compensate for tilting of the display unit through a tilt angle, comprising:

a raster display unit having a horizontal display axis and a vertical display axis;
a horizontal deflection circuit and a vertical deflection circuit connected to said display unit to produce horizontal and vertical raster sweeps on said display unit;
a horizontal sweep generator for said display unit having a variable analog horizontal output signal;
a vertical sweep generator for said display unit having a variable analog vertical output signal;

analog signal means supplying an analog tilt angle signal for rotating a display image on said display unit with respect to said horizontal and vertical axes by an amount determined by said tilt angle;

tilt angle signal conversion means connected to said analog signal means for conversion of said analog tilt angle signal to a corresponding digital tilt angle signal;

a first read only memory means connected via digital data path to said conversion means and responsive to said digital tilt angle signal to produce a corresponding digital sine function signal;

first and second tilt angle sine function modulators each responsive to said digital tilt angle signal comprising, respectively, first and second multiplying digital-to-analog converters connected to said first read only memory and responsive to said digital sine function signal;

a second read only memory means connected via a digital data path to said conversion means and responsive to said

digital tilt angle signal to produce a corresponding digital cosine function signal,
first and second tilt angle cosine function modulators each responsive to said tilt angle signal comprising respectively, third and fourth multiplying digital-to-analog converters connected to said second read only memory and responsive to said digital cosine function signal;
first means connecting said analog horizontal output signal to said first multiplying digital to analog converter and to said third multiplying digital-to-analog converter for multiplying said analog horizontal output signal by the sine and by the cosine of said tilt angle to provide first and second modified analog horizontal sweep signals;
second means connecting said analog vertical output signal to said second multiplying digital to analog converter and to said fourth multiplying digital to analog converter for multiplying said analog vertical output signal by the sine and by the cosine of said tilt angle to provide first and second modified analog vertical sweep signals;
third means connecting said first modified analog horizontal sweep signal and said second modified analog vertical sweep signal to the vertical deflection circuit of said display unit; and
fourth means connecting said second modified analog horizontal sweep signal and said first modified analog vertical sweep signal to the horizontal deflection circuit of said display unit, whereby said horizontal and vertical deflection circuits rotate said horizontal and vertical display axis and horizontal and vertical raster sweeps by an amount determined by said tilt angle.

4,876,489

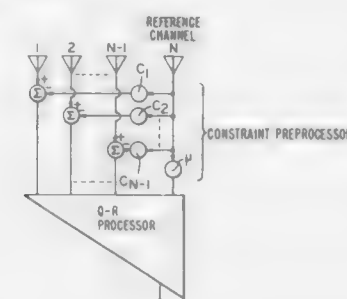
SIGNAL PROCESSING

Christopher D. Cawthorne, Hertford, Great Britain, assignor to STC PLC, London, United Kingdom

Continuation of Ser. No. 127,908, Dec. 2, 1987, abandoned. This application Dec. 27, 1988, Ser. No. 290,875
Claims priority, application United Kingdom, Dec. 9, 1987, 8629426

Int. Cl.⁴ G01S 3/16

U.S. Cl. 342—383



1. A method for digitally correcting I/Q phase and amplitude imbalances within signal channels and for correcting interchannel phase and amplitude mismatches in arrays of signal channels, in which method the correcting operations are combined, the method comprising forming I and Q channels from one said channel, orthogonalising the I and Q channels of the one said signal channel, which one said signal channel comprises a reference channel, and employing the orthogonalised I and Q channels of the reference channel to correct phase and amplitude imbalances in the reference channel, and simultaneously commencing correcting another said signal channel, which comprises an auxiliary channel, by forming I and Q channels from said auxiliary channel, and orthogonalising the said Q channel of the auxiliary channel with the I channel of the reference channel.

4,876,490

BATTERY OPERATED MOTOR DRIVE FOR SMALL APPLIANCES

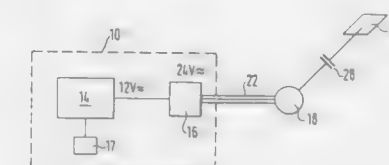
Walter Kolb, Betzdorf/Sieg, Fed. Rep. of Germany, assignor to Wolf-Geräte GmbH, Fed. Rep. of Germany

Filed Dec. 17, 1987, Ser. No. 134,010
Claims priority, application Fed. Rep. of Germany, Dec. 19, 1986, 3643558

Int. Cl.⁴ H02K 7/14

U.S. Cl. 318—17

10 Claims



1. An electric motor drive system for hand guided tools, comprising:

a tool for being motor operated;
a battery power source;
a converter comprising an electronic circuit for converting the direct current from the battery to multi-phase current;
a multi-phase drive motor connected between the electronic circuit and the tool for operating the tool, the converter being adapted for delivering an adjustable frequency voltage, adjusted for speed control of the motor, in a range between 50 and 500 Hz;
a portable power pack containing the electronic circuit and the battery; and
a carrier bag for accommodating the power pack, the carrier bag being provided with suspension straps.

4,876,491

METHOD AND APPARATUS FOR BRUSHLESS DC MOTOR SPEED CONTROL

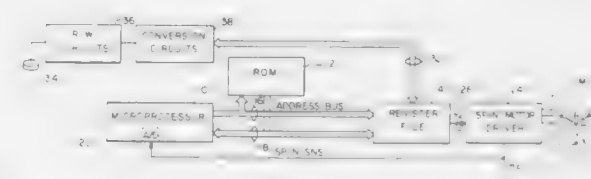
John P. Squires, Jamestown, and Louis J. Shrinkle, Boulder, both of Colo., assignors to Conner Peripherals, Inc., San Jose, Calif.

Continuation of Ser. No. 880,754, Jul. 1, 1986, abandoned. This application Feb. 26, 1988, Ser. No. 163,222

Int. Cl.⁴ H02P 6/02

U.S. Cl. 318—138

30 Claims



5. A commutatorless direct current motor having a rotor for rotating with respect to a stator, said motor comprising:

(a) means, provided on the rotor, for establishing a plurality of first magnetic fields;
(b) means, provided on the stator, for inducing a second magnetic field; and
(c) control means, coupled to said inducing means, for directing a discrete short-period inducement of said second magnetic field and a discrete long-period inducement of

said second magnetic field wherein said discrete short period inducement is insufficient to cause rotation of said rotor and said discrete long-period inducement is sufficient to cause rotation of said rotor, said control means including means for monitoring the interaction of said discrete short-period induced second magnetic field with said first magnetic fields.

27. A method of operating a control system for providing rotation control of a hard-disk drive spin motor, wherein the spin motor includes a rotor having a plurality of permanent magnet poles and a stator having a plurality of windings, each winding having first and second ends with the first ends of the windings being interconnected and wherein a spin motor drive current circuit is coupled to the second ends of the windings for switching current through phase pairs of the windings as defined by pairs of said second ends, said spin motor drive current circuit providing a sense signal proportional to the magnitude of the current conducted through the phase pairs of windings, the method comprising the steps of:

- applying a short-duration period current pulse to each phase pair of windings, where said short-duration current pulse is insufficient to cause rotation of said rotor to the next pole position relative to said stator;
- acquiring the sense signal produced by said spin motor drive current circuit in response to the respective application of the short-duration period current pulses;
- comparing the sense signals acquired to identify a phase pair of windings corresponding to an acquired sense signal distinguishable from the remaining acquired sense signals; and
- selecting a phase pair of windings for the conduction of a long-duration period current pulse to induce rotation of the rotor.

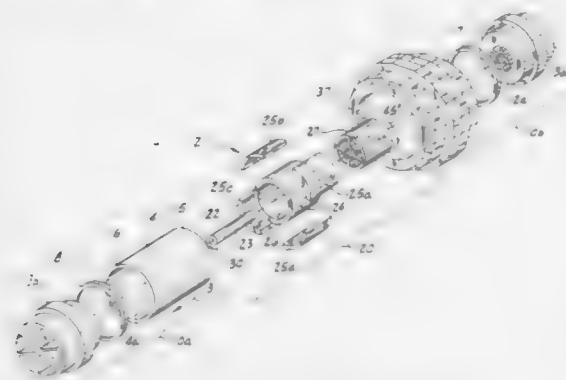
4,876,492

ELECTRONICALLY COMMUTATED MOTOR DRIVEN APPARATUS INCLUDING AN IMPELLER IN A HOUSING DRIVEN BY A STATOR ON THE HOUSING
Gene D. Lester, Louisville; Richard A. Morgan, Mt. Washington, both of Ky.; Harold B. Harms, Fort Wayne, Ind.; John P. Barrett, Birmingham, Mich.; Tsung K. Chang, Louisville, Ky.; Donald S. Cushing, Lady Lake, Fla.; Richard F. Broo, Farmington Hills, Mich.; and William M. Hood, Akron, Ohio, assignors to General Electric Company, Fort Wayne, Ind.

Filed Feb. 26, 1988, Ser. No. 160,526
Int. Cl. F04B 35/04; H02K 29/00

U.S. Cl. 318—254

32 Claims



1. An apparatus for pumping fluid comprising: an inlet adapted to engage an inlet conduit for conveying the fluid to the apparatus; and an outlet adapted to engage an outlet conduit for conveying the fluid away from the apparatus; a housing connecting said inlet and said outlet; means, located within and adapted to rotate within the hous-

ing, for moving fluid through the housing from said inlet to said outlet; and

means secured to the exterior of the housing for applying an electromagnetic field through the housing to and around the fluid moving means to rotate the fluid moving means and thereby to cause it to move fluid through the housing, said means for applying including a stator assembly having a plurality of winding stages spaced circumferentially about said housing to surround said housing.

32. An electronically commutated motor comprising:

- a housing having an axis;
 - a rotatable assembly coaxial with said housing and including: a cylindrical ferromagnetic member having an axial opening coaxial with the axis;
 - a cylindrical element to be rotated and adapted to be received in the axial opening of said cylindrical ferromagnetic member; and
 - a plurality of permanent magnet elements peripherally secured to the ferromagnetic member;
- means coaxial with the axial opening of the ferromagnetic member and within the housing for supporting said rotatable assembly for rotation about the assembly axis; and
- a stationary assembly having a plurality of winding stages circumferentially spaced about said housing, said winding stages adapted to be electrically energized to apply an electromagnetic field to said rotatable assembly to cause the rotatable assembly to rotate about the axis.

4,876,493

MOTOR CONTROLLING SWITCH DEVICE

Masaru Suzuki, Aichi, Japan, assignor to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi, Japan

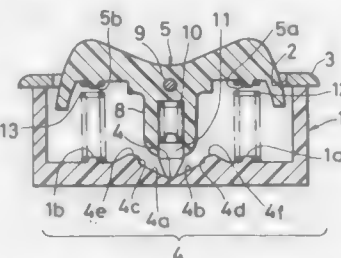
Filed Dec. 23, 1987, Ser. No. 137,083

Claims priority, application Japan, Dec. 24, 1986, 61-202290; Mar. 31, 1987, 62-49733; Mar. 31, 1987, 62-49730; Mar. 31, 1987, 62-49731

Int. Cl. H02P 1/22; B60J 1/17; H01H 21/00, 71/18

U.S. Cl. 318—293

43 Claims



1. A motor controlling switch device comprising:

- a casing;
- an operating member provided in said casing, said operating member being movable from an original position to a first operating position and from said first operating position to a second operating position in response to the application of an operating force to said operating member;
- a depressing piece disposed in one of said casing and said operating member;
- first restoring means acting in cooperation with said depressing piece for restoring said operating member from said first operating position to said original position when said operating force is removed from said operating member and said operating member has moved to said first operating position;
- holding means for holding said operating member in said second operating position when said operating member moves through said first operating position to said second operating position, said holding means comprising a holding protrusion acting in cooperation with said depressing piece;
- switch circuit means for supplying a locking current to an

electric drive means in response to the movement of the operating member; and

second restoring means disposed in said casing for restoring said operating member from said second operating position to said original position, said switch circuit means supplying said second restoring means with said locking current when said operating member moves to said second operating position, said second restoring means including at least one restoring member made of a material capable of being restored to an original stretched configuration when supplied with said locking current to thereby restore the operating member to said original position from said second operating position through said first operating position.

4,876,494

POSITION AND VELOCITY FEEDBACK SYSTEM FOR A DIGITAL ROBOT CONTROL

Kenneth E. Daggett, Murrysville, Pa.; Eimei M. Onaga, Brookfield Center, and Richard J. Casler, Jr., Newtown, both of Conn., assignors to Unimation, Inc., Danbury, Conn.

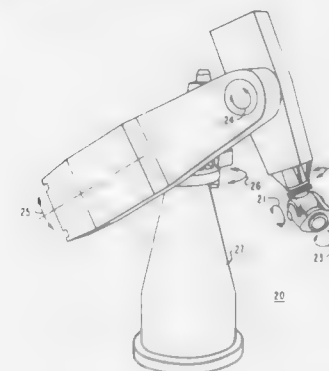
Continuation of Ser. No. 932,853, Nov. 20, 1986, abandoned.

This application Apr. 1, 1988, Ser. No. 178,811

Int. Cl. G05B 19/42

U.S. Cl. 318—568.22

16 Claims



1. A digital control for a robot having a plurality of arm joints, said control comprising:

- an electric motor constituting a joint motor for driving each of the robot arm joints;
- a power amplifier operable to supply drive current to each joint motor;
- feedback control loop means for each joint motor including at least digital position and velocity control loops operable at a predetermined sampling rate to control the associated power amplifier;
- encoder means for generating a plurality of signals representing joint motor position changes;
- a digital feedback system responsive to said encoder means to provide position and velocity feedback signals for said feedback control means at the predetermined sampling rate;
- said feedback system including circuit means having means responsive to said encoder means signals to accumulate a count of increment pulses representing incremental changes in position and operating as said position feedback signal for said feedback control means;
- said circuit means further having means for detecting the elapsed time between successive increment pulses, the elapsed time being detected by first determining the time interval between the start of a sample pulse and the start of a first increment pulse which occurs before the next sample pulse, and for adding the time interval between the end of the last increment pulse in the sample period and the start of the next sample pulse, which defines the sample period, and then subtracting this time interval summation from the time period between the two sample pulses

which define the sample period, and means for computing velocity from the elapsed time and generating said velocity feedback signal for said feedback control means.

4,876,495

APPARATUS AND METHOD FOR CHARGING AND TESTING BATTERIES

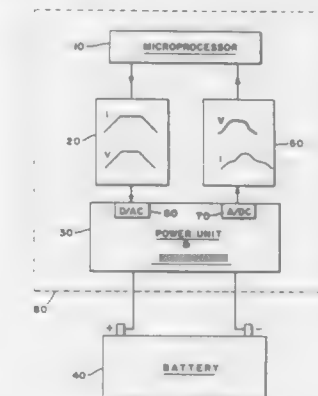
Thirumalai G. Palanisamy, Morris Township, Morris County, and Stuart E. Mendelson, Kendall Park, both of N.J., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Jun. 27, 1988, Ser. No. 211,609

Int. Cl. H02J 7/04

U.S. Cl. 320—18

4 Claims



1. A method for charging a rechargeable battery which comprises the steps of:

- measuring the open circuit voltage of said battery and estimating the minimum number of cells possible for the measured open circuit voltage;
- charging said battery at any charge rate and at a substantially constant or constant current until the battery charge voltage equals or is substantially equal to the estimated number of cells of the battery multiplied by a predetermined voltage which is characteristic of the battery;
- charging said battery at a charge rate and at a constant or substantially constant voltage equal to or substantially equal to the battery charge voltage in step (b) until the charge current decreases to a predetermined low value;
- repeating steps (a), (b) and (c) until step (a) indicates a constant or substantially constant value for the estimated number of cells;
- charging said battery at a constant or substantially constant voltage equal to or substantially equal to said constant or substantially constant value of step (d) times a voltage which is characteristic of the battery cells until the current decreases to zero or a predetermined low value; and
- charging the said battery with a predetermined constant or substantially constant current at any voltage for a predetermined period of time.

4,876,496

CURRENT SUPPLYING DEVICE

Richard C. Duncan, Scarborough, Canada, assignor to Allanson, Division of Jannock Limited, Toronto, Canada

Filed Feb. 22, 1988, Ser. No. 158,932

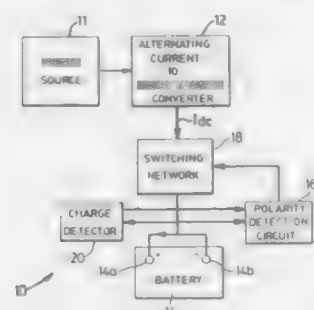
Int. Cl. H02J 7/04

U.S. Cl. 320—31

9 Claims

1. A current supplying device connectable across the positive and negative terminals of a battery for supplying a direct current to said positive terminal, said device comprising: means for connecting said device to a power supply for supplying said direct current;

a pair of circuits each biased to an inoperative condition, each of said circuits being actuable to an operative position to supply said direct current to one of said terminals; polarity detection means in communication with said circuits, said polarity detection means for sensing the polarity of said terminals and generating switching signals upon determination of the polarity of said terminals; switch means responsive to said switching signals to actuate



one of said circuits to said operative condition to supply said direct current to said positive terminal; overload protection means for limiting the direct current applied to said polarity detection means and inhibiting the operation thereof in the event of a current overload; and charge detection means for monitoring the charge of said battery and electrically isolating said polarity detection means from said terminals when said battery is fully charged to prevent overcharging of said battery.

4,876,497

POWER FACTOR CORRECTOR

Frank Colver, Costa Mesa, Calif., assignor to HC Power, Inc., Santa Ana, Calif.

Filed Sep. 20, 1988, Ser. No. 247,039

Int. Cl.⁴ G05F 1/70

U.S. Cl. 323—211

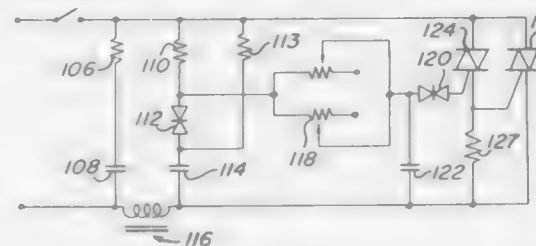
15 Claims



1. A power factor correction circuit connectable to receive an AC input waveform across a pair of input terminals and to communicate an AC output waveform across a pair of output terminals, said output terminals being connectable to a load, the circuit comprising:

an energy storage inductor having an input connected to one of the AC input terminals and an output connected to one of the output terminals; and a short circuit path connecting the output terminals; and control circuitry for selectively enabling the short circuit path during a portion of each half cycle of the AC input voltage waveform.

4,876,498
TWO WIRE LOW VOLTAGE DIMMER
David G. Lachance, Macungie, Pa., and Charles C. Houng, Clinton, N.J., assignors to Lutron Electronics Co. Inc., Coopersburg, Pa.
Continuation of Ser. No. 839,304, Mar. 13, 1986, abandoned.
This application Nov. 17, 1987, Ser. No. 122,588
Int. Cl.⁴ G05F 5/02
U.S. Cl. 323—300 20 Claims



1. A circuit for controlling the RMS value of an AC voltage applied to a partially resistive and partially inductive load comprising:

- only a pair of wires for connection in series with the load and an AC supply voltage;
- first bidirectional electronic switch means operatively coupled across the pair of wires and having control input means for selectively rendering the first electronic switch means conductive to apply AC voltage to the load, the first electronic switch means having first and second thyristors, each having a gate terminal and first and second main terminals, the first main terminal of the first thyristor being operatively coupled to one of the pair of wires, a first resistor operatively coupling the second main terminal of the first thyristor to the other one of the pair of wires, the main terminals of the second thyristor operatively coupled directly across the pair of wires, the gate terminal of the first thyristor receiving control signals from the control circuit, the gate terminal of the second thyristor being operatively coupled to a junction between the first resistor and the second main terminal of the first thyristor, the first and second thyristors each having a holding current characteristic, the holding current characteristic of the first thyristor being substantially less than the holding characteristic of the second thyristor;
- a control circuit operatively coupled to the control input means and responsive to the instantaneous magnitude of the AC voltage appearing across the pair of wires for repetitively rendering the first electronic switch means conductive at selected periods of time defining a firing angle; and
- voltage compensating means in series with correction means operatively coupled across the pair of wires for regulating the RMS value of the AC voltage applied to the load and for correcting asymmetries in the waveform of the AC voltage applied to the load.

4,876,499

DIFFERENTIAL VOLTAGE CONTROLLED EXPONENTIAL CURRENT SOURCE

James R. Anderson, Chicago, and Richard Brander, Cicero, both of Ill., assignors to Beltone Electronics Corporation, Chicago, Ill.

Continuation of Ser. No. 202,664, Jan. 6, 1988, Pat. No. 4,829,270, which is a division of Ser. No. 838,924, Mar. 12, 1986, Pat. No. 4,792,977. This application Nov. 10, 1988, Ser. No. 269,618

Int. Cl.⁴ G05F 3/22

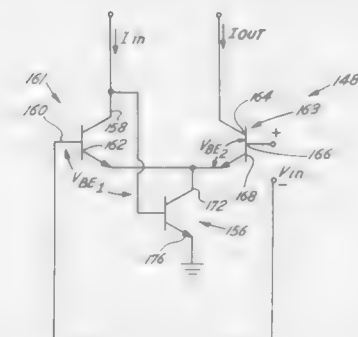
U.S. Cl. 323—312

1 Claim

1. A current source for providing an output current substantially exponentially related to a difference between voltages on a first input terminal and a second input terminal and substan-

tially linearly related to an input current applied to a third input terminal comprising, in combination:

- a first transistor having a collector, base, and emitter, said collector being interconnected to said third input terminal, said base sensing said voltage on said first input terminal and having a first base to emitter voltage;
- a second transistor, having a second transistor base interconnected to said collector of said first transistor and a second transistor collector, interconnected to said emitter of said



- first transistor, as feedback means to regulate said first base to emitter voltage, whereby said first transistor collector current is substantially equivalent to said input current; and
- a third transistor, having a third transistor emitter interconnected to said emitter of said first transistor, having a third transistor base to sense said voltage on said second input terminal, and having a third transistor collector for responsively drawing said output current.

4,876,500

USER CARRIED SENSOR FOR DETECTING DISPLACEMENT RELATIVE TO THE GROUND

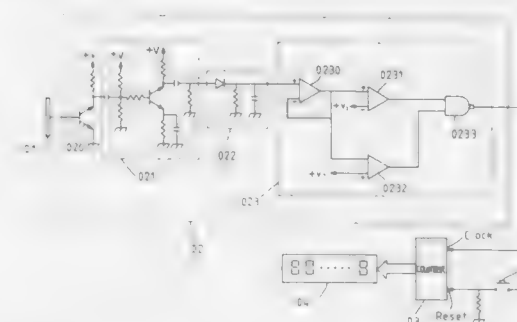
Chuan-Chung Wu, No. 15, Lane 41, Ta-Tung Road, Fei-Sha Tsun, Su-Hu Hsiang, Yun-Lin Hsien, Taiwan

Filed Aug. 3, 1988, Ser. No. 227,615

Int. Cl.⁴ G01R 27/26; G01C 22/00; G01B 7/00

U.S. Cl. 324—61 R

14 Claims



1. A motion-sensing arrangement, comprising:

- a sensor means positioned in a predetermined relationship relative to the body of a user performing a movement relative to the ground, said sensor means being operative for sensing changes in the elevation, and in the size of the contact area, between the user and the ground, said sensor means being further operative for generating, in response to said sensing, an electrical signal having a variable voltage amplitude proportional to said changes;
- converter means for converting the variable electrical signal into a rectified electrical signal having a component with a generally fixed voltage amplitude; and
- comparator means operatively connected to the converter means, and operative for generating an output signal when the generally fixed voltage component falls within a predetermined voltage range.

4,876,501

METHOD AND APPARATUS FOR HIGH ACCURACY MEASUREMENT OF VLSI COMPONENTS

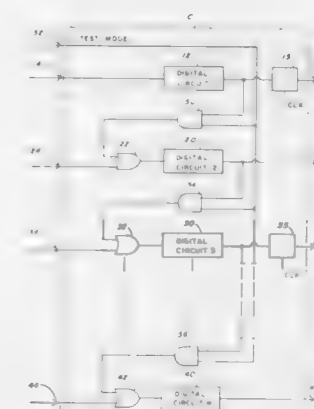
Joseph L. Ardini, Needham; Brian Lefsky, West Newton, and Barbara J. Farr, Newton, all of Mass., assignors to Prime Computer, Inc., Natick, Mass.

Continuation of Ser. No. 37,708, Apr. 13, 1987, abandoned. This application Dec. 14, 1988, Ser. No. 285,362

Int. Cl.⁴ G01R 31/00

U.S. Cl. 324—73 R

12 Claims



4. A method for measuring propagation delay through a digital integrated circuit including a plurality of digital circuits each having an operational signal path therethrough, with test equipment having an operating speed that is comparable to the operating speed of said plurality of digital circuits, said method comprising the steps of:

- individually coupling the outputs of selected ones of said plurality of digital circuits to the inputs of other selected ones of said plurality of digital circuits in series to define a test signal path on said integrated circuit through said selected digital circuits, said test signal path having an input node and an output node;
- applying a test signal to the input node of said test signal path; and
- measuring the propagation delay between the test signal applied to the input node and an output signal which propagates through said test signal path and appears at the output node, whereby the propagation delay through said test signal path is the sum of the individual propagation delays through each of the digital circuits in the test signal path, and is substantially longer than the propagation delay through any of said digital circuits and can be accurately and directly measured by said test equipment without further processing.

4,876,502

WIDE DYNAMIC RANGE CURRENT MEASURING APPARATUS

William R. Verbanets, Plum Borough, and Robert T. Elms, Monroeville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 9, 1988, Ser. No. 192,059

Int. Cl.⁴ G01R 19/25, 19/257

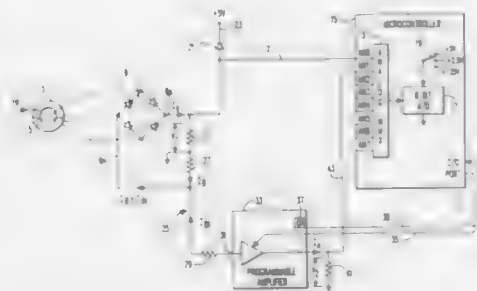
U.S. Cl. 324—115

9 Claims

1. Wide dynamic range current measuring apparatus comprising:

- a current transformer having a primary winding and a secondary winding in which a secondary current proportional to a current flowing in the primary winding is induced;
- an analog to digital converter having a plurality of discrete

selectable reference voltages providing a plurality of resolutions for a digital signal generated thereby; an amplifier with programmable gain and with means generating an overrange signal when the amplifier output exceeds a preset limit; means applying a signal proportional to said secondary current to said amplifier; means applying the output of the amplifier to said analog to digital converter to generate said digital signal; and



control means responsive to said overrange signal selecting the highest programmable gain of the amplifier which does not produce an overrange signal, selecting in response to the magnitude of the digital signal generated by the analog to digital converter the selectable reference voltage for the analog to digital converter which provides the greatest resolution of said digital signal and providing an output signal including said digital signal and a scale factor which is a function of both the selected gain of said amplifier and the selected reference voltage of the analog to digital converter.

4,876,503

METHOD OF MEASURING THE INTENSITY OF A DC CURRENT AND A DEVICE IMPLEMENTING THIS METHOD

Guy Aubert, Grenoble, France, assignor to Thomson-CGR, Paris, France

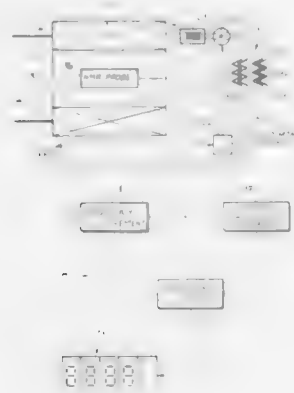
PCT No. PCT/FR85/00343, § 371 Date Oct. 3, 1986, § 102(e) Date Oct. 3, 1986, PCT Pub. No. WO86/03843, PCT Pub. Date Jul. 3, 1986

PCT Filed Nov. 29, 1985, Ser. No. 901,512

Int. Cl.⁴ G01R 33/00, 15/00

U.S. Cl. 324—117 R

8 Claims



1. A device for measuring the intensity of a DC current flowing in a circuit, including a magnetic coil intended to be

inserted in series in said circuit for generating a magnetic field in a given volume of space, means for determining at least the temperature of said coil, means for stabilizing the temperature of said coil, means for measuring the magnetic field in said given volume and means for linearly determining said intensity from said measurement of the magnetic field and from said temperature.

4,876,504

APPARATUS FOR INVESTIGATING THE CONDITION OF A BACTERIA CONTAINING SUSPENSION THROUGH FREQUENCY PROFILE OF ELECTRICAL ADMITTANCE

Barry C. Blake, and David J. Clarke, both of Wiltshire, United Kingdom, assignors to Public Health Laboratory Service Board, England

Division of Ser. No. 829,644, Jan. 31, 1986, Pat. No. 4,810,963.

This application Nov. 9, 1988, Ser. No. 269,173

Claims priority, application United Kingdom, Apr. 3, 1984, 8405529

Int. Cl.⁴ G01N 27/74, 27/02; G01R 27/22; A61B 5/05 U.S. Cl. 324—204 7 Claims

1. Apparatus for investigating the condition of a suspension of bacteria in a medium, comprising:
a chamber comprising a conduit filled with the medium in use;
a pair of electrodes positioned to contact said medium contained within the chamber;
means for producing a controlled continuous flow of said medium through said conduit between said electrodes;
voltage generator means electrically connected with said electrodes and serving to generate an alternating voltage of selected frequency across said electrodes, thereby causing an alternating current to flow in said medium therebetween;
coil means disposed so that a time varying voltage is induced therein by a time-varying magnetic field associated with said alternating current flow in the medium;
means for measuring said induced voltage; and
processor means, including means for controlling said voltage generator means to generate said alternating voltage at a plurality of frequencies and for also controlling said measuring means to provide an output corresponding to said induced voltage at said frequencies for generating a profile therefrom of measured induced voltage in the coil means as a plot thereof against a plurality of different selected frequencies of the alternating voltage applied to the electrode, said profile being indicative of a condition of the bacteria suspended in said medium.

4,876,505

APPARATUS AND METHOD FOR MONITORING STEAM TURBINE SHROUD CLEARANCE

Robert L. Osborne, Winter Springs, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 27, 1988, Ser. No. 199,633

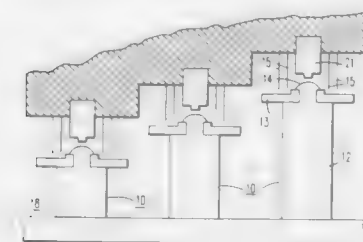
Int. Cl.⁴ G01B 7/14, 7/30; G01R 33/02

U.S. Cl. 324—208

26 Claims

1. A system for monitoring the clearance between a plurality of turbine blade shroud segments configured in a row and a stationary portion of a turbine, comprising:
means for measuring the clearance between the stationary portion of the turbine and each of the shroud segments a

number of times along each shroud segment under dynamic conditions;
means for averaging said measurement to produce an average clearance value for each shroud segment;



means for analyzing said average clearance values for each shroud segment to determine when the clearance between a shroud segment and the stationary portion of the turbine is approaching a critical value; and
means for developing control signals in response to said means for analyzing.

4,876,506

APPARATUS AND METHOD FOR INSPECTING THE PROFILE OF THE INNER WALL OF A TUBE EMPLOYING A WALL FOLLOWER AND AN EDDY CURRENT PROBE

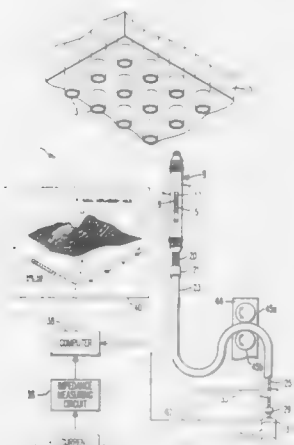
Stephen D. Brown, Delmont; Warren R. Junker, Monroeville, and Francis X. Gradich, Elizabeth Township, Allegheny County, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 13, 1988, Ser. No. 205,768

Int. Cl.⁴ G01B 7/28, 7/14; G01N 27/90; G21C 17/00

U.S. Cl. 324—220

24 Claims



1. An apparatus for inspecting the profile of the inner wall of a conduit, comprising:

- a probe body insertable within said conduit;
- a probe assembly disposed within said probe body including a non-magnetic conductive plate means, and an eddy current probe means spaced from said plate means on one side thereof for generating a signal indicative of the distance between itself and said plate means, said plate and probe means being movably mounted with respect to one another to vary said distance, and
- a wall follower assembly movably mounted within said probe body including a follower body having an outside portion for resiliently following the profile of the inner wall of a conduit, and an inside portion fixedly connected to the plate means of said probe assembly on a side thereof opposite said one side for converting changes in the con-

duit wall profile to changes in distance between said probe means and said plate means of said probe assembly.

4,876,507

METHOD OF AND DEVICE FOR AUTOMATIC PHASE CORRECTION OF COMPLEX NMR SPECTRA

Johannes J. Van Vaak, Eindhoven, Netherlands, assignor to U.S. Philips Ltd., New York, N.Y.

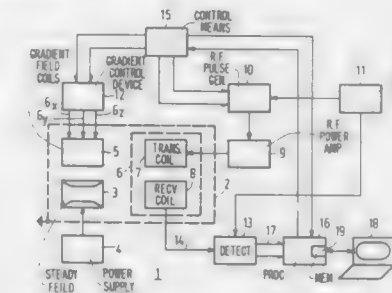
Filed Nov. 14, 1988, Ser. No. 270,914

Claims priority, application Netherlands, Nov. 12, 1987, 8702700

Int. Cl.⁴ G01R 33/20

U.S. Cl. 324—307

20 Claims



1. A method of correcting phase errors in a complex magnetic resonance spectrum obtained by Fourier transformation from samples of at least one resonance signal excited in an object situated in a steady, uniform magnetic field by means of R.F. electromagnetic pulses, said complex magnetic resonance spectrum having peak locations and phase values in the peak locations, said method comprising: determining the coefficients of a frequency-dependent phase function extending across the complex spectrum from the phase values in selected peak locations in such a manner that said function meets a predetermined best fit criterion, and correcting phase errors in the complex spectrum by means of the frequency-dependent phase function determined.

4,876,508

METHOD AND APPARATUS FOR NMR IMAGING

David G. Taylor, Guildford, England, assignor to Surrey Medical Imaging Systems Ltd., Guildford, England

PCT No. PCT/GB88/00066, § 371 Date Nov. 29, 1988, § 102(e) Date Nov. 29, 1988, PCT Pub. No. WO88/06288, PCT Pub. Date Aug. 25, 1988

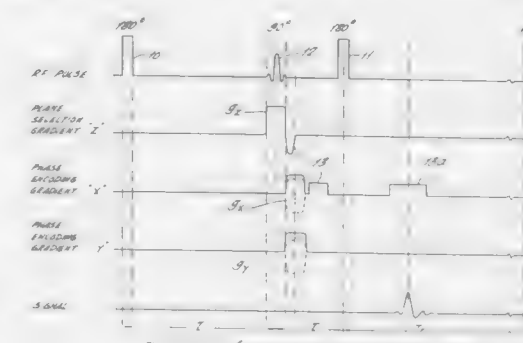
PCT Filed Feb. 4, 1988, Ser. No. 259,000

Claims priority, application United Kingdom, Feb. 10, 1987, 8702951

Int. Cl.⁴ G01R 33/20

U.S. Cl. 324—309

6 Claims



1. A method of NMR imaging in which phase and frequency encoding of precessing nuclear spins are performed on the same spatial axis.

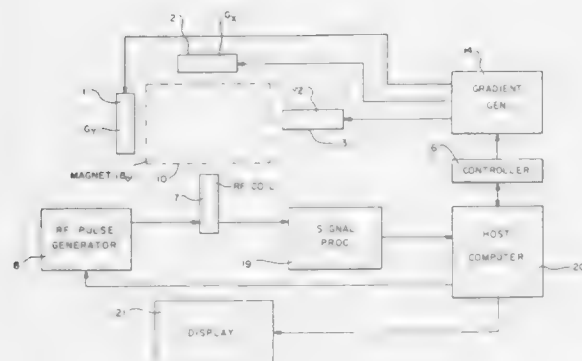
4,876,509

IMAGE RESTORATION PROCESS FOR MAGNETIC RESONANCE IMAGING RESONANCE IMAGING

Robert J. Perlmuter, Palo Alto, Calif., assignor to Resonex, Inc., Sunnyvale, Calif.
Continuation-in-part of Ser. No. 942,604, Dec. 17, 1986, abandoned. This application Nov. 3, 1987, Ser. No. 116,437
Int. Cl.⁴ G01R 33/20

U.S. Cl. 324—309

16 Claims



1. An image restoration process for correcting the warped reconstructed image produced by a magnetic resonance imaging (MRI) method where by determining the inhomogeneities of the magnetic field used in the MRI method corrected pixel locations for a corrected image are calculated, each such pixel location having a known offset, $1y, 1x$, from a group of four pixels (x_1, x_2, x_3, x_4) of the reconstructed warped image each of said four pixels having a known intensity value including a signal portion and a noise portion, said restoration process interpolating said four values to determine an intensity value for said corrected pixel location comprising the following steps:

for each corrected pixel location, y , computing the corresponding intensity value using

$$y = \sum_{i=1}^4 \alpha_i x_i$$

where α_i is the relative weight to be given each x_i in computing said intensity value of y , by determining $\alpha_1, \alpha_2, \alpha_3, \alpha_4$ within the following constraints and taking into account said offset:

$$\alpha_i \geq 0 \quad i = 1, 2, 3, 4$$

$$\sum_{i=1}^4 \alpha_i = 1$$

$$\sum_{i=1}^4 \alpha_i^2 = \beta^2 < 1$$

where β^2 is a constant and whereby noise variance of said noise portion is uniform for each corrected pixel location and is independent of location of each pixel within said group of four pixels;

and displaying or storing said computed intensity values for each corrected pixel location to provide a said restored image.

4,876,510

APPARATUS FOR NUCLEAR SPIN TOMOGRAPHY HAVING SUPERCONDUCTING BASE FIELD MAGNETIC COILS AND A RADIATION SHIELD

Horst Siebold, and Günter Ries, both of Erlangen, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

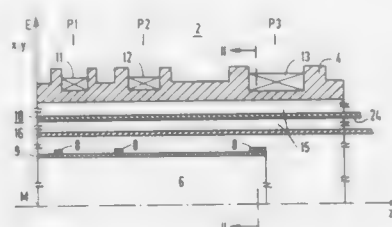
Filed May 12, 1988, Ser. No. 193,513

Claims priority, application Fed. Rep. of Germany, Jun. 4, 1987, 3718755

Int. Cl.⁴ G01R 33/20

U.S. Cl. 324—318

15 Claims



1. A magnet coil system for a nuclear spin tomography apparatus comprising;
superconducting base field coils for generating a homogeneous magnetic base field, said superconducting base field coils defining an interior region;
gradient coils that are not superconducting positioned within said interior region for developing magnetic field gradients;
at least one cooled radiation shield that is electrically and thermally conducting and comprises a superconducting material of a second kind having a high superconducting transition temperature; and
said shield is positioned between said gradient coils and said superconducting base field coils and has a nonsuperconducting state during a starting process and a superconducting state during undisturbed operation of the magnetic coil system.

4,876,511

METHOD AND APPARATUS FOR TESTING AND CALIBRATING AN ELECTROMAGNETIC LOGGING TOOL

Brian Clark, Missouri City, Tex., assignor to Schlumberger Technology Corporation, Houston, Tex.

Filed Oct. 20, 1988, Ser. No. 260,536

Int. Cl.⁴ G01V 13/00, 3/28, 3/30

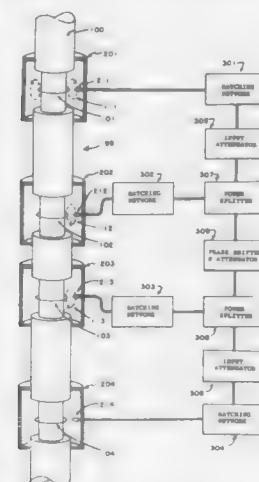
U.S. Cl. 324—338

14 Claims

8. An apparatus for testing an electromagnetic logging tool having an electromagnetic field transmitting antenna and at least one longitudinally spaced electromagnetic field receiving antenna, said apparatus comprising:

- means positioned in the proximity of said transmitting antenna for detecting a primary magnetic field generated by said transmitting antenna and generating a signal representative thereof;
- means coupled to said detecting means and responsive to said generated signal representative of the primary field

for producing in the proximity of said receiving antenna a secondary magnetic field that simulates the transmitted



electromagnetic field after it has propagated through a geological formation of known properties.

4,876,512

METHOD FOR RAPIDLY DETERMINING THE SWELLING-CLAY CONTENT IN SHALES AND SHALY SANDSTONE FORMATIONS BY HIGH-FREQUENCY DIELECTRIC CONSTANT MEASUREMENTS

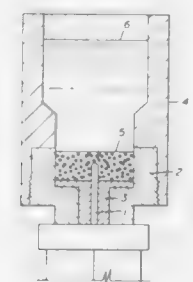
Michael K. Kroeger; John M. Longo; Ronald P. Steiger, all of Houston, and Peter K. Leung, Sugar Land, all of Tex., assignors to Exxon Production Research Company, Houston, Tex.

Filed Mar. 30, 1988, Ser. No. 175,081

Int. Cl.⁴ G01V 3/06, 3/12

U.S. Cl. 324—376

43 Claims



1. A method for measuring the swelling-clay content of earth formations by dielectric measurements, comprising the steps of:

- grinding a sample of the earth formation to a size suitable for testing;
- washing the sample with a fluid having a water activity substantially less than that of water;
- packing the washed sample into a sample cell suitable for dielectric measurement;
- measuring the dielectric constant of the washed sample at a preselected frequency; and
- comparing the measured dielectric constant of the rock sample to a calibration curve, to determine the swelling-clay content of the earth formation.

4,876,513

DYNAMIC STATE-OF-CHARGE INDICATOR FOR A BATTERY AND METHOD THEREOF

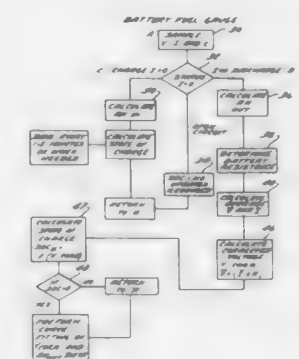
George H. Brilmyer, and William H. Tiedemann, both of Cedarburg, Wis., assignors to Globe-Union Inc., Milwaukee, Wis.

Filed Dec. 5, 1988, Ser. No. 279,213

Int. Cl.⁴ G01N 27/46

U.S. Cl. 324—427

10 Claims



first electrical load from the first supply line, means responsive to the controls for generating first and second control signals, a first contactor responsive to the first control signal for connecting the voltage supply to a first supply line, the first electrical load connected to the first supply line, a second contactor responsive to the second control signal for connecting a second supply line to the first supply line thereby connecting the voltage supply to the second supply line and causing said means for generating the control voltage difference to interrupt power through the electronic switch means thereby discontinuing the supply of power to the first electrical load, means for disconnecting the electrical loads from the switching system, indicating means responsive to the controls only



when the switching system is in a testing mode for indicating a fault in the switching system, and the indicating means including terminals; and the testing system comprises:

a connector having a plurality of electrical terminals adapted for connection to the switch terminal connected to the first electrical load and to the terminals of the indicating means when the electrical loads have been disconnected from the switching system, the connector for placing the switching system in the test mode when connected; electrical circuit means for connecting the switch terminal to the indicating means; whereby operation of the control associated with the first electrical load will actuate the indicating means to indicate proper operation of the switching system.

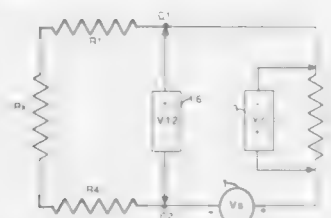
4,876,515

SELF-CHECKING OHMMETER THAT CHECKS FOR CONTACT RESISTANCE OF ITS PROBES
Edward R. Ball, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed May 8, 1987, Ser. No. 48,021
Int. Cl.⁴ G01R 27/14

U.S. Cl. 324-538

19 Claims



1. Apparatus for providing accurate information pertaining to the resistance of means under test, said apparatus comprising:
ohmmeter means for providing a resistance reading, connecting means coupled to said ohmmeter means and manually operable for establishing connection with said means under test, wherein said connection is characterized as resistive, and means coupled to said connecting means for determining the acceptability of the resistance of said connection between said ohmmeter means and said means under test for indicating the

accuracy of the ohmmeter reading, the relative resistance of said connection being determined relative to reference resistance of said ohmmeter means and separately from said ohmmeter reading.

4,876,516

HIGH GAIN DISTRIBUTED AMPLIFIERS

Richard M. Dougherty, Scottsdale, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 27, 1989, Ser. No. 302,525
Int. Cl.⁴ H03F 3/60

U.S. Cl. 330-54

11 Claims



1. A high gain distributed amplifier comprising:
input transmission means for supplying an input signal;
a plurality of darlington type amplifier means;
a plurality of FET type amplifier means;
one each of said plurality of FET type amplifier means coupled in series to a corresponding one of said plurality of darlington type amplifier means to form a plurality of cascaded elements;
output transmission means;
each of said cascaded elements including an input coupled in parallel to said input transmission means, and having an output coupled in parallel to said output transmission means;
said plurality of darlington type amplifier means and said plurality of FET type amplifier means for amplifying said input signal; and
said output transmission means for combining a first portion of said amplified signal from each of said cascaded elements to output said combined first portion of said amplified signal.

4,876,517

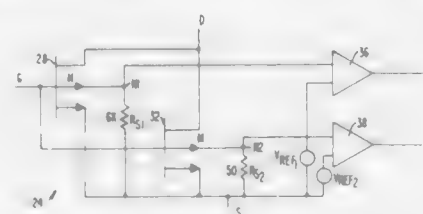
CIRCUIT FOR SENSING FET OR IGBT DRAIN CURRENT OVER A WIDE DYNAMIC RANGE

Christopher G. Arcus, San Jose, Calif., assignor to Ixys Corporation, San Jose, Calif.

Filed Jan. 17, 1988, Ser. No. 208,290
Int. Cl.⁴ H03F 3/16

U.S. Cl. 330-277

18 Claims



1. A circuit for sensing very small currents flowing through

an FET having a source terminal, a drain terminal, and a mirror terminal comprising:

a comparator having a first input terminal coupled to the mirror terminal of the FET and a second input terminal coupled to a reference voltage;
a high resistance coupled between the mirror terminal of the FET and a ground potential; and
wherein the high resistance is greater than the source to drain resistance of the FET.

4,876,518

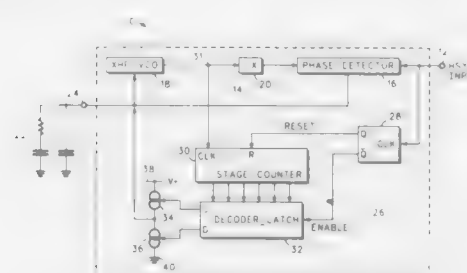
FREQUENCY TRACKING SYSTEM

Geoffrey W. Perkins, Chandler, Ariz., assignor to Motorola Inc., Schaumburg, Ill.

Filed Dec. 2, 1988, Ser. No. 279,182
Int. Cl.⁴ H03L 7/00

U.S. Cl. 331-1 A

10 Claims



1. A system for tracking an applied input signal the frequency of which may vary over a predetermined range, comprising:

a phase locked loop including a phase detector having first and second inputs and an output, said first input being coupled to an input of the system to which the input signal is applied, a controlled oscillator, means for coupling said oscillator to said second input of said phase detector, and means coupled to said output of said phase detector for providing a direct current control signal to said controlled oscillator whenever the frequency of said oscillator is greater or less than the frequency of the applied input signal by a predetermined amount;

digital frequency counting means forming a closed loop with said controlled oscillator for digitally counting the frequency of said oscillator and comparing the same to the frequency of the applied input signal and for providing an error signal to said means for providing a direct current control signal whenever said oscillator frequency is outside a predetermined frequency range of the input signal frequency such that the frequency of said oscillator automatically tracks the frequency of the applied input signal.

4,876,519

HIGH FREQUENCY ECL VOLTAGE CONTROLLED RING OSCILLATOR

Craig M. Davis, Santa Clara, and Richard R. Rasmussen, Fremont, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

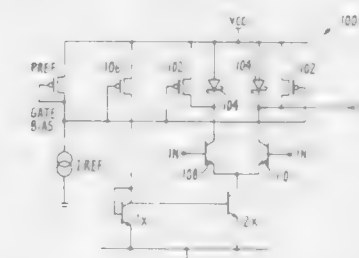
Filed Jan. 23, 1989, Ser. No. 299,768
Int. Cl.⁴ H03B 1/00

U.S. Cl. 331-57

11 Claims

1. Emitter-coupled logic circuitry comprising:
(a) a plurality of input transistors having commonly-coupled emitters, each input transistor having a collector;
(b) a current source connected between the commonly-coupled emitters and ground; and

(c) variable resistive means connected between the collectors of the input transistors and a supply voltage for controlling the charging current provided to the collectors of the input transistors.



trolling the charging current provided to the collectors of the input transistors.

4,876,520

COAXIAL SWITCHING SYSTEM WITH SWITCHED SHIELDS AND CROSSTALK SUPPRESSION

David P. Kjosness, Longmont, and Joe E. Marriott, Loveland, both of Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Division of Ser. No. 79,568, Jul. 30, 1987, Pat. No. 4,766,401.

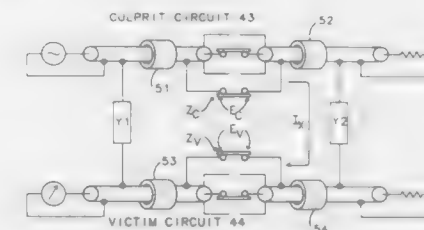
This application Apr. 28, 1988, Ser. No. 187,101

The portion of the term of this patent subsequent to Aug. 23, 2005, has been disclaimed.

Int. Cl.⁴ H04B 3/28; H01P 1/12

U.S. Cl. 333-12

1 Claim



1. A circuit for switching transmission lines comprising:
first and second segments of a first transmission line having a center conductor and a shield;

a first coaxial relay having first and second center conductor and shield contacts, the first center conductor and shield contacts respectively coupled to the center conductor and shield of the first segment of the first transmission line;
a second coaxial relay having first and second center conductor and shield contacts, the second center conductor and shield contacts respectively coupled to the center conductor and shield of the second segment of the first transmission line;

a first section of interconnecting transmission line having a center conductor and a shield, at one end of the first section the center conductor being connected to the second center conductor contact of the first coaxial relay and the shield being connected to the second shield contact of the first coaxial relay, and at the other end of the first section the center conductor being connected to the first center conductor contact of the second coaxial relay, and the shield of the first section being left unconnected to the second shield contact of the second coaxial relay;

a first relay means, coupled to the shield contacts of the first and second coaxial relays, for electrically connecting those shield contacts together whenever the first and second coaxial relays are closed;

first and second segments of a second transmission line having a center conductor and a shield;

a third coaxial relay having first and second center conductor and shield contacts, the first center conductor and

shield contacts respectively coupled to the center conductor and shield of the first segment of the second transmission line;

a fourth coaxial relay having first and second center conductor and shield contacts, the second center conductor and shield contacts respectively coupled to the center conductor and shield of the second segment of the second transmission line;

a second section of interconnecting transmission line having a center conductor and a shield, at one end of the second section the center conductor being connected to the second center conductor contact of the third coaxial relay and the shield being connected to the second shield contact of the third coaxial relay, and at the other end of the second section the center conductor being connected to the first center conductor contact of the fourth coaxial relay, and the shield of the second section being left unconnected to the second shield contact of the fourth coaxial relay; and

a second relay means, coupled to the shield contacts of the third and fourth coaxial relays, for electrically connecting those shield contacts together whenever the third and fourth coaxial relays are closed.

4,876,521

TRIPPING COIL WITH FLUX SHIFTING COIL AND BOOSTER COIL

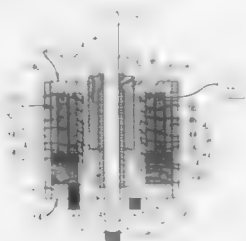
Donald R. Boyd, Sanford, N.C., assignor to Siemens Energy & Automation, Inc., Atlanta, Ga.

Continuation of Ser. No. 89,298, Aug. 25, 1987, abandoned. This application May 31, 1988, Ser. No. 203,554

Int. Cl.⁴ H01H 9/00

U.S. Cl. 335-179

8 Claims



1. A tripping coil for tripping a circuit breaker, comprising: a translatable armature;

a permanent magnet for biasing the armature;

a coil unit having a first winding and a second winding, wherein the first and second windings are mutually radially adjacent, each winding producing a magnetic flux when energized, the first winding being energizable such that it produces a magnetic flux which assists the magnetic flux of the permanent magnet in biasing the armature into a biased position, the second winding being energizable such that it produces a magnetic flux which opposes the magnetic flux of the permanent magnet urging the armature into an unbiased position when the first winding is not energized to produce a magnetic flux which assists the magnetic flux of the permanent magnet, the armature being translatable between the biased position and the unbiased position; and

means for connecting the armature to the circuit breaker such that the circuit breaker is tripped when the armature moves to the unbiased position.

4,876,522 ELECTROMAGNETIC SWITCHGEAR

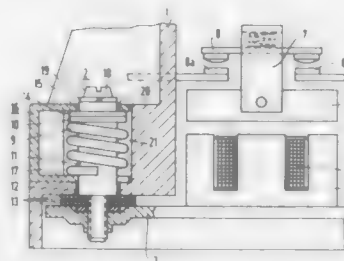
Norbert Mittemeier, Amberg, and Barilo Koppmann, Kaitenbrunn, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany
Filed Sep. 23, 1988, Ser. No. 248,428

Claims priority, application Fed. Rep. of Germany, Sep. 25, 1987, 3732428

Int. Cl.⁴ H01H 3/60, 51/08

U.S. Cl. 335-193

7 Claims



1. An electromagnetic switchgear having a housing top comprising:

- (a) a movable switching magnet part;
- (b) a movable contact part coupled with said movable switching magnet part and guided in the housing top;
- (c) a fixed contact part disposed in said housing top;
- (d) a bottom plate holding a non-switching magnet part, said bottom plate closing off the housing top;
- (e) at least one screw having a screw head and screw threads which couple the housing top to the bottom part;
- (f) at least one resilient damping element associated with said screw and which permits movement of the bottom plate relative to the housing part and further wherein the bottom plate has a bore which receives said screw threads and the at least one damping element comprises a compression spring braced at one end either directly or indirectly against the screw head and, at the other end, against the housing top.

4,876,523

SWITCH FOR CIRCUIT BREAKER

Osami Kushida, Hisamitsu Nishimura, Masakazu Nezu, all of Gotemba, and Yoshihiko Ishikawa, Tokyo, all of Japan, assignors to Texas Instruments Incorporated, Dallas, Tex.

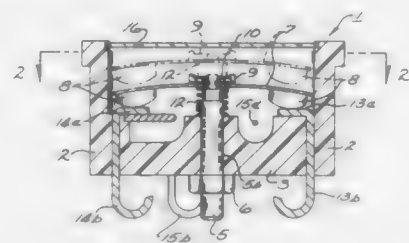
Filed Oct. 19, 1988, Ser. No. 259,641

Claims priority, application Japan, May 2, 1988, 63-109735

Int. Cl.⁴ H01H 85/04, 37/00

U.S. Cl. 337-299

6 Claims



1. A switch device comprising a deformable member that deforms in response to variations in its temperature used to control the position of a movable contact which is movable into and out of engagement with a stationary contact, the deformable member being a snap acting disc mounting thereon the movable contact, an aperture formed through the disc and a support member including a protrusion which extends from

the bottom of the disc up through the aperture supporting the deformation member, a plate having an aperture extending therethrough being received on top of the disc with the protrusion extending through the aperture in the plate, the deformation member and the support member being mutually fixed by means of a meltable material with the meltable material engaging the protrusion and the plate to lock the disc to the support, the meltable material melting at the time of an emergency, with the deformable member becoming separated from its support to thereby open an electrical circuit.

4,876,524

SIX-AXIS JOYSTICK CONTROL

Richard L. Jenkins, 224 13th Ave. N.E., Calgary, Alberta, Canada T2K 1H7

Continuation of Ser. No. 885,691, Jul. 15, 1986, abandoned. This application Jun. 20, 1988, Ser. No. 208,794

Claims priority, application Canada, Jul. 19, 1985, 487089

Int. Cl.⁴ G01L 1/22

U.S. Cl. 338-2

36 Claims



1. A control device comprising:

- an elastic beam;
- strain gauges attached to the surface of said beam;
- a first group of not more than three of said strain gauges each having an operative axis thereof inclined with a single predetermined angle with respect to the main axis of said beam,
- said strain gauges being disposed at a first predetermined level along said beam.

4,876,525

EMERGENCY WARNING BRAKE SYSTEM

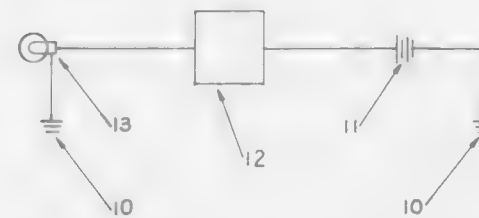
Sylvia Gross, 228 E. St., Easthampton, Mass. 01027

Filed Feb. 22, 1988, Ser. No. 158,794

Int. Cl.⁴ B60Q 1/26

U.S. Cl. 340-436

1 Claim



1. In a vehicle equipped with an external signal visible to other motorists, which indicates that the brakes of said vehicle have been applied; and equipped with an antiskid brake system, in combination with an antiskid brake system, in combination with an external brake signal visible to other motorists, controlling the brake signal to pulsate when the antiskid brake system pulsates.

4,876,526

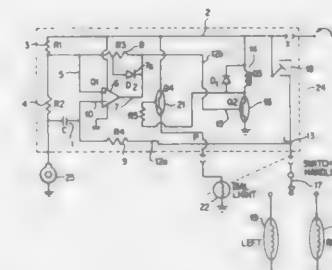
HEAVY DUTY FLASHER

Joseph Spiteri, P.O. Box 243, Harborcreek, Pa. 16421
Filed Apr. 29, 1988, Ser. No. 187,967

Int. Cl.⁴ B60Q 1/38

U.S. Cl. 340-471

4 Claims



1. In combination with a turn signal having power and light terminals and a switch handle for conducting current from said light terminal to left or right turn signal lights, a flasher having a ground terminal connected to ground and power and light terminals connected to the corresponding turn signal terminals, an op-amp connected between ground and said power terminal, said op-amp having a non-inverting input connected to an above ground terminal of a voltage divider and an inverting input connected to ground through a capacitor and connected to said light terminal through a resistor, said op-amp having an output which is positive when the voltage on the non-inverting input exceeds the voltage on the inverting input and which is negative or ground when the voltage on the inverting input exceeds the voltage on the non-inverting input, a relay for furnishing current from the power terminal to the light terminal, and means for turning said relay "on" when the op-amp output is positive and "off" when the op-amp output is negative or ground.

4,876,527

VEHICLE SPEED DETECTING DEVICE

Hiroki Oka, Toyota, and Nobuyoshi Nagura, Anjo, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Aichi, Japan

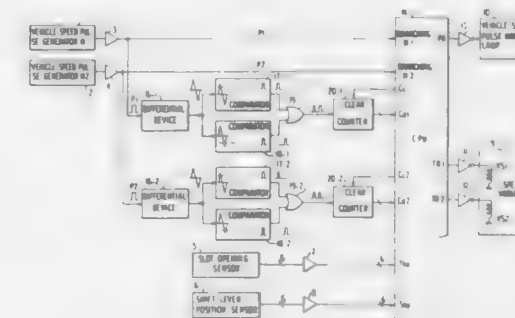
Filed Sep. 29, 1988, Ser. No. 250,899

Claims priority, application Japan, Sep. 29, 1987, 62-245627

Int. Cl.⁴ B60Q 1/00

U.S. Cl. 340-441

2 Claims



1. A vehicle speed detecting device comprising first and second vehicle speed pulse generators, each of which provides electrical pulses proportionate to the vehicle speed, vehicle speed calculation means for calculating the vehicle speed based on said electrical pulses, means for memorizing the vehicle

speed, means for counting the pulses generated by said vehicle speed pulse generators, abnormality detecting means for producing an abnormal operation signal when the count value of one of said vehicle speed pulse generators is lower than a predetermined value when the vehicle speed calculated by the vehicle speed calculation means is greater than the predetermined vehicle speed, means for transferring the electrical pulses for the calculation of the vehicle speed from one pulse generator to the other pulse generator and means for initiating an alarm in response to the abnormality signal.

4,876,528

METHOD OF DETECTING A DEFLATED TIRE ON A VEHICLE

John C. Walker, and Thomas Holmes, both of Sutton Coldfield, England, assignors to SP Tyres UK Limited, Birmingham, England

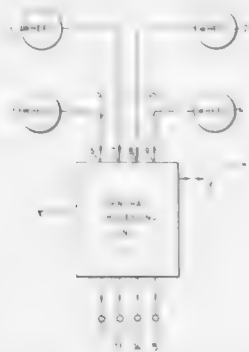
Filed May 13, 1988, Ser. No. 193,741

Claims priority, application United Kingdom, May 13, 1987, 8711310

Int. Cl.⁴ B60C 23/00

U.S. Cl. 340—442

11 Claims



1. A method of detecting a partially deflated pneumatic tire on a vehicle having four tires, each mounted on a wheel, which comprises

sensing the angular velocity of each wheel and producing a signal proportional thereto, processing the four signals in a processor unit which subtracts the sum of the signals from one pair of diagonally opposite wheels from the sum of the signals from the other pair of diagonally opposite wheels, sensing when the magnitude of the result is between 0.05% and 0.60% of the mean of the sums, comparing the signals for each of the four wheels in turn with the signals for each of the other wheels, sensing when one of said signals is different from the average of all four signals by more than 0.1%, and in the event of both sensed signal factor bring present, operates a warning device to indicate a tire is partially or complete deflated.

4,876,529

METHOD AND SYSTEM FOR DETECTING THE LEVEL OF ENGINE OIL OF AN ENGINE

Shin'ichi Kubota; Hideyo Miyano, and Hiromitsu Adachi, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 921,129, Oct. 21, 1986, abandoned.

This application Sep. 13, 1988, Ser. No. 244,579

Claims priority, application Japan, Oct. 21, 1985, 60-234733

Int. Cl.⁴ G08B 21/00

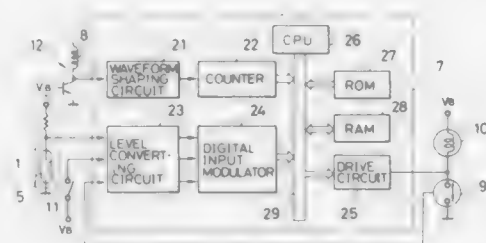
U.S. Cl. 340—450.3

8 Claims

1. A method for detecting a level of an engine oil of an engine having an oil pan, comprising:

a first step including timer means for detecting that said engine has operated for more than a first predetermined time period required for a sufficient temperature rise of

the engine oil to reduce viscosity of the engine oil, and producing a first detection output signal; a second step for detecting that said engine has stopped for more than a second predetermined time period required



for the engine oil to return to the oil pan from the engine after the stop of the engine, after said first detection signal is generated, and producing a second detection signal; and a third step for detecting an oil level after generation of said second detection signal.

4,876,530

METHOD AND APPARATUS FOR DETECTING LEAKAGE IN FUEL STORAGE AND DELIVERY SYSTEM

Wayne E. Hill, Bucyrus, Kans., and Dennis McEachern, Concord, N.C., assignors to The Marley Company, Mission Woods, Kans.

Filed Oct. 13, 1987, Ser. No. 108,275

Int. Cl.⁴ G01M 3/26; G08B 21/00

U.S. Cl. 340—605

32 Claims



1. A method of detecting leakage from a product line through which liquid is pumped and in which the liquid is subject to possible thermally induced contraction, said method comprising the steps of:

monitoring the pressure in the product line; measuring the time required for the produce line pressure to drop from one preselected pressure level to a lower preselected pressure level during a first cycle; raising the pressure in the product line from said lower preselected pressure level to a level at least as high as said one preselected pressure level; measuring the time required for the product line pressure to drop from said one preselected pressure level to said lower preselected pressure level during a second cycle;

interpreting the drops in pressure as resulting from a leak in the product line unless the time measured during said second cycle exceeds the time measured during first cycle by a predetermined amount.

4,876,531

POSITION DETECTOR FOR THE MOVABLE ELEMENT OF A FLUID-OPERATED ACTUATOR

Wolfgang Dondorf, Marienheide-Dannenberg, Fed. Rep. of Germany, assignor to Pulsotronic Merten GmbH & Co. KG, Gummersbach, Fed. Rep. of Germany

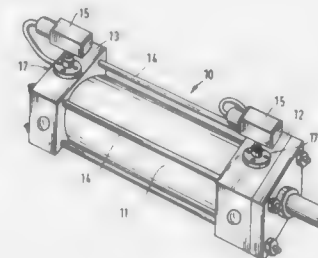
Filed Jun. 17, 1988, Ser. No. 208,257

Claims priority, application Fed. Rep. of Germany, Jun. 27, 1987, 87109271

Int. Cl.⁴ G08B 21/00; G01L 9/00; H01H 35/38

U.S. Cl. 340—686

9 Claims



1. A device for detecting the position of a movable part of a fluid-operated actuator having an actuator wall including a bore therein, the device comprising:

a holder configured to be secured to the wall of the actuator so that the holder encompasses the bore of the wall, the holder having a cylindrical channel, a cylindrical probe projecting from the holder and configured for introduction into the bore, the probe having a detector for detecting the movable part, guide means for displaceably guiding the probe in the cylindrical channel of the holder, first sealing means for establishing a seal between the holder and the wall, second sealing means for establishing a seal between the holder and the probe, a hollow shaft extending from the probe, and adjustment means for axially adjusting the relative position of the hollow shaft and the holder, whereby the length of projection of the probe from the holder is adjustable.

4,876,532

VENDING RACK BURGLAR ALARM

Charles L. Sauls, Rockingham, N.C., assignor to Fisher/Sauls Electronics, Inc., Rockingham, N.C.

Filed Jun. 23, 1988, Ser. No. 210,752

Int. Cl.⁴ G08B 13/14

U.S. Cl. 340—689

14 Claims



1. A vending machine, such as a newspaper vending rack, which is protected from theft or pilferage comprising, in combination a housing,

a vending compartment provided in said housing for receiving and storing the articles to be vended by the machine, an enclosed locking coin compartment carried by said housing,

a coin receiving mechanism located within said coin compartment, an audible alarm, and means located within said enclosed locking coin compartment for sounding said audible alarm in response to movement of said housing beyond a predetermined limited range of movement occurring for a predetermined time duration.

4,876,533

METHOD AND APPARATUS FOR REMOVING AN IMAGE FROM A WINDOW OF A DISPLAY

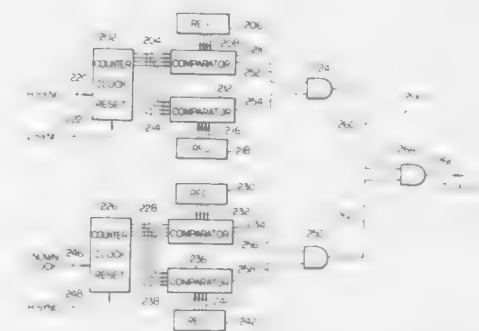
Anthony C. Barkans, Woburn, Mass., assignor to Schlumberger Technology Corporation, Houston, Tex.

Continuation of Ser. No. 915,502, Oct. 6, 1986, abandoned. This application Oct. 18, 1988, Ser. No. 259,474

Int. Cl.⁴ G09G 1/06

U.S. Cl. 340—721

20 Claims



1. A method for removing an image from a selected area of a scanned display device driven by a video generator and replacing said image with a predetermined background color comprising the steps of:

(a) identifying the boundary locations of said selected area on a display to within a pixel independent of said video generator driving said display; (b) determining the current position of the scan to within a pixel on the display device; (c) comparing said current position of said scan to said boundary locations to determine whether said current position of said scan is inside said selected area; and (d) generating a forcing signal for said video generator to drive said display to said preselected background color when said scan is within said selected area.

4,876,534

SCANNING METHOD AND APPARATUS FOR CURRENT SIGNALS HAVING LARGE DYNAMIC RANGE

Carver A. Mead, San Jose, and Timothy P. Allen, Mountain View, both of Calif., assignors to Synaptics Incorporated, San Jose, Calif.

Filed Feb. 5, 1988, Ser. No. 152,894

Int. Cl.⁴ H04N 3/12, 9/07

U.S. Cl. 340—825.950

33 Claims

1. An apparatus for reading a current signal from a source in an array of sources, each current having a changeable sign, a small amplitude and several orders of magnitude dynamic range comprising:

a first conductor; a second conductor means for carrying a first addressing signal; coupling means for coupling said current signal to said first conductor upon receipt of said first addressing signal;

the motor and having a transmitter means for generating a carrier signal independent of said AC power and for superimposing the carrier signal onto a circuit which includes one conductor in said multiple conductor cable and the ground;

sensing means in the downhole assembly for providing an electrical signal corresponding to the magnitude of said at least one physical parameter;

modulating means in the downhole assembly for modulating the carrier signal with the electrical response, and providing a modulated signal to the circuit defined by said one conductor and the ground conductor means that corresponds to the physical parameter; and

conversion means in a surface unit for converting the modulated signal into a readout signal proportional to the physical parameter.

4,876,540

SYSTEM FOR CONTROLLING METERED PARKING

Patrick Berthou, Besancon, and Christian Guion, Verrieres Le Buisson, both of France, assignors to Flonic, Montrouge, France

Continuation of Ser. No. 870,554, Jan. 4, 1986, abandoned. This application Aug. 22, 1988, Ser. No. 235,785

Claims priority, application France, Jun. 7, 1985, 85 08608
Int. Cl.⁴ G08G 1/00

U.S. Cl. 340—932.2

36 Claims



1. A system for controlled metered parking of road vehicles, the system comprising:

a parking meter for controlling a plurality of parking spaces, said meter comprising means accessible to drivers for entering vehicle identity data, means for computing a parking time limit associated with said vehicle identity data as a function of an amount of money prepaid by said drivers, means for storing a plurality of pairs of data items where a first data item of each of said pairs is a particular vehicle identity data item and a second data item of each said pairs is a parking time limit data item associated with said vehicle identity data item, and a first clock for delivering data corresponding to the present time; and

a portable terminal for use by a checker of said controlled metered parking, said terminal including means accessible to said checker for entering identification data corresponding to a vehicle parked at a particular one of said parking spaces, a second clock for providing data corresponding to the present time, means for comparing said identification data entered into said portable terminal with said vehicle identity data stored in said parking meter, means for comparing said stored parking time limit data with the present time as delivered by said second clock, and means for processing the results of said comparisons in order to cause a warning signal to appear at said terminal when said stored parking time limit data item corresponding to said parked vehicle has expired.

4,876,541

STEM FOR DYNAMICALLY COMPRESSING AND DECOMPRESSING ELECTRONIC DATA

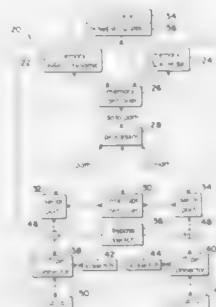
James A. Storer, Lincoln, Mass., assignor to Data Compression Corporation, Lexington, Mass.

Filed Oct. 15, 1987, Ser. No. 108,929

Int. Cl.⁴ H03M 7/42

U.S. Cl. 341—51

55 Claims



1. An apparatus for dynamically compressing and decompressing an input stream of data characters into a compressed stream code and for decompressing said compressed stream of code into uncompressed data characters, the apparatus comprising:

first dictionary means for storing a first plurality of strings of data characters, said first dictionary means comprising a plurality of unique codes each for identifying a corresponding respective one of said first plurality of strings, wherein said first plurality of strings comprises an initial set of unique data characters, with each character in said initial set being positioned in a corresponding respective one of said first plurality of strings;

second dictionary means for storing a second plurality of strings of data characters, said second dictionary means comprising a plurality of unique codes each for identifying a corresponding respective one of said second plurality of strings, wherein said second plurality of strings comprises an initial set of unique data characters that is identical to said initial set of unique data characters in said first plurality of strings, with each character in said initial set in said second plurality of strings being positioned in the one of said second plurality of strings that is identified by the same unique code as the string in said first plurality of strings in which the identical character from said initial set of characters in said first plurality of strings is positioned; first match means for receiving and parsing said input stream of data characters into parsed strings of data characters and for comparing each of said parsed strings of data characters with said first plurality of strings so as to locate the one of said first plurality of strings that matches a corresponding one of said parsed strings, wherein the most recently matched one of said parsed strings is identified as the current match;

first transmitting means for transmitting the one of said plurality of unique codes identifying the one of said first plurality of stored strings that matches said current match, for each current match;

second match means for receiving said one unique code transmitted by said first transmitting means for each current match, and for comparing each said one unique code with said plurality of unique codes identifying said second plurality of strings so as to locate the one of said plurality of unique codes in said second dictionary means that matches said each said one unique code received from said first transmitting means;

second transmitting means for transmitting the string of character data in said second plurality of strings identified by the one of said plurality of unique codes in said second

dictionary means that matches said one unique code received from said first transmitting means, for each string of character data matched by said second match means; first update means for adding N new strings of data characters to said first dictionary means for each current match, wherein N equals the number of characters in said current match, said N new strings comprising the last current match concatenated with each non-empty prefix of said current match, and including means for assigning one of said plurality of unique codes to each of said new strings;

second update means for adding said N new strings of data characters to said second dictionary means for each current match, including means for assigning the same one of said plurality of unique codes to each of said N new strings added to said second dictionary means that is assigned to corresponding respective ones of said N new strings added to said first dictionary means.

4,876,542

MULTIPLE OUTPUT OVERSAMPLING A/D CONVERTER WITH EACH OUTPUT CONTAINING DATA AND NOISE

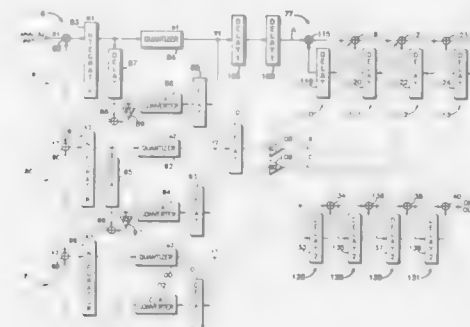
Nicholas van Bavel, and Tim A. Williams, both of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 25, 1988, Ser. No. 147,958

Int. Cl.⁴ H03M 3/02

U.S. Cl. 341—143

10 Claims



1. A data conversion system having a multiple output oversampling A/D converter for operating at a sampling frequency and having an input terminal for receiving an analog input signal and a plurality of output terminals for providing a plurality of output signals, each output signal containing data and noise, comprising:

a rank ordered plurality of quantization loops equal in number to the plurality of output terminals, each loop separately comprising:

an integrator for integrating a difference between an input terminal signal and a feedback signal;

a quantizer for quantizing an output from the integrator and providing one of the output signals at a predetermined one of the plurality of output terminals, each of the output signals providing a predetermined amount of data and noise; and

means for converting the output signal from the quantizer to the feedback signal,

the highest ranked quantization loop receiving the input signal as the input terminal signal, and the remaining quantization loops receiving the input terminal signal from an immediately higher ranked loop, all the loops except the lowest ranked loop further comprising coupling means for providing the input terminal signal to the immediately lower ranked loop; and

filter means having a plurality of input terminals, each of the input terminals being coupled to a predetermined one of the plurality of output terminals, said filter means using the data of each of the plurality of output signals without

individually differentiating each data output by a predetermined power of (1-D), where D is a predetermined delay, before filtering to provide a digital equivalent of predetermined bit width of the analog input signal.

4,876,543

MULTI-RATE CASCADED NOISE SHAPING MODULATOR

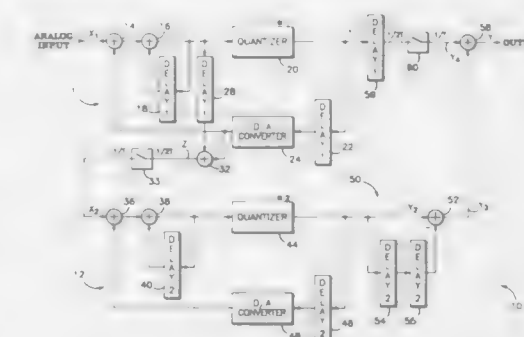
Nicholas R. van Bavel, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed May 31, 1988, Ser. No. 200,475

Int. Cl.⁴ H03M 3/00

U.S. Cl. 341—143

9 Claims



1. A multi-rate cascaded noise shaping modulator operating at a plurality of sampling frequencies, each greater than an input signal frequency, said modulator having an input for receiving an analog input signal and an output for providing an equivalent digital output signal, comprising:

at least first and second quantization loops, each quantization loop comprising:

means for filtering a difference between an input terminal signal and a feedback signal;

a quantizer for quantizing an output from an integrator and providing a loop output signal; and

feedback means having an input coupled to the loop output signal and an output for providing the feedback signal;

said first quantization loop operating at a first sampling frequency and said second quantization loop operating at a second sampling frequency which is higher than the first sampling frequency.

4,876,544

OVERSAMPLING A/D CONVERTER COMPRISING AN ADDITIONAL CAPACITOR SWITCHED IN SYNCHRONISM WITH SWITCHING OF AN INPUT CAPACITOR

Yoshiaki Kuraishi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Apr. 8, 1988, Ser. No. 179,458

Claims priority, application Japan, Apr. 10, 1987, 62-88232

Int. Cl.⁴ H03M 1/50

U.S. Cl. 341—166

3 Claims

1. In an oversampling analog-to-digital converter having a converter input terminal supplied with an input analog signal, and comprising an input switched capacitor connected to said input terminal for sampling said analog signal into output electric charges, an integrator for integrating input electric charges into an integrated signal, a quantizer for quantizing said integrated signal into an output digital signal, a control logic responsive to said digital signal for producing a predetermined number of control signals, a reference voltage source, a capacitor array coupled to said reference voltage source and responsive to said control signals for producing controlled electric charges, and combining means connected to said input

switched capacitor, said capacitor array, and said integrator for combining said output electric charges and said controlled electric charges into said input electric charges, the improvement wherein said combining means comprises:

an additional switched capacitor connected to said capacitor array for sampling in cooperation with said capacitor



array said controlled electric charges into additional electric charges in synchronism with sampling of said analog signal; and
summing means connected to said input switched capacitor, said additional switched capacitor, and said integrator for summing said output electric charges and said additional electric charges into said input electric charges.

4,876,545

ADAPTIVE BLANKING INTERFACE APPARATUS FOR SELF-PROTECTION JAMMING EQUIPMENT EMPLOYED IN CONJUNCTION WITH RADAR SYSTEMS

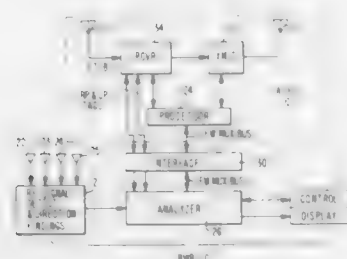
Christopher M. Carlson, Deenville, and Nicholas Deninno, Mahwah, both of N.J., assignors to ITT Corporation, New York, N.Y.

Filed Dec. 24, 1987, Ser. No. 137,854

Int. Cl.⁴ H04K 3/00

U.S. Cl. 342-14

18 Claims



1. In an electronic countermeasures (ECM) system of the type employing a jamming apparatus including a transmitter portion for transmitting jamming signals in order to deceive a foreign transmitter/receiving apparatus and including a warning receiver means operative to receive foreign or threat transmissions to determine the nature of such transmissions and to inform said jamming apparatus of the nature of such threat transmissions, with said warning receiver means capable of operating according to different modes in order to determine the nature of said foreign transmissions, the combination therewith of apparatus for providing selective blanking to said jamming apparatus according to the modes of operation of said receiver means to allow said receiver means and said jamming means to operate without interference between the same, comprising:

interface means coupled between said jamming apparatus

and said receiver means and adapted to exchange information between said jamming apparatus and said receiver means to generate optimum blanking parameter information between said jamming apparatus and said receiver means according to the mode of operation of said receiver means whereby any one of said modes can be accommodated by said ECM system according to said information exchanged, said interface means including

a first data bus coupled between said jamming apparatus and said receiver means and adapted to propagate a series of command codes determined according to the mode of operation of said receiver means and indicative of said information exchange according to said series of command codes,

a second data bus coupled between said jamming apparatus and said receiver means and adapted to propagate code assignment messages defining a frequency range of operation to said receiver means to determine said blanking parameter information according to one of said command codes on said first bus indicative of said information exchange according to said code assignment messages.

4,876,546

DOPPLER SHIFT GENERATOR APPARATUS

Charles B. Koerner, Port Murray, N.J., assignor to ITT Corporation, New York, N.Y.

Filed Oct. 11, 1988, Ser. No. 255,938

Int. Cl.⁴ G01S 7/38

U.S. Cl. 342-15

20 Claims



1. A doppler shift generator apparatus for providing a predetermined Doppler shift to an incoming received RF signal as generated by a Doppler tracking radar to provide an output RF signal for transmission having said Doppler shift with said output signal providing false information to a tracking radar, comprising:

first and second analog memories, each having an input for receiving analog data at a first rate to be stored in said memories and an output for outputting the stored analog data,

clock control means coupled to said first and second analog memories for controlling the outputting of stored analog data therefrom at a second rate different from the first rate,

first switching means responsive to said received RF signal coupled to said inputs of said first and second memories and operative to select either said input of said first or second memory for applying said RF signal thereto,

second switching means coupled to said outputs of said first and second memories and operative to apply either output of said first or second memory to an output terminal indicative of said output RF signal, and

control means coupled to said first and second switching means and operative in conjunction with said first and second analog memories and said clock control means for

selectively applying said received RF signal to said first and second memories to store said signal in said first and second memories at the first rate and for outputting said stored signals at the second rate to provide said output RF signal with a Doppler shift relatively equal to the difference between said first and second rates.

4,876,547

M.T.I. RADAR SYSTEM

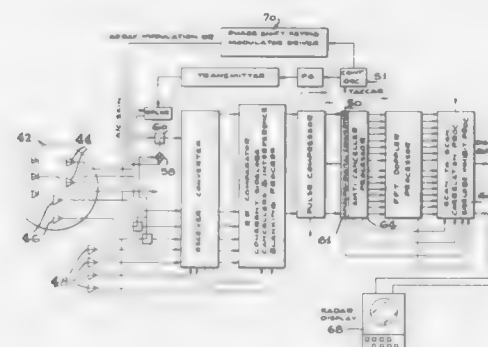
Maurice Franco, Granada Hills, Calif., assignor to Lockheed Corporation, Calabasas, Calif.

Filed Sep. 13, 1988, Ser. No. 243,755

Int. Cl.⁴ G01S 13/52

U.S. Cl. 342-160

15 Claims



1. A radar system comprising:

a main directional antenna, having maximum response in a mainlobe direction, and lesser levels of response from sidelobe directions;

radar system means for transmitting pulses from said main directional antenna, and for receiving reflected signals back from moving targets and clutter from stationary objects, from said antenna;

said radar system including a coherent local oscillator, and circuit means for driving said oscillator to maintain the ground clutter returns received from the mainlobe, spread about the pulse repetition frequency lines representing zero doppler shift; said circuit means affecting sidelobe returns from fixed objects so that they appear to be moving targets;

said system including auxiliary antenna elements for receiving signals from said sidelobe directions;

means for modulating signals received from said sidelobe directions from said auxiliary antenna elements, to the exclusion of signals received from the mainlobe direction; said radar system including target data processing circuitry; a delay circuit and a signal inhibit circuit coupling said directional antenna to said target data processing circuitry;

pulse sampling circuitry for identifying the presence of modulated return signals from fixed objects in the sidelobe directions; and

means for actuating said signal inhibit circuit to block delayed pulse signals from said directional antenna when said modulated signals are detected by said pulse sampling circuitry to eliminate false target signals received on said main directional antenna from side lobe returns.

4,876,548

PHASED ARRAY ANTENNA WITH COUPLERS IN SPATIAL FILTER ARRANGEMENT

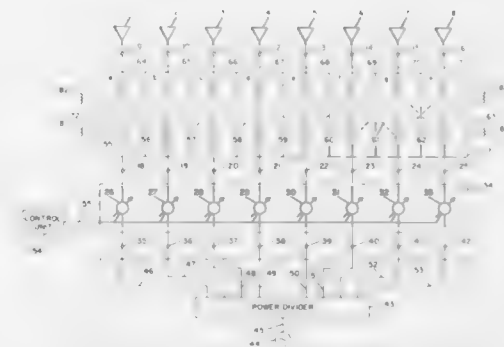
Alfred R. Lopez, Commack, N.Y., assignor to Hazeltine Corp., Greenlawn, N.Y.

Filed Dec. 19, 1986, Ser. No. 943,419

Int. Cl.⁴ H01Q 3/22

U.S. Cl. 342-368

15 Claims



1. An antenna system for radiating wave energy signals into a selected angular region of space and in a desired radiation pattern, comprising:

special filter means, having N input ports and N corresponding output ports, where N is a number greater than five, comprising a network of couples for coupling signals from each of said input ports to its corresponding output port and to at least two other output ports on at least one side of said corresponding port and with the same phase;

an aperture comprising a plurality of N antenna elements arranged along a predetermined path, each element coupled to only one output port of the special filter means; beam steering means for controlling the direction of said radiation pattern, said means comprising N phase shifters. Each phase shifter having a phase shifter input port and a phase shifter output port which output port is coupled to only one input port of said special filter means; and supply means for supplying wave energy signals, said supply means including a signal generator supplying a power divider having N signal output ports, each output port coupled to only one phase shifter;

whereby when wave energy signals are supplied by the signal generator through the power divider, signals supplied by a signal output port of the power divide are coupled to the antenna element associated with said output port and to at least two adjacent antenna elements on at least one side of the antenna element associated with said output port, to cause said aperture to radiate said desired radiation pattern primarily within said selected region of space without grating lobes.

4,876,549

DISCRETE FOURIER TRANSFORM DIRECTION FINDING APPARATUS

Michael S. Masheff, St. Petersburg, Fla., assignor to E-Systems, Inc., Dallas, Tex.

Filed Mar. 7, 1988, Ser. No. 165,003

Int. Cl.⁴ G01S 5/02, 13/00

U.S. Cl. 342-417

8 Claims

1. A circuit for finding the direction of an RF signal received on two antennae separated by a known distance "d" comprising:

an RF signal receiver coupled to each antenna for receiving the antenna signals and generating orthogonal I and Q baseband signal outputs

a CCD Chirp-Z Discrete Fourier transform circuit coupled to each receiver for receiving, sampling and separating

said I and Q baseband signals into components by frequency and amplitude,
 a control circuit coupled to said CCD Chirp-Z Discrete Fourier transform circuit for controlling the sampling rate at which the I and Q signal components are sampled and separated to adjust frequency resolution, and



means coupled to the CCD Chirp-Z Discrete Fourier transform circuit for utilizing the sampled and separated baseband I and Q signal components to obtain the direction of propagation of the RF signal.

4,876,550

RIDGE REGRESSION SIGNAL PROCESSING FOR POSITION-FIX NAVIGATION SYSTEMS

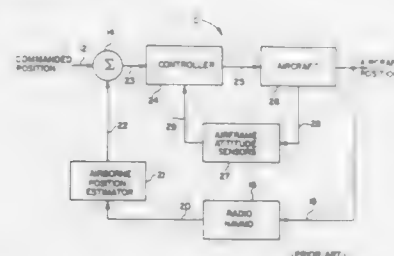
Robert J. Kelly, Baltimore, Md., assignor to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Oct. 8, 1987, Ser. No. 107,430

Int. Cl.⁴ G01S 3/02

U.S. Cl. 342-451

13 Claims



1. Apparatus for determining the position and velocity of a moving platform comprising:

a radio navigation aid having at least three portions, two of which are distant from said platform and having a known position for providing to said platform a plurality of samples indicative of the position of said platform at respective times,

a position estimator for receiving said plurality of samples for generating an estimate of position and velocity both with an unbiased estimator wherein the mean square error of the estimate is the variance and with a biased estimator and selecting said estimate of position and velocity from said biased estimator at times said geometry of said moving platform is substantially co-linear with said two distant portions of said radio navigation aid.

4,876,551 APPARATUS FOR THE DETECTION OF AN ELECTROMAGNETIC PULSE, MORE PARTICULARLY DUE TO A NUCLEAR EXPLOSION

Jean-Pierre Climent, St. Germain les Corbeil; Georges Petelet, Escurolles, and Jean-Claude Tronel, Bretigny sur Orge, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

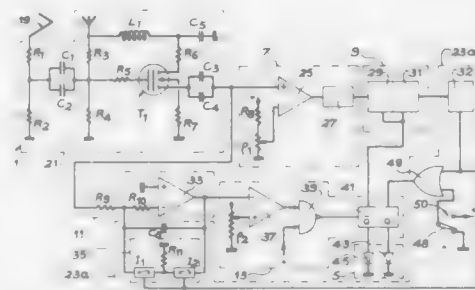
Filed Jun. 26, 1987, Ser. No. 66,760

Claims priority, application France, Jun. 26, 1986, 86 09294

Int. Cl.⁴ G01S 3/02

U.S. Cl. 342-460

12 Claims



1. An apparatus for detecting and for discriminating a first electromagnetic pulse due to a nuclear explosion from a second electromagnetic pulse due to another source, comprising at least one detection unit including:

(a) sensing means fixed on the ground for sensing the electrical component of an electromagnetic pulse emanating from a nuclear explosion regardless of the orientation of said fixed sensing means relative to said nuclear explosion, said fixed sensing means supplying an electric signal representative of the polarization of the sensed electrical component of the electromagnetic pulse and being proportional to the sensed electrical component,

(b) first detection means connected via an impedance matching device to the fixed sensing means for detecting the passage of the electric signal supplied by the fixed sensing means at a value higher than a predetermined threshold value,

(c) a first time counter connected to and started by the first detection means during the detection of the passage of the electric signal at a value higher than the threshold value,

(d) integration means connected to the fixed sensing means for integrating the electric signal supplied by the fixed sensing means, and

(e) first comparison means connected to the integration means and to the first time counter, for comparing the value of the electric signal integrated up to a time t_1 after the starting of the first time counter with a first reference value.

4,876,552

INTERNALLY MOUNTED BROADBAND ANTENNA

Zdravko M. Zakman, Schaumburg, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 27, 1988, Ser. No. 186,545

Int. Cl.⁴ H01Q 1/24; H04B 1/40

U.S. Cl. 343-702

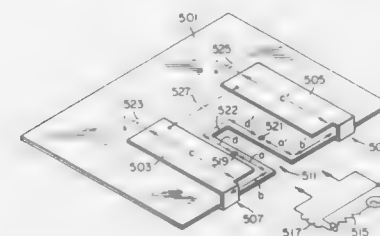
8 Claims

1. A broadband reactive ground feed antenna comprising:
 a conductive surface having a notch extending from a first edge of said conductive surface toward a second edge of said conductive surface thereby dividing said conductive surface into first and second portions about a center line of said notch;

a two-point antenna feed coupled to said first and second portions and disposed on symmetrically opposite sides of said notch thereby creating a reactive ground feed;

a first resonator comprising a microstrip transmission line

coupled to said reactive ground feed, said first resonator microstrip transmission line having first and second ends and coupled at said first end to said first edge of said first portion, and



a second resonator comprising a microstrip transmission line coupled to said reactive ground feed, said second resonator microstrip transmission line having first and second ends and coupled at said first end to said first edge of said second portion.

4,876,553

APPARATUS FOR ADJUSTING THE POLARIZATION PLANE OF AN ANTENNA

Norbert Nathrath, Taufkirchen, and Dietmar Fasold, Zorneding, both of Fed. Rep. of Germany, assignors to Messerschmitt-Bölkow-Blohm GmbH, Munich, Fed. Rep. of Germany

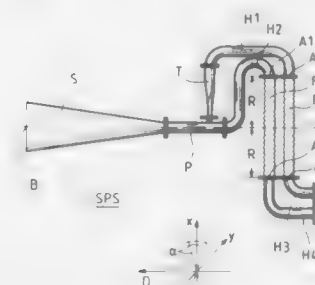
Filed Nov. 30, 1988, Ser. No. 277,878

Claims priority, application Fed. Rep. of Germany, Dec. 1, 1987, 3740651

Int. Cl.⁴ H01Q 13/02, 3/12

U.S. Cl. 343-756

1 Claim



1. Apparatus for rotatably adjusting the polarization plane in an antenna feed system, the feed system having an axis of rotation, comprising:

rotatable feed horn means having a main beam direction coincident with the axis of rotation of the feed system; orthogonal mode transducer means coupled to the feed horn means;

at least two movable feeding waveguide means coupled to the orthogonal mode transducer means, the feeding waveguide means having at least two moving flange means aligned in the same plane in close proximity to one another, and arranged at an equal distance from the axis of rotation of the feed system;

at least two fixed relaying waveguide means arranged at the same distance from the axis of rotation as the movable feeding waveguide means, the fixed relaying waveguide means having fixed flange means aligned in the same plane, the fixed flange means being in close proximity to one another, said two fixed relaying waveguide means being arranged along an axis of symmetry of the feed system which is substantially disposed perpendicular to said axis of rotation; and

flexible waveguide means coupled respectively to the fixed and moving flange means, the flexible waveguide means

being capable of rotation through angles of $\pm\alpha$ on either side of said axis of symmetry.

4,876,554

PILLBOX ANTENNA AND ANTENNA ASSEMBLY

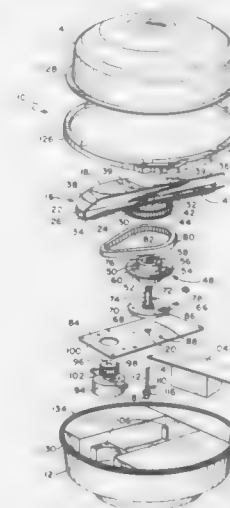
Duane G. Tubbs, La Mesa, Calif., assignor to Qualcomm, Inc., San Diego, Calif.

Filed Jan. 19, 1988, Ser. No. 145,790

Int. Cl.⁴ H01Q 13/00

U.S. Cl. 343-780

17 Claims



1. A directive communications antenna comprising:
 a substantially parabolic upper plate having a leading edge;
 a substantially parabolic lower plate having a leading edge;
 a parabolic reflecting cylinder, having a pair of leading edges, disposed between and axially intersecting said plates so as to form an antenna cavity having a focus line and an antenna focus located on said focus line within said cavity, said upper and lower plate leading edges and said parabolic reflecting cylinder leading edges aligned along a common plane defining a cavity aperture thereat;

an upper lip plate extending along said upper plate leading edge and projecting upwardly therefrom at a first predetermined angle with respect to a plane defined by said lower plate;

a lower lip plate extending along said lower plate leading edge and projecting upwardly therefrom at a second predetermined angle with respect to said plane; and electromagnetic feed means disposed along said focus line within said cavity, comprising;

a waveguide feed probe extending through a hole in said lower plate into said cavity at a point along said focus line;

a reflector extending upwardly within said cavity from said lower plate, said reflector having a concave face facing said reflecting cylinder centered on said focus line between said probe and said lower plate leading edge at said antenna cavity focus.

4,876,555

RESONANCE LABEL AND METHOD FOR ITS FABRICATION

Paul R. J100 rgensen, Almunecar, Spain, assignor to Durgo AG, Switzerland

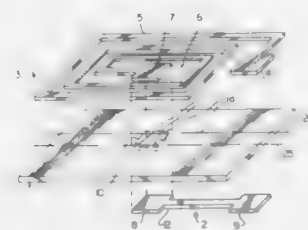
Filed Mar. 15, 1988, Ser. No. 168,468

Claims priority, application Switzerland, Mar. 17, 1987, 1000/87

Int. Cl.⁴ G08B 13/24; H01Q 1/38

U.S. Cl. 343-895

24 Claims



1. A deactivatable resonance label, comprising: a dielectric layer having first and second opposed faces; a first conducting layer on the first face of the dielectric layer, the first conducting layer being shaped to form an inductor and a first capacitor plate; a second conducting layer on the second face of the dielectric layer, the second conducting layer being shaped to form a second capacitor plate, the first and second conducting layers being at least partially superposed, said first and second conducting layers and said dielectric layer forming together an oscillating circuit; and shorting means for enabling creation of a short-circuit between the first and second conducting layers when it is desired to deactivate the oscillating circuit, the shorting means being comprised of at least one throughhole passing through the dielectric layer to provide a short circuit path between the first and second conducting layers.

4,876,556

BEAN RECORDER WITH A TEMPERATURE SENSOR FOR LIGHT QUANTITY CONTROL

Yuji Ohara, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

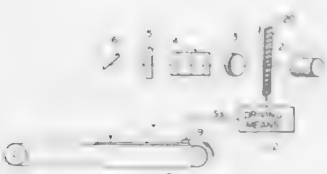
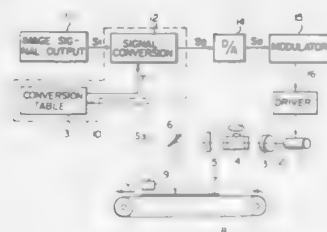
Filed Mar. 30, 1988, Ser. No. 175,430

Claims priority, application Japan, Mar. 30, 1987, 62-77323

Int. Cl.⁴ G01D 15/14; H04N 1/23

U.S. Cl. 346-108

2 Claims



1. A light beam recording apparatus which modulates a light beam on the basis of information in an image signal and deflects the modulated light beam to scan a photosensitive recording

material, thereby recording an image borne by said image information on said recording material,

characterized by having a temperature sensor for detecting the temperature of said photosensitive recording material, and a light quantity control means which controls the quantity of light in the light beam on the basis of the output of the temperature sensor, wherein said light beam recording apparatus includes a graduation correction means in which said image signal is converted to a predetermined signal according to a conversion table, for obtaining an image density based on said image signal irrespective of the energy density-image density characteristics of said recording material, and wherein said light quantity control means includes means for rewriting said conversion table according to temperature in said graduation correction means.

4,876,557

RECORDING MEDIUM OF AIR-SANDWICH STRUCTURE

Masao Yabe, Fujinomiya, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

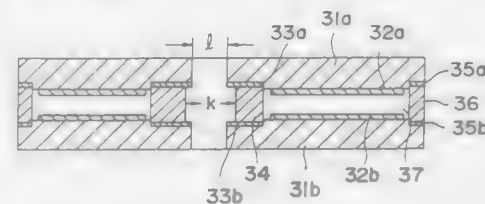
Continuation of Ser. No. 914,200, Oct. 1, 1986, abandoned. This application Mar. 22, 1988, Ser. No. 172,974

Claims priority, application Japan, Oct. 2, 1985, 60-221070

Int. Cl.⁴ G01D 15/24

U.S. Cl. 346-137

10 Claims



1. In a recording medium of air-sandwich structure comprising two disc-shaped substrates opposed to each other, the two substrates having at the center a hole of the same size to each other, with a ring-shaped inner plastic spacer, a ring-shaped outer plastic spacer and a recording layer for writing and/or reading information with a laser beam interposed between the two disc-shaped substrates, wherein the recording layer is provided on the inner surface of at least one substrate,

the improvement including a recessed seat means for fitting and aligning said inner spacer between said two substrates, said recessed seat means comprised of a recessed portion formed around each said hole on each said substrate, wherein said inner spacer has an inside diameter larger than the diameters of the holes of the substrates.

4,876,558

PUMP DEVICE AND AN INK JET RECORDING APPARATUS HAVING THE PUMP DEVICE

Toshiharu Mamiya, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 894,105, Aug. 7, 1986, abandoned. This application Jul. 25, 1988, Ser. No. 224,246

Claims priority, application Japan, Aug. 9, 1985, 60-175464

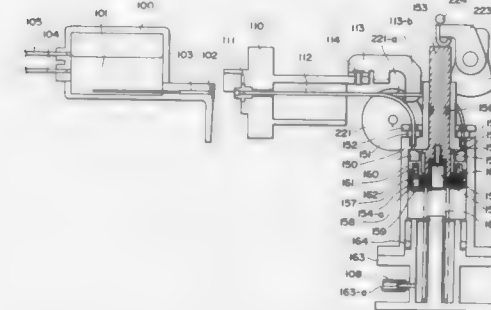
Int. Cl.⁴ G01D 15/16; B41J 3/04; F04B 7/00

U.S. Cl. 346-140 R

22 Claims

1. A pump device for use in an ink jet recording apparatus comprising a cylinder, a piston mounted for reciprocally moving within a predetermined range of movement in said cylinder to generate pressure and a liquid inlet in said cylinder, wherein: said liquid inlet is disposed outside of the predetermined range of movement of said piston and a negative pressure is generated in said cylinder between said piston and said liquid inlet during movement of said piston; said piston includes a sealing member biased into sealing

engagement with said liquid inlet when said piston is in a first portion of its predetermined range of movement; and said liquid inlet is sealed by said sealing member against negative pressure in said cylinder when said piston is in



the first portion of its predetermined range of movement and said liquid inlet is open to negative pressure in said cylinder when said piston is in a second portion of its predetermined range of movement.

4,876,559

RECORDING APPARATUS HAVING A PRINT PERMISSION CIRCUIT FOR PROTECTING PLURAL RECORDING HEADS DRIVEN IN ACCORDANCE WITH SELECTIVELY APPLIED PRINT SIGNALS FROM OVERLOAD

Hiroshi Nishikawa, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

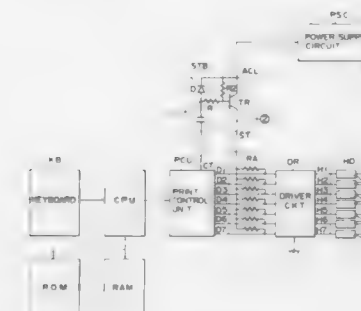
Filed Mar. 7, 1988, Ser. No. 165,095

Claims priority, application Japan, Mar. 13, 1987, 62-058312

Int. Cl.⁴ G01D 15/16; B41J 3/04

U.S. Cl. 346-140 R

6 Claims



1. A recording apparatus comprising a keyboard for inputting data, data processing means connected to said keyboard for processing the data input from the keyboard and an output unit connected to said data processing means for outputting the data processed by said data processing means, wherein said output unit includes:

a plurality of recording heads for dot recording on a recording medium the data processed by said data processing means when said recording heads are actuated; a like plurality of resistors, each having an end connected with a corresponding one of said recording heads; signal generating means connected to said data processing means and to said one end of said resistors for generating output signals to be selectively supplied to each of said recording heads and for generating a control signal to control actuation of said recording heads; and output permission means connected to said signal generating means and having a differentiating circuit for differentiating the control signal to provide an output permission signal to the other end of each said resistor to permit said

plurality of recording heads to be actuated in accordance with the output signals.

4,876,560

RECORDING APPARATUS

Jiro Egawa, Naruhito Yoshida, Toshihiro Kasei, Moriya Nagasawa, all of Kanagawa; Naoki Ide, and Hiromasa Machida, both of Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

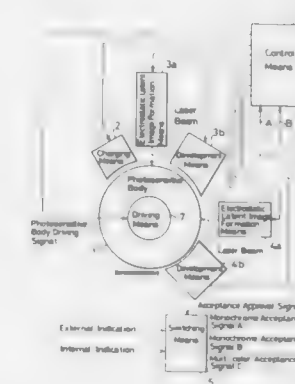
Division of Ser. No. 9,349, Jan. 30, 1987. This application Aug. 15, 1988, Ser. No. 232,222

Claims priority, application Japan, Jan. 31, 1986, 61-18235

Int. Cl.⁴ G03G 15/00

U.S. Cl. 346-153.1

3 Claims



1. An image forming apparatus for forming an image on a recording member, comprising: means for detecting a size of the recording member; means for forming an image in accordance with a plurality of dot signals; means for providing a clock signal for sending the dot signals synchronous with the clock signal, whose pulse number changes according to the size of the recording member detected by said detecting means; means for receiving the clock signal provided by said clock signal providing means; and means for sending image signals corresponding to said dot signals to said image forming means, synchronous with said clock signal received by said clock signal receiving means.

4,876,561

PRINTING APPARATUS AND TONER/DEVELOPER DELIVERY SYSTEM THEREFOR

Fred W. Schmidlin, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 31, 1988, Ser. No. 200,277

Int. Cl.⁴ G01D 15/00

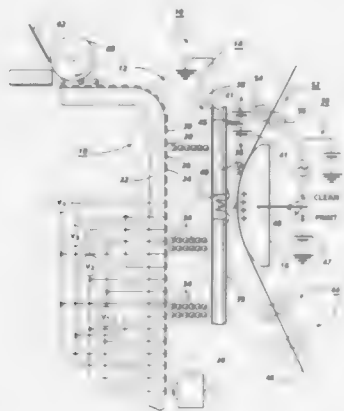
U.S. Cl. 346-159

14 Claims

1. Direct electrostatic printing apparatus, said apparatus comprising:

a supply of well charged toner particles; an apertured printhead structure; an image receiving member disposed adjacent one side of said apertured printhead; a charged toner conveyor including a plurality of spaced-apart electrodes, said charged toner conveyor being disposed adjacent said supply of well charged toner and the opposite side of said apertured printhead for moving toner particles from said supply to an area adjacent said printhead; a source of electrical power operatively connected to said spaced-apart electrodes for creating wave energy for effecting the movement of toner particles;

said printhead being electrically biased to establish an electrostatic field thereacross; and



said apertured printhead having a thickness in the direction of toner particle movement that is relatively small to thereby maximize the field strength of said electrostatic field whereby aperture clogging is minimized.

4,876,562

IMAGE RECORDING APPARATUS

Yasuhito Suzuki, Kawasaki; Koichiro Akimoto, Yokohama; Hajime Ohshima, Tokyo; Kazuyuki Honda, and Yukio Isaka, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

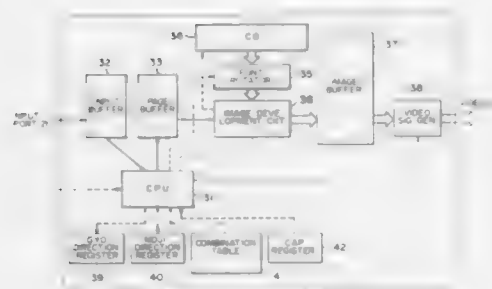
Continuation of Ser. No. 779,107, Sep. 23, 1985, abandoned. This application Feb. 21, 1989, Ser. No. 313,361

Claims priority, application Japan, Sep. 25, 1984, 59-198623; Sep. 25, 1984, 59-198624; Sep. 25, 1984, 59-198626

Int. Cl.⁴ G01D 15/14; G03G 21/00

U.S. Cl. 346-160

39 Claims



1. An image recording apparatus comprising: print data input means for inputting print data;

image forming means for forming an image on a record medium in accordance with the inputted print data; and control means for determining a processing code of the inputted print data on the basis of inputted page direction information representing a page direction of an image to be formed and inputted print direction information representing a print direction of the image to be formed.

4,876,563

MOTOR-DRIVEN SHUTTER FOR CAMERA

Hiroaki Ishida; Nobuo Shinozaki, and Michitake Nakazawa, all of Tokyo, Japan, assignors to Seikosha Co., Ltd., Japan

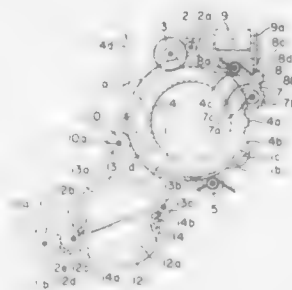
Filed Mar. 23, 1988, Ser. No. 172,078

Claims priority, application Japan, Mar. 23, 1987, 62-68354

Int. Cl.⁴ G03B 3/10, 9/24, 17/00

U.S. Cl. 354-234.1

17 Claims



1. A motor-driven shutter for a camera which comprises at least one barrier for covering the front surface of a lens before and after said shutter is operated and a motor for operating said shutter for the purpose of focussing, said barrier being driven by linking means which is responsive to operation of said motor.

4,876,564

DRIVE DEVICE FOR PHOTOGRAPHIC LENS

Takashi Amikura, Tokyo; Akihiro Fujiwara, Kanagawa; Masamichi Toyama, Tokyo; Kouichi Ueda, Kanagawa, and Susumu Kozaki, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

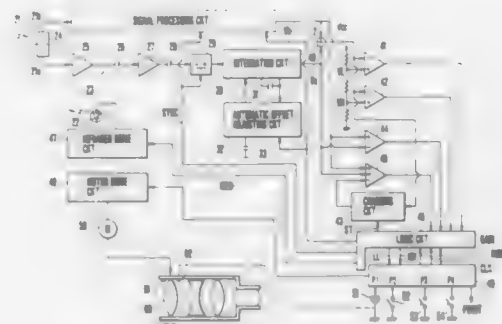
Continuation of Ser. No. 195,393, May 13, 1988, abandoned, which is a continuation of Ser. No. 5,782, Jan. 21, 1987, abandoned. This application Dec. 22, 1988, Ser. No. 289,458

Claims priority, application Japan, Jan. 23, 1986, 61-12835; Jan. 23, 1986, 61-12836; Jan. 23, 1986, 61-12837

Int. Cl.⁴ G03B 3/00

U.S. Cl. 354-400

11 Claims



1. A photographic apparatus operating with selection of a first interchangeable lens having a lens member movable in a prescribed range and equipped with position detector means responsive to attainment of said lens member on one of the

terminal ends of said range for producing a position signal and a second interchangeable lens equipped with no position detector means for producing the position signal, comprising:

- (a) drive means for driving said movable lens means;
- (b) command means for producing an actuating signal for said drive means;
- (c) control means, when said first interchangeable lens is in use, responsive to said position signal for stopping the output of said command means, and when said second interchangeable lens is in use, responsive to production of said actuating signal for counting a prescribed time upon attainment to stop said actuating signal.

4,876,565

APPARATUS AND METHOD OF UNDERWATER OPTICAL RECORDING

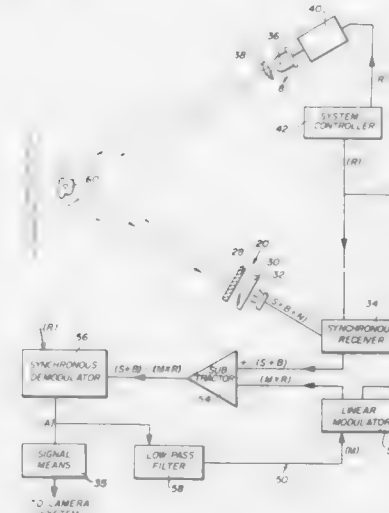
Robert F. Tusting, Ft. Pierce, Fla., assignor to Harbor Branch Oceanographic Institution, Inc., Ft. Pierce, Fla.

Filed Oct. 24, 1988, Ser. No. 261,334

Int. Cl.⁴ G03B 3/00

U.S. Cl. 354-403

11 Claims



1. In apparatus for underwater optical recording including a camera to record scenes in a predetermined sector forward thereof, first optical means spaced apart radially from said camera to project a divergent light beam so that it intersects said predetermined sector, receiver means to detect and measure the intensity of light provided with second optical means spaced apart radially from said camera to view a conical volume that intersects said light beam and the intersecting peripheries of said light beam and said conical volume substantially define said predetermined sector, and signal means that is activated by said receiver means when it measures an intensity of light in said predetermined sector above a predetermined minimum value, the improvement of a nulling loop in series between said receiver means and said signal means, said nulling loop comprising a synchronous linear modulator, an algebraic subtracter, a synchronous demodulator and a low-pass filter.

4,876,566

CAMERA HAVING AUTO-TRIM EXPOSURE CONTROL

Peter P. Carcia, and Judith N. Colman, both of Reading, Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Oct. 17, 1988, Ser. No. 258,879

Int. Cl.⁴ G03B 7/08

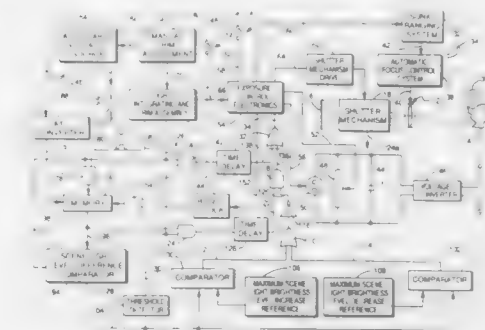
U.S. Cl. 354-436

11 Claims

1. An exposure control system for a self-processing camera having means for defining a film plane and an optical system for directing light along an optical path from a scene onto

photosensitive material located in the film plane, said exposure control system comprising:

- a blade mechanism mounted for movement between a blocking arrangement in which said blade mechanism is in light blocking relation with respect to the optical path so as to preclude scene light from being transmitted along the optical path to the film plane and an unblocking arrangement in which said blade mechanism is in light unblocking relation with respect to said optical path so as to allow the passage of scene light to the film plane;
- drive means for displacing said blade mechanism between its said blocking and unblocking arrangements to define an exposure interval;
- first means for generating a first electrical signal representative of the magnitude of the brightness level of a scene to be photographed;
- means for storing said first signal for a predetermined period of time;



second means for generating a second electrical signal representative of the difference in magnitude between said stored first signal and a scene light brightness signal generated by said first generating means subsequent to the generation of said first light signal and within said predetermined period of time;

trim control means for manually increasing or decreasing the magnitude of a scene light brightness level signal and said stored first signal over a limited range of corresponding scene light brightness levels;

third means for generating a third signal indicating that the difference in magnitude between said stored first signal and said subsequently generated scene light brightness level signal exceeds some predetermined magnitude; and control means for actuating said drive means to effect the displacement of said blade mechanism to produce an exposure interval of a first value in the absence of generating of said third signal, and for producing an exposure interval of a second value upon the receipt of said third signal.

4,876,567

CRT PRINTING METHOD AND APPARATUS FOR MAKING A PRINT OF AN IMAGE WITH LETTERS

Kiyoshi Yamaguchi; Azuchi Endo, and Kichiro Sakamoto, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 25, 1987, Ser. No. 29,921

Claims priority, application Japan, Mar. 25, 1986, 61-64895; Mar. 25, 1986, 61-64896; Apr. 1, 1986, 61-72424; Apr. 1, 1986, 61-72425; Apr. 1, 1986, 61-72426; Apr. 1, 1986, 61-72427

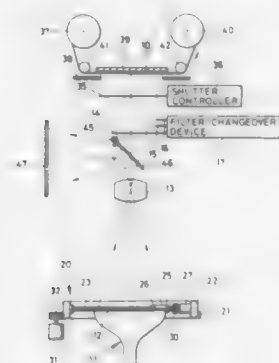
Int. Cl.⁴ E03B 27/52

U.S. Cl. 355-20

21 Claims

1. An apparatus for printing compositely an image and letters on a photographic paper, which comprises: display means having a CRT display device for displaying said image on the screen thereof;

letter bearing means provided with at least a complimentary phrase thereon which is removably disposed at least close to said screen;
adjusting means for linearly and rotationally adjusting said letter bearing means such that said complimentary phrase



can be positioned at substantially any desired location with respect to said screen; and
means for exposing said photographic paper to said CRT image on said screen and said complimentary phrase on said letter bearing means.

4,876,568

FOCUSING METHOD FOR PRINTER

Yoshio Ozawa, Takashi Yamamoto, Takao Shigaki, and Rokusaburo Kaneko, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 24, 1988, Ser. No. 210,950

Claims priority, application Japan, Jul. 10, 1987, 62-172381

Int. Cl.⁴ G03B 27/34

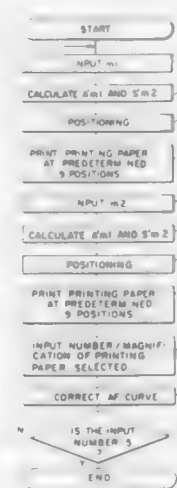
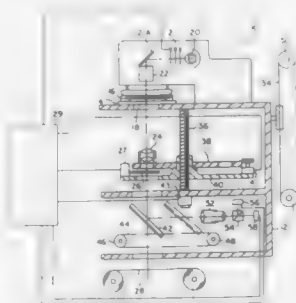
U.S. Cl. 355-56

15 Claims

1. A focusing method for a printer in which a lens is disposed between a photographic film and a printing paper, in which the conjugate distance between said photographic film and said printing paper as well as the lens position are changeable, and in which focusing is provided for printing by changing said conjugate distance and said lens position in accordance with a magnification value, comprising the steps of:

- calculating said lens position and said conjugate distance at a previously selected magnification value on the basis of an equation which expresses a lens position and a conjugate distance which ensures focusing in accordance with a magnification value;
- changing the lens position within a predetermined range including the calculated lens position which serves as an original position, and conducting printing at each of these lens positions;
- selecting a lens position which provides an optimal focusing;
- correcting said equation using the selected lens position and the actual magnification employed when the selection is made; and
- calculating a lens position and a conjugate distance at

an other magnification value using the equation corrected when the selected lens position coincides with said original position.



nal position, and then changing the lens position and the conjugate distance accordingly.

4,876,569

IMAGE EXPOSURE APPARATUS

Yukitsugu Nishitoku, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

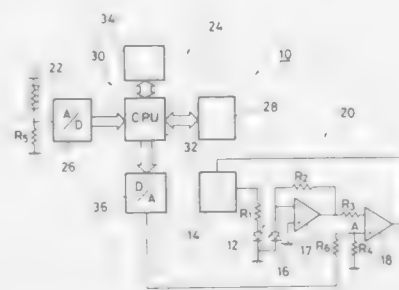
Filed Sep. 9, 1988, Ser. No. 242,459

Claims priority, application Japan, Sep. 9, 1987, 62-225580

Int. Cl.⁴ G03B 27/72

U.S. Cl. 355-68

10 Claims



1. An image exposure apparatus which comprises: a light source for exposing a light-sensitive material with light having a predetermined wavelength; a drive source for driving said light source; a photodetector for detecting the optical output of said light source; a comparator for comparing the detected optical output level with a reference level; a temperature detector for detecting the change in the temperature of said light

source; and control means which controls the optical output level of the light source on the basis of both the temperature change signal detected with said temperature detector and the output signal from said comparator in such a way that the exposure sensitivity of said light-sensitive material will not deteriorate in the face of the variation in the wavelength of light from said light source that occurs on account of the change in its temperature.

4,876,570

IMAGE RECORDING APPARATUS

Toshio Iwaya, Shiki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

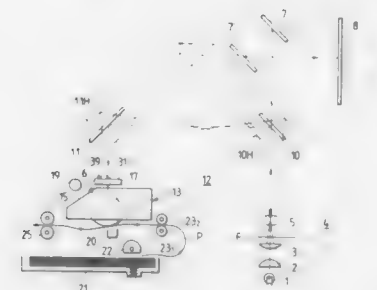
Filed Sep. 14, 1988, Ser. No. 244,157

Claims priority, application Japan, Sep. 21, 1987, 62-236741; Dec. 11, 1987, 62-311841

Int. Cl.⁴ G03G 15/00

U.S. Cl. 355-204

22 Claims



1. An image recording apparatus for recording an image on a recording medium, comprising:
detection means for detecting an information recorded area on the recording medium;
setting means for setting a to-be-recorded area for the recording medium;
determination means for determining if the information recorded area detected by said detection means and the image area set by said setting means overlap; and
signal generating means for generating a signal when said determination means determines the overlap.

4,876,571

COPYING MACHINE HAVING A BAR CODE READER
Yoko Nakamura, Kawasaki; Fumiyo Kojima, Mitaka, and Hirobumi Yoshino, Tokyo, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

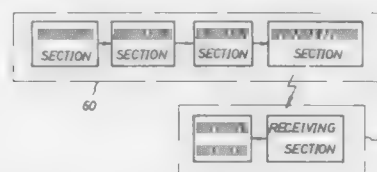
Filed Apr. 11, 1988, Ser. No. 180,068

Claims priority, application Japan, Apr. 11, 1987, 62-87906; Apr. 11, 1987, 62-87907; Apr. 11, 1987, 62-87910; Apr. 13, 1987, 62-88777; Apr. 13, 1987, 62-88778; Apr. 13, 1987, 62-88779

Int. Cl.⁴ G03G 15/00

U.S. Cl. 355-210

6 Claims



4. A copying machine comprising:
a sheet fixedly attached to a surface of a main body of the copying machine, in which bar codes corresponding to various copying modes are printed;
a portable type bar code reader being separable from the main body for reading the bar codes from the sheet;

a decoding section disposed in the main body for decoding signals transmitted from said bar code reader; and
a control section disposed in the main body for setting a copying mode based on data derived from said decoding section.

4,876,572

IMAGE RECORDING HAVING A REMOVABLE IMAGE FORMING CASE

Shinji Nagatsuna, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

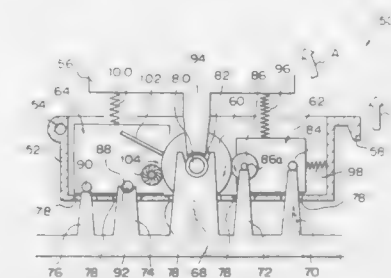
Filed Sep. 15, 1988, Ser. No. 244,354

Claims priority, application Japan, Sep. 16, 1987, 62-141370[U]

Int. Cl.⁴ G03G 15/00H

U.S. Cl. 355-210

4 Claims



1. In an image recorder having a body which is divided into an upper and a lower unit being openable relative to each other, and an image forming case which is disposed between said upper and lower units and accommodates a photoconductive element, a developing device and a cleaning device detachably therein, the improvement wherein said lower unit comprises positioning means for positioning said photoconductive element, said developing device and said cleaning device individually, and said upper unit comprises pressing means for pressing said photoconductive element, said developing device and said cleaning unit against said lower unit so that said photoconductive element, said developing device and said cleaning device are positioned by said positioning means.

4,876,573

DEVELOPING METHOD USING NON-MAGNETIC ONE-COMPONENT TONER AND DEVELOPING UNIT THEREFOR

Taisuke Kamimura, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

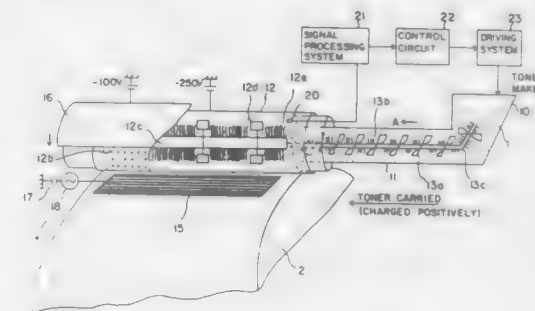
Continuation of Ser. No. 74,874, Jul. 17, 1987, abandoned. This application Feb. 15, 1989, Ser. No. 311,407

Claims priority, application Japan, Jul. 18, 1986, 61-170267

Int. Cl.⁴ G03G 15/08, 15/06; B05B 5/02; B05C 5/02

U.S. Cl. 355-250

10 Claims



1. A developing unit for developing an electrostatic latent image formed on a photoreceptor drum surface with non-mag-

netic, one-component toner composition comprising in combination:

- a conveyor unit for transporting non-magnetic, single component toner particles therein, said conveyor unit including a fur brush means for electrically charging said toner particles by friction;
- a photoreceptor drum for forming an electrostatic latent image on the surface thereof having an electrically attracting force;
- a hollow cylinder connected with said conveyor unit juxtaposed to and facing said photoreceptor drum into which said single component toner particles are conveyed, said hollow cylinder including a fur brush means therein for further charging said single component toner particles by friction and for mechanically stirring said toner particles to create a cloud-like state of said toner particles, said hollow cylinder comprising a surface portion having toner passages formed in at least that portion of said surface facing said photoreceptor drum surface;
- means for applying a bias voltage to said hollow cylinder to assist said fur brush means in stirring said toner particles and creating said cloud-like state of said toner particles;
- a screen grid mounted in a zone between said hollow cylinder and said photoreceptor drum through which said charged toner particles must pass in the development of said electrostatic latent image; and
- means for applying an AC bias voltage to said screen grid to cause said toner particles to fly about after emerging from said hollow cylinder to be selectively deposited on said electrostatic latent image.

4,876,574

DEVELOPING APPARATUS

Hatsuo Tajima, Matsudo; Takahiro Kubo, Tokyo, and Hiroshi Tajika, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

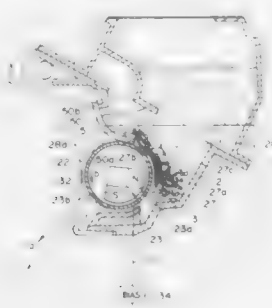
Filed Nov. 3, 1988, Ser. No. 266,810

Claims priority, application Japan, Nov. 4, 1987, 62-277346; Nov. 4, 1987, 62-277347; Nov. 4, 1987, 62-277348

Int. Cl.⁴ G03G 15/08

U.S. Cl. 355—253

27 Claims



1. A developing apparatus, comprising:
 - a rotatable member;
 - magnetic field generating means disposed in said rotatable member;
 - means for applying toner and magnetic particles on said rotatable member; and
 - toner layer forming means including an elastic member having a free end portion, adjacent to which it is contacted to said rotatable member and a magnetic member disposed at least adjacent the free end portion of said elastic member and disposed in a magnetic field provided by said magnetic field generating means.

4,876,575

PRINTING APPARATUS INCLUDING APPARATUS AND METHOD FOR CHARGING AND METERING TONER PARTICLES

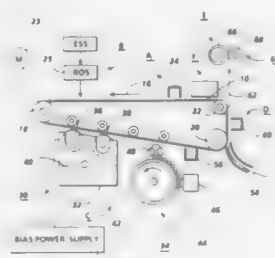
Dan A. Hays, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 31, 1988, Ser. No. 200,328

Int. Cl.⁴ G03G 15/08

U.S. Cl. 355—259

29 Claims



1. Apparatus for developing latent electrostatic images on a charge retentive surface with toner, said apparatus comprising:
 - a supply of toner;
 - a donor structure supported for movement in an endless path for conveying toner from said supply of toner to an area opposite said charge retentive surface;
 - means including a flexible rod, supported in contact with toner on said donor structure and disposed between it and said donor structure, for effecting metering and charging of said toner without being adversely affected by runout of said donor structure.

4,876,576

DEVICE FOR CHANGING SHEET SHAPE BEFORE ENTRY INTO FUSEM NIP

Keiji Itaya, Yokohama, and Hiromasa Kohayakawa, Tokyo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 21, 1988, Ser. No. 184,414

Claims priority, application Japan, Apr. 25, 1987, 62-102792; Apr. 30, 1987, 62-106853

Int. Cl.⁴ G03G 15/00

U.S. Cl. 355—285

7 Claims

1. A fixing device for an image forming apparatus, comprising:
 - first and second rollers forming a nip portion therebetween,

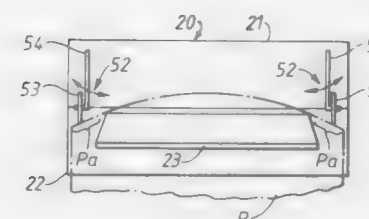
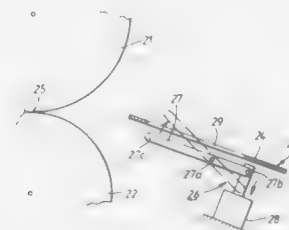
the rollers transporting an image forming medium and fixing an image thereon;

means for conveying the image forming medium having a flat shape and a leading edge approaching the nip portion; and

means for changing the shape of the leading edge of the image forming medium from the flat shape to a convex shape by thrusting against the leading edge in the vicinity of the center of the width of the image forming medium while the image forming medium approaches the nip portion.

5. A fixing device for an image forming apparatus, comprising:

- first and second rollers for forming a nip portion therebetween,



tween, which rollers transport an image forming medium and fix an image thereon, the image forming medium having a flat shape and having a leading edge approaching the nip portion;

means for conveying the image forming means, the conveying means including a guide plate having a predetermined width smaller than the width of the image forming medium to form portions of the image forming medium not in contact with the guide plate, the guide plate leading the image forming medium to the nip portion; and

means for pushing downwardly the non-contact portions of the image forming medium below the guide plate to change the shape of the leading edge of the image forming medium from the flat shape to a convex shape while the image forming medium approaches the nip portion.

4,876,577

MULTI-COMPONENT PHOTORECEPTOR CARTRIDGE UNIT

Mitsuru Ogura, Nara, and Kimihide Tsukamoto, Yamatokoriyama, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 945,516, Dec. 23, 1986, abandoned.

This application Sep. 26, 1988, Ser. No. 251,055

Claims priority, application Japan, Dec. 27, 1985, 60-297306

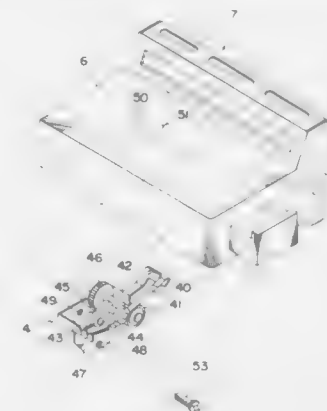
Int. Cl.⁴ G03G 21/00, 15/06

U.S. Cl. 355—315

3 Claims

1. A photoreceptor cartridge unit for use in an image forming apparatus for accommodating a photoreceptor drum and its peripheral components in said image forming apparatus, which comprises a housing, a photoreceptor drum rotatably provided in said housing, a cleaner unit including a used toner containing and a multi-component separating unit, which includes a separating unit frame and a separating tape for separating copy paper from the photoreceptor drum following image

transfer, mounted on said housing of said cartridge unit, sequentially disposed around said photoreceptor drum, said housing, photoreceptor drum, cleaner unit and separating unit being formed into one single unit to constitute said cartridge unit which is detachable with respect to said image forming



apparatus, said separating tape being stretched so as to freely expand and contract between said separating unit frame via a spring and said housing of said photoreceptor cartridge unit, such that proper tension on said separating tape is applied upon the fixing of said multi-component separating unit to said housing.

4,876,578

PAPER SEPARATION CHARGER FOR USE IN ELECTROPHOTOGRAPHIC COPIER AND THE LIKE

Kazuyoshi Hara, and Masataka Oda, both of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

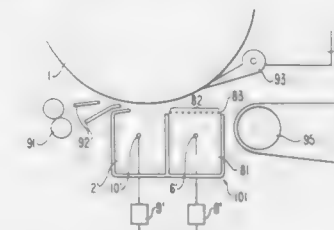
Filed May 18, 1988, Ser. No. 195,676

Claims priority, application Japan, May 18, 1987, 62-120781

Int. Cl.⁴ G03G 15/14

U.S. Cl. 355—315

9 Claims



1. A paper separation charger for use in electro-photographic copiers for separating papers from a photosensitive member, comprising:
 - a corona wire for discharging electric charges toward said photosensitive member;
 - a housing enclosing said corona wire, said housing having an aperture portion at a side of said housing facing said photosensitive member; and
 - a grid member disposed at said aperture portion of said housing for regulating the amount of said electric charges travelling toward said photosensitive member, said grid member having a higher aperture efficiency at the upstream side of said grid member with respect to the paper transport direction of said photosensitive member than at the downstream side of said grid member.

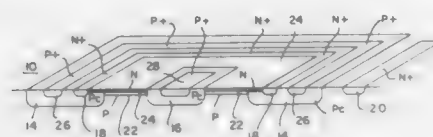
4,876,579

LOW TOP GATE RESISTANCE JFET STRUCTURE
Christopher K. Davis, Merritt Island, and James D. Benson, Melbourne Village, both of Fla., assignors to Harris Corporation, Melbourne, Fla.

Filed Jan. 26, 1989, Ser. No. 301,835
Int. Cl.⁴ H01L 29/80

U.S. Cl. 357—22

13 Claims



1. A junction field effect transistor comprising:
 - a bottom gate region of a first conductivity type;
 - a source and a drain region of a second conductivity type spaced in said bottom gate;
 - a channel region of said second conductivity type in said bottom gate region and extending between said source and drain regions;
 - a top gate region of said first conductivity type on said channel region for extending between said source and drain regions and into at least one of said source and drain regions, wherein it terminates at a first edge; and
 - a top gate contact region of said first conductivity type, having a lower resistance than said top gate region, and contacting said top gate region at said first edge in said one of said source and drain regions.

4,876,580

TUNNEL INJECTION CONTROLLING TYPE SEMICONDUCTOR DEVICE CONTROLLED BY STATIC INDUCTION EFFECT

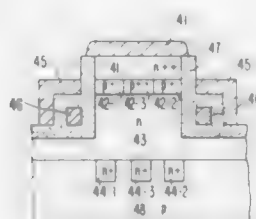
Jun-ichi Nishizawa, Sendai, Japan, assignor to Zaiden Hojin Handotai Keikyo Shinkokai, Sendai, Japan
Division of Ser. No. 314,496, Oct. 23, 1981, abandoned. This application Apr. 27, 1987, Ser. No. 42,811

Claims priority, application Japan, Oct. 28, 1980, 55-151849
The portion of the term of this patent subsequent to Jan. 17, 2006, has been disclaimed.

Int. Cl.⁴ H01L 11/00

U.S. Cl. 357—22

10 Claims



1. A tunnel injection controlling type semiconductor device, comprising:
 - a source semiconductor region having a first conductivity type for supplying carriers;
 - a drain semiconductor region for receiving said carriers;
 - a gate semiconductor region for controlling a flow of said carriers;
 - said source semiconductor region having a high impurity concentration region;
 - said source semiconductor region containing a highly-doped semiconductor region having a second conductivity type opposite to said first conductivity type;
 - said gate region being provided on said device at a close but separate site relative to said highly-doped semiconductor

region having a second conductivity type to serve as a controlling electrode;
the source and drain regions defining a main current passageway having an $n^+ - p^+ - n - n^+$ structure; and
an insulation layer substantially surrounding the n^+ , p^+ and n type regions.

4,876,581

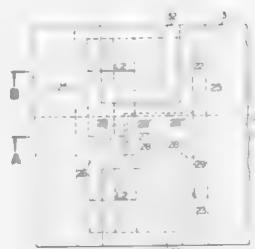
FIELD EFFECT TRANSISTOR WITH SHORT CHANNEL LENGTH AND PROCESS OF FABRICATION THEREOF
Toshiyuki Ishijima, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jun. 17, 1988, Ser. No. 207,837

Claims priority, application Japan, Jun. 17, 1987, 62-151837
Int. Cl.⁴ H01L 29/78

U.S. Cl. 357—23.3

9 Claims



1. A field effect transistor fabricated on a semiconductor substrate of a first conductivity type, comprising:

- (a) an insulating layer formed on said semiconductor substrate and upwardly extending from a major surface of the semiconductor substrate;
- (b) a semiconductor layer of said first conductivity type formed in said insulating layer and having relatively long protrusions and a relatively short protrusion located between the relatively long protrusions, a bottom surface of said semiconductor layer being in contact with said semiconductor substrate, said relatively long protrusions and said relatively short protrusion laterally projecting from an upper portion of said semiconductor layer;
- (c) a gate insulating film covering a leading end surface of said relatively short protrusion and respective inner side surfaces of said relatively long protrusions;
- (d) a gate electrode formed in said insulating layer and contacting to said gate insulating film;
- (e) source and drain regions of a second conductivity type formed in said insulating layer and contacting to respective leading ends of said relatively long protrusions for forming P-N junctions, respectively, bottom surface of said source and drain regions being in contact with an upper surface of said insulating layer;
- (f) an upper insulating film covering said relatively long protrusions, said relatively short protrusion and said source and drain regions and formed with source and drain contact windows partially exposing upper surfaces of said source and drain regions, respectively, said p-n junctions being located under said upper insulating film;
- (g) source and drain electrodes formed on said upper insulating layer and respectively projecting through said source and drain contact windows so as to be in contact with the upper surfaces of said source and drain regions, respectively, wherein said source and drain regions are separated from each other by a part of said insulating layer and said gate electrode accommodated in the part of the insulating layer.

4,876,582

CRYSTALLIZED SILICON-ON-INSULATOR NONVOLATILE MEMORY DEVICE

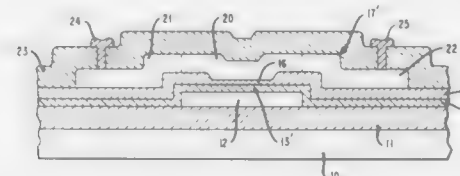
John L. Janning, Dayton, Ohio, assignor to NCR Corporation, Dayton, Ohio

Filed May 2, 1983, Ser. No. 490,743

Int. Cl.⁴ H01L 29/78, 29/34

U.S. Cl. 357—23.5

7 Claims



1. A semiconductor memory device comprising:
 - a substrate;
 - a conductive gate overlying a portion of said substrate;
 - a gate insulating film overlying said gate, said insulating film being relatively thin in a central portion of the region overlying said gate and relatively thick in the remaining portion of the region overlying the gate;
 - a conductive, silicon layer formed over said gate insulating film; and
 - wherein said gate insulating film is a dual layer of silicon nitride-silicon dioxide, said silicon nitride being of uniform thickness and said silicon dioxide being relatively thin in said central portion for permitting charged transfer therethrough and relatively thick in said remaining portion for preventing a charge transfer therethrough.

4,876,583

RADIATION-INDUCED SUBSTRATE PHOTO-CURRENT COMPENSATION APPARATUS

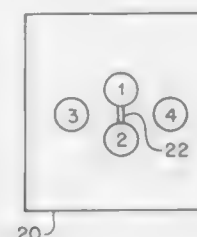
Arlen J. Hughes, Tustin, and Virgil H. Strahan, Orange, both of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 21, 1988, Ser. No. 171,494

Int. Cl.⁴ H01L 29/78

U.S. Cl. 357—23.7

5 Claims



1. A radiation-induced substrate photo-current compensation apparatus for a silicon FET on a sapphire substrate comprising in combination:

- first and second electrodes formed on the top surface of said silicon FET, said first and second electrodes aligned with each other to establish a conductive channel therebetween in said Silicon FET;
- third and fourth electrodes formed on the top surface of said sapphire substrate, said third electrode being operatively aligned with said first electrode, said fourth electrode being operatively aligned with said second electrode, during a radiation event when a photo-current flows through said sapphire substrate from said first electrode to said second electrode, said third electrode provides current to said first electrode and said fourth electrode receives current from said second electrode thereby com-

pensating for the radiation induced photo-current between said first and second electrodes.

4,876,584

ELECTROSTATIC DISCHARGE PROTECTION CIRCUIT
Clive R. Taylor, Stevenage, England, assignor to British Aerospace plc, London, England

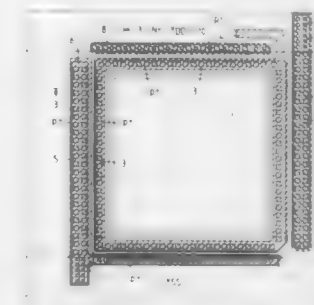
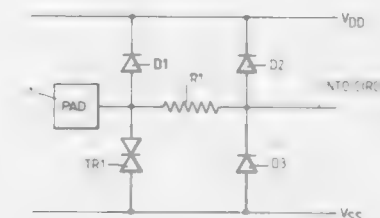
Filed Sep. 8, 1987, Ser. No. 93,701

Claims priority, application United Kingdom, Sep. 10, 1986, 8621639

Int. Cl.⁴ H01L 79/78

U.S. Cl. 357—23.13

4 Claims



1. An integrated circuit device including a substrate of one conductivity type, two power supply buses, a terminal pad on said substrate, said pad having at least two sides, said substrate comprising a first diffusion region of said one conductivity type underlying the pad, and an electrostatic discharge protection circuit associated with said terminal pad, the protection circuit comprising:

- a diode directly connected between said pad and one of said power supply buses, said diode comprised of said first diffusion region and a second diffusion region of said one conductivity type, adjacent one side of the pad and connected to said power supply bus, said first and second diffusion regions forming said diode;
- a punchthrough transistor directly connected between said pad and said other power supply bus, said punchthrough transistor comprised of a third diffusion region of said other conductivity type, spaced from said first region and adjacent an other side of said pad, said third region being connected to said other power supply bus so that the substrate, said first and third diffusion regions form said punchthrough transistor; and
- a resistive path connecting said pad to the remainder of said integrated circuit, said resistive path comprised of said other conductivity type, whereby static charges applied to the pad are selectively transmitted to said one and said other power supply buses by means of said diode and said punchthrough transistor, respectively, so that the remainder of the integrated circuit is protected from said static charges, in which the protection circuit also includes a pair of diodes connected in series in a reverse bias configuration between the one and the other power supply buses

with the node between the diodes being connected to the end of the resistive path remote from the pad.

4,876,581

CONTACT TYPE IMAGE SENSOR WITH SEPARATE CHARGE TRANSFER DEVICE

Takashi Ozawa, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

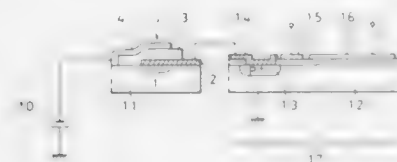
Continuation of Ser. No. 504,394, Jun. 15, 1983. This application Aug. 3, 1987, Ser. No. 81,531

Claims priority, application Japan, Jun. 18, 1982, 57-104800 The portion of the term of this patent subsequent to Oct. 22, 2002, has been disclaimed.

Int. Cl.⁴ H01L 29/78, 27/14, 31/00; H01J 40/14

U.S. Cl. 357-24

8 Claims



1. A contact type image sensor comprising:
 - a first substrate;
 - a plurality of first electrodes arranged in line and being disposed on said first substrate;
 - an amorphous silicon layer disposed on said first electrodes;
 - a second electrode disposed on said amorphous silicon layer, said second electrode working as common electrode, said second electrode and said amorphous silicon forming a Schottky contact therebetween;
 - first biasing means for applying a negative bias voltage to said second electrode;
 - a second substrate provided separately and spaced apart from said first substrate, said second substrate being made of P type semiconductor;
 - a charge transfer device formed on said second substrate, said charge transfer device including a plurality of input diodes each for storing electric charge whose amount respectively corresponding to output of associated one of said first electrodes and adapted to transfer said electric charge stored in said output diodes;
 - means for connecting each of said input diodes to said associated one of the first electrodes;
 - second biasing means for biasing said second substrate at a voltage equal to or lower than said negative bias voltage applied by said first biasing means.

4,876,586

GROOVED SCHOTTKY BARRIER PHOTODIODE FOR INFRARED SENSING

Rudolph H. Dyck, Palo Alto, and Jae S. Kim, Cupertino, both of Calif., assignors to Sangamo-Weston, Incorporated, Norcross, Ga.

Filed Dec. 21, 1987, Ser. No. 135,816

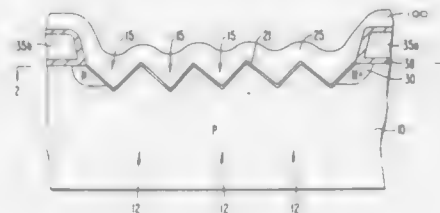
Int. Cl.⁴ H01L 27/14

U.S. Cl. 357-30

15 Claims

1. A plurality of electromagnetic radiation sensitive semiconductor structures on a substrate having a first surface region, each of said structures comprising:
 - a plurality of corrugations extending into the substrate from the first surface region, said corrugations having corrugation surfaces with a crystal orientation of $\langle 111 \rangle$; and
 - an electrically conductive radiation sensitive coating dis-

posed over the plurality of corrugations, said radiation sensitive layer exciting carriers upon exposure to radiation



such that at least a portion of said carriers are injected into said substrate.

4,876,587

ONE-PIECE INTERCONNECTION PACKAGE AND PROCESS

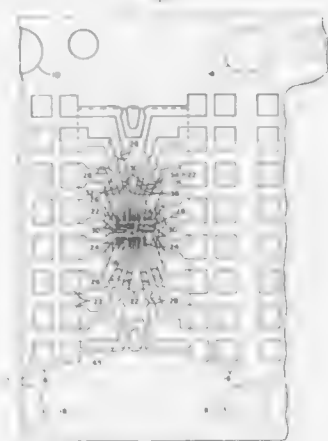
Robert Hilton, Border Town, Australia; Ali Emamjomeh, Sunnyvale, and Jagdish Belani, Cupertino, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed May 5, 1987, Ser. No. 46,988

Int. Cl.⁴ H01L 23/48, 23/28, 23/02

U.S. Cl. 357-70

8 Claims



1. A one-piece interconnection structure for an integrated circuit, which comprises a plurality of conductive metal leads having body portions with outwardly directed first ends and second ends directed inward to surround a centrally disposed area, a plurality of contact fingers attached to the second ends of said body portions, said contact fingers having tips extending unsupported into the centrally disposed area, said contact finger tips being arranged and positioned for bonding to contact pads of an integrated circuit, said body portions of said leads having a first thickness and said contact finger tips having a second thickness less than the first thickness, said body portions of said leads having a cross-section with upper sides and lower sides forming an intersection between a top surface and a bottom surface of said body portions of said leads, said intersection between said upper and lower sides of said body portions of said leads being closer to one of said top surface and said bottom surface of said body portions of said leads, said contact finger tips having a surface parallel to said top surface and said bottom surface of said body portions of said leads, said surface of said contact finger tips being aligned with said intersection.

4,876,588

SEMICONDUCTOR DEVICE HAVING CERAMIC PACKAGE INCORPORATED WITH A HEAT-RADIATOR

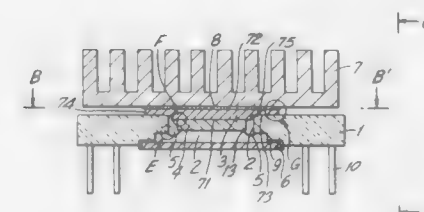
Takashi Miyamoto, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Sep. 15, 1988, Ser. No. 244,940

Claims priority, application Japan, Sep. 16, 1987, 62/233108 Int. Cl.⁴ H01L 23/02

U.S. Cl. 357-81

9 Claims



1. A semiconductor device comprising:
 - a ceramic substrate having a through-hole, a plurality of terminals each including a first metallized layer of high melting point material formed on the surface of said ceramic substrate at a portion outside said through-hole and a first nickel-plated layer covering said first metallized layer of said terminal, a plurality of bonding pads each including a second metallized layer of said high melting point material formed on the surface of said ceramic substrate at a portion inside said through-hole, a second nickel-plated layer covering said second metallized layer of said bonding pad and a first gold-plated layer covering said second nickel-plated layer of said bonding pad, and a sealing film including a third metallized layer of said high melting point material formed on the surface of said ceramic substrate surrounding said through-hole and a third nickel-plated layer covering said third metallized layer of said sealing film;
 - a plurality of leads connected to respective said terminals, each lead including a lead body bonded to said first nickel-plated layer of said terminal by solder, a fourth nickel-plated layer covering said lead body and a second gold-plated layer covering said fourth-nickel plated layer of said lead;
 - a metal plate including a metal plate substrate having first and second flat surfaces, said first surface being covered by a fifth nickel-plated layer and a third gold-plated layer on said fifth nickel-plated layer, said second surface being covered by a sixth nickel-plated layer so that any gold plating layer is free from on said sixth nickel-plated layer, said metal plate being bonded to said sealing film by solder in such a manner that said metal plate closes one side opening of said through-hole to form a recess defined by said metal plate and said through-hole and that said first flat surface of said metal plate substrate is located inside said recess and said second flat surface of said metal plate substrate is located outside said recess;
 - a semiconductor chip provided within said recess and fixed to said metal plate on said first flat surface;
 - a heat-radiator; and
 - a silicone resin film provided between said radiator and said metal plate and adhered to said radiator and to said sixth nickel-plated layer on said second flat surface of said metal plate substrate to bond said radiator to said metal plate.

4,876,589

PHASE RESPONSIVE COMPOSITE VIDEO SIGNAL CONTROL SYSTEM

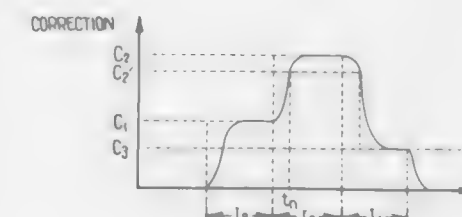
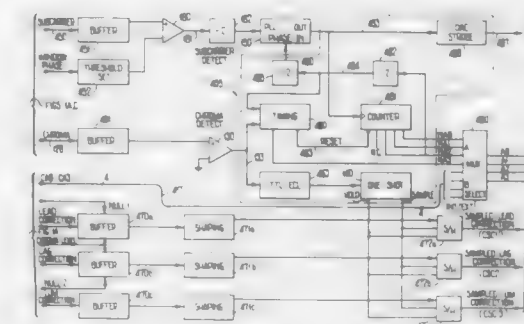
Michael L. Orsburn, Cooper City; Robert L. Hemsky; Terry L. Tucker, both of Boca Raton; Robert E. Schwarz, North Dade, and Craig F. Fearing, Hollywood, all of Fla., assignors to Utah Scientific Advanced Development Center, Inc., Burlington, Mass.

Division of Ser. No. 760,339, Jul. 29, 1985, which is a continuation-in-part of Ser. No. 604,845, Apr. 27, 1984, Pat. No. 4,642,682. This application Jan. 11, 1988, Ser. No. 142,691

Int. Cl.⁴ H04N 9/74

U.S. Cl. 358-22

61 Claims



1. A phase responsive video signal correction system for correcting a video parameter of an image represented by a phase encoded video signal, comprising:
 - phase detecting means responsive to detect relative phase between a phase encoded component of an uncorrected video signal and a phase reference signal
 - correction signal means responsive to said plane reference signal for providing a plurality of correction signals, each of said correction signals being related to a predetermined range of phase differences between said phase reference signal and said uncorrected video signal;
 - means for dividing each cycle of said phase reference signal into a plurality of discrete color intervals, each of said color intervals being related to a particular one of said correction signals;
 - correction signal selecting means responsive to said detected relative phase for selecting a particular one of said correction signals, said correction signal selecting means being operative to select said particular one of said correction signals twice per cycle of said phase reference signal; and
 - means responsive to said selected particular one of said correction signals for correcting said uncorrected video signal to provide a color corrected video signal.
30. A phase responsive video signal correction system for correcting a video parameter of an image represented by an uncorrected input color video signal, comprising:
 - phase detecting means responsive to detect relative phase between a phase encoded component of said uncorrected input video signal and a reference signal in each one of a plurality of ranges of phases representable by said input video signal;

means for adjusting the phase of said reference signal so as to adjust the relative boundaries of said plurality of ranges of phases;
correction signal means responsive to said detected relative phase for generating a correction signal related to said detected relative phase; and
means responsive to said correction signal for correcting said uncorrected input video signal to provide a corrected video output signal.

4,876,590

LOW RESOLUTION VERIFIER FOR A STILL VIDEO IMAGE

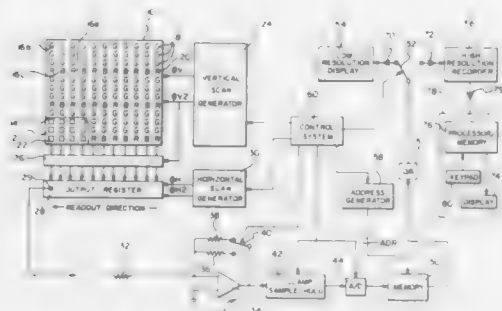
Kenneth A. Parulski, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 17, 1988, Ser. No. 208,303

Int. Cl.⁴ H04N 9/04, 9/07

U.S. Cl. 358—41

11 Claims



1. Imaging apparatus for generating a lower resolution verification image signal from a higher resolution image source, said imaging apparatus comprising:

an area image sensor having a plurality of light-sensitive areas arranged two-dimensionally in parallel lines each oriented lengthwise in the horizontal high speed scanning direction;

a color filter array having a pattern of at least one line of same-color luminance filter elements oriented in the horizontal scanning direction adjacent to at least one line of chrominance filter elements including at least one other color oriented in the horizontal scanning direction;

means for scanning said image sensor and generating an output signal comprising a plurality of discrete image signals corresponding to the plurality of light-sensitive areas, said output signal comprising a line-separated pattern of luminance image signals and chrominance image signals; and

means for generating a low resolution verification image signal from all or a portion of the luminance signals from said lines of same-color luminance filter elements.

4,876,591

COLOR VIDEO SIGNAL GENERATING DEVICE USING MONOCHROME AND COLOR IMAGE SENSORS HAVING DIFFERENT RESOLUTIONS TO FORM A LUMINANCE SIGNAL

Akira Muramatsu, Tokyo, Japan, assignor to Fuji Photo Film Co., Kanagawa, Japan

Continuation of Ser. No. 134,748, Dec. 18, 1987, Pat. No.

4,823,186. This application Feb. 13, 1989, Ser. No. 309,655

Claims priority, application Japan, Dec. 19, 1986, 61-301688

Int. Cl.⁴ H04N 9/09, 9/04

U.S. Cl. 358—43

1 Claim

1. A device for generating a video signal, comprising:
means for splitting an optical image from an image pickup system into first and second images;

a monochrome image sensor which scans said first image in a horizontal direction and which has a first Nyquist spatial

frequency band in said horizontal direction to produce a monochrome signal;

a color image sensor having a color filter array on a surface thereof which scans said second image in a horizontal direction and which has a second Nyquist spatial frequency band in said horizontal direction which is lower than said first Nyquist spatial frequency band to produce color-separated signals;

optical low-pass filter means for limiting said second image to a spatial frequency band lower than said first Nyquist spatial frequency band prior to scanning by said color image sensor;



low frequency luminance signal forming means for forming a low frequency luminance signal in response to said color-separated signals;

a matrix circuit for forming color difference signals in response to said low frequency luminance signal and said color-separated signals;

high frequency luminance signal forming means for forming a high frequency luminance signal in response to said monochrome signal; and

means for generating said video signal in response to said color difference signals and a luminance signal formed in response to at least said high frequency luminance signal.

4,876,592

SYSTEM FOR MECHANISING AND THE EVALUATION OF RESPONSES TO BROADCAST TRANSMISSIONS

Henry Von Kohorn, 945 Treasure La., Vero Beach, Fla. 32963, assignor to Henry Von Kohorn, Vero Beach, Fla.

Continuation-in-part of Ser. No. 837,827, Mar. 10, 1986, Pat.

No. 4,745,468. This application May 10, 1988, Ser. No. 192,248

Int. Cl.⁴ H04H 9/00

U.S. Cl. 358—84

68 Claims

59. A method for evaluating responses to task-setting messages electronically transmitted from a central station to members of a remote shopping audience who have responded to said messages in a manner meeting predetermined response criteria, which method comprises the steps of:

transmitting audio-visual signals to the members of the audience, the audio-visual signals conveying a presentation of data accompanied by task-setting messages defining tasks to be performed by members of the audience;

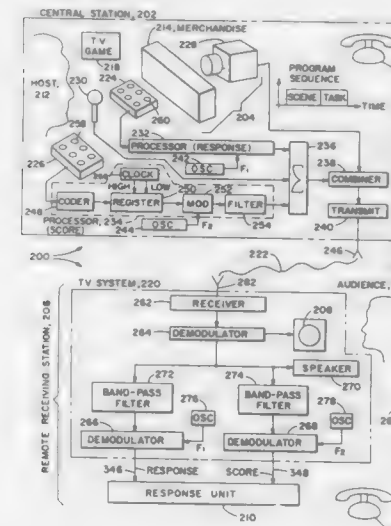
transmitting response criteria to members of the audience at remote locations for responding to individual ones of said task-setting messages, said response criteria including a scoring basis for responses to be entered by the members of the audience within a specified period of time, said scoring basis including a difficulty level;

entering responses to said task-setting messages by members of said audience;

rejecting responses entered by members of the audience after expiration of said period of time;

comparing at least one response entered by a member of said audience within said period of time with said response criteria;

scoring each response relative to said response criteria in correlation with a difficulty level;
informing members of said audience of results of said scoring;
allowing interaction between a member of the remote audience and the central station by means of a communication link between a remote location and the central station;



computing the value of an award to be issued to a member of said audience who has entered an acceptable response to said task-setting message within said period of time, the value of the award being based on a score provided by said scoring step; and
dispensing said award to said member of said audience who has entered the acceptable response.

4,876,593

TEMPORARY HOT CELL AND RELATED METHOD FOR HANDLING HIGH RADIATION LEVEL SOURCES

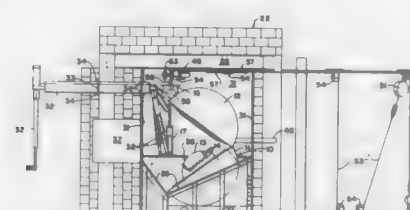
Frank I. Bauer, Perry; Robert S. Mavretish, New Stanton; Regis P. Shogan, Monroeville, and James Sejvar, Murrysville, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 19, 1988, Ser. No. 158,009

Int. Cl.⁴ H04H 7/18

U.S. Cl. 358—100

17 Claims



1. A temporary hot cell for handling high level radiation sources comprising:

wall, ceiling and floor structures comprised at least in part of temporary structures forming an enclosure to reduce to acceptable levels radiation of the surround from high level radiation sources handled within the enclosure;

at least one manipulator arm extending through a wall structure of the enclosure to permit handling of high level radiation sources within the enclosure by an operator located external to the enclosure, said manipulator arm being removable from the enclosure through the wall structure;

a window positioned in a wall structure of the enclosure to

allow an operator external of the enclosure operating the manipulator arm to view handling of high level radiation sources within the enclosure, said window also reducing to acceptable levels radiation of the surround by high level radiation sources within the enclosure;

a false floor in the enclosure, as necessary, to prevent high level radiation sources dropped within the enclosure from being out of reach of the manipulator arm; and

at least one access port in a wall structure of the enclosure to allow transport of tools and materials between the interior and exterior of the enclosure.

4,876,594

APPARATUS FOR PROMOTING THE VIGILANCE OF A MOTOR VEHICLE OPERATOR

Julius Schiffman, 12960 LaSalle La., Huntington Woods, Mich. 48070

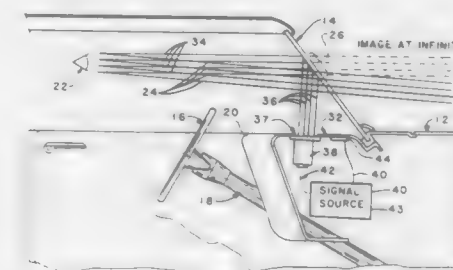
Division of Ser. No. 187,834, Apr. 29, 1988, which is a division of Ser. No. 15,160, Feb. 17, 1987, Pat. No. 4,742,389, which is a continuation of Ser. No. 710,678, Mar. 12, 1983, abandoned.

This application Mar. 22, 1989, Ser. No. 326,917

Int. Cl.⁴ H04N 7/18

U.S. Cl. 358—103

6 Claims



1. An apparatus for use in a ground vehicle having a windshield through which a driver may view conditions in the direction of travel of the ground vehicle, the apparatus comprising:

a first signal source for generating a first video signal comprising a series of moving visual images constituting a visual program of unpredictable, new information unrelated to the operation of the ground vehicle;

a second signal source for generating a second video signal comprising an image of information related to the operation of the ground vehicle;

a switch device connected to said first and second signal sources for selecting either said first signal source or said second signal source; and

a visual display means connected to said switch device for presenting a visual display of said video signal of said signal source selected by said switch device, the visual display utilizing a small fraction of the total windshield area and disposed in a position slightly above the line of sight of the driver toward the direction of travel of the ground vehicle,

whereby the driver can observe said visual display corresponding to said selected signal source while operating the ground vehicle and such observation will maintain the field of view of the driver in the proper position for operation of the ground vehicle and will maintain the driver in a mental state of vigilance.

4,876,595

DEVICE FOR REPRODUCING DIGITIZED VIDEO PICTURES USING AN IMPROVED RESTORATION METHOD

Raymond N. J. Veldhuis, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

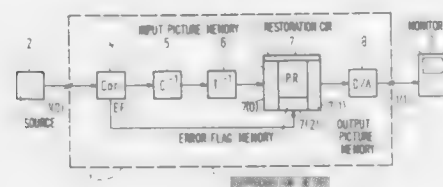
Filed Jul. 20, 1988, Ser. No. 221,684

Claims priority, application Netherlands, Jun. 6, 1988, 8801441

Int. Cl.⁴ H04N 7/12

U.S. Cl. 358—136

1 Claim



1. A device for reproducing digitally received video pictures comprising an array of picture elements, said device including a restoration circuit for restoring erroneous picture elements located within a reference sub-picture within which said erroneous picture elements are enclosed by non-erroneous picture elements, said restoration process comprising:

- a preset process; and
 - an iteration prediction process;
- characterized in that the preset process comprises:
- a substitution step for replacing the erroneous picture elements by predetermined fixed picture elements;
 - a coefficient prediction step for determining a plurality of sets of prediction coefficients, each set being associated with the picture elements of a prediction field of a plurality of different prediction fields;
 - a selection step for selecting said prediction field for performing the coefficient prediction step in the iteration prediction process and the associated set of prediction coefficients for which the prediction coefficient function has the smallest value;
 - a picture element prediction step for determining the auxiliary picture elements on the basis of the prediction coefficients selected in the selection step; and
 - a substitution step for replacing the original erroneous picture elements of the reference sub-picture by the auxiliary picture elements to compose the up-dated reference sub-picture.

4,876,596

FILM-TO-VIDEO CONVERTER WITH SCAN LINE DOUBLING

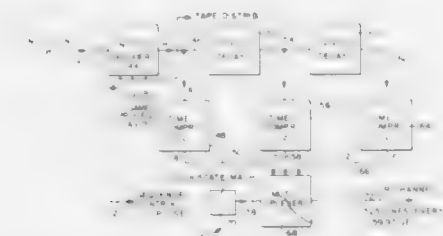
Yves C. Faroudja, 26595 Anacapa Dr., Los Altos, Calif. 94022

Filed Oct. 25, 1988, Ser. No. 262,321

Int. Cl.⁴ H04N 7/01, 3/36

U.S. Cl. 358—140

21 Claims



14. Apparatus for improving apparent picture quality in film-to-video transfer television systems operating in accordance with an odd ratio between film frame display rate and

television scan field rate wherein the video scan line rate is multiplied by an integer for display at an output television display device and comprising:

- film-to-video transfer means for transferring each film frame to a television signal of predetermined numbers of even and odd video fields at nominal line scan rate in accordance with a predetermined transfer scheme related to the odd ratio;
- delay means comprising plural series connected field period delays, having an input connected to the film-to-video transfer means and providing at outputs thereof an undelayed portion and plural delayed signal portions, the total number of such portions being related to the odd ratio;
- time compressor means comprising separate time compressors connected to the outputs of the delay means for time compressing and putting out each said portion of the television signal in accordance with an inverse of the integer to provide an undelayed and plural delayed signal time compressed components; and,
- multiplexer means connected receive the time compressed components for selecting among the undelayed and the plural delayed components so as to derive line multiplied even and odd output video fields wherein even and odd scan lines are sequentially interleaved according to their spatial relation and wherein each resultant line multiplexed, sequentially interleaved even and odd composite video field obtained at the video output is the video representation of a single film frame.

4,876,597

VIDEO OBSERVATION SYSTEMS

Bernard J. J. Roy; Lorne D. O'Connor, both of Laval; Philippe F. Rioux, Boucherville, all of Canada; Donald A. Dingle, Burlingame, Calif., and Andre L. Raymond, Ste. Therese, Canada, assignors to ADT Security Systems, Inc., Parsippany, N.J.

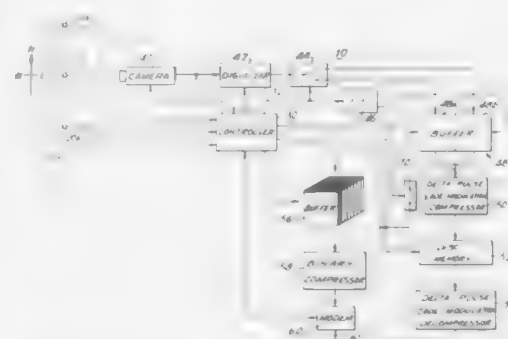
Continuation-in-part of Ser. No. 93,241, Sep. 4, 1987. This application Aug. 18, 1988, Ser. No. 233,711

Int. Cl.⁴ H04N 7/04, 7/18

U.S. Cl. 358—141

42 Claims

MICROFICHE APPENDIX INCLUDED (8 Microfiche, 744 Pages)



1. Apparatus for remote observation of objects comprising: first means adjacent the objects for periodically generating data representative of an image of said objects, said data being broken into segments, each of which represents an element of said image;
- second means adjacent said objects for transmitting to said point of observation the most significant portion of the data segment associated with each image element;
- third means adjacent said point of observation for receiving said most significant portions and for displaying an image based on said most significant portions;
- fourth means adjacent said point of observation for transmitting to the location of said objects a first signal indicative

of the acceptability of the image displayed by said third means;

- fifth means adjacent said objects for receiving said first signal and for transmitting to said point of observation the next most significant portion of the data segment associated with each image element only if said first signal indicates that the image displayed by said third means is not acceptable; and
- sixth means adjacent said point of observation for receiving said next most significant portions and for displaying an image based on said most and next most significant portions of said next most significant portions are transmitted; wherein said objects move relative to said first means so that a portion of an object feature to be observed may be in one image and another portion of said object feature may be in the next sequential image, and wherein said apparatus further comprises: first and second buffer means adjacent said point of observation, each of said buffer means being large enough to hold all of the data for one image; means for storing the data received from said second and fifth means for successive images in alternate ones of said first and second buffers so that the data for two sequential images is respectively stored in said first and second buffers; and means for displaying an image based on part of the data stored in said first buffer and part of the data stored in said second buffer so that both portions of said object feature are visible in the displayed image.

4,876,598

APPARATUS FOR DIGITIZING A COMPOSITE VIDEO SIGNAL

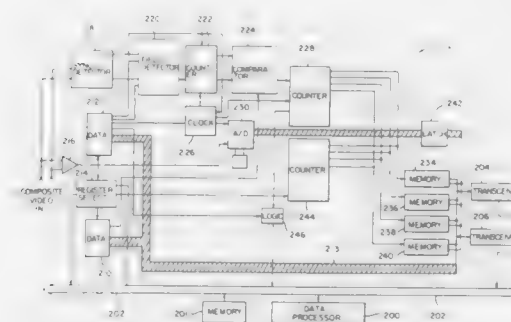
Kenneth T. Carlstedt, Seattle, and Richard S. Penn, Issaquah, both of Wash., assignors to Tecon, Inc., Redmond, Wash.

Filed May 20, 1988, Ser. No. 196,386

Int. Cl.⁴ H04N 5/14

U.S. Cl. 358—160

17 Claims



3. Apparatus coupleable to a standard personal computer for digitizing a composite video signal of the type which includes an analog image signal that carries information for reproducing an image on a cathode ray tube and a composite synchronization signal which carries a horizontal synchronization signal and a vertical synchronization signal for synchronizing the video signal receiver and for controlling the decoding of the image signals to produce the image, said apparatus comprising: interface means for interfacing said apparatus with the standard personal computer, said interface means including means for receiving control data from the standard personal computer and for transmitting digital data values to the personal computer;
- control means for controlling the digitization of the composite video signal, said control means including means for extracting the composite synchronization signal from the composite video signal, said control means being responsive to the control data for initiating the digitization of the composite video signal;
- sample clock means for periodically providing a plurality of

clock pulses wherein each clock pulse has a substantially constant, predetermined duration, said sample clock means being responsive to the composite synchronization signal to start generating the clock pulses; and data converter means responsive to the clock pulse provided by said sample clock means for converting the analog image signals to digital data values, said converter means being coupled to said interface means for transferring the digital data values thereto.

4,876,599

APERTURE CORRECTION CIRCUIT

Taku Kihara, Kanagawa, Japan, assignor to Sony Corp., Tokyo, Japan

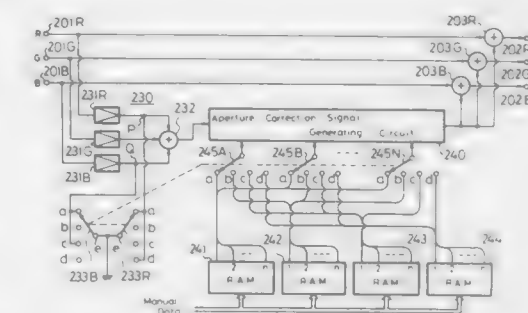
Division of Ser. No. 171,764, Mar. 22, 1988. This application Mar. 14, 1988, Ser. No. 323,401

Claims priority, application Japan, Mar. 31, 1987, 62-080310

Int. Cl.⁴ H04N 5/14

U.S. Cl. 358—162

3 Claims



1. An aperture correction circuit comprising: a video signal source generating first, second and third primary color signals; matrix circuit means receiving said first, second and third primary color signals and being responsive to a control signal for selectively matrixing said first, second and third primary color signals to produce a respective composite digital color video signal; aperture correction signal generating means supplied with said composite digital color video signal for generating an aperture correction signal therefrom; adding means for adding said aperture correction signal to each of said first, second and third primary color signals; and characteristic control means responsive to said control signal for controlling characteristics of said aperture correction signal generated by said aperture correction signal generating means in coordination with the selective matrixing of said first, second and third primary color signals.

4,876,600

METHOD AND DEVICE FOR REPRESENTING A COMPOSITE IMAGE ON A SCREEN OF A SCREEN DEVICE

Ludwig Pietzsch, Karlsruhe; Detlef Senger, Ettlingen; Horst Winter, Karlsruhe, and Hubert Völlinger, Steinmann, all of Fed. Rep. of Germany, assignors to IBP Pietzsch GmbH, Ettlingen, Fed. Rep. of Germany

Filed Jan. 26, 1988, Ser. No. 148,755

Claims priority, application Fed. Rep. of Germany, Jan. 26, 1987, 3702220

Int. Cl.⁴ H04N 5/262, 9/74

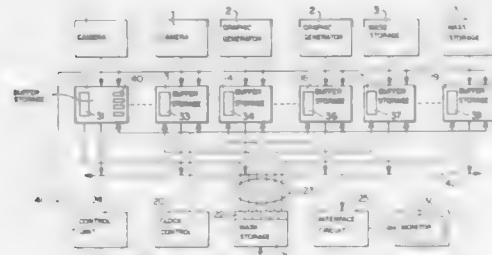
U.S. Cl. 358—183

16 Claims

1. A device for representing a composite image on a screen of a screen device, said image being composed of a plurality of

natural and/or synthetic sub-images which are generated by different sources, comprising:

- a storage associated to each of said sources, each said storage having a control element;
- a mask storage for storing data words which receives directions for composing said sub-images from a control unit and having an output register, wherein the width of data



in said data words, which may be read parallelly of, conforms to the number of said sources and one bit is set per each said data word; and

a control circuit into which the content of the mask storage is written at pixel frequency, the output register of said mask storage being connected to the control element of each said storage.

4,876,601

IMAGING APPARATUS HAVING ZOOM CAPABILITY VIA READOUT VARIATION

Seiji Hashimoto, Yokohama, and Tadanori Harada, Tokorozawa, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

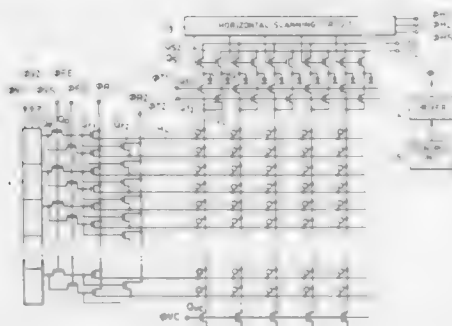
Filed Mar. 15, 1988, Ser. No. 168,176

Claims priority, application Japan, Mar. 31, 1987, 62-77953

Int. Cl.⁴ H04N 3/14

U.S. Cl. 358—213.26

26 Claims



21. An imaging apparatus comprising:
- (a) a plurality of pixels arranged in lines and columns; and
 - (b) control means for selectively switching a reading operation mode between a first mode in which signals on said pixels are sequentially read in a first sequence at a first speed and a second mode in which signals on a selected portion of an area of said pixels are sequentially read in a second sequence different from said first sequence and at a second speed different from said first speed, said second sequence being a sequence in which signals are simultaneously read from pixels of a group of horizontal lines of pixels and then signals are simultaneously read from pixels of a next group of horizontal lines of pixels, said next group of horizontal lines of pixels including at least one horizontal line belonging to the preceding group of horizontal lines, thus conducting

simultaneous reading of signals from each, of successive groups of horizontal lines of pixels.

4,876,602

ELECTRONIC FOCUS CORRECTION BY SIGNAL CONVOLUTION

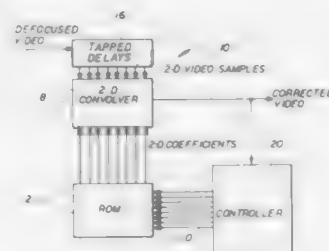
Robert Zwirn, Los Angeles, and Gerard L. Rafanelli, Fountain Valley, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed May 2, 1988, Ser. No. 189,073

Int. Cl.⁴ H04N 5/208

U.S. Cl. 358—227

21 Claims



1. An electronic focus correction system for correcting focus aberrations in an electro-optical system having means for providing electrical signals representative of a scene of image data, said electronic focus correction system comprising:
- first means for providing plural sets of weighting coefficients;
 - second means for multiplying the electrical signals corresponding to a window around each pixel of image data by a set of said weighting coefficients and for assigning to each pixel a weighted signal equal to the sum of the products of the coefficients times the electrical signals within the window to provide one of a plurality of weighted sequential output signals which constitute a corrected image;
 - third means responsive to the output of said second means for measuring a figure of merit of said output image; and
 - fourth means operatively connected to said third means for selectively providing control signals, in response to said measured figure of merit, to change said plurality of weighted coefficients to thereby optimize said figure of merit.

4,876,603

SIGNAL PROCESSING DEVICE FOR AUTOMATIC-FOCUSING VIDEO SIGNAL IN ELECTRONICALLY CONTROLLED PHOTOGRAPHIC CAMERA

Noboru Suzuki, Shigeo Toji, and Yukio Uenaka, all of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 25, 1988, Ser. No. 173,449

Claims priority, application Japan, Mar. 26, 1987, 62-72916; Mar. 26, 1987, 62-45016[U]

Int. Cl.⁴ H04N 5/232

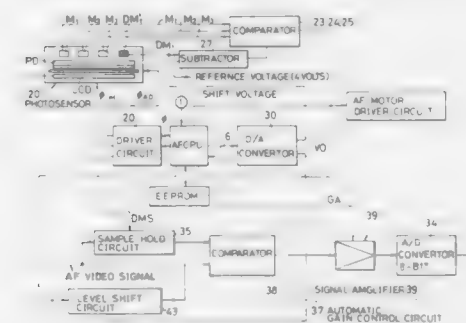
U.S. Cl. 358—227

10 Claims

1. A signal processor for an automatic focusing video signal in an electronically controlled camera, comprising:
- a photosensor having an electric charge accumulating part for accumulating a signal electric charge which corresponds to an object brightness, an exposure monitor for accumulating an electric charge which corresponds to the amount of said signal electric charge accumulated in said electric charge accumulating part, and a dark charge monitor for accumulating a dark charge therein, said photosensor being adapted to sequentially transmit said

signal electric charge accumulated in said electric charge accumulating part; and

an automatic gain control circuit for automatically controlling the gain of said automatic-focusing video signal produced from said photosensor when said object contrast is low, in such a manner that a low-contrast corresponding level difference, which is the difference between a high-



luminance corresponding level and a low-luminance corresponding level of an automatic-focusing video signal arising from a low-contrast object, approaches a high-contrast corresponding level difference, which is the difference between a high-luminance corresponding level and a low-luminance corresponding level of an automatic-focusing video signal arising from a high-contrast object.

4,876,604

APPARATUS FOR COMMUNICATING IMAGE DATA OF DIFFERENT RESOLUTIONS

Hiroshi Nobuta, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

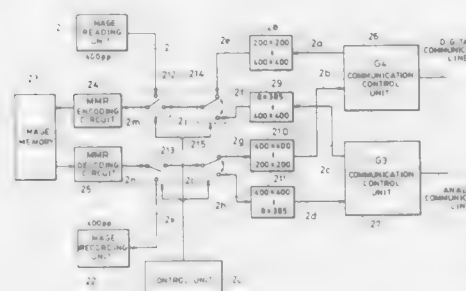
Filed Apr. 1, 1988, Ser. No. 177,350

Claims priority, application Japan, Apr. 15, 1987, 62-90877

Int. Cl.⁴ H04N 1/00, 1/40

U.S. Cl. 358—400

20 Claims



1. An image communication apparatus for processing image data of different resolutions, said apparatus comprising:
- a memory for storing image data;
 - image data supply means for supplying first and second image data of different resolutions, respectively; and
 - an image data resolution converter for converting the resolution of at least one of said first and second image data such that the resolution of the first and second image data supplied to said memory is unified.

4,876,605

IMAGE READING DEVICE

Osamu Ishikawa, and Kiyoshi Sumiya, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

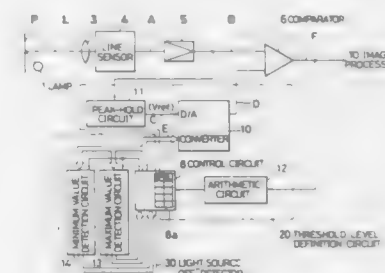
Filed Dec. 31, 1987, Ser. No. 140,509

Claims priority, application Japan, Jan. 12, 1987, 62-003337; Dec. 16, 1987, 62-319327

Int. Cl.⁴ H04N 1/40, 1/00

U.S. Cl. 358—400

3 Claims



1. An image reading device comprising
- a light source for illuminating a medium to be read,
 - a line sensor including a line of photoelectric conversion elements for receiving light from the medium and producing an image signal,
 - means for determining white levels for respective intervals into which said line of photoelectric conversion elements are divided,
 - means for setting threshold levels for the respective intervals on the basis of said white levels for the respective intervals,
 - means for comparing the image signal with said threshold levels to produce a series of binary signals, and
 - means for detecting the off condition of said light source on the basis of the relative magnitudes between said white levels for said respective intervals.

4,876,606

IMAGE FORMING SYSTEM

Masahiko Banno, Yokohama, and Yasuaki Nakazato, Tokyo, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

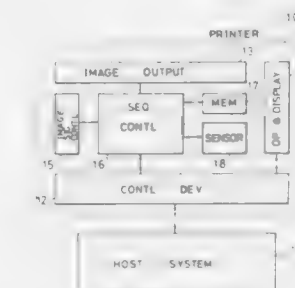
Filed Apr. 27, 1988, Ser. No. 186,604

Claims priority, application Japan, Apr. 28, 1987, 62-103283

Int. Cl.⁴ H04N 1/32

U.S. Cl. 358—434

20 Claims



1. An image forming system comprising:
- an image forming apparatus at least comprising an image forming part for forming an image, a sensor part for detecting status information on said image forming apparatus, a memory for storing the status information, an operation and display part for entering an instruction to said image forming apparatus and for displaying a message and

a control part for controlling an operation of said image forming apparatus; and
 a host system coupled to said image forming apparatus through said control part,
 said control part having means for controlling said memory to read out said status information at an arbitrary time, and means for converting said status information into a message.

4,876,607

COMPLEX CHARACTER GENERATOR UTILIZING BYTE SCANNING

Samuel C. Taeng, Pleasantville, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.
 Filed Mar. 31, 1982, Ser. No. 364,061
 Int. Cl.⁴ H04N 1/415

U.S. Cl. 358—261.2

17 Claims

ENCODE TABLE

A CODE	SYMBOL	PRG#	BIT
0	00	000	0
1	01	001	1
2	10	010	2
3	11	011	3
4	20	100	4
5	21	101	5
6	22	110	6
7	23	111	7
8	30	200	8
9	31	201	9
10	32	210	10
11	33	211	11
12	40	300	12
13	41	301	13
14	42	310	14
15	43	311	15
16	50	400	16
17	51	401	17
18	52	410	18
19	53	411	19
20	60	500	20
21	61	501	21
22	62	510	22
23	63	511	23
24	70	600	24
25	71	601	25
26	72	610	26
27	73	611	27
28	80	700	28
29	81	701	29
30	82	710	30
31	83	711	31
32	90	800	32
33	91	801	33
34	92	810	34
35	93	811	35
36	00	000	0
37	01	001	1
38	10	010	2
39	11	011	3
40	20	100	4
41	21	101	5
42	22	110	6
43	23	111	7
44	30	200	8
45	31	201	9
46	32	210	10
47	33	211	11
48	40	300	12
49	41	301	13
50	42	310	14
51	43	311	15
52	50	400	16
53	51	401	17
54	52	410	18
55	53	411	19
56	60	500	20
57	61	501	21
58	62	510	22
59	63	511	23
60	70	600	24
61	71	601	25
62	72	610	26
63	73	611	27
64	80	700	28
65	81	701	29
66	82	710	30
67	83	711	31
68	90	800	32
69	91	801	33
70	92	810	34
71	93	811	35

1. A method of compacting a complex character, wherein said character is defined by an I row by J column matrix, wherein each row is comprised of J bytes, where I and J are integers, said method comprising the steps of:

scanning each row a byte at a time to concurrently determine if a given byte of any numerical value has the same numerical value as the previous byte in the scanning sequence or has the same numerical value as the above byte in the same column and immediately preceding row;

encoding the number of successive bytes that are the same numerical value as the previous byte as a symbol P_n, where n is an integer which is indicative of the number of given bytes scanned in sequence which are equal in numerical value to the previous byte;

encoding the number of successive bytes that are the same numerical value as the above bytes as a symbol A_m, where m is an integer which is indicative of the number of given bytes scanned in sequence which are equal in numerical value to the above bytes; and

encoding any given byte, which is not of the same numerical value as the previous byte or the above byte, with a symbol S_x, where x is indicative of the numerical value of said any given byte.

4,876,558

FOCUS AND SIGNAL TO NOISE MEASUREMENT ROUTINES IN INPUT SCANNERS

Richard B. Eaton, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 7, 1988, Ser. No. 268,091

Int. Cl.⁴ H04N 1/32, 1/40

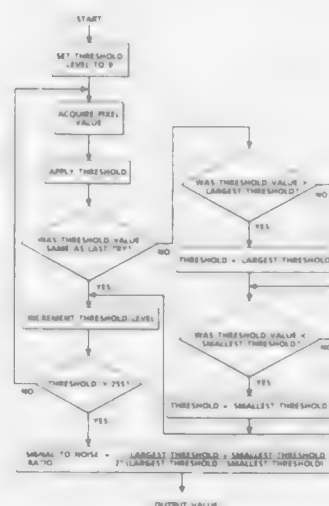
U.S. Cl. 358—443

10 Claims

1. In an input scanner for deriving an electronic representation of an image from an original, having a light intensity detecting arrangement, deriving image information across a scan line in a fast scan direction, and producing a signal proportional to the intensity of light detected over a selected

period from the original for a discrete area thereof; means for providing relative movement between the original and the light intensity detecting arrangement in a slow scan direction, and a thresholding arrangement applying a selected threshold value to each signal to produce a first binary output when the threshold exceeds the signal, and a second binary output the threshold does not exceed the signal, a method of examining imaging quality comprising the steps of:

- placing a selected test pattern original at an imaging position relative to the light intensity detecting arrangement;
- causing the relative movement providing means to maintain said test pattern original and the light intensity detecting arrangement at fixed relative positions, whereby for



each scan line produced, the same image information is derived from the test pattern original;

- producing signals for a plurality of scan lines;
- for each scan line for which signals are produced, applying a different threshold value to the signals constituting the scan line at the thresholding arrangement;
- detecting transmissions in the output of the thresholding arrangement, as signals representing image information originally producing a first binary output with a first threshold value applied subsequently produce a second binary output as the threshold value is varied; and
- deriving image quality information from said detected transitions.

4,876,609

DIGITAL COPIER WITH A FACSIMILE FUNCTION

Massaki Ogura, Kawasaki, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed May 9, 1988, Ser. No. 191,880

Claims priority, application Japan, May 9, 1987, 62-113074

Int. Cl.⁴ H04N 1/40

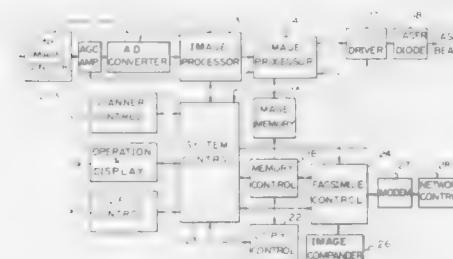
U.S. Cl. 358—443

7 Claims

1. An image forming apparatus having a function of storing and reading out image data which are associated with a plurality of pages of documents, comprising:

- first store means for sequentially storing image data inputted;
 second store means for storing leading addresses which are assigned to the individual pages of the image data which are stored in said first store means;
 first reading means for reading the leading addresses out of said second store means and reading the image data out of said first store means one page at a time on the basis of the leading addresses; and

commanding means for commanding an order in which the individual pages are stored in said first store means or in an



opposite order said first reading means should read the leading addresses out of said second store means.

4,876,610

IMAGE PROCESSING APPARATUS WITH BINARIZATION-ERROR DISPERSAL

Hidefumi Ohsawa, Kawaguchi; Akihiro Katayama, Kawasaki; Hiroshi Hosokawa, Yokohama; Izuru Sanohara, Ichikawa, and Masahiko Yoshimoto, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

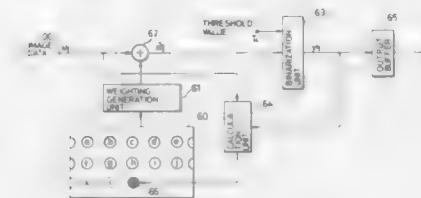
Filed Dec. 23, 1987, Ser. No. 137,439

Claims priority, application Japan, Dec. 25, 1986, 61-313168; May 21, 1987, 62-122611

Int. Cl.⁴ H04N 1/40

U.S. Cl. 358—443

37 Claims



34. An image processing apparatus comprising:
 input means for inputting digital image data;
 binarization means for binarizing the digital image data input by said input means by using a predetermined threshold value;
 calculation means for calculating a difference between the digital image data input by said input means and output data after the digital image data has been binarized, to provide error data;
 process means for processing such that the error data provided by said calculation means is dispersed to the peripheral digital image data; and
 discrimination means for discriminating a feature of an area in which the digital image data input by said input means exists, wherein said process means is adapted to vary the area in which the error data is dispersed, in accordance with the feature discriminated by said discrimination means.

4,876,611

PROCESS FOR RECORDING SEMIHALFTONE IMAGES

Gerhard Fischer, Offenbach, and Helmut Quabeck, Babenhäusen, both of Fed. Rep. of Germany, assignors to E. I. Du Pont De Nemours and Company, Wilmington, Del.

Filed Sep. 21, 1987, Ser. No. 98,941

Claims priority, application Fed. Rep. of Germany, Oct. 14, 1986, 3634939

Int. Cl.⁴ H04N 1/23, 1/46

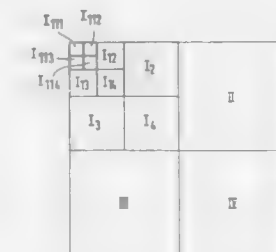
U.S. Cl. 358—456

22 Claims

16. A process for reproducing an image by scanning the image with a scanning dot having a predetermined area to

obtain information related to the single tonal values of the image, and using the information to reproduce the image on a display medium by generating a multiplicity of recording dots of fixed predetermined tonal value and dimension, and of variable frequency per unit area, the improvement comprising:

- (1) detecting discrete tonal values for discrete areas of the image corresponding to the scanning dot area,
- (2) storing information corresponding to the discrete tonal values for the full image area to be reproduced,
- (3) defining at least one scanning field equivalent to a portion of an image area, containing k scan dots,
- (4) calculating the average tonal value of each scanning field by averaging the tonal values of each of the scanning dots within the field,



- (5) subdividing each of the scanning fields into at least two subfields,
- (6) calculating the average tonal value of the subfields such that the sum of the tonal values of the subfields equals the tonal value of the field which preceded the subfields,
- (7) repeating steps (5) and (6) until the number of scan dots contained in the subfield equals one or the ratio of the scan dot area to the recording dot area whichever is greater,
- (8) generating on the display medium recording dots of fixed tonal value and dimension at a frequency and location to produce tonal values in each of the subfields in accordance with the calculated tonal values for each of the subfields.

4,876,612

IMAGE PROCESSING APPARATUS

Toshio Honma, Tokyo, and Nobuyuki Watanabe, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 798,672, Nov. 15, 1985, abandoned.

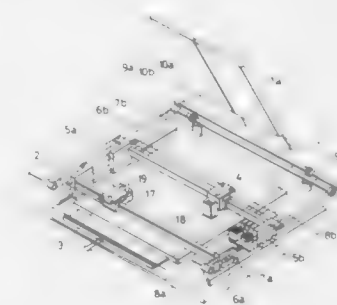
This application Dec. 29, 1988, Ser. No. 291,361

Claims priority, application Japan, Nov. 19, 1984, 59-243931

Int. Cl.⁴ H04N 1/04

U.S. Cl. 358—474

24 Claims



1. An image processing apparatus comprising:
 (a) means for reading out an object, said reading means having at least three reading element groups, each group including a concerned pixel reading element and a periph-

eral pixel reading element, said concerned pixel reading element and peripheral pixel reading element being linearly arranged in a predetermined direction;

(b) first scan means for scanning the object in a second direction inclined by a predetermined angle from said predetermined direction in said reading means; and

(c) second scan means for scanning the object along a direction transverse to said second direction so that at least part of a read-out range of said peripheral pixel reading element is overlapped.

4,876,613

MANUALLY OPERATED COPIER WITH A DAMPER
Iwakazu Honda, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

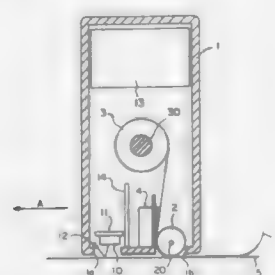
Filed Oct. 30, 1987, Ser. No. 115,441

Claims priority, application Japan, Nov. 5, 1986, 61-169789[U]

Int. Cl.⁴ H04N 1/40

U.S. Cl. 358-471

6 Claims



1. In a manually operated copier having an image reading means which is manually operated for scanning a document to read an image on said document, a printing means for printing said read image on a given sheet of paper and a transportation roller for transporting said sheet out of said copier, the improvement wherein said transportation roller is so disposed that the surface thereof touches said document, wherein said transportation roller is longer than the width of said sheet of paper and wherein said copier further comprises a damper for causing said roller to rotate at a uniform speed.

4,876,614

TRACK-READJUSTED MAGNETIC-TAPE RECORDER WITH TRANSVERSE TRACKING

Jürgen Kaaden, Pfaffenweiler, and Hartmut Schandl, Villingen-Schwenningen, both of Fed. Rep. of Germany, assignors to Deutsche Thomson-Brandt GmbH, Villingen-Schwenningen, Fed. Rep. of Germany

Continuation of Ser. No. 871,413, May 15, 1986, abandoned.

This application Oct. 14, 1988, Ser. No. 259,434

Claims priority, application Fed. Rep. of Germany, Sep. 28, 1984, 3423649

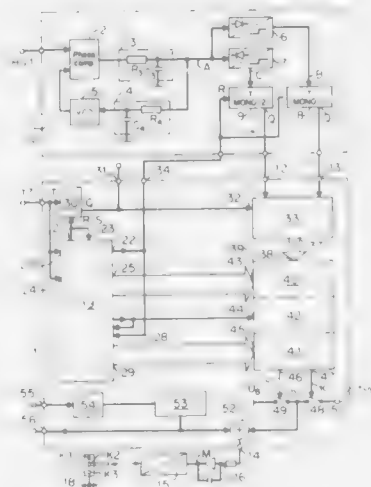
Int. Cl.⁴ H04N 5/783

U.S. Cl. 360-10.2

18 Claims

4. A track readjustment arrangement for a video magnetic tape recorder with magnetic tape having motion in a predetermined direction; at least two magnetic heads traveling across said motion direction for scanning transversely signals recorded on said magnetic tape; a rotatable head wheel carrying said magnetic heads and having a central axis; said magnetic heads having air gaps with an azimuth angle alternating mirror-inverted around said central axis; said signals scanned by said magnetic heads may have phase errors of horizontal sync pulses, said phase errors having magnitude and direction; each of said magnetic heads providing control parameters derived from the magnitude and direction of said phase errors; and means for selectively axially varying and resetting said head wheel as a function of said control parameters, said headwheel with all magnetic heads following recorded magnetic tracks on

said tape during still picture reproduction as well as during normal reproduction when said tapes moves, said headwheel



with said magnetic heads following said recorded magnetic tracks exclusively through said phase errors.

4,876,615

DATA DECODING SYSTEM

Tadaaki Chikashige, Tokyo, Japan, assignor to Nakamichi Corporation, Tokyo, Japan

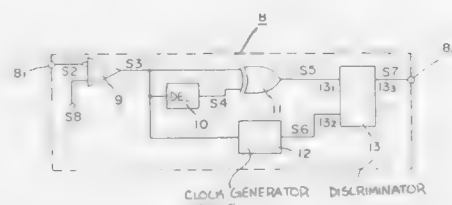
Filed Oct. 30, 1987, Ser. No. 114,777

Claims priority, application Japan, Oct. 31, 1986, 61-260493

Int. Cl.⁴ G11B 5/09

U.S. Cl. 360-43

6 Claims



1. A data decoding system for decoding digital signals stored on a magnetic medium so that one of logical variables "1" and "0" is indicated by a state inversion of signals "H" and "L" at a time interval of a bit cell period, while the other logical variable is indicated by a state inversion at a time interval of half of said bit cell period, said data decoding system characterized by:

means to produce a processing signal having the logic state thereof varying in response to the inversion of the logic state corresponding to only one of said logical variables,

means to form an NRZ signal by exclusive logical addition of said processing signal and a delay signal delaying said processing signal for a time interval of one bit cell period.

4,876,616

APPARATUS FOR REPRODUCING A DIGITAL SIGNAL
Azusa Katsumata, and Shigeyuki Satomura, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

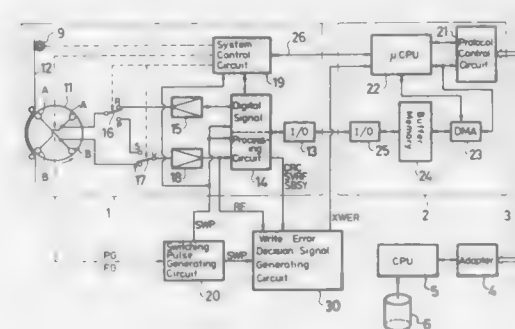
Filed Jul. 15, 1988, Ser. No. 220,028

Claims priority, application Japan, Jul. 22, 1987, 62-183022; Jul. 22, 1987, 62-183023

Int. Cl.⁴ G11B 5/09

U.S. Cl. 360-53

14 Claims



1. An apparatus for reproducing a digital signal from a recording medium which has tracks patterned thereon in each of which are recorded a plurality of blocks of data signals, each block of data including a header, a parity of the header and other digital information, the apparatus comprising:

means for reproducing the recorded signals from the recording medium;

error detecting means, which monitors the reproduced header parity, for detecting good parity for each block and outputting a corresponding good parity detection signal;

counting means for counting the good parity detection signal from the error detecting means; and

comparing means for comparing the error count in the counting means with a predetermined value and outputting a write error decision signal, indicating the corresponding data block has no uncorrectable errors, when the count exceeds the predetermined value, and indicating that the corresponding data block has uncorrectable errors, when the count does not exceed the predetermined value.

4,876,617

SIGNAL IDENTIFICATION

Stuart J. Best, and Reginald A. Willard, both of Hayes, England, assignors to Thorn Emi plc, London, England

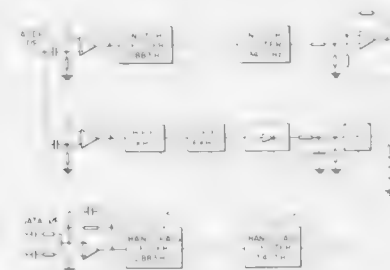
Filed May 5, 1987, Ser. No. 46,126

Claims priority, application United Kingdom, May 6, 1986, R611014

Int. Cl.⁴ G11B 15/04, 5/62

U.S. Cl. 360-60

4 Claims



1. Apparatus for the labelling of signals, said apparatus having an encoder circuit comprising:

means to eliminate at least two particular, predetermined

frequency bands from a given signal to form corresponding notches therein;

means to insert a code sequence into said notches, the code comprising frequencies corresponding to the respective centre frequencies of the notches;

means to inhibit the insertion of said notches and hence said code sequence when the signal frequency lies outside a specified range;

means to monitor the amplitude of the said signal and means to set the code amplitude at a predetermined level below the signal amplitude level, so that the code level varies with the signal level.

4,876,618

METHOD FOR DETECTING ZERO TRACK

Jun Ide, and Tomoo Iizumi, both of Furukawa, Japan, assignors to Alps Electric Co., Ltd., Japan

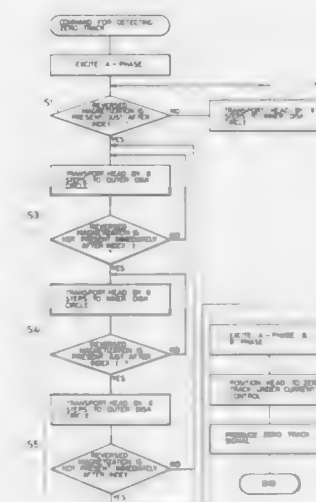
Filed Sep. 8, 1987, Ser. No. 94,295

Claims priority, application Japan, Nov. 22, 1986, 61-277820

Int. Cl.⁴ G11B 5/55, 21/08

U.S. Cl. 360-78.13

3 Claims



1. A method for detecting a zero track of a plurality of concentrically formed tracks on a disk-shaped recordable medium by transporting a detection head along the medium by means of a stepping motor having at least two excitable phases, the recordable medium being rotated in a predetermined direction and having at least one index mark on each track, the method comprising the steps of:

(a) forming a recorded region at least on a part of the concentrically formed tracks, onto which data has been previously recorded;

(b) forming a non-recorded region on tracks outside the recorded region;

(c) exciting a first phase of the stepping motor so as to transport the detecting head to a track;

(d) detecting by means of the detecting head if data has been recorded immediately after an index mark on the track, and if data has been recorded proceeding a step(e) otherwise if data has not been recorded transporting the head inwards towards the center of the medium and repeating this step;

(e) transporting the head outwards from the center of the medium by a certain number of steps of the stepping motor to a track;

(f) detecting by means of the head if data has been recorded immediately after an index mark on the track of step (e), and if data has not been so recorded proceeding a step(g) otherwise if data has been so otherwise recorded, returning to step (e);

- (g) transporting and the head inwards by a certain number of steps of the stepping motor to a track;
- (h) detecting by means of the detecting head if data has been recorded immediately after an index mark on the track of step (g), and if data has been so recorded proceeding to a step (i) otherwise if data has not been so recorded, returning to step (g);
- (i) transporting the head outwards by a certain number of steps of the stepping motor to a track;
- (j) detecting by means of the detecting head if data has been recorded immediately after an index mark on the track of step (i), and if data has not been so recorded proceeding to a step (k) otherwise if data has been so recorded, returning to step (e);
- (k) exciting both phases of the stepping motor simultaneously so as to position the head over the track of step (i); whereby the track of step (i) is the zero track.

4,876,619

DISK CARTRIDGE HAVING SHUTTER AND A DEVICE FOR OPENING AND CLOSING THE SHUTTER

Masayuki Suzuki, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

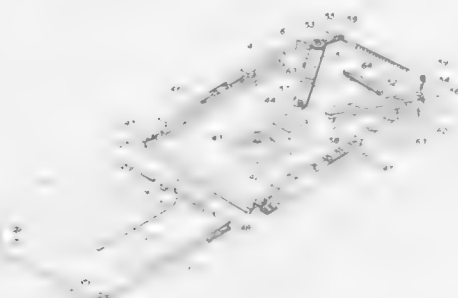
Continuation of Ser. No. 86,729, Jul. 22, 1987, abandoned. This application Jan. 23, 1989, Ser. No. 300,242

Claims priority, application Japan, Nov. 22, 1985, 60-180502[U]

Int. Cl.⁴ G11B 5/012, 23/03

U.S. Cl. 360-97.01

8 Claims



1. In a disk cartridge having an upper side connected by a lateral edge to a lower side, said cartridge having a shutter that may be slide along the lateral edge by a shutter opening and closing device between a first position for closing signal read-out or signal write apertures on the upper or lower side of the disk-containing cartridge and a second position for opening said apertures, the improvement comprising said opening and closing device having a first rotary arm and a second rotary arm, said shutter having a lateral side with an engaging hole for engagement with the first rotary arm of the shutter opening and closing device, said hole extending orthogonal to a direction of insertion for said disk cartridge, said first rotary arm being engaged in said opening and being turned by the movement of insertion of said disk cartridge to slide said shutter along the lateral edge of the cartridge from said first position to said second position to open said apertures, and a recess in the lateral edge of said cartridge at a position exposed by said shutter when moved to the second position, said recess receiving a portion of said second rotary arm as the cartridge moves to the inserted position and the shutter is in the second position.

4,876,620 PROTECTION DEVICES AND ARRANGEMENTS FOR TELEPHONE LINES

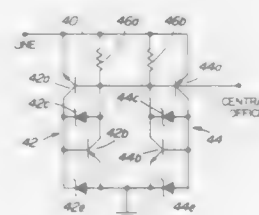
Jerzy Borkowicz, Nepean, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Sep. 29, 1988, Ser. No. 250,651

Int. Cl.⁴ H02H 3/24

U.S. Cl. 361-56

17 Claims



1. A protection device comprising:
- a first and second terminals, for connection to a wire of a telephone subscriber line and to ground respectively, and a third terminal;
- a first SCR (semiconductor controlled rectifier) having a cathode and an anode connected to the first and second terminals respectively, and a gate adjacent to the cathode coupled directly to the third terminal;
- a second SCR, complementary to the first SCR, having an anode and a cathode connected to the first and second terminals respectively, and a gate adjacent to the anode coupled directly to the third terminal; and
- resistive means connected between the first and third terminals, whereby a predetermined current flowing via the resistive means triggers one of the SCRs to conduct current between the first and second terminals.

4,876,621

LINE PROTECTOR FOR A COMMUNICATIONS CIRCUIT

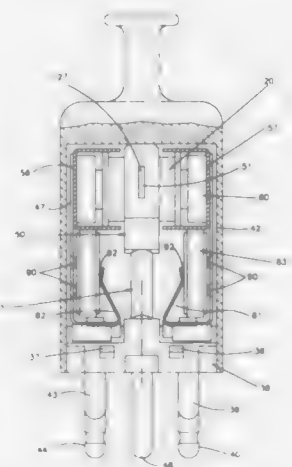
Wayne Rust, Berwyn, and Alexander G. Gilberts, Algonquin, both of Ill., assignors to Reliance Comm/Tec Corporation, Chicago, Ill.

Filed Dec. 8, 1988, Ser. No. 281,492

Int. Cl.⁴ H02H 9/04

U.S. Cl. 361-58

10 Claims



1. A line protector for a communications circuit comprising:
- (a) an insulating means;
- (b) a surge voltage arrestor in spaced relationship to said insulating means, said arrestor having opposed electrodes;

- (c) first and second conductive elements on said insulating means and extending therefrom so as to be in electrical contact, respectively, with said opposed electrodes;
- (d) third and fourth conductive elements on said insulating means and extending therefrom towards said arrestor; and
- (e) two devices each having the capability of limiting current flowing therein to have an amplitude which is no greater than a predetermined amplitude, one of said devices in contact with said first and third conductive elements to provide a conductive path therebetween and the other of said devices in contact with said second and fourth conductive elements to provide a conductive path therebetween.

4,876,622

CIRCUIT BREAKER WARNING RELAY AND CONTROL ACCESSORY

John J. Dougherty, Avon, Conn., assignor to General Electric Company, New York, N.Y.

Filed Aug. 3, 1988, Ser. No. 228,135

Int. Cl.⁴ H02H 3/08

U.S. Cl. 361-94

15 Claims



1. A circuit breaker warning relay and indicator circuit comprising:
- a plurality of input terminals;
- a corresponding plurality of first operational amplifiers connected with said input terminals;
- a corresponding plurality of double-diodes connected with outputs from said first operational amplifiers;
- said double-diodes having first outputs connected in parallel with each other and in series with one input to a second operational amplifier having ON and OFF states, another input to said second operational amplifier being connected with a reference voltage; and
- an indicator diode connected to an output from said second operational amplifier for providing indication of the ON state of said second operational amplifier.

4,876,623

MAGNETIC DISC DEVICE WITH GIMBAL SPRING HAVING VARIABLE ELASTIC CHARACTERISTICS

Shigeru Takekado, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Sep. 30, 1987, Ser. No. 103,017

Claims priority, application Japan, Sep. 30, 1986, 61-231762

Int. Cl.⁴ G11B 5/48

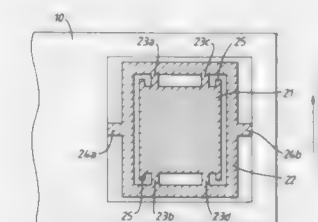
U.S. Cl. 360-104

6 Claims

1. A magnetic recording device for recording and reproducing data on a magnetic disc, comprising:
- a magnetic head for contacting the magnetic disc and for reading and writing data on the magnetic disc;
- means for rotatably supporting the magnetic disc for contact with said magnetic head; and
- gimbal plate means flexibly supporting the head for movement in two directions of rotation with respect to the magnetic disc and for compensating for variations in the thickness and surface level of the disc, said gimbal plate means structured to include link means constructed and

positioned to provide distinct degrees of elasticity of said gimbal plate means in said two directions of rotation, said link means including at least six links in one direction of rotation to reduce elasticity in one of said two directions of rotation and to increase elasticity in the other of said two directions of rotation;

said gimbal plate means includes a support arm having a flexible gimbal portion mounted thereon, said magnetic head being mounted on said flexible gimbal portion;



said gimbal portion includes a head fixing portion and an intermediate gimbal portion located about the periphery of said head fixing portion, said intermediate gimbal portion being flexibly attached to said support arm; and

said six links symmetrically arranged in at least a pair of links on opposite sides of said head fixing portion for connecting said head fixing portion to said intermediate gimbal portion, and said link means including at least two pairs of links in the other direction located on opposite sides of said intermediate gimbal portion for connecting said intermediate gimbal portion to said support arm.

4,876,624

APPARATUS FOR DETECTING UNSYMMETRICAL BIPOLAR WAVEFORMS

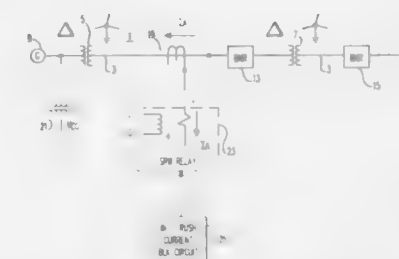
Kung C. Chow, Coral Springs, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 13, 1988, Ser. No. 220,706

Int. Cl.⁴ H02H 3/26

U.S. Cl. 361-87

12 Claims



1. Apparatus for detecting a preselected unsymmetry bipolar waveforms of a predetermined frequency comprising:
- means generating a pulse at each zero crossing of the bipolar waveform;
- first circuit means generating a first signal of a first value for a first preselected interval in response to a pulse from the pulse generating means and generating a first signal having a second value otherwise;
- second circuit means generating a second signal of a first value for a second preselected interval in response to the first signal going from the first value to the second value and having a second value otherwise, said first and second intervals being selected such that first and second signals have said second values simultaneously only when said bipolar waveform has at least said preselected unsymmetry; and
- third circuit means responsive to the simultaneous presence

of said first signal of the second value and the second signal of the second value to generate an output signal indicative of said preselected unsymmetry of the bipolar waveform.

4,876,625

COMPOSITE CIRCUIT BREAKER SYSTEM

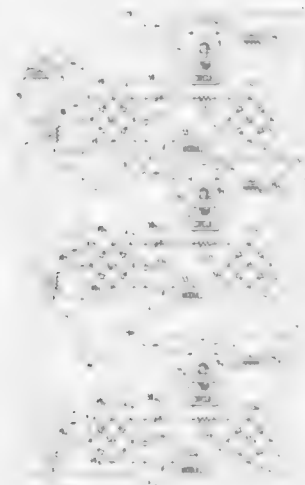
William R. Wolfe, Penn Hills, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 4, 1988, Ser. No. 267,133

Int. Cl.⁴ H02H 3/08

U.S. Cl. 361-93

12 Claims



1. A composite circuit breaker system for a main electrical conductor carrying a total current, said composite circuit breaker system comprising:

- means dividing the main conductor into a plurality of parallel branch conductors, each of which carry a branch current which is a proportionate share of the total;
 - a separate circuit breaker connected in each branch conductor to selectively interrupt the branch current therein;
 - means associated with each circuit breaker generating a branch current signal representative of the current in the branch in which the circuit breaker is connected; and
 - means generating a signal representative of the total current signal for application to each circuit breaker;
- said circuit breakers including circuit means responsive to both the branch current signal and the signal representative of the total current to interrupt said branch current when either of the branch current signal and the signal representative of the total current exceeds a specified value.

4,876,626

CENTRAL OFFICE PROTECTOR MODULE WITH ALARM INDICATOR

Richard Kaczmarek, Chicago, Ill., assignor to Reliance Comm/Tec Corporation, Chicago, Ill.

Filed Jun. 3, 1988, Ser. No. 202,702

Int. Cl.⁴ H02H 9/04

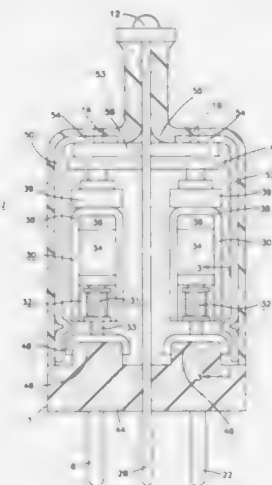
U.S. Cl. 361-119

16 Claims

1. A line protector for a communications circuit comprising:
 - (a) a housing having an end wall and an opening opposite to said end wall;
 - (b) an insulating member forming a base, said member closing said opening;
 - (c) at least one line pin projecting from said base;
 - (d) a ground terminal in said base;
 - (e) an alarm pin for connection to a source of voltage, said pin projecting from said base;
 - (f) at least one protection means communicating between

said at least one line pin and said ground terminal, said protection means for providing an electrical connection between said line pin and said ground terminal upon the occurrence of any one of a predetermined number of conditions, said protection means permanently providing said electrical connection for at least one of said conditions;

- (g) at least one alarm terminal associated with said protection means, said protection means electrically connecting said alarm terminal to said ground terminal when said



protection means permanently provides said electrical connection; and

- (h) electrically powered alarm indicating means having two terminals and mounted in said housing, said alarm terminal in electrical connection with one of said indicating means terminals and said alarm pin in electrical connection with the other of said indicating means terminals such that when said alarm pin is connected to said voltage source and said alarm terminal is electrically connected to said ground terminal current flows through said alarm indicating means to indicate an alarm.

4,876,627

VARIABLE ELECTRONIC COMPONENT

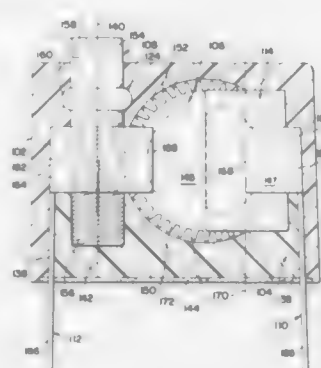
Martin A. Mittler, Lake Hiawatha, and Kenneth J. Scowen, Springfield, both of N.J., assignors to Voltronics Corporation, East Hanover, N.J.

Filed Apr. 6, 1989, Ser. No. 334,911

Int. Cl.⁴ H01G 5/06

U.S. Cl. 361-293

28 Claims



1. A variable electronic component comprising a housing, a

rotor within said housing, said rotor having a contact portion and an impedance varying portion, rotating means for rotating said rotor, an impedance varying member arranged overlying a portion of said impedance varying portion, first contact means engaging said contact portion of said rotor without engaging said impedance varying member, and second contact means urging said impedance varying member into sliding contact with a portion of said impedance varying portion, whereby rotation of said rotor varies the extent of overlap between said impedance varying member and said impedance varying portion to provide a desired range of impedance characteristics to said component.

4,876,628

THIN FILM ION CONDUCTING COATING

Ronald B. Goldner, Lexington; Terry Haas, Sudbury; Kwok-Keung Wong, Watertown, and George Seward, Arlington, all of Mass., assignors to Tufts University, Medford, Mass.

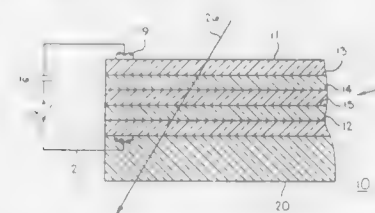
Division of Ser. No. 93,782, Sep. 8, 1987, Pat. No. 4,832,463.

This application Feb. 21, 1989, Ser. No. 312,196

Int. Cl.⁴ H01G 4/06; H01M 10/39

U.S. Cl. 361-313

5 Claims



1. A storage battery comprising:
 - an electronically conductive substrate;
 - a first storage electrode on said substrate, said storage electrode comprising an ion conductive-electron conductive layer;
 - an ion conductive-electron resistive layer on said first storage electrode, said ion conductive-electron resistive layer being capable of transporting positive metal ions into said first storage electrode;
 - a second storage electrode on said ion conductive-electron resistive layer; and
 - an electronically conductive layer on said second storage electrode, said electronically conductive layer and said electronically conductive substrate being adapted for connection with an external voltage source, whereby when voltage of a first polarity is applied across said electronically conductive layer and said electronically conductive substrate, said positive metal ions are transported from said first storage electrode through said ion conductive-electron resistive layer and when voltage of a second polarity is applied across said electronically conductive layer and is electronically conductive substrate, said positive metal ions are transported through said ion conductive-electron resistive layer to said first storage electrode, said ion conductive-electron resistive layer comprising a mixture of lithium oxide and an oxide selected from the group consisting of: boron oxide, magnesium oxide, aluminum oxide, silicon oxide, calcium oxide, manganese oxide and zinc oxide.

4,876,629

UNDERGROUND CONTROL HOUSING

Michael R. Phillips, P.O. Box 1064, Benton Harbor, Mich. 49022

Filed Jun. 27, 1988, Ser. No. 211,579

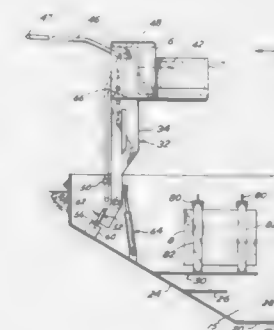
Int. Cl.⁴ H02B 1/20

U.S. Cl. 361-391

4 Claims

1. A housing which stores controls below ground level wherein controls are contained within a plurality of control

boxes, said housing including a pair of side walls and a pair of end walls, and a bottom wall to define an enclosure, said housing including pivot means carried within said enclosure for lifting said control boxes out of said housing, said pivot means including an arm operatively connected to said control boxes at a proximal end thereof, and a distal end attached to said housing, said arm pivotable between a lowered storage position



tion and a raised service position, at least one of said control boxes housing position sensitive equipment, said one control box supported within said enclosure and including latching means for detachably and pivotally connecting the one control box to said pivot means whereby said one control box remains in its original orientation as the arm is pivoted into its raised service position.

4,876,630

MID-PLANE BOARD AND ASSEMBLY THEREFOR

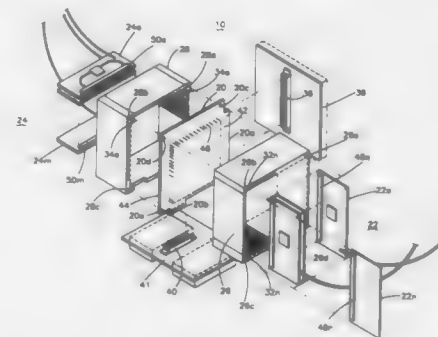
Prithpal Dara, Richardson, Tex., assignor to Reliance Comm/Tec Corporation, Chicago, Ill.

Continuation of Ser. No. 65,025, Jun. 22, 1987, abandoned. This application Sep. 23, 1988, Ser. No. 250,974

Int. Cl.⁴ H05K 01/18

U.S. Cl. 361-413

2 Claims



1. An assembly comprising:
 - (a) a mid-plane board having first and second sides, said board allowing a first group of at least two circuit cards each having means for connection to said first side to be interconnected in any order to a second group of at least two circuit cards having means for connection to said second side, said mid-plane board comprising:
 - (i) a first group of at least four pins projecting outwardly on both said first and said second sides, at least two of said first group of pins being associated with a respective one of each of said first group and said second group connection means;
 - (ii) a second group of at least two pins projecting outwardly only on said first side, at least one of said first

- side projecting only pins being associated with a respective one of said first group connection means; and
- (iii) a third group of at least two pins projecting outwardly only on said second side, at least one of said second side projecting only pins being associated with a respective one of said second group connection means,
- (b) a first housing having at least two card guide and support means each of said means associated with a respective one of said at least two first group circuit cards, each of said means allowing said associated one of said first group circuit cards connection means to be brought into contact with said associated ones of said first, second and third groups of pins when said associated ones of said first group circuit cards is inserted therein; and
- (c) a second housing having at least two card guide and support means each associated with a respective one of said at least two second group circuit cards, each of said means allowing said associated ones of said second group circuit cards connection means to be brought into contact with said associated ones of said first, second and third groups of pins when said associated ones of said second group circuit cards is inserted therein,
- said at least two card guide and support means of said first housing being in an orthogonal relationship to said at least two card guide and support means of said second housing, said mid-plane board, said first housing and said second housing including coaxially aligned means for assembling said assembly such that said first housing is attached to said mid-plane board first side and said second housing is attached to said mid-plane board second side when said assembly is assembled.

4,876,631

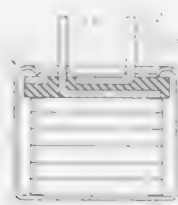
ELECTRIC DOUBLE LAYER CAPACITOR

Masanori Endo, and Kouichi Watanabe, both of Kyoto, Japan, assignors to Murata Manufacturing Co., Ltd., Japan
Filed Feb. 8, 1989, Ser. No. 308,111

Claims priority, application Japan, Feb. 9, 1988, 63-28125
Int. Cl.⁴ H01G 9/00

U.S. Cl. 361—502

4 Claims



1. An electric double layer capacitor comprising:
first and second polarizable electrodes,
a separator disposed between said first and second polarizable electrodes, and
first and second current collectors in contact with said first and second polarizable electrodes, and
each of said first and second polarizable electrodes comprising an activated carbon electrode which is made from activated carbon obtained by subjecting a synthetic resin to flame resisting treatment and activating treatment and which contains a titanium compound whose amount is between 0 and 0.2 wt % in terms of Ti, and electrolyte.

4,876,632

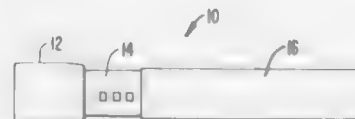
FLASHLIGHT WITH BATTERY LIFE INDICATOR MODULE

Ralph F. Osterhout, San Francisco; Paul L. Howard, Belmont, and Greta G. Light, San Mateo, all of Calif., assignors to Tekna, Inc., Redwood City, Calif.

Continuation-in-part of Ser. No. 147,795, Feb. 10, 1988, abandoned. This application Feb. 12, 1988, Ser. No. 155,426
Int. Cl.⁴ F21L 9/00

U.S. Cl. 362—183

22 Claims



1. An apparatus for a flashlight comprising:
a tubular module having first and second ends;
means for coupling said first end to a flashlight head assembly;
means for coupling said second end to a battery holder assembly;
means for providing an electrical connection between said battery holder assembly and said flashlight bulb assembly;
an indicator mounted in said tubular module and visible from the exterior of said tubular module; and
circuit means for measuring a battery level and activating said indicator when said battery level passes a predetermined value.

4,876,633

LIGHTING SYSTEM

Hartmut S. Engel, Schloss Heutingen, Freiburg am Neckar, Fed. Rep. of Germany 7141

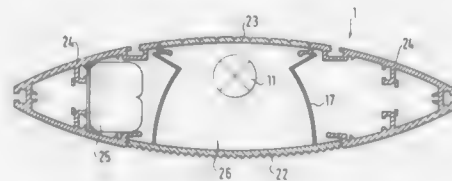
Filed Dec. 22, 1987, Ser. No. 136,689

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1986, 3644335

Int. Cl.⁴ F21S 3/00

U.S. Cl. 362—223

1 Claim



1. Elongate lighting unit for use in a modular lighting system for generating light band type structures, said lighting unit comprising:
an elongate carrier section having a cross-section resembling a double convex lens and being composed of two identically constructed, extruded, lateral profiled sections each having an essentially V-shaped cross-section with an apex and ends, defining a mouth, opposite to said apex;
means connecting said lateral profiled sections together at said ends with said apices forming respective longitudinal side edges of said lighting unit and with said mouths confronting each other but spaced apart from each other, whereby to form a central chamber between said lateral profiled sections and side chambers within said lateral profiled sections;
at least one fluorescent tube received within said central chamber;
functional means comprising a choke and electrical cables

and optionally other functional elements disposed in at least one of said side chambers;
said lateral profiled sections including continuous webs, and undercuts forming coupling connections with modular elements to be mounted in said central region above and below said at least one fluorescent tube, said modular elements comprising translucent covers, non-light permeable covers, shield arrays and scattering grids; and
reflectors provided to the sides of said at least one fluorescent tube with said reflectors extending across the mouths of the respective associated lateral profiled sections.

4,876,634

MULTI-PULSE CONVERTER SYSTEM

Derek A. Paice, Palm Harbor, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 1, 1988, Ser. No. 214,080

Int. Cl.⁴ H02M 7/00

U.S. Cl. 363—5

13 Claims



1. A multiple AC/DC converter system comprising:
a regular polygon connected transformer having at least six successive windings defining successive tappings therebetween which constitute secondary tappings of the transformer;
alternate ones of said windings each having a mid-point tapping;
a three-phase primary power supply being supplied to said midpoint tappings which constitute primary tappings of the transformer;
said secondary tappings being respectively connected to six pairs of static-controlled rectifiers, each of said pairs being serially mounted across opposite polarity DC terminals;
wherein said secondary tappings belong to two sets of three tappings symmetrically disposed about said primary tappings, one set being oriented clockwise, the other set being oriented counterclockwise relative thereto;
whereby a voltage phase shift of predetermined magnitude relative to the voltage applied by the power supply is provided by three pairs of static-controlled rectifiers connected to said primary tappings, such phase shift being one polarity for one of said two sets of secondary tappings and opposite in polarity for the other of said two sets of secondary tappings.

4,876,635

SERIES RESONANT INVERTER WITH LOSSLESS SNUBBER-RESETTING COMPONENTS

John N. Park, Rexford; Robert L. Steigerwald, Burnt Hills, and Michael J. Schutten, Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 23, 1988, Ser. No. 288,909

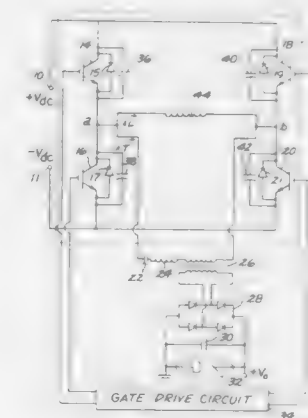
Int. Cl.⁴ H02M 3/337, 7/5387

U.S. Cl. 363—17

9 Claims

1. An improved series resonant bridge inverter, comprising:
two pairs of controllable switch means, the switch means of each pair being connected in series and each pair of series-

connected switch means being adapted to be connected in parallel across a DC supply;
a series resonant circuit connected between the junctions of the controllable switch means in each pair of controllable switch means and comprising a capacitor and an inductor, said series resonant circuit further having means for coupling the output of the resonant inverter to a load, said



controllable switch means providing a rectangular wave signal to said resonant circuit;
a snubber capacitor coupled across each of said controllable switch means; and
circuit means coupled to said series resonant circuit for drawing sufficient current to ensure that each said snubber capacitor is discharged before turning on the respective switch means coupled thereacross.

4,876,636

SWITCHING POWER SUPPLY HAVING AN EMERGENCY MODE REGULATING VOLTAGE ON THE PRIMARY SIDE

Gerard Rilly, Unterkirnach, and Jose-Ignacio Rodriguez, Villingen, both of Fed. Rep. of Germany, assignors to Deutsche Thomson-Brandt GmbH, Villingen-Schwenningen, Fed. Rep. of Germany

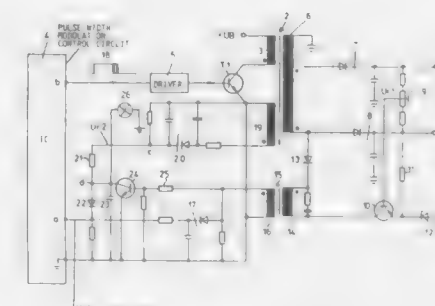
Filed Jul. 15, 1988, Ser. No. 219,974

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1984, 3723484

Int. Cl.⁴ H02M 3/335

U.S. Cl. 363—21

12 Claims



1. In a switching power supply including a transformer having a primary winding and a secondary winding, a switching transistor connected to said primary winding, a control circuit means, having a control input terminal and responsive to a regulating voltage at said control input terminal, for controlling the switching of said transistor for causing same to produce a pulsed voltage in said primary winding, rectifier circuit means, connected to said secondary winding, for pro-

ducing at least one operating voltage at its output, and further circuit means for generating a first regulating voltage from said at least one operating voltage, and for feeding said first regulating voltage to said control input terminal of said control circuit means to control same to stabilize said at least one operating voltage to a rated value; the improvement wherein said further circuit means for generating said first regulating voltage comprises means for producing a regulating voltage value proportional to said at least one operating voltage, means for producing a pulsed voltage, means for amplitude modulating said pulsed voltage with said regulating voltage value, a further transformer having first and second windings with said first winding being connected to receive the modulated pulsed voltage, and a rectifier connected between said second winding of said further transformer and said control input terminal; and further comprising an emergency regulating voltage circuit means for generating a second regulating voltage disposed on the primary side of said transformer, with said second regulating voltage having a value such that, when applied to said control input, it causes regulation of said at least one operating voltage to at most said rated value of said at least one operating voltage, and a switching circuit means for automatically switching said second regulating voltage to said control input terminal in the absence of said first regulating voltage.

4,876,637

POWER CONVERTER AND METHOD OF CONTROLLING THE SAME

Tadao Mose, Tachikawa, Yasuhiro Andoh, Hachioji, and Tatsuhisa Kitase, Fuchu, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

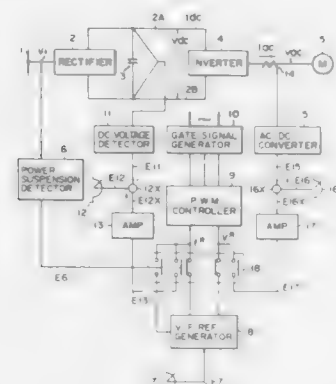
Filed Mar. 21, 1989, Ser. No. 326,647

Claims priority, application Japan, Mar. 22, 1988, 63-65651; Apr. 5, 1988, 63-83145

Int. Cl. H02M 5/458

U.S. Cl. 363-37

16 Claims



1. A power converter for converting AC input power into DC power and converting the DC power into AC output power to which a load is connected, said power converter comprising:

- control means for controlling power converting operation of said power converter;
- DC voltage detector means for detecting a DC voltage of the DC power to provide a DC voltage signal;
- first reference generator means for generating a first reference;
- output detector means for detecting a condition of the AC output power to provide an output condition signal;
- second reference generator means, coupled to said output detector means, for generating a second reference in response to said output condition signal;
- condition detector means for detecting a condition of the AC input power to provide an input condition signal; and
- selector means, coupled to said condition detector means and said control means, for supplying said second refer-

ence to said control means when said input condition signal is provided.

4,876,638

LOW-NOISE SWITCHING POWER SUPPLY HAVING VARIABLE RELUCTANCE TRANSFORMER

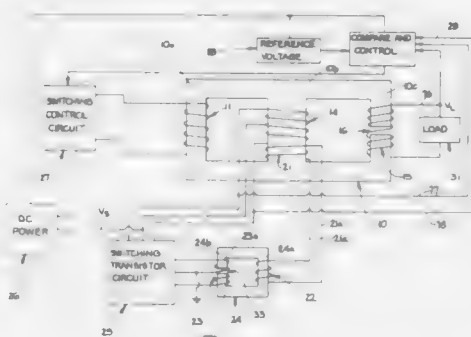
Donald M. Silva, West Lafayette, Leroy F. Silva, Lafayette, and Fred M. Fehsenfeld, Sr., Indianapolis, all of Ind., assignors to Electronic Research Group, Inc., West Lafayette, Ind.

Filed Feb. 10, 1988, Ser. No. 154,863

Int. Cl. H02M 3/337

U.S. Cl. 363-97

17 Claims



1. A low-noise switching power supply for producing a regulated output voltage from an unregulated supply including a non-saturating main transformer having a core with a variable reluctance path, a load winding associated with said core for producing said output voltage, means for producing from said unregulated supply an alternating magnetic flux in said core so as to produce said output voltage from said load winding, and means for varying the reluctance of at least a portion of said transformer core so as to maintain said output voltage at a substantially constant predetermined value, said transformer having a high leakage reactance whereby noise, pulses and voltage spikes are effectively isolated from said means for producing alternating magnetic flux and said load winding, said transformer further comprising first, second, and third legs, said third leg including an air gap therein, wherein the reluctance of a path through said second and third legs is greater than the reluctance of a path through said first and second legs, said load winding being associated with said third leg, said means for producing an alternating magnetic flux comprising a primary winding associated with said second leg and switching means responsive to the unregulated supply for providing an oscillating voltage of substantially constant frequency to said primary winding, whereby a voltage is induced in said primary winding and magnetic flux is produced by alternating voltage acting upon said primary coil.

4,876,639

METHOD AND CIRCUITRY FOR CAUSING SIXTEEN BIT MICROPROCESSOR TO EXECUTE EIGHT BIT OP CODES TO PRODUCE EITHER INTERNAL SIXTEEN BIT OPERATION OR INTERNAL EIGHT BIT OPERATION IN ACCORDANCE WITH AN EMULATION BIT

William D. Menach, Jr., 1924 E. Hope St., Mesa, Ariz. 85203 Division of Ser. No. 675,831, Nov. 28, 1984, Pat. No. 4,739,475, which is a continuation-in-part of Ser. No. 534,181, Sep. 20, 1983, Pat. No. 4,652,992. This application Apr. 6, 1988, Ser. No. 178,470

Int. Cl. G06F 9/22, 9/36, 9/44

U.S. Cl. 364-200

10 Claims

1. A method of operating a 2^N bit microprocessor comprising the steps of:

- setting an emulation bit in a status register in the 2^N bit microprocessor to a first logical level;
 - setting levels of a memory width bit and a register width bit in the status register to first logic levels in response to the first logic level of said emulation bit;
 - loading a 2^{N-M} bit op code in an instruction register, said op code being one of a set of 2^{N-M} bit op codes that includes all of the op codes of a different 2^{N-M} bit microprocessor, and also loading the emulation bit into the instruction register;
 - decoding the 2^{N-M} bit op code and the emulation bit in the instruction register to produce a first group of transfer signals that are useful for effectuating 2^N bit information transfers between various registers and buses of said 2^N bit microprocessor; and
 - further decoding certain ones of said first group transfer signals and said memory width bit and said register width bit to produce a second group of transfer signals that are useful in effectuating 2^{N-M} bit information transfers between various buses and registers and arithmetic logic units of said 2^N bit microprocessor,
- said first and second groups of transfer signals causing said 2^N bit microprocessor to emulate said 2^{N-M} bit microprocessor when said emulation bit has said first level by executing a same set of instructions as said 2^{N-M} bit microprocessor, wherein N and M are integers and N is greater than M.

4,876,640

LOGIC CONTROLLER HAVING PROGRAMMABLE LOGIC "AND" ARRAY USING A PROGRAMMABLE GRAY-CODE COUNTER

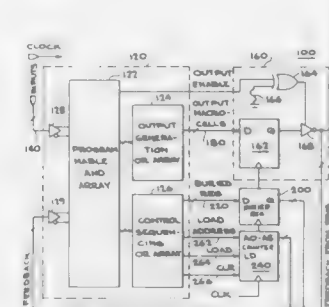
Kapil Shankar, and Om Agrawal, both of San Jose, Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Feb. 7, 1986, Ser. No. 827,840

Int. Cl. H03K 19/177, 21/38; G06F 7/00

U.S. Cl. 364-200

12 Claims



1. A logic device having both a plurality of external terminals and a plurality of device input/output ports, comprising:
 - a programmable array responsive to signals applied to said external terminals of said device for generating a plurality of logic signals;
 - a plurality of programmable output cells connected to said programmable array, each receiving programmably selectable ones of said logic signals from said programmable array, for generating a signal therefrom to a predetermined one of said device input/output ports;
 - a plurality of storage cells operatively connected to said programmable array, each receiving programmably selectable ones of said logic signals, for storing predetermined ones of said logic signals and for generating a signal therefrom; and

a programmable counter connected to said programmable array to receive programmably selectable ones of said logic signals for storing a count value and selectively incrementing or decrementing said count value, to generate counting signals;

said programmable array further responsive to said signals generated by predetermined ones of said programmable output cells, said storage cells and said counter for determining next-state logic signals; wherein said plurality of logic signals generated by said programmable array includes a plurality of load address signals and a load control signal and wherein said programmable counter, in responsive to receipt of said load control signal, replaces its contents with said load address signals.

4,876,641

VLSI DATA PROCESSOR CONTAINING AN ARRAY OF ICs, EACH OF WHICH IS COMPRISED PRIMARILY OF AN ARRAY OF PROCESSING

Colin H. Cowley, Stalybridge, Great Britain, assignor to Active Memory Technology Ltd., Reading, England

Filed Jul. 31, 1987, Ser. No. 80,300

Claims priority, application United Kingdom, Aug. 2, 1986, 561/943

Int. Cl. G06F 15/16

U.S. Cl. 364-200

5 Claims



1. Data processing apparatus comprising:

- a plurality of integrated circuit chips each comprising a plurality of data processing elements,
- means for connecting said processing elements on all the chips together to form an array of rows and columns, allowing transfer of data between adjacent elements in each row and column,
- first switching logic means within each chip for subdividing each row/column into a first plurality of sections, all said processing elements in each individual section being on the same chip, and for interconnecting first and last processing elements in each said section to allow data to be shifted cyclically through said processing elements in that section, and
- second switching logic means external to the chips for subdividing each row/column into a second plurality of sections, each of which contains processing elements from at least two different ones of said chips, and for interconnecting first and last processing elements in each section to allow data to be shifted cyclically through said processing elements in that section.

4,876,642

RULES AND APPARATUS FOR A LOOP CAPTURING CODE BUFFER THAT PREFETCHES INSTRUCTIONS

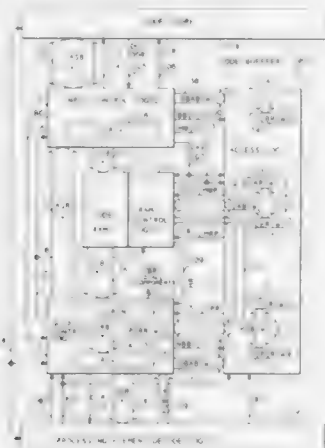
Glenn A. Gibson, 4824 Ballerina, El Paso, Tex. 79922

Filed Jan. 19, 1988, Ser. No. 144,948

Int. Cl.⁴ G06F 9/38

U.S. Cl. 364—200

20 Claims



1. Code buffer apparatus for accepting processor instructions from a code store and transferring said processor instructions to a processing element, said code buffer comprising:
 - a random access memory containing P elements;
 - an input address register;
 - a program counter register;
 - input transfer means for transferring said processor instructions from said code store to said random access memory at a location addressed by said input address register;
 - output transfer means for transferring said processor instructions at a location addressed by said program counter register from said random access memory to said processing element;
 - input access logic means for controlling said input transfer means to block transfer into said random access memory when said input address register addresses a location that is occupied by an unprocessed instruction or when said input address register addresses a location that is within an unprocessed instruction loop; and
 - output access logic means for controlling said output transfer means to block transfer out of said random access memory when said program counter register does not address an unprocessed instruction or said program counter register does not address an instruction within an unprocessed instruction loop.

4,876,643

PARALLEL SEARCHING SYSTEM HAVING A MASTER PROCESSOR FOR CONTROLLING PLURAL SLAVE PROCESSORS FOR INDEPENDENTLY PROCESSING RESPECTIVE SEARCH REQUESTS

Kevin M. McNeill, and Takeshi Ozeki, both of Tucson, Ariz., assigns to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jan. 24, 1987, Ser. No. 66,129

Int. Cl.⁴ G06F 7/06, 13/40, 9/28, 15/16

U.S. Cl. 364—200

3 Claims

1. A parallel processing search system for searching and updating a database at the request of a host system, comprising:
 - a master processor connected to a host system bus for trans-

fer of information between said master processor and said host system bus;

a data bus connected to said master processor; plural slave processors connected to said data bus for independently processing respective search requests under the control of said master processor, said slave processors also connected to said master processor via control lines, said master processor independently and dynamically programming said slave processors to perform match comparison processing of search patterns based on requests from said host system to said master processor, wherein those slave processors programmed by said master processor perform match comparison processing under the control of said master processor and each programmed slave processor signals said master processor when the search



- pattern with which the respective slave processor was programmed is matched with data on said data bus;
- a disk drive interface connected to a disk which stores a database via a disk channel connecting the disk drive to the disk;
 - a buffer memory connected to the data bus and the disk drive for storing of the database retrieved from the disk via the disk drive and for sequentially placing data from the database on the data bus for match comparison by said slave processors so that a search of the database can be made by said slave processors, said buffer memory being controlled by said master processor to store update data transferred by said host to said master processor and to transfer an updated database to said disk via said disk drive interface.

4,876,644

PARALLEL PIPELINED PROCESSOR

David W. Nuechterlein, and Mark A. Rinaldi, both of Durham, N.C., assigns to International Business Machines Corp., Armonk, N.Y.

Continuation of Ser. No. 115,150, Oct. 30, 1987, abandoned.

This application Mar. 28, 1989, Ser. No. 331,021

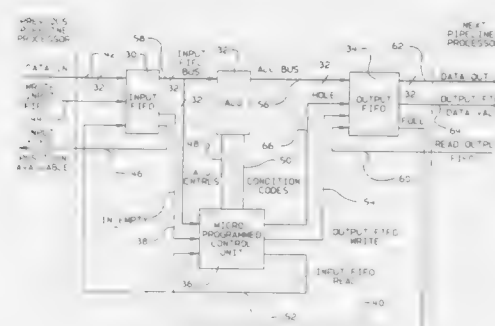
Int. Cl.⁴ G06F 9/28, 9/38

U.S. Cl. 364—200

2 Claims

1. A computer system comprising: at least two processors each including:
 - arithmetic logic unit means for receiving input information signal elements and providing output information signal elements;
 - a first-in first-out output register stack means having a plurality of output data lines and a plurality of input data lines, said input data lines being connected to said arithmetic logic unit means for receiving output information signal elements therefrom and storing the same in the register stack;
 - a program control unit connected to said arithmetic logic unit means for controlling the operation of said arithmetic logic unit and to the first-in first-out output register stack for providing neutral value information elements which are interspersed in said stack with the information ele-

ments from the arithmetic logic unit means all under control of the program control unit, said program control units being programmed such that in each corresponding address in the respective first-in first-out output register stack means not more than one program control unit can control the transfer of output information signal elements from its arithmetic logic unit to its stack means and all other program control units will supply neutral value information elements to the correspond-



- ing addresses in their first-in first-out output register stack means; and means connecting the respective output data lines of the said at least two first-in first-out output register stack means in parallel whereby during predetermined cycles of operation of said computer system output information signal elements from no more than one said first-in first-out output register stack are provided by said parallel connected output data lines.

4,876,645

DIAGNOSTIC SYSTEM

Katsuhiko Shiota, Tokyo; Tetsuhiko Ifuka, Machida, and Seichi Inamasa, Kumamoto, all of Japan, assigns to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 815,197, Dec. 27, 1985, abandoned, which is a continuation of Ser. No. 467,772, Feb. 18, 1983, abandoned. This application Mar. 16, 1987, Ser. No. 27,117

Claims priority, application Japan, Feb. 24, 1982, 51-28641

Int. Cl.⁴ G06F 11/22

U.S. Cl. 364—200

3 Claims



1. A data processor logic unit diagnostic system, comprising:
 - a logic unit;
 - memory means, connectable via memory control means to said logic unit to establish a first data path between said

logic unit and said memory means, for storing process data to be processed by said logic unit; register means, connectable via register control means to said logic unit to establish a second data path, distinct from said first data path, between said register means and said logic unit, for storing test data for testing said logic unit; said memory control means being responsive to memory means input/output control signals for connecting said first data path, said register control means being responsive to register means input/output control signals for connecting said second data path; and converting means for receiving input/output control signals for the memory means and passing said input/output control signals for the memory means as either said memory means input/output control signals or said register means input/output control signals in response to respective states of a test signal.

4,876,646

DATA PROCESSOR HAVING MULTILEVEL ADDRESS TRANSLATION TABLES

Shizuo Goto; Toyohiko Kagimasa, both of Hachioji, and Seichi Yoshizumi, Hino, all of Japan, assigns to Hitachi, Ltd., Tokyo, Japan

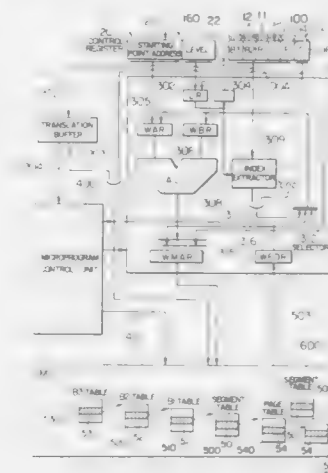
Filed Dec. 18, 1985, Ser. No. 810,189

Claims priority, application Japan, Dec. 24, 1984, 270878

Int. Cl.⁴ G06F 9/20, 9/00

U.S. Cl. 364—200

3 Claims



1. An information processing system, comprising:
 - a group of address translation tables in a multi-level configuration of greater than two levels for translating virtual addresses into corresponding real addresses, each one of said address translation tables not in the lowest level of said multi-level configuration containing a plurality of entries each of which points to a starting address of another address translation table, the former table being in a higher level than the latter table in said multi-level configuration and one of said address translation tables in the lowest level of said multi-level configuration having real address data signals to be provided as a result of address translation of a virtual address into a real address by said group of address translation tables;
 - a virtual address register for holding virtual address data to be transformed into real address data, said virtual address register comprising a plurality of data fields, each data field corresponding to one of said levels, and said virtual address data occupying a respective number of data fields among said plurality of data fields depending upon the data length of said virtual address data;

a control register for holding starting address data and level data, said level data indicating the level of the highest level address translation table required to translate the virtual address data held by said virtual address register into corresponding real address data, and said starting address data indicating a starting address of the highest level address translation table as indicated by said level data; and

means connected to said virtual address register and said control register for sequentially accessing plural address translation tables starting from the address translation table indicated by said level data in said control register, and going down to address translation tables at the levels lower than the level indicated by said level data, said accessing being effected on the basis of the starting address indicated by said starting address data and data in said data fields of said virtual address register.

4,876,647

APPARATUS FOR DETERMINING WATER STRESS IN CROPS

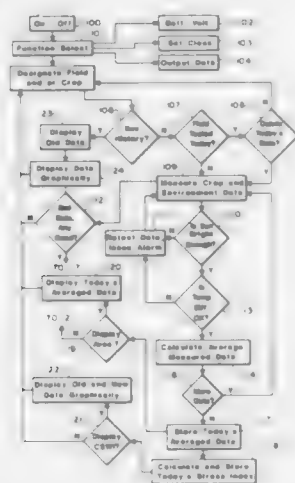
Bromson Gardner, Garfield Heights; Melvin E. Keener, Chagrin Falls; Steven C. DeSutter; Carl T. Jagatich, both of Aurora, and Ralph A. Felice, Macedonia, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Continuation of Ser. No. 9,991, Feb. 2, 1987, abandoned, which is a continuation-in-part of Ser. No. 735,798, May 17, 1985, Pat. No. 4,755,942. This application Feb. 9, 1987, Ser. No. 12,016

Int. Cl.⁴ G06F 15/20; A01G 25/16

U.S. Cl. 364—420

33 Claims



1. A portable apparatus for determining the water stress condition of an agricultural crop growing in a field comprising:

a first, pistol shaped housing carrying a plurality of sensor means for sensing a group of crop and field conditions, including air temperature, crop canopy temperature, relative sunlight intensity and relative humidity, and for generating a group of electrical sensor signals including a sensor signal indicative of each of said conditions, said pistol shaped housing having barrel means for aiming said crop canopy temperature sensor means carried by said housing at a crop and having pistol grip including trigger switch means for actuating said control means to receive said sensor signals, and wherein said relative sunlight sensor comprises at least two photoresponsive electronic devices, each device having a light-receiving surface, said surfaces being disposed at an obtuse angle relative to each other, whereby sensed sunlight intensity is relatively independent for different orientations of said barrel means;

a second housing carrying control means interconnected to said sensor means for controllably receiving said sensor

signals and for calculating, in said field using said sensor signals, at least one water stress index or a particular crop; operator input means, carried by at least one of said first and second housings and interconnected to said control means, for selectively controlling receipt of said sensor signals by said control means, said operator input means including said trigger switch means; and

display means, carried by said second housing and interconnected to said control means, for visually displaying in said field the at least one calculated crop water stress index.

9. An apparatus for determining the water stress condition of an agricultural crop growing in a field comprising:

a first housing carrying a plurality of sensor means for sensing a group of crop and field conditions, including air temperature, crop canopy temperature and relative humidity, and for generating a group of electrical sensor signals including a sensor signal indicative of each of said conditions;

a second housing carrying control means interconnected to said sensor means for controllably receiving said sensor signals and for calculating, in said field using said sensor signals, at least one water stress index for a particular crop;

operator input means, interconnected to said control means, for selectively controlling receipt of said sensor signals by said control means;

first display means, carried by said second housing and interconnected to said control means, for visually displaying the at least one calculated crop water stress index; and

second display means, carried on said first housing interconnected to said control means, for visually displaying in said field the difference between the sensed crop canopy and air temperatures.

18. An apparatus for determining the water stress condition of an agricultural crop growing in a field comprising:

a plurality of sensor means for sensing a group of crop and field conditions, including air temperature, a crop canopy temperature and relative humidity, and for generating a group of electrical sensor signals including a sensor signal indicative of each of said conditions;

control means interconnected to said sensor means for controllably receiving said sensor signals and for calculating, using said sensor signals, at least one water stress index for a particular crop, said control means including memory means for storing, for a particular operator-identified field in which a crop is growing, at least two calculated water stress indices, each of said at least two indices having been calculated from crop and field conditions sensed on a different day and for storing with each of said indices their respective dates of said crop and field condition sensing;

operator input means interconnected to said control means, for selectively controlling receipt of said sensor signals by said control means; and

display means, interconnected to said control means, for visually displaying said at least two indices graphically as a function of the date of crop and field condition sensing.

24. An apparatus for determining the water stress condition of an agricultural crop growing in a field comprising:

a plurality of sensor means for sensing a group of crop and field conditions, including air temperature, crop canopy temperature and relative humidity, and for generating a group of electrical sensor signals including a sensor signal indicative of each of said conditions;

control means interconnected to said sensor means for controllably receiving said sensor signals and for calculating, using said sensor signals, at least one water stress index for a particular crop, said control means including means for comparing a function of at least one sensed condition indicated in a said group of sensor signals with at least one limit value for said sensed condition and for rejecting said group of sensor signals when said function of at least one condition falls outside said at least one limit value;

operator input means, interconnected to said control means,

for selectively controlling receipt of said sensor signals by said control means; and

display means, interconnected to said control means, for visually displaying the at least one calculated crop water stress index.

4,876,648

SYSTEM AND METHOD FOR IMPLEMENTING AND ADMINISTERING A MORTGAGE PLAN

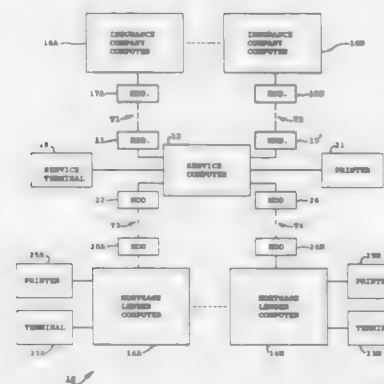
Clarke B. Lloyd, 4710 N. Marine Dr., Ste. 23A, Chicago, Ill. 60613

Filed Jan. 12, 1988, Ser. No. 143,003

Int. Cl.⁴ G06F 15/00; G06G 7/52

U.S. Cl. 364—408

43 Claims



1. A system for implementing a mortgage plan, comprising:

lender computer means;

service computer means for storing borrower information and for storing groups of investment information;

said service computer means including means for receiving said borrower information and said groups of investment information;

means for selecting an individual one of said groups of investment information;

means responsive to said borrower information and to the selected one of said group of investment information for determining a desired amount of investment funding to help repay a mortgage plan structured according to the stored mortgage information; and

means for generating mortgage implementing information for a given mortgage based on the determined amount of funding and for sending said mortgage implementing information to said lender computer means to facilitate the establishment of a mortgage plan.

4,876,649

HARM PREVENTING APPARATUS FOR VEHICLE

Faneichi Kawai, Anjo; Tomio Yasuda, Kasukabe, and Koji Aoki, Kawasaki, all of Japan, assignors to Aisin Seiki Kabushikikaisa, Aichi, Japan

Filed May 4, 1987, Ser. No. 46,006

Claims priority, application Japan, May 6, 1986, 61-103688; May 6, 1986, 61-103689; Aug. 19, 1986, 61-193835

Int. Cl.⁴ B60R 25/00

U.S. Cl. 364—424.05

70 Claims

1. A harm preventing apparatus for vehicle comprising

first detecting means for detecting the presence or absence of an occupant onboard a vehicle;

second detecting means for detecting an open/closed condition of a door of the vehicle;

an onboard door lock mechanism;

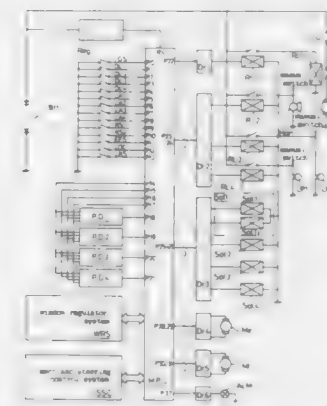
unlock means for unlocking the onboard door lock mechanism;

third detecting means for detecting the operation of the unlocking means upon the onboard door lock mechanism; and

means for establishing a harm preventive mode in re-

sponse to the detection of the absence of an occupant by the first detecting means and to the detection of the closed condition of the door by the second detecting means and for terminating the harm preventive mode in response to the detection of the operation of the unlocking means by the third detecting means;

said means for establishing a harm preventive mode includes running distance detecting means for detecting the distance through which the vehicle has run, and establishes the harm preventive mode in response to the detection of



a given distance run by the vehicle by the running distance detecting means after the detection of the absence of an occupant by the first detecting means and the detection of the closed condition of the door by the second detecting means and before the detection of the operation of the unlocking means by the third detecting means;

wherein said harm preventive mode comprises a theft monitoring mode which includes means for monitoring said first, second and third detecting means and a theft detecting mode which includes means for energizing alarm means when the harm preventive mode is established.

4,876,650

ANTI-SKID AUTOMOTIVE BRAKE CONTROL SYSTEM INCLUDING WHEEL DECELERATION CALCULATION WITH SHORTER LAG-TIME AND METHOD FOR PERFORMING CALCULATION

Jun Kubo, Hino, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Continuation of Ser. No. 601,344, Apr. 17, 1984, abandoned.

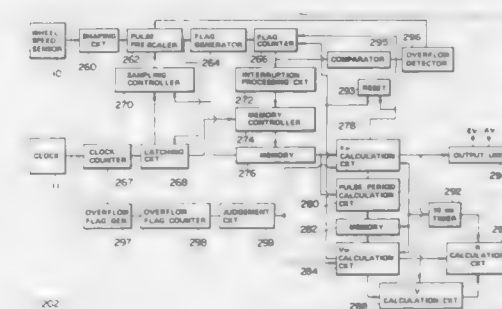
This application Feb. 5, 1988, Ser. No. 152,856

Claims priority, application Japan, Apr. 23, 1983, 58-70896

Int. Cl.⁴ B60T 8/34

U.S. Cl. 364—426.02

26 Claims



1. An anti-skid brake control system for an automotive brake system comprising:

- a hydraulic brake circuit including a wheel cylinder for applying braking force to a vehicle wheel;
- a pressure control valve disposed within said hydraulic brake circuit and operative for increasing fluid pressure in said wheel cylinder in a first position thereof and for decreasing the fluid pressure in the wheel cylinder in a second position thereof;
- a wheel speed sensor means for detecting rotational speed of said vehicle wheel and producing sensor signal pulses separated by intervals, said intervals representative of the detected wheel rotation speed;
- a timer means for producing a timer signal;
- a first means for sampling a value of said timer signal in response to a given number of said sensor signal pulses, and storing the sampled time signal value as input timing data, said input timing data including successively sampled first, second and third timer signal values;
- a second means for determining said given number of sensor signal pulses based on an interval between occurrence of one sensor signal pulse at which said first timer signal value is sampled and an immediately preceding sensor signal pulse occurring immediately before the occurrence of said one sensor signal pulse in such a manner that the intervals over said given number of sensor signal pulses becomes greater than a predetermined value, said second means triggering said first means for sampling said second timer signal value after given number of said sensor signal pulses as counted from said one sensor signal pulse, and sampling said third timer signal value after the given number of said sensor signal pulses as counter from the sensor signal pulse at which said second timer value is sampled;
- a third means for processing the stored timer signal values to produce a control signal to operate said pressure control valve at one of said first and second positions so as to maintain a slip rate at approximately optimum value, said third means being operative for deriving a wheel acceleration based on said first, second and third timer values; and
- a fourth means, associated with said first and third means, for interrupting operation of said third means when said first means is active for sampling said first, second and third timer signal values.

4,876,651

DIGITAL MAP SYSTEM

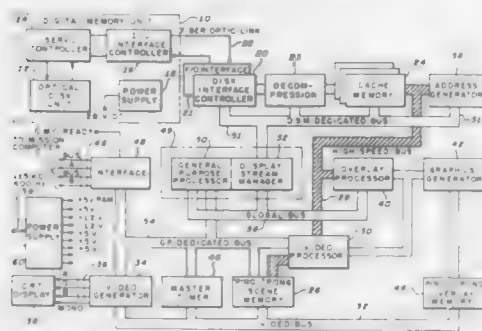
John F. Dawson, Albuquerque, N. Mex.; Eldon J. Thompson, Rockersville, Va., and James A. Consens, Albuquerque, N. Mex., assignors to Honeywell Inc., Minneapolis, Minn.

Filed May 11, 1988, Ser. No. 192,798

Int. Cl.⁴ G01S 7/44, 7/04

U.S. Cl. 364-449

70 Claims

MICROFICHE APPENDIX INCLUDED
(1 Microfiche, 44 Pages)

1. Digital mapping display system for an aircraft, wherein said aircraft includes a mission computer for generating digital signals indicative of the aircraft's present longitude and latitude coordinate positions, a heading signal indicative of the angular direction of motion, and signals corresponding to map data and graphical data, further including a mass memory unit

for storing said map data signals in digital form representative of a map of territory overflowed by the aircraft and for providing map data signals corresponding thereto, and for storing overlay data in digital form representative of graphical information to be superimposed on said map data, and for providing overlay data signals corresponding thereto, said display system comprising:

mass data controller means for extracting said map data signals or said overlay data signals from said mass memory unit and periodically providing updated images;

cache memory means coupled to said mass data controller means for electronically storing digital data indicative of a portion of a complete map of territory overflowed by and surrounding said aircraft, said cache memory means comprised of an array of storage segments, the number of said storage segments being substantially less than the number of segments necessary to store an image representative of a complete map of territory and greater than that necessary to store an image of said portion of a complete map for any orientation of said aircraft, each such segment being randomly positionally programmable along predetermined X and Y coordinates corresponding to latitude and longitude of said complete map of territory, and responsive to means for dynamically relocating said positions in a predetermined physical address space with respect to changes in said aircraft's coordinate position and orientation, said storage segments configured in a logical Cartesian coordinate array corresponding to said portion of said complete map of territory, each of said segments comprised of a plurality of storage elements wherein each of said storage elements stores at least one bit of digital map data and wherein each storage location has a corresponding address, and further comprising segment mapping means responsive to an address command for storing an address representative of the location of each segment within said physical address space and the location of each storage element within each segment,

first control processor means responsive to said signals generated by said mission computer and for transmitting status signals to said mission computer, and further providing display mode commands and mass memory control data,

second control processor means responsive to said first control processor means for retrieving said map and data overlay signals from said mass memory unit in accordance with said aircraft's coordinate position, for providing control signals for periodically storing said updated images derived from said mass memory unit into said cache memory means, and for controlling data display,

address generator means responsive to control signals from said second control processor means for reading and extracting map data or overlay data from said cache memory means, and transferring said data in the form of displayable pixels to first or second memory means,

video generator means, responsive to digital outputs of said first and second memory means, for converting said map data pixel signal and said overlay data pixel signal to signals displayable in color or monochrome form, and display means coupled to said video generator means and responsive to said map data and overlay data pixel signals and to a source of timing signals for providing a displayable image at a predetermined frame rate, said image corresponding to at least said portion of said complete map of territory.

4,876,652

APPARATUS AND METHOD FOR CONTROLLING THE SHEAR MECHANISM OF A GLASSWARE FORMING MACHINE

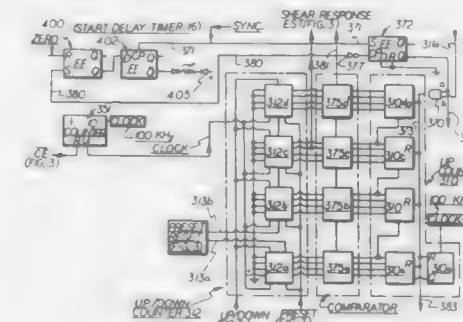
E. Boyd Gardner, Bloomfield, Conn., assignor to Emhart Industries, Inc., Farmington, Conn.

Continuation of Ser. No. 76,239, Jul. 21, 1987, abandoned. This application Nov. 16, 1988, Ser. No. 273,116

Int. Cl.⁴ G06F 15/46

U.S. Cl. 364-473

2 Claims



1. A control system for controlling the operation of a shear mechanism which is repetitively cycled to cut identically sized gobs from a runner of molten glass to be formed into containers in a glass machine which has, means for generating sync signals, comprising shear mechanism means for cutting discrete gobs from a runner of molten glass when displaced from a retracted position to an advanced position,

means for displacing said shear mechanism means, after a timed start delay,

means for generating a shear mechanism return signal to return the shear mechanism from its advanced position to its retracted position,

first means for calculating a first time offset between a return signal and a later occurring sync signal,

second means for calculating a second time offset between a return signal and an earlier occurring sync signal, and

means for offsetting said start delay timer means by said first or second time offset so that said control system will be resynchronized each cycle of said shear mechanism.

4,876,653

PROGRAMMABLE MULTIPLE BLENDER

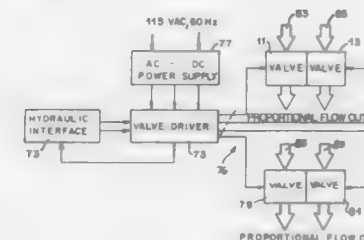
John S. McSpadden, 1008 Wharton St.; Russel D. Leatherman, 8P Woodstream La., both of Greensboro, N.C. 27410, and Harold R. Young, 1489 Old Coach Rd., Kernersville, N.C. 27284

Filed Jul. 15, 1987, Ser. No. 73,974

Int. Cl.⁴ G05D 11/13

U.S. Cl. 364-479

31 Claims



1. A system for blending low and high octane gasoline, comprising:

nozzle means for dispensing the blended gasoline, said nozzle means including blend manifold means having a first

port for receiving low octane gasoline, a second port for receiving high octane gasoline, and a mixing chamber for blending received high and low octane gasoline together just prior to dispensing;

a first flow path for delivery of said low octane gasoline from a source thereof to said first port;

a second flow path, wholly independent of and isolated from said first flow path, for delivery of said high gasoline fuel from a source thereof to said second port;

first flow control means responsive to a first control signal for controlling the rate of flow of gasoline in said first flow path;

second flow control means responsive to a second control signal for controlling the rate of flow of gasoline in said second flow path;

blend selection means for producing a blend set point signal indicative of a desired blend ratio of said low and high octane gasoline; and

processor means responsive to the flow of said low and high octane gasolines for producing, after a predetermined initial volume of gasoline has been dispensed, said first and second control signals at any given time as a function of a comparison of the ratio of the actual accumulated volume of said low octane gasoline to said high octane gasoline, relative to a statistically determined ratio of the ideal volume of said low octane gasoline to said high octane gasoline for the total actual accumulated volume of the sum of the low and high octane gasoline at a given time, said processor means including means responsive to said blend set point signal for producing an idealized ratio equivalent to at a given time what the accumulated volumes of said low and high octane gasolines must be for providing said selected blend.

4,876,654

TRUE RMS POWER DEMODULATION SYSTEM AND METHOD FOR A MODULATED RF SIGNAL

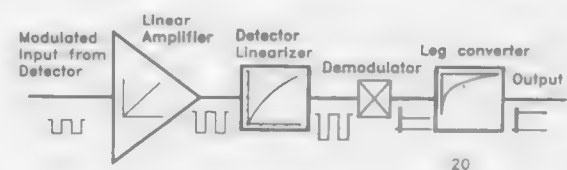
Bret A. Herscher, Mountain View, Calif., assignor to Wavetek Microwave, Inc., Sunnyvale, Calif.

Filed Apr. 1, 1988, Ser. No. 176,717

Int. Cl.⁴ G01R 23/00; H03D 1/04

U.S. Cl. 364-483

26 Claims



1. A method for true RMS power demodulation of an input signal comprising the steps of:

detecting said input signal to provide a detected signal;

linearly amplifying said detected signal to produce an amplified signal;

linearizing said amplified signal to provide a converted signal; and,

demodulating said converted signal to provide a demodulated signal.

4,876,655

METHOD AND APPARATUS FOR EVALUATING JITTER

Dale E. Carlton, Portland; Clifford E. Baker, Aloha, and Ronald M. Henricksen, Beaverton, all of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Dec. 2, 1985, Ser. No. 803,186

Int. Cl.⁴ G06F 15/74; G01D 9/00; G06K 9/46

U.S. Cl. 364-487

7 Claims

1. Apparatus for observing the distribution with respect to time of an event defined by the magnitude of a repetitive input

4,876,661

ARITHMETIC LOGIC SYSTEM CAPABLE OF CHECKING CARRY LOOK-AHEAD CIRCUIT

Kel Koya, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

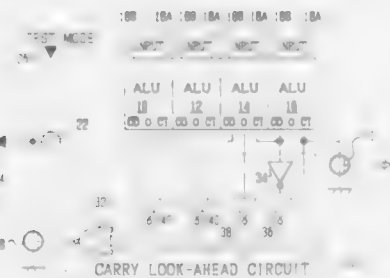
Filed Apr. 28, 1988, Ser. No. 187,180

Claims priority, application Japan, Apr. 28, 1987, 62-105821

Int. Cl.⁴ G06F 7/50

U.S. Cl. 364—787

7 Claims



1. An arithmetic logic system which includes a plurality of arithmetic logic units, arranged in series from most significant bit (MSB) to least significant bit (LSB) positions, for processing data composed of a corresponding number of bits and having a path for transferring a carry through the respective arithmetic logic units, said system further including a carry look-ahead circuit provided in parallel to the carry transfer path and having inputs respectively connected to the arithmetic logic units for generating a carry look-ahead signal when a carry look-ahead condition is realized, said system comprising a carry signal output connected to a most significant end of said carry transfer path, a first transfer gate connected at its one end to said carry signal output and at its other end to a predetermined voltage and operating in response to said carry look-ahead signal so as to connect said carry signal output to said predetermined voltage, and a second transfer gate connected between said carry signal output and said most significant end of said carry transfer path and operating in response to a test mode signal to isolate said carry signal output from said carry transfer path, whereby when said carry signal output is isolated from said carry transfer path by said second transfer gate, a carry is transferred through only said carry look-ahead circuit to said carry signal output.

4,876,662

OPTIMIZING VOLUME MOUNTS IN A MULTIDRIVE ENVIRONMENT

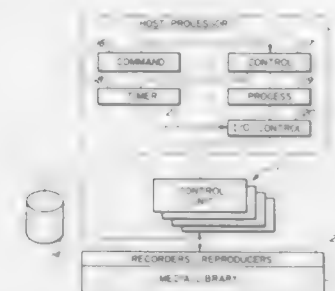
Jerry W. Pence, Tucson, Ariz., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 2, 1988, Ser. No. 188,880

Int. Cl.⁴ G06F 12/00

U.S. Cl. 364—900

7 Claims



1. In a machine-implemented method of operating a data storage system having a plurality of recorders/players for

recording and reading data, each of the recorders/players for receiving and recording on and reading from record media; the steps of:

measuring elapsed time since data was received that is targeted to a record medium received in a given one of said recorders/players; accumulating and measuring data to be transferred with respect to an unmounted record medium; mounting an unmounted record medium in said given one recorder/player only after said accumulated and measured data reaches a first predetermined amount of said data.

4,876,663

DISPLAY INTERFACE SYSTEM USING BUFFERED VDRAMS AND PLURAL SHIFT REGISTERS FOR DATA RATE CONTROL BETWEEN DATA SOURCE AND DISPLAY

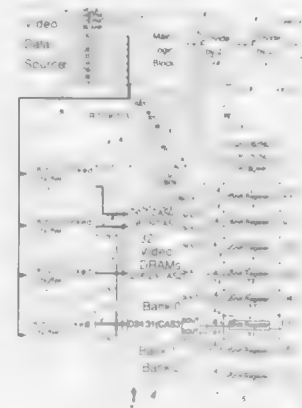
Donald G. McCord, 6304 Cat Mountain Cove, Austin, Tex. 78731

Filed Apr. 23, 1987, Ser. No. 42,111

Int. Cl.⁴ G06F 3/153, 13/10, 9/44, 15/66

U.S. Cl. 364—900

6 Claims



1. For use in a video graphics system having a source of video data and a visual display device, a virtual visual display apparatus comprising:

four 8-bit buffers; three banks of VDRAMs each of said banks having 32 VDRAMs, each of said VDRAMs having 256 rows and 256 columns of storage locations and a 256-bit internal shift register; eight 4-bit shift registers external to said VDRAMs; means for transferring 8 bits of data in parallel from said source of said video data to each of said buffers one at a time; means for transferring in parallel the contents of each buffer to a storage location in eight of said VDRAMs such that the contents of said four buffers is stored in 32 VDRAMs; means for transferring the contents of a row of said video data in each of said VDRAMs to its internal shift register; means for transferring one bit of said video data from four of said internal shift registers in parallel each of said shift registers external to said VDRAMs such that 32 bits of data from one of a bank of VDRAMs is transferred to said eight shift registers external to said VDRAMs simultaneously at said first rate; and means for transferring bits of a video data in series from each of said eight shift registers external to said VDRAMs to said visual display device at said second rate.

4,876,664

PROGRAMMABLE CONTROLLER WITH A DUAL INTERMODULE MESSAGE SYSTEM

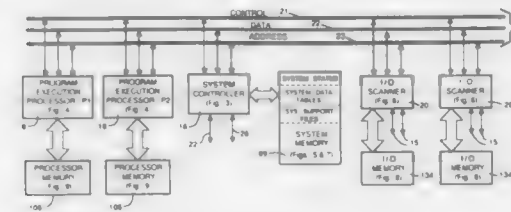
Bradley J. Bittorf, Shaker Heights, Mark A. Flood, Michael D. Kala, both of Mayfield Heights, and Robert R. Sepal, Richmond Heights, all of Ohio, assignors to Allen-Bradley Company, Inc., Milwaukee, Wis.

Filed Aug. 26, 1987, Ser. No. 89,572

Int. Cl.⁴ G06F 15/46

U.S. Cl. 364—900

11 Claims



1. A programmable controller for operating a machine to carry out a plurality of programmed functions, which includes a plurality of modules connected to a common backplane, the common backplane having a plurality of conductors for carrying data address and control signals among the modules, each module comprising:

means for obtaining access to the backplane to transmit data messages to another module; and means for storing message data from another modules, said storage means having a first set of addressable storage locations with a storage location designated for each other module.

4,876,665

DOCUMENT PROCESSING SYSTEM DECIDING APPARATUS PROVIDED WITH SELECTION FUNCTIONS

Isamu Iwai, Kawasaki; Toshio Okamoto, Bunkyo, and Miwako Doi, Kawasaki, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

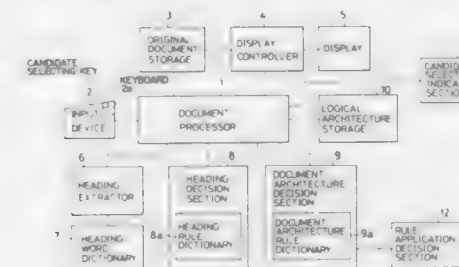
Filed Dec. 29, 1986, Ser. No. 947,091

Claims priority, application Japan, Apr. 18, 1986, 61-88065

Int. Cl.⁴ G06F 3/14, 15/21, 15/40, 15/62

U.S. Cl. 364—900

3 Claims



1. A document processing apparatus comprising: processor means for controlling document processing operations; input means connected to said processor means, for inputting document data; heading dictionary storing means for storing words and phrases frequently used as headings arranged in a column direction; heading candidate extraction means connected to said processor means and said heading dictionary storing means, for extracting, as a heading candidate, one of a plurality of words and phrases, which corresponds to one of the head-

ings stored in said heading dictionary storing means, from the document data input at said input means; heading rule dictionary means for storing rules used in determining the headings;

heading deciding means connected to said processor means and said heading rule dictionary means, for checking whether the heading candidate extracted by said heading candidate extracting means is a heading or a non-heading according to the heading rules stored in said heading rule dictionary means;

document architecture rule dictionary means for storing rules associated with document logical architectures; and document architecture deciding means connected to said processor means and said document architecture rule dictionary means, for deciding document logical architecture candidates of the heading by checking whether the heading and the non-heading decided by said heading deciding means is a chapter heading, a section heading or a paragraph, in accordance with the document architecture rules stored in said document architecture rule dictionary means;

the apparatus further comprising document architecture selecting and indicating means for allowing an operator to select at least one desired document architecture when said document architecture deciding means decides a plurality of document architecture candidates in accordance with document architecture rules, wherein said document architecture selecting and indicating means comprises:

(a) rule application deciding means accessible to said document architecture rule dictionary means when plural document logical architecture candidates are decided by said document architecture deciding means, for checking a rule name requesting candidate selection to retrieve flags corresponding to the rule name from an application rule table; and

(b) candidate selecting and indicating means responsive to a candidate selecting key, provided in said document input means, for allowing the operator to update the flags by selecting at least one desired document architecture through the candidate selecting key, said document architecture rule dictionary means storing rule application record information indicative of past rule application situations and said document architecture deciding means deciding a document architecture rule to be applied with reference to the stored rule application record information in order to facilitate document architecture selection dependent upon a learning function.

4,876,666

WAVELENGTH SELECTIVE OPTICAL DATA STORAGE SYSTEM

Hiroshi Imai; Kazuo Okada, and Michihiro Tadokoro, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 31, 1987, Ser. No. 140,210

Claims priority, application Japan, Apr. 23, 1987, 62-102712

Int. Cl.⁴ G11C 13/04

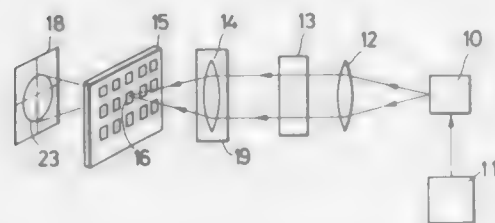
U.S. Cl. 365—106

7 Claims

1. A wavelength selective optical data storage system comprising:

a light source emitting a light beam with a variable wavelength; a recording medium having at least one pit-like memory element with a characteristic of wavelength selective optical data storage on which information is recorded by creating at least one recording hole by a narrow band light beam at specific wavelength position within a broad inhomogeneous absorption line, the pit-like memory element causing diffraction of the light beam transmitted through or reflected by it, an optical means guiding the beam emitting from the source into the medium,

a position controlling means controlling a position of a beam spot on the medium so that it is positioned on the selected memory element, and
a photodetector detecting the beam transmitted through or reflected by the pit-like memory element, wherein the photodetector is divided by a first dividing line



into two portions so that each portion detects at least part of two diffracted beams which are generated by the diffraction through the pit-like memory element, and the position controlling means controls the position of the beam spot in accordance with an error signal produced from the difference between outputs of the two portions of the photodetector.

4,876,667

DATA STORAGE DEVICE HAVING A PHASE CHANGE MEMORY MEDIUM REVERSIBLE BY DIRECT OVERWRITE

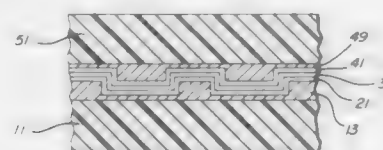
Randall R. Ross, Murray Hill, N.J.; Eric Bjornard, Concord, Calif., and David Strand, West Bloomfield, Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Filed Jun. 22, 1987, Ser. No. 64,645

Int. Cl.⁴ G11C 13/00; G11B 3/70; G01D 15/10

U.S. Cl. 365—113

2 Claims



1. In an optical data storage memory device comprising a substrate, a dielectric first encapsulating layer on the substrate, a memory layer on the dielectric first encapsulating layer, and a dielectric second encapsulating layer atop the memory layer, the improvement wherein the memory layer is a non-ablative, reversible, phase change memory layer comprising a solid solution of antimony, selenium, and tellurium, said solid solution being single phase in the amorphous and crystalline states, having a crystallization temperature above 120 degrees Centigrade, and having the composition



where x is from 0.18 to 0.43.

4,876,668

THIN FILM MEMORY MATRIX USING AMORPHOUS AND HIGH RESISTIVE LAYERS

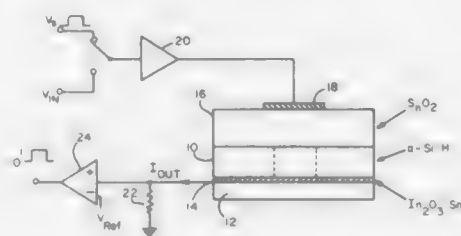
Anilkumar P. Thakoor, Pasadena; John Lambe, Altadena, and Alexander Moopen, Pasadena, all of Calif., assignors to California Institute of Technology, Pasadena, Calif.

Continuation-in-part of Ser. No. 761,185, Jul. 31, 1985, abandoned. This application Apr. 29, 1986, Ser. No. 857,076

Int. Cl.⁴ G11C 13/00

U.S. Cl. 365—163

12 Claims



1. A matrix of nonvolatile memory cells for storing bits of data comprised of
a thin film of amorphous semiconductor material overlaid by a thin film of resistive material,
a plurality of parallel ohmic contact strips on the surface of said resistive material opposite said amorphous semiconductor material,
a plurality of parallel ohmic contact strips on the surface of said semiconductor material opposite said resistive material and perpendicular to said contact strips on said thin film of resistive material, and
means for applying a pulse of electrical energy through said thin film of amorphous semiconductor material and said overlying resistive material through said contacts, said pulse being sufficient voltage to switch said amorphous semiconductor material from a high state to a low state of resistance, and for thereafter applying a pulse of electrical current sufficient to sense the state of said semiconductor material.

4,876,671

MOS STATIC TYPE RAM HAVING A VARIABLE LOAD

Sho Yamamoto, Kodaira; Osamu Minato, Hinode; Makoto Saeki, Kodaira; Yasuo Yoshitomi, Fucyu; Hideaki Nakamura, Kodaira, and Masaki Kubotera, Koganei, all of Japan, assignors to Hitachi Microcomputer Hitachi, Ltd. & Engineering, Ltd., Tokyo, Japan

Continuation of Ser. No. 740,550, Jun. 3, 1985, Pat. No. 4,760,561. This application Jun. 7, 1988, Ser. No. 203,459

Claims priority, application Japan, Jun. 4, 1984, 59-113001

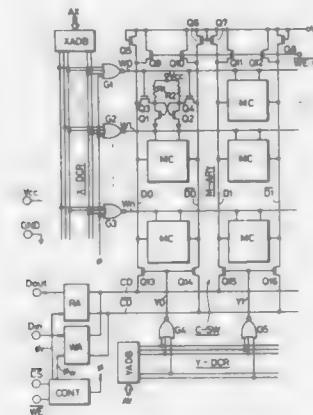
Int. Cl.⁴ G11C 7/00, 11/40

U.S. Cl. 365—189.01

34 Claims

1. An MOS static RAM comprising:
a plurality of static memory cells;
a pair of complementary data lines to which data input-output terminals of the static memory cells are connected;
a plurality of word lines to which the selection terminals of said static memory cells are connected, respectively;
variable load means coupled between a power supply terminal of the static RAM and the complementary data lines, respectively, the variable load means being constructed to be controlled such that their impedance becomes higher in a data write-in operation than the impedance thereof in a data read-out operation;
selection means for selecting one of said plurality of word lines; and
control means for controlling the state of the selected word line in the read-out operation so that the selected state of the word line is held during a period from the start of the selection of the word line to the time when there is a

predetermined difference in the level difference between the pair of complementary data lines to be changed in accordance with the data stored in a static memory cell to



which the selected word line is coupled, the selected word line being brought into an unselected state after the period.

4,876,670

VARIABLE DELAY CIRCUIT FOR DELAYING INPUT DATA

Takeo Nakabayashi, and Masao Nakaya, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

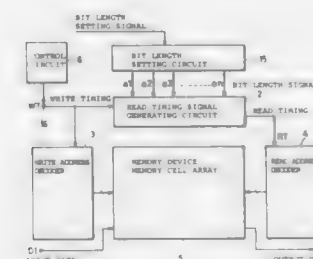
Filed Dec. 9, 1987, Ser. No. 130,741

Claims priority, application Japan, Dec. 10, 1986, 61-293712

Int. Cl.⁴ G11C 7/00

U.S. Cl. 365—194

6 Claims



1. A variable delay circuit for delaying input data, comprising:
a memory device (5) formed by a two-dimensional array of memory cells for storing the input data;
write address decoder means (3) for accessing selectively memory cells of said memory device (5) and writing said input data into the cells accessed by said write address decoder means (3);
read address decoder means (4) for accessing said memory cells of said memory device (5) and reading said input data from the cells accessed by said read address decoder means (4);
programmable timing signal generating means (2) synchronized to an operation of said write addresses decoder means (3) for controlling an operation of said read address decoder means (2) following a programmable delay time;
delay means (15) for setting the programmable delay time of said timing signal generating means (2) to a desired delay time.

4,876,671

SEMICONDUCTOR DYNAMIC MEMORY DEVICE WITH METAL-LEVEL SELECTION OF PAGE MODE OR NIBBLE MODE

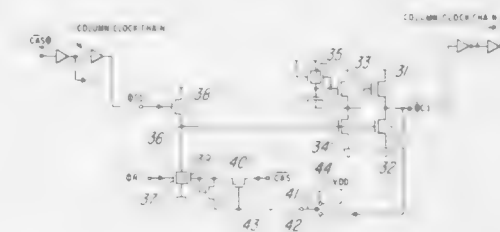
Roger D. Norwood, Sugar Land; Jino Chan, Houston, and Pravin P. Patel, Sugar Land, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 232,543, Aug. 11, 1988, abandoned, which is a continuation of Ser. No. 122,508, Nov. 17, 1987, abandoned, which is a continuation of Ser. No. 728,740, Apr. 30, 1985, abandoned. This application Apr. 6, 1989, Ser. No. 336,637

Int. Cl.⁴ G11C 8/00, 7/00

U.S. Cl. 365—233

29 Claims



1. A semiconductor dynamic read/write memory device manufactured to provide either page mode or nibble mode of operation, but not both, comprising:
a memory array with rows and columns of cells,
row addressing means for selecting a row of cells in response to a row address and a row address strobe signal,
column addressing means for selecting a plurality of columns of cells in response to a column address and a column address strobe signal,
data input/output means coupled to said column addressing means to input or output data selected among said plurality of columns,
and selector means for selecting between page mode of operation and nibble mode of operation, said selector means including clock circuitry for coupling said column address strobe signal to said data input/output means, said selector means rendering a clock to be either responsive or non-responsive to toggling of said column address strobe signal, wherein said clock is rendered either responsive or non-responsive by a single conductor-level connection in manufacture.

4,876,672

ULTRASONIC LOGGING TOOL WITH ROTATING EXPOSED TRANSDUCER

Steven G. Petermann, Plano, and Thomas Schasteen, Garland, both of Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Mar. 1, 1988, Ser. No. 162,771

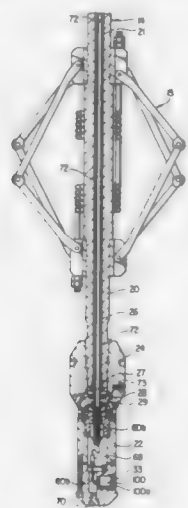
Int. Cl.⁴ R21B 47/00; G01V 1/40

U.S. Cl. 367—35

9 Claims

1. An ultrasonic logging tool for use in a borehole of a well filled with borehole fluid, and tool comprising:
a housing;
a drive means mounted in said housing;
a hollow drive shaft coupled to and adapted to be rotated by said drive means, said drive shaft extending out of said housing;
a rotor attached to said drive shaft outside said housing for rotation with said shaft;
a transducer means having a surface for emitting ultrasonic pulses and receiving echoes from said pulses, said transducer means being mounted on said rotor for rotating therewith and with said one surface being directly exposed to the borehole fluid when said tool is in an operable position within said borehole;
seal means mounted in said housing and surrounding said

drive shaft for sealing between said shaft and said housing; and
pressure compensating means in said housing for providing a



pressure in said housing at the interior of said sealing means equal to or greater than the pressure in the borehole fluid applied against the exterior of said seal means when said tool is in an operable position in said borehole.

4,876,673

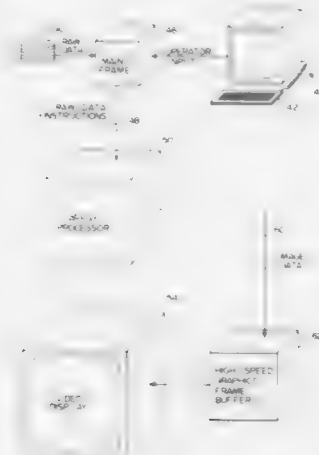
DISPLAY OF COMMON DEPTH POINT SEISMIC DATA WITH VELOCITY CORRECTION IN REAL TIME
Douglas W. McCowan, Colleyville, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jan. 19, 1988, Ser. No. 145,015

Int. Cl.⁴ G01V 1/28

U.S. Cl. 367—68

9 Claims



8. A method of generating a depiction of the subterranean structure of the earth, comprising the steps of:

performing seismic exploration operations at a location on the surface of the earth, in which seismic energy is transmitted downwardly into the earth at a first shotpoint location, and is reflected upwardly at interfaces between rock layers in the earth, and detecting and recording the reflected energy employing transducers located at a number of recording locations on the surface of the earth spaced from the shotpoint;
accepting operator commands indicative of initial assumptions concerning the velocity of seismic energy in the

subterranean structure, and the shape and thickness of the various layers of rock in the subterranean structure;
performing normal movement correction on each of the signals recorded by each of the transducers at the recording locations, thereby making correction for travel time variations between the shotpoint and recording locations close to the shotpoint and locations further from the shotpoint;

displaying the corrected signals as traces corresponding to the signals recorded by each of the transducers, wherein the traces are ordered according to the relative positions of the corresponding transducers with respect to the shotpoint, and the display is of the amplitude of the corrected signals versus time of receipt of the signal;

accepting further operator commands regarding updated assumptions with respect to the velocity of seismic energy and the shape and thickness of the layers of rock in the subterranean structure; and

repeating said performing and displaying steps essentially instantaneously in response to accepted further operator commands;

wherein said performing, displaying and accepting steps are performed on a computer system comprising:

a display device for displaying the corrected traces;
an array processor for performing said normal movement correction step, connected to said display device for supplying the corrected signals directly thereto for display; and

a mainframe computer, comprising means for accepting said operator commands and for supplying the to said array processor means;

wherein the mainframe computer does not in any way control the display of the corrected traces on the display device after performance of the normal movement correction step by the array processor, so that said display of said corrected traces is updated responsive to new operator commands substantially in real time.

4,876,674

SONIC COLLAR SHEEP PROTECTOR

Kevin W. Parmely, HRC 89, Box 193, Hamill, S. Dak. 57534;
Scott R. Van Asten, 1021A Wisconsin St., Oshkosh, Wis. 54901, and Harbor E. Stanton, P.O. Box 232, Ferryville, Wis. 54601

Filed Aug. 15, 1988, Ser. No. 232,226

Int. Cl.⁴ H04B 1/02

U.S. Cl. 367—139

6 Claims



1. A motion-sensing predator control sonic collar alarm unit adapted to be placed around the neck of livestock for repelling attacking predators, comprising:

means for detecting startled or sudden bodily motion of said livestock in excess of a preselected threshold;
means for transforming said bodily motion into an electrical impulse; and
means for converting said electrical impulse into an audio

alarm sound which is detectable by and repulsive to a predator and for a period of time sufficient to repel an attack.

4,876,675

TOWED PIEZOELECTRIC CABLE

Kohji Ogura, Ohgaki, and Kasumi Ogawa, Kagamihara, both of Japan, assignors to NGK Spark Plug Co., Ltd., Japan

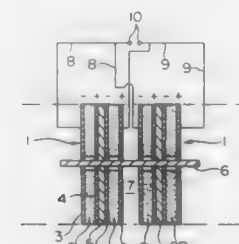
Filed Sep. 7, 1988, Ser. No. 241,308

Claims priority, application Japan, Sep. 12, 1987, 62-228941; Nov. 9, 1987, 62-283816; Nov. 12, 1987, 62-287008

Int. Cl.⁴ G01V 1/38

U.S. Cl. 367—155

22 Claims



1. A towed piezoelectric cable comprising a plurality of receiver units, each of said receiver units comprising piezoelectric element layers having a thickness which are polarized in the direction of the thickness of the layers and arranged so that the piezoelectric element layers have the same polarizing direction and a conductive connecting member having a pair of surfaces on which respective ones of said piezoelectric element layers are provided, each said piezoelectric element layer being provided with an inner electrode and an outer electrode, and the inner electrodes of each of said piezoelectric element layers in each said piezoelectric receiver unit being electrically connected together by and thus shortcircuited through said connecting member; a nonshrinking flexible core disposed to pass through the center of said each receiver unit for supporting said receiver units while leaving a buffer zone between adjacent receiver units; means connected to each said receiver unit for producing a potential induced between the outer electrodes of said piezoelectric element layers; and a flexible tube containing the assembly of said receiver units and said flexible core, said flexible tube being filled with an insulating oil.

4,876,676

VOICE RECOGNIZING ALARM TIMEPIECE

Hiroshi Shimizu, and Yoshito Yamaguchi, both of 496, Ohbusuma, Showa-machi, Kitakatsushika-gun, Saitama, Japan

Filed Feb. 15, 1989, Ser. No. 311,106

Claims priority, application Japan, Feb. 29, 1988, 63-27444[U]

Int. Cl.⁴ G04B 21/08, 23/00

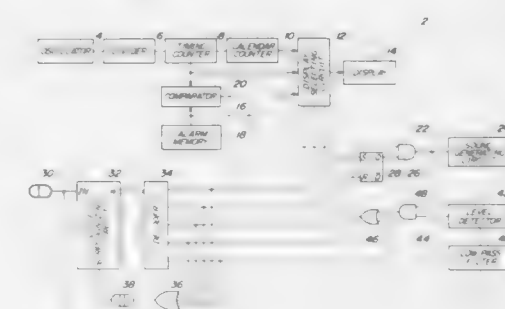
U.S. Cl. 368—63

2 Claims

1. In a voice recognizing alarm timepiece including a timing circuit which counts the current time, an alarm circuit which outputs a coincident signal when the current time counted by said timing circuit coincides with a predetermined time, a sound generating circuit which generates a sound by receiving said coincident signal, an alarm control circuit which controls whether to supply said coincident signal to said sound generating circuit or not, a microphone which detects an external voice, a voice recognizing circuit which outputs a recognizing signal by recognizing whether said external voice detected by said microphone corresponds to one of the stored voices or not, a decoder which supplies to said alarm control circuit the alarm turn on signal allowing said coincident signal to be supplied to said sound generating circuit and the alarm turn off signal preventing said coincident signal from being supplied to

said sound generating circuit, upon receipt of said recognizing signal, and said timepiece includes:

a low-pass filter which eliminates high frequency components in said voice signal from said microphone;
a level detector which outputs a detected signal whenever the volume level of said voice signal through said low-pass filter is higher than predetermined level; and



a gating circuit which receives said detected signal from said level detector and supplies said alarm turn off signal to said alarm control circuit when said coincident signal from said alarm control circuit is supplied to said sound generating circuit.

4,876,677

SENSOR MOUNT FOR AN ELECTRONIC TIMEPIECE
Tatsuo Moriya, Suwa, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan

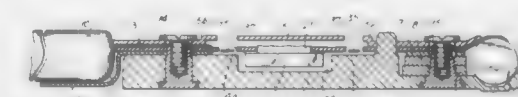
Filed Mar. 4, 1988, Ser. No. 164,352

Claims priority, application Japan, Mar. 5, 1987, 62-32208[U]; Mar. 5, 1987, 62-32209; Mar. 6, 1987, 62-32785[U]

Int. Cl.⁴ G01C 19/00; G04B 37/00

U.S. Cl. 368—87

11 Claims



1. In an electronic timepiece including a base plate, an IC chip having a built-in semiconductor sensor for measuring the surrounding state, a circuit substrate having the IC chip mounted thereon, the improvement which comprises:

fixing means for fixing the circuit substrate to the base plate at at least two fixing positions spaced sufficiently far from the mounting position of the IC chip so that the circuit substrate in the region around the IC chip does not contact any other element of the time piece, the fixing means including a circuit supporting plate for securing the circuit substrate to the base plate only at the fixing positions.

4,876,678

SOUND REPRODUCING DEVICE FOR PLAYING A RECORD DISC HAVING A PLURALITY OF RECORDED GROOVES

Koike, Eishi, Sagami-hara, and Yasuhiko Yusa, Machida, both of Japan, assignors to Ozen Corporation, Machida, Japan

Filed Mar. 23, 1989, Ser. No. 327,762

Claims priority, application Japan, Mar. 23, 1988, 63-68702

Int. Cl.⁴ G11B 17/06, 3/60

U.S. Cl. 369—31

4 Claims

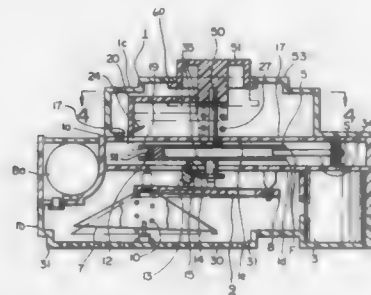
1. A simplified sound reproducing device for playing a record disc having a plurality of recorded grooves comprising:

(a) a casing;

(b) a record disc unit disposed in the casing and having a

plurality of recorded grooves which define a recorded face thereof, the record disc unit having a circular periphery with an index tracking portion formed thereon, the casing having a plurality of index setting openings formed therein along the periphery of the record disc, the number of index setting openings corresponding to the number of recorded grooves;

- (c) a center pin disposed in the casing, the disc unit being rotatably supported on the center pin,
- (d) a speaker unit comprising a speaker cone and a sound transmitting member attached thereto,
- (e) means for mounting the speaker unit to the casing, the mounting means allowing for swingable movement of the speaker unit toward or away from the recorded face of the record disc unit;



- (f) a stylus force spring disposed in the casing for urging the sound transmitting member toward the recorded face of said record disc unit,
- (g) a pickup interposed said sound transmitting member and said record disc unit;
- (h) means for urging the pickup radially outwardly with respect to the recorded face,
- (i) means for rotating the disc unit,
- (j) a rotatable index setting knob disposed at an upper end of the center pin,
- (k) an index setting arm supported by said index setting knob, the index setting arm having an engaging hook thereon for insertion into the index setting openings; and
- (l) a fixed indexing ring disposed outside the casing and bearing indicia thereon for showing items recorded in the grooves of said record disc unit.

4,876,679

DIGITALLY CONTROLLED POSITIONING SYSTEM FOR QUICKLY MOVING AND THEN FINELY POSITIONING AN OBJECT

Toshiharu Mukai, Sennan, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

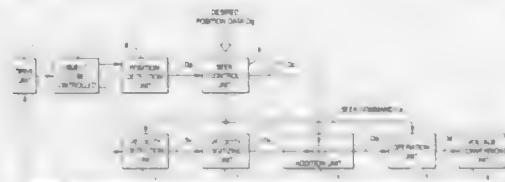
Filed Feb. 4, 1988, Ser. No. 152,428

Claims priority, application Japan, Feb. 4, 1987, 62-24065; Feb. 4, 1987, 62-24070

Int. Cl.⁴ G11B 7/00

U.S. Cl. 369-44

5 Claims



1. A positioning system for controlling an object which is to be moved quickly in a first, high speed moving, mode and which is to be positioned finely at a desired position in a second, high positional resolution moving, mode, said system comprising:

a position detecting means for detecting an actual position of

said object, and for producing absolute position data indicative of said actual position;

a seek control means for comparing said actual position data with predetermined desired position data and for producing position compensation data representing a difference between said actual position data and said desired position data, said seek control means also outputting a seek command signal when said position compensation data is larger than a predetermined value;

a velocity sense means for detecting a moving velocity of the object to be moved and for providing an output corresponding thereto, said sense means decreasing its gain in response to said seek command signal from said seek control means;

a velocity digitizing means for digitizing said output of said velocity sense means so as to output digital velocity data; an addition means for adding said velocity data from said velocity digitizing to said position compensation data from said seek control means and for providing an output corresponding thereto;

an operation means for processing said output of said addition means to be obtain position control data, and for multiplying said position control data by a predetermined coefficient to produce output data corresponding thereto, said predetermined coefficient being increased in response to said seek command signal from said seek control means;

a voltage conversion means for converting said output data from said operation means into a voltage signal; and

a drive means for moving said object to be controlled according to said voltage signal.

4,876,680

MONOLITHIC OPTICAL PICK-UP USING AN OPTICAL WAVEGUIDE

Shigeoaki Misawa, Tokyo, and Hirooaki Funato, Chigasaki, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Sep. 4, 1987, Ser. No. 93,368

Claims priority, application Japan, Sep. 5, 1986, 61-209811; Sep. 16, 1986, 61-217785; Mar. 20, 1987, 62-66834

Int. Cl.⁴ G11B 7/12, 7/135

U.S. Cl. 369-110

26 Claims



1. An optical pick-up device for optically reading and/or recording information from and/or to a recording medium, comprising:

an opaque substrate formed with an opening through which light may pass;

an optical waveguide formed on said substrate, said optical waveguide also extending across said opening;

a first diffraction grating formed on said optical waveguide located in registry with said opening;

detecting means provided integrally with said substrate for detecting diffracted light from said first diffraction grating; and

focusing means for focusing light passing through said opening of said substrate onto said recording medium.

4,876,681

PACKET SWITCHING EQUIPMENT AND A PACKET SWITCHING METHOD FOR CONTROLLING PACKET SWITCHED NETWORKS

Manayoshi Hagiwara, Kawasaki; Michio Suzuki, Yokohama; Ryoichi Sasaki, Fujisawa; Minoru Sugano; Akira Horiki, both of Yokohama, and Kazuyuki Hayashi, Fujisawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

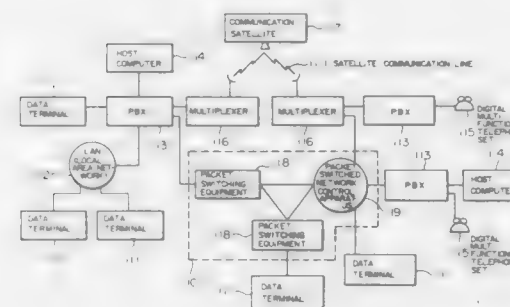
Filed May 13, 1988, Ser. No. 194,044

Claims priority, application Japan, May 15, 1987, 62-116805; Jan. 8, 1987, 62-141463

Int. Cl.⁴ H04Q 11/04

U.S. Cl. 370-60

6 Claims



1. A packet switching equipment connected to a plurality of terminals or other packet switching equipment by plurality of first transmission line means, each of said plurality of first transmission line means having a pair of an input line and an output line, wherein a packet received from the input line of one first transmission line means is sent out to the output line of another first transmission line means in accordance with a destination address contained in the packet, said packet switching equipment comprising:

a plurality of switch units connected in a hierarchy configuration having a least first and second levels, said first level including a plurality of first switch units each connected to a group of said first transmission line means, said second level including a single second switch unit connected to said plurality of first switch units respectively by a plurality of second transmission line means, each of said plurality of second transmission line means having a second pair of an input line and an output line, wherein,

each of said plurality of first switch units includes:

anterior judging means having a plurality of bit switches coupled so as to selectively output the packet to the output line of one of said second transmission line means or a third signal line in accordance with a content of a first part of an address in the packet received from each input line of said group of said first transmission line means, and

posterior judging means having a plurality of bit switches coupled so as to selectively output the packet to any output line of said group of said first transmission line means in accordance with a content of a second part of the address in the packet received from said third signal line or the output of said second transmission line means,

wherein, said single second switch unit includes a plurality of bit switches coupled so as to selectively output the packet received from the input line of each said second transmission line means to the output line of any another one of said second transmission line means in accordance with the content of the first part of the address of the packet.

4,876,682

SWITCHING TDM DIGITAL SIGNALS

Alan F. Graves, Sherwood Park; Paul A. Littlewood, and Johannes S. Weiss, both of Edmonton, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

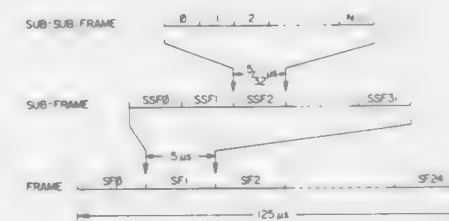
Filed May 13, 1986, Ser. No. 862,730

Claims priority, application Canada, Apr. 1, 1986, 505501

Int. Cl.⁴ H04J 3/22

U.S. Cl. 370-66

16 Claims



1. A method of switching digital signals multiplexed in tdm (time division multiplex) frames having harmonically related frame and sub-frame periods, comprising the steps of cyclically operating a first time switch with a frame period corresponding to one of said harmonically related periods thereby to switch time channels of said digital signals to provide switched signals having a first bandwidth; cyclically operating a second time switch with a frame period corresponding to another of said harmonically related periods thereby to switch time channels of said digital signals to provide switched signals having a second bandwidth harmonically related to the first bandwidth; and conducting digital signals to, from, and between the switches.

4,876,683

REPEATER FOR REGENERATING FRAME-MULTIPLEXED SIGNAL

Eiji Suzuki, Tochigi, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

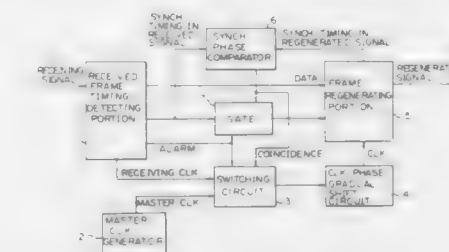
Filed Mar. 15, 1989, Ser. No. 323,942

Claims priority, application Japan, Mar. 16, 1988, 63-060219

Int. Cl.⁴ H04J 3/06

U.S. Cl. 370-97

3 Claims



1. A repeater comprising:

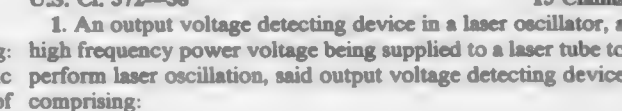
a received frame timing detecting portion which extracts a receiving clock from a received frame-multiplexed signal, detects a timing of frame synchronization in said received signal, and outputs an alarm signal which indicates whether or not said timing of frame synchronization is successfully detected;

a master clock generator which generates a master clock;

a frame synchronization phase comparator which detects a coincidence between said timing of frame synchronization detected in said received signal and a timing of frame synchronization in a regenerated frame-multiplexed signal;

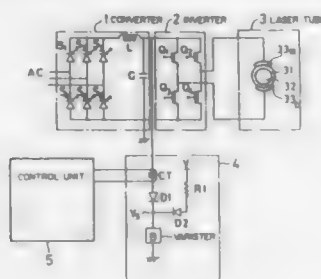
a switching circuit the output of which is said receiving clock except: said output is switched to said master clock

15 Claims



an inverter for supplying the high frequency power voltage; a voltage detection circuit connected to an input of said inverter, said voltage detector circuit comprising:

a non-linear element in which a reference voltage is set;



a current transformer, connected to said non-linear element, for detecting a current flowing in said non-linear element, an abnormality of the output voltage being detected from the current flowing in said non-linear element.

4,876,690

METAL VAPOR LASER APPARATUS

Naoto Nishida, and Mitsuhiro Nishio, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

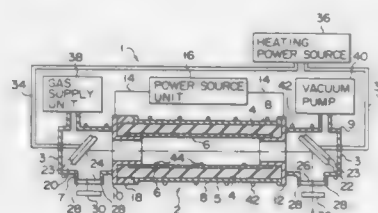
Filed Dec. 20, 1988, Ser. No. 286,864

Claims priority, application Japan, Dec. 24, 1987, 62-325362

Int. Cl.⁴ H01S 3/22, 3/04

U.S. Cl. 372—56

9 Claims



1. A metal vapor laser apparatus comprising: a discharge tube for generating a laser beam, said tube containing a buffer gas under a predetermined pressure and having at least one set of discharge electrodes; power source means for applying a voltage to said electrodes; a metal vapor source arranged in said tube; two high reflecting mirrors for reflecting the laser beam in the direction crossing its optical axis, said high reflecting mirrors being arranged at both side end portions of said discharge tube to oppose each other; heating means for heating said two high reflecting mirrors; transmission windows for transmitting a laser beam reflected by said high reflecting mirrors, said windows being arranged in said discharge tube; and a pair of resonator mirrors for emitting a laser beam which transmits said transmission windows, said resonator mirrors being arranged outside of said tube.

4,876,691

ION LASER

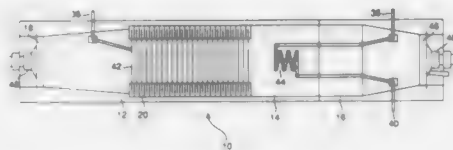
Joseph F. Rando, Los Altos Hills, and Eric W. Blumer, Sunnyvale, both of Calif., assignors to Spectra-Physics, Inc., San Jose, Calif.

Division of Ser. No. 913,163, Sep. 29, 1986. This application Sep. 16, 1988, Ser. No. 245,109

Int. Cl.⁴ H01S 3/03

U.S. Cl. 372—65

9 Claims



1. An ion laser, comprising: a substantially cylindrical ceramic tube including an interior step; a plurality of thin metal disc each having a central aperture defining a plasma discharge region extending substantially along a longitudinal axis of said tube, and a plurality of apertures disposed substantially at the periphery of each disc to allow for equalization of pressure within the interior of said tube; an annulus of ceramic formed around the periphery of each individual disc forming a metal disk member said disc being stacked in the interior of said tube and being supported by said step, said annulus of ceramic supporting each of said disc members in said ceramic tube and said ceramic annulus and providing heat transport from said thin metal disc to said ceramic tube to provide cooling of said plasma discharge region; a cathode disposed in the interior of said ceramic tube; an anode disposed in the interior of said ceramic tube; means for hermetically sealing each opposing end of said tube; and mirror means disposed at each opposing end of said tube.

4,876,692

MICROWAVE-PUMPED ATOMIC GAS LASER

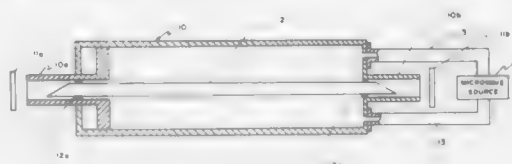
Jenny Bramley, Falls Church, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 26, 1982, Ser. No. 362,419

Int. Cl.⁴ H01S 3/09

U.S. Cl. 372—70

3 Claims



1. A method of obtaining coherent optical or quasi-optical radiation from a chemical element whose first excited state is metastable, including the steps of: enclosing a solid compound containing said element in a gas-tight enclosure containing a buffer gas or mixture of gases; placing said enclosure in a microwave cavity and between laser mirrors; and pumping said compound with microwave radiation to dissociate the said element from the compound, whereby said element goes to its first excited state and whereby the optical or quasi-optical radiation is emitted by said element as it falls to its ground state and recombines with at least one element of said compound to form a compound.

which may be excited by the microwaves to again dissociate and to repeat the process.

4,876,693

INTEGRATED LASER HEAD AND LOW INDUCTANCE PULSE FORMING CIRCUIT FOR PULSED GAS LASERS

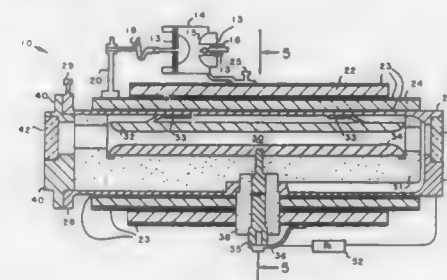
David J. Lacero, Upland; Claudio G. Parazzoli, Pacific Palisades, and Metin S. Mangir, Los Angeles, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Dec. 26, 1984, Ser. No. 686,339

Int. Cl.⁴ H01S 3/09

U.S. Cl. 372—82

23 Claims



10. Integrated self-sustained discharge laser head apparatus for pulsed gas lasers comprising: (a) pulse initiation means; (b) energy storage means which provides for minimal inductance between said energy storage means and a plurality of transverse discharge electrodes, and in which said discharge electrodes are located within; (c) LC inverter means for delivering energy from said energy storage means to said discharge electrode means; (d) laser resonator means including a pressure vessel which further includes a chamber containing a gas laser medium for producing high power laser pulses said apparatus being adapted to operate at internal gas pressures substantially above one atmosphere.

4,876,694

EXTERNAL CAVITY SLAB LASERS

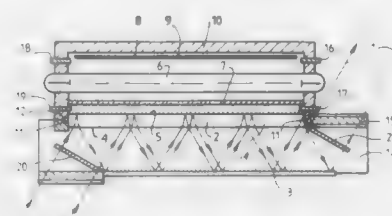
John L. Hughes, Torrens, Australia, assignor to Advanced Lasers Limited, Canberra City, Australia

Continuation of Ser. No. 882,678, Jul. 7, 1986, abandoned. This application Dec. 23, 1988, Ser. No. 289,500

Int. Cl.⁴ H01S 3/081

U.S. Cl. 372—93

9 Claims



1. An external cavity, single slab laser system comprising three sections, namely, a slab laser medium for amplifying a laser beam, a source of optical radiation which excites said slab, said slab laser medium being cut into the shape of a rectangular block whose length is greater than its width and whose thickness is less than the diameter of the laser beam to be amplified, two large faces defined by the length and width of said block being optically polished, one of the said faces being coated with the dielectric laser mirror while the other face is anti-reflection coated at the laser wavelength, said block laser medium being optically excited through the said laser mirror using the filtered optical output of water cooled lamps, the

4,876,695

DIGITAL DATA TRANSMISSION SYSTEM HAVING ADDITIONAL BITS FOR AUXILIARY DATA

Hugo F. J. Witters, Berlaar, and Joannes C. A. M. Wouters, Schoten, both of Belgium, assignors to Alcatel N.V., Amsterdam, Netherlands

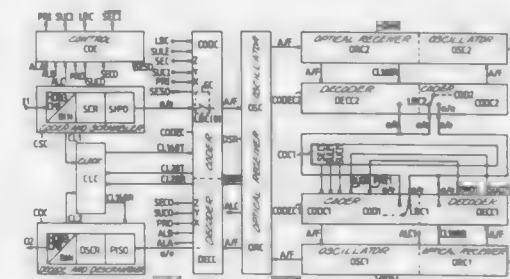
Filed Jun. 12, 1987, Ser. No. 62,145

Claims priority, application Belgium, Jun. 13, 1986, 2/60994

Int. Cl.⁴ H04B 3/36; H04L 25/20

U.S. Cl. 375—3

20 Claims



1. In a digital data transmission system having a sending station able to convert serial p-bit words into serial q-bit words, with q larger than p, and a receiving station able to convert received serial q-bit words back into serial p-bit words, an improved repeater station for repeating transmissions from said sending station to said receiving station, said repeater station comprising:

a sender unit comprising means for converting at least one predetermined p-bit word together with an auxiliary signal into a predetermined q-bit word and a receiver unit having a q-bit output connected in parallel to p-bit input of said sender unit, said receiver unit comprising means for converting a predetermined q-bit word back into a predetermined p-bit word and an auxiliary signal, and a user and source circuit responsive to a received auxiliary signal derived from the auxiliary signal provided by said receiver unit and including gating means controlled by a control signal provided by said user and source circuit for supplying to said sender unit either said received auxiliary signal or an alternative auxiliary signal provided by said user and source circuit.

4,876,696

TRANSMISSION SYSTEM FOR TRANSMITTING MULTIFREQUENCY SIGNALS OR MODEM SIGNALS WITH SPEECH SIGNALS

Toshio Yoshikawa, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

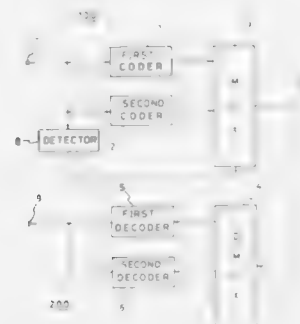
Filed Jul. 20, 1987, Ser. No. 75,455

Claims priority, application Japan, Jul. 18, 1986, 61-167793; Sep. 30, 1986, 61-230132

Int. Cl.⁴ H04J 3/16

U.S. Cl. 375-5

1 Claim



1. A transmission system comprising:

transmitting means comprising a common input terminal for receiving a speech signal and one of a dual tone signal and a modulated signal, first coding means connected to said common input terminal for efficiently coding said speech signal to produce a first coded output, detecting means connected to said common input terminal for detecting said one of said dual tone signal and said modulated signal, second coding means connected to said common input terminal for coding said one of said dual tone and said modulated signal to produce a second coded output, and means for selecting one of said first and second coded outputs in response to an output of said detecting means;

receiving means comprising separating means for separating a signal transmitted from said transmitting means into said first and second coded outputs, first decoding means for decoding said first coded output from said separating means, and second decoding means for decoding said second coded output from said separating means.

4,876,697

THREE-PART DECODER CIRCUIT

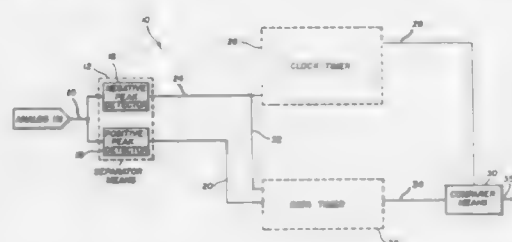
Arthur A. Whitfield, Rochester, N.Y., assignor to Kodak Company, Rochester, N.Y.

Filed Jun. 14, 1988, Ser. No. 206,553

Int. Cl.⁴ H04L 25/49; H03K 7/08

U.S. Cl. 375-22

1 Claim



1. An electrical circuit suitable for decoding a binary data stream that has been encoded in a sequential bitcell code format, the encoding resulting in an encoded signal waveform

that carries clock information and data information, which electrical circuit comprises:

(a) a separator means

(i) for inputting the encoded signal waveform and separating the clock information and the data information, and

(ii) for generating an output clock signal pulse train, and an output data signal pulse train;

(b) a clock timer for inputting the clock signal pulse train and generating a clock parameter CP that is a measure of a time elapsed between a first and a second clock signal pulse, for each of a succession of bitcells;

(c) a data timer for inputting the data signal pulse train, and the clock signal pulse train, and at the advent of the first clock signal pulse, generating a data parameter that is a measure of a time elapsed between the first clock signal pulse and a first data signal pulse, for each of a succession of bitcells;

and

(d) a comparer means for

(i) inputting the clock parameter CP,

(ii) inputting the data parameter,

(iii) generating a parameter CP/2, and

(iv) generating a decoded output signal, the decoded output signal being assigned a first valuation if the data parameter is less than CP/2, and a second valuation if the data parameter is greater than CP/2.

4,876,698

SYSTEM FOR TRANSMITTING SEQUENCES OF DIGITAL SAMPLES ENCODED BY VARIABLE-LENGTH BINARY WORDS

Jean-Yves Boisson, Clamart, and Jean-Paul Bastien, Maisse, both of France, assignors to Telecommunications Radioelectriques et Telephoniques, Paris, France

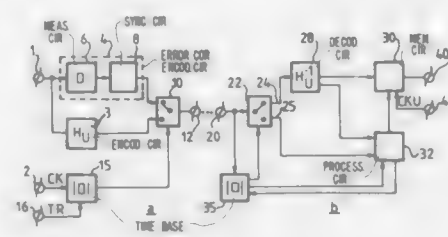
Filed Jun. 24, 1988, Ser. No. 211,307

Claims priority, application France, Jul. 3, 1987, 87 09446

Int. Cl.⁴ H04B 14/04

U.S. Cl. 375-25

1 Claim



1. A system for transmitting and receiving sequences of digital samples, said system comprising:

(a) a transmitter device comprising means for encoding as variable length words a plurality of said sequences provided as words of a fixed length at an input thereof, a synchronizing means coupled to said encoding means for forming synchronizing words which define the position of respective ones of said variable length words within the sequences, a multiplexer means coupled to said synchronizing means for combining said synchronizing words with said variable length words and;

(b) a receiver device comprising demultiplexing means for providing at a first output said variable length words received from said transmitting device to a decoding means coupled thereto for recovering said fixed length words, and for providing at a second output said synchronizing words to a processing means coupled thereto for restoring in the event of a transmission error, the position of said digital samples in said sequences, characterized in that said system further comprises combining means for combining an error detecting code with said synchroniz-

ing words and said synchronizing means comprises control means for distributing said synchronizing words combined with said error detection code.

4,876,699

HIGH SPEED SAMPLED DATA DIGITAL PHASE DETECTOR APPARATUS

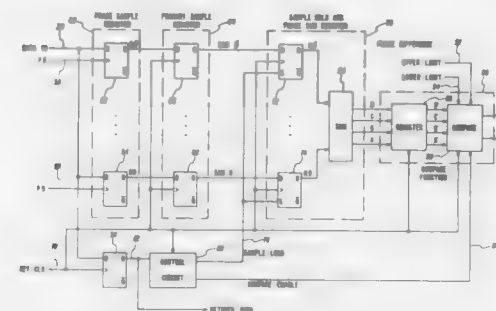
Blaine J. Nelson, Plano, Tex., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed May 6, 1988, Ser. No. 190,914

Int. Cl.⁴ H03D 3/18

U.S. Cl. 375-82

7 Claims



1. High speed digital phase detector apparatus comprising, in combination:

signal supplying first means for supplying a plurality of first signals of the same frequency but each of a different relative phase with respect to a reference;

data signal supplying second means for supplying logic level changing data signals which change at a given maximum data rate;

clock signal third means for supplying a reference clock signal which periodically provides a given logic level change at a frequency which may be similar to that of the given maximum data rate but is not synchronized to the data signal;

logic signal fourth means, connected to said first, second and third means for receiving signals therefrom and including signal output means, for counting the number of first signals that change to a given logic level between the time of occurrence of commencement of a data signal and the time of occurrence of the given logic level change of said reference clock signal and providing an output fourth signal indicative of said count at said signal output thereof;

compare fifth means, connected to said fourth means to receive the count fourth signal and including increment and decrement signal output means, for comparing the count value of said fourth signal with a predetermined allowable range of counts and providing one of an increment and decrement signal to said signal output means thereof in accordance with whether the count exceeds or is less than said predetermined allowable range.

4,876,700

DATA DEMODULATOR

Mervin L. Grindahl, Waseca, Minn., assignor to E. F. Johnson Company, Waseca, Minn.

Filed Apr. 16, 1986, Ser. No. 852,539

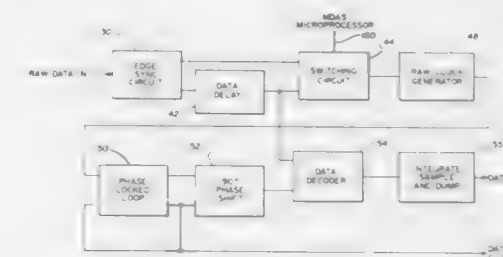
Int. Cl.⁴ H04L 27/06

U.S. Cl. 375-87

20 Claims

1. A data recovery circuit for demodulating transmitted encoded data comprising:
means for receiving the encoded data;
means for delaying the received encoded data for a delay time comprising a plurality of data bit time intervals;
means for recovering the transmitted data clock signal from either the received data during the delay time or from the

delayed data after the delay time connected to the received data and to the delayed data;
means for switching the clock recovery means from the received data to the delayed data after a synchronization sequence of data bits has been received and for preventing



switching from taking place until the logic level of the received data and the logic level of the delayed data are the same; and
means for decoding the delayed data with the recovered data clock signal.

4,876,701

SYNCHRONIZATION FAILURE DETECTION

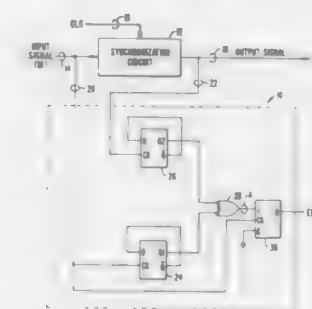
Martin W. Sanner, San Jose, Calif., assignor to Tandem Computers Incorporated, Cupertino, Calif.

Filed Nov. 30, 1987, Ser. No. 126,971

Int. Cl.⁴ H04L 7/00

U.S. Cl. 375-106

7 Claims



1. In a digital system, having synchronizing means operable to receive an asynchronously occurring input pulse to generate therefrom an output signal in the form of a representation of the input pulse having at least one digital state change synchronized to a transition of a digital clock signal, apparatus for monitoring the operation of the synchronizing means to determine that for each received input pulse a corresponding representation is produced, the apparatus comprising:

first circuit means, coupled to receive the asynchronously occurring input pulse and to note occurrence of the asynchronously occurring input pulse, for generating a first signal indicative of the noted occurrence of the asynchronously occurring input pulse;

second circuit means, coupled to receive the output signal of the synchronizing means and to note the appearance of the representation of the input pulse, for generating a second signal indicative of the noted appearance of the representation; and

third circuit means, coupled to receive the first and second signals and responsive to the occurrence of the asynchronously occurring input pulse, for producing therefrom an output error signal when the occurrence of the asynchronously occurring input signal is without a responsive

occurrence of the output signal of the synchronizing means.

4,876,702

PROGRAMMABLE TIME ADVANCE

Alan J. Lesko, Fort Collins, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jul. 28, 1988, Ser. No. 225,123

Int. Cl.⁴ H03L 7/10

U.S. Cl. 375-120

16 Claims



10. A method of producing a programmable time advance for a clock generation circuit having an input control terminal comprising the steps of:

- generating a clock signal having a predetermined center frequency, which center frequency is adjustable via the application of control signals to said input control terminal;
- measuring the difference between a reference clock signal and said generated clock signal to produce a clock adjust signal to adjust said center frequency of said generated clock signal;
- producing a clock advance signal of predetermined magnitude; and
- concurrently applying said clock advance signal and said clock adjust signal to said input control terminal of said clock generation circuit to advance the timing of said generated clock signal with respect to said reference clock signal by a fixed time offset.

4,876,703

APPARATUS FOR COMPRESSING AND/OR EXPANDING TIME BASE

Kaoru Urata, Kanagawa; Maki Nakashio, Tokyo; Koichi Ono, Kanagawa; Hitooshi Hirai, Kanagawa, and Masayuki Iwamoto, Kanagawa, all of Japan, assignors to Sony Corp., Tokyo, Japan

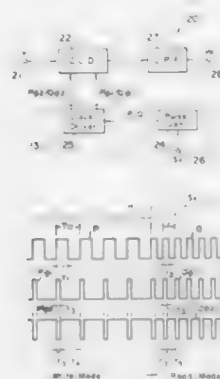
Filed Feb. 24, 1988, Ser. No. 159,896

Claims priority, application Japan, Mar. 12, 1987, 62-57818

Int. Cl.⁴ G11C 29/00; H03K 23/46

U.S. Cl. 377-62

5 Claims



1. Apparatus for compressing and/or expanding the time base of an input signal, comprising:
charge coupled device means having an input terminal supplied with said input signal, an output terminal, first and

second clock terminals, and a charge transfer channel having at least one bent portion and through which charges corresponding to said input signal are transferred with the direction of the charge transfer being changed at said at least one bent portion at which some charges remain as a residual charges resulting in noise,

clock generating means for generating a write clock signal and a read clock signal in a time-divisional manner, said read clock signal and said write clock signal having a read clock period and a write clock period, respectively, which are different in length from each other,

clock driver means supplied with one of said write and read clock signals selectively for generating first and second pulse trains to be supplied to said first and second clock terminals, respectively, when said write clock signal is supplied and for generating third and fourth pulse trains to be supplied to said first and second clock terminals, respectively, when said read clock signal is supplied, said first pulse train being 180° out of phase in respect to said second pulse train and said third pulse train being 180° out of phase in respect to said fourth pulse train, said first pulse train and said third pulse train having respective pulse widths that are equal to each other, and that are each smaller than one-half of the shorter one of said write clock period and read clock period, whereby to reduce said noise due to said residual charges in said bent portion of the charge transfer channel.

4,876,704

LOGIC INTEGRATED CIRCUIT FOR SCAN PATH SYSTEM

Hidehara Ozaki, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

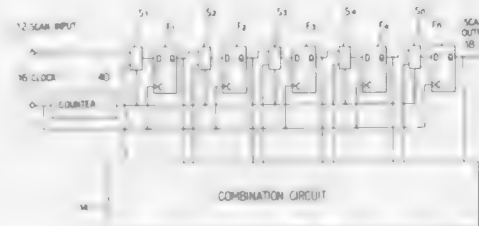
Filed Dec. 22, 1987, Ser. No. 136,572

Claims priority, application Japan, Dec. 22, 1986, 61-307009

Int. Cl.⁴ G01R 31/28; G11C 19/00

U.S. Cl. 377-70

2 Claims



1. A logic integrated circuit for performing scan path testing of a combination circuit having a plurality of outputs, comprising:

- a plurality of flipflops coupled in a cascaded arrangement, each of said flipflops having a data input, a data output and a clock input;
- a clock terminal commonly connected to the clock inputs of all the plurality of flipflops;
- a scan input terminal connected to the data input of a first flipflop of said flipflops;
- a scan output terminal connected to the data output of a last flipflop of said flipflops;
- a plurality of selectors each located just before each of the flipflops, each of the selectors except a first selector having a first input connected to the data output of an immediately preceding flipflop, each of said selectors having a second input connected to a corresponding one of the outputs of the combination circuit, an output connected to the data input of an immediately succeeding flipflop and a selection control input; and
- a counter having an input connected to the clock terminal

and an output connected to the selection control input of each selector, the counter generating a frequency division signal having a frequency division ratio equivalent to the number of the flipflops, so that when the counter does not generate a frequency division signal, selectors supply the data output of an immediately preceding flipflop to the data input of the immediately succeeding flipflop whereby a shift register is formed by all the flipflops, and when the counter generates the frequency division signal, selectors supply the corresponding output of the combination circuit to the data input of the immediately succeeding flipflop whereby the flipflops do not form the shift register and function to latch the corresponding outputs of the combination circuit.

4,876,705

X-RAY TUBE WITH A MOLYBDENUM TARGET

Jacques Delair, Bois D'Arcy, and Olivier Peyret, Boulogne Billancourt, both of France, assignors to General Electric CGR S.A., Paris, France

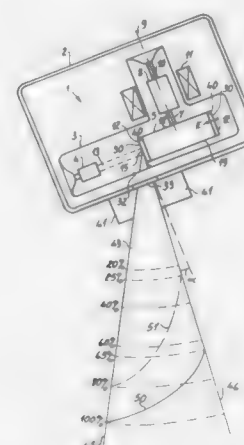
Filed Nov. 10, 1988, Ser. No. 269,719

Claims priority, application France, Nov. 13, 1987, 87 15671

Int. Cl.⁴ H01J 35/10

U.S. Cl. 378-144

7 Claims



1. An X-ray tube comprising an anode and a cathode, with the cathode delivering an electron beam and the anode comprising a target impinged by the electron beam on a surface forming the source of an X-radiation, said target being made of molybdenum, wherein the molybdenum is alloyed with vanadium in a proportion, by weight, of at least 0.5%.

4,876,706

SHEET FILM PACKAGE

Kenji Tajima, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 21, 1987, Ser. No. 96,824

Claims priority, application Japan, Sep. 19, 1986, 61-221593

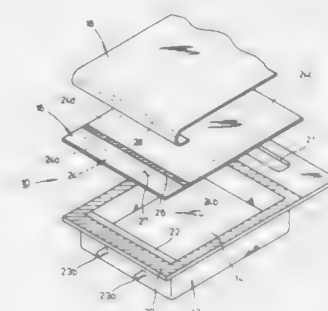
Int. Cl.⁴ G03B 42/04

U.S. Cl. 378-174

5 Claims

- 1. A sheet film package comprising:
a tray for storing a stack of sheet films, said tray having a film access opening;
a flexible first cover member peelably joined at a portion to said tray for closing said film access opening to hold said sheet films under light-shielded conditions, said first cover member having a peeling-starting area where said first cover member starts to be peeled off, said peeling-starting area being unjoined to said tray and located inwardly of the joined portion thereof, wherein said first cover mem-

ber includes a cut-off area provided between an edge portion of the tray and said peeling-starting area; and



a second cover member joined to said first cover member inwardly of said peeling-starting area.

4,876,707

TWO-DIRECTIONAL CALL FORWARDING DEVICE

Kazuo Hashimoto, Tokyo, Japan, assignor to Hashimoto Corporation, Tokyo, Japan

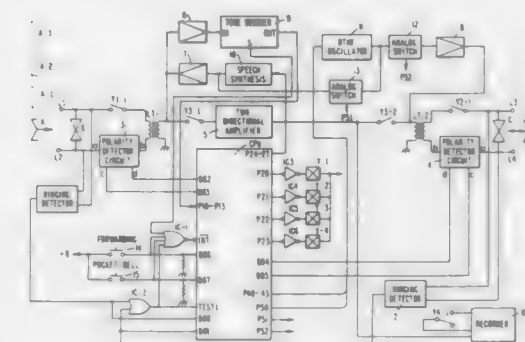
Filed Apr. 14, 1988, Ser. No. 183,532

Claims priority, application Japan, Apr. 14, 1988, 62-91377

Int. Cl.⁴ H04M 1/57, 1/64, 11/00

U.S. Cl. 379-57

4 Claims



1. A tow-directional call forwarding device for receiving at a telephone set B incoming calls from general calling parties at telephone sets A, A-1, A-2, A-3 . . . , and through a telephone set C, dialing a number of a called party at a telephone set D or initiating paging of a pocket bell carrier set E, comprising:
a memory;

- means for successively storing into said memory telephone numbers of set A-1, A-2, A-3, . . . , when the called party at set D does not answer the calls sent by the telephone sets of said calling parties;
- means for engaging the telephone B when the called party at set D or at the pocket bell carrier set at E calls the telephone C thereafter, reading out successively a plurality of said telephone numbers stored in said memory, and for automatically and successively dialing said telephone numbers of said sets A, A-1, A-2, A-3 . . . for placing calls thereto through the telephone set B after each call to said set A, A-1, A-2, A-3 . . . is completed; and
- means for forming a loop between said set D and a particular one of said telephone sets A-1, A-2, A-3, when said set A answers a call from set D to the particular set A-1, A-2, A-3, through the telephone set B.

4,876,708

CORDLESS TELEPHONE SYSTEM

Noboru Saegusa; Yoshihiro Hara; Ryoji Kawasaki, all of Tokyo; Kazuyuki Tate, Aichi; Syoji Hase, Tokyo, and Koji Ono, Tokyo, all of Japan, assignors to NEC Corporation; Nippon Telegraph and Telephone Corp., both of Tokyo and Kabushiki Kaisha Toshiba, Kanagawa, all of Japan

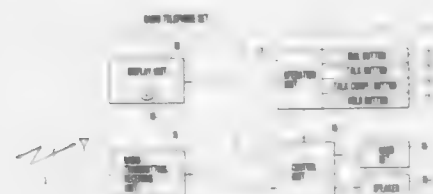
Filed Oct. 27, 1987, Ser. No. 112,927

Claims priority, application Japan, Oct. 30, 1986, 61-258745

Int. Cl.⁴ H04M 11/00, 1/00

U.S. Cl. 379—61

6 Claims



1. A cordless telephone system comprising at least one radio telephone set, a subscriber line connected through a telephone exchanger to a subscriber telephone set, and connector means, connected to said at least one radio telephone set through a radio channel and to said subscriber line and having a function for establishing a communication channel between said at least one radio telephone set and said subscriber telephone set and a function for holding said communication channel in response to a hold signal from said at least one radio telephone set, wherein said connector means comprises:

first hold state setting means for setting said communication channel in a first hold state without disconnecting said radio channel in response to the hold signal received upon establishment of said communication channel;

first determining means for determining the presence/absence of a radio reception signal within a first predetermined period of time after the first hold state is initiated; hold state releasing means for releasing the first hold state and reconnecting the communication channel when the radio reception signal received at first within the first predetermined period of time is the hold signal in accordance with a determination result of said first determining means;

second hold state setting means for disconnecting said radio channel and setting said communication channel in a second hold state when the radio reception signal received at first within the first predetermined period of time is an on-hook signal or the radio reception signal is not received within the first predetermined period of time, in accordance with the determination result of said first determining means;

second determining means for determining the presence/absence of the radio reception signal within a second predetermined period of time after the second hold state is initiated;

hold state changing means for changing the second hold state to the first hold state when the radio reception signal received within the second predetermined period of time is an off-hook signal, in accordance with a determination result of said second determining means; and

circuit control means for forcibly disconnecting said communication channel and setting said communication channel in a stand-by state when the radio reception signal is not received within the second predetermined period of time, in accordance with the determination result of said second determining means.

4,876,709

ANTENNA FOR CORDLESS TELEPHONE SYSTEM

Max W. Rogers, Franklin Park, and Daniel R. Skinner, Graylake, both of Ill., assignors to Dynascan Corporation, Chicago, Ill.

Filed Sep. 8, 1988, Ser. No. 240,702

Int. Cl.⁴ H04R 1/38

U.S. Cl. 379—61

31 Claims



1. In a cordless telephone handset containing transmitter-receiver means contained within an elongated hand-grippable handset housing having ear-receiving and sound-accepting portions, said ear-receiving and sound-accepting handset housing portions each having a front wall configured to be placed adjacent to the user's face in use and a rear wall spaced apart from said front wall, and side walls joiningly extending between said front and rear handset housing walls, said transmitter-receiver means having a handset chassis ground and including earphone transducer means disposed in said ear-receiving handset housing portion for generating sound waves from electrical signals, microphone transducer means disposed in said sound-accepting housing portion for generating electrical signals from sound waves, antenna means for receiving and transmitting electromagnetic waves, and coupling network means for coupling said transmitter-receiver means to said antenna, said handset antenna means being counterpoised against said handset chassis and isolated at a distance therefrom, said handset housing being configured to be normally gripped by the user at a housing gripping portion at a distance from said handset antenna the improvement comprising:

said handset antenna means configured as a plate-shaped means having its longest dimension much less than one-fourth of the operating wavelength of said transmitter-receiver means and disposed to be spaced from said housing gripping portion, a major dimension of said antennas means being disposed to extend in a generally vertical direction when said handset housing is in position for use.

4,876,710

METHOD AND APPARATUS FOR CORDLESS MICROPHONE COMMUNICATION SYSTEM

John D. Reed, Arlington, Tex.; Teddy P. Roberts, Fort Wayne, Ind., and Thomas R. Berger, Crystal Lake, Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation-in-part of Ser. No. 917,923, Oct. 10, 1986, Pat. No. 4,748,685. This application Jan. 5, 1987, Ser. No. 2,332

Int. Cl.⁴ H01B 1/10

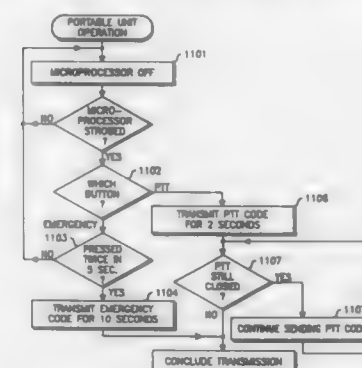
U.S. Cl. 379—63

2 Claims

1. In a communications system comprising vehicle mounted transceiver means for receiving an input message and for transmitting a signal comprised of said input message as modulated with a first carrier frequency signal, an improvement comprising:

portable transmitter means for transmitting a message signal and an ID signal as modulated with a second carrier frequency signal, the portable transmitter means including: push-to-talk switch means for providing a push-to-talk signal;

stroke means responsive to said push-to-talk signal for providing an initial stroke signal; microprocessor means responsive to said stroke signal controlling transmission of said ID signal; wherein said microprocessor means are usually switched off until said microprocessor means receives said stroke signal;



vehicle mounted received means for receiving said message signal and said ID signal, for providing said message signal to said transceiver means, and for allowing said transceiver means to transmit said message signal as said input message when said ID signal represents a proper ID signal.

4,876,711

SERIES CONNECTED TELEPHONE SERVICE SYSTEM

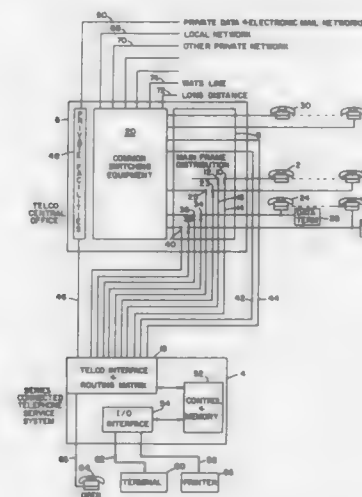
William J. Curtin, 4037 Tokay Blvd., Madison, Wis. 53711

Continuation of Ser. No. 285,938, Jul. 23, 1981, abandoned. This application Dec. 7, 1987, Ser. No. 132,700

Int. Cl.⁴ H04M 3/50, 3/56, 11/00

U.S. Cl. 379—94

19 Claims



9. A series connected telephone service system, said system comprising:

telephone answering means located remote from an associated telephone central office and including: means for intercepting calls to a subscriber telephone and directing such calls to said telephone answering means

an operator controlled means for answering calls directed to a subscriber telephone; an independent telephone line extending between the tele-

phone central office and said system and coupling said system to the central office;

a control switching means coupled in a series connection in between each of a plurality of subscriber telephone lines and corresponding central office telephone lines associated with such subscribers,

said control switching means including bridging means for coupling a selected one of the plurality of subscriber telephone lines to a telephone line to the central office for placement and receipt of calls for enabling normal service, said bridging means further operable for connecting said operator controlled means to the subscriber telephone for announcing an incoming call while holding the incoming call, and

special service means for providing special services to the subscriber by acting as an intercept between the subscriber telephone and the central office, and

control means operable upon command for coupling a selected one of the plurality of subscriber telephones to said independent line to the central office for placement of outgoing calls thereon and for leaving free the central office line associated with said subscriber to receive other calls to enable said system to communicate in both directions between the central office and the subscriber telephone.

4,876,712

PROGRAMMABLE TELEPHONE AMPLIFIER CIRCUIT INTERFACE

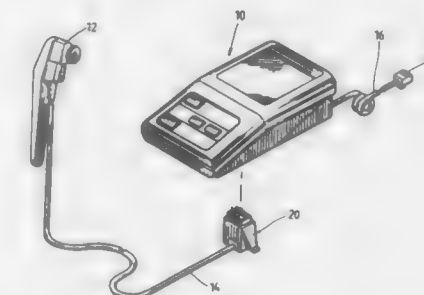
Gary T. Brist, Scotts Valley; Gabriele Bangardt, Santa Cruz; Jerol C. Gedecke, San Jose; Robert L. Harris, Aptos, and Vladimir Krav, Santa Cruz, all of Calif., assignors to Electronics, Inc., Santa Cruz, Calif.

Filed Dec. 9, 1988, Ser. No. 282,278

Int. Cl.⁴ H04M 1/62

U.S. Cl. 379—387

10 Claims



1. Apparatus for interfacing a two-way voice communication instrument to a communication link, comprising:

a signal conditioning circuit having a transmit signal channel and a receive signal channel, the circuit being programmable by an electrical input signal to establish a signal conditioning characteristic of at least one of the channels;

a first wire connection adapted to couple the signal conditioning circuit to a telephone link;

a second wire connection adapted to couple the signal conditioning circuit to a voice communication instrument;

a connector coupled in the second wire connection between the signal conditioning circuit and a voice communication instrument; and

means carried by the connector for providing the electrical input signal to program the signal conditioning circuit.

4,876,713

SIGNAL CIRCUIT PROTECTOR DEVICE FOR CONSUMER USE

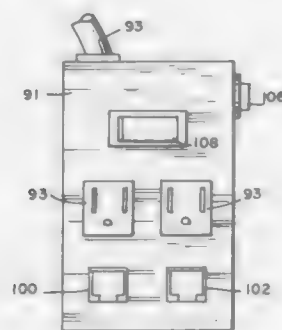
John J. Crosby, Gosham, and John J. Napierkowski, Cape Elizabeth, both of Me., assignors to GTE Products Corporation, Stamford, Conn.

Filed May 31, 1988, Ser. No. 213,950

Int. Cl.⁴ H04M 1/74

U.S. Cl. 379-412

4 Claims



1. A solid state protector device for protecting a consumer's solid state electronic telephone equipment from abnormal voltage and current surges comprising:

an enclosure made of electrically non-conductive material having front, rear, side, top and bottom walls;

a protector circuit means for protecting electronic equipment from abnormal current and voltage surges comprising first and second circuit portions;

said first protector circuit portion comprising:

a pair of input terminals;

a pair of output terminals for connection across the electronic equipment;

a voltage sensitive switch means connected across said output terminals;

a variable resistance means connected in series with said electronic equipment between one of the input terminals and one of the output terminals before said voltage sensitive switch means; and

a ground means connected in series with said voltage sensitive switch means between said output terminals;

said second protector circuit portion comprising:

resistance means connected in series with said electronic equipment between said input terminals and the output terminals before said voltage sensitive switch means;

a printed circuit board means disposed within said enclosure and dividing said enclosure into first and second chambers;

said first protector circuit portion being disposed in said first chamber and said second protector circuit portion being disposed in said second chamber portion;

said printed circuit board means being operable to electrically connect said first and second protector circuit portions and to provide access to said input and output terminals and said ground means within said second chamber;

an input connector for receiving an input circuit signal disposed in the front wall of said second chamber and electrically connected to the input terminal of said protector circuit;

an output connector for conducting said signal circuit to the electronic equipment to be protected disposed in the front wall of said chamber and electrically connected to the output terminal of said protector circuit; and

a plug means for connection to an outside ground means disposed in the rear wall of said second chamber and electrically connected to said ground means.

4,876,714

TELEPHONE SET

Shigeyuki Yoshida; Atsushi Musha, and Takayuki Nonami, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

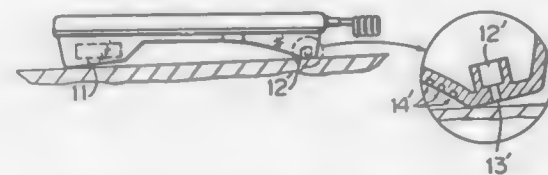
Filed Jan. 15, 1987, Ser. No. 4,085

Claims priority, application Japan, Jan. 30, 1986, 61-13442

Int. Cl.⁴ H04M 1/19

U.S. Cl. 379-433

7 Claims



1. In a telephone handset having a transmitter for generating sound, a receiver for receiving sound, and a handset housing incorporating said transmitter and said receiver substantially on said first side and at respective transmitter and receiver handset housing sections, the improvement wherein said handset housing is generally oblong in shape, having a first and a second end and said transmitter is mounted at said first end and said receiver is mounted at said second end and said transmitter and said receiver are positioned in said housing so that when said telephone set is placed on a flat surface with said transmitter and said receiver facing said flat surface, a sound-imperious portion of said housing contacts said surface at a contact line formed between said transmitter and said receiver, said contact line extending substantially orthogonal to a line joining the transmitter and receiver and substantially across the width of said housing both said transmitter and receiver housing sections comprising acoustic-coupling aperture means respectively subscribing an aperture means coupling area, said sound impervious contact line extending a length across the width of said housing that is greater than both said respective aperture means coupling areas whereby said housing acts as a sound baffle at the contact line and sound generated by said transmitter and reflected from said surface cannot directly enter said receiver, both said transmitter and receiver handset housing sections having a housing section wall extending along a predetermined plane and having defined therein said acoustic-coupling aperture means for the coupling of acoustic signals along a predetermined axis that is substantially orthogonal to said predetermined plane, said transmitter and receiver housing section walls being formed so that at least one of said aperture means predetermined axes extends in a direction out of normal to said flat surface, said aperture means predetermined axes extending in a direction away from said handset housing and diverging therefrom whereby acoustic signals radiated from said transmitter are, in addition to being baffled by said sound-imperious portion, directed away from said receiver.

4,876,715

SANITIZING DEVICE FOR A TELEPHONE

Donald F. Neubert, W225 N4007 Grandview Dr., Pewaukee, Wis. 53073

Filed Oct. 26, 1988, Ser. No. 263,013

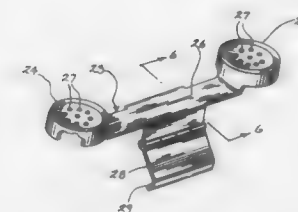
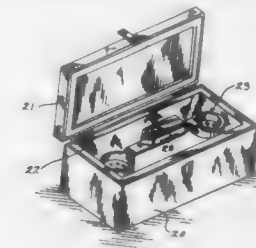
Int. Cl.⁴ H04R 1/12

U.S. Cl. 379-452

11 Claims

7. A sanitizing device for a telephone comprising a housing having a pair of first openings disposed to receive the mouthpiece and earpiece of a telephone respectively, a nested stack of sanitizing generally cup shaped filters disposed within each of said first openings, an adhesive on the inner surface of each filter and disposed to engage the outer surface of the respective mouthpiece and earpiece as the mouthpiece and earpiece are inserted within said first openings to thereby adhere said filters to the respective mouthpiece and earpiece, said housing having a plurality of second openings disposed to receive the mouth-

piece and earpiece respectively, and means associated with each of said second openings for removing the filters from the



mouthpiece and earpiece as the mouthpiece and earpiece are inserted and withdrawn from said second openings.

4,876,716

KEY DISTRIBUTION METHOD

Eiji Okamoto, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

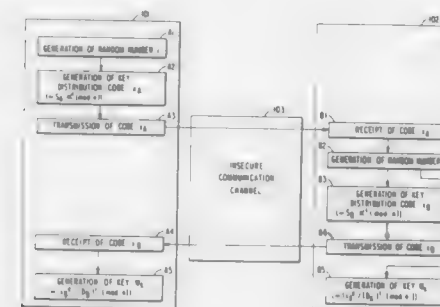
Filed Aug. 24, 1987, Ser. No. 88,319

Claims priority, application Japan, Aug. 22, 1986, 61-197610; Aug. 22, 1986, 61-197611

Int. Cl.⁴ H04L 9/02; H04K 1/00

U.S. Cl. 380-21

12 Claims



1. A key distribution method comprising the following steps:

(a) generating a first random number in a first system in use by a first converser;

(b) generating first key distribution information in said first system by applying a predetermined first transformation to said first random number on the basis of first secret information;

(c) transmitting said first key distribution information to a second system in use by a second converser via a communication channel;

(d) receiving said first key distribution information in said second system;

(e) generating a second random number in said second system;

(f) generating second key distribution information by applying said predetermined first transformation to said second random number on the basis of second secret information;

(g) transmitting said second key distribution information to said first system via said communication channel;

(h) receiving said second key distribution information in said first system; and

(i) generating an enciphering key in said first system by applying a predetermined second transformation to said second key distribution information on the basis of said first random number and identification information of said second converser.

4,876,717

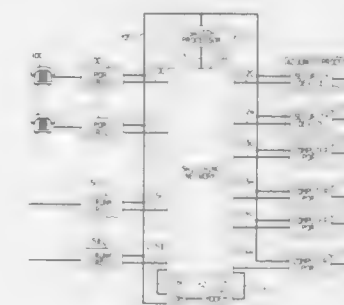
ADJUNCT PROCESSOR FOR PROVIDING COMPUTER FACILITY ACCESS PROTECTION VIA CALL TRANSFER

Salvador Barron, Westminster, and James E. Coffman, Boulder, both of Colo., assignors to American Telephone and Telegraph Company and AT&T Information Systems, Morristown, N.J. Continuation of Ser. No. 913,288, Sep. 30, 1986, abandoned. This application Jan. 3, 1988, Ser. No. 205,054

Int. Cl.⁴ H04L 9/00

U.S. Cl. 380-25

14 Claims



1. In a business communication system which serves a plurality of communication devices, each of which is connected by an associated port circuit to a switching network of said business communication system, and a plurality of computer facilities, each of which is connected to said switching network by one or more computer port circuits, said switching network having a plurality of ports, a method of providing computer port access security comprising the steps of:

interdicting all calls from any calling one of said communication devices to any of said plurality of computer facilities;

in response to a call request from said calling communication device, said call request defining one of said plurality of computer facilities, establishing a digital call connection from said calling communication device through said switching network to an adjunct processor connected to a first one of said plurality of ports of said switching network;

confirming the identity of the user at said calling communication device in said adjunct processor by exchanging information between said user and said adjunct processor; disconnecting said calling communication device from said adjunct processor;

originating a new digital call connection from said adjunct processor to a preassigned telephone number associated with said user;

determining, by said adjunct processor, the one of said plurality of computer facilities defined by said call request;

effecting, by said adjunct processor, data call transfer of said new digital call connection from said first port of said switching network connected to said adjunct processor, to a second one of said plurality of ports of said switching network, said second port being connected to one of said computer port circuits associated with one of said plurality of computer facilities determined by said adjunct processor.

4,876,718

SECURE DATA PACKET TRANSMISSION SYSTEM AND METHOD

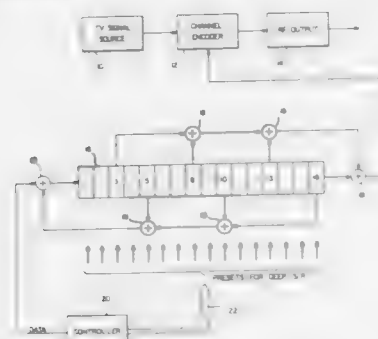
Richard W. Citta, Oak Park; Paul M. Gosc, Buffalo Grove; Dennis M. Muzabangh, and Gary J. Sgrignoli, both of Mount Prospect, all of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

Division of Ser. No. 25,236, Mar. 12, 1987, Pat. No. 4,771,458. This application Jul. 19, 1988, Ser. No. 221,166

Int. Cl.⁴ H04L 9/02; H04N 7/167

U.S. Cl. 380-42

12 Claims



1. A method of operating a data packet communication system comprising the steps of: formatting data into binary data packets; processing said binary data packets by division and multiplication by different factors to simultaneously encrypt and error protect said binary data packets; and transmitting the processed binary data packets.

4,876,719

SYNCHRONIZING SYSTEM FOR DIGITAL APPARATUS

Taro Makagami; Takeshi Fukami, both of Kanagawa, and Toshiro Terauchi, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

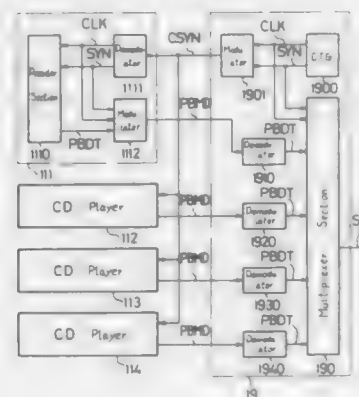
Filed Apr. 10, 1987, Ser. No. 37,382

Claims priority, application Japan, Apr. 10, 1986, 61-82550

Int. Cl.⁴ H04S 1/00

U.S. Cl. 381-1

8 Claims



1. A synchronizing system for use with a plurality of digital signal reproducers comprising:
a plurality of digital signal reproducers, each producing an output signal and having a digital I/O modulator, a digital I/O demodulator and a decoder for producing decoded data;
a digital signal multiplexer supplied with the output signals from said plurality of digital signal reproducers, and for producing a frame synchronizing signal and a multiplex output signal;
said digital signal multiplexer including means for generating

a clock pulse and a word synchronizing signal, a digital I/O modulator, and digital I/O demodulator for each of said reproducers;

circuit connecting means for interfacing the digital I/O modulator of said digital signal multiplexer and each digital I/O demodulator of said plurality of digital signal reproducers, so as to supply a demodulated clock pulse and a word synchronizing signal to each decoder thereof;

circuit connecting means for interfacing said digital I/O modulator of each of said plurality of digital signal reproducers and the respective digital I/O demodulator of said digital signal multiplexer so as to transmit said decoded data of each said decoder to said digital signal multiplexer, said digital signal multiplexer producing a time-division multiplex signal arranged in a frame format including;

(a) a word synchronizing signal,
(b) a service bit signal indicating a transmission mode, and
(c) a channel of digital data whereby the digital signals from said plurality of digital reproducers are multiplexed as indicated by said service bit signal.

4,876,720

SPEECH RECOGNITION SYSTEM

Toyohisa Kaneko, Tokyo, and Osaki Watanuki, Kawasaki, both of Japan, assignors to International Business Machines Corporation, Armonk, N.Y.

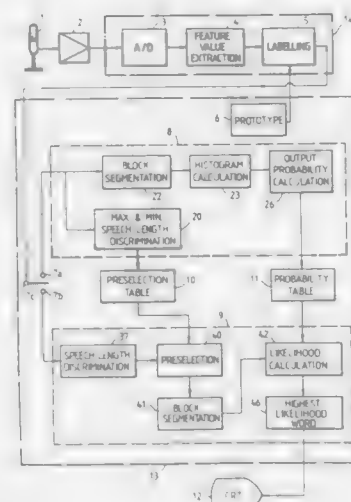
Filed Mar. 12, 1987, Ser. No. 25,126

Claims priority, application Japan, Mar. 25, 1986, 65028/86

Int. Cl.⁴ G10L 1/00

U.S. Cl. 381-43

12 Claims



1. A speech recognition system comprising:
means for storing probabilities of each of a plurality of labels being produced in each of a plurality of first segments in each of a plurality of recognition units;
means for generating a label string from an input unit;
means for segmenting said label string into a plurality of second segments, each corresponding to each of said first segments;
means for calculating, for each recognition unit, a likelihood that said input unit represents the recognition unit, by reading out from said storing means, for each of said labels in said label string, said probabilities of each of said labels associated with said one recognition unit and corresponding to each of said labels in said label string, according to the identity of each of said labels in said label string and the identity of each of said second segments to which each of said labels in said label string belongs;
means for determining a recognition unit having the highest likelihood among said recognition units, as a recognition

result, according to the outputs of said likelihood calculating means.

4,876,721

METHOD AND DEVICE FOR IDENTIFYING DIFFERENT SPECIES OF HONEYBEES

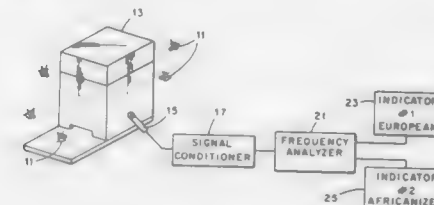
Howard T. Kerr, Maryville; Michael E. Buchanan, Lenoir City, and Kenneth H. Valentine, Knoxville, all of Tenn., assignors to Martin Marietta Energy Systems, Inc., Oak Ridge, Tenn.

Filed Mar. 3, 1988, Ser. No. 163,673

Int. Cl.⁴ H04R 29/00

U.S. Cl. 358-56

13 Claims



1. A method of identifying at least two different species of honeybees whose wing movements produce distinctly different distinguishing frequency bands for each said species within an acoustical signal spectra, comprising the steps of:

detecting said acoustical signal spectra produced by said honeybees to be identified; and

analyzing said detected acoustical signal spectra simultaneously with at least two frequency responsive circuits, one of said circuits responsive to a frequency band of one of said species and a second of said circuits responsive to a frequency band of a second of said species, to determine the presence of said distinguishing frequency bands specific to the identity of a particular species as an indication of the species of said honeybees being identified.

4,876,722

ACTIVE NOISE CONTROL

Nicolas M. J. Dekker; John W. Edwards, both of Pinner, and Adrian W. James, London, all of England, assignors to The General Electric Company, p.l.c., England

Filed May 13, 1988, Ser. No. 193,801

Int. Cl.⁴ A61F 11/02; H03B 29/00

U.S. Cl. 381-71

8 Claims



1. An active noise control system for reducing the amount of noise propagated through a duct, comprising: a microphone incorporated in a wall of said duct, and operative for detecting the sound of the propagated noise; a source of anti-sound mounted substantially at the center of a transverse cross-section of said duct; and a control circuit responsive to the magnitude of the sound detected by the microphone for driving the anti-sound source to substantially suppress first transverse mode excitation in said duct.

4,876,723

LOUDSPEAKER SYSTEM

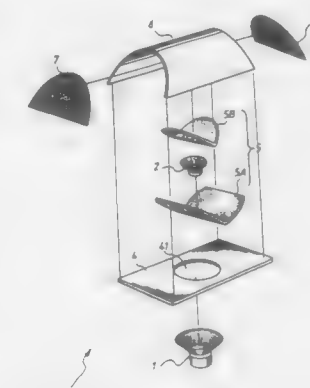
Jimmy Fang, Taipei, Taiwan, assignor to Peter Tsung-Hou Fel, Calif.

Filed Nov. 30, 1988, Ser. No. 278,026

Int. Cl.⁴ H05K 5/00

U.S. Cl. 381-182

3 Claims



1. A coaxial-type multi-speaker system for use in a motor vehicle comprising:

a low frequency transducer;

a high frequency transducer; and

a cover, said cover including an elongated substantially half-cylindrical periphery having two oppositely disposed terminating ends with lower sections thereof inclined downwardly and outwardly from the terminating ends of the corresponding upper sections;

a rigid flat bottom of which length and width are equal to those of the elongated half-cylindrical periphery, said flat bottom having a central aperture, with the low frequency transducer attached to flat bottom and a membrane of said transducer facing such aperture;

and mounted between said cover and said flat bottom, an upper and lower section as defined by two sound reflector panels of substantially V-shaped cross section each panel formed with a pair of angled members, each panel mounted perpendicularly to the length of said elongated substantially half-cylindrical periphery and in double level fashion, an apex portion of a lower level sound reflector panel facing the center of the membrane of the low frequency transducer, the high frequency transducer fixed between the two angled members of the lower level sound reflecting panel, and an upper level sound reflecting panel attached to the underside of the half-cylindrical periphery with an apex portion thereof facing the center of a membrane of the high frequency transducer.

4,876,724

PERSONAL SOUND SYSTEM

Osami Suzuki, Glenrock, N.J., assignor to Toshiba America, Inc., Wayne, N.J.

Filed Apr. 29, 1988, Ser. No. 188,221

Int. Cl.⁴ H04R 1/02; A41D 1/02, 27/20; H04M 1/05

U.S. Cl. 381-187

13 Claims

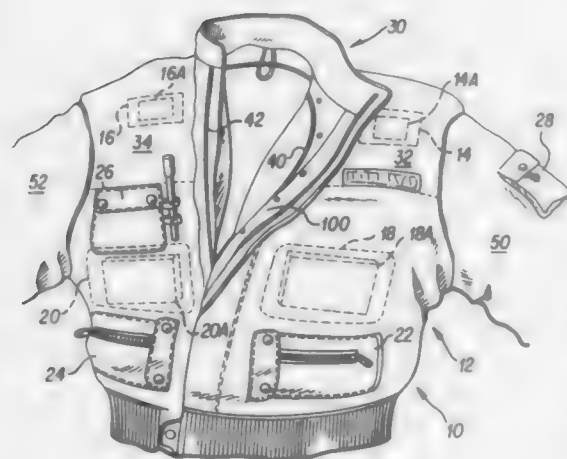
1. A personal sound system comprising:

a. a garment adapted to substantially cover a person's upper torso, said garment having portions encircling a person's neck and depending forwardly and rearwardly from the person's right and left shoulders;

b. first means for removably supporting a first speaker on said garment in the vicinity of one of the person's shoulders;

c. second means for removably supporting a second speaker on said garment in the vicinity of the person's other shoulder;

- d. third means for removably supporting an electrical signal producing device on said garment, said third means is adjacent said second means; and
- e. fourth means for removably supporting flexible wires on said garment, which wires are adapted to removably connect between said third means and said first and second means to permit transmission of an electrical signal

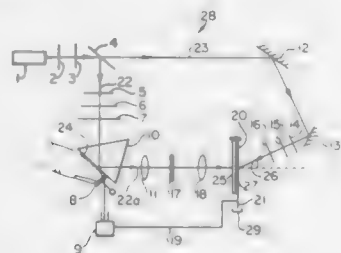


from said electrical signal producing device to said first and second speakers over said wires and to permit removal of said wires from said garment is to be cleaned, said fourth means comprising a flap extended from said third means to said second means and through that portion of said garment encircling the person's neck to said first

4,876,725
METHOD AND APPARATUS FOR FINGERPRINT VERIFICATION
George J. Tomko, Toronto, Canada, assignor to Mytec Technologies Inc., Toronto, Canada
Filed Oct. 8, 1987, Ser. No. 105,615
Int. Cl.⁴ G06K 9/00

U.S. Cl. 382-4

11 Claims



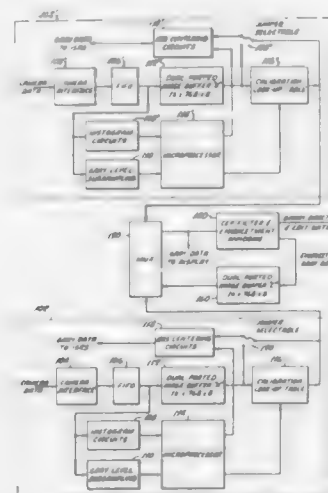
1. An optical processor fingerprint verification apparatus comprising:
- a source of incoherent light for providing an illuminating beam along a beam path;
 - input means including means to receive at least one

- fingerprint or fingerprint recording of an individual located in said beam path for producing an optical information beam modulated with data from said at least one fingerprint or fingerprint recording along an optical information beam path;
- optical Fourier transform means in said optical information beam path for providing a Fourier transformed optical information beam in a transform plane;
 - supporting means for supporting a reference data record including a pre-recorded reflection hologram of at least one reference fingerprint in said transform plane, said pre-recorded reflection hologram for reflecting and filtering a Fourier transformed optical information beam to provide light having an intensity distribution representing the correlation between said pre-recorded reflection hologram and said Fourier transformed optical information beam; and
 - verification indicating means responsive to the intensity distribution of light reflected from said pre-recorded reflection hologram when said pre-recorded reflection hologram is illuminated by a Fourier transformed optical information beam.

4,876,726
METHOD AND APPARATUS FOR CONTEXTUAL DATA ENHANCEMENT
Richard D. Capello, Orange, and George R. Mabry, Fullerton, both of Calif., assignors to De La Rue Priatrak, Inc., Anaheim, Calif.
Filed Jan. 7, 1986, Ser. No. 816,865
Int. Cl.⁴ G06K 9/00

U.S. Cl. 382-4

108 Claims



1. A method for enhancing data contained in data elements of an $N \times M$ matrix of data elements, each data element containing data representative of an intensity within a range of intensities, the method comprising:

- selecting a $Y \times Y$ direction estimate scan window of data elements, from within the $N \times M$ matrix, with $Y < N$, $Y < M$, and wherein said window has a center data element;
- taking the cumulative sum of the differences in the intensity values for each of a plurality of pairs of data elements which are spaced apart by a selected number of data elements, and each comprising one of the data elements in a respective one of a plurality of different slits, wherein each different slit represents a different slit direction and wherein the respective one of a plurality of different slits contains the center data element and is within the direction estimate scan window; and
- assigning a direction estimate to the center data element

based upon a comparison of the cumulative sum of such differences for the respective slits.

4,876,727
METHOD AND APPARATUS FOR DETECTING FAULTS IN AN OBJECT

Albrecht Maurer, Seligenstadt, and Josef Fabian, Hanau, both of Fed. Rep. of Germany, assignors to Nukem GmbH, Hanau, Fed. Rep. of Germany

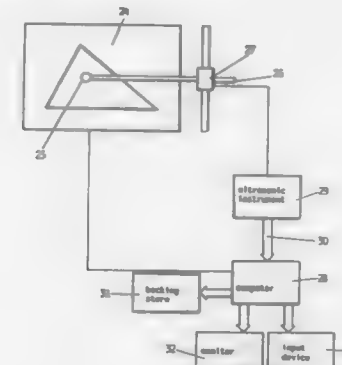
Filed Jan. 30, 1987, Ser. No. 8,950

Claims priority, application Fed. Rep. of Germany, Feb. 10, 1986, 3604111

Int. Cl.⁴ G06K 9/62

U.S. Cl. 382-8

10 Claims



1. A method for nondestructively detecting faults in and an object comprising the steps of:
 - measuring fault related values at various points of said object;
 - storing said measured fault related values with respect to a coordinate system in memory locations;
 - obtaining master values which relate to an object not having faults;
 - storing said master values with respect to said coordinate system in memory locations;
 - comparing said measured values and said master values to each other so that corresponding edges or corners are found;
 - aligning said measured values and said master values by restoring said measured values in said memory so that said corresponding edges and corners have corresponding coordinates to said master values;
 - defining partial areas of said aligned measured values and corresponding partial areas of said aligned master values so that each of said partial areas and corresponding partial areas have the same coordinate distances from said edge;
 - aligning said measured values in said partial areas and said master values in said corresponding partial area by restoring said measured values of said corresponding partial areas in memory locations to obtain minimal differences between said measured values and master values; and
 - determining a fault difference between said twice aligned measured values in said partial areas and said twice aligned master values in said corresponding partial areas to determine if said fault exists.

4,876,728
VISION SYSTEM FOR DISTINGUISHING TOUCHING PARTS

Scott D. Roth, Rowland Heights, Calif., assignor to Adept Technology, Inc., San Jose, Calif.

Continuation of Ser. No. 741,313, Jan. 4, 1985, abandoned. This application Nov. 20, 1987, Ser. No. 124,408

Int. Cl.⁴ G06K 9/48

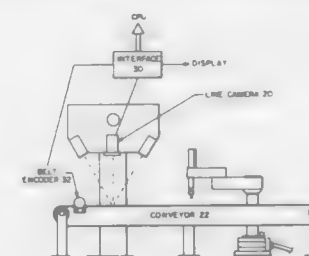
U.S. Cl. 382-21

20 Claims

1. In a vision system for identifying touching parts, a method

for identifying an object independent of the orientation of said object, comprising the steps of

- developing sensory data comprising an image of said object;
- separating closed regions from background by connectivity analysis of the data representing said image;
- developing a chain encoded representation of a region boundary of each of said closed regions of said image;
- fitting edge segments to the chain encoded representation of each region boundary to produce a more succinct representation of the boundary of each of said closed regions of said image;
- fitting straight line and circular arc segments to the edge segments to create edges and corners which characterize said image;
- classifying said straight line and circular arc segments by



feature classes, each said feature class describing a group of related features with a specific range of lengths, radii, included angles and/or angular ranges, one or more of said feature classes being associated with each of a plurality of prototypes stored in memory of said vision system to facilitate matching said image with one or more of said plurality of prototypes;

- proposing a match of an image of said object to said prototype based on said feature present in said object being classified in feature classes associated with said prototype; and
- verifying the match of the object and the prototype by translation and rotation of a region boundary of the prototype to align with the image of the object to match features of said image with features of said prototype whereby the object can be identified even when overlying another part.

4,876,729
METHOD OF IDENTIFYING OBJECTS

Yuji Watanabe, Hirakata, and Masahiro Nakamura, Osaka, both of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Continuation of Ser. No. 147,088, Jan. 2, 1988, abandoned, which is a continuation of Ser. No. 703,989, Feb. 21, 1985, abandoned. This application Nov. 14, 1988, Ser. No. 271,405
Claims priority, application Japan, Feb. 21, 1984, 59-31043; Apr. 20, 1984, 59-80763

Int. Cl.⁴ G06K 9/48

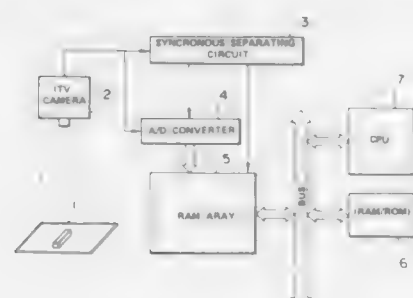
U.S. Cl. 382-22

5 Claims

1. A method of identifying an object to be detected wherein said object is photographed and is identified by detecting a portion of a contour line of the detection object from a photographed input picture image data, said method comprising the steps of:

preparing a filter means for designating a plurality of filter element data sets, each of said filter element data sets consisting of a first data indicative of the amounts of offset in two given points from a reference point, said two points being set in a manner such that one of the two points is placed inside of the photographed input picture image data of said detection object and the other one of the two points is placed outside of the photographed input picture

image data of said detection object along the boundary of said contour line so as to sandwich the portion of the contour line of said detection object, a second data indicative of a threshold value of a brightness difference between picture image data of said input picture image data corresponding these two points, and a third data indicative of a condition about a gradient in the brightness between picture image data corresponding to the two points, the number of said filter element data sets being determined according to a number by which a shape of the detection object can be determined, said filter element data sets being previously registered in a proper memory;



trace scanning said input picture image on the basis of said filter means; and identifying that the object is present when the brightness difference between the picture image data corresponding to the two points and represented by said first data exceed respective threshold values represented by said second data simultaneously with respect to all said filter element data sets and also when the brightness gradient between the picture image data corresponding to the two points satisfies the corresponding condition represented by said third data with respect to all said filter element data sets.

4,876,730

OPTICAL CHARACTER READER WITH SKEW RECOGNITION

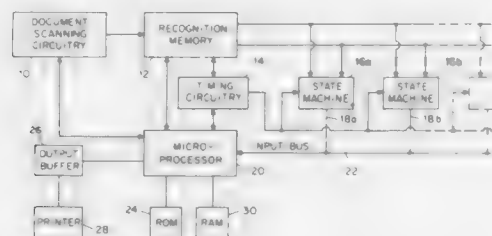
Ronald H. Britt, Leicester, England, assignor to Lundy Electronics & Systems, Inc., Charlotte, N.C.

Filed Feb. 25, 1987, Ser. No. 18,585

Int. Cl.⁴ G06K 9/00, 9/70

U.S. Cl. 382—37

4 Claims



1. An optical character recognition system comprising: optically sensitive means for scanning characters on a document, and for producing successively bit strings representing the black character bits or white background bits in slices of each character in sequence; a plurality of state machines connected to receive said bit strings, with each state machine being provided for each different associated character by programming each state machine with a different program table, and wherein each state machine changes state in accordance with its program table in response to receipt of said bit strings, each of said program tables providing, in sequence, a plurality of positive pattern tests, characteristic of its associated character, against which said received bit strings are com-

pared, and wherein each program table compares a received bit string with the same positive reference pattern in a positive reference pattern test until a received bit string compares favorably with the positive reference pattern, whereupon said state machine changes state to advance to the next positive reference pattern test, and wherein the program tables for at least some of the state machines provide for comparing received bit strings with at least one selected negative reference pattern, and wherein each program table causes its respective state machine to reset to an initial machine state when the received bit string compares favorably with said at least one selected negative reference pattern for that state thereby protecting against a stalled state by establishing a maximum time within which a character will be identified, or upon failure of a predetermined number of sequentially received bit strings to compare favorably with the respective positive reference pattern, and wherein the character will be identified in response to one of said state machines reaching and comparing favorably with the last of its positive reference pattern tests in the sequence.

4,876,731

NEURAL NETWORK MODEL IN PATTERN RECOGNITION USING PROBABILISTIC CONTEXTUAL INFORMATION

Keith Loria, Brooklyn, and James Euchner, Bedford, both of N.Y., assignors to Nynex Corporation, New York, N.Y.

Filed Feb. 19, 1988, Ser. No. 158,215

Int. Cl.⁴ G06K 9/62

U.S. Cl. 382—40

32 Claims

1. A system for recognizing an unknown pattern, said unknown pattern including one or more symbols which are part of a pattern system which is devoid of inherent context, comprising:

storing means for storing artificial contextual information associated with said unknown pattern and based upon other than information as to symbol features and the pattern system; and

recognizer means responsive to said known pattern and to said artificial contextual information, said recognizer means processes at least one symbol of said unknown pattern and outputs as a recognition decision that said one symbol is one of a plurality of category names and wherein in reaching said recognition decision during said processing phase utilizes said artificial contextual information.

4,876,732

SYSTEM FOR DETECTING ROTATIONAL ANGLE OF OBJECTIVE PATTERN

Michiaki Miyagawa, Yutaka Ishizaka, and Shoji Shimomura, all of Kanagawa, Japan, assignors to Fuji Electric Co., Ltd., Kanagawa, Japan

Filed May 18, 1987, Ser. No. 50,578

Claims priority, application Japan, Jan. 4, 1986, 61-128032

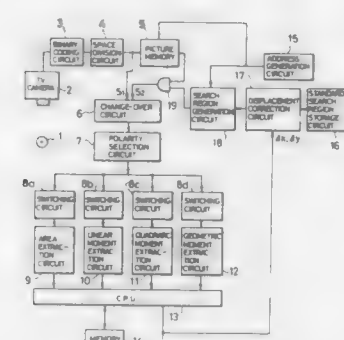
Int. Cl.⁴ G06K 9/36

U.S. Cl. 382—41

4 Claims

1. A method for detecting a rotational angle of an objective pattern comprising the steps of:

- optically sensing an objective pattern by a picture sensor to form a sense signal;
- binary coding said sense signal into picture elements;
- calculating an area of said objective pattern and a plurality of linear moments of said objective pattern from said picture elements;
- calculating a center of gravity of said objective pattern from said area and said linear moments;
- storing said area, linear moments, center of gravity and said binary-coded picture elements into a memory;
- calculating a displacement of said center of gravity corresponding to a difference between a center of gravity of a predetermined picture sample and said center of gravity of said objective pattern;



- determining an appropriate search region from among said binary-coded picture elements and reading out data corresponding to said search region;
- normalizing a position of said search region;
- calculating a rotational angle for said objective pattern based on predetermined mathematical formulae and utilizing said stored information; and
- storing predetermined data for determining whether said logic state of said picture information is to be inverted, and as to which one of said methods of calculation are to be used in detection of said rotational angle of said objective pattern.

4,876,733

METHOD FOR PERFORMING MORPHIC TRANSFORMATIONS ON IMAGE DATA IN A GENERAL PURPOSE COMPUTER

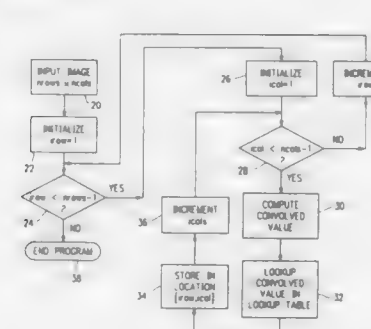
Mark A. Lavin, Mount Kisco, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 925,333, Oct. 31, 1986, abandoned. This application Mar. 7, 1989, Ser. No. 320,824

Int. Cl.⁴ G06K 9/36

U.S. Cl. 382—27

7 Claims



1. A method for use in a general purpose computer, for transforming an input image into an output image using a morphic transformation on image data comprised of pixels,

said general purpose computer having a memory, said method comprising the steps of:

- storing original pixels of said input image in said memory, said original pixels being addressed by at least first and second indexes;
- mapping each of said original pixels in memory into an image of transformed pixels wherein each transformed pixel contains data representing an original pixel and neighboring pixels in a predefined neighborhood wherein, said mapping comprises;
- accumulating said original pixels accessed according to said first index to provide first accumulated values and storing said first accumulated values in said memory;
- shifting said first accumulated value stored in said memory by two and replacing said first accumulated value stored in said memory with said value shifted by two to provide a first replaced accumulated value;
- ORing said value of said original pixel with said first replaced accumulated value to provide a first ORred accumulated value and replacing said first accumulated value with said first ORred accumulated value in said memory;
- accumulating said original pixels accessed according to said second index to provide second accumulated values and storing said second accumulated values in said memory;
- shifting said second accumulated values a second predetermined number of bits to provide a shifted second accumulated value; and
- ORing said first ORred accumulated value in said memory to said second accumulated value to provide a second added accumulated value and replacing said value in said memory with said second added accumulated value;
- searching a lookup table using said second added accumulated value as an index and storing a value pointed to in said lookup table by said index in an output array in said memory; and
- repeating said steps of mapping and searching for each of said original pixels; and
- providing an output image having pixels corresponding to values in said output array, thereby requiring only four accesses to said memory to determine said morphic transformation.

4,876,734

IMAGE SIGNAL PROCESSING METHOD AND APPARATUS

Kazuhige Kawamura, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

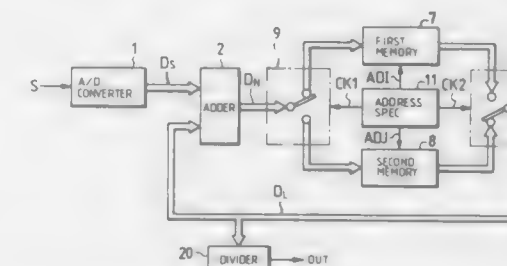
Filed May 25, 1988, Ser. No. 198,272

Claims priority, application Japan, May 25, 1987, 62-125679

Int. Cl.⁴ G06K 9/44

U.S. Cl. 382—54

7 Claims



1. An image signal processing apparatus in which first picture element data for one image are added to second picture element data for a second image in accordance with the data arrangement thereof to provide addition data, and said addition data are averaged to provide averaged data for use in image reproduction; comprising:

first memory means having memory regions a given number, less than all, of said elements of said first picture element data, an initial empty memory region for storing at least one picture element;

second memory means having memory regions for storing the remaining first picture element data;

control means for repeatedly performing:

(1) a first operation in which one of said second picture elements is added to a picture element read out from said second memory means, data provided as a result of said addition is stored in said empty region of said first memory means, and the memory region of said second memory means thus read out is designated as the next empty memory region; and

(2) a second operation in which the next picture element of said second picture element data is added to a picture element read out from said first memory means, data provided as a result of said addition is stored in said next empty memory region in said second memory means, and the memory region of said first memory means thus read out is selected as the next empty memory region; and means for dividing said addition data by the number of addition operations, to provide said averaged data.

4,876,735

METHOD AND APPARATUS FOR CHARACTER RECOGNITION SYSTEMS

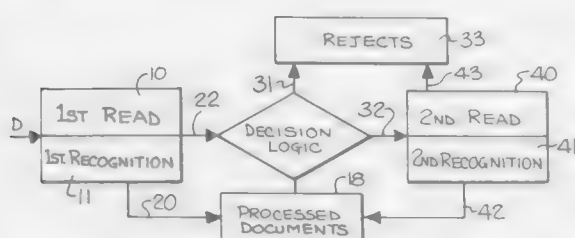
William C. Martin, and Gene D. Rohrer, both of Charlotte, N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 18, 1987, Ser. No. 134,729

Int. Cl.⁴ G06K 9/00

U.S. Cl. 382-57

10 Claims



1. A document reading machine comprising a first character reading system mounted for reading characters on documents; a second character reading system also mounted for reading said characters on said documents; first character recognition logic for recognizing characters read by first system and generating a reject character when a character cannot be recognized, said first logic periodically creating a first undetected error by recognizing a character when a reject character should have been generated;

second character recognition logic for recognizing characters read by said second system and generating said reject character when a character cannot be recognized, said second logic periodically creating a second undetected error by recognizing a character when said reject character should have been generated;

decision logic for choosing one of: a character recognized by said first logic, said reject character, and a character recognized by said second logic, as the character most accurately representing a character on said document; and said decision logic including means for substantially randomly choosing with a probability of p, said character generated by said second logic when said first logic generates said reject character, where p is a probability having a value from 0 to 1; and

means for adjustably setting the value within the range said probability p within the range of from 0 to 1.

4,876,736 METHOD AND APPARATUS FOR DETERMINING CHANNEL RECEPTION OF A RECEIVER

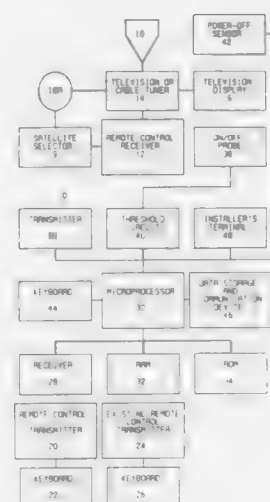
David A. Kiewit, Palm Harbor, Fla., assignor to A. C. Nielsen Company, Northbrook, Ill.

Filed Sep. 23, 1987, Ser. No. 100,198

Int. Cl.⁴ H04B 17/00

U.S. Cl. 455-2

38 Claims



1. Apparatus for identifying the channel to which a remotely controlled receiver is tuned comprising:

first wireless transmitter means for receiving a plurality of viewer entered selections and for transmitting a first unique predetermined control signal for each of said viewer entered selections;

receiver means for receiving said transmitted first predetermined control signals;

processor means coupled to said receiver means for processing said first received predetermined control signals, said processor means including means for identifying said viewer entered selection, and means for generating a second unique predetermined control signal representative of said identified viewer entered selection; and

second wireless transmitter means coupled to said processor means for receiving said generated second predetermined control signal and transmitting a representation thereof to said remotely controlled receiver to thereby tune the receiver.

4,876,737

SATELLITE DATA TRANSMISSION AND RECEIVING STATION

Donald J. Woodworth, Frank A. Ziegler, and James B. Grabenstein, all of Ocala, Fla., assignors to Microdyne Corporation, Ocala, Fla.

Filed Nov. 26, 1986, Ser. No. 935,197

Int. Cl.⁴ H04B 7/14

U.S. Cl. 455-12

11 Claims

1. A satellite data transmitting and receiving system comprising, a data transmission station having a data transmission modem,

means at said modem for phase modulating data onto an intermediate frequency signal,

a source of an identification signal providing a signal indicative solely of a specific channel on a specific satellite, means for periodically phase modulating said identification signal onto the intermediate frequency signal,

means for modulating said intermediate frequency signal onto a subcarrier frequency signal,

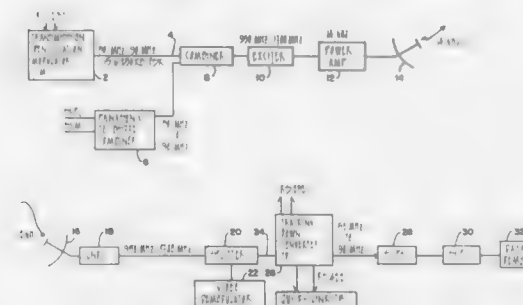
means for modulating said subcarrier signal onto a radio frequency signal,

a receiving station having a receiver

means for transmitting the radio frequency signal from said data transmission station to said receiving station via a satellite,

said last mentioned means transmitting in one of the available satellite transmission bands, said receiving station comprising

downconverter means at the receiving station for generating



a local oscillator frequency to recover the subcarrier frequency from the radio frequency signal.

a mixer,

a voltage controlled oscillator means at the receiving station for generating a local oscillator frequency for application to said mixer to retrieve at the output of said mixer the intermediate frequency signal,

means for retrieving said ID signal from said intermediate frequency signal and

means for recovering said phase modulated data in response to recovery of the ID signal generated by said source.

4,876,738

MOBILE RADIO TRANSMISSION SYSTEM

Geoffrey R. Selby, Banstead, England, assignor to U.S. Phillips Corporation, New York, N.Y.

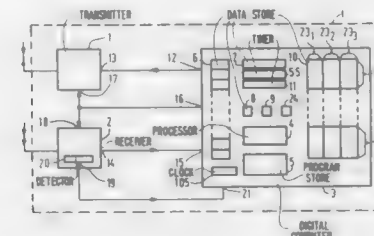
Filed Sep. 16, 1987, Ser. No. 98,443

Claims priority, application United Kingdom, Sep. 18, 1986, 2,455,555

Int. Cl.⁴ H04B 1/00; H04Q 7/00

U.S. Cl. 455-33

15 Claims



1. A mobile radio transmission system comprising:

a plurality of receiving and transmitting base stations situated at respective geographic locations, defining a plurality of respective service areas;

a plurality of mobile stations, each including means for transmitting a registration identification and communicating by two-way radio with each base station when in communication range of that base station; and

control means including a station location record store corresponding to each mobile station, for storing a respective service area identity responsive to receipt at a base station of a registration identification transmitted by the corresponding mobile station,

characterized in that each mobile station comprises

means for storing a mobile location record capable of storing at least n service area identities, where n > 1,

means for determining if the number of service area identities currently stored in that mobile location record equals n,

means for sensing when that mobile station is not within communication range of any base station serving a service area whose identity is currently stored in that mobile location record,

means responsive to said means for sensing, when that mobile station is not within such range, for attempting to communicate with another base station having another service area identity, which may be within range; and upon communicating with said another base station, for replacing a service area identity already stored in said mobile location record with said another service area identity if n service area identities were already stored in said mobile location record, and otherwise storing said another service area identity in said mobile location record, and said control means further comprises

means for storing n different service area identities in each location record, responsive to receipt of registration identification signals by respective base stations from respective mobile stations, and

means for responding to such communicating with said another base station by updating the contents of the station location record for the corresponding mobile station such that the corresponding mobile station is recorded as being currently located in said another service area; and for replacing a service area identity already stored in said station location record with said another service area identity if n service area identities were already stored in said station location record, and otherwise storing said another service area identity in said station location record while retaining the service area identities already stored.

4,876,739

TVRO RECEIVER SYSTEM WITH LOW-COST VIDEO-NOISE REDUCTION FILTER

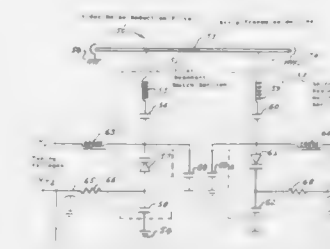
John Y. Ma, Milpitas, and Albert C. Houston, Santa Cruz, both of Calif., assignors to Capetronic (BSR) Ltd., Kowloon, Hong Kong

Continuation of Ser. No. 792,767, Oct. 30, 1985, Pat. No. 4,718,117. This application Dec. 31, 1987, Ser. No. 140,037

Int. Cl.⁴ H04B 1/10

U.S. Cl. 455-266

8 Claims



1. A TVRO receiver for receiving frequency modulated video signals centered within a frequency range having a nominal center frequency, the receiver comprising:

a tuner including a superheterodyne circuit having a voltage-controlled oscillator (VCO), means for supplying a controlling input voltage to said VCO, and a mixer for combining incoming 1st IF signals within a predetermined IF frequency range with the output of said VCO to reduce the frequency of the 1st IF signal to within a 2nd IF frequency range having a predetermined nominal center frequency which permits the output frequencies of said

VCO to be substantially non-interfering with the frequency range of the 1st IF signals, thereby preventing the output of the VCO from interfering with the 1st IF signals, and

linear phase passband filter means for passing a single video channel in the second IF input from said mixer, said filter means having characteristics with a peak at the center of the filter passband and having sharply sloping passband edges on either side thereof, so as the essentially pass only those signals in the 2nd IF output from said mixer which are centered about the center of said filter passband.

4,876,740

RADIOTELEPHONE SYSTEM EMPLOYING DIGITIZED SPEECH/DATA SIGNALLING

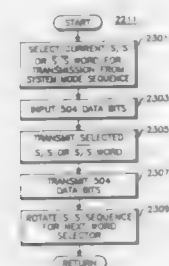
Stephen N. Levine, and Albert J. Leitch, both of Chicago, Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 905,369, Sep. 8, 1986, abandoned, which is a division of Ser. No. 771,460, Aug. 30, 1985, abandoned. This application Feb. 13, 1989, Ser. No. 310,013

Int. Cl.⁴ H04Q 7/04

U.S. Cl. 455—33

19 Claims



12. A digital message transmitter for a cellular radiotelephone system having at least two modes of operation, said transmitter comprising:

means for generating one of a plurality of high auto correlation, low cross correlation multiple bit data words and its logical inverse whereby the transmitter may be identified; means for generating a pattern of one of a predetermined sequence of said generated multiple bit data word and said logical inverse whereby a mode of operation may be specified;

means for interleaving said generated pattern with a predetermined number of bits of the digital message; and means for modulating said interleaved pattern and message on a radio carrier.

4,876,741

METHOD OF RECEIVING A COMPRESSED COMPOSITE SIGNAL

Paul H. Jacobs, Fairport, N.Y., and Douglas P. Collette, Raleigh, N.C., assignors to General Signal Corporation, Stamford, Conn.

Division of Ser. No. 807,641, Dec. 11, 1985, Pat. No. 4,718,116, which is a continuation-in-part of Ser. No. 558,046, Jan. 26, 1984, Pat. No. 4,573,208, which is a division of Ser. No. 348,148, Jan. 1, 1982, Pat. No. 4,539,707. This application Aug. 21, 1987, Ser. No. 87,914

Int. Cl.⁴ H04B 1/16, 1/48

U.S. Cl. 455—47

16 Claims

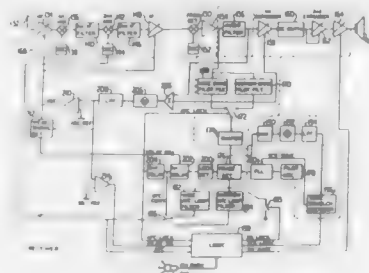
1. A two-way, land mobile, single sideband, radio communication system comprising:

a push-to-talk transmitter for broadcasting a compressed signal, said compressed signal including an unattenuated frequency modulated pilot tone during an initial predetermined time interval and thereafter a composite signal including an attenuated frequency modulated pilot tone and an audio signal, said transmitter including means operative only during said initial predetermined time

interval for adjusting said transmitter to produce full rated power; and a receiver for receiving said broadcast signal, said receiver including:

means for detecting said compressed composite signal, pilot tone filter means for separating the pilot tone from said compressed signal,

phase lock loop means responsive to said pilot tone filter means for (a) varying the filter characteristics of said pilot tone filter to thereby enhance the acquisition of



said detected compressed composite signal, (b) varying the filter characteristics of said phase lock loop means after acquisition of said detected compressed composite signal to thereby enhance maintenance of lock-on of said detected compressed composite signal, audio signal filter means for separating said audio signal from said compressed composite signal, and means responsive to said pilot filter means for expanding and amplifying said compressed audio signal without expanding and amplifying said pilot tone.

4,876,742

APPARATUS AND METHOD FOR PROVIDING A WIRELESS LINK BETWEEN TWO LOCAL AREA NETWORK SYSTEMS

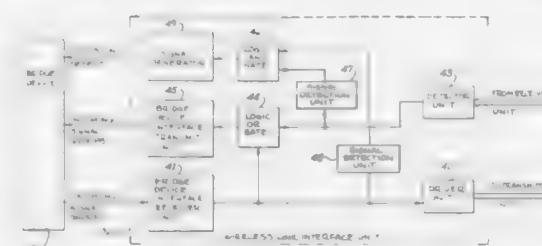
Gary Vacon, 52 Mill St., Woburn, Mass. 01801, and James J. Liu, 34 Wadsworth Rd., Sudbury, Mass. 01776

Filed Mar. 23, 1987, Ser. No. 29,214

Int. Cl.⁴ H04B 7/00

U.S. Cl. 455—66

8 Claims



1. Apparatus for exchanging signal groups between two local area networks, wherein said signal groups are exchanged through a wireless medium, said apparatus comprising:

a first and a second transmitter/receiver unit for transmitting and detecting radiation propagated across said wireless medium, said first and said second transmitter/receiver units exchanging signal groups therebetween;

a first and a second local area network each including a local bus and local processing components coupled to said local bus, said local processing components applying signals to and receiving signals from said local bus;

a first bridge circuit coupled to said first transmitter/receiver unit and to a first local bus of said first local area network for transferring signal groups therebetween, said first bridge circuit identifying first signal groups on said

first local bus to be applied to a processing component of said second local area network and applying said first signal groups to said first transmitter/receiver unit for transmission to said second transmitter/receiver unit; and a second bridge circuit coupled to said second transmitter/receiver unit and a second local bus of said second local area network for transferring signal groups therebetween, said second bridge identifying second signal groups on said second local bus to be applied to a processing component in said first local area network and applying said second signal groups to said second transmitter/receiver unit for transmission to said first transmitter/receiver unit, wherein said first and said second bridge circuits include apparatus for identifying simultaneous transfer of a first signal group and a second signal group therethrough, an identification of a simultaneous transfer causing a reapplication of said first signal group participating in said simultaneous transfer to said first transmitter/receiver unit and a reapplication of said second signal group participating in said simultaneous transfer to said second transmitter/receiver unit.

4,876,744

MIXER WITH RAT RACE CIRCUIT

Haruyoshi Endo, Zama; Komei Misaizu, Kawasaki, and Mitsuo Makimoto, Yokohama, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

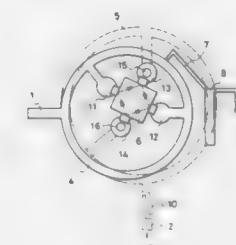
Filed Jan. 15, 1988, Ser. No. 144,156

Claims priority, application Japan, Jan. 16, 1987, 62-8489; Aug. 7, 1987, 62-198529

Int. Cl.⁴ H04B 1/26

U.S. Cl. 455—326

8 Claims



4,876,743

SIGNAL DIVERSITY ARRANGEMENT FOR MOBILE RECEPTION

Karl-Heinz G. Lindenmeier, Planegg, and Gerhard Flachsencker, Ottobrunn, both of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 1, 1987, Ser. No. 127,827

Claims priority, application Fed. Rep. of Germany, Dec. 2, 1986, 3641109

Int. Cl.⁴ H04B 11/16

U.S. Cl. 455—133

12 Claims

1. A signal diversity receiving system comprising a receiver and a diversity processor,

said processor comprising means for applying a selected one of a plurality of input signals to said receiver, and means for applying a different one of said input signals to said receiver after a switching interval, in case of interference affecting said selected one,

characterized in that said means for applying a different one comprises an interference detector operating in an analog mode, and a comparator having first and second inputs, said interference detector having an output connected to said first input,

further comprising means for applying a set value to said

1. A mixer including a balanced-to-unbalanced conversion circuit and a bridge-coupled diode circuit, coupled to said balanced-to-unbalanced conversion circuit, for outputting an intermediate frequency signal as the result of mixing of a radio frequency signal and a local oscillator signal which are inputted into said mixer, said balanced-to-unbalanced conversion circuit being constructed of first and second rat race circuits, one being for said radio frequency signal and comprising a first ring-shaped conductive line and the other being for said local oscillator signal and comprising a second ring-shaped conductive line of said second rat race circuit being formed as a pattern on said second surface, said bridge-coupled diode circuit comprising four diodes so as to mix said radio frequency signal and said local oscillator signal to produce a signal with a frequency between frequencies of the radio frequency signal and said local oscillator signal and being positioned within said first ring-shaped line on said first surface thereof.

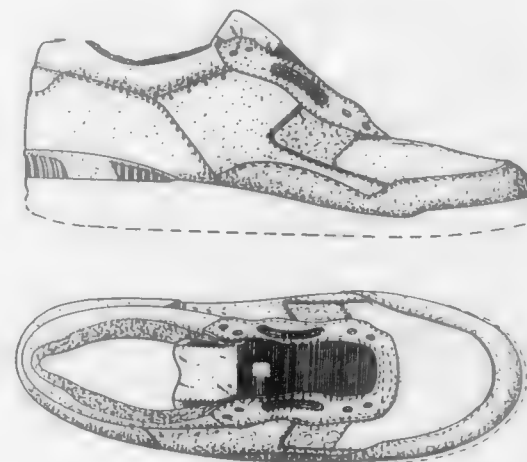
DESIGNS

OCTOBER 24, 1989

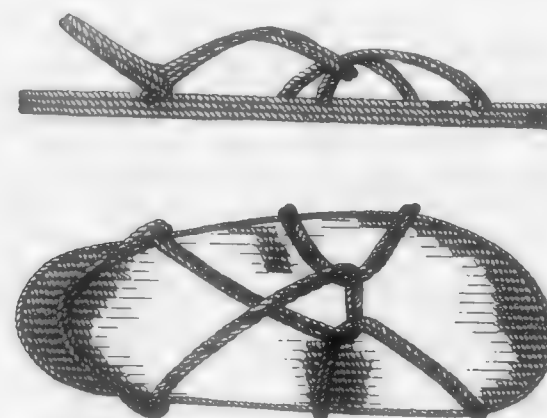
304,125
BOOT FOR A MOTORCYCLIST
 Hisashi Kuchitani, No. 9-14,4-chome, Yoga, Setagaya-ku Tokyo, Japan
 Filed Dec. 31, 1986, Ser. No. 948,283
 Term of patent 14 years
 U.S. Cl. D2-275



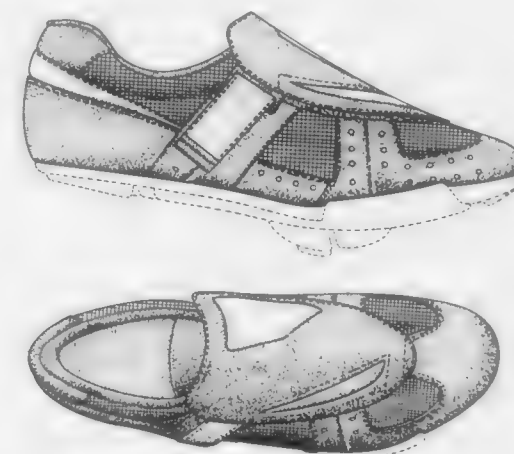
304,127
SHOE UPPER
 Miza Mourad, Portland, Oreg., assignor to AVIA Group International, Inc., Portland, Oreg.
 Filed Aug. 22, 1988, Ser. No. 234,829
 Term of patent 14 years
 U.S. Cl. D2-314



304,126
SANDAL
 Kristy L. Christian; Fred A. Ridley, Jr., both of 7908 Lakehurst Dr., and Clay K. Ridley, 2916 Lansdowne, all of Oklahoma City, Okla. 73120
 Filed Jul. 23, 1987, Ser. No. 77,534
 Term of patent 14 years
 U.S. Cl. D2-293



304,128
SHOE UPPER
 Kenneth R. Kolman, Lake Oswego; Michael J. Nyberg; Richard W. Cote, both of Tualatin, all of Oreg.; Rory W. Faerst, Menlo Park, Calif., and James Granville, San Antonio, Tex., assignors to Avia Group International, Inc., Portland, Oreg.
 Filed Nov. 3, 1988, Ser. No. 266,497
 Term of patent 14 years
 U.S. Cl. D2-314



304,129

HOLDER FOR FLOSS AND SIMILAR ARTICLES
Vonda J. Thorpe, 1220 W. 4575 North, Brigham City, Utah 84302

Filed Feb. 24, 1986, Ser. No. 834,863
Term of patent 14 years

U.S. Cl. D3—23

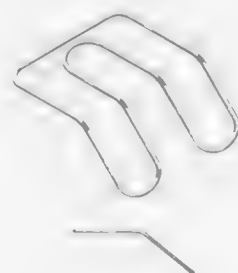


304,132

BELT MOUNTED CLIP BOARD HOLDER
Richard A. Jackson, 114 Garvins Falls Rd., Concord, N.H. 03301

Filed Jun. 12, 1986, Ser. No. 874,345
Term of patent 14 years

U.S. Cl. D3—100



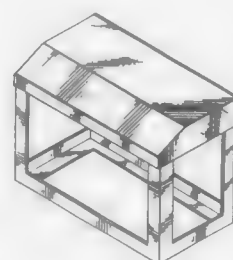
304,133

GAS CAN RACK

Michael D. Casselman, 16981 Krameria, Riverside, Calif. 92504
Filed Mar. 30, 1987, Ser. No. 31,120

Term of patent 14 years

U.S. Cl. D6—420



304,130

ATTACHABLE KEY LIGHT

Chang J. Song, 6751 Mang Road, Richmond, B.C., Canada V7C 2Y1

Filed Feb. 12, 1987, Ser. No. 13,821
Term of patent 14 years

U.S. Cl. D3—63



304,134

TELEPHONE SHELTER

Thomas R. Griffiths, Lambs Lane, Rainham Essex RM13 7RT, England

Filed Jan. 28, 1987, Ser. No. 8,408

Claims priority, application United Kingdom, Jul. 28, 1986, 1035685

Term of patent 14 years

U.S. Cl. D6—421



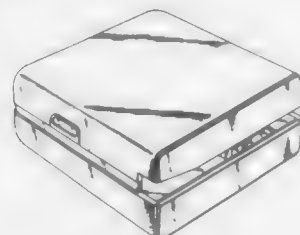
304,131

ENVELOPE OPENER

Shintaro Tanigami, Tokyo, Japan, assignor to Elm Industry Co., Ltd., Tokyo, Japan

Filed May 25, 1988, Ser. No. 198,383
Term of patent 14 years

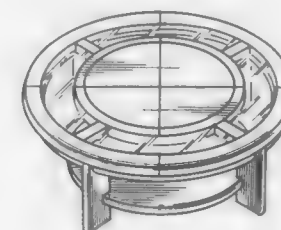
U.S. Cl. D3—72

304,135
TABLE

George Mergenov, Longwood, Fla., assignor to Lune-Ching Hu, Paramount, Calif.

Filed Nov. 20, 1986, Ser. No. 933,603
Term of patent 14 years

U.S. Cl. D6—477

304,138
SUGAR POT

Johannes H. Weernink, Goor, Netherlands, assignor to Mepal B.V., Lochem, Netherlands

Filed May 7, 1987, Ser. No. 46,862
Claims priority, application World Int. Prop. O., Nov. 27, 1986, DM007,846

Term of patent 14 years
U.S. Cl. D7—17



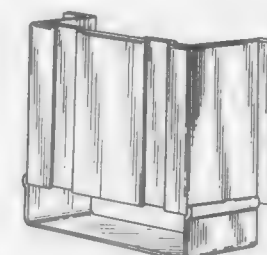
304,136

PLASTIC BAG DISPENSER

John J. Severini, 2911 Severini La., Castro Valley, Calif. 94546
Filed May 26, 1987, Ser. No. 54,240

Term of patent 14 years

U.S. Cl. D6—515



304,139

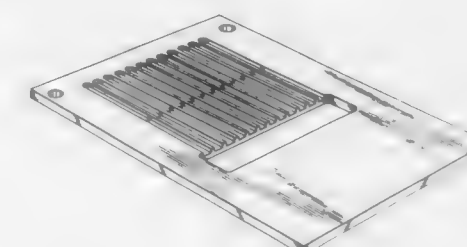
MOLD PLATE ADAPTER

Bernard Miles, 119 Trenton Ave., Point Pleasant Beach, N.J. 08742

Filed Aug. 20, 1985, Ser. No. 767,373

Term of patent 14 years

U.S. Cl. D7—43



304,140

JUICE PRESSER OR SIMILAR ARTICLE

Yung-To Li, No. 58, Jen-Ai St., Eng-Hang Tsua, Yung-Kang Hsiang, Tainan Hsien, Taiwan

Filed May 19, 1987, Ser. No. 51,812

Claims priority, application Taiwan, Feb. 28, 1987, 76301131

U.S. Cl. D7—49



304,137

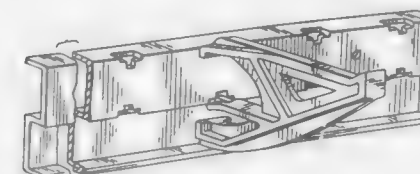
IMPLEMENT HOLDER

Milton E. Handler, Northbrook, and Michael Peterson, Evanston, both of Ill., assignors to Hirsh Company, Skokie, Ill.

Filed Jun. 11, 1987, Ser. No. 61,142

Term of patent 14 years

U.S. Cl. D6—569



304,141

JUICE PRESSER OR SIMILAR ARTICLE

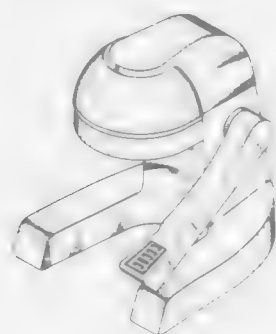
Yung-To Li, No. 58, Jen-Ai St., Eng-Hang Tsun, Yung-Kang Hsiang, Tainan Hsien, Taiwan

Filed May 19, 1987, Ser. No. 51,813

Claims priority, application Taiwan, Mar. 3, 1987, 76301191

Term of patent 14 years

U.S. Cl. D7-49



304,142

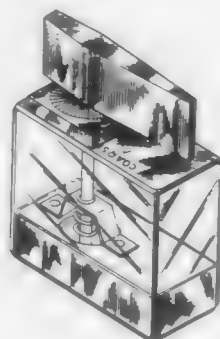
CONDIMENT MILL

William E. Bounds, P.O. Box 1547, Torrance, Calif. 90505

Filed May 30, 1986, Ser. No. 869,023

Term of patent 14 years

U.S. Cl. D7-53



304,143

SOFT DRINK CARRIER

William M. Dennis, 9421 Steel, Detroit, Mich. 48228

Filed Feb. 6, 1986, Ser. No. 826,889

Term of patent 14 years

U.S. Cl. D7-70



304,144

SPATULA

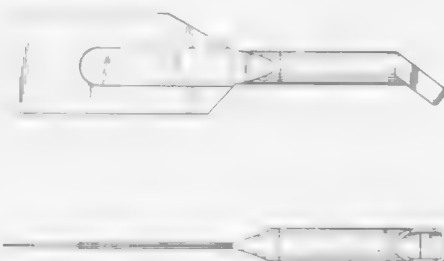
Bruno Gecchelin, Milan, Italy, assignor to Fratelli Guzzini S.p.A., Recanati, Italy

Filed Nov. 19, 1986, Ser. No. 932,899

Claims priority, application Italy, May 23, 1986, 21970/86[U]

Term of patent 14 years

U.S. Cl. D7-102



304,145

SPOON

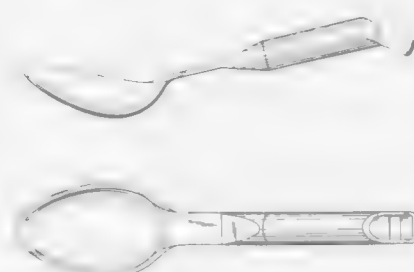
Bruno Gecchelin, Milan, Italy, assignor to Fratelli Guzzini S.p.A., Recanati, Italy

Filed Nov. 19, 1986, Ser. No. 932,898

Claims priority, application Italy, May 23, 1986, 21970/86[U]

Term of patent 14 years

U.S. Cl. D7-104



304,146

MILK CAN

Johannes H. Weernink, PG Goor, Netherlands, assignor to MEPAL B.V., Lochem, Netherlands

Filed May 7, 1987, Ser. No. 46,774

Claims priority, application World Int. Prop. O., Nov. 27, 1986, DM 007,846

Term of patent 14 years

U.S. Cl. D7-317



304,147

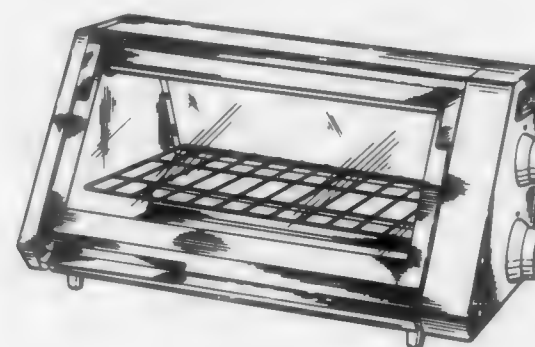
ELECTRIC OVEN TOASTER

Kazuo Takada, Nara; Yayoi Ogata, Hyogo, and Naomi Nakajima, Kyoto, all of Japan, assignors to Sanyo Electric Co., Ltd., Japan

Filed Dec. 30, 1986, Ser. No. 947,967

Term of patent 14 years

U.S. Cl. D7-350



304,149

MICROWAVE OVEN

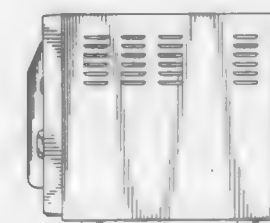
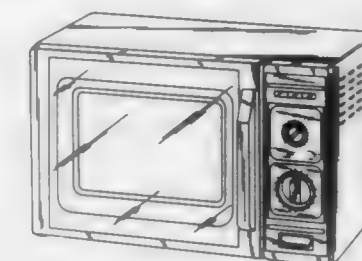
Hideo Nishikawa; Kenzo Okamoto, both of Osaka, and Fumihiko Kitada, Neyakawashi, all of Japan, assignors to Imanishi Kinzoku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jun. 10, 1986, Ser. No. 873,208

Claims priority, application Japan, Feb. 27, 1986, 61-6612

Term of patent 14 years

U.S. Cl. D7-351



304,148

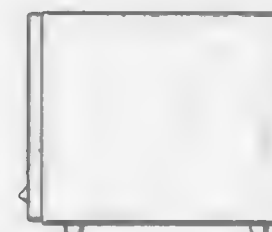
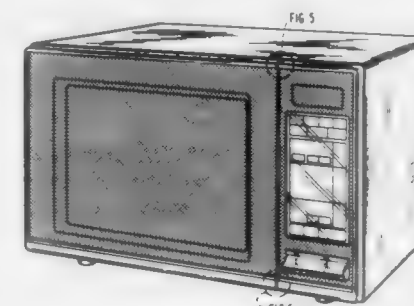
MICROWAVE OVEN

Kensuke Mizuma; Masayoshi Kubo; Hisayoshi Matoba, and Masuo Ichihara, all of Nara, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 30, 1986, Ser. No. 869,070

Term of patent 14 years

U.S. Cl. D7-351



304,150

MICROWAVE OVEN

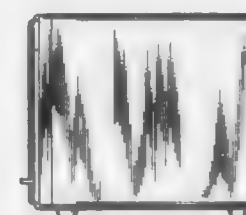
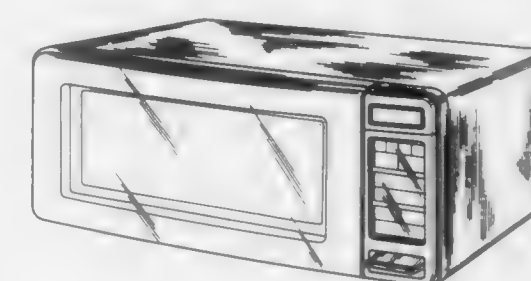
Masayoshi Kubo, Nara; Katsutoshi Kido, Kyoto; Masuo Ichihara, Nara; Kensuke Mizuma, Nara, and Hisayoshi Matoba, Nara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 22, 1987, Ser. No. 64,494

Claims priority, application Japan, Mar. 20, 1987, 62-10575

Term of patent 14 years

U.S. Cl. D7-351



304,151

REFILLABLE PROPANE TORCH

David S. Chapin, Raleigh, N.C., and Gilbert R. Farnham, Sycamore, Ill., assignors to Cooper Industries, Inc., Houston, Tex.
Filed May 1, 1986, Ser. No. 858,519
Term of patent 14 years

U.S. Cl. D8—30

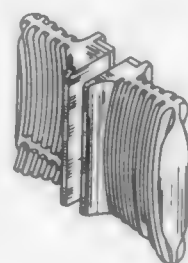


304,153

HAND HELD KNIFE SHARPENER

James R. Reichow, Brooklyn Park, Minn., assignor to Normark Corporation, Minneapolis, Minn.
Filed May 12, 1986, Ser. No. 862,566
Term of patent 14 years

U.S. Cl. D8—93

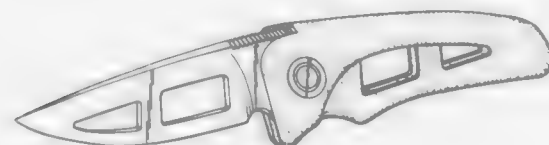


304,154

FOLDABLE KNIFE

Ralph F. Osterhout, San Francisco, Calif., assignor to Tekna, Redwood City, Calif.
Filed Mar. 9, 1987, Ser. No. 24,102
Term of patent 14 years

U.S. Cl. D8—99



304,152

CORDLESS SCREWDRIVER

David G. Kmetz, Westborough, Mass., assignor to The Stanley Works, New Britain, Conn.
Filed Oct. 19, 1987, Ser. No. 110,484
The portion of the term of this patent subsequent to Jul. 4, 2003, has been disclaimed.

U.S. Cl. D8—68

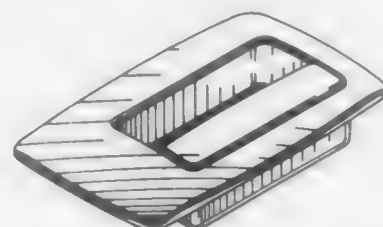


304,155

FLUSH MOUNTED LATCH ASSEMBLY

Richard H. Russell, Farmington, and David W. Kaiser, North Haven, both of Conn., assignors to The Eastern Company, Cleveland, Ohio
Filed Jul. 10, 1987, Ser. No. 72,276
The portion of the term of this patent subsequent to Sep. 26, 2003, has been disclaimed.

U.S. Cl. D8—303



304,156

COVERED SLIDING GLASS DOOR HANDLE

Ben A. Paente, Jr., 3800 Kings Way, Sacramento, Calif. 95821
Continuation-in-part of Ser. No. 728,693, Apr. 29, 1985, abandoned. This application Nov. 22, 1988, Ser. No. 274,993
Term of patent 14 years

U.S. Cl. D8—314



304,158

BOTTLE

York Kleinert, Middlesex, N.J., assignor to Alloy Tool and Mold, Mfg., Corp. (ATM), North Branch, N.J.
Filed Jan. 31, 1986, Ser. No. 824,771
Term of patent 14 years

U.S. Cl. D9—375

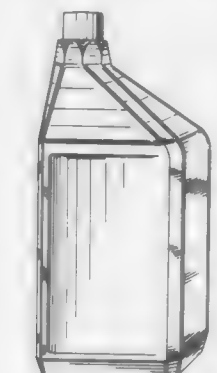


304,159

BOTTLE

York Kleinert, Middlesex, N.J., assignor to Alloy Tool and Mold, Mfg., Corp. (ATM), North Branch, N.J.
Filed Jan. 31, 1986, Ser. No. 824,772
Term of patent 14 years

U.S. Cl. D9—375

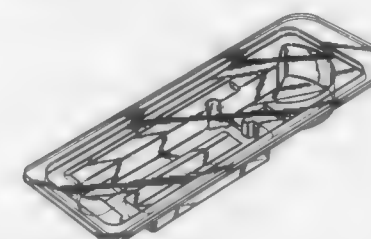


304,157

PACKAGE FOR DENTAL PRODUCTS

Robert D. Holewinaki, Lakehurst, N.J., assignor to Johnson & Johnson Consumer Products, Inc., New Brunswick, N.J.
Filed Nov. 24, 1986, Ser. No. 934,535
Term of patent 14 years

U.S. Cl. D9—347

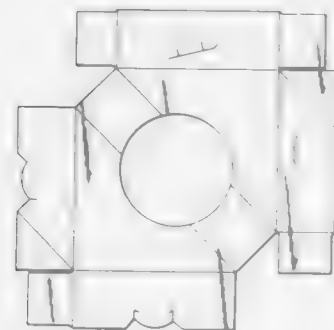


304,160

CARTON BLANK

Neil V. H. Goldman, London, England, assignor to Frank Coleman (Luton) Limited, Flitwick, England
 Filed Jan. 16, 1987, Ser. No. 3,923
 Claims priority, application United Kingdom, Jul. 25, 1986, 1035642

Term of patent 14 years
 U.S. Cl. D9—433

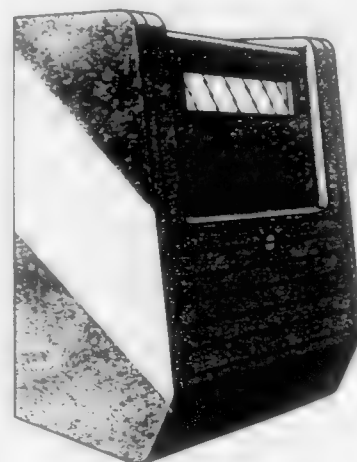


304,162

COMPUTER CONTROLLED TIME CLOCK WITH FOLD-UP KEYBOARD

Darward W. Calkins, Cincinnati, Ohio, assignor to Cincinnati Time, Inc., Cincinnati, Ohio
 Filed Sep. 26, 1986, Ser. No. 913,221

Term of patent 14 years
 U.S. Cl. D10—41



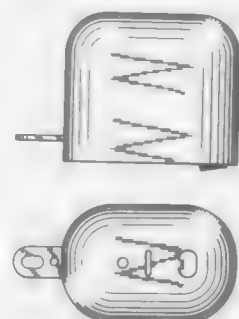
304,163

ELECTROMAGNETIC BILL

Junichi Aizawa; Shoichi Kumazawa; Satoru Yamachi, and Isao Kondo, all of Tokyo, Japan, assignors to Seikosha Co., Ltd., Japan

Filed Dec. 11, 1986, Ser. No. 940,646
 Claims priority, application Japan, Jul. 17, 1986, 61-28011
 Term of patent 14 years

U.S. Cl. D10—116



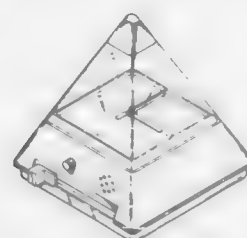
304,161

TALKING CLOCK

Hidekatsu Nomizu, Yoshida, Japan, assignor to Twin Bird Industrial Company, Limited, Niigata, Japan

Filed Nov. 10, 1986, Ser. No. 929,237
 Claims priority, application United Kingdom, May 12, 1986, 1034024

Term of patent 14 years
 U.S. Cl. D10—21

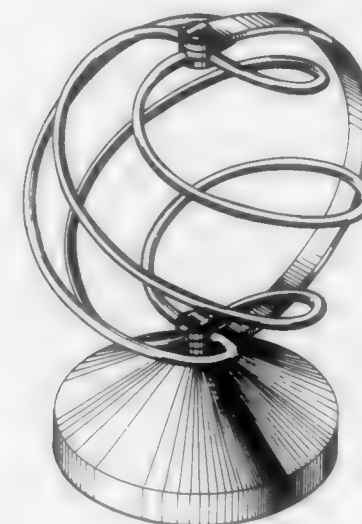


304,164

GEOMETRIC ORNAMENT

Randall S. Rochte, 5 Concord Green #6, Concord, Me. 01742
 Filed Apr. 14, 1986, Ser. No. 851,688

Term of patent 14 years
 U.S. Cl. D11—131



304,166

TIRE

Maurice Graas, Luxembourg City, Luxembourg, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio
 Filed Jun. 16, 1986, Ser. No. 875,778

Claims priority, application Brunel, Jan. 13, 1986, 60794-00
 The portion of the term of this patent subsequent to Jun. 16, 2002, has been disclaimed.
 Term of patent 14 years

U.S. Cl. D12—143



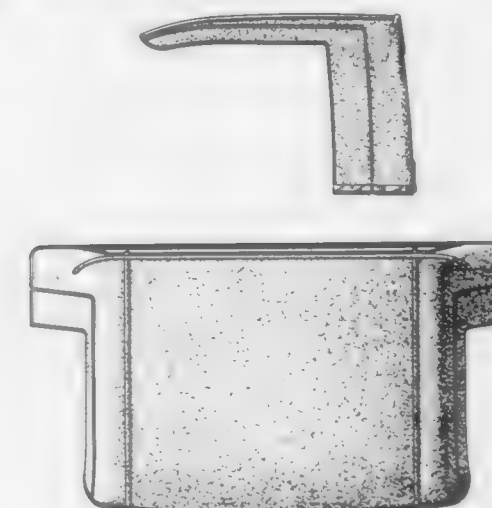
304,167

DECORATIVE TOP ADAPTED TO BE PLACED OVER THE EXISTING ROOF OF A TRUCK

David D. Eash, and Richard Hannas, both of Columbia, Md., assignors to E&G Classics, Inc., Columbia, Md.

Filed Nov. 4, 1988, Ser. No. 267,008
 Term of patent 14 years

U.S. Cl. D12—156

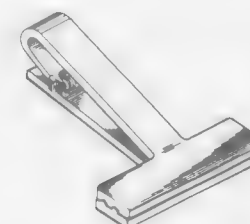


304,165

NECKTIE CLASP

Keith A. Mosley, 439 Shannon Dr., Atlanta, Ga. 30310
 Filed Sep. 4, 1985, Ser. No. 772,723

Term of patent 14 years
 U.S. Cl. D11—202



304,168

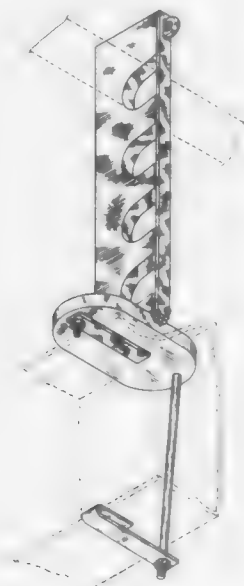
SUPPORT BRACKET FOR HOLDING LOAD LOCKS WHEN NOT IN USE FOR MOUNTING ON A BEAM BEHIND THE CAB OF A TRUCK VEHICLE

Marvin E. Gurganus, 2129 Holcomb Rd., Dalton, Ga. 30720

Filed Jan. 12, 1987, Ser. No. 2,429

Term of patent 14 years

U.S. Cl. D12—157



304,170

POWER INVERTER

Nobuyuki Kondo; Yoshinori Abe, both of Kamakura; Hideaki Tata, Nagoya; Eiji Ito, Nagoya; Katsuhiko Chonan, Nagoya, and Hideo Inuma, Nagoya, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 743,703, Jan. 3, 1985. This application Sep.

21, 1988, Ser. No. 247,325

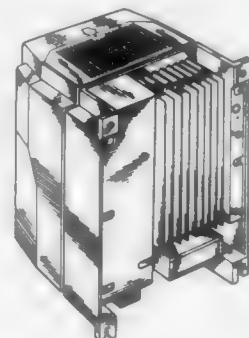
Claims priority, application Japan, Dec. 3, 1984, 59-49661;

Dec. 3, 1984, 59-49665; Dec. 3, 1984, 59-49666; Dec. 3, 1984,

59-49667

Term of patent 14 years

U.S. Cl. D13—4



304,171

POWER INVERTER

Nobuyuki Kondo; Yoshinori Abe, both of Kamakura; Hideaki Tata, Nagoya; Eiji Ito, Nagoya; Katsuhiko Chonan, Nagoya, and Hideo Inuma, Nagoya, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 740,323, Jun. 3, 1985. This application Oct.

21, 1988, Ser. No. 260,891

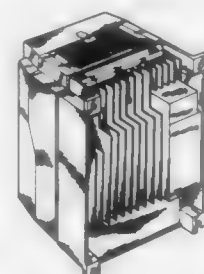
Claims priority, application Japan, Dec. 3, 1984, 59-49660;

Dec. 3, 1984, 59-49662; Dec. 3, 1984, 59-49663; Dec. 3, 1984,

59-49664

Term of patent 14 years

U.S. Cl. D13—4



304,169

ELECTRIC MOTOR

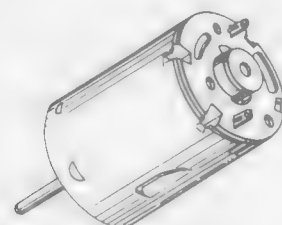
Michio Hoshino; Masakazu Ikegami, and Hajime Sato, all of Matsudo, Japan, assignors to Mabuchi Motor Co., Ltd., Japan

Filed Mar. 10, 1986, Ser. No. 842,401

Claims priority, application Japan, Sep. 12, 1985, 60-38602

Term of patent 14 years

U.S. Cl. D13—1



304,172

STORAGE BATTERY

Takashi Sogabe, Tokyo, and Kunio Takeyama, Kyoto, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jul. 22, 1987, Ser. No. 76,262

Claims priority, application Japan, Jan. 30, 1987, 62-3646

Term of patent 14 years

U.S. Cl. D13—8



304,174

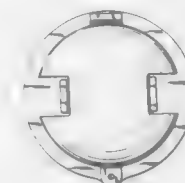
UTILITY RECEPTACLE COVER

William E. Giles, Garden Grove, and Joseph P. Kapp, Santa Ana, both of Calif., assignors to Trucker's Comfort Systems, Inc., Tustin, Calif.

Filed Jan. 31, 1986, Ser. No. 825,092

Term of patent 14 years

U.S. Cl. D13—31



304,175

INPUT/OUTPUT TERMINAL

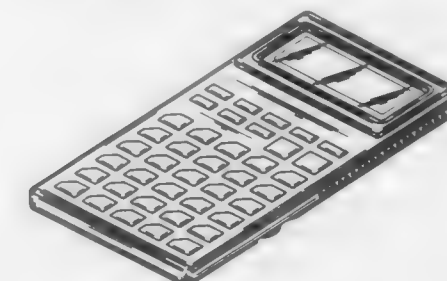
Hiroshi Sakaguchi, and Masaki Kawamura, both of Osaka, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Nov. 26, 1986, Ser. No. 935,532

Claims priority, application Japan, May 29, 1986, 61-20952

Term of patent 14 years

U.S. Cl. D14—100



304,173

ELECTRICAL TRACK FOR A ROOM LIGHTING SYSTEM

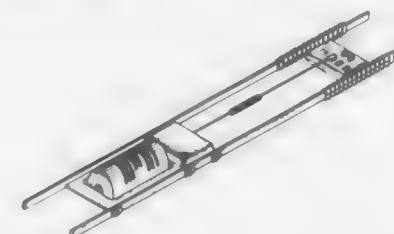
Guido Frassati, Leumann; Giuseppe Mugliardo, Pino Torinese, and Riccardo Valvassori, Turin, all of Italy, assignors to S.A.M.E.S. S.p.A., Pinerolo, Italy

Filed Jan. 24, 1986, Ser. No. 822,267

Claims priority, application Italy, Jul. 24, 1985, 53625/85[U]

Term of patent 14 years

U.S. Cl. D13—13



304,176

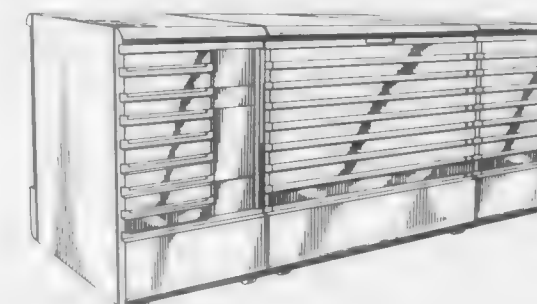
EXPANDABLE CENTRAL PROCESSING SYSTEM

Edward J. Cesarczyk, Watertown, and Richard R. Dillon, Wellesley, both of Mass., assignors to Bull HN Information Systems Inc., Billerica, Mass.

Filed May 29, 1986, Ser. No. 868,416

Term of patent 14 years

U.S. Cl. D14—102



304,177

ELECTRONIC COPYING MACHINE

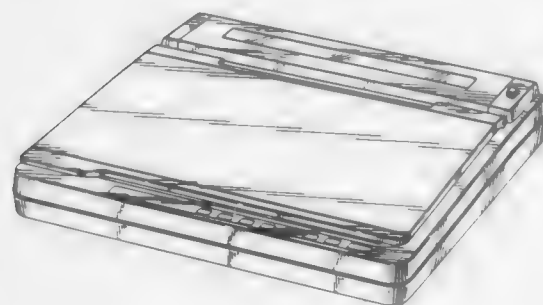
Kunio Hara, Chiba, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 4, 1986, Ser. No. 903,435

Claims priority, application Japan, Mar. 12, 1986, 61-8541

Term of patent 14 years

U.S. Cl. D14-107



304,179

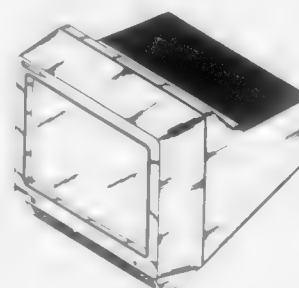
COMPUTER DISPLAY

Larry G. Beaton, Garner; Kevin T. McClain, Durham; Jonathan J. Vitello, Raleigh; Timothy D. Wetzel, Durham, and Roger C. Williams, Raleigh, all of N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 18, 1986, Ser. No. 943,964

Term of patent 14 years

U.S. Cl. D14-113



304,180

RETAINER FOR A COMPUTER MOUSE

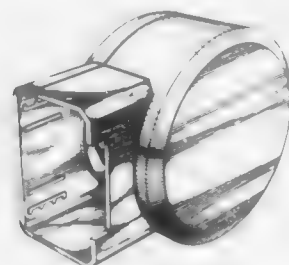
Robert J. Gibson, Ten Piedmont Center, Ste. 302, Atlanta, Ga.

00305

Filed Jun. 10, 1987, Ser. No. 60,372

Term of patent 14 years

U.S. Cl. D14-114



304,178

DISK DRIVE SHROUD ENCLOSURE FOR AN INDUSTRIAL COMPUTER

William V. Cranston, III; Randall W. Martin, both of Boca Raton; Mark S. Small, Pompano Beach, and Mark A. Young, Lake Worth, all of Fla., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Sep. 25, 1986, Ser. No. 910,513

Term of patent 14 years

U.S. Cl. D14-109



304,181

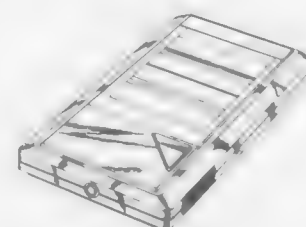
SCANNER FOR COMPUTER

Katsuji Kagayama; Yoshihiko Sugiyama, both of Nara, and Benito Mishiro, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 19, 1987, Ser. No. 28,160

Term of patent 14 years

U.S. Cl. D14-116



304,182

FACSIMILE

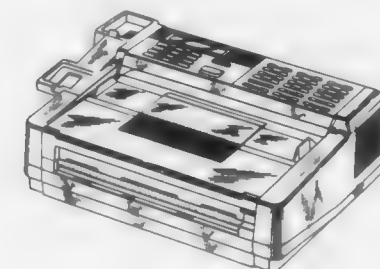
Masaki Takahashi, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 21, 1987, Ser. No. 6,093

Claims priority, application Japan, Jul. 22, 1986, 61-28684

Term of patent 14 years

U.S. Cl. D14-118



304,185

FACSIMILE

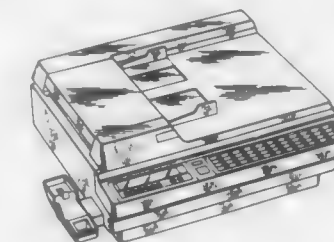
Tsutomu Yoshihara, Ayase, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 21, 1987, Ser. No. 5,874

Claims priority, application Japan, Jul. 24, 1986, 61-29142

Term of patent 14 years

U.S. Cl. D14-118



304,186

COMBINED COPYING MACHINE, FACSIMILE TRANSMITTER/RECEIVER AND PRINTER

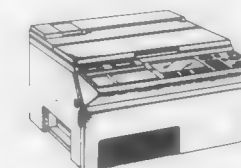
Fumiyo Kojima, Mitaka, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Oct. 6, 1987, Ser. No. 105,191

Claims priority, application Japan, Apr. 6, 1987, 62-013322

Term of patent 14 years

U.S. Cl. D14-118



304,183

FACSIMILE

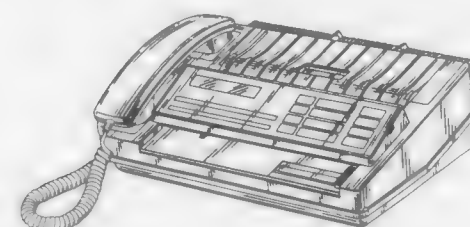
Kunio Hara, Chiba, and Shin-ichi Hiroki, Tokyo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 29, 1987, Ser. No. 55,742

Claims priority, application Japan, Dec. 8, 1986, 61-48253

Term of patent 14 years

U.S. Cl. D14-118



304,184

FACSIMILE TRANSMITTER/RECEIVER

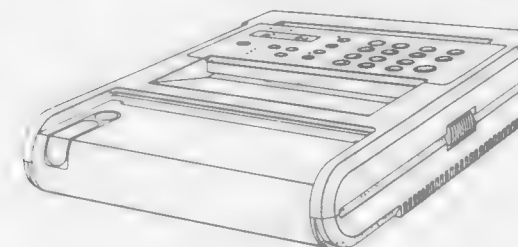
Hiroaki Watanabe, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed May 29, 1987, Ser. No. 55,751

Claims priority, application Japan, Jan. 7, 1987, 62-000175

Term of patent 14 years

U.S. Cl. D14-118



304,187

FACSIMILE

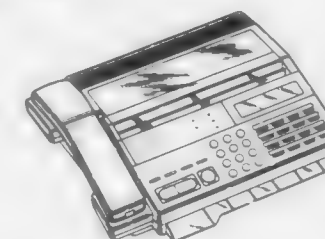
Hiroshi Komatsu, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 24, 1987, Ser. No. 124,768

Claims priority, application Japan, May 28, 1987, 62-21649

Term of patent 14 years

U.S. Cl. D14-118



304,188

PORTABLE HANDSET RADIO TELEPHONE

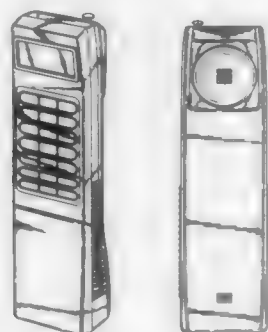
Shigeru Sutoh, Urawa, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Mar. 24, 1988, Ser. No. 172,355

Claims priority, application Japan, Nov. 5, 1987, 62-44921

Term of patent 14 years

U.S. Cl. D14-138



304,190

DEBIT CARD PUBLIC PAY TELEPHONE STAND

Martin S. Rose, Sudbury, England, assignor to GEC Plessey Telecommunications Ltd., Coventry, England

Filed Jun. 14, 1988, Ser. No. 206,683

Claims priority, application United Kingdom, Dec. 16, 1987, 1407133

Term of patent 14 years

U.S. Cl. D14-142



304,189

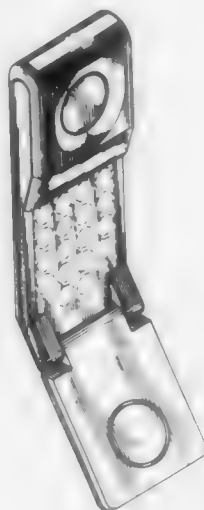
HOUSING FOR PORTABLE HANDSET TELEPHONE OR SIMILAR ARTICAL

Albert L. Nagele, Wilmette, and Leonid Soren, Lincolnwood, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 5, 1988, Ser. No. 218,507

Term of patent 14 years

U.S. Cl. D14-147



304,191

RADIO PAGING RECEIVER

Isamu Sekine, Kawagoe, Japan, assignor to Kokusai Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 4, 1987, Ser. No. 117,642

Claims priority, application Japan, May 19, 1987, 62-19359

Term of patent 14 years

U.S. Cl. D14-192



304,192

RADIO PAGER

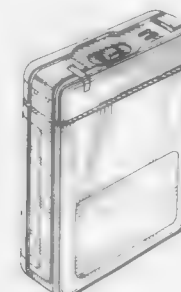
Sigeki Hayasaka, and Mamoru Takahashi, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Feb. 5, 1988, Ser. No. 152,608

Claims priority, application Japan, Aug. 6, 1987, 62-32235

Term of patent 14 years

U.S. Cl. D14-191



304,194

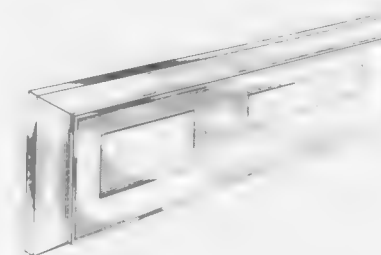
RADIO CABINET FRONT

Thomas G. Fuller, Michael H. Stock, and Howard F. Weckel, III, all of Elkhart, Ind., assignors to Mito Corporation, Elkhart, Ind.

Filed Jul. 7, 1986, Ser. No. 882,849

Term of patent 14 years

U.S. Cl. D14-257



304,195

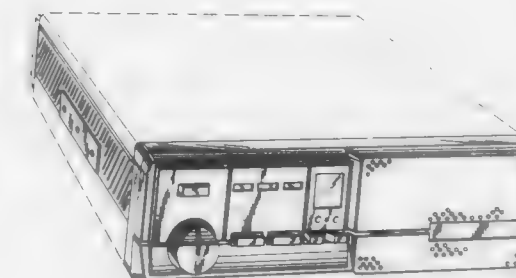
FRONT AND SIDE PANELS FOR A TWO-WAY MOBILE RADIO

Richard Culbertson, Lynchburg, Va., assignor to General Electric Company, Lynchburg, Va.

Filed Oct. 20, 1986, Ser. No. 922,445

Term of patent 14 years

U.S. Cl. D14-265



304,193

CARTRIDGE FOR TELEPHONE SYSTEM EQUIPMENT CABINET

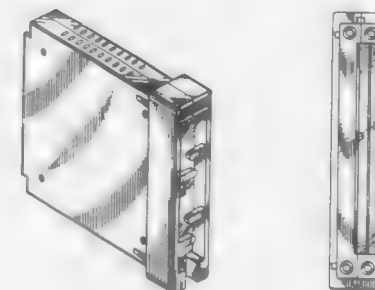
Willi Lotz, Carp, Canada, assignor to Mitel Corporation, Canada

Filed Nov. 18, 1986, Ser. No. 931,789

Claims priority, application Canada, Aug. 21, 1986, 21-08-86-15

Term of patent 14 years

U.S. Cl. D14-240



304,196

POWER HEAD FOR A VEGETATION CUTTER

Lloyd H. Tuggle, and Jeffery G. Sadler, both of Shreveport, La., assignors to White Consolidated Industries, Inc., Cleveland, Ohio

Filed Dec. 11, 1987, Ser. No. 131,537

Term of patent 14 years

U.S. Cl. D15-1



304,197

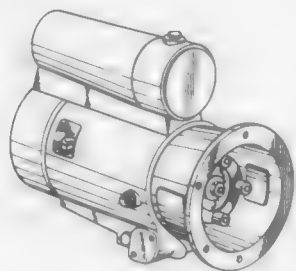
AIR COMPRESSOR

Boldrini Adolfo, Milan, Italy, assignor to Ing. Enea Mattei S.p.A., Vimodrone, Italy

Filed Jul. 21, 1987, Ser. No. 76,562

Claims priority, application Italy, Feb. 2, 1987, 20717/87[U]
Term of patent 14 years

U.S. Cl. D15—9



304,200

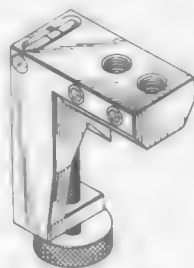
HOLDER FOR TOOL SETTER GAUGE

Philip A. MacKelvie, Silver Plume, Colo., assignor to Technical Tools, Inc., Lakewood, Colo.

Filed May 4, 1987, Ser. No. 45,677

Term of patent 14 years

U.S. Cl. D15—140



304,198

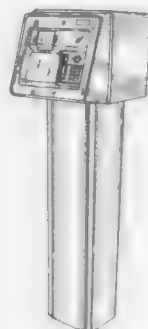
MOTOR FUEL DISPENSING CONTROL TERMINAL OR SIMILAR ARTICLE

Douglas G. Long, North Canton, Ohio, assignor to Diebold, Incorporated, Canton, Ohio

Filed Jun. 20, 1986, Ser. No. 877,547

Term of patent 14 years

U.S. Cl. D15—9.1



304,201

CASE FOR VIDEO CAMERA COMBINED WITH VIDEO TAPE RECORDER

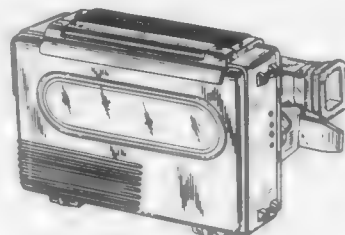
Takuya Niitsu, Kawasaki, and Akinari Mohri, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jun. 27, 1986, Ser. No. 879,467

Claims priority, application Japan, Jan. 7, 1986, 61-120

Term of patent 14 years

U.S. Cl. D16—202



304,199

VANE FOR THROWING WHEEL

James H. Carpenter, Hagerstown, Md., assignor to Pangborn Corporation, Inc., Hagerstown, Md.

Filed Nov. 3, 1986, Ser. No. 926,240

Term of patent 14 years

U.S. Cl. D15—126



304,202

CASE FOR VIDEO CAMERA COMBINED WITH VIDEO TAPE RECORDER

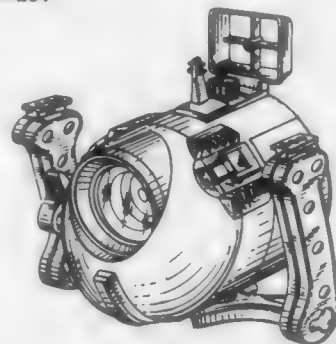
Takuya Niitsu, Kawasaki, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jun. 26, 1986, Ser. No. 879,190

Claims priority, application Japan, Jan. 13, 1986, 61-717

Term of patent 14 years

U.S. Cl. D16—204



304,203

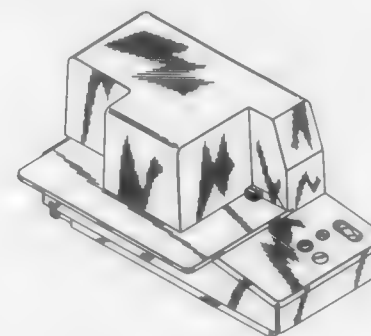
FLIP PRINTER OR SIMILAR ARTICLE

Shuzo Kato, Hiratsuka; Satoru Sakama, Ischawa, and Tamihai Takahashi, Atsugi, all of Japan, assignors to NCR Corporation, Dayton, Ohio

Filed Jul. 11, 1986, Ser. No. 884,818

Claims priority, application Japan, Mar. 27, 1986, 10933/86
Term of patent 14 years

U.S. Cl. D18—13



304,206

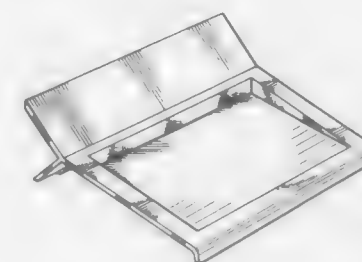
MEMO TRAY

Henry Sawatsky; Richard K. Sawatsky, and David P. Sawatsky, all of Brampton, Canada, assignors to Precisioncraft Limited, Ontario, Canada

Filed Jan. 23, 1986, Ser. No. 824,566

Claims priority, application Canada, Nov. 27, 1985, 27-11-85-1
Term of patent 14 years

U.S. Cl. D19—86



304,204

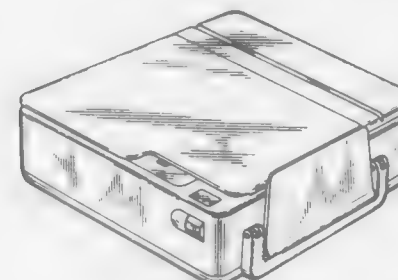
COPYING MACHINE

Elko Wada, Yokohama, and Yuichi Seki, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 15, 1986, Ser. No. 941,934

Claims priority, application Japan, Jun. 16, 1986, 23150/1986
Term of patent 14 years

U.S. Cl. D18—37



304,207

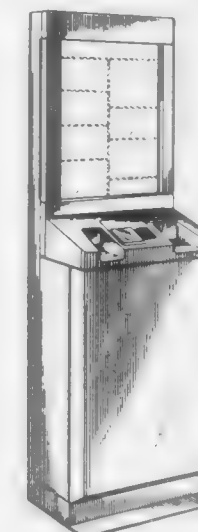
COUPON DISPENSING TERMINAL

John C. Wistrand, New Canaan, Conn., assignor to The Savings Spot, Ltd., Providence, R.I.

Filed May 27, 1986, Ser. No. 867,377

Term of patent 14 years

U.S. Cl. D20—2



304,205

PAPER CLIP

Kurt Lorber, and Beate Lorber, both of Aichwald, Fed. Rep. of Germany, assignors to Laurel-Plastic Kurt Lorber, Fed. Rep. of Germany

Filed Jul. 8, 1986, Ser. No. 883,151

Claims priority, application Fed. Rep. of Germany, Feb. 20, 1986, GR II 454/86

Term of patent 14 years

U.S. Cl. D19—65

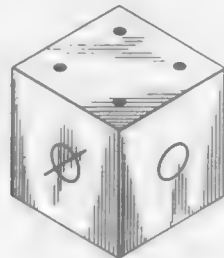


304,208
LOTTERY DIE

Frank Loftus, 2221 20th St., Apt. #5, Santa Monica, Calif. 90405

Filed Dec. 4, 1986, Ser. No. 938,129
Term of patent 14 years

U.S. Cl. D21-41

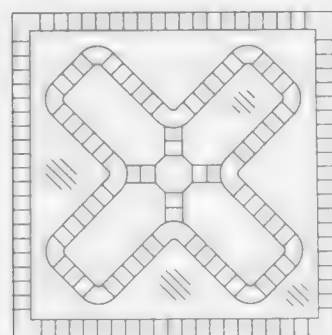


304,209
GAME BOARD DESIGN

James M. Guidotti, 2502 S. Colorado St., Philadelphia, Pa. 19145

Filed Dec. 5, 1986, Ser. No. 938,758
Term of patent 14 years

U.S. Cl. D21-34



304,210
SCOOTER

Frank Fonte, Tampa, Fla., assignor to C & S Manufacturing, Tampa, Fla.

Continuation-in-part of Ser. No. 25,836, Mar. 13, 1987. This application May 4, 1987, Ser. No. 45,148
Term of patent 14 years

U.S. Cl. D21-81

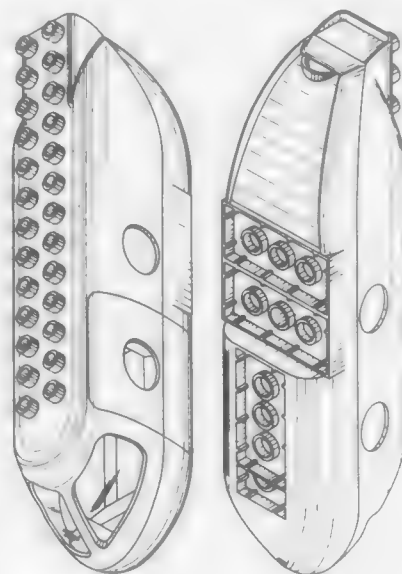


304,211
BODY ELEMENT FOR A TOY AIRCRAFT

Erik P. Tapdrep, Virum, Denmark, assignor to Interlego A.G., Baar, Switzerland

Filed Dec. 2, 1987, Ser. No. 128,482
Term of patent 14 years

U.S. Cl. D21-91



304,212
TOY CONSTRUCTION LINK

Dennis Moe, 2344 State Hwy. 16, La Crosse, Wis. 54601

Filed Jan. 23, 1987, Ser. No. 6,618
Term of patent 14 years

U.S. Cl. D21-108

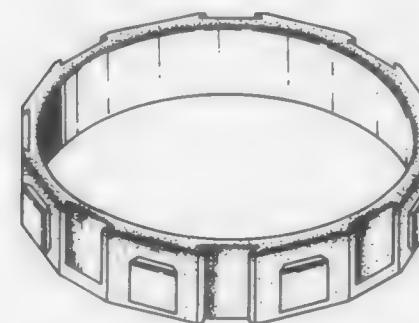


304,213
TOY CONSTRUCTION RING

Chen-Tsung Chen, No. 16, Alley 2, Lane 7, Feng-Tung Rd., Taichung, Taiwan

Filed Jul. 22, 1987, Ser. No. 76,196
Term of patent 14 years

U.S. Cl. D21-108

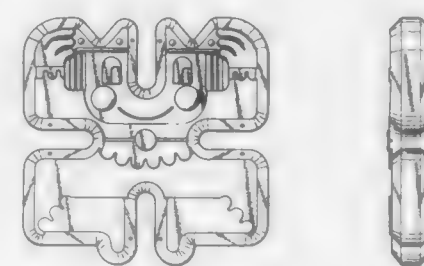


304,216
SIMULATIVE CONSTRUCTION TOY

Daniel B. Klitzner, San Francisco, Calif., assignor to Discovery Toys, Inc., Martinez, Calif.

Filed Jan. 27, 1988, Ser. No. 150,557
Term of patent 14 years

U.S. Cl. D21-108

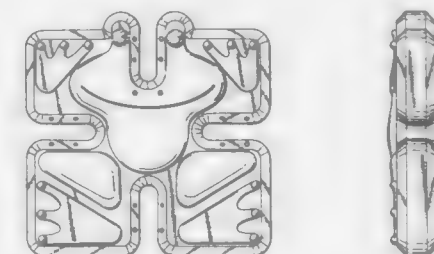


304,217
FROG CONSTRUCTION TOY

Daniel B. Klitzner, San Francisco, Calif., assignor to Discovery Toys, Inc., Martinez, Calif.

Filed Jan. 27, 1988, Ser. No. 150,558
Term of patent 14 years

U.S. Cl. D21-108

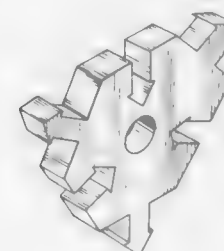


304,214
HEXAGONAL LOCKING TOY BLOCK

Kevin S. Buist, Montgomery, N.J., assignor to Design Visions, Inc., Belle Mead, N.J.

Filed Aug. 20, 1987, Ser. No. 87,627
Term of patent 14 years

U.S. Cl. D21-108

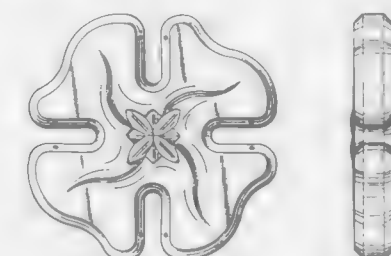


304,218
LILY PAD CONSTRUCTION TOY

Daniel B. Klitzner, San Francisco, Calif., assignor to Discovery Toys, Inc., Martinez, Calif.

Filed Jan. 27, 1988, Ser. No. 150,563
Term of patent 14 years

U.S. Cl. D21-108

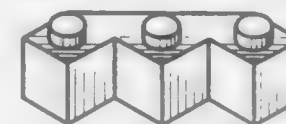


304,215
BEVELLED TOY CONSTRUCTION ELEMENT

Jens N. Knudsen, Billund, Denmark, assignor to Interlego A.G., Baar, Switzerland

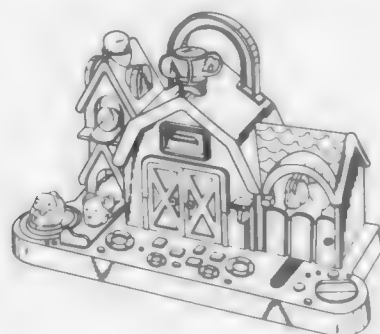
Filed Dec. 2, 1987, Ser. No. 128,478
Term of patent 14 years

U.S. Cl. D21-108



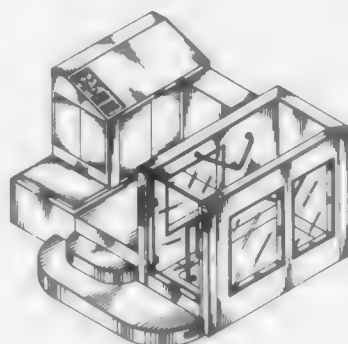
304,219
TOY BARN

Steven Taylor, Minnetonka, Minn., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Oct. 17, 1986, Ser. No. 920,800
Term of patent 14 years
U.S. Cl. D21—116



304,221
COMBINED UNDERWATER TREADMILL AND STATION THEREFOR

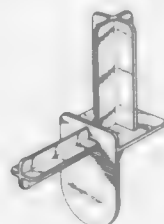
Jeff Keller, and Robert Linton, both of Edmonds, Wash., assignors to Edmonds Medical Systems, Inc., Edmonds, Wash.
Filed Feb. 12, 1987, Ser. No. 13,619
Term of patent 14 years
U.S. Cl. D21—192



304,220

AXLE ELEMENT FOR A CONSTRUCTION TOY

Vic Bertrand, Dollard des Ormeaux, Canada, assignor to The Ritvik Group Inc., Dorval, Canada
Filed Sep. 21, 1987, Ser. No. 99,206
Claims priority, application Canada, May 6, 1987, 06-06-87-10
Term of patent 14 years
U.S. Cl. D21—141



304,223

RIFLE STOCK WITH INSERTS

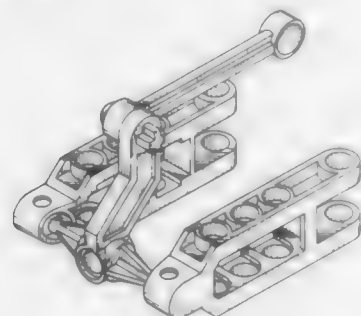
William B. Ruger, Croydon, N.H., and Lawrence L. Larson, Branford, Conn., assignors to Sturm, Ruger & Company, Inc., Southport, Conn.
Filed Jan. 10, 1986, Ser. No. 817,713
Term of patent 14 years
U.S. Cl. D22—108



304,221

WHEEL SUSPENSION UNIT FOR A TOY VEHICLE

Ole V. Poulsen, Vejle, Denmark, assignor to Interlego A.G., Bear, Switzerland
Filed Dec. 2, 1987, Ser. No. 127,884
Term of patent 14 years
U.S. Cl. D21—141



304,224

FLOW CONTROL VALVE FOR LAWN SPRINKLER

Dennis A. Wilson, Wauconda Township, Lake County; Dennis W. Anesi, Rolling Meadows, and Mark S. Williamson, Evanston, all of Ill., assignors to Anson Industries Ltd., Harwood Heights, Ill.
Filed Apr. 28, 1986, Ser. No. 858,233
Term of patent 14 years
U.S. Cl. D23—245



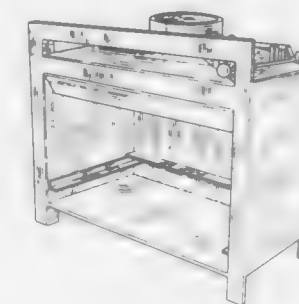
304,225
HFOUT

Bethany Lathrop, Los Angeles, Calif., assignor to Aloys F. Dornbracht GmbH & Co. KG, Iserlohn, Fed. Rep. of Germany
Filed Jan. 28, 1986, Ser. No. 823,375
Claims priority, application France, Jul. 29, 1985, 85 3654; Oct. 9, 1985, 85 4715
Term of patent 14 years
U.S. Cl. D23—257



304,227
FIREPLACE

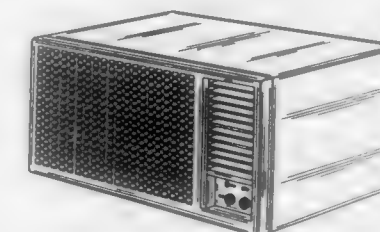
Bruce V. Benfield; Peter J. Benfield, both of North Haven; Tim T. Pyyvaara, Port Noarlunga; Victor L. Bishop, Klemzig, and Stuart L. Speck, Wynavale, all of Australia, assignors to Heatshield PTY. Ltd., Australia
Filed Aug. 7, 1987, Ser. No. 83,416
Claims priority, application Australia, Feb. 10, 1987, 395/87
Term of patent 14 years
U.S. Cl. D23—344



304,228

AIR CONDITIONER

Hiroshi Moritani, Osaka, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Nov. 25, 1987, Ser. No. 125,073
Claims priority, application Japan, May 29, 1987, 62-22485
Term of patent 14 years
U.S. Cl. D23—353



304,226

COVER FOR JARS OF FRAGRANCE, JEWELRY OR SIMILAR ARTICLE

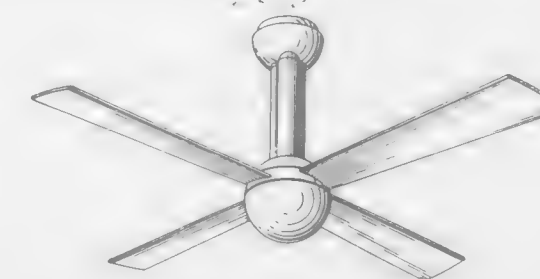
Yun S. Kim, and Mee S. Kim, both of 5702 Oak Stake Ct., Burke, Va. 22015
Filed Oct. 24, 1986, Ser. No. 923,713
Term of patent 14 years
U.S. Cl. D23—267



304,229

CEILING FAN

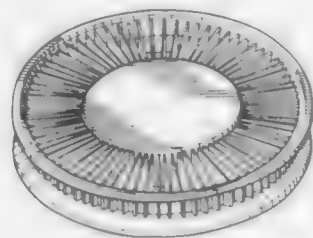
Ron Rezek, Los Angeles, Calif., assignor to Beverly Hills Trading Company, Inc., North Hollywood, Calif.
Filed Apr. 12, 1988, Ser. No. 180,793
Term of patent 14 years
U.S. Cl. D23—377



304,231

CERAMIC HEATING ELEMENT

Tim Wang, No. 80, Yang Feng Rd., Tai-Ping Village, Taiwan
 Filed Oct. 21, 1987, Ser. No. 111,971
 Term of patent 14 years
 U.S. Cl. D23—386



304,231

SUBGINGIVAL DELIVERY TIP FOR ATTACHMENT TO DENTAL IRRIGATION INSTRUMENTS

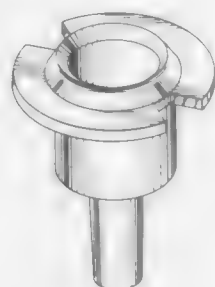
Robert D. Stream, Fort Collins, Colo., assignor to Teledyne Industries, Inc., Fort Collins, Colo.
 Filed Sep. 25, 1987, Ser. No. 101,277
 Term of patent 14 years
 U.S. Cl. D24—15



304,232

BREATH SAMPLE RECEIVING MOUTHPIECE

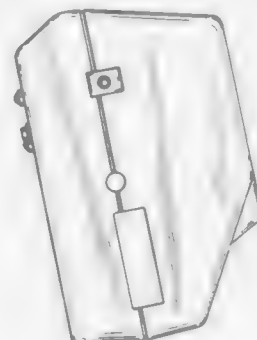
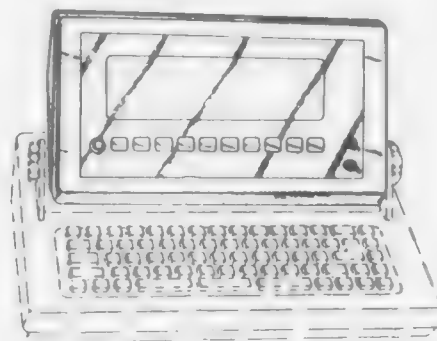
Kip L. Fuller, Denver, Colo., assignor to Guardian Technologies, Inc., Cincinnati, Ohio
 Filed May 1, 1987, Ser. No. 45,871
 Term of patent 14 years
 U.S. Cl. D24—17



304,233

HOUSING FOR AN AUTOMATED BLOOD PRESSURE AND OTHER VITAL SIGNS MONITORING DEVICE

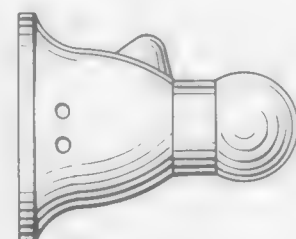
Maynard Ramsey, III; James Muskatello, both of Tampa, Fla.; Arthur Burton, Califon, N.J.; Kenneth Alexander, Palm Harbor, and John George, Clearwater, both of Fla., assignors to Critikon, Inc., Tampa, Fla.
 Filed Apr. 28, 1987, Ser. No. 43,679
 Term of patent 14 years
 U.S. Cl. D24—21



304,234

ANNULAR ANVIL FOR A SURGICAL STAPLER

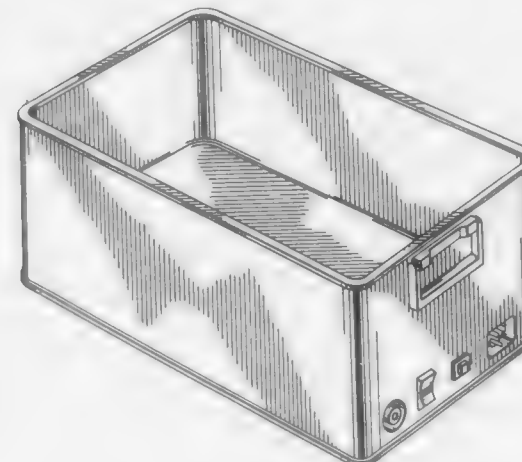
David T. Green, Norwalk, and Keith Ratcliff, Sandy Hook, both of Conn., assignors to United States Surgical Corporation, Norwalk, Conn.
 Filed Apr. 21, 1987, Ser. No. 41,314
 Term of patent 14 years
 U.S. Cl. D24—27



304,235

FOOT BATH

Arthur E. Chambers, 21421 N. Seventh Avenue, Phoenix, Ariz. 85027
 Filed May 14, 1987, Ser. No. 49,416
 Term of patent 14 years
 U.S. Cl. D24—38



304,237

TEETHER

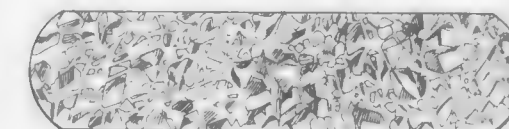
Kevin Daykin, Hollowell, England, assignor to Hestair Keddi-craft Limited, Bristol, England
 Filed May 1, 1987, Ser. No. 45,664
 Claims priority, application United Kingdom, Nov. 4, 1986, 1037802
 Term of patent 14 years
 U.S. Cl. D24—45



304,238

HANDAGE

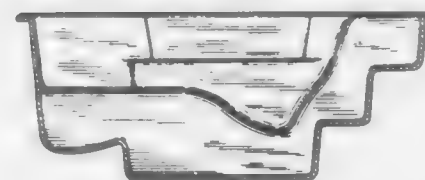
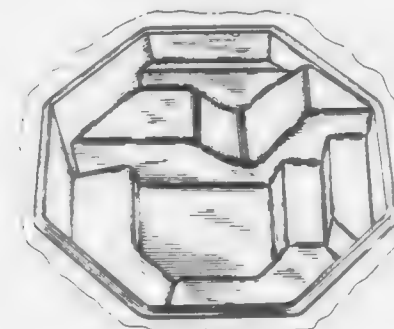
Margaret Palau, P.O. Box 880, Brookline, Mass. 02146
 Filed Feb. 13, 1987, Ser. No. 14,347
 Term of patent 14 years
 U.S. Cl. D24—49



304,236

TUB SHELL FOR A HYDROTHERAPY SPA OR THE LIKE

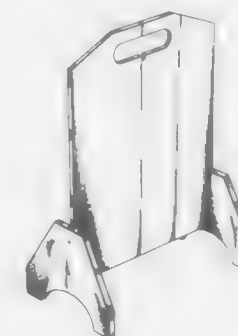
Robert C. Giese, Sheboygan, Wis., and Keith L. Poulson, Canyon Country, Calif., assignors to Kohler Co., Kohler, Wis.
 Filed Nov. 12, 1987, Ser. No. 119,429
 Term of patent 14 years
 U.S. Cl. D24—38



304,239

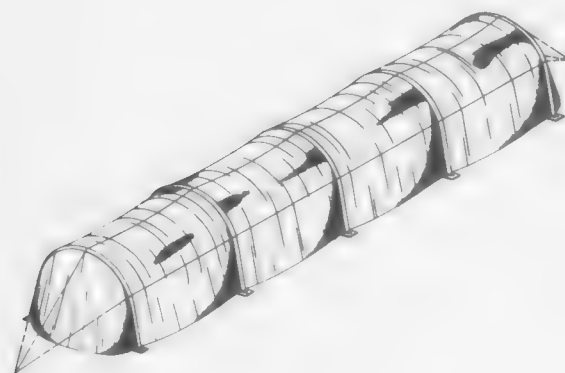
BODY WASTE COLLECTION BAG STAND

Kevin Miller, 201 Ellis Pkwy., Piscataway, N.J. 08854
 Filed Nov. 30, 1987, Ser. No. 126,954
 Term of patent 14 years
 U.S. Cl. D24—51



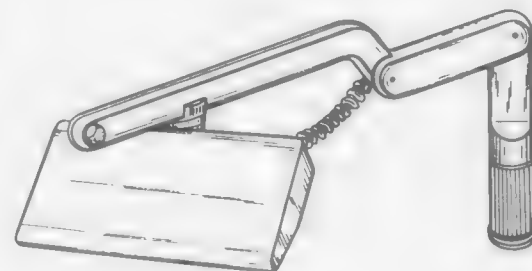
304,240
BATTING CAGE

Robert L. Wright, Des Moines, Iowa, assignor to Creative Athletic Products and Services, Inc., Des Moines, Iowa
Filed Feb. 24, 1986, Ser. No. 834,874
Term of patent 14 years
U.S. Cl. D25—1



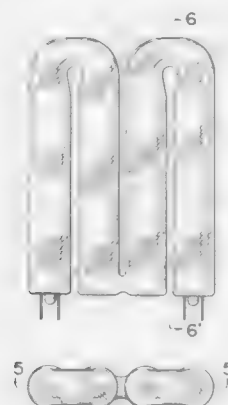
304,242
TABLE-MOUNTED ADJUSTABLE LAMP

Fritz Strüter, Unterm Bamberg 1, D-5882 Meinerzhagen, Fed. Rep. of Germany
Filed Oct. 23, 1986, Ser. No. 922,560
Claims priority, application World Int. Prop. O., Apr. 24, 1986, DM/006835
Term of patent 14 years
U.S. Cl. D26—65



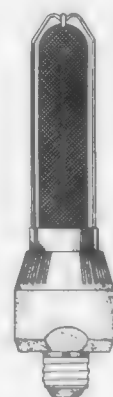
304,241
FLUORESCENT LAMP TUBE

Taketo Kamei, Yokosuka, and Masashi Saigo, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Feb. 3, 1987, Ser. No. 10,568
Claims priority, application Japan, Aug. 8, 1986, 61-30877
Term of patent 14 years
U.S. Cl. D26—3



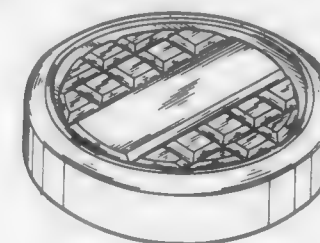
304,243
FLUORESCENT LAMP WITH SIMULATIVE GASLIGHT COVER

John J. Zwald, Marblehead, Mass., assignor to GTE Products Corporation, Danvers, Mass.
Filed Oct. 14, 1986, Ser. No. 918,459
Term of patent 14 years
U.S. Cl. D26—4

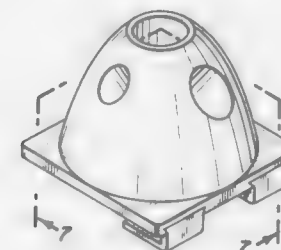


304,244
PHARMACEUTICAL TABLET

Geoffrey D. Tovey, Harpenden, England, assignor to Smith Kline & French Laboratories, Ltd., Welwyn Garden City, England
Filed Mar. 20, 1987, Ser. No. 28,626
Claims priority, application United Kingdom, Sep. 26, 1986, 1037014
The portion of the term of this patent subsequent to Aug. 29, 2003, has been disclaimed.
Term of patent 14 years
U.S. Cl. D28—2



304,245
HAIR CARE APPLIANCE STAND
Rosemarie Ianni, 15546 Friar St., Van Nuys, Calif. 91411
Filed Dec. 29, 1986, Ser. No. 947,554
Term of patent 14 years
U.S. Cl. D28—73

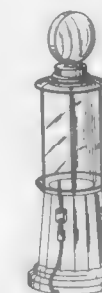


304,246
AQUARIUM
Robert M. Ross, Jr., Garland, and Robert J. McNally, Richardson, both of Tex., assignors to Great Western Trading Corp., Plano, Tex.
Filed May 16, 1988, Ser. No. 194,555
Term of patent 14 years
U.S. Cl. D30—102

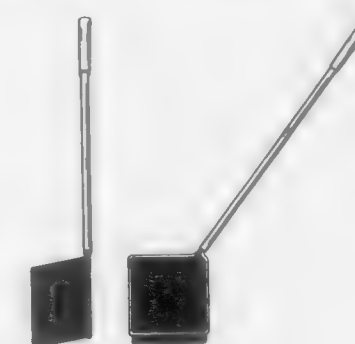


304,247
AQUARIUM

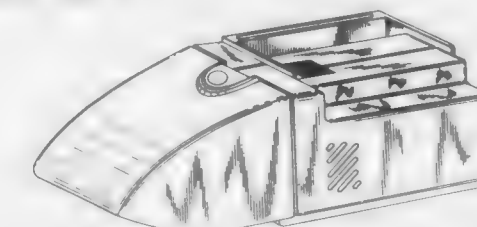
Robert M. Ross, Jr., Garland, and Robert J. McNally, Richardson, both of Tex., assignors to Great Western Trading Corp., Plano, Tex.
Filed May 16, 1988, Ser. No. 194,560
Term of patent 14 years
U.S. Cl. D30—102



304,248
LITTER SCOOP
Elliot Elrod, 5254 Enfield, Skokie, Ill. 60077
Filed Jun. 9, 1986, Ser. No. 872,413
Term of patent 14 years
U.S. Cl. D30—162



304,249
VACUUM CLEANER WITH ADJUSTABLE HANDLE
John S. Yuen, Kowloon, Hong Kong, assignor to John Manufacturing Limited, Kowloon, Hong Kong
Filed Aug. 12, 1987, Ser. No. 84,109
Claims priority, application United Kingdom, Mar. 30, 1987, 1 041 172
Term of patent 14 years
U.S. Cl. D32—18



304,250

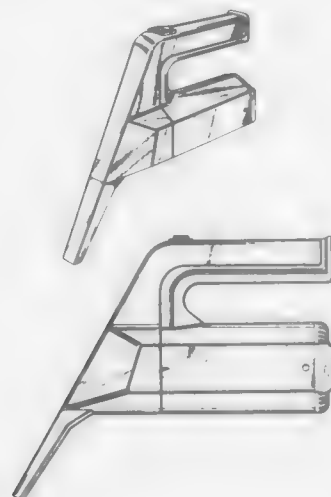
HAND HELD VACUUM CLEANER

H. Charles Hassel, Los Angeles, Calif., and Clifford Ghetti, Belvidere, N.J., assignors to MicroComputer Accessories Inc., Los Angeles, Calif.

Filed Oct. 1, 1987, Ser. No. 103,506

Term of patent 14 years

U.S. Cl. D32-18



304,252

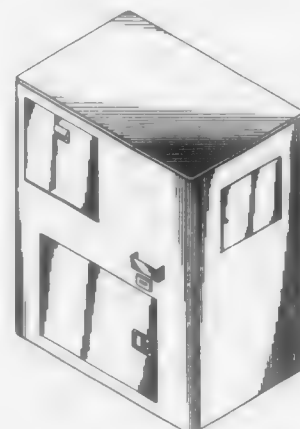
ELECTRONICALLY CONTROLLED CLOTHING RECEPTACLE OR SIMILAR ARTICLE

William R. Ferguson, 804 Lockwood, Richardson, Tex. 75080

Filed May 4, 1987, Ser. No. 45,303

Term of patent 14 years

U.S. Cl. D32-37



304,251

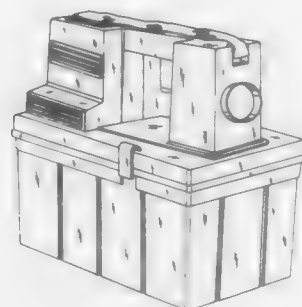
DUAL VACUUM CLEANER DESIGN

Emerson J. Parkaple, Chicago, Ill., assignor to Philips Home Products, Akron, Ohio

Filed Feb. 22, 1988, Ser. No. 136,642

Term of patent 14 years

U.S. Cl. D32-21



304,253

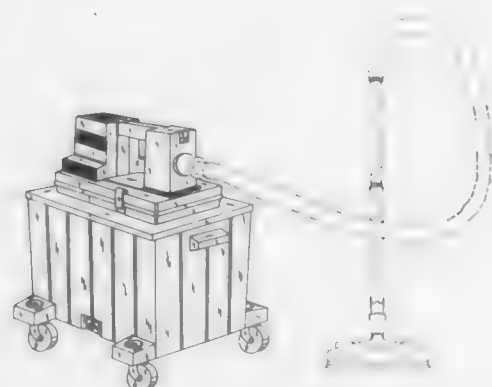
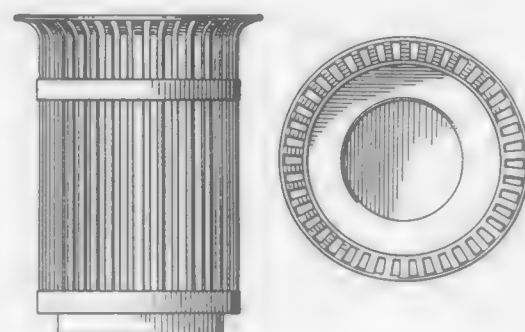
TRASH CAN HOLDER

Gerald P. Skalka, Washington, D.C., assignor to Victor Stanley, Inc., Dunkirk, Md.

Filed May 28, 1987, Ser. No. 58,026

Term of patent 14 years

U.S. Cl. D34-6



304,254

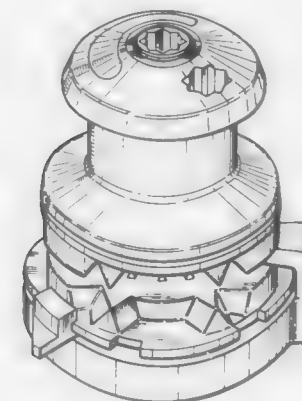
VERTICAL MARINE WINDLASS

Gordon M. Lyall, Glasgow, and Philip F. McCarron, Paisley, both of Scotland, assignors to Simpson-Lawrence Limited, Glasgow, Scotland

Filed Feb. 14, 1986, Ser. No. 834,033

Term of patent 14 years

U.S. Cl. D34-33



LIST OF PATENTEEES

TO WHOM

PATENTS WERE ISSUED ON THE 24TH DAY OF OCTOBER, 1989

NOTE.—Arranged in accordance with the first significant character or word of the name
(in accordance with city and telephone directory practice).

- A. C. Nielsen Company: See—
Kiewit, David A., 4,876,736, Cl. 455-2.000.
- A. Monforts GmbH & Co.: See—
van Wersch, Kurt; Freiberg, Helge; and Mevissen, Peter, 4,875,942, Cl. 134-15.000.
- A. O. Smith Corporation: See—
Kramer, David W., 4,875,465, Cl. 126-391.000.
- ABC Auto Alarms, Inc.: See—
Faust, James H., 4,875,350, Cl. 70-241.000.
- Abe, Akira; Nakajima, Junya; Takase, Haruo; Uenaka, Kazushige; and Otomo, Ruyzi, to Fuji Photo Film Co., Ltd. Method of and apparatus for processing silver halide-containing photosensitive material for color photography. 4,876,180, Cl. 430-393.000.
- Abe, Kunihiro, to Fuji Jukogyo Kabushiki Kaisha. Air-fuel ratio control system for an engine. 4,875,453, Cl. 123-440.000.
- Abe, Masami: See—
Ishii, Yoh; Abe, Masami; Harada, Yuhzoh; Takasugi, Atsumi; and Kato, Kazumi, 4,875,519, Cl. 164-465.000.
- Abernathy, Joe V.: See—
Davis, Cecil J.; Matthews, Robert T.; Loewenstein, Lee M.; Abernathy, Joe V.; and Wooldridge, Timothy A., 4,875,989, Cl. 204-298.000.
- ABG Semca: See—
Signoret, Jacques, 4,875,345, Cl. 62-402.000.
- Abrahms, Robert M.: See—
Messner, Kirsten L.; Abrahms, Robert M.; and Beitelia, Ray R., 4,875,489, Cl. 128-772.000.
- Abrashkin, Shmuel: See—
Issachar, David; Trumper, Jacob; and Abrashkin, Shmuel, 4,876,073, Cl. 423-2.000.
- Abrego, Elsa: See—
MacDonald, Robert C.; and Abrego, Elsa, 4,875,554, Cl. 187-124.000.
- Abuaf, Nesim: See—
Rasmussen, Neil S.; Szema, Li-Chieh; and Abuaf, Nesim, 4,875,339, Cl. 60-757.000.
- Abukawa, Toshimi; Tahara, Kazuo; Muramoto, Katsuji; Koterazawa, Toshiyuki; Hombu, Mitsuyuki; Takahashi, Tadashi; Takamatsu, Shuichi; Ishikura, Hisatugu; Yamamura, Hiroshisa; Tatsuzaki, Toru; Ohmae, Tsutomu; Okuyama, Toshiaki; Yamashita, Seizi; Saito, Shigeki; and Sakai, Masato, to Hitachi, Ltd.; and Hitachi Automotive Engineering Co., Ltd. Electric power steering control system. 4,875,539, Cl. 180-79.100.
- ACCRA Manufacturing Co.: See—
Finch, Jack A., 4,875,290, Cl. 33-265.000.
- ACF Industries, Incorporated: See—
Coulborn, John W.; and Krug, John A., 4,875,417, Cl. 105-248.000.
- Ache, Hans-Joachim: See—
Gusten, Hans; Ache, Hans-Joachim; Rinke, Monika; and Wirth, Hermann O., 4,876,029, Cl. 252-301.170.
- Ackeret, Peter, to IDN Inventions and Development of Novelties AG. Container for magnetic tape cassettes. 4,875,584, Cl. 206-387.000.
- Actel Corporation: See—
Mohsen, Amr M.; Hamdy, Esmat Z.; and McCollum, John L., 4,876,220, Cl. 437-170.000.
- Active Memory Technology Ltd.: See—
Cowley, Colin H., 4,876,641, Cl. 364-200.000.
- Actron Manufacturing Company: See—
Frantz, Leo R.; Bauer, Alfred; Koran, Matthew H.; and Becker, Jack, 4,876,416, Cl. 200-11.00R.
- Adachi, Hiromitsu: See—
Kubota, Shin'ichi; Miyano, Hideyo; and Adachi, Hiromitsu, 4,876,529, Cl. 340-450.300.
- Adachi, Tatsuya: See—
Kaito, Takashi; and Adachi, Tatsuya, 4,876,112, Cl. 427-38.000.
- Adams, Charles A. Cylindrical apparatus for holding table skirting for wrinkle removal. 4,875,301, Cl. 38-14.000.
- Adams, Lowell J.; Simshauser, Steven C.; Pisarski, Nathan; and Weisend, Norbert A., Jr., to B. F. Goodrich Company, The. Electrorepulsive separation system for deicing. 4,875,644, Cl. 244-134.00R.
- Adams, Paul E.; and Kinzer, Darryl W., to Lubrizol Corporation, The. Process for manufacturing amides. 4,876,374, Cl. 558-109.000.
- Adams, William R.: See—
Van Driesen, Roger P.; Adams, William R.; Baldasari, Mario; Caspers, John; and Trimble, Harold, 4,875,995, Cl. 208-152.000.
- Adept Technology, Inc.: See—
Roth, Scott D., 4,876,728, Cl. 382-21.000.
- Adin, Anthony: See—
Proehl, Gary S.; Gingello, Anthony D.; Collett, David J.; Parton, Richard L.; Stegman, David A.; and Adin, Anthony, 4,876,181, Cl. 430-522.000.
- Adler, Alfons: See—
Fuhrer, Wolfgang; Kuhle, Engelbert; Adler, Alfons; and Hanssler, Gerd, 4,876,253, Cl. 514-241.000.
- ADT Security Systems, Inc.: See—
Roy, Bernard J. J.; O'Connor, Lorne D.; Rioux, Philippe F.; Dingle, Donald A.; and Raymond, Andre L., 4,876,597, Cl. 358-141.000.
- Advance Transformer Co.: See—
Joanino, Fernando A., 4,876,486, Cl. 315-290.000.
- Advanced Cardiovascular Systems, Inc.: See—
Messner, Kirsten L.; Abrahms, Robert M.; and Beitelia, Ray R., 4,875,489, Cl. 128-772.000.
- Advanced Lasers Limited: See—
Hughes, John L., 4,876,694, Cl. 372-93.000.
- Advanced Micro Devices, Inc.: See—
Shankar, Kapil; and Agrawal, Om, 4,876,640, Cl. 364-200.000.
- Advanced Techtronics, Inc.: See—
Rapoport, Uri; and Panosh, Richard, 4,875,486, Cl. 128-653.000.
- Agracetus Corporation: See—
Pasu, Alan, 4,875,921, Cl. 71-7.000.
- Agrawal, Om: See—
Shankar, Kapil; and Agrawal, Om, 4,876,640, Cl. 364-200.000.
- Agrawal, Rakesh; Auvil, Steven R.; and Deeba, Michel, to Air Products and Chemicals, Inc. Alkylation of aromatic amines with olefins on partially dealuminated zeolites. 4,876,377, Cl. 558-416.000.
- Agria-Werke GmbH: See—
Saur, Niko K.; and Bronner, Wolfgang, 4,875,536, Cl. 180-6.320.
- AHA Automotive Technologies Corporation: See—
Hodgson, Gordon; Broadhead, Douglas G.; and Parent, David J., 4,875,538, Cl. 180-379.000.
- Aikman, Collin D.: See—
Fulks, Bernard D.; Sawin, Steven P.; Aikman, Collin D.; and Jenkins, John M., III, 4,876,320, Cl. 526-62.000.
- Air Powder Systems: See—
Brors, Kenneth A., 4,875,629, Cl. 241-39.000.
- Air Products and Chemicals, Inc.: See—
Agrawal, Rakesh; Auvil, Steven R.; and Deeba, Michel, 4,876,377, Cl. 558-416.000.
- Airhart, Tom P., to Atlantic Richfield Company. Transducer for inducing seismic signals into an elastic medium. 4,875,544, Cl. 181-113.000.
- Airxchange, Inc.: See—
Steele, Donald F.; Hoagland, Lawrence C.; Kyricos, Christopher; and Tolan, Peter, 4,875,520, Cl. 165-10.000.
- Aisin AW Co. Ltd.: See—
Kato, Eiji; Kadotani, Masanori; Sakaguchi, Yoshikazu; Kubo, Seitoku; Iwatsuki, Kunihiro; Taniguchi, Hiroji; and Harada, Yoshihara, 4,875,665, Cl. 267-170.000.
- Aisin Seiki Kabushiki Kaisha: See—
Ishikawa, Hitoshi, 4,875,422, Cl. 112-258.000.
- Oka, Hiroki; and Nagura, Nobuyoshi, 4,876,527, Cl. 340-441.000.
- Aisin Seiki Kabushikikaisha: See—
Kawai, Taneichi; Yasuda, Tomio; and Aoki, Koji, 4,876,649, Cl. 364-424.050.
- Aisin-Warner Kabushiki Kaisha: See—
Kuwayama, Yoshinari; Yokoyama, Fumitomo; and Miura, Masa-katsu, 4,875,392, Cl. 74-867.000.
- Aiyama, Fumihiko: See—
Hirayama, Koji; and Aiyama, Fumihiko, 4,875,384, Cl. 74-500.500.
- Ajinomoto Co., Inc.: See—
Nozoe, Shigeo; and Ohta, Tomihisa, 4,876,383, Cl. 560-163.000.
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Suzuki, Yasuhito; Akimoto, Koichiro; Ohshima, Hajime; Honda, Kazuyuki; and Isaka, Yukio, 4,876,562, Cl. 346-160.000.
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Johansson, Jan A.; Jonsson, Jan I.; and Lindstrom, Bjorn T., 4,875,555, Cl. 187-9.00R.
- Albert, Winfried: See—
Schettler, Hartmut; Endl, Josef; and Albert, Winfried, 4,876,189, Cl. 435-7.000.

PI 1

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Witters, Hugo F. J.; and Wouters, Joannes C. A. M., 4,876,695, Cl. 375-3.000.
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Clark, Abbot F., 4,876,250, Cl. 514-179.000.
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Holm, Sune, deceased; Malmberg, Rolf; and Svensson, Kjell, 4,876,100, Cl. 426-491.000.
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Duncan, Richard C., 4,876,496, Cl. 320-31.000.
- Allard Avionics Corp.: See—
Hass, Hyman, 4,876,658, Cl. 364-550.000.
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Bittorf, Bradley J.; Flood, Mark A.; Kalan, Michael D.; and Sepsi, Robert R., 4,876,664, Cl. 364-900.000.
- Thackston, Clyde D., 4,875,528, Cl. 173-12.000.
- Allen, Christopher M.: See—
Hanson, Raymond; Tillyard, Malcolm; and Allen, Christopher M., 4,876,434, Cl. 219-215.000.
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Mead, Carver A.; and Allen, Timothy P., 4,876,534, Cl. 340-825.950.
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Benn, Gerald; Farrar, David; and Flesher, Peter, 4,876,047, Cl. 562-41.000.
- Allied-Signal Inc.: See—
Kelly, Robert J., 4,876,550, Cl. 342-451.000.
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- Palanisamy, Thirumalai G.; and Mendelson, Stuart E., 4,876,495, Cl. 320-18.000.
- Allred, Thomas O.: See—
Moyer, Donald L.; and Allred, Thomas O., 4,875,813, Cl. 410-9.000.
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Siegel, Herbert; Kampe, Klaus-Dieter; Alpermann, Hans G.; Gerhards, Hermann J.; Usinger, Patricia; Schacht, Ulrich; Leven, Margret; Raether, Wolfgang; Dittmar, Walter; and Sachse, Burkhard, 4,876,354, Cl. 548-341.000.
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Ide, Jun; and Izumi, Tomoo, 4,876,618, Cl. 360-78.130.
- Taniguchi, Yuji; and Banju, Masaru, 4,876,481, Cl. 313-502.000.
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Alsip, Bruce F., 4,875,687, Cl. 273-241.000.
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Spaeth, Werner; Wail, Guenther; Kuhlmann, Werner; Althaus, Hans-Ludwig; Birkmann, Rolf; Klos, Waltraud; and Schubert, Axel, 4,875,750, Cl. 350-96.180.
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Theeuwes, Felix; and Wong, Patrick S. L., 4,876,093, Cl. 424-438.000.
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Ostermeier, Bruce H., 4,875,751, Cl. 350-96.180.
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Nixdorf, Richard D., 4,875,616, Cl. 228-120.000.
- America, William G., to Perkin-Elmer Corporation. The High pressure column assembly for a liquid chromatograph system. 4,876,005, Cl. 210-198.200.
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Asato, Goro; and Tamura, Susan Y., 4,876,272, Cl. 514-450.000.
- Morgan, Leonard J.; and Bell, Mark, 4,875,929, Cl. 71-121.000.
- Torley, Lawrence W.; Johnson, Bernard D.; and Dusza, John P., 4,876,252, Cl. 514-224.800.
- American Home Products Corporation: See—
Musser, John H.; Kref, Anthony F., III; and Bender, Reinhold H. W., 4,876,346, Cl. 546-172.000.
- American Medical Products, Inc.: See—
Blanch, G. Marsden, 4,876,110, Cl. 427-2.000.
- American Medical Systems, Inc.: See—
Levius, Dezzo K., 4,875,472, Cl. 128-79.000.
- American Standard Inc.: See—
Hart, James E.; and Gaughan, Edward W., 4,875,739, Cl. 303-33.000.
- Kurokawa, Masayuki, 4,875,958, Cl. 156-108.000.
- American Telephone and Telegraph Company: See—
Barron, Salvador; and Coffman, James E., 4,876,717, Cl. 380-25.000.
- Bose, Chinmoy B., 4,876,457, Cl. 250-563.000.
- American Telephone and Telegraph Company, AT&T Bell Laboratories: See—
Chapin, John T.; and Sabia, Raffaele A., 4,876,303, Cl. 524-296.000.
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- American Telephone and Telegraph Company, AT&T Technologies, Inc.: See—
Baltzer, Gary L.; Lynch, Brian; and O'Brien, William D., Jr., 4,875,916, Cl. 65-2.000.
- Ameron, Inc.: See—
Mercado, Hector P., 4,875,710, Cl. 285-24.000.
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- Amoco Corporation: See—
Chiang, Weilong L.; Fjare, Douglas E.; and Nowicki, Neal R., 4,876,329, Cl. 528-353.000.
- Holzhauser, Juergen K.; Michalak, Dennis J.; and Schammel, Wayne P., 4,876,386, Cl. 562-414.000.
- Kukes, Simon G.; Miller, Jeffrey T.; and Gutberlet, Louis C., 4,875,991, Cl. 208-59.000.
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- Udovich, Carl A., 4,876,379, Cl. 560-158.000.
- Young, Grant A.; Wakley, William D.; and Andrews, Steven L., 4,876,016, Cl. 210-739.000.
- AMP Incorporated: See—
Demler, Henry W., Jr.; Dola, Frank P.; Kimmel, David J.; and Sotolongo, Thomas J., 4,875,865, Cl. 439-101.000.
- Fleak, David S.; Koegel, Keith S.; Long, William B.; Moist, Stanford C., Jr.; and Nauman, Warren D., 4,875,877, Cl. 439-497.000.
- Reed, Carl G., 4,875,863, Cl. 439-79.000.
- Anchor Hocking Corporation: See—
Ochs, Charles S., 4,875,594, Cl. 215-252.000.
- Anderson, James R.; and Brander, Richard, to Beltone Electronics Corporation. Differential voltage controlled exponential current source. 4,876,499, Cl. 323-312.000.
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- Ando, Akira: See—
Kittaka, Toshihiko; Ando, Akira; and Sakabe, Yukio, 4,876,476, Cl. 310-320.000.
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Imura, Takeshi; Ando, Katsuhiko; Nakabayashi, Shigemitsu; and Hirose, Maki, 4,875,518, Cl. 164-119.000.
- Ando, Kenji: See—
Chiba, Yuji; Ando, Kenji; Sugata, Masao; Sugata, Hiroyuki; Kimura, Toshiaki; and Osabe, Kuniji, 4,875,810, Cl. 406-14.000.
- Ando, Yasunori: See—
Ogata, Kiyoshi; Ando, Yasunori; Kamijo, Eiji; and Matsumura, Noriaki, 4,875,284, Cl. 29-830.000.
- Andoh, Yasuhiro: See—
Mose, Tadao; Andoh, Yasuhiro; and Kitasin, Tatuhsa, 4,876,637, Cl. 363-37.000.
- Andrews, Steven L.: See—
Young, Grant A.; Wakley, William D.; and Andrews, Steven L., 4,876,016, Cl. 210-739.000.
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Kawai, Taneichi; Yasuda, Tomio; and Aoki, Koji, 4,876,649, Cl. 364-424.050.
- Aoki, Masaru: See—
Maejima, Taro; Yada, Toshio; Tsutsumi, Michinari; Tabuchi, Tsuyoshi; Terazono, Takeshi; and Aoki, Masaru, 4,875,434, Cl. 118-52.000.
- Aoki, Tetuya: See—
Suzuki, Nobuhiko; and Aoki, Tetuya, 4,875,832, Cl. 417-222.000.
- Aoki, Toshiyuki: See—
Ariizumi, Ryozo; Kainuma, Masakuni; Suda, Shoji; Aoki, Toshiyuki; Ejiri, Takashi; Kojima, Masao; and Hoshi, Mitsunori, 4,875,500, Cl. 137-596.180.

- Aotani, Yoshimasa: See—
Maemoto, Kazuo; Iwasaki, Masayuki; Maeda, Minoru; and Aotani, Yoshimasa, 4,876,173, Cl. 430-271.000.
- Aoyama, Motoo; Bessho, Yasunori; Uchikawa, Sadao; Takeda, Renzo; and Ishii, Yoshihiko, to Hitachi, Ltd. Fuel assembly. 4,876,062, Cl. 376-444.000.
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Mizuno, Shinji; Kawato, Humio; Hanazawa, Kazuyoshi; Aoyama, Tatsuki; and Ogasawara, Yoshinari, 4,875,911, Cl. 55-162.000.
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Wilke, Daniel R., 4,875,327, Cl. 53-475.000.
- Applied Micro Circuits Corporation: See—
Tobias, Eric; and Chen, Chau-Shiong A., 4,876,216, Cl. 437-67.000.
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- Ardini, Joseph L.; Lefsky, Brian; and Farr, Barbara J., to Prime Computer, Inc. Method and apparatus for high accuracy measurement of VLSI components. 4,876,501, Cl. 324-73.00R.
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- Armour Pharmaceutical Company: See—
Feldman, Fred; Klekamp, Mark S.; Hrinda, Michael E.; Shaw, Arthur B.; and Chandra, Sudhish, 4,876,241, Cl. 514-2.000.
- Armstrong International, Inc.: See—
Schlesch, Ronald D.; Armstrong, Merrill H.; Vallery, Stafford J.; and Durham, Harold S., 4,875,428, Cl. 114-255.000.
- Armstrong, Marty A.: See—
Armstrong, Monroe A.; and Armstrong, Marty A., 4,875,462, Cl. 126-29.000.
- Armstrong, Merrill H.: See—
Schlesch, Ronald D.; Armstrong, Merrill H.; Vallery, Stafford J.; and Durham, Harold S., 4,875,428, Cl. 114-255.000.
- Armstrong, Monroe A.; and Armstrong, Marty A. Campfire smoke-stack. 4,875,462, Cl. 126-29.000.
- Armstrong, W. Ted. Swing board toy. 4,875,672, Cl. 272-33.00R.
- Aron, Jerome, to Kuhn, S.A. Hay making machine. 4,875,332, Cl. 56-377.000.
- Arriveau, Claude: See—
Guyonard, Daniel; Torrez, Gerald; Lambour, Jean-Michel; and Arriveau, Claude, 4,876,111, Cl. 427-31.000.
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- Asahi Glass Company, Ltd.: See—
Arai, Yoshimasa; Enamito, Satoshi; and Oda, Noriyuki, 4,875,335, Cl. 60-274.000.
- Oda, Noriyuki; Takehara, Tetsuo; Higashi, Katsumi; and Muramatsu, Keiji, 4,875,712, Cl. 285-47.000.
- Asahi Kogyo Kogyo Kabushiki Kaisha: See—
Suzuki, Noboru; Toji, Shigeo; and Uenaka, Yukio, 4,876,603, Cl. 358-227.000.
- Asai, Yoshiro, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Electromagnetic valve. 4,875,658, Cl. 129.21.
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- Ashimi, Tokuji: See—
Kawano, Ikuo; Takiguchi, Tsuyoshi; Kimura, Norihisa; Yanagisawa, Yohei; Ashimi, Tokuji; and Yoshino, Hiroyuki, 4,876,103, Cl. 426-574.000.
- Ashland Oil, Inc.: See—
Shriver, H. Randall; Dunnivant, William R.; and Gruber, Bruce A., 4,876,294, Cl. 523-139.000.
- Asonen, Harry: See—
Pessa, Markus; Asonen, Harry; Varrio, Jukka; and Salokatte, Arto, 4,876,218, Cl. 437-107.000.
- AT&T Information Systems: See—
Barron, Salvador; and Coffman, James E., 4,876,717, Cl. 380-25.000.
- Atlantic Richfield Company: See—
Airhart, Tom P., 4,875,544, Cl. 181-113.000.
- Leyshon, David W.; and Bader, Robert A., 4,876,409, Cl. 585-500.000.
- Mana, Michael L., 4,875,525, Cl. 166-280.000.
- Montgomery, Melvin G., 4,876,450, Cl. 250-261.000.
- Petermann, Steven G.; and Schastee, Thomas, 4,876,672, Cl. 367-35.000.
- Taylor, James M.; and Karner, Gary M., 4,875,398, Cl. 83-100.000.
- Atochem: See—
Kakimoto, Yukihiro; Sawada, Masayuki; Kajimoto, Yoshiaki; and Kiguchi, Isamu, deceased, 4,875,909, Cl. 55-40.000.
- Atomic Skifabrik Alois Rohrmoser: See—
Scherubl, Franz, 4,875,702, Cl. 280-602.000.
- Aubert, Guy, to Thomson-CGR. Method of measuring the intensity of a DC current and a device implementing this method. 4,876,503, Cl. 324-117.00R.
- Ausimont S.p.A.: See—
Gervasutti, Claudio, 4,876,405, Cl. 570-156.000.
- Austruy, Georges: See—
Cagnon, Francois; Di Paola, Denis; Austruy, Georges; and Vinchon, Andre, 4,875,850, Cl. 431-8.000.
- Autant, Pierre; Cartillier, Andre; and Pigeon, Raymond, to Rhone-Poulenc Sante. Compositions for coating feeding stuff additives intended for ruminants and feeding stuff additives thus coated. 4,876,097, Cl. 426-74.000.
- Autokraft Limited: See—
Parker, Robert H., 4,875,535, Cl. 180-6.200.
- Automobiles Citroen: See—
Chaintreuil, Rene, 4,875,250, Cl. 16-4.000.
- Automobiles Peugeot: See—
Chaintreuil, Rene, 4,875,250, Cl. 16-4.000.
- Auvil, Steven R.: See—
Agrawal, Rakesh; Auvil, Steven R.; and Deeba, Michel, 4,876,377, Cl. 558-416.000.
- Avakian, Roger W.: See—
Nelson, Linda H.; Avakian, Roger W.; and Factor, Arnold, 4,876,309, Cl. 524-109.000.
- Avar, Lajos, to Sandoz Ltd. Oxalanilides useful as U.V. absorbers. 4,876,299, Cl. 524-99.000.
- B.A.S.F. Peintures & Encres S.A.: See—
Guyonard, Daniel; Torrez, Gerald; Lambour, Jean-Michel; and Arriveau, Claude, 4,876,111, Cl. 427-31.000.
- B. F. Goodrich Company, The: See—
Adams, Lowell J.; Simshauser, Steven C.; Pisarski, Nathan; and Weisend, Norbert A., Jr., 4,875,644, Cl. 244-134.00R.
- Mazany, Anthony M., 4,876,305, Cl. 524-401.000.
- Phillips, Ronald W., II, 4,875,815, Cl. 411-38.000.
- Babcock, Walter C.; and Friesen, Dwayne T., to Bend Research, Inc. Selective ion-complexing media for the removal of metal-ion contaminants from plating baths. 4,876,287, Cl. 521-28.000.
- Baca, Oswald G.: See—
Frazier, Marvin E.; Mallavia, Louis P.; Baca, Oswald G.; and Samuel, James E., 4,876,186, Cl. 435-6.000.
- Baczynski, Andrzej: See—
Niederhufner, Detlev; Hahn, Guenter; and Baczynski, Andrzej, 4,876,417, Cl. 200-48.00V.
- Bader, Robert A.: See—
Leyshon, David W.; and Bader, Robert A., 4,876,409, Cl. 585-500.000.
- Badger, Ronald L.; and Pejakovich, Michael, to United Steel & Wire Company. Child seat for over-the-counter shopping cart. 4,875,695, Cl. 280-33.993.
- Badiali, Mario: See—
Schmidt, Iosif; and Badiali, Mario, 4,876,013, Cl. 210-650.000.
- Baethmann, Hans-Juergen: See—
Gronsfeld, Josef; Jacobi, Hatto; and Baethmann, Hans-Juergen, 4,875,371, Cl. 73-598.000.
- Baier, James J.: See—
Cohen, Abraham D.; Diana, William D.; and Baier, James J., 4,876,403, Cl. 568-913.000.
- Bailey, John S.: See—
Tullis, Barclay J.; Bailey, John S.; Gunawardena, D. R.; and Kampe, Ulrich, 4,875,825, Cl. 414-786.000.
- Bailey, Linda F. Synthetic leather-like material. 4,876,138, Cl. 428-172.000.
- Baines, Roger F.: See—
Wang, Patrick S.-C.; and Baines, Roger F., 4,876,474, Cl. 310-236.000.
- Baker, Clifford E.: See—
Carlton, Dale E.; Baker, Clifford E.; and Henricksen, Ronald M., 4,876,655, Cl. 364-487.000.
- Bakewell, Joseph J., to Dynamics Research Corporation. Method of fabricating a printhead. 4,875,281, Cl. 29-825.000.
- Balcke-Durr Aktiengesellschaft: See—
Krips, Herbert; and Podhorsky, Miroslav, 4,875,270, Cl. 29-421.100.

- Baldasari, Mario: See—
Van Driesen, Roger P.; Adama, William R.; Baldasari, Mario; Caspers, John; and Trimble, Harold, 4,875,995, Cl. 208-152.000.
- Baldwin, Donald C., to Gorge Technology, Inc. Sailboard construction, 4,875,424, Cl. 114-39.200.
- Ball, David R.: See—
Orac, Thomas H.; Quandt, Herbert C.; and Ball, David R., 4,875,979, Cl. 201-5.000.
- Ball, Edward R., to Boeing Company, The. Self-checking ohmmeter that checks for contact resistance of its probes, 4,876,515, Cl. 324-538.000.
- Ballard, Wayne W.: See—
Evans, Walter R.; Remenick, Joseph M.; Jasper, Thomas E.; and Ballard, Wayne W., 4,875,351, Cl. 70-271.000.
- Ballinger, Kedric L.; and Dornbush, Robert A., Sr. Golf practice apparatus, 4,875,685, Cl. 273-195.00B.
- Ballmer, Horst; and Grosskopf, Rudolf, to Zeiss Ikon AG. Method and apparatus for non-contacting information transmission, 4,876,535, Cl. 340-825.340.
- Baltzer, Gary L.; Lynch, Brian; and O'Brien, William D., Jr., to American Telephone and Telegraph Company, AT&T Technologies, Inc. Methods of adjusting the configuration of optical substrates, 4,875,916, Cl. 65-2.000.
- Banju, Masaru: See—
Taniguchi, Yuji; and Banju, Masaru, 4,876,481, Cl. 313-502.000.
- Banno, Masahiko; and Nakazato, Yasushi, to Ricoh Company, Ltd. Image forming system, 4,876,606, Cl. 358-434.000.
- Barabino, William A.: See—
Chickering, Robert; and Barabino, William A., 4,875,602, Cl. 222-187.000.
- Barbero, Mario, to Fiat Auto S.p.A. Window for a motor vehicle door, 4,875,307, Cl. 49-374.000.
- Barbier, Alain; Breliere, Jean-Claude; and Garcia, Georges, to Sanofi. Methylenediphosphonic acid derivatives, and antirheumatic pharmaceutical composition in which they are present and methods of using same, 4,876,247, Cl. 514-89.000.
- Bard, Steven: See—
Jones, Jack A.; Wen, Liang-Chi; and Bard, Steven, 4,875,346, Cl. 62-467.000.
- Bardos, Gary M., to Recycling Systems, Inc. Wear protection chipper disc, 4,875,631, Cl. 241-92.000.
- Barito, Thomas R.: See—
Johnson, William C.; Richardson, Hubert, Jr.; and Barito, Thomas R., 4,875,840, Cl. 418-55.000.
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Zitz, Alfred; and Brandl, Erich, 4,875,738, Cl. 299-80.000.

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Mertz, William J.; and Braun, Robert J., 4,876,304, Cl. 524-314.000.

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Bedard, Donna L.; and Brennan, Michael J., Jr., 4,876,201, Cl. 435-262.000.

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Brintec Corporation: See—
Archer, Lee A.; and Brownell, Kenneth W., Jr., 4,875,875, Cl. 439-401.000.

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Stringer, Hugh C.; and Montgomery, Larry D., 4,875,580, Cl. 206-319.000.

British Aerospace plc: See—
Taylor, Clive R., 4,876,584, Cl. 357-23.130.

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Bowley, Heather J.; and Gerrard, Donald L., 4,875,771, Cl. 356-30.000.

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Brock, Alan J.: See—
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Broussard, Jerry A.; Fuqua, Wayne C.; and George, James H., to Hoechst Celanese Corporation. Production of monohydroxy monocyclic acetals and their esters. 4,876,368, Cl. 549-374.000.

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Boede, Robert H., 4,875,656, Cl. 248-642.000.

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Rock, Erich; and Brustle, Klaus, 4,875,746, Cl. 312-330.100.

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Kerr, Howard T.; Buchanan, Michael E.; and Valentine, Kenneth H., 4,876,721, Cl. 358-56.000.

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Buchler, Rene, 4,876,429, Cl. 219-69.150.

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Kubein-Messenburg, Dietmar; Meyer, Georg; and Bucking, Wolfram, 4,875,857, Cl. 433-56.000.

Buckingham Manufacturing Company, Inc.: See—
Rullo, James J., 4,875,550, Cl. 182-221.000.

Buckland, Paul R., to Eastman Kodak Company. Photographic elements containing pyrazolone color couplers. 4,876,182, Cl. 430-555.000.

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Peterson, Francis C., 4,875,816, Cl. 411-104.000.

Buhler, James E.; Crapper, James R.; Miller, Allen D.; and Wefler, Mark E., to S. C. Johnson & Son, Inc. Piston-powered dispensing system. 4,875,626, Cl. 239-314.000.

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Cebalo, Tony; and Buntrock, Robert E., 4,876,044, Cl. 71-90.000.

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Burkhardt, Claus: See—
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Burnand, Richard P.: See—
Phaal, Cornelius; and Burnand, Richard P., 4,875,907, Cl. 51-293.000.

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Butler, Jerry F.: See—
Wilson, Richard A.; Butler, Jerry F.; Withycombe, Donald; Mookherjee, Braja D.; Katz, Ira; and Schrankel, Kenneth R., 4,876,087, Cl. 424-84.000.

Butler, Lawrence: See—
Bender, Stanley I.; Butler, Lawrence; and Dawes, Peter W., 4,875,655, Cl. 248-557.000.

Buxton, Clifford A.: See—
Leone, David A.; Buxton, Clifford A.; and Robbins, W. Dale, 4,876,424, Cl. 200-306.000.

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Engel, James F.; Byerley, Thomas J.; and Christie, Howard W., 4,876,323, Cl. 526-310.000.

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Michal, Ronald J.; Udd, Eric; and Cahill, Richard F., 4,875,775, Cl. 356-350.000.

California Institute of Technology: See—
Thakoor, Anilkumar P.; Lambe, John; and Moopen, Alexander, 4,876,668, Cl. 365-163.000.

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Mitchell, Cheryl R.; Mitchell, Pat R.; and Mitchell, William A., 4,876,096, Cl. 426-28.000.

Calviello, Joseph A.; Bie, Paul R.; and Pomian, Ronald J., to Eaton Corporation. Method for fabricating quasi-monolithic integrated circuits. 4,876,176, Cl. 430-311.000.

Cameron Iron Works USA, Inc.: See—
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Andros, Andrew A.; Campana, Thomas J., Jr.; Thelen, Gary F.; and Kinast, Robert A., 4,876,538, Cl. 340-825.260.

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Durney, Cronin Rebecca L.; Rutherford W. Scott; and Campbell, James F., 4,876,293, Cl. 523-122.000.

Campbell, Marvin J. Ground clamp for coaxial cable junction block. 4,875,864, Cl. 439-100.000.

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Canada, Larry J., to Sekine Corporation. Brush device containing carrier media. 4,875,792, Cl. 401-283.000.

Canaud, Michel; and Dewitte, Philippe, to Saint-Gobain Vitrage. Pumping of high viscosity materials. 4,875,833, Cl. 417-259.000.

Candau, Sauveur; Leroy, Maurice; Brunette, Jean-Pierre; Mallo, Paul; Loret, Jean-Francois; and Waton, Gilles, to Societe Chimique des Charbonnages S.A. Process for the extraction of cations and application thereof to the treatment of aqueous effluents. 4,876,036, Cl. 252-637.000.

Canfield, Glenn. Method of deoxidizing molten ferrous metals. 4,875,934, Cl. 75-58.000.

Canon Kabushiki Kaisha: See—
Amikura, Takashi; Fujiwara, Akihiro; Toyama, Masamichi; Ueda, Kouichi; and Kozuki, Susumu, 4,876,564, Cl. 354-400.000.

Chiba, Yuji; Ando, Kenji; Sugata, Masao; Sugata, Hiroyuki; Kimura, Toshiaki; and Osabe, Kuniji, 4,875,810, Cl. 406-14.000.

Hashimoto, Seiji; and Harada, Tadanori, 4,876,601, Cl. 358-213.260.

Honma, Toshio; and Watanabe, Nobuyuki, 4,876,612, Cl. 358-474.000.

Imataki, Hiroyuki; Hiraoka, Mizuho; Tamura, Tomoyuki; and Satoh, Tetsuya, 4,876,042, Cl. 264-39.000.

Iwaya, Toshio, 4,876,570, Cl. 355-204.000.

Mamiya, Toshiharu, 4,876,558, Cl. 346-140.00R.

Matsumoto, Yasuyuki; Murai, Keiichi; Fukuda, Tadaji; and Ogawa, Kyosuke, 4,876,185, Cl. 430-580.000.

Nishikawa, Hiroshi, 4,876,559, Cl. 346-140.00R.

Nobuta, Hiroshi, 4,876,604, Cl. 358-400.000.

Ohsawa, Hidefumi; Katayama, Akihiro; Hosokawa, Hiroshi; Sunohara, Izuru; and Yoshimoto, Masahiko, 4,876,610, Cl. 358-443.000.

Suzuki, Yasuhito; Akimoto, Koichiro; Ohshima, Hajime; Honda, Kazuyuki; and Isaka, Yukio, 4,876,562, Cl. 346-160.000.

Tajima, Hatsu; Kubo, Takahiro; and Tajika, Hiroshi, 4,876,574, Cl. 355-253.000.

Yoshinaga, Kazuo; Katagiri, Kazuharu; Kobayashi, Toyoko; and Shinjo, Kenji, 4,876,027, Cl. 252-299.650.

Capello, Richard D.; and Mabry, George R., to De La Rue Printrak, Inc. Method and apparatus for contextual data enhancement. 4,876,726, Cl. 382-4.000.

Capetronic (BSR) Ltd.: See—
Ma, John Y.; and Houston, Albert C., 4,876,739, Cl. 455-266.000.

Carboly Inc.: See—
Haque, Sazzadul; Floyd, Thomas O.; Savas, Nick; and Kelm, Walter H., 4,875,812, Cl. 407-104.000.

Carcia, Peter P.; and Colman, Judith N., to Polaroid Corporation. Camera having auto-trim exposure control. 4,876,566, Cl. 354-436.000.

Cardenas, Alfonso, to Sunclipse, Inc. Disassemblable corrugated board backed chair. 4,875,737, Cl. 297-442.000.

Carian, Peter J.: See—
Brook, Arthur H.; Carian, Peter J.; Katzin, Leonard; Landsinger, Edmund E.; Moore, James D.; Rotter, Leah D.; and Schreiber, Stanley, 4,875,469, Cl. 128-26.000.

Candac Pacemakers, Inc.: See—
Mayer, David W.; Gilman, Byron L.; Walgren, Susan M.; and Berglund, June M., 4,876,109, Cl. 427-2.000.

Carlson, Christopher M.; and Deninno, Nicholas, to ITT Corporation. Adaptive blanking interface apparatus for self-protection jamming equipment employed in conjunction with radar systems. 4,876,545, Cl. 342-14.000.

Carlson, William P. Leaf vacuum and shredder. 4,875,630, Cl. 241-56.000.

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Arvidsson, Folke L. E.; Carlsson, Per A. E.; Hackzell, Uli A.; Hjorth, John S. M.; Johansson, Anette M.; and Lindberg, Per L., 4,876,284, Cl. 514-657.000.

Carlstedt, Kenneth T.; and Penn, Richard S., to Tecon, Inc. Apparatus for digitizing a composite video signal. 4,876,598, Cl. 358-160.000.

Carlton, Dale E.; Baker, Clifford E.; and Henriksen, Ronald M., to Tektronix, Inc. Method and apparatus for evaluating jitter. 4,876,655, Cl. 364-487.000.

Carroll, James E.; and Zillig, Steven R. Controlled leak path. 4,875,709, Cl. 285-14.000.

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Carswell, Robert: See—
Meyer, Louis W.; Vanderhider, James A.; and Carswell, Robert, 4,876,019, Cl. 252-32.500.

Cartillier, Andre: See—
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Casad, Burton M.; and Gant, Preston L., to Conoco Inc. Reservoir evaluation using partitioning tracer. 4,876,449, Cl. 250-259.000.

Casberg, John M., to Olin Corporation. Encased pool chemical tablet with domed ends. 4,876,003, Cl. 210-169.000.

Caschi, John L.; Lowe, Barrie M.; and Lowe, Thomas V., to Imperial Chemical Industries PLC. Zeolite EU-2. 4,876,412, Cl. 585-640.000.

Cascieri, Margaret A.: See—
Applebaum, Joy D.; Bayne, Marvin L.; and Cascieri, Margaret A., 4,876,242, Cl. 514-3.000.

Casida, John E.: See—
Palmer, Christopher J.; and Casida, John E., 4,876,274, Cl. 514-452.000.

Casio Computer Co., Ltd.: See—
Hara, Kazuya; Inoue, Takanori; and Bito, Hiroyasu, 4,876,441, Cl. 235-488.000.

Okuda, Hiroko; and Takenaka, Makoto, 4,875,400, Cl. 84-626.000.

Casler, Richard J., Jr.: See—
Daggett, Kenneth E.; Onaga, Eimei M.; and Casler, Richard J., Jr., 4,876,494, Cl. 318-568.220.

Caspers, John: See—
Van Driesen, Roger P.; Adams, William R.; Baldasari, Mario; Caspers, John; and Trimble, Harold, 4,875,995, Cl. 208-152.000.

Castaneda, Henry B., to Chemetrics, Inc. Test kit for colorimetric analysis. 4,876,068, Cl. 422-58.000.

Cattanaach, James B., to Imperial Chemical Industries PLC. Shaping of syntactic foam. 4,876,055, Cl. 264-512.000.

Caveny, Jack E.; Bulanda, John J.; Fischer, Richard L.; Stroede, Andrew J.; and Wiencek, Donald C., to Panduit Corp. Communication box assembly. 4,875,881, Cl. 439-535.000.

Cavitt, Michael B.; and Duncan, David J., to Dow Chemical Company, The. Flexible thermoplastic epoxy resin and coatings prepared therefrom. 4,876,295, Cl. 523-172.000.

Cawthorne, Christopher D., to STC PLC. Signal processing. 4,876,489, Cl. 342-383.000.

CBS Explosives Pty Limited: See—
Waldock, Kevin H.; and Wasson, Daniel A., 4,875,950, Cl. 149-21.000.

Cebalo, Tony; and Buntrock, Robert E. Thiazole compounds and methods of use. 4,876,044, Cl. 71-90.000.

Central Glass Company, Limited: See—
Kondo, Takeshi; Kawai, Toshikazu; and Oshio, Hideki, 4,876,404, Cl. 570-145.000.

Nishimura, Yasunobu; and Kawai, Toshikazu, 4,876,382, Cl. 560-109.000.

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Alota, Santa; Ferrari, Vincenzo; Memmi, Massimo; Pacelli, Leonardo; and Ramundo, Susanna, 4,875,983, Cl. 204-28.000.

Ceramtec, Inc.: See—
Virkar, Anil V., 4,876,148, Cl. 428-384.000.

Cerier, Jeffrey C.: See—
Trotta, Robert A.; and Cerier, Jeffrey C., 4,875,288, Cl. 30-49.000.

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Chamot, Jean P.: See—
Cook, Andre; and Chamot, Jean P., 4,875,437, Cl. 123-411.000.

Champagne, Venerand R. Frame for supporting stairs or the like. 4,875,315, Cl. 52-189.000.

Chandoneet, Yvon: See—
Chandonnet, Michel; and Chandonnet, Luc, 4,875,654, Cl. 248-467.000.

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Chandonnet, Michel; and Chandonnet, Luc, to Chandoneet, Yvon. Magnetic picture retainer. 4,875,654, Cl. 248-467.000.

Chandra, Sudhish: See—
Feldman, Fred; Klekamp, Mark S.; Hrinda, Michael E.; Shaw, Arthur B.; and Chandra, Sudhish, 4,876,241, Cl. 514-2.000.

Chang, Chung L.: See—
Moyer, George A.; and Chang, Chung L., 4,875,735, Cl. 297-367.000.

Chang, Clarence D.; Chu, Cynthia T-W; Chu, Pochen; Dessau, Ralph M.; Garwood, William E.; Kuehl, Guenter H.; Miale, Joseph N.; and Shihabi, David S., to Mobil Oil Corporation. Zeolite modifications. 4,876,228, Cl. 502-71.000.

Chang, Clarence D.: See—
Bowes, Emerson; Chang, Clarence D.; Han, Scott; and Shihabi, David S., 4,876,411, Cl. 585-533.000.

Chang, John C.: See—
Payet, George L.; and Chang, John C., 4,875,901, Cl. 8-115.560.

Chang, Robert W. H.; and Relyea, Keith E., to Minnesota Mining and Manufacturing Company. Lipstick sampling device. 4,876,136, Cl. 428-130.000.

Chang, Tsung K.: See—
Lester, Gene D.; Morgan, Richard A.; Harms, Harold B.; Barrett, John P.; Chang, Tsung K.; Cushing, Donald S.; Broo, Richard F.; and Hood, William M., 4,876,492, Cl. 318-254.000.

Chapin, John T.; and Sabia, Raffaele A., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Mineral-oil-free encapsulant composition. 4,876,303, Cl. 524-296.000.

Chapman, Derek D.: See—
Byers, Gary W.; and Chapman, Derek D., 4,876,237, Cl. 503-227.000.

Chapotel, Bernard: See—
Mauleon, Jean-Louis; Sigaud, Jean-Bernard; Chapotel, Bernard; and Seglin, Leonard, 4,875,993, Cl. 208-113.000.

Chaussadas, Jean, to Mead Corporation. The. Multipack with top panel keel. 4,875,586, Cl. 206-427.000.

Cheeki, Edward T. Catalytic converter with screen enclosure holding pellets under tension. 4,876,072, Cl. 422-179.000.

Chemetrics, Inc.: See—
Castaneda, Henry B., 4,876,068, Cl. 422-58.000.

Chen, Chau-Shiong A.: See—
Tobias, Eric; and Chen, Chau-Shiong A., 4,876,216, Cl. 437-67.000.

Chen, Chin H.; Fox, John L.; Specht, Donald P.; and Farid, Samir Y., to Eastman Kodak Company. Dye sensitized photographic imaging systems. 4,876,175, Cl. 430-281.000.

Chen, Harry H. Portable compression grid & needle holder. 4,875,478, Cl. 128-303.000.

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Kanber, Hilda; and Chen, James C., 4,876,211, Cl. 437-22.000.

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Nowak, Ronald R.; and Cherko, Carl F., 4,875,693, Cl. 279-2.000.

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Nespor, Ronald R., 4,875,822, Cl. 414-563.000.

Chevron Research Company: See—
Hsieh, C. Richard; King, Desmond F.; Pettersen, Frederick A.; and Shargay, Cathleen A., 4,875,996, Cl. 208-157.000.

Chi, Tsu T.: See—
Weder, Donald E.; and Chi, Tsu T., 4,876,192, Cl. 435-21.000.

Chiang, Weilong L.; Fjare, Douglas E.; and Nowicki, Neal R., to Amoco Corporation. Polyimide polymers and copolymers using 3,5-diaminobenzotrifluoride. 4,876,329, Cl. 528-353.000.

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Ostrup, Heinrich; and Hegger, Josef, 4,875,331, Cl. 56-208.000.

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Schumacher, Doris P.; Clark, Jon E.; and Murphy, Bruce L., 4,876,352, Cl. 548-232.000.

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Burke, Robert W., II; Cahen, Albert J., Jr.; Credle, William S., Jr.; Gupta, Ashis S.; and Heenan, Richard H., 4,875,508, Cl. 141-2.000.

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Melby, Earl G.; and Cocain, H. William, 4,876,308, Cl. 524-780.000.

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Frink, Tommy S.; Reed, Lowell M.; Cochran, Dwayne V.; and McNair, Will L., 4,875,530, Cl. 175-27.000.

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Lea Plaza, Carlos, 4,875,471, Cl. 128-69.000.

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Zon, Arie Van; and Coleman, Brian, 4,876,020, Cl. 252-40.500.

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Spyra, Rudolf A., 4,875,668, Cl. 270-45.000.

Comte, Pierre-Andre; Schurch, Hans; and Ritter, Gebhard, to Synthes (U.S.A.). Device for treating a bone. 4,875,475, Cl. 128-924.00Y.

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Romano, James, 4,875,502, Cl. 137-627.500.

- Concept II, Inc.: See—
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- Condon, David C.; and Stumfall, David M., to Printronix, Inc. Magnetic print hammer actuator protection circuit. 4,875,409, Cl. 101-93.290.
- Conner Peripherals, Inc.: See—
Squires, John P.; and Shrinkle, Louis J., 4,876,491, Cl. 318-138.000.
- Connolly, Donald P. Support systems and apparatus for suspending and resuspending articles at selected height positions. 4,875,653, Cl. 248-332.000.
- Connor, Michael J., to Boeing Company, The. Conically-shaped corrugated seal. 4,875,692, Cl. 277-212.0FB.
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- Conroy, Peter J., to United Kingdom Atomic Energy Authority. Temperature measurement. 4,876,059, Cl. 376-247.000.
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- Cook, Frederick A., Jr.: See—
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- Coopman, Lucien: See—
Moeneclay, Denis; Coopman, Lucien; and Victor, Johnny, 4,875,505, Cl. 139-448.000.
- Copeland-Sirois Enterprises, Inc.: See—
Sirois, William L., 4,875,430, Cl. 114-355.000.
- Copp, David F.; and Wojciechowski, Stephen J., to Chrysler Motors Corporation. Bumper fascia attachment structure. 4,875,728, Cl. 293-126.000.
- Corbeels, Roger J.: See—
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- Cordis Corporation: See—
Higgins, Sheryl W., 4,875,481, Cl. 128-344.000.
- Cornelison, Richard C.: See—
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- Lentz, William P., deceased, 4,875,917, Cl. 65-3.110.
- Correa, David J.: See—
Moe, Rolf; Correa, David J.; and Premeau, John E., 4,875,824, Cl. 414-751.000.
- Cosmo Instruments Co., Ltd.: See—
Uchiyama, Yoshichika; and Tsuchiya, Atsushi, 4,875,932, Cl. 73-202.000.
- Coss, Malcolm M.; and Tolman, Richard L., to Merck & Co., Inc. Alkylpiperazinyldipyrindines as hypoglycemic agents. 4,876,256, Cl. 514-252.000.
- Cotone, Cris A. Reciprocating rolling massager with varying pressure and varying wheel placement. 4,875,470, Cl. 128-57.000.
- Cottenceau, Remi: See—
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- Cotteret, Jean: See—
Grollier, Jean F.; and Cotteret, Jean, 4,875,902, Cl. 8-406.000.
- Coulborn, John W.; and Krug, John A., to ACF Industries, Incorporated. End structure for railway car. 4,875,417, Cl. 105-248.000.
- Coulston, John W.; and Huffman, David C., to Lechler, Inc. Free passage nozzle. 4,875,627, Cl. 239-466.000.
- Courter, Jack P., to Boeing Company, The. Modular cargo conveyor and restraint system for aircraft. 4,875,645, Cl. 244-137.100.
- Cousens, James A.: See—
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- Cowley, Colin H., to Active Memory Technology Ltd. Vlsi data processor containing an array of ICs, each of which is comprised primarily of an array of processing. 4,876,641, Cl. 364-200.000.
- Cox, David A., to GTE Products Corporation. Arc lamp with surface arc resistant barrier. 4,876,483, Cl. 313-634.000.
- Craighead, Jimmy R., to Manville Corporation. Packaging machine jamming detector. 4,875,323, Cl. 53-48.000.
- Crapser, James R.: See—
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- Crass, Guenther: See—
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- Creagan, Richard W.; and Nicol, Alan J., to Black Clawson Company, The. Horizontal twin wire machine with vertically adjustable open roll and deflector blade. 4,875,977, Cl. 162-300.000.
- Creasy, Walter S.; and Lorenz, Donald H., to Hydromer, Inc. Shaving articles lubricious when wet and compositions therefor. 4,875,287, Cl. 30-34.010.
- Credle, William S., Jr.: See—
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- Crist, Larry L. Underlift attachment for tow trucks. 4,875,269, Cl. 29-401.100.
- Crosby, John J.; and Napiorkowski, John J., to GTE Products Corporation. Signal circuit protector device for consumer use. 4,876,713, Cl. 379-412.000.
- Crosby, William: See—
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- Crudginton, Cleveland B., Jr. Champagne bottle opener. 4,875,394, Cl. 81-3.080.
- Csajtai, Geza; Doleschall, Sandor; Milley, Gyula; Kristof, Miklos; Paal, Tibor; Racz, Daniel; and Toth, Bela. Method for stabilizing clay minerals during oil exploitation by steam injection. 4,875,809, Cl. 405-263.000.
- Culbreath, J. Charles. Mouthpiece plates of flute-type wind instruments. 4,875,401, Cl. 84-384.000.
- Culp, Gordon W.: See—
Voss, David L.; DeCamp, Howard S.; and Culp, Gordon W., 4,876,178, Cl. 430-314.000.
- Curtin, William J. Series connected telephone service system. 4,876,711, Cl. 379-94.000.
- Curtiss, Linda K.: See—
Smith, Richard; Lamb, Peta-Maree; Curtiss, Linda K.; and Witzum, Joseph, 4,876,188, Cl. 435-7.000.
- Cushing, Donald S.: See—
Lester, Gene D.; Morgan, Richard A.; Harms, Harold B.; Barrett, John P.; Chang, Tsung K.; Cushing, Donald S.; Broo, Richard F.; and Hood, William M., 4,876,492, Cl. 318-254.000.
- Cwirzen, Casimir Z.; and Kupferschmidt, Albert, to Northern Telecom Limited. Electrically protected connector for telephone distribution frames. 4,875,868, Cl. 439-188.000.
- Czech, Joachim. Dispenser for paste-like products. 4,875,604, Cl. 222-257.000.
- Czogalla, Claus-D., to von der Haar-Czogalla, Rita. Process for the production of thiophenes from alpha-methylene ketones in the single-stage process and new ortho-fused thiophenes produced by means of the process. 4,876,361, Cl. 549-41.000.
- D. G. Shelter Products Co.: See—
Coller, John H.; and Littleton, Donald N., 4,875,271, Cl. 29-432.000.
- Daggett, Kenneth E.; Onaga, Eimei M.; and Casler, Richard J., Jr., to Unimation, Inc. Position and velocity feedback system for a digital robot control. 4,876,494, Cl. 318-568.220.
- Dahl, Frank L. Vending machine for vending one-at-a-time merchandise articles of a plurality of similar such merchandise objects, each of a substantially rectangular parallelepiped shape, such as a newspaper, magazine, or the like. 4,875,598, Cl. 221-4.000.
- Daikin Industries Ltd.: See—
Hisanaga, Yorisato; Shimokawa, Kazuhiro; Kawano, Toshihiko; Suita, Yasunori; and Yamashita, Tsuneo, 4,876,245, Cl. 514-29.000.
- Daiku, Yoshiharu: See—
Oinuma, Hitoshi; Yamanaka, Motosuke; Miyake, Kazutoshi; Hosshiko, Tomonori; Minami, Norio; Shoji, Tadao; Daiku, Yoshiharu; Sawada, Kohji; and Nomoto, Kenichi, 4,876,262, Cl. 514-318.000.
- Daimler-Benz Aktiengesellschaft: See—
Leiber, Heinz, 4,875,338, Cl. 60-550.000.
- Dainihon Glass Industry Co., Ltd.: See—
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Isono, Koichi; and Sho, Ikuo, 4,876,456, Cl. 250-561.000.
- Daiwa Kasei Kogyo Kabushiki Kaisha: See—
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- Dallas Semiconductor Corporation: See—
Podkova, William J.; and Williams, Clark R., 4,876,465, Cl. 307-443.000.
- Dallavia, Anthony J., Jr.; Vande Ven, Susan; and Smith, Bobby E., to J.M. Huber Corporation. Mineral filler fire retardant composition and method. 4,876,291, Cl. 521-124.000.
- Dallum, Barry J., to Owens-Corning Fiberglass Corporation. Underground tank. 4,876,124, Cl. 428-34.500.
- Daltrozso, Ewald; and Sulger, Werner, to BASF Aktiengesellschaft. Methine dyes having a pyridyl group and a pyridyl or a quinolonyl group. 4,876,347, Cl. 546-176.000.
- Daly, Robert C.: See—
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- Damon, Robert E., II, to Sandoz Pharm. Corp. Arylcyclohexane and arylcyclohexene analogs of mevalonolactone derivatives and their use. 4,876,280, Cl. 514-510.000.
- Dana Corporation: See—
Holman, James L.; and Willford, George A., 4,875,383, Cl. 74-473.00R.
- Kern, Karl O., Jr., 4,875,794, Cl. 403-132.000.
- Daniel, Mervyn F.: See—
Smith, Gilbert W.; Daniel, Mervyn F.; Barton, John W.; and Ratcliffe, Norman M., 4,876,150, Cl. 428-411.100.
- Dara, Prithipal, to Reliance Comm/Tec Corporation. Mid-plane board and assembly therefor. 4,876,630, Cl. 361-413.000.
- Darche, Yves: See—
Gongora, Henri; and Darche, Yves, 4,876,389, Cl. 568-26.000.

- Da Silva, Jean, to E.R.C.D. Industries Inc. Air pump pressure control system for inflating pairs of automotive tires. 4,875,509, Cl. 141-38.000.
- Data Compression Corporation: See—
Storer, James A., 4,876,541, Cl. 341-51.000.
- Davis, Cecil J.; Mathews, Robert T.; Loewenstein, Lee M.; Abernathy, Joe V.; and Wooldridge, Timothy A., to Texas Instruments Incorporated. Wafer processing apparatus. 4,875,989, Cl. 204-298.000.
- Davis, Christopher K.; and Beasom, James D., to Harris Corporation. Low top gate resistance JFET structure. 4,876,579, Cl. 357-22.000.
- Davis, Craig M.; and Rasmussen, Richard R., to National Semiconductor Corporation. High frequency ECL voltage controlled ring oscillator. 4,876,519, Cl. 331-57.000.
- Davydov, Anatoly B.: See—
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- Dawes, Peter W.: See—
Bender, Stanley I.; Butler, Lawrence; and Dawes, Peter W., 4,875,655, Cl. 248-557.000.
- Dawson, John F.; Thompson, Eldon J.; and Cousens, James A., to Honeywell Inc. Digital map system. 4,876,651, Cl. 364-449.000.
- De La Rue Printak, Inc.: See—
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- De La Rue Systems, Ltd.: See—
Lacey, Paul D.; and Martin, Anthony, 4,875,589, Cl. 209-534.000.
- DeAngelis, Thomas P., to Corning Incorporated. Reaction sintered boride-oxide-silicon nitride for ceramic cutting tools. 4,876,227, Cl. 501-97.000.
- Debaes, Johny, to N.V. Michel Van De Wiele. Process and apparatus for guiding the weft threads in weaving looms. 4,875,507, Cl. 139-450.000.
- DeBoer, Charles D., to Eastman Kodak Company. Dye-receiving element containing spacer beads in a laser-induced thermal dye transfer. 4,876,235, Cl. 503-227.000.
- DeCamp, Howard S.: See—
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- De Deugd, Johannes A. G.; and van Moorsel, Josephus J. Color television display tube. 4,876,477, Cl. 313-404.000.
- Deeba, Michel: See—
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- Deem, William C. Notebook binder/label holder. 4,875,793, Cl. 402-3.000.
- Deere & Company: See—
Boardman, Peter W.; and McCombs, Daniel G., 4,875,356, Cl. 72-321.000.
- Deutsch, Timothy A.; Schreiner, Joel M.; and McBee, Steve H., 4,875,330, Cl. 56-41.000.
- Foley, Daniel M.; Snyder, Michael D.; and Long, John D., 4,875,527, Cl. 172-248.000.
- Hadley, Howard C., 4,875,421, Cl. 111-200.000.
- Hagerer, Paul; Glaser, Fritz; Klimmer, Josef W.; and Kunze, Reinhard, 4,875,889, Cl. 460-1.000.
- Larson, Scott A.; and Johnson, Duane R., 4,875,563, Cl. 192-4.00A.
- Turner, Reed J.; Peters, Loren W.; Wilson, John E.; and Bennett, Robert E., 4,875,891, Cl. 460-110.000.
- Defendorf, James: See—
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- DeFraine, Paul: See—
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- DeGrave, Gilbert F., to Eastman Kodak Company. Process for manufacturing a grain chill roller. 4,875,262, Cl. 29-121.800.
- Dekker, Nicolaas M. J.; Edwards, John W.; and James, Adrian W., to General Electric Company, p.l.c., The. Active noise control. 4,876,722, Cl. 381-71.000.
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- Delatorre, Leroy C., to Panex Corporation. Pressure sensor system. 4,875,368, Cl. 73-151.000.
- Delatorre, Leroy C., to Panex Corporation. Pressure sensor system. 4,875,369, Cl. 73-151.000.
- Delfield Precision Engineering Limited: See—
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- Okuda, Akihiko; Totake, Yukinori; and Matsumura, Hideki, 4,876,407, Cl. 570-239.000.
- Dennany, Robert D., Jr.; and Pontbriand, Duane J., to ITT Corporation. Quick connect connector. 4,875,715, Cl. 285-87.000.
- Dennison Manufacturing Company: See—
Tighe, Laurence E.; and Parker, Tim, 4,876,423, Cl. 219-10.55E.
- Denny, David S.; Metzger, Edward C. R.; Rexroad, John; and Glynn, William, to SINCO, Inc. Debris barrier. 4,875,549, Cl. 182-138.000.
- Dentsply Research & Development Corp.: See—
Jefferies, Steven R.; and Huang, Chin-Teh, 4,875,858, Cl. 433-226.000.
- Depoli, Erminio, to Baruffaldi S.p.A. Coupling with two clutches, especially for looms. 4,875,565, Cl. 192-48.200.
- DeSaro, Robert; Doyle, Edward F.; Metcalfe, Christopher I.; and Patch, Keith D., to Gas Research Institute. Direct contact raining bed counterflow cullet preheater and method for using. 4,875,919, Cl. 65-27.000.
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- Design Systems, Inc.: See—
Rudy, Norman A.; and Tomlin, James S., 4,875,254, Cl. 17-61.000.
- Dessau, Ralph M.: See—
Chang, Clarence D.; Chu, Cynthia T-W; Chu, Pochen; Dessau, Ralph M.; Garwood, William E.; Kuehl, Guenter H.; Miale, Joseph N.; and Shihabi, David S., 4,876,228, Cl. 502-71.000.
- DeSutter, Steven C.: See—
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- Deutsch, Timothy A.; Schreiner, Joel M.; and McBee, Steve H., to Deere & Company. Alignable cotton conveying structure for a transversely movable row unit. 4,875,330, Cl. 56-41.000.
- Deutsche Thomson-Brandt GmbH: See—
Kaaden, Jürgen; and Schandl, Hartmut, 4,876,614, Cl. 360-10.200.
- Rilly, Gerard; and Rodriguez, Jose-Ignacio, 4,876,636, Cl. 363-21.000.
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- DeWachter, Gary, to Reliance Electric Company. Snap-ring with pin release seal. 4,875,786, Cl. 384-482.000.
- DeWeert, William R.; and Manning, Frank. Muzzleloading powder and projectile tool. 4,875,303, Cl. 42-90.000.
- Dewert, Heribert: See—
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- Dewitte, Philippe: See—
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- D'Hooghe, Martial; Perrette, Claude; and Goffinet, Pierre, to Union Generale De Savonnerie. Device for dosing and dispensing a fluid product to be deposited freely in the mobile enclosure of a machine. 4,875,600, Cl. 222-52.000.
- Diafoil Company, Limited: See—
Utsumi, Shigeo, 4,876,137, Cl. 428-141.000.
- Diamond Shamrock Chemicals Co.: See—
Higbie, Francis A.; Lieberman, Robert A.; and Rose, Ira M., 4,876,384, Cl. 560-224.000.
- Diana, William D.: See—
Cohen, Abraham D.; Diana, William D.; and Bael, James J., 4,876,403, Cl. 568-913.000.
- Dickenson, Haydn G. W.; and Huntington, David H., to Procter & Gamble Company, The. Laundry products. 4,876,023, Cl. 252-90.000.
- Dickerson, Daryl E. Handlegrip cruise assist device. 4,875,386, Cl. 74-551.900.
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- Diehl GmbH & Co.: See—
Stadler, Hansjorg; and von Laar, Klaus, 4,875,414, Cl. 102-307.000.
- Diel, Peter J.: See—
Schurter, Rolf; and Diel, Peter J., 4,875,926, Cl. 71-94.000.
- Diesel Kiki Co., Ltd.: See—
Ichihashi, Kouji; and Yasuma, Jun-ichi, 4,875,501, Cl. 137-625.640.
- Nakajima, Nobuyuki; Inomata, Kenichi; Morita, Masaya; Yamaguchi, Toshio; and Eitai, Kazuo, 4,875,835, Cl. 417-295.000.
- Suzuki, Nobuhiko; and Aoki, Tetuya, 4,875,832, Cl. 417-222.000.
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- DiGiacomo, Ralph: See—
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- Digital Equipment Corporation: See—
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- Steltzer, Edward L., 4,875,635, Cl. 242-67.30R.
- Welch, Glenn S.; Fidrych, Stephen; Romm, Michael; and Maurer, Bernie J., 4,875,880, Cl. 439-536.000.
- Dingle, Donald A.: See—
Roy, Bernard J. J.; O'Connor, Lorne D.; Rioux, Philippe F.; Dingle, Donald A.; and Raymond, Andre L., 4,876,597, Cl. 358-141.000.
- Dinter, Peter: See—
Paschke, Klaus; Crass, Guenther; and Dinter, Peter, 4,875,963, Cl. 156-249.000.
- Di Paola, Denis: See—
Cagnon, Francois; Di Paola, Denis; Austruy, Georges; and Vinchon, Andre, 4,875,850, Cl. 431-8.000.

- Dirschel, Teresa A.: See—
Solarek, Daniel B.; Dirschel, Teresa A.; Hernandez, Henry R.; and Jarowenko, Wadym, 4,876,336, Cl. 536-109.000.
- Disdier, Camille: See—
Desbois, Michael; and Disdier, Camille, 4,876,376, Cl. 558-412.000.
- Dittmar, Walter: See—
Siegel, Herbert; Kampe, Klaus-Dieter; Alpermann, Hans G.; Gerhards, Hermann J.; Usinger, Patricia; Schacht, Ulrich; Leven, Margret; Raether, Wolfgang; Dittmar, Walter; and Sachse, Burkhard, 4,876,354, Cl. 548-341.000.
- Dixon, George G.; Parlman, Robert M.; and Stewart, Wayne, to Phillips Petroleum Company. Organophilic clay suspension medium. 4,876,030, Cl. 252-315.200.
- Dobhan, Herbert: See—
Bauer, Bernhard; and Dobhan, Herbert, 4,875,787, Cl. 384-548.000.
- Dobosz, Ronald F., to Boro, John R.; and Dobosz, Ronald F. Wind deflector. 4,875,431, Cl. 116-173.000.
- Dr. Ing. h.c.F. Porsche AG: See—
Gietzen, Stas; Weiner, Hans; Hain, Klaus; Hofbauer, August; and Hawener, Juergen, 4,875,643, Cl. 244-53.00A.
- Dr. Ing. h.c.F. Porsche Aktiengesellschaft: See—
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- Doi, Miwako: See—
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- Doi, Yoshiharu, to Mitsubishi Kasei Corporation. Copolyester and process for producing the same. 4,876,331, Cl. 528-361.000.
- Doinghaus, Hermann: See—
Moeckl, Ernst; Stumpf, Jorg; Hardt, Walter; and Doinghaus, Hermann, 4,875,418, Cl. 108-50.000.
- Dola, Frank P.: See—
Demler, Henry W., Jr.; Dola, Frank P.; Kimmel, David J.; and Sotolongo, Thomas J., 4,875,865, Cl. 439-101.000.
- Doleschall, Sandor: See—
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- Domain Technology: See—
Bornstein, Jonathan G., 4,876,117, Cl. 427-130.000.
- Donahue, Raymond J.; Cleary, Terrance M.; Hauenstein, Frederick M.; and Marcellia, Daniel H., to Brunswick Corporation. Method of producing salt cores for use in die casting. 4,875,517, Cl. 164-34.000.
- Donahue, Raymond J.; Hesterberg, William G.; and Cleary, Terrance M., to Brunswick Corporation. Method and apparatus for producing titanium. 4,875,985, Cl. 204-64.00T.
- Donaldson Company, Inc.: See—
Betts, Peter; and Jahn, Darrell D., 4,876,011, Cl. 210-526.000.
- Dondorf, Wolfgang, to Pulsotronic Merten GmbH & Co. KG. Position detector for the movable element of a fluid-operated actuator. 4,876,531, Cl. 340-686.000.
- Donnay, James A.; Jensen, Van E., Jr.; and Kruzel, Bryon S., to Minnesota Mining and Manufacturing. Buffing apparatus for book-fold carton; and method. 4,875,895, Cl. 493-117.000.
- Dorenkamp, Richard: See—
Kramer, Karl-Martin; and Dorenkamp, Richard, 4,875,449, Cl. 123-400.000.
- Dornbrock, Ronald F.: See—
Martin, Richard W.; Fisher, John L.; Fortenberry, William R.; Schlake, Randall L.; Dornbrock, Ronald F.; Richerson, James D.; and Marrett, Kenneth E., Sr., 4,875,277, Cl. 29-606.000.
- Dornbush, Robert A., Sr.: See—
Ballinger, Kedric L.; and Dornbush, Robert A., Sr., 4,875,685, Cl. 273-195.00B.
- Dougherty, John J., to General Electric Company. Circuit breaker warning relay and control accessory. 4,876,622, Cl. 361-94.000.
- Dougherty, Richard M., to Motorola, Inc. High gain distributed amplifiers. 4,876,516, Cl. 330-54.000.
- Dow Chemical Company, The: See—
Cavitt, Michael B.; and Duncan, David J., 4,876,295, Cl. 523-172.000.
- Chen, Lao-Jer; and Lowenkron, Steven B., 4,876,380, Cl. 560-352.000.
- Meister, Bernard J.; Dryzga, Craig D.; and Tien, Li C., 4,876,312, Cl. 525-263.000.
- Meyer, Louis W.; Vanderhider, James A.; and Carswell, Robert, 4,876,019, Cl. 252-32.500.
- Dow Corning Corporation: See—
Lo, Peter Y. K.; and Ziemelis, Maris J., 4,876,039, Cl. 264-4.700.
- Witucki, Gerald L.; and Plueddemann, Edwin P., 4,876,154, Cl. 428-447.000.
- Dowle, Michael D.: See—
Butina, Darko; Dowle, Michael D.; Bays, David E.; and Webb, Colin F., 4,876,267, Cl. 514-415.000.
- Dowrick, John S., to Beecham Group p.l.c. Injectable compositions of amoxycillin trihydrate. 4,876,086, Cl. 424-80.000.
- Doyle, Edward F.: See—
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Waschke, Christine; Topfer, Lothar; and Rath, Alfred, 4,875,477, Cl. 128-206.210.
- Dragnea, Felicia: See—
Lee, Andrew J.; Sanduja, Mohan L.; Sugathan, Kenneth; Dragnea, Felicia; and Horowitz, Carl, 4,875,410, Cl. 101-170.000.
- Drake, Charles A.: See—
Ewert, Warren M.; Kubicek, Donald H.; and Drake, Charles A., 4,876,410, Cl. 585-516.000.
- Siegel, Donald J.: See—
O'Neill, James F.; Drake, Donald J.; and Hawkins, William G., 4,875,968, Cl. 156-633.000.
- Dreissigacker, Peter D.; and Dreissigacker, Richard A., to Concept II, Inc. Energy absorbing means with self calibrating monitor. 4,875,674, Cl. 272-72.000.
- Dreissigacker, Richard A.: See—
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- Drent, Eit: See—
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- Dresser Industries, Inc.: See—
Langford, James W., Jr., 4,875,532, Cl. 175-371.000.
- Drewitz, Hans: See—
Hagin, Faust; Drewitz, Hans; and Krenner, Manfred, 4,875,557, Cl. 188-79.550.
- Dryzga, Craig D.: See—
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- Dubal, Hans-Rolf: See—
Hemmerling, Wolfgang; Dubal, Hans-Rolf; Muller, Ingrid; Ohlen-dorf, Dieter; and Wingen, Rainer, 4,876,028, Cl. 252-299.610.
- Duce, Edward, to Stockrail Ltd. Endless path storage carousel with selective discharge. 4,875,416, Cl. 104-167.000.
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- Duncan, David J.: See—
Cavitt, Michael B.; and Duncan, David J., 4,876,295, Cl. 523-172.000.
- Duncan, Richard C., to Allanson, Division of Jannock Limited. Current supplying device. 4,876,496, Cl. 320-31.000.
- Duncan, Scott M.: See—
Santos, Alfred J.; Cook, Frederick A., Jr.; Duncan, Scott M.; and Moseley, John, 4,875,785, Cl. 384-448.000.
- Dunlop Limited a British Company: See—
Moore, Alan F., 4,875,664, Cl. 267-140.100.
- Dunnavant, William R.: See—
Shriver, H. Randall; Dunnavant, William R.; and Gruber, Bruce A., 4,876,294, Cl. 523-139.000.
- Dunnigan, Jacques; and Menard, Hugues, to L'Institut De L'Amiante. Filter for removing cancer causing compounds from exhaust fumes. 4,875,910, Cl. 55-74.000.
- Du Pont de Nemours, E. I., and Company: See—
Fischer, Gerhard; and Quabeck, Helmut, 4,876,611, Cl. 358-456.000.
- Fremont, Joseph M., 4,876,231, Cl. 502-174.000.
- Heikkila, Kurt E.; Williams, Rodney K.; and Bohnen, Bruce A., 4,875,973, Cl. 156-664.000.
- Myers, Melvyn J.; and Nickolson, Victor J., 4,876,259, Cl. 514-256.000.
- Penney, Penio; Rajagopalan, Parthasarathi; and Scribner, Richard M., 4,876,269, Cl. 514-429.000.
- Sakiadis, Byron C., 4,875,279, Cl. 29-740.000.
- Williams, Rodney K.; Bohnen, Bruce A.; and Heikkila, Kurt E., 4,875,972, Cl. 156-664.000.
- Zafiroglu, Dimitri P., 4,876,128, Cl. 428-102.000.
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Grollier, Jean F.; and Dupuis, Christine, 4,876,083, Cl. 424-47.000.
- Durgo AG: See—
J100 rgensen, Paul R., 4,876,555, Cl. 343-895.000.
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- Durney, Cronin Rebecca L.; Rutherford W. Scott; and Campbell, James F., to Reichhold Chemicals, Inc. Textile adhesives comprising a latex binder consisting essentially of styrene, butadiene, and mono-ester of maleic or fumaric acid. 4,876,293, Cl. 523-122.000.
- Dust, Matthias; Neumann, Peter; Schefczik, Ernst; Benthack-Thoms, Heidi; Barzynski, Helmut; Schomann, Klaus-Dieter; Kuppelmaier, Harald; and Koester, Eberhard, to BASF Aktiengesellschaft. Naphtholactam dyes and optical recording medium containing these dyes. 4,876,356, Cl. 548-419.000.
- Dusza, John P.: See—
Torley, Lawrence W.; Johnson, Bernard D.; and Dusza, John P., 4,876,252, Cl. 514-224.800.
- Dutcher, James C.: See—
Plitt, Cheryl A.; and Dutcher, James C., 4,875,882, Cl. 440-66.000.

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- Dykstra, Richard A., to Briggs & Stratton Corporation. Cyclic responding electronic speed governor. 4,875,448, Cl. 123-352.000.
- Dynamics Research Corporation: See—
Bakewell, Joseph J., 4,875,281, Cl. 29-825.000.
- Dynascan Corporation: See—
Rogers, Max W.; and Skinner, Daniel R., 4,876,709, Cl. 379-61.000.
- Dziurla, Heinz-Jurgen; Freitag, Dieter; Waldenrath, Werner; Burkhardt, Claus; and Schulte, Bernhard, to Bayer Aktiengesellschaft. Moulded bodies containing carbon. 4,876,033, Cl. 252-511.000.
- E. F. Johnson Company: See—
Grindahl, Mervin L., 4,876,700, Cl. 375-87.000.
- E.R.C.D. Industries Inc.: See—
Da Silva, Jean, 4,875,509, Cl. 141-38.000.
- E-Systems, Inc.: See—
Masheff, Michael S., 4,876,549, Cl. 342-417.000.
- Eakin, Oscar, Jr.: See—
Merrett, Ronald G.; and Eakin, Oscar, Jr., 4,875,811, Cl. 406-39.000.
- Eakin, Thomas G. Incontinence device for women. 4,875,898, Cl. 604-331.000.
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- Eastlick, David T.: See—
Robinson, Colin; Eastlick, David T.; and Bownass, Audrey J., 4,876,351, Cl. 548-204.000.
- Eastman Christensen Company: See—
Biehl, Johann; and Ostertag, Alfred, 4,875,531, Cl. 175-250.000.
- Eastman Kodak Company: See—
Beach, David E., 4,875,637, Cl. 242-71.100.
- Buckland, Paul R., 4,876,182, Cl. 430-555.000.
- Byers, Gary W.; and Chapman, Derek D., 4,876,237, Cl. 503-227.000.
- Chen, Chin H.; Fox, John L.; Specht, Donald P.; and Farid, Samir Y., 4,876,175, Cl. 430-281.000.
- DeBoer, Charles D., 4,876,235, Cl. 503-227.000.
- DeGrave, Gilbert F., 4,875,262, Cl. 29-121.800.
- Estes, Marvin F.; and Lungershausen, Arnold W., 4,875,756, Cl. 350-96.200.
- Harvey, Donald M., 4,875,638, Cl. 242-71.100.
- Henzel, Richard P., 4,876,234, Cl. 503-227.000.
- Hsu, Kevin; Rao, Srinivas T.; and Kaukenen, Joseph Y., 4,875,969, Cl. 156-633.000.
- Mack, Arthur R., II; and Sutherland, John W. H., Jr., 4,876,207, Cl. 436-135.000.
- Marino, Philip F.; and Vandenberg, Donald E., 4,875,764, Cl. 350-611.000.
- Moran, Kevin E.; Smith, Michael L.; and Lippard, Ernest R., III, 4,875,780, Cl. 356-446.000.
- Parulski, Kenneth A., 4,876,590, Cl. 358-41.000.
- Proehl, Gary S.; Gingello, Anthony D.; Collett, David J.; Parton, Richard L.; Stegman, David A.; and Adin, Anthony, 4,876,181, Cl. 430-522.000.
- Sherburne, David G., 4,875,671, Cl. 271-302.000.
- Shin, Sung-Chul, 4,876,159, Cl. 428-607.000.
- Snow, Robert A.; McGuckin, Hugh G.; Ponticello, Ignazio S.; Daly, Robert C.; Pace, Laurel J.; Fischer, Sandra K.; and Hanrahan, Michael J., 4,876,167, Cl. 430-7.000.
- Vandenberg, Donald E.; Jacques, Donald A.; and Schaffer, William E., 4,875,765, Cl. 350-611.000.
- Vanier, Noel R.; and Lum, Kin K., 4,876,236, Cl. 503-227.000.
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- Van Sickle, Dale E., 4,876,378, Cl. 560-78.000.
- Wake, Ronald W.; Reithel, Sibylle L.; and McGuckin, Hugh G., 4,876,166, Cl. 430-7.000.
- Whitfield, Arthur A., 4,876,697, Cl. 375-22.000.
- Eaton Corporation: See—
Calviello, Joseph A.; Bie, Paul R.; and Pomian, Ronald J., 4,876,176, Cl. 430-311.000.
- Storm, Eric L., 4,875,796, Cl. 403-359.000.
- Eaton, Richard B., to Xerox Corporation. Focus and signal to noise measurement routines in input scanners. 4,876,608, Cl. 358-443.000.
- Ebara Corporation: See—
Ohkubo, Kazuo; Hayashi, Tadamasu; and Nagai, Hiroshi, 4,876,006, Cl. 210-321.690.
- Eberhard, John: See—
Willkop, Franz; Zahring, Gerhard; Rutsch, Robert; Popp, Joachim; and Eberhard, John, 4,875,828, Cl. 415-173.400.
- Ebonite International, Inc.: See—
Lee, Andrew J.; Sanduja, Mohan L.; Sugathan, Kenneth; Dragnea, Felicia; and Horowitz, Carl, 4,875,410, Cl. 101-170.000.
- Ebonwood Limited: See—
Griffiths, Colin; and Walker, William G., 4,875,954, Cl. 156-64.000.
- Edward W. Face Co., Inc.: See—
Face, Samuel A., III, 4,875,802, Cl. 404-67.000.
- Edwards, John W.: See—
Dekker, Nicolaas M. J.; Edwards, John W.; and James, Adrian W., 4,876,722, Cl. 381-71.000.
- Egawa, Akira, to Fanuc Ltd. Output voltage detecting device in a laser oscillator. 4,876,689, Cl. 372-38.000.
- Egawa, Jiro; Yoshida, Naruhito; Kasai, Toshihiro; Nagasawa, Moriya; Ide, Naoki; and Machida, Hironobu, to Kabushiki Kaisha Toshiba. Recording apparatus. 4,876,560, Cl. 346-153.100.
- Eichen, Howard R., to Treestone Corporation. Building material and method of producing the building material. 4,876,151, Cl. 428-446.000.
- Eisai Co., Ltd.: See—
Oinuma, Hitoshi; Yamanaka, Motosuke; Miyake, Kazutoshi; Hoshiko, Tomonori; Minami, Norio; Shoji, Tadao; Daiku, Yoshiharu; Sawada, Kohei; and Nomoto, Kenichi, 4,876,262, Cl. 514-318.000.
- Eitai, Kazuo: See—
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- Ejiri, Takashi: See—
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- Ekereth, Douglas E.; and Veronesi, Luciano, to Westinghouse Electric Corp. Resiliently loaded lateral supports for cantilever-mounted rod guides of a pressurized water reactor. 4,876,061, Cl. 376-353.000.
- Eleo Industries, Inc.: See—
Reinwall, Ernest W., 4,875,818, Cl. 411-369.000.
- Elder, Jerome E.; and Mosman, Nancy L., to Minnesota Mining and Manufacturing Company. Disc dispenser. 4,875,609, Cl. 225-13.000.
- Electronic Research Group, Inc.: See—
Silva, Donald M.; Silva, Leroy F.; and Fehsenfeld, Fred M., Sr., 4,876,638, Cl. 363-97.000.
- Electronics, Inc.: See—
Brint, Gary T.; Bungardt, Gabriele; Gedecke, Jerel C.; Harris, Robert L.; and Kraz, Vladimir, 4,876,712, Cl. 379-387.000.
- Eli Lilly and Company: See—
Hamill, Robert L.; and Yao, Raymond C., 4,876,273, Cl. 514-451.000.
- Robertson, David W.; and Wong, David T., 4,876,282, Cl. 514-554.000.
- Elisabet, Ingrid Birgitta, nee Jansson, Eva Christina Holm, Claes Fredrick Holm, executors: See—
Holm, Sune, deceased; Malmberg, Rolf; and Svensson, Kjell, 4,876,100, Cl. 426-491.000.
- Elliott, Raymond; Griffin, David A.; and Gairns, Raymond S., to Imperial Chemical Industries PLC. Pyrimidine derivatives. 4,875,922, Cl. 71-76.000.
- Ellis, Roger D.: See—
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- Elms, Robert T.: See—
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- Elpatronic AG: See—
Becker, Anton; and Kramer, Felix, 4,875,382, Cl. 74-84.00R.
- Elron Electronic Industries, Ltd.: See—
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- Emamjomeh, Ali: See—
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- Emery, Leslie M. Miniature forge. 4,875,854, Cl. 432-120.000.
- Emhart Industries, Inc.: See—
Gardner, E. Boyd, 4,876,652, Cl. 364-473.000.
- Miller, Theodore H., deceased; and Slusarski, Ronald S., 4,875,722, Cl. 292-92.000.
- Emonds-Alt, Xavier: See—
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- Enamito, Satoshi: See—
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- Endl, Josef: See—
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- Endo, Azuchi: See—
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- Endo, Masanori; and Watanabe, Kouichi, to Murata manufacturing Co., Ltd. Electric double layer capacitor. 4,876,631, Cl. 361-502.000.
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Ross, Randall R.; Bjornard, Eric; and Strand, David, 4,876,667, Cl. 365-113.000.
- Engel, Hartmunt S. Lighting system. 4,876,633, Cl. 362-223.000.
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- Engineered Air Systems, Inc.: See—
Mutchler, Paul A., 4,875,851, Cl. 431-6.000.
- Enomoto, Michio; and Riisgaard, Steen, to Novo Industri A/S. Enzymatic detergent additive, a detergent, and a washing method. 4,876,024, Cl. 252-174.120.
- ENSCO, Inc.: See—
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- Ensyn Engineering Associates Inc.: See—
Underwood, Gary; and Graham, Robert G., 4,876,108, Cl. 426-650.000.
- EPS Environmental Protection Systems Limited: See—
Roydhouse, Richard H., 4,876,025, Cl. 252-182.320.
- Equipments Et Composants Pour L'Industrie Automobile: See—
Henique, Christian, 4,875,387, Cl. 74-552.000.
- Era, Koh: See—
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- Erickson, Curtis: See—
501 Hydrosplash Enterprises, Inc. Aquatic exercise device, 4,875,673, Cl. 272-71.000.
- Erickson, Frederick L.: See—
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- Erwin Sick GmbH Optik-Elektronik: See—
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Browder, George A. G., Jr.; and Grant, David W., 4,875,241, Cl. 2-409.000.
- Essex Group, Inc.: See—
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- Etheridge, David R. Method of connecting a non-contaminating fluid heating element to a power source, 4,875,957, Cl. 156-85.000.
- Ethyl Petroleum Additives, Inc.: See—
Lam, William Y., 4,876,375, Cl. 558-235.000.
- Etoh, Masahiro: See—
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- Euchner, James: See—
Loris, Keith; and Euchner, James, 4,876,731, Cl. 382-40.000.
- Eur-Control Kalle AB: See—
Skallen, Bengt, 4,875,362, Cl. 73-54.000.
- European Economic Community: See—
Murray, Charles N.; and Jamet, Michel R., 4,875,429, Cl. 114-331.000.
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Laucht, Horst; and Euskirchen, Jurgen, 4,876,448, Cl. 250-234.000.
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- Evans, Walter R.; Remenick, Joseph M.; Jasper, Thomas E.; and Ballard, Wayne W., to Sargent & Greenleaf, Inc. Electronic time lock, 4,875,351, Cl. 70-271.000.
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- Ewert, Warren M.; Kubicek, Donald H.; and Drake, Charles A., to Phillips Petroleum Company. Catalyst support, and catalyst for olefin dimerization, 4,876,410, Cl. 585-516.000.
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Tuttle, John E.; and Ewing, Sheldon M., 4,875,599, Cl. 221-231.000.
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Cohen, Abraham D.; Diana, William D.; and Bael, James J., 4,876,403, Cl. 568-913.000.
- Exxon Production Research Company: See—
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Maurer, Albrecht; and Fabian, Josef, 4,876,727, Cl. 382-8.000.
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- Factor, Arnold: See—
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Wan, Chi-Meen, 4,875,933, Cl. 75-10.170.
- Fan, Liang-Tseng: See—
Somerville, Robin; and Fan, Liang-Tseng, 4,875,905, Cl. 44-589.000.
- Fang, Jimmy, to Fei, Peter Tsung-Hou. Loudspeaker system, 4,876,723, Cl. 381-182.000.
- Fanuc Ltd.: See—
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- Farid, Samir Y.: See—
Chen, Chin H.; Fox, John L.; Specht, Donald P.; and Farid, Samir Y., 4,876,175, Cl. 430-281.000.
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Longo, Antonio; and Lombardi, Paolo, 4,876,045, Cl. 260-397.300.
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- Farque, Claude A., to Oil Dynamics, Inc. Parameter telemetering from the bottom of a deep borehole, 4,876,539, Cl. 340-856.000.
- Farr, Barbara J.: See—
Ardini, Joseph L.; Lefsky, Brian; and Farr, Barbara J., 4,876,501, Cl. 324-73.00R.
- Farrar, David: See—
Benn, Gerald; Farrar, David; and Flesher, Peter, 4,876,047, Cl. 562-41.000.
- Fasold, Dietmar: See—
Nathrath, Norbert; and Fasold, Dietmar, 4,876,553, Cl. 343-756.000.
- Faulk, Michael B.: See—
Trahan, David O.; and Faulk, Michael B., 4,876,017, Cl. 252-8.510.
- Faust, James H., to ABC Auto Alarms, Inc. Push lock actuable anti-theft vehicle device, 4,875,350, Cl. 70-241.000.
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Quackenbush, John, 4,876,140, Cl. 428-216.000.
- Fearing, Craig F.: See—
Orsburn, Michael L.; Hensky, Robert L.; Tucker, Terry L.; Schwarz, Robert E.; and Fearing, Craig F., 4,876,589, Cl. 358-22.000.
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- Fehsenfeld, Fred M., Sr.: See—
Silva, Donald M.; Silva, Leroy F.; and Fehsenfeld, Fred M., Sr., 4,876,638, Cl. 363-97.000.
- Fei, Peter Tsung-Hou: See—
Fang, Jimmy, 4,876,723, Cl. 381-182.000.
- Feigenbaum, Jeffery J.: See—
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- Feinstein, Joseph, to Varian Associates, Inc. Short-period electron beam wiggler, 4,876,687, Cl. 372-2.000.
- Feldman, Fred; Klekamp, Mark S.; Hinda, Michael E.; Shaw, Arthur B.; and Chandra, Sudhish, to Armour Pharmaceutical Company. Stabilization of biological and pharmaceutical products during thermal inactivation of viral and bacterial contaminants, 4,876,241, Cl. 514-2.000.
- Felice, Ralph A.: See—
Gardner, Bronson; Keener, Melvin E.; DeSutter, Steven C.; Jagatich, Carl T.; and Felice, Ralph A., 4,876,647, Cl. 364-420.000.
- Ferco International: See—
Kautt, Jean-Jacques, 4,875,727, Cl. 292-337.000.
- Fero, Arnold H.; Potocnik, Lawrence M.; Riling, Ronald W.; and Semethy, Kenneth F., to Westinghouse Electric Corp. Nuclear power generating station equipment qualification method and apparatus, 4,876,058, Cl. 376-247.000.
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- Ferren, Robert C. Lamp device, 4,875,852, Cl. 431-324.000.
- Ferrero, Jean-Pierre: See—
Bernard, Patrice; Sauvage, Laurent; Girard, Henri; and Ferrero, Jean-Pierre, 4,876,057, Cl. 376-216.000.
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- Fetzer, Gunter, to Erwin Sick GmbH Optik-Elektronik. Light curtain apparatus, 4,875,761, Cl. 350-171.000.
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Barbero, Mario, 4,875,307, Cl. 49-374.000.
- Giacosa, Dante, 4,875,893, Cl. 474-28.000.
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Welch, Glenn S.; Fidrych, Stephen; Romm, Michael; and Maurer, Bernie J., 4,875,880, Cl. 439-536.000.
- Field, Bruce F., to Tennant Company. Protection from extraneous light for light guided vehicle, 4,876,444, Cl. 250-214.0AL.
- Filbert, Norman V. Method of making a mortar binder and product, 4,875,938, Cl. 106-120.000.
- Filtration Water Filters For Agriculture and Industry, Ltd.: See—
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- Finch, Jack A., to ACCRA Manufacturing Co. Windage locking apparatus for an archery bow sight, 4,875,290, Cl. 33-265.000.
- Finney, James E.; and Brubaker, Weldon L., to Molex Incorporated. Carrier assembly and method of manufacturing same, 4,875,582, Cl. 206-330.000.
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- Fischer, Glenn N. Guided-bend test apparatus, 4,875,376, Cl. 73-852.000.

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Caveny, Jack E.; Bulanda, John J.; Fischer, Richard L.; Stroede, Andrew J.; and Wiencok, Donald C., 4,875,881, Cl. 439-535.000.
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Nehl, Wolfgang, 4,875,578, Cl. 206-309.000.
- Fisher, Abraham; and Karton, Ishai, to State of Israel, Israel Institute of Biological Research. Oxathiolanes, 4,876,260, Cl. 514-278.000.
- Fisher, John L.: See—
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- Fisher/Sauls Electronics, Inc.: See—
Sauls, Charles L., 4,876,532, Cl. 340-689.000.
- Fitton, Stephen, to Neo Electronics Limited. Coin validation device, 4,875,567, Cl. 194-318.000.
- Fitzner, Arthur O., to Brunswick Corporation. Apparatus and method for protecting engine electronics from radio frequency interference, 4,875,457, Cl. 123-633.000.
- Fjare, Douglas E.: See—
Chiang, Weikong L.; Fjare, Douglas E.; and Nowicki, Neal R., 4,876,329, Cl. 528-353.000.
- Flaakt AB: See—
Ziemer, Wolf, 4,875,360, Cl. 73-40.700.
- Flachenecker, Gerhard: See—
Lindenmeier, Karl-Heinz G.; and Flachenecker, Gerhard, 4,876,743, Cl. 455-133.000.
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- Fleckenstein, Phillip P., to Silomaster, Inc. Drop-weight material level indicator, 4,875,295, Cl. 33-720.000.
- Flesher, Peter: See—
Benn, Gerald; Farrar, David; and Flesher, Peter, 4,876,047, Cl. 562-41.000.
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Berthon, Patrick; and Guion, Christian, 4,876,540, Cl. 340-932.200.
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Bittorf, Bradley J.; Flood, Mark A.; Kalan, Michael D.; and Sepsi, Robert R., 4,876,664, Cl. 364-900.000.
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Haque, Sazzadul; Floyd, Thomas O.; Savas, Nick; and Kelm, Walter H., 4,875,812, Cl. 407-104.000.
- Flux Gerate GmbH: See—
Gschwendner, Alois; Kruger, Horst; and Schleifer, Bernhard, 4,875,827, Cl. 415-111.000.
- Flynn, John P. P., to Powerchute Systems International Inc. Light aircraft with parachute wing, 4,875,642, Cl. 244-13.000.
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Peake, Clinton J., 4,876,285, Cl. 514-746.000.
- Foley, Daniel M.; Snyder, Michael D.; and Long, John D., to Deere & Company. Dual implement hitch assembly, 4,875,527, Cl. 172-248.000.
- Ford New Holland, Inc.: See—
Margerum, Edwin O.; and Strong, Russell W., 4,875,890, Cl. 460-68.000.
- Forester, Guy, to Clecim. Closure device with cleaning of a pouring hole, 4,875,663, Cl. 266-272.000.
- Forester, Serge: See—
Lang, Gerard; Maignan, Jean; Forester, Serge; Restle, Serge; Lagrange, Alain; and Shroot, Abraham, 4,876,381, Cl. 560-56.000.
- Forrest, Stephen R., to U.S.C. Method of making avalanche photodiode, 4,876,209, Cl. 437-5.000.
- Fortenberry, William R.: See—
Martin, Richard W.; Fisher, John L.; Fortenberry, William R.; Schlake, Randall L.; Dornbrock, Ronald F.; Richerson, James D.; and Marrett, Kenneth E., Sr., 4,875,277, Cl. 29-606.000.
- Fortin, Rejean: See—
Guindon, Yvan; Girard, Yves; Lau, Cheuk K.; Fortin, Rejean; Rokach, Joshua; and Yoakim, Christiane, 4,876,246, Cl. 514-80.000.
- Fory, Werner: See—
Schurter, Rolf; Meyer, Willy; and Fory, Werner, 4,875,923, Cl. 71-92.000.
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Viles, Robert F., 4,875,937, Cl. 106-104.000.
- Foster, Larry L. Method of cutting metal stud and bending and securing same to form angel member, 4,875,274, Cl. 29-525.100.
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Grollier, Jean F.; and Fourcadier, Chantal, 4,876,085, Cl. 424-47.000.
- Fournier, Bernard, to La Telemecanique Electrique. Device for rendering contactors electrically and mechanically inoperative, 4,876,418, Cl. 200-50.00C.
- Fox, Carol A.: See—
Gruber, Robert J.; Yourd, Raymond A., III; Malhotra, Shadi L.; Nelson, Robert A.; Fox, Carol A.; and Hoffend, Thomas R., 4,876,169, Cl. 430-110.000.
- Fox, Clarence D., to Borg-Warner Corporation. Proportional solenoid valve, 4,875,499, Cl. 137-82.000.
- Fox, Daniel W.: See—
Blackmon, Kenneth P.; Clagett, Donald C.; Fox, Daniel W.; Mare-sca, Louis M.; and Shafer, Sheldon J., 4,876,317, Cl. 525-433.000.
- Fox, John L.: See—
Chen, Chin H.; Fox, John L.; Specht, Donald P.; and Farid, Samir Y., 4,876,175, Cl. 430-281.000.
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Norton, Edward J.; Fram, Craig F.; Graham, Kenneth W.; and Smith, James A., 4,876,053, Cl. 264-255.000.
- Frankowiak, Gerhard; Kayser, Michael; Schramm, Matthias; Thomas, Gunther; Gross, Rainer; Perzbom, Elisabeth; and Seuter, Friedel, to Bayer Aktiengesellschaft. Circulation-active substituted 5-nitro-1,4-dihydropyridines, 4,876,254, Cl. 514-252.000.
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- Franco, Maurice, to Lockheed Corporation. M.T.I. radar system, 4,876,547, Cl. 342-160.000.
- Frank, Jeffrey B.: See—
Panique, Kenneth L.; and Frank, Jeffrey B., 4,875,291, Cl. 33-293.000.
- Frantz, Leo R.; Bauer, Alfred; Koran, Matthew H.; and Becker, Jack, to Acron Manufacturing Company. Multiple position rotary switch, 4,876,416, Cl. 200-11.00R.
- Frazier, Marvin E.; Mallavia, Louis P.; Baca, Oswald G.; and Samuel, James E., to Battelle Development Corporation. Detection and differentiation of coxiella burnetii in biological fluids, 4,876,186, Cl. 435-6.000.
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Hakamori, Sen-Itiroh, 4,876,199, Cl. 530-387.000.
- Freiberg, Helge: See—
van Wersch, Kurt; Freiberg, Helge; and Mevissen, Peter, 4,875,942, Cl. 134-15.000.
- Freitag, Dieter: See—
Dziurla, Heinz-Jurgen; Freitag, Dieter; Waldenrath, Werner; Burkhardt, Claus; and Schulte, Bernhard, 4,876,033, Cl. 252-511.000.
- Freitag, Helmut: See—
Denke, Ulfert; Nagel, Rolf; Rothe, Anselm; and Freitag, Helmut, 4,876,067, Cl. 422-56.000.
- Fremont, Joseph M., to Du Pont de Nemours, E. I., and Company. Process for preparing crystalline malachite, 4,876,231, Cl. 502-174.000.
- Fridman, Vladimir M.: See—
Khutoretzky, Garri M.; Tjurin, Jury G.; Varshavsky, Vladimir D.; Zagorodnaya, Galina A.; and Fridman, Vladimir M., 4,876,469, Cl. 310-52.000.
- Friedrich, Steven G.: See—
Lulham, Cedric M.; Wofford, George D.; Bradfute, John G.; and Friedrich, Steven G., 4,875,587, Cl. 206-484.000.
- Friesen, Dwayne T.: See—
Babcock, Walter C.; and Friesen, Dwayne T., 4,876,287, Cl. 521-28.000.
- Frink, Tommy S.; Reed, Lowell M.; Cochran, Dwayne V.; and McNair, Will L., to Parker Technology, Inc. Automatic drilling system, 4,875,530, Cl. 175-27.000.
- Fritsche-Mollmann GmbH & Co.: See—
Onnenberg, Volker; and Mollmann, Gunter, 4,875,843, Cl. 425-4.00R.
- Fry, Arthur C.: See—
Browning, Nigel; Fry, Arthur C.; Malpass, Robert L. H.; Matthews, Brian; and Peters, Michaels S., 4,875,646, Cl. 244-190.000.
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Tamagawa, Shigehisa; Kuroishi, Masayuki; and Fuchizawa, Tetsuro, 4,876,170, Cl. 430-138.000.
- Fuentes, Ricardo I. Silicon carbide sintering, 4,876,226, Cl. 501-89.000.
- Fuhrer, Wolfgang; Kuhle, Engelbert; Adler, Alfons; and Hanssler, Gerd, to Bayer Aktiengesellschaft. Trisubstituted 1,3,5-triazine-2,4,6-triones, 4,876,253, Cl. 514-241.000.
- Fuji Electric Co., Ltd.: See—
Miyagawa, Michiaki; Ishizaka, Yutaka; and Shimomura, Shoji, 4,876,732, Cl. 382-41.000.
- Fuji Electric Corporate Research and Development, Ltd.: See—
Yoshida, Takashi, 4,875,944, Cl. 136-249.000.
- Fuji Jukogyo Kabushiki Kaisha: See—
Abe, Kunihoro, 4,875,453, Cl. 123-440.000.
- Oshita, Saichiro; Mouri, Toyohiko; and Takahashi, Tsutomu, 4,875,540, Cl. 180-79.100.
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- Uchiyama, Shintaro, 4,875,698, Cl. 180-233.000.
- Fuji Photo Film Co.: See—
Muramatsu, Akira, 4,876,591, Cl. 358-43.000.
- Fuji Photo Film Co., Ltd.: See—
Abe, Akira; Nakajima, Junya; Takase, Haruo; Uenaka, Kazushige; and Otomo, Ruyzi, 4,876,180, Cl. 430-393.000.
- Akao, Mutsuo; Osanai, Hiroyuki; and Inoue, Koji, 4,876,125, Cl. 428-35.200.
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Horikawa, Kazuo, 4,876,452, Cl. 250-327.200.
 Ishikawa, Takatoshi; and Yagihara, Morio, 4,876,174, Cl. 410-180.000.
 Kawamura, Kazushige, 4,876,734, Cl. 382-54.000.
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 Yamaguchi, Kiyoshi; Endo, Azuchi; and Sakamoto, Kiichiro, 4,876,567, Cl. 355-20.000.
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 Fuji Xerox Co., Ltd.: See—
 Ozawa, Takashi, 4,876,585, Cl. 357-24.000.
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 Suzuki, Nobuhiko; and Aoki, Tetuya, 4,875,832, Cl. 417-222.000.
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 Fujitsu Limited: See—
 Eshita, Takashi; Mieno, Fumitake; Furumura, Yuji; and Watanabe, Takuya, 4,876,219, Cl. 437-126.000.
 Koshizuka, Atuo, 4,876,467, Cl. 307-570.000.
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 Suzuki, Eiichi, 4,876,683, Cl. 370-97.000.
 Fujiwara, Akihiro: See—
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 Fujiwara, Masanori: See—
 Hotomi, Hideo; Osawa, Izumi; Iino, Syuji; Doi, Isao; and Fujiwara, Masanori, 4,876,168, Cl. 430-58.000.
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 Fukami, Takeshi: See—
 Makagami, Taro; Fukami, Takeshi; and Terauchi, Toshiro, 4,876,719, Cl. 381-1.000.
 Fukuda, Naoya: See—
 Takeya, Fuminori; Fukuda, Naoya; and Suzuki, Miki, 4,875,970, Cl. 156-645.000.
 Fukuda, Seiji: See—
 Sasaki, Katsuhiko; and Fukuda, Seiji, 4,876,686, Cl. 371-49.100.
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 Fukunaga, Osamu: See—
 Mishima, Osamu; Yamaoka, Shinobu; Fukunaga, Osamu; Tanaka, Junzo; and Era, Koh, 4,875,967, Cl. 156-605.000.
 Fukushima, Masaya, to NEC Corporation. Laser control circuit. 4,876,442, Cl. 250-205.000.
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 Itoh, Kunio; Fukushima, Motoo; and Nakamura, Tsutomu, 4,876,344, Cl. 544-219.000.
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 Hughes, Leonard; Fuller, James G.; and Earl, Gary W., 4,876,355, Cl. 548-352.000.
 Fulmer, Thomas L. Scented furnace filter. 4,875,912, Cl. 55-279.000.
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 Funato, Hiroyoshi: See—
 Misawa, Shigeyoshi; and Funato, Hiroyoshi, 4,876,680, Cl. 369-110.000.
 Fuqua, Wayne C.: See—
 Broussard, Jerry A.; Fuqua, Wayne C.; and George, James H., 4,876,368, Cl. 549-374.000.
 Furcht, Leo T.: See—
 Tsalibary, Effie C.; and Furcht, Leo T., 4,876,332, Cl. 530-326.000.
 Furtek, Allan B., to Mobil Oil Corporation. Catalyst composition for polymerizing olefins of narrow molecular weight distribution and polymerization therewith. 4,876,229, Cl. 502-107.000.
 Furukawa Aluminum Co., Ltd.: See—
 Ishii, Yoh; Abe, Masami; Harada, Yuhzoh; Takasugi, Atsumi; and Kato, Kazumi, 4,875,519, Cl. 164-465.000.
 Furukawa Electric Co., Ltd.: See—
 Noda, Hajime; Sato, Kuniyoshi; and Sotani, Junji, 4,875,522, Cl. 165-104.140.
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 Furumura, Yuji: See—
 Eshita, Takashi; Mieno, Fumitake; Furumura, Yuji; and Watanabe, Takuya, 4,876,219, Cl. 437-126.000.
 Furuya, Hirohide: See—
 Iwasa, Hiroki; Watanabe, Toyofumi; and Furuya, Hirohide, 4,875,984, Cl. 204-56.100.
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 Futamura, Shoji: See—
 Inoue, Satoru; and Futamura, Shoji, 4,875,264, Cl. 29-163.600.
 Futonair Quebec, Inc.: See—
 Tremblay, Gilles, 4,875,244, Cl. 5-37.00R.
 Futsuki, Atsunori: See—
 Anzai, Hiroshi; and Futsuki, Atsunori, 4,875,484, Cl. 128-421.000.
 G. D. Searle & Co.: See—
 Koszyk, Francis J.; Paris, Richard A.; and Mueller, Richard A., 4,876,268, Cl. 514-425.000.
 G.D. Societa per Azioni: See—
 Gamberini, Antonio; and Brizzi, Marco, 4,875,325, Cl. 53-137.000.
 Mattei, Riccardo; and Ghini, Franco, 4,875,493, Cl. 131-84.100.
 G & H Montage: See—
 Schwartz, Karl-Gunter, 4,875,312, Cl. 52-144.000.
 Gacsay, Loran; and Meierhofer, Beat, to Sulzer Brothers Limited. Yarn brake for a weft yarn. 4,875,506, Cl. 139-450.000.
 Gagnon, Pierre; and Laforest, Pierre. Push actuator. 4,875,660, Cl. 254-1.000.
 Gairns, Raymond S.: See—
 Elliott, Raymond; Griffin, David A.; and Gairns, Raymond S., 4,875,922, Cl. 71-76.000.
 Gala, Dinesh: See—
 Hou, Donald; Wong, Yee-Shing; Gala, Dinesh; and Steinman, Martin, 4,876,338, Cl. 540-357.000.
 Galiotti, George: See—
 Rao, Ram A.; Kofod, Mogens; Puchhammer, Julius; and Galiotti, George, 4,875,754, Cl. 350-96.200.
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 Oury, Robert F.; and Gallione, Joseph, 4,875,569, Cl. 198-36.00D.
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 Gant, Preston L.: See—
 Casad, Burton M.; and Gant, Preston L., 4,876,449, Cl. 250-259.000.
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 Barbier, Alain; Brelie, Jean-Claude; and Garcia, Georges, 4,876,247, Cl. 514-89.000.
 Brelie, Jean C.; Emonds-Alt, Xavier; and Garcia, Georges, 4,876,248, Cl. 514-108.000.
 Garcia, Mario C., to Prevent Products, Inc. Ankle support bandage for prevention of ankle injury. 4,875,476, Cl. 128-157.000.
 Gardin, Gilles D.: See—
 Movillat, Pierre A.; Piegay, Yves; and Gardin, Gilles D., 4,875,679, Cl. 273-73.00R.
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 Gardner, David L.: See—
 Benton, Ben F.; and Gardner, David L., 4,876,094, Cl. 424-491.000.

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 Garnatz, Anthony H.; and Ronne, William M., to Garon Corp. Disposable oil absorbent drip pad assembly for a vehicle. 4,875,537, Cl. 180-69.100.
 Garon Corp.: See—
 Garnatz, Anthony H.; and Ronne, William M., 4,875,537, Cl. 180-69.100.
 Garria, Charles A., to Memrysafe, Inc. Valve control. 4,875,623, Cl. 236-12.120.
 Garwood, William E.: See—
 Chang, Clarence D.; Chu, Cynthia T-W; Chu, Pochen; Dessau, Ralph M.; Garwood, William E.; Kuehl, Guenter H.; Male, Joseph N.; and Shihabi, David S., 4,876,228, Cl. 502-71.000.
 Gas Research Institute: See—
 DeSaro, Robert; Doyle, Edward F.; Metcalfe, Christopher I.; and Patch, Keith D., 4,875,919, Cl. 65-27.000.
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 Gathanga, Thomas. Apparatus for feeding bar stock to a machining operation. 4,875,396, Cl. 82-124.000.
 Gaughan, Edward W.: See—
 Hart, Michael E.; and Gaughan, Edward W., 4,875,739, Cl. 303-33.000.
 Gay, Michael J., to Motorola Inc. Sampled data circuit. 4,876,464, Cl. 307-353.000.
 Gaz de France: See—
 Cagnon, Francois; Di Paola, Denis; Austruy, Georges; and Vinchon, Andre, 4,875,850, Cl. 431-8.000.
 Geary, Philip J.: See—
 Schofield, John A.; Betteridge, Peter R.; Ryback, George; and Geary, Philip J., 4,876,200, Cl. 435-253.300.
 Gedecke, Jerel C.: See—
 Brint, Gary T.; Bungardt, Gabriele; Gedecke, Jerel C.; Harris, Robert L.; and Kraz, Vladimir, 4,876,712, Cl. 379-387.000.
 Gelardi, Anthony; Lowry, Alan; and Lovecky, Craig, to Shape Inc. Recording media storage apparatus. 4,875,743, Cl. 312-13.000.
 Geller, Marius, to BBC Brown Boveri AG. Gas-cooled electric machine. 4,876,470, Cl. 310-59.000.
 Gellert, Jobst U. Injection molding heated gate insert and method. 4,875,848, Cl. 425-549.000.
 GenCorp Inc.: See—
 Melby, Earl G.; and Cocain, H. William, 4,876,308, Cl. 524-780.000.
 General Dynamics Corp., Pomona Div.: See—
 Perko, Louis S., 4,875,966, Cl. 156-580.000.
 General Electric CGR S.A.: See—
 Delair, Jacques; and Peyret, Olivier, 4,876,705, Cl. 378-144.000.
 General Electric Company: See—
 Bedard, Donna L.; and Brennan, Michael J., Jr., 4,876,201, Cl. 435-262.000.
 Belke, Robert E.; Zakraysek, Louis; and Pillar, Walter O., 4,876,120, Cl. 428-1.000.
 Bender, Stanley I.; Butler, Lawrence; and Dawes, Peter W., 4,875,655, Cl. 248-557.000.
 Blackmon, Kenneth P.; Clagett, Donald C.; Fox, Daniel W.; Maresca, Louis M.; and Shafer, Sheldon J., 4,876,317, Cl. 525-433.000.
 Dougherty, John J., 4,876,622, Cl. 361-94.000.
 Herschitz, Roman; Bogorad, Alexander; and Harhigh, Robert N., 4,876,430, Cl. 219-110.000.
 Johansson, Eric B., 4,876,063, Cl. 376-444.000.
 Kissinger, Gaylord M., 4,876,391, Cl. 568-724.000.
 Kissinger, Gaylord M., 4,876,395, Cl. 568-728.000.
 Lester, Gene D.; Morgan, Richard A.; Harms, Harold B.; Barrett, John P.; Chang, Tsung K.; Cushing, Donald S.; Broo, Richard F.; and Hood, William M., 4,876,492, Cl. 318-254.000.
 Miller, Richard; and Zlupko, John E., 4,876,421, Cl. 200-144.00C.
 Nelson, Linda H.; Avakian, Roger W.; and Factor, Arnold, 4,876,309, Cl. 524-109.000.
 Park, John N.; Steigerwald, Robert L.; and Schutten, Michael J., 4,876,635, Cl. 363-17.000.
 Rasmussen, Neil S.; Szema, Li-Chieh; and Abuaf, Nesim, 4,875,339, Cl. 60-757.000.
 Taylor, Dale F., 4,876,064, Cl. 420-422.000.
 Vermilyea, Mark E., 4,876,413, Cl. 174-15.400.
 General Electric Company, p.l.c.: See—
 Dekker, Nicolaas M. J.; Edwards, John W.; and James, Adrian W., 4,876,722, Cl. 381-71.000.
 General Foods Corporation: See—
 McGuire, Michael; DiGiacomo, Ralph; Palmer, Marcia; and Liggett, Louis, 4,876,104, Cl. 426-57.000.
 General Motors Corporation: See—
 Compeau, David E.; Manuel, Mark; and Rogers, Lloyd W., Jr., 4,875,723, Cl. 292-201.000.
 General Signal Corporation: See—
 Jacobs, Paul H.; and Collette, Douglas P., 4,876,741, Cl. 455-47.000.
 Gentile, Geoffrey E., to Boeing Company, The. Raster rotation circuit. 4,876,488, Cl. 315-378.000.
 Gentile, John R., to Laser Precision Corporation. Remotely controlled optical time domain reflectometer serving a plurality of fiber optic cables. 4,875,772, Cl. 356-73.100.
 Gentry, Dennis L.: See—
 Head, James D.; Burns, Edward F.; Schleizer, William A.; White, C. Douglas; and Gentry, Dennis L., 4,875,662, Cl. 266-44.000.
 Georg Fischer AG: See—
 Hanselka, Reinhard, 4,876,041, Cl. 264-25.000.
 George, James H.: See—
 Broussard, Jerry A.; Fuqua, Wayne C.; and George, James H., 4,876,368, Cl. 549-374.000.
 Gerhards, Hermann J.: See—
 Siegel, Herbert; Kampe, Klaus-Dieter; Alpermann, Hans G.; Gerhards, Hermann J.; Usinger, Patricia; Schacht, Ulrich; Leven, Margret; Raether, Wolfgang; Dittmar, Walter; and Sachse, Burkhard, 4,876,354, Cl. 548-341.000.
 Germundson, Elon: See—
 Lindberg, Kaj; Steen, Gerry; and Germundson, Elon, 4,875,806, Cl. 405-224.000.
 Gerrard, Donald L.: See—
 Bowley, Heather J.; and Gerrard, Donald L., 4,875,771, Cl. 356-30.000.
 Gervasutti, Claudio, to Ausimont S.p.A. Process for preparing fluoroethylenes and chlorofluoro-ethylenes from chlorofluoroethanes. 4,876,405, Cl. 570-156.000.
 Ghahremani-Ghadjar, Fathali: See—
 Hariri, Robert J.; Ghajar, Jamshid B. G.; and Ghahremani-Ghadjar, Fathali, 4,875,482, Cl. 128-352.000.
 Ghajar, Jamshid B. G.: See—
 Hariri, Robert J.; Ghajar, Jamshid B. G.; and Ghahremani-Ghadjar, Fathali, 4,875,482, Cl. 128-352.000.
 Ghini, Franco: See—
 Mattei, Riccardo; and Ghini, Franco, 4,875,493, Cl. 131-84.100.
 Giacosa, Dante, to Fiat Auto S.p.A. Continuous speed variator with expanding pulleys. 4,875,893, Cl. 474-28.000.
 Giallorenzi, Thomas G., to United States of America, Navy. Optical paramagnetic/diamagnetic gas sensor. 4,875,357, Cl. 73-27.00A.
 Gibson, D. Glenn: See—
 Andrews, T. Arthur; and Gibson, D. Glenn, 4,875,498, Cl. 137-78.300.
 Gibson, Glenn A. Rules and apparatus for a loop capturing code buffer that prefetches instructions. 4,876,642, Cl. 364-200.000.
 Gibson, Paul N., to McFarlane, Ronald L. Control system for earth boring tool. 4,875,292, Cl. 33-304.000.
 Gietzen, Staas; Weiner, Hans; Hain, Klaus; Hofbauer, August; and Hawener, Juergen, to Dr. Ing. h.c.F. Porsche AG. Starter arrangement for a helicopter. 4,875,643, Cl. 244-53.00A.
 Gijsman, Pieter: See—
 Peerkamp, Erik R.; and Gijsman, Pieter, 4,876,301, Cl. 524-255.000.
 Gilbert, Dennis H., to Boeing Company, The. Echo cancellation system. 4,875,372, Cl. 73-614.000.
 Gilberts, Alexander G.: See—
 Rust, Wayne; and Gilberts, Alexander G., 4,876,621, Cl. 361-58.000.
 Gillette Company, The: See—
 Trotta, Robert A.; and Cerier, Jeffrey C., 4,875,288, Cl. 30-49.000.
 Gilman, Byron L.: See—
 Mayer, David W.; Gilman, Byron L.; Walgren, Susan M.; and Berglund, June M., 4,876,109, Cl. 427-2.000.
 Gingello, Anthony D.: See—
 Proehl, Gary S.; Gingello, Anthony D.; Collett, David J.; Parton, Richard L.; Stegman, David A.; and Adin, Anthony, 4,876,181, Cl. 430-522.000.
 Girard, Henri: See—
 Bernard, Patrice; Sauvage, Laurent; Girard, Henri; and Ferrero, Jean-Pierre, 4,876,057, Cl. 376-216.000.
 Girard, Mario D. Device for locking double sliding doors. 4,875,349, Cl. 70-95.000.
 Girard, Yves: See—
 Guindon, Yvan; Girard, Yves; Lau, Cheuk K.; Fortin, Rejean; Rokach, Joshua; and Yoakim, Christiane, 4,876,246, Cl. 514-80.000.
 Giroux, Richard L.: See—
 Bradley, Billie J.; Giroux, Richard L.; and Joyce, Allen T., 4,875,524, Cl. 166-241.000.
 Glanzner, Gary C.: See—
 Wright, Norman D.; Glanzner, Gary C.; and Signorelli, John A., 4,875,412, Cl. 101-425.000.
 Glaser, Fritz: See—
 Hagerer, Paul; Glaser, Fritz; Klimmer, Josef W.; and Kunze, Reinhard, 4,875,889, Cl. 460-1.000.
 Glaxo Group Limited: See—
 Butina, Darko; Dowle, Michael D.; Bays, David E.; and Webb, Colin F., 4,876,267, Cl. 514-415.000.
 Robinson, Colin; Eastlick, David T.; and Bownass, Audrey J., 4,876,351, Cl. 548-204.000.
 Globe-Union Inc.: See—
 Brilmyer, George H.; and Tiedemann, William H., 4,876,513, Cl. 324-427.000.
 Glushkov, Robert G.: See—
 Granik, Vladimir G.; Stezhko, Tatyana V.; Glushkov, Robert G.; Mashkovsky, Mikhail D.; Roschina, Lidia F.; Polzhaeva, Antonina I.; Parimbetova, Roza B.; Bobkov, Jury G.; Losev, Alexander S.; and Ivanova, Irina A., 4,876,360, Cl. 548-550.000.
 Glynn, William: See—
 Denny, David S.; Metzger, Edward C. R.; Rexroad, John; and Glynn, William, 4,875,549, Cl. 182-138.000.

Glyzinc Pharmaceuticals Limited: See—
Taylor, Reginald M.; and Brock, Alan J., 4,876,278, Cl. 514-494.000.

Godbersen, Byron L. Boat trailer hull and keel supporting assembly. 4,875,701, Cl. 280-414.100.

Godfrey, Christopher R. A.: See—
Anthony, Vivienne M.; Clough, John M.; DeFraine, Paul; and Godfrey, Christopher R. A., 4,876,264, Cl. 514-345.000.

Goedecke, Hans J. Gas- and liquid-tight fastener. 4,875,258, Cl. 24-389.000.

Goffinet, Pierre: See—
D'Hooghe, Martial; Perrette, Claude; and Goffinet, Pierre, 4,875,600, Cl. 222-52.000.

Goldner, Ronald B.; Haas, Terry; Wong, Kwok-Keung; and Seward, George, to Tufts University. Thin film ion conducting coating. 4,876,628, Cl. 361-313.000.

Gongora, Henri; and Darche, Yves, to Societe Nationale Elf Aquitaine (Production). Process for the production of organic polysulphides and catalyst system for its use. 4,876,389, Cl. 568-26.000.

Goodell, Jeffrey W. Curtain supporting bracket. 4,875,650, Cl. 248-261.000.

Goodwin, Paul, to Perma Tubes Ltd. Concrete forming method. 4,876,054, Cl. 264-333.000.

Goodyear Tire & Rubber Company, The: See—
Rinehart, Verne R., 4,876,326, Cl. 528-272.000.

Gordon, Lucas S.: See—
Bringham, Richard L.; Gordon, Lucas S.; and Mosch, Karl E., 4,876,066, Cl. 422-46.000.

Gorge Technology, Inc.: See—
Baldwin, Donald C., 4,875,424, Cl. 114-39.200.

Goris, Gregory A.: See—
Wetch, Stephen B.; Goris, Gregory A.; and Krasnov, Igor, 4,875,529, Cl. 173-163.000.

Gosc, Paul M.: See—
Citta, Richard W.; Gosc, Paul M.; Mutzabaugh, Dennis M.; and Sgrignoli, Gary J., 4,876,718, Cl. 380-42.000.

Goshima, Takahiro: See—
Ozawa, Takashi; Tanaka, Hitoshi; Goshima, Takahiro; and Takagi, Kozi, 4,875,741, Cl. 303-116.000.

Gosselink, Eugene P.: See—
Claus, Allen D.; and Gosselink, Eugene P., 4,876,046, Cl. 8-111.000.

Gotaverken Arendal AB: See—
Lindberg, Kai; Steen, Gerry; and Germundson, Elon, 4,875,806, Cl. 405-224.000.

Gotou, Shizuo; Kagimasa, Toyohiko; and Yoshizumi, Seiichi, to Hitachi, Ltd. Data processor having multilevel address translation tables. 4,876,646, Cl. 364-200.000.

Gottlieb, A. Arthur, to Imreg, Inc. (Delaware corporation). Determination of suppressor functional reserve. 4,876,193, Cl. 435-29.000.

Governor of Gunma-ken: See—
Kawano, Ikuo; Takiguchi, Tsuyoshi; Kimura, Norihisa; Yanagisawa, Yohei; Ashimi, Tokuji; and Yoshino, Hiroyuki, 4,876,103, Cl. 426-574.000.

Grabenstein, James B.: See—
Woodworth, Donald J.; Ziegler, Frank A.; and Grabenstein, James B., 4,876,737, Cl. 455-12.000.

Graber, John W., to Graber Products, Inc. Vehicle mounted foldable bicycle carrier. 4,875,608, Cl. 224-42.03B.

Graber Products, Inc.: See—
Graber, John W., 4,875,608, Cl. 224-42.03B.

Gradich, Francis X.: See—
Brown, Stephen D.; Junker, Warren R.; and Gradich, Francis X., 4,876,506, Cl. 324-220.000.

Graham, Kenneth W.: See—
Norton, Edward J.; Fram, Craig F.; Graham, Kenneth W.; and Smith, James A., 4,876,053, Cl. 264-255.000.

Graham, Robert G.: See—
Underwood, Gary; and Graham, Robert G., 4,876,108, Cl. 426-650.000.

Granik, Vladimir G.; Stezhko, Tatyana V.; Glushkov, Robert G.; Mashkovsky, Mikhail D.; Roschina, Lidia F.; Polezhaeva, Antonina I.; Parimbetova, Roza B.; Bobkov, Yuri G.; Losev, Alexandr S.; and Ivanova, Irina A. 1-thiocarbamylmethylpyrrolidine-2-thione, process for preparing. 4,876,360, Cl. 548-550.000.

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Gratke, Norman G., to W. H. Brady Co. Self-referencing capacitive key cell structure and switchcore matrices formed therefrom. 4,876,461, Cl. 307-116.000.

Graves, Alan F.; Littlewood, Paul A.; and Weiss, Johannes S., to Northern Telecom Limited. Switching tdm digital signals. 4,876,682, Cl. 370-66.000.

Green Cross Corporation: See—
Hirao, Yutaka; Takechi, Kazuo; Uriyu, Katuhiro; and Uemura, Yohiro, 4,876,088, Cl. 424-85.800.

Green, Monika J.; and Lias, Roger J., to Medisense, Inc. Electrochemical assay for haemoglobin. 4,876,205, Cl. 436-66.000.

Greig, Walter G.: See—
Ashby, Robert E.; and Greig, Walter G., 4,876,131, Cl. 428-42.000.

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Holter, Heinz; Igelbuscher, Heinrich; Gresch, Heinrich; Dewert, Herbert; and Burggraf, Peter, 4,875,406, Cl. 98-2.010.

Greveling, Johannes, to Northern Telecom Limited. Optical cable. 4,875,757, Cl. 350-96.230.

Grice, Neal J.: See—
Knifton, John F.; and Grice, Neal J., 4,876,397, Cl. 568-798.000.

Griffin, David A.: See—
Elliott, Raymond; Griffin, David A.; and Gairns, Raymond S., 4,875,922, Cl. 71-76.000.

Griffiths, Colin; and Walker, William G., to Ebonwood Limited. Method and apparatus for manufacturing carpet. 4,875,954, Cl. 156-64.000.

Grindahl, Mervin L., to E. F. Johnson Company. Data demodulator. 4,876,700, Cl. 375-87.000.

Grollier, Jean F.; and Cotteret, Jean, to L'Oreal. Alkyl derivatives of hydroquinone as antioxidants in oxidation dyeing compositions. 4,875,902, Cl. 8-406.000.

Grollier, Jean F.; and Dupuis, Christine, to L'Oreal. Composition in the form of an aerosol foam, based on a polymer derived from quaternized cellulose and an anionic polymer. 4,876,083, Cl. 424-47.000.

Grollier, Jean F.; and Fourcadier, Chantal, to L'Oreal. Cosmetic composition containing oxathiazinones. 4,876,085, Cl. 424-47.000.

Gronsfeld, Josef; Jacobi, Hatto; and Baethmann, Hans-Juergen, to Mannesmann AG. Determining impurities in samples. 4,875,371, Cl. 73-598.000.

Groot, William P.: See—
Petersen, Borge; and Groot, William P., 4,875,670, Cl. 271-265.000.

Gross, Anthony E.; and Bonin, Jacqueline L., to Nalco Chemical Company. Anionic acrylamide polymers as copper ore agglomeration aids. 4,875,935, Cl. 75-117.000.

Gross, Douglas P. Miniature golf game apparatus. 4,875,680, Cl. 273-87.00B.

Gross, Rainer: See—
Frankowiak, Gerhard; Kayser, Michael; Schramm, Matthias; Thomas, Gunther; Gross, Rainer; Perzborn, Elisabeth; and Seuter, Friedel, 4,876,254, Cl. 514-252.000.

Gross, Robert. Toxic waste storage facility. 4,875,805, Cl. 405-128.000.

Gross, Sylvia. Emergency warning brake system. 4,876,525, Cl. 340-436.000.

Grosskopf, Rudolf: See—
Ballmer, Horst; and Grosskopf, Rudolf, 4,876,535, Cl. 340-825.340.

Gruber, Bruce A.: See—
Shriver, H. Randall; Dunnavant, William R.; and Gruber, Bruce A., 4,876,294, Cl. 523-139.000.

Gruber, Herbert, to Magna International Inc. Hood latch mechanism. 4,875,724, Cl. 292-216.000.

Gruber, Robert J.; Yourd, Raymond A., III; Malhotra, Shadi L.; Nelson, Robert A.; Fox, Carol A.; and Hoffend, Thomas R., to Xerox Corporation. Toner compositions with release additives therein. 4,876,169, Cl. 430-110.000.

Grumman Aerospace Corporation: See—
Anderson, Robert E., 4,875,795, Cl. 403-279.000.

Grussmark, Stephen M. Orthodontic appliance for closing spaces and correcting malocclusion. 4,875,856, Cl. 433-18.000.

Gschwender, Alois; Kruger, Horst; and Schleifer, Bernhard, to Flux Gerate GmbH. Fluid pump and method for making the same. 4,875,827, Cl. 415-111.000.

GTE Products Corporation: See—
Cox, David A., 4,876,483, Cl. 313-634.000.

Crosby, John J.; and Napiorkowski, John J., 4,876,713, Cl. 379-412.000.

Ide, Mason G.; Lawrence, Noel L. W.; and Prager, Lee, 4,876,436, Cl. 219-370.000.

GTE Sylvania Licht GmbH: See—
Beucher, Josef, 4,876,443, Cl. 250-211.00R.

Guarnori, Manuel, to Roland Racine. Assembly comprising rolling means and slideways, and lighting apparatus comprising such an assembly. 4,875,648, Cl. 248-125.000.

Guigan, Jean. Method of performing medical analysis on a liquid sample using at least one dry reagent, and apparatus for the method. 4,876,203, Cl. 436-45.000.

Guindon, Yvan; Girard, Yves; Lau, Cheuk K.; Fortin, Rejean; Rokach, Joshua; and Yoakim, Christiane, to Merck Frost Canada, Inc. Benz[a]phenothiazines and hydro-derivatives for inhibiting leukotriene biosynthesis. 4,876,246, Cl. 514-80.000.

Guion, Christian: See—
Berthon, Patrick; and Guion, Christian, 4,876,540, Cl. 340-932.200.

Guiver, Harold C.: See—
Wagner, Edward A.; and Guiver, Harold C., 4,876,225, Cl. 437-248.000.

Gunawardena, D. R.: See—
Tullis, Barclay J.; Bailey, John S.; Gunawardena, D. R.; and Kempf, Ulrich, 4,875,825, Cl. 414-786.000.

Gunkinger, Siegfried, to Zinser Textilmaschinen GmbH. Method and apparatus for replacing empty sliver cans with full sliver cans in a draw frame. 4,875,256, Cl. 19-159.00A.

Guntheroth, Kurt, to John Fluke Mfg. Co., Inc. Method of and apparatus for diagnosing failures in read only memory systems and the like. 4,876,684, Cl. 371-21.200.

Gunze Kabushiki Kaisha: See—
Yamamoto, Takeshi; Kondo, Kunio; Yoshimura, Hiroshi; Wada, Yoshihiro; and Wada, Fusazo, 4,876,139, Cl. 428-200.000.

Gupta, Ashis S.: See—
Burke, Robert W., II; Cahen, Albert J., Jr.; Credle, William S., Jr.; Gupta, Ashis S.; and Heenan, Richard H., 4,875,508, Cl. 141-2.000.

Gustafson, Eric K.; Trebino, Rick; and Lee, John, to Yellowstone Diagnostics Corporation. Diffraction immunoassay apparatus and method. 4,876,208, Cl. 436-531.000.

Gustafsson, Bengt O.; and Johansson, Nils B., to SKF Plasma Technologies AB. Method for separating zinc out of a hot gas containing zinc vapour. 4,876,074, Cl. 423-210.500.

Guten, Hans; Ache, Hans-Joachim; Rinke, Monika; and Wirth, Hermann O., to Kernforschungszentrum Karlsruhe Gesellschaft mit Beschränkter Haftung. Substituted and unsubstituted ring-bridged para-oligophenylene UV laser dyes. 4,876,029, Cl. 252-301.170.

Gutberlet, Louis C.: See—
Kukes, Simon G.; Miller, Jeffrey T.; and Gutberlet, Louis C., 4,875,991, Cl. 208-59.000.

Guyomard, Daniel; Torre, Gerald; Lambour, Jean-Michel; and Ariveau, Claude, to B.A.S.F. Peintures & Encres S.A. Method for depositing a primer or sealer of programmed color on an object. 4,876,111, Cl. 427-31.000.

Haas, Franz; and Hock, Lothar, to Siemens Aktiengesellschaft. Apparatus and method for equipping printed circuit boards with components. 4,875,285, Cl. 29-832.000.

Haas, Terry: See—
Goldner, Ronald B.; Haas, Terry; Wong, Kwok-Keung; and Seward, George, 4,876,628, Cl. 361-313.000.

Habitation: See—
Isola, Richard A., 4,875,245, Cl. 5-482.000.

Hackzell, Uli A.: See—
Arvidsson, Folke L. E.; Carlsson, Per A. E.; Hackzell, Uli A.; Hjorth, John S. M.; Johansson, Anette M.; and Lindberg, Per L., 4,876,284, Cl. 514-657.000.

Hadaway, Bernard M.: See—
Wingate-Hill, Robin; and Hadaway, Bernard M., 4,875,511, Cl. 144-208.00R.

Haddad, James H.; Owen, Hartley; and Schatz, Klaus W. Process and apparatus for catalytic cracking of residual oils. 4,875,994, Cl. 208-113.000.

Hadley, Howard C., to Deere & Company. Seeding implement with a combination transport-drive wheel. 4,875,421, Cl. 111-200.000.

Hadley, Stephen W.: See—
Wilbut, Daniel S.; and Hadley, Stephen W., 4,876,081, Cl. 424-1.100.

Hafele, Carl H.; and Weyand, Manfred, to Sempell Aktiengesellschaft; and Hafele, Carl Heinz. Servo-valve. 4,875,659, Cl. 251-282.000.

Hafele, Carl Heinz: See—
Hafele, Carl H.; and Weyand, Manfred, 4,875,659, Cl. 251-282.000.

Hagerer, Paul; Glaser, Fritz; Klimmer, Josef W.; and Kunze, Reinhard, to Deere & Company. Combine crop material flow adjustment system. 4,875,889, Cl. 460-1.000.

Hagin, Faust; Drewitz, Hans; and Krenner, Manfred, to MAN Nutzfahrzeuge GmbH. Brake play resetting device. 4,875,557, Cl. 188-79.550.

Hagiwara, Masayoshi; Suzuki, Michio; Sasaki, Ryoichi; Sugano, Minoru; Horiki, Akira; and Hayashi, Kazuyuki, to Hitachi, Ltd. Packet switching equipment and a packet switching method for controlling packet switched networks. 4,876,681, Cl. 370-60.000.

Hahn, Guenter: See—
Niederhufner, Detlev; Hahn, Guenter; and Baczymski, Andrzej, 4,876,417, Cl. 200-48.00V.

Haight, William J., to Mineral Recovery Corporation. Apparatus and method of classifying particles. 4,875,999, Cl. 209-245.000.

Hain, Klaus: See—
Gietzen, Staas; Weiner, Hans; Hain, Klaus; Hofbauer, August; and Hawener, Juergen, 4,875,643, Cl. 244-53.00A.

Hain, Leonard P. Clamp for holding work pieces in the formation of trusses. 4,875,666, Cl. 269-37.000.

Haining, Alvin S.: See—
Albrecht, Leonard N.; and Burke, Steven R., 4,875,242, Cl. 4-243.000.

Haining, Katherine R.: See—
Albrecht, Leonard N.; and Burke, Steven R., 4,875,242, Cl. 4-243.000.

Hajos, Zoltan G.; Kanojia, Ramesh M.; and Press, Jeffery B., to Ortho Pharmaceutical Corporation. 6-Substituted purinyl piperazine derivatives useful as cardiotonic and antiarrhythmic agents. 4,876,257, Cl. 514-253.000.

Hakamori, Sen-Itiroh, to Fred Hutchinson Cancer Research Center. Hybridomas producing monoclonal antibodies to mono-, di-, and trifucosylated type 2 chain. 4,876,199, Cl. 530-387.000.

Haley, William J.: See—
Schneider, Karl F.; Haley, William J.; and Miller, Alan L., 4,875,561, Cl. 192-0.033.

Hall, Richard A., Sr. Hopper transport for injection molding. 4,876,043, Cl. 264-39.000.

Halliburton Company: See—
Bradley, Billie J.; Giroux, Richard L.; and Joyce, Allen T., 4,875,524, Cl. 166-241.000.

Hamaguchi, Tatsuya: See—
Shimodaira, Hisayo; Ono, Toshio; Miyawaki, Keizo; and Hamaguchi, Tatsuya, 4,875,766, Cl. 350-641.000.

Hamakawa, Yoshihiro; Tawada, Yoshihisa; Tsuge, Kazunori; and Izumina, Masanobu, to Kanagafuchi Kagaku Kogyo Kabushiki Kaisha. Flexible photovoltaic device. 4,875,943, Cl. 136-244.000.

Handy, Esmat Z.: See—
Mohsen, Amr M.; Hamdy, Esmat Z.; and McCollum, John L., 4,876,220, Cl. 437-170.000.

Hamill, Robert L.; and Yao, Raymond C., to Eli Lilly and Company. Antibiotic A80577 and process for its production. 4,876,273, Cl. 514-451.000.

Hamner, Glen P., to Exxon Research and Engineering Company. Process for the production of high density jet fuel from fused multi-ring aromatics and hydroaromatics. 4,875,992, Cl. 208-89.000.

Hamrick, Jerry O. Mechanics creeper apparatus. 4,875,694, Cl. 280-32.600.

Han, Ink S.: See—
Park, Ho J.; Rhim, Moo S.; Kim, Hak M.; Kim, Du H.; Yoo, Seog C.; Kim, Sang H.; Park, Sa Ng B.; Han, Ink S.; Park, Jong T.; and Kim, Si M., 4,876,040, Cl. 264-14.000.

Han, Scott: See—
Bowes, Emmerson; Chang, Clarence D.; Han, Scott; and Shihabi, David S., 4,876,411, Cl. 585-533.000.

Hanazawa, Kazuyoshi: See—
Mizuno, Shinji; Kawato, Humio; Hanazawa, Kazuyoshi; Aoyama, Tatsuki; and Ogasawara, Yoshinari, 4,875,911, Cl. 55-162.000.

Handy Button Machine Company: See—
Anderson, Robert E.; and Baritz, Michael L., 4,875,257, Cl. 24-90.00B.

Hanrahan, Michael J.: See—
Snow, Robert A.; McGuckin, Hugh G.; Ponticello, Ignazio S.; Daly, Robert C.; Pace, Laurel J.; Fischer, Sandra K.; and Hanrahan, Michael J., 4,876,167, Cl. 430-7.000.

Hanselka, Reinhard, to Georg Fischer AG. Method for fusion joining plastic pipe. 4,876,041, Cl. 264-25.000.

Hansen, Arthur J. Thumb controlled fishing line, casting device. 4,875,304, Cl. 43-25.000.

Hanson, Raymond; Tillyard, Malcolm; and Allen, Christopher M., to British United Shoe Machinery Limited. Curing coatings of a moisture-curable composition. 4,876,434, Cl. 219-215.000.

Hanssler, Gerd: See—
Fuhrer, Wolfgang; Kuhle, Engelbert; Adler, Alfons; and Hanssler, Gerd, 4,876,253, Cl. 514-241.000.

Hanthorn, Philip T. Portable conveyor system with telescopic boom assembly and load carrying apparatus. 4,875,547, Cl. 182-102.000.

Haque, Sazzadul; Floyd, Thomas O.; Savas, Nick; and Kelm, Walter H., to Carboly Inc. Cutting tool employing a double pin retention assembly. 4,875,812, Cl. 407-104.000.

Hara, Hitoshi; and Sumen, Hiroyoshi, to Sumitomo Heavy Industries, Ltd. Injection nozzle for an injection molding machine. 4,875,845, Cl. 425-143.000.

Hara, Junichiro; Oghira, Yoshiyuki; and Takahashi, Hideo, to Nissan Motor Company, Limited. Air conditioner system for automotive vehicle. 4,875,624, Cl. 236-49.500.

Hara, Kazuya; Inoue, Takanori; and Bito, Hiroyasu, to Casio Computer Co., Ltd. Card-like electronic apparatus. 4,876,441, Cl. 235-488.000.

Hara, Kazuyoshi; and Oda, Masataka, to Minolta Camera Kabushiki Kaisha. Paper separation charger for use in electrophotographic copier and the like. 4,876,578, Cl. 355-315.000.

Hara, Tadayuki: See—
Morishita, Mitsuharu; Kohge, Shinichi; Hara, Tadayuki; Hata, Yasuaki; and Umemaru, Hisato, 4,875,367, Cl. 73-118.100.

Hara, Toshihiro: See—
Saegusa, Noboru; Hara, Toshihiro; Kawasaki, Ryoji; Tate, Kazuyuki; Huse, Syoji; and Ono, Koji, 4,876,708, Cl. 379-61.000.

Hara, Toshiro; Fujimoto, Takanori; and Musa, Ikuo, to Mitsubishi Denki Kabushiki Kaisha. Fuel control apparatus for an internal combustion engine. 4,875,452, Cl. 123-488.000.

Harada, Tadanori: See—
Hashimoto, Seiji; and Harada, Tadanori, 4,876,601, Cl. 358-213.260.

Harada, Yoshihara: See—
Kato, Eiji; Kadotani, Masanori; Sakaguchi, Yoshikazu; Kubo, Seito; Iwatsuki, Kunihiko; Taniguchi, Hiroji; and Harada, Yoshihara, 4,875,665, Cl. 267-170.000.

Harada, Yuhzoh: See—
Ishii, Yoh; Abe, Masami; Harada, Yuhzoh; Takasugi, Atsumi; and Kato, Kazumi, 4,875,519, Cl. 164-465.000.

Harbor Branch Oceanographic Institution, Inc.: See—
Tusting, Robert F., 4,876,565, Cl. 354-403.000.

Harbor Industries: See—
Martin, Gregory G.; and Nook, Thomas J., 4,875,590, Cl. 211-55.000.

Harding, Kevin G., to Industrial Technology Institute. Off-axis high accuracy structured light profiler. 4,875,777, Cl. 356-376.000.

Hardt, Walter: See—
Moeckl, Ernst; Stumpf, Jorg; Hardt, Walter; and Doinghaus, Hermann, 4,875,418, Cl. 108-50.000.

Hardy, Judy; and Wallington, Kenneth, to Raychem Limited. Article for protecting a substrate. 4,875,870, Cl. 439-204.000.

Harhigh, Robert N.: See—
Herschitz, Roman; Bogorad, Alexander; and Harhigh, Robert N., 4,876,430, Cl. 219-110.000.

Hariri, Robert J.; Ghajar, Jamshid B. G.; and Ghahremani-Ghajar, Fathali, to Neurodynamics, Inc. Flexible grasping device. 4,875,482, Cl. 128-352.000.

Harms, Harold B.: See—
Lester, Gene D.; Morgan, Richard A.; Harms, Harold B.; Barrett, John P.; Chang, Tsung K.; Cushing, Donald S.; Broo, Richard F.; and Hood, William M., 4,876,492, Cl. 318-254.000.

Harris Corporation: See—
Davis, Christopher K.; and Beasom, James D., 4,876,579, Cl. 357-22.000.

Harris, Rano J., Jr., to Romar Technologies, Inc. Boat fenders with internal rope storage capacity. 4,875,427, Cl. 114-219.000.

Harris, Robert L.: See—
Brint, Gary T.; Bungardt, Gabriele; Gedecke, Jerel C.; Harris, Robert L.; and Kraz, Vladimir, 4,876,712, Cl. 379-387.000.

- Harrison, George M. Traffic lane marking device. 4,875,799, Cl. 404-12.000.
- Hart, James E.; and Gaughan, Edward W., to American Standard Inc. Independent continual quick service valve device. 4,875,739, Cl. 303-33.000.
- Hart, Michael G.: See—
Wong, Roger W.; Vifian, Hugo; and Hart, Michael G., 4,875,859, Cl. 434-214.000.
- Hartman, George D.; and Prugh, John D., to Merck & Co., Inc. Substituted thien[3,2-b]thiophene-2-sulfonamides as topically active carbonic anhydrase inhibitors. 4,876,271, Cl. 514-443.000.
- Hartner, Timothy R.: See—
Wenger, LaVon G.; Hauck, Bobbie W.; and Hartner, Timothy R., 4,875,847, Cl. 425-204.000.
- Hartwig, Klaus, to Kaymar-Parkguard Inc. Parking space guard. 4,875,797, Cl. 404-9.000.
- Harvey, Donald M., to Eastman Kodak Company. Film cassette. 4,875,638, Cl. 242-71.100.
- Harvey, Thomas J. Eye construction for toy doll. 4,875,888, Cl. 446-392.000.
- Hasegawa, Hiroshi; Sugimoto, Koichi; Yano, Takeshi; Netsu, Tositada; Tani, Mitsukiyo; and Kojima, Tosaku, to Hitachi, Ltd. Wire stacked bonding method. 4,875,618, Cl. 228-179.000.
- Hasegawa, Hiroshi; Shioiri, Noriaki; Narita, Tadashi; and Katori, Tatsuhiko, to SS Pharmaceutical Co., Ltd. Novel gamma-butyrolactone derivatives. 4,876,359, Cl. 548-533.000.
- Hashimoto Corporation: See—
Hashimoto, Kazuo, 4,876,707, Cl. 379-57.000.
- Hashimoto, Kazuo, to Hashimoto Corporation. Two-directional call forwarding device. 4,876,707, Cl. 379-57.000.
- Hashimoto, Noboru; Hitomi, Mitsuo; Onishi, Koji; Yada, Yoshikuni; Nobumoto, Hidetoshi; and Hotate, Makoto, to Mazda Motor Corporation. Automobile exhaust gas recirculating system. 4,875,455, Cl. 123-568.000.
- Hashimoto, Seiji; and Harada, Tadanori, to Canon Kabushiki Kaisha. Imaging apparatus having zoom capability via readout variation. 4,876,601, Cl. 358-213.260.
- Hashino, Hiroshi: See—
Tomosada, Kenji; Kondo, Toshiro; Yamamoto, Tadanobu; and Hashino, Hiroshi, 4,875,704, Cl. 280-695.000.
- Hass, Hyman, to United States Tennis Association Incorporated; and Allard Avionics Corp. Method and apparatus for systematically testing objects including tennis balls. 4,876,658, Cl. 364-550.000.
- Hassan, Shawky A. Liquid dispensing brush. 4,875,791, Cl. 401-176.000.
- Hata, Yasuaki: See—
Morishita, Mitsuharu; Kohge, Shinichi; Hara, Tadayuki; Hata, Yasuaki; and Umemaru, Hisato, 4,875,367, Cl. 73-118.100.
- Hatada, Kenzo, to Matsushita Electric Industrial Co., Ltd. Bonding method. 4,876,221, Cl. 437-212.000.
- Hattori, Akinobu: See—
Usami, Jun; Hattori, Akinobu; and Sasaki, Yuichi, 4,875,981, Cl. 204-1.00T.
- Hattori, Hitoshi: See—
Sakata, Hirotsugu; Murasaki, Hiroaki; Hayano, Makoto; Hattori, Hitoshi; Morozumi, Naoya; Yoneyama, Kouichi; Suzuki, Isao; Sone, Junji; and Nagatomo, Shigemi, 4,875,839, Cl. 418-55.000.
- Hattori, Junichi: See—
Aoyama, Takeo; Imai, Teruo; Hattori, Junichi; and Uehara, Mikio, 4,876,049, Cl. 264-49.000.
- Hattori, Yumi: See—
Shiokawa, Kozo; Tsuboi, Shinichi; Sasaki, Shoko; Moriya, Koichi; Hattori, Yumi; and Shibuya, Katsuhiko, 4,876,263, Cl. 514-338.000.
- Hauck, Bobbie W.: See—
Wenger, LaVon G.; Hauck, Bobbie W.; and Hartner, Timothy R., 4,875,847, Cl. 425-204.000.
- Hauenstein, Frederick M.: See—
Donahue, Raymond J.; Cleary, Terrance M.; Hauenstein, Frederick M.; and Marcellis, Daniel H., 4,875,517, Cl. 164-34.000.
- Haumschild, Daniel J.: See—
Borgos, John A.; Bradac, Francis; Haumschild, Daniel J.; Johnson, Timothy; and Lee, Rebecca, 4,875,755, Cl. 350-96.200.
- Hausz, Alfred F.: See—
Schlag, Johannes; Koehnlein, Ernst; Bauer, Peter; Koessler, Ludwig; and Hausz, Alfred F., 4,876,147, Cl. 428-379.000.
- Hawener, Juergen: See—
Gietzen, Staas; Weiner, Hans; Hain, Klaus; Hofbauer, August; and Hawener, Juergen, 4,875,643, Cl. 244-53.00A.
- Hawker, Michael J., to Clayton Dewandre Co. Ltd. Solenoid operated hydraulic control valve. 4,875,742, Cl. 303-119.000.
- Hawkins, Junior F. Sanitary hand dryer. 4,876,435, Cl. 219-364.000.
- Hawkins, William G.: See—
O'Neill, James F.; Drake, Donald J.; and Hawkins, William G., 4,875,968, Cl. 156-633.000.
- Hawley, Dan W.: See—
Brewer, Terry L.; Hawley, Dan W.; Lamb, James E.; Latham, William J.; and Stichnote, Lynn K., 4,876,165, Cl. 430-7.000.
- Hay, George H.; and Bleke, Jeffrey P., to Infrared Waste Technology, Inc. Mobile hazardous waste treatment system. 4,875,420, Cl. 110-215.000.
- Hayakawa, Toshimasa: See—
Karube, Yoshiyuki; Hayakawa, Toshimasa; and Yoshida, Yasunari, 4,875,790, Cl. 400-605.000.
- Hayano, Makoto: See—
Sakata, Hirotsugu; Murasaki, Hiroaki; Hayano, Makoto; Hattori, Hitoshi; Morozumi, Naoya; Yoneyama, Kouichi; Suzuki, Isao; Sone, Junji; and Nagatomo, Shigemi, 4,875,839, Cl. 418-55.000.
- Hayashi, Kazuyuki: See—
Hagiwara, Masayoshi; Suzuki, Michio; Sasaki, Ryoichi; Sugano, Minoru; Horiki, Akira; and Hayashi, Kazuyuki, 4,876,681, Cl. 370-60.000.
- Hayashi, Kotaro; Ito, Sumio; and Kobashi, Kiyoshi, to Toyota Jidosha Kabushiki Kaisha. Exhaust gas emission control device for diesel engine. 4,875,336, Cl. 60-286.000.
- Hayashi, Tadamasa: See—
Ohkubo, Kazuo; Hayashi, Tadamasa; and Nagai, Hiroshi, 4,876,006, Cl. 210-321.690.
- Hayashi, Tsutomu; Katoh, Masaie; Yakigaya, Nobuyuki; Nakamura, Kazuhiko; Yoshida, Yoshihiro; Nakajima, Yoshihiro; Saito, Mitsuru; and Kobayashi, Akio, to Honda Giken Kogyo Kabushiki Kaisha. Shift control device for hydrostatic continuously variable transmission. 4,875,390, Cl. 74-731.000.
- Hays, Dan A., to Xerox Corporation. Printing apparatus including apparatus and method for charging and metering toner particles. 4,876,575, Cl. 355-259.000.
- Hazard, James T. Toilet seat handle of unitary construction. 4,875,251, Cl. 16-111.00R.
- Hazeltine Corp.: See—
Lopez, Alfred R., 4,876,548, Cl. 342-368.000.
- HC Power, Inc.: See—
Colver, Frank, 4,876,497, Cl. 323-211.000.
- Head, James D.; Burns, Edward F.; Schleizer, William A.; White, C. Douglas; and Gentry, Dennis L., to BMI, Inc. Method and apparatus for relining blast furnace. 4,875,662, Cl. 266-44.000.
- Heenan, Richard H.: See—
Burke, Robert W. II; Cahen, Albert J., Jr.; Credle, William S., Jr.; Gupta, Ashis S.; and Heenan, Richard H., 4,875,508, Cl. 141-2.000.
- Heger, Werner; Kramer, Manfred; and Schlossarczyk, Heinrich, to WABCO Westinghouse Fahrzeuggesellschaft GmbH. Stop for compressor plate valve. 4,875,503, Cl. 137-856.000.
- Hegger, Josef: See—
Ostrup, Heinrich; and Hegger, Josef, 4,875,331, Cl. 56-208.000.
- Heh, Shiang-Jiun; Chen, Swe-Kai; Jin, Fu-Teh; and Chen, Li-Kou, to Industrial Technology Research Institute. Process for producing rare earth-cobalt permanent magnet. 4,875,946, Cl. 148-103.000.
- Heidinger, George H.: See—
Evans, Vernon C.; and Heidinger, George H., 4,876,514, Cl. 324-556.000.
- Heikkila, Kurt E.; Williams, Rodney K.; and Bohnen, Bruce A., to Du Pont de Nemours, E. I., and Company. Hydrogen peroxide compositions containing a substituted aminobenzaldehyde. 4,875,973, Cl. 156-664.000.
- Heikkila, Kurt E.: See—
Williams, Rodney K.; Bohnen, Bruce A.; and Heikkila, Kurt E., 4,875,972, Cl. 156-664.000.
- Heine, Hans-Georg; and Ooms, Pieter, to Bayer Aktiengesellschaft. β -fluoroacyl- β -halovinyl alkyl ethers. 4,876,393, Cl. 568-415.000.
- Hellsten, Martin, to Berol Kemi AB. Package capable of preventing foam formation, method of manufacturing such a package, and anti-foaming agent. 4,876,122, Cl. 428-34.100.
- Helton, Catherine; and Wright, Tim. Collapsible paperboard pallet. 4,875,419, Cl. 108-56.100.
- Hemmann, Siglinde: See—
Blum, Helmut; and Hemmann, Siglinde, 4,876,339, Cl. 540-450.000.
- Hemmerling, Wolfgang; Dubal, Hans-Rolf; Muller, Ingrid; Ohlendorf, Dieter; and Wingen, Rainer, to Hoechst Aktiengesellschaft. Chiral aryl-2,3-epoxyalkyl-ethers and the corresponding thio compounds thereof, and the use thereof as dopes in liquid-crystal phases. 4,876,028, Cl. 252-299.610.
- Hemsky, Robert L.: See—
Orsburn, Michael L.; Hemsky, Robert L.; Tucker, Terry L.; Schwarz, Robert E.; and Fearing, Craig F., 4,876,589, Cl. 358-22.000.
- Henique, Christian, to Equipments Et Composants Pour L'Industrie Automobile. Lightened steering wheel, in particular for a motor vehicle, produced from stampable, reinforced, synthetic materials and process for the manufacture thereof. 4,875,387, Cl. 74-552.000.
- Henkel Kommanditgesellschaft auf Aktien: See—
Blum, Helmut; and Hemmann, Siglinde, 4,876,339, Cl. 540-450.000.
- Breitzke, Willi; and Hensen, Hermann, 4,876,035, Cl. 252-550.000.
- Hennig, Jurgen; Vetter, Heinz; and Munzer, Manfred, to Rohm GmbH Chemische Fabrik. Opaque synthetic resins. 4,876,311, Cl. 525-229.000.
- Henricksen, Ronald M.: See—
Carlton, Dale E.; Baker, Clifford E.; and Henricksen, Ronald M., 4,876,655, Cl. 364-487.000.
- Hensen, Hermann: See—
Breitzke, Willi; and Hensen, Hermann, 4,876,035, Cl. 252-550.000.
- Henzel, Richard P., to Eastman Kodak Company. Thermally-transferable fluorescent oxazoles. 4,876,234, Cl. 503-227.000.
- Hercules Incorporated: See—
Policelli, Frederick J., 4,875,717, Cl. 285-149.000.
- Herding GmbH Entstaubungsanlagen: See—
Herding, Walter; and Rausch, Walter, 4,876,288, Cl. 521-53.000.
- Herding, Walter; and Rausch, Walter, to Herding GmbH Entstaubungsanlagen. Carrier material for immobilization of microorganisms. 4,876,288, Cl. 521-53.000.

- Hermach, Carl J., to Publishers Equipment Corporation. Conversion of letterpress to offset printing. 4,875,936, Cl. 101-218.000.
- Hermann, Dietrich E.; and Holzhauser, Ralf, to Otis Elevator Company. Escalator handrail drive. 4,875,568, Cl. 198-335.000.
- Hernandez, Henry R.: See—
Solarek, Daniel B.; Dirscherl, Teresa A.; Hernandez, Henry R.; and Jarowenko, Wadym, 4,876,336, Cl. 536-109.000.
- Herscher, Bret A., to Wavetek Microwave, Inc. True RMS power demodulation system and method for a modulated RF signal. 4,876,654, Cl. 364-483.000.
- Herschitz, Roman; Bogorad, Alexander; and Harhigh, Robert N., to General Electric Company. Preweld test method. 4,876,430, Cl. 219-110.000.
- Herzig, Paul: See—
Tzikas, Athanasios; and Herzig, Paul, 4,876,334, Cl. 534-632.000.
- Hesterberg, William G.: See—
Donahue, Raymond J.; Hesterberg, William G.; and Cleary, Terrance M., 4,875,985, Cl. 204-64.00T.
- Heubner, Ulrich: See—
Rockel, Manfred; Wallis, Ernst; Kohler, Michael; Heubner, Ulrich; and Kirchheiner, Rolf, 4,876,065, Cl. 420-582.000.
- Hewett, Richard H.; and Luscombe, Brian M., to May & Baker Limited. Herbicidal method using diflufenican. 4,875,925, Cl. 71-94.000.
- Hewlett-Packard Company: See—
Kjosness, David P.; and Marriott, Joe E., 4,876,520, Cl. 333-12.000.
- Lesko, Alan J., 4,876,702, Cl. 375-120.000.
- Pennington, Roy E., 4,875,861, Cl. 439-79.000.
- Tullis, Barclay J.; Bailey, John S.; Gunawardena, D. R.; and Kampe, Ulrich, 4,875,825, Cl. 414-786.000.
- Wong, Roger W.; Vifian, Hugo; and Hart, Michael G., 4,875,859, Cl. 434-214.000.
- Hicks, Gary D., to Way Construction, Inc. Temporary support surfaces for use on muddy or marshy land areas. 4,875,800, Cl. 404-35.000.
- Higashi, Katsumi: See—
Oda, Noriyuki; Takehara, Tetsuo; Higashi, Katsumi; and Muramatsu, Keiji, 4,875,712, Cl. 285-47.000.
- Higashi, Kazumi; and Noda, Yuzuru, to Nitto Electric Industrial Co., Ltd. Colorless transparent polyimide shaped article and process for producing the same. 4,876,330, Cl. 528-353.000.
- Higbie, Francis A.; Lieberman, Robert A.; and Rose, Ira M., to Diamond Shamrock Chemicals Co. Radiation-hardenable diluents. 4,876,384, Cl. 560-224.000.
- Higgins, George D.: See—
McCain, William B.; and Higgins, George D., 4,875,669, Cl. 270-54.000.
- Higgins, Sheryl W., to Cordis Corporation. Catheter with coiled wire attachment. 4,875,481, Cl. 128-344.000.
- Hightech Receptor AB: See—
Bjorck, Lars; Erntell, Mats; and Myhre, Erling, 4,876,194, Cl. 435-68.000.
- Higuchi, Teruo; Terauchi, Kiyoshi; Takai, Kazuhiko; Kikuchi, Sei; and Kobayashi, Hideto, to Sanden Corporation. Wobble plate type compressor with variable displacement mechanism. 4,875,834, Cl. 417-269.000.
- Hiketa, Manabu, to Mazda Motor Corporation. Vehicle four wheel drive system. 4,875,978, Cl. 180-248.000.
- Hilderbrandt, Bodo; and Steigerwald, Franz, to Wella Aktiengesellschaft. Multichamber container. 4,875,577, Cl. 206-219.000.
- Hill, Wayne E.; and McEachern, Dennis, to Marley Company, The. Method and apparatus for detecting leakage in fuel storage and delivery systems. 4,876,530, Cl. 340-605.000.
- Hillenbrand, Gary F., to Mead Corporation, The. Imaging method employing photoadhesive microparticles. 4,876,172, Cl. 430-253.000.
- Hilton, Robert; Emamjomeh, Ali; and Belani, Jagdish, to National Semiconductor Corporation. One-piece interconnection package and process. 4,876,587, Cl. 357-70.000.
- Himmele, Walter; Theobald, Hans; Merger, Franz; Hofmann, Ernst; Kuenast, Christoph; and Hofmeister, Peter, to BASF Aktiengesellschaft. 3,4-dihydro-2H-pyran useful as pesticides. 4,876,275, Cl. 514-452.000.
- Hinduja, Murli; Thompson, Mark L.; and Spriggs, John R., to Sterling Engineered Products Inc. Apparatus and method for testing flow characteristics of molding compounds. 4,875,363, Cl. 73-56.000.
- Hirai, Hiroyuki, to Fuji Photo Film Co., Ltd. Silver salt diffusion transfer with complexing compound. 4,876,171, Cl. 430-203.000.
- Hirai, Hitoshi: See—
Urata, Kaoru; Nakashio, Miaki; Ono, Koichi; Hirai, Hitoshi; and Iwamoto, Masayuki, 4,876,703, Cl. 377-62.000.
- Hirano, Norimitsu: See—
Shiraki, Manabu; and Hirano, Norimitsu, 4,876,472, Cl. 30-198.000.
- Hirao, Sumio: See—
Tsuchida, Hirofumi; Tanaka, Toshiaki; Oyama, Akira; and Hirao, Sumio, 4,875,444, Cl. 123-270.000.
- Hirao, Yutaka; Takechi, Kazuo; Uriyu, Katuhiro; and Uemura, Yahiyo, to Green Cross Corporation. Gamma-globulin injectable solutions containing sorbitol. 4,876,088, Cl. 424-85.800.
- Hiraoka, Mizuo: See—
Imatoki, Hiroyuki; Hiraoka, Mizuo; Tamura, Tomoyuki; and Satoh, Tetsuya, 4,876,042, Cl. 264-39.000.
- Hirasawa, Hideaki; and Ueda, Nobuo, to Minolta Camera Kabushiki Kaisha. Microfiche reading apparatus. 4,875,768, Cl. 353-27.00A.
- Hirata, Toichi: See—
Sugiyama, Genroku; Hirata, Toichi; and Satoh, Shinichi, 4,875,337, Cl. 60-421.000.
- Hirayama, Koji; and Aiyama, Fumihiko, to Kioritz Corporation. Throttle lever mechanism. 4,875,384, Cl. 74-500.500.
- Hirono, Atsuyuki: See—
Kambe, Yoshiaki; Okuda, Yoshihiko; Hirono, Atsuyuki; Nagao, Akira; and Ito, Takayasu, 4,876,446, Cl. 250-221.000.
- Hirose, Maki: See—
Imura, Takeshi; Ando, Katsuhiko; Nakabayashi, Shigemitsu; and Hirose, Maki, 4,875,518, Cl. 164-119.000.
- Hirota, Hajime; Ogino, Hidekazu; Igarashi, Sakoko; and Sotoya, Koh-shiro, to Kao Corporation. Secondary amidoamino acid based detergent composition. 4,876,034, Cl. 252-546.000.
- Hisanaga, Yorisato; Shimokawa, Kazuhiro; Kawano, Toshihiko; Suita, Yasunori; and Yamashita, Tsuneo, to Daikin Industries Ltd. Fluorine-containing macrolide compounds and their use. 4,876,245, Cl. 514-29.000.
- Hitachi Automotive Engineering Co., Ltd.: See—
Abukawa, Toshiaki; Tahara, Kazuo; Muramoto, Katsuji; Koterazawa, Toshiyuki; Hombu, Mitsuyuki; Takahashi, Tadashi; Takamatsu, Shuichi; Ishikura, Hisatugu; Yamamura, Hiroshisa; Tatsuzaki, Toru; Ohmae, Tsutomu; Okuyama, Toshiaki; Yamashita, Seizi; Saito, Shigeki; and Sakai, Masato, 4,875,539, Cl. 180-79.100.
- Hitachi Construction Machinery Co., Ltd.: See—
Sugiyama, Genroku; Hirata, Toichi; and Satoh, Shinichi, 4,875,337, Cl. 60-421.000.
- Hitachi, Ltd.: See—
Abukawa, Toshiaki; Tahara, Kazuo; Muramoto, Katsuji; Koterazawa, Toshiyuki; Hombu, Mitsuyuki; Takahashi, Tadashi; Takamatsu, Shuichi; Ishikura, Hisatugu; Yamamura, Hiroshisa; Tatsuzaki, Toru; Ohmae, Tsutomu; Okuyama, Toshiaki; Yamashita, Seizi; Saito, Shigeki; and Sakai, Masato, 4,875,539, Cl. 180-79.100.
- Akahoshi, Haruo; Murakami, Kanji; Kawamoto, Mineo; Tadokoro, Akio; and Yoshimura, Toyofusa, 4,876,177, Cl. 430-313.000.
- Aoyama, Motoo; Bessho, Yasunori; Uchikawa, Sadao; Takeda, Renzo; and Ishii, Yoshihiko, 4,876,062, Cl. 376-444.000.
- Gotou, Shizuo; Kagimasa, Toyohiko; and Yoshizumi, Seichi, 4,876,646, Cl. 364-200.000.
- Hagiwara, Masayoshi; Suzuki, Michio; Sasaki, Ryoichi; Sugano, Minoru; Horiki, Akira; and Hayashi, Kazuyuki, 4,876,681, Cl. 370-60.000.
- Hasegawa, Hiroshi; Sugimoto, Koichi; Yano, Takeshi; Netsu, Tositada; Tani, Mitsukiyo; and Kojima, Tosaku, 4,875,618, Cl. 228-179.000.
- Susa, Kenzo; Takagi, Kazumasa; Kobayashi, Toshio; Takayama, Takanobu; and Ohta, Norio, 4,876,144, Cl. 428-336.000.
- Takeda, Kazuo; Ito, Yoshitoshi; Honma, Noriaki; and Munakata, Chusuke, 4,876,458, Cl. 250-574.000.
- Usami, Saburo; Uchiyama, Kyoichi; and Suzuki, Satoshi, 4,875,837, Cl. 417-407.000.
- Hitachi Maxell, Ltd.: See—
Mizutani, Hikaru, 4,875,640, Cl. 242-198.000.
- Sugiyama, Toshinori; Ikegaki, Tetsuro; Shimizu, Mitsuru; and Taburaya, Yoshitane, 4,876,133, Cl. 428-64.000.
- Hitachi Microcomputer Hitachi, Ltd. & Engineering, Ltd.: See—
Yamamoto, Sho; Minato, Osamu; Saeiki, Makoto; Yoshitomi, Yasuo; Nakamura, Hideaki; and Kubotera, Masaaki, 4,876,669, Cl. 365-189.010.
- Hitachi Seiko, Ltd.: See—
Kashima, Takayuki; Sakabe, Akira; and Yamanaka, Yoshifumi, 4,876,433, Cl. 219-130.510.
- Hitomi, Mitsuo: See—
Hashimoto, Noboru; Hitomi, Mitsuo; Onishi, Koji; Yada, Yoshikuni; Nobumoto, Hidetoshi; and Hotate, Makoto, 4,875,455, Cl. 123-568.000.
- Hjorth, John S. M.: See—
Arvidsson, Folke L. E.; Carlsson, Per A. E.; Hacksell, Uli A.; Hjorth, John S. M.; Johansson, Anette M.; and Lindberg, Per L., 4,876,284, Cl. 514-657.000.
- Ho, Ling-Wen: See—
Lin, Trong-Goang; Ho, Ling-Wen; Ko, An-Nan; and Perng, Yeong-Ju, 4,876,398, Cl. 568-804.000.
- Hoagland, Lawrence C.: See—
Steele, Donald F.; Hoagland, Lawrence C.; Kyricos, Christopher; and Tolan, Peter, 4,875,520, Cl. 165-10.000.
- Hock, Lothar: See—
Haan, Franz; and Hock, Lothar, 4,875,285, Cl. 29-832.000.
- Hoden Seimitsu: See—
Inoue, Satoru; and Futamura, Shoji, 4,875,264, Cl. 29-163.600.
- Hodges, John C.; and Klutchko, Sylvester, to Warner-Lambert Company. Process for statine and statine analogs. 4,876,343, Cl. 544-168.000.
- Hodgson, Gordon; Broadhead, Douglas G.; and Parent, David J., to AHA Automotive Technologies Corporation. Reduced size transmission tunnel in an automobile and a method for the same. 4,875,538, Cl. 180-379.000.
- Hoechst Aktiengesellschaft: See—
Hemmerling, Wolfgang; Dubal, Hans-Rolf; Muller, Ingrid; Ohlendorf, Dieter; and Wingen, Rainer, 4,876,028, Cl. 252-299.610.
- Paschke, Klaus; Crass, Guenther; and Dinter, Peter, 4,875,963, Cl. 156-249.000.
- Schutz, Joachim; and Schweikert, Otto E., 4,876,341, Cl. 544-2.000.
- Siegel, Herbert; Kampe, Klaus-Dieter; Alpermann, Hans G.; Gerhards, Hermann J.; Usinger, Patricia; Schacht, Ulrich; Leven, Margret; Raether, Wolfgang; Dittmar, Walter; and Sachse, Burkhard, 4,876,354, Cl. 548-341.000.
- Thoes, Klaus; and Jung, Karl-Heinz, 4,876,155, Cl. 428-480.000.

- Hoechst Celanese Corporation: See—
Broussard, Jerry A.; Fuqua, Wayne C.; and George, James H., 4,876,368, Cl. 549-374.000.
- Hoehener, Alfred; and Smith, Roy E., to Ciba-Geigy Corporation. β -crystalline modification of diazo acid dyestuff. 4,876,333, Cl. 534-575.000.
- Hofbauer, August: See—
Gietzen, Staas; Weiner, Hans; Hain, Klaus; Hofbauer, August; and Hawener, Juergen, 4,875,643, Cl. 244-53.00A.
- Hoffend, Thomas R.: See—
Gruber, Robert J.; Yourd, Raymond A., III; Malhotra, Shadi L.; Nelson, Robert A.; Fox, Carol A.; and Hoffend, Thomas R., 4,876,169, Cl. 430-110.000.
- Hoffman, Brian: See—
Hutchinson, James; Hoffman, Brian; and Pollack, Steven, 4,875,275, Cl. 29-568.000.
- Hoffman, William F.; Lee, Ta J.; Smith, Robert L.; and Rooney, Clarence S., to Merck & Co., Inc. Antihypercholesterolemic compounds. 4,876,366, Cl. 514-570.000.
- Hoffman, William F.: See—
Lee, Ta J.; Hoffman, William F.; and Rooney, Clarence S., 4,876,279, Cl. 514-510.000.
- Hoffmann-La Roche Inc.: See—
Aschwarden, Werner; Imhof, Rene; Jakob, Roland; and Kyburz, Emilio, 4,876,340, Cl. 540-461.000.
- Barnier, Richard; and Hubscher, Josef, 4,876,369, Cl. 549-411.000.
- Klaus, Michael; and Weiss, Ekkehard, 4,876,349, Cl. 546-350.000.
- Hofmann, Ernst: See—
Himmele, Walter; Theobald, Hans; Merger, Franz; Hofmann, Ernst; Kuenast, Christoph; and Hofmeister, Peter, 4,876,275, Cl. 514-452.000.
- Hofmeister, Peter: See—
Himmele, Walter; Theobald, Hans; Merger, Franz; Hofmann, Ernst; Kuenast, Christoph; and Hofmeister, Peter, 4,876,275, Cl. 514-452.000.
- Hohmann & Barnard, Inc.: See—
Hohmann, Ronald P., 4,875,319, Cl. 52-383.000.
- Hohmann, Ronald P., to Hohmann & Barnard, Inc. Seismic construction system. 4,875,319, Cl. 52-383.000.
- Hokari, Hiroshi: See—
Matsuzawa, Masafumi; Hokari, Hiroshi; Kusano, Shoji; Miyazawa, Takeshige; and Toyokawa, Yasufumi, 4,875,930, Cl. 71-106.000.
- Hokkai Can Co., Ltd.: See—
Shinomiya, Tsutomu; Yoshino, Eiichi; Maki, Chihiro; Tojima, Hitoshi; Izai, Sadamu; Nakata, Akio; and Tamura, Michiya, 4,875,960, Cl. 156-203.000.
- Holbrook, Gerald L.: See—
Leising, Maurice B.; Benford, Howard L.; and Holbrook, Gerald L., 4,875,391, Cl. 74-866.000.
- Hollander, Zeev; Salomon, Bekas; and Katchalski-Katzir, Ephraim, to Ramot University Authority for Applied Research and Industrial Development Ltd. Immobilization of biologically active substances with carrier bond antibody. 4,876,191, Cl. 435-7.000.
- Hollenstein, Helmut, to Julius Blum Gesellschaft m.b.H. Drawer. 4,875,747, Cl. 312-330.100.
- Hollister, Graham, Jr. Wood splitting method and apparatus. 4,875,514, Cl. 144-367.000.
- Holm, Sune, deceased (Elisabeth, Ingrid Birgitta, nee Jansson, Eva Christina Holm, Claes Frederick Holm, executors); Malmberg, Rolf; and Svensson, Kjell, to Alfa-Laval Food and Dairy Engineering AB. Method for producing milk with a lowered bacterial content. 4,876,100, Cl. 426-491.000.
- Holman, James L.; and Willford, George A., to Dana Corporation. Dual ratio transmission shifter assembly with neutral safety switch. 4,875,383, Cl. 74-473.00R.
- Holmes, Thomas: See—
Walker, John C.; and Holmes, Thomas, 4,876,528, Cl. 340-442.000.
- Holter, Heinz; Igelbuscher, Heinrich; Gresch, Heinrich; Dewert, Heribert; and Burggraf, Peter, to Holter, Heinz. Device for detecting different pollutants in gas streams. 4,875,406, Cl. 98-2.010.
- Holtermann, Henri, to Laboratories Biotrol. Filter system with an incorporated gas escape opening, intended to be fitted in artificial anus drainage bags during their manufacture. 4,875,899, Cl. 604-333.000.
- Holton, Robert A.; Joo, Rouh-Rong; and Lowenthal, Richard, to Research Corporation Technologies, Inc. Taxols, their preparation and intermediates thereof. 4,876,399, Cl. 568-817.000.
- Holzhauser, Juergen K.; Michalak, Dennis J.; and Schammel, Wayne P., to Amoco Corporation. Process for the oxidation of di- or trimethylbenzenes in the presence of cobalt and manganese from oxidation residue incinerator ash. 4,876,386, Cl. 562-414.000.
- Holzhauser, Ralf: See—
Hermann, Dietrich E.; and Holzhauser, Ralf, 4,875,568, Cl. 198-335.000.
- Holzmeister, John P.; and Holzmeister, June. Anatomical measuring device. 4,875,296, Cl. 33-770.000.
- Holzmeister, June: See—
Holzmeister, John P.; and Holzmeister, June, 4,875,296, Cl. 33-770.000.
- Hombu, Mitsuyuki: See—
Abukawa, Toshimi; Tahara, Kazuo; Muramoto, Katsuji; Koterazawa, Toshiyuki; Hombu, Mitsuyuki; Takahashi, Tadashi; Takamatsu, Shuichi; Ishikura, Hisatugu; Yamamura, Hiroshisa; Tatsuzaki, Toru; Ohmae, Tsutomu; Okuyama, Toshiaki; Yamashita, Seizi; Saito, Shigeki; and Sakai, Masato, 4,875,539, Cl. 180-79.100.
- Honda Giken Kogyo Kabushiki Kaisha: See—
Fuse, Genzo; Miwa, Hiroshi; and Kawasaki, Yoshinobu, 4,875,823, Cl. 414-735.000.
- Hayashi, Tsutomu; Katoh, Masaie; Yakigaya, Nobuyuki; Nakamura, Kazuhiko; Yoshida, Yoshihiro; Nakajima, Yoshihiro; Saito, Mitsuru; and Kobayashi, Akio, 4,875,390, Cl. 74-731.000.
- Imura, Takeshi; Ando, Katsuhiko; Nakabayashi, Shigemitsu; and Hirose, Maki, 4,875,518, Cl. 164-119.000.
- Kiuchi, Takeo; and Sakurai, Hidetoshi, 4,875,447, Cl. 123-339.000.
- Kubota, Shin'ichi; Miyano, Hideyo; and Adachi, Hiromitsu, 4,876,529, Cl. 340-450.300.
- Suzuki, Shigeru; and Shimida, Shinichi, 4,875,438, Cl. 123-52.0MB.
- Yamamoto, Yasuhiro, 4,875,273, Cl. 29-467.000.
- Yoshikawa, Haruhiko; and Kawai, Makoto, 4,875,450, Cl. 123-425.000.
- Honda, Iwakazu, to Sharp Kabushiki Kaisha. Manually operated copier with a damper. 4,876,613, Cl. 358-471.000.
- Honda, Kazuyuki: See—
Suzuki, Yasuhiro; Akimoto, Koichiro; Ohshima, Hajime; Honda, Kazuyuki; and Isaka, Yukio, 4,876,562, Cl. 346-160.000.
- Honeywell, Inc.: See—
Clancy, Kevin F., 4,876,415, Cl. 200-5.00A.
- Dawson, John F.; Thompson, Eldon J.; and Cousens, James A., 4,876,651, Cl. 364-449.000.
- Honma, Noriaki: See—
Takeda, Kazuo; Ito, Yoshitoshi; Honma, Noriaki; and Munakata, Chusuke, 4,876,458, Cl. 250-574.000.
- Honma, Toshio; and Watanabe, Nobuyuki, to Canon Kabushiki Kaisha. Image processing apparatus. 4,876,612, Cl. 358-474.000.
- Hoo, Kee K., to Tektronix, Inc. Extension handle for a circuit board injector/ejector mechanism. 4,875,867, Cl. 439-157.000.
- Hood, William M.: See—
Lester, Gene D.; Morgan, Richard A.; Harms, Harold B.; Barrett, John P.; Chang, Tsung K.; Cushing, Donald S.; Broo, Richard F.; and Hood, William M., 4,876,492, Cl. 318-254.000.
- Hopkins, H. Kenneth: See—
Luebke, Richard J.; and Hopkins, H. Kenneth, 4,875,778, Cl. 356-394.000.
- Luebke, Richard J.; and Hopkins, H. Kenneth, 4,875,779, Cl. 356-394.000.
- Hori, Kimihiko; Nakamura, Koichi; Kawai, Michio; Motegi, Itsuro; Imokawa, Genji; and Takaishi, Naotake, to Kao Corporation. P-hydroxycinnamamide derivatives and melanin inhibitor comprising the same. 4,876,084, Cl. 424-62.000.
- Hori, Tetsuhiro: See—
Toda, Kenichi; and Hori, Tetsuhiro, 4,876,071, Cl. 422-133.000.
- Hori, Toshio: See—
Sakamoto, Yukio; Tanabe, Takeshi; Fukutani, Iwao; and Hori, Toshio, 4,875,862, Cl. 439-79.000.
- Horikawa, Kazuo, to Fuji Photo Film Co., Ltd. Radiation image read-out apparatus. 4,876,452, Cl. 250-327.200.
- Horiki, Akira: See—
Hagiwara, Masayoshi; Suzuki, Michio; Sasaki, Ryoichi; Sugano, Minoru; Horiki, Akira; and Hayashi, Kazuyuki, 4,876,681, Cl. 370-60.000.
- Horowitz, Carl: See—
Lee, Andrew J.; Sanduja, Mohan L.; Sugathan, Kenneth; Dragnea, Felicia; and Horowitz, Carl, 4,875,410, Cl. 101-170.000.
- Horton, Jack, to Murdock, Inc. Process for dry fiber winding and impregnating of projectiles. 4,876,050, Cl. 264-102.000.
- Horton, Raymond R.: See—
Cipolla, Thomas M.; Horton, Raymond R.; Murphy, Philip; and Palmer, Michael J., 4,875,614, Cl. 228-5.500.
- Hoshi, Mitsunori: See—
Aritsumi, Ryojo; Kainuma, Masakuni; Suda, Shoji; Aoki, Toshikazu; Ejiri, Takashi; Kojima, Masao; and Hoshi, Mitsunori, 4,875,500, Cl. 137-596.180.
- Hoshiko, Tomonori: See—
Onuma, Hitoshi; Yamanaka, Motosuke; Miyake, Kazutoshi; Hoshiko, Tomonori; Minami, Norio; Shoji, Tadao; Daiku, Yoshiharu; Sawada, Kohei; and Nomoto, Kenichi, 4,876,262, Cl. 514-318.000.
- Hosiden Electronics Co., Ltd.: See—
Tanaka, Masanori, 4,875,872, Cl. 439-344.000.
- Hosoi, Yuichi: See—
Takahashi, Kenji; Nakamura, Takashi; and Hosoi, Yuichi, 4,876,161, Cl. 428-691.000.
- Hosokawa, Hiroshi: See—
Ohsawa, Hidefumi; Katayama, Akihiro; Hosokawa, Hiroshi; Sunohara, Izuru; and Yoshimoto, Masahiko, 4,876,610, Cl. 358-443.000.
- Hosono, Masaki: See—
Inui, Masaki; Okuda, Shozo; and Hosono, Masaki, 4,875,566, Cl. 192-53.00F.
- Hosoya, Toshifumi: See—
Masuda, Shigeo; and Hosoya, Toshifumi, 4,875,758, Cl. 350-96.300.
- Hotate, Makoto: See—
Hashimoto, Noboru; Hitomi, Mitsuo; Onishi, Koji; Yada, Yoshikuni; Nobumoto, Hidetoshi; and Hotate, Makoto, 4,875,455, Cl. 123-568.000.
- Hotomi, Hideo; Osawa, Izumi; Iino, Syuji; Doi, Isao; and Fujiwara, Masanori, to Minolta Camera Kabushiki Kaisha. Photosensitive member comprising charge generating layer and charge transporting layer comprising amorphous carbon containing halogen or transition metal. 4,876,168, Cl. 430-58.000.

- Hotta, Tomio: See—
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Coulston, John W.; and Huffman, David C., 4,875,627, Cl. 239-466.000.
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Kamber, Hilda; and Chen, James C., 4,876,211, Cl. 437-22.000.
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Bartmann, Martin, 4,876,310, Cl. 525-149.000.
- Huntington, David H.: See—
Dickenson, Haydn G. W.; and Huntington, David H., 4,876,023, Cl. 252-90.000.
- Huse, Syoji: See—
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- Hwo, Charles C., to Shell Oil Company. Film and sheet capable of forming retortable and easy-open packagings. 4,876,156, Cl. 428-516.000.
- Hydromer, Inc.: See—
Creasy, Walter S.; and Lorenz, Donald H., 4,875,287, Cl. 30-34.010.
- Hyodo, Hiroshi: See—
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- I.M.A. - Industrie Macchine Automatiche S.p.A.: See—
Miselli, Carlo A., 4,875,329, Cl. 53-559.000.
- I.P.I. S.p.A.: See—
Ravetta, Guido, 4,876,388, Cl. 564-437.000.
- IBP Pietzsch GmbH: See—
Pietzsch, Ludwig; Senger, Detlef; Winter, Horst; and Vollinger, Hubert, 4,876,600, Cl. 358-183.000.
- Ichihashi, Kouji; and Yasuma, Jun-ichi, to Diesel Kiki Co., Ltd. Electromagnetic proportional control valve apparatus. 4,875,501, Cl. 137-625.640.
- Ide, Jun; and Iizumi, Tomoo, to Alps Electric Co., Ltd. Method for detecting zero track. 4,876,618, Cl. 360-78.130.
- Ide, Mason G.; Lawrence, Noel L. W.; and Prager, Lee, to GTE Products Corporation. PTC air heater employing triangular PTC heating elements. 4,876,436, Cl. 219-370.000.
- Ide, Naoki: See—
Egawa, Jiro; Yoshida, Naruhito; Kasai, Toshihiro; Nagasawa, Moriya; Ide, Naoki; and Machida, Hironobu, 4,876,560, Cl. 346-153.100.
- IDN Inventions and Development of Novelties AG: See—
Ackeret, Peter, 4,875,584, Cl. 206-387.000.
- Ifuku, Tetsuhiko: See—
Shioya, Katsuhiko; Ifuku, Tetsuhiko; and Inamasu, Seiichi, 4,876,645, Cl. 364-200.000.
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Hirota, Hajime; Ogino, Hidekazu; Igarashi, Sahoko; and Sotoya, Kohshiro, 4,876,034, Cl. 252-546.000.
- Igelbuscher, Heinrich: See—
Holter, Heinz; Igelbuscher, Heinrich; Gresch, Heinrich; Dewert, Heribert; and Burggraf, Peter, 4,875,406, Cl. 98-2.010.
- Iida, Toshikatsu; Fujiwara, Takayoshi; and Fukuda, Tetsuo, to Kabushiki Kaisha Toshiba. Axial flow fluid compressor. 4,875,842, Cl. 418-220.000.
- Iino, Syuji: See—
Hotomi, Hideo; Osawa, Izumi; Iino, Syuji; Doi, Isao; and Fujiwara, Masanori, 4,876,168, Cl. 430-58.000.
- Iizumi, Tomoo: See—
Ide, Jun; and Iizumi, Tomoo, 4,876,618, Cl. 360-78.130.
- Ijichi, Kouichi: See—
Kobayashi, Sadao; Ishihara, Yuji; Sato, Katsuyuki; and Ijichi, Kouichi, 4,876,141, Cl. 428-217.000.
- Ikeda, Hironosuke; Ezaki, Tadashi; Yoshida, Kakushiyon; Yamaguchi, Rikizou; and Suenaga, Kazuhiro, to Sanyo Electric Co., Ltd., and Sanyo Sanyo Industry Co., Ltd. Aluminum solid electrolytic capacitor and manufacturing method thereof. 4,876,451, Cl. 361-540.000.
- Ikeda, Naotaka: See—
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- Ikeda, Susumu, to Sanden Corporation. Temperature control means for a refrigerating apparatus. 4,875,342, Cl. 62-115.000.
- Ikegaki, Tetsuro: See—
Sugiyama, Toshinori; Ikegaki, Tetsuro; Shimizu, Mitsuru; and Tsuburaya, Yoshitane, 4,876,133, Cl. 428-64.000.
- Ikumi, Tomonori: See—
Matsumoto, Yasuo; Murakami, Kazunori; Ikumi, Tomonori; and Iwafune, Yasuo, 4,875,748, Cl. 350-6.800.
- Imai, Hitoshi; Okada, Kazuo; and Tadokoro, Michihiro, to Mitsubishi Denki Kabushiki Kaisha. Wavelength selective optical data storage system. 4,876,666, Cl. 365-106.000.
- Imai, Teruo: See—
Aoyama, Takeo; Imai, Teruo; Hattori, Junichi; and Uehara, Mikio, 4,876,049, Cl. 264-49.000.
- Imaizumi, Tomio, to Tokico Ltd. Damping force adjustable hydraulic shock absorber. 4,875,560, Cl. 188-319.000.
- Imanishi Kinzoku Kogyo Kabushiki Kaisha: See—
Okamoto, Kenzo; and Kitada, Fumihiko, 4,875,721, Cl. 292-29.000.
- Imataki, Hiroyuki; Hiraoka, Mizuho; Tamura, Tomoyuki; and Satoh, Tetsuya, to Canon Kabushiki Kaisha. Molding processing using a reproducible molding die. 4,876,042, Cl. 264-39.000.
- Imbert, Christian, to Medinvent S.A. Device for transluminal implantation. 4,875,480, Cl. 128-343.000.
- Imhof, Rene: See—
Aschwarden, Werner; Imhof, Rene; Jakob, Roland; and Kyburz, Emilio, 4,876,340, Cl. 540-461.000.
- Imokawa, Genji: See—
Hori, Kimihiko; Nakamura, Koichi; Kawai, Michio; Motegi, Itsuro; Imokawa, Genji; and Takaishi, Naotake, 4,876,084, Cl. 424-62.000.
- Imoto, Koji; Tateishi, Mataji; Omura, Tadao; Nakajima, Kunihiro; Maekawa, Motoyuki; Matsuyama, Moritake; and Tamura, Hiroki, to Mitsubishi Jukogyo Kabushiki Kaisha; and Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Combustion chamber of a sub-chamber type internal combustion engine. 4,875,445, Cl. 123-292.000.
- Imperial Chemical Industries PLC: See—
Anthony, Vivienne M.; Clough, John M.; DeFraine, Paul; and Godfrey, Christopher R. A., 4,876,264, Cl. 514-345.000.
- Casci, John L.; Lowe, Barrie M.; and Lowe, Thomas V., 4,876,412, Cl. 585-640.000.
- Cattanach, James B., 4,876,055, Cl. 264-512.000.
- Elliott, Raymond; Griffin, David A.; and Gairns, Raymond S., 4,875,922, Cl. 71-76.000.
- Prest, David W.; and Yorke, William J., 4,875,951, Cl. 149-109.600.
- Tadros, Tharwat F., 4,875,927, Cl. 71-94.000.
- Imreg, Inc. (Delaware corporation): See—
Gottlieb, A. Arthur, 4,876,193, Cl. 435-29.000.
- Imura, Takeshi; Ando, Katsuhiko; Nakabayashi, Shigemitsu; and Hirose, Maki, to Honda Giken Kogyo Kabushiki Kaisha. Method of and apparatus for low-pressure casting of light metal alloy. 4,875,518, Cl. 164-119.000.
- Inada, Yasuo: See—
Sugita, Minoru; Nakatsuji, Teruyuki; Fujisaki, Tadashi; Sawade, Minoru; Ishikawa, Noboru; and Inada, Yasuo, 4,876,143, Cl. 428-294.000.
- Inagaki, Jitsuo. Sterilizing method for treatment of fresh fruits and apparatus used for the method. 4,875,407, Cl. 99-451.000.

Inamasu, Seiichi: See—
Shioya, Katsuhiko; Ifuku, Tetsuhiko; and Inamasu, Seiichi, 4,876,645, Cl. 364-200.000.

Industrial Technology Institute: See—
Harding, Kevin G., 4,875,777, Cl. 356-376.000.

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Heh, Shiang-Jiun; Chen, Swe-Kai; Jin, Fu-Teh; and Chen, Li-Kou, 4,875,946, Cl. 148-103.000.

Infrared Waste Technology, Inc.: See—
Hay, George H.; and Bleke, Jeffrey P., 4,875,420, Cl. 110-215.000.

Innovative Medical Engineering, Inc.: See—
Brook, Arthur H.; Carian, Peter J.; Katzin, Leonard; Landsinger, Edmund E.; Moore, James D.; Rotter, Leah D.; and Schreiber, Stanley, 4,875,469, Cl. 128-26.000.

Inomata, Kenichi: See—
Nakajima, Nobuyuki; Inomata, Kenichi; Morita, Masaya; Yamaguchi, Toshio; and Eitai, Kazuo, 4,875,835, Cl. 417-295.000.

Inoue, Hiromichi: See—
Saito, Shinichi; Inoue, Hiromichi; Miyazawa, Kazutoshi; Ohno, Kouji; and Ushioda, Makoto, 4,876,026, Cl. 252-299.610.

Inoue, Kazushige; Yamamoto, Hiroshi; Hyodo, Hiroshi; and Kishimoto, Shinichi, to Kabushiki Kaisha Kyoto Daiichi Kagaku. Method and apparatus of automatic continuous analysis using analytical implement, 4,876,204, Cl. 436-46.000.

Inoue, Koji: See—
Akao, Mutsuo; Osanai, Hiroyuki; and Inoue, Koji, 4,876,125, Cl. 428-35.200.

Inoue, Masanobu: See—
Mihara, Makoto; Inoue, Masanobu; Ohji, Kenzo; and Itou, Shuji, 4,875,533, Cl. 177-144.000.

Inoue, Satoru; and Futamura, Shoji, to NGK Insulators, Ltd.; and Hoden Seimitsu. Method for producing dies for extruding honeycomb structures, 4,875,264, Cl. 29-163.600.

Inoue, Takanori: See—
Hara, Kazuya; Inoue, Takanori; and Bito, Hiroyasu, 4,876,441, Cl. 235-488.000.

Inoue, Takashi: See—
Kawabata, Akira; Terasaki, Yoshikazu; Inoue, Takashi; and Takita, Hidenori, 4,876,479, Cl. 313-440.000.

Shimazu, Hideaki; Ito, Hiroshi; and Yamakoshi, Kenichi, 4,875,488, Cl. 128-694.000.

Integrated Device Technology, Inc.: See—
Hsu, Fu-Chieh, 4,876,215, Cl. 437-60.000.

Integrated Fluidics, Inc.: See—
Brackett, Tom S., 4,875,956, Cl. 156-84.000.

Intellipower, Inc.: See—
Johnson, Ronald W., 4,876,460, Cl. 307-64.000.

InterMetro Industries Corporation: See—
Welch, Robert J.; Kolvits, Albert; and White, Robert M., 4,875,696, Cl. 280-47.340.

Intermodal Container Systems: See—
Merrett, Ronald G.; and Eakin, Oscar, Jr., 4,875,811, Cl. 406-39.000.

International Business Machines Corporation: See—
Cipolla, Thomas M.; Horton, Raymond R.; Murphy, Philip; and Palmer, Michael J., 4,875,614, Cl. 228-5.500.

Kaneko, Toyohisa; and Watanuki, Osaki, 4,876,720, Cl. 381-43.000.

Lavin, Mark A., 4,876,733, Cl. 382-27.000.

Martin, William C.; and Rohrer, Gene D., 4,876,735, Cl. 382-57.000.

Nuechterlein, David W.; and Rinaldi, Mark A., 4,876,644, Cl. 364-200.000.

Pence, Jerry W., 4,876,662, Cl. 364-900.000.

Phinney, Richard R.; and Strippe, David C., 4,876,114, Cl. 427-45.100.

Tseng, Samuel C., 4,876,607, Cl. 358-261.200.

International Flavors & Fragrances Inc.: See—
Wilson, Richard A.; Butler, Jerry F.; Withycombe, Donald; Mookherjee, Braja D.; Katz, Ira; and Schrankel, Kenneth R., 4,876,087, Cl. 424-84.000.

Interprovincial Pipe Line Company: See—
Savard, Donald D., 4,875,615, Cl. 228-119.000.

Intui, Masaki; Okuda, Shozo; and Hosono, Masaki, to Toyota Jidosha Kabushiki Kaisha. Gear synchronizer mechanism, 4,875,566, Cl. 192-53.00F.

Inventio AG: See—
MacDonald, Robert C.; and Abrego, Elsa, 4,875,554, Cl. 187-124.000.

Isaka, Tsutomu; and Ohta, Saburo, to Toyo Boseki Kabushiki Kaisha. Anti-fogging multilayered film and bag produced therefrom for packaging vegetables and fruits, 4,876,146, Cl. 428-347.000.

Isaka, Yukio: See—
Suzuki, Yasuhito; Akimoto, Koichiro; Ohshima, Hajime; Honda, Kazuyuki; and Isaka, Yukio, 4,876,562, Cl. 346-160.000.

Ishida, Hiroaki; Shinozaki, Nobuo; and Nakazawa, Michitake, to Seiksha Co., Ltd. Motor-driven shutter for camera, 4,876,563, Cl. 354-234.100.

Ishiguro, Masanori: See—
Naruo, Kyoichi; Ohtani, Sumio; Etoh, Masahiro; Tsuruta, Masao; Moriya, Ikuro; Ishiguro, Masanori; and Matsumoto, Akira, 4,876,007, Cl. 210-339.000.

Ishihara, Yuji: See—
Kobayashi, Sadao; Ishihara, Yuji; Sato, Katsuyuki; and Ijichi, Kouichi, 4,876,141, Cl. 428-217.000.

Ishii, Yoh; Abe, Masami; Harada, Yuhzoh; Takasugi, Atsumi; and Kato, Kazumi, to Furukawa Aluminum Co., Ltd. Method of manufacturing hollow billet and apparatus therefor, 4,875,519, Cl. 164-465.000.

Ishii, Yoshihiko: See—
Aoyama, Motoo; Bessho, Yasunori; Uchikawa, Sadao; Takeda, Renzo; and Ishii, Yoshihiko, 4,876,062, Cl. 376-444.000.

Ishijima, Toshiyuki, to NEC Corporation. Field effect transistor with short channel length and process of fabrication thereof, 4,876,581, Cl. 357-23.300.

Ishikawa, Hitoshi, to Aisin Seiki Kabushiki Kaisha. Reduced height sewing machine with a arcuately swinging needle bar arm, 4,875,422, Cl. 112-258.000.

Ishikawa, Noboru: See—
Sugita, Minoru; Nakatsuji, Teruyuki; Fujisaki, Tadashi; Sawaide, Minoru; Ishikawa, Noboru; and Inada, Yasuo, 4,876,143, Cl. 428-294.000.

Ishikawa, Osamu; and Sumiya, Kiyoshi, to Oki Electric Industry Co., Ltd. Image reading device, 4,876,605, Cl. 358-400.000.

Ishikawa, Takatoshi; and Yagihara, Morio, to Fuji Photo Film Co., Ltd. Method of processing silver halide color photosensitive material using developer comprising dialkyl hydroxylamine and no benzyl alcohol, 4,876,174, Cl. 430-380.000.

Ishikawa, Yoshihiko: See—
Kushida, Osami; Nimomiya, Hisamitsu; Nezuka, Masakazu; and Ishikawa, Yoshihiko, 4,876,523, Cl. 337-299.000.

Ishikura, Hisatugu: See—
Abukawa, Toshimi; Tahara, Kazuo; Murumoto, Katsuji; Koterazawa, Toshiyuki; Hombu, Mitsuyuki; Takahashi, Tadashi; Takamatsu, Shuichi; Ishikura, Hisatugu; Yamamura, Hiroshisa; Tatsuzaki, Toru; Ohmae, Tsutomu; Okuyama, Toshiaki; Yamashita, Seizi; Saito, Shigeki; and Sakai, Masato, 4,875,539, Cl. 180-79.100.

Ishiwa, Hiromi; Shibahara, Harue; Mutai, Masahiko; and Tsuchida, Nobuo, to Kabushiki Kaisha Yakult Honsha. Chimeric plasmids, 4,876,202, Cl. 435-320.000.

Ishizaka, Yutaka: See—
Miyagawa, Michiaki; Ishizaka, Yutaka; and Shimomura, Shoji, 4,876,732, Cl. 382-41.000.

Ishizuka, Shigeo; and Kuzuno, Katsutoshi, to Yazaki Corporation. Multi-terminal connector, 4,875,873, Cl. 439-347.000.

Isola, Richard A., to Habitation. Bed clothes, 4,875,245, Cl. 5-482.000.

Isomura, Shigenori: See—
Sano, Ryuichi; and Isomura, Shigenori, 4,875,443, Cl. 123-179.00G.

Isono, Koichi; and Sho, Ikuo, to Dainippon Screen Mfg. Co., Ltd. Method of and apparatus for detecting presence or absence of photosensitive object at a prescribed position, 4,876,456, Cl. 250-561.000.

Issachar, David; Trumper, Jacob; and Abrashkin, Shmuel, to State of Israel, Prime Minister's Office Israel Atomic Energy Commission, Soreq Nuclear Research Center. Radionuclide generator, 4,876,073, Cl. 423-2.000.

Itaya, Keiji; and Kohayakawa, Hiromasa, to Kabushiki Kaisha Toshiba. Device for changing sheet shape before entry into fuser nip, 4,876,576, Cl. 355-285.000.

Ito, Hiroshi: See—
Shimazu, Hideaki; Ito, Hiroshi; and Yamakoshi, Kenichi, 4,875,488, Cl. 128-694.000.

Ito, Iko; Toyoshima, Yoshiki; Takagishi, Hisao; and Takahashi, Tsutomu, to Sumitomo Chemical Company, Limited. Process of producing glycidyl ethers of monohydric or polyhydric phenols, 4,876,371, Cl. 549-517.000.

Ito, Sumio: See—
Hayashi, Kotaro; Ito, Sumio; and Kobashi, Kiyoshi, 4,875,336, Cl. 60-286.000.

Ito, Takayasu: See—
Kambe, Yoshiaki; Okuda, Yoshihiko; Hirono, Atsuyuki; Nagaoka, Akira; and Ito, Takayasu, 4,876,446, Cl. 250-221.000.

Ito, Yoshitoshi: See—
Takeda, Kazuo; Ito, Yoshitoshi; Honma, Noriaki; and Munakata, Chusuke, 4,876,458, Cl. 250-574.000.

Itoh, Hajime; and Mitani, Kazutami, to Mitsubishi Rayon Co., Ltd. Hydrophilized porous membrane and production process thereof, 4,876,289, Cl. 521-54.000.

Itoh, Kunio; and Shiobara, Toshio, to Shin-Etsu Chemical Co., Ltd. Epoxy resin composition, 4,876,298, Cl. 523-433.000.

Itoh, Kunio; Fukushima, Motoo; and Nakamura, Tsutomu, to Shin-Etsu Chemical Co., Ltd. Novel organosilicon compounds, 4,876,344, Cl. 544-219.000.

Itoh, Mituru. Door apparatus, 4,875,306, Cl. 49-208.000.

Itou, Shinji: See—
Oshita, Saiichiro; Mouri, Toyohiko; Takahashi, Tsutomu; and Itou, Shinji, 4,875,541, Cl. 180-79.100.

Itou, Shuji: See—
Mihara, Makoto; Inoue, Masanobu; Ohji, Kenzo; and Itou, Shuji, 4,875,533, Cl. 177-144.000.

ITT Corporation: See—
Carlson, Christopher M.; and Deninno, Nicholas, 4,876,545, Cl. 342-14.000.

Dennany, Robert D., Jr.; and Pontbriand, Duane J., 4,875,715, Cl. 285-87.000.

Koerner, Charles B., 4,876,546, Cl. 342-15.000.

Ivanova, Irina A.: See—
Granik, Vladimir G.; Stezhko, Tatyana V.; Glushkov, Robert G.; Mashkovsky, Mikhail D.; Roschina, Lidia F.; Polezhaeva, Antonina I.; Parimbetova, Roza B.; Bobkov, Yuri G.; Losev, Alexander S.; and Ivanova, Irina A., 4,876,360, Cl. 548-550.000.

Iwafune, Yasuo: See—
Matsumoto, Yasuo; Murakami, Kazunori; Ikumi, Tomonori; and Iwafune, Yasuo, 4,875,748, Cl. 350-6.800.

Iwai, Isamu; Okamoto, Toshio; and Doi, Miwako, to Kabushiki Kaisha Toshiba. Document processing system deciding apparatus provided with selection functions, 4,876,665, Cl. 364-900.000.

Iwakura, Ken: See—
Saeki, Keiso; Sano, Shojiro; Matsuoka, Katsumi; Takashima, Masanobu; and Iwakura, Ken, 4,876,233, Cl. 503-209.000.

Iwamoto, Masayuki: See—
Urata, Kaoru; Nakashio, Miaki; Ono, Koichi; Hirai, Hitoshi; and Iwamoto, Masayuki, 4,876,703, Cl. 377-62.000.

Iwasa, Hiroki; Watanabe, Toyofumi; and Furuya, Hirohide, to NKK Corporation. Method for manufacturing electrolytically chromated steel sheet, 4,875,984, Cl. 204-56.100.

Iwasaki, Masayuki: See—
Maemoto, Kazuo; Iwasaki, Masayuki; Maeda, Minoru; and Aotani, Yoshimasa, 4,876,173, Cl. 430-271.000.

Iwatsuki, Kunihiko: See—
Kato, Eiji; Kadotani, Masanori; Sakaguchi, Yoshikazu; Kubo, Seitoku; Iwatsuki, Kunihiko; Taniguchi, Hiroji; and Harada, Yoshihara, 4,875,665, Cl. 267-170.000.

Iwaya, Toshio, to Canon Kabushiki Kaisha. Image recording apparatus, 4,876,570, Cl. 355-204.000.

Ixys Corporation: See—
Arcus, Christopher G., 4,876,517, Cl. 330-277.000.

Izai, Sadamu: See—
Shinomura, Tsutomu; Yoshino, Eiichi; Maki, Chihiro; Tojima, Hitoshi; Izai, Sadamu; Nakata, Akio; and Tamura, Michiya, 4,875,960, Cl. 156-203.000.

Izumina, Masanobu: See—
Hamakawa, Yoshihiro; Tawada, Yoshihisa; Tsuge, Kazunori; and Izumina, Masanobu, 4,875,943, Cl. 376-244.000.

J.M. Huber Corporation: See—
Dallavia, Anthony J., Jr.; Vande Ven, Susan; and Smith, Bobby E., 4,876,291, Cl. 521-124.000.

J. M. Voith GmbH: See—
Schiel, Christian, 4,875,975, Cl. 162-273.000.

Jacobi, Hatto: See—
Gronsfeld, Josef; Jacobi, Hatto; and Baethmann, Hans-Juergen, 4,875,371, Cl. 73-598.000.

Jacobs, Paul H.; and Collette, Douglas P., to General Signal Corporation. Method of receiving a compressed composite signal, 4,876,741, Cl. 455-47.000.

Jacques, Donald A.: See—
Vandenbergh, Donald E.; Jacques, Donald A.; and Schaffer, William E., 4,875,765, Cl. 350-611.000.

Jagatchi, Carl T.: See—
Gardner, Bronson; Keener, Melvin E.; DeSutter, Steven C.; Jagatchi, Carl T.; and Felice, Ralph A., 4,876,647, Cl. 364-420.000.

Jager, Willem W.: See—
Sie, Swan T.; Drent, Eit; and Jager, Willem W., 4,876,286, Cl. 518-700.000.

Jahn, Darrell D.: See—
Betts, Peter; and Jahn, Darrell D., 4,876,011, Cl. 210-526.000.

Jakob, Roland: See—
Aschwendt, Werner; Imhof, Rene; Jakob, Roland; and Kyburz, Emilio, 4,876,340, Cl. 540-461.000.

James, Adrian W.: See—
Dekker, Nicolaas M. J.; Edwards, John W.; and James, Adrian W., 4,876,722, Cl. 381-71.000.

James Burn International Ltd.: See—
Jones, Leonard W. N., 4,875,355, Cl. 72-306.000.

Jamet, Michel R.: See—
Murray, Charles N.; and Jamet, Michel R., 4,875,429, Cl. 114-331.000.

Jan, Chaur-Ming; and Oehling, Mark E., to Warner-Lambert Company. Fluidized bed dryer/granulator, 4,875,435, Cl. 118-62.000.

Janai, Meir I.: See—
Orbach, Zvi; and Janai, Meir I., 4,875,971, Cl. 156-644.000.

Janning, John L., to NCR Corporation. Crystallized silicon-on-insulator nonvolatile memory device, 4,876,582, Cl. 357-23.500.

Japan as represented by Director General of Agency of Industrial Science and Technology: See—
Yabe, Akira; Ouchi, Akihiko; Moriyama, Hiroshi; and Masuda, Etsuro, 4,875,986, Cl. 204-157.600.

Japan Electronic Control Systems Company Limited: See—
Tomisawa, Naoki, 4,875,456, Cl. 123-585.000.

Jaran, John R.: See—
Ray, Robert; Neal, Robert A.; Jaran, John R.; and Parker, Tim, 4,875,581, Cl. 206-328.000.

Jarowenko, Wadym: See—
Solarek, Daniel B.; Dirscherl, Teresa A.; Hernandez, Henry R.; and Jarowenko, Wadym, 4,876,336, Cl. 536-109.000.

Jasper, Thomas E.: See—
Evans, Walter R.; Remenicky, Joseph M.; Jasper, Thomas E.; and Ballard, Wayne W., 4,875,351, Cl. 70-271.000.

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Jefferson, Robert C. Gauge for determining depth of cut in keys and the like, 4,875,294, Cl. 33-539.000.

Jenkins, John M., III: See—
Fulks, Bernard D.; Sawin, Steven P.; Aikman, Collin D.; and Jenkins, John M., III, 4,876,320, Cl. 526-62.000.

Jenkins, Richard L. Six-axis joystick control, 4,876,524, Cl. 338-2.000.

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Donnay, James A.; Jensen, Van E., Jr.; and Kruzel, Bryon S., 4,875,895, Cl. 493-117.000.

Jeppsson, E. Hakan O. Climate chamber with conveyor, 4,875,343, Cl. 62-381.000.

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Christopher, Glenn B.; and Motley, Jerry D., 4,875,413, Cl. 102-307.000.

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Heh, Shiang-Jiun; Chen, Swe-Kai; Jin, Fu-Teh; and Chen, Li-Kou, 4,875,946, Cl. 148-103.000.

Jimbo, Toshikatsu: See—
Kobatake, Hiroyuki; and Jimbo, Toshikatsu, 4,876,462, Cl. 307-246.000.

Joanino, Fernando A., to Advance Transformer Co. Two-lead starter circuit for a gaseous discharge lamp, 4,876,486, Cl. 315-290.000.

Job, Robert C., to Shell Oil Company. Magnesium alkoxide polymerization catalyst by boiling in organic solvents, 4,876,230, Cl. 502-171.000.

Jochimsen, Siegfried. Blood clotting time measuring apparatus, 4,876,069, Cl. 422-73.000.

Johansson, Anette M.: See—
Arvidsson, Folke L. E.; Carlsson, Per A. E.; Hacksell, Uli A.; Hjorth, John S. M.; Johansson, Anette M.; and Lindberg, Per L., 4,876,284, Cl. 514-657.000.

Johansson, Eric B., to General Electric Company. Double-d water rod for 9 by 9 fuel bundle, 4,876,063, Cl. 376-444.000.

Johansson, Jan A.; Jonsson, Jan I.; and Lindstrom, Bjorn T., to Aktiebolaget Electrolux. Patient lifting device, 4,875,555, Cl. 187-9.00R.

Johansson, Nils B.: See—
Gustafsson, Bengt O.; and Johansson, Nils B., 4,876,074, Cl. 423-210.500.

John Fluke Mfg. Co., Inc.: See—
Guntheroth, Kurt, 4,876,684, Cl. 371-21.200.

Johns Hopkins University, The: See—
Devereux, William S.; and Westerfield, Edwin E., 4,876,659, Cl. 364-717.000.

Johnson, Bernard D.: See—
Torley, Lawrence W.; Johnson, Bernard D.; and Dusza, John P., 4,876,252, Cl. 514-224.800.

Johnson, Duane R.: See—
Larson, Scott A.; and Johnson, Duane R., 4,875,563, Cl. 192-4.00A.

Johnson Electric Industrial Manufactory, Limited: See—
Wang, Patrick S.-C.; and Baines, Roger F., 4,876,474, Cl. 310-236.000.

Johnson, Horton. Engine noise simulating device for a bicycle, 4,875,885, Cl. 446-189.000.

Johnson, Ronald W., to Intellipower, Inc. Uninterrupted power supply, 4,876,460, Cl. 307-64.000.

Johnson, Ruben R. Electrical service fittings and service system including same, 4,876,414, Cl. 174-81.000.

Johnson, Timothy: See—
Borgos, John A.; Bradac, Francis; Haumschild, Daniel J.; Johnson, Timothy; and Lee, Rebecca, 4,875,755, Cl. 350-96.200.

Johnson, William C.; Richardson, Hubert, Jr.; and Barito, Thomas R., to Tecumseh Products Company. Compressor lubrication system with vent, 4,875,840, Cl. 418-55.000.

Johnston, Bernard A. Combination metal and wood window frame assembly, 4,875,316, Cl. 52-204.000.

Johnston, James A. Method for manufacturing printed circuit boards, 4,875,283, Cl. 29-830.000.

Jones, Bruce A., to Digital Equipment Corporation. Constant flow deionized water spray gun, 4,875,625, Cl. 239-124.000.

Jones, Jack A.; Wen, Liang-Chi; and Bard, Steven, to United States of America, National Aeronautics and Space Administration. Two-stage sorption type cryogenic refrigerator including heat regeneration system, 4,875,346, Cl. 62-467.000.

Jones, Leonard W. N., to James Burn International Ltd. Manufacture of wire binding elements, 4,875,355, Cl. 72-306.000.

Jonsson, Jan I.: See—
Johansson, Jan A.; Jonsson, Jan I.; and Lindstrom, Bjorn T., 4,875,555, Cl. 187-9.00R.

Jorgensen, Betty S.: See—
Liepins, Raimond; Jorgensen, Betty S.; and Liepins, Leila Z., 4,876,032, Cl. 252-500.000.

Joseph, Philippe; and Perrochat, Jean Michel, to S.A.M.M. - Societe d'Applications des Machines Motrices. Hydropneumatic suspension unit for wheeled vehicles, particularly cross-country vehicles, 4,875,706, Cl. 280-708.000.

Joyce, Allen T.: See—
Bradley, Billie J.; Giroux, Richard L.; and Joyce, Allen T., 4,875,524, Cl. 166-241.000.

Julius Blum Gesellschaft m.b.H.: See—
Hollenstein, Helmut, 4,875,747, Cl. 312-330.100.

Rock, Erich; and Brustle, Klaus, 4,875,746, Cl. 312-330.100.

Jung, Karl-Heinz: See—
Thoes, Klaus; and Jung, Karl-Heinz, 4,876,155, Cl. 428-480.000.

Junker, Warren R.: See—
Brown, Stephen D.; Junker, Warren R.; and Gradich, Francis X., 4,876,506, Cl. 324-220.000.

Junkosha Co., Ltd.: See—
Akiba, Jyuji, 4,875,359, Cl. 73-40.000.

Juo, Rouh-Rong: See—
Holton, Robert A.; Juo, Rouh-Rong; and Lowenthal, Richard, 4,876,399, Cl. 568-817.000.

Just, Karl, to MTU Motoren- und Turbinen-Union Friedrichshafen GmbH. Divided slide bearing, 4,875,784, Cl. 384-273.000.

Justice, Kendall W. Truck bed load organizer and stabilizer apparatus. 4,875,730, Cl. 296-37.500.
 J100 rrgensen, Paul R., to Durgio AG. Resonance label and method for its fabrication. 4,876,555, Cl. 343-895.000.
 K. Rutschi AG. See—
 Zehnder, Paul; Niklaus, Hans-Ulrich; Schmiedl, Engelbert; and Patri, Franz, 4,875,836, Cl. 417-360.000.
 Kaaden, Jürgen; and Schandl, Hartmut, to Deutsche Thomson-Brandt GmbH. Track-readjusted magnetic-tape recorder with transverse tracking. 4,876,614, Cl. 360-10.200.
 Kabeya, Motoo. See—
 Shindou, Yoshio; Kabeya, Motoo; Shimazu, Takashi; and Yamazaki, Fumio, 4,876,160, Cl. 428-623.000.
 Kabushiki Kaisha Asahi Kinzoku Kogyosho. See—
 Kaneko, Toshio, 4,875,353, Cl. 72-133.000.
 Kabushiki Kaisha Daikin Seisakusho. See—
 Fujimoto, Shinji, 4,875,562, Cl. 192-3.280.
 Kabushiki Kaisha Komatsu Seisakusho. See—
 Onuki, Toru; Sagawa, Junichi; Watanabe, Tamotsu; and Yoshimatsu, Toshio, 4,876,158, Cl. 428-565.000.
 Watanabe, Yuji; and Nakamura, Masahiro, 4,876,729, Cl. 382-22.000.
 Kabushiki Kaisha Kyoto Daiichi Kagaku. See—
 Inoue, Kazushige; Yamamoto, Hiroshi; Hyodo, Hiroshi; and Kishimoto, Shinichi, 4,876,204, Cl. 436-46.000.
 Kabushiki Kaisha Nihon M.D.M.: See—
 Shimazu, Hideaki; Ito, Hiroshi; and Yamakoshi, Kenichi, 4,875,488, Cl. 128-694.000.
 Kabushiki Kaisha Polyurethane Engineering. See—
 Toda, Kenichi; and Hori, Tetsuhiro, 4,876,071, Cl. 422-133.000.
 Kabushiki Kaisha Tokai Rika Denki Seisakusho. See—
 Suzuki, Masaru, 4,875,860, Cl. 439-15.000.
 Suzuki, Masaru, 4,876,493, Cl. 318-293.000.
 Kabushiki Kaisha Toshiba. See—
 Egawa, Jiro; Yoshida, Naruhito; Kasai, Toshihiro; Nagasawa, Moriya; Ide, Naoki; and Machida, Hironobu, 4,876,560, Cl. 346-153.100.
 Iida, Toshikatsu; Fujiwara, Takayoshi; and Fukuda, Tetsuo, 4,875,842, Cl. 418-220.000.
 Itaya, Keiji; and Kohayakawa, Hiromasa, 4,876,576, Cl. 355-285.000.
 Matsutani, Kinya, 4,875,485, Cl. 128-653.000.
 McNeill, Kevin M.; and Ozeki, Takeshi, 4,876,643, Cl. 364-200.000.
 Morohashi, Katsuei; Shimokobe, Jiro; and Shimoma, Taketoshi, 4,876,478, Cl. 313-413.000.
 Mose, Tadao; Andoh, Yasuhiro; and Kitasin, Tatuhsa, 4,876,637, Cl. 363-37.000.
 Nishida, Naoto; and Nishio, Mitsuhiro, 4,876,690, Cl. 372-56.000.
 Saegusa, Noboru; Hara, Toshihiro; Kawasaki, Ryoji; Tate, Kazuyuki; Huse, Syoji; and Ono, Koji, 4,876,708, Cl. 379-61.000.
 Saito, Mitsuo; Matoba, Tsukasa; and Okamoto, Toshio, 4,876,657, Cl. 364-521.000.
 Sakata, Hirotugu; Murasaki, Hiroaki; Hayano, Makoto; Hattori, Hirosi; Morozumi, Naoya; Yoneyama, Kouichi; Suzuki, Isao; Sone, Junji; and Nagatomo, Shigemi, 4,875,839, Cl. 418-55.000.
 Takeda, Hiromitsu; Nakahashi, Masako; Shirokane, Makoto; and Yamazaki, Tatsu, 4,876,119, Cl. 427-250.000.
 Takekado, Shigeru, 4,876,623, Cl. 360-104.000.
 Torita, Fumio; Ikeda, Naotaka; Nakamura, Kimihiko; Matsuo, Katsuharu; Hotta, Tomio; and Makino, Yoshiyuki, 4,875,607, Cl. 222-643.000.
 Yoda, Takashi; and Watanabe, Tohru, 4,876,223, Cl. 437-228.000.
 Yoshioka, Ritsuo; Ueda, Makoto; Motora, Yoichi; and Nakamura, Mitsuharu, 4,876,060, Cl. 376-333.000.
 Kabushiki Kaisha Yakult Honsha. See—
 Ishiwa, Hiromi; Shibahara, Harue; Mutai, Masahiko; and Tsuchida, Nobuo, 4,876,202, Cl. 435-320.000.
 Kabushiki Kaishi Toshiba. See—
 Iwai, Isamu; Okamoto, Toshio; and Doi, Miwako, 4,876,665, Cl. 364-900.000.
 Kabushikikaisha Riken. See—
 Onuki, Toru; Sagawa, Junichi; Watanabe, Tamotsu; and Yoshimatsu, Toshio, 4,876,158, Cl. 428-565.000.
 Kaczmarek, Richard, to Reliance Comm/Tec Corporation. Central office protector module with alarm indicator. 4,876,626, Cl. 361-119.000.
 Kada, Masumi. See—
 Nakano, Yoshitomo; and Kada, Masumi, 4,876,324, Cl. 528-142.000.
 Kadleck, Richard G.; and Nowak, William W., to Shelby Paper Box Co., The. Carton having a horizontal object holding panel and blank. 4,875,585, Cl. 206-426.000.
 Kadotani, Masanori. See—
 Kato, Eiji; Kadotani, Masanori; Sakaguchi, Yoshikazu; Kubo, Seitoku; Iwatsuki, Kunihiro; Taniguchi, Hiroji; and Harada, Yoshihara, 4,875,665, Cl. 267-170.000.
 Kaempf, Ulrich. See—
 Tullis, Barclay J.; Bailey, John S.; Gunawardena, D. R.; and Kaempf, Ulrich, 4,875,825, Cl. 414-786.000.
 Kagimasa, Toyohiko. See—
 Goto, Shizuo; Kagimasa, Toyohiko; and Yoshizumi, Seiichi, 4,876,646, Cl. 364-200.000.
 Kainuma, Masakuni. See—
 Arizumi, Ryo; Kainuma, Masakuni; Suda, Shoji; Aoki, Toshikazu; Ejiri, Takashi; Kojima, Masao; and Hoshi, Mitsunori, 4,875,500, Cl. 137-596.180.

Kaito, Takashi; and Adachi, Tatsuya, to Seiko Instruments Inc. Process for forming metallic patterned film. 4,876,112, Cl. 427-38.000.
 Kajimoto, Yoshiaki. See—
 Kakimoto, Yukihiro; Sawada, Masayuki; Kajimoto, Yoshiaki; and Kiguchi, Isamu, deceased, 4,875,909, Cl. 55-40.000.
 Kakimoto, Yukihiro; Sawada, Masayuki; Kajimoto, Yoshiaki; and Kiguchi, Isamu, deceased (by Kiguchi, Kuniko, legal representative), to Nippon Shokubai Kasaku Kogyo Co., Ltd.; and Atochem. Method for recovery of ethylene oxide. 4,875,909, Cl. 55-40.000.
 Kalan, Michael D.: See—
 Bittorf, Bradley J.; Flood, Mark A.; Kalan, Michael D.; and Seps, Robert R., 4,876,664, Cl. 364-900.000.
 Kalomiris, Vasilios E. Fiber optic connectors. 4,875,753, Cl. 350-96.200.
 Kamath, Hundi P.; and Leder, Jeffrey C., to Raychem Corporation. Electrical devices comprising conductive polymer compositions. 4,876,440, Cl. 219-548.000.
 Kambe, Yoshiaki; Okuda, Yoshihiko; Hirono, Atsuyuki; Nagaoka, Akira; and Ito, Takayasu, to Matsushita Electric Works, Ltd. Optical sensor with optical interconnection board. 4,876,446, Cl. 250-221.000.
 Kamijo, Eiji. See—
 Ogata, Kiyoshi; Ando, Yasunori; Kamijo, Eiji; and Matsumura, Noriaki, 4,875,284, Cl. 29-830.000.
 Kamimura, Taisuke, to Sharp Kabushiki Kaisha. Developing method using non-magnetic one-component toner and developing unit therefor. 4,876,573, Cl. 355-250.000.
 Kampe, Klaus-Dieter. See—
 Siegel, Herbert; Kampe, Klaus-Dieter; Alpermann, Hans G.; Gerhards, Hermann J.; Usinger, Patricia; Schacht, Ulrich; Leven, Margret; Raether, Wolfgang; Dittmar, Walter; and Sachse, Burkhard, 4,876,354, Cl. 548-341.000.
 Kanai Juyo Hyogo Kogyo Company Limited. See—
 Nakano, Yuzuru, 4,875,333, Cl. 57-125.000.
 Kanber, Hilda; and Chen, James C., to Hughes Aircraft Company. Method for fabricating varactor diodes using ion implantation. 4,876,211, Cl. 437-22.000.
 Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. See—
 Hamakawa, Yoshihiro; Tawada, Yoshihisa; Tsuge, Kazunori; and Izumina, Masanobu, 4,875,943, Cl. 136-244.000.
 Kaneko, Rokusaburo. See—
 Ozawa, Yoshio; Yamamoto, Takashi; Shigaki, Takao; and Kaneko, Rokusaburo, 4,876,568, Cl. 355-56.000.
 Kaneko, Toshio, to Kabushiki Kaisha Asahi Kinzoku Kogyosho. Method and apparatus for manufacturing curved pipe. 4,875,353, Cl. 72-133.000.
 Kaneko, Toyohisa; and Watanuki, Osaki, to International Business Machines Corporation. Speech recognition system. 4,876,720, Cl. 381-43.000.
 Kanezawa, Nobuyoshi, to Uchiya Termostat Co. Waterproof switch. 4,876,422, Cl. 200-302.100.
 Kang, Hyung H., to PPG Industries, Inc. Water-proofing composition. 4,876,152, Cl. 428-447.000.
 Kanojia, Ramesh M.: See—
 Hajos, Zoltan G.; Kanojia, Ramesh M.; and Press, Jeffery B., 4,876,257, Cl. 514-253.000.
 Kanshin, Nikolai N.: See—
 Belykh, Sergei I.; Davydov, Anatoly B.; Moschensky, Anatoly D.; Kanshin, Nikolai N.; Kovalenko, Igor L.; Kirillov, Yuri B.; Osiipov, Gennady I.; and Utyamyshev, Rustam I., 4,875,479, Cl. 128-335.500.
 Kao Corporation. See—
 Hirota, Hajime; Ogino, Hidekazu; Igarashi, Sahoko; and Sotoya, Kohshiro, 4,876,034, Cl. 252-546.000.
 Hori, Kimihiko; Nakamura, Koichi; Kawai, Michio; Motegi, Itsuro; Imokawa, Genji; and Takaishi, Naotake, 4,876,084, Cl. 424-62.000.
 Kaptur, Stephen J. Valve control system for internal combustion engines. 4,875,440, Cl. 123-81.00B.
 Karner, Gary M.: See—
 Taylor, James M.; and Karner, Gary M., 4,875,398, Cl. 83-100.000.
 Karton, Ishai. See—
 Fisher, Abraham; and Karton, Ishai, 4,876,260, Cl. 514-278.000.
 Kartidg Pak Co., The. See—
 Cohrs, Donald E., 4,875,324, Cl. 53-88.000.
 Roberts, Gary F.; and Meeker, Rick A., 4,875,601, Cl. 222-145.000.
 Karube, Yoshiyuki; Hayakawa, Toshimasa; and Yoshida, Yasunari, to Brother Kogyo Kabushiki Kaisha. Printing device having gear connected multiple feed paths. 4,875,790, Cl. 400-605.000.
 Karydas, Athanasios, to Ciba-Geigy Corporation. Use of organic fluorochemical compounds with oleophobic and hydrophobic groups in asphaltic crude oils as viscosity reducing agents. 4,876,018, Cl. 252-8.551.
 Kasai, Toshihiro. See—
 Egawa, Jiro; Yoshida, Naruhito; Kasai, Toshihiro; Nagasawa, Moriya; Ide, Naoki; and Machida, Hironobu, 4,876,560, Cl. 346-153.100.
 Kashima, Takayuki; Sakabe, Akira; and Yamanaka, Yoshifumi, to Hitachi Seiko, Ltd. Inverter controlled-type power source for arc welding. 4,876,433, Cl. 219-130.510.
 Kaspro, Robert F.: See—
 Trousdell, Edmund D.; and Kaspro, Robert F., 4,875,830, Cl. 416-215.000.
 Kasugai, Heki, to Mitsubishi Jukogyo Kabushiki Kaisha. Rotary jack assembly for a crane. 4,875,415, Cl. 104-35.000.
 Katagiri, Kazuharu. See—
 Yoshinaga, Kazuo; Katagiri, Kazuharu; Kobayashi, Toyoko; and Shinjo, Kenji, 4,876,027, Cl. 252-299.650.

Kataoka, Hiroshi, to Kataoka Machine Co., Ltd. Web dividing and rewinding machine and method for removing rewind rolls therefrom. 4,875,632, Cl. 242-56.200.
 Kataoka Machine Co., Ltd.: See—
 Kataoka, Hiroshi, 4,875,632, Cl. 242-56.200.
 Katayama, Akihiro. See—
 Ohsawa, Hidefumi; Katayama, Akihiro; Hosokawa, Hiroshi; Sunohara, Izuru; and Yoshimoto, Masahiko, 4,876,610, Cl. 358-443.000.
 Katchalski-Katzir, Ephraim. See—
 Hollander, Zeev; Salomon, Beka; and Katchalski-Katzir, Ephraim, 4,876,191, Cl. 435-7.000.
 Kato, Chujo; and Kuroda, Kazuyuki, to Osaka Yuki Kagaku Kogyo Kabushiki Kaisha. Photochromic-electrochromic intercalation compound. 4,875,762, Cl. 350-357.000.
 Kato, Eiji; Kadotani, Masanori; Sakaguchi, Yoshikazu; Kubo, Seitoku; Iwatsuki, Kunihiro; Taniguchi, Hiroji; and Harada, Yoshihara, to Aisin AW Co. Ltd.; and Toyota Jidosha Kabushiki Kaisha. Accumulator. 4,875,665, Cl. 267-170.000.
 Kato, Fumiyasu. See—
 Mochizuki, Seiji; and Kato, Fumiyasu, 4,875,633, Cl. 242-58.300.
 Kato, Kazumi. See—
 Ishii, Yoh; Abe, Masami; Harada, Yuhzoh; Takasugi, Atsumi; and Kato, Kazumi, 4,875,519, Cl. 164-465.000.
 Katoh, Masaie. See—
 Hayashi, Tsutomu; Katoh, Masaie; Yakigaya, Nobuyuki; Nakamura, Kazuhiko; Yoshida, Yoshihiro; Nakajima, Yoshihiro; Saito, Mitsuru; and Kobayashi, Aki, 4,875,390, Cl. 74-731.000.
 Katori, Tatsuhiko. See—
 Hasegawa, Hiroshi; Shioiri, Noriaki; Narita, Tadashi; and Katori, Tatsuhiko, 4,876,359, Cl. 548-533.000.
 Katsumata, Azusa; and Satomura, Shigeyuki, to Sony Corporation. Apparatus for reproducing a digital signal. 4,876,616, Cl. 360-53.000.
 Katsuyama, Yoshiaki. See—
 Wada, Toshiaki; Katsuyama, Yoshiaki; and Nakaoka, Junichi, 4,875,987, Cl. 204-192.150.
 Katz, Ira. See—
 Wilson, Richard A.; Butler, Jerry F.; Withycombe, Donald; Mookherjee, Braja D.; Katz, Ira; and Schrankel, Kenneth R., 4,876,087, Cl. 424-84.000.
 Katzin, Leonard. See—
 Brook, Arthur H.; Carian, Peter J.; Katzin, Leonard; Landsinger, Edmund E.; Moore, James D.; Rotter, Leah D.; and Schreiber, Stanley, 4,875,469, Cl. 128-26.000.
 Kaukenen, Joseph Y.: See—
 Hsu, Kevin; Rao, Srinivas T.; and Kaukenen, Joseph Y., 4,875,969, Cl. 156-633.000.
 Kaushik, Pushpendar K.: See—
 Singh, Vir B.; Moorthy, Kanniah N. G. K.; Kaushik, Pushpendar K.; and Sankarasub-Ramanian, Hariharan, 4,875,900, Cl. 8-94.270.
 Kautt, Jean-Jacques, to Ferco International. Covering element for multilock fitting fastened to a door, window or the like. 4,875,727, Cl. 292-337.000.
 Kawabata, Akira; Terasaki, Yoshikazu; Inoue, Takashi; and Takita, Hidenori, to Mitsubishi Denki Kabushiki Kaisha. Deflection yoke for a color cathode ray tube. 4,876,479, Cl. 313-440.000.
 Kawada, Mikio. See—
 Otera, Junzo; Mandai, Tadakatsu; and Kawada, Mikio, 4,876,400, Cl. 568-824.000.
 Kawaguchi, Kiyoshi. See—
 Yamada, Muneki; and Kawaguchi, Kiyoshi, 4,876,052, Cl. 264-148.000.
 Kawai, Makoto. See—
 Yoshikawa, Haruhiko; and Kawai, Makoto, 4,875,450, Cl. 123-425.000.
 Kawai, Michio. See—
 Hori, Kimihiko; Nakamura, Koichi; Kawai, Michio; Motegi, Itsuro; Imokawa, Genji; and Takaishi, Naotake, 4,876,084, Cl. 424-62.000.
 Kawai, Taneichi; Yasuda, Tomio; and Aoki, Koji, to Aisin Seiki Kabushikikaisha. Harm preventing apparatus for vehicle. 4,876,649, Cl. 364-424.050.
 Kawai, Toshikazu. See—
 Kondo, Takeshi; Kawai, Toshikazu; and Oshio, Hideki, 4,876,404, Cl. 570-145.000.
 Nishimura, Yasunobu; and Kawai, Toshikazu, 4,876,382, Cl. 560-109.000.
 Kawamoto, Mineo. See—
 Akahoshi, Haruo; Murakami, Kanji; Kawamoto, Mineo; Tadokoro, Akio; and Yoshimura, Toyofusa, 4,876,177, Cl. 430-313.000.
 Kawamura, Kazushige, to Fuji Photo Film Co., Ltd. Image signal processing method and apparatus. 4,876,734, Cl. 382-54.000.
 Kawano, Ikuo; Takiguchi, Tsuyoshi; Kimura, Norihisa; Yanagisawa, Yohei; Ashimi, Tokuji; and Yoshino, Hiroyuki, to Governor of Gunma-ken; and Nakamura Co., Ltd. Process for making meat products containing a konjac mannan gel. 4,876,103, Cl. 426-574.000.
 Kawano, Toshihiko. See—
 Hisanaga, Yorisato; Shimokawa, Kazuhiro; Kawano, Toshihiko; Suita, Yasunori; and Yamashita, Tsuneo, 4,876,245, Cl. 514-29.000.
 Kawasaki Jukogyo Kabushiki Kaisha. See—
 Soga, Katumasa; and Matsutani, Kazuo, 4,875,426, Cl. 114-123.000.
 Kawasaki, Ryoji. See—
 Saegusa, Noboru; Hara, Toshihiro; Kawasaki, Ryoji; Tate, Kazuyuki; Huse, Syoji; and Ono, Koji, 4,876,708, Cl. 379-61.000.

Kawasaki, Yoshinobu. See—
 Fuse, Genzo; Miwa, Hiroshi; and Kawasaki, Yoshinobu, 4,875,823, Cl. 414-735.000.
 Kawasoe, Tatsuro. See—
 Yamane, Akio; Kawasoe, Tatsuro; Tsukumo, Noriko; and Miyoshi, Kenichi, 4,876,335, Cl. 536-27.000.
 Kawata, Ken. See—
 Ozaki, Hiroyuki; and Kawata, Ken, 4,876,184, Cl. 430-607.000.
 Kawato, Humio. See—
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Kobatake, Hiroyuki; and Jinbo, Toshikatsu, to NEC Corporation. Control circuit for multipurpose input terminal, 4,876,462, Cl. 307-246.000.

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Itaya, Keiji; and Kohayakawa, Hiromasa, 4,876,576, Cl. 355-285.000.

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Kohler, Rudolf: See—
Leitz, Hermann; Krayer, Erich; and Kohler, Rudolf, 4,875,564, Cl. 192-45.100.

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Kojima, Masao: See—
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Kolb, Walter, to Wolf-Gerate GmbH. Battery operated motor drive for small appliances, 4,876,490, Cl. 318-17.000.

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Park, Ho J.; Rhim, Moo S.; Kim, Hak M.; Kim, Du H.; Yoo, Seog C.; Kim, Sang H.; Park, Sa Ng B.; Han, Ink S.; Park, Jong T.; and Kim, Si M., 4,876,040, Cl. 264-14.000.

Kolvites, Albert: See—
Welch, Robert J.; Kolvites, Albert; and White, Robert M., 4,875,696, Cl. 280-47.340.

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Kondo, Takeshi; Kawai, Toshikazu; and Oshio, Hideki, to Central Glass Company, Limited. Preparation of dichlorotrifluoromethyltoluenes including novel isomers, 4,876,404, Cl. 307-465.000.

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Tomosada, Kenji; Kondo, Toshiro; Yamamoto, Tadanobu; and Hashino, Hiroshi, 4,875,704, Cl. 280-695.000.

Kondou, Harufusa; and Kuranaga, Hiroshi, to Mitsubishi Denki Kabushiki Kaisha. Programmable logic array having a changeable logic structure, 4,876,466, Cl. 307-465.000.

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Regel, Erik; Bockmann, Klaus; Buchel, Karl H.; Lurssen, Klaus; Brandes, Wilhelm; Konze, Jorg; and Reinecke, Paul, 4,875,928, Cl. 71-92.000.

Kopp, Clinton V.; Roberts, Dennis; Billoft, Bruce G.; and White, Victor, to Memtec Limited. Hollow fibre filter cartridge and header, 4,876,012, Cl. 210-644.000.

Koppmann, Bardo: See—
Mittmeier, Norbert; and Koppmann, Bardo, 4,876,522, Cl. 335-193.000.

Koran, Matthew H.: See—
Frantz, Leo R.; Bauer, Alfred; Koran, Matthew H.; and Becker, Jack, 4,876,416, Cl. 200-11.000.

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Siems, Wolfgang, 4,875,494, Cl. 131-84.100.

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Kosi, Cesar U., to Westinghouse Electric Corp. Radial seal, 4,875,691, Cl. 277-147.000.

Kosugi, Isao: See—
Mori, Kei; and Kosugi, Isao, 4,875,749, Cl. 350-96.180.

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Koury, Daniel N., to Motorola Inc. Process for fabricating complementary semiconductor devices having pedestal structures, 4,876,212, Cl. 437-34.000.

Kovalenko, Igor L.: See—
Belykh, Sergei I.; Davydov, Anatoly B.; Moschensky, Anatoly D.; Kanshin, Nikolai N.; Kovalenko, Igor L.; Kirillov, Jury B.; Osipov, Gennady I.; and Utyamyshev, Rustam I., 4,875,479, Cl. 128-335.500.

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Koyama, Toshihide, to Mazda Motor Corporation. Automobile rear suspension structure, 4,875,705, Cl. 280-697.000.

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Amikura, Takashi; Fujiwara, Akihiro; Toyama, Masamichi; Ueda, Kouichi; and Kozuki, Susumu, 4,876,564, Cl. 354-400.000.

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Kramer, David W., to A. O. Smith Corporation. High efficiency submersible chamber water heater, 4,875,465, Cl. 126-391.000.

Kramer, Felix: See—
Becker, Anton; and Kramer, Felix, 4,875,382, Cl. 74-84.000.

Kramer, Karl-Martin; and Dorenkamp, Richard, to Volkswagen AG. Arrangement for prevention of troublesome load change shocks in an internal combustion engine serving to propel a vehicle, 4,875,449, Cl. 123-400.000.

Kramer, Manfred: See—
Heger, Werner; Kramer, Manfred; and Schlossarczyk, Heinrich, 4,875,503, Cl. 137-856.000.

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Wetch, Stephen B.; Goris, Gregory A.; and Krasnov, Igor, 4,875,529, Cl. 173-163.000.

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Krayer, Erich: See—
Leitz, Hermann; Krayer, Erich; and Kohler, Rudolf, 4,875,564, Cl. 192-45.100.

Kraz, Vladimir: See—
Brint, Gary T.; Bungardt, Gabriele; Gedecke, Jerel C.; Harris, Robert L.; and Kraz, Vladimir, 4,876,712, Cl. 379-387.000.

Kreft, Anthony F., III: See—
Musser, John H.; Kreft, Anthony F., III; and Bender, Reinhold H. W., 4,876,346, Cl. 546-172.000.

Krenner, Manfred: See—
Hagin, Faust; Drewitz, Hans; and Krenner, Manfred, 4,875,557, Cl. 188-79.550.

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Kristof, Miklos: See—
Csajtai, Geza; Doleschall, Sandor; Milley, Gyula; Kristof, Miklos; Paul, Tibor; Racz, Daniel; and Toth, Bela, 4,875,809, Cl. 405-263.000.

Kriz, Frantisek: See—
Rajsigl, Zdenek; and Kriz, Frantisek, 4,875,334, Cl. 57-406.000.

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Kroeger, Michael K.; Longo, John M.; Steiger, Ronald P.; and Leung, Peter K., to Exxon Production Research Company. Method for rapidly determining the swelling-clay content in shales and shaly sandstone formations by high-frequency dielectric constant measurements, 4,876,512, Cl. 324-376.000.

Krom, Knute R. Combined crayon and coloring book holder, 4,875,707, Cl. 281-30.000.

Krug, John A.: See—
Coulborn, John W.; and Krug, John A., 4,875,417, Cl. 105-248.000.

Kruger, Horst: See—
Gschwendner, Alois; Kruger, Horst; and Schleifer, Bernhard, 4,875,827, Cl. 415-111.000.

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Knobloch, Osbert; and Muller, Manfred, 4,875,628, Cl. 241-24.000.

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Bosse, Gerhard R.; Lienow, Michael; Spiegel, Bernd; and Kruse, Bernd O., 4,875,652, Cl. 248-311.200.

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Kruzel, Bryon S.: See—
Donnay, James A.; Jensen, Van E., Jr.; and Kruzel, Bryon S., 4,875,895, Cl. 493-117.000.

Kubein-Messenburg, Dietmar; Meyer, Georg; and Bucking, Wolfram. Method for reconstruction of teeth in an upper jaw, 4,875,857, Cl. 433-56.000.

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Ewert, Warren M.; Kubicek, Donald H.; and Drake, Charles A., 4,876,410, Cl. 585-516.000.

Kubo, Jun, to Nissan Motor Company, Limited. Anti-skid automotive brake control system including wheel deceleration calculation with shorter lag-time and method for performing calculation, 4,876,650, Cl. 364-426.020.

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Kato, Eiji; Kadotani, Masanori; Sakaguchi, Yoshikazu; Kubo, Seitoku; Iwatsuki, Kunihiro; Taniguchi, Hiroji; and Harada, Yoshihara, 4,875,665, Cl. 267-170.000.

Kubo, Takahiro: See—
Tajima, Hatsuho; Kubo, Takahiro; and Tajika, Hiroshi, 4,876,574, Cl. 355-253.000.

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Fournier, Bernard, 4,876,418, Cl. 200-50.00C.

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Holtermann, Henri, 4,875,899, Cl. 604-333.000.

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Brook, Arthur H.; Carian, Peter J.; Katzin, Leonard; Landsinger, Edmund E.; Moore, James D.; Rotter, Leah D.; and Schreiber, Stanley, 4,875,469, Cl. 128-26.000.

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Lapadakis, Theodore. Paper tape roll control unit. 4,875,634, Cl. 242-67.30R.

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Les Plaza, Carlos, to Codespi Corporation. Device for correcting deformities of the spine. 4,875,471, Cl. 128-69.000.

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Kamath, Hundi P.; and Leder, Jeffrey C., 4,876,440, Cl. 219-548.000.

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Lee, Garrett, to University of California, Regents of. Catheter assem-bly. 4,875,897, Cl. 604-283.000.

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Lee, Lawrence L. Guided hammer. 4,875,612, Cl. 227-147.000.

Lee, Leonard E., to Mid-Continent Pipe & Supply Company, Inc. Plastic pipe with locking integral end connection. 4,875,714, Cl. 285-86.000.

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Mabboux, Michel; De Marchi, Jean-Louis; and Legon, Fabrice, 4,875,299, Cl. 36-117.000.

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Leitch, Albert J.: See—
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Leningradskoe Proizvodstvennoe Elektromashinostroitelnoe Obiedine-nie "Electrosila" Imeni S.M. Kirova: See—
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Lacour, Gilles, 4,876,471, Cl. 310-105.000.

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Lentz, William P., deceased, 4,875,917, Cl. 65-3.110.

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Krusse, Lawrence I.; Leonard, Thomas B.; and Ross, Stephen T., 4,876,266, Cl. 514-392.000.

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Lester, Gene D.; Morgan, Richard A.; Harms, Harold B.; Barrett, John P.; Chang, Taung K.; Cushing, Donald S.; Broo, Richard F.; and Hood, William M., to General Electric Company. Electronically commutated motor driven apparatus including an impeller in a hous-ing driven by a stator on the housing. 4,876,492, Cl. 318-254.000.

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Kroeger, Michael K.; Longo, John M.; Steiger, Ronald P.; and Leung, Peter K., 4,876,512, Cl. 324-376.000.

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Levavi, Shmuel. Human powered vehicles and mechanisms particularly useful therein. 4,875,699, Cl. 280-236.000.

Leven, Margret: See—
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Lias, Roger J.: See—
Green, Monika J.; and Lias, Roger J., 4,876,205, Cl. 436-66.000.

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Supra, Carl F. W., 4,876,001, Cl. 210-123.000.

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Van Elderen, Daniel N.; and Lichac, Gerald J., 4,875,459, Cl. 124-49.000.

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Liepins, Raimond; Jorgensen, Betty S.; and Liepins, Leila Z., 4,876,032, Cl. 252-500.000.

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Liggett, Louis: See—
McGuire, Michael; DiGiacomo, Ralph; Palmer, Marcia; and Lig-gett, Louis, 4,876,104, Cl. 426-57.000.

Light, Greta G.: See—
Osterhout, Ralph F.; Howard, Paul L.; and Light, Greta G., 4,876,632, Cl. 362-183.000.

Ligi, Joseph J.: See—
Piotrowski, Andrzej M.; and Ligi, Joseph J., 4,875,941, Cl. 134-11.000.

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Nowak, Deanne M.; and Lin, Henry C., 4,876,387, Cl. 562-493.000.

Lin, Trong-Goang; Ho, Ling-Wen; Ko, An-Nan; and Perng, Yeong-Ju, to China Petrochemical Development Corporation. Preparation of ortho-alkylated phenols in the presence of a catalyst prepared by co-precipitation process. 4,876,398, Cl. 568-804.000.

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Arvidsson, Folke L. E.; Carlsson, Per A. E.; Hacksell, Uli A.; Hjorth, John S. M.; Johansson, Anette M.; and Lindberg, Per L., 4,876,284, Cl. 514-657.000.

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Kliem, Erhard; Weber, Guenter; and Kunz, Alfred, 4,876,079, Cl. 423-578.00R.

Lindenmeier, Karl-Heinz G.; and Flachenecker, Gerhard, to U.S. Philips Corporation. Signal diversity arrangement for mobile recep-tion. 4,876,743, Cl. 455-133.000.

Lindstrom, Bjorn T.: See—
Johansson, Jan A.; Jonsson, Jan I.; and Lindstrom, Bjorn T., 4,875,555, Cl. 187-9.00R.

Linebarger, Randolph S., to Rockwell International Corporation. Velocimeter for a printing press web. 4,875,769, Cl. 356-28.000.

L'Institut De L'Amiante: See—
Dunnigan, Jacques; and Menard, Hugues, 4,875,910, Cl. 55-74.000.

Lippard, Ernest R., III: See—
 Moran, Kevin E.; Smith, Michael L.; and Lippard, Ernest R., III, 4,875,780, Cl. 356-446.000.
 Litovitz, Theodore A.: See—
 Barkatt, Aaron, 4,876,232, Cl. 502-417.000.
 Little, D. Dawn: See—
 Luttmer, Joseph D.; and Little, D. Dawn, 4,876,222, Cl. 437-225.000.
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 Liu, James J.: See—
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 Lloyd, Clarke B. System and method for implementing and administering a mortgage plan, 4,876,648, Cl. 364-408.000.
 Lo, Frederick Y.; Nowlin, Thomas E.; and Wu, Margaret M., to Mobil Oil Corporation. Preparation of alpha-olefin polymers of relatively narrow molecular weight distribution, 4,876,321, Cl. 526-129.000.
 Lo, Peter Y. K.; and Ziemelis, Maria J., to Dow Corning Corporation. Process for preparing silicone microparticles cured by a Michael addition reaction, 4,876,039, Cl. 264-4.700.
 Lockheed Corporation: See—
 Franco, Maurice, 4,876,547, Cl. 342-160.000.
 Rogers, Philip L.; and Rogers, Milton, 4,875,770, Cl. 356-28.500.
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 Davis, Cecil J.; Matthews, Robert T.; Loewenstein, Lee M.; Abernathy, Joe V.; and Wooldridge, Timothy A., 4,875,989, Cl. 204-298.000.
 Logan, John R.; and Wickens, Donald C. Molded vent, 4,875,317, Cl. 52-208.000.
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 Gelardi, Anthony; Lowry, Alan; and Lovecky, Craig, 4,875,743, Cl. 312-13.000.
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 Lummus Crest, Inc.: See—
 Van Driesen, Roger P.; Adams, William R.; Baldassarri, Mario; Caspers, John; and Trimble, Harold, 4,875,995, Cl. 208-152.000.
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 Britt, Ronald H., 4,876,730, Cl. 382-37.000.
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 Estes, Marvin F.; and Lungershausen, Arnold W., 4,875,756, Cl. 350-96.200.
 Lunk, Hans E.: See—
 Mehan, Ashok K.; and Lunk, Hans E., 4,876,116, Cl. 427-118.000.
 Lurssen, Klaus: See—
 Regel, Erik; Bockmann, Klaus; Buchel, Karl H.; Lurssen, Klaus; Brandes, Wilhelm; Konze, Jorg; and Reinecke, Paul, 4,875,928, Cl. 71-92.000.
 Luscombe, Brian M.: See—
 Hewett, Richard H.; and Luscombe, Brian M., 4,875,925, Cl. 71-94.000.
 Lutron Electronics Co. Inc.: See—
 Luchaco, David G.; and Houg, Charles C., 4,876,498, Cl. 323-300.000.
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 Zittel, David R., 4,875,344, Cl. 62-381.000.
 Lyle, Robert L., to North American Philips Corporation. Duty cycle controller for horizontal synchronization signals in a television receiver, 4,876,463, Cl. 307-265.000.
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 Shiraki, Manabu; and Hirano, Norimitsu, 4,876,472, Cl. 30-198.000.
 M. Manufacturing Services, Inc.: See—
 Mikesell, Jerome J., 4,875,591, Cl. 211-69.100.
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 Macedo, Pedro B.: See—
 Barkatt, Aaron, 4,876,232, Cl. 502-417.000.
 MacGregor, Darlene M.: See—
 MacGregor, Robert J.; MacGregor, Darlene M.; and Lueck, Arnold, 4,876,099, Cl. 426-242.000.
 MacGregor, Francis W., to Quad Research, Inc. Surface treating device, 4,875,246, Cl. 15-98.000.
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 MacGregor, Robert J.; MacGregor, Darlene M.; and Lueck, Arnold, 4,876,099, Cl. 426-242.000.
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 Egawa, Jiro; Yoshida, Naruhito; Kasai, Toshihiro; Nagasawa, Moriya; Ide, Naoki; and Machida, Hironobu, 4,876,560, Cl. 346-153.100.
 Machida, Minoru: See—
 Miyakawa, Yasuhiro; and Machida, Minoru, 4,875,939, Cl. 123-271.000.
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 MacLeod, Richard J.; and Schiedegger, Charles E., to Tapco Products Company, Inc. Plastic building product, 4,875,318, Cl. 52-211.000.
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 Maemoto, Kazuo; Iwasaki, Masayuki; Maeda, Minoru; and Aotani, Yoshimasa, 4,876,173, Cl. 430-271.000.
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 Chado, Hiroyuki; Maeda, Tatsuo; and Nakano, Mitsuo, 4,875,733, Cl. 296-195.000.
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 Piccirilli, Alessandro, 4,876,142, Cl. 428-224.000.
 Magline, Inc.: See—
 Monroe, George E., 4,875,700, Cl. 280-414.100.
 Magna International Inc.: See—
 Gruber, Herbert, 4,875,724, Cl. 292-216.000.
 Thau, Wolfgang, 4,875,726, Cl. 292-337.000.
 Magnavox Government and Industrial Electronics Company: See—
 Richeson, William E.; and Erickson, Frederick L., 4,875,441, Cl. 123-90.130.
 Maignan, Jean: See—
 Lang, Gerard; Maignan, Jean; Forestier, Serge; Restle, Serge; Lagrange, Alain; and Shroot, Braham, 4,876,381, Cl. 560-56.000.
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 Maki, Chihiro: See—
 Shinomiya, Tsutomu; Yoshino, Eiichi; Maki, Chihiro; Tojima, Hitoshi; Izai, Sadamu; Nakata, Akiro; and Tamura, Michiya, 4,875,960, Cl. 156-203.000.
 Makimoto, Mitsuo: See—
 Endo, Haruyoshi; Misaizu, Kouei; and Makimoto, Mitsuo, 4,876,744, Cl. 455-326.000.
 Makino, Masahiro: See—
 Endo, Katsuo; and Makino, Masahiro, 4,875,641, Cl. 242-199.000.
 Makino, Yoshiyuki: See—
 Torita, Fumio; Ikeda, Naotaka; Nakamura, Kimihiko; Matsuo, Katsuharu; Hotta, Tomio; and Makino, Yoshiyuki, 4,875,607, Cl. 222-643.000.
 Makishima, Reichi: See—
 Sasa, Takeya; Kobayashi, Yoshikazu; and Makishima, Reichi, 4,875,720, Cl. 285-249.000.
 Malhotra, Shadi L.: See—
 Gruber, Robert J.; Yourd, Raymond A., III; Malhotra, Shadi L.; Nelson, Robert A.; Fox, Carol A.; and Hoffend, Thomas R., 4,876,169, Cl. 430-110.000.
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 Frazier, Marvin E.; Mallavia, Louis P.; Baca, Oswald G.; and Samuel, James E., 4,876,186, Cl. 435-6.000.

Mallo, Paul: See—
 Candau, Sauveur; Leroy, Maurice; Brunette, Jean-Pierre; Mallo, Paul; Loret, Jean-Francois; and Waton, Gilles, 4,876,036, Cl. 252-637.000.
 Malmberg, Rolf: See—
 Holm, Sune, deceased; Malmberg, Rolf; and Svensson, Kjell, 4,876,100, Cl. 426-491.000.
 Malpass, Dennis B.; Triplett, Kelly B.; and Piotrowski, Andrzej M., to Texas Alkyls, Inc. Organoaluminum coupling agents and filled polymer compositions thereof, 4,876,318, Cl. 525-446.000.
 Malpass, Robert L. H.: See—
 Browning, Nigel; Fry, Arthur C.; Malpass, Robert L. H.; Matthews, Brian; and Peters, Michael S., 4,875,646, Cl. 244-190.000.
 Malson, William S., to Water Systems Development Corporation. Method and apparatus for producing ultrapure water, 4,876,014, Cl. 210-668.000.
 Mamiya, Toshiharu, to Canon Kabushiki Kaisha. Pump device and an ink jet recording apparatus having the pump device, 4,876,558, Cl. 346-140.00R.
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 Hagin, Faust; Drewitz, Hans; and Krenner, Manfred, 4,875,557, Cl. 188-79.550.
 Mana, Michael L., to Atlantic Richfield Company. Consolidated propellant pack for producing formations, 4,875,525, Cl. 166-280.000.
 Mandai, Tadakatsu: See—
 Otera, Junzo; Mandai, Tadakatsu; and Kawada, Mikio, 4,876,400, Cl. 568-824.000.
 Mangir, Metin S.: See—
 Lucero, David J.; Parazzoli, Claudio G.; and Mangir, Metin S., 4,876,693, Cl. 372-82.000.
 Mannesmann AG: See—
 Grönsfeld, Josef; Jacobi, Hatto; and Baethmann, Hans-Juergen, 4,875,371, Cl. 73-598.000.
 Manning, Frank: See—
 DeWeert, William R.; and Manning, Frank, 4,875,303, Cl. 42-90.000.
 Manuel, Mark: See—
 Compeau, David E.; Manuel, Mark; and Rogers, Lloyd W., Jr., 4,875,723, Cl. 292-201.000.
 Manville Corporation: See—
 Craighead, Jimmy R., 4,875,323, Cl. 53-48.000.
 Marcellis, Daniel H.: See—
 Donahue, Raymond J.; Cleary, Terrance M.; Hauenstein, Frederick M.; and Marcellis, Daniel H., 4,875,517, Cl. 164-34.000.
 Maresca, Louis M.: See—
 Blackmon, Kenneth P.; Clagett, Donald C.; Fox, Daniel W.; Maresca, Louis M.; and Shafer, Sheldon J., 4,876,317, Cl. 525-433.000.
 Margerum, Edwin O.; and Strong, Russell W., to Ford New Holland, Inc. Feed plate assembly for axial flow combine, 4,875,890, Cl. 460-68.000.
 Marino, Philip F.; and Vandenberg, Donald E., to Eastman Kodak Company. Assembly for correction of distortions of a mirror, 4,875,764, Cl. 350-611.000.
 Marius, Hert, to Societe Chimique Des Charbonnages S.A. Liquid mixtures based on ethylene polymers, a process for producing them and a coating or bonding process in which they are used, 4,875,964, Cl. 156-327.000.
 Mark, John G.: See—
 Tazartes, Daniel A.; Mark, John G.; and Matthews, Anthony, 4,875,774, Cl. 356-350.000.
 Marken, Robert E. Swivel connector for preventing kinking of flexible medical hoses, 4,875,718, Cl. 285-175.000.
 Marks, George R. Woven-wire gate lock, 4,875,725, Cl. 292-244.000.
 Markussen, Erik K., to Novo Industri A/S. Method for production of an enzyme granulate, 4,876,198, Cl. 435-183.000.
 Marley Company, The: See—
 Hill, Wayne E.; and McEachern, Dennis, 4,876,530, Cl. 340-605.000.
 Marocco, Norbert. Venetian blind control, 4,875,516, Cl. 160-178.100.
 Marrett, Kenneth E., Sr.: See—
 Martin, Richard W.; Fisher, John L.; Fortenberry, William R.; Schlake, Randall L.; Dornbrock, Ronald F.; Richerson, James D.; and Marrett, Kenneth E., Sr., 4,875,277, Cl. 29-606.000.
 Marriott, Joe E.: See—
 Kjosness, David P.; and Marriott, Joe E., 4,876,520, Cl. 333-12.000.
 Marsh, Stephan: See—
 Marsh, Stephen A.; and Young, Robert W., 4,875,358, Cl. 73-40.000.
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 Marshall, Garland R.; and Moore, Michael L., to Smithkline Beckman Corporation. Vasopressin compounds, 4,876,243, Cl. 514-11.000.
 Marshall, John D.; and McLain, Thomas N., to Schlumberger Industries, Inc. Reverse osmosis water purification unit, 4,876,002, Cl. 210-136.000.
 Martin, Anthony: See—
 Lacey, Paul D.; and Martin, Anthony, 4,875,589, Cl. 209-534.000.
 Martin, Gregory G.; and Nook, Thomas J., to Harbor Industries. Foldable display, 4,875,590, Cl. 211-55.000.
 Martin Marietta Energy Systems, Inc.: See—
 Kerr, Howard T.; Buchanan, Michael E.; and Valentine, Kenneth H., 4,876,721, Cl. 358-56.000.
 Martin, Richard W.; Fisher, John L.; Fortenberry, William R.; Schlake, Randall L.; Dornbrock, Ronald F.; Richerson, James D.; and Marrett, Kenneth E., Sr., to Kuhlman Corporation. Formed metal core blocking method, 4,875,277, Cl. 29-606.000.

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Maruyama Mfg. Co. Inc.: See—
Tojo, Nobuo, 4,875,690, Cl. 277-12.000.

Marzullo, Joseph H., to Pitney Bowes Inc. Apparatus for folding and sealing documents. 4,875,965, Cl. 156-442.100.

Mase, Akira: See—
Yamazaki, Shunpei; and Mase, Akira, 4,875,378, Cl. 73-862.040.

Masheff, Michael S., to E-Systems, Inc. Discrete fourier transform direction finding apparatus. 4,876,549, Cl. 342-417.000.

Mashkovsky, Mikhail D.: See—
Granik, Vladimir G.; Stezhko, Tatyana V.; Glushkov, Robert G.; Mashkovsky, Mikhail D.; Roschina, Lidia F.; Polezhaeva, Antonina I.; Parimbetova, Roza B.; Bobkov, Yuri G.; Losev, Alexander S.; and Ivanova, Irina A., 4,876,360, Cl. 548-550.000.

Massa, Ted R.: See—
Powell, John W.; and Massa, Ted R., 4,875,365, Cl. 73-104.000.

Masuda, Etsuro: See—
Yabe, Akira; Ouchi, Akihiko; Moriyama, Hiroshi; and Masuda, Etsuro, 4,875,986, Cl. 204-157.600.

Masuda, Shigeo; and Hosoya, Toshifumi, to Sumitomo Electric Industries, Ltd. Plastic-coated optical transmission fiber and an estimating method thereof. 4,875,758, Cl. 350-96.300.

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Matoba, Tsukasa: See—
Saito, Mitsuo; Matoba, Tsukasa; and Okamoto, Toshio, 4,876,657, Cl. 364-521.000.

Matsuda, Shuichi: See—
Watakabe, Yaichiro; Okamoto, Tatsuo; and Matsuda, Shuichi, 4,876,164, Cl. 430-5.000.

Matsumoto, Akira: See—
Naruo, Kyoichi; Ohtani, Sumio; Etoh, Masahiro; Tsuruta, Masao; Moriya, Ikuro; Ishiguro, Masanori; and Matsumoto, Akira, 4,876,007, Cl. 210-339.000.

Matsumoto, Makoto: See—
Funahashi, Yuichi; Watanabe, Junichiro; Takeda, Kiyoshi; and Matsumoto, Makoto, 4,876,363, Cl. 549-215.000.

Matsumoto, Yasuo; Murakami, Kazunori; Ikumi, Tomonori; and Iwafune, Yasuo, to Tokyo Electric Co., Ltd. Polygon mirror. 4,875,748, Cl. 350-6.800.

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Matsumura, Hideki: See—
Okuda, Akihiko; Totake, Yukinori; and Matsumura, Hideki, 4,876,407, Cl. 570-239.000.

Matsumura, Noriaki: See—
Ogata, Kiyoshi; Ando, Yasunori; Kamijo, Eiji; and Matsumura, Noriaki, 4,875,284, Cl. 29-830.000.

Matsuoka, Katsuharu: See—
Torita, Fumio; Ikeda, Naotaka; Nakamura, Kimihiko; Matsuoka, Katsuharu; Hotta, Tomio; and Makino, Yoshiyuki, 4,875,607, Cl. 222-643.000.

Matsuoka, Katsumi: See—
Saeki, Keiso; Sano, Shojiro; Matsuoka, Katsumi; Takashima, Masanobu; and Iwakura, Ken, 4,876,233, Cl. 503-209.000.

Matsushita Elec. Industries Co. Ltd.: See—
Murakami, Mutsuaki, 4,876,077, Cl. 423-448.000.

Matsushita Electric Industrial Co., Ltd.: See—
Mihara, Makoto; Inoue, Masanobu; Ohji, Kenzo; and Ito, Shuji, 4,875,533, Cl. 177-144.000.

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Endo, Haruyoshi; Misaizu, Kouei; and Makimoto, Mitsuo, 4,876,744, Cl. 455-326.000.

Hatada, Kenzo, 4,876,221, Cl. 437-212.000.

Mukai, Toshiharu, 4,876,679, Cl. 369-44.000.

Ogawa, Kazufumi, 4,875,759, Cl. 350-96.340.

Matsushita Electric Works, Ltd.: See—
Kambe, Yoshiaki; Okuda, Yoshihiko; Hirono, Atsuyuki; Nagaoka, Akira; and Ito, Takayasu, 4,876,446, Cl. 250-221.000.

Matsutani, Kazuo: See—
Soga, Katumasa; and Matsutani, Kazuo, 4,875,426, Cl. 114-123.000.

Matsutani, Kinya, to Kabushiki Kaisha Toshiba. Magnetic resonance system. 4,875,485, Cl. 128-653.000.

Matsuura, Hiromichi: See—
Yoshida, Susumu; Nakagawa, Shizutoshi; Ushiroguchi, Tsuyoshi; Matsuura, Hiromichi; and Yazaki, Akira, 4,876,281, Cl. 514-517.000.

Matsuzawa, Masafumi; Hokari, Hiroshi; Kusano, Shoji; Miyazawa, Takeshige; and Toyokawa, Yasufumi. Cyclohexane derivatives having plant growth regulating activities and applications thereof. 4,875,930, Cl. 71-106.000.

Mattei, Riccardo; and Ghini, Franco, to G. D. Societa' Per Azioni. Device for feeding streams of tobacco on to a cigarette manufacturing machine. 4,875,493, Cl. 131-84.100.

Matthews, Anthony: See—
Tazartes, Daniel A.; Mark, John G.; and Matthews, Anthony, 4,875,774, Cl. 356-350.000.

Matthews, Brian: See—
Browning, Nigel; Fry, Arthur C.; Malpass, Robert L. H.; Matthews, Brian; and Peters, Michaels S., 4,875,646, Cl. 244-190.000.

Matthews, Robert T.: See—
Davis, Cecil J.; Matthews, Robert T.; Loewenstein, Lee M.; Abernathy, Joe V.; and Wooldridge, Timothy A., 4,875,989, Cl. 204-298.000.

Matsuyama, Moritake: See—
Imoto, Koji; Tateishi, Mataji; Omura, Tadao; Nakajima, Kunihiko; Maekawa, Motoyuki; Matsuyama, Moritake; and Tamura, Hiroki, 4,875,445, Cl. 123-292.000.

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Maurer, Albrecht; and Fabian, Josef, to Nukem GmbH. Method and apparatus for detecting faults in an object. 4,876,727, Cl. 382-8.000.

Maurer, Bernie J.: See—
Welch, Glenn S.; Fidyrych, Stephen; Romm, Michael; and Maurer, Bernie J., 4,875,880, Cl. 439-536.000.

Mavretish, Robert S.: See—
Bauer, Frank L.; Mavretish, Robert S.; Shogan, Regis P.; and Seivar, James, 4,876,593, Cl. 358-100.000.

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Hewett, Richard H.; and Luscombe, Brian M., 4,875,925, Cl. 71-94.000.

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Mazany, Anthony M., to B. F. Goodrich Company, The. Oxidation resistant compositions for use with rare earth magnets. 4,876,305, Cl. 524-401.000.

Mazda Motor Corporation: See—
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Fujii, Hiroshi, 4,875,955, Cl. 156-64.000.

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Deutsch, Timothy A.; Schreiner, Joel M.; and McBee, Steve H., 4,875,330, Cl. 56-41.000.

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Mohsen, Amr M.; Hamdy, Esmat Z.; and McCollum, John L., 4,876,220, Cl. 437-170.000.

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Kirkup, Michael P.; and McCombie, Stuart W., 4,876,365, Cl. 549-215.000.

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McGrady, Joseph: See—
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McGuckin, Hugh G.: See—
Snow, Robert A.; McGuckin, Hugh G.; Ponticello, Ignazio S.; Daly, Robert C.; Pace, Laurel J.; Fischer, Sandra K.; and Hanrahan, Michael J., 4,876,167, Cl. 430-7.000.

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McGuire, Michael; DiGiacomo, Ralph; Palmer, Marcia; and Liggett, Louis, to General Foods Corporation. Method for preparing and preserving fresh pasta. 4,876,104, Cl. 426-57.000.

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McKibben, Kenneth D., to CMI International, Inc. Method and apparatus for reclaiming used hydraulic fluid. 4,876,015, Cl. 210-695.000.

McLain, Thomas N.: See—
Marshall, John D.; and McLain, Thomas N., 4,876,002, Cl. 210-136.000.

McMaster, Richard L., to Nvtek Security Products, Inc. Intrusion detection device with extended field of view. 4,876,445, Cl. 250-221.000.

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Frink, Tommy S.; Reed, Lowell M.; Cochran, Dwayne V.; and McNair, Will L., 4,875,530, Cl. 175-27.000.

McNeill, Kevin M.; and Ozeke, Takeshi, to Kabushiki Kaisha Toshiba. Parallel searching system having a master processor for controlling plural slave processors for independently processing respective search requests. 4,876,643, Cl. 364-200.000.

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Chaussadas, Jean, 4,875,586, Cl. 206-427.000.

Hillenbrand, Gary F., 4,876,172, Cl. 430-253.000.

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Imbert, Christian, 4,875,480, Cl. 128-343.000.

Medisense, Inc.: See—
Green, Monika J.; and Lias, Roger J., 4,876,205, Cl. 436-66.000.

Meeker, Rick A.: See—
Roberts, Gary F.; and Meeker, Rick A., 4,875,601, Cl. 222-145.000.

Megamation Incorporated: See—
Hutchinson, James; Hoffman, Brian; and Pollack, Steven, 4,875,275, Cl. 29-568.000.

Mehan, Ashok K.; and Lunk, Hans E., to Raychem Corporation. Metal conductors with improved solderability. 4,876,116, Cl. 427-118.000.

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Gacsay, Lorant; and Meierhofer, Beat, 4,875,506, Cl. 139-450.000.

Meiogenics, Inc.: See—
Duck, Peter; Bender, Robert; Crosby, William; and Robertson, John G., 4,876,187, Cl. 435-6.000.

Meisenburg, Gary L., to Brunswick Corporation. Marine propulsion device with thru-transom engine oil drain system. 4,875,884, Cl. 440-88.000.

Meister, Bernard J.; Dryzga, Craig D.; and Tien, Li C., to Dow Chemical Company, The. Process for preparing rubber-modified styrenic polymer compositions containing hydroperoxide derivatives of rubbery polymers. 4,876,312, Cl. 525-263.000.

Meixner, Otto: See—
Salzbrunn, Wolfgang; Steiner, Eva; Wohrer, Wilfried; and Meixner, Otto, 4,876,196, Cl. 435-161.000.

Melby, Earl G.; and Cocain, H. William, to GenCorp Inc. Polyurethane adhesive for a surface treatment-free fiber reinforced plastic. 4,876,308, Cl. 524-780.000.

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Shmidt, Iosif; and Badiali, Mario, 4,876,013, Cl. 210-650.000.

Memmi, Massimo: See—
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Memrysafte, Inc.: See—
Garris, Charles A., 4,875,623, Cl. 236-12.120.

Memtec Limited: See—
Kopp, Clinton V.; Roberts, Dennis; Biltoft, Bruce G.; and White, Victor, 4,876,012, Cl. 210-644.000.

Menard, Hugues: See—
Dunnigan, Jacques; and Menard, Hugues, 4,875,910, Cl. 55-74.000.

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Palanisamy, Thirumalai G.; and Mendelson, Stuart E., 4,876,495, Cl. 320-18.000.

Mensch, William D., Jr. Method and circuitry for causing sixteen bit microprocessor to execute eight bit op codes to produce either internal sixteen bit operation or internal eight bit operation in accordance with an emulation bit. 4,876,639, Cl. 364-200.000.

Mercado, Hector P., to Ameron, Inc. Abrasive threaded fiberglass pipe joint. 4,875,710, Cl. 285-24.000.

Merck & Co., Inc.: See—
Applebaum, Joy D.; Bayne, Marvin L.; and Cascieri, Margaret A., 4,876,242, Cl. 514-3.000.

Cosa, Malcolm M.; and Tolman, Richard L., 4,876,256, Cl. 514-252.000.

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Wolf, Carol L.; LaVelle, William M.; and Clark, Ross C., 4,876,105, Cl. 426-573.000.

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Guindon, Yvan; Girard, Yves; Lau, Cheuk K.; Fortin, Rejean; Rokach, Joshua; and Yoakim, Christiane, 4,876,246, Cl. 514-80.000.

Merger, Franz: See—
Himmele, Walter; Theobald, Hans; Merger, Franz; Hofmann, Ernst; Kuenast, Christoph; and Hofmeister, Peter, 4,876,275, Cl. 514-452.000.

Merrett, Ronald G.; and Eakin, Oscar, Jr., to Intermodal Container Systems. Apparatus and method for transporting and unloading containers. 4,875,811, Cl. 406-39.000.

Merriam, Jay S.: See—
Logsdon, John E.; Loke, Richard A.; Merriam, Jay S.; and Voight, Richard W., 4,876,402, Cl. 568-881.000.

Mertz, William J.; and Braun, Robert J., to National Distillers and Chemical Corp. Polyvinyl chloride compositions plasticized with copolyesters. 4,876,304, Cl. 524-314.000.

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Laucht, Horst; and Euskirchen, Jurgen, 4,876,448, Cl. 250-234.000.

Nathrath, Norbert; and Fasold, Dietmar, 4,876,553, Cl. 343-756.000.

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DeSaro, Robert; Doyle, Edward F.; Metcalfe, Christopher I.; and Patch, Keith D., 4,875,919, Cl. 65-27.000.

Mettler Instruments AG: See—
Kunz, Peter, 4,875,534, Cl. 177-212.000.

Metz, Josef, to Rheinmetall GmbH. Recoil brake for a gun having a heat equalization and indication device. 4,875,402, Cl. 89-43.010.

Metzger, Edward C. R.: See—
Denny, David S.; Metzger, Edward C. R.; Rexroad, John; and Glynn, William, 4,875,549, Cl. 182-138.000.

Meuter, Herbert: See—
Rohs, Ulrich; and Meuter, Herbert, 4,875,379, Cl. 73-862.340.

Mevissen, Peter: See—
van Wersch, Kurt; Freiberg, Helge; and Mevissen, Peter, 4,875,942, Cl. 134-15.000.

Meyer, Dieter, to Paper Converting Machine GmbH. Packaging machine for multi-sheet compressible paper products, such as paper towels, toilet paper rolls and the like. 4,875,328, Cl. 53-529.000.

Meyer Flooring Inc.: See—
Meyer, Robert R., 4,875,878, Cl. 439-501.000.

Meyer, Georg: See—
Kubein-Messenburg, Dietmar; Meyer, Georg; and Bucking, Wolfram, 4,875,857, Cl. 433-56.000.

Meyer, Louis W.; Vanderhider, James A.; and Carswell, Robert, to Dow Chemical Company, The. Internal mold release compositions. 4,876,019, Cl. 252-32.500.

Meyer, Robert R., to Meyer Flooring Inc. Extension cord/tool carrier. 4,875,878, Cl. 439-501.000.

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Schurter, Rolf; Meyer, Willy; and Fory, Werner, 4,875,923, Cl. 71-92.000.

Meyers, Leo J., to Sun Room Designs, Inc. Beam construction. 4,875,311, Cl. 52-90.000.

Miale, Joseph N.: See—
Chang, Clarence D.; Chu, Cynthia T.-W.; Chu, Pochen; Dessau, Ralph M.; Garwood, William E.; Kuehl, Guenter H.; Miale, Joseph N.; and Shihabi, David S., 4,876,228, Cl. 502-71.000.

Michaels, Francis J.: See—
Wellman, Edward F.; and Michaels, Francis J., 4,875,683, Cl. 273-187.000.

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Holzhauer, Juergen K.; Michalak, Dennis J.; and Schammel, Wayne P., 4,876,386, Cl. 562-414.000.

Microdyne Corporation: See—
Woodworth, Donald J.; Ziegler, Frank A.; and Grabenstein, James B., 4,876,737, Cl. 455-12.000.

Microvol Limited: See—
Weston, Terence E., 4,875,605, Cl. 222-402.240.

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Lee, Leonard E., 4,875,714, Cl. 285-86.000.

Midwest Instrument Co., Inc.: See—
Boron, Joseph J., 4,875,380, Cl. 73-864.580.

Midwest Research Institute: See—
Engel, James F.; Byerley, Thomas J.; and Christie, Howard W., 4,876,323, Cl. 526-310.000.

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Eshita, Takashi; Mieno, Fumitake; Furumura, Yuji; and Watanabe, Takuya, 4,876,219, Cl. 437-126.000.

Mihara, Makoto; Inoue, Masanobu; Ohji, Kenzo; and Itou, Shuji, to Matsushita Electric Industrial Co., Ltd. Automatic weight detecting device, 4,875,533, Cl. 177-144.000.

Mikesell, Jerome J., to M. Manufacturing Services, Inc. Marking board implement holder, 4,875,591, Cl. 211-69.100.

Mikhail, Ameer G. Postal stamp process, apparatus, and metering device, therefor, 4,876,000, Cl. 209-584.000.

Miller, Alan L.: See—
Schneider, Karl F.; Haley, William J.; and Miller, Alan L., 4,875,561, Cl. 192-0.033.

Miller, Allen D.: See—
Buhler, James E.; Crapser, James R.; Miller, Allen D.; and Wefler, Mark E., 4,875,626, Cl. 239-314.000.

Miller, Anthony D. Chair construction, 4,875,732, Cl. 297-181.000.

Miller, Arden O., to Navistar International Transportation Corp. Variable wheelbase length steering linkage, 4,875,697, Cl. 280-95.100.

Miller, Bruce E.: See—
Owen, Robert E.; and Miller, Bruce E., 4,876,660, Cl. 364-754.000.

Miller, Cecelia B., executrix: See—
Miller, Theodore H., deceased; and Shusarski, Ronald S., 4,875,722, Cl. 292-92.000.

Miller, J. Stanley; and Bowles, Thomas J., to Olin Corporation. Method and composition for controlled thickening of thermosetting resins using microencapsulated thickeners, 4,876,296, Cl. 523-200.000.

Miller, Jeffrey T.: See—
Kukes, Simon G.; Miller, Jeffrey T.; and Gutberlet, Louis C., 4,875,991, Cl. 208-59.000.

Miller, Richard; and Zlupko, John E., to General Electric Company. Asbestos-free arc-confining insulating structure, 4,876,421, Cl. 200-144.000.

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Milley, Gyula: See—
Csajtai, Geza; Doleschall, Sander; Milley, Gyula; Kristof, Miklos; Paul, Tibor; Racz, Daniel; and Toth, Bela, 4,875,809, Cl. 405-263.000.

Milliren, Charles M., to Mobay Corporation. Isocyanate reactive mixture and the use thereof in the manufacture of flexible polyurethane foams, 4,876,292, Cl. 521-159.000.

Milton Roy Company: See—
Burns, Richard; Defendorf, James; King, Edward; and McCarthy, Cornelius, 4,875,773, Cl. 356-328.000.

Minami, Norio: See—
Oinuma, Hitoshi; Yamanaka, Motosuke; Miyake, Kazutoshi; Hoshiko, Tomonori; Minami, Norio; Shoji, Tadao; Daiku, Yoshiharu; Sawada, Kohei; and Nomoto, Kenichi, 4,876,262, Cl. 514-318.000.

Minato, Osamu: See—
Yamamoto, Sho; Minato, Osamu; Saeki, Makoto; Yoshitomi, Yasuo; Nakamura, Hideaki; and Kubotera, Masaaki, 4,876,669, Cl. 365-189.010.

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Haight, William J., 4,875,999, Cl. 209-245.000.

Miniaci, Francesco: See—
Vriesema, Bindert K.; and Miniaci, Francesco, 4,876,327, Cl. 528-173.000.

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Appeldorn, Roger H., 4,875,259, Cl. 24-576.000.

Chang, Robert W. H.; and Relyea, Keith E., 4,876,136, Cl. 428-130.000.

Elder, Jerome E.; and Mosman, Nancy L., 4,875,609, Cl. 225-13.000.

May, David C., 4,875,798, Cl. 404-12.000.

Payet, George L.; and Chang, John C., 4,875,901, Cl. 8-115.560.

Ramharack, Roopram, 4,876,149, Cl. 428-425.900.

Rao, Ram A.; Kofod, Mogens; Puchhammer, Julius; and Galiotti, George, 4,875,754, Cl. 350-96.200.

Rivera, Raymond R.; VanVleet, Stephen B.; and Wilson, Shari J., 4,876,123, Cl. 428-34.200.

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Donnay, James A.; Jensen, Van E., Jr.; and Kruzel, Bryon S., 4,875,895, Cl. 493-117.000.

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Hara, Kazuyoshi; and Oda, Masataka, 4,876,578, Cl. 355-315.000.

Hirasawa, Hideaki; and Ueda, Nobuo, 4,875,768, Cl. 353-27.00A.

Hotomi, Hideo; Osawa, Izumi; Iino, Syuji; Doi, Isao; and Fujiwara, Masanori, 4,876,168, Cl. 430-58.000.

Yamakawa, Kazuo, 4,875,763, Cl. 350-432.000.

Misatzu, Kouei: See—
Endo, Haruyoshi; Misatzu, Kouei; and Makimoto, Mitsuo, 4,876,744, Cl. 455-326.000.

Misawa, Shigeyoshi; and Funato, Hiroyoshi, to Ricoh Company, Ltd. Monolithic optical pick-up using an optical waveguide, 4,876,680, Cl. 369-110.000.

Miselli, Carlo A., to I.M.A. - Industrie Macchine Automatiche S.p.A. Wrapping machine, particularly for blister packs and the like, with synchronized plural driving means, 4,875,329, Cl. 53-559.000.

Mishima, Osamu; Yamaoka, Shinobu; Fukunaga, Osamu; Tanaka, Junzo; and Era, Koh, to National Institute for Research in Inorganic Materials. Method for growing a single crystal of cubic boron nitride

semiconductor and method for forming a p-n junction thereof, and light emitting element, 4,875,967, Cl. 156-605.000.

Mishra, Indu B.; and Vande Kieft, Lawrence J., to United States of America, Army. Insensitive binder for propellants and explosives, 4,875,949, Cl. 149-19.300.

Mitani, Kazutami: See—
Itoh, Hajime; and Mitani, Kazutami, 4,876,289, Cl. 521-54.000.

Mitchell, Cheryl R.; Mitchell, Pat R.; and Mitchell, William A., to California Natural Products. Rice syrup sweetener, 4,876,096, Cl. 426-28.000.

Mitchell, Debra J.; and Ranzau, Cheryl L. Washable and contoured nursing pads, 4,875,492, Cl. 128-890.000.

Mitchell, Pat R.: See—
Mitchell, Cheryl R.; Mitchell, Pat R.; and Mitchell, William A., 4,876,096, Cl. 426-28.000.

Mitchell, Roy O.; Klaudt, Milton D.; and Ullom, Kathleen F. M., to Tektronix, Inc. Remote video interconnect and method, 4,876,484, Cl. 315-94.000.

Mitchell, William A.: See—
Mitchell, Cheryl R.; Mitchell, Pat R.; and Mitchell, William A., 4,876,096, Cl. 426-28.000.

Mitlmeier, Norbert; and Koppmann, Bardo, to Siemens Aktiengesellschaft. Electromagnetic switchgear, 4,876,522, Cl. 335-193.000.

Mito, Nobuaki: See—
Mizutani, Masato; Shiroshita, Masao; Sakaki, Masaharu; Okuda, Hiroki; and Mito, Nobuaki, 4,875,924, Cl. 71-92.000.

Mitsubishi Denki Kabushiki Kaisha: See—
Hara, Toshiro; Fujimoto, Takanori; and Musa, Ikuo, 4,875,452, Cl. 123-488.000.

Imai, Hitoshi; Okada, Kazuo; and Tadokoro, Michihiro, 4,876,666, Cl. 365-106.000.

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Kondou, Harufusa; and Kuranaga, Hiroshi, 4,876,466, Cl. 307-465.000.

Kusakabe, Kenji, 4,876,224, Cl. 437-228.000.

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Morishita, Mitsuharu; Kohge, Shinichi; Hara, Tadayuki; Hata, Yasuaki; and Umamaru, Hisato, 4,875,367, Cl. 73-118.100.

Nakabayashi, Takeo; and Nakaya, Masao, 4,876,670, Cl. 365-194.000.

Shimodaira, Hisayo; Ono, Toshio; Miyawaki, Keizo; and Hamaguchi, Tatsuya, 4,875,766, Cl. 350-641.000.

Suzuki, Akinobu, 4,875,752, Cl. 350-96.200.

Tanaka, Toshinori; Miyazaki, Shigekazu; and Morishita, Akira, 4,876,473, Cl. 310-216.000.

Watakabe, Yaichiro; Okamoto, Tatsuo; and Matsuda, Shuichi, 4,876,164, Cl. 430-5.000.

Yoshida, Shigeyuki; Musha, Atsushi; and Nonami, Takayuki, 4,876,714, Cl. 379-433.000.

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Asai, Yoshiro, 4,875,658, Cl. 129-21.

Imoto, Koji; Tateishi, Mataji; Omura, Tadao; Nakajima, Kunihiro; Maekawa, Motoyuki; Matsuyama, Moritake; and Tamura, Hiroki, 4,875,445, Cl. 123-292.000.

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Imoto, Koji; Tateishi, Mataji; Omura, Tadao; Nakajima, Kunihiro; Maekawa, Motoyuki; Matsuyama, Moritake; and Tamura, Hiroki, 4,875,445, Cl. 123-292.000.

Kasugai, Heki, 4,875,415, Cl. 104-35.000.

Mitsubishi Kasei Corporation: See—
Doi, Yoshiharu, 4,876,331, Cl. 528-361.000.

Mitsubishi Petrochemical Co., Ltd.: See—
Nakano, Yoshitomo; and Kada, Masumi, 4,876,324, Cl. 528-142.000.

Mitsubishi Rayon Co., Ltd.: See—
Arita, Masujiro; and Sugimoto, Yukinobu, 4,875,980, Cl. 203-14.000.

Itoh, Hajime; and Mitani, Kazutami, 4,876,289, Cl. 521-54.000.

Kurokawa, Satoshi; Tayama, Suehiro; and Sato, Fumio, 4,876,306, Cl. 524-423.000.

Mitsubishi Rayon Engineering Co., Ltd.: See—
Arita, Masujiro; and Sugimoto, Yukinobu, 4,875,980, Cl. 203-14.000.

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Nakanishi, Takehisa; Koga, Eizi; and Fukada, Isao, 4,876,372, Cl. 549-529.000.

Mittler, Martin A.; and Scowen, Kenneth J., to Voltronics Corporation. Variable electronic component, 4,876,627, Cl. 361-293.000.

Miura, Masakatsu: See—
Kuwayama, Yoshinari; Yokoyama, Fumitomo; and Miura, Masakatsu, 4,875,392, Cl. 74-867.000.

Miwa, Hiroshi: See—
Fuse, Genzo; Miwa, Hiroshi; and Kawasaki, Yoshinobu, 4,875,823, Cl. 414-735.000.

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Miyake, Kazutoshi: See—
Oinuma, Hitoshi; Yamanaka, Motosuke; Miyake, Kazutoshi; Hoshiko, Tomonori; Minami, Norio; Shoji, Tadao; Daiku, Yo-

shiharu; Sawada, Kohei; and Nomoto, Kenichi, 4,876,262, Cl. 514-318.000.

Miyamoto, Takashi, to NEC Corporation. Semiconductor device having ceramic package incorporated with a heat-radiator, 4,876,588, Cl. 357-81.000.

Miyano, Hideyo: See—
Kubota, Shin'ichi; Miyano, Hideyo; and Adachi, Hiromitsu, 4,876,529, Cl. 340-450.300.

Miyasaka, Tsutomu; Okazaki, Masaki; and Sugimoto, Tadao, to Fuji Photo Film Co., Ltd. Tubular silver halide photosensitive materials sensitized with a luminous dye, 4,876,183, Cl. 430-567.000.

Miyawaki, Keizo: See—
Shimodaira, Hisayo; Ono, Toshio; Miyawaki, Keizo; and Hamaguchi, Tatsuya, 4,875,766, Cl. 350-641.000.

Miyazaki, Shigekazu: See—
Tanaka, Toshinori; Miyazaki, Shigekazu; and Morishita, Akira, 4,876,473, Cl. 310-216.000.

Miyazawa, Kazutoshi: See—
Saito, Shinichi; Inoue, Hiromichi; Miyazawa, Kazutoshi; Ohno, Kouji; and Ushioda, Makoto, 4,876,026, Cl. 252-299.610.

Miyazawa, Takeshige: See—
Matsuzawa, Masafumi; Hokari, Hiroshi; Kusano, Shoji; Miyazawa, Takeshige; and Toyokawa, Yasufumi, 4,875,930, Cl. 71-106.000.

Miyoshi, Kenichi: See—
Yamane, Akio; Kawasoe, Tatsuro; Tsukumo, Noriko; and Miyoshi, Kenichi, 4,876,335, Cl. 536-27.000.

Miyoshi, Makoto: See—
Uchida, Koh; Kurihara, Takashi; and Miyoshi, Makoto, 4,875,542, Cl. 180-142.000.

Mizobuchi, Tadafumi; Ohji, Akihito; Sakoh, Seichi; and Muguruma, Yasuyoshi, to Teikoku Seiyaku Kabushiki Kaisha. Sheet-shaped adhesive preparation applicable to oral cavity, 4,876,092, Cl. 424-435.000.

Mizuno, Shinji; Kawato, Humio; Hanazawa, Kazuyoshi; Aoyama, Tatsuki; and Ogasawara, Yoshinari, to CKD Kabushiki Kaisha. Apparatus for separating gaseous mixtures, 4,875,911, Cl. 55-162.000.

Mizutani, Futoshi; Kyogoku, Takeshi; Saitoh, Tatsuo; and Endoh, Shigeki, to Sumitomo Electric Industries, Ltd. Method of manufacturing fiber preform for single-mode fibers, 4,875,918, Cl. 65-3.120.

Mizutani, Hikaru, to Hitachi Maxell, Ltd. Tape cartridge, 4,875,640, Cl. 242-198.000.

Mizutani, Masato; Shiroshita, Masao; Sakaki, Masaharu; Okuda, Hiroki; and Mito, Nobuaki, to Sumitomo Chemical Company, Limited. Cinnoline derivative, process for preparing the same and herbicidal composition containing the same, 4,875,924, Cl. 71-92.000.

Mobay Corporation: See—
Milliren, Charles M., 4,876,292, Cl. 521-159.000.

Mobil Oil Corporation: See—
Bowes, Emerson; Chang, Clarence D.; Han, Scott; and Shihabi, David S., 4,876,411, Cl. 585-533.000.

Chang, Clarence D.; Chu, Cynthia T.-W.; Chu, Pochen; Dessau, Ralph M.; Garwood, William E.; Kuehl, Guenter H.; Miale, Joseph N.; and Shihabi, David S., 4,876,228, Cl. 502-71.000.

Furtek, Allan B., 4,876,229, Cl. 502-107.000.

Lo, Frederick Y.; Nowlin, Thomas E.; and Wu, Margaret M., 4,876,321, Cl. 526-129.000.

McCowan, Douglas W., 4,876,673, Cl. 367-68.000.

Mochizuki, Seiji; and Kato, Fumiyasu, to Toppan Moore Company, Ltd. Paper splicing device, 4,875,633, Cl. 242-58.300.

Mode, Duane R., to Waldorf Corporation. Locking, double-layered microwave package, 4,876,427, Cl. 219-10.55E.

Moe, Rolf; Cornea, David J.; and Premeau, John E., to Biome Enterprises, Inc. Wafer transfer apparatus, 4,875,824, Cl. 414-751.000.

Moeckl, Ernst; Stumpf, Jorg; Hardt, Walter; and Doinghaus, Hermann, to Nixdorf Computer AG. Set of components for constructing furniture pieces, 4,875,418, Cl. 108-50.000.

Moeneclay, Denis; Coopman, Lucien; and Victoor, Johnny, to Picanol N.V. Thread clamp, 4,875,505, Cl. 139-448.000.

Mohsen, Amr M.; Hamdy, Esmat Z.; and McCollum, John L., to Actel Corporation. Method of making programmable low impedance interconnect diode element, 4,876,220, Cl. 437-170.000.

Moist, Stanford C., Jr.: See—
Fleak, David S.; Koegel, Keith S.; Long, William B.; Moist, Stanford C., Jr.; and Nauman, Warren D., 4,875,877, Cl. 439-497.000.

Molex Incorporated: See—
Finney, James E.; and Brubaker, Weldon L., 4,875,582, Cl. 206-330.000.

Moller, Ronald H.; and Batty, Alan K., to Thermit Australia Pty. Limited. Rail repairing method and apparatus, 4,875,657, Cl. 249-86.000.

Mollmann, Gunter: See—
Onnenberg, Volker; and Mollmann, Gunter, 4,875,843, Cl. 425-4.00R.

Moly, Jose: See—
Leandris, Sergio; and Moly, Jose, 4,875,286, Cl. 29-872.000.

Monroe, George E., to Magline, Inc. Boat trailers, 4,875,700, Cl. 280-414.100.

Monsell, Craig C.: See—
Snyder, Stephen W.; Monsell, Craig C.; and Puckett, Carol S., 4,875,575, Cl. 206-0.500.

Montana Refining Company: See—
Langford, Virgil, 4,875,997, Cl. 208-235.000.

Monteiro, Luciano T. S., to Prody Engenharia E Comercio Ltda. Parts transfer system having three orthogonal movement axes wherein the part lifting and lowering mechanism moving along the third axis is

actuated by the motion of the grippers in closing and opening along the first axis, 4,875,931, Cl. 72-405.000.

Montgomery Elevator Company: See—
Smith, Stephen W.; Londeen, Gilbert E.; and Lair, Christopher, 4,875,552, Cl. 187-1.00R.

Smith, Stephen W.; Londeen, Gilbert E.; and Lair, Christopher, 4,875,553, Cl. 187-1.00R.

Montgomery, Larry D.: See—
Stringer, Hugh C., and Montgomery, Larry D., 4,875,580, Cl. 206-319.000.

Montgomery, Melvin G., to Atlantic Richfield Company. Cryosonde for well logging tool, 4,876,450, Cl. 250-261.000.

Montrym, Anthony. Expansion joint brace and aligner, 4,875,801, Cl. 404-48.000.

Mookherjee, Braja D.: See—
Wilson, Richard A.; Butler, Jerry F.; Withycombe, Donald; Mookherjee, Braja D.; Katz, Ira; and Schrankel, Kenneth R., 4,876,087, Cl. 424-84.000.

Moopen, Alexander: See—
Thakoor, Anilkumar P.; Lambe, John; and Moopen, Alexander, 4,876,668, Cl. 365-163.000.

Moore, Alan F., to Dunlop Limited a British Company. Vibration attenuation, 4,875,664, Cl. 267-140.100.

Moore Business Forms, Inc.: See—
Ashby, Robert E.; and Greig, Walter G., 4,876,131, Cl. 428-42.000.

Moore, James D.: See—
Brook, Arthur H.; Carian, Peter J.; Katzin, Leonard; Landsinger, Edmund E.; Moore, James D.; Rotter, Leah D.; and Schreiber, Stanley, 4,875,469, Cl. 128-26.000.

Moore, John S.: See—
Anderson, Jeffrey J.; and Moore, John S., 4,875,619, Cl. 228-190.000.

Moore, Michael L.: See—
Marshall, Garland R.; and Moore, Michael L., 4,876,243, Cl. 514-11.000.

Moorthy, Kanniah N. G. K.: See—
Singh, Vir B.; Moorthy, Kanniah N. G. K.; Kaushik, Pushpendar K.; and Sankarabharan, Hariharan, 4,875,900, Cl. 8-94.270.

Moran, Kevin E.; Smith, Michael L.; and Lippard, Ernest R., III, to Eastman Kodak Company. Method and apparatus for inspecting reticles, 4,875,780, Cl. 356-446.000.

Morgan, Leonard J.; and Bell, Mark, to American Cyanamid Company. Aqueous suspension concentrate compositions, 4,875,929, Cl. 71-121.000.

Morgan, Richard A.: See—
Lester, Gene D.; Morgan, Richard A.; Harms, Harold B.; Barrett, John P.; Chang, Tsung K.; Cushing, Donald S.; Broo, Richard F.; and Hood, William M., 4,876,492, Cl. 318-254.000.

Morgenthaler, Eugen, to Seewer AG. Method of rolling dough, 4,876,098, Cl. 426-231.000.

Mori, Kei; and Kosugi, Isao, to Mori, Kei. Mechanism for positioning the light-receiving end of an optical conductor cable at the focal position of a lens, 4,875,749, Cl. 350-96.180.

Morimoto, Akira; Choh, Nobuo; and Noguchi, Noriyoshi, to Takeda Chemical Industries, Ltd. Tricyclic penam compounds, their production and their use, 4,876,251, Cl. 514-193.000.

Morishita, Akira: See—
Tanaka, Toshinori; Miyazaki, Shigekazu; and Morishita, Akira, 4,876,473, Cl. 310-216.000.

Morishita, Mitsuharu; Kohge, Shinichi; Hara, Tadayuki; Hata, Yasuaki; and Umamaru, Hisato, to Mitsubishi Denki Kabushiki Kaisha. Steering torque detecting device, 4,875,367, Cl. 73-118.100.

Moriya, Ikuro: See—
Naruo, Kyoichi; Ohtani, Sumio; Etoh, Masahiro; Tsuruta, Masao; Moriya, Ikuro; Ishiguro, Masanori; and Matsumoto, Akira, 4,876,007, Cl. 210-339.000.

Moriya, Koichi: See—
Shiokawa, Kozo; Tsuboi, Shinichi; Sasaki, Shoko; Moriya, Koichi; Hattori, Yumi; and Shibuya, Katsuhiko, 4,876,263, Cl. 514-338.000.

Moriya, Tatsuo, to Seiko Epson Corporation. Sensor mount for an electronic timepiece, 4,876,677, Cl. 368-87.000.

Moriyama, Hiroshi: See—
Yabe, Akira; Ouchi, Akihiko; Moriyama, Hiroshi; and Masuda, Etsuro, 4,875,986, Cl. 204-157.600.

Morohashi, Katsuei; Shimokobe, Jiro; and Shimoma, Taketoshi, to Kabushiki Kaisha Toshiba. Cathode ray tube apparatus with improved deflection unit, 4,876,478, Cl. 313-413.000.

Morozumi, Naoya: See—
Sakata, Hirotugu; Murasaki, Hiroaki; Hayano, Makoto; Hattori, Hitoshi; Morozumi, Naoya; Yoneyama, Kouichi; Suzuki, Isao; Sone, Junji; and Nagatomo, Shigemi, 4,875,839, Cl. 418-55.000.

Moruta, Masaya: See—
Nakajima, Nobuyuki; Inomata, Kenichi; Moruta, Masaya; Yamaguchi, Toshio; and Eitai, Kazuo, 4,875,835, Cl. 417-295.000.

Mosch, Karl E.: See—
Bringham, Richard L.; Gordon, Lucas S.; and Mosch, Karl E., 4,876,066, Cl. 422-46.000.

Moschensky, Anatoly D.: See—
Belykh, Sergei I.; Davydov, Anatoly B.; Moschensky, Anatoly D.; Kanshin, Nikolai N.; Kovalenko, Igor L.; Kirillov, Yuri B.; Osipov, Gennady I.; and Utyamyshev, Rustam I., 4,875,479, Cl. 128-335.500.

Mose, Tadao; Andoh, Yasuhiro; and Kitasin, Tadahisa, to Kabushiki Kaisha Toshiba. Power converter and method of controlling the same. 4,876,637, Cl. 363-37.000.

Moseley, John: See—
Santos, Alfred J.; Cook, Frederick A., Jr.; Duncan, Scott M.; and Moseley, John, 4,875,785, Cl. 384-448.000.

Mosman, Nancy L.: See—
Elder, Jerome E.; and Mosman, Nancy L., 4,875,609, Cl. 225-13.000.

Motegi, Itsuro: See—
Hori, Kimihiko; Nakamura, Koichi; Kawai, Michio; Motegi, Itsuro; Imokawa, Genji; and Takaishi, Naotake, 4,876,084, Cl. 424-62.000.

Motley, Jerry D.: See—
Christopher, Glenn B.; and Motley, Jerry D., 4,875,413, Cl. 102-307.000.

Motora, Yoichi: See—
Yoshioka, Ritsuo; Ueda, Makoto; Motora, Yoichi; and Nakamura, Mitsuharu, 4,876,060, Cl. 376-333.000.

Motorola, Inc.: See—
Dougherty, Richard M., 4,876,516, Cl. 330-54.000.
Gay, Michael J., 4,876,464, Cl. 307-353.000.
Koury, Daniel N., 4,876,212, Cl. 437-34.000.
Leicht, John L.; and Leitheiser, Jeffrey D., 4,876,656, Cl. 364-491.000.
Levine, Stephen N.; and Leitich, Albert J., 4,876,740, Cl. 455-33.000.
Perkins, Geoffrey W., 4,876,518, Cl. 331-1.00A.
Pfiester, James R., 4,876,213, Cl. 437-34.000.
Reed, John D.; Roberts, Teddy P.; and Berger, Thomas R., 4,876,710, Cl. 379-63.000.
van Bavel, Nicholas; and Williams, Tim A., 4,876,542, Cl. 341-143.000.
van Bavel, Nicholas R., 4,876,543, Cl. 341-143.000.
Zakman, Zdravko M., 4,876,552, Cl. 343-702.000.
Zebel, Peter J., 4,876,217, Cl. 437-67.000.

Mouri, Toyohiko: See—
Oshita, Saichiro; Mouri, Toyohiko; and Takahashi, Tsutomu, 4,875,540, Cl. 180-79.100.
Oshita, Saichiro; Mouri, Toyohiko; Takahashi, Tsutomu; and Itou, Shinji, 4,875,541, Cl. 180-79.100.

Movilliat, Pierre A.; Pigey, Yves; and Gardin, Gilles D., to Societe SKIS ROSSIGNOL S.A. Tennis racket. 4,875,679, Cl. 273-73.00R.

Moyer, Donald L.; and Allred, Thomas O. Wheel chock. 4,875,813, Cl. 410-9.000.

Moyer, George A.; and Chang, Chung L. Seatback recliner mechanism. 4,875,735, Cl. 297-367.000.

MTU Motoren- und Turbinen-Union Friedrichshafen GmbH: See—
Just, Karl, 4,875,784, Cl. 384-273.000.

MTU Motoren- und Turbinen-Union Munchen GmbH: See—
Willkop, Franz; Zahring, Gerhard; Rutsch, Robert; Popp, Joachim; and Eberhard, John, 4,875,828, Cl. 415-173.400.

Mueller, Richard A.: See—
Koszyk, Francis J.; Partis, Richard A.; and Mueller, Richard A., 4,876,268, Cl. 514-425.000.

Muellers, John H. Dovetail machine. 4,875,510, Cl. 144-145.00A.

Muguruma, Yasuyoshi: See—
Mizobuchi, Tadafumi; Ohji, Akihito; Sakoh, Seiichi; and Muguruma, Yasuyoshi, 4,876,092, Cl. 424-435.000.

Mukai, Toshiharu, to Matsushita Electric Industrial Co., Ltd. Digitally controlled positioning system for quickly moving and then finely positioning an object. 4,876,679, Cl. 369-44.000.

Muller, Ingrid: See—
Hemmerling, Wolfgang; Dubal, Hans-Rolf; Muller, Ingrid; Ohlen-dorf, Dieter; and Wingen, Rainer, 4,876,028, Cl. 252-299.610.

Muller, Manfred: See—
Knobloch, Osbert; and Muller, Manfred, 4,875,628, Cl. 241-24.000.

Mullin, Francis J.; and Reed, William C., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Forced encapsulation means for a cable. 4,875,952, Cl. 156-48.000.

Mumford, Van E.: See—
Vollmann, William; and Mumford, Van E., 4,875,483, Cl. 128-419.0PG.

Munakata, Chusuke: See—
Takeda, Kazuo; Ito, Yoshitoshi; Honma, Noriaki; and Munakata, Chusuke, 4,876,458, Cl. 250-574.000.

Munk, Harald, to NOVOPACK Maschinenbau GmbH. Coffee bean roaster. 4,875,904, Cl. 34-67.000.

Munzer, Manfred: See—
Hennig, Jurgen; Vetter, Heinz; and Munzer, Manfred, 4,876,311, Cl. 525-229.000.

Murai, Keiichi: See—
Matsumoto, Yasuyuki; Murai, Keiichi; Fukuda, Tadaji; and Ogawa, Kyosuke, 4,876,185, Cl. 430-580.000.

Murakami, Kanji: See—
Akaoshi, Haruo; Murakami, Kanji; Kawamoto, Mineo; Tadokoro, Akio; and Yoshimura, Toyofusa, 4,876,177, Cl. 430-313.000.

Murakami, Kazunori: See—
Matsumoto, Yasuo; Murakami, Kazunori; Ikumi, Tomonori; and Iwafune, Yasuo, 4,875,748, Cl. 350-6.800.

Murakami, Mutsuaki, to Research Development Corp. of Japan; and Matsushita Elec. Industries Co. Ltd., a part interest. Process for producing graphite. 4,876,077, Cl. 423-448.000.

Murakami, Takuya, to Nissan Motor Co., Ltd. Double link type suspen-sion including a stabilizer bar. 4,875,703, Cl. 280-665.000.

Muramatsu, Akira, to Fuji Photo Film Co. Color video signal generat-ing device using monochrome and color image sensors having differ-ent resolutions to form a luminance signal. 4,876,591, Cl. 358-43.000.

Muramatsu, Keiji: See—
Oda, Noriyuki; Takehara, Tetsuo; Higashi, Katsumi; and Mura-matsu, Keiji, 4,875,712, Cl. 285-47.000.

Murasaki, Hiroaki: See—
Sakata, Hirotosugu; Murasaki, Hiroaki; Hayano, Makoto; Hattori, Hitoshi; Morozumi, Naoya; Yoneyama, Kouichi; Suzuki, Isao; Sone, Junji; and Nagatomo, Shigemi, 4,875,839, Cl. 418-55.000.

Murata Kikai Kabushiki Kaisha: See—
Kiriake, Masaharu, 4,875,572, Cl. 198-744.000.

Murata manufacturing Co., Ltd.: See—
Endo, Masanori; and Watanabe, Kouichi, 4,876,631, Cl. 361-502.000.
Kittaka, Toshihiko; Ando, Akira; and Sakabe, Yukio, 4,876,476, Cl. 310-320.000.
Sakamoto, Yukio; Tanabe, Takeshi; Fukutani, Iwao; and Hori, Toshio, 4,875,862, Cl. 439-79.000.

Murdock, Inc.: See—
Horton, Jack, 4,876,050, Cl. 264-102.000.

Murphy, Bruce L.: See—
Schumacher, Doris P.; Clark, Jon E.; and Murphy, Bruce L., 4,876,352, Cl. 548-232.000.

Murphy, Lawrence M., to United States of America, Energy. Support and maneuvering apparatus for solar energy receivers. 4,875,467, Cl. 126-424.000.

Murphy, Philip: See—
Cipolla, Thomas M.; Horton, Raymond R.; Murphy, Philip; and Palmer, Michael J., 4,875,614, Cl. 228-5.500.

Murray, Charles N.; and Jamet, Michel R., to European Economic Community. Braking device for a capsule at the end of a trajectory. 4,875,429, Cl. 114-331.000.

Murumoto, Katsuji: See—
Abukawa, Toshimi; Tahara, Kazuo; Murumoto, Katsuji; Koterazawa, Toshiyuki; Hombu, Mitsuyuki; Takahashi, Tadashi; Takamatsu, Shuichi; Ishikura, Hisatugu; Yamamura, Hiroshisa; Tatsuzaki, Toru; Ohmae, Tsutomu; Okuyama, Toshiaki; Yama-shita, Seizi; Saito, Shigeki; and Sakai, Masato, 4,875,539, Cl. 180-79.100.

Musa, Ikuo: See—
Hara, Toshio; Fujimoto, Takanori; and Musa, Ikuo, 4,875,452, Cl. 123-488.000.

Musha, Atsushi: See—
Yoshida, Shigeyuki; Musha, Atsushi; and Nonami, Takayuki, 4,876,714, Cl. 379-433.000.

Musser, John H.; Kref, Anthony F., III; and Bender, Reinhold H. W., to American Home Products Corporation. Quinoline compounds. 4,876,346, Cl. 546-172.000.

Mutai, Masahiko: See—
Ishiwa, Hiromi; Shibahara, Harue; Mutai, Masahiko; and Tsuchida, Nobuo, 4,876,202, Cl. 435-320.000.

Mutchler, Paul A., to Engineered Air Systems, Inc. Steady state fuel burner assembly for a heat exchanger and method of operating same. 4,875,851, Cl. 431-6.000.

Mutzabaugh, Dennis M.: See—
Citta, Richard W.; Gosc, Paul M.; Mutzabaugh, Dennis M.; and Sgrignoli, Gary J., 4,876,718, Cl. 380-42.000.

Myers, John D., to Kigre, Inc. Ion-exchangeable phosphate glass com-positions and strengthened optical quality glass articles. 4,875,920, Cl. 65-30.140.

Myers, Melvyn J.; and Nickolson, Victor J., to Du Pont de Nemours, E. I., and Company. 3,3-disubstituted indolines. 4,876,259, Cl. 514-256.000.

Myhre, Erling: See—
Bjorck, Lars; Erntell, Mats; and Myhre, Erling, 4,876,194, Cl. 435-68.000.

Mylett, Christopher J. Universal hose connector. 4,875,719, Cl. 285-239.000.

Mytec Technologies Inc.: See—
Tomko, George J., 4,876,725, Cl. 382-4.000.

Nachtamp, Klaus: See—
Noll, Klaus; Thoma, Wilhelm; Nachtamp, Klaus; Schroer, Walter; and Pedain, Josef, 4,876,302, Cl. 524-267.000.

Nagahori, Atsushi, to Nippon Mektron, Ltd. PTC devices. 4,876,439, Cl. 219-541.000.

Nagai, Hiroshi: See—
Ohkubo, Kazuo; Hayashi, Tadamasu; and Nagai, Hiroshi, 4,876,006, Cl. 210-321.690.

Nagai, Toshitake: See—
Tsukahara, Hitoshi; Kurokawa, Keiko; Tsukui, Toshimitsu; and Nagai, Toshitake, 4,876,070, Cl. 422-122.000.

Nagaoka, Akira: See—
Kambe, Yoshiaki; Okuda, Yoshihiko; Hirono, Atsuyuki; Nagaoka, Akira; and Ito, Takayasu, 4,876,446, Cl. 250-221.000.

Nagasawa, Moriya: See—
Egawa, Jiro; Yoshida, Naruhito; Kasai, Toshihiro; Nagasawa, Moriya; Ide, Naoki; and Machida, Hironobu, 4,876,560, Cl. 346-153.100.

Nagatomo, Shigemi: See—
Sakata, Hirotosugu; Murasaki, Hiroaki; Hayano, Makoto; Hattori, Hitoshi; Morozumi, Naoya; Yoneyama, Kouichi; Suzuki, Isao; Sone, Junji; and Nagatomo, Shigemi, 4,875,839, Cl. 418-55.000.

Nagatsuna, Shinji, to Ricoh Company, Ltd. Image recording having a removable image forming case. 4,876,572, Cl. 355-210.000.

Nagel, Rolf: See—
Deneke, Ulfert; Nagel, Rolf; Rothe, Anselm; and Freitag, Helmut, 4,876,067, Cl. 422-56.000.

Nagji, Moez M.; and Trubac, Robert E., to UOP. Process for the production of methyl tert.-alkyl ethers. 4,876,394, Cl. 568-697.000.

Nagura, Nobuyoshi: See—
Oka, Hiroki; and Nagura, Nobuyoshi, 4,876,527, Cl. 340-441.000.

Nair, Muralcedharan G.: See—
Burke, Basil A.; and Nair, Muralcedharan G., 4,876,277, Cl. 514-465.000.

Najjar, Mitri S.; and Corbeels, Roger J., to Texaco Inc. Partial oxida-tion process. 4,876,031, Cl. 252-373.000.

Nakabayashi, Shigemitsu: See—
Imura, Takeshi; Ando, Katsuhiko; Nakabayashi, Shigemitsu; and Hirose, Maki, 4,875,518, Cl. 164-119.000.

Nakabayashi, Takeo; and Nakaya, Masao, to Mitsubishi Denki Kabu-shiki Kaisha. Variable delay circuit for delaying input data. 4,876,670, Cl. 365-194.000.

Nakagawa, Shizutoshi: See—
Yoshida, Susumu; Nakagawa, Shizutoshi; Ushiroguchi, Tsuyoshi; Matsura, Hiromichi; and Yazaki, Akira, 4,876,281, Cl. 514-517.000.

Nakahashi, Masako: See—
Takeda, Hiromitsu; Nakahashi, Masako; Shirokane, Makoto; and Yamazaki, Tatsuo, 4,876,119, Cl. 427-250.000.

Nakajima, Junya: See—
Abe, Akira; Nakajima, Junya; Takase, Haruo; Uenaka, Kazushige; and Otomo, Ruyzi, 4,876,180, Cl. 430-393.000.

Nakajima, Kunihiro: See—
Imoto, Koji; Tateishi, Mataji; Omura, Tadao; Nakajima, Kunihiro; Maekawa, Motoyuki; Matsuyama, Moritake; and Tamura, Hiroki, 4,875,445, Cl. 123-292.000.

Nakajima, Nobuyuki; Inomata, Kenichi; Moruta, Masaya; Yamaguchi, Toshio; and Eitai, Kazuo, to Diesel Kiki Co., Ltd. Variable displace-ment compressor. 4,875,835, Cl. 417-295.000.

Nakajima, Sadaaki; and Terakawa, Taiju, to Chisso Corporation. Spin-neret assembly for sheath-core type composite fibers. 4,875,844, Cl. 425-131.500.

Nakajima, Yoshihiro: See—
Hayashi, Tsutomu; Katoh, Masaie; Yakigaya, Nobuyuki; Nakamura, Kazuhiko; Yoshida, Yoshihiro; Nakajima, Yoshihiro; Saito, Mitsuru; and Kobayashi, Akio, 4,875,390, Cl. 74-731.000.

Nakamichi Corporation: See—
Chikashige, Tadaaki, 4,876,615, Cl. 360-43.000.

Nakamura, Hideaki: See—
Yamamoto, Sho; Minato, Osamu; Saeki, Makoto; Yoshitomi, Yasuo; Nakamura, Hideaki; and Kubotera, Masaaki, 4,876,669, Cl. 365-189.010.

Nakamura, Kazuhiko: See—
Hayashi, Tsutomu; Katoh, Masaie; Yakigaya, Nobuyuki; Nakamura, Kazuhiko; Yoshida, Yoshihiro; Nakajima, Yoshihiro; Saito, Mitsuru; and Kobayashi, Akio, 4,875,390, Cl. 74-731.000.

Nakamura, Kimihiko: See—
Torita, Fumio; Ikeda, Naotaka; Nakamura, Kimihiko; Matsuo, Katsuharu; Hotta, Tomio; and Makino, Yoshiyuki, 4,875,607, Cl. 222-643.000.

Nakamura, Koichi: See—
Hori, Kimihiko; Nakamura, Koichi; Kawai, Michio; Motegi, Itsuro; Imokawa, Genji; and Takaishi, Naotake, 4,876,084, Cl. 424-62.000.

Nakamura, Masahiro: See—
Watanabe, Yuji; and Nakamura, Masahiro, 4,876,729, Cl. 382-22.000.

Nakamura, Mitsuharu: See—
Yoshioka, Ritsuo; Ueda, Makoto; Motora, Yoichi; and Nakamura, Mitsuharu, 4,876,060, Cl. 376-333.000.

Nakamura, Takashi: See—
Takahashi, Kenji; Nakamura, Takashi; and Hosoi, Yuichi, 4,876,161, Cl. 428-691.000.

Nakamura, Teruya: See—
Umezawa, Hamao; Suzuki, Shintaro; Ohkuma, Taka'aki; Sato, Fumihiro; and Nakamura, Teruya, 4,876,244, Cl. 514-19.000.

Nakamura, Tsutomu: See—
Itoh, Kunio; Fukushima, Motoo; and Nakamura, Tsutomu, 4,876,344, Cl. 544-219.000.

Nakamura, Yoko; Kojima, Fumiyo; and Yoshino, Hirobumi, to Ricoh Company, Ltd. Copying machine having a bar code reader. 4,876,571, Cl. 355-210.000.

Nakamura, Yoko, Ltd.: See—
Kawano, Ikuo; Takiguchi, Tsuyoshi; Kimura, Norihisa; Yanagisawa, Yohei; Ashimi, Tokuji; and Yoshino, Hiroyuki, 4,876,103, Cl. 426-574.000.

Nakanishi, Takehisa; Koga, Eizi; and Fukada, Isao, to Mitsui Toatsu Chemicals, Incorporated. Method for preparing epichlorohydrins. 4,876,372, Cl. 549-529.000.

Nakano, Mitsusou: See—
Chado, Hiroyuki; Maeda, Tatsuo; and Nakano, Mitsusou, 4,875,733, Cl. 296-195.000.

Nakano, Yoshitomo; and Kada, Masumi, to Mitsubishi Petrochemical Co., Ltd. High molecular weight ortho cresol-novolak resins and process for the preparation thereof using alcoholic or acidic organic solvents. 4,876,324, Cl. 528-142.000.

Nakano, Yuzuru, to Kanai Juyo Hyogo, Kogyo Company Limited. Plastic traveller for ring spinning machinery. 4,875,333, Cl. 57-125.000.

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Wada, Toshiaki; Katsuyama, Yoshiaki; and Nakaoka, Junichi, 4,875,987, Cl. 204-192.150.

Nakaoku, Shozo; Sakuma, Kazuhiko; Oshika, Yasuhiro; and Ohira, Kazuo, to Taiyo Pharmaceutical Industry Co., Ltd. Indene com-pounds. 4,876,345, Cl. 544-379.000.

Nakashio, Miaki: See—
Urata, Kaoru; Nakashio, Miaki; Ono, Koichi; Hirai, Hitoshi; and Iwamoto, Masayuki, 4,876,703, Cl. 377-62.000.

Nakata, Akio: See—
Shinomiya, Tsutomu; Yoshino, Eichi; Maki, Chihiro; Tojima, Hitoshi; Izai, Sadamu; Nakata, Akio; and Tamura, Michiya, 4,875,960, Cl. 156-203.000.

Nakatsuji, Teruyuki: See—
Sugita, Minoru; Nakatsuji, Teruyuki; Fujisaki, Tadashi; Sawaide, Minoru; Ishikawa, Noboru; and Inada, Yasuo, 4,876,143, Cl. 428-294.000.

Nakaya, Masao: See—
Nakabayashi, Takeo; and Nakaya, Masao, 4,876,670, Cl. 365-194.000.

Nakayama, Hisanobu; Tanaka, Osamu; Yasumoto, Hiromichi; Senoo, Seiichi; Zaizen, Youichi; and Yamasaki, Kouji, to Nippon Steel Corporation. Method for producing grain-oriented electrical steel sheet having metallic luster and excellent punching property. 4,875,947, Cl. 148-113.000.

Nakazato, Yasushi: See—
Banno, Masahiko; and Nakazato, Yasushi, 4,876,606, Cl. 358-434.000.

Nakazawa, Michitake: See—
Ishida, Hiroaki; Shinozaki, Nobuo; and Nakazawa, Michitake, 4,876,563, Cl. 354-234.100.

Nakazawa, Shinsuke: See—
Nemoto, Toshiyuki; and Nakazawa, Shinsuke, 4,875,446, Cl. 123-339.000.

Nalco Chemical Company: See—
Gross, Anthony E.; and Bonin, Jacqueline L., 4,875,935, Cl. 75-117.000.

Napiorkowski, John J.: See—
Crosby, John J.; and Napiorkowski, John J., 4,876,713, Cl. 379-412.000.

Narita, Tadashi: See—
Hasegawa, Hiroshi; Shioiri, Noriaki; Narita, Tadashi; and Katori, Tatsuhiko, 4,876,359, Cl. 548-533.000.

Naruo, Kyoichi; Ohtani, Sumio; Etou, Masahiro; Tsuruta, Masao; Moriya, Ikuro; Ishiguro, Masanori; and Matsumoto, Akira, to Fuji Photo Film Co., Ltd. Plate-type filter cartridge with internal support. 4,876,007, Cl. 210-339.000.

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National Distillers and Chemical Corporation: See—
Hoyt, John M.; and Blazey, Steven D., 4,876,315, Cl. 525-346.000.
Mertz, William J.; and Braun, Robert J., 4,876,304, Cl. 524-314.000.

National Institute for Research in Inorganic Materials: See—
Mishima, Osamu; Yamaoka, Shinobu; Fukunaga, Osamu; Tanaka, Junzo; and Era, Koh, 4,875,967, Cl. 156-605.000.

National Radiological Protection Board: See—
Burgess, Peter H., 4,876,454, Cl. 250-370.140.

National Semiconductor Corporation: See—
Davis, Craig M.; and Rasmussen, Richard R., 4,876,519, Cl. 331-57.000.
Hilton, Robert; Emamjomeh, Ali; and Belani, Jagdish, 4,876,587, Cl. 357-70.000.

National Service Industries, Inc.: See—
Booty, Donald J., Sr.; and Booty, Donald J., Jr., 4,875,871, Cl. 439-209.000.

National Starch and Chemical Corporation: See—
Solarek, Daniel B.; Dirscherl, Teresa A.; Hernandez, Henry R.; and Jarowenko, Wadym, 4,876,336, Cl. 536-109.000.

Nauman, Warren D.: See—
Fleak, David S.; Koegel, Keith S.; Long, William B.; Moist, Stan-ford C., Jr.; and Nauman, Warren D., 4,875,877, Cl. 439-497.000.

Navistar International Transportation Corp.: See—
Miller, Arden O., 4,875,697, Cl. 280-95.100.

Nayar, Shree K.: See—
Sanderson, Arthur C.; Weiss, Lee E.; and Nayar, Shree K., 4,876,455, Cl. 250-560.000.

NCR Corporation: See—
Janning, John L., 4,876,582, Cl. 357-23.500.
Petersen, Borge; and Groot, William P., 4,875,670, Cl. 271-265.000.

Neal, Robert A.: See—
Ray, Robert; Neal, Robert A.; Jaran, John R.; and Parker, Tim, 4,875,581, Cl. 206-328.000.

NEC Corporation: See—
Fukushima, Masaya, 4,876,442, Cl. 250-205.000.
Ishijima, Toshiyuki, 4,876,581, Cl. 357-23.300.
Kobatake, Hiroyuki; and Jinbo, Toshikatsu, 4,876,462, Cl. 307-246.000.
Koya, Kei, 4,876,661, Cl. 364-787.000.
Kurashi, Yoshiaki, 4,876,544, Cl. 341-166.000.
Matai, Masahiro; and Tsunoda, Kazuyuki, 4,876,536, Cl. 340-825.440.
Miyamoto, Takashi, 4,876,588, Cl. 357-81.000.
Okamoto, Eiji, 4,876,716, Cl. 380-21.000.
Oyamada, Takashi, 4,876,537, Cl. 340-825.440.
Ozaki, Hideharu, 4,876,704, Cl. 377-70.000.

- Saegusa, Noboru; Hara, Toshihiro; Kawasaki, Ryoji; Tate, Kazuyuki; Huse, Syoji; and Ono, Koji, 4,876,708, Cl. 379-61.000.
Sasaki, Katsuhiko; and Fukuda, Seiji, 4,876,686, Cl. 371-49.100.
Yoshikawa, Toshio, 4,876,696, Cl. 375-5.000.
Nehl, Wolfgang, to Fischerwerke Artur Fischer GmbH & Co. KG. Container for record carriers, 4,875,578, Cl. 206-309.000.
Neisen, Gerald F.: See—
Widmer, Steven L.; Neisen, Gerald F.; Ruhnke, Jeffrey P.; Steffes, Thomas J.; and Buchholz, Brian S., 4,875,439, Cl. 123-541.000.
Nelson, Blaine J., to Rockwell International Corporation. High speed sampled data digital phase detector apparatus, 4,876,699, Cl. 375-82.000.
Nelson, Linda H.; Avakian, Roger W.; and Factor, Arnold, to General Electric Company. Enhancing color stability to sterilizing radiation of polymer compositions, 4,876,309, Cl. 524-109.000.
Nelson, Robert A.: See—
Gruber, Robert J.; Yourd, Raymond A., III; Malhotra, Shadi L.; Nelson, Robert A.; Fox, Carol A.; and Hoffend, Thomas R., 4,876,169, Cl. 430-110.000.
Nelson, Thomas E. Method of making spaced-wall appliance with a sealing and insulating device between said walls, 4,875,272, Cl. 29-451.000.
Nemoto, Toshikazu; and Nakazawa, Shinsuke, to Nissan Motor Company, Limited. System and method for controlling an engine idling speed for an internal combustion engine, 4,875,446, Cl. 123-339.000.
Neo Electronics Limited: See—
Fitton, Stephen, 4,875,567, Cl. 194-318.000.
NeoRx Corporation: See—
Wilbut, Daniel S.; and Hadley, Stephen W., 4,876,081, Cl. 424-1.100.
Nespor, Ronald R., to Chevron, Inc. Quick-couple L-bar sleeve assembly for wheel lift, 4,875,822, Cl. 414-563.000.
Neste Oy: See—
Suvanto, Erkki, 4,875,515, Cl. 152-210.000.
Netsu, Tositada: See—
Hasegawa, Hiroshi; Sugimoto, Koichi; Yano, Takeshi; Netsu, Tositada; Tani, Mitsukiyo; and Kojima, Tsakau, 4,875,618, Cl. 228-179.000.
Neubert, Donald F. Sanitizing device for a telephone, 4,876,715, Cl. 379-452.000.
Neumann, Peter: See—
Dust, Matthias; Neumann, Peter; Schefczik, Ernst; Benthack-Thomas, Heidi; Barzynski, Helmut; Schomann, Klaus-Dieter; Kuppelmaier, Harald; and Koester, Eberhard, 4,876,356, Cl. 548-419.000.
Neurodynamics, Inc.: See—
Hariri, Robert J.; Ghajar, Jamshid B. G.; and Ghahremani-Ghadjari, Fathali, 4,875,482, Cl. 128-352.000.
New Balance Athletic Shoe, Inc.: See—
Norton, Edward J.; Fram, Craig F.; Graham, Kenneth W.; and Smith, James A., 4,876,053, Cl. 264-255.000.
Nezuka, Masakazu: See—
Kushida, Osami; Ninomiya, Hisamitsu; Nezuka, Masakazu; and Ishikawa, Yoshihiko, 4,876,523, Cl. 337-299.000.
NGK Insulators, Ltd.: See—
Inoue, Satoru; and Futamura, Shoji, 4,875,264, Cl. 29-163.600.
Kodachi, Toru; and Usami, Jun, 4,875,990, Cl. 204-408.000.
Miyakawa, Yasuhiro; and Machida, Minoru, 4,875,939, Cl. 123-271.000.
Takeya, Fuminori; Fukuda, Naoya; and Suzuki, Miki, 4,875,970, Cl. 156-645.000.
Usami, Jun; Hattori, Akinobu; and Sasaki, Yuichi, 4,875,981, Cl. 204-1.00T.
NGK Spark Plug Co., Ltd.: See—
Akao, Shigeaki; and Taniguchi, Masato, 4,875,442, Cl. 123-90.390.
Ogura, Kohji; and Ogawa, Kasumi, 4,876,675, Cl. 367-155.000.
Nicholson, Walter P. Recreational vehicle gate valve actuator, 4,875,504, Cl. 137-899.000.
Nickolson, Victor J.: See—
Myers, Melvyn J.; and Nickolson, Victor J., 4,876,259, Cl. 514-256.000.
Nicol, Alan J.: See—
Creagan, Richard W.; and Nicol, Alan J., 4,875,977, Cl. 162-300.000.
Niederhuesner, Detlev; Hahn, Guenter; and Baczymski, Andrzej, to Siemens Aktiengesellschaft. Combined high voltage connecting and grounding switch, 4,876,417, Cl. 200-48.00V.
Niehoff, Raymond L.: See—
Feeney, Robert D.; Prossie, Robert L.; McGrady, Joseph; and Niehoff, Raymond L., 4,876,102, Cl. 426-550.000.
Nihon Den-Netsu Keiki Co., Ltd.: See—
Kondo, Kenshi, 4,876,437, Cl. 219-388.000.
Nihon Tokushu Nayaku Seizo K.K.: See—
Shiokawa, Kozo; Tsuboi, Shinichi; Sasaki, Shoko; Moriya, Koichi; Hattori, Yumi; and Shibuya, Katsuhiko, 4,876,263, Cl. 514-338.000.
Nikkiso Co., Ltd.: See—
Arakawa, Kohei; and Ohsaki, Takashi, 4,876,078, Cl. 423-447.300.
Niklaus, Hans-Ulrich: See—
Zehnder, Paul; Niklaus, Hans-Ulrich; Schmiedl, Engelbert; and Patri, Franz, 4,875,836, Cl. 417-360.000.
Nilten, Trond; and Normann, Erling C. Machine for adjustable longitudinal corrugating of sheet materials, 4,875,354, Cl. 72-180.000.
Ninomiya, Hisamitsu: See—
Kushida, Osami; Ninomiya, Hisamitsu; Nezuka, Masakazu; and Ishikawa, Yoshihiko, 4,876,523, Cl. 337-299.000.

- Nippon Hoso Kyokai: See—
Kitamoto, Tatsuji; Yokoyama, Katsuya; and Sekiguchi, Takuji, 4,875,610, Cl. 226-10.000.
Nippon Mektron, Ltd.: See—
Nagahori, Atsushi, 4,876,439, Cl. 219-541.000.
Nippon Petrochemicals Co., Ltd.: See—
Aoyama, Takeo; Imai, Teruo; Hattori, Junichi; and Uehara, Mikio, 4,876,049, Cl. 264-49.000.
Nippon Seiko Kabushiki Kaisha: See—
Furumura, Kyozauro, 4,875,263, Cl. 29-149.50S.
Nippon Shokubai Kasaku Kogyo Co., Ltd.: See—
Kakimoto, Yukihiro; Sawada, Masayuki; Kajimoto, Yoshiaki; and Kiguchi, Isamu, deceased, 4,875,909, Cl. 55-40.000.
Nippon Steel Corporation: See—
Nakayama, Hisanobu; Tanaka, Osamu; Yasumoto, Hiromichi; Senoo, Seiichi; Zaizen, Youichi; and Yamasaki, Kouji, 4,875,947, Cl. 148-113.000.
Shindou, Yoshio; Kabeya, Motoo; Shimazu, Takashi; and Yamazaki, Fumio, 4,876,160, Cl. 428-623.000.
Nippon Telegraph and Telephone Corp.: See—
Saegusa, Noboru; Hara, Toshihiro; Kawasaki, Ryoji; Tate, Kazuyuki; Huse, Syoji; and Ono, Koji, 4,876,708, Cl. 379-61.000.
Nippondenso Co., Ltd.: See—
Ozawa, Takashi; Tanaka, Hitoshi; Goshima, Takahiro; and Takagi, Koji, 4,875,741, Cl. 303-116.000.
Sano, Ryuichi; and Isomura, Shigenori, 4,875,443, Cl. 123-179.00G.
Nishi, Yasuhiko: See—
Sugitani, Yuji; Sato, Yoshikazu; and Nishi, Yasuhiko, 4,876,432, Cl. 219-124.320.
Nishida, Masahiro, to Koyo Seiko Co., Ltd. Back-up roll in a rolling mill, 4,875,261, Cl. 29-116.100.
Nishida, Naoto; and Nishio, Mitsuhiro, to Kabushiki Kaisha Toshiba. Metal vapor laser apparatus, 4,876,690, Cl. 372-56.000.
Nishikawa, Hiroshi, to Canon Kabushiki Kaisha. Recording apparatus having a print permission circuit for protecting plural recording heads driven in accordance with selectively applied print signals from overload, 4,876,559, Cl. 346-140.00R.
Nishimura, Yasunobu; and Kawai, Toshikazu, to Central Glass Company, Limited. Process for making fluorobenzoic acid fluorophenyl-esters, 4,876,382, Cl. 560-109.000.
Nishio, Mitsuhiro: See—
Nishida, Naoto; and Nishio, Mitsuhiro, 4,876,690, Cl. 372-56.000.
Nishitoku, Yukitsugu, to Fuji Photo Film Co., Ltd. Image exposure apparatus, 4,876,569, Cl. 355-68.000.
Nishizawa, Jun-ichi, to Zaiden Hojin Handotai Kenkyu Shinkokai. Tunnel injection controlling type semiconductor device controlled by static induction effect, 4,876,580, Cl. 357-22.000.
Nissan Motor Company, Limited: See—
Hara, Junichiro; Ogihara, Yoshiyuki; and Takahashi, Hideo, 4,875,624, Cl. 236-49.500.
Kubo, Jun, 4,876,650, Cl. 364-426.020.
Murakami, Takuya, 4,875,703, Cl. 280-665.000.
Nemoto, Toshikazu; and Nakazawa, Shinsuke, 4,875,446, Cl. 123-339.000.
Tsuchida, Hirofumi; Tanaka, Toshiaki; Oyama, Akira; and Hirao, Sumio, 4,875,444, Cl. 123-270.000.
Uchida, Koh; Kurihara, Takashi; and Miyoshi, Makoto, 4,875,542, Cl. 180-142.000.
Nissho Corporation: See—
Yoshida, Toshiaki, 4,875,265, Cl. 29-240.000.
Nissin Electric Company, Ltd.: See—
Ogata, Kiyoshi; Ando, Yasunori; Kamijo, Eiji; and Matsumura, Noriaki, 4,875,284, Cl. 29-830.000.
Nitto Electric Industrial Co., Ltd.: See—
Higashi, Kazumi; and Noda, Yuzuru, 4,876,330, Cl. 528-353.000.
Nitto Kohki Co., Ltd.: See—
Sasa, Takeya; Kobayashi, Yoshikazu; and Makishima, Reichi, 4,875,720, Cl. 285-249.000.
Nixdorf Computer AG: See—
Moeckl, Ernst; Stumpf, Jorg; Hardt, Walter; and Doinghaus, Hermann, 4,875,418, Cl. 108-50.000.
Nixdorf, Richard D., to America Matrix, Inc. Method of producing a high temperature, high strength bond between a ceramic shape and metal shape, 4,875,616, Cl. 228-120.000.
NKK Corporation: See—
Iwasa, Hiroki; Watanabe, Toyofumi; and Furuya, Hirohide, 4,875,984, Cl. 204-56.100.
Sugitani, Yuji; Sato, Yoshikazu; and Nishi, Yasuhiko, 4,876,432, Cl. 219-124.320.
Nobumoto, Hidetoshi: See—
Hashimoto, Noboru; Hitomi, Mitsuo; Onishi, Koji; Yada, Yoshikuni; Nobumoto, Hidetoshi; and Hotate, Makoto, 4,875,455, Cl. 123-568.000.
Nobuta, Hiroshi, to Canon Kabushiki Kaisha. Apparatus for communicating image data of different resolutions, 4,876,604, Cl. 358-400.000.
Noda, Hajime; Sato, Kuniyoshi; and Sotani, Junji, to Furukawa Electric Co., Ltd. Heat pipe heat exchanger, 4,875,522, Cl. 165-104.140.
Noda, Yuzuru: See—
Higashi, Kazumi; and Noda, Yuzuru, 4,876,330, Cl. 528-353.000.
Noffsinger, Alfred A. Collapsible display sign, 4,875,302, Cl. 40-610.000.
Nogami, Ikuo: See—
Shirafuji, Hideo; Yamaguchi, Takamasa; and Nogami, Ikuo, 4,876,195, Cl. 435-137.000.

- Noguchi, Noriyoshi: See—
Morimoto, Akira; Choh, Nobuo; and Noguchi, Noriyoshi, 4,876,251, Cl. 514-193.000.
Noll, Klaus; Thoma, Wilhelm; Nachtkamp, Klaus; Schroer, Walter; and Pedain, Josef, to Bayer Aktiengesellschaft. Polyurethane dispersions and the use thereof as finishing agents, 4,876,302, Cl. 524-267.000.
Nomoto, Kenichi: See—
Oinuma, Hitoshi; Yamanaka, Motosuke; Miyake, Kazutoshi; Hoshiko, Tomonori; Minami, Norio; Shoji, Tadao; Daiku, Yoshiharu; Sawada, Kohei; and Nomoto, Kenichi, 4,876,262, Cl. 514-318.000.
Nonami, Takayuki: See—
Yoshida, Shigeyuki; Musha, Atsushi; and Nonami, Takayuki, 4,876,714, Cl. 379-433.000.
Nook, Thomas J.: See—
Martin, Gregory G.; and Nook, Thomas J., 4,875,590, Cl. 211-55.000.
Normag Corporation: See—
Fox, Steve A., 4,875,782, Cl. 374-148.000.
Normann, Erling C.: See—
Nilten, Trond; and Normann, Erling C., 4,875,354, Cl. 72-180.000.
North American Philips Corporation: See—
Lyle, Robert L., 4,876,463, Cl. 307-265.000.
Northern Telecom Limited: See—
Borkowicz, Jerzy, 4,876,620, Cl. 361-56.000.
Cwirzen, Casimir Z.; and Kupferschmidt, Albert, 4,875,868, Cl. 439-188.000.
Graves, Alan F.; Littlewood, Paul A.; and Weiss, Johannes S., 4,876,682, Cl. 370-66.000.
Greveling, Johannes, 4,875,757, Cl. 350-96.230.
Norton, Edward J.; Fram, Craig F.; Graham, Kenneth W.; and Smith, James A., to New Balance Athletic Shoe, Inc. Process of molding a component of a sole unit for footwear, 4,876,053, Cl. 264-255.000.
Norwood, Roger D.; Chun, Jino; and Patel, Pravin P., to Texas Instruments Incorporated. Semiconductor dynamic memory device with metal-level selection of page mode or nibble mode, 4,876,671, Cl. 365-233.000.
Nosanchuk, Jerry L. Needle cap replacement device, 4,875,583, Cl. 206-365.000.
Nosowitz, Martin: See—
Gardner, David M.; Wheaton, Gregory A.; and Nosowitz, Martin, 4,876,048, Cl. 260-543.00R.
Novo Industri A/S: See—
Enomoto, Michiyo; and Riisgaard, Steen, 4,876,024, Cl. 252-174.120.
Markussen, Erik K., 4,876,198, Cl. 435-183.000.
NOVOPACK Maschinenbau GmbH: See—
Munk, Harald, 4,875,904, Cl. 34-67.000.
Nowak, Deanne M.; and Lin, Henry C., to Occidental Chemical Corporation. Process for preparing 2,4,5-trifluorobenzoic acid, 4,876,387, Cl. 562-493.000.
Nowak, Ronald R.; and Cherko, Carl F., to Oerlikon Motch Corporation. Arbor assembly, 4,875,693, Cl. 279-2.00R.
Nowak, William W.: See—
Kadleck, Richard G.; and Nowak, William W., 4,875,585, Cl. 206-426.000.
Nowicki, Neal R.; and Thomka, Donald E., to Amoco Corporation. Batch or semicontinuous pseudocumene oxidation and catalyst recovery and recycle, 4,876,385, Cl. 562-414.000.
Nowicki, Neal R.: See—
Chiang, Weilong L.; Fjare, Douglas E.; and Nowicki, Neal R., 4,876,329, Cl. 528-353.000.
Nowlin, Thomas E.: See—
Lo, Frederick Y.; Nowlin, Thomas E.; and Wu, Margaret M., 4,876,321, Cl. 526-129.000.
Nozoe, Shigeo; and Ohta, Tomihisa, to Ajinomoto Co., Inc. Amino acid derivatives, their production and use in preparing carbenem and carbenam compounds, 4,876,383, Cl. 560-163.000.
Nuechterlein, David W.; and Rinaldi, Mark A., to International Business Machines Corp. Parallel pipelined processor, 4,876,644, Cl. 364-200.000.
Nukem GmbH: See—
Maurer, Albrecht; and Fabian, Josef, 4,876,727, Cl. 382-8.000.
N.V. Michel Van De Wiele: See—
Debaes, Johny, 4,875,507, Cl. 139-450.000.
Nvtek Security Products, Inc.: See—
McMaster, Richard L., 4,876,445, Cl. 250-221.000.
Nynex Corporation: See—
Loris, Keith; and Euchner, James, 4,876,731, Cl. 382-40.000.
O'Brien, William D., Jr.: See—
Baltzer, Gary L.; Lynch, Brian; and O'Brien, William D., Jr., 4,875,916, Cl. 65-2.000.
Occidental Chemical Corporation: See—
Nowak, Deanne M.; and Lin, Henry C., 4,876,387, Cl. 562-493.000.
Ocha, Charles S., to Anchor Hocking Corporation. Closure cap, 4,875,594, Cl. 215-252.000.
O'Connor, Lorne D.: See—
Roy, Bernard J. J.; O'Connor, Lorne D.; Rioux, Philippe F.; Dingie, Donald A.; and Raymond, Andre L., 4,876,597, Cl. 358-141.000.
O'Connor, Sean P., to BP Chemicals Limited. Lubricating oil compositions containing anti-wear/anti-corrosion, 4,876,021, Cl. 252-48.200.
Oda, Masataka: See—
Hara, Kazuyoshi; and Oda, Masataka, 4,876,578, Cl. 355-315.000.

- Oda, Noriyuki; Takehara, Tetsuo; Higashi, Katsumi; and Muramatsu, Keiji, to Asahi Glass Company, Ltd. Joint structure for a tube support plate and a tube, 4,875,712, Cl. 285-47.000.
Oda, Noriyuki: See—
Arai, Yoshimasa; Enamito, Satoshi; and Oda, Noriyuki, 4,875,335, Cl. 60-274.000.
Oehling, Mark E.: See—
Jan, Chaur-Ming; and Oehling, Mark E., 4,875,435, Cl. 118-62.000.
Oerlikon Motch Corporation: See—
Nowak, Ronald R.; and Cherko, Carl F., 4,875,693, Cl. 279-2.00R.
Ofir, Arie. Hingedly connected cubical prisms amusement and display device, 4,875,681, Cl. 273-155.000.
Ogasawara, Yoshinari: See—
Mizuno, Shinji; Kawato, Humio; Hanazawa, Kazuyoshi; Aoyama, Tatsuki; and Ogasawara, Yoshinari, 4,875,911, Cl. 55-162.000.
Ogata, Kiyoshi; Ando, Yasunori; Kamijo, Eiji; and Matsumura, Noriaki, to Nissin Electric Company, Ltd. Process for producing a package for packing semiconductor devices, 4,875,284, Cl. 29-830.000.
Ogawa, Kasumi: See—
Ogura, Kohji; and Ogawa, Kasumi, 4,876,675, Cl. 367-155.000.
Ogawa, Kazufumi, to Matsushita Electric Industrial Co., Ltd. Optical fiber and method of producing the same, 4,875,759, Cl. 350-96.340.
Ogawa, Kyosuke: See—
Matsumoto, Yasuyuki; Murai, Keiichi; Fukuda, Tadaji; and Ogawa, Kyosuke, 4,876,185, Cl. 430-580.000.
Ogihara, Yoshiyuki: See—
Hara, Junichiro; Ogihara, Yoshiyuki; and Takahashi, Hideo, 4,875,624, Cl. 236-49.500.
Ogino, Hidekazu: See—
Hirota, Hajime; Ogino, Hidekazu; Igarashi, Sahoko; and Sotoya, Kohshiro, 4,876,034, Cl. 252-546.000.
Ogura, Kohji; and Ogawa, Kasumi, to NGK Spark Plug Co., Ltd. Towed piezoelectric cable, 4,876,675, Cl. 367-155.000.
Ogura, Masaki, to Ricoh Company, Ltd. Digital copier with a facsimile function, 4,876,609, Cl. 358-443.000.
Ogura, Mitsuru; and Tsukamoto, Kimihide, to Sharp Kabushiki Kaisha. Multi-component photoreceptor cartridge unit, 4,876,577, Cl. 355-315.000.
Ohara, Yuji, to Fuji Photo Film Co., Ltd. Bean recorder with a temperature sensor for light quantity control, 4,876,556, Cl. 346-108.000.
Ohhara, Nobuhiro: See—
Watanabe, Masataka; Ohhara, Nobuhiro; and Taguchi, Kenichi, 4,876,438, Cl. 219-497.000.
Ohira, Kazuo: See—
Nakaoku, Shozo; Sakuma, Kazuhiko; Oshika, Yasuhiro; and Ohira, Kazuo, 4,876,345, Cl. 544-379.000.
Ohji, Akihito: See—
Mizobuchi, Tadamu; Ohji, Akihito; Sakoh, Seiichi; and Muguruma, Yasuyoshi, 4,876,092, Cl. 424-435.000.
Ohji, Kenzo: See—
Mihara, Makoto; Inoue, Masanobu; Ohji, Kenzo; and Itou, Shuji, 4,875,533, Cl. 177-144.000.
Ohkita, Masao: See—
Yunokuchi, Ryu; Omori, Shinichi; and Ohkita, Masao, 4,875,276, Cl. 29-603.000.
Ohkubo, Kazuo; Hayashi, Tadamasu; and Nagai, Hiroshi, to Ebara Corporation. Hollow fiber filter device, 4,876,006, Cl. 210-321.690.
Ohkuma, Taka'aki: See—
Umezawa, Hamao; Suzuki, Shintaro; Ohkuma, Taka'aki; Sato, Fumihiko; and Nakamura, Teruya, 4,876,244, Cl. 514-19.000.
Ohlendorf, Dieter: See—
Hemmerling, Wolfgang; Dubal, Hans-Rolf; Muller, Ingrid; Ohlendorf, Dieter; and Wingen, Rainer, 4,876,028, Cl. 252-299.610.
Ohmae, Tsutomu: See—
Abukawa, Toshiaki; Tahara, Kazuo; Muramoto, Katsuji; Koterazawa, Toshiyuki; Hombu, Mitsuyuki; Takahashi, Tadashi; Takamatsu, Shuichi; Ishikura, Hisatugu; Yamamura, Hiroshisa; Tatsuzaki, Toru; Ohmae, Tsutomu; Okuyama, Toshiaki; Yamashita, Seizi; Saito, Shigeki; and Sakai, Masato, 4,875,539, Cl. 180-79.100.
Ohno, Kouji: See—
Saito, Shinichi; Inoue, Hiromichi; Miyazawa, Kazutoshi; Ohno, Kouji; and Ushioda, Makoto, 4,876,026, Cl. 252-299.610.
Ohoka, Susumu: See—
Maeda, Tetsuro; Wada, Fukuaki; Ohoka, Susumu; and Okamoto, Akihiro, 4,876,145, Cl. 428-327.000.
Ohsaki, Takashi: See—
Arakawa, Kohei; and Ohsaki, Takashi, 4,876,078, Cl. 423-447.300.
Ohsawa, Hidefumi; Katayama, Akihiro; Hosokawa, Hiroshi; Sunohara, Izuru; and Yoshimoto, Masahiko, to Canon Kabushiki Kaisha. Image processing apparatus with binarization-error dispersal, 4,876,610, Cl. 358-443.000.
Ohshima, Hajime: See—
Suzuki, Yasuhito; Akimoto, Koichiro; Ohshima, Hajime; Honda, Kazuyuki; and Isaka, Yukio, 4,876,562, Cl. 346-160.000.
Ohta, Norio: See—
Susa, Kenzo; Takagi, Kazumasa; Kobayashi, Toshio; Takayama, Takano; and Ohta, Norio, 4,876,144, Cl. 428-336.000.
Ohta, Saburo: See—
Isaka, Tsutomu; and Ohta, Saburo, 4,876,146, Cl. 428-347.000.
Ohta, Tomihisa: See—
Nozoe, Shigeo; and Ohta, Tomihisa, 4,876,383, Cl. 560-163.000.
Ohtani, Sumio: See—
Naruo, Kyoichi; Ohtani, Sumio; Etoh, Masahiro; Tsuruta, Masao; Moriya, Ikuro; Ishiguro, Masanori; and Matsumoto, Akira, 4,876,007, Cl. 210-339.000.

Oike, Hitoshi; and Yanagimachi, Motohige, to Oike Industrial Co., Ltd. Heat-sensitive transfer medium. 4,875,961, Cl. 156-234.000.
Oike Industrial Co., Ltd.: See—
Oike, Hitoshi; and Yanagimachi, Motohige, 4,875,961, Cl. 156-234.000.
Oil Dynamics, Inc.: See—
Farque, Claude A., 4,876,539, Cl. 340-856.000.
Oinuma, Hitoshi; Yamanaka, Motonuke; Miyake, Kazutoshi; Hoshiko, Tomonori; Minami, Norio; Shoji, Tadao; Daiku, Yoshiharu; Sawada, Kohei; and Nomoto, Kenichi, to Eisai Co., Ltd. Piperidine derivative and pharmaceutical composition containing the same. 4,876,262, Cl. 514-318.000.
Oka, Hiroki; and Nagura, Nobuyoshi, to Aisin Seiki Kabushiki Kaisha. Vehicle speed detecting device. 4,876,527, Cl. 340-441.000.
Okada, Kazuo: See—
Imai, Hitoshi; Okada, Kazuo; and Tadokoro, Michihiro, 4,876,666, Cl. 365-106.000.
Okamoto, Akihiro: See—
Maeda, Tetsuro; Wada, Fukuaki; Ohoka, Susumu; and Okamoto, Akihiro, 4,876,145, Cl. 428-327.000.
Okamoto, Eiichi, to NEC Corporation. Key distribution method. 4,876,716, Cl. 380-21.000.
Okamoto, Kenzo; and Kitada, Fumihiko, to Imanishi Kinzoku Kogyo Kabushiki Kaisha. Latch assembly for door or window of microwave range. 4,875,721, Cl. 292-29.000.
Okamoto, Tatsuo: See—
Watakabe, Yaichiro; Okamoto, Tatsuo; and Matsuda, Shuichi, 4,876,164, Cl. 430-5.000.
Okamoto, Toshio: See—
Iwai, Isamu; Okamoto, Toshio; and Doi, Miwako, 4,876,665, Cl. 364-900.000.
Saito, Mitsuo; Matoba, Tsukasa; and Okamoto, Toshio, 4,876,657, Cl. 364-521.000.
Okamoto, Yuji: See—
Suzumura, Hiroyuki; Okamoto, Yuji; and Suezaki, Isao, 4,875,817, Cl. 411-171.000.
Okawa, Tadashi; and Suzuki, Toshio, to Toray Silicone Company, Ltd. Method of manufacturing organopolysiloxane having terminal alkynyl groups. 4,876,373, Cl. 556-453.000.
Okazaki, Masaki: See—
Miyasaka, Tadamu; Okazaki, Masaki; and Sugimoto, Tadao, 4,876,183, Cl. 430-567.000.
Oki Electric Industry Co., Ltd.: See—
Ishikawa, Osamu; and Sumiya, Kiyoshi, 4,876,605, Cl. 358-400.000.
Okimoto, Haruo; and Tashima, Seiji, to Mazda Motor Corporation. Supercharging apparatus for an internal combustion engine. 4,875,454, Cl. 123-559.300.
Okuda, Akihiro; Totake, Yukinori; and Matsumura, Hideki, to Denki Kagaku Kogyo Kabushiki Kaisha. Process for producing 2,3-dichlorobutadiene-1,3. 4,876,407, Cl. 570-239.000.
Okuda, Hiroki: See—
Mizutani, Masato; Shiroshita, Masao; Sakaki, Masaharu; Okuda, Hiroki; and Mito, Nobuaki, 4,875,924, Cl. 71-92.000.
Okuda, Hiroko; and Takenaka, Makoto, to Casio Computer Co., Ltd. Electronic musical instrument with touch response function. 4,875,400, Cl. 84-626.000.
Okuda, Shozo: See—
Inui, Masaki; Okuda, Shozo; and Hosono, Masaki, 4,875,566, Cl. 192-53.00F.
Okuda, Yoshihiro: See—
Kambe, Yoshiaki; Okuda, Yoshihiro; Hirono, Atsuyuki; Nagaoka, Akira; and Ito, Takayasu, 4,876,446, Cl. 250-221.000.
Okuyama, Toshiaki: See—
Abukawa, Toshiaki; Tahara, Kazuo; Muramoto, Katsuji; Koterazawa, Toshiyuki; Hombu, Mitsuyuki; Takahashi, Tadashi; Takamatsu, Shuichi; Ishikura, Hisatugu; Yamamura, Hiroshisa; Tatsuzaki, Toru; Ohmae, Tsutomu; Okuyama, Toshiaki; Yamashita, Seizi; Saito, Shigeki; and Sakai, Masato, 4,875,539, Cl. 180-79.100.
Olin Corporation: See—
Casberg, John M., 4,876,003, Cl. 210-169.000.
Miller, J. Stanley; and Bowles, Thomas J., 4,876,296, Cl. 523-200.000.
O'Loughlin, Francis A., to Thomas & Betts Corporation. Electrical connector for overlapped conductors. 4,875,876, Cl. 439-431.000.
Olson, Larry D.; and Pallardy, Eugene P., Jr., to Allied-Signal Inc. Polyimide resin from bis-imide, polyphenol and dicyandiamide. 4,876,325, Cl. 528-170.000.
Omni Optical Products, Inc.: See—
Panique, Kenneth L.; and Frank, Jeffrey B., 4,875,291, Cl. 33-293.000.
Omori, Shinichi: See—
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Omura, Tadao: See—
Imoto, Koji; Tateishi, Mataji; Omura, Tadao; Nakajima, Kunihiko; Maekawa, Motoyuki; Matsuyama, Moritake; and Tamura, Hiroki, 4,875,445, Cl. 123-292.000.
Onaga, Eimei M.: See—
Daggett, Kenneth E.; Onaga, Eimei M.; and Casler, Richard J., Jr., 4,876,494, Cl. 318-568.220.
O'Neill, James F.; Drake, Donald J.; and Hawkins, William G., to Xerox Corporation. Method of fabricating ink jet printheads. 4,875,968, Cl. 156-633.000.

Onishi, Koji: See—
Hashimoto, Noboru; Hitomi, Mitsuo; Onishi, Koji; Yada, Yoshikuni; Nobumoto, Hidetoshi; and Hotate, Makoto, 4,875,455, Cl. 123-568.000.
Onnenberg, Volker; and Mollmann, Gunter, to Fritsche-Mollmann GmbH & Co.; and Bayer Aktiengesellschaft. Vacuum mold for manufacturing cushions with back-foamed covers. 4,875,843, Cl. 425-4.00R.
Ono, Koichi: See—
Urata, Kaoru; Nakashio, Miaki; Ono, Koichi; Hirai, Hitoshi; and Iwamoto, Masayuki, 4,876,703, Cl. 377-62.000.
Ono, Koji: See—
Sagawa, Noboru; Hara, Toshihiro; Kawasaki, Ryoji; Tate, Kazuyuki; Huse, Syoji; and Ono, Koji, 4,876,708, Cl. 379-61.000.
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Shimodaira, Hisayo; Ono, Toshio; Miyawaki, Keizo; and Hamaguchi, Tatsuya, 4,875,766, Cl. 350-641.000.
Onuki, Toru; Sagawa, Junichi; Watanabe, Tamotsu; and Yoshimitsu, Toshio, to Kabushiki Kaisha Riken; and Kabushiki Kaisha Komatsu Seisakusho. Piston ring having a wear resistant surface layer. 4,876,158, Cl. 428-565.000.
Ooms, Pieter: See—
Heine, Hans-Georg; and Ooms, Pieter, 4,876,393, Cl. 568-415.000.
Orac, Thomas H.; Quandt, Herbert C.; and Ball, David R., to Union Carbide Corporation. Treatment of petroleum cokes to inhibit coke puffing. 4,875,979, Cl. 201-5.000.
Orbach, Zvi; and Janai, Meir I., to Elron Electronic Industries, Ltd. Fabrication of customized integrated circuits. 4,875,971, Cl. 156-644.000.
Oren, David D. Front end loading enclosed semi trailer. 4,875,821, Cl. 414-481.000.
Orsburn, Michael L.; Hemsley, Robert L.; Tucker, Terry L.; Schwarz, Robert E.; and Fearing, Craig F., to Utah Scientific Advanced Development Center, Inc. Phase responsive composite video signal control system. 4,876,589, Cl. 358-22.000.
Ortho Pharmaceutical Corporation: See—
Hajos, Zoltan G.; Kanojia, Ramesh M.; and Press, Jeffery B., 4,876,257, Cl. 514-253.000.
Osabe, Kuniji: See—
Chiba, Yuji; Ando, Kenji; Sugata, Masao; Sugata, Hiroyuki; Kimura, Toshiaki; and Osabe, Kuniji, 4,875,810, Cl. 406-14.000.
Osaka Yuki Kagaku Kogyo Kabushiki Kaisha: See—
Kato, Chuzo; and Kuroda, Kazuyuki, 4,875,762, Cl. 350-357.000.
Osana, Hiroyuki: See—
Akao, Mutsuo; Osana, Hiroyuki; and Inoue, Koji, 4,876,125, Cl. 428-35.200.
Osawa, Izumi: See—
Hotomi, Hideo; Osawa, Izumi; Iino, Syuji; Doi, Isao; and Fujiwara, Masanori, 4,876,168, Cl. 430-58.000.
Osborne, Robert L., to Westinghouse Electric Corp. Apparatus and method for monitoring steam turbine shroud clearance. 4,876,505, Cl. 324-208.000.
Oshika, Yasuhiro: See—
Nakaoku, Shozo; Sakuma, Kazuhiko; Oshika, Yasuhiro; and Ohira, Kazuo, 4,876,345, Cl. 544-379.000.
Oshio, Hideki: See—
Kondo, Takeshi; Kawai, Toshikazu; and Oshio, Hideki, 4,876,404, Cl. 570-145.000.
Oshita, Saichiro; Mouri, Toyohiko; and Takahashi, Tsutomu, to Fuji Jukogyo Kabushiki Kaisha. Electric power steering system. 4,875,540, Cl. 180-79.100.
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Osipov, Gennadi I.: See—
Belykh, Sergei I.; Davydov, Anatoly B.; Moschensky, Anatoly D.; Kanchin, Nikolai N.; Kovalenko, Igor L.; Kirillov, Yuri B.; Osipov, Gennadi I.; and Utyamyshev, Rustam I., 4,875,479, Cl. 128-335.500.
Osterhout, Ralph F.; Howard, Paul L.; and Light, Greta G., to Tekna, Inc. Flashlight with battery life indicator module. 4,876,632, Cl. 362-183.000.
Ostermeier, Bruce H., to AM International Corporation. Low loss photoplotter imaging system. 4,875,751, Cl. 350-96.180.
Ostertag, Alfred: See—
Biehl, Johann; and Ostertag, Alfred, 4,875,531, Cl. 175-250.000.
Ostrup, Heinrich; and Hegger, Josef, to CLAAS OHG. Product receiving arrangement for agricultural machines, especially for self-propelling harvester threshers. 4,875,331, Cl. 56-208.000.
Otera, Junzo; Mandai, Tadakatsu; and Kawada, Mikio, to Kuraray Co., Ltd. Process for producing vitamin A or its carboxylic acid esters, and intermediate compounds useful for the process. 4,876,400, Cl. 568-824.000.
Otis Elevator Company: See—
Berkhan, Dietmar; and Mehler, Martin, 4,875,558, Cl. 188-171.000.
Hermann, Dietrich E.; and Holzhauser, Ralf, 4,875,568, Cl. 198-335.000.
Otomo, Ruyzi: See—
Abe, Akira; Nakajima, Junya; Takase, Haruo; Uenaka, Kazushige; and Otomo, Ruyzi, 4,876,180, Cl. 430-393.000.
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Yabe, Akira; Ouchi, Akihiko; Moriyama, Hiroshi; and Masuda, Eisuro, 4,875,986, Cl. 204-157.600.
Oury, Robert F.; and Gallione, Joseph, to Rotec Industries, Inc. Concrete delivery system. 4,875,569, Cl. 198-36.000D.

Owen, Hartley: See—
Haddad, James H.; Owen, Hartley; and Schatz, Klaus W., 4,875,994, Cl. 208-113.000.
Owen, Robert E.; and Miller, Bruce E., to Bipolar Integrated Technology, Inc. Fixed-point multiplier-accumulator architecture. 4,876,660, Cl. 364-754.000.
Owens-Corning Fiberglass Corporation: See—
Dallum, Barry J., 4,876,124, Cl. 428-34.500.
Oy Nokia Ab: See—
Pessa, Markus; Asonen, Harry; Varrio, Jukka; and Salokative, Arto, 4,876,218, Cl. 437-107.000.
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Takagi, Akira; Oyazui, Hirotugu; Takahashi, Nobuatsu; and Kume, Kiyotaka, 4,875,647, Cl. 248-74.300.
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Oyamada, Takashi, to NEC Corporation. Pager receiver including a light emitting and a light sensing element adjacent to a translucent portion of a receiver housing. 4,876,537, Cl. 340-825.440.
Ozaki, Hideharu, to NEC Corporation. Logic integrated circuit for scan path system. 4,876,704, Cl. 377-70.000.
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Ozawa, Takashi, to Fuji Xerox Co., Ltd. Contact type image sensor with separate charge transfer device. 4,876,585, Cl. 357-24.000.
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Ozeki, Takeshi: See—
McNeill, Kevin M.; and Ozeki, Takeshi, 4,876,643, Cl. 364-200.000.
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Koike, Eishi; and Yusa, Yasuhiko, 4,876,678, Cl. 369-31.000.
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Paau, Alan, to Agracetus Corporation. Bacterial agricultural inoculants. 4,875,921, Cl. 71-7.000.
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Snow, Robert A.; McGuckin, Hugh G.; Ponticello, Ignazio S.; Daly, Robert C.; Pace, Laurel J.; Fischer, Sandra K.; and Hanrahan, Michael J., 4,876,167, Cl. 430-7.000.
Pacelli, Leonardo: See—
Alota, Santa; Ferrari, Vincenzo; Memmi, Massimo; Pacelli, Leonardo; and Ramundo, Susanna, 4,875,983, Cl. 204-28.000.
Padley, Frederick B.: See—
King, David M.; and Padley, Frederick B., 4,876,107, Cl. 426-601.000.
Paice, Derek A., to Westinghouse Electric Corp. Multi-pulse converter system. 4,876,634, Cl. 363-5.000.
Palac, Donald T., heir: See—
Palac, Kazimir, deceased; Palac, Judith A., heir; Palac, Donald T., heir; and Palac, Susan M., heir, 4,876,480, Cl. 313-477.00R.
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Palac, Kazimir, deceased (by Palac, Phyllis J., heir); by Palac, Judith A., heir; by Palac, Donald T., heir; and by Palac, Susan M., heir, to Zenith Electronics Corporation. Low-cost, self-polished color CRT flat faceplate. 4,876,480, Cl. 313-477.00R.
Palac, Phyllis J., heir: See—
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Olson, Larry D.; and Pallardy, Eugene P., Jr., 4,876,325, Cl. 528-170.000.
Palmer, Christopher J.; and Casida, John E., to University of California, The Regents of the. New class of pesticides comprising 1,4-bis-substituted-2,6,7-trioxabicyclo(2.2.2)octanes. 4,876,274, Cl. 514-452.000.
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Cipolla, Thomas M.; Horton, Raymond R.; Murphy, Philip; and Palmer, Michael J., 4,875,614, Cl. 228-5.500.
Palmer, Paul D., Sr.: See—
Kinnebrew, Earl, II; and Palmer, Paul D., Sr., 4,875,348, Cl. 68-200.000.
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Caveny, Jack E.; Bulanda, John J.; Fischer, Richard L.; Stroede, Andrew J.; and Wiencek, Donald C., 4,875,881, Cl. 439-535.000.
Panel International Ltd. p.l.c.: See—
Tikkanen, Tim, 4,876,008, Cl. 210-498.000.
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Delatorre, Leroy C., 4,875,368, Cl. 73-151.000.
Delatorre, Leroy C., 4,875,369, Cl. 73-151.000.

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Long, William W., III, 4,875,309, Cl. 51-419.000.
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Paper Converting Machine GmbH: See—
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Lucero, David J.; Parazzoli, Claudio G.; and Mangir, Metin S., 4,876,693, Cl. 372-82.000.
Parent, David J.: See—
Hodgson, Gordon; Broadhead, Douglas G.; and Parent, David J., 4,875,538, Cl. 180-379.000.
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Granik, Vladimir G.; Stezhko, Tatyana V.; Glushkov, Robert G.; Mashkovsky, Mikhail D.; Roschina, Lidia F.; Polezhaeva, Antonina I.; Parimbetova, Roza B.; Bobkov, Yuri G.; Losev, Alexander S.; and Ivanova, Irina A., 4,876,360, Cl. 548-550.000.
Park, Ho J.; Rhim, Moo S.; Kim, Hak M.; Kim, Du H.; Yoo, Seog C.; Kim, Sang H.; Park, Sa Ng B.; Han, In S.; Park, Jong T.; and Kim, Si M., to Kolon Industries, Inc. Two-stage process for preparing aromatic polyamide fiber. 4,876,040, Cl. 264-14.000.
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Frink, Tommy S.; Reed, Lowell M.; Cochran, Dwayne V.; and McNair, Will L., 4,875,530, Cl. 175-27.000.
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Ray, Robert; Neal, Robert A.; Jaran, John R.; and Parker, Tim, 4,875,581, Cl. 206-328.000.
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Joseph, Philippe; and Petrochat, Jean Michel, 4,875,706, Cl. 280-708.000.
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Dixon, George G.; Parلمان, Robert M.; and Stewart, Wayne, 4,876,030, Cl. 252-315.200.
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Autant, Pierre; Cartillier, Andre; and Pigeon, Raymond, 4,876,097, Cl. 426-74.000.
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Belke, Robert E.; Zakraysek, Louis; and Pillar, Walter O., 4,876,120, Cl. 428-1.000.
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Malpass, Dennis B.; Triplett, Kelly B.; and Piotrowski, Andrzej M., 4,876,318, Cl. 525-446.000.
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Gasiunas, Donatas V.; Sette, Paul R.; and Storace, Anthony, 4,875,788, Cl. 400-163.100.
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Witucki, Gerald L.; and Plueddemann, Edwin P., 4,876,154, Cl. 428-447.000.
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Krips, Herbert; and Podhorsky, Miroslav, 4,875,270, Cl. 29-421.100.
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Hutchinson, James; Hoffman, Brian; and Pollack, Steven, 4,875,275, Cl. 29-568.000.

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Calviello, Joseph A.; Bie, Paul R.; and Pomian, Ronald J., 4,876,176, Cl. 430-311.000.
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Dennany, Robert D., Jr.; and Pontbriand, Duane J., 4,875,715, Cl. 285-87.000.
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Flynn, John P. P., 4,875,642, Cl. 244-13.000.
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Kang, Hyung H., 4,876,152, Cl. 428-447.000.
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- Precision Mecanique Labinal: See—
Leandris, Sergio; and Moly, Jose, 4,875,286, Cl. 29-872.000.
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Szarka, Sandor, 4,875,268, Cl. 29-283.000.
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Weinstein, Jack, 4,875,603, Cl. 222-205.000.
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Condon, David C.; and Stumfall, David M., 4,875,409, Cl. 101-93.290.
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Cook, Andre; and Chamot, Jean P., 4,875,437, Cl. 123-411.000.
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Claus, Allen D.; and Gosselink, Eugene P., 4,876,046, Cl. 8-111.000.
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Hartman, George D.; and Prugh, John D., 4,876,271, Cl. 514-443.000.
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Blake, Barry C.; and Clarke, David J., 4,876,504, Cl. 324-204.000.
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Hermach, Carl J., 4,875,936, Cl. 101-218.000.
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Snyder, Stephen W.; Monsell, Craig C.; and Puckett, Carol S., 4,875,575, Cl. 206-0.500.
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Dondorf, Wolfgang, 4,876,531, Cl. 340-686.000.
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Fischer, Gerhard; and Quaback, Helmut, 4,876,611, Cl. 358-456.000.
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Budde, Klaus; Koch, Friedrich; and Quella, Ferdinand, 4,876,322, Cl. 526-242.000.
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Lulich, John F., 4,875,551, Cl. 184-6.300.
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Zwirn, Robert; and Rafanelli, Gerard L., 4,876,602, Cl. 358-227.000.
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Pennev, Penio; Rajagopalan, Parthasarathi; and Scribner, Richard M., 4,876,269, Cl. 514-429.000.
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Hollander, Zeev; Salomon, Beka; and Katchalski-Katzir, Ephraim, 4,876,191, Cl. 435-7.000.
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Liu, Benjamin Y. H.; and Ramsey, James W., 4,875,340, Cl. 62-50.200.
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Alota, Santa; Ferrari, Vincenzo; Memmi, Massimo; Pacelli, Leonardo; and Ramundo, Susanna, 4,875,983, Cl. 204-28.000.
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Mitchell, Debra J.; and Ranzau, Cheryl L., 4,875,492, Cl. 128-890.000.
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Hsu, Kevin; Rao, Srinivas T.; and Kaukenen, Joseph Y., 4,875,969, Cl. 156-633.000.
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Davis, Craig M.; and Rasmussen, Richard R., 4,876,519, Cl. 331-57.000.
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Smith, Gilbert W.; Daniel, Mervyn F.; Barton, John W.; and Ratcliffe, Norman M., 4,876,150, Cl. 428-411.100.
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Waschke, Christine; Topfer, Lothar; and Rath, Alfred, 4,875,477, Cl. 128-206.210.
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LeBlanc, Jean-Claude; and Ratton, Serge, 4,876,396, Cl. 568-779.000.
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Herdling, Walter; and Rausch, Walter, 4,876,288, Cl. 521-53.000.
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Ray, Robert; Neal, Robert A.; Jaran, John R.; and Parker, Tim, 4,875,581, Cl. 206-328.000.
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Kamath, Hundi P.; and Leder, Jeffrey C., 4,876,440, Cl. 219-548.000.
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Hardy, Judy; and Wallington, Kenneth, 4,875,870, Cl. 439-204.000.
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- Readman, John, to Sundstrand Corporation. Pitot pump assembly for a rotating fluid management device. 4,875,826, Cl. 415-89.000.
- Reason, John R.: See—
Brandemuhl, Michael J.; and Reason, John R., 4,875,341, Cl. 62-115.000.
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- Recycling Systems, Inc.: See—
Bardos, Gary M., 4,875,631, Cl. 241-92.000.
- Reed, Carl G., to AMP Incorporated. Electrical device having improved leads for surface mounting on a circuit board. 4,875,863, Cl. 439-79.000.
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Frink, Tommy S.; Reed, Lowell M.; Cochran, Dwayne V.; and McNair, Will L., 4,875,530, Cl. 175-27.000.
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Mullin, Francis J.; and Reed, William C., 4,875,952, Cl. 156-48.000.
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Pochlein, Raymond E.; and Reese, Franklin S., 4,875,611, Cl. 226-186.000.
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Durney, Cronin Rebecca L.; Rutherford W. Scott; and Campbell, James F., 4,876,293, Cl. 523-122.000.
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- Reinbold, Heinz. Spinning apparatus. 4,875,846, Cl. 425-186.000.
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Peetz, Dieter; Scheeren, Peter; Siemonsen, Hans-Peter; Reinicke, Ralf; Witting, Lothar; and Schafhausen, Aloisius, 4,875,308, Cl. 49-501.000.
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Wake, Ronald W.; Reithel, Sibylle L.; and McGuckin, Hugh G., 4,876,166, Cl. 430-7.000.
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Dara, Prithpal, 4,876,630, Cl. 361-413.000.
- Kaczmarek, Richard, 4,876,626, Cl. 361-119.000.
- Rust, Wayne; and Gilberts, Alexander G., 4,876,621, Cl. 361-58.000.
- Reliance Electric Company: See—
DeWachter, Gary, 4,875,786, Cl. 384-482.000.
- Relyea, Keith E.: See—
Chang, Robert W. H.; and Relyea, Keith E., 4,876,136, Cl. 428-130.000.
- Remenicky, Joseph M.: See—
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- Research Corporation Technologies, Inc.: See—
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- Research Development Corp. of Japan: See—
Murakami, Mutsuaki, 4,876,077, Cl. 423-448.000.
- Resoner, Inc.: See—
Perlmutter, Robert J., 4,876,509, Cl. 324-309.000.
- Restle, Serge: See—
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- Reynolds, Richard W.: See—
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- Rheinmetall GmbH: See—
Metz, Josef, 4,875,402, Cl. 89-43.010.
- Rhema Enterprises, Inc.: See—
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- Rhim, Moo S.: See—
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Vivant, Gilbert, 4,876,290, Cl. 521-76.000.
- Rhone-Poulenc Sante: See—
Autant, Pierre; Cartillier, Andre; and Pigeon, Raymond, 4,876,097, Cl. 426-74.000.
- Duhamel, Lucette; and Duhamel, Pierre, 4,876,370, Cl. 549-455.000.
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- Rich, Thomas F., to Procter & Gamble Company. The Absorbent vegetable material and process for making same. 4,875,974, Cl. 162-10.000.
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- Misawa, Shigeyoshi; and Funato, Hiroyoshi, 4,876,680, Cl. 369-110.000.
- Nagatsuna, Shunji, 4,876,572, Cl. 355-210.000.
- Nakamura, Yoko; Kojima, Fumiyo; and Yoshino, Hirobumi, 4,876,571, Cl. 355-210.000.
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- Ries, Gunter: See—
Siebold, Horst; and Ries, Gunter, 4,876,510, Cl. 324-318.000.
- Riffle, Rob G.: See—
Campbell, Michael L.; Williams, Benjamin G.; Riffle, Rob G.; and Biggerstaff, Charles E., 4,876,051, Cl. 264-127.000.
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Enomoto, Michio; and Riisgaard, Steen, 4,876,024, Cl. 252-174.120.
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Fero, Arnold H.; Potochnik, Lawrence M.; Riling, Ronald W.; and Semethy, Kenneth F., 4,876,058, Cl. 376-247.000.
- Rilly, Gerard; and Rodriguez, Jose-Ignacio, to Deutsche Thomson-Brandt GmbH. Switching power supply having an emergency mode regulating voltage on the primary side. 4,876,636, Cl. 363-21.000.
- Rinaldi, Mark A.: See—
Nuechterlein, David W.; and Rinaldi, Mark A., 4,876,644, Cl. 364-300.000.
- Rinehart, Verne R., to Goodyear Tire & Rubber Company. The Solid state polymerization of polyester prepolymers. 4,876,326, Cl. 528-272.000.
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- Rioux, Philippe F.: See—
Roy, Bernard J. J.; O'Connor, Lorne D.; Rioux, Philippe F.; Dingle, Donald A.; and Raymond, Andre L., 4,876,597, Cl. 358-141.000.
- Ritter, Gebhard: See—
Comte, Pierre-Andre; Church, Hans; and Ritter, Gebhard, 4,875,475, Cl. 128-924.00Y.
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Leone, David A.; Buxton, Clifford A.; and Robbins, W. Dale, 4,876,424, Cl. 200-306.000.
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McIntosh, Harold A., 4,875,278, Cl. 29-622.000.
- Robertson, David W.; and Wong, David T., to Eli Lilly and Company. 1-Phenylalkylamines as selective serotonin uptake inhibitors. 4,876,282, Cl. 514-554.000.
- Robertson, John G.: See—
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- Robertson, Robert A., to Spirax Sarco Limited. Flowmeters. 4,875,377, Cl. 73-861.020.
- Robinson, Colin; Eastlick, David T.; and Bownass, Audrey J., to Glaxo Group Limited. Process for the separation of a mixture of "syn" and "anti" oxime isomers. 4,876,351, Cl. 548-204.000.
- Rock, Erich; and Brustle, Klaus, to Julius Blum Gesellschaft m.b.H. Drawer assembly. 4,875,746, Cl. 312-330.100.
- Rockel, Manfred; Wallis, Ernst; Kohler, Michael; Heubner, Ulrich; and Kirchheiner, Rolf, to VDM Nickel-Technologie Aktiengesellschaft. Corrosion-resisting Fe-Ni-Cr alloy. 4,876,065, Cl. 420-582.000.
- Rockenfeller, Uwe. Method and apparatus for transferring energy and mass. 4,875,915, Cl. 62-4.000.
- Rockwell International Corporation: See—
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- Nelson, Blaine J., 4,876,699, Cl. 375-82.000.
- Rodriguez, Jose-Ignacio: See—
Rilly, Gerard; and Rodriguez, Jose-Ignacio, 4,876,636, Cl. 363-21.000.
- Rogers, Lloyd W., Jr.: See—
Compeau, David E.; Manuel, Mark; and Rogers, Lloyd W., Jr., 4,875,723, Cl. 292-201.000.
- Rogers, Max W.; and Skinner, Daniel R., to Dynascan Corporation. Antenna for cordless telephone system. 4,876,709, Cl. 379-61.000.
- Rogers, Milton: See—
Rogers, Philip L.; and Rogers, Milton, 4,875,770, Cl. 356-28.500.
- Rogers, Philip L.; and Rogers, Milton, to Lockheed Corporation. Wind shear detector. 4,875,770, Cl. 356-28.500.
- Rohm GmbH Chemische Fabrik: See—
Hennig, Jürgen; Vetter, Heinz; and Munzer, Manfred, 4,876,311, Cl. 525-229.000.
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Lorah, Dennis P., 4,876,313, Cl. 525-281.000.
- Rohrer, Nicholas J. Roofing shingles. 4,875,321, Cl. 52-553.000.
- Rohrer, Gene D.: See—
Martin, William C.; and Rohrer, Gene D., 4,876,735, Cl. 382-57.000.
- Rohs, Ulrich; and Meuter, Herbert. Apparatus for measuring the torque of an operating shaft. 4,875,379, Cl. 73-862.340.
- Rokach, Joshua: See—
Guindon, Yvan; Girard, Yves; Lau, Cheuk K.; Fortin, Rejean; Rokach, Joshua; and Yoakim, Christiane, 4,876,246, Cl. 514-80.000.
- Roland Racine: See—
Guarnori, Manuel, 4,875,648, Cl. 248-125.000.
- Romano, James, to Con-Tech Industries, Inc. Flapper actuated pilot valve. 4,875,502, Cl. 137-627.500.
- Romar Technologies, Inc.: See—
Harris, Rano J., Jr., 4,875,427, Cl. 114-219.000.
- Romeo, Roch. Tooth-paste with brushing time indicator. 4,876,082, Cl. 424-7.100.
- Romm, Michael: See—
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- Ronne, William M.: See—
Garnatz, Anthony H.; and Ronne, William M., 4,875,537, Cl. 180-69.100.
- Rooney, Clarence S.: See—
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- Roschina, Lidia F.: See—
Granik, Vladimir G.; Stezhko, Tatyana V.; Glushkov, Robert G.; Mashkovsky, Mikhail D.; Roschina, Lidia F.; Polezhaeva, Antonina I.; Parimbetova, Roza B.; Bobkov, Jury G.; Losev, Alexander S.; and Ivanova, Irina A., 4,876,360, Cl. 548-550.000.
- Rose, Ira M.: See—
Higbie, Francis A.; Lieberman, Robert A.; and Rose, Ira M., 4,876,384, Cl. 560-224.000.
- Rosenberg, Harvey J.: See—
Solomon, Ruth; and Rosenberg, Harvey J., 4,875,238, Cl. 2-115.000.
- Rosenberg, Steven: See—
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- Rosentreter, Ulrich: See—
Frankowiak, Gerhard; Rosentreter, Ulrich; Perzborn, Elisabeth; Seuter, Friedel; Kayser, Michael; and Thomas, Gunther, 4,876,255, Cl. 514-252.000.
- Ross, Randall R.; Bjornard, Eric; and Strand, David, to Energy Conversion Devices, Inc. Data storage device having a phase change memory medium reversible by direct overwrite. 4,876,667, Cl. 365-113.000.
- Ross, Stephen T.: See—
Kruze, Lawrence I.; Leonard, Thomas B.; and Ross, Stephen T., 4,876,266, Cl. 514-392.000.
- Rotec Industries, Inc.: See—
Oury, Robert F.; and Gallione, Joseph, 4,875,569, Cl. 198-36.00D.
- Roth, Scott D., to Adept Technology, Inc. Vision system for distinguishing touching parts. 4,876,728, Cl. 382-21.000.
- Rothe, Anselm: See—
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- Rotter, Leah D.: See—
Brook, Arthur H.; Carian, Peter J.; Katzin, Leonard; Landsinger, Edmund E.; Moore, James D.; Rotter, Leah D.; and Schreiber, Stanley, 4,875,469, Cl. 128-26.000.
- Roy, Bernard J. J.; O'Connor, Lorne D.; Rioux, Philippe F.; Dingle, Donald A.; and Raymond, Andre L., to ADT Security Systems, Inc. Video observation systems. 4,876,597, Cl. 358-141.000.
- Roydhouse, Richard H., to EPS Environmental Protection Systems Limited. Composition to absorb mercury. 4,876,025, Cl. 252-182.320.
- Rozzi, Costantino, to R.E.I.N. S.p.A. Process for the insulation of existing building facades and prefabricated panel to be used in applying said process. 4,875,322, Cl. 52-746.000.
- Rudy, Norman A.; and Tomlin, James S., to Design Systems, Inc. Method and apparatus for automatically cutting food products to predetermined weight or shape. 4,875,254, Cl. 17-61.000.
- Ruhnke, Jeffrey P.: See—
Widmer, Steven L.; Neisen, Gerald F.; Ruhnke, Jeffrey P.; Steffes, Thomas J.; and Buchholz, Brian S., 4,875,439, Cl. 123-541.000.
- Ruiz, Samantha L. Combination pick-up truck bed liner and camper top. 4,875,731, Cl. 296-37.200.
- Rullo, James J., to Buckingham Manufacturing Company, Inc. Gaff. 4,875,550, Cl. 182-221.000.
- Rust, Wayne; and Gilberts, Alexander G., to Reliance Comm/Tec Corporation. Line protector for a communications circuit. 4,876,621, Cl. 361-58.000.
- Rutherford W. Scott: See—
Durney, Cronin Rebecca L.; Rutherford W. Scott; and Campbell, James F., 4,876,293, Cl. 523-122.000.
- Rutsch, Robert: See—
Willkop, Franz; Zahring, Gerhard; Rutsch, Robert; Popp, Joachim; and Eberhard, John, 4,875,828, Cl. 415-173.400.
- Ryback, George: See—
Schofield, John A.; Betteridge, Peter R.; Ryback, George; and Geary, Philip J., 4,876,200, Cl. 435-253.300.
- S.A.M.M. - Societe d'Applications des Machines Motrices: See—
Joseph, Philippe; and Perrochat, Jean Michel, 4,875,706, Cl. 280-708.000.
- S. C. Johnson & Son, Inc.: See—
Buhler, James E.; Crapser, James R.; Miller, Allen D.; and Wefler, Mark E., 4,875,626, Cl. 239-314.000.
- Sabatura, Gail J. Highly versatile comprehensive nutritional composition. 4,876,106, Cl. 426-583.000.
- Sabia, Raffaele A.: See—
Chapin, John T.; and Sabia, Raffaele A., 4,876,303, Cl. 524-296.000.
- Sachse, Burkhard: See—
Siegel, Herbert; Kampe, Klaus-Dieter; Alpermann, Hans G.; Gerhards, Hermann J.; Usinger, Patricia; Schacht, Ulrich; Leven, Margret; Raether, Wolfgang; Dittmar, Walter; and Sachse, Burkhard, 4,876,354, Cl. 548-341.000.
- Saegusa, Noboru; Hara, Toshihiro; Kawasaki, Ryoji; Tate, Kazuyuki; Huse, Syoji; and Ono, Koji, to NEC Corporation; Nippon Telegraph and Telephone Corp.; and Kabushiki Kaisha Toshiba. Cordless telephone system. 4,876,708, Cl. 379-61.000.
- Saeiki, Keiso; Sano, Shojiro; Matsuoka, Katsumi; Takashima, Masanobu; and Iwakura, Ken, to Fuji Photo Film Co., Ltd. Recording material. 4,876,233, Cl. 503-209.000.
- Saeiki, Makoto: See—
Yamamoto, Sho; Minato, Osamu; Saeiki, Makoto; Yoshitomi, Yasuo; Nakamura, Hideaki; and Kubotera, Masaaki, 4,876,669, Cl. 365-189.010.
- Saga Sanyo Industry Co., Ltd.: See—
Ikeda, Hironosuke; Ezaki, Tadashi; Yoshida, Kakushiyou; Yamaguchi, Rikizou; and Suenaga, Kazuhiro, 4,876,451, Cl. 361-540.000.
- Sagawa, Junichi: See—
Onuki, Toru; Sagawa, Junichi; Watanabe, Tamotsu; and Yoshimitsu, Toshio, 4,876,158, Cl. 428-565.000.
- Saint-Gobain Vitrage: See—
Canaud, Michel; and Dewitte, Philippe, 4,875,833, Cl. 417-259.000.
- Kunert, Heinz, 4,876,132, Cl. 428-43.000.
- Peetz, Dieter; Scheeren, Peter; Siemonsen, Hans-Peter; Reinicke, Ralf; Witting, Lothar; and Schafhausen, Aloisius, 4,875,308, Cl. 49-501.000.
- Saito, Mitsuo; Matoba, Tsukasa; and Okamoto, Toshio, to Kabushiki Kaisha Toshiba. Presentation display apparatus for displaying two different images on separate displays for a listener and a speaker. 4,876,657, Cl. 364-521.000.
- Saito, Mitsuru: See—
Hayashi, Tsutomu; Katoh, Masaie; Yakigaya, Nobuyuki; Nakamura, Kazuhiko; Yoshida, Yoshihiro; Nakajima, Yoshihiro; Saito, Mitsuru; and Kobayashi, Akio, 4,875,390, Cl. 74-731.000.
- Saito, Shigeki: See—
Abukawa, Toshimi; Tahara, Kazuo; Murumoto, Katsuji; Koterazawa, Toshiyuki; Hombu, Mitsuyuki; Takahashi, Tadashi; Takamatsu, Shuichi; Ishikura, Hisatugu; Yamamura, Hiroshisa; Tatsuzaki, Toru; Ohmae, Tsutomu; Okuyama, Toshiaki; Yama-

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- Saitoh, Tatsuo: See—
Mizutani, Futoshi; Kyogoku, Takeshi; Saitoh, Tatsuo; and Endoh, Shigeki, 4,875,918, Cl. 65-3.120.
- Saitoh, Yoshiro; and Tatsumi, Takashi, to Ciba-Geigy Corporation. Laminated panel having a stainless steel foil core and a process for producing the panel. 4,876,134, Cl. 428-73.000.
- Sakabe, Akira: See—
Kashima, Takayuki; Sakabe, Akira; and Yamanaka, Yoshifumi, 4,876,433, Cl. 219-130.510.
- Sakabe, Yukio: See—
Kittaka, Toshihiko; Ando, Akira; and Sakabe, Yukio, 4,876,476, Cl. 310-320.000.
- Sakaguchi, Yoshikazu: See—
Kato, Eiji; Kadotani, Masanori; Sakaguchi, Yoshikazu; Kubo, Seito; Iwatsuki, Kunihiro; Taniguchi, Hiroji; and Harada, Yoshihara, 4,875,665, Cl. 267-170.000.
- Sakai, Mari: See—
Kikukawa, Hiroyasu; Shimoda, Eiji; Sakai, Mari; and Kitada, Fumiko, 4,875,908, Cl. 55-16.000.
- Sakai, Masato: See—
Abukawa, Toshihiko; Tahara, Kazuo; Muramoto, Katsuji; Koterazawa, Toshiyuki; Hombu, Mitsuyuki; Takahashi, Tadashi; Takamatsu, Shuichi; Ishikura, Hisatugu; Yamamura, Hiroshisa; Tatsuzaki, Toru; Ohmae, Tsutomu; Okuyama, Toshiaki; Yamashita, Seizi; Saito, Shigeki; and Sakai, Masato, 4,875,539, Cl. 180-79.100.
- Sakaki, Masaharu: See—
Mizutani, Masato; Shiroshita, Masao; Sakaki, Masaharu; Okuda, Hiroki; and Mito, Nobuaki, 4,875,924, Cl. 71-92.000.
- Sakamoto, Kiichiro: See—
Yamaguchi, Kiyoshi; Endo, Azuchi; and Sakamoto, Kiichiro, 4,876,567, Cl. 355-20.000.
- Sakamoto, Yukio; Tanabe, Takeshi; Fukutani, Iwao; and Hori, Toshio, to Murata Manufacturing Co., Ltd. Surface mountable connector. 4,875,862, Cl. 439-79.000.
- Sakata, Hirotsugu; Murasaki, Hiroaki; Hayano, Makoto; Hattori, Hitoshi; Morozumi, Naoya; Yoneyama, Kouichi; Suzuki, Isao; Sone, Junji; and Nagatomo, Shigemitsu, to Kabushiki Kaisha Toshiba. Scroll member for use in a positive displacement device, and a method for manufacturing the same. 4,875,279, Cl. 418-55.000.
- Sakiadis, Byron C., to Du Pont de Nemours, E. I., and Company. Die attach pickup tools. 4,875,279, Cl. 29-740.000.
- Sakoh, Seichi: See—
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- Sakuma, Kazuhiko: See—
Nakaoku, Shozo; Sakuma, Kazuhiko; Oshika, Yasuhiro; and Ohira, Kazuo, 4,876,345, Cl. 544-379.000.
- Sakurai, Hidetoshi: See—
Kiuchi, Takao; and Sakurai, Hidetoshi, 4,875,447, Cl. 123-339.000.
- Salokatve, Arto: See—
Pessa, Markus; Asonen, Harry; Varrio, Jukka; and Salokatve, Arto, 4,876,218, Cl. 437-107.000.
- Salomon, Bekar: See—
Hollander, Zeev; Salomon, Bekar; and Katchalski-Katzir, Ephraim, 4,876,191, Cl. 435-7.000.
- Salomon S. A.: See—
Mabboux, Michel; De Marchi, Jean-Louis; and Legon, Fabrice, 4,875,299, Cl. 36-117.000.
- Salzbrunn, Wolfgang; Steiner, Eva; Wohrer, Wilfried; and Meixner, Otto, to Vogelbusch Gesellschaft m.b.H. Method of continuously producing ethanol from sugar-containing substrates. 4,876,196, Cl. 435-161.000.
- Samuel, James E.: See—
Frazier, Marvin E.; Mallavia, Louis P.; Baca, Oswald G.; and Samuel, James E., 4,876,186, Cl. 435-6.000.
- Sanden Corporation: See—
Higuchi, Teruo; Terauchi, Kiyoshi; Takai, Kazuhiko; Kikuchi, Sei; and Kobayashi, Hideto, 4,875,834, Cl. 417-269.000.
- Ikeda, Susumu, 4,875,342, Cl. 62-115.000.
- Sanderson, Arthur C.; Weiss, Lee E.; and Nayar, Shree K., to Westinghouse Electric Corp. Fiber optic solder joint inspection system. 4,876,455, Cl. 250-560.000.
- Sandoz Ltd.: See—
Avar, Lajos, 4,876,299, Cl. 524-99.000.
- Pedrazzi, Reinhard, 4,875,903, Cl. 8-640.000.
- Pedrazzi, Reinhard, 4,876,342, Cl. 544-14.000.
- Sandoz Pharm. Corp.: See—
Damon, Robert E., II, 4,876,280, Cl. 514-510.000.
- Sanduja, Mohan L.: See—
Lee, Andrew J.; Sanduja, Mohan L.; Sugathan, Kenneth; Dragnea, Felicia; and Horowitz, Carl, 4,875,410, Cl. 101-170.000.
- Sangamo-Weston, Incorporated: See—
Dyck, Rudolph H.; and Kim, Jae S., 4,876,586, Cl. 357-30.000.
- Swanson, Scott C., 4,875,783, Cl. 374-170.000.
- Sankarasub-Ramanian, Hariharan: See—
Singh, Vir B.; Moorthy, Kanniah N. G. K.; Kaushik, Pushpendar K.; and Sankarasub-Ramanian, Hariharan, 4,875,900, Cl. 8-94.270.
- Sanner, Martin W., to Tandem Computers Incorporated. Synchronization failure detection. 4,876,701, Cl. 375-106.000.
- Sano, Ryuuichi; and Isomura, Shigenori, to Nippondenso Co., Ltd. Start control system for internal combustion engine. 4,875,443, Cl. 123-179.000.
- Sano, Shojiro: See—
Sacki, Keiso; Sano, Shojiro; Matsuoka, Katsumi; Takashima, Masao; and Iwakura, Ken, 4,876,233, Cl. 503-209.000.
- Sanofi: See—
Barbier, Alain; Breliere, Jean-Claude; and Garcia, Georges, 4,876,247, Cl. 514-89.000.
- Breliere, Jean C.; Emonds-Alt, Xavier; and Garcia, Georges, 4,876,248, Cl. 514-108.000.
- Radisson, Joel; and Braye, Emile, 4,876,362, Cl. 549-59.000.
- Santos, Alfred J.; Cook, Frederick A., Jr.; Duncan, Scott M.; and Moseley, John, to Torrington Company, The. Thrust bearing with a magnetic field detector. 4,875,785, Cl. 384-448.000.
- Sanyo Electric Co., Ltd.: See—
Ikeda, Hironosuke; Ezaki, Tadashi; Yoshida, Kakushiyu; Yamaguchi, Rikizou; and Suenaga, Kazuhiro, 4,876,451, Cl. 361-540.000.
- Tsukahara, Hitoaki; Kurokawa, Keiko; Tsukui, Toshimitsu; and Nagai, Toshitake, 4,876,070, Cl. 422-122.000.
- Sargent & Greenleaf, Inc.: See—
Evans, Walter R.; Remenick, Joseph M.; Jasper, Thomas E.; and Ballard, Wayne W., 4,875,351, Cl. 70-271.000.
- Sasa, Takeya; Kobayashi, Yoshikazu; and Makishima, Reichi, to Nitto Kohki Co., Ltd. Fluid coupling. 4,875,720, Cl. 285-249.000.
- Sasaki, Katsuhiro; and Fukuda, Seiji, to NEC Corporation. Fault detection signal transmission system. 4,876,686, Cl. 371-49.100.
- Sasaki, Ryoichi: See—
Hagiwara, Masayoshi; Suzuki, Michio; Sasaki, Ryoichi; Sugano, Minoru; Horiki, Akira; and Hayashi, Kazuyuki, 4,876,681, Cl. 370-60.000.
- Sasaki, Shoko: See—
Shiokawa, Kozo; Tsuboi, Shinichi; Sasaki, Shoko; Moriya, Koichi; Hattori, Yumi; and Shibuya, Katsuhiko, 4,876,263, Cl. 514-338.000.
- Sasaki, Yuichi: See—
Usami, Jun; Hattori, Akinobu; and Sasaki, Yuichi, 4,875,981, Cl. 204-1.00T.
- Sasazawa, Koji: See—
Yasunaga, Tadashi; and Sasazawa, Koji, 4,876,113, Cl. 427-39.000.
- Sato, Fumihiko: See—
Umezawa, Hamao; Suzuki, Shintaro; Ohkuma, Taka'aki; Sato, Fumihiko; and Nakamura, Teruya, 4,876,244, Cl. 514-19.000.
- Sato, Fumio: See—
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- Sato, Hiroyuki, to Seikosha Co., Ltd. Ink ribbon cassette with slidable ribbon guide. 4,875,789, Cl. 400-196.100.
- Sato, Katsuyuki: See—
Kobayashi, Sadao; Ishihara, Yuji; Sato, Katsuyuki; and Ijichi, Kouichi, 4,876,141, Cl. 428-217.000.
- Sato, Kuniyoshi: See—
Noda, Hajime; Sato, Kuniyoshi; and Sotani, Junji, 4,875,522, Cl. 165-104.140.
- Sato, Takanori, to Shimizu Construction Co., Ltd. Device for suppressing vibration of structure. 4,875,313, Cl. 52-167.00F.
- Sato, Yoshikazu: See—
Sugitani, Yuji; Sato, Yoshikazu; and Nishi, Yasuhiko, 4,876,432, Cl. 219-124.320.
- Satoh, Shinichi: See—
Sugiyama, Genroku; Hirata, Toichi; and Satoh, Shinichi, 4,875,337, Cl. 60-421.000.
- Satoh, Tetsuya: See—
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- Satomura, Shigeyuki: See—
Katsumata, Azusa; and Satomura, Shigeyuki, 4,876,616, Cl. 360-53.000.
- Sauls, Charles L., to Fisher/Sauls Electronics, Inc. Vending rack burglar alarm. 4,876,532, Cl. 340-689.000.
- Saunders, William T., to Weirton Steel Corporation. Convenience packaging. 4,875,597, Cl. 220-458.000.
- Saur, Niko K.; and Bronner, Wolfgang, to Agria-Werke GmbH. Control device for operating a motor vehicle. 4,875,536, Cl. 180-6.320.
- Sauvage, Laurent: See—
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- Savard, Donald D., to Interprovincial Pipe Line Company. Vapor plug for temporarily sealing or plugging a pipeline. 4,875,615, Cl. 228-119.000.
- Savas, Nick: See—
Haque, Sazzadul; Floyd, Thomas O.; Savas, Nick; and Kelm, Walter H., 4,875,812, Cl. 407-104.000.
- Savini, Charles: See—
Yeh, Chuen Y.; and Savini, Charles, 4,876,392, Cl. 568-404.000.
- Sawada, Kohei: See—
Oinuma, Hitoshi; Yamanaka, Motosuke; Miyake, Kazutoshi; Hoshiko, Tomonori; Minami, Norio; Shoji, Tadao; Daiku, Yoshiharu; Sawada, Kohei; and Nomoto, Kenichi, 4,876,262, Cl. 514-318.000.
- Sawada, Masayuki: See—
Kakimoto, Yukihiko; Sawada, Masayuki; Kajimoto, Yoshiaki; and Kiguchi, Isamu, deceased, 4,875,909, Cl. 55-40.000.

- Sawaide, Minoru: See—
Sugita, Minoru; Nakatsuji, Teruyuki; Fujisaki, Tadashi; Sawaide, Minoru; Ishikawa, Noboru; and Inada, Yasuo, 4,876,143, Cl. 428-294.000.
- Sawin, Steven P.: See—
Fulks, Bernard D.; Sawin, Steven P.; Aikman, Collin D.; and Jenkins, John M., III, 4,876,320, Cl. 526-62.000.
- Sawyer, Hermon R. Ball retrieval system. 4,875,678, Cl. 273-30.000.
- Sayer, Wayne L. Methods for detecting rare earth minerals. 4,876,206, Cl. 436-82.000.
- Scales, Michael J. Block-formed revetment system for controlling soil erosion. 4,875,803, Cl. 405-16.000.
- Schacht, Ulrich: See—
Siegel, Herbert; Kampe, Klaus-Dieter; Alpermann, Hans G.; Gerhards, Hermann J.; Usinger, Patricia; Schacht, Ulrich; Leven, Margret; Raether, Wolfgang; Dittmar, Walter; and Sachs, Burkhard, 4,876,354, Cl. 548-341.000.
- Schafer, Randal D. Apparatus for clamping a template to a workpiece. 4,875,667, Cl. 269-91.000.
- Schaffer, William E.: See—
Vandenberg, Donald E.; Jacques, Donald A.; and Schaffer, William E., 4,875,765, Cl. 350-611.000.
- Schafhausen, Aloisius: See—
Peetz, Dieter; Scheeren, Peter; Siemonsen, Hans-Peter; Reinicke, Ralf; Witting, Lothar; and Schafhausen, Aloisius, 4,875,308, Cl. 49-501.000.
- Schammel, Wayne P.: See—
Holzhauer, Juergen K.; Michalak, Dennis J.; and Schammel, Wayne P., 4,876,386, Cl. 562-414.000.
- Schandl, Hartmut: See—
Kaaden, Jurgen; and Schandl, Hartmut, 4,876,614, Cl. 360-10.200.
- Schara, Kristen T.; Kulik, David B.; and McIlvaine, Scott E., to Westinghouse Electric Corp. Automatic dendritic silicon web separation machine. 4,875,461, Cl. 125-23.00R.
- Schasteen, Thomas: See—
Petermann, Steven G.; and Schasteen, Thomas, 4,876,672, Cl. 367-35.000.
- Schatz, Klaus W.: See—
Haddad, James H.; Owen, Hartley; and Schatz, Klaus W., 4,875,994, Cl. 208-113.000.
- Scheeren, Peter: See—
Peetz, Dieter; Scheeren, Peter; Siemonsen, Hans-Peter; Reinicke, Ralf; Witting, Lothar; and Schafhausen, Aloisius, 4,875,308, Cl. 49-501.000.
- Schefczik, Ernst: See—
Dust, Matthias; Neumann, Peter; Schefczik, Ernst; Benthack-Thoms, Heidi; Barzynski, Helmut; Schomann, Klaus-Dieter; Kuppelmaier, Harald; and Koester, Eberhard, 4,876,356, Cl. 548-419.000.
- Scherer Corporation: See—
Hou, Donald; Wong, Yee-Shing; Gala, Dinesh; and Steinman, Martin, 4,876,338, Cl. 540-357.000.
- Kirkup, Michael P.; and McCombie, Stuart W., 4,876,365, Cl. 549-215.000.
- Schumacher, Doris P.; Clark, Jon E.; and Murphy, Bruce L., 4,876,352, Cl. 548-232.000.
- Scherub, Franz, to Atomic Skifabrik Alois Rohrmoser. Method of producing skis and ski. 4,875,702, Cl. 280-602.000.
- Schettler, Hartmut; Endl, Josef; and Albert, Winfried, to Boehringer Mannheim GmbH. Process for the quantification of cell populations or subpopulations and a reagent suitable therefor. 4,876,189, Cl. 435-7.000.
- Schiedegger, Charles E.: See—
MacLeod, Richard J.; and Schiedegger, Charles E., 4,875,318, Cl. 52-211.000.
- Schiel, Christian, to J. M. Voith GmbH. Device for drawing an endless belt into a paper making machine. 4,875,975, Cl. 162-273.000.
- Schiffman, Julius. Apparatus for promoting the vigilance of a motor vehicle operator. 4,876,594, Cl. 358-103.000.
- Schlag, Johannes; Koehnlein, Ernst; Bauer, Peter; Koessler, Ludwig; and Hausz, Alfred F., to BASF Aktiengesellschaft. Cable insulation based on ethylene polymers having high resistance to the formation of water trees. 4,876,147, Cl. 428-379.000.
- Schlage Lock Company: See—
Smallegan, Jon M.; and Bettger, Richard R., 4,875,352, Cl. 70-395.000.
- Schlake, Randall L.: See—
Martin, Richard W.; Fisher, John L.; Fortenberry, William R.; Schlake, Randall L.; Dornbrock, Ronald F.; Richerson, James D.; and Marrett, Kenneth E., Sr., 4,875,277, Cl. 29-606.000.
- Schleifer, Bernhard: See—
Gschwendner, Alois; Kruger, Horst; and Schleifer, Bernhard, 4,875,827, Cl. 415-111.000.
- Schleizer, William A.: See—
Head, James D.; Burns, Edward F.; Schleizer, William A.; White, C. Douglas; and Gentry, Dennis L., 4,875,662, Cl. 266-44.000.
- Schlesch, Ronald D.; Armstrong, Merrill H.; Vallery, Stafford J.; and Durham, Harold S., to Armstrong International, Inc. Motorized outrigger drive. 4,875,428, Cl. 114-255.000.
- Schlossarczyk, Heinrich: See—
Heger, Werner; Kramer, Manfred; and Schlossarczyk, Heinrich, 4,875,503, Cl. 137-856.000.
- Schlumberger Industries, Inc.: See—
Marshall, John D.; and McLain, Thomas N., 4,876,002, Cl. 210-136.000.
- Schlumberger Technology Corporation: See—
Barkans, Anthony C., 4,876,533, Cl. 340-721.000.
- Clark, Brian, 4,876,511, Cl. 324-338.000.
- Schmid, Wolfgang, to Ciba-Geigy Corporation. Process and compositions for controlling mites parasitizing on honey bees. 4,876,265, Cl. 514-370.000.
- Schmidlin, Fred W., to Xerox Corporation. Printing apparatus and toner/developer delivery system therefor. 4,876,561, Cl. 346-159.000.
- Schmiedl, Engelbert: See—
Zehnder, Paul; Niklaus, Hans-Ulrich; Schmiedl, Engelbert; and Patri, Franz, 4,875,836, Cl. 417-360.000.
- Schneider, Karl F.; Haley, William J.; and Miller, Alan L., to Borg-Warner Automotive, Inc. Dual clutch application area and control. 4,875,561, Cl. 192-0.033.
- Schofield, John A.; Betteridge, Peter R.; Ryback, George; and Geary, Philip J., to Shell Oil Company. New strains of pseudomonas putida. 4,876,200, Cl. 435-253.300.
- Schomann, Klaus-Dieter: See—
Dust, Matthias; Neumann, Peter; Schefczik, Ernst; Benthack-Thoms, Heidi; Barzynski, Helmut; Schomann, Klaus-Dieter; Kuppelmaier, Harald; and Koester, Eberhard, 4,876,356, Cl. 548-419.000.
- Schramm, Matthias: See—
Frankowiak, Gerhard; Kayser, Michael; Schramm, Matthias; Thomas, Gunther; Gross, Rainer; Perzborn, Elisabeth; and Seuter, Friedel, 4,876,254, Cl. 514-252.000.
- Schrinkel, Kenneth R.: See—
Wilson, Richard A.; Butler, Jerry F.; Withycombe, Donald; Mookherjee, Braja D.; Katz, Ira; and Schrinkel, Kenneth R., 4,876,087, Cl. 424-84.000.
- Schreiber, Stanley: See—
Brook, Arthur H.; Carian, Peter J.; Katzin, Leonard; Landsinger, Edmund E.; Moore, James D.; Rotter, Leah D.; and Schreiber, Stanley, 4,875,469, Cl. 128-26.000.
- Schreiner, Joel M.: See—
Deutsch, Timothy A.; Schreiner, Joel M.; and McBee, Steve H., 4,875,330, Cl. 56-41.000.
- Schroer, Walter: See—
Noil, Klaus; Thoma, Wilhelm; Nachtkamp, Klaus; Schroer, Walter; and Pedain, Josef, 4,876,302, Cl. 524-267.000.
- Schubert, Axel: See—
Spaeth, Werner; Wail, Guenther; Kuhlmann, Werner; Althaus, Hans-Ludwig; Birkmann, Rolf; Klos, Waltraud; and Schubert, Axel, 4,875,750, Cl. 350-96.180.
- Schuda, Ann D.; Verhoeven, Thomas R.; and Shinkai, Ichiro, to Merck & Co., Inc. Hydrogenation process for the formation of 4A,5-dihydro HMG-CoA reductase inhibitors. 4,876,364, Cl. 549-214.000.
- Schulte, Bernhard: See—
Dziurla, Heinz-Jurgen; Freitag, Dieter; Waldenrath, Werner; Burkhardt, Claus; and Schulte, Bernhard, 4,876,033, Cl. 252-511.000.
- Schumacher, Doris P.; Clark, Jon E.; and Murphy, Bruce L., to Schering Corporation. Pressurized fluorination of hydroxy alkyl groups. 4,876,352, Cl. 548-232.000.
- Schurch, Hans: See—
Comte, Pierre-Andre; Schurch, Hans; and Ritter, Gebhard, 4,875,475, Cl. 128-924.00Y.
- Schurter, Rolf; Meyer, Willy; and Fory, Werner, to Ciba-Geigy Corporation. N-pyridinylsulfonyl-N'-pyrimidinylureas. 4,875,923, Cl. 71-92.000.
- Schurter, Rolf; and Diel, Peter J., to Ciba-Geigy Corporation. 3-Fluoropyridyl-2-oxo-phenoxy derivatives having herbicidal activity. 4,875,926, Cl. 71-94.000.
- Schutten, Michael J.: See—
Park, John N.; Steigerwald, Robert L.; and Schutten, Michael J., 4,876,635, Cl. 363-17.000.
- Schutz, Joachim; and Schweikert, Otto E., to Hoechst Aktiengesellschaft. Process for the preparation of 6-methyl-3,4-dihydro-1,2,3-oxathiazin-4-one 2,2-dioxide. 4,876,341, Cl. 544-2.000.
- Schwabische Huttenwerke GmbH: See—
Zaoralek, Heinz-Michael, 4,875,297, Cl. 34-48.000.
- Schwartz, Karl-Gunter, to G & H Montage. Wall panelling for altering the acoustic properties of a wall. 4,875,312, Cl. 52-144.000.
- Schwarz, Robert E.: See—
Orsburn, Michael L.; Hemsky, Robert L.; Tucker, Terry L.; Schwarz, Robert E.; and Fearing, Craig F., 4,876,589, Cl. 358-22.000.
- Schweikert, Otto E.: See—
Schutz, Joachim; and Schweikert, Otto E., 4,876,341, Cl. 544-2.000.
- Scott, William D.; and Swartout, James J. Miter box attachment for cutting crown mouldings and the like. 4,875,399, Cl. 83-468.300.
- Scowen, Kenneth J.: See—
Mittler, Martin A.; and Scowen, Kenneth J., 4,876,627, Cl. 361-293.000.
- Scribner, Richard M.: See—
Pennev, Penio; Rajagopalan, Parthasarathi; and Scribner, Richard M., 4,876,269, Cl. 514-429.000.
- Scripps Clinic and Research Foundation: See—
Smith, Richard; Lamb, Peta-Maree; Curtiss, Linda K.; and Witzum, Joseph, 4,876,188, Cl. 435-7.000.
- Seezer AG: See—
Morgenthaler, Eugen, 4,876,098, Cl. 426-231.000.
- Segin, Leonard: See—
Mauleon, Jean-Louis; Sigaud, Jean-Bernard; Chapotel, Bernard; and Segin, Leonard, 4,875,993, Cl. 208-113.000.

Seibulite International Kabushiki Kaisha: See—
Kobayashi, Sadao; Ishihara, Yuji; Sato, Katsuyuki; and Ijichi, Kouichi, 4,876,141, Cl. 428-217.000.

Seiko Epson Corporation: See—
Moriya, Tatsuo, 4,876,677, Cl. 368-87.000.

Seiko Instruments Inc.: See—
Kaito, Takashi; and Adachi, Tatsuya, 4,876,112, Cl. 427-38.000.

Seikosha Co., Ltd.: See—
Ishida, Hiroaki; Shinozaki, Nobuo; and Nakazawa, Michitake, 4,876,563, Cl. 354-234.100.

Sato, Hiroyuki, 4,875,789, Cl. 400-196.100.

Seiler, Claus-Dietrich: See—
Raueder, Hartwig; Seiler, Claus-Dietrich; and Vahlensieck, Hans-Joachim, 4,876,337, Cl. 556-415.000.

Sejvar, James: See—
Bauer, Frank I.; Mavretish, Robert S.; Shogan, Regis P.; and Sejvar, James, 4,876,593, Cl. 358-100.000.

Sekiguchi, Takuji: See—
Kitamoto, Tatsuji; Yokoyama, Katsuya; and Sekiguchi, Takuji, 4,875,610, Cl. 226-10.000.

Sekine Corporation: See—
Canada, Larry J., 4,875,792, Cl. 401-283.000.

Selby, Geoffrey R., to U.S. Philips Corporation. Mobile radio transmission system, 4,876,738, Cl. 455-33.000.

Seltzer, Raymond; Ravichandran, Ramanathan; and Patel, Ambelal R., to Ciba-Geigy Corporation. Polyolefin compositions stabilized with long chain N,N-dialkylhydroxylamines, 4,876,300, Cl. 524-100.000.

Semethy, Kenneth F.: See—
Fero, Arnold H.; Potochik, Lawrence M.; Riling, Ronald W.; and Semethy, Kenneth F., 4,876,058, Cl. 376-247.000.

Semiconductor Energy Laboratory Co., Ltd.: See—
Yamazaki, Shunpei; and Mase, Akira, 4,875,378, Cl. 73-862.040.

Sempell Aktiengesellschaft: See—
Hafele, Carl H.; and Weyand, Manfred, 4,875,659, Cl. 251-282.000.

Senger, Detlef: See—
Pietzsch, Ludwig; Senger, Detlef; Winter, Horst; and Vollinger, Hubert, 4,876,600, Cl. 358-183.000.

Senoo, Seichi: See—
Nakayama, Hisanobu; Tanaka, Osamu; Yasumoto, Hiromichi; Senoo, Seichi; Zaizen, Youichi; and Yamasaki, Kouji, 4,875,947, Cl. 148-113.000.

Seppi, Edward J., to Varian Associates, Inc. Compressional wave hyperthermia treating method and apparatus, 4,875,487, Cl. 128-660.030.

Sepsi, Robert R.: See—
Bittorf, Bradley J.; Flood, Mark A.; Kalan, Michael D.; and Sepsi, Robert R., 4,876,664, Cl. 364-900.000.

Serter, Erbil H. Hull forms, 4,875,425, Cl. 114-56.000.

Sette, Paul R.: See—
Gasiunas, Donatas V.; Sette, Paul R.; and Storace, Anthony, 4,875,788, Cl. 400-163.100.

Seuter, Friedel: See—
Frankowiak, Gerhard; Kayser, Michael; Schramm, Matthias; Thomas, Gunther; Gross, Rainer; Perzborn, Elisabeth; and Seuter, Friedel, 4,876,254, Cl. 514-252.000.

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Seven W. Enterprises, Inc.: See—
Weder, Donald E.; and Chi, Tsu T., 4,876,192, Cl. 435-21.000.

Seward, George: See—
Goldner, Ronald B.; Haas, Terry; Wong, Kwok-Keung; and Seward, George, 4,876,628, Cl. 361-313.000.

Sgrignoli, Gary J.: See—
Citta, Richard W.; Gosc, Paul M.; Mutzabaugh, Dennis M.; and Sgrignoli, Gary J., 4,876,718, Cl. 380-42.000.

Shafer, Sheldon J.: See—
Blackmon, Kenneth P.; Clagett, Donald C.; Fox, Daniel W.; Maresca, Louis M.; and Shafer, Sheldon J., 4,876,317, Cl. 525-433.000.

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Shape Inc.: See—
Gelardi, Anthony; Lowry, Alan; and Lovecky, Craig, 4,875,743, Cl. 312-13.000.

Shargay, Cathleen A.: See—
Hsieh, C. Richard; King, Desmond F.; Pettersen, Frederick A.; and Shargay, Cathleen A., 4,875,996, Cl. 208-157.000.

Sharp, Bruce R. Double walled storage tanks with common rib supports, 4,875,361, Cl. 73-49.200.

Sharp Kabushiki Kaisha: See—
Honda, Iwakazu, 4,876,613, Cl. 358-471.000.

Kamimura, Taisuke, 4,876,573, Cl. 355-250.000.

Ogura, Mitsuru; and Tsukamoto, Kimihide, 4,876,577, Cl. 355-315.000.

Shaughnessy, Ernest P. Modular building, 4,875,310, Cl. 52-81.000.

Shaw, Arthur B.: See—
Feldman, Fred; Klekamp, Mark S.; Hrinda, Michael E.; Shaw, Arthur B.; and Chandra, Sudhish, 4,876,241, Cl. 514-2.000.

Shaw, Steven; and Weiss, Elmar, to Dr. Ing H.C.F. Porsche Aktiengesellschaft. Brake arrangement, 4,875,536, Cl. 188-72.400.

Shelby Paper Box Co., The: See—
Kadleck, Richard G.; and Nowak, William W., 4,875,585, Cl. 206-426.000.

Shell Canada Limited: See—
Verhoeff, Abraham, 4,876,004, Cl. 210-170.000.

Shell Explorer Limited: See—
Verhoeff, Abraham, 4,876,004, Cl. 210-170.000.

Shell Oil Company: See—
Allen, Robert C., 4,876,307, Cl. 524-612.000.

Drent, Eit, 4,876,401, Cl. 568-861.000.

Hoxmeier, Ronald J.; and Slauch, Lynn H., 4,876,314, Cl. 525-338.000.

Hwo, Charles C., 4,876,156, Cl. 428-516.000.

Job, Robert C., 4,876,230, Cl. 502-171.000.

Schofield, John A.; Betteridge, Peter R.; Ryback, George; and Geary, Philip J., 4,876,200, Cl. 435-253.300.

Sie, Swan T.; Drent, Eit; and Jager, Willem W., 4,876,286, Cl. 518-700.000.

Van Kleeck, David A., 4,876,075, Cl. 423-226.000.

Vonk, Willem C.; and van Gooswilligen, Gerrit, 4,876,130, Cl. 428-40.000.

Zon, Arie Van; and Coleman, Brian, 4,876,020, Cl. 252-40.500.

Sheppard, Clyde H.: See—
Lubowitz, Hyman R.; and Sheppard, Clyde H., 4,876,328, Cl. 528-322.000.

Sherburne, David G., to Eastman Kodak Company. Transporting and sorting system for a flexible workpiece, 4,875,671, Cl. 271-302.000.

Sherex Chemical Company, Inc.: See—
Hughes, Leonard; Fuller, James G.; and Earl, Gary W., 4,876,355, Cl. 548-352.000.

Shia, John J.: See—
Kesler, John K.; McCown, Robert J.; and Shia, John J., 4,875,366, Cl. 73-118.100.

Shibahara, Harue: See—
Ishida, Hiromi; Shibahara, Harue; Mutai, Masahiko; and Tsuchida, Nobuo, 4,876,202, Cl. 435-320.000.

Shibuya, Katsuhiko: See—
Shiokawa, Kozo; Tsuboi, Shinichi; Sasaki, Shoko; Moriya, Koichi; Hattori, Yumi; and Shibuya, Katsuhiko, 4,876,263, Cl. 514-338.000.

Shichoh Engineering Co., Ltd.: See—
Shiraki, Manabu; and Hirano, Norimitsu, 4,876,472, Cl. 30-198.000.

Shigaki, Takao: See—
Ozawa, Yoshio; Yamamoto, Takashi; Shigaki, Takao; and Kaneko, Rokusaburo, 4,876,568, Cl. 355-56.000.

Shihabi, David S.: See—
Bowe, Emmerson; Chang, Clarence D.; Han, Scott; and Shihabi, David S., 4,876,411, Cl. 585-533.000.

Chang, Clarence D.; Chu, Cynthia T.-W.; Chu, Pochen; Dessau, Ralph M.; Garwood, William E.; Kuehl, Guenter H.; Miale, Joseph N.; and Shihabi, David S., 4,876,228, Cl. 502-71.000.

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Shimazu, Takashi: See—
Shindou, Yoshio; Kabeya, Motoo; Shimazu, Takashi; and Yamazaki, Fumio, 4,876,160, Cl. 428-623.000.

Shimek, Daniel C.: See—
Shimek, Ronald J.; and Shimek, Daniel C., 4,875,464, Cl. 126-92.00R.

Shimek, Ronald J.; and Shimek, Daniel C. Clean burning gas log burner system, 4,875,464, Cl. 126-92.00R.

Shimida, Shinichi: See—
Suzuki, Shigeru; and Shimida, Shinichi, 4,875,438, Cl. 123-52.0MB.

Shimizu Construction Co., Ltd.: See—
Sato, Takanori, 4,875,313, Cl. 52-167.0DF.

Sugita, Minoru; Nakatsuji, Teruyuki; Fujisaki, Tadashi; Sawade, Minoru; Ishikawa, Noboru; and Inada, Yasuo, 4,876,143, Cl. 428-294.000.

Shimizu, Hiroshi; and Yamaguchi, Yoshito. Voice recognizing alarm timepiece, 4,876,676, Cl. 368-63.000.

Shimizu, Mitsuru: See—
Sugiyama, Toshinori; Ikegaki, Tetsuro; Shimizu, Mitsuru; and Tuburaya, Yoshitane, 4,876,133, Cl. 428-64.000.

Shimoda, Eiji: See—
Kikukawa, Hiroyasu; Shimoda, Eiji; Sakai, Mari; and Kitada, Fumiko, 4,875,908, Cl. 55-16.000.

Shimodaira, Hisayo; Ono, Toshio; Miyawaki, Keizo; and Hamaguchi, Tatsuya, to Mitsubishi Denki Kabushiki Kaisha. Fiber reinforced plastic reflector, 4,875,766, Cl. 350-641.000.

Shimokawa, Kazuhiro: See—
Hisanaga, Yorisato; Shimokawa, Kazuhiro; Kawano, Toshihiko; Suita, Yasunori; and Yamashita, Tsuneo, 4,876,245, Cl. 514-29.000.

Shimokobe, Jiro: See—
Morohashi, Katsuei; Shimokobe, Jiro; and Shimoma, Taketoshi, 4,876,478, Cl. 313-413.000.

Shimoma, Taketoshi: See—
Morohashi, Katsuei; Shimokobe, Jiro; and Shimoma, Taketoshi, 4,876,478, Cl. 313-413.000.

Shimomura, Shoji: See—
Miyagawa, Michiaki; Ishizaka, Yutaka; and Shimomura, Shoji, 4,876,732, Cl. 382-41.000.

Shin-Etsu Chemical Co., Ltd.: See—
Itoh, Kunio; and Shiobara, Toshio, 4,876,298, Cl. 523-433.000.

Itoh, Kunio; Fukushima, Motoo; and Nakamura, Tsutomu, 4,876,344, Cl. 544-219.000.

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Kewin, Daniel D., 4,875,636, Cl. 242-68.600.
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Sremba, Gerald F.; Sremba, Patricia M.; and Sullivan, James P., 4,875,708, Cl. 281-45.000.
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DiCosimo, Robert; Burrington, James D.; and Suresh, Dev D., 4,876,348, Cl. 546-252.000.
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Fisher, Abraham; and Karton, Ishai, 4,876,260, Cl. 514-278.000.
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Issachar, David; Trumper, Jacob; and Abrashkin, Shmuel, 4,876,073, Cl. 423-2.000.
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Kolodziej, Helmut, 4,875,571, Cl. 198-431.000.
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Lindberg, Kaj; Steen, Gerry; and Germundson, Elon, 4,875,806, Cl. 405-224.000.
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Proehl, Gary S.; Giggello, Anthony D.; Collett, David J.; Parton, Richard L.; Stegman, David A.; and Adin, Anthony, 4,876,181, Cl. 430-522.000.
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Kroeger, Michael K.; Longo, John M.; Steiger, Ronald P.; and Leung, Peter K., 4,876,512, Cl. 324-376.000.
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Hilderbrandt, Bodo; and Steigerwald, Franz, 4,875,577, Cl. 206-219.000.

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Park, John N.; Steigerwald, Robert L.; and Schutten, Michael J., 4,876,635, Cl. 363-17.000.
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Hou, Donald; Wong, Yee-Shing; Gala, Dinesh; and Steinman, Martin, 4,876,338, Cl. 540-357.000.
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Hinduja, Murti; Thompson, Mark L.; and Spriggs, John R., 4,875,363, Cl. 73-56.000.
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Dixon, George G.; Parلمان, Robert M.; and Stewart, Wayne, 4,876,030, Cl. 252-315.200.
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- Stichnote, Lynn K.: See—
Brewer, Terry L.; Hawley, Dan W.; Lamb, James E.; Latham, William J.; and Stichnote, Lynn K., 4,876,165, Cl. 430-7.000.
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Lambooy, Elbert, 4,875,253, Cl. 17-1.00E.
- Stockrail Ltd.: See—
Duce, Edward, 4,875,416, Cl. 104-167.000.
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Keller, Werner, 4,875,606, Cl. 222-600.000.
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Gasiunas, Donatas V.; Sette, Paul R.; and Storace, Anthony, 4,875,788, Cl. 400-163.100.
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Hughes, Arlen J.; and Strahan, Virgil H., 4,876,583, Cl. 357-23.700.
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Rosa, Randall R.; Bjornard, Eric; and Strand, David, 4,876,667, Cl. 365-113.000.
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- Strippe, David C.: See—
Phinney, Richard R.; and Strippe, David C., 4,876,114, Cl. 427-45.100.
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Caveny, Jack E.; Bulanda, John J.; Fischer, Richard L.; Stroede, Andrew J.; and Wienczek, Donald C., 4,875,881, Cl. 439-535.000.
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Margerum, Edwin O.; and Strong, Russell W., 4,875,890, Cl. 360-8E.000.
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- Stumfall, David M.: See—
Condon, David C.; and Stumfall, David M., 4,875,409, Cl. 101-93.290.
- Stumpf, Jorg: See—
Moeckl, Ernst; Stumpf, Jorg; Hardt, Walter; and Doinghaus, Hermann, 4,875,418, Cl. 108-50.000.
- Suda, Shoji: See—
Ariizumi, Ryozo; Kainuma, Masakuni; Suda, Shoji; Aoki, Toshikazu; Ejiri, Takashi; Kojima, Masao; and Hoshi, Mitsunori, 4,875,500, Cl. 137-596.180.
- Sueda, Yutaka, to Mazda Motor Corporation. Steplessly variable transmission control for automotive vehicle. 4,875,892, Cl. 474-17.000.
- Suenaga, Kazuhiro: See—
Ikeda, Hironosuke; Ezaki, Tadashi; Yoshida, Kakushiyu; Yamaguchi, Rikizou; and Suenaga, Kazuhiro, 4,876,451, Cl. 361-540.000.
- Suezaki, Isao: See—
Suzumura, Hiroyuki; Okamoto, Yuji; and Suezaki, Isao, 4,875,817, Cl. 411-171.000.
- Sugano, Minoru: See—
Hagiwara, Masayoshi; Suzuki, Michio; Sasaki, Ryoichi; Sugano, Minoru; Horiki, Akira; and Hayashi, Kazuyuki, 4,876,681, Cl. 370-60.000.
- Sugata, Hiroyuki: See—
Chiba, Yuji; Ando, Kenji; Sugata, Masao; Sugata, Hiroyuki; Kimura, Toshiaki; and Osabe, Kuniji, 4,875,810, Cl. 406-14.000.
- Sugata, Masao: See—
Chiba, Yuji; Ando, Kenji; Sugata, Masao; Sugata, Hiroyuki; Kimura, Toshiaki; and Osabe, Kuniji, 4,875,810, Cl. 406-14.000.
- Sugathan, Kenneth: See—
Lee, Andrew J.; Sanduja, Mohan L.; Sugathan, Kenneth; Dragnea, Felicia; and Horowitz, Carl, 4,875,410, Cl. 101-170.000.
- Sugimoto, Koichi: See—
Hasegawa, Hiroshi; Sugimoto, Koichi; Yano, Takeshi; Netsu, Tositada; Tani, Mitsukiyo; and Kojima, Tosaku, 4,875,618, Cl. 228-179.000.
- Sugimoto, Tadao: See—
Miyaoka, Tsutomu; Okazaki, Masaki; and Sugimoto, Tadao, 4,876,183, Cl. 430-567.000.
- Sugimoto, Yukinobu: See—
Arita, Masujiro; and Sugimoto, Yukinobu, 4,875,980, Cl. 203-14.000.
- Sugita, Minoru; Nakatsuji, Tetsuyuki; Fujisaki, Tadashi; Sawade, Minoru; Ishikawa, Noboru; and Inada, Yasuo, to Shimizu Construction Co., Ltd.; Dainihon Glass Industry Co., Ltd.; and Kyojin Rope Manufacturing Co., Ltd. Rod material. 4,876,143, Cl. 428-294.000.
- Sugitani, Yuji; Sato, Yoshikazu; and Nishi, Yasuhiko, to NKK Corporation. Method for controlling a penetration bead. 4,876,432, Cl. 219-124.320.
- Sugiyama, Genroku; Hirata, Toichi; and Satoh, Shinichi, to Hitachi Construction Machinery Co., Ltd. Construction machine dual-dump hydraulic circuit with piloted arm-boom cylinder supply priority switching valves. 4,875,337, Cl. 60-421.000.
- Sugiyama, Toshinori; Ikegaki, Tetsuro; Shimizu, Mitsuru; and Tuburaya, Yoshitane, to Hitachi Maxell, Ltd. Optical data recording system and method of production of recording medium. 4,876,133, Cl. 428-64.000.
- Suita, Yasunori: See—
Hisanaga, Yorisato; Shimokawa, Kazuhiro; Kawano, Toshihiko; Suita, Yasunori; and Yamashita, Tsuneo, 4,876,245, Cl. 514-29.000.
- Sulger, Werner: See—
Daltrozzi, Ewald; and Sulger, Werner, 4,876,347, Cl. 546-176.000.
- Sullivan, James P.: See—
Sremba, Gerald F.; Sremba, Patricia M.; and Sullivan, James P., 4,875,708, Cl. 281-45.000.
- Sulzer Brothers Limited: See—
Gacsay, Loran; and Meierhofer, Beat, 4,875,506, Cl. 139-450.000.
- Sumen, Hiroyoshi: See—
Hara, Hitoshi; and Sumen, Hiroyoshi, 4,875,845, Cl. 425-143.000.
- Sumitomo Chemical Company, Limited: See—
Ito, Iko; Toyoshima, Yoshiki; Takagishi, Hisao; and Takahashi, Tsutomu, 4,876,371, Cl. 549-517.000.
- Mizutani, Masato; Shirohita, Masao; Sakaki, Masaharu; Okuda, Hiroki; and Mito, Nobuaki, 4,875,924, Cl. 71-92.000.
- Sumitomo Electric Industries, Ltd.: See—
Masuda, Shigeo; and Hoooya, Toshifumi, 4,875,758, Cl. 350-96.300.
- Mizutani, Futoshi; Kyogoku, Takeshi; Saitoh, Tatsuo; and Endoh, Shigeki, 4,875,918, Cl. 65-3.120.
- Sumitomo Heavy Industries, Ltd.: See—
Hara, Hitoshi; and Sumen, Hiroyoshi, 4,875,845, Cl. 425-143.000.
- Sumitomo Special Metals, Co., Ltd.: See—
Wada, Toshiaki; Katsuyama, Yoshiaki; and Nakaoka, Junichi, 4,875,987, Cl. 204-192.150.
- Sumiya, Kiyoshi: See—
Ishikawa, Osamu; and Sumiya, Kiyoshi, 4,876,605, Cl. 358-400.000.
- Sun Room Designs, Inc.: See—
Meyers, Leo J., 4,875,311, Cl. 52-90.000.
- Sunbeam Corporation: See—
Smith, Richard A., 4,876,475, Cl. 310-239.000.
- Sunclipse, Inc.: See—
Cardenas, Alfonso, 4,875,737, Cl. 297-442.000.
- Sundstrand Corporation: See—
Readman, John, 4,875,826, Cl. 415-89.000.
- Stroze, Mark S.; and Reynolds, Richard W., 4,875,403, Cl. 91-482.000.
- Sung, Rak M. Hula doll having compound motions. 4,875,886, Cl. 446-298.000.
- Sunohara, Izuru: See—
Ohsawa, Hidefumi; Katayama, Akihiro; Hosokawa, Hiroshi; Sunohara, Izuru; and Yoshimoto, Masahiko, 4,876,610, Cl. 358-443.000.
- Supra, Carl F. W., to Liberty Pool Products S.A. Apparatus for use with a pool cleaner. 4,876,001, Cl. 210-123.000.
- Suresh, Dev D.: See—
DiCosimo, Robert; Burrington, James D.; and Suresh, Dev D., 4,876,348, Cl. 546-252.000.
- Surrey Medical Imaging Systems Ltd.: See—
Taylor, David G., 4,876,508, Cl. 324-309.000.
- Susa, Kenzo; Takagi, Kazumasa; Kobayashi, Toshio; Takayama, Takanobu; and Ohta, Norio, to Hitachi, Ltd. Single crystal thin film. 4,876,144, Cl. 428-336.000.
- Sutherland, John W. H., Jr.: See—
Mack, Arthur R., II; and Sutherland, John W. H., Jr., 4,876,207, Cl. 436-135.000.
- Suvanto, Erkki, to Neste Oy. Sleeve-mounted spike fitted on a vehicle tire. 4,875,515, Cl. 152-210.000.
- Suzuki, Akinobu, to Mitsubishi Denki Kabushiki Kaisha. Optical semiconductor module using dummy ferrule. 4,875,752, Cl. 350-96.200.
- Suzuki, Eiji, to Fujitsu Limited. Repeater for regenerating frame-multiplexed signal. 4,876,683, Cl. 370-97.000.
- Suzuki, Isao: See—
Sakata, Hirotugu; Murasaki, Hiroaki; Hayano, Makoto; Hattori, Hitoshi; Morozumi, Naoya; Yoneyama, Kouichi; Suzuki, Isao; Sone, Junji; and Nagatomo, Shigemi, 4,875,839, Cl. 418-55.000.
- Suzuki, Masaru, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Electrical connecting apparatus for steering wheel and steering column. 4,875,860, Cl. 439-15.000.
- Suzuki, Masaru, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Motor controlling switch device. 4,876,493, Cl. 318-293.000.

Suzuki, Masayuki, to Sony Corporation. Disk cartridge having shutter and a device for opening and closing the shutter. 4,876,619, Cl. 360-97.010.

Suzuki, Michio: See—

Hagiwara, Masayoshi; Suzuki, Michio; Sasaki, Ryoichi; Sugano, Minoru; Horiki, Akira; and Hayashi, Kazuyuki, 4,876,681, Cl. 370-60.000.

Suzuki, Miki: See—

Takeya, Fuminori; Fukuda, Naoya; and Suzuki, Miki, 4,875,970, Cl. 156-645.000.

Suzuki, Noboru; Toji, Shigeo; and Uenaka, Yukio, to Asahi Kogaku Kogyo Kabushiki Kaisha. Signal processing device for automatic-focusing video signal in electronically controlled photographic camera. 4,876,603, Cl. 358-227.000.

Suzuki, Nobuhiko; and Aoki, Tetuya, to Diesel Kiki Co., Ltd.; and Fujikoki Manufacturing Co., Ltd. Pressure control valve for variable displacement swash plate type compressor. 4,875,832, Cl. 417-222.000.

Suzuki, Osami, to Toshiba America, Inc. Personal sound system. 4,876,724, Cl. 381-187.000.

Suzuki, Satoshi: See—

Usami, Saburo; Uchiyama, Kyoichi; and Suzuki, Satoshi, 4,875,837, Cl. 417-407.000.

Suzuki, Shigeru; and Shimida, Shinichi, to Honda Giken Kogyo Kabushiki Kaisha. Method of controlling composite intake manifold system for internal combustion engine. 4,875,438, Cl. 123-52.0MB.

Suzuki, Shintaro: See—

Umezawa, Hamao; Suzuki, Shintaro; Ohkuma, Taka'aki; Sato, Fumihiko; and Nakamura, Teruya, 4,876,244, Cl. 514-19.000.

Suzuki, Toshio: See—

Okawa, Tadashi; and Suzuki, Toshio, 4,876,373, Cl. 556-453.000.

Suzuki, Yasuhito; Akimoto, Koichiro; Ohshima, Hajime; Honda, Kazuyuki; and Isaka, Yukio, to Canon Kabushiki Kaisha. Image recording apparatus. 4,876,562, Cl. 346-160.000.

Suzumura, Hiroyuki; Okamoto, Yuji; and Suezaki, Isao, to Toyota Jidosha Kabushiki Kaisha. Sealed weld nut. 4,875,817, Cl. 411-171.000.

Svensson, Kjell: See—

Holm, Sune, deceased; Malmberg, Rolf; and Svensson, Kjell, 4,876,100, Cl. 426-491.000.

Swanson, Scott C., to Sangamo Weston, Inc. Temperature transducer for KYZ pulse recorder. 4,875,783, Cl. 374-170.000.

Swartout, James J.: See—

Scott, William D.; and Swartout, James J., 4,875,399, Cl. 83-468.300.

Synaptics Incorporated: See—

Mead, Carver A.; and Allen, Timothy P., 4,876,534, Cl. 340-825.950.

Synthes (U.S.A.): See—

Comte, Pierre-Andre; Schurch, Hans; and Ritter, Gebhard, 4,875,475, Cl. 128-924.00Y.

Szarka, Sandor, to Precision Screen Machines, Inc. Apparatus for mounting articles of clothing to a printing pallet. 4,875,268, Cl. 29-283.000.

Szema, Li-Chieh: See—

Rasmussen, Neil S.; Szema, Li-Chieh; and Abuaf, Nesim, 4,875,339, Cl. 60-757.000.

Tabuchi, Tsuyoshi: See—

Maejima, Taro; Yada, Toshio; Tsutsumi, Michinari; Tabuchi, Tsuyoshi; Terazono, Takeshi; and Aoki, Masaru, 4,875,434, Cl. 118-52.000.

Tachi-S Co., Ltd.: See—

Yokoyama, Sho, 4,875,734, Cl. 297-284.000.

Tadokoro, Akio: See—

Akahoshi, Haruo; Murakami, Kanji; Kawamoto, Mineo; Tadokoro, Akio; and Yoshimura, Toyofusa, 4,876,177, Cl. 430-313.000.

Tadokoro, Michihiro: See—

Imai, Hitoshi; Okada, Kazuo; and Tadokoro, Michihiro, 4,876,666, Cl. 365-106.000.

Tadros, Tharwat F., to Imperial Chemical Industries PLC. Formulation process. 4,875,927, Cl. 71-94.000.

Taguchi, Kenichi: See—

Watanabe, Masataka; Ohhara, Nobuhiro; and Taguchi, Kenichi, 4,876,438, Cl. 219-497.000.

Tahara, Kazuo: See—

Abukawa, Toshimi; Tahara, Kazuo; Murumoto, Katsuji; Koterazawa, Toshiyuki; Hombu, Mitsuyuki; Takahashi, Tadashi; Takamatsu, Shuichi; Ishikura, Hisatugu; Yamamura, Hiroshisa; Tatsuzaki, Toru; Ohmae, Tsutomu; Okuyama, Toshiaki; Yamashita, Seizi; Saito, Shigeki; and Sakai, Masato, 4,875,539, Cl. 180-79.100.

Taiyo Pharmaceutical Industry Co., Ltd.: See—

Nakaoku, Shozo; Sakuma, Kazuhiko; Oshika, Yasuhiro; and Ohira, Kazuo, 4,876,345, Cl. 544-379.000.

Tajika, Hiroshi: See—

Tajima, Hatsu; Kubo, Takahiro; and Tajika, Hiroshi, 4,876,574, Cl. 355-253.000.

Tajima, Hatsu; Kubo, Takahiro; and Tajika, Hiroshi, to Canon Kabushiki Kaisha. Developing apparatus. 4,876,574, Cl. 355-253.000.

Tajima, Kenji, to Fuji Photo Film Co., Ltd. Sheet film package. 4,876,706, Cl. 378-174.000.

Tak, Seung W. Portable container assembly for containing golf accessories. 4,875,579, Cl. 206-315.100.

Takagi, Akira; Oyaizu, Hirotsugu; Takahashi, Nobuatsu; and Kume, Kiyotaka, to Daiwa Kasei Kogyo Kabushiki Kaisha. Cable tie. 4,875,647, Cl. 248-74.300.

Takagi, Kazumasa: See—

Susa, Kenzo; Takagi, Kazumasa; Kobayashi, Toshio; Takayama, Takanobu; and Ohta, Norio, 4,876,144, Cl. 428-336.000.

Takagi, Kozi: See—

Ozawa, Takashi; Tanaka, Hitoshi; Goshima, Takahiro; and Takagi, Kozi, 4,875,741, Cl. 303-116.000.

Takagishi, Hisao: See—

Ito, Iko; Toyoshima, Yoshiki; Takagishi, Hisao; and Takahashi, Tsutomu, 4,876,371, Cl. 549-517.000.

Takahashi, Hideo: See—

Hara, Junichiro; Ogihara, Yoshiyuki; and Takahashi, Hideo, 4,875,624, Cl. 236-49.500.

Takahashi, Kenji; Nakamura, Takashi; and Hosoi, Yuichi, to Fuji Photo Film Co., Ltd. Phosphor and radiation image storage panel. 4,876,161, Cl. 428-691.000.

Takahashi, Nobuatsu: See—

Takagi, Akira; Oyaizu, Hirotsugu; Takahashi, Nobuatsu; and Kume, Kiyotaka, 4,875,647, Cl. 248-74.300.

Takahashi, Tadashi: See—

Abukawa, Toshimi; Tahara, Kazuo; Murumoto, Katsuji; Koterazawa, Toshiyuki; Hombu, Mitsuyuki; Takahashi, Tadashi; Takamatsu, Shuichi; Ishikura, Hisatugu; Yamamura, Hiroshisa; Tatsuzaki, Toru; Ohmae, Tsutomu; Okuyama, Toshiaki; Yamashita, Seizi; Saito, Shigeki; and Sakai, Masato, 4,875,539, Cl. 180-79.100.

Takahashi, Tsutomu: See—

Ito, Iko; Toyoshima, Yoshiki; Takagishi, Hisao; and Takahashi, Tsutomu, 4,876,371, Cl. 549-517.000.

Oshita, Saichiro; Mouri, Toyohiko; Takahashi, Tsutomu; and Itou, Shinji, 4,875,541, Cl. 180-79.100.

Takahashi, Tsutomu: See—

Oshita, Saichiro; Mouri, Toyohiko; and Takahashi, Tsutomu, 4,875,540, Cl. 180-79.100.

Takai, Kazuhiko: See—

Higuchi, Teruo; Terauchi, Kiyoshi; Takai, Kazuhiko; Kikuchi, Sei; and Kobayashi, Hideto, 4,875,834, Cl. 417-269.000.

Takaishi, Naotake: See—

Hori, Kimihiko; Nakamura, Koichi; Kawai, Michio; Motegi, Itsuro; Imokawa, Genji; and Takaishi, Naotake, 4,876,084, Cl. 424-62.000.

Takamatsu, Shuichi: See—

Abukawa, Toshimi; Tahara, Kazuo; Murumoto, Katsuji; Koterazawa, Toshiyuki; Hombu, Mitsuyuki; Takahashi, Tadashi; Takamatsu, Shuichi; Ishikura, Hisatugu; Yamamura, Hiroshisa; Tatsuzaki, Toru; Ohmae, Tsutomu; Okuyama, Toshiaki; Yamashita, Seizi; Saito, Shigeki; and Sakai, Masato, 4,875,539, Cl. 180-79.100.

Takase, Haruo: See—

Abe, Akira; Nakajima, Junya; Takase, Haruo; Uenaka, Kazushige; and Otomo, Ruyzi, 4,876,180, Cl. 430-393.000.

Takashima, Masanobu: See—

Saeki, Keiso; Sano, Shojiro; Matsuoka, Katsumi; Takashima, Masanobu; and Iwakura, Ken, 4,876,233, Cl. 503-209.000.

Takasugi, Atsumi: See—

Ishii, Yoh; Abe, Masami; Harada, Yuhzoh; Takasugi, Atsumi; and Kato, Kazumi, 4,875,519, Cl. 164-465.000.

Takayama, Takanobu: See—

Susa, Kenzo; Takagi, Kazumasa; Kobayashi, Toshio; Takayama, Takanobu; and Ohta, Norio, 4,876,144, Cl. 428-336.000.

Takayama, Toshio, to Tokico, Ltd. Braking device for use in a motor vehicle. 4,875,740, Cl. 303-50.000.

Takechi, Kazuo: See—

Hirao, Yutaka; Takechi, Kazuo; Uriyu, Katuhiro; and Uemura, Yohiro, 4,876,088, Cl. 424-85.800.

Takeda Chemical Industries, Ltd.: See—

Morimoto, Akira; Choh, Nobuo; and Noguchi, Noriyoshi, 4,876,251, Cl. 514-193.000.

Shirafuji, Hideo; Yamaguchi, Takamasa; and Nogami, Ikuo, 4,876,195, Cl. 435-137.000.

Takeda, Hiromitsu; Nakahashi, Masako; Shirokane, Makoto; and Yamazaki, Tatsuo, to Kabushiki Kaisha Toshiba. Method of coating a nitride ceramic member. 4,876,119, Cl. 427-250.000.

Takeda, Kazuo; Ito, Yoshitoshi; Honma, Noriaki; and Munakata, Chu-suke, to Hitachi, Ltd. Apparatus for measuring particles in liquid. 4,876,458, Cl. 250-574.000.

Takeda, Kiyoshi: See—

Funahashi, Yuichi; Watanabe, Junichiro; Takeda, Kiyoshi; and Matsumoto, Makoto, 4,876,363, Cl. 549-215.000.

Takeda, Renzo: See—

Aoyama, Motoo; Bessho, Yasunori; Uchikawa, Sadao; Takeda, Renzo; and Ishii, Yoshihiko, 4,876,062, Cl. 376-444.000.

Takehara, Tetsuo: See—

Oda, Noriyuki; Takehara, Tetsuo; Higashi, Katsumi; and Muramatsu, Keiji, 4,875,712, Cl. 285-47.000.

Takekado, Shigeru, to Kabushiki Kaisha Toshiba. Magnetic disc device with gimbal spring having variable elastic characteristics. 4,876,623, Cl. 360-104.000.

Takemura, Naoto; and Tanabe, Susumu, to Terumo Kabushiki Kaisha. Medical instrument and method for making. 4,876,126, Cl. 428-35.700.

Takenaka, Makoto: See—

Okuda, Hiroko; and Takenaka, Makoto, 4,875,400, Cl. 84-626.000.

Takeshima, Hideki: See—

Fujioka, Toyohiko; and Takeshima, Hideki, 4,875,280, Cl. 29-783.000.

Takeya, Fuminori; Fukuda, Naoya; and Suzuki, Miki, to NGK Insulators, Ltd. Method of forming recessed profile on ferrite single crystal by chemical etching. 4,875,970, Cl. 156-645.000.

Takiguchi, Tsuyoshi: See—

Kawano, Ikuo; Takiguchi, Tsuyoshi; Kimura, Norihisa; Yanagisawa, Yohci; Ashimi, Tokuji; and Yoshino, Hiroyuki, 4,876,103, Cl. 426-574.000.

Takita, Hidenori: See—

Kawabata, Akira; Terasaki, Yoshikazu; Inoue, Takashi; and Takita, Hidenori, 4,876,479, Cl. 313-440.000.

Tamagawa, Shigehisa; Kuroishi, Masayuki; and Fuchizawa, Tetsuro, to Fuji Photo Film Co., Ltd. Light-sensitive material comprising light-sensitive layer containing microcapsules provided on specific paper support. 4,876,170, Cl. 430-138.000.

Tampa Electric Company: See—

Coiley, James D., 4,876,076, Cl. 423-242.000.

Tamura, Hiroki: See—

Imoto, Koji; Tateishi, Mataji; Omura, Tadao; Nakajima, Kunihiko; Maekawa, Motoyuki; Matsuyama, Moritake; and Tamura, Hiroki, 4,875,445, Cl. 123-292.000.

Tamura, Michiya: See—

Shinomai, Tsutomu; Yoshino, Eiichi; Maki, Chihiro; Tojima, Hitoshi; Izai, Sadamu; Nakata, Akio; and Tamura, Michiya, 4,875,960, Cl. 156-203.000.

Tamura, Susan Y.: See—

Asato, Goro; and Tamura, Susan Y., 4,876,272, Cl. 514-450.000.

Tamura, Tomoyuki: See—

Imataki, Hiroyuki; Hiraoka, Mizuho; Tamura, Tomoyuki; and Satoh, Tetsuya, 4,876,042, Cl. 264-39.000.

Tanabe, Susumu: See—

Takemura, Naoto; and Tanabe, Susumu, 4,876,126, Cl. 428-35.700.

Tanabe, Takeshi: See—

Sakamoto, Yukio; Tanabe, Takeshi; Fukutani, Iwao; and Hori, Toshio, 4,875,862, Cl. 439-79.000.

Tanaka, Akihiro; Fujikura, Takashi; Tsuzuki, Ryuji; Yokota, Masaki; and Yatsu, Takeyuki. Substituted tetrahydroisoquinoline compounds and composition containing them. 4,876,261, Cl. 514-307.000.

Tanaka, Hitoshi: See—

Ozawa, Takashi; Tanaka, Hitoshi; Goshima, Takahiro; and Takagi, Kozi, 4,875,741, Cl. 303-116.000.

Tanaka, Junzo: See—

Mishima, Osamu; Yamaoka, Shinobu; Fukunaga, Osamu; Tanaka, Junzo; and Era, Koh, 4,875,967, Cl. 156-605.000.

Tanaka, Masanori, to Hosiden Electronics Co., Ltd. Telephone connector. 4,875,872, Cl. 439-344.000.

Tanaka, Osamu: See—

Nakayama, Hisanobu; Tanaka, Osamu; Yasumoto, Hiromichi; Senoo, Seichi; Zaizen, Youichi; and Yamasaki, Kouji, 4,875,947, Cl. 148-113.000.

Tanaka, Toshiaki: See—

Tsuchida, Hirofumi; Tanaka, Toshiaki; Oyamada, Akira; and Hirao, Sumio, 4,875,444, Cl. 123-270.000.

Tanaka, Toshinori; Miyazaki, Shigekazu; and Morishita, Akira, to Mitsubishi Denki Kabushiki Kaisha. Armature. 4,876,473, Cl. 310-216.000.

Tandem Computers Incorporated: See—

Sanner, Martin W., 4,876,701, Cl. 375-106.000.

Tani, Mitsukiyo: See—

Hasegawa, Hiroshi; Sugimoto, Koichi; Yano, Takeshi; Netsu, Tosiada; Tani, Mitsukiyo; and Kojima, Tosaku, 4,875,618, Cl. 228-179.000.

Taniguchi, Hiroji: See—

Kato, Eiji; Kadotani, Masanori; Sakaguchi, Yoshikazu; Kubo, Seitoku; Iwatsuki, Kunihiko; Taniguchi, Hiroji; and Harada, Yoshihara, 4,875,665, Cl. 267-170.000.

Taniguchi, Masato: See—

Akao, Shigeaki; and Taniguchi, Masato, 4,875,442, Cl. 123-90.390.

Taniguchi, Yuji; and Banju, Masaru, to Alps Electric Co., Ltd. Electroluminescent element. 4,876,481, Cl. 313-502.000.

Tapco Products Company, Inc.: See—

MacLeod, Richard J.; and Schiedegger, Charles E., 4,875,318, Cl. 52-211.000.

Tashima, Seiji: See—

Okimoto, Haruo; and Tashima, Seiji, 4,875,454, Cl. 123-559.300.

Tate, Kazuyuki: See—

Saegusa, Noboru; Hara, Toshihiro; Kawasaki, Ryoji; Tate, Kazuyuki; Huse, Syoji; and Ono, Koji, 4,876,708, Cl. 379-61.000.

Tateishi, Mataji: See—

Imoto, Koji; Tateishi, Mataji; Omura, Tadao; Nakajima, Kunihiko; Maekawa, Motoyuki; Matsuyama, Moritake; and Tamura, Hiroki, 4,875,445, Cl. 123-292.000.

Tatsumi, Takashi: See—

Saitoh, Yoshiro; and Tatsumi, Takashi, 4,876,134, Cl. 428-73.000.

Tatsuzaki, Toru: See—

Abukawa, Toshimi; Tahara, Kazuo; Murumoto, Katsuji; Koterazawa, Toshiyuki; Hombu, Mitsuyuki; Takahashi, Tadashi; Takamatsu, Shuichi; Ishikura, Hisatugu; Yamamura, Hiroshisa; Tatsuzaki, Toru; Ohmae, Tsutomu; Okuyama, Toshiaki; Yamashita, Seizi; Saito, Shigeki; and Sakai, Masato, 4,875,539, Cl. 180-79.100.

Tawada, Yoshihisa: See—

Hamakawa, Yoshihiro; Tawada, Yoshihisa; Tsuge, Kazunori; and Izumina, Masanobu, 4,875,943, Cl. 136-244.000.

Tayama, Suehiro: See—

Kurokawa, Satoshi; Tayama, Suehiro; and Sato, Fumio, 4,876,306, Cl. 524-423.000.

Taylor, Clive R., to British Aerospace plc. Electrostatic discharge protection circuit. 4,876,584, Cl. 357-23.130.

Taylor, Dale F., to General Electric Company. Corrosion resistant zirconium alloys containing bismuth. 4,876,064, Cl. 420-422.000.

Taylor, David G., to Surrey Medical Imaging Systems Ltd. Method and apparatus for NMR imaging. 4,876,508, Cl. 324-309.000.

Taylor, James M.; and Karner, Gary M., to Atlantic Richfield Company. Retractable dust control hood and guard for rotary table saw. 4,875,398, Cl. 83-100.000.

Taylor, Reginald M.; and Brock, Alan J., to Glyzinc Pharmaceuticals Limited. Zinc glycerolate complex and additions for pharmaceutical applications. 4,876,278, Cl. 514-494.000.

Tazartes, Daniel A.; Mark, John G.; and Matthews, Anthony, to Litton Systems, Inc. Apparatus and method for determining ring laser gyroscope phase at turnaround

- Kushida, Osami; Ninomiya, Hiromitsu; Nezuka, Masakazu; and Ishikawa, Yoshihiko, 4,876,523, Cl. 337-299.000.
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Steele, Donald F.; Hoagland, Lawrence C.; Kyricos, Christopher; and Tolan, Peter, 4,875,520, Cl. 165-10.000.
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Mochizuki, Seiji; and Kato, Fumiyasu, 4,875,633, Cl. 242-58.300.
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Suzuki, Osami, 4,876,724, Cl. 381-187.000.
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Funahashi, Yuichi; Watanabe, Junichiro; Takeda, Kiyoshi; and Matsumoto, Makoto, 4,876,363, Cl. 549-215.000.
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Okuda, Akihiko; Totake, Yukinori; and Matsumura, Hideki, 4,876,407, Cl. 570-239.000.
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Anzai, Hiroshi; and Futsuki, Atsunori, 4,875,484, Cl. 128-421.000.
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Isaka, Tsutomu; and Ohta, Saburo, 4,876,146, Cl. 428-347.000.
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Yamada, Muneki; and Kawaguchi, Kiyoshi, 4,876,052, Cl. 264-148.000.
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Matsuzawa, Masafumi; Hokari, Hiroshi; Kusano, Shoji; Miyazawa, Takeshige; and Toyokawa, Yasufumi, 4,875,930, Cl. 71-106.000.
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Ito, Iko; Toyoshima, Yoshiki; Takagishi, Hisao; and Takahashi, Tsutomu, 4,876,371, Cl. 549-517.000.
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Hayashi, Kotaro; Ito, Sumio; and Kobashi, Kiyoshi, 4,875,336, Cl. 60-288.000.
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Kump, Wilhelm; and Traxler, Peter, 4,876,258, Cl. 514-254.000.
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Gustafson, Eric K.; Trebino, Rick; and Lee, John, 4,876,208, Cl. 436-531.000.
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Eichen, Howard R., 4,876,151, Cl. 428-446.000.
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Chickering, Robert; and Barabino, William A., 4,875,602, Cl. 222-187.000.
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Van Driesen, Roger P.; Adams, William R.; Baldasari, Mario; Caspers, John; and Trimble, Harold, 4,875,995, Cl. 208-152.000.
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Malpass, Dennis B.; Triplett, Kelly B.; and Piotrowski, Andrzej M., 4,876,318, Cl. 525-446.000.
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Climent, Jean-Pierre; Petelet, Georges; and Tronel, Jean-Claude, 4,876,551, Cl. 342-460.000.
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Nagji, Moez M.; and Trubac, Robert E., 4,876,394, Cl. 568-697.000.
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Trulaskie, Arthur W., 4,875,745, Cl. 312-298.000.
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- Trumper, Jacob: See—
Issachar, David; Trumper, Jacob; and Abrashkin, Shmuel, 4,876,073, Cl. 423-2.000.
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Leibowitz, Joseph D., 4,875,282, Cl. 29-830.000.
- Tseng, Samuel C., to International Business Machines Corporation. Complex character generator utilizing byte scanning, 4,876,607, Cl. 358-261.200.
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Ishida, Hiromi; Shibahara, Harue; Mutai, Masahiko; and Tsuchida, Nobuo, 4,876,202, Cl. 435-320.000.
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Uchiyama, Yoshichika; and Tsuchiya, Atsushi, 4,875,932, Cl. 73-202.000.
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Hamakawa, Yoshihiro; Tawada, Yoshihisa; Tsuge, Kazunori; and Iruma, Masanobu, 4,875,943, Cl. 136-244.000.
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Ogura, Mitsuru; and Tsukamoto, Kimihide, 4,876,577, Cl. 355-315.000.
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Tsukahara, Hitoshi; Kurokawa, Keiko; Tsukui, Toshimitsu; and Nagai, Toshiaki, 4,876,070, Cl. 422-122.000.
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Yamane, Akio; Kawasoe, Tatsuhiro; Tsukumo, Noriko; and Miyoshi, Kenichi, 4,876,335, Cl. 536-27.000.
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Matai, Masahiro; and Tsunoda, Kazuyuki, 4,876,536, Cl. 340-825.440.
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Naruo, Kyoichi; Ohtani, Sumio; Etoh, Masahiro; Tsuruta, Masao; Moriya, Ikuro; Ishiguro, Masanori; and Matsumoto, Akira, 4,876,007, Cl. 210-339.000.
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Maejima, Taro; Yada, Toshio; Tsutsumi, Michinari; Tabuchi, Tsuyoshi; Terazono, Takeshi; and Aoki, Masaru, 4,875,434, Cl. 118-52.000.
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Tanaka, Akihiro; Fujikura, Takashi; Tsuzuki, Ryuji; Yokota, Masaki; and Yatsu, Takeyuki, 4,876,261, Cl. 514-307.000.
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- Tuburaya, Yoshitane: See—
Sugiyama, Toshihiro; Ikegaki, Tetsuro; Shimizu, Mitsuru; and Tuburaya, Yoshitane, 4,876,133, Cl. 428-64.000.
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Orsburn, Michael L.; Hemsky, Robert L.; Tucker, Terry L.; Schwarz, Robert E.; and Fearing, Craig F., 4,876,589, Cl. 358-22.000.
- Tufts University: See—
Goldner, Ronald B.; Haas, Terry; Wong, Kwok-Keung; and Seward, George, 4,876,628, Cl. 361-313.000.
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Kyo, Takatsugu, 4,875,570, Cl. 198-408.000.
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Forrest, Stephen R., 4,876,209, Cl. 437-5.000.
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- Uchikawa, Sadao: See—
Aoyama, Motoo; Bessho, Yasunori; Uchikawa, Sadao; Takeda, Renzo; and Ishii, Yoshihiko, 4,876,062, Cl. 376-444.000.
- Uchiya Termostat Co.: See—
Kanezawa, Nobuyoshi, 4,876,422, Cl. 200-302.100.
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Usami, Saburo; Uchiyama, Kyoichi; and Suzuki, Satoshi, 4,875,837, Cl. 417-407.000.
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Michal, Ronald J.; Udd, Eric; and Cahill, Richard F., 4,875,775, Cl. 356-350.000.
- Udovich, Carl A., to Amoco Corporation. Oxidative alkoxy carbonylation of amines and amine derivatives, 4,876,379, Cl. 560-158.000.
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Amikura, Takashi; Fujiwara, Akihiro; Toyama, Masamichi; Ueda, Kouichi; and Kozuki, Susumu, 4,876,564, Cl. 354-400.000.
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Yoshioka, Ritsuo; Ueda, Makoto; Motora, Yoichi; and Nakamura, Mitsuharu, 4,876,060, Cl. 376-333.000.
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Hirasawa, Hideaki; and Ueda, Nobuo, 4,875,768, Cl. 353-27.00A.
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Aoyama, Takeo; Imai, Teruo; Hattori, Junichi; and Uehara, Mikio, 4,876,049, Cl. 264-49.000.
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Hirao, Yutaka; Takechi, Kazuo; Uriyu, Katuhiro; and Uemura, Yohiro, 4,876,088, Cl. 424-85.800.
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Abe, Akira; Nakajima, Junya; Takase, Haruo; Uenaka, Kazushige; and Otomo, Ruyzi, 4,876,180, Cl. 430-393.000.
- Uenaka, Yukio: See—
Suzuki, Noboru; Toji, Shigeo; and Uenaka, Yukio, 4,876,603, Cl. 358-227.000.
- Ullom, Kathleen F. M.: See—
Mitchell, Roy O.; Klaut, Milton D.; and Ullom, Kathleen F. M., 4,876,484, Cl. 315-94.000.
- Umemaru, Hisato: See—
Morishita, Mitsuharu; Kohge, Shinichi; Hara, Tadayuki; Hata, Yasuaki; and Umemaru, Hisato, 4,875,367, Cl. 73-118.100.
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- Unilever Patent Holdings BV: See—
King, David M.; and Padley, Frederick B., 4,876,107, Cl. 426-601.000.
- Unimation, Inc.: See—
Daggett, Kenneth E.; Onaga, Eimei M.; and Casler, Richard J., Jr., 4,876,494, Cl. 318-568.220.
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Fulks, Bernard D.; Sawin, Steven P.; Aikman, Collin D.; and Jenkins, John M., III, 4,876,320, Cl. 526-62.000.
- Logsdon, John E.; Loke, Richard A.; Merriam, Jay S.; and Voight, Richard W., 4,876,402, Cl. 568-881.000.
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Orac, Thomas H.; Quandt, Herbert C.; and Ball, David R., 4,875,979, Cl. 201-5.000.
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D'Hooghe, Martial; Perrette, Claude; and Goffinet, Pierre, 4,875,600, Cl. 222-52.000.
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Ratcliffe, Charles T.; and Ward, John W., 4,876,408, Cl. 585-467.000.

United Kingdom Atomic Energy Authority: See—
Clayton, Colin G.; and Speckman, Ramon, 4,876,056, Cl. 376-152.000.
Conroy, Peter J., 4,876,059, Cl. 376-247.000.
United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Majesty's Government of the: See—
Smith, Gilbert W.; Daniel, Mervyn F.; Barton, John W.; and Ratcliffe, Norman M., 4,876,150, Cl. 428-411.100.
United States of America
Air Force: See—
Hughes, Arlen J.; and Strahan, Virgil H., 4,876,583, Cl. 357-23.700.
Army: See—
Bramley, Jenny, 4,876,692, Cl. 372-70.000.
Mishra, Indu B.; and Vande Kieft, Lawrence J., 4,875,949, Cl. 149-19.300.
Energy: See—
Liepins, Raimond; Jorgensen, Betty S.; and Liepins, Leila Z., 4,876,032, Cl. 252-500.000.
Murphy, Lawrence M., 4,875,467, Cl. 126-424.000.
Paulson, Leland E., 4,876,080, Cl. 423-648.100.
Rastrick, Ian D., 4,876,115, Cl. 427-115.000.
Wang, Francis; and Velsko, Stephan P., 4,876,688, Cl. 372-22.000.
National Aeronautics and Space Administration: See—
Jones, Jack A.; Wen, Liang-Chi; and Bard, Steven, 4,875,346, Cl. 62-467.000.
Navy: See—
Giallorenzi, Thomas G., 4,875,357, Cl. 73-27.00A.
U.S. Philips Corporation: See—
Lindenmeier, Karl-Heinz G.; and Flachenecker, Gerhard, 4,876,743, Cl. 455-133.000.
Selby, Geoffrey R., 4,876,738, Cl. 455-33.000.
Simons, Johannes M. M., 4,876,319, Cl. 525-456.000.
Veldhuis, Raymond N. J., 4,876,595, Cl. 358-136.000.
U.S. Philips Ltd.: See—
Van Vaals, Johannes J., 4,876,507, Cl. 324-307.000.
United States Tennis Association Incorporated: See—
Hass, Hyman, 4,876,658, Cl. 364-550.000.
United Steel & Wire Company: See—
Badger, Ronald L.; and Pejovich, Michael, 4,875,695, Cl. 280-33.993.
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McElroy James F., 4,876,162, Cl. 429-13.000.
Trousell, Edmund D.; and Kaspro, Robert F., 4,875,830, Cl. 416-215.000.
University of Minnesota, Regents of the: See—
Tulibary, Effie C.; and Furcht, Leo T., 4,876,332, Cl. 530-326.000.
Universal Industrial Products, a Division of Core Industries, Inc.: See—
Falconer, Donald R.; and Sneddon, James C., 4,875,252, Cl. 16-288.000.
University of California, Regents of: See—
Lee, Garrett, 4,875,897, Cl. 604-283.000.
Palmer, Christopher J.; and Casida, John E., 4,876,274, Cl. 514-452.000.
University of Delaware, The: See—
Barnett, Allen M.; and Zolper, John C., 4,876,210, Cl. 437-5.000.
University of Florida, The: See—
Wilson, Richard A.; Butler, Jerry F.; Withycombe, Donald; Mookherjee, Braja D.; Katz, Ira; and Schrankel, Kenneth R., 4,876,087, Cl. 424-84.000.
University of Iowa Research Foundation: See—
Wu, Han-Chin; and Xu, Zhiyou, 4,875,375, Cl. 73-795.000.
University of Minnesota, Regents of the: See—
Liu, Benjamin Y. H.; and Ramsey, James W., 4,875,340, Cl. 62-50.200.
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McCulloch, Beth, 4,876,390, Cl. 568-34.000.
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Kodachi, Toru; and Usami, Jun, 4,875,990, Cl. 204-408.000.
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Kerr, Howard T.; Buchanan, Michael E.; and Valentine, Kenneth H., 4,876,721, Cl. 358-56.000.
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Van der Woude, Gerbrigg W., 4,875,829, Cl. 416-2.000.
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Marino, Philip F.; and Vandenberg, Donald E., 4,875,764, Cl. 350-611.000.
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Meyer, Louis W.; Vanderhider, James A.; and Carswell, Robert, 4,876,019, Cl. 252-32.500.
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De Deugd, Johannes A. G.; and van Moorsel, Josephus J., 4,876,477, Cl. 313-404.000.
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Rivera, Raymond R.; Van Vleet, Stephen B.; and Wilson, Shari J., 4,876,123, Cl. 428-34.200.
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Wetch, Stephen B.; Goris, Gregory A.; and Krasnov, Igor, 4,875,529, Cl. 173-163.000.
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Feinstein, Joseph, 4,876,687, Cl. 372-2.000.
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Pessa, Markus; Asonen, Harry; Varrio, Jukka; and Salokatve, Arto, 4,876,218, Cl. 437-107.000.
Varshavsky, Vladimir D.: See—
Khutoretsky, Garri M.; Tjurin, Yuri G.; Varshavsky, Vladimir D.; Zagorodnaya, Galina A.; and Fridman, Vladimir M., 4,876,469, Cl. 310-52.000.
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Velle, Larry N., 4,875,982, Cl. 204-14.000.
Velle, Larry N., to Velle Circuits, Inc. Plating high aspect ratio holes in circuit boards, 4,875,982, Cl. 204-14.000.
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Wang, Francis; and Velsko, Stephan P., 4,876,688, Cl. 372-22.000.
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Schuda, Ann D.; Verhoeven, Thomas R.; and Shinkai, Ichiro, 4,876,364, Cl. 549-214.000.
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Ekeroth, Douglas E.; and Veronesi, Luciano, 4,876,061, Cl. 376-353.000.
Vetter, Heinz: See—
Hennig, Jurgen; Vetter, Heinz; and Munzer, Manfred, 4,876,311, Cl. 525-229.000.
Victoor, Johnny: See—
Moeneclay, Denis; Coopman, Lucien; and Victoor, Johnny, 4,875,505, Cl. 139-448.000.
Vifian, Hugo: See—
Wong, Roger W.; Vifian, Hugo; and Hart, Michael G., 4,875,859, Cl. 434-214.000.
Viles, Robert F., to Fosroc International Limited. Cementitious composition, 4,875,937, Cl. 106-104.000.
Vinchon, Andre: See—
Cagnon, Francois; Di Paola, Denis; Austruy, Georges; and Vinchon, Andre, 4,875,850, Cl. 431-8.000.
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Vivant, Gilbert, to Rhone-Poulenc Chimie. Microencapsulation by interfacial polyaddition, 4,876,290, Cl. 521-76.000.
Vivenzio, Robert L.: See—
Krauter, Allan I.; and Vivenzio, Robert L., 4,875,468, Cl. 128-3.000.
Voest-Alpine Maschinenbau Gesellschaft m.b.H.: See—
Zitz, Alfred; and Brandl, Erich, 4,875,738, Cl. 299-80.000.
Vogelbusch Gesellschaft m.b.H.: See—
Salzbrunn, Wolfgang; Steiner, Eva; Wohrer, Wilfried; and Meixner, Otto, 4,876,196, Cl. 435-161.000.
Vogt, Ernst: See—
Kloucek, Franz; Larsson, Per-Olof; and Vogt, Ernst, 4,875,613, Cl. 228-44.300.
Voight, Richard W.: See—
Logsdon, John E.; Loke, Richard A.; Merriam, Jay S.; and Voight, Richard W., 4,876,402, Cl. 568-881.000.
Volkswagen AG: See—
Kramer, Karl-Martin; and Dorenkamp, Richard, 4,875,449, Cl. 123-400.000.
Vollinger, Hubert: See—
Pietzsch, Ludwig; Senger, Detlef; Winter, Horst; and Vollinger, Hubert, 4,876,600, Cl. 358-183.000.
Vollmann, William; and Mumford, Van E., to Teletronics, N.V. Implantable cardiac pacer with programmable antitachycardia mechanisms, 4,875,483, Cl. 128-419.00P.
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Mittler, Martin A.; and Scowen, Kenneth J., 4,876,627, Cl. 361-293.000.
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Czogalla, Claus-D., 4,876,361, Cl. 549-41.000.

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von Laar, Klaus: See—
Stadler, Hansjorg; and von Laar, Klaus, 4,875,414, Cl. 102-307.000.
Voss, David L.; DeCamp, Howard S.; and Culp, Gordon W., to Sierracin Corporation. Electroconductive film system for aircraft windows, 4,876,178, Cl. 430-314.000.
Vriesema, Bindert K.; and Miniaci, Francesco, to Stamicarbon B.V. Aromatic polyester, 4,876,327, Cl. 528-173.000.
Vsesojuzny Nauchno-Issledovatel'skiy Ispytatel'nyy Institut Meditsinskoi Tekhniki: See—
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W. A. Lane, Inc.: See—
Lane, William A., Sr., 4,875,620, Cl. 229-1.50B.
W. H. Brady Co.: See—
Gratke, Norman G., 4,876,461, Cl. 307-116.000.
W. L. Gore & Associates, Inc.: See—
Campbell, Michael L.; Williams, Benjamin G.; Riffle, Rob G.; and Biggerstaff, Charles E., 4,876,051, Cl. 264-127.000.
W. R. Grace & Co.-Conn.: See—
Lulham, Cedric M.; Wofford, George D.; Bradfute, John G.; and Friedrich, Steven G., 4,875,587, Cl. 206-484.000.
Smith, Edward M.; and Cornelison, Richard C., 4,875,436, Cl. 122-7.00R.
WABCO Westinghouse Fahrzeugbremsen GmbH: See—
Heger, Werner; Kramer, Manfred; and Schlossarczyk, Heinrich, 4,875,503, Cl. 137-856.000.
WABCO Westinghouse Steuerungstechnik GmbH: See—
Bernhardt, Bruno; and Kedzierski, Heinrich, 4,875,405, Cl. 92-194.000.
Wada, Fukuaki: See—
Maeda, Tetsuro; Wada, Fukuaki; Ohoka, Susumu; and Okamoto, Akihiro, 4,876,145, Cl. 428-327.000.
Wada, Fusazo: See—
Yamamoto, Takeshi; Kondo, Kunio; Yoshimura, Hiroshi; Wada, Yoshihiro; and Wada, Fusazo, 4,876,139, Cl. 428-200.000.
Wada, Yoshiaki; Katsuyama, Yoshiaki; and Nakaoka, Junichi, to Sumitomo Special Metals, Co., Ltd. Grooved magnetic substrates and method for producing the same, 4,875,987, Cl. 204-192.150.
Wada, Yoshihiro: See—
Yamamoto, Takeshi; Kondo, Kunio; Yoshimura, Hiroshi; Wada, Yoshihiro; and Wada, Fusazo, 4,876,139, Cl. 428-200.000.
Waddell, James A.: See—
Lents, Rollie T., 4,875,622, Cl. 232-39.000.
Waespe, Hans-Rudolf, to Ciba-Geigy Corporation. Pesticidal diphenylethylene derivatives, 4,876,270, Cl. 514-439.000.
Wagner, Edward A.; and Guiver, Harold C., to Berkeley Quartz Lab, Inc. Cantilevered diffusion chamber atmospheric loading system and method, 4,876,225, Cl. 437-248.000.
Waitl, Guenther: See—
Spaeth, Werner; Waitl, Guenther; Kuhlmann, Werner; Althaus, Hans-Ludwig; Birkmann, Rolf; Klos, Waltraud; and Schubert, Axel, 4,875,750, Cl. 350-96.180.
Wake, Ronald W.; Reithel, Sibylle L.; and McGuckin, Hugh G., to Eastman Kodak Company. Color filter array, 4,876,166, Cl. 430-7.000.
Wakefield, Peter D., to Delfield Precision Engineering Limited. Golf club measuring device, 4,875,293, Cl. 33-508.000.
Wakley, William D.: See—
Young, Grant A.; Wakley, William D.; and Andrews, Steven L., 4,876,016, Cl. 210-739.000.
Wakunaga Seiyaku Kabushiki Kaisha: See—
Yamane, Akio; Kawasoe, Tatsuhiro; Tsukumo, Noriko; and Miyoshi, Kenichi, 4,876,335, Cl. 536-27.000.
Yoshida, Susumu; Nakagawa, Shizutoshi; Ushiroguchi, Tsuyoshi; Matsuura, Hiromichi; and Yazaki, Akira, 4,876,281, Cl. 514-517.000.
Waldenrath, Werner: See—
Dziurla, Heinz-Jurgen; Freitag, Dieter; Waldenrath, Werner; Burkhardt, Claus; and Schulte, Bernhard, 4,876,033, Cl. 252-511.000.
Waldock, Kevin H.; and Wasson, Daniel A., to CBS Explosives Pty Limited. Explosive composition, 4,875,950, Cl. 149-21.000.
Waldorf Corporation: See—
Mode, Duane R., 4,876,427, Cl. 219-10.55E.
Walgren, Susan M.: See—
Mayer, David W.; Gilman, Byron L.; Walgren, Susan M.; and Berglund, June M., 4,876,109, Cl. 427-2.000.
Walker, John C.; and Holmes, Thomas, to SP Tyres UK Limited. Method of detecting a deflated tire on a vehicle, 4,876,528, Cl. 340-442.000.
Walker, William G.: See—
Griffiths, Colin; and Walker, William G., 4,875,954, Cl. 156-64.000.
Walbillich, Guenter, to BASF Aktiengesellschaft. Negative correction of gravure printing plates, 4,876,118, Cl. 427-142.000.
Waller, George W. Drying rack and receptacle for towels and wash cloths, 4,875,592, Cl. 211-88.000.
Wallington, Kenneth: See—
Hardy, Judy; and Wallington, Kenneth, 4,875,870, Cl. 439-204.000.

- Wallis, Ernst: See—
Rockel, Manfred; Wallis, Ernst; Kohler, Michael; Heubner, Ulrich; and Kirchheiner, Rolf, 4,876,065, Cl. 420-582.000.
- Wan, Chi-Mee, to Fancys Steel Corporation. Melting method for producing low chromium corrosion resistant and high damping capacity Fe-Mn-Al-C based alloys, 4,875,933, Cl. 75-10.170.
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- Ward, John W.: See—
Ratcliffe, Charles T.; and Ward, John W., 4,876,408, Cl. 585-467.000.
- Wardlaw, Stephen C.: See—
Levine, Robert A.; and Wardlaw, Stephen C., 4,875,364, Cl. 73-61.10R.
- Warner-Lambert Company: See—
Hodges, John C.; and Klutchko, Sylvester, 4,876,343, Cl. 544-168.000.
- Jan, Chaur-Ming; and Oehling, Mark E., 4,875,435, Cl. 118-62.000.
- Piano, Anthony P., 4,875,326, Cl. 53-435.000.
- Yang, Robert K., 4,876,093, Cl. 426-3.000.
- Waschke, Christine; Topfer, Lothar; and Rath, Alfred, to Dragerwerk Aktiengesellschaft. Protective mask having a built-in sensor for monitoring vital functions, 4,875,477, Cl. 128-206.210.
- Washbourn, Jack: See—
Langley, Keith W.; and Washbourn, Jack, 4,875,559, Cl. 188-203.000.
- Washington, James O. Stove top adapter, 4,875,463, Cl. 126-80.000.
- Wasson, Daniel A.: See—
Waldock, Kevin H.; and Wasson, Daniel A., 4,875,950, Cl. 149-21.000.
- Watakabe, Yaichiro; Okamoto, Tatsuo; and Matsuda, Shuichi, to Mitsubishi Denki Kabushiki Kaisha. Process for manufacturing a photomask, 4,876,164, Cl. 430-5.000.
- Watanabe, Ikuro, to Usui Kokusai Sangyo Kaisha Ltd. Slender tube connector, 4,875,711, Cl. 285-45.000.
- Watanabe, Junichiro: See—
Funahashi, Yuichi; Watanabe, Junichiro; Takeda, Kiyoshi; and Matsumoto, Makoto, 4,876,363, Cl. 549-215.000.
- Watanabe, Kouichi: See—
Endo, Masanori; and Watanabe, Kouichi, 4,876,631, Cl. 361-502.000.
- Watanabe, Masataka; Ohhara, Nobuhiro; and Taguchi, Kenichi, to Shin-Etsu Handotai Co., Ltd. Control of the power to the heater and the speed of movement of a crystal rod by control of the crystal rod diameter, 4,876,438, Cl. 219-497.000.
- Watanabe, Nobuyuki: See—
Honma, Toshio; and Watanabe, Nobuyuki, 4,876,612, Cl. 358-474.000.
- Watanabe, Takuya: See—
Eshita, Takashi; Mieno, Fumitake; Furumura, Yuji; and Watanabe, Takuya, 4,876,219, Cl. 437-126.000.
- Watanabe, Tamotsu: See—
Onuki, Toru; Sagawa, Junichi; Watanabe, Tamotsu; and Yoshimatsu, Toshio, 4,876,158, Cl. 428-565.000.
- Watanabe, Tohru: See—
Yoda, Takashi; and Watanabe, Tohru, 4,876,223, Cl. 437-228.000.
- Watanabe, Toyofumi: See—
Iwasa, Hiroki; Watanabe, Toyofumi; and Furuya, Hirohide, 4,875,984, Cl. 204-56.100.
- Watanabe, Yuji; and Nakamura, Masahiro, to Kabushiki Kaisha Komatsu Seisakusho. Method of identifying objects, 4,876,729, Cl. 382-22.000.
- Watanuki, Osaaki: See—
Kaneiko, Toyohisa; and Watanuki, Osaaki, 4,876,720, Cl. 381-43.000.
- Water Systems Development Corporation: See—
Malson, William S., 4,876,014, Cl. 210-668.000.
- Watson, Gilles: See—
Candau, Sauveur; Leroy, Maurice; Brunette, Jean-Pierre; Mallo, Paul; Loret, Jean-Francois; and Watson, Gilles, 4,876,036, Cl. 252-637.000.
- Wavetek Microwave, Inc.: See—
Herscher, Bret A., 4,876,654, Cl. 364-483.000.
- Way Construction, Inc.: See—
Hicks, Gary D., 4,875,800, Cl. 404-35.000.
- Webb, Colin F.: See—
Butina, Darko; Dowle, Michael D.; Bays, David E.; and Webb, Colin F., 4,876,267, Cl. 514-415.000.
- Weber, Guenter: See—
Kliem, Erhard; Weber, Guenter; and Kunz, Alfred, 4,876,079, Cl. 423-578.00R.
- Wedel, Gregory L., to Beloit Corporation. Transfer apparatus from press section to drying section, 4,875,976, Cl. 162-306.000.
- Weder, Donald E.; and Chi, Tsu T., to Seven W. Enterprises, Inc. Detection of antibodies against a chorionic gonadotropin-like substance, 4,876,192, Cl. 435-21.000.
- Wefler, Mark E.: See—
Buhler, James E.; Crapser, James R.; Miller, Allen D.; and Wefler, Mark E., 4,875,626, Cl. 239-314.000.
- Weiner, Hans: See—
Gietzen, Stas; Weiner, Hans; Hain, Klaus; Hofbauer, August; and Hawener, Juergen, 4,875,643, Cl. 244-53.00A.
- Weinstein, Jack, to Primary Delivery Systems, Inc. Metered dispensing cap for tubes, 4,875,603, Cl. 222-205.000.
- Weirton Steel Corporation: See—
Saunders, William T., 4,875,597, Cl. 220-458.000.
- Weisend, Norbert A., Jr.: See—
Adams, Lowell J.; Simshauser, Steven C.; Pisarski, Nathan; and Weisend, Norbert A., Jr., 4,875,644, Cl. 244-134.00R.
- Weisler, Richard. Systemic insect repellent composition and method, 4,876,090, Cl. 424-195.100.
- Weiss, Ekkehard: See—
Klaus, Michael; and Weiss, Ekkehard, 4,876,349, Cl. 546-350.000.
- Weiss, Elmar: See—
Shaw, Steven; and Weiss, Elmar, 4,875,556, Cl. 188-72.400.
- Weiss, Johannes S.: See—
Graves, Alan F.; Littlewood, Paul A.; and Weiss, Johannes S., 4,876,682, Cl. 370-66.000.
- Weiss, Lee E.: See—
Sanderson, Arthur C.; Weiss, Lee E.; and Nayar, Shree K., 4,876,455, Cl. 250-560.000.
- Welch Allyn, Inc.: See—
Krauter, Allan I.; and Vivenzio, Robert L., 4,875,468, Cl. 128-3.000.
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- Welch, Robert J.; Kolvites, Albert; and White, Robert M., to Inter-Metro Industries Corporation. Caster direction-locking mechanism for mobile cart, 4,875,696, Cl. 280-47.340.
- Wella Aktiengesellschaft: See—
Hilderbrandt, Bodo; and Steigerwald, Franz, 4,875,577, Cl. 206-219.000.
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- Wellman, Edward F.; and Michaels, Francis J. Golf club swing improvement apparatus, 4,875,683, Cl. 273-187.00B.
- Wen, Liang-Chi: See—
Jones, Jack A.; Wen, Liang-Chi; and Bard, Steven, 4,875,346, Cl. 62-467.000.
- Wenger, LaVon G.; Hauck, Bobbie W.; and Hartter, Timothy R., to Wenger Manufacturing, Inc. Twin-screw extruder having respective conical nose screw sections, 4,875,847, Cl. 425-204.000.
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Wenger, LaVon G.; Hauck, Bobbie W.; and Hartter, Timothy R., 4,875,847, Cl. 425-204.000.
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Winzen, Wilfried; and Wunschmann, Manfred, 4,875,716, Cl. 285-137.100.
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Lo, Frederick Y.; Nowlin, Thomas E.; and Wu, Margaret M., 4,876,321, Cl. 526-129.000.
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Winzen, Wilfried; and Wunschmann, Manfred, 4,875,716, Cl. 285-137.100.
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Eaton, Richard B., 4,876,608, Cl. 358-443.000.

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Hashimoto, Noboru; Hitomi, Mitsuo; Onishi, Koji; Yada, Yoshikuni; Nobumoto, Hidetoshi; and Hotate, Makoto, 4,875,455, Cl. 123-568.000.

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Ishikawa, Takatoshi; and Yagihara, Morio, 4,876,174, Cl. 430-380.000.

Yakigaya, Nobuyuki: See—
Hayashi, Tsutomu; Katoh, Masaie; Yakigaya, Nobuyuki; Nakamura, Kazuhiko; Yoshida, Yoshihiro; Nakajima, Yoshihiro; Saito, Mitsuru; and Kobayashi, Akio, 4,875,390, Cl. 74-731.000.

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Ikeda, Hironosuke; Ezaki, Tadashi; Yoshida, Kakushiyou; Yamaguchi, Rikizou; and Suenaga, Kazuhiro, 4,876,451, Cl. 361-540.000.

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Nakajima, Nobuyuki; Inomata, Kenichi; Moruta, Masaya; Yamaguchi, Toshio; and Eitai, Kazuo, 4,875,835, Cl. 417-295.000.

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Shimizu, Hiroshi; and Yamaguchi, Yoshito, 4,876,676, Cl. 368-63.000.

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Shimazu, Hideaki; Ito, Hiroshi; and Yamakoshi, Kenichi, 4,875,488, Cl. 128-694.000.

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Inoue, Kazushige; Yamamoto, Hiroshi; Hyodo, Hiroshi; and Kishimoto, Shinichi, 4,876,204, Cl. 436-46.000.

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Tomasada, Kenji; Kondo, Toshiro; Yamamoto, Tadanobu; and Hashino, Hiroshi, 4,875,704, Cl. 280-695.000.

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Ozawa, Yoshio; Yamamoto, Takashi; Shigaki, Takao; and Kaneko, Rokusaburo, 4,876,568, Cl. 355-56.000.

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Yamanaka, Motosuke: See—
Oinuma, Hitoshi; Yamanaka, Motosuke; Miyake, Kazutoshi; Hoshiko, Tomonori; Minami, Norio; Shoji, Tadao; Daiku, Yoshiharu; Sawada, Kohei; and Nomoto, Kenichi, 4,876,262, Cl. 514-318.000.

Yamanaka, Yoshifumi: See—
Kashima, Takayuki; Sakabe, Akira; and Yamanaka, Yoshifumi, 4,876,433, Cl. 219-130.510.

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Yamaoka, Shinobu: See—
Mishima, Osamu; Yamaoka, Shinobu; Fukunaga, Osamu; Tanaka, Junzo; and Era, Koh, 4,875,967, Cl. 156-605.000.

Yamasaki, Kouji: See—
Nakayama, Hisanobu; Tanaka, Osamu; Yasumoto, Hiromichi; Senoo, Seiichi; Zaizen, Youichi; and Yamasaki, Kouji, 4,875,947, Cl. 148-113.000.

Yamashita, Seizi: See—
Abukawa, Toshimi; Tahara, Kazuo; Murumoto, Katsuji; Koterazawa, Toshiyuki; Hombu, Mitsuyuki; Takahashi, Tadashi; Takamatsu, Shuichi; Ishikura, Hisatugu; Yamamura, Hiroshisa; Tatsuzaki, Toru; Ohmae, Tsutomu; Okuyama, Toshiaki; Yamashita, Seizi; Saito, Shigeki; and Sakai, Masato, 4,875,539, Cl. 180-79.100.

Yamashita, Tsuneo: See—
Hisanaga, Yorisato; Shimokawa, Kazuhiro; Kawano, Toshihiko; Suita, Yasunori; and Yamashita, Tsuneo, 4,876,245, Cl. 514-29.000.

Yamazaki, Fumio: See—
Shindou, Yoshio; Kabeya, Motoo; Shimazu, Takashi; and Yamazaki, Fumio, 4,876,160, Cl. 428-623.000.

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Takeda, Hiromitsu; Nakahashi, Masako; Shirokane, Makoto; and Yamazaki, Tatsuo, 4,876,119, Cl. 427-250.000.

Yanagimachi, Motoshige: See—
Oike, Hitoshi; and Yanagimachi, Motoshige, 4,875,961, Cl. 156-234.000.

Yanagisawa, Yohei: See—
Kawano, Ikuo; Takiguchi, Tsuyoshi; Kimura, Norihisa; Yanagisawa, Yohei; Ashimi, Tokuji; and Yoshino, Hiroyuki, 4,876,103, Cl. 426-574.000.

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Yang, Robert K., to Warner-Lambert Company. Chewing gum composition and method of making same. 4,876,095, Cl. 426-3.000.

Yano, Takeshi: See—
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Yao, Raymond C.: See—
Hamill, Robert L.; and Yao, Raymond C., 4,876,273, Cl. 514-451.000.

Yasuda, Tomio: See—
Kawai, Taneichi; Yasuda, Tomio; and Aoki, Koji, 4,876,649, Cl. 364-424.050.

Yasuma, Jun-ichi: See—
Ichihashi, Kouji; and Yasuma, Jun-ichi, 4,875,501, Cl. 137-625.640.

Yasumoto, Hiromichi: See—
Nakayama, Hisanobu; Tanaka, Osamu; Yasumoto, Hiromichi; Senoo, Seiichi; Zaizen, Youichi; and Yamasaki, Kouji, 4,875,947, Cl. 148-113.000.

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Yatsu, Takeyuki: See—
Tanaka, Akihiro; Fujikura, Takashi; Tsuzuki, Ryuji; Yokota, Masaki; and Yatsu, Takeyuki, 4,876,261, Cl. 514-307.000.

Yazaki, Akira: See—
Yoshida, Susumu; Nakagawa, Shizutoshi; Ushiroguchi, Tsuyoshi; Matsuura, Hiromichi; and Yazaki, Akira, 4,876,281, Cl. 514-517.000.

Yazaki Corporation: See—
Ishizuka, Shigeo; and Kuzuno, Katsutoshi, 4,875,873, Cl. 439-347.000.

Tsukamoto, Sakae, 4,875,433, Cl. 116-335.000.

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Gustafson, Eric K.; Trebino, Rick; and Lee, John, 4,876,208, Cl. 436-531.000.

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Mechoulam, Raphael; Feigenbaum, Jeffery J.; Lander, Naphtali; and Srebnik, Morris, 4,876,276, Cl. 514-454.000.

Yoakim, Christiane: See—
Guindon, Yvan; Girard, Yves; Lau, Cheuk K.; Fortin, Rejean; Rokach, Joshua; and Yoakim, Christiane, 4,876,246, Cl. 514-80.000.

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Yokota, Masaki: See—
Tanaka, Akihiro; Fujikura, Takashi; Tsuzuki, Ryuji; Yokota, Masaki; and Yatsu, Takeyuki, 4,876,261, Cl. 514-307.000.

Yokoyama, Fumitomo: See—
Kuwayama, Yoshinari; Yokoyama, Fumitomo; and Miura, Masa-katsu, 4,875,392, Cl. 74-867.000.

Yokoyama, Katsuya: See—
Kitamoto, Tatsuji; Yokoyama, Katsuya; and Sekiguchi, Takuji, 4,875,610, Cl. 226-10.000.

Yokoyama, Sho, to Tachi-S Co., Ltd. Automotive seat. 4,875,734, Cl. 297-284.000.

Yoneyama, Kouichi: See—
Sakata, Hirotosugu; Murasaki, Hiroaki; Hayano, Makoto; Hattori, Hitoshi; Morozumi, Naoya; Yoneyama, Kouichi; Suzuki, Isao; Sone, Junji; and Nagatomo, Shigemi, 4,875,839, Cl. 418-55.000.

Yoo, Seog C.: See—
Park, Ho J.; Rhim, Moo S.; Kim, Hak M.; Kim, Du H.; Yoo, Seog C.; Kim, Sang H.; Park, Sa Ng B.; Han, In S.; Park, Jong T.; and Kim, Si M., 4,876,040, Cl. 264-14.000.

Yorke, William J.: See—
Prest, David W.; and Yorke, William J., 4,875,951, Cl. 149-109.600.

Yoshida, Hiroshi: See—
Penzhorn, Ralf-Dieter; and Yoshida, Hiroshi, 4,875,945, Cl. 376-146.000.

Yoshida, Kakushiyou: See—
Ikeda, Hironosuke; Ezaki, Tadashi; Yoshida, Kakushiyou; Yamaguchi, Rikizou; and Suenaga, Kazuhiro, 4,876,451, Cl. 361-540.000.

Yoshida, Naruhito: See—
Egawa, Jiro; Yoshida, Naruhito; Kasai, Toshihiro; Nagasawa, Moriyo; Ide, Naoki; and Machida, Hironobu, 4,876,560, Cl. 346-153.100.

Yoshida, Shigeyuki; Musha, Atsushi; and Nonami, Takayuki, to Mitsubishi Denki Kabushiki Kaisha. Telephone set. 4,876,714, Cl. 379-433.000.

Yoshida, Susumu; Nakagawa, Shizutoshi; Ushiroguchi, Tsuyoshi; Matsuura, Hiromichi; and Yazaki, Akira, to Wakunaga Seiyaku Kabushiki Kaisha. Antifungal agents. 4,876,281, Cl. 514-517.000.

Yoshida, Takashi, to Fuji Electric Corporate Research and Development, Ltd. Amorphous photoelectric converting device. 4,875,944, Cl. 136-249.000.

Yoshida, Toshiaki, to Nissin Corporation. Injection needle-detaching device. 4,875,265, Cl. 29-240.000.

Yoshida, Yasunari: See—
Karube, Yoshiyuki; Hayakawa, Toshimasa; and Yoshida, Yasunari, 4,875,790, Cl. 400-605.000.

Yoshida, Yoshihiro: See—
Hayashi, Tsutomu; Katoh, Masaie; Yakigaya, Nobuyuki; Nakamura, Kazuhiko; Yoshida, Yoshihiro; Nakajima, Yoshihiro; Saito, Mitsuru; and Kobayashi, Akio, 4,875,390, Cl. 74-731.000.

Yoshikawa, Haruhiko; and Kawai, Makoto, to Honda Giken Kogyo Kabushiki Kaisha. Ignition timing controlling device for an internal combustion engine. 4,875,450, Cl. 123-425.000.

Yoshikawa, Toshiro, to NEC Corporation. Transmission system for transmitting multifrequency signals or modem signals with speech signals. 4,876,696, Cl. 375-5.000.

Yoshimitsu, Toshio: See—
Onuki, Toru; Sagawa, Junichi; Watanabe, Tamotsu; and Yoshimitsu, Toshio, 4,876,158, Cl. 428-565.000.

Yoshimoto, Masahiko: See—
Ohsawa, Hidefumi; Katayama, Akihiro; Hosokawa, Hiroshi; Sunohara, Izuru; and Yoshimoto, Masahiko, 4,876,610, Cl. 358-443.000.

Yoshimura, Hiroshi: See—
Yamamoto, Takeshi; Kondo, Kunio; Yoshimura, Hiroshi; Wada, Yoshihiro; and Wada, Fusazo, 4,876,139, Cl. 428-200.000.

Yoshimura, Toyofusa: See—
Akahoshi, Haruo; Murakami, Kanji; Kawamoto, Mineo; Tadokoro, Akio; and Yoshimura, Toyofusa, 4,876,177, Cl. 430-313.000.

Yoshinaga, Kazuo; Katagiri, Kazuharu; Kobayashi, Toyoko; and Shinjo, Kenji, to Canon Kabushiki Kaisha. Optically active composition, mesomorphic compound and liquid crystal device. 4,876,027, Cl. 252-299.600.

Yoshino, Eiichi: See—
Shinomiya, Tsutomu; Yoshino, Eiichi; Maki, Chihiro; Tojima, Hitoshi; Imai, Sadamu; Nakata, Akiro; and Tamura, Michiya, 4,875,960, Cl. 156-203.000.

Yoshino, Hirobumi: See—
Nakamura, Yoko; Kojima, Fumiyo; and Yoshino, Hirobumi, 4,876,571, Cl. 355-210.000.

Yoshino, Hiroyuki: See—
Kawano, Ikuo; Takiguchi, Tsuyoshi; Kimura, Norihisa; Yanagisawa, Yohei; Ashimi, Tokuji; and Yoshino, Hiroyuki, 4,876,103, Cl. 426-574.000.

Yoshioka, Ritsuo; Ueda, Makoto; Motora, Yoichi; and Nakamura, Mitsuharu, to Kabushiki Kaisha Toshiba. Control blade for nuclear reactor. 4,876,060, Cl. 376-333.000.

Yoshitomi, Yasuo: See—
Yamamoto, Sho; Minato, Osamu; Saeiki, Makoto; Yoshitomi, Yasuo; Nakamura, Hideaki; and Kubotera, Masaaki, 4,876,669, Cl. 365-189.010.

Yoshizumi, Seiichi: See—
Gotou, Shizuo; Kagimasa, Toyohiko; and Yoshizumi, Seiichi, 4,876,646, Cl. 364-200.000.

Young, Grant A.; Wakley, William D.; and Andrews, Steven L., to Amoco Corporation. Method of controlling the separation efficiency of a hydrocyclone. 4,876,016, Cl. 210-739.000.

Young, Harold R.: See—
McSpadden, John S.; Leatherman, Russel D.; and Young, Harold R., 4,876,653, Cl. 364-479.000.

Young, Lloyd L. Shooting tab. 4,875,458, Cl. 124-35.00A.

Young, Robert W.: See—
Marsh, Stephen A.; and Young, Robert W., 4,875,358, Cl. 73-40.000.

Youngren, David J.: See—
Youngren, John H.; and Youngren, David J., 4,875,760, Cl. 350-102.000.

Youngren, John H.; and Youngren, David J. Reflective prism assembly. 4,875,760, Cl. 350-102.000.

Yourd, Raymond A., III: See—
Gruber, Robert J.; Yourd, Raymond A., III; Malhotra, Shadi L.; Nelson, Robert A.; Fox, Carol A.; and Hoffend, Thomas R., 4,876,169, Cl. 430-110.000.

Yu, Simon: See—
Yamaguchi, Tadanori; Patton, Evan; Lane, Eric; and Yu, Simon, 4,876,214, Cl. 437-038.000.

Yunokuchi, Ryu; Omori, Shinichi; and Ohkita, Masao, to Alps Electric Co., Ltd. Method of producing magnetic head device. 4,875,276, Cl. 29-603.000.

Yusa, Toshikazu. Mounting container for measuring instruments. 4,875,381, Cl. 73-866.300.

Yusa, Yasuhiko: See—
Koike, Eishi; and Yusa, Yasuhiko, 4,876,678, Cl. 369-31.000.

Zafiroglu, Dimitri P., to Du Pont de Nemours, E. I., and Company. Stitchbonded nonwoven fabric. 4,876,128, Cl. 428-102.000.

Zagorodnaya, Galina A.: See—
Khutoretsky, Garri M.; Tjurin, Jury G.; Varshavsky, Vladimir D.; Zagorodnaya, Galina A.; and Fridman, Vladimir M., 4,876,469, Cl. 310-52.000.

Zahring, Gerhard: See—
Willkop, Franz; Zahring, Gerhard; Rutsch, Robert; Popp, Joachim; and Eberhard, John, 4,875,828, Cl. 415-173.400.

Zaidan Hojin Biseibutsu Kagaku: See—
Umezawa, Hamao; Suzuki, Shintaro; Ohkuma, Takaaki; Sato, Fumihiko; and Nakamura, Teruya, 4,876,244, Cl. 514-19.000.

Zaiden Hojin Handotai Kenkyu Shinkokai: See—
Nishizawa, Jun-ichi, 4,876,580, Cl. 357-22.000.

Zaizen, Youichi: See—
Nakayama, Hisanobu; Tanaka, Osamu; Yasumoto, Hiromichi; Senoo, Seiichi; Zaizen, Youichi; and Yamasaki, Kouji, 4,875,947, Cl. 148-113.000.

Zakman, Zdravko M., to Motorola, Inc. Internally mounted broadband antenna. 4,876,552, Cl. 343-702.000.

Zakraysek, Louis: See—
Belke, Robert E.; Zakraysek, Louis; and Pillar, Walter O., 4,876,120, Cl. 428-1.000.

Zaoralek, Heinz-Michael, to Schwabische Huttenwerke GmbH. Device for treating a material web. 4,875,297, Cl. 34-48.000.

Zavody na vyrobu lozisk, Povazska Bystrica: See—
Rajsigl, Zdenek; and Kriz, Frantisek, 4,875,334, Cl. 57-406.000.

Zebel, Peter J., to Motorola Inc. Method of forming semiconductor structure isolation regions. 4,876,217, Cl. 437-67.000.

Zebco Corporation: See—
Zurcher, John A., 4,875,639, Cl. 242-309.000.

Zehnder, Paul; Niklaus, Hans-Ulrich; Schmiedl, Engelbert; and Patri, Franz, to K. Rutsch AG. Self-sucking pump apparatus for liquids. 4,875,836, Cl. 417-360.000.

Zeiss Ikon AG: See—
Ballmer, Horst; and Grosskopf, Rudolf, 4,876,535, Cl. 340-825.340.

Zenith Electronics Corporation: See—
Citta, Richard W.; Gosc, Paul M.; Mutzabaugh, Dennis M.; and Sgrignoli, Gary J., 4,876,718, Cl. 380-42.000.

Palac, Kazimir, deceased; Palac, Judith A., heir; Palac, Donald T., heir; and Palac, Susan M., heir, 4,876,480, Cl. 313-477.00R.

Ziegler, Frank A.: See—
Woodworth, Donald J.; Ziegler, Frank A.; and Grabenstein, James B., 4,876,737, Cl. 455-12.000.

Ziemelis, Maris J.: See—
Lo, Peter Y. K.; and Ziemelis, Maris J., 4,876,039, Cl. 264-4.700.

Ziemer, Wolf, to Flaakt AB. Method and device for checking filters. 4,875,360, Cl. 73-40.700.

Zillig, Steven R.: See—
Carroll, James E.; and Zillig, Steven R., 4,875,709, Cl. 285-14.000.

Zimmer, Karl A. Weight lifting machine for safe free-bar bench press exercising. 4,875,676, Cl. 272-123.000.

Zinser Textilmaschinen GmbH: See—
Gunkinger, Siegfried, 4,875,256, Cl. 19-159.00A.

Ziolo, Ronald F., to Xerox Corporation. Processes for the preparation of copper oxide superconductors. 4,876,240, Cl. 505-1.000.

Zittel, David R., to Lyco Manufacturing, Inc. Chiller. 4,875,344, Cl. 62-381.000.

Zitz, Alfred; and Brandl, Erich, to Voest-Alpine Maschinenbau Gesellschaft m.b.H. Arm-supported cutting roll with effective length pivotally adjustable along mining face. 4,875,738, Cl. 299-80.000.

Zlupko, John E.: See—
Miller, Richard; and Zlupko, John E., 4,876,421, Cl. 200-144.00C.

Zolper, John C.: See—
Barnett, Allen M.; and Zolper, John C., 4,876,210, Cl. 437-5.000.

Zon, Arie Van; and Coleman, Brian, to Shell Oil Company. Lubricating oil composition. 4,876,020, Cl. 252-40.500.

Zuercher, Erwin: See—
Vermot-Gaud, Jacques; Cottencau, Remi; and Zuercher, Erwin, 4,875,347, Cl. 66-219.000.

Zurcher, John A., to Zebco Corporation. Depth setting device for a spinning reel. 4,875,639, Cl. 242-309.000.

Zurwelle, Donald W.: See—
Runyea, Roderick F.; and Zurwelle, Donald W., 4,875,879, Cl. 439-501.000.

Zwinn, Robert; and Rafanelli, Gerard L., to Hughes Aircraft Company. Electronic focus correction by signal convolution. 4,876,602, Cl. 358-227.000.

501 Atari Games: See—
Van Elderen, Daniel N.; and Lichac, Gerald J., 4,875,459, Cl. 124-49.000.

501 Hydrosplash Enterprises, Inc.: See—
Erickson, Curtis, 4,875,673, Cl. 272-71.000.

LIST OF REISSUE PATENTEEES

TO WHOM

PATENTS WERE ISSUED ON THE 24TH DAY OF OCTOBER, 1989

NOTE—Arranged in accordance with the first significant character or word of the name
(in accordance with city and telephone directory practice).

- Burndy Corporation: See—
Center, Warren A., Re. 33,098, Cl. 60-635.000.
Center, Warren A., to Burndy Corporation. Explosively-operated tool. Re. 33,098, Cl. 60-635.000.
DEN-MAT Corporation: See—
Ibsen, Robert L.; Glace, William R.; and Pacropis, Donald R., Re. 33,100, Cl. 106-35.000.
Glace, William R.: See—
Ibsen, Robert L.; Glace, William R.; and Pacropis, Donald R., Re. 33,100, Cl. 106-35.000.
Ibsen, Robert L.; Glace, William R.; and Pacropis, Donald R., to DEN-MAT Corporation. Dental compositions incorporating glass ionomers. Re. 33,100, Cl. 106-35.000.
Nenna, Vito. Method of forming the primary core of a prestressed concrete pipe. Re. 33,101, Cl. 264-71.000.
Pacropis, Donald R.: See—
Ibsen, Robert L.; Glace, William R.; and Pacropis, Donald R., Re. 33,100, Cl. 106-35.000.
Shoher, Itzhak; and Whiteman, Aharon. Dental crown, coping and method. Re. 33,099, Cl. 433-222.100.
Whiteman, Aharon: See—
Shoher, Itzhak; and Whiteman, Aharon, Re. 33,099, Cl. 433-222.100.

LIST OF REEXAMINATION PATENTEEES

TO WHOM

CERTIFICATES WERE ISSUED

- Blucher, Hubert; von Blucher, Hasso; and de Ruiter, Ernest. Filter sheet material. B1 4,510,193, 10-24-89, Cl. 428-196.000.
de Ruiter, Ernest: See—
Blucher, Hubert; von Blucher, Hasso; and de Ruiter, Ernest, B1 4,510,193, Cl. 428-196.000.
Excello Specialty Company, The: See—
Isaksen, Robert A.; Frappier, David E.; and Jones, Wallace R., B1 4,588,627, Cl. 428-80.000.
Frappier, David E.: See—
Isaksen, Robert A.; Frappier, David E.; and Jones, Wallace R., B1 4,588,627, Cl. 428-80.000.
Isaksen, Robert A.; Frappier, David E.; and Jones, Wallace R., to Excello Specialty Company, The. Deflector for vehicle body components. B1 4,588,627, 10-24-89, Cl. 428-80.000.
Jones, Wallace R.: See—
Isaksen, Robert A.; Frappier, David E.; and Jones, Wallace R., B1 4,588,627, Cl. 428-80.000.
Noss Company: See—
Wikdahl, Nils A. L., B1 3,415,374, Cl. 209-211.000.
Pelikan AG: See—
von Wartburg, Rene, B1 4,246,033, Cl. 106-23.000.
Schubert, Hans A.; and Schulze, Klaus, to SMS Hasenclever Maschinenfabrik GmbH. Forging press of underfloor design. B1 4,607,518, 10-24-89, Cl. 72-453.120.
Schulze, Klaus: See—
Schubert, Hans A.; and Schulze, Klaus, B1 4,607,518, Cl. 72-453.120.
SMS Hasenclever Maschinenfabrik GmbH: See—
Schubert, Hans A.; and Schulze, Klaus, B1 4,607,518, Cl. 72-453.120.
von Blucher, Hasso: See—
Blucher, Hubert; von Blucher, Hasso; and de Ruiter, Ernest, B1 4,510,193, Cl. 428-196.000.
von Wartburg, Rene, to Pelikan AG. Arrangement for applying written or drawn information onto image carriers for overhead projection. B1 4,246,033, 10-24-89, Cl. 106-23.000.
Wikdahl, Nils A. L., to Noss Company. Method and apparatus for vortical separation of solids. B1 3,415,374, 10-24-89, Cl. 209-211.000.

LIST OF DESIGN PATENTEEES

- Abe, Yoshinori: See—
Kondo, Nobuyuki; Abe, Yoshinori; Tata, Hideaki; Ito, Eiji; Chonan, Katsuhiko; and Iinuma, Hideo, 304,170, Cl. D13-4.000.
Kondo, Nobuyuki; Abe, Yoshinori; Tata, Hideaki; Ito, Eiji; Chonan, Katsuhiko; and Iinuma, Hideo, 304,171, Cl. D13-4.000.
Adolfo, Boldrini, to Ing. Enea Matti S.p.A. Air compressor. 304,197, 10-24-89, Cl. D15-9.000.
Aizawa, Junichi; Kumazawa, Shoichiro; Yamauchi, Satoru; and Kondo, Isao, to Seikosha Co., Ltd. Electromagnetic bell. 304,163, 10-24-89, Cl. D10-116.000.
Alexander, Kenneth: See—
Ramsey, Maynard, III; Muskatello, James; Burton, Arthur; Alexander, Kenneth; and George, John, 304,233, Cl. D24-21.000.
Alloy Tool and Mold, Mfg., Corp. (ATM): See—
Kleinert, York, 304,158, Cl. D9-375.000.
Kleinert, York, 304,159, Cl. D9-375.000.
Aloys F. Dornbracht GmbH & Co. KG: See—
Lathrop, Bethany, 304,225, Cl. D23-257.000.
Anesi, Dennis W.: See—
Wilson, Dennis A.; Anesi, Dennis W.; and Williamsen, Mark S., 304,224, Cl. D23-245.000.
Ansan Industries Ltd.: See—
Wilson, Dennis A.; Anesi, Dennis W.; and Williamsen, Mark S., 304,224, Cl. D23-245.000.
Avia Group International, Inc.: See—
Kolman, Kenneth R.; Nyberg, Michael J.; Cote, Richard W.; Fuerst, Rory W.; and Granville, James, 304,128, Cl. D2-314.000.
Mourad, Miza, 304,127, Cl. D2-314.000.
Beaton, Larry G.; McClain, Kevin T.; Vitello, Jonathan J.; Wetzel, Timothy D.; and Williams, Roger C., to International Business Machines Corporation. Computer display. 304,179, 10-24-89, Cl. D14-113.000.
Benfield, Bruce V.; Benfield, Peter J.; Pyyvaara, Tim T.; Bishop, Victor L.; and Speck, Stuart L., to Heatshield PTY. Ltd. Fireplace. 304,227, 10-24-89, Cl. D23-344.000.
Benfield, Peter J.: See—
Benfield, Bruce V.; Benfield, Peter J.; Pyyvaara, Tim T.; Bishop, Victor L.; and Speck, Stuart L., 304,227, Cl. D23-344.000.
Bertrand, Vic, to Ritvik Group Inc., The. Axle element for a construction toy. 304,220, 10-24-89, Cl. D21-141.000.
Beverly Hills Trading Company, Inc.: See—
Rezek, Ron, 304,229, Cl. D23-377.000.
Bishop, Victor L.: See—
Benfield, Bruce V.; Benfield, Peter J.; Pyyvaara, Tim T.; Bishop, Victor L.; and Speck, Stuart L., 304,227, Cl. D23-344.000.
Bounds, William E. Condiment mill. 304,142, 10-24-89, Cl. D7-53.000.
Buist, Kevin S., to Design Visions, Inc. Hexagonal locking toy block. 304,214, 10-24-89, Cl. D21-108.000.

LIST OF DESIGN PATENTEEES

PI 65

- Bull HN Information Systems Inc.: See—
Cesarczyk, Edward J.; and Dillon, Richard R., 304,176, Cl. D14-102.000.
Burton, Arthur: See—
Ramsey, Maynard, III; Muskatello, James; Burton, Arthur; Alexander, Kenneth; and George, John, 304,233, Cl. D24-21.000.
C & S Manufacturing: See—
Fonte, Frank, 304,210, Cl. D21-81.000.
Calkins, Durward W., to Cincinnati Time, Inc. Computer controlled time clock with fold-up keyboard. 304,162, 10-24-89, Cl. D10-41.000.
Canon Kabushiki Kaisha: See—
Komatsu, Hiroshi, 304,187, Cl. D14-118.000.
Takahashi, Masaki, 304,182, Cl. D14-118.000.
Wada, Eiko; and Seki, Yuichi, 304,204, Cl. D18-37.000.
Yoshihara, Tsutomu, 304,185, Cl. D14-118.000.
Carpenter, James H., to Pangborn Corporation, Inc. Vane for throwing wheel. 304,199, 10-24-89, Cl. D15-126.000.
Casselman, Michael D. Gas can rack. 304,133, 10-24-89, Cl. D6-420.000.
Cesarczyk, Edward J.; and Dillon, Richard R., to Bull HN Information Systems Inc. Expandable central processing system. 304,176, 10-24-89, Cl. D14-102.000.
Chambers, Arthur E. Foot bath. 304,235, 10-24-89, Cl. D24-38.000.
Chapin, David S.; and Farnham, Gilbert R., to Cooper Industries, Inc. Refillable propane torch. 304,151, 10-24-89, Cl. D8-30.000.
Chen, Chen-Tsung. Toy construction ring. 304,213, 10-24-89, Cl. D21-108.000.
Chonan, Katsuhiko: See—
Kondo, Nobuyuki; Abe, Yoshinori; Tata, Hideaki; Ito, Eiji; Chonan, Katsuhiko; and Iinuma, Hideo, 304,170, Cl. D13-4.000.
Kondo, Nobuyuki; Abe, Yoshinori; Tata, Hideaki; Ito, Eiji; Chonan, Katsuhiko; and Iinuma, Hideo, 304,171, Cl. D13-4.000.
Christian, Kristy L.; Ridley, Fred A., Jr.; and Ridley, Clay K. Sandal. 304,126, 10-24-89, Cl. D2-293.000.
Cincinnati Time, Inc.: See—
Calkins, Durward W., 304,162, Cl. D10-41.000.
Cooper Industries, Inc.: See—
Chapin, David S.; and Farnham, Gilbert R., 304,151, Cl. D8-30.000.
Cote, Richard W.: See—
Kolman, Kenneth R.; Nyberg, Michael J.; Cote, Richard W.; Fuerst, Rory W.; and Granville, James, 304,128, Cl. D2-314.000.
Cranston, William V., III; Martin, Randall W.; Small, Mark S.; and Young, Mark A., to International Business Machines Corp. Disk drive shroud enclosure for an industrial computer. 304,178, 10-24-89, Cl. D14-109.000.
Creative Athletic Products and Services, Inc.: See—
Wright, Robert L., 304,240, Cl. D25-1.000.
Critikon, Inc.: See—
Ramsey, Maynard, III; Muskatello, James; Burton, Arthur; Alexander, Kenneth; and George, John, 304,233, Cl. D24-21.000.
Culbertson, Richard, to General Electric Company. Front and side panels for a two-way mobile radio. 304,195, 10-24-89, Cl. D14-265.000.
Daykin, Kevin, to Hestair Keddlicraft Limited. Teether. 304,237, 10-24-89, Cl. D24-45.000.
Dennis, William M. Soft drink carrier. 304,143, 10-24-89, Cl. D7-70.000.
Design Visions, Inc.: See—
Buist, Kevin S., 304,214, Cl. D21-108.000.
Diebold, Incorporated: See—
Long, Douglas G., 304,198, Cl. D15-9.100.
Dillon, Richard R.: See—
Cesarczyk, Edward J.; and Dillon, Richard R., 304,176, Cl. D14-102.000.
Discovery Toys, Inc.: See—
Klitsner, Daniel B., 304,216, Cl. D21-108.000.
Klitsner, Daniel B., 304,217, Cl. D21-108.000.
Klitsner, Daniel B., 304,218, Cl. D21-108.000.
E&G Classics, Inc.: See—
Eash, David D.; and Hannas, Richard, 304,167, Cl. D12-156.000.
Eash, David D.; and Hannas, Richard, to E&G Classics, Inc. Decorative top adapted to be placed over the existing roof of a truck. 304,167, 10-24-89, Cl. D12-156.000.
Eastern Company, The: See—
Russell, Richard H.; and Kaiser, David W., 304,155, Cl. D8-303.000.
Edmonds Medical Systems, Inc.: See—
Keller, Jeff; and Linton, Robert, 304,222, Cl. D21-192.000.
Elm Industry Co., Ltd.: See—
Tanigami, Shintaro, 304,131, Cl. D3-72.000.
Elrod, Elliot. Litter scoop. 304,248, 10-24-89, Cl. D30-162.000.
Farnham, Gilbert R.: See—
Chapin, David S.; and Farnham, Gilbert R., 304,151, Cl. D8-30.000.
Ferguson, William R. Electronically controlled clothing receptacle or similar article. 304,252, 10-24-89, Cl. D32-37.000.
Fonte, Frank, to C & S Manufacturing. Scooter. 304,210, 10-24-89, Cl. D21-81.000.
Frank Coleman (Luton) Limited: See—
Goldman, Neil V. H., 304,160, Cl. D9-433.000.
Frassati, Guido; Mugliardo, Giuseppe; and Valvassori, Riccardo, to S.A.M.E.S. S.p.A. Electrical track for a room lighting system. 304,173, 10-24-89, Cl. D13-13.000.
Fratelli Guzzini S.p.A.: See—
Gecchelin, Bruno, 304,144, Cl. D7-102.000.
Gecchelin, Bruno, 304,145, Cl. D7-104.000.
Fuerst, Rory W.: See—
Kolman, Kenneth R.; Nyberg, Michael J.; Cote, Richard W.; Fuerst, Rory W.; and Granville, James, 304,128, Cl. D2-314.000.
Fuller, Kip L., to Guardian Technologies, Inc. Breath sample receiving mouthpiece. 304,232, 10-24-89, Cl. D24-17.000.
Fuller, Thomas G.; Stock, Michael H.; and Weckel, Howard F., III, to Mito Corporation. Radio cabinet front. 304,194, 10-24-89, Cl. D14-257.000.
GEC Plessey Telecommunications Ltd.: See—
Rose, Martin S., 304,190, Cl. D14-142.000.
Gecchelin, Bruno, to Fratelli Guzzini S.p.A. Spatula. 304,144, 10-24-89, Cl. D7-102.000.
Gecchelin, Bruno, to Fratelli Guzzini S.p.A. Spoon. 304,145, 10-24-89, Cl. D7-104.000.
General Electric Company: See—
Culbertson, Richard, 304,195, Cl. D14-265.000.
George, John: See—
Ramsey, Maynard, III; Muskatello, James; Burton, Arthur; Alexander, Kenneth; and George, John, 304,233, Cl. D24-21.000.
Ghetti, Clifford: See—
Hassel, H. Charles; and Ghetti, Clifford, 304,250, Cl. D32-18.000.
Gibson, Robert J. Retainer for a computer mouse. 304,180, 10-24-89, Cl. D14-114.000.
Giese, Robert C.; and Poulson, Keith L., to Kohler Co. Tub shell for a hydrotherapy spa or the like. 304,236, 10-24-89, Cl. D24-38.000.
Giles, William E.; and Kapp, Joseph P., to Trucker's Comfort Systems, Inc. Utility receptacle cover. 304,174, 10-24-89, Cl. D13-31.000.
Goldman, Neil V. H., to Frank Coleman (Luton) Limited. Carton blank. 304,160, 10-24-89, Cl. D9-433.000.
Goodyear Tire & Rubber Company, The: See—
Graas, Maurice, 304,166, Cl. D12-143.000.
Graas, Maurice, to Goodyear Tire & Rubber Company, The. Tire. 304,166, 10-24-89, Cl. D12-143.000.
Granville, James: See—
Kolman, Kenneth R.; Nyberg, Michael J.; Cote, Richard W.; Fuerst, Rory W.; and Granville, James, 304,128, Cl. D2-314.000.
Great Western Trading Corp.: See—
Ross, Robert M., Jr.; and McNally, Robert J., 304,246, Cl. D30-102.000.
Ross, Robert M., Jr.; and McNally, Robert J., 304,247, Cl. D30-102.000.
Green, David T.; and Ratcliff, Keith, to United States Surgical Corporation. Annular anvil for a surgical stapler. 304,234, 10-24-89, Cl. D24-27.000.
Griffiths, Thomas R. Telephone shelter. 304,134, 10-24-89, Cl. D6-421.000.
GTE Products Corporation: See—
Zwald, John J., 304,243, Cl. D26-4.000.
Guardian Technologies, Inc.: See—
Fuller, Kip L., 304,232, Cl. D24-17.000.
Guidotti, James M. Game board design. 304,209, 10-24-89, Cl. D21-34.000.
Gurganus, Marvin E. Support bracket for holding load locks when not in use for mounting on a beam behind the cab of a truck vehicle. 304,168, 10-24-89, Cl. D12-157.000.
Handler, Milton E.; and Peterson, Michael, to Hirsh Company. Implement holder. 304,137, 10-24-89, Cl. D6-569.000.
Hannas, Richard: See—
Eash, David D.; and Hannas, Richard, 304,167, Cl. D12-156.000.
Hara, Kunio, to Kabushiki Kaisha Toshiba. Electronic copying machine. 304,177, 10-24-89, Cl. D14-107.000.
Hara, Kunio; and Hiroki, Shin-ichi, to Kabushiki Kaisha Toshiba. Facsimile. 304,183, 10-24-89, Cl. D14-118.000.
Hassel, H. Charles; and Ghetti, Clifford, to MicroComputer Accessories Inc. Hand held vacuum cleaner. 304,250, 10-24-89, Cl. D32-18.000.
Hayasaka, Sigeki; and Takahashi, Mamoru, to NEC Corporation. Radio pager. 304,192, 10-24-89, Cl. D14-191.000.
Heatshield PTY. Ltd.: See—
Benfield, Bruce V.; Benfield, Peter J.; Pyyvaara, Tim T.; Bishop, Victor L.; and Speck, Stuart L., 304,227, Cl. D23-344.000.
Hestair Keddlicraft Limited: See—
Daykin, Kevin, 304,237, Cl. D24-45.000.
Hiroki, Shin-ichi: See—
Hara, Kunio; and Hiroki, Shin-ichi, 304,183, Cl. D14-118.000.
Hirsh Company: See—
Handler, Milton E.; and Peterson, Michael, 304,137, Cl. D6-569.000.
Holewinski, Robert D., to Johnson & Johnson Consumer Products, Inc. Package for dental products. 304,157, 10-24-89, Cl. D9-347.000.
Hoshino, Michio; Ikegami, Masakazu; and Sato, Hajime, to Mabuchi Motor Co., Ltd. Electric motor. 304,169, 10-24-89, Cl. D13-1.000.
Ianni, Rosemarie. Hair care appliance stand. 304,245, 10-24-89, Cl. D28-73.000.
Ichihara, Masuo: See—
Kubo, Masayoshi; Kido, Katsutoshi; Ichihara, Masuo; Mizuma, Kensuke; and Matoba, Hisayoshi, 304,150, Cl. D7-351.000.
Mizuma, Kensuke; Kubo, Masayoshi; Matoba, Hisayoshi; and Ichihara, Masuo, 304,148, Cl. D7-351.000.
Iinuma, Hideo: See—
Kondo, Nobuyuki; Abe, Yoshinori; Tata, Hideaki; Ito, Eiji; Chonan, Katsuhiko; and Iinuma, Hideo, 304,170, Cl. D13-4.000.
Kondo, Nobuyuki; Abe, Yoshinori; Tata, Hideaki; Ito, Eiji; Chonan, Katsuhiko; and Iinuma, Hideo, 304,171, Cl. D13-4.000.
Ikegami, Masakazu: See—
Hoshino, Michio; Ikegami, Masakazu; and Sato, Hajime, 304,169, Cl. D13-1.000.

Imanishi Kinzoku Kogyo Kabushiki Kaisha: See—
Nishikawa, Hideo; Okamoto, Kenzo; and Kitada, Fumihiko, 304,149, Cl. D7-351.000.

Ing. Enea Mattei S.p.A.: See—
Adolfo, Boldrini, 304,197, Cl. D15-9.000.

Interlego A.G.: See—
Knudsen, Jens N., 304,215, Cl. D21-108.000.
Poulsen, Ole V., 304,221, Cl. D21-141.000.
Tapdrup, Erik P., 304,211, Cl. D21-91.000.

International Business Machines Corporation: See—
Beaton, Larry G.; McClain, Kevin T.; Vitello, Jonathan J.; Wetzel, Timothy D.; and Williams, Roger C., 304,179, Cl. D14-113.000.
Cranston, William V., III; Martin, Randall W.; Small, Mark S.; and Young, Mark A., 304,178, Cl. D14-109.000.

Ito, Eiji: See—
Kondo, Nobuyuki; Abe, Yoshinori; Tata, Hideaki; Ito, Eiji; Chonan, Katsuhiko; and Iinuma, Hideo, 304,170, Cl. D13-4.000.
Kondo, Nobuyuki; Abe, Yoshinori; Tata, Hideaki; Ito, Eiji; Chonan, Katsuhiko; and Iinuma, Hideo, 304,171, Cl. D13-4.000.

Jackson, Richard A. Belt mounted clip board holder. 304,132, 10-24-89, Cl. D3-100.000.

John Manufacturing Limited: See—
Yuen, John S., 304,249, Cl. D32-18.000.

Johnson & Johnson Consumer Products, Inc.: See—
Holewinski, Robert D., 304,157, Cl. D9-347.000.

Kabushiki Kaisha Toshiba: See—
Hara, Kunio, 304,177, Cl. D14-107.000.
Hara, Kunio; and Hiroki, Shin-ichi, 304,183, Cl. D14-118.000.
Kamei, Taketo; and Saigo, Masashi, 304,241, Cl. D26-3.000.
Sutoh, Shigeru, 304,188, Cl. D14-138.000.

Kagayama, Katsuji; Sugiyama, Yoshihiko; and Mishi, Benito, to Matsushita Electric Industrial Co., Ltd. Scanner for computer. 304,181, 10-24-89, Cl. D14-116.000.

Kaiser, David W.: See—
Russell, Richard H.; and Kaiser, David W., 304,155, Cl. D8-303.000.

Kamei, Taketo; and Saigo, Masashi, to Kabushiki Kaisha Toshiba. Fluorescent lamp tube. 304,241, 10-24-89, Cl. D26-3.000.

Kapp, Joseph P.: See—
Giles, William E.; and Kapp, Joseph P., 304,174, Cl. D13-31.000.

Kato, Shuzo; Sakama, Satoru; and Takahashi, Tamihei, to NCR Corporation. Slip printer or similar article. 304,203, 10-24-89, Cl. D18-13.000.

Kawamura, Masaki: See—
Sakaguchi, Hiroshi; and Kawamura, Masaki, 304,175, Cl. D14-100.000.

Keller, Jeff; and Linton, Robert, to Edmonds Medical Systems, Inc. Combined underwater treadmill and station therefor. 304,222, 10-24-89, Cl. D21-192.000.

Kido, Katsutoshi: See—
Kubo, Masayoshi; Kido, Katsutoshi; Ichihara, Masuo; Mizuma, Kensuke; and Matoba, Hisayoshi, 304,150, Cl. D7-351.000.

Kim, Mee S.: See—
Kim, Yun S.; and Kim, Mee S., 304,226, Cl. D23-267.000.

Kim, Yun S.; and Kim, Mee S. Cover for jars of fragrance, jewelry or similar article. 304,226, 10-24-89, Cl. D23-267.000.

Kitada, Fumihiko: See—
Nishikawa, Hideo; Okamoto, Kenzo; and Kitada, Fumihiko, 304,149, Cl. D7-351.000.

Kleinert, York, to Alloy Tool and Mold, Mfg., Corp. (ATM). Bottle. 304,158, 10-24-89, Cl. D9-375.000.

Kleinert, York, to Alloy Tool and Mold, Mfg., Corp. (ATM). Bottle. 304,159, 10-24-89, Cl. D9-375.000.

Klitsner, Daniel B., to Discovery Toys, Inc. Simulative construction toy. 304,216, 10-24-89, Cl. D21-108.000.

Klitsner, Daniel B., to Discovery Toys, Inc. Frog construction toy. 304,217, 10-24-89, Cl. D21-108.000.

Klitsner, Daniel B., to Discovery Toys, Inc. Lily pad construction toy. 304,218, 10-24-89, Cl. D21-108.000.

Kmetz, David G., to Stanley Works, The. Cordless screwdriver. 304,152, 10-24-89, Cl. D8-68.000.

Knudsen, Jens N., to Interlego A.G. Bevelled toy construction element. 304,215, 10-24-89, Cl. D21-108.000.

Kohler Co.: See—
Giese, Robert C.; and Poulson, Keith L., 304,236, Cl. D24-38.000.

Kojima, Fumiyo, to Ricoh Company, Ltd. Combined copying machine, facsimile transmitter/receiver and printer. 304,186, 10-24-89, Cl. D14-118.000.

Kokusai Denki Kabushiki Kaisha: See—
Sekine, Isamu, 304,191, Cl. D14-192.000.

Kolman, Kenneth R.; Nyberg, Michael J.; Cote, Richard W.; Fuerst, Rory W.; and Granville, James, to Avia Group International, Inc. Shoe upper. 304,128, 10-24-89, Cl. D2-314.000.

Komatsu, Hiroshi, to Canon Kabushiki Kaisha. Facsimile. 304,187, 10-24-89, Cl. D14-118.000.

Kondo, Isao: See—
Aizawa, Junichi; Kumazawa, Shoichiro; Yamauchi, Satoru; and Kondo, Isao, 304,163, Cl. D10-116.000.

Kondo, Nobuyuki; Abe, Yoshinori; Tata, Hideaki; Ito, Eiji; Chonan, Katsuhiko; and Iinuma, Hideo, to Mitsubishi Denki Kabushiki Kaisha. Power inverter. 304,170, 10-24-89, Cl. D13-4.000.

Kondo, Nobuyuki; Abe, Yoshinori; Tata, Hideaki; Ito, Eiji; Chonan, Katsuhiko; and Iinuma, Hideo, to Mitsubishi Denki Kabushiki Kaisha. Power inverter. 304,171, 10-24-89, Cl. D13-4.000.

Kubo, Masayoshi; Kido, Katsutoshi; Ichihara, Masuo; Mizuma, Kensuke; and Matoba, Hisayoshi, to Matsushita Electric Industrial Co., Ltd. Microwave oven. 304,150, 10-24-89, Cl. D7-351.000.

Kubo, Masayoshi: See—
Mizuma, Kensuke; Kubo, Masayoshi; Matoba, Hisayoshi; and Ichihara, Masuo, 304,148, Cl. D7-351.000.

Kumazawa, Shoichiro: See—
Aizawa, Junichi; Kumazawa, Shoichiro; Yamauchi, Satoru; and Kondo, Isao, 304,163, Cl. D10-116.000.

Kushitani, Hisashi. Boot for a motorcyclist. 304,125, 10-24-89, Cl. D2-275.000.

Larson, Lawrence L.: See—
Ruger, William B.; and Larson, Lawrence L., 304,223, Cl. D22-108.000.

Lathrop, Bethany, to Aloys F. Dornbracht GmbH & Co. KG. Spout. 304,225, 10-24-89, Cl. D23-257.000.

Laurel-Plastic Kurt Lorber: See—
Lorber, Kurt; and Lorber, Beate, 304,205, Cl. D19-65.000.

Li, Yung-To. Juice presser or similar article. 304,140, 10-24-89, Cl. D7-49.000.

Li, Yung-To. Juice presser or similar article. 304,141, 10-24-89, Cl. D7-49.000.

Linton, Robert: See—
Keller, Jeff; and Linton, Robert, 304,222, Cl. D21-192.000.

Loftus, Frank. Lottery die. 304,208, 10-24-89, Cl. D21-41.000.

Long, Douglas G., to Diebold, Incorporated. Motor fuel dispensing control terminal or similar article. 304,198, 10-24-89, Cl. D15-9.100.

Lorber, Beate: See—
Lorber, Kurt; and Lorber, Beate, 304,205, Cl. D19-65.000.

Lorber, Kurt; and Lorber, Beate, to Laurel-Plastic Kurt Lorber. Paper clip. 304,205, 10-24-89, Cl. D19-65.000.

Lotz, Willi, to Mitel Corporation. Cartridge for telephone system equipment cabinet. 304,193, 10-24-89, Cl. D14-240.000.

Lune-Ching Hu: See—
Mergenov, George, 304,135, Cl. D6-477.000.

Lyall, Gordon M.; and McCarron, Philip F., to Simpson-Lawrence Limited. Vertical marine windlass. 304,254, 10-24-89, Cl. D34-33.000.

Mabuchi Motor Co., Ltd.: See—
Hoshino, Michio; Ikegami, Masakazu; and Sato, Hajime, 304,169, Cl. D13-1.000.

MacKelvie, Philip A., to Technical Tools, Inc. Holder for tool setter gauge. 304,200, 10-24-89, Cl. D15-140.000.

Martin, Randall W.: See—
Cranston, William V., III; Martin, Randall W.; Small, Mark S.; and Young, Mark A., 304,178, Cl. D14-109.000.

Matoba, Hisayoshi: See—
Kubo, Masayoshi; Kido, Katsutoshi; Ichihara, Masuo; Mizuma, Kensuke; and Matoba, Hisayoshi, 304,150, Cl. D7-351.000.

Mizuma, Kensuke; Kubo, Masayoshi; Matoba, Hisayoshi; and Ichihara, Masuo, 304,148, Cl. D7-351.000.

Matsushita Electric Industrial Co., Ltd.: See—
Kagayama, Katsuji; Sugiyama, Yoshihiko; and Mishi, Benito, 304,181, Cl. D14-116.000.

Kubo, Masayoshi; Kido, Katsutoshi; Ichihara, Masuo; Mizuma, Kensuke; and Matoba, Hisayoshi, 304,150, Cl. D7-351.000.

Mizuma, Kensuke; Kubo, Masayoshi; Matoba, Hisayoshi; and Ichihara, Masuo, 304,148, Cl. D7-351.000.

McCarron, Philip F.: See—
Lyall, Gordon M.; and McCarron, Philip F., 304,254, Cl. D34-33.000.

McClain, Kevin T.: See—
Beaton, Larry G.; McClain, Kevin T.; Vitello, Jonathan J.; Wetzel, Timothy D.; and Williams, Roger C., 304,179, Cl. D14-113.000.

McNally, Robert J.: See—
Ross, Robert M., Jr.; and McNally, Robert J., 304,246, Cl. D30-102.000.

Ross, Robert M., Jr.; and McNally, Robert J., 304,247, Cl. D30-102.000.

Mepal B.V.: See—
Weernink, Johannes H., 304,138, Cl. D7-17.000.

Weernink, Johannes H., 304,146, Cl. D7-317.000.

Mergenov, George, to Lune-Ching Hu. Table. 304,135, 10-24-89, Cl. D6-477.000.

MicroComputer Accessories Inc.: See—
Hassel, H. Charles; and Ghetti, Clifford, 304,250, Cl. D32-18.000.

Miles, Bernard. Mold plate adapter. 304,139, 10-24-89, Cl. D7-43.000.

Miller, Kevin. Body waste collection bag stand. 304,239, 10-24-89, Cl. D24-51.000.

Mishi, Benito: See—
Kagayama, Katsuji; Sugiyama, Yoshihiko; and Mishi, Benito, 304,181, Cl. D14-116.000.

Mitel Corporation: See—
Lotz, Willi, 304,193, Cl. D14-240.000.

Mito Corporation: See—
Fuller, Thomas G.; Stock, Michael H.; and Weckel, Hoawrd F., III, 304,194, Cl. D14-257.000.

Mitsubishi Denki Kabushiki Kaisha: See—
Kondo, Nobuyuki; Abe, Yoshinori; Tata, Hideaki; Ito, Eiji; Chonan, Katsuhiko; and Iinuma, Hideo, 304,170, Cl. D13-4.000.

Kondo, Nobuyuki; Abe, Yoshinori; Tata, Hideaki; Ito, Eiji; Chonan, Katsuhiko; and Iinuma, Hideo, 304,171, Cl. D13-4.000.

Mizuma, Kensuke; Kubo, Masayoshi; Matoba, Hisayoshi; and Ichihara, Masuo, to Matsushita Electric Industrial Co., Ltd. Microwave oven. 304,148, 10-24-89, Cl. D7-351.000.

Mizuma, Kensuke: See—
Kubo, Masayoshi; Kido, Katsutoshi; Ichihara, Masuo; Mizuma, Kensuke; and Matoba, Hisayoshi, 304,150, Cl. D7-351.000.

Moe, Dennis. Toy construction link. 304,212, 10-24-89, Cl. D21-108.000.

Mohri, Akinari: See—
Niitsu, Takuya; and Mohri, Akinari, 304,201, Cl. D16-202.000.

Moritani, Hiroshi, to Sharp Kabushiki Kaisha. Air conditioner. 304,228, 10-24-89, Cl. D23-353.000.

Mosley, Keith A. Necktie clasp. 304,165, 10-24-89, Cl. D11-202.000.

Motorola, Inc.: See—
Nagele, Albert L.; and Soren, Leonid, 304,189, Cl. D14-147.000.

Mourad, Miza, to AVIA Group International, Inc. Shoe upper. 304,127, 10-24-89, Cl. D2-314.000.

Mugliardo, Giuseppe: See—
Frassati, Guido; Mugliardo, Giuseppe; and Valvassori, Riccardo, 304,173, Cl. D13-13.000.

Muskatello, James: See—
Ramsey, Maynard, III; Muskatello, James; Burton, Arthur; Alexander, Kenneth; and George, John, 304,233, Cl. D24-21.000.

Nagele, Albert L.; and Soren, Leonid, to Motorola, Inc. Housing for portable handset telephone or similar article. 304,189, 10-24-89, Cl. D14-147.000.

Nakajima, Naomi: See—
Takada, Kazuo; Ogata, Yayoi; and Nakajima, Naomi, 304,147, Cl. D7-350.000.

NCR Corporation: See—
Kato, Shuzo; Sakama, Satoru; and Takahashi, Tamihei, 304,203, Cl. D18-13.000.

NEC Corporation: See—
Hayasaka, Sigeki; and Takahashi, Mamoru, 304,192, Cl. D14-191.000.

Niitsu, Takuya; and Mohri, Akinari, to Sony Corporation. Case for video camera combined with video tape recorder. 304,201, 10-24-89, Cl. D16-202.000.

Niitsu, Takuya, to Sony Corporation. Case for video camera combined with video tape recorder. 304,202, 10-24-89, Cl. D16-204.000.

Nishikawa, Hideo; Okamoto, Kenzo; and Kitada, Fumihiko, to Imanishi Kinzoku Kogyo Kabushiki Kaisha. Microwave oven. 304,149, 10-24-89, Cl. D7-351.000.

Nomizu, Hidekatsu, to Twin Bird Industrial Company, Limited. Talking clock. 304,161, 10-24-89, Cl. D10-21.000.

Normark Corporation: See—
Reichow, James R., 304,153, Cl. D8-93.000.

Nyberg, Michael J.: See—
Kolman, Kenneth R.; Nyberg, Michael J.; Cote, Richard W.; Fuerst, Rory W.; and Granville, James, 304,128, Cl. D2-314.000.

Ogata, Yayoi: See—
Takada, Kazuo; Ogata, Yayoi; and Nakajima, Naomi, 304,147, Cl. D7-350.000.

Okamoto, Kenzo: See—
Nishikawa, Hideo; Okamoto, Kenzo; and Kitada, Fumihiko, 304,149, Cl. D7-351.000.

Osterhout, Ralph F., to Tekna. Foldable knife. 304,154, 10-24-89, Cl. D8-99.000.

Palau, Margaret. Bandage. 304,238, 10-24-89, Cl. D24-49.000.

Pangborn Corporation, Inc.: See—
Carpenter, James H., 304,199, Cl. D15-126.000.

Peterson, Michael: See—
Handler, Milton E.; and Peterson, Michael, 304,137, Cl. D6-569.000.

Philips Home Products: See—
Purkapile, Emerson J., 304,251, Cl. D32-21.000.

Poulsen, Ole V., to Interlego A.G. Wheel suspension unit for a toy vehicle. 304,221, 10-24-89, Cl. D21-141.000.

Poulson, Keith L.: See—
Giese, Robert C.; and Poulson, Keith L., 304,236, Cl. D24-38.000.

Precisioncraft Limited: See—
Sawatsky, Henry; Sawatsky, Richard K.; and Sawatsky, David P., 304,206, Cl. D19-86.000.

Puente, Ben A., Jr. Covered sliding glass door handle. 304,156, 10-24-89, Cl. D8-314.000.

Purkapile, Emerson J., to Philips Home Products. Dual vacuum cleaner design. 304,251, 10-24-89, Cl. D32-21.000.

Pyyvaara, Tim T.: See—
Benfield, Bruce V.; Benfield, Peter J.; Pyyvaara, Tim T.; Bishop, Victor L.; and Speck, Stuart L., 304,227, Cl. D23-344.000.

Quaker Oats Company, The: See—
Taylor, Steven, 304,219, Cl. D21-116.000.

Ramsey, Maynard, III; Muskatello, James; Burton, Arthur; Alexander, Kenneth; and George, John, to Critikon, Inc. Housing for an automated blood pressure and other vital signs monitoring device. 304,233, 10-24-89, Cl. D24-21.000.

Ratcliff, Keith: See—
Green, David T.; and Ratcliff, Keith, 304,234, Cl. D24-27.000.

Reichow, James R., to Normark Corporation. Hand held knife sharpener. 304,153, 10-24-89, Cl. D8-93.000.

Rezek, Ron, to Beverly Hills Trading Company, Inc. Ceiling fan. 304,229, 10-24-89, Cl. D23-377.000.

Ricoh Company, Ltd.: See—
Kojima, Fumiyo, 304,186, Cl. D14-18.000.

Watanabe, Hiroaki, 304,184, Cl. D14-118.000.

Ridley, Clay K.: See—
Christian, Kristy L.; Ridley, Fred A., Jr.; and Ridley, Clay K., 304,126, Cl. D2-293.000.

Ridley, Fred A., Jr.: See—
Christian, Kristy L.; Ridley, Fred A., Jr.; and Ridley, Clay K., 304,126, Cl. D2-293.000.

Ritvik Group Inc., The: See—
Bertrand, Vic, 304,220, Cl. D21-141.000.

Rochte, Randall S. Geometric ornament. 304,164, 10-24-89, Cl. D11-131.000.

Rose, Martin S., to GEC Plessey Telecommunications Ltd. Debit card public pay telephone stand. 304,190, 10-24-89, Cl. D14-142.000.

Ross, Robert M., Jr.; and McNally, Robert J., to Great Western Trading Corp. Aquarium. 304,246, 10-24-89, Cl. D30-102.000.

Ross, Robert M., Jr.; and McNally, Robert J., to Great Western Trading Corp. Aquarium. 304,247, 10-24-89, Cl. D30-102.000.

Ruger, William B.; and Larson, Lawrence L., to Sturm, Ruger & Company, Inc. Rifle stock with inserts. 304,223, 10-24-89, Cl. D22-108.000.

Russell, Richard H.; and Kaiser, David W., to Eastern Company, The. Flush mounted latch assembly. 304,155, 10-24-89, Cl. D8-303.000.

S.A.M.E.S. S.p.A.: See—
Frassati, Guido; Mugliardo, Giuseppe; and Valvassori, Riccardo, 304,173, Cl. D13-13.000.

Sadler, Jeffery G.: See—
Tuggle, Lloyd H.; and Sadler, Jeffery G., 304,196, Cl. D15-1.000.

Saigo, Masashi: See—
Kamei, Taketo; and Saigo, Masashi, 304,241, Cl. D26-3.000.

Sakaguchi, Hiroshi; and Kawamura, Masaki, to Sharp Kabushiki Kaisha. Input/output terminal. 304,175, 10-24-89, Cl. D14-100.000.

Sakama, Satoru: See—
Kato, Shuzo; Sakama, Satoru; and Takahashi, Tamihei, 304,203, Cl. D18-13.000.

Sanyo Electric Co., Ltd.: See—
Takada, Kazuo; Ogata, Yayoi; and Nakajima, Naomi, 304,147, Cl. D7-350.000.

Sato, Hajime: See—
Hoshino, Michio; Ikegami, Masakazu; and Sato, Hajime, 304,169, Cl. D13-1.000.

Savings Spot, Ltd., The: See—
Wistrand, John C., 304,207, Cl. D20-2.000.

Sawatsky, David P.: See—
Sawatsky, Henry; Sawatsky, Richard K.; and Sawatsky, David P., 304,206, Cl. D19-86.000.

Sawatsky, Henry; Sawatsky, Richard K.; and Sawatsky, David P., to Precisioncraft Limited. Memo tray. 304,206, 10-24-89, Cl. D19-86.000.

Sawatsky, Richard K.: See—
Sawatsky, Henry; Sawatsky, Richard K.; and Sawatsky, David P., 304,206, Cl. D19-86.000.

Seikosha Co., Ltd.: See—
Aizawa, Junichi; Kumazawa, Shoichiro; Yamauchi, Satoru; and Kondo, Isao, 304,163, Cl. D10-116.000.

Seki, Yuichi: See—
Wada, Eiko; and Seki, Yuichi, 304,204, Cl. D18-37.000.

Sekine, Isamu, to Kokusai Denki Kabushiki Kaisha. Radio paging receiver. 304,191, 10-24-89, Cl. D14-192.000.

Severini, John J. Plastic bag dispenser. 304,136, 10-24-89, Cl. D6-515.000.

Sharp Kabushiki Kaisha: See—
Moritani, Hiroshi, 304,228, Cl. D23-353.000.

Sakaguchi, Hiroshi; and Kawamura, Masaki, 304,175, Cl. D14-100.000.

Simpson-Lawrence Limited: See—
Lyall, Gordon M.; and McCarron, Philip F., 304,254, Cl. D34-33.000.

Skalka, Gerald P., to Victor Stanley, Inc. Trash can holder. 304,253, 10-24-89, Cl. D34-6.000.

Small, Mark S.: See—
Cranston, William V., III; Martin, Randall W.; Small, Mark S.; and Young, Mark A., 304,178, Cl. D14-109.000.

Smith Kline & French Laboratories, Ltd.: See—
Tovey, Geoffrey D., 304,244, Cl. D28-2.000.

Sogabe, Takashi; and Takeyama, Kunio, to Sony Corporation. Storage battery. 304,172, 10-24-89, Cl. D13-8.000.

Song, Chang J. Attachable key light. 304,130, 10-24-89, Cl. D3-63.000.

Sony Corporation: See—
Niitsu, Takuya; and Mohri, Akinari, 304,201, Cl. D16-202.000.

Niitsu, Takuya, 304,202, Cl. D16-204.000.

Sogabe, Takashi; and Takeyama, Kunio, 304,172, Cl. D13-8.000.

Soren, Leonid: See—
Nagele, Albert L.; and Soren, Leonid, 304,189, Cl. D14-147.000.

Speck, Stuart L.: See—
Benfield, Bruce V.; Benfield, Peter J.; Pyyvaara, Tim T.; Bishop, Victor L.; and Speck, Stuart L., 304,227, Cl. D23-344.000.

Stanley Works, The: See—
Kmetz, David G., 304,152, Cl. D8-68.000.

Stock, Michael H.: See—
Fuller, Thomas G.; Stock, Michael H.; and Weckel, Hoawrd F., III, 304,194, Cl. D14-257.000.

Strater, Fritz. Table-mounted adjustable lamp. 304,242, 10-24-89, Cl. D26-65.000.

Stream, Robert D., to Teledyne Industries, Inc. Subgingival delivery tip for attachment to dental irrigation instruments. 304,231, 10-24-89, Cl. D24-15.000.

Sturm, Ruger & Company, Inc.: See—
Ruger, William B.; and Larson, Lawrence L., 304,223, Cl. D22-108.000.

- Sugiyama, Yoshihiko: See—
Kagayama, Katsuji; Sugiyama, Yoshihiko; and Mishiro, Benito, 304,181, Cl. D14-118.000.
- Sutoh, Shigeru, to Kabushiki Kaisha Toshiba. Portable handset radio telephone. 304,188, 10-24-89, Cl. D14-118.000.
- Takada, Kazuo; Ogata, Yayoi; and Nakajima, Naomi, to Sanyo Electric Co., Ltd. Electric oven toaster. 304,147, 10-24-89, Cl. D7-350.000.
- Takahashi, Mamoru: See—
Hayasaka, Sigeki; and Takahashi, Mamoru, 304,192, Cl. D14-118.000.
- Takahashi, Masaki, to Canon Kabushiki Kaisha. Facsimile. 304,182, 10-24-89, Cl. D14-118.000.
- Takahashi, Tamihei: See—
Kato, Shuzo; Sakama, Satoru; and Takahashi, Tamihei, 304,203, Cl. D18-13.000.
- Takeyama, Kunio: See—
Sogabe, Takashi; and Takeyama, Kunio, 304,172, Cl. D13-8.000.
- Tanigami, Shintaro, to Elm Industry Co., Ltd. Envelope opener. 304,131, 10-24-89, Cl. D3-72.000.
- Tapdrup, Erik P., to Interlego A.G. Body element for a toy aircraft. 304,211, 10-24-89, Cl. D21-91.000.
- Tata, Hideaki: See—
Kondo, Nobuyuki; Abe, Yoshinori; Tata, Hideaki; Ito, Eiji; Chonan, Katsuhiko; and Inuma, Hideo, 304,170, Cl. D13-4.000.
Kondo, Nobuyuki; Abe, Yoshinori; Tata, Hideaki; Ito, Eiji; Chonan, Katsuhiko; and Inuma, Hideo, 304,171, Cl. D13-4.000.
- Taylor, Steven, to Quaker Oats Company, The. Toy barn. 304,219, 10-24-89, Cl. D21-91.000.
- Technical Tools, Inc.: See—
MacKelvie, Philip A., 304,200, Cl. D15-140.000.
- Tekna: See—
Osterhout, Ralph F., 304,154, Cl. D8-99.000.
- Teledyne Industries, Inc.: See—
Stream, Robert D., 304,231, Cl. D24-15.000.
- Thorpe, Vonda J. Holder for floss and similar articles. 304,129, 10-24-89, Cl. D3-23.000.
- Tovey, Geoffrey D., to Smith Kline & French Laboratories, Ltd. Pharmaceutical tablet. 304,244, 10-24-89, Cl. D28-2.000.
- Trucker's Comfort Systems, Inc.: See—
Giles, William E.; and Kapp, Joseph P., 304,174, Cl. D13-31.000.
- Tuggle, Lloyd H.; and Sadler, Jeffery G., to White Consolidated Industries, Inc. Power head for a vegetation cutter. 304,196, 10-24-89, Cl. D15-1.000.
- Twin Bird Industrial Company, Limited: See—
Nomizu, Hidekatsu, 304,161, Cl. D10-21.000.
- United States Surgical Corporation: See—
Green, David T.; and Ratcliff, Keith, 304,234, Cl. D24-27.000.
- Valvassori, Riccardo: See—
Frassati, Guido; Mugliardo, Giuseppe; and Valvassori, Riccardo, 304,173, Cl. D13-13.000.
- Victor Stanley, Inc.: See—
Skalka, Gerald P., 304,253, Cl. D34-6.000.
- Vitello, Jonathan J.: See—
Beaton, Larry G.; McClain, Kevin T.; Vitello, Jonathan J.; Wetzel, Timothy D.; and Williams, Roger C., 304,179, Cl. D14-113.000.
- Wada, Eiko; and Seki, Yuichi, to Canon Kabushiki Kaisha. Copying machine. 304,204, 10-24-89, Cl. D18-37.000.
- Wang, Tim. Ceramic heating element. 304,230, 10-24-89, Cl. D23-386.000.
- Watanabe, Hiroaki, to Ricoh Company, Ltd. Facsimile transmitter/receiver. 304,184, 10-24-89, Cl. D14-118.000.
- Weckel, Howard F., III: See—
Fuller, Thomas G.; Stock, Michael H.; and Weckel, Howard F., III, 304,194, Cl. D14-257.000.
- Weernink, Johannes H., to Mepal B.V. Sugar pot. 304,138, 10-24-89, Cl. D7-17.000.
- Weernink, Johannes H., to MEPAL B.V. Milk can. 304,146, 10-24-89, Cl. D7-317.000.
- Wetzel, Timothy D.: See—
Beaton, Larry G.; McClain, Kevin T.; Vitello, Jonathan J.; Wetzel, Timothy D.; and Williams, Roger C., 304,179, Cl. D14-113.000.
- White Consolidated Industries, Inc.: See—
Tuggle, Lloyd H.; and Sadler, Jeffery G., 304,196, Cl. D15-1.000.
- Williams, Roger C.: See—
Beaton, Larry G.; McClain, Kevin T.; Vitello, Jonathan J.; Wetzel, Timothy D.; and Williams, Roger C., 304,179, Cl. D14-113.000.
- Williamson, Mark S.: See—
Wilson, Dennis A.; Anesi, Dennis W.; and Williamsen, Mark S., 304,224, Cl. D23-245.000.
- Wilson, Dennis A.; Anesi, Dennis W.; and Williamsen, Mark S., to Ansan Industries Ltd. Flow control valve for lawn sprinkler. 304,224, 10-24-89, Cl. D23-245.000.
- Wistrand, John C., to Savings Spot, Ltd., The. Coupon dispensing terminal. 304,207, 10-24-89, Cl. D20-2.000.
- Wright, Robert L., to Creative Athletic Products and Services, Inc. Batting cage. 304,240, 10-24-89, Cl. D25-1.000.
- Yamauchi, Satoru: See—
Aizawa, Junichi; Kumazawa, Shoichiro; Yamauchi, Satoru; and Kondo, Isao, 304,163, Cl. D10-116.000.
- Yoshihara, Tsutomu, to Canon Kabushiki Kaisha. Facsimile. 304,185, 10-24-89, Cl. D14-118.000.
- Young, Mark A.: See—
Cranston, William V., III; Martin, Randall W.; Small, Mark S.; and Young, Mark A., 304,178, Cl. D14-109.000.
- Yuen, John S., to John Manufacturing Limited. Vacuum cleaner with adjustable handle. 304,249, 10-24-89, Cl. D32-18.000.
- Zwald, John J., to GTE Products Corporation. Fluorescent lamp with simulative gaslight cover. 304,243, 10-24-89, Cl. D26-4.000.

LIST OF PLANT PATENTEES

- Bradford, Lowell G.: See—
Bradford, Norman G.; and Bradford, Lowell G., 7,049, Cl. 41.000.
Bradford, Norman G.; and Bradford, Lowell G., 7,050, Cl. 41.000.
- Bradford, Norman G.; and Bradford, Lowell G. Nectarine tree (Summer Bright). 7,049, 10-24-89, Cl. 41.000.
- Bradford, Norman G.; and Bradford, Lowell G. Nectarine tree (Diamond Jewel). 7,050, 10-24-89, Cl. 41.000.

CLASSIFICATION OF PATENTS

ISSUED OCTOBER 24, 1989

NOTE—First number, class; second number, subclass; third number, patent number

CLASS 1	487,235	487,236	487,237	487,238	487,239	487,240	487,241	487,242	487,243	487,244	487,245	487,246	487,247	487,248	487,249	487,250	487,251	487,252	487,253	487,254	487,255	487,256	487,257	487,258	487,259	487,260	487,261	487,262	487,263	487,264	487,265	487,266	487,267	487,268	487,269	487,270	487,271	487,272	487,273	487,274	487,275	487,276	487,277	487,278	487,279	487,280	487,281	487,282	487,283	487,284	487,285	487,286	487,287	487,288	487,289	487,290	487,291	487,292	487,293	487,294	487,295	487,296	487,297	487,298	487,299	487,300	487,301	487,302	487,303	487,304	487,305	487,306	487,307	487,308	487,309	487,310	487,311	487,312	487,313	487,314	487,315	487,316	487,317	487,318	487,319	487,320	487,321	487,322	487,323	487,324	487,325	487,326	487,327	487,328	487,329	487,330	487,331	487,332	487,333	487,334	487,335	487,336	487,337	487,338	487,339	487,340	487,341	487,342	487,343	487,344	487,345	487,346	487,347	487,348	487,349	487,350	487,351	487,352	487,353	487,354	487,355	487,356	487,357	487,358	487,359	487,360	487,361	487,362	487,363	487,364	487,365	487,366	487,367	487,368	487,369	487,370	487,371	487,372	487,373	487,374	487,375	487,376	487,377	487,378	487,379	487,380	487,381	487,382	487,383	487,384	487,385	487,386	487,387	487,388	487,389	487,390	487,391	487,392	487,393	487,394	487,395	487,396	487,397	487,398	487,399	487,400	487,401	487,402	487,403	487,404	487,405	487,406	487,407	487,408	487,409	487,410	487,411	487,412	487,413	487,414	487,415	487,416	487,417	487,418	487,419	487,420	487,421	487,422	487,423	487,424	487,425	487,426	487,427	487,428	487,429	487,430	487,431	487,432	487,433	487,434	487,435	487,436	487,437	487,438	487,439	487,440	487,441	487,442	487,443	487,444	487,445	487,446	487,447	487,448	487,449	487,450	487,451	487,452	487,453	487,454	487,455	487,456	487,457	487,458	487,459	487,460	487,461	487,462	487,463	487,464	487,465	487,466	487,467	487,468	487,469	487,470	487,471	487,472	487,473	487,474	487,475	487,476	487,477	487,478	487,479	487,480	487,481	487,482	487,483	487,484	487,485	487,486	487,487	487,488	487,489	487,490	487,491	487,492	487,493	487,494	487,495	487,496	487,497	487,498	487,499	487,500	487,501	487,502	487,503	487,504	487,505	487,506	487,507	487,508	487,509	487,510	487,511	487,512	487,513	487,514	487,515	487,516	487,517	487,518	487,519	487,520	487,521	487,522	487,523	487,524	487,525	487,526	487,527	487,528	487,529	487,530	487,531	487,532	487,533	487,534	487,535	487,536	487,537	487,538	487,539	487,540	487,541	487,542	487,543	487,544	487,545	487,546	487,547	487,548	487,549	487,550	487,551	487,552	487,553	487,554	487,555	487,556	487,557	487,558	487,559	487,560	487,561	487,562	487,563	487,564	487,565	487,566	487,567	487,568	487,569	487,570	487,571	487,572	487,573	487,574	487,575	487,576	487,577	487,578	487,579	487,580	487,581	487,582	487,583	487,584	487,585	487,586	487,587	487,588	487,589	487,590	487,591	487,592	487,593	487,594	487,595	487,596	487,597	487,598	487,599	488,000	488,001	488,002	488,003	488,004	488,005	488,006	488,007	488,008	488,009	488,010	488,011	488,012	488,013	488,014	488,015	488,016	488,017	488,018	488,019	488,020	488,021	488,022
CLASS 2	487,235	487,236	487,237	487,238	487,239	487,240	487,241	487,242	487,243	487,244	487,245	487,246	487,247	487,248	487,249	487,250	487,251	487,252	487,253	487,254	487,255	487,256	487,257	487,258	487,259	487,260	487,261	487,262	487,263	487,264	487,265	487,266	487,267	487,268	487,269	487,270	487,271	487,272	487,273	487,274	487,275	487,276	487,277	487,278	487,279	487,280	487,281	487,282	487,283	487,284	487,285	487,286	487,287	487,288	487,289	487,290	487,291	487,292	487,293	487,294	487,295	487,296	487,297	487,298	487,299	487,300	487,301	487,302	487,303	487,304	487,305	487,306	487,307	487,308	487,309	487,310	487,311	487,312	487,313	487,314	487,315	487,316	487,317	487,318	487,319	487,320	487,321	487,322	487,323	487,324	487,325	487,326	487,327	487,328	487,329	487,330	487,331	487,332	487,333	487,334	487,335	487,336	487,337	487,338	487,339	487,340	487,341	487,342	487,343	487,344	487,345	487,346	487,347	487,348	487,349	487,350	487,351	487,352	487,353	487,354	487,355	487,356	487,357	487,358	487,359	487,360	487,361	487,362	487,363	487,364	487,365	487,366	487,367	487,368	487,369	487,370	487,371	487,372	487,373	487,374	487,375	487,376	487,377	487,378	487,379	487,380	487,381	487,382	487,383	487,384	487,385	487,386	487,387	487,388	487,389	487,390	487,391	487,392	487,393	487,394	487,395	487,396	487,397	487,398	487,399	487,400	487,401	487,402	487,403	487,404	487,405	487,406	487,407	487,408	487,409	487,410	487,411	487,412	487,413	487,414	487,415	487,416	487,417	487,418	487,419	487,420	487,421	487,422	487,423	487,424	487,425	487,426	487,427	487,428	487,429	487,430	487,431	487,432	487,433	487,434	487,435	487,436	487,437	487,438	487,439	487,440	487,441	487,442	487,443	487,444	487,445	487,446	487,447	487,448	487,449	487,450	487,451	487,452	487,453	487,454	487,455	487,456	487,457	487,458	487,459	487,460	487,461	487,462	487,463	487,464	487,465	487,466	487,467	487,468	487,469	487,470	487,471	487,472	487,473	487,474	487,475	487,476	487,477	487,478	487,479	487,480	487,481	487,482	487,483	487,484	487,485	487,486	487,487	487,488	487,489	487,490	487,491	487,492	487,493	487,494	487,495	487,496	487,497	487,498	487,499	487,500	487,501	487,502	487,503	487,504	487,505	487,506	487,507	487,508	487,509	487,510	487,511	487,512	487,513	487,514	487,515	487,516	487,517	487,518	487,519	487,520	487,521	487,522	487,523	487,524	487,525	487,526	487,527	487,528	487,529	487,530	487,531	487,532	487,533	487,534	487,535	487,536	487,537	487,538	487,539	487,540	487,541	487,542	487,543	487,544	487,545	487,546	487,547	487,548	487,549	487,550	487,551	487,552	487,553	487,554	487,555	487,556	487,557	487,558	487,559	487,560	487,561	487,562	487,563	487,564	487,565	487,566	487,567	487,568	487,569	487,570	487,571	487,572	487,573	487,574	487,575	487,576	487,577	487,578	487,579	487,580	487,581	487,582	487,583	487,584	487,585	487,586	487,587	487,588	487,589	487,590	487,591	487,592	487,593	487,594	487,595	487,596	487,597	487,598	487,599	488,000	488,001	488,002	488,003	488,004	488,005	488,006	488,007	488,008	488,009	488,010	488,011	488,012	488,013	488,014	488,015	488,016	488,017	488,018	488,019	488,020	488,021	488,022
CLASS 3	487,235	487,236	487,237	487,238	487,239	487,240	487,241	487,242	487,243	487,244	487,245	487,246	487,247	487,248	487,249	487,250	487,251	487,252	487,253	487,254	487,255	487,256	487,257	487,258	487,259	487,260	487,261	487,262	487,263	487,264	487,265	487,266	487,267	487,268	487,269	487,270	487,271	487,272	487,273	487,274	487,275	487,276	487,277	487,278	487,279	487,280	487,281	487,282	487,283	487,284	487,285	487,286	487,287	487,288	487,289	487,290	487,291	487,292	487,293	487,294	487,295	487,296	487,297	487,298	487,299	487,300	487,301	487,302	487,303	487,304	487,305	487,306	487,307	487,308	487,309	487,310	487,311	487,312	487,313	487,314	487,315	487,316	487,317	487,318	487,319	487,320	487,321	487,322	487,323	487,324	487,325	487,326	487,327	487,328	487,329	487,330	487,331	487,332	487,333	487,334	487,335	487,336	487,337	487,338	487,339	487,340	487,341	487,342	487,343	487,344	487,345	487,346	487,347	487,348	487,349	487,350	487,351	487,352	487,353	487,354	487,355	487,356	487,357	487,358	487,359	487,360	487,361	487,362	487,363	487,364	487,365	487,366	487,367	487,368	487,369	487,370	487,371	487,372	487,373	487,374	487,375	487,376	487,377	487,378	487,379	487,380	487,381	487,382	487,383	487,384	487,385	487,386	487,387	487,388	487,389	487,390	487,391	487,392	487,393	487,394	487,395	487,396	487,397	487,398	487,399	487,400	487,401	487,402	487,403	487,404	487,405	487,406	487,407	487,408	487,409	487,410	487,411	487,412	487,413	487,414	487,415	487,416	487,417	487,418	487,419	487,420	487,421	487,422	487,423	487,424	487,425	487,426	487,427	487,428	487,429	487,430	487,431	487,432	487,433	487,434	487,435	487,436	487,437	487,438	487,439	487,440	487,441	487,442	487,443	487,444	487,445	487,446	487,447	487,448	487,449	487,450	487,451	487,452	487,453	487,454	487,455	487,456	487,457	487,458	487,459	487,460	487,461	487,462	487,463	487,464	487,465	487,466	487,467	487,468	487,469	487,470	487,471	487,472	487,473	487,474	487,475	487,476	487,477	487,478	487,479	487,480	487,481	487,482	487,483	487,484	487,485	487,486	487,487																																																																																																																																							

6.2	4,875,535	113	4,875,993	CLASS 236	4,875,441	4.7	4,876,039	126	4,875,728	277	4,876,517
6.32	4,875,536	152	4,875,995	CLASS 236	4,876,441	14	4,876,040	126	4,875,728	CLASS 331	
69.1	4,875,537	157	4,875,996	CLASS 236	4,876,441	25	4,876,041	126	4,875,728	1 A	4,876,518
79.1	4,875,538	235	4,875,997	CLASS 236	4,876,441	39	4,876,042	126	4,875,728	57	4,876,519
	4,875,540	390	4,875,998	CLASS 236	4,876,441	49.5	4,876,043	126	4,875,728	CLASS 333	
	4,875,541			CLASS 236	4,876,441	49	4,876,044	126	4,875,728	12	4,876,520
142	4,875,542	3.3	4,875,588	CLASS 236	4,876,441	71	Re. 33,101	126	4,875,728	CLASS 337	
219	4,875,543	211	BI 3,415,374	CLASS 236	4,876,441	102	4,876,050	126	4,875,728	179	4,876,521
233	4,875,544	245	4,875,589	CLASS 236	4,876,441	127	4,876,051	126	4,875,728	193	4,876,522
239	4,875,545	534	4,875,589	CLASS 236	4,876,441	148	4,876,052	126	4,875,728	CLASS 337	
379	4,875,538	534	4,875,589	CLASS 236	4,876,441	255	4,876,053	126	4,875,728	299	4,876,523
		534	4,875,589	CLASS 236	4,876,441	333	4,876,054	126	4,875,728	CLASS 337	
		534	4,875,589	CLASS 236	4,876,441	512	4,876,055	126	4,875,728	CLASS 337	
		534	4,875,589	CLASS 236	4,876,441	44	4,875,662	126	4,875,728	CLASS 337	
		534	4,875,589	CLASS 236	4,876,441	272	4,875,663	126	4,875,728	CLASS 337	
		534	4,875,589	CLASS 236	4,876,441	80	4,875,738	126	4,875,728	CLASS 337	
		534	4,875,589	CLASS 236	4,876,441	33	4,875,739	126	4,875,728	CLASS 337	
		534	4,875,589	CLASS 236	4,876,441	50	4,875,740	126	4,875,728	CLASS 337	
		534	4,875,589	CLASS 236	4,876,441	116	4,875,741	126	4,875,728	CLASS 337	
		534	4,875,589	CLASS 236	4,876,441	119	4,875,742	126	4,875,728	CLASS 337	
		534	4,875,589	CLASS 236	4,876,441	11	4,876,459	126	4,875,728	CLASS 337	
		534	4,875,589	CLASS 236	4,876,441	116	4,876,461	126	4,875,728	CLASS 337	
		534	4,875,589	CLASS 236	4,876,441	246	4,876,462	126	4,875,728	CLASS 337	
		534	4,875,589	CLASS 236	4,876,441	265	4,876,463	126	4,875,728	CLASS 337	
		534	4,875,589	CLASS 236	4,876,441	353	4,876,464	126	4,875,728	CLASS 337	
		534	4,875,589	CLASS 236	4,876,441	443	4,876,465	126	4,875,728	CLASS 337	
		534	4,875,589	CLASS 236	4,876,441	465	4,876,466	126	4,875,728	CLASS 337	
		534	4,875,589	CLASS 236	4,876,441	570	4,876,467	126	4,875,728	CLASS 337	
		534	4,875,589	CLASS 236	4,876,441	643	4,876,468	126	4,875,728	CLASS 337	
		534	4,875,589	CLASS 236	4,876,441	52	4,876,469	126	4,875,728	CLASS 337	
		534	4,875,589	CLASS 236	4,876,441	59	4,876,470	126	4,875,728	CLASS 337	
		534	4,875,589	CLASS 236	4,876,441	105	4,876,471	126	4,875,728	CLASS 337	
		534	4,875,589	CLASS 236	4,876,441	216	4,876,473	126	4,875,728	CLASS 337	
		534	4,875,589	CLASS 236	4,876,441	236	4,876,474	126	4,875,728	CLASS 337	
		534	4,875,589	CLASS 236	4,876,441	239	4,876,475	126	4,875,728	CLASS 337	
		534	4,875,589	CLASS 236	4,876,441	320	4,876,476	126	4,875,728	CLASS 337	
		534	4,875,589	CLASS 236	4,876,441	13	4,875,743	126	4,875,728	CLASS 337	
		534	4,875,589	CLASS 236	4,876,441	266	4,875,744	126	4,875,728	CLASS 337	
		534	4,875,589	CLASS 236	4,876,441	298	4,875,745	126	4,875,728	CLASS 337	
		534	4,875,589	CLASS 236	4,876,441	330.1	4,875,746	126	4,875,728	CLASS 337	
		534	4,875,589	CLASS 236	4,876,441	404	4,876,477	126	4,875,728	CLASS 337	
		534	4,875,589	CLASS 236	4,876,441	413	4,876,478	126	4,875,728	CLASS 337	
		534	4,875,589	CLASS 236	4,876,441	108	4,876,479	126	4,875,728	CLASS 337	
		534	4,875,589	CLASS 236	4,876,441	137	4,876,480	126	4,875,728	CLASS 337	
		534	4,875,589	CLASS 236	4,876,441	140 R	4,876,481	126	4,875,728	CLASS 337	
		534	4,875,589	CLASS 236	4,876,441	153.1	4,876,482	126	4,875,728	CLASS 337	
		534	4,875,589	CLASS 236	4,876,441	159	4,876,483	126	4,875,728	CLASS 337	
		534	4,875,589	CLASS 236	4,876,441	160	4,876,484	126	4,875,728	CLASS 337	
		534	4,875,589	CLASS 236	4,876,441	94	4,876,485	126	4,875,728	CLASS 337	
		534	4,875,589	CLASS 236	4,876,441	244	4,876,486	126	4,875,728	CLASS 337	
		534	4,875,589	CLASS 236	4,876,441	290	4,876,487	126	4,875,728	CLASS 337	
		534	4,875,589	CLASS 236	4,876,441	362	4,876,488	126	4,875,728	CLASS 337	
		534	4,875,589	CLASS 236	4,876,441	378	4,876,488	126	4,875,728	CLASS 337	
		534	4,875,589	CLASS 236	4,876,441	17	4,876,490	126	4,875,728	CLASS 337	
		534	4,875,589	CLASS 236	4,876,441	138	4,876,491	126	4,875,728	CLASS 337	
		534	4,875,589	CLASS 236	4,876,441	254	4,876,492	126	4,875,728	CLASS 337	
		534	4,875,589	CLASS 236	4,876,441	293	4,876,493	126	4,875,728	CLASS 337	
		534	4,875,589	CLASS 236	4,876,441	568.22	4,876,494	126	4,875,728	CLASS 337	
		534	4,875,589	CLASS 236	4,876,441	18	4,876,495	126	4,875,728	CLASS 337	
		534	4,875,589	CLASS 236	4,876,441	31	4,876,496	126	4,875,728	CLASS 337	
		534	4,875,589	CLASS 236	4,876,441	211	4,876,497	126	4,875,728	CLASS 337	
		534	4,875,589	CLASS 236	4,876,441	300	4,876,498	126	4,875,728	CLASS 337	
		534	4,875,589	CLASS 236	4,876,441	312	4,876,499	126	4,875,728	CLASS 337	
		534	4,875,589	CLASS 236	4,876,441	61 R	4,876,500	126	4,875,728	CLASS 337	
		534	4,875,589	CLASS 236	4,876,441	73 R	4,876,501	126	4,875,728	CLASS 337	
		534	4,875,589	CLASS 236	4,876,441	115	4,876,502	126	4,875,728	CLASS 337	
		534	4,875,589	CLASS 236	4,876,441	117 R	4,876,503	126	4,875,728	CLASS 337	
		534	4,875,589	CLASS 236	4,876,441	204	4,876,504	126	4,875,728	CLASS 337	
		534	4,875,589	CLASS 236	4,876,441	208	4,876,505	126	4,875,728	CLASS 337	
		534	4,875,589	CLASS 236	4,876,441	220	4,876,506	126	4,875,728	CLASS 337	
		534	4,875,589	CLASS 236	4,876,441	307	4,876,507	126	4,875,728	CLASS 337	
		534	4,875,589	CLASS 236	4,876,441	309	4,876,508	126	4,875,728	CLASS 337	
		534	4,875,589	CLASS 236	4,876,441	318	4,876,509	126	4,875,728	CLASS 337	
		534	4,875,589	CLASS 236	4,876,441	338	4,876,510	126	4,875,728	CLASS 337	
		534	4,875,589	CLASS 236	4,876,441	376	4,876,511	126	4,875,728	CLASS 337	
		534	4,875,589	CLASS 236	4,876,441	427	4,876,512	126	4,875,728	CLASS 337	
		534	4,875,589	CLASS 236	4,876,441	538	4,876,513	126	4,875,728	CLASS 337	
		534	4,875,589	CLASS 236	4,876,441	556	4,876,514	126	4,875,728	CLASS 337	
		534	4,875,589	CLASS 236	4,876,441	20	4,876,567	126	4,875,728	CLASS 337	
		534	4,875,589	CLASS 236	4,876,441	56	4,876,568	126	4,875,728	CLASS 337	
		534	4,875,589	CLASS 236	4,876,441	68	4,876,569	126	4,875,728	CLASS 337	
		534	4,875,589	CLASS 236	4,876,441	204	4,876,570	126	4,875,728	CLASS 337	
		534	4,875,589	CLASS 236	4,876,441	210	4,876,571	126	4,875,728	CLASS 337	
		534	4,875,589	CLASS 236	4,876,441	250	4,876,572	126	4,875,728	CLASS 337	
		534	4,875,589	CLASS 236	4,876,441	489	4,876,573	126	4,875,728	CLASS 337	

253	4,876,574	473	4,876,652	42	4,876,718	217	4,876,141	126	4,876,219
259	4,876,575	479	4,876,653	CLASS 331		224	4,876,142	170	4,876,220
285	4,876,576	483	4,876,654	CLASS 331		294	4,876,143	212	4,876,221
315	4,876,577	487	4,876,655	CLASS 331		327	4,876,144	225	4,876,222
	4,876,578	491	4,876,656	CLASS 331		337	4,876,145	228	4,876,223
		521	4,876,657	CLASS 331		359	4,876,146	230	4,876,224
		550	4,876,658	CLASS 331		379	4,876,147	232	4,876,225
		717	4,876,659	CLASS 331		379	4,876,148	234	4,876,226
		754	4,876,660	CLASS 331		411.1	4,876,149	236	4,876,227
		787	4,876,661	CLASS 331		425.9	4,876,150	238	4,876,228
		900	4,876,662	CLASS 331		447	4,876,151	240	4,876,229
			4,876,663	CLASS 331			4,876,152	242	4,876,230
			4,876,664	CLASS 331			4,876,153	244	4,876,231
			4,876,665	CLASS 331			4,876,154	246	4,876,232
			4,876,666	CLASS 331			4,876,155	248	4,876,233
			4,876,667	CLASS 331			4,876,156	250	4,876,234
			4,876,668	CLASS 331			4,876,157	252	4,876,235
			4,876,669	CLASS 331			4,876,158	254	4,876,236
			4,876,670	CLASS 331			4,876,159	256	4,876,237
			4,876,671	CLASS 331			4,876,160	258	4,876,238
			4,876,672	CLASS 331			4,876,161	260	4,876,239

CLASSIFICATION OF PATENTS

254	4,876,258	53	4,876,288	433	4,876,317	451	4,876,340	374	4,876,368	34	4,876,390
256	4,876,259	54	4,876,289	446	4,876,318		CLASS 544	411	4,876,369		4,876,392
278	4,876,260	76	4,876,290	456	4,876,319			455	4,876,370	415	4,876,393
307	4,876,261	124	4,876,291			2	4,876,341	517	4,876,371	697	4,876,394
318	4,876,262	159	4,876,292		CLASS 526	14	4,876,342	529	4,876,372	724	4,876,391
338	4,876,263			62	4,876,320		4,876,343		4,876,373	728	4,876,395
345	4,876,264			129	4,876,321	219	4,876,344		4,876,374	779	4,876,396
370	4,876,265	122	4,876,293	242	4,876,322	379	4,876,345	415	4,876,375	798	4,876,397
392	4,876,266	172	4,876,294	310	4,876,323		CLASS 546	453	4,876,376	804	4,876,398
415	4,876,267	200	4,876,295						4,876,377	817	4,876,399
429	4,876,268	351	4,876,297	142	4,876,324	172	4,876,346	109	4,876,378	824	4,876,400
439	4,876,270	433	4,876,298	170	4,876,325	252	4,876,347	235	4,876,379		4,876,401
443	4,876,271			173	4,876,327	350	4,876,348	412	4,876,380	881	4,876,402
450	4,876,272			272	4,876,328		CLASS 548	416	4,876,381	913	4,876,403
451	4,876,273	99	4,876,299	322	4,876,329	110	4,876,350		4,876,382		
452	4,876,274	100	4,876,300	353	4,876,330	204	4,876,351	56	4,876,383	145	4,876,404
	4,876,275	109	4,876,301		4,876,331	232	4,876,352	78	4,876,384	156	4,876,405
454	4,876,276	255	4,876,302	361	4,876,332	262	4,876,353	109	4,876,385	165	4,876,406
465	4,876,277	296	4,876,303		CLASS 530	341	4,876,354	158	4,876,386	239	4,876,407
	4,876,278	314	4,876,304	326	4,876,332	352	4,876,355	163	4,876,387		
510	4,876,279	401	4,876,305	387	4,876,333	419	4,876,356	224	4,876,388		
	4,876,280	423	4,876,306		CLASS 534	463	4,876,357	352	4,876,389		
517	4,876,281	612	4,876,307			521	4,876,358		CLASS 562	467	4,876,408
554	4,876,282	780	4,876,308	575	4,876,333	533	4,876,359	41	4,876,047	516	4,876,410
562	4,876,283			632	4,876,334	550	4,876,360	414	4,876,385	533	4,876,411
570	4,876,284				CLASS 536		CLASS 549	493	4,876,386		4,876,412
657	4,876,285	149	4,876,310			41	4,876,361		CLASS 564	187	4,875,896
746		229	4,876,311	27	4,876,335	59	4,876,362			283	4,875,897
		263	4,876,312	109	4,876,336	214	4,876,363	437	4,876,388	331	4,875,898
700	4,876,286	281	4,876,313		CLASS 540	215	4,876,364		CLASS 568	333	4,875,899
	CLASS 521	338	4,876,314				4,876,365				
28	4,876,287	346	4,876,315	357	4,876,338		4,876,366	26	4,876,389		
		427	4,876,316	450	4,876,339	349	4,876,367				

CLASSIFICATION OF DESIGNS

D2—	275	304,125	350	304,147	D13—	I	304,169	191	304,192		304,213	27	304,234				
	293	304,126	351	304,148		II	304,170	192	304,191		304,214	38	304,235				
	314	304,127		304,149			304,171	240	304,193		304,215		304,236				
D3—	23	304,129	D8—	30	304,151	8	304,172	257	304,194		304,216	45	304,237				
	63	304,130		68	304,152	13	304,173	265	304,195		304,217	49	304,238				
	72	304,131		93	304,153	31	304,174	D15—	I	304,196	304,218	51	304,239				
D6—	100	304,132		99	304,154	D14—	100	304,175	9	304,197	116	304,219	D25—	1	304,240		
	420	304,133		303	304,155		102	304,176	9.1	304,198	141	304,220	D26—	3	304,241		
	421	304,134		314	304,156		107	304,177	126	304,199		304,221		II	304,242		
	477	304,135	D9—	347	304,157		109	304,178	140	304,200		192	304,222	65	304,243		
	515	304,136		375	304,158		113	304,179	D16—	202	304,201	D22—	108	304,223	D28—	2	304,244
	569	304,137			304,159		114	304,180		204	304,202	D23—	245	304,224	73	304,245	
D7—	17	304,138		433	304,160		116	304,181	D18—	13	304,203		257	304,225	D30—	102	304,246
	43	304,139	D10—	21	304,161		118	304,182		37	304,204		267	304,226		304,247	
	49	304,140		41	304,162			304,183	D19—	65	304,205		34	304,227	162	304,248	
		304,141		116	304,163			304,184		86	304,206		304,228	D32—	18	304,249	
	53	304,142	D11—	131	304,164			304,185	D20—	2	304,207		377	304,229		304,250	
	70	304,143		202	304,165			304,186	D21—	34	304,209		386	304,230	21	304,251	
	102	304,144	D12—	143	304,166			304,187		41	304,208		15	304,231	37	304,252	
	104	304,145		156	304,167	138	304,188			108	304,210		17	304,232	D34—	6	304,253
	317	304,146		157	304,168	142	304,190			91	304,211		21	304,233		33	304,254
						147	304,189				304,212						

CLASSIFICATION OF PLANTS

P.—	41	7,049		7,050					
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GEOGRAPHICAL INDEX
OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Mexico	34	West Virginia	54
Hawaii	15	New York	35	Wisconsin	55
Idaho	16	North Carolina	36	Wyoming	56
Illinois	17	North Dakota	37	U.S. Air Force	57
Indiana	18	Ohio	38	U.S. Army	58
Iowa	19	Oklahoma	39	U.S. Navy	59
Kansas	20		40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

01 :	4,875,374	4,875,634	4,876,249	4,875,830	4,876,010	4,876,621
	4,876,002	4,875,649	4,876,277	4,875,933	4,876,291	4,876,626
	4,876,140	4,875,666	4,876,328	4,875,956	4,876,303	4,876,648
02 :	4,876,317	4,875,672	4,876,408	4,875,965	4,876,424	4,876,656
04 :	4,875,599	4,875,677	4,876,425	4,876,003	4,876,630	4,876,709
	4,875,300	4,875,678	4,876,428	4,876,005	4,875,630	4,876,718
	4,875,526	4,875,689	4,876,440	4,876,162	4,875,886	4,876,740
	4,875,668	4,875,691	4,876,453	4,876,296	4,875,504	4,875,441
	4,875,713	4,875,694	4,876,460	4,876,367	4,876,101	4,875,474
	4,875,730	4,875,708	4,876,485	4,876,394	4,875,257	4,875,662
	4,875,731	4,875,737	4,876,497	4,876,622	4,875,316	4,875,685
	4,876,051	4,875,744	4,876,509	4,876,652	4,875,350	4,875,697
	4,876,217	4,875,751	4,876,517	4,876,658	4,875,397	4,876,273
	4,876,516	4,875,767	4,876,519	4,875,858	4,875,403	4,876,282
	4,876,518	4,875,769	4,876,534	4,876,128	4,875,412	4,876,309
	4,876,639	4,875,770	4,876,547	4,876,210	4,875,460	4,876,316
	4,876,643	4,875,774	4,876,554	4,876,259	4,875,478	4,876,391
06 :	4,876,662	4,875,775	4,876,583	4,876,293	4,875,486	4,876,395
	Re.33,100	4,875,778	4,876,586	4,875,239	4,875,499	4,876,638
	4,875,242	4,875,779	4,876,596	4,875,247	4,875,569	4,875,235
	4,875,266	4,875,824	4,876,602	4,875,298	4,875,591	4,875,324
	4,875,271	4,875,825	4,876,632	4,875,373	4,875,601	4,875,330
	4,875,274	4,875,859	4,876,640	4,875,428	4,875,627	4,875,375
	4,875,278	4,875,897	4,876,654	4,875,430	4,875,669	4,875,421
	4,875,282	4,875,906	4,876,663	4,875,481	4,875,792	4,875,527
	4,875,291	4,875,953	4,876,668	4,875,483	4,875,793	4,875,563
	4,875,302	4,875,957	4,876,687	4,875,488	4,875,818	4,875,701
	4,875,305	4,875,966	4,876,688	4,875,505	4,875,826	4,875,852
	4,875,314	4,875,982	4,876,687	4,875,529	4,875,829	4,875,852
	4,875,346	4,875,996	4,876,688	4,875,571	4,875,868	4,875,553
	4,875,352	4,876,041	4,876,691	4,875,586	4,875,871	4,875,692
	4,875,394	4,876,050	4,876,693	4,875,593	4,875,881	4,875,847
	4,875,395	4,876,063	4,876,701	4,875,596	4,875,885	4,876,435
	4,875,408	4,876,066	4,876,712	4,876,090	4,875,891	4,876,530
	4,875,409	4,876,089	4,876,726	4,876,128	4,875,935	4,875,251
	4,875,451	4,876,093	4,876,728	4,876,152	4,875,991	4,875,272
	4,875,459	4,876,096	4,876,739	4,876,192	4,876,091	4,875,277
	4,875,466	4,876,105	4,875,462	4,876,241	4,876,152	4,875,351
	4,875,469	4,876,116	4,875,467	4,876,268	4,876,192	4,875,410
	4,875,470	4,876,117	4,875,467	4,876,284	4,876,241	4,875,688
	4,875,487	4,876,151	4,875,467	4,876,329	4,876,268	4,875,796
	4,875,489	4,876,153	4,875,467	4,876,334	4,876,329	4,875,841
	4,875,492	4,876,178	4,875,467	4,876,336	4,876,334	4,875,914
	4,875,497	4,876,188	4,875,467	4,876,336	4,876,385	4,876,138
	4,875,529	4,876,190	4,875,467	4,876,390	4,876,385	4,876,483
	4,875,547	4,876,197	4,875,467	4,876,414	4,876,386	4,876,492
	4,875,588	4,876,208	4,875,467	4,875,508	4,876,390	4,875,323
	4,875,595	4,876,209	4,875,467	4,875,529	4,876,414	4,875,427
	4,875,598	4,876,211	4,875,467	4,875,579	4,876,439	4,875,593
	4,875,602	4,876,215	4,875,467	4,875,783	4,876,480	4,875,992
	4,875,612	4,876,216	4,875,467	4,875,803	4,876,486	4,875,997
	4,875,617	4,876,220	4,875,467	4,875,916	4,876,499	4,876,012
	4,875,620	4,876,225	4,875,785	4,875,952	4,876,514	4,876,193
		4,875,816	4,875,816	4,875,969	4,875,552	4,875,582

	4,875,743	4,876,099	35 :	4,876,724	4,875,875	4,875,877	4,876,397
	4,876,436	4,876,109		4,875,998	4,876,521	4,875,890	4,876,402
24 :	4,876,713	4,876,123		4,876,032	4,876,532	4,875,912	4,876,415
	4,875,289	4,876,136		4,876,115	4,876,644	4,876,044	4,876,426
	4,875,309	4,876,149	36 :	4,876,651	4,876,653	4,876,048	4,876,450
	4,876,366	4,876,332		4,875,240	4,876,735	4,876,058	4,876,465
	4,875,879	4,876,427		4,875,262	4,875,252	4,876,061	4,876,511
	4,875,938	4,876,444		4,875,319	4,875,339	4,876,131	4,876,512
	4,875,948	4,876,700		4,875,321	4,875,343	4,876,163	4,876,538
	4,875,949	4,875,238	29 :	4,875,341	4,875,361	4,876,231	4,876,542
	4,876,000	4,875,417		4,875,389	4,875,363	4,876,269	4,876,543
	4,876,232	4,875,458		4,875,411	4,875,376	4,876,271	4,876,630
	4,876,550	4,875,714		4,875,468	4,875,380	4,876,279	4,876,642
25 :	4,876,659	4,875,745		4,875,482	4,875,383	4,876,292	4,876,671
	4,875,281	4,875,801		4,875,550	4,875,440	4,876,313	4,876,672
	4,875,288	4,875,851		4,875,561	4,875,575	4,876,346	4,876,673
	4,875,358	4,876,165		4,875,611	4,875,585	4,876,366	4,876,699
	4,875,520	4,876,243		4,875,614	4,875,594	4,876,377	4,876,710
	4,875,546	4,876,323		4,875,638	4,875,644	4,876,409	4,875,303
	4,875,625	4,876,375		4,875,671	4,875,655	4,876,421	4,875,717
	4,875,635	4,875,576	30 :	4,875,682	4,875,676	4,876,494	4,876,110
	4,875,880	4,875,997		4,875,707	4,875,693	4,876,498	4,876,148
	4,875,887	4,875,269	31 :	4,875,709	4,875,794	4,876,502	4,875,637
	4,875,919	4,875,431		4,875,725	4,875,799	4,876,506	4,875,674
	4,876,053	4,875,813		4,875,729	4,875,815	4,876,526	4,875,114
	4,876,423	4,875,514	32 :	4,875,756	4,875,878	4,876,593	4,875,255
	4,876,455	4,875,651		4,875,764	4,875,974	4,876,625	4,875,357
	4,876,501	4,875,915		4,875,765	4,875,979	4,875,574	4,875,495
	4,876,525	4,876,206		4,875,772	4,875,988	4,875,888	4,875,573
	4,876,533	Re.33,098	33 :	4,875,773	4,876,015	4,875,292	4,875,580
	4,876,541	4,875,283		4,875,788	4,876,046	4,875,528	4,875,623
	4,876,566	4,876,431		4,875,795	4,876,094	4,875,587	4,875,802
	4,876,628	Re.33,101	34 :	4,875,866	4,876,172	4,875,786	4,875,814
	4,876,742	4,875,268		4,875,917	4,876,294	4,875,920	4,876,068
26 :	4,875,245	4,875,287		4,875,968	4,876,304	4,876,674	4,876,121
	4,875,295	4,875,304		4,875,999	4,876,305	4,875,241	4,876,692
	4,875,318	4,875,326		4,876,013	4,876,308	4,875,294	4,875,237
	4,875,327	4,875,404		4,876,018	4,876,315	4,875,320	4,875,254
	4,875,385	4,875,435		4,876,031	4,876,326	4,875,616	4,875,296
	4,875,391	4,875,473		4,876,064	4,876,348	4,875,680	4,875,372
	4,875,399	4,875,521		4,876,104	4,876,355	4,876,378	4,875,419
	4,875,537	4,875,554		4,876,120	4,876,374	4,876,463	4,875,645
	4,875,583	4,875,603		4,876,142	4,876,416	4,876,721	4,875,667
	4,875,590	4,875,695		4,876,159	4,876,582	4,875,236	4,875,687
	4,875,631	4,875,753		4,876,166	4,876,647	4,875,368	4,875,867
	4,875,653	4,875,754		4,876,167	4,876,664	4,875,369	4,876,043
	4,875,700	4,875,808		4,876,169	4,588,627	4,875,398	4,876,081
	4,875,715	4,875,876	40 :	4,876,175	4,875,243	4,875,413	4,876,186
	4,875,723	4,875,994		4,876,176	4,875,290	4,875,420	4,876,199
	4,875,728	4,875,995		4,876,181	4,875,348	4,875,432	4,876,515
	4,875,735	4,876,087		4,876,201	4,875,524	4,875,498	4,876,598
	4,875,777	4,876,095		4,876,207	4,875,530	4,875,502	4,876,684
	4,875,781	4,876,102		4,876,212	4,875,639	4,875,525	4,875,463
	4,875,791	4,876,106		4,876,227	4,876,016	4,875,532	4,875,597
	4,875,812	4,876,127		4,876,234	4,876,030	4,875,544	4,876,080
	4,875,838	4,876,228		4,876,235	4,876,321	4,875,545	4,875,344
	4,875,840	4,876,229		4,876,236	4,876,410	4,875,710	4,875,439
	4,876,014	4,876,242		4,876,237	4,876,449	4,875,719	4,875,448
	4,876,039	4,876,256		4,876,238	4,876,539	4,875,800	4,875,457
	4,876,154	4,876,257	41 :	4,876,240	4,875,386	4,875,811	4,875,465
	4,876,312	4,876,272		4,876,252	4,875,424	4,875,896	4,875,491
	4,876,343	4,876,280		4,876,300	4,875,619	4,875,905	4,875,517
	4,876,594	4,876,285		4,876,387	4,875,650	4,875,934	4,875,608
27 :	4,876,629	4,876,333		4,876,413	4,875,661	4,875,941	4,875,626
	4,875,259	4,876,336		4,876,445	4,875,718	4,875,989	4,875,656
	4,875,340	4,876,338		4,876,548	4,875,854	4,876,019	4,875,864
	4,875,464	4,876,352		4,876,561	4,876,009	4,876,075	4,875,882
	4,875,472	4,876,364		4,876,575	4,876,214	4,876,076	4,875,883
	4,875,476	4,876,365		4,876,590	4,876,287	4,876,124	4,875,884
	4,875,609	4,876,368		4,876,607	4,876,484	4,876,156	4,875,921
	4,875,621	4,876,384		4,876,608	4,876,655	4,876,213	4,875,976
	4,875,629	4,876,392		4,876,635	4,875,275	4,876,222	4,875,985
	4,875,732	4,876,411		4,876,697	4,875,279	4,876,226	4,876,072
	4,875,755	4,876,430		4,876,731	4,875,311	4,876,230	4,876,108
	4,875,760	4,876,447		4,876,733	4,875,436	4,876,250	4,876,325
	4,875,798	4,876,457		4,876,741	4,875,461	4,876,295	4,876,461
	4,875,821	4,876,488	37 :	4,875,365	4,875,551	4,876,307	4,876,468
	4,875,895	4,876,495		4,875,396	4,875,683	4,876,314	4,876,475
	4,875,901	4,876,545		4,875,401	4,875,696	4,876,318	4,876,513
	4,875,972	4,876,546		4,875,780	4,875,739	4,876,320	4,876,711
	4,875,973	4,876,627		4,875,782	4,875,822	4,876,358	4,876,715
	4,876,011	4,876,667		4,875,863	4,875,865	4,876,380	

DESIGN PATENTS

04 :	304,235	304,245	13 :	304,233	23 :	304,164	34 :	304,139	42 :	304,128
06 :	304,133	304,250		304,165	24 :	304,167		304,157		304,209
	304,136	304,200	08 :	304,168		304,199		304,158	48 :	304,246
	304,142	304,231		304,180	25 :	304,152		304,159		304,247
	304,154	304,232	17 :	304,137		304,176		304,214	49 :	304,252
	304,156	304,155		304,189		304,238		304,239	51 :	304,129
	304,174	304,207		304,224		304,243	37 :	304,151		304,195
	304,208	304,234		304,248	26 :	304,143		304,179	53 :	304,226
	304,216	304,253	11 :	304,251	27 :	304,153	39 :	304,162		304,130
	304,217	304,135	12 :	304,194		304,219		304,198		304,222
	304,218	304,178		304,240	33 :	304,132	40 :	304,126	55 :	304,212
	304,225	304,210		304,196		304,223	41 :	304,127		304,236
	304,229									

PLANT PATENTS

06 :	7,049	7,050				
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Donald J. Quigg, *Commissioner*

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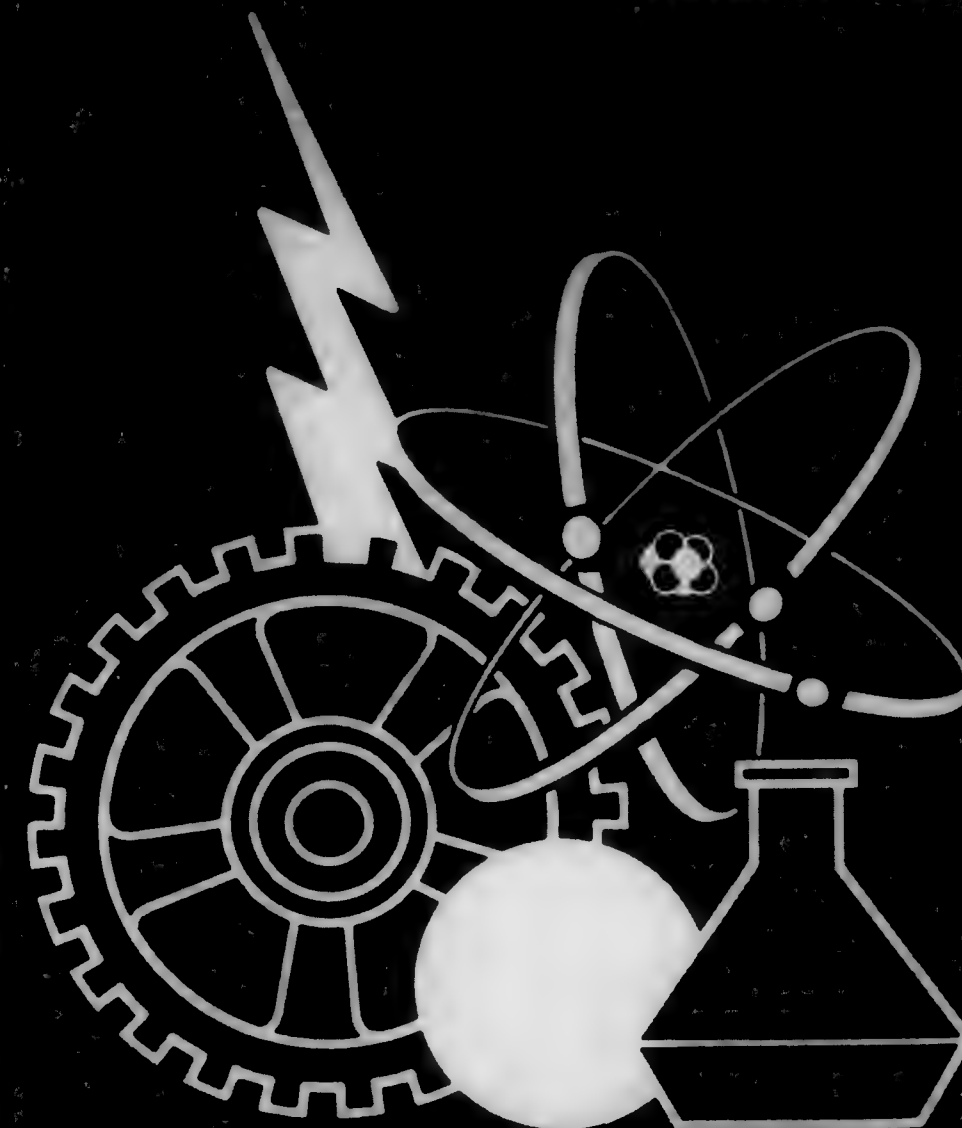
Vol. 1107 Number 5

OFFICIAL GAZETTE

of the
UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

October 31, 1989



PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

OFFICIAL GAZETTE of the
UNITED STATES PATENT AND TRADEMARK OFFICE
October 31, 1989 Volume 1107 Number 5

CONTENTS

	Page
Patent and Trademark Office Notices	
Patent Cooperation Treaty (PCT) Information	1103 OG 82
Status of Appeal Cases	1103 OG 82
Notice of Maintenance Fees Payable	1103 OG 82
Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees	1103 OG 83
Notification of Acceptance of Delayed Payment of Maintenance Fee	1103 OG 85
Reissue Applications Filed	1103 OG 85
Requests for Reexaminations Filed	1103 OG 85
Service by Publication	1103 OG 86
Maintenance Fee Payments	1103 OG 86
Status of PTO Services	1103 OG 87
Patent Certificates of Correction	1103 OG 89
Disclaimers	1103 OG 89
Dedication	1103 OG 89
Disclaimers and Dedications	1103 OG 89
Special Boxes for Mail	1107 OG 90
Reference Collections of U.S. Patents Available for Public Use in	
Patent Depository Libraries	1107 OG 91
Condition of Patent Applications	1107 OG 93
Reissue Patents Granted (33,102)	2129
Plant Patents Granted (7,051)	2131
Patents Granted	
General and Mechanical (4,876,745)	2133
Chemical (4,877,410)	2365
Electrical (4,877,923)	2507
Design Patents Granted (304,255)	2623
Index of Patentees	PI 1
Indices of Reissue and Design Plant Patentees	PI 62
Classification of	
Patents (Including Reissues)	PI 67
Designs, and Plants Applications	PI 70
Geographical Index of Residence of Inventors	
Patents (Including Reissues)	PI 71
Designs and Plant Applications	PI 72
Change of Address Form and Subscription Order Form	Back Page

The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed.
THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.
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COPIES OF PATENTS are furnished by the Patent and Trademark Office at \$1.50 each; PLANT PATENTS in color, \$10.00 each; copies of TRADEMARKS at \$1.50 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1107 O.G. 5 on Oct. 3, 1989.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2 on July 7, 1987 and at 1091 O.G. 2 on June 7, 1988.

The Search fee of the European Patent Office was changed due to a difference in the exchange rate of the U.S. dollar with regard to the German Mark as of Sept. 1, 1989, and was announced in the *Official Gazette* at 1105 O.G. 36 on Aug. 15, 1989.

International PCT fees were changed on June 1, 1989 due to a difference in the exchange rate of the U.S. dollar with regard to the Swiss Franc and were announced in the *Official Gazette* at 1102 O.G. 90 on May 30, 1989.

Certain domestic PCT fees and charges for International Search and Preliminary Examination have been changed effective Apr. 17, 1989 and were announced in the *Official Gazette* at 1100 O.G. 24 on Mar. 7, 1989.

The current schedule of PCT fees (in U.S. dollars) is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
—No corresponding prior U.S. national application filed	550.00
—Corresponding prior U.S. national application filed	380.00
—Supplemental search fee, per additional invention	150.00
European Patent Office as ISA	1040.00
Preliminary examination fee	
USPTO as International Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as ISA	400.00
—Additional examination fee, per additional invention	130.00
—ISA not the USPTO	600.00
—Additional examination fee, per additional invention	200.00
International fees	
Basic fee	436.00
Basic Supplemental fee (for each page over 30)	9.00
Designation fee per country or region for the first 10 national or regional offices	106.00
Designation fee for 11th and subsequent designations	No Charge
Handling fee	134.00

U.S. National Stage fees

	Small Entity	Regular
USPTO was IPEA	165.00	330.00
USPTO was ISA but not IPEA	185.00	370.00
USPTO was neither ISA nor IPEA	250.00	500.00

USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(2) to (4)	25.00	50.00
—For each independent claim in excess of 3	18.00	36.00
—For each claim in excess of 20	6.00	12.00
—For each application containing a multiple dependent claim	60.00	120.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39.1	60.00	120.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39.1	30.00	30.00

Sept. 12, 1989. DONALD J. QUIGG, Assistant Secretary and Commissioner of Patents and Trademarks.

Status of Appeal Cases

The Date of Examiner's Answer of Oldest Ex Parte Appeals Awaiting Assignment to Panel For A Decision Without a Hearing as of September 30, 1989.

Chemical Discipline -	April 3, 1989
Mechanical Discipline -	June 6, 1988
Electrical Discipline -	April 25, 1988

The Date of Examiner's Answer of Oldest Ex Parte Appeals Awaiting Hearing as of September 30, 1989.

Chemical -	October 1, 1987
Electrical -	December 1, 1987
Mechanical -	August 4, 1987

Board of Patent Appeals and Interferences Decisions Rendered in Ex Parte Appeals During the Month of September 1989.

Affirmed	291
Affirmed-in-Part	58
Reversed	177
Total Decided	526

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on application filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Apr. 17, 1989. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the patent.

OCTOBER 31, 1989

U. S. PATENT AND TRADEMARK OFFICE

1107 OG 83

Attention is drawn to the patents which were issued on October 28, 1986, for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,619,003 through 4,620,321
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on October 26, 1982 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,355,424 through 4,356,568
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months and seven years and six months are set forth in 37 CFR 1.20(e), (f), (h) and (i), as amended effective Apr. 17, 1989, which are reproduced below:

37 CFR § 1.20 Post-issuance fees
"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:.....\$245.00"

"(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant:.....\$495.00"

"(h) For maintaining an original or reissue patent except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (\$1.9(f)).....\$245.00
By other than a small entity.....\$490.00"

"(i) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (\$1.9(f)).....\$495.00
By other than a small entity.....\$990.00"

The amounts of the surcharges as amended effective Apr. 17, 1989, are set forth in 37 CFR 1.20 (k), (l) and (m) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982:.....\$120.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity (\$1.9(f)).....\$60.00
By other than a small entity.....\$120.00"

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been unavoidable:.....\$550.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED AUGUST 13, 1989 DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,534,065	06/575,272	08/13/85
4,534,066	06/657,358	08/13/85
4,534,072	06/616,688	08/13/85
4,534,073	06/516,206	08/13/85
4,534,074	06/581,843	08/13/85
4,534,085	06/486,998	08/13/85
4,534,090	06/500,374	08/13/85
4,534,093	06/415,658	08/13/85
4,534,096	06/661,634	08/13/85
4,534,108	06/528,914	08/13/85
4,534,110	06/453,838	08/13/85
4,534,118	06/412,932	08/13/85
4,534,125	06/629,055	08/13/85
4,534,140	06/472,814	08/13/85
4,534,144	06/441,076	08/13/85
4,534,147	06/448,246	08/13/85
4,534,150	06/456,374	08/13/85
4,534,151	06/514,802	08/13/85
4,534,156	06/577,009	08/13/85
4,534,159	06/441,088	08/13/85
4,534,169	06/385,190	08/13/85
4,534,170	06/560,684	08/13/85
4,534,172	06/544,955	08/13/85
4,534,185	06/503,282	08/13/85
4,534,189	06/568,571	08/13/85
4,534,195	06/464,940	08/13/85
4,534,199	06/532,070	08/13/85
4,534,209	06/532,363	08/13/85
4,534,224	06/611,333	08/13/85
4,534,227	06/553,353	08/13/85
4,534,228	06/462,608	08/13/85
4,534,231	06/506,372	08/13/85
4,534,235	06/547,809	08/13/85
4,534,237	06/539,329	08/13/85
4,534,265	06/537,212	08/13/85
4,534,271	06/508,793	08/13/85
4,534,276	06/665,313	08/13/85
4,534,280	06/545,229	08/13/85
4,534,282	06/374,906	08/13/85
4,534,293	06/667,315	08/13/85
4,534,296	06/490,025	08/13/85
4,534,303	06/537,482	08/13/85
4,534,307	06/540,042	08/13/85
4,534,308	06/438,276	08/13/85
4,534,310	06/512,680	08/13/85
4,534,311	06/561,927	08/13/85
4,534,317	06/645,788	08/13/85
4,534,319	06/589,214	08/13/85
4,534,339	06/542,611	08/13/85
4,534,342	06/594,208	08/13/85
4,534,369	06/641,212	08/13/85
4,534,370	06/537,447	08/13/85
4,534,373	06/428,562	08/13/85
4,534,377	06/543,162	08/13/85
4,534,391	06/560,733	08/13/85
4,534,393	06/617,963	08/13/85
4,534,399	06/625,278	08/13/85
4,534,402	06/478,273	08/13/85

Patent Number	Serial Number	Issue Date	4,534,835	06/454,674	08/13/85
4,534,407	06/527,810	08/13/85	4,534,844	06/678,480	08/13/85
4,534,418	06/447,259	08/13/85	4,534,851	06/500,408	08/13/85
4,534,430	06/562,514	08/13/85	4,534,858	06/616,905	08/13/85
4,534,431	06/594,132	08/13/85	4,534,862	06/521,775	08/13/85
4,534,432	06/332,209	08/13/85	4,534,863	06/612,905	08/13/85
4,534,445	06/609,617	08/13/85	4,534,890	06/570,202	08/13/85
4,534,446	06/563,667	08/13/85	4,534,891	06/574,155	08/13/85
4,534,448	06/463,294	08/13/85	4,534,897	06/598,608	08/13/85
4,534,460	06/457,970	08/13/85	4,534,901	06/523,968	08/13/85
4,534,464	06/448,030	08/13/85	4,534,913	06/572,805	08/13/85
4,534,467	06/668,172	08/13/85	4,534,937	06/479,900	08/13/85
4,534,471	06/488,678	08/13/85	4,534,946	06/558,777	08/13/85
4,534,472	06/533,663	08/13/85	4,534,955	06/510,379	08/13/85
4,534,474	06/430,279	08/13/85	4,534,984	06/523,807	08/13/85
4,534,476	06/510,703	08/13/85	4,534,993	06/569,869	08/13/85
4,534,481	06/636,910	08/13/85	4,534,994	06/608,023	08/13/85
4,534,488	06/673,592	08/13/85	4,535,014	06/307,439	08/13/85
4,534,501	06/357,240	08/13/85	4,535,019	06/270,265	08/13/85
4,534,505	06/569,450	08/13/85	4,535,024	06/438,220	08/13/85
4,534,517	06/540,492	08/13/85	4,535,026	06/509,118	08/13/85
4,534,520	06/563,218	08/13/85	4,535,031	06/586,108	08/13/85
4,534,524	06/539,119	08/13/85	4,535,032	06/539,034	08/13/85
4,534,525	06/493,386	08/13/85	4,535,059	06/457,807	08/13/85
4,534,527	06/575,407	08/13/85	4,535,065	06/421,111	08/13/85
4,534,528	06/574,529	08/13/85	4,535,074	06/593,323	08/13/85
4,534,529	06/503,668	08/13/85	4,535,076	06/503,371	08/13/85
4,534,531	06/283,157	08/13/85	4,535,079	06/543,013	08/13/85
4,534,537	06/504,258	08/13/85	4,535,087	06/443,010	08/13/85
4,534,548	06/549,734	08/13/85	4,535,089	06/494,023	08/13/85
4,534,553	06/415,357	08/13/85	4,535,091	06/589,290	08/13/85
4,534,562	06/502,050	08/13/85	4,535,092	06/438,351	08/13/85
4,534,565	06/625,675	08/13/85	4,535,147	06/629,281	08/13/85
4,534,566	06/638,531	08/13/85	4,535,164	06/478,272	08/13/85
4,534,567	06/463,636	08/13/85	4,535,172	06/338,008	08/13/85
4,534,570	06/594,986	08/13/85	4,535,179	06/471,760	08/13/85
4,534,576	06/471,133	08/13/85	4,535,192	06/671,330	08/13/85
4,534,581	06/561,474	08/13/85	4,535,202	06/509,789	08/13/85
4,534,583	06/441,190	08/13/85	4,535,213	06/435,509	08/13/85
4,534,584	06/464,258	08/13/85	4,535,217	06/516,144	08/13/85
4,534,588	06/603,682	08/13/85	4,535,223	06/544,830	08/13/85
4,534,591	06/433,905	08/13/85	4,535,224	06/544,829	08/13/85
4,534,593	06/492,191	08/13/85	4,535,230	06/367,056	08/13/85
4,534,594	06/677,321	08/13/85	4,535,240	06/535,384	08/13/85
4,534,605	06/497,206	08/13/85	4,535,254	06/492,025	08/13/85
4,534,607	06/616,873	08/13/85	4,535,278	08/481,324	08/13/85
4,534,609	06/524,987	08/13/85	4,535,280	06/594,300	08/13/85
4,534,627	06/402,049	08/13/85	4,535,288	06/399,320	08/13/85
4,534,654	06/517,587	08/13/85	4,535,293	06/526,727	08/13/85
4,534,663	06/539,665	08/13/85	4,535,297	06/569,429	08/13/85
4,534,670	06/552,111	08/13/85	4,535,298	06/549,479	08/13/85
4,534,672	06/582,822	08/13/85	4,535,312	06/530,182	08/13/85
4,534,675	06/535,792	08/13/85	4,535,321	06/612,551	08/13/85
4,534,686	06/455,987	08/13/85	4,535,325	06/510,586	08/13/85
4,534,699	06/506,785	08/13/85	4,535,331	06/533,120	08/13/85
4,534,703	06/527,686	08/13/85	4,535,336	06/545,402	08/13/85
4,534,705	06/460,025	08/13/85	4,535,339	06/525,390	08/13/85
4,534,708	06/638,496	08/13/85	4,535,346	06/493,317	08/13/85
4,534,716	06/536,917	08/13/85	4,535,355	06/415,317	08/13/85
4,534,725	06/364,305	08/13/85	4,535,370	06/452,335	08/13/85
4,534,736	06/602,713	08/13/85	4,535,386	06/497,099	08/13/85
4,534,737	06/495,528	08/13/85	4,535,390	06/623,834	08/13/85
4,534,743	06/528,310	08/13/85	4,535,391	06/632,886	08/13/85
4,534,747	06/522,598	08/13/85	4,535,394	06/559,298	08/13/85
4,534,753	06/559,672	08/13/85	4,535,395	06/521,026	08/13/85
4,534,759	06/488,543	08/13/85	4,535,400	06/529,307	08/13/85
4,534,762	06/453,606	08/13/85	4,535,403	06/618,776	08/13/85
4,534,778	06/542,058	08/13/85	4,535,418	06/445,378	08/13/85
4,534,786	06/600,260	08/13/85	4,535,435	06/393,292	08/13/85
4,534,796	06/307,448	08/13/85	4,535,436	06/504,223	08/13/85
4,534,800	06/554,681	08/13/85	4,535,443	06/504,101	08/13/85
4,534,802	06/573,259	08/13/85	4,535,444	06/341,671	08/13/85
			4,535,446	06/524,776	08/13/85

Patent Number	Serial Number	Issue Date	4,535,471	06/526,843	08/13/85
4,535,457	06/593,759	08/13/85	4,535,474	06/522,993	08/13/85
			4,535,475	06/427,000	08/13/85

NOTIFICATION OF ACCEPTANCE OF DELAYED PAYMENT OF MAINTENANCE FEE (35 U.S.C. 41(c); 37 CFR 1.378)

The patent(s) listed below is considered as not having expired but is subject to the conditions set forth in 35 U.S.C. 41(c)(2), in view of the Petition to Accept Late Payment of the maintenance fees which has been GRANTED BY THE COMMISSIONER OF PATENTS AND TRADEMARKS, as provided for under 35 U.S.C. 41(c)(1) and 37 CFR 1.378.

Patent No	Serial No.	Patent Date	Application Filing Date	Delayed Payment Acceptance Date
4,456,413	06/434,294	06/26/84	10/14/82	09/26/89

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

4,606,166, Re. S. N. 233,633, Filed Aug. 18, 1988, Cl. 52/644, FIRE-RATED BEAM WITH EXPANSION RELIEF SECTION, Eugene E. Brady, et al., Owner of Record: *National Rolling Mills Inc., Malvern, Pa.*, Attorney or Agent: Eugene Chovanec, Ex. Gp.: 354

4,665,851, Re. S. N. 411,826, Filed Sept. 25, 1989, Cl. 112/262.100, METHOD OF ASSEMBLING TEXTILES, Paul J. Sweet, Owner of Record: *Inventor*, Attorney or Agent: Donald S. Dowden, Ex. Gp.: 247

4,679,637, Re. S. N. 384,775, Filed July 14, 1989, Cl. 175/61, APPARATUS AND METHOD FOR FORMING AN ENLARGED UNDERGROUND ARCuate BORE AND INSTALLING A CONDUIT THEREIN, Martin D. Cherrington, Owner of Record: *Inventor(s)*, Attorney or Agent: William L. Lafuze, Ex. Gp.: 356

4,694,924, Re. S. N. 411,305, Filed Sept. 22, 1989, Cl. 180/068.3, MOTOR CYCLE, Toshimitsu Asakura, et al., Owner of Record: *Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan*, Attorney or Agent: Gerald H. Kiel, Ex. Gp.: 316

4,695,176, Re. S. N. 410,734, Filed Sept. 21, 1989, Cl. 410/144, FOUNTAIN APPLICATION HANDLE WITH REFILL VALVE, Dallas W. Simonette, et al., Owner of Record: *Power-Flo Products Corporation, Minneapolis, Minn.*, Attorney or Agent: John L. Knoble, Ex. Gp.: 332

4,695,953, Re. S. N. 410,651, Filed Sept. 21, 1989, Cl. 364/410, T.V. ANIMATION INTERACTIVELY CONTROLLED BY THE VIEWER, Preston E. Blair et al., Owner of Record: *Inventor(s)*, Attorney or Agent: Leslie G. Murray, Ex. Gp.: 236

4,700,979, Re. S. N. 408,865, Filed Aug. 28, 1989, Cl. 294/89, APPARATUS FOR LIFTING CONCRETE PANELS, Peter D. Courtois, et al., Owner of Record: *Dayton Superior Corp., Miamisburg, Ohio*, Attorney or Agent: Thomas W. Flynn, Ex. Gp.: 312

4,708,338, Re. S. N. 411,803, Filed Sept. 25, 1989, Cl. 272/70, STAIR CLIMBING EXERCISE APPARATUS, Lanny L. Potts, Owner of Record: *Tri-Tech Inc., Tulsa, Okla.*, Attorney or Agent: Richard L. Hughes, Ex. Gp.: 332

4,758,723, Re. S. N. 409,440, Filed Sept. 18, 1989, Cl. 250/305, ELECTRON SPECTROMETER, Ian R. M. Wardell et al., Owner of Record: *VG Instruments Group Ltd.*, Attorney or Agent: Authur Schwartz, Ex. Gp.: 256

4,785,102, Re. S. N. 411,962, Filed Sept. 25, 1989, Cl. 546/20, PHOTOLYTICALLY CLEAVABLE, N-ACYLATED

STERICALLY HINDERED AMINES, Godwin Berner, et al., Owner of Record: *Ciba-Geigy Corp., Ardsley, N.Y.*, Attorney or Agent: Joann Villamizar Ex. Gp.: 129

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

3,425,430, Reexam. No. 90/001,804, Requested June 30, 1989, Cl. 318/576, FLUID-OPERATED SYSTEM, Billy M. Horton, Owner of Record: *Ronald E. Bowles, Raymond W. Warren, Billy M. Horton, Shaker Heights, Ohio*, Attorney or Agent: Unknown, Ex. Gp.: 210, Requester: Jim Zegeer, Alexandria, Va.

3,826,728, Reexam. No. 90/001,848, Requested Sept. 25, 1989, Cl. 204/192, TRANSPARENT ARTICLES HAVING REDUCED SOLAR RADIATION TRANSMITTANCE AND METHOD OF MAKING THE SAME, Douglas L. Chambers, et al., Owner of Record: *The BOC Group, PLC., Windlesham Surrey, England*, Attorney or Agent: David Draeger, Ex. Gp.: 110, Requester: Shatterproof Glass Corp., Detroit, Mich.

4,314,665, Reexam. No. 90/001,849, Requested Sept. 27, 1989, Cl. 236/46, ELECTRONIC THEROSTAT, Michael Levine, Owner of Record: *Honeywell Inc., Minneapolis, Minn.*, Attorney or Agent: Unknown, Ex. Gp.: 340, Requester: Owner

4,473,362, Reexam. No. 90/001,853, Requested: Sept. 29, 1989, Cl. 474/135, BELT TENSIONER WITH VARIABLY PROPORTIONAL DAMPING, Henry W. Thomey, et al., Owner of Record: *Litens Automotive Inc., Ontario, Canada*, Attorney or Agent: Cushman, Darby & Cushman, Ex. Gp.: 350, Requester: The Gates Rubber Co., Denver, Colo.

4,484,104, Reexam. No. 90/001,852, Requested Sept. 29, 1989, Cl. 315/86, SOLAR-POWERED LIGHTING SYSTEM, Peter O'Brien, Owner of Record: *Solarmark ITL, Crownest, New South Wales, Australia*, Attorney or Agent: Kimmel, Crowell & Weaver, Ex. Gp.: 260, Requester: William A. Blake, Arlington, Va.

4,491,005, Reexam. No. 90/001,851, Requested Sept. 27, 1989, Cl. 72/201, ROLLING MILL, Tomoaki Kimura, et al., Owner of Record: *Hitachi Ltd., Tokyo, Japan*, Attorney or Agent: Thomas E. Beall, Ex. Gp.: 320, Requester: SMS Shloemann-Siemag AG, Dusseldorf, Germany

4,841,988, Reexam. No. 90/001,850, Requested Sept. 27, 1989, Cl. 128/804, MICROWAVE HYPER THERMIA, Richard

W. Fetter, et al., Owner of Record: *Marquette Electronics, Inc.*, Milwaukee, Wis., Attorney or Agent: Andrus, Scealess, Starke & Sawall, Ex. Gp.: 330, Requester: Owner

Service by Publication

A petition to cancel the registration identified below having been filed, and the notice of such proceeding sent by certified mail to registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrant listed herein, its assigns or legal representatives shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

San Francisco Shirt Works, Inc., San Francisco, Calif., Reg. No. 1,013,581, for the mark "PRIVATE RESERVE" and design, Canc. No. 17,925

ERMA S. BROWN
Administrator of the Trademark Trial
and Appeal Board
For JEFFREY M. SAMUELS
Assistant Commissioner for
Trademarks

MAINTENANCE FEE PAYMENTS

The Patent and Trademark Office (PTO) has received inquiries concerning the PTO's refusal to accept payment of a maintenance fee in two fact situations.

A. The PTO has refused to accept authorization to charge a maintenance fee and/or surcharge to a Deposit Account unless the paper containing the authorization to charge was timely filed and included an authorizing signature. Upon reconsideration, this requirement for a signature to authorize a maintenance fee and/or surcharge to be charged to a Deposit Account is abolished since papers concerning maintenance fees are not considered to be papers filed in the application under 37 CFR 1.33(a).

Request for refunds due to the above-noted change in practice should be directed to the Refund Section of the Accounting Division of the Office of Finance.

B. The PTO has refused to accept the maintenance fee and surcharge specified in a Maintenance Fee Reminder mailed prior

to April 17, 1989, but paid on or after April, 17, 1989. New fees effective April 17, 1989, raised the amount due for maintenance fees and surcharges. However, Maintenance Fee Reminders mailed prior to that date reflected the old fees. Some patentees have submitted the amount requested on the Maintenance Fee Reminder only to have the PTO refuse to accept those fees due as being insufficient. Often, the PTO notice that the amount tendered is insufficient is received after the expiration date of the patent under 37 CFR 1.362(g).

The amount of the maintenance fee required by statute is based upon the date of effective receipt in the PTO. The amount of the surcharge needed for payment during the six month grace period is set by regulation. The PTO will accept the payment submitted under the following conditions:

(1) the total amount submitted for the maintenance fee and surcharge was at least the amount of the maintenance fee required by statute based upon the date of receipt in the PTO and was the total amount requested in the Maintenance Fee Reminder for the patent;

(2) the amount submitted was paid prior to expiration of the patent under 37 CFR 1.362(g);

(3) the insufficiency in payment of the maintenance fee and surcharge is discovered after expiration of the patent under 37 CFR 1.362(g); and

(4) a petition under 37 CFR 1.183 is promptly filed after discovery of the insufficiency in payment of the maintenance fee and surcharge. The petition must request (a) that the amount previously paid be accepted as the maintenance fee required by statute; (b) that the amount submitted above that required for the maintenance fee be accepted as the surcharge; (c) that the holding of expiration be withdrawn; and (d) that no petition fee be required. The petition must state the date the insufficiency in payment of the maintenance fee and surcharge was discovered. The petition must also include a statement that the person who authorized or instructed that the maintenance fee and surcharge be paid was not aware of the fee increase. Such statement must be verified if made by a person not registered to practice before the PTO.

Petition under 37 CFR 1.183 should be directed to the Office of the Deputy Assistant Commissioner for Patents.

October 4, 1989

DONALD J. QUIGG
Assistant Secretary and
Commissioner of Patents
and Trademarks

Status of PTO Services

The following is an update of the status of PTO services for August 1989:

Service Item	FY 1989 Goal (Calendar Days ¹)	Monthly Average (Calendar Days ¹)
Filing Receipts:		
Patents	22	16
Trademarks	30	18
Patent/Trademark Copies:		
Special Window Coupons	24 Hours	14 Hours
Window Coupons	5	2
Mail Coupons	12	6
Letter Orders	16	8
Certified Copies:		
Trademark Registrations	21	35
Applications-As-Filed	17	13*
File-Wrapper/Contents	N/A	16
Walk-up Certification	1	1
Trademark Search Library:		
Filing Pending Marks	21	28**
Filing Reg. Certificates	Issue Date+2 Days	+1 Day
Filing Temp. Drawings	6	7
Assignments:		
Recording Patent-New Applications	43	121***
Recording Patents-Mail Room Recpts.	20	122***
Receipt Date of Bulk Pat. Docs.		
Returned by End of Month		Mar. 27-Apr. 9, 1989***
Recording Trademarks	20	84***
Receipt Date of Bulk		
Trademark Documents		
Returned by End of Month		June 19-July 2, 1989***
Avg. Days from Issue Fee		
Payment to Issue Date	90-100	74
Issue Fee Receipts Mailed	4 weeks prior to Issue Date	+27 Days****
Patent Copies Available	95% on Issue Date	+67 Days****
Trademark Copies Available	95% on Issue Date	99% on Issue Date

¹ Unless otherwise noted.

* The 5% of orders for which fiche are not on site are not included in calculations.

** Staffing vacancies exist in TMSL. Overtime is being used to reduce the backlog.

*** Working on backlog.

**** Contractor difficulties in keeping up with the increase in the quantities of patents being issued.

IMPROVEMENT TO SERVICES

•*Mail Processing Improvements—Preaddressed Incoming Mail*—In July 1989, a pilot program was established to determine the feasibility of providing preaddressed return envelopes and/or preaddressed labels with Office actions in order to provide faster and more accurate handling of responses. Four offices - a Trademark Law Office, a Patent Examining Group, the Patent Application Division, and the Assignment Division are involved in the pilot program. From July through September, each of these offices mailed out an envelope and a label with each office action for which a response is expected. A total of four thousand envelopes and labels have been mailed out. The envelopes and labels are a distinctive yellow color so that the PTO can readily sort them from other mail. Records of receipts will be analyzed to determine the responsiveness in using the envelopes or labels provided and the predominant preference of the two alternatives. The pilot will terminate in December. Thus far, the response has been almost unanimously in favor of the program.

•*Trademark Minority Exhibit*—An exhibit focusing on black entrepreneurship in the 20th century was unveiled recently at the PTO. It features eight registered trademark holders whose accomplishments reflect the growth and diversity of Black-owned businesses in this century. The exhibit was developed collaboratively by the Assistant Commissioners for Trademarks and Administration. After an inaugural showing at the PTO, the exhibit was on display at a Blacks in Government meeting and will be available for other meetings and special events.

•*Voice Information System—Special Boxes*—Effective Oct. 1, 1989, The PTO began a four-month test of a prerecorded Voice Information System. The system will contain messages on special box designations within the PTO which enable the Mail Room to identify and sort mail at a faster rate. Use of the special box designations will result in a more efficient operation and provide better service to the public.

In order to reach the prerecorded message, callers should dial (703) 557-MAIL. The system will answer calls 24 hours a day, 7 days a week. If the service is determined to be useful to the public, it will be installed permanently with an additional referral feature that will allow callers who need additional information to be transferred to a Information Specialist in the Public Service Center.

HELPFUL HINTS

•Appeal Briefs—Briefs filed in cases where the notice of appeal to the Board of Patent Appeals and Interferences was filed on or after Sept. 12, 1988, must comply with amended 37 CFR 1.192(c) and MPEP Section 1206. 37 CFR 1.192(c) now requires that the brief contain at least the following headings, in the order indicated, and narratives as explained therein and elaborated upon in MPEP Section 1206:

- (1) Status of Claims
- (2) Status of Amendments
- (3) Summary of Invention
- (4) Issues
- (5) Grouping of Claims
- (6) Argument - Each issue presented for review should be treated under the following headings, as appropriate:
 - (i) 35 U.S.C. Section 112, first paragraph
 - (ii) 35 U.S.C. Section 112, second paragraph
 - (iii) 35 U.S.C. Section 102
 - (iv) 35 U.S.C. Section 103
 - (v) Other Rejections
- (7) Appendix - A clean copy of the claims, preferably double spaced, involved in the appeal.

37 CFR 1.192(d) provides that if a brief is filed which does not comply with the requirements of paragraph (c), the appellant will be notified of the reasons for non-compliance and given a one month time limit within which to file an amended brief.

If the applicant does not file an amended brief within the one-month period, or files an amended brief which does not overcome all the reasons for non-compliance stated in the notification, the appeal will be dismissed.

Oct. 6, 1989

THERESA A. BRELSFORD
Assistant Commissioner
for Administration

PATENT NOTICES

Certificates of Correction For Week of October 31 1989

4,515,920	4,778,787	4,802,567	4,813,772
4,556,126	4,779,111	4,802,743	4,813,823
4,693,014	4,779,149	4,803,170	4,814,107
4,708,141	4,780,121	4,805,075	4,814,158
4,710,403	4,783,367	4,805,154	4,814,243
4,717,189	4,783,376	4,806,234	4,814,324
4,719,295	4,783,524	4,806,288	4,814,404
4,719,373	4,785,355	4,806,645	4,814,620
4,726,876	4,785,427	4,806,920	4,815,169
4,728,825	4,785,440	4,807,172	4,815,685
4,735,259	4,786,107	4,807,193	4,816,834
4,736,230	4,786,377	4,807,405	4,817,229
4,737,857	4,786,501	4,807,596	4,817,359
4,739,164	4,787,148	4,808,045	4,817,403
4,743,917	4,788,485	4,808,138	4,817,655
4,746,406	4,789,415	4,808,255	4,817,747
4,748,474	4,789,672	4,808,302	4,818,126
4,749,848	4,789,999	4,809,103	4,818,171
4,749,931	4,790,165	4,810,003	4,818,185
4,750,888	4,792,669	4,810,118	4,818,380
4,751,344	4,794,164	4,810,122	4,818,630
4,751,553	4,794,342	4,810,358	4,818,848
4,752,254	4,795,466	4,810,361	4,818,874
4,753,649	4,795,962	4,810,518	4,818,947
4,755,450	4,796,118	4,811,050	4,819,459
4,757,213	4,797,319	4,811,273	4,819,770
4,760,353	4,798,511	4,811,564	4,819,779
4,762,521	4,798,796	4,812,133	4,820,045
4,764,728	4,800,175	4,812,178	4,820,397
4,765,717	4,800,404	4,812,311	4,820,840
4,766,135	4,800,597	4,812,810	4,821,370
4,767,293	4,800,639	4,812,872	4,822,261
4,768,227	4,800,681	4,812,971	4,828,210
4,769,018	4,800,980	4,813,365	4,828,469
4,770,493	4,801,330	4,813,481	4,829,072
4,771,350	4,801,980	4,813,657	4,829,787
4,774,963	4,802,226	4,813,687	
4,775,476	4,802,371	4,813,691	

Disclaimers

4,086,287.—Warren W. Kaeding, Westfield; Lewis B. Young, Kendall Park, both of N. J. SELECTIVE ETHYLATION OF MONO ALKYL BENZENES. Patent dated Apr. 25, 1978. Disclaimer filed Jan. 27, 1988, by the assignee, Mobil Oil Corp.

The term of this patent subsequent to April 25, 1995, has been disclaimed.

4,699,469.—Heinz John, Ottobrunn, Josef Windele, Puchheim, both of Fed. Rep. of Germany. CONTACT PRESSURE MECHANISM FOR A WEB-SHAPED IMAGE RECEIVING MATERIAL. Patent dated Oct. 13, 1987. Disclaimer filed July 17, 1989, by the assignee, Siemens Aktiengesellschaft.

Hereby enters this disclaimer to claims 1, 2, 6, and 7 of said patent.

4,761,686.—Donald H. Willis, Indianapolis, Ind. TV RECEIVER HAVING FREEZE FIELD DISPLAY. Patent dated Aug. 2, 1988. Disclaimer filed July 21, 1989, by the assignee, RCA Licensing Corp.

Hereby enters this disclaimer to claim 1 of said patent.

4,763,418.—John A. Decker, Jr., Wailuku, Hi. AUTOMATIC SEXTANT. Patent dated Aug. 16, 1988. Disclaimer filed Aug. 3, 1989, by the assignee, Kuau Technology, Ltd.

The term of this patent subsequent to Nov. 24, 2004, has been disclaimed.

Dedication

4,747,859.—David C. F. Gladman, Toddington; John D. Oakley, London, both of England. AIR SEPERATION. Patent dated May 31, 1988. Dedication filed July 14, 1989, by the assignee, the BOC Group plc.

Hereby dedicates to the Public claims 1-12, of said patent.

Disclaimers and Dedications

4,560,691.—George Y. Leshner, Schodack; Baldev Singh, East Greenbush, both of N. Y. 5-(PHENYL)-1, 6-NAPHTHYRIDIN-2(1H)-ONES, THEIR CARDIOTONIC USE AND PREPARATION. Patent dated Dec. 24, 1985. Disclaimer and Dedication filed Sept. 18, 1989, by the assignee, Sterling Drug Inc.

Hereby disclaims and dedicates to the Public claims 16, 17 and 22 of said patent.

4,574,806.—Brian D. McCarthy, Miami, Fla. TUNNELLING DEVICE FOR PERIPHERAL VASCULAR RECONSTRUCTION. Patent dated Mar. 11, 1986. Disclaimer and Dedication filed July 13, 1989, by the assignee, Bio Nova Neo Technics Pty. Ltd.

Hereby disclaims and dedicates to the Public claims 1 through 19 of said patent.

4,763,983.—P. Stephen Keith, Rougemont, N. C. OPTICAL TRANSMISSION CABLE WITH MESSENGER. Patent dated Aug. 16, 1988. Disclaimer and Dedication filed Apr. 10, 1989, by the assignee, Sumitomo Electric Fiber Optics Corp.

Hereby disclaims and dedicates to the Public claims 4, 5 and 9 of said patent.

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PATENT EXAMINING CORPS

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GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	1-3-89

Expiration of patents: The patents within the range of numbers indicated below expire during September 1989, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents	Numbers 3,688,314 to 3,694,813 inclusive
Plant Patents	None

REISSUES

OCTOBER 31, 1989

Matter enclosed in heavy brackets [] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

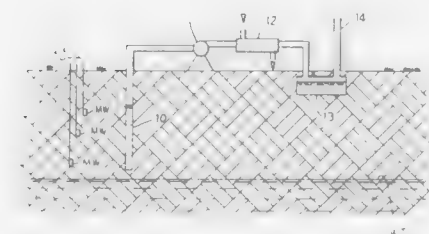
Re. 33,102

REMOVAL OF VOLATILE CONTAMINANTS FROM THE VADOSE ZONE OF CONTAMINATED GROUND
Melvin J. Visser, Portage, Mich., and James J. Malot, Dorado, P.R., assignors to The Upjohn Company, Kalamazoo, Mich.
Original No. 4,660,639, dated Apr. 28, 1987, Ser. No. 826,713, Feb. 6, 1986. Continuation of Ser. No. 567,972, Jan. 4, 1984, Pat. No. 4,590,760. Application for reissue Jul. 12, 1988, Ser. No. 218,154

Int. Cl.⁴ E21B 43/00

U.S. Cl. 166—267

8 Claims U.S. Cl. 210—172



1. A process for removing a not-naturally-occurring, volatile liquid contaminant from a contaminated area of the earth, wherein the contaminated area of the earth has a subsurface water table and a subsurface vadose zone above the water table, the contaminant being present in the vadose zone, which comprises the steps of:

- establishing a borehole extending downwardly from the surface of the ground within the contaminated area;
- placing a first conduit within said borehole so that a ring-shaped zone is formed between the wall of said borehole and said conduit, said conduit having a perforate lower portion located in the vadose zone and spaced vertically above the water table so that fluids can flow from the vadose zone into the interior of said conduit, said perforate lower portion having an upper end and a lower end, said conduit having an imperforate upper portion above the upper end of said perforate lower portion [];
- filling fluid-permeable first fill material into a lower portion of said ring-shaped zone around said perforate lower portion of said conduit and which extends to the upper end of said perforate lower portion so that said first fill material will permit fluid readily to flow into said perforate lower portion of said conduit;
- filling a second fill material of low fluid permeability into an upper portion of said ring-shaped zone around said imperforate upper portion of said conduit, said second fill material being effective to impede flow of air from the surface of the ground to the lower portion of the borehole;
- applying a vacuum to the upper end of said conduit effective to induce flow of air and a gas containing vapor of said contaminant present in said vadose zone into the lower portion of said conduit and thence to the upper end of said conduit, the vacuum being effective to cause vaporization of a substantial quantity of said contaminant within the vadose zone around the borehole so that said contaminant is removed from the ground in vapor form.

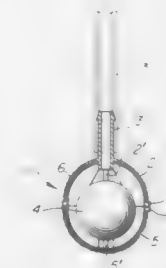
Re. 33,103

STRAINER

Akira Nagashima, Kawasaki, Japan, assignor to Kioritz & Corporation, Japan
Original No. 4,428,835, dated Jan. 31, 1984, Ser. No. 394,396, Jul. 1, 1982. Continuation of Ser. No. 824,212, Jan. 30, 1986, abandoned. Application for reissue Apr. 21, 1988, Ser. No. 186,694

Claims priority, application Japan, Jul. 8, 1981, 56-100657[U]
Int. Cl.⁴ B01D 35/28

16 Claims



2. A strainer for removing impurities from a liquid being transferred from a body of the liquid to a liquid sucking device, said strainer comprising:

- a perforate shell having an inside surface defining an internal cavity and exposed surface means on the shell to facilitate free rolling of the outer surface of the shell in contact with a surface on a tank confining the body of liquid;
- a single flexible liquid sucking tube means for delivering liquid to a liquid sucking device and for attaching the shell to a liquid sucking device so that the shell changes its posture readily in response to a change in posture of the liquid sucking device;
- outlet means for communicating said cavity with the liquid sucking tube means;
- a strainer element associated with the perforate shell to capture and thereby prevent impurities in a body of liquid from reaching said internal cavity;
- a weight having an outer surface; and
- means mounting the weight substantially entirely within the cavity and in spaced relationship to at least a portion of the inside surface of the shell and the outlet means for the cavity so that the outer surface of the weight and inside surface portion of the shell cooperatively establish a flow path through said cavity communicating with said outlet means for conducting strained liquid through the shell and to the sucking device.

Re. 33,104

ROCK CLIMBING ADJUSTABLE CHOCK

Peter C. Taylor, 1222 N. DeJoy St., Santa Maria, Calif. 93454
Original No. 4,575,032, dated Mar. 11, 1986, Ser. No. 719,990, Apr. 4, 1985. Application for reissue Sep. 14, 1987, Ser. No. 96,920

Int. Cl.⁴ A47G 29/00

U.S. Cl. 248—231.2

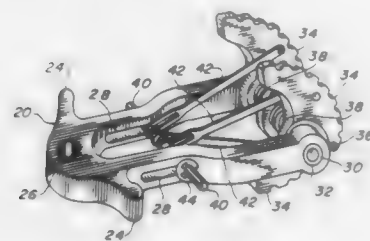
14 Claims

- 8. A rock climbing adjustable chock of the type having opposed pivotal cams the improvement comprising:
 - (a) a bifurcated yoke handle having a hole in each fork on the first end and a second end;
 - (b) a shaft tensionally positioned between said forks of the handle, each end urgingly supported within said holes;
 - (c) a plurality of opposed cams rotatably positioned on said

shaft, at least one pivoting in one direction and at least a pair pivoting in the opposite direction, for gripping the inside surface of a crack in a rock;

(d) a plurality of torsional springs disposed upon said shaft with each end pivotally fixed to said cam urging opposed rotation thereof;

(e) a pull rod slideably disposed relative to each fork and free to move transversely fore and aft, providing a gripping surface for actuation of said chock; and;



(f) a plurality of connecting links, each link freely reciprocable having one end pivotally mounted on the periphery of said cam and the other end slidably joined to said pull rod for retractably rotating said spring loaded opposed cams when sliding said pull rod toward said second yoke end while being

inserted into an open rock fault, further providing an adjustable device to which a climbing rope may be attached to arrest a fall.

Re. 33,105

SEPARATION OF MANNOSE BY SELECTIVE ADSORPTION ON ZEOLITIC MOLECULAR SIEVES
John D. Sherman, Chappaqua, and Chien C. Chao, Millwood, both of N.Y., assignors to UOP, Des Plaines, Ill.
Original No. 4,471,114, dated Sep. 11, 1984, Ser. No. 454,646, Dec. 30, 1982. Application for reissue Sep. 9, 1986, Ser. No. 51,271

Int. Cl.⁴ C07H 1/06; C13D 3/12

U.S. Cl. 536—127

51 Claims

15. A selective adsorption process for the separation of glucose from a mixture containing glucose and xylose which comprises contacting said mixture at a pressure sufficient to maintain the mixture in the liquid phase with an adsorbent composition comprising at least one crystalline aluminosilicate zeolite selected from the group consisting of BaY, NaX, CaY and mixtures thereof, whereby glucose is selectively adsorbed thereon, removing the non-adsorbed portion of said mixture from contact with the zeolite adsorbent and desorbing the adsorbent therefrom by contacting said adsorbent with a desorbing agent and recovering glucose.

PLANT PATENTS

GRANTED OCTOBER 31, 1989

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

7,051

MINIATURE ROSE PLANT

Gijsbert de Ruiter, Hazerswoude, Netherlands, assignor to de Ruiter's Nieuwe Rozen B.V., Netherlands

Filed Sep. 15, 1988, Ser. No. 245,008

Int. Cl.⁴ A01H 5/00

U.S. Cl. Plt.—9

1 Claim

1. A new and distinct variety of rose plant of the miniature rose class, substantially as shown and described, characterized particularly by a plant suitable for growing in pots and by attractive light pink flowers which are long lasting on the plant.

7,052

HYBRID TEA ROSE PLANT NAMED BURAM

Joseph Winchel, Harbor City, Calif., assignor to Larry J. Burks, Tyler, Tex.

Filed Nov. 7, 1988, Ser. No. 268,937

Int. Cl.⁴ A01H 5/00

U.S. Cl. Plt.—21

1 Claim

1. A new and distinct variety of rose plant of the hybrid tea class, substantially as shown and described, characterized particularly by flowers with exhibition form and brilliant red coloration.

PATENTS

GRANTED OCT. 31, 1989

ERRATA

For CLASS	See PATENT NO.
460-097	4,877,039
165-181	4,877,087
206-459	4,877,119
220-269	4,877,129
209-601	4,877,138
206-514	4,877,151
248-298	4,877,204
356-350	4,877,311
418-051	4,877,379
075-005	4,877,445
552-204	4,877,559
156-610	4,877,573
585-751	4,877,581
426-087	4,877,609
428-645	4,877,696
428-034	4,877,705
548-336	4,877,801
525-146	4,877,813
252-344	4,877,842
544-227	4,877,873
528-272	4,877,922
219-381	4,877,990
371-005	4,878,049
367-137	4,878,210
374-166	4,878,226

PATENTS

GRANTED OCTOBER 31, 1989

GENERAL AND MECHANICAL

4,876,745

KNEE PADS

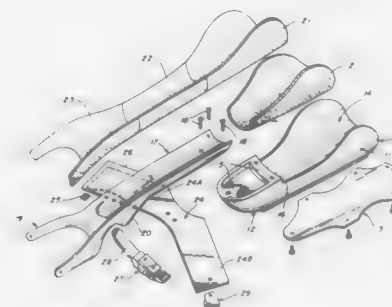
Lee E. Richards, 1681 Devine Rd., North Whitfield, Me. 04253

Filed May 12, 1988, Ser. No. 192,912

Int. Cl.⁴ A41D 13/00

U.S. Cl. 2—24

19 Claims



1. A knee pad attachable to a lower leg, said knee pad including a flat bottomed support of a length, when so attached and the knee bent with the wearer in a kneeling position, such as to underlie the knee cap and an adjacent portion of the tibia, the upper portion of said support having a concavity for the knee cap and provided with a cushioning layer and including a leg-receiving channel provided with a cushioning layer and inclined away from the surface on which the wearer is kneeling and extending beyond the support and towards the foot of said leg, and means connected to the channel and operable to secure the channel to the leg about the calf, a substantial percentage of the weight of the wearer transmitted to the surface through that part of the support underlying said adjacent portion of the tibia.

4,876,746

ENVIRONMENTAL PROTECTIVE GARMENT

Robin M. Howie, Edinburgh, Scotland, assignor to Coal Industry (Patents) Limited, United Kingdom

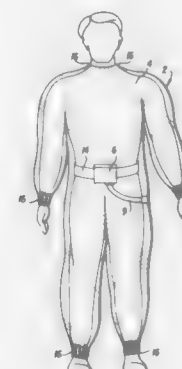
Filed Mar. 7, 1988, Ser. No. 164,918

Claims priority, application United Kingdom, Mar. 6, 1987, 8705123

Int. Cl.⁴ A41D 13/00

U.S. Cl. 2—69

5 Claims



1. An environmental protective garment for use in a dust free clean room to prevent dispersal of particulate matter from

the body of the wearer but permitting the wearer to avoid excessive body heat buildup, said garment comprising a suit of partly air resistant material to cover substantially the entire body of the wearer and having a seal around parts of the wearer's body extending beyond the garment; air mover means connected to said garment to draw air through said partly air resistant material so as to provide a negative pressure within said garment; a filter or scrubber for gas connected to said garment downstream from the air mover means.

4,876,747

GLOVE WITH EASY SAFE REMOVAL MEANS

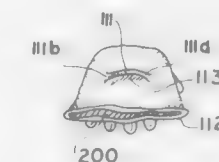
Carl E. Coffey, and Darlene M. Coffey, both of 8408 Garland Rd., Pasadena, Md. 21122

Filed May 4, 1988, Ser. No. 190,076

Int. Cl.⁴ A41D 19/00

U.S. Cl. 2—168

7 Claims



1. A surgical glove adapted to be worn on the human hand for protection against or deterring the transmission of, chemical or biological contamination, comprising;
a unitary glove body of impervious elastomeric material having palm and back portions terminating in a wrist portion providing an opening extending substantially transversely of the length of the glove,
removal means on the exterior of said back portion of said wrist portion adjacent to said opening,
said removal means including an elongated loop member having distal portions and an intermediate portion, and
said loop member distal portions affixed relative said glove back portion with said elongated loop member disposed substantially parallel to said opening and said loop member intermediate portion substantially spaced from said back portion to define an open unobstructed clearance therebetween when said elastomeric glove is being worn, whereby
transmission of contamination on the exterior of the glove is deterred upon removal of the glove as a user employs a hook member within said loop member open clearance to engage said loop member intermediate portion to remove the glove from the hand by pulling it, in an inverted man-

ner, back upon itself, beginning at said wrist portion opening.

4,876,749 TWIST DRAIN

Frank Antonello, Commack, N.Y., assignor to I.W. Industries, Inc., Melville, N.Y.

Continuation-in-part of Ser. No. 183,256, Apr. 8, 1988, abandoned, which is a continuation-in-part of Ser. No. 68,619, Jun. 30, 1987, abandoned. This application Nov. 15, 1988, Ser. No. 271,731

Int. Cl.⁴ A47K 1/14; F16K 31/50

U.S. Cl. 4—295

8 Claims



1. A twist drain, comprising a cylindrical drain element mountable on a tail piece, and including a brace, a holding member, said holding member supported within said cylindrical drain element by said brace, and a rotatable member which is supported in said holding member rotatably between open and closed positions and including closure means to respectively permit and interrupt a flow of fluid through the twist drain, between said cylindrical drain element and said holding member;

thread means rotatably connecting said rotatable member with said holding member;
sealing means located in the region of said thread means and sealing the latter so as to prevent penetration of debris and foreign matter to said thread means;
said sealing means includes at least one O-ring provided between said rotating member and said holding member in the region of said thread means; and
said sealing means includes a further such O-ring provided between said rotating member and said holding member in the region of said thread means, said rotating member and said holding member being extended lengthwise in an elongated direction, said thread means including a first thread provided on said holding member and a second thread provided on said rotating member and engageable with said first thread, each of said threads having two ends spaced from one another in the lengthwise elongated direction, said O-rings being located outwardly beyond said ends of said threads as considered in the lengthwise elongated direction.

4,876,750 WATER CLOSET AND BIDET APPARATUS

Michael T. Broyles, 7720 Pinkney St., Omaha, Nebr. 68134

Filed Sep. 11, 1987, Ser. No. 96,511

Int. Cl.⁴ A47K 3/20

U.S. Cl. 4—420.4

42 Claims

1. Water closet and bidet apparatus, comprising:
bowl means having an upper enlarged opening and defining a fluid reservoir having a generally elongated hemispheric shape, said bowl means having a discharge opening in the bottom portion thereof and connected to a discharge siphon, said bowl means having a flushing channel for passing fluid into said reservoir;
tank means located rearwardly and upwardly of said bowl

4,876,748 TOILET ODOR FILTER ASSEMBLY

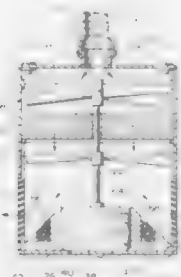
Duk K. Chun, 6811 - 32 Avenue, Edmonton, Canada (T6K 1L8)

Filed Mar. 3, 1988, Ser. No. 163,773

Int. Cl.⁴ E03D 9/05

U.S. Cl. 4—213

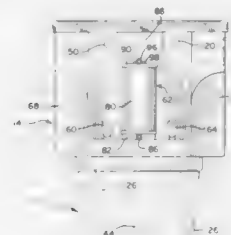
3 Claims



1. A toilet bowl ventilating and deodorizing structure for use in conjunction with a bathroom toilet bowl and seat assembly, said structure including a hollow housing having inlet and outlet openings, said inlet opening being adapted to have the outlet end of conduit means extending from the upper rim portion of the toilet bowl operatively communicated therewith, said housing including opposite end walls and peripheral side walls extending between and interconnecting said end walls, one of said end walls being removably mounted relative to the remainder of said housing and having said inlet opening formed therein, motor means mounted within said housing adjacent the other end wall thereof and including a rotatable output shaft exposed end portion, an intermediate length portion of said housing including air filtering means removably supported therein and extending thereacross and incorporating a pair of separate filter panels disposed on opposite sides of an intermediate portion of said exposed end portion of said shaft, one of said peripheral walls including at least a portion thereof removably supported from the remainder of said housing and closing a lateral opening defined by said housing registered with said air filtering means and through which said panels may be separately removed for replacement or servicing, said shaft exposed end portion including first axial flow impeller means mounted thereon between said filter means and said one end wall and second axial flow impeller means mounted thereon between said filter means and said motor means, at least one of said peripheral walls including a portion thereof spaced therealong from said second axial flow impeller means toward said motor having said outlet opening formed therein, said housing including at least two opposite side outlet openings formed therein and support means adjacent said other end wall supporting a deodorizing agent closely adjacent said outlet openings, said support means comprises a body mounted against the inner surface of said other end wall and including a center recess in which said motor is seated, said body supporting said deodorizing agent therefrom intermediate said recess and the outer peripheral portions of said body.

means and defining a reservoir for receiving fluid for flushing said bowl means, said tank means having a lower outlet opening in communication with said flushing channel, and said tank means having a width that exceeds the width of said bowl means so that the sides of said tank means extend beyond the sides of said bowl means;
discharge valve means for discharging fluid to said flushing channel;

control means adapted to be operably connected to a source of fluid supply and to said discharge valve means, said control means including a manually operable control actuator that extends exteriorly of said tank means, which when actuated, opens said discharge valve means to discharge fluid from said tank means to said discharge channel, and thereby activates said source of fluid supply to replenish the fluid in said tank means;
means for dispensing fluid comprising a container adapted to be connected to a source of fluid and an outlet means for



dispensing fluid, said container being located adjacent the rear portion of said bowl means and the front portion of said tank means, said container being removable from said apparatus;

flow control means for interconnecting said fluid dispensing means with sources of hot and cold fluid, and including a manually adjustable valve means for controlling the proportion of hot and cold fluid to control the temperature of the fluid entering said fluid dispensing means and for controlling the volume of flow thereof; and,
a recess located in the outer front and said walls on each side of said tank means, each recess extending from a portion generally coextensive with the upper surface of said bowl means to a higher elevation, and extending from the side wall interiorly to a location generally coextensive with the sides of said bowl means, said recesses defining openings in which the knees of a user may extend when the user is sitting over the bowl means when facing the tank means.

4,876,751 AUTOMATIC TOILET FLUSH CONTROL SYSTEM

Larry W. Van Meter, Louisville, Ky., assignor to LineTech, Inc., Louisville, Ky.

Filed Dec. 15, 1987, Ser. No. 133,356

Int. Cl.⁴ E03D 11/02, 5/10

U.S. Cl. 4—431

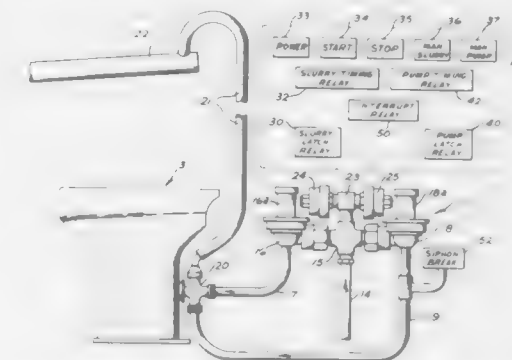
4 Claims

1. An automatic flush control system for a toilet of the type employing a first water flow to slurry the waste contents in the toilet bowl and a second water flow to pump the waste water slurry from the bowl, the system comprising:

means for supplying input water from a pressurized supply line;
first solenoid operated valve means for initiating and maintaining the first water flow from the input water supply to the toilet for a predetermined slurry cycle time period as required to slurry the waste in the toilet bowl;
second solenoid operated valve means for initiating and maintaining the second water flow from the input water supply to the toilet for a predetermined pump cycle time period as required to pump out the waste water slurry from the toilet bowl;
control means responsive to a decrease in pressure of the

input water supply for interrupting operation of the first and second valve means until the decrease in pressure is eliminated;

timing means providing a timing count coupled to the first and second valve means for setting the duration of each of said slurry and pump cycle time periods, said timing



4,876,752 CONTROL DEVICE FOR AN AIR TURBULENCE MASSAGE DEVICE

Heinz Bucher, Rottweil, Fed. Rep. of Germany, assignor to Metronic Electronic GmbH, Rottweil, Fed. Rep. of Germany

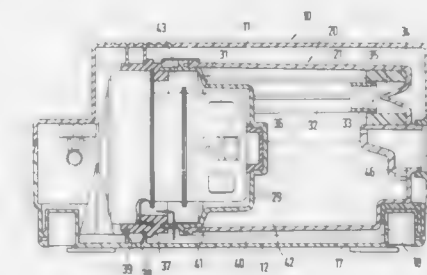
Filed Nov. 14, 1988, Ser. No. 271,204

Claims priority, application Fed. Rep. of Germany, Nov. 12, 1987, 3738364

Int. Cl.⁴ A61H 33/02

U.S. Cl. 4—542

23 Claims



an internal housing (20) forming a separate compressed air distributing chamber (42) positioned in said external housing (10) outside of said blower unit (31);
said internal housing (20) having a connecting piece (44) for said air tube which is sealed off from said external housing (10) and is in communication with an insertion opening (15) of said external housing (10);
compressed air produced by said blower unit (31) flowable

through a compressed air connecting piece (32) into said compressed air distributing chamber (42) positioned above said connecting piece (44) for said air tube;
 said internal housing (20) having an internal housing water discharge opening (41) at a low point of said compressed air distributing chamber (42) behind a mount of the control device;
 said internal housing water discharge opening (41) of said compressed air distributing chamber (42) in communication with a water collecting chamber (40) formed between said lower housing part (12) of said external housing (10) and said internal housing (20), said water discharge opening (41) sealed off from said motor means and said blower unit (31); and
 an external housing water discharge opening (17) positioned at a low point of said water collecting chamber (40) of said lower housing part (12) behind said mount of the control device.

4,876,753

AIR TURBULENCE MASSAGE DEVICE

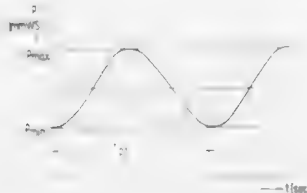
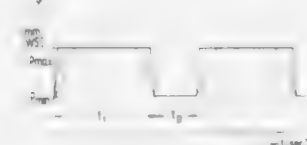
Heinz Bucher, Rottwell, Fed. Rep. of Germany, assignor to Metronic Electronic GmbH, Rottwell, Fed. Rep. of Germany
 Filed Nov. 14, 1988, Ser. No. 271,205

Claims priority, application Fed. Rep. of Germany, Nov. 12, 1987, 3738363

Int. Cl. A61H 33/02

U.S. Cl. 4—542

20 Claims



1. A turbulence process for an air turbulence massage device having a control device accommodating a blower unit and a turbulence matting which is positionable in a bathtub, the turbulence matting being connected with the blower unit outlet by means of an air tube, a turbulence intensity and a duration of a turbulence process is selected by preset program means, the turbulence intensity of the turbulence process is adjusted by varying a rotational speed of the blower unit between a lower and an upper value, and the duration of the turbulence process is changed by a connection duration of the blower unit, the turbulence process steps comprising:

- presetting the lower value as a minimum pressure value (P_{min}) which overcomes a counter-pressure from a static head of a water level in the bathtub;
- predetermining the upper value as a maximum pressure value (P_{max});
- presetting at least one of the minimum pressure value (P_{min}) and the maximum pressure value (P_{max}) by at least one of manual means and the program means; and
- during preselected time intervals (t_{pt}) of the turbulence process, abruptly switching the turbulence intensity between at least one of: (1) the preset minimum pressure value (P_{min}) and the preselected maximum pressure value

(P_{max}); and (2) predetermined time intervals (t_{pt}) to alternately increase and decrease the turbulence intensity.

11. An air turbulence massage device having a control device accommodating a blower unit and a turbulence matting which is positionable in a bathtub, said turbulence matting being connected with said blower unit outlet by means of an air tube, a turbulence intensity and a duration of turbulence selectable by means of a preset program, said turbulence intensity adjustable by a variable rotational speed of said blower unit operating between a lower and an upper value, and said duration of turbulence changeable by operating said blower unit, said air turbulence massage device comprising: presetting means for presetting said lower value as a minimum pressure value (P_{min}) which overcomes a counter-pressure from a static head of a water level in said bathtub, predetermining means for predetermining said upper value as a maximum pressure value (P_{max}), at least one of manual preset means and program means for presetting at least one of said minimum pressure value (P_{min}) and said maximum pressure value (P_{max}), and switching means for abruptly switching said turbulence intensity between at least one of: (1) said preset minimum pressure value (P_{min}) and said preselected maximum pressure value (P_{max}); and (2) predetermined time intervals (t_{pt}) to alternately increase and decrease said turbulence intensity.

4,876,754

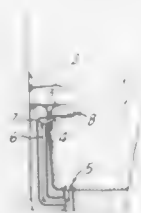
BATHTUB SILENCER AND OVERFLOW PROTECTOR

Miklos G. Kurz, 300 Winston Dr., Cliffside Park, N.J. 07010
 Filed Jan. 22, 1988, Ser. No. 146,822

Int. Cl. A47K 3/00

U.S. Cl. 4—546

8 Claims



1. A collector and silencer unit for use in a bathtub having an overflow, for intercepting the water discharged from a spout, disposed above said unit in its free fall and redirecting it towards the back wall of the bathtub wherein said unit comprises:

- a bottom wall, side walls and a back wall defining an open top receptacle, said bottom wall slanting downwardly toward said back wall, said back wall including means for mounting on a bathtub wall below a spout, flowpath means adjacent the intersection of said back wall, bottom wall, and side walls for directing the flow of water along the bathtub wall, whereby water from said spout is collected and silenced by being directed along the inside surface of a bathtub.

4,876,755

TOTAL BACK SUPPORT SYSTEM

Deborah Parrish, 12 Glenn Ter., Vineland, N.J. 08360
 Filed Aug. 25, 1988, Ser. No. 236,233

Int. Cl. A47C 20/08

U.S. Cl. 5—431

22 Claims

1. A back support device comprising at least two cushion devices, each cushion device comprising:

- a semicylindrical resilient cushion, the halving being through a lengthwise central axis of a cylinder, the cushion comprising a flat rectangular surface, a semicylindrical surface, and two semicircular end surfaces, and
- at least two hook or loop fabric fastening means attached on surfaces of the cushion device, each fastening means to

detachably fasten to a complimentary hook or loop fabric fastening means on a surface of another cushion device, wherein one of said cushion devices is a first cushion comprising a first hook or loop fabric fastening means positioned on the rectangular surface and a second hook or loop fabric fastening means on an end surface, wherein a second of said cushion devices is a second cushion comprising a first hook or loop fabric fastening means positioned on the rectangular surface and a second hook or loop fabric fastening means on the semicylindrical surface positioned intermediate the length of the semicylindrical surface and proximate a lengthwise edge,



wherein the first hook or loop fabric fastening means on the first and second cushion devices are positioned to fasten together to form a cylindrical shaped support device, and

wherein the second hook or loop fabric fastening means on the first and second cushions are positioned to fasten together to form a "T" shaped support device with the two rectangular surfaces facing in a same direction.

4,876,756

AIR MATTRESS

Nicola Vaccaro, Niagara Falls, Canada, assignor to Nick Vaccaro International, Niagara Falls, Canada
 Continuation-in-part of Ser. No. 861,450, May 9, 1986, Pat. No. 4,723,329. This application Feb. 8, 1988, Ser. No. 154,454. The portion of the term of this patent subsequent to Feb. 9, 2005, has been disclaimed.

Int. Cl. A47C 27/10, 27/08

U.S. Cl. 5—455

18 Claims



1. A posture supporting device having an inflatable air mattress with head and foot regions, said head region comprising an elongate recess extending in a length direction of said mattress, said recess having a depth approximating that of said mattress to receive and support a person's head when lying on said mattress in a prone position, said recess having an upper end and a lower end and being defined by opposing spaced-apart inflated mattress sections extending generally parallel to one another in said length direction of said mattress and lower means for closing off said recess lower end and upper means for closing off said recess upper end, said mattress sections being spaced-apart a distance which supports a person's head when a person is lying in a prone position by contacting a person's cheekbones and accommodating a person's mouth and nose to permit free breathing while lying in a prone position, means for elevating a user's lumbar region, said elevating means being associated with said mattress and positioned intermediate said head and foot regions, said elevating means elevating a user's lumbo-sacral region sufficiently to minimize

hyper-extension in a user's lumbo-sacral region while a person is lying prone on said mattress, said elevating means further comprises a cushion, and means for attaching said cushion to said mattress.

4,876,757

TOOL FOR REPLACING NOZZLES ON CAULKING TUBES

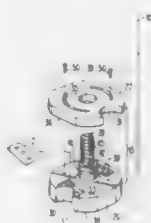
Michael B. Wentworth, 7015 Buckingham Blvd., Berkeley, Calif. 94705

Filed Jun. 24, 1988, Ser. No. 211,209

Int. Cl. B25F 1/04

U.S. Cl. 7—158

10 Claims



3. A tool for allowing a user to replace the nozzle on a caulking tube, comprising:

- a body having a flat end face and a peripheral wall, said peripheral wall being formed with a recess sized to accommodate at least a portion of the base region of the nozzle;
- a blade mounted within said recess so that it is in a plane parallel to said end face and spaced a predetermined distance therefrom, said blade having an outwardly pointing edge spaced inwardly from said peripheral wall;
- guard means for selectively exposing said blade, said guard means and said blade being relatively movable from a first position where said recess extends along said peripheral wall with said blade edge exposed to enable cutting the nozzle so as to leave a stub, and a second position wherein said recess is interrupted so that said blade edge is not exposed; and
- a tap sized to cut internal threads in the stub, mounted to and extending outwardly from said body.

4,876,758

SYSTEM AND METHOD FOR FORMING CUSTOM-MADE SHOE INSERTS

Paul D. Roloff, Fremont, and Reginald T. Lamb, Redwood City, both of Calif., assignors to Amfit Inc., Sunnyvale, Calif.

Filed Mar. 31, 1987, Ser. No. 34,077

Int. Cl. A43D 09/00; A61F 03/00

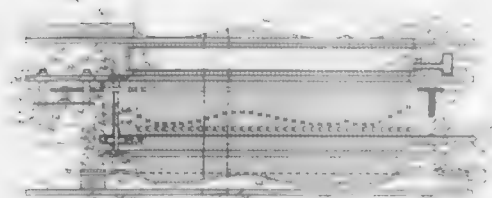
U.S. Cl. 12—142 N

13 Claims

1. Apparatus for digitizing the undersurface of a person's foot, said apparatus comprising:

- an array of gauging elements, each of said gauging elements including an activator;
- a frame for supporting the person's foot and for supporting the gauging elements in spaced relationship for independently guided movement towards the undersurface of the person's foot;
- control means, supported by the frame, for urging the gauging elements into contact with the undersurface of the person's foot;
- sensor means, supported by the frame and movable relative

to the gauging elements, for scanning the gauging elements to sense the positions of the gauging elements and produce digital signals indicative of those positions; said sensor means including a plurality of sensors, each corresponding to an associated one of the gauging elements, and a support structure, movably supported by the frame adjacent to each of the gauging elements, for supporting each of the sensors adjacent to the corresponding gauging element; each of said sensors being operable, when moved adjacent to the activator of the corresponding gauging element, for



detecting that activator to sense the position of the corresponding gauging element and produce a digital signal indicative of that position; control means, supported by the frame and coupled to the support structure of the sensor means, for moving the support structure and the sensors supported thereon relative to the gauging elements to scan the gauging elements; storage means, coupled to the sensor means, for storing the digital signals indicative of the positions of the gauging elements to provide a digital representation of the under-surface of the person's foot.

4,876,759

BRIDGE EXPANSION JOINT

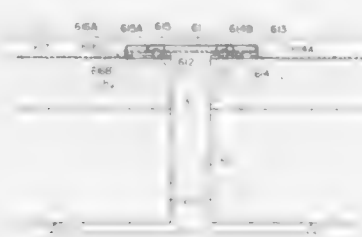
Jesse S. Yang, No. 28, Sec. 2, Chung Cheng Rd., Shih Lin, Taipei, Taiwan

Filed Jun. 14, 1988, Ser. No. 207,111

Int. Cl.⁴ E01D 19/06

U.S. Cl. 14-16.5

1 Claim



1. In a road bridge having a bridge deck including a reinforced concrete ground deck layer provided with an open expansion seam therein and with an upper surface of the ground deck being paved thereover by a road surface pavement, an expansion joint for buried inner placement below the road surface pavement in the expansion seam, the expansion joint comprising:

- a pair of padded sheets fixed to the upper surface of the ground deck adjacent respective edges of the expansion seam;
- a pair of padding slats fixed to the upper surface of the

- ground deck and spaced respectively outboard of padded sheets with respect to the expansion seam;
- a steel plate superimposed over the padded sheets and padding slats on both sides of the expansion seam; the steel plate spanning the expansion seam;
- a pair of sliding pads respectively fixed to an underside of the steel plate at respective locations thereof overlying and corresponding with the padded sheets fixed to the ground deck;
- a second pair of padding slats respectively fixed to the underside of the steel plate at respective locations thereof overlying and corresponding with the first pair of padding slats fixed to the ground deck;
- a plurality of rivets anchored in the ground deck on respective sides of the expansion seam, said rivets piercing the padded sheets and passing upwardly through expansion slots provided in the sliding pads and the steel plate, said rivets having flanged heads extending above an upper surface of the steel plate, wide edge ring washers being inserted between the upper surface of the steel plate and the flanged heads of the rivets;
- a guard cover mounted on the steel plate over each rivet, each guard cover covering a respective expansion slot in the steel plate and accommodating the head of the rivet in said expansion slot; and
- a wire screen extending outwardly from edges of the steel plate for receiving a road paving material layer.

4,876,760

APPARATUS FOR BUFFING AND OTHERWISE TREATING VEHICLE BODIES

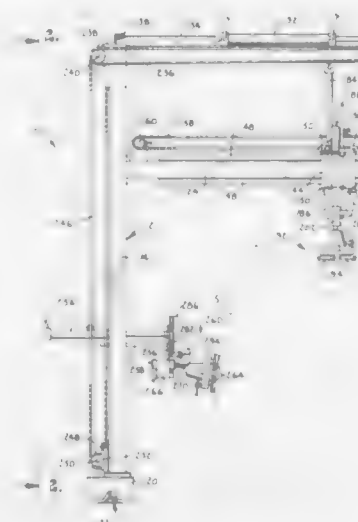
William B. Rabourn, Route 1, Box 126, Sedalia, Mo. 65301, and Daniel R. Heckart, Sedalia, Mo., assignors to William B. Rabourn, Sedalia, Mo.

Filed Jun. 1, 1988, Ser. No. 201,574

Int. Cl.⁴ B60S 3/06

U.S. Cl. 15-97 B

19 Claims



1. Apparatus for treating a vehicle body having opposite sides and a top, said apparatus comprising:
- a frame including a pair of upright columns spaced apart from one another;
 - a carriage on each column mounted for up and down movement thereon;
 - means for moving each carriage up and down on the corresponding column;
 - a pair of side treatment heads mounted on the respective carriages for generally horizontal extension and retraction toward and away from the opposite sides of a vehicle body positioned between said columns;

- a substantially horizontal bridge extending between said columns at an elevated position to span the top of the vehicle body;
- an overhead carriage mounted on said bridge for movement lengthwise thereon;
- means for moving said overhead carriage along the bridge;
- a top treatment head mounted on said overhead carriage for generally vertical extension and retraction toward and away from the top of the vehicle body;
- treatment means on each treatment head for effecting a preselected treatment of the vehicle body when extended adjacent thereto and activated;
- means for selectively extending and retracting each of said treatment heads; and
- means for selectively activating said treatment means of each treatment head to effect said preselected treatment of the sides and top of the vehicle.

4,876,761

PIN FOR SWEEPERS

Shizuo Sagawa, 12-8, Minami Kugahara 1-chome, Ota-ku, Japan

Filed Feb. 10, 1988, Ser. No. 154,228

Claims priority, application Japan, Jul. 31, 1987, 62-117773; Jul. 31, 1987, 62-117774

Int. Cl.⁴ B08B 9/04

U.S. Cl. 15-104.061

7 Claims



1. A pin for a sweeper for cleaning pipe, comprising:
- A shaft portion;
 - an anchoring portion provided at a lower end of said shaft portion for being driven into the sweeper to prevent the pin from falling out of the sweeper; and
 - a head portion provided at an upper end of said shaft portion;
- said head portion having a plurality of spaced, pointed projections having respective tip portions, said projections being disposed in such a manner that the tip portions thereof have a non-overlapping arrangement when said head portion is viewed from a side thereof.

4,876,762

PORTABLE APPLIANCE COVER

David W. Foster, Germantown, Md., assignor to Soft Vac, Inc., Washington, D.C.

Filed Jul. 22, 1988, Ser. No. 223,093

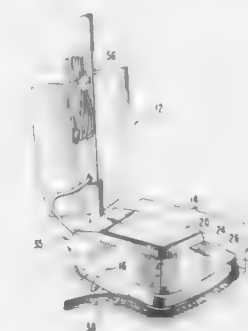
Int. Cl.⁴ A47L 9/00

U.S. Cl. 15-247

9 Claims

1. A cover for a portable appliance, the appliance including a body section having a bottom surface disposed adjacent a floor when the appliance is in use, a top surface opposite the bottom surface and a side surface between and connecting the top and bottom surfaces, the cover comprising:
- removable bonnet means for substantially covering one or more of the top surface and side surface of the body section and being capable of absorbing mechanical energy;
 - retaining means for removably attaching said removable bonnet means to the body section of the appliances, said

retaining means being capable of holding said bonnet means at a fixed space relationship to the bottom surface of the body section of the appliance to establish a selected spacing between the cover and the floor when the appliance is disposed on the floor, the portable cleaning appli-



ance including an adjustable upright arm having one position wherein the arm is substantially perpendicular to the top section of the appliance, and said retaining means includes strap means to secure said bonnet means to said

appliance

4,876,763

VACUUM CLEANER

Hae S. Cho, and In K. Kwon, both of Suwon, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

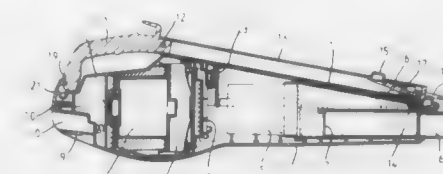
Filed Dec. 22, 1988, Ser. No. 289,220

Claims priority, application Rep. of Korea, Dec. 31, 1987, 87-15664

Int. Cl.⁴ A47L 9/32

U.S. Cl. 15-329

3 Claims



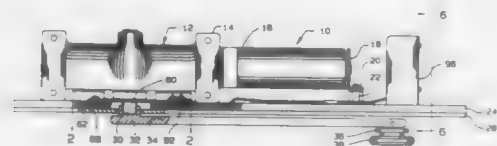
1. A vacuum cleaner comprising a body having an air suction port at a front end, and a plurality of air discharging openings at a back end, an air suction means placed inside said body, a suction nozzle attached to said air suction port, a front upper cap mounted on the front upper side of said body, a rear upper cap mounted on the rear upper side of said body, a handle incorporated with an extension member, a holding means provided on the free end of said extension member, a catching means provided on the front upper end of said front upper cap, a cup formed in the free end of said handle, a hooking means provided on the back side of said rear upper cap, and a catching hole formed into the back side of said body, characterized in that when said vacuum cleaner is used as a portable hand-carried type, said holding means of said extension member, and said cup of said handle, are immovably caught respectively by said catching means and said hooking means of said rear upper cap, and when said vacuum cleaner is used as a floor-carried, upright type, said holding means is inserted into said catching hole of said body and immovably caught therein.

4,876,764

CLOSER HAVING DOOR POSITION INDICATOR
Ralph T. Teague, Jr., Monroe, N.C., assignor to Yale Security Inc., Monroe, N.C.Filed Oct. 17, 1988, Ser. No. 258,704
Int. Cl.⁴ G08B 13/08

U.S. Cl. 16-71

7 Claims



1. A door closer having a door position indicator, the closer having an operator arm associated at one end with the door and at the other end mounted on the lower end of a vertically disposed pinion shaft of the closer, the pinion shaft having a cam surface on its periphery adjacent its lower end, the indicator comprising:

- a. a switch-operating lever having a rotatable, circular mount eccentrically mounting a pivot point of the lever, a portion of the lever engaging against the periphery of the pinion shaft,
- b. electric switch means mounted adjacent the closer and adapted to be engaged by the lever,
- c. biasing means urging the lever toward the shaft,
- d. signal means electrically connected to the switch means whereby when the door is closed, the cam surface on the shaft causes the lever to assume a position wherein the lever puts the switch in a first condition, and when the door is not closed the cam surface causes the lever to assume a different position wherein the lever puts the switch in a second condition, and for either condition the signal means indicates accordingly.

4,876,765

DOOR APPARATUS WITH MAGNETIC SUPPORT
Mitsuji Karita, Mie, Japan, assignor to Shinko Electric Co., Ltd., Tokyo, Japan

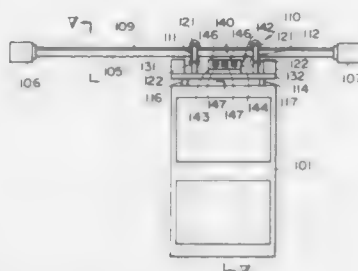
Continuation of Ser. No. 48,418, May 11, 1987, abandoned, which is a continuation of Ser. No. 841,157, Mar. 19, 1985, Pat. No. 4,698,876. This application Jul. 1, 1988, Ser. No. 214,865

Claims priority, application Japan, Mar. 20, 1985, 60-40421; Mar. 20, 1985, 60-40422; Mar. 20, 1985, 60-40423; May 21, 1985, 60-75382

Int. Cl.⁴ E05D 15/06

U.S. Cl. 16-102

7 Claims



1. A door apparatus comprising:

- (a) a door member movable between a closed position and an open position with respect to a stationary structure;
- (b) an elongated guide member mounted on one of the door member and the stationary structure, and extending along the door member to help guide movement of the door member between the open and closed positions, the elongated guide member including

- (i) an inner tube of magnetic material, and
- (ii) an outer tube of non-magnetic and electrically conductive material;
- (c) first magnet means mounted on the other of the door member and the stationary structure, to produce a propulsion magnetic force between the first magnet means and the elongated guide member to move the door member between the open and closed positions; and
- (d) second magnet means mounted on the other of the door member and the stationary structure, spaced from the elongated guide member, to produce a levitating magnetic force between the elongated guide member and the second magnet means to support at least part of the weight of the door member and to maintain the elongated guide member spaced from the first magnet means as the door member moves between the open and closed positions the second magnet means comprising a pair of electromagnetic units fixedly mounted on said other of the door member and the stationary structure, said electromagnetic units being spaced from each other and surrounding the elongated guide member to produce said levitating magnetic force to help support the door member and to help guide movement of the door member along the elongated guide member; and
- the first magnet means comprising a travelling magnetic field generating unit fixedly mounted on said other of the door member and the stationary structure between the pair of electromagnetic units.

4,876,766

DECORATIVE FAUCET HANDLE MOUNTING APPARATUS

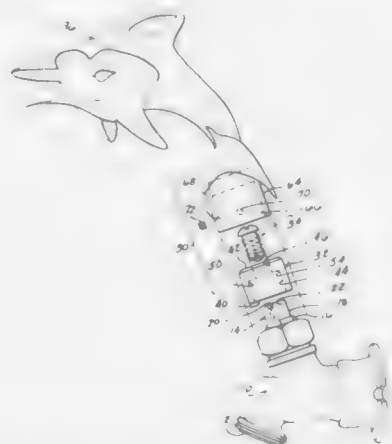
Richard K. Cohen, 2561 Hawthorn, Ann Arbor, Mich. 48104

Filed Dec. 27, 1988, Ser. No. 290,573

Int. Cl.⁴ F16K 31/60

U.S. Cl. 16-114 R

8 Claims



1. A decorative faucet handle assembly for a faucet having an outwardly extending rotatable stem with a longitudinal, threaded bore formed therein, comprising:

- an adapter having a first bore complementarily shaped to slidably fit in registry over the stem of a faucet;
- a second bore formed in the adapter coaxial with the first bore and forming an extension of the first bore;
- a first fastener means attachable to the faucet stem for fastening the adapter to the stem;
- a decorative handle having a longitudinal handle bore extending inward from one end, the longitudinal handle bore being configured to be disposed in registry over the adapter;
- a second bore formed in the decorative handle perpendicular to the longitudinal handle bore; and
- a second fastener threadably insertable through the second

bore in the decorative handle into engagement with the adapter to secure the decorative handle to the adapter.

4,876,767

VENT CLEANING APPARATUS AND METHOD FOR POULTRY

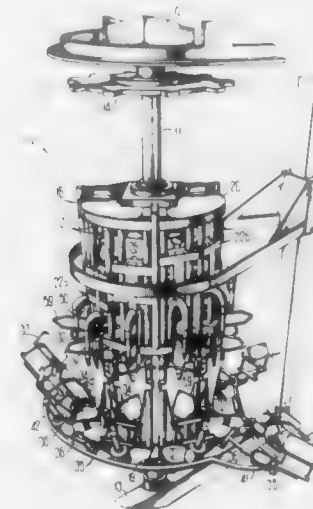
Grover S. Harben, III, 3319 Edgewater Terr., Gainesville, Ga. 30501, and Leonard G. Clark, Route 2, Dawsonville, Ga. 30534

Filed Jan. 29, 1988, Ser. No. 213,247

Int. Cl.⁴ A22C 21/00

U.S. Cl. 17-11

8 Claims



8. Apparatus for cleaning the vent of fowl and for use in conjunction with an overhead conveyor for moving suspended fowl carcasses comprising:

- a carousel support apparatus including a vertical rotatable shaft and a toothed wheel carried by the shaft for engagement by the overhead conveyor, whereby the shaft simultaneously rotates with movement of the conveyor;
- a plurality of elongated members mounted in symmetrical relation around the shaft for rotation with the shaft, each elongated member having a forward end operative for insertion into the vent of a fowl;
- fowl support means associated with each elongated member to engage a suspended fowl arriving on the conveyor and support that fowl with the vent in predetermined relation to the corresponding elongated member as the shaft rotates;
- each elongated member including first and second fluid flow passages having openings communicating with the forward end;
- the first passage selectively connected to a source of suction tending to draw fecal matter from the vent into the opening of the one passage;
- the second passage selectively connected to introduce a flow of liquid within the vent so as to entrain the fecal matter for withdrawal through the first passage;
- vertical positioning means associated with each elongated member to move the corresponding vertical member along a predetermined vertical path to enter the vent of a fowl supported in relation to the elongated member, and to withdraw the elongated member after the shaft has rotated a predetermined extent; and
- valve means associated with the passages of each elongated member and operative in response to the rotary position of the shaft to initially apply suction to the first passage of each elongated member after that elongated member moves to enter the vent, to maintain the suction applied to the first passage while subsequently applying a liquid flow to the second passage for a time, and then to shut off that

water flow and thereafter to remove the suction from each elongated member, so that liquid from the second passage enters the vent only while suction from the first passage is applied to the vent, thereby preventing injection of the liquid into the fowl beyond the forward end; whereby fecal matter is withdrawn seriatim from the vent of each fowl moving along the conveyor.

4,876,768

FISH SCALING APPARATUS

Clarence K. Bright, Davison, Mich., assignor to Lil' Beaver Company, Davison, Mich.

Filed Mar. 1, 1989, Ser. No. 317,437

Int. Cl.⁴ A22C 25/02

U.S. Cl. 17-64

5 Claims



1. A fish scaling apparatus for removal of scales from fish, said apparatus comprising:

- a container means for containing a predetermined quantity of fish suspended in water;
- a scaling element rotatable about a substantially vertical axis, said scaling element including at least one horizontal rod member and at least one vertical rod member;
- a plurality of scaling protrusions attached to and extending from at least one of said vertical or horizontal rod members, said scaling protrusions for scaling of the fish in response to relative motion between the fish and said scaling protrusions, said scaling protrusions providing for removing scales of the fish substantially without damage to the remaining portion of the fish; and
- a manually operated means for providing rotational motion to said scaling element in said container means thereby providing contact between and relative motion between said scaling protrusions and said fish for scaling of said fish.

4,876,769

REGULATION OF PROCESSING STAGES OF A FIBER PROCESSING INSTALLATION

Walter Schlepfer, Winterthur, and Christoph Staeheli, Frauenfeld, both of Switzerland, assignors to Reiter Machine Works, Ltd., Winterthur, Switzerland

Filed Oct. 6, 1988, Ser. No. 254,407

Claims priority, application Switzerland, Oct. 8, 1987, 03943/87; Oct. 8, 1987, 03947/87

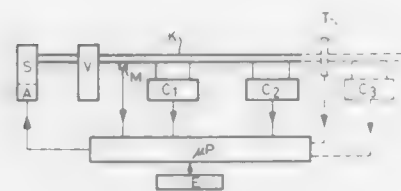
Int. Cl.⁴ D01G 15/40

U.S. Cl. 19-105

14 Claims

1. A fiber processing installation comprising

a plurality of fiber processing stages including at least one stage operable on a discontinuous basis; conveying means interconnecting said stages for conveying fibers for processing in a preset sequence; means for generating a signal representative of the total production of a second stage downstream of said one stage; and



control means for monitoring the actual ratio of operative time to inoperative time of at least said one stage, said control means being responsive to said signal from said signal generating means to form a set value for the operative to inoperative time ratio of said one stage for comparison with said actual ratio to change the production of said one stage in response to a difference therebetween in order to adjust said actual ratio to said set value.

4,876,770

ANTI-CREEP CAM BAR

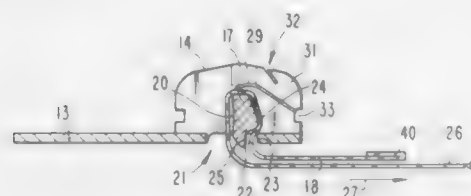
Jerry D. Bougher, Lebanon, Ind., assignor to Indiana Mills & Manufacturing, Inc., Westfield, Ind.

Filed Oct. 3, 1988, Ser. No. 252,151

Int. Cl.⁴ A44B 11/12

U.S. Cl. 24—170

20 Claims



1. A seat belt device comprising:
a web having a fixedly mountable proximal end and a free distal end;
a frame including mounting means and a web stop;
a bar movably mounted by said mounting means to said frame and having a locked position for holding said web tight to said frame and an unlocked position to allow said web to move around said bar and relative to said frame, said bar in said locked position applying pinching force to lock said web between said bar and said web stop; and,
spring means located on said bar laterally outward of said web extending between and received by said frame and said bar, said spring means operable to normally urge said bar to said locked position but yieldable to allow said bar to controllably move to said unlocked position, said spring means further operable to maintain said bar in said locked position even though said web momentarily loosens on said bar as web force from said proximal end to said bar is varied and until web force from said distal end to said bar moves said web and moves said bar away from said web stop.

4,876,771

PLASTIC CLIP PARTICULARLY USEFUL AS A CLOTHES PIN

Izhak Givati, Tel Aviv, Israel, assignor to Shikbar Investments Ltd., Tel Aviv, Israel

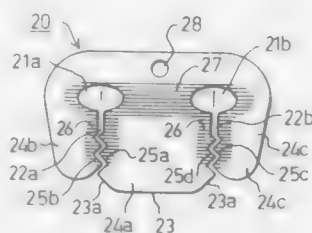
Filed Aug. 9, 1988, Ser. No. 230,089

Claims priority, application Israel, Sep. 3, 1987, 83765

Int. Cl.⁴ D06F 53/00

U.S. Cl. 24—298

14 Claims



1. A plastic clip particularly useful as a clothes pin for hanging articles of clothing on a clothes line, comprising: a strip of an elastic plastic material formed with at least one opening therethrough for receiving the clothes line, and with a slot extending from said opening, for a length substantially greater than the size of the opening, to an edge of said strip to define a pair of jaws for gripping the article to be hung from the clothes line; the sides of said slot being formed with a zigzag configuration to define teeth on the edges of said jaws for gripping the article of clothing between them; the outer faces of said plastic strip bordering said slot being roughened to define non-slip surfaces for gripping the article engaged by said jaws.

4,876,772

SAFETY BELT BUCKLE

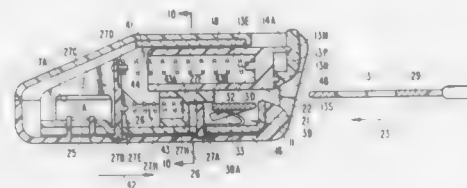
James R. Anthony, Carmel; David Merrick, Indianapolis; Ronald F. Homeier, Plainfield, and Allan R. Lortz, Carmel, all of Ind., assignors to Indiana Mills & Manufacturing, Inc., Westfield, Ind.

Filed Feb. 25, 1988, Ser. No. 160,405

Int. Cl.⁴ A44B 11/25

U.S. Cl. 24—637

24 Claims



1. A buckle comprising:
a body having an entrance to admit a latchable tongue;
a latch member in said body and having a latching pawl thereon;
said latch member being pivotable in said body to enable said latching pawl to move into a latching position to interfere with movement of a tongue through said entrance;
guide means in said body defining a guideway for a release slide;
a release slide received in said guideway and having a pawl release cam thereon, said slide having a rest position and a release position, and normally biased to said rest position;
resilient means mounted between said body and said latch member and operating independently of said release slide and urging said pawl to said latching position;
said latch member having a cam follower engageable by said cam when said slide is moved from said rest position to

said release position to move said latching pawl out of said latching position; and
a spring loaded ejector behind said entrance and in the path of a latchable tongue when inserted through said entrance, and operable between a cocked position and a rest position;
said ejector being movable along a path traveled by the tongue as the tongue is moved into the body through said entrance, and returnable along said path as the tongue is removed from the body.

4,876,773

ENCLOSED CONTAINMENT APPARATUS FOR POSTMORTEM SETTINGS

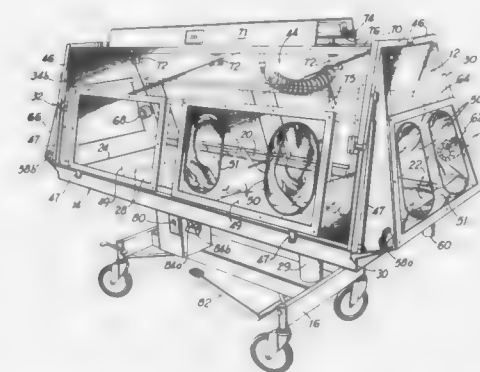
James D. Wade, Marietta, Ga., assignor to Kin, Inc., Atlanta, Ga.

Filed Jan. 11, 1989, Ser. No. 295,897

Int. Cl.⁴ A61G 13/00

U.S. Cl. 27—23.1

25 Claims



1. An autopsy device, comprising:
(a) a work surface upon which a body may be placed;
(b) an hermetically sealed chamber assembly on said work surface, at least a portion of said chamber assembly being movable between closed and opened positions to allow said body to be placed within said chamber assembly on said work surface, said chamber assembly further comprising:
(i) means for providing access of the hands of an operator into the interior of said chamber assembly when said chamber assembly is in said closed position; and
(ii) a transparent portion to allow said operator to view said body on said work surface;
(c) means for providing a decontaminant fluid to said interior of said chamber assembly and said work surface; and
(d) means for removing said decontaminant fluid from said device.

4,876,774

METHOD FOR PREPARING HEAT SET FABRICS

Sheldon Kaveah; Dusan C. Prevorsek, and Gary A. Harpell, all of Morris County, Morris Township, N.J., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Continuation-in-part of Ser. No. 429,942, Sep. 30, 1982. This application Sep. 1, 1983, Ser. No. 527,701

Int. Cl.⁴ D04B 1/16, 21/16; D03D 15/00; D06C 7/02

U.S. Cl. 28—166

14 Claims

1. A method for preparing heat-set fabrics which comprises the steps:

(a) forming a fabric from stretched fibers of tenacity at least about 20 g/denier and tensile modulus at least about 600 g/denier containing polyethylene of weight average molecular weight at least about 500,000, and

(b) heating the fabric under an applied stress or strain at a temperature between about 120° C. and 155° C. sufficient

Form fabric from stretched fibers having:
a) Mw \geq 500,000
b) tenacity \geq 20 g/denier
c) modulus \geq 600 g/denier

Heat set yarn used to form fabric at temperature between \sim 100° C. \sim 150° C.

Heat fabric at temperature between \sim 120° C. \sim 155° C.

and for at time sufficient to set the fabric in a shape assumed under the applied stress or strain.

4,876,775

YARN SHEET TRANSFER SYSTEM

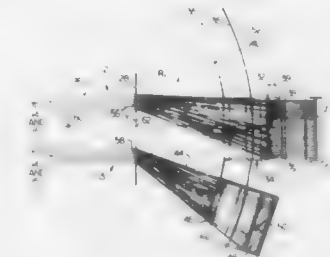
Joseph A. Steele, Greensboro, and Kenneth A. Byrd, Aberdeen, both of N.C., assignors to Burlington Industries, Inc., Greensboro, N.C.

Filed Jan. 18, 1988, Ser. No. 145,532

Int. Cl.⁴ D02H 5/00

U.S. Cl. 28—190

19 Claims



1. An apparatus for forming a warp beam, comprising:
(a) first stationary warp yarn supply means for supplying a plurality of warp yarns from yarn packages;
(b) second stationary warp yarn supply means for supplying a plurality of warp yarns from yarn packages;
(c) means for winding warp yarns onto a spool to form a warp beam; and
(d) warp yarn transfer means located between said first and second warp yarn supply means and said means for winding for supplying warp yarns to said means for winding, said transfer means being selectively engagable between either of said first and second supply means and said means for winding to permit yarn to be wound onto the spool from the yarn packages on the selected supply means;
wherein said warp yarn transfer means includes as transfer device operatively associated with each of said warp yarn supply means and movable between an operable position and an inoperable position with respect to said winding means and the associated warp supply means.

4,876,776

METHOD OF MAKING PIEZOELECTRIC COMPOSITES
Roger W. Whatmore, Bletchley; Andrew G. Munns, Northampton, and David W. Lane, Wiltshire, all of England, assignors to Plessey Overseas Limited, Ilford, England

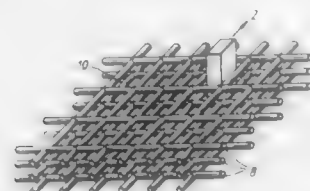
Continuation of Ser. No. 804,565, Dec. 4, 1985, abandoned. This application Feb. 11, 1988, Ser. No. 109,358

Claims priority, application United Kingdom, Dec. 15, 1984, 843173H

Int. Cl.⁴ H01L 41/22

U.S. Cl. 29—25.35

3 Claims



1. A method of fabricating a piezoelectric composite comprising an array of piezoelectric elements and a reinforcement structure embedded in a matrix material, wherein the improvement lies in that the method comprises forming the reinforcement structure, prior to assembly with the piezoelectric elements, as a reinforcement cage by weaving a strand of reinforcing fibrous material into a multi-layered cage-like structure defining an array of holes therethrough for receiving and supporting the piezoelectric elements during the fabrication of the piezoelectric composite, inserting the piezoelectric elements into the array of holes through the reinforcement cage and casting the matrix material around the resulting structure to form the piezoelectric composite.

4,876,777

METHOD TO INCREASE HOT OFFSET TEMPERATURE OF SILICONE FUSER

Che C. Chow, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 2, 1987, Ser. No. 92,343

Int. Cl.⁴ B32B 31/00; G03G 15/00

U.S. Cl. 29—132

1 Claim



1. A method of fabricating a fuser member for roll fusing apparatus used in fixing toner images to support sheets, the fuser member having a core, comprising the steps of:

securing a generally cylindrical metal oxide embedded member made of rubber around the core, grinding the cylindrical member to suitable size, the cylindrical member having an outer surface, the outer surface having a plurality of holes, a portion of the holes being in the 30-200 micron diameter range, and

coating the outer surface with a layer of RTV silicone impregnated with metal oxide conductive particles, the conductive particles being evenly distributed throughout the elastomer, the layer of elastomer filling said holes in the 30-200 micron diameter range.

4,876,778

METHOD OF MANUFACTURING A MOTORCYCLE RADIATOR

Hisao Hagihara; Takayuki Banno; Shigenori Miya, and Norio Tanaka, all of Yokochi, Japan, assignors to Toyo Radiator Co., Ltd., Tokyo, Japan

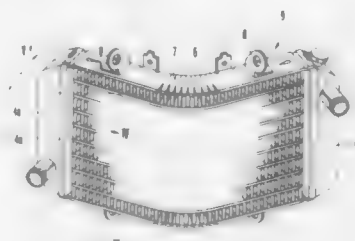
Filed Mar. 15, 1988, Ser. No. 168,769

Claims priority, application Japan, Mar. 30, 1987, 62-47883[U]

Int. Cl.⁴ B21D 53/02

U.S. Cl. 29—157.3 A

12 Claims



1. A method of manufacturing a motorcycle radiator comprising the steps of:

- (i) preparing, (a) a straight radiator core constructed of a plurality of corrugated sheets spaced alternately with a plurality of flattened tubes, said corrugated sheets constituting air fins for heat-exchange use, and said flattened tubes constituting water tubes through which cooling water passes, (b) a pair of elongated water tanks having a plurality of holes and disposed in positions horizontally adjacent to opposite end openings of said flattened tubes so as to communicate with said flattened tubes through said holes and said openings, and (c) a pair of metallic reinforcing plates having an elongated straight shape, between which said straight radiator core is sandwiched, each of said reinforcing plates being provided with a plurality of slits formed at opposite longitudinal edge portions of each of said plates, each of said slits extending in a direction perpendicular to a longitudinal axis of each of said reinforcing plates, said slits on one of said opposite longitudinal edge portions being disposed in a row and at a predetermined pitch, and said slits on the other of said opposite longitudinal edge portions being disposed in another row and at said predetermined pitch at respective positions halfway between positions of adjacent ones of said slits on said one of said edge portions with respect to a direction parallel to said longitudinal axis;
- (ii) brazing, joints between said corrugated sheets and said flattened tubes, and joints between said corrugated sheets and said reinforcing plates, so that these components are fixedly assembled to form a straight radiator assembly whereby said opposite end openings of said flattened tubes join with said water tanks in a watertight manner; and
- (iii) bending said straight radiator assembly by a predetermined amount in a plane parallel to said longitudinal axis of said reinforcing plates.

4,876,779

APPARATUS AND METHOD FOR MANUFACTURING PLATE FIN COILS OF DIFFERENT CONFIGURATIONS
Kenneth P. Gray, Syracuse, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Nov. 6, 1987, Ser. No. 118,380

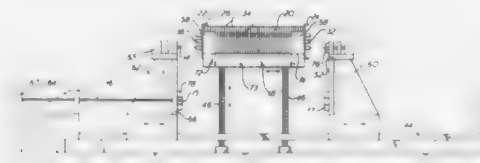
Int. Cl.⁴ B21D 53/02

U.S. Cl. 29—157.3 R

7 Claims

1. A method of belling and expanding a partially assembled multi-row plate fin heat exchanger having a plurality of sheets of plate fins and at least one tube sheet laced with a plurality of tubes having front and back ends which comprises the steps of:

indexing the partially assembled plate fin heat exchanger in a belling station on a vertically movable dimensionally adjustable platform;
setting the length and width dimensions of said vertically movable dimensionally adjustable platform to generally conform with the size of the partially assembled plate fin heat exchanger and adjusting a side clamp means to the width of the partially assembled plate fin heat exchanger for clamping the sides of the heat exchanger with the tube sheet extending beyond the dimensions of said platform;



belling the open ends of the partially assembled multi-row heat exchanger one row at a time;
moving said platform with the belled heat exchanger vertically to an expansion station; and
selecting appropriate expanding rods for the heat exchanger configuration and expanding the tubes of the partially assembled multi-row heat exchanger into the plate fins one row at a time.

4,876,780

DOUBLE WALL VACUUM TUBING AND METHOD OF MANUFACTURE

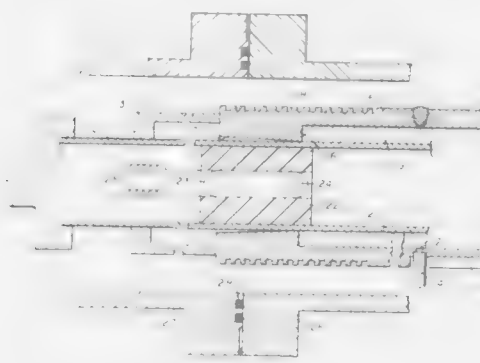
Charles R. Stahl, Scotia, N.Y.; Michael A. Gibson, and Christian W. Knudsen, both of Houston, Tex., assignors to Carbotek, Inc., Houston, Tex.

Filed Oct. 31, 1988, Ser. No. 264,351

Int. Cl.⁴ B23P 15/00

U.S. Cl. 29—157.4

35 Claims



1. A method of producing evacuated, double wall pipe for use in transporting hot or cold fluids which comprise:
providing a first pipe of predetermined larger diameter and a second pipe having an O.D. substantially smaller than the I.D. of the first pipe,
forming an evacuation opening in said first pipe,
inserting said second pipe inside said first pipe with an annular space therebetween,
welding said pipes together at one end,
securing a stretching tool to the other end of said second pipe,
prestressing said second pipe mechanically with said stretching tool an amount sufficient to prevent substantial buckling of said second pipe when said double wall pipe is used at elevated temperatures,
welding the other end of said first pipe and said prestressed

second pipe together without the introduction of mechanical spacers between the pipes,
evacuating the annulus between said pipes through said evacuation opening, and
sealing said evacuation opening.

4,876,781

METHOD OF MAKING A GARTER-TYPE AXIALLY RESILIENT COILED SPRING

Peter J. Balsella, P.O. Box 15092, Santa Ana, Calif. 92705, assignor to Peter J. Balsella, Santa Ana, Calif. and Joan C. Balsella

Division of Ser. No. 186,018, Apr. 25, 1988, Pat. No. 4,826,144. This application Nov. 7, 1988, Ser. No. 268,217

Int. Cl.⁴ B21F 37/02, 3/12

U.S. Cl. 29—173

6 Claims



1. A method for making a garter-type axially resilient coiled spring comprising the steps of:

fabricating by winding a metallic wire to produce coils canted with respect to a centerline of the garter-type axially resilient coiled spring, each coil having a leading portion and a trailing portion, said leading portion being disposed at a front angle in a range from 0 to 35 degrees with respect to a line normal to a centerline of the garter-type axially resilient coiled spring and said trailing portion being disposed at a back angle to the normal line;
during fabricating of the wire-adjusting the magnitude of the back angle in order to achieve a preselected resiliency of the garter-type axially resilient coiled spring; and
attaching two ends of the wound wire by welding in a manner that form forming a garter-type axially resilient coiled spring having the trailing portion along the inside diameter of the garter-type axially resilient coiled spring and the leading portion along the outside diameter of the garter-type axially resilient coiled spring.

4,876,782

APPARATUS FOR ATTACHING A GLIDE TO A CHAIR LEG

Ralph Carpinella, Middlebury, and Karl Becher, New Preston, both of Conn., assignors to Carpin Manufacturing, Inc., Waterbury, Conn.

Filed Aug. 17, 1988, Ser. No. 233,332

Int. Cl.⁴ B23P 19/04

U.S. Cl. 29—234

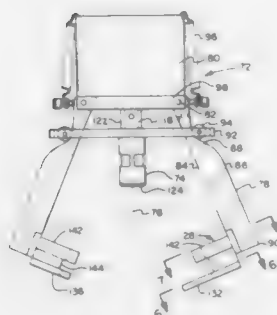
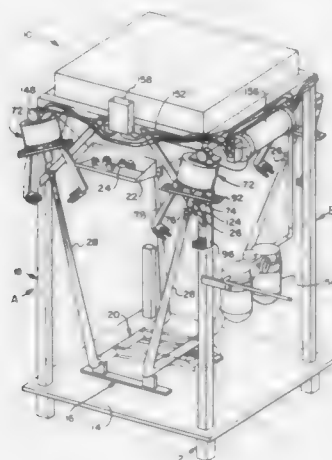
18 Claims

1. Apparatus for driving a glide into the free end of a chair leg that has a longitudinal axis, comprising:

means for holding a supply of glides, each glide being adapted to fit loosely on the free end of the leg in a first position and to be driven tightly onto the leg in a second position;
fixture means for engaging the leg remote from the free end of the leg, to support the leg against longitudinal displacement;
drive means mounted in fixed relation to the fixture means and in spaced relation to the free end of the leg, the drive means including means for selectively advancing and withdrawing a ram along a ram axis toward and away from the leg over a known stroke distance;
a pair of cam arms pivotally connected at one end to said drive means independently of the ram, for movement along arcuate paths transverse to the ram axis, each arm

having a free end and a portion defining a cam profile between the pivoted and free ends;
cam follower means connected to move with the ram and engaging the cam profiles, for controlling the arcuate movement of the cam arms such that when the ram is advanced the arm free ends pivot toward each other; and jaw means carried by the respective free ends of the pair of cam arms and oriented toward each other, for engaging the leg near the free end thereof as the ram advances, whereby the jaw means cooperate to align the leg axis with the ram axis while the glide is in the first position and to support the leg transversely to the leg axis as the ram advances along the known stroke distance to drive the glide into the second position.

12. Apparatus for driving a ram along a ram axis toward a work piece supported in a stationary position and having a work piece axis, comprising:



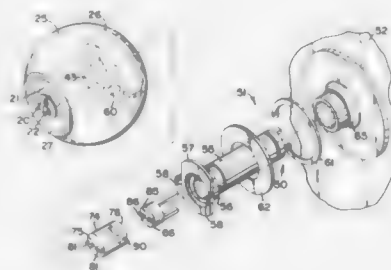
drive means adapted to be mounted in fixed, spaced relation to the work piece, for selectively advancing and withdrawing the ram over a stroke distance along the ram axis; a pair of cam arms pivotally connected at one end to said drive means independently of the ram, each arm having a free end for movement along an arcuate path transverse to the ram axis, and a side portion defining a cam profile; cam follower means connected to move with the ram and engaging the profiles of the cam arms, for controlling the arcuate movement of the cam arms such that when the ram is advanced the arms pivot toward the ram axis; and jaw means carried by the respective free ends of the cam arms and oriented toward each other, for engaging respective portions of the work piece as the ram advances, whereby the jaw means cooperate to align the axis of the work piece with the ram axis and to support the work piece as the ram advances over the stroke distance toward the work piece.

4,876,783 METHOD AND APPARATUS FOR CONVERSION OF DOORKNOB LOCK SETS

Neil P. Campion, Edina; Michael J. Foty, Bloomington, and Richard P. Novak, Minneapolis, all of Minn., assignors to Progressive Security Products, Inc., Edina, Minn.
Filed Jun. 19, 1987, Ser. No. 64,805
Int. Cl.⁴ E05B 15/00

U.S. Cl. 29—401.1

21 Claims



1. A method of converting a lock set having a first lock cylinder to one having a different alternate lock cylinder therein; said method including the steps of:

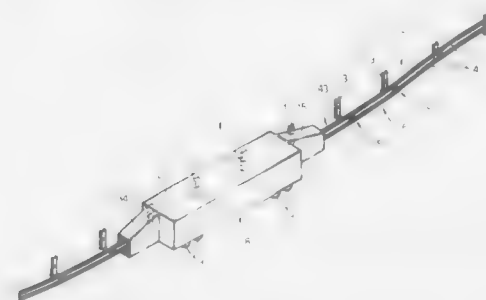
- (a) providing a lock set having a first lock cylinder, a spindle, and a driver mechanism to be converted; and, removing the first lock cylinder therefrom;
- (b) providing a universal knob for mounting on a variety of lock sets of a variety of designs; said universal knob having an outer edge portion, an inner edge portion and an internal bore;
 - (i) said bore defining a mounting chamber extending inwardly from said inner edge portion and including mounting means;
 - (ii) said universal knob including means for operatively mounting a lock cylinder mechanism therein;
- (c) providing a lock cylinder mechanism having a rotatable alternate lock cylinder with a first end and a second end;
 - (i) said rotatable alternate cylinder first end including a key slot therein;
 - (ii) said rotatable alternate cylinder second end including a tail piece engagement mechanism thereon;
- (d) providing a tail piece member selectively engageable by said rotatable alternate lock cylinder second end, to be rotated thereby; said tail piece member including means for selectively engaging and operating a driver mechanism of the lock set to be converted;
- (e) providing a spindle adaptor selectively mountable on a lock spindle of the lock set; said spindle adaptor including a mounting flange receivable within said universal knob bore;
 - (i) said spindle adaptor mounting flange including first and second mounting ears projecting outwardly therefrom;
 - (ii) said universal knob bore defining an inner mounting face having first and second oppositely positioned mounting recesses therein, said mounting recesses being oriented for receipt of said mounting ears therein;
- (f) mounting said spindle adaptor on the spindle of the lock set;
- (g) mounting the universal knob on the spindle adaptor with said spindle adaptor ears received within said knob bore mounting recesses; and,
- (h) mounting said lock cylinder mechanism in said universal knob with said tail piece member in engagement with, and in extension between, said rotatable alternate cylinder and the driver mechanism to transmit rotational motion therebetween.

4,876,784 METHOD FOR ON-SITE MAINTENANCE OF GUARDRAILS

Romolo Bussolino, Castiglione d'Asti, Italy, assignor to Hasta-sider Metal S.R.L., Asti, Italy
Filed Jul. 21, 1988, Ser. No. 222,264
Claims priority, application Italy, Jul. 24, 1987, 67655 A/87; Mar. 18, 1988, 52985/88[U]

Int. Cl.⁴ B23P 6/00; E01B 27/06; B61B 13/04
U.S. Cl. 29—402.06

9 Claims



1. A method for on-site maintenance of guardrails consisting of a number of posts; a number of metal section segments; a number of first joints connecting the said segments into a continuous strip; and a number of second joints connecting the said continuous strip to the said posts; said method comprising the steps of:

- starting at a first portion of said guardrail;
- successively dismantling the said second joints on the said first portion;
- moving along the said first portion a mobile, continuous maintenance apparatus by which unprocessed segments on the said first portion are engaged as they are detached from the respective said posts by dismantling the respective said second joints, the said apparatus presenting a processing tunnel with an input for the unprocessed segments and an output for processed segments processed in said apparatus;
- reconnecting said processed segments to said posts by reforming said second joints as said processed segments come out of said output, thus defining a bend moving with said apparatus along the guardrail, and consisting of a number of adjacent segments supported on said apparatus and connected by respective said first joints into a continuous strip.

4,876,785 METHOD FOR INSTALLING AND REMOVING A FIREPLACE INSERT

Roberts H. Driggers, 302 Covewood Tr., Asheville, N.C. 28805
Filed Aug. 25, 1987, Ser. No. 89,235
Int. Cl.⁴ B23P 19/04

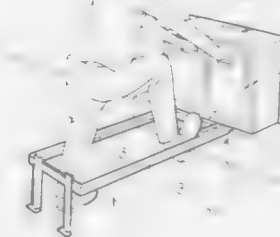
U.S. Cl. 29—426.3

3 Claims

1. A process for initially installing a fireplace insert into a hearth cavity, said process including steps for the subsequent removal and reinsertion of said fireplace insert for the purpose of cleaning said cavity and its associated chimney, comprising the steps of:

- positioning an apparatus for moving said fireplace insert to the proximity of said hearth cavity, said apparatus comprising:
- a roller device having a vertically movable topmost pair of parallel rails and a stationary bottommost pair of parallel rails, each with a proximal end and a distal end;
- said bottommost pair of parallel rails having wheels appropriately positioned for moving said device along the ground or floor;
- said roller device also having a vertical member joining and bracing said parts of parallel rails at said proximal ends;

an adjustable vertical support means for said topmost pair of parallel rails comprising a pulley system;
said topmost rails each having a roller at said distal end;
said topmost rails attached and supported by a bar at said proximal end and a bar near said distal end;
a track disposed along the inward side of said topmost rails;
a tray with wheels for moving along said tracks, said tray also including rollers for conveying said insert onto said tray;
adjusting said vertical support means to conform the height of said topmost parallel rails to a lower surface of said fireplace insert;



elevating the lower surface of said insert;
positioning said distal end of said rails under said insert;
rolling said tray along said tracks toward said distal end of said rails;
loading said insert onto said tray;
rolling said tray to said proximal end of said rails;
moving roller device to proximity of said hearth cavity;
adjusting said vertical support means to conform the height of said topmost rails to the height of a hearth adjacent said hearth cavity; and
conveying said insert to said hearth cavity.

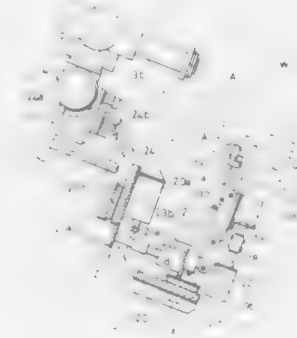
4,876,786 METHOD AND APPARATUS FOR ASSEMBLING AN INSTRUMENT PANEL IN AN AUTOMOBILE

Yasuhiro Yamamoto; Teiji Miwa, both of Sayama, and Tadashi Ajima, Kameyama, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 30, 1988, Ser. No. 278,122
Claims priority, application Japan, Dec. 1, 1987, 62-301418; Dec. 1, 1987, 62-301419

Int. Cl.⁴ B23P 11/00, 21/00
U.S. Cl. 29—429

3 Claims



1. A method of assembling an automobile instrument panel

in which the instrument panel is mounted in the front part of a cabin of a car body, said method comprising the steps of:

clamping an instrument panel set on a setting jig by applying clamp means on both longitudinal ends of the panel so as to hold the panel on an assembly jig, the clamp means being provided on both ends of the assembly jig which is mounted on a robot arm;

operating the robot arm to insert the assembly jig into the car cabin through a door opening in the car body;

moving the assembly jig to predetermined assembly position so that end walls located at the longitudinal ends of the instrument panel overlap the outer side surfaces of brackets, each bracket being pre-installed on each side, width-wise of the car, of the front part of the car cabin;

setting in advance at a predetermined position in the front part of the car cabin a cable that is to be connected to a cable connector attached to a built-in component incorporated in the instrument panel;

setting an X-axis, one of the coordinate axes of the stationary coordinates for the assembly jig, so that it is aligned with the longitudinal axis of the cable connector when the instrument panel is held on the assembly jig;

clamping the cable set at the predetermined position by a cable holder means when the assembly jig is moved to a position before the assembly position, the cable holder means being provided on the assembly jig so as to be movable in the X-axis direction; and

moving the cable holder means in the X-axis direction to connect the cable to the cable connector.

4,876,787

APPARATUS AND METHOD FOR FRAME WALL FABRICATION

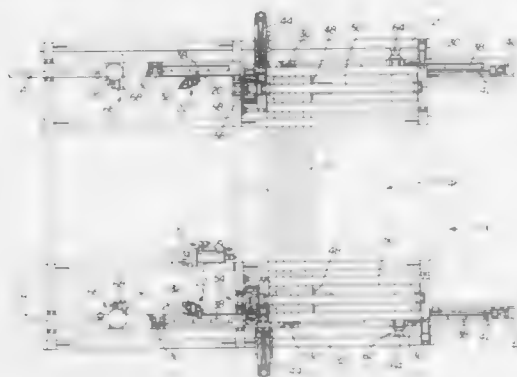
Jeffrey L. Ditty, P.O. Box 55128, Lexington, Ky. 40555; Robert L. Rives, Lexington, Ky.; James T. Schanding, Paris, Ky., and Eric S. Burke, Lexington, Ky., assigns to Jeffrey L. Ditty and Versa Tech Engineering, both of Lexington, Ky.

Filed Jan. 20, 1988, Ser. No. 208,686

Int. Cl.⁴ B27F 7/00

U.S. Cl. 29—430

15 Claims



1. A method for fabricating a frame wall with a framing apparatus, comprising the steps of:

feeding first and second end plates into registration position; positioning a first stud in registration position between said end plates;

tacking said first stud in registration position while maintaining clearance between said end plates for positioning of a second stud in registration between said end plates; and staking and anchoring said end plates and first stud fully together only after said second stud is in registration; whereby the necessary clearance is provided between said end plates to allow proper and efficient positioning of said second stud while application of pressure tending to pull

said end plates and first stud apart in order to position said second stud in registration is substantially eliminated.

4,876,788

METHOD OF MAKING A LEAKPROOF CONNECTION ABOUT THE OUTLET TUBE OF A LIQUID CONTAINMENT BAG

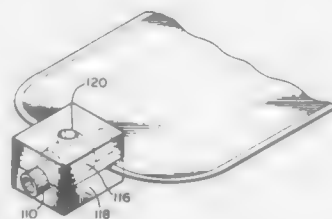
Peter L. Steer, and Graham E. Steer, both of North Reigate, England, assigns to E. R. Squibb and Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 123,428, Nov. 20, 1987, abandoned. This application Jul. 6, 1988, Ser. No. 215,835 Claims priority, application United Kingdom, Nov. 28, 1986, 86 28480; Nov. 28, 1986, 86 28481; Jul. 8, 1987, 87 16089

Int. Cl.⁴ B21K 25/00

U.S. Cl. 29—508

4 Claims



1. A method of making a bag for containing liquids and having an outlet tube comprising a first step of placing the tube between two superposed bag walls, and by a subsequent step of sliding an encircling sleeve over the tube to a position where it contains within it the portions of the bag walls on either side of the tube, and thirdly, compressing the sleeve onto the tube by a crimping operation in which the lines of action of the crimping forces are perpendicular to a first plane which is substantially perpendicular to the plane containing the walls of the bag, said first plane also containing the longitudinal axis of the tube.

4,876,789

APPARATUS FOR MEASURING AND CUTTING SHEETROCK

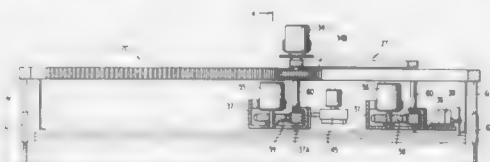
Joseph M. Burwell, 7202 Fairchild Dr., Fairfax, Va. 22306

Continuation-in-part of Ser. No. 185,689, Apr. 22, 1988. This application Aug. 26, 1988, Ser. No. 236,881

Int. Cl.⁴ B23P 23/00; G01B 5/20

U.S. Cl. 29—560

8 Claims



1. An apparatus for simultaneously measuring the walls and ceilings of an area to be paneled with sheetrock and cutting 4x8 panels of sheetrock for installation comprising, a measuring unit having a stylus supported thereon for both vertical and horizontal movement to trace out the outline of a panel of sheetrock to be cut directly from the wall upon which the panel is to be installed, a cutting unit having sawing means mounted thereon for both vertical and horizontal movement positionable over a stack of 4x8 sheetrock panels and including drive means for said sawing means and electrical control means connected between said measuring unit and said sawing means drive means to direct said sawing means of said cutting unit to cut panels of sheetrock as outlined by the measuring

stylus of said measuring unit simultaneously with the path traced by the measuring stylus on said measuring unit, said measuring unit comprising a pair of U-shaped frames connected at the top inner ends of said U-shape by a cross member having a universal pivot for swing mounting said U-shaped frames of the measuring unit to a wheeled floor carrier for either vertical or horizontal movement to measure directly from either wall or ceiling to direct the sawing means of the cutting means to follow the pattern outlined by the stylus of said measuring means, sleeves carried by the outer free ends of said U-shaped frames having external gear teeth on each sleeve to permit driving of the secondary rectangular frame therealong, and a secondary rectangular frame being mounted with its major axis transverse to the vertical axis of the U-shaped frames of the measuring unit on which said stylus is carried.

4,876,790

MAGNETIC INFORMATION RECORDING AND/OR READING HEAD WITH INCREASED WEAR-RESISTANT PROPERTIES AND A METHOD FOR MANUFACTURING THE SAME

Istvan Grimm; Sandor Stenczinger; Istvan Bolla, all of Budapest, and Istvan Csanyi, Dunakeszi, all of Hungary, assigns to Budapesti Radiotechnikai Gyar, Budapest, Hungary

PCT No. PCT/HU84/00053, § 371 Date Sep. 5, 1985, § 102(e) Date Sep. 5, 1985, PCT Pub. No. WO85/02289, PCT Pub. Date May 23, 1985

Continuation of Ser. No. 770,863, Jul. 11, 1985, abandoned. This PCT application Nov. 9, 1984, Ser. No. 170,681

Claims priority, application Hungary, Nov. 11, 1983, 3862/83

Int. Cl.⁴ G11B 5/42

U.S. Cl. 29—603

9 Claims



1. A method for producing magnetic recording and/or playback heads with improved abrasion resistance for use with a magnetic record medium having a magnetizable surface for retaining information in the form of a pattern of magnetization, comprising the steps of:

(a) providing pole sheets of predetermined shape made of a material with high magnetic permeability, each sheet having a frontal zone for sliding engagement with said recording medium and a lateral surface substantially normal to said frontal zone for defining a side of a pole gap;

(b) providing a hard layer on at least one surface of said sheets extends to said frontal zone by means of high rate reactive cathode sputtering, said layer having a substantially uniform thickness in the range of 0.5 to 2.0 micrometer, having a Vickers hardness corresponding to the hardness exhibited by titanium nitride, chromium nitride, silicon carbide, tantalum nitride or tungsten nitride and being of an electrically non-conductive and non-magnetizable material;

(c) assembling said sheets together to form a pair of half cores in such a way that in each of said half cores said sheets are stacked on each other and at least one of said layers 12 arranged between each pair of sheets in each half core; and

(d) mounting said half cores together to form said head.

4,876,791

APPARATUS FOR AND METHODS OF DIE BONDING

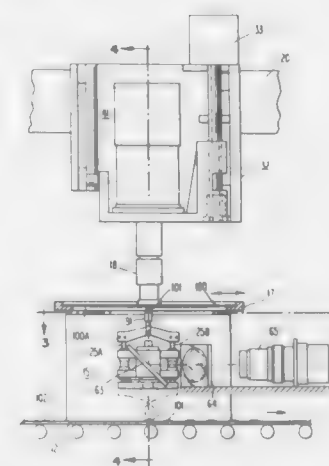
Gerard H. Michaud, Furlong; James H. Graham, Pottstown, both of Pa., and Roger P. Stout, Chandler, Ariz., assigns to Kulicke & Soffa Industries, Inc., Willow Grove, Pa.

Continuation of Ser. No. 855,009, Apr. 22, 1986, abandoned. This application Mar. 21, 1988, Ser. No. 170,825

Int. Cl.⁴ H05K 13/04

U.S. Cl. 29—840

54 Claims



1. An apparatus for removing a die from a flexible adhesive film mounted wafer containing a plurality of dice and bonding the die to a bond site on a substrate having a plurality of bond sites thereon, said apparatus comprising:

(a) component holding means, including an XY table for holding the dice side of said wafer upside down in a first substantially horizontal plane, said XY table being movable such that each die is locatable at a pickup location within said first plane;

(b) a die eject pin above said wafer, including means for actuating said pin towards the film side of the wafer;

(c) substrate holding means, including a substrate track for holding the substrate in a second substantially horizontal plane below said first plane, said substrate track being movable such that each of the bond sites is locatable at a bond location and aligned below said pickup location; and

(d) a die bond head rotatably located between said first and second planes, including means for actuating said die bond head for removing the die from the flexible adhesive film and for placing the die on the substrate.

4,876,792

CABLE STRIPPING DEVICE

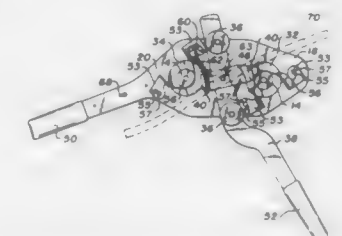
Lia Black, SS #3, Site 13, Comp 39, Prince George, B. C., Canada (V2N 2S7)

Filed Dec. 6, 1988, Ser. No. 280,448

Int. Cl.⁴ B21F 13/00; B26B 27/00

U.S. Cl. 30—90.9

9 Claims



1. A cable stripping device for removing armour from an armoured cable, comprising

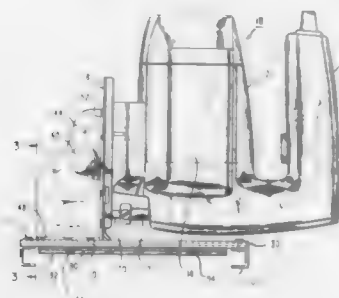
a pair of rotatable cutter members; cutter support means for supporting said cutter members for rotation about parallel axes of rotation and in a common plane; said cutter members being spaced apart to receive said cable therebetween; cable guide means for guiding said cable between said cutter members; and means for displacing said cable guide means against opposite sides of said cable to thereby press opposite sides of said cable against said cutter members, whereby said cutter members make longitudinal cuts along opposite sides of said cable.

4,876,793
JAMB SAW

James A. Quaglia, 88C Friendship Rd., Howell, N.J. 07731
Filed Jan. 27, 1988, Ser. No. 212,248
Int. Cl.⁴ B27B 11/02

U.S. Cl. 30—122

9 Claims



1. A portable, power-driven, horizontally reciprocating saw utilizing a standard jig saw having a reciprocating means, a skid plate and a motor means, said jig saw positioned such that said reciprocating means is positioned to reciprocate in a horizontal plane, comprising:

- an upper assembly plate having longitudinal edges and transverse ends, said upper assembly plate having two upstanding mounting brackets perpendicularly secured to said upper assembly plate, said upper assembly plate having a U-shaped slot positioned between said brackets, said upper assembly plate having said longitudinal edges thereof curved under to define a channel between said transverse ends;
- a lower assembly plate slidably receivable in said channel of said upper assembly plate, said lower assembly plate having a drive post secured thereto, said drive post slidably receivable in said U-shaped slot of said upper assembly plate when said lower assembly plate is slidably received in said channel of said upper assembly plate;
- a saw plate having a mounting portion and at least one longitudinally extending saw blade portion;
- a means for mounting said saw plate to said lower assembly plate;
- a plurality of shoe plates secured to said transverse ends of said upper assembly plate to adjust the height of said saw blades;
- a drive pin having a first end secured to said reciprocating means of said jig saw and having a second end secured to a drive block removably secured to said drive post on said lower assembly plate for transmitting said horizontal reciprocating action of said jig saw to said lower assembly plate and to said saw blade.

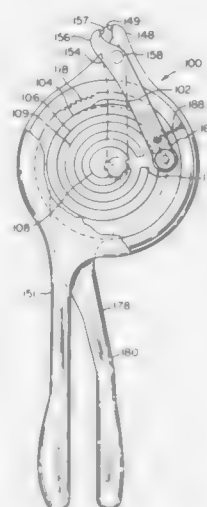
4,876,794
VARIABLE MECHANICAL ADVANTAGE DEVICE
UTILIZING A RADIAL CAM

Herman A. Myers, Hopwood, Pa., assignor to Radia-Cam Inc., Hopwood, Pa.

Filed Jul. 13, 1988, Ser. No. 218,813
Int. Cl.⁴ B26B 13/00

U.S. Cl. 30—252

49 Claims



1. A cam comprising a flat plate having at least a first flat surface and having a spiral groove in the first flat surface, the spiral groove formed of a plurality of tracks having progressively smaller radii and including at least an innermost track and an outermost track, the cam further including a return slot connecting the innermost track to the outermost track, with the tracks and return slot forming a continuous groove on the first flat surface.

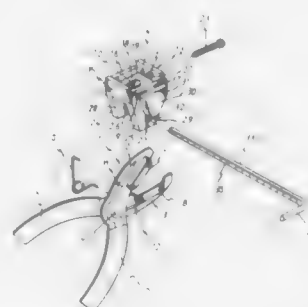
4,876,795
CUTTER, IN PARTICULAR FOR A SLAT, ESPECIALLY
OF A VENETIAN BLIND

Huang Chun-cheng, Taipei, Taiwan, assignor to Teh Yor Industrial Co., Ltd., Taiwan

Filed Jul. 28, 1988, Ser. No. 225,269
Int. Cl.⁴ B26B 13/10

U.S. Cl. 30—254

8 Claims



1. A cutter, in particular for a slat, especially of a venetian blind, comprising a pair of scissors with extended handles and joined at a center fulcrum, said scissors being partially deflected at a portion of an inner part thereof to form a pair of knife blades deviated from and substantially parallel to the plane of its respective scissor, a guide block having opposite higher lateral guide walls and opposite lower side walls, which all together define a recess, and a connector attached to one of

said side walls at a central upper portion thereof to form a spacing between an inner surface of said connector and an outer surface of said one side wall for engaging with one of said scissors.

4,876,796

SPROCKET ASSEMBLY FOR CHAIN SAWS

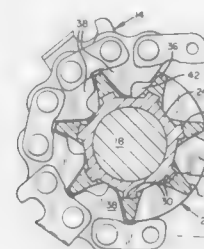
Eugene E. Calkins, Salem, and Michael V. Petrovich, Portland, both of Oreg., assignors to Blount, Inc., Portland, Oreg.

Filed Mar. 18, 1988, Ser. No. 169,899

Int. Cl.⁴ B23D 57/02

U.S. Cl. 30—383

6 Claims



1. A sprocket assembly for a chain saw comprising; a sprocket and a sprocket adapter, said sprocket provided with rims and multiple sprocket teeth confined between the rims and forming therewith tang receiving pockets having open pocket bottoms, said sprocket adapter including an adapter shaft having a circular center opening adapted to receive the drive shaft of a chain saw power head and a determined outer configuration including outwardly projected splines having spline roots, said adapter shaft having a radial thickness adjacent the roots of the splines that is a determined thickness for strength and said configuration of the adapter shaft being characterized by relieved areas of thickness between the splines, said relieved areas of thickness including a minimum thickness at the center position between the splines and having progressively greater thicknesses progressing toward the spline roots, said sprocket having spline-receiving grooves positioned for receiving the splines of the adapter shaft whereby the open pocket bottoms between the teeth are positioned over the center position of the relieved areas of thickness between the spline roots upon assembly of the sprocket and sprocket adapter.

4,876,797

REDUCED VIBRATION PORTABLE GAS OPERATED
HAND SAW

Alvaro Zapata, 7511 Maldive St., Rio Linda, Calif. 95673

Filed Jan. 17, 1989, Ser. No. 297,029

Int. Cl.⁴ B23D 45/16; B25F 3/00; B26B 11/00

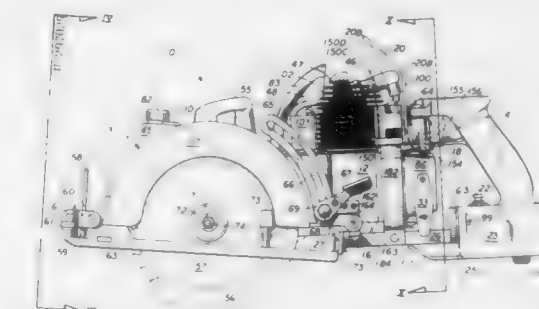
U.S. Cl. 30—388

16 Claims

1. In a self contained gas operated portable hand saw including

- a engine housing having a gas operated engine mounted therein and a engine shaft extending out of said housing driven by said engine, a carburetor mounted in said housing coupled to said engine, a handle mounted at one end spaced from said engine housing and a saw blade housing adapted to house therein a circular saw blade mounted at the other end of said engine housing, said saw housing being fixedly secured to and extending linearly from said engine housing and also having a handle thereon spaced from said first mentioned handle a distant sufficient for an operator to simultaneously grasp both of said handles when said engine is running and said engine shaft is rotating, a trigger provided on said first mentioned handle operatively connected to said carburetor for activating the same, a rotatable saw blade shaft extending transverse to said saw housing adapted to have said saw blade keyed

thereto for rotation, a rotatable gear mounted in said saw housing having said rotatable saw blade shaft fixedly secured thereto, said gear rotating in a plane extending normal to the longitudinal axis of said hand saw whereby any saw blade keyed to said rotatable saw blade shaft rotates in a plane extending normal to the longitudinal extent of said hand saw, a worm gear in driving engagement with said saw blade shaft fixedly secured to a worm gear shaft extending toward said engine shaft, and centrifugal clutch means mounted in a clutch housing coupled to said engine housing between said worm gear shaft and said



engine shaft driven by said engine shaft and engageable with said worm gear shaft when activated to thereby rotate said worm gear to rotate said blade shaft gear thereby rotating any saw blade keyed to said rotatable saw blade shaft, the improvement which comprises:

said engine being suspended within said engine housing by vibration dampening means whereby said engine can vibrate freely with respect to said engine housing, and vibration isolating means coupled to both said first-mentioned handle and said engine housing for isolating vibration between said engine and said handle, and said saw blade housing.

4,876,798

LEVEL WITH ILLUMINATED BUBBLE VIALS

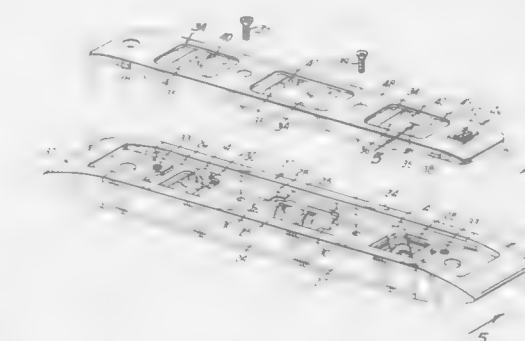
Harold Zimmerman, 2606 Mercury La., Bismarck, N. Dak. 58501

Filed Jan. 11, 1988, Ser. No. 142,649

Int. Cl.⁴ G01C 9/32

U.S. Cl. 33—348.2

4 Claims



1. A retrofit assembly for converting an unlighted level to an illuminated level, the unlighted level including:

- an elongate main frame provided with two parallel, spaced-apart longitudinally extending flat, plane working surfaces and a web extending between said working surfaces generally in parallel relation to the longitudinal axes of the working surfaces and at right angles to the plane of the

working surfaces, said web being provided with a plurality of frame sight ports therethrough;
a plurality of bubble vials each positioned in the main frame across and slightly beyond one of the frame sight ports to have a permanent fixed angular relationship with respect to the plane of the main frame working surfaces, and
first and second side plates positioned in parallel relation to each other to cover at least a substantial portion of the main frame web, with one of said side plates being positioned on each side of the main frame, said side plates each being provided with a plurality of side plate sight ports in visual alignment with each of the main frame sight ports, and

fastening means to removably position the first side plate to the main frame;
said retrofit assembly including:

- a retrofit side plate of configuration and character to effectively replace said first side plate when said first side plate has been removed, said retrofit side plate having a plurality of side plate sight ports therethrough positioned to be in visual alignment with the main frame sight ports;
- a plurality of light emitting diodes each mounted on a side of the retrofit side plate adjacent the main frame web to have position to emit light on end portions of said bubble vials, each such diode being in spaced, adjacent relation to and outside of a bubble vial;
- a switch mounted to the retrofit side plate in position to be activated by an operator;
- battery means mounted to a side of the retrofit side plate adjacent the web; and
- electrical conductors mounted to a side of the retrofit side plate adjacent the web, said conductors coupling the light emitting diodes, the battery means and the switch to cause energization of the light emitting diodes when the switch is actuated.

4,876,799

LEVEL SENSING UNIT AND A LEVEL INDICATING DEVICE THEREOF

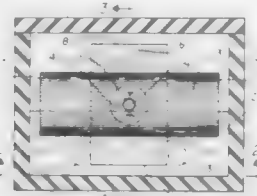
Kenneth E. Wolf, 995 Sheridan, Wauconda, Ill. 60084

Filed Aug. 3, 1988, Ser. No. 227,696

Int. Cl.⁴ C01C 9/06; B60Q 1/52

U.S. Cl. 33—366

4 Claims



1. A level sensing unit comprising a sealed housing with a front and back wall, a top and bottom and two side walls and containing a fluid reservoir;
an axle with an electrically conductive surface connected to and extending between the front and back walls;
a generally cylindrical float pivotally mounted on the axle via a bushing with an electrically conductive surface located approximately centrally on the float, coincident with a short axis thereof, and in electrical contact with the axle;
said float having a flat electrical conductive plate with a first and second edge intersecting the float along its long axis and placed normal to and in electrical contact with said bushing, said plate extending above the surface of the cylindrical body and placed approximately midway between the ends of the float and disposed symmetrically with respect to said bushing; and
first and second electrically conductive strips mounted be-

tween the front and back walls coparallel to the axle and proximate to the first and second edges of said plate.

4,876,800

PORTABLE GRIP LENGTH INDICATOR

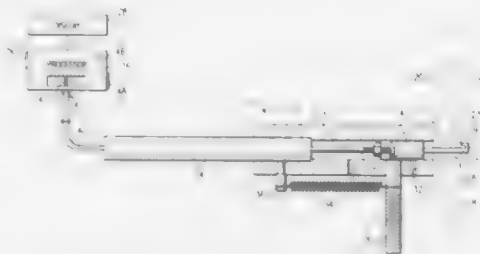
Gary W. Pekar, Jack W. Mason, both of Grand Prairie, and Michael Blanc, Fort Worth, all of Tex., assignors to LTV Aerospace and Defense Company, Grand Prairie, Tex.

Filed Oct. 7, 1988, Ser. No. 254,978

Int. Cl.⁴ G01B 7/06, 7/02

U.S. Cl. 33—784

19 Claims



1. A portable grip length indicator for determining a discrete fastener length for a fastener to be used in fastening the opposite faces of sheet-like material(s), said indicator comprising:
a body;
probe means connected to said body and capable of extension beyond said body for determining the dimension between the opposite faces, said probe means having a distal end that is extendible beyond the body;
transducer means connected to said probe means for sensing the relative movement of the probe means and translating said movement into an electrical output signal; and
electrical processing means for processing the output signal from the transducer means and computing a discrete fastener length according to a predetermined correlation of the dimension between the opposite faces and the type of fastener to be used, said electrical processing means including means for storing information concerning the type of fastener used said correlation being stored and maintained in memory by said processing means.

4,876,801

METHOD AND MEANS FOR DRYING BULK GOODS

Johann Gehring, Spardorf, and Siegfried Birkle, Hoechststadt A/Alsch, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Mar. 21, 1988, Ser. No. 170,906

Claims priority, application Fed. Rep. of Germany, Apr. 16, 1987, 3713069

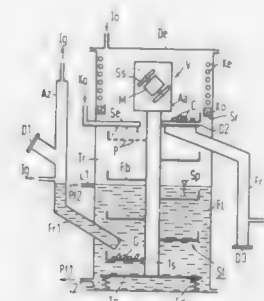
Int. Cl.⁴ F26B 3/00

U.S. Cl. 34—9

9 Claims

1. A drying device for bulk goods comprising:
a chamber having a drying space therein,
a vibratory helical conveyor for conveying bulk goods through said drying space,
a body of water-immiscible liquid contained in said drying space, said liquid being lighter than water,
means for rendering said drying space gas-tight,

means for introducing an inert gas into said drying space,



means for directing moisture displaced by said liquid to the bottom of said chamber for discharge therefrom.

4,876,802

PROCESS AND MEANS FOR THE HEAT TREATMENT OF POWDERY OR GRANULATE MATERIAL

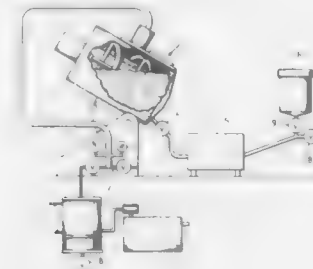
Gerhard Gergely, Irmgard Gergely, and Thomas Gergely, all of A-1050 Vienna, Gartengasse 8, Austria

Continuation-in-part of Ser. No. 766,884, Aug. 16, 1985, abandoned. This application Jun. 23, 1986, Ser. No. 877,112 Claims priority, application Austria, Dec. 21, 1983, 4465/83-1; Switzerland, Jun. 21, 1985, 2640/85; Oct. 3, 1985, 4287/85

Int. Cl.⁴ F26B 5/04

U.S. Cl. 34—15

18 Claims



1. In a process for heat treating agitated powder or granulate material contained in a closed drum wherein hot gas is driven through the material, the improvement which comprises the gas comprising a treatment agent and a carrier gas at a temperature sufficient that the treatment agent is present in the vapor state and is drawn through the agitated material, said material being at a temperature below the boiling temperature of the treatment agent and at nearly pressure, and after the desired reaction time, the treatment agent condensed on the material is evaporated and drawn out of the drum by the application of a vacuum at or below the pressure corresponding the boiling point of the treatment agent.

4,876,803

DRYER APPARATUS FOR DRYING A WEB

Gregory L. Wedel, Beloit, Wis., assignor to Beloit Corporation, Beloit, Wis.

Continuation-in-part of Ser. No. 14,569, Feb. 13, 1987. This application Jul. 22, 1988, Ser. No. 223,186

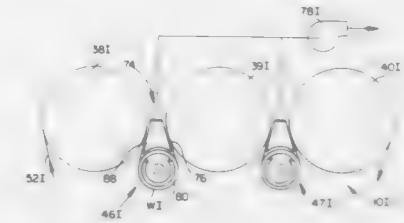
Int. Cl.⁴ F26B 11/02

U.S. Cl. 34—117

8 Claims

1. A dryer apparatus for drying a web extending through a dryer section of a paper machine, said apparatus comprising:
a first dryer of the dryer section;
a dryer felt movably extending around said first dryer such

that the web is disposed between said first dryer and said felt for drying the web;
a second dryer disposed downstream relative to said first dryer, the web and said felt extending around said second dryer such that the web is disposed between said second dryer and said felt for further drying of the web;
a vacuum transfer roll disposed downstream relative to said first dryer and upstream relative to said second dryer such that the web and said felt extend around said transfer roll so that said felt is disposed between the web and said transfer roll when the web and said felt move around said transfer roll;
sealing means extending between said first and second dryers for reducing a flow of air between said first and second dryers into a pocket defined by said transfer roll and said felt extending between said dryers and said transfer roll;



said transfer roll including:

- a perforate shell, said shell being connected to a source of partial vacuum such that in use of the apparatus, a partial vacuum is generated within said shell, said partial vacuum inducing through said perforate shell a further partial vacuum within said pocket so that air flows in a direction from the web towards said felt for urging the web into close conformity with said felt during movement of the web around said transfer roll and also during movement of the web between said dryers and said transfer roll; and
- said sealing means further including:
a wedge-shaped box disposed within and conforming to the shape of said pocket such that said further vacuum is induced within said pocket and externally relative to said box.

4,876,804

JUMPING SHOE

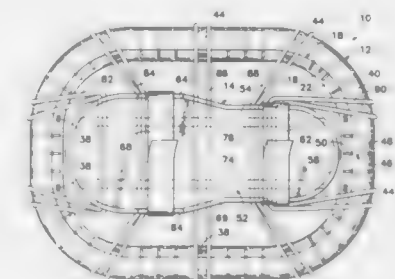
LeRoy Hart, 9340 NE. 76th St., Vancouver, Wash. 98662

Filed Nov. 22, 1988, Ser. No. 275,397

Int. Cl.⁴ A43B 3/10

U.S. Cl. 36—7.8

19 Claims

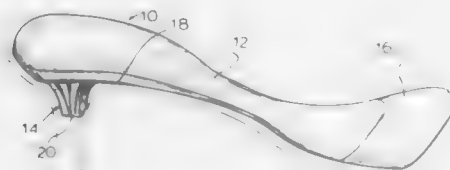


1. An improved jumping shoe attachment for use with a shoe comprising:
a base having spaced apart top and bottom margins and a rigid, continuous, peripherally extending wall extending between the margins;
a shoe holder for receiving a shoe thereon including straps for holding the shoe to the holder; and

resilient means extending in tension between said base and said shoe holder allowing resilient, returnable vertical movement of said shoe holder relative to said base.

4,876,805 **SHOCK ABSORBING DEVICE FOR HIGH HEEL FOOTWEAR**

William J. Peoples, Allentown, Pa., assignor to Polymer Dynamics Technology, Inc., Allentown, Pa.
Filed Apr. 29, 1988, Ser. No. 188,907
Int. Cl.⁴ A43B 13/40, 13/28, 21/32
U.S. Cl. 36—43 11 Claims



1. The shock absorbing insole of claim 1, further comprises: an energy absorbing viscoelastic polymer component at the metatarsal portion of the footbed.

4,876,806 **ASYMMETRIC SHOE**

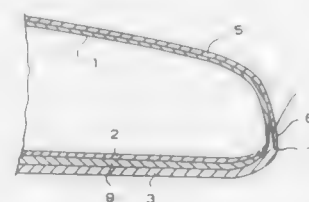
John R. Robinson, Beaverton, and Daniel J. Richard, Portland, both of Oreg., assignors to Nike, Inc., Beaverton, Oreg.
Continuation of Ser. No. 823,772, Jan. 29, 1986, abandoned. This application Sep. 8, 1988, Ser. No. 243,191
Int. Cl.⁴ A43B 5/00, 23/00, 13/12
U.S. Cl. 36—114 18 Claims



1. An asymmetric shoe having a forepart section and a rearpart section comprising:
an upper;
a sole attached to said upper;
said upper being formed of a plurality of layers of material including an inner layer and an outer layer, said outer layer including a medial overlay in the area of the first metatarsal-phalanges joint and a lateral overlay in the area of the fifth metatarsal-phalanges joint, said medial and lateral overlays having medial and lateral flex notches for enhancing the flexibility of the material in the area of said notches, said medial flex notch extending over the area overlying and having a border on either side of the first metatarsal-phalanges joint, said lateral flex notch extending posterior of said medial flex notch to the area overlying the fifth metatarsal-phalanges joint and having a border on either side of the fifth metatarsal-phalanges joints, at least one of said layers of material defining a quarter portion with an ankle opening in the rearpart section, said quarter portion at said ankle opening having a greater height on the medial side than on the lateral side by a distance approximately equal to an average difference

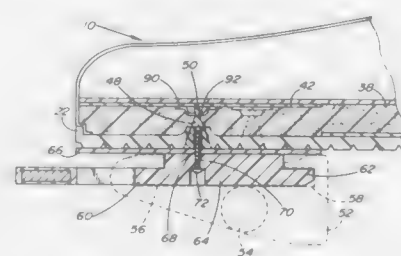
between the medial and lateral malleolar heights, the lowest point of the ankle opening in said quarter portion on the medial side being located anterior of the lowest point of the ankle opening in said quarter portion on the lateral side by a distance approximately equal to the difference between the medial and lateral malleolar lengths; said sole including a midsole with a wedge section increasing the thickness of the midsole in the area generally between the metatarsal-phalanges joints and the heel, the anterior edge of said wedge section on the medial side of the sole being located posterior of the first metatarsal-phalanges joint and on the lateral side being located posterior of the fifth metatarsal-phalanges joint.

4,876,807
SHOE, METHOD FOR MANUFACTURING THE SAME, AND SOLE BLANK THEREFOR
Antti-Jussi Tiitola, Kaivanto, and Kari Pohja, Mikkeli, both of Finland, assignors to Karhu-Titan Oy, Finland
Filed Jul. 1, 1988, Ser. No. 214,608
Claims priority, application Finland, Jul. 1, 1987, 872898
Int. Cl.⁴ A43B 5/00 13 Claims



1. A shoe, having a sole structure including an insole, a flexible midsole, and an outer sole forming a wearing surface, said outer sole being formed, at least in a toe region of the shoe, with an upwardly-extending, cup-like edge, and an upper comprising, at least in the toe region of the shoe, an inner layer, and an outer layer, said outer layer and outer sole being attached with said upwardly-rising, cuplike edge of said outer sole lying between said inner and outer layers of said upper.

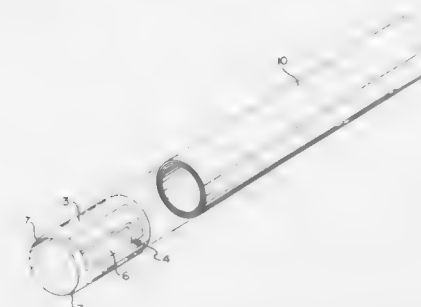
4,876,808
RUNNING AND CYCLING SHOE
Gerald W. Hsieh, P.O. Box 1299, El Toro, Calif. 92630
Filed Jun. 20, 1988, Ser. No. 208,487
Int. Cl.⁴ A43B 5/14, 5/04 8 Claims



1. A sport shoe useful for cycling and running which comprises:
a. a composite sole including an outer sole, an intermediate sole, and a cushioning layer therebetween;
b. a plurality of through apertures in a preselected array in the toe portion of said outer sole;

c. brackets on the underside of said intermediate sole, each bracket having a receiving aperture and being positioned on said intermediate sole in said preselected array, whereby each aperture in said brackets is aligned with a respective through aperture in said outer sole; and
d. aperture seals comprising at least one flexible and slotted membrane extending across each of said through apertures.

4,876,809
METHOD OF IDENTIFICATION OF ROLLED-UP SHEETS OF MATERIAL
Frank M. Johnson, 530 S. Seventh, Ann Arbor, Mich. 48103
Filed Dec. 16, 1987, Ser. No. 134,505
Int. Cl.⁴ G09F 3/00 5 Claims



1. A method for identifying and storing rolled-up sheets of material, comprising the steps of:
rolling said material to a first predetermined diameter;
deforming a combination retainer and identification means from a collapsed-tube configuration thereof to a substantially cylindrical configuration thereof having a second predetermined diameter which is greater than said first predetermined diameter; and
applying said combination retainer and identification means to said rolled material to retain it in rolled condition at said second predetermined diameter, by sliding said combination retainer and identification means over one end of said rolled material to a position surrounding a substantially central portion of said rolled material.

4,876,810
OPEN SLEEVE SUPPORT FOR WIRE MARKING ELEMENTS WITH SNAP LOCK
Ivana Piana, and Silvano Piana, both of Genova, Italy, assignors to Graphoplast S.p.A., Italy
Filed Jun. 15, 1988, Ser. No. 207,284
Claims priority, application Italy, Jun. 19, 1987, 12502 A/87; Mar. 25, 1988, 12446 A/88
Int. Cl.⁴ G09F 3/00 13 Claims



1. A support for identifying electric wire or cable, which comprises:
(a) an elongated sleeve in the form of an open c having an

internal central portion and opposed longitudinally extending free ends defining therebetween a longitudinally extending opening into said internal central portion,
(b) at least one of said free ends of said sleeve being connected via a weakened zone to a longitudinally extending member operable to urge an electric wire or cable into said internal central portion of said sleeve,
(c) said member having first and second portions projecting away from said weakened zone towards and away from said internal central portion of said sleeve, respectively, such that when said sleeve is mounted on a wire or cable by lateral pressure of the sleeve against the wire or cable, the sleeve will initially be subject to elastic deformation during its opening, while the member will oscillate around the weakened zone until it fits snugly around the wire or cable and, when the wire or cable is further pushed into the sleeve, elastic pressure of the member on the wire or cable will cause a snap action automatically pushing the cable into the sleeve and resulting in a renewed oscillation of the member around the weakened zone which will exert pressure on the wire or cable which rests inside the internal central portion of the sleeve.

4,876,811
HAND-HELD MESSAGE SIGN
David Peltz, 5766 N. Bel Aire Dr., Glendale, Wis. 53209
Filed Feb. 19, 1988, Ser. No. 157,706
Int. Cl.⁴ G09F 21/02 19 Claims

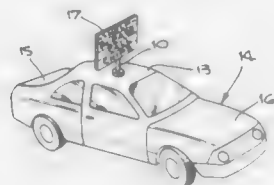


1. A hand-held message sign comprising:
a substantially vertical planar message-bearing member having a message-bearing front side and a back side with a central portion;
a pistol-grip member with a handle portion and a substantially horizontal extension portion having a distal end; and
means attaching the distal end of the horizontal member to the back side of the planar member in position thereon such that the pistol-grip member is behind the central portion whereby in use it is substantially occluded from view from the front by the message-bearing member.

4,876,812
EMERGENCY CAR CALL KIT
Katherine Haralson, 4617 Ledge Ave., Toluca Lake, Calif. 91602
Filed May 6, 1988, Ser. No. 191,199
Int. Cl.⁴ G09F 21/04 2 Claims

1. An emergency kit for temporary storage and subsequent

display of selected visible messages when in assembled mounted condition on the exterior of a passenger carrying vehicle, said kit comprising a post means having a base member and an upright member for mounting on the base member, a mono-color display sheet comprising a single thickness of sheet material having a forward side and a rearward side, releasable engagement means on said display sheet having a releasable engagement with said post means in assembled condition for securing said display sheet on the post means in exposed display position, a plurality of substantially horizontally extending parallel retention bands on said forward side of the display



sheet, a container and multiple sets of substantially flat message characters adapted to be stored in sequential visible order in said container, each of said characters having substantially the same perimetrical shape and size, a display face having a color different from the color of said display sheet, and a rear face, said display faces being in visible position during storage to facilitate selection, attachment media adjacent the rear face of each character comprising a mechanical interlock adapted to releasably engage portions of said retention bands in selected sequence whereby to display messages on the bands visible from a direction facing said forward side of the display sheet.

4,876,813

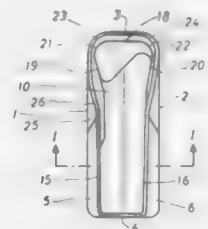
MAGAZINE FOR FIREARMS

Martin Tuma, Solothurn, Switzerland, assignor to ITM Industrial Technology & Machines AG, Solothurn, Switzerland
Filed Dec. 7, 1988, Ser. No. 280,988

Int. Cl.⁴ F41C 25/04

U.S. Cl. 42—50

4 Claims



1. A magazine for a firearm specifically a hand gun, the magazine being for storing cartridges of various sizes and comprising:

a housing having two narrow side walls and two broad side walls, the latter terminating at an open end of the housing in magazine lips, cartridge guideway of a V-shaped cross section respectively extending along said broad side walls in a longitudinal direction of said housing and projecting towards the inside thereof, respective housing wall areas forming flanks of the respective V-shaped cartridge guideways which, at a firing direction side, extend curvilinearly at least at edge areas at said open end of said housing and pass continuously curved into the said narrow side wall at the firing direction side, and a feeder having a cartridge support surface and a magazine spring biasing said feeder towards said open end of said housing;

said magazine lips each comprising an inner surface defining part of a jacket of a cylinder having a diameter substantially equal to the diameter of the base of the largest cartridge which is storable in the magazine, and elongated

edges extending at an angle relative to each other and at any point along their longitudinal extent at a mutual distance which is smaller than the diameter of the base of the smallest cartridge which is storable in the magazine; and said cartridge support surface of said feeder comprising a bulged surface section which ensures a line contact between said feeder and any cartridge shell supported thereupon.

4,876,814

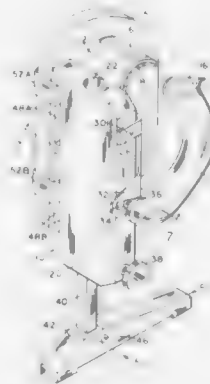
GUN REST FOR SUPPORTING THE BUTTSTOCK
Philip C. Lombardo, P.O. Box 3106, Kirkland, Wash.
98033-3106

Filed Mar. 8, 1989, Ser. No. 320,710

Int. Cl.⁴ F41C 29/00

U.S. Cl. 42—94

13 Claims



1. A portable and pivotally adjustable gun rest for supporting and controlling a buttstock of a firearm comprising:

a vertical support assembly including a generally horizontal rigid base disposed transversely to the general orientation of said firearm, having top and bottom surfaces, and front and rear sides, and an upwardly extending elongated support member issuing from and rigidly affixed to the uppermost surface of said base and effectively shaped and dimensioned to provide a rigid and secure vertical support,

a vertical slide substantially rectangular in its cross section and of sufficient dimension to receive an aperture through its vertical length and cooperatively interconnected with said elongated support member through said aperture, enabling said vertical slide to raise and lower in elevation, a lock screw for releasably securing said vertical slide at desired elevations along the length of said elongated support member, and means issuing from and aligned to the rear of said vertical slide to facilitate the removable attachment of a recoil dampening pad so as to remain in the proper alignment during the pivotal adjustment and vertical adjustment of said gun rest,

a pivotally adjustable attaching bracket effectively shaped, dimensioned and contoured to secure and support said buttstock in an adjusted and controlled position, fastening means affixed to at least one end of said attaching bracket to facilitate the removable attachment from said attaching bracket to said buttstock, pivotally connecting means issuing from at least one edge of said attaching bracket and effectively positioned to pivotally connect said attaching bracket to said vertical slide, and releasable securing means issuing from at least one edge of said attaching bracket effectively shaped and positioned to releasably secure the pivotal motion from said attaching bracket to said vertical slide, whereby said firearm can be pivoted from side to side adjusting the firearm sights, be they open or telescopic, perfectly vertical for the proper eye to sight alignment regardless of the contour of said buttstock,

forming a secure, portable and fully adjustable rear gun rest for sighting and shooting.

4,876,815

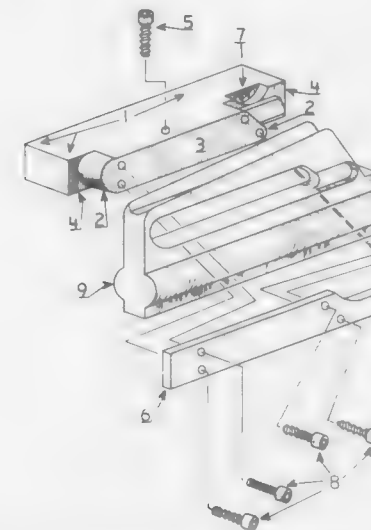
SIGHT MOUNTING PLATFORM FOR COLT M-16/AR-15 RIFLE

Rufus O. Terrill, 1793 Saxoa Pl., NE., Atlanta, Ga. 30319
Filed Feb. 24, 1989, Ser. No. 315,558

Int. Cl.⁴ F41G 1/38

U.S. Cl. 42—100

2 Claims



1. A sight mounting plate for use with a firearm having a carrying handle defining an elongated opening having an inner contoured surface which provides access of the operator's hand to facilitate carrying the weapon and a mounting hole extending through the top of the carrying handle to the opening; the sight mounting plate comprising:

an elongated first plate portion having a side surface which exceeds the elongated length of the handle opening;

an elongated second plate portion integral with the side surface of the first plate portion and shaped to completely match the inner contoured surface of the handle opening and having at least two blind side apertures in a side surface thereof and one blind top aperture on a top surface thereof; the top aperture located such that it is aligned with the mounting hole in the handle when the elongated second plate portion is inserted in the handle opening; and a separate third plate portion having substantially the same length as the first plate side surface and including at least two blind side apertures of the second plate portion;

wherein the second plate portion is inserted in the opening of the handle with the side surface of the first plate abutting a first side surface of the handle and fastened thereto via the mounting hole and the top aperture, and the third plate is abutted against an opposite side surface of the handle and is mounted to the second plate via the at least two apertures in the second and third plates.

4,876,816

TARGET ILLUMINATING AIMING SYSTEM

Melvin W. Triplett, P.O. Box 124, Guthrie, Okla. 73044
Filed Nov. 18, 1988, Ser. No. 273,264

Int. Cl.⁴ F41G 1/34

U.S. Cl. 42—103

10 Claims

1. A target illuminating aiming apparatus for use with a firing weapon adapted to be fired by an individual at a target within a target area comprising:

a housing a first end and a second end with the housing

opening extending through a portion thereof and intersecting the first and the second ends of the housing; means for securing the housing to the firing weapon; means for generating and emitting light supported within the housing, comprising:

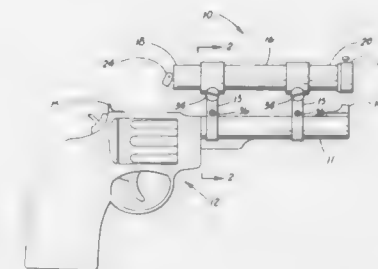
a light for emitting light mounted in the housing opening generally between the first and the second ends of the housing;

a reflector mounted in the housing generally near the light bulb for directly light emitted by the light bulb generally through the housing opening and out from the second end of the housing;

at least one battery mounted in the housing opening, the light bulb emitting light when electrical continuity is established between the light bulb and the battery;

means for selectively establishing electrical continuity between the light bulb and the battery and for interrupting electrical continuity between the light bulb and that battery;

means for focusing said light into at least a first zone and a second zone, wherein the first zone provides an aid for aiming the firing weapon at the target, and wherein the



second zone illuminates at least a portion of the target area comprising:

a lens mounted in the housing opening generally near the second end of the housing, the light being emitted from the light bulb and passing through the lens;

means for adjustably moving the lens for adjustably focusing the light emitted from the light bulb, comprising:

a vertical adjustment screw and a horizontal adjustment screw, wherein the vertical adjustment screw is mounted to the housing through a vertical bore such that an end of the vertical adjustment screw extending into the housing contacts the lens for moving the lens in a vertical direction, and wherein the horizontal adjustment screw is mounted to the housing through a horizontal bore such that an end of the horizontal adjustment screw extending into the housing contacts the lens for moving the lens in a horizontal direction;

means for biasing the lens against the vertical adjustment screw and the horizontal adjustment screw; and a resilient material encircling the lens and disposed between the housing and the lens.

4,876,817

BOW-MOUNTABLE BLIND

Troy D. Hill, Box 146, Farley, Mo. 64028

Filed Jan. 17, 1988, Ser. No. 209,074

Int. Cl.⁴ A01M 31/00

U.S. Cl. 43—1

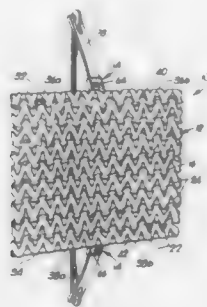
8 Claims

1. A bow-mountable blind comprising:

a camouflage unit including a sheet of camouflage material, and support structure for coupling with said supporting said sheet,

said support structure including a pair of respective elongated support members for supporting said sheet therebetween, and shifting means for allowing shifting of said members between an extended position wherein said

members are generally transverse to the long axis of the bow and a collapsed position in which said members are generally aligned with the long axis of the bow; and attachment means for attaching said unit to the bow, said sheet having structure defining a plurality of separate



cuts therethrough forming a plurality of integral flaps and allowing shifting of said flaps in order to expose respective corresponding openings through said sheet such that said openings allow an archer holding the bow with said blind attached thereto to see through said openings and allow an arrow to extend therethrough.

4,876,818

MARKED FISHING NET AND METHOD FOR MAKING SAME

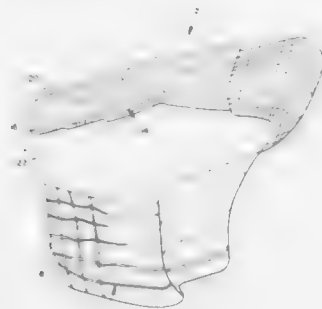
Richard D. Frailek, East Sound, and Phillip A. Ekstrom, Shaw Island, both of Wash., assignors to Northwest Marine Technology, Inc., Shaw Island, Wash.

Filed May 4, 1988, Ser. No. 190,139

Int. Cl.⁴ A01K 71/00

U.S. Cl. 43—7

53 Claims



1. A method of manufacturing fishing gear, comprising the steps of:

- marking a preselected strand at spaced intervals with sequential numerical codes;
- substantially inextricably incorporating said preselected strand in a cord of a multiplicity of strands so that said preselected strand extends along the length of said cord;
- incorporating said cord in a net so that said cord extends substantially from one end of said net to an opposite end thereof; and
- locating ends of said cord at readily accessible preselected points relative to said net so that a smallest numerical code and a largest numerical code on said cord are easily determinable upon visual inspection of said net.

4,876,819

FISHING REEL PROTECTOR

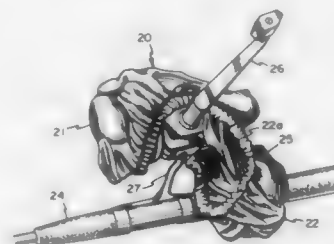
James R. Clifford, 12013-22nd St., Santa Fe, Tex. 77510

Filed Mar. 27, 1989, Ser. No. 329,350

Int. Cl.⁴ A01K 97/08

U.S. Cl. 43—26

4 Claims



1. A fishing reel protector comprising a body member made from flexible material,
- a plurality of interconnected protective pockets formed of the body member made from flexible material,
- each of the plurality of pockets fashioned to accommodate a portion of a reel to be protected
- wherein the body member has a mouth, each pocket entirely or partially extending from the mouth, and
- an elastic band attached to and around the mouth to keep the reel protector in place on the reel.

4,876,820

FISHING PLANER

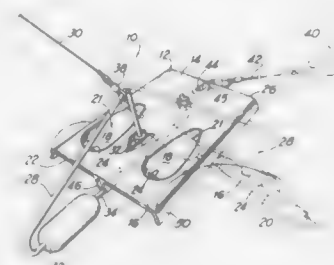
William C. Vann, 79 S. Underwood Dr., Garden City, S.C. 29576

Filed Jan. 13, 1989, Ser. No. 296,624

Int. Cl.⁴ A01K 95/00

U.S. Cl. 43—43.13

15 Claims



1. A fishing planer, comprising:
- a planer body having an upper surface and a lower surface,
- said planer body having a concavity on the upper surface extending into a convexity on the lower surface, said concavity and said convexity having a hole extending therethrough to allow water flowing under said planer body to pass therethrough to the upper surface of said planer body to mix with water flowing over the upper surface in order to reduce swirl below said planer body;
- means for attaching said planer body to a reel line; and
- means for attaching said planer body to a bait line.

4,876,821

MAGNETIC AUTOMATIC RESET ANIMAL TRAP

Paul Benzie, P.O. Box 244, Bellefonte, Pa. 16823

Filed Dec. 27, 1988, Ser. No. 290,457

Int. Cl.⁴ A01M 1/12, 23/14

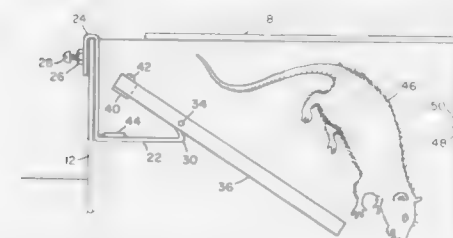
U.S. Cl. 43—69

5 Claims

1. A trap for mouse size animals adapted for attachment to a container having substantially vertical walls with a substantially flat top, comprising in combination:

a clamping means adapted to be secured to the top of said container walls, comprising in combination:

- a downwardly disposed slotted member adapted to fit over the top of said vertical walls of said container;
- a hanging bracket integrally attached to said slotted member extending downwardly within said container;
- a rotatable screw extending through said slotted member and adapted to clamp said vertical walls of said container;



a walkway pivotally attached to said hanging bracket and adapted to allow said walkway to rotate;

- a magnetic release device attached to said walkway and to said hanging bracket;
- a bait holding device attached to said container;
- a reset device attached to said walkway adapted to rotate said walkway to its set position.

4,876,822

FLYING INSECT CONTROL UNIT USING LIGHTS AND ADHESIVES

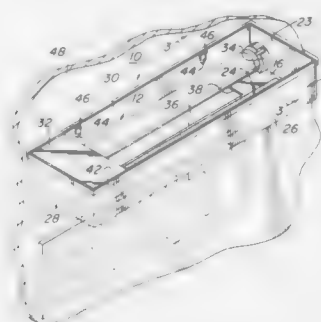
James N. White, 506 Exton Rd., Hatboro, Pa. 19040

Filed Apr. 4, 1989, Ser. No. 333,168

Int. Cl.⁴ A01M 1/04

U.S. Cl. 43—113

21 Claims



1. A flying insect control unit including:
- a. an enclosure including a compartment provided by a bottom wall and a closed peripheral side wall means extending laterally from said bottom wall and terminating in upper marginal edges defining an upper opening into said compartment;
- b. said bottom wall including peripheral edges defining a passageway extending through a portion of said bottom wall, said bottom wall including a continuous surface adjacent at least one of said peripheral edges;
- c. a member for trapping flying insects thereon, said member including a bottom surface adhered to said continuous surface of the bottom wall, an upper, light-reflective surface and a material on said light reflective surface for trapping flying insects thereon;
- d. a light source for emitting ultraviolet radiation, said light source being disposed above said passageway and said upper, light-reflective surface of said member, whereby light emitted by said light source is transmitted through said passageway and is reflected toward the upper opening into said compartment from the light-reflective sur-

face, said light-reflective surface with the material for trapping flying insects thereon being concealed from view during use of the unit.

4,876,823

INSECT TRAP

Anthony Brunetti, 423 Charlotte, Royal Oak, Mich. 48073

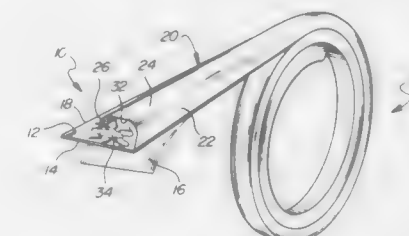
Continuation of Ser. No. 31,351, Mar. 30, 1987. This application

Jun. 14, 1988, Ser. No. 207,901

Int. Cl.⁴ A01M 1/14

U.S. Cl. 43—114

9 Claims



1. A trap for insects consisting of an elongated member formed of sheet material having a uniform cross section along its length, said cross section being characterized by:

- a flat base member having an underside and an upperside, the underside being coated with a pressure sensitive adhesive operative to allow the section to be secured to a supporting surface with the underside of the base member in contact with the surface;
- an upper portion connected to the base member at one edge thereof, said upper portion comprising three sections running longitudinally along the base;
- a first section projecting substantially laterally upwardly away from the base section;
- a second section extending substantially parallel to the base, so as to overlie the base; and
- a third section extending substantially downwardly toward the base with the free edge of the third section terminating at a spaced distance from the base providing an area between the base and the free edge of the base which is clear of supporting structure; and
- a pressure sensitive adhesive coating on the interior opposed sides of the trap section, whereby an insect walking over the upper side of the base section would become entangled in the last said adhesive.

4,876,824

CANDY PLANTER

Robert Newsteder, Utica, N.Y., assignor to Chocolate Pix, Inc., Utica, N.Y.

Filed Mar. 17, 1988, Ser. No. 169,437

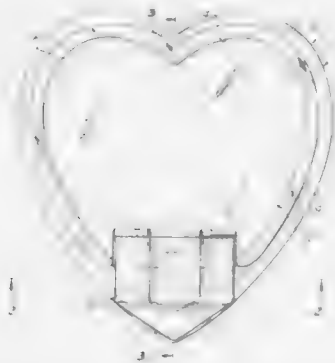
Int. Cl.⁴ A01G 9/02

U.S. Cl. 47—66

11 Claims

1. A combination food holder and planter comprising:
- a main frame having an opening;
- a substantially flat means for supporting food removably connected to said main frame within said opening with the

food then being constrained from movement in part by abutting against said food support means; and



plant support means connected to said main frame for supporting a plant within said opening when said food support means is removed from said main frame.

4,876,825

VEHICLE DOOR

Jakob Widrig, Winterthur, and Gunther Wulff, Stein am Rhein, both of Switzerland, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

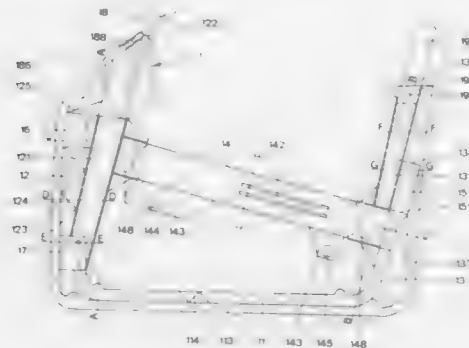
Filed Nov. 30, 1987, Ser. No. 126,709

Claims priority, application Switzerland, Dec. 11, 1986, #544,76

Int. Cl.⁴ B60J 5/04

U.S. Cl. 49—502

21 Claims

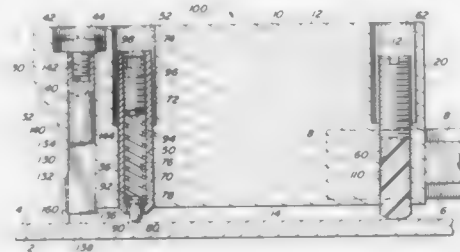


1. A vehicle door comprising: and outer wall, an inner wall and a single equipment carrier onto which all other door parts are arranged positioned between said outer and inner walls; said equipment carrier having a high degree of rigidity and providing effective protection against collision forces; said equipment carrier serving as a fastening base for at least two door hinges and for at least one door mounted latch arrangement; and said equipment carrier consisting of a bottom boom section having two legs directed upwards, each said leg being positioned at an end of said bottom boom section and being at least partially formed by a hollow frame, said boom section and legs consisting of a casting, at least one strut formed by an extruded section connecting said legs to one another at a distance from the bottom boom section; and said at least one strut being connected to said legs by having been partially cast thereto in order to provide said high degree of rigidity.

4,876,826
GRINDING AND POLISHING APPARATUS
Anthony J. Denboer, 8130 N. 17th Dr., Phoenix, Ariz. 85021
Filed Sep. 19, 1988, Ser. No. 246,404
Int. Cl.⁴ B24B 7/00

U.S. Cl. 51—125

21 Claims



1. Grinding and polishing apparatus for holding a sample to be ground and polished for examination on a grinding and polishing wheel, comprising, in combination: block means, including a block having
a top surface,
a bottom surface,
a rear surface,
a top front surface adjacent to the top surface,
a sloping surface adjacent to the top front surface,
a bottom front surface adjacent to the bottom surface, and
a shoulder extending between the sloping front surface and the bottom front surface;
paddle means removably securable to the block, including a paddle block to which the sample is secured; and
means for securing the paddle means to the block against the shoulder in which the means for securing the paddle mean to the block includes a post extending outwardly from the paddle block and a paddle bore in the block for receiving the post, and means for securing the post in the paddle bore wherein the paddle bore extends into the block from the shoulder.

4,876,827

GUTTER ASSEMBLY

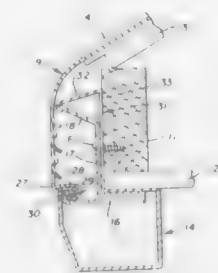
Robert D. Williams, Box 95, Lumby, British Columbia, Canada (V0E 2G0)

Filed Jan. 3, 1989, Ser. No. 190,455

Int. Cl.⁴ E04D 13/06

U.S. Cl. 52—12

5 Claims



1. An improvement in a gutter assembly for a roof structure which includes a fascia board having a vertical outer surface and a roof deck inclined towards the fascia board, the improvement comprising an elongated trough portion and an elongated water shed portion, a plurality of clips securing said trough portion to said roof structure, said water shed portion comprising an upper wall engaging said roof deck and a lower wall in a substantially vertical plane extending to said trough portion with an integral curved wall joining said upper and

lower walls, a plurality of vertically spaced rows of horizontally spaced vertical slots and horizontal slits connecting pairs of said vertical slots in said lower wall defining flanges in said lower wall between said vertical slots and above said horizontal slits, each of said flanges being intumed and curved, the apex of each of said curved flanges being within the substantially vertical plane of said lower wall, a plurality of vertically spaced, longitudinally extending recessed curved areas between each of said rows defining a portion of each of said intumed curved flanges whereby water flowing downwardly on said water shed portion will follow said recessed curved areas and said intumed curved flanges into said trough portion.

4,876,828

ARCHED, TRANSLUCENT COVERS FOR SPORT GROUNDS, SWIMMING POOLS, HOTHOUSES AND THE LIKE

Uri Brill, 77 Sweden Street, Haifa, Israel

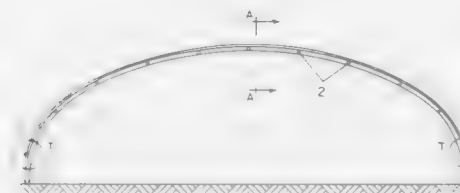
Filed Jan. 25, 1988, Ser. No. 147,898

Claims priority, application Israel, Sep. 29, 1987, 83837

Int. Cl.⁴ E04B 7/08, 7/16

U.S. Cl. 52—23

22 Claims



1. A translucent arched cover for swimming pools, sport grounds, hothouses and the like comprises
a supporting structure including a plurality of rigid, arcuate ribs of uniform cross section held in parallel, distanced alignment by a plurality of purlins extending between two adjacent ribs, each said rib being bent from rigid bar material containing an outwardly extending channel and two parallel co-planar flanges on both sides of said channel extending along the outside of said structure,
a plurality of rectangular panels of a translucent, semi-rigid material of a length slightly shorter than the length of said ribs and of a width coextensive with the distance between two adjacent ribs, each said channel being positioned with its longitudinal margins on and along said flanges of two adjacent ribs,
a plurality of flexible strips, one strip for each said rib, of a width coextensive with the width of said rib across said two flanges and of a length corresponding to the length of said translucent panels, the ends of each said strip being provided with tension means cooperating with the lower portions of the corresponding rib,
wherein each said strip is positioned along the outside of a rib covering the margins of said panel or panels positioned on and along said flanges of said rib, and is tensioned on said panel or panels by said tensioning means, thus securing said panels to said ribs by pressure and friction.

4,876,829

INFLATABLE TENT STRUCTURE

Michael J. Mattick, Charlotte, N.C., assignor to Pneumo-Beam International Ltd., Charlotte, N.C.

Filed Jan. 19, 1988, Ser. No. 145,051

Int. Cl.⁴ E04B 1/34

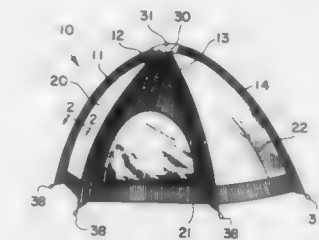
U.S. Cl. 52—2

8 Claims

1. An inflatable tent structure comprising:

(a) a plurality of pneumatically interconnected, elongate inflatable tubes positioned in spaced-apart relation around the perimeter of the tent structure for being inflated in unison, said tubes defining a dome-shaped structure termi-

nating at an apex, said tubes converging in pneumatic interconnection with each other in a single plane at the apex of the dome-shaped structure;
(b) valve means for inflating the tubes and comprising a manifold into which all of the tubes interconnect at the apex of the dome-shaped structure; and



(c) a plurality of wall panels suspended from and between adjacent tubes to define an enclosure of the tent whereby the tubes define a support structure exterior to the enclosure of the tent; wherein said tubes include an interiorly projecting flange to which said wall panels are attached in spaced-apart relation.

4,876,830

OUTDOOR COVER ASSEMBLY

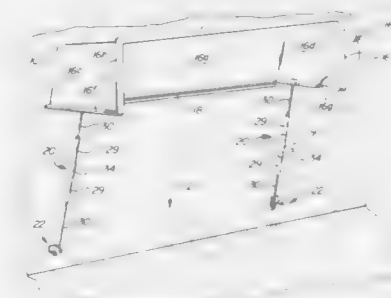
John E. Wate, 755 W. Buno, Milford, Mich. 48042

Filed Sep. 6, 1988, Ser. No. 240,618

Int. Cl.⁴ E04B 1/344

U.S. Cl. 52—29

18 Claims



1. An cover assembly adapted to be mounted on a wall surface for purposes of selectively sheltering items positioned adjacent the wall surface on a base surface, said cover assembly comprising:

(A) a cover structure including

(1) a top wall;
(2) a front wall extending downwardly from the front edge of said top wall, and
(3) left and right side walls joined at their upper edges to respective side edges of said top wall and at their forward edges to respective side vertical edges of said front wall;

(B) hinge means secured to the rearward edge of said top wall and adapted to be secured to said wall surface at a height above the base surface generally corresponding to the height of the cover structure so that the cover structure may be pivotally moved about the hinge pivot axis between a lowered storage position in which the lower edges of the side walls and the front wall are resting on the base surface and the rearward edges of the side walls and top wall are adjacent the building surface, and a raised access position in which the cover structure extends generally forwardly from the building surface to provide access to the sheltered items; and
(C) assist means positioned between said cover structure and

the wall surface operative to store energy in response to movement of said cover structure from its raised position to its lowered position and operative in response to movement of said cover structure from its lowered position toward its raised position to release said stored energy to assist in the upward movement of said cover structure to its raised position;

(D) said assist means comprising at least one strut assembly adapted to be secured at its lower end to the wall surface at a lower attachment point between said pivot axis and the base surface and secured at its upper end to said cover structure at an upper attachment point spaced from said hinge pivot axis and positioned, with said cover member in its lowered position, adjacent the rearward edge of said one side wall and below said hinge axis.

4,876,831

FOLDING MODULAR BUILDING STRUCTURE

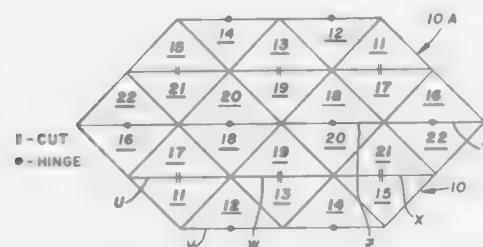
John F. Runyon, 91 Kent St., Apt. 4, St. Paul, Minn. 55102

Filed Mar. 14, 1988, Ser. No. 167,885

Int. Cl.⁴ E04B 1/346

U.S. Cl. 52—70

18 Claims



1. In a folding building structure comprised of a plurality of flexibly interconnected structural modules,

(A) each of said modules comprised of a plurality of hinged structural elements defining twelve equal sized right isosceles triangular components,

(B) each of said modules, if laid flat, defining a trapezoid, the hypotenuses of the triangles forming the trapezoid being parallel,

(C) each of said trapezoidal modules including a first row of five triangular components and a second row of seven triangular components,

(D) the hypotenuses of two of said two triangular components in said first row defining the top edge of the trapezoidal module,

(E) the hypotenuses of four of said triangular components in said second row defining the base of the trapezoidal module,

(F) the shared hypotenuses of the remaining three triangular components of said first row and the remaining three triangular components of said second row defining an intermediate line parallel to and midway between the top edge and base of the trapezoidal module,

(G) said interconnected modules being disposed in repeating right and left-handed mirror image form, each right handed module being adjacent to a left-handed module,

(H) said structural elements being composed of linear strut-like elements flexibly connected at their ends point-to-point to like linear elements, the improvement which consists in:

the hypotenuses defining the top edges and bases of said trapezoidal modules being hinged and the hypotenuses defining the alternating intermediate lines of said trapezoidal modules being severed and reversibly separable, i.e., reattachable.

4,876,832

WALKING POWER MOWER ENCLOSURE

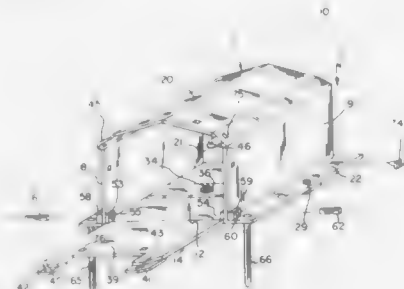
Ervin W. Wasserman, 1515 Seward, Roselle, Ill. 60172

Filed May 7, 1987, Ser. No. 46,704

Int. Cl.⁴ E04H 6/02

U.S. Cl. 52—79.1

11 Claims



1. An enclosure for a walking mower that may be easily user installed, comprising: a one-piece housing having spaced side walls, a rear wall and a top wall with an open front and without a bottom wall, a ground engaging cross member separate from the housing, means for attaching the cross member to the ground prior to the attachment of the housing, means to attach the housing to the cross member after the cross member is attached to the ground, a door pivotally connected to the side walls positioned to at least partly close the open front of the housing, and means for the user to easily adjust the spacing between the side walls so the pivotal connection between the door and the side walls is properly maintained.

4,876,833

ACCESSIBLE AREAWAY SYSTEM

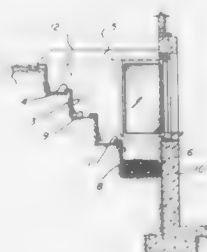
James A. Gefroh, and Fredric J. Hattman, both of Fort Collins, Colo., assignors to RM Base Company, Fort Collins, Colo.

Filed Mar. 14, 1989, Ser. No. 323,351

Int. Cl.⁴ E04F 17/06

U.S. Cl. 52—107

26 Claims



1. An open areaway escape system for a building having: a basement window having a top and a bottom, and a foundation, said areaway escape system comprising:

a. a unitary body comprising:

(1) a wall member having a top edge, a bottom edge, and a foundation face edge;

(2) an uncovered upper opening adjacent to the top edge of said wall member;

(3) an upper flange between said uncovered upper opening and said wall member along said top edge;

(4) a vertical opening adjacent to the foundation face edge of said wall member; and

(5) a floor opening adjacent to the bottom edge of said wall member.

b. a positive means for escaping;

c. a means along said vertical opening for attaching said unitary body to the exterior of the foundation of said

building adjacent to said basement window without significantly altering said foundation; and
d. a means for draining the areaway.

4,876,834

DOUBLE ADJUSTABLE DUCT SUPPORT

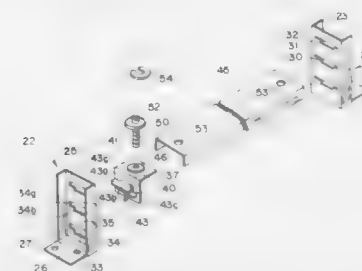
Charles N. Domigan, Coolville, Ohio, assignor to Butler Manufacturing Company, Kansas City, Del.

Filed Aug. 9, 1988, Ser. No. 230,489

Int. Cl.⁴ E04B 5/48

U.S. Cl. 52—126.2

1 Claim



1. A double adjustable duct support to be mounted on a concrete pouring form or on a concrete subfloor for supporting and leveling duct above the form or the floor, the support comprising:

a pair of spaced apart support standards each having a foot section and an upright section, each foot section to be mounted on and secured to a pouring form or a subfloor with the upright section extending substantially vertically upward therefrom and each upright section having a plurality of vertically spaced adjusting slots;

a pair of adjusting supports each having an adjusting arm and a mounting arm, the respective mounting arms extending toward one another and the adjusting arms respectively engaging one side of an upright section;

on each adjusting arm, an adjusting tab extending thru one of the adjusting slots in an upright section and engaging the opposite side of the upright section to cause the adjusting arm to tightly engage the upright section;

on each mounting arm, a nut and threaded in each nut an adjusting screw having a support platform and a head extending upwardly therefrom;

a bridge member having opposite end sections each of which has a clearance aperture receiving the head of an adjusting screw and being supported on the support platform of the adjusting screw;

said adjusting tabs and adjusting slots providing for said bridge member to be positioned vertically with respect to said feet in a plurality of discrete, spaced-apart positions; and

said adjusting screws providing for said bridge member to be positioned vertically with respect to said feet when the bridge member is in any of said discrete, spaced-apart positions.

4,876,835

WORK SPACE MANAGEMENT SYSTEM

James O. Kelley, Spring Lake, Mich.; William E. Stumpf, Minneapolis, Minn., and Frank A. Friedman, San Francisco, Calif., assignors to Herman Miller, Inc., Zeeland, Mich.

Continuation-in-part of Ser. No. 648,900, Sep. 10, 1984. This application Apr. 7, 1987, Ser. No. 35,351

Int. Cl.⁴ E04H 1/06

U.S. Cl. 52—239

49 Claims

1. A work space management system for dividing a space into separate work areas comprising:

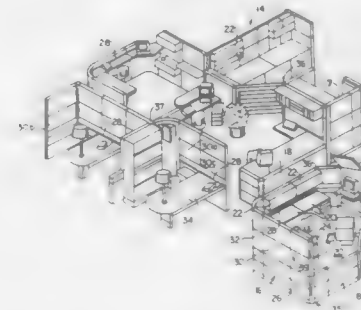
a rigid structural framework formed of rigid structure rect-

angular frames rigidly joined together at the edges thereof to form at least one work area;

each of said frames having outer faces on opposite sides thereof and receiving means on said opposite sides of said frames;

a plurality of interchangeable tiles of relatively equal modular size and substantially common height, with each of said tiles having an attaching means cooperating with said receiving means on said frames for removably mounting said tiles to said frames for ease of placement on and removal from said frames;

said tiles being mounted to the outer faces of said frames to substantially cover both sides of said frames from a bottom



portion thereof to a top thereof in juxtaposed parallel relationship;

said tiles having a width substantially equal to the width of the frames to which said tiles are mounted and have a height such that at least two of said tiles are mounted in vertical juxtaposition on each of said frames;

some of said tiles having a decorative surface and other of said tiles having a structure to serve a function other than decorative in the work area defined by said framework and tiles;

whereby said tiles, whether decorative or functional, can be selectively interchanged easily and quickly with tiles mounted within the same frame or with tiles mounted on different frames within the system.

4,876,836

SUPPORT AND ATTACHMENT SYSTEM FOR LONG-SPAN BEAMS

Marc E. Irigoyen, 53, cours de l'Intendance, 33000 Bordeaux, and Pierre Bourrier, 2, rue de La Planche, 75007 Paris, both of France

PCT No. PCT/FR88/00096, § 371 Date Oct. 24, 1988, § 102(e) Date Oct. 24, 1988, PCT Pub. No. WO88/06214, PCT Pub. Date Aug. 25, 1988

PCT Filed Feb. 22, 1988, Ser. No. 276,449

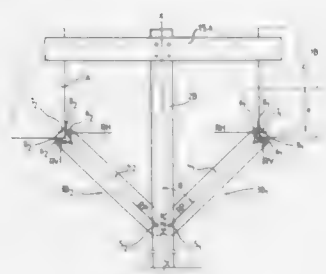
Claims priority, application France, Feb. 23, 1987, 87 02306 Int. Cl.⁴ E04B 1/36

U.S. Cl. 52—263

19 Claims

1. Improved system for supporting and attaching long-span laminate or composite material beams (1A, 1B, 1C, etc.) on and to metal supporting posts (2A, 2B, 2C, etc.), characterized in that each post is provided with at least one buttress member (3A₁, 3B₁, 3C₁, etc.) articulated at its end to an articulation shaft (5₁, 5₂, etc.) a to the corresponding post and the upper end of which is provided with a two-wing channel (6₁, 6₂, etc.) on which bears a corner strengthening member (7₁, 7₂) attached to the end of a long-span beam (1A, 1B, etc.) through the intermediary of contact members (8₁, 8₂, etc.) with which said corner strengthening member is provided, whereby the vertical reaction force R_v to the weight of the beam is trans-

ferred into a buttress force R_p on the axis of the corresponding leg member (3B₁, 3B₂)



which produces a horizontal longitudinal stress force R_H in the corresponding long-span beam.

4,876,837

CORNER BEAD STRUCTURE

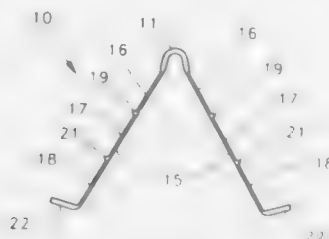
Patrick M. Kelly, Cleveland; Robert E. Howlett, Middleburg Heights; Paul A. Pomeroy, Spencer, and Dennis A. Alvarez, Euclid, all of Ohio, assignors to USG Interiors, Inc., Chicago, Ill.

Filed Aug. 22, 1988, Ser. No. 234,810

Int. Cl.⁴ E04B 2/00; E04F 13/06

U.S. Cl. 52-287

16 Claims



1. In a wall structure including two planar wall portions intersecting at a corner, and a corner bead mounted on said corner with a flange secured to each of said wall portions, the improvement comprising said corner bead including a single strip of metal providing a shaped nose having a first thickness, and each of said flanges having a shear-deformed band extending lengthwise thereof having a reduced thickness substantially less than said first thickness.

4,876,838

PANEL JOINT

Bruce A. Hagemeyer, Pella, Iowa, assignor to Rolacreen Company, Pella, Iowa

Division of Ser. No. 69,055, Jul. 2, 1987. This application Jan. 31, 1989, Ser. No. 304,214

Int. Cl.⁴ E06B 3/70

U.S. Cl. 52-455

2 Claims

1. A panel joint comprising, a pair of panel members each having mortices to receive a spline, said mortices extending to an exterior edge of said panel members, a spline positioned in said mortices and being exposed along one edge which is substantially coplanar with said exterior edge of said panel members, screw means accessible from said one edge of said spline extending angularly through said spline into at least one of said panel members for pulling said one panel member tight against said other panel member, and said pair of panel members forming a door having a plurality

of vertically oriented abutting panel members with exterior vertically extending grooves running lengthwise of the door at the interface of each pair of abutting panel members, said mortices being at the top of the panel members and extending the substantial width of the door and



positioned between the front and back sides of said door, said spline having two legs with one leg received in said mortices and the other leg extending horizontally over the top end edge of the door and covering the top ends of said grooves.

4,876,839

APPARATUS FOR APPLYING SEAL-STRIPS TO PACKAGES TRAVELLING ON A CONVEYOR

Sumio Honda; Taiso Ogata, both of Chiba, and Tadao Etani, Tokyo, all of Japan, assignors to Japan Tobacco Inc./Tokyo Automatic Machinery Works Ltd., Tokyo, Japan

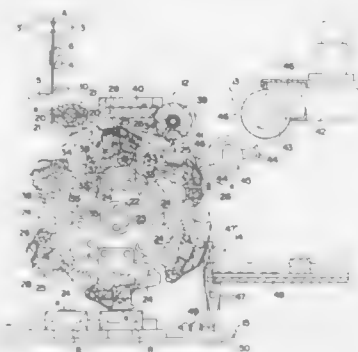
Filed Dec. 22, 1987, Ser. No. 136,541

Claims priority, application Japan, Dec. 25, 1986, 61-201923

Int. Cl.⁴ B65C 9/02, 9/22

U.S. Cl. 53-137

11 Claims



1. Apparatus for attaching seal-strip segments to individual packages where said segments are in the form of a strip having opposed surfaces, said apparatus comprising:

- a transfer element movable periodically between a receiving position for receiving a segment from a supply thereof, and a transfer position for transferring the segment, said transfer element including means for releasably holding a segment with one surface thereof in contact with said element;
- a rotatable turret having a plurality of stations at equal angular positions about the axis of rotation of the turret, each station having a support surface for supporting a segment;
- means for rotating said turret in synchronism with movement of said transfer element such that, during one revolution of said turret, a different one of said stations is opera-

tively associated with said transfer element each time the latter moves to its transfer position;

- holding means in each station made effective when the latter is operatively associated with said transfer element for effecting a transfer of a segment from said transfer element to a support surface such that the other surface of the segment is held in contact with the support surface of the station and the one surface of the segment is exposed; until
- an adhesive applicator for applying adhesive to the one surface of the segments held by the station;
- said turret having an angular position at which a surface of a package tangentially contacts a station for adhering the segment held thereon to the package;
- said transfer element being rotatable and having a holding surface that faces a station on the turret when the element is in its transfer position, said means for releasably holding a segment being suction means connected to said holding surface, said element being constructed and arranged so that the holding surface is essentially tangent to the support surface of a station when the element is in its transfer position so that the other surface of a segment in contact with said holding surface, overlies the support surface of the station, the holding means of the station being constructed and arranged to mechanically engage the segment and hold the same against the support surface thereby stripping the segment from the transfer element as the turret and the transfer element rotate simultaneously.

4,876,840

BAG COVERING APPARATUS

Yoshiyuki Takamura, Nagoya, Japan, assignor to Fuji Pack System Ltd., Nagoya, Japan

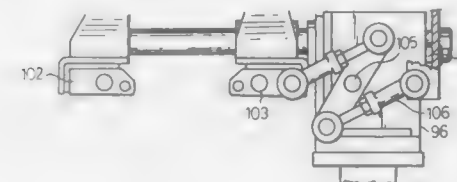
Filed Sep. 16, 1988, Ser. No. 245,721

Claims priority, application Japan, Sep. 19, 1987, 62-235619; Aug. 8, 1988, 63-197656

Int. Cl.⁴ B65B 7/02, 57/04, 61/14

U.S. Cl. 53-137

12 Claims



1. A bag covering apparatus that puts a cover folded in two at a folding portion on an opening of a bag, comprising: folding means that can operate to fold said cover in two at said folding portion,

cover retaining means provided adjacent to said folding means, having at least two holding portions capable of holding said folding portion of said cover, said folding portion of said cover being inserted into each of said holding portions of said cover retaining means by the action of said folding means, said cover retaining means being movable such that when one of said holding portions faces said opening of said bag, the other one of said holding portions facing said folding means, and linking means, operationally connected to said cover retaining means, that makes said opening of said bag and said holding portions of said cover retaining means facing said opening of said bag approach each other by the action of said folding means, thereby positioning said cover on said opening of said bag.

4,876,841

METHOD AND MEANS FOR SECURING PALLETIZED MATERIALS

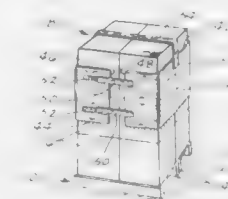
Janet R. Jensen, 107 Northwest First St., (Box 36), Melcher-Dallas, Iowa 50163

Filed May 23, 1988, Ser. No. 197,670

Int. Cl.⁴ B65B 13/02

U.S. Cl. 53-399

5 Claims



1. A combination comprising:

- a pallet having a horizontal supporting surface;
- a plurality of irregularly shaped and sized containers having groceries therein, said containers being piled on top of said supporting surface and piled upon one another to form a stack of said containers, said stack having a perimeter and extending upwardly from said supporting surface to a stack top;
- wrapping means extending around said perimeter of said stack and engaging at least a portion of said plurality of said containers to prevent said containers and said groceries from falling from said stack, said wrapping means comprising an elongated flexible sheet member, at least first and second elongated straps, and at least first and second elongated complimentary straps;
- said sheet member having an upper horizontal edge, a lower horizontal edge, a first end and a second end, said sheet member having a vertical height between said upper and lower horizontal edges which is at least one half of the height of said stack of containers;
- said first and second straps having first ends attached to said first end of said sheet member in vertical spaced relation to one another, said first and second straps also having second ends adjacent said second end of said sheet member;
- said first and second complimentary straps extending horizontally and being attached to said second end of said sheet member in vertical spaced relation with one another;
- each of said first and second straps having an elongated securing member attached to said second end thereof;
- each of said first and second complimentary straps having a complimentary securing member attached thereto;
- said first and second complimentary securing members being detachably retentively engageable with said first and second securing members so as to permit said first and second straps to be detachably secured to said first and second complimentary straps, whereby said wrapping means can be detachably secured in snug surrounding relation to said stack of said containers of groceries.

4,876,842

METHOD OF AND APPARATUS FOR PACKAGING PRODUCT MASSES IN A FORM, FILL AND SEAL MACHINE

Steven Ausnit, New York City, N.Y., assignor to Minigrip, Inc., Orangeburg, N.Y.

Filed Jan. 15, 1988, Ser. No. 144,094

Int. Cl.⁴ B65B 9/08, 57/04, 61/18

U.S. Cl. 53-410

20 Claims

1. A method of packaging product masses in a form, fill and seal machine, comprising: running a continuous length of packaging film in the following order through a succession of work stations in the machine, including a loading station wherein product

masses are successively placed into engagement with the film at substantially uniformly spaced intervals, a product mass enclosing and film sealing station wherein the film is wrapped and sealed into a tube about the product, and a cross sealing and package separation station wherein the film tube is cross sealed in the spaces between the successive product masses to seal the product masses within individual packages;

adjacent to said loading station joining in corunning relation with the packaging film, a continuous length of separately formed plastic reclosable fastener assembly having interlocked profile strips spot sealed together at package length intervals;



effecting said joining near one side of said product masses, and orienting the co-running fastener strip assembly and the packaging film so that the spot seals of the strip are located in alignment with the spaces between the product masses on the film;

adjacent to said enclosing and sealing station securing the fastener assembly permanently within a fold of said film so that a package length section of the fastener strip assembly will be present in each individual product package; and at the cross sealing station cross sealing the fastener strip assembly spot seals with the cross sealing of the film tube.

4,876,843

TAMPER INDICATOR FOR A BLISTER PACKAGE AND METHOD OF ASSEMBLY

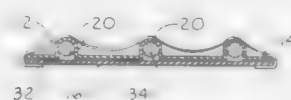
Denise M. O'Brien, Whippany, and Carlo P. Croce, Leonia, both of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 134,342, Dec. 17, 1987, Pat. No. 4,838,425. This application Nov. 28, 1988, Ser. No. 276,581

Int. Cl.⁴ B65B 53/06, 11/52, 9/02

U.S. Cl. 53-410

2 Claims



1. A method for affixing a tamper indicator film to a package having a base formed with a recess and a rupturable lid positioned thereon to define a margin therebetween and hold articles within the recess comprising the steps of:

- Registering a heat seal coating on said lid near said margin;
- Dimensioning said film to cover said base with the periphery of said film having suitable overlap to extend beyond said margin;
- Placing said film against said base; and
- Heating the periphery of said film to shrink and fold the periphery of said film over said margin to bring said overlap periphery into contact with said coating on said lid.

4,876,844 FIELD CROP HARVESTING, CARTON PACKAGING AND PACKED CARTON HANDLING MACHINE AND METHOD

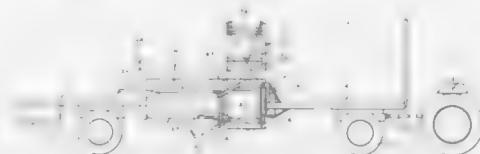
Donald M. Grey, Selma, Calif., assignor to Grey Technologies, Inc., Selma, Calif.

Filed May 19, 1989, Ser. No. 354,896

Int. Cl.⁴ B65B 67/02

U.S. Cl. 53-458

28 Claims



1. A field crop harvesting, carton packaging and packed carton handling machine, comprising:

- transport means including a front section, a central section and a trailing section;
- said front and trailing sections having ground engaging means and each having a platform mounted on said ground engaging means;
- said front platform including area means for stacking and supplying non-erected cartons and for erecting said non-erected cartons;
- said central section including conveyor support means including a central conveyor means and left and right conveyor means;
- said left and right conveyor means each including erected carton receiving and supplying means;
- said left and right conveyor means each including a series of carton packing stations;
- said left and right conveyor means each including a conveyor for moving packed cartons to said central conveyor means;
- said central conveyor means including a rearwardly moving conveyor for transporting said packed cartons rearwardly to said trailing platform; and
- said trailing platform including area means for receiving, handling and sealing said packed cartons and distributing said sealed cartons.

4,876,845

SELF PROPELLED MOWER AND TOWED MOWER WITH ADJUSTABLE HEIGHT CONNECTION

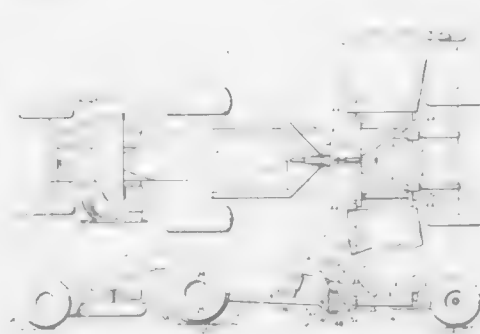
James D. Sturgill, St. Simons Island, Ga., assignor to Robert M. Torras, St. Simons Island, Ga.

Filed Apr. 12, 1989, Ser. No. 337,188

Int. Cl.⁴ A01D 34/56, 34/66

U.S. Cl. 56-6

5 Claims



2. In combination with a self propelled powered mower and a trailing towed mower, said powered mower including driving wheels for propelling said powered mower in a forward direction, and a draw bar connected at one end to said pow-

ered mower and extending rearwardly from adjacent said rear driving wheels, a connector assembly connecting together the rear end portion of said draw bar and the forward portion of said towed mower whereby said towed mower is pulled by said draw bar in trailer fashion, said connector assembly including detecting means for detecting the change of angle of trail of the towed mower with respect to said draw bar, and lifting means responsive to the detection of change of the angle of trail for adjusting the height of the forward portion of said towed mower.

4,876,846

MOWER WITH TANDEM PUMPS

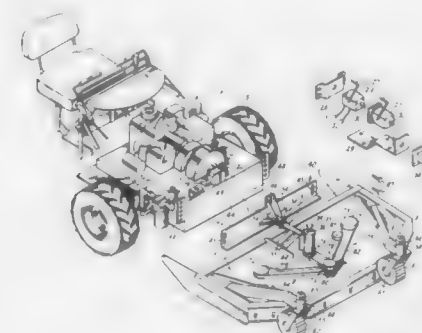
Robert M. Torras, St. Simons Island, Ga., assignor to Kut Kwick Corporation, Brunswick, Ga.

Filed Oct. 2, 1986, Ser. No. 914,712

Int. Cl.⁴ A01D 34/66, 34/80

U.S. Cl. 56-11.9

19 Claims



1. A self propelled mower comprising a power unit and a cutter unit,

said power unit including a chassis, an operator's seat mounted on said chassis, driving wheels mounted on opposite sides of said chassis for supporting said power unit and for moving the power unit along the ground surface in forward and rearward directions, and fluid driven wheel motor means in driving relationship with respect to said driving wheels,

said cutter unit being positioned in front of said power unit and including a housing, at least one cutter blade rotatably supported about an upwardly extending axis in said housing, a fluid driven cutter blade motor supported by said housing in driving relationship with respect to said cutter blade, and support wheels mounted at opposite sides of said housing for supporting the cutter unit from the ground surface,

a pivot mounting means connecting said power unit and said cutter unit, said pivot mounting means forming a longitudinal pivot axis extending along the forward direction of movement of the mower about which said cutter unit can pivot with respect to said power unit and forming a substantially rigid connection between said power unit and said cutter unit with respect to the vertical and lateral directions about said pivot axis so that the mower is supported from the ground surface by the driving wheels and the support wheels.

an engine and pump assembly supported by said power unit and extending from said power unit over the cutter unit, said engine and pump assembly including an internal combustion engine and at least one pump is driven relationship with respect to said engine with conduit in fluid communication between said pump and the fluid driven motor means of said wheels and of said cutter blade motor, whereby said cutter unit is pivotable with respect to the engine and pump assembly below the engine and pump assembly.

4,876,847

RING SPINNING MACHINE

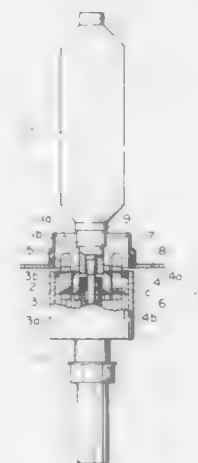
Takeaki Obata, Narashino, and Hideaki Kobayashi, Sakura, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 22, 1988, Ser. No. 147,326

Claims priority, application Japan, Jan. 23, 1987, 62-12311 Int. Cl.⁴ D01H 1/244, 7/08

U.S. Cl. 57-100

14 Claims



1. A ring spinning machine including:

- a bolster having an upper bearing provided in an upper portion thereof and a foot step bearing provided in a lower portion thereof;
- a spindle rotatably supported by the bolster and carrying a bobbin for winding yarn thereon;
- a substantially cylindrical ring having an upper end provided with a traveler for guiding the yarn to said bobbin;
- a ring rail connected with a base portion of said ring and capable of moving said ring up and down in the direction of the axis of said spindle; and
- a spindle motor having a motor rotor including a rotor core fixed to said spindle and secondary windings on said rotor core and a motor stator including a cylindrical stator core surrounding said rotor core leaving an annular gap therebetween and a stator winding on said stator core; wherein said stator winding of said motor stator has an upper coil end which projects above the upper end surface of said stator core;
- said upper coil end has an outside diameter smaller than the outside diameter of said stator core;
- said upper bearing is disposed substantially at the center of said motor rotor; and
- said ring has an inside diameter greater than the outside diameter of said upper coil end so that said ring together with said ring rail can be lowered to a level where said upper coil end is received in said ring.

8. A ring spinning machine including:

- a bolster having an upper bearing provided in an upper portion thereof and a foot step bearing provided in a lower portion thereof;
- a spindle rotatably supported by the bolster and carrying a bobbin for winding yarn thereon;
- a generally cylindrical wharve having a first upper thick-walled portion with an inner peripheral surface connected to said spindle, a second lower thick-walled portion spaced from said spindle and an intermediate thin-walled cylindrical portion disposed between said first and second thick-walled portions;
- a spindle motor having a motor rotor including a rotor core fixed to said wharve and secondary windings on said rotor core and a motor stator including a cylindrical stator core surrounding said rotor core leaving an annular gap therebetween and a stator winding on said stator core;

wherein said rotor core is fixed to an outer peripheral surface of said intermediate thin-walled cylindrical portion.

4,876,848

FIBER OPENING DEVICE HAVING FIBER CLEARING SUCTION TUBE

Josef Vitak, Liberec, and Frantisek Burysek, Usti nad Orlici, both of Czechoslovakia, assignors to Vyzkumny ustav bavi-narsky, Usti nad Orlici, Czechoslovakia

Filed Sep. 1, 1988, Ser. No. 239,477

Claims priority, application Czechoslovakia, Sep. 2, 1987, 1275/87

Int. Cl.⁴ D01H 7/885, 7/888

U.S. Cl. 57—301

3 Claims



1. A fiber opening device for a spinning unit of open-end-rotor spinning machines, having a row of spinning units arranged next to each other, such spinning unit including a fiber opening housing having a cleaning hole, said housing communicating via said cleaning hole with an ejecting duct merging into an impurity withdrawing duct which has, on the one hand, an outlet opening connected to a central impurity withdrawing conduit provided in the machine frame along the spinning units, and, on the other hand, an atmospheric air inlet provided in the front wall of the fiber opening housing, and comprising in combination an automatic travelling service unit having a sucking tube, said air inlet being selectively coupled to said sucking tube of the travelling automatic service unit; said sucking tube being pivotally mounted on said service unit, said tube being provided with a free end having a self-adjustable sealing head slidably movably mounted over a predetermined distance on said tube and having a front sealing surface adapted to sealingly engage said front wall of the fiber opening housing, said head having in its interior a partially spherical concave surface which surrounds the free end of said tube and which fits onto a mating, partially spherical convex surface disposed at the end of said sucking tube.

4,876,849

GAS TURBINE PROPULSION UNIT WITH A GAS GENERATOR

Hermann Klingels, Munich, Fed. Rep. of Germany, assignor to MTU Motoren- und Turbinen-Union München GmbH, Fed. Rep. of Germany

Continuation of Ser. No. 122,363, Nov. 18, 1987, abandoned.

This application Feb. 28, 1989, Ser. No. 316,554

Claims priority, application Fed. Rep. of Germany, Nov. 20, 1986, 3639684

Int. Cl.⁴ F02C 3/10

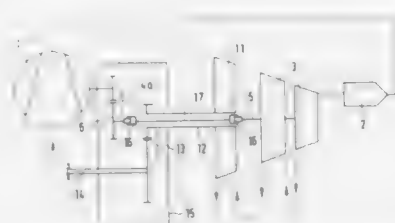
U.S. Cl. 60—39,161

19 Claims

1. A gas turbine power plant, comprising a gas generator unit and power output means, said gas generator unit including:

- gas generator compressor means,
- combustion chamber means,
- gas generator turbine means drivingly coupled with the gas generator compressor means, said gas generator turbine

means including at least two turbine stages with ceramic turbine blade parts, and gas generator transmission means drivingly connecting the gas generator turbine means to the compressor means independently of said power output means, said gas generator means exhibiting a predetermined transmission ratio



providing a speed-up of the compressor means as compared to the gas generator turbine means whereby the gas generator turbine means can be operated at relatively low speeds with consequent reduction in centrifugal force induced stress while still permitting optimal rotational speeds and efficiencies of the compressor means and gas generator turbine means.

4,876,850

COMBUSTION ENGINE FOR SOLID BLOCK FUEL

Karl Eickmann, 2420 Isehiki, Hayama-machi, Kanagawa-ken, Japan

Continuation-in-part of Ser. No. 799,663, Nov. 14, 1985,

abandoned, and a continuation-in-part of Ser. No. 803,035, Nov. 29, 1985, abandoned, which is a continuation-in-part of Ser. No. 531,513, Sep. 9, 1983, which is a continuation-in-part of Ser. No. 224,772, Jan. 1, 1981, abandoned. This application Aug. 19,

1987, Ser. No. 107,460

Int. Cl.⁴ F02C 3/28

U.S. Cl. 60—39,464

5 Claims



1. A combustion engine, comprising, in combination, at least one compressor in communication with at least one combustion chamber, said combustion chamber in communication with at least one expander, while said expander drives said compressor and has an output means for the supply of power out of said combustion engine; a fuel supplied into said combustion chamber and subjected therein to burn at least partially in the compressed hot air which flows from said compressor to and through said combustion chamber and said expander when the moveable parts of said compressor and expander move under the forces of the expanding gases in said expander; wherein a fuel supply arrangement is provided and said fuel supply arrangement comprises, in combination a fuel container with a storage space, a transfer mechanism and

longitudinally straight rigid fuel bars of equal cross sectional configuration throughout their entire lengths in said storage space, wherein said transfer mechanism includes a linearly moving member, wherein said linearly moving member touches at least one of said fuel bars to move the respective fuel bar forward in a linear direction towards a smasher device in front of said respective fuel bar to powderize the front end of said respective fuel bar to powder in a permanently continuing operation, wherein a fuel powder transfer device is provided between said smasher device and said combustion chamber for the transfer of the pulverized fuel from said smasher device to and into said combustion chamber, and; wherein a plurality of said fuel bars are provided side by side with an outer face of one of said fuel bars meeting an outer face of a neighboring fuel bar to prevent the presence of excessive air between said fuel bars.

4,876,851

INFRARED RADIATION SCREENING DEVICE

Werner Mueller, Pullenbafen, Fed. Rep. of Germany, assignor to Messerschmitt-Boelkow-Blohm GmbH, Munich, Fed. Rep. of Germany

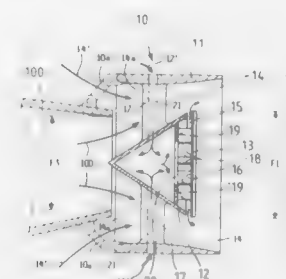
Filed Mar. 24, 1988, Ser. No. 173,193

Claims priority, application Fed. Rep. of Germany, Apr. 11, 1987, 3712328

Int. Cl.⁴ F02K 1/38

U.S. Cl. 60—264

6 Claims



1. An apparatus for shielding infrared emissions of an operating engine for hindering IR-detection, comprising an outer gas guiding ring (11), pivotable link means (10a) for adjustably attaching said gas guiding ring to an exhaust outlet (100) of said engine, a conical core structure (12) arranged essentially in a concentric position within said gas guiding ring (11) for forming a cooling air channel (14, 14') with an ejector effect between said exhaust outlet and said gas guiding ring and between said gas guiding ring and said conical core structure, a cover plate (13) secured to a large downstream directed end of said conical core structure for covering said large downstream directed end of said conical core structure, said engine exhaust outlet forming with an upstream end of said outer gas guiding ring a ring inlet for feeding cooling air into said cooling air channel having said ejector effect, strut means (17) for supporting said conical core structure and said cover plate in said concentric position within said gas guiding ring, said gas guiding ring, said conical core structure, said cover plate, and said strut means being made of a carbon-fiber-carbon composite material having a high temperature resistance to form an integral unit which is position adjustable.

4,876,852

DIESEL INTERNAL COMBUSTION ENGINE WITH AN EXHAUST GAS LINE SYSTEM

Joerg Abthoff, Pluedershausen; Hans-Dieter Schuster, Schorn-dorf; Hans-Joachim Langer, Remseck; Erwin Strohmer, Bergien; Rolf Gabler, Waiblingen, and Roland Schalte, Korb, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

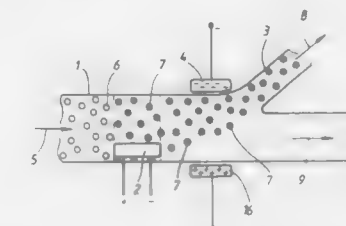
Filed Mar. 31, 1988, Ser. No. 176,279

Claims priority, application Fed. Rep. of Germany, Apr. 3, 1987, 3711312

Int. Cl.⁴ F01N 3/02

U.S. Cl. 60—275

4 Claims



1. An exhaust gas line system for a diesel internal combustion engine comprising ionizing means in the course of the exhaust gas line system for ionizing soot particles taken along in the exhaust gas stream, separating means downstream of the ionizing means for separating the soot particles out of the exhaust gas stream, the means for ionizing the soot particles being constructed as light source means emitting ultraviolet light in a wavelength range between about 10 nm and 400 nm, wherein a soot particle line branches off from the exhaust gas line system downstream of the ionizing means, and wherein within the area upstream of the branching place, an electric field is built up in which the soot particles are deflected in the direction of the soot particle line, and wherein the exhaust gas line system within the area upstream of the branching consists of an electrically non-conductive material.

4,876,853

TANDEM MASTER CYLINDER WITH BOOSTER PISTON AT PEDAL-REMOTE END OF MASTER CYLINDER AND WITH BOOSTER-PRESSURE RESPONSIVE RESERVOIR VALVE FOR FORWARD BRAKE CIRCUIT

Kenji Shirai, Mishima, and Yoshihisa Nomura, Toyota, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

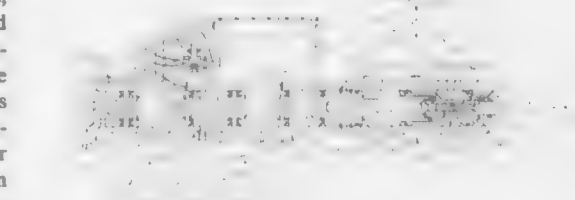
Filed Feb. 5, 1987, Ser. No. 11,240

Claims priority, application Japan, Feb. 5, 1986, 61-23376

Int. Cl.⁴ B60T 11/24, 11/28, 13/12, 13/14

U.S. Cl. 60—547.1

12 Claims



1. A combination including a tandem master cylinder and a booster, said master cylinder having a first housing, a first and

a second presser piston which are disposed in tandem in the first housing such that the first and second presser pistons are movable independently of each other and cooperate with the first housing to define a first and a second pressure chamber which are formed in front of said first and second presser pistons, respectively, said booster having a second housing, a first power piston cooperating with the second housing to define a first power chamber, said first power piston being advanced by a fluid pressure in said first power chamber, so as to advance said first presser piston, said booster further having a booster valve which is operated due to relative movement between said first power piston, and an operating member for operating said booster, said booster valve being operable to control the fluid pressure in said first power chamber according to an operating force applied to said operating member, wherein the improvement comprises:

- a third housing,
- a second power piston disposed in said third housing and cooperating with the third housing to define a second power chamber, said second power piston having opposite pressure-receiving faces one of which receives a fluid pressure in said second pressure chamber, the other pressure-receiving face receiving a fluid pressure in said second power chamber, said second power piston being operable to control the fluid pressure in said second pressure chamber according to the fluid pressure in said second power chamber;
- a fluid passage for connecting said second power chamber and said first power chamber;
- a reservoir for storing a working fluid under an atmospheric pressure;
- a compensating passage formed so as to effect communication between said second pressure chamber and said reservoir, at least when said second pressure piston is in a retracted position thereof; and
- shut-off means operable so as to normally hold said compensating passage open, and shut-off said compensating passage when the fluid pressure in said second power chamber exceeds a predetermined limit.

4,876,854

SOLAR ENERGY THERMALLY POWERED ELECTRICAL GENERATING SYSTEM

William R. Owens, Rockford, Ill., assignor to Sundstrand Corp., Rockford, Ill.

Filed May 27, 1988, Ser. No. 199,459

Int. Cl. F03G 7/02

U.S. Cl. 60-641.8

13 Claims



1. A solar energy thermally powered electrical generating system having a thermal energy storage medium which stores a variable quantity of heat which should not exceed a maximum quantity of heat in which solar energy is absorbed by the thermal storage medium during periods of insolation and is released during periods of eclipse comprising:

- (a) a thermally powered electrical generating system, thermally coupled to the thermal energy storage medium, for

generating electrical energy from thermal energy stored in the thermal energy storage medium which is variable in magnitude in accordance with a first control signal;

- (b) means for varying the rate of generation of electrical energy by the electrical generating system as a function of a scheduled demand of electrical power to be consumed by an electrical load coupled to the electrical generating system; and
- (c) control means, coupled to the thermally powered electrical generating system and to the means for varying the rate of generation, for generating the first control signal to control the rate of electrical power generation from the thermal energy stored in the thermal energy storage medium and to provide stored thermal energy to meet the scheduled demand of electrical power during periods of eclipse and to prevent the storage of an amount of thermal energy during periods of insolation exceeding the maximum quantity of heat.

4,876,855

WORKING FLUID FOR RANKINE CYCLE POWER PLANT

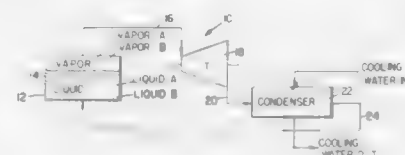
Amnon Yogeve, Rehovot, and David Mahlab, Yavne, both of Israel, assignors to Ormat Turbines (1965) Ltd., Yavne, Israel

Filed Jan. 8, 1986, Ser. No. 817,130

Int. Cl. F01K 25/06, 25/08

U.S. Cl. 60-651

11 Claims



1. A method for increasing the thermodynamic efficiency of a Rankine cycle power plant of the type that employs an organic working fluid, such as a hydrocarbon or a halogenated derivative thereof, and that has a boiler for vaporizing the working fluid, a turbine responsive to vaporized working fluid produced by the boiler and producing power and heat depleted working fluid, and a condenser for condensing the heat depleted working fluid and producing condensate that is returned to the boiler, said method comprising the step of adding water to the organic fluid such that most of the liquid in the boiler is water and most of the vapor in the turbine is the vaporized organic fluid.

4,876,856

HEAT EXCHANGING SYSTEM

Naotsugu Iishiki, Tokyo; Shigetou Okano, Kashiwa, and Shiro Mishima, Kamagaya, all of Japan, assignors to Yamato Kosen Co., Ltd., Ichikawa, Japan

PCT No. PCT/JP87/00316, § 371 Date Mar. 16, 1988, § 102(e) Date Mar. 16, 1988, PCT Pub. No. WO87/07360, PCT Pub. Date Dec. 3, 1987

PCT Filed May 19, 1987, Ser. No. 144,922

Claims priority, application Japan, May 19, 1986, 61-113979; Oct. 29, 1986, 61-257584; Feb. 20, 1987, 62-37247; Feb. 20, 1987, 62-37246; Mar. 6, 1987, 62-51544

Int. Cl. F25B 27/00

U.S. Cl. 60-671

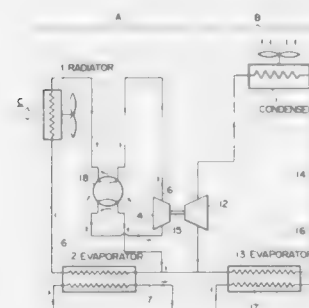
7 Claims

1. A heat changing system, which comprises:

- a heating cycle part and a thermal power cycle part wherein the heating cycle part includes a first radiator, a first evaporator, and a compressor in a heating medium circulation line connecting said first radiator and said first evaporator, said compressor being driven by said thermal power cycle part, wherein said thermal power cycle part comprises a second condenser, a second evaporator, and a

turbo-engine in a thermal power medium circulation line connecting said second condenser and said second evaporator, an output shaft of said turbo-engine being connected with said compressor;

- a constant heat source heater provided to heat said second evaporator in said thermal power medium circulation line;



means for generating an air current which flows concurrently through said radiator and said second condenser; and

means for generating air currents which flow through said radiator and said and second condenser separately.

4,876,857

SHUT OFF/PRESSURE REGULATING VALVE FOR TURBINE ENGINE

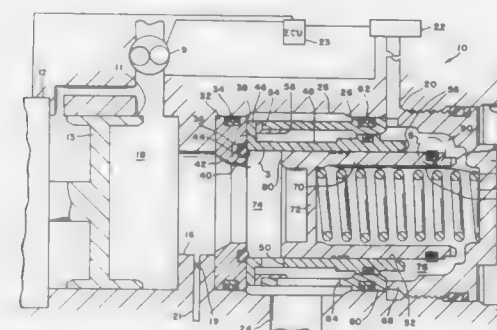
Kevin L. Feltz, New Carlisle; Glenn A. Richardson, and Jonathan C. Burrell, both of South Bend, all of Ind., assignors to Allied-Signal Inc., Morristown, N.J.

Filed Aug. 15, 1988, Ser. No. 233,106

Int. Cl. F02C 7/232

U.S. Cl. 60-734

7 Claims



1. A shut off and pressure regulator valve for use with a metering valve in a fuel system for a turbine engine, comprising:

- a housing having a bore therein with an inlet port connected to receive operational fuel under pressure, a control port connected to receive control fuel and an outlet port connected to provide said turbine with operational fuel, said bore having a shoulder located between said inlet and outlet ports;
- a seat member located adjacent said shoulder and having a first face with an annular groove;
- a first seal member located in said annular groove;
- a sleeve member located in said bore having a flange on a first end that retains said first seal member in said annular groove and a ramp on a second end, said sleeve member having a plurality of radial openings, through which said bore is connected to said outlet port;
- a piston located in said sleeve for separating said bore into a control chamber and a supply chamber, said piston having a first end exposed to said operational fuel in said supply

chamber and a second end exposed to control fuel in said control chamber, said piston responding to a pressure differential between said operational fuel and control fuel by moving to allow operational fuel to flow through, said radial openings in said sleeve to said outlet port, said piston having a peripheral groove adjacent said second end;

a second seal member located in said peripheral groove; an end cap fixed to said housing for engaging said sleeve member to hold said seat member against said shoulder;

resilient means located between said end cap and piston for urging said first end of said piston toward said seat member in opposition to said pressure differential, said resilient means overcoming a predetermined pressure differential by initially moving said first end of said piston past said radial openings in said sleeve to substantially terminate communication of operational fluid to said outlet port and thereafter moving said second seal member into engagement with said ramp on said sleeve, said second seal member moving down the ramp to prevent fluid communications of control fuel from said control chamber to said outlet port along a first flow path created by the operational clearance between said piston and sleeve, said first end of said piston moving into engagement with said first seal member to prevent communication of operational fuel to said outlet port along a second flow path created by the operational clearance between said piston and sleeve to thereafter totally interrupt communication of fuel to said outlet port and correspondingly said turbine engine.

4,876,858

AIR CONDITIONER AND METHOD OF DEHUMIDIFIER CONTROL

Allan Shaw, and Russell E. Laxton, both of 5th Floor, Security House, 233 North Terrace, Adelaide, Australia, assignors to Allan Shaw; Russell Eastcourt Laxton and Luminis Pty. Ltd., all of Adelaide, Australia

Filed Nov. 24, 1987, Ser. No. 124,876

Claims priority, application Australia, Nov. 24, 1986, PH9126

Int. Cl. F25D 17/06; F25B 41/04

U.S. Cl. 62-93

2 Claims



1. An air conditioner comprising a dehumidifier, said dehumidifier comprising a plurality of coil portions, coolant supply means, conduits connecting the dehumidifier and coolant supply means in a coolant circuit, an air flow fan, means coupling the air flow fan and the dehumidifier such that the fan, in operation, causes air flow through at least some of the coil portions, at least one sensor downstream of the dehumidifier, valve means selectively controlling flow of coolant from the supply means through the coil portions, and valve coupling means coupling the valve means thereby reducing heat transfer of that portion, but flow through the remainder of the coil portions remains sufficient to maintain dehumidification, said valve means comprising some at least of a plurality of valves which are electrically operated throttle valves, a further sensor downstream of said air flow fan, air flow speed control means, and

said further sensor being an air flow sensor, and means so interconnecting said electronic circuit, air flow sensor and air flow speed control means that, if air flow speed reduces to an insufficient ventilation velocity pursuant to load reduction, air flow speed is again increased by a preset signal from the control system which resets the supply air thermostat to a higher temperature thus decreasing the enthalpy difference across the coil condition curve and causing the air dampers associated with each zone to take corrective action by moving to more open positions and thus to increase the volume flow rate of the fan to result in sufficient ventilation.

4,876,859

MULTI-TYPE AIR CONDITIONER SYSTEM WITH STARTING CONTROL FOR PARALLEL OPERATED COMPRESSORS THEREIN

Manabu Kitamoto, Fuji, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

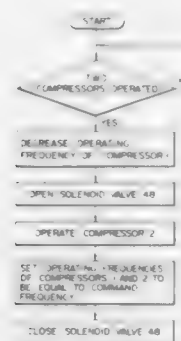
Filed Jul. 28, 1988, Ser. No. 225,483

Claims priority, application Japan, Sep. 10, 1987, 62-227311

Int. Cl.⁴ F25B 7/00

U.S. Cl. 62-117

15 Claims



1. A multi-type air conditioner apparatus, comprising:
 - an outdoor unit having at least two variable-capacity compressors, an outdoor heat exchanger to which said two compressors are commonly coupled, and bypass means including a solenoid valve between a refrigerant intake side and a delivery side of one of said variable-capacity compressors;
 - a plurality of indoor units, each having at least an indoor heat exchanger and detecting means for detecting an air condition load of said indoor heat exchanger, to output required capacity data;
 - a distribution unit for coupling said outdoor unit in parallel with said plurality of indoor units, so as to constitute each refrigerant cycle, said distribution unit having a plurality of refrigerant flow control means for each refrigerant cycle;
 - first control means, for supplying a control command based on required capacity data from said plurality of indoor units to said refrigerant flow control means of said distribution unit, and outputting total sum data of the respective required capacity data;
 - second control means, for supplying a single operation command with a predetermined capacity by one of said two variable-capacity compressors to said outdoor unit when said total sum data from said first control means is smaller than a predetermined value, and supplying a parallel operation command with predetermined capacities by both said two variable-capacity compressors to said outdoor unit when the total sum data is larger than said predetermined value; and
 - third control means, for supplying a command for setting said solenoid valve in an open state for temporarily decreasing from said predetermined capacity one of said two

variable-capacity compressors to said outdoor unit and thereafter supply a command for starting another of said two variable-capacity compressors to said outdoor unit when said single operation command supplied from said second control means is switched to a parallel operation command, thus allowing said another of said two variable-capacity compressors to start while the operation frequency of said one compressor is decreased.

4,876,860

REFRIGERATOR WITH VARIABLE VOLUME INDEPENDENTLY COOLED STORAGE CHAMBERS

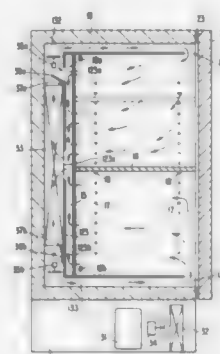
Kozaburo Negishi, Iseaki, Japan, assignor to Sanden Corporation, Gunma, Japan

Filed May 31, 1988, Ser. No. 200,733

Int. Cl.⁴ F25D 17/06

U.S. Cl. 62-179

12 Claims



1. A refrigerator with at least two variable volume, independently cooled storage chambers comprising:
 - a cabinet with a front opening;
 - a door element hinged on said cabinet to normally close the front opening;
 - an inner separation member disposed within the cabinet to define a storage space;
 - one or more adjustable partitions for dividing said storage space into at least two variable volume, independently cooled storage chambers;
 - flow control means associated with each variable volume, independently cooled storage chamber for controlling air flow into each of said variable volume, independently cooled storage chambers;
 - connecting hole means formed through said inner separation member for allowing air flow from said variable volume, independently cooled storage chambers;
 - refrigerating means comprising an evaporator disposed adjacent to said connecting hole means to cool air from the variable volume, independently cooled storage chambers so that air from each variable volume, independently cooled storage chamber can be cooled by flowing through said connecting hole means and over said evaporator; and
 - an air flow space formed by disposing said inner separation member within the cabinet with a gap between said inner separation member and the cabinet so that air cooled by flowing over said evaporator can selectively flow under control of said flow control means through the air flow space and selectively into each of the variable volume, independently cooled storage chambers.

4,876,861

DEFROST-WATER VAPORIZER OF A REFRIGERATOR

Hiroshi Tanaka, Hirakata; Yasukiyo Murata, and Kazami Eto, both of Ibaraki, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

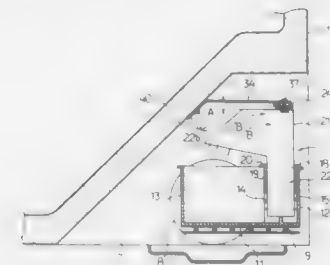
Filed Jan. 19, 1989, Ser. No. 298,963

Claims priority, application Japan, Jan. 20, 1988, 63-10213; Mar. 14, 1988, 63-34168[U]

Int. Cl.⁴ F25B 47/00

U.S. Cl. 62-279

6 Claims



1. A defrost-water vaporizer of a refrigerator including a heat-insulated cabinet having a storage space at the interior and provided with an evaporator, a machine compartment provided at the outside of the heat-insulated cabinet so as to have a surface open to the atmosphere, a compressor mounted in the machine compartment for supplying the evaporator with refrigerant, and a defrost-water vaporizer provided in the machine compartment, the defrost-water vaporizer comprising:
 - (a) a water reservoir provided in the machine compartment for receiving defrost water resulting from the melting of frost adherent to the evaporator to be discharged outside the storage space of the heat-insulated cabinet;
 - (b) a plurality of vaporizing elements each having a lower portion inserted in the water reservoir so as to come into contact with the defrost water in the water reservoir and an upper portion disposed higher than the compressor, the vaporizing elements absorbing the defrost water in the water reservoir by capillarity to thereby vaporize the absorbed water from the surfaces thereof; and
 - (c) a lower support formed from an elastic material and provided between the lower portion of each vaporizing element and the inner surface of a side wall of the water reservoir, the lower support supporting the vaporizing elements in the water reservoir.

4,876,862

CONTROL DEVICE FOR THREADING TUBES IN CROCHET GALLOON LOOMS

Luigi O. Zorini, Cilavegna, Italy, assignor to Comez S.P.A., Cilavegna, Italy

Filed Jul. 19, 1988, Ser. No. 221,128

Claims priority, application Italy, Jul. 21, 1987, 22047/87[U]

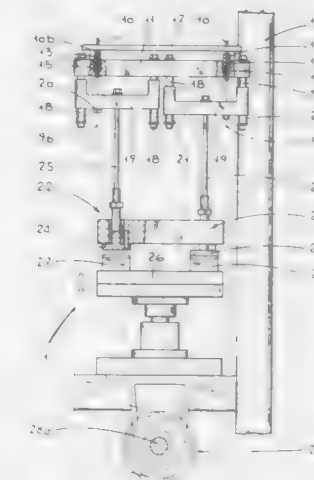
Int. Cl.⁴ D04B 23/00

U.S. Cl. 66-207

3 Claims

1. A control device for threading tubes in crochet galloon looms, comprising:
 - a thread guide rail provided with an oscillatory motion;
 - a number of threading tubes oscillatably supported by the thread guide rail and individually translatable with respect to said rail against the action exerted by respective first return springs;
 - a number of actuation cables each of them having one end connected to one of said threading tubes;
 - a number of sheaths each slidably engaging one of said actuation cables and having one end fixedly fastened with respect to the thread guide rail and the second end engaged with a fixed support;
 - a number of control plates each engaging at least one of said actuation cables at a second end thereof and being provided with a to-and-fro translation movement with re-

spect to said fixed support in order to cause, through said actuation cables, the translations of said threading tubes against the action of said first return springs; control means to selectively translate the control plates in synchronism with the movements of said thread guide rail,



4,876,863

LOCK PARTICULARLY ADAPTED FOR BAGS, BRIEF-BAGS, OR THE LIKE

Pietro Mannato, Bologna, Italy, assignor to Finduck S.r.l., Bologna, Italy

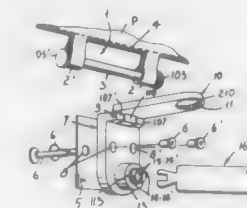
Filed Jul. 7, 1988, Ser. No. 215,969

Claims priority, application Italy, Jul. 8, 1987, 15204/8 [U]

Int. Cl.⁴ E05B 65/52

U.S. Cl. 70-64

4 Claims



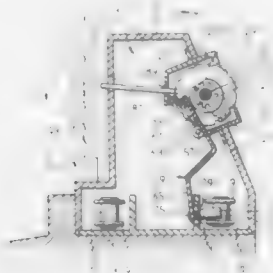
1. A lock for a bag having a closure flap to be secured to said bag, said lock comprising:
 - (a) a slot (1) adjacent an edge of said closure flap (P);
 - (b) a supporting platelet (7) attached to said bag (F);
 - (c) a rotatable locking barrel (13) projecting from a front side of said platelet (7) and having at least one lateral projection (14-14') at a free end of said barrel, with side recesses (15, 15') in said free end, and a matching key (16) engageable in said side recesses for rotating said locking barrel;
 - (d) a latch member (10) pivotally hinged to an end (107) of said platelet (7) turned toward said closure flap (10), said latch member having a circular opening (11) diameter corresponds to the diameter of a free end (113) of said locking barrel (13), said opening having at least one recess

- (12, 12') mating with said at least one lateral projection (14, 14') on said locking barrel;
- (e) wire fork spring means (20, 21) attached to a rear side of said platelet (7), for stabilizing said locking barrel (13) in a first angular position in which said at least one lateral projection (14, 14') coincides with said at least one recess (12, 12'), and in at least another angular position in which said at least one lateral projection is angularly offset relative to said at least one recess, said locking barrel (13) having a stepped rear end (213) rotatably passing through said platelet (7) and axially retained by said wire fork spring means (21), said wire fork spring means having ends engaged in an annular groove (18) formed in said rear end (213) of said locking barrel (13);
- (f) a bottom of said annular groove (18) being provided with angularly equispaced, secant flattened portions (20), said ends of said fork spring means (21) bearing against said bottom of said annular groove;
- (g) whereby said latch member (10) can be passed through said slot (1) in said closure flap (P) and fitted on said locking barrel (13) by means of said opening (11), and secured to said locking barrel by rotating said locking barrel (13) to angularly offset said at least one lateral projection (14, 14') relative to said at least one recess (12, 12') and to place said at least one projection on said latch member (10).

4,876,864

COMBINATION LOCK

Christopher D. Sassella, Lower Plenty, Australia, assignor to Dowell Australia Limited, Victoria, Australia
 Filed May 6, 1988, Ser. No. 190,811
 Claims priority, application Australia, May 13, 1987, PI1892
 Int. Cl.⁴ E05B 37/02; E05F 11/04
 U.S. Cl. 70—89 8 Claims



1. A combination lock for a panel and a frame assembly where said panel can move relative to said frame, said panel having a chain winding mechanism and an arm member extending therefrom which can be used to hold said panel in a closed condition, said combination lock comprising combination locking means and an engaging member operated thereby, said engaging member being for releasably preventing said arm member from moving so as to inhibit opening of said panel, said arm member being a chain of said chain winding mechanism for a swing-out window and said combination lock being fitted within a housing of said chain winding mechanism, said engaging member being movable into engagement with said chain within said housing for releasably preventing said chain from moving so as to inhibit opening of said panel.

4,876,865 **AUTOMOBILE ANTI-THEFT, BRAKE-LOCKING DEVICE**

Antonio Trinidad, HC-763 B2N3321, Patillas, P.R. 00723; Victor M. Zayas Luna, Box 674, Arroyo, P.R. 00615, and Miguel A. Rey, Urb. Valle Alto, Calle 4E-18, Patillas, P.R. 00615

Filed Jul. 27, 1988, Ser. No. 224,815
 Int. Cl.⁴ B60R 25/00

U.S. Cl. 70—203

10 Claims



1. An anti-theft device for vehicles for use in retaining the brake pedal of the vehicle in its depressed, brake-engaging state to prevent the movement of the vehicle, comprising: brake-pedal engaging means for contacting a brake pedal of a vehicle which is to be made theft-proof; means operatively engaged with said brake-pedal engaging means for retaining said brake-pedal engaging means in a first state thereof representative of the depression of the brake pedal engaged by said brake-pedal engaging means so that the brake pedal is in its downward, braking state for braking the wheels of the vehicle; said brake-pedal engaging means comprising a first upper plate member contacting a surface portion of a brake pedal of a vehicle, and a second plate member, means for pivotally connecting said first and second plate members together to allow for relative rotation therebetween, a pair of spaced apart retaining means for sandwiching therebetween a portion of an operating brake lever of a vehicle, said pair of retaining means projecting downwardly from said first plate member, and means for locking said first and second plate members together to prevent relative rotation therebetween, so that said brake-pedal engaging means is fixedly locked to a brake pedal.

4,876,866

DOOR LATCH AND DEADBOLT ASSEMBLY

Paul D. Fleming, Glendale, and David L. O'Day, Canoga Park, both of Calif., assignors to W & F Manufacturing, Inc., Glendale, Calif.
 Division of Ser. No. 12,434, Feb. 9, 1987, Pat. No. 4,784,417, which is a division of Ser. No. 825,053, Jan. 31, 1986, Pat. No. 4,671,089. This application Aug. 22, 1988, Ser. No. 216,956
 Int. Cl.⁴ E05B 3/08

U.S. Cl. 70—379 R

3 Claims

1. A door latch mechanism, comprising:
 a latch case;
 a latch slidably supported within said case for movement between an advanced position projecting from said case and a retracted position substantially within said case;
 spring means for urging said latch normally toward said advanced position;
 a latch retractor having one end connected to said latch, said latch retractor having a yoke-shaped opposite end defining a pair of spaced legs, at least one of said legs being

twisted out of the plane of said retractor adjacent said latch to define a twisted tab cam follower; and
 a cam sleeve rotatably supported adjacent said twisted tab



cam follower and having a cam lobe engageable therewith upon rotation of said cam sleeve to move said latch retractor in a direction displacing said latch toward said retracted position.

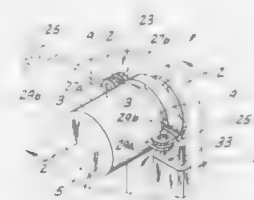
4,876,867

DOOR LOCK

William H. Leneave, R.R. 1, Box 39, Dix, Ill. 62830
 Filed Aug. 18, 1988, Ser. No. 234,026
 Int. Cl.⁴ E05B 17/14

U.S. Cl. 70—428

4 Claims



1. A door lock adapted for placement on a door handle having a knob with a front face having a keyhole therein, said door lock comprising:
 a tubular casing substantially closed at one end by an end wall member and open at its other end for enabling the casing to be placed on the handle in a position wherein the knob is disposed in the casing with its front face adjacent said end wall member, said tubular casing having an inside radial dimension sufficient to permit the casing to rotate freely on the knob,
 no more than one circumferential slot generally adjacent the open end,
 a locking lever pivotally connected to the casing adjacent one end of the slot to permit the lever to swing in a plane extending generally radially with respect to the casing between a non-obstructing position wherein the casing may be placed on the door handle and removed from the door handle, and an obstructing position wherein the lever is received in the slot and extends across the interior of the casing obstructing the open end of the casing, the lever being engageable by the knob when the casing is on the handle and the lever is in said obstructing position for preventing the casing from being pulled off the handle, and
 locking means for locking the lever in said obstructing position whereby, when the casing is on the door handle, the knob cannot be turned and said substantially closed end wall member prevents a key from being inserted into the keyhole.

4,876,868

METHOD FOR FORMING AN OBJECT OF METAL BY COLD PRESSING

Hans-Joachim Tüshaus, Hanau, and Michael Hörmann, Möbris, both of Fed. Rep. of Germany, assignors to W. C. Heraeus GmbH, Hanau, Fed. Rep. of Germany

Filed Jan. 25, 1989, Ser. No. 301,808

Claims priority, application Fed. Rep. of Germany, Feb. 13, 1985, 3804567

Int. Cl.⁴ B21C 23/32, 23/20; B21J 3/00

U.S. Cl. 72—42

7 Claims



1. Method for making a body from a metal from the group consisting of tantalum, niobium and a base alloy of one of these metals comprising:

applying to a metal slug a lubricant film which consists of an oxide coating of said metal, embedding at least one of polytetrafluorethylene of low molecular weight and chlorotrifluorethylene in said metal oxide coating, and then cold forming the metal slug by forcing a hard-metal punch in a single step into said slug to shape said body by back-flow pressing, the punch having a shank and a head provided with a crowned bottom surface and a rounded undercut in an area of transition between said punch head and said punch shank.

4,876,869

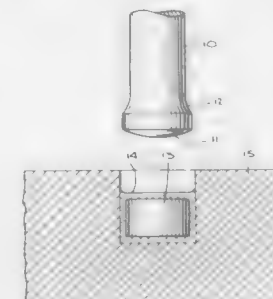
INNER GROOVING PROCESS FOR A METALLIC TUBE
 Chikara Saeiki, Hatano, and Minoru Nishibe, Kobe, both of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Jun. 30, 1988, Ser. No. 214,054

Claims priority, application Japan, Jul. 7, 1987, 62-169571
 Int. Cl.⁴ B21C 3/08, 37/06; B21D 53/06, 17/04

U.S. Cl. 72—68

3 Claims



1. An inner grooving process for a metallic tube wherein a metallic tube is reduced in diameter by means of a drawing die and a floating plug and is then grooved on an inner wall thereof by means of a rolling member supported on a retaining ring and a grooved plug whereafter the diameter of the metallic tube is adjusted by means of a diameter adjusting die, and wherein said drawing die has an exit hole of a fixed diameter

while said floating plug comprises a plug having no bearing portion thereon, which comprises:

connecting said floating plug and said grooved plug for rotation, said grooved plug having an outer diameter smaller than the diameter of said exit hole of said drawing die;

inserting said floating plug and said grooved plug into said metallic tube upstream of said drawing die;

drawing said grooved plug while within said metallic tube through said drawing die to a predetermined location of said rolling member and retaining said grooved plug at said predetermined location, whereafter said floating plug and said drawing die cooperate with each other for reducing the inner diameter of the metallic tube to a dimension smaller than the outer diameter of the grooved plug; and tube expanding rolling drawing the metallic tube with said rolling member and said grooved plug for expanding and grooving the metallic tube continuously.

4,876,870

METHOD FOR MANUFACTURING TUBES

Mauri V. Rantanen, Espoo, Finland, assignor to Outokumpu Oy, Helsinki, Finland

Filed Mar. 23, 1988, Ser. No. 172,196

Claims priority, application Finland, Mar. 26, 1987, 871344

Int. Cl.⁴ B21B 19/06

U.S. Cl. 72—78

8 Claims

1. A method of manufacturing tubes of a non-ferrous metal, starting with a tube shell of a material consisting of copper, nickel, zirconium or titanium or their alloys at ambient temperature which tube shell has been made by continuous casting or extrusion, consisting of planetary cold rolling of the tube shell to cause an area reduction of at least 70 percent in one single pass, and because of said area reduction and resistance of the material to deformation, a temperature rise to the recrystallization temperature of the material, the grain size of the material remaining within the range of 0.005 to 0.050 mm.

4,876,871

FLEXIBLE HARDROLL MANDREL ASSEMBLY FOR SLEEVING PERIPHERALLY LOCATED HEAT EXCHANGER TUBES

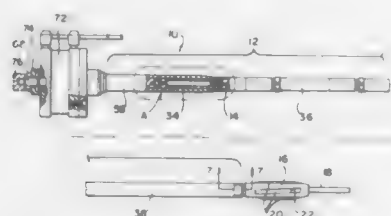
Thomas E. Arzenti, Hempfield Township, and Robert D. Senger, Unity Township, both of Westmoreland County, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 29, 1988, Ser. No. 250,737

Int. Cl.⁴ B21D 39/10

U.S. Cl. 72—122

28 Claims



1. A flexible hardroll mandrel assembly for expanding a sleeve comprising:

an elongate housing for transferring torque including at least one flexure means along the length thereof;
a roller cage rotatably mounted to a first end of said elongate housing, including a roller rotatably mounted within a slot in said roller cage;
a tapered actuator shaft axially slidably supported in an opening in said roller cage for radially extending, orbiting and rotating said roller;
an end effector and drive means for rotatably driving said elongate housing, and
a flexible inner shaft means within said elongate housing for

axially shifting said tapered actuator shaft and for translating rotational drive torque from said elongate housing to said tapered actuator shaft.

4,876,872

METHOD AND APPARATUS FOR MANUFACTURING CURVED PIPE

Toshio Kaneko, Kanagawa, Japan, assignor to Kabushiki Kaisha Asahi Kinzoku Kogyo, Kawasaki, Japan

Filed Oct. 27, 1988, Ser. No. 263,643

Claims priority, application Japan, Oct. 28, 1987, 62-270464

Int. Cl.⁴ B21D 7/08, 9/12

U.S. Cl. 72—133

7 Claims



1. A curved pipe manufacturing method comprising the steps of:

- (1) providing a fixed die having a curved cavity, an entrance opening and an exit opening contained therein, said curved cavity being formed in a circular arc and extending from said entrance opening to said exit opening;
- (2) providing a movable block, an ejecting rod and a curved mandrel, said movable block being attached to said ejecting rod at a basal end of said ejecting rod and said curved mandrel being concentrically attached to said ejecting rod at a distal end of said ejecting rod, said ejecting rod being of greater diameter than said curved mandrel and forming a stepped surface with said curved mandrel where said curved mandrel is concentrically attached to said ejecting rod;
- (3) inserting the curved mandrel into the curved cavity of the fixed die through the exit opening therein and forming a curved annular chamber inside said cavity;
- (4) pressing a work with a presser rod through said entrance opening into said curved annular chamber to form a curved pipe;
- (5) turning the movable block in a first direction so that the mandrel and the curved pipe are ejected from the entrance opening of the fixed die;
- (6) advancing a movable chuck provided adjacent said entrance opening to a position where said movable chuck contacts a rear end portion of said curved pipe and restrains the movement of said curved pipe in a direction opposite to said first direction;
- (7) turning said movable block in said direction opposite to said first direction so as to return only the mandrel into the curved cavity of the fixed die; and
- (8) retracting the movable chuck to recover the curved pipe.

4,876,873

ANTIROTATION METHOD TO STRAIGHTEN SECTIONS AND ANTIROTATION STRAIGHTENING MACHINE WHICH EMPLOYS SUCH METHOD

Giorgio Del Fabro, Cassacco Franz, Montegnacco, and Marcello Del Fabro, Udine, both of Italy, assignors to M.E.P. Macchine Elettroniche Piegatrici SpA, Reana Del Rojale (UD), Italy

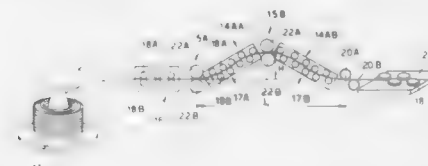
Filed Nov. 24, 1987, Ser. No. 125,005

Claims priority, application Italy, Nov. 26, 1986, 83445 A/86; Aug. 21, 1987, 83441 A/87; Oct. 6, 1987, 83467 A/87

Int. Cl.⁴ B21F 1/02

U.S. Cl. 72—162

6 Claims



1. Antirotation method to straighten sections, comprising: guiding the sections through a guide and prestraightener assembly to initially straighten the sections;
- passing the initially straightened sections through at least two straightening assemblies, wherein each of said straightening assemblies includes multiple pairs of rolls, and each of said pairs of at least one of said straightening assemblies is positioned to form a half-loop, thereby essentially preventing rotation of the sections while the sections are straightened;
- passing the sections through a linearizing assembly to form linear, straightened sections; and
- passing the sections through a finishing assembly to form a finished, straightened section product, wherein the sections pass through each assembly along a sinuous path lying substantially on one single plane.

4,876,874

METHOD OF HOT ROLLING STEEL STRIP WITH DEFORMED SECTIONS

Nobuo Kakehi, Yuzuru Takahashi, Norio Higuchi, Yoshikazu Izumihara, all of Muroran; Hiromi Matsumoto, and Yuji Uehori, both of Kitakyushu, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

PCT No. PCT/JP87/00158, § 371 Date Nov. 13, 1987, § 102(e) Date Nov. 13, 1987, PCT Pub. No. WO87/05543, PCT Pub. Date Sep. 24, 1987

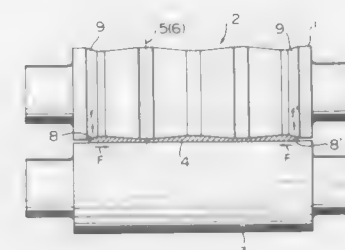
PCT Filed Mar. 12, 1987, Ser. No. 128,112

Claims priority, application Japan, Mar. 15, 1986, 61-57676; Mar. 15, 1986, 61-57676

Int. Cl.⁴ B21B 1/08, 1/22, 27/02

U.S. Cl. 72—199

5 Claims



1. A method of rolling a steel strip with deformed sections having a thickness change in the direction of the width of the strip, by use of a continuous, hot strip mill, said method comprising the steps of: providing an excess metal portion along each lateral side

edge of a steel strip material to be rolled for simultaneously obtaining one or a plurality of deformed section portions;

providing, on a roll for effecting said rolling, a pair of holding portions, each portion being located at the opposite end of said roll;

positioning one of the excess metal portions at a position corresponding to one of said holding portions, each of said holding portions being constituted by a tilted surface placed in a contact-and-rolling relation to the excess metal portion, said tilted surfaces being oriented, such as to exert onto the steel material being rolled a force directed towards the center of the steel material; and,

rolling said deformed section steel strip in a plurality of reducing stages so that said forces exerted by said tilted surfaces effect a self-alignment of said strip during said rolling stages.

4,876,875

SUPPORTED CERAMIC GUIDE ROLLER

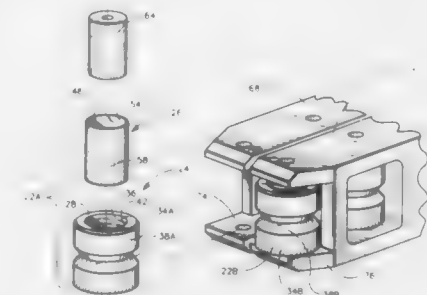
Rudyard J. Bruggeman, Arvada, and Gregory A. Carscallen, Lakewood, both of Colo., assignors to Coors Porcelain Company, Golden, Colo.

Filed Dec. 4, 1987, Ser. No. 130,109

Int. Cl.⁴ B21B 27/02, 27/06, 39/14

U.S. Cl. 72—199

19 Claims



1. A ceramic roller comprising: an annulus-shaped member comprising a first ceramic material and having first and second side surfaces and outer and inner circumferential surfaces;
- a support member comprising a second material, different from said first ceramic material and having a support surface and being positioned such that said support surface is spaced from said inner surface to define a first space therebetween, wherein at least a portion of at least one of said first side surface and said second side surface extends radially outward from said support member;
- adhesive means comprising an epoxy in said first space for adhering to said inner surface and said support surface and for at least partially relieving stress on said annulus-shaped member.

4,876,876

DIES FOR FORGING GEAR-SHAPED PART MADE OF SHEET METAL

Kyoso Ishida, Hiroshima, and Shinya Kodama, Aki, both of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Oct. 27, 1988, Ser. No. 263,250

Claims priority, application Japan, Oct. 27, 1987, 62-269211; Nov. 10, 1987, 62-294509

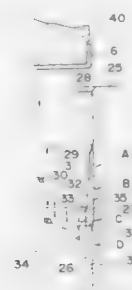
Int. Cl.⁴ B21D 22/26

U.S. Cl. 72—348

9 Claims

1. Dies for forging a gear-shaped part made of a sheet metal, comprising a cylindrical die for forming, in cooperation with a cylindrical punch, tooth portions and bottom land portions at

a peripheral wall portion of a cup-shaped work integrally formed from the sheet metal, wherein ridges and grooves provided at the inner peripheral surface of the cylindrical die in the axial direction of the die in order to form the tooth portions and the bottom land portions are such that, in the



direction from an insertion-side opening of the cylindrical die toward the depth of the die, the height of the ridges is gradually increased to a final height, then the width of the ridges is gradually increased to a final width, and thereafter the depth of the grooves is gradually decreased to a final depth.

4,876,877

PORTABLE TOOL FOR BENDING ROOF BOLTS FOR INSERTION IN MINE ROOF OPENINGS

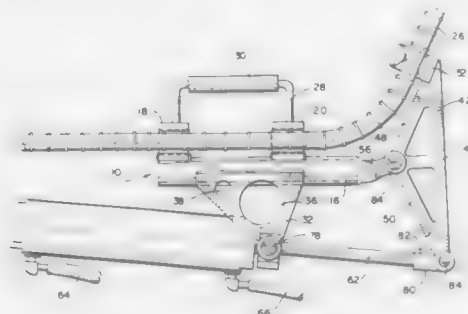
Claude C. White, Birmingham, Ala., assignor to Birmingham Bolt Company, Inc., Birmingham, Ala.

Filed Jun. 14, 1988, Ser. No. 206,362

Int. Cl.⁴ B21D 9/07

U.S. Cl. 72—388

7 Claims



1. Apparatus for bending elongated roof bolts preparatory to insertion thereof into mine roof openings, said apparatus including

- (a) a stationary support portion for holding a first part of an elongated roof bolt in a substantially horizontal plane;
- (b) said stationary support portion comprising a rectilinear member, elongated in a direction parallel with the elongated roof bolt;
- (c) a spaced bolt retaining member fixedly connected with said elongated rectilinear member for holding the bolt;
- (d) a power cylinder and piston connected to said elongated rectangular member;
- (e) a pivotally movable support portion axially aligned with said stationary support portion;
- (f) said movable support portion including a triangular shaped member having sides and a base;
- (g) a bolt retaining member fixedly connected with one side of said triangular shaped member;
- (h) a first means for pivotally connecting said triangular shaped member, at the juncture of the sides thereof, to said elongated rectilinear member;
- (i) a second means pivotally connecting said piston with said triangular shaped member at the juncture of one of the sides and the base thereof, and
- (j) control means operatively connected with said cylinder

and piston, said control means being actuated to a first position to move the piston to extended position, to effect rotational movement of said triangular shaped member and movable support portion in a vertical plane to effect bending of the bolt in an upward direction for insertion of the bent portion of the bolt into the mine roof opening;

(k) said control means being moved to a second position to effect rotational movement of said triangular shaped member and movable support portion to its initial position, to effect straightening of the bolt to permit full insertion thereof into the mine roof opening.

4,876,878

PRESS WITH HYDRO-MECHANICAL DRIVE

Andrea Scheitza, Weiterstadt, Fed. Rep. of Germany, assignor to Werner Leinhaus, Gelnhausen, Fed. Rep. of Germany

Filed Mar. 23, 1988, Ser. No. 172,696

Claims priority, application European Pat. Off., Mar. 24, 1987, 87104278.4

Int. Cl.⁴ B21J 9/18

U.S. Cl. 72—450

8 Claims



1. A cutting and reshaping press, comprising

a frame comprising a top plate, a base plate and vertical supports extending between said top plate and said base plate, said frame having a substantially hollow interior region,

a press ram comprising a top wall, a bottom wall and side-wall extending between said top wall and said bottom wall, said press ram including a substantially hollow interior region, said press ram being located within said hollow interior region of said frame and being movable relative to said frame,

adjustable suspension means connecting said top wall of said press ram to said top plate of said frame, said adjustable suspension means passing through said top wall and extending into the interior region of said press ram,

a drive system located between said top wall of said press ram and said top plate of said frame, said drive system passing through said top wall and extending into the interior region of said press ram, said drive system including a piston,

a central guide located substantially centrally of said top wall and extending into the interior region of said press ram, said piston travelling within said central guide,

a support axle located at a second end of said suspension means within the interior region of said press ram,

a bridge structure located within the interior region of said press ram and connecting said central guide to said suspension means,

first, second and third movable articulation points located within the interior region of said press ram, first coupling means comprising first, second, and third levers connecting said support axle, said first articulation point, and said second articulation point into a rigid triangle pivotable about said support axle, second coupling means comprising a fourth lever connecting said first articulation point to said bottom wall of said press ram, and third coupling means comprising a fifth lever connecting said second articulation point to said third articulation point, said third articulation point being attached to said piston and travelling within said central guide along with said piston, wherein movement by said piston through a distance S_2 causes said press ram to move a distance S_1 relative to said frame, said distance S_1 being less than said distance S_2 .

4,876,879

APPARATUS AND METHODS FOR MEASURING THE DENSITY OF AN UNKNOWN FLUID USING A CORIOLIS METER

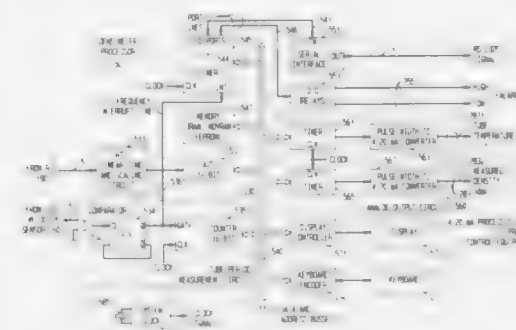
James R. Ruesch, 6941 Harvest Rd., Boulder, Colo. 80301 Division of Ser. No. 235,234, Aug. 23, 1988, abandoned, which is a continuation of Ser. No. 916,780, Aug. 9, 1986, abandoned.

This application Mar. 27, 1989, Ser. No. 329,181

Int. Cl.⁴ G01N 9/06; G01F 1/74

U.S. Cl. 73—32 A

17 Claims



1. Apparatus for a metering system which measures the density of a process fluid using a Coriolis meter having at least one flow tube which is driven to resonantly oscillate in a substantially sinusoidal manner about a bending axis while the fluid flows through said flow tube, said apparatus comprising: means for measuring a value of a period at which said flow tube resonantly vibrates while a process fluid flows there-through and for generating a first interrupt at the conclusion of each period value measurement; means for measuring a temperature of said flow tube; means for displaying a value of density of said process fluid;

a processing circuit comprising:

- means, responsive to an occurrence of said first interrupt, for filtering said period value measurement to yield a filtered period measurement;
- means for generating a second interrupt at a first pre-defined periodic interval of time;
- means, operative in response to an occurrence of said second interrupt and to said temperature measuring means, for providing a measured temperature value of said flow tube coincidentally occurring while said process fluid flows therethrough;
- means for determining, in response to the measured temperature value, a temperature coefficient value for said process fluid;
- means, responsive to said temperature coefficient determining means and to said filtered period measurement,

for determining a first factor as being a product of said temperature coefficient value and a square of said period value;

means, responsive to said first factor and to second and third factors associated with first and second known calibration fluids, for producing a current density value of said process fluid;

means, responsive to said current density value, for updating the displayed density value appearing on said first displaying means with said current density value at a second pre-defined periodic interval of time, wherein said second pre-defined interval is longer than said first pre-defined interval;

wherein said apparatus further comprises means for correspondingly setting each of the second and third factors substantially equal to the first factor that occurs when the first and second known calibration fluids are correspondingly and selectively passed through the flow tube as the process fluid in order to calibrate the meter.

4,876,880

DENSIMETER

Gerald P. Dyer, Enfield, Conn., assignor to United Technologies Corporation, Hartford, Conn.

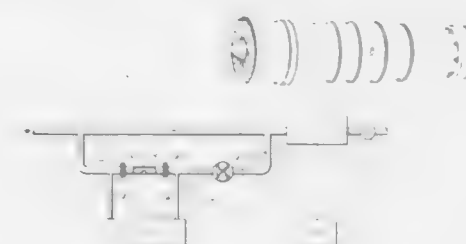
Division of Ser. No. 51,887, May 20, 1987, Pat. No. 4,809,499.

This application Oct. 25, 1988, Ser. No. 262,392

Int. Cl.⁴ G01N 9/00

U.S. Cl. 73—32 R

1 Claim



1. Apparatus for determining the density of a liquid characterized by:

- means for impelling a liquid at a constant volumetric flow along a flow path;
- an orifice having a fixed area disposed within said flow path, said liquid flowing through said orifice;
- means for determining a pressure drop of said liquid across said orifice and for sending a signal corresponding to said determined pressure drop; and
- means for receiving said signal and determining said density of said liquid as a function of said pressure drop wherein said density is equal to the pressure drop divided by a constant times said square of the volumetric flow.

4,876,881

METHOD AND APPARATUS FOR MEASURING SETTLING RATE, COMPACTION, AND CLARITY OF A LIQUID

Daniel F. Pope, Issaquah, Wash., assignor to Mt. Fury Company, Issaquah, Wash.

Filed Aug. 12, 1988, Ser. No. 231,767

Int. Cl.⁴ G01N 15/04, 15/06

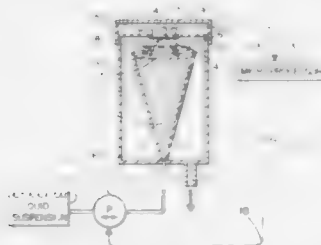
U.S. Cl. 73—53

8 Claims

1. In a method for determining the settling rate and percent ultimate compaction of suspended solids in a liquid sample, of the type wherein a reservoir, having an inlet port near the bottom and which will permit overflow near the top, is filled with the liquid sample and the level within the reservoir of an interface formed between the clarified and unclarified portions of the liquid sample is measured, the improvement comprising: adjusting the rate at which additional sample is supplied to

the reservoir through the inlet port so that the interface level is maintained at a desired constant level within the reservoir;

calculating the settling rate from the necessary adjustments



to the rate at which liquid sample is supplied to the reservoir; and
calculating the percent ultimate compaction from the slowing of the settling rate as liquid sample is supplied to the reservoir.

4,876,881

VISCOSITY DETECTION METHOD FOR LIQUID CHROMATOGRAPHY SYSTEMS WITH CARRIER LIQUIDS HAVING TIME-VARYING VISCOSITY

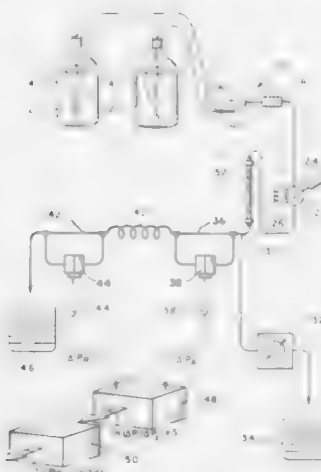
Wallace W. Yan, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 30, 1989, Ser. No. 302,899

Int. Cl.⁴ G01N 11/08

U.S. Cl. 73—55

1 Claim



1. A method for measuring the inherent viscosity of individual solute components in a multicomponent sample in solution with a solvent, comprising:

passing a stream of a carrier liquid having a viscosity which varies as a function of time at a flow rate R sequentially through (1) means for separating said sample into its individual solute components, (2) a first capillary tube and (3) a second capillary tube, which tubes are separated from each other by an offset volume ΔV , where $0 < \Delta V \leq RT$, where T is as defined below;

introducing into said stream of carrier liquid, upstream of said means for separating said sample into its individual solute components, a predetermined volume of a solution comprising the sample and the solvent, whereby said sample is separated into its individual solute components; measuring, as a function of time, pressure differences $\Delta P_1(t)$ and $\Delta P_2(t)$ across said first and second capillary tubes,

respectively, said $\Delta P_1(t)$ and $\Delta P_2(t)$ being characterized by a rise time T; measuring, as a function of time, the concentration C(t) of the individual solute components in the carrier liquid; obtaining a function S(t), where

$$S(t) = \ln [\Delta P_1(t) / \Delta P_2(t)];$$

obtaining a function $S_0(t)$, where

$$S_0(t) = \ln [\Delta P_1(t) / \Delta P_2(t)];$$

when only carrier liquid is flowing through both the first and second capillary tubes; obtaining a function I(t), where

$$I(t) = \int [S(t) - S_0(t)] dt;$$

and relating C(t), I(t) and ΔV to the inherent viscosity of the individual solute components.

4,876,883

PNEUMATIC RING GAUGE

Olivier Ecoffey, Colombier; Théodore Mueller, Lamboing, and Hans Sigg, Neuchâtel, all of Switzerland, assignors to Meseltron S.A., Corcelles, Switzerland

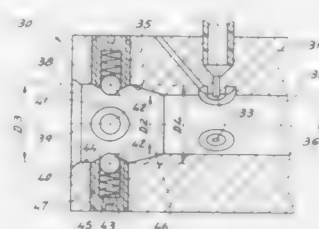
Filed Mar. 14, 1988, Ser. No. 168,075

Claims priority, application Switzerland, Mar. 16, 1987, 967/87

Int. Cl.⁴ G01B 13/08

U.S. Cl. 73—37.5

2 Claims



1. A ring gauge (30) for a pneumatic apparatus for measuring an outer diameter of a part (P1), such ring gauge including an entry zone followed by a measuring zone defined by a guide cylinder (32) in which an air jet measuring system (33) is installed, the guide cylinder exhibiting a diameter only slightly greater than the diameter of the part to be measured the entry zone including, successively in the sense of penetration of the part, a first region (38) exhibiting an opening (D3) substantially larger than the opening (D1) exhibited by the guide cylinder, a second region (41) including at least three guide means (42) which define a circle the diameter (D2) of which is equal to the diameter (D1) of the guide cylinder opening, said guide means being adapted to be spread apart against the return force of a spring (45) by the part being measured and a third tapered region (46) having an entry diameter (D4) substantially greater than that of the guide cylinder opening and an exit diameter (D1) equal to that of the guide cylinder opening.

4,876,884

APPARATUS FOR TESTING THE GAS-TIGHTNESS OF JOINTS BETWEEN HOLLOW BODIES

Manfred Jansch, Garbsen, Fed. Rep. of Germany, assignor to Weatherford Oil Tool GmbH, Hanover, Fed. Rep. of Germany

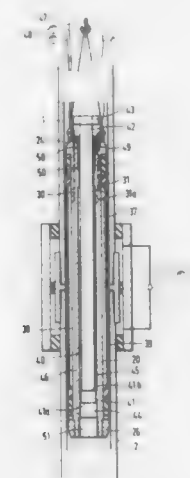
Filed Dec. 29, 1987, Ser. No. 139,013

Claims priority, application Fed. Rep. of Germany, Jan. 8, 1987, 3700384

Int. Cl.⁴ G01M 3/28

U.S. Cl. 73—49.1

6 Claims



1. An apparatus for testing the gas-tightness of joints between hollow bodies, which apparatus comprises:

a support shaft;
a first resilient seal element mounted on said support shaft;
a second resilient seal element mounted on said support shaft and spaced from said first resilient seal element with a space between them;
a membrane extending between said first resilient seal element and said second resilient seal and second resilient seal elements into two concentric pressure chambers;
means for transmitting a liquid to one side of said membrane; means to supply a gas to the other side of said membrane; and

a pressure amplifier, said pressure amplifier comprising a bore extending along said shaft, a piston slidable in said bore, said piston having differential pressure surfaces on opposite faces thereof, a channel for conveying liquid to the surface of the piston having the greater pressure area, and a channel interconnecting the surface of the piston having the smaller pressure area with the other side of said membrane.

4,876,886

RAILROAD COUPLER MOUNT

Gregory C. Martin, and Gary W. Egerton, both of Montgomery County, Md., assignors to Pulse Electronics, Inc., Rockville, Md.

Filed Jul. 19, 1988, Ser. No. 221,352

Int. Cl.⁴ G01L 5/28

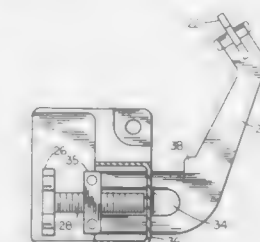
U.S. Cl. 73—129

11 Claims

1. An improved railroad coupler mount for securing signaling and monitoring equipment to the guard arm side of a coupler head, comprising:

a mounting base for supporting said signalling and monitoring equipment;
a banana shaped arm member long enough to extend through a pair of horizontally aligned relief holes in said coupler head and extending from said mounting base, said arm member having first and second ends and a bulge

section between said first and second ends for bracing against an inside wall of said coupler head;
a swivel toggle pivotally mounted on said second end of said banana shaped arm member, said swivel toggle being able to pass through said pair of relief holes in an in-line orientation, but preventing the withdrawal of said banana shaped arm when in a perpendicular orientation;
tightening means on said mounting base and connected to said first end of said banana shaped arm member for tightening said mounting base against said coupler head, said swivel toggle bearing against a sidewall said coupler head when said tightening means draws said banana shaped arm towards said mounting base; and
stabilizing means on said mounting base for stabilizing said improved railroad coupler mount against rotation in a vertical plane.



9. An improved railroad coupler mount for securing signaling and monitoring equipment to the guard arm side of a coupler head, comprising:

a mounting base for supporting said signalling and monitoring equipment, said signalling and monitoring equipment being contained in an equipment box releasably fastened to said mounting base and having a compartment door for allowing access to a component positioned inside said equipment box;
a banana shaped arm member long enough to extend through a pair of horizontally aligned relief holes in said coupler head and extending from said mounting base;
a swivel toggle pivotally mounted on said banana shaped arm; and
locking means connected to said mounting base for simultaneously locking said compartment door of said equipment box and locking said mounting base to said coupler head.

4,876,886

METHOD FOR DETECTING DRILLING EVENTS FROM MEASUREMENT WHILE DRILLING SENSORS

Matthew Bible, Houston; Marc Lesage, Missouri City, and Ian Falconer, The Meadows, all of Tex., assignors to Anadrill, Inc., Sugar Land, Tex.

Filed Apr. 4, 1988, Ser. No. 176,826

Int. Cl.⁴ E21B 44/00

U.S. Cl. 73—151.5

8 Claims

1. A method for determining subsurface conditions encountered by a drill bit while drilling a borehole, comprising the steps of:

a. during the drilling process, determining rate of penetration and generating a signal indicative thereof;
b. during the drilling process, determining downhole torque and generating a signal indicative thereof;
c. in response to signals indicative of rate of penetration and

downhole torque, generating an indication of the occurrence of a subsurface condition selected from the group



comprising high formation porosity, a damaged bit bearing and the development of an undergauge bit.

4,876,887

THERMAL FLUX MASS FLOWMETER

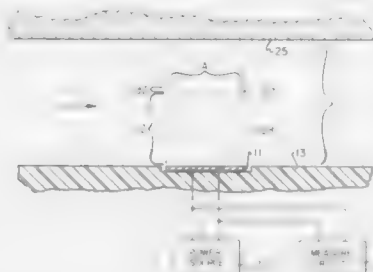
Brian E. Mickler, 4028 Tamworth Rd., Fort Worth, Tex. 76116

Filed Jun. 27, 1988, Ser. No. 211,891

Int. Cl.⁴ G01F 1/68

U.S. Cl. 73-204.11

8 Claims



1. A mass flowmeter for measuring the velocity of a flowing fluid, comprising in combination:

a sensor adapted to be placed in the flowing fluid, the sensor being capable of generating heat when supplied with electrical power, the sensor having a resistance which is a function of temperature;

a heat sink located a selected distance from the sensor in a direction substantially perpendicular to the flowing fluid; means for supplying electrical power to the sensor to cause a thermal flux to flow from the sensor to the heat sink which is modulated by the flowing fluid, the heat sink and the sensor being separated from each other by a space that is unobstructed so as to allow the thermal flux to flow from the sensor to the heat sink in a direction substantially perpendicular to the flowing fluid;

means for computing the temperature rise of the sensor over the ambient temperature of the heat sink and the flowing fluid by measuring the resistance of the sensor with said electrical power supplied and subtracting from this measurement the resistance of the sensor at said ambient temperature to determine a difference, and for computing from said difference the temperature rise of the sensor above said ambient temperature, and for computing from said temperature rise and said electrical power supplied, the velocity of the flowing fluid.

4,876,888

THICKNESS MONITOR FOR FLOATED SLUDGE

John Ricketts, and George M. Greca, both of P.O. Box 147,

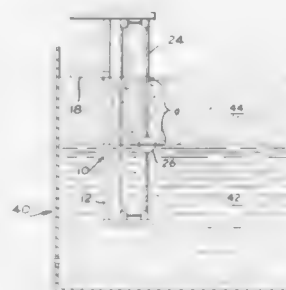
Columbia, S.C. 29217

Filed Nov. 17, 1988, Ser. No. 272,425

Int. Cl.⁴ G01F 23/30, 23/76

U.S. Cl. 73-319

12 Claims



1. Apparatus for determining the thickness of a layer of aerated sludge floating on a layer of a heavier liquid in a tank, comprising:

(a) a frame means which can be positioned to extend vertically into the tank;

(b) horizontally-extending indicator means supported by and movable vertically with respect to a portion of said frame means extending vertically into said tank, said indicator means being selectively positionable at the highest level of sludge in the tank;

(c) horizontally-extending lower base means attached to said frame means at or near the bottom thereof;

(d) horizontally-extending upper base means attached to said frame means at or near the top thereof; and

(e) a line carrying a float means, said line being movably secured at said upper base means and said lower base means, such that said float means is movable between said upper and lower base means, said float means being floatable on the liquid and including a horizontally-extending portion presenting an upwardly directed generally planar surface, which surface will be parallel to the interface of the sludge and liquid.

4,876,889

ACOUSTIC HUMIDITY SENSOR

Parthasarathy Shakkottai, 2622 Gardi St., Duarte, Calif. 91010;

Eug Y. Kwack, 20946 E. Canyon Ridge Rd., Walnut, Calif. 91789, and Shakkottai P. Venkatesh, 34, III Main Rd.,

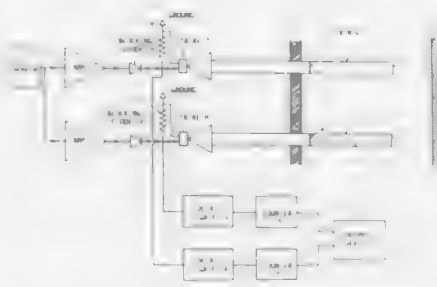
Gandhi Nagar, Adyar Madras, India (600020)

Filed Jul. 5, 1988, Ser. No. 215,374

Int. Cl.⁴ G01W 1/02; G01N 29/02

U.S. Cl. 73-336.5

10 Claims



1. An acoustic time-of-flight method for deriving data indicative of average gas temperature and average water vapor content in humidity chambers, ovens, driers, furnaces and the like comprising the steps of:

- installing a closed tubular sensor containing dry air and allowing it to come to equilibrium with hot, moist air in one of said chambers, ovens, driers, or furnaces,
- transmitting sound pulses from the cold end of said tubular sensor and allowing said pulse to propagate through said dry air,
- receiving sound pulses partially reflected from both a stub or other reflecting means located in said sensor and the end wall,
- measuring a time difference between said reflected pulses,
- synchronously transmitting sound pulses in a second tubular sensor of identical size as the first said tubular sensor, but containing many holes in the region between its end wall and stub or other reflecting means, to allow moist environment of said chamber, oven, drier or furnace to be present inside said second sensor,
- receiving sound pulses as in (c) partially reflected from the end wall and from said stub or other reflecting means located at the same distance from said end wall as in the first sensor,
- measuring a time interval between said pulses in (f),
- forming a ratio of time intervals found in (d) and (f) which is equal to ratio of speeds of sound in moist air and in dry air,
- and calculating the volume fraction of moisture which is related only to said speed of sound ratio in (h) independently of said air temperature in said chamber, oven, drier or furnace, over an extremely wide range of temperatures.

4,876,890

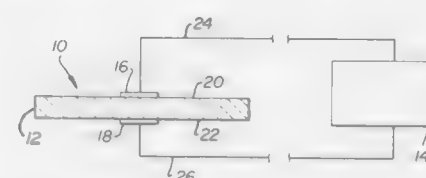
MOISTURE SENSING APPARATUS AND METHOD
William C. Mercer, Brookfield, Conn.; Peter K. Coughlin, Yorktown Heights, N.Y.; Donald McLeod, Jr., Briarcliff Manor, N.Y., and Edith M. Flanigen, White Plains, N.Y., assignors to UOP, Des Plaines, Ill.

Filed Jun. 29, 1988, Ser. No. 213,236

Int. Cl.⁴ G01W 1/00

U.S. Cl. 73-336.5

47 Claims



1. A moisture sensing element comprising an electrically continuous article comprising an inorganic crystalline composition selected from the group consisting of zeolite molecular sieves in which the molar ratio of silica to alumina is greater than 6, silica molecular sieves, non-zeolitic molecular sieves and mixtures thereof; and two electrodes affixed to said article at different locations in current carrying relationship so that the current between said two electrodes passes through at least a portion of said inorganic crystalline composition.

7. The element of claim 1 wherein said zeolite molecular sieve is selected from the group consisting of LZ-210, LZ-105 and mixtures thereof.

11. The element of claim 1 wherein said inorganic crystalline composition is selected from the group consisting of silicalite, silicalite II, fluoride silicalite and mixtures thereof.

4,876,891

PRODUCT-DISPENSING METHOD AND APPARATUS
George R. Felt, Brown Deer; Donna K. Multhaupt, Grafton, and Sadhakar S. Wagle, Mequon, all of Wis., assignors to Rorer Pharmaceutical Corporation, Fort Washington, Pa.

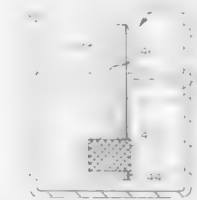
Continuation of Ser. No. 840,876, Mar. 18, 1986, abandoned.

This application May 25, 1988, Ser. No. 203,566

Int. Cl.⁴ G01F 19/00; G01G 5/02

U.S. Cl. 73-426

1 Claim



1. Product-dispensing apparatus, comprising: product-dispensing container means for storing and dispensing flowable product, said container means being floatable in water when the amount of said product contained therein is within a predetermined range;

floatation stabilizing means associated with said container means for stabilizing the angular position of said container means when said container means is floating in water; and scale means associated with said container means for indicating the position with respect to said scale means of the surface of said water on which said container means is floating, while the amount of said product therein is within said range;

wherein said floatation stabilizing means comprises a cap fitting over a top portion of said container means and containing weighting means at its upper end such that said container means and cap will float in water in a stabilized upright position with said cap facing downwardly in said water; and

wherein said scale means comprises a scale integral with said cap and extending along a side portion of said container means in a vertical direction when said container means is floating in said water.

4,876,892

PRESSURE SENSOR

F. Gene Arabia, Yorba Linda, Calif.; Zvi Shkedi, Tucson, Ariz., and Randy L. Brandt, Orange, Calif., assignors to Allied-Signal Inc., Phoenix, Ariz.

Filed Apr. 19, 1988, Ser. No. 183,103

Int. Cl.⁴ G01L 9/12

U.S. Cl. 73-718

32 Claims



1. A sensor responsive to a variable physical parameter and producing an electrical signal varying in response to changes in said physical parameter, said sensor comprising: a variable first capacitor responsive to said physical parameter to change capacitance value predictably in response to change of said physical parameter, a second capacitor, circuit means includ-

ing said first capacitor and said second capacitor for defining a simulated tuned inductor-capacitor circuit having an inductive impedance and not requiring an inductor, said circuit means including a pair of series connecting integrating operational amplifiers, one of said pair of operational amplifiers being in parallel connection with said first capacitor and the other of said pair of operational amplifiers being in parallel connection with said second capacitor, and an inverting operational amplifier series connecting with said pair of operational amplifiers between an output of a first and an input of a second thereof.

4,876,893

STRAIN GAUGES FOR THE PRESSURE SENSOR

Yukihiko Kato, Masami Ishii, Ryobei Yabuno, and Tetsuo Oka, all of Toyooka, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Aichi, Japan

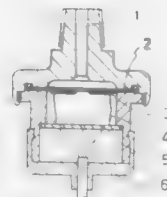
Filed Dec. 24, 1987, Ser. No. 137,822

Claims priority, application Japan, Dec. 26, 1986, 61-314349

Int. Cl.⁴ G01L 7/08, 9/04

U.S. Cl. 73—726

7 Claims



1. A strain gauge comprising:
 - a base plate of electrically insulated substance; and
 - a thin alloy film of non-magnetic substance on said base plate wherein said thin alloy film is an amorphous $(\text{Ni}_a\text{Cr}_{10-0-a})_{100-b}\text{Si}_b$ where the ranges of symbols a and b is established as $4 \leq a(\text{wt}\%) \leq 60$, $3 \leq b(\text{wt}\%) \leq 8$.

4,876,894

PRESSURE GAUGE CONNECTION

Heinz Heller, Rippberg, and Roland Waigand, Klingenberg/Main, both of Fed. Rep. of Germany, assignors to Alexander Wiegand GmbH & Co., Klingenberg/Main, Fed. Rep. of Germany

Filed Jun. 16, 1988, Ser. No. 207,771

Claims priority, application Fed. Rep. of Germany, Jun. 25, 1987, 8708828[U]

Int. Cl.⁴ G01L 7/04

U.S. Cl. 73—756

9 Claims



1. A connection for connecting a pressure sensor to a pressure vessel or conduit, said connection comprising:
 - (a) a stem integrally connected at one end to a pressure sensor and having a flange at its other end; and,
 - (b) an attachment element receiving said flange of said stem therein, said attachment element having a deformation portion which is deformable radially inwardly toward said stem after said attachment element is placed onto said

stem, said attachment element having a shoulder thereon which has radially and axially extending surfaces which sealingly engage radially and axially extending surfaces on said stem when said deformation portion is deformed toward said stem whereby said interengaged surfaces form said seal.

4,876,895

ENGINEERING CONSTRUCTIVE LOAD CELL

Heng-er Y. Kao, 3F.No. 4-2, Lane 16, Wen-Chow Street, Taipei, Taiwan (10616)

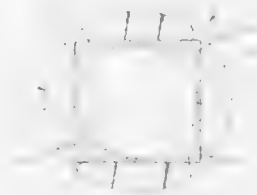
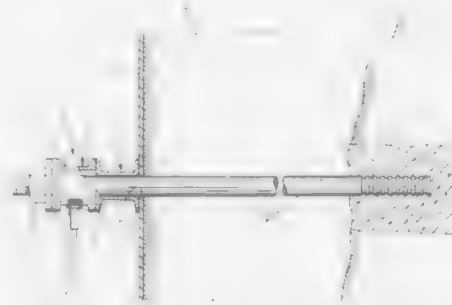
Filed Apr. 14, 1988, Ser. No. 181,355

Claims priority, application Japan, Apr. 14, 1987, 62-56127[U]

Int. Cl.⁴ F16B 31/02

U.S. Cl. 73—761

8 Claims



1. A load cell for use in determining a load placed upon said load cell which comprises:
 - a main body having an axially aligned cylindrical aperture and outwardly extending cylindrical end flanges integral with said main body with an outer central portion separating said cylindrical end flanges,
 - said outer central portion of said main body having an outer polygonal shape with equally spaced corners along the length of said outer central portion of said main body, and
 - one each of a plurality of strain gauges affixed adjacent each of said equally spaced corners with each of said strain gauges equally spaced from said cylindrical outwardly extending end flanges.

4,876,896

METHOD OF TESTING PROTECTIVE ENCAPSULATION OF STRUCTURAL MEMBERS

Richard K. Snow, Gallatin, and Milton W. Ellisor, Jr., Houston, both of Tex., assignors to I.W. Industries, Inc., Houston, Tex.

Filed Jun. 16, 1986, Ser. No. 874,500

Int. Cl.⁴ G01N 3/08

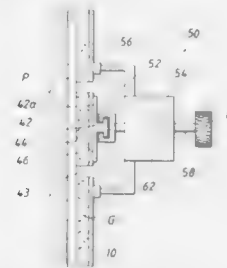
U.S. Cl. 73—827

4 Claims

1. A non-destructive field method of determining the minimum acceptable bond strength of a grout filling of an encapsulation jacket to a structural member, including the steps of:
 - coring the encapsulation jacket and grout filling to isolate a

predetermined size bonded area of the grout filling to the structural member;

- subjecting the isolated portion of the grout filling of the encapsulation jacket to a controlled tensile loading for separating the isolated portion of the grout filling of the encapsulation jacket from the structural member only if



the bond strength is less than the specified minimum acceptable bond strength; and

- determining the actual bond strength as a function of the tensile loading required to actually separate the isolated portion of the grout filling of the encapsulation jacket from the structural member if the grout filling separates from the structural member.

4,876,897

STEAM QUALITY MEASUREMENT APPARATUS AND METHOD

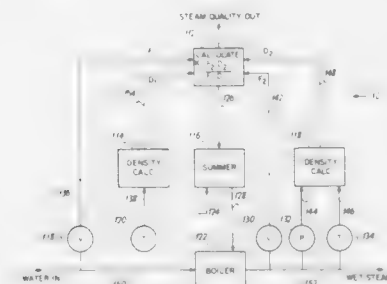
Joseph P. DeCarlo, and Thomas M. Kegal, both of Wrentham, Mass., assignors to The Foxboro Company, Foxboro, Mass.

Filed Dec. 10, 1987, Ser. No. 130,908

Int. Cl.⁴ G01F 1/32, 1/74

U.S. Cl. 73—861.04

3 Claims



1. Apparatus for measuring two-phase flows output from a boiler having water feed and steam output via a flowpipe, comprising:
 - (a) a horizontally disposed flowpipe carrying from said boiler a two-phase fluid having a vapor phase and a liquid phase;
 - (b) a first flowmeter means for producing an output signal related to the water feed flow input to said boiler;
 - (c) a first temperature measuring means for producing an output signal related to the water feed temperature input to said boiler;
 - (d) first density calculation means for producing a boiler feed density signal from said first temperature measuring means;
 - (e) a vortex flowmeter for producing a second velocity signal related to the vapor phase flow rate of said two-phase fluid output from said boiler, said vortex flowmeter having a horizontally disposed vortex generating bar mounted transversely within said flowpipe;
 - (f) means for determining the density of the vapor phase of

said two-phase fluid and producing a density signal therefrom; and

- (g) calculation block means for deriving the two-phase flow measurand from said first and second density signals, said first flow velocity signal, and said second velocity signal.

4,876,898

HIGH TEMPERATURE CORIOLIS MASS FLOW RATE METER

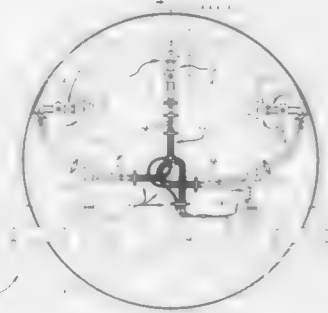
Donald R. Cage, Longmont, and Craig B. Van Cleve, Lyons, both of Colo., assignors to Micro Motion, Inc., Boulder, Colo.

Filed Oct. 13, 1988, Ser. No. 257,806

Int. Cl.⁴ G01F 1/84

U.S. Cl. 73—861.38

10 Claims



1. A Coriolis mass flow meter, electrically connectable to processing means including means for providing a driver signal to said meter and to means for processing a deflection signal produced in said meter to provide an output representative of the mass flow rate of the fluid flow, said flow meter being capable of operating in a temperature range having a lower boundary in excess of 260 degrees C., comprising:
 - means for hermetically enclosing said flow meter;
 - an inert gas situated within said enclosing means;
 - flow conduit means, substantially insusceptible to carbide precipitation occurring in said temperature range, for receiving fluid therethrough whose mass flow rate is to be measured;
 - means for mounting said flow conduit;
 - high temperature driver means, responsive to said driver signal, for vibrating said flow conduit with respect to said mounting means;
 - high temperature sensor means for sensing the deflection of said flow conduit means caused by fluid flow through said flow conduit means and for producing said deflection signal representative of said deflection, said driver and said sensor means comprising:
 - a high temperature magnet means; and
 - a high temperature coil means;
 - terminal block means, having multiple conductors, mounted adjacent to said high temperature coil means and in a stationary relationship with respect to said enclosing means; and
 - high temperature flexure means, having one or more uninsulated electrical conductors, for electrically interconnecting said coil means of said driver means and said sensor means with said adjacent terminal block means, said flexure means dimensioned so as to form a U-shape when electrically interconnecting said coils with said conductors of said adjacent terminal block means;
 - feed-through means having multiple conductors therethrough for providing an hermetically sealed passage for routing signals through said enclosing means, said signals including said driver signals and said deflection signals from said driver means and said sensor means;
 - multiple internal insulated wiring leads for electrically inter-

connecting individual ones of said conductors of said terminal block means with corresponding internal ends of said individual conductors of said feedthrough means; and multiple external insulated wiring leads for providing at least a portion of the electrical interconnection between individual ones of said conductors of said external ends of said individual conductors of said feed-through means and said processing means.

4,776,899

TORQUE SENSING DEVICE

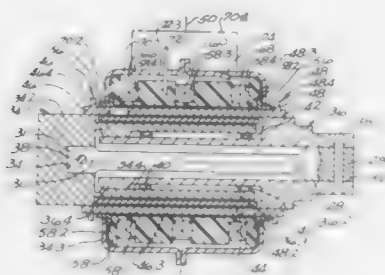
Douglas B. Strott, Attleboro, and Keith W. Kawate, Attleboro Falls, both of Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 31, 1988, Ser. No. 264,754

Int. Cl.⁴ G01L 3/10

U.S. Cl. 73—862.33

12 Claims



1. A torque sensing device comprising a member having one end rotatable around a member axis relative to an opposite end of the member in response to an applied torque to an extent representative of the applied torque; a pair of ferromagnetic elements secured to respective member ends to be rotatable therewith, each element having a plurality of portions spaced around the member axis extending into interleaved relation with portions of the other element to form a plurality of pairs of the portions of the respective elements at each of two sides of a plane which extends transversely across the member axis between the ends of the member, the portions of the respective elements in each pair being normally disposed in a first closely spaced relation to each other to form a selected discontinuity therebetween and to be responsive to said relative rotation of the member ends to increase said discontinuity between the element portions in each pair at one side of the plane and decrease said discontinuity between the element portions in each pair at an opposite side of the plane; a magnetic field exciting coil for inducing magnetic leakage flux at said pairs of element portions representative of the discontinuity between the element portions in the pairs; and a pair of sensing coils disposed at respective sides of said plane coupled to the magnetic leakage flux at said pairs of the spaced element portions at the respective sides of said plane, the sensing coils being differentially connected to be responsive to said flux to provide an output signal corresponding to the applied torque.

4,775,866

RACKET STRING TENSION TESTER

William P. Carney, and Donald P. Carney, both of 4 High Ridge La., Oyster Bay, N.Y. 11771

Filed Jun. 13, 1988, Ser. No. 205,846

Int. Cl.⁴ G01L 5/06

U.S. Cl. 73—862.48

10 Claims

1. In a device for determining tension in the strings of a tennis racket, the strings forming a grid, including a generally cylindrical mainframe adapted to contact said strings on a first side thereof and a string deflecting means adapted to contact said strings on a second side thereof serving to deflect said strings to a predetermined degree; and sensing means for determining the value of tension in said strings developed upon

deflection to said predetermined degree, the improvement comprising: said sensing means carried by said mainframe; said deflecting means including a shaft projecting through an interstice between four intersecting generally centrally disposed string segments, said shaft having a first end contacting said sensing means, and a second end having deflecting means thereon; an interchangeable cylindrical washer having a centrally disposed bore surrounding said shaft, and adapted to be



4,876,901

ASBESTOS SAMPLE FILTER CLEARING SYSTEM

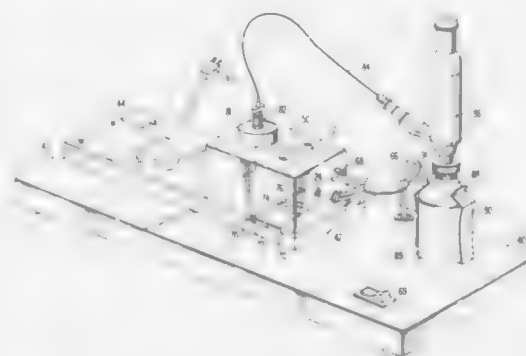
Jeptia E. Campbell, Cincinnati, Ohio, assignor to Spiral Systems, Inc., Cincinnati, Ohio

Filed Aug. 10, 1988, Ser. No. 230,522

Int. Cl.⁴ G01N 1/00

U.S. Cl. 73—863

13 Claims



1. Apparatus for clarifying asbestos fibers collected on a cellulose ester membrane filter comprising:

a base;
a container of liquid acetone secured to said base;
a slide for supporting a filter;
a metal plate having an upper surface for supporting said slide at a first position;
means having a heat conducting relationship with said metal plate for applying acetone vapors to said filter, said means including a heated flash chamber to vaporize said acetone, said flash chamber being off-set from said first position, and heated conduit means for transporting said vapors to said first position whereby the vapors condense upon reaching said filter;

means associated with said container for injecting a limited amount of liquid acetone to said flash chamber to restrict the quantity of vapors to the quantity needed for clearing said filter material; and
a slab of insulating material sandwiched between said base and said metal plate whereby the metal plate is maintained at an elevated temperature relative to said base by the heat associated with said heated flash chamber.

3. Apparatus for clarifying asbestos fibers collected on a cellulose ester membrane filter comprising:

a base;
a container of liquid acetone secured to said base;
a slide for supporting a filter;
a metal plate having an upper surface for supporting said slide at a first position;
means having a heat conducting relationship with said metal plate for applying acetone vapors to said filter, said means including a heated flash chamber to vaporize said acetone, said flash chamber being off-set from said first position, and heat conduit means for transporting said vapors to said first position whereby the vapors condense upon reaching said filter;
means associated with said container for injecting a limited amount of liquid acetone to said flash chamber to restrict the quantity of vapors to the quantity needed for clearing said filter material;
a slab of insulating material sandwiched between said base and said metal plate whereby the metal plate is maintained at an elevated temperature relative to said base by the heat associated with said heated flash chamber; and
the vapor applying means comprises a block of heat conductive material mounted by a hinge means along one edge to said slab of insulating material to permit pivotal movement of said block relative to said metal plate about a horizontal pivot axis, and said apparatus further comprises a handle to lift a side of said block opposite said hinge means to facilitate loading and removal of said slide from said first position.

4,876,902

METHOD FOR DRAWING SAMPLES FROM MATERIAL CONTAINING SOLID INGREDIENTS

George C. von Alfthan, Espoo, and Jorma T. Helanniemi, Helsinki, both of Finland, assignors to Outokumpu Oy, Helsinki, Finland

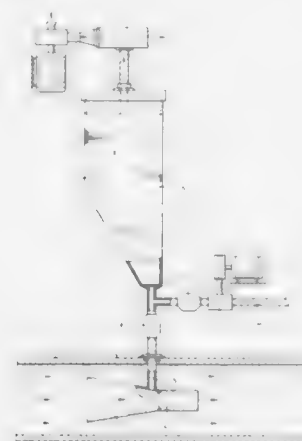
Filed Apr. 21, 1988, Ser. No. 184,408

Claims priority, application Finland, Apr. 23, 1987, 871781

Int. Cl.⁴ G01N 1/14

U.S. Cl. 73—863.83

9 Claims



1. An apparatus for drawing a sample from a flow of slurry material, comprising:

a sampling member defining a passage having a first end and a second end, the sampling member being adapted to be placed with the first and second ends of the passage both in direct open communication with the flow of slurry and the first end upstream of the second end,
a flow control device having a first state in which it permits flow of slurry through the passage and a second state in which it prevents such flow, and
suction means coupled to the passage defined by the sampling member at a location between the flow control

device and the first end of the passage, for extracting slurry material from the passage when the flow control device is in its second state.

9. An apparatus for conducting a slurry material from a first location to a second location, comprising:
a duct through which the slurry material flows from the first location to the second location,
a sampling member defining a passage having a first end and a second end, the first and second ends of the passage being in direct open communication with the interior space of the duct at locations spaced apart along the duct, whereby slurry material flowing from the first location to the second location may enter the passage at the first end thereof and leave the passage at the second end thereof,
a flow control device located inside the duct and having a first condition in which it permits flow of slurry material through the passage and a second condition in which it prevents flow of slurry material through the passage,
a sampling conduit connected to the sampling member at a location between the flow control device and the first end of the sampling member, and
suction means connected to the sampling conduit for drawing slurry material from the passage.

4,876,903

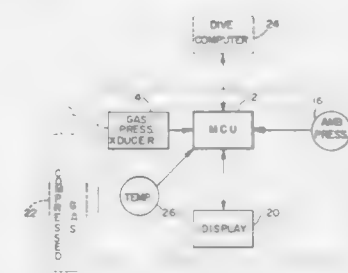
METHOD AND APPARATUS FOR DETERMINATION AND DISPLAY OF CRITICAL GAS SUPPLY INFORMATION

William D. Budinger, 16 Southridge Dr., Kennett Square, Pa. 19348

Continuation-in-part of Ser. No. 142,370, Jan. 11, 1988, abandoned. This application Mar. 21, 1988, Ser. No. 169,651
Int. Cl.⁴ G06F 15/42

U.S. Cl. 73—865.1

2 Claims



1. A portable diving apparatus for continuously displaying, during a dive, the amount of time that a known amount of pressurized breathable gas can be consumed at a known rate from a fixed volume container if a user changes from a present ambient pressure during a dive to some other ambient pressure comprising:

means for determining a current ambient pressure of the user;
means for determining the amount of breathable gas in the container;
means for determining the present consumption rate of gas by the user at the current ambient pressure;
means for determining the maximum time (Adjusted Remaining Air Time) that the remaining supply of gas will sustain the present consumption rate of the gas by the user at the present ambient pressure and for each of a plurality of ambient pressures other than the present ambient pressure, and allowing for any predetermined reserve; and
display means, including a two-dimensional pictorial display showing variations in depth along one axis and increments of time on the other axis for simultaneously, graphically displaying to the user representations of the current ambient pressure, the other ambient pressures and the associ-

ated Adjusted Remaining Air Time for the current ambient pressure and for each of the other ambient pressures.

2. A portable diving apparatus for continuously displaying during a dive the amount of time that a known amount of pressurized breathable gas can be consumed at a known rate from a fixed volume container if a user changes from a present ambient pressure during a dive to surface pressure, comprising:

- means for determining a current ambient pressure of the user associated with the current depth of the user;
- means for determining the amount of breathable gas in the container;
- means for determining the present consumption rate of gas by the user at the current ambient pressure;
- means for determining the amount of breathable gas which will be consumed by the user in ascending to the surface from a plurality of selected depths;
- means for determining the maximum time (Adjusted Remaining Air Time) that the remaining supply of gas will sustain the present consumption rate of the gas by the user at the present ambient pressure and allowing for any predetermined reserve and for determining the maximum rate (Safe Air Limit) that the remaining amount of breathable gas will allow the user to remain at the current depth and at each of the plurality of selected depths and then ascend to the surface without consuming the predetermined gas reserve; and
- display means for displaying to the user a representation of the time in the future at which the user must begin to ascend to the surface to avoid having the present and projected consumption of a breathable gas from the fixed volume container cause the gas supply to fall below predetermined safety limits, the display means including a two dimensional pictorial display showing variations in depth along one axis and increments of time on the other axis for simultaneously, graphically displaying to the user representations of the current ambient pressure, the associated Adjusted Remaining Air Time for the current ambient pressure and the Safe Air Limit Times for the current depth and for each of the plurality of selected depths.

4,876,904

METHOD AND AUTOMATIC DEVICE FOR MEASURING THE CONTENT OF A SOLUBLE COMPONENT IN A POWDERY PRODUCT

Bernard Limon, Ceyzeriat, France, assignor to Hasler Freres International S.A., Switzerland

PCT No. PCT/CH86/00097, § 371 Date Apr. 16, 1987, § 102(e) Date Apr. 16, 1987, PCT Pub. No. WO87/00636, PCT Pub. Date Jan. 29, 1987

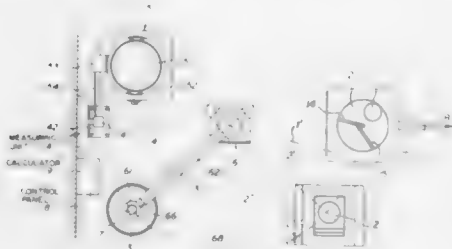
PCT Filed Jul. 14, 1986, Ser. No. 44,845

Claims priority, application France, Jul. 16, 1985, 85 10987

Int. Cl.⁴ G01N 33/38, 27/00, 5/00

U.S. Cl. 73—866

9 Claims



1. An automatic method of determining the quantity of a soluble component in a powdery product comprising the steps of:

- providing a sample receiving container;
- weighing said sample receiving container;
- computing the weight of a predetermined quantity of a solvent for said soluble component and introducing said

- predetermined quantity of solvent into said sample receiving container;
- introducing a predetermined quantity of said powdery product into said sample receiving container including said computed weight of said solvent;
- weighing said solvent receiving container with said predetermined quantity of said powdery product and said solvent therein;
- computing the weight of said predetermined quantity of said powdery product;
- computing the weight ratio of said predetermined quantity of said powdery product to said predetermined quantity of said solvent;
- agitating said predetermined quantity of said powdery product and said predetermined quantity of said solvent within said sample receiving container so as to create a solution of said soluble component in said powdery product;
- determining an electrical characteristic of said solution of said soluble component in said powdery product; and
- correcting said electrical characteristic of said solution as a function of said weight ratio of said predetermined quantity of said powdery product to said predetermined quantity of said solvent.

4,876,905

POSITIONING ARRANGEMENT FOR A MEASURING-VALUE SENSOR

Georg H. Callisen, and George U. P. Kindler, both of Hamburg, Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 25, 1988, Ser. No. 224,083

Claims priority, application Fed. Rep. of Germany, Jul. 28, 1987, 3724897

Int. Cl.⁴ G01B 7/14

U.S. Cl. 73—866.5

8 Claims



1. A positioning arrangement for a sensor, comprising:
 - a housing, said housing comprising a base part and a cover part for connection to said base part for enclosing a space therebetween, said base part having a bore therethrough defining an axis of said arrangement;
 - an elongate guide tube having a first end disposed in the interior space of said housing and extending through said bore to a second end external to said housing, said second end being adapted for receiving a sensor, and said guide tube being complementary in shape to said bore for being slidably received therein;
 - guide means for preventing rotation of said guide tube during axial translation of said guide tube through said bore;
 - a tubular adjustment screw disposed within said housing for translating said guide tube in said bore and axially positioning said guide tube with respect to said housing;
 - holding means within said housing for rotatably supporting

said adjustment screw and fixing said tubular adjustment screw in the axial direction; and

an electrical connection cable extending from said second end of said guide tube through said tubular adjustment screw and having an end portion secured within said housing, said tubular adjustment screw having an internal diameter such that said electrical connection cable extends therethrough with a clearance fit and is not rotated by rotation of said adjustment screw,

said adjustment screw and said first end of said guide tube having threaded portions in threading engagement such that rotation of said adjustment screw in a first direction of rotation advances said guide tube away from said housing and rotation of said adjustment screw in the opposite direction of rotation advances said guide tube towards said housing,

during rotation of said adjustment screw said guide tube being guided by said guide means and advancing without rotation, and

said threaded portions of said guide tube and adjustment screw having a length chosen such that said guide tube has a predetermined range of axial travel.

4,876,906

NON-JAMMING ACTUATOR SYSTEM

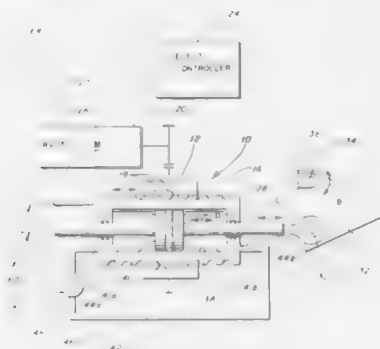
Teddy L. Jones, Cherry Valley, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Nov. 20, 1986, Ser. No. 932,878

Int. Cl.⁴ B64C 13/42

U.S. Cl. 74—89.15

9 Claims



1. A non-jamming actuator system, comprising:
 - a ballscrew assembly including a rotatable nut and an axially movable ballscrew, said ballscrew having means thereon for cooperating with the nut and for producing axial movement of the ballscrew upon the nut being rotated, the ballscrew comprising a cylinder of a double-acting piston and cylinder device;
 - drive means for rotating the nut;
 - axially moveable actuator means operatively associated with a load to be actuated, the actuator means being coupled to a piston within a chamber defined by said cylinder, at least part of said cooperating means on said ballscrew axially overlapping said cylinder chamber; and
 - a closed hydraulic circuit, including selectively operable valve means, communicating with the cylinder on opposite sides of the piston, whereby a closed condition of the valve means traps fluid in the circuit to effect movement of the actuator means in response to movement of the ballscrew and an open condition of the valve means allows fluid flow in the circuit in the event of failure or jamming of the ballscrew assembly to allow reaction movement of the actuator means in response to load forces.

4,876,907

MOTOR VEHICLE GEARBOX

Lars Andersson, Västra Frölunda, and Sven Andersson, Floda, both of Sweden, assignors to AB Volvo, Gothenburg, Sweden

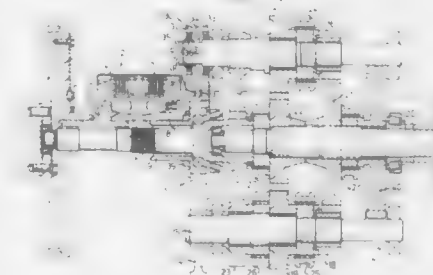
Filed Feb. 16, 1988, Ser. No. 156,142

Claims priority, application Sweden, Feb. 13, 1987, 8700583

Int. Cl.⁴ F16H 3/38

U.S. Cl. 74—331

6 Claims



1. A motor vehicle gearbox, comprising first and second concentrically mounted input shafts, said input shafts arranged to be driven alternately such that one said input shaft comprises a temporarily non-driven input shaft, an output shaft, and first and second countershafts driven by said first and second input shafts, respectively, said countershafts having gear wheels in engagement with gear wheels on said output shaft, at least one of the gear wheels on each countershaft being rotatably mounted thereon and being lockable by means of engaging means to said countershaft, and each input shaft being in driving engagement with a corresponding countershaft, said first and second countershafts being coordinated with synchronizing means shiftable independently of said engaging means, by means of which synchronizing means each countershaft, which is drivingly coupled to said respective temporarily non-driven input shaft, can be accelerated up to a rotational speed determined by a gear speed selected.

4,876,908

TRANSMISSION WITH PLURAL TORQUE TRANSMISSION PATHS

Eric A. Pengilly, 17 Wellington Court, Knightsbridge, London SW1, United Kingdom

Filed Apr. 30, 1987, Ser. No. 44,269

Claims priority, application United Kingdom, May 2, 1986, 8610756

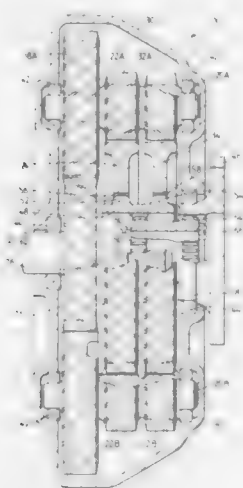
Int. Cl.⁴ F16H 57/12

U.S. Cl. 74—410

19 Claims

1. A transmission comprising input and output rotatable members between which torque is to be transmitted, a first single-helical gear rotatable with one of said members, a plurality of further helical gears meshed with said first gear, coupling means for coupling said further gears with the other said member, and mounting means for said first gear arranged to permit the axis of said first gear to pivot about a radial axis under the action of reaction forces arising under load so that torque can

be transmitted between the members through each of said further helical gears, characterized in that the mounting means



is arranged also to permit the first gear axis to move in a radial direction independently of the pivoting of the first gear.

4,876,909

VEHICLE DOOR LOCKING SYSTEM

Marcel Andrei-Alexandru, Bietigheim-Bissingen; Heiner Bayha, Sersheim; Rainer Bruhn, and Iris Maier, both of Bietigheim-Bissingen, all of Fed. Rep. of Germany, assignors to SWF Auto-Electric GmbH, Bietigheim-Bissingen, Fed. Rep. of Germany

PCT No. PCT/EP87/00424, § 371 Date Apr. 14, 1988, § 102(e) Date Apr. 14, 1988, PCT Pub. No. WO88/01334, PCT Pub. Date Feb. 25, 1988

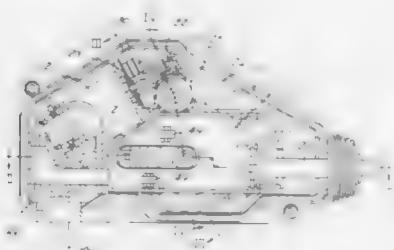
PCT Filed Aug. 1, 1987, Ser. No. 208,357

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1987, 3627893

Int. Cl.⁴ E05B 65/12, 47/00

U.S. Cl. 74—411.5

5 Claims



1. In a vehicle door locking device including a housing, an elongate lock actuating slide mounted for longitudinal reciprocatory movement along a fixed path within said housing between a locked position and an unlocked position, manually operable means for shifting said slide between said locked and unlocked position, crank means mounted in said housing at one side of said slide for rotation about a fixed axis normal to said fixed path and having a relatively small diameter pin means projecting toward said slide at fixed radial distance from said axis, a pair of stop members longitudinally and transversely offset from each other fixedly mounted on and projecting from said slide member into the path of rotation of said pin means about said axis, the longitudinal spacing of said stop means being less than the radial distance between said axis and said pin means and the transverse offset between said stop means being greater than the diameter of said pin means, unidirectional

rotary drive means operable to drive said crank means about said axis between first and second parked positions 180° apart from each other wherein said slide may be manually shifted between said locked and unlocked positions without interference between said pin means and said stop means, said pin means being engageable with one of said stop means during rotation of said crank means between said parked positions to shift said slide between its locked and unlocked positions; the improvement wherein said drive means comprises a rotary member coupled to said crank means; brake means engageable with said rotary member to apply a predetermined braking force resisting rotation of said rotary member, and brake actuating means for applying said brake means when said crank means is within a predetermined rotative displacement from either of said parked positions and for releasing said brake means at all other rotary portions of said crank means.

4,876,910

TILTING STEERING APPARATUS

Masumi Nishikawa, Toyooka, and Masanobu Ishikawa, Nagoya, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Japan

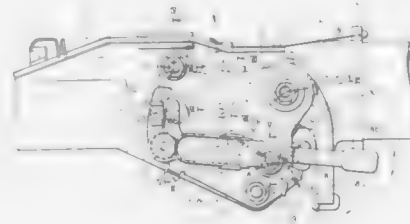
Filed Mar. 17, 1988, Ser. No. 169,508

Claims priority, application Japan, Mar. 20, 1987, 62-63975; Mar. 23, 1987, 62-65583

Int. Cl.⁴ B62D 1/18

U.S. Cl. 74—493

6 Claims



1. A tilting steering apparatus for a vehicle, which comprises:

- a fixed bracket secured to a chassis of the vehicle;
- a movable bracket pivotally supported on said fixed bracket;
- a ratchet provided on said movable bracket and having terminal ratchet teeth;
- a pawl having pawl teeth meshing with the terminal ratchet teeth and constraining the ratchet position;
- a tilt operation lever causing the pawl teeth and the terminal ratchet teeth to be meshed and unmeshed with each other; means for biasing said movable bracket to a lifted position with respect to said fixed bracket;
- a main lever rotatably supported by a first pin about which said movable bracket is turned, said main lever pivotally supporting the pawl;
- a second pin secured to said fixed bracket so as to abut against the other end of said main lever to inhibit turning of said main lever in one direction;
- a hook lever supported by said fixed bracket so as to clamp said main lever in the inhibit position in cooperation with said second pin;
- a lifted position locking means provided on said fixed bracket for engaging and locking at a lifted position a projection provided on said ratchet;
- a lift operating lever pivotally mounted on said fixed bracket and adapted to unclamp said main lever by the turning of said hook lever; and
- a return lever pivotally supported on said fixed bracket for disengaging the lifted position lock means and said projection of said ratchet member from each other.

4,876,911

REMOTELY CONTROLLED MIRROR DEVICE OF WIRE TYPE

Kenji Kurihara, Yamato, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Continuation of Ser. No. 943,758, Dec. 19, 1986, abandoned.

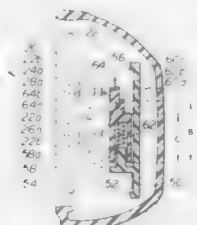
This application Aug. 17, 1988, Ser. No. 232,945

Claims priority, application Japan, Dec. 30, 1985, 60-204066[U]

Int. Cl.⁴ F16C 1/10

U.S. Cl. 74—502.1

11 Claims



1. A mirror device remotely controlled by a control device, comprising:

- a mirror housing;
- a mirror unit pivotally disposed in said mirror housing;
- a plurality of wire assemblies each including a wire and a shield tube in which said wire is longitudinally slidable, each wire assembly extending between said mirror unit and said control device so that said mirror unit and said control device so that said mirror unit is pivotally movable in response to manipulation of said control device;
- a wire guide member mounted in said mirror housing, said wire guide member having a base portion resiliently mounted on a stud portion, said base portion having a plurality of stepped curved surfaces which said wire assemblies slidably contact respectively; and
- resilient means for resiliently urging said base portion in a direction away from said stud portion to cause said curved surfaces of said wire guide member to simultaneously press said wire assemblies and thereby apply tension to said wire assemblies, said curved surfaces being so stepped and constructed having different radii of curvature as to apply said wire assemblies with substantially equal tension.

4,876,912

SWITCHING MECHANISM FOR DRIVING SELF-PROPELLING AGRICULTURAL MACHINES

Franz Stein, Harzewinkel, Fed. Rep. of Germany, assignor to Claas Ohg, Harzewinkel, Fed. Rep. of Germany

Filed Oct. 13, 1988, Ser. No. 257,965

Claims priority, application Fed. Rep. of Germany, Oct. 13, 1987, 3734554

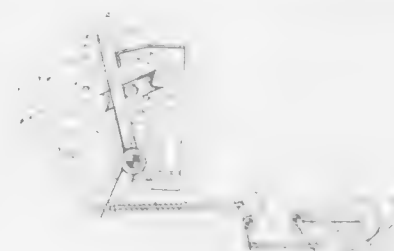
Int. Cl.⁴ G05G 5/06

U.S. Cl. 74—535

4 Claims

1. A switching mechanism for driving a self-propelling agricultural machine, particularly a harvester thresher, comprising a switching lever supported rotatably around a pivot point against a spring force; a pawl associated with said switching lever and operative for securing the latter in its switching-on position, said pawl being rotatably connected with said switching lever and having two notches spaced by equal distances from said pivot point; four stationary pins associated with said switching lever for controlling a rotary position of said pawl during a manual displacement of said switching lever alternat-

ingly in one of two switching positions; and abutments each associated with a respective one of the switching positions and



holding said switching lever by means of the spring force in a selected switching position.

4,876,913

GEAR SELECTOR FOR BICYCLE SPEED GEARS

Antonio Romano, Padua, Italy, assignor to Campagnolo S.p.A., Vicenza, Italy

Filed Aug. 20, 1987, Ser. No. 87,389

Claims priority, application Italy, Sep. 9, 1986, 21647 A/86; Feb. 11, 1987, 19346 A/87

Int. Cl.⁴ G05G 5/06

U.S. Cl. 74—535

4 Claims



1. A gear selector for controlling speed gears with a spring-loaded derailleur for sport and racing bicycles, said gear selector comprising

- an operating lever mounted rotatably on a pivot;
- a snap-action mechanism controlling a plurality of positions of said lever which positions correspond to a like number of positions of correct alignment of the speed gear with which various sprockets of a free wheel correspond; means for activating and deactivating said snap-action mechanism on command;
- said snap-action mechanism comprising a removable toothed ring mounted coaxially to said gear selector lever on a bush locked against rotation;
- pawl means for engaging said toothed ring in diametrically opposed positions, said pawl means comprising an integral portion of spring means which urges said pawl means into engagement with said toothed ring; and
- said means for activating and deactivating said snap-action mechanism comprising a clutch ring by which said toothed ring can be made rigid with or free to rotate about said bush.

4,876,914

PARKING-BRAKE OPERATING DEVICE

Kimio Kanno, Toyota, Japan, assignor to Toyota Iron Works Co., Ltd., Japan

Filed May 26, 1988, Ser. No. 199,146

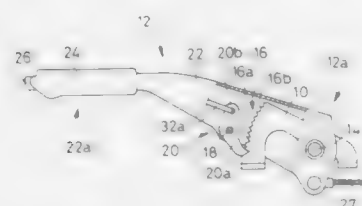
Int. Cl.⁴ G05G 1/10

U.S. Cl. 74—538

4 Claims

1. A parking-brake operating device for selectively placing a

parking brake in an operative and an inoperative position thereof, the device including (a) an operating lever which is selectively placed in a first and a second position thereof to place said parking brake in said operative and inoperative positions, respectively, said lever being disposed pivotably about a first pivot axis and connected to said parking brake through a brake cable, said lever including a free end portion having a free end, said portion having a longitudinal hole which is formed along a longitudinal axis of the lever and is open in said free end; (b) a stationary sector having a plurality of teeth; (c) a pawl supported by said lever pivotably about a second pivot axis parallel to said first pivot axis, said pawl having a first and a second arm; (d) a knob having a first and a second end, and fitted, over an axial part thereof having said first end, in said longitudinal hole of said lever such that said knob is retractable inward upon operation thereof on said second end, said axial part having an axial recess which is formed therein and is open in said first end and a lateral surface adjacent to said first end, said knob having at said first end a stopper protruding radially inward from an inner wall surface thereof defining said axial recess; (e) a release rod having a first and second end, said second arm of said pawl being connected to said first end, said rod including a head having said second end, said head being fitted in said axial recess of said knob such that said head is engageable with said stopper; (f) a first spring possessing a first biasing force for permitting said pawl to be pivoted about said second pivot axis in a first direction to cause said first arm of the pawl to be engaged with said plurality of teeth of said sector; and (g) a second spring fitted in said axial



recess of said knob and possessing a second biasing force for permitting said head of said rod to be engaged with said stopper of the knob, said second biasing force being determined such that, upon retraction of said knob when said lever is held in said second position, said second spring causes said rod to be moved relative to said lever with said head engaged with said stopper, whereby said pawl is pivoted in a second direction opposite to said first direction and said first arm of the pawl is released from the engagement with said sector, and that, upon retraction of said knob when the lever is held in said first position, said second spring permits said knob to be moved relative to said rod, while said second biasing force is overcome by pivot resistance associated with the forced engagement between said pawl and said sector due to a tension force of said brake cable, whereby said rod is not moved relative to said lever and said pawl is not released from said forced engagement with said sector,

the parking-brake operating device comprising the improvements that:

said knob has cylindrical shape and is fitted in said longitudinal hole of said operating lever, said head of said release rod having a pair of opposite side surfaces, said inner wall surface of said knob including a pair of opposed wall surfaces, and said head is fitted in said axial recess of the knob such that said pair of opposite side surfaces of said head are fitly engaged with said pair of opposed wall surfaces of said inner wall surface, respectively, whereby said knob is not rotatable about said longitudinal axis of said longitudinal hole.

4,876,915

STEERING WHEEL

Yasuaki Iuchi, Aichi, Japan, assignor to Toyota Gosei Co., Ltd., Nishikasugai, Japan

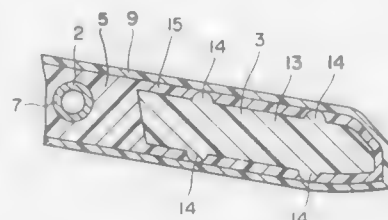
Continuation of Ser. No. 60,614, Jun. 11, 1987, abandoned. This application Mar. 28, 1989, Ser. No. 331,045

Claims priority, application Japan, Aug. 28, 1986, 61-204949; Aug. 29, 1986, 61-122610[U]

Int. Cl.⁴ B62D 1/04; B28B 9/00

U.S. Cl. 74—552

5 Claims



1. A steering wheel intermediate product including a part on which a thick covering material is molded, comprising:

a core metal;

at least one resinous insert, each said insert having positioning protrusions defined on both top and bottom surfaces thereof; and

first means for covering said core metal and said at least one resinous insert which is injection molded into a die containing said core metal and said at least one resinous insert so as to define therewith the steering wheel intermediate product, a position of the at least one resinous insert which is spaced apart and separated from the core metal being defined in the die while the protrusions of the resinous insert contact the die, the height of said positioning protrusions being substantially equal to or less than a thickness of said first covering means.

4,876,916

CAST SHAFTS, PARTICULARLY CAMSHAFTS

Konrad Maier, Romanshorn, Switzerland, assignor to Von Roll, AG, Gerlafingen, Switzerland

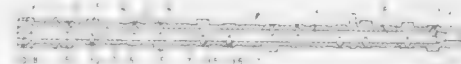
Filed Dec. 9, 1987, Ser. No. 130,413

Claims priority, application Switzerland, Dec. 18, 1986, 86043/86

Int. Cl.⁴ F16H 53/00

U.S. Cl. 74—567

10 Claims



1. An elongated generally cylindrical iron shaft having a longitudinal axis and a centrally disposed longitudinal channel extending completely therethrough along the axis, the shaft further having a plurality of transverse channels extending outwardly from the longitudinal channel completely through the shaft to the outside thereof and communicating with the longitudinal channel, each transverse channel having the shape of a nozzle and being wider at said longitudinal channel than at outside openings thereof, the outside openings of the transverse channels being spaced apart and disposed along a helical path on an outer surface of the shaft, the helix having an axis coincident with the longitudinal axis, said shaft together with said longitudinal channel and said transverse channels being cast as a single piece.

4,876,917

TORQUE VARIATION ABSORBING DEVICE

Shigetaka Aiki, Kariya; Kiyomori Kobayashi, Chiryu, and Satoshi Kato, Anjo, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya and Toyota Jidosha Kabushiki Kaisha, Toyota, both of Japan

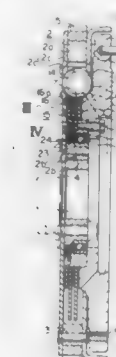
Continuation of Ser. No. 25,631, Mar. 13, 1987, abandoned, which is a continuation of Ser. No. 755,899, Jul. 17, 1985, abandoned. This application Jul. 29, 1988, Ser. No. 227,445

Claims priority, application Japan, Jul. 19, 1984, 59-108288[U]; Jul. 19, 1984, 59-108289[U]; Jul. 19, 1984, 59-108290[U]

Int. Cl.⁴ F16D 3/14; F16F 15/10

U.S. Cl. 74—574

13 Claims



1. A torque variation absorbing device comprising:
a driving plate coupled to an engine crankshaft;
a flywheel, which is connectable to a power train, arranged coaxial with said driving plate and rotatably supported via a bearing on said driving plate, said flywheel comprising a flywheel body extending in a radial direction of said flywheel so as to be opposed to said driving plate in an axial direction of said flywheel and to be provided substantially parallel to said driving plate; and
a spring mechanism, a torque limiting mechanism and a hysteresis mechanism interposed between said driving plate and said flywheel, said spring mechanism extending in a circumferential direction of said driving plate and flywheel, said torque limiting mechanism being adjusted so as to slip only when an excessively large torque acts on said torque limiting mechanism and being located radially inside of said spring mechanism, and said hysteresis mechanism being provided so as to produce a friction force when relative rotation occurs between said driving plate and said flywheel, said spring mechanism and said torque limiting mechanism being arranged in series with each other and between said driving plate and said flywheel as a vibration damping system, said hysteresis mechanism being arranged in parallel to the series arrangement of said spring mechanism and said torque limiting mechanism.

4,876,918

HIGH SPEED DIFFERENTIAL UNIT

John L. Hudson, Rte. 1, Florence, S.C. 29501

Filed Jul. 11, 1988, Ser. No. 217,615

Int. Cl.⁴ F16D 41/06; F16H 35/04

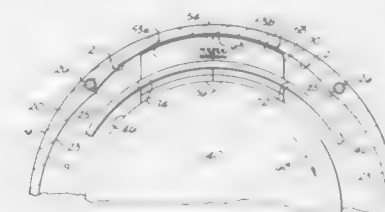
U.S. Cl. 74—650

13 Claims

1. A drive arrangement for differentially powering a pair of drive axles, said drive arrangement comprising:
rotatably drivable housing means, adapted for receiving rotating drive power applied thereto for driven rotation of said housing means, and for rotatably receiving at least one end of each respective drive axle, said housing means being generally annular in nature, with an inside diameter defining relatively inwardly-projecting engagement areas;
a pair of drive plates, rotatably received within said housing

means, and respectively associated therein with the drive axle ends for rotation therewith, said drive plates being longitudinally displaced with respect to one another; and carriage means, comprising an integral annular member disposed respectively between said housing means and each of said drive plates, for supporting thereon at least one pair of engagement means, said pair of engagement means being longitudinally displaced so as to correspond respectively with said longitudinally displaced drive plates, for transferring rotating drive power from said housing means to their corresponding drive plate upon respective contact with said housing means engagement areas; wherein

one of said drive plates may receive drive power transferred thereto via its corresponding engagement means for rotation with said housing means, while the other of said drive plates is rotated by its corresponding drive axle at a rate faster than that of said housing means;



said carriage means annular member includes a plurality of circumferential slots defined through the circumference thereof for receiving therein said engagement means in respective of such slots;

said pair of engagement means each comprise a pair of curved wedge members journaled respectively in one of said slots for limited circumferential movement therein, joined together with a spring; and

said wedge members have a concave surface forming a curvature adapted for concentric mating and frictional engagement with the outside diameter of its respective drive plate, and further have a convex surface forming a curvature adapted for interfering engagement with said housing means inwardly-projecting engagement areas, whereby rotating drive power applied to said housing means may be transmitted to a respective drive plate via simultaneous interfering engagement by one of its corresponding wedge members with an engagement area and frictional engagement of such one wedge member with such respective drive plate.

4,876,919

POWER TRANSFER DEVICE FOR FOUR-WHEEL DRIVE

Shuji Nagano, and Masaki Inui, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Jul. 25, 1988, Ser. No. 223,384

Claims priority, application Japan, Jul. 24, 1987, 62-186118

Int. Cl.⁴ F16H 35/04; B60K 17/354, 17/352

U.S. Cl. 74—650

4 Claims

1. A power transfer device adapted for use in combination with a power transmission for an automotive vehicle, comprising:

a housing;
a first shaft rotatably mounted within said housing and having an input end for drive connection to an output shaft of said power transmission and an output end for drive connection to a first set of road wheels;
a second shaft rotatably mounted within said housing in parallel with said first shaft and having an output end for drive connection to a second set of road wheels;
a drive member rotatably mounted on said first shaft;
a driven member mounted on said second shaft for rotation

therewith and being drivably connected to said drive member;

- a limited-slip differential in the form of a viscous clutch coupling including an outer casing mounted on said first shaft for rotating therewith, an inner sleeve coupled with said outer casing in a liquid-tight manner for defining a viscous fluid chamber and for relative rotation thereto and being rotatably mounted on said first shaft, a first set of viscous coupling plates splined to an internally splined



portion of said outer casing, and a second set of viscous coupling plates splined to an externally splined portion of said inner sleeve and being interleaved with said first set of coupling plates; and

- a clutch sleeve axially movably mounted on a hub portion of said drive member for rotation therewith and shiftable between a first position where it is retained to engage both said outer casing and inner sleeve of said clutch coupling and a second position where it is retained to engage only said inner sleeve of said clutch coupling.

4,876,920

DUAL RANGE INFINITELY VARIABLE TRANSMISSION
Peter Eichenberger, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Jul. 7, 1988, Ser. No. 216,065

Int. Cl.⁴ F16H 37/00

U.S. Cl. 74—689

4 Claims



1. In a transaxle assembly comprising an infinitely variably belt and sheave assembly having driving sheave portions and driven sheave portions, a housing assembly enclosing said sheave portions;

- a torque input shaft coaxially disposed with respect to the

driving sheave portions, means for drivably connecting the driving sheave portions and said input shaft;

- a secondary shaft having an axis in spaced parallel relationship with respect to said torque input shaft, said driven sheave portions being mounted for rotation on the axis of said secondary shaft;

- a flexible drive member drivably connected to said input sheave portions and said output sheave portions, said flexible drive member engaging said input and output sheave portions at an effective pitch diameter for each sheave portion;

fluid pressure servo means for adjustably positioning said sheave portions to effect variations in the effective pitch diameters of said driving sheave portions and said driven sheave portions;

- a countershaft mounted in spaced parallel disposition with respect to said secondary shaft, a bearing assembly means for journalling said countershaft in said housing assembly, a high speed range gear train and low speed range gear train connecting said secondary shaft with said countershaft;

fluid pressure operated clutch means for activating and deactivating selectively said high speed range gear train and said low speed range gear train;

planetary forward and reverse gear means disposed concentrically with respect to said countershaft including clutch means for establishing a one-to-one driving relationship through said planetary gear means and a brake for establishing a reverse drive ratio;

said countershaft being disposed relative to said secondary shaft so that said low speed range gear train is disposed between said driven sheave portions and said fluid pressure operated clutch means and in proximity to said secondary shaft adjacent said driven sheave portions whereby the center distance between said secondary shaft and said countershaft and the dimensions of said transaxle measured in the direction of said axis are reduced.

4,876,921

DIFFERENTIAL GEAR UNIT WITH LIMITED SLIP MECHANISM

Yasuyoshi Yasui, and Hitoshi Azuma, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

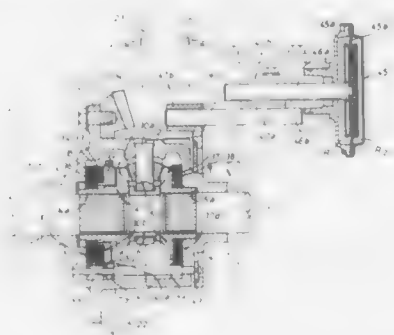
Filed Jan. 13, 1988, Ser. No. 143,486

Claims priority, application Japan, Jan. 13, 1987, 62-4176[U]

Int. Cl.⁴ F16H 1/44

U.S. Cl. 74—710.5

8 Claims



1. A differential gear unit provided with a limited slip mechanism which comprises:

- a first annular cam element integral with one side gear of the gear unit,

- a second annular cam element axially slidably and rotatably mounted on a hub portion of said side gear and being engaged with said first annular cam element to be axially

displaced by its cam action when rotated relatively to said first annular cam element, and

- a friction clutch mechanism including a first set of clutch discs slidably mounted on the hub portion of said side gear for rotation herewith and a second set of clutch discs axially slidably carried by a differential case of the gear unit for rotation therewith and being interposed between the first set of clutch discs for frictional engagement therewith,

wherein a clutch ring is axially slidably mounted within said differential case in surrounding relationship with said second annular cam element, said clutch ring being formed at an inner periphery thereof with a conical surface for frictional engagement with a corresponding conical surface formed on an outer periphery of said second cam element.

wherein a shift mechanism is operatively connected to said clutch ring to shift said clutch ring between a disengaged position where it is disengaged from said second annular cam element and an engaged position where it is engaged with said second annular cam element to effect relative rotation between said cam elements,

wherein said clutch ring is carried by a plurality of circumferentially equally spaced slide rods which are axially slidably mounted within said differential case, and wherein said shift mechanism includes an axially movable shift rod arranged in parallel with said slide rods and operatively connected to said slide rods, and an actuator operatively connected to one end of said shift rod to be activated under control of a driver.

4,876,922

STEPLESS SPEED-CHANGE POWER TRANSMISSION FOR VEHICLE

Masahiko Koshimo, Osaka, Japan, assignor to Kabushiki Kaisha Daikin Seisakusho, Osaka, Japan

Division of Ser. No. 826,037, Feb. 24, 1986, Pat. No. 4,765,200.

This application May 26, 1988, Ser. No. 200,147

Claims priority, application Japan, Feb. 5, 1985, 60-20380

Int. Cl.⁴ F16H 47/06, 45/02

U.S. Cl. 74—731

2 Claims



1. A stepless speed-change power transmission for a vehicle having a fluid coupling, a drive plate for transmitting drive power from an engine to said fluid coupling, a forward/backward change-over mechanism coupled to a rear stage of said fluid coupling, and a stepless speed changer coupled to a rear stage of said forward-backward change-over mechanism, wherein said fluid comprises:

- an external shell element (26);

- a turbine wheel (52) interconnected through a turbine hub (58) to an output shaft (28);

- a pump wheel (50) including a pump shell (51b) having an end face (93a) facing an inner surface of said external shell element (26) of the fluid coupling connected to said drive

plate, an inner peripheral portion formed into a cylindrical shape fitting onto an outer peripheral surface of the turbine hub (58) and slidable axially thereon, an outer peripheral portion formed into a cylindrical shape surrounding said turbine wheel (52), and a facing (55e) secured to the end face (93a) forming a clutch element therewith respect to said external shell element (26) inner surface; said pump wheel (50) forming a first working oil chamber (57a) therewith and a second working oil chamber (51f) between said end face (93a) and said external shell element (26) whereby oil pumped into said first and second chambers acts upon said pump wheel as a piston to respectively bring said clutch element into and out of contact with said external shell element; and

a centrifugal lock-up clutch (56) fixed to said turbine wheel (52) within said surrounding outer peripheral portion of said pump wheel (50) so as to engage an inner surface of said outer peripheral portion to lock said pump wheel to said turbine wheel.

4,876,923

TORQUE CONVERTER LOCKUP CLUTCH CONTROL FOR AN AUTOMATIC TRANSMISSION

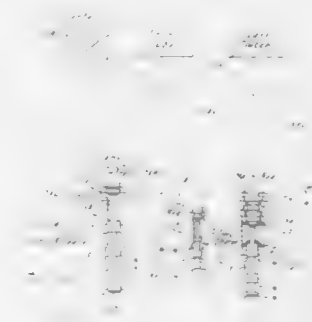
Scott R. Crandall, Wixom; Timothy A. Droste, Howell, and Stanley D. Rosen, Southfield, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jul. 11, 1988, Ser. No. 217,723

Int. Cl.⁴ F16H 47/00; F16D 33/00, 35/00, 37/00

U.S. Cl. 74—732

9 Claims



1. A converter lockup clutch system controlling an automatic transmission torque converter having an impeller adapted for driveable connection to an engine and a turbine hydrokinetically driveable connected to the impeller, comprising:

- a torque converter clutch for alternately locking and releasing the impeller and turbine, having a first passage carrying converter release pressure to unlock the clutch and a second passage carrying apply pressure to lock the clutch;

a source of line pressure; manual valve means for connecting the source of line pressure to an outlet when a low gear ratio is selected manually by a vehicle operator;

first control means for producing first control pressure states representing commands to release and to apply the torque converter; and

a converter clutch control valve means communicating with the outlet, the first control means and the source of line pressure when the first control means produces the converter release pressure state, for connecting the second passage to the source of line pressure when the first con-

trol means produces the converter apply pressure state, and for connecting the first passage to the source of line pressure when said low gear ratio is selected regardless of the pressure state produced by the first control means.

4,876,924

EXTENDED RANGE SPLITTER TYPE COMPOUND TRANSMISSION

Melvina W. Fletcher, Manchester, and David G. Wylie, Bolton, both of Great Britain, assignors to Eaton Corporation, Cleveland, Ohio

Filed Aug. 1, 1988, Ser. No. 227,031

Claims priority, application United Kingdom, Sep. 21, 1987, 8722186; Nov. 7, 1987, 8726222

Int. Cl.⁴ F16H 3/02

U.S. Cl. 74—745

10 Claims



1. An extended range compound splitter type change gear transmission (10) comprising a housing (16) defining a multiple speed main transmission section (12) connected in series with a multiple speed auxiliary transmission section (14) connected in series with a multiple speed extended range section (15) said main transmission section including a selectable lowest forward speed gear ratio and a selectable reverse speed gear ratio; said main transmission section (12) comprising an input shaft (18) having an input gear (22) rotationally fixed thereto, mainshaft (28) generally coaxial with said input shaft and extending into said auxiliary transmission section, at least one countershaft (24, 26) rotationally supported in said housing and driven by said input gear, a plurality of counter shaft gear (36, 38, 40, 42) fixed to said countershaft, a plurality of main section mainshaft gears (46, 48, 50) surrounding but not constantly engaged said mainshaft and constantly driven by said countershaft gears, and main section jaw clutch assemblies (56, 58, 60) for selectively clutching said main section mainshaft gears, one at a time, to said mainshaft;

said auxiliary transmission section (14) comprising at least one auxiliary countershaft (78, 80) rotationally supported in said housing, an intermediate shaft (200) generally coaxial with said mainshaft, said auxiliary countershaft having a plurality of auxiliary countershaft gear (84, 86, 88) fixed thereto, an output gear (112) splined to said intermediate shaft for rotational movement therewith, said output gear constantly meshed with one (88) of said auxiliary countershaft gears, at least one auxiliary mainshaft gear (108, 110) surrounding said mainshaft for rotational movement relative thereto, said auxiliary mainshaft gear constantly meshed with another (84, 86) of said auxiliary countershaft gears, auxiliary section jaw clutch assemblies (116, 118, 120) for selectively coupling said auxiliary mainshaft gear and said output gear, one at a time, to said mainshaft;

main section shifting means (72) for selectively moving said main section jaw clutch assemblies relative to said mainshaft; and

auxiliary section shifting means (144) for selectively moving said auxiliary jaw clutch assembly relative to said mainshaft, said transmission characterized by: said extended range section (15) comprising: an output shaft (74) generally coaxial with said mainshaft

and said intermediate shaft and independently rotatable relative thereto;

a range section countershaft gear (204) fixed for rotation with said auxiliary section counter shaft (78, 80);

a range section output shaft gear (202) surrounding said output shaft and independently rotatable relative thereto;

a range section clutch (206) having a first selectable position for rotationally coupling said intermediate shaft to said output shaft and allowing said range section output gear to rotate independently of said output shaft, a second selectable position allowing independent rotation of said intermediate shaft, said output shaft and said range section output shaft gear; and a third selectable position for rotationally coupling said range section output shaft gear to said output shaft and allowing independent rotation between said intermediate shaft and said output shaft; and range section shifting means (210) for selectively positioning said range section clutch in a selected one of the three selectable positions thereof.

4,876,925

HYDRAULIC CONTROL SYSTEM FOR AUTOMATIC AUTOMOTIVE TRANSMISSION

Koichi Hayasaki, Fujisawa, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

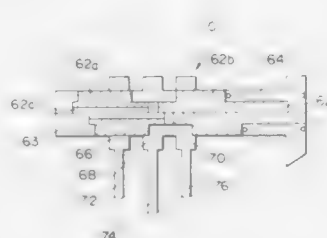
Filed Apr. 25, 1988, Ser. No. 185,437

Claims priority, application Japan, Jun. 15, 1987, 62-147140

Int. Cl.⁴ B60K 41/16

U.S. Cl. 74—868

3 Claims



1. A hydraulic control circuit for a multi-speed automatic transmission for an automotive vehicle, comprising:

a source of line pressure;

a source of throttle pressure which varies with the load on a prime mover associated with the transmission;

a source of governor pressure, said source of governor pressure being arranged to produce pressure only after the speed of the vehicle has reached a predetermined value and to thereafter produce a pressure which varies with the vehicle speed;

a shift valve, said shift valve having a first port in communication with said source of governor pressure and a second port in communication with said source of throttle pressure;

a throttle pressure adjustment valve, said throttle pressure adjustment valve being fluidly communicated with said source of line pressure and said source of throttle pressure, said throttle pressure adjustment valve being fluidly interposed between said source of throttle pressure and the second port of said shift valve, said throttle pressure adjustment valve being responsive to the throttle pressure from said source of throttle pressure being below a predetermined value and arranged to increase the level of throttle pressure supplied to the second port of said shift valve.

4,876,926

STOPPER REMOVER APPARATUS

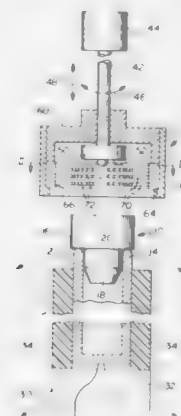
Martin F. Muszak, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 14, 1989, Ser. No. 310,159

Int. Cl.⁴ B67B 7/02

U.S. Cl. 81—3.2

4 Claims



1. In a stopper remover for automatically removing a stopper in a open end of an otherwise closed liquid container, the remover comprising first means for gripping said container against rotation, second means for gripping said stopper, and means for rotating said second means about an axis while said second means grips a stopper;

the improvement wherein said second gripping means includes engaging means for frictionally engaging a stopper while said rotating means rotates in only one direction, said engaging means comprising an annular ring and extending from the inside of said ring, a plurality of spikes terminating in ends disposed generally to form an annular surface inside of said ring constructed to engage a stopper, said spikes being mounted on said ring so as to be similarly non-radially aligned,

whereby said spikes positively grip said stopper only if said ring is rotated in said one direction, and slip off the stopper when said rotating means rotates in a direction opposite to said one direction.

4,876,927

DOOR OPENING APPARATUS AND METHOD OF USING SAME

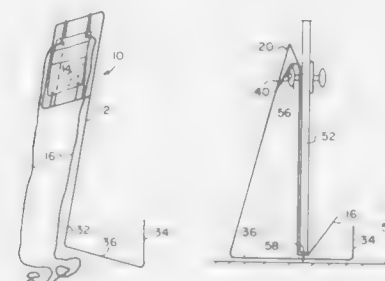
Robert S. Mullen, P.O. Box 4533, Hayward, Calif. 94544

Filed Dec. 1, 1988, Ser. No. 278,590

Int. Cl.⁴ B25B 33/00

U.S. Cl. 81—15.9

16 Claims



1. An apparatus for opening doors having a door handle, comprising:

a flexible patch having means for grasping the door handle; an elongated rigid member having a top portion defining a frame having at least three sides, the flexible patch sus-

ended within the frame and in balanced relation thereto; and means connected to the patch for unbalancing the patch on the frame and for translating linear movement of the patch into rotational movement of the door handle.

4,876,928

HAMMER HEAD HAVING REMOVABLE WEIGHT COMPONENTS

Philip E. Gaulin, HCR 1, Box 174, Palenville, N.Y. 12463-9712

Filed Jul. 1, 1988, Ser. No. 214,259

Int. Cl.⁴ B25R 15/00

U.S. Cl. 81—20

4 Claims



1. A new hammer head construction comprising:

a hammer head member having an elongated core recess portion which is centrally disposed in the body of the hammer head member; and,

a plurality of weighted core inserts which are dimensioned to be received in a nested fashion relative to one another within the core recess portion of the hammer head member; wherein, each of the plurality of weighted core inserts comprise individual core insert members; wherein, each of the core insert members have a different effective weight from the other core insert members; wherein, the core recess portion and the plurality of weighted core inserts have a generally rectangular configuration.

4,876,929

PORTABLE SCREW DRIVER HAVING FLEXIBLE EXTENSION SHAFT

Burton Kozak, 551 Clavey La., Highland Park, Ill. 60035

Filed Sep. 15, 1988, Ser. No. 244,334

Int. Cl.⁴ B25B 13/46

U.S. Cl. 81—57.43

8 Claims

1. In a cordless portable electric screwdriver having a chuck for normally holding a tool for rotary driven motion at one end thereof, the improvement comprising:

a flexible extension shaft having a first end adapted to cooperate with said chuck and a second end adapted to hold said tool for rotary driven motion, said first end of said flexible extension shaft and said chuck having complementarily shaped non-circular cross-sections, said chuck having an axis and being adapted to receive said first end of said flexible extension shaft by means of axial insertion of said shaft into said chuck with said non-circular cross-sections in rotationally aligned relationship and said chuck also including means for holding said first end of said flexible extension shaft for rotary driven motion of said shaft, said second end of said flexible extension shaft and said tool having complementarily shaped non-circular cross-sections, said second end of said flexible extension shaft including means for holding said tool for rotary driven motion thereof;

said flexible extension shaft normally being disposed so as to be substantially entirely coaxial with said chuck, said flexible extension shaft being universally deflectable relative to said axis of said chuck so as to position said second

end of said shaft and said tool at an acute angle relative to said axis of said chuck, said tool being rotary driven by said cordless portable electric screwdriver through said flexible extension shaft;

said flexible extension shaft including a plurality of concentric coil springs in tightly wound adjacent relation extending between and secured to generally cylindrical body portions at said first and second ends of said shaft to accommodate universal deflection of said shaft relative to said axis of chuck, and including a flexible sleeve disposed



about said concentric coil springs, said flexible sleeve having cylindrical fittings secured thereto at opposite ends thereof so as to define a shoulder internally of each of said fittings, said cylindrical fittings each being adapted to receive one of said cylindrical body portions therein, said cylindrical body portions being spaced apart by a distance greater than the distance between said shoulders in said cylindrical fittings to permit limited axial movement of said cylindrical body portions and said concentric coil springs relative to said cylindrical fittings and said flexible sleeve.

4,876,930

SPIN TRIMMING MACHINE WITH OBJECT POSITIONING

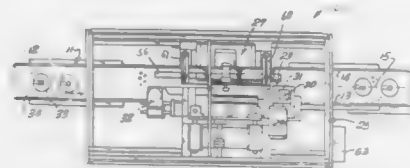
Alan J. Thatcher, 9182 E. Russel St., La Habra, Calif. 90631

Filed Jun. 13, 1988, Ser. No. 205,832

Int. Cl.⁴ B26D 3/16; B23B 3/04, 5/14

U.S. Cl. 82—46

12 Claims



1. A spin trimming machine for trimming the necks of objects that have a dome molded above the trim line of the object, which machine is capable of positioning the object being trimmed in a predetermined orientation with respect to its starting orientation, said spin trimming machine comprising:

- a frame;
- a conveyor belt held by said frame for conveying objects to be trimmed along the machine, said conveyor belt having a central axis and a first side and a second side;
- a dome-spinning belt assembly including a drive belt, a belt backup bar, and means for driving said belt along the face

of the backup bar, said belt assembly being supported by said frame with the face of the belt backup bar being parallel to said conveyor belt;

a dome backup bar having a top and a bottom and having at least one elongated groove therealong, said dome backup bar being supported by said frame so that the groove is parallel to said conveyor belt and at the same height as the face of the backup bar;

an elongated knife, and knife support clamp means for holding said knife on said frame adjacent the bottom of said dome backup bar so that the position of said elongated knife is adjustable inwardly or outwardly with respect to the dome backup bar by means during the running of said machine whereby the length that the bottle will travel along the knife before the dome is cut off from the bottle may be adjusted so that the object always drops from the dome at a predetermined number of degrees.

4,876,931

DEVICE FOR MACHINING A SEALING GROOVE ON AN ENGINE BLOCK

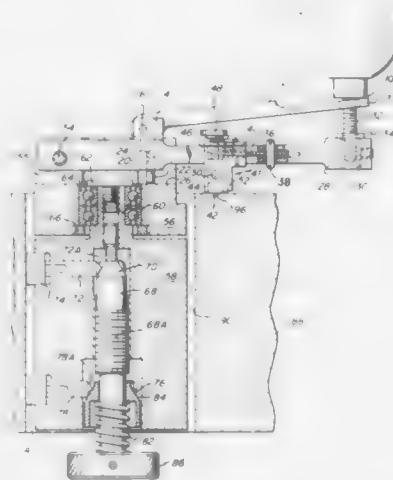
Millo Bertini, 679 Garden St., Trumbull, Conn. 06611

Filed Jul. 11, 1988, Ser. No. 217,290

Int. Cl.⁴ B23B 5/00, 5/48

U.S. Cl. 82—128

14 Claims



1. A device for machining a groove about a cylinder bore in an engine block comprising

- a body portion,
- means on said body portion for securing said body portion in situ within a cylinder bore of an engine block,
- a laterally extending arm having a free end,
- means for supporting said arm at the other end thereof on said body portion of pivoting and rotating relative said body portion,
- a handle means rotatably mounted adjacent to said free end of said arm for producing said rotation of said arm relative to said body portion,
- a cutting tool means for cutting a groove about the cylinder bore, said cutting tool means including a cutting tool mounted on an intermediate portion of said arm for rotation with said arm to cut said groove about said bore, and a lever pivotably mounted at one end thereof to said arm and having its other end engaging said handle means,
- a fulcrum disposed intermediate said lever about which said lever is permitted to pivot relative to said arm upon the rotation of said handle means for producing rotation of said arm and causing said lever to pivot relative to said

arm for advancing said cutting tool toward the engine block during a machining operation.

13. A device for machining a groove about a cylinder bore in an engine block comprising:

- a body portion,
- means on said body portion for securing said body portion in situ within a cylinder bore of an engine block,
- a laterally extending arm, means for pivotably connecting said arm to said body portion at one end, said arm having a free end extending radially thereof, said arm being rotatably mounted on said body portion for rotation about the cylinder bore,
- a handle means rotatably journaled to said free end of said arm for producing said rotation,
- a cutting tool mounted intermediate the ends of said arm for rotation with said arm to cut said groove about said bore,
- feed means connected between said cutting tool and said handle means for imparting a feed motion to said tool in addition to said rotation produced by said handle means whereby rotation of said arm by said handle means effects rotation of said handle means relative to said arm to activate said means for progressively advancing said cutting tool in said feed motion during a machining operation.

4,876,932

CUTTING TOOL HOLDER

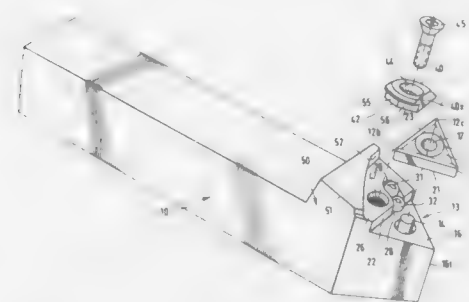
Eliezer Nessel, Haifa, Israel, assignor to Iscar Ltd., Nahariya, Israel

Filed Aug. 16, 1988, Ser. No. 232,908

Int. Cl.⁴ B23B 27/00

U.S. Cl. 82—158

4 Claims



1. In a cutting tool assembly, a clamping arrangement for clamping a cutting insert to a tool holder wherein said tool holder is formed at an end thereof with an insert seat defined by a base surface and a transverse side surface; a mounting pin secured to said tool holder and extending out of said base surface so as to have mounted thereon a centrally apertured cutting insert; a ball guide groove formed in said tool holder; a plurality of clamping balls located in said groove; an upper opening of said groove extending along the length thereof in an upper surface of the tool holder adjacent to the insert seat so as to allow for ready introduction of said clamping balls into said groove; a first inner end of said groove constituting a bearing surface for an innermost of said clamping balls; a second outer end of said groove opening into said transverse side surface and having a transverse dimension less than the diameter of an outermost of said clamping balls; a groove base spaced from said upper surface in the region of said first end by a first amount less than the diameter of the innermost clamping ball and, in the region of said second end, by a second amount greater than the first amount; a ball displacing member articulated to said tool holder and juxtaposed with respect to said groove so as to bear on said innermost clamping ball and displacing means for displacing said member towards said tool holder so as to displace said outermost clamping ball into displacing said innermost clamping ball outwardly with respect to said side surface, whereby an insert mounted on said pin and resting on said base surface is clampingly pressed

against said pin and is pivoted into clamping engagement with said side and base surfaces.

4,876,933

SLITTER HOLDER HAVING CLAMPING MECHANISM FOR SLITTER BLADE SUPPORT ROD

Yoshinori Tahara, Numazu, Japan, assignor to Meisan Co., Ltd., Fuji, Japan

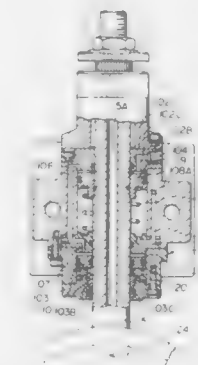
Filed Mar. 22, 1988, Ser. No. 171,668

Claims priority, application Japan, Jun. 12, 1987, 62-146496

Int. Cl.⁴ B23D 19/04; B26D 5/04

U.S. Cl. 83—482

4 Claims



1. A slitter holder having a slitter blade support rod that can be moved relative to a stationary position, said slitter holder comprising:

- a moving mechanism for moving said slitter blade support rod relative to said stationary portion between a slitter blade operation position and a slitter blade rest position; and

- a clamping mechanism for clamping the slitter blade support rod to said stationary portion when said slitter blade support rod is moved to said slitter blade operation position; said moving mechanism including:

- a first cylinder portion which is formed in said stationary portion and in which said slitter blade support rod is inserted;

- a first piston which moves in said first cylinder portion and which is secured to said slitter blade support rod; and

- a first compressed air control means which controls the supply of the compressed air to said first cylinder portion in order to control the movement of said slitter blade support rod; and

- said clamping mechanism including:

- a second cylinder portion which is formed in said stationary portion and in which said slitter blade support rod is inserted;

- a second piston which moves in said second cylinder portion so that said slitter blade support rod slides;

- a clamp member which moves together with said second piston to acquire a liberated position where the slitter blade support rod is liberated and to acquire a clamp position where the slitter blade support rod is clamped;

- a clamp action member which is provided on said stationary portion and acts upon said clamp member so that said clamp member acquires said clamp position; and

- a second compressed air control means which controls the supply of the compressed air to the second cylinder portion and which, after the slitter blade support rod has moved to said slitter blade operation position, moves said second piston so that said clamp member is caused by said clamp action member to acquire said clamp position.

4,876,934

COMPUTERIZED BREAD SPLITTER

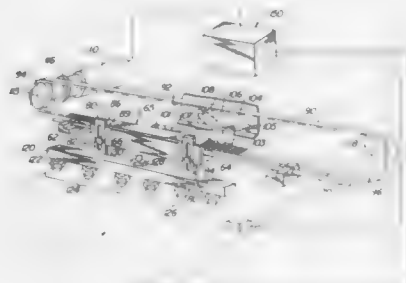
John E. Fagan, and A. Farrel Droke, both of Norman, Okla., assignors to Barford Corp., Maysville, Okla.

Filed Sep. 8, 1987, Ser. No. 93,816

Int. Cl.⁴ B26D 3/08

U.S. Cl. 83—879

8 Claims



1. A hydraulic splitter for cutting a product carried on a conveyor comprising: support means adjacent the conveyor; guide means on said support means, said guide means extending transversely of the conveyor; a source of pressurized fluid; a nozzle; means operably connecting said source of pressurized fluid to said nozzle; a carriage; means movably securing said carriage to said guide means; means securing said nozzle to said carriage; a motor; a flexible belt; means drivingly connecting said motor to said belt; means securing said belt to said carriage for moving said carriage longitudinally of said guide means and transversely of the conveyor; and control means associated with said motor to move said nozzle transversely of the conveyor such that fluid dispensed from said nozzle impinges a product moved by the conveyor to form a chevron shaped pattern on the product.

4,876,935

ELECTRONIC MUSICAL INSTRUMENT

Hiroshi Kitagawa, Shizuoka, Japan, assignor to Kabushiki Kaisha Kawai Gakki Seisakusho, Hamamatsu, Japan

Filed Sep. 29, 1987, Ser. No. 102,410

Claims priority, application Japan, Oct. 4, 1986, 61-236864

Int. Cl.⁴ G10H 1/02

U.S. Cl. 84—627

4 Claims



1. An electronic musical instrument in which a natural musical tone is converted into a digital signal and at least a section of the waveform of the digital signal is compressed to a quantized waveform, stored in a memory and read out therefrom for producing a musical tone, including:
means for storing data of the compressed waveform section in the memory, wherein said compressed waveform section has had its amplitude expanded in accordance with a predetermined envelope waveform; and,
means for reading the stored amplitude-expanded digital waveform section data out of the memory and for digitally multiplying the digital waveform data read out by a digital envelope waveform, thereby reproducing the original waveform.

4,876,936

ELECTRONIC TONE GENERATOR FOR GENERATING A MAIN MELODY, A FIRST ACCOMPANIMENT, AND A SECOND ACCOMPANIMENT

Walter C. Y. Yeh, 6th Fl., No. 210, An Ho Road, Taipei, Taiwan

Filed May 9, 1988, Ser. No. 191,885

Int. Cl.⁴ G10H 1/40, 7/00

U.S. Cl. 84—612

1 Claim

1. An electronic tone generator comprising:
a main melody generation circuit, having a main melody generator and a first latch circuit, for generating a main melody signal;
a first accompaniment circuit, having a first accompaniment generator and a second latch circuit, for generating a first accompaniment signal;
a second accompaniment circuit, having a second accompaniment generator and a third latch circuit, for generating a second accompaniment signal;
first, second and third envelope circuits, respectively coupled to said main melody generator circuit, said first accompaniment circuit, and said second accompaniment circuit, for respectively waveform shaping said main melody signal, said first accompaniment signal, and said second accompaniment signal;
a memory, coupled to said first, second and third latch circuits, for storing information concerning key activation, tempo, melody, notes and timings;
a tempo generator coupled to said memory for outputting a tempo signal;
a melody generator coupled to said tempo generator for outputting a melody signal to said memory;
a control circuit coupled to said memory for controlling a generation of said main melody signal, said first accompaniment signal, and said second accompaniment signal; and
a mixing modulator, coupled to said first, second and third envelope circuits, for combining the shaped main melody signal, first accompaniment signal, and second accompaniment signal respectively output from said envelope circuits.

4,876,937

APPARATUS FOR PRODUCING RHYTHMICALLY ALIGNED TONES FROM STORED WAVE DATA

Hideo Suzuki, Shizuoka, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan

Continuation of Ser. No. 34,350, Apr. 3, 1987, abandoned, which is a continuation of Ser. No. 649,431, Sep. 11, 1984, abandoned.

This application Nov. 29, 1988, Ser. No. 277,418

Claims priority, application Japan, Sep. 12, 1983, 58-167765; Sep. 12, 1983, 58-167766

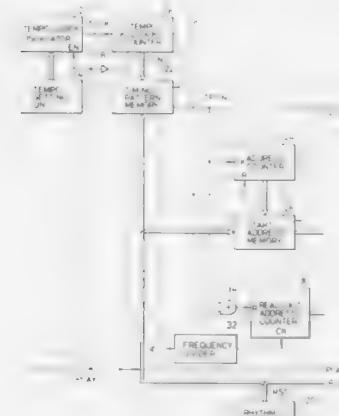
Int. Cl.⁴ G10H 1/40, 7/00

U.S. Cl. 84—612

15 Claims

13. An apparatus for producing rhythm tones at a rhythm tempo rate, comprising:
memory means for storing a series of waveshapes representing an alignment of sequential rhythm tones to be produced;
readout means for reading out said waveshapes from said

memory means in sequence of the alignment according to rhythm timings and at a readout rate selected such that



said read out waveshaped are of the same pitch independent of said tempo rate.

4,876,938

ELECTRONIC MUSICAL INSTRUMENT WITH AUTOMATIC PERFORMING FUNCTION

Isao Shinohara, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

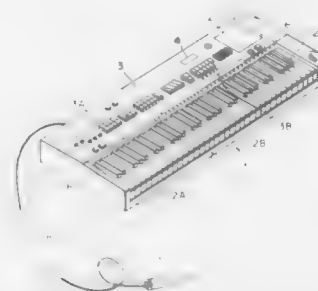
Continuation of Ser. No. 654,053, Sep. 24, 1984, abandoned, which is a continuation of Ser. No. 433,047, Oct. 6, 1982, abandoned. This application Dec. 16, 1988, Ser. No. 287,619

Claims priority, application Japan, Oct. 9, 1981, 56-161409

Int. Cl.⁴ G10F 1/00

U.S. Cl. 84—611

8 Claims



1. An electronic musical instrument with an automatic performing function, comprising:
melody tone data storing means for storing tone name, tone octave and tone interval data;
chord tone data storing means for storing chord name and chord tone interval data, said chord name data being subdivided into chord root data and chord classification data;
said melody tone data and chord tone data being stored in their respective storing means in the same format, including a common format for melody tone name data and chord root data, a common format for melody tone octave data and chord classification data, and a common format for melody tone interval data and chord tone interval data;
musical tone signal generating means including at least one output processing unit having a plurality of time-division-switched channels for producing respective musical tone signals selectively responsive to the melody tone data supplied from said melody tone data storing means and to the chord data supplied from said chord tone data storing

means, said output processing unit being capable of producing one or more musical tones simultaneously, each tone in a separate time-division-switched channel;
first automatic control means for successively reading out, and supplying to said musical tone signal generating means, melody tone data stored in said melody tone data storing means;
second automatic control means for successively reading out, and supplying to said musical tone signal generating means, chord tone data stored in said chord tone data storing means; and
operating mode selection means coupled to said first and said second automatic control means for selecting one of several automatic operation modes among which there are, at least, one mode in which only said first automatic control means is rendered operative, one mode in which only said second automatic control means is rendered operative and one mode in which both said first and second automatic control means are rendered operative.

4,876,939

DEVICE FOR REPOSITIONING AMMUNITION FEED OF AN AUTOMATIC WEAPON

Gerhard Bilger, Lauterbach; Helmut Mader, Schramberg, and Erich Matzagg, Oberndorf/Beffendorf, all of Fed. Rep. of Germany, assignors to Mauser-Werke Oberndorf GmbH, Oberndorf, Fed. Rep. of Germany

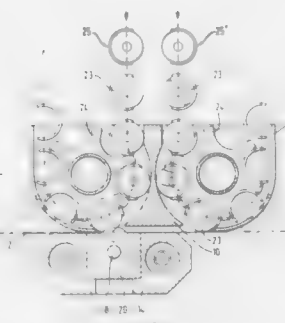
Filed Apr. 5, 1988, Ser. No. 177,632

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1987, 3711690

Int. Cl.⁴ F41D 10/32

U.S. Cl. 89—33.04

8 Claims



1. A device for positioning a plurality of different ammunition feeding devices which are selectively positionable between an operable position and a secured position so as to selectively feed different types of ammunition to a weapon breech, comprising a rotatable drive shaft, a shifting lever having a driving end adjacent said drive shaft and an opposite engagement end engageable with the different ammunition feeding devices, and coupling means defined between said drive shaft and said lever for rotating said lever in response to rotation of said drive shaft so as to move a selected ammunition feeding device into and out of an operable position.

4,876,940

MAGAZINE AMMUNITION CONVEYING SYSTEM

Anthony J. Aloï, Richmond; Robert R. Bernard, Essex Jct., and Edward A. Proulx, Burlington, all of Vt., assignors to General Electric Company, Burlington, Vt.

Filed Apr. 14, 1988, Ser. No. 181,756

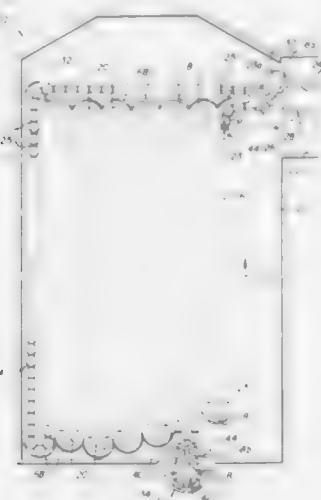
Int. Cl.⁴ F41D 10/14; B65G 29/00

U.S. Cl. 89—33.16

16 Claims

1. An article feeding system comprising, in combination:
A. a magazine including at least one article transfer port therein;

- B. an endless article conveyor arranged within said magazine in a serpentine formation consisting of a plurality of straight line sections and interconnecting turnaround sections, one of said turnaround sections being located at said magazine transfer port, said conveyor including
- (1) a series of spaced turnaround sprockets about which said conveyor turnaround sections are trained, and
 - (2) a succession of article carriers, each said carrier holding a single article and including a pair of opposed, pivotally interconnected carrier halves configured to assume closed, article retentive relative positions while in said straight line conveyor sections and opened, article releasing relative positions while in said conveyor turnaround sections;
- C. an article transfer station located at said magazine transfer port, said transfer station including



- (1) first means operating to accelerate successive articles released by said carriers upon arrival at said one turnaround section from conveyor velocity to a transfer velocity,
 - (2) transfer means for accepting accelerated articles from said first means, and
 - (3) second means operating to decelerate successive articles accepted from said transfer means to conveyor velocity and individually deposit the decelerated articles in successive said carriers prior to departure from said one turnaround section; and
- guides positioned at the other said turnaround sections for precluding the release of the articles from said carriers during transit through said other turnaround sections.

4,876,941

COMPOSITE FOR PROTECTION AGAINST ARMOR-PIERCING PROJECTILES

Albert L. Barnes, Wickliffe; Thomas M. Clere, Hudson, both of Ohio; Gholamreza J. Abbaschian, Gainesville, Fla., and Douglas J. Wheeler, Tolland, Conn., assignors to Eltech Systems Corporation, Boca Raton, Fla.

Filed Dec. 31, 1987, Ser. No. 140,077

Int. Cl.⁴ F41H 5/00

U.S. Cl. 89—36.02

32 Claims

1. An armor plate layered composite for protection against projectiles and having enhanced resistance to penetration from high kinetic energy projectiles, which armor plate comprises a metal substrate and a surface layer composite ceramic on said substrate of very finely-divided and interconnected grains of TiB₂ and AlN.

4,876,942

ANTI-AIRCRAFT SIGHT

Hans-Arne Nilsson, Ulricehamn, Sweden, assignor to Saab Instruments Aktiebolag, Jönköping, Sweden

Continuation of Ser. No. 44,850, Apr. 6, 1987, Pat. No.

4,823,674. This application Mar. 13, 1989, Ser. No. 322,690

Claims priority, application Sweden, Aug. 19, 1985, 8503860

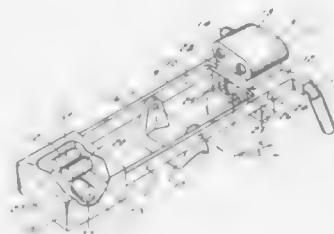
The portion of the term of this patent subsequent to Apr. 25,

2006, has been disclaimed.

Int. Cl.⁴ F41G 3/06, 5/08

U.S. Cl. 89—41.22

2 Claims



1. A ranging unit for a gun such as an anti-aircraft gun that is normally fired at moving targets and comprises a barrel with a barrel axis, an aiming unit which is mounted on the barrel for angular adjusting motion relative to it and which defines an aiming axis that a gunner manually maintains aligned on a target during a period terminating at an instant of firing to thus aim the barrel, and servo means reacting between the barrel and the aiming unit and responsive to outputs from a calculating device for angularly adjusting said aiming axis relative to said barrel axis in accordance with lead and offset angles needed for a projectile fired from the gun to hit the target, said ranging unit comprising:

- A. a base;
- B. optical means fixed on said base through which an operator can view a target and which defines a sighting axis that the operator can maintain aligned on a target by moving the base;
- C. first pivoting means providing a connection between said base and said barrel whereby the base is constrained to move with the barrel but is pivotable relative to the barrel for swinging said sighting axis in azimuth and in elevation relative to said barrel axis;

- D. a laser ranging device fixed on said base and connected with said calculating device, said laser ranging device being arranged

- (1) to emit and receive laser beam radiations along a laser axis substantially coinciding with said sighting axis and
- (2) to produce range outputs which correspond to distances from the sighting unit to a target aligned with said sighting axis and which are delivered to said calculating device as inputs for the latter;

- E. means on said base for measuring values of

- (1) the elevation angle of said sighting axis and
- (2) the rates of change in azimuth and elevation of said sighting axis, and for producing inputs to said calculating device corresponding to those measured values;

- F. a handle for imparting movements to said base; and

- G. second pivoting means providing a connection between said handle and said barrel whereby the handle is constrained to move with the barrel but is movable relative to said barrel axis in directions corresponding to azimuth and elevation.

4,876,943

AUTOMATIC MACHINE GUN

Gerhard Bilger, Lauterbach; Helmut Mader, Schramberg, both of Fed. Rep. of Germany, and Erich Matzagg, Oberndorf, Austria, assignors to Mauser-Werke Oberndorf GmbH, Oberndorf, Fed. Rep. of Germany

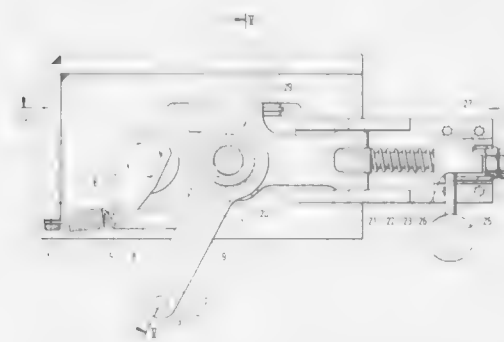
Filed Jul. 7, 1987, Ser. No. 70,568

Claims priority, application Fed. Rep. of Germany, Jul. 12, 1986, 3623565

Int. Cl.⁴ F41D 11/02

U.S. Cl. 89—141

4 Claims



1. An automatic machine gun weapon housing a housing with a stationary and a movable part, a firing mechanism in said stationary housing part for tripping a trigger for single firing and optionally for continuously firing, comprising pivotal trigger means for tripping the trigger for single firing and continuous firing optionally, including a mechanically actuated cocking lever for cocking the trigger, and a trigger plate for tripping by said cocking lever and functionally connected to said trigger, said mechanism acting to return said trigger plate to its starting position independently of the position of said cocking lever, first and second separately rotatable but relatively non-rotatable crankshafts, a crank connected to each crankshaft, a parallel link interconnecting said crankshafts for parallel movement together at a spaced location apart, a cam disk on each crankshaft aligned parallel and holding said trigger plate for stroke motion in a straight line, a coupling engageable to prevent relative rotation of coupled parts located on said first crankshaft coupled with said coupling coupling in a gear connection with axial mobility for uncoupling with the movable part of said housing moving backward and forward, a fork rotatably mounted on said housing, a return spring action on said second crankshaft acting to move it in a return direction.

4,876,944

PNEUMATIC LIMB CONTROL SYSTEM

James F. Wilson, Durham; Rhett T. George, Jr., Hillsborough, and Zhenhai Chen, Durham, all of N.C., assignors to Duke University, Durham, N.C.

Filed Mar. 3, 1988, Ser. No. 164,061

Int. Cl.⁴ F15B 21/02

U.S. Cl. 91—35

12 Claims



1. A controller for a pneumatically-powered flexible limb

characterized in that it provides for rapid movement of said limb from a first position to a second position with minimal overshooting of said second position, and comprising:

computer means for providing signal data corresponding to a plurality of successive events of air introduction and non-air introduction, respectively, into said flexible limb for a predetermined limb movement from a first position to a second position, wherein duration of non-air introduction relative to air introduction permits the effects of inertia to dissipate, and further wherein said signal data provide for varying the air introduction time in relation to the non-air introduction time for said successive events and the time periods each consisting of an air introduction event and a non-air introduction event are variable during at least a portion of the flexible limb movement from said first position to said second position;

means for converting said time-varying signal data from said computer means into corresponding time-varying electrical signals; and

valve means pneumatically connected to said flexible limb and electrically connected to said converting means for successively opening to introduce pressurized air into said flexible limb and closing to prevent air introduction into said limb for said plurality of successive events according to said time-varying electrical signals from said converting means.

4,876,945

PISTON AND CYLINDER UNIT

Kurt Stoll, and Lothar Müller, both of Esslingen, Fed. Rep. of Germany, assignors to Festo KG, Esslingen, Fed. Rep. of Germany

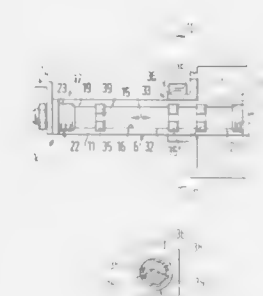
Filed Oct. 13, 1988, Ser. No. 257,387

Claims priority, application Fed. Rep. of Germany, Oct. 13, 1987, 3734547

Int. Cl.⁴ F01B 25/26, 31/12

U.S. Cl. 92—5 R

21 Claims



18. A piston and cylinder unit comprising: a cylinder: a piston arranged inside and being axially displaceable relative to said cylinder; a cylinder end cover at one end of said cylinder, said end cover having a hole; a tubular rod having a load end and a piston end, said rod having a bore extending substantially from said load end to said piston end, said bore having female threads extending from each of said ends toward the other of said ends, said rod piston end being threadably engaged to said piston, said rod projecting away from said piston and extending through said end cover hole, said rod load end being threadably engaged to a load attachment means for attaching said rod to a load, said bore being adapted to receive a permanent magnet moving with said rod;

a switch positioned adjacent said cylinder and cooperating with said magnet, said magnets being axially adjustable in said bore.

4,876,946

FLEXIBLE HOSE PUMP

Viktor V. Shishkin, ulitsa Festivalnaya, 16, kv. 5; Nikolai F. Kryazhevskikh, ulitsa Krasnykh Partizan, 599, kv. 13, and Jury P. Shapovalov, ulitsa Turgeneva, 18, all of Krasnodar, U.S.S.R.

PCT No. PCT/SU86/00139, § 371 Date Jul. 27, 1987, § 102(e) Date Jul. 27, 1987, PCT Pub. No. WO87/03936, PCT Pub. Date Jul. 2, 1987

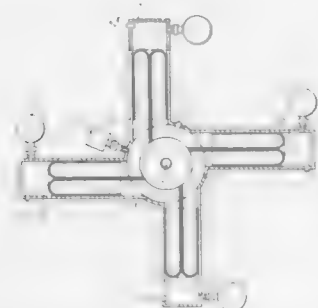
PCT Filed Dec. 19, 1986, Ser. No. 112,610

The portion of the term of this patent subsequent to Jul. 12, 2005, has been disclaimed.

Int. Cl.⁴ F01B 19/00; F16J 3/00

U.S. Cl. 92—93

11 Claims



1. A pump comprising a casing (1) having an inner wall and an interior space having a flexible hose (2) mounted for reciprocation having a first end (5) which is turned inside out and sealingly secured along the perimeter to the inner wall of the casing (1) and a second end which is closed so as to sealingly divide the interior space of the casing (1) into two chambers (6, 7) wherein one chamber communicates with a source (12) of fluid being pumped and with a delivery line, the second end is secured to a drum operatively connected to a motor arranged in one of the chambers (6, 7), to move the flexible hose in one direction, and means for effecting movement in the opposite direction by the action of a pressure of a working fluid in one of the chambers (6, 7).

4,876,947

PISTONS WITH BEARING LANDS

Michael L. P. Rhodes, Rugby, England, assignor to AE PLC, Cawston, England

Filed Mar. 19, 1987, Ser. No. 27,876

Claims priority, application United Kingdom, Mar. 20, 1986, 8606998

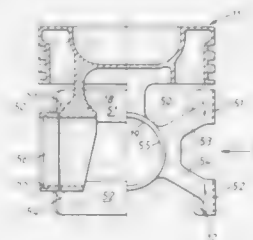
Int. Cl.⁴ F16J 1/14; F22B 5/00

U.S. Cl. 92—187

3 Claims

1. A piston comprising a crown portion which also includes a piston ring belt and gudgeon-pin bosses and which crown portion comprises a casting of steel or cast-iron and a separate

articulated skirt portion comprising a casting of aluminum alloy, steel or cast-iron which also includes gudgeon-pin bores, said crown portion and said skirt portion having a common gudgeon-pin about which said articulated skirt portion is freely able to move relative to said crown portion, wherein portions



of the skirt which co-operate with an associated cylinder or cylinder liner comprise axially-spaced circumferentially extending bearing lands, and said circumferentially extending bearing lands are arcuate, load bearing skirt lands supported by struts depending from gudgeon-pin boss pieces of the skirt portion.

4,876,948

CONSTANT SPEED HOLDING DEVICE FOR VEHICLE

Takeshi Yasukawa; Masayoshi Onishi, and Tadayuki Fujimoto, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP87/00596, § 371 Date May 20, 1988, § 102(e) Date May 20, 1988, PCT Pub. No. WO88/01239, PCT Pub. Date Feb. 25, 1988

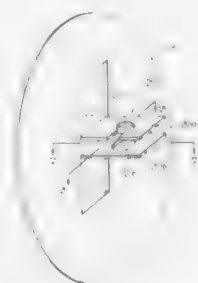
PCT Filed Aug. 10, 1987, Ser. No. 184,554

Claims priority, application Japan, Aug. 19, 1986, 61-126148; Aug. 19, 1986, 61-126149

Int. Cl.⁴ F01B 19/02; F16B 7/10

U.S. Cl. 92—99

3 Claims



1. A cruise control device for a vehicle, including an actuator (A) having a diaphragm (12) and controlling a throttle valve (8) by transmitting movements of the diaphragm to a throttle link (9), comprising: a metal connector (19, 20) fixedly secured to the diaphragm and having an upper plate (20a) formed with an exclusively circular through-hole (21a) and a slot (22) extending from a side edge of said upper plate to said circular through-hole, and a lower plate (20b) disposed parallel to said upper plate and spaced therefrom, and formed with an aperture for receiving a lower end of a circular cylindrical rod (6b), said aperture being larger than said circular through-hole and including a projected area of said through-hole perpendicular to said lower plate, and a wire device (6) including a wire (6a) and said rod fixedly connected to one end of said wire, one end of said rod being inserted into said through-hole of said upper plate and another, opposite end of said rod being inserted into said aperture of said lower plate, with said wire passing through said slot during insertion, and the other end of said wire being connected to the throttle link.

4,876,949

LOW TEMPERATURE AIR INDUCTION DIFFUSER

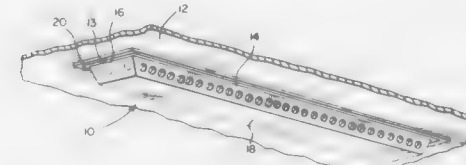
Paul W. Fairchild, Rogersville; Jim L. Clancy, Springfield; William G. Fields, Branson, all of Mo.; Louis Bishop, Jr., and Mark W. Fly, both of Lowell, Ark., assignors to Thermo-Aire Systems, Inc., Springfield, Mo.

Filed Apr. 18, 1988, Ser. No. 182,457

Int. Cl.⁴ F24F 13/06

U.S. Cl. 98—40.1

3 Claims



1. An air diffuser comprising: a base;

first, second, third and fourth side walls extending from said base to form a hollow shell, a first pair of said side walls diverging from one another and a second pair of said side walls also diverging from one another as the side walls extend upwardly from said base, at least one of said side walls including a plurality of bores therein forming multiple discharge tubes, said multiple discharge tubes each having a longitudinal central axis disposed at an acute angle relative to a surface on which said hollow shell is secured;

said base and said side walls forming a plenum into which conditioned, pressurized air is supplied, the conditioned air being discharged from said plenum through said multiple discharge tubes in streams of air, a low pressure area caused by each air stream exiting from said multiple discharge tubes pulling air surrounding the exterior surface of said hollow shell along said surface to evaporate moisture on the surface;

means securing said hollow shell to said surface; said multiple discharge tubes each being spaced from the surface and discharging said streams of air away from and in acute angular relation to the surface for entraining ambient air from both above and below each column of air being discharged along the exterior of said hollow shell for mixing of ambient air with each column of the discharged conditioned air.

4,876,950

ROOF VENTILATOR

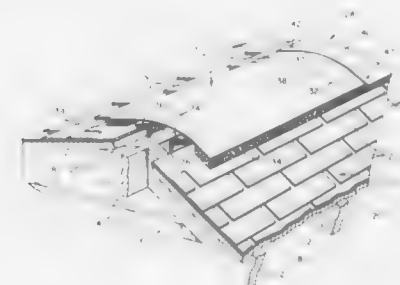
Richard D. Rudeen, 4008 Roanoke Cir. North, Golden Valley, Minn. 55422

Filed Apr. 18, 1988, Ser. No. 182,460

Int. Cl.⁴ F24F 7/02

U.S. Cl. 98—42.21

9 Claims



1. A roof ventilator section comprising an impervious flexible plastic membrane constituting a flat sheet conformable to different roof pitches, and a pair of laterally-spaced open cell

foamed plastic strips secured to one side of said membrane, said strips having a multiplicity of interlinked filaments.

4,876,951

AIR REGISTER HANDLE ARRANGEMENT

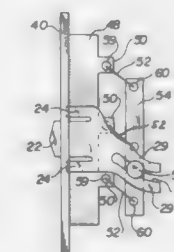
Donald J. Vork, Holland, Mich., assignor to Hart & Cooley, Inc., Holland, Mich.

Filed Dec. 9, 1987, Ser. No. 130,622

Int. Cl.⁴ F24F 13/15

U.S. Cl. 98—107

19 Claims



17. An air register handle adapted to be mounted in air register means for regulation of air flow, said air register handle comprising:

a forward bracket; a substantially flat and straight portion extending rearwardly from said bracket and integral therewith; an arcuate flat portion integral with said straight portion and having a fork-shaped configuration, whereby two substantially parallel and arcuate arms form an open slot at an end of said handle opposing an end of said straight portion to which said bracket is integrally connected; and a pair of handle tabs connected to and extending above and below said straight portion, wherein said tabs are coplanar and positioned at an acute angle of less than 90° relative to a plane of said straight portion.

4,876,952

AIR-CONDITIONING APPARATUS

Toshio Kuno; Yoshikazu Shindo; Yukio Kuno; Takeshi Ueno, all of Fukuoka; Akira Torimi, Saga, and Yoji Mori, Fukuoka, all of Japan, assignors to Kabushiki Kaisha Kyoritsu, Kasuya, Japan

Division of Ser. No. 184,013, Apr. 20, 1988. This application

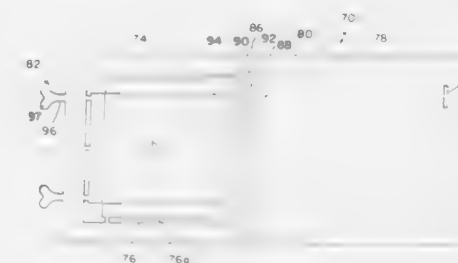
Feb. 10, 1989, Ser. No. 309,102

Claims priority, application Japan, May 22, 1987, 62-77574; Jul. 16, 1987, 62-178648; Sep. 8, 1987, 62-137868; Sep. 26, 1987, 62-147426; Oct. 19, 1987, 62-160641; Feb. 10, 1988, 63-29338

Int. Cl.⁴ F24F 11/04

U.S. Cl. 98—121.2

1 Claim



1. In an air-conditioning damper having a duct means forming an air passage passing through said duct means, and an airflow adjusting means provided with vanes disposed in said air passage, said vanes being independently rotatable around supporting shaft portions to adjust their angles without exter-

nal driving mechanisms such as handles and gears, an operation port apparatus provided to said duct means in the vicinity of said airflow adjusting means and comprising:

- an opening formed on a wall of said duct means; and
- a closure means fixed to said opening to open and close said opening,
- said closure means comprising:
- a frame body having an operation port corresponding to said opening;
- fixing portions connected to said frame body to fix said frame body to said opening;
- a cover body connected to said frame body to open and close said operation port of said frame body;
- hinge portions connected to said frame body and said cover body;
- tabs connected to said frame body; and
- long holes provided to said cover body to receive said tabs respectively,
- said closure means being integrally made from a single thin plate.

4,876,953

SIPHON COFFEE MAKER

Humihiro Imamura, Seto, and Tomio Hotta, Kuwana, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

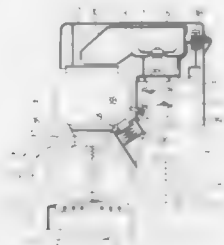
Filed Apr. 5, 1989, Ser. No. 333,199

Claims priority, application Japan, May 30, 1988, 63-133593; May 30, 1988, 63-133594

Int. Cl.⁴ A47J 31/42, 31/12

U.S. Cl. 99—280

9 Claims



1. A siphon coffee maker comprising:

- (a) a lower container for containing water;
- (b) a heater for applying heat to the lower container;
- (c) an upper container disposed on the lower container, the upper container being provided with a water feed tube communicating to the interior of the lower container;
- (d) storage means for storing data of an amount of coffee to be extracted; and
- (e) control means for operating to energize the heater in response to an extracting operation command, thereby starting the extracting operation, the control means operating, after completion of the extracting operation, to supply the heater with an electrical output varied in proportion to the amount of coffee to be extracted, data of which is stored in the storage means, so that the heater is energized to execute a warmth retaining operation for the coffee extracted.

4,876,954
METHOD AND APPARATUS FOR PITTING AND SLICING OLIVES

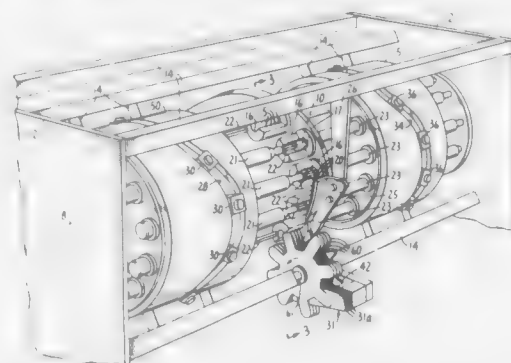
Fred J. Climperman, Castro Valley, Calif., assignor to Ashlock Company, San Leandro, Calif.

Filed Jan. 13, 1988, Ser. No. 143,822

Int. Cl.⁴ A23N 4/12

U.S. Cl. 99—545

20 Claims



1. An olive pitting and slicing apparatus, including:

- a rotatable drive shaft;
 - a plate fixedly attached to the drive shaft;
 - a first cup dimensioned to receive an olive, and fixedly mounted on the plate so that rotation of the drive shaft will cause the plate to translate the first cup, and any olive within the first cup, along a substantially circular cup path;
 - a first pitting means capable of extending toward the first cup when the first cup occupies a first segment of the cup path to extract an olive pit from an olive in the first cup, wherein the first pitting means is also capable of retracting away from the first cup after extraction of the olive pit;
 - a set of slicing knives non-translatably mounted adjacent a second segment of the cup path, in such a position that the slicing knives engage with and slice a pitted olive in the first cup when the first cup occupies the second segment of the cup path, wherein the drive shaft is capable of rotating in a first rotational direction so as to translate the first cup along the cup path in said first rotational direction, and also including:
 - a frame;
 - a slicing knife shaft rotatably mounted on the frame and fixedly attached to the slicing knives so that rotation of the slicing knife shaft will rotate each slicing knife; and
 - a slicing knife rotation means coupled to the slicing knife shaft, for rotating the slicing knife shaft and the slicing knives as a unit in a second rotational direction opposite the first rotational direction as the first cup translates through the second segment of the cup path.
16. A method for pitting and slicing an olive, including the steps of:
- (a) translating a cup containing an olive along a portion of a substantially circular cup path;
 - (b) translating a pitting unit, including a pitting knife and a coring knife, along a path substantially parallel to the cup path;
 - (c) while the cup occupies a first segment of the cup path, extending the pitting knife and the coring knife from the pitting unit into engagement with the olive in the cup to extract a pit from the olive;
 - (d) retracting the pitting and coring knives away from the cup after the pit is extracted; and
 - (e) while the pitted olive remains in the cup with unchanged orientation relative to the cup, translating the cup past a set of non-translating slicing knives in such a manner that

the slicing knives engage with and slice the pitted olive in the cup.

4,876,955

EXTENSION FOR COMPACTING DEVICE

O. L. Jackson, 3324 Mustang Dr., Brooksville, Fla. 33512

Filed Jul. 21, 1988, Ser. No. 222,642

Int. Cl.⁴ B30B 15/00

U.S. Cl. 100—219

6 Claims



1. An extension for use with a compacting device adapted to be inserted into a container wherein the compacting device comprises:

- a base member,
- a plurality of equally spaced threaded rods secured to the base member,
- a supporting band secured about the upper ends of the rods and a plurality of plates with unidirectional locking means adapted to be inserted within the rods for compacting loose waste material and preventing springback;
- said extension comprising:
- a hollow tubular sleeve adapted to be supported on said supporting bands and having a plurality of smooth rods secured in spaced locations to the inner surface of said sleeve in alignment with respect to the threaded rods and locating means secured to said extension adjacent each smooth rod for engagement with a respective threaded rod to prevent rotation of said extension relative to said compacting device when used in conjunction with said compacting device.

4,876,956

REMOVABLE POSTAGE METER HAVING AN INDICIA COVER

Gilbert N. Riley, Wilton; Richard S. Holodnak, Stratford, and Richard A. Malin, Westport, all of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Oct. 27, 1987, Ser. No. 114,363

Int. Cl.⁴ G07B 5/06, 17/04

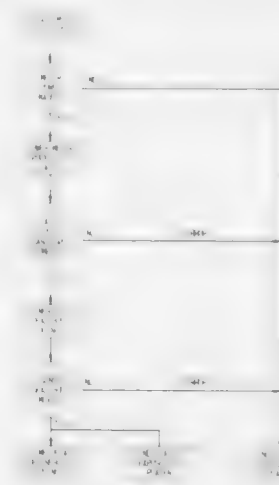
U.S. Cl. 101—91

7 Claims

- 1. A postage meter comprising:
- (a) a meter housing having disposed therein a print die, said housing being removable from a postage meter base;
- (b) microprocessor means disposed in said housing for enabling the printing of postage using said print die and for accounting for the printing of postage;
- (c) means for inputting information to said microprocessor means, said inputting means including a communication port;
- (d) said postage meter housing having an aperture therein adjacent said print die;
- (e) a shutter mounted on said postage meter housing, said shutter covering said aperture for preventing access to the print die, said shutter being locked in position covering

the aperture whenever said housing is removed from the postage meter base; and

(f) said shutter being movable upon being enabled by said microprocessor means upon predetermined communica-



tion between the postage meter base and the microprocessor means to a second position in which said aperture and thereby said die are exposed for the purpose of printing whenever said postage meter housing is locked on the postage meter base.

4,876,957

APPARATUS FOR APPLYING AN EMULSION SCREEN FILM OF SCREEN-PRINTING

Shigekazu Sakai, Gifu, Japan, assignor to Tokai Shoji Co., Ltd., Tokyo and Tokai Seiki Co., Ltd., Gifu, both of, Japan

Filed Sep. 14, 1987, Ser. No. 96,975

Claims priority, application Japan, Oct. 31, 1986, 61-167877[U]

Int. Cl.⁴ B41C 1/14

U.S. Cl. 101—128.4

11 Claims



1. An apparatus for applying an emulsion screen film of screen-printing, which comprises a support frame, means for vertically supporting on said frame a screen-printing plate with a screen surface and for holding a rolled emulsion screen film above the screen-printing plate, a swingable and vertically adjustable film guiding- and cutting-mechanism for vertically guiding and positioning the unrolled emulsion screen film in contact with said screen surface of the screen-printing plate

from its upper portion and for cutting the film at a predetermined length, and a pressing-and-applying-mechanism for pressing the emulsion screen film against the screen surface at its lower portion and for supplying an emulsion onto an opposite side of the screen surface relative to the contacted screen side while said pressing- and-applying-mechanism is sliding upwardly in contact with the screen surface.

4,876,958

SWING APPARATUS FOR AN OFFSET PRESS AUXILIARY PRINT UNIT

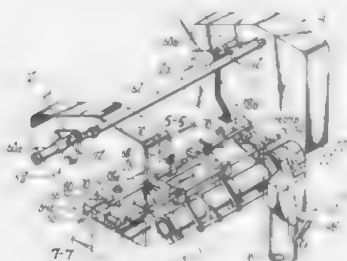
Robert T. Townsend, Altoona, Iowa, assignor to Townsend Industries, Inc., Altoona, Iowa

Filed Dec. 9, 1986, Ser. No. 939,948

Int. Cl.⁴ B41F 5/02, 13/12

U.S. Cl. 101—175

10 Claims



1. In combination, a single-color offset printing press having a frame and single-color printing means, a second-color auxiliary print unit removably mounted on said frame in operative engagement with said single-color printing means, and a swing apparatus for selectively engaging and disengaging said auxiliary print unit from said press, the swing apparatus comprising: swingable support means pivotally mounted on said frame for pivotal movement about a vertical axis, securing means on said support means for detachably securing said support means to said auxiliary print unit; and said support means including lift means to lift said auxiliary print unit out of engagement with said single-color printing means, whereby said auxiliary print unit can be lifted and then pivoted in a substantially horizontal plane from its operative position on said press to an inoperative position laterally adjacent said press.

4,876,959

DRIVE SYSTEM FOR ROTARY PRINTING APPARATUS INCLUDING IMPROVED MEANS FOR LOCKING AND UNLOCKING THE APPARATUS

John R. Noble, Fairfield; William A. Ross, Darien, and William D. Toth, Milford, all of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Feb. 8, 1989, Ser. No. 307,804

Int. Cl.⁴ B41F 13/24

U.S. Cl. 101—233

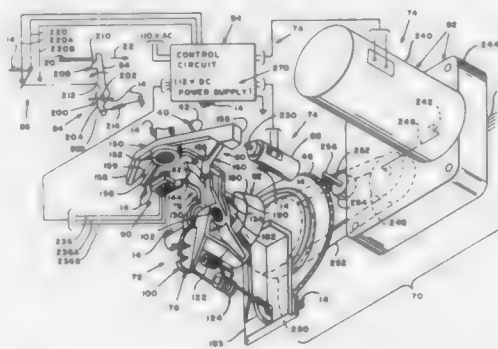
19 Claims

1. In a machine including rotary means for printing indicia on a sheet fed to the machine, wherein the machine includes means for driving the rotary printing means, wherein the driving means includes a drive gear having a home position, wherein driving means includes a locking member movable into and out of locking engagement with the drive gear when the drive gear is in its home position, and wherein the machine includes trip means for sensing a sheet fed to the machine, an improvement comprising:

- a. an actuating member for moving the locking member into and out of locking engagement with the drive gear;
- b. means for controlling the actuating member, the controlling means including resilient means for urging the actuat-

ing member to move the locking member into and out of locking engagement with the drive gear; and

- c. the trip means including means for normally latching the controlling means for preventing the resilient means from moving the actuating member to move the locking mem-



ber out of locking engagement with the drive gear, and the latching means unlatching the controlling means for permitting the resilient means to move the actuating member for moving the locking member out of locking engagement with the drive gear when the trip mean senses a sheet fed to the machine.

4,876,960

FUSE FOR LOW-SPIN OR NON-SPIN PROJECTILES

Wolfgang Schillinger, Schiltach; Andreas Hüllsig, Denklingen, and Wolfgang Zehnder, Schramberg, all of Fed. Rep. of Germany, assignors to Gebrüder Junghans GmbH, Schramberg, Fed. Rep. of Germany

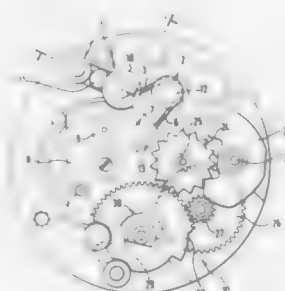
Filed Dec. 6, 1988, Ser. No. 280,359

Claims priority, application Fed. Rep. of Germany, Dec. 16, 1987, 3742575

Int. Cl.⁴ F42C 9/04, 15/18, 15/24

U.S. Cl. 102—249

5 Claims



1. A fuse for low spin or non-spin projectiles comprising: a detonator carrier movable to a live position, blocking means for normally preventing movement of said detonator carrier to said live position and being releasable in response to firing recoil to permit movement of said detonator carrier to said live position, spring means operably connected to said detonator carrier and disposed in a relaxed state prior to firing recoil, and spring-energizing recoil means operable connected to said spring means for energizing said spring means in response to firing recoil to bias said detonator carrier toward said live position, said spring-energizing recoil means comprising a recoil member arranged for movement in response to firing recoil, said recoil member including cam means arranged to displace one portion of said spring means for imparting a bias to another portion of said spring means which bears against said movable detonator carrier.

4,876,961

FUZES

Bert Åström, Degerfors, and Olof Nygård, Karlskoga, both of Sweden, assignors to Aktiebolaget Bofors, Bofors, Sweden

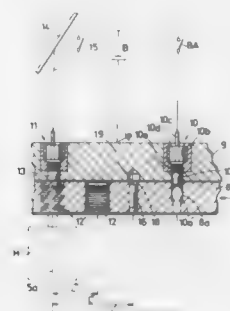
Filed Oct. 6, 1988, Ser. No. 253,631

Claims priority, application Sweden, Oct. 6, 1987, 8703840

Int. Cl.⁴ F42C 15/34

U.S. Cl. 102—254

10 Claims



1. A fuze arrangement for an ammunition unit dischargeable from a gun, in which the fuze includes electronics with an associated electrical trajectory safety device for preventing arming of the ammunition unit within a trajectory safety distance, an arming igniter actuable by the trajectory safety device after the trajectory safety distance, and a movable portion which is actuable by the arming igniter for executing an instantaneous movement to move a bursting cap disposed in the movable portion to the arming position in a detonation chain including a initiation detonator actuable by means of an impact or a proximity fuze contact;

wherein the movable portion is lockable by a locking device, which is actuable on a first hit of the ammunition unit against an object located within the trajectory safety distance for preventing the movable portion from executing the instantaneous movement even if the first hit mechanically influences electronics and/or the electrical trajectory safety device to effect activation of the arming igniter, such that the ammunition unit, upon a second hit against a further object within the trajectory safety distance, assumes the safe secured position, thereby preventing total bursting of the ammunition unit by the shock-triggering of the bursting cap on the second hit.

4,876,962

PROPELLANT CHARGE FOR CANNONS AND A METHOD OF PRODUCING SUCH A CHARGE

Mats Olsson, Karlskoga, Sweden, assignor to Nobel Kemi AB, Karlskoga, Sweden

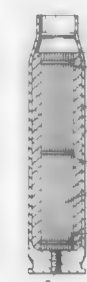
Filed Aug. 3, 1988, Ser. No. 227,565

Claims priority, application Sweden, Aug. 21, 1987, 8703246

Int. Cl.⁴ C06B 45/12

U.S. Cl. 102—288

18 Claims



1. A propellant charge for cannons, wherein it comprises a

number of tubular propellant sticks (1) of large length in relation to the diameters of the propellant combustion channels included therein, each one of said tubular propellant sticks having been provided with slits or slots or incisions (4) which connect the propellant sticks outer surface with the respective combustion channel, and said propellant sticks having been densely packed to form one or more linearly disposed bundles of optional outer configuration and with a total length corresponding to at least the major fraction of the available charge space for the charge under consideration, whilst the remainder of the available charge space is taken up by loosely added, disorientated powder flakes, powder grains or short powder rods or tubes (9).

4,876,963

HIGH PENETRATION ANTI-RUNWAY BOMB

Jean Deffayet, Chaville, France, assignor to Thomson-Brandt Armements, Boulogne-Billancourt, France

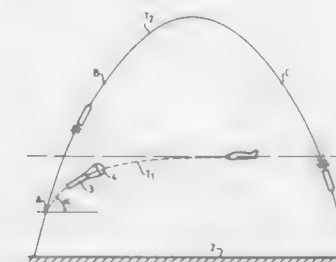
Filed Aug. 15, 1988, Ser. No. 232,239

Claims priority, application France, Aug. 14, 1987, 87 11583

Int. Cl.⁴ F42B 25/02

U.S. Cl. 102—387

5 Claims



1. An anti-runway bomb intended to be released at a very low altitude, equipped with a downward propulsive unit and comprising means for braking and orienting said bomb during its initial fall so as to position the bomb in a plane, and an upward propulsive unit activated when said bomb is positioned in said plane.

4,876,964

PROJECTILE AND METHOD OF MAKING IT

Kare R. Strandli, and Svein T. Halvorsen, both of Raufoss, Norway, assignors to Raufoss A/S, Raufoss, Norway

Continuation of Ser. No. 54,787, May 25, 1987, abandoned. This application Jul. 25, 1988, Ser. No. 224,244

Claims priority, application Norway, May 29, 1986, 862128

Int. Cl.⁴ F42B 13/12

U.S. Cl. 102—499

7 Claims



1. A projectile comprising:
(a) a metallic nose portion having an inner wall defining an interior cavity with a closed forward end portion;
(b) an impact detonatable charge filling the cavity and extending into the forward end portion; and

- (c) a coating formed of a material that is softer than the metal forming the nose portion applied to the inner wall so as to substantially cover the entire inner wall between the nose portion and the charge except for the closed forward end portion so as to prevent detonation of the charge caused by low velocity impact deformation of the nose portion.
5. A method of making a projectile having reduced detonation on low velocity impact comprising the steps of:
- forming a nose portion of metal having an inner wall defining an interior cavity with a closed forward end portion;
 - applying a coating to the inner wall so as to substantially cover the entire inner wall except for the closed forward end portion, the coating comprising a material softer than the metal forming the nose portion; and,
 - filling the interior cavity with an impact detonatable charge such that the charge extends into the closed forward end portion.

4,876,966

DEVICE FOR THE CENTERING OF A RAIL IN ELEVATOR STATIONS OF ELECTRIC OVERHEAD TROLLEY CONVEYORS

Gunter Koslowski, Soyer, and Georg Uttscheid, Rosenheim, both of Fed. Rep. of Germany, assignors to ROFA Rosenheimer Förderanlagen GmbH, Fed. Rep. of Germany

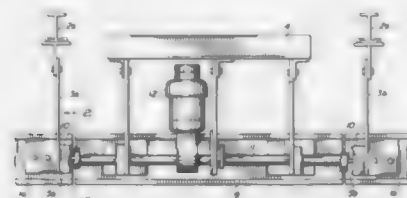
Filed Mar. 30, 1988, Ser. No. 175,102

Claims priority, application Fed. Rep. of Germany, Apr. 2, 1987, 3711043

Int. Cl.⁴ B66B 17/18

U.S. Cl. 104—127

2 Claims



1. A device for centering a moveable rail section relative to a stationary rail section in a lift station of a trolley conveyor comprising, a centering body attached to one of said rail sections, a centering piece attached to the other of said rail sections, said centering body having a generally vertically disposed slot therein permitting entry of said centering piece from above and below said body, said slot having oppositely disposed lateral cavities in the sidewalls thereof, said cavities being vertically displaced with respect to each other with an upper region of one cavity overlapping a lower region of the other cavity, said centering piece having an oblong cross-section and being rotatable about a central axis, the relationship between the centering body and the centering piece being such that when said centering piece is rotated to a position in which its longer dimension is disposed generally upright the centering piece can enter the slot in said centering body and when said centering piece is rotated to a position in which its longer dimension is disposed generally horizontally the centering piece occupies substantially entirely the overlapping regions of said cavities, the arrangement being such that rotation of said centering body to its horizontal position cams said moveable rail section into alignment with said stationary rail section regardless of the direction of initial displacement of said moveable rail section.

4,876,966

TRANSPORT CONTROL SYSTEM WITH LINEAR MOTOR DRIVE

Kazuyoshi Okawa, 1810-2, Kobiki-cho, Hachioji-shi, Tokyo 193; Kazumasa Moriya, 6-4-9, Kamikizaki, Urawa-shi, Saitama 338; Tomoyuki Kashiwazaki, 4-21-1, Hosoyama, Anso-ku, Kawasaki-shi, Kanagawa 215; Hiroshi Kawashima, 4-12-25, Higashikashiwaya, Ebina-shi Kanagawa 243-04, and Yoshitaka Murakawa, 3-16-29, Nishihara-cho, Fuchu-shi, Tokyo 183, all of Japan

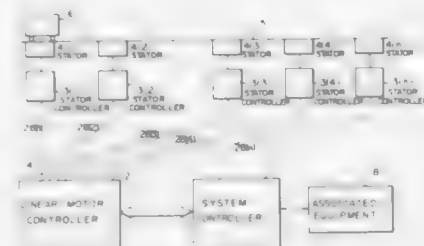
Continuation of Ser. No. 706,586, Mar. 5, 1985, Pat. No. 4,721,045. This application Jun. 8, 1987, Ser. No. 60,081 Claims priority, application Japan, Mar. 6, 1984, 59-043590; Mar. 6, 1984, 59-043591

The portion of the term of this patent subsequent to Jan. 26, 2005, has been disclaimed.

Int. Cl.⁴ H02K 41/00; B60L 15/22

U.S. Cl. 104—290

5 Claims



1. A transport control system with linear motor drive comprising:

a rail-path for providing a route of transport;
a carrier driven along said rail-path by linear motor drive;
a plurality of stator portions coupled to said rail-path to produce a driving force in association with said carrier;

and
a main controller for deriving a plurality of optimum velocities of said carrier at stator portions from an ideal speed control characteristic curve and for sending velocity data of said optimum velocities to stator portions respectively; each of said stator portions including a stator controller for controlling the driving of said carrier, said main controller having means for multiple address transmission of the optimum velocities and means for sending to each respective said stator controller information indicating rail configuration, and said stator controller having means for rail configuration selection, said stator controller selects an optimal velocity of said carrier on the basis of the selection by said rail configuration selection means or the information indicating the rail configuration from said main controller and the velocity data from said main controller.

4,876,967

TRANSPORTER FOR PLANT TRAYS

Robert Postma, Towaco, N.J., assignor to Orle VanWingerden, Pompton Plains, N.J.

Filed Sep. 6, 1988, Ser. No. 240,716

Int. Cl.⁴ B61C 11/00; B61D 15/12

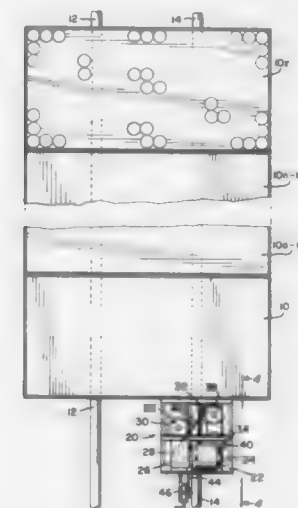
U.S. Cl. 105—30

10 Claims

1. For a plurality of juxtapositioned plant trays movably supported on elongate beams, a transporter for moving said plurality, in unison, along said beams, comprising:

a frame fastened to one of such trays;
first means fastening each of said trays together for coincident movement;
second means, supported on said frame, for grippingly engaging one of said beams; and
third means, secured to said frame, for moving said beam-engaging means along said one beam; wherein

said first means comprises means (a) fastened to a foremost tray of said plurality thereof, (b) fastened to a rearmost



tray of said plurality, and (c) in traverse of trays intermediate said foremost and rearmost trays.

4,876,968

CONTAINER CARRYING RAILROAD CAR WITH IMPROVED SUPPORT SYSTEM

Thomas W. Lindauer, Dyer, Ind., and Richard E. Jamroz, Lansing, Ill., assignors to Thrall Car Manufacturing Company, Chicago Heights, Ill.

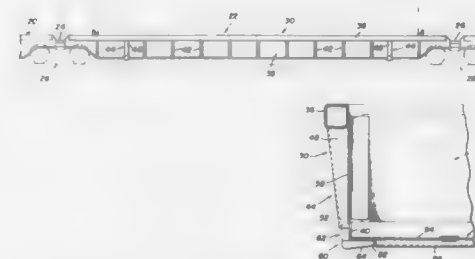
Continuation of Ser. No. 890,284, Jul. 29, 1986. This application May 23, 1988, Ser. No. 197,647

The portion of the term of this patent subsequent to Sep. 20, 2005, has been disclaimed.

Int. Cl.⁴ B61D 3/20, 17/10

U.S. Cl. 105—415

6 Claims



1. A railroad car for carrying containers comprising:
a car body supported by rail truck means adapted for movement over a railroad;
the car body having opposing side walls and an end wall near each end, spaced longitudinally inward of the truck means and connected to the side walls with said side walls and end walls defining a well in which a container can be received;
means for supporting the bottom of a container, when in the well, comprising a plurality of separate individual spaced metal reinforcements joined to each side wall and spaced inward of the well end walls; and
each metal reinforcement having a substantially vertical leg joined at the bottom of and being entirely adjacent a side wall and the reinforcement having an arm extending later-

ally substantially horizontally inward toward the center of the car on which a container bottom can be supported.

4,876,969

ROLLING DISPLAY TABLE FOR ICE SCULPTURES AND THE LIKE

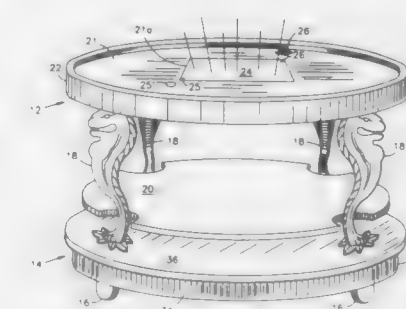
Vittorio Infanti, Staten Island, N.Y., assignor to Infanti Chair Manufacturing Corp., Staten Island, N.Y.

Filed May 13, 1988, Ser. No. 193,908

Int. Cl.⁴ A47B 85/00

U.S. Cl. 108—24

6 Claims



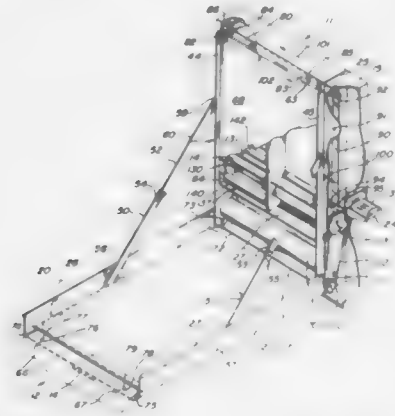
1. A display table for displaying perishable food and the like upon a bed of ice comprising:

hollow upper and lower display table housings;
decorative legs mounted upon said lower housing for supporting the upper housing at a spaced distance above said lower housing;
a plurality of casters being mounted to and just below said lower housing for facilitating rolling movement of said display table;
said upper housing having a recessed display surface which recessed surface is relatively shallow and is watertight for receiving a bed of ice therein;
said lower housing containing a watertight tank fully concealed within said lower housing and having receiving openings;
said recessed display surface having a plurality of drain holes;
flexible drain tubes coupled between said drain holes and receiving openings provided in said tank and running along and substantially concealed by an associated one of said legs for providing means for continuously carrying water away from the recessed display surface and formed due to melting of the ice while at the same time not distracting from the aesthetic appearance of the display table and especially the decorative legs thereof;
said shallow recessed display surface being provided with a centrally located opening;
a transparent member being fitted within said opening to provide a substantially watertight fit between said display surface and said transparent member;
said upper housing having a hollow illumination means receiving region; and
illumination means being provided beneath said transparent member and within said upper housing illumination means receiving region and being secured to said upper housing and beneath said transparent member for providing light which passes through said transparent member.

4,876,970
COIN OPERATED INFANT CHANGING TABLE
 Wendy Boldac, 5285 Elmhurst St., Ventura, Calif. 93003
 Filed Jul. 29, 1988, Ser. No. 225,829
 Int. Cl.⁴ A47B 3/00

U.S. Cl. 108—35

10 Claims



1. A coin operated infant changing table comprising:
 - a wall housing attachable to a vertical surface, said wall housing including a dispensing means for storing and dispensing convenience products;
 - a cover unit, defining a table surface, pivotally secured to said wall housing and rotatable between a closed position against said wall housing and an extended position in which said cover unit extends outwardly from said wall housing to support said table surface horizontally;
 - a pair of hinged support members coupled between said wall housing and said cover unit and forming protective side members adjacent said table surface in said extended position;
 - coin means for locking said cover unit to said wall housing in said closed position and releasing said cover unit when a predetermined combination of coins are received within said coin means; and
 - operating means coupled to said cover unit and said dispensing means, said operating means dispensing a convenience product each time said cover unit is rotated from said closed position to its extended position.

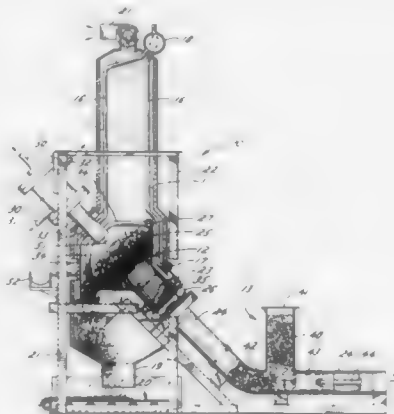
4,876,971
WATER COOLED INCINERATOR
 Chadwell O'Connor, 2024 Galaxy Dr., Newport Beach, Calif. 92660
 Filed Aug. 29, 1988, Ser. No. 237,981
 Int. Cl.⁴ A47J 36/00, 36/24

U.S. Cl. 110—246

4 Claims

1. An incinerator comprising, in combination, a firebox, a funnel shaped burning chamber having a cylindrical portion and open end, said burning chamber rotatably supported in said firebox on an angle so that the lowermost conical portion of the chamber is substantially horizontal, a material receiving chute mounted outside of said firebox and opening into a cylindrical feeding tube, the cylindrical portion of said burning chamber extending through said firebox and being aligned with said feeding tube, a combustion air supply extending into said firebox and ending in a nozzle for driving air into the open

end of the conical portion of the burning chamber, means for rotating said chamber about its axis, and means for forcing

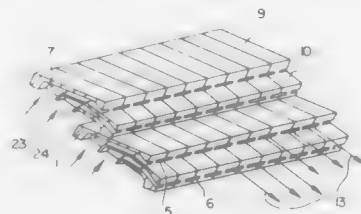


material from said feeding tube into and up the cylindrical portion of said burning chamber.

4,876,972
GRATE BAR ELEMENT FOR A SLIDING GRATE FURNACE FOR GARBAGE INCINERATION
 Louis Mrlkas, c/o Pam. Lör, Feledstr. 21, D-4352 Herten, Fed. Rep. of Germany
 Filed Apr. 21, 1988, Ser. No. 184,378
 Claims priority, application Fed. Rep. of Germany, Apr. 25, 1987, 371608

U.S. Cl. 110—298

6 Claims



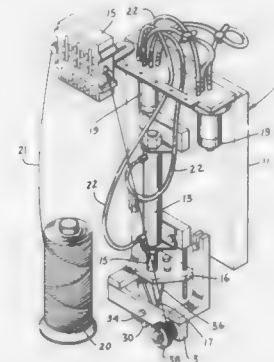
1. Grate bar element for a sliding grate furnace for garbage incineration, where the bar elements are adapted to be arranged lying one on the other like roof tiles and have at their ends openings for the escape of combustion air, characterized in that
 - for multiple circulation of the material (3) to be incinerated each grate bar element (1) has at least two skid surfaces (9, 10) which are limited at their ends by step-like lugs (22, 22a) or shoulders,
 - the air outlet openings are provided in each lug (22, 22a) of the grate bar element (1) and are formed, for horizontal or parallel supply of combustion air onto the adjacent next skid surface (9 or 10), as air outlet slots (5, 6) which extend over largely the total width of the grate bar element (1),
 - for heat removal each grate bar element (1) is subdivided vertically by an inner longitudinal center web, at which air passages (23, 24) for the supply of combustion air to the air outlet slots (5, 6) are formed on both sides.

4,876,973
METHOD OF AND APPARATUS FOR BLIND TUFTING COMPOSITE LAMINATED JOINTS
 Albert A. Marrache, Smyrna, and Frank C. Salpes, Jr., Marietta, both of Ga., assignors to Lockheed Corporation, Calabasas, Calif.

Filed Sep. 4, 1984, Ser. No. 647,062
 Int. Cl.⁴ D05B 21/00

U.S. Cl. 112—121.16

19 Claims

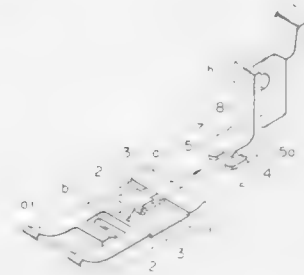


1. A self-threading stitching device for joining uncured composite laminates comprising a machine platform, a vertically reciprocating needle shaft mounted on said platform, means for imparting reciprocating motion to said needle shaft, a thread feeding means operating synchronously with the needle shaft, means for synchronizing the movement of said thread feeding means with the movement of said shaft and self-threading needle means adapted to pick up thread on its down-stroke and to carry said thread through said uncured composite laminate as said needle means penetrates said laminate, said needle means being further adapted to release said thread in said laminate as the needle shaft begins its upward stroke so that a thread loop is left protruding from that side of the composite laminate which is the opposite side from needle entry.

4,876,974
SNAP FIT PRESSER FOOT ASSEMBLY FOR A SEWING MACHINE
 Manabu Ando, Asou, Japan, assignor to Kohshin Seimitsu Kikai Kabushiki Kaisha, Tokyo, Japan
 Filed Dec. 22, 1988, Ser. No. 288,231
 Claims priority, application Japan, Jan. 5, 1988, 63-470
 Int. Cl.⁴ D05B 29/00

U.S. Cl. 112—240

1 Claim



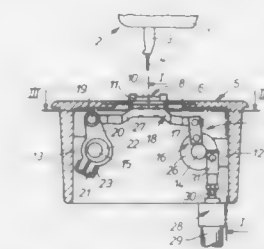
1. A presser foot assembly in a sewing machine comprising: a presser foot "a" comprising a cambered press plate having a needle aperture "b", a guide rise 1 located behind the needle aperture "b" and integrally connected to an upper surface of the cambered press plate "a", opposite side extensions 3, 3 integrally connected to the opposite side

edges of a top surface of the guide rise 1 and a catch pin 2 integrally connected to a front portion of the top of the guide rise 1 and extending laterally beyond the opposite side extensions 3, 3; and a holder "h" which is adapted to be fixed to a body of the sewing machine, said holder "h" having a curved front extension, which curved front extension has a lateral and longitudinal slot 4, 6 to define two opposite resilient pieces 5, 5 and a fitting space, which fitting space is wide enough to permit the insertion of the opposite side extensions 3, 3 of the guide rise 1, and is high or large in vertical dimension, compared with the thickness of the opposite side extensions 3, 3 of the guide rise 1, and further said curved front extension having two opposite recesses 8, 8 facing the opposite resilient pieces 5, 5 to permit the catch pin extending portion 2 to snap in the spaces defined by the recesses 8, 8 and the underlying opposite resilient pieces 5, 5 allowing said presser foot to freely incline about its pivot within controlled limits.

4,876,975
SEWING MACHINE WITH A NEEDLE PLATE INSERT
 Oskar Braun, Hochspeyer, Fed. Rep. of Germany, assignor to Pfaff Industriemaschinen GmbH, Fed. Rep. of Germany
 Filed Jul. 5, 1988, Ser. No. 215,248
 Claims priority, application Fed. Rep. of Germany, Jul. 24, 1987, 8710148

Int. Cl.⁴ D05B 73/12
 U.S. Cl. 112—260

9 Claims



1. An apparatus for adjusting the position of a surface of a needle plate insert which has a needle insertion hole therethrough, relative to the surface of a needle plate which has a recess in which the needle plate insert is movably positionable, comprising an insert carrier movable backwardly and forwardly and having first and second opposite ends, the needle plate insert having a hole therethrough for the passage of a needle, the needle plate insert being connected to said carrier and being positionable in the recess of the needle plate, a first pivotal member articulated to said first end of said insert carrier, a second pivotal member articulated to said second end of said insert carrier, adjustment means pivotally connected to the second pivotal member to raise and lower said carrier and thereby adjust the height of the needle plate insert surface relative to the needle plate, and a rocker arm operatively connected with shifting means, said rocker arm being pivotally mounted to said first pivotal member, said shifting means moving said rocker arm to raise and lower said first end of the needle plate insert carrier to move the surface of said insert carrier between an operating position in which the surface is above said needle plate and a rest position in which the surface of said insert is below said needle plate surface.

4,876,976

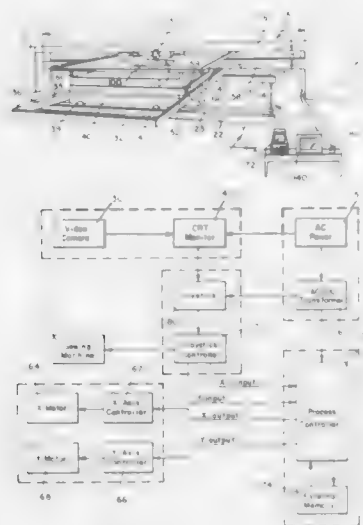
AUTOMATIC QUILTING MACHINE AND METHOD FOR SPECIALIZED QUILTING OF PATTERNS WHICH CAN BE CONTROLLED BY A REMOTE JOYSTICK AND MONITORED ON A VIDEO SCREEN INCLUDING PATTERN DUPLICATION THROUGH A REPROGRAMMABLE COMPUTER

David Brower, Tarzana, and Thomas K. Jernigan, Canoga Park, both of Calif., assignors to TD Quilting Machinery, Burbank, Calif.

Continuation-in-part of Ser. No. 220,734, Jul. 13, 1988. This application Sep. 22, 1988, Ser. No. 247,696
Int. Cl.⁴ D05B 21/00, 11/00

U.S. Cl. 112—262.3

35 Claims



32. The method of repetitively sewing a pattern into a fabric having a large surface comprising:

- positioning a sewing machine head having a source of thread and a sewing needle relative to said fabric;
- retaining said fabric on a movable structure which can be made to move in a horizontal direction relative to the sewing needle and which can cause a portion of the surface of the fabric to be reached by the sewing needle so that thread can be sewn into the fabric;
- obtaining an electronically generated video image of the intersection of the sewing needle and fabric;
- controlling the movement of the movable structure relative to the sewing needle by a remote control apparatus and determining the direction of movement based upon the video image of the intersection of the sewing needle and fabric; and
- storing the information on the movement of the movable structure into the memory of a process controller;
- whereby the process controller can cause the movement of the movable structure relative to the sewing needle to be subsequently repeated at any multiplicity of locations on the fabric.

4,876,977

SELECTED PATTERN DISPLAY DEVICE OF SEWING MACHINE

Takumi Ando, and Takayuki Kawasato, both of Tokyo, Japan, assignors to Janome Sewing Machine Company Limited, Japan

Filed Apr. 22, 1988, Ser. No. 184,851

Claims priority, application Japan, Apr. 24, 1987, 62-99694; Mar. 11, 1988, 63-56121

Int. Cl.⁴ D05B 3/02

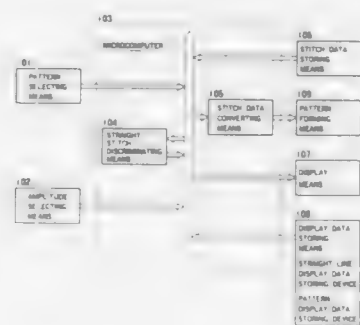
U.S. Cl. 112—445

4 Claims

1. A selected pattern display device of a sewing machine having a laterally elongated needle dropping hole of a pre-

termined range formed in a needle plate thereof, within which a vertically reciprocating needle may be swingable from minimum to maximum so that a straight stitch pattern and various zigzag patterns of variable amplitudes may be selectively produced, including pattern selecting means selectively operated to select stitch data for a stitch pattern selected from a plurality of different patterns including a straight stitch pattern stored in pattern storage means, amplitude selecting means selectively operated to select a numeral value for determining an amplitude of the selected pattern, and display means for displaying the selected pattern and the amplitude determining numeral value for the selected pattern, said selected pattern display device comprising:

- means for discriminating if the selected pattern is the straight stitch pattern, said discriminating means producing a signal when the selected pattern is the straight stitch pattern;



- memory means storing groups of display data for graphically displaying a plurality of patterns showing in different combinations the laterally elongated needle dropping hole and a needle position determined with respect to said needle dropping hole for producing a series of straight stitches, said memory means being responsive to said signal from said discriminating means and said numeral value produced from said amplitude selecting means to produce one of said groups of display data to said display means to thereby display therein one of said graphic patterns; and

- stitch data converting means responsive to the stitch data for the straight stitch pattern read out from said pattern storage means and to said numeral value produced from said amplitude selecting means to determine the needle position with respect to said laterally elongated needle dropping hole in accordance with said numeral value produced from said amplitude selecting means.

4,876,978

COUPLING BETWEEN TWO PARTS WHICH ARE MOVABLE WITH RESPECT TO EACH OTHER

Geoffery O'Nion, Monte Carlo, Monaco, and Jean C. Gramet, Beaulieu, France, assignors to Single Buoy Moorings Inc., Marly, Switzerland

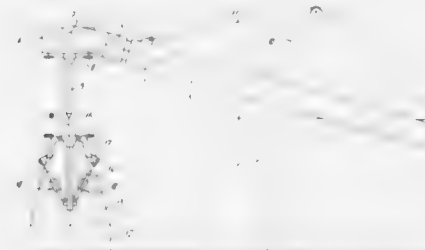
Filed Jul. 11, 1988, Ser. No. 217,225

Claims priority, application Netherlands, Jul. 10, 1987, 8701637

Int. Cl.⁴ B64G 1/64

U.S. Cl. 114—230

5 Claims



- Coupling for performing a connection between a vessel and a mooring device, comprising a pin pivotably suspended from one of said vessel and mooring device as well as a receiving unit on the other of said vessel and mooring device with guide means for receiving the pin to perform said connection between said vessel and said mooring device; the improvement wherein the receiving unit is a substantially vertical sleeve which is swingably suspended about at least two perpendicular axes, which sleeve below its place of suspension is connected to at least two lockable struts distributed about the axis of the sleeve and adapted to allow or block respectively the swinging movements of the sleeve, said struts comprising cylinder-piston units having liquid spaces mutually connected by a hydraulic circuit having shut-off valves, which valves in their open position allow the flow of liquid from one said unit into at least one other said unit to allow free swinging movement of the said sleeve and which in the closed position block the pistons within their respective cylinders, said struts being connected with the body supporting the sleeve through the intermediation of a buffer.

4,876,979

APPARATUS FOR DEPLOYING AND RECOVERING A SEABORNE VESSEL

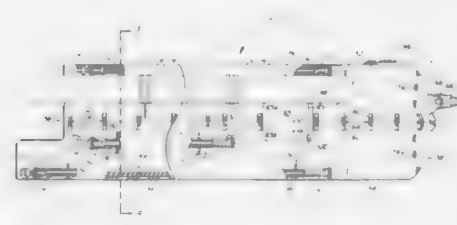
Jim M. Walton, and Arthur E. Munson, both of San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 11, 1988, Ser. No. 142,898

Int. Cl.⁴ B63B 21/66

U.S. Cl. 114—258

23 Claims



- An apparatus for shipboard deployment and recovery of a seaborne vessel, comprising:
muzzle means for selectively gripping the exterior of the

vessel and retaining the vessel so that the vessel may be towed;

cocoon means having a hollow interior, a bow end, and a stern end, the stern end being open for receiving the muzzle means and attached vessel into the interior of the cocoon;

first tensile means connected to the muzzle means, the tensile means being threaded through the aperture in the bow end of the cocoon for towing the muzzle and vessel retained therein in the cocoon; and

second tensile means connected to the cocoon for towing the cocoon; and

inflatable resilient bladder means mounted in the interior of the cocoon for snugly engaging and retaining the vessel within the cocoon and for providing the vessel with shock attenuation protection upon introduction of pressurized fluid therein.

4,876,980

FISHING ROD HOLDER EXTENSION

Randall R. Bell, III, 4135 Baisden Dr., Pensacola, Fla. 32503

Filed Nov. 22, 1988, Ser. No. 274,834

Int. Cl.⁴ A01K 97/00; B63B 17/00

U.S. Cl. 114—364

12 Claims



- In combination with a boat including opposite side gunnels and a transom extending between and interconnecting the aft ends of said gunnels, at least one of said gunnels including an upwardly and outwardly inclined upwardly opening fishing rod handle receiving socket, a generally Z-shaped extension including substantially parallel and relatively longitudinally offset elongated first and second end portions and an angled connecting member extending between and rigidly connecting adjacent ends of said end portions, the end of one of said end portions remote from said connecting member being removably telescopically received in said socket, a fishing rod including handle and tip ends and having the handle end thereof removably telescopically received in the end of the other end portion remote from said connecting member.

4,876,981

BICYCLE SAFETY FLAG

Jill P. Barnhart, 2837 E. Arden Ln., Merced, Calif. 95340

Filed Oct. 8, 1987, Ser. No. 106,628

Int. Cl.⁴ G09F 17/00

U.S. Cl. 116—173

14 Claims

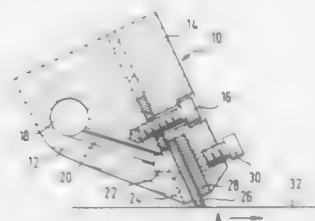
- A bicycle safety flag comprising:
a mounting pole adapted for fastening to a bicycle frame at one end, rising substantially vertically from that end; and
a body mounted at the opposite end of the mounting pole having a flexible plastic upper perimeter frame, a fabric sheet stretched over the frame, the fabric sheet having an upper perimeter supported by the frame and a bottom

edge not supported by the frame, and a vertical sleeve along the fabric sheet spaced apart from the ends of the



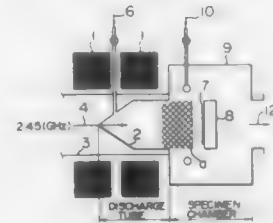
frame into which the mounting pole can be inserted for mounting the body to the mounting pole.

4,876,983
APPARATUS FOR THE APPLICATION OF LIQUID ADHESIVES TO A SUBSTRATE
Henning J. Claassen, Industriegebiet Hafen, 2120 Lüneburg, Fed. Rep. of Germany
Filed Jun. 6, 1988, Ser. No. 202,611
Claims priority, application Fed. Rep. of Germany, Jun. 30, 1987, 3721593
Int. Cl.⁴ B05C 1/04
U.S. Cl. 118—406 10 Claims



1. An apparatus for the application of liquid adhesives to a substrate, comprising:
a supply container for the adhesive;
a conduit connected to said supply container;
an applicator nozzle defining a slit-shaped outlet opening and connected to the supply container via said conduit;
a supply passage;
a spreading chamber connected to said slit-shaped outlet opening via said supply passage;
a doctor blade of sheet metal being arranged at the slit-shaped outlet opening; and
a clamp support securing said doctor blade to said nozzle at said slit-shaped outlet opening, said clamp support including an engaging clamp plate connected to said nozzle with a clamp screw.

4,876,983
PLASMA OPERATION APPARATUS
Takuya Fukuda, Hitachi; Yasuhiro Mochizuki, Katsuta; Naohiro Momma, Hitachi; Shigeru Takahashi, Hitachi; Noboru Suzuki, Hitachi; Tadao Sonobe, Iwaki; Kiyosi Chiba, and Kazuo Suzuki, both of Hitachi, all of Japan, assignors to Hitachi, Ltd. and Service Engineering Co. Ltd., both of Tokyo, Japan
Filed Jan. 19, 1988, Ser. No. 145,371
Claims priority, application Japan, Jan. 19, 1987, 62-8062; Mar. 2, 1987, 62-45259; Mar. 6, 1987, 62-50090
Int. Cl.⁴ C23C 16/00, 14/00
U.S. Cl. 118—722 18 Claims

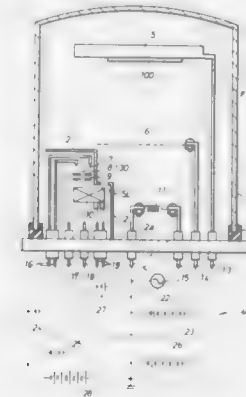


1. A plasma operation apparatus comprising:
a discharge tube forming a part of discharge space and into which a discharge gas is admitted;
magnetic field generation means for generating a magnetic field within the discharge space in said discharge tube;
means for introducing a microwave into the discharge space in said discharge tube; and
a specimen chamber coupled to said discharge tube and housing a specimen stand for holding a specimen to be operated,
said magnetic field has magnetic flux density having the shape of distribution which substantially monotonously decreases, starting from the microwave incident space, toward said specimen stand,
wherein a resonance conditioning position at which said magnetic field and microwave cooperate together to cause electron cyclotron resonance is located at least partially within said specimen chamber.

4,876,984
APPARATUS FOR FORMING A THIN FILM
Mikio Kinoshita, Kawasaki; Wasaburo Ohta, Yokohama, and Toru Miyabori, Kawasaki, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan
Filed Jun. 9, 1988, Ser. No. 204,279
Claims priority, application Japan, Jun. 12, 1987, 62-146554; Jun. 12, 1987, 62-146555
Int. Cl.⁴ C23C 8/36, 14/32, 16/50
U.S. Cl. 118—723 7 Claims

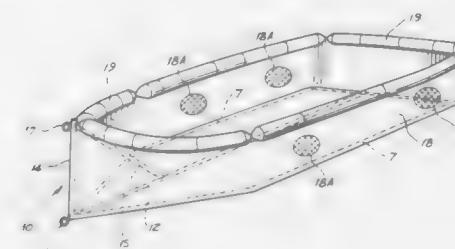
1. An apparatus for forming a thin film comprising:
a vacuum container evacuated to high vacuum and receiving a gas for vapor deposition therein;
a source of evaporation disposed within said container for evaporating a substance to be evaporated;
a counter electrode disposed within said container and holding a substrate to be vapor-deposited such that said substrate opposes said source;
a grid disposed between said source and said electrode for allowing said evaporated substances to pass therethrough and accelerating said evaporated substances;
an electronic gun disposed within said container for emitting thermions, which are hit on said evaporated substances existing between said source and said electrode to ionize said evaporated substances;
a guiding means for deflecting electromagnetically a path of said emitted thermions and guiding said emitted thermions toward a space in the vicinity of said grid;
a shielding member disposed within said container for pre-

venting a direct impact, onto said substrate, of particles including said thermions emitted from said gun, and



a slit disposed in said shielding member for allowing said guided thermions to pass therethrough and arrive at said space.

4,876,985
METHOD OF AND APPARATUS FOR BREEDING AND/OR RAISING SHELL FISH SUCH AS GIANT CLAM
Bruce Marcum, and Robert C. Reynolds, Bayview Heights, both of Australia, assignors to Pacific Clam Pty. Ltd., Australia
Filed Apr. 24, 1987, Ser. No. 42,157
Claims priority, application Australia, Apr. 24, 1986, PH5615
Int. Cl.⁴ A01K 61/00
U.S. Cl. 119—4 9 Claims



4. A larval tank for growing and raising fertilized eggs of shell fish, such as giant clams, said larval tank comprising a base frame having a substantially flat support platform for the support of growing shell fish, a flexible non-rigid sheet material side wall extending upwardly from the perimeter of the base frame, the entire support platform being substantially rigid, a ring of buoyant material extending around the upper edge of the side wall adapted to support the tank when floating in water, and anchor means arranged to locate the tank at a desired position relative to the sea bed.

4,876,986
HEAT REGENERATOR TO RECOVER BOTH SENSIBLE AND HEAT OF CONDENSATION OF FLUE GASES
Arthur F. Johnson, Boulder, Colo., assignor to Energy Conservation Partnership, Ltd., Boulder, Colo.
Division of Ser. No. 885,902, Jul. 15, 1986, Pat. No. 4,703,794.
This application Sep. 11, 1987, Ser. No. 96,183
Int. Cl.⁴ F28F 21/08, 13/12
U.S. Cl. 122—20 B 3 Claims

1. A heat regenerator for recovery of heat from fossil fuel boiler flue gases, comprising:
(a) a closed loop of piping of a corrosion-resistant material containing recirculating water, water in a first end of said

loop being heated by exposure to said flue gases, and water in a second end of said loop being cooled by air subsequently supplied to a fossil fuel boiler for combustion, whereby said combustion air is preheated by said flue gases;
(b) means for forcibly circulating said water in said loop;
(c) plural sections of tubing containing boiler feedwater

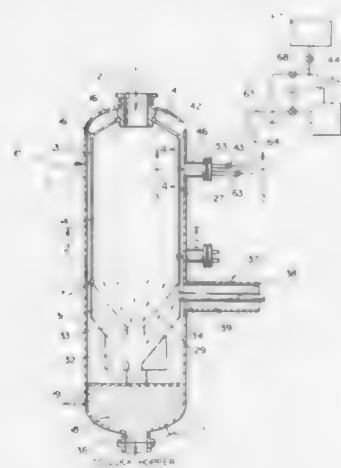


being physically exposed to said flue gases for reheating said feedwater using the heat of said flue gases; and
(d) a bed of members sized to ensure turbulent flue gas flow surrounding said plural sections of tubing exposed to said flue gases and said first end of said loop of piping; whereby relatively efficient heat transfer between said flue gases, said water in said closed loop, and said boiler feedwater is ensured.

4,876,987
SYNTHETIC GAS COOLER WITH THERMAL PROTECTION
Michael C. Martin; Beth E. McCracken, and George M. Gulko, all of Houston, Tex., assignors to Texaco, Inc., White Plains, N.Y.
Filed Jun. 27, 1988, Ser. No. 211,934
Int. Cl.⁴ F22B 37/38
U.S. Cl. 122—504.2 7 Claims

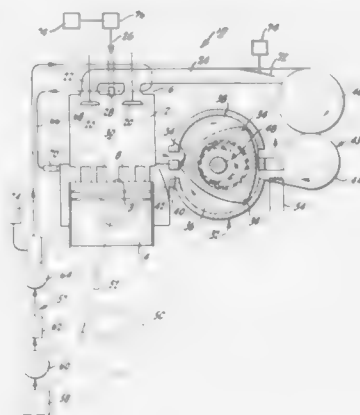
1. In a heat exchange apparatus for treating a stream of a hot, particulate carrying gas, said apparatus including:
an elongated shell having an inlet port for receiving said hot particulate carrying gas, and having an outlet port for discharging cooled, substantially particle free gas,
a water wall positioned in said elongated shell defining a heat exchange chamber having a downstream end and being spaced from said shell to form an annular passage, passage means communicating said inlet port with said heat exchange chamber to introduce hot, particulate carrying gas to the latter, and
cross passage means communicating the heat exchange chamber downstream end with said discharge port and with said annular passage, respectively, the improvement therein of
a pressure monitoring system associated with said heat exchange apparatus and including means forming a gas pressure differential indicator,

first conduit means communicating said heat exchange chamber with said gas pressure differential indicator and

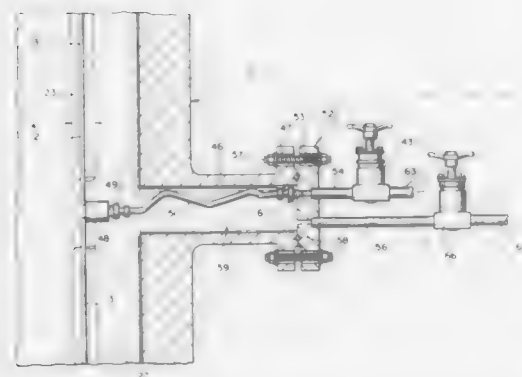


supply including a fuel supply line to the intake port that includes means for cooling hot areas of the engine while preheating the fuel before injection into the combustion chamber,

means for varying the proportion of fuel injection from the first fuel injection means from 100% to 5% of fuel required for a lean combustible mixture and concurrently



varying the fuel injected from the second fuel injector means to provide a fuel charge that provides the balance of fuel required for such lean combustible mixture wherein the fuel charge from the second fuel injector means is maintained sufficiently lean to prevent premature detonation, wherein detonation results upon injection of fuel by the first injection means.



second conduit means communicating said annular passage with said gas pressure differential indicator.

4,876,988

COMBINED FUEL ENGINE

Marius A. Paul, and Ana Paul, both of 967 La Paz, Placentia, Calif. 92670

Filed Jun. 13, 1988, Ser. No. 206,229

Int. Cl.⁴ F02B 75/12

U.S. Cl. 123-1 A

10 Claims

1. A combined fuel engine for reduced emission pollution comprising:

a cylinder with at least one piston reciprocal therein with a cycle having at least a compression stroke and a power stroke, the cylinder and piston forming in part a combustion chamber,

an air intake port and a combustion gas exhaust port communicating with the combustion chamber,

first fuel injection means with a first fuel supply for injecting a first conventional fuel from the high carbon group including gasoline and diesel oil stored in the first fuel supply into the combustion chamber proximate the cycle time of peak compression at the end of the piston compression stroke, and

second fuel injection means with a second fuel supply for injecting a second auxiliary fuel from the high hydrogen group including methanol, ethanol and liquefied natural gas stored in the second fuel supply into the intake port of the combustion chamber proximate the cycle time of low compression at the beginning of the piston compression stroke after the exhaust port is closed, the second fuel

ENHANCED PERFORMANCE OF ALCOHOL FUELED ENGINE DURING COLD CONDITIONS

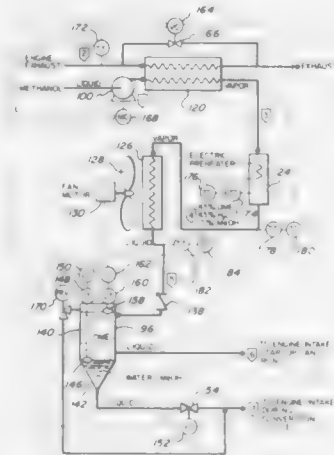
Michael E. Karpuk, Boulder, and Scott W. Cowley, Lakewood, both of Colo., assignors to Technology Development Associates, Inc., Wheat Ridge, Colo.

Filed May 10, 1988, Ser. No. 192,243

Int. Cl.⁴ F02B 43/08

U.S. Cl. 123-3

41 Claims



1. Apparatus for enhancing performance of an internal combustion engine under cold conditions, said apparatus comprising:

generating means for generating ether from alcohol on-board a vehicle having said internal combustion engine thereon, said generating means including dehydration means having vaporizing means for receiving said alcohol, superheater means for receiving said vaporized alcohol

and heating the same to the alcohol reaction temperature, and catalytic means for receiving said heated vaporized alcohol and causing said ether to be generated therefrom;

and application means for applying said ether to said engine whereby at least one of cold starting and cold operation of said engine can be effected.

4,876,991

TWO STROKE CYCLE ENGINE

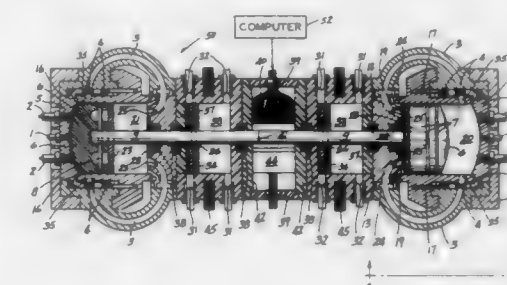
Kenneth A. Galitello, Jr., P.O. Box 25, Torrington, Conn. 06790

Filed Dec. 8, 1988, Ser. No. 281,530

Int. Cl.⁴ F02B 71/00

U.S. Cl. 123-46 E

25 Claims



4,876,990

SPRAY NOZZLE ASSEMBLY FOR PISTON COOLING

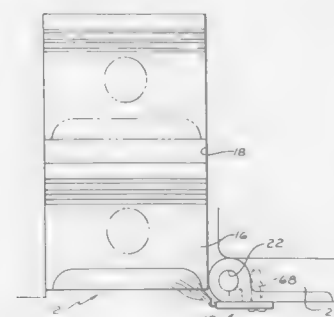
David H. Hodgkins, Granby, and Leon P. Janik, Suffield, both of Conn., assignors to Stanadyne Automotive Corp., Windsor, Conn.

Continuation-in-part of Ser. No. 203,439, Jun. 7, 1988, abandoned. This application Sep. 30, 1988, Ser. No. 251,906

Int. Cl.⁴ F01P 3/08

U.S. Cl. 723-41.35

15 Claims



10. A nozzle assembly for cooling the crown of a piston in an internal combustion engine, comprising:

housing means having a first end and an opposing second end and integrally forming a transversely protruding inlet well defining an inlet opening intermediate said first and second ends;

cover plate means having a first end and an opposing second end, the cover plate means being secured to set housing means so that said cover means cooperates with said housing means to define a passageway from said well to the first ends of the housing means and cover plate means;

an intermediate plate member located between and substantially coextensive with housing means and the cover plate means, and having first and second ends adjacent the first and second ends of the housing means and an orifice substantially coaxial with respect to the inlet well;

a nozzle tip member having one end mounted in said passageway and another end projecting from the housing means and adapted to discharge fluid in a predetermined spray pattern;

valve means comprising a valve member interposed between the inlet opening and said passageway and captured between said housing means and said intermediate plate means to interrupt the passage of fluid from said inlet opening to said nozzle tip member when said fluid has a pressure below a preestablished threshold;

wherein one of the housing means and cover plates means includes integral retaining flanges being bent around and against the other of said housing means and cover plate means to secure the housing means, cover plate means, intermediate plate member and nozzle tip member in assembled relationship.

1. For use in a free-piston two stroke cycle engine, a piston rod assembly comprising a rigid unitary connecting rod having first and second ends and a longitudinal center, first and second power pistons mounted on said first and second ends, respectively, said connecting rod having, substantially at said longitudinal center, a circumferential groove therearound, said groove providing a slot for use in determining the position and velocity of said piston rod assembly, and first and second power transfer pistons of high strength permanent magnet material rigidly mounted on said connecting rod at first and second locations, respectively, said first location being between said groove and said first end and said second location being between said groove and said second end.

4,876,992

CRANKSHAFT PHASING MECHANISM

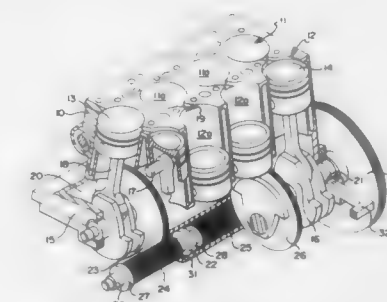
Rafal A. Sobotowski, Bay Village, Ohio, assignor to Standard Oil Company, Cleveland, Ohio

Filed Aug. 19, 1988, Ser. No. 234,561

Int. Cl.⁴ F02B 75/04

U.S. Cl. 123-48 R

7 Claims



1. In a VCR engine having two crankshafts which rotate about parallel axes, one or more pairs of pistons with one piston in each pair linked to one of the crankshafts and the other piston in each pair linked to the other crankshaft, the pistons in each pair operating in interconnected cylinders, a phase adjuster mechanism including an axially movable adjuster member and two pairs of helical phasing gears, said member rotatable about an axis parallel to the axes of rotation of the crankshafts and supported by radial sliding bearings, each pair of said phasing gears consisting of a phasing gear fixedly mounted on a respective one of said crankshafts and a respective wider phasing gear operatively engaged therewith and fixedly mounted on the adjuster member, the respective helix angles and directions of helices of said phasing gears

being arranged to alter the phase relation between the two crankshafts in response to axial displacement of the adjuster member, the combination comprising:

- an engine block;
- connecting rod means operatively associated with the crankshaft;
- each of said crankshafts together with the connecting rod means associated therewith sweeping a respective envelope during engine operation;
- each of said two phasing gears on said adjuster member bounded by a respective imaginary cylindrical surface whose axis coincides with and whose points are equidistant from the axis of rotation of said adjuster member, and whose diameter is equal to the outside diameter of said phasing gear bounded thereby and which extends axially along the length of said engine block without intersecting said envelopes.

4,876,993

FUEL SYSTEM WITH VAPOR BYPASS OF OIL-FUEL MIXER HALTING OIL PUMPING

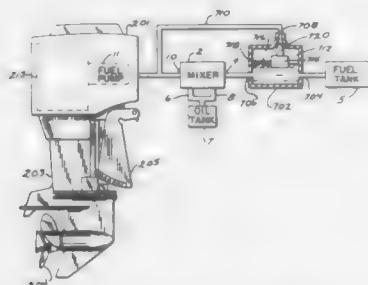
Gordon C. Slattery, Osmo, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Jul. 12, 1988, Ser. No. 217,655

Int. Cl.⁴ F02B 33/02

U.S. Cl. 123—73 AD

6 Claims



1. A marine propulsion system comprising an outboard two cycle internal combustion engine, a fuel tank, an oil tank, an oil-fuel mixer having a fuel inlet receiving fuel from said fuel tank, an oil inlet receiving oil from said oil tank, and an oil-fuel outlet delivering an oil-fuel mixture to said engine, a vapor separator coupled to said mixer and removing fuel vapor from said fuel, wherein said vapor separator is connected between said fuel tank and said mixer.

4,876,994

HYDRAULIC PLAY COMPENSATION ELEMENT

Walter Speil, Ingolstadt; Bolko Schussel, Erlangen, and Dieter Schmidt, Nuremberg, all of Fed. Rep. of Germany, assignors to INA Walzlager Schaeffler KG, Fed. Rep. of Germany

Filed Apr. 14, 1989, Ser. No. 337,952

Claims priority, application Fed. Rep. of Germany, Apr. 30, 1988, 3814700

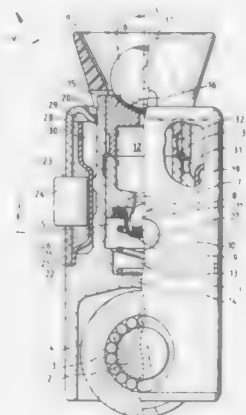
Int. Cl.⁴ D01L 1/24; F15B 15/08

U.S. Cl. 123—90.5

10 Claims

1. A hydraulic play compensation element for the drive of a valve of an internal combustion engine comprising a housing in which a hollow piston is mounted so as to be acted upon by oil pressure via a non-return valve, the hollow piston being surrounded by an oil reservoir which communicates via an oil passage with the inner space of the hollow piston and in which a sleeve is inserted which forms with a part of its wall an oil transfer channel between an oil inlet in the housing and an upper region of the reservoir, characterized in that the sleeve has a shaped section in which an anti-torsion body is propped which is inserted in a recess of the housing, the sleeve covers the oil reservoir against the recess and the oil transfer channel

opens into the oil reservoir at a first circumferential point which is located higher than other circumferential points in the



torsion-proof assembled position of the play compensation element when the longitudinal axis (L) is in a slanting position.

4,876,995

VALVE OPERATION CONTROL DEVICE FOR INTERNAL COMBUSTION ENGINE

Yutaka Otake, Saitama, and Noriyuki Kishi, Tokyo, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

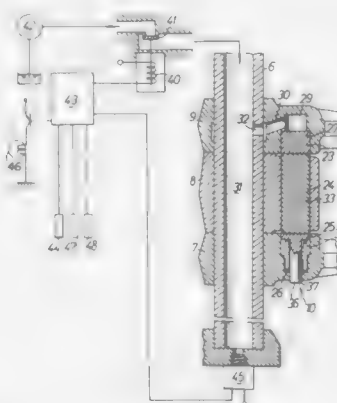
Filed Jun. 23, 1988, Ser. No. 210,409

Claims priority, application Japan, Jun. 25, 1987, 62-158491

Int. Cl.⁴ F01L 9/02, 1/34

U.S. Cl. 123—90.12

13 Claims



1. In a valve operation system for an internal combustion engine having a selective coupling mechanism for operating an engine operating valve in one of a plurality of opening and closing modes of operation dependent on the level of hydraulic pressure applied to said mechanism, a control valve disposed between said selective coupling mechanism and a hydraulic pressure source for varying the level of hydraulic pressure supplied to said mechanism, and control means for controlling the operation of said control valve dependent upon the operating conditions of said engine, means for determining the operability of said valve operation system comprising:

- a hydraulic pressure detector for detecting the level of hydraulic pressure supplied to said selective coupling mechanism;
- means for imparting to said control means a signal representative of the respective modes of operation of said control valve;
- means for imparting to said control means signals representa-

tive of the level of pressure detected by said hydraulic pressure detector; and
said control means including means for comparing the signals imparted thereto by said two signal imparting means for determining whether said signals correspond to each other.

4,876,996

DEVICE FOR THE VALVE CONTROL GEAR OF AN INTERNAL COMBUSTION ENGINE

Ernst Mayer, Grossenseebach; Norbert Geheeb, Bamberg, and Uwe Köhler, Aidingen, all of Fed. Rep. of Germany, assignors to INA Walzlager Schaeffler KG, Fed. Rep. of Germany

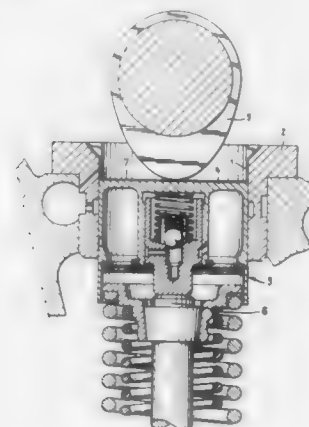
Filed Mar. 7, 1989, Ser. No. 319,957

Claims priority, application Fed. Rep. of Germany, Mar. 23, 1988, 3809702

Int. Cl.⁴ F01L 3/04, 1/14, 1/16

U.S. Cl. 123—90.51

6 Claims



1. A device for the valve control gear of an internal combustion engine a surface of which acts as a stop face for a cam, characterized in that a chromium coating is applied to the stop face, the maximum thickness of this coating being 5 μ m.

4,876,997

SELF-ADJUSTING HYDRAULIC VALVE TAPPET

Helmut Zorn, and Georg Schaeffler, both of Herzogenaurach, Fed. Rep. of Germany, assignors to INA Walzlager Schaeffler KG, Fed. Rep. of Germany

Filed Feb. 27, 1989, Ser. No. 316,467

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1988, 3810436

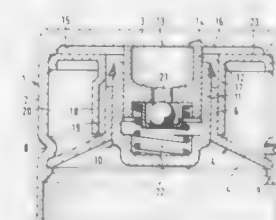
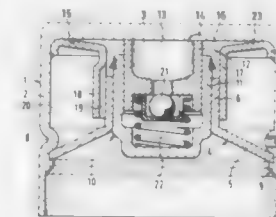
Int. Cl.⁴ F01L 1/14, 1/24

U.S. Cl. 123—90.52

8 Claims

1. A self-adjusting hydraulic valve tappet arranged in a guide bore of a cylinder head of an internal combustion engine against whose one end face a cam abuts and whose other end face lies against a valve stem whereby the valve tappet comprises a cup-shaped housing made up of a hollow cylindrical wall closed at one end by an end member against whose outer surface the cam abuts and in which a guide sleeve is arranged concentrically with the hollow cylindrical wall, the guide sleeve being integrally formed at its end away from the end member with a disk member which at its outer periphery verges into the hollow cylindrical wall of the housing and which guide sleeve at its other end is at a distance from the end member where in an actual play compensating element is mounted in the guide sleeve for longitudinal displacement and is comprised of an inner piston and an outer overlapping piston placed within one another for longitudinal displacement, and together defining a high-pressure oil reservoir connected with a central oil reservoir by a bore in the inner piston closed by a check valve, the central oil reservoir being located in the inner piston and defined by the wall of the inner piston and by the

inner surface of the end member of the housing against which the inner piston sits close with its end face whereas the outer piston is mounted in the cylindrical guide sleeve for longitudinal displacement and lies against the end of the valve stem with its closed end wherein an annular oil reservoir is defined by the hollow cylindrical wall, the guide sleeve, the actual play compensating element, the end member and the disk member and fed with oil through a bore leading to the outside and wherein



a sleeve starting from the end member is provided which overlaps the guide sleeve and extends to near the disk member forming a channel between the sleeve and the guide sleeve which permits the transfer of oil from the annular oil reservoir to an annular space defined by the sleeve and the inner piston, characterized in that the sleeve is provided at its end adjacent to the end member with an outwardly directed radial flange extending to the hollow cylindrical wall.

4,876,998

CRANKCASE FOR INTERNAL COMBUSTION ENGINES

Peter Wünsche, Graz, Austria, assignor to 501 AVL Gesellschaft für Verbrennungskraftmaschinen und Messtechnik MbH, Graz, Austria

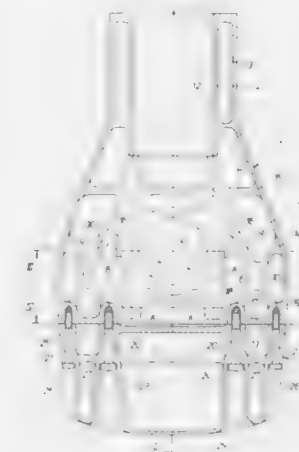
Filed Sep. 19, 1988, Ser. No. 245,829

Claims priority, application Austria, Sep. 22, 1987, 2404/87

Int. Cl.⁴ F02B 77/00

U.S. Cl. 123—198 E

5 Claims



1. A crankcase for an internal combustion engine, comprising main crankshaft bearing walls and sidewalls, said bearing walls comprising main bearing seats and main lower bearing

4,877,004

INTERNAL COMBUSTION ENGINE FOR A VEHICLE
Hiroyuki Nakazawa, Kyoto, Japan, assignor to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

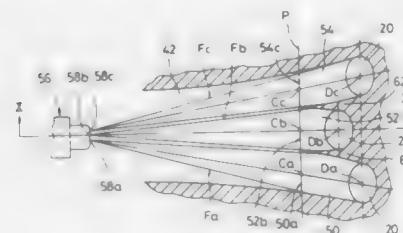
Filed Dec. 12, 1988, Ser. No. 283,227

Claims priority, application Japan, Dec. 18, 1987, 62-192081(U)

Int. Cl.⁴ F02B 15/00

U.S. Cl. 123—432

9 Claims



1. An internal combustion engine for a vehicle which has at least one combustion chamber, said engine comprising: port means defining three intake ports opening into said combustion chamber; an intake valve unit for opening and closing said three intake ports; passage means defining an intake passage connected to said combustion chamber through said three intake ports; partition wall means for dividing the lower-course region of said intake passage on the intake-port side into three separate branch intake passages leading to said individual intake ports; and a fuel injection valve disposed on the upper course side of said branch intake passages of said intake passage and adapted to inject a fuel into said intake passage, said fuel injection valve including an injection end face fronting the inside of said intake passage and three jets through which atomized fuel flows of substantially equal quantities are injected toward said branch intake passages corresponding thereto, said jets being formed in said injection end face.

4,877,005

FUEL INJECTION PUMPING APPARATUS

David J. C. Law, London, and Lakhbir S. Panesar, Feltham, both of Great Britain, assignors to Lucas Industries Public Limited Company, Birmingham, England

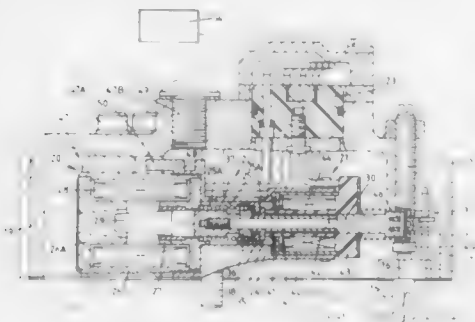
Filed Mar. 20, 1989, Ser. No. 326,155

Claims priority, application United Kingdom, Mar. 25, 1988, 8807137

Int. Cl.⁴ F02M 38/00

U.S. Cl. 123—458

6 Claims



1. A fuel injection pumping apparatus for supplying fuel to an internal combustion engine comprising a high pressure fuel

pump to which fuel is supplied through an angularly adjustable throttle member from a low pressure pump, an axially movable connecting rod, one end of said rod being coupled to said throttle member by means of a link which is pivotally coupled to said one end of the rod and to an arm integral with the throttle member, an electromagnetic actuator for moving the rod in response to a control signal supplied by an electronic control system, the actuator moving the throttle member in a direction to increase the amount of fuel supplied to the high pressure pump, said electromagnetic actuator including an armature which is connected to the other end of the rod, a transducer for providing a signal to said control system indicative of the setting of said throttle member, said transducer including a core which is carried by said rod intermediate the ends thereof, a first spring acting between said one end of the rod and a fixed part to oppose movement of the rod and throttle member by the actuator and a second spring acting to assist the action of the first spring said second spring acting on said rod adjacent the other end thereof.

4,877,006

AIR-FUEL RATIO CONTROL METHOD FOR INTERNAL COMBUSTION ENGINE

Kunio Noguchi, Yuzuru Koike, and Kazushige Toshimitsu, all of Wako, Japan, assignors to Honda Giken Kogyo K.K., Tokyo, Japan

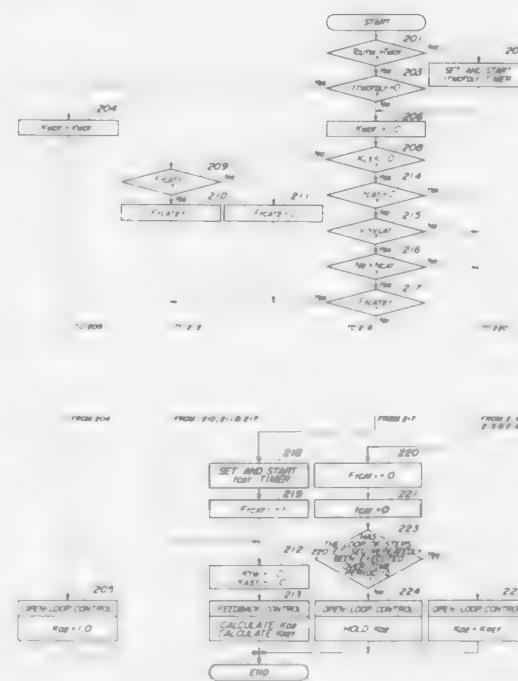
Filed Sep. 1, 1988, Ser. No. 239,786

Claims priority, application Japan, Sep. 8, 1987, 62-224803

Int. Cl.⁴ F02M 23/04

U.S. Cl. 123—589

12 Claims



1. A method of controlling the air-fuel ratio of a mixture of fuel supplied to an internal combustion engine having an exhaust system and an exhaust-gas concentration sensor provided in said exhaust system, wherein feedback control is effected in response to an output from said exhaust-gas concentration sensor to bring the air-fuel ratio to a predetermined value when said engine is in a predetermined medium-load operating region, the method comprising the steps of:

(1) determining whether or not said engine is in a predetermined high-load operating region in which the feedback

- control is interrupted for bringing the air-fuel ratio to a value smaller than said predetermined value;
- (2) determining whether or not said engine is in a predetermined low-load operating region in which the feedback control is interrupted for bringing the air-fuel ratio to a value larger than said predetermined value; and
 - (3) effecting the feedback control even when said engine is in said predetermined low-load operating region, if said engine continually stayed over a first predetermined time period in said predetermined high-load operating region, and has shifted to said low-load operating region within a second predetermined time period after leaving said predetermined high-load operating region.

4,877,007

SLING BOW

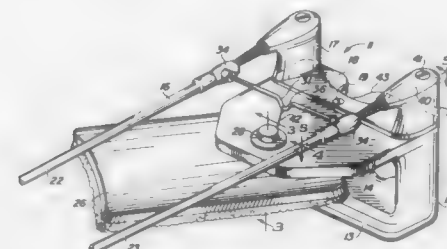
Elwin N. Olson, 361 N. Washington St., P.O. Box 507, Wickenburg, Ariz. 85358

Filed Aug. 5, 1988, Ser. No. 228,501

Int. Cl.⁴ F41B 7/00

U.S. Cl. 124—22

10 Claims



1. A sling bow comprising a handle, a pair of spaced sling posts connected to said handle, a flexible sling having its opposite ends connected respectively to said posts and having arms extending rearwardly from the posts to receive the nock of an arrow, the arms of said sling being made at least in part of elastic material so that they can be stretched and released to propel an arrow from the bow between the posts, and an arrow rest extending between the arms of said sling, said arrow rest being secured to and supported solely by flexible regions of said sling arms in spaced relation to and moveable with respect to said posts, the flexible arms of said sling providing the sole support for said arrow rest whereby the rest drops out of the path of the arrow when the sling is released to launch an arrow.

4,877,008

CROSSBOW TRIGGER MECHANISM

William C. Troubridge, R.R. No. 1, Breslau, Ontario, Canada (NOB 1M0)

Filed Nov. 28, 1984, Ser. No. 675,543

Claims priority, application Canada, Apr. 17, 1984, 452246

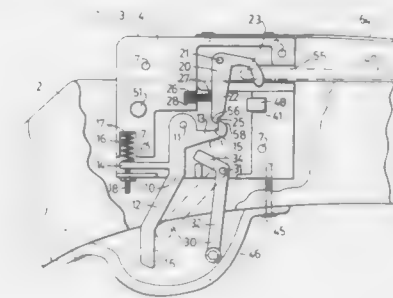
Int. Cl.⁴ F41B 5/00

U.S. Cl. 124—25

12 Claims

1. A crossbow trigger mechanism comprising:
 - (a) a mechanism-containing case adapted for installation in a crossbow stock;
 - (b) a forward-opening bowstring entry area in the upper portion of said case for receiving a bowstring;
 - (c) a one-piece trigger pivotally installed in a lower portion of said case, said trigger comprising a trigger arm extending downwardly from the trigger pivot point and out of the case and an integral sear arm extending forwardly from said trigger pivot point, said sear arm having a rearward-facing sear surface, such that said sear arm and its sear surface move downwardly when said trigger arm is pulled rearwardly, the length of said sear arm and said

- trigger arm being such that a mechanical advantage of in excess of 2.1 is achieved; and
- (d) a catch pivotally installed in said case, its pivot point being slightly above the plane of said bowstring entry area and said bowstring, said catch comprising a bowstring-retaining hook portion extending forwardly from said catch pivot point for pivoting downwardly into said bowstring entry area for retaining a bowstring to arm the crossbow and upwardly away from said bowstring entry area for releasing said bowstring to project an arrow or other projectile, and a catch arm extending downwardly from said catch pivot point, said catch arm terminating in



- a forward-facing sear surface, said sear surface adapted to be engaged by the sear surface of the sear arm of the trigger, such that rearward motion of the trigger arm disengages the sear arm sear surface from the catch arm sear surface;

whereby, when a bowstring is retained by said bowstring-retaining hook portion of said catch, and said trigger is pulled rearwardly, the sear surface disengages the catch arm sear surface, and the catch rotates about its pivot point by virtue of the force produced by bowstring tension, whereby the bowstring-retaining hook portion pivots upwardly away from said bowstring entry area, thereby releasing said bowstring to project an arrow or other projectile.

4,877,009

BOWSTRING DRAW AND RELEASE DEVICE

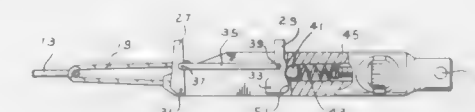
Richard R. Becker, 9910 Pecos St., Thornton, Colo. 80221

Filed May 9, 1988, Ser. No. 192,693

Int. Cl.⁴ F41C 19/02

U.S. Cl. 124—35 A

11 Claims



1. Device for drawing and automatically releasing an archery bowstring, comprising:

- a. main body, adapted to be held by an archer;
- b. means for releasably retaining said bowstring including lever means pivotally mounted to said body and having an initial orientation in which it retains said bowstring and being pivotable to a bowstring releasing position, said lever means providing a radially extending protuberance;
- c. adjustable, spring biased means mounted to said main body, and providing a depressible member which engages said protuberance to hold with an adjustable amount of force said lever means against rotation from its bowstring retaining position, and wherein said lever means is rotated to its release position when a predetermined amount of bowstring generated force creates torque in said lever means sufficient to cause said protuberance to depress said member.

4,877,010

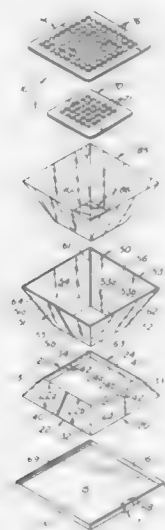
OUTDOOR COOKING UNIT WITH DISPOSABLE COMPONENT

Paul W. Hait, Los Gatos, Calif., assignor to Pyramid, Inc., San Jose, Calif.

Division of Ser. No. 726,835, Apr. 24, 1985. This application
Dec. 16, 1988, Ser. No. 285,660
Int. Cl.⁴ F24C 1/16

U.S. Cl. 126—9 A

9 Claims



1. A bendable, non-combustible, disposable member for cooking unit in which is disposed a fuel element, said member comprising:

- (a) a closed bottom made of bendable, non-combustible material; and
- (b) a plurality of panels extending upwardly from said bottom forming a member having an inverted truncated pyramidal configuration with an open top, each of said panels being made of bendable, non-combustible material;
- (c) said closed bottom and said panels being made of metallic paper.

4,877,011

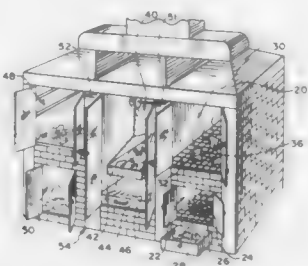
BARBECUE PIT

George W. Willice, 7000 Hawthorne, Apt. 333, Hollywood, Calif. 90028

Filed Aug. 11, 1988, Ser. No. 231,200
Int. Cl.⁴ A47J 37/07

U.S. Cl. 126—25 R

15 Claims



1. A barbecue pit comprising:

a shell of masonry including a bottom wall, side walls, a back wall and a partial front wall, said shell further including two inner wall sections which divide the space within the shell into identical first, second and third compartments extending front to back within the shell;

said first compartment including a cooking chamber having

a plurality of horizontal grates removably supported therein and a topless heat chamber including heat source means beneath said cooking chamber for supplying heat and smoke to said cooking chamber;

said second compartment including a sauce applying chamber having a container of sauce therein and means for applying said sauce to cooked meat placed within said chamber; and

said third compartment including a sauce drying chamber including a plurality of horizontal grates removably supported therein and a plurality of ultraviolet light emitting means situated about said chamber for drying said sauce onto said meat to provide prepared meat, and a prepared meat storing chamber including heat source means for maintaining the prepared meat at a predetermined temperature; and

an exhaust hood forming a top wall of the shell and mounting means therein for exhausting gas and smoke from within the compartments upwardly into a chimney of the hood.

4,877,012

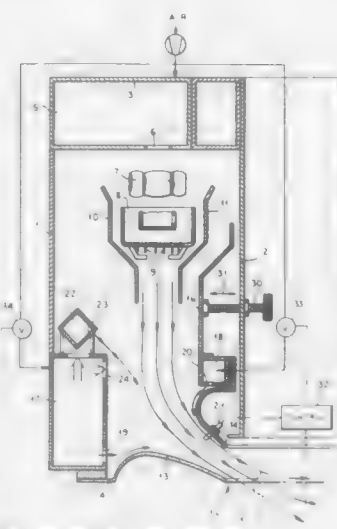
APPARATUS FOR PRODUCING HOT GAS FOR THE SHRINKAGE OF SYNTHETIC RESIN FOILS

Reiner Hannen, Goch-Pfalzdorf, and Norbert Vermeulen, Kleve-Warbeyen, both of Fed. Rep. of Germany, assignors to MSK-Verpackungs-Systeme Gesellschaft, Kleve, Fed. Rep. of Germany

Filed Mar. 14, 1988, Ser. No. 167,576
Claims priority, application Fed. Rep. of Germany, Mar. 18, 1987, 8704033Int. Cl.⁴ F24H 3/00

U.S. Cl. 126—79 R

9 Claims



1. A device for generating hot air for the shrinkage of synthetic-resin foils, comprising:

a housing having a generally rectangular cross section with a pair of mutually parallel long sides and a pair of opposite short sides;

a burner in said housing proximal to one of said short sides and generating a combustion exhaust gas flow traveling generally toward the other of said short sides;

means on said housing defining an outlet nozzle proximal to said other of said short sides and trained out of said housing at an angle to said flow from said burner;

respective air-guide walls flanking said burner between said burner and said long sides of said housing, said air-guide walls extending beyond said burner in a direction of said flow to flank said flow beyond said burner, said air-guide walls being spaced from respective one of said long sides

of said housing to define respective air-flow compartments therewith and by distances which exceed spacings of said air-guide walls from the burner; and means for supplying air to said housing in a region of said one of said short sides whereby said supplied air flows through said compartments and downstream of said air-guide walls forms streams flanking said exhaust gas flow which exits said outlet nozzle.

4,877,013

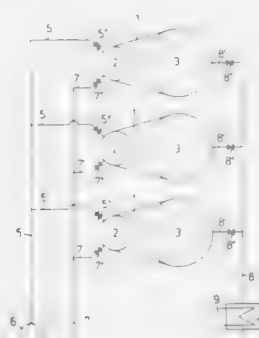
HOT BLAST STOVE INSTALLATIONFriedrich Eschmann, Bischofsheim, and Christian Streuber, Wiesbaden-Auringen, both of Fed. Rep. of Germany, assignors to Didier-Werke AG, Wiesbaden, Fed. Rep. of Germany
Filed Dec. 11, 1987, Ser. No. 131,719

Claims priority, application Fed. Rep. of Germany, Jul. 31, 1987, 3725450

Int. Cl.⁴ F24H 3/02

U.S. Cl. 126—110

12 Claims



1. In a hot blast stove installation for heating cold blast to form hot blast and including a plurality of hot blast stoves each alternately operable during a heating phase and a blowing phase, and a cold blast main for supplying cold blast to respective said stoves during the blowing phases thereof, wherein said cold blast in said cold blast main has a relatively high temperature compared to ambient temperature, the improvement comprising:

means for reducing the temperature of said cold blast from said cold blast main prior to the supply thereof to said stoves.

4,877,014

TUBE ARRANGEMENT FOR HEAT EXCHANGER

John A. Beasley, Clarksville, Tenn., assignor to American Standard Inc., New York, N.Y.

Filed Jan. 19, 1988, Ser. No. 144,971

Int. Cl.⁴ F24H 3/00

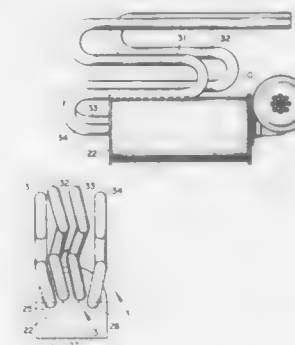
U.S. Cl. 126—116 R

14 Claims

1. A heat exchanger comprised of:

a generally horizontally disposed drum defining a substantially cylindrical combustion chamber with an end thereon having an upper portion and a lower portion, said end directly covering over and enclosing said combustion chamber, said end further having a plurality of apertures therethrough, with a majority of said apertures defined in the upper portion of said end;

a plurality of heat exchange members connected to said end for flow communication with said combustion chamber



through said apertures of said end so as to improve ignition and combustion characteristics of the heat exchanger.

4,877,015

MULTIPURPOSE SMOKELESS ROASTER

Takeshi Yamada, Nagaya, Japan, assignor to Shinpo Kabushiki Kaisha, Nagaya, Japan

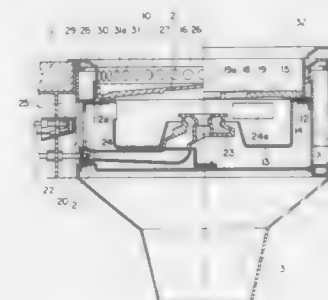
Filed May 6, 1988, Ser. No. 191,275

The portion of the term of this patent subsequent to Jan. 10, 2006, has been disclaimed.

Int. Cl.⁴ F24C 15/20

U.S. Cl. 126—299 R

11 Claims



1. A multipurpose smokeless roaster comprising:

(a) an upper support wall extending horizontally and having an opening contained therein;

(b) a roasting unit comprising a cylindrical outer box having an opened upper end, said outer box being mounted and supported within said opening in said upper support wall by end edges thereon, a cylindrical inner box having an opened upper end contained and supported within said outer box and defining a suction passage therebetween, said inner box having contained therein a burner and an annular surface on which a metal grill or a pot stand may be mounted, said annular surface being defined at an inner peripheral wall surface of said opened upper end of said inner box, and an exhausting unit provided at a lower part of said roasting unit, said exhausting unit being in fluid communication with said suction passage and diminishing in outer and inner diameter as it extends away from said lower part of said roasting unit;

(c) a movable draft pipe vertically, slidably fitted on the outer circumference of said exhausting unit, said movable draft pipe being capable of introducing outside air into gas exhausted from said roasting unit and regulating a suction force applied to said roasting unit, said movable draft pipe additionally having an inner diameter approximately equal to the maximum outer diameter of said exhausting unit;

- (d) a connector box provided at a lower part of said movable draft pipe and connected therewith at a side surface thereof through a fixed pipe, said connector box containing a static pressure equalizer comprising a slit of triangular shape, said slit gradually widening from a lower portion to an upper portion thereof and separating an inner exhaust passage from an outer exhaust passage, said static pressure equalizer equalizing said suction force applied to said roasting unit with a static pressure; and
- (e) a duct unit provided at the side of said connector box and attached thereto, said duct unit leading to a source of said suction force.

4,877,016

VIDEO ENDOSCOPIC MICROSCOPE

Edward A. Kantor, 9872 Whitwell Dr., Beverly Hills, Calif. 90210; George Berci, 555 Levering Ave., #309, Los Angeles, Calif. 90024, and Karl Storz, AM Schildein 39, 7200 Tuttlingen, Fed. Rep. of Germany

Filed Jul. 29, 1988, Ser. No. 226,417

Int. Cl.⁴ A61B 1/04, 1/06

U.S. Cl. 128—6

20 Claims



1. An improved endoscope including an extended side wall having distal and proximal ends comprising in combination: a first tube having distal and proximal ends extending the length of the endoscope, said distal end being wholly within the endoscope and adjacent the side wall at the distal end thereof;
- optical system means within said first tube including a lens at said distal end for magnifying objects of interest, said optical system means being capable of viewing an area up to 25 mm with a depth of field in excess of 10 mm; and
- viewing means coupled to said first tube and extending laterally from the endoscope at the proximal end thereof to provide a viewing port remote from the interior of the endoscope;
- whereby a magnified image of an area of interest accessible to the distal end of the endoscope can be viewed from a location that is laterally displaced from the side wall of the endoscope.

4,877,017

APPARATUS FOR NON-CONTACTING DISINTEGRATION OF CONCRETIONS

Alfred Hahn, and Georg Vogel, both of Erlangen, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 860,590, May 7, 1986, abandoned. This application Jan. 27, 1989, Ser. No. 302,144

Claims priority, application Fed. Rep. of Germany, May 28, 1985, 3519127

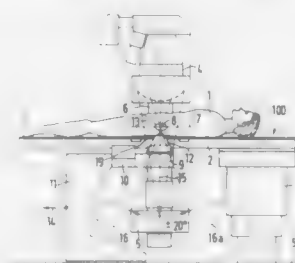
Int. Cl.⁴ A61B 17/22

U.S. Cl. 128—24 A

4 Claims

1. In an apparatus for a non-contacting disintegration of concretion situated in a body of a life form, said apparatus including a shock wave generator having energy waves being focused at a focal point on an isocenter positioned in a target region of the body, said generator having coupling means for transferring the energy from the generator to the body, said coupling means including a container having at least one flexible wall and being filled with a coupling agent, the improve-

ments comprising a patient bed having a surface extending in a longitudinal direction for receiving a body, said bed having an aperture through said surface in an area below said isocenter, a carriage supporting the shock wave generator for pivotal movement around a longitudinal axis spaced above the surface of the bed and extending parallel to the longitudinal direction with the shock wave generator being below the bed with the coupling means located between the generator and bed and the focal point being on said longitudinal axis, said carriage being moveable along the longitudinal direction from a working position with the coupling means extending through the aper-



ture and the flexible wall contacting said body to a removed position with the focal point being moved along the longitudinal axis, an X-ray unit with an X-ray emitter and radiator receiver, and means for separately adjusting the position of the X-ray unit while the shock wave generator is in the working position comprising a C-shaped carrier mounting the receiver and emitter on opposite sides of the bed at the working position and having a pivot point lying on said longitudinal axis so that while the shock wave generator is treating a patient, the X-ray unit can be adjusted and operated without imaging the generator on an X-ray image.

4,877,018

DEVICE FOR DEODORIZING AND DRYING PORTION BETWEEN TOES

Takashi Ikebe, Sakai, and Takigawa: Masuhiko, Osaka, both of Japan, assignors to Masuhiko Takigawa, Osaka, Japan

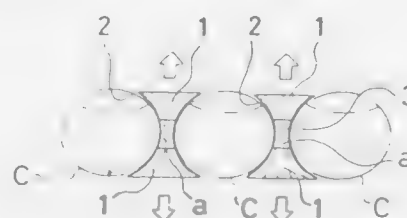
Filed Sep. 12, 1988, Ser. No. 243,042

Claims priority, application Japan, Sep. 21, 1987, 62-144783[U]

Int. Cl.⁴ A61F 5/00

U.S. Cl. 128—81 R

1 Claim



1. A device for deodorizing and drying an area between toes, comprising:
- two rod-shaped flexible fibrous elements, each element comprising a large number of fibers disposed parallel to the longitudinal axis of said element,
- an air- and water-permeable flexible shell member enclosing the rod-shaped surface of said flexible fibrous elements, the flexible fibrous elements being disposed in spaced apart end to end relation in the longitudinal direction for defining a cavity between the flexible fibrous elements,
- particulate substances having a hygroscopic function housed

in said cavity in a quantity corresponding to a part of a volume of said cavity,

wherein the transverse dimension of said device is such that said device is capable of being inserted between toes.

4,877,019

INTRAMEDULLARY NAIL AND APPARATUS FOR ITS INSERTION

Pierre Vives, Via Clemente Prudenzio, 14/16, 20138 Milan, Italy

Filed Nov. 16, 1987, Ser. No. 120,823

Claims priority, application Italy, Dec. 2, 1986, 22543 A/86

Int. Cl.⁴ A61B 17/58

U.S. Cl. 128—92 YK

1 Claim



1. An intramedullary nail, comprising an elongated tubular body of hexagonal cross section having a distal end and a proximal end, with a frustoconical taper at said distal end, said elongated tubular body further having a side wall including at least a hole therein adjacent said distal end and at least a slot adjacent said proximal end, wherein said elongated tubular body has a slot extending in a longitudinal direction of said tubular body and formed for a given length along a longitudinal corner defined by two adjoining sides of said hexagonal cross-section, said longitudinal slot being so designed and arranged as to increase flexural elasticity of said elongated tubular body in said longitudinal direction.

4,877,020

APPARATUS FOR BONE GRAFT

Jose M. O. Vich, Av. de Montero Rios 24, 3°, Vigo (Pontevedra), Spain

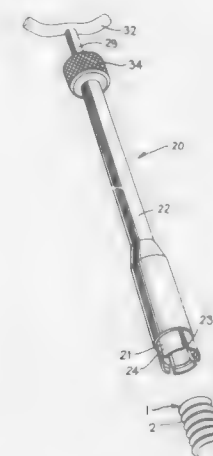
Division of Ser. No. 707,305, Mar. 1, 1985. This application May 24, 1988, Ser. No. 198,081

Claims priority, application Spain, Nov. 30, 1984, 283078

Int. Cl.⁴ A61F 5/04; A61B 17/00; B25B 23/00

U.S. Cl. 128—92 V

1 Claim



1. An instrument for holding and permitting insertion of a substantially cylindrical bone implant which is externally threaded into a substantially cylindrical bed, said instrument comprising:
- an elongated rod shaped handle defining opposite ends and having a substantially central bore extending coaxially therethrough, one end of said handle defining an opening terminating in a substantially frusto-conical bore which

divergently opens outwardly through said one end of the handle;

a substantially cylindrical sleeve-like implant holding head engageable with said one end of said handle, said holding head being formed of a sleeve defining a bore for accommodating one end of the implant, said sleeve having axial slits formed in one end thereof so that the sleeve defines a resiliently deformable collet structure for gripping the implant, said sleeve having an external frusto-conical surface which projects into and wedgingly engages the frusto-conical surface on said handle;

an elongated control rod projecting coaxially through the opening of said handle and being fixedly secured to said holding head, said control rod projecting outwardly through the other end of said handle and being provided with an enlarged gripping portion thereon; and

said control rod and said handle each having a coaxially threaded portion to be threadably coupled together so that relative rotation therebetween results in a corresponding axial displacement of the holding head.

4,877,021

EMERGENCY AIRWAY SURGICAL DEVICE

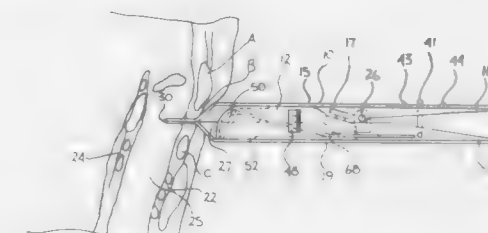
Gary Higer, 14000 Peach Grove, Sherman Oaks, Calif. 91423, and Michael L. Mintz, 141 Kush La., Corpus Christi, Tex. 78404

Continuation-in-part of Ser. No. 733,961, May 14, 1985, abandoned. This application Apr. 16, 1987, Ser. No. 39,620

Int. Cl.⁴ A61M 11/00

U.S. Cl. 128—200.76

16 Claims



1. A laryngeal-tracheal instrument for permitting pulmonary ventilation of a subject comprising:
- (a) a cutting means for incising a trachea of the subject comprising:
- (i) a housing defining a cavity, said housing divided horizontally to form a pair of horizontally aligned superior and inferior arms, and including pivot means disposed between the arms for pivotally interconnecting said arms to enable scissor-like movement; and
- (ii) a sharpened flattened blade horizontally disposed of the posterior end of each of said arms, said blades forming a unitary horizontal cutting edge when said arms are in a closed relationship; and
- cannula means disposed within said cavity formed by said arms and removable at the posterior end thereof when said arms are in an open relationship, said cannula means comprising:
- (i) a housing having a blunt posterior surface and being of adapted to engage the posterior portion of the trachea of the subject, an inferior surface having an opening in the posterior portion thereof and a superior surface having an opening in the anterior portion thereof, said housing being sized such that when the posterior surface engages the posterior portion of the trachea, the opening in the superior surface is external of the subject; and
- (ii) centering means adjustably disposed within said housing, said centering means comprising a flattened member means and inferiorly angled flange means at the posterior thereof adapted to engage the anterior portion

of the trachea, said flattened member means being adapted to move from a first position in which said flange means is disposed substantially within said housing for easy insertion into the trachea to a second position where said flange means extends through said opening in the inferior surface of the housing and engages the anterior portion of the trachea when said posterior surface of the housing engages the posterior portion of the trachea thereby securing said cannula means in position.

4,877,022

SKIN DIVING SNORKEL

Tomy Christianson, 277 Grulla Ct., Norco, Calif. 91760

Filed Dec. 30, 1988, Ser. No. 292,225

Int. Cl.⁴ B63C 11/16

U.S. Cl. 128—201.11

15 Claims



1. A snorkel device comprising:
 - a conduit having first and second ends thereof; said first end of said conduit being open whereby it is unobstructed and freely admits ambient fluid into said conduit; mouthpiece means joined to said second end of said conduit and communicating fluid flow with said conduit;
 - a chamber having a first opening into said conduit, and an ambient opening;
 - said first opening of said chamber communicating fluid flow with said conduit;
 - purge valve means disposed at said ambient opening of said chamber, said purge valve means arranged to selectively provide unidirectional flow from said chamber to ambient; and
 - a mobile member situated in said chamber, said mobile member substantially blocking fluid flow to said purge valve means when water is not flooding said chamber.

4,877,023

APPARATUS FOR ARTIFICIAL VENTILATION FOR ASSISTING THE VOLUMETRIC BREATHING OF A PATIENT

Daniel Zalkin, Rambouillet, France, assignor to B.O.C.S.A., Maurepas, France

Continuation-in-part of Ser. No. 799,849, Nov. 14, 1985. This application Feb. 25, 1988, Ser. No. 160,257

Claims priority, application France, Nov. 20, 1984, 84 17653

Int. Cl.⁴ A61M 16/00

U.S. Cl. 128—204.21

17 Claims

1. Apparatus for assisting the spontaneous breathing of a patient, comprising:
 - a single source of breathable gas under pressure;
 - an inspiration tube and an exhalation tube, both of said tubes being connected to a patient;

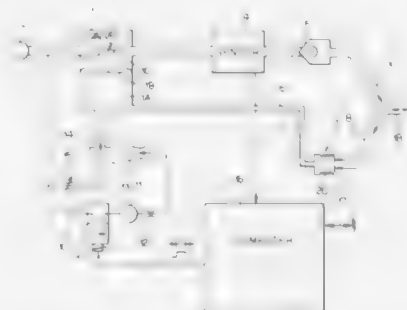
a demand valve connected between said source and said inspiration tube;

flow rate control generator means coupled to said source; computer means, and sensor means connected to said computer means for detecting the flow rate of gas delivered to the patient, and wherein said computer means, in real time, calculates the volume of gas delivered to the patient and controls said generator means;

a flow rate sensor connected to said demand valve and to said inspiration tube;

a Venturi tube having an inlet communicating with said source and an outlet communicating with said reference chamber;

a bellows communicating with the interior said reference chamber and with said exhalation tube;



means permitting breathable gas from said source to enter into said reference chamber via said Venturi tube for creating a pressure in said reference chamber which communicates simultaneously with said bellows as a PEEP pressure and with said demand valve to control the flow rate of breathable gas from said source, through said demand valve toward said inspiration tube; and

said flow rate control generator means coupled to said source, also being coupled to said computer means and to said Venturi tube for increasing the pressure in the reference chamber in response to a demand from said flow rate sensor and thereby the flow rate of breathable gas from said source to said inspiration tube, said flow rate control generator means having an inlet connected to said single source and an outlet communicating with the inlet of said Venturi tube.

4,877,024

AIRWAY

Patrick K. Sheehy, Reading, England, assignor to P K Airway Limited, Berkshire, England

PCT No. PCT/GB85/00023, § 371 Date Sep. 18, 1985, § 102(e)

Date Sep. 18, 1985, PCT Pub. No. WO85/03232, PCT Pub.

Date Aug. 1, 1985

Continuation of Ser. No. 930,054, Nov. 12, 1986, abandoned,

which is a continuation of Ser. No. 778,181, Sep. 18, 1985,

abandoned. This PCT application Jan. 18, 1985, Ser. No.

201,376

Claims priority, application United Kingdom, Jan. 18, 1984,

8401324; PCT Int'l Appl., Jan. 18, 1985, PCT/GB85/00023

Int. Cl.⁴ A61M 16/00

U.S. Cl. 128—207.14

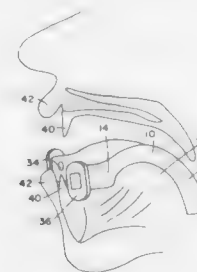
6 Claims

1. An airway for insertion into the mouth of a subject, and for defining a passage for air or anaesthetic gas into the trachea of the subject, comprising:

- (a) first and second tubes each having a forward end and a rear end;
- (b) the first and second tubes being joined at their rear ends to define an intersection, said first and second tubes also being joined at said intersection to a third tube, and said first and second tubes being inclined to one another and to the third tube, said first and second tubes being otherwise

spaced apart from each other, the spacing between said tubes increasing from said intersection to said forward ends, said first, second and third tubes thus defining a structure in a configuration which is Y-shaped in plan view;

- (c) the third tube being shaped to extend into the oropharyngeal space of the subject;
- (d) each of the first and second tubes having a bore which extends from its forward end to its rear end, and the third tube having a bore which is connected to the bores in the first and second tubes, the bores in the first, second and third tubes forming a passage for air or anaesthetic gas;
- (e) each of the first and second tubes having a straight bracing



ing portion extending rearward from its forward end and a rear portion connecting the bracing portion to the third tube, said spacing between said first and second tubes being such that said bracing portions and their associated bores are positioned for being gripped in use between upper and lower molar teeth of the subject on respective opposite sides of the mouth of the subject so that said forward ends of said first and second tubes face outward from the mouth, thereby to hold the mouth open to prevent engagement between upper and lower front teeth of said subject and wherein said airway is free of connections extending between said first and second tubes forward of said intersection to prevent engagement between said airway and said upper and lower front teeth.

4,877,025

TRACHEOSTOMY TUBE VALVE APPARATUS

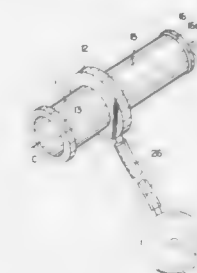
Donald W. Hanson, 8516 Great Plains Blvd., Chanhassen, Minn. 55317

Filed Oct. 6, 1988, Ser. No. 254,258

Int. Cl.⁴ A61M 16/00

U.S. Cl. 128—207.16

16 Claims



1. Tracheostomy tube valve apparatus insertable into tracheostomy stoma in the neck of a patient to extend through the tracheal wall into the trachea, comprising a tube valve assembly that includes a tube part having an inner peripheral wall, a distal annular end and a proximal annular end, a proximal annular flange adapted for abutment against the skin of the throat and being joined to the tube part proximal end, a distal annular flange insertable through the stoma and adapted for forming a close fit with the tissue surrounding the stoma being joined to the tube part distal end in axial spaced relation to the

proximal flange, each flange being of an outer diameter substantially larger than the outer diameter of the tube part, and inflatable first means joined to at least one of the distal flange, the proximal flange and the tube part, and extending within the tube part between the flanges, for selectively being inflated to block fluid flow through the tube part and second means connected to the assembly for selectively inflating the inflatable means and deflating the inflatable means when the inflatable means is inflated, said inflatable first means includes means acting in cooperation with the inner peripheral wall for forming an inflatable chamber that when inflated blocks fluid flow through the tube part, and that the second means includes a fluid passage that opens through the proximal flange to the chamber to permit fluid flow to and from the chamber.

4,877,026

SURGICAL APPARATUS

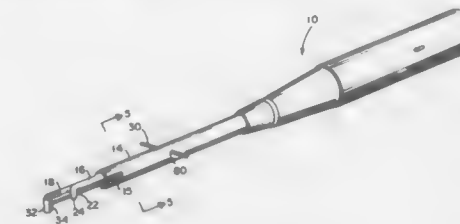
Hughes de Laforcade, Manchester, Mass., assignor to Microline Inc., Danvers, Mass.

Filed Jul. 22, 1988, Ser. No. 223,432

Int. Cl.⁴ A61B 17/32

U.S. Cl. 128—305

24 Claims



1. A surgical apparatus for insertion into the eye for surgical procedures, said apparatus comprising:

- an elongated rigid tubular housing of circular cross section having an inner tubular wall supporting therein a first and a second elongated shaft member;
- said first and said second elongated shaft members each having juxtaposed inner surfaces slidable relative to each other for a predetermined stroke distance, said first and said second shaft members further having outer surfaces terminating in corners, said corners abutting said inner tubular wall, said shaft members being held in a special relationship relative to each other and said inner tubular wall by said corners, whereby said shaft members occupy only a portion of the space in said inner tubular housing, thus leaving a freeboard space between said outer surfaces and the inner tubular wall;
- said first shaft member having at one end, a driven end, and at the other end a first operable means disposed thereon;
- said second shaft member being fixedly disposed in said tubular housing and having a second operable means disposed thereon, said second operable means being cooperable with said first operable means to perform a surgical procedure; and
- means for restraining the motion of said first shaft member on a plane parallel to the axis of said tubular housing and for limiting the distance of a stroke of said first shaft member relative to said second shaft member, whereby to limit the movement of said first operable means relative to said second operable means.

4,877,027

HEARING SYSTEM

Wayne B. Brunkan, P.O. Box 2411, Goleta, Calif. 93118

Filed Jun. 6, 1988, Ser. No. 202,679

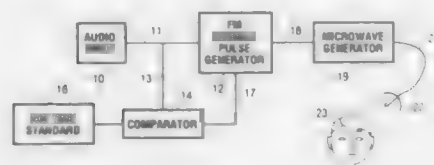
Int. Cl.⁴ A61N 5/00

U.S. Cl. 128—420.5

8 Claims

1. Apparatus for creating human hearing comprising:

- (a) an audio source for creating electrical audio waves having positive peaks;
- (b) a frequency modulator generator connected to the audio source to create frequency modulated bursts;
- (c) a source of constant voltage to create a voltage standard that is in the range of 25% to 85% of the peak voltage of the audio waves;
- (d) a comparator connected to the voltage source and the audio source to compare the instantaneous voltage of the waves from the audio source with the voltage standard;



- (e) a connection of the comparator to the frequency modulator generator to activate the frequency modulator generator when the instantaneous voltage of the audio wave exceeds the standard voltage;
- (f) a microwave generator creating microwaves in the range of 100 megahertz to 10,000 megahertz and connected to the frequency modulator generator, generating microwaves only when pulsed by the frequency modulator generator; and
- (g) an antenna connected to the microwave generator to radiate the head of a human being to produce the sounds of the audio source.

4,877,028

APPARATUS FOR EFFECTING OCCLUSION OF THE VAS DEFERENS

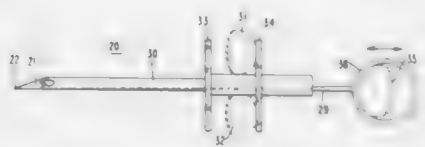
Jeffrey Sandhaus, Palisades, N.Y., assignor to Vastech Medical Products Inc., New Brunswick, N.J.

Continuation of Ser. No. 884,417, Jul. 11, 1986, abandoned. This application Jul. 25, 1988, Ser. No. 223,682

Int. Cl.⁴ A61B 17/12

U.S. Cl. 128—326

6 Claims



1. Apparatus for implanting locking clips to effect percutaneous occlusion of a target vessel comprising
 - a. tissue penetration means including a forward face and a rearward face, said forward face including a barbed end portion for penetrating tissue upon forward movement of said tissue penetration means, and said rearward face defining at least a portion of a target vessel chamber, and including a rearwardly facing barb-shaped portion capable of penetrating tissue upon rearward movement of said tissue penetration means
 - b. clip retaining means for retaining said locking clip in a predetermined location distal to said rearward face of said tissue penetration means,
 - c. camming means disposed within said target vessel chamber for closing said locking clip, and
 - d. slide means for obtaining relative slidable movement between said tissue penetration means and said clip retaining means, whereby said tissue penetration means can be used for penetrating tissue substantially entirely around said target vessel, and said tissue penetration means and said clip retaining means can be slidably moved between a first relative position in which said target vessel chamber and said clip retaining means are longitudinally separated

from each other, a second relative position in which said target vessel chamber and said clip retaining means are substantially superimposed with each other such that said target vessel located within said target vessel chamber is substantially surrounded, at least in part within said locking clip, and a third relative position in which said locking clip is caused to close upon said target vessel by movement against said camming means so as to effect said occlusion thereof.

4,877,029

SEMI-IMPERMEABLE NERVE GUIDANCE CHANNELS

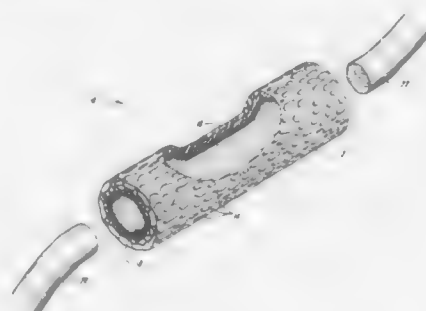
Robert F. Valentini; Patrick Aebischer, and Pierre M. Galletti, all of Providence, R.I., assignors to Brown University Research Foundation, Providence, R.I.

Filed Mar. 30, 1987, Ser. No. 32,489

Int. Cl.⁴ A61B 17/04

U.S. Cl. 128—334 R

7 Claims



1. A medical device for use in regenerating a severed nerve, the device comprising a tubular semipermeable membrane having openings adapted to receive the ends of a severed nerve, at least one longitudinally-oriented trabecula within the membrane to provide a passageway for capillary ingrowth, a porous outer membrane surface which permits capillary ingrowth into said trabecula, and a semipermeable inner membrane surface, whereby the tubular membrane device provides a protective guidance channel for the regeneration of said nerve therethrough.

4,877,030

DEVICE FOR THE WIDENING OF BLOOD VESSELS

Andreas Beck, W. Hausenstrasse 10a, 7746 Hornberg, and Norbert Nanko, 7800 Freiburg, both of Fed. Rep. of Germany

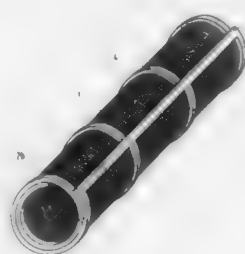
Filed May 31, 1988, Ser. No. 200,380

Claims priority, application Fed. Rep. of Germany, Feb. 2, 1988, 3803/003

Int. Cl.⁴ A61M 29/02

U.S. Cl. 128—343

7 Claims



1. A device having a non-widened state for insertion within a blood vessel and selectively expandable therewithin by means of a balloon catheter or the like, the device comprising:

a generally rectangular panel of a relatively flexible woven material and having end edges and side edges; the panel being wound around in a generally cylindrical shape with the end edges overlapping each other in the non-widened state, and with internal area sufficient to accommodate a balloon catheter or the like; reinforcing means defining an end border and reinforcing each end edge of the woven material, each such reinforcing end border having a surface coplanar with the panel and parallel to the corresponding end edge of the panel; reinforcing means defining a side border along and reinforcing each side edge of the panel; and the end borders being operative to move into manual abutment when the panel is unwound by inflation of a balloon catheter or the like to unwind and widen the cylindrical shape to an extent that the end edges no longer overlap, so that the surfaces of the end borders abut one another and maintain the widened cylindrical shape of the device within a blood vessel.

4,877,031

STEERABLE PERFUSION DILATATION CATHETER

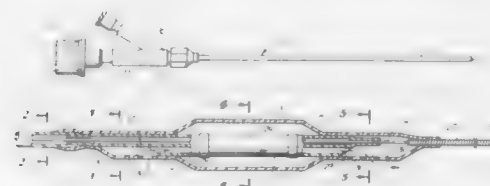
Jean M. Conway, Mountain View, and Peter R. McLane, Sunnyvale, both of Calif., assignors to Advanced Cardiovascular Systems, Inc., Mountain View, Calif.

Filed Jul. 22, 1988, Ser. No. 223,088

Int. Cl.⁴ A61M 25/00

U.S. Cl. 128—344

10 Claims



1. A steerable perfusion dilatation catheter comprising:
 - (a) an elongated tubular member having an inner lumen extending along the interior thereof;
 - (b) a tubular perfusion body secured by the proximal end thereof to the distal extremity of the elongated tubular member, said perfusion body having a first, relatively small diameter lumen extending longitudinally therethrough in fluid communication with the inner lumen of the tubular member and having an inflation/deflation port open to the exterior of the perfusion body and a second, relatively large diameter lumen extending longitudinally therethrough with at least one inlet port on the proximal end thereof and at least one discharge port on the distal portion thereof adapted to facilitate the passage of blood therethrough;
 - (c) an inflatable dilatation balloon member which is sealably secured by proximal and distal extremities thereof about the perfusion body with the inflation/deflation port of the perfusion body within the interior of the balloon member connecting in fluid communication the first, relatively small diameter lumen within the perfusion body with the interior of the balloon member to facilitate the inflation and deflation thereof; and
 - (d) a guiding member extending through and fixed within the small diameter lumen of the perfusion body and having a distal portion extending out the distal end of the balloon, whereby the catheter can be advanced through a patient's vascular system and a stenosis therein, the balloon thereof inflated to dilate the stenosis and blood is perfused through the balloon distal to the catheter.

4,877,032

SENSOR ARRANGEMENT FOR THE CONTROL OF IMPLANTABLE DEVICES

Roland Heinze, Munich, and Hans-Dieter Liem, Muenning, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany and Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

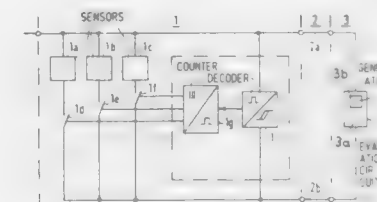
Continuation of Ser. No. 51,856, May 20, 1987, abandoned. This application Apr. 6, 1989, Ser. No. 333,805

Claims priority, application Fed. Rep. of Germany, Jun. 16, 1986, 3620277

Int. Cl.⁴ A61N 1/00

U.S. Cl. 128—419 PG

18 Claims



1. An apparatus for medically treating a patient comprising: an implantable device which supplies a medical treatment to said patient, said device having at least one variable function;
- a catheter connected to said device and also implantable in said patient, said catheter having a plurality of leads therein;
- a plurality of sensors which respectively generate measured signals corresponding to different body parameters of said patient contained within said catheter;
- control means in said catheter for successively respectively connecting said sensors across only two leads of said plurality of leads and thereby activating said sensors chronologically offset;
- an evaluation means disposed in said implantable device remote from said sensors and connected to said sensors by said catheter for generating a signal for use in varying said variable function from said measured signals; and means for transmitting said respective measured signals from each activated sensor chronologically offset to said evaluation means via no more than said two leads.

4,877,033

DISPOSABLE NEEDLE GUIDE AND EXAMINATION SHEATH FOR TRANSVAGINAL ULTRASOUND PROCEDURES

H. Michael Seitz, Jr., 214 Airdale Road, Rosemont, Pa. 19010

Filed May 4, 1988, Ser. No. 190,059

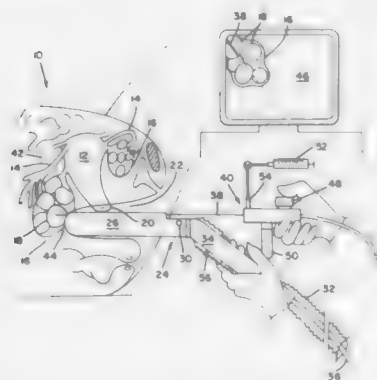
Int. Cl.⁴ A61B 10/00

U.S. Cl. 128—660.05

17 Claims

1. A disposable combination needle guide and operative sheath adapted for use in surgical procedures on a transvaginal ultrasound probe comprising:
 - a rigid hollow body having one closed and one open end, said open end sized to receive the insertion end of said probe;
 - a sealed window in said body, said window being positioned at said closed end and permitting passage of ultrasonic waves therethrough without undue distortion;
 - an integral elongated needle or instrument passageway extending along a portion of said hollow body;

a flexible sleeve sealed to said open end and sized to receive said probe; and



locking means associated with said hollow body to fix said hollow body in position with respect to said ultrasound probe.

4,877,034

METHOD AND DEVICE FOR DETECTION OF TISSUE INFILTRATION

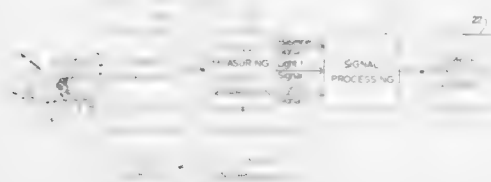
Judy M. Atkins; Benjamin J. Comfort, both of Hillsborough, and Ralph A. Liebelt, Durham, all of N.C., assignors to Smith & Nephew, Inc., Itasca, Ill.

Filed Jun. 18, 1987, Ser. No. 65,015

Int. Cl.⁴ A61B 6/00

U.S. Cl. 128-664

10 Claims



1. A device for the detection of infiltration of intravenously delivered fluids into tissue surrounding an intravenous insertion site comprising radiation monitoring means for measuring changes in the relationship between a plurality of wavelengths of electromagnetic radiation traveling in said tissue upon the occurrence of tissue infiltration by said fluids in order to prevent tissue damage, said radiation monitoring means including:

- (a) a patch placed over said intravenous insertion site;
- (b) a plurality of electromagnetic radiation sources incorporated in said patch, said radiation sources directing electromagnetic radiation at said tissue;
- (c) radiation detection means additionally incorporated in said patch, said radiation detection means being capable of detecting said wavelengths of electromagnetic radiation and converting them to electrical signals; and
- (d) timing synchronization means electrically connected to said electromagnetic radiation sources, said timing synchronization means being capable of regulating the activation of said electromagnetic radiation sources.

4,877,035 MEASUREMENT OF THE END-SYSTOLIC PRESSURE-VOLUME RELATION USING INTRAAORTIC BALLOON OCCLUSION

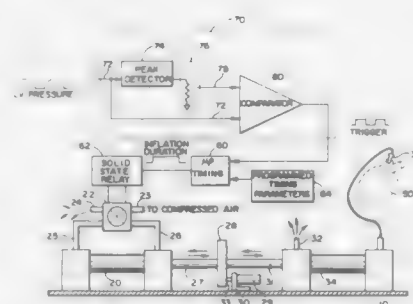
Daniel Bogen, Philadelphia, Pa., and Krishanu Gupta, Cherry Hill, N.J., assignors to Trustees of the University of Pennsylvania, Philadelphia, Pa.

Filed Oct. 12, 1988, Ser. No. 257,105

Int. Cl.⁴ A61B 5/02

U.S. Cl. 128-673

11 Claims



1. A method of determining an index of the global ventricular contractility of a biological pump, comprising the steps of:
 - (a) acquiring data representative of ventricular pressure and data representative of ventricular volume of the biological pump during at least one beat of the biological pump;
 - (b) transiently altering the hemodynamic load of the biological pump;
 - (c) acquiring data representative of ventricular pressure and data representative of ventricular volume of the biological pump during at least one beat of the biological pump while the biological pump is in the altered hemodynamic state;
 - (d) identifying the pressure and volume data value associated with the end-systolic point of the beats the biological pump of steps (a) and (c); and (e) relating the data identified in step (d) to the end-systolic elastance of the biological pump.

4,877,036

SWAB TRANSPORT SYSTEM

Elmer F. Saint-Amand, 15740 Mill Meadow, Canyon Country, Calif. 91351

Division of Ser. No. 107,408, Oct. 13, 1987, Pat. No. 4,813,432.

This application Nov. 28, 1988, Ser. No. 276,639

Int. Cl.⁴ A61B 10/00

U.S. Cl. 128-749

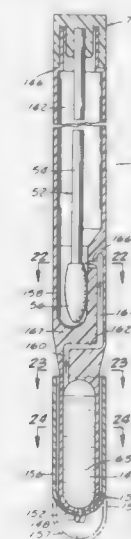
4 Claims

1. A swab transport apparatus for containing and transporting a swab of the character having an elongated stem and a bibulous swab material carried proximate one end of the stem, said apparatus comprising:

- (a) an elongated longitudinally extending plastic body having first and second ends, said body being open at said first end and including:
 - (i) a first elongated chamber having resiliently deformable side walls communicating with said first open end for receiving at least a portion of the swab;
 - (ii) a second chamber having resiliently, deformable side walls for containing fluid therewithin, said second fluid medium chamber being longitudinally spaced from said first chamber;
 - (iii) a third chamber having resiliently deformable side walls disposed intermediate said first and second chambers, said third chamber being in communication with said first chamber via an axially extending fluid passageway and said third chamber being in communication with said second chamber via a circuitous fluid flow path; and
 - (iv) a tubular segment formed proximate said second end of said body having a fluid passageway extending there-

through for interconnecting said second chamber with atmosphere;

(b) a removable first cover means for sealably closing said open first end of said tube, said first cover means including an



- axially extending bore for closely receiving a portion of the elongated stem of the swab; and
- (c) a removable second cover means carried by said tubular segment for surrounding said second chamber to prevent inadvertent deformation of the side walls thereof.

4,877,038

HAND AND ARM RESTRAINT

Eberhard Fricke, and Marie S. Fricke, both of 7021 Kittyhawk Ave., Los Angeles, Calif. 90045

Filed Sep. 2, 1988, Ser. No. 239,927

Int. Cl.⁴ A61F 13/00

U.S. Cl. 128-869

10 Claims



1. A hand and arm restraint comprising a pouch member of a size large enough to receive the hands, lower arms, and at least a portion of the upper arms of a patient, said pouch member having a top edge, a bottom edge, and four corners, two corners being associated with said top edge and two corners being associated with said bottom edge, with two arm-receiving openings disposed along said top edge and separated by a distance similar to that of said arms of said patient, each arm-receiving opening provided with a pair of ties for adjusting the extent of said opening so as to prevent removal of an arm therefrom, and zipper means disposed along said bottom edge for gaining access by a care-taker to the interior of said pouch member.

4,877,039

GRAIN CLEANER

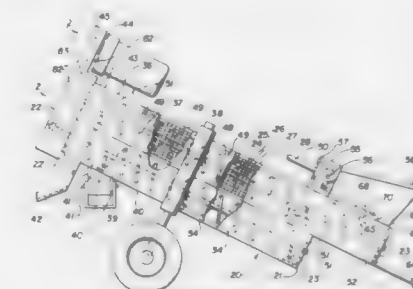
Dean S. Somerville, P.O. Box 215, McHenry, N. Dak. 58464, and Curtis T. Stokkeland, Route #1, Box 21, Cooperstown, N. Dak. 58425

Filed Aug. 26, 1988, Ser. No. 237,510

Int. Cl.⁴ A01F 12/30

U.S. Cl. 460-97

3 Claims



1. A grain cleaning device comprising a frame, a plurality of augers mounted to said frame beside one another in parallel relation, cylindrical screens surrounding the augers with the ends of the augers being open and free of the screens to allow access to the ends of the augers, a motor means to rotate the augers simultaneously, a box-like structure at the rearward ends of the augers to guide grain into the open rearward ends of the augers, said screens having mesh openings of a size slightly smaller than the size of the grain being cleaned, whereby grain may be dumped into the box-like structure at the rearward ends of the augers and will be augered simultaneously by all the augers along the augers and retained within the screens to the forward ends of the augers and out the

4,877,037

TISSUE OR MUCUS SAMPLING DEVICE

Su-sen Ko, and Dan L. Faselow, both of White Bear Township, Ramsey County, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 69,766, Jul. 6, 1987, abandoned, which is a continuation-in-part of Ser. No. 796,967, Nov. 12, 1985, abandoned. This application Oct. 6, 1988, Ser. No. 254,358

Int. Cl.⁴ A61B 10/00

U.S. Cl. 128-756

14 Claims



1. A tissue or mucus sampling device for obtaining a tissue or mucus sample from the cervical os or the vaginal fornix comprising at one-piece elongate, cylindrical outer protective sleeve terminating in a tip, positionable guard means on said protective sleeve for limiting the insertion depth of said device into the vaginal cavity, an elongate, cylindrical insertion tube having a first end and a second end telescopically fitting within said protective sleeve, surmountable stop means on said insertion tube for temporarily inhibiting said first end of said insertion tube from protruding through said protective sleeve, stop means on said insertion tube for permanently limiting the extent of protrusion of said tube beyond said sleeve, a tissue or mucus sampling member on said first end of said insertion tube and a handle member affixed to said second end of said insertion tube for manipulating said tube.

forward ends of the screens and augers, while foreign and other non-grain particles of a size smaller than the size of the mesh openings will be allowed to pass through the mesh openings in the screens and gravitate downward from the screened augers, to thereby clean the grain, a bin beneath the screened augers to collect said particles, a chute at the forward end of the augers whereby the grain may travel down the chute at the forward end of the augers to the exterior of the frame.

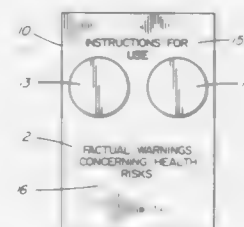
4,877,041

CIGARETTE SUBSTITUTE FOR SMOKING CESSATION
Robert L. Barnhouse, 113 Almeria St., Royal Palm Beach, Fla.
RMII

Filed Aug. 8, 1988, Ser. No. 230,003
Int. Cl.⁴ A24F 47/00

U.S. Cl. 131—270

14 Claims



1. A cigarette substitute for smoking cessation comprising: a flat card-like member having at least one abrasable encapsulated smoke aroma area on one surface, including directions for use printing and health advisory printing on said one surface.

4,877,042

DYNAMIC HAIR GROOMING APPLIANCE

John H. Downey, 114 Sandy Heaven Dr., Scarborough, Ontario, Canada (M1W 3M9)

Continuation-in-part of Ser. No. 533,450, Sep. 19, 1983, abandoned. This application Apr. 14, 1987, Ser. No. 38,179
Int. Cl.⁴ A45D 20/08

U.S. Cl. 132—212

13 Claims



1. A dynamic hair grooming appliance comprising: an axially elongated body portion; hair engaging means supported from said body portion; handle means from which said body is supported for moving said hair engaging means into selective contact with the hair of a person to effect the grooming thereof; electrode means for contacting the hair interspersed with said hair engaging means and positioned remote from the distal ends thereof so as not to contact the scalp of a person during said grooming, and circuit means located in said handle and electrically connected to said electrode means for measuring an electrical value at said electrode means related to the moisture content of hair contacted thereby, said circuit means further including signal means and means responsive to the attainment of a predetermined value at said electrode means for changing the state of operation of said signal

4,877,040

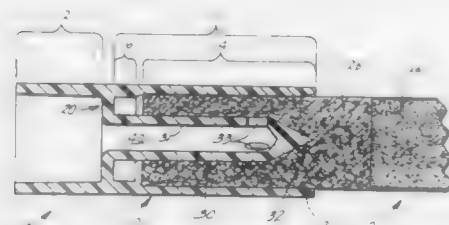
CIGARETTE HOLDER WITH FILTER MODIFIER, AND RELATED METHOD

Donald Jansma, Grand Rapids, Mich., and Howard W. Stemm, Lenexa, Kans., assignors to Bissell Health Care Corporation, Grand Rapids, Mich.

Continuation-in-part of Ser. No. 42,326, Apr. 24, 1987, abandoned. This application Apr. 8, 1988, Ser. No. 179,287
Int. Cl.⁴ A24D 3/04

U.S. Cl. 131—189

40 Claims



1. A cigarette filter modifier comprising: a base shield; a probe projecting from said base shield; at least one aperture in said probe communicating with the interior thereof, said aperture opening laterally outwardly with respect to the length of said probe, in order that smoke being drawn from a cigarette into said probe aperture is forced to turn sharply with respect to the longitudinal axis of flow of smoke through a cigarette filter in order to enter said aperture, and is forced to turn another sharp turn in order to pass down the length of said interior passage of said probe; each said aperture being sufficiently large to facilitate draw but less than about 0.1 inch in length along the longitudinal axis of said probe and the overall aperture area being less than about 0.0135 square inches; an interior passage in flow communication with said probe aperture and extending through the interior of said probe at least from said probe aperture to and through said base shield, said interior passage being sufficiently large in cross-section to facilitate draw but being no greater than about 0.008 square inches; said base shield being at least approximately as large in diameter as the diameter of a cigarette filter whereby passage of smoke is blocked by said shield and smoke is forced through said probe aperture and through said interior passage when a cigarette containing said probe is drawn upon.

4,877,043

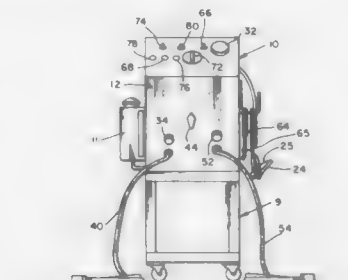
INTERNAL COMBUSTION ENGINE SCRUBBER

Maurice Carmichael, 23920 Anza Ave., Apt. 241, Torrance, Calif. 90505, and Janis Binatena, 4110 Lenora, Torrance, Calif. 90503

Continuation-in-part of Ser. No. 28,546, Mar. 20, 1987, abandoned. This application May 9, 1988, Ser. No. 191,395
Int. Cl.⁴ B06B 3/08

U.S. Cl. 134—57 R

16 Claims



1. An apparatus for cleaning of carbon and other contaminants from a fuel distribution system and soft carbon and other contaminants from a combustion chamber of an internal combustion engine, wherein said engine includes a fuel pump, a fuel line, a fuel intake, and a return fuel line, wherein said apparatus operates at a pressure that defines an independent cleaning solution fuel system to temporarily replace an engine's fuel system, said apparatus comprising in combination: a reservoir for holding cleaning solution therein; means for pumping said cleaning solution from said reservoir into the fuel intake of the internal combustion engine, said means comprising: a cleaning solution pump; an output line connecting the cleaning solution pump and the fuel line of the engine at a point after the engine fuel pump to transport the cleaning solution to the fuel intake of the engine; means for controlling said cleaning solution pump; means connecting said apparatus to a power supply for said cleaning solution pumping means; excess cleaning solution return means comprising: a return line connecting the reservoir and the return fuel line of the engine to provide a conduit for returning excess cleaning solution from the engine to said reservoir; and an adjustable return pressure regulator means mounted to the return line to adjust the pressure of the apparatus to a pressure required to start the engine using the cleaning solution in said reservoir as fuel for the engine.

4,877,044

TENT, TENT RIBS, AND METHOD OF ERECTING TENTS

Robert R. Cantwell, Lealie; Raymond F. Halleman, and Deborah M. Zamateg, both of New Haven, all of Mo., assignors to American Recreation Products, Inc., St. Louis, Mo.

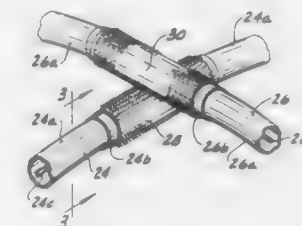
Filed Aug. 26, 1988, Ser. No. 236,846
Int. Cl.⁴ E04H 15/40

U.S. Cl. 135—104

11 Claims

1. An improved tent of the type comprising a fabric shell supported on a skeleton frame having at least two criss-crossing ribs, the improvement comprising: patches of mating halves of hook-and-loop type fastening material on portions of the ribs that criss-cross, one half of the hook-and-loop material being attached to one of said

two criss-crossing ribs and the other half of the hook-and-loop material being attached to the other of said criss-crossing ribs, to releasably attach the ribs together at the point where they criss-cross and stabilize the frame.



crossing ribs, to releasably attach the ribs together at the point where they criss-cross and stabilize the frame.

4,877,045

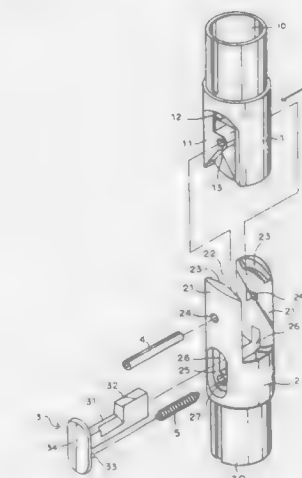
PIVOTAL POSITIONING MEANS FOR USE IN BEACH UMBRELLA

Chia-Hui Lin, Chiayi Hsien, Taiwan, assignor to Tai Yu Enterprise Co., Ltd., Chiayi Hsien, Taiwan

Filed Aug. 3, 1988, Ser. No. 228,668
Int. Cl.⁴ A45B 17/00

U.S. Cl. 135—20 M

2 Claims



1. An improved pivotal positioning means for use as a joining knuckle of a shade or beach umbrella, comprising: an upper element having a tubular shape with two opposite walls defined in flattened manner, one of the flattened walls being provided with a projected, flat engaging portion; a through hole defined through the central portion of the upper element; a plurality of spaced positioning grooves disposed a bottom edge of the other flattened wall; a projection block disposed at a top edge of each of said flattened walls; a hollow tube disposed in connection with a top end of said upper element; a lower element having a tubular shape with a pair of upright lugs, and a slot being defined between said lugs so that said upper element can be received therein in assembly; a countersink disposed near the bottom end of one of said lugs; a groove defined right behind said countersink and through the lower element; a deep hole disposed right below said groove; an arcuate groove disposed at a top edge of each of said lugs for slidable engagement with said projection block in assembly; a pivot pin for placement through the through holes of the

upper and lower elements in assembly so to permit the pivotal movement of said upper element with respect to the lower element;

a locking piece adapted to be inserted into said groove in said lower element for selective engagement in said positioning grooves, said locking piece having a front engagement end, a button end and a connecting portion between said front engagement end and said button end, said button end being adapted to be received in said counter sink and having a protrusion on an inner side thereof;

a spring having a first end adapted to be in engagement with said protrusion of said button end of said locking piece, and a second end adapted to be received in said deep hole of said lower element;

wherein the projection block of said upper element and said arcuate groove of said lower element in combination constitute said pivotal positioning means, which are able to limit the pivot angle of the upper element with respect to the lower element so that the over-tilting of the canopy can be prevented and the tilting operation can be performed in a more precise manner.

4,877,044

CLOSING AND INJECTION VALVE ESPECIALLY FOR HOT GAS DEFROSTING IN FREEZING AND COOLING INSTALLATIONS

Rolf H. Albrigtsen, Norge, and Per R. Samuelsen, Oslo, both of Norway, assignors to A/S Finsam International Inc., Oslo, Norway

PCT No. PCT/NO87/00078, § 371 Date Aug. 15, 1988, § 102(e) Date Aug. 15, 1988, PCT Pub. No. WO88/04383, PCT Pub. Date Jan. 16, 1988

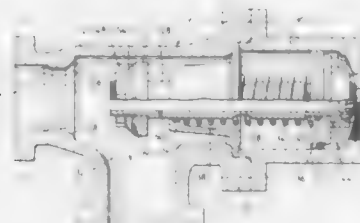
PCT Filed Dec. 8, 1987, Ser. No. 222,079

Claims priority, application Norway, Dec. 9, 1986, 864941

Int. Cl.⁴ F16K 49/00; F25B 41/04

U.S. Cl. 137-107

4 Claims



1. A valve for shutting off or closing a main fluid flow through a main flow passage (32), comprising a valve stem (28) having a valve head (48) which may be operated to engage a valve seat (18) in order to close said passage, the valve stem carrying at the end remote from the valve head a piston (36) which operates in a cylinder (22) and can be actuated by a closing fluid against spring action in order to move the valve stem (28) and the valve head (48) into closed position, characterized in that the valve stem (28) is hollow and at the end at which the valve head (48) is provided, is open and at the opposite end has openings (46) opening into the interior of the hollow valve stem (28), and that the piston (36) is mounted for axial movement on the valve stem (28) to allow further movement towards the valve seat (18) against spring action when the valve head (48) has engaged the valve seat (18) and the valve stem (28) has therefore come to a halt, said further movement relative to the valve stem (28) opening a passage (45) into the openings (46) in the valve stem (28), whereby closing fluid will be injected into the main flow passage (32) at one side of the valve seat (18) through the valve stem.

4,877,047

CONTROL MECHANISM FOR CONTROLLING THE WATER SUPPLY IN AN IRRIGATION SYSTEM AND SIMILAR, OPERATING BY MEANS OF PRESSURE PULSES

Guido Isidoro, Fraz. Com. S. Casciano V. di Penna, Via per Cerbaia, 8A, Firenze, Italy

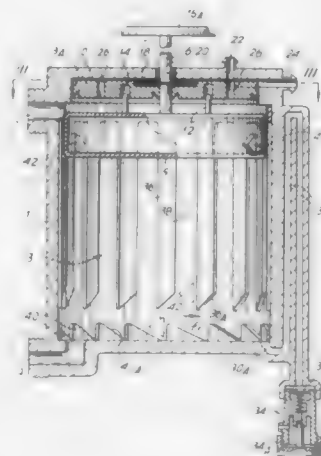
Filed Oct. 17, 1988, Ser. No. 259,040

Claims priority, application Italy, Oct. 16, 1987, 9514 A/87

Int. Cl.⁴ F16K 11/02, 31/18

U.S. Cl. 137-119

10 Claims



1. A control mechanism for controlling a water supply by means of pressure pulses in a water supply pipe which is capable of preventing erroneous commands caused by brief accidental pulses, comprising: a housing defining a chamber having a liquid inlet and chamber port means; a shutter in the chamber mounted for rotation and reciprocation, the shutter having shutter port means therein for registering with the chamber port means in the housing in various rotative positions of the shutter; a float positioned in the chamber operatively connected to the shutter to cause reciprocation and rotation of the shutter in response to reciprocation and rotation of the float; cam means connected to the float and connected to the housing, said cam means cooperating to effect stepped rotation of the float and shutter in response to each reciprocation thereof from an upper position to a lower position and back to the upper position in the chamber, liquid siphon discharge means connected to the chamber for discharging liquid from the chamber, a flow metering device for regulating liquid discharge through said siphon discharge means to provide a slow discharge of liquid to permit the siphon discharge means to slowly discharge liquid from the chamber in response to release of pressure in the chamber.

4,877,048

WHEEL END VALVE FOR CENTRAL TIRE INFLATION SYSTEM

Jerry M. Oltean, Ontario, Canada, and Paul E. Goodwin, Southfield, Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Oct. 14, 1988, Ser. No. 257,594

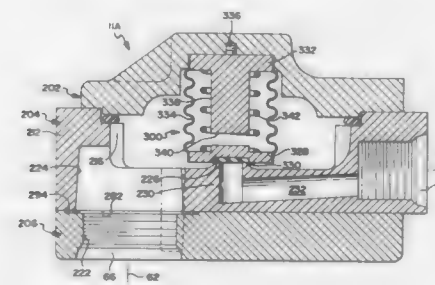
Int. Cl.⁴ B60C 29/00

U.S. Cl. 137-225

4 Claims

1. A central tire inflation system comprising a wheel end valve assembly including a valve body having a first fluid connection defined by a first port connected to a selectively pressurized and exhausted conduit, a second fluid connection defined by a second port connected to an interior pressurized chamber of an inflatable tire, said valve assembly comprising a valve means responsive to pressurization of said selectively pressurized and exhausted conduit to assume an opened position for establishing fluid communication between said first

and second ports and responsive to exhausting to atmosphere of said selectively pressurized and exhausted conduit to assume a closed position for blocking fluid communication between said first and second ports thereof, said valve means comprising a valve seat and a valve head having a sealing means for sealing said head to the valve seat when said valve means is closed, said valve characterized by:



an elongated bellows having an end secured to said head and an end secured to a base which is secured to said valve body and an elongated spring means located internally of said bellows and extending between said valve head and said valve base to resiliently bias said valve means into said closed position.

4,877,049

PNEUMATIC, WATER LEAKAGE SAFETY DEVICE FOR WASHING MACHINES

Paolo Fornasari, Alessandria, Italy, assignor to Eltek, S.p.A., Alessandria, Italy

Filed Oct. 14, 1988, Ser. No. 259,362

Claims priority, application Italy, Oct. 23, 1987, 67883-A/87

Int. Cl.⁴ F16K 31/122, 31/126, 33/00; H01H 35/18

U.S. Cl. 137-312

9 Claims



1. A pneumatic, water leakage safety device designed for domestic and/or industrial washing machines having a housing containing at least one pneumatically-actuated valve controlling the entry of water into the tub of said washing machine; said at least one valve being actuated, power supply means; at least one calibrated spring which reacts against the movement of the at least one valve in response to the compressed air acting upon said at least one valve; an electric switch associated with a float being included in the power supply means of said pump; said float being positioned so as to rise due to the effect of leakage water collecting in a tray due to machine malfunctions; said float causing said switch to open shutting off the power supply to said pump and that of the washing machine.

4,877,050

VALVE HANDLE

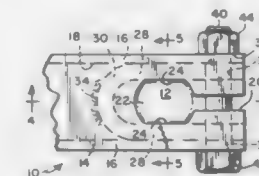
Carl B. Harris, Rutland, Mass., assignor to Thomas Smith Co. Inc., Worcester, Mass.

Filed Oct. 28, 1988, Ser. No. 264,336

Int. Cl.⁴ F16K 31/00; G05G 1/10

U.S. Cl. 137-315

6 Claims



1. A valve handle for effecting rotation of a valve stem having spaced, parallel sides, said valve handle being structured to be applied to the valve stem at right angles to the axis of the valve stem and extending radially from the axis of the valve stem, said valve handle comprising an elongate, rigid bar of U-shaped cross section embodying a substantially flat back part and transversely-spaced, parallel, flat side parts perpendicular to the back part and connected, respectively, at one edge to the opposite edges of the back part, said back part containing adjacent one end an opening situated midway between the side parts, said opening being spaced from said one end and embodying transversely-spaced, parallel edges and longitudinally-spaced arcuate edges for non-rotatably receiving the stem, said spaced, parallel edges of said openings being parallel to said flat side parts and said longitudinally-spaced, arcuate edges being disposed transversely of the flat back part, said opening being spaced from the end of the handle and said back part containing a medially-disposed slot extending from the arcuate end adjacent said end of the handle to the end of the handle and said side parts containing transversely-aligned holes midway between the upper and lower edges of the side parts and a U-shaped clamp embodying spaced, parallel sides corresponding in width to the width of the spaced, parallel side parts of the handle and an integral, semicircular end part joining the ends of the spaced, parallel side parts at one end, said U-shaped clamp being dimensioned to be received between the flat side parts of the handle with its ends coinciding with the ends of the side parts of the handle and with its semicircular end part disposed within the handle between the spaced, parallel side parts of the handle such that the semicircular end part extends beyond the opening in the flat back part such that when the handle is applied to the stem, the stem will be situated between the side parts of the handle forwardly of the semicircular back part and said side parts containing transversely-disposed openings so situated as to coincide with the openings in the spaced, parallel sides of the handle and a bolt disposed transversely of the handle within the openings in the handle and the U-shaped clamp, provided with a head at one end and a nut at the other end by means of which the side parts of the U-shaped clamp can be drawn into clamping engagement with the spaced, parallel sides of the valve stem, said opening being situated substantially midway between the arcuate back part and the clamping bolt such as to apply gripping pressure uniformly to the flat sides of the stem.

4,877,051

FLOW CONTROLLER

Christopher C. Day, Newtonville, Mass., assignor to MKS Instruments, Inc., Andover, Mass.

Filed Nov. 28, 1988, Ser. No. 277,030

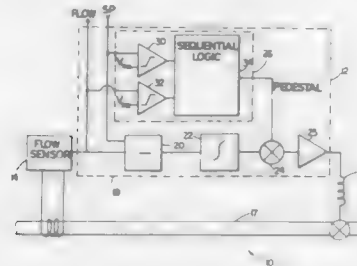
Int. Cl.⁴ G05D 7/06

U.S. Cl. 137-486

17 Claims

1. A fluid flow control apparatus comprising

- a fluid flow control valve being configured to be located in a fluid path and controlled by a control signal,
 a fluid flow sensor, said fluid flow sensor configured to sense fluid flow in the fluid path, and output an actual flow signal indicative thereof, and
 a fluid flow control circuit,
 said fluid flow control circuit configured to control said fluid flow control valve,
 said fluid flow control circuit including
 an actual control circuit configured to compare said



- actual flow signal with a desired flow signal and produce a signal related to this comparison,
 a desired flow comparator circuit configured to compare said desired flow signal with a desired flow threshold signal and provide a desired flow comparator output indicative of this comparison, and
 a summing circuit configured to receive said signal related to the comparison of said actual flow signal with said desired flow signal and a signal related to said desired flow comparator output, and provide said control signal based on said signals.

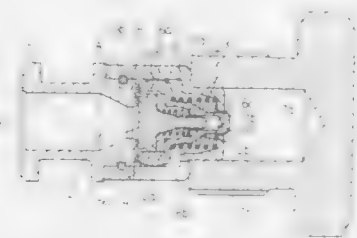
4,877,052 CHECK VALVE

Kamimura Toshio, and Ito Koji, both of Gifu, Japan, assignors to Teijin Seiki Co., Ltd., Osaka, Japan
 Filed May 12, 1988, Ser. No. 193,405
 Claims priority, application Japan, May 14, 1987, 62-72307[U]

Int. Cl.⁴ F16K 15/02

U.S. Cl. 137—512.3

2 Claims



1. A check valve comprising
 (a) a case including:
 (i) a hollow portion,
 (ii) an inner sliding surface,
 (iii) an inlet port,
 (iv) an outlet port,
 (v) a first planar sealing means located in a first plane,
 (vi) a second planar sealing means which is concentric with and surrounds said first planar sealing means and which is located in said first plane, and
 (vii) an opening;
 (b) an outer flat top poppet including:
 (i) a head portion in sliding engagement with the inner sliding surface of the case,
 (ii) a shaft portion extending from said head portion and through the opening in the case,

- (iii) a flat top, and
 (iv) a recess defined by an inner wall;
 (c) an inner flat top poppet including:
 (i) a head portion in sliding engagement with the inner wall of the outer flat top poppet,
 (ii) a shaft portion extending from the head portion of the inner flat top poppet and in the recess of the outer flat top poppet, and
 (iii) a flat top; and
 (d) spring means for biasing the flat tops of said inner and outer flat top poppets into sealing engagement with said first and second planar sealing means, respectively.

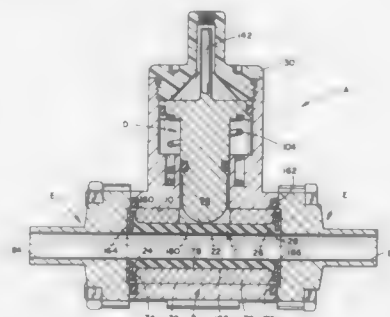
4,877,053 PINCH VALVE

Edward M. Yasko, Jr., Denmark; Cal R. Brown, Euclid; Terry M. Kalain, Willoughby, and Peter C. Williams, Cleveland Heights, all of Ohio, assignors to Whitey Co., Highland Heights, Ohio

Continuation-in-part of Ser. No. 177,971, Apr. 5, 1988, Pat. No. 4,800,920. This application Sep. 30, 1988, Ser. No. 252,257
 Int. Cl.⁴ F16K 37/00; F16L 55/14

U.S. Cl. 137—556

13 Claims



1. A valve comprising:
 a body having a bore extending therethrough;
 a flexible member received in said bore and having a passage defined therethrough adapted to be selectively opened and closed;
 a casing member received around said flexible member and having an outer diametrical dimension adapted for close receipt in said bore, said casing member including an aperture extending through a sidewall thereof; and,
 an actuating member adapted for close receipt through said aperture for selectively engaging said flexible member and opening and closing said passage.

4,877,054 ROTARY VALVE ASSEMBLY

John Walter, Evergreen Park, Ill., assignor to Continental Can Company, Inc., Norwalk, Conn.

Division of Ser. No. 207,500, Jun. 16, 1988, Pat. No. 4,830,048.
 This application Jan. 31, 1989, Ser. No. 304,181

Int. Cl.⁴ F16K 11/02

U.S. Cl. 137—560

3 Claims

1. A valve assembly for use in a multiple work station machine, said machine including a rotating shaft carrying a plurality of work stations, each work station requiring a separate multiple fluid supply, said valve assembly comprising a manifold plate separately mounted on said shaft for rotation with said shaft, said manifold plate having a cylindrical surface and a flat surface, plural sets of fluid delivery ports in said manifold plate extending from said flat surface to said cylindrical surface, there being a set of fluid delivery ports for each work station, an annular supply manifold having a flat surface facing said manifold plate flat surface and a cylindrical surface, a set of fluid supply ports extending through said supply manifold

from said supply manifold cylindrical surface to said supply manifold flat surface, mounting means mounting said supply manifold on said rotating shaft in a fixed non-rotating position, and an annular seal carried by said supply manifold and engaging said flat surfaces in sealed relation, said seal having a first flat surface engaging said supply manifold flat surface, said first flat surface having individual supply ports opening there-

with means defining a leak path between the inlet aperture and the outlet aperture.

4,877,056 DIGITAL VALVE

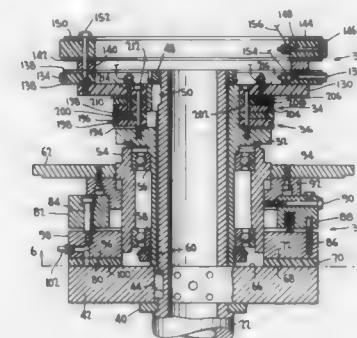
Gilles Comte, Chelles, and Andre Viode, Saint-Etienne, both of France, assignors to Societe Anonyme dite: SOGELERG, Rangis Cedex, France and Societe Nouvelle Auxim, Saint-Etienne, France

Filed Mar. 30, 1989, Ser. No. 330,577

Claims priority, application France, Mar. 31, 1988, 88 04305
 Int. Cl.⁴ G05D 7/03

U.S. Cl. 137—599

8 Claims



through in alignment with said fluid supply ports, said seal having a second flat surface engaging said manifold plate flat surface, said seal having in said second flat surface accurate grooves disposed in continuous communication with said seal supply ports and being periodically alignable with said manifold plate delivery ports as said manifold plate rotates relative to said seal.

4,877,055 LEAKAGE DEVICE FOR THE DRAINAGE OF A DIAPHRAGM ACCUMULATOR

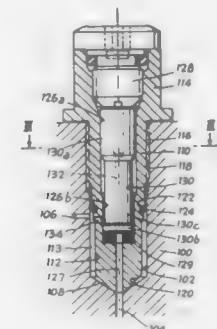
Pierre Kauchel, Germigny L'Eveque, and Jacques Nollez, Paris, both of France, assignors to Bendix France, Drancy, France
 Filed Jan. 9, 1989, Ser. No. 294,081

Claims priority, application France, Feb. 5, 1988, 88 01331;
 Apr. 28, 1988, 88 05656

Int. Cl.⁴ F16L 55/04

U.S. Cl. 137—568

17 Claims



1. A leakage device in a process for emptying a diaphragm accumulator whose diaphragm is adapted to be applied against at least a part of an inside wall of the accumulator in the absence of pressure, said accumulator being disposed in a hydraulic circuit including a low-pressure reservoir, and a pump pumping liquid from the reservoir to feed a pressurized circuit including said accumulator, process according to which a leak of said liquid from said circuit to said low-pressure reservoir is maintained with a predetermined rate of flow, said leakage device, comprising a body provided with a chamber, an inlet aperture for connection to the hydraulic circuit, an outlet aperture for connection to the low-pressure reservoir, and a plunger mounted in said chamber, the plunger being provided

1. A digital valve comprising:
 an inlet duct disposed on a valve axis in order to receive a fluid at an upstream pressure via an upstream side, and an outlet duct disposed on the same axis in order to allow said fluid to leave via a downstream side under a downstream pressure which is substantially smaller;
 a plurality of shutters, each serving, when open, to disengage an orifice allowing a flow of said fluid to pass from said inlet duct to said outlet duct at a rate which is individual to said shutter, and serving, when closed, to prevent said flow;
 a valve body forming a plurality of seatings angularly distributed around said valve axis around a ring of shutters, with the diameter of the ring being greater than the diameter of said inlet duct, at least, said seatings each receiving a corresponding one of said shutters in such a manner as to connect said shutters in parallel between said inlet duct and said outlet duct so that the flows through open shutters are added together; and
 a plurality of actuators each for actuating a corresponding one of said shutters;
 wherein:
 each of said seatings in said valve body is in the form of a re-entrant dihedral angle open outwardly and in the upstream direction, one side of said angle being constituted by an inlet wall disposed on the radially inside side of the corresponding one of said shutters and extending along a circumferential direction and along a direction which is axial or outwardly oblique, and on the other side by an outlet wall disposed downstream from said shutter and extending along a circumferential direction and along a direction which is radial or oblique towards the downstream direction;
 each of said shutters is incorporated in a corresponding shutter module having two bearing faces forming a projecting dihedral angle of the same value as said re-entrant dihedral angle;
 module fixing means removably fix each of said shutter modules to bear via said bearing faces against said inlet and outlet walls of its seating;
 said inlet and outlet walls of each of said seatings and said corresponding shutter module incorporating one of said shutters, form, for said fluid, when said shutter is open, a bent duct having an inlet branch substantially perpendicular

lar to said inlet wall and an outlet branch substantially perpendicular to said outlet wall, enabling said fluid to penetrate into an outlet chamber which is common to at least a plurality of said seatings, and which communicates with said outlet duct or is constituted thereby; and sealing means are provided between said bearing faces of said module and said walls of its seating around said inlet and outlet branches.

4,877,057

PRESSURE EQUALIZING VALVE

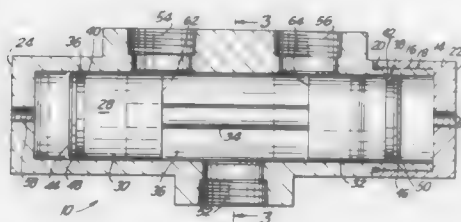
Bruce C. Christensen, Marinette, Wis., assignor to Wormald, U.S. Inc., Marinette, Wis.

Division of Ser. No. 839,143, Mar. 12, 1986, Pat. No. 4,722,358. This application Nov. 13, 1987, Ser. No. 120,014

Int. Cl.⁴ G05D 11/03

U.S. Cl. 137—625.48

10 Claims



1. A pressure equalizing valve, comprising:

a valve body with first and second end faces, said body having a longitudinally disposed bore therein, an inlet port for receiving a first pressurized fluid therethrough, an outlet port for transporting said first fluid downstream of said valve, a by-pass outlet port for transporting said first fluid away from said outlet port, a first sense port disposed in said first end face for sensing the pressure of said first fluid downstream of said valve, a second sense port disposed in said second end face for sensing the pressure of a source of a second pressurized fluid to be mixed with said first fluid downstream of said valve, said ports in fluid communication with said bore;

spool means longitudinally disposed within said bore, said spool means formed with first and second piston means having first and second faces, respectively, said spool means freely translatable within said bore in response to a pressure differential between fluids at said first and second sense ports so as to allow said piston means to regulate the flow of said first fluid through said outlet and by-pass ports such that said first and second fluids maintain substantially equal pressures downstream of said valve; and

first and second sealing means disposed proximate said first and second faces of said piston means, respectively, for sealing said inlet port, said outlet port, and said by-pass port from fluid communication with said first and second sense ports.

4,877,058

SPOOL VALVE

Kurt Stoll, Esslingen, Fed. Rep. of Germany, assignor to Festo KG, Esslingen, Fed. Rep. of Germany

Filed Sep. 20, 1988, Ser. No. 246,700

Claims priority, application Fed. Rep. of Germany, Oct. 9, 1987, 3734136

Int. Cl.⁴ F15B 13/042; F16K 31/126

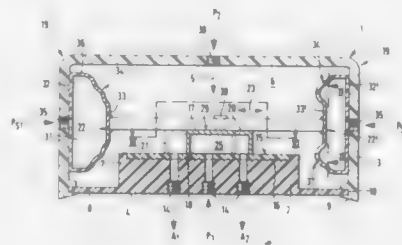
U.S. Cl. 137—625.48

13 Claims

1. A valve comprising:

a valve housing having opposite wall portions;
a connection plate having a sealing surface, the connection

plate being attached to said housing with the sealing surface facing into said housing;
ducts extending through said connection plate;
ports at the ends of respective ducts and opening into said sealing surface;
a flat spool having opposite ends mounted for reciprocation along an axis parallel to said sealing surface passing through said opposite wall portions and said opposite ends so as to slide across said surface, connecting together and isolating selected of said ports from each other;
means for effecting said reciprocation of said spool comprising:



a pair of bellows in the housing connected between respective opposite ends of the spool and said opposite wall portions, providing operating surfaces attached to the spool in all reciprocal positions thereof;
means for supplying an operating fluid to each of said bellows for expanding one bellows while contracting the other thereby effecting reciprocation of the spool, the spool being suspended by the attachment to the bellows for float thereof laterally of the axis of reciprocation; and,
biasing means urging the flat spool against the sealing surface in all reciprocal positions thereof.

4,877,059

VALVE

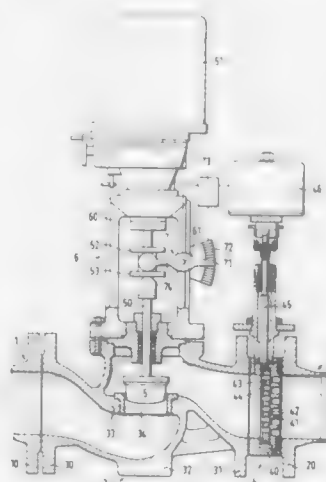
Ian C. Popescu, Krefeld, and Rainer Lange, Neuburg/Donau, both of Fed. Rep. of Germany, assignors to Schubert & Salzer, Ingolstadt, Fed. Rep. of Germany

Filed May 6, 1988, Ser. No. 190,709

Int. Cl.⁴ F16K 37/00

U.S. Cl. 137—637.1

8 Claims



1. An adjustable flow valve for regulating the flow of liquids, comprising:
(a) a valve seat having an opening through which the liquid flows;

(b) an adjustable closing element, adapted to vary the liquid flow through said valve seat;
(c) a flow divider disposed within the liquid flow path adjacent to said valve seat, having adjustable apertures for regulating the flow of the liquid and for dividing the liquid into a plurality of streams, and means for regulating the size of said apertures;
(d) sensing means for sensing the position of the closing element; and
(e) control means, responsive to said sensing means, for varying the size of the apertures in said flow divider in response to variations in the position of said closing element to reduce cavitation noise and wear on the valve.

4,877,060

DEVICE FOR COUPLING HEDDLE FRAMES TO THE TRANSMISSION ELEMENTS OF A MECHANISM FOR FORMING THE SHED

Jean-Paul Froment, Doussard, and Joseph Palan, Duingt, both of France, assignors to S.A. Des Etablissements Staubli (France), Faverges, France

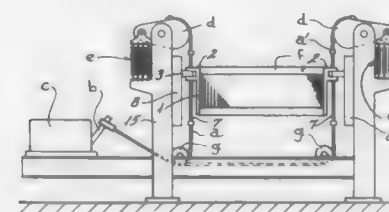
Filed Jun. 13, 1988, Ser. No. 205,839

Claims priority, application France, Jun. 26, 1987, 87 09275

Int. Cl.⁴ D03C 13/00

U.S. Cl. 139—82

13 Claims



1. A coupling device for connecting the uprights of a heddle frame to a motion transmission element in a weaving loom wherein the uprights are disposed along a plane and the motion transmission element includes an elongated axis comprising, a male tenon member and a female mortise member, one of said members being connected to the upright of the heddle frame and the other of said members being connected to the motion transmission element, said one of said members including an open slot along the plane of the upright to form at least one pair of opposing and outwardly extending arm elements, said other of said members being selectively seated between said arm elements so that the axis of the motion transmission element passes through said slot and intermediate said arm elements whereby forces distributed along the axis of the motion transmission element are distributed to said members to thereby prevent shifting of said said members with respect to one another.

4,877,061

AUTOMATIC COP EXCHANGING APPARATUS FOR SHUTTLE LOOM

Takao Yurita, Chiba; Hideo Komori, Ibaraki; Koji Ogasawara, and Hiroaki Takami, both of Kanagawa, all of Japan, assignors to Ichikawa Woolen Textile Co., Ltd., Tokyo, Japan

Filed Jun. 16, 1988, Ser. No. 207,484

Claims priority, application Japan, Jun. 16, 1987, 62-148063; Jun. 26, 1987, 62-157834; Jun. 30, 1987, 62-161024; Jun. 30, 1987, 62-161025

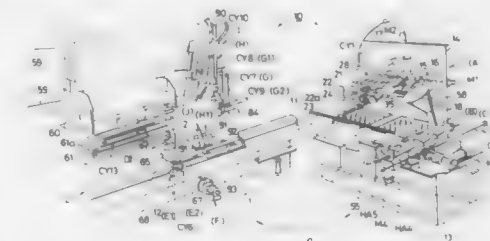
Int. Cl.⁴ D03D 45/00, 45/50; B65H 67/00

U.S. Cl. 139—224 R

9 Claims

1. An automatic cop exchanging apparatus for exchanging a cop on which weft yarn is wound in a loom for producing woven material in which a shuttle is passed between an upper warp and a lower warp, comprising:

cop pick up means for picking up a new cop and delivering said new cop to a predetermined position;
cop setting means for picking up an old cop within said shuttle, receiving said new cop delivered by said pickup means, and setting said new cop in said shuttle;



thread processing means for processing threads of said new and old cops by making said threads of said new and old cops coincide in position;
tying means for tying said ends of said threads together; and
reel means for dispersing the position of knot portions of the tied threads through said woven material.

4,877,062

TEMPLE

Tilman Hoefelmayr, Steinwichelestr. 20, CH-9052 Nieder- teufen, Switzerland

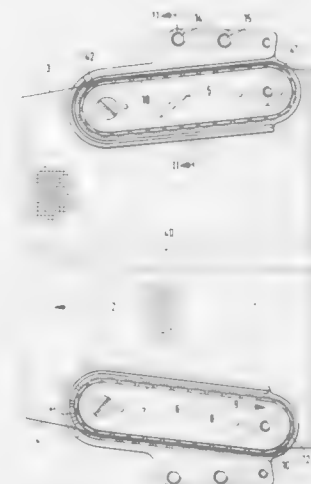
Filed Sep. 25, 1987, Ser. No. 101,363

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1986, 3632821

Int. Cl.⁴ D03J 1/22

U.S. Cl. 139—294

24 Claims



1. A temple for securing a woven fabric advanceable in a weaving apparatus, the temple comprising endless guide means having displaceably arranged therein a plurality of discrete, unconnected members provided with needles for engagement with said woven fabric, said guide means providing a displacement path along which said members are constrained to travel between a fabric needling-in position and a fabric de-needling position, said displacement path being angularly inclined with respect to a longitudinal axis of the woven fabric and convergent in the direction of advancement of the fabric, the displacement path being arranged such that the needles of at least two members are simultaneously in engagement with an edge of the woven fabric and that, in the course of fabric needling-in, the needles brought into engagement with the woven fabric are located at a greater distance from the longitudinal axis of the width of woven fabric than they are in the course of fabric

de-needling characterized in that the members are supported in such a way that they can be displaced relative to one another such that the aggregate amount of space between all members on the endless guide means is at least as great as the amount of fabric elongation between the needling-in position and the de-needling position, there being means provided for holding within a predetermined distance one of said plurality of members adjacent the member in the needling-in position.

4,877,063

MAIN INJECTOR WITH INCREASED TENSIONING FORCE, FOR AIRJET WEAVING MACHINES

Josef Verhulst, Zillebeke, Belgium, assignor to Picanol N.V., Ypres, Belgium

Continuation of Ser. No. 127,060, Dec. 1, 1987, abandoned. This application Mar. 28, 1989, Ser. No. 331,084

Claims priority, application Netherlands, Dec. 2, 1986, 1603063

Int. Cl.⁴ D03D 47/30

U.S. Cl. 139—435

18 Claims



1. An apparatus for fluidly injecting a weft thread into a shed of a weaving loom with increased tensile force exerted on the weft thread comprising:

- a main injection nozzle having a weft admission passage, a fluid pressure admission passage, and an exit passage; and
- a fluid jet injection tube of predetermined length and constant cross section diameter fixedly disposed coaxially to the exit passage of the main nozzle and adjacent the exit outlet of the main nozzle, and having at least one group of fluid outlet openings in direct communication with ambient atmosphere extending through the wall of the tube and positioned symmetrically to the axis of the tube, the outlet openings of said at least one group intersecting a single plane extending transversely perpendicular to the axis of the tube, whereby pressurized fluid passing through the tube will egress equally from each of the openings of the group symmetrically to the axis of the tube.

4,877,064

DEVICE FOR THE AUTOMATIC CONTROL OF THE WEFT YARN FEED IN AIR LOOMS

Luigi Pezzoli, Leffe, Italy, assignor to Vilmaire Officine Meccaniche S.P.A., Vilmaire Di Scelve, Italy

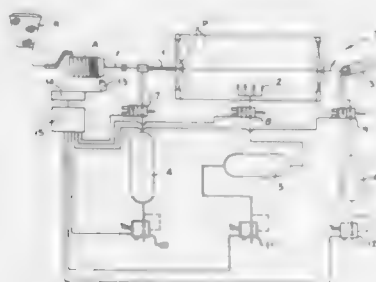
Filed Jan. 22, 1988, Ser. No. 147,310

Claims priority, application Italy, Jan. 26, 1987, 19157 A/87

Int. Cl.⁴ D03D 47/30, 47/36

U.S. Cl. 139—435

7 Claims



1. In an air loom, the combination comprising:

weft yarn feeding means for feeding the weft yarn from a spool;

means for moving said weft yarn through a shed of said loom, said means comprising multiple air jet nozzles or sets of nozzles blowing air along said shed from air supply means;

sensing means, positioned at the outlet of the feeding means, to sense the time required for each turn or part of a turn of said weft yarn leaving said feeding means to unwind, said sensing means generating a signal in response to said sensing;

a programmable control circuit, to control said movement of said weft yarn through said shed, which circuit supplies reference values according to predetermined weft yarn unwinding times; and

comparator means, to compare said signals generated by said sensing means with said reference values and to adjust air blowing parameters of the air jet nozzles, either in response to differences existing between said compared signals and values so as to reduce said differences, or in order to obtain the most economical adjustment of said parameters which will avoid said differences.

4,877,065

DECANTING DEVICE FOR LIQUIDS, E.G. PERMANENT WAVE AGENTS

Peter Lamboy, Weiterstadt; Franz Steigerwald, Griesheim; Karlheinz Zulauf, Hoechst-Hassenroth, all of Fed. Rep. of Germany, and Harmut Gnanow-Markert, Minneapolis, Minn., assignors to Wella Aktiengesellschaft, Darmstadt, Fed. Rep. of Germany

PCT No. PCT/EP83/00075, § 371 Date Jan. 26, 1984, § 102(e) Date Jan. 26, 1984, PCT Pub. No. WO83/03234, PCT Pub. Date Sep. 29, 1983

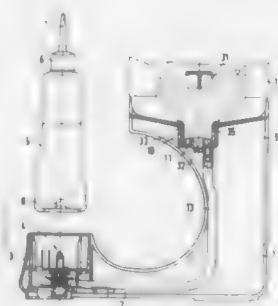
PCT Filed Mar. 16, 1983, Ser. No. 557,281

Claims priority, application Fed. Rep. of Germany, Mar. 19, 1982, 3210154

Int. Cl.⁴ B65B 3/06, 3/16

U.S. Cl. 141—19

21 Claims



1. A device for decanting liquids, particularly liquid permanent wave agents, from a storage container provided with a dispensing closure into a receiver container provided at a base thereof with a filling closure and a discharge nozzle at which the receiver container is vented, comprising a frame having a lower part (2) and an upper part forming a support (9) for the storage container; a filling valve (4) connectable to the filling closure and including a base (15), a hollow filling tube (14) which projects upwardly from the base and is insertable into the filling closure of the receiver container when the latter is placed with its base onto the base of the filling valve, and at least one spring-loaded valve actuator (17) projecting upwardly from the base of the filling valve so that it is pressed by the base of the receiver container when the latter is placed onto the base of the filling valve to open said filling valve; a dispensing connector (10) connectable to said dispensing closure and mountable on said support so that it is positioned laterally

offset of and above and at a vertical distance from said filling valve; and means for venting said storage container.

4,877,067

APPARATUS FOR DISTRIBUTEDLY FILLING PARTICULATE OR GRANULAR MATERIAL INTO CONTAINERS

Masao Shimokawa, and Hisanori Hamada, both of Tokushima, Japan, assignors to Shikoku Kakoki Co., Ltd., Tokushima, Japan

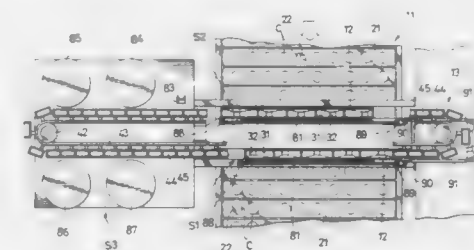
Filed Sep. 21, 1988, Ser. No. 247,192

Claims priority, application Japan, Sep. 25, 1987, 62-146568[U]

Int. Cl.⁴ B65B 43/42

U.S. Cl. 141—129

4 Claims



4,877,066

APPARATUS FOR FILLING TRANSMISSION FLUID INTO TRANSMISSIONS

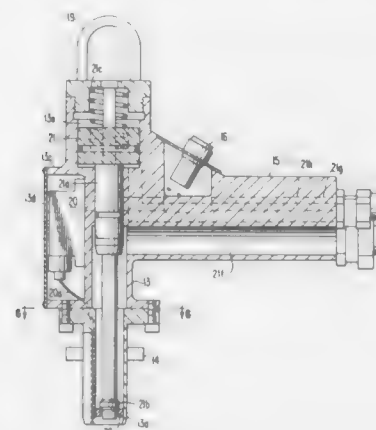
Shigeo Okamizu, Southgate, Mich., assignor to Mazda Motor Manufacturing (USA) Corporation, Flat Rock, Mich.

Filed Aug. 31, 1988, Ser. No. 239,615

Int. Cl.⁴ B65B 57/00; G01N 21/26

U.S. Cl. 141—96

9 Claims



1. A filling apparatus for filling liquid into a container for the liquid to either of at least two levels, comprising:

- a liquid pouring gun unit having means for dispensing a liquid and a sensor thereon for sensing that the distance of a surface of the liquid in said container from the end of the dispensing means closest to the liquid is a predetermined distance, said sensor including means for producing a signal when said distance is sensed;
- a liquid supply line connected to said liquid pouring gun unit, said liquid supply line having a liquid controlling valve means therein and liquid flow amount determining means for determining the amount of liquid which is flowing in said liquid supply line; and
- controller means to which said sensor and said liquid flow amount determining means are connected, and connected to said liquid controlling valve means, and including means for setting said controller means for actuation at either of at least two levels, and further including means for actuating said liquid controlling valve means, when said setting means is set for a first level, to close said liquid controlling valve means in response to the signal from said sensor, and for actuating said liquid controlling valve means, when said setting means is set for a second level, for closing said liquid controlling valve means only after said liquid flow amount determining means has determined that a predetermined amount of liquid has flowed through said liquid supply line after receipt of the signal from said sensor.

1. An apparatus for distributedly filling a particulate or granular material into containers comprising:

an apparatus frame having first and second filling stations, a container conveyor having an even number of spaced container transport paths extending through the first and second filling stations, the container conveyor being adapted to be driven intermittently so as to stop containers at the first and second filling stations during transport,

first chutes equal in number to one-half of the number of container transport paths and so arranged and spaced as to have their lower-end openings disposed above the respective containers stopped at the first filling station in the even-numbered transport paths as arranged from one side of the container conveyor,

second chutes equal in number to one-half of the number of container transport paths and so arranged and spaced as to have their lower-end openings disposed above the respective containers stopped at the second filling station in the odd-numbered transport paths as arranged from said one side of the container conveyor,

a particulate or granular material conveyor having an endless material transport path including a forward path portion and a return path portion, the path portions extending across and being positioned above the even number of spaced container transport paths, the material conveyor having a chain extending along the material transport path and first and second buckets arranged alternately and attached to the chain at the same spacing as the container transport paths, the buckets being movable above the upper-end openings of all the first chutes when traveling through the forward path portion and above the upper-end openings of all the second chutes when traveling through the return path portion, the material conveyor being so driven continuously that each time the container conveyor is intermittently driven, each bucket moves by a distance equal to the spacing between adjacent chutes multiplied by the number of first or second chutes, a number of said first buckets being positionable above the upper-end openings of the respective first chutes and a number of said second buckets being positionable above the upper-end openings of the respective second chutes when containers being transported are stopped at the first and second filling stations, and

means operable only one each time the container conveyor is intermittently driven to place the particulate or granular material into the first and second chutes respectively from the first and second buckets positioned above the upper-end openings of the first and second chutes while the

containers are stopped at the first and second filling stations.

scaffold to which said saw table may be mounted, and a plurality of scaffold platform engaging hooks disposed on said table

4,877,068
BAG LOADER AND BAG FOR BEVERAGE CANS
Gregory L. Blake, 1508 Humphrey, Birmingham, Mich. 48008
Filed Jul. 15, 1988, Ser. No. 219,183
Int. Cl.⁴ B65B 67/04
U.S. Cl. 141—390

6 Claims

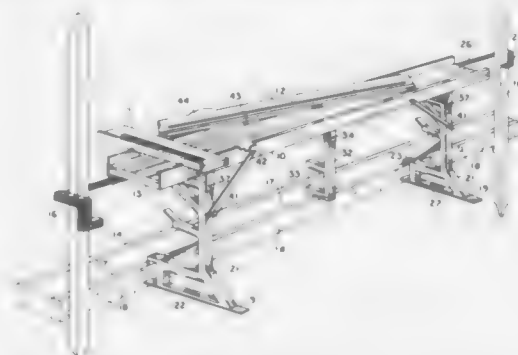


1. A receptacle for empty beverage cans comprising: a bag loader comprising a cluster of rigid cylindrical, vertically extending, tubes all having the same diameter with open top and bottom ends, said tubes being arranged in three parallel rows comprising two outer rows and an inner row therebetween with four tubes in each row, the adjacent tubes in each row being contiguous, the two outer rows being spaced from each other with each tube in one outer row being centered on a line perpendicular to the other outer row, the inner row of tubes being offset from the outer rows along the row direction by one-half diameter of a tube with each tube thereof nested and contiguous with adjacent tubes in the outer rows, each of the tubes having a diameter slightly larger than a beverage can and a length greater than two cans, and means for holding said tubes in said cluster;
- a standard paper grocery bag of one-sixth barrel size having a rectangular opening slightly smaller in both dimensions than a rectangle circumscribing said cluster;
- said bag loader being inserted into said bag with said bag distorted sufficiently from a rectangular shape to accommodate the nonrectangular shape of said cluster;
- a rubber band adapted to be stretched around said bag, whereby beverage cans may be stacked in each tube and the bag loader may be pulled out of said bag to leave said cans stacked in rows.

4,877,069
CUTTING TABLE
Stephen C. Plumley, 5312 Gallatin St., Hyattsville, Md. 20781
Filed May 17, 1988, Ser. No. 194,981
Int. Cl.⁴ B25H 1/00
U.S. Cl. 144—286 R

6 Claims

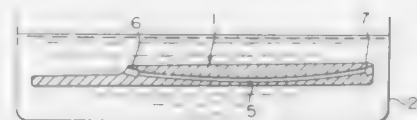
1. A scaffold mountable saw table assembly comprising in combination, a bedplate, a crosscut sawing guide and an angular sawing guide, each being adapted for movable mounting relative to said bedplate, a plurality of spaced, retractably mounted table leg members, a plurality of locking means on said bedplate allowing for engagement with vertical posts of a



leg members for releasable attachment to a side of a longitudinally extending rail "I" beam of a scaffold platform.

4,877,070
METHOD OF REINFORCING A GUITAR NECK
Nobuaki Hayashi, 5882-2, Sasaga, Matsumoto City, Nagano Prefecture, Japan
Filed Jul. 15, 1988, Ser. No. 219,254
Claims priority, application Japan, Feb. 22, 1988, 63-37574
Int. Cl.⁴ B27M 1/00; B27K 1/00
U.S. Cl. 144—364

7 Claims



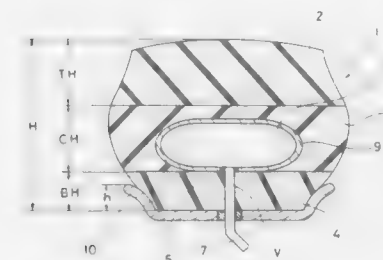
1. A method for reinforcing a guitar neck comprising: preliminary bending the guitar neck into an arcuate shape; forming a long straight aperture for an adjusting rod within the neck over substantially all of its length by a laser beam or a long drill and at the same time forming a spot facing for a nut and another spot facing for a head of the adjusting rod at the sides of the long aperture; submerging the guitar neck within a resin in a vacuum pan or an autoclave to promote resin impregnation into the interior of the neck portion; polymerizing the guitar neck with a heat energy polymerizing apparatus; inserting the adjusting rod into the long aperture; and fitting the nut on the end of the rod to adjust to a desired correcting tension.

4,877,071
THREE LAYER CUSHION TIRE
Motoshi Tanigawa, Himeji; Hidehiko Dohi, Takasago; Takashi Nishimura, Kobe; Kouji Ichikawa, Nishinomiya, and Tetsuo Koishi, Kobe, all of Japan, assignors to Sumitomo Rubber Industries, Ltd., Hyogo, Japan
Filed Mar. 4, 1988, Ser. No. 164,218
Claims priority, application Japan, Mar. 6, 1987, 62-52595
Int. Cl.⁴ B60C 5/00
U.S. Cl. 152—165

7 Claims

1. A cushion tire having a triple layered structure comprising a base layer of hard rubber, a middle layer of soft rubber and a tread layer of rubber arranged in that order in a radially outward sequence from the base layer to the tread layer, the section height of said base layer being in the range of 15 to 40% of the tire section height, the section height of said middle layer being in the range of 20 to 50% of the tire section height, the section height of said tread layer being in the range of 20 to 40% of the tire section height,

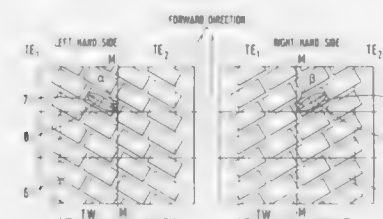
the hardness of the base layer being more than 75 JIS-A, the hardness of the middle layer being in the range of 45 to 60 JIS-A and the impact resilience of the middle layer being more than 50%, the hardness of the tread layer being in the range of 60 to 75 JIS-A,



said middle layer being provided with a circumferentially extending circular hollow part, and the volume of said circular hollow part being in the range of 30 to 60% of the whole volume of the middle layer.

4,877,072
TREAD FOR LEFT AND RIGHT VEHICLE TIRES
Jean F. L. Fontaine, Burden, Belgium, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Dec. 17, 1987, Ser. No. 134,333
Int. Cl.⁴ B60C 11/11
U.S. Cl. 152—209 R

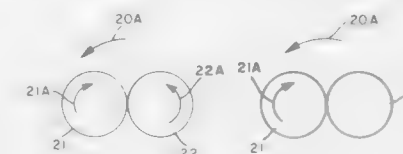
6 Claims



1. A vehicle comprising at least two steering wheels, each wheel having a pneumatic tire mounted thereon, each said tire having a ground engaging tread portion comprising a plurality of circumferentially extending arrays of substantially rectangular relief elements, as measured in a footprint of each said tire the ratio of the sum of the areas of the ground engaging surfaces of said substantially rectangular shaped relief elements to the total area of the ground engaging surface of said tread portion being greater than 50%, the treads of said tires having structures such that, using Cartesian axes wherein the center of the Cartesian axes of each said substantially rectangular relief element is located at its center of gravity and the x-axis being the axial direction of the tire and the y-axis being the circumferential direction of the tire, in a footprint of a tire mounted on a steering wheel on the left hand side of the vehicle said substantially rectangular shaped relief elements have central ellipses of inertia with the direction of their major axes being located in the second and fourth quadrants of their Cartesian axes and making an angle of between 45° and 80° with respect to the y-axis of said Cartesian axes, and in a footprint of a tire mounted on a steering wheel on the right hand side of the vehicle said substantially rectangular shaped relief elements have central ellipses of inertia with the direction of their major axes being located in the first and third quadrants of their Cartesian axes and making an angle of between 45° and 80° with respect to the y-axis of said Cartesian axes.

4,877,073
CABLES AND TIRES REINFORCED BY SAID CABLES
Marie R. Thise, Bras, Belgium, and Rene F. Reuter, Burden, Luxembourg, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Feb. 17, 1988, Ser. No. 156,677
Int. Cl.⁴ D02G 3/48; B60C 9/20
U.S. Cl. 152—451

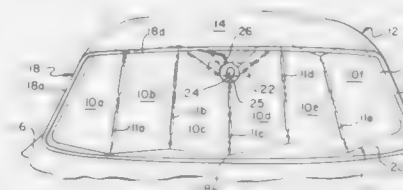
17 Claims



1. A nonmetallic cable comprising two yarns twisted together with one another, each of said yarns comprising a plurality of filaments, said cable being manufactured by the process consisting of the steps of imparting a yarn twist to each of said yarns such that before said yarns are twisted together with one another one of said yarns has a yarn twist that is at least twice as large as the yarn twist of the other yarn, said yarn twists being in opposite rotational directions from one another, and then twisting both of said yarns together with one another to form a cable having a cable twist that is opposite in rotational direction to the twist of the yarn having the larger of the two yarn twists, the resultant twist of said yarns in said cable differing from one another by a factor of at least two and said cable having an elongation of at least 4% when subjected to a force of 12 Newtons.

4,877,074
SUN SCREEN FOR VEHICLE
Anthony J. Castellano, Elmhurst, Ill., assignor to Century Container Corporation, Oak Brook, Ill.
Filed Feb. 6, 1989, Ser. No. 306,490
Int. Cl.⁴ E06B 9/24
U.S. Cl. 160—84.1

22 Claims



1. A sun screen for a windshield of a vehicle having a rearview mirror disposed adjacent to and aft of the windshield, said sun screen comprising: a plurality of planar sections hingedly coupled together along adjacent edges thereof, wherein each of said planar sections is in the general form of a trapezoid tapered toward an upper edge thereof and wherein the sun screen may either be extended to a generally planar configuration or folded into a compact configuration; engaging means disposed in an upper, center portion of the sun screen when extended and including an aperture coupled to an upper edge of the sun screen via an elongated linear slot, wherein said aperture is wider than said slot and is adapted for receiving and engaging a rearview mirror support element disposed adjacent to the windshield; and a flexible portion disposed about said aperture and adjacent to said slot to facilitate insertion of said mirror support into and its removal from said aperture.

4,877,075

WINDOW SHADE ASSEMBLY

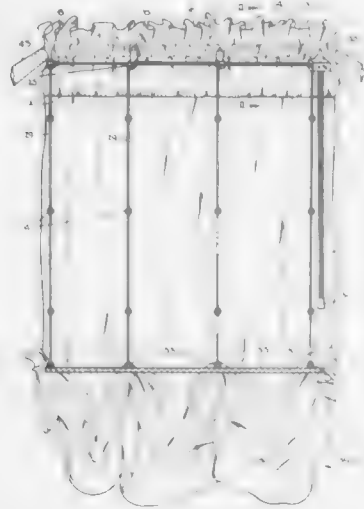
Steven Markowitz, 719 Greenwich St., No. 2 South, New York, N.Y. 10014

Filed Mar. 6, 1984, Ser. No. 586,771

Int. Cl.⁴ A47H 5/032

U.S. Cl. 160—84.1

6 Claims



1. An assembly for mounting a window shade on a curtain rod, said window shade having an upper end and a lower end substantially parallel thereto, comprising:

support means, having an elongate dimension extending substantially parallel and proximate to the upper end of the window shade, for engaging the curtain rod and cooperating therewith to support said window shade, said support means including at least one tubular formation on said window shade proximate to said upper end and extending substantially the entire width of said window shade in the direction of said elongate dimension, said tubular formation being provided with a plurality of apertures spaced along the length of said tubular formation, said curtain rod longitudinally traversing said tubular formation in an assembled state of the window shade mounting assembly;

a plurality of pulleys each provided with securing means insertable through said apertures and engageable with said curtain rod for removably attaching said pulleys thereto; and

tensile force transmission means operatively engaging said pulleys and attached to said window shade at the lower end thereof for alternately raising and lowering the lower end of said window shade in response to manipulations of said tensile force transmission means by an operator.

4,877,076

SCREEN UNIT WITH BUILT-IN BLIND

Akihiro Komori, Takamatsu, and Muneyoshi Hirano, Kurobe, both of Japan, assignors to Yoshida Kogyo K. K., Tokyo, Japan

Filed Aug. 11, 1988, Ser. No. 231,348

Claims priority, application Japan, Aug. 12, 1987, 62-124062[U]

Int. Cl.⁴ E06B 3/32

U.S. Cl. 160—107

11 Claims

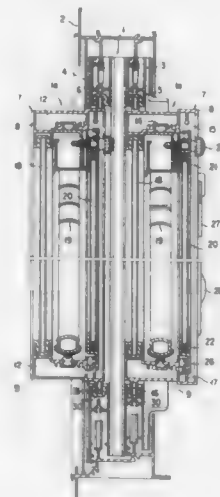
1. A screen unit with a built-in blind, comprising: an existing sash;

a rectangular unit frame formed of an upper horizontal frame member, a lower horizontal frame member, a right vertical frame member and left vertical frame member;

an outdoor side glass panel fixedly mounted on the unit frame in the outdoor side of the same;

an indoor side glass panel member detachably mounted on the unit frame in the indoor side of the same;

a blind disposed between the outdoor side glass panel and the indoor side glass panel member; and



a flange formed integrally with the unit frame so as to extend along and project from the periphery of the unit frame, for engagement with a frame for an existing sash, said flange being fastened to a sacrifice frame fixed to said existing sash frame.

4,877,077

VERTICAL COEXTRUDED PEARLESCENT LOUVER FOR VERTICAL BLINDS

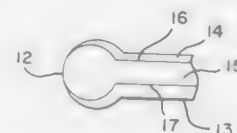
George W. Ebert, Chatsworth, Calif., assignor to Home Fashions, Inc., Santa Monica, Calif.

Filed May 13, 1988, Ser. No. 193,806

Int. Cl.⁴ E06B 3/04

U.S. Cl. 160—236

23 Claims



1. A multilayer coextruded slat having upper and lower surfaces, first and second side edges, and first and second ends; having an opaque base layer comprising a first thermoplastic polymer, and a thin transparent pearlescent layer comprising a second thermoplastic polymer upon at least one surface of said opaque base layer; and having a coextruded fusion interface between said opaque base layer and said transparent pearlescent layer.

4,877,078

PATTERN FOR USE IN LOST PATTERN FOUNDRY PROCESS

Adalbert Wittmoer, 6840 Lampertheim, Fed. Rep. of Germany

Filed Jan. 26, 1989, Ser. No. 303,282

Claims priority, application Fed. Rep. of Germany, Jan. 30, 1988, 3802727; Jul. 4, 1988, 3822601

Int. Cl.⁴ B22C 9/04

U.S. Cl. 164—34

10 Claims

1. In a method of manufacturing of metallic castings by using a vaporizable pattern of plastic foam to form a full mold for the

casting process, the improvement comprising the addition to said mold of an effective quantity of at least one organo metallic compound to reduce the formation of solid carbon during the vaporization of the plastic foam pattern.

4,877,079

COUNTERFLOW ELECTROMAGNETIC STIRRING METHOD AND APPARATUS FOR CONTINUOUS CASTING

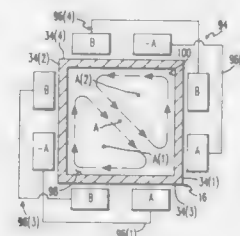
Lawrence J. Long, Crafton, and James A. Henrickson, Freedom, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 107,436, Oct. 9, 1987, abandoned. This application Oct. 14, 1988, Ser. No. 258,069

Int. Cl.⁴ B22D 27/02

U.S. Cl. 164—468

6 Claims



1. A method of converting an electromagnetic stirring (EMS) apparatus from a rotary electromagnetic stirring (REMS) mode to a counterflow electromagnetic stirring (CEMS) mode, said converting method comprising the steps of:

- (a) disconnecting a first arrangement of connections between a plurality of induction coils which establish the induction coils in a first predetermined phase relationship placing the apparatus in the REMS mode in which the coils generate a single rotating magnetic field capable of moving molten metal in a rotary stirring pattern; and
- (b) reconnecting the induction coils in a second arrangement of connections therebetween to establish the induction coils in a second predetermined phase relationship which places the apparatus in the CEMS mode in which the coils generate a pair of counterrotating and colliding magnetic fields capable of moving molten metal in a pair of counterflow stirring patterns.

4,877,080

PROCESS AND APPARATUS FOR COOLING A FLUID

Rolf Ryham, Princeton, N.J., assignor to Ahlström AB, Norrköping, Sweden

Filed Jan. 13, 1988, Ser. No. 206,036

Int. Cl.⁴ B41C 3/02; B22D 19/00; F25B 15/00

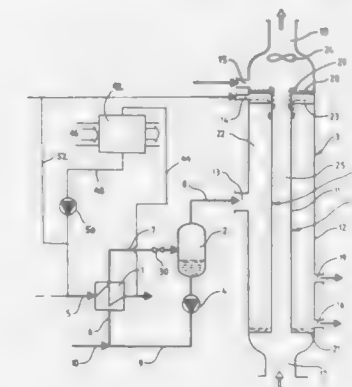
U.S. Cl. 165—2

16 Claims

1. A process for cooling a fluid comprising the steps of: removing heat from a fluid by indirect contact with a liquid in a first heat exchanger; expanding said liquid at reduced pressure so as to obtain vapor and remaining liquid; condensing and absorbing said vapor in an absorption liquid having a lower vapor pressure than said vapor at a corresponding temperature; removing heat from said absorption liquid; and recirculating said remaining liquid to said heat exchanger.
7. An apparatus for cooling a fluid comprising: first means for transferring heat from said fluid to a liquid; means connected to said first heat transferring means for releasing vapor by expansion from said liquid; means connected to said vapor releasing means for condensing said vapor; said condensing means comprising second means for transferring heat having a first cooling surface

for condensing and absorbing said vapor in an absorption liquid on said first cooling surface;

means for circulating said liquid through said vapor releasing means and said first heat transfer means; and



means for maintaining a reduced pressure in said vapor releasing means and over said cooling surface in said condensing means.

4,877,081

AIR-CONDITIONING APPARATUS FOR AUTOMOBILES

Eiichi Ohtsu, Katsuta, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

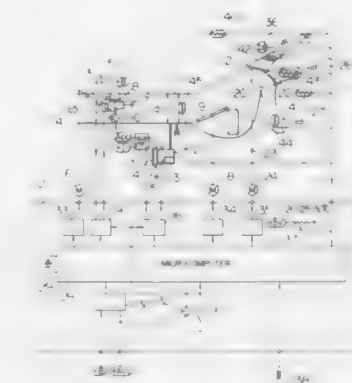
Filed Mar. 20, 1989, Ser. No. 326,069

Claims priority, application Japan, Mar. 22, 1988, 63-67592; Mar. 22, 1988, 63-67593

Int. Cl.⁴ F25B 29/00

U.S. Cl. 165—30

12 Claims



1. An air-conditioning apparatus for automobiles, comprising: means for sucking in air and guiding said air to an air blow-down outlet open to a cabin of an automobile; means for cooling the air sucked in including a variable capacity compressor operatively connected in a refrigeration circuit; means for heating the air sucked in; first control means interposed between said cooling means and heating means for controlling the amount of the sucked in air proceeding to the heating means; means for detecting the internal air temperature representing the interior of the cabin of an automobile; means for detecting the atmospheric air temperature; means for detecting the air blowdown temperature at said air blowdown outlet into the cabin;

means for setting a target value of said internal air temperature;
 means for calculating a target value of the air blowdown temperature from the output signals of the internal air temperature detection means, the atmospheric air temperature detection means and the internal air temperature target value setting means;
 means for calculating a compensation amount of the compressor capacity from the difference between the target air blowdown temperature and the output signal of the air blowdown temperature detection means; and
 second control means for controlling the compressor capacity on the basis of the output of said calculation means.

4,877,082

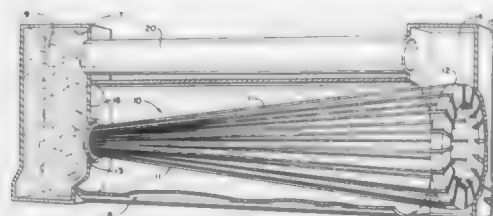
CONVERGENT STRAND ARRAY LIQUID PUMPING SYSTEM

Earl R. Collins, Jr., La Canada, Calif., assignor to United States of America as represented by the Administrator, National Aeronautics and Space Administration, Washington, D.C.

Filed Apr. 13, 1989, Ser. No. 337,767

Int. Cl.⁴ F28D 15/02

U.S. Cl. 165—104.26



1. A surface-tension liquid pumping system comprised of at least one array of taut converging strands spaced apart at one end adapted to receive liquid and gathered close together at the opposite ends of the strands to allow liquid wetting the strands to form menisci between adjacent strands where they approach convergence thereby to cause surface tension to force liquid wetting the strands to flow toward the converging ends of the strands.

4,877,083

BRAZED HEAT EXCHANGER AND METHOD OF MAKING THE SAME

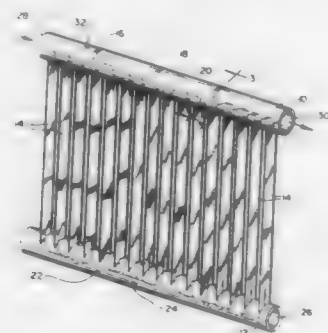
Z. Philip Saperstein, Lake Bluff, Ill., assignor to Modine Manufacturing Company, Racine, Wis.

Filed Jan. 9, 1989, Ser. No. 294,870

Int. Cl.⁴ F28D 1/02

U.S. Cl. 165—176

15 Claims



7. A heat exchanger comprising:
 a pair of elongated spaced, parallel generally cylindrical headers;

a plurality of tubes extending between said headers and in fluid communication with the interior thereof;
 slots in said headers generally transverse to the elongated dimension of said headers and extending at least about half way through the corresponding header;
 baffles brazed in said slots, each baffle having an interior semicircular shaped peripheral section sized to embrace the interior wall of the corresponding header and an exterior, semicircular shaped peripheral section of larger radius than said interior section, and a notch in said exterior section of sufficient depth as to extend inwardly of said interior wall; and
 braze metal filling at least that portion of said notch inwardly of said interior wall.

4,877,084

GAS WELL DISCHARGE VELOCITY DISSIPATOR

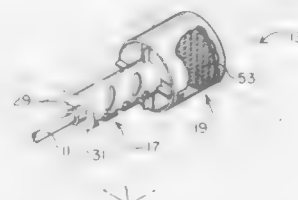
Philip E. Goggia, P.O. Box 4186, Marbleton, Wyo. 83113

Filed Nov. 14, 1988, Ser. No. 270,839

Int. Cl.⁴ B05B 1/26, 1/20

U.S. Cl. 166—75.1

12 Claims



1. Device for dissipating a high pressure stream of gas and liquid conducted for a well through a discharge line for release to atmospheric pressure, said device mounted at the end of said line and locatable in a liquid containment enclosure, said device comprising:

- open-bottomed hood mountable in said enclosure with the hood bottom spaced from the bottom of said enclosure and said hood having a front wall, an opposing rear wall and a downwardly sloped mid wall;
- conduit means mounted through said front wall and connected to said discharge line for discharging said stream towards the rear wall of said hood;
- first dissipator tube lying with its axis generally perpendicular to the rear wall of said hood and having a front wall connected to said conduit for conducting said stream into said first tube, the tubular wall of said first tube having a plurality of apertures therein and the diameter of said first tube being larger than the diameter of said conduit;
- first grate affixed within the rearward portion of said first tube and having a multitude of stream-passing apertures therein;
- second dissipator tube having a diameter significantly larger than the diameter of said first tube and mounted coaxially with said first tube with the open rear end of said first tube disposed at the open front end of said second tube, and the open rear end of said second tube spaced from and directly opposite the rear wall of said hood, and the wall of said second tube having a plurality of apertures therein; and
- second grate affixed within the rearward portion of said second tube, and having a multitude of stream-passing apertures therein.

4,877,085

MANUALLY OPERATED SPEAR APPARATUS

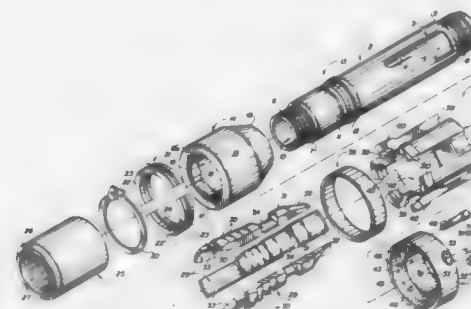
Joe G. Pullig, Jr., 104 Reeder Rd., Bossier City, La. 71112

Filed Dec. 27, 1988, Ser. No. 289,830

Int. Cl.⁴ E21B 31/00

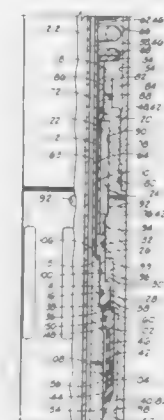
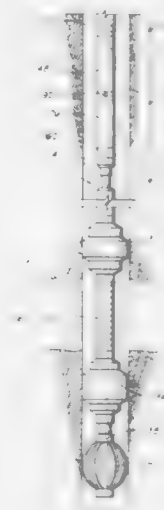
U.S. Cl. 166—98

8 Claims



1. A manually operated spear apparatus for removing an object from a well bore, comprising an outer sleeve having three internal windows disposed in spaced relationship in said outer sleeve, said outer sleeve adapted for attachment to a string of wash-over pipe, wherein the outer sleeve and the wash-over pipe are supported in a well bore by a fishing string connected to the wash-over pipe, and a spear assembly adapted for disposition inside said outer sleeve and the wash-over pipe, said spear assembly further comprising a cylindrical mandrel provided with connecting means for removably connecting said cylindrical mandrel to the object; a slip cone carried by said cylindrical mandrel, said slip cone having a tapered body portion; a control lug housing carried by said cylindrical mandrel, bias means provided in said control lug housing and three control lugs disposed in spaced relationship in said control lug housing in alignment with said internal windows, respectively, said control lugs adapted for selectively engaging said windows in said outer sleeve and retaining said spear assembly in said outer sleeve in well insertion configuration, and disengaging said windows and releasing said spear assembly from said outer sleeve in operational configuration responsive to attachment of said spear assembly to the object in the well bore and rotation of the fishing string and lowering of the fishing string, the outer sleeve and the wash-over pipe in the well bore with respect to the spear assembly; a stabilizing bushing threadably carried by said cylindrical mandrel and said control lug housing and a keeper lug ring carried by said control lug housing and engaging said control lugs for maintaining said control lugs in said control lug housing; and further comprising a pair of J-slots provided in oppositely-disposed relationship in said cylindrical mandrel, said J-slots each having a first leg segment and a second leg segment connected to said first leg segment, a slip housing slidably mounted on said cylindrical mandrel, a plurality of slips seated in said slip housing and a pair of J-bolts disposed in said slip housing, said J-bolts adapted for selectively engaging said first leg segment and said second leg segment of said J-slots and retaining said slips in said slip housing in said well insertion configuration, and extending said slips in said slip housing responsive to rotation of the fishing string and raising of the fishing string in the well bore, in said operational configuration.

said pump and packer, said housing means defining a central opening therethrough and an outlet to the annulus of the well in communication with said central opening; mandrel means for positioning in said central opening of said housing means;
 port means on said housing means in communication with a discharge portion of said pump for providing a flow path in said housing means;



valve means disposed between said housing means and mandrel means for providing communication between said port means and said outlet when in an open position in response to an outlet pressure of said pump, said valve means further having a closed position; and
 biasing means for biasing said valve means toward said closed position.

4,877,087

SEGMENTED FIN HEAT EXCHANGER CORE

David T. Hill, Granger, Ind., assignor to Sundstrand Heat Transfer, Inc., Dowagiac, Mich.

Filed Aug. 16, 1984, Ser. No. 641,476

Int. Cl.⁴ F28F 1/20

U.S. Cl. 165—181

11 Claims

1. A core for use in a heat exchanger comprising:
 a tube of heat conductive material; and
 a tape of heat conductive material wound a round said tube, said tape having a base extending completely about the periphery of the tube in abutment therewith to be in heat communication with the tube.

4,877,086

PRESSURE LIMITER FOR A DOWNHOLE PUMP AND TESTING APPARATUS

Gary D. Zunkel, Chickasha, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Sep. 20, 1988, Ser. No. 247,122

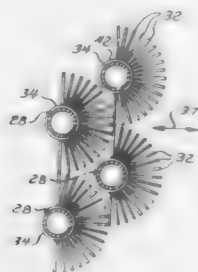
Int. Cl.⁴ E21B 34/06, 47/00

U.S. Cl. 166—106

18 Claims

1. A pressure limiter for use in a tool string having a pump and an inflatable packer, said pressure limiter comprising:
 housing means for positioning in said tool string between

transfer relation with the tube and a plurality of spines extending generally radially from said base in fanned relation over an arc length in the range of about 180°-220° in circumferential rows; the circumferential rows being aligned longitudinally of the tube along the length thereof such that said circumferential rows define an axial row of spines;



said tube being essentially free of said spines along a longitudinally extending area having an arc length in the range of approximately 180°-140° to thereby provide a heat exchanger having a heat transfer rate substantially equal to a heat exchanger having the spines extending over an arc length of 360°.

4,877,088

PROCESS AND EQUIPMENT FOR OIL WELL DRILLING AND COMPLETING OPERATIONS IN DEEP WATER

Renato S. Rodrigues, Niterói, and Jayme H. Ogura, Macaé, both of Brazil, assignors to Petroleo Brasileiro S.A. - Petrobras, Rio de Janeiro, Brazil

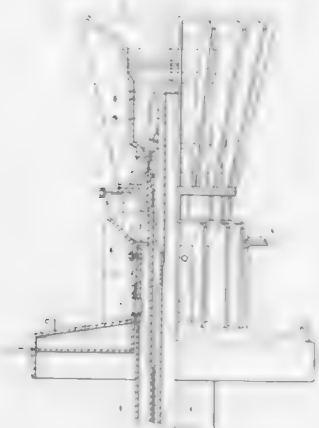
Filed Jan. 13, 1988, Ser. No. 143,535

Claims priority, application Brazil, Jan. 13, 1987, 8700104

Int. Cl.⁴ E21B 7/128, 41/04

U.S. Cl. 166-342

3 Claims



1. A process for oil well drilling and completing operations in deep water which allows an oil well drilled in deep water to start producing, said operations being conducted from a dynamically placed vessel, comprising:

- (a) providing a permanent guide base (9) on the sea bottom containing a high pressure housing (13) having an upper free end (15) adapted to receive safety, drilling, and production (completion) equipment, the upper free end of the high pressure housing being covered by a protective cover (17) having an external conical part (18), said permanent guide base (9) also having attached thereto, by means of a releasing device, a releasable guide-funnel (10) which covers and protects the upper free end of the high

pressure housing during drilling of the well but which prevents said production equipment from being installed because of its size and shape;

- (b) withdrawing said releasable guide-funnel, after drilling operations are finished, by means of a remote control vehicle which activates said releasing device, thus leaving said protective cover exposed which, because of said conical part, is capable of performing the same guiding work as said guide-funnel after said guide-funnel has been removed; and

- (c) lowering a production (completion) base (20) onto said permanent guide base (9) whereby said protective cover protects the upper free end of the high pressure housing from damage during said lowering step.

4,877,089

METHOD AND APPARATUS FOR COUPLING WIRELINE TOOLS TO COIL TUBING

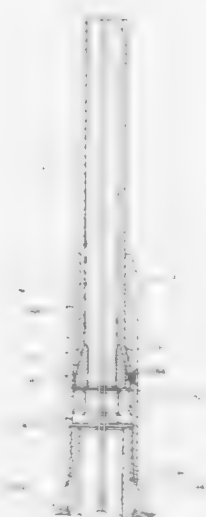
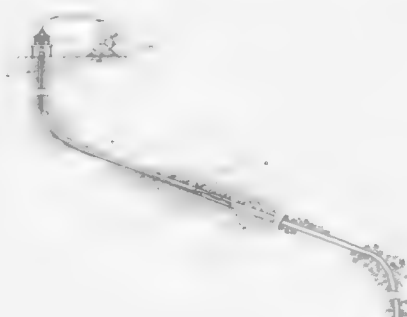
Robert W. Burns, Richmond, Tex., assignor to Western Atlas International, Inc., Houston, Tex.

Filed Jun. 18, 1987, Ser. No. 63,420

Int. Cl.⁴ E21B 47/00

U.S. Cl. 166-377

16 Claims



14. A method for coupling a tool to a string of coil tubing disposed within a bore hole, comprising the steps of: attaching an end of a lower housing to said tool; attaching an end of an upper housing to said string of coil tubing; and axially receiving an opposite end of said upper housing in an opposite end of said lower housing; and detachably coupling said upper housing within said lower housing by way of an adjustable pressure fitting, com-

pressing the opposite end of said upper housing against the opposite end of said lower housing by a pressure applying means positioned within said lower housing.

15. A method for decoupling a tool from a string of coil tubing disposed within a bore hole, comprising the steps of: attaching a lower housing to said tool; attaching an upper housing to said string of coil tubing; and pressure coupling an end of said upper housing coaxially within said lower housing; decoupling the tool from the coil tubing by applying a tension force to the coil tubing thereby deforming the end of said upper housing and allowing the upper housing to be withdrawn from the lower housing.

4,877,090

RECIPROCATING IMPLEMENT

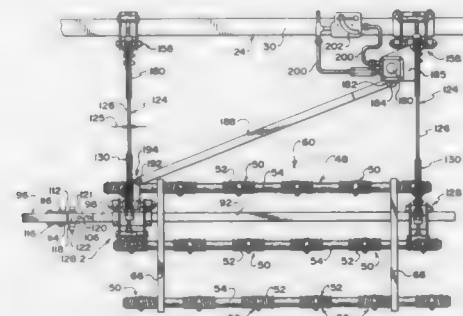
Zan Gullickson, Barons, Canada, assignor to Kebo Alta Industries Ltd., Barons, Canada

Filed Sep. 15, 1987, Ser. No. 97,561

Int. Cl.⁴ A01B 19/06

U.S. Cl. 172-102

13 Claims



1. A harrow, comprising: a body having a front and a plurality of spaced apart tines; means for transversely reciprocating the body; means for supporting the harrow vertically and for permitting transverse reciprocation of the body, the means for supporting and for permitting transverse reciprocation including a plurality of spaced apart support members connected to the body, each of the support members being rigid in one direction to provide vertical support for the body and being flexible in a second direction, which is perpendicular to said one direction, to accommodate said transverse reciprocation, the support members including leaf springs extending from the front of the body and being spaced apart and parallel, the leaf springs being elongated and relatively broad in said one direction, which is vertical when the harrow is positioned for use, and relatively thin in said second direction which is transverse when the harrow is positioned for use, the leaf springs having front ends which are distal with respect to the body, the harrow further including a clamp at the front end of each of the leaf springs capable of securing the harrow to a cultivator.

4,877,091

AUGERING APPARATUS AND DRILLING RIG

Richard L. Howell, Jr., 6711 Park Ave., Garden Grove, Calif.

Filed Jun. 27, 1988, Ser. No. 211,691

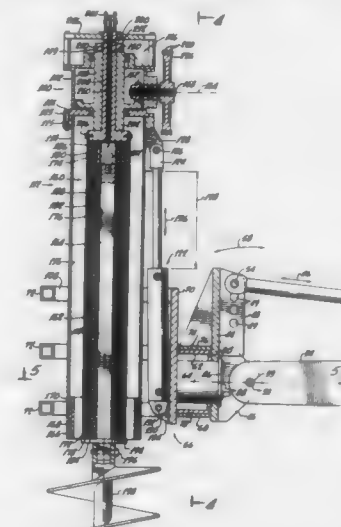
Int. Cl.⁴ E21C 5/12

U.S. Cl. 173-89

32 Claims

31. A downcrowdable telescopic augering apparatus for drilling a hole in the surface of the earth comprising: cradle means having a longitudinal central cavity; housing means having a cylindrical inside surface which

defines a torque axis, said longitudinal central cavity of said cradle means for receiving said housing means; means for permitting slidable displacement of said housing means relative to said cradle means in, and restricted to, a predetermined straight line direction in axial alignment with said torque axis; downcrowd means for downcrowding said housing means relative to said cradle means in said predetermined straight line direction; torque transmission means rigidly attached to said reaction torque housing means, said torque transmission means adaptable for receiving torque from a source of rotary



power along an input power axis at an angle to said torque axis and transmitting torque in axial alignment with said torque axis; telescopic kelly means having a plurality of telescoping kelly sections, said kelly means being rotatably mounted in said housing means for rotation about said torque axis thereof, said kelly means having a bottom part adaptable for coupling to an auger; torque coupling means for transmitting torque from said torque transmission means to said kelly means; and means for retracting said kelly means into said reaction torque housing means.

4,877,092

NEAR BIT OFFSET STABILIZER

Charles W. Helm, Rocky Hill, and Vernon E. Koval, Middletown, both of Conn., assignors to Teleco Oilfield Services Inc., Meriden, Conn.

Filed Apr. 15, 1988, Ser. No. 181,915

Int. Cl.⁴ E21B 7/08

U.S. Cl. 175-74

43 Claims

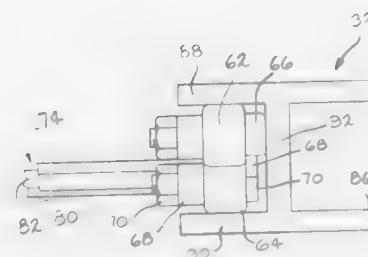
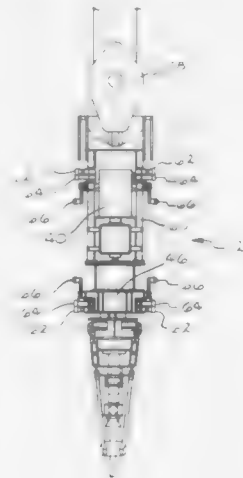
1. A bottomhole assembly including, a drilling motor, a bent sub upstream of the drilling motor and a drill bit downstream of the drilling motor, further comprising: an offset stabilizer between said drilling motor and said drill bit, said offset stabilizer having a fixed degree of offset; and means for orienting and locking said offset stabilizer in a pre-selected position in alignment with said bent sub while maintaining said fixed degree of offset wherein said orienting and locking means comprises: adapter ring means positioned between said stabilizer and said drilling motor, said adapter ring means having upper and lower opposed ends, said lower end including a plurality of radially arranged first slot means; and

said stabilizer having opposed upper and lower ends, said upper end of said stabilizer including a plurality of radially



arranged second slot means, said first and second slot means being complimentary and mutually interlocking.

yieldably engages said flange and said roller on said second spring yieldably engages said web,



whereby said springs prevent free rotation of said power swivel around said longitudinal axis during rotation of said drill string by said power swivel.

4,877,093

ROCK DRILLING MACHINE, ESPECIALLY FOR UNDERGROUND MINING

Wolfgang Ebeling, Hannover, Fed. Rep. of Germany, assignor to Turmag Turbo-Maschinen-Ag Nüsse & Gräfer, Sprockhövel, Fed. Rep. of Germany

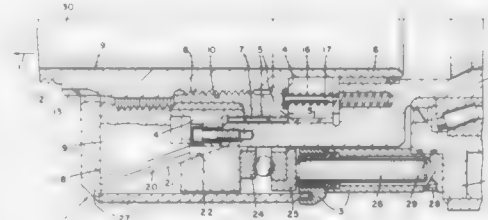
Filed Jun. 3, 1988, Ser. No. 202,872

Claims priority, application Fed. Rep. of Germany, Jun. 4, 1987, 3718636

Int. Cl.⁴ E21B 3/02

U.S. Cl. 175—170

27 Claims



1. A rock drilling machine, particularly for underground excavations, comprising a drilling carriage; and a rotary drilling drive arranged in a longitudinally displaceable manner on said drilling carriage, said rotary drilling drive having a drive shaft; an adaptor connected with said drive shaft for joint rotation therewith and having a threaded end for form-locking receipt of drilling rods with a respective counter thread, and a

4,877,093 SPRING ACTUATED POWER SWIVEL SUPPORT ROLLERS

David B. Ford, Frisco; James E. Lynch, Dallas, both of Tex., and Leroy R. Rateike, Rockford, Ill., assignors to National-Oil-well, Houston, Tex.

Filed Mar. 3, 1988, Ser. No. 163,583

Int. Cl.⁴ E21B 3/02

U.S. Cl. 175—113

11 Claims

1. A combination, comprising:
a power swivel suspended for vertical movement within a derrick,
said power swivel including a drill motor for rotating a drill string into a well,
means for guiding said power swivel during said vertical movement along a track,
said track fixed to said derrick and disposed parallel to the longitudinal axis of said well,
said track including a flange and a web,
said guide means including first and second springs each having first and second ends,
said first ends being rigidly connected to said power swivel, each of said second ends having a roller journaled thereto, said springs preloaded so that said rollers on said first spring

clamping head co-rotating with said drive shaft for force-transmitting receipt of outwardly smooth drilling rods, said adaptor being arranged forwardly of said clamping head as considered in a drilling direction, said threaded end of said adaptor extending outwardly beyond said clamping head for free observation and being releasably mounted on a part of said drive shaft independently of said clamping head.

4,877,095

STOPPER FOR CABLE PASSAGES OR CONDUITS

Christian Wittrisch, Rueil-Malmaison, France, assignor to Institut Français du Pétrole, Rueil-Malmaison, France

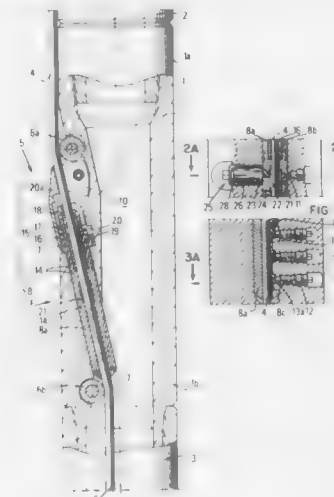
Filed Jun. 24, 1988, Ser. No. 211,258

Claims priority, application France, Jun. 25, 1987, 87 09007

Int. Cl.⁴ E21B 17/00, 34/14

U.S. Cl. 175—237

18 Claims



1. A stopper for a cable passage conduit passing through a support which comprises a first chamber placed in the passage, said first chamber comprising at least one bearing surface located in said passage and adapted to cooperate with a closure element for closing said passage, a second chamber, located in a side wall of said conduit, having an opening adapted to communicate with the first chamber, said closure element being housed in the second chamber in a first position of the stopper relative to the support, and means for moving the closure element into the first chamber at a second position of the stopper relative to the support, where the cable is withdrawn from the passage, the stopper further comprising a separating member located between said first chamber and said second chamber, said separating member being adapted for controlling the movement of the closure element from the second chamber to the first chamber.

4,877,096

REPLACEABLE CUTTER USING INTERNAL DUCTILE METAL RECEPTACLES

Gordon A. Tibbitts, Salt Lake City, Utah, assignor to Eastman Christensen Company, Salt Lake City, Utah

Continuation of Ser. No. 121,471, Nov. 17, 1987, abandoned.

This application Apr. 7, 1989, Ser. No. 336,643

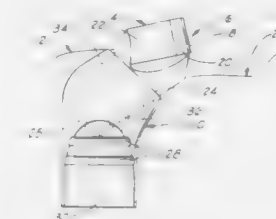
Int. Cl.⁴ E21B 10/46, 10/62

U.S. Cl. 175—410

12 Claims

1. An improved matrix drag bit comprising:
a body defining a curved bit face thereon;
at least one ductile metal receptacle substantially disposed within said body and adapted to receive a replaceable cutter element, said receptacle including a first, leading end defining a receiving cavity and a second, trailing end extending from said first end at an angle thereto deeper into said body and comprising a progressively laterally

narrowing, tapered root having first mechanical locking means associated therewith for permanently securing said receptacle within said body,
the length of the tapered root in cross section measured from the front to the back of the tapered root being greater than the thickness of the tapered root in cross section measured from side to side of the tapered root at least for a major portion thereof;



a replaceable cutter element comprising a cutting surface supported on a body portion disposed at least in part within said receiving cavity, whereby said cutting surface extends above said curved bit face, said body portion being temporarily secured within said receiving cavity by second mechanical locking means adjacent thereto adapted to prevent rotational movement of said cutting element within said receiving cavity.

4,877,097

SUPPORT AND SUSPENSION ARM FOR A DRIVING WHEEL

Daniel Trema, Bezons, France, assignor to Elf France, Courbevoie, France

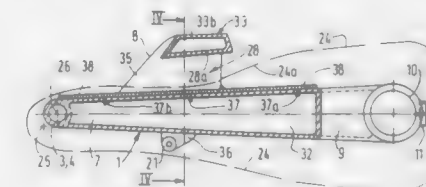
Filed May 5, 1988, Ser. No. 190,956

Claims priority, application France, May 15, 1987, 87 06824

Int. Cl.⁴ B62K 21/00, 25/00

U.S. Cl. 180—357

8 Claims



1. Support and suspension arm for a driving wheel of a vehicle having a frame, the wheel mounted on one side of the arm and connected at least in rotation on the other side of the arm to a driving endless chain, the said arm being pivoted on the frame of the vehicle by an arm part which is disposed transversely to the moving direction of the vehicle, and is connected by at least two rotary bearings to the vehicle frame, wherein said arm has a region where it is subjected to a large flexion moment beyond the connection with an arm part thereof that is disposed transversely with respect to the frame

of the vehicle, and said arm has, in said region, an outer casing of the arm cross-section through which crosses at least one of the two strands of the chain in a chain channel, the walls of which cooperate for increasing the inertia moment of the arm section in the said region.

4,877,098

AUTOMATIC ROAD WHEEL STEERING SYSTEM
Nobuyoshi Asanuma, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

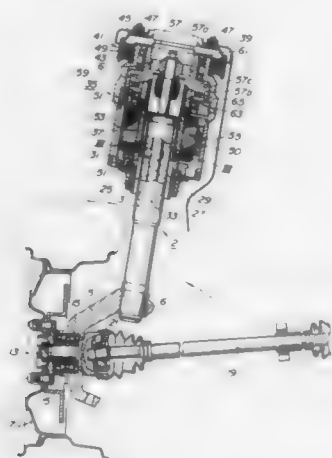
Filed May 13, 1988, Ser. No. 193,622

Claims priority, application Japan, May 13, 1987, 62-116476

Int. Cl.⁴ B62D 5/04

U.S. Cl. 180—79.1

4 Claims



1. A system for automatically steering a road wheel, comprising:

- a strut-type suspension including a cylinder, a piston rod having a longitudinal axis and reciprocable within the cylinder, and a piston attached to one end of the piston rod;
- a wheel support member including a steering knuckle fixed to the cylinder and rotatably supporting the road wheel thereon;
- first means for rotating said piston rod about its longitudinal axis, said first means being mounted to a vehicle body and operatively connected to the other end of said piston rod; and
- second means for axially guiding said piston rod within said cylinder and operatively connecting the piston rod with the cylinder, so that rotary motion of the piston rod may be carried to the cylinder and the steering knuckle fixed thereto, thereby effecting steering of the road wheel.

4,877,099

ELECTRONICALLY CONTROLLED VARIABLE ASSIST POWER STEERING SYSTEM

James J. Duffy, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Continuation-in-part of Ser. No. 902,919, Sep. 2, 1986, Pat. No. 4,760,892. This application Jun. 17, 1988, Ser. No. 209,162

The portion of the term of this patent subsequent to Aug. 2, 2005, has been disclaimed.

Int. Cl.⁴ B62D 5/08

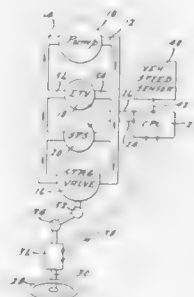
U.S. Cl. 180—142

5 Claims

1. In a power steering system for an automotive vehicle having a tooth member adapted to be connected to a vehicle steering linkage, a driving member engageable with said gear tooth member, a driver controlled steering shaft and torsion bar connection between said steering shaft and said driving

member whereby steering forces are distributed from said steering shaft to said gear tooth member;

- a rotary valve assembly comprising a valve sleeve connected to and rotatable with said driving member, an inner valve element received in said valve sleeve and connected to and rotatable with said steering shaft;
- a power steering pump, hydraulic pressure operated fluid motor having a pressure operated member connected to said gear tooth member whereby a fluid pressure force may be applied to said gear tooth member to supplement the manual steering effort, thereby providing the vehicle operator with a power assist;
- a fluid pressure circuit connecting said pump to said fluid motor, said steering valve assembly being located in and defining in part said fluid pressure circuit whereby pressure is distributed to either one side of said fluid motor or the other depending upon the direction of torque applied to said steering shaft, said fluid pressure circuit comprising a high pressure passage connecting a high pressure side of said pump to the inlet side of said steering valve assembly and a low pressure return flow passage connecting the outlet side of said steering valve assembly with the inlet side of said pump;
- an electronically controlled throttling valve located in parallel disposition in said fluid pressure circuit between the inlet side of said pump and the outlet side of said pump whereby a bypass flow path is established in parallel relationship with respect to the fluid flow path through said steering valve assembly;



- an electronic central processor unit connected to said electronically controlled throttling valve, a steering torque sensor connected to said central processor unit, a steering pressure sensor in said hydraulic pressure circuit connected to said central processor unit;
- a vehicle speed sensor connected to said central processor unit, said central processor unit having an electronic memory with stored vehicle speed, steering torque and steering pressure data, the relationship between said data indicating the optimum electrical voltage signal which when distributed to the electronically controlled throttle valve effects a controlled bypass of fluid from the high pressure side of said pump to the inlet side of said pump thereby effecting a controlled power assist that depends upon vehicle speed;

said electronically controlled throttling valve comprises a valve spool and a valve sleeve surrounding said valve spool, said sleeve and said spool being ported to effect controlled communication between the high pressure side of said pump and the low pressure side of said pump, and spring means for biasing said valve spool in one direction and a solenoid having windings surrounding an armature connected to said valve spool whereby displacement of said valve spool against the opposing force of said spring is dependent upon the output signal of said central processing unit, the magnitude of said output signal being determined by the magnitude of the vehicle speed sensor signal and the steering pressure sensor signal.

4,877,100

HYDRAULIC REACTION FORCE APPARATUS FOR POWER STEERING SYSTEM

Yasuyoshi Emori, Hiroshi Ohsaki, and Ikuro Nomura, all of Higashimatsuyama, Japan, assignors to Jidosha Kiki Co., Ltd., Tokyo, Japan

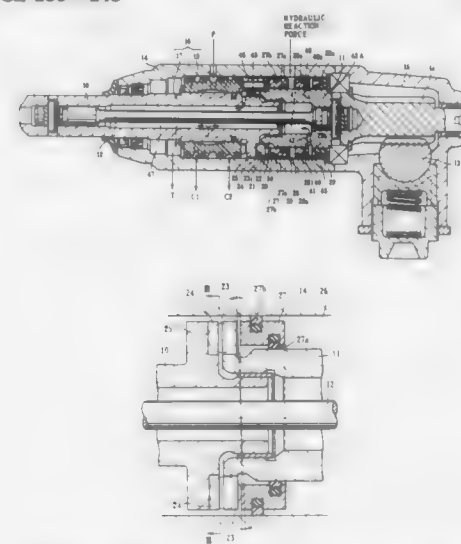
Filed Aug. 12, 1988, Ser. No. 231,808

Claims priority, application Japan, Sep. 16, 1987, 62-139995[U]; Sep. 16, 1987, 62-139996[U]; Sep. 16, 1987, 62-139997; Sep. 30, 1987, 62-150198[U]; Sep. 30, 1987, 62-150199[U]

Int. Cl.⁴ B62D 5/083

U.S. Cl. 180—143

9 Claims



1. A hydraulic reaction force apparatus for a power steering system, comprising:

- a body;
- input and output shafts accommodated in said body, each shaft having an outer surface;
- a flange formed on one of said input and output shafts and having a plurality of axially extending guide holes;
- a plurality of balls movably fitted in said guide holes, respectively;
- a reaction force receiving portion, formed on the other one of said input and output shafts, for axially receiving said balls;
- a hydraulic reaction force chamber formed at a position opposite to said reaction force receiving portion with respect to said flange;
- an annular reaction force piston, movably and coaxially fitted on said output shaft with a clearance, for urging said balls against said reaction force receiving portion to generate a restriction force corresponding to a reaction force oil pressure, the restriction force acting between said input and output shafts; and
- a plurality of seal rings one of said seal rings being disposed between said reaction force piston and said body and another of said seal rings being disposed between said reaction force piston and said one of said input and output shafts.

4,877,101

CONSTANT-SPEED CONTROL DEVICE FOR A VEHICLE

Tetsuya Tada, Anjo; Masumi Nagasaka, Toyota; Tatsuo Teratani, Aichi; Akira Miyazaki, and Junji Takahashi, both of Kobe, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha and Fujitsu Ten Limited, both of Japan

Filed Nov. 16, 1987, Ser. No. 120,930

Claims priority, application Japan, Nov. 26, 1986, 61-279618

Int. Cl.⁴ B60K 31/08

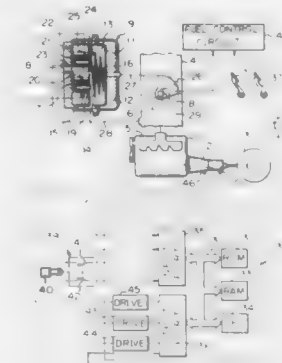
U.S. Cl. 180—177

7 Claims

1. A constant-speed control device for a vehicle, said device

controlling a throttle valve provided in an intake passage of an internal combustion engine so that said vehicle runs at a constant speed set by a driver, said device comprising:

- an actuator controlling the degree of opening of said throttle valve;
- means for controlling said actuator in accordance with the vehicle speed to obtain constant-speed control;
- means for sensing the degree of opening of said throttle valve;
- means for supplying fuel to said engine;
- means for preventing a fuel supply by said fuel supply means when the degree of opening of said throttle valve is smaller than a predetermined value; and



4,877,102

MULTI-WHEELED VEHICLE SUSPENSION AND DRIVE MECHANISM

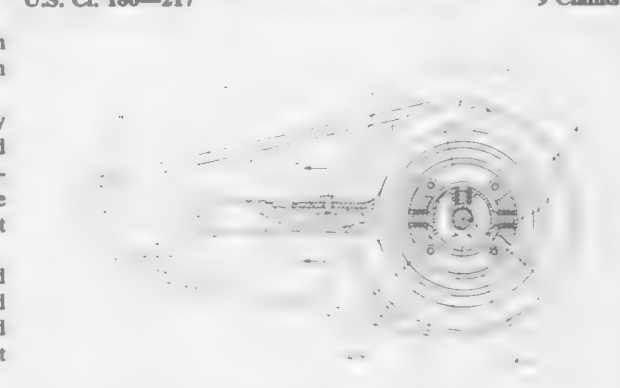
Jeff Stewart, 1531 N. Drexel Rd., #74, West Palm Beach, Fla. 33417

Filed Jul. 5, 1988, Ser. No. 215,253

Int. Cl.⁴ B62D 61/06; B62K 5/02

U.S. Cl. 180—217

9 Claims



1. A suspension and drive mechanism for a vehicle having two or more laterally mounted driven wheels, comprising:

- a. an axle housing which rotatably supports a driven axle;
- b. an axle housing support which is attached to the vehicle body;
- c. said axle housing being supported by said axle housing support such that said vehicle body is pivotable about the vehicle longitudinal axis relative to said axle housing;
- d. a driven member to which rotational energy is transmitted from a driving member, said driving member being connected to said vehicle body; rotatable about a transverse axis; and, offset from the vehicle longitudinal axis;

- e. a means for supporting said driven member relative to said vehicle body such that: the plane of rotation of said driven member is essentially coplanar with the plane of rotation of said driving member; and, said driven member is translatable in an essentially vertical direction; and,
- f. a coupling means which connects said driven member to said driven axle such that rotational energy is transmitted to said driven axle over a range of relative angles between the axes of rotation of said driven member and said driven axle, said coupling means being translatable along said driven axle.

4,877,103

POWER TRANSMISSION APPARATUS

Erkki Nuutio, Tampere, Finland, assignor to Autojoukko OY, Finland

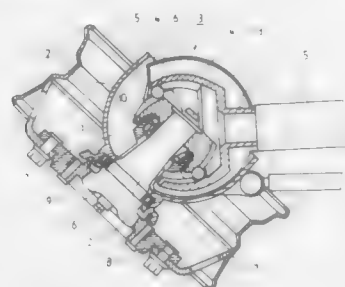
Filed Mar. 21, 1988, Ser. No. 170,761

Claims priority, application Finland, Mar. 19, 1987, 871218

Int. Cl.⁴ B60K 17/30

U.S. Cl. 180—259

20 Claims



1. Apparatus for power transmission, in which power is transmitted from a driving shaft to a driven shaft through a joint having an outer section coupled to said driving shaft and an inner section coupled to said driven shaft which is rotatably supported in a frame surrounding the same,

said inner and outer sections being turnable with respect to one another, and

said frame including a generally cylindrical part in which said driven shaft is rotatably supported and an at least partially substantially spherical section extending out from said cylindrical part and surrounding said driven shaft, wherein

said inner section of said joint is coupled to said driven shaft such that an inner end of said frame cylindrical part towards said joint is at least partially situated within a movement range of said outer section of said joint when said driving shaft and said driven shaft are turned out of axial alignment and at an angle with respect to one another, and

at least one notch is provided in said frame cylindrical part and arranged such that said outer section of said joint at least partially penetrates therinto when said driven shaft and driving shaft are turned by a sufficiently large angle with respect to one another.

4,877,104

BRAKING SYSTEM FOR A MOTORIZED DUMPING VEHICLE

Donald R. Morrison, 6228 Eagle Park Dr., Charlotte, N.C. 28214

Filed Feb. 3, 1988, Ser. No. 151,973

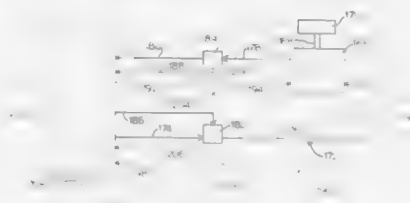
Int. Cl.⁴ B60K 17/14

U.S. Cl. 180—308

3 Claims

1. A hydraulic braking system, comprising:
- a hydraulic fluid source;
 - a hydraulic fluid flow circuit coupled to said hydraulic fluid source for flow of hydraulic fluid therethrough;
 - an anti-cavitation valve, a hydraulic motor, and a pressure relief valve disposed in said flow circuit, in series relationship with one another, and with said hydraulic

- motor disposed in said circuit between said anti-cavitation valve and said pressure relief valve;
- a branch conduit joining said hydraulic fluid source with said anti-cavitation valve;
 - a second branch conduit joining said hydraulic fluid source with said pressure relief valve;
 - means for selectively flowing hydraulic fluid through said flow circuit and said anti-cavitation valve, said hydraulic motor, and said pressure relief valve in sequence, and for terminating the flow of hydraulic fluid from said hydraulic fluid source through said flow circuit; and



- a second hydraulic fluid flow circuit having disposed therein in series relationship a second anti-cavitation valve, and a second pressure relief valve, said hydraulic motor being disposed in said second hydraulic fluid flow circuit between said second anti-cavitation valve and said second pressure relief valve, whereby said hydraulic motor may be selectively driven in opposite directions by hydraulic fluid flow through a selected one of said first and second flow circuits, and with means for selectively flowing said hydraulic fluid from said hydraulic fluid source through a selected one of said first and second flow circuits.

4,877,105

REAR SPEAKER UNIT FOR A MOTOR VEHICLE

Norio Mugikura, Wako, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

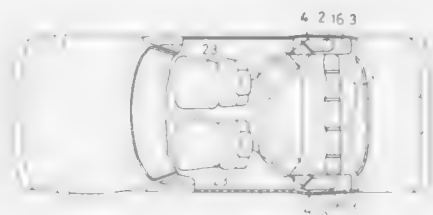
Filed Sep. 7, 1988, Ser. No. 241,730

Claims priority, application Japan, Sep. 8, 1987, 62-136195[U]

Int. Cl.⁴ H05K 5/00

U.S. Cl. 181—141

5 Claims



1. A rear speaker unit for a motor vehicle, comprising:
- a speaker box located at a rear side portion of a passenger compartment of said vehicle to extend in a longitudinal direction of a vehicle body of said vehicle, said speaker box being provided with an opening at a front end of said speaker box and having a front end portion which is bent toward a center of said passenger compartment; and
 - a speaker mounted in said opening of said speaker box.

4,877,106

SOUND-ATTENUATING DISCHARGE APPARATUS FOR A PACKAGED TERMINAL AIR CONDITIONER

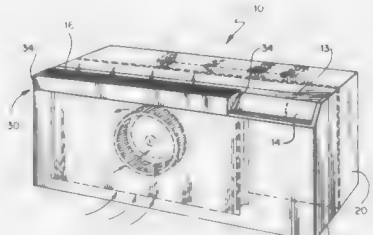
Donald G. Neville, Syracuse; David A. Giordano, East Syracuse, and Mark R. Hogan, Manlius, all of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Apr. 29, 1988, Ser. No. 187,688

Int. Cl.⁴ E04F 17/04

U.S. Cl. 181—224

9 Claims



1. In a unit having a fan for moving air to be conditioned through the unit and a discharge opening sloping downward from a top of the unit covered by a removable grille for discharging conditioned air to a space containing the unit, a silencer for attenuating noise generated by the fan comprising:
- a vertically projecting assembly adapted to be connected to the sloped discharge opening in place of said grille and defining a flow path for the conditioned air discharged to the space containing the unit, said assembly including a generally vertical front wall and two generally vertical side walls connected to said front wall, said assembly having means attached to at least one said wall for securing said assembly to the unit, and
 - a sound attenuating material layer means adapted to be connected to an inside surface of said walls for absorbing sound.

4,877,107

MOBILE SCAFFOLDING SYSTEM AND SCAFFOLD SUPPORT

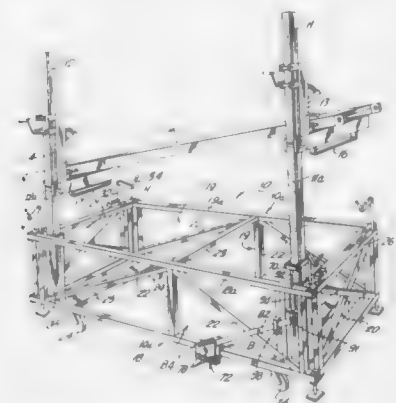
Carl Anderson, c/o Alum-A-Pole Corporation 2589 Richmond Ter., Staten Island, N.Y. 10303

Filed Jul. 5, 1988, Ser. No. 215,256

Int. Cl.⁴ E04G 1/20, 1/24

U.S. Cl. 182—17

46 Claims



1. A movable scaffolding system comprising a scaffold support having rolling means depending from the bottom thereof, a pair of pump jack poles, means on said support for supporting said poles in a vertical free-standing manner on said support on which can ride a pair of pump jacks respectively mounted on said poles supporting a scaffold staging extending between the pump jacks, and extensible means secured to said support

surface for stabilizing and restraining motion of said scaffolding, said extensible means comprising said means for supporting said poles in a vertical manner and being responsive to a weight applied to the scaffold staging.

4,877,108

HYDRAULIC LADDER BRACE

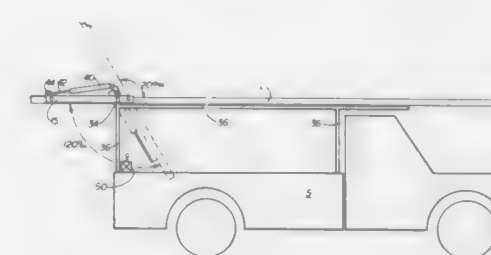
Lamar H. Griffin, 3737 Northview Ln., Dallas, Tex. 75229, and Paul Hutchins, 15707 Wingale, Houston, Tex. 77082

Filed Oct. 11, 1988, Ser. No. 255,389

Int. Cl.⁴ E06C 5/06

U.S. Cl. 182—68

10 Claims



1. A hydraulically operated ladder brace for transporting, for deploying and for supporting a standard, mobile extension ladder which ladder brace is pivotally attachable to a separate member carried at the rear of the vehicle, said ladder brace comprising:

two elongated structural members, each member having a distal end and a proximal end, said structural members being arranged substantially in parallel relationship one with the other and connected one to the other by at least one cross piece;

pivot means attached to each of said elongated structural members;

a hydraulically operated ram and cylinder device having one end pivotally connected to said cross piece and an opposite end capable of being connected with said separate member associated with a rack mounted on the rear portion of a vehicle; and

fastening means positioned to secure said mobile extension ladder in parallel relationship with said two elongated structural members.

4,877,109

ADJUSTABLE SAWHORSE AND SCAFFOLD

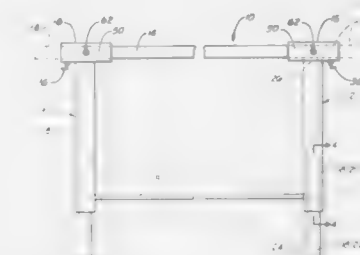
Donald G. Welch, P.O. Box 1040, Hooker, Okla. 73945, and Randall N. Barton, 1402 N. Quinn, Guymon, Okla. 73942

Filed Sep. 28, 1988, Ser. No. 250,221

Int. Cl.⁴ B27B 21/00; B25H 1/06

U.S. Cl. 182—183

28 Claims



1. A sawhorse apparatus comprising:
- a pair of end supports, each end support comprising:
 - a longitudinally extending tubular member; and

a plurality of legs attached to said tubular member and extending downwardly therefrom;
a horizontal member disposed through said tubular members of said end supports and having a portion extending longitudinally inwardly between said tubular members; and clamping means on each of said tubular members for clamping said horizontal member thereto, each clamping means being positioned on the corresponding tubular member at a position longitudinally outwardly of said legs.

4,877,110

SAFETY DEVICE WITH RETRACTABLE LIFELINE
J. Thomas Wolner, Red Wing, Minn., assignor to D B Industries, Inc., Red Wing, Minn.

Filed Oct. 14, 1988, Ser. No. 257,599
Int. Cl.⁴ A62B 1/10

U.S. Cl. 182—232

12 Claims



1. A safety device for restraining a person who works at great heights, said device comprising
a housing adapted to be connected to one of the person and a restraint,
a drum rotatably mounted and contained within said housing and including
a first drum flange,
a spaced generally parallel second drum flange having a braking surface generally perpendicular to the axis of drum rotation, and
a cylinder centrally connected between said first drum flange and said second drum flange,
a lifeline having a first end attached to said drum cylinder, and a second end extending outside said housing and adapted to be connected to the other of the person and the restraint, said lifeline being wound around said drum cylinder in response to said drum being rotated in a retracting direction, and said lifeline being unwound from around said drum cylinder in response to said drum being rotated in an opposite extending direction,
means for biasing said drum to rotate in said retracting direction, and
means for braking extending rotation of said drum at an angular velocity in excess of some predetermined speed, said braking means comprising
a disk assembly in braking pressure contact with said drum brake surface, and
means for fixing said disk assembly to said housing in response to the predetermined speed.

4,877,111

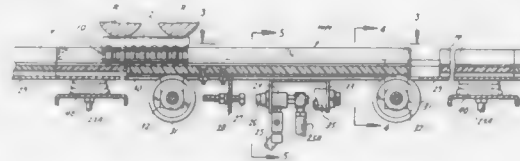
CHAIN LUBRICATOR

John J. Kilper, St. Louis County, Mo., assignor to Alvey, Inc., St. Louis County, Mo.

Filed Aug. 19, 1988, Ser. No. 233,813
Int. Cl.⁴ F16N 1/00

U.S. Cl. 184—15.1

7 Claims



1. An endless chain drive with lubrication supply control; comprising:
(a) an endless chain having a tension run and a non-tension run;
(b) motor driven means to drive said endless chain;
(c) friction sensing means mounted adjacent said endless chain in position to engage with and move in response to a predetermined value of the friction developed by the engagement therewith;
(d) a source of lubrication connected to normally closed valve means, the opening of said valve being capable of dispensing lubricant onto said chain; and
(e) control means responsive to the operation of said motor means to said endless chain and also responsive to the movement of said friction sensing means responsive to said predetermined value in the friction between said chain and said movable friction sensing means for opening said valve means and effecting the dispensing of lubricant onto said chain whereby the dispensed lubricant reduces the friction value below said predetermined value of the friction and said control means allows said normally closed valve means to close and discontinue dispensing lubricant.

4,877,112

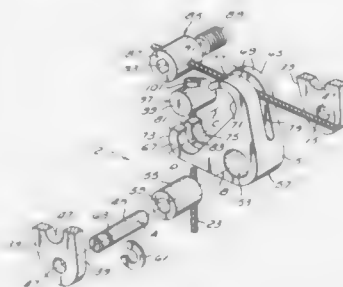
BICYCLE BRAKE CABLE ASSEMBLY

Roger A. Malinowski, Newport Beach, Calif., assignor to Malcom Smith Products, Riverside, Calif.

Filed Sep. 19, 1988, Ser. No. 246,428
Int. Cl.⁴ B62L 3/02

U.S. Cl. 188—24.22

4 Claims



1. A bicycle brake cable assembly, comprising:
a stem, comprising:
a substantially vertical shaft;
an elongate arm extending substantially horizontally outward from said shaft; and
a clamp secured to the end of said arm opposite said shaft for securing and supporting a pair of handlebars;
a housing extending from said shaft or said arm, said housing including a pair of sides horizontally spaced from one another;

a pin, at least a portion of which is secured between the sides of said housing defining an axis of rotation;
a device mounted on and rotatable about said pin, said device comprising:
a generally triangular body including a horizontal bore having a diameter larger than the diameter of said pin, through which said pin extends;
a first fork extending from said body for retaining a brake cable connected to a brake lever, said first fork including a pair of curved prongs, wherein the space between the prongs of said first fork forms a vertical slot and one side of said prongs of said first fork forms a partial cylindrical surface; and
a second fork spaced from said first fork extending from said body for retaining a brake cable connected to a brake caliper, said second fork including a pair of curved prongs, wherein the space between the prongs of said second fork forms a vertical slot, the side of said prongs of said second fork facing said first fork forms a partial cylindrical surface, and the ratio between the perpendicular distance between said axis of rotation and the axis of the partial cylindrical surface formed by said prongs of said first fork and the perpendicular distance between said axis of rotation and the axis of the partial cylindrical surface formed by said prongs of said second fork is between 7 to 6 and 3 to 2.

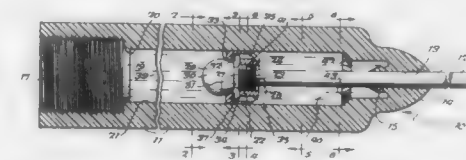
4,877,113

ADJUSTABLE FLUID AMPLIFIED SHOCK ABSORBER
Paul H. Taylor, Grand Island, N.Y., assignor to Tayco Developments, Inc., North Tonawanda, N.Y.

Filed Jul. 19, 1988, Ser. No. 221,477
Int. Cl.⁴ F16F 9/34

U.S. Cl. 188—285

25 Claims



1. An adjustable fluid amplified shock absorber comprising a casing, compressible fluid in said casing, a piston rod slidable in said casing, a chamber within said casing, a piston head, mounting means mounting said piston head on said piston rod within said chamber, channel means operatively associated with said piston head and having an unrestricted smooth entry portion for receiving said compressible fluid and providing fluid amplified flow, and means for adjusting the size of said channel means to thereby vary the level at which said fluid amplified flow occurs.

4,877,113

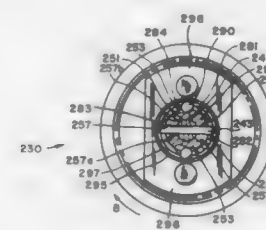
ONE-WAY CLUTCH PREVENTING BACK DRIVE OF REVERSIBLE MOTOR

Allstair G. Taig, Edwardsburg, Mich., assignor to Allied-Signal Inc., Morristown, N.J.

Division of Ser. No. 183,129, Apr. 19, 1988, Pat. No. 4,836,338.
This application Jan. 18, 1989, Ser. No. 298,604
Int. Cl.⁴ F16D 55/16

U.S. Cl. 188—82.84

9 Claims



1. A one-way clutch mechanism which prevents the back drive of a reversible motor, comprising a drive shaft having a drive pin extending transversely therefrom, the drive shaft and drive pin disposed within a drive member, the drive member having therein a pair of oppositely disposed radially extending drive slots, the drive pin extending radially through said drive slots and for engaging and rotating the drive member in one direction of rotation, the drive member having cam surfaces about the periphery thereof receiving bearing means thereat, a cage member disposed about said drive member and having oppositely disposed radial cage slots, the drive pin extending radially into said radial cage slots, the radial cage slots being in circumferential nonalignment with said drive slots, and a housing disposed about said cage member and having an interior surface engaged by said bearing means, so that rotation in an opposite direction of the drive pin by the drive shaft results in the drive pin engaging and rotating the cage member to release the bearing means from engagement between the interior surface and cam surfaces before the drive pin engages and rotates the drive member in the opposite direction.

4,877,115

PISTON FOR A PISTON-CYLINDER UNIT

Hans-Peter Bauer, and Hans J. Bauer, both of Altdorf, Fed. Rep. of Germany, assignors to Fritz Bauer and Sohne OHG, Altdorf, Fed. Rep. of Germany

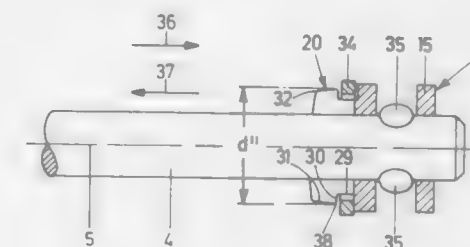
Filed Jul. 15, 1988, Ser. No. 219,750

Claims priority, application Fed. Rep. of Germany, Jul. 29, 1987, 3725101

Int. Cl.⁴ F16F 9/34; F16J 1/06

U.S. Cl. 188—322.15

9 Claims



1. A piston for a piston-cylinder unit, comprising a substantially cylindrical housing (1) having two ends (2, 3) and being filled with a pressurized fluid, and closed at one end (2) and in which there is displaceably guided a piston rod (4) which emerges in sealed manner from the other end (3) of the said housing (1), the piston rod (4) carrying the piston (6) on a portion of an end which is located in the interior (10) of the housing (1), the piston (6) comprising a piston ring groove (26) in which there is disposed a piston ring (34) which comes to bear against side walls (27, 30) of the groove (26), wherein a portion (20) of the piston (6) which extends at least from the piston ring groove (26) to a free end (22) consists of a plurality of segments (23) separated from one another by longitudinal slots (24) and wherein this portion (20) is provided with a bore (21) the diameter (di') of which is at the free end (22) smaller than the diameter (d') of a portion of the piston rod (4) which carries the segments (23).

4,877,116

HYDRAULIC CONTROL SYSTEM FOR A TRACTOR TRANSMISSION

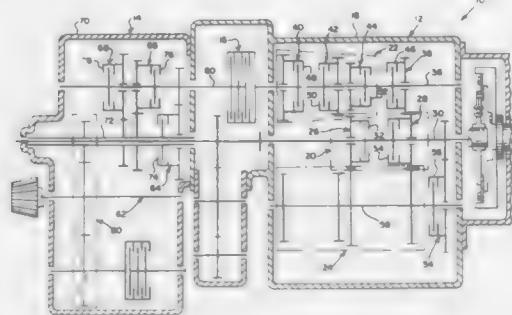
Joachim Horach, Lombard, Ill., assignor to J. I. Case Company, Racine, Wis.

Filed Jun. 30, 1988, Ser. No. 213,364

Int. Cl.⁴ B60K 41/22

U.S. Cl. 192—3.57

41 Claims



1. A control system for a transmission which is shiftable from a neutral condition into either forward or reverse conditions as selected by a positionable shift lever, said transmission having speed and range transmission assemblies which are selectively coupled by a fluid actuated master clutch, said speed transmission assembly comprising interconnected input and output sections, said input section including alternatively operated drive clutch assemblies for developing at least two different input speed ratios, said output section including at least three clutch operated forward drive gears and a clutch operated reverse drive gear, said range transmission assembly including at least three different clutch operated range assemblies, said control system comprising:

- a valve body connected to a source of pressurized fluid; first operative means arranged in combination with said valve body for directing pressurized fluid to the alternatively operated drive clutch assemblies of the speed transmission assembly input section;
- second operative means arranged in combination with said valve body for selectively directing pressurized fluid to one of said three clutch operated forward drive gears of the speed transmission assembly output section;
- third operative means arranged in combination with said valve body for selectively directing pressurized fluid to one of said clutch operated range assemblies of the range transmission assembly; and
- fourth operative means arranged in combination within the valve body for directing pressurized fluid to the first, second and third operative means and to the clutch operated reverse drive gear as a function of the position of the shift lever.

4,877,117

ROTATIONAL CONTROL APPARATUS

Charles J. Kniebel, Plymouth; Virgil Schieffer, White Bear Lake, and Robert C. Brett, Minneapolis, all of Minn., assignors to Horton Industries, Inc., Minneapolis, Minn.

Filed Aug. 24, 1988, Ser. No. 235,960

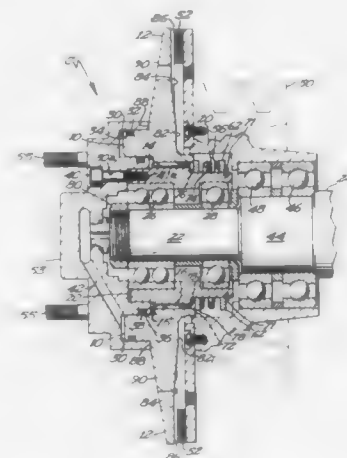
Int. Cl.⁴ F16D 3/14

U.S. Cl. 192—85 A

21 Claims

1. In a rotational control apparatus including a friction disc portion slidably mounted on and rotationally related to a hub rotatably mounted on a shaft, with the friction disc being biased on the hub by a spring engaging a retainer on the hub, with the improvement comprising an improved hub comprising a radially outermost portion and a radially reduced portion, with a shoulder being defined by and between the radially outermost portion and the radially reduced portion, with the friction disc portion being slidably mounted on and rotation-

ally related to the radially outermost portion of the hub; a washer slidably mounted on the radially reduced portion of the hub, with the spring being sandwiched between the washer and the retainer of the hub, with the washer abutting with the friction disc portion in the assembled apparatus and with the



friction disc portion being slidable from the hub when disassembling the apparatus without requiring removal of the hub from the shaft, with the washer abutting with the shoulder of the hub for retaining the spring in a compressed condition on the hub.

4,877,118

SLIP DETECTING DEVICE FOR APPARATUS DRIVEN BY A PRIME MOVER

Yasuji Tamura, Ojima, Japan, assignor to Sanden Corporation, Gunma, Japan

Continuation of Ser. No. 732,289, May 9, 1985, abandoned. This application Nov. 12, 1987, Ser. No. 122,635

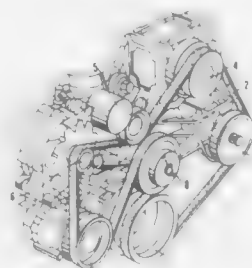
Claims priority, application Japan, May 9, 1984, 59-91043

The portion of the term of this patent subsequent to Sep. 29, 2004, has been disclaimed.

Int. Cl.⁴ F16D 27/16, 43/00

U.S. Cl. 192—103 R

15 Claims



1. In an apparatus driven by a prime mover, a device for providing a slippage signal when slippage is present in the power transfer mechanism used to connect said apparatus to said prime mover, said device comprising:

- speed detecting means for detecting the rotational speed of said apparatus and providing a speed signal corresponding to said speed;
- reference signal means for providing a reference speed signal which corresponds to a speed less than the idling speed of said prime mover;
- a comparator means for receiving said speed signal and said reference speed signal, wherein said comparator means

provides said slippage signal when said speed signal is less than said reference speed signal, wherein said speed detecting means provides a plurality of voltage pulses, the period between each of said voltage pulses being dependent on the rotational speed of said apparatus; and waveform-shaping means coupled to said detecting means by coupling means for shaping the waveform of said voltage pulses to a standard width while maintaining the original period between said voltage pulses, wherein said waveform-shaping means comprises first and second logic NOR gates coupled in cascade, wherein a first input of said first NOR gate receives said voltage pulses and a second input of said first NOR gate is coupled to the output of said second NOR gate, the output of said first NOR gate being coupled to a first input of said second NOR gate by coupling means formed of a capacitor/resistor network and a second input of said second NOR gate being coupled to a logic zero.

4,877,119

DRINKING-BEAKER ASSEMBLY

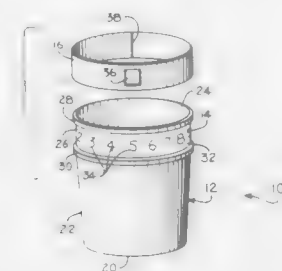
Jeannette T. Hosking, 2927 N. 73rd St., Kansas City, Kans. 66109

Filed Mar. 21, 1989, Ser. No. 326,379

Int. Cl.⁴ B65D 25/20

U.S. Cl. 206—459

10 Claims



1. A drinking-beaker assembly for use in the consumption of desired amounts of potable liquid within a predetermined time period by a user, the assembly comprising:

- a beaker presenting a substantially horizontal base, an upright wall structure extending upwardly therefrom, upper portions of said wall structure defining a wide-mouthed, open top, certain portions of said wall defining an annular groove on the exterior of said wall structure, including an upper rib and a lower rib, said ribs being substantially parallel and extending substantially radially from the exterior of said wall structure, said groove further presenting a bight connecting said ribs;
 - use-indicia means, including portions adjacent said bight, for sequentially indicating the number of consumptive uses of said assembly by said user within a predetermined time period; and
 - an opaque resilient, annular, split-ring collar, complementarily configured with said groove and snugly disposed therein, said collar being axially rotatable relative to said beaker along and within said groove, and certain portions of said collar forming a window, cooperatively aligned with said use-indicia means, for selectively exclusively displaying portions of said use-indicia means having a sequentially appropriate number,
- thus allowing the user, with each consumptive use to rotate said collar with respect to said beaker sufficiently to align said window with portions of said use-indicia means having the sequentially appropriate number associated with such consumptive use and thereby exclusively displaying the total number of consumptive uses of said assembly.

4,877,120

ACTUATOR MECHANISM HAVING ADJUSTABLE STOP

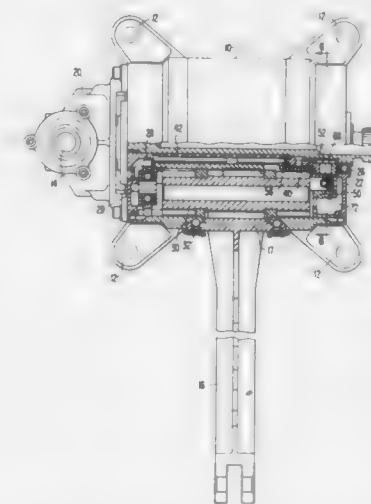
John D. Tysver, and Duane Grimm, both of Rockford, Ill., assignors to Sunstrand Corp., Rockford, Ill.

Filed Mar. 8, 1988, Ser. No. 165,607

Int. Cl.⁴ F16D 71/00

U.S. Cl. 192—141

13 Claims



1. A mechanism containing an adjustable mechanical stop to provide protection against overtravel of a rotatable main shaft having a longitudinal axis comprising:

- a housing for supporting said main shaft for rotation about said shaft axis;
- a wheel mounted in said housing and having fixed stops thereon at a plurality of spaced positions radially outwardly of said main shaft;
- means mounted to said housing and drivingly connected to the wheel to control the position of said wheel for adjustably controlling the angular position of said wheel and fixed stops about said main shaft;
- a member including stop members mounted for rotation with said main shaft and for translation along said main shaft between a running position where the stop members do not contact the fixed stops and a locking position where the stop members are engaged with said fixed stops; biasing means for normally maintaining said stop members in said running position; and
- means responsive to a predetermined number of revolutions of the main shaft as measured from an index position for causing said stop members to translate in a direction along the main shaft axis against the bias force of said biasing means from said running position into said locking position.

4,877,121

VERTICAL EXCURSION ACCOMMODATION APPARATUS

Yoshikazu Yamashita, and Toshihara Ikenaga, both of Yokohama, Japan, assignors to Okamura Corporation, Japan

Filed Oct. 20, 1987, Ser. No. 110,687

Claims priority, application Japan, Oct. 30, 1986, 61-256955; Mar. 31, 1987, 62-78769

Int. Cl.⁴ B65G 17/18

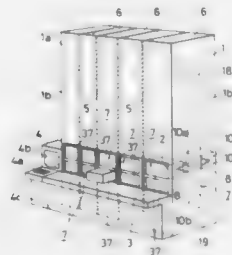
U.S. Cl. 198—475.1

3 Claims

1. A vertical excursion accommodation apparatus comprising a plurality of excursion shelf units disposed side by side and control means for driving said excursion shelf units independently, each of said excursion shelf units comprising:

- at least one tray;
- a first driven shaft and a first driving shaft disposed horizon-

tally and parallel with respect to each other and having sprockets mounted thereon;
 a first endless chain passing around said sprockets;
 first and second arms for supporting each of said trays, said first support arm including a pair of first links, said first links having first ends pivotally coupled to said first endless chain, said first ends being spaced a distance apart in a vertical direction, said first links having free ends pivotally connected to a first pin on one side wall of said tray;
 a second driven shaft and a second driving shaft disposed horizontally and parallel with respect to each other and having sprockets mounted thereon;
 a second endless chain passing around said sprockets of said second driven and driving shafts;
 said second support arm including a pair of second links, said second links having first ends pivotally coupled to said



second endless chain, said first ends of said second links being spaced a distance apart in a vertical direction, said second links having free ends pivotally connected to a second pin on the other side wall of said tray,
 said first pin is provided at a position on said one side wall and said second pin is provided at a position on said other side wall of said tray so that said tray will always be held horizontally;
 guide rails having an oval side view;
 guide arms, each of said trays having a first guide arm connected to said one side wall and a second guide arm connected to said other side wall, each of said guide arms having a free end thereof guided by one of said guide rails; and
 said control means for adjustably controlling said trays moving around said horizontal shafts along an oval orbit by rotating said sprockets.

4,877,122

CONVEYOR BELT SCHAFERS

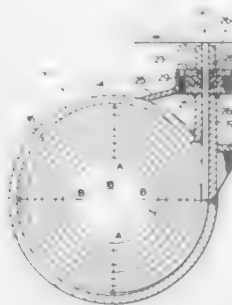
Normand Morin, P.O. Box 636, 80 Nickel Street, Leval, Ontario, Canada (P0M 2C0)

Filed May 2, 1988, Ser. No. 189,239

Int. Cl.⁴ B65G 45/00

U.S. Cl. 198—499

20 Claims



1. Apparatus for removing particulate material from a conveyor belt, comprising:

(a) a flexible wear element for bearing against the working

surface of a moving conveyor belt and for removing particulate material therefrom;

- (b) a housing shaped and dimensioned for dispensing one end of the wear element against the conveyor belt and for storing the rest of the wear element in the interior of the housing, the transverse dimensions of the interior of the housing being less than the length of the wear element;
 (c) wherein the housing is pressure-tight up to a given operating pressure when the wear element is within the housing; and
 (d) wherein the housing is adapted to be filled by a fluid which when compressed acts directly on the wear element within the housing to force the wear element against the conveyor belt and to maintain the wear element against the conveyor belt as the wear element wears.

4,877,123

CONVEYOR MEANS FOR WAFERS

Ichiro Fukuwatari, and Seiji Watanabe, both c/o Hitachi Kiden Kogyo, Ltd., 1-go 11-ban, 3-chome, Shimosakabe, Amagasaki, Hyogo, Japan

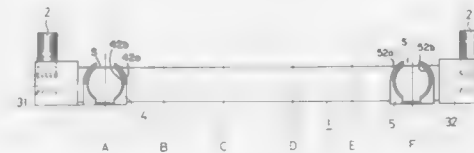
Filed Mar. 10, 1988, Ser. No. 166,308

Claims priority, application Japan, Nov. 2, 1987, 62-278016

Int. Cl.⁴ B65G 35/00

U.S. Cl. 198—619

1 Claim



1. A conveyor means for transporting wafers, comprising: an elongated wafer carrying vehicle-transporting course; at least one wafer carrying vehicle movable along said transporting course, said vehicle having a generally C-shaped cross-section when viewed in side elevation, an upper arm having an upwardly open recess for receiving a wafer to be transported, a vertical arm from the upper end of which said upper arm extends, and a lower arm extending from the lower end of said vertical arm, said upper arm and said vertical arm having a transverse slot there-through;
 permanent magnets on the under surface of said lower arm and magnetic fluid interposed between said lower magnets and said transporting course; and
 a moving means for moving the vehicle along the transporting course, whereby the vehicle is caused to float by the magnetic fluid above the transporting course and is caused to move along the transporting course so as to transport the wafers therealong.

4,877,124

CONVEYOR SYSTEM AND METHOD FOR TRANSPORTING MATERIALS

Murrell T. Miller, Portland, Oreg., assignor to ACRAVAC, Portland, Oreg.

Division of Ser. No. 947,041, Dec. 29, 1986, Pat. No. 4,766,994.

This application May 25, 1988, Ser. No. 198,513

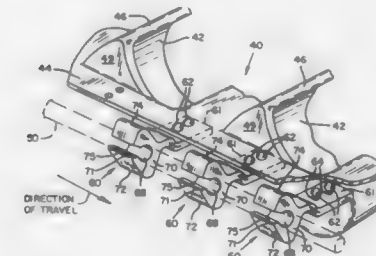
Int. Cl.⁴ B65G 17/36

U.S. Cl. 198—711

16 Claims

1. A conveyor system for transporting materials which comprises:
 a plurality of continuous cables which are disposed generally parallel one to the other;
 a continuous conveyor belt, disposed between said continuous cables, which includes a plurality of unitary, open top, pocket-like receptacles for transporting said materials;
 flat planar portions located between, and joined to, adjacent pocket-like receptacles;

a plurality of connectors for connecting said continuous cables to said conveyor belt; and
 a plurality of drive means for driving said continuous conveyor belt; and
 said receptacles including a smooth, continuous concave surface, located so that they extend above and below the



plane of travel of said continuous cables whereby said materials can be transported within the confines of said receptacles in both a horizontal path of travel and a vertical path of travel, respectively, until said materials are conveyed to the point of travel where they are discharged from the conveyor system for further subsequent processing.

4,877,125

CONVEYOR SKIRTBOARD MOUNTING ASSEMBLY

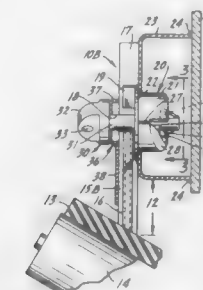
James R. Gordon, Benton, Ill., assignor to Gordon Belt Scrapers, Inc., Benton, Ill.

Filed Jul. 21, 1988, Ser. No. 222,021

Int. Cl.⁴ B65G 21/20

U.S. Cl. 198—836

15 Claims



1. A mounting assembly for a belt conveyor installation including a wall positioned a short gap distance above a conveyor belt and a replaceable skirtboard member extending downwardly from the wall to close the gap between the wall and the belt, the mounting assembly comprising:

- a cam member having a key aperture extending there-through, at least one keyway projecting radially from the key aperture, a cam ramp starting at a low point on one end of the cam member, adjacent the keyway, and extending arcuately away from that point, and key latching means located at the end of the cam ramp farthest from the keyway;
 means for mounting the cam member on the wall with the key aperture approximately normal to the wall;
 a key comprising a shaft, a head substantially larger than the cam member key aperture on one end of the shaft, and a key element projecting radially from the other end of the shaft;
 the dimensions and configuration of the cam member and the key being complementary to each other so that the key element and shaft of the key may be inserted through the

key aperture and keyway of the cam member with the key shaft fitting closely in the aperture;
 the key being rotated relative to the cam member to move the key element along the cam ramp into engagement with the key latching means so that the key head firmly clamps a skirtboard member onto the wall.

4,877,126

CONVEYOR BELT

Freerk R. van Calker, Lathum; Pieter J. M. Koppels, Wehl, and Antonius W. M. Ter Burg, Arnhem, all of Netherlands, assignors to Akzo nv, Arnhem, Netherlands

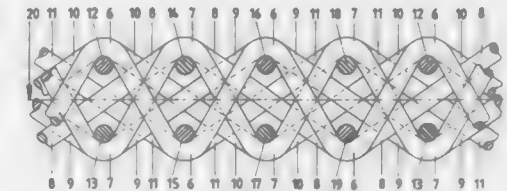
Filed Jun. 2, 1988, Ser. No. 203,739

Claims priority, application Netherlands, Jun. 4, 1987, F701305

Int. Cl.⁴ B65G 15/34

U.S. Cl. 198—847

9 Claims



1. A conveyor belt formed by a matrix, more particularly based on rubber, such as polychloroprene rubber, in which there is at least provided a layer of woven reinforcing fabric extending parallel to the bearing surface and the tread of the conveyor belt, of which reinforcing fabric the warp extending in longitudinal direction of the conveyor belt comprises both load bearing yarns, cords or cables consisting of polyester and load bearing yarns, cords or cables consisting of aramid, wherein the load bearing aramid warp yarns, cords or cables in the reinforcing fabric display a greater yarn-in-fabric take up than the load bearing polyester yarns, cords or cables.

4,877,127

FRAME FOR BAND CONVEYING DEVICES

Helmut Geppert, Niederfeld 12, D-5162 Niederzier-Kranthausen, Fed. Rep. of Germany

Continuation of Ser. No. 803,410, Nov. 13, 1985, abandoned.

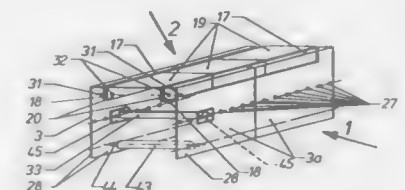
This application Jun. 20, 1988, Ser. No. 210,178

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1984, 3409160

Int. Cl.⁴ B65G 21/00

U.S. Cl. 198—860.3

11 Claims



1. A frame for a band conveying device comprising:
 a pair of adjacent longitudinal beams, each longitudinal beam being an inverted U-shape beam including a to web which is the base of the U-shape, a side web forming one leg of the U-shape and a connection flange forming the other leg of the U-shape, wherein said connection flange is of vertical extent relatively shorter than that of said side web, and wherein said connection flanges of said pair of

longitudinal beams are positioned between said side webs of said longitudinal beams;

a skid plate, said skid plate being an inverted U-shape piece, said skid plate including a central web which is the base of the U-shape and a pair of side webs which are the legs of the U-shape, and having said pair of side webs substantially parallel to said connection flange of each longitudinal beam, wherein said central web and said top webs of said pair of longitudinal beams are in the same plane;

a cross beam separate from and located below and spaced from said skid plate, said cross beam adapted to connect and hold together said side webs of said pair of adjacent longitudinal beams, said cross beam having an extent in the direction of movement of the band of said conveying device substantially less than the respective extent of said skid plate; and

means for connecting said cross beam to each of said side webs of said pair of adjacent longitudinal beams.

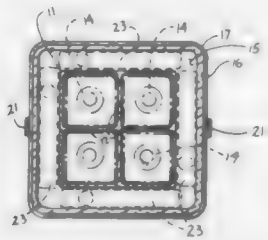
4,877,128

BABY BOTTLE CADDY

Joyce M. Strickland, 100 West St., #103, Vernon, Conn. 06066
Filed Nov. 21, 1988, Ser. No. 274,364
Int. Cl.⁴ B65D 71/00, 81/18

U.S. Cl. 206—170

10 Claims



1. A bottle caddy comprising,

a first interior continuous wall integrally formed to a first floor portion, and

a plurality of crossed partition walls integrally formed interiorly of a cavity defined by the interior wall and the first floor portion to define a plurality of compartments, and

a second cup-shaped wall portion including an integrally formed second floor portion and a second vertical wall wherein said first floor portion is integrally secured to an upper surface of said second floor portion, and

said second wall is spaced from said first interior wall to define a continuous gap therebetween, and

a third cup-shaped wall portion including a hinged mounted cover flap integrally secured to an exterior surface of said second wall portion, and

a plurality of bottles receivable within said compartments to provide rigidity to said caddy.

4,877,129

RECLOSABLE SELF-OPENING CAN END

Robert A. Wells, 107 N. Lakeside Dr., Kennesaw, Ga. 30144
Division of Ser. No. 207,141, Jun. 15, 1988. This application
Apr. 14, 1989, Ser. No. 338,989
Int. Cl.⁴ B65D 41/32

U.S. Cl. 220—269

3 Claims

1. Selectably reclosable easy-opening apparatus for a container, comprising:

a container wall;

a selectably openable panel defined in said wall at least in part by a selectably separable region of predetermined weakness formed in the container wall;

an opening and reclosure member pivotably attached to said wall and having a hinge connection permitting selectable movement of said member on a first path substantially normal to the container wall, said pivotable attachment

allowing the opening member to undergo movement on said second path substantially parallel to the container wall;

said opening member having a finger portion overlying at least a portion of said openable panel in position to apply force downwardly against the openable panel in response to movement of the opening member about said hinge connection along said first path, thereby separating said separable region and displacing said panel downwardly relative to said wall, so that an opening is formed in said wall by separation and displacement of said panel;

said opening member having a lift portion with an aperture formed therein;

a separate reclosure member being inserted and fastened within said aperture of said lift portion;



said lift portion and said separately attached reclosure member confronting the container wall at a location displaced from said openable panel while said finger portion overlies at least a portion of said openable panel; and

said separately attached reclosure member being located on the opening member in relation to said pivotable attachment so as to be selectably registable with said opening by pivoting said opening member on said second path after said opening is formed;

so that the container may be opened by hinging the opening member on said first path, and thereafter may be reclosed by pivoting said lift portion with said inserted and fastened separate reclosure member on said second path and urging said reclosure member into removable engagement with the container wall adjacent said opening therein.

4,877,130

TAMPER-PROOF JACKET-BOX ASSEMBLY FOR LOAN OR SALE

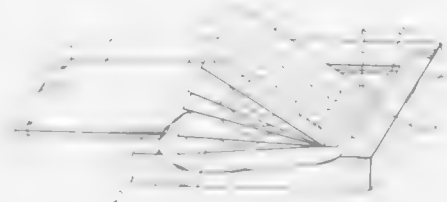
Louis Matuz, 24 rue Bizet, Saint Michel sur Orge, 91240, France

Filed Jun. 6, 1988, Ser. No. 202,324
Claims priority, application France, Jun. 24, 1987, 87 08896;
Sep. 30, 1987, 87 13503

Int. Cl.⁴ B65D 85/57

U.S. Cl. 206—309

9 Claims



1. A tamper-proof box assembly adapted for storing compact discs, comprising:

a compact disc jacket assembly having at least two sleeves, a first of said sleeves adapted to hold an information card and a second of said sleeves adapted to hold a compact disc;

box means for enclosing at least the second of said sleeves therein;

a sliding cover for closing and opening said box means;

lock means disposed between said box means and said sliding cover for locking the sliding cover to close the box means, said locking means incorporating a metal locking strip between the box means and the sliding cover.

4,877,131

FIREARM RECOVERY BAG

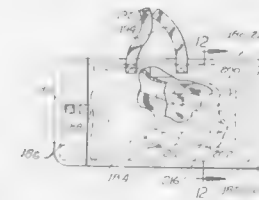
Spiro Patros, 13034 S. Buffalo, Chicago, Ill. 60633, and Dominic C. Vimarco, 2929 W. 102nd Pl., Chicago, Ill. 60642

Filed Apr. 29, 1988, Ser. No. 187,742

Int. Cl.⁴ B65D 85/00; F41C 27/00

U.S. Cl. 206—317

20 Claims



1. A containment apparatus for the safe recovery and transport of a firearm having a barrel and loaded with a cartridge, the cartridge loaded with a shot and an explosive for projecting the shot through the barrel of the firearm in a preselected direction, the apparatus comprising:

a body of flexible ballistic material forming an enclosure defining an opening through which the firearm is inserted for entry into the body, the body having at least a pair of sidewalls and a bottom portion generally opposite the opening;

a cover of flexible ballistic material overlying substantially the entire body opening so as to cooperate with the body to completely enclose the firearm and any shot discharge therefrom, the cover having a free end overlying the enclosure;

a releasable fastener for releasably securing the cover free end to the body, and openable to relieve gas pressure generated within said body by the explosive, after the shot contained within the body has been stopped by at least one of the body and cover; and

a stop member within the body adjacent the bottom portion thereof covering the bottom of the body and extending at least partly over said sidewalls, for at least one of said significant dissipation of the kinetic energy of the shot and said deflecting of the shot away from the bottom portion;

said bottom portion and said sidewalls cooperating to restrain movement of said stop member when impacted by the shot.

4,877,132

SYRINGE PROTECTION DEVICE

Lake Makris, 7455 Ridge Blvd., Chicago, Ill. 60645, and George Dimopoulos, 916 Cumberland, Park Ridge, Ill. 60068

Filed Mar. 20, 1989, Ser. No. 326,099

Int. Cl.⁴ B65D 85/00

U.S. Cl. 206—364

17 Claims

1. A container for use with a syringe, having a body with two end portions one end portion adapted for fitting a needle and the other adapted for slidably encompassing a plunger, the plunger having a syringe engagement end and a surface end, the syringe body having finger grip means, the improvement comprising:

first tube means having a terminal end, an engagement end and interior and exterior surfaces;

second tube means having a terminal end, an engagement end and interior and exterior surfaces;

said first tube engagement end having finger grip engagement slots defined by elongate legs extending from said tube and engagement surface means disposed between said legs; and

said legs having second tube engagement means;

said second engagement end having first tube engagement



means corresponding to the engagement means on the first tube and having a finger grip engagement surface;

where said tubes may be engaged in telescoping relationship; and

where said syringe is inserted in said container and said first tube engagement surfaces and second tube engagement surface bear against said syringe finger grips and are maintained in said bearing relation by the compression of the respective tube engagement means.

4,877,133

END WALL OF MOLDABLE MATERIAL FOR A WOUND ROLL

Otto Kleuter, Much, and Klaus Burk, Overath-Vilkerath, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 8, 1989, Ser. No. 320,714

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1988, 3809065

U.S. Cl. 206—416

Int. Cl.⁴ B05D 61/00

16 Claims



1. An end wall of moldable material for a wound roll comprising a central wall body and a plurality of outer wall parts adjacently contacting the circumferential surface of said central wall body, wherein said central wall body and outer wall parts form a rectangular plate comprising a front side facing said roll, a rear side facing outward, and a plurality of rounded corner surfaces, wherein said front side comprises a smooth flat surface, a central insertion plug and a plurality of locking bosses, and said rear side comprises a plurality of radial and annular ribs, whereby said rear side is stiffened.

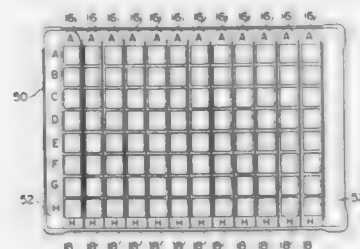
4,877,134

TEST TUBE CASSETTE SYSTEM AND CASSETTES FOR USE THEREIN

David C. Klein, 20 Redding Ridge Dr., Gaithersburg, Md. 20878
 Filed Mar. 29, 1988, Ser. No. 174,855
 Int. Cl.⁴ B65D 85/62

U.S. Cl. 206—443

9 Claims



1. A test tube cassette system comprising a rack, at least eight test tube cassettes and means for precisely positioning said cassettes on said rack;

each said cassette comprising a plurality of substantial identical test tubes, each said test tube having a pair of parallel planar surfaces, each said cassette further comprising a pair of opposed end side walls, a pair of coplanar protrusions, each one of said pair of coplanar protrusions extending transversely from one of said end side walls and including a rack contacting surface, said cassette further comprising positioning means located proximate each of said pair of coplanar protrusions;

said rack comprising a frame-like rectangular upper support surface, a rectangular opening formed in said upper support surface and four legs extending from the corners of said rectangular support surface, said upper support surface further comprising two parallel support edges for supporting the coplanar protrusions of at least eight cassettes, positioning means located proximate said support edges for cooperating with the positioning means of at least eight cassettes for precisely positioning said at least eight cassettes with respect to one another.

4,877,135

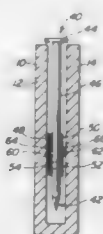
COLLATED NAIL STRIP

William L. Gabriel, 78 Lakeview Pkwy., Barrington, Ill. 60010, and Reinhold Meditz, 1136 Stanton Rd., Lake Zurich, Ill. 60059

Filed Sep. 26, 1988, Ser. No. 248,724
 Int. Cl.⁴ B65D 85/24

U.S. Cl. 206—344

8 Claims



1. For use in a nail-feeding magazine, which is adapted to feed a standard strip of collated nails, the nails of the standard strip having cylindrical shanks of a uniform diameter and being collated by at least one pair of tapes, each tape of each pair of tapes of the standard strip extending across the shanks of the nails of the standard strip and being adhered to a respective one of diametrically opposed areas on the shank of each nail of the standard strip, the standard strip having an overall width, as measured at each pair of tapes of the standard strip, which

width is selected so as to enable the nail-feeding mechanism to feed the standard strip without allowing the shanks of the nails of the standard strip to wobble excessively;

a substitute strip of collated nails having cylindrical shanks of a uniform diameter smaller than the diameter of the shanks of the nails of the standard strip and being collated by at least one pair of tapes, each tape of each pair of tapes of the substitute strip extending across the shanks of the nails of the substitute strip and being adhered by an adhesive layer to a respective one of diametrically opposed areas on the shank of each nail of the substitute strip, at least one tape of at least one such pair of such tapes of the substitute strip having an outer rib extending along such tape, the outer rib constituting means for compensating for the shanks of the nails of the substitute strip being of a smaller diameter than the shanks of the nails of the standard strip, and for causing the overall width of the substitute strip, as measured at the outer rib of each such pair of tapes of the substitute strip, to be approximately equal to the overall width of the standard strip, which lacks such a rib, so as to enable the nail-feeding magazine to feed the substitute strip without allowing the shanks of the nails of the substitute strip to wobble excessively.

4,877,136

VIBRATION FREE CONTAINER FOR TRANSPORTATION

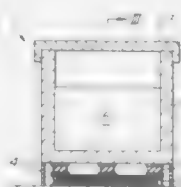
Kelchiro Mizuno, Tokyo, and Kazuyoshi Iida, Yokohama, both of Japan, assignors to Bridgestone Corporation, Tokyo, Japan
 Filed Apr. 18, 1988, Ser. No. 182,706

Claims priority, application Japan, Apr. 17, 1987, 62-93295; May 1, 1987, 106249

Int. Cl.⁴ B65D 81/02

U.S. Cl. 206—521

16 Claims



1. A vibration free container for transportation comprising: a container, and vibration isolating means arranged under said container and comprising first and second vibration isolating devices disposed one on top of another, said first vibration isolating device eliminating vibration only in a vertical direction, and said second vibration isolating device comprising laminated rubber bodies for eliminating vibration only in a horizontal direction.

4,877,137

DISPLAY PACKAGE MODULE FOR PROMOTIONAL DISPLAY USE

James A. Govang, Killingworth, and Mark E. Goldstein, Farmington, both of Conn., assignors to The Stanley Works, New Britain, Conn.

Filed Mar. 5, 1987, Ser. No. 21,986
 Int. Cl.⁴ B65D 19/38

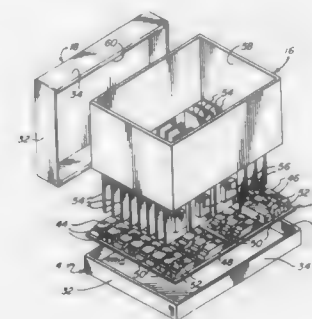
U.S. Cl. 206—597

9 Claims

1. A display package module comprising a box; a product stand within said box; and a multiplicity of product units within said box on said product stand; said box including a base component and a sidewall component removably assembled therewith and extending upwardly about the periphery of said base component to define an internal cavity within which said product stand and product units are disposed, said base component comprising a base panel element with a flange element

extending upwardly about the periphery thereof, said sidewall component comprising a unitary shell substantially conforming in cross section to said base panel element and seated within the recess defined by said flange element in close proximity thereto; said product stand being unitary and seated upon and supported by said base panel element of said base component, said product stand being substantially disposed within said base panel element so as to be substantially enclosed thereby, said product stand providing a multiplicity of upwardly extending recesses, and said product units being individually engaged and stably supported in said recesses of said stand to extend upwardly beyond said base component within said cavity, whereby removal of said sidewall component will expose said product units for display upon said base component, said product units extending above said flange element and said product stand for display thereon upon removal of said sidewall component.

9. An integrated assembly of package modules, comprising: a skid having an upper, normally horizontal support surface, a plurality of rectangular pallets arranged in side-by-side relationship upon said support surface, a multiplicity of package modules arranged as a plurality of stacks upon said pallets, each of said stacks comprising a multiplicity of vertically disposed package modules, horizontally adjacent package modules being elements of different stacks; first means extending vertically along all four sides of the modules and engaged with the modules of a stack and with all four side of its associated pallet for separately securing each of said stacks of mod-



ules to the associated one of said pallets to provide a plurality of independent subassemblies separately removable from said skid with said first means substantially intact; and second means engaged with and securing all of said subassembly to said skid to provide said integrated assembly, said second means being disengagable from said subassemblies without injury to said first means, said subassemblies of said pallets and modules lying substantially within the periphery of said skid support surface; said pallets having support surface which are dimensioned and configured to cumulatively occupy substantially the same area as said skid support surface; each of said package modules comprising: a box, a product stand within said box, and a multiplicity of product units within said box on said product stand, said box including a base component and a sidewall component removably assembled therewith and extending upwardly about the periphery of said product stand and product units are disposed, said base component comprising a base panel element with a flange element extending upwardly about the periphery thereof, said sidewall component comprising a unitary shell substantially conforming in cross section to said base panel element and seated within the recess defined by said flange element in close proximity thereto, said product stand being unitary and seated upon and supported by said base panel element of said base component, said product stand being substantially disposed within said base panel element so as to be substantially enclosed thereby, said product stand providing a multiplicity of upwardly extending recesses and said product units being individually engaged and stably supported in said recesses of said stand to extend upwardly beyond said base component within said cavity, whereby re-

moval of said sidewall component will expose said product units for display upon said base component, said product units extending above said flange element and said product stand for display thereof upon removal of said sidewall component.

4,877,138

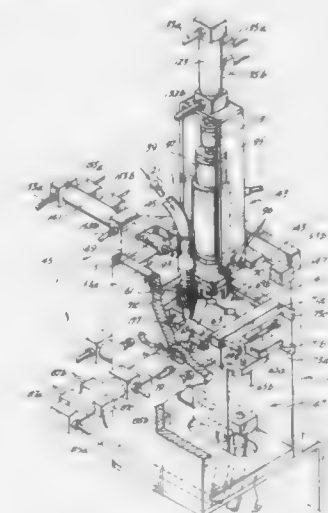
FASTENER HEAD ELEVATION MEASURING APPARATUS

Mohammad I. Motiwala, Everett, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Jul. 27, 1987, Ser. No. 78,257
 Int. Cl.⁴ B07C 5/04

U.S. Cl. 209—601

15 Claims



1. A fastener head elevation measuring apparatus comprising:

- gauge block having an upper surface and at least one vertically oriented, precisely sized hole opening into said upper surface, said hole being sized to receive a shank of a headed fastener;
- a fastener delivery mechanism for delivering head fasteners, each having a countersunk head and a shank, said fastener delivery mechanism having an outlet located above said gauge block for delivering said headed fasteners, shank down, to said vertically oriented, precisely sized hole;
- a head elevation measuring instrument located above said gauge block and spaced from the outlet of said fastener delivery mechanism for measuring the elevation of the headed fastener above the upper surface of said gauge block after said fastener delivery system has delivered the headed fastener to said vertically oriented, precisely sized hole;
- alignment means coupled to said gauge block for selectively aligning said vertically oriented, precisely sized hole with the outlet of said fastener delivery mechanism and said head elevation measuring instrument; and,
- a discharge mechanism for discharging measured fasteners from said vertically oriented, precisely sized hole in said gauge block.

11. A fastener head elevation measuring apparatus as claimed in claim 10 wherein said discharge mechanism includes directing means for directing dropped measured fasteners to one or the other of two outlet tubes.

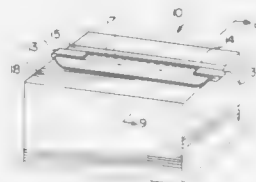
4,877,139

**CONTAINER WITH AN OPENING DEVICE
COMPRISING A GUIDE STRIP AND TEAR BAND**
Myun H. Kim, 37-57 80th St. 190 D37, Jackson Heights, N.Y.
11372

Continuation-in-part of Ser. No. 947,806, Dec. 30, 1986. This
application Apr. 29, 1988, Ser. No. 188,224
Int. Cl.⁴ B65D 27/38

U.S. Cl. 206-617

12 Claims



1. A container having an opening-closing flap with inside and outside surfaces and provided with an opening device which comprises:

- a strip of adhesive disposed along a straight line on the inside surface of said opening-closing flap for sealing the container;
- a non-tearable guide strip disposed in a straight line along the outside surface of said opening-closing flap, and
- a non-tearable, elongated straight tear band attached to the inside surface of said opening-closing flap, one elongated edge of said tear band being adjacent said adhesive strip, while the opposite elongated edge of said tear band is aligned with an edge of said guide strip whereby the tear band is disposed between said adhesive strip and said guide strip so that when said flap is sealed by said adhesive and said tear band is freed and pulled away from the container, the container is opened with a tear line which extends along the container flap in a straight line defined by said adhesive strip and said tear band.

4,877,140

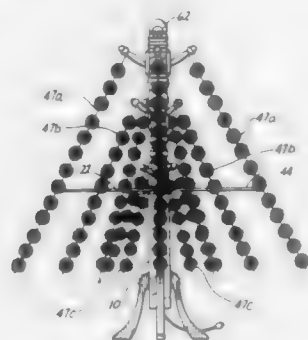
ROTATING CLOTHES TREE

Kil J. Lee, 508 Crocker Ave., Pacific Grove, Calif. 93950

Continuation-in-part of Ser. No. 48,324, May 11, 1987,
abandoned. This application Aug. 1, 1988, Ser. No. 227,084
Int. Cl.⁴ A47F 5/02

U.S. Cl. 211-163

2 Claims



1. A convertible clothes stand comprising:

- (a) a base member, said member being at least partially axially orificed, from its top downwardly, said base member including means to support said base member on a horizontal surface with the axis of said orifice in a substantially vertical orientation;
- (b) a cylindrical axle rod, said rod having a portion of a

configuration to fit into the orifice in said base member, and being inserted therein;

- (c) a plurality of spool-like elements disposed in series on said axle rod, each of said spool-like elements having an internal diameter slightly greater than the external diameter of said axle rod, thereby being rotatable about said axle rod, and each of said spool-like elements being rotatable independently of the others;
- (d) a plurality of support arms longitudinally extending angularly upwardly from, and disposed equi-angularly about, each of said spool-like elements to support a coat or other garment therefrom;
- (e) each spool-like element above the lowermost said element being of a greater outside diameter than that immediately below it, and each support arm extending from the spool-like element above the lowermost such element, being of a greater longitudinal dimension than that of any of the arms extending from the spool-like element immediately below;
- (f) the support arms extending from each spool-like element being vertically spaced from the arms extending from the adjacent spool-like element
- (g) an annular support member mounted on top of the base member, the last said support member comprising:
 - (i) a central mounting ring fitting about the axle rod and resting on top of the base member, and
 - (ii) a plurality of coaxial annular support elements secured in spaced relationship to each other and to said mounting ring by a plurality of struts radiating from said ring and to which struts said annular support elements are secured; and
- (h) a plurality of decorative rigid branch members, each branch member being secured at one of its extremities to one of said support arms to hang downwardly therefrom and to supportingly rest upon one of said annular support elements, with all branch members depending from the support arms extending from a particular spool-like member, supportingly resting upon the same annular element for disposition in an imaginary cone coaxial with said axle rod.

4,877,141

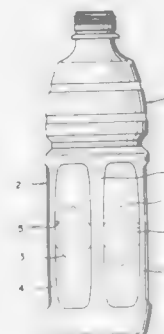
PRESSURE RESISTANT BOTTLE-SHAPED CONTAINER

Yoshiaki Hayashi, Matsudo; Takeshi Itakura, Adachi; Toyoji Kato, and Yukio Koshidaka, both of Matsudo, all of Japan, assignors to Yoshino Kogyosha Co., Ltd., Tokyo, Japan

Filed Feb. 16, 1988, Ser. No. 155,732
Claims priority, application Japan, Oct. 3, 1986, 61-235865;
Feb. 17, 1987, 62-34008; Feb. 17, 1987, 62-34007
Int. Cl.⁴ B65D 23/00

U.S. Cl. 215-1 C

5 Claims



- 1. A pressure resistant bottle-shaped container having a body with an outer surface including panels surrounded by outer sheaths, wherein: each panel has a longitudinal height and a transverse width,

4,877,143

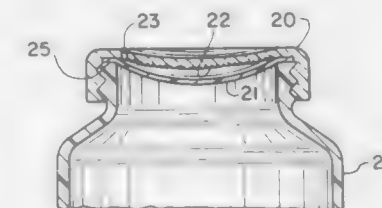
TAMPER EVIDENT INDICATING MEANS

Frank P. Traviano, 300 Bucklew Ave., Jamesburg, N.J. 08831
Filed Jun. 16, 1988, Ser. No. 207,458

Int. Cl.⁴ B65D 55/02

U.S. Cl. 215-230

9 Claims



- and includes stress absorbing tones comprising vertexes recessed from the outer surface of the panel toward the interior of the container and bending lines formed, in V shape and inverted V shape in mirror-image, confronting relationship from the vertexes toward the outer sheaths, said vertexes are formed on the center line of the panel along the longitudinal height of the panel,
- a flat recessed portion is formed between the vertexes at the center of the longitudinal height of the panel, and
- a depth of a recessing step between the surface of the panel and the flat portion is 1.0 mm or less.

4,877,142

RECTANGULAR BOTTLE FOR MOTOR OIL AND LIKE FLUIDS

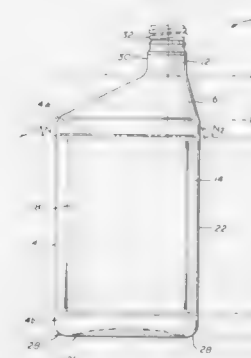
John P. Doering, Humble, Tex., assignor to Texaco, Inc., White Plains, N.Y.

Continuation of Ser. No. 53,762, May 26, 1987, abandoned. This
application Jun. 3, 1988, Ser. No. 203,636

Int. Cl.⁴ B65D 1/02

U.S. Cl. 215-1 C

19 Claims



- 1. A substantially rectangular bottle for motor oil and like fluids designed to be stacked and shipped on a standard 40 in. x 48 in. GMA pallet without overhang, comprising:
 - a hollow body including a front wall, back wall, right side wall, left side wall and bottom, said front wall and said back wall are substantially parallel, and said right side wall and said left side wall are substantially parallel, said hollow body having an exterior length, between said right side wall and said left side wall, to exterior width, between said front wall and back wall, ratio of from about 1:0.53 to about 1:0.56;
 - a tubular spout through which said bottle may be filled and emptied, said spout being centrally oriented between said front and back walls of said bottle, the centerline of said spout being offset from said left side wall toward said right side wall between about 75% to about 80% of said exterior length of said hollow body; and
 - a tapered section interposed between and connecting said hollow body and said spout, whereby said front wall, back wall, right side wall and left side wall slope toward and merge into said spout, said front wall sloping at an angle of between about 60° to about 70°, said back wall sloping at a supplementary angle of between about 120° to about 110°, said right side wall sloping at an angle of between about 100° to about 110°, and said left side wall sloping at an angle of about 25°, from the horizontal toward said spout.

4,877,144

PLASTIC THREADED SLEEVE

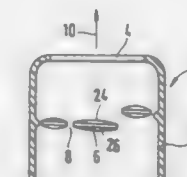
Klaus Thanisch, Zell, Fed. Rep. of Germany, assignor to Zeller Plastik Koehn, Gruebner & Co., Zell, Fed. Rep. of Germany
Filed Mar. 16, 1988, Ser. No. 168,957

Claims priority, application Fed. Rep. of Germany, Mar. 16, 1987, 3708472

Int. Cl.⁴ B65D 41/04

U.S. Cl. 215-330

6 Claims



- 1. A threaded sleeve closure having a circumference and an axis manufactured by a process which includes stripping the finished closure from a mold in the direction of said axis, comprising:
 - (a) a skirt;
 - (b) screw thread means for mating with a thread on a neck of a container, said thread means being formed on a helical path on the interior surface of said skirt which corresponds and mates with a helical screw thread formed on the neck of a container which is to receive the closure, said closure helical path extending one full turn around said closure skirt circumference, said container helical

- screw thread extending for more than one full turn around said neck;
- (c) said screw thread means including a plurality of spaced thread segments located on said closure helical path;
- (d) said segments having a base occupying a given surface area on said skirt and tapering to edges having a surface area less than said given surface area, thereby permitting said closure to be stripped from a mould in said direction of said axis; and
- (e) said segments separated from one another in the direction of said circumference by spaces shorter than said segments.

4,877,145

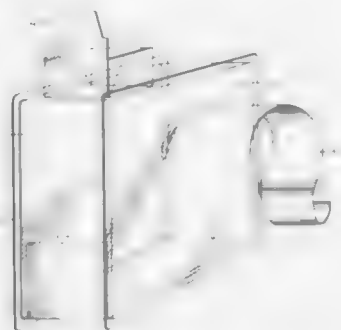
RIBBON WRAPPED INTRINSIC OPENING PLASTIC PACKAGE

Warren R. Manner, 11652 Camden St., Omaha, Nebr. 68164, assignor to Warren R. Manner, Omaha, Nebr.

Filed Feb. 29, 1988, Ser. No. 161,479
Int. Cl.⁴ B65D 6/10

U.S. Cl. 220—83

19 Claims



1. A package, comprising upright front and back panels, top, bottom and opposite end walls, each integrally connected to both said front and back panels and extended between said front and back panels, whereby said package is free of seams between said panels and walls, a spout through one of said walls, a closure flap integrally formed with one of said walls and movable between a closed position operatively covering and closing said spout and an open position away from said spout whereby contents may be inserted into and removed from said package through said spout, flap securement means for releasably securing said flap in the closed position thereof, and a removable elongated ribbon wrap extended around said package over said spout and operative to obstruct movement of said closure flap from its closed position and thereby prevent access to the contents of said package prior to removal of said ribbon wrap.

4,877,146

VACUUM CONTROLLED VAPOR RECOVERY SYSTEM

Robert S. Harris, Connersville, Ind., assignor to Stant Inc., Connersville, Ind.

Continuation-in-part of Ser. No. 148,394, Jan. 23, 1988, which is a continuation-in-part of Ser. No. 106,632, Oct. 8, 1987, Pat. No. 4,816,045, which is a continuation-in-part of Ser. No. 846,081, Mar. 31, 1986, Pat. No. 4,770,677. This application Mar. 24, 1989, Ser. No. 328,287

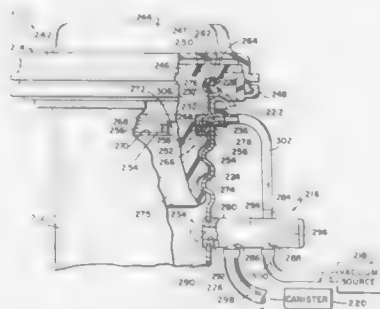
Int. Cl.⁴ B65D 6/12

U.S. Cl. 220—85 VR

16 Claims

1. A recovery system for recovering fuel vapor normally discharged from a fuel system during refueling, the recovery system comprising

- a fuel tank filler neck having a mouth and a vent outlet spaced in relation to the mouth,
- a fuel cap including closure means rotatably engaging the filler neck for closing the mouth, the closure means including first seal means for normally establishing a seal between the closure means and the filler neck,
- vent means for selectively venting pressurized fuel vapor from the filler neck through the vent outlet, and



- actuation means for actuating the vent means upon rotation of the cap relative to the filler neck to a position breaking said seal and prior to removal of the cap from the filler neck to vent pressurized fuel vapor in the filler neck through the vent outlet without venting pressurized fuel vapor through the filler neck mouth.

4,877,147

TANK COMPRISING EMBEDDED FLANGED CONDUIT

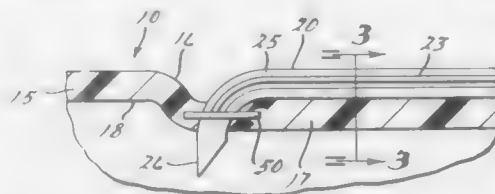
James P. Hyde, Saline, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Aug. 1, 1988, Ser. No. 226,901

Int. Cl.⁴ B65D 25/00, 1/00

U.S. Cl. 220—85 VR

15 Claims



1. A molded plastic tank comprising a tank wall and a closed-section conduit comprising an external flange, at least an elongate portion of said closed-section conduit being at least partially embedded in said wall, wherein
- (a) said flange extends longitudinally along at least said elongate portion of said closed-section conduit, and
- (b) substantially the entire exterior surface of said flange is submerged within said tank wall.

4,877,148

DISPENSING STRAW FOR LIQUID CONTAINER

Gordon Larson, 1780 Pass Rd., and John Pates, 193 Miramar, both of Biloxi, Miss. 39531

Filed Nov. 17, 1988, Ser. No. 272,435

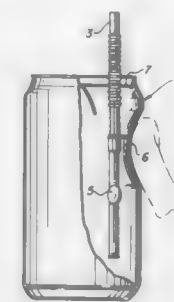
Int. Cl.⁴ A47G 19/22

U.S. Cl. 220—90.2

12 Claims

1. A straw assembly for a liquid container having a top wall, bottom wall and side wall with an openable closure for the dispensing opening of the container in the top wall including a straw disposed in said container, means for retaining the straw attached to the side wall of the container in the same position completely within the container with the openable closure in

- place closing the container or with the container open and means for causing the straw to be released to emerge through



- the dispensing opening when the closure is opened by depressing a portion of the external surface of the container.

4,877,149

SCORED CONTAINER TOP

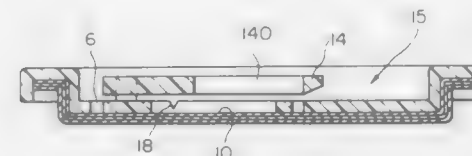
Akinori Kodama, and Takeshi Takahashi, both of Kanagawa, Japan, assignors to Showa Denko Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 30, 1988, Ser. No. 278,529

Int. Cl.⁴ B65D 17/30

U.S. Cl. 220—267

3 Claims



1. A top adapted to be attached to a body of a can-like container, comprising: a multilayer circular base (4) composed of a gas-insulating basic material (19) and resin layers (20, 21) provided on both the sides of said basic material and capable of being fuse-bonded, a resin layer (5) is deposited, by injection molding, on one side of said base, a central portion (3) of said top having a closed figure defined by a continuous groove (6) extending through said molded resin layer and down to said base, a projection (9) disposed inside said groove and extending from a pedestal (8), a butt of a pull tab (12, 14) joined to said pedestal, and scores (18) extending across the projection perpendicular to a direction of opening of said top.

4,877,150

DISPOSABLE CONTAINER

Werner Otto, Forstweg 2, D-5910 Kreuztal; Ulrich Beese, Brunnenstrasse 6, D-5963 Wenden-Hünsborg, and Martin Schmidt, Am Zollstock 11, D-3565 Breidenbach-Achenbach, all of Fed. Rep. of Germany

Filed Dec. 28, 1987, Ser. No. 138,444

Claims priority, application Fed. Rep. of Germany, Jan. 12, 1987, 3700683

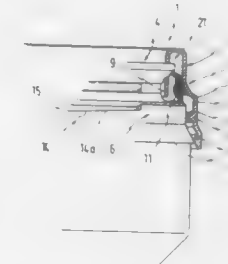
Int. Cl.⁴ B65D 43/14

U.S. Cl. 220—304

19 Claims

1. A disposable container and lid, having both a releasable seal and a non-releasable seal, comprising
- (a) a container having a filling opening at one end and a sealing ring about its outer periphery proximate said one end, said container further having an outer surface extending away from said one end; a container locking projection extending from said outer surface; and an outwardly increasing ramp face extending from said outer surface, said ramp face terminating in a retaining projection; and
- (b) a lid sized for closure of said filling opening, said lid

- having a downwardly projecting inner edge surface, said inner edge surface having an inner encircling counter face engageable against said sealing ring; said inner edge surface also having a lid locking projection extending inwardly from said surface and engageable in releasable locking engagement against said container locking projection; said inner edge surface terminating in an inwardly



- directed detent engageable in non-releasing locking engagement against said retaining projection, whereby said sealing ring is partially compressed when said lid locking projection is in locking engagement with said container locking projection, and said sealing ring is further partially compressed when said detent is in locking engagement against said retaining projection.

4,877,151

SNAP-ON LID AND MOLD FOR MAKING THE LID

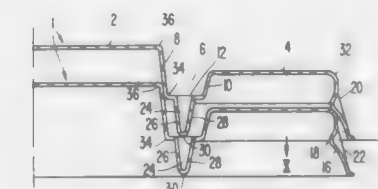
Jonathan E. Rush, 310 Prospect St., Phillipsburg, N.J. 08865; Phillip D. Scavini, 1267 Saddle Dr., Nazareth, Pa. 18064, and Reinhold Gerber, 3000 Swanson St., Easton, Pa. 18042

Filed Jan. 30, 1988, Ser. No. 214,053

Int. Cl.⁴ B65D 21/02

U.S. Cl. 206—514

37 Claims



1. A stack of disposable plastic circular lids for containers having openings surrounded by a beaded rim wherein the lids have aligned central axes and wherein each said lid comprises:
- a. a generally circular closure wall including an annular central portion lying in a first plane, an annular outer portion lying in a second plane below said first plane and an annular U-shaped recess extending between said central portion and said annular outer portion and having an inner wall, an outer wall and a bottom wall lying in a third plane below said second plane formed by said annular outer portion;
- b. a peripheral skirt depending from a rim portion of said closure wall for engaging the beaded rim of a container; and
- c. stabilizing means for distributing and counteracting both lateral and axial loads to maintain stack integrity while preventing jamming of adjacent lids, said stabilizing means including:
- (i) anti-jamming means for preventing sticking of adjacent lids including a plurality of lug members extending downwardly from said bottom wall for a sufficient distance to engage the bottom wall of the lower adja-

cent lid, the inner radial surface of each lug member being spaced radially outwardly along its entire axial length from the inner wall of said U-shaped recess; and (ii) anti-shifting means for preventing relative lateral movement of adjacent lids, said antishifting means including the portion of said inner wall which lies above the bottom wall of the upper adjacent lid.

4,877,152

FUEL TANK VENT

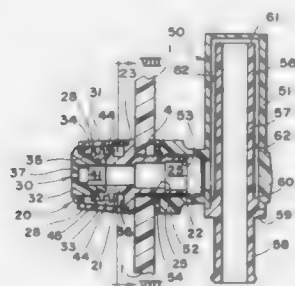
Warwick M. Whitley, II, Panama City, Fla., assignor to Attwood Corporation, Lowell, Mich.

Filed Feb. 10, 1989, Ser. No. 306,558

Int. Cl.⁴ B65D 25/02; F16K 24/04

U.S. Cl. 220—374

15 Claims



1. In a fuel tank for a marine vessel in which an elongated member is provided to extend through an opening in the hull of said vessel; said elongated member having an inner end adapted to be located inside said hull and an outer end adapted to be located outside said hull and an opening extending there-through providing communication between the inner and outer ends of said elongated member with means for securing said elongated member to said hull in said opening the improvement comprising:

an elongated housing adapted to be located inside said hull and having an open lower end and a closed upper end and a chamber communicating with said opening in said elongated member;

said housing being arranged at an angle to said elongated member; and

a vent tube open at both of its ends extending into said chamber short of said closed upper end and of a smaller outer cross section than the inner cross section of said housing to provide a space therebetween; said vent tube having an end extending out of said chamber for connection to a hose leading to a fuel tank; and means at the lower end of said housing for closing said space between said tube and housing whereby air and fumes vented from said tank are required to pass upwardly through said tube and then downwardly through said space and into the opening of said elongated member.

5. In a fuel tank for a marine vessel in which an elongated member is provided to extend through an opening in the hull of said vessel; said elongated member having an inner end adapted to be located inside said hull and an outer end adapted to be located outside said hull and an opening extending there-through providing communication between the inner and outer ends of said elongated member with means for securing said elongated member to said hull in said opening the improvement comprising a cover assembly having a top secured to said elongated member and having a side wall extending from said top to the base thereon and spaced from said elongated member to form a passageway for the flow of air from the said top to said base; said cover assembly having a first vent opening means inside the side walls near the top of said cover assembly to provide communication with the vent opening through said elongated member and said passageway; and a second vent opening means located in said side wall adjacent the base thereof to provide communication with said passage-

way and the atmosphere outside said cover only adjacent said base whereby the passage of air for communication with the said opening of said elongated member is confined through said passageway extending along said elongated member between said first vent opening near said top to said second vent opening adjacent said base.

11. In a fuel tank for a marine vessel in which an elongated member is provided to extend through an opening in the hull of said vessel; said elongated member having an inner end adapted to be located inside said hull and an outer end adapted to be located outside said hull and an opening extending there-through providing communication between the inner and outer ends of said elongated member;

means for securing said elongated member to said hull in said opening in said hull, the improvement comprising:

a cover assembly including a trim cover having a top with an opening therein and a wall extending from said top substantially to said hull;

a separate retainer member extending through said opening, said retainer member having at one end a closure means for closing the said opening in said trim cover and at the other end a securing means for removably securing said retainer member to the outer end of said elongated member;

vent openings in said retainer member between said closure means and securing means; and vent openings in the wall of said trim cover adjacent said hull.

4,877,153

METHOD AND APPARATUS FOR STORING CRYOGENIC FLUIDS

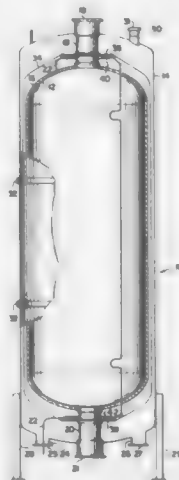
Alexander P. Varghese, Bethlehem, and Robert H. Herring, New Tripoli, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Feb. 4, 1988, Ser. No. 152,278

Int. Cl.⁴ B65D 90/04

U.S. Cl. 220—469

12 Claims



1. In a dewar for storing or transporting cryogenic fluid of the type containing an outer vessel and an inner vessel disposed therein, said inner vessel including means to admit and withdraw cryogenic fluid from the interior thereof, and insulation between said inner and outer vessels, the improvement comprising:

disposing at least one metallic transient heat shield between said inner and outer vessels, said heat shield containing means to retain refrigeration, said means to retain refrigeration adapted to be contacted by cold vaporized cryogen as it is withdrawn from said inner vessel, said means to retain refrigeration also includes a heat sink in heat exchange with said vapor withdrawal means.

4,877,154

DISPENSING CONTAINER FOR PAPER TISSUES AND THE LIKE

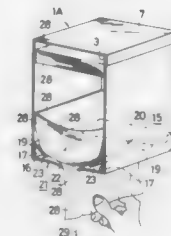
Samio Matsui, 5-7, Kitami 9-chome, Setagaya-ku, Tokyo, Japan
Continuation of Ser. No. 55,157, May 28, 1987, Pat. No. 4,768,679, which is a continuation of Ser. No. 783,342, Oct. 2, 1985, Pat. No. 4,678,099. This application Jul. 27, 1988, Ser. No. 224,885

Claims priority, application Japan, Feb. 19, 1985, 60-29390; Aug. 22, 1985, 60-188504

The portion of the term of this patent subsequent to Sep. 6, 2005, has been disclaimed.

Int. Cl.⁴ B67H 1/00

U.S. Cl. 221—48



1. In combination with a stack of folded and partially interleaved thin and soft sheets, a container holding the stack such that the sheets can be drawn one at a time from the container and that, after one sheet is drawn from the container, the next sheet is ready to be drawn from the container, the container having:

a bottom formed with two pairs of opposing lower flexible lugs together defining a discharge port consisting of a central discharge port and four blind port extensions extending obliquely towards four corners of the bottom of the container from the central discharge port and having respective rounded ends, the flexibility of the lugs being such that on pulling of the lowermost sheet of the stack down through the discharge port, first the sheet flexes down one of the lugs of one of the pairs, then both lugs of the other pair, and finally the other lug of the one pair, the stack of the sheets thus being supported normally by the two pairs of the lower flexible lugs and by at least two lugs at all times as the sheet is drawn out from the discharge port of the container; and

one pair of opposite side flaps forming respective upper flexible lugs each extending to the full extent of the associated side of the container and extending from said associated side towards said discharge port, the stack substantially resting on said upper flexible lugs, the upper flexible lugs guiding the sheets towards the discharge port as the sheet is drawn out from the container by way of said lower flexible lugs.

4,877,155

SPILL PROTECTING APPARATUS

Richard H. Tull, Marietta, Ga., assignor to MGM Petro Equipment & Enviro Services, Inc., Lakeland, Fla.

Filed Aug. 23, 1988, Ser. No. 235,300

Int. Cl.⁴ B67D 5/00; F16N 33/00

U.S. Cl. 222—108

4 Claims

1. Apparatus for preventing spillage of liquids from a dispensing pump during the changing of a filtering element removably attached to a mount on such pump, comprising

a hollow member elongated in an axial direction and formed of a liquid-tight, flexible, petroleum resistant material, said member having an upper open end and a lower open end distal said upper open end, said upper open end of sufficient area transverse to said axial direction to fit over said filtering element and having an open interior of sufficient length and cross sectional area a transverse to said axial

direction to receive said filtering element completely therewithin;

constricting means engaging said upper open end of said hollow member for contracting said hollow member upper open end about said filtering element mount to support said hollow member on said mount, whereby the hollow member will be supported on the mount during the changing of the filtering element;

a flexible liquid conduit having a first end and a second end spaced from said first end, said first end being connected



to said lower open end of said hollow member and said conduit extending downwardly therefrom, whereby liquid introduced into the hollow member will flow by gravity out the lower open end of the hollow member and down the liquid conduit; and

anchoring means attached to a lower end of said liquid conduit to assist in maintaining said liquid conduit lower end in a predetermined position within a receiving container, whereby the liquid conduit and anchor means will resist movement relative to the container during the changing of the filtering element.

4,877,156

COLLAPSIBLE AND INFLATABLE PISTON FOR TWO-OR MULTI-COMPARTMENTAL CONTAINER

Frank Claret, and Anne Deller, both of 4 bis Sentier des Voisins, 92190 Meudon-Bellevue, France

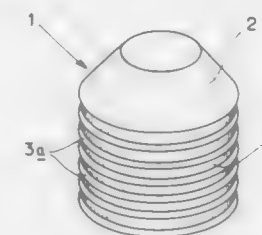
Continuation of Ser. No. 884,636, Jul. 11, 1986, abandoned. This application Dec. 9, 1987, Ser. No. 132,634

Claims priority, application France, Mar. 24, 1986, 86 04186

Int. Cl.⁴ B67D 5/42

U.S. Cl. 222—386.5

19 Claims



1. A collapsible and inflatable piston, particularly useful in containers for packaging requiring a fluid-tight separation between the packaged product and a propellant agent for said piston, comprising:

a hollow vessel having a frustoconical cap closed at one end

and extended by a cylindrical portion open at the base, forming a skirt,
said cylindrical portion having a plurality of external semi-toric sealing means for forming a seal in a fluid-tight manner with the inner wall of the container, the semi-toric sealing means closest to the frustoconical cap being located where said cap meets said cylindrical portion and is evenly integral to said cap,
whereby when said piston inflates, radial forces act on said closest semi-toric sealing means in a radial direction so as to enhance the seal between the piston and the container, said piston being formed of an elastomeric material that is impermeable to gases and liquids.

4,877,157

DISPENSER FOR FLUID PRODUCTS

Lorenzo Sallie, Pieve Emanuele, Italy, assignor to Stacos di Sallie Lorenzo e Pontarollo Luciana s.n.c., Milan, Italy
Continuation of Ser. No. 11,105, Feb. 5, 1987, abandoned. This application Feb. 23, 1989, Ser. No. 315,350
Claims priority, application Italy, Feb. 6, 1986, 19323 A/86; Jul. 31, 1986, 21352 A/86

Int. Cl.⁴ B65D 83/14

U.S. Cl. 222—387

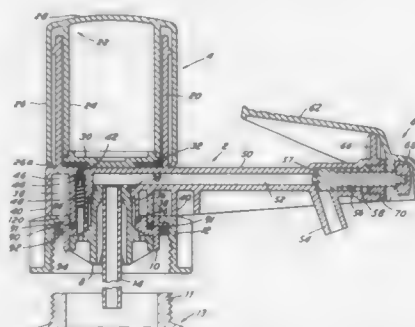


1. A dispenser for flowable materials which comprises: a tubular outer container having an open lower end, a tubular inner container having an open lower end positioned coaxially and concentrically within the outer container, an outer annular chamber between said outer and said inner container for compressed air, said outer container and said inner container each having an upper end, said upper ends being sealed, a first valve positioned on said sealed ends for ejection of said flowable material, a convex bottom sealed to the lower ends of said outer container and said inner container, a filling valve on said convex bottom, a piston slidable within said inner container defining in the inner tubular container an upper chamber for the flowable material and a second lower chamber between said piston and said bottom for the compressed air, said piston being provided with lower guiding fins projecting diametrically across the lower surface thereof into said second lower chamber, radial holes in the lower part of said inner tubular container for communicating said outer annular chamber with said second lower chamber, said piston being made of flexible elastic material, said radial holes being below the bottom and being aligned with said guiding fins, said fins being V-cut in the lower central portion thereof, whereby a free space for said filling valve is provided.

4,877,158

FLUID DISPENSING APPARATUS

Tilmann L. Kohler, 31 Blossom Way, Heston, Middlesex TW5 9TH, United Kingdom
Filed Apr. 12, 1988, Ser. No. 180,400
Int. Cl.⁴ B65D 83/14; B05B 11/06
U.S. Cl. 222—400.8 12 Claims



1. Apparatus for dispensing liquids from a container through an opening defined by the container, the apparatus comprising:
a body portion,
a pump assembly for pumping air, supported on the body portion,
a valve portion having an outlet duct supported on the body portion,
a valve housed in said valve portion for opening and closing the duct,
a locking member for locking the body portion on to the opening of said container,
a locking member retainer rotatably supporting the locking member,
a fastening member defining a liquid flow passage, the fastening member being arranged to be fastened to the body portion, to sealingly couple the liquid flow passage to the outlet duct and to lock the locking member retainer to the body portion, the fastening member and the locking member retainer when locked to the body portion defining an uninterrupted fluid passage from the pump assembly which does not directly communicate with the liquid flow passage, and
sealing means located on the locking member retainer for enabling a seal to be effected between the container and the locking member retainer when the locking member retained by the locking member retainer is locked to the container.

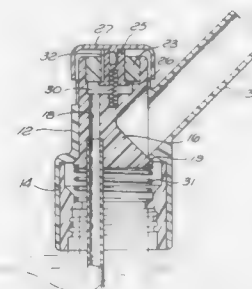
4,877,159

POUR DISPENSER

Victor Strand, Yorba Linda, Calif., assignor to Strand Art Co., Inc., Anaheim, Calif.
Filed Jul. 28, 1988, Ser. No. 225,195
Int. Cl.⁴ B67D 3/00; B65D 47/00
U.S. Cl. 222—484 8 Claims

1. In a pour dispenser for pouring fluid from a container, the combination of:
a body having an outlet nozzle and an adapter for mounting said body on a container;
a piston in said body, with said piston and body having first interengaging valve means with said piston slideable in said body between a first valve open condition providing a first flow path between the container and said nozzle, and a first valve closed condition blocking fluid flow between the container and said nozzle,
said piston including a vent line for positioning in the container;
a plunger in said piston, with said plunger and piston having second interengaging valve means with said plunger

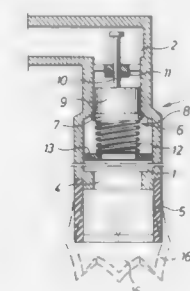
slideable in said piston between a second valve open condition providing a second fluid flow path between the container and the atmosphere, and a second valve closed condition blocking fluid flow between the container and the atmosphere; and
spring means between said plunger, piston and body for urging said plunger to said second valve closed condition and said piston to said first valve closed condition, with pressure on said plunger actuating said spring means and moving said plunger to said second valve open condition to open said second fluid flow path and then moving said piston to said first valve open condition to open said first fluid flow path.



4,877,160

VALVE UNIT

Jackie Derring, Malmö, Sweden, assignor to Tetra Pak International AB, Lund, Sweden
Continuation of Ser. No. 358,705, Mar. 16, 1982, abandoned.
This application Mar. 29, 1989, Ser. No. 330,999
Claims priority, application Sweden, Apr. 1, 1981, 8102088
Int. Cl.⁴ B67D 5/72
U.S. Cl. 222—494 11 Claims

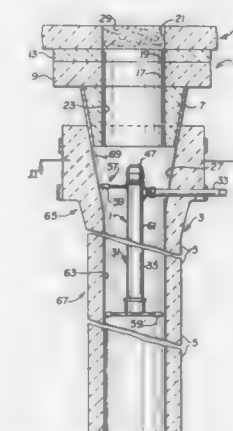


1. A valve unit comprising:
valve body means having a valve chamber, an inlet duct and an outlet duct;
a flexible material nozzle secured over said outlet duct of said valve body means, said nozzle being provided with a slit-like opening which opens in response to fluid pressure in said valve chamber and which is resiliently biased into a closed position; and
means within said valve chamber for sealing closed said inlet duct and for changing the volume of the valve chamber, said sealing and changing means being biased so as to seal off said inlet duct and to increase the volume of the valve chamber when the fluid pressure upstream of the inlet duct falls below a predetermined level, thus reducing the fluid pressure in said valve chamber and closing said opening rapidly.

4,877,161

TELESCOPING DEVICE FOR UNPLUGGING A VESSEL DISCHARGE PORT

Michael F. Harasym, Havertown, Pa., assignor to Vesuvius Crucible Company, Pittsburgh, Pa.
Continuation-in-part of Ser. No. 930,484, Nov. 14, 1986, Pat. No. 4,746,037. This application May 17, 1988, Ser. No. 195,040
Int. Cl.⁴ C21C 5/48
U.S. Cl. 222—591 17 Claims



1. An apparatus for unplugging a vessel discharge port, the vessel having refractory pouring means associated therewith positioned directly below the discharge port, the pouring means having an axial bore formed therein, said apparatus comprising:
an elongated tubular housing having a hollow interior chamber for coaxial placement within the bore of said refractory pouring means;
a conduit communicating with the interior chamber of the housing for introducing a pressurized gas into the housing;
an axially displaceable tube at least partially disposed within said housing, said tube having an upper end disposed outside the housing and an open, flared lower end disposed within said housing, said tube adapted to be projected upwardly when said pressurized gas is introduced into the housing;
bushing means disposed within and secured to an upper end of said housing for axially guiding said axially displaceable tube and for forming a stop for said flared lower end thereof; and
a plurality of radially and axially spaced-apart centering members disposed on said elongated tubular housing extending radially outwardly therefrom for axially aligning said housing relative to the bore of said refractory pouring means and to said discharge port whereby said displaceable tube is axially aligned within the bore of the refractory pouring means as it is projected upwardly therein.

4,877,162

BASEBALL GLOVE SHAPER

Michael L. McGinley, 5710 Cedar, Roeland Park, Kans.
Filed Apr. 21, 1988, Ser. No. 184,599
Int. Cl.⁴ A41D 1/00; D06C 15/00
U.S. Cl. 223—78 20 Claims

1. A device for shaping a ball glove having a palm, a thumb extending from the palm, a finger section extending from the palm, a webbing between the thumb and finger section, and laces interconnecting the webbing with the thumb and with the finger section, said device comprising:
at least three elongate arms including first, second and third arms interconnected in a manner permitting application of said arms to the glove with one end of each arm applied to the palm of the glove, each arm having a free end opposite said one end; and

each arm being pliable and constructed to retain the shape of which it is bent to permit the first arm to curve along the palm and generally between the thumb and webbing, the second arm to curve along the palm and along the finger



section and the third arm to curve along the palm and along the finger section at a location more remote from the webbing than the second arm, whereby the arms cooperate to hold the glove in a configuration to present a ball receiving pocket adjacent the webbing.

4,877,163

GARMENT HANGER ACCESSORY

Karen M. Zimmerman, 1949 Woodhaven Dr., Fort Wayne, Ind. 46819-1053

Filed Jul. 26, 1988, Ser. No. 225,025
Int. Cl.⁴ A47G 25/48

U.S. Cl. 223—93

7 Claims



1. A detachable accessory device for a garment hanger, comprising:

- a plastic ring sized so as to slide over and snugly fit around a portion of the garment hanger;
- a plurality of flexible, elastic elements commonly connected at first ends thereof to said plastic ring, each of said elastic elements having a second end;
- a plurality of plastic fastening elements, each connected to the second end of one of said flexible, elastic elements, each of said fastening elements having a pair of opposing body elements movable between open and closed positions, and each of said body elements having an outwardly facing exterior surface; and
- decorative fabric means for covering substantially all of said outwardly facing exterior surfaces of the opposing body elements to shield said elements from view and to prevent unintended and potentially damaging contact with an overlying garment.

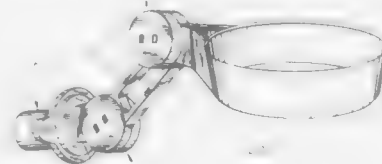
4,877,164

DEVICE FOR HOLDING CUPS, CANS, AND SIMILAR ARTICLES IN VEHICLES

Walter H. Baucum, Loudonville, N.Y., assignor to Datamain 2000, Inc., Loudonville, N.Y.

Filed Jun. 17, 1988, Ser. No. 208,404
Int. Cl.⁴ B60R 7/06; E05D 3/06, 7/10
U.S. Cl. 224—42.44

11 Claims



10. A holder for cups and similar articles, comprising: three adjustably interconnectable elongated articulated members,

a first of said members terminating at one end in an expandable plug mounting means arranged and constructed to form a secure, removable connection within a hollow cylindrical opening and terminating at its other end in a hollow cylindrical collar means having a plurality of internal teeth and a central bore,

a second of said members terminating at one end in an article holding means and at its other end in a hub means having a plurality of external teeth and a pair of spaced-apart, axially extending legs having oppositely directed hook means at the ends thereof, and

the third of said members being arranged and constructed to interconnect the first and second members together to provide a rigid, angularly adjustable assembly,

one end of said third member terminating in a hub means having a plurality of external teeth and a pair of spaced-apart, axially extending legs having oppositely directed hook means at the ends thereof, said hub means arranged and constructed to fit within the collar means of said first member with the external teeth of said hub means intermeshing with the internal teeth of said collar means and with the legs of said hub means passing through the central bore of said collar means so that the hook means at the ends of said legs snap over a portion of said collar means and retain the hub means of said third member and the collar means of said first member together,

the other end of said third member terminating in a hollow cylindrical collar means having a plurality of internal teeth and a central bore, said collar means of said third member arranged and constructed to fit over the hub means of said second member with the internal teeth of said collar means intermeshing with the external teeth of the hub means of said second member and the legs thereof passing through the central bore of said collar means so that the hook means at the ends of said legs snap over a portion of said collar means and retain the collar means of said third member and the hub means of said second member together.

4,877,165

FISHING ROD HOLDER

William L. Behrle, 385 Grand Terrace Ct., Fenton, Mo. 63026

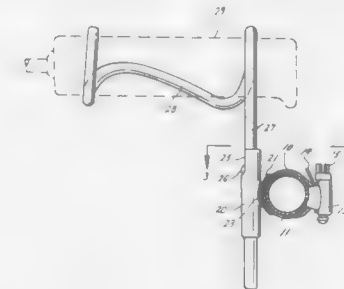
Filed Jun. 20, 1988, Ser. No. 208,727
Int. Cl.⁴ B60R 11/00; A01K 97/10

U.S. Cl. 224—42.45 R

2 Claims

1. A fishing rod holder comprising a hose clamp type of strap having substantially annular inner and outer surfaces and

a tubular receptacle having a first end, an opposite end, and substantially annular inner and outer surfaces, for receiving the shank of a fishing rod holder member, the hose clamp type of strap including means securely attaching said strap to a support extending in a first direction, such as a horizontal direction, the tubular receptacle being disposed transversely to the axis of the hose clamp, such as in a vertical direction, there being a strip



of metal between said outer surfaces of the tubular receptacle and the strap and tightly bonded to both and through which the tubular receptacle is attached to the strap at the outside thereof, the tubular receptacle having a notch in said first end, and a fishing rod holder member having a shank with a nodule thereon, removably inserted into the tubular receptacle with the nodule engaging within the notch.

4,877,166

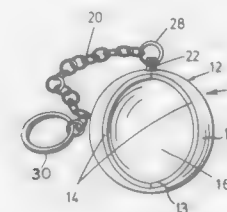
APPARATUS FOR RETAINING A BALL

Robert C. Gelinas, Jr., 493 Gregory Ln., West Chester, Pa. 19380

Filed May 2, 1988, Ser. No. 189,019
Int. Cl.⁴ A45F 5/00

U.S. Cl. 224—223

8 Claims



5. A device for holding one or more objects comprising: at least one spherically shaped body constructed from a resilient material and having an interior for receiving and securely holding one object in surrounding relationship and including an opening having the form of a wedge shaped slice for permitting insertion of said object into and removal of said object from said interior, said opening allowing visual inspection of at least a portion of said object when said object is retained in said body, said interior cavity being of a spherical shape; and means for attaching each said body to a second object, said means for attaching also removably securing the body to the second object.

4,877,167

RETENTION SYSTEM FOR DIVER ACCESSORIES

Glenn A. McNemar, 2031 Hillside Dr., Falls Church, Va. 22043

Filed Jun. 10, 1988, Ser. No. 204,835
Int. Cl.⁴ A45F 5/02

U.S. Cl. 224—269

28 Claims

1. A retention system comprising a lanyard having opposite relatively spaced first and second ends, first clip means at said lanyard first end for securing an implement thereto, second clip means at said second lanyard end for securing said lanyard

to a garment whereby the lanyard retains the implement connected to the garment, releasable connecting means disposed between said second clip means and said second lanyard end for releasing said lanyard from said second clip means without affecting the secured connection between said second clip



means and garment said first clip means includes relatively releasable fastener means for relatively releasably fastening an implement to said lanyard, and said second clip means includes relatively permanently fastened fastener means for relatively permanently fastening said second clip means to a garment.

4,877,168

VEHICLE ARTICLE CARRIER

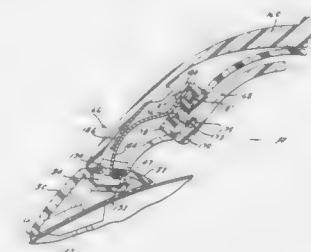
John A. Bott, 931 Lakeshore Dr., Grosse Pointe Shores, Mich. 48230

Continuation of Ser. No. 3,134, Jan. 14, 1987, Pat. No. 4,754,905, which is a continuation of Ser. No. 778,385, Sep. 20, 1985, Pat. No. 4,684,048. This application Jun. 30, 1988, Ser. No. 213,899

The portion of the term of this patent subsequent to Jul. 5, 2005, has been disclaimed.
Int. Cl.⁴ B60R 9/04

U.S. Cl. 224—321

3 Claims



1. An article carrier adapted to be secured to a motor vehicle adjacent to a generally horizontally extending body surface on said vehicle comprising a pair of elongated support members adapted to be secured to said vehicle and having upper article supporting surfaces on the upper sides of said support members, an upward facing channel extending longitudinally on each of said support members, and clamping surfaces extending longitudinally within the channel and toward each other, at least one cross member having two end portions, and means for locking said cross mem-

ber in a selected position on each support member, said locking means having a housing with a lower surface, an outside surface and an inside surface spaced transversely from said outside surface by said lower surface and a first portion mounted to one end portion of said cross member and a second portion removably engaged with the corresponding channel of one of said corresponding support members, said locking means including a hook extending from said second end portion and projecting into said channel, yoke means associated with said hook and disposed on said inside surface of said housing, and rotatable means associated with said yoke means and hook for moving said hook toward and away from said second end portion such that said hook engages one of said clamping surfaces and forces said lower surface of said housing against said clamping surfaces.

4,877,169

SELF-TIGHTENING VEHICLE ROOF RACK

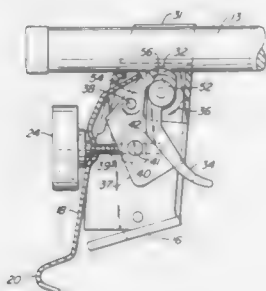
Michael Grim, Bayside, Calif., assignor to Yakima Products, Inc., Arcata, Calif.

Filed Mar. 15, 1988, Ser. No. 168,786

Int. Cl.⁴ B60R 9/04

U.S. Cl. 224—331

9 Claims



1. A self-tightening vehicle roof rack comprising:
 - a crossbar;
 - a pair of pedestals, each having an inner face and an outer face;
 - a pair of cams; one such cam rotatably mounted to each said pedestal, and arranged thereon to clamp said crossbar to said pedestal upon rotation of said cam toward the other pedestal;
 - a pair of threaded studs, one such threaded stud accessible through an opening in each said outer face, operable independently from said cams, for securing each said pedestal to said vehicle roof; and
 - lever means, mounted to each said pedestal and accessible through an opening in said inner face, for manually rotating each said cam into a position clamping said crossbar to said pedestal independently of said threaded studs.

4,877,170

TUBULAR CONDUIT FOR TRANSPORTING TRAVELING TEXTILE YARN

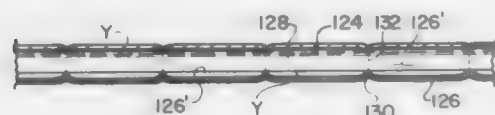
Alan Gutschmit, P.O. Box 708, Troy, N.C. 27371

Filed Jan. 22, 1985, Ser. No. 693,532

Int. Cl.⁴ B65H 57/12

U.S. Cl. 226—196

13 Claims



1. A continuous extended length flexible tubular conduit

adapted to be resiliently formed to selected curvi-linear configurations for transporting a traveling textile yarn or the like in curvi-linear paths from one location to another remote location, said tubular conduit comprising an annular interior wall surface defining a yarn pathway and a plurality of interior yarn engaging portions projecting inwardly from said annular interior wall surface at spacings along the length of said tubular conduit, said yarn engaging portions being adapted to engagingly support said yarn and maintain it out of substantial contact with said interior wall surface intermediate said yarn engaging portions to reduce the amount of frictional contact between said yarn and said tubular conduit as said yarn travels in said pathway therethrough, said yarn engaging portions comprising inwardly formed deformations in said tubular conduit forming crimps therein.

4,877,171

INDIRECT FIRING FASTENER DRIVING APPARATUS WITH FIRING POWER ADJUSTMENT

Roland Almeras, Tournon, France, assignor to Societe De Prospection Et D'Inventions Techniques, Bourg Les Valence, France

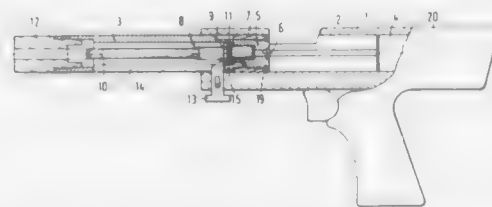
Filed Sep. 14, 1988, Ser. No. 243,813

Claims priority, application France, Sep. 15, 1987, 87 12755

Int. Cl.⁴ B25C 1/14, 1/18

U.S. Cl. 227—10

13 Claims



1. An indirect firing fastener driving apparatus, comprising:
 - a barrel holder;
 - a barrel movable within said barrel holder between a rearward position and a forward position;
 - propulsive charge means mounted within said barrel for generating combustion gases when a fastener driving operation is to be performed;
 - a piston mounted in frictional contact within said barrel so as to be driven by said combustion gases and to in turn drive said fastener;
 - a pawl mounted upon said barrel holder so as to project through a groove, defined within said barrel, and engage said piston so as to retain said piston in a fired position;
 - a combustion chamber defined between said piston and said propulsive charge means; and
 - means for varying the volume of said combustion chamber comprising adjustment means mounted upon said barrel so as to be movably adjustable with respect to said barrel, and stop means operatively engaged with said piston and having a front end and a rear end, wherein said rear end is in contact with said adjustment means, and when said barrel is disposed in said forward position, said front end of said stop means is in contact with said pawl so as to position said piston within said barrel in accordance with said movable adjustment of said adjustment means with respect to said barrel.

4,877,172

DISPENSING OF ATTACHMENTS

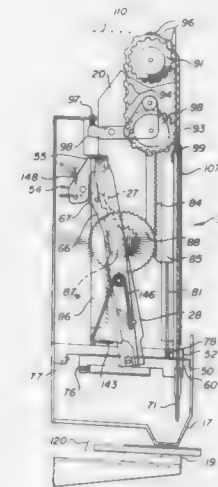
Harlow Franklin, Randolph, Mass.; William J. Cooper, Woonsocket, R.I., and Charles L. Deachenos, No. Attleboro, Mass., assignors to Dennison Manufacturing Company, Framingham, Mass.

Filed Sep. 2, 1988, Ser. No. 239,695

Int. Cl.⁴ A41H 37/00

U.S. Cl. 227—67

18 Claims



1. Apparatus for dispensing attachments, comprising at least one hollow slotted needle; shuttle means to which said hollow needle is secured, reciprocally mounted to move between a first position and a second position; means for advancing a connected plurality of attachments to said needle while said shuttle is at said first position; isolating means for causing an individual attachment in said needle to be isolated from said connected plurality while said attachment is housed in the needles; and means for expelling the individual attachment from said needle while said shuttle means is located at said second position, wherein the shuttle, advancing means, isolating means, and ejecting means are mounted to a head member which moves between an attachment dispensing position and a withdrawn position, further comprising an electric motor driven assembly for reciprocating the head member including a clutch means for coupling said electric motor to said head means in response to a user command.

4,877,173

WIRE BONDING APPARATUS

Hitooshi Fujimoto, and Hisao Masuda, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Continuation of Ser. No. 80,875, Aug. 3, 1987, abandoned. This application Nov. 23, 1988, Ser. No. 275,604

Claims priority, application Japan, Aug. 6, 1986, 61-185740

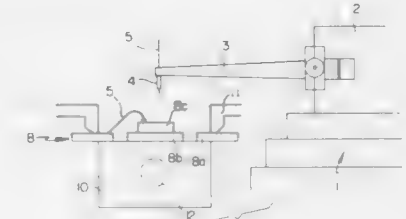
Int. Cl.⁴ B23K 20/10

U.S. Cl. 228—1.1

7 Claims

1. A wire bonding apparatus which bonds electrodes and external leads of a semiconductor integrated circuit element, said wire bonding apparatus comprising:
 - a heat block having a lead frame which supports the semiconductor integrated circuit element in a bonding position; and
 - an electronic horn fixed to a bonding head and generating ultrasonic waves to bond the electrodes and the external leads when the circuit element is in the bonding position, said ultrasonic horn being formed of a metallic material having a thermal expansion coefficient (TEC) of a maximum of $5 \times 10^{-6}/^{\circ}\text{C}$. and having a head portion and a root

portion from a lengthwise midpoint, said head and root portions having a maximum length of $50 \times 10^3 \mu\text{m}$ after thermal expansion, and said ultrasonic horn and heat block being operated to generate a maximum bonding temperature in said head portion of 80°C . during bonding, said head portion having an actual length which is inversely



proportional with the TEC at a mean temperature difference between temperature during bonding and temperature before bonding, the head and root portions having an actual length before thermal expansion which limits locational errors of said horn due to thermal expansion to a maximum value of $5 \mu\text{m}$.

4,877,174

TAP DEVICE EXCISE AND LEAD FORM APPARATUS

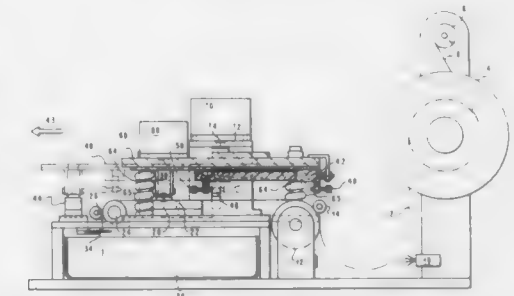
Peter H. Bruha, Georgetown, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 21, 1988, Ser. No. 289,996

Int. Cl.⁴ H01L 21/98

U.S. Cl. 228—5.1

10 Claims



1. Apparatus for automatedly handling leaded electronic components born on a flexible tape comprising:
 - means for simultaneously excising a component from the tape and forming its leads;
 - means for feeding the tape to and past said means for simultaneously excising and forming;
 - means for precisely aligning a component at said means for simultaneously excising and forming;
 - a component pickup station; and
 - means for conveying a component, excised and formed, to said station pickup for subsequent operations thereon.

4,877,175

LASER DEBRIDGING OF MICROELECTRONIC SOLDER JOINTS

Marshall G. Jones, Scotia, N.Y., and Prem N. Batra, Cincinnati, Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 30, 1988, Ser. No. 292,048

Int. Cl.⁴ B23K 26/00, 26/04, 26/06

U.S. Cl. 228—102

20 Claims

1. A method of debridging microelectronic solder joints comprising positioning a tool in contact with a bridge of solder

which extends between soldered leads of microelectronic circuit; projecting a laser beam onto the solder bridge to heat the solder; controlling the laser beam power to cause melting



of the solder and wicking of the solder onto the tool; and removing the tool to remove the solder bridge between the

4,877,176

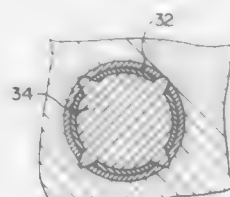
SOLDERING PINS INTO PRINTED CIRCUIT BOARDS
Leon S. Kabla, West Palm Beach, Fla., assignor to Northern Telecom Limited, Montreal, Canada

Filed Nov. 25, 1987, Ser. No. 125,152

Int. Cl.⁴ B23K 31/02

U.S. Cl. 228—173.5

17 Claims



1. A method of soldering a pin having a splined section into a hole lined with conductive material in a printed circuit board comprising:

providing a layer of solidified solder within the hole and on the inner surface of the conductive material;
said layer of solder having a maximum nominal thickness of 0.001 inches;

providing a pin with a substantially circular cross-section and a plurality of splines protruding radially therefrom, the radial length of said protruding splines being substantially equal to the radial thickness of said conductive material and said solder layer, the diameter of said circular cross-section being substantially equal to the inner diameter of said lined, solder-layered hole;

inserting the pin into the hole to locate the splined section within the hole with the splines projecting through the solidified solder and into the conductive material;

with the board disposed with the pin and hole extending vertically and with the avoidance of additional solder, flowing solely the solder layer to bond the pin to the conductive layer, said solder flowing downwardly and increasing in thickness towards the bottom of the hole;

completely blocking all the gaps between the splines in at least one position along the hole.

4,877,177

WINDOW LETTER

Willi Felix, Strengelbach, Switzerland, assignor to Jos. Hunzeler Ltd., Wilkon, Switzerland

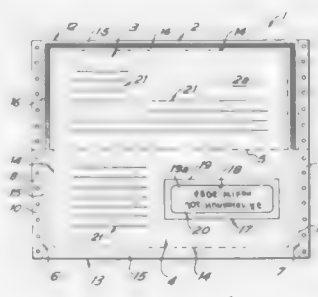
Filed Jun. 4, 1987, Ser. No. 58,050

Claims priority, application Switzerland, Jun. 6, 1986, 01312/86

Int. Cl.⁴ B65D 27/00

U.S. Cl. 229—92.3

50 Claims



1. A process for the production of a ready-to-mail letter form from a single sheet comprising the steps of:

a. providing a printable and foldable single sheet with a preselected window opening, said sheet having an inside major surface comprising horizontal top and bottom edges and vertical left side and right side lateral edges;

b. affixing to said major surface a see-through cover over said window opening, said cover having an inside cover surface corresponding to the inside major surface of said sheet;

c. printing information to be sent on said inside major surface;

d. printing in mirror writing addressing information on said inside cover surface;

e. folding said sheet at least once, whereby said addressing information is readable through the cover over the window opening; and

f. securing said sheet in its folded state.

4,877,178

PAPERBOARD FOLDABLE CARTON

Larry Elman, Elkins Park, Pa., assignor to Dopaco, Inc., Downingtown, Pa.

Filed May 4, 1989, Ser. No. 347,040

Int. Cl.⁴ B65D 43/08

U.S. Cl. 229—114

6 Claims



1. A carton formed from a unitary blank of cut and foldable paperboard comprising:

a tray, a cover fitting over said tray, and a fold line hinge connecting said tray and cover, said tray comprising:

a bottom panel, two side walls, a rear wall and a front wall, said front wall having two glue flaps, each glue flap being adhered to one of said side walls, each glue flap having a detent in an upper portion thereof extending forwardly

and above said front wall, each side wall having a detent in an upper portion thereof extending forwardly and above said front wall, each glue flap detent and each side wall detent being in overlapped joined relation to form a pair of double thickness detents, said cover comprising: a top panel, two side walls, a rear wall and a front wall, said front wall having a slot at each end portion thereof, said slots receiving said pair of detents when said cover is closed to lock said cover to said tray.

4,877,179

FAREBOX SECURITY DEVICE

Joseph R. Baker, San Diego; Golland, Wesley A., La Jolla; Paul A. Mullen, and Roger B. Trimble, both of San Diego, all of Calif., assignors to Cubic Western Data Corporation, San Diego, Calif.

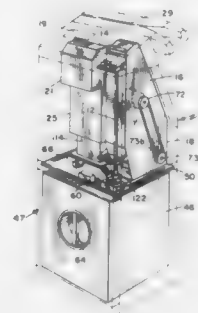
Division of Ser. No. 114,565, Oct. 29, 1987, which is a continuation of Ser. No. 750,534, Jun. 28, 1985. This application

Mar. 31, 1988, Ser. No. 176,165

Int. Cl.⁴ G07B 15/00

U.S. Cl. 232—7

3 Claims



1. A farebox comprising:

a housing having two separate chambers with a connecting opening communicating between said two chambers;

a fare receiving module located in a first one of said chambers and having means for receiving fares deposited in the housing, and means for transporting deposited fares to said connecting opening;

a locking device associated with the fare receiving module for releasably retaining said module in the first chamber;

a security shutter in the housing movable between a first position blocking said connecting opening and a second position in which the opening is unblocked;

a cashbox located in the second of said chambers and having at least one deposit opening communicating with said connecting opening for receiving fares deposited in said connecting opening by the fare receiving module; and

linkage means linking said security shutter to said locking device for moving said security shutter into said first position in response to unlocking of said locking device to release the fare receiving module from the housing and moving said security shutter into said second position in response to locking of said locking device to secure said module in said housing.

4,877,180

MAILBOX SIGNALLING APPARATUS

James A. Shall, P.O. Box 299, Butteville, Ind. 47223

Filed Apr. 17, 1989, Ser. No. 338,321

Int. Cl.⁴ B65D 91/00; A47G 29/12

U.S. Cl. 232—35

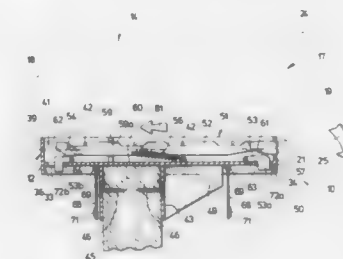
18 Claims

1. Mailbox signalling apparatus for a mailbox having a front end and a back end and a closure member mounted on the front end which is adapted to be pivotally moved from a closed position to an open position, said signalling apparatus comprising:

a base for supporting said mailbox;

a first indicator member support means on said base for supporting an indicator member toward the front end of said mailbox;

a second indicator member support means on said base for supporting an indicator member toward the back end of said mailbox;



an indicator member selectively supported by one of said first or second indicator member support means for movement between a first, stand-by position and a second, signalling position; and

actuating means on said base for actuating said indicator member for movement from said first, stand-by position to said second, signalling position when said closure member is pivotally moved from a closed position to an open position.

4,877,181

FLOWER VALVE

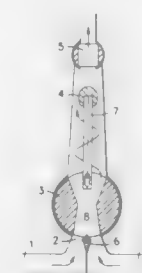
John V. Stewart, 1308 Henry Balch Dr., Orlando, Fla. 32810

Filed Aug. 18, 1988, Ser. No. 233,578

Int. Cl.⁴ G05D 23/13

U.S. Cl. 236—12.17

15 Claims



1. An apparatus for mixing two fluids of different temperatures, and controlling the resultant and total flow volume, comprising in combination:

mixing-valve means for mixing two fluids in controllable proportion, having a first control shaft, and a case with two fluid inlets and an elongated fluid outlet;

a flow valve having a second control shaft, said flow valve mounted in said outlet;

first and second control levers, connected to said first and second control shafts respectively;

a control dial mounted on the exterior of said case, having a dial face with means for indicating the positions of the control levers; said control levers mounted on the exterior of said case approximately concentric with the control dial.

4,877,182

CRAWL SPACE VENTILATION SYSTEM

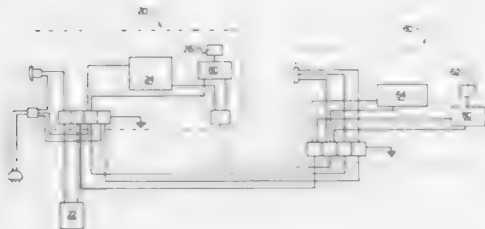
J. Robert Pugh, Greensboro, and James F. Matherly, Summerfield, both of N.C., assignors to Custom Industries, Inc., Greensboro, N.C.

Filed Oct. 14, 1988, Ser. No. 258,315

Int. Cl.⁴ F24F 13/12

U.S. Cl. 236—44 C

6 Claims



6. A ventilation system for creating air in the dead air spaces of a structure, such as the crawl space beneath a house; said ventilation system comprising:

- (a) an intake unit for pulling outside air into the area to be ventilated; said intake unit including:
 - (i) at least one intake ventilator for entrance of outside air to the area being ventilated;
 - (ii) means for opening and closing said intake ventilator responsive to temperature of outside air;
- (b) an exhaust unit for exhausting air from the area being ventilated; said exhaust unit including:
 - (i) at least one exhaust ventilator for passage of exhaust air therethrough;
 - (ii) means for pulling exhaust air through said exhaust ventilator responsive to a prescribed humidity level within the area to be ventilated;
- (c) means for controlling said intake and exhaust units in series relationship responsively to prescribed temperature and humidity levels such that said system cuts off when outside temperature reaches a prescribed cutoff point, automatically cycling on and off when the humidity reaches a certain level and the temperature is above said prescribed cutoff point.

4,877,183

AIR FLOW CONTROL DEVICE FOR AN AIR CONDITIONER

Kenji Matsuda; Kenji Togashi; Hiroyuki Umemura; Tetsuji Okada; Hidenori Ishioka, and Katsuyuki Aoki, all of Shizuoka, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

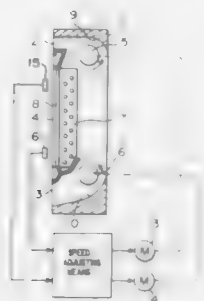
Filed Sep. 19, 1988, Ser. No. 246,269

Claims priority, application Japan, Sep. 22, 1987, 62-238405

Int. Cl.⁴ F24F 13/00

U.S. Cl. 236—49.3

12 Claims



1. An air flow control device for an air conditioner having an outlet port and an intake port formed in an indoor unit main

body, and having a fan motor arranged so as to face the outlet port, comprising:

- detecting means for detecting information corresponding to a possibility that the outlet air blown out off an outlet port is blown into the intake port, and
- fan motor speed adjusting means for controlling the revolution of the fan motor based on the output signal from the detecting means.

4,877,184

EXHAUST HEATED TRAILER

William T. Johnston, P.O. Box 3820, Randolph, Ohio 44601

Continuation of Ser. No. 935,839, Nov. 28, 1986, Pat. No. 4,751,873. This application Jun. 20, 1988, Ser. No. 209,289

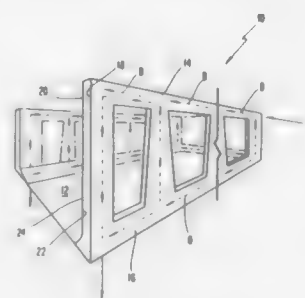
The portion of the term of this patent subsequent to Jun. 21,

2005, has been disclaimed.

Int. Cl.⁴ B60H 1/02

U.S. Cl. 237—12.3 C

1 Claim



1. A container body for a vehicle powered by an internal combustion engine, said container body comprising a front wall, opposite side walls, and a bottom interconnecting said side walls and said front wall, said front wall and said side walls having gas passages extending longitudinally of said side walls from adjacent said front wall, said front wall having conduit means for receiving exhaust gases from said internal combustion engine, ambient air inlet scoops in said side walls adjacent said front wall and communicating with a one of said longitudinal passages, and fluid outlet means in said side walls communicating with said longitudinal passages at a distance remote from said front wall, whereby the introduction of hot engine gases from said vehicle through said conduit means is drawn through said longitudinal passages by ambient air flowing into said scoop means and exhausting through said fluid outlet means to heat the interior of said body.

4,877,185

OSCILLATING SPRINKLER

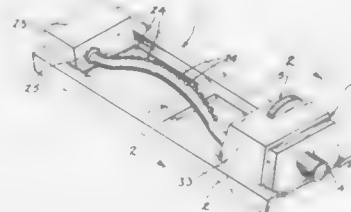
Fred W. Kufria, Janesville, Wis., assignor to Western Industries Inc., Milwaukee, Wis.

Filed Dec. 31, 1986, Ser. No. 948,123

Int. Cl.⁴ B05B 3/16

U.S. Cl. 239—242

18 Claims



1. An improved oscillating sprinkler, comprising a frame, a housing mounted on the frame and having a water inlet fitting

to be connected to a source of water under pressure, a sprinkler tube mounted for oscillating movement on the frame and having a plurality of water outlets, water supply means disposed within the housing for supplying water from said inlet fitting to said sprinkler tube, an output shaft driven by water flowing in said water supply means, crank arm means operably connected to the sprinkler tube to oscillate said tube through a given amplitude, a pair of elliptical gears, one of said gears being connected to said output shaft and the other of said gears being operably connected to said crank arm means, said elliptical gears being constructed and arranged so that the variable speed output of said other gear balances the variable speed output of said crank arm means to thereby oscillate said sprinkler tube with a substantially uniform velocity throughout its amplitude of oscillating movement, and slip clutch means interconnecting the sprinkler tube and the frame, said slip clutch means having a locking position to transmit oscillating movement of said crank arm means to said sprinkler tube and being constructed and arranged to permit manual rotation of said sprinkler tube relative to the frame to thereby shift the spray pattern.

4,877,187

UNIT INJECTOR FOR GASOLINE ENGINES

Paul D. Daly, Troy, Mich., assignor to Allied-Signal Inc., Morris Township, Morris County, N.J.

Division of Ser. No. 112,653, Oct. 23, 1987, Pat. No. 4,784,322.

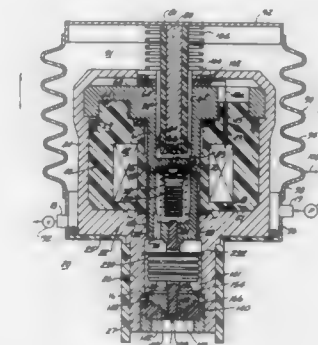
This application Jul. 6, 1988, Ser. No. 215,679

The portion of the term of this patent subsequent to Nov. 15, 2005, has been disclaimed.

Int. Cl.⁴ F02M 47/02

U.S. Cl. 239—89

14 Claims



1. A unit injector adapted to receive fuel from a relatively low pressure source, comprising:

- a housing;
- armature means responsive to an electromagnetic force for opening and closing a metering orifice to control the ejection of fuel therefrom;
- a fuel receiving chamber disposed upstream of the metering orifice;
- a check valve disposed upstream of the fuel receiving chamber, responsive to a pressure differential thereacross to control the flow of fuel to such chamber;
- first accumulator means disposed in the fuel receiving chamber, compressible in response to the pressure of the fuel therein for pressurizing fuel upstream of the metering orifice;
- an outer bellows, fluidly sealed at one end, and adapted to expand and contract as fuel is received and purged therefrom, including a flexible, springlike wall effecting to restore the outer bellows to its non-expanded size;
- means defining a pressure chamber;
- means movable with the outer bellows to pressurize the fuel in the pressure chamber and for urging same across the check valve, compressing the first accumulator means; and
- means for generating the electromagnetic force to move the armature means away from the metering orifice.

4,877,188

DISTRIBUTION FOR FORMING A THIN LIQUID LAYER ON A SURFACE

Joseph Ritter, Tamm-Hohenstange, Fed. Rep. of Germany, assignor to Nestec S.A., Vevey, Switzerland

Filed May 27, 1988, Ser. No. 200,002

Claims priority, application European Pat. Off., Jun. 4, 1987, 2128/87

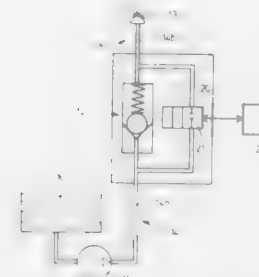
Int. Cl.⁴ B05B 1/04, 1/14, 1/24

U.S. Cl. 239—135

9 Claims

1. A distribution device for forming a thin layer of liquid on a surface comprising:

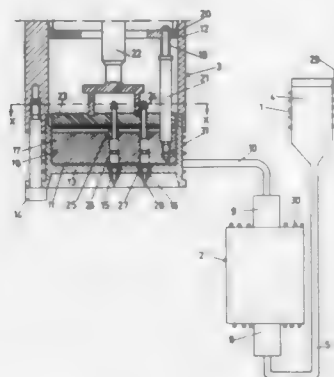
- a cylinder housing;
- a base member comprising a plate being affixed to a first end of the cylinder housing and having a plurality of bores therethrough for distribution of the liquid;
- a pressure plate being affixed to a second end of the cylinder;
- a freely displaceable piston disposed within the cylinder



1. In a windshield washing system, especially for motor vehicles, comprising a feed pipe connected at one end to at least one washing jet, and intermediately operable pump means connected to the other end of said feed pipe for pumping washing fluid through said pipe to said jet upon operation of said pump means and for maintaining washing fluid in said pipe between successive operations of said pump means; the improvement comprising control means selectively positionable in either of a first or a second position, said control means being operable in said first position to drain fluid from at least that portion of said feed pipe adjacent said one end and being operable in its second position to prevent drainage of fluid from said portion of said feed pipe.

adjacent the base plate member and connected to rods loaded by springs and anchored to the pressure plate, the displaceable piston being movable away from and towards the base plate member bores for forming a distributing chamber and having a plurality of bores corresponding in number and positioning with the base plate member bores;

- a connection into the chamber for allowing liquid to be distributed into the chamber for forcing the displaceable piston away from the base plate member bores;
- a support plate disposed within the cylinder between and displaced from the pressure plate and the displaceable piston and being movable to a position towards and to a position away from the displaceable piston and the base plate member bores; and



- a plurality of nozzle needles affixed to the support plate corresponding in number and position with the number and position of the base plate member bores and displaceable piston bores, the nozzle needles extending through the displaceable piston bores and having a configuration and length sufficient for extending to the base plate member bores so that when the support plate is moved to a position towards the displaceable piston and base plate member bores, the base plate member bores are sealed, and for allowing, when the support plate is moved to a position away from the displaceable piston and base plate member bores, liquid to be ejected and distributed, by means of the displaceable piston, through the base plate member bores.

4,877,189

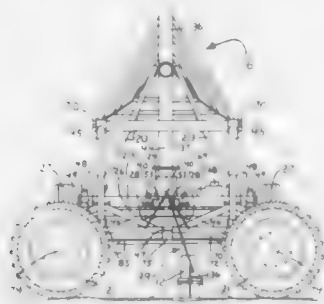
IRRIGATION SYSTEM

Christopher G. Williams, P.O. Box 1372, Spokane, Wash. 99211-1372

Filed May 18, 1987, Ser. No. 50,965
Int. Cl.⁴ A01G 25/09

U.S. Cl. 239-749

28 Claims



27. For use with a land irrigation system including a series of

access valves spaced along a water main and a water delivery pipe mounted by carts for travel transverse to the delivery pipe length; an apparatus to successively forward an access valve coupler along the series of access valves in relation to travel of the water delivery pipe comprising:

- valve coupling means for selectively connecting the water delivery pipe to the individual access valves,
- a truss supported conduit span mounted to the water delivery pipe and extending therefrom to a free swinging end supporting the valve coupling means for guided transport of the valve coupling means between access valves and for flowing water between the valve coupling means and the delivery pipe,
- pivot means for pivotably mounting the truss supported conduit span to the water delivery pipe,
- travel means for ground supporting and moving the free swinging end of the truss supported conduit span,
- valve coupler rotation means for allowing rotation of the truss supported conduit span when the free swinging end is secured by the valve coupling means to an access valve,
- control means operative responsive to the valve coupling means and travel means for controlling the uncoupling, travel and recoupling of the valve coupling means along the series of access valves.

4,877,190

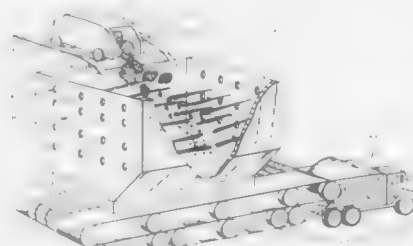
SANDBLASTED GARBAGE DISPOSAL SYSTEM AND METHOD OF USING

Cecil Lineback, Indian Head, Md., assignor to Waste Management Systems, Inc., Bethesda, Md.

Filed Jan. 4, 1989, Ser. No. 293,353
Int. Cl.⁴ B02C 19/06

U.S. Cl. 241-5

6 Claims



1. A process for comminuting large pieces of garage, said process comprising the steps of:
introducing large pieces of garbage into a container;
applying heat from heat lamps for removing water from said garbage;
sandblasting said garbage for reducing said garbage to particles of a size smaller than sand;
separating particles smaller than sand; and
disposing of said particles smaller than sand.

4,877,191

SHREDDING OR SLICING TOOL ARRANGEMENT FOR CUTTING FOOD MATERIAL, IN PARTICULAR FOR FOOD PROCESSORS

Jürgen Golob, Friedrichsdorf, and Wolfgang Franke, Langen, both of Fed. Rep. of Germany, assignors to Braun Aktiengesellschaft, Kronberg, Fed. Rep. of Germany

Filed May 25, 1988, Ser. No. 198,788
Claims priority, application Fed. Rep. of Germany, Jun. 4, 1987, 3718728

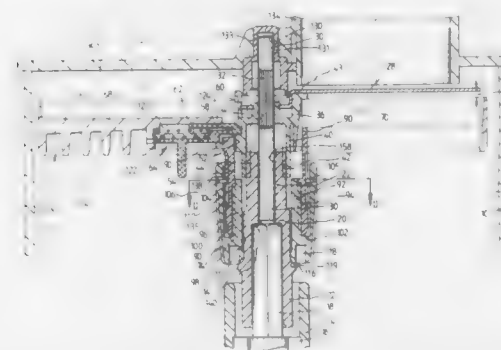
Int. Cl.⁴ B02C 18/18

U.S. Cl. 241-92

11 Claims

1. A cutting tool arrangement for cutting food material, in particular for domestic appliances, which arrangement is

adapted to be fitted in a non-rotatable relationship to a drive shaft extending through the bottom of a bowl comprising a shaft coupling, a disk adapted to divide the bowl into an upper and a lower bowl section, said disk having an opening, a cutting tool provided in said opening of said disk, and an adjusting device for adjustment of the position of said disk relative to said cutting tool, said adjusting device being rotatably mounted and fixed in



axial longitudinal direction on said shaft coupling while at the same time being connected with said disk via coupling structure that includes elongated toothed structure such that said shaft coupling is in driving relation with said disk and said cutting tool via said elongated toothed structure, and that said cutting tool bears against the drive shaft in axial direction and is held in a fixed position relative to said drive shaft while said adjusting device adjusts the position of said disk relative to said cutting tool.

4,877,192

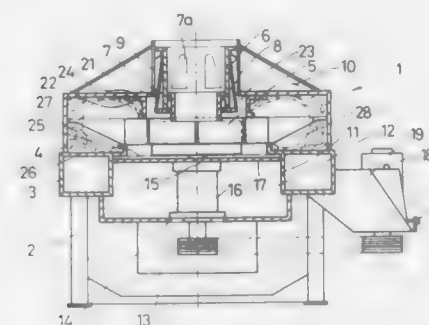
ROTARY IMPACT CRUSHER MAIN WEAR TIP

Pieter J. Rossouw, and Jan H. Rossouw, both of 31 Newton Road, Uranville, Klerksdorp, Transvaal Province, South Africa

Filed Jun. 6, 1988, Ser. No. 203,304
Int. Cl.⁴ B02L 1/10

U.S. Cl. 241-275

8 Claims



1. A main wear tip for an outlet of a rotary impact crusher rotor comprising:
a backing plate having a forward end;
a wear resistant assembly secured to the backing plate forward end forming an inwardly directed step which is with respect to the rotor outlet, the step having sufficient size to cause autogenous build up of material being crushed behind the step and to form a protecting lining against an inner wall of the rotor, the wear resistant assembly including a carrier block from which projects hard metal tips.

4,877,193

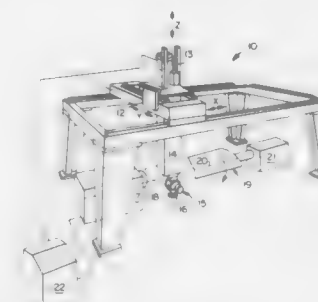
REDIRECT ROLLER APPARATUS FOR FIBER PLACEMENT MACHINE

Milo M. Vaniglia, Southgate, Ky., assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Aug. 25, 1988, Ser. No. 236,417
Int. Cl.⁴ B21F 17/00; B32B 31/00

U.S. Cl. 242-7.21

1 Claim



1. In a fiber placement machine, having a band of fibers oriented with its length running along a path with respect to a relatively stationary machine member, the band of fibers being ultimately paid-out to a fiber application surface, an improved fiber guidance system comprising:

- a fiber supply creel including plural spools of fiber mounted to said relatively stationary machine member said fiber supply creel also including means for maintaining tension on said fibers;
- a manipulator wrist affixed to said relatively stationary machine member;
- a fiber placement head affixed to said manipulator wrist, and having a fiber payout zone, said head capable of being manipulated through a variety of spatial orientations by said manipulator wrist, especially at least two-dimensional spatial orientations with respect to said relatively stationary machine member;
- a plurality of fiber redirect rollers, having roller elements rotatable about a first roller axis with respect to a roller base, and
- wherein said roller base includes a bearing member for providing rotary movement of said base about a base axis transverse to the roller axis as said fiber placement head is manipulated, and
- wherein at least a first redirect roller is affixed to said relatively stationary machine member and at least a second redirect roller is affixed to said fiber placement head, and wherein a band of fibers is trained around said first and second redirect rollers under tension, and said redirect rollers will cooperatively swivel about their bases in accordance with spatial orientation of the placement head and in accordance with tension of the fiber band, thereby maintaining approximately equal tension at the outer fibers at each side of the fiber band, while guiding said fiber band.

4,877,194

METHOD FOR PREVENTING DEFECTIVE SPLICING FOR AUTOMATIC WINDERS

Isamu Matsui, Kyoto; Kenji Ohashi, Uji, and Koji Deno, Oumihachiman, all of Japan, assignors to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

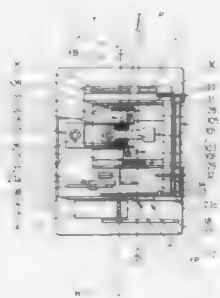
Filed Apr. 20, 1988, Ser. No. 183,977
Claims priority, application Japan, Apr. 22, 1987, 62-99447; Apr. 30, 1987, 62-106878; Nov. 12, 1987, 62-284297
Int. Cl.⁴ B65H 54/22; D01H 15/00

U.S. Cl. 242-35.6 R

20 Claims

1. A method for preventing defective splicing in an automatic winder in which two ends of cut yarns are spliced after

being guided into a yarn splicing device and then a winding operation is re-started, the method comprising the steps of: clamping a superfluous yarn portion branching off from the joint of the spliced yarn; and



starting a drum to cause a package to start winding after the superfluous yarn portion is clamped.

4,877,195

ROLLED WEB HOLDER

Charles A. Smith, 3404 Winchester Rd., Louisville, Ky. 40207
Filed Oct. 17, 1988, Ser. No. 258,874
Int. Cl.⁴ B65D 85/67; B65H 19/00
U.S. Cl. 242—55.2

1 Claim



1. A holder for a web material wound onto a hollow generally cylindrical core including a base member for attachment to supporting base means with a generally "T" shaped bracket extending laterally therefrom where the bracket is planar and includes a leg base attached to the base member and a laterally extending arm member of selected width, a first generally planar support having an aperture therein generally conforming to the cross sectional periphery of the arm member to be received thereon and rest on the leg base where the width of the arm is generally equal to the diameter of the core of the web of material, and a second cover member having a geometric configuration generally congruent to the geometric configuration of the outer periphery of the web of material having an opening therein having a geometric configuration generally similar to the geometric configuration of the periphery of the cross section of the arm member.

4,877,196
RIDER ROLLER FOR A ROLL FORMED IN A WEB-WINDING MACHINE

Willi Heymanns, Kaarst, Fed. Rep. of Germany, assignor to Jagenberg Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

Filed Jan. 10, 1988, Ser. No. 206,010
Claims priority, application Fed. Rep. of Germany, Jan. 10, 1987, 3719282

Int. Cl.⁴ B65H 18/20

U.S. Cl. 242—66

16 Claims



1. A web-winding machine comprising:
at least one support roller;
a roll of a web resting upon said support roller and adapted to be wound up by rotation by contact with said support roller;
means for feeding said web to said support roller for winding in said roll; and
at least one rider roller resting against said roll and contacting said web only after said web has been wound on said roll and wherein said rider roller is nonsupporting of said roll and is located across said roll from a region at which said web first meets the roll said rider roller having a web-engaging surface formed with a multiplicity of grooves.

4,877,197

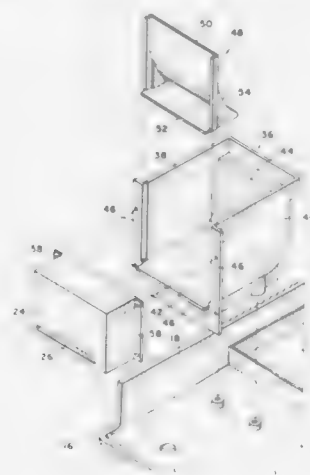
INSTRUMENT HOUSING WITH IMPROVED PAPER FEED

John R. Nelson, Oviedo, and Thomas F. Lehman, Winterpark, both of Fla., assignors to Invivo Research, Inc., Broken Arrow, Okla.

Filed Jul. 22, 1988, Ser. No. 223,447
Int. Cl.⁴ B65H 19/00; B41J 15/00

U.S. Cl. 242—68.7

1 Claim



1. An instrument housing having improved means for stor-

ing a roll of paper of selected width and maximum diameter for use by a printer comprising:

an instrument housing formed of thin-wall, stiff material such as plastic or metal and having a front and a top, the top having a generally rectangular opening therein adjacent the housing front and the front having a generally rectangular opening therein forward of and below said opening in said top;

a trough positioned within said instrument housing below said opening in said top and rearwardly of said opening in said front, the trough having an open top and front and having opposed paralleled side walls, and a rearward wall and bottom wall which merge into a quarter circular integral intersection, the radius of curvature of the intersection being about one-half of the maximum diameter of the paper roll for which the trough is dimensioned to receive and the spacing between said side walls being slightly greater than the width of paper roll the trough is dimensioned to receive;

a trough gate receivable by said trough and forming a front wall therefor, the trough gate being of a width substantially equal to the width between said trough sidewalls, the trough gate having a downwardly extending inner surface curved at the lower portion thereof towards said trough back wall at a radius of curvature substantially equal to said radius of curvature of said intersection of said trough rearward and bottom wall, and the trough gate having a bottom wall spaced slightly above said trough bottom wall providing a slot therebetween whereby when a roll of paper is positioned within said trough the free end of the paper may exit said trough through said slot; and
an electrically actuated printer mechanism positioned in said housing forwardly of said trough gate and closing said housing front opening, the printer having means to receive paper from and for pulling paper through said slot as the printer functions.

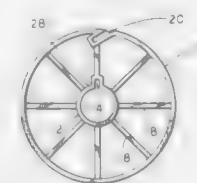
4,877,198

DEVICE FOR GROUNDING CONDUCTIVE FILM
Moshe Gershenson, Mohegan Lake, N.Y., and Mark L. Moskowitz, Wayne, N.J., assignors to GAF Corporation, Wayne, N.J.

Filed Aug. 3, 1988, Ser. No. 228,133
Int. Cl.⁴ B65H 75/28

U.S. Cl. 242—74

13 Claims



1. A device for supplying a film having an electrically conductive layer comprising:

(a) a spool adapted for mounting on a rotatable grounded spindle for rotation therewith;
(b) retaining means for securing the trailing edge of an electrically conductive film wound on the spool;
(c) conductive means for electrically connecting the spool to said grounded spindle; and
(d) contact means mounted on the trailing edge of the film for maintaining electrical contact between the conductive layer of the film and the conducting means during unwinding of the film from the spool.

4,877,199

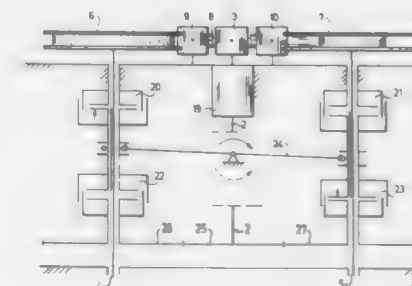
TAPE-CONVEYING SYSTEM FOR FORWARD AND BACKWARD PLAYING MAGNETIC TAPE RECORDER AND/OR PLAY-BACK UNIT

Gábor Nagy; György Neumann; Márta Kovács, and András Strömpl, all of Budapest, Hungary, assignors to BRG Mechanikai Vállalat, Hungary

Filed Apr. 27, 1988, Ser. No. 186,958
Int. Cl.⁴ G11B 15/18

U.S. Cl. 242—201

17 Claims



1. A tape transport system comprising:

(a) a frame;
(b) a variable speed, reversible drive mechanism comprising a motor;
(c) two winding shafts;
(d) a winding clutch associated with each of said winding shafts;
(e) a secondary mechanism that connects each winding clutch with said drive mechanism;
(f) an unwinding clutch associated with each of said winding shafts, each of said unwinding clutches connected to said frame; and
(g) an actuation means, said actuation means engaging one winding clutch and one unwinding clutch, wherein the two engaged clutches are each on a different winding shaft, or alternately the opposite such pair and wherein the clutch engagements are such that the motions, if any, of the winding shafts are compatible with the motions, if any, of the drive mechanism so as to provide proper tape tensioning.

4,877,200

CINE CAMERA EMPLOYING INTERCHANGEABLE FILM MAGAZINES WITH DISPLACEMENT OF THE SPINDLES OF THE FILM TAKE-OFF AND TAKE-UP WHEELS

Jean-Pierre Beauviala, Grenoble, France, assignor to Aston, R.G., Grenoble, France

Filed Apr. 22, 1988, Ser. No. 185,077

Claims priority, application France, Apr. 28, 1987, 87 06000
Int. Cl.⁴ G03B 1/04

U.S. Cl. 242—205

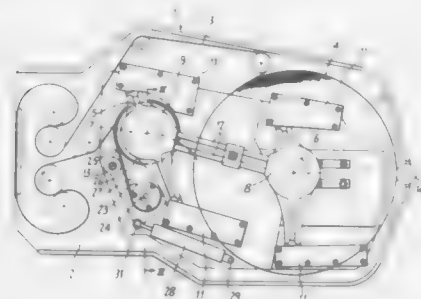
10 Claims

1. A cine camera for use with interchangeable film magazines having a casing therein, displaceable spindles for a film take-off reel and for a film take-up reel, and connection means for rendering the spindles fast in translation, each said interchangeable film magazine having a wall with an outer face, comprising:

an electric motor mounted on the body of the camera, and said electric motor being coupled with a horizontal driven shaft fast with a driving magnetic plate of a magnetic coupler housed in an opening in said camera body and having an axis coaxial with the axis of the motor and the axis of said shaft, and said camera body having an outer face;
said driving magnetic plate having an outer front face which is substantially flush with the outer face of said camera body, said outer face of said camera body being fast with

said take-up reel and said spindle thereof adjacent to the outer face of the wall of the casing of said interchangeable film magazines;

said magnetic coupler comprising a driving pinion, a driven magnetic plate in said magazine, said driven magnetic plate having an axis merging with the axis of said driving magnetic plate, said driven magnetic plate being fast with said driving pinion, said driven magnetic plate and said driving pinion being mounted to rotate in said magazine about an axis which is merged with the axis of said drive motor;



a driven pinion, coupled with said driving pinion and being coaxial therewith, said driven pinion being fast with the take-up reel spindle; and
means mounting said take-up reel spindle and said driven pinion to rotate jointly on a pivot plate, a driven plate forming with said driving pinion a driven plate-driving pinion assembly, and said pivot plate being mounted to pivot about the axis of the driven plate-driving pinion assembly.

4,877,201

BALLISTIC PROJECTILES

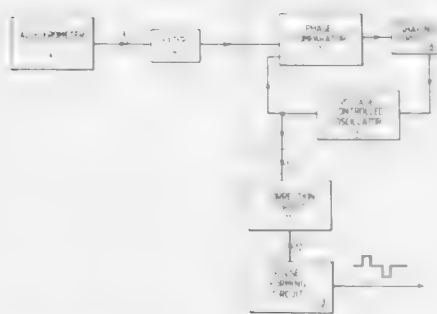
Brian T. Trayner, Stevenage, United Kingdom, assignor to British Aerospace Public Limited Company, London, England
Continuation of Ser. No. 80,234, Jul. 28, 1987, abandoned, which is a continuation of Ser. No. 883,725, Jul. 9, 1986, abandoned.
This application May 31, 1988, Ser. No. 201,324

Claims priority, application United Kingdom, Jul. 10, 1985, 851746A

Int. Cl.⁴ F42B 15/02

U.S. Cl. 244—3.21

11 Claims



1. A method of determining a position of a vertical plane extending through a spin axis of a spinning ballistic projectile in flight, the method comprising the steps of:

obtaining signals corresponding to an acceleration experienced along a sensitive axis parallel to but spaced from the spin axis, said signals containing periodic and non-periodic terms, the periodic term being related to the spin frequency;

processing said signals to isolate the periodic term, and ascertaining the phase of said signal with reference to a reference phase so that an indication of the vertical plane is obtained.

4,877,202

PROTECTED ESCAPE SYSTEM FOR FIGHTER AIRCRAFT

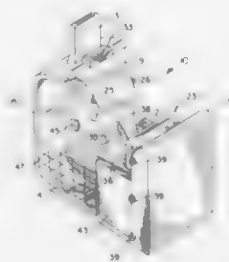
Allen D. Disselkoen, Jr., Dayton, Ohio; Robert F. Gargiulo, Bedford, Mass.; James E. Haywood, Redlands, Calif.; Keith H. Heise, Huber Heights, Ohio; Darrell H. Holcomb, Helotes, Tex.; Stuart C. Kramer, Beavercreek, Ohio; Gregory R. Miller, Roy, Utah; Jeffrey S. Nicholson, Albuquerque, N. Mex.; Jeffrey J. Olinger, Tijeras, N. Mex., and Curtis H. Spenny, Bellbrook, Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Nov. 23, 1988, Ser. No. 277,576

Int. Cl.⁴ B64D 25/10

U.S. Cl. 244—122 A

5 Claims



1. An ejectable seat system for an aircraft cockpit, comprising:

- a platform supporting at a rearward end thereof a seat having a seat back and seat pan sized and configured for receiving an occupant of said cockpit;
- said platform supporting at a forward end thereof a generally upwardly extending cowling substantially integral with said platform and faired therewith for providing windblast protection to said occupant upon ejection from said cockpit;
- an upright wall member disposed on said platform generally centrally thereof and extending between said seat and said cowling, said wall member supporting an inclined chest plate extending generally from said seat pan to an upper end of said cowling for supporting the chest of said occupant in a forward leaning position within said cockpit;
- a shield disposed on said cowling near an upper end of said plate for shielding the head of said occupant upon ejection from said cockpit; and
- harness means for releasably holding said occupant in said forward leaning position against said plate upon ejection from said cockpit.

4,877,203

METHOD AND APPARATUS FOR DISPERSING CREMATED REMAINS

Bonnie J. Harden, 3279 Silverthorne Dr., Fort Collins, Colo.

Filed Sep. 18, 1987, Ser. No. 98,500

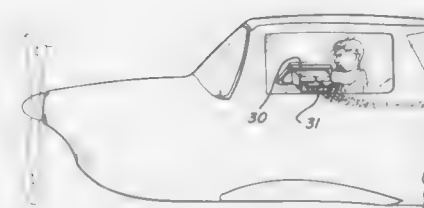
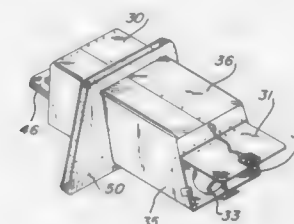
Int. Cl.⁴ B64D 1/16

U.S. Cl. 244—136

21 Claims

1. An apparatus for dispersing cremated remains comprising:

- a sealable container having an outlet from which said cremated remains may be dispersed;
- a means for opening said container;



- a means for preventing retention of any cremated remains within said container; and
- a means for directing air into said container at said outlet.

4,877,204

TILT/SWIVEL DISPLAY BASE

Joseph A. Gregory, Kingston, and David L. Schaum, Woodstock, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 260,979, Oct. 21, 1988, abandoned. This application Apr. 5, 1989, Ser. No. 333,740

Int. Cl.⁴ A47D 19/04

U.S. Cl. 248—298

10 Claims



1. A support apparatus for movably mounting a product, said apparatus comprising:

- at least one rocker member connectable along its top to the bottom of said product the bottom of said rocker member having an arcuate profile between an end of the rocker member nearest the front of said product and an end of the rocker member nearest the back of said product, friction means for holding the rocker member in a selected position, wherein said friction means is generally triangular in shape having a first surface in frictional contact with said rocker member and a second surface in frictional contact with a support surface;
- constant force tension means connected to said rocker member and to said friction means to maintain said frictional means in frictional contact with said rocker member and said support surface;
- and oriented so that the bottom of said rocker member is in contact with said support surface.

4,877,205

HIGH-ALTITUDE BALLOON AND METHOD AND APPARATUS FOR MAKING IT

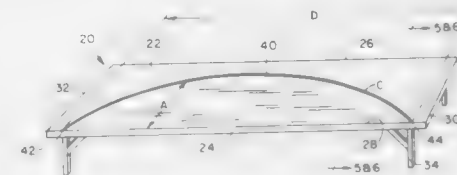
James L. Rand, San Antonio, Tex., assignor to Winzen International, Inc., San Antonio, Tex.

Filed Dec. 28, 1987, Ser. No. 138,586

Int. Cl.⁴ B64B 1/58

U.S. Cl. 244—31

21 Claims



21. A balloon assembly table for making high-altitude balloons with gores cut and shaped from an asymmetrical gore pattern comprising:

- a flat surface upon which material for said gores may be laid, folded, and secured;
- a means for cutting and sealing said gores along a straight edge, thereby forming a seam, said means for cutting and sealing forming a first edge of said asymmetrical gore pattern;
- an index line for aligning each of said seams along a curved path, thereby forming a second edge of said asymmetrical gore pattern.

4,877,206

CONCRETE DELIVERY TROLLEY

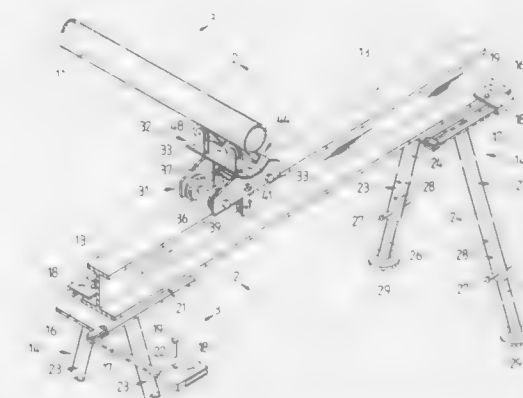
Lamar Barrett, 108 Pine Cone Cir., Clanton, Ala. 35045

Filed May 23, 1988, Ser. No. 197,210

Int. Cl.⁴ F16L 3/00

U.S. Cl. 248—49

15 Claims



1. Apparatus for movably supporting a conduit for delivering a concrete slurry at a construction site comprising:

- a support beam extending transversely of the longitudinal axis of said conduit at a predetermined height;
- a carriage member supported for movement along said support beam;
- a cradle member carried by said carriage member and having a plurality of roller-like members therein for engaging said conduit such that said conduit, cradle member, and carriage member are movable concomitantly along said support beam responsive to force exerted thereon substantially parallel to said beam; and
- means for adjusting the height of said beam including a plurality of legs of selectable length and a beam engaging member.

4,877,207

DEVICE FOR CARRYING BAGS, PARTICULARLY REFUSE BASKET

Victor Farah, 64-70 av. André Morizet, F-92100 Boulogne, France

PCT No. PCT/FR87/00067, § 371 Date Jan. 6, 1988, § 102(e) Date Jan. 6, 1988, PCT Pub. No. WO87/05579, PCT Pub. Date Sep. 24, 1987

PCT Filed Mar. 11, 1987, Ser. No. 128,011

Claims priority, application France, Mar. 12, 1986, 86 03478; Mar. 2, 1987, 87 02786

Int. Cl.⁴ A63B 55/04

U.S. Cl. 248—97

14 Claims



1. A device for supporting bags of various dimensions to convert them into baskets, particularly for refuse, providing support of one or more bags and other objects at the same time, which comprises:

- a first support vertically disposed comprising two arms forming an angle having the shape of an upturned V, said arms being rounded close to the angle at the base of the V and having at their ends means through which a shaft of a second support member can pivot, said angle receiving around it a handle of one side of the bag to be supported and also serving for suspending the device to a hanger;
- the second support member which comprises said shaft presenting at its ends two arms to form a wide open U, said arms of the second support member being flexible and having at their ends supporting means for the opposite side of the bag, pivoting of said second support member allowing said supporting means to hold the walls of the bags at different locations permitting the size and shape of the bag opening to vary; and
- a third support member comprising a folding base which rotates on the shaft of said second support member, said folding base having locking means adapted to co-act with the first support member to lock together said folding base and said first support member, allowing the device to be stood on the ground, the second support member being freely pivotable therebetween, said folding base being able to be unlocked and unfolded to allow accommodation of bags of greater heights.

4,877,208

SUPPORT FOR MIXER BUCKETS

Edsel Kennard, Jr., 310 Shipley Rd., Apt. 112, Wilmington, Del.

1988

Filed May 31, 1988, Ser. No. 200,237

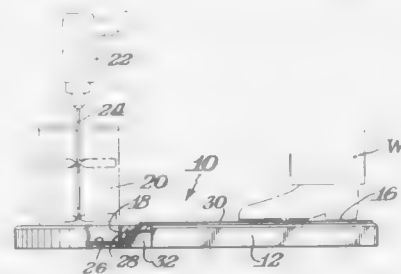
Int. Cl.⁴ A47G 23/02

U.S. Cl. 248—146

8 Claims

1. A support for a mixer bucket comprising a raised platform, said platform having a bucket support section, an annular recess in said bucket support section whereby a mixer bucket of circular cross section may be inserted into said recess, said recess having a bottom and a peripheral side wall, resistance means in said recess for engagement with the bucket to main-

tain the bucket stationary while the contents of the bucket are being mixed, and said resistance means comprising non-skid



material mounted to said bottom and around said peripheral side wall of said recess.

4,877,209

DECORATIVE LIGHT PEDESTAL

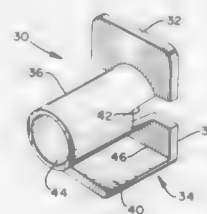
Lonnie F. Gary, Lubbock, Tex., assignor to Gary Products Group, Inc., Lubbock, Tex.

Continuation-in-part of Ser. No. 257,392, Oct. 13, 1988, abandoned. This application Jan. 6, 1989, Ser. No. 294,268

Int. Cl.⁴ A47F 5/00

U.S. Cl. 248—205.3

2 Claims



1. A decorative light pedestal adapted to receive and maintain the socket portion of a decorative bulb socket assembly and bond said pedestal to a support surface, said pedestal comprising a base member having a substantially planar mounting service; a circumferential socket support member extending outwardly from said base member on the side of said base member that is opposite said mounting surface; and adhesive means adapted to bond said mounting surface of said pedestal to said support surface;

said pedestal further comprising a first void extending axially through the circumferential support member and the plane of the base member to permit said socket assembly to be inserted into the circumferential support member through said base member, and a second void adapted to receive and accommodate the passage of wiring connected to said socket assembly through said circumferential support member after said socket assembly is inserted therein;

said base member further comprising spaced apart sections which cooperate to define the plane of said mounting surface.

4,877,210

POT HANGER

Manfred F. Missalla, 52 Shieldmark Crescent, Thornhill, Ontario, Canada (L3T 3T5)

Filed Jan. 26, 1989, Ser. No. 301,490

Claims priority, application Canada, Apr. 26, 1988, 565121

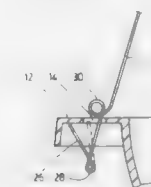
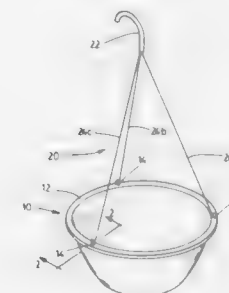
Int. Cl.⁴ A47H 1/10

U.S. Cl. 248—318

1 Claim

1. A hanger for pots of the type having a plurality of openings spaced around a perimeter and comprising: a suspension member;

a plurality of wires, said wires being connected at one end of their ends to said suspension member;
a finger formed on the other end of each said wire, each said finger being bent at an acute angle to said wire;
a generally circular loop formed at the junction between said wire and said finger, said finger extending from one side of said wire to the opposite side of said wire, said loop being



resiliently flexible permitting said finger to flex inwardly against said wire, flexing of said wire and said finger towards one another causing partial expansion of said loop whereby to facilitate insertion of said wire said finger and said loop through a said opening, and,
a stop portion formed in said wire spaced from said finger, said stop portion being incapable of passing through said opening.

4,877,211

RECREATIONAL VEHICLE LEVELING DEVICE

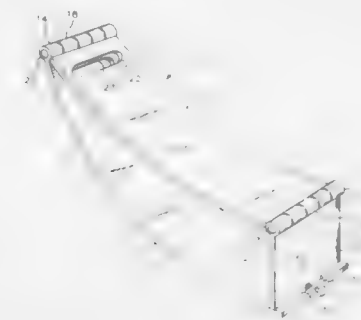
Paul I. Orr, 4039 Enero Way, San Diego, Calif. 92154

Filed Feb. 21, 1989, Ser. No. 313,061

Int. Cl.⁴ B66F 7/00

U.S. Cl. 248—352

2 Claims



1. A recreational vehicle leveling device comprising:
an elongated wheel receiving plate having a predetermined curvature along its longitudinal axis, said wheel receiving plate having a front end and a rear end, a plurality of laterally spaced curved hinge fingers formed on said front end, a plurality of laterally spaced curved hinge fingers formed on said rear end;
an elongated terrain engaging plate having a predetermined curvature along its longitudinal axis, said terrain engaging plate having a front end and a rear end, a plurality of laterally spaced curved hinge fingers formed on said front end;
means for connecting the respective hinge fingers on the

front ends of said wheel receiving plate and said terrain engaging plate to form a first hinge assembly;
a rear spacer plate having a top end and a bottom end, a plurality of laterally spaced curved hinge fingers formed on said top end, a tongue member extends downwardly from the bottom end of said rear spacer plate and it has an aperture therein;

means for connecting the respective hinge fingers on the rear end of said wheel receiving plate and on the top end of said rear spacer plate to form a second hinge assembly;

means for detachably securing the bottom end of rear spacer plate to the rear end of said terrain engaging plate comprising: a transversely extending slot formed in said elongated terrain engaging plate adjacent its rear end, a bore hole is also formed in the end of said elongated terrain engaging plate and said bore hole communicates with said slot, a pin having a head and a shank is inserted into said bore hole, a coil spring is slipped over the shank of said pin and a shoulder member is attached to said shank to capture one end of said spring, said pin having a tip that passes through the aperture in the tongue of said spacer plate to form a rigid leveling device structure, to disengage the bottom end of said spacer plate it is merely necessary to pull the head of said pin which will allow the tip to be removed from the bore hole in said tongue and the respective members of said leveling device can be folded into a compact stack.

4,877,212

DOCUMENT STAND

Mitsuo Kobayashi, Kawasaki, Japan, assignor to Nippon Kaishiki Kaisha, Yokohama, Japan

Continuation of Ser. No. 80,177, Jul. 31, 1987, abandoned, which is a continuation of Ser. No. 835,719, Mar. 3, 1986, abandoned.

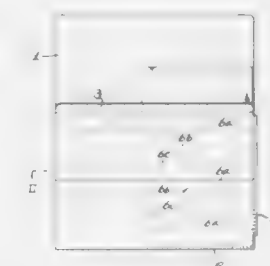
This application Oct. 31, 1988, Ser. No. 267,633

Claims priority, application Japan, Mar. 2, 1985, 60-65826[U]

Int. Cl.⁴ B41J 11/02

U.S. Cl. 248—444.1

4 Claims



1. A document stand for a word processor or the like comprising:

- a main rectangular plate having a first side edge and a first bottom edge;
- a transparent rectangular plate having a second side edge and a second bottom edge, said first and second bottom edges being connected to form a first document support, said first and second side edges being connected to form a second document support, and said transparent plate being connected in stationary spaced relation to said main plate solely by said first and second document supports such that remaining non-connected two sides of each of said main plate and said transparent plate form an L-shaped opening to allow a document to be inserted there-through in a predetermined fixed relationship with respect to at least one of said first and second document supports, said main rectangular plate and said transparent rectangular plate forming a document holder;
- a plurality of stationary reference indicia fixed on a substantially whole surface of said transparent plate, each of

said plurality of stationary reference indicia being in parallel to said first document support and vertical to said second document support to emphasize a plurality of sentences on said document and to prevent misreading or omission of a portion of said sentences of said document;

d. a support arm to hold said document holder in a variety of positions as desired such that said document holder can be rotated,

wherein said first document support being adapted to work as bottom support for a document in which said sentences are printed horizontally and said second document support being adapted to work as a bottom support for a document in which said sentences are printed vertically.

4,877,213

CONFERENCE EASEL

Joël Lambert, Virieu sur Bourbre, France, assignor to Solyfob Fonctions, Isere, France

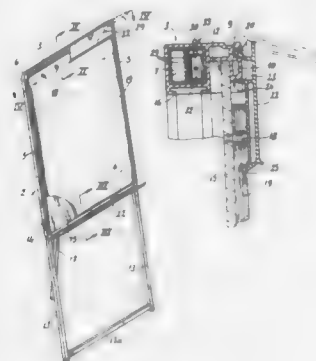
Filed Jan. 29, 1988, Ser. No. 149,753

Claims priority, application France, Jan. 29, 1987, 87 01381

Int. Cl.⁴ A47G 1/06

U.S. Cl. 248—451

12 Claims



1. A conference easel, comprising:

a tubular frame comprising a pair of opposite generally vertical frame sections, a pair of generally horizontal upper and lower frame sections, and corner members interconnecting said frame sections, all of said frame sections being formed as identical profile elements having a main tubular portion and projecting perpendicular from said main tubular portion, a tubular panel-receiving portion having an edge remote from said main tubular portion; portion and panel-engaging means on a face of said panel-receiving portion extending parallel to said main tubular portion;

legs supporting said tubular frame and operatively connected therewith;

a panel enclosed by said frame and engaged in said panel-engaging means of said sections; and

at least one elongated flap pivotally connected to the said edge of a respective one of said horizontal frame sections and swingable between two stable positions including a position wherein said flap forms generally an extension of the respective panel-receiving portion reaching away from the respective main tubular portion and a position wherein said flap lies generally perpendicular to the respective panel-receiving portion.

4,877,214

HOLDING DEVICE OF MIRROR ELEMENT FOR REARVIEW MIRROR

Kikuchi Toshiaki, Toshihiro Mochizuki, Yasutoshi Ito, and Tohru Yamana, all of Shizuoka, Japan, assignors to Murakami Kaimido Co., Ltd., Shizuoka, Japan

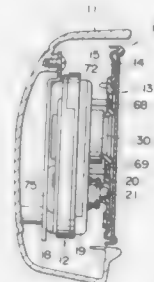
Filed Jan. 12, 1988, Ser. No. 143,447

Claims priority, application Japan, Jan. 13, 1987, 62-2359

Int. Cl.⁴ A47G 1/24

U.S. Cl. 248—483

11 Claims



1. A holding device of a mirror element for a rearview mirror, comprising:

a mirror element having a mirror plate and a mirror holder supporting said mirror plate, said mirror holder having a central area, an aperture portion formed at said central area, and an undercut, said mirror element having an angle of incline that is adjustable;

actuator unit means for adjusting said angle of incline of said mirror element;

supporting means formed at said actuator unit means for tiltable supporting said mirror element;

pivot means mounted on said actuator unit means by said supporting means and mounted separately on said aperture portion, said pivot means having a pivot plate with an upper portion and a lower portion;

hook type latch means for engaging said mirror holder with said upper portion of said pivot plate;

pawl engaging means for engaging said undercut of said mirror holder with said lower portion of said pivot plate;

said mirror holder being formed with a cutout for inserting a separating tool at a skirt of a peripheral edge thereof and with a contacting surface to be contacted with an end of said separating tool.

4,877,215

MANUFACTURING FRAMEWORK FOR USE IN MANUFACTURING A COSMETIC-PUFF

Yoshihiro Marume, and Tadao Iwamoto, both of Hiroshima, Japan, assignors to Nishikawa Rubber Co., Ltd., Hiroshima, Japan

Division of Ser. No. 129,556, Dec. 7, 1987. This application Jul. 7, 1988, Ser. No. 216,467

Int. Cl.⁴ B29C 33/00

U.S. Cl. 249—109

6 Claims

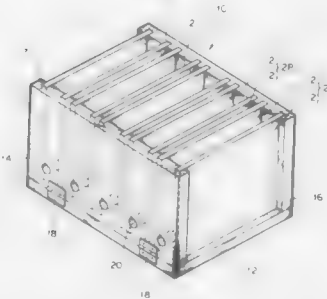
1. A manufacturing framework for a cosmetic puff comprising:

a bottom plate;

a pair of side plates pivotally mounted to said bottom plate, each side plate having a plurality of grooves formed on an inside surface thereof, one of said side plates includes a plurality of inlet ports formed at a lower portion of said side plate; and

a plurality of crimp pattern plates arranged in a vertical parallel relationship with one another on said bottom plate with both side ends of each plate being received in the grooves of said side plates, each crimp pattern plate having a crimp pattern formed surface, each pair of the crimp

pattern plates being spaced at a distance equal to a thickness of the cosmetic puff to be manufactured the crimp



pattern formed surfaces of adjacent crimp pattern plates facing each other.

4,877,216

AUTOMATICALLY-RELEASEABLE PIPE-ATTACHMENT DEVICE

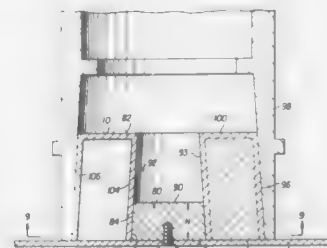
Gerold J. Harbeck, 2443 Waterside Cir., Lakewood, Fla. 33461
Continuation-in-part of Ser. No. 116,175, Nov. 3, 1987, Pat. No. 4,804,160, which is a continuation of Ser. No. 92,337, Sep. 1, 1987. This application Jun. 6, 1988, Ser. No. 202,292

The portion of the term of this patent subsequent to Feb. 14, 2006, has been disclaimed.

Int. Cl.⁴ E04G 15/06

U.S. Cl. 249—207

11 Claims



1. Pipe-attachment apparatus for attaching an elongated pipe to a concrete form wall, with an axis of said pipe extending laterally away from said form wall, said apparatus including:

a first attachment means for being attached to said concrete form wall and extending axially away from said form wall, laterally to said form wall, said first attachment means having an outwardly, radially directed, outer surface for helping to support said pipe on said concrete form wall;

a second attachment means separate from said first attachment means and said pipe, said second attachment means defining a radially outwardly directed surface for tightly contacting a radially inwardly directed, internal surface of said pipe to have frictional engagement therewith, thereby helping to support said pipe on said concrete form wall, said second attachment means contacting only said radially inwardly directed internal surface of said pipe, said second attachment means radially outwardly directed surface being tapered radially inwardly away from said concrete form wall when said second attachment means is mounted on said first attachment means, said second attachment means defining a cavity extending axially, laterally away from said concrete form wall for substantially completely receiving said first attachment means, said cavity defining a radially inwardly directed surface corresponding to said radially outwardly directed outer surface of said first attachment means;

said radially outwardly directed outer surface of said first

attachment means and said radially inwardly directed cavity surface of said second attachment means being of approximately the same size for fitting tightly together but allowing sliding axial movement between them without damaging either member;

means for attaching said first attachment means to said concrete form wall to permit sliding axial movement between said first attachment means and said cavity surface thereby aiding in supporting said pipe on said concrete form wall during a pouring of concrete, but after the concrete is cured allowing the form wall to be removed in an axial direction with said first and second attachment means sliding away from one another leaving the first attachment means on the concrete-form wall and the second attachment means on said pipe.

4,877,217

FAIL-SAFE BLOWOUT PREVENTER

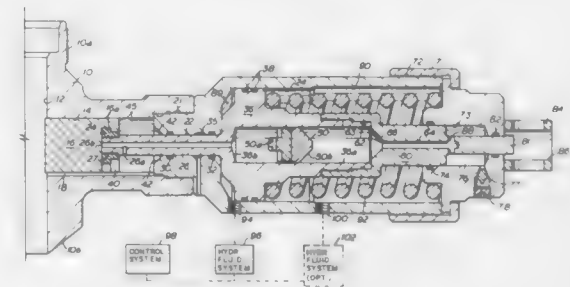
Archie W. Pell, and Thomas R. Bishop, both of Houston, Tex., assignors to Bowen Tools, Inc., Houston, Tex.

Filed Oct. 27, 1988, Ser. No. 263,519

Int. Cl.⁴ F16K 31/00

U.S. Cl. 251—1.3

20 Claims



7. A fail-safe blowout preventer, comprising:

a preventer body having a ram bore for guiding a ram between an open and a closed position;

means for allowing fluid within the ram bore to bypass the ram;

a ram shaft having an inner end and an outer end, the cross-sectional area of the inner end being smaller than the cross-sectional area of the outer end, and the cross-sectional area of the outer end being smaller than the cross-sectional area of the ram;

means for allowing fluid within the ram bore to exert a force upon the cross-sectional area of the outer end of the ram shaft for urging the ram to the closed position; and means for opposing movement of the ram from the open to the closed position until an external signal is received.

4,877,218

DRAIN VALVE DEVICE

Clayton S. Kanner, North Canton, Ohio, assignor to Design Improvement Corporation, Akron, Ohio

Continuation-in-part of Ser. No. 863,366, May 15, 1986, abandoned. This application Apr. 29, 1988, Ser. No. 188,352

Int. Cl.⁴ F16K 31/126

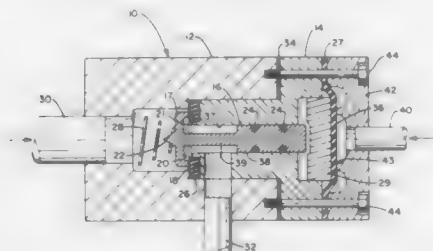
U.S. Cl. 251—61.3

7 Claims

1. A drain valve device, comprising:

a valve with a stem-mounted valve disc activated between opened and closed positions by longitudinal movement of the stem and corresponding movement of the valve disc against and away from a valve seat, said valve seat comprising a replaceable, pressure deformable, resilient annular disc having an opening therein through which a flow of material may axially pass, and said valve disc having an inner surface facing said valve seat, said inner surface

being recessed to provide a peripheral land on said inner surface, thereby limiting an area of contact between said valve seat and valve disc in the valve's closed position to the surface area of the land;
a valve actuator mounted on said valve and adapted to exert a force on said stem, thereby moving the stem and forcing said disc away from said valve seat and thus opening the valve, wherein said valve is equipped with a spring to return it to its closed position when said force is removed;



wherein said valve disc has a pointed tapered cone extending from a center of a surface of said disc opposite said valve seat, said pointed tapered cone being axially aligned with said annular disc, with a pointed end of said cone positioned upstream of said flow of materials to said annular disc, and wherein said spring is conical in shape and is positioned within said valve so that its smaller end is seated against said cone.

4,877,219 PIPE FITTING

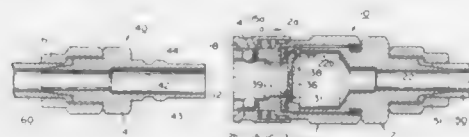
Kazuo Yano, Tokyo, Japan, assignor to Thyme Tech Co., Ltd., Tokyo, Japan

Filed Oct. 20, 1988, Ser. No. 260,031

Claims priority, application Japan, Oct. 20, 1987, 62-159252
Int. Cl.⁴ F16L 37/28

U.S. Cl. 251-149.2

3 Claims



1. A pipe fitting comprising:
a socket body including a main member and a fitting member each formed with an internal passage;
said internal passage of said main member being formed with a stepped support portion of an annular shape;
said stepped support portion having a deformable annular valve seat acting also as a packing and a support ring securely arranged therein in order;
said main member being provided therein with an on-off valve and a helical spring acting on said on-off valve, said on-off valve being arranged on said support ring in a manner to be pivotally moved about a support shaft and normally seated on a surface of said deformable annular valve seat by an elastic force of said helical spring so that a part of said deformable annular valve seat is expanded toward said internal passage of said main member;
said main member being formed on an opening side thereof with holding through-holes which are circumferentially spaced from one another at predetermined intervals and in which balls for engagement are movably arranged;
said main member being provided on an outer periphery thereof with an operating sleeve slidable in an axial direction of said main member;
said operating sleeve being normally held at its engaged position by an elastic force of a coiled spring and formed

on an inner periphery thereof with a cam surface engaged with said balls to project said balls into said internal passage of said main member; and
a connecting plug including a connecting member;
said connecting member being formed into a hollow cylindrical shape with an outer configuration sufficient to cause said connecting plug to be detachably fitted in said internal passage of said main member;
said connecting member being provided on a side thereof connected to said main member with a cylindrical connecting portion, said cylindrical connecting portion being formed on an outer periphery thereof with an annular groove engaged with said balls;
said on-off valve being opened when said connecting plug is engagedly connected with said socket body.

4,877,220

HEXASUBSTITUTED CYCLOHEXANE COMPOUNDS
Klaus Praefcke, Bernd Kohne, and Werner Stephan, all of Berlin, Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft Mit Beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

PCT No. PCT/EP86/00780, § 371 Date Sep. 11, 1987, § 102(e) Date Sep. 11, 1987, PCT Pub. No. WO87/04155, PCT Pub. Date Jul. 16, 1987

PCT Filed Dec. 24, 1986, Ser. No. 114,365

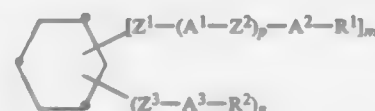
Claims priority, application Fed. Rep. of Germany, Jan. 11, 1985, 3600601

Int. Cl.⁴ C09K 19/30, 19/34; C07C 149/273, 147/02, 147/14; C07D 211/66, 319/06, 339/08

U.S. Cl. 252-299.61

5 Claims

1. A discotic liquid-crystalline phase comprising at least two liquid-crystalline components, wherein at least one component is a hexasubstituted cyclohexane compound of the formula I



wherein $\text{Z}^1\text{-(A}^1\text{-Z}^2\text{)}_p\text{-A}^2\text{-R}^1$ is different from $\text{Z}^3\text{-A}^3\text{-R}^2$ and in which

Z^1 is $\text{-CO-X}^1\text{-}$, $\text{-X}^1\text{-CO-}$, $\text{-CH}_2\text{-X}^2\text{-}$, $\text{-X}^2\text{-CH}_2\text{-}$ or $\text{-CH}_2\text{-CH}_2\text{-}$;

Z^2 has one of the meanings of Z^1 or is a single bond,

Z^3 is $\text{-X}^1\text{-CO-}$ or $\text{-X}^2\text{-CH}_2\text{-}$;

X^1 is O, S or Se,

X^2 is O, S, Se, SO or SO_2 ;

A^1 , A^2 and A^3 each are, independently of one another, a 1,4-phenylene group which is unsubstituted or mono- or poly-substituted by halogen atoms and/or CH_3 groups and/or CN groups and in which one or more CH groups might also be replaced by N atoms, or are a 1,4-cyclohexylene group in which one or two non-adjacent CH_2 groups might also be replaced by -O- and/or -S- , or are a piperidine-1,4-diyl group or a 1,4-bicyclo[2.2.2]octylene group, and A^2 and A^3 can also be a single bond,

p is [0 or] 1,

R^1 and R^2 each are, independently of one another, alkyl having 1 to 20 C atoms, wherein one or more CH_2 groups might also be replaced by -O- , -S- , -CHCH_3 , -CHCN- , -CHhalogen- , -CO- , -O-CO- , -CO-O- and/or -CH=CH- , or are H, F, Cl, Br, I, OH, NH_2 , COOH or CN, no two heteroatoms being directly linked to one another,

m is 1, 2 or 3 and

$(n+m)$ is 6,

with the proviso that, in at least one group,

Z^1 is other than $\text{-X}^1\text{-CO-}$.

4,877,221

EXPANDABLE TAP HOLE PLUG

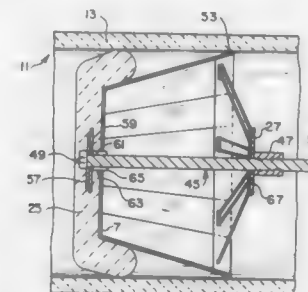
Rick R. Scriven, Riverview, Mich., assignor to Tri-Star Manufacturing & Service, Inc., Butler, Pa.

Filed Dec. 5, 1988, Ser. No. 279,502

Int. Cl.⁴ C21B 7/12

U.S. Cl. 266-272

9 Claims



1. An expandable tap hole plug comprising:
a plug comprising a cylindrical member having a circular nose and an outwardly extending flexible sidewall forming a variable obtuse angle with respect to said nose, said plug being adapted to be oriented within a tap hole of a metalurgical vessel with said nose directed towards the interior of said vessel;
an expander in the form of a truncated cone, having a base and a flexible side section extending outwardly from said base forming a variable obtuse angle with respect to said base, said expander being inverted relative to said plug and attached to said plug with said side section of said expander engaging said sidewall of said plug; and
means for varying said angle between said side section and said base of said expander so as to vary said angle of said sidewall of said plug relative to said nose thereof to block said tap hole.

4,877,222

FLUID SUSPENSION SPRING AND DAMPENER FOR VEHICLE SUSPENSION SYSTEM

Leo W. Davis, Dallas, Tex., assignor to Liquid Spring Investors, Ltd., Dallas, Tex.

Division of Ser. No. 907,140, Sep. 12, 1986, Pat. No. 4,735,402, which is a continuation of Ser. No. 753,365, Jul. 5, 1985, which is a continuation of Ser. No. 550,883, Nov. 9, 1983, abandoned.

This application Mar. 31, 1988, Ser. No. 175,742

Int. Cl.⁴ F16F 5/00, 9/42; F15B 15/22

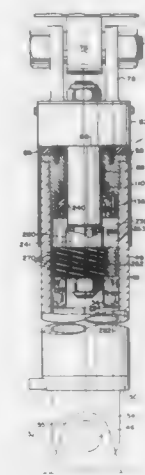
U.S. Cl. 267-64.13

9 Claims

1. A suspension apparatus for a vehicle for permitting displacement of wheel support means relative to a frame of said vehicle and for dampening said displacement, said apparatus comprising a hydraulic cylinder and piston assembly, including:

an elongated cylinder member defining a wall enclosed longitudinal bore and opposed head portions;
a piston reciprocally disposed for relative bidirectional movement in said bore and dividing said bore into opposed fluid chambers, and a piston rod connected at one end to said piston and extending through one of said chambers and one of said head positions to form a rod end chamber and a second end chamber;
piston rod seal means supported by said cylinder member and including means in fluid sealing engagement with said piston rod to prevent leakage of fluid from said rod end chamber to the exterior of said apparatus;
a compressible liquid fluid filling the chambers;
means for interconnecting said apparatus between said frame and said wheel support means whereby said piston and piston rod are forced into the cylinder until the fluid is compressed sufficiently in said cylinder member to sup-

port the vehicle while permitting displacement of said wheel support means;
flow restriction means formed at least partially between the piston and the cylinder for permitting only restricted flow of fluid from one chamber to the other chamber in response to reciprocation of said piston and piston rod with respect to said cylinder member to provide for damped displacement of said wheel support means with resulting heating of the fluid; and



means movably associated with the piston and piston rod for at least retarding the intermingling of the fluid after the fluid has passed through the restrictive flow means and been heated therein with the major portion of the fluid in the second end chamber while maintaining the heated fluid in heat exchange relationship with the piston member, piston rod and cylinder wall adjacent thereto.

4,877,223

LOAD LEVELING SHOCK ABSORBER

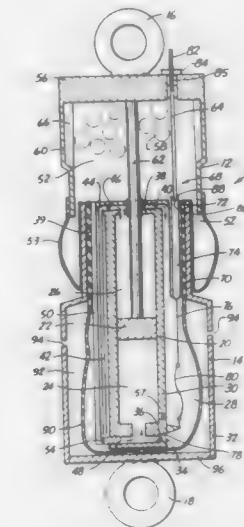
Jeffrey K. Hackett, P.O. Box 68, Benedict, Minn. 56436, assignor to Jeffrey K. Hackett, Benedict, Minn.

Filed Sep. 21, 1988, Ser. No. 247,248

Int. Cl.⁴ F16F 9/342

U.S. Cl. 267-64.17

21 Claims



1. A telescoping hydraulic shock absorber unit comprising: a cylinder body having a cylinder charged with a damping medium;

- a piston disposed for axial reciprocation within the cylinder and dividing the cylinder into a compression chamber and a rebound chamber;
- a lift chamber disposed in relationship with the cylinder body and the piston for displacing the piston outwardly from the cylinder;
- a reservoir bladder; and
- a damping medium circuit path interconnecting the compression chamber, the rebound chamber, the lift chamber and the reservoir bladder including,
 - first one-way valve means from the compression chamber to the lift chamber,
 - a displacement responsive valve for passing damping medium from the lift chamber to the reservoir bladder when the piston is displaced outwardly in the cylinder beyond a predetermined level position;
 - second one-way valve means from the reservoir bladder to the rebound chamber,
 - third one-way valve means from the rebound chamber to the reservoir bladder, and
 - fourth one-way valve means from the reservoir bladder to the compression chamber.

4,877,224

CORRUGATED ENERGY ABSORBER

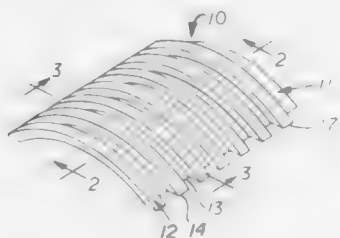
James L. Watts, 2101 Wincrest, Galveston, Tex. 77551

Filed Aug. 31, 1988, Ser. No. 238,419

Int. Cl.⁴ F16M 7/00; F16F 1/18; B63B 59/02; F16L 11/00

U.S. Cl. 267-140

30 Claims



1. An energy absorber for positioning on one object to absorb the impact of the later with another object comprising;
 - an arcuate strip of rigid resiliently deflectable material having a plurality of circumferential alternating arcuate ridge and furrow corrugations formed therein generally parallel and coaxial with the radius of curvature of said strip and the ridges of said corrugations terminating a distance beyond two opposed side edges of said strip to define laterally opposed tips,
 - the center of the arcuate strip bowed radially outwardly from the surface of the object on which it is to be positioned, and
 - said strip of material having sufficient resiliency to allow deflection of the arcuate surface of the material inwardly relative to the radius of curvature upon impact to the bowed surface and thereafter returning to its original configuration, and
 - the depth of said corrugations being sufficient to allow independent deflection of the corrugations relative to one another along the longitudinal axis of said strip upon impact and thereafter returning to their original configuration.

4,877,225

VIBRATION ISOLATOR

Takeaki Noguchi, Yokohama; Kazuya Takano, Kamakura, and Takashi Kikuchi, Yokohama, all of Japan, assignors to Bridgestone Corp., Tokyo, Japan

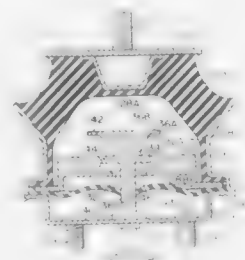
Filed Mar. 31, 1988, Ser. No. 176,276

Claims priority, application Japan, Jun. 29, 1987, 62-162101

Int. Cl.⁴ F16F 9/10, 13/00

U.S. Cl. 267-140.1

27 Claims



1. A vibration isolator interposed between a vibration source and a vibration receiving object and adapted to reduce and absorb vibrations transmitted from said vibration source to said object, said vibration isolator comprising:
 - a fluid chamber partially formed of an elastic body to expand and contract by vibrations, said fluid chamber being filled with a fluid;
 - a partition wall for dividing said fluid chamber into a plurality of small fluid chambers;
 - a relatively large central limitational passage through said partition wall capable of providing communication between said small fluid chambers;
 - changing means for changing the area of said central limitational passage by linearly moving itself close to or away from said central limitational passage, said changing means including a valve which abuts against said partition wall when said valve is at least substantially at the end of the stroke of its movement to at least substantially close said central limitational passage; and
 - first and second relatively small limitational passages through said partition wall and said valve, respectively, said first and second limitational passages being connectable to provide communication between said small fluid chambers when said valve is at least substantially at the end of the stroke of its movement, and said changing means also adapted to control the flow of said fluid through said small limitational passages;
 - whereby the rate at which said fluid moves between said small fluid chambers is changed so as to enable vibrations from said vibration source to be absorbed over a wide range.

4,877,226

FLUID SHOCK ABSORBER CONSTRUCTIONS

Paul H. Taylor, Grand Island, N.Y., assignor to Tayco Developments, Inc., North Tonawanda, N.Y.

Continuation of Ser. No. 125,297, Nov. 25, 1987, abandoned.

This application Apr. 12, 1989, Ser. No. 338,409

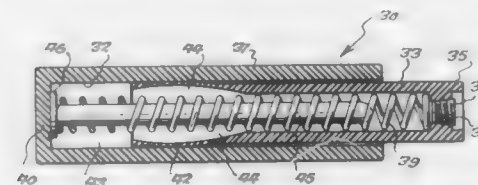
Int. Cl.⁴ F16F 11/00

U.S. Cl. 267-196

29 Claims

1. A fluid shock absorber comprising a cylinder, a first chamber in said cylinder, fluid in said first chamber, piston means for movement into said first chamber to increase the pressure of said fluid, and adjustable bleed means for varying the flow of said pressurized fluid relative to said first chamber, said bleed means comprising threaded plug means rotatably mounted in a tapped hole in one of said cylinder or said piston means for varying its spacing with said tapped hole by being

axially threaded relative to said tapped hole to thereby vary the rate of said flow of said fluid through said bleed means, said cylinder including a cylindrical inner surface, said piston means comprising an elongated hollow tubular member having a substantially cylindrical wall and an open end located within said cylinder and having an extreme outer edge portion immediately adjacent said open end, said substantially cylindrical wall of said elongated hollow tubular member having an outer surface having a diameter which is only slightly less than the diameter of said inner surface of said cylinder for a substantial portion of the length of said inner surface of said cylinder and for a substantial portion of the length of said elongated hollow tubular member extending away from said extreme outer edge portion, said substantially cylindrical outer surface of said wall which extends away from said extreme outer edge portion being substantially parallel to said inner surface of said cylinder,



der, and said elongated hollow tubular member defining a second chamber in communication with said first chamber through said open end of said piston means, said second chamber extending into said elongated substantially cylindrical tubular member for a substantial portion of the length thereof inwardly of said open end, and said wall of said elongated hollow tubular member being expandable for said substantial portion of its length extending away from said extreme outer edge portion to create an increase of friction between said outer surface of said elongated hollow tubular member and said inner surface of said cylinder in response to said increase of pressure within said second chamber to thereby supplement the shock absorption resulting from said increase of pressure of said fluid in said first and second chambers, said wall of said elongated hollow tubular member returning to an unexpanded condition when said elongated hollow tubular member moves out of said cylinder.

4,877,227

APPARATUS FOR MACHINING A WORK PIECE AND A JIG ASSEMBLY FOR HOLDING THE WORK PIECE

Christopher D. Sassella, Melbourne; John R. Whitney, MacLeod, and Harold K. McGeehan, Pascoe Vale, all of Australia, assignors to Dowell Australia Ltd., Victoria, Australia

Filed Jun. 30, 1987, Ser. No. 67,884

Claims priority, application Australia, Jun. 30, 1986, PH6657

Int. Cl.⁴ B25B 1/20

U.S. Cl. 269-43

12 Claims



1. A set of jaws comprising at least two pairs of identical jaw pieces, at least one pair being different from the other pair, the first pair of jaw pieces being arranged in an abutting relationship as mirror images of each other about a central axis and the second pair of jaw pieces being arranged as mirror images of each other spaced apart from the central axis but located equi-

distant on either side from the central axis, said jaw pieces being movable with respect to each other between an operative position for securely holding a profiled work piece therebetween in use and a release position allowing insertion and withdrawal of the work piece between the jaw pieces in use, said jaw pieces of the first pair of jaw pieces including a first jaw piece and said jaw pieces of said second pair including a second jaw piece, said first jaw piece having a first portion for cooperatively engaging with a first portion of said second jaw piece to facilitate engagement of the two jaw pieces together into the operative position when the jaw pieces are moved together and to facilitate movement of the jaw pieces apart from each other into the release position, said jaw pieces each having a respective second portion, said second portion of said first jaw piece having a profile complementary to the profile of one side of the work piece and said second portion of said second jaw piece having a profile complementary to the reverse side of the work piece so that when the jaw pieces are in the operative position the space defined between the two respective second portions substantially corresponds to the profile of the work piece, whereby damage and distortion of a work piece inserted into the space during selective machining of the work piece is substantially avoided.

4,877,228

CLAMP FOR FITTING TO A CONVEYOR OF AN AUTOMATIC CABLING MACHINE AND INTENDED TO HOLD ONE OR MORE ELECTRICALLY CONDUCTIVE WIRES

Victor L. Ripert, Aix-en-Provence, France, assignor to Automatisme et Robotique Appliquées -A.R.A., La Barque, France

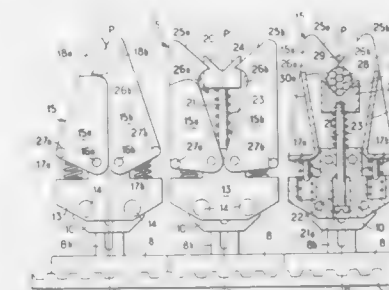
Filed Jul. 26, 1988, Ser. No. 224,544

Claims priority, application France, Aug. 7, 1987, 87 11392

Int. Cl.⁴ C25B 1/00

U.S. Cl. 269-156

11 Claims



1. A clamp for fitting to a conveyor in an automatic cabling machine for the purpose of holding one or more electrically conductive wires, the clamp comprising two pairs of jaws hinged to a fixed base, each of said pairs comprising two jaws which are symmetrical about a plane of symmetry and which are fitted with return means for urging them automatically towards a closed position, said pairs being spaced apart by an intermediate space, and said clamp further including a central piston which is situated in said intermediate space, which is symmetrical about said plane of symmetry, and which is fitted with return means for urging it automatically towards the free ends of said jaws.

4,877,229

METHOD OF EXTRACTING AND ACCELERATING FLAT OBJECTS

Emmanuel Delbe, Granges Les Valence; Francois Gillet, Par-main; Etienne Serot; Raymond Chifflet, both of Granges Les Valence; Roland Allio, La Roche De Glun; Philippe Jeantin, Valence; Gilbert Del Fabro, La Roche De Glun, and Guy Forella, Saint Pery, all of France, assignors to Societe anonyme dite: Compagnie Generale D'Automatisme CGA-HBS, Paris, France

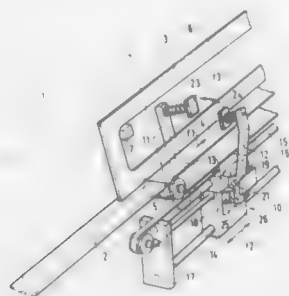
Filed Jun. 30, 1988, Ser. No. 213,562

Claims priority, application France, Jul. 1, 1987, 87 09312

Int. Cl.⁴ B65H 5/10

U.S. Cl. 271—2

7 Claims



1. A method of extracting and accelerating flat postal items presented in an outlet position of an unstacking head for use by a machine downstream therefrom, said method making use of a clamp for grasping said flat postal items one-by-one and of various sensors to indicate the presence of a postal item in the outlet position of the unstacking head, or in the field of action of the clamp, and to indicate that the clamp is in a waiting position or in an end-of-stroke position, said method comprising the following steps:

- moving said clamp to a waiting position;
- when the presence of a postal item is expected in the outlet position from the unstacking head, driving the carriage towards the outlet position of the unstacking head;
- detecting the presence of the postal item within the field of action of the clamp, closing said clamp and driving said carriage towards the downstream machine;
- detecting the lack of continued presence of a postal item in the outlet position of the unstacking head, unclamping said clamp, thereby releasing the postal item; and
- stopping the carriage and returning said carriage to the waiting position.

4,877,230

COMPACT APPARATUS FOR DISPENSING A PRESELECTED MIX OF PAPER CURRENCY OR THE LIKE

Theodore Winkler, Levittown, Pa., and Fredric W. Burger, Cherry Hill, N.J., assignors to Brandt, Inc., Bensalem, Pa. Continuation of Ser. No. 941,301, Dec. 12, 1986, abandoned, which is a division of Ser. No. 699,044, Feb. 7, 1985, Pat. No. 4,660,822. This application Mar. 10, 1988, Ser. No. 169,139

Int. Cl.⁴ B65H 3/44

U.S. Cl. 271—3

6 Claims

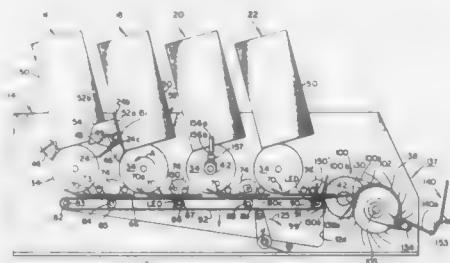
- 1. Apparatus for selectively dispensing sheets from a plurality of individual dispensing devices and for transporting dispensed sheets to a delivery location including in combination an output stacker at said delivery location for receiving dispensed sheets,
- means mounting said devices in serial relationship along a generally horizontal line,
- a belt disposed below said devices along said line and common to said devices for transporting dispensed sheets along a path leading to said output stacker,
- a plurality of belt-supporting rollers disposed at spaced locations along said belt,

a plurality of pinch rollers respectively associated with said dispensing devices,

means mounting said pinch rollers in cooperative relationship with said belt at the locations of said belt-supporting rollers to form pairs of upper and lower rollers, means for urging the rollers of each pair toward each other to form a plurality of drive nips associated with the respective dispensing devices,

said dispensing devices including respective input stackers for receiving stacks of sheets,

said dispensing devices including respective feed means for feeding sheets one-at-a-time from the bottom of a stack in its input stacker to advance the leading edge of each sheet into the associated drive nip,



and means for driving said belt positively to drive sheets entering said nips along said path leading to said output stacker,

the arrangement being such that sheets from dispensing devices relatively remote from said output stacker pass through the drive nips associated with dispensing devices relatively adjacent to said output stacker,

a platform for supporting said belt; and means for raising and lowering said platform and said belt-supporting rollers and said belt between a first position adjacent said pinch rollers and a second position displaced from said pinch rollers.

4,877,231

DEVICE FOR FEEDING AND DISCHARGING ORIGINALS IN SHEET FORM

Gerardus M. H. M. Jacobs, Velden, and Johannes H. A. Din-nissen, Venlo, both of Netherlands, assignors to OCE-Neder-land B.V., Venlo, Netherlands

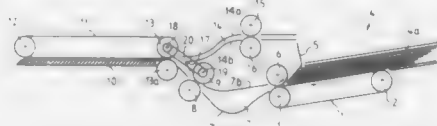
Continuation of Ser. No. 891,682, Jul. 29, 1986, abandoned. This application Mar. 23, 1988, Ser. No. 172,941

Claims priority, application Netherlands, Aug. 2, 1985, 8501175

Int. Cl.⁴ B65H 5/06

U.S. Cl. 271—3.1

3 Claims



- 1. In a device for feeding originals in sheet form to and from an exposure window of a copying machine having: a holder for storing originals; a feed path for guiding said originals from said holder to said exposure window; a cooperating pair of rollers mounted in said feed path for conveying the originals therein; a conveyor adapted to be driven in a first direction for conveying said originals from said feed path to and over said exposure window and thereafter driven in a second and opposite direction for removing the originals from said exposure window; a discharge path for returning said originals from said exposure window to said holder; and a drive means for driving

said pair of rollers, the improvement in combination therewith comprising a mechanical coupling means mounted between said pair of rollers and said conveyor for stopping said pair of rollers or reversing the direction of rotation of said pair of rollers during or substantially during the periods of time in which said conveyor is driven in said second direction, whereby there is a fixed time relationship between the times at which the states of rotation of said pair of rollers and the conveying direction change.

4,877,232

PAPER DISCHARGE APPARATUS

Tomoyuki Nakanishi, Moriyama, Japan, assignor to Omron Tateisi Electronics Co., Kyoto, Japan

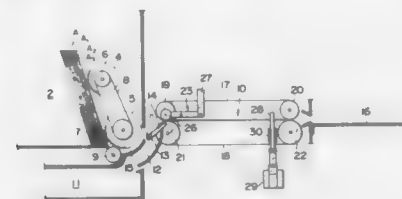
Filed Jun. 8, 1988, Ser. No. 203,813

Claims priority, application Japan, Jun. 15, 1987, 62-91624[U]

Int. Cl.⁴ B65H 3/06

U.S. Cl. 271—10

3 Claims



- 1. A paper discharge apparatus for discharging paper in sequence beginning from an endmost paper of a plurality of papers accommodated in a container, comprising:

- (a) first let-out roller means, disposed in contact with a portion adjacent to a first end of an endmost paper, for discharging the endmost paper;
- (b) second let-out roller means, disposed in contact with a portion adjacent to a second end of the same endmost paper remote from the first end, for discharging a second paper in contact therewith after said first let-out roller means has let out the endmost paper a little;
- (c) paper conveying means for conveying the paper delivered by said first and second let-out roller means to a paper discharge outlet;
- (d) means for operating said first and second let-out roller means and paper conveying means in order to feed papers from said plurality of papers in said container in an overlapped condition in which successive fed papers are shifted from one another in a direction of paper conveyance through said paper conveying means with a part of a preceding paper being superimposed upon part of a succeeding paper;
- (e) paper stopping means, movably disposed midway of said paper conveying means, for stopping paper being conveyed when moved into a paper convey path of said paper conveying means; and
- (f) paper thickness sensing means, disposed between said first let-out roller means and said paper stopping means, for detecting a thickness of paper being conveyed by said paper conveying means.

4,877,233

ROTARY VACUUM WICKETTER

Earl T. Pottorff, 2346 Taylor Rd., Savannah, N.Y. 13146

Filed Sep. 23, 1988, Ser. No. 248,134

Int. Cl.⁴ B65H 29/24

U.S. Cl. 271—196

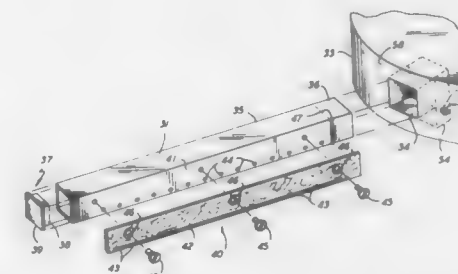
15 Claims

- 1. Rotary vacuum pickup apparatus for carrying flat work-pieces from a first work station and placing the workpieces on a wicket at a second work station; comprising
- a vacuum hub assembly formed of a stationary hub and a rotary hub superposed on one another and having a common axis,
- the stationary hub including vacuum channel means for

applying vacuum over a predetermined angular portion of the superposed rotary hub, and

the rotary hub having a peripheral surface, an axial surface in communication with the vacuum channel means of the stationary hub, and a plurality of spaced sockets which penetrate to said axial surface to communicate with said vacuum channel means; and

a plurality of radial arms mounted in the rotary hub and projecting radially outward therefrom, each said arm being a tube closed at its radial outward end, having a



male portion at its radial inward end which fits into a respective one of said sockets, and having a flat longitudinal face on the side that faces in the rotation direction of said rotary hub and which is provided with perforations therethrough so that the arm can carry said workpieces by vacuum from the first work station to said second work station; comprising the improvement herein each said arm is of uniform internal cross section from the radial outward end to and including the male portion, so that blind pockets are avoided where dust might accumulate.

4,877,234

SHEET TURNING AND REGISTRATION SYSTEM

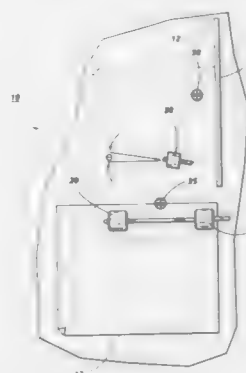
Barry P. Mandel, Fairport, N.Y., assignor to Xerox Corpora-tion, Stamford, Conn.

Filed Aug. 2, 1988, Ser. No. 227,381

Int. Cl.⁴ B65H 7/02

U.S. Cl. 271—225

7 Claims



- 1. A sheet turning mechanism having the capability of turn-ing sheets 90 degrees and registering them against a registra-tion member or passing them unturned but registered is adapted for use with a folder apparatus and characterized by at least one pair of crowned rollers that form nips with cooperat-ing idler rollers; sensor means adapted to provide a signal when blocked by a sheet to a clutch mechanism that stops one of said at least one of said pair of crowned rollers with the other of said at least one pair crowned of rollers continuing to revolve and thereby rotate each sheet 90 degrees; means for re-energizing said stopped crowned roller after each sheet has

finished rotating; and scuffer means for registering each sheet after it leaves said at least one crowned roller pair.

4,877,235

CURRENCY SORTER AND STORAGE DEVICE

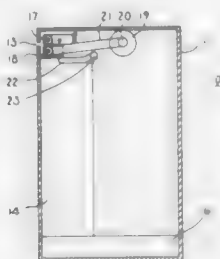
Larry A. Robinson, Boise, Id., and Richard R. Robinson, Red Feather Lakes, Colo., assignors to Tidel Systems, Inc., Carrollton, Tex.

Filed Jul. 14, 1988, Ser. No. 218,954

Int. Cl.⁴ B65H 29/22

U.S. Cl. 271-279

19 Claims



1. A currency sorter and storage device which comprises:
 - a lockable storage container having a front plate, said front plate having a plurality of currency receiving slots;
 - a plurality of currency receiving chutes disposed and aligned within said container, each for receiving and holding currency inserted into said storage container through a currency receiving slot;
 - a pair of currency rollers held in parallel spaced relationship for receiving and transporting currency inserted through said currency receiving slots to the currency receiving chutes, said rollers rotatably mounted within the storage container behind said currency receiving slots;
 - means for rotating said rollers when currency is inserted through said currency receiving slots;
 - a rotatable shaft disposed in parallel spaced relation with said currency rollers and having one end extending to the exterior of said storage container;
 - a plurality of biasing dogs radially attached to said rotatable shaft, each of said dogs disposed for radial displacement about the axes of said rotatable shaft and for downwardly biasing currency in said currency receiving chute;
 - means for biasing currency into said currency receiving chutes; and
 - means for separating currency in each chute by chronological time of insertion.

4,877,236

ROTATING PLAYGROUND EQUIPMENT ASSEMBLY

William H. Shannon, Mentone, Ala., assignor to Game Time, Inc., Ft. Payne, Ala.

Filed Dec. 14, 1984, Ser. No. 681,587

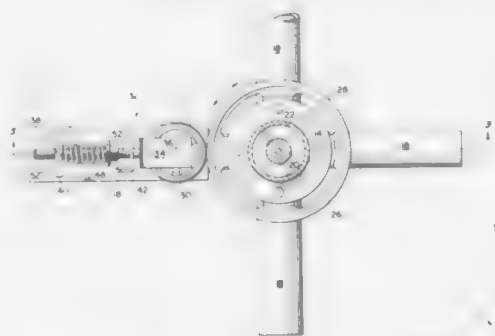
Int. Cl.⁴ A63G 1/12

U.S. Cl. 272-33 R

31 Claims

1. A rotating user-propelled playground equipment assembly comprising:
 - an equipment support base,
 - a substantially vertical spindle secured to said support base,
 - a rotatable platform assembly supported at least in part by said support base,
 - said rotatable platform assembly including a substantially vertical hub assembly rotatable about said spindle,
 - a pressure wheel rotatable about a rotation axis and positioned to rollingly engage said hub assembly, and
 - said support base including an urging means connected to said pressure wheel for urging said pressure wheel into

rolling engagement with said hub assembly and biasingly urging said rotation axis towards said hub assembly and



thereby automatically retarding the rotation of said rotatable platform assembly about said spindle.

4,877,237

MULTIPURPOSE STRUCTURE

Rowland H. Goble, P.O. Box 423, Lake Mary, Fla. 32746

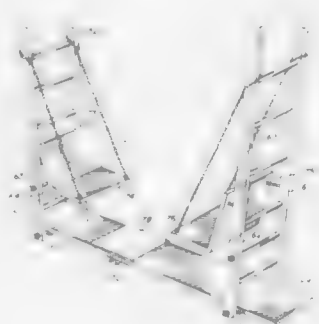
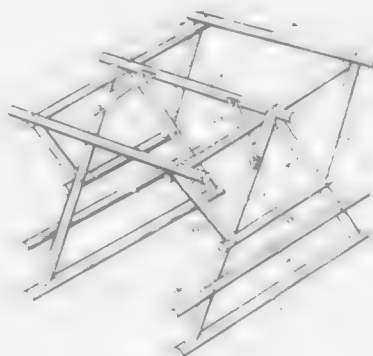
Division of Ser. No. 583,651, Feb. 27, 1984, Pat. No. 4,804,176.

This application Jan. 3, 1989, Ser. No. 293,070

Int. Cl.⁴ A63B 17/04

U.S. Cl. 272-54

7 Claims



1. A multipurpose structure comprising in combination:
 - a frame having a plurality of frame members;
 - a roof supported by said frame;
 - a first ladder member having a plurality of rungs pivoted from one end thereof to said frame;
 - a second spaced ladder member having a plurality of rungs pivoted from one end thereof to said frame;
 - means to support said first and second ladder members adja-

cent to said roof in one position for storage and in a hanging pivoting position in a second position thereof; fastener means attached to said frame for holding said first and second ladder members in a raised storage position; and

a connecting board operatively and removably connected between said first and second spaced ladder members for holding said ladder members in a predetermined spaced relationship when swinging said first and second ladder members on their pivots whereby a multipurpose structure provides for a storable swinging portion.

4,877,238

SWING EXERCISER

Arthur L. Barrett, 651 Espanita St., Long Beach, Calif. 90815

Continuation-in-part of Ser. No. 40,375, Apr. 20, 1987, Pat. No.

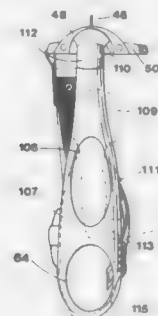
4,763,894. This application Aug. 5, 1988, Ser. No. 229,122

The portion of the term of this patent subsequent to Aug. 16, 2005, has been disclaimed.

Int. Cl.⁴ A63B 1/00; A63G 9/00

U.S. Cl. 272-70

16 Claims



1. A swing exerciser comprising:
 - a support frame;
 - a U-shaped sling formed of a unitary fabric band having a bottom with contiguous, integral and opposite sides formed by the upper ends of said fabric band which are attached to said support frame; with
 - opposite leg apertures through said fabric band at said bottom of said sling;
 - an arm aperture through said fabric band at each of said sides;
 - a back support band extending downwardly from said support frame and secured to the rear edges of said sides at the lower portion of said sling; and
 - front support means removably secured to said sides, whereby a user can be supported in said sling and secured therein with said sling enclosing the sides and back of the upper torso of the user and said front support means securely fastening said user in said sling.

4,877,239

THIGH MUSCLE STRETCHING DEVICE

Gregorio Dela Rosa, 3117 Laconia La., Aurora, Ill. 60504

Filed Jan. 3, 1989, Ser. No. 292,836

Int. Cl.⁴ A63B 23/04; A61H 1/02

U.S. Cl. 272-126

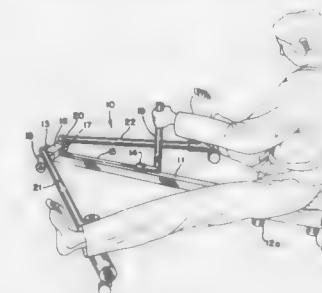
5 Claims

1. A device for aiding user stretching of adductor and other muscles of the thighs, said device comprising:
 - an elongate spine or main shaft having top and bottom sides and front and back ends;
 - a seat bottom retained on said top side of said spine adjacent said back end thereof;
 - an elongate worm gear mounted for free rotation in spatial

parallel relation to said spine adjacent said front end thereof;

user operated means for rotating said worm gear in clockwise and counterclockwise directions;

a movable housing including a threaded bore therethrough which is engaged with said worm gear to travel substantially the length of said gear; and



a pair of elongate rod members, each mounted at one end to said housing on opposing sides of said threaded bore therethrough, said elongate members each including a distal end having cushioning means thereon adapted for engaging a user's leg said mounting between each of said one ends of said elongate rod members and said housing assembly including means for pivoting each said rod member in two perpendicular planes, and any combination thereof relative said movable housing.

4,877,240

PROJECTION TOY

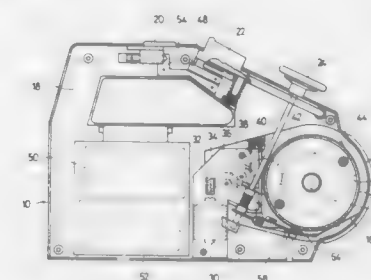
Dai Aoki, Tokyo, Japan, assignor to Nikko Co., Ltd., Tokyo, Japan, a part interest

Filed Feb. 26, 1988, Ser. No. 160,860

Int. Cl.⁴ A63F 9/14

U.S. Cl. 273-1 GA

2 Claims



1. A projection toy with a game function comprising a case body having a transparent window, a cylindrical transparent film within the case body in alignment with the window, a lamp within the cylindrical film to shine through the film to project on a remote surface an image on the film, a running game body overlying the film to cast a shadow on the remote surface in the light from the lamp, a moving plate on which the running body is mounted, means operable from the outside of the case body to move the moving plate parallel to the axis of the cylindrical film to move the position of the shadow cast by the running body in a direction parallel to the axis of the film, a rotary supporting member that carries the film for rotation about the axis of the film, an electric motor within the case body connected by gearing to the rotary supporting member to rotate the rotary supporting member and the film, the rotary supporting member having plural groove portions therein displaced from each other in a direction parallel to the axis of the film, said moving plate having a protrusion thereon that is

selectively engageable in said groove portions to temporarily stop the rotation of said rotary supporting member.

4,877,241

BASKETBALL HOOP AND NET APPARATUS

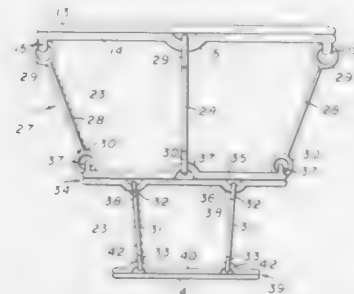
Robert Rothbard, 4900 Laurel, Bellaire, Tex. 77401

Filed Dec. 7, 1987, Ser. No. 129,184

Int. Cl.⁴ A63B 63/08

U.S. Cl. 273-1.5 R

14 Claims



1. A basketball hoop and net apparatus comprising:
 - a circular rim member;
 - a continuous circular net supporting ring member secured to the underside of said rim member and coaxial therewith and having a plurality of integrally formed circumferentially spaced semicircular depending loops about its periphery;
 - a mounting bracket secured to the outer periphery of said rim member and said ring member for mounting said hoop to a backboard;
 - a net assembly comprising a series of separate elongate rod members each having an eye at their top and bottom ends;
 - a continuous circular bottom ring smaller in diameter than said rim member secured to the bottom ends of said net assembly rod members;
 - the eyes at the top ends of said rod members slidably received each on one loop of said net supporting ring and movably captured between said rim and said net supporting ring when secured together and the eyes at the bottom ends of said rod members each movably connected by said circular bottom ring in generally vertical circumferentially spaced relation to allow a basketball to slide there-through.

4,877,242

APPARATUS FOR PLAYING BILLIARDS OR POOL

Jewell P. W. James, 4305 1/2 Lummi Shore Rd., Ferndale, Wash. 98748

Filed Oct. 15, 1987, Ser. No. 108,626

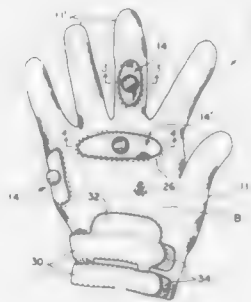
Int. Cl.⁴ A63D 13/00

U.S. Cl. 273-2

7 Claims

1. An apparatus for playing the game of billiards or pool without a cue stick comprising:
 - a glove for use on a player's hand having a palm, back and finger projections;
 - a cue adapter including a protective element having an opening disposed on said back of and attached to said glove;
 - a substrate member captively disposed within said protective element and provided with fastening means;
 - a cue insert element having a head joined to a shank;
 - fastening means on said shank mating with said substrate member fastening means to provide attachment therebetween; and

a cue cap on said cue insert head disposed at an elevation substantially spaced from said glove, whereby



a wearer of said glove may strike a cue ball directly with said cue insert element cue cap as said substrate member absorbs the shock of such striking.

4,877,243

AUTOMATIC BALL PITCHER

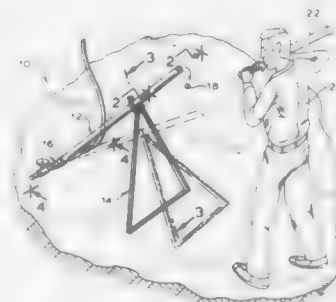
Jim Taylor, 102 S. College St., Thomasville, Ga. 31792

Filed Jun. 30, 1987, Ser. No. 68,896

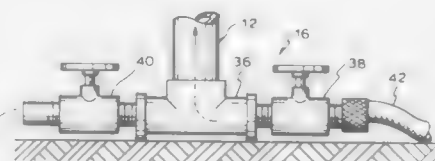
Int. Cl.⁴ A63B 69/40

U.S. Cl. 273-26 R

16 Claims



1. An automatic ball pitcher comprising:
 - a hollow elongated member having a top end and a bottom end;
 - support means for maintaining the top end at a desired height and position, said support means including means to adjust the top end of said elongated member to a variety of heights and positions;
 - a plurality of spherical objects adapted to be inserted in said elongated member; and,
 - inlet means for introducing a volume of liquid into said elongated member to cause said spherical objects to float towards and be singularly dispensed out of the top end of said elongated member.



4,877,244

BASEBALL GAME APPARATUS

Garry L. Burrows, 924 Rodman Way, and Michael R. Burrows,

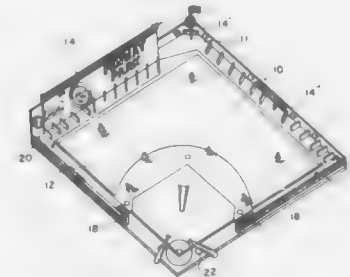
937 Rodman Way, both of, Baltimore, Md. 21205

Filed Mar. 8, 1988, Ser. No. 164,873

Int. Cl.⁴ A63F 7/06

U.S. Cl. 273-89

5 Claims



1. An apparatus resembling an actual baseball stadium having a playing surface, home plate and baseball field indicia, for playing a simulated baseball game comprising:
 - a simulated baseball;
 - hitting means including simulated bats rotatably affixed to both the left and right side of home plate;
 - pitching means for initiating and directing a pitch toward home plate;
 - fielding means including resilient indicia representing fielders affixed at designated areas on the playing surface;
 - hit valuation means;
 - means thereon for advertising products or services, said means including means to change the message as desired; whereby a simulated game of baseball is played thereon.

4,877,245

GAME APPARATUS

Kenneth A. Haynes, 55 Garden Walk, Royston, Hertfordshire,

England (SG8 7JE)

PCT No. PCT/GB87/00236, § 371 Date Nov. 30, 1987, § 102(e)

Date Nov. 30, 1987, PCT Pub. No. WO87/05820, PCT Pub.

Date Oct. 8, 1987

PCT Filed Apr. 6, 1987, Ser. No. 132,096

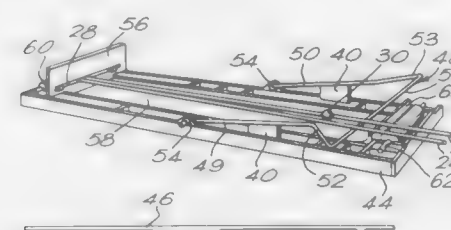
Claims priority, application United Kingdom, Apr. 4, 1986,

8608284; Nov. 14, 1986, 8627235

Int. Cl.⁴ A63B 67/14

U.S. Cl. 273-110

22 Claims



1. A game apparatus comprising frame means, a pair of rods which define a track and which are mounted on or in the frame means so as to line at a shallow upward angle to the horizontal from one end where they are mounted on or in the frame means to the other end where they are capable of relative movement, and a rolling element arranged to move along the track defined by the rods from said one end towards said other end upon relative movement of the rods, the angle to the horizontal at which the rods lie being capable of adjustment to vary the angle relative to the horizontal of the track defined by the rods, and a grid member of clear plastics material arranged to be received by the frame means and which when the rolling

element is dropped thereon restrains the rolling element from rolling movement.

4,877,246

MIXING AND DISPENSING APPARATUS FOR GAME

James Kropkowski, 1012 Henderson Blvd., Fair Lawn, N.J.

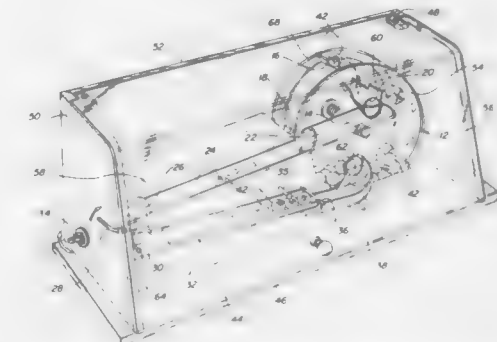
07410

Filed Jul. 8, 1986, Ser. No. 883,178

Int. Cl.⁴ A63B 71/00

U.S. Cl. 273-144 R

1 Claim



1. A device for mixing and selecting a plurality of balls said device comprising:
 - a base;
 - first and second side walls mounted on said base;
 - a back wall mounted on said base and affixed to said side walls;
 - shaft means mounted for rotation in said back wall;
 - a rotating cylindrical container coupled to said shaft means and rotatably mounted thereon;
 - a cover mounted on said shaft means, said cover enclosing said rotating container, a ramp support cover mounted on said back wall and extending outwardly therefrom to form an inclined surface;
 - ramp means for permitting the balls to pass therealong formed integrally on said ramp support cover;
 - an aperture formed in said ramp support cover for permitting said balls to pass from a first ramp to a first location;
 - a second ramp means pivotally mounted about said first location beneath said aperture;
 - means coupled to said second ramp means for pivoting same about said first location;
 - means coacting with said pivoting ramp means for inhibiting said selected balls from passing further along said pivoting ramp means when said ramp is in a first position and permitting balls to pass beneath said inhibiting means when said pivoting ramp means is in its second, pivoted position;
 - third ramp means coupled to said cover for returning said selected balls to said container on pivoting said pivoting ramp means to its second position; all of said ramp means providing a continuous path for said balls.

4,877,247

BACKGAMMON SCORE TOWER

Raymond L. Francis, P.O. Box 1015, Youngstown, Fla. 32466

Filed Oct. 24, 1983, Ser. No. 544,989

Int. Cl.⁴ A63F 9/00, 9/04, 3/02

U.S. Cl. 273-148 R

12 Claims

1. A score tower for use with a backgammon game board having a doubling cube and stones comprising:
 - (a) a body;
 - (b) thirty stones;
 - (c) means for keeping score;
 - (d) means in said body for holding said doubling cube; and
 - (e) means for retaining said stones in groups of five comprising

ing six recesses in said body, each recess having an edge slot, a bottom shoulder, and a finger groove extending into



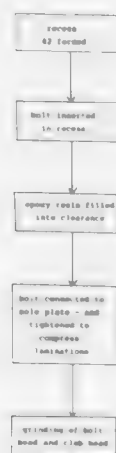
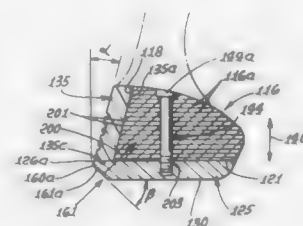
said shoulder beneath the recess, each recess having a depth equal to the thickness of five stones.

4,877,249 GOLF CLUB HEAD AND METHOD OF STRENGTHENING SAME

Stanley C. Thompson, 2702 S. Fairfax Ave., Culver City, Calif. 90231

Continuation-in-part of Ser. No. 31,535, Mar. 30, 1987, Pat. No. 4,775,156, and Ser. No. 929,099, Nov. 10, 1986, Pat. No. 4,756,534. This application May 31, 1988, Ser. No. 200,235

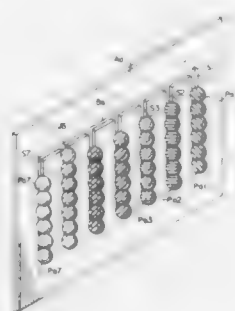
Int. Cl.⁴ A63B 53/04; B23P 9/00, 19/00; B32B 31/16
U.S. Cl. 273—169 19 Claims



1. The method of strengthening a golf club head having laminations which extend in vertically stacked relation, and generally horizontally, the head having a front face, bottom and top surfaces, and a metallic sole plate having a keel extending generally forwardly at the bottom of the head, the method including:

- forming on the keel a forwardmost surface sloping upwardly and forwardly from the bottom of the keel, to intersect the front face at a lateral linear location substantially above the bottom level of the keel,
- forming a hole in the laminations vertically between the top of the head and the keel, rearwardly of said forwardmost sloping surface,
- and clamping said laminations by bolting them together directly above the keel, and rearwardly of said forwardmost sloping surface, said bolting step including introducing a bolt downwardly into said hole and rigidly connecting the lower end of the bolt to the sole plate directly above the keel and at substantially the level of the keel forwardmost sloping surface so that a normal to said sloping surface intersects said bolt, whereby the keel forwardmost sloping surface, upon striking the ground during a golf swing, will transfer force upwardly and rearwardly toward the bolt via the head laminations.

18. An amusement device comprising a rigid, double-sided surface, a series of elongated slots, each closed at one end, and a bridging slot which interconnects the other ends of the slots, forming a common passage thereamong, a plurality of playing-pieces each freely slidable along and manipulable from any elongated slot to any other elongated slot via the bridging slot, the playing-pieces constituting a number of groups carrying thereon distinctive features including at least one of color and shape, the number of said groups corresponding to the number of the elongated slots, the number of playing-pieces of one of said groups being such that the passage of playing-pieces of other groups across a junction of the respective slot and the bridging slot is blocked when all of the playing-pieces in said one group are disposed in said respective slot, and wherein the number of playing-pieces of one group exceeds the number of the pieces in the remaining groups.



4,877,248

AMUSEMENT DEVICE WITH PLAYING PIECES REARRANGABLE IN SLOTS

Hefetz Farraj, 8 Harakevet Street, Lod, Israel

Filed Apr. 19, 1988, Ser. No. 182,929

Claims priority, application Italy, Feb. 23, 1988, 85505

Int. Cl.⁴ A63F 9/08

U.S. Cl. 273—153 S

18 Claims

4,877,250

PORTABLE GOLF PUTTING COURSE

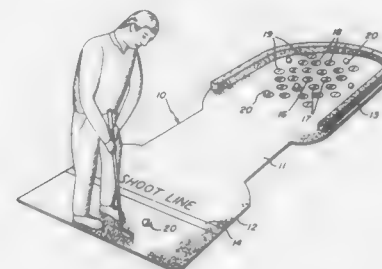
Rocco Centafanti, 27 India St., Portland, Me. 04101

Filed Feb. 8, 1988, Ser. No. 153,601

Int. Cl.⁴ A63B 69/36

U.S. Cl. 273—176 FB

1 Claim



1. A course for use in playing a game with a putter and golf balls, said course including a greens section of substantial length and having first and second ends and of uniform thickness throughout its length, said green section consisting of a flexible surface layer, a substantially thicker and flexible underlying layer of the size and shape of the surface layer, said layers united in face to face contact, the exposed material of the surface layer offering a non-deflective degree of opposition to a putt ball and provided at the second end with at least one objective painted or printed on the surface layer towards which a ball is to be putted from the first end, the width of said course such that a person about to putt may stand on the first end in a substantial range of positions transversely thereof, the underlying layer of sufficient firmness to provide non-wrinkling support for the surface layer, said course sufficiently flexible to enable the course to be formed into a roll for shipment or storage, a U-shaped retaining wall, and means detachably attaching the wall to the second end with the wall opening towards the first end with the objective spaced from but bordered by said wall, said means comprising sections of hook and eye fasteners spaced from each other on the upper surface of the greens section and the surface of the wall to be secured thereto, the hook and loop sections arranged to enable the wanted U-shape of the wall to be established when corresponding portions of the wall and of the greens sections are in mutual contact, said wall sufficiently flexible to enable the wall, when detached, to be folded upon itself for shipment or storage.

4,877,251

PUTTING DEVICE

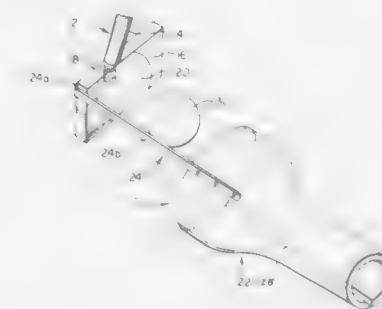
Wayne Faust, 2941 Kinwood Dr., Antioch, Tenn. 37013

Filed Aug. 19, 1988, Ser. No. 234,081

Int. Cl.⁴ A63B 69/36

U.S. Cl. 273—194 A

12 Claims



1. A novelty golf putter device comprising:
a putter including a shaft and putter head;
guide means for guiding the path of travel of a golf ball or a

facsimile thereof, after the ball is struck by the putter head; and
connecting means connecting said guide means to said putter and supporting said guide means in fixed, spaced relationship to said putter head forwardly of the putter head in the direction of movement of the putter head when striking the ball, by an amount sufficient to permit the insertion of such a golf ball or facsimile thereof between the putter head and the guide means.

4,877,252

GOLF BALLS

Michael Shaw, Wakefield, England, assignor to Dunlop Limited a British Company, United Kingdom

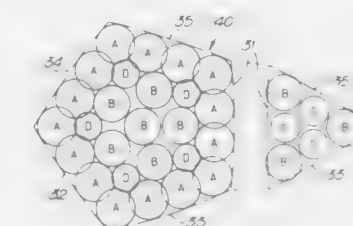
Filed Oct. 20, 1988, Ser. No. 260,069

Claims priority, application United Kingdom, Nov. 3, 1987, 8725685

Int. Cl.⁴ A63B 37/14

U.S. Cl. 273—232

10 Claims



1. A golf ball having in its spherical outer surface a plurality of dimples, wherein at least 10% of said dimples are so disposed relative to one another that any two of said dimples which are adjacent each other on said outer surface have peripheries which extend inside each other to form an overlapping region.

4,877,253

REUSABLE BINGO CARD

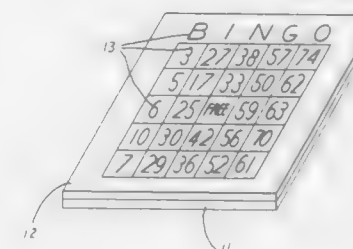
Robert P. Arens, North St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 6, 1987, Ser. No. 12,547

Int. Cl.⁴ A63F 3/06

U.S. Cl. 273—240

9 Claims



1. A repeatedly reusable Bingo card comprising sheet material having an exposed layer that is microporous and comprises an organic polymer having interconnected microvoids, said exposed layer being permanently imprinted with at least one rectangle divided into individual smaller rectangles, at least five of said smaller rectangles being permanently imprinted with a number of one or two digits, each of said numbers being substantially darker in color than the background are within said smaller rectangles, said exposed layer being bonded to a liquid-imperious support sheet having a Hunter L value on the order of 30-55, substantially darker than the background are within said smaller rectangles but substantially lighter than

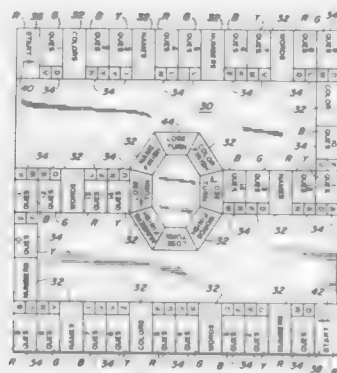
said numbers, whereby when the area within a smaller rectangle is contacted with a colorless volatile liquid that is a non-solvent for said organic polymer and has a refractive index smaller to that of said polymer, the thus-contacted portions of the microporous layer become temporarily transparent, exposing the support sheet and forming indicia that are darker than said background area but lighter than said numbers, whereby it can be determined that the area within a given small rectangle has been marked but the number therein remains visible, volatilization of said liquid restoring said Bingo card to its original appearance.

4,877,254 BOARD GAME

John J. Yancavage, 8 Gardner Ln., Mountaintop, Pa. 18707
Filed Dec. 9, 1988, Ser. No. 281,788
Int. Cl.⁴ A63F 3/00

U.S. Cl. 273-249

6 Claims



1. A board game comprising
 - (a) a plurality of separate player pieces,
 - (b) board means having a plurality of first and second spaces defining a travel path for said player pieces,
 - (c) said first spaces including indicia referring to a general subject category and said second spaces including indicia referring to a question, a number and a color,
 - (d) random chance control means for controlling the movement of said player pieces along said path of said board means, said random chance control means includes a number for determining the number of said first and second spaces to be advanced by one of said player pieces, colors corresponding to the color indicia of said second spaces and a letter of the alphabet corresponding to the letters of alphabet answer cards,
 - (e) a plurality of general subject category cards corresponding to said indicia of said first spaces with each of said general subject category cards having questions and answers thereon,
 - (f) a plurality of said alphabet answer cards corresponding to said indicia of said second spaces with said alphabet answer cards having answers to said question on said second spaces thereon with said alphabet answer cards arranged in alphabetical order and each alphabet answer card further listing answers by number, whereby during play of said board game when one of said player pieces lands on one of said second spaces, a player is asked to provide an answer to said question on said one of said second spaces beginning with the letter on said random chance control means which has the same color as the color on said one of said second spaces with the answer to said question appearing on the alphabet answer card having the same letter as said letter on said random chance control means.

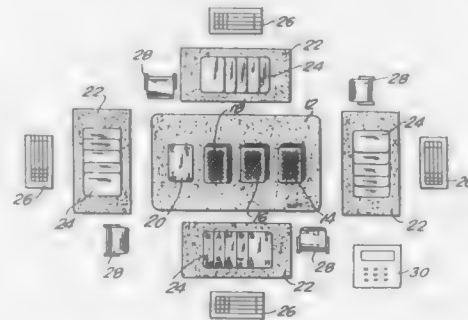
4,877,255

WORD CARD GAME

Harold von Braunkhut, P.O. Box 809, Bryans Road, Md. 20616
Filed Apr. 19, 1988, Ser. No. 183,645
Int. Cl.⁴ A63F 1/04

U.S. Cl. 273-299

12 Claims



1. A deck of symmetric playing cards, which can be held in either of two opposing orientations to provide equivalent card designations, and comprising a plurality of individual cards, each card having a front and back face, first designator means in a first location of the front face for associating a first designation to the card when retained in a first orientation, second designator means equivalent to the first designator means in an opposing location of the front face for associating a second designation to the card when retained in a second orientation opposite to the first orientation and equivalent to the first designation, said first and second designators being alphabet indicia, whereby the card is symmetric in its two orientations, first indicator means in a third location of the front face associated with said card in its first orientation for providing an indication of the second designation, second indicator means in a fourth location of the front face, associated with said card in its second orientation for providing an indication of the first designation of the card, and further comprising a numeric indication means in both orientations of the card for designating a single numeric value to each card for both first and second designations in both first and second orientations.

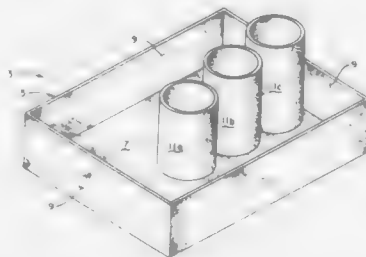
4,877,256

TOSSING GAME

David R. Falloon, 901 Pickering, Montgomery City, Mo. 63361
Continuation of Ser. No. 936,142, Nov. 28, 1986, abandoned.
This application Aug. 17, 1988, Ser. No. 233,148
Int. Cl.⁴ A63B 63/04

U.S. Cl. 273-400

3 Claims



1. A tossing game comprising a pair of spaced target areas and a plurality of projectiles tossed by one or more players from a position proximate one of the target areas to the other, each of said target areas comprising a tray having a base adapted to rest on the ground and upstanding vertical walls around the base, a plurality of vertical cups within the tray of varying height secured to the tray base, with said cups being arranged on their respective said base generally along a line

between said target areas with the ends of said target areas closest to one another constituting their front ends with their ends distal one another constituting their respective rear ends, with the shortest of said cups being in front and extending above the level of said vertical walls, with the tallest of said cups being in the rear, and positioned adjacent to and in touching relation with the rear vertical wall of the tray, and with the height of any intermediate cups progressively increasing from front to rear, said cups being in side-to-side touching relation, said cups each having a cross section ranging between about 1.2 and 2.2 times the maximum cross section of said projectile such that the cups are capable of receiving said projectiles when tossed therein, said tray having side vertical walls the distance between said cups and the side vertical walls being between about 1.2 and 2.2 times the maximum size of said projectiles so as to receive said projectiles landing within the walls of the trays on the base outside of said cups.

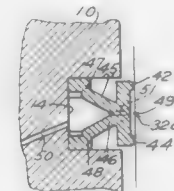
4,877,257

PISTON RING

Russell D. Ide, 28 Daniel Dr., Coventry, R.I. 02816
Continuation of Ser. No. 86,873, Aug. 19, 1987, abandoned. This application Jan. 6, 1989, Ser. No. 295,002
Int. Cl.⁴ F16J 15/32; F02F 75/06

U.S. Cl. 277-206 A

13 Claims



6. A piston and piston ring assembly comprising a piston having a predetermined diameter, the piston having at least one ring groove therein; a piston ring received in the ring groove, the piston ring comprising an outer sealing face member and an outer sealing face member support structure, the outer sealing face member having a cylindrical sealing face which has a diameter greater than the predetermined diameter of the piston, the outer sealing face member being supported within the ring groove by the support structure and extending circumferentially around the piston, the support structure supporting the sealing face such that under load the sealing face member deflects so as to form a hydrodynamic wedge.

4,877,258

FOLD BELLOWS FOR ROTATING VEHICLE DRIVE JOINT

Claus-Christian Alt, Ebersbach; Rudolf Gobel, Stuttgart; Heinz Koch, Fellbach; Wolfgang Niechoj, Weinstadt; Theodor Grossmann, Bad Ditzgenbach, and Felix Deffner, Esslingen, all of Fed. Rep. of Germany, assignors to Daller-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany
Filed Dec. 3, 1987, Ser. No. 128,182

Claims priority, application Fed. Rep. of Germany, Dec. 4, 1986, 3641393

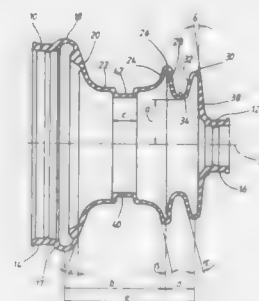
Int. Cl.⁴ F16D 3/84; F16J 3/04, 15/52

U.S. Cl. 277-212 FB

8 Claims

1. Fold bellows made of resilient material for lubricated drive joints exhibiting large bend angles, which is adapted for fastening by collars provided on its end portions both to a drive shaft and also to an external circumference of a drive joint outer section and is provided with a configuration which avoids contact between folds, and contact between a fold and a drive means extending therethrough, while at the same time providing flexibility to the bellows to accommodate flexing of the drive means, and which exhibits adjacent one end portion and close to another end portion a respective fold, a con-

stricted bellows section extending between said folds, said constricted bellows section being substantially cylindrical for an axial distance extending between said folds and which has ends which flare outwardly to meet said folds, wherein the fold adjacent the one end portion fastenable to the drive joint has the greatest diameter of all of the folds of the fold bellows,



wherein at least one further fold is provided on the substantially cylindrical constricted bellows section spaced axially from the flared ends of said constricted bellows section, and wherein the diameter of said further fold is smaller than the diameter of that fold close to the end portion fastenable to the drive shaft.

4,877,259

POWER-DRIVEN CHUCK

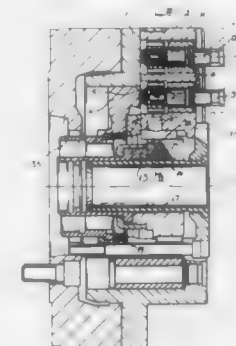
Günter H. Röhm, Sontheim, and Karl Pesch, Dillingen/Donau, both of Fed. Rep. of Germany, assignors to Günter Horst Röhm, Sontheim, Fed. Rep. of Germany
Filed Jan. 25, 1988, Ser. No. 147,716

Claims priority, application Fed. Rep. of Germany, Feb. 11, 1987, 3704135

Int. Cl.⁴ B23B 31/16

U.S. Cl. 279-123

16 Claims



1. In a power-driven chuck with a plurality of clamp jaws radially adjustable by a drive member, each of said clamp jaws comprising a jaw base operable by said drive member guided in a chuck body and a mounted jaw member removably attached to said jaw base and having at least one connecting pin with a pin axis parallel to the chuck axis which is mounted rotatable about said pin axis in said jaw base and which releases or makes a jaw member attachment between said jaw base and said mounted jaw member defined in the rotary position, at least one control rod guided longitudinally slidably in said jaw base transverse to said pin axis and a plurality of gear teeth coupling said control rod and said connecting pin with each other are provided so that the motion of said control rod relative to said jaw base converts into a rotation of said connecting pin and vice versa the improvement wherein the displacement of said

control rod in said jaw base runs parallel to the displacement of said jaw base in said chuck body, a controlling member is provided for said control rod by which said control rod is fixed in regard to said motion in said chuck body and said jaw base is slidable by said drive member with said control rod fixed to rotate said connecting pins.

4,877,260

ANTI-TIP WHEELCHAIR ACCESSORY

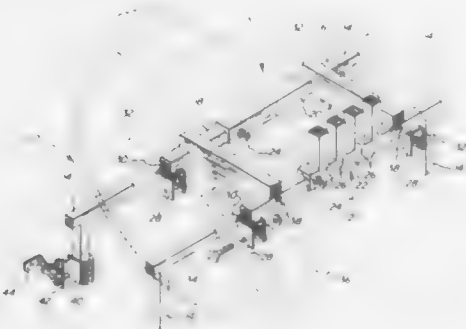
Frank S. Howland, 1187 Hillside Ave. 1 B9, Niskayuna, N.Y. 12035

Filed Nov. 30, 1988, Ser. No. 278,325

Int. Cl.⁴ B62B 5/02; A47C 1/02

U.S. Cl. 280—304.1

7 Claims



1. A wheelchair anti-tip apparatus for mounting to the frame of the chair, and ready for rapid employment, comprising:

a base having defined front, rear and lateral portions adapted to receive insertable legs proximate the corners of said base, said base adapted for mounting to the lower frame of a wheelchair;

a plurality of legs removably insertable proximate said intersecting base portions, at least two of said legs disposed outward of the rim of the wheelchair main wheels when said base is attached to said chair and said legs are inserted therein; and

height adjuster means disposed on the bottoms of the front legs of said chair, whereby when at least four of said legs are installed in said base, which is attached to a wheelchair, and the front legs of said four are extended by said adjuster means, said chair's main wheels are lifted from the contact surface and said chair is suspended between said plurality of legs in an immobile anti-tip configuration.

4,877,261

FLUID WASTE TRANSPORTER

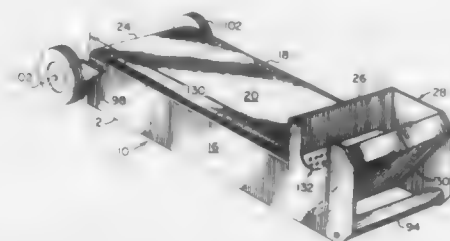
Gary J. Heisson, 86 Rockland Rd., Auburn, Mass. 01501

Filed Jun. 30, 1988, Ser. No. 213,777

Int. Cl.⁴ B62B 1/10

U.S. Cl. 280—47.26

25 Claims



1. Fluid waste transporter comprising:

(a) an elongated container having a hollow interior enclosed by walls on all sides, by a solid end wall at one end and by

centrally open end wall at the other end, and provided with a chute at said other end, said chute being open at the top and in communication with said hollow interior via a central opening formed in said centrally open end wall;

(b) a perforated partition e-r mounted in said central opening of id centrally open end wall at said other end of said elongated container and in parallel spaced relation to said end wall, said perforated partition extending across a portion of said hollow interior and separating said hollow interior from said chute;

(c) said chute provided with a fill slot in one of its sides and formed with a front side disposed at an angle to both said perforated partition and said end wall, the free edge of said front side terminating in a reentrant lip;

(d) a first handle secure to said container adjacent said chute;

(e) a second handle secured to said container adjacent its said end wall; and

(f) a pair of wheels mounted to said container adjacent said second handle about an axis located in front of said end wall such that their peripheries in conjunction with said container adjacent said chute support said elongated container at an angle to ground downwardly inclined toward said first handle.

4,877,262

CYLINDRICAL UPPER SUPPORT FOR SHOCK ABSORBER

Haruhiko Tanahashi, Toyota; Yoshikazu Tsukamoto, Komaki, and Shinji Miyakawa, Inuyama, all of Japan, assignors to Tokai Rubber Industries, Ltd. and Toyota Jidosha Kabushiki Kaisha, both of Aichi, Japan

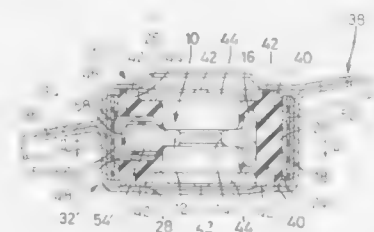
Filed Nov. 21, 1988, Ser. No. 274,340

Claims priority, application Japan, Nov. 27, 1987, 62-181781[U]

Int. Cl.⁴ B60G 13/00

U.S. Cl. 280—668

11 Claims



1. A cylindrical upper support interposed between a body of a vehicle and a piston rod of a shock absorber of the vehicle, for elastically connecting the vehicle body and the shock absorber, comprising:

a generally cylindrical or annular inner rigid member to which said piston rod of the shock absorber is fixed;

a generally cylindrical outer rigid member which is disposed radially outwardly of said inner rigid member and fixed to said body of the vehicle;

an elastic body interposed between said inner and outer rigid members for elastically connecting the inner and outer rigid members, said elastic body having two fluid chambers which are filled with a non-compressible fluid and which are formed in respective intermediate portions thereof as viewed in axial directions of said rigid members, said fluid chambers being opposed to each other in a diametric direction of said inner rigid member; and

one of said inner and outer rigid members having two wing members which extend in a substantially radial direction thereof into said two fluid chambers, respectively, such that each of said two fluid chambers is substantially divided by the corresponding wing member into two sections, and such that said corresponding wing member provides said each fluid chamber with a restricted part

through which said two sections communicate with each other.

4,877,263

HEIGHT CONTROL SYSTEM IN AUTOMOTIVE SUSPENSION SYSTEM WITH FEATURE OF CAPABILITY OF HEIGHT ADJUSTMENT IN LOCK CONDITION OF DRIVE WHEEL AND POWER TRAIN

Junkichi Konishi, and Yasuhiro Shiraishi, both of Kanagawa, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

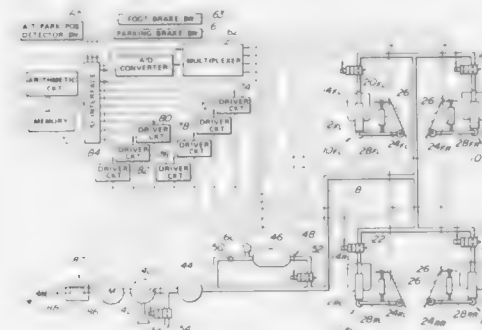
Filed Apr. 26, 1988, Ser. No. 186,223

Claims priority, application Japan, May 13, 1987, 62-71144[U]

Int. Cl.⁴ B60G 11/26

U.S. Cl. 280—707

31 Claims



1. A height control system for an automotive suspension system, comprising:

a suspension system disposed between a vehicle body and a suspension member rotatably supporting a road wheel, said suspension system including means for varying suspension force to be exerted between said vehicle body and said suspension member;

a sensor monitoring a relative distance between said vehicle body and said suspension member for producing a height indicative sensor signal;

a detector for detecting lock condition of said road wheel to produce a lock condition indicative signal; and

a controlling means for receiving said sensor signal, and checking the value of said sensor signal with respect to a predetermined value for deriving a control signal to operate said varying means to adjust said suspension force for maintaining said relative distance between said vehicle body and said suspension member at a desired value, said controlling means being responsive to said lock condition indicative signal to limit magnitude of height adjustment with a predetermined range.

4,877,264

ASPIRATING/VENTING AIR BAG MODULE ASSEMBLY

Jess Cuevas, Scottsdale, Ariz., assignor to Talley Automotive Products, Inc., Mesa, Ariz.

Filed Dec. 27, 1988, Ser. No. 290,495

Int. Cl.⁴ B60R 21/28, 21/30

U.S. Cl. 280—731

20 Claims

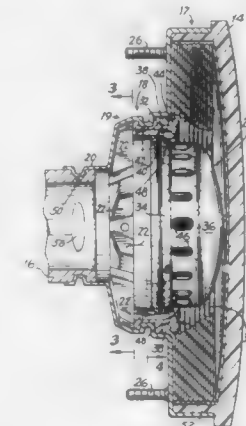
1. An airbag module adapted for installation within a motor vehicle steering assembly, said module comprising:

(a) means for mounting a pyrotechnic gas inflator device upon a steering wheel portion of said steering assembly, said inflator device capable of producing a sufficient amount of a gaseous combustion product within a sufficient time to substantially deploy an inflatable air cushion located in contact relation therewith within an interval between a primary collision between said motor vehicle and an object external thereto and a secondary collision between an operator of said motor vehicle and an interior

portion thereof, said mounting means comprising open pan means for supporting said pyrotechnic inflator device, said pan means having several stepped levels extending rearwardly thereon, wherein each said level has a substantially unvarying depth at any point thereon and is positioned directly over a next rearward one of said levels, said levels correspondingly decreasing in volume from front to rear upon said mounting means;

(b) first means, formed integral with a lower portion of said mounting means, for permitting a reciprocal flow of a quantity of surrounding ambient atmosphere from outside said motor vehicle through said mounting means and into said inflatable air cushion upon actuation of said inflator device to facilitate rapid inflation of said air cushion and to permit cooling of said gaseous combustion products produced by said inflator and, subsequent to said primary collision, to permit the contents of said air cushion to flow out of said interior portion of said motor vehicle to the surrounding atmosphere;

(c) a pyrotechnic inflator device positioned within said mounting means, said inflator device comprising a housing formed of a diffuser member having a first open end and a second closed end, and a closure plate member sealing said open end thereof, said housing further comprising an arcuate surface extending along at least a portion of an exterior peripheral surface thereof, said arcuate surface having a relatively greater diameter than a remain-



ing portion of said housing and wherein said surface is configured and adapted to permit a locking engagement of said inflator device within said mounting means;

(d) means for retaining said inflatable air cushion in a contact relation with said inflator device, said retaining means having a first upper grooved portion and a second lower grooved portion extending along at least a portion of an outer surface thereof, wherein said retaining means is installed within said mounting means in surrounding relation to said diffuser member and configured to correspond to a portion of said arcuate surface thereof; and

(e) an inflatable air cushion in contact relation with said diffuser member of said inflator device, said cushion configured and adapted for preventing injury to said vehicle operator due to contact with said interior portion of said vehicle upon the occurrence of said primary collision, said cushion comprising means located within a mouth portion thereof configured to facilitate a locking engagement between said cushion and a first grooved portion upon an outer surface of said retaining means upon assembly of said module,

wherein at least a portion of said mounting means is lockingly engaged within said second grooved portion of said retaining means forming a structural seal therebetween such that said inflator device, said retaining means and said inflatable air cushion are all maintained together in

locking engagement with one another within said mounting means without the use of any additional locking means.

4,877,265

ADJUSTABLE HEIGHT VEHICLE ROLL-OVER BAR

Stanley J. DeBraal, West Bend, Wis., and Daniel R. Nickles, Monroe, N.Y., assignors to Deere & Company, Moline, Ill.
Filed Jul. 29, 1988, Ser. No. 226,253
Int. Cl.⁴ B60R 21/13

U.S. Cl. 280—756

23 Claims



1. An adjustable roll-over bar comprising:
two substantially vertical members angled slightly towards one another;
a substantially horizontal cross-piece;
two extensions, each extension being selectively connectible to a corresponding one of said vertical members; and
two corner pieces, each corner piece having two legs, with one of said legs being connectible to an end of said cross-piece and the other of said legs being connectible to one of said extensions if said extensions are connected to said vertical members and to an upper end of one of said vertical members if said extensions are not connected to said vertical members, one leg of each corner piece being longer than the other leg by an amount sufficient to compensate for the difference in horizontal distance between the tops of said vertical members and the tops of said extensions when positioned on the vertical members.

4,877,266

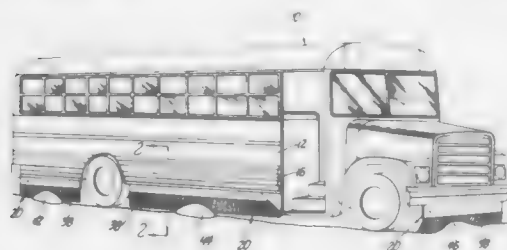
VEHICLE SAFETY SYSTEM

Ronald C. Lamparter, Grosse Pointe Shores, and Robert J. Brown, Troy, both of Mich., assignors to Transpec Inc., Troy, Mich.

Filed Nov. 14, 1988, Ser. No. 270,943
Int. Cl.⁴ B60R 13/04

U.S. Cl. 280—762

5 Claims



1. A vehicle safety device of the type wherein the vehicle includes a body (10) having a side panel (12) with a lower edge portion (14) disposed about the periphery of the body, a device secured to the body and adapted to be lowered to substantially fill the space between the lower edge of the body and the ground, and a mechanism (34-36) for selectively raising and lowering said device, the improvement wherein said device includes
a. a rigid beam member (22) extending along said body edge,

- said member having upper and lower edge portion (24 and 26) generally parallel to the lower edge (14) of the body;
b. bracket means (28) pivotally supporting the upper edge portion (24) of the beam to the body proximate the lower edge (14) thereof;
c. flexible means (38) including upper and lower portions (39 and 41),
d. means (40) containing and securing the upper portion of the flexible means to the lower edge portion (26) of said beam member (22), said mechanism (34-36) being operatively connected to said beam member (22) and to an inner flange (32) of the bracket means (28) such that the flexible means is adapted to engage an object and tend to sweep it from beneath the vehicle as the device is pivotally lowered from a retracted position.

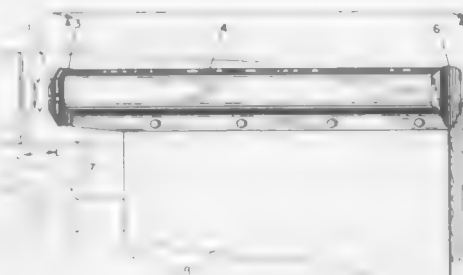
4,877,267

TRUCK MUD FLAP ARM

Charles F. Leonard, Rte. 1, Box 99, Star, Id. 83669
Filed Sep. 15, 1988, Ser. No. 245,703
Int. Cl.⁴ B12B 9/16

U.S. Cl. 280—848

7 Claims



1. A mud-flap supporting assembly for mounting a mud-flap on a vehicle comprising:
a horizontally oriented, elongated tubular support arm for supporting said mud-flap, said support arm including means for attaching said mud-flap thereto;
a mounting plate for pivotally mounting said support arm at a first end thereof to said vehicle, said mounting plate adapted for providing pivotal movement of said support arm about a vertical and a horizontal axis adjacent said first end, said mounting plate including a first lug and a support platform supporting said first lug;
spring means disposed within said tubular support arm, a first end of said spring means connected to said first lug and a second end of said spring means connected to a second lug fixedly attached to a removable outside end cap disposed at a second end of said support arm, said second lug extending lengthwise into said tubular support arm, said spring means urging said support arm against said mounting plates with sufficient force to retain said support arm in a first position, said spring means allowing said support arm to pivot about said vertical and horizontal axes out of said first position, said spring means urging said pivoted support arm to return to said first position;
an end plate fixedly attached to said first end of said tubular support arm disposed between said tubular support arm and said support plate, said end plate having an aperture formed therein, said spring means extending through said aperture, said end plate having a flat end face portion in abutting engagement with and urged against said support plate by the action of said spring means, said support plate being flat at a major area of engagement with said end plate, said aperture being similar to and encompassing said support platform when said support arm is in said first position, said support plate having edge portions for engaging said end plate during pivoting of said support arm from said first position.

4,877,268

CUSTOM MOLDED VEHICLE SPLASH GUARD AND TEMPLATE PACKAGE THEREFOR

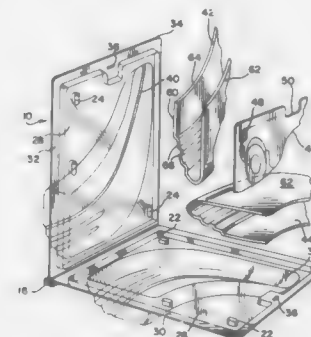
Robert A. Price, Glenview, Ill., assignor to G-P Manufacturing Co., Inc., Chicago, Ill.

Filed Oct. 19, 1988, Ser. No. 259,868

Int. Cl.⁴ B62D 25/16

U.S. Cl. 280—851

6 Claims



1. A custom molded splash guard package combination comprising:
at least a pair of left and right mirror image splash guards, said left splash guard being adapted for attachment to a fender on the left side of a vehicle, said right splash guard being adapted for attachment to a fender on the right side of a vehicle, each said splash guard having a display surface and a mounting surface, said display and mounting surfaces having a common outer edge and open inner edges and being disposed in spaced, generally parallel relationship to each other, said surfaces being joined along said common outer edge to form a pocket;
a blister package having a front portion and a rear portion, said portions adapted to be joined together along a common edge margin, each of said front and rear portions having a recess adapted to retain a respective one of said right and left splash guards therein, each of said recesses substantially resembling the configuration of a corresponding one of said display surfaces;
wherein each of said front and rear portions is adapted to be used as a template for conforming the display surface of a respective one of said right and left splash guards for attachment to the respective vehicle fender.

4,877,269

BOARD BOOK FOR PRESCHOOL CHILDREN

Jean D. Callaghan, 1332 59th Pl., LaGrange, Ill. 60525, and Robert J. Lane, Lake Bluff, Ill., assignors to Jean Davis Callaghan, LaGrange, Ill.

Filed Nov. 24, 1987, Ser. No. 124,619

Int. Cl.⁴ B42F 1/06; B42D 5/00, 1/08, 1/00

U.S. Cl. 283—40

7 Claims



1. In a board book for preschool children and having a front and a rear, said board book in its closed relation comprising:
a plurality of generally quadrilateral, essentially planar, panels of similar size and configuration, in side-by-side congruent relation,
with the panel of said panels forming the front of the book being the book front panel, and the panel of said panels forming the rear of the book being the book rear panel,

each of said panels defining a top edge, an outside edge, a bottom edge, and an inside edge.
means for binding said panels together at their inside edges forming the spine of said book and for connecting consecutive of said panels to said spine for approximately one hundred eighty degrees free swinging movement relative to said spine from positioning at one side of said spine to the other side of said spine to form the respective open relations of the book,
said book defining a top edging, an outside edging, a bottom edging, and an inside edging, with said spine being at said book inside edging,
with those of said book panels, following said book front panel, at their respective said outside edges and at the outside edging of said book, being consecutively progressively indented toward said book spine, through said rear panel, to define for each of said indented panels a recess edging exposing a panel turning surfacing portion of the panel preceding same in said book,
said panel turning surfacing portions being substantially aligned transversely of said book and comprising means for swinging the respective panels relative to said spine to provide the respective book open relations,
and with at least those of said book panels intermediate said book front and rear panels each defining a front face and a rear face each bearing indicia means for facilitating by observation preschooler sequential learning,
whereby, when the book in its closed relation is lying flat in an essentially horizontal disposed relation on said rear panel thereof, a preschooler to page through the book may consecutively swing said book panels to form the book consecutive open relations, starting with said front panel thereof, and down to said rear panel thereof, by manually and consecutively engaging the respective panel turning surfacing portions of the respective book panels, from one side of said book spine at least beyond an upright position relative to said book spine and allow such swung panel to fall flat on the other side of said spine, to dispose in substantial horizontal open book relation and expose for preschooler viewing said rear face of such swung panel and the front face of such next succeeding panel of said panels of the book, free of any manual hold down of any of said panels, free of any manual gripping by the preschooler of any of such swung panels, and free of any adult assistance in exposing said faces of said panels,
whereby such swung panel rear side, and such succeeding panel front side, in paging through the book, provide full spread areas bearing said indicia means that are consecutively openable for viewing by the preschooler paging said panels through the book from the front to the rear of the book.

4,877,270

CONNECTOR FOR TAPERED GLASS JOINTS

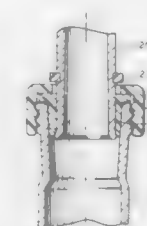
Edwin D. Phillips, 700 Cedar Ave., Middlesex, N.J. 08846

Filed Sep. 20, 1988, Ser. No. 246,735

Int. Cl.⁴ F16L 49/00

U.S. Cl. 285—18

6 Claims



1. A connector for tapered glass joints, comprising:
a first section of glass tubing having a tapered, outwardly flared sealing surface formed on an inside surface of one

end thereof, and threads formed on an outside surface of said end;

- a second section of glass tubing for connection to the first section, said second section having an end adapted to be inserted into said end of said first tubing section, and said end including a cylindrical portion with an outwardly flared terminal end defining a first retaining means;
- a replaceable, resilient sealing sleeve for concentric sealing engagement between said ends of the first and second sections of glass tubing when said end of the second section is inserted into said end of the first section in coaxial relationship with the sealing surface thereof, said sealing sleeve maintaining said first and second sections of glass tubing in spaced, non-contacting relationship with one another, said sleeve having a cylindrical inner surface for sliding engagement with the cylindrical portion of said second section of glass tubing, and a tapered outer surface for mating engagement with the tapered portion of the first section; and
- a cap having an internally threaded skirt for mating engagement with the threads on said end of the second tubing section and an end portion adapted to engage the sealing sleeve to force the sleeve into tight-fitting sealing engagement with the sealing surface in the first tubing section when the cap is tightened on the first tubing section, said outwardly flared terminal end of said second tubing section engaging said sealing sleeve to resist axial displacement of the second tubing section out of the first tubing section when the cap is tightened, and second retaining means engaged between the cap and the second tubing section to limit relative axial movement between the cap and said second tubing section for preventing the second tubing section from being displaced into said second tubing section.

4,877,271

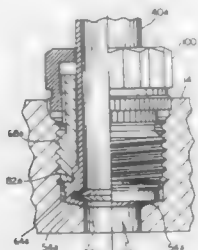
HYDRAULIC CONNECTOR

Daniel J. McCorkle, Irvine, and Tai H. Do, Fountain Valley, both of Calif., assignors to Rexnord Inc., Torrance, Calif.
Filed Apr. 1, 1987, Ser. No. 32,700

Int. Cl.⁴ F16L 35/00

U.S. Cl. 285—39

11 Claims



1. A connector for connecting a tube, for carrying fluid, to an internally threaded parent material using a tube having an external flanged portion around an end portion of the tube to be connected to the parent material, the connector comprising:

- a first member comprising:
 - a generally annular body means having upper and lower portions for encircling at least part of a tube, external threads on only the lower portion of the body means, for threadably engaging the parent material,
 - first means on the upper portion of the body means for engaging a second member,
 - a first substantially uniform surface on an interior portion of at least the upper portion of the body means for encircling the tube, and
 - a second surface in the lower portion of the body means separate from the first substantially uniform surface facing at least partly in a direction away from the upper portion

of the body means for contacting an external flanged portion on a tube; and

- a second member engaging and axially movable relative to the first member and comprising
- second means on an interior portion of the second member for engaging the first means on the upper portion of the body means of the first member for substantially preventing relative rotational movement therebetween,
- means on an external surface of the second member for axially engaging the parent material after the first member has been threaded at least partially into the parent material to substantially prevent rotation of the second member relative to the parent material, and
- means for engagement with a removal tool for moving the second member away from the first member.

4,877,272

METAL STATIC SEAL AND ASSEMBLY COMPRISING SUCH A SEAL

Marc Chevallier, Tournay, and Guy Froger, Vernon, both of France, assignors to Societe Anonyme: Societe Europeenne De Propulsion, Suresnes, France

PCT No. PCT/FR87/00100, § 371 Date Dec. 1, 1987, § 102(e) Date Dec. 1, 1987, PCT Pub. No. WO87/05978, PCT Pub. Date Oct. 8, 1987

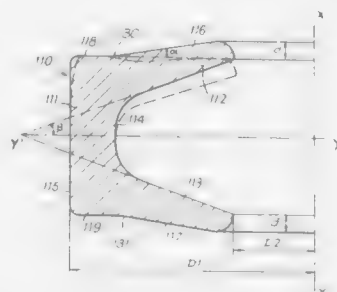
PCT Filed Mar. 31, 1987, Ser. No. 143,080

Claims priority, application France, Apr. 1, 1986, 86 04610

Int. Cl.⁴ F16L 17/06

U.S. Cl. 285—111

10 Claims



1. A generally round static seal made of a material selected from the group consisting of metal and metal alloys, presenting a unitary load with the limit of remanent elongation Re at least equal to about 60 h bar, coated with a thin layer of coating for the assembly of the seal without the interposition of a washer, having a longitudinal axis, and comprising an annular-part-forming slightly flexible semi-rigid bead and first and second wings connected laterally to the bead and extending transversely therefrom with respect to the axis of the seal, the seal presenting in axial half-section the form of a V lying on its side, the bead having two oppositely disposed planar lateral surfaces perpendicular to the axis of the seal, each wing having an outer tapered surface slightly inclined to its respective planar lateral surface of the bead and connected thereto in a gradual and regular manner to form a concave surface with a large radius of curvature, the wings and bead having an elasticity such that when the wings are flexed said bead flexes displacing said planar lateral surfaces, said wings outer tapered surfaces provide with the displaced planar lateral surfaces of the bead two sealing regions, the flexural capabilities of the wings being determined exclusively by the characteristics of the seal and remaining independent from outer connecting pieces cooperating with the seal.

4,877,273

OPERATION CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINES

Yoshio Wazaki, and Keisuke Kudo, both of Wako, Japan, assignors to Honda Giken Kogyo K.K., Tokyo, Japan

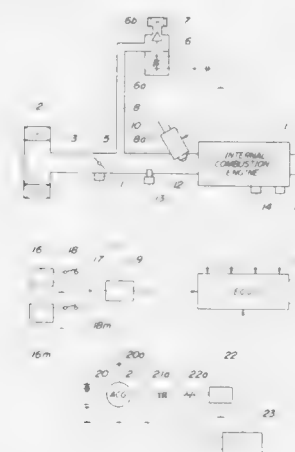
Filed Sep. 7, 1988, Ser. No. 241,700

Claims priority, application Japan, Sep. 8, 1987, 62-224811

Int. Cl.⁴ F02D 29/06

U.S. Cl. 290—40 C

7 Claims



1. In a system for controlling an operation of an internal combustion engine having an AC generator mechanically driven by said engine and having a field winding, and at least one electrical load electrically driven by said AC generator, said system including first current detecting means for detecting value of electric current flowing in said field winding of said AC generator, control amount determining means responsive to the detected value of electric current from said first current detecting means for determining a control amount by which the operation of said engine is to be controlled, and output torque changing means responsive to the determined control amount from said control amount determining means for changing output torque of said engine,

the improvement comprising:

- second current detecting means for detecting a value of electric current flowing from said AC generator to said at least one electrical load;
- transient state detecting means for detecting a transient state of said at least one electrical load, based upon the detected value of electric current from said second current detecting means; and
- transient correction amount determining means operable when said transient state is detected by said transient state detecting means, for determining a transient correction amount of the control amount determined by said control amount determining means, in response to the detected value of electric current from said first current detecting means

4,877,274

TRIGGER LOCK CAM

L. Richard Poe, Long Beach, Calif., assignor to The Hartwell Corporation, Placentia, Calif.

Filed Sep. 2, 1987, Ser. No. 92,001

Int. Cl.⁴ E05C 5/00

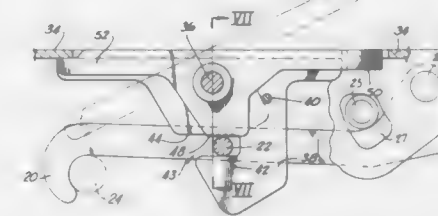
U.S. Cl. 292—113

4 Claims

1. A latch handle assembly for securing a latch having a trigger pin comprising:

- a handle pivotally joined to the latch;

a trigger latch pivotally joined to said handle and including a trigger opening engageable onto the trigger pin;



a cam pivotally joined to said handle, rotatable in relation to said handle and said trigger latch and engageable onto the trigger pin.

4,877,275

PROTECTED SLIDING BOLT LOCKING STRUCTURE

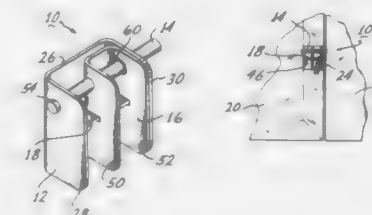
William DeForrest, Sr., 1825 Via Burton, Anaheim, Calif. 92806

Filed Jan. 19, 1988, Ser. No. 145,507

Int. Cl.⁴ E05B 67/02

U.S. Cl. 292—148

18 Claims



9. A sliding bolt locking structure which comprises:

- a housing, said housing including a back and left and right sides integrally formed with said back;
- a guide element located on said housing between said left and right sides, said guide element including at least one lock shackle hole located in said guide element;
- a member having left and right side panels, said member sized and shaped to fit in said housing between said respective sides of said housing, said left and right side panels spaced apart from each other a distance sufficient to allow positioning of a lock body between said respective side panels;

said member including a guide channel located in said side panels, said guide channel sized and shaped to fit onto and slide on said guide element whereby in a first position said shackle hole in said guide element is located between said left and right side panels of said member and in a further position said shackle hole is located exterior of one of said left or right side panels of said member;

- at least one of said respective sides of said housing including a bolt hole; and
- a bolt fixed to said member to move with said member, said bolt sized and shaped to project through said bolt hole in said one of said respective sides of said housing and to be movable in said bolt hole between extended and retracted positions in response to movement of said member on said guide element.

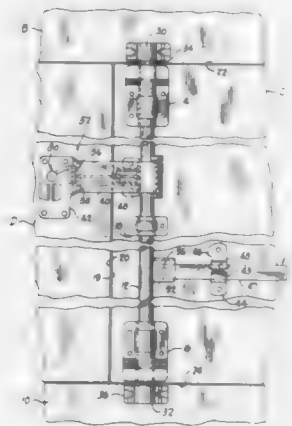
4,877,276

DOOR CONTROL MECHANISM

John V. Pastva, Parma Heights, Ohio, assignor to The Eastern Company, Cleveland, Ohio
Continuation of Ser. No. 804,885, Dec. 5, 1985, abandoned. This application May 27, 1987, Ser. No. 56,345
Int. Cl.⁴ E05C 9/08

U.S. Cl. 292-218

9 Claims



1. A door control mechanism for securing a swinging door in a closed position, said mechanism comprising a shaft having a vertical axis of rotation, bearing members adjacent to opposite ends of said shaft adapted to rotatably connect said shaft to a swinging door with the shaft axis of rotation spaced from and parallel with the pivotal axis of the door, door operating means attached to the shaft for oscillating said shaft about its longitudinal axis, discrete latch members secured to said shaft adjacent to opposite ends thereof, discrete keeper members adapted to be secured to structure adjacent to opposite edge portions of a door that extends transversely to the pivotal axis of the door, said keeper members being engagable with said latch members, and a discrete security locking means connected to said shaft intermediate the means for oscillating said shaft about its longitudinal axis and an upper end of said shaft, said locking means including a security latch member pivotably secured to said shaft for lateral movement between latched and unlatched positions upon movement with said shaft and means for engaging said pivoted latch having a first base part secured to a structure adjacent a door and a second part movably secured to the first part to engage an end of the latch member to block lateral movement of the latch member and thereby prevent rotation of said shaft by said door operating means.

4,877,277

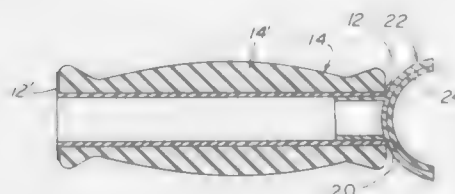
LEVER ADAPTER FOR DOOR KNOBS

Norbert Leopoldi, Chicago, Ill., assignor to The Cloverline, Inc., Chicago, Ill.

Filed Sep. 19, 1988, Ser. No. 246,333
Int. Cl.⁴ E05C 21/00

U.S. Cl. 292-347

8 Claims



1. A lever adapter for use with a door knob for converting

linear movement of a hand to the rotary movement of the door knob, comprising:

- an elongated lever having a first end and a second end;
- said second end comprising a concave, arcuate member having a radius of curvature conforming to the radius of curvature of a door knob, and a layer of means for securing said arcuate member to a door knob;
- said elongated lever comprising an inner core member, and an outer, soft rubber-like member concentrically mounted about said inner core, whereby a hand may squeeze said lever.

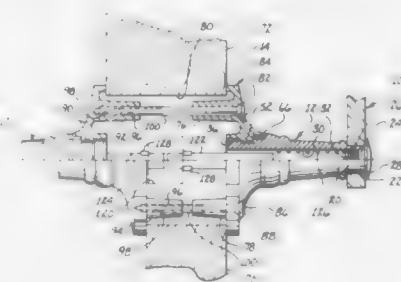
4,877,278

RETAINER FOR DOOR HANDLE

Harold J. Valley, 2046 Badger Glen, Escondido, Calif. 92025
Filed Feb. 17, 1989, Ser. No. 312,953
Int. Cl.⁴ E05C 21/00

U.S. Cl. 292-350

14 Claims



1. Apparatus for detachably attaching the end of a shaft extending from a door handle to an apertured rose having a passageway extending therethrough, said apparatus comprising in combination:

- (a) a first threaded segment disposed proximate and about the end of the shaft;
- (b) a second threaded segment disposed in the passageway of the rose for threadedly engaging said first threaded segment;
- (c) a first annular groove disposed adjacent said first threaded segment and about the shaft for receiving said second threaded segment upon insertion of the shaft in the passageway of the rose and after said first threaded segment has been axially threadedly displaced past said second threaded segment;
- (d) a second annular groove disposed adjacent said second threaded segment in the passageway of the rose for receiving said first threaded segment upon insertion of the shaft in the passageway of the rose and after said second threaded segment has been axially threadedly displaced past said first threaded segment; and
- (e) journal means for rotatably supporting the shaft within the rose when said first threaded segment is in said second annular groove and said second threaded segment is in said first annular groove.

4,877,279

STROKING FASCIA FOR VEHICLE ENERGY ABSORBING BUMPER SYSTEMS

James L. Logan, Lansing, Mich., assignor to General Motors Corp., Detroit, Mich.

Filed Sep. 3, 1987, Ser. No. 92,762
Int. Cl.⁴ B60R 19/08

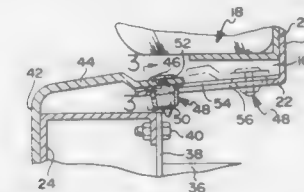
U.S. Cl. 293-121

2 Claims

1. In an automotive vehicle having exterior body work, a bumper assembly operatively disposed at one end of said body work for stroking movement from an outer position away from said bodywork to an inner position adjacent to said body work, support structure means forming part of said vehicle, energy

absorbing means operatively connecting said bumper assembly to said support structure means for movement between said inner and outer positions to absorb energy of impact loads applied to said bumper assembly, a fascia covering said bumper assembly, said body work having a plurality of laterally spaced track means formed therein, each of said track means comprising a longitudinally extending channel recessed in said body work defined by opposing side walls with a bottom wall there-

a post portion integrally formed with the free end of the arm, mounting means on the post portion for engaging the tip, a flange extending longitudinally of each arm for providing structural reinforcement of the arm, and a gusset integrally formed with the flange and post portion for providing structural reinforcement of the joint between each arm and the post portion.



4,877,281

VEHICLE INTERIOR CARGO AREA LINER

Peter B. Altmann, 3111-6th Ave., Tacoma, Wash. 98406-6216
Filed Feb. 2, 1988, Ser. No. 151,519
Int. Cl.⁴ B62D 25/00

U.S. Cl. 296-39.1

14 Claims

between and longitudinally extending slot means extending completely through said bottom wall, slide assembly means connecting said fascia to said track means so that said fascia strokes with said bumper assembly in response to impact loads applied thereto, said slide assembly means comprising resilient push-in nut means extending through said slot means having a first portion slidably received within said channel and retainer means extending through said fascia into engagement with said slide nut means.

4,877,280

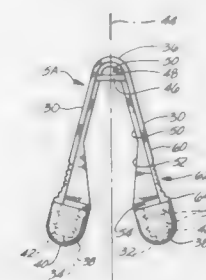
PAPER PICK-UP DEVICE

Reed Milano, 510 Valido Rd., Arcadia, Calif. 91006

Continuation of Ser. No. 859,045, May 2, 1986, abandoned, which is a continuation-in-part of Ser. No. 732,144, May 9, 1985, abandoned. This application Jun. 9, 1988, Ser. No. 208,843
Int. Cl.⁴ A47J 43/28; B25B 9/02; B25J 1/02

U.S. Cl. 294-99.2

4 Claims



- (a) a first arm having a free end and a fixed end,
- (b) a second arm having a free end and a fixed end,
- (c) hinge means integrally joining together each of said fixed ends at a point defining an apex,
- (d) a high-friction tip of a rubber-like material having a high tack attached to the free end of each arm, each tip having the form of a cap having an outwardly facing semi-spherical face portion whereby when the tips are placed against a stack of flexible paper sheets and the arms are squeezed together, a single sheet of paper is secured between the tips for lifting from the stack, and
- (e) a structural cross-member integrally formed with each arm near the apex defining an aperture between the cross-member and the apex and providing structural integrity and a pivoting fulcrum for each arm of the pick-up device adjacent the apex, each arm further including

1. A liner apparatus for covering and protecting a bed, a left and a right interior wall, a ceiling, a door, a threshold, and a bumper of a completely or partially enclosed cargo area of a vehicle, comprising:

- (a) a floor appropriately dimensioned sit upon, cover, and protect a desired area of said bed;
- (b) a left wall appropriately dimensioned to cover and protect a desired area of said left interior wall, said left wall being attached to said floor;
- (c) a right wall appropriately dimensioned to cover and protect a desired area of said right interior wall, said right wall being attached to said floor;
- (d) a front wall appropriately dimensioned to enclose a front end of said apparatus, said front wall being attached to said floor, said left wall, and said right wall;
- (e) a roof appropriately dimensioned to cover and protect a desired area of said ceiling, said roof being attached to said front, right and left walls; and
- (f) a gate attached to said floor, said gate being adjustably and removably secured to said left wall and to said right wall, said gate being capable of being adjustably raised or lowered, said gate serving as a tailgate having an adjustable height when raised and secured to said left wall and to said right wall, said gate at least partially losing an opening in said apparatus when said gate is raised, said liner supporting said gate at said adjustable height, said gate at least partially covering and protecting said threshold and said bumper when said gate is lowered.

4,877,282

FOLDABLE SEAT ASSEMBLY FOR MOTOR VEHICLE

Yoshihiko Yamauchi, Kanagawa Prefecture, Japan, assignor to Ikeda Bussan Co., Ltd., Ayase City, Japan

Filed Apr. 14, 1988, Ser. No. 181,761

Claims priority, application Japan, Apr. 17, 1987, 62-58339[U]

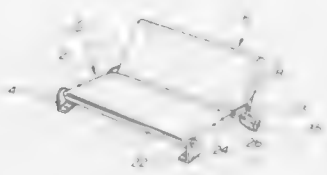
Int. Cl.⁴ B60N 1/10

U.S. Cl. 296-65.1

9 Claims

1. A foldable seat assembly comprising:
a first supporting structure;

- a second supporting structure positioned apart from said first supporting structure;
- a seatback pivotally supported by said second supporting structure so that said seatback is inclinable toward said first supporting structure;
- a first link structure pivotally connected at one end thereof to said seatback;
- a first frame member held by said first supporting structure;



- a second frame member pivotally held by said first link structure; and
- a cushion supporting member extending between said first and second frame members, said cushion supporting member dangling loosely when a distance between said first and second supporting members is reduced to a certain degree in response to the inclination of the seatback toward the first supporting structure.

4,877,283

FLEXIBLE COVER AND SYSTEM FOR ENCLOSING AUTOMOBILE HATCH

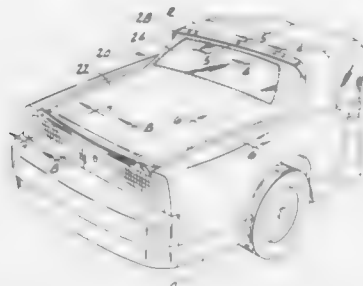
Johnny L. Little, and Vernetta Little, both of 4883 Pine Needle, Florissant, Mo. 63033

Filed Sep. 28, 1988, Ser. No. 250,348

Int. Cl.⁴ B60J 7/10

U.S. Cl. 296—100

16 Claims



1. A flexible cover system for enclosing the rear hatch opening of an automobile having a passenger compartment, an immovable roof structure over the passenger compartment and a hatch opening rearward of the immovable roof structure, the hatch opening providing communication between the passenger compartment and the environment outside the automobile and being defined by a hatch frame in the body of the automobile, the flexible cover system comprising:

- a flexible water-impermeable sheet dimensioned for covering the hatch opening, the sheet having a peripheral edge margin;

- securing means along at least portions of the peripheral edge margin of the sheet for securing the sheet tautly over the hatch opening and adjacent the hatch frame, the securing means being releasable only upon access to a designated portion of the peripheral edge margin; and
- lockable access means for restricting access to said designated portion of the peripheral edge margin such that removal of the sheet from over the hatch opening is prevented when the access means is in a locked position and permitted when the access means is in an unlocked position,

- tion, the securing means and lockable access means cooperating to prevent unauthorized removal of the sheet from over the hatch opening and unauthorized entry into the passenger compartment through the hatch opening in the absence of damage to the cover system or automobile.

4,877,284

DEVICE FOR SUPPORTING OBJECTS ON A VEHICLE DOOR

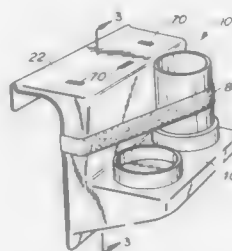
Leland R. Donne, 1786 36th Ave., San Francisco, Calif. 94122

Continuation-in-part of Ser. No. 125,947, Nov. 27, 1987, Pat. No. 4,810,026. This application Nov. 28, 1988, Ser. No. 276,927

Int. Cl.⁴ B60J 9/00

U.S. Cl. 296—153

6 Claims



1. A device for supporting objects on a vehicle door having a sill defining a slot and a door panel disposed below said sill, said device comprising:

- a downwardly extending projection positionable within said slot;

- a first support element connected to said projection and adapted to extend away from said slot and over and beyond said sill to a first location spaced from said slot, said first support element defining a first support surface;

- a connector element attached to said first support element at said first location and extending obliquely downwardly therefrom, said connector element adapted to extend downwardly along said door panel and toward said door panel, said connector element having a distal end disposed below said first support element;

- a second support element defining a second support surface, said second support element being attached to said connector element at a second location spaced from said first support element, said second support element adapted to extend away from said door panel, and said first and second support surfaces each being of a size and configuration to support objects on said vehicle door at different levels; and

- spaced side walls attached to said connector element, said side walls adapted to extend toward said door panel when said projection is in said slot.

4,877,285

OPEN ROOF CONSTRUCTION FOR A VEHICLE

Johannes N. Huyer, Velsebroek, Netherlands, assignor to Vermeulen-Hollandia Octrooten II B.V., Netherlands

Filed Jun. 3, 1988, Ser. No. 202,529

Claims priority, application Netherlands, Jun. 25, 1987, 8701491

Int. Cl.⁴ B60J 7/47

U.S. Cl. 296—216

17 Claims

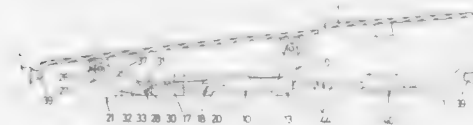
1. An open roof construction for a vehicle having an opening in its fixed roof, comprising

- a stationary guide means provided on a side of the roof opening and extending in the longitudinal direction of the vehicle;

- an adjustable panel having front and rear sides and closing the opening in the fixed roof in a closed position, and, by operating an adjusting mechanism, being capable of being

- firstly pivoted from its closed position to a position inclining upwardly in a rearward direction and thereupon being slidably movable rearwardly into positions above the fixed roof;

- a tilt out lever having lower and upper ends and being spaced from the front side of the panel, the tilt out lever being pivotally connected to the panel at said upper end; and
- a slide being slidably guided in the stationary guide means



- and being adapted to be driven by a drive means, the slide and the tilt out lever being pivotally operatively connected; and a height adjusting means carrying a pivot shaft connected to the front side of the panel and comprising a tumbler coupled to the slide and adapted to tumble in a vertical longitudinal plane; wherein said slide is a control slide not only positively controlling movement of the tilt out lever but also of the height adjusting means.

4,877,286

ADJUSTABLE WIDTH BICYCLE SEAT

Richard S. Hobson, Van Nuys, and David Potter, Los Angeles, both of Calif., assignors to J. B. Two Corporation, Minn.

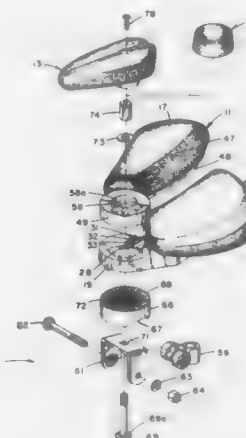
Continuation of Ser. No. 054,613, May 27, 1987. This

application Jul. 8, 1988, Ser. No. 217,054

Int. Cl.⁴ B62J 1/00

U.S. Cl. 297—195

3 Claims



1. A convertible bicycle seat comprising a support shaft, a first rider support platform, a second rider support platform, and means to adjustably secure the support platforms to said support shaft, said securement means being for secure positioning of said rider support platforms at any of selected angles with respect to each other, each of said rider support platforms including a forward ring portion that defines an opening through which said support shaft extends, said second platform support forward ring portion being superimposed over said first platform support forward portion, said support shaft having a threaded upper portion, said securement means comprising a threaded nut which is engaged with said threaded upper shaft portion to secure said first and said second rider support platforms in the selected of said angular positions, said set further including a horn portion and a button portion, one of said horn portion and said button portion being selectively secured over said threaded nut, one of said forward portions including at least one projection and the other of said forward

- portions including a recess for reception of said at least one projection thereby releasably locking said forward portions from rotational movement with respect to each other, one of said support shaft and said first platform portion including at least one projection and the other of said shaft and platform portion including recess means thereby locking said support platforms from rotational movement with respect to said shaft.

4,877,287

DEVICE FOR ADJUSTING THE POSITION OF AN ARMREST OF AN AUTOMOBILE VEHICLE SEAT

Gerard Escaravage, Valentigney, France, assignor to ECLA - Equipements Et Composants Pour L'Industrie Automobile, Audincourt, France

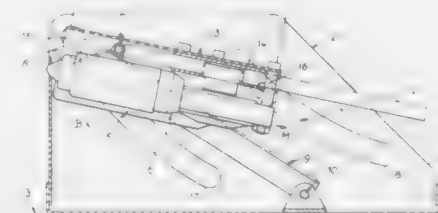
Filed Jun. 20, 1988, Ser. No. 208,615

Claims priority, application France, Jun. 19, 1988, 87 08633

Int. Cl.⁴ A47C 7/54

U.S. Cl. 297—417

7 Claims



1. Device for adjusting the position of an armrest for an automobile vehicle seat, the armrest being movable between an active position of the armrest and a retracted position of the armrest which is substantially in a plane defined by the cushion of the seat with which it is associated, said device comprising a frame for fixing to the automobile vehicle and a support structure for the armrest which is movable relative to the frame between two positions for putting the armrest in said two positions of the armrest, a reversible motor-speed reducer unit drivingly connected to the support structure for shifting the support structure between said two positions of the support structure, and control means for controlling the motor-speed reducer unit;

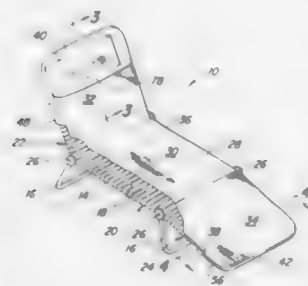
- wherein the frame has a generally a U-shape having two branches between which branches the support structure of the armrest is movable, the support structure comprising the motor-speed reducer unit, means for shifting the support structure and guide means cooperative with complementary guide means associated with the branches of the frame, the motor-speed reducer unit being cooperative with the means for shifting the support structure and therefore the armrest between said two positions; and wherein the means for shifting the support structure comprise an element constituting a rocker having one end articulated to the frame and another end, a rack which is guidedly movably mounted on the support structure, a gear pinion cooperative with the rack, an output shaft of the motor-speed reducer unit carrying the gear pinion for shifting the support structure and therefore the armrest between said two positions.

4,877,288 LOUNGE CHAIR COVER

Susan Lee, 1344 Laurel Valley, Pontiac, Mich. 48054
Filed Sep. 6, 1988, Ser. No. 240,549
Int. Cl.⁴ A47C 31/11

U.S. Cl. 297—229

11 Claims



1. A lounge chair cover for covering a conventional multiple position lounge chair of the type having a central seat portion supported on legs, a back support hinged to the seat portion and a leg support hinged to an opposite side of the seat portion, the supports and the seat portion each having a top and a bottom surface of webbing or the like, said covering comprising:

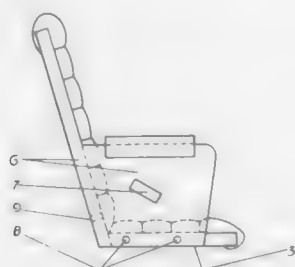
- an elongated panel of fabric having a head end, a foot end and an intermediate section dimensioned to cover substantially the entire top surface of the back support, the leg support and the seat portion, respectively;
- a pair of end flaps, each dimensioned to cover less than the entire surface area of the lower surface of one of the back support and the leg support;
- means for securing each of said end flaps to an outermost portion of a respective one of said head and leg end of said panel, forming a pocket in each of said head and foot ends, said pockets being spaced apart and each having an open edge directed inwardly so that the back support and the leg support of the chair can be inserted through said open edges and into a respective one of said pockets;
- a cover flap extending from said end flap; and
- means defining a secret pocket disposed on an underside of said cover flap and having an opening directed towards said head end.

4,877,289 CART CAR CHAIR

Manro Herrera, 11779 Francis Scobee, El Paso, Tex. 79936
Filed Jan. 23, 1988, Ser. No. 210,742
Int. Cl.⁴ A47D 1/10

U.S. Cl. 297—250

2 Claims



1. A shopping cart chair for children which consists of a chair seating part and a one piece back and side support part; said chair seating part is usable by itself or may be attached to the back and side support by means of screws to form a shopping cart chair that provides a stable and comfortable and safe restraint for children; said chair seating part having a cutout portion at its front center edge that allows the chair seating

part to fit flatly in the shopping cart and wherein portions on each side of the cutout extend separately outward, outside and away from the shopping cart, and which are wide enough and long enough to provide a resting area for the child's legs; said shopping cart chair may, along with the child, be held in place on the shopping cart by means of a safety belt which passes through holes formed in said side support part.

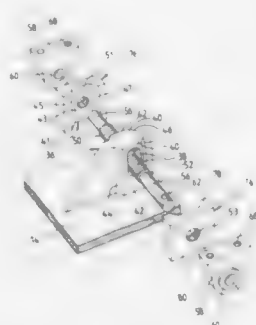
4,877,290 ROCKER MECHANISM WITH A LOCKING FACILITY

Laszlo Schettl, Jönköping, Sweden, assignor to Swing-Matic AB, Jönköping, Sweden
PCT No. PCT/SE87/00079, § 371 Date Sep. 20, 1988, § 102(e)
Date Sep. 20, 1988, PCT Pub. No. WO87/04908, PCT Pub. Date Aug. 27, 1987

PCT Filed Feb. 17, 1987, Ser. No. 250,625
Claims priority, application Sweden, Feb. 19, 1986, 8600764-8
Int. Cl.⁴ A47C 3/02, 3/00

U.S. Cl. 297—270

12 Claims



1. A rocker mechanism provided with a locking arrangement for chairs provided with rocking seats, comprising an upper part connected to the seat to pivot or rock together therewith; an underpart pivotally connected to the upper part via a pivot shaft; and rocking means for firmly locking said parts in different tilt positions relative to one another, said locking means comprising a holder connected to one of the underpart and the upper part, and which presents an opening said holder having an opening elongated in the rocking direction, and a locking rod extending through said opening and disposed parallel with the pivot shaft, said rod being rotatably journaled in the other of said underpart and upper part, said rod being provided with a lefthand and a righthand screwthread at opposite sides of said holder opening respectively, and clamping plates having corresponding screwthreads mounted for co-action with said holder, characterized in that the holder engages each clamping plate through at least one promontory and at least one recess having a shape conforming to the shape of the promontory to form respective converging and diverging flank surfaces which form guiding and locking surfaces; said converging flank surfaces of the promontories for said clamping plates, in the tightened mode of the locking arrangement abutting opposing flank surfaces of the recesses in a wedging action, said flank surfaces being curved in the rocking direction with the centre of curvature located in the pivot centre of the pivot shaft.

4,877,291 RECLINING CHAIR

William P. Taylor, 244 Lamplighter Cir., Winston-Salem, N.C. 27106

Continuation-in-part of Ser. No. 132,317, Dec. 14, 1987, abandoned. This application Nov. 1, 1988, Ser. No. 265,695
Int. Cl.⁴ A47C 1/02

U.S. Cl. 297—321

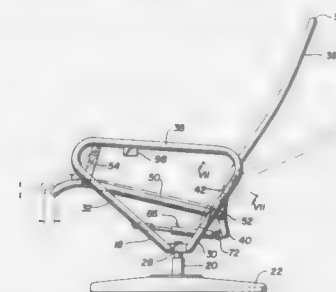
8 Claims

1. In a reclining chair including a base frame having spaced arm rest members disposed one at each side of the chair and at

least one laterally extending cross frame member rigidly connecting said arm rest members, a generally U-shaped seat frame having a front and opposed side members, a generally rectangular back frame having a top, a bottom, and opposed side members, pivot means mounting said back frame side members one on each of said arm rest members, hinge means pivotally connecting said seat side members to said back side members at points spaced below said pivot means and above said back frame bottom member, a pair of elongated link members having one end pivotally connected one to each of said arm rest members above said seat frame and the other end connected one to each of said seat frame side members, the improvement comprising

elongated fluid spring cylinder means having a first pin means pivotally connecting one end of said fluid spring cylinder means to a cross frame member beneath said seat frame at a position substantially equally spaced between said arm rest members,

second pin means pivotally connecting the other end of said



fluid spring cylinder to said back frame bottom member at a point substantially equally spaced between said back frame side members, said fluid spring cylinder normally urging said back frame to a full upright position and being compressible upon application of force to the chair back frame to move the chair back frame to a fully reclined position, the fluid spring cylinder having a predetermined fixed stroke which prevents pivotal movement of the seat back frame beyond the fully upright and fully reclined positions,

the ratio of the distance of said hinge means below said pivot means to the distance of said second pin means below said pivot means is within the range of about 0.5 to about 0.6, and

control means supported on one of said arm rest members and connected to said fluid spring cylinder, said control means being manually operable to selectively lock said air spring cylinder in any position of adjustment of the seat back frame between the fully upright and fully reclined position.

4,877,292
IMPROVED UNITARY DISPOSABLE CHAIR WITH COMFORT-CONTOURED INNER REINFORCEMENT
James R. Volpe, 2710 S. San Pedro St., Los Angeles, Calif. 90011, and James L. Kelley, 22461 St. Andrews Ave., Cupertino, Calif. 95014

Continuation-in-part of Ser. No. 947,645, Dec. 30, 1986, Pat. No. 4,811,987. This application Oct. 7, 1987, Ser. No. 106,055
Int. Cl.⁴ A47C 4/00

U.S. Cl. 297—440

19 Claims

1. A disposable chair that in a few seconds can be folded substantially flat for storage and shipment or unfolded and configured for use; said chair comprising:

four substantially contiguous and substantially rectangular panels of material that is of generally planar character, extended in only two dimensions and substantially very thin in a third dimension but sufficiently stiff and strong in the aggregate, when configured for use, to support a person; said four rectangular panels defining generally

vertical edges of substantially equal length, which length is the overall height of the chair;

one pair of the four rectangular panels being mutually of substantially equal width, which is substantially the width of the chair when in use; one of the pair forming the back of the chair, and the other of the pair having portions that respectively form the front and seat of the chair;

another pair of the four rectangular panels being mutually of substantially equal width, which is substantially the front-to-back depth of the chair when in use; each of this other pair forming one of the sides of the chair;

said four rectangular panels being joined along substantially the entire lengths of their equal-length edges, the side panels alternating with the front and back panels to form an upstanding tube of substantially rectangular plan;

a fifth rectangular panel that is disposed erect within the tube, and that;

defines two vertical edges and a horizontal upper edge, is joined along its two vertical edges to the two side panels, respectively,

is parallel and nearly equal in width to the front and back of the chair, and

is also of generally planar material that is sufficiently stiff and strong to significantly aid in supporting, and in distributing to the other four panels for support thereby, the weight of a person;

the seat-forming portion of the panel that forms the front and seat of the chair being folded downwardly and inwardly, with respect to the tube, against the back of the chair to be supported by the horizontal upper edge of the fifth panel;



each side panel being doubled over and inwardly, with respect to the tube, along a line extending generally from the top rear corner downward and forward to intersect the fold in the panel that forms the front and seat; and upper portions of the side panels being adapted for folding along additional intermediate angled lines, to permit buckling deformation of the tube out of rectangular plan and thereby to facilitate folding of said seat-forming portion upward and outward relative to the tube for shipment and storage, or downward and inward relative to the tube for

wherein the height of the fifth panel defines the height of the seat panel above the bottom of the chair, and very generally equals the difference between the overall height of the chair and said front-to-back depth of the chair; and

further comprising an intermediate generally planar vertical strip interconnecting one vertical edge of the fifth panel with a vertical edge of a first one of the side panels;

said strip standing parallel to and in generally planar contact with said first one of the side panels and being of a width that is very generally half the front-to-back depth of the chair;

further comprising a generally vertical tab, unitary with the other vertical edge of the fifth panel, that secures said other vertical edge to a second one of the side panels, which is opposite the intermediate strip;

all of said five panels, the intermediate strip and the vertical

tab being formed of a single unitary blank, one of the four first-mentioned rectangular panels being at one end of the blank and the tab being at the other end of the blank; and the panel that is at one end of the blank being secured to the intermediate strip; and

further comprising a stiffening-angle tab joined to the fifth panel along the horizontal upper edge of that panel, and folded backward and downward toward a generally horizontal orientation;

wherein the fifth panel and the stiffening-angle tab are unitary and are mutually demarcated by, in part, a transverse score along which they are mutually folded and by, in part, a generally transverse through-cut;

wherein the through-cut interrupts a segment of the score, and is at least in part offset from a projection of the score through that interrupted segment; and

wherein the offset through-cut causes part of the fifth panel below the projection of the score through said interrupted segment to function as a part of the stiffening-angle tab and to be folded toward a generally horizontal orientation together with the rest of the stiffening-angle tab.

4,877,293

LOAD BRIDGING DUMP TRAILER

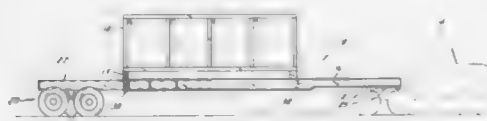
Paul H. French, Rte. 3, Box 135, and Craig P. French, Rte. 3, Box 135A, both of Surin, Wis. 54174

Filed Apr. 29, 1985, Ser. No. 728,200

Int. Cl.⁴ B62D 21/14

U.S. Cl. 298—17 R

13 Claims



1. A cargo dump trailer comprising a substantially elongate trailer frame having a coupling means at one end for coupling the frame to the fifth wheel of a vehicle, a cargo box mounted on said frame at a spaced distance from said coupling means and a rear extension frame having an axle assembly mounted thereon, said extension frame being slideably mounted in said trailer frame for movement between a first position within said trailer frame under said cargo box to a second position rearwardly from said trailer frame with said axle assembly located a distance from said cargo box equal to the distance of said coupling means from said cargo box whereby the wheel loads at the fifth wheel and at the axle assembly will be substantially equal when said rear extension frame is in the second position.

4,877,294

ELECTRO-PNEUMATIC TRACTOR-TRAILER BRAKE SYSTEM

Lawrence H. Kuhn, New Haven, and Michael B. Durant, Fort Wayne, both of Ind., assignors to Navistar International Transportation Corp., Chicago, Ill.

Filed Nov. 8, 1988, Ser. No. 268,426

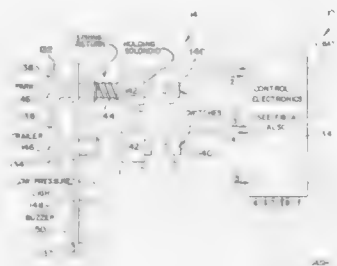
Int. Cl.⁴ B60T 13/68

U.S. Cl. 303—9

35 Claims

1. In an automotive tractor which comprises road-engaging wheels which are suspended from a powertrain-containing chassis to support the tractor for over-the-road travel and via at least certain of which the powertrain-containing chassis imparts automotive motion to the tractor, a cab supported on said chassis containing an interior space for a driver of the tractor, pneumatic-operated service brakes and spring-operated parking brakes for at least some of said wheels, a pneumatic power supply mounted on said chassis, a pneumatic circuit coupling said pneumatic power supply with said service and said parking brakes, said pneumatic circuit comprising one branch which extends from said pneumatic power supply,

through a service brake control valve disposed for operation by the driver, to said service brakes such that operation of said service brake control valve is effective to operate said service brakes, and another branch extending from said pneumatic power supply to said parking brakes, said pneumatic circuit further comprising valve means for exercising control over pneumatic-operated service and spring-operated parking brakes for road-engaging wheels of a trailer when such a trailer is coupled to said tractor for hauling and also over said parking brakes of said tractor, means coupling said valve means with said one branch such that the operation of the service brakes of such a trailer is slaved to the operation of said service brakes of said tractor via said valve means, and means coupling said valve means with said another branch such that the operation of said parking brakes of said tractor and of the parking brakes of such a trailer is effected via said valve means from a control which is on the interior of the cab and which is accessible to a



driver for selective operation of said parking brakes of said tractor and the parking brakes of such a trailer, the improvement which comprises said valve means being mounted on said chassis external to the interior space of said cab, and said control on the interior of the cab comprising an electrical control for selectively operating said parking brakes of said tractor and the parking brakes of such a trailer, said electrical control comprising electrical command means for operation by the driver, electrical circuitry coupling said electrical command means to said valve means, said valve means including an electric-actuated valve means portion to which said electrical circuitry is connected such that said electric-actuated valve means portion is under the control of said electrical command means, in which said electrical command means comprises two separate command devices, one for controlling the operating of solely the parking brakes of such a trailer and the other for controlling the operation of both the parking brakes of such a trailer and said parking brakes of said tractor.

4,877,295

ANTISKID CONTROL DEVICE

Masato Yoshino, Itami, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jul. 13, 1988, Ser. No. 218,257

Claims priority, application Japan, Jul. 16, 1987, 62-179337

Int. Cl.⁴ B60T 8/68, 8/64

U.S. Cl. 303—109

8 Claims

1. An antiskid control device for a vehicle having driven and undriven wheels comprising:

a wheel speed detecting means for detecting speeds of wheels of a motor vehicle;

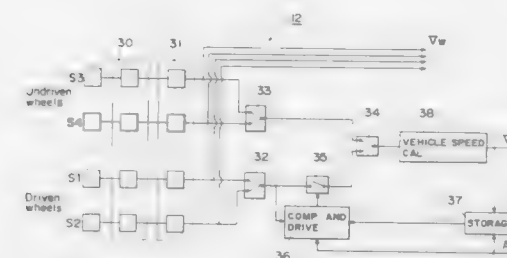
a vehicle speed estimating means for calculating a speed of a vehicle body of said motor vehicle on the basis of wheel

speed signals supplied from said wheel speed detecting means, said vehicle speed estimating means including:

a first comparator means for comparing the speeds of the wheels to select a higher wheel speed of the wheels, said first comparator means having a plurality of select-high comparators including a first select-high comparator which selects a higher wheel speed of the driven wheels, a second select-high comparator which selects a higher wheel speed of the undriven wheels, and a third select-high comparator which selects a higher wheel speed of the wheels,

a storage means for storing the speed of the vehicle body calculated at the time of the start of execution of antiskid control, and

a second comparator means for comparing the speed stored in said storage means with the higher wheel speed of the driven wheels which has been selected by said first select-high comparator of said first comparator means, said second comparator means enabling the higher wheel speed of the driven wheels to be output therefrom when the higher wheel speed of the driven wheels does not exceed the speed of the vehicle body stored in said storage means and execution of antiskid control has already started, and disabling the higher wheel speed of the driven wheels from being output therefrom when the higher wheel speed of the driven wheels exceeds the speed of the vehicle body stored in said storage means or execution of antiskid control has not yet started;



an arithmetic and locking detecting means, which performs arithmetic operations on the basis of signals supplied from said wheel speed detecting means and said vehicle speed estimating means, for issuing a first command of decreasing a brake pressure of the wheels when having detected that the wheels are in a state towards locking and issuing a second command of increasing the brake pressure, when having detected that the wheels are in a state towards recovery from locking, and

a solenoid driving means for driving a solenoid of a pressure control valve of a hydraulic circuit in response to the first and second commands from said arithmetic and locking detecting means;

wherein during nonexecution of antiskid control, said storage means and said second comparator means are not actuated, disabling the higher wheel speed of the driven wheels from being output, and a higher wheel speed of the undriven wheels is selected by said first select high comparator such that the speed of the vehicle body is calculated on the basis of said highest speed; while during execution of antiskid control, said storage means and said second comparator are actuated, enabling the higher wheel speed of the driven wheels to be output such that another highest wheel speed among the speeds of the undriven wheels and the higher wheel speed of the driven wheels lower than the speed stored in said storage means is selected by said first select high comparator such that the speed of the body is calculated on the basis of said another highest speed.

4,877,296

ANTILOCKING SYSTEM FOR A ROAD VEHICLE

Heinz Leiber, Oberriexingen, and Reinhard Reech, Stuttgart, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Jul. 18, 1988, Ser. No. 220,168

Claims priority, application Fed. Rep. of Germany, Jul. 18, 1987, 3723875

Int. Cl.⁴ B60T 8/42, 8/40, 13/68

U.S. Cl. 303—115

16 Claims



1. An antilocking system for a road vehicle having vehicle wheels with a hydraulic multiple circuit wheel brake system, comprising:

at least one closed static brake circuit which is connected to at least one wheel brake from an output pressure space of a brake booster in which an output pressure proportional to an actuation force is generated;

the connection including an inlet valve means for connecting said brake booster to a primary chamber of a pressure modulator means having a pressure output line leading to said at least one wheel brake via at least one electrical 2/2-way solenoid controllable brake pressure control valve means for controlling pressure build-up, pressure reduction and pressure maintenance phases respectively of said antilocking control system;

said at least one wheel brake connected to or closed from said output of said primary chamber of said brake pressure control valve means;

said pressure modulator means having a hydraulically driven piston pump;

a drive pressure space connected to said pressure modulator means to displace said piston pump;

an electrically controllable ABS function control valve means connecting said drive pressure space alternatively to a pressure output of a hydraulic auxiliary pressure source and to its pressureless reservoir;

said piston pump separating said primary chamber from said drive pressure space;

said piston pump being displaceable by the pressure in said drive pressure space when said inlet valve is open;

said piston pump displacement being opposed by a powerful restoring spring and against pressure prevailing in said primary chamber;

said piston pump being displaced to an end position associated with a minimum volume of said primary chamber when said drive pressure space is connected to said auxiliary pressure source by said ABS function control valve means, and to another end position associated with a maximum volume of said primary chamber of action of said restoring spring, when said ABS function control

valve means connects said drive pressure space to said reservoir of said auxiliary pressure source;

said maximum volume expansion or minimum volume reduction of said primary chamber corresponding to between 25% and 50% of a volume of brake fluid quantity which is expelled by an actuation of said brake booster with the maximum force actuation which is applied into said brake circuit;

an electronic ABS control unit means for generating control signals required for the appropriate control of said ABS function control valve means and of said at least one brake pressure control valve in response to vehicle wheel speed proportional to output signals from vehicle wheel speed sensors associated with said vehicle wheels;

said inlet valve means operating as a change over solenoid valve which in a normal non-ABS brake mode, occupies a basic position connecting said primary chamber of said pressure modulator means to said pressure output of said brake booster;

said inlet valve means controlled by output signals of said ABS electronic control unit to an excited position closing off said primary chamber of said pressure modulator means from said pressure output of said brake booster, during pressure reduction as well as pressure build-up phases of said antilocking control system; and

said inlet valve means being switched back to its basic position when said pressure modulator functions in a return feed mode at the same time as said brake pressure control valve means, connected to said modulator means, are switched back to excited positions.

4,877,297

RECONFIGURABLE OPTICAL INTERCONNECT USING DYNAMIC HOLOGRAM

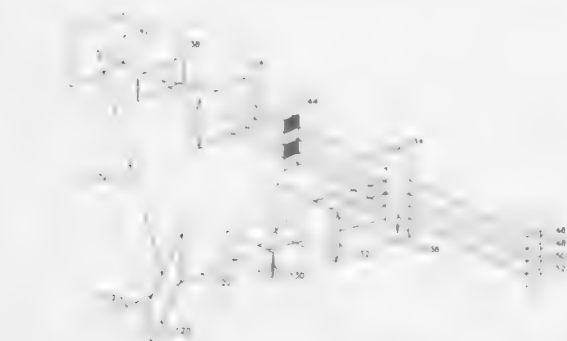
Pochi A. Yeh, Thousand Oaks, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Apr. 29, 1988, Ser. No. 187,807

Int. Cl.⁴ G02F 1/01; G03H 1/02

U.S. Cl. 350-3.68

16 Claims



1. A reconfigurable optical interconnect for coupling at least one input beam of coherent light into an array of light detectors, comprising:

- a beam splitter for dividing each input beam into a probe beam containing a relatively small portion of the intensity of the input beam and a pump beam containing a relatively large portion of the intensity of the input beam;
- a first cylindrical lens system positioned in the path of each probe beam for expanding each probe beam in a first direction perpendicular to the direction of propagation of the beam;
- a second cylindrical lens system positioned in the path of each pump beam for expanding each pump beam in the first direction;
- a spatial light modulator for varying the intensity of each expanded probe beam in the first direction; and
- a photorefractive element positioned to receive each modulated probe beam and each expanded pump beam, the

beams being oriented with respect to the photorefractive element and with respect to each other such that photorefractive two-wave mixing within the photorefractive element nonreciprocally transfers energy from each expanded pump beam to the corresponding modulated probe beam, each probe beam thereby being amplified before impinging on the detector array.

4,877,298

THIN FILM WAVEGUIDE ELECTROOPTIC MODULATOR

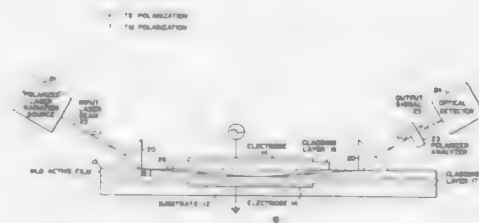
Chia-Chi Teng, Edison, and Dagobert E. Stuetz, Watchung, both of N.J., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Continuation of Ser. No. 19,369, Feb. 26, 1987, Pat. No. 4,767,169. This application Jul. 5, 1988, Ser. No. 215,193

Int. Cl.⁴ G02B 6/10; G02F 1/35

U.S. Cl. 350-96.14

3 Claims



1. A thin film waveguide electrooptic intensity modulation device comprising (1) a transparent optical waveguiding thin film on a supporting substrate, wherein the thin film comprises an organic polymer medium which exhibits nonlinear optical response, and the waveguiding thin film is laminated between two cladding layers which have a lower index of refraction than the cladded thin film; (2) a pair of optical input-output coupling means which are structurally integrated with the waveguiding thin film for coupling linearly polarized coherent electromagnetic radiation to the said thin film, wherein the coupling means are in spaced positions such that there is an optical phase shift between transverse electric mode and transverse magnetic mode of waveguided electromagnetic radiation which is an integral multiple of π and the output radiation is linearly polarized; and (3) a pair of elongated strip electrodes parallel to the waveguiding direction and situated in an intermediate zone between the positioned coupling means, and said electrodes are connected to a voltage source and are in a spaced proximity for application of a uniform electric field to the thin film waveguide; and wherein the device is adapted to modulate waveguided radiation by refractive index change in the waveguide medium in accordance with the following equations:

$$\Gamma = \Gamma_0 + \delta\phi$$

$$\frac{I_0}{I} = \sin^2 \frac{\Gamma}{2}$$

where Γ is the radiation phase retardation; Γ_0 is the radiation phase retardation by the thin film waveguide medium; $\delta\phi$ is the radiation phase shift caused by the applied voltage; I is the input electromagnetic radiation signal; and I_0 is the output electromagnetic radiation signal.

4,877,299 METAL-INSULATOR-SEMICONDUCTOR CONTROL OF GUIDED OPTICAL WAVES IN SEMICONDUCTOR WAVEGUIDES

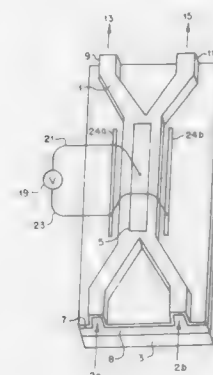
Joseph P. Lorenzo, Stow, and Richard A. Soref, Newton Centre, both of Mass., assignors to United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 15, 1989, Ser. No. 323,736

Int. Cl.⁴ G02B 6/10

U.S. Cl. 350-96.14

37 Claims



1. Apparatus for changing the refractive index of a light transmitting semiconductor waveguide comprising:

- (a) a light transmitting doped semiconductor waveguide;
- (b) an electrically insulating dielectric member in contact with and overlying at least a portion of said waveguide;
- (c) electrically conductive gate electrode means in contact with and overlying at least a portion of said dielectric member; and
- (d) voltage supply means coupled to said gate electrode means and to said waveguide for inducing depletion of mobile charge carriers within said light transmitting semiconductor waveguide.

4,877,300

NON-ADIABATICALLY-TAPERED CONNECTOR

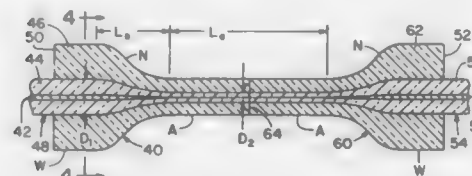
Mark A. Newhouse, Daniel A. Nolan, and David L. Weidman, all of Corning, N.Y., assignors to Corning Incorporated, Corning, N.Y.

Filed Oct. 24, 1988, Ser. No. 261,270

Int. Cl.⁴ G02B 6/26

U.S. Cl. 350-96.15

11 Claims



1. A mode field modifier for coupling light from a source positioned adjacent one of the ends thereof to a transmission optical fiber positioned adjacent the opposite end thereof, said mode field modifier comprising

- a modifier core having a refractive index n_1 ,
- cladding means surrounding said modifier core, the refractive index of said cladding means being less than n_1 , and
- a tapered region intermediate the ends of said mode field modifier, whereby said mode field modifier has a large diameter end and a small diameter end, the mode field of an optical signal propagating in one end of the modifier being modified as said signal propagates through said tapered region,

characterized in that said tapered region has a nonadiabatic

taper, whereby a significant amount of mode coupling occurs therein and in that said mode field modifier further comprises an adiabatic region of sufficient length that the relative phases of the modes at the junction between said adiabatic and tapered regions have that relationship which is necessary to substantially couple the maximum possible amount of the energy from said source to the transmission optical fiber.

4,877,301

COVERED OPTICAL WAVEGUIDE HAVING AN INLET OPENING

Kiyoshi Yokomori, and Tami Isobe, both of Yokohama, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

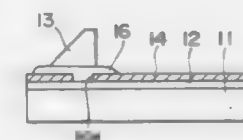
Filed Oct. 11, 1988, Ser. No. 255,702

Claims priority, application Japan, Oct. 9, 1987, 62-256089; Oct. 9, 1987, 62-256090

Int. Cl.⁴ G02B 5/14

U.S. Cl. 350-96.19

29 Claims



1. An optical waveguide device comprising:

- an optical waveguide having a first index of refraction;
- a cover layer formed on said optical waveguide at least partly from a dielectric material having a complex dielectric constant whose real component has a negative value, said cover layer being formed with an opening extending therethrough; and
- an inlet coupler element fixedly attached to said cover layer covering said opening, said inlet coupler element having a second index of refraction which is higher than said first index of refraction, whereby light incident upon said inlet coupler element is coupled into said optical waveguide through said opening.

4,877,302

PLUG CONNECTOR FOR THE ENDS OF TWO LIGHT WAVEGUIDES

Erich Schürmann, Sendenhorst, and Ulrich Grzesik, Bergisch-Gladbach, both of Fed. Rep. of Germany, assignors to U.S. Philips Corp., New York, N.Y.

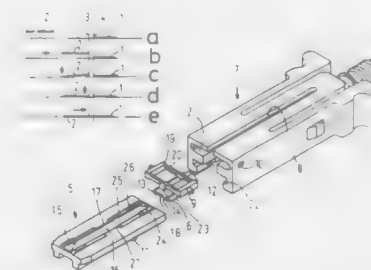
Filed Apr. 8, 1988, Ser. No. 179,104

Claims priority, application Fed. Rep. of Germany, Apr. 9, 1987, 3711965

Int. Cl.⁴ G02B 6/38

U.S. Cl. 350-96.21

30 Claims



1. A mode field modifier for coupling light from a source positioned adjacent one of the ends thereof to a transmission optical fiber positioned adjacent the opposite end thereof, said mode field modifier comprising

- a modifier core having a refractive index n_1 ,
- cladding means surrounding said modifier core, the refractive index of said cladding means being less than n_1 , and
- a tapered region intermediate the ends of said mode field modifier, whereby said mode field modifier has a large diameter end and a small diameter end, the mode field of an optical signal propagating in one end of the modifier being modified as said signal propagates through said tapered region,

characterized in that said tapered region has a nonadiabatic

1. A plug connector for the ends of two light waveguides which are connected to holders and can be pressed in the guide groove of a guide element and can be pressed against each other with their end faces by means of a longitudinal resilient element, wherein the guide devices are constructed so that at least one of the ends of the second light waveguide (2) can first

be moved with a free space over the guide groove over such a distance towards the other light waveguide (1) that a small axial distance remains between the end faces of the two light waveguides that one light waveguide (2) can then be pressed into the guide groove while maintaining said small axial distance, and by further movement of the pressed second light waveguide (2) in the guide groove a resilient engagement of the end faces of the two light waveguides (1, 2) to be connected is then obtained.

4,877,303

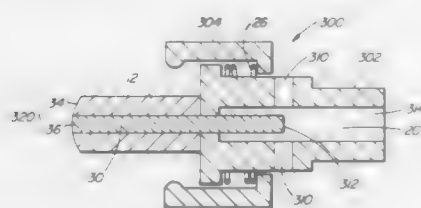
FIBER OPTIC CONNECTOR ELEMENT & METHOD FOR ITS USE

Kevin G. Caldwell, Kanata; Steve J. Lichynsky, and Elza V. Bagi, both of Ottawa, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Sep. 22, 1988, Ser. No. 247,465
Int. Cl.⁴ G02B 6/38; G03B 23/20

U.S. Cl. 350—96.21

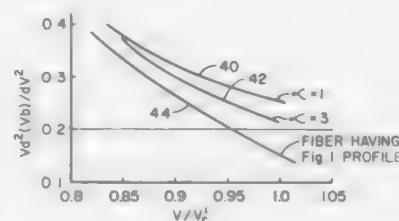
17 Claims



1. An optical fiber connector element for terminating an optical fiber cable, the connector element comprising: a connector body having a passage extending therethrough, the passage having a forward portion for receiving an optical fiber and a rearward portion which is wider than the forward portion for receiving an optical fiber and surrounding protective material; and an optical fiber stub secured within the forward portion of the passage, the optical fiber stub having a forward end surface which has an optical finish; wherein the connector body has at least one lateral opening exposing a rearward end of the optical fiber stub for providing access to the rearward end of the stub by fusion splicing equipment; and wherein the rearward end of the optical fiber stub is within the forward portion of the passage and the opening provides access to the forward portion of the passage.
2. A method for terminating a fiber optic cable with a fiber optic connector element, the method comprising: providing an optical fiber connector element by:

- providing a connector body having a passage extending therethrough, the passage having a forward portion for receiving an optical fiber and a rearward portion which is wider than the forward portion for receiving an optical fiber and surrounding protective material;
- securing an optical fiber stub within the forward portion of the passage, the fiber stub having a forward end portion which extends beyond a forward end surface of the connector body;
- trimming the forward end portion of the fiber stub at the forward end surface of the connector body to define a forward end surface of the fiber stub; and
- polishing the forward end surface of the fiber stub to an optical finish; cutting the cable to a desired length; stripping back an end portion of protective material surrounding an optical fiber of the cable to expose an end portion of the optical fiber; and
- securing the exposed fiber end portion and an end portion of the protective material remaining on the fiber in the connector body passage with the fiber end portion in abutment and axial alignment with the fiber stub.

4,877,304
FEW-MODE/SINGLE-MODE FIBER
Venkata A. Bhagavatula, Big Flats, N.Y., assignor to Corning Incorporated, Corning, N.Y.
Continuation-in-part of Ser. No. 94,504, Sep. 9, 1987, abandoned. This application May 23, 1988, Ser. No. 197,594
Int. Cl.⁴ G02B 6/02, 6/16
U.S. Cl. 350—96.29 45 Claims



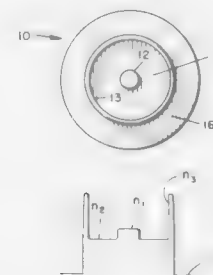
1. An optical fiber comprising a core of transparent material having a maximum refractive index n_1 and a radius a , and a layer of transparent cladding material on the outer surface of said core, the refractive index n_0 of said cladding being less than n_1 , said fiber being characterized in that the refractive indices n_1 and n_0 , the radius a , and the refractive index profile of the core are designed such that
- (a) $-\tau_j$, the difference between $|d(Vb)/dV|_j$, the normalized delay time of the j th mode and $|d(Vb)/dV|_0$, the normalized delay time of the fundamental mode, is less than about 5×10^{-2} over a range of V -values equal to about 10% of V near V/V_c , where j is an integer up to 2 and represents the highest order mode that is capable of propagating through said fiber, 0 represents the fundamental mode, b is the propagation constant and V is the normalized frequency, and V/V_c is the normalized cutoff frequency of the $j+1$ mode, and
- (b) the normalized waveguide dispersion $Vd^2(Vb)/dV^2$ is about equal to or less than 0.2 at V -values near V/V_c , the normalized cutoff frequency of the first higher order mode.

4,877,305
FIBER OPTIC LIGHT MODE MIXER
Robert H. Ricciardelli, 2213 Cottage Ct., Waukesha, Wis. 53188
Filed Mar. 9, 1988, Ser. No. 165,693
Int. Cl.⁴ G02B 5/14
U.S. Cl. 350—96.30 6 Claims



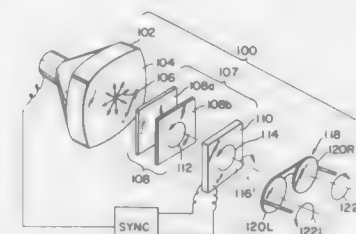
1. An apparatus for mixing modes of light transmitted through an optical fiber, comprising: a length of single fiber optic material configured in a generally circular spiral shape, the spiral having at least two coils, each coil being splayed so as to be not co-planar with another coil.

4,877,306
COATED OPTICAL WAVEGUIDE FIBERS
Glimmoy Kar, Painted Post, N.Y., assignor to Corning Glass Works, Corning, N.Y.
Filed Sep. 30, 1987, Ser. No. 103,032
Int. Cl.⁴ G02B 6/22
U.S. Cl. 350—96.33 17 Claims



1. An optical waveguide fiber comprising: (a) a glass core; (b) a glass cladding which includes a layer in the region of its outer surface which has an index of refraction and an absorption coefficient which are greater than the index of refraction and the absorption coefficient of the remainder of the cladding; and (c) a polymeric protective coating which is in direct contact with the outer surface of the cladding and which has an index of refraction which is less than the index of refraction of the layer and less than the index of refraction of the remainder of the cladding.

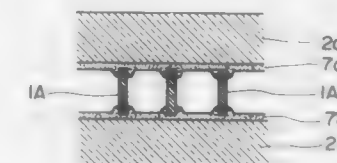
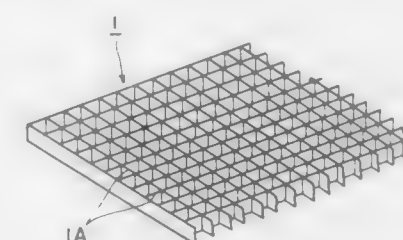
4,877,307
STEREOSCOPIC DISPLAY
Michael H. Kalmanash, Los Altos, Calif., assignor to Kaiser Aerospace & Electronics Corporation, Oakland, Calif.
Filed Jul. 5, 1988, Ser. No. 215,260
Int. Cl.⁴ G02B 27/26; H04N 13/00
U.S. Cl. 350—132 17 Claims



1. A stereoscopic display, comprising: projector means for sequentially projecting, at a projection rate sufficient to avoid objectional flicker, alternate ones of successive pairs of substantially monochromatic images corresponding to right-eye- and left-eye-perspective views of a scene, each said image having a wavelength of about L_0 ; variable polarizer means operated synchronously with said projector means for circularly-polarizing alternate ones of said images in each said pair in opposite senses; and binocular eyewear, comprising: a pair of circular polarizing elements having opposite senses, each said element containing a cholesteric liquid crystal material having a refractive index of about n and a pitch of about p , where $n \gg p/L_0$, and wherein said polarizing elements are each disposed within said eyewear to transmit corresponding ones of said

polarized images to a corresponding eye, and to reflect oppositely-polarized ones of said images therefrom.

4,877,308
LIGHT SHIELDING SCREEN STRUCTURE AND A PROCESS FOR PRODUCING THE SAME
Osamu Okuno, Chigasaki, and Shigeru Sugiyama, Fuji, both of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan
Filed Jun. 2, 1988, Ser. No. 201,467
Claims priority, application Japan, Jun. 24, 1987, 62-155511
Int. Cl.⁴ G02B 27/00
U.S. Cl. 350—276 R 10 Claims



1. A light shielding screen structure comprising: a first light transmissible substrate; a second light transmissible substrate; and a light shielding screen interposed between said first light transmissible substrate and said second light transmissible substrate, said light shielding screen comprising a photocured resin composition layer and a plurality of apertures passing through said resin composition layer, said apertures in said resin composition layer forming a perforated structure of a striped or sectioned pattern, in which said resin composition layer constitutes partition walls defining said apertures, said apertures having their respective upper and lower openings respectively defined by the upper and lower ends of said partition walls, the upper and lower end surfaces of said partition walls being connected respectively to said first light transmissible substrate and said second light transmissible substrate through a photocured adhesive layer, with part of the photocured adhesive layer which protrudes outwardly from the areas of the upper and lower end surfaces of said partition walls forming a fillet in each aperture at a corner portion which is defined by the inner wall of each aperture and the inner surface of each light transmissible substrate, the connection between each partition wall and each light transmissible substrate having a peeling strength of 50 g/cm or more, and said fillet having a width of not greater than 5 μ m.

4,877,309

COLOR LIQUID CRYSTAL DISPLAY UNIT

Toshiaki Takamatsu, Yamatokoriyama, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

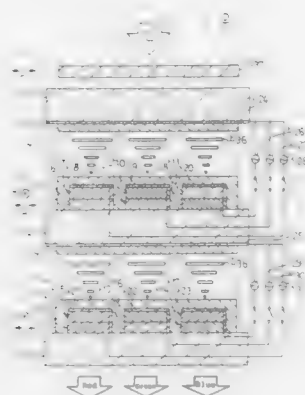
Filed Dec. 8, 1987, Ser. No. 130,110

Claims priority, application Japan, Dec. 8, 1986, 61-292107; Feb. 10, 1987, 62-28560; Apr. 22, 1987, 62-99322; Jul. 13, 1987, 62-174439; Aug. 19, 1987, 62-205383

Int. Cl.⁴ G02F 1/13

U.S. Cl. 350—337

6 Claims



1. A color liquid crystal display device, comprising: a first liquid crystal display cell having a liquid crystal material disposed between first and second substrates; first and second color polarizers disposed over said second substrate, said first and second color polarizers each containing at least one color which is the complement of the color contained by the other color polarizer, and having polarization axes oriented at right angles to each other; a second liquid crystal display cell having a liquid crystal material disposed between said second substrate and a third substrate and having picture elements aligned with said first display cell; third and fourth color polarizers disposed over said third substrate, said third and fourth color polarizers each containing at least one color which is the complement of the color contained by the other color polarizer and which is different from the colors contained by said first and second color polarizers of corresponding picture elements, and having polarization axes oriented at right angles to each other; and a neutral polarizer having a polarization axis parallel to a predetermined polarization axis of one of said first and second, and said third and fourth color polarizers, disposed on an incident light side of said first substrate.
2. A color liquid crystal display device, comprising: a first liquid crystal display cell having a liquid crystal material disposed between first and second substrates; a second liquid crystal display cell having a liquid crystal material disposed between said second substrate and a third substrate; picture elements of said first and second display cells being aligned; a pair of color polarizers disposed on each of said second and third substrates, each pair of color polarizers having polarization axes oriented at right angles to each other, each of said pair of color polarizers disposed on said second substrate containing at least one color which is complementary to a color contained by a corresponding color polarizer disposed on said third substrate; and a neutral polarizer having a polarization axis parallel to a predetermined one of said pairs of color polarizers disposed on an incident light side of said first substrate.

4,877,310

ELECTRONICALLY VARIABLE MTF FILTER FOR IMAGE SENSOR ARRAYS

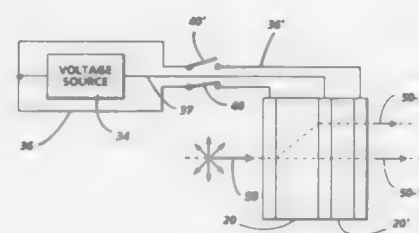
Ned J. Seachman, Penfield; Joseph P. Taillie, Rochester, and Gary A. Dir, Fairport, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 4, 1988, Ser. No. 228,077

Int. Cl.⁴ G02F 1/13; G02B 27/42

U.S. Cl. 350—347 E

6 Claims



1. An image input scanner having at least one sensor array for scanning and converting images to electrical signals, and means providing an optical path for focusing image rays to the image being scanned on the array, the combination of: (a) a birefringent MTF filter stationarily disposed in said optical path for filtering said image rays, said filter including: (1) a pair of transparent plates, (2) a liquid crystal cell between said plates, and (3) a transparent electrode between each of said plates and said liquid crystal cell, (b) a source of electrical potential adapted when coupled to said electrodes to switch said filter from a non-filtering state to a filtering state; and (c) control means for selectively coupling said electrodes to said source of electrical potential to filter said image rays.

4,877,311

LASER POWER MONITORING OPTICS FOR A RING LASER GYROSCOPE

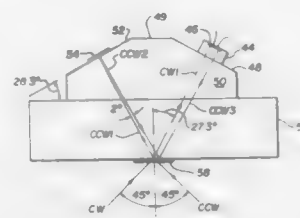
Donald I. Shernoff, White Plains, N.Y., assignor to Kearfott Guidance & Navigation Corporation, Wayne, N.J.

Filed Jan. 19, 1988, Ser. No. 145,021

Int. Cl.⁴ G01C 19/64

U.S. Cl. 356—350

10 Claims



1. In a ring laser gyroscope assembly having a plurality of mirrors, a monitor assembly for monitoring the power of two laser beams circulating in a cavity along one axis of the gyroscope assembly, the monitor assembly comprising: beam combiner means including multiple facets mounted on a light transmissive block, the light transmissive block having a mirror means attached coplanarly to a surface thereof opposite the surface onto which the beam combiner means is mounted, the laser beams circulating within the cavity striking and refracting through the mirror photodetector means mounted on a first facet of the beam combiner means for directly intercepting one of the beams refracting through the mirror means, the photodetector

means measuring the power of the directly intercepted beam; and reflective means mounted on a second facet of the beam combiner means for intercepting the other of the beams refracting through the mirror means, and for reflecting the thus intercepted other beam back to the mirror means, the mirror means reflecting the reflected other beam toward the photodetector means; wherein the photodetector means, upon impingement thereof of the twice reflected other beam, measures the power of the other beam and sums the same with the measured power of the directly intercepted beam; and wherein the second facet is so angled that the reflective means mounted thereon reflects the other beam back to the mirror means at a position thereof which is different from the position at which it and the directly intercepted beam refracted through so that the directly intercepted beam and the other beam strike said photodetector means at diverging angles.

4,877,312

BISTABLE OPTICAL PHOTOREFRACTIVE CRYSTAL DEVICE

Jean P. Huignard, Paris, and Jean P. Heriau, Bures Sur Yvette, both of France, assignors to Thomson-CSF, Paris, France

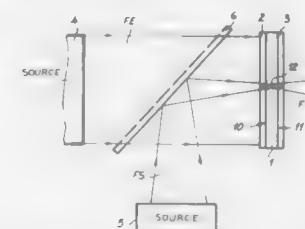
Filed Dec. 8, 1987, Ser. No. 130,176

Claims priority, application France, Dec. 9, 1986, 86 17208

Int. Cl.⁴ G02F 1/01

U.S. Cl. 350—354

5 Claims



1. An optical bistable photorefractive crystal device including: a photorefractive crystal with a first and a second face; a first mirror applied to the first face; a second mirror applied to the second face; a first light source which emits a light beam illuminating the first face uniformly with a given intensity through the first mirror; at least a second light source which emits a control signal beam of given intensity, also illuminating the first face through the first mirror and focused on a given portion of the photorefractive crystal so as to cause bistable switching of this photorefractive crystal portion.

4,877,313

LIGHT-POLARIZING MATERIALS AND SUSPENSIONS THEREOF

Robert L. Saxe, New York, and Robert I. Thompson, Plainview, both of N.Y., assignors to Research Frontiers Incorporated, Woodbury, N.Y.

Continuation-in-part of Ser. No. 913,516, Sep. 30, 1986, abandoned, which is a continuation-in-part of Ser. No. 742,797, Jun. 10, 1985, abandoned. This application Feb. 10, 1989, Ser. No. 309,693

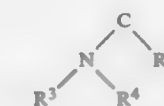
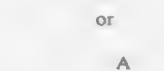
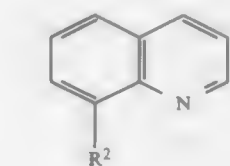
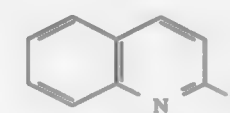
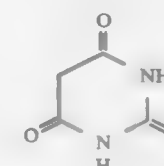
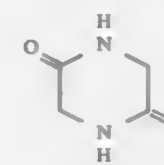
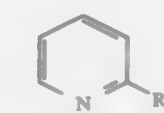
Int. Cl.⁴ F21V 9/14; G02B 5/22, 5/30

U.S. Cl. 350—391

16 Claims

1. A light-polarizing material containing adsorbed iodine, comprising complex obtained by reacting (i) elemental molecular iodine, (ii) a hydrohalic acid and/or an ammonium or

alkali metal or alkaline earth metal halide and (iii) a compound having the formula:



wherein R¹ is carboxy, hydroxy, 2-pyridyl or lower alkyl substituted by carboxy or hydroxy; A is alkylene forming with the depicted carbon atom a carbocyclic ring; R² is carboxy, hydroxy, or lower alkyl substituted by carboxy or hydroxy; and R³ and R⁴ are independently hydrogen or lower alkyl.

4,877,314

OBJECTIVE LENS SYSTEM FOR ENDOSCOPES
Iwao Kanamori, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

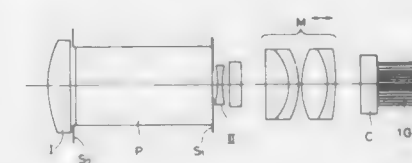
Filed May 24, 1988, Ser. No. 198,057

Claims priority, application Japan, May 25, 1987, 62-125859

Int. Cl.⁴ G02B 15/06, 9/60, 9/62

U.S. Cl. 350—422

16 Claims



1. An objective lens system for endoscopes having a field angle of 40° or smaller and comprising a first lens component

arranged on the extreme object side in said objective lens system and having positive refractive power as a whole;
a master lens arranged on the extreme image side in said objective lens system and having positive refractive power and comprising a lens component arranged on the extreme object side in said master lens and having positive refractive power and an aperture stop arranged between said first lens component and said master lens.

4,877,315

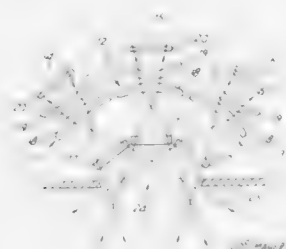
OPTICAL DEVICE

William R. Bradford, Camberley, England, assignor to Thorn Emi Electronics Limited, Hayes, United Kingdom
Filed Apr. 19, 1988, Ser. No. 183,245
Claims priority, application United Kingdom, Apr. 22, 1987, 8709528

Int. Cl.⁴ G02B 13/06, 13/14

U.S. Cl. 350—451

8 Claims



1. An optical device for panoramic viewing comprising a housing provided with an entry window, a plurality of spaced receptive areas and a lens system for each receptive area, each lens system being so disposed that it lies between the entry window and the associated receptive area, the lenses within each said system being arranged so that an image of a respective sector of a panoramic scene produced by radiation from the scene passing through the window is formed at each receptive area, at least part of the respective radiation beams entering each lens system crossing at the entry window.

4,877,316

TELEMICROSCOPIC APPARATUS FOR SIGHTING AND BI-LEVEL VIEWING

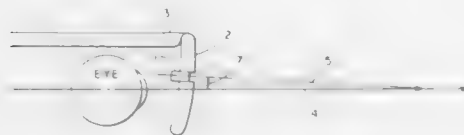
D. Brandon Edwards; Bruce W. Edwards, both of Virginia Beach; Ian D. Howard, Norfolk, and Donald H. Ives, Chesapeake, all of Va., assignors to Edwards Optical Corporation, Virginia Beach, Va.

Filed Dec. 18, 1987, Ser. No. 134,794

Int. Cl.⁴ G02B 23/00, 23/12

U.S. Cl. 350—537

25 Claims



1. Telemicroscopic apparatus comprising a telemicroscope mounted to a carrier for positioning of the telemicroscope in front of a person's eye, the telemicroscope being of small outer diameter and mounted such that the person is able to view and perceive a principal image of an object and a clear magnified image of the object simultaneously, the telemicroscope being mounted to the carrier at an angle such that the telemicroscope's central viewing axis is angled relative to the proper central line of sight through the carrier, the end of the telemi-

roscope closest to the eye being displaced further from the central line of sight.

4,877,317

DUAL FIELD OF VIEW CATADIOPTRIC OPTICAL SYSTEM

Robert C. Gibbons, Richardson, and Wilbur W. Cottle, Plano, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 538,397, Oct. 3, 1983, abandoned. This application Feb. 27, 1987, Ser. No. 2,061

Int. Cl.⁴ G02B 15/02, 23/04

U.S. Cl. 350—559

5 Claims



1. A dual field of view optical system including a narrow field of view optical subsystem, a wide field of view optical subsystem and a relay subsystem common to said narrow field of view and wide field of view optical subsystems, comprising:

- said narrow field of view optical subsystem including a reflective objective system for forming a first focal plane, the reflective objective system including a primary reflector for reflecting radiant energy incoming thereto and a fixed optical element responsive to an external source of electrical power for reflecting radiant energy from said primary reflector towards the relay subsystem to form a first focal plane, said fixed optical element mounted in the optical path between said wide field of view subsystem and said optically refractive relay subsystem;
- said wide field of view optical subsystem including a refractive objective lens system for forming a first focal plane and including said fixed optical element which transmits the wide field of view light to said relay subsystem when said fixed optical element provides radiant energy transmission in response to an absence of supplied electrical power;
- said optically refractive relay subsystem common to the narrow field of view reflective objective system optical path and wide field of view refractive objective lens system optical path for forming an exit pupil, said exit pupil being a second focal plane at an accessible location, said optically refractive relay subsystem including an apertured means serving as a field stop for substantially eliminating the passage of any extraneous energy; and
- control means in the optical path between the narrow field of view optical subsystem and the wide field of view optical subsystem for controlling selectively the fixed optical element coupling of the narrow field of view optical subsystem or the wide field of view optical subsystem to the optically refractive relay subsystem;
- the control means for controlling selectively the optical coupling of the narrow field of view optical subsystem and the wide field of view optical subsystem to the optically refractive relay subsystem comprises an electrical means for converting the fixed optical element into one of a secondary reflector for blocking the wide field of view subsystem from the optically refractive relay subsystem and optically connecting the narrow field of view subsystem to the optically refractive relay subsystem; wherein
- the transparent reflector optical element changes from being a transparent to a reflector element with temperature and the electrical means includes an electrical heater mounted in close proximity to the transparent reflector

optical element and a circuit means for selectively providing power to the heater means whereby temperature is selectively changeable with the selectively providing of power to the heater means and thus the optical coupling of the narrow field of view optical subsystem and the wide field of view optical subsystem to the optically refractive relay subsystem is controllable.

4,877,318

ULTRA-SHORT OPTICAL SYSTEM FOR BINOCULARS

John R. Miles, deceased, late of Glenview; by Mildred L. Miles, heir, 830 N. Glenayre Dr., Glenview, both of Ill. 60025, and Grant Miles, 2121 W. Caylor Ave., Chicago, Ill. 60618
Continuation-in-part of Ser. No. 344,062, Jan. 29, 1982, Pat. No. 4,488,790. This application Aug. 22, 1984, Ser. No. 643,180

Int. Cl.⁴ G02B 23/02, 27/40

U.S. Cl. 350—569

12 Claims



1. An optical system for binoculars and telescopes having an air-spaced objective of extremely short focal length, a plurality of four ultra-thin, highly-reflective, lightweight, oval mirrors of varying size and a 9° Erfle type, 5 element eyepiece of extremely short focal length in which the first element of the objective is a double convex crown glass, SK16, 30 mm in diameter and 1.0 mm thick on the edge and 5.65 mm thick in the center, with the first radius 34.7410 mm and the second radius, -79.6844 mm; the second surface of the first element is separated by 5.48 mm from the first surface of the second lens, which is a double concave flint element of SF1 glass 25.4 mm in diameter, with the first radius -47.5333 mm and the second radius 223.2772 mm; the distance to the first mirror from the second surface of the second lens along the optical axis is 13.4 mm; the distance from the first mirror to the second is 23.0 mm; the distance from the second mirror to the third is 83.4 mm; the distance from the third mirror to the fourth is 19.5 mm; the distance from the fourth mirror to the focal plane of the objective is 2.0 mm and from the focal plane to the first surface of the first achroet of the eyepiece is 9.8 mm; the first element of the eyepiece is a double concave flint element of SF8 glass 19.0 mm in diameter, 4.8 mm thick on the edge and 0.96 mm in the center, with the first radius -76.3510 mm and the second radius 14.4100 mm and is cemented to the second crown element of LaK21 rare earth glass of the same diameter, which is 1.0 mm thick on the edge and 7.3 mm thick in the center and has a second surface radius of -20.3100 mm; the second double convex crown element is spaced 0.1 mm from the first and is an FK5 fluor crown glass 19 mm in diameter with the first radius 23.9800 mm and the second radius -60.6500 mm, 0.5 mm thick on the edge and 3.1 mm thick in the center and is separated by 0.1 mm from the first surface of the fourth element which is part of an achromat 15.6 mm in diameter; the first element of this doublet is a double convex crown element of LaK21 rare earth glass, 1.0 mm thick on the edge and 5.1 mm thick in the center, in which the first radius is 15.8590 mm and the second radius is -14.9570 mm and this element is cemented to a double concave flint element of SF7 glass of the same diameter, which is 3.6 mm thick on the edge and 0.8 mm thick in the center, the second radius being 26.5470 mm; the first and last doublets of the eyepiece are tapered to follow exactly the light rays and are thus cone-shaped lenses.

4,877,319

EXTERNAL MIRROR FOR A VEHICLE

Bernhard Mittelhäuser, Am Krühenberg, D-3002 Wedemark 2, Fed. Rep. of Germany

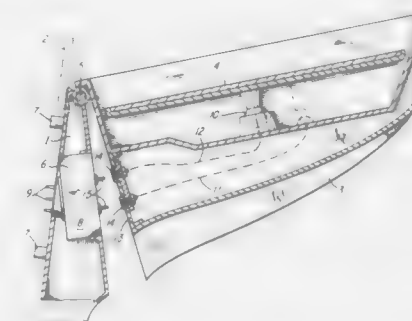
Filed Apr. 22, 1988, Ser. No. 185,165

Claims priority, application Fed. Rep. of Germany, Apr. 23, 1987, 3713579

Int. Cl.⁴ G02B 5/08

U.S. Cl. 350—604

8 Claims



1. An external mirror for a motor vehicle, including a base that is to be secured to said vehicle, and a housing that is mounted on said base in such a way as to be pivotable about an approximately vertical axis, with said housing accommodating an adjustable mirror body; said mirror further comprising: adjustment members connected to said mirror body to effect adjustment thereof; and an electric motor that is mounted in said mirror base and is connectable to said adjustment members for operating same; wherein said adjustment members are disposed in said housing include first connector elements connected to said adjustment members, and second connector elements connected electric motor, with said first and second connector elements being automatically disengaged from one another when said housing is pivoted away from said base, and with said first and second connector elements automatically engaging one another, to effect said connection between said electric motor and said adjustment members, when said housing is pivoted all the way in.

4,877,320

EYE-SHIELDING GLASSES

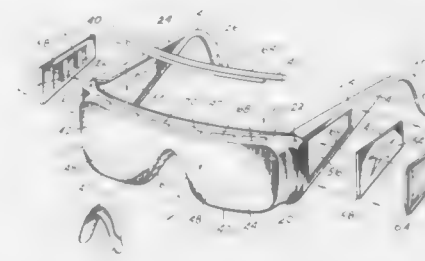
W. Bruce Holden, 500 Cohasset Rd., Ste. 34, Chico, Calif. 95926

Filed Oct. 3, 1988, Ser. No. 252,541

Int. Cl.⁴ G02C 7/10, 11/02, 11/08

U.S. Cl. 351—44

16 Claims



1. In eye-shielding glasses of a type having a pair of transparent lenses formed in a one-piece curved lens section narrowed centrally by a bridge opening and retained to a human face by ear hooking temples, improved glasses comprising: circuitous framing edgewise along said lens section being a molded continuation thereof interfacing a concave surface

side of said lens section, said framing being a wide horizontal strip along the upper edge of said lens section ending longitudinally flanged upwardly into a short vertical lip, said framing being a narrow horizontal strip along the lower edge of said lens section widened into a frame for a nose rest along a semicircular bridge, said framing forming transversely along both shorter ends of said lens section into side shielding hinge housing having temple attachment apertures upwardly downwardly inside said side shielding hinge housing;

two temples each having ear hooks at distal ends thereof and oppositely widened into framed air vent web sections adjacent insert end members affixed with upwardly and downwardly positioned hinging attachment pins, said temples attaching inside said side shielding hinge housing and being and being snap-in and removable for replacement by various temples having a variety of designs in said framed air vent web section.

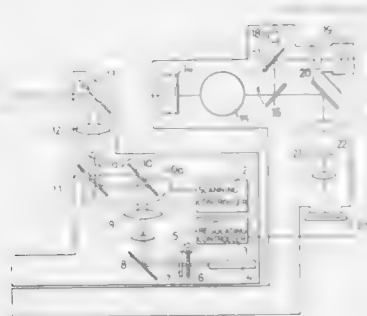
4,877,321

SLIT LAMP MICROSCOPE

Tadashi Ichihashi, and Masunori Kawamura, both of Tokyo, Japan, assignors to Kowa Company Ltd., Japan
Continuation of Ser. No. 059,735, Jun. 8, 1987, abandoned. This application Feb. 14, 1989, Ser. No. 311,424
Claims priority, application Japan, Jun. 6, 1986, 61-130060
Int. Cl.⁴ A61B 3/10

U.S. Cl. 351—214

7 Claims



1. A slit lamp microscope for observing the cornea, crystalline lens and other tissues of an eye, comprising:
a laser source for producing a laser beam;
a projector for projecting the laser beam onto an eye to be examined;
scanning means for scanning the laser beam vertically and horizontally within a selected area of the eye to be examined to form thereon a slit image which illuminates the selected area;
scanner controller means for varying scanning speed of the laser beam and varying the vertical and horizontal range of scanning;
optical means for receiving light scattered by the selected area of the eye to be examined; and
light regulating means for regulating the intensity of the laser beam to a predetermined level depending upon the quantity of light received by the optical means to obtain a substantially constant luminous intensity of the slit image irrespective of variations in the scanning image.

4,877,322
METHOD AND APPARATUS FOR MEASURING BLOOD OXYGEN LEVELS IN SELECTED AREAS OF THE EYE FUNDUS

Robert V. Hill, Portland, Oreg., assignor to Eyedentify, Inc., Portland, Oreg.
Continuation of Ser. No. 44,800, Apr. 30, 1987, abandoned. This application Aug. 22, 1988, Ser. No. 235,692
Int. Cl.⁴ A61B 3/10, 5/00

U.S. Cl. 351—221

9 Claims

1. The method of measuring the relative oxygen saturation of the choroidal blood of only a specifically selected area of the fundus of the eye of a subject, to the exclusion of any unselected area, comprising:

- providing a light source including incandescent light, pulsed red light of 620–780 nm wavelength and pulsed infrared light of 840–930 nm wavelength,
- passing said light source through a field stop of dichroic masking material selected to block the passage there-through of said pulsed red and infrared wavelengths and having an aperture positioned at the conjugate focus of the eye retina, the aperture being of predetermined geometry for outlining with sharply defined borders only a specifically selected area of the fundus,
- focusing the light source at the pupillary plane of the subject's eye and passing said light into the subject's eye to diffusely illuminate an area of the fundus and to form within said diffusely illuminated area a sharply defined image of said aperture on the fundus for positioning said aperture on the selected area of the fundus to the exclusion of any unselected area, the source and aperture light being reflected back out of the eye as a collimated beam of light,
- passing the collimated beam to an observer's eye for viewing of the eyegrounds of the eye of the subject,
- measuring the intensity of pulsed red light from the light source,
- measuring the intensity of pulsed infrared light from the light source,
- measuring the intensity of the pulsed red light from the reflected collimated beam,
- measuring the intensity of the pulsed infrared light from the reflected collimated beam,
- comparing the measured intensities of the pulsed red light of the light source and the pulsed red light of the collimated beam reflected from the eye, and
- comparing the measured intensities of the pulsed infrared light of the light source and the pulsed infrared light of the collimated beam reflected from the eye.

4,877,323

METHOD AND APPARATUS FOR INSPECTING A HIGH SPEED WEB

W. C. Stillwagon, 7610 Bell Mill Rd., Dunwoody, Ga. 30338
Continuation-in-part of Ser. No. 674,098, Nov. 23, 1984, abandoned. This application Jul. 7, 1986, Ser. No. 882,828
Int. Cl.⁴ G01P 3/40

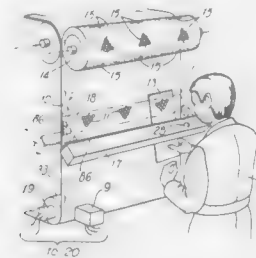
U.S. Cl. 356—23

17 Claims

1. A method of inspecting a high speed printed web having

spaced repetitive impressions printed thereon, comprising the steps of:

- translating said web past a flash tube assembly including at least one flash tube adapted to be stroboscopically excited and a photocell for sensing light transitions;
- sensing at least one light transition in each printed impression on the portion of the web which passes said photocell;
- generating an electrical signal for each sensed transition;
- generating one strobe trigger pulse per repetition of the printed impression by dividing the frequency of occurrence of said generated electrical signals by the number of



transitions in the photocell sensed portion of one impression;
exciting said at least one flash tube with the trigger pulse to produce light flashes;
directing said light flashes to one surface of the web whereby a stroboscopic effect is produced to produce a virtually stationary image of the impression of the web;
generating a steady stream of pulses proportional to the speed of said web;
counting the number of pulses of said steady stream of pulses between two contiguous strobe trigger pulses; and
storing the value of said number of counting steady stream pulses.

4,877,324

OPTICAL SIGHTING DEVICE WITH ILLUMINATED AIMING MARK

Bernhard Hauri, Staffellbach, and Hans Etter, Ueberstorf, both of Switzerland, assignors to Kern & Co. AG, Aarau, Switzerland

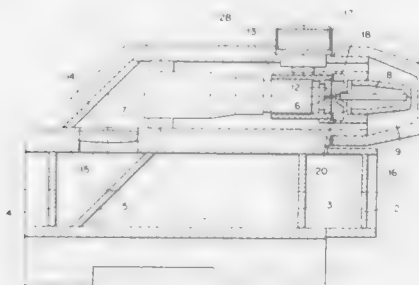
Filed Jul. 23, 1987, Ser. No. 76,854

Claims priority, application Switzerland, Jul. 23, 1986, 2976/86

Int. Cl.⁴ G02B 23/10

U.S. Cl. 356—251

8 Claims



1. Optical aiming device comprising:
first means for viewing a target field along an optical path, comprising a partiallyreflecting mirror, second means defining an aiming mark, comprising at least one first source of artificial light to illuminate said aiming mark, reflecting means for directing the artificial light of said first source to said aiming mark, and means for superim-

posing light from said illuminated aiming mark on the optical path from the target field via said partiallyreflecting mirror whereby the image of said aiming mark can be seen by an observer, viewing the target field, substantially at infinity, and means for moving at least one of said first source of artificial light, aiming mark and reflecting means with respect to the two other elements so that the illumination intensity of at least part of said aiming mark varies with such motion.

4,877,325

MACHINE COMPONENT ACCURACY MEASURING SYSTEM

Hartmut Weule, Karlsruhe, and Bernhard Reichling, Rülzheim, both of Fed. Rep. of Germany, assignors to Polytec Gesellschaft für Analysen, Mess- & Regel- Technik mbH & Co., Waldbraun, Fed. Rep. of Germany

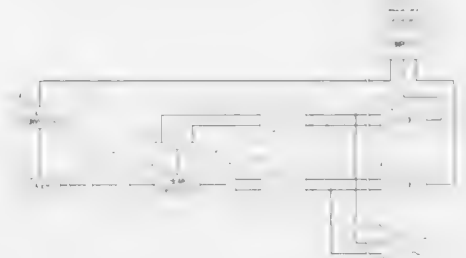
Filed Mar. 31, 1987, Ser. No. 33,074

Claims priority, application Fed. Rep. of Germany, Apr. 4, 1986, 3611209

Int. Cl.⁴ G01B 11/00

U.S. Cl. 356—373

22 Claims



1. A measuring system, to determine the accuracy of movement or position of a machine element, having
a laser beam generator (7) projecting a laser beam along a predetermined axis;
a measuring head (4) located on the machine element and including a first beam-impingement-position-responsive photo-detector (20) located in the path of the laser beam and providing first output signals representative of the location of beam impingement on the first photo-detector; and
a computer apparatus (15) receiving said first output signals and processing the signals, said system comprising, in accordance with the invention, a beam splitter (19) located in the measuring head and positioned in the path of the laser beam, and in advance of said first photo-detector (20) at a first distance, the beam splitter splitting the beam into two beam portions and deflecting one of said beam portions out of said axis and in a direction at an angle with respect to said axis;
a second beam-impingement-position-responsive photo-detector (21) located in the path of said one deflected beam portion at a second distance relative to the beam splitter, said second distance being different from said first distance, said second beam-impingement-responsive photo-detector providing second output signals, said second output signals being received by the computer apparatus, and
means for detecting rotation of said measuring head (4) about said predetermined axis;
said computer apparatus computing the deviation of the measuring head with respect to said beam, based on deviation, from a reference position, of said two beam portions on the first and second photo-detectors.

4,877,326

METHOD AND APPARATUS FOR OPTICAL INSPECTION OF SUBSTRATES

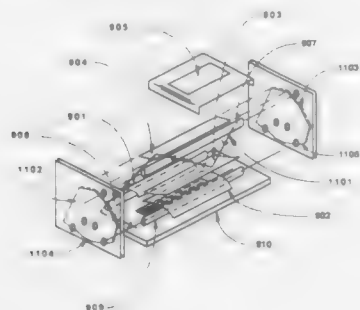
Curt H. Chadwick, Los Gatos; Robert R. Sholes, Ben Lomond; John D. Greene, Santa Cruz; Francis D. Tucker, III, Menlo Park; Michael E. Fein; P. C. Jann, both of Mountain View; David J. Harvey, Campbell, and William Bell, San Jose, all of Calif., assignors to KLA Instruments Corporation, San Jose, Calif.

Filed Feb. 19, 1988, Ser. No. 158,289

Int. Cl.⁴ G01B 11/30

U.S. Cl. 356—394

56 Claims



1. Inspection apparatus for inspecting surface features of a substrate comprising:
 - memory means for storing the desired features of the surface of the substrate;
 - focussed quasi-Lambertian illumination means for substantially uniformly illuminating a region of the surface of the substrate to be inspected;
 - sensor means for imaging the region of the substrate illuminated by the illumination means; and
 - comparison means responsive to the memory and sensor means for comparing the imaged region of the substrate with the stored desired features of the substrate.

4,877,327

MORTAR MIXING DRUM

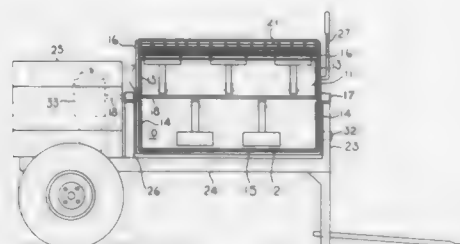
Marvin E. Whiteman, Jr., 2254 Braniff St., Bosie, Id. 83705

Filed Feb. 27, 1989, Ser. No. 315,914

Int. Cl.⁴ B28C 5/12, 7/16

U.S. Cl. 366—46

17 Claims



1. In an improved mortar mixer having a generally horizontally oriented cylindrical mortar drum with generally vertical and circular end walls, and paddle means rotatably and axially secured therein, and paddle rotation means, wherein the improvement comprises:
 - said drum being molded from a polyethylene material, said drum further having an elemental cylindrical segment opening through which material to be mixed may be deposited into or poured from said drum;
 - an elemental perimeter frame member positioned in elemental, external, contact with said cylindrical drum opposite the elemental segment opening; and
 - a pair of diametric end wall frame members each in diamet-

ric external contact with an end wall and attached to the corresponding end of the elemental perimeter frame.

4,877,328

INTERNAL MIXER

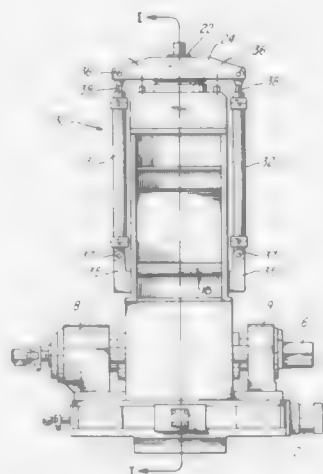
Friedhelm Müller, Freudenberg, and Klaus Ruthenberg, Ronnenberg, both of Fed. Rep. of Germany, assignors to Continental Aktiengesellschaft, Hannover, Fed. Rep. of Germany

Filed Apr. 12, 1988, Ser. No. 183,564

Int. Cl.⁴ B01F 7/02, 15/02

U.S. Cl. 366—76

9 Claims



1. In an internal mixer having a mixer housing in which are disposed mixing means and which has a charging opening that can be closed off by a floating weight, with a charging hopper being placed on said charging opening and being provided with at least one closeable filling opening, and with said floating weight being guided in an upwardly and downwardly slidable manner in said hopper, and being movable between various positions in said hopper via a hydraulic actuating mechanism that includes pistons, piston rods, and piston chambers, with a hydraulic control mechanism being associated with said hydraulic actuating mechanism, the improvement wherein:
 - said floating weight is connected to shaft means that is guided by guide means secured to said housing, with said shaft means being secured to a movable crosspiece; and
 - said hydraulic actuating mechanism includes only four hydraulic, double-acting cylinders for respective ones of said pistons, with said cylinders being disposed to the side of said hopper, and being symmetrically distributed about said shaft means of said floating weight, and with said cylinders each having two ends, with one end of each cylinder being secured to said crosspiece, and the other end of each cylinder being secured to one of said mixer housing and said hopper in such a way as to provide a certain amount of flexibility; said crosspiece includes two transverse supports, and said hydraulic actuating mechanism includes four hydraulic, double-acting cylinders that are connected in a paired manner to said transverse supports so that considerable forces acting upon the floating weight cannot lead to any swinging and tilting of said hydraulic actuating mechanism which thus avoids wear on said guide means and allows a lower overall installation height; said hopper having a rectangular-shaped configuration; and including a hydraulic cylinder means respectively at each of four corners of said rectangular-shaped charging hopper, said charging hopper at all four sides thereof respectively having a charging opening.

4,877,329

METHOD AND APPARATUS FOR MEASURING THE DEW POINT OF A GAS

Thomas Sauerbaum, Gross Grünau, and Stefan Kühning, Lübeck, both of Fed. Rep. of Germany, assignors to Draegerwerk Aktiengesellschaft, Fed. Rep. of Germany

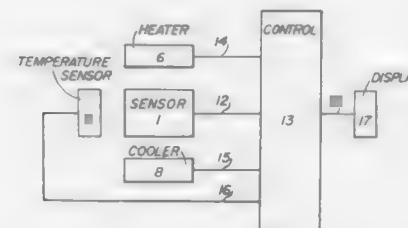
Filed Mar. 17, 1988, Ser. No. 169,409

Claims priority, application Fed. Rep. of Germany, Mar. 18, 1987, 3708697

Int. Cl.⁴ G01N 25/68

U.S. Cl. 374—28

4 Claims



1. A method for measuring the dew point using a unit including a sensor which outputs a signal corresponding to a thickness of a dew layer on a surface exposed to the atmosphere to be examined, and a tempering device connected to the sensor including a heater and a cooler comprising the steps of: cooling and heating the sensor to bring the sensor to a temperature which leads to the formation of a dew layer on the surface of the sensor; detecting the dew layer by measuring the signal of the sensor; measuring the temperature of the sensor as the dew point temperature and calibrating the unit by heating the sensor surface to the point of completely drying the layer of dew, measuring the sensor output and comparing successive measurements of the sensor output to detect a zero rate of change of the sensor output corresponding to a zero point calibration value.

4,877,330

TEMPERATURE SENSING SYSTEM

Joseph J. Torre, Kalamazoo, Mich., assignor to Pacific Atlantic Products, Ltd., Kalamazoo, Mich.

Filed Feb. 5, 1988, Ser. No. 155,069

Int. Cl.⁴ A01K 91/06; G01K 7/00

U.S. Cl. 374—136

26 Claims



1. A system for detecting the temperature at a first region of a fluid and for displaying an indication thereof at a second region, removed from the first region a continuously variable distance, the system comprising:
 - sensing means, locatable in the first region, for determining the temperature of the first region of the fluid and for providing an electrical current proportional substantially only thereto;
 - flexible, elongated, current conducting means electrically coupled to said sensing means, and extending between the two regions said current conducting means having a vari-

able electrical impedance dependent, at least in part on the continuously variable distance between the two regions and display means, coupled to said current conducting means, and positionable at the second region of fluid, for detecting said current independently of any changes in said impedance of said conducting means and for displaying an indication thereof.

4,877,331

APPARATUS FOR MEASURING THE TEMPERATURE OF THE SURFACE OF A ROTATING ROLL

Günter Schrörs, Tönisvorst; Bernhard Brendel, Grefrath, and Werner Hartmann, Krefeld, all of Fed. Rep. of Germany, assignors to Eduard Küsters Maschinenfabrik GmbH & Co. KG, Krefeld, Fed. Rep. of Germany

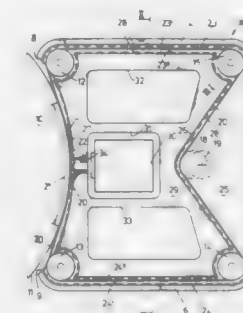
Filed Oct. 13, 1988, Ser. No. 257,350

Claims priority, application Fed. Rep. of Germany, Oct. 8, 1987, 3734018

Int. Cl.⁴ G01K 13/08, 1/16

U.S. Cl. 374—153

21 Claims



1. Apparatus for measuring the temperature of a surface of a rotating roll comprising:
 - (a) a roll rotatable about a longitudinal axis and including a surface having a temperature to be sensed;
 - (b) a temperature sensor comprising a radiation sensor directed toward the roll surface; and
 - (c) a belt disposed between the roll and the temperature sensor that abuts against the roll surface in a looping region to transmit heat from the roll to the temperature sensor, said belt being supported for endless revolution and revolving in a closed loop path such that its longitudinal axis lies in a plane perpendicular to the longitudinal axis of the roll and wherein said temperature sensor measures heat radiated from the roll without contacting the roll and the belt

4,877,332

TRANSDUCER FOR DETERMINING CONTAMINATIONS IN FABRICS

Wouter D. Ravensbergen, Leiderdorp, Netherlands, assignor to Yokogawa Electrofact B.V., Amersfoort, Netherlands

PCT No. PCT/NL87/00021, § 371 Date May 9, 1988, § 102(e) Date May 9, 1988, PCT Pub. No. WO88/02113, PCT Pub. Date Mar. 24, 1988

PCT Filed Sep. 10, 1987, Ser. No. 207,048

Claims priority, application Netherlands, Sep. 18, 1986, 8602368

Int. Cl.⁴ G01K 17/08; G01N 25/18

1. A transducer for use in apparatus for determining the concentration, in fabrics, of contaminants in the fabrics which affect the conductivity of the fabrics, wherein said transducer contacts a web of fabric being tested and produces an output signal related to the conductivity of the fabric and wherein said apparatus includes a measuring circuit, including a conductiv-

ity meter, connected to said transducer, said transducer comprising a measuring roller made of insulating material including two electrode rings separated from each other by said insulating material and being disposed so as to smoothly join the insulating surface of said roller, said roller being rotatably supported by support means and including a rotation shaft



provided with slip rings by means of which the electrode rings are connected in the measuring circuit of said conductivity meter, said transducer further comprising spring means acting on said support means for pressing said roller with predetermined force against a guiding roller for guiding the fabric web, said guiding roller being provided with an insulating surface.

4,877,333

ELECTRONIC THERMOMETER

Hiroaki Ota, Takatsuki, and Isao Kai, Kameoka, both of Japan, assignors to Omron Tateisi Electronics Co., Nagakakyō, Japan

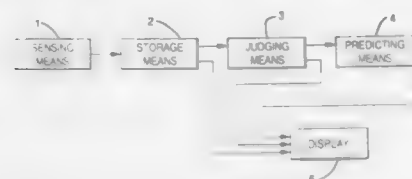
Filed Jan. 16, 1987, Ser. No. 3,988

Claims priority, application Japan, Jan. 16, 1986, 61-7566

Int. Cl.⁴ G01K 7/00

U.S. Cl. 374-169

5 Claims



1. An electronic thermometer, comprising: sensing means for sensing a temperature to be taken by the thermometer; storage means for storing said sensed temperature from said sensing means; judging means for judging whether said sensed temperature is changing within a predetermined range of change; predicting means for predicting a steady temperature based on said sensed temperature, wherein the operation of the predicting means is conditioned on said judging means judging that said sensed temperature is changing within the predetermined range of change; and displaying means for displaying said sensed temperature or said steady temperature predicted by said predicting means.

4,877,334

INFLATABLE BAG

Dennis Cope, 1621 Westminister Dr., Apt. 210, Naperville, Ill. 60540

Filed Aug. 29, 1988, Ser. No. 237,340

Int. Cl.⁴ B65D 30/00

U.S. Cl. 383-3

7 Claims

1. An inflatable bag, comprising in combination a first sheet of a gas impervious flexible material, a second sheet of a gas impervious flexible material, said first and second sheets being sealably joined together to provide a first sealed chamber disposed between said first and second sheets, a first inflation tube means extending into said first sealed

chamber between said first and second sheets for inflating said first chamber, a third sheet of a gas impervious flexible material, a fourth sheet of a gas impervious flexible material, said third and fourth sheets being sealably joined together to provide a second sealed chamber disposed between said third and fourth sheets, a second inflation tube means extending into said second chamber between said third and fourth sheets for inflating said second chamber, said first and second inflation tubes being mutually adjacent to permit a person to blow into both of said tubes simultaneously,



first and second check valve means respectively incorporated in said first and second inflation tube means internally of said first and second compartments for preventing the flow of gas from said first and second chambers through said first and second tube means, said second and third sheets being bonded together to partially enclose a third chamber located between said second and third sheets to receive one or more articles to be bagged, and locking means for locking said second and third sheets together to complete the enclosure of said third chamber.

4,877,335

CARTON LOOK PLASTIC BAG WITH EAR HANDLES

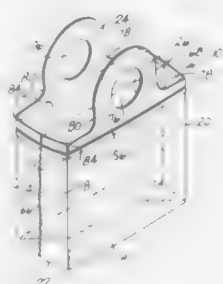
Delbert J. Barnard, Federal Way, Wash., assignor to Cello Bag Company, Inc., Seattle, Wash.

Filed Dec. 19, 1988, Ser. No. 286,454

Int. Cl.⁴ B65D 33/06

U.S. Cl. 383-6

12 Claims



1. A plastic bag, comprising:

a bag web of thermoplastic material folded laterally on itself to form front and rear panels, a top gusset between the panels at one end of the bag, and a fill opening at a second end of the bag, said panels having parallel side edges, and said top gusset having end edges colinear with and positioned between upper portions of the side edges of the panels when the bag is flat and unfilled; side seals connecting the side edges of the panels together, and further connecting the end edges of the top gusset together and to the upper portions of the side edges of the

panels, in a manner resulting in the bag, when filled, assuming a substantially hexahedral shape and the gusset being substantially flat and forming a closed top for the bag;

handle web panels of thermoplastic material, one on each side of the bag, said panels having inner edge attachment portions contiguous the front and rear panels of the bag web adjacent the top gusset, and central ear handles extending from the attachment portions, said central ear handles being substantially identical in size and shape and including substantially circular hand-receiving openings; said attachment portions extending the full width of the front and rear panels and including end edges contiguous the side seals;

connecting seals connecting the attachment portions to outer regions of the front and rear panels of the bag web adjacent the top gusset, said connecting seals also extending the full width of the front and rear panels; and wherein in use the bag is filled through the fill opening and then the second end is sealed shut.

4,877,337

BAG WITH TOP COVER INCLUDING HANDLE

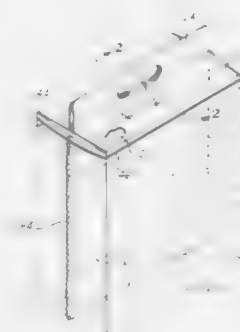
Jerry W. Wood, Kent, Wash., assignor to Cello Bag Company, Inc., Seattle, Wash.

Filed Feb. 13, 1989, Ser. No. 310,304

Int. Cl.⁴ B65D 33/06

U.S. Cl. 383-21

3 Claims



1. A top gusset, bottom-loaded bag comprising a unitary piece of flexible thermoplastic material including first and second rectangular panels and a rectangular gusset integral in one piece with said panels and extending between said panels at the top end of the bag, and said edge seals connecting said panels and said gusset together in a manner resulting in the bag approximating the shape of a hexahedron when filled and when closed at its bottom, and the improvement comprising: a top cover of flexible thermoplastic material having first and second end portions and a central portion between said end portions that is longer than the gusset is wide when the bag is filled and the gusset is substantially flat; said first end portion being connected to the first panel outwardly adjacent where said first panel meets the gusset; said second end portion being connected to the second panel outwardly adjacent where the second panel meets the gusset; said central portion of the cover being connected to itself along a line extending longitudinally of the gusset, to divide the cover into a lower base part which overlies said gusset and an upper handle part which is exposed above said base part; and said handle part including a hand-receiving opening extending laterally through the handle part which is shaped to receive a person's hand.

4,877,336

BOTTOM LOADED DUPLEX BAG HAVING A HANDLE AND METHOD OF MAKING SAME

Harry R. Peppiatt, Doylestown, Pa., assignor to Paramount Packaging Corporation, Chalfont, Pa.

Continuation of Ser. No. 3,110, Jan. 14, 1987, abandoned, which is a continuation-in-part of Ser. No. 821,561, Jan. 21, 1986, Pat. No. 4,713,839, which is a continuation-in-part of Ser. No. 388,381, Jun. 14, 1982, Pat. No. 4,573,203. This application

Mar. 6, 1989, Ser. No. 320,845

Int. Cl.⁴ B65C 30/00

U.S. Cl. 383-8

25 Claims



1. A duplex bag, comprising:

top and bottom end portions; an inner bag for storing product and an outer bag for supporting the inner bag, the inner and outer bags being respectively made of discrete inner and outer webs of thermal plastic material; the outer bag including a front panel, a rear panel and handle portion connecting the panels together; the inner bag including a front panel, a rear panel and a fold portion connecting the last-mentioned panels together; said outer bag handle portion straddling said inner web fold portion at the top end portion of the duplex bag, the outer bag otherwise being open at the top end portion of the duplex bag; said inner bag being open along the bottom end portion of the duplex bag to facilitate introduction of product into the inner bag.

4,877,338

GUIDE ARRANGEMENT IN A LINEAR POWER UNIT

Martin Aman, Skärholmen, Sweden, assignor to Linjär Transportteknik I Stockholm AB, Skärholmen, Sweden

Filed Jun. 1, 1988, Ser. No. 201,027

Claims priority, application Sweden, Jun. 3, 1987, 8702317

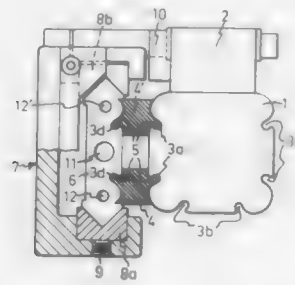
Int. Cl.⁴ F16C 17/00

U.S. Cl. 384-26

12 Claims

1. A power unit, comprising a cylinder housing, a piston disposed in said housing and linearly movable relative to said housing for producing push/pull forces in the direction of relative movement, a slide disposed externally of said housing and connected to said piston through a slot in said housing for movement with said piston relative to said housing, a linear guide rail fixedly connected to said housing and extending in said direction of relative movement, a guide device mounted on said guide rail and guided by said guide rail in said direction

of relative movement, and means coupling said slide to said guide device in such a manner as not to transmit force compo-



nents directed laterally of said direction of relative movement, between said guide device and said slide.

4,877,339

BEARING SUPPORT OF A THROTTLE VALVE SHAFT IN THE HOUSING OF AN EXHAUST GAS LINE
Hans-Dieter Schuster, Schorndorf; Christoph Noller, Winnenden; Gottfried Wollenraup; Reiner Kreeb, both of Stuttgart, and Roland Hum, Esslingen, all of Fed. Rep. of Germany, assignors to Daimler-Benz AG, Stuttgart, Fed. Rep. of Germany

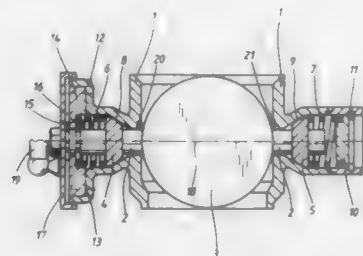
Filed Jan. 31, 1989, Ser. No. 304,123

Claims priority, application Fed. Rep. of Germany, Jan. 26, 1988, 3802243

Int. Cl.⁴ F16C 17/02

U.S. Cl. 384—218

8 Claims



1. A bearing support of a throttle valve shaft within the housing of an exhaust gas line, comprising bearing sleeve means of cup-shaped construction for rotatably supporting the shaft on both sides, the housing being constructed conically within the area of the bearing sleeve means, with the inner cross-sectional surface of the housing within the area of a bearing sleeve means and the outer cross-sectional surface of the latter tapering in the same direction, the bearing sleeve means being retained in the axial direction against the housing by way of their outer surfaces by at least one spring means acting in the direction of the shaft longitudinal axis, each bearing sleeve means being retained by itself against the housing by means of a spring means supported at the housing, and a separate axial bearing means securing the shaft against axial displacement.

4,877,340
PROCESS FOR DERIVING THE CONTACT GEOMETRY FOR RACEWAYS AND ROLLERS OF A ROLLER BEARING

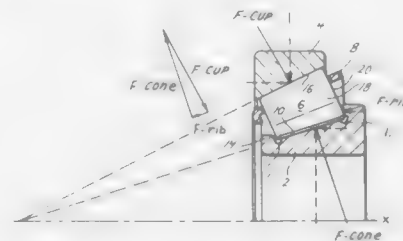
Michael R. Hoepflich, North Canton, Ohio, assignor to The Timken Company, Canton, Ohio

Filed Jun. 16, 1988, Ser. No. 207,542

Int. Cl.⁴ F16C 33/36, 33/58, 43/04

U.S. Cl. 384—571

10 Claims



1. In connection with a tapered roller bearing including at least one cone having an outwardly presented raceway, at least one cup having an inwardly presented raceway, and tapered rollers located between the cone and cup and having side faces which contact the cone and cup raceways, whereby for each roller a first contact exists between the cup raceway and the roller side face and a second contact exists between the cone raceway and the roller side face, a process for deriving the contact geometries for the raceways and roller side faces from a plurality of known load cycle repetitions, each load cycle repetition having a plurality of segments including load, external misalignment, and duration, said process comprising: arbitrarily selecting initial contact geometries for the raceways and roller side faces; for the selected contact geometries computing the internal misalignment between the cup raceway and the rollers and between the cone raceway and the rollers for each segment of the load cycle; using the internal misalignments, computing modifications to the selected contact geometries to provide altered contact geometries in which substantially uniform life theoretically exists along the first contact and also along the second contact; computing the internal bearing misalignments for the altered contact geometries for each segment of the load cycle; computing further modifications to the altered contact geometries to provide further altered contact geometries in which substantially uniform life theoretically exists along the first and second contacts at the recomputed internal misalignments; and reiterating the foregoing steps of computing internal misalignments and computing geometry modifications and altered contact geometries until substantial convergence is achieved, the resulting contact geometries having tapers which are off taper.

4,877,341

DEVICE FOR INTERMITTENT APPLICATION OF PARTICLES OF A POWDERED DEVELOPER TO THE RECORDING SURFACE OF A MAGNETOGRAPHIC PRINTER

Bernard Cherbuy, Belfont, and Jacques Estavoyer, Bavilliers, both of France, assignors to Bull S.A., Paris, France

Filed Jan. 27, 1989, Ser. No. 302,331

Claims priority, application France, Jan. 29, 1988, 88 01077

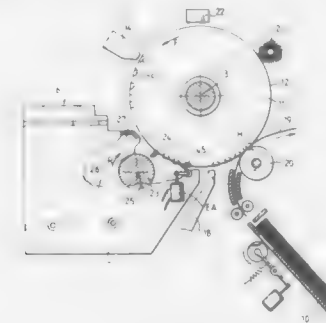
Int. Cl.⁴ B41J 3/02

U.S. Cl. 400—119

27 Claims

1. An applicator device for intermittent application of particles of a powdered developer to the recording surface (12) of a magnetographic printer, the surface being driven by displacement along a predetermined closed orbit that allows it to travel past a transfer station (H) where the developer that has been deposited on the surface is transferred to a printing substrate (19), means (17, 23, 24) for permanent application of 8 developer particles to said recording surface (12), means for recording latent images (14) on the recording surface in the course of

a plurality of successive displacement revolutions of the surface, and a particle eliminator device (45, 50, 51, 52, EA) disposed along said orbit, downstream of the application point (G) of particles on the recording surface by said applicator



device, said particle eliminator device disposed between the application point (G) and said transfer station (H) being arranged to pull away particles of developer located on this surface except during the final one of said successive displacement revolutions of the surface.

4,877,342

METHOD OF MOVING PRINT ELEMENTS IN PRINTHEADS AND A PRINthead WITH MOVING MECHANISM FOR PRINT ELEMENTS

Sven G. V. Stenudd, Lidingsö, Sweden, assignor to Facit Aktiebolag, Sundbyberg, Sweden

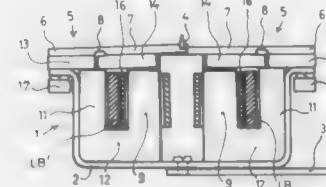
Filed Mar. 9, 1988, Ser. No. 165,732

Claims priority, application Sweden, Mar. 27, 1987, 8701287

Int. Cl.⁴ B41J 3/12, 9/38

U.S. Cl. 400—121

14 Claims



1. A method of controlling a plurality of print elements of a printhead each arranged to execute a striking motion comprising the steps of:

controlling a variable strength resultant magnetic field about each of a plurality of print element actuating means; and controlling a magnetic field opposed to said variable strength resultant magnetic field about an individual one of said print element actuating means, whereby a corresponding individual one of said print elements executes said striking motion with a controlled forcefulness dependent on said variable strength resultant magnetic field.

4,877,343

SERIAL PRINTER HAVING MEANS FOR CONTROLLING PRINT HEAD IN RELATION TO CARRIAGE MOVEMENT

Masaaki Hori, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Oct. 19, 1987, Ser. No. 109,540

Claims priority, application Japan, Oct. 23, 1986, 61-252187

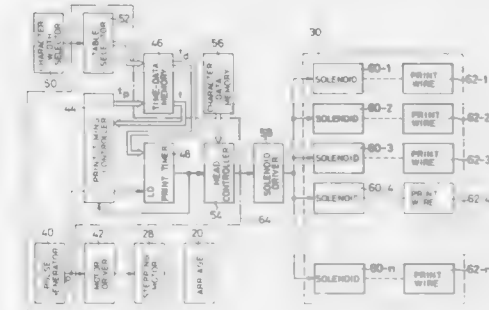
Int. Cl.⁴ B41J 3/02

U.S. Cl. 400—121

11 Claims

1. A serial printer comprising:
a print head;

a carriage supporting said print head and moved by a drive motor along a line of printing;
a pulse generator for generating pulse signals corresponding to incremental distances of movements of said carriage;
a time-data memory for storing time data representative of a time interval between a point of generation of each of said



pulse signals, and a point at which said print head effects a printing operation; and
time-interval measuring means operable to measure said time interval according to said time data stored in said time-data memory, and generate a printing command to activate said print head for effecting said printing operation upon termination of measurement of said time interval.

4,877,344

IMPACT PRINTER TEMPERATURE CONTROL DEVICE
Shinichi Watahiki; Nobuhiko Itoh; Nobuo Iwata, and Masao Miyasaka, all of Ibaraki, Japan, assignors to Hitachi Koki Company, Limited, Tokyo, Japan

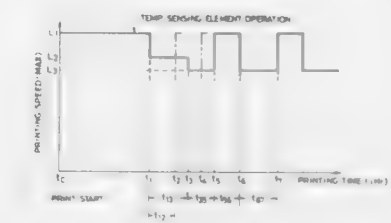
Filed Apr. 18, 1988, Ser. No. 182,679

Claims priority, application Japan, Apr. 17, 1987, 62-95794

Int. Cl.⁴ B41J 3/12

U.S. Cl. 400—124

10 Claims



1. In an impact printer in which a plurality of printing hammers operable by an electromagnetic unit are arranged linearly, and a printing operation is carried out at a first predetermined printing speed L_1 with a printing cycle and a sheet-feeding cycle conducted repeatedly, a control device comprising:
a temperature sensing means positioned to detect the temperature of said electromagnetic unit by one of direct detection and indirect detection, said temperature sensing means having a hysteresis characteristic such that said temperature sensing means produces a signal in response to a first predetermined temperature and is restored at a second predetermined temperature lower than said first predetermined temperature; and
a controller means for limiting said printing speed to a second printing speed L_2 lower than said first printing speed in response to said signal produced by said temperature sensing means in response to a first predetermined temperature and for returning said printing speed to said printing speed L_1 when said temperature sensing means is restored, and for limiting said printing speed to a third printing speed L_3 lower than said second printing speed L_2 when

said temperature sensing means produces said signal for a duration greater than a first predetermined period of time.

4,877,345

MARGIN SETTING MEANS FOR A PRINTER

Hisanobu Hori, Fukuoka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

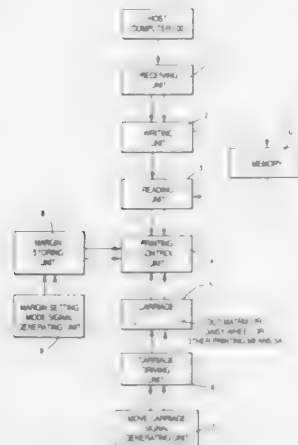
Continuation of Ser. No. 849,674, Apr. 9, 1986, abandoned. This application Apr. 20, 1988, Ser. No. 183,144

Claims priority, application Japan, Apr. 10, 1985, 60-75649

Int. Cl.⁴ B41J 29/42

U.S. Cl. 400—342

4 Claims



1. A printer for operating with a host computer and having a movable carriage, said printer comprising:
 - a receiving means for receiving control codes and printing character data from the host computer;
 - a memory means operatively connected to said receiving means for storing and subsequently reading out said control codes and printing character data received by said receiving means from the host computer;
 - a control means operatively connected to said memory means and to a carriage driving means for moving the carriage in accordance with said control codes and printing character data;
 - a margin position data storing means operatively connected to said control means for storing margin position data;
 - a move carriage signal generating means operatively connected to said control means for manually moving said carriage in response to manual inputs by an operator;
 - a margin setting signal generating means operatively connected to said margin position data storing means and for providing a margin setting mode signal to said control means via said margin position data storing means, said signals being provided in response to manual inputs by said operator;
- wherein said receiving means and memory means and control means and margin position data storing means and move carriage signal generating means and margin setting signal generating means recited above are arranged such that said operator first provides a manual input to said margin setting signal generating means to cause said receiving means and memory means and control means and margin position data storing means and move carriage signal generating means and margin setting signal generating means recited above to generate said margin setting mode signal so as to place the printer in a margin mode and said operator then manually moves said carriage to a desired margin position by providing a manual input to said move carriage signal generating means and then causes said margin position data storing means to store said carriage position as margin position data by providing a manual input to said margin setting signal generating

means so as to cause said receiving means and memory means and control means and margin position data storing means and move carriage signal generating means and margin setting signal generating means recited above to generate margin setting signals to be fed to said margin position data storing means.

4,877,346

SHEET FEED HOPPER FOR INSERTION MACHINE

Kenneth L. Gueather, Park Ridge; Karavattuvelil G. Rabin-dran, Morton Grove; Thomas J. Faber, Skokie, and Jack S. Abrams, Arlington Heights, all of Ill., assignors to Bell & Howell Company, Chicago, Ill.

Filed Feb. 1, 1988, Ser. No. 151,200

Int. Cl.⁴ B41J 13/10

U.S. Cl. 400—624

5 Claims



1. A printer apparatus for printing pre-selected indicia on a document to be placed on a transport raceway of an insertion machine, including a lower frame means and an upper support frame means, said lower frame means carrying, but not limited to the following, namely, a base plate assembly, a controlled means, a power source means, pusher means, and pivot means on opposite sides of said lower frame means, said upper support frame means including complimentary means for cooperating with said pivot means to support said upper support frame means for pivotal movement relative to said base plate assembly, said upper transport frame means further including means for carrying a hopper, open on at least two sides, to hold a plurality of said documents in an easily accessible stacked arrangement, said upper support frame also carrying printing means for printing said documents, said printing means being modular and readily removable from said upper support frame means, said controlled means actuated by said power source to repeatedly and individually deposit said documents one at a time from said hopper onto said base plate assembly, said resilient pusher means driven by said power source in timed relation to said controlled means for advancing each said document across said base plate assembly to a printing station beneath said printing means, flexible control means extending from said power source up to and connectable to said printing means for providing motive power for lateral movement thereof during the printing cycle carried out by said printing means, means for moving said document after printing from said printing station to said transport raceway, at least one extremity of said flexible control means connectable to said printing means is terminated in a large radius limited motion fixation device to thereby eliminate stress normally found in flexure about a limited point of fixation, said fixation device including an enlarged grooved sheave with said flexible control means passing over said sheave and having its termination fixed generally perpendicular to the normal position of said flexible control means, said fixation device further including

body means pivotally mounted and fixed relative to said sheave, said body means extending beyond the periphery of said sheave and carrying an enlarged termination means at the extremity of said flexible control means, and means for providing adjustable spring loaded pivotal control means for limiting rotary motion of said sheave and body means, said hopper and said upper support frame means being readily tipped about said pivot away from said base plate assembly whereby any jams or other impediments to proper operation of the device can be removed by an operator to permit continuation of proper operation thereof.

4,877,347

KEYBOARD FOR TYPEWRITERS OR SIMILAR MACHINES

Johannes Haftmann, Schwabach, and Rudolf Schmeikal, Hemhofen, both of Fed. Rep. of Germany, assignors to Ta Triumph-Adler Aktiengesellschaft, Nuremberg, Fed. Rep. of Germany

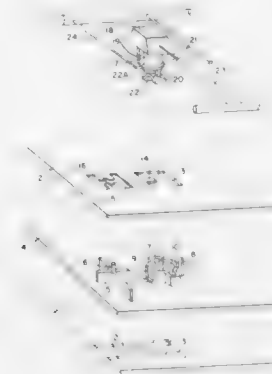
Filed Nov. 25, 1987, Ser. No. 125,451

Claims priority, application Fed. Rep. of Germany, Jul. 9, 1987, 3722616

Int. Cl.⁴ B41J 5/08

U.S. Cl. 400—479

7 Claims



1. A keyboard for typewriters or similar machines having a key support, switching contacts and individual key push rods with keys, and a bed plate, with guides for the key push rods being provided in the key support, comprising:
 - spacers having a drop-in pin for engagement with the bed plate and provided on the key support;
 - resilient flaps cut-out of the bed plate which, when the bed plate is placed on the spacers, are locked to the drop-in pin of the key support;
 - means defining cut-outs in the bed plate and the key support for receiving, from above, corresponding key push rods;
 - a spring hook disposed on the guide which extends behind an edge on the key push rod when the key push rods are stopped in the correspondingly assigned guide and in this way limits movement of the key push rod against the direction of operation;
 - a resilient tongue formed out of the bed plate for activating the key push rods and extending behind a protrusion on the key push rod for maintaining the key push rod in a position in which the spring hook rests against the edge;
 - a contact bridge diecast on the key push rod; and
 - switching contacts closeable by the contact bridge when the key push rod is activated.

4,877,348

MANUALLY OPERATED PAINT STRIPPER

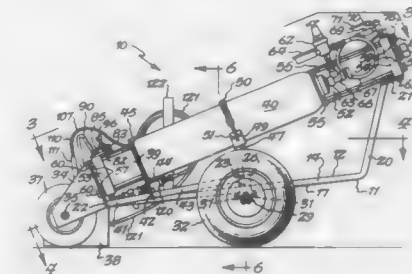
David H. Ople, 614 Grandview Road, Fort Erie, Ontario, Canada (L2A 4V3)

Filed Sep. 14, 1988, Ser. No. 244,483

Int. Cl.⁴ E01C 23/16

U.S. Cl. 404—93

14 Claims



1. A stripper for spraying a stripe of paint onto a surface without substantial bounce-back or overspray comprising a container containing high viscosity marking paint of the type conventionally used for striping, a nozzle, means for forcing said paint from said container through said nozzle by extrusion only at a pressure of between about 225 and 350 psi to produce a stripe of paint on a surface without producing substantial overspray, and means for moving said container across said surface to lay down said stripe at a velocity of between about 0.8 and 4.0 feet per second to thereby obviate bounce-back.

4,877,349

WAVE ABATEMENT DEVICE

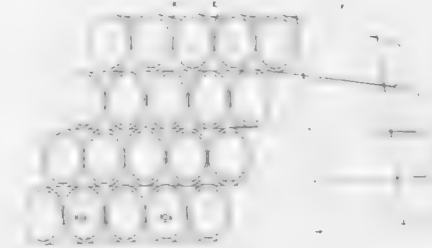
Richard M. Greene, Southold, N.Y., assignor to Erosion Protection Devices, Incorporated, Southold, N.Y.

Filed May 27, 1988, Ser. No. 200,049

Int. Cl.⁴ E02B 3/04

U.S. Cl. 405—27

12 Claims



1. A wave abatement device for dissipating the energy of waves intended to strike a shorefront of a body of water, said device comprises:
 - at least three rows of elongated, hollow cylindrical tubes, said tubes in each row positioned in a side-by-side relation, each tube of said at least three rows of tubes being positioned in the same direction and with the centerline of each row basically perpendicular to the shorefront and basically parallel to the calm water surface of the body of water, said tubes of said at least three rows receive there-through waves from the body of water, said at least three rows of tubes being buoyant in the body of water with said first row being positioned above the calm water line, said second row being positioned approximately at the calm water line, and said third row being positioned below the calm water line of the body of water and above the floor of the body of water; and
 - means for retaining said at least three rows of tubes in position with respect to each other,

wherein waves exiting said device are calm as compared to the same waves as they entered said device.

4,877,350

FOUNDATION WATERPROOFING METHOD

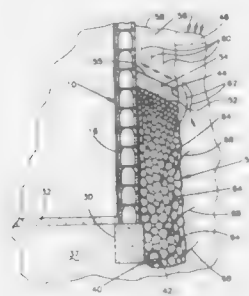
Dante DiFiore, 5387 Wilson Mills Rd., Highland Hts., Ohio 44143

Filed Oct. 26, 1988, Ser. No. 262,731

Int. Cl.⁴ E02B 11/00

U.S. Cl. 405—38

4 Claims



1. A method of relieving and eliminating ground water buildup near at least a portion of a foundation of a building, wherein the building is of the type that has a footer drain tile system extending along the base of its foundation, and has a basement floor that is located at a level above the base of the foundation, the method including the steps of:

- digging a trench extending along and adjacent the exterior of an underground wall which forms at least a portion of a foundation of a building, with the trench being dug to a depth extending along the base of the foundation and to a depth that is below the level of the basement floor of the building;
- servicing such portions of the foundation wall as are exposed by the trench to diminish water permeability of the wall;
- servicing such portions of the footer drain tile system of the building as are exposed by the trench to assure that the portion of the foundation that is exposed by the trench is provided with footer drain tile means that extends along the base of the trench at a level below that of the basement floor for ducting water from the base of the trench to a suitable drain;
- filling lower portions of the trench with a bed of graded stone to provide a porous reservoir that extends from the building foundation to the outer wall of the trench and that surrounds the footer drain tile means and extends upwardly therefrom along a major portion of the height of the foundation wall portion for receiving ground water and ducting it to the footer drain tile means to prevent the buildup of ground water in the vicinity of the foundation wall portion, with the graded stones being installed in the trench in an ordered array with the largest of the stones being positioned in lowermost portions of the trench and about the footer drain tile means, and with progressively smaller stones filling progressively higher portions of the trench;
- providing a capping layer of densely compacted clay atop the bed of graded stone, with at least the upper surface of the capping layer slanting downwardly as it extends across the width of the trench in directions away from the foundation wall, with the angle of inclination of the upper surface thereof being inclined from the horizontal within the range of about 20 to about 40 degrees; and
- filling remaining upper portions of the trench with topsoil, with the upper surface of the topsoil being inclined such that it slants downwardly as it extends across the width of the trench in directions away from the foundation wall.

4,877,351

APPARATUS FOR ADJUSTING A WATER LEVEL OF A LOCK

Yasushi Enami, Kodaira, Japan, assignor to Bridgestone Corporation, Tokyo, Japan

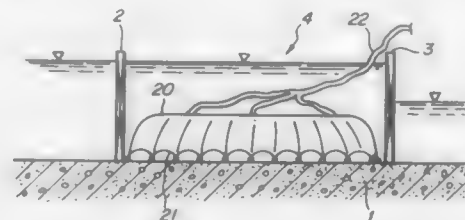
Filed Sep. 1, 1988, Ser. No. 239,360

Claims priority, application Japan, Sep. 9, 1987, 62-226065

Int. Cl.⁴ E02C 5/00

U.S. Cl. 405—86

7 Claims



1. An apparatus for adjusting a water level of a lock, comprising: at least one collapsible fluid chamber arranged on a bottom of a lock room between lock gates in the lock, said fluid chamber comprising a parachute-like body made of a flexible sheet material fixed to the bottom of said lock room at peripheral edges thereof, means for supplying air into the fluid chamber to raise the water level in the lock room and wherein said fluid chamber is deflated by discharging air therein to lower the water level in the lock room.

4,877,352

METHOD AND APPARATUS FOR CONTROL OF AN UPSTREAM WATER LEVEL

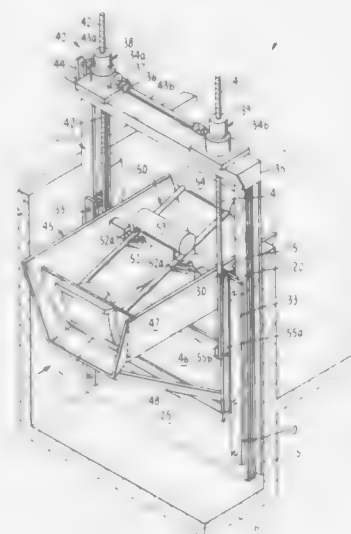
Gary M. Tuttle, Tulare, and Steven DeShaw, Three Rivers, both of Calif., assignors to Waterman Industries, Inc., Exeter, Calif.

Filed Feb. 10, 1989, Ser. No. 309,471

Int. Cl.⁴ E02B 7/28

U.S. Cl. 405—104

15 Claims

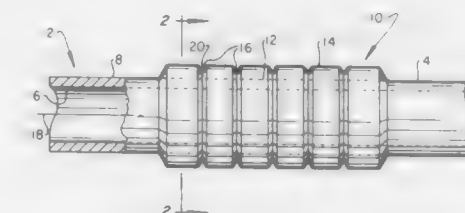


1. In an improved adjustable weir for the control of upstream water levels, allowing the flow of water at a level complementary to the upstream water level, the improvement comprising:

- an open frame;
- a trough assembly mounted within said open frame for vertical movement relative thereto, said assembly having a support plate with an upper portion forming a trough;

- a sluice pivotally mounted to said plate for movement about an axis of rotation, said sluice comprising:
 - a sector-shaped gate leaf to one side of said axis of rotation;
 - two ballast containers, one of said ballast containers centered on said axis of rotation and the second of said ballast containers disposed on the opposite side of said axis from said gate; and
- means for raising or lowering said trough assembly, said means comprising a tandem screw jack assembly fixedly mounted to said open frame wherein said trough assembly may be raised or lowered by means of said screw jack assembly.

ally circumferentially extending grooves longitudinally spaced apart on the exterior surface of said anode to direct crack



4,877,353

WASTE PILE

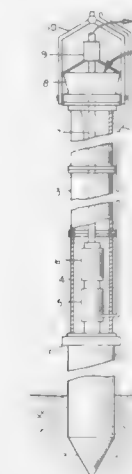
Serge Wisotsky, Sr., 89 Bullard St., Sharon, Mass. 02067-0422

Filed Jul. 14, 1986, Ser. No. 884,935

Int. Cl.⁴ B09B 1/00

U.S. Cl. 405—128

31 Claims



propagation in said anode in a generally circumferentially direction.

4,877,355

UNDERWATER CABLE LAYING SYSTEM

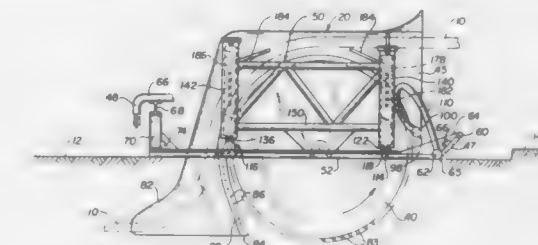
Norman Van Pelt, Cocoa Beach, Fla., assignor to Casper Colosimo & Son, Inc., Pittsburgh, Pa.

Filed Apr. 19, 1988, Ser. No. 183,075

Int. Cl.⁴ F16L 1/04

U.S. Cl. 405—159

40 Claims



1. A geophysical repository method to more safely dispose of hazardous wastes in a hollow pile depository buried in a geologically stable subseabed under deep waters of minimum motion and life; immobilizing said hazardous materials within containers inside said pile; said pile interred into deka-millions years old sediments employing offshore piledriving techniques including repetitively applying impulsive, vibratory, and/or sustained driving forces from an extrinsic power source; burying said wastes inside said pile at a minimum depth of one hundred feet within the subseabed; precisely determined the location of said buried pile, for entry or future recovery of said containers, by surface and submarine navigation/positioning techniques.

4,877,354

PIPELINE ANODE

George C. Williamson, Wylie, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jul. 11, 1988, Ser. No. 217,255

Int. Cl.⁴ F16L 1/04

U.S. Cl. 405—157

12 Claims

1. Apparatus comprising an iron-containing tubular member having an interior surface and an exterior surface, said iron-containing tubular member having an anode positioned on said exterior surface, said anode having an interior surface contacting the exterior surface of the iron-containing tubular member and an exterior surface characterized by a plurality of gener-

1. An apparatus for embedding a cable-like member under water, comprising:
a waterbed contacting support assembly having a front end, means mounted on said support assembly for receiving and guiding said cable-like member along said waterbed, a system of spray nozzle means located on said front end of said support assembly for creating spray flows at a sufficient flow rate and positive pressure of fluidize into a slurry at least the sand overburden of said waterbed in the path of said apparatus, eductor means supported by said waterbed contacting support assembly and said front end of said support assembly and extending longitudinally relative to and behind said apparatus, and including means for creating a negative pressure in said eductor means for picking up, carrying, and discharging said slurry in said path immediately behind said apparatus to embed said cable-like member, said eductor means further including intake means located in said front end of said support assembly in close proximity to said system of spray nozzle means, and being cooperatively operable with said system of spray nozzle means for directly removing said slurry from in front of said apparatus to substantially clear said path for relative ease of movement of said apparatus in said waterbed, fluid supply means for providing water under pressure and connected to said system of spray nozzle means and said eductor means for creating said positive and negative pressure therein.

4,877,356

METHOD AND APPARATUS FOR INSTALLING A FLOWLINE NEAR THE WATERBOTTOM

Pieter J. Bontenbal, Rijswijk, Netherlands, assignor to Shell Oil Company, Houston, Tex.

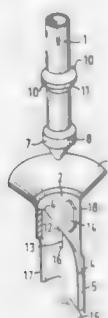
Continuation of Ser. No. 245,606, Sep. 19, 1988, abandoned. This application Apr. 17, 1989, Ser. No. 338,555

Claims priority, application United Kingdom, Sep. 30, 1987, 8722945

Int. Cl.⁴ E21B 43/01; F16L 1/04

U.S. Cl. 405-169

9 Claims



1. A method for lowering a flowline through a body of water and subsequently hinging over the flowline to a substantially horizontal position near the waterbottom, the method comprising:

erecting a guide tube adjacent the waterbottom, said guide tube comprising a central opening defined downwardly therethrough, a pair of parallel slots formed within said central opening at the opposite side thereof, and passage means for allowing the flowline to hinge over about a horizontal pivot axis passing transversally through said slots;

stabbing a lower end of said flowline downwardly into the guide tube, and maneuvering pivots which are mounted at opposite sides of the flowline near the lower end thereof in slidable engagement with said slots;

deflecting the flowline near the lower end thereof in a predetermined lateral direction thereby inducing at least a lower portion of said flowline to hinge over to an inclined position in response to lowering of said pivots into said slots; and

landing said pivots on a pair of pivot supports mounted at the lower ends of said slots, allowing said lower portion of the flowline to further hinge over to a substantially horizontal position and laying the flowline away from the guide tube.

4,877,357

METHOD AND APPARATUS FOR MAKING A SLURRY TRENCH OR WALL IN THE SOIL

Alexander J. Verstraeten, Kaokke-Heist, Belgium, assignor to Funderingstechnieken Verstraeten B.V., Oostburg, Netherlands

Filed Jan. 6, 1988, Ser. No. 141,322

Claims priority, application Netherlands, Dec. 10, 1987, 8702945

Int. Cl.⁴ E02D 5/20

U.S. Cl. 405-267

8 Claims

1. An apparatus for making a slurry trench or wall in the soil, substantially comprising a beam section provided at least at its bottom with a soil displacement portion, said beam being adapted to be driven into the soil by vibro-driving or pile driving, with simultaneous injection of a supporting fluid adjacent the soil displacement portion, and being subsequently extractable from the soil for forming a trench filled with supporting fluid, forming a slurry trench or wall after the supporting fluid has hardened, characterized in that said soil displacement

portion (3,8) of the beam section (1) includes a box section substantially rectangular in cross-section and having side walls (8) provided with holes (10), said box section being provided at its bottom with a shut-off plate (3) whose edges project beyond the side walls (8) of the box section, said shut-



off plate (3) shutting off the interior of the box section during the driving of beam (1) into the ground and clearing this interior during its extraction from the soil, at least one feed tube (6) for supporting fluid (5) terminating in the interior of the box section.

4,877,358

METHOD AND APPARATUS OF CONSTRUCTING A NOVEL UNDERGROUND IMPERVIOUS BARRIER

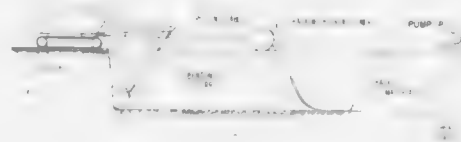
Arturo L. Reasi di Cervia, New York, N.Y., assignor to Finic, B.V., Rotterdam, Netherlands

Continuation of Ser. No. 252,676, Apr. 9, 1984, abandoned. This application Jan. 30, 1989, Ser. No. 303,046

Int. Cl.⁴ E02D 29/00

U.S. Cl. 405-267

5 Claims



1. An underground fluid material flow control barrier comprising,

- (1) a narrow slot in the earth having a length extending across the expected flow path of said material, said slot having a depth extending at least to the water table,
- (2) bentonite impregnating the earth walls of said slot and forming a bentonite cake on the inner surfaces thereof,
- (3) a pair of flexible plastic sheets joined at their lower ends to form a sheath in said narrow slot and in contiguous relation to all surfaces in said slot,
- (4) a coarse granular backfill material forming a liquid pervious filling in said sheath, said liquid pervious filling having a density greater than bentonite slurry used in forming said narrow slot and filling the entire space between said pair of flexible plastic sheets, and
- (5) means in said sheath for draining the liquid pervious filling, including pump means for draining said coarse granular backfill material.

4,877,359

ADJUSTABLE STOP MEMBER

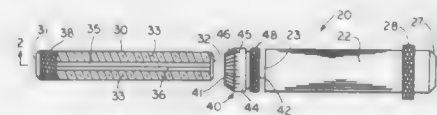
Ivo Kolacek, 1004 S. Milwaukee, Wheeling, Ill. 60090

Filed Aug. 6, 1987, Ser. No. 82,329

Int. Cl.⁴ B23B 49/00; B23C 1/06

U.S. Cl. 409-218

16 Claims



1. An adjustable stop member for use with machines having a tool support structure, a tool mounted on said tool support structure, a work holder, means for producing relative movement between the tool support structure and the work holder, such that the tool mounted on the tool holder can be brought into cutting contact with a work piece mounted on the work holder, and stop means for limiting the relative movement between the tool support structure and the

an elongate, cylindrical member having first and second ends and an elongate bore which is coaxial with a longitudinal axis of said cylindrical member, said elongate bore extending inwardly from the first end of said cylindrical member;

internal threads along the length of said elongate bore;

an elongate rod having first and second ends;

a threaded section formed along the longitudinal length of said elongate rod, said threaded section comprising external threads which extend from the first end of said elongate rod along at least the major portion of the length of said elongate rod, with the threaded section of said elongate rod being receivable within said elongate bore in said cylindrical member for making engagement with the internal threads of said elongate bore such that the threaded section of said elongate rod can be adjustably advanced into and withdrawn from the elongate bore in said cylindrical member to thereby adjustably vary the effective, combined, longitudinal length of the cylindrical member and the elongate rod threaded therein;

an elongate, relatively narrow, linear flat formed along the length of the threaded section in said elongate rod, said flat being formed at least as deeply into the surface of the elongate rod as are the deepest portions of the threads;

an index line on said flat, said index line extending along the length of said flat and being parallel to the longitudinal axis of said elongate rod;

a nut having first and second ends is threaded on the threaded section of said elongate rod such that the first end of said nut faces the first end of said elongate rod when the nut is fully threaded on the threaded section of said elongate rod;

a circumferential band adjacent to the first end of said nut, said band being polished; and equally spaced markings along the circumferential length of the polished band on said nut, said markings forming a scale which extends around the length of said band, whereby, when the threaded section of the elongate rod is threaded into the first end of said cylindrical member, the scale on the nut and the index line on said flat of said elongate rod can be used to accurately adjust the overall length of the cylindrical member and elongate rod, and the nut can further be tightened against the first end of said cylindrical member to firmly secure the elongate rod and the cylindrical member in a releasably, fixed position relative to each other, and the stop member, comprising the elongate rod and the cylindrical member, can then be positioned in the stop means of said machine to limit the distance within which the tool support structure and the work holder can approach each other during use of said machine.

4,877,360

APPARATUS FOR LOCKING AND/OR GRIPPING MODULAR ATTACHMENTS OF BORING HEADS, BORING BARS, INTERMEDIATE MEMBERS, ADAPTERS, TOOL HOLDERS, HYDRAULIC PUNCHES, LONG TONGS, OR OTHER MECHANICAL MEMBERS

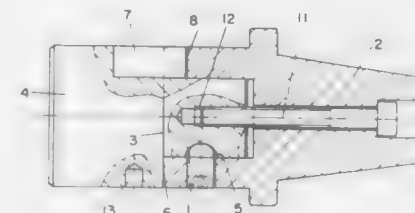
Emile Pfalzgraf, 7, rue de Neuwiller, 67330 Bouxwiller, France

Filed May 7, 1985, Ser. No. 731,586

Int. Cl.⁴ B23C 5/26; B23B 31/00

U.S. Cl. 409-234

5 Claims



1. In an apparatus for locking and/or gripping modular mechanical members, of the type comprising a rotatable driving member having a central bore extending in the direction of its axis of rotation and a driven member having a tool and a central projection adapted to be received by said bore, said driving and driven members adapted to be interfitted along the axis of the rotation of said driving member such that said driven member is driven in rotation by rotating said driving member; the improvement comprising: at least one fastening element comprising a radially inwardly extending screw having a hemispherical head, said screw being disposed in said driving member, and a hemispherical recess disposed on said central projection of said driven member; said screw and said recess being so dimensioned and disposed that when said driving and driven members are interfitted said hemispherical head of said screw is insertable in said hemispherical recess; said hemispherical recess having a radius greater than the radius of said hemispherical head, to provide relative rotation of said interfitted driving and driven members for urging said hemispherical head against said hemispherical recess, whereby said driven member is urged into tight frictional engagement with said driving member upon rotation of said driving member.

4,877,361

ELASTOMERIC INSERT FOR CONTAINING LASHING

Angelo DeRosa, and Kevin D. McKenna, both of Holmdel, N.J., assignors to Sterling Plastic & Rubber Products, Inc., South Amboy, N.J.

Filed Dec. 16, 1986, Ser. No. 942,274

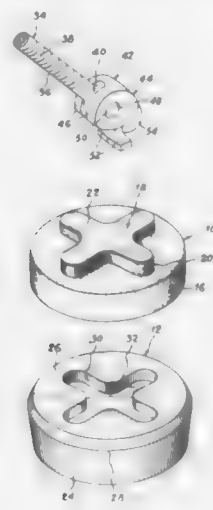
Int. Cl.⁴ B60P 7/13; B61D 45/00

U.S. Cl. 410-112

5 Claims

1. In a steel container ship, an insert for filling a cavity of a socket installed flush with a deck's surface of said ship for securing a container by lashing equipment to the deck, said socket including a top plate rigidly secured to said socket and to said deck with an upper surface of said plate being flush with said deck, said plate having an opening for permitting a lashing knuckle of the lashing equipment to be inserted through said plate opening into the filled cavity of said socket for engagement with an underside portion of said top plate so as to secure said container to said deck socket and for permitting the lashing knuckle to be withdrawn therefrom for releasing the container, said insert comprising an elastomeric element consisting of a base conforming to the cavity of said socket and filling said cavity, a top of said element conforming to said plate opening so as to fill said plate opening flush with said upper plate surface, and adhesive means for securing said top of said elastomeric element to said base of said elastomeric element, said elastomeric element being of such resilient consistency whereupon insertion of the lashing knuckle through the plate open-

ing depresses that portion of the top elastomeric element engaged by the lashing knuckle while part of the remaining portion of the top elastomeric element remains substantially



undepressed within the plate opening and substantially flush with the top surface of said plate, thus preventing debris from entering the cavity during securing of the container by the lashing equipment.

4,877,362

THREADED COMPOSITE BLIND RIVET

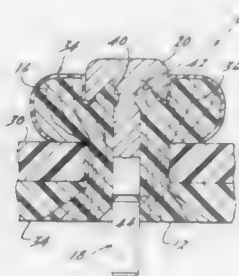
Imre Berecz, El Toro; Dennis Schultz, Chino, and Dennis L. Hinton, Yorba Linda, all of Calif., assignors to Microdot Inc., Darien, Conn.

Continuation of Ser. No. 727,779, Apr. 26, 1985, Pat. No. 4,478,544. This application Jul. 18, 1986, Ser. No. 886,672

Int. Cl.⁴ F16B 13/04

U.S. Cl. 411—34

1 Claim



1. A blind plastic rivet for acceptance in an aperture in a workpiece, said rivet comprising:

- a tubular body portion,
- a head forming portion,
- a mandrel extending centrally of the body portion of said rivet and having a stem portion at one end and an anvil at the other end overlying the head forming portion of said rivet, said mandrel being movable axially relative to the body and head forming portions of said rivet to form a radially expanded blind head on the head forming portion of said rivet, said body and head forming portions comprising a plurality of substantially continuous carbon fibres encapsulated in a resin matrix, the head forming portion of said rivet being radially deformable upon heating thereof, and
- a tubular, ductile, elastically expandable plastic sheath separate from said body portion but fully covering the blind head on said rivet, said sheath having one end portion initially engaged with said workpiece and movable to a

position partially underlying the head forming portion of said rivet at the radially outer extremity thereof after deformation of said head forming portion, an opposite end portion of said sheath being initially disposed in close proximate relation to and about the stem portion of said mandrel and movable to a position partially underlying the anvil on said mandrel at the radially outer extremity thereof so as to be mechanically retained by said anvil, the head on said rivet having radially inner portions in direct engagement with both the anvil on said mandrel and the workpiece.

4,877,363

BLIND FASTENER

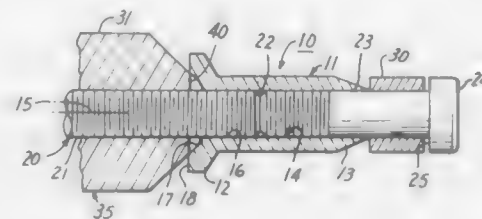
Herman L. Williamson, Seal Beach, and Michael M. Schuster, Santa Monica, both of Calif., assignors to Hi-Shear Corporation, Torrance, Calif.

Filed Feb. 10, 1987, Ser. No. 13,011

Int. Cl.⁴ F16B 13/04

U.S. Cl. 411—43

4 Claims



1. In a blind fastener of the type having an axially extending sleeve with an axially extending internally threaded passage therethrough, a head at one end having an axially facing surface thereon with off-axis recesses therein, and an external taper on the other end; a mandrel including an extended threaded shank threaded into and through said passage, a head on said mandrel with a bearing surface facing said tapered end, and torque tool engaging means on the opposite side of the said sleeve from said head; a tubular collar on said mandrel between said tapered end and said head; and a nut threaded to said mandrel with a bearing face facing toward said surface of the head of said sleeve, the improvement comprising:

said bearing face of said nut being adapted to deform so as at least partially to enter and engage in said recesses in the head of said sleeve; and said bearing face being scalloped to form relieved and projecting portions, the latter to make said entry, deforming while doing so.

4,877,364

CAPTIVE SCREW AND ASSEMBLY

Gregory Sorrentino, Brewster, N.Y., assignor to General Data-Comm. Inc., Middlebury, Conn.

Continuation of Ser. No. 758,194, Jul. 24, 1985, abandoned. This application May 26, 1987, Ser. No. 54,299

Int. Cl.⁴ F16B 21/00, 35/04

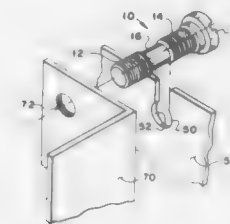
U.S. Cl. 411—337

13 Claims

1. A threaded fastener assembly, adaptable to detachably fasten a panel member to a support member of the assembly in a first mode of operation, which assembly includes a male threaded fastener screw member that may be loosely held in captive relation to said support member in a second mode of operation, which screw member is adaptable to be readily detached by manual effort from said support member and which screw member is adaptable to be readily subsequently reengaged by manual effort to said support member, comprising:

- a support member having a female threaded hole; and
- a male threaded screw member having a head and a shank, said shank shaped with an unthreaded mid-section of the

shank that separates to spaced-apart male threaded portions of the same pitch and thread size, said unthreaded mid-section of said screw member shank having a diameter smaller than the root diameter of the said threaded sections, said head and the threaded head-end portion of the shank adjacent said head being heavier than the other tail-end threaded portion of said shank so that when said unthreaded mid-section of said screw fastener is loosely held in unthreaded engagement in the female threaded hole of said support member, said male threaded screw member tilts relative to the axis said male threaded screw member assumes when it is in threaded engagement with said female threaded hole such that said male threaded screw member is captive to said support member and such that accidental threaded engagement of either said tail-end or said head-end threaded portion with said female threaded hole is eliminated, wherein,



said female threaded hole is of a thread size to readily mate in threaded engagement with either of the threaded portions of said screw member so that the screw member may be readily engaged into or removed from engagement with said female threaded hole, with

said screw member adaptable to be retained in a captive mode to said support member, with its unthreaded midsection held loosely in said female threaded hole of said support member without stressing the threaded portions of said threaded fastener assembly during said captive mode and during positioning of said screw member into or out of said captive mode, and with

said screw member adaptable to detachably bolt a panel member to said support member in threaded engagement of the head-end threaded portion of the screw member to the said female threaded hole, and in which

said screw member is readily manually detachable from captive engagement to said female threaded support member.

4,877,365

SIDE SHIFT GRAPPLER

John J. Lanigan Jr., Lynwood; Myron Glickman, Morton Grove, and Bernard A. Ermel, Clarendon Hills, all of Ill., assignors to Mi-Jack Products Inc., Northbrook, Ill.

Filed Oct. 20, 1986, Ser. No. 920,792

Int. Cl.⁴ B60P 1/64

U.S. Cl. 414—459

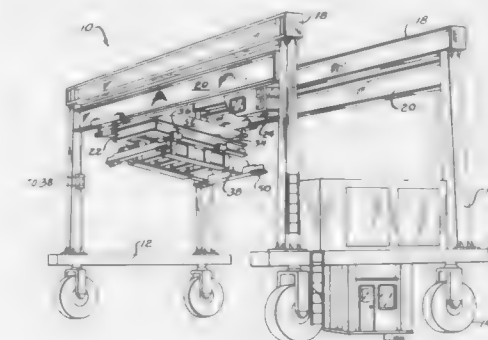
8 Claims

1. A crane and lift apparatus including frame means having a pair of lower beams supporting four corner beams in turn supporting a pair of vertically movable upper stabilizing beams forming generally parallel track means transverse to said lower beams, wheel means rotatably supported beneath said frame means, drive means operatively coupled to said wheel means for causing movement of said frame means, upper frame assembly means movably mounted on said stabilizing beams for transverse movement therealong, lower frame assembly means movably to an underside portion of said upper frame assembly adaptable for longitudinal horizontal movement therealong and having longitudinally, slidable container attachment means thereon

power drive means operatively coupled to said drive means, said upper frame assembly and said lower frame assembly

means, said power drive means acting selectively to operate said drive means to cause movement of said frame means, to move said upper frame assembly along said upper stabilizing beams, and to move said lower frame assembly means longitudinally along said upper frame assembly means for attaching to, carrying, positioning and releasing a container,

operator control means connected to said power drive means for independently controlling the operations of said drive means, said upper frame assembly means and said lower assembly means, comprising side shift grapples means mounted within said upper frame assembly means for preselected incremental



rectilinear movement therein as directed at times by said operator control means, said side shift grapple means comprising

first end means fixedly mounted on said upper frame assembly means,

second end means movably mounted on said upper frame assembly means for reciprocable movement therein, and retractable cylinder means connected between said first end means and said second end means for at times being effective to move said second end means toward and away from said first end means thereby to cause said lower frame assembly means when attached to said container to move a preselected incremental horizontal distance.

4,877,366

REFUSE VEHICLE

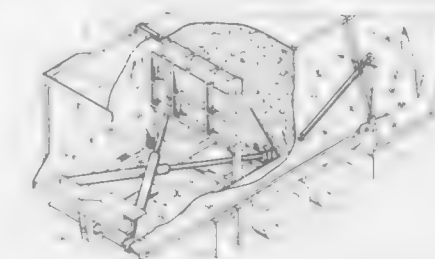
Quinto De Filippi, 29 Edenvalley Drive, Islington, Ontario, Canada

Filed Apr. 22, 1988, Ser. No. 184,668

Int. Cl.⁴ B65F 3/28

U.S. Cl. 414—517

5 Claims



1. A refuse vehicle body of the type having a generally rectangular main body, a tailgate body portion which may be raised to eject the contents, and a forward opening in the main body through which refuse may be dumped, and a ram member moveable through said main body, from said forward opening to said tailgate, for compacting refuse, and for subse-

quently ejecting refuse from said main body and being characterized by:

- a moveable bridge member of hollow multi-wall construction extending from side to side of said main body;
- slide means in said main body for cooperation with said bridge member, for permitting sliding movement of said bridge member along said main body between a forward compacting position and a rearward ejecting position;
- left and right hand compacting cylinders connecting diagonally across said main body, with respective left and right hand corners of said ram member, and said right and left hand cylinders being pivotally mounted to said bridge member and to said ram member, whereby said cylinders being operable to move said ram member relative to said bridge member along said main body for compacting refuse in said main body and said tailgate portion;
- cylinder storage recess means formed in said bridge member for receiving portions of said right and left hand cylinders when said ram member is in its retracted position, said cylinder storage recess means including a lower wall, side walls, an intermediate wall, and a top wall, and wherein said lower wall and said intermediate wall define a first storage recess for one of said right and left cylinders, and wherein said intermediate wall and said top wall define a second storage recess for the other of said right and left cylinders; and,
- ejection cylinder means connected to a forward portion of said main body, and to said bridge member, for moving said bridge member away from said forward portion of said main body towards said tailgate portion, for ejecting contents from said main body.

4,877,367

APPARATUS FOR THE AUTOMATIC SEPARATION INTO REAMS OF A STACK OF LARGE FORMAT SHEETS OF PAPER THE REAM DIVISIONS OF WHICH ARE COUNTED OFF PREVIOUSLY AND INDICATED BY MARKERS

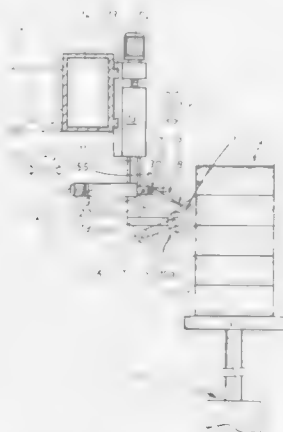
Andrea Cinotti, Bologna, Italy, assignor to Wrapmatic S.p.A., Bologna, Italy

Filed Nov. 16, 1987, Ser. No. 120,827

Claims priority, application Italy, Dec. 16, 1986, 3609 A/86
Int. Cl.⁴ B65H 3/50

U.S. Cl. 414—796

5 Claims



1. An apparatus for the automatic separation into reams of a large format sheet stack of paper the ream divisions of which are counted off previously and indicated by markers inserted into said sheets so that a portion of said marker is outside of a side of said sheet stack comprising:
 - gripping means able to grip each marker and simply tension it at an angle in relation to the sheet stack;
 - a non-suction separator mechanism vertically disposed with respect to the gripping means, said separator consisting in a follower, exhibiting a tapered projecting end that is

designed to enter into contact with each marker and thereafter to penetrate easily into the sheet stack hinged to a support horizontally movable once the marker is gripped and taut, among a retracted position in which the follower is distanced from the marker, through intermediate positions in which the follower touches and follows the gripped marker along its bare portion, and at least one extended position in which the follower penetrates into the sheet stack causing a lifting of the separating uppermost sheet stack ream;

pushing means able to horizontally distance the separated ream from the stack and operate through the direction of said separator mechanism; and

said gripping means being located on a level below that of the separator mechanism, and the follower of the separator mechanism pivots freely about the support to follow the gripped marker by gravity.

4,877,368

FLUIDIZING CENTRIFUGAL PUMP

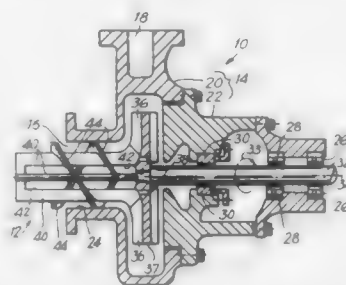
Jukka Timperi; Reijo Vesala, both of Kotka, and Vesa Viikman, Kymi, all of Finland, assignors to Ahlstrom Corporation, Finland

Filed Nov. 8, 1988, Ser. No. 268,599

Int. Cl.⁴ F04D 13/12

U.S. Cl. 415—143

18 Claims



1. A fluidizing pump for medium to high consistency fiber suspension, comprising:
 - a housing having an axis, an axially-extending inlet channel through which fiber suspension is received and an outlet through which fiber suspension is discharged;
 - an impeller operatively rotatable in said housing and comprising a working vane and a fluidizing blade extending substantially axially along and in said inlet channel; and
 - a feeder vane extending in and along said inlet channel and oriented at an angle of between approximately 1 and 89 degrees to said housing axis, said feeder vane being disposed radially outward of said fluidizing blade and extending along at least a portion of said substantially axial extension of the fluidizing blade.

4,877,369

VANED DIFFUSER CONTROL

Phiroze Bandukwalla, Olean, N.Y., assignor to Dresser-Rand Company, Corning, N.Y.

Filed Feb. 8, 1988, Ser. No. 153,589

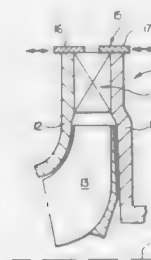
Int. Cl.⁴ F01D 17/14

U.S. Cl. 415—148

9 Claims

1. In a compressor diffuser having an inlet, an annular outlet, a passageway between said inlet and said annular outlet for the flow of compressed fluid therethrough, and a plurality of vanes formed in said passageway, the improvement comprising
 - an annular restriction downstream of, adjacent to and cooperating with the annular outlet,

wherein the restriction defines an annular exit opening for compressed fluid exiting said diffuser, the width of which



annular opening can be varied by movement of said restriction transverse to said annular opening.

4,877,370

DIFFUSER FOR CENTRIFUGAL COMPRESSOR

Koji Nakagawa, Tsuchiura; Takeo Takagi, Tsukuba; Yoshiaki Abe, and Haruki Sakai, both of Ibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

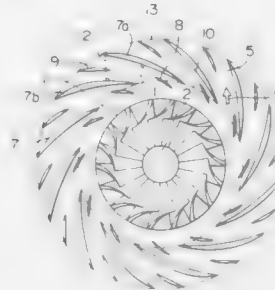
Filed Aug. 30, 1988, Ser. No. 238,176

Claims priority, application Japan, Sep. 1, 1987, 62-218941; Sep. 28, 1987, 62-240737

Int. Cl.⁴ F04D 29/30

U.S. Cl. 415—148

12 Claims



1. A diffuser of a centrifugal compressor including a plurality of stator blades disposed on an outside of an impeller thereof, and which converts kinetic energy of fluid discharged from said impeller into pressure energy by operation of said stator blades, said diffuser comprising sub-blades having a cord length shorter a cord length of said stator blades disposed near inner ends of and between said plurality of stator blades, one side surface of each of said sub-blades confronting said stator blade, the other side surface of each of said sub-blades not confronting a neighboring stator blade, said sub-blades being situated at positions intersecting a circle having a center thereof at a center of a rotational shaft of said impeller and which passes through the inner end of said stator blade.

4,877,371

PUMP

Francis G. Putt, Brighton, Mich., assignor to Kerr Machinery Corporation, Oak Park, Mich.

Filed Aug. 22, 1988, Ser. No. 234,588

Int. Cl.⁴ F04D 29/62

U.S. Cl. 415—169.1

1 Claim

1. A vertical turbine pump for transferring liquid from a tank having a top panel with an aperture therein, said pump comprising
 - a motor bracket secured to the top panel of said tank;
 - a rotatable pump shaft extending downwardly through said

motor bracket and through the aperture in the top panel of said tank;

an impeller on said pump shaft;

an impeller bowl surrounding said impeller and having a discharge throat of relatively smaller diameter than said impeller and a truncated conical upwardly divergent fluid pressure reducing chamber above the discharge throat thereof;

a fluid flow diverter having a first 90° elbow portion communicating with the pressure reducing chamber of said impeller bowl for directing fluid flow at a right angle to the axis of rotation of said pump shaft, the first 90° elbow portion of said diverter having circular upper and lower flanges removably and sealably acceptable in complementary circular apertures in said diverter, a second 90° elbow portion of said diverter communicating with the first elbow portion for directing fluid flow to a path parallel to the axis of rotation of said pump shaft;



- a shaft seal in the first 90° elbow of said flow diverter on an opposite wall thereof from the pressure reducing section of said impeller bowl, said shaft and one side of said shaft seal being exposed to fluid pressure internally of said flow diverter and the other side of said shaft seal being in fluid flow communication with the inside of said tank and exposed to internal tank pressure; and
- a vapor seal in the cover plate of said tank and disposed about said shaft, said vapor seal being disposed in axially spaced relation to said shaft seal, whereby said shaft between said shaft and said vapor seal is exposed to internal tank pressure and fluid leakage past said shaft seal is vented back to tank; said motor bracket, pump shaft, vapor seal, shaft seal, first diverter section, suction bowl, impeller bowl and impeller being vertically removable as an assembly through the aperture in the top panel of said tank.

4,877,372

MULTI-STAGE ROTARY PUMP

Niels D. Jensen, and Erik Svarre, both of Bjerringbro, Denmark, assignors to Grundfos International A/S, Bjerringbro, Denmark

Filed Sep. 2, 1988, Ser. No. 240,085

Claims priority, application Fed. Rep. of Germany, Sep. 4, 1987, 3729673

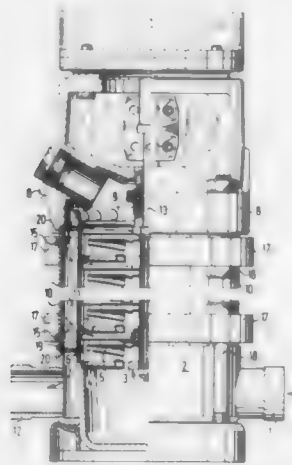
Int. Cl.⁴ F04D 29/62

U.S. Cl. 415—199.1

2 Claims

1. A multistage rotary pump comprising a substantially closed elongated pump body which is provided at one of its extremities with a base element containing suction and pressure connecting pieces and at its other extremity with a top element and which is surrounded in spaced relationship by a jacket to

form an annular return volume, and clamping means joining the jacket to the base element and the top element, the jacket being sealed with respect to these elements and being provided at least substantially close to its two extremities with contact shoulders which are acted upon by the clamping means,



wherein the terminal portions of the jacket are each provided with a pressed-in peripheral groove, each of the two grooves having inserted into it an annular element projecting radially outwards with respect to the jacket and forming the said contact shoulder, and an axially stressed clamping ring acts on the said annular element.

4,877,373

VANED DIFFUSER WITH SMALL STRAIGHTENING VANES

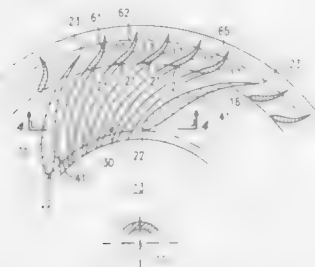
Phiroze Bandukwala, Olean, N.Y., assignor to Dresser-Rand Company, Corning, N.Y.

Filed Feb. 8, 1988, Ser. No. 153,591

Int. Cl.⁴ F04D 29/44

U.S. Cl. 415-208.4

17 Claims



1. In a diffuser having a first row of primary curved vanes, each of said primary curved vanes having a leading edge and a trailing edge, the improvement comprising:

a second row of secondary curved vanes which are smaller than said primary curved vanes, said second row being located radially outwardly from the leading edges of the first row of primary curved vanes, each of the secondary curved vanes having a leading edge located radially inwardly of the trailing edges of the primary curved vanes, each pair of adjacent primary curved vanes having a respective plurality of said secondary curved vanes positioned between the primary curved vanes of the respective pair, the camber of the secondary curved vanes opposing the camber of the primary curved vanes.

4,877,374

SELF-REGULATING WINDMILL

Bill Burkett, 4319 Los Serranos Blvd., Chino, Calif. 91709

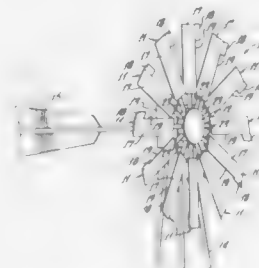
Continuation-in-part of Ser. No. 186,380, Apr. 26, 1988,

abandoned. This application Jan. 23, 1989, Ser. No. 299,886

Int. Cl.⁴ F03D 7/04

U.S. Cl. 416-136

10 Claims



1. A windmill comprising

a hub,

means for mounting said hub for rotation about a generally horizontal axis,

a plurality of blades,

means for connecting said blades to said hub such that said blades project radially from said hub and are adapted to receive wind traveling in a direction toward said blades and generally parallel to said axis,

said means for connecting said blades to said hub including means for permitting pivotal movement of said blades about a longitudinal axis for varying the angle of each of said blades relative to said direction between a first position in which said blades are at a relatively large angle relative to said direction and a second position in which said blades are at a relatively shallow angle relative to said direction,

and resilient means biasing said blades to said first position, each of said blades including an elongated principal portion having a leading edge, and a relatively small tab means projecting from said leading edge and spaced from said longitudinal axis, said tab means being shorter than said elongated principal portion and located substantially at the outer end thereof,

said tab means being at a more shallow angle relative to said direction than is said principal portion when said blade is in said first position thereof, whereby when said blade is rotated the resistance of the air to the rotation of said tab means generates a force on said tab means so that said tab means causes said blade to pivot from said first position to said second position thereof in opposition to said resilient means when said blade is subjected to relatively high rotational velocities.

4,877,375

DRIVE SHAFT AND ROTOR HUB FOR HELICOPTER FLEXIBLE ROTOR SYSTEM

Rene A. Desjardins, Media, Pa., assignor to The Boeing Company, Seattle, Wash.

Filed Sep. 30, 1986, Ser. No. 913,274

Int. Cl.⁴ B64C 27/33

U.S. Cl. 416-134 A

14 Claims

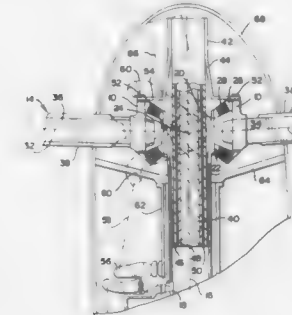
1. A rotor for supporting helicopter rotor blades that extend radially outward from the rotor comprising:

a rotor shaft driveably connecting the rotor to a power source, mounted for rotation about a central longitudinal axis;

a rotor hub surrounding the axis of the rotor shaft and adapted for attachment to the rotor blades;

bearing means located between the rotor hub and the rotor shaft, defining a center about which the rotor hub is supported on the rotor shaft; and

flexible shaft means coaxial with, connected to and forming an extension of the rotor shaft, said flexible shaft means also being connected to the rotor hub for flexibly connecting the rotor shaft to the rotor hub for pivotal movement about said center and for inflexibly connecting the rotor



shaft to the rotor hub for torsional movement, wherein the load path by which rotor torque is transmitted between the rotor shaft and the rotor hub through the bearing means is flexible in relation to the load path by which rotor torque is transmitted between the rotor shaft and rotor hub through the flexible shaft means.

4,877,376

ATTACHMENT OF A ROTOR BLADE OF FIBER REINFORCED PLASTIC TO A METAL ROTOR HUB

Siegfried Sikorski, Munich, and Werner Hütther, Karlsfeld, both of Fed. Rep. of Germany, assignors to Motoren- und Turbinen-Union München GmbH, Munich, Fed. Rep. of Germany

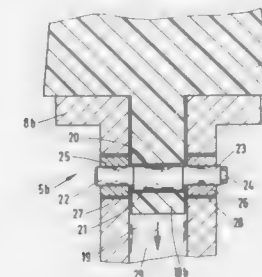
Filed Jun. 3, 1988, Ser. No. 202,710

Claims priority, application Fed. Rep. of Germany, Jun. 4, 1987, 3718678

Int. Cl.⁴ B64C 11/04

U.S. Cl. 416-207

15 Claims



1. Apparatus for attaching a rotor blade of a turbine to a rotor hub of the turbine, said apparatus comprising a shank extending axially on a rotor blade of a turbine, a tubular, metal body constituting part of a hub of the turbine, said metal body having a bore receiving said shank, and tensioning means connecting said shank and said tubular body for applying tensile force to said shank, said shank being integrally formed with the blade of a fiber reinforced synthetic resin material, said tensioning means comprising a tension bolt received in a transverse opening provided in said shank, means on said tension bolt projecting laterally of said shank, and turnable means accessible from outside said metal body and engaging said metal body and said means which projects laterally of said shank for applying adjustable tensile force to said shank via said tension bolt by turning said turnable means from outside said metal body.

4,877,377

ROTARY PUMP SYSTEM

Peter J. Taylor, Hants, England, assignor to Plessey Overseas Limited, Ilford, England

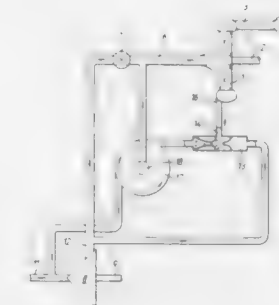
Filed Jun. 24, 1988, Ser. No. 211,286

Claims priority, application United Kingdom, Jun. 25, 1987, 8714966

Int. Cl.⁴ F04B 23/14

U.S. Cl. 417-89

5 Claims



1. A rotary pump system for pumping a liquid which is delivered under pressure from a backing pump, in which the rotary pump has a pump body which is required to be drained of liquid at times when the rotary pump is inoperative, wherein the backing pump has a by-pass circuit between its inlet and outlet ports, the by-pass circuit comprising a multiphase pump which has a suction inlet connected to a drain point on the rotary pump body and a vortex chamber through which liquid passes from the multiphase pump outlet to the backing pump inlet, a central outlet of said vortex chamber being connected to an inlet port of said rotary pump.

4,877,378

VIBRATORY DIAPHRAGM PUMP

Michael J. Saggert, 9 Pennycroft, Harpenden, Hertfordshire, AL52PD, England

PCT No. PCT/GB86/00759, § 371 Date Aug. 10, 1987, § 102(c) Date Aug. 10, 1987, PCT Pub. No. WO87/03650, PCT Pub. Date Jun. 18, 1987

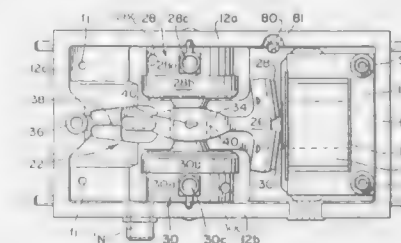
PCT Filed Dec. 11, 1986, Ser. No. 95,171

Claims priority, application United Kingdom, Dec. 11, 1985, 8530514; Dec. 12, 1985, 8530666; Dec. 12, 1985, 8530667

Int. Cl.⁴ F04B 45/04, 35/04

U.S. Cl. 417-299

10 Claims



1. A pneumatic vibratory diaphragm pump, characterised by a casing comprising an upper chamber having an inlet by which air can be drawn from outside the casing and a lower chamber having an outlet from which air can issue from the casing, an oscillatory armature within the lower chamber to actuate a diaphragm of at least one diaphragm and valve assembly and drive means to cause oscillatory movement of the armature, each diaphragm and valve assembly being operatively connected with the upper chamber so as to induce air to be pumped thereby from the upper chamber and to discharge air into the lower chamber whereby the lower chamber pro-

vides an expansion chamber for the pump and from which the discharged air issues from said outlet.

4,877,379

ROTARY MECHANISM FOR THREE-DIMENSIONAL VOLUMETRIC CHANGE

Kunio Okabe, 8-31, Kyomei 1-chome, Chikusa-ku, Nagoya, Aichi, Japan

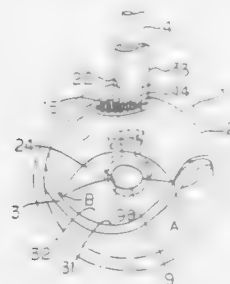
Filed Jun. 25, 1987, Ser. No. 66,243

Claims priority, application Japan, Jun. 25, 1986, 61-147083

Int. Cl.⁴ F01C 3/00, 17/02, 19/08

U.S. Cl. 418-51

93 Claims



1. A rotary mechanism for a three-dimensional volumetric change, comprising:

- a casing having an at least partly spherical inner space;
 - a rotor disposed in the casing and having a partially spherical surface associated with a spherical wall of said inner space as a bottom surface and a substantially conical surface which includes a plurality of apexes extending substantially radially;
 - a member having a curved surface constituted by a spherical peritrochoidal cone surface defined by a locus of the apex due to precessing motion of said rotor relative to the member; and
 - a means for establishing the relative precessing motion at a defined angular velocity ratio;
- wherein a space defined in the spherical space of the casing and having its volume changed by relative precessing motion between said member and said rotor serves as a working space; the relative precessing motion between said member and rotor has an angular velocity ratio of $\omega:\omega' = 1:(1-1/n)$ where ω represents a planetary rotation velocity of a spin axis of one of said member and rotor, ω' represents a spin velocity of the spin axis per se, and n is a natural number of 2 or more and equal to the number of apexes in the rotor; and the casing includes at least one pair of inlet and outlet ports in the spherical wall.

4,877,380

CONTROL SYSTEM FOR CONTROLLING THE INTERNAL VOLUME IN A ROTARY COMPRESSOR

Rune Glasvall, Norrköping, Sweden, assignor to Stal Refrigeration AB, Norrköping, Sweden

Filed Mar. 2, 1988, Ser. No. 162,954

Claims priority, application Sweden, Mar. 4, 1987, 8700900

Int. Cl.⁴ F04B 49/02; F04C 18/16

U.S. Cl. 417-310

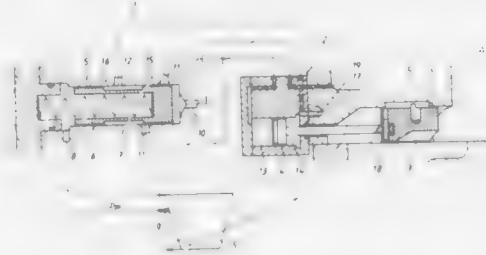
2 Claims

1. A control system for controlling the positioning of a valve body with respect to an outlet gate of an operating chamber of a rotary compressor to thereby adjust the internal volume of the rotary compressor, said rotary compressor providing a first outlet port for fluid medium at a low pressure, a second outlet port for fluid medium at a high pressure and a third outlet port for fluid medium at an intermediate pressure, said control system comprising

an operating device which includes a housing means forming a cylindrical operating chamber; a piston which is movable within said operating chamber and which divides said

operating chamber into first and second chamber spaces; a piston rod which extends from said piston through said second chamber space and connects with said valve body; said second chamber space communicating with said first outlet port of said rotary compressor;

a control device which includes a housing means forming a cylindrical control chamber having first and second ends, said housing means providing a first opening communicating with said control chamber near said first end thereof, a second opening communicating with said control chamber about halfway between said first and second ends thereof, third and fourth openings communicating with said control chamber near said second end thereof, and a fifth opening at said second end of said control chamber; a plunger which is movable within said control chamber, said plunger having a first end portion which faces said first end of said control chamber, an opposite second end portion which can block said third and fourth openings,



and a middle portion of reduced diameter which is in register with said second opening, and spring means biasing said plunger towards said second end of said control chamber;

first conduit means connecting said first opening with said third outlet port,

second conduit means connecting said second opening with said first outlet port,

third conduit means connecting said third and fourth openings with said first chamber space of said operating device,

fourth conduit means connecting said fifth opening with said second outlet port,

the positioning of said valve body being determined by the relative pressures of fluid medium in said first and second chamber spaces of said operating chamber, which in turn is controlled by the positioning of the plunger in said control chamber.

4,877,381

COMPRESSOR SHAFT COLLAR THROUGH PORT FOR PRESSURE EQUALIZATION BETWEEN FLUID POCKETS

William C. Johnson, Onsted, and Hubert Richardson, Jr., Brooklyn, both of Mich., assignors to Tecumseh Products Company, Tecumseh, Mich.

Filed May 12, 1988, Ser. No. 193,750

Int. Cl.⁴ F04C 18/04, 29/02; F01M 11/02; F16C 32/06

U.S. Cl. 418-55

19 Claims

1. A hermetic compressor, comprising:

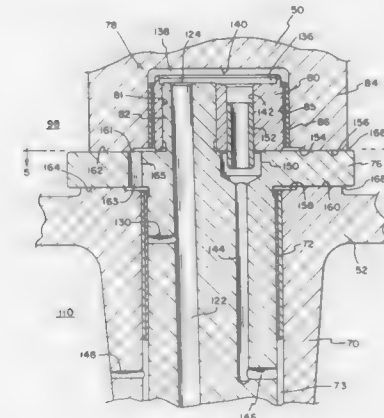
a housing;

compressor means within said housing for compressing refrigerant fluid;

a rotatable crankshaft including an axial shaft portion and a radially extending plate portion, said plate portion having a top surface and a bottom surface;

a first annular pocket of fluid adjacent said top surface and a second annular pocket of fluid adjacent said bottom surface, said first and second pockets being circumjacent said shaft portion, the radially outermost boundary of each of

said first and second pockets being radially inward from a perimeter edge of said plate portion; and



pressure equalization means in said crankshaft for providing fluid communication between said first pocket and said second pocket such that said first and second pockets of fluid are at substantially equal pressures.

4,877,382

SCROLL-TYPE MACHINE WITH AXIALLY COMPLIANT MOUNTING

Jean-Luc M. Caillat; Roger C. Weatherston, both of Dayton, and James W. Bush, Sidney, all of Ohio, assignors to Copeland Corporation, Sidney, Ohio

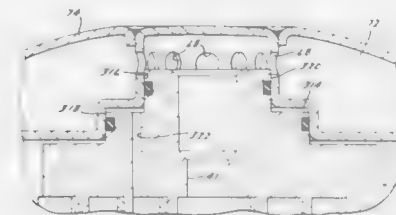
Division of Ser. No. 899,003, Aug. 23, 1986, Pat. No. 4,767,293.

This application May 2, 1988, Ser. No. 189,485

Int. Cl.⁴ F01C 1/04, 19/08

U.S. Cl. 418-55

34 Claims



1. A scroll-type machine comprising:

(a) a first scroll member having a spiral wrap thereon;

(b) a second scroll member having a spiral wrap thereon;

(c) support means for mounting said scroll members with said spiral wraps intermeshing with one another, said first scroll member being mounted for non-orbital movement with respect to said support means, and said second scroll member being mounted for orbital movement with respect to said support means and said first scroll member whereby said orbital movement will cause said wraps to define moving fluid pockets communicating between a low pressure and a high pressure; and

(d) biasing means for biasing said first scroll member toward said second scroll member, said biasing means comprising means defining a first chamber containing fluid at a first pressure; and means defining a second chamber containing a fluid at a second pressure; said first and second pressures being greater than said low pressure; said first and second chambers being positioned such that said fluid at said first pressure and said fluid at said second pressure cooperate to exert a biasing force on said first scroll member in a direction toward said second scroll member and generally parallel to the axis of

said orbital movement to thereby enhance sealing therebetween.

4,877,383

DEVICE HAVING A SEALED CONTROL OPENING AND AN ORBITING VALVE

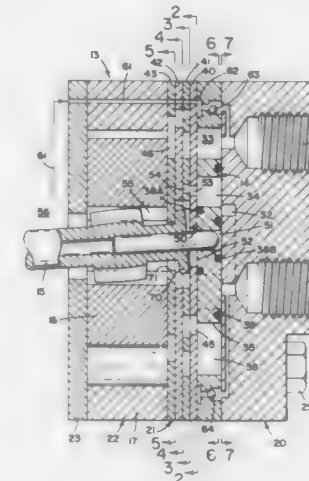
Hollis N. White, Jr., 243 Pyle La., Hopkinsville, Ky. 42240

Continuation of Ser. No. 80,606, Aug. 3, 1967, abandoned. This application Dec. 12, 1988, Ser. No. 282,675

Int. Cl.⁴ F01C 1/10, 19/08; F17K 3/02

U.S. Cl. 418-61.3

9 Claims



1. An improvement for a device having a housing with a stationary body and an orbiting valve selectively interconnecting fluid of two ports to expanding and contracting motor cells through bi-directional fluid passages through the stationary body of the housing of the device, the orbiting valve directly rotated by an orbiting drive shaft extending through a central opening of the device to connect to the valve with the diameter of the central opening being larger than the diameter of the drive shaft extending therethrough, the improvement of the addition of a means to seal the central opening from the fluid, in the orbiting valve.

9. An improvement for a device having an orbiting valve having a central opening selectively interconnecting fluid of a port to expanding and contracting cells, the central opening being between a central section and an outside edge connected by radial arms having a width, and the orbiting valve moving against a surface, the improvement comprising means in the surface to allow fluid to bypass the arms of the orbiting valve, said means including passages having a circumferential width greater than the width of the radial arms of the valve.

4,877,384

VANE TYPE ROTARY COMPRESSOR

Jen-Yeh Chu, No. 75-2, Feng Jen Street, Chi-Lung City, Taiwan

Filed May 16, 1988, Ser. No. 194,964

Int. Cl.⁴ F04C 15/02, 29/08

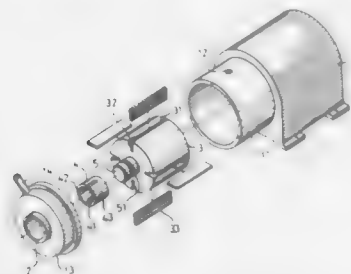
U.S. Cl. 418-184

5 Claims

1. A vane-type rotary compressor comprising: a cylinder (11) having an upper gas inlet (12) at a selected location in its circumference; a rotor (3) eccentrically mounted in a lower portion of said cylinder spaced away from said gas inlet, said rotor having a plurality of circumferentially spaced radial slots therein, each slot having a notch near an outer end thereof on a leading side of said slot in a direction of rotation of said rotor; motor means connected to said rotor for rotating said rotor in the rotational direction;

a vane (33) slidably mounted in each of said slots, each vane being slidable outwardly against an inner surface of said cylinder for defining gas chambers between said vanes and between an outer surface of said rotor and the inner surface of said cylinder; an end plate (13) fixed to and closing said cylinder, said end plate having an arc shaped groove (15) in a position to be covered by an end surface of said rotor, said arc shaped groove being in the path of said notches with rotation of said rotor, said end plate having a hub cavity (2) which is centered with a center of rotation for said rotor, said end plate including a discharging passage communicating with said cavity, an unloading passage communicating with said cavity and an expelling passage communicating with said cavity, said passages being circumferentially spaced around said cavity;

a sliding ring (4) mounted for axial movement in said cavity, said sliding ring being fixed against rotation to said end plate, said sliding ring having a discharging hole (42)



therethrough at one axial end of said ring, an unloading hole (43) therethrough at an opposite axial end of said ring, and an expelling hole (41) therethrough which is large enough to always be in communication with said arc shaped groove despite the axial position of said ring, said expelling hole always overlapping 100% of said expelling passage despite the axial position of said ring, said discharging hole overlapping by between 0 and 100% of said discharging passage depending on the axial position of said ring and said unloading hole overlapping by 100% to 0% of said unloading passage depending on the axial position of said ring, said unloading passage being 100% overlapped by said unloading hole when said discharging passage is 0% overlapped by said discharging hole; and

a shaft end (5) connected to said rotor and extending outwardly from the center of rotation of said rotor into sliding contact with an inner surface of said ring, said shaft end having an annular groove (51) therein for establishing communication between said holes of said ring.

4,877,385

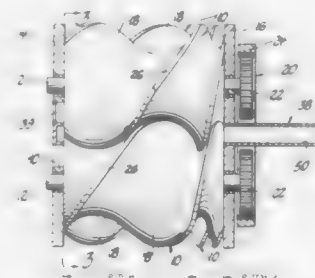
POSITIVE DISPLACEMENT ROTARY MECHANISM
Constantinos A. Koromilas, Utica, Mich., assignor to General Motors Corporation, Detroit, Mich.
Division of Ser. No. 5,077, Jan. 20, 1987, Pat. No. 4,782,802.
This application Jul. 22, 1988, Ser. No. 222,880
Int. Cl.⁴ F02B 53/00

U.S. Cl. 418—197

1 Claim

1. A positive displacement rotary mechanism comprising four essentially identical rotary helical intermeshing lobes with parallel axes and identical helical surfaces extending between axially spaced ends thereof, a four-sided stationary cylindrical member extending centrally of said lobes and parallel to said axes, said helical surfaces having a varying pitch and a cross sectional profile as viewed axially having at least two convex circular apexes joined by convex circular sides such that said helical surfaces cooperate through close apex-to-side and apex-to-apex relationships therebetween and also cooperate with the sides of said cylindrical member through close apex relationship therewith to define a repetitive working space internal of

said lobes having boundaries along and between said lobes and along and between said lobes and said cylindrical member which boundaries move on rotation of said lobes to effect expansion and contraction of said working space while repeti-



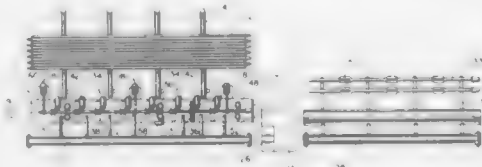
tively moving same from one of said ends of said lobes toward the other end, and said stationary member having an exhaust passage extending therethrough with an opening to said working space.

4,877,386

AUTOMATED SUCKER ROD CLEANING APPARATUS
Robert B. Hinds, Borger; Charles B. Hutchinson, Jr., Fritch, and James S. Dowell, Phillips, all of Tex., assignors to J.M. Huber Corporation, Rumson, N.J.
Filed Dec. 20, 1988, Ser. No. 287,414
Int. Cl.⁴ B29C 45/14; B08B 1/04

U.S. Cl. 425—110

11 Claims



1. In an automated system for molding a polymer rod guide onto an oilfield sucker rod, the system including a rod feeding means, an apparatus for cleaning a pre-determined section of the rod to receive the rod guide, a conveying means for conveying the cleaned rod and an injection molding apparatus for receiving the clean rod and molding a rod guide thereon, the rod cleaning apparatus comprising:

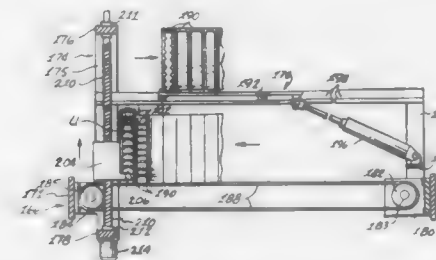
- a substantially linear member having a member axis and secured to a frame, the linear member moveable along the member axis;
 - a means for reciprocating the linear member along the member axis a pre-selected stroke distance;
 - a means for rotating a rod to be cleaned about a rod axis substantially parallel the member axis;
 - a plurality of guide rollers mounted on the frame on radially opposite sides of the rod axis and spaced radially together sufficiently close to rotatably support the rod therebetween along the rod axis to secure the rod in position for cleaning; and
 - a brush assembly releasably mounted on the linear member, the brush assembly including:
 - a rotatable wire brush on a shaft for engaging and cleaning a point on the rod,
 - a rotationally powered shaft for rotating the brush when the brush is engaged against the rod, and
 - a brush support for releasably mounting the brush at a preselected point along the linear member,
- so that when the brush assembly is releasably mounted at a preselected point on the reciprocating linear member and a brush is engaged against the rod and rotated, the move-

ment of the reciprocating linear member cleans a predetermined length of the rod.

4,877,387

AUTOMATIC CONTINUOUSLY CYCLEABLE MOLDING SYSTEM

Richardus H. J. Flerkens, Herwen, and Ireneus J. T. M. Pas, Rozendaal, both of Netherlands, assignors to ASM Fico Tooling, b.v., Herwen, Netherlands
Division of Ser. No. 586,855, Mar. 6, 1984, Pat. No. 4,575,328.
This application Nov. 15, 1985, Ser. No. 798,677
Int. Cl.⁴ B29C 39/04, 39/10
U.S. Cl. 425—116 3 Claims



1. A multi-station molding system for use with bottom and top molds that are assembleable into mold sets, said system comprising:

- a means for placing at least one package which comprises a lead frame and a semiconductor chip into a cavity located within said bottom and top molds;
- a means for inserting molding material into said cavity to encapsulate, in liquid form, said semiconductor chip of said package, said means for inserting being operably separate from said means for placing;
- a means for curing said liquid molding material to form a solid encapsulation of said semiconductor chip during cycling and transporting away from said means for inserting of said bottom and top molds assembled together with said package located therein, said means for curing having clamp means coupled to a plurality of walking beams for holding together said bottom and top molds during said cycling and being operably separate from said means for placing and said means for inserting; and
- a means for positioning said package for removal therefrom.

4,877,388

MOLD CLAMPING APPARATUS IN AN INJECTION MOLDING MACHINE

Yoshiharu Inaba, Kawasaki, and Shigeo Tokunaga, Hino, both of Japan, assignors to Fanuc Ltd., Minamitsuru, Japan
PCT No. PCT/JP87/00577, § 371 Date Mar. 8, 1988, § 102(e) Date Mar. 8, 1988, PCT Pub. No. WO88/01225, PCT Pub. Date Feb. 25, 1988

PCT Filed Jul. 31, 1987, Ser. No. 183,736
Claims priority, application Japan, Aug. 11, 1986, 61-186967
The portion of the term of this patent subsequent to May 3, 2005, has been disclaimed.
Int. Cl.⁴ B29C 45/66

U.S. Cl. 425—150

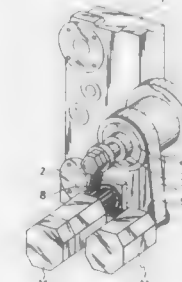
3 Claims

1. A mold clamping apparatus having a fixed platen, a movable platen and a spindle operatively connected to the moving platen, for use in an injection molding machine which is controlled by a host controller, comprising:

- a plurality of servomotors for driving the spindle;
- coupling means for coupling each of said servomotors to the spindle;
- detecting means for detecting at least one of a rotational position and a rotational speed of one of said servomotors

and producing an output signal indicative of said detected position or speed;

a control circuit for generating a torque command signal in accordance with a difference between said output signal from said detecting means indicative of the detected posi-



tion or speed and a command signal from the host controller; and

driving circuits for driving corresponding servomotors, in accordance with said torque command signal supplied from said control circuit, said driving circuits corresponding in number to that of said plurality of servomotors.

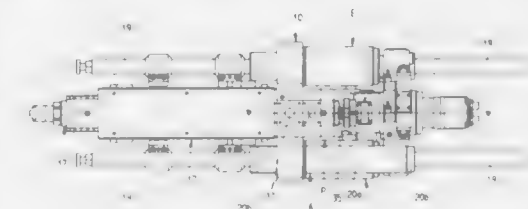
4,877,389

LOCKING APPARATUS FOR LOCKING A DETACHABLY MOUNTED PLASTICIZING CYLINDER OF A PLASTICIZING UNIT IN OPERATIVE POSITION TO A CARRYING BLOCK OF AN INJECTION MOLDING MACHINE

Karl Hehl, Arthur-Hehl-Str. 32, D-7298 Loosburg 1, Fed. Rep. of Germany

Filed Oct. 12, 1988, Ser. No. 256,609
Claims priority, application Fed. Rep. of Germany, Oct. 22, 1987, 3735769

Int. Cl.⁴ B29C 45/03, 45/62, 45/50
U.S. Cl. 425—190 9 Claims



1. In an injection molding machine having a locking apparatus for locking a detachably mounted plasticizing cylinder in an operative position to a carrying block of an injecting unit of said machine, which locking apparatus has a vertical longitudinal plane of symmetry and comprises

two sliders, which are arranged on opposite sides of the axis of said plasticizing cylinder and are arranged to be radially movable on said cylinder for a movement between a locking position for positively locking said plasticizing cylinder in said operative position to said carrying block, and an unlocking position, which is defined by a stop and in which said sliders release said plasticizing cylinder for its removal from said carrying block, and

hydraulic unlocking cylinder means, which are operatively connected to said sliders and operable to move said sliders from said locking position to said unlocking position, the improvement wherein

said unlocking cylinder means comprise two unlocking cylinders, which are disposed on opposite sides of said

plane of symmetry and are symmetrical to one another with respect to said plane, said sliders consist of a clamping slider and backing slider, each of said unlocking cylinders comprises two functional parts consisting of a cylinder proper and a piston and piston rod, one of said functional parts of each of said unlocking cylinders is integrated in said clamping slider, the other of said functional parts of each said unlocking cylinders protrudes from said clamping slider and is secured to said backing slider.

4,877,390

DEGASSIFICATION DEVICE FOR A SCREW EXTRUDER WHICH PROCESSES PLASTIC MATERIAL

Herbert Ocker, Leonberg, and Gerhard Wehrich, Illingen, both of Fed. Rep. of Germany, assignors to Werner & Pfleiderer GmbH, Stuttgart, Fed. Rep. of Germany

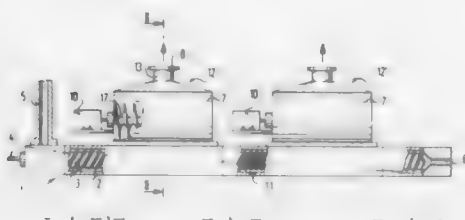
Filed Apr. 1, 1988, Ser. No. 176,703

Claims priority, application Fed. Rep. of Germany, Apr. 3, 1987, 3711328

Int. Cl.⁴ B29C 47/76

U.S. Cl. 425—203

14 Claims



1. A degassification device for a screw extruder which processes plastic material, the extruder having a hollow housing and an extruder screw rotatable in the housing, said degassification device comprising a pair of degassification screws disposed adjacent to said extruder screw for rotation about axes parallel to the axis of rotation of the extruder screw, a housing headpiece accommodating said degassification screws and having an opening in communication with an opening provided in the extruder housing such that gas and vapor produced in the extruder housing can flow radially therefrom into the housing headpiece, said housing headpiece having an outlet for discharge of said gas and vapor, said degassification screws having threads which interengage one another, means for driving the degassification screws in the same direction of rotation, said housing headpiece having adjacent longitudinal bores which overlap one another and respectively receive said degassification screws therein with their threads interengaged with one another, said threads having outer peripheral surfaces which confront, in close proximity, the inner surface of the housing headpiece around the overlapped bores, said degassification screws each comprising a spiral thread without a shaft having a length and cross sectional profile such that upon rotation of the screws, the overlapped bores in the housing headpiece are longitudinally and transversely traversed by said screws substantially in entirety, the outer peripheral surfaces of the threads of the degassification screws being radially spaced from the outer peripheral surface of the extruder screw such that the threads of the degassification screw do not intermesh with the threads of the extruder screw.

4,877,391

APPARATUS FOR SCORING RIGID PLASTIC SHEET MATERIAL

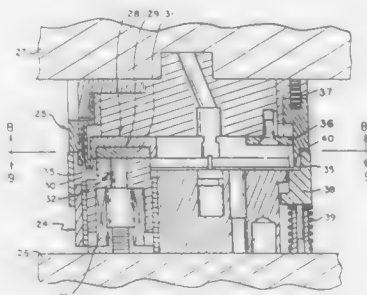
Edward E. Batson, Mesa, and John H. Kurz, Scottsdale, both of Ariz., assignors to WMF Container Corporation, Phoenix, Ariz.

Division of Ser. No. 4,818,461, Aug. 11, 1986, which is a continuation-in-part of Ser. No. 774,225, Sep. 9, 1985, abandoned. This application Aug. 18, 1988, Ser. No. 233,583

Int. Cl.⁴ B29C 43/40

U.S. Cl. 425—289

6 Claims



1. An apparatus for forming frangible score lines in rigid plastic sheet material comprising:

- (a) a flat surface;
- (b) a scoring means having means to move said scoring means to strike downwardly on a sheet of rigid plastic material overlying said flat surface;
- (c) a serrated edge located on said flat surface, said serrated edge having points and notches; and,
- (d) means to control the distance of travel of said scoring means relative to said flat surface such that when said scoring means strikes downwardly on said sheet of rigid plastic material overlying said flat surface and said serrated edge the points of said serrated edge will extend into said sheet of rigid plastic material a distance further than the notches of said serrated edge to form a corrugated fracturable score line in said plastic sheet material.

4,877,392

ARRANGEMENT FOR APPLYING SURFACE PRESSURE TO CONTINUOUSLY MOVING WORKPIECE WEBS

Raoul De Brock, Kortrijk, Belgium, assignor to Akzo NV, Arnhem, Netherlands

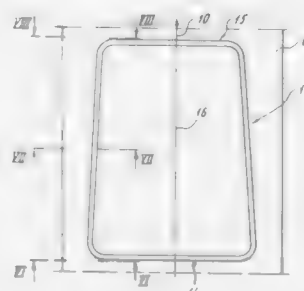
Filed Jun. 27, 1988, Ser. No. 211,696

Claims priority, application Fed. Rep. of Germany, Jul. 4, 1987, 3722157

Int. Cl.⁴ B29C 43/48, 43/22

U.S. Cl. 425—371

6 Claims



1. An arrangement for applying a surface pressure to continuously moving workpiece webs, such as laminates, comprising at least one movable pressing band arranged to be pressed against a workpiece web by a pressure medium; means forming

a pressure chamber which has a supply side and a discharge side so that said pressing band is movable in a direction from said supply side into said pressure chamber to be first heated and softened and then to be cooled and hardened and then further in the direction of movement to said discharge side, said means including a sealing frame which has a contour defining an enclosed region; means for applying pressure to said frame in a direction towards said pressing band, said sealing frame having a transverse frame portion located at said supply side, a transverse frame portion located at said discharge side and longitudinal frame portions and extending therebetween in the direction of movement and converging from said supply side to said discharge side so that said transverse frame portion at said discharge side has a smaller width than said transverse frame portion at said supply side.

4,877,394

APPARATUS FOR MOLDING PARTS HAVING SMALL DIAMETER HOLE

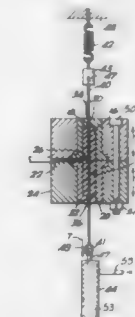
Richard H. McFarlane, Geneva, Ill., assignor to Taut Inc., Geneva, Ill.

Division of Ser. No. 302,490, Sep. 16, 1981, abandoned. This application May 23, 1983, Ser. No. 496,894

Int. Cl.⁴ B29C 45/03, 45/27

U.S. Cl. 425—567

7 Claims



4,877,393

APPARATUS FOR PRODUCING BIAXIALY ORIENTED POLYMER SHEET

Ying-Cheng Lo, Bethlehem, Pa., assignor to Aluminum Company of America, Alcoa Center, Pa.

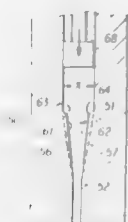
Division of Ser. No. 806,994, Dec. 9, 1985, Pat. No. 4,789,514.

This application Nov. 30, 1988, Ser. No. 277,815

Int. Cl.⁴ B29C 43/48, 47/54

U.S. Cl. 425—383

7 Claims



1. An apparatus for producing biaxially oriented polymer sheet from a workpiece of semi-crystalline polymer material having inboard and outboard portions, wherein the workpiece has a first lateral dimension extending in a first lateral direction; a second lateral dimension oriented in a direction normal to the first lateral dimension and extending in a second lateral direction, and a longitudinal dimension extending in a longitudinal direction normal to both first and second lateral dimensions, the apparatus comprising:

- means for applying a force to the workpiece in the longitudinal direction to move the workpiece from an upstream position to a downstream position;
- means for confining the workpiece while the force is applied, wherein the material of the workpiece flows in directions having components parallel to the first and second lateral dimensions and parallel to the longitudinal dimension of the workpiece, the confining means including rigid surfaces which converge toward one another in a direction parallel to the first lateral dimension of the workpiece while expanding in a direction parallel to the second lateral dimension of the workpiece, the rigid surfaces terminating to define an outlet opening having a rectangular cross-section; the rigid surfaces which converge toward one another having rigid protrusion means thereon for squeezing inboard portions of the workpiece more than outboard portions, and means for maintaining a continuous convex surface while the material is confined; whereby the material of the workpiece flows bidirectionally to produce the biaxially oriented polymer sheet.

1. An apparatus for molding a long tubular plastic piece of thin wall thickness which includes a central coaxial hole extending therethrough along the length thereof, said apparatus comprising:

- (a) a mold comprising a first and a second mating mold part positionable into mating engagement with one another and structured when so positioned to define a mold cavity within said mold,
- (b) said mold cavity having an interior longitudinal dimension between opposite ends thereof substantially equal to the length of the resulting plastic piece,
- (c) said mold including a passageway having a predetermined transverse dimension located at each of said opposite ends of said mold cavity and in communicating relation between said mold cavity and the exterior of said mold,
- (d) each passageway disposed in coaxial relation with one another and with a central longitudinal axis of said mold cavity,
- (e) a wire core including an intermediate portion disposed within said mold cavity and extending the length thereof and in coaxial relation to said mold cavity,
- (f) said wire core including a first end and a second end extending from said intermediate portion, each of said ends disposed to pass through one of said passageways and extend outwardly from said mold cavity so as to be exteriorly accessible relative thereto,
- (g) tension applying means for tensioning said wire core and located in spaced relation to and exteriorly of said mold and including a first tensioning means and a second tensioning means secured to said first exteriorly accessible end of said core and said second exteriorly accessible end of said core respectively for applying tension thereto,
- (h) said first tensioning means anchored in place and structured to maintain and resist any force applied to said wire core, said second tensioning means structured to selectively apply an adjustable axially directed tensioning force to said second exteriorly accessible end and against said first tensioning means,
- (i) plastic injection means mounted at least in part on said mold and in communicating relation with said mold cavity, said plastic injection means structured and disposed for directing flowable plastic material into said cavity and about said wire core,
- (j) said second tensioning means adapted to subsequently adjust axial force applied to said second exteriorly accessible end to compensate for distorting pressures on said wire

core subsequent to the injection of plastic material within said cavity, and
(k) said wire core disposed and maintained in a straight line coaxial orientation relative to said mold cavity during molding formation of the plastic material into said plastic piece.

4,877,395

SYSTEM CONTROL MEANS TO PREHEAT WASTE OIL FOR COMBUSTION

Gary Schubach, South 4805 Farr Rd., Spokane, Wash. 99206, and Frank Schubach, N. 1406 Aladdin Rd., Spokane, Wash. 99016

Division of Ser. No. 65,919, Jun. 22, 1987, Pat. No. 4,797,089. This application Oct. 4, 1988, Ser. No. 253,268

Int. Cl.⁴ F23N 5/00

U.S. Cl. 431—28

3 Claims



1. A waste oil burner feed system apparatus for preheating and then controlling the temperature of fuel oil for the atomization of the fuel oil in cooperation with a waste oil burner, comprising:

a heat transfer assembly which includes a helical oil passageway through an elongated aluminum heat transfer body, which receives heat from a heating element operatively connected to it, and which distributes the heat to fuel oil within its helical oil passageway;

an oil supply line in constant communication with the helical oil passageway in the heat transfer assembly and consequently in constant communication with an atomization nozzle which is securable at a terminal end of the heat transfer assembly;

an oil expansion and pressure relief means which prevents expanding fuel oil from passing through the atomization nozzle on cold startup and prior to the fuel oil attaining a temperature of a pre-selected value, and which prevents fuel oil from passing through the atomization nozzle as a result of residual pressure exerted during the operation cycle after a shutdown, by means of associated configuration of the heat transfer assembly in cooperation with the atomization nozzle and an adjacent pressure relief line in constant communication therewith; and

a system control means for cold startup to energize only the heating element, until the heat transfer assembly adjacent to the atomization nozzle attains a temperature of a pre-selected value, at which time said system control means energizes a fuel oil pump means, energizes an air blower, and energizes a means of igniting the atomized fuel oil exiting the aperture of the atomization nozzle.

4,877,396

INDUSTRIAL BURNER WITH CYLINDRICAL CERAMIC RECUPERATIVE AIR PREHEATER

Joachim Wunning, Leonberg, Fed. Rep. of Germany, assignor to WS Wärmeprozess-technik GmbH, Reiningen, Fed. Rep. of Germany

Filed Dec. 29, 1988, Ser. No. 291,744

Claims priority, application European Pat. Off., Jan. 15, 1988, 85100498.0

Int. Cl.⁴ F23R 3/00; F23D 11/44

U.S. Cl. 431—158

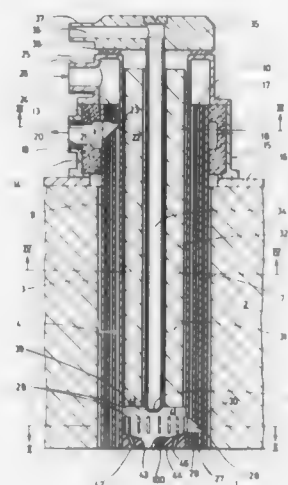
21 Claims

1. Industrial burner means for heating furnaces and other high heat treatment installation having recuperative air-

preheating means and a combustion chamber means (42) constructed of ceramic material providing for an input thereto of fuel and air and a hot gas exit in the form of jet-producing nozzle means (43), and wherein:

said recuperative air-preheating means is constituted as a substantially cylindrical centrally hollow body (4, 4a, 4b) of ceramic material disposed coaxially with said combustion chamber means (42) and said nozzle means (43) thereof and of tubular construction containing a multiplicity of longitudinal channels for countercurrent flow of combustion-supporting air and combustion product gas through respective sets of channels (9, 10) interleaved for provision of wall parts capable of thermally coupling said respective sets of channels, said channels of said set for flow of combustion supporting air being connected to a supply manifold of a source of said air flow located at an axial extremity of said substantially cylindrical body of tubular construction opposite to an axial extremity thereof connected to said combustion chamber means;

said channels (9, 10) of both of said sets of channels in said



hollow cylindrical body being distributed annularly next to one another interleaved sets about the longitudinal axis of said hollow cylindrical body;

said hollow cylindrical body having an inner substantially cylindrical jacket wall (5) surrounding an inner substantially cylindrical space (6), and said combustion chamber means (42) being provided either directly at a said end of said hollow cylindrical body or in a position utilizing an end portion of said substantially cylindrical space for at least a portion of said combustion chamber means;

at least a portion of said channels (10) of said set for flow of combustion supporting air being connected at their flow output ends to said combustion chamber means and all of said channels (10) of said air flow set having outflow orifices at an end of said hollow cylindrical body in the vicinity of said combustion chamber means (42), and said nozzle means (43) being constituted, at least in part by structure either passing through said hollow cylindrical body or connected to said hollow cylindrical body or both passing through said hollow cylindrical body and connected thereto.

4,877,397

PLANT FOR MANUFACTURING CEMENT CLINKER

June Tatebayashi, Takarazuka; Tomoaki Takada, Tokyo; Kimitaka Hayashi, Kakogawa, and Chikanori Kumagai, Kobe, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Japan

Filed Feb. 9, 1988, Ser. No. 154,433

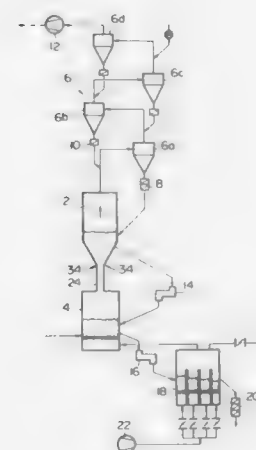
Claims priority, application Japan, Apr. 1, 1986, 61-75131; Aug. 29, 1986, 61-204302; Nov. 21, 1986, 61-279468

Int. Cl.⁴ F27B 15/00

U.S. Cl. 432—106

18 Claims U.S. Cl. 433—8

23 Claims



1. A plant for manufacturing cement clinker comprising: a suspension preheater in which a cement material powder is preheated;

granulating and sintering means for granulating and sintering the preheated cement material powder including a spouted bed furnace section provided with a spouted bed; said spouted bed furnace section having a straight barrel portion, a conical portion formed below said straight barrel portion, and a central throat portion connected to the bottom end portion of said conical portion so as to blow combustion air upwardly into said conical portion;

a plurality of burners disposed in a region in the vicinity of the juncture between the conical portion and the central throat portion, and arranged to direct fuel along paths upwardly inclined and converging on a central axis of said spouted bed furnace section, whereby the fuel when burned produces a local hot region in which the cement material powder is granulated directly above the central throat portion, the local hot region having a temperature substantially higher than at a peripheral region of said spouted bed furnace section;

a charging chute provided slightly above the local hot region and charging the preheated cement material powder from the suspension preheater into said furnace section;

and a discharge chute disposed on one side of the local hot region through which the cement material powder which has been at least granulated is discharged from said furnace section.

4,877,398

BRACKET FOR PERMITTING TIPPING AND LIMITING UPRIGHTING

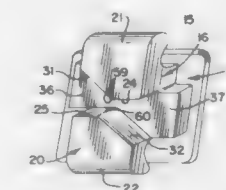
Peter C. Keeling, La Porte, Ind., assignor to TP Orthodontics, Inc., Westville, Ind.

Continuation-in-part of Ser. No. 39,530, Apr. 16, 1987, abandoned, which is a continuation-in-part of Ser. No. 879,072, Jun. 26, 1986, abandoned. This application Jun. 4, 1987, Ser. No. 54,837

Int. Cl.⁴ A61C 3/00

U.S. Cl. 433—8

23 Claims



1. An orthodontic bracket mountable on the crown of a tooth and coating with a generally passive archwire extending substantially parallel to the occlusal plane, said bracket having a body with a horizontally opening archwire slot with means coating with said archwire for crown tipping including fulcrum means, and means coating with said archwire for limiting root uprighting, said crown tipping means having at least one surface extending at an angle relative to the occlusal plane, said means limiting root uprighting having at least one surface extending parallel to the occlusal plane, whereby said bracket is mesiodistally pivotal on the archwire about a generally horizontal axis, and said slot and archwire being sized so that the archwire substantially fills the area between the fulcrum means and the root uprighting limiting means when the tooth is uprighted.

4,877,399

DENTAL EQUIPMENT CLEANING APPARATUS AND METHOD

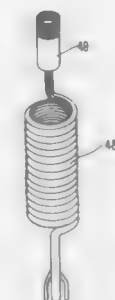
Glenn R. Frank, New Fairfield, and Edward T. Stewart, Jr., New Milford, both of Conn., assignors to Robert Thomas Ltd., Media, Pa.

Filed Jun. 13, 1988, Ser. No. 205,735

Int. Cl.⁴ A61C 1/05

U.S. Cl. 433—25

2 Claims



1. For use in combination with an air driven turbine-type dental handpiece, wherein the handpiece has an upper portion containing the turbine, a first opening for receiving a drill or other dental instrument, and a lower portion terminating in connecting means, and wherein said handpiece has an internal channel for transmitting drive air to the turbine extending from said turbine to said connecting means, and cleaning water and cleaning air channels extending internally within said hand-

piece from openings adjacent said first opening to said connecting means.

the improvement comprising:
an adapter for removing debris from said cleaning water and cleaning air channels within said handpiece, said adapter having:

- (a) a fitting having means for connecting the fitting to said connecting means of the handpiece;
 - (b) an insert positioned within said fitting, said insert having means for blocking the flow of drive air to the handpiece, said insert also having first and second channels respectively aligned to communicate with said cleaning water and cleaning air channels of said handpiece, and,
 - (c) means for introducing pressurized air into said fitting and into said first and second channels thereof and thence through said cleaning water and cleaning air channels of said handpiece,
- whereby said pressurized air removes debris from said cleaning water and cleaning air channels of said handpiece.

4,877,400

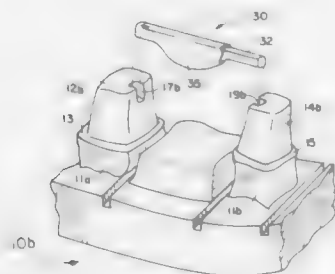
DENTAL BRIDGE AND METHOD

Linda A. Holclaw, 2420 Forest Meadow, Lewisville, Tex. 75067
Filed Jan. 24, 1988, Ser. No. 210,802

Int. Cl.⁴ A61C 13/22

U.S. Cl. 433—183

12 Claims



1. A method of constructing a dental bridge for a patient having a pair of reduced and prepared abutment teeth and a space therebetween, said preparation including forming a first notch in the distal portion of the occlusal surface of the mesial abutment tooth and a second notch in the mesial occlusal surface of the distal abutment tooth, and for which teeth an impression has been made, comprising the steps of:

- (a) forming a master model from said impression;
- (b) forming first and second dies of the modeled abutment teeth;
- (c) forming a refractory model from the master model;
- (d) making a pontic rod to fit in and between said first and second notches of said refractory model;
- (e) disposing said pontic rod in said first and second notches of the refractory model;
- (f) covering the refractory model abutment teeth and pontic rod with a mix of porcelain;
- (g) baking said refractory model to cure porcelain mix;
- (h) building a crown of porcelain over each of the refractory model abutment teeth, and at least one pontic of porcelain over the pontic rod to form the dental bridge;
- (i) baking the crowns and the pontic; and
- (j) removing the dental bridge from the refractory model.

4,877,401
METHOD OF PREVENTING TOOTH DECAY BY LASER BEAM IRRADIATION AND CHEMICAL TREATMENT
William I. Higuchi, Jeffrey I. Fox, and G. Lynn Powell, all of Salt Lake City, Utah, assignors to University of Utah, Salt Lake City, Utah

Filed Mar. 9, 1988, Ser. No. 165,807
Int. Cl.⁴ A61K 6/00, 7/16

U.S. Cl. 433—215

8 Claims

1. A method of treating a tooth comprising: irradiating said tooth with a laser beam at a power ranging from about 20 watts to about 50 watts for a period of time ranging from about 1 second to about 400 seconds; and thereafter applying ethane-1-hydroxy-1, 1 diphosphonic acid as a dissolution rate-inhibiting agent to said tooth, said dissolution rate inhibiting agent being in a sufficient concentration to decrease the dissolution rate of that tooth.

4,877,402

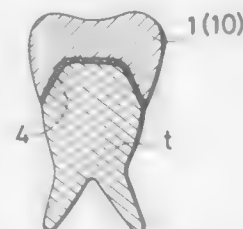
ARTIFICIAL TOOTH CROWN AND METHOD OF PRODUCING THE SAME

Masaya Hirabayashi, and Iwao Noda, both of Shiga, Japan, assignors to Kyocera Corporation, Kyoto, Japan
Continuation of Ser. No. 922,825, Oct. 22, 1986, abandoned, which is a continuation of Ser. No. 634,654, Sep. 25, 1984, abandoned. This application Jul. 1, 1988, Ser. No. 217,145
Claims priority, application Japan, Sep. 26, 1983, 58-178962

Int. Cl.⁴ A61C 5/08

U.S. Cl. 433—218

11 Claims



1. An artificial tooth crown for attachment to a tooth of a dental patient, comprising a body consisting of a glass ceramic, wherein said glass ceramic comprises a generally transparent glass matrix and at least 30% by volume of crystallized calcium phosphate crystals, said body being prepared by casting followed by crystallization at a temperature of between about 800° and 900° C.

4,877,403

PROCESS, AND DEVICE FOR FIRING AND BATTLE SIMULATION

Lothar Jürgens, Hamburg, Fed. Rep. of Germany, assignor to Precitronic Gesellschaft für Feinmechanik und Electronic mbh, Hamburg, Fed. Rep. of Germany
Filed Sep. 2, 1988, Ser. No. 239,733

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1987, 3729483

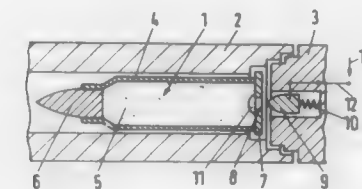
Int. Cl.⁴ F41F 27/00

U.S. Cl. 434—24

15 Claims

1. A practice cartridge for use in simulating firing in a firing system having a firing mechanism including an electrically conductive pin, the practice cartridge comprising:
a cartridge body having a breach-facing wall, the body being sized to fit within the firing system;
first and second spaced apart electrically conductive electrodes disposed on said breach-facing wall a distance apart less than a transverse dimension of the pin in the firing mechanism;
means for providing a voltage within the cartridge body;

said first electrode being switchably connected to said means for providing when the firing mechanism includes a pin unconnected to an external voltage source, such that actuating the firing system causes the pin to complete an electric circuit between the first and second electrodes thereby providing a voltage to the second electrode;
said first electrode being switchably disconnected from said



means for providing when the firing mechanism includes a pin connected to an external voltage source, such that actuating the firing system causes the pin to contact said second electrode thereby providing a voltage to the second electrode;
means, disposed within the cartridge body, for detecting the presence of a voltage on said second electrode, the detected voltage signaling the firing of the system.

4,877,404

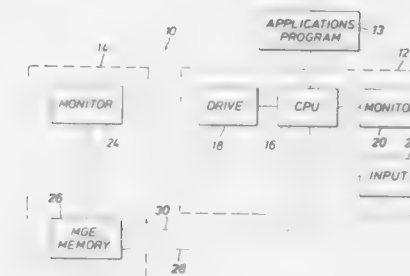
GRAPHICAL INTERACTIVE SOFTWARE SYSTEM

Bruce A. Warren, and Dana L. Webb, both of Lake Jackson, Tex., assignors to Warren-Forthought, Inc., Angleton, Tex.
Filed Jan. 4, 1988, Ser. No. 140,404

Int. Cl.⁴ G09B 19/00

U.S. Cl. 434—118

15 Claims



1. An interactive computer software system permitting a user to take a pre-selected computer course or access a pictorial data base, comprising:

- (a) a host computer sub-system including CPU means for executing computer programs, means for entering the data into the system, and display means for displaying the input data;
- (b) means for loading said pre-selected computer course in said host computer sub-system;
- (c) a graphics computer sub-system operatively connected to said host computer sub-system, said graphics computer sub-system executing said course upon interrogation by said host computer sub-system wherein said course includes a series of interrelated pictures displayed by said graphics computer sub-system, said series of pictures defining a course responsive to input data from the user and interactively dialoguing with the user as the user progresses through said pre-selected course or data base; and
- (d) wherein said pre-selected computer course comprises a distributed program embedded in said series of interrelated pictures.

4,877,405
SYSTEM OF MODULES FOR COMPOSING ALPHANUMERICS

Mark R. Stewart, 60 Pleasant St. #2, Cambridge, Mass. 02139
Continuation of Ser. No. 911,219, Sep. 24, 1986, abandoned. This application Mar. 7, 1988, Ser. No. 165,180
Int. Cl.⁴ G09B 1/00

U.S. Cl. 434—160

21 Claims



1. A system of modules for constructing alphanumeric characters and decorative and figurative designs by assembling such modules in a coplanar array, comprising:

a group of modules, each being shaped so that said modules can be assembled in a coplanar array in an adjacent manner, each module having a major surface circumscribed by a plurality of straight edges,
each module having at least one line segment thereon which extends from a fixed point on at least one of said straight edges intermediate the ends thereof and which contrasts with the rest of said major surface,
said modules being of seven different types and having respectively seven different line segment patterns thereon, said seven different line segment patterns having the following configurations:

- (a) a straight line transversing said major surface from a point between the ends of one edge to an opposite edge,
 - (b) a straight line transversing said major surface from a point between the ends of one edge to an opposite edge and another straight line extending from a point between the ends of said first straight line at approximately a right angle to said line and extending to an edge not intersected by said first straight line,
 - (c) two straight line segments, each originating at a point between the ends of two adjacent edges and meeting at approximately a right angle at a point spaced from the edges of said major surface,
 - (d) a straight line originating at a point between the ends of one edge and extending at approximately a right angle to such edge, said line segment terminating at a point spaced from the edges of said major surface,
 - (e) a curved line having an end at a point between the ends of each of two adjacent edges, said curved line providing an arc which contains substantially one quadrant of said major surface,
 - (f) two curved lines, each originating at a point between the ends of each of two opposite edges and providing an arc from said points to a point between the ends of one edge between said opposite edges, each said arc substantially containing an adjacent quadrant of said major surface, and
 - (g) a straight line extending from a point substantially in the middle of one edge to a point substantially in the middle of an adjacent edge, said line extending at an angle of approximately 45 degrees to each of said edges, and such that said line will line up with any line on any of said modules,
- whereby, by using only said seven types of modules, one can form any Latin alphabetic character or any Arabic numeral in a coplanar array.

4,877,406
MANIPULATABLE, SPHERICAL EDUCATIONAL AND AMUSEMENT DEVICES

Howard J. Wilk, 1600 Church Rd. Apt. A307, Wyncote, Pa. 19095-1920

Filed Nov. 4, 1988, Ser. No. 267,215

Int. Cl.⁴ G09B 23/26; A63F 9/08

U.S. Cl. 434—278

20 Claims

1. An educational device comprising:

first sphere means for defining at least first and second cross-
ing great circle channels;
second sphere means concentrically surrounded by the first
sphere means for defining at least third and fourth great
circle channels crossing each other and crossing under the
first and second great circle channels;
a plurality of inserts extending radially at least from the
second sphere means through the first sphere means, a first
channel portion of each insert being received in and mov-



able along one of the first and second great circle channels
and a second channel portion of each insert being simulta-
neously receivable in and movable along one of the third
and fourth great circle channels, the plurality of inserts
being arranged such that each of the great circle channels
receives at least one of the inserts; and
at least one of the first and second sphere means being rota-
table with respect to the other of the sphere means through
movement of the inserts.

4,877,407

STACKABLE BLOCKS

Benjamin F. du Pont, Rockland, Del., and Carl J. Sakeforth,
Lexington, Mass., assignors to Benjamin F. Du Pont, Rock-
land, Del.

Continuation of Ser. No. 800,527, Nov. 21, 1985, abandoned.

This application May 25, 1988, Ser. No. 201,396

Int. Cl.⁴ A63F 9/00

U.S. Cl. 434—302

7 Claims



1. A set of blocks that are stackable and restackable in differ-
ent configurations, each block arranged to rest stably only
when its center of mass lies vertically above a part of the block
which is supported,

at least some blocks each having a frame and a weight within
the frame arranged so that the center of mass of the block
is at a location that differs from the location the center of
mass would have if the block had a uniform distribution of
mass, the weight in at least one of the blocks being signifi-
cantly heavier than the frame,

different blocks having different masses,

at least some of the blocks each bearing a mark which sym-
bolizes the relative magnitude of the weight and the loca-
tion of the weight and hence the location of the center of
mass of the block.

4,877,408

COMPETITIVE COMPUTER EDUCATIONAL GAME

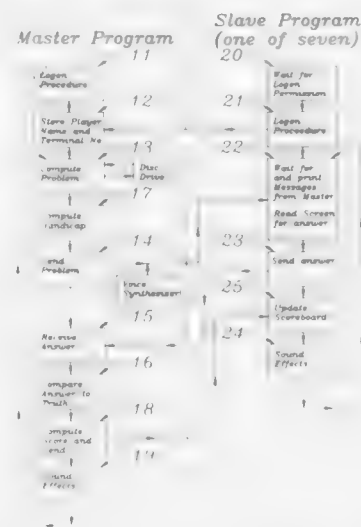
Ben W. Hartsfield, Rte. 3, Morrison, Tenn. 37357

Filed Feb. 9, 1988, Ser. No. 153,954

Int. Cl.⁴ G09B 5/00

U.S. Cl. 434—350

10 Claims



1. A competitive computer educational game for teaching a
plurality of students in the classroom environment, utilizing a
computer network where all students are simultaneously asked
a question, each student having access to an input device with
which to enter an answer, with a master computer asking the
questions and keeping score, and comprising: a means of provid-
ing a continuously updated handicap to the faster students
in order to encourage the slower students to maintain an inter-
est in the learning process.

4,877,409

HINGED ELECTRICAL CONNECTOR

Junichi Tanigawa, Kawasaki, and Shoji Kikuchi, Hiratsuka,
both of Japan, assignors to AMP Incorporated, Harrisburg,
Pa.

Filed Dec. 8, 1988, Ser. No. 281,435

Claims priority, application Japan, Jan. 22, 1988, 63-12425

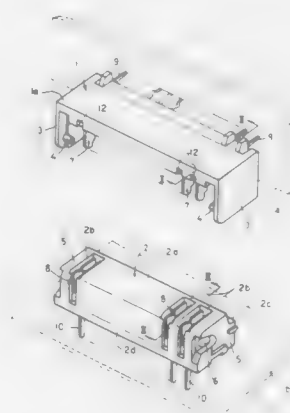
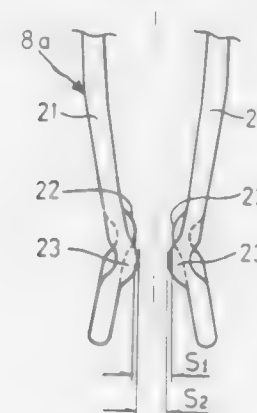
Int. Cl.⁴ H01R 13/193, 23/70

U.S. Cl. 439—31

9 Claims

1. A hinged electrical connector comprising first and second
connector members having first and second dielectric hous-
ings, electrical tab contacts secured in the first housing and
electrical receptacle contacts secured in the second housing,
the tab contacts and the receptacle contacts having termination
sections for electrical connection to circuit boards, shafts of
one connector member being disposed within recesses of the
other connector member for hinged mounting the one connec-
tor member to the other connector member and tab contact
sections of the tab contacts being electrically engaged between
receptacle contact sections of the receptacle contacts, charac-
terized in that the receptacle contact sections have low-pres-
sure contact members and high-pressure contact members, the
high-pressure contact members being spaced apart a distance
which is less than the spacing between the low-pressure

contact members, said tab contact sections having outer ends the tab contact sections have inner sections which are electri-
cally engaged between the low-pressure cally engaged between the high-pressure contact members of



contact members of the receptacle contact sections when the the receptacle contact sections when the circuit boards are at
circuit boards are at a first position relative to one another and a second position relative to one another.

CHEMICAL

4,877,410

PROCESS FOR TANNING FISH SKIN

Francesco Renzulli; Antonio Del Gaudio, and Piero Renzulli, all of Napoli, Italy, assigns to CO.GE.IT. S.R.L. - Costruzioni Generali Italiane, Napoli, Italy

Filed Feb. 26, 1987, Ser. No. 19,014

Claims priority, application Italy, Mar. 7, 1986, 47736 A/86
Int. Cl.⁴ C14C 3/00

U.S. Cl. 8-94,12

24 Claims

1. A process for treating fish skins comprising in sequence:
(a) introducing into a rotatable apparatus for the processing of skins an amount of cold water which is between 1 time and 8 times the weight of the skins to be processed; and an amount of salt which is between 2% and 30% by weight of the weight of the skins;
(b) rotating the apparatus for a period between 2 and 45 minutes;
(c) introducing fish skins to be processed into the apparatus and rotating the apparatus for a period between 5 minutes and 1 hour;
(d) introducing into the apparatus an amount of disinfectant which is between 1% and 10% by weight of the weight of the skins, such disinfectant being compatible and having preservation properties with respect to the skins; and rotating the apparatus for a period between 5 minutes and 1 hour;
(e) introducing into the apparatus an amount of emulsifying agent which is between 0.3% and 5% by weight of the weight of the skins, and rotating the drum-tumbler for a period between 5 minutes and 1 hour;
(f) removing the entire contents of the apparatus;
(g) removing the flesh residue attached to the skins;
(h) weighing the cleaned skins to obtain a partially processed skin weight;
(i) reintroducing into the apparatus the cleaned skins, an amount of water which is between 0.5 and 6 times the partially processed skin weight and an amount of salt so as to obtain a degree Baume (B^B) of approximately 6.5;
(j) rotating the apparatus for a period between 2 and 30 minutes;
(k) introducing into the apparatus formic acid progressively until a pH value between 3 and 4 is obtained, and rotating the apparatus for a period between 10 minutes and 1 hour;
(l) introducing into the apparatus while it is at a standstill, an amount of chromium which is between 3% and 30% by weight of the partially processed skin weight;
(m) rotating the apparatus for a period between 1 hour and 20 hours;
(n) allowing the entire contents of the apparatus to settle for approximately 12 hours;
(o) removing the entire contents of the apparatus;
(p) washing the removed skins with water;
(q) arranging the skins, on a supporting device and allowing them to rest for at least 36 hours, whereby a tanned fish skin is formed.

4,877,411

METHOD FOR COLOR MOUNTING THE LEVEL OF FINISH APPLIED TO TEXTILE MATERIALS AND FOR COLOR CODING TEXTILE MATERIALS: AMINE-REDUCIBLE FUGITIVE TINTS

John B. Hines, and Jeffery R. Harris, both of Spartanburg, S.C., assigns to Milliken Research Corporation, Spartanburg, S.C.

Filed Aug. 29, 1988, Ser. No. 237,478
Int. Cl.⁴ D06P 5/13

U.S. Cl. 8-403

13 Claims

1. A method for temporary coloration of textile materials, which comprises applying to said textile material, an amine-reducible tint in an amount sufficient to provide coloration to said textile material, said tint being characterized by the formula:

$R\{A-[alkyleneoxy\ constituent]_nX\}_p$

wherein RA is the organic, amine-reducible dyestuff radical selected from triarylmethane, cyanine, hemicyanine, azacyanine or methine dyestuff radicals, A is a linking moiety in said organic, easily reduced dyestuff radical selected from the group consisting of —N—, —O—, —S—, or —CO₂—, the alkylene moiety of said alkyleneoxy constituent contains from 2 to about 4 carbon atoms, n is an integer of from 2 to about 300, m is 1 when A is —O—, —S—, —CO₂— and 2 when A is —N—, p is an integer of from 1 to 5, and X is a member of the group consisting of —H—, -alkyl-, -alkylcarboxylate, or -arylcarboxylate; and contacting said amine-reducible tint with an amine compound in an amount sufficient to reduce said tint whereby said coloration of said textile material is removed.

4,877,412

SULFO GROUP-CONTAINING MONOAZO COMPOUNDS HAVING AN UNSUBSTITUTED OR SUBSTITUTED 4-(BENZOTHIASOL-2'-YL)PHENYL OR 4-(6'-BENZOTHIASOL-2'-YL)-BENZOTHIASOL-2'-YL)PHENYLDIAZO COMPONENT RADICAL AND A 6-HYDROXYPIRID-2-ONE COUPLING COMPONENT RADICAL

Reinhard Pedrazzi, Allschwil, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Continuation of Ser. No. 30,948, Mar. 26, 1987, abandoned, which is a continuation-in-part of Ser. No. 877,659, May 19, 1986, abandoned. This application Mar. 31, 1988, Ser. No. 183,565

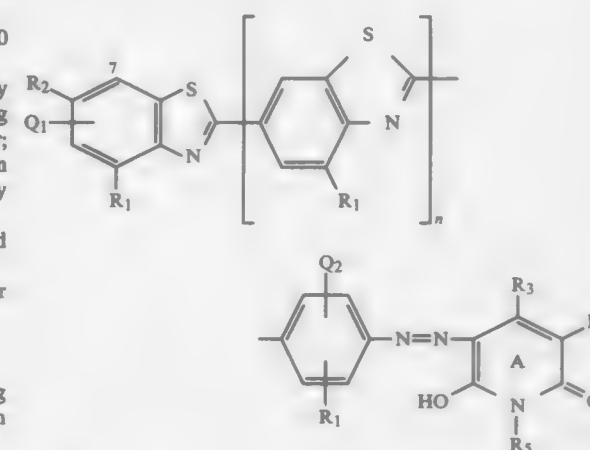
Claims priority, application Fed. Rep. of Germany, Sep. 22, 1984, 3434921

Int. Cl.⁴ C09B 29/01, 44/08; D06P 1/02; D21H 3/80

U.S. Cl. 8-437

20 Claims

1. A compound of the formula



or an internal, external or acid addition salt thereof, wherein each of Q₁ and Q₂ is independently hydrogen or —SO₃M₁, each R₁ and R₂ is independently hydrogen, C₁₋₄alkyl, C₁₋₄alkoxy or —COOM, R₃ is hydrogen; cyano; amino; hydroxy; C₁₋₄alkoxy; C₁₋₄alkyl; C₂₋₄alkyl monosubstituted by hydroxy or C₁₋₄alkoxy; C₃₋₆cycloalkyl; phenyl; phenyl substituted by 1 to 3 substituents selected from C₁₋₄alkyl, C₁₋₄alkoxy, halo, —COOM and —SO₃M; phenyl(C₁₋₄alkyl); phenyl(C₁₋₄alkyl) the phenyl group of which is substituted by 1 to 3 substituents selected from C₁₋₄alkyl, C₁₋₄alkoxy, halo, —COOM and —SO₃M; —CO—R₆; —(CH₂)₆—R₇; or a saturated or unsaturated 5- or 6-membered heterocyclic ring containing 1 to 3 hetero atoms, which ring is unsubstituted or substituted by 1 to 3 C₁₋₄alkyl groups and is bound to Ring A by a carbon or nitrogen atom directly or via a bridge member, with the proviso that any



is bound via a bridge member, wherein

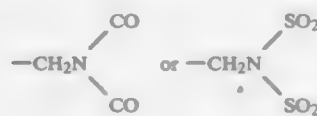
R_6 is hydroxy, amino or C_{1-4} alkoxy,

R_7 is cyano, halo, $-SO_3M$, $-OSO_3M$, $-CO-R_8$ or pyridyl-4, wherein

R_8 is hydroxy, amino; C_{1-4} alkyl; C_{1-4} alkyl monosubstituted by hydroxy, halo, cyano or C_{1-4} alkoxy; C_{1-4} alkoxy; phenyl; phenyl substituted by 1 to 3 substituents selected from C_{1-4} alkyl, C_{1-4} alkoxy, halo, $-COOM$ and $-SO_3M$; phenoxy; phenyl(C_{1-4} alkyl); or phenoxy or phenyl(C_{1-4} alkyl) the phenyl group of which is substituted by 1 to 3 substituents selected from C_{1-4} alkyl, C_{1-4} alkoxy, halo $-COOM$ and $-SO_3M$, and

b is 1, 2 or 3,

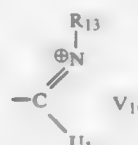
R_4 is hydrogen; cyano; halo; $-SO_3M$; nitroso; nitro; $-NR_9R_{10}$; C_{1-4} alkyl; C_{1-4} alkyl monosubstituted by hydroxy, halo, cyano, C_{1-4} alkoxy, phenyl, $-SO_3M$ or $-OSO_3M$; $-SO_2NH_2$; $-CO-R_{11}$; $-CH_2-NH-CO-R_{12}-E$; a group of the formula



wherein the two carbonyl or sulfonyl groups are bound to two carbon atoms of an aromatic ring that are ortho to each other; a group of the formula



which is a 5- or 6-membered ring containing 1 to 3 hetero atoms which is unsubstituted or substituted by 1 or 2 methyl groups or by amino, C_{1-4} alkylamino or N,N -di(C_{1-4} alkyl)amino; benzoimidazolium-1; benzoimidazolium-1 monosubstituted by methyl, amino, methylamino or dimethylamino; or a group of the formula

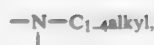


wherein

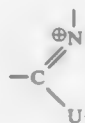
each of R_9 and R_{10} is independently hydrogen; C_{1-4} alkyl; C_{1-4} alkyl monosubstituted by hydroxy, halo, cyano, C_{1-4} alkoxy or phenyl; or $-CO-R_{12}-E$,

R_{11} is hydroxy, amino; C_{1-4} alkyl-amino; N,N -di(C_{1-4} alkyl)amino; C_{1-4} alkyl; C_{1-4} alkoxy; phenyl; phenyl substituted by 1 to 3 substituents selected from C_{1-4} alkyl, C_{1-4} alkoxy, halo, $-COOM$ and $-SO_3M$; phenoxy; or phenoxy the phenyl group of which is substituted by 1 to 3 substituents selected from C_{1-4} alkyl, C_{1-4} alkoxy, halo, $-COOM$ and $-SO_3M$,

R_{13} is hydrogen, C_{1-4} alkyl or C_{1-4} alkyl monosubstituted by hydroxy, halo, cyano, C_{1-4} alkoxy or phenyl, U_1 is $-S-$, $-NH-$ or



V_1 is a radical which, together with the

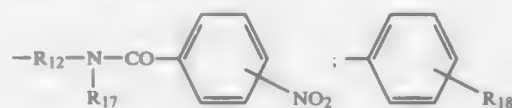


radical, forms a 5- or 6-membered ring or a 5- or 6-membered ring fused to a 5- or 6-membered carbocyclic ring or to a 5- or 6-membered heterocyclic ring containing 1 or 2 hetero atoms, or

R_3 and R_4 taken together form a 3 or 4 carbon atom chain or a 3 or 4 carbon atom chain that forms part of a further 5- or 6-membered ring by 2 vicinal chain members, and

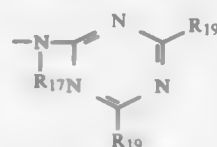
R_5 is hydrogen; $-NR_{14}R_{15}$; C_{1-4} alkyl; C_{2-4} alkenyl; C_2 alkynyl; C_{1-4} alkyl monosubstituted by hydroxy, cyano, C_{1-4} alkoxy, acetamido, $-CO-R_{16}$, $-SO_3M$ or $-OSO_3M$; C_5 cycloalkyl; phenyl; phenyl substituted by 1 to 3 substituents selected from C_{1-4} alkyl, C_{1-4} alkoxy, halo, nitro, amino, $-COOM$ and $-SO_3M$; phenyl(C_{1-4} alkyl); phenyl(C_{1-4} alkyl) the phenyl group of which is substituted by 1 to 3 substituents selected from C_{1-4} alkyl, C_{1-4} alkoxy, halo, nitro, amino,

$-COOM$ and $-SO_3M$; $-R_{12}-E_1$;



or a saturated or unsaturated 5- or 6-membered heterocyclic ring containing 1 or 2 hetero atoms, which ring is unsubstituted or substituted by 1 to 3 methyl groups or by amino, C_{1-4} alkylamino or N,N -di(C_{1-4} alkyl)amino and is bound by a carbon or nitrogen atom, wherein

E_1 is a protonatable amino group, a quaternary ammonium group, a hydrazinium group or



wherein

each R_{19} is independently halo, amino or an aliphatic amino group,

each of R_{14} and R_{15} is independently hydrogen; C_{1-4} alkyl; C_{1-4} alkyl monosubstituted by hydroxy, halo, cyano or C_{1-4} alkoxy; phenyl; or phenyl substituted by 1 or 2 substituents selected from halo, C_{1-4} alkyl and C_{1-4} alkoxy,

R_{16} is hydroxy or C_{1-4} alkoxy, and R_{18} is E_2 , $-NH-CO-R_{12}-E_2$, $-SO_2-NH-R_{12}-E_2$ or $-CO-NH-R_{12}-E_2$, wherein

is a protonatable amino group, a quaternary ammonium group or a hydrazinium group, and

n is 0 or 1,

wherein

each E is independently hydrogen, halo, a protonatable

amino group, a quaternary ammonium group, a hydrazinium group, $-SO_3M$ or $-OSO_3M$, each R_{12} is independently linear or branched C_{1-6} alkylene,

each R_{17} is independently hydrogen or C_{1-4} alkyl, wherein

each M and M_1 is independently hydrogen or a non-chromophoric cation, and

each halo is independently fluoro, chloro or bromo, with the proviso that (i) the compound contains at least one $-SO_3M$ or $-SO_3M_1$ group, (ii) at least one of R_4 and R_5 is hydrogen, (iii) the total number of anionic groups equals or exceeds the total number of basic and cationic groups, (iv) the positive charge of each cationic group is balanced by the negative charge of an $-SO_3^-$ or $-COO^-$ group of the molecule or of an external non-chromophoric anion, and (v) the hydroxy group of any hydroxyalkyl group attached to a nitrogen atom is in other than the 1-position.

4,877,413

PROCESS FOR THE END-TO-END DYEING OF CELLULOSIC FIBRES

Jean-Marie Sire, Hégelheim, France, and Peter Scheffli, Bottmingen, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Mar. 26, 1987, Ser. No. 30,188

Claims priority, application Switzerland, Apr. 7, 1986, 1347/86

Int. Cl. C09B 62/00; D06M 13/34

U.S. Cl. 8-543

35 Claims

1. A process for the uniform end-to-end dyeing of dyeing of cellulosic materials, or blends that contain cellulose, with direct or reactive dyes by the pad dyeing process, which comprises treating said cellulosic materials or blends with an aqueous liquor that contains at least one water-soluble direct or reactive dye and an effective amount of at least one water-soluble anionic colourless organic compound containing a carboxy or sulfonic acid group and having an affinity factor A , at a concentration of 0.2 to 0.3 g/l, for mercerised cotton of 1.1 to 4, said factor A being the quotient of the concentration of the water-soluble, colourless organic compound in a liquor without addition of dye, before impregnation, divided by the concentration of the water-soluble, colourless organic compound in the liquor without dye after impregnation.

4,877,414

FUEL COMPOSITIONS

Kenneth Mekonen, 5601 N. Quincy Ave., Kansas City, Mo. 64119

Filed Mar. 31, 1988, Ser. No. 176,186

Int. Cl. C10L 1/32

U.S. Cl. 44-51

41 Claims

1. A hydrosol fuel comprising from about 67% to 94% by weight of a hydrocarbon combustible fuel selected from the group consisting of the gasolines, diesel fuels and heavy fuel oils, from 5 to 25% by weight of water, at least one surfactant operable to create a hydrosol with the fuel and water present in the range of 1.0 to 2.5 weight percent, and from 0.1 up to about 3.4% by weight of an additive selected from the group consisting of alpha (mono) olefins and alkyl benzenes, each of the former having 7 to 15 recurring CH_2 monomers therein.

4,877,415

HYDROCARBON COMPOSITIONS CONTAINING POLYOLEFIN GRAFT POLYMERS

Maria M. Kapsasinski, Carmel; Larry D. Grina, Wappingers Falls; Ronald E. Jones, Glenham, and Rodney L. Sung, Fishkill, all of N.Y., assignors to Texaco Inc., White Plains, N.Y. Division of Ser. No. 726,567, Apr. 24, 1985, Pat. No. 4,820,776. This application Jul. 22, 1988, Ser. No. 222,872

Int. Cl. C10L 1/14

U.S. Cl. 44-42

12 Claims

1. A hydrocarbon fuel composition comprising a major

portion of a hydrocarbon fuel and a dispersing amount of a graft polymer comprising an oil-soluble, substantially linear, carbon-carbon backbone polymer having bonded thereto (i) first graft units derived from a first dispersant monomer amine containing a polymerizable, ethylenically unsaturated double bond and (ii) second units derived from a phenothiazine.

4,877,416

SYNERGISTIC FUEL COMPOSITIONS

Curtis B. Campbell, Rodeo, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Nov. 18, 1987, Ser. No. 121,986

Int. Cl. C10L 1/18, 1/22

U.S. Cl. 44-62

12 Claims

1. A fuel composition comprising a major portion of hydrocarbons boiling in the gasoline range and (a) from about 0.001% by weight to about 1.0% by weight of a hydrocarbyl-substituted amine or polyamine having an average molecular weight of about 750 to about 10,000 and also having at least one basic nitrogen atom, and (b) a hydrocarbyl-terminated poly(oxyalkylene) monool having an average molecular weight from about 500 to 5000 wherein said oxyalkylene group of the hydrocarbyl-terminated poly(oxyalkylene) monool is a C_{20} to C_{50} oxyalkylene group and the hydrocarbyl group of said hydrocarbyl-terminated poly(oxyalkylene) monool is a C_7 - C_{30} alkylphenyl group and wherein the weight percent of hydrocarbyl-terminated poly(oxyalkylene) monool in the fuel composition ranges from about 0.01 to 100 times the amount of hydrocarbyl-substituted amine or polyamine.

4,877,417

ARTIFICIAL FIREPLACE LOG

Robert J. Crace, Brentwood, Tenn., assignor to Crace Associates, Inc., Ocala, Fla.

Filed Mar. 3, 1988, Ser. No. 164,066

The portion of the term of this patent subsequent to Nov. 29, 2005, has been disclaimed.

Int. Cl. C10L 11/00

U.S. Cl. 44-535

13 Claims

11. A partially combustible fireplace log which maintains the appearance of a fireplace log after said partial combustion comprising from about 30 percent to 80 percent by weight of clay, about 20 percent to 70 percent by weight of at least one non-fluid combustible material, and about 1 to 15 percent by weight of a nitrate, and about 1 to 5 percent by weight of borax.

4,877,418

BRIQUETTE TREATMENT PROCESS

Joseph Goleczka, Cheltenham; Walter Harris, and John Pringle, both of Tewkesbury, all of England, assignors to Coal Industry (Patents) Limited, United Kingdom

Filed Nov. 6, 1987, Ser. No. 117,559

Claims priority, application United Kingdom, Dec. 2, 1986, 8627133

Int. Cl. C10L 10/00

U.S. Cl. 44-600

5 Claims

1. A process for the reduction of the efflorescence in a formed and shaped coal briquettes, comprising: applying to the briquettes after formation thereof an aqueous solution of a medium viscosity polyvinyl alcohol of a concentration of greater than 0.4 and up to 2% of polyvinyl alcohol solids by weight.

4,877,419

STRIPPING AND DEPRESSURIZATION OF SOLIDS AND GAS MIXTURE

Thomas S. Dewitz, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Sep. 18, 1987, Ser. No. 98,180
Int. Cl.⁴ C10J 3/84

U.S. Cl. 48—197 R

5 Claims

1. A method for stripping and depressurizing fine particulates mixed with gas discharged from a vessel operated at elevated temperature and pressure conditions, said method comprising the steps of:

- receiving and conveying said mixture from said vessel;
- stripping said particulates of entrained synthesis gas by selectively injecting gas into a means for receiving and conveying said mixture from said vessel;
- maintaining a substantially constant fraction of gas volume to particulates volume in said means for receiving and conveying said mixture;
- maintaining a higher pressure at a lower end of said means for receiving and conveying said mixture than the pressure of said vessel, said maintaining a higher pressure includes actuating valving means located at a lower portion of said means for receiving and conveying said mixture;

decreasing the pressure in said means for receiving and conveying said mixture downstream from said lower end, said decreasing the pressure includes gradually increasing the diameter of said means for receiving and conveying said mixture downstream from said lower end;

controlling the mass flow rate of said mixture discharged from said means for receiving and conveying said mixture, said controlling includes determining the mass flow rate of said mixture downstream of said selectively injecting gas into said means for receiving and conveying said mixture, comparing said mass flow rate with a preselected mass flow rate, and adjusting said mass flow rate.

4,877,420

HALOGEN-CONTAINING FILLERS FOR ABRASIVE BODIES, IN PARTICULAR FOR GRINDING WHEELS OR CUTTING WHEELS, TO A PROCESS FOR THE PRODUCTION OF THESE FILLERS AND TO ABRASIVE BODIES CONTAINING THEM

Lothar Buxbaum, Landskron, and Helmut Stessel, Arnoldstein, both of Austria, assignors to BBU-Chemie Gesellschaft m.b.H., Arnoldstein, Austria

Filed Jul. 14, 1988, Ser. No. 219,549

Claims priority, application Austria, Jul. 17, 1987, 1810/87
Int. Cl.⁴ C09C 1/02

U.S. Cl. 51—309

22 Claims

1. A halogen-containing filler for abrasive bodies comprising:

- (a) at least one halogen-containing member selected from the group consisting of:
- (1) metal halides or metal complex salts of the formula



wherein

A is an alkali metal or ammonium,
x is a number from 0 to 10,
Me^{II} is Mn, Ca, Mg, Zn, Sn, Cu, Co or Ni,
y is a number from 0 to 2,
Me^{III} is Al, B or Ti,
z is a number from 0 to 2,
Hal is a halogen,
E is a number from 1 to 10,
n is a number from 0 to 10,
B is an alkali metal or ammonium,
f is a number from 0 to 1,
C is Ca, Mg, Zn, Sn or Mn,
g is a number from 0 to 1,

e is a number from 1 to 2,
m is a number from 0 to 10 and
o is a number from 0 to 10;

- (2) alkali chloroferrates of the formula



wherein

A is an alkali metal or ammonium,

x is a number from 1 to 10,

y is a number from zero to 1,

z is a number from zero to 1, with the proviso that y and z cannot be zero at the same time; and

- (3) mixtures of a basic aluminum chloride and at least one chloride selected from the group consisting of NaCl and KCl; and

- (b) at least one additive compound selected from the group consisting of:

- (1) fluorine compounds, and

- (2) salts of an oxygen acid selected from the group consisting of the oxygen acids of nitrogen, phosphorous, sulfur and combinations thereof.

4,877,421

TREATMENT OF PERMEABLE MEMBRANES

Benjamin Bikson, Brookline, and Salvatore Giglia, Norwood, both of Mass., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Nov. 2, 1987, Ser. No. 115,927

Int. Cl.⁴ B01D 53/22

U.S. Cl. 55—16

16 Claims

1. A process for restoring the permeability characteristics of a gas separation membrane that has suffered degradation upon use in gas separation operations, without deleterious effect on the selectivity thereof, said membrane being capable of selectively permeating a more readily permeable component of a feed gas mixture containing said more readily permeable component and a less readily permeable component, said membrane having been dried to remove solvents employed in the preparation thereof prior to use in gas separation operations, said process consisting essentially of:

- (a) removing said gas separation membrane from service after a period of use in gas separation operations, during which time the permeability characteristics of the membrane, with respect to the more readily permeable component of the feed gas mixture, has suffered degradation as compared to said permeability characteristics of the membrane at the time it was placed in service due to the deposition of impurities thereon from said feed gas mixture during said period of use; and

- (b) heat treating said gas separation membrane at a temperature of from about 50° C. to about 140° C. to remove said deposited impurities therefrom, said heat treating being continued for a period of time on the order of from about 0.5 to about 3 hours, whereby the permeability characteristics of the membrane are restored without deleterious effect on the selectivity characteristics thereof.

4,877,422

MOBILE AERIAL LIFT WITH BOOM STRUCTURE HAVING INSULATED BOOM SECTION CONTAINING A CLEAN, MOISTURE FREE ENVIRONMENT AND METHOD

Van J. Walbridge, Arvada, and R. Michael Donohue, Berthoud, both of Colo., assignors to GK Technologies, Inc., Woodcliff Lake, N.J.

Filed Nov. 1, 1988, Ser. No. 265,508

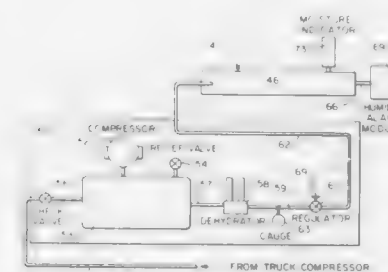
Int. Cl.⁴ B01D 53/04

U.S. Cl. 55—20

11 Claims

1. In a mobile aerial lift, a vehicle, a boom structure mounted on the vehicle having an outer extremity, a workman's basket mounted on the outer extremity, control means carried by the

boom structure and accessible to the workman's basket for controlling operation of the boom structure, the boom structure having an insulated boom section, means providing enclosed space for at least a portion of the insulated boom section,



tion, and means for supplying a gas under positive pressure to the enclosed space to provide a clean, relatively moisture-free environment for a portion of the interior of the insulated boom section to maintain the electrical insulating properties of the insulated boom section.

4,877,423

METHOD AND DEVICE FOR COOLING FLUE DUST

Frank Dziobek, and Horst Möllenhoff, both of Mülheim, Fed. Rep. of Germany, assignors to Deutsche Babcock Werke Aktiengesellschaft, Oberhausen, Fed. Rep. of Germany

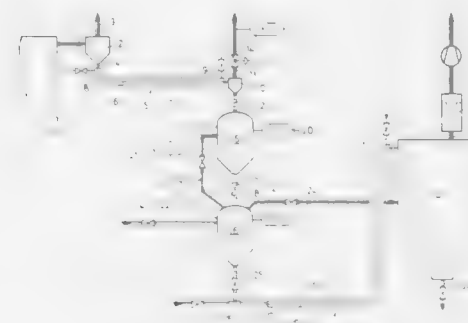
Filed Oct. 14, 1988, Ser. No. 257,992

Claims priority, application Fed. Rep. of Germany, Oct. 28, 1987, 3736521

Int. Cl.⁴ B01D 53/24

U.S. Cl. 55—27

4 Claims



1. A method of cooling flue dust precipitated from compressed flue gas from a fluidized bed of a combustion chamber comprising the steps of:

- pneumatically conveying flue gas containing dust through at least one pipe to an air-lock system;
- cooling said pipes externally so that the flue gas is at a temperature above the dew point of water and acid present in the flue gas;
- separating said dust from said flue gas before entering said air-lock system;
- removing said dust from said air lock system and conveying said dust by air therefrom; and
- cooling said dust to a final predetermined temperature by a coolant.

4,877,424

METHOD AND APPARATUS FOR SEPARATING SOLIDS FROM A SOLIDS-GAS MIXTURE

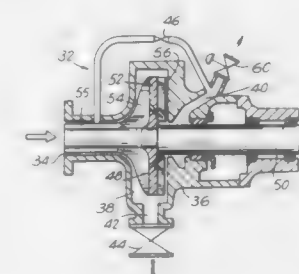
Markku Perkola, 35 Walker Ln., Glens Falls, N.Y. 12801, and Ilkka Seppä, 261 Blackberry Hill Dr., Wakefield, R.I. 02879

Filed Feb. 26, 1988, Ser. No. 160,669

Int. Cl.⁴ B01D 19/00

U.S. Cl. 55—52

21 Claims



1. In a centrifugal pump of use in the degasification of a gas and solids containing flowable material and including an inlet for the flowable material and an outlet for gas separated from the flowable material, a fluidizing rotor having radially extending open blades and being disposed for driven rotation about its center for generating a degasifying centrifugal force and having a substantially disk-shaped radially extending back plate, said back plate having a front side and a rear side, a plurality of air passages defined in and through said back plate and through which gas separated from the flowable material travels from the front side to the rear side of said back plate for discharge through said outlet, said passages extending from said front and said rear side of the back plate in a direction angled radially inwardly in the direction of flow and toward the center of said rotor and counter to the centrifugal forces generated by the rotating rotor; and said outlet being located behind the back plate and in fluid communication with said air passages for permitting the separated air to travel therethrough.

4,877,425

NOVEL METAL-DIKETONE ABSORBENTS FOR CARBON MONOXIDE

John A. T. Norman, Whitehall, and Robert E. Stevens, Emmaus, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

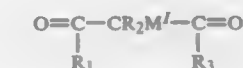
Continuation-in-part of Ser. No. 167,605, Mar. 14, 1988, which is a division of Ser. No. 83,742, Aug. 7, 1987, abandoned. This application Oct. 17, 1988, Ser. No. 258,741

Int. Cl.⁴ B01D 53/14

U.S. Cl. 55—68

7 Claims

1. A process for removing carbon monoxide from a feedstream containing at least one other component, said process comprising contacting said feedstream with a compound of the formula:



wherein R₁ is trichloromethyl or R_F; R_F is C_nF_{2n+1} and n is 1-8; R₂ is H or hydrocarbyl of 2-20 carbon atoms having at least one olefinic unsaturated bond; R₃ is hydrocarbyl of 2-20 carbon atoms having at least one olefinic unsaturated bond and M^I is Cu^I or Ag^I, whereby said compound selectively absorbs carbon monoxide to remove it from the feedstream.

4,877,426
METHOD AND APPARATUS FOR UNLOADING VAPOR ADSORBERS

Harry W. Robertson, IV, Covington, Va., assignor to Westvaco Corporation, New York, N.Y.

Filed Nov. 14, 1988, Ser. No. 270,815

Int. Cl.⁴ B01D 53/02

U.S. Cl. 55—74

6 Claims



3. A method for removing spent adsorbent particles from a gas adsorption device having vessel means to contain a particulate adsorption bed, fan means to energize the flow of gas through said adsorption bed, first duct means to confine gas flow into said fan means and second duct means to confine gas flow from said fan means into said vessel means, said method comprising the steps of:

- connecting said first duct means to draw gas flow from vacuum receiver means;
- connecting a vacuum pickup wand with said vacuum receiver means for drawing gas therethrough;
- disconnecting said second duct means from said vessel means;
- exposing said adsorption bed to external accessibility; and,
- manipulating said pickup wand within said adsorption bed to draft the particulate constituency of said adsorption bed into said vacuum receiver means.

4,877,427
DRY ELECTROSTATIC PRECIPITATOR

Charles G. Smith, West Bromwich, and Terence B. F. Cottrell, Mr. Walsall, both of England, assignors to Dresser U.K. Limited, A British Company, London, England

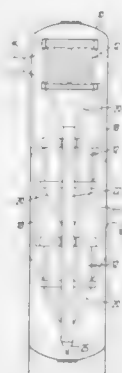
Filed May 9, 1988, Ser. No. 191,501

Claims priority, application United Kingdom, May 15, 1987, 8711467

Int. Cl.⁴ B03C 3/00

U.S. Cl. 55—136

4 Claims



1. A dry electrostatic precipitator for removing dust particu-

lates from a flowing gas stream and comprising an upright cylindrical vessel, a plurality of precipitator stages secured vertically spaced within said cylindrical vessel, each of said precipitator stages having particulate charging electrodes and associated collector electrodes and arranged in a controlled flow path effecting horizontal flow of a received gas past said electrodes with the charging electrodes of each stage being operatively controlled separately from the charging electrodes of the other of said stages, and ducting for passing the received gas from an inlet to an outlet through the precipitator stages in succession in said controlled flow path to flow horizontally through said precipitator stages and vertically between said stages, a dust hopper located beneath each stage; and dust chutes extending from the hoppers to discharge outlets at the bottom of the vessel.

4,877,428
IONIC AIR CLEANER FOR HOMES AND MOTOR VEHICLES

Riccardo Zorloni, Via Trento Trieste, 78 - 20030 Baruccana di Seveso, Milano, Italy

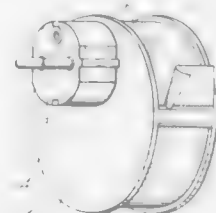
Filed Dec. 7, 1988, Ser. No. 281,251

Claims priority, application Italy, Dec. 17, 1987, 23066 A/87

Int. Cl.⁴ B03C 3/02

U.S. Cl. 55—139

12 Claims



1. An environment ionic cleaner device, particularly designed for domestic and/or motor vehicle use, of the type in which ions are generated by means of a high electrostatic voltage, comprising a box housing, of substantially cylindrical shape, enclosing a double high static voltage generator, having at least an input and at least two outputs, one of said outputs being electrically coupled to at least an ionizing point assembly and the other output being coupled to at least a preset zone of said housing thereat there is applied a metallized plastics material film roll, and further including film cutting means for removing portions of said film.

4,877,429
VALVE DEVICE FOR P.S.A. OR R.P.S.A. SYSTEMS

Donald W. Hunter, 3516 Cedar La., Guntersville, Ala. 35976

Filed Mar. 6, 1989, Ser. No. 319,095

Int. Cl.⁴ B01D 53/04

U.S. Cl. 55—162

7 Claims

1. An improvement in a rapid pressure swing adsorption process for separation of a multicomponent feed gas by selectively adsorbing at least one component in an adsorption system having at least first and second adsorption beds, the improvement comprising:

- a valve device positioned between said feed gas and said adsorption beds, comprising:
 - (a) a valve cover having front and rear walls;
 - (i) a pair of intake chambers in said valve cover in fluid communication with each other, each of said intake chamber having an opening through said rear wall of said valve cover;
 - (ii) a feed intake line into one of said intake chambers;
 - (iii) a pair of exhaust chambers in said valve cover, each of

4,877,430
SEPARATOR FOR GASEOUS FLUIDS

Paul Gutermuth, D-6456 Langenselbold, Fed. Rep. of Germany
Continuation of Ser. No. 144,617, Jan. 11, 1988, abandoned. This application Aug. 18, 1988, Ser. No. 234,131

Claims priority, application Fed. Rep. of Germany, Jun. 19, 1985, 3521927; Oct. 8, 1985, 3535911

The portion of the term of this patent subsequent to May 16, 2006, has been disclaimed.

Int. Cl.⁴ B01D 45/00

U.S. Cl. 55—269

17 Claims



- said exhaust chambers having an opening through said rear wall of said cover;
- (iv) a first conduit with one of its ends extending into one of said exhaust chambers and its other end being in the intake side of said first adsorption bed;
- (v) a second conduit with one of its ends extending into the other of said exhaust chambers and its other end being in the intake side of said second adsorption bed;
- (b) a valve body having a front face and rear face, said front face being juxtaposed to said rear wall of said valve cover, said valve body having
 - (i) a pair of intake valve ports extending through said front and rear faces the ends of each of said intake valve ports through said front face being in registry with a respective one of said openings through said rear wall for said intake chambers;
 - (ii) an intake valve in each of said intake valve ports, said intake valve being normally urged into a closed position and also being movable into an open position;
 - (iii) a passageway interconnecting the interior of each of said intake valve ports with one of said intake chambers;
 - (iv) a pair of exhaust valve ports extending through said front and rear faces, the ends of each of said exhaust valve ports through said front face being in registry

1. A separator for gaseous fluids containing solid or liquid contaminants comprising first section parts and second section parts, each of said parts being open and trough-shaped in cross section, said first parts being arranged in a first row, said second parts being arranged in a second row opposite said first row, each of said parts having free longitudinal edges, said edges of said first parts overlapping and spaced apart from said edges of said second parts said first or second section, parts being detachable from a support.

4,877,431
RADIAL IMPINGEMENT SEPARATOR

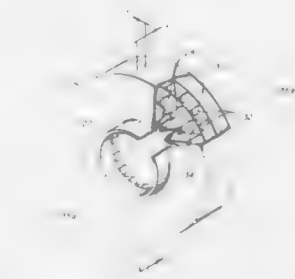
Leo Avondoglio, Ivoryton, Conn., assignor to Aercology Incorporated, Old Saybrook, Conn.

Filed Oct. 14, 1988, Ser. No. 257,538

Int. Cl.⁴ B01D 50/00

U.S. Cl. 55—321

8 Claims



- with a respective one of said openings through said rear wall for said chambers;
- (v) means for evacuating said interiors of said exhaust valve ports through said valve body; and
- (vi) an exhaust valve in each of said exhaust valve ports, said exhaust valve being normally urged into a closed position and also being movable into an open position; and
- (c) valve actuating means on said device for effecting a sequence of moving for a first predetermined amount of time a first pair of said valves consisting of one of said intake valves and one of said exhaust valves into said open position while a second pair of said valves consisting of the other of said intake valves and the other of said exhaust valves remains in said closed position, then allowing said first pair of valves to return to said closed positions while said second pair remains closed for a second predetermined amount of time, then moving said second pair of valves into said open positions while said first pair remains closed for a third predetermined amount of time and then allowing said second pair of valves to return to said closed positions while said first pair remains closed for a fourth predetermined amount of time, and repeating said sequence for a selected period of time.

1. Apparatus for removing entrained particulate from a fluid stream comprising

- a housing, having an inlet port an outlet port, a plate within the housing mounted perpendicular to the centerline of the inlet port, the housing and other parts mounted therein configured to cause a fluid stream within the housing to follow a flow path which runs radially outward from the inlet across the plate, and then to the outlet; and,
- a plurality of impingement vanes within the housing mounted generally circumferentially around the inlet port on the plate or part of the housing which lies perpendicular to the inlet port centerline, so that the radially outward flowing fluid stream and entrained particulate impinges on the vanes, to cause the particulate to thereby be separated by impingement from the fluid stream.

4,877,432

DISPOSABLE DUST BAG FOR VACUUM CLEANERS AND THE LIKE

John R. Lackner, North Ridgeville, Ohio, assignor to The Scott Fetzer Company, Cleveland, Ohio

Filed Jun. 17, 1988, Ser. No. 208,735

Int. Cl.⁴ B01D 46/02

U.S. Cl. 55—375

16 Claims



1. A vacuum cleaner providing a connector through which dirt-laden air is discharged, said connector providing a generally cylindrical wall portion having an end and peripherally spaced outwardly extending projections substantially adjacent to said end, a disposable dust bag formed of permeable sheet material defining a dust collection chamber, an inlet in said dust bag providing a substantially rigid collar having an opening therein proportioned to fit over said gas connector and said projections when in a mounting and removal position, said collar being rotatable relative to said connector from said mounting and removal position to an installed position in which portions of said collar engage the sides of said projections remote from said end, and an elastomeric seal around said inlet providing a generally circular opening, said seal extending past said projections from the sides thereof remote from said end to the side of said projections adjacent said end and include airtight sealing engagement with the surface of said connector on the side of said projections adjacent to said end, said seal forming an airtight seal between said dust bag and said connector when said collar is in said installed position, said seal resisting rotation of said collar relative to said connector from said installed positions toward said mounting and removal positions.

4,877,433

HIGH PERFORMANCE GAS FILTER ASSEMBLY

Yoshimi Oshitani, 10-8, 1-Chome, Hon-Cho, Tanashi City, Tokyo-To, Japan (188)

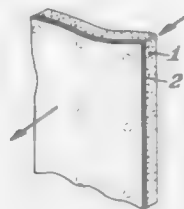
Continuation of Ser. No. 53,937, May 22, 1988, abandoned. This application Sep. 26, 1988, Ser. No. 230,275

Claims priority, application Japan, May 23, 1986, 61-117497; Jul. 1, 1986, 61-152642; Jul. 1, 1986, 61-152643

Int. Cl.⁴ B01D 50/00

U.S. Cl. 55—486

9 Claims



1. A high performance filter assembly comprising: a filter paper with inlet and outlet surfaces made of fibers and a fine particle checking member provided on the outlet surface of said filter paper so as to overlie each other, said fine particle

checking member comprised of a thin microporous film and a breathable support member to which the thin microporous film is bonded at a plurality of spaced positions over its entire surface.

4,877,434

CRYOGENIC REFRIGERATOR

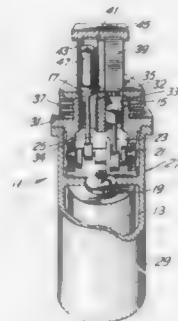
Stephen F. Malaker, Mountainside, N.J., assignor to Cryodynamics, Inc., Mountainside, N.J.

Filed Jun. 9, 1987, Ser. No. 60,034

Int. Cl.⁴ F25B 9/00

U.S. Cl. 62—6

11 Claims



1. A modified Stirling cycle cryogenic refrigerator having first piston for compressing a working gas in a first cylinder, a second piston for expanding such working gas in a second cylinder, channel means connecting said first and second cylinders, and a cold head in thermal contact with said working gas in said second cylinder, comprising:

a thin walled, hollow, evacuated extender affixed to said second piston on the face proximate said cold head for thermally isolating said second piston from the working gas in said second cylinder.

4,877,435

MECHANICALLY ALLOYED NICKEL-COBALT-CHROMIUM-IRON COMPOSITION OF MATTER AND GLASS FIBER METHOD AND APPARATUS FOR USING SAME

Ronald M. Haebler, Jr.; Gaylord D. Smith; John H. Weber; Roneldo L. Fisher, all of Huntington, W. Va.; David J. Gaul, Granville, and Jay W. Hinz, Newark, both of Ohio, assignors to Inco Alloys International, Inc., Huntington, W. Va. and Owens-Corning Fiberglass Corporation, Toledo, Ohio

Filed Feb. 8, 1989, Ser. No. 307,485

Int. Cl.⁴ C22C 19/05; C03B 37/095; C21D 8/00

U.S. Cl. 65—1

43 Claims

1. A mechanically alloyed composition of matter consisting in weight percent essentially of about 30–40% chromium, about 5–25% cobalt, about 0.5–10% iron, about 0.2–0.6% aluminum, about 0.3–1.2% titanium, up to about 0.15% carbon, about 0.2–1% of yttria in a yttria-containing oxidic phase, up to about 0.7% oxygen inclusive of the oxygen in yttria, up to about 0.3% nitrogen with the proviso that the weight of said titanium is at least about 1.5 times the weight of nitrogen, up to about 0.4% zirconium, up to about 1% hafnium, up to about 1% silicon, up to about 2% manganese, up to about 0.05% boron, up to about 1% niobium, up to about 1% tantalum, up to about 1% molybdenum, up to about 1% tungsten, up to about 1% rhenium, up to about 1% total yttrium and the lanthanides provided that the total of hafnium, silicon, manganese, boron, niobium, tantalum, molybdenum, tungsten, rhenium, yttrium and the lanthanides does not exceed about 10%, the balance of the composition being essentially nickel.

16. In the method of handling material from the group of molten glass and molten slag in the presence of atmospheric oxygen, the improvement comprising employing as a handling

device a metallic structure composed, at least in the material contacting portion of said device, of a coarse-grained, mechanically alloyed alloy consisting in weight percent essentially of about 30–40% chromium, about 5–25% cobalt, about 0.5–10% iron, about 0.2–0.6% aluminum, about 0.3–1.2% titanium, up to about 0.15% carbon, about 0.2–1% of yttria in a yttria-containing oxidic phase, up to about 0.7% oxygen inclusive of the oxygen in yttria, up to about 0.3% nitrogen with the proviso that the weight of said titanium is at least about 1.5 times the weight of nitrogen, up to about 0.4% zirconium, up to about 1% hafnium, up to about 1% silicon, up to about 2% manganese, up to about 0.05% boron, up to about 1% niobium, up to about 1% tantalum, up to about 1% molybdenum, up to about 1% tungsten, up to about 1% rhenium, up to about 1% total yttrium and the lanthanides provided that the total of hafnium, silicon, manganese, boron, niobium, tantalum, molybdenum, tungsten, rhenium, yttrium and the lanthanides does not exceed about 10%, the balance of the composition being essentially nickel.

30. A foraminously walled glass spinner, at least the foraminous wall of which is made of a coarse-grained mechanically alloyed alloy of substantially 100% theoretical density which consists, in weight percent essentially of about 30–40% chromium, about 5–25% cobalt, about 0.5–10% iron, about 0.2–0.6% aluminum, about 0.3–1.2% titanium, up to about 0.15% carbon, about 0.2–1% of yttria in a yttria-containing oxidic phase, up to about 0.7% oxygen inclusive of the oxygen in yttria, up to about 0.3% nitrogen with the proviso that the weight of said titanium is at least about 1.5 times the weight of nitrogen, up to about 0.4% zirconium, up to about 1% hafnium, up to about 1% silicon, up to about 2% manganese, up to about 0.05% boron, up to about 1% niobium, up to about 1% tantalum, up to about 1% molybdenum, up to about 1% tungsten, up to about 1% rhenium, up to about 1% total yttrium and the lanthanides provided that the total of hafnium, silicon, manganese, boron, niobium, tantalum, molybdenum, tungsten, rhenium, yttrium and the lanthanides does not exceed about 10%, the balance of the composition being essentially nickel.

4,877,436

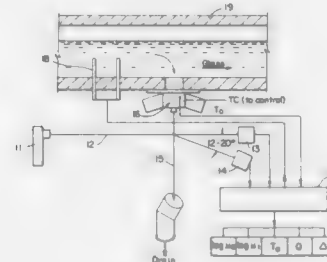
CONTINUOUS VISCOSITY MONITORING OF GLASS
Sheinkop Inc., 19513-M Gunners Branch Rd., Germantown, Md. 20874

Filed Mar. 13, 1989, Ser. No. 322,211

Int. Cl.⁴ C03B 5/24

U.S. Cl. 65—29

7 Claims



1. A method of manufacturing glass comprising: feeding molten mineral material from a delivery means through a primary discharge bushing to a means for forming mineral fibers; forming glass from the molten mineral material; discharging continuously an auxiliary stream of molten mineral material from the delivery means through an auxiliary discharge outlet; measuring continuously temperature and mass flow rate by a laser means of the auxiliary stream; calculating viscosity of the molten mineral material using the laser measured mass flow rate; and modifying, as needed, a process parameter in response to the

measured temperature of the auxiliary stream and the calculated viscosity of the stream.

4,877,437

VACUUM PLATEN FOR SHARP BENDS

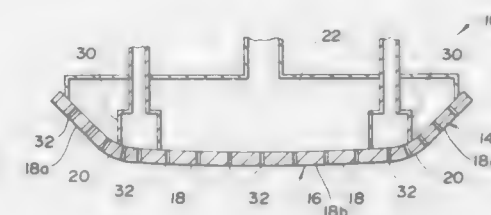
David B. Nitschke, Perrysburg, Ohio, assignor to Glasstech International L.P., Scarsdale, N.Y.

Filed Apr. 29, 1988, Ser. No. 187,837

Int. Cl.⁴ C03B 23/03

U.S. Cl. 65—287

8 Claims



1. Apparatus (10) for press bending a heated glass sheet (12) comprising a first bending mold (14) having a shaping surface (16); said shaping surface (16) including a first portion (18) defined by end portions (18a) and an intermediate portion (18b) extending between said end portions (18a); said shaping surface (16) also including an abruptly curved second portion (20) between each of said end portions (18a) and said intermediate portion (18b); said second portion (20) having a more abrupt curvature relative to the first portion (18); a first vacuum chamber (22) for establishing a vacuum on the first portion (18) of the shaping surface (16) and supporting the glass sheet (12) thereon during bending; a second vacuum chamber (30) located at the second portion (20) of the shaping surface (16); said second vacuum chamber (30) establishing a greater vacuum on the second portion (20) of the shaping surface (16) where the curvature of the surface (16) is most abrupt; a second bending mold (24) having a peripheral surface (26) of a complementary shape to that of the shaping surface (16); and an actuator (28) for providing relative movement between the first and second bending molds (14,24) to press bend the heated glass sheet (12).

4,877,438

MICROBIAL AND CHEMICAL CONTROL OF FRUIT RUSSETTING

Steven E. Lindow, Berkeley, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Filed Aug. 3, 1987, Ser. No. 80,707

Int. Cl.⁴ A01N 63/00, 25/00

U.S. Cl. 71—79

6 Claims

1. A method of reducing fruit russetting on growing fruit, which comprises: inoculating a surface of a stone or pome fruit or an open flower from which said fruit develops with an auxin-deficient pseudomonad bacteria in an amount sufficient to reduce the population of auxin-producing bacteria on said surface.

4,877,439

HERBICIDAL 1-ARYLPYRAZOLES, COMPOSITIONS AND USE

Reinhold Gehring, Wuppertal; Otto Schallner, Monheim; Jörg Stetter, Wuppertal; Hans-Joachim Santel, Leverkusen; Robert R. Schmidt, Bergisch-Gladbach, and Harry Strang, Düsseldorf, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany
Filed Jan. 23, 1988, Ser. No. 210,607

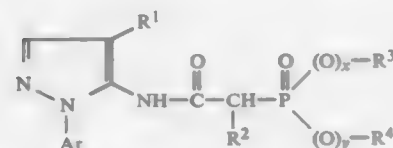
Claims priority, application Fed. Rep. of Germany, Jul. 2, 1987, 3711188

Int. Cl.⁴ A01N 57/02; C07F 9/65

U.S. Cl. 71-96

12 Claims

1. A 1-arylpazole of the formula



in which

R¹ represents hydrogen or nitro,
R² represents hydrogen or alkyl,
R³ and R⁴ independently of one another each represent alkyl, halogenoalkyl or optionally substituted aryl,
Ar represents optionally substituted phenyl or optionally substituted pyridyl,
x represents a number 0 or 1 and
y represents a number 0 or 1.

4,877,440

THIOPHENESULFONAMIDE HERBICIDES

Joel R. Christensen; John Caomo, both of Newark, and George Levitt, Wilmington, all of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 935,504, Nov. 26, 1986, Pat. No. 4,743,290, which is a continuation-in-part of Ser. No.

852,739, Apr. 21, 1986, abandoned, which is a continuation-in-part of Ser. No. 739,074, May 29, 1985, abandoned. This application Feb. 18, 1988, Ser. No. 158,985

Int. Cl.⁴ A01N 43/66; C07D 409/12

U.S. Cl. 71-90

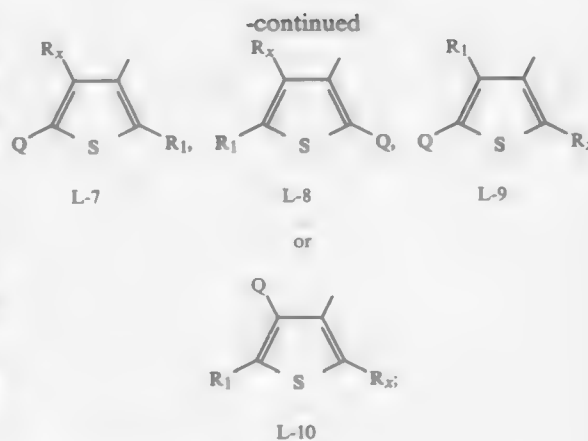
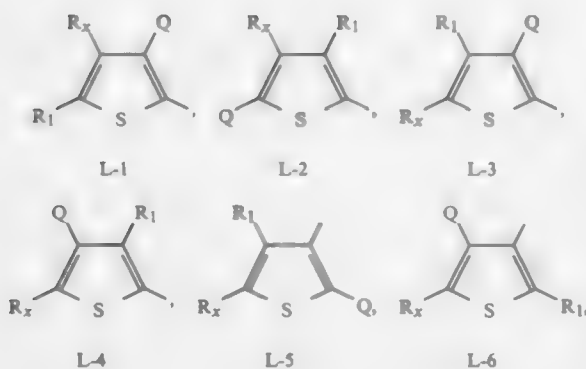
77 Claims

1. A compound having the formula:



wherein

L is

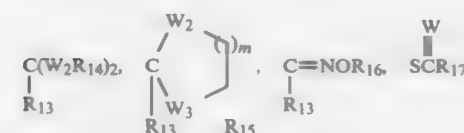


R is H or CH₃;
W is O or S;
R₁ is R₁' or R₁'';
R_x is H or halogen;
R₁' is H, C₁-C₃ alkyl, C₁-C₃ haloalkyl, halogen, nitro, C₁-C₃ alkoxy, CN, C₁-C₃ haloalkoxy or C₁-C₃ haloalkylthio;
R₁'' is SO₂NR₆R₆, C₁-C₃ alkylthio, C₁-C₃ alkylsulfenyl, C₁-C₃ alkylsulfonfyl, CO₂R₆ or C(O)NR₆R₆;
R₆ is H, C₁-C₄ alkyl, C₂-C₃ cyanoalkyl, methoxy, ethoxy or C₃-C₄ alkenyl;
R₆ is H or C₁-C₃ alkyl; or
R₆ and R₆ may be taken together to form (CH₂)₃, (CH₂)₄, (CH₂)₅ or CH₂CH₂OCH₂CH₂;
R₆ is C₁-C₄ alkyl, C₃-C₄ alkenyl, C₃-C₄ alkynyl, C₂-C₄ haloalkyl, C₂-C₃ cyanoalkyl, cyclopropylmethyl or C₂-C₄ alkoxyalkyl;
R₆ is H or C₁-C₃ alkyl;
R₆ is C₁-C₃ alkyl;
Q is Q₁ or Q₂;
Q₁ is ER₂, NR₃R₄.

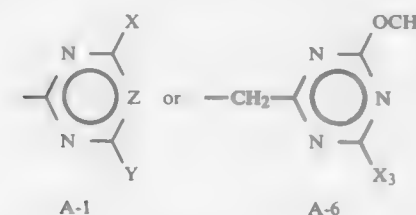
OSO₂R₇, CN, SO₂NHR₂₁.

SO₂NR₂₂NR₂₃R₂₄ or C₁-C₄ alkyl substituted with R₈;
E is O, S, SO or SO₂;
W₁ is O or S;
J is O, S, NH, NCH₃, CH₂ or a single bond;
Q₂ is SO₂NH₂, SO₂NR₆R₆, CO₂R₆, C(O)NR₆R₆, C₁-C₃ alkylthio, C₁-C₃ alkylsulfenyl, C₁-C₃ alkylsulfonfyl, halogen, CHO or CR₆=NOR₆;
R₁ is C₁-C₄ alkyl, C₂-C₃ cyanoalkyl, methoxy, ethoxy or C₃-C₄ alkenyl;
R₂ is C₁-C₃ alkyl or
R₂ and R₂ may be taken together to form (CH₂)₃ or CH₂CH₂OCH₂CH₂;
R₂ is C₁-C₄ alkyl, C₃-C₄ alkenyl, C₃-C₄ alkynyl, C₂-C₄ haloalkyl, C₂-C₃ cyanoalkyl, cyclopropylmethyl or C₂-C₄ alkoxyalkyl;
R₂ is H or C₁-C₃ alkyl;
R₂ is C₁-C₃ alkyl;
R₂ is H, C₁-C₄ alkyl or C₁-C₄ haloalkyl;
R₂ is H, C₁-C₄ alkyl, C₃-C₄ alkenyl or C₃-C₄ alkynyl;
R₂ is C₁-C₆ alkyl substituted with R₈, C₂-C₆ alkenyl substituted

tuted with R₈, C₃-C₆ alkynyl, C₃-C₆ alkynyl substituted with R₈, C₁-C₆ haloalkyl, C₂-C₆ haloalkenyl or C₃-C₆ haloalkynyl;
R₃ is C₁-C₄ alkyl;
R₄ is H or C₁-C₄ alkyl; or
R₃ and R₄ may be taken together to form (CH₂)₄, (CH₂)₅ or CH₂CH₂OCH₂CH₂;
R₅ and R₆ are independently C₁-C₂ alkyl, C₁-C₂ alkoxy, C₁-C₂ alkylthio, C₁-C₂ alkylamino or di(C₁-C₂ alkylamino);
R₇ is C₁-C₄ alkyl, C₁-C₄ haloalkyl, C₃-C₄ alkenyl, C₃-C₄ haloalkenyl, C₃-C₄ alkynyl, C₃-C₄ haloalkynyl or NR₁₉R₂₀;
R₈ is OR₉, S(O)_nR₁₀, CO₂R₁₀, SO₂NR₁₁R₁₂, NR₁₁R₁₂, CONR₁₁R₁₂, C(O)R₁₃.

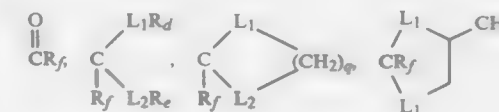


CN, SCN, SH, NO₂ or N₃;
R₉ is H, C₁-C₄ alkyl, C₃-C₄ alkenyl, C₃-C₄ alkynyl, C₁-C₄ haloalkyl, C₃-C₄ haloalkenyl, C₃-C₄ haloalkynyl, C₂-C₄ alkylcarbonyl, C₁-C₄ alkylsulfonfyl, C₂-C₄ alkoxyalkyl, C₂-C₄ alkylthioalkyl or C₂-C₄ cyanoalkyl;
R₁₀ is C₁-C₄ alkyl, C₃-C₄ alkenyl, C₃-C₄ alkynyl, C₁-C₄ haloalkyl, C₃-C₄ haloalkenyl, C₃-C₄ haloalkynyl, C₂-C₄ alkoxyalkyl, C₂-C₄ alkylthioalkyl or C₂-C₄ cyanoalkyl;
R₁₁ is H or C₁-C₃ alkyl;
R₁₂ is H, C₁-C₄ alkyl, C₁-C₄ haloalkyl, C₃-C₆ cycloalkyl, C₂-C₄ alkoxyalkyl, C₂-C₄ alkylthioalkyl, C₂-C₄ cyanoalkyl, C₁-C₃ alkoxy, C₃-C₄ alkenyl or C₃-C₄ alkynyl; or
R₁₁ and R₁₂ may be taken together to form (CH₂)₃, (CH₂)₄, (CH₂)₅ or CH₂CH₂OCH₂CH₂;
R₁₃ is H, C₁-C₄ alkyl or C₁-C₄ haloalkyl;
R₁₄ is C₁-C₂ alkyl;
R₁₅ is H or CH₃;
R₁₆ is H, C₁-C₄ alkyl, C₃-C₄ alkenyl or C₃-C₄ alkynyl;
R₁₇ is C₁-C₄ alkyl, C₁-C₄ alkoxy, C₁-C₄ alkylthio, C₁-C₄ alkylamino or di(C₁-C₄ alkylamino);
R₁₉ is H, C₁-C₃ alkyl, C₃-C₄ alkenyl or C₃-C₄ alkynyl;
R₂₀ is H or C₁-C₃ alkyl; or
R₁₉ and R₂₀ may be taken together to form (CH₂)₄, (CH₂)₅ or CH₂CH₂OCH₂CH₂;
R₂₁ is C₁-C₄ alkyl, C₁-C₃ haloalkyl, C₂-C₃ cyanoalkyl, cyclopropyl, C₃-C₄ alkenyl, C₃-C₄ alkynyl, C₂-C₄ alkoxyalkyl or C₁-C₂ alkoxy;
R₂₂ is H or C₁-C₄ alkyl;
R₂₃ is H or C₁-C₄ alkyl;
R₂₄ is H, C₁-C₄ alkyl, C₃-C₄ alkenyl, C₃-C₄ alkynyl, C₁-C₄ haloalkyl or phenyl which may be optionally substituted with R₂₅; or
R₂₃ and R₂₄ may be taken together to form (CH₂)₄, (CH₂)₅ or CH₂CH₂OCH₂CH₂;
R₂₅ is H, CH₃, Cl, F, Br, NO₂, CF₃, CH or OCH₃;
m is 1 or 2;
n is 0, 1 or 2;
W₂ and W₃ are independently O or S;
A is

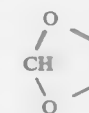


X is H, C₁-C₄ alkyl, C₁-C₄ alkoxy, C₂-C₄ haloalkoxy, C₁-C₄ haloalkyl, C₁-C₄ haloalkylthio, C₁-C₄ alkylthio,

C₂-C₅ alkoxyalkyl, C₂-C₅ alkoxyalkoxy, amino, C₁-C₃ alkylamino or di(C₁-C₃ alkylamino);
Y is H, C₁-C₄ alkyl, C₁-C₄ alkoxy, C₂-C₄ haloalkoxy, C₁-C₄ haloalkylthio, C₁-C₄ alkylthio, C₂-C₅ alkoxyalkyl, C₂-C₅ alkoxyalkoxy, amino, C₁-C₃ alkylamino, di(C₁-C₃ alkylamino), C₃-C₄ alkenyloxy, C₃-C₄ alkynyl, C₂-C₅ alkylthioalkyl, C₂-C₅ alkylsulfonfylalkyl, C₂-C₅ alkylsulfonfylalkyl, C₁-C₄ haloalkyl, C₄-C₅ cycloalkyl, C₂-C₄ alkynyl, cyano,



or N(OCH₃)CH₃;
q is 2 or 3;
L₁ and L₂ are independently O or S;
R_d and R_e are independently C₁-C₂ alkyl;
R_f is H or CH₃;
z is N;
X₃ is CH₃ or OCH₃;
and their agriculturally suitable salts; provided that
(a) when E is O or S and R₉ is H, then R₂ is other than CH₂OR₉;
(b) when W is S, then A is A-1, R is H and Y is CH₃, OCH₃, OC₂H₅, CH₂OCH₃, C₂H₅, CF₃, SCH₃, OCH₂CH=CH₂, OCH₂C=CH, OCH₂CH₂OCH₃, CH(OCH₃)₂ or



(c) the total number of carbon atoms in R₁ and Q is less than or equal to 10;
(d) when Q is



then X and Y are other than SCF₂H;
(e) when R₁ is R₁' then L is L-1, L-3, L-5, L-6, L-8 or L-10;
(f) the total number of carbon atoms in R₂₂, R₂₃ and R₂₄ is less than or equal to 10;
(g) when R₂₁ is C₁-C₄ alkyl, C₂-C₃ cyanoalkyl, C₁-C₂ alkoxy or C₃-C₄ alkenyl, then X and Y are other than SCF₂H;
(h) when Y is CN and R₁' is H, F, Cl or CH₃, then R₂₁ is other than C₁-C₃ alkyl;
(i) when R₁ is R₁' then Q is Q₁;
(j) when R₁ is R₁'' then Q is Q₁ or Q₂;
(k) when Q₂ is halogen then R_x is halogen;
(l) when R₁'' is SO₂NR₆R₆, CO₂R₆ or C(O)NR₆R₆ when Q is SO₂NHR₂₁.



SO₂NR₂₂NR₂₃R₂₄, SO₂NH₂, SO₂NR₆R₆, CO₂R₆, C(O)NR₆R₆ or CHO then L is L-1, L-2, L-5 or L-6; and
(m) when Q₂ is halogen then L is L-2, L-4, L-5, L-6, L-7 or L-9.

66. A method for controlling the growth of undesired vegetation which comprises applying to the locus to be protected

an effective amount of a compound of claim 1.

4,877,441

FUNGICIDAL SUBSTITUTED CARBOXYLIC ACID DERIVATIVES

Tatsuya Mori; Tadaaki Ohsami; Shigeo Nakamura; Kiyoto Maeda; Samio Nishida, and Hirotsuka Takano, all of Hyogo, Japan, assignors to Sumitomo Chemical Company Ltd., Osaka, Japan

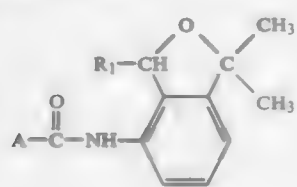
Filed Oct. 18, 1988, Ser. No. 259,283

Claims priority, application Japan, Nov. 6, 1987, 62-281563; Nov. 6, 1987, 62-281564; Nov. 6, 1987, 62-281565; Jul. 15, 1988, 63-177751; Jul. 29, 1988, 63-191919; Jul. 29, 1988, 63-191920; Aug. 2, 1988, 63-193598

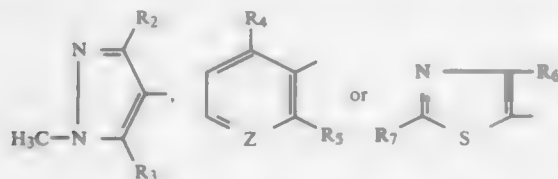
Int. Cl.⁴ C07D 417/12, 405/12; A01N 43/78, 43/56

U.S. Cl. 71-92 12 Claims

8. An agricultural or horticultural fungicide which contains, as an active ingredient, a substituted carboxylic acid derivative having the formula:



wherein R₁ stands for a methyl or ethyl group, A stands for



R₂ stands for a methyl, ethyl or trifluoromethyl group, R₃ stands for a methyl group or a halogen or hydrogen atom, R₄ stands for a fluorine or hydrogen atom, R₅ stands for a methyl, nitro or trifluoromethyl group or a halogen atom, Z stands for an N atom, R₆ stands for a methyl, ethyl or trifluoromethyl group and R₇ stands for an amino or methyl group or a chlorine atom, with an inert carrier.

4,877,442

HERBICIDAL SULFONAMIDES

Craig L. Hillemann, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 916,266, Oct. 7, 1986, abandoned, which is a continuation-in-part of Ser. No. 801,120, Nov. 22, 1985, abandoned, which is a continuation-in-part of Ser. No.

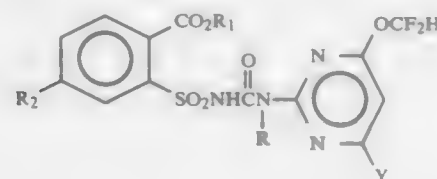
715,511, Mar. 27, 1985, abandoned, which is a

continuation-in-part of Ser. No. 613,412, May 24, 1984, abandoned. This application Oct. 7, 1985, Ser. No. 257,143

Int. Cl.⁴ C07D 239/69; A01N 43/54

U.S. Cl. 71-92 51 Claims

1. A compound of the structural formula



wherein

R is H or CH₃;

R₁ is C₁-C₃ alkyl, C₃-C₄ alkoxyalkyl, C₂-C₄ haloalkyl, C₃-C₄ alkenyl or C₃-C₄ alkynyl;

R₂ is C₁-C₃ alkyl, cyclopropyl, C₁-C₃ alkylthio, C₁-C₃ alkylsulfinyl, C₁-C₃ alkylsulfonyl, allyloxy, allylthio, allylsulfinyl, allylsulfonyl, propargyloxy, propargylthio, propargylsulfinyl, propargylsulfonyl, OCF₂H, C₂-C₃ haloalkoxy, C₁-C₃ alkyl substituted with 1-3 atoms of F or Cl, C₁-C₂ alkyl substituted with C₁-C₂ alkoxy, C₁-C₂ haloalkoxy, C₁-C₂ alkylthio, C₁-C₂ haloalkylthio, C₁-C₂ alkylsulfinyl, C₁-C₂ haloalkylsulfinyl, C₁-C₂ alkylsulfonyl, C₁-C₂ haloalkylsulfonyl, OH or OC(O)C₁-C₂ alkyl, C₁-C₂ alkoxy substituted with C₁-C₂ alkoxy, C₁-C₂ haloalkoxy, C₁-C₂ alkylthio, C₁-C₂ haloalkylthio, C₁-C₂ alkylsulfinyl, C₁-C₂ haloalkylsulfinyl, C₁-C₂ alkylsulfonyl, C₁-C₂ haloalkylsulfonyl or CN, OCH₂CH₂NH₂, OCH₂CH₂NHCH₃, OCH₂CH₂N(CH₃)₂, C₁-C₂ alkylthio substituted by C₁-C₂ alkoxy, C₁-C₂ haloalkoxy, C₁-C₂ alkylthio, C₁-C₂ haloalkylthio or CN, SCF₂H, C₂-C₃ haloalkylthio, C₁-C₃ haloalkylsulfinyl, C₁-C₃ haloalkylsulfonyl, C₂-C₃ alkenyl, NR₆R₇ or OC(O)C₁-C₂ alkyl;

R₆ is H or C₁-C₂ alkyl;

R₇ is C₁-C₂ alkyl or C₁-C₂ haloalkyl;

Y is, OCH₃ and their agriculturally suitable salts.

22. An agriculturally suitable composition for controlling the growth of undesired vegetation comprising an effective amount of a compound of claim 1 and at least one of the following: surfactant, solid or liquid diluent.

4,877,443

2,4-DIAMINO-6-TRIFLUOROMETHYLPYRIMIDINE COMPOUNDS USEFUL AS HERBICIDES

Michael Schwamborn, Cologne; Erich Klauke, Odenthal; Robert R. Schmidt, Bergisch-Gladbach; Hans-Joachim Santel, Leverkusen, and Robert H. Strang, Dueseldorf, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

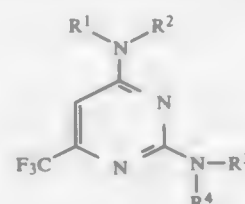
Filed Jan. 13, 1987, Ser. No. 2,881

Claims priority, application Fed. Rep. of Germany, Jan. 22, 1986, 3,681,600

Int. Cl.⁴ C07D 239/48; A01N 43/54

U.S. Cl. 71-92 10 Claims

1. A 2,4-diamino-6-haloalkylpyrimidine of the formula



in which

R¹ and R³, independently of one another, represent hydrogen or alkyl having 1-6 C atoms, and

R² and R⁴, independently of one another, represent hydrogen, alkyl having 1-8 C atoms, which is unsubstituted or substituted by fluorine, chlorine, bromine, iodine, cyano or cyclopropyl, represent alkoxyalkyl or alkylthioalkyl, in each case having 1-6 C atoms in each alkylthio or alkoxy moiety and 2-8 C atoms in each alkyl moiety, cycloalkyl having 3-5 C atoms, alkenyl, having 3-6 C atoms, which is unsubstituted or substituted by halogen, or alkynyl having 3-6 C atoms, and with the proviso that (a) R³ and R⁴ do not simultaneously represent hydrogen, and (b) R¹ and R² do not simultaneously represent hydrogen when R⁴ represents alkoxyalkyl or alkylthioalkyl.

8. A method of combating unwanted vegetation which comprises applying to such vegetation or to a locus from

which it is desired to exclude such vegetation a herbicidally effective amount of a compound according to claim 1.

4,877,444

TETRAHYDROINDAZOLYL-BENZOXAZINES AND USE Masayuki Enomoto, Takarazuka; Eiki Nagano, Tabata; Toru Haga, Toyonaka; Kouichi Morita, Kasai, and Ryo Sato, Tabata, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

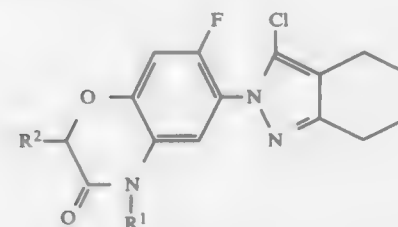
Filed Aug. 22, 1988, Ser. No. 234,619

Claims priority, application Japan, Aug. 27, 1987, 62-213946; Feb. 24, 1988, 63-042922

Int. Cl.⁴ A01N 43/84; C07D 413/04

U.S. Cl. 71-92 14 Claims

1. A compound of the formula:



wherein R¹ is a C₁-C₆ alkyl group, a C₃-C₇ alkenyl group, a C₃-C₇ alkynyl group, a halo(C₁-C₅)alkyl group, a halo(C₃-C₄)alkenyl group, a halo(C₃-C₄)alkynyl group, a C₁-C₄alkoxy(C₁-C₂)alkyl group or a C₁-C₂ alkylthio(C₁-C₂)alkyl group and R² is a hydrogen atom or a methyl group.

13. A method for exterminating harmful weeds, which comprises applying a herbicidally effective amount of the compound according to claim 1 and an inert carrier or diluent to the area where the undesired weeds grow or will grow.

4,877,445

METHOD FOR PRODUCING A METAL FROM ITS HALIDE

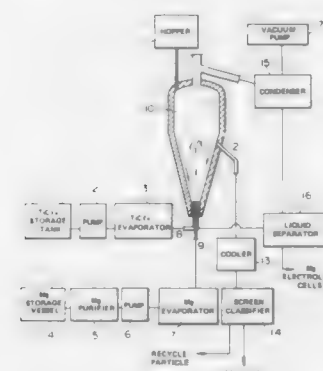
Shigenori Okudaira, Ninomiya; Takefumi Irie; Hiroshi Uchida, both of Chigasaki; Eiichi Fukasawa, Samukawa; Kazuhiko Kobayashi, Chigasaki, and Masanori Yamaguchi, Nakai, all of Japan, assignors to Toho Titanium Co., Ltd., Tokyo, Japan

Filed Jun. 30, 1988, Ser. No. 214,042

Claims priority, application Japan, Jul. 9, 1987, 62-169715

Int. Cl.⁴ C22B 34/10; C01B 33/02

U.S. Cl. 75-0.5 B 8 Claims



4,877,447

METHOD AND COMPOSITION FOR INCREASING HARVESTS OF CROPS

Akinori Suzuki, Chiba; Toshio Kajita, Narashino, and Masakazu Furukawa, Nagareyama, all of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Jul. 8, 1987, Ser. No. 71,257

Claims priority, application Japan, Jul. 11, 1986, 61-161974
Int. Cl.⁴ A01N 41/06

U.S. Cl. 71—103 15 Claims

1. A method of increasing the harvest of a crop which comprises applying 50 to 10,000 g of taurine per hectare at the locus where the crop is cultivated.

4,877,448

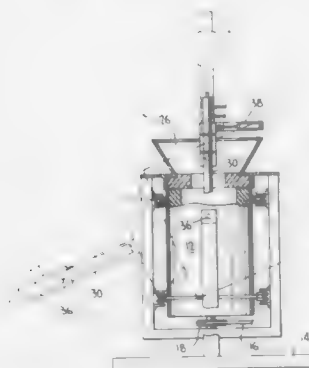
PROCESS FOR RECOVERY OF FREE ALUMINUM FROM ALUMINUM DROSS OR ALUMINUM SCRAP USING PLASMA ENERGY

Richard D. Lindsay, Raleigh, N.C., assignor to Plasma Energy Corporation, Raleigh, N.C.

Filed Dec. 8, 1988, Ser. No. 281,049

Int. Cl.⁴ C22B 21/00, 4/00

U.S. Cl. 75—10.21 6 Claims



1. A process of recovering free aluminum from aluminum dross or aluminum scrap comprising charging aluminum dross or aluminum scrap to a furnace equipped with a plasma arc torch for heating said charge; heating said charge by providing plasma energy to said charge which plasma energy is generated by feeding air to said torch for ionization; continuing said heating until said charge is molten, and removing free aluminum in the molten state from said furnace.

4,877,449

VERTICAL SHAFT MELTING FURNACE AND METHOD OF MELTING

Mark J. Khinkia, Morton Grove, Ill., assignor to Institute of Gas Technology, Ill.

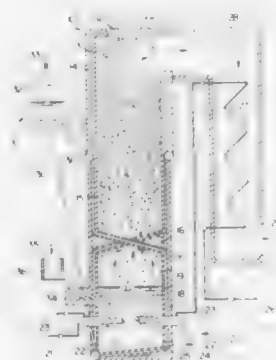
Filed Jul. 22, 1987, Ser. No. 76,491

Int. Cl.⁴ C22B 9/16; F27B 1/24; C03B 3/00, 5/12

U.S. Cl. 75—20 R 49 Claims

1. A process for melting solids comprising: charging meltable solids to an upper region of a bed of said solids supported in a vertical shaft melting furnace by a support means consisting of a fluid cooled support grid having openings smaller than an average diameter of said meltable solids; maintaining a melt pool at a bottom of said vertical shaft melting furnace; maintaining submerged combustion in said melt pool thereby producing combustion product gases; passing said combustion product gases of said submerged combustion upwardly through said bed of solids preheating and melting a portion of said solids forming melt

which flows downwardly into said melt pool and partially melting a remaining portion of said solids reducing their



size to a sufficiently small size to pass through said support grid openings into said melt pool.

4,877,450

FORMALDEHYDE-FREE ELECTROLESS COPPER PLATING SOLUTIONS

William R. Brasch, Newconset, N.Y., assignor to LeaRon, Inc., Freeport, N.Y.

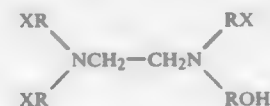
Filed Feb. 23, 1989, Ser. No. 314,537

Int. Cl.⁴ C23C 3/02, 16/00

U.S. Cl. 106—1.26 22 Claims

1. A formaldehyde-free electroless copper plating solution comprising:

a solution soluble divalent copper compound;
an amine borane reducing agent for said copper compound;
a complexing and chelating agent mixture of an amine alcohol compound having at least one alkyl group of 1 to 3 carbon atoms and an ethylene diamine compound of the formula



wherein R is an alkyl moiety having between 1 and 3 carbon atoms and X is —OH or —COOH;

said solution having a pH above about 6 but less than about 9 and a temperature above about 125° F. but below about 165° F., said complexing and chelating agent mixture being present in an amount sufficient to provide stability to the solution and to enable the solution to provide a uniform plating rate of copper upon a substrate which is immersed therein.

4,877,451

INK JET INKS CONTAINING COLORED SILICA PARTICLES

Francoise M. Winnik, Toronto, and Barkev Keoshkerian, Thornhill, both of Canada, assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 17, 1988, Ser. No. 232,967

Int. Cl.⁴ C09D 11/02

U.S. Cl. 106—23 47 Claims

1. An ink jet ink composition which comprises water; a solvent selected from the group consisting of glycols, dimethylsulfoxide, and sulfolane; and a plurality of colored particles comprising hydrophilic porous silica particles, to the surface of which dyes are covalently bonded through silane coupling agents.

4,877,452

COMPOUND CEMENT, MORE PARTICULARLY USABLE IN BORE HOLES

Michel Roussel, Paris, and Daniel Baffrean, St Maur Les Fosses, both of France, assignors to Entreprise Gagneraud Pere & Fils and Total Compagnie Francaise des Petroles, both of Tokyo, Japan

Filed Apr. 28, 1988, Ser. No. 187,542

Claims priority, application France, May 14, 1987, 87 06774
Int. Cl.⁴ C04B 7/02, 7/14

U.S. Cl. 106—97 4 Claims

1. A cementitious composition for bore holes consisting essentially of (1) a first component consisting essentially of from 50% to 90% of a ground blast-furnace slag with a vitrification rate of 90 to 100% and (2) a second component consisting essentially of from 50% to 10% of a Portland cement, said Portland cement consisting essentially of from 0 to 6% magnesium oxide, from 0 to 3% sulfur trioxide, from 0 to 3% tricalcium aluminate, an insoluble residue of from 0 to 0.75%, from 48 to 65% tricalcium silicate, and a total amount formed by the amount of tetracalcium aluminoferrite plus the amount of dicalcium ferrite plus two times the amount of tricalcium aluminate of up to 24%, the mesh size of said components being substantially similar, in the range of from 2800 to 3000 cm²/g.

4,877,453

PROCESS OF PRETREATING A POZZOLANIC MATERIAL FOR INCREASING THE POZZOLANIC PROPERTIES OF SAID MATERIAL

Hendrik Loggers, Amerongen, Netherlands, assignor to Aardelte Holding B.V., Nunspeet, Netherlands

Continuation of Ser. No. 83,978, Aug. 11, 1987, Pat. No.

4,770,709, which is a continuation of Ser. No. 853,458, Apr. 18, 1986, abandoned. This application Sep. 12, 1988, Ser. No.

243,502

Claims priority, application Netherlands, Apr. 18, 1985, 8501137

The portion of the term of this patent subsequent to Sep. 13, 2005, has been disclaimed.

Int. Cl.⁴ C04B 7/34

U.S. Cl. 106—118 8 Claims

1. A process of preparing a mixture for forming articles to be cured, by mixing a pozzolanic material, including fly ash, water, and one of calcium oxide and calcium hydroxide, wherein at least sufficient additional heat is or has been added at the time of the action of water upon a mixture of pozzolanic material and one of calcium oxide and calcium hydroxide so that the resulting mixture has or immediately thereafter attains a temperature of 50 deg. C. to 80 deg. C.

4,877,454

MODEL HUMAN SKIN

John C. Charkoudian, Newton, Mass., assignor to The Kendall Company, Boston, Mass.

Filed Feb. 4, 1988, Ser. No. 152,212

Int. Cl.⁴ C08L 89/04

U.S. Cl. 106—131 10 Claims

1. A model skin substrate adapted for screening testing of adhesion of adhesives to human skin, said model skin substrate being characterized as being water-swellaable and water-insoluble, said substrate being further characterized in that the major surface thereof for testing possesses human skin topography, said substrate consisting essentially of:

- (1) water in an adjustable amount ranging from about 8 percent to about 45 percent by weight based upon the total weight of said substrate;
- (2) water-soluble proteinaceous material which has been crosslinked to render it water-insoluble and water-swellaable; and
- (3) di- or triglyceridic ester of a C₁₂ or greater fatty acid, said proteinaceous material and glyceridic ester being the remaining percentage of essential material in said sub-

strate, the ratio by weight of proteinaceous material to glyceridic ester being from about 2:1 to about 4:1.

4,877,455

COATINGS UTILIZING GRAFT POLYOLS

Melvin Braner, East Brunswick, and Dominic Simone, Lincroft, both of N.J., assignors to CaseChem, Inc., Bayonne, N.J.

Continuation-in-part of Ser. No. 680,705, Dec. 12, 1984, Pat. No. 4,640,801, which is a continuation-in-part of Ser. No. 581,816, Feb. 21, 1984, abandoned. This application Jan. 30, 1987, Ser.

No. 8,720

Int. Cl.⁴ C08F 242/00

U.S. Cl. 106—244 58 Claims

1. A coating composition comprising: a polyol component comprising the liquid reaction product of:

- (a) at least one unsaturated fatty carbon compound having at least 8 carbon atoms, at least one hydroxyl group, and at least one ethylenic double bond, said compound having other than terminal unsaturation;
- (b) at least one liquid cyclopentadienyl compound; and
- (c) at least one terminally unsaturated monomer or compound having at least one hydroxyl group; and a curing agent comprising an isocyanate compound or an aminoplast resin.

4,877,456

ANTIOXIDANT WAX FOR RUBBER

Kaoru Chikamune, Manabu Tokuda, both of Tokuyama; Kazuo Inoue, Nagaokakyo; Kyoshi Utsumomiya, and Yoshii Hito-fude, both of Tokuyama, all of Japan, assignors to Nippon Seiro Company, Limited, Tokyo, Japan

Filed Nov. 30, 1988, Ser. No. 277,828

Claims priority, application Japan, Nov. 30, 1987, 62-300050; Oct. 28, 1988, 63-270723

Int. Cl.⁴ C08L 91/06; C08H 3/00

U.S. Cl. 106—270 1 Claim

1. An antioxidant wax characterized in that the content of normal saturated hydrocarbon is at least 75%, which contains the normal saturated hydrocarbon having a carbon number of 36 to 51 in from 20 to 45% and the normal saturated hydrocarbon having a carbon number of 21 to 26 in from 5 to 25% respectively.

4,877,457

CATIONIC AQUEOUS BITUMINOUS EMULSION-AGGREGATE SLURRIES PREPARATION

Peter Schilling, and Hans G. Schreuders, both of Charleston, S.C., assignors to Westvaco Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 197,100, May 20, 1988, Pat. No. 4,810,299. This application Oct. 27, 1988, Ser. No. 263,440

Int. Cl.⁴ C08L 95/00; C09D 3/24, 3/20

U.S. Cl. 106—277 5 Claims

1. A method of forming a bituminous emulsion at a temperature above 100° F. comprising

- (1) from about 30% to about 80% by weight of bitumen,
- (2) from about 0.1% to about 10% by weight of an emulsifier obtained by reacting a sugar-containing syrup with a modified polyamine prepared by reacting a polyamine with a member selected from the group consisting of fatty acids, animal fats, vegetable oils, tall oil, reaction products of tall oil fatty acids with a member of the group consisting of acrylic acid, methacrylic acid, fumaric acid, maleic anhydride, sulfonated fatty acid, sulfonated resin acids, and reaction products of resin acids with a member of the group consisting of acrylic acid, fumaric acid, and maleic anhydride, epoxidized fats, vegetable oils, and fatty acid esters, and
- (3) water to make up 100% by weight.

4,877,458

CONTINUOUS AUTOMATIC SNOW AND ICE
PREVENTION AND CLEARING OF AUTOMOBILE
FRONT AND REAR WINDOWSMoshe Trop, Brooklyn, N.Y., assignor to Morton Weintraub,
Brooklyn, N.Y.Filed Nov. 30, 1987, Ser. No. 126,469
Int. Cl.⁴ B08B 7/04

U.S. Cl. 134—5

25 Claims

1. A method for clearing an accumulation of snow and ice upon a window of an automobile when said automobile is in operation and when said automobile is not in operation, the steps comprising, attaching to said automobile in proximity of said window a container having means for allowing contact of said falling snow and ice with solid hygroscopic material contained in said container such that when said snow and said ice comes into said contact with said hygroscopic material, said snow and ice dissolves a quantity of said hygroscopic material, said dissolved material flows onto said window via means for allowing said flow of said material comprising a solution of said hygroscopic material and melted said snow and ice, thereby providing said clearing of said accumulation in accordance with said flow by melting said accumulation of snow and ice when said automobile is in operation and when said automobile is not in operation.

4,877,459

FLOOR CLEANING COMPOSITIONS AND THEIR USE
John R. Cockrell, Jr., Greensboro, and Joseph T. Thekkekan-
dam, Siler City, both of N.C., assignors to Kay Chemical
Company, Greensboro, N.C.Division of Ser. No. 763,733, Aug. 8, 1985, Pat. No. 4,749,508,
and a continuation-in-part of Ser. No. 698,468, Feb. 5, 1985,
abandoned. This application Sep. 4, 1987, Ser. No. 78,774Int. Cl.⁴ B08B 30/00; C11D 3/04

U.S. Cl. 134—40

54 Claims

24. The method according to claim 20, wherein the stripper comprises:

- (a) 4-20 parts citric acid;
- (b) 0.7-3 parts phosphoric acid;
- (c) 8-32 parts buffering salt of a weak acid;
- (d) 2-9 parts hydrotrope;
- (e) 1-15 parts surfactant;
- (f) 1-8 parts filler;
- (g) 0.6-3 parts neutralizer; and
- (h) 0.8-3.5 parts foam stabilizer.

53. The method according to claim 50, wherein the aqueous solution comprises:

- (a) 5 to 30 parts of citric acid;
- (b) 0.1 to 10 parts of sulfamic and/or phosphoric acid;
- (c) 2 to 50 parts of monosodium phosphate and/or sodium acid pyrophosphate;
- (d) 0 to 10 parts of hydrotrope;
- (e) 5 to 40 parts of nonionic and/or anionic surfactant;
- (f) 0 to 10 parts of fumed silica;
- (g) 0 to 15 parts of sodium tripolyphosphate; and
- (h) 0 to 50 parts of filler.

4,877,460

SOLAR CELL MODULE

Helmut Flödl, Bad Friedrichshall, Fed. Rep. of Germany, as-
signor to Telefunken electronic GmbH, Heilbronn, Fed. Rep.
of Germany

Filed Mar. 4, 1988, Ser. No. 164,464

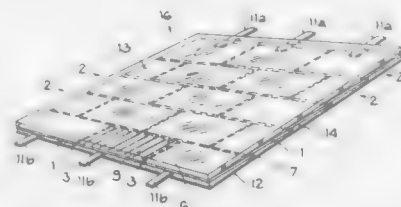
Claims priority, application Fed. Rep. of Germany, Mar. 17,
1987, 3708548Int. Cl.⁴ H02N 6/00

U.S. Cl. 136—244

7 Claims

1. In a solar cell module comprising a plurality of rows of solar cells with adjacent ones of said solar cell rows being arranged with an overlap, and being electrically interconnected in the overlap zone, and with each solar cell row including at least two solar cells and having the butt joints cre-

ated by the alignment of the solar cells in a solar cell row offset relative to those in adjacent said solar cell rows; the improvement wherein: each of said solar cells has a rectangular configuration and is provided on its front surface with a conductive contact bridge which extends parallel to and along one entire edge; the overlap zones on said front surfaces in the region of said contact bridges and the overlap zones on the diametrically



opposed edges of the rear surfaces, extend over the entire length of a respective solar cell row and make direct contact with the aligned said solar cells in a respective solar cell row as well as with the successive said solar cell rows so that the aligned solar cells of a solar cell row are connected in parallel and the aligned solar cell rows are connected in series; and said solar cell rows are soldered together at the contacts in the overlap zones.

4,877,461

NICKEL-BASE ALLOY

Gaylord D. Smith; Curtis S. Tassen; Pasupathy Ganesan, all of
Huntington, and Jack M. Wheeler, Lesage, all of W. Va.,
assignors to Inco Alloys International, Inc., Huntington, W.
Va.

Filed Sep. 9, 1988, Ser. No. 242,732

Int. Cl.⁴ C22F 1/10

U.S. Cl. 148—11.5 N

16 Claims

7. A process for enhancing the stress-rupture strength of the alloy set forth in claim 1 such that it is characterized by a life in excess of 20 hours under a stress of 11,000 psi and a temperature of 1700° F. (927° C.), said process being comprised of a combination of cold rolling and thermal treatment in which the alloy is first cold reduced from 10% up to less than 60% and thereafter annealed at a temperature of 1850° to 2125° F. (1010°-1163° C.) for a period to provide a substantially recrystallized microstructure with an average grain size of about ASTM #3 to ASTM #5, and such that M_6C carbide is formed and constitutes at least 1% by weight of the alloy.

4,877,462

PROCESS FOR PRODUCING OIL QUENCH
HARDENING AND TEMPERING AND HARD DRAWN
STEEL WIRE OF SHAPED SECTIONHeiji Sugita, Tokyo, Japan, assignor to Sugita Wire Mfg. Co.,
Ltd., Tokyo, Japan

Filed Jul. 7, 1988, Ser. No. 217,494

Claims priority, application Japan, Jul. 10, 1987, 62-172372

Int. Cl.⁴ C22C 8/06

U.S. Cl. 148—12 B

8 Claims

1. A process for producing an oil tempered and hard drawn steel wire for springs having a shaped cross section free of twist in the longitudinal direction, which comprises descaling, annealing and descaling again a hot rolled wire rod, cold work-



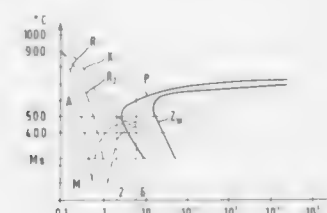
ing the wire rod, oil tempering the cold worked wire, descaling the oil tempered wire, and giving the wire a shaped cross section free of twist in the longitudinal direction by cold working the treated wire.

4,877,463

METHOD FOR PRODUCING ROLLED STEEL
PRODUCTS, PARTICULARLY THREADED STEEL
TENSION MEMBERSMax Aicher, Freilassing; Dieter Jungwirth, Munich; Hans-Wil-
helm Klein, Mitterfelden, and Dieter Rauswurm, Puchheim,
all of Fed. Rep. of Germany, assignors to Dyckerhoff & Wid-
mann Aktiengesellschaft, Munich, Fed. Rep. of Germany
Continuation of Ser. No. 86,215, Aug. 13, 1987, abandoned,
which is a continuation of Ser. No. 769,156, Aug. 23, 1985,
abandoned. This application Jun. 7, 1988, Ser. No. 205,556
Claims priority, application Fed. Rep. of Germany, Aug. 23,
1984, 3431008Int. Cl.⁴ C21D 9/52

U.S. Cl. 148—12 B

5 Claims



1. A method of producing an axially extending rolled steel member for use as prestressing steel member and having a generally circular transverse section with an axially extending core zone (K) enclosed by an axially extending annular rim zone (R) and comprising the steps of forming the steel member with a C content in the range of 0.50 to 0.80%, a Si content in the range of 0.20 to 0.50%, a Mn content in the range of 0.30 to 0.80%, hot rolling the steel member in a rolling mill with a finishing stand having an outlet, removing the rolled member from the outlet of the finishing stand at the final rolling temperature and selecting the final rolling temperature in the range of 860° to 1060° C., surface quenching in a single operation the rolled member at the rolling temperature from the finishing stand using a cooling medium so that the rim zone (R) is transformed immediately into martensite while maintaining the heat content in the core zone (K) so that the heat content does not temper the martensite rim zone during subsequent cooling beyond the range of the intermediate stage, and surface quenching and tempering the steel member so that the surface temperature of the rim zone, depending on the diameter of the steel product, is in the range of 400° and 500° C. in the time interval between the second and sixth second following the commencement of surface quenching.

4,877,464

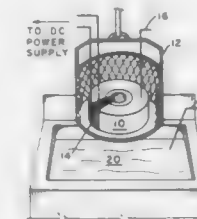
RAPID MAGNETIC ANNEALING OF AMORPHOUS
METAL IN MOLTEN TINJohn Stigall, Cedar Grove; Davidson Nathasingh, Stanhope,
and Christopher A. Bruckner, Madison, all of N.J., assignors
to Allied-Signal Inc., Morris Township, N.J.Continuation of Ser. No. 871,955, Jun. 9, 1986, Pat. No.
4,668,309. This application Apr. 2, 1987, Ser. No. 33,981The portion of the term of this patent subsequent to May 26,
2004, has been disclaimed.Int. Cl.⁴ C21D 1/04

U.S. Cl. 148—108

16 Claims

1. A method for rapid magnetic annealing of an amorphous metal alloy comprising the steps of
(a) applying a magnetic field to the alloy,
(b) immersing the alloy in a liquid comprising molten tin, whose temperature is in the range between about 0.6 T_g

and 1.0 T_g, where T_g is the glass transition temperature of the alloy in degrees C.,



- (c) separating the alloy from the liquid, and
- (d) immersing the alloy in a cooling fluid.

4,877,465

STRUCTURAL PARTS OF AUSTENITIC
NICKEL-CHROMIUM-IRON ALLOYJean R. Donati, Thomery; Daniele Guttman, Samois sur Seine;
Yves Rouillon, Avon; Pierre S. Paul, Samois sur Seine, and
Guy Zacharie, Fontainebleau, all of France, assignors to
Electricite de France (Service National), France

Filed Mar. 17, 1987, Ser. No. 26,514

Claims priority, application France, Mar. 18, 1986, 86 03832

Int. Cl.⁴ C22C 19/05; C22F 1/10

U.S. Cl. 148—428

8 Claims

1. Structural part for use in contact with high temperature high pressure water in a nuclear reactor, of stainless austenitic nickel base alloy containing, by weight, from 5 to 10% of iron, from 18 to 20% of chromium and more than 60% of nickel, the total amount of iron, chromium and nickel representing less than 100% of the alloy, wherein said alloy has been subjected to a homogenization and hardening heat treatment recommended for X750 alloys comprising homogenization at 1093° C. for one hour and subsequent hardening at 704° C. for 20 hours; and wherein said alloy has a yield limit of at least 700 MPa and the contents of all constituents of the alloy, except chromium, are in the standard ranges corresponding to X750 alloys.

4,877,466

PERCUSSION-SENSITIVE THERMOSTABLE
PYROTECHNIC COMPOUNDGérard Dasse, Tarbes, France, assignor to Etat Français as
represented by the Delegee general pour l'armement, France
Filed Dec. 30, 1988, Ser. No. 292,247

Claims priority, application France, Dec. 3, 1987, 87 16762

Int. Cl.⁴ D03D 23/00

U.S. Cl. 149—108.6

5 Claims

1. Pyrotechnic compound that is stable at temperatures of the order of 100° C., percussion-sensitive, having an initiation power, wherein it includes a mixture of a primary explosive consisting of silver nitride and a powder of selenium, tellurium and/or sulfur.

4,877,467

ELECTRICALLY INSULATED WIRE

Eric P. Marsden, and John A. Checkland, both of Pointe Claire,
Canada, assignors to Northern Telecom Limited, Ottawa,
CanadaContinuation of Ser. No. 263,610, May 14, 1981, abandoned,
which is a continuation of Ser. No. 105,590, Dec. 20, 1979,
abandoned, which is a continuation-in-part of Ser. No. 910,644,
May 30, 1978, abandoned. This application Nov. 20, 1985, Ser.
No. 799,983

Claims priority, application Canada, May 26, 1978, 304201

Int. Cl.⁴ B05D 3/06, 5/12; H01B 13/00

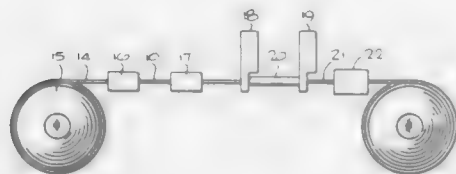
U.S. Cl. 156—51

2 Claims

1. A method of making an electrically insulated wire in which

a conductor is covered with a first layer of non-crosslinked and non-crosslinkable polymeric material comprising:

feeding the conductor with its first layer through an extruder to form a skin layer of crosslinkable polymeric material, compatible with the first layer, around the first layer, and irradiating the skin layer to crosslink it,



wherein the first layer is extruded onto the conductor before the extrusion of the skin layer.

wherein the first layer is a non-crosslinkable polyvinylchloride composition and the skin layer is extruded as an irradiation of crosslinkable composition.

4,877,468

HOT TIRE FORMING METHOD

Karl J. Siegenthaler, Rome, Italy, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Filed May 18, 1987, Ser. No. 51,436

Claims priority, application Italy, May 20, 1986, 67 413-A/86

Int. Cl.⁴ B29C 35/02; B60C 9/00

U.S. Cl. 156—111

15 Claims



1. A method of hot-forming tires including a number of component elements, each of said component elements being formed at least partially from a respective final mix of non-precured elastomeric material, said component elements defining an internal carcass and an external annular package assembled together in a green tire assembly department including at least one tire building drum, said carcass comprising an impermeable inner layer and at least one outer body ply, and said external annular package comprising a number of superimposed tread plies and an outer tread wherein the method includes the steps of:

- producing final mixes of elastomeric material at a temperature greater than room temperature so that each said mix will absorb thermal energy, wherein at least one of said final mixes is obtained by mixing respective masterbatches with respective chemical components within respective mixers, said mixing including the transfer of thermal energy to at least one final mix to impart a temperature to said at least one final mix, at the output of said mixer, which is greater than room temperature;
- feeding each said at least one final mix for the continuous production of a continuous strip prior to dissipation of the thermal energy which is imparted to each at least one final mix during step (a);
- forming at least some of said elements by cutting semifin-

ished products, each in the form of respective continuous strips produced by direct continuous production of the respective final mixes of step (b), said direct continuous production involving a given transfer of thermal energy to each of said continuous strips and conferring to each of said strips an output temperature greater than room temperature;

- hot-feeding at least some of the directly produced and cut continuous strips directly onto said one tire building drum for assembling a finished green tire on said drum, wherein said hot-feeding of at least some of said produced and cut continuous strips preserves at least part of the thermal energy imparted to said produced and cut continuous strips during said producing step and said forming step, so that each of said cut continuous strips are maintained at a total final temperature greater than room temperature;

- subjecting each finished green tire to a curing operation prior to dissipation of the thermal energy imparted to said continuous strips during said forming step, and prior to dissipation of the thermal energy imparted to said mixes during said producing step.

4,877,469

REINFORCED TIRE CURING BLADDER AND METHOD FOR USING SAME

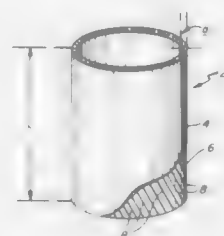
Walter Szymas, Branford, and Joseph W. Valaitis, Guilford, both of Conn., assignors to The Armstrong Rubber Company, New Haven, Conn.

Continuation of Ser. No. 27,448, Mar. 18, 1987, abandoned. This application Aug. 10, 1988, Ser. No. 230,735

Int. Cl.⁴ B29D 23/00; 30/08

U.S. Cl. 156—123

11 Claims



1. In a method of shaping and curing a tire wherein the carcass of the tire to be cured is supported in a mold, a tire curing membrane bladder is inflated within said carcass to hold the latter in place against the walls of said mold, and heat is applied to said carcass to cure the same, the improvement which comprises employing as the tire curing bladder, a bladder which, in the uninflated condition, comprises a cylindrical membrane of rubber having embedded therein a layer of reinforcing material comprising a plurality of cords traversing parallel spiral paths within said cylinder of rubber and which, in the inflated condition within said carcass, assumes a toroidal cross-sectional profile wherein said cords are aligned substantially in the direction of the longitudinal axis of said bladder.

4,877,470

METHOD FOR THE PRODUCTION OF BIAS FABRICS

Ronald G. Krueger, Sparks, Nev., assignor to J B Group, Inc., Greenwich, Conn.

Filed Oct. 23, 1986, Ser. No. 922,344

The portion of the term of this patent subsequent to Dec. 3, 2002, has been disclaimed.

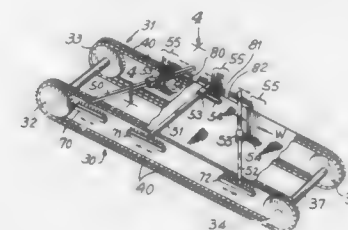
Int. Cl.⁴ D04H 3/00

U.S. Cl. 156—177

10 Claims

1. In a method for forming a bias-laid, non-woven fabric employing a pair of movable, parallel conveyors, said conveyors lying parallel to the long axis of the fabric being formed, and at the extremities of the short axis, each of said conveyors

being provided with a first series of needles, said first needles being aimed away from the fabric being formed, comprising: providing at least two yarn carriers which lay a plurality of yarns, the yarns from each carrier lying essentially parallel to other yarns from said carrier, from a first conveyor to a second conveyor and, subsequently, from said second conveyor to said first conveyor, the yarns from the second carrier lying at a predetermined angle to those from the first carrier providing means to vertically depress said yarn carrier at a point outside of each said conveyor providing a first driving means for said yarn carrier, said second driving means providing for a reduction in the speed of movement of said yarn carrier at the extremities of travel, the improvement comprising: providing



two rake means for each yarn carrier, one rake means being placed adjacent, but beyond said first conveyor, and within the extremities of travel of said yarn carriers; and said second rake means being placed adjacent, but beyond said second conveyor, and within the extremities of travel of said yarn carriers; each said rake means being provided with a second series of needles, said second series of needles being aimed toward said fabric being formed, whereby said yarns from said yarn carrier are first wrapped about or impaled on said second series of needles and, on return of said yarn carrier from said first conveyor to said second conveyor and from said second conveyor to said first conveyor, said yarns are removed from said second series of needles and wrapped about or impaled on said first series of needles.

4,877,471

METHOD AND APPARATUS FOR DELIVERING A RESIN-IMPREGNATED, MULTIFILAMENT BAND

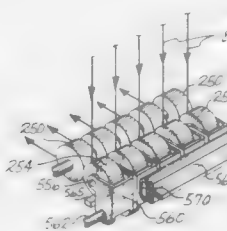
Peter D. McCowin, Federal Way, Wash., and Brent R. Meredith, Fullerton, Calif., assignors to The Boeing Company, Seattle, Wash.

Filed Aug. 24, 1984, Ser. No. 643,772

Int. Cl.⁴ B32B 27/02

U.S. Cl. 156—181

42 Claims



1. A method for delivering a multifilament band comprising the steps of:

- providing a plurality of rovings, each roving being comprised of a bundle of resin impregnated filaments;
- compacting each roving to a predetermined width, said compacting step including the steps of:
 - providing a plurality of cylindrical compaction backup rollers, each compaction backup roller being mounted for rotation about a shaft;

- guiding each of said provided rovings past the radial face of one of said compaction backup rollers;
- providing a plurality of compaction rollers, each compaction roller being mounted for rotation about an axially aligned shaft; and
- applying a predetermined, individually adjustable force to each compaction roller such that the radial face thereof engages the roving guided past the radial face of one of said compaction backup rollers such that said roving is compacted between said radial faces to said predetermined width; and

(c) guiding said compacted rovings to a side-by-side alignment such that a band of aligned rovings is formed.

20. Apparatus for delivering a multifilament band comprising: compaction means for compacting each of a plurality of rovings to a predetermined width, with each roving being comprised of a bundle of resin impregnated filaments, said compaction means comprising:

- a plurality of cylindrical compaction backup rollers;
- a plurality of cylindrical compaction rollers, each compaction roller being predeterminedly aligned with one of said compaction backup rollers;
- actuating means for controlling individually displacing said compaction rollers such that the radial faces thereof moves with a predetermined compacting force in a direction to engage the radial faces of said compaction backup rollers; and
- input guide means for guiding each of said plurality of rovings to said compaction means; said input guide means including guides for routing each roving past the radial face of one of said compaction backup rollers, such that upon said actuating means displacing said compaction rollers, each roving is compacted between one of said compaction rollers and one of said backup compaction rollers to said predetermined width; and

output guide means for guiding said compacted rovings to a side-by-side alignment such that a band of aligned rovings is formed.

4,877,472

METHOD OF MAKING A BEARING BLANKET

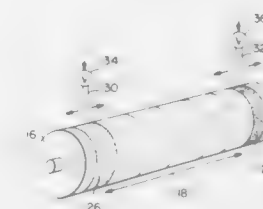
José J. A. Rodal, Clarks Summit, Pa., assignor to Beloit Corporation, Beloit, Wis.

Filed Oct. 31, 1988, Ser. No. 265,080

Int. Cl.⁴ B37B 31/00; D21F 3/02

U.S. Cl. 156—184

20 Claims



1. A method of making a bearing blanket for an extended nip press, said method comprising steps of:

- wrapping a reinforcing mat with uncured elastomeric polymer around a mandrel such that a central portion of the resultant blanket includes both the reinforcing mat and the elastomeric polymer, while a first and second lateral edge of the blanket includes only elastomeric polymer;
- curing the elastomeric polymer;
- removing the resultant blanket from the mandrel; and
- folding the first and second edges of the blanket radially inwardly so that the edges inhibit the escape of lubricating oil from the extended nip press past the blanket.

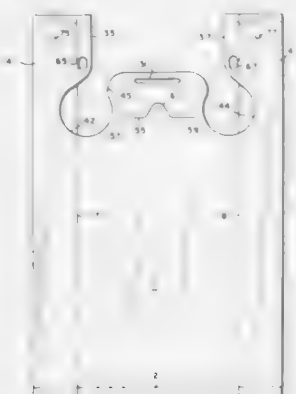
4,877,473

METHOD OF MAKING A BAG PACK

Michael Snowden, East Providence, R.I., and Jay Shapiro, Sandwich, Mass., assignors to Berensford Packaging, Inc., Taunton, Mass.

Filed Feb. 16, 1988, Ser. No. 156,339
Int. Cl.⁴ B32B 31/18, 31/20

U.S. Cl. 156—204



1. The method of forming a bag pack comprising: forming a flattened gusseted tube of thermoplastic film; heat sealing and cutting said tube along transverse lines at periodic intervals thereby to form enclosures; stacking a plurality of said enclosures; at one end of the enclosures in the stack, cutting out a central portion thereof overlapping the gusset regions thereby to form from each enclosure a bag having front and back walls defining an article receiving opening with loop handles at each side of the opening; aperturing said handles intermediate said article receiving openings and the distal ends of said handles for receiving spaced support rods for holding the pack for dispensing; and applying pressure locally without heat at a point intermediate said support rod receiving aperture and the distal end of the handle thereby to form a frangible pressure bond linking the film layers forming each of said handles.

4,877,474

PROCESS FOR THE PRODUCTION OF A HOLLOW CHAMBER PLATE OF SYNTHETIC MATERIAL

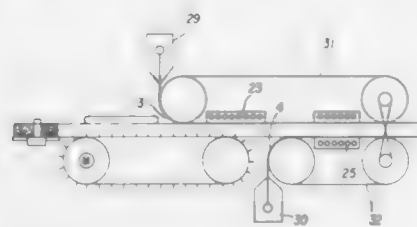
Heinz Gross, Muehlital, Fed. Rep. of Germany, assignor to Rohm GmbH Chemische Fabrik, Darmstadt, Fed. Rep. of Germany
Continuation of Ser. No. 884,799, Jul. 11, 1986, abandoned. This application Mar. 25, 1988, Ser. No. 172,934

Claims priority, application Fed. Rep. of Germany, Jul. 26, 1985, 3526752

Int. Cl.⁴ B32B 3/12

U.S. Cl. 156—244.13

4 Claims



1. A process for the production of a hollow chamber plate of synthetic material, comprising the steps of: (i) continuously supplying a plurality of prefabricated webs at a temperature below their softening point, (ii) extruding a first cover layer in a thermoplastic condition

- onto a continuous belt heated to the melting temperature of said first cover layer and contact said webs and said first extruded cover layer, wherein when contacted, said first extruded cover layer is in a thermoplastic condition and said webs are at a temperature below their softening point,
- (iii) cooling said contacted first extruded cover layer to below its softening temperature by cooling said continuous belt and indirectly said first cover layer,
- (iv) extruding a second cover layer in a thermoplastic condition onto a continuous belt heated to the melting temperature of said second cover layer and contacting said web and said second extruded cover layer, wherein when contacted, said second extruded cover layer is in a thermoplastic condition and said webs are at a temperature below their softening point, and
- (v) cooling said contacted second extruded cover layer to below its softening temperature by cooling said continuous belt and indirectly said second cover layer.

4,877,475

METHOD FOR PRODUCING INFORMATION STORAGE DISK

Masami Uchida, Hirakata, and Seiko Minamide, Nara, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

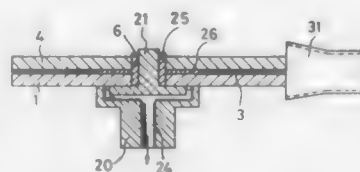
Division of Ser. No. 856,286, Apr. 28, 1986, abandoned. This application Dec. 18, 1987, Ser. No. 135,539

Claims priority, application Japan, Nov. 1, 1984, 59-230704; Dec. 11, 1984, 59-261141; Dec. 11, 1984, 59-261142

Int. Cl.⁴ B32B 31/28

U.S. Cl. 156—273.7

8 Claims



1. A method for making information storage disk, comprising the steps of: applying viscose adhesive on a first disk having a center hole, at a part near said center hole, placing a second disk having a center hole corresponding to said center hole of said first disk on said first disk, to form an assembled disk, in which a face of said first disk confronts a face of said second disk, temporarily mounting said assembled disk on rotating means, temporarily inserting a center boss of said rotating means in both said center holes, while releasably holding only said first disk, revolving said assembled disk around an axis of said center boss by said rotating means to spread said viscose adhesive to all parts of said confronting faces, and revolving said assembled disk around said axis of said center boss by said rotating means, while hardening said adhesive while maintaining said assembled disk temporarily mounted on said center boss.

4,877,476

PROCESS OF MAKING A RESIN-COMPOSITE PANEL

Jerry M. Wolf, Westerville, Ohio, assignor to Midwest Acoust-A-Fiber, Inc., Ostrander, Ohio

Filed Nov. 4, 1988, Ser. No. 267,281

Int. Cl.⁴ B32B 31/20

U.S. Cl. 156—307.3

11 Claims

1. A method of making an air conditioning frame having an insulating article thereon, comprising coating a resin impregnated, partially cured fiberglass batt on a first surface with a layer of compatible resin;

applying a porous non-woven polymeric sheet onto the coated resin layer to form an article; forming and curing the article at elevated temperature and pressure wherein the polymeric sheet melts and forms a non-porous coating on the first surface of the cured article;



coating a layer of effective adhesive on the first surface having the non-porous coating; bonding the article in a desired location to an air conditioning frame.

4,877,477

STRIP SUPPLYING DEVICE

Toshinori Yabe, and Kazuo Ozaki, both of Tokyo, Japan, assignors to Bridgestone Corporation, Tokyo, Japan

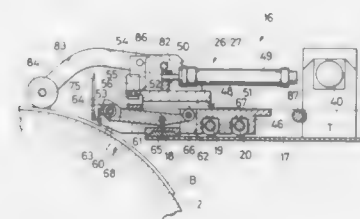
Filed Oct. 23, 1987, Ser. No. 111,734

Claims priority, application Japan, Oct. 23, 1986, 61-252687

Int. Cl.⁴ B32B 31/18

U.S. Cl. 156—406.4

5 Claims



1. A strip supplying device comprising: supplying means for supplying long-narrow strips formed by coating cords with rubber to a forming drum while guiding said strips, said supplying means being disposed immediately before said drum; moving means for moving said supplying means along the axis of said drum so that said strip is spirally wound on said drum with said strip's winding density changed in said drum widthwise direction as desired while being guided by said supplying means; detecting means for detecting rotation of said drum and producing an output; and control means for controlling said moving means according to the output of said detecting means, to control the directions of movement and the speed of movement of said supplying means.

4,877,478

DEVICE FOR CONTINUOUS HOT-SEALING OF THERMOPLASTIC FILMS

Angelo Cappi, Vignola, Italy, assignor to Awax S.r.l., Modena, Italy

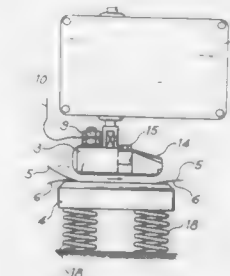
Filed Jan. 27, 1988, Ser. No. 148,436

Claims priority, application Italy, Feb. 13, 1987, 40012 A/87

Int. Cl.⁴ B30B 15/34

U.S. Cl. 156—555

6 Claims



1. A device for continuous heat-sealing of a relatively moving thermoplastic film, said device comprising: a sealing head; a heated element on said sealing head; a counter-plate disposed in close proximity to said sealing head to define a sealing zone between said counter-plate and said sealing head to accommodate in said zone the relatively moving thermoplastic film; drive means operable for rapidly reciprocating said sealing head toward and away from said counter-plate so as to rapidly pound the relatively moving thermoplastic film between the sealing head heated element and the counter-plate and thereby effect heat sealing of the film; and spring means mounting said counter-plate for movement so that, as the sealing head is operatively reciprocated to pound the thermoplastic film between the sealing plate and counterplate, said reciprocated movement of the sealing head imparts movement to said counter-plate thereby enhancing said rapid pounding of the relatively moving thermoplastic film between the sealing head and counter-plate.

4,877,479

METHOD AND APPARATUS FOR ION DEPOSITION AND ETCHING

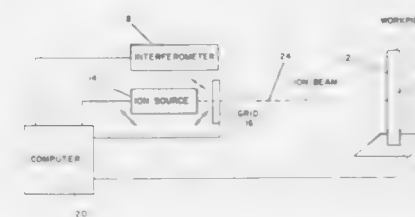
John R. McNeil, and Scott R. Wilson, both of Albuquerque, N. Mex., assignors to University of New Mexico, Albuquerque, N. Mex.

Continuation-in-part of Ser. No. 28,246, Mar. 20, 1987, Pat. No. 4,758,304. This application Jun. 27, 1988, Ser. No. 212,272

Int. Cl.⁴ B44C 1/22; C03C 15/00; C23C 14/00; B05D 3/06

U.S. Cl. 156—626

16 Claims



9. A method using ion etching for changing the existing topography of the surface of an object to a predetermined topography, the method comprising the steps of:

- (a) comparing the existing topography of the surface to the predetermined topography;
 (b) using an algorithm comprising image restoration, and using a plurality of ion sources, selectively etching material from the surface of the object to cause the surface to reach the predetermined topography.

4,877,480

LITHOGRAPHIC TECHNIQUE USING LASER FOR FABRICATION OF ELECTRONIC COMPONENTS AND THE LIKE

Shyam Das, Acton, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 894,784, Aug. 8, 1986, abandoned. This application Jun. 6, 1988, Ser. No. 205,490

Int. Cl.⁴ B44C 1/22

U.S. Cl. 156—635

9 Claims



1. A process of etching a recess in a workpiece using laser radiation through a patterned mask defining the boundaries of the recess, wherein the improvement comprises using as the material comprising the mask a material that is reflective at the wavelengths of the laser radiation; providing a layer of liquid over the surface of the mask, the liquid selected to be substantially transparent to the radiation of the laser to be used and substantially non-reactive to the materials forming the workpiece at room temperature, and reactive to the materials forming the workpiece, except the material comprising the mask, at elevated temperatures produced by the laser radiation; and exposing the workpiece to laser radiation to remove material from the exposed portions for a time sufficient to produce a recess of the desired depth, the reflective mask preventing the portions covered thereby from being etched by the laser radiation.

4,877,481

PATTERNING METHOD BY LASER SCRIBING

Takeshi Fukuda, Ebina; Shunpei Yamazaki, Tokyo, and Akira Sugawara, Atsugi, all of Japan, assignors to Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan

Filed May 27, 1988, Ser. No. 200,063

Claims priority, application Japan, May 28, 1987, 62-13326; May 28, 1987, 62-13326

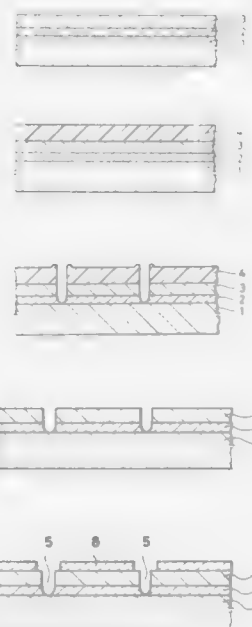
Int. Cl.⁴ B44C 1/22; C03C 15/00, 25/06; C23F 1/02

U.S. Cl. 156—643

12 Claims

1. A method of producing patterns on a first film formed on a substrate, the method comprising the steps of: coating said first film with an organic buffer film; irradiating said film with a laser beam through said organic buffer film; removing the irradiated portions of said first film together with the overlying portions of said organic buffer film

while leaving said substrate substantially intact to produce said patterns on said first film;



removing said organic buffer film with a solvent; and forming a second film on said first film.

4,877,482

NITRIDE REMOVAL METHOD

James H. Knapp, Gilbert; George F. Carney, and Francis J. Carney, both of Tempe, all of Ariz., assignors to Motorola Inc., Schaumburg, Ill.

Filed Mar. 23, 1989, Ser. No. 327,630

Int. Cl.⁴ B44C 1/22; C03C 15/00, 25/06

U.S. Cl. 156—643

15 Claims

1. A method for removing nitride coatings from metal surfaces comprising the steps of: providing a metal surface having a nitride coating disposed thereon; placing said nitride coated metal surface into a plasma reactor; and exposing said nitride coated metal surface to a gaseous plasma comprising a reactive fluorine species.

4,877,483

METHOD FOR CONTACT BETWEEN TWO CONDUCTIVE OR SEMI-CONDUCTIVE LAYERS DEPOSITED ON A SUBSTRATE

Albert Bergemont, La Tronche, and Richard Ferrant, Aix En Provence, both of France, assignors to S.G.S. Thomson Microelectronics, S.A., Gentilly, France

Filed Jun. 29, 1988, Ser. No. 212,889

Claims priority, application France, Jul. 3, 1987, 87 09455

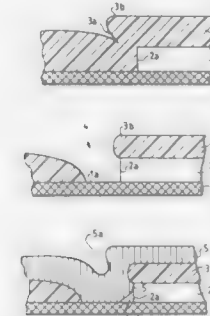
Int. Cl.⁴ H01L 21/306; B44C 1/22; C03C 15/00; C23F 1/02

U.S. Cl. 156—653

13 Claims

1. A method for establishing a contact between two conductive or semiconductive layers deposited on a substrate, comprising the following steps: depositing a first conductive or semiconductive layer on the substrate, and selectively etching said layer so as to define in said first layer regions having lateral edges; depositing an insulating layer on the substrate, under pressure and temperature conditions such that the insulating layer has a thickness which is smaller around the lateral edges of said regions than over the remainder of the substrate including the remainder of said first layer regions;

chemically etching the insulating layer to an amount which is at least equal to the thickness of said insulating layer where it is smaller but which is substantially less than the thickness of said insulating layer elsewhere;



depositing a second conductive or semiconductive layer over the etched insulating layer under pressure and temperature conditions leading to high covering capacity, so as to form a contact between said first and second conductive or semiconductive layers at the edges of said first layer.

4,877,484

FLOCED 2:1 LAYERED SILICATES AND WATER-RESISTANT ARTICLES MADE THEREFROM

Walter J. Bohrn, Lancaster; Richard A. Brubaker, Willow Street; Shelly N. Garman, Lancaster; Lewis K. Hosfeld, Mountville; Kenneth K. Ko, and Thomas M. Tymon, both of Lancaster, all of Pa., assignors to Armstrong World Industries, Inc., Lancaster, Pa.

Continuation-in-part of Ser. No. 715,973, Mar. 25, 1985, abandoned. This application Feb. 17, 1987, Ser. No. 15,756

The portion of the term of this patent subsequent to Nov. 17, 2004, has been disclaimed.

Int. Cl.⁴ C04B 20/02, 20/06

U.S. Cl. 162—103

31 Claims

1. A method of preparing a floced mineral material that can be utilized to form a non-asbestos high temperature article that exhibits water resistance, this method comprising (1) contacting a layered silicate having an average charge per structural unit in the range of from about -0.4 to about -1 which was exchangeable interstitial ions that promotes layer swelling, and is selected from mica and vermiculite, with a polar liquid to cause gel formation and form a swelled layered silicate dispersion, and then (2) contacting the swelled layered silicate dispersion with at least one species of an exchange ion consisting essentially of a cationic diamine compound to flocculate the silicate by an ion exchange reaction between at least some of the exchangeable interstitial ions, and at least some of the exchange ions to form a flocculated silicate product.

4,877,485

SHEET INSPECTION STATION WITH PNEUMATIC SHEET GUIDE

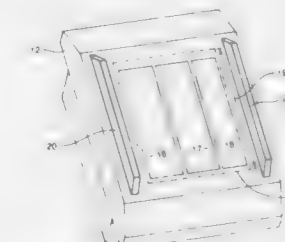
Keith J. Carson, Kalamazoo, Mich., assignor to Process Automation Business, Inc., Columbus, Ohio

Continuation of Ser. No. 56,025, Jun. 1, 1987, abandoned. This application Mar. 6, 1989, Ser. No. 320,852

Int. Cl.⁴ D21F 7/06; G01N 21/01

U.S. Cl. 162—263

4 Claims



1. An inspection station of the type used in measuring physical properties of a continuously-moving web of paper having a direction of motion including a sensor package contained within a housing and having a cross-machine width, the sensor package being adapted to produce electrical signals indicative of one or more of the physical properties as the web is moving past the sensor package, said sensor package including a web entrance end and a web exit end, and including sensor means on opposite sides of said web extending at least a portion of the cross-machine width, each of said sensor means including a sensor surface extending parallel to said web and spaced therefrom and wherein the improvement comprises pneumatic means to position the web in a desired path between and spaced from said sensor surfaces comprising a pair of air-directing means extending across substantially the cross-machine width of said sensor package and positioned to direct air onto opposite surfaces of said web at said web entrance end, each of said air-directing means extending out from its respective sensor surface toward said web and including at least one row of air-directing apertures for directing air onto said web surface substantially over the cross-machine width of said sensor package to space said web between said air-directing means and between and spaced from said sensor surfaces, wherein said air-directing means of said pair are spaced from each other in the direction of motion of said web.

4,877,486

HEADBOX FOR PAPER MACHINE WITH HOLLOW EXPANDING MEMBER FOR PROFILE BAR ADJUSTMENT

Werner Kade, and Hermann Rahmig, both of Heidenheim, Fed. Rep. of Germany, assignors to J.M. Voith GmbH, Heidenheim, Fed. Rep. of Germany

Filed Mar. 21, 1988, Ser. No. 170,793

Claims priority, application Fed. Rep. of Germany, Mar. 27, 1987, 3710058

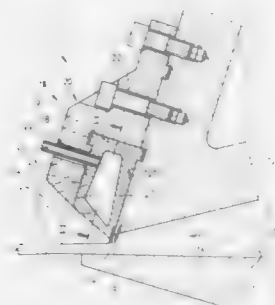
Int. Cl.⁴ D21F 1/02

U.S. Cl. 162—336

24 Claims

1. Headbox for a paper machine for producing a paper web, comprising: a first machine-wide flow guide wall; a second machine-wide flow guide wall disposed opposite said first flow guide wall and movable relative thereto; said first and second flow guide walls defining therebetween a nozzle-like, machine-wide stock channel having a machine-wide stock discharge opening; said second flow guide of wall having means connected thereto proximate the stock discharge opening for adjusting the basis weight cross direction profile of the paper web produced in the paper machine, said means for adjusting including a machine-wide profile bar limiting the

effective width of the stock discharge opening and being adjustable relative to said second flow guide wall;
 a hollow expanding member extending across the machine width having pressure chambers separated by intermediate walls arranged in succession across the machine width, which pressure chambers are supported against said second flow guide wall and can be pressurized independently of one another with a pressure fluid, the pressure chambers of said hollow expanding member having sidewalls oriented parallel to the direction of movement of the profile bar on the stock flow opening side of the sidewalls, the sidewalls being composed of a material of high elasticity, the pressure chambers further including an end wall facing the stock discharge opening and connecting the



sidewalls to one another, the end wall being stiffened by an armoring to avoid buckling;

said expanding member being guided parallel to the direction of movement of the profile bar on both sidewalls between planar sliding surfaces connected at least indirectly to said second flow guide wall, being fastened at a section thereof facing away from the profile bar at least indirectly to said second flow guide wall, and being connected at one of the sidewalls with the profile bar proximate the stock discharge opening, the profile bar being guided by one of said planar sliding surfaces corresponding to said one of the sidewalls such that the profile bar is moved by a flexible expansion of said one of the sidewalls running in the plane of said one of said planar sliding surfaces.

4,877,487

BELT AND DRUM-TYPE PRESS WITH SUPPLEMENTAL NIP LOADING MEANS

Ray R. Miller, 8816 Warren Dr. N.W., Gig Harbor, Wash. 98343

Continuation-in-part of Ser. No. 94,137, Sep. 8, 1987, Pat. No. 4,758,310, which is a continuation-in-part of Ser. No. 849,931, Aug. 8, 1986, Pat. No. 4,710,271. This application Jul. 1, 1988, Ser. No. 214,594

The portion of the term of this patent subsequent to Dec. 1, 2004, has been disclaimed.

Int. Cl.⁴ D21F 3/00

U.S. Cl. 162—360.1

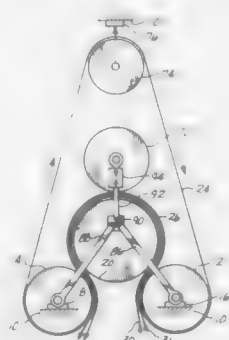
17 Claims

1. A drum and belt-type press for compressing a moving web or mat which comprises:

- a supporting frame;
- first and second spaced apart rotatable nip rolls mounted on the frame, said rolls having parallel axes of rotation, the first roll positioned as a belt entry nip roll and the second roll positioned as a belt exit nip roll;
- a central drum adjacent the first and second nip rolls, the drum having an axis of rotation essentially parallel to said nip rolls;
- at least one idler nip roll having limited freedom of movement generally radial to the drum also being located adjacent the drum;
- an endless flexible belt having an inner generally U-shaped course and an outer generally U-shaped course, the inner and outer courses meeting in loops, one loop

containing the first nip roll and the other loop containing the second nip roll, the inner course of the belt being wrapped around more than one half of the circumference of the drum, said first and second nip rolls being located within the body of the belt, said idler nip roll or rolls also being located within the body of the belt, between the first and second nip rolls, all of the nip rolls making nip contact with the drum through the interposed inner course of the belt

- at least one belt guide roll located within the body of the belt to support the outer course of the belt, said guide roll or rolls not making nip contact with the drum, the location and sizes of the guide roll or rolls and the nip rolls acting to maintain clearance between the outer course of the belt and the inner course of the belt;
- tensioning means to control belt tension;



- supplemental loading means for one or more of said idler nip roll or rolls, to create a desired nip force for said idler nip roll or rolls acting upon the drum, independent of belt tension, the location of all said idler nip rolls and the nature of the forces they exert on the drum being such and the press being constructed and arranged such that the net resultant force of all idler nip roll forces upon the drum is directed between the centers of rotation of the first and second nip rolls; and
- driving means for rotating the belt through its endless path so as to compress a web or mat interposed between the moving belt and drum,

the drum being structured and arranged to have freedom to move radially toward or away from the first and second nip rolls so that the drum presses upon the first and second nip rolls with a force controlled by belt tension and the net resultant force of the idler nip roll forces.

4,877,488

PASSIVE ACOUSTIC POWER SPECTRA TO MONITOR AND CONTROL PROCESSING

George D. Cody, Princeton, N.J.; Eugene R. Elzinga, Jr., Marquette, Mich.; Andrew J. Callegari, Princeton, and Roger W. Cohen, Trenton, both of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Continuation-in-part of Ser. No. 924,998, Oct. 30, 1986, abandoned. This application Jul. 13, 1987, Ser. No. 72,533

Int. Cl.⁴ C10B 55/10; C01H 13/00

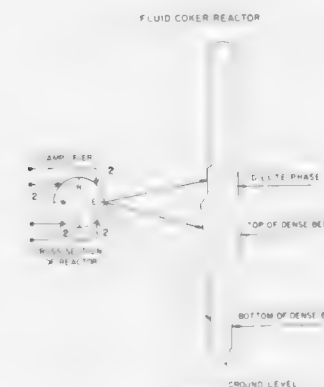
U.S. Cl. 201—1

5 Claims

1. A process for the non-intrusive passive acoustic detection and measurement of a change in thickness of a wall defining a reactor for processing material, wherein said change in thickness is due to erosion of said wall or material buildup on said wall, the wall vibrations produced during processing of the material within the reactor by impact of the material with the interior surface of the wall comprising:

- measuring the wall vibrations of said reactor wall and then determining a first power spectrum indicative of the

- measured wall vibrations as a function of frequency at a time $t=0$ while said reactor is operating,
- operating said reactor for a time t ,
- measuring the wall vibrations of said reactor wall and then determining a second power spectrum indicative of the measured wall vibrations as a function of frequency at said time t , while said reactor is operating.



- determining a frequency shift of a resonance on said first spectrum from the corresponding resonance on said second spectrum, and
- correlating said frequency shift with the change in thickness of the reactor wall.

4,877,489

ELECTRONIC CONTROL AND DOSING SYSTEM FOR DESALINATORS

Ian Lloyd, Queensland, Australia, assignor to Nautical Services Pty. Ltd., Queensland, Australia

PCT No. PCT/AU86/00352, § 371 Date Jul. 21, 1987, § 102(e) Date Jul. 21, 1987, PCT Pub. No. WO87/03275, PCT Pub. Date Jun. 4, 1987

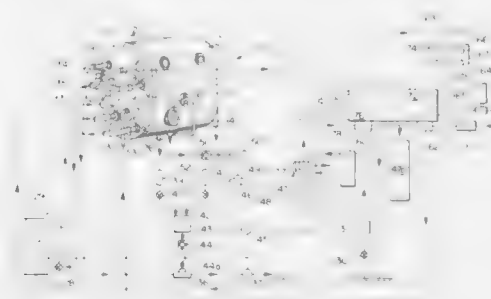
PCT Filed Nov. 21, 1986, Ser. No. 105,387

Claims priority, application Australia, Nov. 21, 1985, Ph 3506; Nov. 27, 1985, Ph 3611

Int. Cl.⁴ B01D 3/42; G01F 23/00

U.S. Cl. 202—181

16 Claims



1. A feed water level control system for a desalinator including an evaporation chamber and a condenser zone including condenser coils, said feed water level control system including:
 - a feed water inlet to the evaporation chamber of the desalinator;
 - feed water valve means for controlling the flow of feed water through the inlet in response to the feed water level in the desalinator;
 - a perforate baffle, having openings therein and being disposed above the evaporation chamber, for allowing steam to pass therethrough to the condenser zone to be condensed;
 - electric probe means, including a plurality of spaced probes disposed above the baffle, for detecting the presence of

water created by entrained bubbles which pass through the openings in the baffle; and
 electronic control means, connected to said probe means and responsive thereto, for controlling the valve means such that when the water from said entrained bubbles contacts the probes, the valve means is shut off to terminate the flow of feed water to the inlet until bubbles are no longer entrained.

8. A foam and scale inhibitor dosing unit for a desalinator including:

- a feed water inlet to the desalinator;
- feed water valve means for controlling the flow of feed water through the inlet in response to the feed water level in the desalinator;
- an inhibitor supply tank;
- an inhibitor supply valve means for controlling the flow of inhibitor from the supply tank to the feed water; and
- timer means for controlling said inhibitor supply valve means so as to permit a preset volume of inhibitor to be fed from the supply tank to the feed water.

4,877,490

DEHYDRATION OF FORMIC ACID BY EXTRACTIVE DISTILLATION WITH DICARBOXYLIC ACIDS

Lloyd Berg, 1314 S. Third Ave., Bozeman, Mont. 59715; Kraig M. Wendt, and Rudolph J. Szabados, both of Bozeman, Mont., assignors to Lloyd Berg, Bozeman, Mont.

Continuation-in-part of Ser. No. 126,003, Nov. 27, 1987, abandoned. This application Jan. 23, 1989, Ser. No. 299,977

Int. Cl.⁴ B01D 3/40; C07C 53/02

U.S. Cl. 203—15

2 Claims

1. A method for recovering formic acid from mixtures of formic acid and water which comprises distilling a mixture of formic acid and water in a rectification column in the presence of about one part of an extractive agent per part of formic acid - water mixture, recovering water as overhead product and obtaining the formic acid and the extractive agent from the stillpot, wherein said extractive comprises oxalic acid and at least one member selected from the group consisting of ethyl benzoate and adiponitrile.

4,877,491

SEPARATION OF M-DIISOPROPYL BENZENE FROM P-DIISOPROPYL BENZENE BY AZEOTROPIC DISTILLATION WITH KETONES

Lloyd Berg, 1314 S. Third Ave., Bozeman, Mont. 59715, assignor to Lloyd Berg, Bozeman, Mont.

Filed Nov. 14, 1988, Ser. No. 270,200

Int. Cl.⁴ B01D 3/38; C07C 7/06

U.S. Cl. 203—62

1 Claim

1. A method for recovering m-diisopropylbenzene from a mixture of m-diisopropylbenzene and p-diisopropylbenzene which comprises distilling a mixture of m-diisopropylbenzene and p-diisopropylbenzene in a rectification column in the presence of an azeotrope forming agent, recovering the m-diisopropylbenzene and the azeotrope forming agent as overhead product, obtaining the p-diisopropylbenzene from the stillpot, wherein said azeotrope forming agent is a ketone selected from the group consisting of 4-methoxy-4-methyl pentanone-2, 2-undecanone and isophorone.

4,877,492

METHOD OF MEASURING ELECTROLYTE IN BLOOD AND URINE BY ELECTRODE METHOD

Hiroaki Uematsu, and Shinji Imanishi, both of Kyoto, Japan, assignors to Horiba, Ltd., Kyoto, Japan

Continuation of Ser. No. 948,064, Dec. 30, 1986, abandoned.

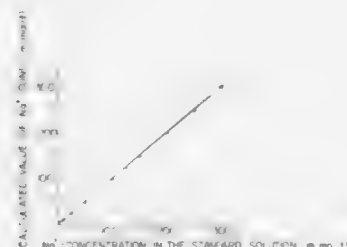
This application Jan. 10, 1988, Ser. No. 204,994

Claims priority, application Japan, Jan. 11, 1986, 61-3800

Int. Cl.⁴ G01N 27/26, 33/20, 33/49, 33/493

U.S. Cl. 204-1 T

3 Claims



1. A method of measuring a concentration of at least one electrolyte selected from the group consisting of Na⁺, K⁺ and Cl⁻ in both a urine sample and a blood sample, which comprises:

preparing a calibrating solution containing at least one ion selected from the group consisting of Na⁺ in an amount of 120 to 160 mmol/liter, K⁺ in an amount of 4.0 to 6.0 mmol/liter and Cl⁻ in an amount of 100 to 140 mmol/liter;

preparing a diluent containing a buffering agent and at least one ion selected from the group consisting of Na⁺ in an amount of 50 to 150 mmol/liter, K⁺ in an amount of 0 to 4.0 mmol/liter and Cl⁻ in an amount of 50 to 150 mmol/liter, wherein said ions in said calibrating solution and said diluent are the same as said electrolyte to be measured;

diluting said urine sample with said diluent; measuring said electrolyte in the diluted urine with an electrode using said calibrating solution; calculating the concentration of said electrolyte in said urine sample based on the measured value; and measuring the concentration of said electrolyte in said blood sample with an electrode using said calibrating solution.

4,877,493

DIELECTRIC BLOCK PLATING PROCESS

Osamu Yamato, and Tetsuji Takino, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

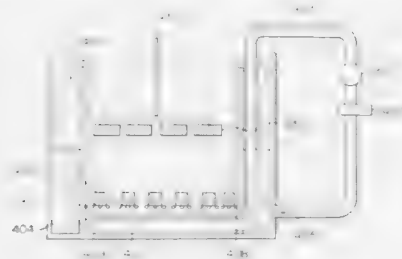
Division of Ser. No. 189,165, May 2, 1988. This application Oct. 17, 1988, Ser. No. 258,856

Claims priority, application Japan, May 1, 1987, 62-106347

Int. Cl.⁴ C25D 5/02

U.S. Cl. 204-15

6 Claims



1. A dielectric block plating process for forming a conductive layer by an electroplating process over surfaces of a dielectric block, having parallel through holes extending from

the top of the block to the bottom thereof and coated with a ground conductive layer formed by an electroless plating process, in a plating tank filled with an electrolytic solution, said dielectric block plating process comprising the steps of: immersing said dielectric block in said electrolytic solution contained in said plating tank and therein orienting said dielectric block with axes of said through holes extending substantially vertically; circulating said electrolytic solution through said plating tank and causing said electrolytic solution to flow there-through in a generally vertically upward direction through said through holes; applying a negative voltage to said ground conductive layer of said dielectric block and applying a positive voltage to said electrolytic solution to thereby electroplate at least inner surfaces of said through holes; and removing the thus plated dielectric block from said electrolytic solution.

4,877,494

CORROSION RESISTANT PLATED STEEL STRIP AND METHOD FOR PRODUCING SAME

Tatsuya Kanamaru; Motohiro Nakayama; Katutoshi Arai; Shinichi Suzuki, and Ryoichi Naka, all of Tokai, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

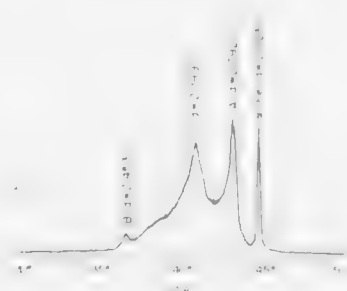
Division of Ser. No. 174,830, Mar. 29, 1988. This application Mar. 7, 1989, Ser. No. 320,071

Claims priority, application Japan, Mar. 31, 1987, 62-79027; Aug. 6, 1987, 62-195343; Aug. 6, 1987, 62-195344; Aug. 26, 1987, 62-210253; Aug. 26, 1987, 62-210254; Sep. 22, 1987, 62-237765; Sep. 22, 1987, 62-237766; Dec. 17, 1987, 62-319830; Dec. 17, 1987, 62-319831; Jan. 8, 1988, 63-1187; Jan. 26, 1988, 63-15156; Jan. 28, 1988, 63-17626; Feb. 23, 1988, 63-40292; Feb. 23, 1988, 63-40293

Int. Cl.⁴ C25D 7/06

U.S. Cl. 204-28

13 Claims



1. A method for producing a corrosion resistant plated steel strip, comprising forming, on at least one surface side of a substrate consisting of a steel strip, a principal plating layer by a co-deposition electroplating procedure using an acid plating liquid containing zinc ions and trivalent chromium ions in amounts adequate to ensure that the principal plating layer comprises a zinc-chromium based alloy comprising more than 5% by weight but not more than 40% by weight of chromium and the balance consisting of zinc.

4,877,495

ELECTROLYTIC COLORING OF ANODIZED ALUMINUM

Willi Buchmeier, and Dieter Brodalla, both of Dueseldorf, Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Dueseldorf, Fed. Rep. of Germany

Continuation of Ser. No. 202,761, Jun. 3, 1988, abandoned. This application Feb. 2, 1989, Ser. No. 306,287

Claims priority, application Fed. Rep. of Germany, Jun. 5, 1987, 3718849

Int. Cl.⁴ C25D 11/22

U.S. Cl. 204-42

32 Claims

1. A process for the electrolytic coloring of anodized surfaces of aluminum or aluminum alloy substrates, comprising subjecting to alternating current, with or without superimposed direct current, in electrolytic coloring effective amounts, in the presence of an aqueous electrolyte solution containing a color-imparting effective amount of a cationic dye.

32. A colored anodized surface of aluminum or an aluminum alloy produced by the process of claim 1.

4,877,496

ZINC-NICKEL ALLOY PLATING SOLUTION

Moriyuki Yanagawa, Kawasaki; Shunichi Ishida, Yamato; Ken Ogura, Okazaki, and Yoshi Saito, Anjo, all of Japan, assignors to Nippon Hyomen Kagaku Kabushiki Kaisha, Japan

Filed Dec. 30, 1988, Ser. No. 291,962

Int. Cl.⁴ C25D 3/56

U.S. Cl. 204-44.2

8 Claims

3. A zinc-nickel alloy plating solution comprising, as represented in terms of metal ions, 4 to 30 g/liter of zinc, 0.05 to 4 g/liter of nickel, 50 to 220 g/liter of an alkali hydroxide, 4 to 110 g/liter of a complexing agent, 0.1 to 10 g/liter of a primary brightener and 0.01 to 0.2 g/liter of a booster brightener, characterized in that

said primary brightener is at least one selected from the reaction products of at least one amine with epialohydrin, and

said booster brightener is at least one aromatic aldehyde.

4,877,497

ACIDIC ELECTRO-GALVANIZING SOLUTION

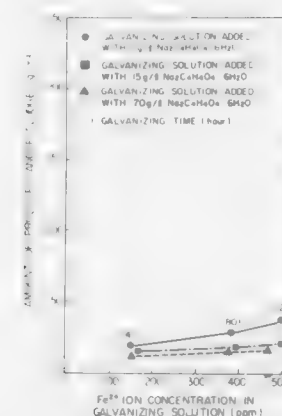
Tutomu Watanabe, and Akihiko Furuta, both of Tokyo, Japan, assignors to NKK Corporation, Tokyo, Japan

Filed Nov. 18, 1988, Ser. No. 273,910

Int. Cl.⁴ C25D 3/22

U.S. Cl. 204-55.1

10 Claims



1. An acidic aqueous electro-galvanizing solution consisting essentially of:
zinc chloride: from 100 to 400g/l,
at least one substance selected from the group consisting of

ammonium chloride and potassium chloride: from 100 to 400 g/l, and

at least one substance selected from the group consisting of saturated carboxylic acid, sodium salt thereof and potassium salt thereof: from 1 to 70 g/l.

4,877,498

METHOD FOR PRODUCING A METAL SALT BY ELECTROLYSIS

Kenichi Fukuda; Takashi Mori; Yasuhiro Kurachi; Masaharu Doi, all of Shin-nanyo, and Tetsuya Saematsu, Tokuyama, all of Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Shin-nanyo, Japan

Continuation of Ser. No. 35,309, Apr. 7, 1987, abandoned. This application May 23, 1988, Ser. No. 198,663

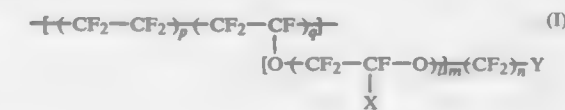
Claims priority, application Japan, Apr. 7, 1986, 61-78255; Jun. 13, 1986, 61-135890

Int. Cl.⁴ C25B 1/00; C08D 5/20

U.S. Cl. 204-86

11 Claims

1. A method for producing a metal salt by electrolysis in an electrolytic cell comprising an anode compartment and a cathode compartment partitioned by a diaphragm, characterized by disposing in the anode compartment a metal anode soluble in an aqueous electrolyte solution, and conducting electrolysis to dissolve the metal anode, wherein the diaphragm is a fluorinated anion exchange membrane made of a copolymer having repeating units of the formula:



wherein X is F or CF₃, l is an integer of from 0 to 5, m is 0 or 1, n is an integer of 1 to 5, each of p and q is a positive number and the ratio of p/q is from 2 to 16, and Y is a group involving a quaternary ammonium group.

4,877,499

MEMBRANE UNIT FOR ELECTROLYTIC CELL

Richard N. Beaver, Angleton, Tex., and Gregory J. E. Morris, Milan, Italy, assignors to The Dow Chemical Company, Midland, Mich.

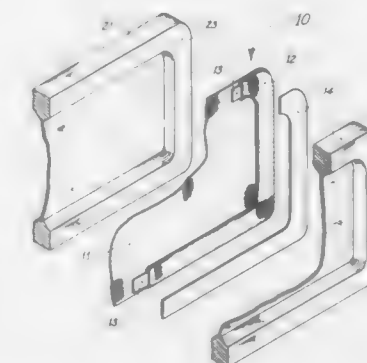
Continuation-in-part of Ser. No. 860,703, Jun. 5, 1986, which is a continuation of Ser. No. 668,043, Nov. 15, 1984, abandoned.

This application Sep. 26, 1988, Ser. No. 249,546

Int. Cl.⁴ C25B 1/16, 1/24, 9/00

U.S. Cl. 204-98

28 Claims



27. A method of electrolysis comprising electrolyzing an alkali metal salt between a pair of electrodes separated by a membrane unit, said membrane unit comprising
(i) at least one sheet of an ion exchange membrane having a

gasket-bearing surface portion and an active surface portion;

- (ii) at least one first non-gasket, non-frame means for strengthening the gasket-bearing surface portion of the membrane such that tearing or shear stresses on the gasket-bearing surface portion of the membrane is minimized when the gasket-bearing surface portion of the membrane is under a compressive force; and
- (iii) at least one second non-gasket, non-frame means for strengthening the gasket-bearing surface portion of the membrane such that tearing or shear stresses on the gasket-bearing surface portion of the membrane is minimized when the gasket-bearing surface portion of the membrane is under a compressive force,
- said first and second strengthening means positioned only along the gasket-bearing surface portion of the membrane on at least one side of the membrane.

4,877,500

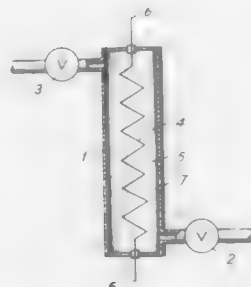
PROCESS FOR THE PRODUCTION OF CHLORINE DIOXIDE

Joseph Callera, 2220 Casper Dr., Lake Havasu City, Ariz. 86403

Filed Jan. 30, 1988, Ser. No. 213,543
Int. Cl.⁴ B01J 19/08; C01B 11/02

U.S. Cl. 204-157.48

10 Claims



1. Process of producing chlorine dioxide which comprises introducing chlorine gas and oxygen gas into a reaction space to form a reaction mixture and subjecting the reaction mixture thus obtained to ultraviolet radiation at a temperature at which chlorine is in the gaseous form.

4,877,501

PROCESS FOR FABRICATION OF LIPID MICROSTRUCTURES

Joel M. Schnur, 6009 Lincolnwood Ct., Burke, Va. 22015; Ronald Price, Slip 39, Dock P, Mears Point Marina, Rt. 50 & Kent Narrows, Grasonville, Md. 21638; Paul Yager, 206, 10th St., S.E., Washington, D.C. 20003; Paul Schoen, 5006 Taney Ave., Alexandria, Va. 22304; Jacques H. Georger, 8409 Great Lake Rd., Springfield, Va. 22153, and Alok Singh, 6340 Rockside St., Alexandria, Va. 22304

Filed Feb. 6, 1987, Ser. No. 11,838

Int. Cl.⁴ B01J 19/08; C07F 9/00; C11B 3/00

U.S. Cl. 204-157.64

19 Claims

1. Process for forming microstructures of selected shape and dimension from surfactants comprising the steps of:
- selecting a lipid which self aggregates into a microstructure selected from the group consisting of helices and tubules;
 - selecting a lipid solvating organic solvent in which microstructures form;
 - dissolving the selected lipid in the selected organic solvent;
 - adding a non-solvent to the selected organic solvent in an amount sufficient to initiate microstructure growth;
 - allowing the selected lipid to grow into the microstructure in the solution of organic solvent and non-solvent for a

period of time and at a temperature below the melting point of the selected lipid.

4,877,502

POLY(EPOXIDE) COATINGS CONTAINING A MANNICH BASE OF A HYDROXYSTYRENE CONTAINING POLYMER

Donna L. Keene, Carrollton, Va., and Darrell D. Hicks, Jeffersonstown, Ky., assignors to Hoechst Celanese Corporation, North Somerville, N.J.

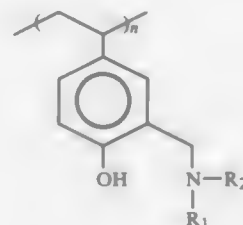
Filed Jul. 18, 1988, Ser. No. 219,697

Int. Cl.⁴ C08L 29/00, 63/00

U.S. Cl. 204-181.7

21 Claims

1. A coating composition which comprises a uniformly dispersed admixture of
- A. a fluid carrier; and
 - B. a homopolymer or copolymer containing monomer units of the formula



wherein R₁ and R₂ are independently C₁ to C₁₂ alkyl, or hydroxyalkyl, or aryl, wherein the comonomer is a substituted or unsubstituted component selected from the group consisting of styrene, acrylates, methacrylates and maleimides; said homopolymer or copolymer having a value of n which corresponds to an average molecular weight in the range of from about 360 to about 200,000; and

C. a poly(epoxide).

21. A method of protecting a metallic surface which comprises cationically electrodepositing the composition of claim 1 onto said surface and curing wherein the fluid carrier is water or a water/co-solvent mixture.

4,877,503

APPARATUS AND METHOD FOR REMOVING LIQUID FROM LIQUID BEARING MATERIAL

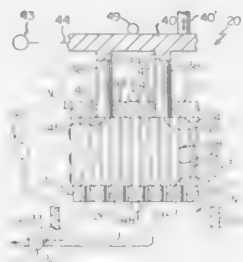
James T. Candor, 5440 Cynthia Ln., Dayton, Ohio 45429

Continuation-in-part of Ser. No. 213,709, Jun. 30, 1988, abandoned, which is a continuation-in-part of Ser. No. 189,974, May 4, 1988, abandoned, which is a continuation-in-part of Ser. No. 62,201, Jun. 15, 1987, Pat. No. 4,780,188, which is a continuation-in-part of Ser. No. 32,746, Mar. 31, 1987, Pat. No. 4,767,514. This application Dec. 14, 1988, Ser. No. 284,197 The portion of the term of this patent subsequent to Aug. 30, 2005, has been disclaimed.

Int. Cl.⁴ B03C 5/00, 5/02; B01D 57/02

U.S. Cl. 204-182.1

44 Claims



1. In an apparatus for removing liquid from liquid bearing

material and comprising a pair of spaced apart electrodes for being disposed on opposite sides of said material, means for creating an electrostatic field between said electrodes for acting through said material to remove liquid from said material, and a projection extending from one of said electrodes so as to be disposed in said material between said electrodes to assist in removing liquid from said liquid bearing material, said electrodes comprising a pair of movable endless belts having adjacent runs thereof adapted to move in the same direction with said material disposed therebetween so as to move in the same direction therewith, the improvement wherein said apparatus has means to project said projection from said one electrode to different positions thereof relative to said material between said electrodes and relative to said one electrode at least some time during the time that said material is disposed between said electrodes.

4,877,504

METHODS FOR FABRICATING ELECTRO-OPTICALLY ACTIVE NIOBIUM DIOXIDE (NBO₂) THIN FILMS

James C. Lee, Plymouth, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

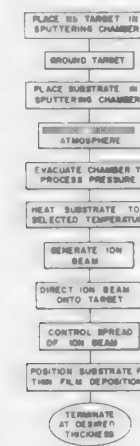
Division of Ser. No. 717,261, Mar. 28, 1985, Pat. No. 4,712,857.

This application Aug. 19, 1987, Ser. No. 86,858

Int. Cl.⁴ C23C 14/08, 14/46

U.S. Cl. 204-192.11

10 Claims



1. A method of forming an electro-optically switchable niobium dioxide (NbO₂) crystalline thin film on a solid substrate by reactive ion-beam sputtering in a hermetic chamber, comprising:

- placing a niobium (Nb) target in said chamber;
- grounding said target;
- placing said substrate in said chamber;
- providing an oxidizing background atmosphere in said chamber;
- evacuating said chamber to a pressure sufficient for said sputtering process;
- heating said substrate to a temperature sufficient to allow said crystalline thin film to form on said substrate;
- generating an ion-beam from a source;
- directing said ion-beam onto said target so that Nb atoms are sputtered from said target;
- controlling the spread of said ion-beam as said beam travels from said source to said target; and
- positioning said substrate so that the majority of said Nb atoms sputtered from said target strike said substrate, thereby forming said electro-optically switchable thin film of NbO₂ on said substrate.

4,877,505

METHOD AND APPARATUS FOR APPLICATION OF COATINGS ON SUBSTRATES

Erich Bergmann, Mels, Switzerland, assignor to Balzers Aktiengesellschaft, Fürstentum, Liechtenstein

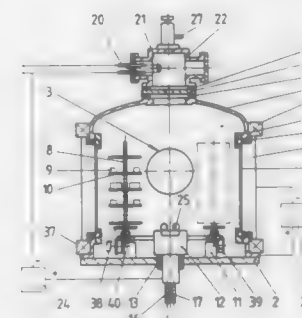
Filed Jun. 22, 1988, Ser. No. 209,866

Claims priority, application Switzerland, Aug. 26, 1987, 83275/87

Int. Cl.⁴ C23C 14/34

U.S. Cl. 204-192.38

20 Claims



1. A method for the application of a coating onto a functional area of a substrate, the coating being made of material having a metal fraction consisting essentially of one metal comprising:

- placing the substrate, having the functional area to be coated, in a vacuum chamber;
- converting a portion of said metal into a first vapor in the vacuum chamber and depositing the first vapor onto the substrate by magnetic field-supported sputtering; and
- separately converting a further portion of said metal into a second vapor and depositing the second vapor onto the substrate by electric arc discharge using an electrode made of said metal;

said functional area of said substrate being exposed substantially during the whole application of the coating simultaneously to both the first vapor from the conversion by magnetic field-supported sputtering and the second vapor from the conversion by electric arc discharge, in such a way, that

the first vapor from the conversion by magnetic field-supported sputtering and the second vapor from the conversion by electric arc discharge are deposited jointly on the functional area, and substantially throughout the whole coating on the functional area at least five out of one hundred atoms of the metal are derived from the conversion by the electric arc discharge and the remaining atoms are derived from the conversion by the magnetic field-supported sputtering.

4,877,506

MONOLITHIC SOLID ELECTROLYTE OXYGEN PUMP

Darrell C. Fee, 2529 Lee St., Woodridge, Ill. 60517; Roger B. Poeppel, 67 Stephanie Ln., Glen Ellyn, Ill. 60137; Timothy E. Easler, 564 N. Pinecrest, Bolingbrook, Ill. 60439, and Dennis W. Dees, 6224 Middaugh Ave., Downers Grove, Ill. 60517

Filed Apr. 8, 1987, Ser. No. 35,799

Int. Cl.⁴ C25B 9/00

U.S. Cl. 204-242

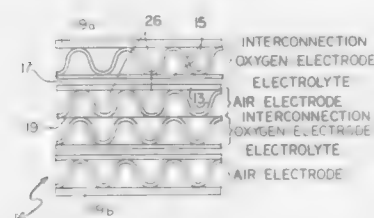
15 Claims

1. An oxygen pump for removing oxygen from an oxygen-bearing gas comprising:

- an anode comprised of a non-oxidizing material and formed of a first corrugated portion and a second planar portion in contact with said first corrugated portion so as to form a first plurality of elongated, generally linear corrugations therein;

a cathode formed of a third corrugated portion and a fourth planar portion in contact with said third corrugated portion so as to form a second plurality of elongated, generally linear corrugations therein;

a thin, porous, flat, electrically conductive solid electrolyte having first and second opposed electrode surfaces disposed between and in respective electrical contact with the second planar portion of said anode and with the fourth planar portion of said anode, wherein a first plural-



ity of closed channels is formed between the third corrugated portion and the fourth planar portion of said cathode and a second plurality of closed channels is formed between the first corrugated portion and the second planar portion of said anode; and

a DC potential source coupled to said anode and said cathode for applying a DC voltage thereacross for transferring oxygen form an oxygen-bearing gas introduced into said first plurality of closed channels through said solid electrolyte and into said second plurality of closed channels.

4,877,507

LININGS FOR ALUMINUM REDUCTION CELLS

Tom J. Hudson, Beaconsfield; John McIntyre, Kingston; Pierre Tremblay, Chicoutimi; Claude Allaire, Chicoutimi-Nord, and Bohdan Gnyra, Kingston, all of Canada, assignors to Alcan International Limited, Montreal, Canada

Continuation-in-part of Ser. No. 138,503, Dec. 24, 1987. This application Jul. 13, 1988, Ser. No. 218,834

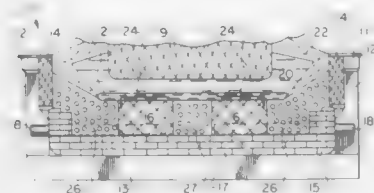
Claims priority, application Canada, Jul. 14, 1987, 542053; Aug. 28, 1987, 545660

The portion of the term of this patent subsequent to Oct. 31, 2005, has been disclaimed.

Int. Cl.⁴ C25C 3/08; C21B 7/04; C04B 35/10

U.S. Cl. 204—243 R

61 Claims



1. An aluminum electrolytic cell having a cell floor and cell walls for containing liquid cell components comprising aluminum and an electrolyte, a lining for said cell floor, a lining for said cell walls and one or more anodes capable of dipping into said liquid electrolyte from above and each having an anode surface spaced from but confronting said cell floor lining, said cell floor lining, at least at the upper surface thereof, comprising a region made of solid electrically conductive material, and at least one region made of a solid refractory electrically non-conductive material extending between the electrically conductive material and the cell wall lining, and at least one current collector bar extending from outside the cell into said cell floor lining beneath said upper surface and forming electrically conductive contact with said solid electrically conductive material, wherein the electrically non-conductive material comprises a close-packed array of alumina shapes, the gaps

between the shapes substantially filled with particulate alumina in one or more fractions having discrete particle size ranges, including a fraction having an average particle diameter no more than 20% of the average diameter of the shapes, the mass having a bulk density of at least 2.0 g/cc.

4,877,508

HIGHLY DURABLE CATHODE OF LOW HYDROGEN OVERVOLTAGE AND METHOD FOR MANUFACTURING THE SAME

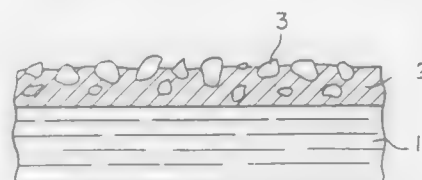
Takeshi Morimoto, and Eiji Endoh, both of Yokohama, Japan, assignors to Asahi Glass Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 834,332, Feb. 4, 1986, Pat. No. 4,780,452. This application Oct. 5, 1988, Ser. No. 253,616

Int. Cl.⁴ C25B 11/04, 11/06

U.S. Cl. 204—290 R

12 Claims



1. A highly durable cathode of low hydrogen overvoltage, which comprises an electrode core material having on the surface thereof a metal layer containing electrode active metal particles at least a portion of which particles comprises a hydrogen absorbing metal capable of electrochemically absorbing and desorbing hydrogen, wherein said metal layer has a porosity of about 20 to 90%, and further wherein a portion of said electrode active metal particles comprises Raney nickel or Raney cobalt or a mixture thereof, and said hydrogen absorbing metal is selected from the group consisting of Mischmetal/nickel system alloys, and titanium/nickel system alloys.

4,877,509

SEMICONDUCTOR WAFER TREATING APPARATUS UTILIZING A PLASMA

Toshiaki Ogawa; Nobuo Fujiwara; Kenji Kawai; Teruo Shibano; Hiroshi Morita, and Kyusaku Nishioka, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

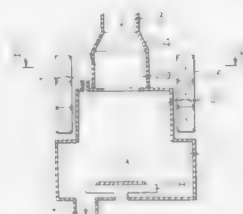
Filed Nov. 10, 1988, Ser. No. 269,688

Claims priority, application Japan, Jul. 5, 1988, 165813

Int. Cl.⁴ C23C 14/34; B05B 5/02

U.S. Cl. 204—298

8 Claims



1. An apparatus for treating semiconductor wafers utilizing a plasma generated by electron cyclotron resonance comprising:

- a first chamber accommodating means for supporting a semiconductor wafer;
- a second chamber disposed adjacent to and in communication with said first chamber;
- gas supplying means for supplying a gas to said second chamber;
- a microwave source;

waveguide means operatively coupled to said microwave source for guiding microwave energy generated by said microwave source toward said second chamber, said waveguide means comprising converter means for converting microwaves propagating in a rectangular mode into microwaves propagating in a circular mode;

circular polarization means interposed between said waveguide means and said second chamber for rotating the direction of oscillation of an electric field of microwaves in a circular TE₁₁ mode supplied from said waveguide means one complete turn in a circumferential direction in one period of the microwave, thereby converting the microwave in a circular mode into chamber polarized microwaves, said circular polarization means comprising means for supplying the circularly polarized microwaves to said second chamber; and

electromagnet means surrounding at least said second chamber for forming a magnetic field in said first and second chambers, said electromagnet means forming in said second chamber a magnetic field of a magnetic flux density sufficient to produce electron cyclotron resonance in cooperation with the microwave energy supplied from said circular polarization means, thereby generating a plasma of said gas in said second chamber, said electromagnet means forming in said first chamber a magnetic field diverging in a direction from said second chamber to said support means, thereby causing a plasma generated in said second chamber to be transported to said semiconductor wafer supported by said means for supporting.

4,877,510

APPARATUS FOR PREPARATIVE GEL ELECTROPHORESIS

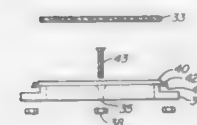
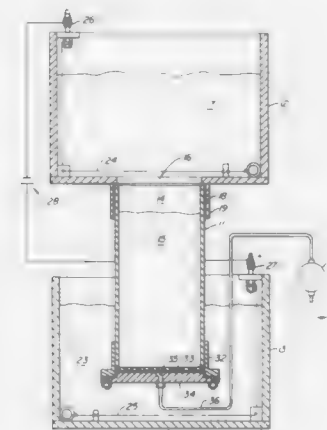
Jin-Hai Chen, Santa Monica, Calif., assignor to Bio-Rad Laboratories, Inc., Hercules, Calif.

Filed Oct. 25, 1988, Ser. No. 262,905

Int. Cl.⁴ G01N 27/28, 27/26

U.S. Cl. 204—299 R

22 Claims



1. Apparatus for drawing solutes eluting from an open-ended

tubular electrophoresis column having a given cross section into transfer tubing, said apparatus comprising

a porous plate and a dialysis membrane, both sized to span said cross section, said dialysis membrane being impermeable to said solutes;

a collar adapted to receive said open end and to secure said porous plate and said dialysis membrane thereto;

a plurality of channels in said collar communicating the exterior of said collar with a plurality of loci along the interior wall thereof, said loci positioned to reside along the periphery of said open end of said tubular electrophoresis column when said collar is joined thereto; and

means for drawing fluid from said porous plate at a withdrawal site within the periphery thereof.

4,877,511

OXYGEN CONCENTRATION-SENSING DEVICE

Toyohi Nakajima, and Toshiyuki Mieno, both of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

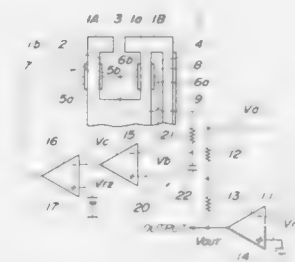
Filed Dec. 28, 1988, Ser. No. 290,955

Claims priority, application Japan, Dec. 28, 1987, 62-332845

Int. Cl.⁴ G01N 27/58

U.S. Cl. 204—406

4 Claims



1. In an oxygen concentration-sensing device including an oxygen concentration-sensing element formed by an oxygen-pumping element and a cell element, each composed of a member of a solid electrolytic material having oxygen ion conductivity, and a pair of electrodes having said member interposed therebetween, one of said electrodes of said oxygen-pumping element and one of said electrodes of said cell element being connected to each other, said oxygen-pumping element and said cell element defining a gas diffusion-limiting zone therebetween, a current-to-voltage converter circuit having an input terminal connected to a junction between said connected ones of said electrodes, and a conversion output terminal, first amplifier means for generating an output having a level variable in response to a difference between a potential at said conversion output terminal of said current-to-voltage converter circuit and a potential at the other of said electrodes of said cell element, said first amplifier means applying said output thereof to the other of said electrodes of said oxygen-pumping element, and second amplifier means having an input thereof connected to said junction between said connected ones of said electrodes for generating an output proportional to current flowing in said oxygen-pumping element,

the improvement wherein said current-to-voltage converter circuit includes gain-changing means for imparting a higher gain to said first amplifier means when said current flowing in said oxygen-pumping element is in a high frequency range.

4,877,512

SILVER/SILVER CHLORIDE COMPOSITIONS

Richard E. Bowne, Hacienda Heights, and David L. Diepholz, Upland, both of Calif., assignors to Advanced Products, Inc., Ontario, Calif.

Filed Aug. 31, 1988, Ser. No. 238,808
Int. Cl.⁴ G01N 27/30, 27/46

U.S. Cl. 204—435

6 Claims

1. A conductive silver/silver chloride composition consisting essentially of:

- about 6 to about 10.5 parts by weight of a vinylidene chloride thermoplastic polymer having a glass transition value of above about 100° F.;
- at least a sufficient amount of an organic solvent capable of dissolving polymer (a);
- about 47 to about 57 parts by weight of silver flake; and
- about 8 to about 16 parts by weight of silver chloride.

4,877,513

OIL CHARACTERISTIC IMPROVEMENT PROCESS AND DEVICE THEREFOR

William M. Haire, Huntington Beach, and Celestino Pou, Diamond Bar, both of Calif., assignors to Hydrocarbon Sciences, Inc., Bakersfield, Calif.

Filed Dec. 11, 1987, Ser. No. 131,944
Int. Cl.⁴ C10G 9/14

U.S. Cl. 208—106

28 Claims

17. A process for increasing the volume of light hydrocarbons distilled from a heavy oil feedstock having an API gravity of 20° or less than a gas-free viscosity of 100 centipoises or more at a selected temperature, the process including the following steps:

- mixing the heavy oil feedstock with one or more organic reagents having a terminal hydroxyl group;
- heating the mixture resulting from step (1) from 300° F. to 750° F. and simultaneously exposing the mixture to a ferrous metal;
- separating the vapor and liquid phases resulting from step (2); and
- separating the hydrocarbons resulting from step (3).

4,877,514

CARBO-METALLIC OIL CONVERSION PROCESS AND CATALYST

William P. Hettinger, Russell, Ky., and H. Wayne Beck, Seabrook, Tex., assignors to Ashland Oil, Inc., Ashland, Ky.
Continuation of Ser. No. 30,752, Mar. 25, 1987, abandoned, which is a continuation of Ser. No. 888,172, Jul. 18, 1986, abandoned, which is a continuation of Ser. No. 516,484, Jul. 22, 1983, Pat. No. 4,612,298, which is a continuation of Ser. No. 328,353, Dec. 7, 1982, abandoned. This application Nov. 10, 1988, Ser. No. 271,414

Int. Cl.⁴ C10G 11/05

U.S. Cl. 208—120

15 Claims

1. A continuous process for cracking of a residual hydrocarbon feedstock into lower molecular weight hydrocarbon transportation fuels, said cracking being carried out in the presence of a catalyst having catalyst parameters comprising porosity, metals content, rare earth content, and zeolite content, said residual hydrocarbon feedstock comprising metal contaminants, fractions boiling above 1025° F. comprising asphaltene, polynuclear aromatics, naphthenes and porphyrins, which process comprises in combination the steps of:

- providing an aqueous slurry of a colloidal matrix material selected from the group consisting of silica colloid, alumina colloid, and mixtures thereof at a pH in the range selected from the group of ranges consisting of (1) about 3.5 to about 5.5 and (2) about 7 to about 13, said pH being selected to retard gelation of said colloidal matrix material;
- providing an aqueous slurry of fluidizable clay particles

adjusted to a pH substantially the same as that of said colloidal matrix material;

- providing an aqueous slurry comprising calcined crystalline zeolite;
- preparing each of said aqueous slurries from ingredients including water, wherein total sodium content of a spray dried composite comprising said slurries is less than about 0.25 percent by weight sodium oxide;
- thoroughly mixing said slurries to provide a mixture of slurries;
- feeding said mixture into a spray drier to provide a fluidizable catalyst suitable for fluid catalyst cracking having less than 0.25 wt. % sodium oxide, said catalyst being prepared at the same site where said conversion process is being conducted, and said catalyst being adapted to optimize said catalyst parameters comprising porosity, metals content comprising rare earth metals and zeolite content with respect to composition of said feedstock; and
- contacting said catalyst in a riser cracking zone with said hydrocarbon feedstock under hydrocarbon cracking conditions comprising a catalyst-to-oil ratio in the range of about 5:1 to 20:1, a product recovery temperature within the range of 950° F. to 1150° F., and a reactant residence time of less than 3 seconds to produce hydrocarbon transportation fuels.

4,877,515

USE OF POLYSULFIDE TREATED MOLECULAR SIEVES TO REMOVE MERCURY FROM LIQUEFIED HYDROCARBONS

Costandi A. Andeh, Princeton, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 30, 1987, Ser. No. 102,958
Int. Cl.⁴ C10G 25/00; B01J 27/02

U.S. Cl. 208—251 R

9 Claims

1. A process for removing mercury from a liquid hydrocarbon stream or dry gaseous stream comprising:

- drying a molecular sieve at a temperature of between 350 and 450° C. in an anhydrous nonreactive atmosphere;
- contacting said molecular sieve with an aqueous solution of water soluble alkali polysulfide until said molecular sieve is saturated with said aqueous solution;
- drying said saturated molecular sieve of (b) at a temperature between about 10 and about 75° C. and a pressure of less than about 500 millimeters of mercury to deposit said water soluble alkali polysulfide onto said molecular sieve without decomposing the water soluble alkali polysulfide;
- contacting said gaseous or liquid hydrocarbon stream with said dried molecular sieve of (c) and recovering a gaseous or liquid hydrocarbon stream depleted of mercury.

4,877,516

MANIPULATING PARTICULATE MATTER

Cornelius J. Schram, Pavenham, England, assignor to National Research Development Corporation, London, England
PCT No. PCT/GB87/00363, § 371 Date Jan. 27, 1988, § 102(e) Date Jan. 27, 1988, PCT Pub. No. WO87/07178, PCT Pub. Date Dec. 3, 1987

PCT Filed May 27, 1987, Ser. No. 153,833

Claims priority, application United Kingdom, May 27, 1986, 8612757

Int. Cl.⁴ B03B 3/02

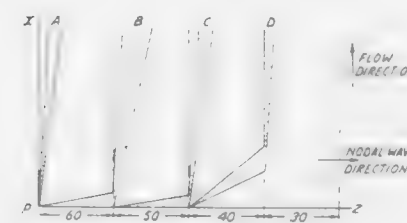
U.S. Cl. 209—155

19 Claims

1. A method of manipulating particles in a fluid medium, comprising the steps of:

- injecting ultrasonic energy into a fluid medium and establishing an ultrasonic standing wave in the medium;
- choosing standing wave characteristics of said standing wave in relation to the particles so as to accumulate at least a portion of the particles at least at one nodal plane of the standing wave in the fluid medium;

- giving a varying spatial energy density distribution to said standing wave in at least one of its at least one nodal planes in the fluid medium; and



- controlling positions of the particles in said at least one nodal plane by the varying energy density of the standing wave in each said at least one nodal plane.

4,877,517

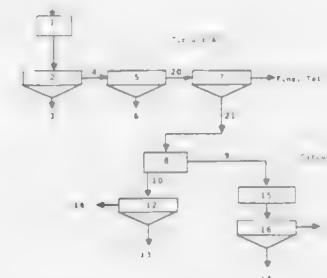
DEPRESSANT FOR FLOTATION SEPARATION OF POLYMETALLIC SULPHIDIC ORES

Srdjan Bulatovic, Peterborough, and Tim M. Jessup, Lakefield, both of Canada, assignors to Falconbridge Limited, Toronto, Canada

Filed May 2, 1988, Ser. No. 188,949
Int. Cl.⁴ B03D 1/02

U.S. Cl. 209—167

20 Claims



changers to preheat said influent stream prior to introduction into said reactor where energy for preheating is extracted by said second heat exchanger from said effluent stream passing through said second heat exchanger to add heat energy to said heat exchange medium, said first heat exchanger removing heat energy from said heat exchange medium to preheat said influent stream whereby influent and effluent streams pass through said tube side of each inner tube of said first and second heat exchangers to minimize clogging of said first and second heat exchanger; said reactor comprising a closed vessel with an inlet and an outlet, a third conduit extending from said tube side outlet of said first heat exchanger to said reactor inlet, said second conduit being connected to said reactor outlet, said reactor having a level control device located below said inlet to provide a liquid level in said reactor below said inlet to ensure that said inlet is above reacting liquid in said reactor, said outlet located at a lower level in said reactor to define a downflow reactor zone, said level control device comprising a control valve for controlling liquid flow in said reactor located below said inlet, said liquid level sensor generating a signal to open fully said control valve when said liquid level sensor senses liquid, means for fully closing said valve after sufficient liquid is drained from said reactor to drop reacting liquid level below said liquid level sensor to provide an intermittent flow of effluent to said second conduit.

4,877,520

DEVICE FOR SEPARATING THE COMPONENTS OF A LIQUID SAMPLE HAVING HIGHER AND LOWER SPECIFIC GRAVITIES

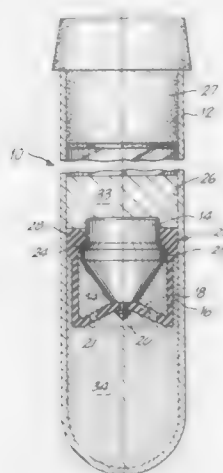
James A. Burns, Elizabeth, N.J., assignor to Becton, Dickinson and Company, Franklin Lakes, N.J.

Continuation-in-part of Ser. No. 106,092, Oct. 10, 1987, Pat. No. 4,818,386. This application Jan. 6, 1988, Ser. No. 202,625

Int. Cl.⁴ B01D 17/038, 21/26

U.S. Cl. 210—94

11 Claims



1. Apparatus for separating the constituents in a liquid sample introduced into said apparatus into those constituents having a higher specific gravity from those constituents having a lower specific gravity under the action of centrifugal force, comprising

- (a) a tube-shaped transparent container having a closed end and an open end and defining a sample receiving chamber;
- (b) a stopper for closing said open end of said container; and
- (c) a dual barrier assembly movable axially in said container under the action of centrifugal force;
- (d) said dual barrier assembly having a specific gravity intermediate the specific gravity of constituents having a

higher specific gravity and constituents having a lower specific gravity of a sample introduced into said container;

- (e) said dual barrier assembly providing selectively a dual annular seal and open passage therearound in response to pressure differentials in said container above and below said dual barrier assembly;
- (f) said dual barrier assembly comprising
 - (1) a cup-shaped flexible portion;
 - (2) said cup-shaped flexible portion having a first annular ring adjacent the upper edge thereof;
 - (3) the outer circumferential edge of said first annular ring selectively movable into and out of sealing engagement with the internal wall of said container chamber in response to alternating equal and different pressures above and below said dual assembly;
 - (4) means defining at least one opening in the bottom wall of said cup-shaped flexible portion providing flow communication therethrough;
 - (5) a round solid core portion nested in said cup-shaped portion;
 - (6) a second annular ring extending from the outer surface of said solid core portion;
 - (7) said solid core portion movable vertical in said cup-shaped portion for causing said first and second ring to move into and out of sealing engagement with each other in response to alternating equal and different pressures above and below said dual assembly;
 - (8) said bottom wall of said cup-shaped portion having a raised central section providing spring action responsive to pressure differentials on each side of said dual barrier assembly; and
 - (9) means connecting said solid core portion and said raised central section of said bottom wall of said flexible cup-shaped portion.

4,877,521

QUICK-CHANGE FILTER CARTRIDGE AND HEAD THEREFOR

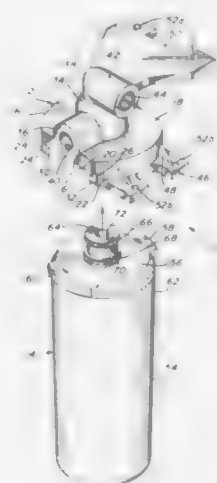
Raymond M. Petrucci, Middlebury; Bruce G. Taylor, Kensington; Edward C. Giordano, Manchester, all of Conn.; James M. Padiall, Covina Heights, and Carl Palmer, La Habra Heights, both of Calif., assignors to CUNO, Incorporated, Meriden, Conn.

Continuation of Ser. No. 44,895, Apr. 30, 1987, Pat. No. 4,735,716, which is a continuation-in-part of Ser. No. 822,536, Jan. 27, 1986, abandoned. This application Mar. 25, 1988, Ser. No. 173,689

Int. Cl.⁴ B01D 27/08

U.S. Cl. 210—171

14 Claims



1. A replaceable filter canister for a permanently installed filter head of a type having first and second ports in fluid

communication with a cylindrical chamber having an interior surface which is intended to receive said filter canister, said filter canister comprising:

- a flask shaped housing having a main body with a top surface;
- a cylindrical neck projecting from said top surface, said neck being intended to be slidably received and rotatable in said cylindrical chamber of said head, said neck having an external cylindrical surface and an internal surface, said external cylindrical surface having an external diameter which is approximately uniform over the entire height of said neck;

tube means for conveying fluid, said tube means disposed in said housing and said neck, said tube means having an upper part extending into said neck and a lower part in sealed fluid communication with said upper part and extending into said housing, the external cross-sectional area of said upper part of said tube means being smaller than the adjacent internal cross-sectional area of said internal surface of said neck proximate thereto to define a clearance therebetween;

filter means for filtering fluid, said filter means disposed in said housing and adapted around said lower part of said tube means, one part of said filter means being in sealed fluid communication with said clearance and another part of said filter means being in sealed fluid communication with said lower part of said tube means;

- a first seal disposed circumferentially in and around said external cylindrical surface of said neck and proximate the upper distal end thereof, said first seal intended to make slidable sealable contact with said interior surface of said cylindrical chamber of said head;

- a first space bounded in part by said first seal and said external cylindrical surface of said neck above said first seal, and when said cylindrical chamber of said head has received said canister bounded in part by said interior surface of said cylindrical chamber, such that one of said first and second ports in said head is in sealed fluid communication with said first space;

- a second seal disposed circumferentially in and around said external cylindrical surface of said neck and disposed below said first seal, said second seal intended to make slidable sealable contact with said interior surface of said cylindrical chamber of said head;

- a second space bounded in part by said first and second seals and said external cylindrical surface of said neck between said first and second seals, and when said cylindrical chamber of said head has received said canister bounded in part by said interior surface of said cylindrical chamber, such that the other one of said first and second ports in said head is in sealed fluid communication with said second space;

- a first opening into said canister through said neck in sealed fluid communication with said clearance and one of said first and second spaces; and

- a second opening into said canister through said neck in sealed fluid communication with said upper part of said tube means and the other one of said first and second spaces,

wherein one of said first and second openings into said canister is located above said first seal and is in sealed fluid communication with said first space,

wherein the other one of said first and second openings is located below said first seal and above said second seal and extends radially inwardly from said external cylindrical surface of said neck and is in sealed fluid communication with said second space, and

whereby fluid directed at one of said first and second spaces will flow into said canister through said clearance, thence into said filter means, thence into said tube means, and thence out of said canister into the other one of said first and second spaces.

4,877,522

LIQUID SUPPLY APPARATUS

Junichi Toei, Sagamihara, and Nobuyuki Baba, Yamato, both of Japan, assignors to Tosho Corporation, Shin-nanyo, Japan

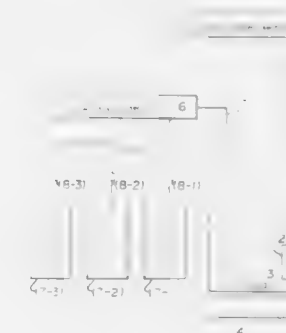
Continuation of Ser. No. 191,239, May 6, 1988, abandoned. This application Mar. 1, 1989, Ser. No. 319,874

Claims priority, application Japan, May 11, 1987, 62-112274

Int. Cl.⁴ B01D 15/08

U.S. Cl. 210—198.2

3 Claims



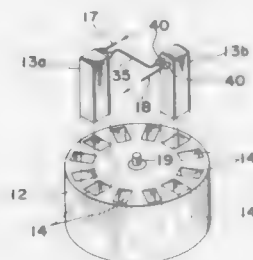
1. A liquid supply apparatus for providing a precisely predetermined volume of liquid mixture having a precisely predetermined hydrogen ion concentration for liquid chromatography, comprising:

- a mixing tank;
- stirring means for stirring a liquid mixture in said mixing tank;
- electrode means for measuring a hydrogen ion concentration of said liquid mixture in said mixing tank;
- a plurality of supply liquid tanks for storing different supply liquids;

liquid supply section means for supplying controlled volumes of said supply liquids to said mixing tank; and supply control section means for controlling said liquid supply section means, including:

- (a) means for calculating first volumes of said supply liquids such that a liquid mixture having a first volume less than said predetermined volume will have a hydrogen ion concentration equal to said predetermined hydrogen ion concentration,
- (b) means for controlling said liquid supply section means for supplying said first volumes of said supply liquids to said mixing tank until a measured hydrogen ion concentration of said liquid mixture equals said predetermined hydrogen ion concentration of said liquid mixture;
- (c) means for determining the total volume of said supply liquids supplied to said mixing tank when the measured hydrogen ion concentration of said liquid mixture equals said predetermined hydrogen ion concentration of said liquid mixture;
- (d) means for calculating additional volumes of said supply liquids such that a liquid mixture having said total volume plus said additional volumes of said supply liquid will have said predetermined volume; and
- (e) means for controlling said liquid supply section means for supplying said additional volumes of said supply liquids to said supply mixture in said mixing tank until the volume of the liquid mixture in said mixing tank equals said predetermined volume, while maintaining said measured hydrogen ion concentration of the mixed liquid in said mixing tank at said predetermined hydrogen ion concentration.

4,877,523
CENTRIFUGAL COUNTER-CURRENT DISTRIBUTION CHROMATOGRAPHY
 Yoshiaki Nunogaki, Nagasaki, Japan, assignor to Sanki Engineering, Ltd., Kyoto, Japan
 Continuation of Ser. No. 120,313, Nov. 13, 1987, abandoned.
 This application Mar. 20, 1989, Ser. No. 326,498
 Int. Cl.⁴ B01D 15/08
 U.S. Cl. 210—198.2



1. A centrifugal counter-current distribution chromatographic apparatus comprising:

a centrifuge having a shaft, and a rotor rotatably mounted to and about the shaft, the shaft having a first fluid rotary coupling operatively connectable to a source of fluid samples and a second fluid rotary coupling, and the rotor having at least one pocket extending therein and spaced radially from the shaft; and

a cassette comprising at least one flat plate having opposite flat surfaces, a sealing plate covering each of said flat surfaces, and metallic side plates between which said at least one flat plate and each said sealing plate are clamped, each said at least one flat plate having a plurality of elongate slots extending in and open to at least one of said flat surfaces and disposed adjacent one another on said at least one of said flat surfaces, and a respective groove extending in said at least one of said flat surfaces between each adjacent pair of said plurality of elongate slots,

each of said elongate slots extending parallel to one another and in a direction of elongation, from a first end thereof to a second end thereof, across said at least one of said flat surfaces,

said plurality of elongate slots spaced apart from one another on said at least one of said flat surfaces in a direction extending perpendicular to said direction of elongation, each said respective groove open to the first end of one of a said adjacent pair of said elongate slots and the second end of the other of said adjacent pair of said elongate slots, and a tortuous separation passage defined in said cassette along said elongate slots and each said respective groove from a first one of said elongate slots to a last one of said elongate slots,

said cassette disposed in a said pocket of the rotor with said direction of elongation of each of said slots extending radially with respect to the shaft of the centrifuge, said direction in which said elongate slots are spaced from one another on said at least one of said flat surfaces extending parallel to the shaft of the centrifuge, the first ends of each of said elongate slots being disposed radially outward of the second ends thereof with respect to the shaft of the centrifuge, the first end of said first one of said elongate slots in fluid communication with the first rotary coupling of the shaft of the centrifuge, and the last one of said elongate slots in fluid communication with the second rotary coupling of the shaft of the centrifuge.

4,877,524
APPARATUS FOR TREATING BODIES OF WATER
 Thomas E. Eberhardt, 20 Blenheim Dr., Easton, Pa. 18042
 Division of Ser. No. 199,314, May 26, 1988, Pat. No. 4,818,416, which is a continuation-in-part of Ser. No. 75,114, Jul. 20, 1987, Pat. No. 4,747,958. This application Feb. 13, 1989, Ser. No. 310,708
 Int. Cl.⁴ A01G 7/00; B63B 7/00
 U.S. Cl. 210—242.1

1. A floating treatment agent transport and application means comprising: means for transporting and applying fluent treatment agent to a body of water to correct a predetermined imbalance in the aquatic environment in such body of water including:

(a) a fluent treatment agent supply tank means arranged and constructed to be partially submerged in and at least in part supported by hydrostatic pressure on its outer surface,

(b) a working deck supported upon the tank means,

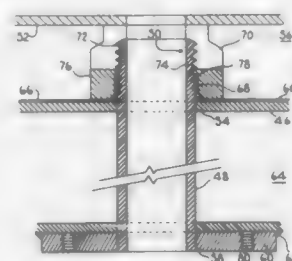
(c) at least two elongated pontoon means arranged and constructed to provide additional stability and flotation to the fluent treatment agent supply tank means when said tank means is loaded,

(d) fluent material dispensing means arranged and constructed for extending transversely from the transport means at least when in use in a pattern adapted to provide substantially uniform application of treatment agent to an extended portion of the body of water,

(e) propulsion means for said spray transport means,

(f) extension means for extending the elongated pontoon means into additionally spaced stability engendering relationship with respect to the fluent treatment agent supply tank means while said transport means is operational.

4,877,525
PRESSURIZED VESSEL WITH FALSE BOTTOM AND THROUGHPIPE COATED AT WELD SITE
 John W. Chapman, Boise, Id., assignor to Micron Technology Inc., Boise, Id.
 Filed Oct. 24, 1988, Ser. No. 261,706
 Int. Cl.⁴ B01D 23/20
 U.S. Cl. 210—289



1. In an apparatus for the manufacture of deionized water comprising a pressurized vessel containing deionizing resin, an inner tank bottom and a lower tank dome defining an air space therebetween, the air space not in fluid communication with the deionized water or the deionizing resin, the improvement comprising:

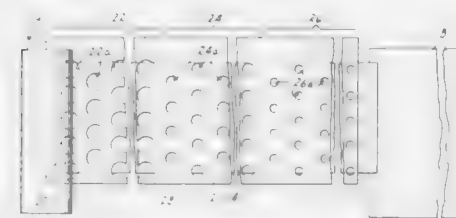
(a) a throughpipe threadably engaged at an upper end to a

distribution header above the inner tank bottom, said throughpipe extending through the inner tank bottom, through the air space and thence through the lower tank dome, said throughpipe being welded at a weld site to the inner tank bottom; and

(b) a corrosion-resistant coating applied to the interior of the pressurized vessel and the inner tank bottom, and extending upwardly to cover the weld site and at least a portion of the throughpipe extending above the inner tank bottom; and

(c) seal means applied to the throughpipe between the distribution header and the corrosion-resistant coating applied to the inner tank bottom and covering an upper edge of the coating applied to the throughpipe.

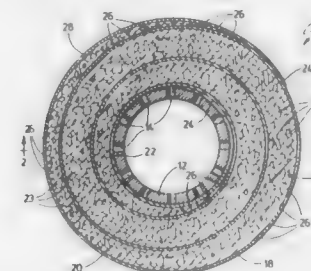
4,877,526
FLEXIBLE FILTER BAG AND METHOD OF FABRICATION
 Todd W. Johnson, and Corazon C. Brizuela, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
 Filed Aug. 31, 1987, Ser. No. 97,441
 Int. Cl.⁴ B01D 29/12
 U.S. Cl. 210—448



1. Flexible filter bag useful for filtering a fluid under pressure and comprising

a strip of flexible filtering fabric having a longitudinal edge and wound upon itself in a large number of convolutions to provide a tube with said edge overlying itself, one end of the tube being secured to a structural ring to provide an open throat, and the ring-free end of the tube being sealed together to provide a flexible filter bag that has a seamless filter element and is open only at said ring.

4,877,527
LIQUID FILTER OF SPIRAL WOUND CONSTRUCTION WITH ALTERNATE LAYERS OF A SURFACE AREA MEDIA AND A DEPTH MEDIA
 Peter Brownell, Providence, R.I., assignor to Allied-Signal Inc., Morristown, N.J.
 Filed Jun. 15, 1987, Ser. No. 62,031
 Int. Cl.⁴ B01D 27/04
 U.S. Cl. 210—489



1. Liquid filter cartridge comprising a perforated centertube, and a filtering media wound circumferentially around said centertube, said filtering media comprising a depth type filtering medium between layers of a surface type filtering medium

having a predetermined porosity placed on opposite sides of said depth type filtering medium, said depth type filtering medium being relatively uncompressed to have a strength sufficient to maintain separation between the layers of said surface type filtering medium on opposite sides of said depth type filtering medium, and having a porosity sufficiently great to permit relatively uninhibited flow of the liquid within the depth type filtering medium both radially and circumferentially with respect to said centertube, said surface type filtering medium having sections of greater porosity relative to said predetermined porosity, said sections of greater porosity being spaced circumferentially from one another whereby said sections of greater porosity are offset radially from one another on adjacent layers of said surface type filtering medium.

4,877,528
SILOXANE-GRAFTED MEMBRANES
 Dwayne T. Friesen, Bend, Oreg., and Alan S. Obligin, Catonsville, Md., assignors to Bend Research, Inc., Bend, Oreg.
 Filed Oct. 27, 1988, Ser. No. 263,062
 Int. Cl.⁴ B01D 13/00
 U.S. Cl. 210—500.29

1. A siloxane-grafted cellulosic semipermeable composite membrane comprising chemical structure for providing a substantially constant flux as a function of time, consisting essentially of non-crosslinked covalently bonded reaction product of hydroxyl-reactive functional groups of a polysiloxane with hydroxyl groups of an asymmetric cellulosic semipermeable membrane, wherein said hydroxyl-reactive functional groups are selected from acid halides, amino acid halides, sulfonyl halides, and phosphoryl halides.

4,877,529
SEPARATION OF ORGANIC LIQUIDS
 Mordechai Pasternak, Spring Valley; Craig R. Bartels, and John Reale, Jr., both of Wappinger Falls, all of N.Y., assignors to Texaco Inc., White Plains, N.Y.
 Division of Ser. No. 166,575, Mar. 10, 1988, Pat. No. 4,798,674.
 This application Jul. 22, 1988, Ser. No. 222,871
 Int. Cl.⁴ B01D 13/00

1. A non-porous ion exchange membrane comprising a molecular structure enabling concentration of a charge solution containing (i) an alcohol having less than three carbon atoms and (ii) an oxygenate selected from the group consisting of organic ethers, aldehydes, ketones, and esters, including a high molecular weight perfluorinated non-porous ion exchange acid resin in membrane form having carbon atoms in the backbone, bearing a pendant acid group, said membrane having been contacted with a quaternary ammonium salt containing hydrocarbon groups each of which contains less than four carbon atoms.

4,877,530
LIQUID CO₂/COSOLVENT EXTRACTION
 John M. Moses, Dedham, Mass., assignor to CF Systems Corporation, Waltham, Mass.
 Division of Ser. No. 603,563, Apr. 25, 1984, Pat. No. 4,770,780.
 This application Feb. 29, 1988, Ser. No. 161,999
 The portion of the term of this patent subsequent to Sep. 13, 2005, has been disclaimed.
 Int. Cl.⁴ B01D 11/04

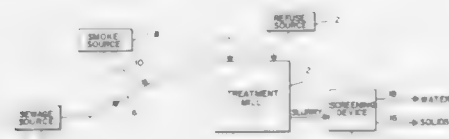
1. A quaternary fluid extraction system comprising: water as a first component of said system; an organic solute as a second component of said system; a fluid extractant formed of the third and fourth components of said system, said fluid extractant comprising a mixture of liquid carbon dioxide as said third component and a monofunctional hydrocarbon cosolvent said fourth component, which cosolvent is a liquid at about 60° C. and

standard pressure; is a substantially better solvent for the liquid solute than for the water; has a solubility in liquid carbon dioxide greater than 1 weight percent than under the conditions of extraction and separation, the carbon dioxide/cosolvent mixture forms a single phase; in the



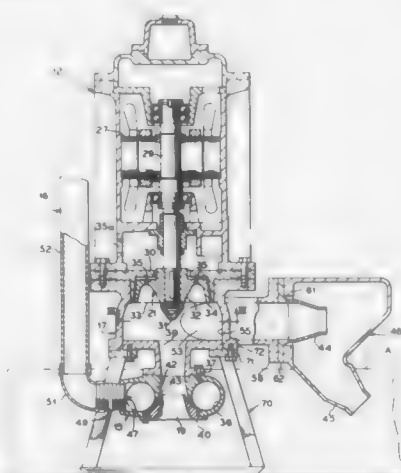
absence of solute, has a distribution coefficient (carbon dioxide/water) of greater than 3 on a weight basis; has a boiling point substantially above or below that of the liquid solute at atmospheric pressure; and is substantially chemically unreactive under process conditions with the first solvent fluid, the liquid solute and water.

4,877,531
PROCESS FOR TREATING VARIOUS REFUSE MATERIALS, PARTICULARLY SMOKE, GARBAGE AND SEWAGE
Albert L. Burkett, 3984 N. Roger Ln., Tucson, Ariz. 85719
Filed Nov. 7, 1988, Ser. No. 268,199
Int. Cl.⁴ B01D 53/34; C02F 3/02
U.S. Cl. 210—620 4 Claims



1. A process for treating solid, liquid and gaseous refuse materials, comprising the steps of:
 - (a) injecting a gaseous refuse material including smoke into a conduit carrying a generally liquid refuse material including raw sewage thereby forming a first mixture;
 - (b) pouring said first mixture into a treatment mill and adding a generally solid refuse material including cellulose thereto for forming a second mixture;
 - (c) aerobically digesting said second mixture by operating said treatment mill for a period of time sufficient to form a pumpable slurry; and
 - (d) processing said slurry to separate the solids from the aqueous solution.

4,877,532
CENTRIFUGAL OXYGENATOR AND METHOD FOR TREATMENT OF WASTE WATER
Walter D. Haentjens, and Thomas E. Stirling, both of Sugarloaf, Pa., assigns to Barrett, Haentjens & Company, Hazelton, Pa.
Continuation of Ser. No. 903,506, Sep. 4, 1986, abandoned. This application Sep. 23, 1987, Ser. No. 100,107
Int. Cl.⁴ C02F 3/26
U.S. Cl. 210—629 13 Claims



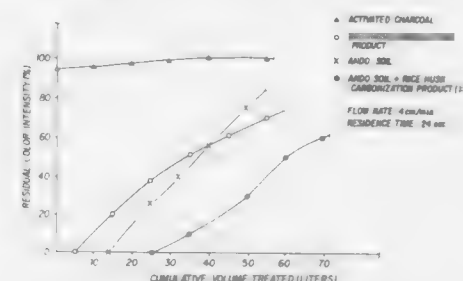
1. An apparatus for effecting the absorption of oxygen by a biodegradable waste in a continuous operation, comprising: a pump having a impeller, means for rotatably driving said impeller, a collector enclosing said impeller and creating a relatively large volume chamber mismatched relative to said impeller, a first inlet in fluid communication with a source of biodegradable waste and disposed in said collector axially of said impeller, a second inlet in fluid communication with a source of air including oxygen and extending around said first inlet for biodegradable waste, said first and second inlets cooperating with a vortex created by said impeller to effect agitation of air and biodegradable waste entering said collector, and an outlet leading from said collector in fluid communication with a means for providing increased back pressure in said collector and forming, in cooperation with said first and second inlets and said impeller, means for impeding axial flow of said biodegradable waste through said outlet by increasing the dwell time of said biodegradable waste in said collector to effect a thorough absorption of oxygen from the air and particle break-up of the biodegradable waste prior to discharge through said outlet.

4,877,533
SEPARATION OF WATER FROM ORGANIC FLUIDS
Ian G. Meldrum, Leatherhead, and Timothy d. Naylor, Woking, both of England, assigns to British Petroleum Company p.l.c., London, England
Continuation of Ser. No. 841,531, Feb. 27, 1986, abandoned.
This application Dec. 29, 1987, Ser. No. 140,908
Claims priority, application United Kingdom, Jul. 27, 1984, 8419174
Int. Cl.⁴ B01D 13/00
U.S. Cl. 210—640 17 Claims

1. The process for separating water from a mixture with a less hydrophilic fluid by bringing the mixture into contact with one side of a membrane and removing the water as vapour from the other side of the membrane wherein the membrane has an active layer which consists essentially of homopolymers of an unsaturated organic acid having acid groups in a free acid form and acid groups in a salt form, the acid having no more than 6 carbon atoms for every acid group, not counting any

carbon atoms in the acid group, and the homopolymer having at least 50% of the acid groups in a salt form.

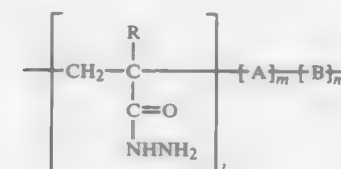
4,877,534
ADSORBENT FOR REMOVING WATER- OR AIR-BORNE CONTAMINANTS
Konosuke Nishida, Kurita; Mitsue Hada, Ibaragi, and Shozo Hiki, Kobe, all of Japan, assigns to Konosuke Nishida, Shiga; Mitsue Hada, Osaka and Hanshim Kikagaku Kabushiki Kaisha, Nishinomiya, all of Japan
Filed Apr. 29, 1988, Ser. No. 188,503
Claims priority, application Japan, Oct. 14, 1987, 62-260463
Int. Cl.⁴ B01D 15/04
U.S. Cl. 210—691 10 Claims



1. A method for removing contaminants from air or water, comprising:
 - passing a fluid to be treated through an adsorbent mainly comprising a mixture of at least one soil selected from the group consisting of Ando soil and loamy soil, and carbonized plant material containing amounts of organic substances sufficient to serve as nutrient sources for the growth of microorganisms that degrade the contaminants.

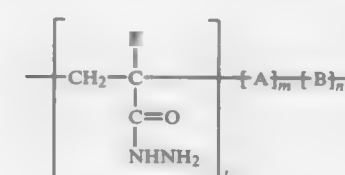
4,877,535
IRON DISPERSANT FOR BOILER WATER
Kenji Kobayashi, Yokohama; Ichiro Kaneko, Machida; Masahiro Kobayashi, and Shinji Nakano, both of Tokushima, all of Japan, assigns to Kurita Water Industries, Ltd., Tokyo and Otsuka Chemical Co., Ltd., Osaka, both of Japan
Continuation of Ser. No. 565, Jan. 5, 1987, abandoned. This application Aug. 26, 1988, Ser. No. 237,647
Claims priority, application Japan, Jan. 13, 1986, 61-4806
Int. Cl.⁴ C02F 5/12
U.S. Cl. 210—701 16 Claims

1. A composition used to disperse iron in boiler water comprising:
 - (a) a first component which is an acrylic copolymer having repeating unit:



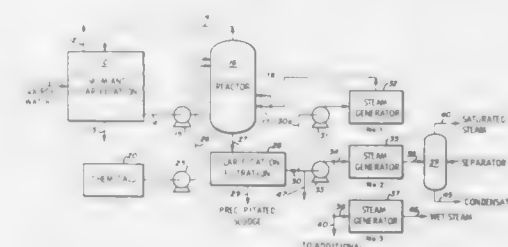
wherein R represents hydrogen or a methyl group; A is a repeating unit representing acrylamide, methacrylamide, acrylic alkyl ester or methacrylic alkyl ester; B is a repeating unit representing acrylic acid, acrylate, methacrylic acid, methacrylate or a monomer copolymerizable with the repeating unit A; l represents a molecular percentage of repeating units of the first component of $10 \leq l \leq 70$; m represents a molecular percentage of repeating units of the first component of $10 \leq m \leq 90$; and n represents a molecular percentage of repeating units of the first component of

- 0 $\leq n \leq 50$, the sum of the molecular percentage of repeating units of l, m and n being 100; and
 - (b) a second component of at least one of a homopolymer or a copolymer of one of an acrylate or a methacrylate, wherein said second component and said first component are present in the composition in a range from 9:1 to 1:9 by weight of each of the components.
13. A process for dispersing iron in boiler water comprising: adding a composition to the water in an amount ranging from 0.01 to 10 mg composition to each liter of water, the composition having a first component which is an acrylic copolymer having repeating unit:



wherein R represents hydrogen or a methyl group; A is a repeating unit representing acrylamide, methacrylamide, acrylic alkyl ester or methacrylic alkyl ester; B is a repeating unit representing acrylic acid, acrylate, methacrylic acid, methacrylate or a monomer copolymerizable with the repeating unit A; l represents a molecular percentage of repeating units of the component of $10 \leq l \leq 70$; m represents a molecular percentage of repeating units of the component of $10 \leq m \leq 90$; and n represents a molecular percentage of repeating units of the component of $0 \leq n \leq 50$, the sum of the molecular percentage of repeating units of l, m and n being 100; and a second component of at least one of a homopolymer or a copolymer consisting of one of an acrylate or a methacrylate, wherein said second component and said first component are present in the composition in a range from 9:1 to 1:9 by weight of each of the components to thereby prevent formation of iron oxide deposits in the boiler water.

4,877,536
METHOD OF TREATING SALINE WATER
Theodore A. Bertness, Whittier, and Samuel P. Lipoma, Delano, both of Calif., assigns to Bertness Enterprises, Inc., Sioux City, Iowa
Continuation of Ser. No. 922,681, Oct. 24, 1986, abandoned, which is a continuation of Ser. No. 434,062, Oct. 13, 1982, abandoned, which is a continuation-in-part of Ser. No. 256,719, Apr. 23, 1981, abandoned. This application Dec. 14, 1987, Ser. No. 132,360
Int. Cl.⁴ C02F 1/52, 1/66
U.S. Cl. 210—712 6 Claims



1. A method of treating hard water produced with petroleum from an oil well or oil wells which comprises, after separation of the hard water from the bulk of the oil, the following steps
 - (a) introducing the separated, hard water into a reaction zone;

- (b) generating steam in a steam boiler from a separate supply of soft water;
- (c) introducing such steam directly into the hard water in such reaction zone in quantity and at a temperature and pressure sufficient to heat the hard water to the range of about 350° to 450° F. and to precipitate the hardness in the form of sludge, the quantity of steam so introduced being insufficient to evaporate more than a small amount of the hard water introduced into the reaction zone in step (a), thereby resulting in softened water as the principal product of step (c) and also producing sludge;
- (d) venting steam from the reaction zone together with non-aqueous volatile substances including carbon dioxide dissolved in the hard water introduced into the reaction zone and/or resulting from thermal decomposition of carbonates and/or bicarbonates in the reaction zone, together with such volatile hydrocarbon constituents of the hard water as may be introduced into the reaction zone;
- (e) separating sludge formed in step (c) from softened water produced in step (c), and
- (f) withdrawing from the system softened water as the major product.

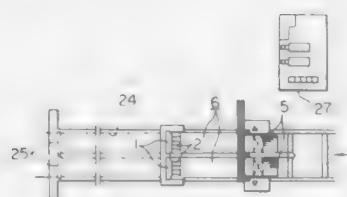
4,877,537

PUMPING SYSTEM FOR GATES

Ichiji Kobayashi, and Motohide Sakata, both of Saga, Japan, assignors to Mizota Industrial Co., Ltd., Japan
Filed Oct. 4, 1988, Ser. No. 253,197
Int. Cl.⁴ B01D 33/00

U.S. Cl. 210-747

4 Claims



1. A method of providing a pumping system for gates comprising the steps of forming a sluice body which is liftably received at its both sides within the guide grooves formed in the side walls of a water channel; mounting a plurality of pumps in parallel with each other with the suction ports of said pumps being located at the upstream side of said water channel and also being opened towards the bottom thereof, and with the discharge ports of said pumps being located at the downstream side of said water channel; mounting a debris collecting device in the upstream side of said water channel on lift means so as to be liftable over said water channel; and lowering said sluice body at the time of lowering said debris collecting device, while raising said sluice body at the time of raising said debris collecting device.

4,877,538

SULFOMETHYLATED STAIN BLOCKING AGENTS
Alexander S. Kirjanov, Reading, Pa., and Michel A. Herlant, Mount Pleasant, N.C., assignors to Crompton & Knowles Corporation, Stamford, Conn.

Filed Apr. 4, 1988, Ser. No. 177,110
Int. Cl.⁴ D06M 00/00

U.S. Cl. 252-8.7

19 Claims

1. A stain blocking composition comprising 1-50 parts a sulfomethylated phenol-formaldehyde or sulfomethylated naphthol-formaldehyde and an 1 part of an anionic surface active agent.

4,877,539

TEXTILE TREATMENT PREPARATIONS CONTAINING
A FATTY ACID AND HYDROXYALKYL-AMINE
CONDENSATE PREPARED IN THE PRESENCE OF
DISPERSION ACCELERATOR

Uwe Ploog, Haas, and Guenter Uphues, Monheim, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Dusseldorf, Fed. Rep. of Germany
Filed Sep. 13, 1988, Ser. No. 243,956

Claims priority, application Fed. Rep. of Germany, Sep. 14, 1987, 3730792

Int. Cl.⁴ C11D 1/52, 3/20; D06M 13/40

U.S. Cl. 252-8.8

20 Claims

1. A textile treatment preparation obtained by condensation reaction of (a) an aliphatic C₈-C₂₂ monocarboxylic acid or amideforming derivative thereof with (b) a hydroxyalkyl polyamine and subsequent neutralization of unreacted amino groups, the fabric treatment preparation containing a dispersion accelerator selected from the group consisting of aldose and ketose monosaccharides and polyhydroxy compounds derived therefrom by hydrogenation; a polyol; an alkylglucoside; a sorbitan ester; and a neutral or synthetic hydrophilic polymer, in sufficient quantity so that the textile treatment preparation is rapidly dispersible in cold water, wherein said dispersion accelerator is present in the reaction mixture during the condensation reaction.

4,877,540

METHYLOLATED AND OPTIONALLY ETHERIFIED
URETHANES CONTAINING FLUOROALKYL LIGANDS

Fritz Engelhardt, Karl Hintermeier, both of Frankfurt am Main; Manfred Müller, Gelnhausen; Norbert Münch, Kelkheim, and Hans Wagener, Hofheim, all of Fed. Rep. of Germany, assignors to Cassella Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 8, 1988, Ser. No. 229,509

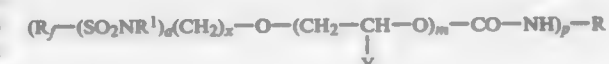
Claims priority, application Fed. Rep. of Germany, Aug. 19, 1987, 3727665

Int. Cl.⁴ C07C 125/06, 127/24, 143/74; D06M 15/57

U.S. Cl. 252-8.75

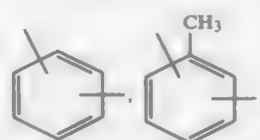
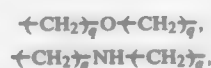
15 Claims

1. Methylolated urethane containing fluoroalkyl ligands prepared by methylation of a urethane reactant of the formula

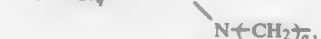
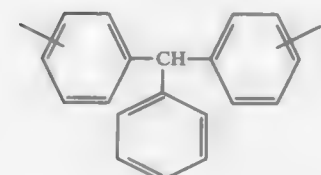
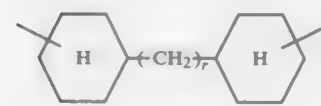
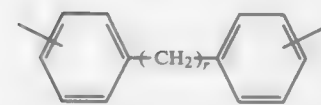
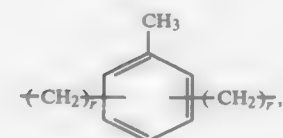
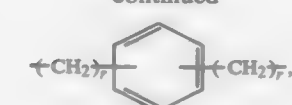


with formaldehyde in a molar ratio of 0.5 to (1.1)t moles urethane reactant per mole formaldehyde wherein

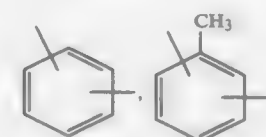
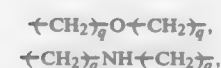
R_f denotes perfluoroalkyl with 4 to 20 carbon atoms;
R¹ denotes hydrogen or an alkyl with 1 to 4 carbon atoms;
a denotes the number 0 to 1;
x denotes a number from 1 to 4;
Y denotes hydrogen, -CH₃ or -CH₂Cl;
R denotes



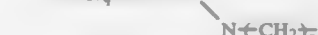
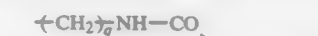
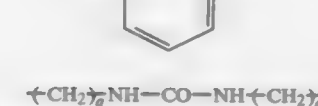
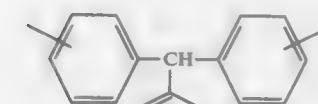
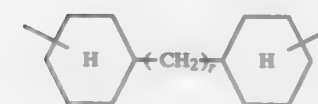
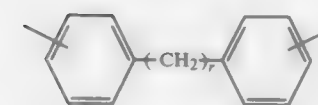
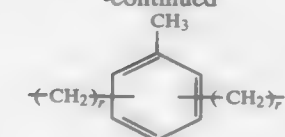
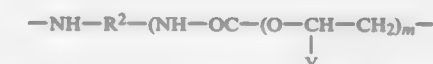
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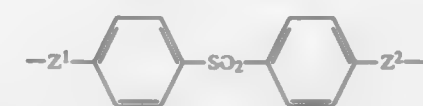
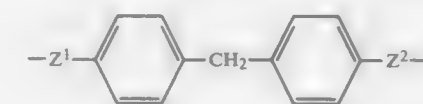
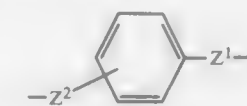
p denotes a number from 1 to 4;
q denotes a number from 2 to 10;
r denotes a number from 1 to 6;
m denotes a number from 0 to 4;
w denotes a number from 1 to 2, with the proviso that the sum of p + w is not more than 3;
R² denotes a (p + w)-valent radical selected from the group

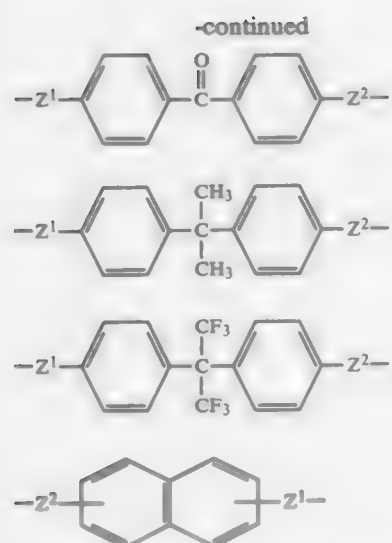


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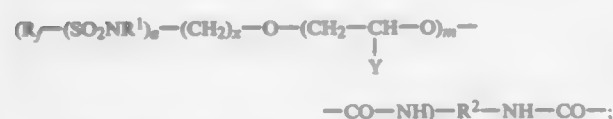
R³ denotes

or the radical of a CH-acid or NH-acid compound;
s denotes a number from 1 to 15,
X¹ denotes





whereby all X^1 radicals can be mono- or polysubstituted by alkyl groups with 1 to 4 C atoms;
 Z^1 , Z^2 which are identical or different denote $-O-$ or $-NH-$;
 R^4 denotes the hydrogen atom, an alkyl group with 1 to 4 C atoms or the group



and t is the total number of methylolatable $-NH$ groups in the urethane reactant.

4,877,541

CORROSION INHIBITOR

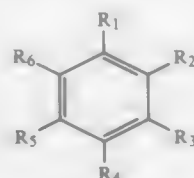
Max J. Wisotaky, Highland Park, N.J., and Stephen J. Metro, Pinehurst, N.C., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Dec. 11, 1987, Ser. No. 131,993
 Int. Cl. C10M 133/16

U.S. Cl. 252-47.5

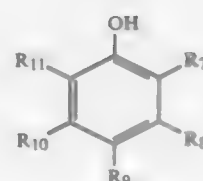
29 Claims

1. A corrosion inhibitor for metal surfaces comprising:
 I. A compound having the formula:



wherein R_1 is an amide, substituted amide or an ester; at least one substituent of R_2 , R_3 , R_4 , R_5 and R_6 is an amide, substituted amide, amine or substituted amine; and the remaining substituents are independently hydrogen, hydroxyl or alkyl; and

II A compound having the formula



wherein at least one substituent of R_7 - R_{11} is an alkanoyl radical having the structure



where R_{12} is alkyl, X is O, N or S; and the remaining R_7 - R_{11} substituents are hydrogen, alkyl, hydroxy, or other functionality.

4,877,542

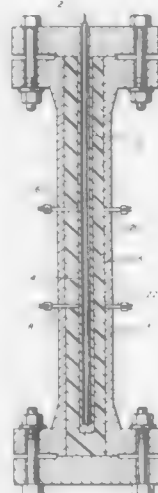
THERMAL INSULATING FLUID

Jesús R. Lón; Olegario Rivas, and Geza N. Zirczy, all of Caracas, Venezuela, assignors to Intevep, S. A., Caracas, Venezuela

Filed May 10, 1988, Ser. No. 192,194
 Int. Cl. E04B 1/76; E21B 36/00

U.S. Cl. 252-62

13 Claims



1. A thixotropic thermal insulating fluid consisting essentially of:

- (a) a heavy oil having an API gravity of not more than 15° and a water content of not more than about 5% by volume present at a concentration of about 85% to about 95% by volume of the liquid portion of said insulating fluid;
- (b) a light oil having an API gravity of at least about 20° and present at a concentration of about 5 to about 15% by volume of the liquid portion of said insulating fluid;
- (c) a smectite-type clay in an amount of about 1 to about 5% by weight of said fluid;
- (d) calcium oxide in an amount of about 0.75% to about 5% by weight of said insulating fluid; and
- (e) hydrated amorphous sodium silicate, with a SiO_2Na_2O modulus ratio of about 3 to about 4, present in an amount of about 1 to about 2% by weight of said insulating fluid.

4,877,543

LOW LOSS OXIDE MAGNETIC MATERIAL

Hirohiko Togane, Sagaminara, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 207,641, Jun. 16, 1988. This application Mar. 29, 1989, Ser. No. 330,284

Claims priority, application Japan, Jun. 19, 1987, 62-152858
 Int. Cl. C04B 35/26

U.S. Cl. 252-62.64

2 Claims

1. A ferrite magnetic material exhibiting low power loss for use as a deflector yoke core for a high speed scanning cathode ray tube, consisting essentially of 43-47 mol % of Fe_2O_3 , 27-35 mol % of MgO , 13-20 mol % of ZnO , 3-10 mol % of MnO and Bi_2O_3 in an amount of from about 0.1 to 1.5 wt. %.

4,877,544

OXIDATION STABLE SURFACTANTS

Robert Gabriel, Maplewood, N.J.; Michael P. Aronson, West Nyack, N.Y., and Peter L. Steyn, West Caldwell, N.J., assignors to Lever Brothers Company, New York, N.Y.

Continuation-in-part of Ser. No. 40,386, Apr. 17, 1987, abandoned. This application Apr. 14, 1988, Ser. No. 183,512
 Int. Cl. C11D 1/722, 3/395

U.S. Cl. 252-99

18 Claims

1. Detergent compositions comprising:

- (i) from about 0.1 to about 15% of a nonionic surfactant identified by formula I:



wherein

R is an alkyl group containing from 8 to about 12 carbon atoms;

EO and PO represent oxyethylene and oxypropylene groups, respectively;

a , b and c may each range from 0 to about 10, with the sum of a , b and c ranging from about 6 to about 12; the ratio of EO to PO is at least 1 but no higher than about 2; and

Z is selected from methyl or chloroethyl groups and said group is attached to an oxyethylene unit at an oxygen atom thereof;

- (ii) from about 0.5 to about 10% of an oxidizing agent selected from hypochlorite and hydrogen peroxide generating compounds; and

- (iii) from about 0 to about 80% of a builder.

4,877,545

AZEOTROPIC COMPOSITIONS OF

1,1,2-TRICHLOROTRIFLUOROETHANE AND TRANS-1,2-DICHLOROETHYLENE WITH ETHANOL, N-PROPANOL, ISOPROPANOL AND ACETONE OR WITH ETHANOL OR ACETONE AND NITROMETHANE

Abid N. Merchant, Wilmington; Robert A. Gorski, Newark, both of Del., and Kenneth C. Burke, Westfield, N.J., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 29, 1988, Ser. No. 291,791

Int. Cl. C11D 7/50, 7/30

U.S. Cl. 252-171

26 Claims

1. An azeotrope or azeotrope-like composition comprising consisting essentially of from about 58-77 weight percent 1,1,2-trichlorotrifluoroethane, about 17-39 weight percent trans-1,2-dichloroethylene and an oxygenated compound selected from the group consisting of about 2-5 weight percent ethanol, about 0.1-2.0 weight percent n-propanol, about 1-5 weight percent isopropanol and about 4-8 weight percent

acetone wherein the composition has a boiling point of about 42.6°-44.2° C., at 760 mm Hg.

17. An azeotrope or azeotrope-like composition comprising consisting essentially of from about 58-77 weight percent 1,1,2-trichlorotrifluoroethane, about 17-39 weight percent trans-1,2-dichloroethylene, about 0.01-1.0 weight percent nitromethane and an oxygenated compound selected from the group consisting of about 2-5 weight percent ethanol or about 4-8 weight percent acetone wherein the composition has a boiling point of about 42.6°-44.2° C., at 760 mm Hg.

4,877,546

FOAM ENHANCING AGENT FOR LIGHT DUTY DETERGENT

Kuo-Yann Lai, Kendall, N.J., assignor to Colgate-Palmolive Company, Piscataway, N.J.

Continuation of Ser. No. 858,827, Apr. 29, 1986, abandoned, which is a continuation of Ser. No. 573,434, Jan. 24, 1984, abandoned, which is a continuation of Ser. No. 290,640, Aug. 6, 1981, abandoned. This application Oct. 30, 1987, Ser. No.

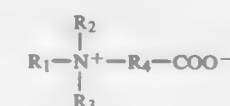
117,380

Int. Cl. C11D 3/22

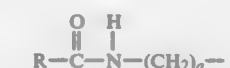
U.S. Cl. 252-174.17

4 Claims

1. A light duty, liquid detergent composition in an aqueous solution consisting essentially of: (a) 0.1% to 1.0% by weight of a nonionic hydroxypropyl guar gum derivative; and (b) a ternary mixture of a water-soluble salt of an anionic C_8 - C_{18} alkyl ethenoxy ether sulfate containing 1 to 12 ethenoxy groups in the molecule, a water-soluble salt of a C_8 - C_{18} alkyl sulfate surfactant, the weight ratio of said alkyl sulfate to said alkyl ethenoxy ether sulfate being from 1:29 to 29:1, and a zwitterionic betaine surfactant of the formula:



wherein R_1 is an alkyl group having 10 to 20 carbon atoms or the amido radical



wherein R is an alkyl group having 9 to 19 carbon atoms and a is an integer from 1 to 4; R_2 and R_3 are C_1 - C_3 alkyl; and R_4 is an alkylene or hydroxyalkylene group having 1 to 4 carbon atoms, said ternary mixture being present in an amount of approximately 20% to 40% by weight of the composition with said betaine constituting 2% to 5% by weight of the composition, said composition having a viscosity of from at least 100 cps. to 1000 cps. at room temperature and exhibiting enhanced foaming properties as compared with the same composition without said nonionic guar gum.

4,877,547

LIQUID CRYSTAL DISPLAY ELEMENT

Georg Weber, Erzhansen, Fed. Rep. of Germany; Bernhard Schenble, Yokohama, Japan, and Joachim Kramse, Dieburg, Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit Beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

PCT No. PCT/EP87/00078, § 371 Date Oct. 23, 1987, § 102(e) Date Oct. 23, 1987, PCT Pub. No. WO87/05317, PCT Pub. Date Sep. 11, 1987

PCT Filed Feb. 14, 1987, Ser. No. 124,791

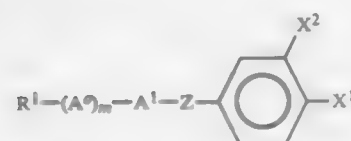
Claims priority, application Fed. Rep. of Germany, Feb. 26, 1986, 3406153

Int. Cl.⁴ G02F 1/13; G09F 9/35; C09K 19/42, 19/08, 19/30/19/20, 19/34

U.S. Cl. 252—299.61

7 Claims

1. A liquid crystal display element with static or multiplex control with a low multiplex ratio and an operating voltage below 3.3 volts, containing a liquid crystal dielectric, wherein the operating temperature range extends from -30° C. to +80° C. and the viscosity of the dielectric at 20° C. is less than 40 mPa.s, wherein the dielectric contains at least one component of the formula I



wherein

R¹ is alkyl with 1 to 12 C atoms, wherein one or two non-adjacent CH₂ groups can also be replaced by O atoms, —CO—, —O—CO—, —CO—O— and/or —CH=CH— groups.

A⁰ and A¹ each independently of one another are Cy, Dio or Phe,

Z is —CH₂—O—, —O—CH₂— or a single bond,

X¹ is F, Cl, —CN or —NCS,

X² is F, Cl and, in the case where X¹=NCS, also H,

m is 0 or 1,

Cy is trans-1,4-cyclohexylene,

Dio is trans-1,3-dioxane-2,5-diyl and

Phe is 1,4-phenylene which is unsubstituted or substituted by fluorine.

4,877,548

LIQUID CRYSTAL COMPOSITION

Kisei Kitano, Chiba; Makoto Ushioda; Manabu Uchida, both of Ichihara, and Toshiharu Suzuki, Ichihara, all of Japan, assignors to Chisso Corporation, Japan

Filed Dec. 27, 1988, Ser. No. 290,701

Claims priority, application Japan, Dec. 28, 1987, 62-335984; Jan. 3, 1988, 63-136820

Int. Cl.⁴ G02F 1/13; C09K 19/30, 19/12; C07C 21/24

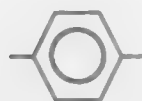
U.S. Cl. 252—299.63

16 Claims

1. A compound expressed by the formula



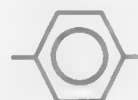
wherein R¹ represents a hydrogen atom or an alkyl group or an alkenyl group each of 1 to 20 carbon atoms wherein one —CH₂— group or two —CH₂— groups not adjacent to each other may be substituted by a —O— group; the position and number of said double bond may be optionally chosen; A¹, A² and A³ each independently represent



or



and the hydrogen of this



may be substituted by fluorine, chlorine or methyl; B¹ and B² each independently represent —CH₂CH₂—, —CH₂O—, —OCH₂— or a single bond; n represents an integer of 0 or 1; and m represents an integer of 0 to 20.

4,877,549

LIQUID CRYSTAL COMPOSITION

Shinichi Sawada, Ichiharashi; Tetsuya Matsushita, Yokohama-shi, and Toyoshiro Isayama, Ichiharashi, all of Japan, assignors to Chisso Corporation, Japan

Filed Feb. 25, 1988, Ser. No. 160,188

Claims priority, application Japan, Mar. 3, 1987, 62-48099

Int. Cl.⁴ G02F 1/13; C09K 19/30

U.S. Cl. 252—299.63

4 Claims

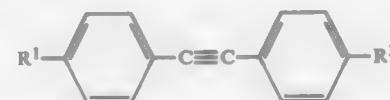
1. A liquid crystal composition usable in a supertwisted birefringence effect display, comprising:

(a) 20 to 40% by weight of a first component consisting of at least one compound expressed by the general formula:



wherein R is an alkyl group of 1 to 8 carbon atoms; and R² is a hydrogen atom or a fluorine atom;

(b) 10 to 40% by weight second component consisting of at least one compound expressed by the general formula:



wherein R¹ is defined above; and R³ is an alkyl group or an alkoxy group each of 1 to 8 carbon atoms; and

(c) 20 to 50% by weight third component consisting of at least one compound expressed by the general formula:



wherein R¹ is as defined above; and R⁴ is a fluorine atom, a cyano group, or an alkyl group or an alkoxy group each of 1 to 8 carbon atoms;

said first, second and third components being contained in a total amount of 70% by weight or more in said composition.

4,877,550

SYNTHESIS GAS PREPARATION AND CATALYST THEREFOR

Duane A. Goetsch, and Geoffrey R. Say, both of Baton Rouge, La., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Continuation-in-part of Ser. No. 174,173, Mar. 28, 1988, abandoned. This application Jan. 9, 1989, Ser. No. 294,854

Int. Cl.⁴ C01B 3/30

U.S. Cl. 252—373

10 Claims

1. In a process for the production of a hydrogen and carbon monoxide containing synthesis gas which comprises

(i) reacting in a fluidized reaction zone a light hydrocarbon feed with steam and oxygen at elevated temperature in the presence of catalyst containing nickel on a support,

(ii) recovering a product gas comprised of carbon monoxide, hydrogen and entrained catalyst, and

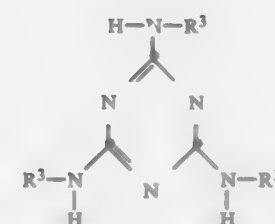
(iii) cooling in a cooling zone the product gas to a temperature below that which favors the reaction of carbon monoxide and hydrogen to form methane in the presence of entrained catalyst;

THE IMPROVEMENT WHICH COMPRISES

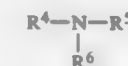
(a) cooling the product gas rapidly by indirect means with boiling water forming high pressure steam and at a rate sufficient to preserve at least about 85% of the feed converted to hydrogen and carbon monoxide as hydrogen and carbon monoxide;

(b) recovering high pressure steam from the cooling zone;

(c) preheating the light hydrocarbon feed with at least a portion of the steam recovered from the cooling zone.



in which R³ is C₁-C₆-carboxyalkyl or an alkali metal, alkaline earth metal, ammonium or amine salt thereof, (c) at least one alkanolamine of the formula III



in which R⁴ is C₁-C₆-hydroxyalkyl and R⁵ and R⁶, which can be identical or different, are hydrogen, C₁-C₆-alkyl or C₁-C₆-hydroxyalkyl, and

(d) water, wherein the ratio a:e (with b+c+d=e) is 1:1 up to 1:80.

4,877,551

AQUEOUS SUSPENSION OF DELAMINATED VERMICULITE

Alexander Lukacs, III, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Aug. 22, 1988, Ser. No. 234,782

Int. Cl.⁴ C04B 20/06

U.S. Cl. 252—378 R

18 Claims

1. In a polymerizable composition comprising vermiculite platelets that have been deposited from an aqueous suspension, wherein the improvement comprises the platelets being ionically bonded to radical or ionically polymerizable organo-substituted onium ions.

4,877,552

CORROSION INHIBITOR

Ulrich Häring, Riehen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Aug. 28, 1987, Ser. No. 91,156

Claims priority, application Switzerland, Sep. 2, 1986, 3514/86

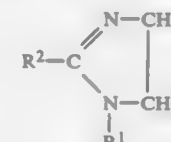
Int. Cl.⁴ C23F 11/10

U.S. Cl. 252—392

19 Claims

1. A corrosion inhibitor comprising

(a) an imidazoline of the formula I



in which R¹ is hydrogen, C₁-C₆-hydroxyalkyl, C₁-C₆-aminoalkyl or C₂-C₁₉-carboxyalkyl or an ammonia or amine salt thereof and R² is hydrogen, C₁-C₁₇-alkyl or C₂-C₁₇-alkenyl,

(b) a heterocyclic polyacid of the formula II

4,877,553

GAS MANTLE TECHNOLOGY

Walter J. Diederich, West Newbury, Mass., assignor to TPV Energy Systems, Inc., Waltham, Mass.

Filed Jun. 6, 1988, Ser. No. 203,312

Int. Cl.⁴ F21H 1/02

U.S. Cl. 252—492

18 Claims

13. A gas mantle that has an operating color temperature of about 2300° K., said mantle being a self-supporting fabric-like structure and consisting essentially of from about one percent to ten percent by weight of ceria and from about ninety percent to ninety-nine percent by weight of erbia.

4,877,554

RESISTANCE PASTE

Kanehito Honma, Nagaokakyo; Tsutomu Yokoi, Suita, and Hiroji Tani, Nagaokakyo, all of Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Jul. 21, 1988, Ser. No. 222,280

Claims priority, application Japan, Jul. 22, 1987, 62-182995

Int. Cl.⁴ H01B 1/06

U.S. Cl. 252—511

14 Claims

1. Resistance paste comprising 5 to 70 weight % conductive powder suspended in 20-80 weight % thermosetting binder resin, in which said conductive powder comprises graphite powder particles having a diameter of not more than 20μm and coated with at least one fatty acid having at least 12 carbon

12. The resistance paste according to claim 11 wherein said conductive powder is graphite.

4,877,555

CONDUCTOR COMPOSITION AND METHOD OF MANUFACTURING A CERAMIC MULTILAYER STRUCTURE USING THE SAME

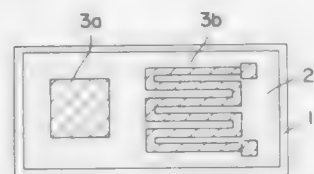
Satoru Yuhaku, Osaka; Seichi Nakatani, Hirakata, and Tutomu Nishimura, Uji, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Apr. 13, 1988, Ser. No. 180,899

Claims priority, application Japan, Apr. 13, 1987, 62-90225; Apr. 13, 1987, 62-90227; Apr. 13, 1987, 62-90238

Int. Cl.⁴ H01B 1/06

U.S. Cl. 252-512



1. A conductor composition comprising an inorganic component and a vehicle, wherein said inorganic component comprises 85 to 95 wt. % of CuO and 15 to 5 wt. % of Cu.

4,877,556

CLEANING COMPOSITIONS CONTAINING AN ALCOHOL AND FATTY ACID ESTER AND THEIR USE IN THE PRETREATMENT OF FABRICS

Heinz-Matthias Wilsberg, Cologne, and Rolf Pacht, Haan, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Düsseldorf, Fed. Rep. of Germany

Continuation of Ser. No. 80,118, Jul. 31, 1987, abandoned. This application Nov. 15, 1988, Ser. No. 274,634

Claims priority, application Fed. Rep. of Germany, Aug. 2, 1986, 3626224

Int. Cl.⁴ C11D 1/44, 1/875, 3/43

U.S. Cl. 252-544

10 Claims

1. A cleaning composition consisting essentially of
 - (a) from about 2 to about 30% by weight of at least one C₁₀-C₂₀ fatty alcohol and/or oxoalcohol wherein the fatty alcohol and oxoalcohol contain from 5 to 10 moles of ethylene oxide,
 - (b) from about 10 to about 90% by weight of at least one fatty acid ester selected from the group consisting of isopropyl myristate, isopropyl palmitate, isopropyl stearate, oleyl oleate, hexyl laurate, di-n-butyladipate, caprylic or capric acid ester of saturated C₁₂-C₁₈ fatty alcohols, esters of branched-chain C₈-C₁₂ fatty acids with C₁₄-C₂₀ fatty alcohols, decyl oleate, isooctyl stearate, glycerol trioleate, and i-butyl oleate,
 - (c) from about 1 to about 50% by weight of a monohydric C₁-C₄ alcohol,
 - (d) from about 0.5 to about 50% by weight of water,
 - (e) an aliphatic straight-chain and/or branched-chain liquid C₁₀-C₄₀ hydrocarbon or mixtures of such hydrocarbons, present in an amount of up to 90% by weight of component (b), and (f) from about 2 to about 10% of either
 - (i) at least one C₁₀-C₂₀ fatty alcohol and/or oxoalcohol wherein the fatty alcohol and oxoalcohol contain from 1 to 4 moles of ethylene oxide,
 - (ii) at least one C₁₀-C₂₀ fatty amine containing from 1 to 4 moles of ethylene oxide, or
 - (iii) a mixture of (i) and (ii).

4,877,557

LUBRICATING OIL COMPOSITION

Ryosuke Kaneshige, and Kiya Mizai, both of Ichihara, Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Feb. 11, 1988, Ser. No. 155,076

Claims priority, application Japan, Feb. 12, 1987, 62-28067

Int. Cl.⁴ C10M 161/00

U.S. Cl. 252-56 S

20 Claims

1. A lubricating oil composition excellent in compatibility, which comprises, as indispensable components, (A) 100 parts by weight of a synthetic hydrocarbon lubricating oil, (B) 0.1 to 20 parts by weight of at least one member selected from the group consisting of oiliness agents and extreme pressure agents and (C) 0.8 to 200 parts by weight of a liquid modified ethylene/α-olefin random copolymer, which is formed by graft-bonding an unsaturated carboxylic acid or a derivative thereof to an ethylene/α-olefin random copolymer, in which (i) the ethylene content in the unmodified ethylene/α-olefin random copolymer is 30 to 75 mole %, (ii) the grafting ratio of the unsaturated carboxylic acid or the derivative thereof is 0.2 to 50 parts by weight per 100 parts by weight of the unmodified ethylene/α-olefin random copolymer and (iii) the intrinsic viscosity as measured in decalin at 135° C. is in the range of from 0.01 to 0.3 dl/g and the molecular weight distribution (Mw/Mn) determined by gel permeation chromatography is not larger than 4.

4,877,558

METHOD OF TREATING RADIOACTIVE ION-EXCHANGE RESINS BY OXIDATIVE DECOMPOSITION

Takayuki Morioka; Nobuyuki Motoyama; Hiroshi Hoshikawa; Takeo Takahashi; Sizuo Suzuki; Teyoshi Ishikawa; Takanori Toyoshi, and Toshio Ueda, all of Kanagawa, Japan, assignors to Fuji Electric Co., Ltd., Kawasaki, Japan

Filed Apr. 29, 1987, Ser. No. 43,723

Claims priority, application Japan, Aug. 20, 1986, 61-194192

Int. Cl.⁴ G21F 9/00; C02F 1/72, 1/68

U.S. Cl. 252-626

6 Claims



1. A method of oxidatively decomposing a radioactive ion-exchange resin containing an anion-exchange resin with hydrogen peroxide used as an oxidizing agent in the presence of iron and copper ions used as catalysts, wherein the weight ratio of hydrogen peroxide to the ion-exchange resin, that is, the ratio of the net weight of hydrogen peroxide of the dry weight of the ion-exchange resin containing an anion-exchange resin, is no higher than 17 and citric acid ions are preliminarily adsorbed on the radioactive ion-exchange resin before it is subjected to decomposition treatment or citric acid ions are co-present with the radioactive ion-exchange resin in the oxidatively decomposing system.

4,877,559

NEW PROCESS FOR THE PREPARATION OF ALPHA-6-DEOXY-5-HYDROXYTETRACYCLINE

Philip R. Page, Parede, and Ivan Villax, Lisboa, both of Portugal, assignors to Plurichenne Anstalt, Liechtenstein, Portugal

Division of Ser. No. 732,952, May 13, 1985, which is a continuation-in-part of Ser. No. 458,068, Jan. 14, 1983, Pat. No. 4,550,096. This application Oct. 27, 1986, Ser. No. 925,109

Claims priority, application Portugal, Jan. 19, 1982, 74,303; Dec. 30, 1982, 76,061; Dec. 28, 1984, 79,774

Int. Cl.⁴ C07C 103/19

U.S. Cl. 552-204

16 Claims

1. A new improved homogeneous hydrogenation process to prepare α-6-deoxy-5-hydroxytetracycline in high yield and purity from a 6-demethyl-6-deoxy-6-methylene-5-hydroxytetracycline acid addition salt in the presence or absence of a tertiary phosphine by stereospecific catalytic hydrogenation, characterized in that the catalyst is a new tertiary phosphinehydrazino-rhodium complex obtained by reacting a rhodium salt or a complex with a hydrazine or salt thereof, at a pressure of 1 to 10 kg/cm² and a temperature from 20° C. to 95° C. in the presence of a solvent inert in the reaction, and subsequently the pure α-6-deoxy-5-hydroxytetracycline formed is recovered directly from the reaction mixture as crystalline p-toluenesulphonate by addition of an excess of p-toluenesulphonic acid.

4,877,560

CARBURETOR AND VALVE MECHANISM

Brian P. Kenny, and Roger A. Bowles, both of Tralee, Ireland, assignors to Tillotson Ltd., Tralee, Ireland

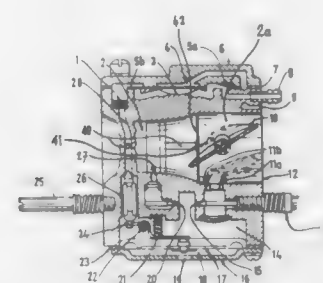
Filed Apr. 14, 1988, Ser. No. 181,567

Claims priority, application Ireland, Apr. 14, 1987, 975/87; Apr. 14, 1987, 976/87

Int. Cl.⁴ F02M 1/16

U.S. Cl. 261-35

14 Claims



1. A carburetor comprising a main body portion defining a carburetor mixing passage comprising a venturi and a throttle bore and having an air intake side and an engine outlet side; a fuel pump; a fuel inlet supply channel for conveying fuel from the fuel pump to the carburetor mixing passage; a throttle shutter mounted within the carburetor mixing passage between the air intake side and the engine outlet side; a metering chamber for supplying fuel from the fuel pump into the carburetor mixing passage via a main discharge port and at least one idle discharge port, the main discharge port opening into the carburetor mixing passage on the air intake side of the throttle shutter; a starting fuel supply passage having an inlet port and an outlet port wherein said inlet port is in direct fluid communication with the supply channel and said outlet port is in direct fluid communication with the carburetor mixing passage and said inlet port is in direct fluid communication with said outlet port; manual valve means for selectively opening and closing the starting fuel supply passage such that when the throttle shutter is in a partially open position and the starting fuel supply passage is open, the fuel pump causes fuel to be injected through the starting fuel supply passage into the carburetor mixing passage, said manual valve means mounted directly in said carburetor main body wherein the means for selectively opening and closing the starting fuel supply passage comprises

4,877,561

METHOD OF PRODUCING LIPOSOME

Katsumi Iga, Suita; Naoru Hamaguchi, and Yasuaki Ogawa, both of Ibaraki, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Apr. 2, 1987, Ser. No. 33,498

Claims priority, application Japan, Apr. 2, 1986, 61-76102

Int. Cl.⁴ A61K 9/66, 37/22, 45/05; B01J 13/02

U.S. Cl. 264-4.3

13 Claims

1. A method of producing liposomes with increased drug trap ratio, which comprises (1) providing a dispersion containing a drug and liposomes prepared from a phospholipid, (2) adding an organic solvent having a boiling point not higher than 100° C. to the dispersion to cause gel formation, and then (3) removing said organic solvent by evaporation to reconstitute liposomes.

4,877,562

MOLDING OF COMPOSITE PLASTICS PRODUCTS

Keith Andrew Wilson, Wymington Nr. Rushden, and Ronald Ian Kliene, Pavenham, both of England, assignors to The Victorian Company PLC, Hitchin and Tecron Industries Limited, Pavenham, both of England

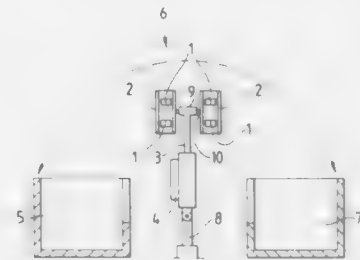
Filed May 8, 1987, Ser. No. 47,669

Claims priority, application United Kingdom, May 10, 1986, 86T1470

Int. Cl.⁴ B29C 41/04, 71/02, 71/04

U.S. Cl. 264-22

3 Claims



1. A method of comprising a composite product having a welded thermoset portion, comprising: rotomolding a mixture of crosslinkable polymer and a catalyst in a mold under conditions insufficient to cause significant crosslinking of the polymer, wherein the polymer remains thermoplastic in nature; cooling the mold and subsequently withdrawing a molded thermoplastic article therefrom; providing a second thermoplastic article; welding the molded thermoplastic article to the second thermoplastic article; and exposing the welded composite product to crosslinking conditions to convert a portion of the material from a thermoplastic material to a thermoset material.

4,877,563

PRODUCTION OF FOAMED POLYMER STRUCTURES
H. Eugene Broemmeisiek, Baton Rouge, La.; Raymond Lee, Elk Grove Village, Ill., and Carroll W. Lanier, Baker, La., assignors to Ethyl Corporation, Richmond, Va.
Continuation of Ser. No. 209,019, Jan. 20, 1988, abandoned.
This application Oct. 3, 1988, Ser. No. 251,797

Int. Cl.⁴ B29C 35/00

U.S. Cl. 264—26 51 Claims

1. In a method of producing a foamed polymer structure in which a body of polyimide precursor is exposed to microwave radiation of intensity sufficient to cause the development of a foamed polymer structure through the generation and evolution of gaseous material within the body of the precursor, the improvement which comprises directing the microwave radiation upon the top, sides and ends of said body of polyimide precursor and of the foam structure as it is developing therefrom, but curtailing the extent to which radiation impinges upwardly into the bottom of said body and said foam structure by maintaining a microwave radiation curtailing shield in close proximity to the bottom of said body.

4,877,564

METHOD AND APPARATUS FOR MEASURING AND CONTROLLING BLOW-UP OF A FOAM SHEET IN A THERMOFORMER OVEN

Jonathan Gross, Canandaigua, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jul. 25, 1988, Ser. No. 223,981

Int. Cl.⁴ B29C 67/22, 51/08, 51/46

U.S. Cl. 264—40.6 8 Claims



1. A method of measuring and controlling foam plastic sheet blow-up by regulating the operation of a thermoformer oven responsive to measuring of the thickness of a continuous sheet of a thermoformable foam plastic material which is conveyed through said thermoformer oven towards a thermoforming installation; comprising:

- sensing the sheet thickness of the thermoformable material at least at one location within a forming station of said thermoforming installation;
- and regulating the temperatures within said thermoformer oven in response to the blow-up in the sheet thickness sensed in said forming station by automatically varying the operation of the thermoformer oven for maintaining the temperatures ranges in said oven so as to thereby obtain a requisite blow-up of the material received in the forming station from said oven.

4,877,565

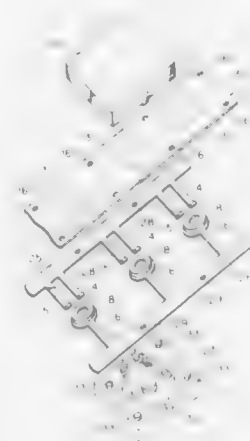
METHOD OF MANUFACTURING CIRCUIT COMPONENT SUCH AS STATOR FOR VARIABLE RESISTOR

Hiroji Tani; Tohru Kasanami, and Tsutomu Yokoi, all of Kyoto, Japan, assignors to Murata Manufacturing Co., Ltd., Japan
Filed Jun. 20, 1988, Ser. No. 209,290

Claims priority, application Japan, Jun. 19, 1987, 62-153637; Jun. 20, 1987, 62-154195

Int. Cl.⁴ B29C 45/14

U.S. Cl. 264—105 11 Claims



1. A method of manufacturing a circuit component comprising a substrate and a film electrical element provided on the surface of said substrate, said method comprising:

- a step of preparing a first element for providing one of a substrate and a film electrical element in a solid state;
- a step of treating the surface of said first element with a silane coupling agent;
- a step of preparing a second element for providing the other one of said substrate and said film electrical element in a fluid state;
- a step of applying said second element, being in a fluid state, on the surface of said first element being treated with said silane coupling agent; and
- a step of hardening said second element in a state being in contact with the surface of said first element.

9. A method of manufacturing a stator, comprising a substrate of resin and a resistor film provided on the surface of said substrate, for a variable resistor, said method comprising:

- a step of preparing a heat resistant film;
- a step of providing a resistor film on said heat resistant film;
- a step of obtaining a transfer sheet by treating said resistor film provided on said heat resistant film with a silane coupling agent;
- a step of preparing a forming die having a cavity for forming a substrate;
- a step of locating said transfer sheet in said forming die to expose at least a part of said resistor film in said cavity;
- a step of introducing resin into said cavity to form a substrate joined with said at least a part of said resistor film; and
- a step of separating said heat resistant film from said substrate to leave said resistor film.

4,877,566

NON-TOXIC RUBBER-BASED COMPOSITION AND METHOD FOR MAKING THE RUBBER BASED COMPOSITION

Tongil Cha, Seoul, Rep. of Korea, assignor to Pop-Limited, Georgetown, Cayman Islands

Filed Apr. 4, 1985, Ser. No. 719,701

Int. Cl.⁴ B29C 59/00

U.S. Cl. 264—118 1 Claim

1. A process for manufacturing a sticky, non-toxic rubber-based toy which comprises the steps of: grinding styrene butadiene rubber into particles having a diameter of less than 0.5 millimeters, adding an oil selected from the group consisting of paraffin and naphthene oils; heating said oil and rubber to a temperature of 50° to 60° C.; mixing said oil and rubber for from 13 to 15 minutes so that said oil becomes absorbed by said rubber; adding ester gum, calcium carbonate and a coloring agent to said rubber and oil mixture, and injection molding said rubber at a pressure of from about 100 to about 130 psi at from about 160° to about 180° C. to produce a sticky, rubber-based toy.

4,877,568

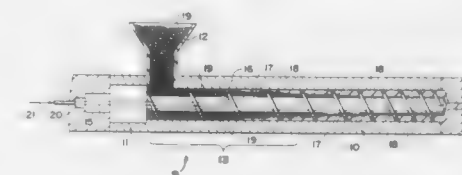
PREPARATION OF PLASTIC EXTRUDATE CONTAINING AN ADDITIVE

Robert C. Austin, 1149 Romaine Cir. East, Jacksonville, Fla. 32215

Filed May 18, 1988, Ser. No. 195,255

Int. Cl.⁴ B29C 47/10

U.S. Cl. 264—211.21 25 Claims



1. A process for incorporating an additive into a molten plastic mass which comprises introducing granular thermoplastic material into a screw extruder, introducing a liquid additive material into the unmelted granular material substantially at the root of the screw downstream of the location of introducing granular thermoplastic material into the screw extruder, and recovering a stream of molten thermoplastic with the additive material intimately dispersed therein.

4,877,569

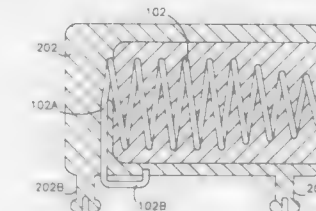
METHOD OF MAKING A ONE-PIECE INJECTION MOLDED BATTERY CONTACT ASSEMBLY

Glenn F. Urbish, Coral Springs; William B. Mullen, III, Boca Raton, and Charles W. Mooney, Lake Worth, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 6, 1988, Ser. No. 203,037

Int. Cl.⁴ B29C 33/52, 39/10

U.S. Cl. 264—221 2 Claims



1. A process for manufacturing a battery contact assembly, comprising the steps of:

- providing a battery contact;
- molding a plastic form around said battery contact, said plastic form being soluble in a solvent, a portion of said battery contact projecting from said plastic form;
- molding a housing around said form, said housing being insoluble in said solvent, said portion of said battery contact being embedded into said housing; and
- dissolving said form in said solvent.

4,877,570

METHOD FOR CONTINUOUSLY CRIMPING THERMOPLASTIC FILAMENTS

Werner Nabulon, Rüdinger, Switzerland, assignor to Rieter Machine Works Ltd., Winterthur, Switzerland

Filed Oct. 3, 1988, Ser. No. 251,817

Claims priority, application Switzerland, Oct. 5, 1987, 88M74/W7

Int. Cl.⁴ D02G 1/00

U.S. Cl. 264—282 9 Claims

1. A method of continuously crimping thermoplastic filaments of a filament bundle, comprising the steps of:

4,877,567

METHOD FOR MANUFACTURING AN ELECTRICALLY INSULATING FORMED CHANNEL MEMBER

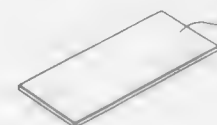
Yasuji Yoshizumi, and Yoshiyuki Matsuno, both of Aiko, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Feb. 26, 1988, Ser. No. 161,027

Claims priority, application Japan, Mar. 2, 1987, 62-47304

Int. Cl.⁴ B29C 53/04

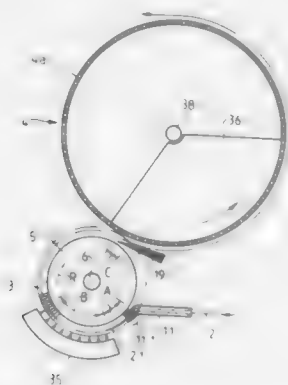
U.S. Cl. 264—153 5 Claims



1. A method for manufacturing an electrically insulating formed channel member for use in electrically insulating an inner corner of a substantially rectangular pancake coil, said channel member comprising a channel portion including a web section, flange sections transversely extending from said web sections and projection portions extending outwardly from said flange sections, said channel member being bent to conform to the inner corner of the rectangular pancake coil with said web located at the inner side of the inner corner, the method comprising:

- preparing a unitary sheet of an electrically insulating press board capable of being press formed;
- cutting and removing a portion of said press board to form projection portions along edges of the press board to relieve tensile stresses in said flange sections during press forming of the channel member; and
- press forming said press board to form a formed channel member including said channel portion and said projection portion and bent to conform to the inner corner of the rectangular pancake coil with said web located at the inner side of the inner corner with the projection portions disposed transversely to said web.

applying a jet of a heated medium to a filament bundle; introducing the filament bundle by means of the jet of the heated medium through a jet nozzle into a stuffing chamber of elongate curvature moving with a predetermined circumferential velocity, the filament bundle being introduced into the stuffing chamber substantially tangentially with respect to said elongate curvature of said stuffing



chamber and at a velocity which is greater than the predetermined circumferential velocity of the stuffing chamber; and positively retaining the filament bundle in elevated position within the stuffing chamber such that the heated medium can escape from all sides of the filament bundle located in the stuffing chamber.

4,877,571

PROCESS FOR DEEP DRAWING COMPOSITE THERMOPLASTIC FOIL WITH A PVDC LAYER

Hans Reifenhäuser, Troisdorf, Fed. Rep. of Germany, assignor to Reifenhäuser GmbH & Co. Maschinenfabrik, Troisdorf, Fed. Rep. of Germany

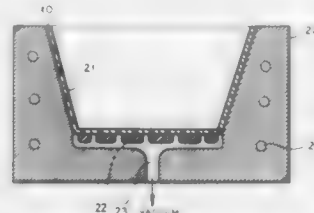
Filed Nov. 4, 1987, Ser. No. 117,520

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1986, 3637744

Int. Cl.⁴ B29C 51/10, 51/14

U.S. Cl. 264—512

5 Claims



1. A process for making a plastic container in which a deep drawable composite thermoplastic foil with a PVDC layer is subjected to a deep drawing process in a mold at a definite temperature and said plastic container is formed by said deep drawing process, said process comprising the steps of:

- heating said composite thermoplastic foil to a temperature above the crystallization temperature of said PVDC layer laminated thereto, said temperature of heating being over 130° C., and to disrupt the crystal structure of said PVDC layer and reduce the degree of crystallization thereof by at least 50%;
- immediately thereafter quenching said composite thermoplastic foil to a temperature below 50° C.; and
- thereafter deep drawing said foil upon the termination of the step (b), said quenching and deep drawing steps being effected in a time interval from 15 to 300 seconds.

4,877,572 PROCESS FOR THE PRODUCTION OF PBT CARPET YARN

Peter G. Clarke, Bad Homburg, Great Britain; Ulrich Mirwaldt, Offenbach/Main, and Dietmar Wandel, Hanau, both of Fed. Rep. of Germany, assignors to Davy McKee Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Nov. 14, 1988, Ser. No. 271,437

Int. Cl.⁴ D01D 5/16; D01F 6/62

U.S. Cl. 264—555

4 Claims

1. A process for the production of polybutyleneterephthalate carpet yarn having a bulk level of at least 15% with thread development at 120° C., and a bulkiness defined as the difference of the degree of bulk with thread development at 120° C. to that at room temperature, of at least 9% absolute, by means of an integrated spinning-draw texturing process comprising:

- melt spinning polybutyleneterephthalate having an intrinsic viscosity of 0.9 to 1.2, and a water content of not more than 50 ppm by weight said spinning being carried out at a temperature of 245° to 270° C., and a spinning draw down of 1:20 to 1:100;
- cooling the filaments in a quenching shaft by means of turbulence-free air flowing perpendicularly to the direction of the filaments at a speed of 0.4 to 0.8 m/sec.;
- coating the cooled filaments with an oil layer in the amount of at least 0.5% relative to the filament weight by means of an oil in water emulsion;
- drawing the filaments between two heated roller systems, the temperature of the first system lying in the range of 30° C. above or below the glass transition temperature, and that of the second system being at least 100° C. higher, the stretching ratio being high enough that the break elongation of the finished filaments is not in excess of 45%;
- feeding the drawn filaments from the second roller system at a speed of at least 1800 m/min. to a texturing unit, in which the filaments are blown and deformed in three dimensions with air having a temperature at least as high as that of said second roller system;
- discharging the filaments from the texturing unit to a cooling unit for a residence time sufficient to cool the filaments below the glass transition temperature;
- removing the filaments from said cooling unit by means of an unheated, third roller system, operating at a speed of at least 10% lower than that of said second roller system;
- controlling the process conditions of stage (a) to (g) in such a manner that the intrinsic viscosity in stage (j) is at maximum 5% lower than that in stage (a);
- intermingling the filaments by means of an air-blowing nozzle at an air pressure sufficient to attain an entangling node number of at least 12 per meter; and
- winding up the filaments.

4,877,573

SUBSTRATE HOLDER FOR WAFERS DURING MBE GROWTH

Boo Nilsson, Hoffman Estates, Ill., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Continuation of Ser. No. 39,757, Apr. 16, 1987, abandoned, which is a continuation of Ser. No. 811,064, Dec. 19, 1985, abandoned. This application Nov. 7, 1988, Ser. No. 270,409

Int. Cl.⁴ H01L 21/05, 21/84; C30B 25/08, 23/06

U.S. Cl. 156—610

21 Claims

1. Apparatus for holding a semi-conductor wafer during heating by radiation comprising:

- an apertured support means defining spaced-apart faces for receiving a generally-planar backplate and a wafer in spaced-apart substantially parallel relationship to define an enclosed volume through which radiation can pass;
- said backplate being fabricated of material selected from

the group consisting of gallium phosphide, pyrolytic boron nitride and sapphire; and



(c) means for retaining said backplate and said wafer in said support means.

4,877,574

METHOD OF AND APPARATUS FOR CONTROLLING POWER OF NATURAL CIRCULATION REACTOR

Hiroaki Suzuki, Hitachi; Yoshiyuki Kataoka, Ibaraki; Michio Murase, Mito; Kotaro Inoue; Isao Sumida, both of Ibaraki; Shozo Yamanari, Hitachi; Masaki Matsumoto, Katsuta; Satoshi Miura, and Koji Hashimoto, both of Hitachi, all of Japan, assignors to Hitachi, Ltd. and Hitachi Engineering Co., Ltd., both of Tokyo, Japan

Filed Mar. 2, 1988, Ser. No. 162,987

Claims priority, application Japan, Mar. 13, 1987, 62-56629

Int. Cl.⁴ B21C 7/00

U.S. Cl. 376—216

10 Claims



1. In a method of controlling the power of a natural circulation reactor having a reactor pressure vessel, a cylindrical shroud disposed within said reactor pressure vessel to surround a reactor core and to extend to a position above said reactor core, and a coolant descending passage defined between said reactor pressure vessel and said shroud for allowing coolant discharged from said reactor core to be returned to said reactor core, the improvement comprising the steps of:

- adjusting the liquid level of said coolant in said coolant descending passage on the basis of a reactor power request signal at a position below the liquid level of coolant in said shroud, and
- providing control over reactor power so that said reactor power may reach a predetermined reactor power by adjusting said liquid level of said coolant in said coolant descending passage.

4,877,575 CORE REACTIVITY VALIDATION COMPUTER AND METHOD

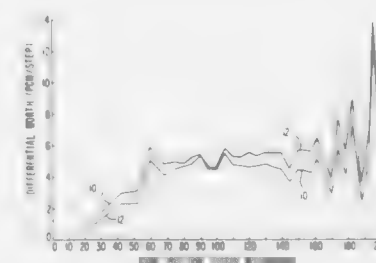
Albert J. Impink, Jr., Murrysville; Francis L. Langford, Jr., Forest Hills; Louis R. Grobmyer, North Huntingdon, and William K. Lainetti, Salem Township, Westmoreland County, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 19, 1988, Ser. No. 145,177

Int. Cl.⁴ G21C 7/36

U.S. Cl. 376—216

8 Claims



1. A method of core reactivity validation, comprising the steps of:

- determining at least two core reactivities using at least two neutron detectors; and
- comparing the core reactivities and indicating that the reactivities are valid when the reactivities are substantially coincident.

4,877,576

LOW DENSITY HIGH STRENGTH ALLOYS OF NB-TI-AL FOR USE AT HIGH TEMPERATURES

Melvin R. Jackson, 2208 Niskayuna Dr., Schenectady, N.Y. 12309

Filed Jun. 6, 1988, Ser. No. 202,357

Int. Cl.⁴ C22C 29/00

U.S. Cl. 420—426

3 Claims



1. As a composition of matter, an alloy consisting essentially of niobium, titanium and aluminum in the approximate concentration in atom percent as follows: titanium 31 to 48, aluminum 8 to 21, the balance being essentially niobium.

4,877,577

COPPER ALLOY LEAD FRAME MATERIAL FOR SEMICONDUCTOR DEVICES

Rensel Futatsuka; Syun-ichi Chiba, and Tadao Sakakibara, all of Japan, assignors to Mitsubishi Shindoh Co., Ltd., Tokyo, Japan

Filed Oct. 12, 1988, Ser. No. 256,747

Claims priority, application Japan, Apr. 25, 1988, 63-101748
Int. Cl.⁴ C22C 9/02

U.S. Cl. 420—473

3 Claims

1. A copper alloy material for lead frames for semiconductor devices, which consists essentially of:

Ni: 0.5–2 percent by weight;
Sn: 1.2–2.5 percent by weight;
Si: 0.05–0.5 percent by weight;
Zn: 0.1–1 percent by weight;
Ca: 0.001–0.01 percent by weight;
Mg: 0.001–0.05 percent by weight;
Pb: 0.001–0.01 percent by weight; and
Cu and inevitable impurities: the balance.

4,877,578

CORROSION INHIBITORS

Michael J. Zetmeisl, and William F. Fahey, both of St. Louis, Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Filed Mar. 29, 1985, Ser. No. 717,916

Int. Cl.⁴ C23F 11/12, 11/14

U.S. Cl. 422—14

19 Claims

1. Process of minimizing hydrocarbon carryunder while inhibiting corrosion in a chemical industry process water system comprising adding thereto an effective corrosion inhibiting amount of the reaction product of an alkylenepolyamine and formaldehyde, wherein said water system is in an oil refinery.

4,877,579

MULTILAYER DEVICE FOR DETECTING BILIRUBIN

Kenichiro Yazawa; Osamu Seshimoto; Masao Kitajima, and Asaji Kondo, all of Saitama, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

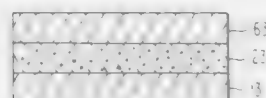
Continuation of Ser. No. 842,748, Mar. 19, 1986, abandoned, which is a continuation of Ser. No. 542,569, Oct. 19, 1983, Pat. No. 4,612,290, which is a continuation of Ser. No. 294,278, Aug. 19, 1981, abandoned. This application May 23, 1988, Ser. No. 198,594

Claims priority, application Japan, Aug. 19, 1980, 55-112998
The portion of the term of this patent subsequent to Sep. 16, 2003, has been disclaimed.

Int. Cl.⁴ G01N 33/72

U.S. Cl. 422—56

20 Claims



13. A device for quantitatively determining the amount of bilirubin in an aqueous liquid sample comprising:

an indicator layer which includes a hydrophobic bilirubin extracting composition, wherein the bilirubin extracting composition comprises a hydrophobic oil-soluble primary, secondary or tertiary amine capable of extracting bilirubin and an extraction aid, said bilirubin extracting composition being hydrophobic to such an extent that it forms at least an emulsion when it is dispersed in neutral water and wherein said device has a single layer containing said bilirubin extracting composition, there being present a disassociating agent for bilirubin in a layer above the indicator layer in an amount sufficient to completely dissociate all bilirubin in a sample and wherein the device includes a

light-transmitting, water-impermeable support with the indicator layer overlaying the support and being in direct contact therewith.

4,877,580

ASSAY KIT INCLUDING AN ANALYTE TEST STRIP AND A COLOR COMPARATOR

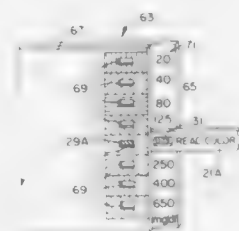
Jack L. Aronowitz, Delray Beach, and Louis Terminiello, Sunrise, both of Fla., assignors to Technimed Corporation, Fort Lauderdale, Fla.

Filed Feb. 9, 1988, Ser. No. 153,967

Int. Cl.⁴ G01N 1/48

U.S. Cl. 422—58

15 Claims



15. A test means comprising:

(a) a test strip which includes an inert support and a sample receptive medium comprising a dry chemistry reagent system specific for an analyte of interest which upon interaction with said analyte produces a characteristic color indicative of an assay value of said analyte of interest, said receptive medium being positioned on said test strip so as to be bordered on one or more sides by said inert support;

(b) a container and a label wrapped around and adhered to the outside surface of said container, said label having a distal panel on one side thereof overlapping a proximal panel on the other side thereof, and an adhesive-free space therebetween;

(c) a color comparator, comprising said overlapping distal panel and said overlapped proximal panel, said overlapping distal panel including a plurality of different color fields representing a range of assay values physically arranged in a predetermined ordered succession for comparison with the color of the sample receptive medium of the test strip, each successive field connoting a different numerical assay value, each of said color fields having an aperture which permits viewing therethrough of at least a portion of a reaction zone of the sample receptive medium after said analyte has reacted to produce a color therein;

(d) means for positioning said test strip between said distal panel and said proximal panel and relative to the aperture of each of said color fields so as to mask from view the inert support which borders the reaction zone of the sample receptive medium.

4,877,581

CATALYST FOR DEWAXING HYDROCARBON FEEDSTOCK

Nai Y. Chen, Titusville, N.J., and Dennis E. Walsh, Richboro, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 1, 1988, Ser. No. 239,257

Int. Cl.⁴ C07C 5/13

U.S. Cl. 585—751

15 Claims

1. A paraffin conversion process for hydroisomerizing a nitrogen and wax-containing hydrocarbon feedstock comprising:

contacting said hydrocarbon feedstock with a catalyst including a ZSM-11 zeolite which has been steamed to achieve an alpha from about 10 to about 50, in combination with a Group VIII metal hydrogenation-dehy-

drogenation component selected from the group consisting of platinum and palladium at a temperature of about 400° F. to about 850° F. and at a pressure of from about 200 to about 2000 psig.

4,877,582

CHEMICAL SENSOR DEVICE WITH FIELD EFFECT TRANSISTOR

Shohel Oda; Osamu Seshimoto; Tohru Sueyoshi, and Hiroyuki Amano, all of Saitama, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

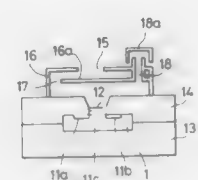
Filed Aug. 20, 1987, Ser. No. 87,508

Claims priority, application Japan, Aug. 20, 1986, 61-194973

Int. Cl.⁴ G01N 27/00

U.S. Cl. 422—68

14 Claims



1. In a chemical sensor device for analyzing a specific substance in a liquid, comprising a chemical receptor for chemically reacting said specific substance in a sample liquid and a field effect transistor connected to said chemical receptor for converting the chemical reaction into a measurable electrical signal, the improvement which comprises:

said field effect transistor connected to said chemical receptor being installed in a housing having light-shielding properties, said housing having an opening portion which receives and introduces to said chemical receptor the sample liquid and a light-shielding means which substantially prevents external light from reaching said field effect transistor but permits the sample liquid to reach said chemical receptor; said light-shielding means comprising a liquid-permeable and light-absorptive porous member for covering said opening portion; and, channel means for conveying the sample to said chemical receptor.

4,877,583

FLUORESCENT ANALYZER

Harufumi Miwa, Tokyo; Minoru Kashiwada, and Ikuro Goto, both of Kawaguchi, all of Japan, assignors to Ajinomoto Company, Inc., Tokyo, Japan

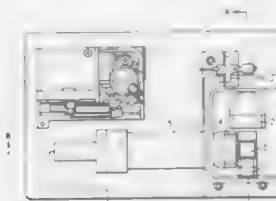
Filed Mar. 29, 1988, Ser. No. 174,818

Claims priority, application Japan, Apr. 1, 1987, 62-77486

Int. Cl.⁴ G01N 33/16, 21/00

U.S. Cl. 422—73

1 Claim



1. A fluorescent analyzer comprising:
a light source for irradiating a sample with light;
a first wave selector for passing a first predetermined wave-

length of light emitted from the light source in a path to said sample in a first direction;

a sample cell for holding said sample in said light path;

a second wave selector arranged in a second direction perpendicular to said first direction passing light of a second predetermined wavelength emitted in said second direction from the sample upon irradiation by light passed by said first wave selector;

a first light detector for producing a first output signal indicative of the amount of light of said second predetermined wavelength passed by said second wave selector;

a second light detector for producing a second output signal indicative of the amount of light of said first predetermined wavelength passing through the sample in said first direction;

a correction circuit for performing a predetermined correction of an amplitude of the first output signal based on an amplitude of the second output signal to produce a correction measurement signal, said correction circuit performing said correction based on the following relationship:

$$Xs' = Xs - [k(Ys - Y1)]$$

where

Xs' = the corrected measurement signal,

Xs = the first output signal obtained from the sample,

Ys = the second output signal obtained from the sample,

Y1 = a predetermined constant, and

k = a predetermined constant; and

an indication means for indicating the corrected measurement signal.

4,877,584

TEMPERATURE PROGRAMMED SPECTROSCOPY TECHNIQUES

John T. Yates, Jr., 8602 Irvington Ave., Bethesda, Md. 20817; Gregory L. Griffin, Dept. of Chemical Engr. & Materials Science, University of Minnesota, Minneapolis, Minn. 55455, and Maya Kiskinova, Institut für Grenzflächenforschung und Vakuum Physik, KFA Jülich, Postfach 1913, D-5170, Jülich 1, Fed. Rep. of Germany

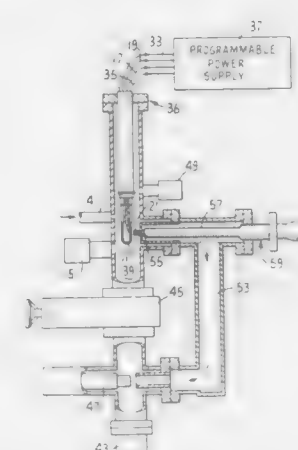
Division of Ser. No. 416,666, Sep. 10, 1982, Pat. No. 4,663,297.

This application Apr. 22, 1987, Ser. No. 41,594

Int. Cl.⁴ G01N 25/00, 30/00

U.S. Cl. 422—88

3 Claims



1. Apparatus for analyzing gaseous reactions on a surface of a quantity of material, comprising:

an enclosed reaction chamber,

means connectable to said chamber for introducing gas thereto,

means connectable to said chamber for controlling pressure of the gas therein,

an electrically resistive filament held within said chamber and adapted to carry a quantity of material thereon, means connecting an electrical potential across said filament for controlling the level of electrical current there-through, whereby heating of said filament and any material carried thereon may be controlled, means including a tube extending from outside said chamber and terminating within said chamber at one end in an orifice positioned adjacent to but spaced apart from said filament for extracting gas from a region of said chamber adjacent said filament, means attached to an area of said filament surface in the vicinity of said tube end orifice for providing an electrical signal that is proportional to temperature of said surface area, whereby the temperature of the surface of a quantity of material carried by said filament adjacent said area may be monitored, and means continuously receiving gas from said gas extracting means at another end of said tube outside of said chamber for analyzing the gas removed from the region adjacent said filament, whereby the product of any gaseous reactions on the surface of the quantity of material carried by said filament in said region may be analyzed.

4,877,585

DILUTION PIPETTE DEVICE

Daniel Perlman, Arlington, Mass., assignor to Brandeis University, Waltham, Mass.

Filed Dec. 9, 1987, Ser. No. 130,406

Int. Cl.⁴ B01L 3/02

U.S. Cl. 422—100

12 Claims



2. A graduated pipette having a known delivery volume, suitable for accurately dispensing both known large and known small volumes of a fluid, wherein said small volume is less than one fourth of the delivery volume of said pipette, said pipette consisting of:

- an unobstructed upper and a lower elongated tube joined together to form a single continuous unit open at both ends, said upper tube having a different internal diameter from said lower tube,
- said upper tube having coarse indicia suitable for accurately dispensing said large volume,
- said lower tube having fine indicia suitable for accurately dispensing said small volume,
- wherein said upper tube comprises a mouthpiece suitable for allowing fluid to be sucked up into said unit, and said lower tube comprises a constricted suitable to allow accurate control of fluid flow said unit, wherein said fluid is accurately from said unit only through said constricted

wherein said upper and lower tubes are detachably secured together by a connector.

4,877,586

SLIDING TEST DEVICE FOR ASSAYS

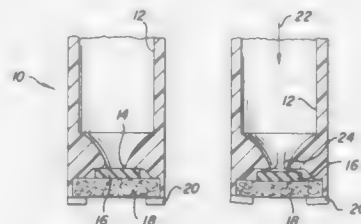
Mark J. Devaney, Jr., and Edward H. Wannenwetsch, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 27, 1988, Ser. No. 224,831

Int. Cl.⁴ B01L 11/00; G01N 31/22

U.S. Cl. 422—101

13 Claims



1. In a test device useful for conducting a reaction, said device comprising (a) a well configured to confine temporarily a liquid sample from a patient admixed with at least one reagent, to provide said reaction, (b) a filter at the bottom of said well with pores effective to pass free, unreacted reagent but not complexed or reacted reagent, and (c) an absorbent material underneath said filter effective to draw off liquid in said well after said reaction,

the improvement wherein said device further includes (d) a non-absorbent pad underneath said filter, adjacent to said absorbent material, and (e) means for moving both (i) said filter and said absorbent material relative to each other and (ii) said filter and said pad relative to each other, between two positions, one in which said filter contacts said non-absorbent pad and the other in which filter contacts said absorbent material.

4,877,587

FLUIDIZED BED POLYMERIZATION REACTORS

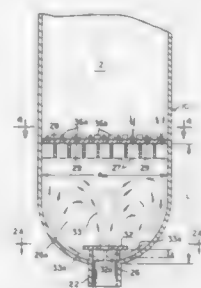
Seung J. Rhee, South Somerville, N.J., and Larry L. Simpson, South Charleston, W. Va., assignors to Union Carbide Chemicals and Plastics Company Inc., Danbury, Conn.

Division of Ser. No. 780,273, Sep. 26, 1985, which is a continuation-in-part of Ser. No. 643,882, Aug. 24, 1984, abandoned. This application Dec. 17, 1987, Ser. No. 134,512

Int. Cl.⁴ B01J 8/20; C08F 2/34

U.S. Cl. 422—135

5 Claims



1. In the operation of a fluidized bed polymerization reactor having distributor plate means positioned below said bed to provide both distribution of fluid and physical support for said bed; entry means at or near the base of said reactor for passage of fluid into said reactor; generally annular fluid flow deflector means including aperture means associated with said entry means and a mixing chamber positioned between said distribu-

tor plate means and said entry means and wherein a fluid stream comprising a gas is continuously introduced into said reactor through said entry means, passed upward through said mixing chamber, through said distributor plate means and through said fluidized bed, the improvement which comprises providing said aperture means with sufficient size to allow passage of the fluidizing medium upwardly therethrough and dividing the entering fluid stream into at least two streams, a first stream flowing upward and outward in a fluid flow path peripherally between said aperture means and the wall of said mixing chamber and a second stream flowing in a central upward fluid flow path through said annular flow deflector means, the combined velocity and orientation of all fluid flow paths being capable of entraining and passing solid particles and liquid out of said mixing chamber through said distributor plate means and into said fluidized bed.

4,877,588

METHOD AND APPARATUS FOR GENERATING OZONE BY CORONA DISCHARGE

Lee C. Ditzler, Diablo; Ronald F. Lemberger, Danville, and Cynthia L. Slezak, Pleasanton, all of Calif., assignors to Trineco, Pleasanton, Calif.

Filed Jan. 17, 1988, Ser. No. 210,469

Int. Cl.⁴ C01B 13/11

U.S. Cl. 422—186.19

7 Claims



1. Apparatus for generating ozone from an oxygen-containing gas:

- an inner cylinder of thermally conductive dielectric material surrounded by an intermediate cylinder of thermally and electrically conductive material to define a first annular space, said intermediate cylinder surrounded by an external cylinder to define a second annular space;
- a passage at one end of said inner cylinder communicating the interior thereof with said first annular space, whereby gas emerging from said inner cylinder is directed into said first annular space to flow therethrough countercurrent to said gas in said inner cylinder;
- a plurality of conductive bands along the interior surface of said dielectric cylinder to define corona discharge regions in said first annular space, said conductive bands spaced apart axially to define corona-free regions therebetween of sufficient axial dimension to permit removal of heat generated in said corona discharge regions by heat exchange through said inner cylinder and said through said intermediate cylinder; and
- means for supplying current to said conductive bands.

4,877,589

NITROGEN FIXATION BY ELECTRIC ARC AND CATALYST

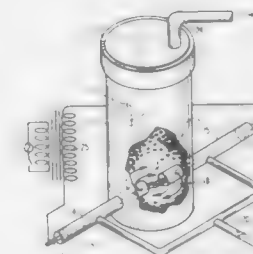
Louis R. O'Hare, 6101 Sequoia Rd., NW., Apt. A-20, Albuquerque, N. Mex. 87120

Filed Sep. 19, 1988, Ser. No. 246,212

Int. Cl.⁴ C01B 21/20

U.S. Cl. 422—186.24

14 Claims



1. A nitrogen fixation system comprising:

- (1) a low frequency, high voltage electric arc production means in the form of two electrodes with electrically insulating, coaxial sleeves, said electrodes being electrically connected to a low frequency, high voltage alternating current transformer, and said electric arc are being capable of raising nitrogen and oxygen to plasma state temperatures and of placing the gases into chemically excited states, and
- (2) an electric arc chamber for contacting a catalyst with arc plasma gases, said chamber being in the form of a cavity which is produced by pressurized streams of reactant gases heated to the plasma state and expanding from within a catalyst bed in a chamber, the inner surface of said cavity being composed of catalyst particles being contacted and impacted by said outward moving plasma state reactant gases, and
- (3) a product gas shielding means for shielding the gas product such as nitric oxide from the destructive effects of ultraviolet light emitted by the arc, said effects being capable of dissociating nitric oxide into nitrogen and oxygen, said shielding means being in the form of catalyst particles compacted by the weight of a vertical column of the catalyst bed above the arc cavity in the catalyst chamber and pressing downward about the cavity to provide a cavity wall of compacted catalyst particles opaque to light but permeable to the flow of gas species, and
- (4) reactant gas transport means in the form of said electrode sleeves, said sleeves being capable of conducting nitrogen and oxygen from inlet ducts to the arc zone through cylindrical channels within said sleeves between the electrode and the inner wall of each sleeve, and
- (5) heat transfer means in the form of gas driven particle turbulence whereby catalyst particles are moved by the reactant gas stream and plasma heat to and from the arc and the chamber walls, and
- (6) reactant gas circulation means capable of producing gas pressure for impelling reactant and product gases through said arc zone and catalyst chamber and of producing such particle displacement as to form said arc cavity and sufficient particle agitation for rapid heat transfer.

4,877,590

PROCESS FOR NITROGEN OXIDES REDUCTION WITH MINIMIZATION OF THE PRODUCTION OF OTHER POLLUTANTS

William R. Epperly, New Canaan; John H. O'Leary, Danbury; James C. Sullivan, Westport, and Barry N. Sprague, West Haven, all of Conn., assignors to Fuel Tech, Inc., Stamford, Conn.

Continuation-in-part of Ser. No. 22,799, Mar. 6, 1987, abandoned, and a continuation-in-part of Ser. No. 50,198, May 14, 1987, Pat. No. 4,780,289, and a continuation-in-part of Ser. No. 108,779, Oct. 14, 1987, abandoned, and a continuation-in-part of Ser. No. 90,962, Aug. 28, 1987, Pat. No. 4,777,024. This application Feb. 29, 1988, Ser. No. 155,864. The portion of the term of this patent subsequent to Oct. 25, 2005, has been disclaimed.

Int. Cl.⁴ C01B 21/00

U.S. Cl. 423—235

41 Claims

1. A process for reducing the concentration of nitrogen oxides in an effluent which is at a temperature below about 1450° F. while minimizing the production of other pollutants, the process comprising:

- determining the condition of the effluent which exists at a location for introduction of a treatment agent;
- effecting a treatment regimen which comprises introducing a treatment agent comprising a hydrocarbon into the effluent to reduce the nitrogen oxides concentration in the effluent under said determined effluent conditions while minimizing the production of other pollutants;
- monitoring the condition of the effluent until a significant alteration in the condition of the effluent is observed;
- adjusting said treatment regimen by varying at least one of the following parameters:
 - dilution and introduction rate of said hydrocarbon treatment agent;
 - composition of said hydrocarbon treatment agent; and
 - relative presence of the components of said hydrocarbon treatment agent,

to effect an adjusted treatment regimen, wherein said adjusted treatment regimen operates under conditions effective to reduce the nitrogen oxides concentration in the effluent under said altered effluent conditions while minimizing the production of other pollutants.

4,877,591

PROCESS FOR THE REDUCTION OF NITROGEN OXIDES IN AN EFFLUENT USING SUGAR

William R. Epperly, New Canaan, and James C. Sullivan, Southport, both of Conn., assignors to Fuel Tech, Inc., Stamford, Conn.

Filed Mar. 13, 1987, Ser. No. 25,350

Int. Cl.⁴ C01B 21/00

U.S. Cl. 423—235

12 Claims

1. A process for the reduction of the concentration of nitrogen oxides in the oxygen-rich effluent from the combustion of a carbonaceous fuel, the process comprising injecting a treatment agent which comprises urea and sugar into an effluent having a temperature of greater than about 1300° F. under conditions effective to reduce the concentration of nitrogen oxides in the effluent.

4,877,592

METHOD OF CATALYTIC CLEANING OF EXHAUST GASES

Jury S. Matros; Viktor A. Chumachenko; Ljudmila J. Zudilina; Alexandr S. Noskov, all of Novosibirsk, and Evgeny S. Bugdan, Novosibirskaya, all of U.S.S.R., assignors to Institut Kataliza Sibirskogo Otdelenia Akademii Nauk SSSR and Spetsialnoe Konstruktorskoe-Tekhnologicheskoe Bjuro Katalizatorov S Optaym Zavodom (Skib Katalizatorov), both of Novosibirsk, U.S.S.R.

PCT No. PCT/SU87/00066, § 371 Date Jun. 2, 1988, § 102(e) Date Jun. 2, 1988, PCT Pub. No. WO88/02660, PCT Pub. Date Apr. 21, 1988

PCT Filed Jun. 2, 1987, Ser. No. 239,956

Claims priority, application U.S.S.R., Oct. 17, 1986, 4131464; Oct. 17, 1986, 4131459

Int. Cl.⁴ B01J 8/00; C10H 23/00; C01B 31/18

U.S. Cl. 423—245.1

2 Claims

1. A method for the reversible flow catalytic oxidation of a gas stream containing organic compositions and/or carbon monoxide which comprises:

- passing the gas stream through a first bed of oxidation catalyst to oxidize at least a portion of the organic composition and/or carbon monoxide;
- mixing the gas stream passing from the first bed of oxidation catalyst so that the difference in temperature between the coldest portion of the gas stream and the hottest portion of the gas stream is not more than 50° C.;
- passing the mixed gas stream through a second bed of oxidation catalyst to further oxidize the oxidizable materials in the gas stream; and
- reversing the direction of flow of the gas stream wherein the second bed of oxidation catalyst becomes the first bed of oxidation catalyst and wherein the temperature of the catalyst beds is maintained in the range of 350° C. to 750° C.

4,877,593

SYNTHESIS OF CRYSTALLINE ALUMINOPHOSPHATE COMPOSITION

Ernest W. Valyocsk, Yardley, Pa., assignor to Mobil Oil Company, New York, N.Y.

Filed Mar. 10, 1988, Ser. No. 166,586

Int. Cl.⁴ C01B 25/36; B01J 27/18; C10G 0/0

U.S. Cl. 423—306

18 Claims

1. A method for synthesizing a crystalline aluminophosphate composition having crystals exhibiting a characteristic X-ray diffraction pattern as shown in Table I of the specification, which comprises (i) preparing a mixture capable of forming said aluminophosphate, said mixture comprising sources of an oxide of aluminum, an oxide of phosphorus, water and a directing agent (R), and having a composition, in terms of mole ratios, within the following ranges:

P_2O_5/Al_2O_3	0.01 to 20
H_2O/Al_2O_3	2 to 400
H^+/Al_2O_3	0.01 to 30
R/Al_2O_3	0.02 to 20

wherein R is a C₅-C₇ alkyldiamine, (ii) maintaining said mixture under sufficient conditions until crystals of said aluminophosphate are formed and (iii) recovering said crystalline aluminophosphate from step (ii).

4,877,594

PURIFICATION OF PHOSPHORIC ACID

Laurence W. Bierman; Michael L. Lopez, and James E. Perkins, III, all of Pocastello, Id., assignors to J. R. Simplot Co., Pocastello, Id.

Filed Dec. 13, 1988, Ser. No. 283,560

Int. Cl.⁴ C01B 25/16

U.S. Cl. 423—321 S

19 Claims

1. A process for purifying impure phosphoric acid, comprising the steps of:
 furnishing impure phosphoric acid;
 adding to the impure phosphoric acid, to form a modified acid, a modifier selected from the group consisting of a polyphosphate, and
 a cation selected from the group consisting of ammonium ion and an alkali metal ion;
 mixing the modified acid with a mixture of alcohols, the mixture of alcohols including both
 a low molecular weight alcohol selected from the group of alcohols having from 1 to 3 carbon atoms, and mixtures thereof, and
 a high molecular weight alcohol selected from the group of alcohols having from 4 to 12 carbon atoms, and mixtures thereof; and
 separating the mixture of alcohols and prepared acid into two fractions, a first fraction including the high molecular weight alcohol and the phosphate values dissolved therein, and a second fraction including the low molecular weight alcohol and the impurities originally present in the impure phosphoric acid.

4,877,595

METHOD OF COMPRESSING PYROGENICALLY PREPARED SILICIC ACID

Reinhard Klinge, Wassero, and Reinhard Manner, Dörnighelm, both of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Feb. 16, 1988, Ser. No. 155,709

Claims priority, application Fed. Rep. of Germany, Feb. 26, 1987, 3706137; Dec. 10, 1987, 3741846

Int. Cl.⁴ C01B 33/12; C05B 19/00; A01J 21/00; B65B 1/20

U.S. Cl. 423—335

2 Claims

1. A method of compressing pyrogenically prepared silicic acid which comprises rotating a drum having a filter covering on its peripheral surface while the lower surface of the drum is in contact with a body of pyrogenically prepared silica, applying vacuum to the interior of the drum to draw a layer of pyrogenically prepared silica into contact with the peripheral surface of the drum, the layer of pyrogenically prepared silica being lifted from said body as the drum rotates, moving a flexible belt in an orbital path parallel with a substantial portion of the upper portion of the peripheral surface of said drum, compressing said pyrogenically prepared silica between said belt and said drum, and releasing the vacuum to separate the compressed pyrogenically prepared silicic acid from the drum.

4,877,596

PROCESS FOR THE PRODUCTION OF LOW CARBON SILICON

Ingo Schwirtlich; Peter Woditach, and Wolfgang Koch, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 3, 1987, Ser. No. 80,879

Claims priority, application Fed. Rep. of Germany, Aug. 14, 1986, 3627624

Int. Cl.⁴ C01B 33/02

U.S. Cl. 423—348

7 Claims

1. Process for the removal of carbon from molten silicon which comprises first heating the molten silicon in a vessel to temperatures of 1420° to 1900° C. and establishing a temperature gradient of 30 to 400° K in the melt, wherein the temperature gradient is established by cooling the bottom of the vessel

containing the molten silicon to a temperature in the range of 1420° to 1500° C., then removing the melt from the vessel to produce silicon having a carbon content of from 60 to 95 atoms per million silicon atoms.

4,877,597

METHOD FOR PRODUCING AQUEOUS SOLUTIONS OF BASIC POLY ALUMINUM SULPHATE

Dieter Haase, Ste-Catherine, and Nela Spiratos, LaPrairie, both of Canada, assignors to Handy Chemicals Ltd., LaPrairie, Canada

Filed Oct. 25, 1988, Ser. No. 262,320

Int. Cl.⁴ C01F 7/74

U.S. Cl. 423—556

17 Claims

1. A process for the preparation of a basic poly aluminum sulphate solution having the following formula:



in which

n is a positive integer;

A is 1.0;

B ranges from 0.75-2.0;

C ranges from 0.5-1.12; and

E is larger than 4 when the product is in aqueous form, wherein the basicity of said basic poly aluminum sulfate solution is defined as B/3A × 100 and said basicity is 25-66% and wherein

B+2C=3

said process comprising the step of reacting in a one step process an aluminum sulphate solution with an alkali metal aluminate solution under high shear mixing conditions sufficient to produce a reactive Al(OH)₃ gel and to produce a transparent basic poly aluminum sulfate solution and recovering the desired product.

4,877,598

CONTINUOUS PROCESS FOR THE DRY SLAKING OF LIME

Wenzel Von Jordan, Darmstadt; Rolf Draf, Friedrichsdorf; Dieter Gröbe, Worms, and Harald Sauer, Frankfurt, all of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

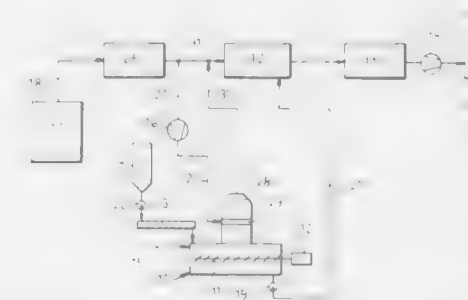
Filed Mar. 3, 1989, Ser. No. 319,435

Claims priority, application Fed. Rep. of Germany, Mar. 3, 1988, 3806708

Int. Cl.⁴ C04B 2/04

U.S. Cl. 423—640

6 Claims



1. A process for the dry slaking of lime, comprising the steps of:

- continuously feeding finely ground lime and only sufficient water to dry slake the continuously fed lime to a slaking vessel and slaking the lime with the water in said vessel to produce a slaked hydrated lime;
- continuously withdrawing said slaked hydrated lime from said vessel;

- (c) evacuating an exhaust gas containing lime dust and water vapor from said vessel; and
- (d) adding to said exhaust gas a hot gas in a direction which is tangential and at a right angle to said exhaust gas, said hot gas being at a temperature and in an amount sufficient to prevent the exhaust gas from contacting the inner surface of the exhaust gas duct and to prevent deposits of calcium hydroxide from said exhaust gas.

4,877,599

DETECTION OF VASCULAR DISEASE WITH LABELLED ANTIBODIES

Robert S. Lees, Brookline, Mass., assignor to New England Deaconess Hospital Corporation, Boston, Mass.
Continuation of Ser. No. 929,012, Nov. 10, 1986, abandoned.
This application Jul. 11, 1988, Ser. No. 220,376
Int. Cl.⁴ A61K 49/02, 49/00; C07K 17/00

U.S. Cl. 424-1.1 17 Claims

1. A conjugated diagnostic reagent having an antibody or fragment thereof with specific affinity for at least one arterial wall component associated with an abnormality of the vascular system, said arterial component being selected from the group consisting of insoluble, cross-linked elastin and insoluble, cross-linked fragments thereof and chondroitin sulfate proteoglycan compounds, a labeling means for labeling said antibody or fragment thereof, and not including porphyrin or derivatives thereof.

4,877,600

LYSINE SALT OF THE GADOLINIUM-DOTA COMPLEX AND ITS DIAGNOSTIC APPLICATIONS

Bruno Bonnemais, Mitry Mory; Jean Lantrea, Saint Mande, and Dominique Meyer, Paris, all of France, assignors to Guerbet S.A., Villepinte, France

PCT No. PCT/FR87/00114, § 371 Date Dec. 7, 1987, § 102(e) Date Dec. 7, 1987, PCT Pub. No. WO87/06229, PCT Pub. Date Oct. 22, 1987

PCT Filed Apr. 7, 1987, Ser. No. 141,360
Claims priority, application France, Apr. 11, 1986, 86 05235
Int. Cl.⁴ C07D 257/02; A61K 49/04, 40/00

U.S. Cl. 424-4 5 Claims

1. The lysine salt of the gadolinium(III) complex of 1,4,7,10-tetra-azacyclododecane-N,N',N'',N'''-tetra-acetic acid.

2. An administratable composition suitable for administration to humans as a contrast agent in magnetic resonance imaging and in radiologic X-ray imaging, said composition comprising an effective amount of the lysine salt of the gadolinium(III) complex of 1,4,7,10-tetra-azacyclododecane-N,N',N'',N'''-tetra-acetic acid.

4,877,601

ADSORBENT COMPOSITION

John J. Wren, London, England, assignor to Watney Combe Reid & Truman Limited, London, England

PCT No. PCT/GB86/00386, § 371 Date Feb. 18, 1987, § 102(e) Date Feb. 18, 1987, PCT Pub. No. WO87/00049, PCT Pub. Date Jan. 15, 1987

PCT Filed Jul. 1, 1986, Ser. No. 27,028
Claims priority, application United Kingdom, Jul. 2, 1985, 8516670

Int. Cl.⁴ A61K 33/06

U.S. Cl. 424-10 6 Claims

1. A method for reducing the alcohol content of the blood of human beings in need thereof comprising the oral administration of an edible composition comprising a dispersion in an edible or physiologically compatible base of an effective alcohol content-reducing amount of a physiologically inert hydrophobic crystalline essentially silicon and oxygen zeolite of pore size permitting the absorption of ethanol but preventing the absorption of larger molecules with lipophilic character that occur in significant concentration in the digestive system.

4,877,602

TRANSPARENT DENTIFRICES

Michio Uematsu, Isehara, and Nobuo Suganuma, Narashino, both of Japan, assignors to Lion Corporation, Tokyo, Japan
Continuation-in-part of Ser. No. 879,606, Jun. 27, 1986, abandoned. This application Nov. 17, 1987, Ser. No. 121,799
Claims priority, application Japan, Jun. 28, 1985, 60-142709
Int. Cl.⁴ A61K 7/16, 7/26

U.S. Cl. 424-49 19 Claims

1. A transparent dentifrice composition comprising:
5 to 50% by weight of an abrasive having a refractive index of from 1.43 to 1.46; and
a transparent vehicle having substantially the same refractive index as said abrasive and comprising,
1 to 4% by weight of sodium carboxymethyl cellulose,
1 to 70% by weight of a humectant,
0.1 to 10% by weight of a surface active agent,
0.1 to 5% by weight of a flavor, and
0.001 to 5% by weight of a sweetener,
said sodium carboxymethyl cellulose having a viscosity of 5 to 20 centipoises measured as 1% aqueous solution at 25° C. and having an average degree of substitution of from 0.9 to 1.5.

4,877,603

ORAL COMPOSITIONS

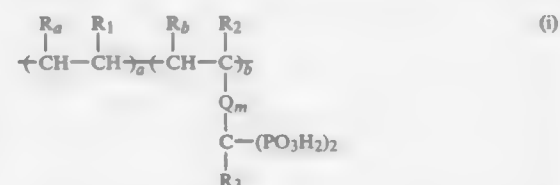
Charles R. Degenhardt, and Barbara A. Kozikowski, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 135,164, Dec. 18, 1987, abandoned. This application Nov. 28, 1988, Ser. No. 276,995
Int. Cl.⁴ A61H 7/06

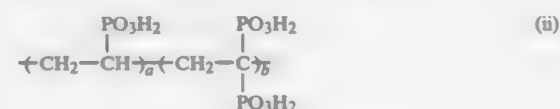
U.S. Cl. 424-57 27 Claims

1. An oral care composition formulated for administration to the oral cavity without substantial ingestion, said composition comprising:

(a) a geminal diphosphonate polymer component wherein said component contains one or more geminal diphosphonate polymers selected from the group consisting of polymers containing the following monomeric unit combinations:



wherein each R_1 , R_2 , R_a , and R_b can independently be $-H$, $-CO_2H$ or ester thereof, $-PO_3H_2$, $-C=N$, substituted or unsubstituted aryl, substituted or unsubstituted C_1 - C_{10} alkyl, or substituted or unsubstituted C_1 - C_{20} oxyalkyl, each R_3 can independently be $-H$, $-OH$, amine, or substituted or unsubstituted C_1 - C_3 alkyl, each m can independently be 0 or 1, each Q can independently be a substituted or unsubstituted aryl or a substituted or unsubstituted C_1 - C_{10} alkylene, and the molar ratio of a/b is greater than or equal to 0 and less than about 30;



wherein the molar ratio of a/b is greater than or equal to 0 and less than about 30; and
(iii) polymerization products of



wherein each X can independently be $-H$ or a C_1 - C_{10} alkyl, and when X is an alkyl, each $-PO_3X_2$ group is converted to a $-PO_3H_2$ group subsequent to polymerization; said geminal diphosphonate polymer component having an average molecular weight of between about 1,000 and about 20,000, an average of at least three geminal diphosphonate units per polymer chain, and a molar ratio of monomeric units not containing a geminal diphosphonate to monomeric units containing a geminal diphosphonate of less than about 30; and
(b) a pharmaceutically acceptable carrier; said composition containing between about 0.1 wt. % and about 20 wt. % of said geminal diphosphonate polymer component.

4,877,604

METHOD OF INCORPORATING COSMETIC PIGMENTS AND BASES INTO PRODUCTS CONTAINING OIL AND WATER PHASES

Mitchell L. Schlossman, 454 Prospect Ave., Unit 164, West Orange, N.J. 07052

Filed Sep. 4, 1987, Ser. No. 93,575

Int. Cl.⁴ A61K 7/025

U.S. Cl. 424-64 2 Claims

1. A liquid makeup, being smoother and possessing a unique emollient slip when compared to existing liquid make up, the same being comprised of:

	RANGE	
	FROM	TO
lanolin alcohol and/or mineral oil	0.00	12.00
synthetic spermaceti	2.00	4.00
stearic acid (triple pressed)	2.00	4.00
glyceryl monostearate	1.00	3.00
talc treated with titanate		
coupling agent	1.00	3.00
titanium dioxide	2.00	8.00
iron oxides	0.75	2.85
propylene glycol	10.00	15.00
trimethylammonium	0.50	2.00
polyorbate 20	0.40	1.00
magnesium aluminum silicate	0.50	2.00
carboxymethyl cellulose	0.20	0.50
deionized water	50.00	60.00
preservatives and fragrance balance		100.0 percent by weight.

where the talc and/or titanium dioxide and iron oxides have been treated with a titanate coupling agent.

4,877,605

FOOT DEODORANT

David Hendricks, Rte. 5, Box 354, Pickens, S.C. 29671

Filed Dec. 12, 1988, Ser. No. 283,546

Int. Cl.⁴ A61K 7/32

U.S. Cl. 424-65 6 Claims

1. A foot deodorant, comprising:
boric acid;
hydrogen peroxide;
sodium chloride; and
alcohol;
balance water.

4,877,606

BIODEGRADABLE AMPHIPATHIC COPOLYMERS

Jeffrey R. Churchill, Northwich, and Francis G. Hutchinson, Lymm, both of United Kingdom, assignors to Imperial Chemical Industries PLC, London, England

Division of Ser. No. 747,173, Jun. 21, 1985, Pat. No. 4,745,160.

This application Jan. 19, 1988, Ser. No. 145,116

Claims priority, application United Kingdom, Jun. 26, 1984, 841623H

Int. Cl.⁴ A61K 47/00

U.S. Cl. 424-78 1 Claim

1. A process for the manufacture of a frozen, stable aqueous dispersion of a copolymer and a drug, the drug comprising up to 99% by weight of the copolymer plus drug content, and the copolymer comprising a pharmaceutically or veterinarily acceptable amphipathic, non-crosslinked linear, branched or graft block copolymer, which has a minimum weight average molecular weight of 1000, in which the hydrophobic component is biodegradable or hydrolytically unstable under normal physiological conditions, and the hydrophilic component may or may not be biodegradable or hydrolytically unstable under such conditions, characterized by freeze-drying a frozen, stable aqueous dispersion of the copolymer and the drug.

4,877,607

ATTRACTANTS FOR Dacus LATIFRONS, THE MALAYSIAN FRUIT FLY

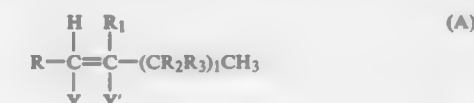
Terrence P. McGovern, Bowie, Md.; Robert A. Flath, Kensington, Calif., and Roy T. Cunningham, Hilo, HI., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Sep. 22, 1988, Ser. No. 247,546

Int. Cl.⁴ A01N 25/00

U.S. Cl. 424-84 11 Claims

1. A method for attracting adult male Malaysian fruit flies, which comprises applying to the locus thereof an effective attractant amount of a compound having the structure



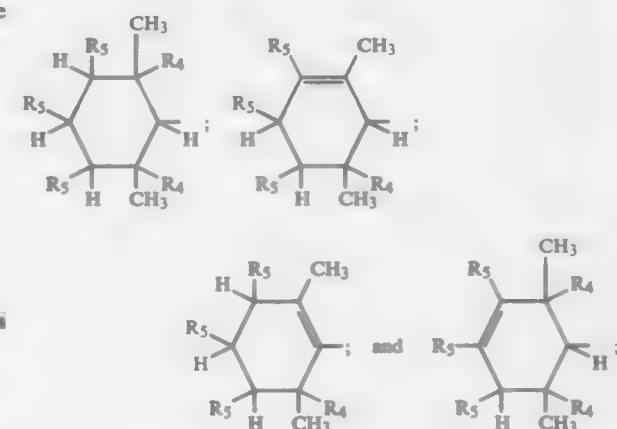
wherein
represents a single or double bond and Y and Y' from the carbon-carbon double bond joining the positions to which they are attached if is a double bond and Y and Y' are each hydrogen if is a single bond;

R_1 is H or CH_3 ;

R_1 is H and R_2 is OH, or R_2 and R_3 taken together are $=O$;

and

R is selected from:



wherein

R₄ is H or CH₃,
R₅ is H or CH₃, with the proviso that only one R₅ on the ring is CH₃, and
when Y and Y' are H and R₂ and R₃ taken together are —O, then R is cyclohexenyl.

4,877,608

PHARMACEUTICAL PLASMA PROTEIN FORMULATIONS IN LOW IONIC STRENGTH MEDIA
Ted C. K. Lee, Fairfax, and Michael E. Hinda, Fairfax Station, both of Va., assignors to Rorer Pharmaceutical Corporation, Fort Washington, Pa.

Filed Nov. 9, 1987, Ser. No. 118,670
Int. Cl.⁴ A61K 39/395, 35/16, 37/18

U.S. Cl. 424—85.8 5 Claims

1. A stable injectable, pharmaceutical plasma protein formulation comprising in an aqueous solution:

- a therapeutically effective amount of a plasma protein selected from the group consisting of Factors II, VII, VIII, IX, X, Protein C, Antithrombin III, and gamma globulin; from about 0.5 mM to about 15 mM sodium chloride, potassium chloride, or mixtures thereof;
 - from about 0.01 mM to about 10 mM lysine hydrochloride; and
 - from about 0.2 mM to about 5.0 mM histidine;
- said aqueous solution having a pH of from about 6.0 to about 7.6.

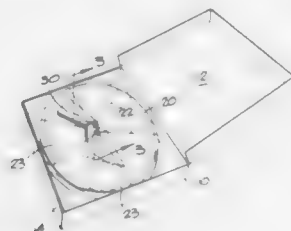
4,877,609

COMBINATION FOOD SERVER AND CONTAINER LID SUPPORT

D'Amian A. Beck, and Susan E. Beck, both of 1486 S. Lee Ct., Lakewood, Colo. 80226

Filed Mar. 15, 1988, Ser. No. 168,145
Int. Cl.⁴ B65D 85/36

U.S. Cl. 426—87 18 Claims



1. In combination with a container for food product having a food product therein, the food product container including a base portion and a cover portion defining a space therebetween, a food product container support, said food product container support comprising

a generally horizontally extending server portion positioned underneath a portion of said food product.

an upstanding portion connected to said server portion and extending through said food product having a dimension generally perpendicular to the server portion adequate to support the cover portion of the food product container to prevent the cover portion from collapsing onto the food product therein when the cover portion is subjected to a downward force such as that normally occurring during transport of the food product in the food product container.

13. A method of packaging a relatively flat food product for transport or storage comprising providing a container, the container having a base portion, a cover portion, and a space adequate to contain the food product therebetween, providing a container support having a server portion and an upstanding portion,

placing the food product on the base portion in the space between the cover portion and the base portion, inserting said container support through said food product to place said server portion underneath a portion of said food product and between the cover portion and the base portion whereby a central region of the cover portion is supported thereby and prevented from collapsing onto the top of the food product during ordinary transport or storage, said server portion having a shape and size adequate for serving portions of the food product, and said upstanding portion having a vertical dimension approximately equal to the height of the space between the cover portion and the base portion of the container.

4,877,610

IMMUNOTHERAPEUTIC METHODS AND COMPOSITIONS EMPLOYING ANTIGENS CHARACTERISTIC OF MALIGNANT NEOPLASMS
John McMichael, P.O. Box 81, R.D. 3, Cambridge Springs, Pa. 16803

Division of Ser. No. 692,822, Jan. 19, 1985, Pat. No. 4,692,332.
This application Aug. 18, 1987, Ser. No. 86,924
Int. Cl.⁴ A61K 39/00, 45/05, 39/40

U.S. Cl. 424—83 4 Claims

1. A method for alleviating symptoms of feline leukemia or tumors in a diseased feline comprising the steps of:

- administering to the diseased feline a member selected from the group consisting of human chorionic gonadotropin and equine chorionic gonadotropin and effective fragments and effective derivatives thereof, in an amount which is less than the lowest amount necessary to provoke a humoral immune response, as exemplified by the presence of a positive wheal upon subcutaneous administration; and

co-administering a lysate of *Staphylococcus aureus* in an amount which is less than the lowest amount necessary to provoke a humoral immune response in combination with the member, as exemplified by the presence of a positive wheal upon subcutaneous administration.

4,877,611

VACCINE CONTAINING TUMOR ANTIGENS AND ADJUVANT

John L. Cantrell, Corvallis, Mont., assignor to Ribi Immuno-Chem Research Inc., Hamilton, Mont.

Continuation-in-part of Ser. No. 852,120, Apr. 15, 1986, Pat. No. 4,806,352. This application Sep. 30, 1987, Ser. No. 102,909
Int. Cl.⁴ A61K 39/39, 39/04

U.S. Cl. 424—88 22 Claims

1. A vaccine useful for the treatment and prevention of tumors in a host, said vaccine comprised of:

- (a) at least one tumor-associated antigen,
- (b) a refined detoxified endotoxin immunostimulant, and
- (c) at least one biological immunostimulant selected from the group consisting of:
 - (1) mycobacterial cell wall skeleton
 - (2) trehalose dimycolate, and
 - (3) pyridine soluble extract of a microorganism, and
 - (d) a pharmaceutically acceptable carrier.

4,877,612

IMMUNOLOGICAL ADJUVANT AND PROCESS FOR PREPARING THE SAME, PHARMACEUTICAL COMPOSITIONS, AND PROCESS

Frank M. Berger, 190 E. 72nd St., New York, N.Y. 10021; Constantia Bona, New York, N.Y., and Mary P. Lechevalier, Placataway, N.J., assignors to Frank M. Berger, New York, N.Y.

Continuation of Ser. No. 735,904, May 20, 1985, abandoned.

This application Sep. 2, 1986, Ser. No. 902,378

Int. Cl.⁴ A61K 39/02

U.S. Cl. 424—92 22 Claims

1. A process for preparing an immunological adjuvant that when administered to animals increases the immune response to antigens, and that is substantially free from mycolic acids, mycolic acid esters, and lipopolysaccharides, which comprises suspending *Amicocata* bacteria cells in aqueous saline solution; extracting the cells with an inert organic solvent in which the immunological adjuvant is soluble or dispersible; separating the organic solvent solution from the bacteria cells and the aqueous saline solution; and recovering immunological adjuvant.

4,877,613

PROCESS FOR PREPARING VETERINARY ACELLULAR VACCINES AGAINST GRAM-NEGATIVE NONENTERIC PATHOGENIC BACILLI

Neylan A. Vedros, Alameda, and Te-ning E. Liu, Martinez, both of, assignors to Biotech Connections, Inc., San Leandro, Calif.

Filed Aug. 5, 1987, Ser. No. 81,942

Int. Cl.⁴ A61K 39/02; A07K 3/02, 3/12, 31/24

U.S. Cl. 424—92 19 Claims

1. Process for preparing an acellular veterinary vaccine against a pathogenic bacilli from an aqueous suspension of the bacilli comprising:

- (a) mechanically shearing surface polysaccharide from the outer membrane of the bacteria without damaging the membrane;
- (b) separating the bacteria from the suspension to provide a surface polysaccharide-containing supernatant;
- (c) adding an organic cationic precipitating agent which does not degrade the surface polysaccharide to the supernatant to form a precipitate comprising an ionic complex of the agent and the surface polysaccharide;
- (d) separating the precipitate of (c) from the supernatant;
- (e) solubilizing the separated precipitate of (d) in an aqueous medium under conditions which cause the ionic complex to dissociate;
- (f) adding a sufficient amount of lower alkanol to the solution of (e) to cause nucleic acids to precipitate therefrom without substantial coprecipitation of the surface polysaccharide;
- (g) separating the precipitate of (f) from the solution;
- (h) thereafter increasing the concentration of lower alkanol in the solution to a level which causes the surface polysaccharide to precipitate therefrom; and
- (i) recovering the surface polysaccharide precipitate of (h).

4,877,614

BIOLOGICALLY ACTIVE FRAGMENTS OF HUMAN ANTIHEMOPHILIC FACTOR AND METHOD FOR PREPARATION THEREOF

Lars-Olof Andersson, Knivsta; Nanna Forsman, Järfälla; Kerstin E. I. Larsson, Lidingö; Annelie B. Lundin, Stockholm; Bohdan Pavin, Huddinge; Inga H. Sandberg, Spånga, and Karin M. Sewerin, Bromma, all of Sweden, assignors to Kabivitrum AB, Stockholm, Sweden

Filed Apr. 25, 1988, Ser. No. 185,629

Claims priority, application Sweden, Mar. 5, 1985, 8501050

Int. Cl.⁴ A61K 37/02; C07K 15/12, 3/18, 3/22

U.S. Cl. 424—101 14 Claims

2. A method for normalizing hemostasis in hemophilic patients comprising administering a therapeutically effective

amount of a Factor VIII fragment selected from the group consisting of:

- (a) fragment containing two peptide chains having molecular weights of 90,000 daltons and 80,000 daltons, respectively, and having the aminoterminal amino acid sequences Ala-Thr-Arg-Arg-Tyr-Tyr- and Glu-Ile-Thr-Arg-Thr-Thr-, respectively, and having the amino acid composition:

	90 kD	80 kD
Cys	1.4	1.3
Asp	6.8	4.7
Asn	4.2	4.5
Thr	5.3	6.1
Ser	7.8	8.3
Glu	6.1	5.7
Gln	3.2	5.7
Pro	5.4	4.5
Gly	5.8	5.7
Ala	5.0	4.8
Val	6.8	5.4
Met	2.6	3.5
Ile	4.7	5.7
Leu	9.6	7.7
Tyr	5.1	4.4
Phe	4.9	5.7
Trp	1.8	2.2
Lys	5.5	5.4
His	3.4	3.5
Arg	4.7	5.0

- (b) fragment containing two peptide chains having molecular weight of 115,000 daltons and 80,000 daltons, respectively, and having the aminoterminal sequences Ala-Thr-Arg-Arg-Tyr-Tyr- and Glu-Ile-Thr-Arg-Thr-Thr-, respectively, and having the amino acid composition:

	115 kD	80 kD
Cys	1.3	1.1
Asp	4.7	6.7
Asn	4.5	4.5
Thr	6.1	6.2
Ser	8.3	9.4
Glu	5.7	5.8
Gln	5.7	3.5
Pro	4.5	6.1
Gly	5.7	5.6
Ala	4.8	4.8
Val	5.4	5.8
Met	3.5	2.6
Ile	5.7	4.4
Leu	7.7	9.9
Tyr	4.4	4.3
Phe	5.7	4.7
Trp	2.2	1.5
Lys	5.4	5.4
His	5.0	3.4
Arg	5.0	4.4

- (c) fragment containing two peptide chains having molecular weights of 130,000 daltons and 80,000 daltons, respectively, and having the aminoterminal amino acid sequences Ala-Thr-Arg-Arg-Tyr-Tyr- and Glu-Ile-Thr-Arg-Thr-Thr-, respectively, and having the amino acid composition:

	130 kD	80 kD
Cys	1.3	1.0
Asp	4.7	6.5
Asn	4.5	5.0
Thr	6.1	6.3
Ser	8.3	10.0
Glu	5.7	5.9
Gln	5.7	3.3

-continued

	80 kD	130 kD
Pro	4.5	5.8
Gly	5.7	5.6
Ala	4.8	4.6
Val	5.4	5.5
Met	3.5	2.6
Ile	5.7	4.4
Leu	7.7	10.3
Tyr	4.4	3.8
Phe	5.7	4.5
Trp	2.2	1.5
Lys	5.4	5.9
His	3.5	3.3
Arg	5.0	4.3

(d) fragment containing two peptide chains having molecular weights of 150,000 daltons and 80,000 daltons, respectively, and having the aminoterminal sequences Ala-Thr-Arg-Arg-Tyr-Tyr- and Glu-Ile-Thr-Arg-Thr-Thr-, respectively, and having the aminoacid composition:

	80 kD	150 kD
Cys	1.3	0.8
Asp	4.7	6.0
Asn	4.5	5.7
Thr	6.1	6.2
Ser	8.3	9.7
Glu	5.7	6.3
Gln	5.7	3.8
Pro	4.5	5.8
Gly	5.7	5.6
Ala	4.8	4.4
Val	5.4	5.7
Met	3.5	2.7
Ile	5.7	4.3
Leu	7.7	10.1
Tyr	4.4	3.3
Phe	5.7	4.4
Trp	2.2	1.4
Lys	5.4	6.6
His	3.5	3.3
Arg	5.0	4.0

(e) fragment containing two peptide chains having molecular weights of 160,000 daltons and 80,000 daltons, respectively, and having the aminoterminal sequences Ala-Thr-Arg-Arg-Tyr-Tyr- and Glu-Ile-Thr-Arg-Thr-Thr-, respectively, and having the aminoacid composition:

	80 kD	160 kD
Cys	1.3	0.8
Asp	4.7	5.8
Asn	4.5	5.9
Thr	6.1	6.5
Ser	8.3	9.6
Glu	5.7	6.3
Gln	5.7	4.0
Pro	4.5	5.5
Gly	5.7	5.6
Ala	4.8	4.4
Val	5.4	5.5
Met	3.5	2.6
Ile	5.7	4.1
Leu	7.7	10.1
Tyr	4.4	3.3
Phe	5.7	4.5
Trp	2.2	1.3
Lys	5.4	6.8
His	3.5	3.2
Arg	5.0	4.2

(f) fragment containing two peptide chains having molecular weights of 180,000 daltons and 80,000 daltons, respectively, and having the aminoterminal aminoacid sequences

Ala-Thr-Arg-Arg-Tyr-Tyr- and Glu-Ile-Thr-Arg-Thr-Thr-, respectively, and having the aminoacid composition:

	80 kD	180 kD
Cys	1.3	0.8
Asp	4.7	5.7
Asn	4.5	5.8
Thr	6.1	6.6
Ser	8.3	10.0
Glu	5.7	6.2
Gln	5.7	4.2
Pro	4.5	5.7
Gly	5.7	5.3
Ala	4.8	4.5
Val	5.4	5.3
Met	3.5	2.4
Ile	5.7	4.4
Leu	7.7	10.0
Try	4.4	3.2
Phe	5.7	4.4
Trp	2.2	1.2
Lys	5.4	6.9
His	3.5	3.2
Arg	5.0	4.3

4,877,615

ANTIFUNGAL PRODUCT

Peter A. Vandenberg, Sarasota, and Blair S. Kunka, Bradenton, both of Fla., assignors to Microlife Techniques, Inc., Sarasota, Fla.

Filed Sep. 23, 1988, Ser. No. 248,438

Int. Cl.⁴ A61K 35/00; C12P 13/08, 7/56, 1/04

U.S. Cl. 424-115

1 Claim

1. An antifungal product (AFP) produced by *Pedococcus acidilactici* ATCC 25742 which comprises a compound consisting of lactic acid and valine having a molecular weight of above 400 daltons and less than about 500 daltons, which is digested by protease, and inhibits *Penicillium oxalicum* as an assay strain in an optimal pH range between about pH 1 and 5 and which has a FAB mass spectrum as shown in FIG. 2.

4,877,616

PROCESS FOR PREPARING XEROSIN II AND XEROSIN III, IMPROVED BIOLOGICAL RESPONSE MODIFIERS
Elizabeth S. Boylan; Robert J. Boylan, both of 66 N. Chatsworth Ave., Larchmont, N.Y. 10538; Vincent Groupé, 7202 Lakeview Largo South - 143rd St. North, Largo, Fla. 34644, and Robert W. Simpson, 261 Amwell Rd., R.D. #1, Neshaun Station, N.J. 08853

Filed Apr. 8, 1988, Ser. No. 179,471

Int. Cl.⁴ A61K 35/74

U.S. Cl. 424-123

2 Claims

1. A method for preparing complexes by the purification of acid precipitated material (APM) recovered from cultures of the bacterium *Achromobacter xerosis* and which complexes are effective at a dosage of between about 10.0 to about 25.0 mg/kg of body weight in abating viral pneumonia in mice, the method of purification comprising the steps of:

growing a suitable culture of *Achromobacter xerosis* in a suitable growth medium using minimal agitation to achieve a relatively low oxygen tension;
recovering a water solubilized substance from acid precipitable material isolated from said culture in a conventional manner including a physical disruption of cells of said *Achromobacter xerosis*;
lyophilizing said water solubilized precipitate to dryness from a frozen state;
homogenizing said lyophilized product in distilled water at about pH 9;
heating the resultant solution readjusted to about pH 9 at about 80 degrees C. for about fifteen (15) minutes;

adjusting the solution to about pH 7;
removing insoluble material by centrifugation;
adding sodium sulfate to a final concentration of about 0.02M;
adding cetyltrimethylammonium bromide stock solution to about a 0.3% final concentration;
warming the resultant solution at about 37 degrees C. for about one (1) hour to form a precipitate;
clarifying the solution by centrifugation;
adding cold acetone to form a further precipitate;
collecting said precipitate by centrifugation; and
washing said precipitate with acetone.

4,877,617

FUNGICIDAL AND BACTERICIDAL METHOD

Hajime Namikoshi, and Tatsuo Goto, both of Himeji, Japan, assignors to Daiichi Chemical Industries Ltd., Osaka, Japan

Filed Dec. 9, 1986, Ser. No. 939,704

Claims priority, application Japan, Dec. 11, 1985, 60-278454; Dec. 11, 1985, 60-278455

Int. Cl.⁴ A61K 31/70; A01N 25/34

U.S. Cl. 424-409

6 Claims

1. A method of imparting fungicidal and bactericidal properties to an article which comprises coating or impregnating the article with a solution of a fungicidal and bactericidal quaternary ammonium salt in an organic solvent or a mixture of the organic solvent and a small amount of water and thereafter removing the solvent from the article, the quaternary ammonium salt being insoluble or sparingly soluble in water and represented by the formula (I)



wherein X⁽⁻⁾ is a group formed by removing a hydrogen ion from at least one carboxyl group of alginic acid or carboxymethylcellulose having 1.5-3.0 as the degree of substitution by carboxymethyl group per anhydrous glucose unit; and R¹ to R⁴ are each a C₁₋₂₀ straight-chain or branched saturated or unsaturated aliphatic hydrocarbon group, three of R¹ to R⁴ are each the hydrocarbon group and the remaining one is an alkyl group, a trialkylammoniumalkyl group or an aryloxyalkyl group, two of R¹ to R⁴ are each the hydrocarbon group and the remaining two are an alkyl group and a dialkylphenoxy- or alkylphenoxy-alkyleneoxyalkyl group, or one or two of R¹ to R⁴ are the hydrocarbon group and the remaining two or three form a heterocyclic ring together with the nitrogen atom.

5. An article having fungicidal and bactericidal properties, said article being coated or impregnated with a quaternary ammonium salt that is insoluble or sparingly soluble in water and is represented by the formula (I):



wherein X⁽⁻⁾ is a group formed by removing a hydrogen ion from at least one carboxyl group of alginic acid or carboxymethylcellulose having 1.5-3.0 as the degree of substitution by carboxymethyl group per anhydrous glucose unit; and R¹ to R⁴ are each a C₁₋₂₀ straight-chain or branched saturated or unsaturated aliphatic hydrocarbon group, three of R¹ to R⁴ are each the hydrocarbon group and the remaining one is an alkyl group, a trialkylammoniumalkyl group or an aryloxyalkyl group, two of R¹ to R⁴ are each the hydrocarbon group and the remaining two are an alkyl group and a dialkylphenoxy- or alkylphenoxy-alkyleneoxyalkyl group, or one or two of R¹ to

R⁴ are the hydrocarbon group and the remaining two or three form a heterocyclic ring together with the nitrogen atom.

4,877,618

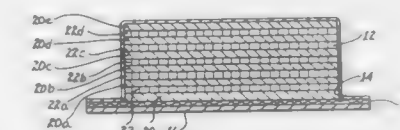
TRANSDERMAL DRUG DELIVERY DEVICE

Fred D. Reed, Jr., Rte. 4, Box 855, Flagstaff, Ariz. 86001
Filed Mar. 18, 1988, Ser. No. 170,427

Int. Cl.⁴ A61K 9/68

U.S. Cl. 424-448

44 Claims



1. A transdermal drug delivery device, said device comprising in combination:

- a plurality of interlaminar layers for adsorbing the drug to be delivered;
- a plurality of adhesive laminae for containing the drug to be delivered interspersed in stacked relationship with said plurality of interlaminar layers, said plurality of adhesive laminae being permeated with the drug to be delivered;
- a layer of contact adhesive for securing the stack of said plurality of interlaminar layers and said plurality of adhesive laminae to a user's skin; and
- an impermeable covering disposed at least proximate the stack of said plurality of interlaminar layers and said plurality of adhesive laminae for preventing dispersion of the drug to be delivered.

4,877,619

LIPOSOMAL VESICLES FOR INTRAPERITONEAL ADMINISTRATION OF THERAPEUTIC AGENTS

LeRoy L. Richer, San Gabriel, Calif., assignor to Vestar, Inc., Pasadena, Calif.

Continuation-in-part of Ser. No. 900,122, Aug. 25, 1986, abandoned. This application Apr. 6, 1987, Ser. No. 35,065

Int. Cl.⁴ A61K 37/22, 9/66; B01J 13/02

U.S. Cl. 424-450

13 Claims

1. A composition including liposomal multilamellar vesicles suitable for sustained delivery of a therapeutic agent to the peritoneal cavity, said multilamellar vesicles comprising a lipid component further comprising a phospholipid component selected from the group consisting of phosphatidylcholines having fatty acid side chains of from 12 to 24 carbons in length and a therapeutic agent incorporated into said vesicles, said vesicles having a size of from about 1 micron to about 15 microns in diameter.

4,877,620

IBUPROFEN-CONTAINING MEDICAMENT

Dieter Loew, Wuppertal; Otto Schuster, and H. Lukas, both of Frankfurt, all of Fed. Rep. of Germany, assignors to MEDICE Chem.-Pharm. Fabrik Pütter GmbH & Co. KG, Iserlohn, Fed. Rep. of Germany

Filed Nov. 10, 1987, Ser. No. 119,028

Claims priority, application Fed. Rep. of Germany, Nov. 14, 1986, 3639038

Int. Cl.⁴ A61K 31/19, 31/195

U.S. Cl. 424-451

6 Claims

1. An ibuprofen containing medicament containing only ibuprofen in the (S)-(-) form without any ibuprofen in the (R)-(-) form, the medicament being in sustained release form in association with a pharmaceutically acceptable carrier.

4,877,621

COMPOSITIONS FOR COATING FEEDSTUFF ADDITIVES FOR RUMINANTS AND FEEDSTUFF ADDITIVES THUS COATED

Pierre Ardailion, Saint-Priest; Pierre Autant, Commentry; Paul Bourrain, Dardilly, and Andre Cartillier, Commentry, all of France, assignors to Rhone-Poulenc Santa, Courbevoie, France

Filed Sep. 2, 1987, Ser. No. 92,139

Claims priority, application France, Sep. 4, 1986, 86 12412
Int. Cl.⁴ A61K 9/16

U.S. Cl. 424—498

9 Claims

1. A composition suitable for coating a biologically active substance to be fed to a ruminant, the said composition being stable in a medium with a pH greater than or equal to 5 and enabling the biologically active substance to be released in a medium with a pH less than 3.5, which composition consists essentially of a basic amino copolymer of one or more vinylpyridines with styrene in which the nitrogen content is from 3 to 14% by weight of said copolymer and a hydrophobic substance having a melting point greater than 60° C. selected from fatty acids, fatty esters, fatty alcohols and mixtures thereof, the hydrophobic substance content being from 55 to 90% of the total weight of the said composition.

4,877,622

PROCESS FOR PRODUCING FOOD MATERIAL

Hiroshi Kiuchi, Saitama; Katsumi Murata; Kazuo Murakami, both of Ibaraki; Isao Kusakabe, Chiba, and Hideyuki Kobayashi, Ibaraki, all of Japan, assignors to Kabushikikaisa Kibun and Kabushikikaisa Kibun Foodchemifa, both of Tokyo, Japan

Continuation of Ser. No. 32,462, Mar. 31, 1987, abandoned. This application Jan. 13, 1989, Ser. No. 298,287

Claims priority, application Japan, Apr. 2, 1986, 61-074170
Int. Cl.⁴ A23J 3/00

U.S. Cl. 426—46

4 Claims

1. A process for producing food material, which comprises: reacting protein containing soymilk with a microbially-produced protease at a pH higher than 5.9 and at a temperature higher by at least 4° C. than the optimum temperature of the microbially-produced protease with respect to said reaction, for a reaction time of 10 to 50 minutes, the amount of protease reacted with said milk being sufficient to coagulate said milk protein at said pH and temperature within said reaction time; separating the thus coagulated protein from the remainder of said milk; and incorporating the thus separated coagulated protein into a food product.

4,877,623

METHOD FOR PRODUCING COMPOSITE FOOD HAVING A CONTROLLED COMPOSITION OF MATERIALS

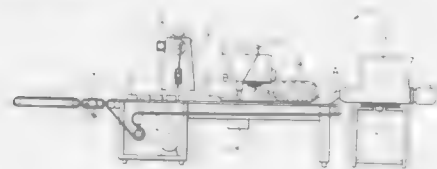
Torahiko Hayashi, Utsunomiya, Japan, assignor to Rheon Automatic Machinery Co., Utsunomiya, Japan

Filed Jul. 30, 1987, Ser. No. 79,884

Claims priority, application Japan, Jul. 30, 1986, 61-179259
Int. Cl.⁴ A21D 8/00; G01N 33/02

U.S. Cl. 426—231

1 Claim



1. A method for producing composite food having a controlled composition of materials including the steps of supply-

ing a plurality of raw materials onto a conveyor, combining and forming said raw materials into composite food and cutting the thus formed composite food into separate products comprising:

- measuring quantities of said raw materials supplied from a plurality of supply means per unit time;
- calculating, with a calculating means, from said quantities measured, the ratio of raw materials in each incremental portion of said composite food and comparing, in a comparator, said ratio with a preselected ratio value; and
- selecting, with a selecting means, products having ratios within a preselected range of said preselected ratio value from separate products not having ratios within said preselected range of said preselected ratio value.

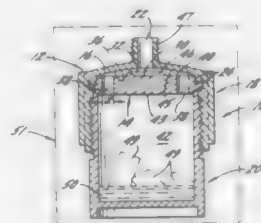
4,877,624

DIGESTION AND STERILIZATION METHODS AND APPARATUS

Terry S. Floyd, Clover, S.C., and Wyatt P. Hargett, Jr., Matthews, N.C., assignors to CEM Corporation, Matthews, N.C. Continuation of Ser. No. 851,785, Apr. 14, 1986, abandoned, which is a division of Ser. No. 722,266, Apr. 11, 1985, abandoned. This application Apr. 19, 1988, Ser. No. 185,250
Int. Cl.⁴ A23L 3/00, 3/26; F16K 15/14

U.S. Cl. 426—241

9 Claims



1. Digestion or sterilization apparatus which comprises a microwave system comprising a microwave heating means, and a lidded vessel comprising a container and a self-opening and self-closing temperaturesensitive valve assembly, said valve assembly being made entirely of microwave radiation transparent, thermoplastic material, and said valve assembly comprising a temperaturesensitive, pressure-deformable, resilient wall member located for direct contact with a hot gas when said lidded vessel is closed, said wall member having an outlet port, and obstructing means normally engaged to block outflow through said outlet port such that said lidded vessel is closed, said wall member being only dome-shaped or planar; wherein said valve assembly is structured so that internal fluid pressure impinging on said wall member, causes outward bulging of said wall member, the pressure-deformed wall member being domeshaped, wherein outflow through said outlet port occurs in response to a certain internal fluid pressure impinging on and deforming said wall member; and wherein said valve assembly lacks a coil spring member.

7. A high pressure, closed vessel digestion method comprising:

- introducing sample to be digested, and an amount of a digesting agent suitable for effecting digestion into a thermoplastic container capable of withstanding high internal pressure;
- placing onto said container, a self-opening and self-closing temperature-sensitive valve assembly, said valve assembly being made entirely of microwave radiation transparent, thermoplastic material, and said valve assembly comprising a temperature-sensitive, pressure-deformable, resilient wall member located for direct contact with a hot gas when said lidded vessel is closed, said wall member having an outlet port, and obstructing means normally engaged to block outflow through said outlet port such that said container is closed, said wall member being only

dome-shaped or planar; wherein said valve assembly is structured so that internal fluid pressure impinging on said wall member, causes outward bulging of said wall member, the pressure-deformed wall member being domeshaped, wherein outflow through said outlet port occurs in response to a certain high internal fluid pressure impinging on and deforming said wall member; and wherein said valve assembly lacks a coil spring member;

(c) digesting said sample by applying microwave energy to the contents of the closed container, wherein a high internal fluid pressure is produced that causes outward bulging of said wall member yet said valve assembly remains closed, said high internal fluid pressure being less than said certain high internal fluid pressure; and

(d) recovering the digested sample from said container.

4,877,625

PROCESS FOR PRODUCING A SWEET CUSTARD FOODSTUFF WITH A LONG TERM SHELF LIFE BASED ON MILK AND EGGS

Bernard Dien, and Jean Cuq, both of Onet Le Chateau, France, assignors to Valmont S.A., Montauban, France

Filed Jan. 15, 1988, Ser. No. 144,261

Claims priority, application France, Jan. 5, 1987, 87 00486
Int. Cl.⁴ A23L 1/187, 1/32

U.S. Cl. 426—250

2 Claims

1. A process for producing a sweet custard foodstuff consisting of milk, eggs and at least one additional ingredient selected from the group consisting of sugar, modified starch, flavors, colorants and stabilizers comprising the steps of: mixing a mixture consisting of milk, eggs and at least one of said additional ingredients at a temperature between 10° and 40° C., preheating said mixed milk mixture to a temperature between 60°-90° C., sterilizing by increasing the temperature to between 100°-160° C. for 1 to 10 seconds by direct steam injection, thereby achieving sterility without prolonged cooking, cooling through evaporation under partial vacuum of water injected as steam to an intermediate temperature between 60°-90° C., homogenizing under aseptic conditions at said intermediate temperature, and filling under aseptic conditions.

4,877,626

METHOD FOR COLORING MEAT

Charles F. Ande, and Mark E. Selz, both of Sun Prairie, Wis., assignors to Oscar Mayer Foods Corporation, Madison, Wis.

Filed Jan. 15, 1988, Ser. No. 144,290

Int. Cl.⁴ A23L 1/275

U.S. Cl. 426—250

18 Claims

1. A method for coloring raw meat which comprises coating raw meat muscle surface or raw meat skin wherein the meat is selected from the group consisting of poultry, red meat and fish with a coloring solution comprising liquid smoke and caramel wherein the coloring solution contains from 40% to 99% liquid smoke and from 1% to 30% caramel and then cooking and packaging the coated meat; thereby obtaining a raw uncooked meat having a uniform fixed dark color.

4,877,627

BALANCED FIBER COMPOSITION

Richard E. A. Leitz, and Donald J. Pusateri, both of Hemet, Calif., assignors to Nutrilite Products, Inc., Buena Park, Calif.

Filed Aug. 19, 1986, Ser. No. 898,056

Int. Cl.⁴ A23L 1/29

U.S. Cl. 426—285

12 Claims

1. A nutritional high fiber composition for ingestion by mammalian organisms to provide an adjunct to the diet without serious risk of inducing disorders in the organism, said composition comprising approximately 30 to 48.5% fiber de-

rived from the fruit and vegetable groups, based on the total weight of fiber in the composition, wherein at least one of the fibers from the fruit and vegetable group is selected from the group consisting of lemon, acerola and carrot, approximately 30 to 48.5% fiber derived from the cereal group, wherein at least one of the fibers from the cereal group is selected from the group consisting of corn bran, barley bran and oat bran, and approximately 3 to 40% fiber from fiber sources other than the fruit, vegetable and cereal groups, wherein at least one of the fibers from other than the fruit, vegetable and cereal groups is selected from the group consisting of soybean bran, psyllium seed husk and guar gum, and wherein at least 10% of the total dietary fiber is soluble dietary fiber.

4,877,628

PROCESS FOR PREPARING A COATED FOOD PRODUCT

Richard J. Stypula, Colts Neck, N.J., assignor to International Flavors & Fragrances Inc., New York, N.Y.

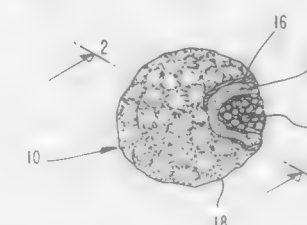
Division of Ser. No. 93,352, Sep. 3, 1987, abandoned. This application Jan. 10, 1988, Ser. No. 205,357

The portion of the term of this patent subsequent to Oct. 31, 2006, has been disclaimed.

Int. Cl.⁴ A23L 1/314, 1/315, 1/317

U.S. Cl. 426—302

7 Claims



1. A process for preparing a product consisting of the steps of:

- providing a porous inner food structure consisting of a mixture of water and macerated beef or macerated chicken meat;
- admixing a starch, methyl cellulose and xanthan gum to provide a barrier mixture;
- providing a batter comprising flour and water;
- coating the barrier mixture onto the porous inner food structure thereby forming a barrier-coated porous inner food structure;
- baking the resulting barrier-coated porous inner food structure to form a baked product;
- coating the batter onto the resulting baked product to form a battered, baked product; and
- baking the resulting battered, baked product whereby a food product is produced having the properties of:
 - retention of a substantial quantity of the water originally contained in the porous inner food structure on storage and/or on cooking; and
 - substantial imperviousness to the absorption or adsorption of cooking oil into said porous inner food structure when said article is contacted with cooking oil on storage and/or on cooking.

4,877,629 PROCESS FOR PREPARING A COATED FOOD PRODUCT

Richard J. Stypula, Colts Neck, and Lawrence Buckholz, Jr., Jackson, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

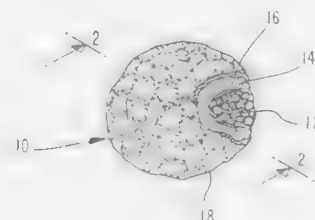
Filed Jun. 10, 1988, Ser. No. 205,358

The portion of the term of this patent subsequent to Oct. 31, 2006, has been disclaimed.

Int. Cl.⁴ A23L 1/314, 1/315, 1/317

U.S. Cl. 426—302

7 Claims



1. A process for preparing a food product consisting of the steps of:

- (1) providing a porous inner food structure consisting of a mixture of water and macerated beef or macerated chicken meat;
- (2) admixing a starch, methyl cellulose, xanthan gum and one or more reaction flavor compositions and/or reaction flavor precursor compositions to provide a barrier mixture;
- (3) providing batter comprising flour and water;
- (4) coating the barrier mixture onto the porous inner food structure thereby forming a barrier-coated porous inner food structure;
- (5) baking the resulting barrier-coated porous inner food structure to form a baked product;
- (6) coating the batter onto the resulting baked product to form a battered baked product; and
- (7) baking the resulting battered, baked product whereby a food product is produced having the properties of:
 - (x) retention of a substantial quantity of the water originally contained in the porous inner food structure on storage and/or on cooking;
 - (y) substantial imperviousness to the absorption or adsorption of cooking oil into said porous inner food structure when said article is contacted with cooking oil on storage and/or on cooking; and
 - (z) retention of substantially all of the flavor nuances originally present in the macerated chicken meat or macerated beef.

4,877,630

RICE COOKIE AND METHOD FOR PRODUCING SAME
Tetsuro Okayama, Kobe, Japan, assignor to Uegaki Beika Kabushiki Kaisha, Kobe, Japan

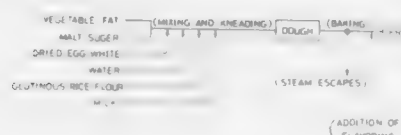
Filed Jun. 10, 1988, Ser. No. 205,455

Claims priority, application Japan, Jun. 19, 1987, 62-154182

Int. Cl.⁴ A21D 8/00; A23L 1/10

U.S. Cl. 426—302

5 Claims



1. A rice cookie comprising a glutinous rice flour as the main ingredient, and oil or fat, sweetener, and egg white mixed with said flour, the amount of oil or fat being approximately half of the weight of said flour, and liquid containing milk products

equalling 35–45% in total weight of the aforementioned ingredients being added to make a dough which is then baked.

4,877,631

PROCESS FOR RECOVERING CAFFEINE ABSORBED IN ACTIVATED CARBON, AND A PROCESS FOR DECAFFEINATING COFFEE

Louis Kaper, Barneveld; Roelof Klamer, and Pieter J. Noomer, both of Utrecht, all of Netherlands, assignors to Douwe Egberts Koninklijke Tabakfabriek-Koffiebranders-Theehandel N.V., Utrecht, Netherlands

Filed Jun. 1, 1987, Ser. No. 55,850

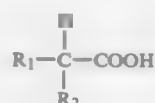
Claims priority, application Netherlands, May 30, 1986, 8601400; May 30, 1986, 8601401; Jul. 8, 1986, 8601783

Int. Cl.⁴ A23F 5/22; C07D 473/12

U.S. Cl. 426—422

16 Claims

1. A process for recovering caffeine from caffeine-loaded activated carbon by treatment of the loaded carbon with an acid, comprising the steps of treating the activated carbon with benzoic acid or a compound having the formula



wherein R₁ is methyl, H or Cl, and R₂ is Cl, OH or phenyl.

4,877,632

PROCESS FOR THE PRODUCTION BY CONTINUOUS ROLLING OF A MASS OF DOUGH FOR BAKERY PRODUCTS AND BUNS AND ROLLS

José M. Vinas I Nogueroles, Mataró, Spain, assignor to Serfont, S.A. and Construcciones Mecánicas AGMI, S.A., both of Barcelona, Spain

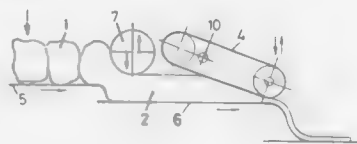
Division of Ser. No. 66,237, Jun. 25, 1987. This application Aug. 18, 1988, Ser. No. 233,433

Claims priority, application Spain, Jun. 25, 1986, 556955

Int. Cl.⁴ A21C 3/02

U.S. Cl. 426—502

1 Claim



1. A method of producing by continuously rolling a mass of dough for bakery products, buns and rolls comprising:

- conveying a plurality of lumps of dough on a conveying means along a conveying path;
- conveying said lumps of dough to a roller means for regulating the amount of dough conveyed along said conveying path;
- intermittently driving said conveying means to intermittently convey the dough downstream of said roller means;
- intermittently bearing the dough downstream of said roller means so that said dough is beaten when said conveying means is at rest to compress the dough into a continuous strip of reduced thickness with a beating member mounted vertically above said conveying means so as to define a gap therebetween that decreases in the direction of conveyance, said beating member being pivotally mounted at one longitudinal end thereof and operatively coupled at the other longitudinal end thereof to a means for reciprocally moving said other end toward and away from said conveying means to intermittently urge at least a portion

of said beating member into compressing contact with dough disposed on said conveying means.

4,877,633

PROCESS FOR IMPROVING THE COLOR OF PRAWNS, SHRIMP AND LOBSTERS

Yer-Lee Ko, No. 2, 11th Floor, Alley 9, Lane 38, Lin-Chuan St., Ling-Ya Dist., Kaohsiung, Taiwan

Filed Sep. 8, 1988, Ser. No. 242,313

Int. Cl.⁴ A22C 29/02

U.S. Cl. 426—506

1 Claim



1. A process for improving the color of prawns, shrimps and lobsters, comprising the successive steps of:

- (a) quick-freezing the raw prawns, shrimps or lobsters until the core temperature of same is reduced to about -25° C.;
- (b) heating the quick-frozen prawns, shrimps or lobsters at between about 90° to 100° C. for about 20 to 40 seconds; and
- (c) cooling the heated prawns, shrimps or lobsters with cold water to a temperature of about 4° C. immediately after step (b).

4,877,634

FOOD PRODUCT CONTAINING NOVEL DRIED COMPOSITIONS WITH POLYSACCHARIDES

Michael J. Pucci, Sarasota, and Blair S. Kunka, Bradenton, both of Fla., assignors to Microlife Technics, Inc., Sarasota, Fla.

Division of Ser. No. 68,435, Jul. 1, 1987, Pat. No. 4,855,149. This application Aug. 31, 1988, Ser. No. 238,415

Int. Cl.⁴ A23C 9/154; A23G 9/00; A23L 1/24

U.S. Cl. 426—531

7 Claims

1. A food product which comprises in admixture:
 - (a) a food which is a mixture of ingredients and
 - (b) a quality improving amount of a dried composition which comprises in admixture a drying aid and polysaccharides derived by fermenting an aqueous growth medium comprising sucrose with a *Leuconostoc dextranum* which produces the polysaccharides which are substantially rehydratable from the sucrose until the sucrose is substantially depleted and then drying the aqueous mixture to a powder with the drying aid, wherein the quality improvement is in thickness, stability or texture of the food product.

4,877,635

HERB FLAVORING AND/OR ANTIOXIDANT COMPOSITION AND PROCESS

Paul H. Todd, Jr., Kalamazoo, Mich., assignor to Kalamazoo Holdings, Inc., Kalamazoo, Mich.

Continuation of Ser. No. 811,514, Dec. 20, 1985, abandoned. This application Oct. 21, 1987, Ser. No. 111,918

Int. Cl.⁴ A23L 1/28, 1/221

U.S. Cl. 426—542

19 Claims

1. A process for producing a natural antioxidant extract of a Labiate herb having superior antioxidant activity, which is oil-soluble and which contains essentially all of the antioxidant factors of the natural herb, and which contains less than 7.5% by weight of substances, comprising pro-oxidant substances, which are insoluble in acetone when the extract is diluted to a 15% w/v concentration in acetone at about 20° C., which consists essentially of the steps of:

- A. Providing an extract of Labiate herbal material in an approved food-grade organic solvent which contains

essentially all of the antioxidant factors of the natural herbal material,

B. Removing the solvent to a concentration of about 5 to 50% of the extract in the remaining solvent, until the solvent is no more than about twenty times the weight of the extract, thereby effecting a concentration of between about 5% and 50% of the extract in such solvent,

C1. In case the solvent employed is acetone or methylethyl ketone, allowing the solvent and extract mixture to stand until insoluble material precipitates, removing the precipitate, and then removing solvent from the remaining natural antioxidant extract, and

C2. In case the solvent employed is not acetone or methylethyl ketone, adding sufficient acetone or methylethyl ketone to precipitate insoluble material and allowing the solvent and extract mixture to stand until insoluble material precipitates, removing the precipitate, and then removing solvent from the remaining natural antioxidant extract.

4,877,636

CHOCOLATE AND CHOCOLATE ADDITIVE

Tetsuo Koyano, Kawasaki; Nobuo Sagi, Sakai; Tsugio Izumi, Sennan; Setsuya Fujita; Tadahiko Murata, both of Yokohama; Iwao Hachiya, Yokohama, and Hiroyuki Mori, Sakai, all of Japan, assignors to Meiji Seika Kaisha, Ltd., Tokyo and Fuji Oil Company, Limited, Osaka, both of Japan

Filed Oct. 28, 1987, Ser. No. 113,762

Claims priority, application Japan, Nov. 11, 1986, 61-269393; May 29, 1987, 62-136530

Int. Cl.⁴ A23D 5/00; A23G 1/00

U.S. Cl. 426—607

3 Claims

1. A chocolate additive for preventing fat blooming and useful for omitting or simplifying the tempering operation comprising powder particles composed of at least 50% by weight of 2-unsaturated-1,3-disaturated glyceride constituent fatty acids of which are unsaturated fatty acids having at least 18 carbon atoms and saturated fatty acids having 20 to 24 carbon atoms, said particles being in a stable crystal form of at least the V form of the glyceride and having an average particle size of not more than 500 μ, and wherein said additive is to be used for addition during solidification of chocolate with cooling in chocolate production.

4,877,637

METHOD OF TREATING SOYBEANS

Emogene Harp, R. R. 1, Box 99, Marietta, Kans. 67863

Filed Jun. 8, 1988, Ser. No. 203,898

Int. Cl.⁴ A23L 1/20

U.S. Cl. 426—634

17 Claims

11. A process for making soybeans palatable and readily digestible, comprising the steps of:

- (a) soaking soybeans in water having a temperature of from 80° F. to 155° F., said soaking being from 1 to 20 hours and until said soybeans comprise 10% to 80% by weight water;
- (b) removing the soaked soybeans of step (a) from the water;
- (c) drying the removed soybeans of step (b) from 1 to 20 hours and until said soybeans comprise 1% to 40% by weight water;
- (d) freezing the dried soybeans of step (c);
- (e) disposing the frozen soybeans of step (d) in a hot oil bath having a temperature of from about 150° F. to about 500° F. to heat the frozen soybeans and cause the soybeans to start popping and cracking;
- (f) stirring said frozen soybeans immediately after said disposing step (e) in order that the hot oil surrounds each soybean;
- (g) continuing to heat the soybeans for 5 minutes to 50 minutes after said disposing step (e) and until the soybeans have stopped popping and cracking; and

(h) removing the heated soybeans of step (g) from the hot oil bath.

4,877,638

METHODS FOR GRIT BLASTING WITH A U.V. DETECTABLE MATERIAL

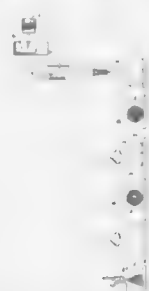
Howard L. Novak, Satellite Beach, and Lee M. Zook, Titusville, both of Fla., assignors to USBI Company, Huntsville, Ala.

Filed Jan. 13, 1988, Ser. No. 206,468

Int. Cl.⁴ B05D 1/12

U.S. Cl. 427—8

3 Claims



1. A method of detecting cracks on the surface of an article after removal of a coating comprising:

- (a) incorporating a U.V. detectable compound in a thermoset or thermoplastic grit blast media;
- (b) grit blasting the coated article to remove the coating; and
- (c) exposing the surface of the article to U.V. radiation to detect grit blast media trapped in surface cracks thereby detecting the surface cracks.

4,877,639

COATING METHOD

Karel S. Willemsens, Berchem; Willy N. V. Abbeneyen, Merksem, and Frans B. Criel, 's-Gravenwezel, all of Belgium, assignors to Agfa-Gevaert N.V., Mortsel, Belgium

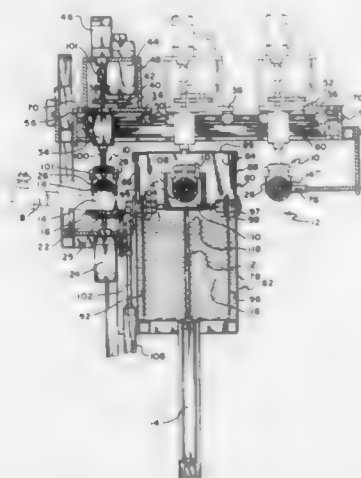
Filed Jan. 29, 1988, Ser. No. 213,112

Claims priority, application European Pat. Off., Jul. 21, 1987, 87201378.4

Int. Cl.⁴ B05D 1/26, 1/30, 1/34

U.S. Cl. 427—13

11 Claims



1. A method of coating a moving web with a composite liquid layer consisting of at least two distinct superimposed liquid layers with different viscosities including at least one relatively high viscosity layer and at least one relatively low viscosity layer, by moving the web adjacent and relative to a coating device, producing in the coating device distinct liquid layers and superimposing said liquid layers onto each other to form one composite layer having a low viscosity layer on the

side opposite the web, discharging the composite layer from the coating device onto said web to form and maintain a bead of liquid composition between a lip of the coating device and the moving web, and subjecting the bead of liquid coating composition to a differential air pressure to withhold the bead from movement in the direction of travel of the web, the air pressures being selected to retain the bead of coating composition in a coating position between the coating device and the web and to maintain a uniform coating on the web, the higher air pressure being on the side of the bead remote of the web, in which method the coating is pre-started by establishing a distance between the coater and the web which is greater than the normal coating gap and forming a flowing stream of said distinct liquid layers, characterized in that the coating is started by,

- reducing to zero the rate of flow of at least that high viscosity layer proximate said web,
- reducing the distance between the coater and the web to at most the normal coating gap and initiating the wetting of the web by one such lower viscosity layer distant from said web, and
- then adjusting the rates of flow of the liquid layers to their normal coating values.

4,877,640

METHOD OF OXIDE REMOVAL FROM METALLIC POWDER

Erich Muehlberger, San Clemente, and Albert Sickinger, Irvine, both of Calif., assignors to Electro-Plasma, Inc., Irvine, Calif.

Filed Apr. 13, 1988, Ser. No. 181,400

Int. Cl.⁴ B05D 1/08

U.S. Cl. 427—34

12 Claims



1. A method of cleansing metal particles of oxides comprising the steps of:

- generating a plasma stream;
- locating a cathode within the plasma stream;
- continuously maintaining a negative transfer arc in conjunction with the plasma stream along a portion of the plasma stream extending to the cathode;
- introducing metal particles into the plasma stream; and
- receiving the metal particles after they have traveled along said portion of the plasma stream.

4,877,641

PROCESS FOR PLASMA DEPOSITING SILICON NITRIDE AND SILICON DIOXIDE FILMS ONTO A SUBSTRATE

Thomas S. Dory, New Haven, Conn., assignor to Olin Corporation, Cheshire, Conn.

Filed May 31, 1988, Ser. No. 200,202

Int. Cl.⁴ B05D 3/02, 3/06; C23C 16/30

U.S. Cl. 427—38

24 Claims

1. A plasma CVD process for forming silicon nitride film having a refractive index from about 2.0 ± 0.2 or silicon dioxide

film having a refractive index from about 1.46 ± 0.2 a substrate comprising the steps of:

- (a) introducing di-tert-butylsilane and at least one other reactant gas capable of reacting with said di-tert-butylsilane to form either silicon nitride or silicon dioxide into a CVD reaction zone containing said substrate on which either a silicon nitride or silicon dioxide film is to be formed;
- (b) maintaining the temperature of said zone and said substrate from about 100°C . to about 350°C ;
- (c) maintaining the pressure in said zone from about 0.1 to about 5 Torr; and
- (d) passing said gas mixture into contact with said substrate while exciting said gas mixture with a plasma for a period of time sufficient to form a silicon film from about 2.0 ± 0.2 or silicon dioxide film having a refractive index from about 1.46 ± 0.2 on said nitride film having a refractive index substrate, wherein said plasma is excited by a RF power at about 10 to 500 Watts.

4,877,642

METHOD OF MANUFACTURING ELECTRICALLY CONDUCTIVE MOLDED BODIES BY PLASMA-ACTIVATED CHEMICAL DEPOSITION FROM THE GASEOUS PHASE

Georg F. Gärtner, Aachen, and Hans-Jürgen Lydtin, Stolberg, both of Fed. Rep. of Germany, assignors to U.S. Philips Corp., New York, N.Y.

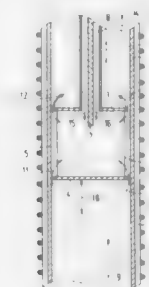
Filed Jul. 2, 1987, Ser. No. 69,476

Claims priority, application Fed. Rep. of Germany, Jul. 5, 1986, 3622614

Int. Cl.⁴ B05D 3/06, 5/12, 7/22

U.S. Cl. 427—38

13 Claims



13. A method of manufacturing a shaped body of at least an electrically conductive material by a plasma-activated chemical deposition of the material, from a gaseous phase comprising at least a starting compound of the material, onto a substrate consisting of a second electrically conductive material which substrate is then removed from the deposited material after completion of deposition of the material wherein:

- (a) the gaseous phase of an electrically conductive material is introduced into a reaction space formed as a microwave cavity resonator whose inner wall comprises at least a part of the substrate on which the electrically conductive material is deposited;
 - (b) the microwaves are applied at a site in the reaction space which is kept free from growing layers of electrically conductive material;
 - (c) the microwaves produce a standing microwave field in the reaction space; and
 - (d) electrically conductive material is deposited on the inner wall of said resonator
- wherein deposition rates are obtained that are substantially higher than those obtained when said microwave cavity resonator does not comprise at least a part of the substrate on which the electrically conductive material is deposited.

4,877,643

PROCESS FOR PRODUCING PREFORMED WIRE FROM SILICON CARBIDE FIBER-REINFORCED ALUMINUM

Toshikatsu Ishikawa, Tokyo; Katsuya Tokutomi, Yokosuka, and Yoshikazu Imai, Tokyo, all of Japan, assignors to Director General Agency of Industrial Science and Technology, Tokyo, Japan

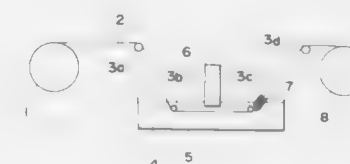
Filed Dec. 30, 1988, Ser. No. 292,465

Claims priority, application Japan, Mar. 24, 1988, 63-68100

Int. Cl.⁴ B05D 3/12

U.S. Cl. 427—57

2 Claims



1. A process for producing a preformed wire from silicon carbide fiber-reinforced aluminum, characterized by spreading and arranging in order a bundle of silicon carbide fibers and continuously dipping said fiber bundle for a period of 60 seconds or shorter in a melt of a eutectic alloy composed of aluminum and 5.0 to 7.0 wt. % of nickel added thereto which melt is kept at or below the liquidus temperature of the melting point thereof plus 50°C . to impregnate said fiber bundle with said alloy.

4,877,644

SELECTIVE PLATING BY LASER ABLATION

Jeff C. Wu, Clemmons; Richard T. Williams, Winston-Salem; John R. Rowlette, Clemmons; Charles P. Brooks, Winston-Salem, all of N.C., and Richard H. Zimmerman, Bradenton, Fla., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Apr. 12, 1988, Ser. No. 180,417

Int. Cl.⁴ B05D 3/06

U.S. Cl. 427—53.1

12 Claims



1. In a method for the selective plating of a metal substrate where a thick polymeric plating resist is first applied to said substrate, followed by selective laser ablation of said resist to expose portions of said substrate to plating, the improvement comprising in combination therewith the steps of

- (a) correlating the operating parameters and character of said laser with said resist and said substrate,
- (i) selecting abating substrate having a low reflectance, at normal incidence of less than about 70%,
- (ii) selecting a polymer based plating resist for application to said substrate, including but not limited to said por-

tions, and having an optical coefficient of absorption, no greater than about 1000 cm^{-1} for a 3 micron film thick-

- (iii) curing said resist on said substrate,
 (iii) subjecting selective areas of said resist to and excimer laser shot, having a wavelength between about 248 to 360 nm, whereby a portion of the laser energy is transmitted through said resist to be absorbed by said substrate, resulting in said metal substrate being heated at the surface thereof to heat and vaporize the adjacent layer of said resist, said vaporized resist expanding causing the solid resist thereover to lift off exposing a clean metal substrate suitable for metal plating, and
 (b) subjecting said exposed portions of said substrate to metal plating.

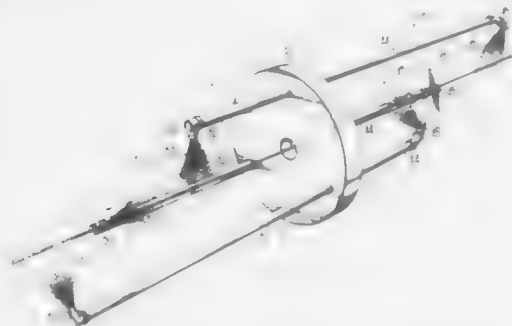
4,877,645

METHODS OF AND APPARATUS FOR APPLYING A COATING MATERIAL TO ELONGATED MATERIAL
 Larry L. Bleich, Omaha, Nebr.; Joni A. Roberts, Stone Mountain, Ga., and Stephen T. Zerba, Gretna, Nebr., assignors to American Telephone & Telegraph AT&T Technologies, Inc., Berkeley Heights, N.J.

Filed Feb. 26, 1988, Ser. No. 160,891
 Int. Cl.⁴ B05D 5/06, 7/00

U.S. Cl. 427-117

13 Claims



1. A method of applying a coating material to the outer surface of an elongated material, said method comprising the steps of:

causing relative motion between the elongated material and a source of coating material along a path of travel in a direction parallel to the longitudinal axis of the elongated material by moving the elongated material along the path of travel; while

directing each of a plurality of spray patterns of the coating material which comprise a first group toward the elongated material in such a manner that the coating material of each spray pattern of the first group is distributed in a generally conical configuration; and then

directing each of a plurality of spray patterns of the coating material which comprise a second group toward the moving elongated material in such a manner that the coating material of each one of the spray patterns of the second group has a substantially planar distribution as the coating material of each spray pattern of the second group is directed into engagement with the elongated material and such that the direction of each of the spray patterns of the second group is at a predetermined angle to the path of travel with the direction of each of the spray patterns of the second group having a horizontal component in a direction opposite to the direction in which the elongated material is moved, the spray patterns of said second group being staggered along and spaced generally equiangularly about the path of travel and cooperating to prevent unintended undulations of the moving elongated material as coating material is applied thereto, the second group being

spaced from the first group in a direction along the path of travel.

4,877,646

METHOD FOR MAKING ELECTRICALLY CONDUCTIVE TEXTILE MATERIALS

Hans H. Kuhn, Spartanburg, and William C. Kimbrell, Jr., Inman, both of S.C., assignors to Milliken Research Corporation, Spartanburg, S.C.

Filed Jun. 27, 1988, Ser. No. 211,630
 Int. Cl.⁴ B05D 3/02, 5/12

U.S. Cl. 427-121

19 Claims

1. A method for imparting electrical conductivity to a textile material, which comprises: (a) contacting the textile material with an aqueous solution of an oxidatively polymerizable pyrrole compound and an oxidizing agent capable of oxidizing said compound to a polymer, said contacting being carried out in the presence of a counter ion or doping agent which imparts electrical conductivity to said polymer when fully formed, said contacting being under conditions at which the pyrrole compound and the oxidizing agent react with each other to form a prepolymer in said aqueous solution; (b) depositing onto the surface of the textile material the prepolymer of the polymerizable compound; and (c) allowing the prepolymer to polymerize while deposited on the textile material so as to uniformly and coherently cover the textile material with a conductive film of polymerized compound; the improvement wherein in step (a) a ferric salt is used as the oxidizing agent and a weak complexing agent for ferric ions is included in the aqueous solution, in an amount sufficient to effectively control the polymerization rate of steps (b) and (c) such that the prepolymer is uniformly and coherently adsorbed onto the surface of the textile material while effectively avoiding undesired formation of polymer in solution.

4,877,647

METHOD OF COATING SUBSTRATES WITH SOLVATED CLUSTERS OF METAL PARTICLES

Kenneth J. Klabunde, Manhattan, Kans., assignor to Kansas State University Research Foundation, Manhattan, Kans.
 Continuation-in-part of Ser. No. 20,581, Mar. 2, 1987, abandoned, which is a continuation-in-part of Ser. No. 853,027, Apr. 17, 1986, abandoned. This application May 2, 1988, Ser. No. 189,221

Int. Cl.⁴ B05D 5/12

U.S. Cl. 427-123

12 Claims

1. The method of forming a continuous metal coating on a substrate, comprising the steps of:

(a) preparing a stable colloidal dispersion of solvated clusters of metal atoms in a polar organic solvent by capturing and complexing vaporized metal in said solvent as a frozen matrix and gradually warming said solvent to room temperature without precipitating the captured metal atoms, said metal being selected from the metals having atomic numbers 21 to 32, 39 to 50, and 71 to 82;

(b) contacting the substrate to be coated with said stable dispersion while evaporating said solvent therefrom, said solvent evaporation causing said dispersion to become unstable with progressive precipitation of solvated metal clusters as the evaporation proceeds, the precipitated solvated metal clusters depositing on said substrate; and

(c) continuing said contacting and solvent evaporating until a continuous layer of the solvated metal clusters is formed on the substrate, the continuity of said layer being indicated by its electrical conductivity.

4,877,648

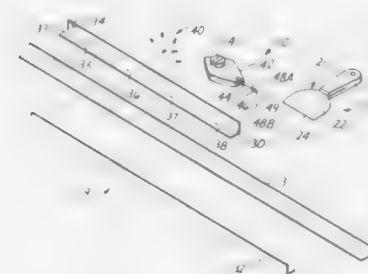
KIT AND METHOD FOR USING KIT TO RE-FINISH PLASTERED CONSTRUCTIONS

Santiago Sotelo, 12105 S. Hamilton, Alsip, Ill. 60658
 Filed Apr. 22, 1988, Ser. No. 184,766

Int. Cl.⁴ B32B 35/00

U.S. Cl. 427-140

11 Claims



1. A method of refinishing an irregular, uneven joint of an open-angle construction to form a substantially straight-line, which comprises:

applying a coating of marking material over the uneven joint, said coating being configured in a first thin straight line;

subsequently applying a coating of marking material configured in a second straight line parallel to the first line at a distance substantially equal to the width of the blade of a tool;

attaching temporarily to the construction surface, guide means having a straight-line edge super-imposed in alignment with the second line;

applying with the tool blade to the construction between the guide edge and the uneven open angle a coating of a refinishing material; and

removing the guide, whereby the uneven open-angle is replaced by a straight line joint.

4,877,649

COATING OF BORON PARTICLES

John C. Trowbridge, Saratoga, Calif., and Jack D. Breazeale, Koloa, HI., assignors to United Technologies Corporation, Hartford, Conn.

Filed Sep. 8, 1987, Ser. No. 93,938

Int. Cl.⁴ B05D 7/00; C23C 16/32

U.S. Cl. 427-215

5 Claims

1. A method of improving the combustion performance of boron comprising reacting boron particles in the absence of a halide and oxygen with a low molecular weight hydrocarbon gas selected from the group consisting of alkanes and alkenes at reaction conditions sufficient to decompose the hydrocarbon gas without reacting all of the boron, resulting in boron particles which are coated with a ceramic layer of boron carbide and are resistant to oxidation and agglomeration.

4,877,650

METHOD FOR FORMING DEPOSITED FILM

Jinsho Matsuyama, Nagahama; Yutaka Hirai, Hikone; Masao Ueki, Urayasu, and Akira Sakai, Nagahama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 30, 1987, Ser. No. 31,133

Claims priority, application Japan, Mar. 31, 1986, 61-73091; Mar. 31, 1986, 61-73094

The portion of the term of this patent subsequent to Oct. 10, 2006, has been disclaimed.

Int. Cl.⁴ C23C 16/00

U.S. Cl. 427-248.1

33 Claims

1. A method for forming a deposited film using starting materials (A) and (B) comprising:

introducing one of the starting materials into a film forming space having a substrate therein; allowing said one starting material to adsorb onto said surface of said substrate to thereby form an adsorption layer; and



introducing the other starting material into said film forming space, to thereby cause a surface reaction on said adsorption layer to form a deposited film; said starting material (A) being a gaseous starting material for forming a deposited film; and starting material (B) being a gaseous halogen oxidizing agent capable of having an oxidative action on said starting material (A).

4,877,651

PROCESS FOR THERMALLY DEPOSITING SILICON NITRIDE AND SILICON DIOXIDE FILMS ONTO A SUBSTRATE

Thomas S. Dory, New Haven, Conn., assignor to Olin Corporation, Cheshire, Conn.

Filed May 31, 1988, Ser. No. 200,203

Int. Cl.⁴ C23C 16/34, 16/40

U.S. Cl. 427-255

20 Claims

1. A thermal CVD process for forming silicon nitride film having a refractive index from about 2.0 ± 0.2 or silicon dioxide film having a refractive index from about 1.46 ± 0.2 onto a substrate comprising the steps of:

(a) introducing di-tert-butylsilane and at least one other reactant gas capable of reacting with said di-tert-butylsilane to form silicon nitride or silicon dioxide into a CVD reaction zone containing said substrate on which either a silicon nitride or silicon dioxide-type film is to be formed;

(b) maintaining the temperature of said zone and said substrate from about 450°C . to about 900°C ;

(c) maintaining the pressure in said zone from about 0.1 to about 10 Torr; and

(d) passing said gases into contact with said substrate for a period of time sufficient to form a silicon nitride film having a refractive index from about 2.0 ± 0.2 or silicon dioxide film having a refractive index from about 1.46 ± 0.2 thereon.

4,877,652

WASHABLE MASK PROCESS

Robert D. Sparling, II, Newmarket, and Gerard L. Vachon, Somersworth, both of N.H., assignors to Davidson Texttron Inc., Dover, N.H.

Filed Jan. 21, 1988, Ser. No. 146,316

Int. Cl.⁴ B05D 3/02, 3/12, 5/00, 1/02

U.S. Cl. 427-264

6 Claims

1. In a masking process for selectively painting a surface of a part with first and second color paint to form a precise paint line between the two colors of paint, the improvement comprising:

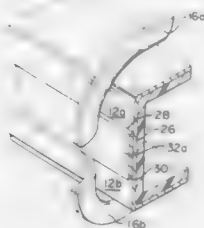
applying a first color paint coating to the surface of the part in preparation for masking, mask trimming and subsequent painting;

masking the surface of the part with a layer of settable and

adherent washable masking material so as to cover the first color paint coating, said material being cuttable when set to form a non-wicking edge;

setting the washable masking material on the first color paint coating to form an adherent layer of masking which covers the first color paint coating so as to be retained thereon during washing and which can be readily and cleanly removed from the first color paint coating following washing;

cutting a first predetermined portion of the set washable masking material to define a paint line and peeling the first predetermined portion of the set washable masking material from the first color paint coating to form an exposed



surface thereon while retaining a second predetermined portion of the set washable masking material on the first color paint coating, the second predetermined portion having a non-wicking edge corresponding to the paint line;

washing and drying the masked and exposed portions of the part surface and thereafter applying a second colored paint coating on the washed surfaces of the part at the non-wicking edge; and thereafter cleanly peeling the second predetermined portion of the set washable masking material from the part surface to define a precision paint line between the first and second color paint coatings on the part.

4,877,653

PROCESS FOR INSOLUBILIZING SOLVENT SOLUBLE POLYIMIDE COMPOSITIONS

Rohitkumar H. Vora; Dinesh N. Khanna, both of West Warwick, and Suzanne Fontaine, Warwick, all of R.I., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Filed Jul. 12, 1988, Ser. No. 217,796

Int. Cl.⁴ B05D 3/02

U.S. Cl. 427—385.5

10 Claims

1. A process for insolubilizing a composition comprising a solvent soluble polyimide comprising:

- (a) forming said composition into a shaped article;
- (b) subjecting said composition to a heat annealing process at a temperature of at least about 325° C., and for a period of time sufficient to insolubilize said polyimide composition; said soluble polyimide being the condensation and imidization product of an aromatic diamine and an aromatic dianhydride, wherein at least one of said dianhydride or said diamine is selected from the group consisting of 2,2-hexafluoro-bis-(3,4-dicarboxyphenyl) propane dianhydride; 2,2-hexafluoro-bis-(3-aminophenyl)propane; 2,2-hexafluoro-bis(4-aminophenyl) propane; 2,2-hexafluoro-bis[4-(3-aminophenoxy) phenyl]propane; 2,2-hexafluoro-bis[4-(4-aminophenoxy) phenyl]propane; 1,1-bis(4-aminophenyl)-1-phenyl-2,2,2-trifluoroethane; 1,1-bis-[4-(1,2-dicarboxyphenyl)]-1-phenyl-2,2,2-trifluoroethane dianhydride; and mixtures thereof.

5. The process of claim 1 wherein said shaped article is prepared by forming a solution of said solvent soluble poly-

imide in organic solvent, applying said solution to a substrate, and evaporating off said organic solvent.

4,877,654

BUFFERED SILANE EMULSIONS FOR RENDERING POROUS SUBSTRATES WATER REPELLENT

Michael E. Wilson, Gainesville, Fla., assignor to PCR, Inc., Gainesville, Fla.

Filed May 2, 1988, Ser. No. 189,146

Int. Cl.⁴ B05D 3/02

U.S. Cl. 427—387

45 Claims

20. A process for increasing the resistance to penetration by aqueous media of a porous substrate, said process comprising:

- (i) applying to the surface of said substrate a buffered aqueous silane emulsion composition comprising effective amounts of
 - (a) a hydrolyzable silane essentially hydrolytically stable within a determinable pH range;
 - (b) an emulsifier or mixture of emulsifiers having an HLB value of from about 1.5 to about 20;
 - (c) at least one compound for buffering the pH of said composition within said determinable pH stable range;
 - (d) water; and
- (ii) allowing said composition to cure.

4,877,655

BALL HOLDING AND CEMENTING APPARATUS AND METHOD

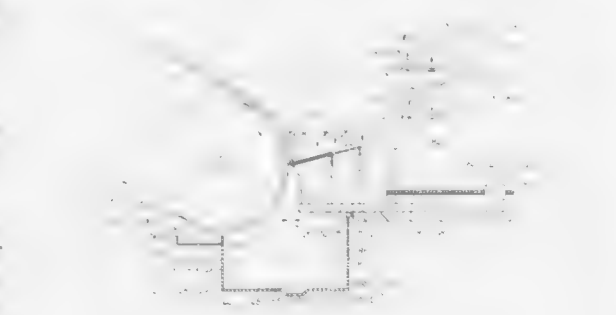
John L. Rockerath, Whitesboro, N.Y., and Dale K. Blust, Atco, N.J., assignors to Figgie International Inc., Willoughby, Ohio

Filed Jul. 15, 1987, Ser. No. 73,819

Int. Cl.⁴ B05D 1/18

U.S. Cl. 427—430.1

23 Claims



1. A method for holding objects having a cross sectional area of a plane cut through the object and a periphery around the cross sectional area, the method comprising:

- (a) supporting a base member,
- (b) structurally attaching a plurality of at least three tines projecting from the base member with the center line of each of the tines spaced apart on the periphery of an area identical to that of the periphery of the cross sectional area of the object, and
- (c) wedging the object into the area between the tines so that the sides of the tines firmly hold the object, when the base member is held with the points of the tines pointed downwardly.

4,877,656

METHOD OF FABRICATING SIMULATED STONE SURFACES AND IMPROVED SIMULATED STONE PRODUCT

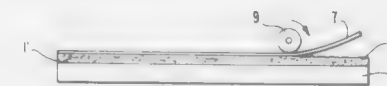
David Baskin, Duxbury, Mass., assignor to Academy of Applied Science, Inc., Concord, N.H., a part interest

Continuation of Ser. No. 928,270, Nov. 6, 1986, abandoned. This application Aug. 18, 1988, Ser. No. 235,702

Int. Cl.⁴ B44F 9/04

U.S. Cl. 428—15

9 Claims



9. An artificial stone-like facing attached to one or more of the topside, edges and areas of the underside of a substrate, and comprising a layer(s) of cured mixture of initially uncured wet and soft synthetic resin binder, color pigment, filler particles and curing agent, said resin being selected from the group consisting of polymerizable unsaturated polyester resins, with and without styrene monomers, epoxy resins and urethane resins; said color pigments being selected from the group consisting of inert inorganic powders and pastes and polyester-dispersed pigments; and said filler particles being selected from the group consisting of powdered silica, silicates, quartz earths and clays and aluminum trihydrate; said layer(s) of cured mixture having been pressure-applied when wet and uncured and compressed against a predetermined smooth surface of high gloss to conform to and the smooth finish of said surface and then cured without heat against and throughout said surface and released therefrom.

4,877,657

DECORATIVE TRIM STRIP WITH ENHANCED DEPTH OF VISION

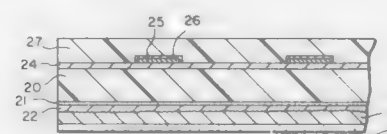
Perry N. Yaver, Brighton, Mich., assignor to The D.L. Auld Company, Columbus, Ohio

Filed Feb. 6, 1989, Ser. No. 306,049

Int. Cl.⁴ B60R 13/04; G02B 5/08

U.S. Cl. 428—31

15 Claims



1. A flexible trim strip especially useful for application to the exterior or interior of an automobile to provide a decorative surface with an enhanced depth of vision, said flexible trim strip comprising a layered composite of:

- (a) an elongated transparent or translucent core of a plastic material having a substantially flat top surface and a substantially flat bottom surface;
- (b) an opaque layer covering the bottom surface of the transparent core;
- (c) an adhesive layer covering the opaque layer, said adhesive layer capable of adhering to the exterior of an automobile for a prolonged time;
- (d) a thin metal layer having a mirror-like appearance covering the top surface of the transparent or translucent core, said metal layer when selected portions are removed providing a surface with both a mirror-like and patterned appearance; and
- (e) a transparent plastic overlay covering the thin metal layer, said overlay characterized in having radiused edges so as to give enhanced depth of vision to the trim strip by

creating a lens effect and providing a three dimensional appearance thereto.

4,877,658

WINDOW LINER FOR USE IN AIRCRAFT

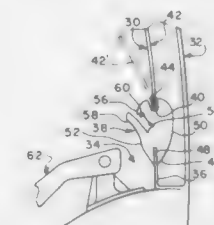
Gale R. Calhoun, 4304 Stearns St., Long Beach, Calif. 90815

Filed Feb. 22, 1988, Ser. No. 158,536

Int. Cl.⁴ E06B 3/64

U.S. Cl. 428—34

12 Claims



1. A liner for an existing window permanently mounted in an existing frame in an aircraft comprising: a stiff sheet of transparent acrylic plastic from about one sixteenth to about one eighth of an inch in thickness having a perimeter firmly set and configured to conform to the shape of said existing window, and a resilient molding engaging said perimeter of said acrylic sheet and formed with an interiorly directed groove adapted to receive and seize said perimeter of said plastic sheet and having an exteriorly directed peripheral surface shaped to conform to the surface of said existing frame of said existing window inwardly of said existing window, whereby said acrylic plastic sheet is held in spaced separation from said existing window.

4,877,659

MULTIWELL ASSAY/CULTURE STRIP

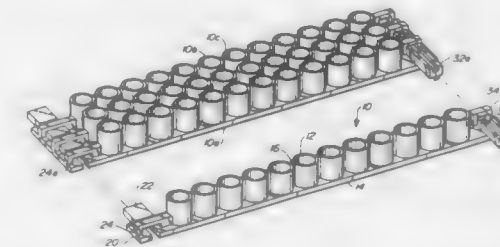
Paul W. Vince, San Rafael, Calif., assignor to Inti Corporation, San Rafael, Calif.

Filed Aug. 2, 1988, Ser. No. 227,508

Int. Cl.⁴ C12M 1/32

U.S. Cl. 428—34.1

4 Claims



1. A multiwell assay/culture strip comprising: a strip member having a base portion and a first and second end; a plurality of well portions supported on said base portion in linear, side-by-side arrangement; first male linking means located on said first end and extending some distance therefrom; first female receiver means located on said first end, said first female receiving means conditioned for releasable engagement with an identical first male linking means of another strip member; second male linking means located on said second end and extending some distance therefrom; and second female receiver means located on said second end, said second female receiving means conditioned for releasable engagement with an identical second male linking means of another strip member;

wherein said first male linking means are not engageable with said second female receiving means, and said second male linking means are not engageable with said first female receiving means.

4,877,660

RECOVERABLE FABRIC SLEEVE

Noel M. M. Overbergh, Bertem, and Jan L. M. F. G. Vansant, Korbek-Lo, both of Belgium, assignors to Raychem Corporation, Menlo Park, Calif.

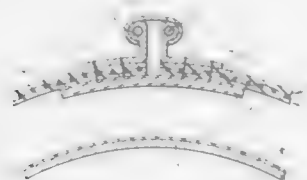
Filed Feb. 4, 1988, Ser. No. 152,123

Claims priority, application United Kingdom, Feb. 9, 1987, 1702833

Int. Cl.⁴ H02G 15/18

U.S. Cl. 428—34.9

24 Claims



1. A heat-recoverable tubular or wrap-around sleeve having a recovery ratio of at least 40% and being suitable for enclosing a junction between elongate substrates, which comprises:

- (a) a polymeric matrix material; and
- (b) a recoverable woven fabric by virtue of which the sleeve is recoverable and which is rendered impervious by the matrix material, comprising 10–35 heat recoverable weft fibres per cm. extending around the circumference of the sleeve in bundles of 2–6, and 2–6 non recoverable warp fibres per cm. extending along the length of the sleeve.

4,877,661

RAPIDLY RECOVERABLE PTFE AND PROCESS THEREFOR

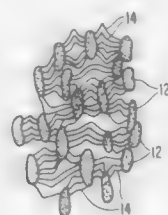
Wayne D. House, Flagstaff, and David J. Myers, Camp Verde, both of Ariz., assignors to W. L. Gore & Associates, Inc., Newark, Del.

Filed Oct. 19, 1987, Ser. No. 110,145

Int. Cl.⁴ F16L 9/16; B32B 27/32; B29D 7/24

U.S. Cl. 428—34.9

53 Claims



1. A porous shaped article consisting essentially of PTFE, said article having a microstructure of nodes interconnected by fibrils, said article at ambient temperature capable of being stretched and then rapidly recovering more than about 6% of its stretched length.

4,877,662

VESSEL COMPRISING RESIN COMPOSITION

Jinichi Yazaki, Tokyo, and Akihiko Tamura, Chigasaki, Japan, assignors to Toyo Seikan Kaisha, LTD., Tokyo, Japan

Filed Sep. 22, 1986, Ser. No. 909,726

Claims priority, application Japan, Sep. 20, 1985, 60-206602; Sep. 20, 1985, 60-206603

Int. Cl.⁴ B32B 27/08

U.S. Cl. 428—36.7

6 Claims

1. A vessel which has a multi-layer structure comprising (a) an inner surface layer composed of a propylene resin, (b) a first adhesive layer, (c) an intermediate layer composed of an ethylene/vinyl alcohol copolymer having a vinyl alcohol content of 30 to 80 mole%, (d) a second adhesive layer, (e) an outer surface layer composed of a propylene resin and (f) a layer composed of a blend resin composition interposed between the inner surface layer and the first adhesive layer and/or between the outer surface layer and the second adhesive layer, wherein said blend resin composition contains a scrap resin produced at the vessel-forming step and comprises (i) an ethylene/vinyl alcohol copolymer, (ii) a resin selected from the group consisting of a propylene resin and a polar group-containing thermoplastic resin having in the main chain or side chain a carboxyl group derived from a compound selected from the group consisting of carboxylic acids, carboxylic acid salts, carboxylic anhydrides, carboxylic acid amides, carboxylic acid esters and carbonic acid esters, (iii) a combined stabilizer comprising an alkaline earth metal hydroxide or oxide and an alkaline earth metal salt of a higher fatty acid at a weight ratio of from 1/10 to 10/1, and (iv) an antioxidant composed of a sterically hindered phenol, the amounts of the ethylene/vinyl alcohol copolymer (i), the resin (ii), the combined stabilizer (iii) and the antioxidant (iv) being 1 to 90% by weight, 5 to 98% by weight, 0.01 to 3% by weight and 0.01 to 3% by weight, respectively, based on the sum of the components (i), (ii), (iii) and (iv).

4,877,663

ETHYLENIC THERMOPLASTIC RESIN COMPOSITION

Shigemitsu Kambe, Kawasaki, and Hideaki Miyafuji, Kisarazu, both of Japan, assignors to Nippon Petrochemicals Company, Limited, Tokyo, Japan

Filed Sep. 6, 1988, Ser. No. 241,084

Claims priority, application Japan, Sep. 11, 1987, 62-226462

Int. Cl.⁴ C08J 5/18; C08L 23/08, 23/18, 33/04; 525 221, 222, 227; 428 35

U.S. Cl. 428—35.5

5 Claims

1. A single-layer film formed from an uncrosslinked ethylenic thermoplastic resin composition comprising:

- (a) 20–80% by weight of an ethylene/ α -olefin copolymer having a density of 0.910 to 0.940 g/cm³.
- (b) 70–5% by weight of a copolymer of ethylene and a carboxyl group containing monomer or a derivative thereof; and
- (c) 50–5% by weight of an ethylene/ α -olefin copolymer having
 - (i) a density in the range of not lower than 0.860 g/cm³ to lower than 0.910 g/cm³,
 - (ii) a maximum peak temperature not lower than 100° C. as measured according to differential scanning calorimetry (DSC) and
 - (iii) a boiling n-hexane insolubles content not smaller than 10% by weight,
 provided the total amount of the components (a), (b) and (c) is 100% by weight.

4,877,664

MATERIALS HAVING A DEOXIDATION FUNCTION AND A METHOD OF REMOVING OXYGEN IN SEALED CONTAINERS

Shigeyoshi Maeda; Tsunetoshi Asai, both of Kawasaki; Hidejiro Asano, Sagami, and Haruyoshi Taguchi, Osaka, all of Japan, assignors to Nippon Steel Corporation, Tokyo; Santory Limited, Osaka and Kansai Paint Company, Ltd., Hyogo, all of Japan

Continuation-in-part of Ser. No. 927,709, Nov. 7, 1986, Pat. No. 4,740,402. This application Apr. 21, 1988, Ser. No. 184,613

Claims priority, application Japan, Nov. 8, 1985, 60-248722; Nov. 9, 1985, 60-251502

The portion of the term of this patent subsequent to Apr. 26, 2005, has been disclaimed.

Int. Cl.⁴ B65D 1/00; B32B 15/04, 27/08

U.S. Cl. 428—35.9

11 Claims

1. A sealed container having a deoxidation function having at least part of said container being composed of the material having a deoxidation function comprising

- (a) a metallic base material reactive with oxygen,
- (b) a hydrophilic coating layer formed on the surface of said metallic base material, and
- (c) an oxygen- and moisture-permeable coating layer formed on said hydrophilic coating layer, said oxygen- and moisture-permeable coating layer being a film of polymethylpentene.

4,877,665

LINING MATERIAL FOR PIPE LINES

Kumao Higuchi, Chiba; Akio Morinaga, Fujisawa; Masahiro Seshimo, Nishinomiya, and Hitoshi Saito, Moriguchi, all of Japan, assignors to Tokyo Gas Kabushiki Kaisha, Tokyo and Ashimori Tokyo Kabushiki Kaisha, Osaka, both of Japan

PCT No. PCT/JP87/00839, § 371 Date Jul. 1, 1988, § 102(e) Date Jul. 1, 1988, PCT Pub. No. WO88/03476, PCT Pub. Date May 19, 1988

PCT Filed Oct. 30, 1987, Ser. No. 233,658

Claims priority, application Japan, Nov. 4, 1986, 61-262496

Int. Cl.⁴ F16L 55/16, 55/18

U.S. Cl. 428—36.1

12 Claims



1. A tubular lining material for pipelines utilizable in a pipeline method wherein the tubular lining material is bonded onto the inner surface of a pipeline, which material comprises:

- (a) a tubular textile jacket having an inner and outer surface, said tubular textile jacket comprising a plurality of interwoven yarns;
- (b) a plurality of bulky yarns interwoven with said plurality of yarns along either one of the inner or outer surface of the tubular textile jacket, said plurality of bulky yarns being proportionably larger in size than said plurality of yarns, and
- (c) an air-impervious layer bonded to the other surface of the tubular textile jacket than said plurality of bulky yarns.

4,877,666

MAGNETO-OPTIC SUBSTRATES

Boris J. Muchnik, Boulder, Colo., and Bernd F. Fischer, Wiesbaden, Fed. Rep. of Germany, assignors to Kerdix, Inc., Boulder, Colo.

Filed Aug. 11, 1987, Ser. No. 84,273

Int. Cl.⁴ G02F 1/09

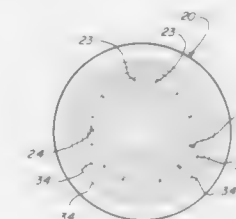
U.S. Cl. 428—64

4 Claims

1. A substrate for supporting a magneto-optic recording

layer and for transmitting optical energy to said layer for magneto-optic recording, said substrate comprising:

a disk formed from polycarbonate material, said disk defining a primary plane having an axis of symmetry perpendicular thereto, said disk being characterized by having relatively uniform azimuthal birefringence characteristics and having recording locations around circular azimuthal paths which do not exhibit birefringence variations with respect to azimuthal position around said paths, said substrate being manufactured according to the following steps:



providing a mold having a cavity designed to form said substrate as a thin disk that defines said plane and that has said axis of symmetry perpendicular thereto; mounting such mold horizontally with said axis of symmetry thereof substantially vertical; and flowing hot, fluid plastic material from said axis of said horizontal mold so that said fluid plastic flows from the center of said mold relatively uniformly and radially outwardly to minimize said azimuthal variations in birefringence of the resulting substrate.

4,877,667

OPTICAL DISC WITH INHIBITED THERMAL DISTORTION

Michinobu Hattori; Hidemitsu Fujisawa, and Akio Kusaura, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP87/00343, § 371 Date Mar. 4, 1988, § 102(e) Date Mar. 4, 1988, PCT Pub. No. WO88/00755, PCT Pub. Date Jan. 28, 1988

PCT Filed May 28, 1987, Ser. No. 168,125

Claims priority, application Japan, Jul. 22, 1986, 61-113992; Jul. 22, 1986, 61-113993; Jul. 22, 1986, 61-113994; Jul. 22, 1986, 61-113995

Int. Cl.⁴ B32B 3/02

U.S. Cl. 428—64

3 Claims



1. An optical disc assembly, comprising:

- (a) a centrally apertured, planar disc substrate (1) made of a plastic material, such as polycarbonate, having a high coefficient of thermal expansion,
- (b) an annular optical information recording/reproducing layer (2) formed on the substrate concentrically surrounding the central aperture thereof and having an inner periphery spaced radially outwardly therefrom,
- (c) a pair of turntable mounting and centering discs (3) individually coaxially disposed on opposite sides of the substrate, said discs having axially aligned central spindle

apertures of smaller diameter than the substrate aperture and being made of a magnetic material having a coefficient of thermal expansion lower than that of the substrate, and

(d) means for fixedly mounting the so disposed discs to the substrate, said mounting means having a coefficient of thermal expansion substantially the same as that of the substrate such that thermal expansions and contractions of the substrate are borne by the mounting means to attendantly avoid any planar distortion or buckling of the substrate,

(e) wherein said mounting means is selected from the group comprising:

- (1) a pair of intermediate discs (7) configured substantially identical to the mounting and centering discs, made of the same plastic material as the substrate, individually coaxially disposed between the respective mounting and centering discs and the substrate, and adhesively bonded thereto, and
- (2) a plurality of headed anchoring studs (9) individually extending through an equal plurality of axially parallel apertures (8) spaced around the spindle aperture of each disc and extending therethrough, said anchoring studs having inner ends ultrasonically welded to the substrate.

4,877,668

PRESSURE VESSEL SIGHT GLASSES

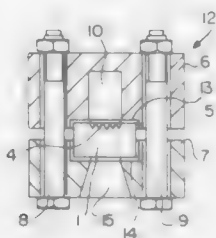
Paul Hinz, Mainz-Fladung; Helmut Distich, Budenheim, and Gerhard Weber, Schornheim, all of Fed. Rep. of Germany, assignors to Schott Glaswerke, Mainz, Fed. Rep. of Germany
Filed Jan. 20, 1987, Ser. No. 4,404

Claims priority, application Fed. Rep. of Germany, Jan. 20, 1986, 3601500

Int. Cl.⁴ B32B 1/04, 3/02

U.S. Cl. 428—68

10 Claims



1. A pressure vessel sight glass suitable for pressure vessels containing boiler feed water at a temperature up to about 300° C., said sight glass being mounted between a base plate and a counter plate, for insertion into or attachment to said pressure vessel, said sight glass having a thickness of 7–30 mm and being protected against the corrosive action of boiler feed water by a transparent coating of stannic oxide additionally containing chromic oxide.

4,877,669

TUFTED PILE FABRIC

Frank Eadrenyi, Jr., Chattanooga, Tenn., and Larry W. Hankins, Dalton, Ga., assignors to Collins & Allman Corporation, New York, N.Y.

Filed Jan. 12, 1989, Ser. No. 296,490

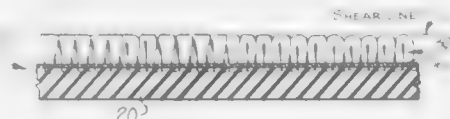
Int. Cl.⁴ B32B 3/02, 33/00

U.S. Cl. 428—88

9 Claims

1. A tufted pile fabric characterized by having diagonal lines of tufts of different colors across the face of the fabric, said fabric comprising a primary backing, first and second sets of pile yarns formed of continuous filaments and forming pile tufts connected to and extending upwardly from the primary backing and forming a pile face across the primary backing, said first set of pile yarns being of a first characteristic, said

second set of pile yarns being of a second characteristic differing in appearance from said first characteristic, the yarns in said first set being of a substantially solid color throughout their lengths, the yarns in said second set being space dyed yarns having a series of different colored segments of yarn along their length and wherein the different colored segments are randomly arranged throughout the respective yarns, each set of pile yarns forming longitudinally extending zig-zag rows of pile tufts so arranged that the pile tufts formed from the yarns of said first set form first diagonal lines of pile tufts extending diagonally across the pile face of the fabric from one



side of the fabric to the other and the pile tufts formed from the yarns of said second set form second diagonal lines of pile tufts alternating with said first diagonal lines of pile tufts across the pile face of the fabric and wherein the face of the fabric presents the overall appearance of cut pile fabric and wherein only some of the pile tufts are cut pile tufts and are randomly arranged throughout the fabric, and wherein the remaining pile tufts include randomly arranged uncut loop pile tufts and randomly arranged partially cut loop pile tufts with only some of the continuous filaments forming the loop pile being cut at the face of the fabric.

4,877,670

CORDIERITE HONEYCOMB STRUCTURAL BODY AND METHOD OF PRODUCING THE SAME

Toshiyuki Hamanaka, Suzuka, Japan, assignor to NGK Insulators, Ltd., Nagoya, Japan

Filed Dec. 29, 1986, Ser. No. 946,901

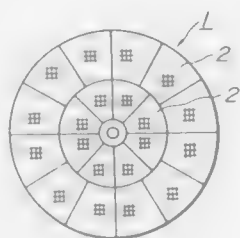
Claims priority, application Japan, Dec. 27, 1985, 60-293691; Aug. 5, 1986, 61-182824

The portion of the term of this patent subsequent to Sep. 20, 2005, has been disclaimed.

Int. Cl.⁴ B32B 3/12

U.S. Cl. 428—116

9 Claims



1. A cordierite honeycomb structural body comprising crystalline phases consisting essentially of cordierite, a total pore volume of a pore diameter of not less than 5 μm of not more than 0.04 cc/g, a coefficient of thermal expansion of not more than 1.0×10⁻⁶/°C. in the temperature range of 40°–800° C., and a chemical composition by weight of 42–56% of SiO₂, 30–45% of Al₂O₃ and 12–16% of MgO.

4,877,671

REDUCING SHRINKAGE OF PHENOLIC FOAM COMPOSITES

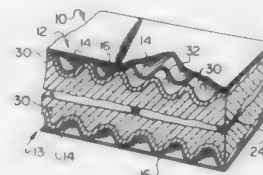
Malcolm J. Stagg, Beaconsfield; Eric P. Stern, Montreal, and Sunil Vidyarthi, Beaconsfield, all of Canada, assignors to BPCO, Inc., Canada

Filed Mar. 9, 1988, Ser. No. 165,747

Claims priority, application Canada, Mar. 13, 1987, 532,006 Int. Cl.⁴ B32B 3/10

U.S. Cl. 428—139

37 Claims U.S. Cl. 428—172



1. A foam composite comprising first and second oppositely disposed corrugated skins and a core of cured foam material between said skins, and a reinforcement medium located at the interface between said foam core and each said skin, said foam extending through interstices or pores in said medium and bonding to said medium and each said skin.

4,877,672

FLOOR MAT WITH RIGID RAILS JOINED BY LIVING HINGES

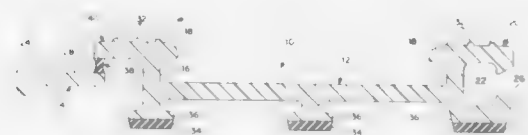
Thomas A. Shreiner, Muncy, Pa., assignor to Construction Specialties, Inc., Cranford, N.J.

Filed Oct. 11, 1988, Ser. No. 255,733

Int. Cl.⁴ B32B 3/10; E04C 1/30

U.S. Cl. 428—156

2 Claims



1. In a floor mat composed of a multiplicity of rigid elongated rails arranged parallel to each other, each rail having a body portion adapted to receive a tread member and a coupling portion by which it is joined to an adjacent rail, the body and coupling portions being a monolithic formation produced by extrusion from a thermoplastic polymeric material, the improvement wherein the body portion and the coupling portion of each rail are formed by extrusion of a rigid high-impact strength thermoplastic polymeric material and wherein the body portion and coupling portion of each rail are joined by a living hinge in the form of a longitudinally continuous thin strand of a highly flexible thermoplastic elastomer coextruded with the body portion and coupling portion and forming a distinct bending line for articulation of the body portion relative to the coupling portion.

4,877,673

EDGE PROTECTOR

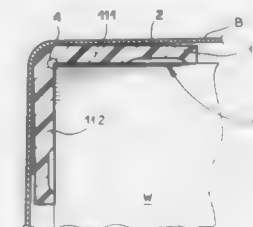
Hans-Joachim Eckel, Wesel, and Hans Warych, Gelsenkirchen, both of Fed. Rep. of Germany, assignors to Signode System GmbH, Dinslaken, Fed. Rep. of Germany

Filed Jun. 13, 1988, Ser. No. 206,235

Claims priority, application Fed. Rep. of Germany, Jun. 13, 1987, 3719847

Int. Cl.⁴ B32B 3/06

4 Claims



1. An edge protector adapted to be interposed between a strap and an article having an edge to be protected, said edge protector comprising:

- a) an elongated body of a generally L-shaped cross section composed of at least in part of extruded thermoplastic synthetic resin and having a pair of flanges angularly adjoining at a junction and formed with respective longitudinal edges, said body having inner and outer surfaces; and
- b) a pressure-adhering adhesive strip on one of said surfaces between said longitudinal edges and extending generally along a longitudinal dimension of said body, said body being formed in the other of said surfaces with a longitudinally extending recess located with respect to said strip such that, upon stacking of the edge protector with other identical, edge protector a said adhesive strip of one of the stacked edge protectors will lie in a said recess of another of the stacked edge protectors without contact with the respective body thereof, the recess being formed in the inner surface of the respective body and the respective adhesive strip being provided on the outer surface of the respective body.

4,877,674

DIRECT OVERWRAP FOR BAR SOAP

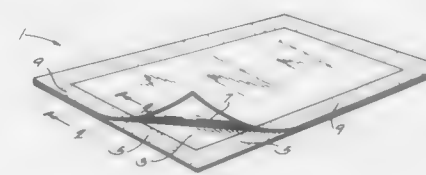
Kenneth C. Kappes, Hartland, Wis., assignor to Milprint, Inc., Milwaukee, Wis.

Filed May 13, 1987, Ser. No. 49,204

Int. Cl.⁴ B32B 23/02; B65D 81/26

U.S. Cl. 428—192

6 Claims



1. A laminate comprising:

- a) a first rectangular sheet of thin flexible plastic material having a size and shape for wrapping around a selected object and having four marginal edges;
- b) a first band of adhesive deposited along the margins of the first sheet;
- c) a second sheet of thin flexible moisture absorbent material having four edges coterminous with the edges of said first sheet and superimposed on the first sheet and bonded thereto along a band line adjacent the margins thereof by

means of the adhesive to form a nonadhered zone within the peripheral band line; and
 d. a second band of adhesive in the form of cold seal cohesive deposited around the margins of the exposed side of the second sheet above said first band,
 so that the laminate may be wrapped around a selected object and said second adhesive bands seal the edges of the object to thereby create a double layer of wrapping around the object so that wrinkling of said second sheet does not cause a corresponding wrinkling of said first sheet within said non-adhered zone with a layer of air between the two sheets.

4,877,675

LIGHT TRANSMITTING OR REFLECTIVE SHEET RESPONSIVE TO TEMPERATURE VARIATIONS
 Waqidi Falicoff, 585 Orchard St., Ashland, Oreg. 97520; Richard Delano, Box 96 Old Field Rd., Setauket, N.Y. 11733, and Chad J. Roseman, 644 West San Francisco, Santa Fe, N. Mex. 87501

Filed Sep. 29, 1988, Ser. No. 250,868
 Int. Cl.⁴ B32B 3/00

U.S. Cl. 428—204

15 Claims



7. A structure as in claim 1 wherein the gel is thick and viscous and has a viscosity in the range of 1000 to 100,000 CPS.

4,877,676

HOT MELT INK TRANSPARENCY

Linda T. Creagh, West Lebanon; Steven F. Fulton, Hanover, both of N.H.; Paul A. Hoisington, Norwich, Vt.; Bruce A. Paulson, Lebanon; Robert R. Schaffer, Canaan, both of N.H., and Charles W. Spehrley, Jr., Hartford, Vt., assignors to Spectra, Inc., Hanover, N.H.

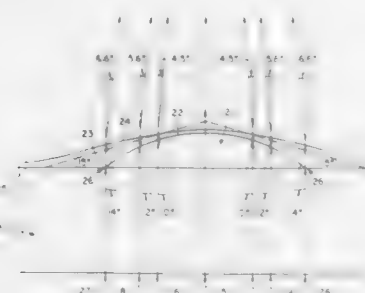
Division of Ser. No. 50,285, May 14, 1987, Pat. No. 4,801,473.

This application Sep. 20, 1988, Ser. No. 246,696

Int. Cl.⁴ B32B 7/04, 3/00

U.S. Cl. 428—204

9 Claims



1. A transparency comprising a transparent substrate, a translucent or transparent ink pattern on the substrate in the form of three-dimensional ink spots having curved surfaces, and a transparent layer on the substrate and the ink spots made of a material which wets the substrate and the ink spots and has approximately the same index of refraction as that of the ink spots.

4,877,677

WEAR-PROTECTED DEVICE

Kumiko Hirochi, Moriguchi; Makoto Kitabatake, Katano, and Osamu Yamazaki, Toyonaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

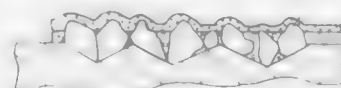
Filed Feb. 18, 1986, Ser. No. 830,085

Claims priority, application Japan, Feb. 19, 1985, 60-30907; Apr. 18, 1985, 60-82850; Jul. 4, 1985, 60-147943; Sep. 12, 1985, 60-200478

Int. Cl.⁴ B32B 9/00; G11B 5/72

U.S. Cl. 428—216

19 Claims



1. A wear-protected device comprising:
 a substrate to be protected from a physical action thereto, said substrate being made of a material selected from the group consisting of glass, metal, plastic film and resin,
 a hard carbon film formed on said substrate by ion irradiation, said hard carbon film consisting essentially of carbon or carbon and hydrogen, and
 a lubricative film, which has a friction coefficient which is less than 0.3 and smaller than that of said hard carbon film, formed on said hard carbon film.

4,877,678

SHEET MATERIAL FOR INK-JET PRINTING

Masamitsu Hasegawa; Satoshi Tamura; Takashi Wakashima, and Isao Sugiyama, all of Saitama, Japan, assignors to Shin-Etsu Polymer Co., Ltd., Tokyo, Japan

Filed May 25, 1988, Ser. No. 198,398

Claims priority, application Japan, Jun. 5, 1987, 62-140897

Int. Cl.⁴ B41M 5/00

U.S. Cl. 428—216

7 Claims

1. A sheet metal for ink-jet printing which comprises three successive layers including:

(a) a base sheet;
 (b) a first coating layer on the surface of the base sheet having a thickness in the range from 5 to 30 μ m formed by coating the surface of the base sheet with a first coating liquid which is a uniform dispersion of a powder of a highly water-absorptive resin capable of absorbing water in an amount of 10 to 2000 times by weight based on the dry weight thereof in a first organic polymer as a binder, the powder of the highly water-absorptive resin having an average particle diameter in the range from 0.1 to 30 μ m, and

(c) a second coating layer on the first coating layer having a thickness in the range from 5 to 50 μ m formed by coating the first coating layer with a second coating liquid which is a uniform dispersion of a powdery water-absorptive inorganic filler having an average particle diameter in the range from 0.01 to 50 μ m and a water absorption of at least 2 x by weight of the dry weight of the powder in a second organic polymer as a binder.

4,877,679

MULTILAYER ARTICLE OF MICROPOROUS AND POROUS MATERIALS

Dennis D. Leatherman, Pittsburgh, Pa.; Thomas Rechlicz, Clinton, and Richard A. Schwarz, Akron, both of Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 19, 1988, Ser. No. 286,585

Int. Cl.⁴ B32B 3/00, 5/22

U.S. Cl. 428—224

35 Claims

1. A multilayer article comprising at least one layer of po-

rous material bonded to at least one layer of microporous material comprising

(a) a matrix consisting essentially of essentially linear ultrahigh molecular weight polyolefin which is essentially linear ultrahigh molecular weight polyethylene having an intrinsic viscosity of at least about 18 deciliters/gram, essentially linear ultrahigh molecular weight polypropylene having an intrinsic viscosity of at least about 6 deciliters/gram, or a mixture thereof; said matrix comprising regions of stretch-induced molecularly oriented ultrahigh molecular weight polyolefin distributed throughout said matrix,

(b) finely divided particulate substantially water-insoluble filler, of which at least about 50 percent by weight is siliceous, distributed throughout said matrix, said filler constituting from about 50 percent to about 90 percent by weight of said microporous material, and

(c) a network of interconnecting pores communicating throughout said microporous material, said pores before bonding constituting more than 80 percent by volume of said microporous material.

6. The multilayer article of claim 1 wherein said layer of porous material is a layer of fabric.

4,877,680

RECORDING MEDIUM WITH NON-POROUS INK-RECEIVING LAYER

Mamoru Sakaki, Hiratsuka; Ryuichi Arai, Sagami-hara; Takashi Akiya, Yokohama; Shigeo Toganoh; Masahiko Higuma, both of Tokyo; Naonobu Eto, Yamato; Hidemasa Mouri; Michiaki Tobita, both of Yokohama; Masahiko Ishida, Fujisawa, and Shunzo Kono, Yokosuka, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 932,524, Nov. 20, 1986, abandoned.

This application Sep. 20, 1988, Ser. No. 246,948

Claims priority, application Japan, Nov. 26, 1985, 60-263830

Int. Cl.⁴ B41M 5/00

U.S. Cl. 428—332

10 Claims

1. A recording medium comprising a substrate and a non-porous ink receiving layer provided thereon, said ink receiving layer comprising a water-insoluble polymer complex and a cationic resin of 2 to 30% by weight based on said polymer complex, said polymer complex being formed from an acidic polymer and a basic polymer.

4,877,681

HEAT-SENSITIVE TRANSFER MATERIAL

Koji Hanada, Ohmiyashi; Masashi Sawamura, Shiraokamati; Takeshi Yoshikawa, Katashikaku; Hiroyuki Nishashi, Yonoshi, and Tsuneo Tanaka, Meguroku, all of Japan, assignors to Toyo Ink Manufacturing Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 170,308, Mar. 14, 1988, abandoned.

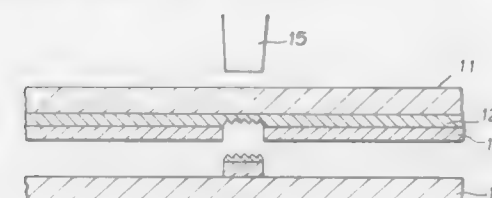
This application Mar. 2, 1989, Ser. No. 319,869

Claims priority, application Japan, Mar. 17, 1987, 62-60215

Int. Cl.⁴ B41M 5/26

U.S. Cl. 428—336

7 Claims

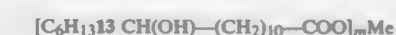


1. In a heat-sensitive transfer material having a substrate and a heat-melting ink layer on one surface of said substrate, the improvement wherein there is provided, between said substrate and said heat-melting ink layer, an interlayer which breaks away within itself under heat at the time of heat trans-

fer, said interlayer containing at least 4% by weight of a high fatty acid metal salt of the formula



or



wherein n is an integer of from 11 to 31,

m is an integer of from 1 to 3, and

Me is a member selected from the group consisting of lithium, sodium, potassium, magnesium, calcium, barium, zinc and aluminum.

4,877,682

LAMINATES CONTAINING COEXTRUDED SCRAP

Marvin E. Sauer, Belle Mead; Tyler F. Hartsing, Jr., Westfield, both of N.J., and Lee P. McMaster, Fairfield, Conn., assignors to Amoco Corporation, Chicago, Ill.

Continuation of Ser. No. 843,297, Mar. 24, 1986, abandoned.

This application Feb. 24, 1988, Ser. No. 160,458

Int. Cl.⁴ B65D 23/00; B32D 27/36

U.S. Cl. 428—412

39 Claims

1. A continuous plastic laminate comprising at least three melt coextruded sheets, each sheet comprising at least one thermoplastic polymer, the outside sheets having a higher stiffness at use temperature than at least one inside sheet, said inside sheet comprising laminate scrap derived from the production of said laminate comprising a blend of a thermoplastic polymer A and thermoplastic polymer B, thermoplastic polymer A having a higher glass transition temperature than thermoplastic polymer B and said outside sheets comprising thermoplastic polymer A, wherein said thermoplastic polymers are selected from the group consisting of one or more of the following: a polyarylethersulfone, a poly(aryl ether), a polyarylate, a polyetherimide, a polyester, an aromatic polycarbonate, a styrene resin, a poly(alkyl acrylate), a polyhydroxyether, a polyamide, a poly(arylene sulfide), a crystalline polyolefin, and a polyphenylene oxide; said laminate comprising the following:

A/ABA/B/A,

A/B/ABA/A,

A/ABA/B/ABA/A,

AABA/B/A,

A/B/AABA,

AABA/B/AABA,

A/ABAB/A,

AABA/ABAB/A,

A/ABAB/AABA, or

AABA/ABAB/AABA.

4,877,683

FLUOROPOLYMER LAMINATES

Chester G. Bragaw, Jr., Kennett Square; Thomas P. Concannon, Newtown Square, both of Pa., and Robert F. Davis, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 25, 1988, Ser. No. 198,521

Int. Cl.⁴ B32B 27/08, 27/32

U.S. Cl. 428—421

8 Claims

1. A laminate comprising at least two abutting layers of fluoropolymer, at least one of which is polyvinyl fluoride, the laminate being free from adhesive between the adjacent fluoro-

polymer layers, having a film-tearing interfacial bond and substantially no interfacial comingling of the adjacent fluoro-polymer layers beyond the molecular level.

4,877,684

NYLON CARRIER FOR POLYMER CONCENTRATE, AND FILMS AND PACKAGES MADE WITH THE CONCENTRATE

Mary E. Shepard, Oshkosh; Deane E. Galloway, and Keith D. Lind, both of Appleton, all of Wis., assignors to American National Can Company, Chicago, Ill.

Filed Aug. 24, 1987, Ser. No. 88,344

Int. Cl.⁴ B32B 27/08, 27/34; C08J 3/20; C08K 3/00

U.S. Cl. 428—475.8 20 Claims

1. A multiple layer film having first and second surface layers, said first surface layer consisting essentially of the composition resulting from the combining of (i) 90% to 99.5% by weight of a first nylon polymer composition and (ii) 10% to 0.5% by weight of an additive concentrate, said additive concentrate consisting essentially of 20% to 85% by weight of a second nylon polymer composition and 80% to 15% by weight of additive agent selected from the group of materials capable of functioning as anti-block agents and slip agents, said second surface layer comprising a polymeric composition capable of forming a heat seal when heat is applied to said first surface layer and driven through said film to said second surface layer.

with a gelling agent selected from the group consisting of boric acid, derivatives of boric acid, and mixtures thereof, and a filler component having high absorption capacity, said binder being present in an amount of from about 10 to 100 percent by weight of the amount of said filler, whereby said filler primarily acts as the ink receptor in said ink-jet printing and the shape, size and uniformity of dots of said ink as applied to said recording sheet may be substantially improved thereby.

4,877,687

SYNTHETIC RESIN MOLDED ARTICLE HAVING ANTISTATIC PROPERTY

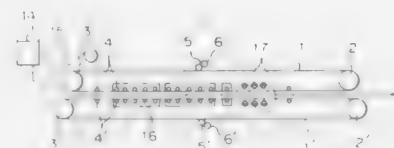
Kiyotaka Azegami, Machida; Suehiro Tayama, Otake; Naoki Yamamoto, Hiroshima; Akira Yanagase, and Hiroki Hatakeyama, both of Otake, all of Japan, assignors to Mitsubishi Rayon Company, Ltd., Tokyo, Japan

Filed Sep. 14, 1987, Ser. No. 95,671

Claims priority, application Japan, Sep. 16, 1986, 61-217601

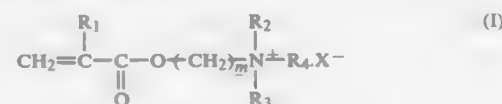
Int. Cl.⁴ B32B 27/08; C09K 3/16

U.S. Cl. 428—520 13 Claims



1. A synthetic resin molded article having good antistatic properties, which comprises a body of a synthetic resin (B) having a surface layer which is predominantly comprised of an antistatic polymer (A) and is integral with the body, said antistatic polymer (A) comprising:

20 to 100% by weight of units derived from a monomer having a quaternary ammonium base, and represented by the following general formula (I):



wherein

R₁ represents a hydrogen atom or a methyl group, R₂ through R₄ independently represent a hydrogen atom or an alkyl group having 1 to 9 carbon atoms, which may have a substituent,

m is an integer of from 1 to 10, and

X⁻ is an anion of a quaternizing agent, and

0 to 80% by weight of units derived from at least one monomer copolymerizable therewith,

wherein said synthetic resin molded article is obtained by forming a film of the antistatic polymer (A) on the molding surface of a casting mold, casting a polymerizable material to be formed into the synthetic resin (B) as the base material in the casting mold, and polymerizing the polymerizable material to form a body of the synthetic resin (B) simultaneously rendering the film of the antistatic polymer (A) integral with the body of the base material.

4,877,685

MODIFIED POLYOLEFINE

Christer Bergstrom, and Tor H. Palmgren, both of Helsinki, Finland, assignors to Neste Oy, Finland

Filed May 28, 1987, Ser. No. 55,032

Claims priority, application Finland, May 28, 1986, 862263

Int. Cl.⁴ B32B 15/08

U.S. Cl. 428—500 18 Claims

1. Modified polyolefine having good adhesion to metals and to polar substances, which comprises an ethylene copolymer selected from ethylene/butylacrylate (EBA), ethylene/ethylacrylate (EEA), ethylene/methylacrylate (EMA), and ethylene/vinylacetate (EVA) being admixed with or grafted to fumaric acid, said modified polyolefine having an acid content of less than 1%.

4,877,686

RECORDING SHEET FOR INK-JET PRINTING AND PROCESS FOR ITS PREPARATION

Claude R. Rion, Veyrier Le Lac, and Georges M. Gidon, La Balme de Stillingy, both of France, assignors to Societe Anonyme: Anusdat-Rey, France

Continuation of Ser. No. 51,053, May 15, 1987, abandoned. This application Oct. 4, 1988, Ser. No. 253,413

Claims priority, application France, May 20, 1986, 86 07355

Int. Cl.⁴ B41M 5/00

U.S. Cl. 428—514 6 Claims

1. A recording sheet for use in connection with inkjet printing comprising an opaque base sheet and a surface coating on said base sheet, said surface coating comprising a polyhydroxylic polymeric binder with the hydroxyl groups in the cis position, a substantial portion of said binder having been gelled

4,877,688

INK-JET RECORDING SHEET

Hideaki Senoo, Tokyo; Takeshi Yamasaki; Yasuo Satoh, both of Funabashi, and Mamoru Sugaya, Kawasaki, all of Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

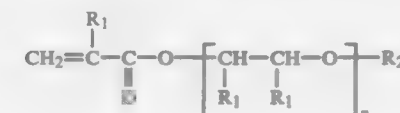
Filed Feb. 19, 1988, Ser. No. 160,749

Claims priority, application Japan, Feb. 24, 1987, 62-40598

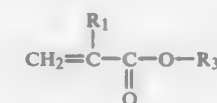
Int. Cl.⁴ B41M 5/00

U.S. Cl. 428—522 5 Claims

1. An ink jet recording sheet consisting essentially of a transparent support and, provided thereon, at least one ink-receiving layer which is a light transmission layer obtained by coating and drying an emulsion polymerized composition obtained by emulsion polymerization of (a) 100 parts by weight of a compound represented by the formula:



wherein R₁ represents a hydrogen atom, a methyl group, an ethyl group or a propyl group; R₂ represents a hydrogen atom or an alkyl group of 1-5 carbon atoms; and n represents an integer of 1-20 or (b) 100 parts by weight in total of the compound of the formula (I) and a compound represented by the formula:



wherein R₁ is as defined above; and R₃ represents an alkyl group of 1-18 carbon atoms, with a proviso that the amount of the compound of the formula (II) is not more than that of the compound of the formula (I); and 30-100 parts by weight of polyvinyl alcohol as an emulsifier.

5. A process for ink jet recording wherein an aqueous ink is applied to the ink jet recording sheet of claim 1.

4,877,689

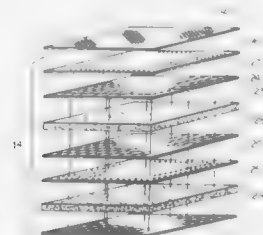
HIGH TEMPERATURE INSULATION BARRIER COMPOSITE

Joseph W. Onstott, Canoga Park, Calif., assignor to United States of America as represented by the Administrator, National Aeronautics and Space Administration, Washington, D.C.

Filed Sep. 30, 1988, Ser. No. 252,078

Int. Cl.⁴ B32B 15/04; F16L 59/00

U.S. Cl. 428—607 14 Claims



1. A composite material suitable for use as a high temperature insulation barrier for outer surfaces of spacecraft and other hypervelocity vehicles comprising an outer skin layer of nickel chromium and of nickel chromium foil, a first layer of silicon carbide fabric under said top layer, a first layer of alumina batting under said first layer of silicon carbide, a second layer of silicon carbide fabric under said first layer of alumina,

an additional layer of nickel chromium foil under said second layer of silicon carbide, a second layer of alumina batting under said additional layer of nickel chromium foil, and finally a third layer of silicon carbide fabric under said second layer of alumina an interleaved inner region comprised of a top layer

4,877,690

MAGNETOOPTICAL RECORDING ELEMENT

David A. Glocker, W. Henrietta; Tukaram K. Hatwar, Penfield; Gregory Lynn McIntire, West Chester, all of N.Y.; Srinivas T. Rao, Los Gatos, Calif., and Douglas G. Stinson, Fairport, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 1, 1989, Ser. No. 317,401

Int. Cl.⁴ G11B 7/24

U.S. Cl. 428—627 10 Claims



1. A magneto-optical recording element which comprises an assembly of layers including a rare earth, transition metal recording layer having on one surface a ceramic barrier layer and on the other surface a self-passivating active metal layer having a thermal conductivity substantially equivalent to that of the ceramic barrier layer, said assembly of layers being supported on a substrate.

4,877,691

SOIL RELEASE AGENT AND METHOD TO FACILITATE THE CLEANING OF OVENS USED FOR COOKING

John R. Cockrell, Jr., Greensboro, N.C., assignor to Kay Chemical Company, Greensboro, N.C.

Filed Nov. 27, 1985, Ser. No. 802,313

Int. Cl.⁴ B32B 19/00; B05D 1/00; B08B 17/00

U.S. Cl. 428—688 54 Claims

1. A composition for the pre-treatment in aqueous form of a surface which is subjected to heat and is liable to soiling by baked-on organic food deposits consisting essentially of:

a. a food-safe, inorganic thickening agent which is substantially insoluble in the aqueous form of said composition and which is present in an amount sufficient so that the aqueous form of said composition is capable of forming a continuous coating adhered to all desired portions of said surface, which coating also remains continuous as the coating dries; and

b. an alkaline, food-safe, water-soluble inorganic salt in an amount sufficient so that said composition is readily removable with water or an aqueous solution after said composition has been dried and soiled.

23. A continuous film adhered to a desired surface which is subjected to heat and is liable to soiling by baked-on organic food deposits, said film having been dried, consisting essentially of:

a. a food-safe, inorganic thickening agent which is an inorganic clay material and which is present in an amount sufficient so that said film is still continuous after said drying; and

b. an alkaline, water-soluble, food-safe inorganic salt present in an amount sufficient so that said film is readily removable with water or an aqueous solution after soiling.

25. A method for cleaning a desired surface which is subjected to heat and is liable to soiling by baked-on organic food deposits comprising the steps of:

- a. applying to the surface a composition consisting essentially of:
- a food-safe, inorganic thickening agent which is substantially insoluble in said composition and which is present in an amount sufficient so that said composition is capable of forming a continuous coating adhered to all desired portions of the surface, which coating also remains continuous as the coating dries;
 - an alkaline, water-soluble, food-safe, inorganic salt in an amount sufficient so that said composition is readily removable with water or an aqueous solution after said composition has been dried and soiled; and
 - water,
- to form a continuous coating on the surface;
- b. drying the continuous coating to form a film;
- c. allowing the film to become soiled; and
- d. removing the soiled film by contacting it with water or an aqueous solution.

4,877,692

CLAD SYSTEM FOR BRAZING TO ALUMINA

Howard Mizuhara, Hillsborough, and Eugene Huebel, Union City, both of Calif., assignors to GTE Products Corporation, Stamford, Conn.

Division of Ser. No. 121,205, Nov. 16, 1987, Pat. No. 4,785,989. This application Sep. 12, 1988, Ser. No. 242,651
Int. Cl.⁴ B32B 15/04

U.S. Cl. 428—673

7 Claims

1. The combustion of a clad system for brazing to alumina comprising a relatively thick layer of a cushioning metal clad with a thinner layer of a low blushing metal, and a thin layer of an active brazing filler metal, the active brazing filler metal blushing to a greater extent on the cushioning metal than on the low blushing metal.

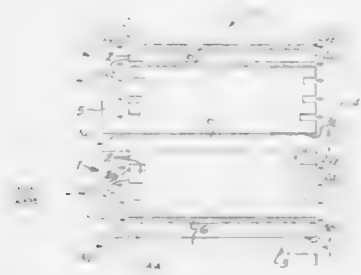
4,877,693

FUEL CELL APPARATUS FOR INTERNAL REFORMING

Bernard S. Baker, Brookfield Center, Conn., assignor to Energy Research Corporation, Danbury, Conn.
Continuation of Ser. No. 37,808, Apr. 10, 1987, abandoned, which is a continuation of Ser. No. 812,315, Dec. 23, 1985, abandoned. This application Dec. 2, 1987, Ser. No. 129,928
Int. Cl.⁴ H01M 8/18

U.S. Cl. 429—19

10 Claims



1. Apparatus comprising:

- a number of one or more first fuel cells arranged in a first stack, the first cells having respective first end faces which are aligned and respective second end faces which are aligned, each first cell including a sandwich construction of an anode chamber, an anode electrode, an electrolyte, a cathode electrode and a cathode chamber, each anode chamber extending between the first and second end faces of its respective first cell and having a gas entry port adjacent the first end face and a gas exit port adjacent the second end face;
- a catalyst chamber in heat conducting relationship with the first stack and running in the direction of the anode chambers of said first cells, said catalyst chamber having a gas entry port adjacent the second end faces of said first cells

and a gas exit port adjacent the first end faces of said first cells;

- a catalyst for endothermic reforming of the hydrocarbon content of a fuel disposed in one of more of said anode chambers and said catalyst chamber, the catalyst in said catalyst chamber being disposed from the gas entry port of said catalyst chamber to a point short of the gas exit port of said catalyst chamber and the catalyst in said one or more anode chambers being partially disposed in each of its respective anode chambers from the gas entry port of the chamber to a point short of the gas exit port; and first means for coupling the gas exit port of said catalyst chamber to the gas entry ports of the anode chambers of said first cells.

4,877,694

GAS DIFFUSION ELECTRODE

Frank Solomon, Great Neck; Yuri Genodman, Brooklyn, both of N.Y., and Jaime Irizarry, Kearny, N.J., assignors to Eltech Systems Corporation, Boca Raton, Fla.

Filed May 18, 1987, Ser. No. 51,551

Int. Cl.⁴ H01M 4/86, 12/06

U.S. Cl. 429—27

49 Claims

1. An electrode capable of extended performance at high current density, said electrode comprising a gas porous, gas supplying layer containing hydrophobic polymer, and an electrolyte porous active layer comprising catalyst containing carbon particles intimately blended with, and uniformly distributed throughout, hydrophilic halogenated polymer binder for said catalyzed carbon particles, which intimate blend is combined in said active layer with particulate substance bound with hydrophobic polymer.

4,877,695

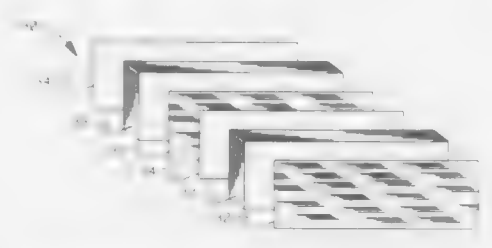
NON-AQUEOUS ELECTROCHEMICAL CELL

Robert A. Cipriano, Lake Jackson; R. Vernon Snelgrove, Damon, and Francis P. McCullough, Jr., Lake Jackson, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 250,789, Sep. 28, 1988, which is a continuation-in-part of Ser. No. 4,003, Jan. 16, 1987, abandoned, which is a continuation-in-part of Ser. No. 3,974, Jan. 16, 1987, abandoned. This application Nov. 1, 1988, Ser. No. 265,652
Int. Cl.⁴ H01M 6/20

U.S. Cl. 429—102

9 Claims



1. A non-aqueous electrochemical cell comprising:

- an anode comprising a molten mixture of at least two elements selected from the group consisting of sodium, potassium, cesium and rubidium;
- a cathod comprising an electrically conductive carbonaceous material; and
- a non-aqueous electrolyte comprising:
- a solvent; and
 - an electrolyte salt selected from the group consisting of an alkali metal tetrafluoroborate and a tetraalkyl ammonium tetrafluoroborate.

4,877,696

COMPOSITE SLIDING STRUCTURE

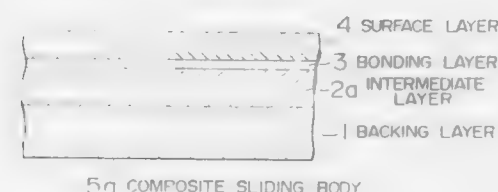
Takashi Muto, Nagoya, Japan, assignor to Daido Metal Company, Nagoya, Japan

Filed Nov. 24, 1987, Ser. No. 129,388

Claims priority, application Japan, Dec. 15, 1986, 61-296627
Int. Cl.⁴ B32B 15/20

U.S. Cl. 428—645

2 Claims



5d COMPOSITE SLIDING BODY

1. A composite sliding structure composed of a surface layer, a bond layer bonded to the surface layer, an intermediate layer bonded to the bond layer and a backing layer bonded to the intermediate layer, said composite sliding structure being characterized in that:

the surface layer is made of any one selected from the group consisting of (a) an alloy consisting of 0.1–6.0% Cu and the balance Pb, (b) an alloy consisting of 0.1–6.0% Cu, 0.5–16.0% In, 0.0–4.0% Sn and the balance Pb, (c) an alloy consisting of 0.5–16.0% In, 0.0–4.0% Sn and the balance Pb;

the bond layer being made of any one selected from the group consisting of an alloy consisting of 0.5–20.0% Zn and the balance Ni, and an alloy consisting of 0.1–4% Sn and the balance Ni;

the intermediate layer being made of any one selected from the group consisting of a single substance Al, an alloy consisting of 1.0–13.0% Si, 1.5–6.0% Zn, 4.0% or less of one or more elements selected from the group consisting of Cu, Mn, Cr, Zr, V, Pb and Sb and the balance Al, an alloy consisting of 1.5–13.0% Si, 40% or less of one or more elements selected from the group consisting of Cu, Mn, Cr, Zr, V, Pb and Sb and the balance Al, and an alloy consisting of 0.1–4% Sn, 4.0% or less of one or more elements selected from the group consisting of Cu, Mn, Cr, Zr, V, Pb and Sb and the balance Al; and the backing metal layer being made of a hard support material.

4,877,697

COLOR FILTER ARRAY FOR LIQUID CRYSTAL DISPLAY DEVICE

Hansjoerg W. Vollmann, Bad-Neuenhain, Fed. Rep. of Germany; George S. K. Wong, Fort Lee, and Dennis Bellville, Phillipsburg, both of N.J., assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany and Hoechst Celanese Corporation, Somerville, N.J.

Filed May 26, 1988, Ser. No. 198,985

Int. Cl.⁴ C09K 19/00; G02F 1/13

U.S. Cl. 430—20

20 Claims

1. A method for producing a display device which comprises forming an array of display electrodes on a surface of a first panel; forming an array of colored filter elements on either side of said first panel in register with said array of display electrodes; forming a counter electrode on a second panel; disposing the first and second panels spaced apart from one another with the display electrodes facing the counter electrode; and confining display material between the spaced first and second panels; wherein at least one of said panels and the electrode or electrodes on said panel is transparent and wherein said colored filter elements are formed by:

- (A) providing a colored photosensitive element which comprises, in order:
- a substrate having a release surface; and
 - a photosensitive layer on said release surface, which

photosensitive layer comprises a light sensitive component selected from the group consisting of negative working, polymeric diazonium compounds, positive working quinone diazide compounds; and photopolymerizable compositions; and a resinous binder composition, which composition contains a major amount of at least one resin selected from the group consisting of a polyvinyl butyral polymer, a polyvinyl alcohol/vinyl acetate/vinyl acetal terpolymer and a styrene-maleic anhydride copolymer half ester; and at least one colorant; and

(iii) an adhesive layer directly adhered to said colored photosensitive layer, which adhesive layer comprises a polyvinyl acetate polymer or vinyl acetate containing copolymer and which adhesive layer has a softening point in the range of from about 60° C. to about 180° C.; and

(B) either

(i) laminating said element with heat and pressure via said adhesive layer to one side of said first panel and removing said substrate by the application of peeling forces; and imagewise exposing said photosensitive layer to actinic radiation; or

(ii) imagewise exposing said photosensitive layer to actinic radiation; and laminating said element with heat and pressure via said adhesive layer to one side of first panel; and removing said substrate by the application of peeling forces; or

(iii) laminating said element with heat and pressure via said adhesive layer to one side of said first panel; and imagewise exposing said photosensitive layer to actinic radiation; and removing said substrate by the application of peeling forces; and then

(C) removing the non-image areas of said photosensitive layer with a liquid developer, which removing is conducted at a temperature at which said adhesive layers are substantially non-tacky; and thereafter

(D) optionally repeating steps A through C at least once whereby another photosensitive element having at least one different colorant is laminated onto one side of said first panel over the non-removed portions of the previously laminated photosensitive layer or layers.

4,877,698

ELECTROPHOTOGRAPHIC PROCESS FOR GENERATING TWO-COLOR IMAGES USING LIQUID DEVELOPER

P. Keith Watson, Rochester; Ian D. Morrison, Webster, both of N.Y., and Melvin D. Croucher, Oakville, Canada, assignors to Xerox Corporation, Stamford, Conn.

Filed May 23, 1988, Ser. No. 197,131

Int. Cl.⁴ G03G 13/01, 13/10

U.S. Cl. 430—45

26 Claims

1. A process for generating two-color images, comprising: (1) charging an imaging member in an imaging apparatus; (2) creating on said member a latent image comprising areas of high, intermediate, and low potential; (3) providing an electrode having a potential within about 100 volts of that of said intermediate potential, enabling generation of an electric field and a development zone between said imaging member and said electrode; and (4) developing said latent image by introducing into said development zone a liquid developer composition containing first toner particles of one color and second toner particles of another different color, said particles being dispersed in a liquid medium, wherein said second toner particles are attracted to said high potential and said first toner particles are attracted to said low potential.

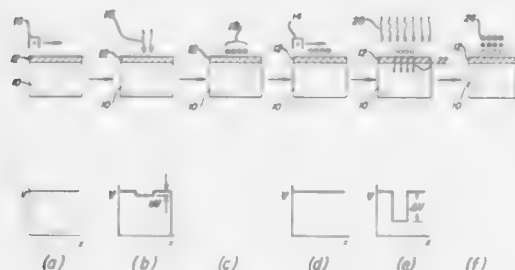
4,877,699

ELECTROPHOTOGRAPHIC LUMINESCENT AMPLIFICATION PROCESS

Ralph H. Young, and John W. May, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Aug. 23, 1988, Ser. No. 236,411
Int. Cl.⁴ G03G 13/22

U.S. Cl. 430—54

19 Claims



1. A method of amplifying an electrophotographic image, comprising the steps of:

- providing a photoconductor having a filter for passing radiation of first and second wavelengths and blocking radiation of a third wavelength;
- uniformly charging the photoconductor;
- imagewise exposing the charged photoconductor with radiation of the first wavelength to produce a low amplitude differential voltage pattern;
- developing the low amplitude differential voltage pattern with a luminescent toner that is excitable by radiation of the third wavelength to emit radiation of the second wavelength to form a luminescent toner image;
- recharging the photoconductor as necessary;
- exciting the luminescent toner image to emit radiation that produces a high amplitude differential voltage pattern in the photoconductor; and
- developing the high amplitude differential voltage pattern to form a high density image.

4,877,700

LAYERED ELECTROPHOTOGRAPHIC RECORDING MATERIAL CONTAINING SELENIUM, ARSENIC AND BISMUTH OR TELLURIUM

Manfred Lutz, and Bernd Reimer, both of Beleck, Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany
Continuation of Ser. No. 476,601, Mar. 18, 1983, abandoned, which is a continuation-in-part of Ser. No. 203,676, Nov. 3, 1980, Pat. No. 4,385,105, which is a continuation-in-part of Ser. No. 269,941, Jun. 3, 1981, Pat. No. 4,379,821. This application Jun. 28, 1988, Ser. No. 218,455

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1982, 3210293

Int. Cl.⁴ G03G 5/04

U.S. Cl. 430—58

14 Claims

1. Fatigue resistant electrophotographic recording material having a high photosensitivity which extends into the infrared range containing a dual photoconductive layer applied to an electrically conductive substrate, with each of the two photoconductive layers of the dual layer containing selenium, the dual layer consisting of a lower photoconductive layer disposed of the substrate, said lower layer consisting of an amorphous system of arsenic and selenium, and an upper photoconductive layer made of $As_{2-x}Bi_xSe_3$ or of $As_2Se_{3-y}Te_y$, where $0 < x < 2$ or $0 < y < 3$, and wherein the lower photoconductive layer disposed on the substrate is made of selenium containing arsenic in the less than stoichiometric amount of from 18 to 37 percent by weight, whereby increasing dark discharges and decreasing charging potential caused by cyclic stress fatigue are avoided.

4,877,701

PHOTOSENSITIVE MEMBER FOR ELECTROPHOTOGRAPHY

Masaaki Hiro, Nisomiya; Tomohiro Kimura, Yokohama; Hisami Tanaka, Tokyo; Noboru Kashimura, Kawasaki; Shigemori Tanaka, Tokyo; Hitooshi Tohma, and Masafumi Hisamura, both of Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jul. 20, 1987, Ser. No. 75,654

Claims priority, application Japan, Jul. 24, 1986, 61-174153
Int. Cl.⁴ G03G 5/14

U.S. Cl. 430—59

14 Claims

1. A photosensitive member for electrophotography comprising a photosensitive layer, at least the surface portion of which comprises a lubricant powder, and a charge-transporting substance having an oxidation potential of 0.6 volt or above.

14. A photosensitive member according to claim 1, wherein the charge-transporting substance is selected from the group consisting of hydrazone compounds, stilbene-type compounds, carbazole compounds, pyrazoline compounds, oxazole compounds, thiazole compounds, triarylmethane compounds and polyaryl alkanes.

4,877,702

ELECTROPHOTOGRAPHIC SENSITIVE MATERIAL
Eiichi Miyamoto, Osaka; Nariaki Muto, Daito, and Tooru Nakazawa, Osaka, all of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

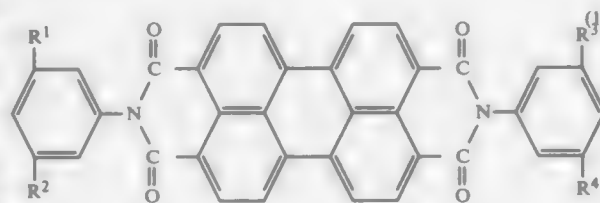
Filed Oct. 27, 1988, Ser. No. 263,255
Claims priority, application Japan, Oct. 30, 1987, 62-277158; Oct. 30, 1987, 62-277159; Oct. 30, 1987, 62-277161; Oct. 30, 1987, 62-277162

Int. Cl.⁴ G03G 5/09

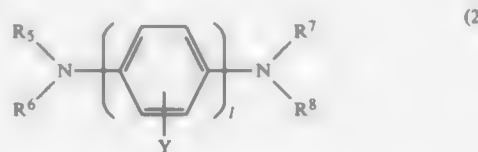
U.S. Cl. 430—72

11 Claims

1. An electrophotographic sensitive material provided with a single-layer type sensitive layer containing an electric charge generating substance, an electric charge transferring substance, and a binding resin, characterized in that said electric charge generating substance is a perylene type compound represented by the following general formula (1) and said electric charge transferring substance is a diamine derivative represented by the following general formula (2):



wherein R^1 , R^2 , R^3 , and R^4 independently stand for an alkyl group of C_1 to C_6 , and



wherein R^5 , R^6 , R^7 , and R^8 independently stand for a group of the following general formula:

4,877,704

PROCESS FOR DEVELOPING LATENT ELECTROSTATIC IMAGE USING TONER CONTAINING POLYESTER RESIN

Hiroyuki Takagiwa, Hachioji; Jiro Takahashi, Sagami; Meizo Shiroya, Hino; Kunio Akimoto, Fujisawa, and Masafumi Uchida, Hachioji, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 73,835, Jul. 15, 1987, abandoned, which is a continuation of Ser. No. 740,176, May 31, 1985, abandoned.

This application Apr. 28, 1988, Ser. No. 191,790

Claims priority, application Japan, May 31, 1984, 59-109543; May 31, 1984, 59-109544; May 31, 1984, 59-109545

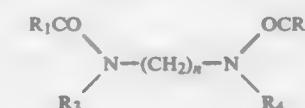
Int. Cl.⁴ G03G 13/20

U.S. Cl. 430—99

21 Claims

1. In a process of developing a latent electrostatic image with a toner, then transferring and fixing the developed image and wherein the fixing is accomplished by the use of a fixing unit having a heat roll fixing unit comprising a fluorinated resin surface and a pressure roller, the improvement wherein the toner comprises

(a) a non-linear copolymer polyester resin having a side chain, said side chain comprising an aliphatic hydrocarbon group containing 3 to 22 carbon atoms, said copolymer being obtained by polymerization of (i) an etherified bisphenol monomer, (ii) a dicarboxylic acid monomer, (iii) at least one of a polyhydric alcohol monomer containing at least 3 hydroxy groups and a monomer component containing a polycarboxylic acid containing at least 3 carboxy groups and (iv) at least one monomer which forms said side chain selected from the group consisting of polyhydric alcohol monomers containing at least 2 hydroxy groups and containing a saturated or unsaturated hydrocarbon group containing 3 to 22 carbon atoms and polycarboxylic acid monomers containing at least 2 carboxy groups and containing a saturated or unsaturated hydrocarbon group containing 3 to 22 carbon atoms; and at least one compound selected from the group consisting of (b) and an alkylene-bis-aliphatic acid amide compound represented by the formula



wherein R^1 and R^2 are independently selected from the group consisting of saturated and unsaturated aliphatic hydrocarbon groups having not less than 10 carbon atoms, R^3 and R^4 are independently selected from a hydrogen atom and a group represented by $-OCR_5$ wherein R_5 is a saturated or unsaturated hydrocarbon group and n is a positive integer, and (c) a wax containing not less than 20% by weight of an ester component, said wax having a needle penetration degree of not more than 4.

4,877,705

PLASMA SPRAY COATED CERAMIC BODIES AND METHOD OF MAKING SAME

Jaromir J. Polidor, Pittsburgh, Pa., assignor to Vesuvius Crucible Company, Pittsburgh, Pa.

Filed Mar. 3, 1988, Ser. No. 163,669

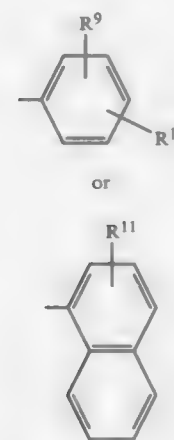
Int. Cl.⁴ B05D 1/08; B32B 9/00

U.S. Cl. 428—34.6

7 Claims

1. A subentry shroud or nozzle for use in delivering molten metal below the surface of a molten slag layer in a continuous casting mold, comprising:

an elongated body member of a compacted and fired ceramic material having an internal bore extending from a first end to a second end thereof for delivering a flow of molten metal from said first end to said second end below the surface of said bath of molten material, said body



(wherein R^9 , R^{10} , and R^{11} independently stand for a member selected from the group consisting of a hydrogen atom, alkyl groups of C_1 to C_6 , alkoxy groups of C_1 to C_6 , and halogen atoms), providing that R^5 , R^6 , R^7 , and R^8 each stand for either of the group (3) and the group (4) or R^5 and R^7 each stand for the group (3) and R^6 and R^8 each stand for the group (4); Y stands for one member selected from the group consisting of a hydrogen atom, alkyl groups of C_1 to C_6 , alkoxy groups of C_1 to C_6 , and halogen atoms; and l stands for an integer in the range of 1 to 3.

4,877,703

PHOTOCONDUCTOR FOR ELECTROPHOTOGRAPHY HAVING A SQUARYLIUM CHARGE GENERATING DYE

Masami Kuroda; Yoshimasa Hattori; Noboru Furusho, and Yoshinobu Sugata, all of Kawasaki, Japan, assignors to Fuji Electric Co., Ltd., Kawasaki, Japan

Filed Dec. 14, 1988, Ser. No. 284,335

Claims priority, application Japan, Dec. 16, 1987, 62-317768; Apr. 26, 1988, 62-103678

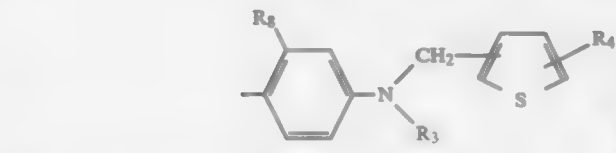
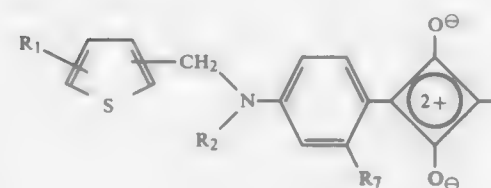
Int. Cl.⁴ G03G 15/06

U.S. Cl. 430—76

9 Claims

1. A photoconductor for electrophotography comprising:

at least one squarylium compound represented by the following general formula (I) as a charge generating substance:



wherein, each of R^1 , R^2 , R^3 and R^4 stands for a hydrogen atom, a halogen atom, an alkyl group, an aryl group, or a nitro group, and each of R^7 and R^8 stands for a hydrogen atom or a hydroxy group.

member also having an outer sidewall surface extending between said first and second ends, a portion of said outer surface adapted to contact the surface of said molten slag layer and defining a slagline area therearound; and a plasma sprayed layer of a ceramic material coating said outer surface of the body in said slagline area, said plasma



sprayed layer having a thickness of between about 0.5 mm to about 5.0 mm and an apparent porosity of at least 15% lower than an apparent porosity of said body, whereby said plasma sprayed layer is adapted to resist corrosive and erosive attack of the molten slag layer at an attack rate lower than that of the body member.

4,877,706

SINGLE COMPONENT COLD PRESSURE FIXABLE ENCAPSULATED TONER COMPOSITIONS

Hadi K. Mahabadi; Tie H. Ng, both of Mississauga; Nancy A. Listigovers, Oakville, and Trevor I. Martin, Burlington, all of Canada, assignors to Xerox Corporation, Stamford, Conn.

Filed May 25, 1988, Ser. No. 198,265
Int. Cl.⁴ G03G 9/08

U.S. Cl. 430—106.6

41 Claims

1. A cold pressure fixing toner composition comprised of a core containing a polymer component and magnetic pigment particles, and wherein the core is encapsulated within a shell comprised of the interfacial polycondensation reaction product of a first polyisocyanate component and a second amine component, which toner includes thereon an electroconductive material obtained from a water based dispersion of said material in a polymeric binder, said first polyisocyanate component being selected from the group consisting of polymethylene polyphenyl isocyanates, diphenylmethane diisocyanates, toluene diisocyanate, and tris(p-isocyanato-phenyl)-thiophosphate; and said second amine component selected from the group consisting of ethylenediamine, tetramethylenediamine, pentamethylenediamine, hexamethylenediamine, p-phenylenediamine, m-phenylenediamine, 2-hydroxy trimethylenediamine, triethylenetetraamine, triethylenepentaamine, 1,8-diaminooctane, xylylene diamine, bis(hexamethylene)triamine, tris(2-aminoethyl)amine, 4,4'-methylene bis(cyclohexylamine), bis(3-aminopropyl)ethylene diamine, 1,3-bis(aminomethyl)cyclohexane, 1,5-diamino-2-methylpentane, piperazine, 2-methylpiperazine, 2,5-dimethylpiperazine, and 1,4-bis(3-aminopropyl)piperazine.

13. A cold pressure fixable toner composition comprised of a core comprising a polymer component selected from the group consisting of poly(lauryl methacrylate), poly(dodecyl acrylate), poly(stearyl methacrylate), styrene-lauryl methacrylate copolymer and poly(dodecyl styrene), and magnetic pigment particles, which core is encapsulated within a shell com-

prised of the interfacial polycondensation reaction product of a first component selected from the group consisting of polymethylene polyphenyl isocyanates, diphenylmethane diisocyanates, toluene diisocyanate, and tris(p-isocyanato-phenyl)-thiophosphate; and a second component selected from the group consisting of ethylenediamine, tetramethylenediamine, pentamethylenediamine, hexamethylenediamine, p-phenylenediamine, m-phenylenediamine, 2-hydroxy trimethylenediamine, diethylenetriamine, triethylenetetraamine, tetraethylenepentaamine, 1,8-diaminooctane, xylylene diamine, bis(hexamethylene)triamine, tris(2-aminoethyl)amine, 4,4'-methylene bis(cyclohexylamine), bis(3-aminopropyl)ethylene diamine, 1,3-bis(aminomethyl)cyclohexane, 1,5-diamino-2-methylpentane, piperazine, 2-methylpiperazine, 2,5-dimethylpiperazine, and 1,4-bis(3-aminopropyl)piperazine; and wherein said toner composition includes thereon an electroconductive component obtained from a water based dispersion of said component in a polymeric binder.

4,877,707

IMAGING PROCESSES WITH COLD PRESSURE FIXABLE TONER COMPOSITIONS

Bernard Grushkin; Hui Chang, both of Pittsford, and John G. Ruhland, Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed May 26, 1988, Ser. No. 198,964
Int. Cl.⁴ G03G 9/08

U.S. Cl. 430—106.6

16 Claims

1. A single component pressure fixable toner composition comprised of resin particles selected from the group consisting of ethylene/propylene copolymers, ethylene-co-vinyl acetate polymers, polyamides, and mixtures thereof, magnetite, and a release fluid therein, which toner contains conductive particles on the surface thereof, and wherein the magnetite is present in an amount of from about 50 to about 80 percent by weight, and the toner has a resistivity of about 10^4 to about 10^7 ohm-cm.

4,877,708

ENCAPSULATED ELECTROSTATOGRAPHIC TONER AND METHOD FOR USE THEREOF

Noriyuki Hosoi, Fujinomiya, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 23, 1987, Ser. No. 137,827

Claims priority, application Japan, Dec. 25, 1986, 61-314424
Int. Cl.⁴ G03G 13/06, 9/08

U.S. Cl. 430—126

8 Claims

1. In a toner in the form of microcapsule comprising a core material enclosed with a resin shell, said core material containing a colorant and an oily medium, the improvement which comprises said oil medium containing a chlorinated paraffin having from 8 to 30 carbon atoms and a chlorination degree ranging from 8 to 40% by weight.

4,877,709

IMAGE FORMING MEMBER FOR ELECTROPHOTOGRAPHY

Etichi Inoue, Tokyo; Isamu Shimizu, and Toshiyuki Komatsu, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 141,158, Jan. 6, 1988, abandoned, which is a division of Ser. No. 77,102, Jul. 23, 1987, Pat. No. 4,737,428, which is a division of Ser. No. 923,027, Oct. 24, 1986, Pat. No. 4,701,394, which is a continuation of Ser. No. 358,356, Mar. 16, 1982, Pat. No. 4,673,628, which is a continuation of Ser. No. 131,495, Mar. 18, 1980, abandoned. This application Aug. 1, 1988, Ser. No. 226,556

Claims priority, application Japan, Mar. 26, 1979, 54-35313
Int. Cl.⁴ G03G 5/082

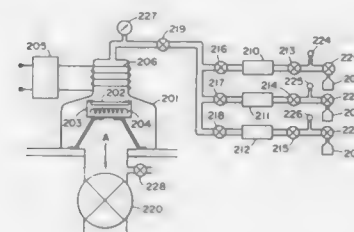
U.S. Cl. 430—128

1 Claim

1. A process for preparing an electrophotographic image-forming member comprising a substrate, a hydrogenated amor-

phous silicon layer containing from 1 to 40 atomic percent of hydrogen and an amorphous inorganic semiconductor layer composed of an amorphous inorganic semiconductor having band gap E_g larger than the band gap E_g of said hydrogenated amorphous silicon and having effective dark resistance for forming electrophotographic images; said hydrogenated amorphous silicon layer being laminated to said amorphous inorganic semiconductor layer whereby a heterojunction is provided in the contact portion between the former layer and the latter layer which comprises the steps of:

- subjecting a substrate suitable for electrophotography to a reduced pressure in an evacuable system;
- introducing gaseous material comprising hydrogenated



silicon gas and hydrogen gas into said system under said reduced pressure;

- causing an electrical discharge in said gaseous material so as to form a hydrogenated amorphous silicon layer containing from 1 to 40 atomic percent of hydrogen on the substrate while maintaining the temperature of said substrate within a predetermined temperature range;
- depositing amorphous inorganic semiconductor on said hydrogenated amorphous semiconductor layer by vacuum vapor deposition so as to form an amorphous inorganic semiconductor layer; and
- after said layer is formed, maintaining the layer under reduced pressure until the temperature of the substrate drops to or below a predetermined temperature.

4,877,710

METHOD FOR FORMING AN IMAGE COMPRISING ADHERENCE OF THE IMAGE-RECEIVING AND IMAGE-FORMING MATERIAL

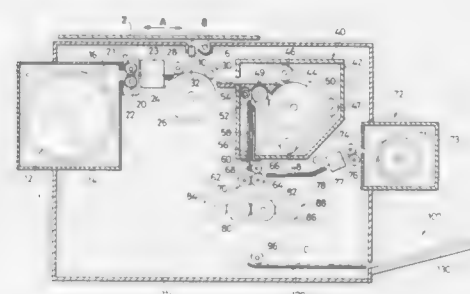
Minoru Ishikawa, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 2, 1987, Ser. No. 127,308

Claims priority, application Japan, Dec. 2, 1986, 61-286001
Int. Cl.⁴ G03C 1/72, 5/54

U.S. Cl. 430—138

3 Claims



1. A method for forming an image comprising the steps of:
 - imagewise exposing a light-sensitive material comprising a support having thereon a light-sensitive layer containing an image-forming material encapsulated in synthetic high molecular resin microcapsules containing a vinyl com-

pound, a photo-polymerization initiator, and a color dye precursor as an image-forming material;

- superposing thereon an image-receiving material comprising a support having thereon an image-receiving layer in contact with the outermost layer of said light-sensitive material;
- applying sufficient pressure to said superposed materials to imagewise rupture at least part of said microcapsules, to transfer an image from said light-sensitive layer to said image-receiving layer, and to adhere said light-sensitive material and said image-receiving material to form a unitary structure; at least one of said support for said light-sensitive material and said support for said image-receiving material being transparent.

4,877,711

LIGHT-SENSITIVE DIAZO PHOTOPOLYMERIZABLE COMPOSITION WITH POLYURETHANE HAVING CARBON-CARBON UNSATURATED AND A CARBOXYL GROUP

Toshiaki Aoi; Kazuo Maemoto; Akihiko Kamiya, and Hiroshi Mitsu, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-Ashigara, Japan

Filed May 12, 1987, Ser. No. 48,949

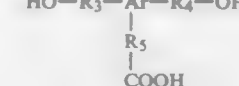
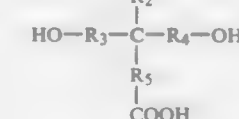
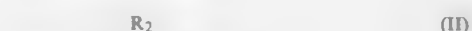
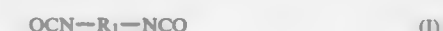
Claims priority, application Japan, May 19, 1986, 61-114342
Int. Cl.⁴ G03C 1/60, 1/70

U.S. Cl. 430—176

14 Claims

1. A light-sensitive composition which comprises an admixture of a polyurethane resin having a carbon-carbon unsaturated bond and a carboxyl group, a monomer having at least one polymerizable, ethylenically unsaturated group, a photopolymerization initiator and/or a sensitizer and a diazonium compound,

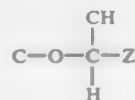
wherein the polyurethane resin has a basic skeleton of a reaction product of a diisocyanate compound represented by the following general formula (I) with a diol compound having a carboxyl group represented by general formula (II) or (III);



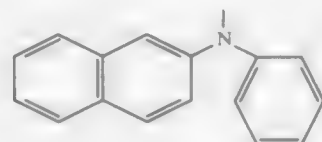
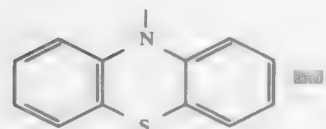
wherein, R_1 represents a divalent aliphatic or aromatic hydrocarbon which may have substituents; R_2 represents a hydrogen atom, alkyl, alkenyl, aralkyl, aryl, alkoxy or aryloxy group, all of which may have substituents; R_3 , R_4 and R_5 may be same or different and represent a single bond or divalent aliphatic or aromatic hydrocarbon which may have substituents; or two or three out of R_2 , R_3 , R_4 and R_5 may form a ring; and Ar represents a trivalent aromatic hydrocarbon which may have substituents, and the carbon-carbon unsaturated bond is introduced into the polyurethane resin by:

- reacting a part of carboxyl groups of the compound of general formula (II) or (III) with a halogen compound or epoxy compound having a carbon-carbon unsaturated bond in the presence of a base, or
- using a diol compound having a carbon-carbon unsaturated bond together with the diol compound of general formula (II) or (III), and the reaction product of said diisocyanate compound and said diol compound does not contain an isocyanate group.

formed by the reaction between said acid and said compound has a solubility, in a developing solution, higher than that of said compound having the acid-decomposable group, and (c) 60 to 90% by weight of an alkali-soluble resin; treating the exposed light-sensitive plate with hot water of 30° C. to 50° C. for a period of at least 10 seconds, and removing the exposed area with an aqueous alkali solution from the plate, wherein said compound having at least one acid-decomposable group is selected from the group consisting of silylether group-containing compounds; acetal or ketal group-containing compounds; enolether group-containing compounds; N-acyliminocarbonate group-containing compounds; orthocarboxylic acid ester group-containing compounds; compounds containing a group expressed by the formula:



in which Z is selected from the group consisting of —OAr, —NRSO₂Ar,



where Ar is monovalent or divalent aromatic group and R is lower alkyl group; and polymeric compounds of aromatic 1,2-dialdehyde.

4,877,720

SILVER HALIDE PHOTOGRAPHIC MATERIAL
Kozo Sato, Shigeru Ohno, and Sumito Yamada, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 29, 1988, Ser. No. 188,583

Claims priority, application Japan, Apr. 30, 1987, 62-106888

Int. Cl.⁴ G03C 1/10, 1/34, 1/42

U.S. Cl. 430—512

18 Claims

1. A silver halide photographic material comprising a support having thereon at least one silver halide emulsion layer, at least one layer of said silver halide photographic material comprising at least one compound represented by formula (I):



wherein PWR represents a group capable of releasing Time—POL upon reduction; Time represents a divalent organic group capable of releasing POL via a subsequent reaction after (Time)_tPOL is released from PWR; t is 0 or 1; and POL represents a polymer group.

4,877,721

PHOTOGRAPHIC SILVER HALIDE ELEMENTS CONTAINING FILTER DYES

Donald R. Diehl, Rochester, and Ralph C. Reed, Brockport, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

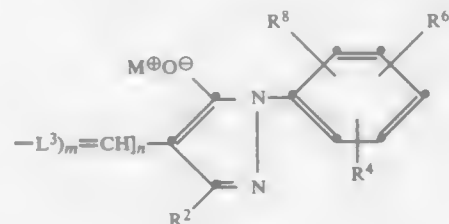
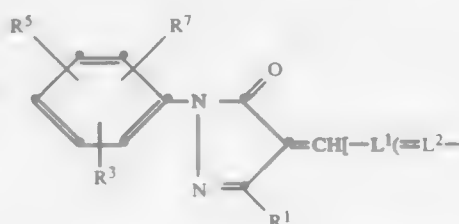
Continuation-in-part of Ser. No. 50,592, May 14, 1987, abandoned, which is a continuation-in-part of Ser. No. 863,667, May 15, 1986, abandoned. This application Aug. 23, 1988, Ser. No. 235,772

Int. Cl.⁴ G03C 1/84

U.S. Cl. 430—522

9 Claims

1. A photographic element comprising a support having thereon a radiation-sensitive silver halide emulsion layer and a hydrophilic colloid layer, which is the same as or different than the silver halide layer, comprising from about 1 to 1000 mg/m² of a dye having the formula:



wherein

R¹ and R² represent an aliphatic, alicyclic, or aromatic acyl group;

R³, R⁴, R⁵, R⁶, R⁷, and R⁸ each represent hydrogen or an acidic substituent capable of forming an anion, provided that (a) at least four of R³, R⁴, R⁵, R⁶, R⁷, and R⁸ are acidic groups and (b) at least two of such acidic groups are other than carboxy;

L¹, L², and L³ each represent CH or CR where R is alkyl of up to four carbons; and

M[⊕] represents hydrogen or a monovalent cation and m and n each may be 0 or 1.

4,877,722

COLOR PHOTOGRAPHIC RECORDING MATERIAL DEVELOPABLE BY HEAT

Manfred Peters; Manfred Becker; Kaspar Wingender, all of Leverkusen; Thomas Kaluschke, Leichlingen, and Sieghart Klötzer, Cologne, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 50,674, May 18, 1987, abandoned. This application Dec. 30, 1988, Ser. No. 293,533

Claims priority, application Fed. Rep. of Germany, May 30, 1986, 3618141

Int. Cl.⁴ G03C 5/54, 7/26

U.S. Cl. 430—559

8 Claims

1. A color photographic recording material developable by heat treatment, comprising at least one light-sensitive silver halide emulsion layer and a non-diffusible dye-releasing compound that release a diffusible dye associated therewith and containing in a light-sensitive layer or in a light-insensitive layer an organic base or base precursor as a development activating compound, wherein the silver halide grains in at

least one silver halide emulsion layer consist mainly of silver bromide and silver iodide and have at least three zones differing in their local iodide content consisting of a core, an outermost shell and at least one intermediate zone between said core and said outermost shell; the local iodide content in the outermost shell is 0–10 mol-%; the local iodide content in at least one intermediate zone is higher than the local iodide content in the core and higher than the iodide content in the outermost shell; the maximum local iodide content in an intermediate zone is higher by at least 6 mol-% than the minimum local iodide content in a zone further away from the core.

4,877,723

SILVER HALIDE PHOTOGRAPHIC MATERIAL COMPRISING A SPECIFIED NUCLEATING AGENT
Shigeo Hirano; Noriyuki Inoue, and Tatsuo Heki, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 6, 1987, Ser. No. 117,725

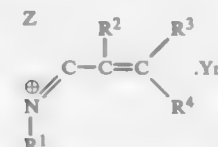
Claims priority, application Japan, Nov. 10, 1986, 61-266866

Int. Cl.⁴ G03C 1/48, 1/06

U.S. Cl. 430—598

10 Claims

1. A silver halide photographic material which comprises a support having provided thereon at least one photosensitive silver halide photographic emulsion layer, wherein the emulsion layer or at least one of the other hydrophilic colloid layers contains at least one nucleating agent which is an alkynyl-substituted heterocyclic quaternary ammonium salt represented by the formula:



(I)

wherein Z represents a group of non-metallic atoms required to form a 5- to 6-membered heterocyclic ring, R¹ represents an aliphatic group, R², R³ and R⁴, which may be the same or different, each represents a hydrogen atom, an aliphatic group, or an aromatic group, at least one of R¹, R², R³, R⁴ and Z has at least one substituent having an alkynyl group, Y represents a counter ion for the charge balance, and n is a number required for charge balance.

4,877,724

METHOD AND COMPOSITION FOR HARDENING GELATIN

Chung Y. Chen, Rochester; Edgar E. Riecke, Webster; Kenneth G. Harbison, and Derek D. Chapman, both of Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

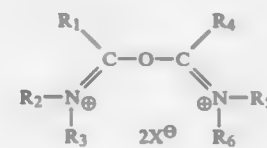
Continuation-in-part of Ser. No. 22,192, Mar. 5, 1987, abandoned. This application Aug. 31, 1988, Ser. No. 238,665

Int. Cl.⁴ G03C 1/30

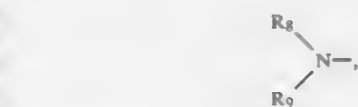
U.S. Cl. 430—621

29 Claims

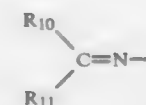
1. A method for hardening gelatin, comprising combining gelatin and a compound of the formula:



wherein R₁ represents hydrogen, alkyl of 1 to 20 carbon atoms, aralkyl of 7 to 20 carbon atoms, aryl of 6 to 20 carbon atoms, alkenyl of 2 to 20 carbon atoms, —YR₇, the group



or the group



wherein Y represents sulfur or oxygen, and R₇, R₈, R₉, R₁₀, and R₁₁ each independently represents alkyl of 1 to 20 carbon atoms, aralkyl of 7 to 20 carbon atoms, aryl of 6 to 20 carbon atoms, or alkenyl of 2 to 20 carbon atoms, or R₈ and R₉ together form a heterocyclic ring, or R₁₀ and R₁₁ are each independently hydrogen or together form a ring structure, or R₁ together with R₂ or R₃ forms a heterocyclic ring.

R₂ and R₃ each independently represents alkyl of 1 to 20 carbon atoms, aralkyl of 7 to 20 carbon atoms, aryl of 6 to 20 carbon atoms, or alkenyl of 2 to 20 carbon atoms, or, taken together with R₁ or each other, forms a heterocyclic ring.

R₄, R₅, and R₆ are defined as are R₁, R₂, and R₃, respectively, and are the same as or different from R₁, R₂, or R₃, and

X[⊖] represents an anion or an anionic portion of the compound to form an intramolecular salt.

4,877,725

IMMUNOASSAYS FOR ANTIBODIES WHICH BIND TO THE ACQUIRED IMMUNODEFICIENCY VIRUS

Alexander R. Neurath, and Nathan Strick, both of New York, N.Y., assignors to New York Blood Center, Inc., New York, N.Y.

Filed Apr. 1, 1985, Ser. No. 718,140

Int. Cl.⁴ G01N 53/00

U.S. Cl. 435—5

13 Claims

1. A process for the detection of antibodies to HTLV III/LAV comprising:

(A) mixing an unknown serum sample with a crude HTLV III/LAV viral antigen selected from the group consisting of

- (i) an antigen prepared by propagating HTLV III virus infected cells in a culture medium;
- (ii) separating the cells out of the medium of step (1)(i);
- (iii) precipitating proteins and virus out from the resultant medium of step (1)(ii);
- (iv) inactivating the virus from the product of step (1)(iii) and releasing P24 core protein and Penv protein; and
- (v) recovering P24 core protein and Penv protein;

- (2) a P24 antigen prepared by
 - (i) propagating HTLV III/LAV virus infected cells in a culture medium;
 - (ii) separating the cells out of the medium of step (2)(i);
 - (iii) precipitating proteins and virus out from the resultant medium of step (2)(ii);
 - (iv) inactivating and disrupting the virus from the product of step (2)(iii), and
 - (v) separating out the HTLV III/LAV P24 antigen; and
- (3) a Penv antigen prepared by
 - (i) propagating HTLV III/LAV virus infected cells in a culture medium;
 - (ii) separating the cells out of the medium of step (3)(i);
 - (iii) precipitating proteins and virus out from the resultant medium of step (3)(ii);
 - (iv) inactivating and disrupting the virus from the product of step (3)(iii), and

- (v) separating out the HTLV III/LAV Penv antigen;
 (B) incubating the resultant mixture from step (A);
 (C) contacting the resultant mixture of step (B) with a solid substrate coated with antibody to HTLV III/LAV;
 (D) incubating the resultant mass from step (C);
 (E) washing the resultant mass from step (D);
 (F) contacting the resultant mass from step (E) with a labeled antibody to HTLV III/LAV;
 (G) incubating the resultant mass from step (F);
 (H) washing the resultant mass from step (G);
 (I) assaying the label in the resultant mass from step (H);
 (J) as a negative control, mixing a serum sample known to be negative to HTLV III/LAV antibody with a diluent;
 (K) subjecting the resultant mass from step (J) to steps (B) to (I);
 (L) as a positive control, mixing a predetermined amount of said crude HTLV III/LAV viral antigen and said diluent;
 (M) subjecting the resultant mass from step (L) to steps (B) to (I); and
 (N) comparing the results of the assay for the label from steps (I), (K) and (M).

4,877,726

METHOD FOR THE DETECTION OF ACUTE-PHASE TOXOPLASMA INFECTION

Yasuhiro Suzuki; Jack S. Remington, both of Menlo Park, Calif.; Georges Desmonts, and Philippe Thulliez, both of Paris, France, assignors to Research Institute of Palo Alto Medical Foundation, Palo Alto, Calif.

Filed Mar. 2, 1988, Ser. No. 163,300
 Int. Cl.⁴ G01N 33/569; C07K 15/04

- U.S. Cl. 435—7 11 Claims
 1. A method of detecting toxoplasma infection and distinguishing acute infection from chronic infection, comprising: combining (1) a sample suspected of containing antibodies to toxoplasma antigens with (2) an acute-phase-specific toxoplasma antigen reactive with an antibody specific for an actone-treated acute-phase-specific toxoplasma antigen, wherein said combining occurs under conditions favorable for formation of antigen-antibody complex; and detecting formation of a complex between IgG antibodies in said sample and said acute-phase-specific toxoplasma antigen as being diagnostic of acute infection.

4,877,727

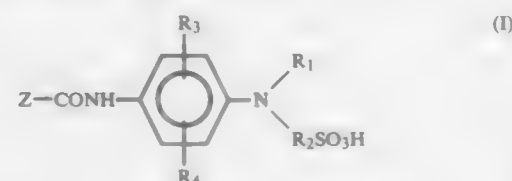
SUBSTRATE FOR DETERMINING LEUCINE AMINOPEPTIDASE OR GAMMA-GLUTAMYLTRANSPEPTASE ACTIVITY

Akira Miike, Shizuka; Yukio Katsumata, Susono, and Toshio Tatano, Numazu, all of Japan, assignors to Kyowa Medex Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 698,623, Feb. 6, 1985, abandoned. This application Sep. 20, 1988, Ser. No. 248,347

Claims priority, application Japan, Feb. 7, 1984, 59-20194
 Int. Cl.⁴ C12Q 1/36, 1/26

- U.S. Cl. 435—24 14 Claims
 1. A test composition for the determination of leucine aminopeptidase (LAP) or γ -glutamyltranspeptidase (γ -GTP) activity in a sample which comprises a substrate for the LAP or γ -GTP represented by the formula (I):



wherein Z represents $(\text{CH}_3)_2\text{CHCH}_2\text{CH}(\text{NH}_2)-$ or $(\text{NH}_2)(\text{COOH})\text{CHCH}_2\text{CH}_2-$, R_1 represents hydrogen, alkyl or substituted alkyl, R_2 represents alkylene or hydroxyalkylene, R_3 and R_4 are the same or different and represents hydrogen,

halogen, nitro, hydroxyl, sulfo, carboxyl, alkyl, and alkoxy, and salts thereof, and a chromogen for reacting with a compound formed from the substrate (I) by action of the LAP or γ -GTP to form a pigment proportional to LAP or GTP activity in a sample.

4,877,728

BIOTRANSFORMATION OF L-TYROSINE AND L-PHENYLALANINE TO 2,5-DIHYDROXYPHENYLACETIC ACID FOLLOWED BY POLYMERIZATION TO MELANIN PIGMENTS

Ramunas Bigelis, Elkhart, and Kathleen A. Black, Bristol, both of Ind., assignors to Miles Inc., Elkhart, Ind.

Filed Mar. 28, 1988, Ser. No. 172,770
 Int. Cl.⁴ C12P 21/00, 21/06, 7/42

- U.S. Cl. 435—68 3 Claims
 1. A method for the production of a melanin pigment which is the polymerization product of homogentisic acid which method comprises growing a fungus which has been mutated to provide a strain which is unable to grow on L-tyrosine and/or L-phenylalanine as the sole carbon source in a nutrient growth medium or a synthetic minimal medium containing a polypeptide containing one or both of these amino acids which medium contains a sub-optimal concentration of carbohydrate assimilable by the fungus, for a period of time and under conditions suitable for the degradation of the polypeptide thereby liberating L-tyrosine, L-phenylalanine and other amino acids resulting in the production of homogentisic acid and to permit the catabolism of the liberated amino acids to form ammonia thereby raising the pH of the medium to a level of at least about 10 to cause the homogentisic acid to polymerize thereby forming the melanin pigment.

4,877,729

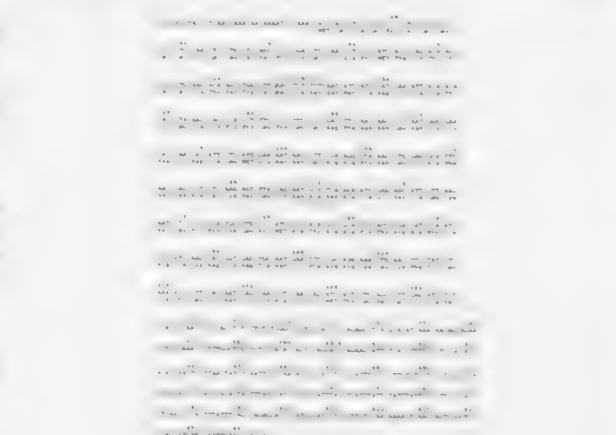
RECOMBINANT DNA ENCODING NOVEL FAMILY OF PRIMATE HEMATOPOIETIC GROWTH FACTORS

Steven C. Clark, Winchester; Agnes B. Claretta, Tewksbury, and Yu-Chung Yang, Arlington, all of Mass., assignors to Genetics Institute, Inc., Cambridge, Mass.

Continuation-in-part of Ser. No. 885,060, Jul. 14, 1986, abandoned, and Ser. No. 893,764, Aug. 6, 1986, abandoned. This application Oct. 7, 1986, Ser. No. 916,335

Int. Cl.⁴ C12P 21/02; C12N 15/00, 1/00

U.S. Cl. 435—68 12 Claims



1. A recombinant DNA sequence comprising vector DNA and an isolated DNA that encodes a polypeptide comprising one of the mature peptide sequences as shown in FIG. I or FIG. II and which possesses at least one of the biological properties of primate IL-3, said biological properties being selected from the group consisting of:

(a) the ability to support the growth and differentiation of

- primate progenitor cells committed to erythroid, lymphoid and myeloid lineages;
 (b) the ability to stimulate granulocytic colonies and erythroid bursts in a standard human bone marrow assay;
 (c) the ability to sustain the growth of primate pluripotent precursor cells; and,
 (d) the ability, at 10 to 100 picomolar concentrations, to stimulate primate chronic myelogenous leukemia (CML) cells in the CML assay.

4,877,730

MICROBIOLOGICAL METHOD FOR PRODUCING ETHYLENE

Sueo Urushizaki, Sakurai; Yasuo Ohta, Tsu; Mamoru Sato; Sakai; Fukumi, both of Ibaraki, and Koushi Nishiyama, Yatabe, all of Japan, assignors to Director of National Institute of Agrobiological Resources, Ibaraki, Japan

Filed Jul. 28, 1986, Ser. No. 891,254

Claims priority, application Japan, Aug. 23, 1985, 60-184299
 Int. Cl.⁴ G12P 5/02, 7/00

- U.S. Cl. 435—132 7 Claims
 1. A method for microbiologically producing ethylene which comprises culturing a bacterial microorganism of *Pseudomonas syringae* pv. *glycinea* in a culture medium to form ethylene and collecting said ethylene and wherein the microorganism is selected from the group consisting of the strains of *P. syringae* pv. *glycinea* KN 38 (IFO 14517), KN 41 (IFO 14518) and KN 50 (IFO 14519).

4,877,731

FERMENTATION PROCESS FOR CARBOXYLIC ACIDS

Lorraine B. Ling, Newark, Del., and Thomas K. Ng, Chadds Ford, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 27, 1988, Ser. No. 212,300

Int. Cl.⁴ C12P 7/44, 7/46, 7/42; C12R 1/845

- U.S. Cl. 435—142 15 Claims
 1. In a fermentation process for producing carboxylic acids selected from the group consisting of fumaric acid, succinic acid, malic acid and mixtures thereof by growing fungi of the genus *Rhizopus* in a culture media comprising a carbon source, a nitrogen source and inorganic salts, wherein the process involves a cell-growth phase and an acid production phase, the improvement comprising growing said fungi under conditions of controlled dissolved oxygen availability in the culture medium, wherein the concentration of oxygen dissolved in the culture medium is maintained between about 80% and 100% of saturation for the cell-growth phase and between about 30% and 80% of saturation for the acid production phase.

4,877,732

BIOCHEMICAL PROCESS FOR THE PREPARATION OF NEW ORGANOFLUORINE COMPOUNDS

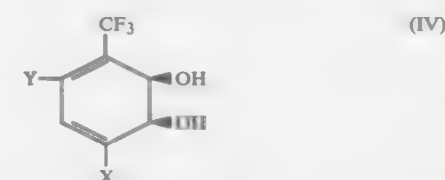
John A. Schofield, Kent, England, assignor to Shell Oil Company, Houston, Tex.

Filed Jul. 2, 1987, Ser. No. 69,137

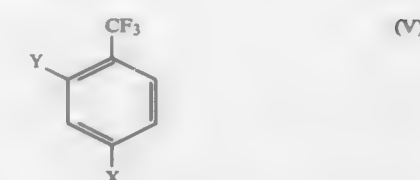
Claims priority, application United Kingdom, Jul. 8, 1986, 8616614

Int. Cl.⁴ C12P 7/22; C12R 1/40

- U.S. Cl. 435—155 5 Claims
 1. A biochemical process for the preparation of a compound of formula (IV)



from a compound of formula (V):



where each of X and Y independently is hydrogen or fluorine, comprising culturing a microorganism selected from *P. putida* NCIB 12190 and mutants thereof, supplying a compound of formula (V) to the culture in a suitable medium and subsequently recovering a compound of formula (IV) therefrom.

4,877,733

GLUCOSE DEHYDROGENASE AND ITS PRODUCTION

Mamoru Takahashi; Shigeyuki Imamura, and Masaki Takada, all of Shizuoka, Japan, assignors to Toyo Joze Kabushiki Kaisha, Shizuoka, Japan

Filed Apr. 28, 1967, Ser. No. 42,655

Claims priority, application Japan, May 2, 1966, 61-101183; Mar. 16, 1967, 62-58874

- U.S. Cl. 435—190 3 Claims
 1. Glucose dehydrogenase having the following biochemical properties:
 (a) enzymatic action: catalyzes a reaction which generates glucono- δ -lactone and reduced NADP from glucose and NADP; and
 (b) substrate specificity: has substrate specificity on glucose and no substrate specificity on 2-deoxyglucose.

4,877,734

MICROBIOLOGICALLY PRODUCED α -ACETYLAMINO CINNAMIC ACID ACYLASE, METHOD OF ITS PRODUCTION AND ITS USE

Maria-Regina Kula, Niederziehr-Hambach; Werner Hummel, Titz; Horst Schütte, Salzgitter, and Wolfgang Leuchtenberger, Bruchkobel, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft and Gesellschaft für biotechnologische Forschung mit beschränkter Haftung GBF, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 26, 1987, Ser. No. 66,492

Claims priority, application Fed. Rep. of Germany, Jun. 28, 1986, 3621839

Int. Cl.⁴ C12N 9/80, 9/78, 9/02; C12P 13/22

U.S. Cl. 435—228 5 Claims

1. A microbiologically produced α -acetyl amino cinnamic acid acylase having the following properties:
 (i) reactivity:
 said acylase reacts with α -acetyl amino cinnamic acid with the formation of α -imino- β -phenylpropionic acid or phenylpyruvic acid;
 (ii) substrate specificity:
 said acylase hydrolyzes α -acetyl amino cinnamic acid but not acetyl amino acrylic acid nor N-acetylphenylalanine;
 (iii) optimum pH:
 said acylase has a pH optimum of 7.5 ± 1 ;
 (iv) pH stability:
 said acylase is stable between pH 6.9 and pH 9.4;
 (v) optimum temperature:
 said acylase has a temperature optimum of 52°C . at a pH of 7.5;
 (vi) temperature resistance:
 said acylase retains 80% of its activity after a 30-minute incubation at 55°C .;
 (vii) influences of inhibitors and activators:
 mercury compounds, CdCl_2 and o-phenanthroline exhibit

an inhibitory effect on said acylase, and dithiothreitol activates said acylase;

(viii) molecular weight; said acylase has a molecular weight of $50,000 \pm 5,000$ Daltons;

(ix) subunits; said acylase consists of 2 subunits each having a molecular weight of $26,000 \pm 3,000$ Daltons; and

(x) K_M value; said acylase has a K_M for α -acetylamino cinnamic acid of 0.45 mmoles at pH 7.5.

4,877,735

PROCESS FOR PRODUCING 2-KETO-L-GULONIC ACID
Ikuo Nogami, Nagaokakyo; Takamasa Yamaguchi, Kobe; Masahide Oka, Kawanishi, and Hideo Shirafuji, Nagaokakyo, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Jun. 8, 1988, Ser. No. 204,529
Claims priority, application Japan, Jun. 19, 1987, 62-154100
Int. Cl.⁴ C12P 7/60, 7/58; C12R 1/01

U.S. Cl. 435—138 7 Claims
1. A process for producing 2-keto-L-gulonic acid which comprises culturing a microorganism belonging to the genus *Pseudogluconobacter* which has an ability to oxidize L-sorbose to 2-keto-L-gulonic acid in a culture medium supplemented with a rare earth element in the presence of L-sorbose.

4,877,736

AEROBIC MICROORGANISM FOR THE DEGRADATION OF CHLORINATED ALIPHATIC HYDROCARBONS

Carl B. Fliermans, Augusta, Ga., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 12, 1988, Ser. No. 256,429
Int. Cl.⁴ C12N 9/00

U.S. Cl. 435—183 18 Claims
1. A biologically pure culture of a microorganism having the identifying characteristics of a representative strain selected from the group consisting of *Welchia alkenophila* sero 5 of ATCC 53570 and *Welchia alkenophila* sero 33 of ATCC 53571.

4,877,737

ATTENUATED PSEUDORABIES VIRUS WHICH HAS A DELETION IN AT LEAST A PORTION OF A REPEAT SEQUENCE AND VACCINE CONTAINING SAME
Meng-Fu Shih, San Diego; Mark D. Cochran, La Jolla, and Richard D. Macdonald, San Diego, all of Calif., assignors to PruTech Research and Development Partnership, San Jose, Calif.

Filed Sep. 6, 1985, Ser. No. 773,430
Int. Cl.⁴ C12N 7/00

U.S. Cl. 435—235 13 Claims
1. An attenuated pseudorabies virus designated S-PRV-001 and deposited under ATCC Accession No. VR 2106.

4,877,738

BIOLOGICAL CONTROL OF DAMPING OFF AND ROOT ROT AND INOCULUM PREPARATION THEREFOR
Jo Handelsman, Madison; Ellen H. Mester, Oregon, and Lynn Wunderlich, Appleton, all of Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Jul. 25, 1986, Ser. No. 890,402
Int. Cl.⁴ C12R 1/07, 1/125

U.S. Cl. 435—252.5 5 Claims
1. A biologically pure culture of *Bacillus cereus* having the identifying characteristics of ATCC 53522.
4. A seed inoculum for application to seeds to be protected from damping off fungal plant disease comprising a carrier and an effective quantity of protecting bacteria selected from the group of bacteria consisting of *Bacillus cereus* ATCC 53522, a

mutant of *Bacillus cereus* ATCC 53522 retaining the capability to produce a plant protecting toxin effective against *Phytophthora megasperma*, a mixture of such mutants, and a mixture of *Bacillus cereus* ATCC 53522 and such mutants, the inoculum being substantially soil-free.

4,877,739

ANTIAMMONIA AZOTOBACTER AND THE USE THEREOF

Zhen H. Yang, No. 101 Hu Dong Road, Fu Zhou City, Fu Jian Province, China
Division of Ser. No. 913,431, Sep. 30, 1986, abandoned. This application Sep. 30, 1988, Ser. No. 252,578

Claims priority, application China, Apr. 8, 1986, 86100490
Int. Cl.⁴ C12N 1/20

U.S. Cl. 435—252.1 14 Claims
1. A group of autogenic azotobacters mutated from *Azotobacter vinelandii*, having the capability of antiammonia nitrification, wherein said azotobacters fix atmospheric nitrogen and maintain azotase activity in a culture medium containing nitrogen and ammonium sulfate.

4,877,740

PRODUCTION OF CELLS

Stephen C. Taylor, Darlington, England, assignor to Imperial Chemical Industries plc, London, England

Filed Jun. 9, 1987, Ser. No. 60,071

Claims priority, application United Kingdom, Jun. 19, 1986, 8614925

Int. Cl.⁴ C12R 1/38

U.S. Cl. 435—253.3 6 Claims
1. A method for the production of cells of *Pseudomonas putida* having an enzyme capable of converting an aromatic or substituted aromatic compound to a corresponding cyclic dihydroxy compound containing a 1,2-dihydroxy-cyclohexa-3,5-diene ring which comprises growing cells of a mutant strain of *Pseudomonas putida* selected from the group consisting of NCIB 11680, NCIB 11767, strains derived from NCIB 11680 and strains derived from NCIB 11767 in a culture medium containing an inducer compound selected from the group consisting of cyclohexane, cyclohexanol, benzene-cis-glycol, furan, thiophene, benzofuran, cyclohexadiene, coumarin, 1,3,5-trimethylbenzene, pyridine and substituted pyridine which causes induction of the enzyme capable of converting the aromatic or substituted aromatic compound to the corresponding cyclic dihydroxy compound and which is not itself a substrate for said enzyme.

4,877,741

TREATMENT OF HUMAN PLASMA WITH BROWN RECLUSE SPIDER TOXIN TO EMULATE A LUPUS ANTICOAGULANT

James L. Babcock, and David L. McGlasson, both of San Antonio, Tex., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 24, 1988, Ser. No. 261,302

Int. Cl.⁴ G01N 31/00

U.S. Cl. 436—8 6 Claims
1. A method for preparing, storing and reconstituting for later use blood plasma treated with brown recluse spider toxin comprising the steps of:
(a) freezing blood plasma treated with brown recluse spider toxin to about -70°C .;
(b) lyophilizing the frozen treated blood plasma;
(c) storing the lyophilized treated blood plasma at freezer temperatures about -70°C .; and
(d) reconstituting the treated blood with distilled water for use as a positive control for blood tests for the presence of lupus anticoagulants and for blood factor deficiencies.

4,877,742

PREGNANCY TEST WITH EPF

Friedrich E. Maly, Bern; Alain L. de Week, Fribourg, and David Henderson, Berlin, all of Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Filed Jan. 29, 1987, Ser. No. 8,239

Claims priority, application Fed. Rep. of Germany, Jan. 30, 1986, 3603053

Int. Cl.⁴ G01N 33/48

U.S. Cl. 436—65 16 Claims
1. A method for early detection of a pregnancy in a female mammal, which does not have a gonadal tumor, comprising determining EPF by measuring its effect on the formation of electronically excited states or free radicals by mononuclear cells or a cell line in a test sample of the female mammal's blood or urine wherein said formation is caused by a treatment effective to form said states or radicals, and comparing said effect to the effect on said formation of a control sample comprising corresponding material from at least one nonpregnant female, which does not have a gonadal tumor, of the same mammalian species, wherein a statistically significant difference between the effect of the test sample compared to the effect of the control sample indicates pregnancy.

4,877,743

MONITORING REACTION OF NITROUS OXIDE TO FORM NITROGEN

Kenneth C. Waugh, Mere, and Godfrey C. Chinchin, Cleveland, both of England, assignors to Imperial Chemical Industries PLC, London, United Kingdom

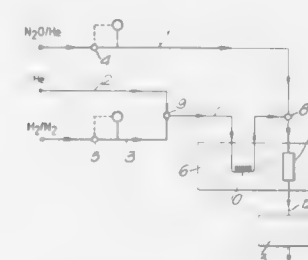
Continuation of Ser. No. 863,028, May 14, 1986, abandoned.

This application Mar. 31, 1988, Ser. No. 177,887

Claims priority, application United Kingdom, May 20, 1985, 851288A

Int. Cl.⁴ G01N 33/00; C01B 21/00

U.S. Cl. 436—116 10 Claims



1. A method of monitoring the reaction between nitrous oxide and a material containing at least one reactive constituent selected from the group consisting of a metal and a metal oxide, said reactive constituent being reactive with nitrous oxide to form nitrogen, comprising

- (i) commencing, and thereafter continuing, flow of a mixture of nitrous oxide and an inert diluent, other than nitrogen, of a known and constant composition, through a bed of the material at a known rate, so that all of said mixture passes through the bed, the proportion of nitrous oxide in said mixture, and the rate of flow thereof, in relation to the amount of said material, being such that for a period of time all the nitrous oxide in the mixture reacts with the material so that there is nitrogen, but not nitrous oxide, in the exit gas leaving the bed, and
- (ii) determining the time interval between
 - (a) the onset of the appearance of nitrogen in the exit gas and
 - (b) the onset of the appearance of nitrous oxide, or the time at which there is a rapid fall in nitrogen content, in the exit gas.

4,877,744

QUALITATIVE METABOLISM ASSESSMENT USING HIGH PERFORMANCE THIN LAYER CHROMATOGRAPHY

Shih-Ling Chang, Lexington, Ky., assignor to The University of Kentucky Research Foundation, Lexington, Ky.

Filed Jul. 27, 1987, Ser. No. 77,924

Int. Cl.⁴ G01N 30/90

U.S. Cl. 436—162 8 Claims
1. In a method for characterizing the oxidative phenotype of a subject comprising collecting a fluid sample from the subject, analyzing the sample to quantitatively determine the presence of oxidative metabolites of a drug and comparing the results obtained for the subject with those obtained for a normal subject subsequent to the administration of said drug, the improvement wherein the analyzing step is rapidly conducted by high performance thin layer chromatography to qualitatively assess the metabolite pattern of the subject; and the comparing step is conducted by visually comparing the subject's metabolite pattern to a normal subject's metabolite pattern.

4,877,745

APPARATUS AND PROCESS FOR REAGENT FLUID DISPENSING AND PRINTING

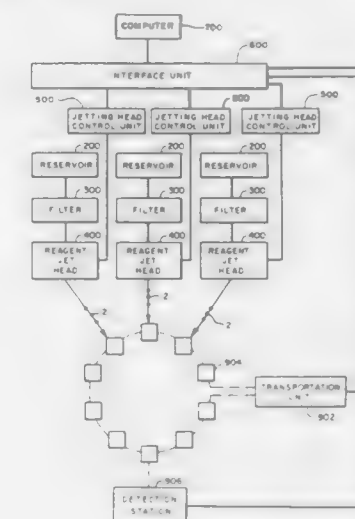
Donald J. Hayes, Plano; David B. Wallace, Dallas, both of Tex.; Donald J. Verlee, Libertyville, Ill., and Kenneth R. Houseman, Racine, Wis., assignors to Abbott Laboratories, Abbott Park, Ill.

Continuation of Ser. No. 931,476, Nov. 17, 1986, abandoned.

This application Mar. 14, 1989, Ser. No. 325,037

Int. Cl.⁴ G01D 9/00, 15/16; G01N 1/10, 21/75

U.S. Cl. 436—166 18 Claims



1. A diagnostic analyzing system comprising:
means for positioning and containing at least one of (1) a diagnostic reagent fluid and (2) a sample; and
means for precisely metering and dispensing the other one of the (1) diagnostic reagent fluid and (2) sample to interact with the positioned one of the (1) diagnostic reagent fluid and (2) sample, the metering and dispensing means comprising:
a jetting chamber defining a volume and comprising a first and second aperture, the first aperture adapted to receive the other one of the (1) diagnostic reagent fluid and (2) sample, the second aperture defining an orifice;
a transducer in mechanical communication with the jetting chamber, the transducer operative to alternately expand and de-expand the volume of the jetting chamber in re-

sponse to a selected electrical pulse and thereby cause the jetting chamber to propel a reproducibly sized droplet of the other one of the (1) diagnostic reagent fluid and (2) sample from the orifice;

means for generating a number of electrical pulses sufficient to cause a precise quantity of the other one of the (1) diagnostic reagent fluid and (2) sample to be dispensed;

means for detecting reaction results produced by the interaction of the diagnostic reagent fluid and sample.

4,877,746

METHODS OF CARRYING OUT ASSAYS FOR LIPOPROTEINS AND APOLIPOPROTEINS

Gunnel B. Jansson, Alunda, and Erling S. Holmlund, Vattholma, both of Sweden, assignors to Pharmacia AB, Upsala, Sweden
PCT No. PCT/SE86/00405, § 371 Date Apr. 21, 1987, § 102(e) Date Apr. 21, 1987, PCT Pub. No. WO87/02137, PCT Pub. Date Apr. 9, 1987

PCT Filed Sep. 12, 1986, Ser. No. 49,997

Claims priority, application Sweden, Sep. 27, 1985, 8504466
Int. Cl.⁴ G01N 33/53

U.S. Cl. 436—518

4 Claims

1. A method for carrying out immunochemical assays for the lipoprotein, Lp(a), and/or the apolipoprotein, apo(a), which comprises

- (a) subjecting a sample suspected for containing Lp(a) and/or apo(a) to an environment where the pH is above about 9.0 or below about 3.0, for a time between 5 minutes and 20 hours, without causing denaturation of said Lp(a) or apo(a);
- (b) adjusting the pH of the mixture resulting from step (a) to a value suitable for an immune reaction between Lp(a) or apo(a) and anti-apo(a) antibodies;
- (c) reacting the mixture resulting from step (b) with anti-apo(a) antibodies;
- (d) measuring the amount of immune complexes formed in step (c); and
- (e) relating the measurement of step (d) to the amount of Lp(a) and/or apo(a) in said sample.

4,877,747

OPTICAL ASSAY: METHOD AND APPARATUS

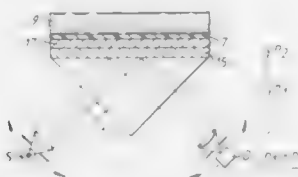
William J. Stewart, Blakesley, Northants, England, assignor to Plessey Overseas Limited, Ilford, United Kingdom
Filed Apr. 4, 1986, Ser. No. 849,679

Claims priority, application United Kingdom, Apr. 12, 1985, 8504466

Int. Cl.⁴ G01N 21/77, 33/553

U.S. Cl. 436—525

12 Claims



1. An optical assay method comprising the following steps: providing a coated metallic medium, the coating thereof being sensitized for a specific assay species; generating in the metallic medium a resonant signal at optical frequency, the power of this signal extending into the sensitized coating; providing coupling between said resonant signal and a monitored optical beam; exposing the coated metallic medium to a fluid assay sample; and, measuring any changes in the optical beam to detect a re-

sponse to the presence of the specific assay species in the fluid sample.

4,877,748

BIPOLAR PROCESS FOR FORMING SHALLOW NPN EMITTERS

Robert H. Havemann, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

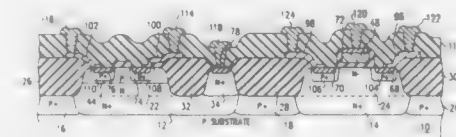
Division of Ser. No. 45,978, May 1, 1987, Pat. No. 4,816,423.

This application Jan. 24, 1989, Ser. No. 301,220

Int. Cl.⁴ H01L 21/74, 21/265

U.S. Cl. 437—31

6 Claims



1. A method for forming a bipolar device, comprising: providing a substrate of a first conductivity type; forming a bipolar region having an intrinsic base at the first conductivity type and a buried collector of a second conductivity type and connected to the surface of the silicon with a deep collector of a second conductivity type; forming a layer of oxide in the bipolar region over the intrinsic base region with an emitter opening and a base opening exposing the underlying surface of the substrate and separated by a portion of the oxide layer; forming a layer of refractory metal over the substrate and contacting the exposed silicon surfaces; reacting the refractory metal to form a silicide with the exposed silicon surfaces; selectively implanting impurities of the first conductivity type into the silicide formed in the emitter opening; selectively implanting impurities of the second conductivity type into the silicide formed in the base opening; removing the portions of the refractory metal layer not reacted to form silicide; and driving the impurities implanted into the silicide downward from the silicide into the underlying silicon to form a metallurgical junction below the silicide layer.

4,877,749

METHOD OF FORMING A LOW LOSS FET

Fred L. Quigg, Thousand Oaks, Calif., assignor to Polyfet Re Devices, Inc., Newbury Park, Calif.

Division of Ser. No. 834,610, Feb. 28, 1986, abandoned. This application Sep. 30, 1988, Ser. No. 252,232

Int. Cl.⁴ H01L 21/22

U.S. Cl. 437—41

7 Claims

1. A method of forming a self-aligned, low loss field effect transistor (FET), comprising: establishing a doped semiconductive substrate of a first polarity with a doped semiconductive body region of opposite polarity set in the substrate and characterized by a raised area and a lateral recessed area, a layer of gate insulative material over the raised area and extending above the recessed area, a gate member on the opposite side of the gate insulative layer from the body region, and a layer of doped semiconductive material of the same relative polarity as the substrate, the doped layer being spaced from the gate member by a lateral portion of the gate insulative layer and extending over the recessed area and under the gate insulative layer to the raised area, substantially removing the doped layer lateral to the gate insulative layer, coating the substrate with a refractory metal, treating the refractory metal coating so that an adherent conductive layer is formed with the underlying gate

member, doped layer and recessed area, but not with the underlying gate insulative layer, removing the refractory metal coating from the gate insulative layer, the conductive layer overlying the recessed area providing a direct metal contact with the body region and doped layer, the conductive layer overlying the gate member providing a direct metal contact with the gate member, the lateral portion of the gate insulative layer electrically insulating the doped layer from the gate member, and connecting a gate connection to the conductive layer overlying the gate member, a source connection to the conductive layer overlying the recessed area, and a drain connection at a drain location.

4,877,750

METHOD OF FABRICATING A TRENCH CAPACITOR CELL FOR A SEMICONDUCTOR MEMORY DEVICE

Yoshinori Okumura, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

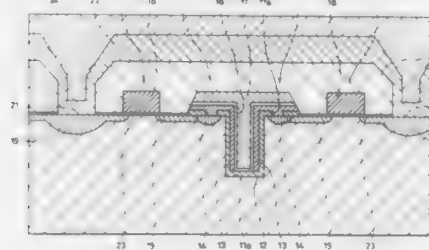
Filed Oct. 7, 1988, Ser. No. 254,836

Claims priority, application Japan, Nov. 17, 1987, 62-291349

Int. Cl.⁴ H01L 21/306

U.S. Cl. 437—47

7 Claims



1. A method of fabricating a trench capacitor cell for a semiconductor device comprising the steps of: forming a trench in a semiconductor substrate; forming a first insulating layer and a first conductor layer successively on the side and bottom walls of said trench; filling said trench with a second insulating layer; coating the surface of said substrate with a layer of mask made of a material that can be removed by subsequent etching procedure for removing said first conductor layer; selectively removing the part of said mask lying over said second insulating layer; removing said second insulating layer out of said trench; selectively removing the part of said first conductor layer lying on the bottom of said trench and said mask by etching procedure; and filling said trench successively with a third insulating layer and a second conductor layer.

4,877,751

METHOD OF FORMING AN N+ POLY-TO- N+ SILICON CAPACITOR STRUCTURE UTILIZING A DEEP PHOSPHOROUS IMPLANT

Chih-Sieh Teng; Tian-I Liou, both of San Jose, and Hiekyung Chun-Min, Los Altos, all of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Mar. 11, 1988, Ser. No. 166,973

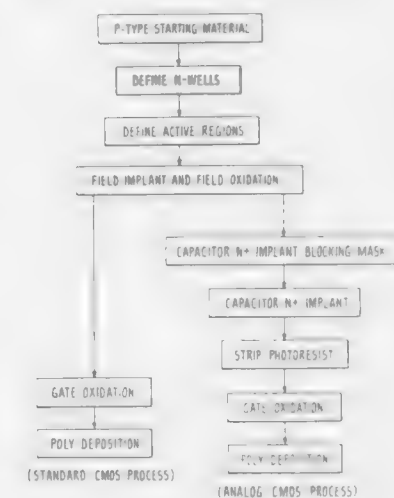
Int. Cl.⁴ H01L 21/94

U.S. Cl. 437—47

24 Claims

1. In a process for fabricating an integrated circuit device structure on a substrate of semiconductor material having a first conductivity type, the improvement comprising: modifying a first region of the substrate by introducing an impurity thereto such that the first region has a conductivity type opposite to that of the substrate, the impurity having a peak concentration below the surface of the first

region so that a layer of dielectric material subsequently grown over the first region has a first preselected thickness; simultaneously growing a layer of dielectric material over the first region and over a second region of the substrate, the thickness of the dielectric layer grown over the second region differing in thickness from the thickness of the



dielectric layer grown over the first region, the thickness of the dielectric layer over the second region being a second preselected thickness; and forming a layer of conductive material over the dielectric layer such that a capacitor structure formed by the first region, the layer of dielectric material overlying the first region and the layer of conductive material has a preselected voltage coefficient.

4,877,752

3-D PACKAGING OF FOCAL PLANE ASSEMBLIES

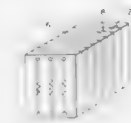
William L. Robinson, El Toro, Calif., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 31, 1988, Ser. No. 265,107

Int. Cl.⁴ H01L 21/302

U.S. Cl. 437—51

5 Claims



1. A method for three-dimensional packaging of a focal plane module assembly, comprising the steps of: processing a silicon wafer in the customary manner to make electronic dies having dielectric material on a surface; cutting said wafer into multiple individual dies, said dies each having a front side and a back side and further having said dielectric material on said back side; bonding a gold ribbon to said front side of each die, using a

suitable micro-joining process, said ribbon having a first end and a second end, so that said first end is attached to said front side of said die away from edges of said die and said second end extends over an edge of said die to form a gold ribbon extension of a suitable length;

stacking and aligning said dies in an alignment mode and compressing said dies together to a preset total thickness to produce a module, said module having a top surface and a bottom surface, said top and bottom surfaces containing said gold ribbon extensions;

back filling spaces between individual dies with epoxy and curing;

depositing and curing dielectric insulation material to a suitable thickness on said top surface of said module;

removing any excess of said gold ribbon extensions and polishing said dielectric insulation material on said top surface;

resisting said top surface and exposing tips of said gold ribbons;

depositing conductive bond pads so that said bond pads are in contact with said tips of said gold ribbons.

4,877,753

IN SITU DOPED POLYSILICON USING TERTIARY BUTYL PHOSPHINE

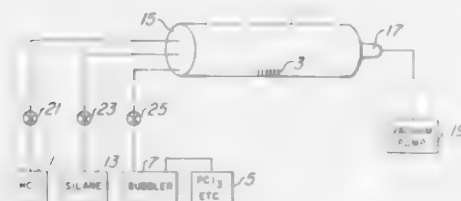
Dean W. Freeman, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 937,956, Dec. 4, 1986, abandoned. This application Mar. 1, 1988, Ser. No. 165,457

Int. Cl.⁴ H01L 21/469

U.S. Cl. 437—101

16 Claims



1. A method of forming a layer of phosphorous doped polysilicon, comprising the steps of:

- providing a furnace having a surface therein for deposition of phosphorous doped polysilicon thereon,
- evacuating said furnace to a pressure in the range of from about 100 to about 1000 milli Torr.,
- heating said furnace to a temperature of from about 610 to about 700 degrees C., and
- simultaneously entering a predetermined ratio of silane and gaseous tertiary butyl phosphine into said furnace to form a layer of uniformly phosphorous doped polysilicon on said surface.

4,877,754

METHOD OF MANUFACTURING SEMICONDUCTOR DEVICE

Hermanus L. Peek, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 507,409, Jun. 24, 1983, Pat. No. 4,763,185. This application Mar. 31, 1988, Ser. No. 173,003

Claims priority, application Netherlands, Jul. 9, 1982, 8202777

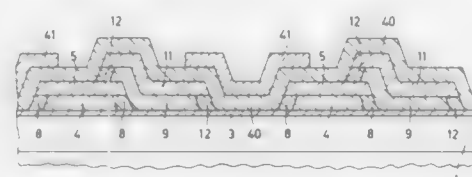
Int. Cl.⁴ H01L 21/00, 21/02, 21/283, 21/31

U.S. Cl. 437—195

9 Claims

1. A method of manufacturing a semiconductor device on a surface of a semiconductor body provided with a first insulating layer, the method comprising the steps of: (a) providing a layer of conducting material and a second insulating layer on the surface, (b) forming a pattern of insulating strips in the second insulating layer, (c) using the pattern as a mask while

etching a corresponding pattern of conductor strips in the layer of conducting material, (d) underetching the corresponding pattern so that the conductor strips exhibit exposed sides which are located under edges of the insulating strips, (e) providing the exposed sides with insulating tracks,



characterized in that the insulating tracks are provided by depositing on the assembly a third insulating layer, which fills spaces located under the edges of the insulating strips, and in that at least a part of the third insulating layer is etched selectively with respect to the first insulating layer, until parts of the first insulating layer adjacent the insulating strips are exposed again.

4,877,755

METHOD OF FORMING SILICIDES HAVING DIFFERENT THICKNESSES

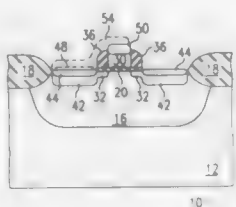
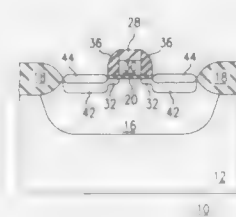
Mark S. Rodder, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed May 31, 1988, Ser. No. 200,394

Int. Cl.⁴ H01L 21/283

U.S. Cl. 437—200

18 Claims



1. A method of manufacturing a semiconductor device in a silicon substrate having semiconducting surface areas thereon, said method comprising the steps of:

- forming a silicon gate region overlying a portion of one of said surface areas;
- forming a first silicide barrier layer overlying said gate region;
- forming a first silicide layer in said substrate at said one surface area along a side of said gate region, said first silicide barrier layer preventing silicide from forming on said gate region;
- forming a second silicide barrier layer overlying said first silicide layer, said second silicide barrier layer substantially preventing said first silicide layer from expanding; and

forming a second silicide layer on said gate region with said second silicide barrier layer in place.

4,877,756

METHOD OF PACKAGING A SEMICONDUCTOR LASER AND PHOTOSENSITIVE SEMICONDUCTOR DEVICE

Isamu Yamamoto, and Jiro Fukushima, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

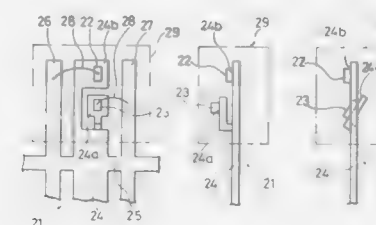
Filed Mar. 30, 1988, Ser. No. 175,356

Claims priority, application Japan, Mar. 31, 1987, 62-79935

Int. Cl.⁴ H01L 21/56

U.S. Cl. 437—209

5 Claims



1. A method of packaging a semiconductor laser and photosensitive semiconductor device together comprising:

- producing a lead frame having a central lead which is used as a die pad at spaced apart first and second regions for a semiconductor laser and a photosensitive semiconductor device, respectively, and first and second outside leads spaced from said central lead and connected by tie bars to said central lead;

mounting the semiconductor laser and the photosensitive device on the respective first and second regions of said central lead of said lead frame;

bending the first region of said central lead relative to the second region of said central lead so that the first and second regions do not lie in the same plane;

electrically connecting the semiconductor laser and the photosensitive device to the respective first and second outside leads with wires;

sealing said laser and photosensitive device and portions of said leads and the wires in a transparent package; and cutting said tie bars to electrically disconnect said first and second outside leads from said central lead.

4,877,757

METHOD OF SEQUENTIAL CLEANING AND PASSIVATING A GAAS SUBSTRATE USING REMOTE OXYGEN PLASMA

Rudy L. York, Plano; Joseph D. Luttmer, Richardson; Patricia B. Smith, Euless, and Cecil J. Davis, Greenville, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 74,386, Jul. 16, 1987, abandoned. This application Dec. 7, 1988, Ser. No. 282,927

Int. Cl.⁴ H01L 21/205

U.S. Cl. 437—235

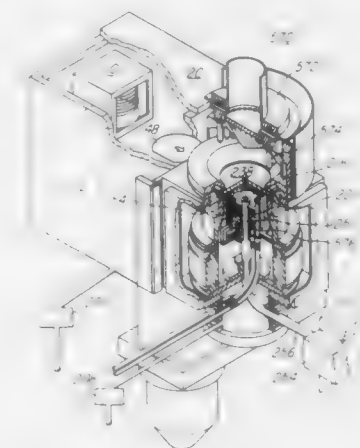
10 Claims

1. A method for sequential cleaning and passivating a mercury-cadmium-telluride wafer with sulfide in a single process chamber, comprising:

- disposing said wafer in a process chamber within a process module at low pressure;
- generating a remote plasma from oxygen gas; and
- introducing the remote plasma within said chamber and to the face of the wafer for an appropriate time period;
- introducing a sulfide gas into the chamber and to the face of the wafer for an appropriate time period; and
- illuminating said sulfide gas within said chamber with additional Ultraviolet light produced within said module.

4. A method for passivating a mercury-cadmium-telluride wafer with selenide comprising:

- disposing a wafer in a process chamber within a process module at low pressure;
- generating a remote plasma from oxygen gas;
- introducing the remote plasma into said chamber and to the face of the wafer for an appropriate time period;



- introducing a selenide gas within the chamber and to the face of the wafer for an appropriate time period; and
- illuminating said selenide gas within said chamber with additional Ultraviolet light produced within said module.

4,877,758

LEAD-FREE FRIT

Paul R. Lee, Hilliard, and Joseph P. Hingsbergen, Delaware, both of Ohio, assignors to Chi-Vit Corporation, Urbana, Ohio

Filed Dec. 22, 1988, Ser. No. 288,783

Int. Cl.⁴ C03C 8/08, 8/04, 3/097, 3/068

U.S. Cl. 501—24

5 Claims

1. A lead-free frit suitable for use on aluminum and its alloys, said frit consisting essentially of about:

33-42 wt. %	SiO ₂
8-13	TiO ₂
0.5-2.5	SnO ₂
0.5-2.5	BaO
2.5-5.0 in the absence of Ce ₂ O ₃ ; 0-4.5% if Ce ₂ O ₃ is present.	SrO
2.2-4.3	ZnO
13-26	Na ₂ O
4-9	K ₂ O
0.7-6.0	Li ₂ O
0.5-4.5	B ₂ O ₃
1.0-3.5	Sb ₂ O ₃
0-0.8	Ce ₂ O ₃
0.5-5.0	P ₂ O ₅
0.2-1.0	MoO ₃

said frit having a fusion temperature below about 1050° F.

4,877,759

ONE STEP PROCESS FOR PRODUCING DENSE ALUMINUM NITRIDE AND COMPOSITES THEREOF
J. Birch Holt, San Jose; Donald D. Kingman, Danville, and Gregory M. Bianchini, Livermore, all of Calif., assignors to Regents of the University of California, Oakland, Calif.

Filed May 29, 1987, Ser. No. 55,475

Int. Cl.⁴ C04B 35/58; C01B 21/072

U.S. Cl. 501—96

11 Claims

1. A combustion synthesis method for producing dense aluminum nitride comprising igniting aluminum powder in a nitrogen atmosphere at a pressure of about 1000 atmospheres.

2. A method for the synthesis of dense aluminum nitride or cermet or composites thereof comprising the steps of: pouring aluminum powder into a suitable container; placing an igniter pellet on top of said container; loading said container into a high pressure autoclave; pressurizing said autoclave with nitrogen gas to a preselected pressure; igniting said aluminum powder by igniting said pellet; allowing the combustion to proceed to completion; and removing the aluminum nitride or aluminum nitride cermet formed in said container.

4,877,760

ALUMINUM NITRIDE SINTERED BODY WITH HIGH THERMAL CONDUCTIVITY AND PROCESS FOR PRODUCING SAME

Akiyama Okuno, Kani; Masakazu Watanabe, Nagoya, and Kazuhiko Ikoma, Komaki, all of Japan, assignors to NGK Spark Plug Co., Ltd., Aichi, Japan
Continuation-in-part of Ser. No. 864,879, May 20, 1986, abandoned. This application Apr. 17, 1987, Ser. No. 39,347
Claims priority, application Japan, May 22, 1985, 60-111113; May 24, 1985, 60-112330

Int. Cl.⁴ C04B 35/58

U.S. Cl. 501—98

35 Claims

4. An aluminum nitride-base sintered body with high thermal conductivity, excellent wettability to metal and a specific resistivity of at least 10^9 ohm-cm which:

(a) consists essentially of: 100 parts by weight of aluminum nitride and 0.1–10 parts by weight, of at least two components selected from the group consisting of metal borides and metal carbides, the borides being of elements of Groups 4a (Ti, Zr, Hf), 5a (V, Nb and Ta) and 6a (Cr, Mo, W) of the International Periodic Table, and the carbides being of elements of said Groups 4a, 5a and 6a, wherein at least one of said components is any one of said borides and at least one of said components is any one of the carbides, calculated as the metal of said at least two components and

(b) has a mean crystal grain size not exceeding $10\ \mu\text{m}$.

5. An aluminum nitride-base sintered body with high thermal conductivity, excellent wettability to metal and a specific resistivity of at least 10^9 ohm-cm which consists essentially of: 100 parts by weight of aluminum nitride and 0.1–10 parts by weight, of at least two components selected from the group consisting of metal nitrides and metal carbides, the nitrides being of elements of Groups 4a (Ti, Zr, Hf) and 5a (V, Nb and Ta) of the International Periodic Table, and the carbides being of elements of said Groups 4a, 5a and Group 6a (Cr, Mo, W) of said International Periodic Table, calculated as the metal of said at least two components wherein at least one of said components is any one of said nitrides and at least one of said components is any one of the carbides.

4,877,761

REFRACTORY COMPOSITION FOR REFRACTORY LININGS OF METALLURGICAL VESSELS

Max Chmiel, and Rainer Prange, both of Hagen, Fed. Rep. of Germany, assignors to Dolomitwerke GmbH, Wulfrath, Fed. Rep. of Germany
Continuation-in-part of Ser. No. 64,817, Jun. 19, 1987, abandoned. This application Apr. 11, 1989, Ser. No. 338,385
Claims priority, application Fed. Rep. of Germany, Jun. 19, 1986, 3620473

Int. Cl.⁴ C04B 35/04, 35/06

U.S. Cl. 501—109

10 Claims

1. A refractory composition for a refractory lining of a metallurgical vessel, consisting essentially of: sintered oxide granulations based on a member selected from the group consisting of magnesium oxide, dolomite, calcium oxide and a combination thereof; an organic binder consisting essentially of 0.5 to 10% by

weight of a mixture selected from the group consisting of carbomethoxy-substituted oligophenyls, carbomethoxy-substituted benzyl esters and a combination thereof which are produced as a residue in the production of dimethyl-terephthalate; and

0 to 20 parts by weight of a fine particulate carbon carrier per 100 parts by weight sintered oxide.

4,877,762

CATALYST FOR SIMULTANEOUS HYDROTREATING AND HYDRODEWAXING OF HYDROCARBONS

John W. Ward, Yorba Linda, Calif., and Timothy L. Carlson, Grand Junction, Colo., assignors to Union Oil Company of California, Los Angeles, Calif.

Division of Ser. No. 267,247, May 26, 1981, Pat. No. 4,428,862, which is a continuation-in-part of Ser. No. 172,868, Jul. 28, 1980, abandoned. This application Aug. 22, 1988, Ser. No. 234,804
The portion of the term of this patent subsequent to Jan. 31, 2001, has been disclaimed.

Int. Cl.⁴ B01J 29/28, 29/34

U.S. Cl. 502—77

54 Claims

46. A catalyst composition useful for simultaneous dewaxing, denitrogenation and desulfurization of hydrocarbons by reaction with hydrogen consisting essentially of between about 1 and about 5 percent by weight of nickel components, calculated as NiO, and between about 15 and 30 percent by weight of tungsten components, calculated as WO_3 , on a support consisting essentially of a porous refractory oxide in admixture with between about 70 and 90 percent by weight of the support of an organic-free silicalite having a specific gravity at 25°C . of 1.70 ± 0.5 g./cc., a mean refractive index of 1.39 ± 0.01 , and an X-ray diffraction pattern whose six strongest lines are as set forth in the following table, wherein S refers to strong lines and VS to very strong lines:

d-A	Relative Intensity
11.1 ± 0.2	VS
10.0 ± 0.2	VS
3.85 ± 0.07	VS
3.82 ± 0.07	S
3.76 ± 0.05	
3.72 ± 0.05	S

and wherein both of said metal components are in part supported on said refractory oxide and in part on said silicalite.

4,877,763

SUPPORTED CHROMIUM OXIDE/BORON CATALYST

Max P. McDaniel, and James N. Short, both of Bartlesville, Okla., assignors to Williams, Phillips & Umphlett, Bartlesville, Okla.
Division of Ser. No. 38,386, Apr. 15, 1987, Pat. No. 4,818,800, which is a continuation-in-part of Ser. No. 759,984, Jul. 29, 1985, abandoned, which is a division of Ser. No. 613,938, May 25, 1984, abandoned. This application Oct. 3, 1988, Ser. No. 252,310

Int. Cl.⁴ C08F 2/14, 4/18, 10/02

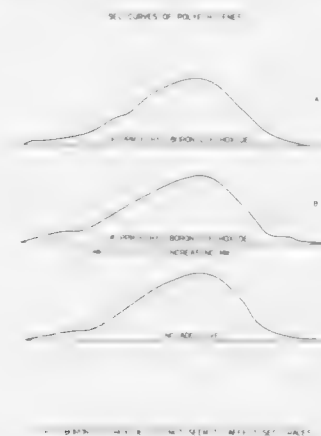
U.S. Cl. 502—117

15 Claims

1. A catalyst and boron-component system consisting essentially of effective ratios of:

(a) a supported chromium oxide catalyst wherein said support is a silica-containing support selected from at least one of the group consisting of silica, silica-alumina, coprecipitated silica-titania, coprecipitated silica-alumina-titania, and mixtures, wherein at least a portion of said chromium is hexavalent, and said catalyst (a) contains about 0.1 to 10 percent by weight chromium; and a boron-component selected from the group consisting of (b) and (b)+(c), employing said boron-component in an amount sufficient to give an atom ratio of boron to chromium within the range of about 0.3:1 to 10:1; wherein said (b) is a dihydrocarbylboron monohydrocar-

byoxide adjuvant R_2BOR and (c) is a trihydrocarbylborane coadjuvant represented BR_3 , wherein each R is



independently selected from C_1 to C_{15} hydrocarbyl radicals; and said (b)+(c) employs a ratio of $\text{R}_2\text{BOR}:\text{BR}_3$ of about 1:4 to 4:1.

4,877,764

CATALYST SYSTEM FOR AMMOXIDATION OF PARAFFINS

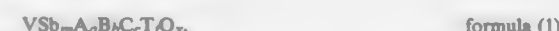
Linda C. Glaeser, Lyndhurst; James F. Brazdil, Jr., Mayfield Village, and Mark A. Toft, Lakewood, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio
Continuation-in-part of Ser. No. 39,859, Apr. 20, 1982, Pat. No. 4,767,739. This application Jul. 22, 1988, Ser. No. 222,985
The portion of the term of this patent subsequent to Aug. 30, 2005, has been disclaimed.

Int. Cl.⁴ B01J 23/18, 23/22, 23/30, 27/198

U.S. Cl. 502—209

10 Claims

1. A catalytic mixture suitable for the ammoxidation of propane to acrylonitrile, which comprises an intimate particulate mixture of a first catalyst composition and a second catalyst composition, said first catalyst composition being 10–99 weight percent of a diluent/support and 90–1 weight percent of a catalyst having the components in the proportions indicated by the empirical formula:

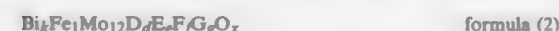


where

A is one or more of W, Sn, Mo, B, P and Ge;
B is one or more of Fe, Co, Ni, Cr, Pb, Mn, Zn, Se, Te, Ga, In and As;

C is one or more of an alkali metal and Tl;
T is one or more of Mg, Ca, Sr, and Ba; and
where m is from 0.01 and up to 20; a is 0.2–10; b is 0–20; c is 0–1; t is 0–20; the ratio $(a+b+c+t):(1+m)$ is 0.01–6; wherein x is determined by the oxidation state of other elements, and wherein the antimony has an average valency higher than +3 and the vanadium has an average valency lower than +5,

said second catalyst composition being 0–99 weight percent of a diluent/support and 100–1 weight percent of a catalyst having the components in the proportions indicated by the empirical formula:



where

D is one or more of an alkali metal, Sm, Ag
E is one or more of Mn, Cr, Cu, V, Zn, Cd, La,
F is one or more of P, As, Sb, Te, W, B, Sn, Pb, Se
G is one or more of Co, Ni, alkaline earth metal, and
k is 0.1–12, l is 0.01–12, d is 0–0.5, e is 0–10,
f is 0–10, g is 0–12, $k+l+d+e+f+g \leq 24$, and x is a number determined by the valence requirements of the other

elements present, and wherein the weight ratio in said mixture of said first catalyst composition to said second catalyst composition is in the range of 0.001 to 2.5.

4,877,765

ADSORPTIVE MATERIAL FOR THE REMOVAL OF CHLOROPHYLL, COLOR BODIES AND PHOSPHOLIPIDS FROM GLYCERIDE OILS

James N. Pryor, West Friendship; James M. Bogdanor, Columbia, and William A. Welsh, Fulton, all of Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed May 15, 1987, Ser. No. 50,998

Int. Cl.⁴ B01J 20/10

U.S. Cl. 502—408

20 Claims

1. An acid-treated amorphous silica adsorbent comprising a high surface area amorphous silica on which is supported an inorganic acid, an acid salt or a strong organic acid having a pK_a of about 3.5 or lower, said adsorbent characterized in having an acidity factor of at least about 2.0×10^{-8} and a pH of about 3.0 or lower.

2. The adsorbent of claim 1 in which said amorphous silica is a silica hydrogel, silica xerogel, precipitated silica, fumed silica, dialytic silica or silica alumina.

5. The adsorbent of claim 1 in which said acid is an inorganic acid.

8. The adsorbent of claim 1 in which said acid is a strong organic acid.

4,877,766

MINI-MONOLITH SUBSTRATE

Rodney L. Frost, Corning, N.Y., assignor to Corning Incorporated, Corning, N.Y.

Filed Jul. 18, 1988, Ser. No. 220,543

Int. Cl.⁴ B01J 32/00, 35/04

U.S. Cl. 502—439

26 Claims

1. A rigid mini-monolith structure having a longitudinal axis, said structure having a plurality of internal openended cells extending longitudinally from one end of said structure to an opposite end thereof, each of said cells being of uniform transverse cross section throughout its own length, not all of said cells being of the same transverse cross section, all of said cells being of the same hydraulic diameter.

4,877,767

VINYL DEVELOPER RESINS

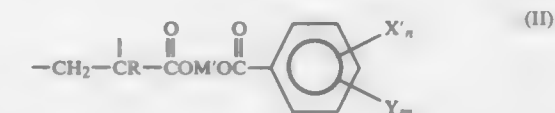
Rong-Chang Liang, Centerville; Karl A. Kintz, Kettering; Joseph G. O'Connor, and Paul C. Adair, both of Springboro, all of Ohio, assignors to The Mead Corporation, Dayton, Ohio
Filed Aug. 14, 1987, Ser. No. 86,059

Int. Cl.⁴ B41M 5/16

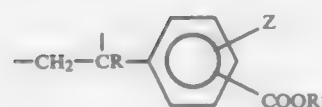
U.S. Cl. 503—212

27 Claims

1. A developer sheet comprising a support having a layer of a color developer on the surface thereof, said color developer being capable of reacting with a substantially colorless electron donating color former to produce a color image and being a microparticle having a core portion and a shell portion, said core portion being thermoplastic and melting at a lower temperature than said shell portion, said microparticle being formed from a vinyl or acrylic polymer having a repeating unit of formulae (I), (II), or (III)



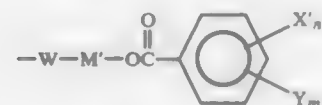
-continued



(III)

where

R is a hydrogen atom or a methyl group;
L is a direct bond or a spacer group;
X is —OH, —COOH, —OM, COOR' or a group of the formula (IV):



(IV)

Y is an alkyl group, an aryl group, or an aralkyl group;
X' is —OH, —COOH, —OM, or —COOR';
W is —O— or



Z is —OH or a hydrogen atom;
M is a metal atom;
M' is a divalent metal atom; R' is a hydrogen atom, an alkyl group, or a metal atom as defined for M;
n is 1 or 2 and when n is 2, X or X' may be the same or different;
m is 0, 1, or 2 and when m is 2; Y may be the same or different.

4,877,768

PROCESSES FOR THE PREPARATION OF COPPER OXIDE SUPERCONDUCTORS

Ronald F. Ziolo, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jul. 25, 1988, Ser. No. 223,827

Int. Cl.⁴ C01G 3/02

U.S. Cl. 505—1 19 Claims

1. A process for the preparation of copper oxide superconductors which comprises (1) mixing stoichiometric amounts of and grinding yttrium nitrate hydrate, copper nitride, and an oxidizing agent in a suitable solvent; (2) forming a paste thereof; (3) applying the paste to a substrate; (4) heating the substrate with the paste thereon; and (5) thereafter cooling.

4,877,769

6,7-(EPITHIO)-3,7-DIMETHYL-1,3-OCTADIENE AND USE THEREOF IN AUGMENTING OR ENHANCING AROMA OF PERFUME COMPOSITIONS, COLOGNES AND PERFUMED ARTICLES

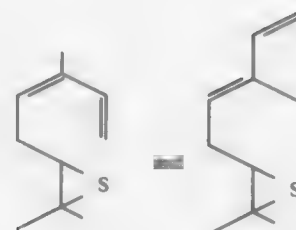
Michael J. Zampino, Roselle Park; Richard A. Wilson, Westfield; Braja D. Mookherjee, Holmdel, all of N.J., and Jean C. Niel, New-Canaan, Conn., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Apr. 28, 1989, Ser. No. 345,015

Int. Cl.⁴ A61K 7/46

U.S. Cl. 512—11 9 Claims

1. An 6,7-(epithio)-3,7-dimethyl-1,3-octadiene selected from the group consisting of compounds having the structures:



4. A process for augmenting or enhancing the aroma of a perfume composition, cologne or perfumed article comprising the step of adding to a perfume composition base, a cologne base or a perfumed article base, an aroma augmenting or enhancing quantity of at least one compound defined according to claim 1.

4,877,770

CHEMICAL DERIVATIVES OF GHL-CU

Loren R. Pickart, Bellevue, Wash., assignor to ProCyte Corporation, Redmond, Wash.

Continuation of Ser. No. 40,460, Apr. 20, 1987, abandoned, which is a continuation-in-part of Ser. No. 699,824, Feb. 8, 1985, Pat. No. 4,665,054. This application Feb. 17, 1989, Ser. No. 312,295

Int. Cl.⁴ A61K 37/02; C07K 5/08

U.S. Cl. 514—18 9 Claims

1. Derivatives of GHL-Cu which possess wound-healing activity and having the general formula:



(II)

wherein R is selected from alkoxy moieties containing from 16 to 18 carbon atoms.

4,877,772

ALCOHOLIC BEVERAGE AND PROCESS FOR PRODUCING SAME

Levan A. Mudzhiri, Pavlova, 55, kv. 16; Gia G. Alkhazashvili, Vazha Pshavela, 55, 2 kvartal, korpus 3, kv.22; Elena I. Kalatozishvili, Akhmeteli, 7, kv. 17; Gia O. Chekurishvili, Palashvili, 36., all of Tbilisi; Izrail I. Brekhan, Admirala Fokina, 27, kv. 4; Alexandr E. Bulanov, Khabarovskaya, 12, kv. 3., both of Vladivostok, and Mira I. Polozhentseva, 2 Parkovaya, 13, kv. 22., Vladivostok, all of U.S.S.R.

Filed Dec. 3, 1986, Ser. No. 937,630

The portion of the term of this patent subsequent to Feb. 28, 2006, has been disclaimed.

Int. Cl.⁴ C12G 1/00; C12C 11/00

U.S. Cl. 514—23 6 Claims

1. An alcoholic beverage consisting of the following components, per 1,000 decaliters of the beverage:

(1) 473–493 kg of a composition inhibiting the development of a pathological addiction to alcohol and containing the following ingredients, mg/g:

leukoanthocyanes	219–270
catechins	153–187
flavonols	81–99
lignin	55–81
reducing sugars	216–264
pectin	18–22
organic acids	76.5–93.5
inerts	4.5–5.5
methylsterols	1.35–1.65
dimethylsterols	1.98–2.42
lignans	13.5–16.5
lignan glycosides	9–11

-continued

phenolic aldehydes	4.5–5.5
alkylferulates	4.5–5.5

- (2) 4,950–5,050 kg of a 40° fruit alcohol,
- (3) 95–105 kg of sugar,
- (4) 1.8–2.2 kg of citric acid,
- (5) 28–32 kg of a tint, and
- (6) 4,317.8–4,452.2 kg of an aqueous-alcoholic liquid.

4,877,773

PHARMACEUTICAL PREPARATION

Leola E. B. Turner, Main St., Greensboro, Ga. 30642

Filed Apr. 29, 1987, Ser. No. 43,761

Int. Cl.⁴ A61K 33/04, 31/715

U.S. Cl. 514—23

2 Claims

1. A composition comprising $\frac{1}{2}$ equal part epsom salt, 1 equal part molasses syrup, 1 equal part castor oil and $\frac{1}{2}$ equal part amorphous sulfur.

4,877,774

ADMINISTRATION OF STEROID HORMONES

Josef Pitha, Baltimore; Mitchell Harman, Ellicott City, both of Md., and Kaneto Uekama, Kumamoto, Japan, assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed Sep. 9, 1987, Ser. No. 94,597

Int. Cl.⁴ A61K 31/70, 31/56

U.S. Cl. 514—26

10 Claims

1. A method for administering steroid hormones to a patient needing supplemental steroid hormones by direct contact with mucosa or the conjunctiva comprising contacting the mucosa of said patient needing supplemental steroid hormones with an effective amount of a steroid hormone complexed with crystalline gamma-cyclodextrin.

4,877,775

POLYMERIC AMINOSACCHARIDES AS ANTIHYPERCHOLESTEROLEMIC AGENTS

Angelo G. Scopellanos, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 16, 1986, Ser. No. 874,478

Int. Cl.⁴ A61K 31/70; C07H 15/20

U.S. Cl. 514—41

24 Claims

1. A cholesterol reducing agent consisting essentially of a copolymer of a monomeric 2-deoxy-streptamine aminoglycosidic antibiotic with a dialdehyde crosslinked to form a reduced polymer containing —CH₂NH— bonds, said polymer being formed in the presence of an excess of dialdehyde, or a pharmaceutically acceptable salt thereof.

17. A method of treating hypercholesterolemia in a mammal comprising administering orally to the mammal an effective bile acid binding amount of a copolymer of claim 1.

4,877,776

K-252 COMPOUNDS

Chikara Murakata, Asaka; Akira Sato, Machida; Masaji Kasai, Fujisawa; Eiji Kobayashi, Shizuoka; Makoto Morimoto, Shizuoka, and Shiro Akinaga, Shizuoka, all of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Filed Dec. 22, 1988, Ser. No. 288,787

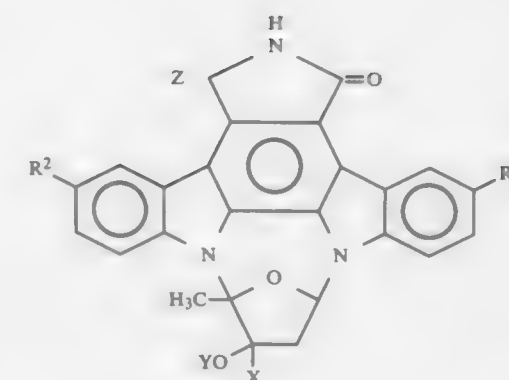
Claims priority, application Japan, Dec. 24, 1987, 62-327857

Int. Cl.⁴ A61K 31/71; C12P 19/38; C07H 19/04

U.S. Cl. 514—43

15 Claims

1. A K-252 compound represented by the formula:



wherein R¹ and R² are independently H or OH; X represents COOH, COOR or CH₂OH; Y represents H, R or COR; and Z represents OH, OR or SR, wherein R represents lower alkyl.

15. A method for treating diseases due to protein kinase C which comprises administering to a human an effective amount of a pharmaceutical composition comprising a K-252 compound defined in claim 1 and a pharmaceutical carrier.

4,877,777

SOLUBLE PHOSPHORYLATED GLUCAN

Nicholas R. DiLazio, Gretna, La., assignor to Bioglacans, L. P., New Orleans, La.

Division of Ser. No. 767,388, Aug. 19, 1985, Pat. No. 4,739,016.

This application Apr. 18, 1988, Ser. No. 182,550

Int. Cl.⁴ A61K 31/66; C08B 37/00

U.S. Cl. 514—54

2 Claims

1. A method for the prevention of leukopenia induced by administration of an anti-cancer agent in animals and humans, comprising: administering to said animal or human a therapeutically effective amount of a soluble phosphorylated glucan, which comprises a phosphorylated poly[β-(1-3)-glucopyranose] chain which is characterized by:

- (a) the capability of dissolving in water or an aqueous solution;
- (b) being non-toxic, non-immunogenic and substantially non-pyrogenic; and
- (c) the capability of exerting a pronounced immunobiological response when administered in vivo to an animal or a human,

in combination with an anti-cancer agent which is an alkylating agent.

4,877,778

METHOD OF ENHANCING LIPOPHILE TRANSPORT USING CYCLODEXTRIN DERIVATIVES

Thomas O. Carpenter, Orange, Conn., and Josef Pitha, Baltimore, Md., assignors to The Children's Medical Center Corporation, Boston, Mass.

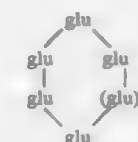
Filed Jul. 1, 1987, Ser. No. 68,921

Int. Cl.⁴ A61K 31/715; C08B 37/16

U.S. Cl. 514—58

9 Claims

1. A method of treating a mammal to catalytically enhance serum transport of a naturally occurring lipophile present in prolonged excessive concentrations, comprising administering to said mammal a cyclodextrin derivative having the following formula:



where $n=1-3$, and glu represents a glucose or substituted glucose residue connected in the manner of an amylose chain, each said glucose residue being independently selected from glucose and alkyl or hydroxyalkyl substituted glucose derivatives, said cyclodextrin being water soluble.

4,877,779

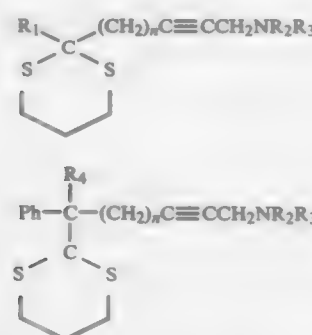
2-AMINOMETHYLAALKYNYLAALKYL-1,3-DITHIANE DERIVATIVES

Waclaw J. Rzeszutowski, Millersville; Maria E. Guzewska, Pasadena; John P. Carter, Baltimore; Theodore C. Adams, Perry Hall; Andrea C. Dupont, Lutherville; and Carl Kaiser, Millersville, all of Md., assignors to Marion Laboratories, Inc., Kansas City, Mo.

Filed May 17, 1988, Ser. No. 194,903

Int. Cl.⁴ A61K 31/385, 31/535; C07D 405/12, 339/08
U.S. Cl. 514-63 4 Claims

1. A compound of Formula I or II



or a pharmaceutically acceptable salt thereof wherein:

R_1 is selected from the group consisting of hydrogen, phenyl, 9H-fluoren-9-yl, 10,11-dihydro-5H-dibenzo[a,d]cyclohepten-5-yl, 5H-dibenzo[a,d]cyclohepten-5-yl, 9H-xanthen-9-yl, 9H-thioxanthen-9-yl, 2-chloro-9H-thioxanthen-9-yl, 1,2,3,4-tetrahydro-1-naphthyl, 4H-chromanyl, diphenylmethyl, phenylcycloalkylmethyl, phenylcycloalkylmethyl in each of which the bridgehead methylene is substituted with a hydroxy group, and the foregoing phenyl or benzo-fused rings substituted with one or more R_5 groups;

R_2 and R_3 , which may be the same or different, are selected from the group consisting of hydrogen, lower alkyl, phenylalkyl (C_1-C_5), and phenylalkyl substituted with one or more R_5 groups, or NR_2R_3 taken together are selected from the group consisting of pyrrolidinyl, piperidinyl, morpholinyl, thiomorpholinyl, 1-piperazinyl and 1-piperazinyl substituted at the 4-position with hydrogen, lower alkyl, hydroxy-substituted lower alkyl, amino-substituted lower alkyl, or acetoxy-substituted lower alkyl;

R_4 is hydrogen, hydroxyl or trimethylsilyloxy;

R_5 is selected from the group consisting of halogen, trifluoromethyl, lower alkyl, hydroxy and lower alkoxy groups; Ph is an unsubstituted phenyl group or a phenyl group substituted by one or more R_5 groups; and n is 2-4.

4,877,780

ANTIEMETIC N-SUBSTITUTED BENZAMIDES

Armando Vega-Noverola; Jose M. Prieto Soto; Fernando P. Noguera; Jacinto M. Mauri, all of Barcelona, and Robert G. W. Spickett, Tibidabo, all of Spain, assignors to Fardonal, S.A., Madrid, Spain

Filed Jul. 12, 1988, Ser. No. 217,646

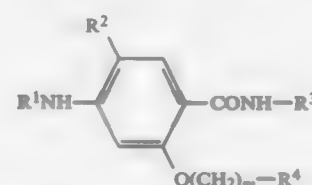
Claims priority, application United Kingdom, Aug. 3, 1987, 8718345

Int. Cl.⁴ A61K 31/625; C07D 453/02

U.S. Cl. 514-161

15 Claims

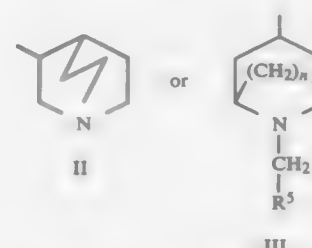
1. A compound of the formula:



wherein R^1 represents hydrogen, a C_{1-6} alkyl group or an acetyl group;

R^2 represents halogen;

R^3 represents a group of the formula:



wherein R^5 represents hydrogen or a phenyl or non-aromatic cyclic ether group and n is 2 or 3;

R^4 represents a C_{3-6} cycloalkyl, cyclohexenyl, C_{1-6} alkoxy, trifluoromethyl, tetrahydrofuryl, 1,3-dioxolanyl or phenoxy group;

m is 0, 1, 2, 3 or 4 with the proviso that when m is 0, then R^4 is only a C_{3-6} cycloalkyl or tetrahydrofuryl group, and when R^3 is II and m is 1, then R^4 is only a C_{3-6} cycloalkyl, cyclohexenyl, C_{1-6} alkoxy, trifluoromethyl, 3-tetrahydrofuryl or phenoxy group and when R^3 is II and m is 2, then R^4 is only a C_{3-6} cycloalkyl, cyclohexenyl, trifluoromethyl, tetrahydrofuryl, 1,3-dioxolanyl or phenoxy group, and when R^3 is II and m is 3, then R^4 is only a C_{3-6} cycloalkyl, cyclohexenyl, trifluoromethyl, tetrahydrofuryl, 1,3-dioxolanyl or a phenoxy group;

or a pharmacologically acceptable acid addition salt, quaternary ammonium salt or a N-oxide thereof.

14. A method of combatting gastro-intestinal disorders which comprises administering to a patient suffering from or expected to suffer from gastro-intestinal disorders an effective amount of a compound of formula I or a pharmacologically acceptable salt or N-oxide thereof as defined in claim 1.

4,877,781

MEDICAL DISPENSER AND PREPARATION FOR INFLAMED TISSUE

Peter G. LaHaye, Medina, Wash., and John A. Selling, Menlo Park, Calif., assignors to Peter G. LaHaye, Medina, Wash.

Filed Sep. 30, 1987, Ser. No. 102,877

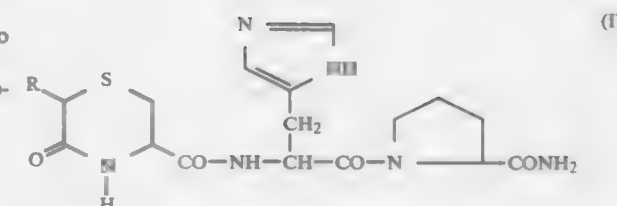
Int. Cl.⁴ A61K 31/56

U.S. Cl. 514-179

20 Claims

1. A composition for the treatment of inflamed tissue, comprising: tixocortol pivalate in an amount sufficient to provide anti-in-

flammatory, anti-pruritic, and vasoconstrictive effects to the inflamed tissue; pramoxine hydrogen chloride in an amount sufficient to anesthetize the inflamed tissue; and ephedrine sulfate in an amount sufficient to minimize arterio-venous shunting of the inflamed tissue.



wherein R is lower alkyl, in combination with a pharmaceutically acceptable carrier.

4,877,782

ZINC CEFTIOFUR COMPLEXES

Alexander R. Cazera, Richland, and K. Thomas Koshy, Kalamazoo, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Feb. 16, 1988, Ser. No. 156,360

Int. Cl.⁴ C07D 501/56; A61K 31/545

U.S. Cl. 514-186

5 Claims

1. A complex of ionic zinc and a ceftiofur molecule selected from the group consisting of ceftiofur per se, a ceftiofur hydrohalide where the halide is chloride or bromide and a ceftiofur alkali metal or alkaline earth metal salt where the metal salt ion is selected from the group consisting of sodium, potassium, calcium and magnesium.

4,877,783

BETA-LACTAM ANTIBACTERIAL AGENTS

Peter H. Milner, Horsham, England, assignor to Beecham Group p.l.c., England

Continuation of Ser. No. 401,266, Jul. 23, 1982, Pat. No. 4,539,149. This application Jan. 24, 1985, Ser. No. 694,622

Claims priority, application United Kingdom, Jul. 25, 1981, 8123033; Jul. 25, 1981, 8123034; Dec. 7, 1981, 8136823; Dec. 7, 1981, 8136824; Mar. 18, 1982, 8207966; Apr. 3, 1982, 8209953; Apr. 3, 1982, 8209954; May 22, 1982, 8215007

The portion of the term of this patent subsequent to Sep. 3, 2002, has been disclaimed.

Int. Cl.⁴ A61K 31/43, 31/545; C07D 499/44, 501/42

U.S. Cl. 514-194

34 Claims

1. A beta-lactam antibiotic having an α -formamido substituent on the carbon atom adjacent to the carbonyl group of the beta-lactam group and having antibacterial activity.

13. A pharmaceutical composition useful for treating bacterial infections in humans and animals which comprises an antibacterially effective amount of a beta-lactam antibiotic having an α -formamido substituent on the carbon atom adjacent to the carbonyl group of the beta-lactam group having antibacterial activity, and a beta-lactamase inhibitory amount of a beta-lactamase inhibitor, in combination with a pharmaceutically acceptable carrier.

4,877,784

HISTIDYLPROLINEAMIDE DERIVATIVES

Kiyoshi Kimura, Yasuokatermachi; Takashi Ogasawara, Ugi, and Takeshi Mushirol, Kyoto, all of, assignors to Nippon Shinyaku Co., Ltd., Japan

Filed Jun. 20, 1988, Ser. No. 209,287

Claims priority, application Japan, Jun. 19, 1987, 62-154237

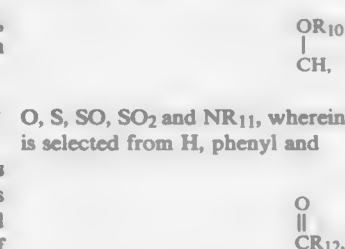
Int. Cl.⁴ A61K 31/54

U.S. Cl. 514-227.8

6 Claims

1. A method of treating epilepsy in humans and animals which comprises administering to a human or animal in need thereof a therapeutically effective amount of a compound of the formula I

wherein Y and Q are selected from CH_2 ,



O, S, SO, SO₂ and NR₁₁, wherein R_{10} is H or lower alkyl, R_{11} is selected from H, phenyl and

and wherein R_{12} is H or lower alkyl; wherein each of m and n is independently an integer from 1 through 4; wherein each of r, t, u and v is independently an integer from zero through two; wherein p is an integer from 1 through 3; wherein each of a through d is independently an integer from zero through 3; wherein T is selected from one or more groups selected from H, linear or branched lower alkyl, alkoxy, oxo, halo, haloalkyl, lower alkenyl, lower alkynyl and cyano; wherein R_1 is selected from H, linear or branched lower alkyl, haloalkyl, alkylcycloalkyl, alkylcycloalkenyl and alkoxy-carbonyl; wherein R_2 is selected from linear or branched lower alkyl, imidazolmethyl and benzyl; wherein R_3 is selected from lower alkyl, acylaminoalkyl, benzyl, naphthylmethyl, aryl and benzyl substituted at the phenyl portion by halo or lower alkyl or by both; wherein each of R_4 and R_5 is independently selected from H and lower alkyl; wherein R_6 is selected from H or phenyl; wherein R_7 is selected from substituted or unsubstituted cycloalkyl, phenyl, cycloalkylalkyl and phenylalkyl, any one of which may be substituted with one or more groups selected from alkyl, alkoxy, halo, haloalkyl, lower alkenyl, lower alkynyl and cyano; and wherein each of R_8 and R_9 is independently selected from the groups H, lower alkyl, cycloalkyl, phenyl, benzyl, naphthyl and naphthylmethyl, any one of which groups having a substitutable position may be optionally substituted with one or more of lower alkyl, alkoxy, alkenyl, alkynyl, halo, haloalkyl, cyano and phenyl, with the proviso that at least one of R_8 and R_9 is an aryl group.

4,877,786

AMINOMETHYLISOXAZOLIDINES, FUNGICIDAL COMPOSITIONS AND USE

Joachim Weissmüller, Monheim; Dieter Berg, Wuppertal; Gerd Hünssler, and Paul Reinecke, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 8, 1987, Ser. No. 130,375

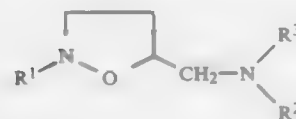
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1986, 3643942

Int. Cl.⁴ A01N 43/80, 43/84; C07D 261/08, 413/06

U.S. Cl. 514—236.8

8 Claims

1. An aminomethylisoxazolidine of the formula



in which

R^1 represents arylalkyl, aryloxyalkyl or arylthioalkyl with in each case 6 to 10 carbon atoms in the aryl part and 1 to 10 carbon atoms in the straight-chain or branched alkyl part, optionally mono-substituted or poly-substituted in the aryl part by identical or different substituents selected from the group consisting of halogen, cyano, nitro, in each case straight-chain or branched alkyl, alkoxy, alkylthio, halogenoalkyl, halogenoalkoxy and halogenoalkylthio with in each case 1 to 6 carbon atoms and where appropriate 1 to 9 identical or different halogen atoms, amino and in each case straight-chain or branched alkylamino, dialkylamino and alkoxyiminoalkyl with in each case 1 to 4 carbon atoms in the individual alkyl parts, and

R^2 and R^3 , together with the nitrogen atom to which they are bonded, represent a saturated 5- to 7-membered heterocyclic radical which optionally can contain further hetero atoms, and is optionally monosubstituted or polysubstituted by identical or different substituents selected from the group consisting of in each case straight-chain or branched alkyl or hydroxyalkyl with in each case 1 to 4 carbon atoms.

6. A fungicidal composition comprising a fungicidally effective amount of a compound or salt according to claim 1 and a diluent.

tive amount of a compound or salt according to claim 1 and a diluent.

4,877,787

BENZYLTHIO PYRIDAZINONE DERIVATIVES, PREPARATION THEREOF, AND INSECTICIDAL ACARICIDAL, FUNGICIDAL COMPOSITIONS

Masakazu Taniguchi, Funabashi; Masayoshi Hirose, Kawaguchi; Masatoshi Baba, Narashino; Kiminori Hirata, Urawa, and Yoshinori Ochiai, Hasuda, all of Japan, assignors to Nissan Chemical Industries, Tokyo, Japan

Continuation of Ser. No. 621,458, Jun. 18, 1984, abandoned.

This application Mar. 17, 1987, Ser. No. 27,191

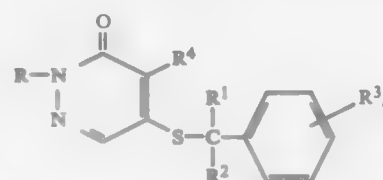
Claims priority, application Japan, Jun. 23, 1983, 58-113409; Jul. 29, 1983, 58-138878

Int. Cl.⁴ A01N 43/58; C07D 403/12, 401/12, 237/18

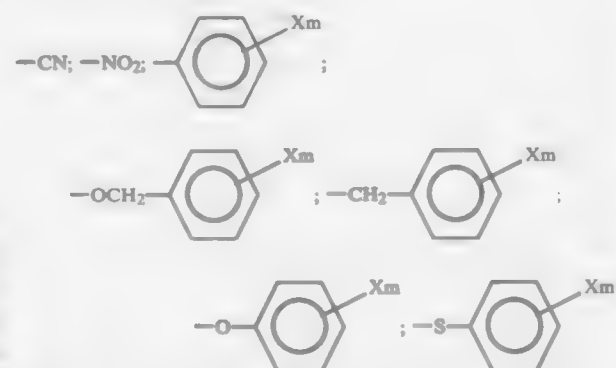
U.S. Cl. 514—247

16 Claims

1. A 3(2H)-pyridazinone derivative having formula (I):



wherein, R denotes C_2 to C_6 alkyl, R^1 and R^2 denote each independently hydrogen or a lower alkyl, R^4 denotes a halogen, R^3 denotes a halogen, a straight or branched C_1 to C_{12} alkyl, a cycloalkyl unsubstituted or substituted by a lower alkyl; a straight or branched C_1 to C_{12} alkoxy; a lower haloalkyl; a lower haloalkoxy;



(wherein X denotes a halogen, a lower alkyl, a cycloalkyl, a lower alkoxy, a lower haloalkyl, a lower haloalkoxy, —CN or —NO₂, and m denotes 0 or an integer of 1 to 5, said X being the same or different when m is an integer of 2 to 5); a pyridyloxy which may be substituted by a halogen and/or —CF₃; a lower alkenyloxy; a lower alkylthio; a lower haloalkylthio; —Si(CH₃)₃; —OH; —N(CH₃)₂; —SCN; —COOCH₃; or —OCH(CH₃)COOC₂H₅, and n denotes an integer of 1 to 5, said R^3 being the same or different when n is an integer of 2 to 5.

4. A method for insecticidal, acaricidal, and/or fungicidal treatment in the agricultural and horticultural field by applying an effective amount of a compound of the formula (I) of claim 1.

4,877,788

NEW PIPRAZINYLALKYLPIPERAZINEDIONE COMPOUNDS

Gilbert Lavielle, La-Celle St-Cloud, and Jean Claude Poignant, Bures S/Yvette, both of France, assignors to Adir Et Cie, Neuilly-sur-Seine, France

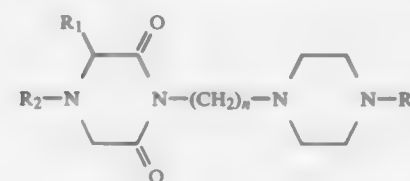
Filed Jun. 14, 1988, Ser. No. 206,512

Claims priority, application France, Jun. 15, 1987, 87 08263

Int. Cl.⁴ A61K 31/495; C07D 471/04

U.S. Cl. 514—252

6 Claims or alternatively a benzyl radical of formula (III):



in which

R_1 and R_2 form together and with the piperazine-2,6-dione radical to which they are attached a hexahydro-pyrazinoisoquinolinedione radical pyrimidinyl radical or a phenyl radical optionally substituted by an alkyl radical of 1 to 4 carbon atoms or a trifluoromethyl radical, n is an integer of from 2 to 4 inclusive and addition salts thereof with a pharmaceutically acceptable inorganic or organic acid.

4,877,789

EICOSATRIENOIC ACID ESTERS AND AMIDES AND THEIR APPLICATION IN PHARMACEUTICAL AND COSMETIC PRACTICE

Braham Shroot, Antibes; Christopher Hensby, Biot; Jean Maignan, Tremblay les Gonesses; Gerard Lang, Saint Gratien; Serge Restle, Aulnay sous Bois, and Michel Collin, Livry Gargan, all of France, assignors to Centre International de Recherches Dermatologiques dite C.I.R.D., Valbonne, France

Filed Jul. 3, 1986, Ser. No. 881,776

Claims priority, application France, Jul. 5, 1985, 85 10363

Int. Cl.⁴ C07D 257/04; C07C 103/60; A61K 31/16; A01N 43/48

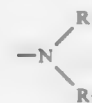
U.S. Cl. 514—255

13 Claims

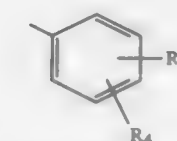
1. A compound having the formula:



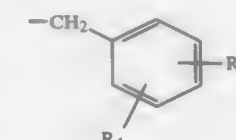
wherein R is (i) an amino group having the formula



wherein R_1 or R_2 , which may be identical or different, denote a hydrogen atom or a linear or branched C_1 - C_8 lower alkyl radical, optionally interrupted by one or more hereto atoms chosen from oxygen, sulphur and nitrogen, said lower alkyl radical being unsubstituted or substituted with one or more hydroxyl groups, R_1 and R_2 not being able to denote hydrogen simultaneously, or alternatively R_1 and R_2 form, together with the nitrogen atom, a heterocyclic system optionally containing oxygen, sulphur or nitrogen as an additional hetero atom, one of the radicals R_1 and R_2 also being to denote, when the other is a hydrogen atom, an aryl radical of formula (II):



(II)



(III)

in which formulae R_3 and R_4 denote, independently of each other, a hydrogen atom, a C_1 - C_4 alkyl radical, a hydroxyl group, a halogen atom or a carboxyl or trifluoromethyl group or (ii) a glucosamine, and the isomers and salts thereof which are pharmaceutically and cosmetically acceptable.

4,877,790

QUINAZOLINE DERIVATIVE, PROCESSES FOR ITS PRODUCTION, AND CEREBRAL DYSFUNCTION REMEDYING AGENT COMPRISING IT AS ACTIVE INGREDIENT

Ryuichi Iemura, Toyonaka; Manabu Hori, Osaka; Hiroshi Oh-taka, Osaka; Takayuki Sakamoto, Osaka; Hideaki Hara, Osaka, and Keizo Ito, Osaka, all of Japan, assignors to Kanebo Limited, Tokyo, Japan

Filed Dec. 15, 1987, Ser. No. 134,302

Int. Cl.⁴ A61K 31/505; C07D 239/84

U.S. Cl. 514—260

2 Claims

1. A quinazoline compound of the formula or a pharmacologically acceptable acid addition salt thereof.
2. A composition for remedying cerebral dysfunction comprising a pharmaceutically effective amount of a quinazoline compound of the formula or a pharmacologically acceptable acid addition salt thereof and a pharmaceutically acceptable carrier or diluent therefor.

4,877,791

METHOD OF TREATMENT FOR INTERSTITIAL CYSTITIS

Fred P. Sherman, Hollywood, Fla., assignor to Baker Cummins Pharmaceuticals, Inc., Miami, Fla.

Filed Nov. 1, 1988, Ser. No. 265,575

Int. Cl.⁴ A61K 31/485

U.S. Cl. 514—282

8 Claims

1. A method of treating a patient suffering from interstitial cystitis comprising the daily administration to the patient of from about 1 to about 50 mg of nalmefene or naltrexone.

4,877,792

HETEROARYLOXY-BETA-CARBOLINE DERIVATIVES, THEIR PREPARATION AND THEIR USE AS MEDICINAL AGENTS

Helmut Biere; Andreas Huth; Dieter Rahtz; Ralph Schmiechen; Dieter Seidelmann; David N. Stephens, all of Berlin, Fed. Rep. of Germany; Mogens Engelstoft, Vaerlose, and John B. Hansen, Lyngby, both of Denmark, assignors to Schering Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 9, 1987, Ser. No. 23,752

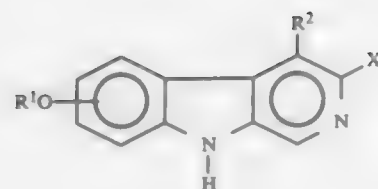
Claims priority, application Fed. Rep. of Germany, Mar. 8, 1986, 3600009

Int. Cl.⁴ A61K 31/395; C07D 471/04, 417/14

U.S. Cl. 514—292

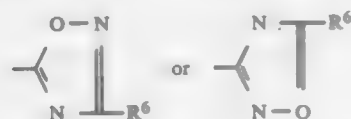
18 Claims

1. A heteroaryloxy- β -carboline of the formula



wherein

R¹ is pyridine, furan, thiophene, pyrrole, imidazole or thiazole, or one of the above substituted by halo, nitro, amino, cyano, C₁₋₆-alkyl, or (C₁₋₆-alkoxy)carbonyl, R² is hydrogen, C₁₋₆-alkyl or C₁₋₆-alkoxy-C₁₋₆-alkyl, X is COOR³, CONR⁴R⁵, or oxadiazoyl of the formula



R³ is H or C₁₋₆-alkyl, R⁴ and R⁵ independently are each H or C₁₋₆-alkyl, and R⁵ is hydrogen, C₁₋₆-alkyl or C₃₋₇-cycloalkyl.

18. A method of claim 16 for treating anxiety accompanied by depression, epilepsy, sleep disturbance or spasticity or for achieving muscle relaxation during anesthesia.

4,877,793

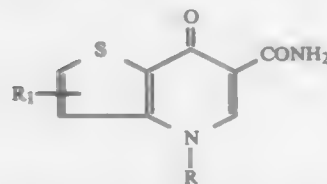
THIENO[3,2-B]PYRIDINE-6-CARBOXAMIDE COMPOUNDS USEFUL IN TREATING HYPERTENSION
Roy V. Davies, Nottingham, Great Britain, assignor to The Boots Company, PLC, Nottingham, England
Filed Nov. 19, 1987, Ser. No. 122,394

Claims priority, application United Kingdom, Nov. 20, 1986, 8627698

Int. Cl.⁴ C07D 213/32

U.S. Cl. 514—301

1. A compound of the formula,



in which R is lower alkyl, and R₁ is hydrogen, lower alkyl, lower alkoxy, halo, trifluoromethyl, or phenyl unsubstituted or substituted with one or two substituents selected, from the group consisting of halo, lower alkyl, lower alkoxy and trifluoromethyl.

4,877,794

2-ALKOXY-N-(1-AZABICYCLO(2.2.2)OCT-3-YL) BENZAMIDE AND THIOMBENZAMIDE COMPOSITIONS AND THE USE THEREOF TO TREAT SCHIZOPHRENIA
Robert J. Naylor, and Brenda Naylor, both of Ilkley, England, assignors to A. H. Robins Company, Incorporated, Richmond, Va.

Filed Sep. 6, 1988, Ser. No. 240,868

Claims priority, application United Kingdom, Sep. 4, 1987, 8720805

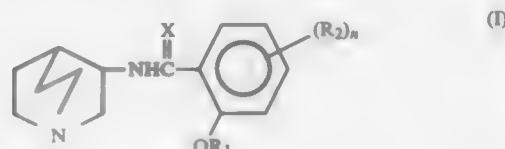
Int. Cl.⁴ A61U 31/44

U.S. Cl. 514—305

8 Claims

1. A method of treating schizophrenia in a warm-blooded animal comprising administering to said animal a pharmaceuti-

cal composition comprising a compound of general formula I:



wherein:

X represents oxygen or sulphur;
R¹ represents loweralkyl;
R² represents hydrogen, halo, 4,5-benzo, loweralkoxy, amino, methylamino or dimethylamino; and
n is 1 or 2;

or a pharmaceutically acceptable acid addition salt thereof, in an amount sufficient to control schizophrenia; and a pharmaceutically acceptable carrier.

4,877,795

4H-QUINOLIZIN-4-ONE COMPOUNDS USEFUL FOR THE TREATMENT OF ALLERGIC BRONCHIAL ASTHMA, ALLERGIC RHINITIS ATROPIC DERMATITIS AND THE LIKE

Yoshikazu Kuraahina; Hiroshi Miyata, and Den-ichi Momose, all of Matsumoto, Japan, assignors to Kinsei Pharmaceutical Co., Ltd., Japan

Filed Jan. 25, 1988, Ser. No. 147,549

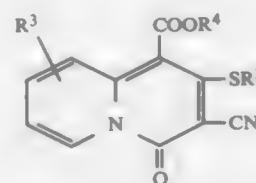
Claims priority, application Japan, Jan. 30, 1987, 62-19734; Jan. 30, 1987, 62-19735; Jan. 30, 1987, 62-19736; Jan. 30, 1987, 62-19737; Feb. 12, 1987, 62-30603; Feb. 12, 1987, 62-30604; Feb. 12, 1987, 62-30605

Int. Cl.⁴ C07D 455/02; A61K 31/435

U.S. Cl. 514—306

12 Claims

1. A 4H-quinolizin-4-one compound corresponding to the formula:



where R² is an alkyl, alkenyl or aralkyl group having up to 18 carbon atoms; R³ is hydrogen or an alkyl group having 1 to 6 carbon atoms; R⁴ is a substituent having up to 16 carbon atoms which is alkenyl, alkynyl, cycloalkyl, cycloalkyl-alkyl, cycloalkenyl, cycloalkyl-alkenyl, aralkyl, aralkenyl, aryloxyalkyl or arylthioalkyl.

4. A method for the treatment of allergic bronchial asthma, allergic rhinitis, atopic dermatitis and hypersensitivity diseases associated with immunoglobulin E-antibody formation in a mammal which comprises administering an effective dosage from about 0.1 mg to 10 mg per Kg of mammal weight by oral administration or from about 0.02 mg to 5 mg per Kg of mammal weight by parenteral administration per day of an immunoglobulin E-antibody formation-inhibiting 4H-quinolizin-4-one compound to the mammal.

4,877,796

DECAHYDROQUINOLINES AND CENTRAL ANALGESIC METHOD OF USE THEREOF
Francois Clemence; Odile Le Martret, both of Paris; Francoise Delevallee, Fontenay Sous Bois, and Michel Fortin, Paris, all of France, assignors to Roussel Uclaf, Paris, France
Filed Aug. 12, 1987, Ser. No. 84,456

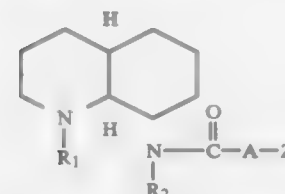
Claims priority, application France, Aug. 12, 1986, 86 11620; Jul. 9, 1987, 87 09747

Int. Cl.⁴ C07D 215/40; A61K 31/47

U.S. Cl. 514—311

18 Claims

1. A compound selected from the group consisting of all enantiomeric and diastereoisomeric forms of a decahydroquinoline of the formula



wherein R₁ is alkyl of 1 to 5 carbon atoms, R₂ is selected from the group consisting of hydrogen and alkyl of 1 to 5 carbon atoms, A is selected from the group consisting of —(CH₂)_n and —CH₂O—, n is an integer from 1 to 5, Z is selected from the group consisting of phenyl, phenyl substituted with at least one member of the group consisting of alkyl and alkoxy of 1 to 5 carbon atoms, halogen, —OH, —CF₃, —NO₂, —NH₂ and mono and dialkylamino of 1 to 5 carbon atoms, naphthyl indenyl, and naphthyl and indenyl substituted with at least one member of the group consisting of alkyl and alkoxy of 1 to 5 carbon atoms, —CF₃, —NO₂, —NH₂, mono and dialkylamino of 1 to 5 carbon atoms and phenyl optionally substituted with one or more members of the group consisting of alkyl and alkoxy of 1 to 5 carbon atoms and halogen and their non-toxic, pharmaceutically acceptable acid addition salts and quaternary ammonium salts.

13. A method of inducing central analgesic activity in warm-blooded animals comprising administering to warm-blooded animals a central analgesically effective amount of at least one compound of claim 1.

4,877,797

1,4-DIHYDROPYRIDINE DERIVATIVES AND PHARMACEUTICAL COMPOSITIONS CONTAINING SAME

Hiroaki Satoh, Saitama; Hiroyasu Koyama, Ageo; Yoshikuni Suzuki, Ohmiya; Toshiji Sugai, and Koichi Watanabe, both of Saitama, all of Japan, assignors to Nissin Flour Milling Co., Ltd., Tokyo, Japan

Filed Jun. 15, 1987, Ser. No. 67,719

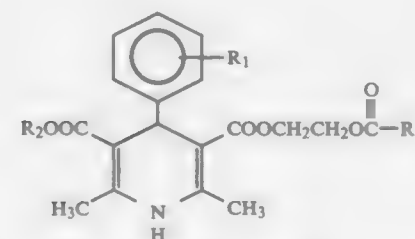
Claims priority, application Japan, Jun. 13, 1986, 61-136152
The portion of the term of this patent subsequent to Jul. 12, 2005, has been disclaimed.

Int. Cl.⁴ A61K 31/44; C07D 401/12

U.S. Cl. 514—314

10 Claims

1. A compound of formula I



wherein R₁ is a nitro or trifluoromethyl group; R₂ is a C₁₋₆

alkyl group; R₃ is a pyridyl or pyridyl N-oxide group fused with a benzene or naphthalene ring, said ring being optionally substituted with C₁₋₆ alkyl, C₁₋₆ alkoxy, halogen or haloalkyl wherein the alkyl moiety has 1-3 carbon atoms, said pyridyl or pyridyl N-oxide group optionally being substituted at a carbon atom with halogen or hydroxyl, and a pharmaceutically acceptable acid addition salt thereof.

4,877,798

TREATMENT OF FIBROMYALGIA

Stephen M. Sorensen, Cincinnati, Ohio, assignor to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Continuation of Ser. No. 123,753, Nov. 23, 1987, abandoned.

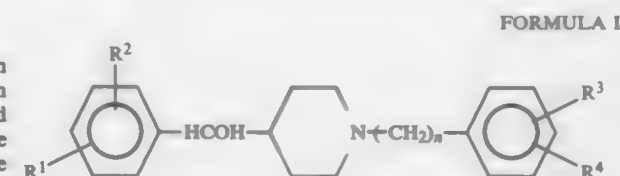
This application Oct. 18, 1988, Ser. No. 262,168

Int. Cl.⁴ A61K 31/445

U.S. Cl. 514—317

8 Claims

1. A method for relieving or alleviating the symptomatology of fibromyalgia in a patient in need thereof comprising administering thereto an antifibromyalgia amount of a compound of the formula:



FORMULA I

wherein: each of R¹, R², R³, and R⁴ are independently selected from the group consisting of hydrogen, a C₁₋₆ alkyl group, halogen, trifluoromethyl, hydroxy, a C₁₋₆ alkoxy group, and an amino group; n is 2, 3, or 4; and the pharmaceutically acceptable acid addition salts thereof.

4,877,799

METHOD OF TREATING CALCIUM OVERLOAD IN BRAIN CELLS OF MAMMALS

Jorgen Drejer, Bronshøj, and Palle Jakobsen, Vaerloese, both of Denmark, assignors to A/S Ferrosan, Soeborg, Denmark
Filed Oct. 8, 1987, Ser. No. 106,154

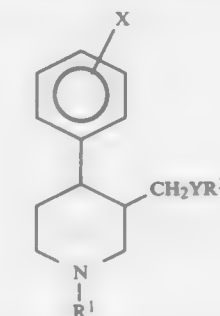
Claims priority, application Denmark, Nov. 3, 1986, 5232/86; Jun. 25, 1987, 3234/87

Int. Cl.⁴ A61K 31/36, 31/38, 31/445

U.S. Cl. 514—317

8 Claims

1. A method of treating calcium overload in brain cells of a mammal in need thereof, which comprises the step of administering to the said mammal a calcium overload blocking amount of a piperidine compound having the formula IV



(IV)

wherein

R³ is 3,4-methylenedioxyphenyl, phenyl, naphthyl, or benzo-thiazolyl which are optionally substituted with one or more C₁₋₆-alkyl, C₁₋₆-alkoxy C₃₋₈-cycloalkyl, C₃₋₅-alkylene or benzyloxy,
R¹ is hydrogen or straight or branched C₁₋₈-alkyl, C₁₋₈-alkoxy-C₁₋₈-alkyl, C₄₋₇-cycloalkyl phenoxy-C₁₋₈-alkyl,

C₁₋₆alkoxyphenoxy-C₁₋₈alkyl, C₄₋₈alkenyl, or C₄₋₈cycloalkylalkyl,
X is hydrogen or halogen, and wherein
Y is O or S or a salt thereof with a pharmaceutically-acceptable acid or a pharmaceutical composition thereof.

4,877,805

ANTIPSYCHOTIC COMPOSITIONS CONTAINING DIOXOPIPERIDINE DERIVATIVES

Brenda Costall, North Yorkshire, United Kingdom, assignor to National Research Development Corporation, London, England

Filed Jul. 11, 1988, Ser. No. 217,450

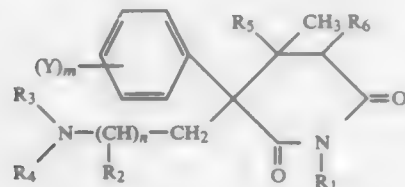
Claims priority, application United Kingdom, Jul. 10, 1987, 8716317

Int. Cl.⁴ A61K 31/445

U.S. Cl. 514—328

8 Claims

1. A method of treatment of psychosis which comprises administering to a patient suffering a psychotic disorder an anti-psychotic effective amount of a compound of the following Formula I.



wherein:

R₁ represents hydrogen or C₁₋₄ alkyl;
n is 1 or 2;
R₂ represents hydrogen or methyl, provided that one R₂ is hydrogen when n is 2;
R₃ represents hydrogen or C₁₋₂ alkyl;
R₄ represents C₁₋₂ alkyl;
R₅ and R₆ independently represent hydrogen or methyl;
m is 0 to 3; and
each X is in a meta or para position and independently represents hydroxy, C₁₋₂ alkoxy, C₁₋₂ alkyl, C₁₋₂ hydroxyalkyl, halogen, or trifluoromethyl, provided that hydroxy and alkoxy are not in the para position, or a pharmacologically acceptable salt thereof.

4,877,801

1-ARYL-1-(1H-AZOL-1-YLALKYL)-1,3-DIHYDROISOBENZOFURANS, RELATED DERIVATIVES AND PHARMACEUTICAL COMPOSITIONS THEREOF USEFUL AS ANTIFUNGALS

Raymond G. Lovey, West Caldwell, N.J., and Arthur J. Elliott, Sloatsburg, N.Y., assignors to Schering Corporation, Kenilworth, N.J.

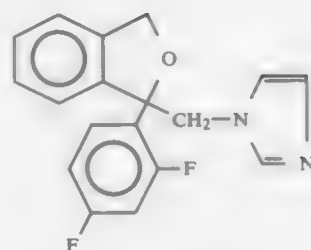
Division of Ser. No. 697,539, Feb. 1, 1985, Pat. No. 4,737,508. This application Apr. 6, 1988, Ser. No. 183,267

Int. Cl.⁴ C07D 405/06

U.S. Cl. 548—336

1 Claim

1. A compound which is 1-(2,4-difluorophenyl)-1-(1H-imidazol-1-ylmethyl)-1,3-dihydroisobenzofuran and is represented by the formula:



4,877,802

THIAZOLE DERIVATIVE

John R. H. Wilson, Rainham, and Ernest Haddock, Sheerness, both of England, assignors to Shell Internationale Research Maatschappij B.V., The Hague, Netherlands

Filed May 27, 1988, Ser. No. 199,430

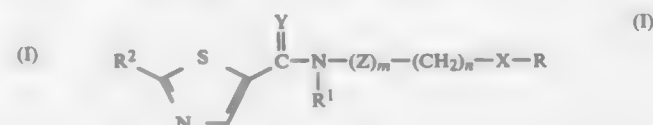
Claims priority, application United Kingdom, Jun. 25, 1987, 8714920

Int. Cl.⁴ C07D 277/56; A01N 43/78

U.S. Cl. 514—365

10 Claims

1. A compound of the general formula:



or an acid-addition salt thereof, in which R represents a phenyl or naphthyl group optionally substituted by one or more substituents selected from the group consisting of halogen atoms, nitro, cyano, hydroxyl, C₁₋₆ alkyl, C₁₋₆ haloalkyl, C₁₋₆ alkoxy, C₁₋₆ haloalkoxy, amino, C₁₋₆ alkylamino, di-C₁₋₆ alkylamino, carbonyl, C₁₋₆ alkoxy-carbonyl, carboxyl, C₁₋₆ alkanoyl, C₁₋₆ alkylthio, C₁₋₆ alkylsulfinyl, C₁₋₆ alkylsulfonyl, carbamoyl, C₁₋₆ alkylamido, C₃₋₆ cycloalkyl, and phenyl groups; R¹ represents a hydrogen atom or a C₁₋₈ alkyl group, a C₂₋₆ alkenyl group or a C₂₋₆ alkynyl group, each of said alkyl, alkenyl or alkynyl groups being optionally substituted by one or more substituents selected from the group consisting of halogen atoms, nitro, cyano, hydroxyl, carboxyl, carbonyl, amino, C₁₋₄ alkylamino, di-C₁₋₄ alkylamino, C₁₋₄ alkoxy or haloalkoxy and C₁₋₄ alkoxy-carbonyl groups; R² represents a hydrogen or haloalkyl group or a C₁₋₈ alkyl, C₁₋₈ haloalkyl, C₁₋₈ alkoxy, C₁₋₈ haloalkoxy, C₁₋₈ alkylthio, hydroxyl, cyano, nitro, amino, C₁₋₈ alkylamino, di-C₁₋₈ alkylamino or morpholine group; X represents an oxygen or sulfur atom, a carbonyl group or a group —CR⁴R⁵— where R⁴ and R⁵ independently represent a hydrogen atom or a C₁₋₈ alkoxy group; Y represents an oxygen or sulfur atom; n represents an integer from 0 to 6; m is 0 or 1; and Z represents a phenyl group; with the proviso that m and n do not simultaneously represent 0.

4,877,803

BIS-DIOXOPIPERAZINE DERIVATIVES AND PHARMACEUTICAL COMPOSITIONS CONTAINING THE SAME

Jun-Chao Cai, and Muneki Takase, both of Tokyo, Japan, assignors to Zenyaku Kogyo Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP86/00324, § 371 Date Feb. 24, 1987, § 102(e) Date Feb. 24, 1987, PCT Pub. No. WO87/00170, PCT Pub. Date Jan. 15, 1987

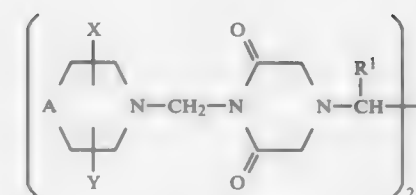
PCT Filed Jan. 25, 1986, Ser. No. 31,011

Claims priority, application Japan, Jun. 26, 1985, 60-139731 Int. Cl.⁴ A61K 31/435; C07D 413/14

U.S. Cl. 514—227.8

10 Claims

1. A compound represented by the formula (I):



wherein R¹ represents a lower alkyl group; A represents an oxygen atom, a sulfur atom or a group of



wherein R² represents a hydrogen atom, a lower alkyl group or phenyl; R³ represents a lower alkyl group, phenyl or benzyl; and X and Y, which are respectively independent and are the same or different, represent a hydrogen atom or a lower alkyl group.

4,877,804

THIADIAZOLE DERIVATIVE, AND INSECTICIDAL AND MITICIDAL COMPOSITION CONTAINING THE DERIVATIVE AS THE EFFECTIVE INGREDIENT

Susumu Matsumoto, Yokohama; Hiroki Ohta, Kokubunji; Masahiro Yamada, Machida; Yoshiaki Higashino, and Toshiki Fukuchi, both of Yokohama, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

Filed Mar. 31, 1988, Ser. No. 176,297

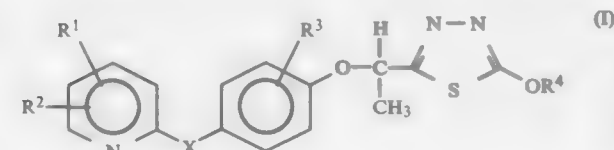
Claims priority, application Japan, Mar. 31, 1987, 62-78311

Int. Cl.⁴ C07D 417/10; A61K 31/44

U.S. Cl. 514—342

9 Claims

1. A thiadiazole derivative represented by the formula (I):



wherein R¹ and R² independently represent hydrogen atom, halogen atom, lower haloalkyl group, lower alkoxy-carbonyl group or cyano group, R³ represents hydrogen atom or haloalkyl group, R⁴ represents lower alkyl group, X represents oxygen atom or sulfur atom.

4,877,805

METHODS FOR TREATMENT OF SUNDAMAGED HUMAN SKIN WITH RETINOLDS

Albert M. Kligman, c/o Dept. of Dermatology, University of Pennsylvania, Philadelphia, Pa. 19104

Continuation of Ser. No. 886,595, Jul. 16, 1986, abandoned, which is a continuation-in-part of Ser. No. 759,505, Jul. 26, 1985, Pat. No. 4,603,146, which is a continuation of Ser. No. 610,711, May 16, 1984, abandoned, which is a continuation-in-part of Ser. No. 297,388, Aug. 28, 1981, abandoned. This application Jun. 3, 1988, Ser. No. 205,057

The portion of the term of this patent subsequent to Jul. 29, 2003, has been disclaimed.

Int. Cl.⁴ A61K 31/20, 31/41

U.S. Cl. 514—381

11 Claims

1. A method for retarding and reversing the loss of collagen fibers, abnormal changes in elastic fibers, and deterioration of small blood vessels in sundamaged human skin, comprising applying topically to the surface of the skin a composition comprising effective amounts of a retinoid in a nontoxic, der-

matologically acceptable vehicle in a program of maintenance therapy, whereby the skin substantially regains and maintains its firmness, turgor and elasticity during said therapy, said composition and amounts of retinoid therein being selected so as to provide a dose for application which is insufficient to cause excessive irritation.

4,877,806

USE OF

TRICYCLODECENE-3,4,7,8-TETRACARBOXYLIC ACID DERIVATIVES AS ANTI-MURINE TUMOR AGENTS

Ralph P. Neighbors, Olathe, and Joseph R. Riden, Overland Park, both of Kan., assignors to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 504,498, Jun. 15, 1983, abandoned, which is a continuation-in-part of Ser. No. 324,882, Nov. 25, 1981, abandoned, which is a continuation-in-part of Ser. No. 231,514, Feb. 4, 1981, abandoned. This application Mar. 18, 1988, Ser. No. 170,583

Int. Cl.⁴ A61K 31/40

U.S. Cl. 514—410

2 Claims

1. A method of treating mammals afflicted with murine tumors comprising administering to said mammals in a therapeutically effective amount sufficient to increase survival time or inhibit tumor growth the diimide of tricyclo[4.2.2.0^{2,5}]dec-9-ene-3,4,7,8-tetracarboxylic acid or a pharmaceutically acceptable salt thereof.

4,877,807

5-PHENYL-1,2,3A,4,5,9B-HEXAHYDRO-3H-BENZ(E)INDOL-3-ONE PREPARATION AND USE THEREOF AS DRUGS

Gerd Steiner, Kirchheim; Walter Himmele, Walldorf; Ernst Buschmann, Ludwigshafen; Hans-Juergen Teschendorf, Dudenhofen, and Harald Weifenbach, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed May 23, 1988, Ser. No. 197,274

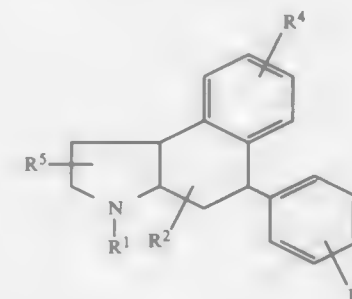
Claims priority, application Fed. Rep. of Germany, May 23, 1987, 3717395

Int. Cl.⁴ A61K 31/40; C07D 209/60, 207/06, 207/08

U.S. Cl. 514—411

13 Claims

1. A 5-phenyl-1,2,3a,4,5,9b-hexahydro-3H-benz[e]indole of compound the formula I:



where R¹ is hydrogen or C₁₋₆ alkyl, R² is hydrogen or C₁₋₃ alkyl in the 3a- or 4-position, R³ and R⁴ are each hydrogen, hydroxyl, halogen, C₁₋₃ alkyl, C₁₋₃ alkoxy, C₁₋₃ alkylthio or trifluoromethyl, acetylamino or amino and R⁵ is hydrogen or C₁₋₃ alkyl, or a salt thereof with a physiologically tolerated acid.

7. A pharmaceutical composition for treating depression or convulsive disorders in a patient or for imparting a sedative or tranquilizing effect to said patient, which comprises an effective amount of one or more compounds of claim 1 as an active substance and a pharmaceutically-acceptable carrier.

4,877,808

NOVEL β -D-PHENYLTHIOXYLIDES, THEIR METHOD OF PREPARATION AND THEIR USE AS THERAPEUTICS

Soth Samreth, Longvic; Francois Bellamy, Sauton la Chapelle, and Jean Millet, Sauton la Rue, all of France, assignors to Fournier Innovation et Synergie, Paris, France

Filed Apr. 25, 1988, Ser. No. 185,422

Claims priority, application France, May 4, 1987, 87 06237

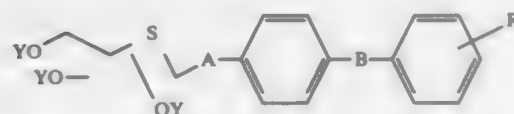
Int. Cl.⁴ A61K 31/38; C07D 335/02

U.S. Cl. 514—432

7 Claims

1. An oxide derivative which is selected from the group consisting of:

(i) the β -D-phenylthioxyloides of the formula:



in which:

R represents a hydrogen atom, a halogen atom, a nitro group or a cyano group,

A represents the sulfur atom or the oxygen atom,

B represents a CH₂, CHOS or CO group, and

Y represents the hydrogen atom or an acyl group containing from 2 to 5 carbon atoms; and (ii) epimers thereof when B is CHOH.

6. A therapeutic composition which contains, in association with a physiologically acceptable excipient, an amount, effective as an antithrombotic, of an oxide derivative selected from the group consisting of the β -D-phenylthioxyloides of the formula I and epimers thereof according to claim 1.

4,877,809

NOVEL 2-THIENYLOXYACETIC ACID DERIVATIVES, A PROCESS FOR THEIR PREPARATION AND PHARMACEUTICAL PREPARATIONS CONTAINING THEM

Dieter Binder, Vienna; Franz Rovinsky, Leitha, and Hubert P. Ferber, Ansfelden, all of Austria, assignors to CL Pharma Aktiengesellschaft, Linz, Austria

Filed Mar. 29, 1988, Ser. No. 174,883

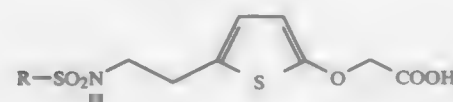
Claims priority, application Austria, Apr. 3, 1987, 820/87

Int. Cl.⁴ A61K 31/38; C07D 409/00

U.S. Cl. 514—444

6 Claims

1. A compound of the formula I



in which R denotes a phenyl or thienyl group which is optionally mono- or polysubstituted by halogen, trifluoromethyl or C₁-C₄ alkyl, or a pharmaceutically usable salt thereof.

4,877,810

PROTECTION OF HEART TISSUE FROM REPERFUSION INJURY

Donald A. G. Mickle, and Tai-Wing Wu, both of Toronto, Ontario, Canada, assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 5, 1988, Ser. No. 152,501

Int. Cl.⁴ A61K 31/35

U.S. Cl. 514—456

18 Claims

1. A method for protecting the heart of a mammal from tissue injury that is associated with reperfusion of an ischemic heart which method comprises introducing into the blood circulation of said mammal, in an amount effective to inhibit

reperfusion injury, the chroman compound 6-hydroxy-2,5,7,8-tetramethyl-chroman-2-carboxylic acid.

4,877,811

CHEMICAL COMPOUNDS

Vivienne M. Anthony, Maidenhead; John M. Clough, Marlow, and Christopher A. Godfrey, Bracknell, all of United Kingdom, assignors to Imperial Chemical Industries PLC, London, Great Britain

Filed Nov. 12, 1987, Ser. No. 119,484

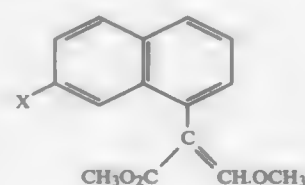
Claims priority, application Denmark, Nov. 11, 1986, 4972/85; United Kingdom, Dec. 3, 1986, 8628923

Int. Cl.⁴ C07C 121/64, 69/76; A01N 37/34, 37/36

U.S. Cl. 514—522

6 Claims

1. A compound of the formula (V):



in which X is phenyl, unsubstituted or substituted with one or more of halogen, C₁-4 alkyl, C₁-4 alkoxy, phenyl, nitro and cyano.

6. A method of killing or controlling insect and mite pests which comprises administering to the pest or a locus thereof an effective amount of a compound according to claim 1.

4,877,812

1-(ACETYLAMINOPHENYL)-2-AMINOPROPANONE DERIVATIVES AND ANTIDEPRESSANT COMPOSITIONS THEREOF

Louis Lafon, Paris, France, assignor to Laboratoire L. Lafon, Maisons Alfort, France

Continuation-in-part of Ser. No. 660,285, Oct. 12, 1984, abandoned. This application Apr. 16, 1987, Ser. No. 38,981

Claims priority, application France, Oct. 14, 1983, 83 16408; Aug. 20, 1984, 84 12963

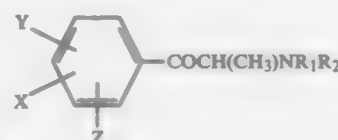
The portion of the term of this patent subsequent to Oct. 8, 2002, has been disclaimed.

Int. Cl.⁴ A61K 31/12; C07C 87/28

U.S. Cl. 514—630

7 Claims

1. A compound of the formula:



wherein R₁ is C₁-C₄ alkyl or C₃-C₆ cycloalkyl and R₂ is hydrogen or C₁-C₄ alkyl, X is CH₃CONH, and Y and Z are independently hydrogen or halogen; or an addition salt thereof.

7. A central nervous system antidepressant composition comprising an effective amount of the compound according to claim 1, or a non-toxic addition salt thereof, and a physiologically acceptable excipient.

4,877,813

BEARING RESIN MATERIAL

Osamu Jinno, Nagoya, and Tatsuhiko Fukuoka, Aichi, both of Japan, assignors to Taiho Kogyo Co., Ltd., Toyota, Japan

Division of Ser. No. 32,923, Mar. 30, 1987, Pat. No. 4,737,539.

This application Mar. 2, 1988, Ser. No. 162,923

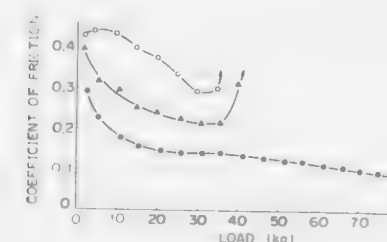
Claims priority, application Japan, Oct. 22, 1984, 59-220400

The portion of the term of this patent subsequent to Apr. 12, 2005, has been disclaimed.

Int. Cl.⁴ C08L 69/00

U.S. Cl. 525—146

8 Claims



1. A resinous bearing material consisting essentially of at least one thermoplastic resin selected from the group consisting of polyacetal, polyamide, polycarbonate, polyphenylene sulfide, polyethylene terephthalate, and ultra-high molecular weight polyethylene, having 0.05 to 15% by weight of short, untangled fibers of an aromatic polyamide uniformly distributed therein.

4,877,814

PROCESS FOR PRODUCING OPEN-CELL POLYETHYLENE FOAM MATERIALS AND THE RESULTANT PRODUCT

Hiroo Ito, Kyoto, Japan, assignor to Kabushiki Kaisha Serutekuno, Kyoto, Japan

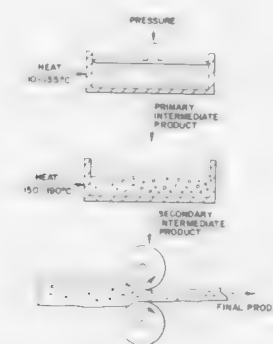
Filed Sep. 5, 1986, Ser. No. 304,385

Claims priority, application Japan, Sep. 6, 1985, 60-198099; Sep. 17, 1985, 60-205795

Int. Cl.⁴ C08J 9/06; B29C 59/04, 67/22

U.S. Cl. 521—79

7 Claims



1. A method for producing polyethylene open-cell foam materials whose characteristic feature is that it comprises:

(i) a first process step of compacting a base compound into a tightly closed mold in a press at a pressure of about 3 kg/cm² to about 10 kg/cm² which is heated at a temperature of approximately 110° to 135° C., said base compound comprising polyethylene or copolymer of polyethylene which has been compounded with an azodicarbonamide foaming agent and a cross-linking agent in order to obtain a primary intermediary product wherein said foaming agent and said cross-linking agent have a decomposition

ratio of from about zero to about 4% to provide a cubical expansion coefficient of 1.0 to 2.0 times.

(ii) a second process step of heating said primary intermediary product under normal pressure at a temperature of 150° to 190° C., thus causing the complete decomposition of said foaming agent and said cross-linking agent in order to obtain a secondary intermediate product having uniform cell membrane capable of being easily ruptured by mechanical compression; and

(iii) a third process step of mechanically compressing said secondary intermediate product to rupture said cell membranes and thereby interconnect said cells and thus obtain open-cell foam products, said open-cell foam products having expansion ratios greater than about 25.

7. A polyethylene open-cell foam material produced by the method set forth in claim 1.

4,877,815

NUCLEATING AGENTS FOR THERMOPLASTIC RESINS

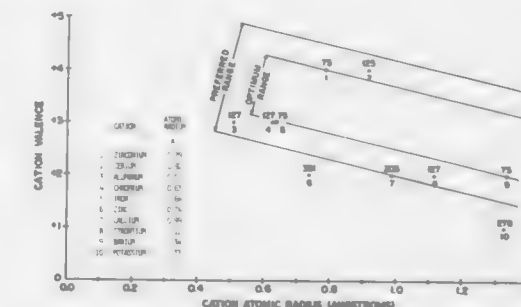
Marlin D. Backmaster, Vienna, W. Va., and Stuart K. Randa, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 17, 1989, Ser. No. 312,989

Int. Cl.⁴ C08J 9/00

U.S. Cl. 521—85

5 Claims



1. In an improved process for producing a foam of a thermoplastic resin composition, the improvement characterized in that the process is carried out with an effective amount of the nucleating agent of the formula



wherein:

Z is CCl₃, CCl₂H, H, F, Cl or Br;

each X, independently, is selected from H, F or Cl;

R is sulfur or phosphorus;

M is H or a metallic, ammonium, substituted ammonium or quaternary ammonium cation;

x is an integer and is 0 to 10;

p is an integer and is 0 to 6;

y is 0 or 1;

z is an integer and is 0 to 10;

x+y+z+p is a positive integer or, if x+y+z+p is 0, Z is CCl₃ or CCl₂H;

n is the valence of M; and

R' is a C₁-16 straight or branched chain perfluoroalkylene diradical containing a perfluorinated alicyclic ring; a C₁-16 perfluorinated aliphatic polyether diradical with repeat units selected from [CF₂O], [CF₂CF₂O] and [CF₂CF(CF₃)O]; or, when z is 0, an aromatic diradical;

so as to produce a foam having uniformity of cell size, small cell size, and high void content.

4,877,816

DEODORANT AND ANTIBACTERIAL FOAMED POLYMER AND SHEET

Katsuyoshi Murabayashi, Sakai, and Katsuyoshi Mitani, Amagasaki, both of Japan, assignors to Daicel Chemical Industries, Ltd., Osaka, Japan

Filed Dec. 22, 1987, Ser. No. 136,778

Claims priority, application Japan, Dec. 24, 1986, 61-313866; Dec. 24, 1986, 61-313867

Int. Cl.⁴ C08J 9/00

U.S. Cl. 521—92

9 Claims

1. A foamed polymer composition which comprises 100 parts by weight of a foamed polymer which comprises a foamed polyurethane, polyethylene, polypropylene or polystyrene, 3 to 30 parts by weight of fine particles of a deodorant which comprises basic zinc carbonate or ferrous sulfate monohydrate and 0.2 to 2 parts by weight of fine particles of an antibacterial agent which comprises N-(fluorodichloromethylthio)-phthalimide or N,N-dimethyl-N'-phenyl-N'-(fluorodichloromethylthio)-sulfamide, wherein the deodorant and the antibacterial agent fine particles are insoluble or difficultly soluble in water and wherein the fine particles of the deodorant and the antibacterial are sufficiently small in size, such that said fine particles will at least pass through a sieve having 30 mesh according to JIS.

4,877,817

CHLORINATED RUBBER

Tetsuo Tojo; Takashi Nakahara; Yasuhiko Otawa, all of Ichihara, and Katsuo Okamoto, Funabashi, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Division of Ser. No. 133,425, Dec. 15, 1987, Pat. No. 4,814,390, which is a division of Ser. No. 924,869, Oct. 30, 1986, Pat. No. 4,764,564. This application Dec. 21, 1988, Ser. No. 287,066

Claims priority, application Japan, Oct. 31, 1985, 60-242716

Int. Cl.⁴ C08F 6/00

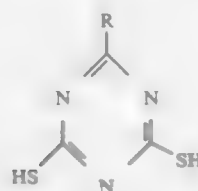
U.S. Cl. 521—142

3 Claims

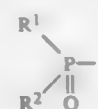
1. A vulcanizable and foamable chlorinated rubber composition comprising

(A) a chlorinated rubber having a chlorine content of 10 to 45% by weight based on the weight of the chlorinated rubber and a Mooney viscosity, ML₁₊₄ (121° C.), of 10 to 190, said chlorinated rubber being obtained by chlorinating an ethylene/alpha-olefin/vinylnorbornene copolymer rubber containing ethylene units and units of an alpha-olefin having 3 to 14 carbon atoms in a mole ratio of from 50:50 to 95:5 and 3 to 30 millimoles, per 100 g of the ethylene units and the alpha-olefin units combined, of 5-vinyl-2-norbornene units,

(B) a triazine compound represented by the general formula



wherein R is R¹R²N—, R¹O—, R¹S or



in which R¹ and R² each represents a hydrogen atom, a C₁–C₂₀ alkyl group, a C₆–C₂₀ aryl group, a substituted

C₁–C₂₀ alkyl group or a substituted C₆–C₂₀ aryl group, and

(C) a chemical blowing agent.

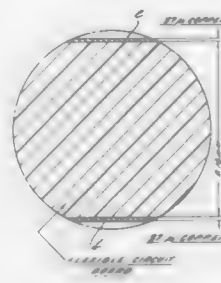
4,877,818

ELECTROPHORETICALLY DEPOSITABLE PHOTOCURABLE POLYMER COMPOSITION

William D. Emmons, Huntingdon Valley, and Mark R. Winkle, Lansdale, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation of Ser. No. 842,323, Mar. 21, 1986, abandoned, which is a division of Ser. No. 654,821, Sep. 26, 1984, Pat. No. 4,592,816. This application Jan. 11, 1988, Ser. No. 142,110

Int. Cl.⁴ G03C 5/00; C08F 220/34, 220/64, 265/06
U.S. Cl. 522—26 9 Claims



1. An aqueously developable, negative acting, electrophoretically depositable photoresist consisting essentially of an aqueous solution or emulsion of at least one polymer, free of ethylenic unsaturation, having less than about 200 milliequivalents of carrier groups per 100 grams of said polymer or polymers, said carrier groups being selected from the group consisting of amines or carboxylic acids, an effective amount of an acid or base for the neutralization of said amine or carboxylic acid carrier groups, respectively, to charged carrier groups such that said polymer or polymers contain from at least 10 milliequivalents to about 50 milliequivalents of charged carrier groups per 100 grams of said polymer or polymers, a photoinitiator, and an unsaturated crosslinking monomer, and where said photoresist can be anaphoretically or cathoretically deposited, depending on the charge of said carrier groups on said polymer, as an adherent uniform film on a conductive surface, and where after exposure of selected portions of said film to actinic radiation, said unexposed portions of said photoresist film are capable of being removed by development with an aqueous solution of a weak organic acid, in the case of a cathoretically deposited photoresist, or an aqueous base solution, in the case of an anaphoretically deposited photoresist, and where the exposed portions of said photoresist film remain resistant to oxidizing agents used to etch said conductive surface, and where said exposed photoresist film portions can be stripped from said surface using an aqueous solution.

4,877,819

PROCESS FOR PRODUCING POLYESTER RESIN COMPOSITION

Kazuto Kiyohara; Toshiyuki Hagiwara; Takanori Nakadate; Ichia Harada, all of Hino; Kentaro Noguchi, Hofu; Shigeru Sakae, Hofu, and Kazuhiro Okuma, Hofu, all of Japan, assignors to Konica Corporation and Kanebo Ltd., both of Japan

Filed Apr. 21, 1988, Ser. No. 184,390

Claims priority, application Japan, Apr. 23, 1987, 62-100917
Int. Cl.⁴ C08K 9/02, 3/22

U.S. Cl. 523—200

8 Claims

1. A process for producing a polyester resin composition by first supplying a polyester resin and titanium dioxide into a continuous kneading extruder, kneading them in molten state, and supplying an additional charge of the polyester resin to

give a desired concentration of the titanium dioxide, wherein the first supplied polyester resin has an intrinsic viscosity of at least 0.40, said titanium dioxide having an average particle size of 0.1–0.5 μm and a water content of no more than 0.5% and having been surface-treated with an aluminum compound and/or a silicon compound, and the concentration of titanium dioxide being in the range of 20–70 wt % when kneaded with the polyester resin in molten state.

4,877,820

CROSS-LINKED ORGANOSILOXANE POLYMERS

Patrick J. Cowan, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Continuation-in-part of Ser. No. 28,430, Mar. 20, 1987, abandoned. This application Aug. 4, 1988, Ser. No. 228,083

Int. Cl.⁴ C08K 7/02; C08G 77/06

U.S. Cl. 523—222

24 Claims

1. A cross-linked or hydrosilation cross-linkable linear poly-(organohydrosiloxane) polymer having at least 30% of its —Si—H groups reacted with hydrocarbon residues derived from polycyclic polyenes selected from the group consisting of unsubstituted or substituted cyclopentadiene oligomers, norbornadiene, norbornadiene dimer and dimethanohexahydronaphthalene.

4,877,821

STABILIZER CONCENTRATE

Mark J. Hall; Joseph R. Powers, both of Midland, Mich., and William A. Wood, Chicago, Ill., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 19,169, Feb. 26, 1987, abandoned. This application Feb. 11, 1988, Ser. No. 154,776

Int. Cl.⁴ C08J 3/22

U.S. Cl. 523—351

6 Claims

1. An improved process for stabilizing a polymeric blend composition containing a vinylidene chloride interpolmer and at least one other polymer, which process comprises forming an intimate admixture of the polymeric blend composition and a stabilizing concentrate which stabilizing concentrate contains a blend of: (1) a carrier resin, and (2) a stabilizing agent capable of stabilizing the vinylidene chloride interpolmer, said stabilizer concentrate having a viscosity of less than 60 percent of the viscosity of the polymeric blend composition.

4,877,822

EPOXY RESIN COMPOSITION

Kunio Itoki; Toshiro Shiobara; Koji Futatsumori; Kazutoshi Tomiyoshi, and Hisashi Shimizu, all of Annaka, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 916,934, Oct. 7, 1986, abandoned. This application Apr. 8, 1988, Ser. No. 179,538
Claims priority, application Japan, Oct. 7, 1985, 60-224211

Int. Cl.⁴ C08L 63/02, 63/04

U.S. Cl. 523—433

6 Claims

1. An epoxy resin composition which comprises a curable epoxy resin, an epoxy resin agent, an inorganic filler, and a copolymer obtained by an addition reaction between aromatic polymers having one or more epoxy groups and one or more alkenyl groups and organopolysiloxanes of the following formula (I)



in which R represents a substituted or unsubstituted monovalent hydrocarbon group, "a" is a value of from 0.01 to 0.1, "b" is a value of from 1.8 to 2.2 and 1.81 < a + b < 2.3, and the number of silicon atoms in a molecule is an integer of from 20 to 400 and the number of hydrogen atoms directly connected to silicon atoms is an integer of from 1 to 5.

4,877,823

FIREPROOFED THERMOPLASTIC MOLDING MATERIALS CONTAINING RED PHOSPHORUS AND BASED ON POLYESTERS OR POLYAMIDES

Christoph Plachetta, Limburgerhof; Graham E. McKee, Weinheim, and Hans-Peter Weiss, Mutterstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Apr. 19, 1988, Ser. No. 183,095

Claims priority, application Fed. Rep. of Germany, Apr. 24, 1987, 3713746

Int. Cl.⁴ C08K 3/32

U.S. Cl. 524—90

14 Claims

1. A fireproofed thermoplastic molding material, which contains red phosphorus as a flameproofing agent and which is obtainable by mixing:

- from 5–95% by weight of a polyamide or a polyester or a combination thereof,
- from 5–95% by weight of an elastomer dispersion containing, an essential components:
 - from 5–75% by weight of an elastomer prepared by emulsion polymerization,
 - from 10–70% by weight of red phosphorus,
 - from 10–80% by weight of water, and
 - from 0.1–5% by weight of a dispersing agent capable of dispersing said elastomer, and
- from 0–60% by weight of fibrous or particulate fillers or a mixture thereof, wherein the total content of red phosphorus in the molding material is from 3–20% by weight, based on the total weight of the molding material, said elastomer composition being introduced into a melt of the polyamide or of the polyester or a combination thereof.

4,877,824

SULFUR-CONTAINING COMPOUNDS AS ANTIOXIDANTS FOR LUBRICANTS AND ELASTOMERS

Samuel Evans, Marly, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 173,841, Mar. 28, 1988, abandoned. This application Jan. 25, 1989, Ser. No. 302,053

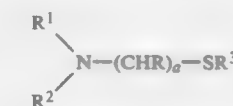
Claims priority, application Switzerland, Apr. 8, 1987, 1351/87

Int. Cl.⁴ C08K 5/47, 5/36; C07C 149/243; C07D 249/10, 241/46, 219/62, 209/86

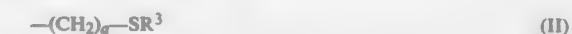
U.S. Cl. 524—83

8 Claims

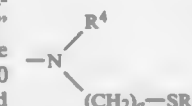
1. A compound of the formula (I)

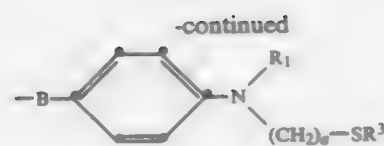


in which the Rs independently of one another are H, phenyl, naphthyl or C₇–C₃₀alkaryl and R¹ is H, C₁–C₈alkyl, C₇–C₉alkaryl, C₅–C₁₂cycloalkylphenyl, naphthyl, C₇–C₃₀alkaryl or a group of the formula (II)

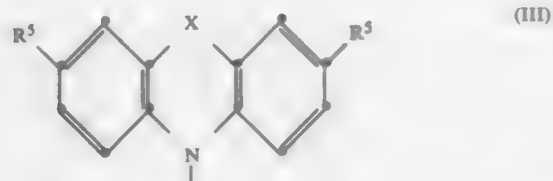


(I) R² is C₇–C₃₀alkaryl, phenyl, naphthyl or phenyl containing an HO of C₁–C₁₈alkoxy group or a group of the formulae





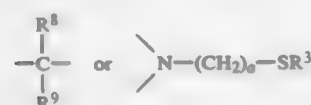
in the para-position, or R¹ and R², together with the nitrogen atom to which they are attached, are a radical of the formula (III)



R³ is a radical of the formulae $-(CH_2)_b-COOR^6$ or $-(CH_2)_2OCOR^7$, a is the number 1, 2 or 3 and b is the number 1 or 2, and R⁴ is phenyl or a group of the formula (II), the two R⁵s independently of one another are H, C₁-C₂₄alkyl, C₃-C₁₂cycloalkyl or C₇-C₂₄alkyl, and R⁶ is H, C₁-C₂₄alkyl or benzyl, R⁷ is C₁-C₁₄alkyl, phenyl or a group of the formula



in which Y is -O- or -S-, a is the number 1, 2 or 3 and m is the number 1 or 2, B is a direct bond, -S-, -S-S- or a C₁-C₁₂alkylene radical, X in the formula (III) is a direct bond, -S- or a group of the formulae



in which a and R³ are as defined above, and R⁸ and R⁹ independently of one another are H, C₁-C₈alkyl or phenyl.

4,877,825

ELASTHANE FIBERS STABILIZED AGAINST ENVIRONMENTAL INFLUENCES

Michael Kauch, Cologne; Hans-Josef Buysch, Krefeld; Hans Schröder, Dormagen, and Carl Hans Silling, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 111,859, Oct. 23, 1987, abandoned.

This application Mar. 10, 1989, Ser. No. 323,042

Claims priority, application Fed. Rep. of Germany, Nov. 4, 1988, 347,759

Int. Cl.⁴ C08K 5/34, 5/53

U.S. Cl. 524-101

9 Claims

1. Elasthane filaments or fibers comprising at least 85%, by weight, segmented polyurea polyurethanes of aromatic diisocyanates containing a phenolic antioxidant and a phosphite stabilizer, in which:

(a) the phenolic antioxidant corresponds to the following formula

in which R¹, R² and R³ are each independently C₁-C₃ alkyl radicals, in addition to which R³ may represent C₄-C₆ alkyl radicals

(b) the phosphite stabilizer is an oligomeric, (cyclo)aliphatic phosphorous acid ester obtained by reaction of pentaerythritol and perhydrobisphenol A with a monomeric trialkyl or triarylphosphite, optionally in the presence of monoalcohol.

4,877,826

WEATHERABLE STYRENIC POLYMER BLEND COMPRISING POLYALKYLENE GLYCOL

Douglas E. Beyer, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Oct. 5, 1988, Ser. No. 254,176

Int. Cl.⁴ C08K 5/06

U.S. Cl. 524-377

20 Claims

1. A method of stabilizing a weatherable molding resin comprising (a) a matrix comprising a copolymer of styrene, acrylonitrile and from 0 to 50 weight percent methymethacrylate, N-phenylmaleimide, N-C₁₋₄ alkyl maleimide, maleic anhydride or mixtures thereof and (b) an impact modifying quantity of a grafted EPDM rubber, grafted alkylacrylate rubber or a mixture thereof, the method comprising incorporating into the resin an amount of a polyalkylene glycol having a molecular weight from 200 to 2,000, said amount being sufficient to plasticize said molding resin and to reduce resin discoloration upon exposure to weathering conditions.

4,877,827

POLYMER COMPOSITION, A PROCESS FOR PRODUCING A POLYMER COMPOSITION, AND THE USE OF SUCH A POLYMER COMPOSITION

Lambertus A. Van Der Groep, Gersthove 33,, 1112 HN Diemen, Netherlands

Filed Mar. 14, 1988, Ser. No. 167,697

Claims priority, application Netherlands, Mar. 13, 1987, 8700606; May 20, 1987, 8701208

Int. Cl.⁴ C08L 23/20, 23/16, 23/08, 31/04

U.S. Cl. 524-477

12 Claims

1. A polymer composition comprising a chemical reaction product obtained by high shear reacting at a temperature of at least 150° C. a mixture consisting essentially of:

- 30-70 parts by weight of one or more ethylenepropylene-diene rubbers,
- 30-70 parts by weight of one or more ethylenevinyl acetate copolymers with a vinyl acetate content of 18-40% by weight,
- 1 to 25 parts by weight of at least one ethylene-olefin-1 copolymer, the olefin-1 containing 4, 5 or 6 carbon atoms,
- optionally, 1-25 parts by weight of at least one other

polymer, with the proviso that the sum of (c) and (d), if any, is 1-25 parts by weight.

4,877,828

SELF-BONDING SILICONE CAULKING COMPOSITIONS

Judith Stein, Schenectady, and Tracey M. Leonard, Clifton Park, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

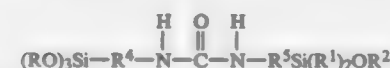
Filed May 31, 1988, Ser. No. 200,478

Int. Cl.⁴ C08K 5/21

U.S. Cl. 524-728

3 Claims

1. Silicone caulking composition comprising (A) a base formulation having 40 to 60% solids comprising a silanol terminated polydimethylsiloxane having a molecular weight of about 5000 to 15,000 stabilized with nonionic surfactant and having a pH in the range of 4 to 6, (B) a calcium carbonate filler, (C) a trialkoxy silane, (D) a tin catalyst and (E) a bisilyl urea having the formula



where the bisilyl urea is present in the silicone caulking composition at from 0.1 to 5 parts per 100 parts of the base formulation, R, R¹ and R² are selected from the same or different C₁₋₅ alkyl radicals, and R⁴ and R⁵ are selected from the same or different C₂₋₄ divalent alkylene radicals,

4,877,829

LIQUID COATINGS FOR BRIDGE DECKINGS AND THE LIKE

Cung Vu, Gaithersburg, Md.; Timothy J. Martin, Loxwood, England; Andrew M. Gillanders, Finchampstead, England, and Bassam Sbaiti, Burnham, England, assignors to W. R. Grace & Co.-Conn., Columbia, Md.

Filed May 19, 1988, Ser. No. 209,406

Int. Cl.⁴ C08L 75/04

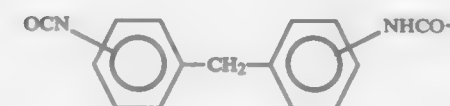
U.S. Cl. 524-729

34 Claims

1. Composition consisting essentially of two separate components, A and B;

Component A consisting essentially of, in parts by weight, (i) about 90 - 140 parts of castor oil; (ii) a low molecular weight polyol having at least 3 hydroxyl groups and a molecular weight between 92 and about 200, 2 - 10 parts; and (iii) an elastomer, about 0 - 120 parts;

Component B, about 40 - 120 parts; being a polyisocyanate of the group consisting of (i) isomers of diphenylmethane diisocyanate and (ii) a mixture of diphenylmethane diisocyanate and the reaction product of diphenylmethane diisocyanate with an alkylene oxide adduct of a polyol, -PAPI®94. PAPI®94 is a mixture, consisting essentially of about 60-70% (i) and about 30-40% (ii), wherein (i) is a mixture of two MDI isomers, viz., about 88% of 4,4'-diphenylmethane diisocyanate and about 12% 2,4'-diphenylmethane diisocyanate; and (ii) is polymeric MDI, viz.,



having a functionality of 2.3, wherein n is a variable in the range of 1 to 3.

4,877,830

METAL CHELATE RESINS

Heinz Döbel, Ziefen, and Frick Hochuli, Aarau, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

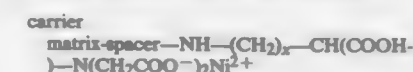
Filed Jul. 13, 1987, Ser. No. 72,452

Int. Cl.⁴ C07C 101/24; C07K 3/20; B01J 20/32

U.S. Cl. 525-54.3

6 Claims

1. A metal chelate resin of the formula:



wherein X=2-4.

4,877,831

POLYCARBONATE RESIN COMPOSITION

Masafumi Hongo, Hideyaki Shigemitsu, both of Otake; Naoki Yamamoto, Hiroshima, and Akira Yanagawa, Otake, all of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Jan. 16, 1987, Ser. No. 62,604

Claims priority, application Japan, Jan. 17, 1986, 61-140636; Jul. 16, 1986, 61-165537

Int. Cl.⁴ C08L 69/00, 51/08

U.S. Cl. 525-63

10 Claims

1. A polycarbonate resin composition comprising either a polycarbonate resin (A) or a mixture (A') of the polycarbonate resin and one of a saturated polyester, a polyester elastomer, or both a saturated polyester and a polyester elastomer and either a siloxane-based graft polymer (B) obtained by graft polymerization of 95 to 10% by weight of at least one vinyl monomer onto 5 to 90% by weight of a polyorganosiloxane rubber

4,877,832

THERMOSET RESIN COMPOSITIONS

Adrian Camols; John C. Kwok; Keith J. Robinson; Brian H. A. Smith, all of Sarnia, Canada, and Michel Longuet, Strasbourg, France, assignors to Polysar Limited, Sarnia, Canada

Continuation-in-part of Ser. No. 942,259, Oct. 29, 1986, abandoned. This application Jan. 13, 1988, Ser. No. 143,322

Int. Cl.⁴ C08L 67/06

U.S. Cl. 525-64

6 Claims

1. A molding composition suitable for preparing an impact resistant thermoset having good surface appearance, said composition comprising:

- 30-65 parts by weight of an unsaturated polyester, and correspondingly
 - 70-35 parts by weight of a first monomer composition, said monomer composition being copolymerizable with said unsaturated polyester and consisting of at least one ethylenically unsaturated monomer,
 - a polymerization initiator, and
 - a partially polymerized additive, said additive consisting of the polymerization product of a dispersion consisting of:
 - between 97 and 85 weight per cent of a second monomer composition consisting of at least one styrenic monomer, and correspondingly
 - between 3 and 15 weight per cent of a single, solid emulsion polymerized acrylonitrile-butadiene copolymer elastomer, and wherein said single, solid elastomer is dispersed within said second monomer composition, and wherein said additive is prepared according to the process whereby said dispersion is polymerized such that the extent of conversion of said second monomer composition is between 10 and 90 percent,
- and wherein said additive is present in a quantity sufficient to provide between 1.5 and 10 parts by weight of said single, solid elastomer per 100 parts combined weight of said polyester plus said first monomer composition, character-

ized in that said molding composition does not contain more than one elastomer.

4,877,833

HEAT RESISTANT COPOLYMER COMPOSITION
Masatsune Kondo, Kiyoshi Ogura, and Koiti Karamoto, all of Niihama, Japan, assignors to Sumitomo Nangatsuck Co., Ltd., Osaka, Japan

Filed Nov. 6, 1987, Ser. No. 117,561

Claims priority, application Japan, Nov. 12, 1986, 61-270521
Int. Cl.⁴ C08L 51/04, 67/02, 69/04, 79/08

U.S. Cl. 525—64

9 Claims

1. A heat resistant copolymer composition comprising:
5 to 95% by weight of a copolymer (I) which is obtainable by copolymerizing (A) a maleimide monomer (B) an aromatic vinyl monomer, (C) an unsaturated nitrile monomer, and 0% to 50% by weight of the total weight of (A), (B), (C), and (D) of (D) at least one other comonomer copolymerizable with (A), (B) and (C) in the presence of 0% to 80% by weight of the total weight of (A), (B), (C), (D) and (E) of (E) an elastomeric polymer and has an intrinsic viscosity of 0.3 to 1.2 dl/g, and

95 to 5% by weight of a copolymer (II) which is obtainable by copolymerizing (B) the aromatic vinyl monomer, (C) the unsaturated nitrile and 0 to 50% by weight of the total weight of (B), (C) and (D) of (D) at least one other comonomer copolymerizable with (B) and (C) in the presence of 0% to 80% by weight of the total weight of (B), (C), (D) and (E) of (E) an elastic polymer and has an intrinsic viscosity of 0.3 to 1.5 dl/g,

wherein the total weight percentage of the monomers (A) and (C) in the copolymer (I) per total weight of the monomers (A), (B), (C) and (D) in the copolymer (I) and the weight percentage of the monomer (C) in the copolymer (II) per total weight of the monomers (B), (C) and (D) in the copolymer (II) satisfy the following equation: (Said total weight percentage of the monomers (A) and (C) in copolymer (I)) = +40 to -15% by weight, and wherein the intrinsic viscosities of the copolymers (I) and (II) satisfy the following equation: (The intrinsic viscosity of the copolymer (I)) = +0.5 to -1.2 dl/g, wherein all intrinsic viscosities refer to the intrinsic viscosity of the non-grafted polymers, when grafted polymers are present, said copolymer (I) having a composition of the monomers (A), (B), (C) and (D) satisfying the following equations (1), (2), and (3) wherein (A), (B), (C) and (D) stand for the respective weights thereof:

$$\frac{(A)}{(A) + (B) + (C) + (D)} \times 100 = (F)$$

$$\frac{(B) + (C)}{(A) + (B) + (C) + D} \times 100 = (G)$$

$$\frac{(C)}{(B) + (C)} \times 100 = (H)$$

where (F) ranges from 1 to 60% by weight, (G) ranges from 99 to 40% by weight and (H) ranges from 5 to 45% by weight,

said copolymer (II) having a composition of the monomers (B) and (C) satisfying the following equation (4) wherein (B) and (C) stand for the respective weights thereof:

$$\frac{(C)}{(B) + (C)} \times 100 = (J)$$

where (J) ranges from 20 to 45% by weight.

4,877,834

LUBRICATING OIL CONTAINING A MANNICH BASE
Christopher S. Lin, Poughkeepsie; Donald J. Clarke, Cold Spring, and Larry D. Grina, Wappingers Falls, all of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Division of Ser. No. 36,950, Apr. 10, 1987, Pat. No. 4,780,230.
This application May 6, 1988, Ser. No. 190,860

Int. Cl.⁴ C08L 51/00

U.S. Cl. 525—66

25 Claims

1. The method which comprises forming a reaction mixture containing (i) a graft polymer, having a carbon-carbon backbone polymer containing residual unsaturation bearing graft moieties derived from a graft monomer containing ethylenic unsaturation and an epoxide moiety, and (ii) a Mannich base formed by the reaction of an aldehyde, a primary or secondary amine, and a hindered phenol;

maintaining said reaction mixture at coupling reaction conditions thereby effecting coupling of said Mannich base through a nitrogen atom to an opened epoxide moiety of said graft monomer on said carbon-carbon backbone polymer; and

recovering said product polymer wherein said Mannich base is joined through a nitrogen atom to an opened epoxide moiety of said graft monomer on said carbon-carbon backbone polymer.

4,877,835

THERMOPLASTIC RESIN COMPOSITION
Yusuke Tsuda; Takashi Kurata; Yoshinobu Suzuki, and Yuji Yamamoto, all of Tokyo, Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

Filed Sep. 8, 1988, Ser. No. 241,459

Claims priority, application Japan, Oct. 2, 1987, 62-249473

Int. Cl.⁴ C08L 69/00

U.S. Cl. 525—67

8 Claims

1. A thermoplastic resin composition comprising:
(A) 50 to 90% by weight of a rubber-modified styrene thermoplastic resin,
(B) 5 to 48 % by weight of an aromatic polyester, and
(C) 2 to 10% by weight of an aromatic polycarbonate; wherein 10 to 60% by weight of α -methyl styrene is copolymerized in said rubber-modified styrene thermoplastic resin.

4,877,836

VISCOSITY INDEX IMPROVER AND COMPOSITION CONTAINING SAME

(2) Robert B. Rhodes, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed May 24, 1988, Ser. No. 198,542

Int. Cl.⁴ C08L 53/02; C10M 143/10, 143/12

U.S. Cl. 525—89

30 Claims

1. A polymeric blend comprising a selectively hydrogenated asymmetric radial polymer having at least one polymeric arm containing one or more hydrogenated conjugated diolefin monomer units and at least one arm which is a selectively hydrogenated diblock copolymer having a single polymeric block containing monoalkenyl aromatic hydrocarbon monomer units and a single polymeric block containing hydrogenated conjugated diolefin monomer units and a selectively hydrogenated linear diblock copolymer having a single polymeric block containing predominantly monoalkenyl hydrocarbon monomer units and a single polymeric block containing hydrogenated conjugated diolefin monomer units.

4,877,837

EPOXY FUNCTIONAL AND SILICONE THERMOSETTING POWDER COATINGS
John C. Reising, Avon, Ohio, and David E. Miles, Port Huron, Mich., assignors to The Glidden Company, Cleveland, Ohio
Filed Oct. 7, 1988, Ser. No. 254,617

Int. Cl.⁴ C08F 8/00

U.S. Cl. 525—100

6 Claims

1. A thermosetting powder paint composition comprising on a weight basis:

between 40% and 70% glycidyl functional acrylic polymer blended with 30% to 60% solid cyclic silicone resin; where said glycidyl acrylic polymer comprises copolymerized ethylenically unsaturated monomers of about 45% to 55% acrylic monomer, about 20% to 30% glycidyl functional monomer, with the balance being other ethylenically unsaturated monomer, said glycidyl acrylic polymer having a T_g above about 40° C. and a number average weight between about 2,500 and 3,000 as measured by GPC;

where the cyclic silicone resin has a T_g above about 50° C. and a molecular weight above about 600 where the cyclic silicone resin includes a cyclic silicone molecule having at least two hydroxyl groups and/or methylol groups per cyclic silicone molecule, and said cyclic silicone resin crosslinks with said glycidyl acrylic polymer upon heating to provide a thermosetting powder coating.

4,877,838

HIGH SOLIDS COATINGS WITH REACTIVE EPOXY ESTER DILUENT

Perry A. Toman, Medina, Ohio, assignor to The Glidden Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 147,440, Jan. 25, 1988, Pat. No. 4,182,523. This application Dec. 23, 1988, Ser. No. 289,257

Int. Cl.⁴ C08L 63/00

U.S. Cl. 525—107

13 Claims

1. A high solids, non-aqueous thermosetting paint coating composition based on a coreactive polymeric binder, the polymeric binder comprising on a weight basis:

between 5% and 50% low molecular weight, hydroxyl functional acrylic copolymer having a hydroxyl number between 50 and 200 and a number average molecular weight between about 500 and 2,500 as measured by GPC; between 10% and 60% of a linear, low molecular weight hydroxyl functional polyester polymer having a hydroxyl number between 115 and 285 and a number average molecular weight between about 250 and 2,000 as measured by GPC;

between 5% and 60% of a hydroxy ester functional epoxy ester diluent;

between 20% and 40% aminoplast or glycoluril crosslinking component adapted to crosslink upon heating with said acrylic copolymer, said polyester, and said epoxy ester diluent.

4,877,839

FLUOROCOPOLYMER COMPOSITIONS
John N. Conti-Ramaden, Wilmington, Mass.; Richard L. Powell, Tarporley, England; Brian D. Young, Winsford, England; Jeffrey Farrar, Kelsall, England, and Debra K. Brown, South Wirral, England, assignors to Imperial Chemical Industries PLC, London, England

Filed Jun. 8, 1988, Ser. No. 203,848

Claims priority, application United Kingdom, Jun. 8, 1987, 8713362

Int. Cl.⁴ C08L 27/16, 27/12, 27/22, 33/06

U.S. Cl. 525—200

14 Claims

1. Composition comprising at least one fluorocopolymer and at least one acrylic polymer, wherein said fluorocopolymer is a copolymer comprising polymerised units derived from:

(A) at least one fluoroolefin of formula $\text{CFX}^1=\text{CFX}^2$ where X¹ is selected from F and halogen other than F and

X² is selected from F, H, halogen other than F, and perfluoroalkyl; and
(B) at least one fluoroalkylether of formula $\text{CH}_2\text{CHCH}_2\text{OR}_f$ where R_f is a fluoroalkyl group having 2 to 10 carbon atoms.

4,877,840

POLYOLEFIN CONCENTRATE

Kenneth C. Chu, Kingston, Canada, assignor to Du Pont Canada Inc., Mississauga, Canada

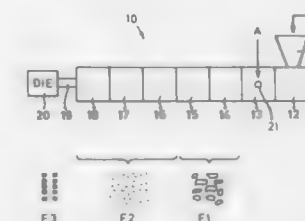
Filed Jan. 15, 1988, Ser. No. 144,232

Claims priority, application United Kingdom, Jan. 28, 1987, 87001914

Int. Cl.⁴ B29C 35/02, 47/00, 67/02; C08L 23/04

U.S. Cl. 525—240

2 Claims



1. Strands or pellets of polyisobutylene having a molecular weight from 300-15,000 in a polyolefin, in which the concentration of polyisobutylene in the strands or pellets is from 30-60 weight percent.

2. A crumble of polyisobutylene in a polyolefin in which the concentration of the polyisobutylene having a molecular weight of from 300-15,000 in the crumble is from 20-60 weight percent.

4,877,841

GRAFT POLYMERIZATION PREFORMER AND METHOD OF MANUFACTURING THE SAME

Yasuo Moriya; Nobuyoshi Suzuki, and Hiroshi Goto, all of Aichi, Japan, assignors to Nippon Oil and Fats Co., Ltd., Tokyo, Japan

Filed Jan. 29, 1988, Ser. No. 149,746

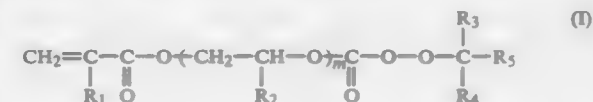
Claims priority, application Japan, Jan. 31, 1987, 62-21127; May 11, 1987, 62-114021; Aug. 10, 1987, 62-199612; Aug. 10, 1987, 62-199615; Aug. 10, 1987, 62-199618

Int. Cl.⁴ C08F 255/02, 255/04, 255/06, 255/08

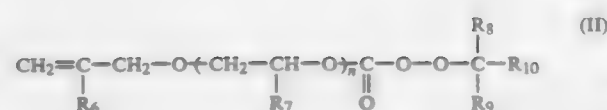
U.S. Cl. 525—286

18 Claims

1. A graft polymerization preformer obtained by copolymerizing in 100 parts by weight of ethylene homopolymer or copolymer or mixtures thereof, (a) 5 to 400 parts by weight of one or more vinyl monomers selected from a group consisting of vinyl aromatic monomers, acrylic or methacrylic ester monomers or mixtures thereof, acrylonitrile methacrylonitrile and vinyl ester monomers and (b) one or more radical polymerizable organic peroxides represented by a formula



where R₁ represents a hydrogen atom or an alkyl group with a carbon number of 1 to 2, R₂ a hydrogen atom or a methyl group, R₃ and R₄ respective alkyl groups with a carbon number of 1 to 4, R₅ an alkyl, phenyl or alkyl-substituted phenyl group with a carbon number of 1 to 12 or a cycloalkyl group with a carbon number of 3 to 12, and m is 1 or 2, or a formula



where R_0 represents a hydrogen atom or alkyl group with a carbon number of 1 to 4, R_7 a hydrogen atom or a methyl group, R_8 and R_9 represents alkyl groups with carbon number of 1 to 4, R_{10} an alkyl, phenyl or alkyl-substituted phenyl group with carbon number of 1 to 12 or cycloalkyl group with carbon number of 3 to 12, and n being 0, 1 or 2, said (b) being incorporated in 0.1 to 10 parts by weight with respect to 100 parts by weight of said vinyl monomer or monomers, said graft polymerization preformer containing 20 to 95% by weight of ethylene polymer and 80 to 5% by weight of vinyl copolymer, said vinyl copolymer containing 0.01 to 0.73% by weight of active oxygen.

4,877,842

DEMULSIFIER COMPOSITIONS AND METHODS OF PREPARATION AND USE THEREOF

Rudolf S. Burika, St. Louis, Mo., and James G. Dolan, Granite City, Ill., assignors to Petrolite Corporation, St. Louis, Mo.
Filed Feb. 29, 1988, Ser. No. 161,863
Int. Cl.⁴ B01D 17/04; C09K 7/00

U.S. Cl. 252-344

6 Claims

1. A method for demulsifying a water-in-oil emulsion comprising adding thereto a composition comprising the reaction product resulting from subjecting to grafting reaction conditions a mixture comprising a solvent, a polyoxyalkylene amine and a vinyl monomer to produce a grafted intermediate and subjecting said grafted intermediate to esterification reaction conditions to produce said reaction product, said mixture being substantially free of copolymers derived from a polyoxyalkylene glycol and a diglycidyl ether, the amount of said solvent in said mixture being such that said reaction product is suitable for use as a demulsifier, and said reaction product being partially cross-linked.

4,877,843

SELECTIVE HYDROLYSIS OF COPOLYMERS OF PARA-ACETOXY STYRENE AND ALLYL ESTERS OF ETHYLENICALLY UNSATURATED ACIDS

Balaram Gupta, North Plainfield, N.J., assignor to Hoechst Celanese Corporation, Somerville, N.J.

Filed Sep. 11, 1987, Ser. No. 99,430

The portion of the term of this patent subsequent to Aug. 25, 2004, has been disclaimed.

Int. Cl.⁴ C08F 8/12

U.S. Cl. 525-344

17 Claims

1. A process for preparing copolymers of p-vinylphenol and allyl esters of ethylenically unsaturated acids which comprises slurrying copolymers of p-acetoxystyrene and allyl esters of ethylenically unsaturated acids in water or an alcohol followed by hydrolyzing the acetoxy groups with an acid or a base with substantially no saponification of the allyl ester groups.

4,877,844

PROCESS FOR PRODUCING A LOW GLOSS THERMOPLASTIC RESIN

Kazuo Kishida, Hiroshima; Yutaka Toyooka, and Yoshiyuki Mikami, both of Ohtake, all of Japan, assignors to Mitsubishi Rayon Company Limited, Tokyo, Japan

Continuation of Ser. No. 860,577, May 7, 1986, abandoned. This application Dec. 21, 1987, Ser. No. 135,470

Claims priority, application Japan, May 10, 1985, 60-98035; Aug. 26, 1985, 60-187113

Int. Cl.⁴ C08F 279/04

U.S. Cl. 525-316

7 Claims

1. A process for producing a low gloss thermoplastic resin,

by emulsion polymerizing in two steps (A) 20 to 70 parts by weight of butadiene polymer having an average particle size of at least 0.05 μm and a gel content of at most 60% by weight, at least 70% by weight of which consists of butadiene, with (B) from 30 to 80 parts by weight of a total of (i) from 15 to 40% by weight of a vinyl cyanide monomer and (ii) from 60 to 85% by weight of an aromatic vinyl monomer, which process consists essentially of:

- reacting from 30 to 70% by weight of the entire butadiene polymer with from 30 to 70% by weight of the entire vinyl cyanide monomer and from 30 to 70% by weight of the entire aromatic vinyl monomer until a monomer conversion of at least 56% is obtained, thereby effecting grafting of the monomers to the butadiene polymer to form a latex; and then
- charging and reacting the remaining portions of the butadiene polymer, vinyl cyanide monomer and aromatic vinyl monomer, thereby effecting partial grafting of said monomers to the butadiene polymer, to render the formed partially grafted copolymer capable of agglomeration when heated, thereby imparting a low gloss to said thermoplastic resin.

4,877,845

CURE ACTIVATORS FOR NONHALOGENATED RUBBERS

Carl R. Parks, Akron, and Donald J. Burlett, Wadsworth, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 129,200, Dec. 7, 1987, Pat. No. 4,839,433.

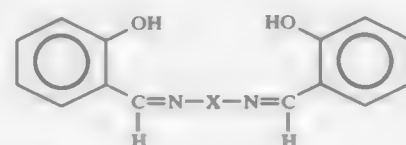
This application Jan. 13, 1989, Ser. No. 296,634

Int. Cl.⁴ C08C 19/20

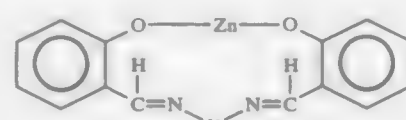
U.S. Cl. 525-346

7 Claims

1. A method for enhancing the rate of sulfur vulcanization of a sulfur vulcanizable elastomer or blend of elastomer selected from the group consisting of natural rubber polybutadiene, polyisoprene, styrene/butadiene copolymers, terpolymers of acrylonitrile butadiene and styrene and blends thereof which comprises adding to said elastomer a compound or compounds of the structural formula:



and/or



wherein X is a radical of the structural formula:



wherein y can equal 0, 1, 2, or 3.

4,877,846

POLYALCOHOL HOMOPOLYMERS

Tao-Chiang Chung, Bridgewater, N.J., assignor to Exxon Research and Engineering Company, Florham Park, N.J.
Division of Ser. No. 520, Jan. 5, 1987, Pat. No. 4,812,529. This application Dec. 23, 1988, Ser. No. 288,755

Int. Cl.⁴ C08F 8/00

U.S. Cl. 525-369

2 Claims

1. A process for the synthesis of a polyalcohol homopolymer which comprises the steps of:

- dissolving a polyborane homopolymer in a solvent; to form a polymeric solution;
- injecting an NaOH solution into said polymeric solution at about 25° C.;
- injecting a hydrogen peroxide solution into said polymeric solution at about 0° C. to about 25° C.;
- heating said polymeric solution to at least about 50° C.;
- maintaining said polymeric solution at least about 50° C. for at least about 2 hours to form said polymeric homopolymer;
- cooling said polymeric solution to about room temperature; and
- precipitating said polyalcohol homopolymer from said polymeric solution by the addition of an aliphatic hydrocarbon to said polymer solution.

4,877,848

THERMOPLASTIC BLENDS CONTAINING POLYAMIDE AND EPOXY FUNCTIONAL COMPOUND

Louis M. Mareca, Pittsfield, Mass., assignor to General Electric Company, Pittsfield, Mass.

Continuation of Ser. No. 812,434, Dec. 23, 1985, abandoned.

This application Mar. 14, 1989, Ser. No. 325,061

Int. Cl.⁴ C08L 77/00

U.S. Cl. 525-423

6 Claims

1. A thermoplastic blend consisting essentially of:
(i) at least one aromatic polycarbonate resin, wherein the polycarbonate consists of recurring structural units of the formula:



wherein D is a divalent aromatic radical of a dihydric phenol;

(ii) at least one polyamide resin; and

(iii) an effective compatibilizing amount of at least one epoxy functional agent selected from the group consisting of aliphatic epoxides and cycloaliphatic epoxides.

4,877,849

OXYFORMYLATED SUBSTITUTED POLYBENZIMIDAZOLE ARTICLE

Joseph J. Rafalko, Chatham, N.J., assignor to Hoechst Celanese Corporation, Somerville, N.J.

Filed Aug. 17, 1987, Ser. No. 86,020

Int. Cl.⁴ C08G 69/26

U.S. Cl. 525-433

31 Claims

1. A process for producing a substituted polybenzimidazole polymer which comprises the steps of:

- preparing a polybenzimidazole polymer solvent solution; and
- reacting the polybenzimidazole polymer with a pyrocarbonate to form an aryl or alkyl oxyformylated polybenzimidazole polymer.

4,877,850

BUFFER WASH OF POLYARYLENE SULFIDES

Jon F. Geibel, and Afif Nesheiwat, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 22, 1988, Ser. No. 158,438

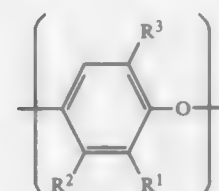
Int. Cl.⁴ C08G 75/14

U.S. Cl. 525-471

62 Claims

1. A process for treating a particular virgin arylene sulfide resin to produce an uncured treated arylene sulfide resin having an increased cure rate comprising:

- preparing a slurry, wherein the solid component of said slurry comprises said particulate virgin arylene sulfide resin, and wherein the liquid component of said slurry comprises an aqueous buffer solution, wherein said buffer solution has a pH less than about 9.35 but greater than that necessary to result in curing of said virgin arylene sulfide resin;
- heating said slurry, while in the substantial absence of a gaseous oxidizing atmosphere, to an elevated temperature below the melting point of said virgin arylene sulfide resin, for a time sufficient to increase the cure rate of said particulate virgin arylene sulfide; and
- recovering the resulting treated particulate arylene sulfide resin from said slurry in a manner which does not result in curing of said treated particulate arylene sulfide resin.

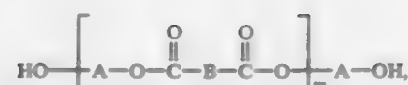


wherein R^1 represents a lower alkyl group having 1 to 3 carbon atoms, and R^2 and R^3 , independently from each other, represent a hydrogen atom or a lower alkyl group having 1 to 3 carbon atoms, in the main chain, and

(B) a polyamide resin having recurring units represented by the following formula (II)



wherein R^4 represents a xylylene group, and R^5 represents a linear alkylene group having 4 to 10 carbon atoms the weight ratio of the polyphenylene ether resin (A) to the polyamide resin (B) being from 0.3 to 3.



said polyester having a molecular weight of about 1800 to about 3600 and having essentially the structure of the reaction product of at least two straight chain aliphatic glycols containing from 2 to about 10 carbon atoms;

(b) an aromatic glycol chain extender of the formula (II)



aliphatic diol chain extenders other than small adventitious amounts not exceeding 0.75 percent of the weight of said polyester (a) being absent, and

(c) an isocyanate of the formula (III)



wherein

- (1) A is at least two alkylene radicals, oxydialkylene radicals or mixture thereof containing from 2 to about 10 carbon atoms, and B is an alkylene radical containing from 2 to about 10 carbon atoms or an arylen radical containing from 6 to about 12 carbon atoms or a mixture thereof;
- Y is a phenylenedialkylene or phenyleneoxyalkylene radical containing from about 8 to about 14 carbon atoms; and Z is a divalent organic radical;
- (2) The value of m is such that said polyester has a molecular weight from about 1800 to about 3600;
- (3) the molar ratio of said chain extender to said polyester is from about 0.75 to about 2;
- (4) the molar quantity of said isocyanate is substantially equal to the sum of the molar quantities of said polyester and said chain extender, and
- (5) said elastomer has a modulus at 100 percent elongation of 350 to 700 psi.

4,877,857

PREPARATION OF EPOXY RESINS

Robert P. Shurtum, Freeport, and Elaine B. Darby, San Antonio, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 190,608, May 5, 1988, abandoned. This application Jan. 11, 1989, Ser. No. 295,859
Int. Cl.⁴ C08G 59/06, 59/10, 59/12

U.S. Cl. 528-95

24 Claims

1. A process for the preparation of epoxy compounds which comprises reacting a molar excess of at least one epichlorohydrin with at least one aromatic compound containing an active hydrogen atom reactive with an epichlorohydrin in the presence of an organic solvent or mixture of organic solvents and an alkali metal hydroxide while controlling the concentration of water in the reaction mixture; the improvement which comprises

- (1) after completion of the reaction, conducting one of the following
 - (a) cooling the reaction mixture to a temperature of not greater than about 30° C. followed by neutralization of the reaction mixture with carbon dioxide or weak inorganic acid in a quantity such that the reaction mixture has a pH of from about 7 to about 10;
 - (b) neutralizing the reaction mixture with carbon dioxide or weak inorganic acid in a quantity such that the reaction mixture has a pH of from about 7 to about 10 followed by cooling the reaction mixture to a temperature of not greater than about 30° C.; or
 - (c) simultaneously neutralizing the reaction mixture with carbon dioxide or weak inorganic acid in a quantity such that the reaction mixture has a pH of from about 7

- to about 10 and cooling the reaction mixture to a temperature of not greater than about 30° C.;
- (2) adding a sufficient quantity of water to form an aqueous layer and an organic layer;
- (3) separating the organic layer and the aqueous layer;
- (4) subjecting the organic layer to multiple washings with water; and
- (5) recovering the epoxy resin from the resultant organic solution containing epichlorohydrin, organic solvent and epoxy resin.

4,877,858

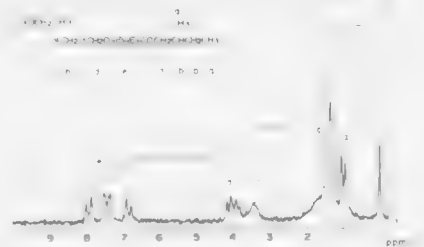
LIQUID-CRYSTALLINE POLYMER

Satoshi Hachiya; Shunji Uchida, and Kenji Hashimoto, all of Kimitu, Japan, assignors to Idemitsu Kosen Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 136,868, Dec. 22, 1987, abandoned. This application Nov. 16, 1988, Ser. No. 272,010
Claims priority, application Japan, Dec. 29, 1986, 61-309466; Nov. 17, 1987, 62-288475; Nov. 17, 1987, 62-288476
Int. Cl.⁴ C08G 59/00

U.S. Cl. 528-100

23 Claims

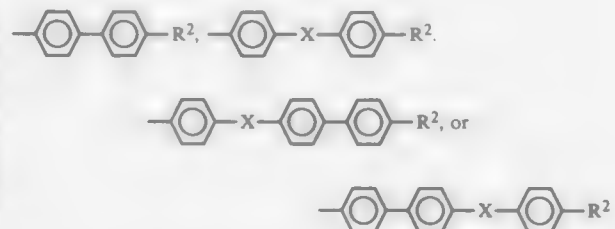


1. A ferroelectric liquid-crystalline polymer comprising the repeating units of the general formula (I)



in which:

k is an interger from 1 to 30; and



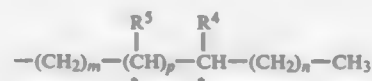
where:

X is ---COO--- or ---OCO--- ; and

R² is ---COOR^3 , or ---OR^3

where:

R³ is



R⁴ and R⁵ being each independently ---CH_3 , a halogen radical, or ---CN , m and n being each independently an integer from 0 to 10 with the proviso that n is not 0 when R⁴ is ---CH_3 ,

p being 0 or 1, and C marked with being an asymmetric carbon atom.

4,877,859

FLUORINE-CONTAINING NOVOLAK RESIN AND DERIVATIVE THEREOF

Sinji Tamara, Saita; Motomasa Kubo, Toyonaka, and Masato Kashiwagi, Settsu, all of Japan, assignors to Dainippon Industries, Ltd., Osaka, Japan

Filed Mar. 21, 1988, Ser. No. 171,126

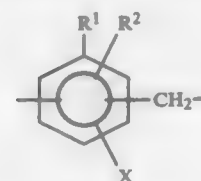
Claims priority, application Japan, Mar. 24, 1987, 62-69394; Apr. 30, 1987, 62-108269

Int. Cl.⁴ C08G 14/02, 8/04

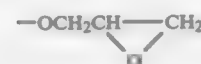
U.S. Cl. 528-129

13 Claims

1. Fluorine-containing novolak resin or its derivative having a repeating unit of the formula



wherein R¹ is a hydrogen atom or



R² is a hydrogen atom or alkyl group having 1 to 4 carbon atoms, X is a fluorine-containing monovalent organic group having 2 to 20 carbon atoms.

4,877,860

CATALYTIC COPOLYMERIZATION OF CARBON MONOXIDE/OLEFIN WITH KETONE/ALCOHOL DILUENT

Adrianus M. van Broekhoven, and Richard L. Wife, both of CM Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Jul. 29, 1988, Ser. No. 225,996

Claims priority, application Netherlands, Jul. 30, 1987, 1701799

Int. Cl.⁴ C08G 67/02

U.S. Cl. 528-392

14 Claims

1. In the process of producing linear alternating polymers of carbon monoxide and at least one ethylenically unsaturated hydrocarbon, by contacting the carbon monoxide and unsaturated hydrocarbon under polymerization conditions in a diluent in the presence of a catalyst composition formed from a palladium salt, the anion of a non-hydrohalogenic acid having a pKa below about 6, and a phosphine ligand, the improvement wherein the diluent is a ketone/alcohol mixture comprising more than 50% by volume of aliphatic ketones which have at most 10 carbon atoms and more than 5% by volume of aliphatic alcohols which have at most 10 carbon atoms.

4,877,861

CARBON MONOXIDE/OLEFIN POLYMERIZATION WITH DISUBSTITUTED 1,3-BIS PHOSPHINO PROPANE

Johannes A. Van Doorn, and Richard L. Wife, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Jun. 20, 1988, Ser. No. 208,948

Claims priority, application Netherlands, Jun. 24, 1987, 1701473

Int. Cl.⁴ C08G 67/02

U.S. Cl. 528-392

9 Claims

1. In the process of producing linear alternating polymers of

carbon monoxide and at least one ethylenically unsaturated hydrocarbon, by contacting the carbon monoxide and unsaturated hydrocarbon under polymerization conditions in the presence of a catalyst composition formed from a palladium salt, the anion of a non-hydrohalogenic acid having a pKa below about 6 and a bis(phosphino)alkane, the improvement wherein the bis(phosphino)alkane is a 1,3-bis(phosphino)propane wherein the propane moiety is substituted with two hydrocarbyl substituents in the 2 position.

4,877,862

SOLID STATE POLYMERIZATION PROCESS FOR INCREASING THE MOLECULAR WEIGHT OF COPOLY(ARYLENE SULFIDE)

David R. Fagerberg, and Joseph J. Watkins, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 196,710, May 20, 1988, abandoned. This application Apr. 13, 1989, Ser. No. 337,712
Int. Cl.⁴ C08G 75/14

U.S. Cl. 528-481

3 Claims

1. A process comprising heating within a heating zone for a period of time and at a temperature which is at least 200 degrees C, said time and temperature sufficient to increase the molecular weight of the polymer such that the value of n is at least 200, a crystalline, solid polymer corresponding to the structure:



wherein A is a divalent substituted or unsubstituted aromatic radical, x is in the range of 0.5 to 0.001 and n is at least 20, wherein the volume of the heating zone not occupied with polymer is either under vacuum or is occupied with an inert gas.

4,877,863

PROCESS FOR DECOLORIZING OF POLYMERS OF THE VINYLAROMATIC-CONJUGATED DIENE TYPE

Emmanuel Lanza, Waterloo, and Jean M. M. G. Naveau, Nivelles, both of Belgium, assignors to Labofina, S.A., Brussels, Belgium

Filed Sep. 20, 1988, Ser. No. 246,993

Claims priority, application Belgium, Sep. 21, 1987, 8701055
Int. Cl.⁴ C08F 6/08, 6/06

U.S. Cl. 528-486

10 Claims

1. A process for decolorizing vinyl aromatic-conjugated diene copolymers which have polymer chains which end with an alkali metal and are obtained by solution polymerization of at least one vinyl aromatic hydrocarbon and a conjugated diene in the presence of a catalyst based on an alkali metal, comprising treating the copolymer in solution with a thiocarboxylic acid of the formula:



wherein: X is S, S $\text{---CH}_2\text{---}$ S, or S ---S , Y and R are alkyl radicals each independently having 1 to 16 carbon atoms, and n is 1 or 2.

4,877,864

OSTEOINDUCTIVE FACTORS

Elizabeth A. Wang, Carlisle; John M. Wozney, Hudson, and Vicki Rosen, Boston, all of Mass., assignors to Genetics Institute, Inc., Cambridge, Mass.

Filed Mar. 26, 1987, Ser. No. 31,346

Int. Cl.⁴ C07K 7/00; A61K 37/00; C12N 15/00

U.S. Cl. 530-324

7 Claims

1. A purified cartilage and bone inductive protein produced by the steps comprising:

- (a) culturing a cell transformed with a DNA sequence comprising the sequences as follows; GCC TTT CTT GGG

GAC ATT GCC CTG GAC GAA GAG GAC CTG
AGG GCC TTC CAG GTA CAG CAG GCT GTG
TAT CTC AGA CGG CAC ACA GCT AAG
TCC TCC ATC AAA GCT GCA, naturally occurring
allelic sequences thereof, equivalent degenerative codon
sequences thereof or sequences which

- (1) hybridize thereto under stringent hybridization conditions; and
- (2) upon expression encode a protein characterized by the ability to induce bone and/or cartilage formation in the in vivo rat bone formation assay at a concentration of between about 10-1000 nanograms per gram bone; and
- (b) recovering and purifying from said culture medium said protein so as to be substantially free from association with other proteinaceous materials and characterized by a peptide sequence comprising the following sequence: Ala Phe Leu Gly Asp Ile Ala Leu Asp Glu Glu Asp Leu Arg Ala Phe Gln Val Gln Gln Ala Val Asp Leu Arg Arg His Thr Ala Arg Lys Ser Ser Ile Lys Ala Ala, and naturally occurring allelic sequences thereof.

4,877,865

BOVINE INTERFERON

Baruch Velaz, Rishon Le-Zion; Sara Cohen, Bat-Yam; Haim Grosfeld, Rehovot, and Avidor Shaffer, Neas-Ziona, all of Israel, assignors to State of Israel, Prime Minister's Office, Israel Institute for Biological Research, Neas-Ziona, Israel
Filed Apr. 9, 1985, Ser. No. 721,204

Claims priority, application Israel, Apr. 15, 1984, 71555

Int. Cl.⁴ C07K 13/00, 15/26; A61K 45/02; C12P 21/00
U.S. Cl. 530—351 12 Claims

1. A genetically engineered bovine interferon of the IFN- α type which is pre-BolFN- α A, mature BolFN- α A and Met-mat-BolFN- α A defined by the amino acid sequence with a methionine codon preceding the Cys codon, as shown in FIG. 1.

4,877,866

METHOD OF PRODUCING A VIRUS SAFE, STORAGE-STABLE, AND INTRAVENOUSLY TOLERABLE IMMUNOGLOBULIN-G PREPARATION

Dieter Rudnick, Rüdernmark; Norbert Kothe, Kronberg/Ts.; Herbert Dichtelmüller, Salzbach/Ts.; Detlef Piechaczek, Münster; Wolfgang Stephan, Dreieich, and Hans Schlemmer, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Biotest Pharma GmbH, Frankfurt, Fed. Rep. of Germany
Filed Nov. 18, 1987, Ser. No. 122,092

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1986, 3640513

Int. Cl.⁴ A61K 39/395, 41/00

U.S. Cl. 530—387 13 Claims

1. A method of producing a virus-safe, storage-stable, and intravenously tolerable immunoglobulin-G preparation from a plasma that has had the coagulation factors removed from it or of a plasma fraction or serum fraction that contains immunoglobulin G, comprising

- (a) diafiltering or gel filtering either the plasma that has had the coagulation factors removed from it or the plasma or serum fraction that contains the immunoglobulin G to eliminate any precipitant, and establishing an ion composition sufficient for subsequent fractionation,
- (b) subjecting the resulting protein solution from (a) to fractionation over an ion exchanger to separate the immunoglobulin G,
- (c) removing the proteolytic enzymes in the resulting immunoglobulin-G solution of (b) by means of affinity chromatography over a dye linked sorbent and/or inhibiting such enzymes by the addition of antithrombin III,
- (d) treating the accordingly stabilized immunoglobulin-G solution of (c), at a protein concentration of 20 to 60 g/l and a pH of 6.0 to 8.0, with 0.03 to 0.07% of β -propiolac-

tone, diluting it to a protein concentration of 5 to 20 g/l, and subjecting it to ultraviolet radiation,

- (e) again diafiltering the accordingly sterilized dilute immunoglobulin-G solution or gel filtration to remove lower molecular-weight substances, and
- (f) adjusting the accordingly stabilized and sterilized solution to the desired protein content of 2 to 16%, and conducting sterile filtering.

4,877,867

ANTIBODIES FOR THE DETECTION OF MAMMALIAN RAS GENE PRODUCTS, METHOD OF PREPARING AND METHOD OF USING SAME

Channa Shalit, 70 Pinsker Str., Haifa, Israel

Continuation-in-part of Ser. No. 753,963, Jul. 11, 1985, Pat. No. 4,767,714. This application Jan. 15, 1988, Ser. No. 144,493

Claims priority, application Israel, Jul. 19, 1984, 72452

Int. Cl.⁴ C07K 3/00, 3/02

U.S. Cl. 530—387

11 Claims

1. Antibodies specific in their binding properties towards nonfixed mammalian ras gene-expressed proteins, obtained using, as an immunogen, a p20 polypeptide derived from chromatin or the degraded p20 polypeptide having a molecular weight in the range of 16,000 to 20,000 and amino acid composition as follows: aspartic + glutamic acids in the range of 21.8–25.5 mole %; lysine + arginine in the range of 13.5–21.4 mole % and a ratio of lysine to arginine in the range of 2.31–3.1.

7. A method for obtaining anti-p20 antibodies which are specific in their binding properties towards mammalian ras gene-expressed proteins wherein animals are immunized with portions of sodium chloride-extracted p20 polypeptide derived from chromatin or the degraded p20 polypeptide having a molecular weight in the range of 16,000 to 20,000 and amino acid composition as follows: aspartic + glutamic acids in the range of 21.8–25.5 mole %; lysine + arginine in the range of 13.5–21.4 mole % and a ratio of lysine to arginine in the range of 2.31–3.1 emulsified in complete Freund's adjuvant and injected intradermally, said animals receiving booster injections with p20 polypeptide or degraded p20 polypeptide and bled thereafter.

9. A method of detecting p21 ras gene-expressed proteins comprising obtaining anti-p20 antibodies according to the method of claim 7 and detecting said p21 ras gene-expressed proteins with said anti-p20 antibodies by immunoprecipitation.

4,877,868

RADIONUCLIDE ANTIBODY COUPLING

John M. Reno, and Becky J. Bottino, both of Lynwood; D. Scott Wilbur, Edmonds, all of Wash., assignors to NeoRx Corporation, Seattle, Wash.

Filed Mar. 12, 1986, Ser. No. 838,992

Int. Cl.⁴ C07K 3/00

U.S. Cl. 530—390

25 Claims

1. A method of preparing a metal radionuclide-labeled protein from a protein precursor having at least one disulfide linkage, the method comprising: reacting said protein precursor with a disulfide reducing agent to form a dimercaptoprotein; reacting said dimercaptoprotein with a divalent or trivalent cation to yield a cation-derivatized protein; and combining said cation-derivatized protein with ^{99m}Tc, ¹⁸⁶Re, ¹⁸⁸Re or ⁶⁷Cu to form said metal radionuclide-labeled protein.

4,877,869

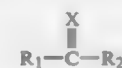
ACID CATALYZED NITRATION

Donald C. Young, Fullerton, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Division of Ser. No. 771,259, Aug. 30, 1985, Pat. No. 4,722,966, which is a continuation-in-part of Ser. No. 679,235, Dec. 7, 1984, Pat. No. 4,589,925, which is a continuation-in-part of Ser. No. 675,774, Nov. 28, 1984, Pat. No. 4,673,522, which is a continuation-in-part of Ser. No. 673,358, Nov. 20, 1984, Pat. No. 4,664,717, which is a continuation-in-part of Ser. No. 673,508, Nov. 20, 1984, which is a continuation-in-part of Ser. No. 453,496, Dec. 27, 1982, which is a continuation-in-part of Ser. No. 442,296, Nov. 17, 1982, abandoned, which is a continuation-in-part of Ser. No. 444,667, Nov. 26, 1982, abandoned, which is a continuation-in-part of Ser. No. 331,001, Dec. 15, 1981, Pat. No. 4,402,852, which is a continuation-in-part of Ser. No. 330,904, Dec. 15, 1981, Pat. No. 4,404,116, which is a continuation-in-part of Ser. No. 318,629, Nov. 5, 1981, Pat. No. 4,445,925, which is a continuation-in-part of Ser. No. 318,368, Nov. 5, 1981, Pat. No. 4,447,253, which is a continuation-in-part of Ser. No. 318,343, Nov. 5, 1981, Pat. No. 4,397,675. This application Jan. 29, 1988, Ser. No. 149,701

Int. Cl.⁴ C08E 5/02; B01J 31/00; C08F 283/02

U.S. Cl. 536—35 17 Claims
1. The method for nitrating an organic compound, which method comprises the step of reacting said organic compound with nitric oxide in the presence of a catalytically active amount of a combination of sulfuric acid, and a chalcogen-containing compound having the empirical formula



wherein X is a chalcogen, each of R₁ and R₂ is selected from the group consisting of hydrogen, NR₃R₄ and NR₅, at least one of R₁ and R₂ is other than hydrogen, each of R₃ and R₄ is selected from the group consisting of hydrogen and monovalent organic radicals, and R₅ is a divalent organic radical, which combination comprises a catalytically active amount of the mono-adduct of sulfuric acid and said chalcogen-containing compound.

4,877,870

PROCESS FOR PRODUCING 10-HYDROXYANTHRACYCLINES

Hamao Umezawa, deceased, late of Tokyo (by Kazuo Umezawa, heir); Kuniaki Tatsuta, Tokyo; Hiroyuki Kawai, and Shohachi Nakajima, both of Maebashi, all of Japan, assignors to Kirin Beer Kabushiki Kaisha, Tokyo, Japan
Filed Jun. 30, 1987, Ser. No. 68,630

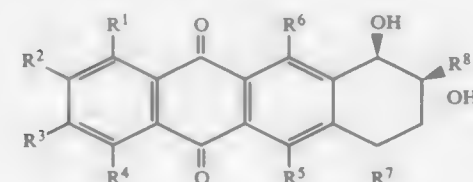
Claims priority, application Japan, Jul. 4, 1986, 61-157358

Int. Cl.⁴ C07H 15/24; C07C 49/66

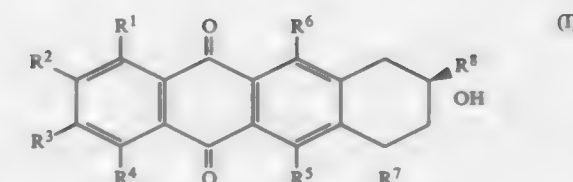
U.S. Cl. 536—6.4

7 Claims

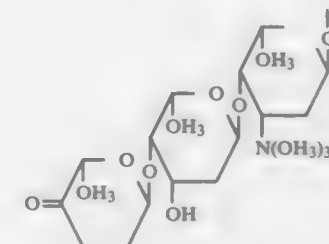
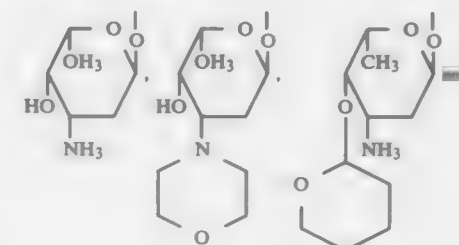
1. A process for producing a 10-hydroxyanthracene of the following formula (II)



which consists of reacting a compound of the following formula (I)



or an acid addition salt thereof with an N-oxide of a tertiary amine wherein R¹ through R⁶ are selected from the group consisting of H, OH and OCH₃; R⁷ is selected from the group consisting of H, OH,



and R⁸ is selected from the group consisting of C₂H₅, COCH₃, CH(OH)CH₃, CH(OH)CH₂(OH) and COCH₂OH.

4,877,871

SYNTHESIS OF SUCROSE POLYESTER

Lawrence P. Klemann, Somerville; John W. Finley, Whippany, and Anthony Scimone, Cedar Grove, all of N.J., assignors to Nabisco Brands, Inc., East Hanover, N.J.

Filed Jun. 14, 1988, Ser. No. 206,656

Int. Cl.⁴ C07G 17/00; C07H 13/02; C09F 5/08

U.S. Cl. 536—124

31 Claims

1. A process for synthesizing sucrose fatty acid polyesters comprising reacting a lower sucrose fatty acid ester selected from the group consisting of mono-, di- or tri-esters of fatty acids or mixtures thereof with fatty acids in a solvent in the presence of an effective amount of a carbodiimide.

4,877,872

PRODUCTION AND USE OF DIMERS OF HEMATOPOROPHYRIN, PURPURINS, CHLORINES AND PURPURIN- AND CHLORIN-COMPLEXES

Alan R. Morgan; Steven H. Selman; Greta M. Garbo, and Rick W. Keck, all of Toledo, Ohio, assignors to The University of Toledo, Toledo, Ohio

Filed Jun. 24, 1986, Ser. No. 877,770

Int. Cl.⁴ A61K 31/40

U.S. Cl. 540—145

3 Claims

1. A dimer of (1) a purpurin or a purpurin metal complex having the structure of any of FIGS. 1, 7, 14-18, 29-38, 44-48 or 54-58 of the attached drawings, or a chlorin or a chlorin metal complex having the structure of any of FIGS. 2, 8, 19-28, 39-43 or 49-53 of the attached drawings and (2) hematoporphyrin or a purpurin or a purpurin metal complex having

the structure of any of FIGS. 1, 7, 14-18, 29-38, 44-48 or 54-58 of the attached drawings, or a chlorin or a chlorin metal complex having the structure of any of FIGS. 2, 8, 19-28, 39-43 or 49-53 of the attached drawings, wherein

each of R10 through R13 and R16 is hydrogen, and each of R1 through R9, R14 and R15 is:

H or CHO,

an alkyl group having from 1 to 4 carbon atoms, excluding tertiary butyl,

an alkylene group having from 2 to 4 carbon atoms, a group having the formula $R_2N(R_3)_2$ where R_2 is a bivalent aliphatic hydrocarbon radical having from 1 to 4 carbon atoms, wherein any carbon to carbon bond is either a single or a double bond, and not more than one is a double bond; R_3 is hydrogen or an alkyl group having from 1 to 2 carbon atoms and the two R_3 groups can be the same or different,

a group having the formula $R_2N(R_4)_3A$ where R_2 is a bivalent aliphatic hydrocarbon radical having from 1 to 4 carbon atoms, wherein any carbon to carbon bond is either a single or a double bond, and not more than one is a double bond; A is a physiologically acceptable anion; and R_4 is an alkyl group having from 1 to 2 carbon atoms and the three R_4 groups can be the same or different,

a group having the formula R_2OH where R_2 is a bivalent aliphatic hydrocarbon radical having from 1 to 4 carbon atoms, wherein any carbon to carbon bond is either a single or a double bond, and not more than one is a double bond,

CO_2R' , CH_2CO_2R' or $CH_2CH_2CO_2R'$, where R' is hydrogen or an alkyl group having from 1 to 4 carbon atoms, excluding tertiary butyl, an amino acid moiety which is attached to the purpurin or chlorin moiety through a carbonyl which is a part of an amide produced by reaction between an amine function of a naturally occurring amino acid and a CO_2R' , CH_2CO_2R' or $CH_2CH_2CO_2R'$ group of the purpurin or chlorin,

a monoclonal antibody moiety which selectively binds to malignant tumors and is attached to the purpurin or chlorin moiety through a carbonyl which is a part of an amide produced by reaction between an amine function of a monoclonal antibody and a CO_2R' , CH_2CO_2R' or $CH_2CH_2CO_2R'$ group of the purpurin or chlorin, or

in the purpurins and purpurin metal complexes of FIGS. 1, 7, 14-18, 34-38 and 54-58 and in the chlorins and chlorin metal complexes of FIGS. 2 and 8 R_1 can be a bivalent aliphatic hydrocarbon radical having from 2 to 4 carbon atoms wherein both of the valences of the radical are attached to the same carbon atom thereof and to a carbon atom of the purpurin, chlorin, or metal complex, and in the purpurins and purpurin metal complexes of FIGS. 29-33 and of FIGS. 44-48 and in the chlorins and chlorin metal complexes of FIGS. 19-28, 39-43 and 49-53, both R_1 and R_2 can be bivalent aliphatic hydrocarbon radicals having from 2 to 4 carbon atoms wherein both of the valences of the radical are attached to the same carbon atom thereof and to a carbon atom of the purpurin or metal complex, and

M comprises a metal cation that is complexed with two of the nitrogens of the purpurin or chlorin and is Ag, Al, Ce, Co, Cr, Dy, Er, Eu, Fe, Ga, Gd, Hf, Ho, In, La, Lu, Mn, MO, Nd, Pb, Pd, Pr, Pt, Rh, Sb, Sc, Sm, Sn, Tb, Th, Ti, Tl, Tm, U, V, Y, Yb, Zn or Zr,

said dimer being the product of reaction between a CO_2R' , CH_2CO_2R' or $CH_2CH_2CO_2R'$ group of the (1) purpurin, chlorin or metal complex or of the (2) hematoporphyrin, purpurin, chlorin or metal complex and an amino nitrogen or an alcoholic OH group of the other, with the proviso that not more than one of R_1 through R_9 , R_14 and R_15 is CHO, a group having the formula $R_2N(R_3)_2$, a group having the formula $R_2N(R_4)_3A$, an amino acid moiety or a monoclonal antibody moiety.

4,877,873

SYN-ISOMER OF

3,7-DISUBSTITUTED-3-CEPHEM-4-CARBOXYLIC ACID COMPOUNDS AND PROCESSES FOR THE PREPARATION THEREOF

Takao Takaya, Sakai; Takashi Masugi, Toyonaka; Hisashi Takasugi, Osaka, and Hiromu Kochi, Sakai, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan Division of Ser. No. 767,700, Feb. 11, 1977, Pat. No. 4,166,115.

This application May 21, 1979, Ser. No. 40,976

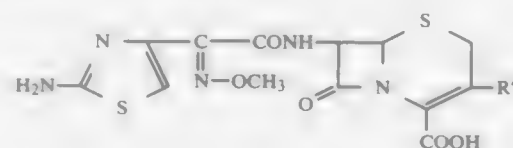
Claims priority, application United Kingdom, Apr. 2, 1976, 14916/76; Jun. 7, 1976, 23490/76; Japan, Oct. 19, 1976, 51-115826

Int. Cl. C07D 501/34

U.S. Cl. 544-227

2 Claims

1. Syn-isomer of 3,7-disubstituted -3-cephem-4-carboxylic acid compounds of the formula:



wherein R_4 is thiadiazolylthiomethyl, and pharmaceutically acceptable salts thereof.

4,877,874

PROCESS FOR PRODUCING

N-AMINOHEXAMETHYLENEIMINE

Minoru Kawano; Katsumi Simizu; Eiji Isonaga, and Shigeo Kurata, all of Ube, Japan, assignors to Ube Industries, Ltd., Ube, Japan

Filed May 26, 1987, Ser. No. 54,315

Claims priority, application Japan, Jun. 13, 1986, 61-136113

Int. Cl. C07D 295/22

U.S. Cl. 540-606

18 Claims

1. A process for producing N-aminohexamethyleneimine which comprises reacting hexamethyleneimine with hydroxylamine-O-sulfonic acid in the presence of an aqueous solvent and an inorganic base and wherein the reaction is carried out by injecting simultaneously an aqueous solution of hydroxylamine-O-sulfonic acid and the inorganic base into an aqueous solution of hexamethyleneimine.

4,877,875

1-SUBSTITUTED

ALKYL-2-OXO-HEXAHYDROQUINOXALINE DERIVATIVES

Masao Yano; Yukio Suzuki; Kensuke Shibata, and Eichi Hayashi, all of Shizuoka, Japan, assignors to Toyo Jozo Kabushiki Kaisha, Shizuoka, Japan

Division of Ser. No. 20,012, Feb. 25, 1987, Pat. No. 4,837,319.

This application Oct. 19, 1988, Ser. No. 259,992

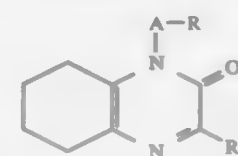
Claims priority, application Japan, Feb. 25, 1986, 61-38210

Int. Cl. C07D 403/06, 403/14, 401/06, 413/06

U.S. Cl. 544-116

8 Claims

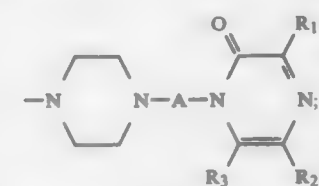
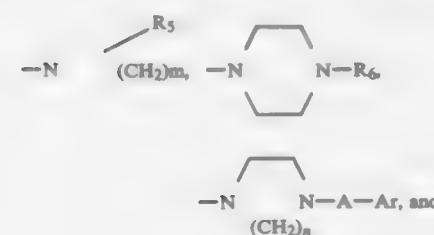
1. A compound of the formula



wherein

A is lower alkylene; R_1 is selected from the group consisting of alkyl, phenyl-lower alkyl, and substituted phenyl-lower alkyl;

and R is selected from the group consisting of 1-methyltetrazole-5-yl-thio, 1-imidazolyl, morpholino,



in which R_5 is hydrogen, lower alkyl or aryl, R_6 is hydrogen, lower alkyl, hydroxy-lower alkyl, aryl, aryl-lower alkanoyl, arylcarbonyl, arylsulfonyl or thienyl-lower alkanoyl, A is phenyl or phenyl substituted with C_{1-3} alkyl, halogen, nitro, or lower alkoxy, A and R_1 are as defined above, R_2 and R_3 are each lower alkyl or together form tetramethylene, m is an integer from 4-6, and n is 2 or 3; and pharmaceutically acceptable salts thereof.

4,877,876

NOVEL INDENOTHIAZOLE DERIVATIVE AND PROCESS FOR PREPARING THE SAME

Masayoshi Tsuji; Akira Nakagawa, both of Toei; Hisataka Inoue, Okawa; Terumi Hachiya, Kanazaki; Yoshihiro Tanoue, Chikushi; Kouichi Ikeda, Saga; Masaru Saita, Miyaki; Takenobu Mizoguchi, Toei; Tetsuo Aoki; Hironobu Sato, both of Miyaki, and Kanji Noda, Chikushi, assignors to Hisamitsu Pharmaceutical Co., Inc., Toei, Japan

PCT No. PCT/JP87/00021, § 371 Date Aug. 31, 1987, § 102(e) Date Aug. 31, 1987, PCT Pub. No. WO87/04434, PCT Pub. Date Jul. 30, 1987

PCT Filed Jan. 14, 1987, Ser. No. 107,600

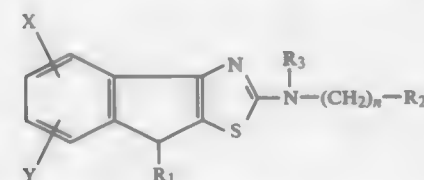
Claims priority, application Japan, Jan. 16, 1986, 61-7640

Int. Cl. C07D 277/60, 417/12

U.S. Cl. 544-133

6 Claims

1. An indenothiazole derivative of formula:



wherein X and Y are identical with, or different from, each other and are each hydrogen, halogen, lower alkyl having 1-6 carbon atoms or lower alkoxy having 1-6 carbon atoms; n is an integer of from 0 to 4; R_1 is hydrogen, lower alkyl having 1-6 carbon atoms or phenyl; R_2 is lower alkyl having 1-6 carbon atoms, cyclohexyl, lower alkoxy having 1-6 carbon atoms, alkenyl having 3-6 carbon atoms, phenyl, m -(1-piperidinylmethyl)phenoxy, phenyl substituted by a halogen atom, hydroxyl, lower alkyl having 1-6 carbon atoms, lower alkoxy having 1-6 carbon atoms or trifluoromethyl group, an heterocyclic ring selected from the group consisting of pyridyl, pyridyl mono- or di-substituted by one or two lower alkyl having 1-6 carbon atoms and thiazolyl and cycloamino selected from the group consisting of morpholino, piperidino, pyrrolidino, piperazino substituted by lower alkyl having 1-6 carbon atoms and piperidino substituted by lower alkyl having

1-6 carbon atoms; R_3 is hydrogen, lower alkyl having 1-6 carbon atoms, acetyl or trifluoromethylcarbonyl, or R_2 and R_3 are combined to form a cycloamino selected from the group consisting of pyrrolidino group, piperidino, morpholino and piperidino di-substituted by two lower alkyl having 1-6 carbon atoms

4,877,877

1-SUBSTITUTED ALKYL-2-OXO-HEXAHYDROQUINOXALINE DERIVATIVES

Masao Yano; Yukio Suzuki; Kensuke Shibata, and Eichi Hayashi, all of Shizuoka, Japan, assignors to Toyo Jozo Kabushiki Kaisha, Shizuoka, Japan

Division of Ser. No. 20,012, Feb. 25, 1987, Pat. No. 4,837,319.

This application Oct. 19, 1988, Ser. No. 260,904

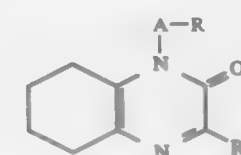
Claims priority, application Japan, Feb. 25, 1986, 61-38210

Int. Cl. C07D 241/44, 403/06, 413/06; A61K 31/495

U.S. Cl. 544-354

6 Claims

1. A compound of the formula



wherein

A is lower alkylene; R_1 is selected from the group consisting of alkyl, phenyl-lower alkyl, and substituted phenyl-lower alkyl; and

R is selected from the group consisting of hydroxyl, halogen, lower alkanoyloxy, R_4 -carbamoyloxy and arylthio, in which R_4 is lower alkyl or aryl; and pharmaceutically acceptable salts thereof.

4,877,878

2-AZOLYLMETHYL-2-ARYL-1,3-DIOXOLANES AND THE SALTS THEREOF, PROCESSES FOR THE PREPARATION THEREOF, AGENTS CONTAINING SAME, AND THE USE THEREOF

Klaus-Dieter Kampe, Bad Soden am Taunus; Wolfgang Raether, Dreieich, and Walter Dittmar, Hofheim am Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Division of Ser. No. 28,173, Mar. 19, 1987, Pat. No. 4,818,758.

This application Dec. 29, 1988, Ser. No. 291,952

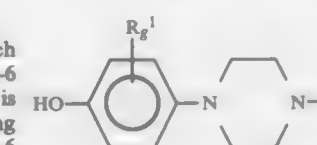
Claims priority, application Fed. Rep. of Germany, Mar. 21, 1986, 3609597

Int. Cl. C07D 403/06, 403/10

U.S. Cl. 544-368

1 Claim

1. A compound of the formula IIIa



in which:

R^1 denotes C_{1-3} -alkyl, F or Cl,

g denotes 0, 1 or 2,

m denotes 0, 1, 2, 3 or 4,
p denotes 0 or, if m does not equal 0, denotes 0 or 1,
X denotes O or, if m does not equal 0 or if, simultaneously,
m and p are 0 and n does not equal 0, denotes O, S or
N—R³, where
R³ denotes H, C₁–C₄-alkyl, phenyl or benzyl,
R², independently of one another, denote C₁–C₄-alkyl,
C₁–C₄-alkoxy, F, Cl, Br, I, SCH₃, CO—C₆H₅, CF₃ or
NO₂, and
n denotes 0, 1 or 2,
or, if n is 2,
R² additionally denotes a —CH=CH—CH=CH group
which, together with the phenyl ring, forms a naphthyl
radical,
or, if p is 0 and n is 1,
R² additionally denotes a phenoxy group which is unsubstituted
or carries up to 2 identical or different substituents in
the phenyl radical, where the substituents denote F, Cl,
Br, OCH₃, CH₃ or C₂H₅,
and the acid-addition salts thereof.

4,877,879

PREPARATION OF POLYETHER COMPOSITIONS
Michael A. P. Gansow, Wädenswil, Switzerland, assignor to
Dow Chemical (Nederland) B.V., Terneuzen, Netherlands
Filed Jan. 4, 1988, Ser. No. 140,379

Claims priority, application United Kingdom, Jan. 6, 1987,
8700101

Int. Cl.⁴ C07D 295/12; C07C 47/18, 41/12
U.S. Cl. 544—402 18 Claims

1. A process for stabilizing against release of complexed
alkylene oxide, a crude polyether composition prepared from
one or more alkylene oxides using an amine initiator in the
presence of an alkaline catalyst, comprising contacting the
composition with an effective amount of a reducing agent
sufficient to effect said stabilization.

9. A process for neutralizing and stabilizing a crude, amine-
initiated polyether composition prepared using an alkaline
catalyst, comprising contacting the composition with an
amount of formic acid in substantial stoichiometric excess with
respect to the amount of alkaline catalyst used.

4,877,880

PROCESS FOR PREPARATION OF IMINOTHIAZOLIDINES

Frank X. Woolard, Richmond, Calif., assignor to ICI Americas
Inc., Wilmington, Del.

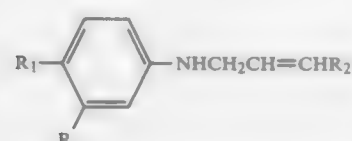
Continuation-in-part of Ser. No. 126,134, Nov. 17, 1987,
abandoned. This application Dec. 9, 1988, Ser. No. 282,807

Int. Cl.⁴ C07D 277/18

U.S. Cl. 548—190 10 Claims

1. A process for the preparation of iminothiazolidines com-
pounds which comprises:

(a) reacting an N-3-substituted allyl aniline having the for-
mula



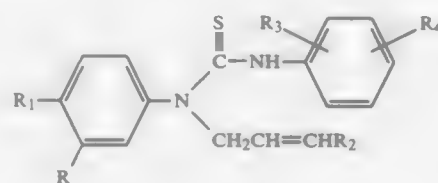
in which

R is halo, nitro, cyano, C₁–C₄ alkyl, C₁–C₄ alkoxy, pen-
tafluoromethyl, difluoromethyl, pentafluoroethyl, tri-
fluoromethylthio, difluoromethoxy, trifluoromethoxy,
tetrafluoroethoxy, methylsulfonyl, C₁–C₄ alkyl-
oximinomethyl, benzyloximinomethyl, 1-(C₁–C₄ alkyl-
oximinomethyl or 1-benzyloximinomethyl;
R₁ is hydrogen or halo; and

R₂ is C₁–C₄ alkyl or C₁–C₄ haloalkyl; with an arylisothi-
ocyanate of the formula

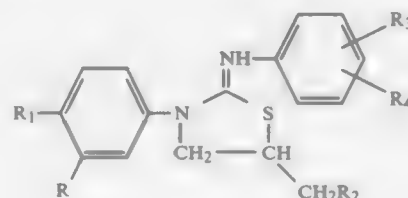


wherein R₃ and R₄ are independently hydrogen, halo,
nitro, cyano, C₁–C₄ alkyl, C₁–C₄ haloalkyl, C₁–C₄ alk-
oxy, C₁–C₄ fluoroalkoxy or C₁–C₄ alkylthio, in the
presence of an organic solvent and a suitable catalyst, at
a temperature and for a sufficient period of time to yield
an N,N'-diaryl-N-3-substituted allyl thiourea of the
formula



and

(b) treating said N,N'-diaryl-N-3-substituted allyl thiourea
with about one equivalent of methanesulfonic acid or
trifluoromethanesulfonic acid in the presence of an aprotic
solvent at a temperature of from about 20° C. to about 45°
C. and for a sufficient period of time to produce an imino-
thiazolidine of the formula



4,877,881

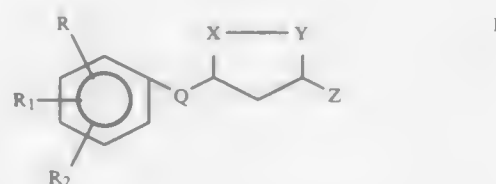
PROCESS OF PREPARING PYRAZOLES, ISOXAZOLES AND ANALOGS THEREOF HAVING ACTIVITY AS 5-LIPOXYGENASE INHIBITORS

Thomas R. Bellotti, Ypsilanti; David T. Connor, Ann Arbor;
Daniel L. Flynn, Ann Arbor; Catherine R. Kostian, Ann Ar-
bor, and Donald E. Nies, Ann Arbor, all of Mich., assignors to
Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 32,730, Apr. 6, 1987, which is a
continuation-in-part of Ser. No. 910,692, Sep. 22, 1986,
abandoned, which is a continuation-in-part of Ser. No. 861,179,
May 9, 1986, abandoned. This application Sep. 21, 1988, Ser. No.
247,837

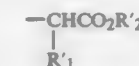
Int. Cl.⁴ A61K 31/42, 31/415; C07D 261/10, 231/20
U.S. Cl. 548—240 1 Claim

1. A process for the preparation of a compound of Formula
(I)



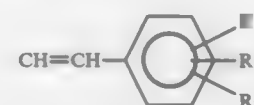
wherein

- (1) is a single or double bond;
- (2) R, R₁, and R₂ may be the same or different and are
selected from the group consisting of hydrogen, lower
alkyl, hydroxy, OR₃ wherein R₃ is lower alkyl, C(O)OR₄
wherein R₄ is hydrogen or lower alkyl, OC(O)R₃ wherein
R₃ is independently as defined above, C(O)R₃ wherein R₃
is independently as defined above, NR₆R₇, wherein R₆
and R₇ may be the same or different and are hydrogen or
lower alkyl, NHC(O)R₃ wherein R₃ is independently as
defined above, NHCHO, NHSO₂R₃ wherein R₃ is inde-
pendently as defined above, NHCONHR₄ wherein R₄ is
as defined above, hydroxymethyl, halogen, trifluoro-
methyl, SR₄ wherein R₄ is independently as defined
above, or nitro;
- (3) Q is CH=CH
- (4) X and Y are (i) N, (ii) NR₅ wherein R₅ is hydrogen, lower
alkyl,

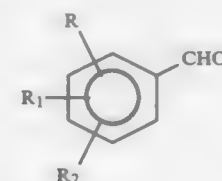


wherein R₁' and R₂' may be the same or different and are
hydrogen or lower alkyl, C(O)R₄ wherein R₄ is indepen-
dently as defined above, cyclolalkyl or from three to
twenty carbons having of from three to eight ring car-
bons, aryl, or aralkyl, (iii) O, (iv) S; with the proviso that
X and Y cannot both be N, NR₅O, or S at once and with
the proviso that one of X and Y cannot be O at the same
time the other of X and Y is S or NR₅ and that one of X
and Y cannot be S at the same time the other of X and Y
is NR₅;

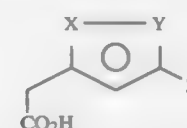
- (5) Z is H, lower alkyl, aryl, aralkyl, OC(O)R₃ wherein R₃ is
independently as defined above, C(O)OR₄ wherein R₄ is
independently as defined above, C(O)R₃ wherein R₃ is
independently as defined above, CH(R₁')CO₂R₂' wherein
R₁' and R₂' are independently as defined above, halogen,
trifluoromethyl,



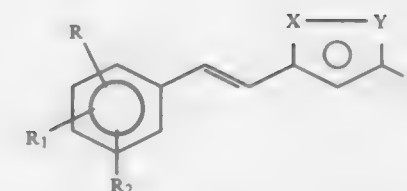
wherein R, R₁ and R₂ are independently as defined above,
heteroaryl, or heteroalkyl; which comprises contacting
a compound of the formula



wherein R, R₁ and R₂ are as defined above and a com-
pound of the formula



wherein Z, X and Y are as defined above; and which is in
situ dehydrated and decarboxylated to yield a compound
of the formula



wherein X and Y are as defined above and R, R₁, R₂ and
Z are also as defined above.

4,877,882

PROCESS FOR THE PREPARATION OF D-(+)-BIOTIN

Elke Poetsch, Mühltal, and Michael Casutt, Pfungstadt, both of
Fed. Rep. of Germany, assignors to Merck Patent Gesell-
schaft mit Beschränkter Haftung, Darmstadt, Fed. Rep. of
Germany

Continuation-in-part of Ser. No. 141,161, Jan. 6, 1988, Pat. No.
4,837,402, which is a division of Ser. No. 39,342, Apr. 17, 1987,
Pat. No. 4,732,987. This application Oct. 5, 1988, Ser. No.
253,995

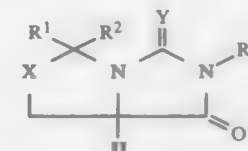
Claims priority, application Fed. Rep. of Germany, Apr. 19,
1986, 3613245; Feb. 7, 1987, 3703872

Int. Cl.⁴ C07D 495/04

U.S. Cl. 548—303 10 Claims

1. A process for the preparation of D-(+)-biotin, compris-
ing:

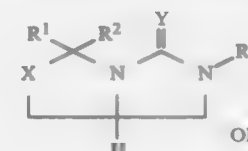
- (a)
- (i) Reducing a starting material compound of the formula



wherein

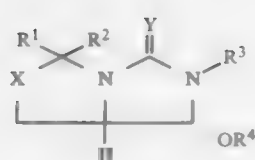
R¹ and R² are each in independently H, alkyl, substi-
tuted alkyl, cycloalkyl, aryl, aralkyl or heteroaryl,
wherein the heteroatom is O, N, or S, or taken to-
gether are alkylene, substituted alkylene or hetero-
alkylene, wherein the heteroatom is O, N, or S;
R³ is H or benzyl, benzyl substituted by one or more of
C₁–C₄-alkyl, C₁–C₄-alkoxy, C₃–5-alkyl-2-enyl or C₃–6-
trialkylsilyl;

X and Y independently are each O or S;
to an alcohol of the formula



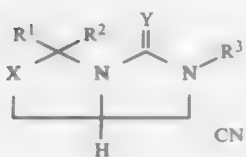
by reacting said starting material compound with a
reducing agent or by catalytically hydrogenating said
starting material compound;

- (ii) converting said alcohol into an activated ester of the
formula

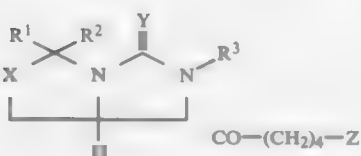


wherein R⁴ is an activating ester group and is alkanoyl, aroyl, alkylsulfonyl or azole-M, wherein azole is a fused or non-fused, substituted or unsubstituted, nitrogen-containing 5-membered ring, and M is CO, CS, SO₂, SO or S;

(iii) reacting said activated ester with an alkali metal cyanide, an alkaline earth metal cyanide or a cyanosilane, to give a nitrile of the formula

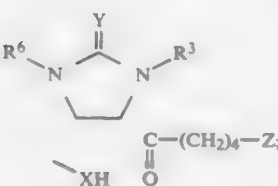


(b) (i) reacting the product of step (a) (iii) with an organometallic compound to give an oxo compound of the formula

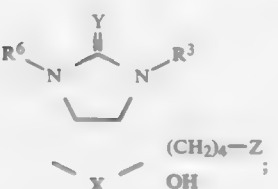


wherein Z is OR⁵ or COOR⁵, wherein R⁵ is H, alkyl, cycloalkyl or aryl;

(ii) splitting said oxo compound by treatment with an acid, a reducing agent or a mixture thereof to give an imidazolidine of the formula



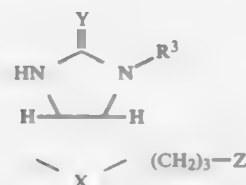
(iii) cyclizing said imidazolidine by reacting with a base to give a biotin derivative of the formula



wherein R⁶ is H or R¹R²CH;

and (iv) converting said derivative into D-(+)-biotin by known processes, or

(c) (i) the oxo compound produced in step (b) (i) above is converted with an acid, to a biotin derivative of the formula



and (ii) this derivative is converted into D-(+)-biotin by known processes.

4,877,883

SUBSTITUTED PYRAZOLES

Henrich H. Paradies, Iserlohn, Fed. Rep. of Germany, assignor to Medice chem.-pharm. Fabrik Putter GmbH & Co. KG, Fed. Rep. of Germany

Filed Aug. 6, 1987, Ser. No. 82,891

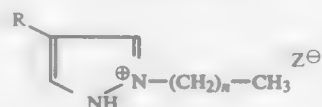
Claims priority, application Fed. Rep. of Germany, Aug. 7, 1986, 3626700

Int. Cl.⁴ C07D 231/12, 231/14, 231/18

U.S. Cl. 548-375

2 Claims

1. A compound having the formula



in which:

R is a member selected from the group consisting of H, CH₃, and OH;

Z is a member selected from the group consisting of chloride, bromide, iodide, maleate, formate, acetate, propionate, HSO₄⁻, malate, fumarate, salicylate, alginate, gluconate, glucuronate, galacturonate, ethylsulfate and H₂PO₄;

n is 8 to 20.

4,877,884

4-BENZYLOXY-3-PYRROLIN-2-ON-1-YL ACETAMIDE PRODUCTION

Thomas Meul, Canton Valais, Switzerland, assignor to Lonza Ltd., Gampel/Valais, Switzerland

Division of Ser. No. 181,435, Apr. 14, 1988, which is a division of Ser. No. 60,262, Jun. 10, 1987. This application Apr. 11, 1989, Ser. No. 336,070

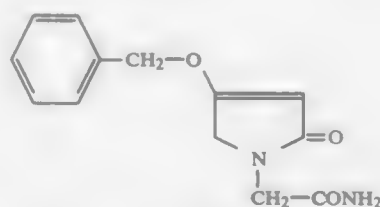
Claims priority, application Switzerland, Jun. 26, 1986, 2567/86

Int. Cl.⁴ C07D 207/38

U.S. Cl. 548-544

17 Claims

1. Process for the production of 4-hydroxy-3-pyrrolidin-2-on-1-yl acetamide, comprising, (a) converting 4-benzyloxy-3-pyrrolin-2-on-1-yl acetamide of the formula:



by catalytic hydrogenolysis using a catalytic effective amount of a hydrogenolysis catalyst in the presence of hydrogen to the intermediate 2,4-dioxypyrrolidin-1-yl acetamide, and (b) reducing the intermediate 2,4-dioxypyrrolidin-1-yl acetamide with an alkali borohydride to the end product.

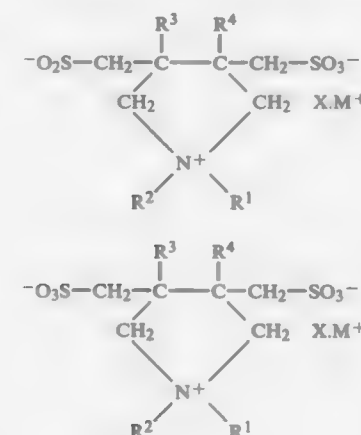
NOVEL 3-SULFINATOMETHYL-OR 3-SULFONATOMETHYL-4-SULFOMETHYL-PYRROLIDINIUM BETAINES AND THEIR SALTS AS WELL AS PROCESS FOR MAKING THE SAME
Detlef Ballschuh; Horst Seibt; Roland Ohme; Jochen Rusche; Egon Gruendemann, and Elke Krause, all of Berlin, German Democratic Rep., assignors to Akademie Der Wissenschaften Der DDR, Berlin, German Democratic Rep.
Continuation of Ser. No. 748,156, Jun. 24, 1985, abandoned.
This application Apr. 2, 1987, Ser. No. 35,254
Claims priority, application German Democratic Rep., Apr. 26, 1985, 275642

Int. Cl.⁴ C07D 209/96

U.S. Cl. 548-570

7 Claims

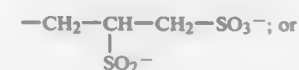
1. 3-sulfinatomethyl- and 3-sulfonatomethyl-4-sulfomethyl-pyrrolidinium betaines of Formula Ia and Ib



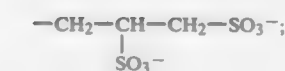
wherein

(A) R¹ is

- (a) hydrogen;
- (b) selected from the group consisting of (bi) unsubstituted C₁-C₂₂ alkyl, (bii) CH₂-CO-NH-alkyl, wherein alkyl is CH₃ to C₂₁H₄₃, and (biii) CH(CO-NH-alkyl)₂, wherein alkyl is CH₃ to C₂₁H₄₃;
- (c) 2-hydroxyethyl;
- (d) (CH₂-CH₂-O)_nH with n = 1 to 10;
- (e) benzyl;
- (f) -CH₂-CH₂-CH₂-SO₃⁻;
- (g)



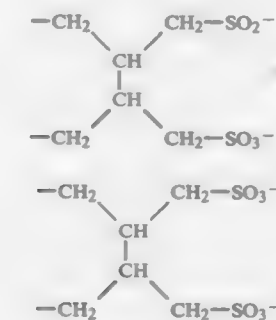
(h)



(B) R² is, independent of R¹,

- (a) hydrogen;
- (b) selected from the group consisting of (bi) unsubstituted C₁-C₂₂ alkyl, (bii) CH₂-CO-NH-alkyl, wherein alkyl is CH₃ to C₂₁H₄₃, and (biii) CH(CO-NH-alkyl)₂, wherein alkyl is CH₃ to C₂₁H₄₃;
- (c) 2-hydroxyethyl or
- (d) (CH₂-CH₂-O)_nH with n = 1 to 10;
- (C) R¹ and R² form together with the nitrogen atom a substituted heterocyclic ring with 4 carbon atoms of the structure

tuted heterocyclic ring with 4 carbon atoms of the structure



- (D) R³ and R⁴ are hydrogen or methyl;
- (E) M⁺ is selected from the group consisting of Na, K, NH₄ and H; and
- (F) X represents a whole number from 1 to 3.

4,877,886

PROCESS FOR THE PRODUCTION OF ALKYLENE CARBONATE

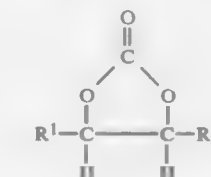
Bernard C. Ream, Charleston, W. Va., assignor to Union Carbide Chemicals and Plastics Company Inc., Danbury, Conn.
Filed Jun. 19, 1987, Ser. No. 63,977

Int. Cl.⁴ C07D 317/36, 317/38

U.S. Cl. 549-230

14 Claims

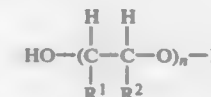
1. A process for the production of alkylene carbonate represented by the formula:



wherein R¹ and R² may be the same or different and are selected from the group consisting of hydrogen and alkyl of 1 to 6 carbons and R¹ and R² may form a cyclic structure, from alkylene oxide of the formula



and carbon dioxide comprising reacting the alkylene oxide with carbon dioxide under carbonate-forming conditions in the presence of catalyst comprising alkali or alkaline earth metal halide to produce alkylene carbonate and alkylene glycol of the formula



wherein n is 1 to about 8, said catalyst being soluble in said alkylene glycol; separating the alkylene carbonate from the alkylene glycol and catalyst to provide an alkylene glycol menstuum; contacting at least a portion of the alkylene glycol menstuum with sufficient acylating agent under acylating conditions to acylate the alkylene glycol and reduce the solubility of the catalyst in the alkylene glycol menstuum; and separating at least a portion of the catalyst from the acylated alkylene glycol menstuum.

4,877,887

PREPARATION OF ALKOXY MALEIC ANHYDRIDES Rainer Becker, Bad Duerkheim, and Wolfgang Rohr, Wachenheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed May 2, 1988, Ser. No. 189,297

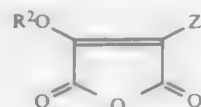
Claims priority, application Fed. Rep. of Germany, May 8, 1987, 3715344

Int. Cl.⁴ C07D 307/56, 307/62

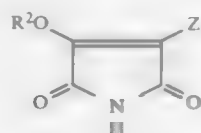
U.S. Cl. 549—253

2 Claims

1. A process for the preparation of a maleic anhydride



where R² is C₁-C₄-alkyl, C₂-C₄-alkenyl, C₁-C₄-haloalkyl or C₂-C₄-haloalkenyl and Z is hydrogen, halogen or a radical OR³, where R³ is C₁-C₄-alkyl, C₂-C₄-alkenyl, C₁-C₄-haloalkyl or C₂-C₄-haloalkenyl, which comprises: subjecting a maleimide



to alkaline hydrolysis at 0° to 100° C. and cyclizing the resulting maleic acid dianion in the presence of an acid to give the anhydride II; and isolating said anhydride II which has been formed in the reaction mixture.

4,877,888

13-DEOXY-23-IMINO DERIVATIVES OF 13-DEOXY C-076-AGLYCONE COMPOUNDS

Goro Asato, Titusville, and Donald J. France, Pennington, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

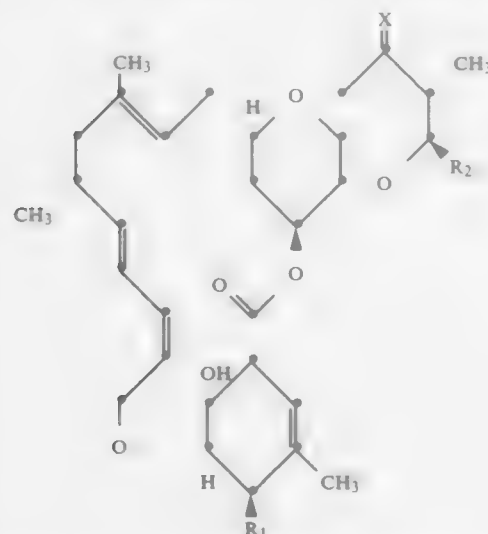
Continuation-in-part of Ser. No. 907,259, Sep. 12, 1986, abandoned. This application Aug. 27, 1987, Ser. No. 88,952

Int. Cl.⁴ C07D 311/68

U.S. Cl. 549—264

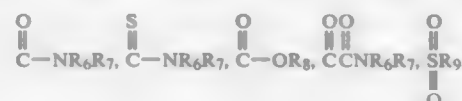
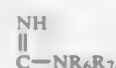
13 Claims

1. A compound represented by structural formula (I):



wherein R₁ is methoxy or hydroxy; R₂ is isopropyl or sec-butyl; X is NOR₄ or N-NHR₅; R₄ is hydrogen, C₁-C₆-alkyl,

C₁-C₄-alkoxymethyl, benzyl, allyl, propargyl, phenyl, CH₂COO-alkyl (C₁-C₄), N-(C₁-C₆ alkyl)carbamoyl, N-(alkyl)carbamoyl, N-(propargyl)carbamoyl, N-(phenyl)carbamoyl, N-(chlorophenyl)carbamoyl, N-(dichlorophenyl)carbamoyl, N-(benzyl)carbamoyl, C₁-C₆ alkanoyl, chloroacetyl, methoxyacetyl, phenylacetyl, optionally substituted on the phenyl ring with one or two halogens, C₁-C₄ alkyl groups, C₁-C₄ alkoxy groups or nitro groups, phenoxyacetyl, optionally substituted on the phenyl ring by one or two halogens, C₁-C₄ alkyl groups, C₁-C₄ alkoxy groups or nitro groups, or benzoyl, optionally substituted with one or two halogens, C₁-C₄ alkyl groups, C₁-C₄ alkoxy groups or nitro groups; R₅ is

C₁-C₆ alkanoyl, C₁-C₆ alkyl,

or benzoyl, optionally substituted with one or two halogens, C₁-C₄ alkyl groups, C₁-C₄ alkoxy groups or nitro groups; R₆ and R₇ are hydrogen or C₁-C₆ alkyl; or phenyl, optionally substituted with one or two halogens, C₁-C₄ alkyl, C₁-C₄ alkoxy, or phenyl optionally substituted with one or two halogens, C₁-C₄ alkyl groups, C₁-C₄ alkoxy groups or nitro groups; R₈ is C₁-C₆ alkyl or phenyl optionally substituted with one or two halogens, C₁-C₄ alkyl groups, C₁-C₄ alkoxy groups or nitro groups; R₉ is C₁-C₆ alkyl or phenyl optionally substituted with one or two halogens, C₁-C₄ alkyl groups, C₁-C₄ alkoxy groups or nitro groups; or a pharmaceutically and pharmacologically acceptable salt thereof.

4,877,889

METHOD AND INSTALLATION FOR THE CRYSTALLIZATION OF GLUCONODELTALACTONE

Jean-Bernard Leleu, and Patrick LeMay, both of Lestrem, France, assignors to Roquette Freres, Lestrem, France

Continuation of Ser. No. 863,144, May 14, 1986, abandoned.

This application Sep. 6, 1988, Ser. No. 241,381

Claims priority, application France, May 15, 1985, 85 07433

Int. Cl.⁴ C07D 309/30

U.S. Cl. 549—292

34 Claims

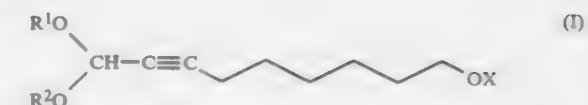


1. Method of continuous crystallization of gluconodeltalactone, i.e. GDL, comprising the steps of introducing into a first crystallization zone a gluconic acid syrup of a richness in gluconic acid higher than 80%, of a

concentration in dry matter of 80 to 95% by weight and of a temperature of 60° to 85° C.,

causing said syrup to traverse under stirring said first crystallization zone and maintaining it within said zone at a substantially constant temperature less by 2° to 10° C. than the saturation temperature, due to which the starting of crystallization is produced which is manifested by the formation of a mixture of syrup and of GDL crystals, the average dwell time of a given fraction of the mixture inside the zone being from 10 to 30 hours, so that this mixture emerging from the first zone shows a concentration of crystals of 2 to 15%,

causing said mixture when emerging from the first zone to pass through, from top to bottom, under malaxation, a second crystallization zone, wherein a temperature gradient decreasing globally from top to bottom by 0.2° to 1° C./hour is imposed on the said mixture, taking up at a level situated in the lower half of the second crystallization zone a fraction of the mixture traversing the said second zone, which fraction represents from 10 to 120% of the amount of syrup introduced into the first zone, the average dwell time of a given fraction of the mixture inside the second zone being from 40 to 80 hours, recycling said fraction to the level of the upper end of the said first crystallization zone thus facilitating the starting of the crystallization inside the first zone, and recovering the crystals from the mixture when emerging from the second zone in the vicinity of its lower end in the form of a crystalline mass rich in crystals.



where R¹ and R² are each C₁-C₆-alkyl or together form an alkylene chain of 2 to 5 carbon atoms and X is hydrogen or a protective group which can be eliminated.

4,877,892

CHIRAL GLYCIDYL AZIDES AS SYNTHETIC INTERMEDIATES TO OPTICALLY ACTIVE COMPOUNDS

David R. Brittelli, Nottingham, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

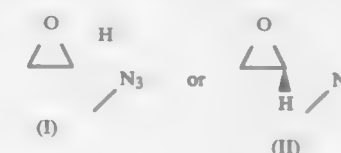
Filed Dec. 3, 1987, Ser. No. 128,287

Int. Cl.⁴ C07D 303/36

U.S. Cl. 549—552

1 Claim

1. A chiral glycidyl azide of the formula:



each said chiral azide of formula (I) or (II) being substantially free of the other chiral azide.

4,877,890

VITAMIN E INTERMEDIATE

Noel Cohen, Montclair, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 58,309, Jun. 5, 1987, Pat. No. 4,801,724.

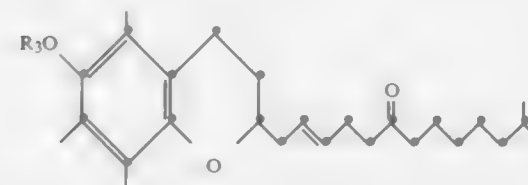
This application Oct. 17, 1988, Ser. No. 258,354

Int. Cl.⁴ C07D 311/72

U.S. Cl. 549—407

4 Claims

1. A compound of the formula:



wherein R₃ forms an ether hydroxy protecting group.

4,877,891

1,1-DIALKOXY- OR 1,1-(ALPHA, OMEGA-METHYLENEDIOXY)-NON-2-YN-9-O1 AND THEIR OH-PROTECTED DERIVATIVES

Rainer Becker, Bad Duerkheim; Walter Seufert, Speyer; Ernst Buschmann, and Christiane Bruchner, both of Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Aug. 5, 1988, Ser. No. 228,681

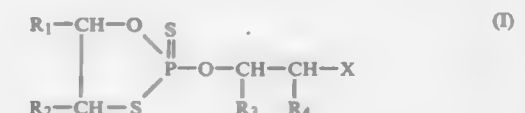
Claims priority, application Fed. Rep. of Germany, Aug. 8, 1987, 3726511

Int. Cl.⁴ C07D 309/10; C07C 43/303

U.S. Cl. 549—416

1 Claim

1. A 1,1-dialkoxy- or 1,1-(α,ω-methylenedioxy)-non-2-yn-9-ol or its OH-protected derivative of the formula I

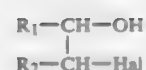


wherein

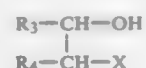
R₁, R₂, R₃, and R₄ independently from each other stand for hydrogen, C₁ to C₆ alkyl C₂ to C₆ alkenyl or C₂ to C₆ alkynyl; and

X is hydrogen, halogen, C₁ to C₆ alkyl, or mercapto; which comprises the steps of:

(a) reacting phosphorous pentasulfide in an organic solvent at a temperature between 20° C. and 100° C. with a compound of the Formula (II)

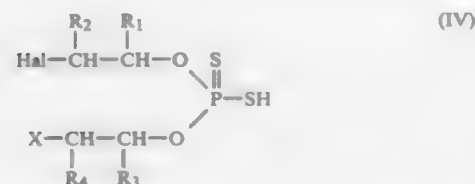


and a compound of the Formula (III)



wherein

Hal is chlorine or bromine, to obtain a compound of the Formula (IV)



- (b) treating the compound of the Formula (IV) with a base at a temperature between 60° C. and 80° C. to obtain a compound of the Formula (I); and
(c) isolating the compound of the Formula (I).

4,877,894

HYDROCARBON GELLER AND METHOD FOR MAKING THE SAME

David A. Huddleston, Sugar Land, Tex., assignor to Nalco Chemical Company, Sugar Land, Tex.

Filed Jan. 11, 1988, Ser. No. 142,703

Int. Cl.⁴ C07F 9/00

U.S. Cl. 558—113

6 Claims

1. A hydrocarbon gelling agent comprising the reaction product of (1) a polyphosphate intermediate produced by reacting triethyl phosphate and phosphorous pentoxide and (2) a mixed alcohol comprising from about 13% to about 92% by weight hexanol.

4,877,895

GLYCINE AND β ALANINE DERIVATIVES AS SWEETENING AGENTS

Claude Nofre, Lyons; Jean M. Tinti, Meyzieu, and Farroudia O. Chatzopoulos, Saint Etienne, all of France, assignors to Université Claude Bernard - Lyon 1, France

Filed Mar. 4, 1986, Ser. No. 836,071

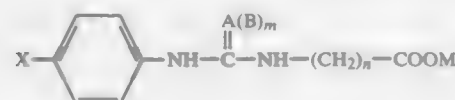
Claims priority, application France, Mar. 19, 1985, 85 04242

Int. Cl.⁴ C07C 121/52

U.S. Cl. 558—413

7 Claims

1. Sweetening agents, characterized in that they respond to the following general formula:



wherein:

A is an imino (=N—), iminium (=N<), methylene (=C₂) group, the iminium group being able to be salified by a chloride ion;

m is a number equal to 1 when A is an imino group and is equal to 2 when A is a methylene or iminium group;

n is a number equal to 1 or 2;

B:

when n=1, represents H, CN, OCH₃, NO₂, SO₂R, wherein

R is an alkyl, cycloalkyl or aryl group having up to 10

carbon atoms, or such a group wherein 1 or 2 carbon atoms are substituted by 1 or 2 sulfur or oxygen atoms; when n=2, represents H, CN, OCH₃;

X:

represents CN, NO₂, when B is H, CN, or OCH₃;

represents CN, NO₂, COCH₃, Cl, F, H, when B is NO₂, or SO₂R;

M is a hydrogen atom or a physiologically acceptable organic or inorganic cation.

4,877,896

SULFOAROYL END-CAPPED ESTER OF OLIGOMERS SUITABLE AS SOIL-RELEASE AGENTS IN DETERGENT COMPOSITIONS AND FABRIC-CONDITIONER ARTICLES

Rene Maldonado, Holland, Pa.; Toan Trinh, Maineville, and Eugene P. Gosselink, Cincinnati, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Oct. 5, 1987, Ser. No. 105,421

Int. Cl.⁴ C07C 143/525

U.S. Cl. 560—14

28 Claims

1. A water-soluble or water-dispersible, oligomeric or polymeric composition which comprises from about 25% to 100% of a substantially linear, sulfoaroyl end-capped ester having molecular weight ranging from about 500 to about 20,000; wherein said ester consists essentially of, on a molar basis,

(i) from about 1 to about 2 moles of sulfobenzoyl end-capping units of the formula (MO₃S)(C₆H₄)C(O)— wherein M is a salt-forming cation;

(ii) from about 2 to about 50 moles of oxy-1,2-propyleneoxy units or mixtures thereof with oxyethyleneoxy units provided that the oxy-1,2-propyleneoxy: oxyethyleneoxy mole ratio is in the range from about 1:10 to about 1:0; and

(iii) from about 1 to about 40 moles of terephthaloyl units provided that the mole ratio of said units identified by (ii) and (iii) is from about 2:1 to about 1:24; and which further optionally comprises, per mole of said ester,

(iv) from 0 to about 30 moles of 5-sulfoisophthaloyl units of the formula —(O)C(C₆H₃)(SO₃M)C(O)— wherein M is a salt-forming cation; or

(v) from 0 to about 25 moles of poly(oxyethylene)oxy units of the formula —(OCH₂CH₂)_nO— wherein the average degree of ethoxylation n ranges from 2 to about 100; or

(vi) from 0 to about 30 moles of a mixture of said units (iv) and (v) at a (iv):(v) mole ratio of from about 29:1 to about 1:29;

provided that when said ester consists essentially of said units identified by (i), (ii), and (iii), the content of said terephthaloyl units ranges from about 1 mole to about 8 moles; when said ester consists essentially of said units identified by (i), (ii), (iii) and (iv), the content of said 5-sulfoisophthaloyl units ranges from about 0.05 moles to about 18 moles; when said ester consists essentially of said units identified by (i), (ii), (iii), and (v), the content of said poly(oxyethylene)oxy units ranges from about 0.05 moles to about 10 moles; and further provided that when said ester consists essentially of said units identified by (i), (ii) and (iii) together with said units identified by said mixture (vi) of said units (iv) and (v), the content of said units identified by (iv) and (v) together ranges from about 0.1 moles to about 20 moles.

4,877,897

4-TRIFLUOROMETHYL-4'-NITRODIPHENYL ETHERS

Colin Swithenbank, Perkaskie, and Ted. T. Fujimoto, Churchville, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

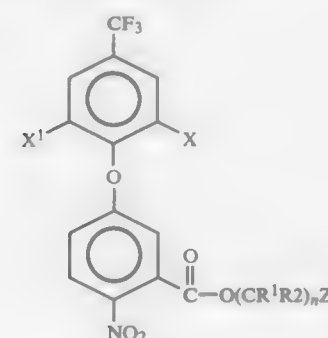
Division of Ser. No. 386,455, Jun. 8, 1982, which is a continuation of Ser. No. 149,618, May 14, 1980, abandoned, which is a continuation-in-part of Ser. No. 47,654, Jun. 11, 1979, abandoned. This application Nov. 10, 1982, Ser. No. 440,700

Int. Cl.⁴ C07C 79/46

U.S. Cl. 560—021

11 Claims

1. A compound of the formula



wherein X is hydrogen, halo, trihalomethyl, alkyl, cyano, or nitro; X' is hydrogen, halo or trifluoromethyl; R¹ and R² are the same or different radicals selected from hydrogen, lower alkyl, phenyl or benzyl; n is an integer of from 1 to 5; and Z is nitro.

4,877,898

PROCESS FOR ONE STEP ESTERIFICATION USING AN INTERMETALLIC PALLADIUM BASED CATALYST SYSTEM

Christos Paparizos, Willowick; Wilfrid G. Shaw, Lyndhurst, and James L. Callahan, Wooster, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Continuation of Ser. No. 724,533, Apr. 18, 1985, abandoned.

This application Jun. 12, 1986, Ser. No. 873,428

Int. Cl.⁴ C07C 67/39

U.S. Cl. 560—208

9 Claims

1. A process for the one step esterification of aldehydes and alcohols comprising the steps of:

combining an aldehyde with an alcohol, in the presence of oxygen and in contact with a catalyst having the general formula



where a and d are from 0.25 to 3.

4,877,899

NOVEL COMPOSITIONS

Robert L. Carney, Palo Alto, and Thomas L. Brown, Modesto, both of Calif., assignors to Sandoz Ltd., Basle, Switzerland

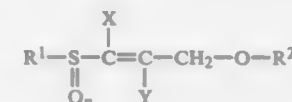
Filed Nov. 23, 1983, Ser. No. 554,733

Int. Cl.⁴ C07C 67/02

U.S. Cl. 560—262

20 Claims

1. A compound of the following formula (A):



wherein,

n is zero, one or two;

R¹ is lower alkyl of 1-8 carbon atoms, lower haloalkyl of 1-8

carbon atoms, lower alkenyl of 2-8 carbon atoms, lower haloalkenyl of 2-8 carbon atoms, lower alkoxyalkyl of 2-10 carbon atoms or phenylalkyl;

R² is hydrogen, lower alkyl of 1-8 carbon atoms, lower haloalkyl of 1-8 carbon atoms, lower alkoxyalkyl of 2-10 carbon atoms, lower acylalkyl of 3-10 carbon atoms, lower alkenyl of 2-8 carbon atoms, lower haloalkenyl of 2-8 carbon atoms, lower alkynyl of 2-8 carbon atoms, lower acyl of 2-8 carbon atoms or lower alkoxyalkenyl of 2-8 carbon atoms;

X is hydrogen, lower alkyl of 1-8 carbon atoms, lower haloalkyl of 1-8 carbon atoms or halogen; and

Y is hydrogen or halogen; provided that:

(a) when n is zero R¹ is 3-methyl-2-butenyl, R² is hydrogen and Y is hydrogen, then X is other than methyl; or

(b) when R² is hydrogen or lower acyl and Y is hydrogen, then X is other than hydrogen.

4,877,900

PROCESS FOR PREPARING TEREPHTHALIC ACID OF HIGH QUALITY

Akio Tamara, and Yoshiaki Izumisawa, both of Kitakyushu, Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

Filed Apr. 5, 1988, Ser. No. 177,951

Claims priority, application Japan, Apr. 24, 1987, 62-101373

Int. Cl.⁴ C07C 51/265

U.S. Cl. 562—413

19 Claims

1. A process for preparing terephthalic acid of high quality which comprises:

oxidizing p-xylene with molecular oxygen in an acetic acid solvent in the presence of a catalyst comprised of at least one heavy metal and bromine at a temperature of from 180° to 230° C. to convert at least 95 wt % of the p-xylene into terephthalic acid and, optionally, subjecting the resultant reaction mixture to low temperature post-oxidation with molecular oxygen at temperatures lower than the temperature of the first oxidation reaction, thereby obtaining a slurry containing terephthalic acid particles whose spectral reflectance defined below is not less than 70% and whose reflectance ratio (400/500) defined below is not less than 0.92;

subjecting the slurry to high temperature post-oxidation with molecular oxygen at a temperature of from 235° to 290° C. and then to crystallization; and collecting the resultant terephthalic acid from the reaction mixture.

4,877,901

PROCESS FOR SYNTHESIZING N,N'-DITHIOBIS(SULFONAMIDES)

Roger J. Hopper; Niranjana V. Shah, both of Akron, and Steven M. Ryba, Norton, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Oct. 28, 1988, Ser. No. 263,836

Int. Cl.⁴ C07C 143/75

U.S. Cl. 564—82

14 Claims

1. A process for synthesizing N,N'-dithiobis(sulfonamides) comprising reacting a sulfonamide of the formula:



with sulfur monochloride and caustic in a mixed organic-aqueous media, wherein R¹ and R² are independently selected from the group consisting of alkyl radicals having 1 to 20 carbon atoms, cycloalkyl radicals having 5 to 20 carbon atoms, phenyl radicals and alkaryl radicals having 7 to 20 carbon atoms, and haloaryl radicals having about 6 to about 10 carbon atoms and where R¹ is also selected from radicals having the formula:



wherein R^3 and R^4 are individually selected from said alkyl, cycloalkyl, phenyl, alkaryl and haloaryl radicals and wherein R^3 and R^4 can be joined together to represent radicals selected from $-\text{CH}_2-$, where n is an integer of 4 to 7 and $-\text{CH}_2)_2$ $\text{O}-\text{CH}_2-$.

4,877,902

POLYTHIOBISPHENOL PROCESS

Vincent J. Gatto, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Mar. 14, 1988, Ser. No. 167,876

Int. Cl.⁴ C07C 148/02

U.S. Cl. 568—23

20 Claims

1. A process for making a 4,4'-polythiobis(2,6-dialkylphenol), said process comprising reacting a 2,6-dialkylphenol with S_2Cl_2 in a nitroalkane solvent at -10° to 30° C. to form a mixture of mainly 4,4'-dithiobis and 4,4'-trithiobis(2,6-dialkylphenol).

4,877,903

CYCLOHEXANOL/CYCLOHEXANONE MIXTURES PRODUCED FROM CYCLOHEXANE

Michel Costantini, Lyons, and Francoise Igersheim, Villeurbanne, both of France, assignors to Rhone-Poulenc Chimie, Courbevoie, France

Continuation of Ser. No. 106,773, Oct. 13, 1987, abandoned.

This application Nov. 14, 1988, Ser. No. 271,346

Claims priority, application France, Oct. 10, 1986, 86 14282

Int. Cl.⁴ C07C 45/33

U.S. Cl. 568—342

16 Claims

1. A process for the preparation of a cyclohexanol/cyclohexanone admixture, comprising oxidizing cyclohexane in air, at a temperature of from about 80° C. to 160° C., and concomitantly decomposing cyclohexyl hydroperoxide thus formed, in the presence of a catalytically effective amount of (i) manganese or compound thereof, (ii) a Brönsted acid having a pK_a of at least 0.7, and (iii) a pyridine ligand.

4,877,904

BICYCLIC KETONES AS ODORANTS AND FLAVORANTS

Peter Naegeli, Wettingen, Switzerland, assignor to Givaudan Corporation, Clifton, N.J.

Filed Sep. 9, 1987, Ser. No. 94,560

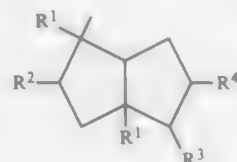
Claims priority, application Switzerland, Sep. 18, 1986, 8740/86

Int. Cl.⁴ C07C 49/21

U.S. Cl. 568—374

8 Claims

1. A compound of the formula



wherein:

R^1 represents methyl or ethyl,
 R^2 represents hydrogen or methyl,
the dotted line represents an optional carbon-carbon bond,
 R^3 is hydrogen and R^4 represents acetyl or propionyl.

4,877,905

POLYETHER COMPOUNDS AND THEIR PREPARATION

Richard D. Chambers, 5 Aykley Green, Whitesmoocks, Durham City, England (DH1 4LM)

Filed May 28, 1987, Ser. No. 55,023

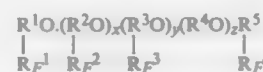
Claims priority, application United Kingdom, May 28, 1986, 8612983

Int. Cl.⁴ C07L 43/11, 43/12

U.S. Cl. 568—615

5 Claims

1. A substituted polyether intermediate of the general formula



wherein the symbols R^1 , R^2 , R^3 , R^4 and R^5 each represent an alkyl group containing from 1 to 4 carbon atoms, which alkyl groups may differ, the symbols R^1 , R^2 , R^3 and R^4 each represent fluorine-containing hydrocarbon groups containing from 2 to 6 carbon atoms, which hydrocarbon groups may differ, x is an integer and each of y and z is zero or an integer, and the sum of x , y and z is at least 2 and not greater than 100.

4,877,906

PURIFICATION OF POLYOLS PREPARED USING DOUBLE METAL CYANIDE COMPLEX CATALYSTS

Stephen D. Harper, West Chester, Pa., assignor to Arco Chemical Technology, Inc., Wilmington, Del.

Filed Nov. 25, 1988, Ser. No. 276,275

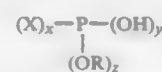
Int. Cl.⁴ C07C 41/34, 41/44

U.S. Cl. 568—621

38 Claims

1. A process for purifying a polyol containing a double metal cyanide complex catalyst which comprises the steps of:

- treating the polyol with at least one alkali metal compound selected from the group consisting of alkali metals, alkali metal hydroxides, alkali metal hydrides, and alkali metal alkoxides in an amount sufficient to convert the double metal cyanide complex catalyst into an insoluble portion and a soluble portion and to convert at least a portion of the polyol hydroxyl groups to alkoxide groups,
- filtering the treated polyol to remove the insoluble portion,
- further treating the filtered polyol with a sufficient amount of at least one phosphorous compound to convert the soluble portion of the double metal cyanide complex catalyst produced in step (a) to a second insoluble portion, said phosphorous compound selected from the group consisting of pyrophosphorous acid, hypophosphorous acid, phosphorous acid, and compounds having the formula



wherein R is linear or branched alkyl, phenyl, or substituted phenyl, X is Cl or Br, x is 0, 1, 2, or 3, y is 0, 1, or 2, z is 0, 1, 2, or 3, and the sum of $x+y+z$ is 3, with the proviso that the filtered polyol additionally be treated with water when the phosphorous compound is pyrophosphorous acid or when x is 1, 2, or 3, or z is 1, 2, or 3,

- filtering the phosphorous compound-treated polyol to remove the second insoluble portion of the double metal cyanide complex catalyst produced in step (c), and
- recovering the resulting purified polyol

4,877,907

PREPARATION PROCESS OF 4,4'-BIPHENOL, PRECURSOR OF SAME AND PREPARATION PROCESS OF PRECURSOR

Tohru Miura; Teruyuki Nagata; Koji Okazaki; Masayuki Furuya, and Emiko Nishida, all of Ohmura, Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Division of Ser. No. 178,301, Apr. 6, 1988. This application Apr. 14, 1989, Ser. No. 338,206

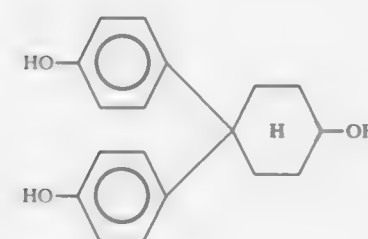
Claims priority, application Japan, Apr. 14, 1987, 62-89890; Dec. 18, 1987, 62-318701

Int. Cl.⁴ C07C 39/17

U.S. Cl. 568—721

1 Claim

1. A preparation process of 4-(4-hydroxyphenyl)-3-cyclohexene-1-ol which comprises conducting a thermal decomposition reaction of 4,4-bis(4-hydroxyphenyl)cyclohexanol having the formula (II):



in the absence of a dehydrogenation catalyst and of a hydrogen acceptor.

4,877,908

CHIRAL PHOSPHORUS COMPOUNDS, A PROCESS FOR THEIR MANUFACTURE AND THEIR APPLICATION TO THE CATALYSIS OF ENANTIOSELECTIVE SYNTHESIS REACTIONS

Michele Petit, Wasquehal; Andre Mortreux, Hem; Francis Petit, Wasquehal, and Gerard Buono, Marseille, all of France, assignors to Norsolor, Paris, France

Continuation of Ser. No. 698,412, Feb. 5, 1983, abandoned, which is a continuation-in-part of Ser. No. 638,268, Aug. 6, 1984, abandoned. This application Oct. 13, 1987, Ser. No. 107,919

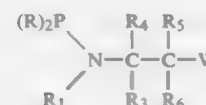
Claims priority, application France, Aug. 5, 1983, 83 12983

Int. Cl.⁴ C07C 27/00

U.S. Cl. 568—814

32 Claims

1. A method of using an aminophosphine-phosphinite chiral ligand of the formula



wherein:

W is $\text{OP}(R)_2$;

R is a hydrocarbon radical selected from the group consisting of alkyl, aryl and cycloalkyl radicals;

R_1 is selected from the group consisting of a hydrogen atom and hydrocarbon radicals;

R_3 and R_4 , which must be different from one another, are selected from the group consisting of a hydrogen atom and hydrocarbon radicals that may or may not carry at least one functional group selected from the group consisting of the alcohol, thiol, thioether, amine, imine, acid, ester, amide, and ether functional groups; and

R_5 and R_6 are selected from the group consisting of a hydrogen atom and hydrocarbon radicals that may or may not contain functional groups, in a reaction for the synthesis of optically active organic compounds, comprising reacting one or more organic compounds that do not possess a center of asymmetry with (A) one or more transition metal complexes of the formula MZ_q , wherein M is a metal of group VIII of the Periodic Table, q is the degree of coordination of the metal M , and Z is an atom or molecule capable of complexing the metal M and (B) one or more such chiral ligands to form said optically active organic compound, wherein said synthesis reaction is selected from the group consisting of the hydroformylation reaction of unsaturated organic substrates at a temperature of between 15° and 300° C. and under a pressure of between 1 and 350 bars, the hydrosilylation reaction of ketones or imines, and the cyclodimerization and dimerization reactions of conjugated dienes and the codimerization reactions of ethylene and a conjugated diene at a temperature of between -30° and $+100^\circ$ C. and under a pressure of less than 100 bars.

14. A method as claimed in claim 1, wherein the synthesis reaction is a hydrosilylation reaction of ketones or imines.

4,877,909

PROCESS FOR REDUCING ALDEHYDES OR KETONES

Shigenobu Mizusaki; Hajime Matsushita; Shigeo Ishiguro; Hiroshi Ichinose, all of Yokohama, and Akira Izumi, Kyoto, all of Japan, assignors to Japan Tobacco, Inc., Tokyo, Japan

PCT No. PCT/JP86/00460, § 371 Date Feb. 22, 1988, § 102(e)

Date Feb. 22, 1988, PCT Pub. No. WO88/01995, PCT Pub.

Date Mar. 24, 1988

PCT Filed Sep. 10, 1986, Ser. No. 126,106

Int. Cl.⁴ C07C 29/132, 29/14

U.S. Cl. 568—880

19 Claims

1. Process for reducing an aldehyde or ketone to the corresponding alcohol, which comprises reacting at a temperature of about 70° to 200° C. an aldehyde or ketone selected from the group consisting of unsubstituted aliphatic or aromatic aldehydes and ketones, with isopropyl alcohol in the presence of a solid catalyst, prepared by partially dehydrating zirconium oxide to form said catalyst, to reduce directly the aldehyde or ketone and thereby form the corresponding alcohol from the aldehyde or ketone.

4,877,910

PROCESS FOR PREPARING POLYALKYL TETRAHYDRONAPHTHALENES

Walter C. Frank, Holland, Pa., assignor to Union Carbide Corporation, Wayne, N.J.

Filed Jan. 27, 1989, Ser. No. 303,366

The portion of the term of this patent subsequent to Oct. 31, 2006, has been disclaimed.

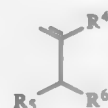
Int. Cl.⁴ C07C 12/00, 12/64, 2/64

U.S. Cl. 585—411

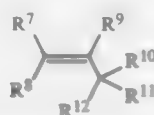
55 Claims

1. A process for producing a polyalkyl tetrahydronaphthalene compound comprising contacting a partially substituted benzene compound, wherein said benzene compound is substituted with two or more substituents that do not substantially interfere with a Friedel-Crafts-type alkylation reaction said substituents including at least one secondary alkyl group having only one alpha-hydrogen, and wherein said benzene

compound is unsubstituted in at least one position adjacent to said secondary alkyl group, with an olefinic compound of the Formula



in the presence of a reagent of the Formula



provided that said reagent has greater electron releasing properties than said olefinic compounds, an alkyl halide or a hydrogen halide, and a Lewis acid, wherein $R^4, R^5, R^6, R^7, R^8, R^9, R^{10}, R^{11}$ and R^{12} , independently, are substituents that do not substantially interfere with a Friedel-Crafts-type alkylation reaction, provided that (i) R^5 and R^6 are each other than H, (ii) no more than one of R^7, R^8 and R^9 are H, and (iii) no more than one of R^{10}, R^{11} and R^{12} are H, wherein said process is carried out in the substantial absence of elemental iodine.

4,877,911 PROCESS FOR PREPARING POLYALKYL TETRAHYDRONAPHTHALENES

Walter C. Frank, Holland, Pa., assignor to Union Camp Corporation, Wayne, N.J.

Filed Jan. 27, 1989, Ser. No. 303,422

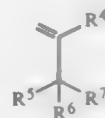
The portion of the term of this patent subsequent to Oct. 31, 2006, has been disclaimed.

Int. Cl.⁴ C07C 12/00, 12/64, 2/64

U.S. Cl. 585—411

38 Claims

1. A process for producing a polyalkyl tetrahydronaphthalene compound comprising contacting a partially substituted benzene compound, wherein said benzene compound is substituted with two or more substituents that do not substantially interfere with a Friedel-Crafts-type alkylation reaction said substituents including at least one secondary alkyl group having only one alpha-hydrogen, and wherein said benzene compound is unsubstituted in at least one position adjacent to said secondary alkyl group, with an olefinic compound of the Formula



[VI]

wherein R^4, R^5, R^6 , and R^7 , independently, are substituents that do not substantially interfere with a Friedel-Crafts-type alkylation reaction, provided that R^5, R^6 and R^7 are each other than H, in the presence of an alkyl halide, a Lewis acid, and a phase transfer agent.

4,877,912 PROCESS FOR PREPARING 1,1,3,4,4,6-HEXAMETHYL-1,2,3,4-TETRAHYDRONAPHTHALENE

Walter C. Frank, Holland, Pa., assignor to Union Camp Corporation, Wayne, N.J.

Filed Jan. 27, 1989, Ser. No. 303,356

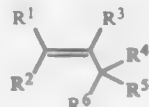
The portion of the term of this patent subsequent to Oct. 31, 2006, has been disclaimed.

Int. Cl.⁴ C07C 12/00, 12/64, 2/64

U.S. Cl. 585—411

10 Claims

1. A process for producing 1,1,3,4,4,6-hexamethyl-1,2,3,4-tetrahydronaphthalene comprising contacting para-cymene with 2,3-dimethyl-1-butene in the presence of a reagent of the Formula



aluminum halide, and I_2 , wherein R^1, R^2, R^3, R^4, R^5 and R^6 , independently, are a H or C_1 - C_3 straight chain, or branched alkyl, provided that (i) no more than one of R^1, R^2 , and R^3 are H, and (ii) no more than one of R^4, R^5 and R^6 are H.

4,877,913 PROCESS FOR PREPARING POLYALKYL TETRAHYDRONAPHTHALENES

Walter C. Frank, Holland, Pa., assignor to Union Camp Corporation, Wayne, N.J.

Filed Jan. 27, 1989, Ser. No. 303,355

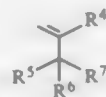
The portion of the term of this patent subsequent to Oct. 31, 2006, has been disclaimed.

Int. Cl.⁴ C07C 12/00, 12/64, 2/64

U.S. Cl. 585—411

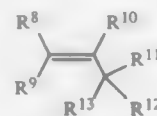
50 Claims

1. A process for producing a polyalkyl tetrahydronaphthalene compound comprising contacting a partially substituted benzene compound, wherein said benzene compound is substituted with two or more substituents that do not substantially interfere with a Friedel-Crafts-type alkylation reaction said substituents including at least one secondary alkyl group having only one alpha-hydrogen, and wherein said benzene compound is unsubstituted in at least one position adjacent to said secondary alkyl group, with an olefinic compound of the Formula



[VI]

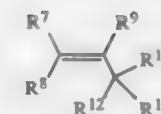
in the presence of a reagent of the Formula



[VII]

provided that said reagent has greater electron releasing properties than said olefinic compounds, and a Lewis acid, wherein $R^4, R^5, R^6, R^7, R^8, R^9, R^{10}, R^{11}, R^{12}$ and R^{13} , independently, are substituents that do not substantially interfere with a Friedel-Crafts-type alkylation reaction, provided that (i) R^5, R^6 and R^7 are each other than H,

(ii) no more than one of R^8, R^9 and R^{10} are H, and (iii) no more than one of R^{11}, R^{12} and R^{13} are H, wherein said process is carried out in the substantial absence of elemental iodine.



[VII]

4,877,914 PROCESS FOR PREPARING POLYALKYL TETRAHYDRONAPHTHALENES

Walter C. Frank, Holland, Pa., assignor to Union Camp Corporation, Wayne, N.J.

Filed Jan. 27, 1989, Ser. No. 303,419

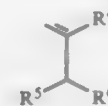
The portion of the term of this patent subsequent to Oct. 31, 2006, has been disclaimed.

Int. Cl.⁴ C07C 12/00, 12/64, 2/64

U.S. Cl. 585—411

38 Claims

1. A process for producing a polyalkyl tetrahydronaphthalene compound comprising contacting a partially substituted benzene compound, wherein said benzene compound is substituted with one or more substituents that do not substantially interfere with a Friedel-Crafts-type alkylation reaction said substituents including at least one secondary alkyl group having only one alpha-hydrogen, and wherein said benzene compound is unsubstituted in at least one position adjacent to said secondary alkyl group, with an olefinic compound of the formula



[VI]

wherein R^4, R^5 and R^6 , independently, are substituents that do not substantially interfere with a Friedel-Crafts-type alkylation reaction, provided that R^5 and R^6 are each other than H, in the presence of an alkyl halide, a Lewis acid, and a phase transfer agent.

4,877,915 PROCESS FOR PREPARING POLYALKYL TETRAHYDRONAPHTHALENES

Walter C. Frank, Holland, Pa., assignor to Union Camp Corporation, Wayne, N.J.

Filed Jan. 27, 1989, Ser. No. 303,364

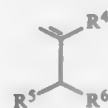
The portion of the term of this patent subsequent to Oct. 31, 2006, has been disclaimed.

Int. Cl.⁴ C07C 12/00, 12/64, 2/64

U.S. Cl. 585—411

48 Claims

1. A process for producing a polyalkyl tetrahydronaphthalene compound comprising contacting a partially substituted benzene compound, wherein said benzene compound is substituted with two or more substituents that do not substantially interfere with a Friedel-Crafts-type alkylation reaction said substituents including at least one secondary alkyl group having only one alpha-hydrogen, and wherein said benzene compound is unsubstituted in at least one position adjacent to said secondary alkyl group, with an olefinic compound of the Formula



[VI]

in the presence of a reagent of the Formula

provided that said reagent has greater electron releasing properties than said olefinic compounds, and a Lewis acid, wherein

$R^4, R^5, R^6, R^7, R^8, R^9, R^{10}, R^{11}$ and R^{12} , independently, are substituents that do not substantially interfere with a Friedel-Crafts-type alkylation reaction, provided that (i) R^5 and R^6 are each other than H, (ii) no more than one of R^7, R^8 and R^9 are H, and (iii) no more than one of R^{10}, R^{11} and R^{12} are H, wherein said process is carried out in the substantial absence of elemental iodine.

4,877,916 PROCESS FOR PREPARING POLYALKYL TETRAHYDRONAPHTHALENES

Walter C. Frank, Holland, Pa., assignor to Union Camp Corporation, Wayne, N.J.

Filed Jan. 27, 1989, Ser. No. 303,365

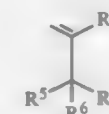
The portion of the term of this patent subsequent to Oct. 31, 2006, has been disclaimed.

Int. Cl.⁴ C07C 12/00, 12/64, 2/64

U.S. Cl. 585—411

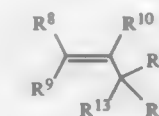
55 Claims

1. A process for producing a polyalkyl tetrahydronaphthalene compound comprising contacting a partially substituted benzene compound, wherein said benzene compound is substituted with two or more substituents that do not substantially interfere with a Friedel-Crafts-type alkylation reaction said substituents including at least one secondary alkyl group having only one alpha-hydrogen, and wherein said benzene compound is unsubstituted in at least one position adjacent to said secondary alkyl group, with an olefinic compound of the Formula



[VI]

in the presence of a reagent of the Formula



[VII]

provided that said reagent has greater electron releasing properties than said olefinic compounds, an alkyl halide or a hydrogen halide, and a Lewis acid, wherein

$R^4, R^5, R^6, R^7, R^8, R^9, R^{10}, R^{11}, R^{12}$ and R^{13} , independently, are substituents that do not substantially interfere with a Friedel-Crafts-type alkylation reaction, provided that (i) R^5, R^6 and R^7 are each other than H, (ii) no more than one of R^8, R^9 and R^{10} are H, and (iii) no more than one of R^{11}, R^{12} and R^{13} are H, wherein said process is carried out in the substantial absence of elemental iodine.

4,877,917

METHOD OF POLYMERIZING α,ω -DIYNES

Michael F. Farona, Cuyahoga Falls, and Ramji Srinivasan, Akron, both of Ohio, assignors to University of Akron, Akron, Ohio

Filed Oct. 17, 1988, Ser. No. 258,791
Int. Cl.⁴ C07C 12/02

U.S. Cl. 585—416

16 Claims

1. A method of reacting an α,ω -diyne to form products containing at least one of the class of dimers, trimers and higher polymers comprising contacting said α,ω -diyne either as a sole reactant or together with an alkyne with a niobium catalyst or tantalum catalyst to effect formation of a benzo product characterized as highly soluble to insoluble in benzene at 25° C.

4,877,918

PROCESS FOR PREPARING INTERNAL OLEFINS

Gohfu Suzukamo, Ibaraki, and Masami Fukao, Shiga, both of Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

Filed Aug. 15, 1988, Ser. No. 232,231
Claims priority, application Japan, Dec. 16, 1987, 62-319294
Int. Cl.⁴ C07C 5/23, 5/25

U.S. Cl. 585—664

23 Claims

1. A process for isomerizing an olefin to an internal olefin in the presence of a solid base which comprises: pretreating alumina with at least one salt selected from the group consisting of alkali metal carbonates and alkali metal aluminates so as to form pretreated alumina, forming a solid base by heating an alkali metal hydride and said pretreated alumina in an atmosphere of an inert gas at a temperature of 200° to 450° C., and isomerizing an unprocessed olefin to an internal olefin in the presence of said solid base at an isomerization temperature of from -30° to +120° C., wherein said solid base is present in an amount of from 1/3000 to 1/20 part by weight of unprocessed olefin.

4,877,919

BUTANE ISOMERIZATION IN THE PRESENCE OF C₅ AND C₆ HYDROCARBONS

Robert J. Schmidt, Rolling Meadows, Ill., assignor to UOP, Des Plaines, Ill.

Filed Apr. 25, 1988, Ser. No. 185,568
Int. Cl.⁴ C07C 5/13

U.S. Cl. 585—748

6 Claims

1. A process for isomerizing C₄ normal hydrocarbons in the presence of C₅ and C₆ normal hydrocarbons, said method comprising:

- charging a feed stream to a reaction zone, said feed stream comprising C₄-C₆ hydrocarbons and having at least 10 mol% C₄ hydrocarbons and at least 25 mol% C₅-C₆ hydrocarbons;
- adding hydrogen to said feed stream at a hydrogen to hydrocarbon ratio of less than 0.5;
- contacting said feed stream and hydrogen in said reaction zone with an isomerization catalyst consisting of alumina, 0.01 to 0.25 wt.% platinum and from 2 to 10 wt.% of a chloride component at isomerization conditions including a temperature in the range of from 200°-225° C. (392°-435° F.), a pressure of from 7 to 70 barsg and a space velocity of from 0.1 to 10;
- maintaining a chloride concentration in the reaction zone of from 30 to 300 ppm; and
- recovering an effluent stream from the reaction zone comprising an isomerate product stream having a C₄ isoparaffin/C₄ hydrocarbon ratio of at least 20%.

4,877,920

PROCESS FOR REMOVING ARSINE IMPURITIES IN PROCESS STREAMS

Richard A. Lush, Wilmington, Del., and Hsiang-Wei Tsao, West Chester, Pa., assignors to San Refining and Marketing Company, Philadelphia, Pa.

Filed Jun. 8, 1988, Ser. No. 203,847
Int. Cl.⁴ C07C 7/12

U.S. Cl. 585—823

9 Claims

1. A process for reducing the arsenic content of a hydrocarbon-containing fluid which comprises contacting said fluid with copper oxide supported and activated carbon.

4,877,920

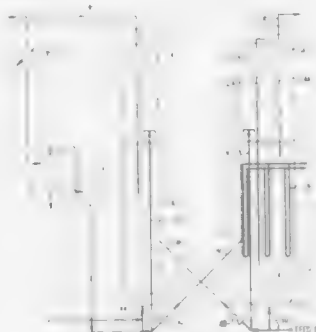
SINGLE ZONE OLIGOMERIZATION OF OLEFINS IN A SUPER-DENSE PHASE TURBULENT FLUID BED

Mohsen N. Harandi, 12 Catbird Ct., Lawrenceville, N.J. 08648, and Hartley Owen, 5 Riverview Ter., Belle Mead, N.J. 08502

Filed Apr. 20, 1988, Ser. No. 184,465
Int. Cl.⁴ C07C 3/10, 3/20

U.S. Cl. 585—533

22 Claims



1. A catalytic process for upgrading a C₂+ olefin feedstream to a heavier product stream rich in C₁₀+ aliphatic hydrocarbons, said process comprising:

- contacting said olefin feedstream with a finely divided medium pore zeolite metallosilicate catalyst having a silica:alumina ratio greater than 12, and a constraint index in the range from about 1 to about 12, maintained as a super-dense fluid-bed operating in a single zone turbulent regime at or above a pressure P_{max} and a temperature T_{max} at which there be no liquid phase present;
- flowing said olefin feedstream through said bed at a weight hourly space velocity (WHSV) in the range from about 0.05 to about 50 hr⁻¹, without forming a liquid phase in said bed;
- maintaining a catalyst fines content of from about 5% to about 20% by wt, based on the weight of the catalyst in the bed, said fines having a particle size less than 32 microns, and;
- recovering said C₁₀+ aliphatic hydrocarbons from said product stream leaving said bed at or above said P_{max} and T_{max}.

4,877,922

COMPOSITION EASILY DYEABLE WITH SUBLIMABLE DESPERSE DYE

Isao Sasaki, Hiroshima; Kenji Kushi, Ohtake, and Nobuyoshi Taguchi, Ikoma, all of Japan, assignors to Mitsubishi Rayon Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 94,293, Sep. 8, 1987, abandoned. This application Mar. 27, 1989, Ser. No. 330,936

Claims priority, application Japan, Sep. 10, 1986, 61-211731
Int. Cl.⁴ C08G 63/60

U.S. Cl. 528—272

26 Claims

1. A resin composition for a crosslinked coating film easily dyeable with a disperse dye, which comprises 100 parts by weight of a mixture composed of 40 to 95% by weight of a polyester resin and 5 to 60% of a crosslinking agent curable with active energy rays, and 0.01 to 12 parts by weight of at least one surface active agent selected from the group consisting of silicon-containing surface active agents and fluorine-containing surface active agents.

ELECTRICAL

4,877,923

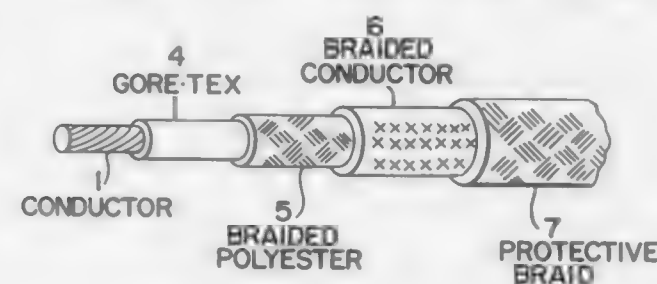
SENSORS FOR DETECTING AND LOCATING LIQUID LEAKS

Jack A. Sahakian, Flagstaff, Ariz., assignor to W. L. Gore & Associates, Inc., Newark, Del.

Continuation-in-part of Ser. No. 226,644, Aug. 1, 1988, abandoned. This application Aug. 17, 1988, Ser. No. 233,305
Int. Cl.⁴ H01B 7/32; H01G 7/00; G01M 3/16

U.S. Cl. 174—11 R

14 Claims



10. A sensor cable for detecting liquid leakage which comprises:

- a first and second electrical conductor each in substantially parallel relation to each other, said first conductor being a core conductor, said second conductor having a construction that is porous enough to permit passage of liquid chemicals;
- a first insulation layer adjacent to said first conductor, said insulation being porous enough to permit passage of liquid chemicals, said insulation being hydrophobic so that it is impermeable to liquid water;
- a second insulation layer positioned between said first insulation layer and said second conductor, said second insulation layer being water absorbent; and
- a protective insulation cover that is porous enough to permit passage of water, said cover comprising the outer portion of the cable.

4,877,924

ELECTRIC WIRE CONNECTOR WITH BUILT-IN STRIPPER AND STRIP GAUGE

Harry Mitzmacher, 59-10 Queens Blvd., Woodside, N.Y. 11377

Filed Nov. 21, 1988, Ser. No. 273,933
Int. Cl.⁴ H01R 4/22; H02G 1/12

U.S. Cl. 174—87

2 Claims



1. An electric wire connector, comprising: a hollow conically shaped body which is open at its large end for receiving wires to be connected and which is closed at its small end, a circular rim wall thicker than the wall of the conically shaped body extending around the large open end of the conically shaped body, a groove extending across the circular rim wall, and a sharp edged blade embedded in the circular rim wall and extending across the groove, a portion of the sharp edged blade being exposed at the groove for stripping insulation off wires to be connected by the wire connector.

4,877,925

MULTI-STAGE PUSH BUTTON SWITCH DEVICE

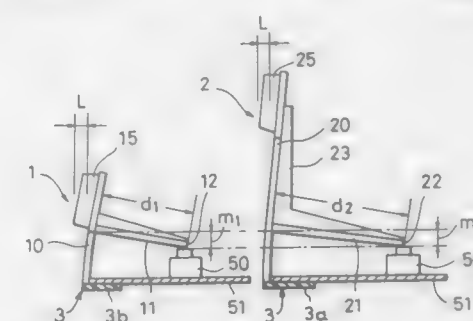
Shigetoshi Kobayashi, Tokyo, Japan, assignor to Clarion Co., Ltd., Tokyo, Japan

Filed Oct. 20, 1988, Ser. No. 260,380
Claims priority, application Japan, Oct. 23, 1987, 62-162401[U]; Oct. 23, 1987, 62-162403[U]

Int. Cl.⁴ H01H 13/70

U.S. Cl. 200—5 A

20 Claims



1. A multi-stage push button switch device comprising:

- a base portion;
- a plurality of first push button members, each of which includes a first button portion and a first flexible arm portion extending from said first button portion approximately in a first direction, one end of each said first flexible arm portion remote from the first button portion being fixedly coupled to said base portion;
- a plurality of second push button members, each of which includes a second button portion and a second flexible arm portion extending from said second button portion approximately in said first direction, one end of each said second flexible arm portion remote from the second button portion being fixedly coupled to said base portion, said second flexible arm portions being longer than said first flexible arm portions;
- a plurality of first push switches and means for supporting each said first push switch stationarily with respect to said base portion at a location spaced in a second direction approximately perpendicular to said first direction from a respective one of said first push button members;
- a plurality of second push switches and means for supporting each said second push switch stationarily with respect to said base portion at a location spaced in said second direction from a respective one of said second push button members, the distance between each said second push switch and the second flexible arm portion of the corresponding second push button member being greater than the distance between each said first push switch and the first flexible arm portion of the corresponding first push button member;
- a first working piece projecting approximately in said second direction from each of said first push button members, each of said first working pieces having a portion which is spaced from the corresponding first flexible arm portion and which, when the corresponding button portion is manually pushed in approximately said second direction, is moved approximately in said first direction and engages and actuates a respective said first push switch; and
- a second working piece projecting approximately in said second direction from each of said second push button members, each of said second working pieces having a portion which is spaced from the corresponding second flexible arm portion and which, when the corresponding button portion is manually pushed approximately in said second direction, is moved approximately in said first direction and engages and actuates a respective said second push switch.

4,877,926

ACTUATOR OF AN AIR CONDITIONER OF A VEHICLE
 Tokuhiro Yamase, Kozai, Japan, assignor to Asmo Co., Ltd.,
 Kozai, Japan

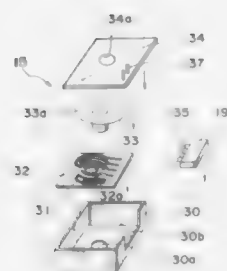
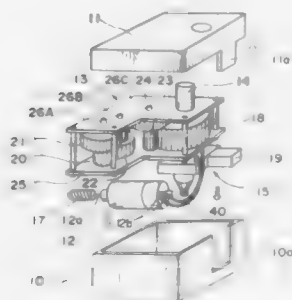
Filed Oct. 4, 1988, Ser. No. 252,936

Claims priority, application Japan, Oct. 30, 1987, 62-167703

Int. Cl.⁴ H01H 19/00, 3/32

U.S. Cl. 200—19 R

1 Claim



1. An actuator of an air conditioner for use in a vehicle comprising:

a motor having a shaft extending therefrom and a worm gear fixed to the shaft;

a reduction gear unit including a helical gear which engages said worm gear and another gear that supports an output shaft, said helical gear and said gear that supports the output shaft being mounted at fixed positions on a gear unit housing, said reduction unit also including a plurality of spur gears which are mounted on the gear unit housing between said helical gear and said gear that supports the output shaft in order to transmit rotational movement of the motor to the output shaft through an appropriate reduction gear ratio;

a position-detecting unit including an output shaft-inserting cylinder having brushes mounted thereon and being removably fixed to said output shaft and being mounted at a predetermined position of a position-detecting unit housing, a printed circuit board mounted at a position on the position-detecting unit housing so that the brushes located on said output shaft-inserting cylinder contact switching patterns on the printed circuit board, and a connector which is connected to the printed circuit board for supplying power; and

an actuator housing for accommodating said motor and said gear, said reduction gear unit, and said position-detecting unit at predetermined positions;

whereby said position-detecting unit including a certain switching pattern and the reduction gear unit having a certain reduction gear ratio can be held together in the actuator housing.

4,877,927

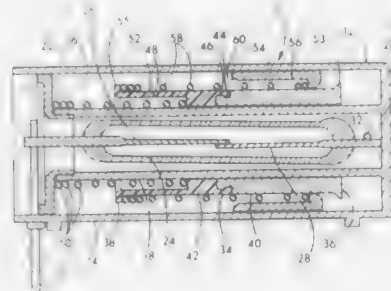
EXTENDED DWELL SHOCK SENSING DEVICE
 Daniel R. Reneau, Madison, Wis., assignor to Hamlin Incorporated, Lake Mills, Wis.

Filed Apr. 6, 1989, Ser. No. 334,311

Int. Cl.⁴ H01H 35/14

U.S. Cl. 200—61.45 M

34 Claims



1. A shock sensor having an extended activation time comprising:

(a) a housing;

(b) a carriage slidably mounted on the housing for travel and including a magnet portion;

(c) a non-magnetic mass slidable on the carriage between a first site and a second site on the carriage;

(d) a reed switch mounted on the housing to be responsive to the position of the magnet such that the reed switch is activated when the magnet travels to a pre-selected activation position during movement of the carriage in response to an initial acceleration force applied to the housing, and the reed switch will remain activated as the non-magnetic mass moves from the first site to the second site in response to an increased acceleration force, then the non-magnetic mass is moved back toward the first site upon cessation of the increased acceleration force, and until the carriage is moved back past the pre-selected activation position.

4,877,928

RELEASE MECHANISM FOR A HIGH SPEED CIRCUIT BREAKER

Henri Duffour, Douvaine, France; Serge Martin, Meyrin, and Ernst Studer, Genf, both of Switzerland, assignors to BBC Brown Boveri Ltd., Baden, Switzerland

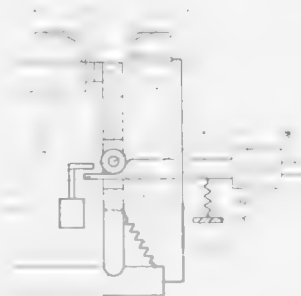
Filed Jul. 21, 1988, Ser. No. 222,639

Claims priority, application Switzerland, Jul. 22, 1987, 2776/87

Int. Cl.⁴ H01H 33/02

U.S. Cl. 200—144 R

4 Claims



1. A release mechanism for a high speed circuit breaker, comprising:

a mobile contact bridge;

an axle in the mobile contact bridge;
 a roller supported rotatably on the axle in the mobile contact bridge;
 a rotatably supported jack acting in the circuit closing direction on the roller;
 the frontal side of the jack facing the roller being in the form of a slide adapted at least in part to the contour of said roller;
 means for exerting a force acting on the contact bridge in the disconnecting direction; and
 a trigger acting on the jack;
 said slide having a configuration such that in the circuit closing state of the contact bridge, the frictional forces acting on the roller are compensated.

4,877,929

BREAKING DEVICE FOR MULTIPOLE ELECTRICAL CIRCUIT BREAKER WITH MULTIPLE CONTACTS
 Marc Rival, Virieu Sur Bourbre, France, assignor to Merlin Gerin, France

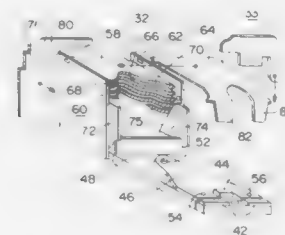
Filed Aug. 17, 1988, Ser. No. 233,032

Claims priority, application France, Aug. 31, 1987, 87 12117

Int. Cl.⁴ H01H 33/12

U.S. Cl. 200—146 R

5 Claims



1. A breaking device for a multipole electrical circuit breaker with a molded insulating case, housing an operating mechanism coupled to a switching bar to provide closing and opening of all the circuit breaker poles, each pole comprising:

a pair of fixed current-conducting terminals, bearing on the base of the case,

an arc extinguishing chamber disposed above the first terminal, and comprising a stacking of metal arc ionization plates, each plate having a V-shaped notch,

a multiple contact system having a plurality of identical movable main contacts, divided into two sets of the same number on either side of a movable arcing contact extending longitudinally according to the center line of the pole, said contacts being pivotally mounted on an axis of a support tunnel securely united to the bar, and cooperating with corresponding stationary contacts fixed on the internal end of the first terminal, the length of the movable arcing contact being greater than that of each movable main contact,

a pair of lower and upper arcing horns surrounding the stacking of arc extinguishing chamber plates, the lower arcing horn being securely united to the upper face of the first terminal with an insulating shield interposed,

a pair of arc guiding jaws arranged in the arc extinguishing chamber, each jaw, made of gas-producing insulating material, having an inclined portion following the outline of the plates up to the vicinity of an intermediate arc catching ridge,

the lower arcing horn being fixed to the first terminal by means of three screws or rivets disposed at the peaks of an isosceles triangle, the first of the screws being situated along the center line of the pole in the vicinity of an edge of the insulating shield penetrating into a rear gap arranged between the plates and an outlet wall of the breaking gases to the outside.

4,877,930

SEALED PUSH-BUTTON SWITCH AND METHOD OF ASSEMBLY

Yasumichi Fukuma, Hirata, Japan, assignor to Omron Tateisi Electronics Co., Kyoto, Japan

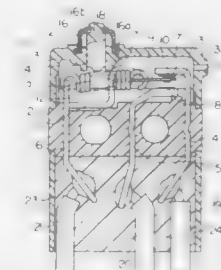
Filed Jul. 28, 1988, Ser. No. 225,129

Claims priority, application Japan, Aug. 14, 1987, 62-124670[U]

Int. Cl.⁴ H01H 35/02

U.S. Cl. 200—302.2

10 Claims



1. A sealed push-button switch, comprising:

a case, comprising a base and a cover attached to said base so as to form a space between the cover and the base;

a switching mechanism located in said space, said switching mechanism having a terminal which extends through the base so that one end of said terminal is located outside the case;

a frame attached to the case for housing said one end of said terminal;

a resin material injected into said frame and set for fixing said one end of said terminal; and

an air passage formed through said case so as to communicate with said space, for allowing air in the space to leak therethrough; and

sealing means for sealing said air passage after said resin material is injected into said frame.

4,877,931

SWITCH HAVING A VISIBLE INDICATOR

Toshihiro Kawase, Aichi, and Sachiya Sano, Gifu, both of Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi, Japan

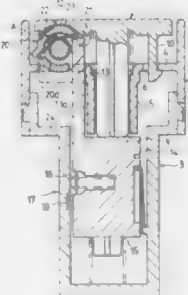
Filed Aug. 5, 1988, Ser. No. 228,653

Claims priority, application Japan, Aug. 12, 1987, 62-123579[U]

Int. Cl.⁴ H01H 9/16

U.S. Cl. 200—308

2 Claims



1. A switch comprising:

a depressable button having an opening;

a contact holder moved from a turned-off position to a turned-on position or from the turned-on position to the turned-off position in response to the depression of said

button and retained in said turned-on or turned-off position until a subsequent depression of said button; an indicator having a turned-on state indicating portion and a turned-off state indicating portion on the outside surface of said indicator and being rotatable to position in the opening of said button either said turned-on state indicating portion or said turned-off state indicating portion such that said positioned indicating portion of said indicator is visible through said opening of said button, said indicator including a rotatable member and said turned-on state indicating portion including a first surface portion of said member signifying said turned-on state of the switch and said turned-off state indicating portion including a second surface portion of said member signifying said turned-off state of the switch;

a spring for rotating said rotatable member to position said turned-on state indicating portion or said turned-off state indicating portion in said opening of said button; and an indication controller movable between an upper position and a lower position in response to the depression of said button and engaging said indicator for rotating said indicator in response to the depression of said button to rotate said indicator to position one of said turned-off state indicating portion and said turned-on state indicating portion in the opening of said button in response to movement of said indication controller to said upper position and to position the other of said turned-off state indicating portion and said turned-on state indicating portion into the opening in response to movement of said indication controller to said lower position, said indication controller including an elongated member formed on said contact holder and having an end for engaging said rotatable member to rotate said rotatable member against the force of said spring to position one of said turned-off state indicating portion and turned-on state indicating portion in said opening of said button in response to movement of said indication controller to said upper position.

4,877,932

MICROWAVE CONTAINER ASSEMBLY

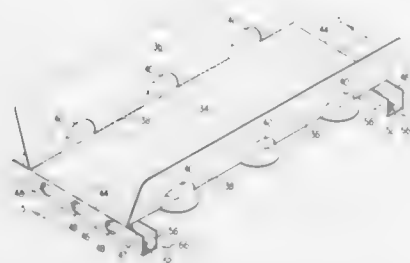
Linda A. Bernstein, Cambell Hall, and Robert L. Gordon, Monroe, both of N.Y., assignors to International Paper Company, Purchase, N.Y.

Filed Aug. 15, 1988, Ser. No. 232,048

Int. Cl.⁴ H05B 6/80

U.S. Cl. 219—10.55 E

7 Claims



1. A container assembly for the packaging of frozen food-stuffs which are to be cooked and browned in a microwave oven, the assembly including an outer carton formed of dielectric material and including a top panel, bottom panel, opposite sidewalls, and opposite end walls, said top panel including means to facilitate its manual removal from the remaining portions of the outer carton, a tray in the carton, the tray being formed from dielectric sheet material, such as paperboard, the tray including a bottom wall having upwardly sloping, opposite sidewalls, said sidewalls having upper, longitudinally extending edges, the tray bottom wall being parallel to and

spaced from the outer carton bottom panel, the tray having a supporting foot at each opposite end thereof extending downwardly relative to said bottom wall of the tray and contacting the bottom wall of the tray, each foot being substantially hollow and elongated and being in the form of a tube where it contacts the tray bottom, having a surface thereof resting on said bottom panel of the outer carton, the ends of each said elongated foot abutting a respective opposite side wall of the outer carton to thereby inhibit relative movement between the tray and the outer carton, at least a portion of the tray bottom wall and tray sidewall surfaces carrying a microwave interactive material, the upper, food contacting surfaces of the tray bottom and sidewalls coated with a polymer.

4,877,933

METHOD AND APPARATUS FOR CONTROLLING DISTRIBUTION AND POWER WITHIN THE CELLS OF A DEVICE FOR PROMOTING THE UNIFORM HEATING OF A FOOD PRODUCT IN A RADIANT ENERGY FIELD
Roger A. Yangas, 14000 Citation Dr., Orland Park, Ill. 60642
Continuation-in-part of Ser. No. 19,216, Feb. 26, 1987, Pat. No. 4,771,155, which is a continuation-in-part of Ser. No. 765,374, Aug. 14, 1985, Pat. No. 4,683,362. This application Jan. 15, 1988, Ser. No. 144,520

The portion of the term of this patent subsequent to Sep. 13, 2005, has been disclaimed.
Int. Cl.⁴ H05B 6/74

U.S. Cl. 219—10.55 M

37 Claims

1. An improved of controlling the distribution of power within an apparatus for promoting the uniform heating of a food product in a microwave radiant energy field, comprising: providing an apparatus having a plurality of radiant energy collector cells formed solely by a plurality of tabs mounted to a plate; and controlling the angle of said tabs relative to said plate of at least one of said collector cells to control the degree of heating of the food product located adjacent said collector cell.

4,877,934

HYPODERMIC SYRINGE NEEDLE DESTROYING AND STERILIZING APPARATUS AND METHOD

Robert P. Spinello, 523 Post Ave., Westbury, N.Y. 11590, assignor to Robert P. Spinello, Westbury, N.Y.

Filed Dec. 18, 1988, Ser. No. 286,321

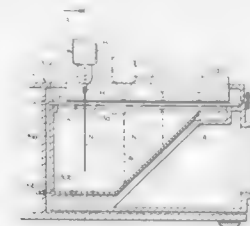
Int. Cl.⁴ B23K 11/22; B26F 3/06

U.S. Cl. 219—68

19 Claims

17. A method for destroying and sterilizing used hypodermic needles comprising the steps of causing an electrical current to flow through substantially the full length of the needle shaft from hub to tip in an amount sufficient to heat the needle shaft to incandescence and partial destruction, and thereafter

progressively passing current through what remains of the needle shaft from the hub outward until substantially the entire



needle shaft is reduced to sterilized bits to a point adjacent the hub.

4,877,935

WIRE CUT ELECTRODISCHARGE MACHINE TOOL

Toshiyuki Aso, Hino, and Tamotsu Ishibashi, Hachioji, both of Japan, assignors to Fanuc Ltd., Yamanashi, Japan

PCT No. PCT/JP87/00643, § 371 Date Jun. 30, 1988, § 102(e)

Date Jun. 30, 1988, PCT Pub. No. WO88/01550, PCT Pub.

Date Mar. 10, 1988

PCT Filed Aug. 31, 1987, Ser. No. 196,198

Claims priority, application Japan, Aug. 30, 1986, 61-202740

Int. Cl.⁴ B23P 1/08

U.S. Cl. 219—69.12

3 Claims



1. A wire cut electrodischarge machine tool having a work table for mounting a workpiece for automatic feed in X and Y plane directions, an electrode feeding device for feeding electrode wire through an electrodischarge machining region in which said workpiece is mounted, upper and lower heads above and below said work table, respectively, said heads each having a built-in wire guide, an automatic electrode wire feeding mechanism for automatically feeding electrode wire fed from said electrode feeding device between said upper and lower heads, said wire feeding mechanism including jet flowing machining fluid for automatic preparing for the start of machining, said wire cut electrodischarging machine tool being characterized by an electrode wire feeding mechanism for drawing back a disconnected end of the electrode wire disconnected in said electrodischarge machining region during the electrodischarge machining and for holding the disconnected end of said disconnected electrode wire for feed out, a wire end detecting means for detecting a disconnected end of said electrode wire outside of said electrodischarge machining region, a moving means for moving said electrode wire disconnected end to a predetermined electrode wire repair position positioned from said electrodischarge machining region according to detection of a disconnected end of said electrode wire by said wire end detecting means and for returning said disconnected end from said repair position to said electrodis-

charge machining region, a cutter means for cutting and repairing said electrode wire disconnected end at said electrode repair position, and a wire supporting plate for preventing the wire end after said cutting from following said cutter when said cutter is retracted.

4,877,936

SOLDERED STRUCTURE OF FINE WIRE, AND METHOD OF AND APPARATUS FOR SOLDERING FINE WIRE

Jyunichi Kobayashi, Sakakura, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

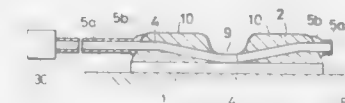
Filed Oct. 16, 1987, Ser. No. 109,166

Claims priority, application Japan, Oct. 17, 1986, 61-245201

Int. Cl.⁴ B23K 1/00

U.S. Cl. 219—85.22

18 Claims



14. A method of soldering a fine wire onto a conductor pattern, comprising:

disposing a solder layer on said conductor pattern; disposing a fine wire with insulating coating on a surface of said solder layer in the longitudinal direction of said conductor pattern; disposing a resistor tip above said fine wire in such a manner that said resistor tip is applied to said solder layer perpendicularly to the longitudinal direction of said conductor pattern; abutting said resistor tip on said fine wire in the longitudinal direction thereof; applying a pressure to said resistor tip and heating said resistor tip so as to press said fine wire towards said conductor pattern for melting said insulating coating so as to form an exposed joint portion and for forming burying portions to bury a part of said fine wire in said solder layer; removing said resistor tip from said exposed joint portion where said fine wire is exposed out of said solder layer.

4,877,937

PLASMA SPRAY TORCH

Niklaus Müller, St. Sulpice, Switzerland, assignor to Castolin S.A., Lausanne, Switzerland

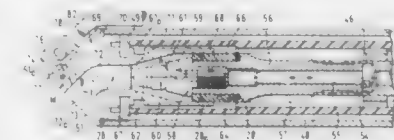
Filed Dec. 8, 1987, Ser. No. 129,986

Claims priority, application Fed. Rep. of Germany, Nov. 12, 1986, 3642375

Int. Cl.⁴ B23C 9/00

U.S. Cl. 219—121.59

34 Claims



1. A plasma spray coating torch for internally coating hollow members comprising: a spray nozzle which forms an electrode and which is connected anodically, said spray nozzle including a spray nozzle duct having a mouth region; a second electrode associated with the spray nozzle which is electrically insulated relative to the spray nozzle, said second electrode including a duct which passes through the second electrode; a torch arm receiving said second electrode having a central

tube, a rear portion and a longitudinal axis (A) and having separate and distinct flow ducts for a working gas and for a cooling agent, said cooling agent flowing from the rear of the torch arm in the direction of the spray nozzle in a first one of the flow ducts for forming a jacket of cooling agent disposed around the central tube, and which after the cooling operation has taken place being discharged from a second one of said flow ducts; a feed duct for a coating powder opening into the spray nozzle duct; the flow duct for said working gas joining the duct which passes through the second electrode; and at least in the mouth region the nozzle duct is inclined at an angle (t) relative to the longitudinal axis (A).

4,877,938

PLASMA ACTIVATED DEPOSITION OF AN INSULATING MATERIAL ON THE INTERIOR OF A TUBE

Hans Rau, Aachen, Fed. Rep. of Germany, and Petrus F. De Jongh, Veldhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

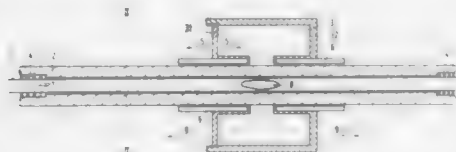
Filed Sep. 24, 1987, Ser. No. 100,391

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1986, 3632664

Int. Cl.⁴ B23K 9/00

U.S. Cl. 219—121.59

4 Claims



4. An apparatus as in claim 2 where the tubular body is dimensioned to surround substantially the entire length of the tube.

4,877,939

MEANS OF ENHANCING LASER PROCESSING EFFICIENCY OF METALS

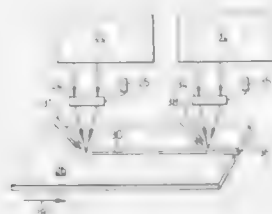
Walter W. Daley, P.O. Box 453, King City, Ontario, Canada L0G 1K0, and Grant Kinsman, York University, 4700 Keele Street, Downsview, Ontario, Canada (M3J 1P3)

Division of Ser. No. 8,656, Jan. 30, 1987. This application May 12, 1988, Ser. No. 192,920

Int. Cl.⁴ B23K 26/00

U.S. Cl. 219—121.76

2 Claims



1. Apparatus for processing a material by laser radiation comprising a first laser having a beam of radiation of a first wavelength directed to impinge upon a surface of said material, means to cause relative movement between said material and said beam to cause said beam to travel along a track and a second laser having a beam of radiation of a second wavelength directed to impinge upon said material in advance of and spaced from said beam of said first laser and reduce the reflectivity thereof to radiation of said first wavelength.

4,877,940 USING INFRARED IMAGING TO MONITOR AND CONTROL WELDING

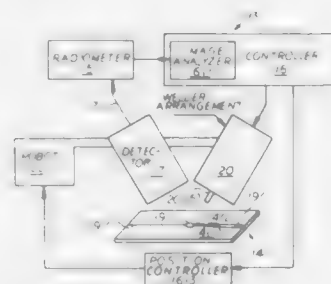
Edmund R. Bangs, Indian Head Park; Nicholas E. Longinow, Oak Park, and James R. Blaha, Palos Heights, all of Ill., assignors to IIT Research Institute, Chicago, Ill.

Filed Jun. 30, 1987, Ser. No. 68,620

Int. Cl.⁴ B23K 9/12

U.S. Cl. 219—124.34

105 Claims



1. A real time welding process for welding adjacent materials with a weld puddle formed between the materials, said method comprising the steps of bringing a welding apparatus and consumable and the materials together to form a weld puddle at the interface of the adjacent materials, producing relative motion between the welding apparatus and the materials thereby defining a front edge of the weld puddle, thermographically scanning the weld puddle and its adjacent heat affected zone from the front and producing image signals representative of a thermographic image of the weld, analyzing said puddle image signals to extract therefrom data indicative of irregularities in the welding procedure, and adjusting the welding procedure to reduce said irregularities.

4,877,941

POWER SUPPLY SYSTEM FOR CONSUMABLE ELECTRODE ARC WELDING AND METHOD OF CONTROLLING THE SAME

Masahiro Hosoma, Kamakura; Maruyama Tokuji, Yokohama; Masashi Okada, Fujisawa, and Yukio Hida, Kamakura, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

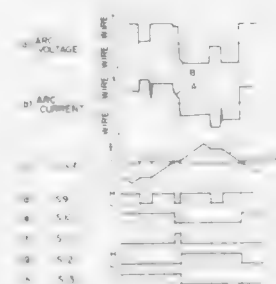
Filed May 11, 1988, Ser. No. 192,622

Claims priority, application Japan, May 12, 1987, 62-113551; Nov. 18, 1987, 62-289445; Nov. 18, 1987, 62-289446; Feb. 23, 1988, 63-38542

Int. Cl.⁴ B23K 9/10

U.S. Cl. 219—130.21

3 Claims



1. A power supply system for consumable electrode arc welding in which a DC welding voltage is applied alternately in the straight polarity and in the reverse polarity across a base metal and a consumable electrode being fed toward the base metal, said power supply system comprising:

- (a) a DC source for generating a DC voltage to be applied across the base metal and the consumable electrode;
- (b) a reactor connected to the output of the DC source;
- (c) an inverter circuit connected through the reactor to the DC source and comprising a plurality of switching elements for changing over the polarity of the DC voltage applied across the base metal and the consumable electrode, and first directional conductive elements respectively connected in parallel to the switching elements;
- (d) an energy absorbing circuit including a series connection of a second directional conductive element and a capacitor, connected in parallel to the input of said inverter circuit; and
- (e) a power supply circuit for applying a DC voltage to the capacitor.

4,877,942

THERMALLY-INSULATED CURLING IRON

John J. Raab, Brielle, N.J., assignor to Conair Corporation, Stamford, Conn.

Filed Jul. 19, 1988, Ser. No. 221,207

Int. Cl.⁴ H05B 1/02; A45D 1/04

U.S. Cl. 219—225

2 Claims



2. In a thermally-insulated curling iron, said curling iron having a handle, a barrel secured to said handle, means for heating said barrel, and a spoon pivotally mounted on said barrel and spring-pressed towards said barrel, and a spoon extension extending upwardly and outwardly from said barrel and said handle, that improvement including

the outer surface of said spoon extension being covered with thermally-insulating material, and the surface of said spoon extension facing said handle not being covered by said thermally-insulating material.

whereby, though heat is conducted from said barrel to said spoon extension, said heated spoon extension is thermally-insulated from contact with one using said curling iron, and heat can be dissipated from said spoon extension by radiation in a direction away from the user.

4,877,943

SEALING DEVICE FOR ELONGATE HEATER

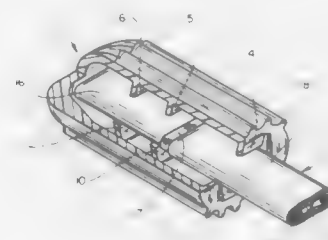
Thomas Y. Oiwa, San Mateo, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Filed Dec. 8, 1988, Ser. No. 282,250

Int. Cl.⁴ H02G 15/02

U.S. Cl. 219—538

18 Claims



15. An assembly comprising an apparatus and an end of an elongate electrical heater, said heater comprising (a) first and

second elongate electrodes, (b) a plurality of resistive heating elements connected in parallel between said electrodes, (c) an insulating jacket surrounding said electrodes and heating elements, and (d) a metallic grounding braid surrounding said insulating jacket, said apparatus comprising a housing of generally tubular shape which comprises

- (1) a first open end and a second closed end;
- (2) a longitudinal top portion with an interior surface and an exterior surface and a longitudinal bottom portion with an interior surface and an exterior surface;
- (3) a plurality of first gripping members which are associated with the top portion and protrude from the interior surface thereof; and
- (4) A plurality of second gripping members which are associated with the bottom portion and protrude from the interior surface thereof,

the insulating jacket being directly contacted with at least one first gripping member and at least one second gripping member and the metallic grounding braid (a) being contacted directly or through an outer insulating jacket which surrounds the braid by at least one first gripping member and at least one second gripping member and (b) being pushed back from the end of the heater.

4,877,944

SELF REGULATING HEATER

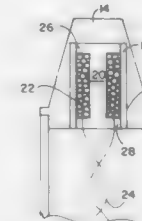
Mark J. Cowell, San Carlos; Kevin Ladd, and Philip S. Carter, Jr., both of Palo Alto, all of Calif., assignors to Metcal, Inc., Menlo Park, Calif.

Filed Jun. 8, 1987, Ser. No. 59,787

Int. Cl.⁴ H05B 3/10

U.S. Cl. 219—548

6 Claims



1. A heater comprising:
a conductive member,
a ferromagnetic material lining a surface of said conductive member,
a magnetic core of a material having a higher electrical resistivity and Curie temperature than said ferromagnetic material and located internally of said ferromagnetic material,
a coil wound on said core,
said core being located and shaped to tightly couple flux in said core to said ferromagnetic material, and
means adapted to connect said coil to a constant, alternating current source of sufficient amplitude to heat said ferromagnetic material to a temperature approaching its Curie temperature.

4,877,945

IC CARD HAVING A FUNCTION TO EXCLUDE ERRONEOUS RECORDING

Kunio Fujisaki, Aichi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 9, 1987, Ser. No. 118,603

Claims priority, application Japan, Nov. 10, 1986, 61-265484
Int. Cl.⁴ G06F 15/30

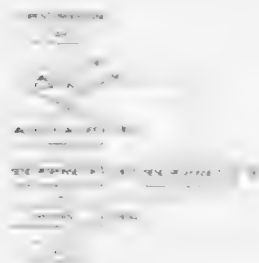
U.S. Cl. 235—379

7 Claims

1. An IC card used in an IC card system for performing transactions with the IC card having therein a microprocessor and memories in which said IC card is fed with power from an

external device and a processing of transaction data is effected in accordance with instructions coming from the external device, comprising:

- communication means for enabling the external device and the IC card to communicate with each other;
- informing means for informing said IC card of instructions regarding the start and the end of the processing from the external device through said communication means;
- generating means for generating information on the validity of transaction data based on instructions regarding the start and the end of the processing from the external device;
- a non-volatile memory connected to said recording means, said communication means and said informing means for storing the information generated in said recording means; and



means for communicating said information on the validity of the transaction data recorded in said non-volatile memory to said external device at the start of the next processing, wherein said non-volatile memory is a rewritable memory and includes a flag table storing a flag indicating the validity of the data held in said memory on the basis of a signal representing the start and the end of the processing applied from said external device, and wherein said micro-processor receives a signal of said start, it refers to said flag table, and said memory includes means, which, if the flag in said table indicates the state of validity, rewrites said flag to the state of invalidity and transmits a response for allowing for said external device to start the processing operation and if it receives a signal at the end, stores a program to rewrite said flag to the state of validity.

4,877,946

CARD ISSUANCE APPARATUS WITH CANCELLATION MODE

Makoto Ando, Koichiro Kakimura, both of Tokyo; Masahiko Sawa, Kanagawa; Hideaki Ohmuro, Chiba, and Akira Ohryo, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Apr. 16, 1986, Ser. No. 852,659

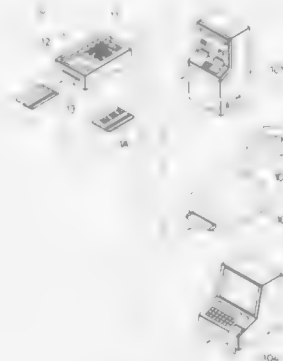
Claims priority, application Japan, Apr. 20, 1985, 60-85218
Int. Cl.⁴ G06F 15/30; G06K 5/00

U.S. Cl. 235—380

8 Claims

1. Apparatus for issuing a card comprising:
 - (a) input means for taking in data necessary for issuing said card, said data including at least an identification of the issuing apparatus;
 - (b) memory means for storing said data;
 - (c) recording means for recording said data in machine readable form, on a portion of said card when said card is issued;
 - (d) reading means for reading said data from said card;
 - (e) said input means including a cancellation key;
 - (f) means responsive to operation of said cancellation key and to recognition of the identification of the issuing apparatus for cancelling said data stored in said memory and recording on said card a message that recorded data has been cancelled;
 - (g) comparison means for comparing said data recorded on said card with said data stored in said memory means and

inhibiting means for inhibiting cancellation in response to a noncomparison of predetermined constant data with



data read from said card, said inhibiting means being responsive to data which identifies that a transaction involving the card has been completed.

4,877,947

TRANSACTION PROCESSING SYSTEM

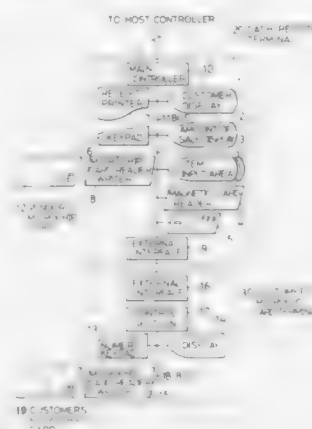
Toru Mori, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Jul. 30, 1987, Ser. No. 79,454

Claims priority, application Japan, Aug. 5, 1986, 61-182730
Int. Cl.⁴ G06F 15/21

U.S. Cl. 235—381

5 Claims



1. A transaction processing system using a prepaid microchip card, comprising

a customer's microchip card in which a balance is recorded, a vendor's microchip card in which a balance is recorded, a terminal means for exchanging data between said customer's microchip card and said vendor's microchip card, for inputting the amount of a transaction, for instructing the customer's microchip card to perform the deduction, and for instructing the vendor's microchip card to perform the addition, said terminal means including a first terminal having a vendor's microchip card reader/writer disposed therein for communicating with said vendor's microchip card, and a second terminal which is electrically coupled to said first terminal for exchange of data therebetween, said second terminal having a customer's microchip card reader/writer disposed therein for communicating with said customer's microchip card, said customer's microchip card having a function of authentication of said second terminal, and

said vendor's microchip card having a function of authentication of said first terminal, wherein a transaction is processed by deducting the amount of the transaction from the balance in the customer's microchip card and adding said amount to the balance in the vendor's microchip card, and said transaction processing is performed after the authentication by the customer's microchip card and the vendor's microchip card.

4,877,948

COMBINATION BAR CODE AND MARK-SENSE

READER

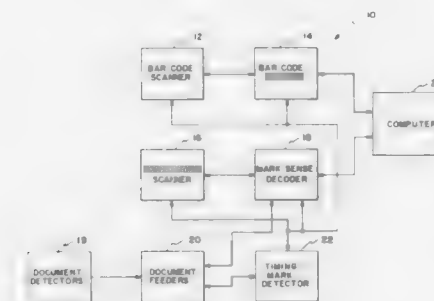
Loren L. Krueger, 4834 Merilee Dr., Minnetonka, Minn. 55343

Filed Jun. 25, 1987, Ser. No. 66,163

Int. Cl.⁴ G06K 7/08

U.S. Cl. 235—449

8 Claims



1. A combination reader comprising:
 - bar code scanning means for scanning bar coded information on a document;
 - mark-sense scanning means for scanning mark-sense data on said document;
 - bar code decoding means, connected to said bar code scanning means, for decoding signals from said bar code scanning means;
 - mark-sense decoding means, connected to said mark-sense scanning means, for decoding signals from said mark-sense scanning means; and
 - timing means, for timing said bar code and mark-sense scanning means with movement of said document relative to said scanning means, comprising:
 - timing mark detecting means, connected to said bar code scanning means, to said mark-sense scanning means, to said bar code decoding means, and to said mark-sense decoding means, for detecting timing marks on said document;
 - document feeding means, connected to said mark-sense decoding means and to said timing mark detecting means, for moving said document through fields of view of said bar code scanning means and said mark-sense scanning means; and
 - document detecting means, connected to said document feeding means, for detecting the presence of said document.

4,877,949

HAND-HELD INSTANT BAR CODE READER SYSTEM WITH AUTOMATED FOCUS BASED ON DISTANCE MEASUREMENTS

Arvin D. Danielson, and Dennis A. Durbin, both of Cedar Rapids, Iowa, assignors to Norand Corporation, Cedar Rapids, Iowa

Filed Aug. 8, 1986, Ser. No. 894,689

Int. Cl.⁴ G06K 7/10

U.S. Cl. 235—462

24 Claims

1. In a bar code reader system, a hand-held bar code reader positionable by hand at varying distances from a bar code to be read and operable for reading bar codes at distances from said

reader within a certain operative range, said reader comprising:

bar code sensor means for generating an output signal in accordance with a bar code image incident thereon, distance measurement means for automated reading of distances of a bar code from the hand-held bar code reader over a certain measurement range which exceeds said certain operative range for reading of bar codes, reading distance adaption means for automatically adapting the reader to the reading of a bar code at varying distances therefrom within the said operative range by causing an image of the bar code to be substantially focused at the image sensor means,



enabling means for enabling a bar code reading operation, and control means coupled with said enabling means and said distance measuring means and operative in response to enabling of a bar code reading operation by said enabling means and in response to reading by said distance measurement means of distances within said operative range for automatically controlling the reading distance adaptation means during movement of the reader relative to a bar code within said operative range to tend to establish and maintain a focused bar code image at the image sensor means

4,877,950

ELECTRONIC PURSE-DEVICE

John W. Halpern, Potomac, Md., assignor to Paperless Accounting, Inc., Washington, D.C.

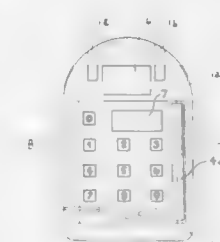
Filed Aug. 23, 1982, Ser. No. 410,246

The portion of the term of this patent subsequent to Oct. 31, 2003, has been disclaimed.

Int. Cl.⁴ G06K 19/00

U.S. Cl. 235—487

10 Claims



1. For use with an electronic fund transfer device having an outer wall portion with a reactive transfer element for enabling transfer of data between said transfer device and an associated device; a terminal having a frame, receptable means coupled to

gles with respect to one another and being joined at first ends of each, said first and second elongated members (124,126) being fixed on the substrate (110) at their other ends, said third elongated member (128) extending and spaced from the substrate and fixed to the support (112), said joined ends of the elongated members (124, 126, 128) supporting one of the sample and scanning probe holding members, and said sample and scanning probe positioned between the substrate and third elongated member, the substrate (110), support (112), third elongated member (128), and first and second elongated members (124,126) defining a closed frame in which said sample (118) and scanning probe are positioned.

4,877,958

RADIATION IMAGE READ-OUT METHOD AND APPARATUS

Toshitaka Agano, and Nobuyoshi Nakajima, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 29, 1987, Ser. No. 138,753

Claims priority, application Japan, Dec. 29, 1986, 61-310250

Int. Cl.⁴ G01N 23/04

U.S. Cl. 250—327.2

4 Claims



1. A radiation image read-out method for exposing a stimula- ble phosphor sheet carrying a radiation image stored thereon to stimulating rays which cause the stimula- ble phosphor sheet to emit light in proportion to the stored radiation energy, and photoelectrically detecting the emitted light by use of a light detection means to obtain image signals for use in reproduction of a visible image,

wherein the improvement comprises the steps of:

- (i) storing light detection ranges of said light detection means suitable for image recording conditions in conformity with the respective image recording conditions in a storage means, and
- (ii) in the course of detection of said light emitted by said stimula- ble phosphor sheet, designating the image recording conditions with respect to said stimula- ble phosphor sheet on which image read-out is to be carried out, reading the light detection range corresponding to the designated image recording conditions from said storage means, and setting said light detection range read from said storage means in said light detection means even though preliminary read-out is not carried out.

4,877,959

SPACE PHOTON SOURCE LOCATOR

George H. Page, La Mirada, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Sep. 21, 1987, Ser. No. 98,642

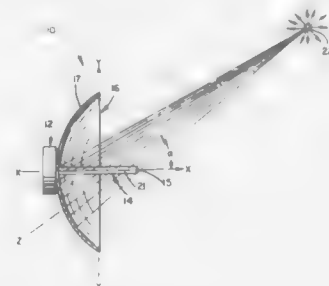
Int. Cl.⁴ G01J 1/20

U.S. Cl. 250—336.1

16 Claims

1. An apparatus, comprising:
means for detecting radiation emanating from a source of radiation;
means positioned with respect to said means for detecting for blocking at least a portion of said means for detecting

when said means for detecting is not oriented in the direction of a source of radiation; and



means coupled to said means for detecting and responsive to blocked radiation for orienting said means for detecting in the direction of a source of radiation.

4,877,960

MICROSCOPE HAVING DUAL REMOTE IMAGE MASKING

Robert G. Messerschmidt, and Donald W. Sting, both of Stamford, Conn., assignors to Spectra-Tech, Inc., Stamford, Conn. Continuation of Ser. No. 15,315, Feb. 17, 1987, abandoned. This application Jan. 4, 1989, Ser. No. 293,549

Int. Cl.⁴ G01J 3/08; G01N 21/00, 21/59, 21/47

U.S. Cl. 250—341

8 Claims



1. A microscope for spectrometry to analyze samples comprising:

- radiant energy source means to provide an invisible radiant energy beam;
- a first light source means to provide a visible light beam;
- a sample plane containing a sample to be analyzed;
- means to direct either the invisible radiant energy beam in a sampling mode or the visible light beam in a viewing mode along a common optical path, such path spatially passing through the sample;
- a first remote sample image plane on the common optical path;
- a first mask located at the first remote sample image plane in the common optical path remote from the sample such that said invisible radiant energy beam passes through said first mask before impinging upon the sample;
- a first lens on the common optical path between said first mask and said sample plane to form an image of said sample at the remote sample image plane and an image of the mask at the sample plane;
- a viewing means located such that said first mask and said remote sample image plane are viewable from the invisible radiant energy source side of the sample;
- means to vary the size of the first mask during viewing in the viewing mode to spatially define the sample area to a selected targeted arbitrary shape;
- an invisible radiant energy detector operative in the sampling mode to detect invisible radiant energy passing from

said radiant energy source through the first mask, as adjusted, and the first lens to the targeted arbitrary shape of the sample to provide analysis of the sample within the selected targeted arbitrary shaped area;
and a movable optical switching means to direct either invisible radiant energy from the sample to the detector in the sampling mode or visible light to the viewing means in the viewing mode.

4,877,961

IN-LINE ELECTRON BEAM ENERGY MONITOR AND CONTROL

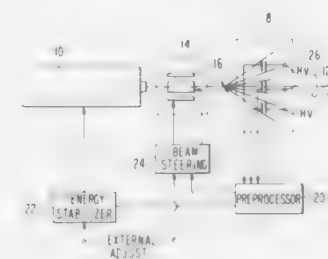
Raymond D. McIntyre, Los Altos Hills, and Stanley W. Johnsen, Palo Alto, both of Calif., assignors to Varian Associates, Inc., Palo Alto, Calif.

Filed Oct. 26, 1988, Ser. No. 263,084

Int. Cl.⁴ H01J 49/44

U.S. Cl. 250—397

7 Claims



1. An accelerator energy detector and stabilization system operative on an unanalyzed beam of charged particles comprising:

- (a) accelerator means for producing a beam flux of charged particles of nominal energy E_0 , said accelerator having at least one operating parameter for varying said nominal energy E_0 , said beam flux defining a beam axis,
- (b) scattering means interposed on said beam axis for interacting with a fraction of said beam whereby said fraction of beam flux is deflected from a path substantially along said axis through a broad angular range with respect to said axis,
- (c) first scattered flux detector means disposed proximate said beam axis and displaced with respect to said axis subsequent to said scattering means for generating a first scattered flux signal indicative of the scattered fraction of the beam intercepted thereby, said disposition and displacement defining a nominal scattering angle θ_1 whereby said scattered flux signal is representative of flux scattered through an angle θ_1 with respect to said axis,
- (d) second scattered flux detector means disposed proximate said beam axis and displaced with respect to said axis subsequent to said scattering means for generating a second scattered flux signal indicative of the scattered fraction of the beam intercepted thereby, said disposition and displacement defining a nominal scattering angle θ_2 whereby said scattered flux signal is representative of flux scattered through an angle θ_2 with respect to said axis,
- (e) differential comparator means for processing said θ_1 and θ_2 signals and producing therefrom an energy difference signal proportional to a function of said θ_1 and θ_2 signals and said nominal energy E_0 ,
- (f) energy correction means for accepting said energy difference signal and for adjusting said operating parameter of said accelerator means.

4,877,962

ION IMPLANTATION METHOD

Saburo Ohsaki; Taketo Takahashi, and Toshihiro Miki, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

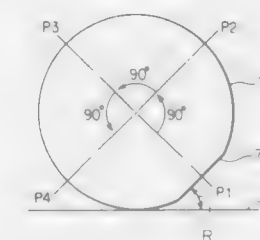
Filed Apr. 29, 1988, Ser. No. 188,485

Claims priority, application Japan, Apr. 30, 1987, 62-109328

Int. Cl.⁴ G21K 5/10

U.S. Cl. 250—442.1

3 Claims



1. An ion implantation method comprising:
positioning a generally planar silicon substrate having a (100) orientation in a first position in which said substrate is tilted with respect to an incident ion beam and said substrate is rotated in its own plane by an angle of 15° to 75° to a first position from a position in which the (110) crystal planes of said substrate are aligned with said ion beam;

irradiating said substrate in said first position with the ion beam with a dose of ions equal to approximately 1/4 of the total desired dose of ions to be implanted into said substrate;

rotating said substrate in its plane to a second position which is 90° removed from the first position and irradiating said substrate with said ion beam with a dose of ions equal to approximately 1/4 of the total desired dose of ions;

rotating said substrate in its plane to a third position which is 180° removed from the first position and irradiating said substrate with said ion beam with a dose of ions equal to approximately 1/4 of the total desired dose of ions; and

rotating said substrate in its plane to a fourth position which is 270° removed from the first position and irradiating said substrate with said ion beam with a dose of ions equal to approximately 1/4 of the total desired dose of ions.

4,877,963

CONTAINER FOR STORING AND STERILIZING A KITCHEN-USE CHOPPING BOARD

Liaw Min-Jenn, 9 Floor, No. 1291, Cheng-Der Rd., Taipei, Taiwan

Filed Jun. 16, 1988, Ser. No. 207,237

Int. Cl.⁴ A61L 3/00

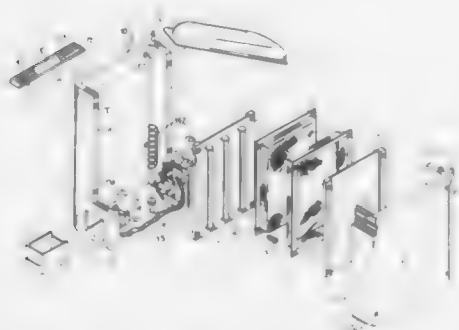
U.S. Cl. 250—455.1

3 Claims

1. A container, in which a kitchen-use chopping board is stored and sterilized, comprising:

- a fixed casing body, which is integrally formed by a horizontal long circumferential wall, a longitudinal long circumferential wall, two longitudinal short circumferential walls, a horizontal short circumferential wall and a bottom part;
- a movable casing body, which is integrally formed by a horizontal long circumferential wall and two longitudinal long circumferential walls and is locked to one lateral side of the fixed casing body;
- a pair of fixing plates on which a lamp tube for sterilization and a lamp tube for heating purposes are rigidly fixed and, each lamp tube is separately fixed to an interior layer of the fixed casing body and the movable casing body;
- a pair of net covers, which is set at an exterior lateral side of the fixing plates and are also jointly fixed with the fixing plates into the interior layer of the fixed casing body and

- the movable casing body, so as to protect the forementioned lamp tube and heating tube from being damaged;
- a micro-switch, which is set at the interior layer proximate an interior lateral side of the longitudinal short circumferential wall;
- a water collection case, which is set at an aperture which is preset at the lower direction proximate an exterior lateral side of the longitudinal short circumferential wall and is removed at will;
- a compression spring, the lower end of which is rigidly fixed to a convex stud which is preset at the bottom part of the fixed casing body and, the upper end of which is rigidly fixed to a convex stud which is preset at the lower direction of the plate plane of a holding plate;
- a fixing seat of the holding plate, which is rigidly fixed at the bottom part of the casing body and on which a joining groove hole is set which is connected with the holding plate;



- the holding plate on which a plurality of convex studs are scattered, having joining pins set at two lateral sides of its front edge to coordinate with joining groove holes set on a fixed seat of the holding plate and, each convex stud is preset at the reversed side of the plate plane being rigidly fixed with the upper end of the compression spring;
- a cover body, which is housed to the top plane of the fixed casing body and the movable casing body and is closed or opened at will;
- a circulation fan mounted in the fixed casing body;
- the elements of the forementioned assembly cooperating such that the holding plate will be caused to descend under the weight of the chopping board when it is being put inside the casing body and placed on it to get in touch with the micro-switch to further activate the functioning of the circulation fan and the sterilization lamp tube and the heating lamp tube to sterilize and store the chopping board.

4,877,968

ULTRAVIOLET STERILIZING APPARATUS

Yoshio Tanaka, and Shiro Saitou, both of Tokyo, Japan, assignors to Kareha Chemical Industry Co., Ltd., Tokyo, Japan

Filed Jul. 19, 1988, Ser. No. 221,229

Claims priority, application Japan, Aug. 5, 1987, 62-119282[U]; Dec. 15, 1987, 62-189377[U]

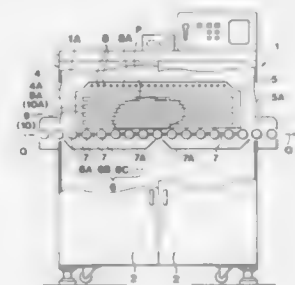
Int. Cl.⁴ A61L 2/10

U.S. Cl. 250-455.1

5 Claims

1. An ultraviolet sterilizing apparatus comprising:
 - a sterilization chamber defining an enclosed space and having an entrance and an exit;
 - a roller conveyor including a number of rollers arranged between the entrance and the exit for conveying products to be sterilized through the interior of said sterilization chamber along a conveyance path;
 - a plurality of first sterilizing ultraviolet lamps arranged about the conveyance path; and
 - a plurality of second sterilizing ultraviolet lamps situated

below the conveyance path, each of said second ultraviolet lamps being interposed between mutually adjacent



ones of said rollers and arranged at a level lower than that of a conveyance plane of said roller conveyor.

4,877,965

FLUOROMETER

Walter B. Dandliker, La Jolla; Howard S. Barr, Carlsbad; Henry S. Katzenstein, Pacific Palisades, and Keith R. Watson, Alpine, all of Calif., assignors to Diatron Corporation, San Diego, Calif.

Filed Jul. 1, 1985, Ser. No. 751,746

Int. Cl.⁴ G01N 21/64

U.S. Cl. 250-458.1

123 Claims



1. A fluorometer for measuring a particular fluorescence emanating from particular fluorophore molecules in a specimen, including,
 - means for producing a burst of concentrated light energy having a pulse time short compared to the decay time of the particular fluorescence and having sufficient energy to excite substantially all of the particular fluorophore molecules;
 - means responsive to the burst of concentrated light energy for directing the burst of concentrated light energy toward the specimen to produce a fluorescence from the specimen including the particular fluorescence;
 - means responsive to the fluorescence from the specimen for detecting the fluorescence and for producing signals in accordance with such detection;
 - means coupled to the detecting means for controlling the detecting means within a particular time period to optimize the detection of the particular fluorescence and to enhance the detection of the particular fluorescence relative to the total fluorescence, the beginning of the particular time period being defined by a first particular time after the burst of concentrated light energy and during the production of the particular fluorescence and the end of the particular time period being defined by a second particular time after the first particular time where the second

particular time occurs during the production of the particular fluorescence from the specimen as a result of the burst of the concentrated light energy.

means coupled to the burst producing means, to the detecting means and to the controlling means for timing the operation of the above means to sequence the detection of the fluorescence during the particular time period as a result of the production of the burst of concentrated light energy,

means coupled to the detection means for forming signals representative of the particular fluorescence from the specimen, and

means responsive to the detection of the particular fluorescence from the specimen during the particular time period for producing an image of the particular fluorescence.

4,877,967

PACKAGE INSPECTING APPARATUS

Shuzo Kawamura, Jojo, Japan, assignor to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Filed May 28, 1987, Ser. No. 55,715

Claims priority, application Japan, Jun. 3, 1986, 61-128413; Jun. 6, 1986, 61-86404[U]; Jun. 10, 1986, 61-89159[U]; Jun. 13, 1986, 61-90103[U]

Int. Cl.⁴ G01N 21/64

U.S. Cl. 250-461.1

2 Claims



4,877,966

METHOD AND APPARATUS FOR THE MEASUREMENT OF LOW-LEVEL LASER-INDUCED FLUORESCENCE

L. David Tomei, Dublin; Fred Cornhill, Worthington; Jogikaj Jagadeesh, and Michael Boninger, both of Columbus, all of Ohio, assignors to Ohio State University Research Foundation, Columbus, Ohio

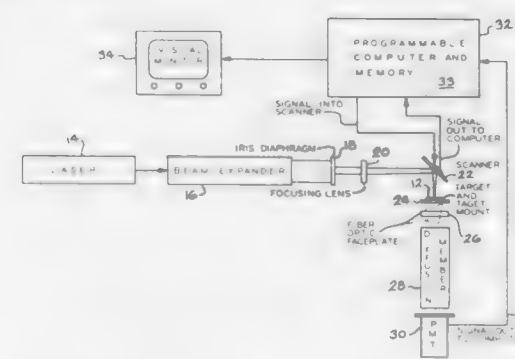
Division of Ser. No. 828,694, Feb. 12, 1986. This application Jan. 29, 1988, Ser. No. 150,293

The portion of the term of this patent subsequent to Jul. 19, 2005, has been disclaimed.

Int. Cl.⁴ G01J 3/10

U.S. Cl. 250-458.1

26 Claims



1. An improved method for measuring the excited fluorescence of an object comprising:
 - binding a specific dye to such object;
 - securing such object in a fixed position;
 - generating a coherent beam of light;
 - scanning such fixed object with said coherent beam of light in a preprogrammed three dimensional pattern and at a preselected rate to induce such fluorescence;
 - gathering such fluorescent light with an optical fiber member, such optical fiber member attenuating said coherent beam of light used to induce such fluorescence;
 - measuring the intensity of said fluorescent light in a light intensity measuring device; and
 - sequentially recording data regarding the intensity of said fluorescent light as a function of the location of said scanning beam of light on said object.

4,877,968

THIN LAYER EL PANEL

Kazunori Miwa, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

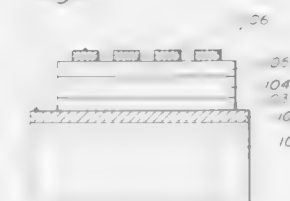
Filed Dec. 8, 1987, Ser. No. 130,191

Claims priority, application Japan, Dec. 9, 1986, 61-291522

Int. Cl.⁴ H01J 1/62

U.S. Cl. 250-484.1

11 Claims



1. An electroluminescent panel comprising:
 - a substrate;
 - a transparent electrode disposed on said substrate;
 - a first dielectric layer disposed on said transparent electrode, said first dielectric layer being comprised of one of silicon yttrium oxynitride and silicon yttrium aluminum oxynitride;
 - a fluorescent layer;
 - a second dielectric layer disposed on said fluorescent layer, said second dielectric layer being comprised of one of silicon yttrium oxynitride and silicon yttrium aluminum oxynitride; and

rear surface electrodes disposed on said second dielectric layer.

4,877,969

FLASKS FOR RADIOACTIVE MATERIALS

Leslie G. James, Sandiway, and Michael J. Old, Antrobus, both of United Kingdom, assignors to British Nuclear Fuels Plc, Warrington, England

Filed Mar. 13, 1988, Ser. No. 168,234

Claims priority, application United Kingdom, Apr. 6, 1987, 170819H

Int. Cl.⁴ G21F 5/00

U.S. Cl. 250—507.1

8 Claims

inputting data of $L(\theta)$ thus detected into a memory of a computer, calculating a value of $L(\theta) + L(\theta + 180^\circ)$, comparing the thus calculated value with that for an ideal contour configuration, and correcting deviations in a position and an angle of the article, whereby a correct measured value is obtained.

4,877,971

METHOD AND APPARATUS FOR DISTRIBUTING A SIGNAL

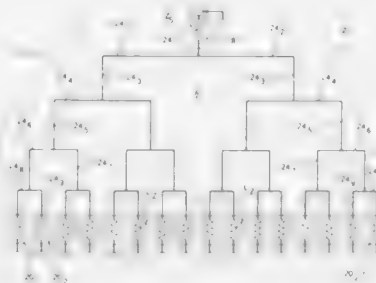
Ching-Wen Hsue, Holland, Pa., assignor to American Telephone and Telegraph Company, New York, N.Y.

Filed Aug. 31, 1988, Ser. No. 238,787

Int. Cl.⁴ H02J 1/00

U.S. Cl. 307—11

4 Claims



1. A network for distributing a signal from a single source to 2^n loads (where n is an integer ≥ 0), consisting of 2^n paths of approximately the same electrical length, each coupling a source to a separate one of the loads, the paths each consisting of $2n+1$ serially connected segments $L_1, L_2, \dots, L_{2n+1}$, respectively, with the segments $L_1, L_2, \dots, L_{2n-1}$ of each path being common to another of the paths, the segments $L_1, L_2, \dots, L_{2n+1}$ having corresponding impedances $Z_1, Z_2, \dots, Z_{2n+1}$, respectively, which are selected such that each load is substantially matched to the source and the internal signal reflections within the branch are minimized.

4,877,972

FAULT TOLERANT MODULAR POWER SUPPLY SYSTEM

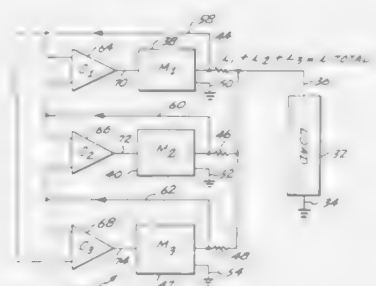
Seyd M. Sobhani, and Ralston M. Smith, both of Renton, Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Jun. 21, 1988, Ser. No. 209,506

Int. Cl.⁴ H02M 3/335; H02J 1/00

U.S. Cl. 307—43

21 Claims



1. A fault tolerant modular power system comprising:
(a) a plurality of power supplies, each having an output connected in parallel to supply current to a load, and each having the same nominal output voltage;
(b) current monitoring means associated with each of the power supplies, for monitoring a condition indicative of

4,877,970

PROCESS FOR MEASURING CONTOUR CONFIGURATIONS OF ARTICLES DEFINED BY NUMEROUS CYLINDRICAL SURFACE PORTIONS
Masayasu Minamikawa, Yoshiaki Onabe, and Masanao Ono, all of Nagoya, Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan

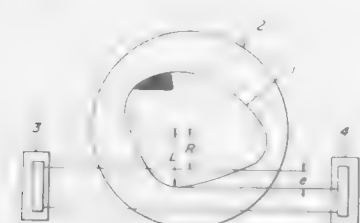
Filed Sep. 13, 1988, Ser. No. 243,998

Claims priority, application Japan, Sep. 17, 1987, 62-233574

Int. Cl.⁴ G01N 21/86

U.S. Cl. 250—560

2 Claims



1. A process for measuring the contour configuration of an article defined by numerous cylindrical surface portions, which process comprises placing the article on a turntable, irradiating parallel light beams upon one side portion of the article while rotating the turntable, detecting changes, as a function $L(\theta)$ by means of a light-receiving member, in locations L at which the parallel light beams are interrupted by the articles, said θ denoting a rotational angle of the turntable,

the magnitude of the current output by each, and operative to produce a signal corresponding to the magnitude of said current; and

(c) comparator means, connected to the current monitoring means and responsive to the signals said current monitoring means produce, for determining the difference between the current supplied by each power supply and at least one other power supply in the system that serves as a first order reference power supply, each power supply having a different first order reference power supply thereby producing a plurality of differential signals corresponding to said differences, each differential signal serving as a reference signal to control the output current of one of the power supplies causing the power supplies to have substantially equal output voltages and equal output currents.

4,877,973

APPARATUS FOR DEALING WITH CABLES IN INDUSTRIAL ROBOTS

Nobutoshi Torii, Hachioji; Hitoshi Mizuno, and Kyoji Iwasaki, both of Hino, all of Japan, assignors to Fanuc Ltd., Minamitsuru, Japan

PCT No. PCT/JP87/00349, § 371 Date Oct. 5, 1987, § 102(e)

Date Oct. 5, 1987, PCT Pub. No. WO87/07450, PCT Pub. Date Dec. 3, 1987

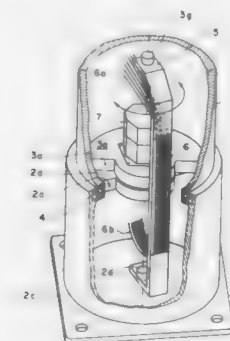
PCT Filed May 30, 1987, Ser. No. 117,195

Claims priority, application Japan, May 30, 1986, 61-124788

Int. Cl.⁴ H01B 7/30; H02G 11/00; B25J 19/00

U.S. Cl. 307—147

9 Claims



1. An apparatus for guiding a cable of an industrial robot having a hollow support casing and a hollow swivel casing rotatably supported by said support casing for undergoing swiveling motion, and equipped with a cable led into the interior of the swivel casing from the support casing, the apparatus comprising:

- an upper wall provided on an upper portion of the support casing;
- a first arcuate cut-out portion provided in said upper wall;
- a lower wall provided on a lower portion of the swivel casing adjacent the upper wall provided on the upper portion of said support casing;
- a second arcuate cut-out portion provided in said lower wall and at least partially overlapping the first arcuate portion provided in the upper wall of the support casing;
- a cable guide having an upper arm, a lower arm, each having proximal and distal ends, and a back column portion joining the proximal ends of the upper and lower arms, the back column portion passing through said first and second arcuate portions and being rotatably supported inside said support casing and swivel casing at the distal ends of the upper and lower arms; and
- a cable provided along the back column portion of the cable

guide and being connected at one end to the support casing and at the opposite end to the swivel casing.

4,877,974

CLOCK GENERATOR WHICH GENERATES A NON-OVERLAP CLOCK HAVING FIXED PULSE WIDTH AND CHANGEABLE FREQUENCY

Hiroyuki Kawai, and Shinichi Nakagawa, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

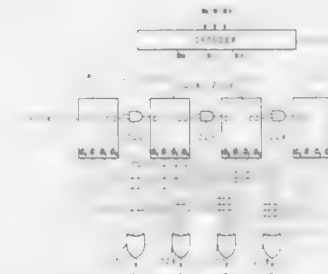
Filed May 3, 1988, Ser. No. 189,885

Claims priority, application Japan, Dec. 4, 1987, 62-308195

Int. Cl.⁴ H03K 5/13, 7/00, 17/80, 5/00

U.S. Cl. 307—269

5 Claims



1. An n-phase clock generating apparatus that receives an external input signal of a predetermined frequency comprising: a plurality of n-phase clock generating circuit stages, n being a predetermined integer, each stage for generating a clock pulse of the first phase in synchronism with the front edge of an external input signal, and $n-1$ following clock pulses having a fixed phase relationship with said clock pulse of the first phase;
a plurality of gates serially connecting said clock generating circuit stages such that a previous clock generating circuit stage supplies a next clock generating circuit stage with a signal whose front edge is generated in synchronism with the rear edge of the last following clock pulse of the previous stage when the gate connecting the previous with the next is enabled;
a plurality of OR gates, each coupled to receive the same phase clock signal from the plurality of stages, each OR gate for outputting a logical sum signal of clock pulses of same phase clock signal received from said clock generating circuit stages; and
a circuit for outputting a switching signal coupled to said each gate to enable the gates connecting a first m sequential clock generating circuit stages such that the frequency of the generated clock pulses may be a multiple of the frequency of the external input signal.

4,877,975

LOGIC CIRCUIT HAVING AN OUTPUT SIGNAL WITH A GENTLE LEADING EDGE

Masaji Ueno, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 25, 1988, Ser. No. 173,668

Claims priority, application Japan, Mar. 27, 1987, 62-71874

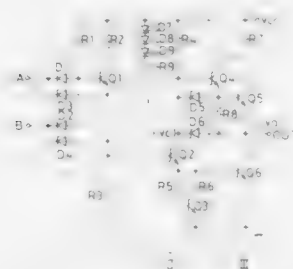
Int. Cl.⁴ H03K 17/16

U.S. Cl. 307—443

3 Claims

1. A logic circuit comprising:
(a) an input section for receiving at least one input signal and generating a logic result signal;
(b) a control section including at least one first switching element having a first constant resistance circuit connected between an output terminal of said first switching element and a supply voltage, said first switching element being turned on or off in response to the logic result signal from said input section to generate a control signal;
(c) an output section including at least two second and third

switching elements and an output terminal connected to a junction point between the two second and third switching elements, said second and third switching means being turned on or off alternatively in response to the control signal to generate a logic output signal; and



(d) means, coupled in parallel to the first constant resistance load circuit, for increasing the load resistance of said first switching element with increasing output terminal potential of said first switching element to obtain an output signal with a gentle leading edge at high response speed.

4,877,976

CASCADE FET LOGIC CIRCUITS

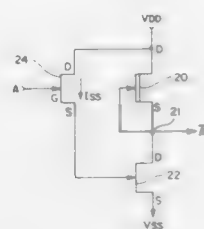
Lawrence E. Lach, Chicago, and Mikiharu Ohoka, Schaumburg, both of Ill., assignors to Gould Inc., Rolling Meadows, Ill. and Nippon Mining Co., Ltd., Japan

Continuation of Ser. No. 25,899, Mar. 13, 1987, abandoned. This application Oct. 13, 1988, Ser. No. 257,897

Int. Cl.⁴ H03K 19/094

U.S. Cl. 307-450

25 Claims



25. A logic circuit, comprising:

- a first potential node;
- a second potential node;
- a first group III-V field effect transistor having a first gate, having a first source, and having a first drain, said first gate receiving an input signal;
- a second group III-V field effect transistor having a second gate, having a second source, and having a second drain, said first drain and said second drain being coupled at said first node to receive said first potential, said second gate and said second source being coupled together; and
- a third group III-V field effect transistor having a third source receiving said second potential, having a third drain coupled to said second source, and having a third gate coupled solely to said first source.

4,877,977

ECL CIRCUIT HAVING AN IMPROVED EMITTER FOLLOWER OUTPUT CIRCUIT

Masayuki Kokado, Machida, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

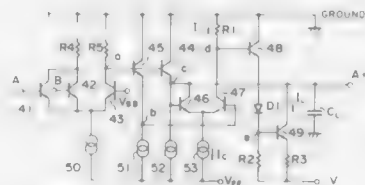
Filed May 27, 1988, Ser. No. 199,637

Claims priority, application Japan, Jun. 2, 1987, 62-138443

Int. Cl.⁴ H03K 19/086, 3/01

U.S. Cl. 307-455

12 Claims



1. A semiconductor integrated circuit having an emitter follower circuit coupled with an output of a logic circuit, comprising:

- a first emitter follower means for receiving an output signal of a logic circuit, an output signal obtained at an emitter output of the first emitter follower means forming a finalized output signal of the logic circuit;
- second emitter follower means for receiving the output signal of the logic circuit, said first and second emitter follower means being supplied with the same output signal of the same phase derived from said logic circuit;
- detecting means, connected to said first and second emitter follower means, for detecting a difference in level between the output signal of the first emitter follower means and an output signal of the second emitter follower means;
- driving means, connected to said detection means, for driving a load capacitance, coupled with the emitter output of the first emitter follower means, during a period when the detecting means detects the difference.

4,877,978

OUTPUT BUFFER TRI-STATE NOISE REDUCTION CIRCUIT

Paul E. Platt, Starkville, Miss., assignor to Cypress Semiconductor, San Jose, Calif.

Filed Sep. 19, 1988, Ser. No. 246,634

Int. Cl.⁴ H03K 19/017, 19/096, 17/04, 17/687

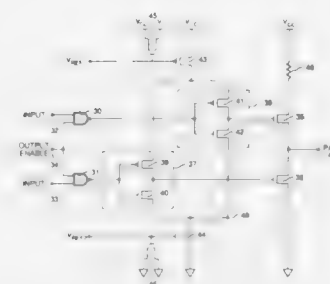
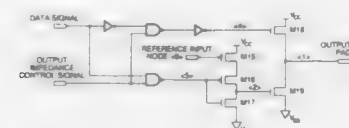
U.S. Cl. 307-473

6 Claims

1. An output buffer circuit capable of switching from the off state to the on state, and from the on state to the off state, without generating significant noise, comprising:

- an MOS inverter circuit having a first node for connection to one terminal of a power supply and a second node for connection to the other power supply node, and having an input means for receiving an input signal and an output means for providing an output signal to an output transistor;
- a first MOS transistor of one polarity type and of either enhancement or depletion mode, having its source-drain circuit coupled in series with said first node of said MOS inverter circuit;
- a second MOS transistor of the opposite polarity type or mode from said first MOS transistor, having its source-drain circuit coupled in series with the said other node of said MOS inverter circuit;
- a means for supplying a first reference voltage to the gate of said first MOS transistor and for supplying a second reference voltage which is the mirror of said first reference voltage to the gate of said second MOS transistor, said reference voltages enabling said first and second MOS transistors to act like constant current sources which

generate stable currents over normal variations in operating and processing conditions of the MOS transistors in the circuit, whereby the rise and fall times of said output signal from said inverter circuit are precisely controlled



4,877,979

FILTER ARRANGEMENT

Adrianus Sempel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

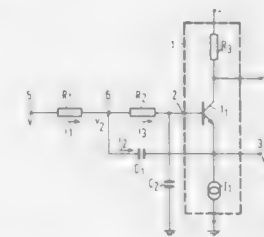
Filed Nov. 30, 1987, Ser. No. 126,380

Claims priority, application Netherlands, Dec. 11, 1986, 5603183

Int. Cl.⁴ H03K 5/00; H03F 1/36

U.S. Cl. 307-520

13 Claims



1. A filter arrangement comprising at least a first and a second resistor connected in series between an input terminal for receiving an input signal and an input of an amplifier circuit comprising a transistor having a base coupled to the input and an emitter coupled to a first power-supply terminal by means of a current source and to a first output for providing a first output signal, means for coupling said first output to a junction point between the first resistor and the second resistor via a first capacitor, second means including a second capacitor for coupling the amplifier circuit input to a power-supply terminal, and third means coupling the collector of the transistor to a

second output for providing a second output signal and to a second power supply terminal via a third resistor.

4,877,980

TIME VARIANT DRIVE CIRCUIT FOR HIGH SPEED BUS DRIVER TO LIMIT OSCILLATIONS OR RINGING ON A BUS

James J. Kubinec, Incline Village, Nev., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Mar. 10, 1988, Ser. No. 166,351

Int. Cl.⁴ H03K 19/003, 17/16, 17/687, 17/284

U.S. Cl. 307-542

10 Claims



1. A time variant drive circuit comprising:

- an N-channel MOS driver transistor coupled to a first circuit, said driver transistor controlling voltage applied to said first circuit in response to a time variant drive signal;
- a first field-effect transistor having a second terminal coupled to a gate of said driver transistor and having a channel with a width-to-length ratio such that a high digital drive signal applied to a first terminal of said first field-effect transistor produces a gradually increasing voltage at said second terminal of said first field-effect transistor, leveling off at a maximum drive signal voltage; and
- a second field-effect transistor having a second terminal coupled to said gate of said driver transistor and having a channel with a width-to-length ratio such that said high digital drive signal applied to a first terminal of said second field-effect transistor rapidly produces a certain voltage at said second terminal of said second field-effect transistor, said certain voltage being lower than said maximum drive signal voltage so as not to cause objectionable ringing on a bus coupling said driver transistor to said first circuit.

4,877,981

PRECISION DEVICE FOR SOFT CLIPPING AC AND DC SIGNALS

Gary D. Gomes, Newark, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed May 25, 1988, Ser. No. 198,420

Int. Cl.⁴ H03K 5/08

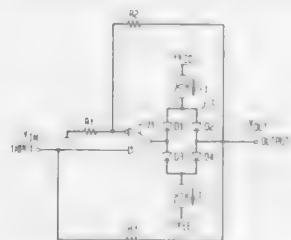
U.S. Cl. 307-555

8 Claims

- 1. An apparatus for soft clipping AC and DC signals, comprising:
 - amplifier means having an inverting and non-inverting input, respectively, said non-inverting input receiving an input signal;
 - a diode switching circuit coupled to an output of said amplifier means for connecting an output signal of said amplifier

means to an output terminal of said apparatus when a magnitude of said output signal is below a threshold level, and for disconnecting said output signal from said output terminal when said magnitude is above said threshold level; and

purely resistive voltage divider means having a linear trans-



4,877,982

MOSFET TURN-ON/OFF CIRCUIT

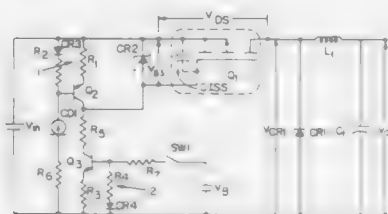
Charles S. Walker, Seattle, Wash., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jan. 23, 1989, Ser. No. 299,508

Int. Cl.⁴ H03K 17/687

U.S. Cl. 307—571

5 Claims



1. A dual current source MOSFET turn-on/off circuit comprising:

a MOSFET connected between a voltage source and a load;
a turn-off current source comprising a first high gain bipolar transistor connected to a gate electrode of said MOSFET;
a turn-on current source comprising a second high gain bipolar transistor connected in series with said first bipolar transistor; and

switch means connected to a base electrode of said second bipolar transistor for turning said second bipolar transistor on and off, said turn-on current source overpowering said turn-off current source when said second bipolar transistor is turned on to charge a gate-to-source capacitance of said MOSFET and said turn-off current source discharging said gate-to-source capacitance of said MOSFET when said second bipolar transistor is turned off.

4,877,983

MAGNETIC FORCE GENERATING METHOD AND APPARATUS

Howard R. Johnson, Box 199, 314 N. Main, Blacksburg, Va.

Filed Nov. 19, 1985, Ser. No. 799,618

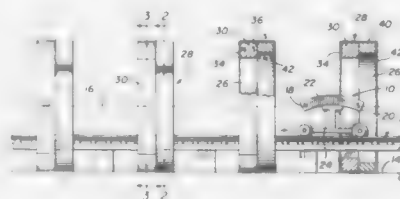
Int. Cl.⁴ H02K 41/00

U.S. Cl. 310—12

6 Claims

1. In combination with a movable armature, means for guiding movement of the armature along a predetermined path and a permanent armature magnet having magnetic poles of oppo-

site polarity spaced from each other along said path to establish a magnetic field of limited extent movable with the armature and magnetic stator means for establishing a stationary magnetic flux zone along said path, the improvement comprising flux emitting surfaces of one polarity mounted on the stator means on opposite sides of said path for limiting said flux zone through which said path extends and means mounting the permanent armature magnet on the armature with the poles thereof orientated relative to said flux emitting surfaces on the stator means for unidirectionally propelling the armature along said path through the limited zone in response to magnetic



interaction between the movable magnetic field and the limited flux zone, said magnetic stator means including a plurality of magnetic gate assemblies fixedly spaced from each other along said path and respectively establishing stationary magnetic fields, each of said gate assemblies including a plurality of interconnected bar magnets substantially bordering said limited flux zone exposing pole faces of opposite polarity in parallel spaced planes intersected by said path, and magnetic means connected to said interconnected bar magnets exposing one of the flux emitting surfaces of said one polarity perpendicular to said parallel planes for magnetic interaction of the stationary magnetic fields.

4,877,984

ELECTRIC MOTOR AND PUMP MOUNTING BRACKET ASSEMBLY AND METHOD OF MAKING

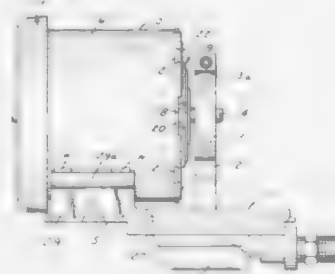
Robert A. Colwell, and Thomas W. Stone, both of Owosso, Mich., assignors to MagneTek Universal Electric, Owosso, Mich.

Filed Jul. 19, 1988, Ser. No. 221,138

Int. Cl.⁴ H02K 7/00

U.S. Cl. 310—66

10 Claims



1. An electric motor pump mounting bracket assembly comprising

an electric motor comprising a stator, a rotor and a shaft on which the rotor is mounted,

a pump mounting bracket fastened to the motor for supporting a pump which is to be driven by the shaft of the electric motor,

said electric motor comprising

a cylindrical shell which encircles the stator of the motor and has a centerline,

said shell having at least one surface on the shell which is accurately positioned longitudinally of the shell,

a pair of end members having radial extending portions engaging said surface, said end members rotatably supporting said shaft in concentric relation to said shell, said pump mounting bracket including a mounting surface that is accurately located parallel to the centerline of the shell and forms the mounting surface for a pump, said bracket further including an opening through which a connecting link may extend from a pump to the shaft of the motor, said mounting surface on said shell being in predetermined longitudinally spaced relation to the opening in the bracket, said bracket including a pair of upstanding portions welded to said shell and supporting said shell with its centerline in accurate relation to said mounting surface.

4,877,985

DYNAMOELECTRIC MACHINE

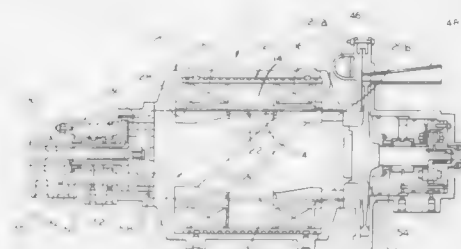
William A. Byrd, 1107 Brookfield, Rockford, Ill. 61107; Joel E. Oman, 4450 River La., Rockford, Ill. 61111, and William Connors, 6830 Millbrook Dr., Rockford, Ill. 61108

Filed Dec. 29, 1986, Ser. No. 946,719

Int. Cl.⁴ H02K 5/10

U.S. Cl. 310—86

26 Claims



1. A dynamoelectric machine, comprising:

a stator including a core having a winding applied thereto;
a rotor disposed inwardly of said stator in spaced relation to said core and said winding;

means for delivering a corrosive reactive fluid to a turbine; and

a composite shielding member disposed within said housing between said stator and said rotor, said composite shielding member being formed of a non-conductive non-magnetic material at least in the region defined by said core of said stator and extending beyond said core at both ends thereof at least into the region defined by said winding of said stator, said non-conductive non-magnetic material including a non-porous ceramic material facing said rotor to prevent said fluid from migrating therethrough;

said composite shielding member also being formed of a second material integral with said non-conductive ceramic material, said second material being adapted for securing said composite shielding member in a fixed position within said housing in a sealed manner to define a sealed rotor cavity capable of receiving said fluid therewithin, said core of said stator being isolated from said fluid in said rotor cavity by said composite shielding member.

4,877,986

ROTOR OF MAGNETIC GENERATOR

Yuzuru Shimizu, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

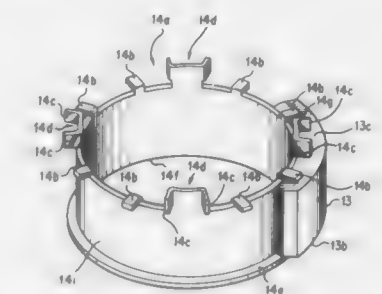
Filed May 19, 1988, Ser. No. 196,625

Claims priority, application Japan, May 19, 1988, 62-122020

Int. Cl.⁴ H02K 21/22, 5/06

U.S. Cl. 310—153

6 Claims



1. A rotor of a magnetic generator, comprising:

a bowl-shaped flywheel having a disc-shaped bottom part and a cylindrical peripheral wall part of a first inside diameter;

a plurality of magnets, disposed on an inner surface of said peripheral wall of said flywheel at intervals of a predetermined angle;

a magnet-holding cylinder having an inner cylindrical surface of a predetermined second diameter smaller than said first inside diameter having an outward flange formed on a first open end and a plurality of outward protrusions circularly formed on a second open end at intervals of another predetermined angle, said plurality of magnets being respectively positioned thereby to be parallel to the axis of said magnet-holding cylinder; and

a resin molded member, that fills in spaces formed between said flywheel, said magnets and said magnet-holding cylinder for making said flywheel, said magnets and said magnet-holding cylinder in one piece so as to leave an inside open space contiguous with said inner cylindrical surface.

4,877,987

MOTOR WITH AXIALLY DISPLACEABLE ROTOR

Heinz Flaig, Bochum; Udo Neumann, Dortmund; Heinz Hasselmann, Hagen; Karl Zacharias, Schwerte; Rainer Horbach, and Harald Bitach, both of Witten, all of Fed. Rep. of Germany, assignors to Mannesmann AG, Duesseldorf, Fed. Rep. of Germany

Filed Dec. 23, 1986, Ser. No. 946,314

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1985, 3546100; Aug. 4, 1986, 3626270; Aug. 18, 1986, 3627992; Nov. 3, 1986, 3637591

Int. Cl.⁴ H02K 17/32

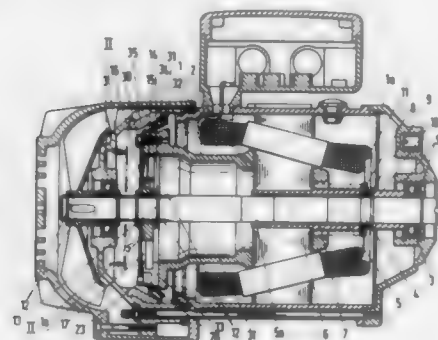
U.S. Cl. 310—209

24 Claims

1. An electrical motor comprising stator and an axially displaceable spring-biased rotor for assuming a first axial position of running and a second axial position upon braking, there being a motor shaft mounted in bearings in a housing for the motor,

at least one deformable rotor mounting element having radial outer portion means fastened to at least one end of the rotor, said element having individual arm means with inward radially extensions for being relatively easily deformable in axial direction to permit axial displacement of the rotor relative to the shaft, said element being axially and peripherally stiff and relatively undeformable in

peripheral direction for the transmission of torque from the rotor upon the shaft; and



carrying means for connecting the deformable rotor mounting element to the shaft.

4,877,988

PIEZOELECTRIC AND PYROELECTRIC POLYMERS
Vincent D. McGinniss, Delaware, and Joseph R. Preston, Radnor, both of Ohio, assignors to Battelle Memorial Institute, Columbus, Ohio

Continuation-in-part of Ser. No. 353,747, Mar. 1, 1982, abandoned. This application May 22, 1985, Ser. No. 736,982

Int. Cl.⁴ H01L 41/18; H02N 7/00

U.S. Cl. 310—306

11 Claims

1. A pyroelectric element comprising a polarized copolymer or homopolymer of trifluorovinyl acetate disposed between two electrodes.

4,877,989

ULTRASONIC POCKET ATOMIZER

Wolf-Dietrich Drews, Lichtenfels; Klaus Van Der Linden, Kronach; Martin Rüttel, Grab a. Forst, and Jürgen Friedrich, Neuenburg, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

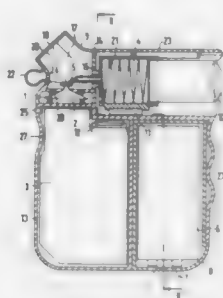
Continuation-in-part of Ser. No. 84,413, Aug. 10, 1987, abandoned. This application Jan. 12, 1989, Ser. No. 296,846

Claims priority, application Fed. Rep. of Germany, Aug. 11, 1986, 3627222

Int. Cl.⁴ H01L 41/08

U.S. Cl. 310—323

18 Claims



1. An ultrasonic pocket-size atomizer comprising:
a first housing;

vibration generation means mounted liquid-tight in said first housing for generating an oscillation with a frequency in the ultrasonic range said vibration generation means including a piezoelectric assembly and electronic circuit means operatively connected to said assembly for energizing said assembly and causing the piezoelectric assembly to vibrate;

power source means disposed in said first housing for supplying electric current to said electronic circuit means; a second housing, removably mounted on said first housing; a cartridge containing liquid to be atomized, said cartridge having at least one section movably disposed in said second housing; and activation means for automatically activating said electronic circuit means upon motion of said section of said cartridge, said activation means including a magnet arranged and configured relative to said section of said cartridge so as to move therewith, said activation means further including a switch operatively connected to said electronic circuit means and operable by said magnet upon a shift in the position thereof during motion of said section of said cartridge.

4,877,990

STERILIZATION SYSTEM BY MEANS OF HIGH THERMAL GRADIENT DUCTS

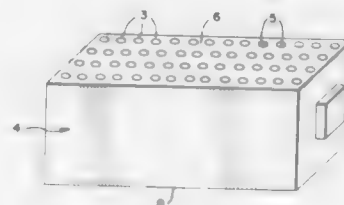
Alintor Florenzano, Jr., Rua Marechal Deodoro, No. 195/214, Cep: 25600 - Petropolis - RJ, Brazil

Continuation-in-part of Ser. No. 683,520, Dec. 19, 1984. This application Mar. 25, 1987, Ser. No. 29,986

Int. Cl.⁴ F24H 3/00; H05B 1/00

U.S. Cl. 219—381

5 Claims



1. An air sterilization apparatus comprising a refractory block having a top and a bottom, a plurality of vertically disposed ducts extending through said block from said bottom to said top, said ducts having a cross-sectional area of between 1.7-7.07 square millimeters and a length of between 4-12 centimeters, said ducts including top and bottom ends and said duct ends communicating directly with ambient air, an axially extending resistive heating filament disposed within each of said ducts, and means for supplying electrical energy to said heating filaments to produce a high thermal gradient in said ducts whereby ambient air is drawn into and upwardly through said ducts solely by convection with minimal increase in temperature of the ambient air due to air issuing from said ducts.

4,877,991

OPTICAL RADIATION SOURCE

Walter L. Colterjohn, Jr., 1201 Oak Ridge Cir., Barrington, Ill. 60010

Filed Dec. 21, 1987, Ser. No. 135,348

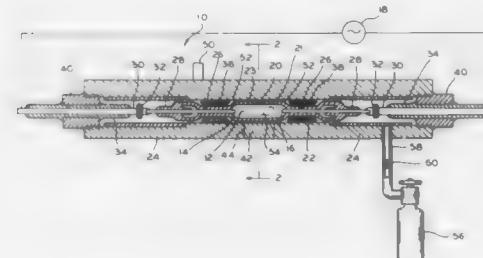
Int. Cl.⁴ H01J 61/34, 61/52

U.S. Cl. 313—22

58 Claims

1. An optical radiation source including a light transmitting electrically insulating tube having an electrode at opposite ends of said tube, pressurized gas within said tube, means for sealing said electrodes to said tube whereby said pressurized gas is retained within said tube, connection means for connecting said electrodes to a suitable source of electrical power to thereby establish a gaseous arc within said tube, an enclosure means having wall means for exerting a compressive force upon said tube adequate to counteract a predetermined internal pressure within said tube that would be in excess of the maximum pressure which said tube could normally withstand, cooling means in contact with said enclosure means and adapted to remove heat transmitted to said enclosure means from said tube, at least one window means in said enclosure

means for transmitting light from said tube through said wall means, said enclosure wall means and said at least one window means providing means for facilitation of heat transfer from said tube, in which said enclosure wall means is fabricated from a material having the product of its tensile strength and thermal conductivity being substantially greater than the similar



product of the material from which said tube is fabricated, whereby, for the retention of said predetermined pressure of said pressurized gas, the thermal impedance between the inside wall of said tube and said cooling medium is reduced, which reduced thermal impedance permits operation of said tube at a higher than normal power input and a higher than normal brightness.

4,877,992

ELECTRIC LAMP HAVING CONDUCTORS WITH MEANS FORMED THEREIN FOR REMOVING CONTACT SURFACE MATERIAL

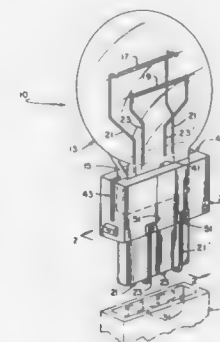
Daniel D. Devir, S. Sutton, N.H., assignor to GTE Products Corporation, Danvers, Mass.

Filed Jul. 9, 1987, Ser. No. 71,235

Int. Cl.⁴ H01J 5/48

U.S. Cl. 313—318

9 Claims



1. An electric lamp for being removably positioned within a socket having electrical contacts therein, said lamp comprising:

- an insulative base;
- an envelope located within said base and having at least one filament therein;
- a sealed end portion and a pair of conductors coupled to said filament and projecting exteriorly of said sealed end portion and passing through said base to extend therefrom in a predetermined alignment on said base, each of said conductors electrically connected to a respective one of said contacts within said socket when said lamp is positioned therein; and
- means for removing surface material from said contacts during insertion and removal of said lamp within said socket, said means comprising a roughened surface within at least a portion of each of said conductors which extends

from said base, said means thereby improving electrical contact between said conductors and said contacts.

4,877,993

INLINE TYPE COLOR PICTURE TUBE HAVING COMA DISTORTION CORRECTING MECHANISM

Takaaki Ogasa, Mobara, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

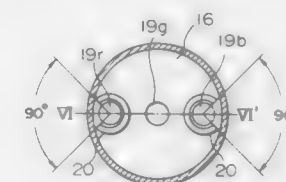
Filed Feb. 19, 1988, Ser. No. 157,793

Claims priority, application Japan, Mar. 20, 1987, 62-63786

Int. Cl.⁴ H01J 29/51

U.S. Cl. 313—414

3 Claims



1. A color picture tube including inline type electron guns and an electron beam electromagnetic deflecting apparatus, comprising:

- a shield cup made of a nonmagnetic material which is attached to tips of said electron guns;
- three electron beam through-holes formed in said shield cup and arranged in the incline direction; and
- annular magnetic material members which are arranged around the two outside electron beam through-holes among said three electron beam through-holes so as to be coaxial with said through-holes and to pass said electron beams, each of said magnetic material members being made of a material of a high permeability and serving as a shield of leakage magnetic fields from said electromagnetic deflecting apparatus, each of said two outside magnetic material members having a gap portion on the side opposite to the central electron beam through-hole, both of said gap portions having symmetrical shapes around said central electron beam through-hole as a center, and each of said gap portion of said annular magnetic material members having an opening angle of $90^\circ \pm 10^\circ$ in the radial direction from the center of said member.

4,877,994

ELECTROLUMINESCENT DEVICE AND PROCESS FOR PRODUCING THE SAME

Moriaki Fuyama; Katsumi Tamura; Kazuo Taguchi, Tokyo; Kenichi Onisawa, Hitachi; Akira Sato, Takahagi; Kenichi Hashimoto, Katsuta; Takahiro Nakayama, Hitachi, and Yoshio Abe, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

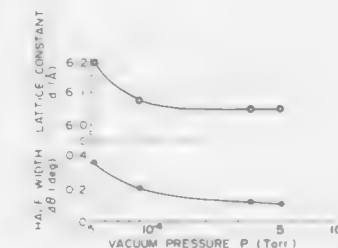
Filed Mar. 23, 1988, Ser. No. 172,415

Claims priority, application Japan, Mar. 25, 1987, 62-68880

Int. Cl.⁴ H05B 33/22

U.S. Cl. 313—503

19 Claims



1. An electroluminescent device which comprises:

transparent electrodes formed on a transparent substrate; a first insulating layer formed on the transparent electrodes; an electroluminescent layer containing strontium sulfide as a matrix and having a lattice constant of not more than 6.07 Å and a half-width at the (111) face of not more than 0.21 degree, formed on the first insulating layer; a second insulating layer formed on the electroluminescent layer; and back side electrodes formed on the second insulating layer.

4,877,995

ELECTROLUMINESCENT DISPLAY DEVICE USING HYDROGENATED AND CARBONATED AMORPHOUS SILICON

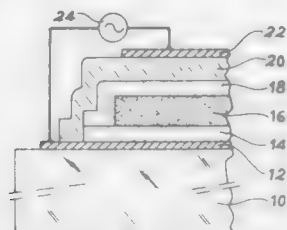
Pascal Thiouliere, Paris, and Israel Solomon, Boulogne, both of France, assignors to Etat Français Represente par le Ministre des PTT, Paris, France

Filed Oct. 19, 1987, Ser. No. 110,116

Claims priority, application France, Oct. 23, 1986, 86 14715 Int. Cl.⁴ G09F 3/30

U.S. Cl. 313—507

6 Claims



1. Electroluminescent display device comprising on an insulating support (10) an electroluminescent layer (16) and a photoconductive layer (20), said layers being stacked on one another, the two layers being inserted between two systems of electrodes (12, 22) connected to a voltage supply source (24) permitting the excitation of certain zones of the electroluminescent layer, said device being characterized in that the photoconductive layer is of hydrogenated and carbonated amorphous silicon $a-Si_xC_{1-x}H$, wherein $1-x$ is between 0.05 and 0.50.

4,877,996

ELECTRON TUBE WITH CONTROL ELECTRODE REMOTE FROM ANODE

Dirk van Houwelingen, and Jozephus J. M. Warringa, both of Heerlen, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 91,288, Aug. 27, 1987, abandoned, which is a continuation of Ser. No. 853,591, Apr. 18, 1986, abandoned. This application Mar. 13, 1989, Ser. No. 323,111

Claims priority, application Netherlands, May 2, 1985, NM01242

Int. Cl.⁴ H01J 1/46, 17/12, 19/38

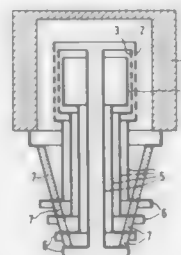
U.S. Cl. 313—592

5 Claims

1. An electron tube comprising an evacuated envelope containing:

- a. an electron-receiving anode;
- b. an electron-emitting cathode spaced from the anode for emitting an electron current which flows to the anode under the influence of an electric field in a region between the cathode and the anode, the cathode including a multiplicity of apertures extending therethrough from a side facing the anode to a remote side of said cathode; and
- c. a control electrode disposed adjacent the remote side of the cathode for producing an electric field extending through the apertures of the cathode and into said region; said control electrode and said cathode being arranged with respect to each other such that the spacing therebetween varies with distance along said control electrode and

affects the penetration of said electric field into said region, said spacing being dimensioned to optimize power



output control of the tube as a function of a voltage applied to said control electrode.

4,877,997

HIGH BRIGHTNESS AND VIEWED GAS DISCHARGE LAMP

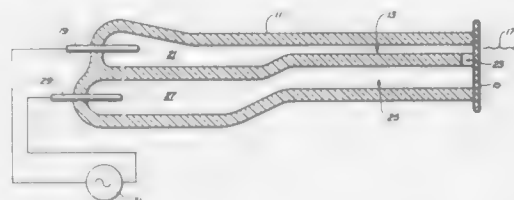
Michael E. Fein, Mountain View, Calif., assignor to Tencor Instruments, Mountain View, Calif.

Filed Feb. 18, 1988, Ser. No. 157,731

Int. Cl.⁴ H01J 61/30, 61/52

U.S. Cl. 313—634

22 Claims



1. An end viewed low pressure gas discharge lamp comprising:

- an elongated envelope including a small bore capillary tube and a second tube in communication with said capillary tube, said second tube defining a return path parallel to said capillary tube and connecting via a cross channel to said capillary tube, an outside wall of said capillary tube being in direct contact with a cooling medium, an electrically excitable gas in said capillary tube, a substantially planar window disposed on an end of said capillary tube adjacent to said cross channel for observing therethrough light emitted by said excitable gas, and
- a pair of spaced apart electrode means sealed hermetically through said envelope for producing a discharge through said capillary tube between said pair of electrodes, one of said electrode means being at an end of said capillary tube opposite from said window, the other of said electrode means being in said return path.

4,877,998

COLOR DISPLAY SYSTEM HAVING AN ELECTRON GUN WITH DUAL ELECTRODE MODULATION

Loren L. Maninger, Lancaster, Pa.; David A. New, Mercerville, N.J., and Carl L. Lundvall, II, Lancaster, Pa., assignors to RCA Licensing Corp., Princeton, N.J.

Filed Oct. 27, 1988, Ser. No. 263,454

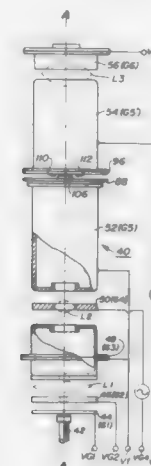
Int. Cl.⁴ H01J 29/46, 29/56

U.S. Cl. 315—15

13 Claims

1. In a color display system including a cathode-ray tube having an envelope with an inline electron gun therein for generating and directing three inline electron beams along initially coplanar paths towards a screen on an interior surface portion of said envelope, said gun including a plurality of

spaced electrodes which provide a first lens, a second lens and a third lens for focusing said electron beams, said first lens including a beam-forming region for providing substantially symmetrical beams to said second lens, said system including a magnetic deflection yoke that produces an astigmatic magnetic deflection field, the improvement comprising means for applying at least a first dynamic voltage signal to



a first modulation electrode of said second lens electrodes, and means for simultaneously applying a second dynamic voltage signal to a second modulation electrode of said third lens, said second modulation electrode being electrically separate from said first modulation electrode, said first and second signals being related to deflection of the electron beams.

4,877,999

METHOD AND APPARATUS FOR PRODUCING AN HF-INDUCED NOBLE-GAS PLASMA

Gunter Knapp, and Andreas Schalk, both of Graz, Austria, assignors to Anton Paar KG, Graz, Austria

Continuation of Ser. No. 931,031, Nov. 17, 1986, abandoned.

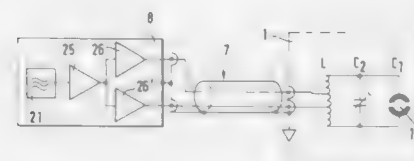
This application Apr. 7, 1988, Ser. No. 180,590

Claims priority, application Austria, Nov. 15, 1985, 3342/85

Int. Cl.⁴ H01J 7/24

U.S. Cl. 315—248

16 Claims



1. An apparatus for producing an HF-induced noble gas plasma, comprising: an HF generator for generating a high frequency output signal; and an oscillation circuit including an inductor and at least one primary capacitor, said oscillation circuit receiving said high frequency output signal, and said primary capacitor comprising at least two capacitor plates positioned with respect to one another so as to define a cavity therebetween through which a noble gas flows at substantially atmospheric pressure.

4,878,000

IMPROVED TRIGGER-TYPE CONTROL SWITCH FOR D.C. MOTORS

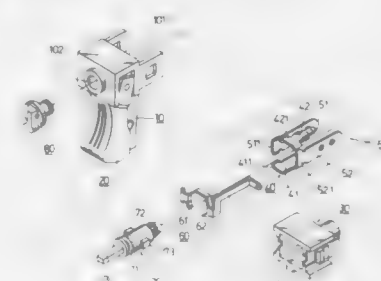
Shang-Hsieh Chen, 27 Chung Shan Rd., Sec. 3, Tainan Hsiang, Taichung Hsien, Taiwan

Filed Jun. 21, 1988, Ser. No. 209,692

Int. Cl.⁴ H02P 3/12

U.S. Cl. 318—362

3 Claims



2. In an improved triggering switch of the type having a base support, a pressing member operatively attached to the base support, a non-conductive coupling stand with an open section disposed in an upper portion of the base support, a set of motor terminals and power source terminals, together with a contact shaft, installed in the open section of the coupling stand, and a selection button adjustably disposed on the upper portion of the base support and movably engaged with the contact shaft, the improvement comprising a braking means integrally formed together with a negative terminal of the motor terminals for being connected to a positive terminal of the motor terminals through a backward movement of the contact shaft so as to cause a short-circuit to the motor terminals and effect an immediate stop of the motor.

4,878,001

DRIVE CONTROL DEVICE FOR MOTOR ACTUATOR IN AUTOMOBILE AIR CONDITIONER

Hirofumi Hagikura, and Haruki Kawamoto, both of Tokyo, Japan, assignors to Nihon Radiator Co., Ltd., Tokyo, Japan

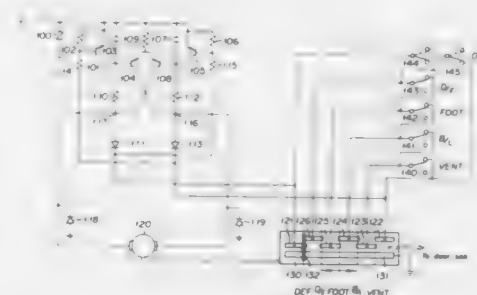
Filed Mar. 28, 1988, Ser. No. 174,178

Claims priority, application Japan, Mar. 30, 1987, 62-74224

Int. Cl.⁴ B60H 3/00

U.S. Cl. 318—446

2 Claims



1. A drive control device for a motor actuator in an automobile air conditioner for controlling opening and closing operations of doors to be installed in said automobile air conditioner, said drive control device comprising:

- a series of plural switches connected in series to each other, wherein when one of said switches for setting an opening degree of one of said doors is opened, all of the other switches for setting the other opening degree of the other doors are closed;
- a first sliding member provided with a plurality of separate contacts located in separation from each other, each of said separate contacts being connected to a terminal of

each said switch, and provided with a main contact connected to one terminal of a power source;

- a second sliding member adapted to be moved relative to said first sliding member and into contact with said main contact and any of said separate contacts;
- a motor for driving said doors to open and close the same and moving either of said first sliding member or said second sliding member;
- a first transistor connected to one input terminal of said motor and any one of said separate contacts provided on said first sliding member, said first transistor being connected to the other terminal of said power source;
- a second transistor connected to the other input terminal of said motor and any one of said separate contacts provided on said first sliding member, said second transistor being connected to the other terminal of said power source; and
- first and second switching circuits for switching said first transistor and said second transistor, respectively, wherein said motor is controlled by said first and second switching circuits from a timing when any one of said switches is opened to a timing when said second sliding member comes into contact with both the main contact and the adjacent separate contacts contacted both the terminals of said switch opened, and when said second sliding member comes into contact with the main contact and the adjacent separate contacts, said first and second transistors are turned off by said first and second switching circuits.

4,878,003

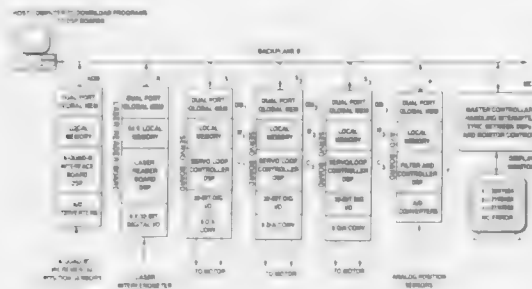
MULTI-AXIS DSP-BASED PARALLEL PROCESSING SERVO CONTROLLER FOR MACHINE TOOLS AND ROBOTS

Eric Hentzig, Watertown, Mass.; Alexander Slocum, and Debra Thurston-Slocum, both of McLean, Va., assignors to Advanced Engineering Systems, Operations & Products, Inc., Concord, N.H.

Filed Oct. 27, 1988, Ser. No. 263,503
Int. Cl.⁴ G05B 19/42

U.S. Cl. 318—568.2

9 Claims



1. A multi-axis DSP-based servo controller system for positioning motor-driven carriages and similar devices in response to multi-axis position-sensing readings as by optical encoders, laser interferometers, and analog position sensors, the system having, in combination, three types of sensor interface boards consisting of an A quad B incremental position sensor reading board, a multi-axis positioning-sensing reader board, an analog-to-digital (A/D) conversion board, and a plurality of multi-axis DSP based servo boards for executing digital control algorithms and outputting analog control voltages, one DSP servo board for each motor associated with one axis, and each board having a dual port memory and a local memory; a multiple bus backplane interconnected with the dual port memory of each of the sensor interface boards such as to enable inter-board communication and parallel processing; means for applying the multi-axis position data read by the A quad B incremental position sensor reader board and stored in its dual port memory by way of the bus backplane to each servo board for storage in each servo board dual port memory; means for transferring the position data thus stored in each servo board dual port memory

to its own local memory; means for feeding the analog position sensed information of the A/D board stored in its local and dual port memory from the latter by way of the bus backplane for storage in each servo board dual port memory; each servo board having servoloop controller DSP means responsive to the position values in its local memory to perform its control loop algorithm while up-dated position data in the positioning board dual port memory is transferred into the dual port memory of the servo board; each servo board having digital-to-analog (D/A) converter means connected to receive output commands from its servo-loop controllers and in turn connected to motor amplifiers means for controlling the corresponding axis motor; each servo board being provided with a self-turning algorithm to find optimal control constants for a physical system connected to the controller.

4,878,004

PROCESS AND INSTALLATION FOR THE AUTOMATIC CONTROL OF A UTILITY VEHICLE

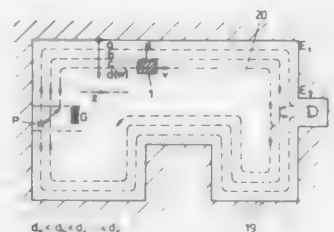
Hans-Reinhard Knepper, Oberhausen, Fed. Rep. of Germany
PCT No. PCT/CH86/00143, § 371 Date Jan. 10, 1987, § 102(e)
Date Jan. 10, 1987, PCT Pub. No. WO87/02483, PCT Pub. Date Apr. 23, 1987

PCT Filed Oct. 14, 1986, Ser. No. 75,811
Claims priority, application Switzerland, Oct. 15, 1985, 4429/85-1

U.S. Cl. 318—587

Int. Cl.⁴ G05D 1/02

41 Claims



1. A method for the automatic control of a utility vehicle over an area having a stationary guide structure where the vehicle is operationally associated with said structure in at least an intermittent manner to effect guidance, characterized by including the steps of:

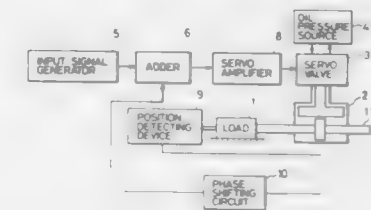
said vehicle laying down a detectable track on the surface of said area to identify its path or movement;
detecting the distance of said vehicle relative to said track; and exerting closed-loop feedback control over the vehicle and utilizing the distance data as one input to the closed-loop feedback control;
said method being further characterized in that the distance to the guide structures is obtained by determining the distance between the guide structure and the vehicle in at least two fixed vehicle axes; utilizing the distance along one of said axes as an input to the closed loop feedback control; and utilizing the distance along the other one of said axes as a control variable for selectively driving and steering the vehicle.

3. A method for the automatic control of a utility vehicle over an area having a stationary guide structure and where the vehicle is operationally associated with said structure at least intermittently to effect guidance of the vehicle, characterized by including the steps of:

maintaining the distance between the vehicle and the guide structure by means of closed-loop feedback control; and obtaining a nominal distance value for use as a command value by the closed-loop feedback control and varying said value according to detection of the guide structure; said method being further characterized by including detecting when the vehicle moves upon an area it has already traversed to alter its path and moving the vehicle further

away from the guide structure by varying the nominal distance value whereby the vehicle traverses a substantially spiral-shaped path.

41. A utility vehicle with an apparatus for its automatic control when moving over an area comprising:
drive means for moving said vehicle;
steering means for steering the vehicle as it moves;
trace generating means to lay down a detectable trace on said area as the vehicle moves on said area;
detecting means arranged on said vehicle and substantially shifted to one of its lateral sides for detecting a border of said last-mentioned trace, said detecting means generating a control signal for operating at least one of said drive means and a steering means so that said vehicle follows said border laterally shifted with respect to said one of its lateral sides.



resonance frequency of said load system in a range of -270° to -360° .

4,878,004

MOTOR-OPERATED POWER STEERING APPARATUS

Yasuo Shimizu, Tochigi, Japan, assignor to Honda Giken Kogyo

Kabushiki Kaisha, Tokyo, Japan

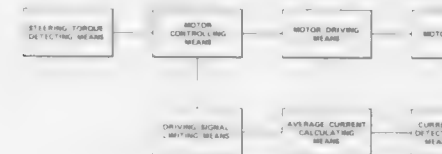
Filed Apr. 20, 1988, Ser. No. 183,813

Claims priority, application Japan, Apr. 20, 1987, 62-98257

Int. Cl.⁴ G05B 11/28

U.S. Cl. 318—599

6 Claims



1. A motor-operated power steering apparatus comprising:
an electric motor for generating an assistive force to be applied to a steering force transmitting mechanism;
a detector for detecting a vehicle operating condition of a steering wheel;
motor controlling means responsive to a signal from said detector for producing a drive signal to control operation of said electric motor;
motor driving means responsive to said drive signal for driving said electric motor;
current detecting means for detecting a magnitude of a current flowing through said electric motor and for producing a signal indicating the detected magnitude of the current;
average current detecting means for calculating an average value of the currents flowing through said electric motor in a prescribed period of time based on the signal from said current detecting means;
upper limit determining means for determining an upper limit for the drive signal from said motor controlling means based on said average current; and
driving signal limiting means for comparing said drive signal with said upper limit and for limiting a maximum value of the drive signal to a value less than said upper limit.

4,878,005

SERVO SYSTEM

Shigeyuki Takagi, Gifu, Japan, assignor to Teijin Seiki Co., Ltd., Japan

Filed Feb. 26, 1988, Ser. No. 161,052

Claims priority, application Japan, Feb. 27, 1987, 62-44846

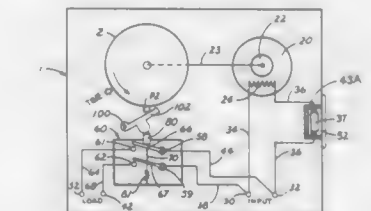
Int. Cl.⁴ G05B 6/02

U.S. Cl. 318—621

5 Claims

1. In servo system comprising an adder receiving an input instruction on a first input thereof, a servo amplifier having an output coupled to drive a load system, and a feedback loop for providing an error signal to a second input of said adder, the

1. A method for use in determining a capacitance to be placed in series with the coil of an alternating current electric motor, having a small range of acceptable voltages on each side of a design voltage, to increase the range of voltages at which the motor can operate including two known voltages:
(1) place a small known capacitance in series with said coil;
(2) apply a first increased known operating voltage across said coil and capacitance;
(3) determine that the motor started and ran at required speed against the required output torque, if it did not add capacitance until it does;
(4) measure the voltage across the coil to determine that the voltage is an acceptable value compared to the design voltage;
(5) apply a second increased known operating voltage across said coil and capacitance;
(6) measure the voltage across the coil to determine that it is a value which does not exceed the maximum design voltage of the motor for proper heat distribution;
(6A) If the voltage in step (6) is a value below maximum acceptable voltage, then the capacitance of step (5) is a capacitance that can be used to increase the range of voltages at which the motor can operate;
(6B) If the voltage in step (6) is a value above maximum acceptable voltage, then the capacitance of step (5) is a capacitance that cannot be used to increase the range of voltages at which the motor can operate.



4,878,007

METHOD FOR CHARGING NICKEL-CADMIUM BATTERIES AND CIRCUIT ARRANGEMENT FOR CARRYING OUT THE METHOD

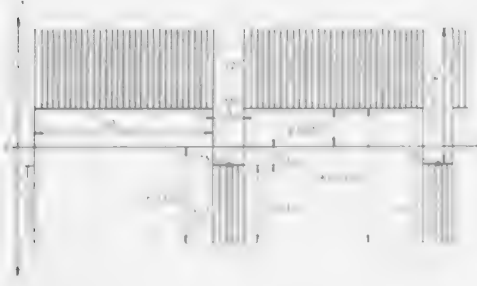
Sátradi Gábor, and Nagy Sándor, both of Budapest, Hungary, assignors to BRG Mechatronikai Vállalat, Hungary

Filed Nov. 30, 1987, Ser. No. 126,887

Claims priority, application Hungary, Dec. 1, 1986, 4949/86
Int. Cl.⁴ H02J 7/00, 7/10

U.S. Cl. 320-14

9 Claims



1. A method for charging nickel-cadmium batteries comprising the steps of supplying said battery during charging periods of a predetermined first duration with a predetermined charging current, and loading said battery during discharging periods of a shorter predetermined second duration with a predetermined loading current, and alternately repeating said supplying and loading steps, wherein said supplying step includes superimposing on said charging current a charging current pulse of the same sense, at least at the beginnings of said charging periods, and wherein said loading step includes superimposing on said loading current a discharging pulse, at least at the beginning of said discharging periods, and providing thereby at the beginning of each of said periods a current charge in amperes which is in absolute magnitude at least seven times as high as one tenth of the numerical value of the storage capacity of said battery when expressed in ampere-hours, wherein in the respective periods a plurality of pulses are superimposed on the predetermined charging and/or discharging currents which have energy and amplitude values at most equal to the corresponding values of the pulse at the beginning of the period.

4,878,008

CONTOUR-CLAMPED HOMOGENEOUS ELECTRIC FIELD GENERATOR

Charles W. Ragdale, Concord, Calif., assignor to Bio-Rad Laboratories, Inc., Richmond, Calif.

Filed Apr. 21, 1988, Ser. No. 184,514

Int. Cl.⁴ G05F 1/46

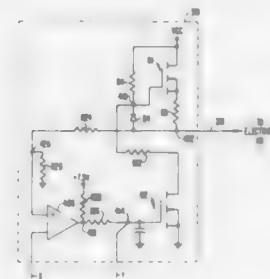
U.S. Cl. 323-271

57 Claims

1. A circuit for maintaining a DC voltage at a prescribed level comprising:
oscillating means for generating a pulse train having a duty cycle;
first converting means, coupled to the oscillating means, for converting the pulse train into a first DC voltage at a first node;
second converting means, coupled to the first node, for converting the first DC voltage into a second DC voltage at a second node;
comparing means, coupled to the second converting means, for comparing the second DC voltage to a prescribed voltage level;
maintaining means, responsive to the comparing means, for maintaining the second DC voltage at the prescribed level by selectively causing the oscillating means to increase

and decrease the duty cycle of the pulse train, the maintaining means comprising:

a first transistor having an input terminal coupled to a current source and an output terminal coupled to the second node for flowing a current into the second node; and



a second transistor having an input terminal coupled to the second node for flowing current away from the second node.

4,878,009

VOLTAGE SOURCE HAVING PRESET VALUES FOR SOURCE VOLTAGE AND INTERNAL RESISTANCE

Wolfgang Esser, and Peter Jung, both of Paderborn, Fed. Rep. of Germany, assignors to Nixdorf Computer AG, Paderborn, Fed. Rep. of Germany

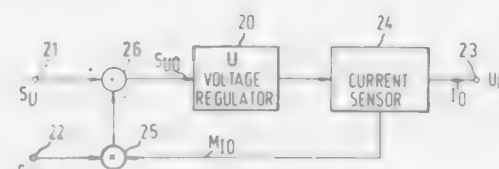
Filed Jul. 29, 1988, Ser. No. 226,168

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1987, 3725348

Int. Cl.⁴ G05F 1/46

U.S. Cl. 323-275

17 Claims



1. A voltage source for delivering an electrical output and having preset values for the source voltage and internal resistance comprising:

regulating means for regulating said electrical output in accordance with a reference parameter; and
computing circuit means coupled with said regulating means for calculating said reference parameter based on the value of said electrical output and said preset values.

4,878,010

ELECTRIC A.C. POWER SWITCH CONTROLLER AND D.C. POWER SUPPLY METHOD AND APPARATUS

Harold J. Weber, 20 Whitney Dr., Sherborn, Mass. 01770

Filed Dec. 10, 1987, Ser. No. 131,096

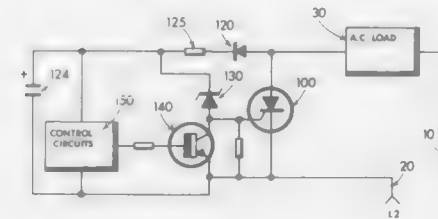
Int. Cl.⁴ G05F 5/00

U.S. Cl. 323-300

20 Claims

8. Electric alternating current (a.c.) power control and direct current (d.c.) power supply means comprising:
a. source of alternating current electric power;
b. a.c. load;
c. thyristor means having a first power terminal including a gate associated therewith, and a second power terminal, whereby said power terminals are coupled effectively in series with at least said a.c. load and said source of electric power, producing a switchable conductive path therebetween;

d. voltage responsive means and current limiting means effectively coupled in series between said gate and said second power terminal, whereby when any voltage appearing across the voltage responsive means is below a predetermined threshold level no substantial gate current is admitted to the gate of the thyristor means and the thyristor means is maintained non-conductive and essentially OFF, whilst the moment said voltage appearing across the voltage responsive means exceeds the predetermined threshold level gate current is admitted to the means to initiate conduction through the thyristor means and essentially turn-ON the a.c. load for at least the remainder of the instant a.c. power half-cycle;
e. gate current diverting means coupled between the gate and the first power terminal of the thyristor means and having a control input thereto, whereby when a first control signal value is coupled with the diverting means any substantial gate current which may otherwise be



admitted to the gate by way of the voltage responsive means is shunted effectively to the first power terminal instead; and when a second control signal value is coupled with the diverting means any gate current which may be admitted to the gate by way of the voltage responsive means is thusly admitted;

f. rectifier means and capacitor means coupled effectively in series with said current limiting means and said first and second power terminals and effectively in parallel with the said voltage responsive means, thereby producing a relatively low voltage d.c. power value substantially across the capacitor means through rectification of at least a portion of the a.c. power appearing across said first and second power terminals in each the ON and OFF state thereof; and,
g. d.c. load coupled to the capacitor means to obtain d.c. power therefrom in each the ON state and OFF state operation of the control means.

4,878,011

PROPORTIONAL FIRING CIRCUIT

Roger A. Holtlander, Mount Clemens, Mich., assignor to Wolf Engineering Corporation, Dearborn, Mich.

Filed Jul. 29, 1988, Ser. No. 226,224

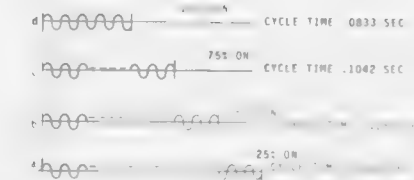
Int. Cl.⁴ G05B 24/02; G05F 1/46

U.S. Cl. 323-319

13 Claims

1. In an electrical switching apparatus having semiconductor controlled rectifier means for controlling the transmission of electrical power from an alternating power supply, a proportional firing circuit comprising:
input means for providing a variable signal whose magnitude is used to control the conduction of said semiconductor controlled rectifier means;
timer means for generating a firing signal for said semiconductor controlled rectifier means whose pulse timing is proportional to the variable characteristic of said variable signal, so as to enable the conduction time of said semiconductor controlled rectifier means to be proportionally varied between a minimum conduction time which is associated with the cycling of said alternating power supply and a maximum conduction time; and
zero crossing means receiving said firing signal of said timer means for permitting the conduction of said semiconductor

tor controlled rectifier means only at zero crossing junctions in the alternating cycle of said power supply;



wherein said firing signal has a fixed pulse duration, and only the time between the pulses of said firing signal is varied in response to said variable input signal.

4,878,012

CHARGE BALANCED FEEDBACK TRANSMITTER

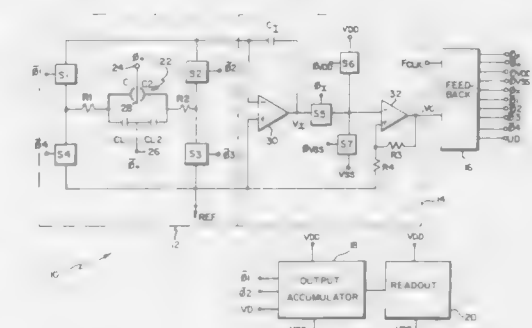
John P. Schulte, Eden Prairie; Kelly M. Orth, Apple Valley; Roger L. Frick, Chanhassen; Brian L. Westfield, Eden Prairie, and Randy K. Paschke, Chaska, all of Minn., assignors to Rosemount Inc., Eden Prairie, Minn.

Filed Jun. 10, 1988, Ser. No. 205,268

Int. Cl.⁴ G01R 27/26

U.S. Cl. 324-60 CD

25 Claims



1. A measurement circuit for providing an output signal as a function of a parameter, the circuit comprising:
generating means for providing a generator signal which is formed by a plurality of charge packets and which is a function of the parameter, the generator means including reactance means for forming the charge packets; switching means for coupling the charge packets; and noise-sup-

pression means connected in series with the reactance means and the switching means;
 measurement means coupled to the generating means for receiving the charge packets and measuring the generator signal to provide a measurement signal as a function thereof;
 feedback means coupled to the measurement means as a function of the measurement signal to control the generator means such that the generator signal tends toward a charge-balanced state;
 output means for providing the output signal as a function of a count of a number of charge packets contained in the generator signal.

4,878,013

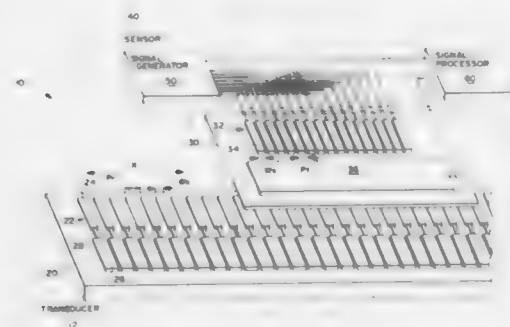
CAPACITIVE TYPE MEASUREMENT TRANSDUCER WITH IMPROVED ELECTRODE ARRANGEMENT

Nils I. Andermo, Kirkland, Wash., assignor to Mitutoyo Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 30,346, Mar. 26, 1987, abandoned. This application May 31, 1988, Ser. No. 200,580
 Claims priority, application Japan, Apr. 4, 1986, 61-78948
 Int. Cl.⁴ G01R 27/26; G08C 19/16

U.S. Cl. 324-61 R

10 Claims



1. Capacitive-type measuring apparatus comprising:
 first and second support members, said support members being relatively displaceable with respect to each other, and at least one of said support members being displaceable relative to a measurement axis;
 first and second electrode arrays mounted on said first and second support members, respectively, in alignment with said measurement axis, for producing a varying capacitance pattern in dependence on the relative positions of said support members with respect to each other;
 said first electrode array comprising a series of discrete first electrodes uniformly spaced with a pitch P_1 defining a scale wavelength;
 said second electrode array comprising a series of discrete second electrodes disposed so as to be capacitively coupled to differing portions of said first electrode array in dependence on the relative positions of said support members; and
 said second electrodes being arranged so as to define a plurality of measuring element groups separated from each other by a group pitch P_g , and wherein each electrode group has N measuring elements, N being an integer greater than 2, and the second electrodes forming each of said electrode groups are positioned within the respective groups so as to respectively occupy predetermined group positions which are spread over a distance greater than one scale wavelength, and each of which corresponds to the relative position of a different one of a group of relative scale wavelength segments obtained by dividing the group pitch into intervals corresponding to the scale wavelength and dividing each interval into N equal segments;
 signal generator means for applying at least one combina-

tion of N periodic excitation signals to the second electrodes in each of said electrode groups such that said excitation signals are respectively applied to corresponding ones of the second electrodes in each group in a relative order corresponding to the sequence of relative scale wavelength segment positions occupied by the electrodes in each group; and
 detector means comprising:
 detector electrode means for sensing the output signals produced by the first electrodes capacitively coupled to said second electrode array in response to said at least one combination of excitation signals, and for producing an output signal which represents a sum of the sensed first electrode output signals; and
 signal processing means for deriving measurement data from said detector electrode means output signal.

4,878,014

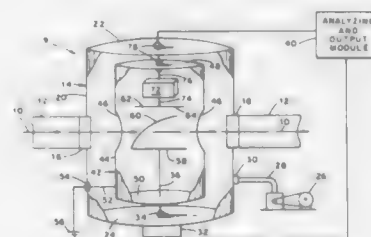
ION BEAM PROFILE SCANNER HAVING SYMMETRIC DETECTOR SURFACE TO MINIMIZE CAPACITANCE NOISE

Michael L. Simpson, Knoxville, Tenn., assignor to Oak Ridge Associated Universities, Oak Ridge, Tenn.

Continuation-in-part of Ser. No. 203,716, Jun. 7, 1988, abandoned. This application Sep. 1, 1988, Ser. No. 239,454
 Int. Cl.⁴ G01N 27/00

U.S. Cl. 324-71.3

23 Claims



1. A particle beam profile scanner for scanning the profile of a particle beam, comprising:
 a probe constructed of a material that will emit electrons when struck by the particle beam;
 drive means for passing said probe through the particle beam whereby said probe, when struck by the particle beam, emits electrons in proportion to the number of particles striking said probe;
 detection means for detecting the electrons emitted from said probe;
 means for applying a positive charge to said detection means so that electrons emitted from said probe are attracted to and received by said detection means;
 a surface disposed on said detection means and being configured and oriented with respect to said probe to minimize changing capacitance noise, said surface being configured and oriented to offer a substantially symmetric view to said probe as said probe moves through the particle beam;
 circuit means connected to said surface for carrying an electric current that is comprised of the electrons emitted from said probe and received by said detection means; and
 output means for receiving the electric current from the circuit means and for generating output data corresponding to the electric current.

4,878,015

SENSORS FOR SELECTIVELY DETERMINING LIQUID-PHASE OR GAS-PHASE COMPONENTS USING A HETEROPOLYSILOXANE SENSITIVE LAYER

Helmut Schmidt, Zelligen; Frank Hutter, Würzburg; Karl-Heinz Haas, Theilheim; Ernst Obermeier, Kaufbeuren; Ulrich Steger, Munich; Hanno-Erik Endres, Munich, and Stephan Drost, Munich, all of Fed. Rep. of Germany, assignors to Fraunhofer-Gesellschaft zur Förderung der angewandten Forschung e.V., Munich, Fed. Rep. of Germany

PCT No. PCT/EP86/00436, § 371 Date Mar. 23, 1987, § 102(e) Date Mar. 23, 1987, PCT Pub. No. WO87/00633, PCT Pub. Date Jan. 29, 1987

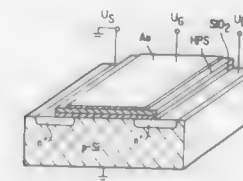
PCT Filed Jul. 23, 1986, Ser. No. 44,506

Claims priority, application Fed. Rep. of Germany, Jul. 23, 1985, 3526348

Int. Cl.⁴ G01N 27/00

U.S. Cl. 324-71.5

26 Claims



1. Sensor for selectively determining liquid-phase or gas-phase components in the form of a field effect transistor, comprising a semiconductor substrate; at the surface of the semiconductor substrate at least two drain and source regions with a dopant type opposite the semiconductor substrate and separated by a channel; drain and source electrodes which are in electrically conducting contact with said drain and source regions; a gate insulator layer on the channel; a sensitive layer consisting of a heteropolysiloxane on the gate insulating layer, it being possible for the sensitive layer to come into contact with the components to be determined; and a gate or reference electrode.

4,878,016

SOLDERING IRON TESTING METHOD AND APPARATUS

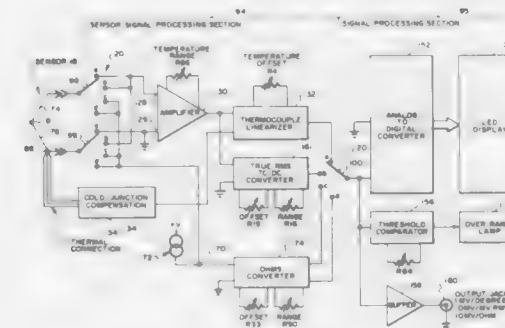
William Wahl, Culver City, and Kenneth G. Junkert, Woodland Hills, both of Calif., assignors to Wahl Instruments, Inc., Culver City, Calif.

Filed Aug. 23, 1988, Ser. No. 235,371

Int. Cl.⁴ G01R 15/12, 31/02; G01K 1/14

U.S. Cl. 324-73 R

7 Claims



1. Apparatus, useful in combination with a soldering iron having a working tip nominally connected to electrical ground, for measuring the (1) tip temperature (2) tip voltage to

ground, and (3) tip resistance to ground, said apparatus comprising:

sensor means including first and second dissimilar metal wires each having first and second ends with said first ends being joined at a junction to form a thermocouple; means mounting said sensor means with said junction readily accessible for contact by said working tip;
 temperature measuring means responsive to an applied input voltage for producing an output voltage related thereto;
 voltage measuring means responsive to an applied input voltage for producing an output voltage related thereto;
 resistance measuring means including current source means for supplying a constant current to a load terminal and means for producing an output voltage related to the voltage drop produced between ground and said load terminal; and
 switching means operable in a temperature mode for applying the voltage between said first and second wire second ends to said temperature measuring means; operable in a voltage mode for electrically shorting said first and second wire second ends and applying the resulting shorted voltage appearing between the shorted second ends and ground to said voltage measuring means; and operable in a resistance mode for electrically shorting said first and second wire second ends and connecting said second ends to said resistance measuring means load terminal.

4,878,017

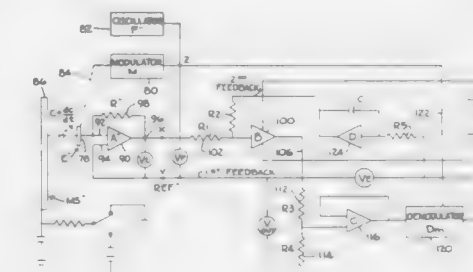
HIGH SPEED D.C. NON-CONTACTING ELECTROSTATIC VOLTAGE FOLLOWER

Bruce T. Williams, 454 South St., Lockport, N.Y. 14094
 Filed Oct. 28, 1986, Ser. No. 924,054

Int. Cl.⁴ G01R 5/28, 29/12

U.S. Cl. 324-109

15 Claims



1. A non-contacting electrostatic voltage follower comprising:

a) a single detector electrode sensitive to electrostatic quantities such as electrostatic fields, voltages or charges having continuous capacitive coupling to a surface;
 b) means operatively associated with said electrode for varying the capacitive coupling between said electrode and said surface bearing an electrostatic quantity to which said electrode is capacitively coupled;
 c) a detector amplifier having first and second inputs and an output, said amplifier having a high input impedance;
 d) means for connecting said detector electrode to said first input of said detector amplifier;
 e) a high bandwidth amplifier having an input and an output;
 f) means for applying the output of said detector amplifier to the input of said high bandwidth amplifier; and
 g) means for providing a first feedback path from said output of said high bandwidth amplifier to said second input of said detector amplifier in a manner producing at the output of said high bandwidth amplifier signals having dynamic components matching all dynamic components of electrostatic quantities on said surface;
 h) whereby the magnitude and phase of said signals produced by said output of said high bandwidth amplifier

provide information as to the magnitude and polarity of said electrostatic quantities borne by said surface.

4,875,011

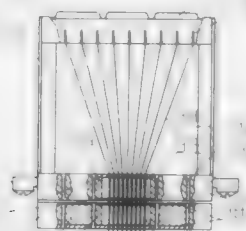
ELECTRICAL TESTING DEVICE

James T. Malloy, 50 Swede Creed Rd., Oak Run, Calif. 96069
Continuation-in-part of Ser. No. 834,367, Feb. 28, 1986,
abandoned. This application Dec. 11, 1987, Ser. No. 131,924

Int. Cl.⁴ G01R 1/06, 31/02

U.S. Cl. 324—158 F

8 Claims



5. A circuit analyzer comprising, a plurality of electrical test points simultaneously contacted with electrically conductive probes, individual probes being in registration with individual test points and adjacent test points being spaced apart and distance ranging between 0.005 inch and 0.050 inch, said probes being aligned with each other generally in parallel and being made of a spring quality, wire-type conductive material having a diameter ranging between 0.001 and 0.050 inch each probe being disposed within a movably mounted housing, each probe having a bend therein that engages the housing, and each probe having a test point contact end and a free end, said bend inhibiting the relative movement between the probe and housing, means for simultaneously moving the housing of each probe towards and away from the test points, an electrical connector for each probe for individually connecting each probe to the circuit analyzer, and each electrical connector being in registration with an individual probe, with each probe being disposed between the test point and the connector of said probe, and each electrical connector including a conductive tubular member having at one end an electrical contact electrically connected to the circuit analyzer and opposite said one end an open tip which receives the free end of the probe.

4,878,019

ELECTRICAL SENSING SYSTEM FOR MEASURING FERROUS PARTICLES WITHIN A FLUID WITH TEMPERATURE COMPENSATION CIRCUIT

Edward Tazaprasia, Havertown; Nicholas P. Maria, Lafayette Hills, and Charles Montague, Media, all of Pa., assignors to Aeroquip Corporation, Jackson, Mich.

Continuation-in-part of Ser. No. 729,759, May 2, 1985, Pat. No. 4,731,578. This application Aug. 31, 1987, Ser. No. 91,576

Int. Cl.⁴ G01N 27/74; G01R 33/12

U.S. Cl. 324—204

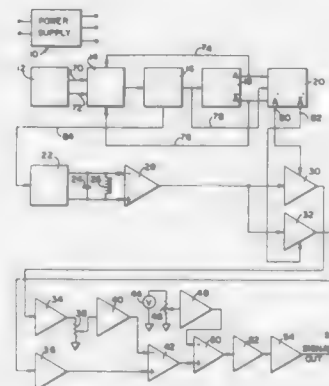
3 Claims

1. A means for sensing ferrous contamination in a fluid comprising:

- a generally cylindrical magnet;
- an electrical coil located co-axially on one end of said magnet, said coil having a hole lengthwise through its center;
- a pole piece of said magnet occupying the hole in said first coil and concentric with said magnet disposed at one end of the magnet, said pole piece of the magnet being available to accumulate ferrous contamination present in a

fluid whereby any ferrous accumulation changes the induction of the coil;

- An electronic circuit means for measuring inductance changes of said electrical coil including:
 - a clock oscillator means providing two discrete frequencies, one high frequency and one low frequency;
 - a frequency selection means to select, upon command, one of the two frequencies of the said clock oscillator
 - a waveform generator;
 - a waveform period counter which switches between one of two states corresponding to said high frequency and said low frequency of said clock oscillator;
 - a sample and hold counter control means operatively connected to said waveform period counter;
 - a first sample and hold amplifier;
 - a second sample and hold amplifier;
 - a constant current coil driver circuit driving a tuned circuit having a resonant frequency between said high frequency and said low frequency, said tuned circuit including said electrical coil;
 - a first differential amplifier; and
 - a second differential amplifier;
- wherein said clock oscillator is operatively connected to the frequency selection means, and said frequency se-



lection means alternatively selects said high and low frequency from said oscillator means to introduce such frequency into the waveform generator, said waveform generator producing a frequency output proportional to the said selected high or low frequency and introducing said proportional output to the said coil driver constant current circuit, and the said waveform period counter; wherein further said constant current driver provides a constant current to said tuned circuit, the output of said tuned circuit being placed across the input of said first differential amplifier such that the output of said amplifier represents the voltage across said tuned circuit; the output of said amplifier being introduced to the input of said first and second sample and hold amplifiers, said first sample and hold amplifier driving an inverting input of said second differential amplifier and said second sample and hold amplifier driving a non-inverting input of said second differential amplifier said second differential amplifier providing an output proportional to inductance changes of said electrical coil; wherein further said first and second sample and hold amplifiers are commanded through said sample and hold counter control means to sample and hold by said waveform period counter in a manner corresponding to said high frequency and said low frequency of said clock oscillator means.

4,878,020

METHOD AND DEVICE FOR MEASURING THE DISTANCE BETWEEN THE DISCS OF A REFINER USING A MEASUREMENT OF THE MAGNETIC FLUX INDUCED BETWEEN THE DISCS

Juha Kiriä, and Heikki Pahlman, both of Tampere, Finland, assignors to Sands Defibrator Jylhä Oy, Valkeakoski, Finland
PCT No. PCT/FI87/00132, § 371 Date Jun. 14, 1988, § 102(e)
Date Jun. 14, 1988, PCT Pub. No. WO88/03054, PCT Pub. Date May 5, 1988

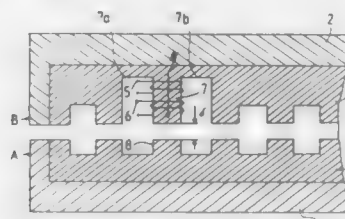
PCT Filed Sep. 30, 1987, Ser. No. 207,156

Claims priority, application Finland, Oct. 31, 1986, 86443

Int. Cl.⁴ B02C 7/14; G01B 7/14

U.S. Cl. 324—207

19 Claims



1. A method for measuring the distance δ between discs in a refiner, each of said discs having at least one tooth, said method comprising: generating a magnetic field by means of first coil means formed at least at one refiner-disc tooth of a first disc, said magnetic field being allowed to run at least partly through a second disc, the second disc comprising a tooth; detecting, by means of a second, coil means formed around the tooth of the first disc, the magnetic flux caused by the first coil means running over the distance between two opposite teeth of the first and second discs, respectively; outputting a signal representing the detected magnetic flux; and interpreting the signal as a quantity that expresses distance δ between the teeth.

4,878,021

MAGNETIC RESONANCE SPECTROSCOPY STUDIES OF RESTRICTED VOLUMES

Joseph Granot, Holon, Israel, assignor to Elscint Ltd., Haifa, Israel

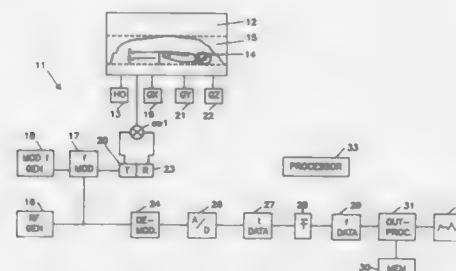
Filed Oct. 11, 1988, Ser. No. 256,403

Claims priority, application Israel, Oct. 12, 1987, 84152

Int. Cl.⁴ G01R 33/20

U.S. Cl. 324—309

22 Claims



1. A magnetic resonance spectroscopic (MRS) method for accurately locating a region of interest within a subject, said method comprising the steps of: applying a first set of two 90° RF pulses during the application of a first gradient pulse of substantially constant value to saturate with each pulse of said first set of two 90° RF pulses a different unwanted region in a first direction leaving as a first unsaturated region in said first direction

a region unaffected by either of said first set of two 90° RF pulses, applying a second set of two 90° RF pulses during the application of a second gradient pulse of substantially constant value to saturate with each pulse of said second set of two 90° RF pulses a different unwanted region in a second direction leaving as a second unsaturated region in said second direction a region unaffected by either of said second set of two 90° RF pulses such that only a selected region of interest at the intersections of said first and said second unsaturated regions contains unsaturated spins, applying a 90° excitation pulse to excite said unsaturated spins in said selected region of interest, and acquiring FID signals from said selected region of interest.

4,878,022

WIDENED AND SHAPED MRI SURFACE COIL HAVING INCREASED SIGNAL-TO-NOISE RATIO

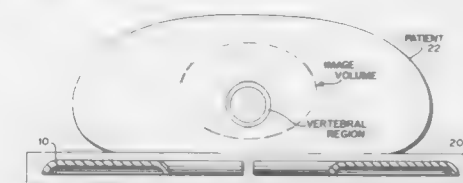
Joseph W. Carlson, Kensington, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Filed Oct. 14, 1988, Ser. No. 257,801

Int. Cl.⁴ G01R 33/20

U.S. Cl. 324—318

10 Claims



1. An MRI RF coil for use in a magnetic resonance imaging system and including: a conductive element for disposition with one side proximal an image area and another side distal thereto; said conductive element having a flat portion on the proximal side and associated edges which curve away from the proximal side toward said distal side.

4,878,023

MAGNETIC RESONANCE APPARATUS COMPRISING AN IMPROVED GRADIENT COIL SYSTEM

Johannes A. Overweg, and Cornelis L. G. Ham, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

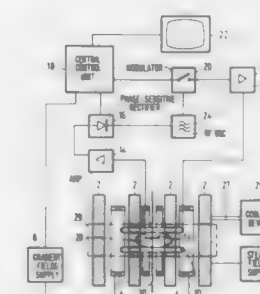
Filed Aug. 17, 1988, Ser. No. 233,310

Claims priority, application Netherlands, Aug. 19, 1987, 8701940

Int. Cl.⁴ G01R 33/20

U.S. Cl. 324—318

21 Claims



1. A magnetic resonance apparatus comprising a magnet system for generating a steady magnet field parallel to a central axis in a measurement space and a gradient coil system for selectively generating a gradient magnetic field in said mea-

surement space superimposed on said steady magnetic field, said coil system comprising electrically series-connected effective and return arc conductors lying in planes intersecting said central axis, said effective arc conductors contributing more substantially to the generation of said gradient magnetic field than said return arc conductors, characterized in that said return arc conductors are positioned to compensation for stray magnetic fields generated by said effective arc conductors.

4,878,024

MAGNETIC RESONANCE APPARATUS COMPRISING A LOW-NOISE GRADIENT COIL

Johannes A. Overweg, and Cornelis L. G. Ham, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

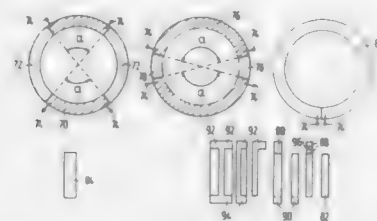
Filed Aug. 17, 1988, Ser. No. 233,307

Claims priority, application Netherlands, Aug. 19, 1987, 8701147

Int. Cl.⁴ G01R 33/20

U.S. Cl. 324—319

11 Claims



1. A self-supporting gradient coil system for generating mutually perpendicularly directed gradient fields in a generally cylindrical measurement space, said system comprising a plurality of axially spaced-apart ring-shaped stacks of arc conductors, each stack comprising a plurality of arc conductors and insulating rings intermediate said arc conductors, and axially directed means for rigidly interconnecting said stacks.

4,878,025

TROUBLE FINDER FOR TESTING AN ELECTRICAL SYSTEM OF A VEHICLE FOR SHORT-CIRCUITING

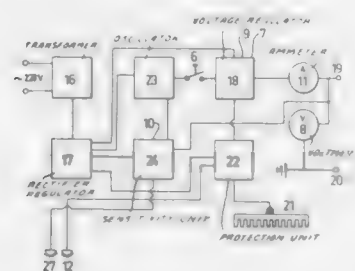
Peter Persson, Tallvågen 75, S-902 Umeå, Sweden
PCT No. PCT/SE87/00059, § 371 Date Aug. 11, 1988, § 102(e)
Date Aug. 11, 1988, PCT Pub. No. WO87/04797, PCT Pub. Date Aug. 13, 1987

PCT Filed Feb. 9, 1987, Ser. No. 235,883

Claims priority, application Sweden, Feb. 11, 1986, 8600595
Int. Cl.⁴ G01R 31/02

U.S. Cl. 324—503

12 Claims



1. A trouble finder for testing an electrical system, comprising:
a transformer having an input adapted to be coupled to a power source;
a rectifier, coupled to an output of said transformer;
an oscillator unit coupled so as to receive power from said rectifier;

a regulator coupled to said rectifier so as to receive power therefrom;
means for coupling an output of said oscillator to an input of said regulator;
first and second output terminals for connection to said electrical system to be tested;
an ammeter coupling said voltage regulator to said first output terminal;
a voltmeter coupling said first and second output terminals;
a protection unit coupled to said regulator;
a sensitivity unit, connected to said first and second output terminals and arranged to enable sensing of a voltage across said output terminals, the output voltage deviating from zero upon connection of said trouble finder to an electrical system being tested;
a potentiometer, coupled to said sensitivity unit, for balancing the sensed voltage to zero level; and
wherein said oscillator unit is intended for limiting the output current of the regulator unit at an occurrence of a short-circuit in the electrical system, said oscillator unit being activated by a balanced 0-zero voltage level detected by the sensitivity unit.

4,878,026

MEASURING CIRCUIT OF THE DC COMPONENT OF THE CURRENT FLOWING THROUGH THE PRIMARY WINDING OF THE OUTPUT TRANSFORMER OF AN INVERTER

Philippe Moreau, Gieres, and Jean-Noël Florina, Grenoble, both of France, assignors to Merlin Gerin, France

Filed Dec. 28, 1987, Ser. No. 137,938

Claims priority, application France, Jan. 9, 1987, 87 00243

Int. Cl.⁴ G01R 31/06

U.S. Cl. 324—547

5 Claims



1. A measuring circuit of the D.C. component of the current flowing through the primary winding of the output transformer of an inverter, comprising a detection device producing a signal representative of the current flowing through said winding, an integrator designed to integrate said signal detected on a period of the A.C. component of the current, the integrator output signal being reset at the beginning of each of said periods and being applied to a sample and hold stage designed to sample it just before it is reset, in such a way as to supply on output a signal representative of the mean amplitude of the D.C. component present during the previous period and wherein the integrator output signal is applied to the sample and hold stage via an intermediate stage comprising a first operational amplifier whose positive input is grounded and whose negative input is connected to the integrator output by a first resistor and to the sample and hold stage input by a second resistor, a third resistor being arranged between the output of the first operational amplifier and the sample and hold stage input, in such a way as to limit the maximum possible variation of the measuring circuit output signal during the sampling period.

4,878,027

DIRECT FREQUENCY SYNTHESIZER USING POWERS OF TWO SYNTHESIS TECHNIQUES

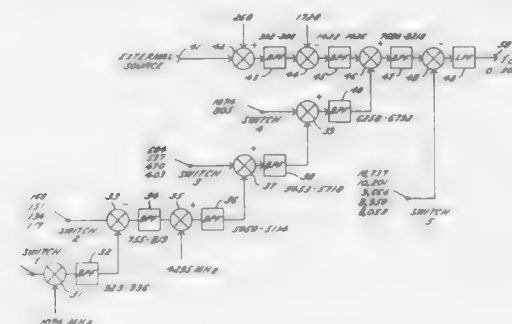
Stuart L. Carp, Menlo Park; Howard L. Swain, Palo Alto, and Bich N. Nguyen, San Jose, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Aug. 3, 1987, Ser. No. 81,207

Int. Cl.⁴ H03B 19/00; H03L 7/18

U.S. Cl. 328—15

24 Claims



1. A signal generator for producing an output signal having an output frequency determined by a digital control word, the signal generator comprising:

means for producing a plurality of sets of reference signals, each set having a plurality of reference signals each having a reference frequency differentiated from reference frequencies of other reference signals in the set by a multiple of an integral power of two;
a plurality of means for selecting, each receiving one or more selected bits of the digital control word and the reference signals from one set for selecting according to the digital control word one reference signal from each set as a selected signal having a selected frequency; and
means responsive to the selected signals for mathematically combining the selected frequencies of the selected signals to produce the output signal having the output frequency which is a mathematical combination of the selected frequencies of each selected signal, wherein application of selected bits to said means for selecting is delayed by a time unique to each said means for selecting, such that any changes in selection of reference signals caused by a change in the control word have simultaneous effect on said output signal.

4,878,028

TECHNIQUE FOR GENERATING PRECOMPENSATION DELAY FOR WRITING DATA TO DISKS

Yun-Che Wang, Saratoga, and Paul H. Scott, San Jose, both of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Feb. 12, 1987, Ser. No. 13,846

Int. Cl.⁴ H03K 5/159, 5/13, 3/01

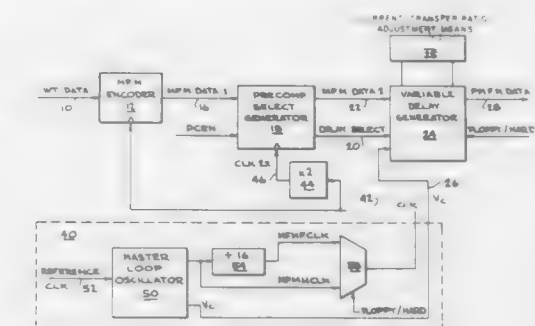
U.S. Cl. 328—55

17 Claims

1. Apparatus for generating a delay in the path of a data signal, for use in association with a delay selection signal (20), comprising:

at least a first (208) and a second (204) delay control node; controlled delay means (FIG. 4A) inserted in the path of the data signal and having a controlled delay means current control port (A,B,C) coupled to an activated one (208 or 204) of the delay control nodes, a current level passing between the controlled delay means current control port and the activated one of the delay control nodes, the

controlled delay means being for generating a delay having a duration responsive to the current level; and



node activation means (228, 224) coupled to the delay control nodes for activating one of the delay control nodes in response to the state of the delay section signal.

4,878,029

COMPLEX DIGITAL SAMPLING CONVERTER FOR DEMODULATOR

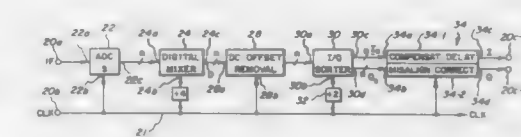
Gary J. Saulnier, Rexford, N.Y.; Randy G. Herrera, Pasadena, Calif., and Timothy E. Thiel, Troy, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 5, 1988, Ser. No. 280,073

Int. Cl.⁴ H03D 3/00

U.S. Cl. 329—341

19 Claims



1. A complex digital sampling converter, for providing substantially simultaneous output streams of in-phase I data and quadrature-phase Q data words to a digital detector means of a digital demodulator receiving an analog IF signal, comprising:

ADC means for converting the analog IF signal, having a carrier frequency F_c , to a stream of digital data samples taken at a sampling frequency F_s substantially equal to $4F_c$;
digital mixer means for converting the digital data sample stream to a stream of baseband digital data words;
sorter means for separating interleaved alternating ones of the baseband data word stream into sequential sorted pairs of an in-phase I_s data word and a quadrature-phase Q_s data word; and
means for compensating the sorted pairs of data words for any quadrature misalignment effects, to provide the output data streams.

4,878,030

LINEARIZER FOR MICROWAVE AMPLIFIER

Arpad D. Vincze, Los Altos, Calif., assignor to Ford Aerospace & Communications Corporation, Newport Beach, Calif.

Filed Oct. 23, 1987, Ser. No. 112,852

Int. Cl.⁴ H03F 1/30, 3/58

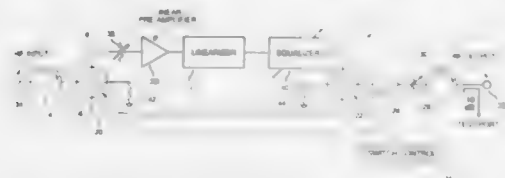
U.S. Cl. 330—149

6 Claims

1. An apparatus for compensating for distortions in the transfer characteristics of a travelling wave tube amplifier comprising:

a first channel;
a second channel;

a third channel;
 signal divider means coupled to provide a microwave signal divided phase synchronously into a first channel microwave signal to said first channel, a second channel microwave signal to said second channel and a third channel microwave signal to said third channel;
 non-linear diode means in said first channel for limiting said first channel microwave signal;
 first attenuation means in said second channel for attenuating said second channel microwave signal by a first adjustable constant;
 second attenuation means in said third channel for attenuat-



ing said third channel microwave signal by a second adjustable constant;
 first hybrid means coupled to said first channel and to said second channel for combining said first channel microwave signal and said second channel microwave signal in a 180° phase relationship to provide a differential signal on a differential signal channel; and
 second hybrid means coupled to said third channel and to said differential channel for combining said differential channel signal and said third channel microwave signal in quadrature phase, thereby to allow for substantially independent adjustment of AM/AM characteristics and AM/PM characteristics of a resultant output signal.

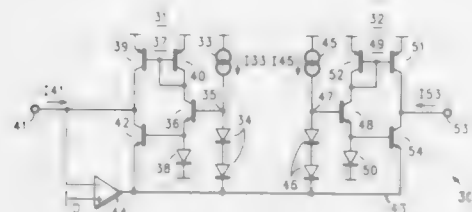
4,878,031

CLASS B VARIABLE GAIN CONTROL CIRCUIT
 W. Eric Main, Mesa, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 6, 1989, Ser. No. 319,038
 Int. Cl.⁴ H03G 3/00

U.S. Cl. 330—254

18 Claims



1. A gain control circuit having an input and an output, comprising:

- a bias source for providing first and second bias signals;
- reference means receiving said first and second bias signals for providing first and second reference voltages;
- circuit means coupled to the input of the circuit responsive to an applied input signal for providing a dynamic control voltage at an output;
- an input stage including circuit means responsive to said input signal and said dynamic control voltage for permitting the absolute magnitude of said input signal to exceed the magnitude of said first bias signal, said input stage coupled between said input and said reference means and being biased by said first reference voltage; and
- an output stage including circuit means responsive to said dynamic control voltage for providing an output signal at the output of the circuit the absolute magnitude of which may exceed the magnitude of said second bias signal, said

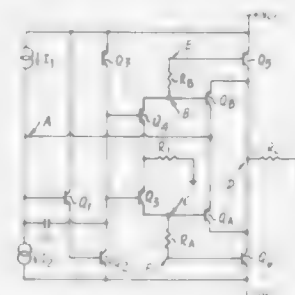
output stage being coupled between said output and said reference means and being biased by said second reference voltage wherein the ratio of said output and input signals is proportional to the ratio of said second and first bias signals.

4,878,032

AMPLIFIER STAGE WITH COLLECTOR OUTPUT
 Edoardo Botti, Mortara; Aldo Torazzina, Monza, and Fabrizio Stefani, Cardano al Campo, all of Italy, assignors to S-Thomson Microelectronics S.p.A., Catania, Italy
 Filed Apr. 12, 1988, Ser. No. 180,743
 Claims priority, application Italy, Apr. 21, 1987, 20195 A/87
 Int. Cl.⁴ H03F 3/26

U.S. Cl. 330—263

8 Claims



1. An amplifier stage with collector output, comprising a pair of input current sources connected in series between a pair of reference voltage lines and feeding respective input currents, a pair of output transistors, connected in series between said pair of reference voltage lines and defining an intermediate output terminal of the amplifier stage, a driving circuit comprising active elements and interposed between said input current sources and said output transistors, and a pair of control circuits each controlling saturation of a respective one of said output transistors, each of said control circuits comprising resistive means interposed between said driving circuit and said respective output transistor for presetting a balance saturation gain of said respective output transistor, and transistor means having base terminals connected to said driving circuit and collector and emitter terminals connected between said respective output transistor and said input current sources, and defining a negative feedback for reducing imbalance between said input currents fed by said input current sources.

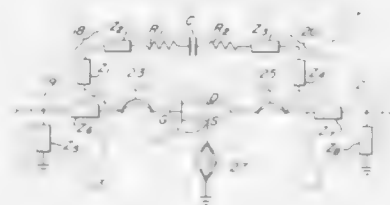
4,878,033

LOW NOISE MICROWAVE AMPLIFIER HAVING OPTIMAL STABILITY, GAIN, AND NOISE CONTROL
 Joseph S. Wong, Upland, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Aug. 16, 1988, Ser. No. 232,728
 Int. Cl.⁴ H03F 3/16

U.S. Cl. 330—277

15 Claims



1. An amplifier comprising:

a field effect transistor means for operating in the microwave frequency range, said transistor means having a drain and a gate; and
 a parallel feedback network connected between the drain and gate of said transistor means and including a first resistor, a capacitor and a second resistor, the first resistor, capacitor and second resistor being connected in series, the values of the first and second resistors being selected to achieve a stability factor K greater than one for said amplifier over a multioctave range of frequencies.

4,878,034

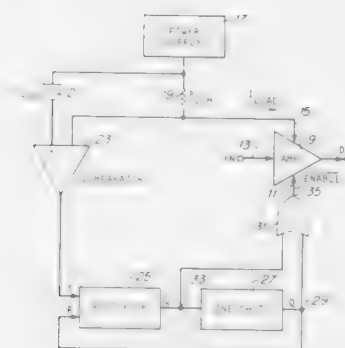
DIGITAL PROTECTION CIRCUIT AND METHOD FOR LINEAR AMPLIFIER

William H. Gross, Sunnyvale, and James B. Cecil, Santa Clara, both of Calif., assignors to Elantec, Milpitas, Calif.

Filed Mar. 27, 1989, Ser. No. 329,377
 Int. Cl.⁴ H03F 1/52

U.S. Cl. 330—298

3 Claims



1. A circuit for controlling operation of an amplifier which receives operating current and which has a control input for disabling the amplification of an applied signal in response to a signal applied to the control input thereof, the circuit comprising: p1 resistor means connected to supply operating current to the amplifier for producing a voltage drop thereacross representative of the operating current supplied thereto;
 comparator means coupled to receive said voltage drop for producing an output in response to said voltage drop exceeding a selected level;
 trigger means coupled to receive the output from said comparator means for operating in response thereto in one of two logic states, said trigger means including an input for receiving an input applied thereto to activate operation thereof in another of said two logic states;
 timing means operable for a selected time interval in response to a signal applied thereto, said timing means being coupled to said trigger means and producing an output indicative of operation thereof for said time interval in response to said trigger means operating in said one logic state;
 means coupling the output of said timing means to said input of said trigger means to activate operation thereof in said other logic state; and
 gating means coupled to said trigger means and to said timing means for producing the signal for application to the control input to disable the amplifier in response to said trigger means operating in said one logic state or said timing means operating in said timing interval.

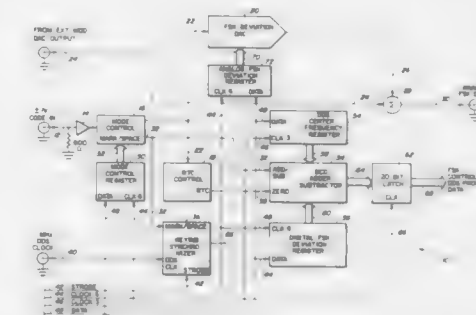
HYBRID FREQUENCY SHIFT KEYING MODULATOR AND METHOD

John A. Vendely, and David M. Badger, both of Indianapolis, Ind., assignors to Wavetek RF Products, Inc., Indianapolis, Ind.

Filed May 27, 1988, Ser. No. 200,075
 Int. Cl.⁴ H03C 3/00

U.S. Cl. 332—101

34 Claims



1. A frequency synthesizer including phase-locked loop and direct digital synthesis sections for generation of a synthesized RF output signal corresponding to a digitally coded input signal wherein the improvement comprises an FSK modulator comprising:

- means for modulating said phase-locked loop section in accordance with said input signal;
- means for deriving an FSK offset signal from said input signal; and
- means for applying said FSK offset signal to said direct digital synthesis section.

4,878,036

SURFACE ELASTIC WAVE FILTER

Hiromi Yatsuda; Yoshihiko Takenchi; Toichi Kohda, and Shokihiro Yoshikawa, all of Mitaka, Japan, assignors to Nihon Musen Kabushiki Kaisha, Tokyo, Japan

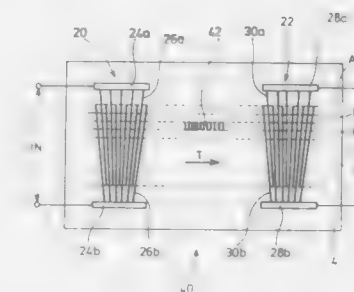
Filed Jul. 15, 1987, Ser. No. 73,976

Claims priority, application Japan, Jul. 16, 1986, 61-167460; Jul. 30, 1986, 61-180798

Int. Cl.⁴ H03H 3/64

U.S. Cl. 333—195

10 Claims



1. A surface elastic wave filter comprising:
 a piezoelectric body having a surface;
 a pair of electrodes disposed on said surface for sending and receiving a surface elastic wave between said electrodes to pick up a signal of prescribed frequency bandwidth characteristics, at least one of said electrodes comprising a plurality of splayed electrode fingers; and
 a structure disposed on said surface between said electrodes for scattering and reflecting surface elastic waves having prescribed frequencies within said bandwidth.

4,878,037

FLANGE CONNECTION USING A RADIALLY ELASTIC CENTERING RING

Hans-Günter Mathews, Oberrohrdingen, and Oskar Schaffel-
tie, Oetwil a.d.L., both of Switzerland, assignors to BBC
Brown Boveri AG, Baden, Switzerland

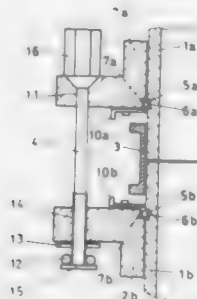
Filed Aug. 19, 1988, Ser. No. 233,826

Claims priority, application Fed. Rep. of Germany, Aug. 20,
1987, 3727797

Int. Cl.⁴ H01P 1/04

U.S. Cl. 333-254

15 Claims



1. A flange connection for connecting a first and a second waveguide, comprising:

- a first and second independent flange ring, which are attached to one end of the first and the second waveguides for joining said first and second waveguides, respectively;
- a radially elastic centering ring enclosing each of said one ends of the waveguides, so as to produce coaxiality of the two waveguides;

wherein:

said centering ring is provided with slots which extend parallel with respect of the axis of the centering ring and which alternatively penetrate from a first and a second edge of said centering ring, so as to achieve a radial spring effect.

4,878,040

CIRCUIT PROTECTION DEVICE

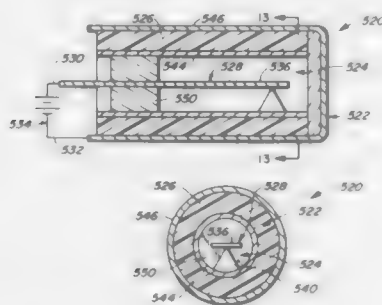
James T. Tsai, 5109 Glenbrook Dr., Vienna, W. Va. 26105

Filed Dec. 7, 1987, Ser. No. 129,651

Int. Cl.⁴ H01H 61/02, 71/16; H02H 5/04

U.S. Cl. 337-107

21 Claims



1. A device suitable for arrangement in a circuit for protection of components in the circuit, comprising

- a temperature responsive electrical regulating means including a conductive polymer means or ceramic means having an electrical regulating capability dependent on temperature;
- first switch means arranged in series with the temperature responsive electrical regulating means, the switch means including trip means for opening the circuit and positively terminating current flow in a reliable manner, and

means for connecting the temperature responsive electrical regulating means and first switch means in the circuit, the trip means of the first switch means comprising and elongated member responsive to temperature for opening the circuit, the conductive polymer or ceramic means of the temperature responsive electrical regulating means being of cylindrical configuration and surrounding the elongated member in spaced apart relation therefrom in order to assure rapid response of the circuit protection device.

4,878,039

APPARATUS AND METHOD FOR PROVIDING A THERMAL-RESISTANT RESISTANCE TEMPERATURE DETECTOR

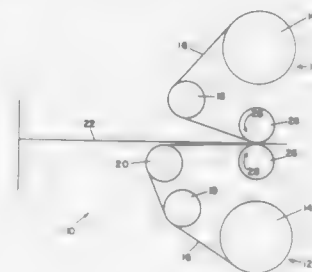
Carolyn Kraemer, Georgetown, Tex., assignor to Wood Instruments Co., Inc., Round Rock, Tex.

Filed Nov. 2, 1987, Ser. No. 115,347

Int. Cl.⁴ H01C 3/04

U.S. Cl. 338-26

8 Claims



1. An electrical resistance temperature element for use in a temperature averaging sensor comprising a length of wire with a known electrical resistance versus temperature characteristic wound on a first flexible, non-elastic substrate and further encapsulated by a second flexible non-elastic substrate.

4,878,040

VARIABLE RESISTOR

Shigeki Tamura, Tanashi, Japan, assignor to Fostex Corporation of Japan, Tokyo, Japan

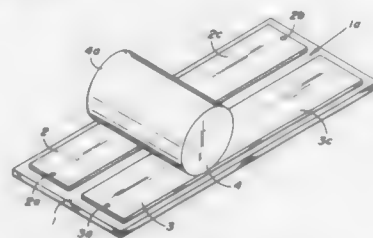
Filed Feb. 24, 1988, Ser. No. 159,831

Claims priority, application Japan, Feb. 25, 1987, 62-27863

Int. Cl.⁴ H01C 10/28

U.S. Cl. 338-158

18 Claims



1. A method for varying electrical resistance, comprising the steps of:

- providing an insulator base plate;
- placing a strip-shaped conductive element on the base plate such that said conductive element extends along a longitudinal length of said base plate;
- a strip-shaped support means for supporting the conductive element and the resistive element, said support means extending along a longitudinal length of said resistive and conductive elements;
- a contact means for conductivity contacting the conductive element with the resistive element, the contact means,

upon activation, remaining in rolling contact with the conductive element and the resistive element while eliminating substantially all sliding contact;

a bracket that surrounds said contact means; and pressure means for applying a biasing pressure on the contact means, said pressure means fixed between and on said bracket and a shaft of said contact means.

7. An improved variable, electrical resistor, comprising: a strip-shaped conductive element;

a strip-shaped resistive element;

4,878,041

HYDRAULIC MASTER CYLINDER SWITCH

Keith V. Leigh-Monstevens, Troy, and Richard A. Nix, Utica, both of Mich., assignors to Automotive Products plc, Warwickshire, England

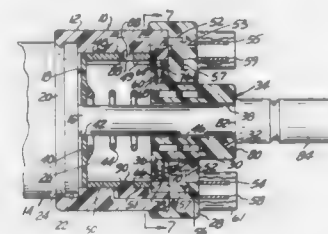
Continuation of Ser. No. 80,196, Jul. 29, 1987, abandoned, which is a continuation of Ser. No. 590,168, Mar. 16, 1984, abandoned.

This application Dec. 2, 1988, Ser. No. 279,332

Int. Cl.⁴ B60Q 1/26

U.S. Cl. 340-479

19 Claims



1. A hydraulic master cylinder assembly for a control system of a motor vehicle, said assembly comprising:

- (A) a master cylinder filled with hydraulic fluid;
- (B) a piston mounted within said master cylinder;
- (C) a rigid input rod including a first end portion projecting into one end of said master cylinder for connection to said piston, a second end portion including means for connection to a control device for the motor vehicle control system, and an elongated central portion rigidly secured to said first and second end portions and extending outside of said master cylinder between said end portions, said input rod being moved axially in response to operator actuation of the control device to move said piston axially in said cylinder and eject hydraulic fluid under pressure from said cylinder;
- (D) a hollow switch housing mounted proximate said central input rod portion and extending axially along said rod portion from a first housing end proximate said one end of said master cylinder to a second housing end remote from said one end of said master cylinder;
- (E) a plunger mounted within the hollow of said housing and movable reciprocally within said housing hollow between a location proximate said first end of said housing to a location proximate said second end of said housing;
- (F) a spring within said housing hollow urging said plunger toward one of said first and second ends of said housing;
- (G) a series of axially spaced electrical contacts mounted in axially spaced location along an internal surface of the hollow of said housing in juxtaposition to the reciprocal path of said plunger within said housing hollow;
- (H) means operative in response to axial movement of said input rod in response to operator actuation of the control device to move said plunger axially within said housing hollow against the resistance of said spring into successive juxtaposition with said series of electrical contacts; and
- (I) means on said plunger operative to successively coast with each of said series of electrical contacts upon successive movement of said plunger into juxtaposition with said contacts to successively make or break vehicular electrical control circuits respectively controlled by said contacts.

4,878,042

APPARATUS FOR FLASHING VEHICLE LIGHTS TO WARN OF ENGINE STALL

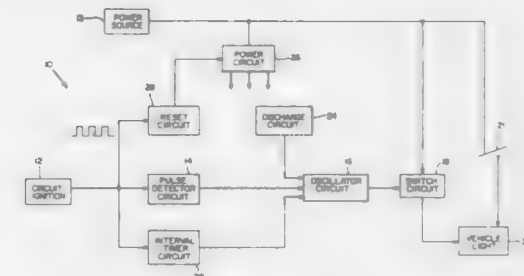
J. Michael Eggiman, 20705 S. Sprague Rd., Redland, Ore. 97045, and Vance A. Dunlop, Troutdale, Ore., assignors to J. Michael Eggiman, Portland, Ore.

Filed Jan. 14, 1988, Ser. No. 206,351

Int. Cl.⁴ B60Q 1/00

U.S. Cl. 340-439

16 Claims



1. Apparatus for flashing a vehicle light to warn of an engine stall of a vehicle, the vehicle employing an ignition circuit for generating ignition pulses while the engine is running and a power source for powering the vehicle light, comprising:

- detecting means for detecting an absence of the ignition pulses while the ignition circuit is switched on;
- signal generating means responsive to the detecting means for generating a flashing signal upon signalling by the detecting means of a lack of ignition pulses; and
- switch means coupled between the power source and the vehicle light and responsive to the flashing signal for alternately connecting and disconnecting the power source to the light to flash the light.

4,878,043

DEVICE FOR INDICATING HYDRO-CULTURE-RELATED VALUES

Guy Heusquin, and Anke Heusquin, both of 19 Roddy Thier, B-4500 Liège-Jupille, Belgium

Filed Nov. 16, 1987, Ser. No. 120,974

Claims priority, application Fed. Rep. of Germany, Nov. 20, 1986, 3639695

Int. Cl.⁴ G08B 19/00, 21/00

U.S. Cl. 340-321

16 Claims

1. A device for indicating values which are of interest in hydroculture applications comprising:

- a tube open at one end thereof and attached to a vessel at another end thereof;
- probe means, comprising at least one sensor and disposed proximate said tube one end, for responding to a liquid;
- an IC connected to said sensor and comprising an electronic system;
- strip means for supporting said probe means and said electronic system; and

means for removably mounting said strip means, within said tube and vessel in order to facilitate removal of said probe



and electronic system for maintenance while said tube and vessel remain insitu in a hydroculture medium

4,878,045

LOCKING CABLE FOR ANTITHEFT DEVICES

Tetsuo Yamagata, Tokyo, Japan, assignor to Honda Giken Kogyo K.K., Tokyo and Kabushiki Kaisha Honda Rokku, Miyazaki-ken, both of Japan

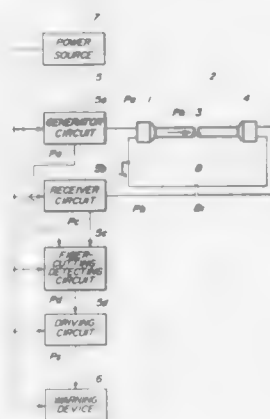
Filed Dec. 26, 1985, Ser. No. 813,390

Claims priority, application Japan, Dec. 27, 1984, 59-273587; Dec. 27, 1984, 59-273588; Dec. 27, 1984, 59-196276[U]

Int. Cl.⁴ G08B 29/00

U.S. Cl. 340—556

8 Claims



1. An antitheft device including a locking cable, an optical fiber longitudinally extending through said locking cable, a pair of photoelectric elements arranged at opposite ends of said optical fiber, and warning means responsive to a change in an electrical signal generated by one of said photoelectric elements and corresponding to a change in a photo signal generated by the other of said photoelectric elements and transmitted through said optical fiber, said locking cable comprising:

- a longitudinally extending core portion including said optical fiber disposed along an axis thereof;
- a longitudinally extending first reinforcing layer concentrically disposed around said core portion and including a plurality of first reinforcing members;
- a longitudinally extending second reinforcing layer concentrically disposed around said first reinforcing layer and including two electric conductors and a plurality of second reinforcing members, each of said electric conductors comprising a single wire, each of said second reinforcing members comprising a plurality of strands each formed of a plurality of twisted steel wires, said electric conductors being arranged diametrically symmetrical to each other with respect to said core portion, said electric conductors and said second reinforcing members being of substantially the same diameter and at substantially the same radial distance from an axis of said locking cable, and said electric signal being transmitted exclusively through said electric conductors; and

an outermost layer formed solely by a flexible hollow protective member disposed around said longitudinally extending second reinforcing layer, said flexible hollow protective member having an inner peripheral surface and covering said electric conductors and said second reinforcing members in a manner such that said electric conductors and said second reinforcing members are disposed in contact with said inner peripheral surface of said flexible hollow protective member, said first reinforcing members being wound around said core portion in a manner extending parallel with each other, and said electric conductors and said second reinforcing members being wound around said first concentric portion in a manner longitudinally extending parallel with each other.

4,878,044

GLAZING UNIT ALARM SYSTEM

James A. A. Hickman, 14a Seaforth Drive, Edinburgh, Scotland

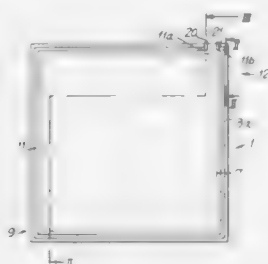
Filed Feb. 19, 1988, Ser. No. 163,509

Claims priority, application United Kingdom, Feb. 19, 1987, 8701007

Int. Cl.⁴ G08B 13/00

U.S. Cl. 340—550

12 Claims



1. A glazing unit alarm system comprising a glazing unit incorporating at least one glazing panel having spaced apart first and second faces, and electric alarm means responsive to a change in resistance, comprising a series connection of a light transmitting electrically conductive coating extending across a major part of the area of said first face of said at least one glazing panel, an electrically conducting strip applied to said second face, an electrically conductive web for connecting one end portion of said strip to said conductive coating, and electrical conductor means for connecting respectively, the other end portion of said strip and said conductive coating to said electric alarm means.

4,878,046

MOUNTING A CATHODE RAY TUBE FOR A HEADS-UP DISPLAY SYSTEM

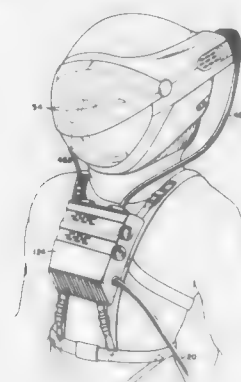
Stephen J. Smith, Simsbury, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Jul. 30, 1987, Ser. No. 79,553

Int. Cl.⁴ G02D 27/14

U.S. Cl. 340—705

3 Claims



1. A helmet mounted display system for displaying, to the wearer of the helmet, electronically generated images in superposition with a view of the environment, comprising:

- a helmet;
- a pack adapted to be worn on the torso of the wearer of said helmet;
- a cathode ray tube disposed in said pack;
- a signal conditioning circuit means disposed in said pack for providing, in response to image related signals received thereat, image generation controlling signals to said cathode ray tube;
- a high voltage supply means disposed in said pack for providing a high voltage signal to said cathode ray tube and for providing operating voltage to said signal conditioning circuit means;
- connection means disposed on said pack for connecting said signal conditioning circuit means for response to image related signals provided externally of said pack and for connecting a voltage source external of said pack to said high voltage supply means;
- optical fiber means extending between said pack and said helmet for conducting images presented on said cathode ray tube to said helmet; and
- a superposing display optics system disposed in said helmet in a manner to permit viewing of the environment there-through by the wearer thereof and disposed with respect to said optical fiber means so as to superpose images presented by said cathode ray tube on the wearer's view of the environment.

4,878,047

STRUCTURE OF MULTIPLEX-TYPE LIQUID CRYSTAL IMAGE DISPLAY APPARATUS, AND CONTROL CIRCUIT THEREFOR

Takashi Fuse, and Koji Yamagishi, both of Tokyo, Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Filed Oct. 16, 1987, Ser. No. 111,686

Claims priority, application Japan, Oct. 21, 1986, 61-160049[U]; Oct. 24, 1986, 61-163256[U]

Int. Cl.⁴ G09G 3/36

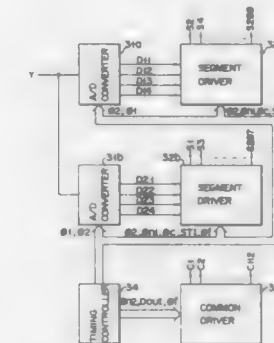
U.S. Cl. 340—784

27 Claims

- 1. An image display apparatus, comprising:
 - a liquid crystal display panel having segment electrodes and common electrodes, wherein odd-numbered segment electrodes are extracted from one side and different, even-numbered segment electrodes are extracted from a different side of the display panel, each common electrode

defining a different scanning line on which the odd-numbered and the even-numbered segment electrodes are alternately arranged to form a corresponding number (n) of pixels when a common electrode is selectively driven a certain time period (T) and the segment electrodes are driven during said time period;

- a first A/D converter for converting a luminance signal, to be displayed on said liquid crystal display panel, into digital data at a certain phase timing;
- a second A/D converter for converting the luminance signal into digital data at a timing having a phase different from that of said first A/D converter;



- a first segment driver for driving the odd segment electrodes of said liquid crystal display panel, in accordance with an output signal from said first A/D converter;
 - a second segment driver for driving the even segment electrodes, in accordance with an output signal from said second A/D converter; and
 - a common driver for sequentially driving the common electrodes of said liquid crystal display panel;
- wherein said first and second A/D converters each include means for operating at a sampling frequency (f_s) substantially equal to one-half (n/T).

4,878,048

CHANNEL REDUNDANCY IN A DIGITAL LOOP CARRIER SYSTEM

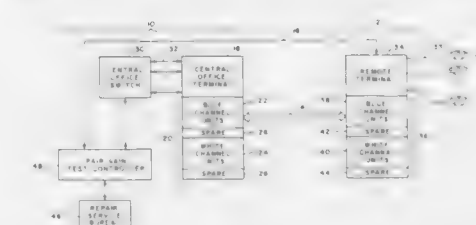
Jeffrey L. Gottesman, Morris Plains, N.J.; Mark A. Dempsey, Glendale Heights, Ill.; Donald E. Koch, Aurora, Ill., and Dev R. Rattan, Chicago, Ill., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Aug. 10, 1988, Ser. No. 230,641

Int. Cl.⁴ H04K 1/00

U.S. Cl. 340—825.010

18 Claims



- 1. A channel redundancy system for use with a central office connected to a remote location comprising:
 - a central office terminal at the central office having a plurality of channel units including at least one spare channel unit;
 - a remote terminal at the remote location having a plurality of channel units including at least one spare channel unit, said channel units in said remote terminal associated cor-

respondingly with said channel units in said central office terminal;
means for providing transmission lines for connecting said channel units of said central office terminal to said channel units of said remote terminal;
means for identifying a defective one of said channel units in one of said remote terminal and in said central office terminal; and
means for automatically exchanging said identified defective channel unit with said spare channel unit in said one of said remote terminal and said central office terminal.

4,878,049

INFORMATION TRANSMISSION SYSTEM FOR RAILWAY VEHICLE

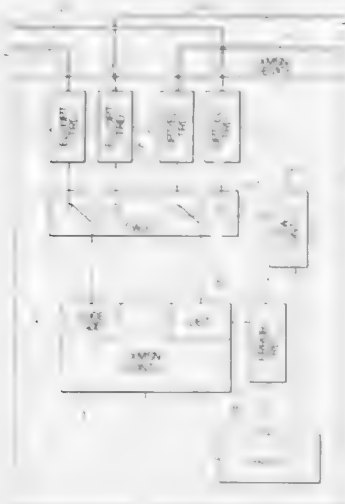
Hajime Ochiai, Nishinomiya, and Kenji Morihara, Takarazuka, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha

Filed Mar. 26, 1985, Ser. No. 716,254

Claims priority, application Japan, Mar. 27, 1984, 59-61380
Int. Cl.⁴ G05B 23/02

U.S. Cl. 371-5.5

2 Claims



1. In an information transmission system wherein information is transmitted optically between cars of a train, a transmission device comprising:

means for transmitting information including data and an error code over a transmission line, said transmitting means including means for adding in succession to the data an error code corresponding to the data to provide the information for transmission;

means for receiving information including data and an error code from the transmission line, said receiving means being coupled to the transmitting means and including means for checking the received data against the received error code to detect a transmission error;

means for determining an error rate at which the transmission error occurs;

means for providing a predetermined signal when the error rate exceeds a predetermined value representing imminent decisive loss of function of the transmission line and for transmitting and receiving over another transmission line responsive to the signal, whereby loss of communication is prevented responsive to the predetermined signal, and display means responsive to the predetermined signal for indicating the excess of the error rate over the predetermined value.

4,878,050
MOTOR VEHICLE REMOTE CONTROL SYSTEM
William L. Kelley, 4633 SW. 31st Dr., Hollywood, Fla. 33023
Filed Mar. 6, 1987, Ser. No. 22,724
Int. Cl.⁴ H04Q 9/00

U.S. Cl. 340-825,060

1 Claim



1. Motor vehicle remote control system for enabling an authorized vehicle to control the movements of at least one general vehicle having drive control elements, comprising: a signal beam transmitter disposed on top of the authorized vehicle; means for directing said signal beam; a signal receiver attached to said general vehicle for receiving said signal beam; vehicle control means disposed in said general vehicle being responsive to said signal receiver, connected to said general vehicle's drive control elements for controlling the movements of said general vehicle; wherein said signal beam contains energy from one of: electromagnetic wave energy, and acoustic energy; said movements of the general vehicle is at least one of: decelerating the general vehicle, stopping the general vehicle, and stopping the general vehicle after a delay; including a transmission disengage element for disengaging the engine from the general vehicle's drive wheels; including a fuel disengage element and wherein said transmission disengage element is disposed in a housing structurally connected to the engine cooling system and being traversed by cooling liquid, for preventing unauthorized tampering with at least one of the transmission and the fuel disengage element.

4,878,051

PAGING SYSTEM WITH COMMANDS FOR CHANGING FUNCTIONALITY OF A PAGING RECEIVER

Andrew A. Andros, Spring, Tex.; Thomas J. Campana, Jr., Chicago, Ill.; Gary F. Thelen, Palos Park, Ill., and Robert A. Kinast, Chicago, Ill., assignors to Telefind Corp., Coral Gables, Fla.

Filed Feb. 22, 1988, Ser. No. 158,982

Int. Cl.⁴ H04Q 7/00

U.S. Cl. 340-825,440

44 Claims



44. A paging system comprising:

(a) a transmitter, coupled to a local paging system, for transmitting pages which are each comprised of an identification number having multiple digits which identify a paging receiver to receive a page, and a plurality of charac-

ters with the page modulating a radio common carrier which is broadcast by the transmitter;
(b) means for receiving pages to be broadcast by the transmitter;
(c) a memory, coupled to the means for receiving, for storing the received pages to be broadcast;
(d) a plurality of subscriber files, each subscriber file having a plurality of fields of information which are stored for each subscriber of the paging system including an identification number which uniquely identifies a subscriber and which uniquely identifies the paging receiver to receive pages charged to the subscriber and a service option field specifying different levels of service to be provided to the subscriber including local service;
(e) a sublocal paging means, for broadcasting pages on a non-common carrier, coupled to the local paging system, for providing pages to the local system which are to be transmitted by the transmitter; and
(f) control means, coupled to the storage means and the subscriber files, for processing each received page to determine if the identification number of the page received from the sublocal switch matches an identification number stored in the subscriber files and if a match is present and if local service has been coded causing the page received from the sublocal system to be broadcast by the transmitter to a paging receiver identified by the identification number in the page.

(e) an HF output stage having an output and coupled to said pulse shaper output and to said oscillator output;
(f) an antenna; and
(g) a filter coupled between said HF output stage and said antenna;
wherein said HF oscillator comprises a circuit which enables a reliable oscillation build-up pattern in a relatively wide range of frequencies around a rated frequency, and said filter is a steeply-flanked low-pass filter.

4,878,053

ACTUATION METHOD

Louis H. Rorden, Los Altos, and T. Charles Moore, Sunnyvale, both of Calif., assignors to Develco, Inc., San Jose, Calif.

Division of Ser. No. 730,397, May 3, 1985, Pat. No. 4,736,791.

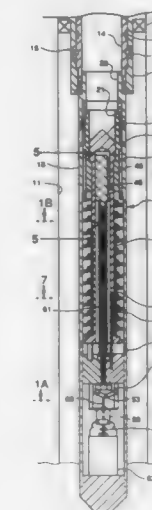
This application Apr. 14, 1988, Ser. No. 181,678

The portion of the term of this patent subsequent to Oct. 21, 2003, has been disclaimed.

Int. Cl.⁴ G01V 1/40

U.S. Cl. 340-853

9 Claims



1. In a method of controlling operation from a remote control location of a device located downhole in a well, the steps comprising:

- Providing a self-contained source of power at the downhole location of said device;
- Generating a signal at the remote control location indicating the time the device is to operate downhole in a selected operating state;
- Transmitting the generated signal from said remote control location toward the downhole location of said device;
- Receiving a signal at said downhole location during all of the time said device is to operate in said selected state, said signal causing said operation;
- Directing operation of said device in said selected state during said time, while as said source of power is capable of maintaining a power output greater than a predetermined threshold level; and
- Using a latch to disconnect said device from said power source when a state of said source indicates that said source will not be capable of maintaining a power output greater than a predetermined threshold level.

HAND-HELD TRANSMITTER FOR THE EMISSION OF CODED ELECTROMAGNETIC PULSES, AND A RECEIVER FOR RECEIVING PULSES EMITTED BY THE TRANSMITTER

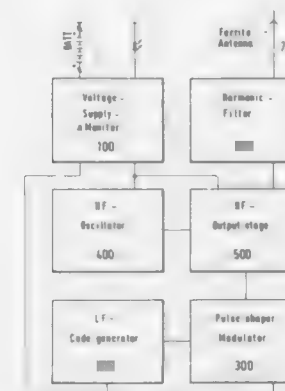
Matthias Schulze, Weiterstadt, Fed. Rep. of Germany, assignor to Alltronik Gesellschaft für Elektronische Steuerung und Antriebe mbH, Weiterstadt, Fed. Rep. of Germany
Filed Feb. 5, 1988, Ser. No. 152,883

Claims priority, application Fed. Rep. of Germany, Dec. 5, 1987, 3741324

Int. Cl.⁴ H04B 1/02

U.S. Cl. 340-825,690

24 Claims



1. A hand-held transmitter for emitting coded electromagnetic pulses for reception and processing by a receiver tuned to said transmitter, preferably for the remote operation of garage doors, said transmitter comprising:

- a current/voltage supply having output means;
- a coded pulse generating coding unit with an adjustable code coupled to said output means of said current/voltage supply and having an output;
- a pulse shaper having an output and coupled to said output of said coding unit;
- an HF oscillator having an output and coupled to said current/voltage supply output means;

4,878,054

METHOD AND DEVICE FOR REPRESENTING THE HORIZON ON BOARD AN AIRCRAFT

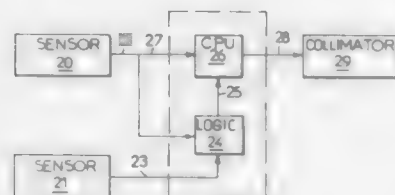
Jean M. Reynaud, Pertuis, France, assignor to Avions Marcel Dassault - Breguet Aviation, Vaucresson, France
PCT No. PCT/FR86/00130, § 371 Date Dec. 18, 1986, § 102(e)
Date Dec. 18, 1986, PCT Pub. No. WO86/06160, PCT Pub. Date Oct. 23, 1986

PCT Filed Apr. 18, 1986, Ser. No. 9,363

Claims priority, application France, Apr. 18, 1985, 85 05854
Int. Cl. G01C 23/00

U.S. Cl. 340-975

12 Claims



1. A method for representing the horizon on board an aircraft, comprising providing a collimator having a cathode ray tube, displaying an image on said cathode ray tube of said collimator comprising a circle of such a diameter as capable of being seen by a pilot under an angle which is between 10 and 30 milliradians, said circle including a horizon line which is inclined to the horizontal by an angle equal but opposite to the roll angle of the aircraft, which is distant from the center of the circle by a distance that depends on the pitch angle, towards the top when the aircraft is nose down and towards the bottom when it is in the process of nosing up, and which delimits two areas of different luminosities, and said circle further including a point representing a pole which is situated on the median line of the horizon line at a constant distance from said horizon line, said distance being such that upon aircraft movement during flight, when the horizon line divides said circle into two equal halves, said point is absent from the circle, and that, when the horizon line leaves the circle, said point is located on the center of said circle.

4,878,055

REMOTE CONTROL DEVICE

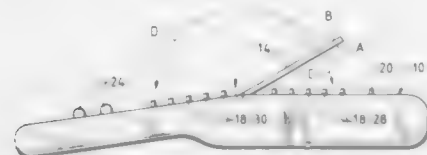
Yoshiki Kasehara, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan

Filed Jun. 22, 1988, Ser. No. 210,080

Claims priority, application Japan, Jun. 22, 1987, 62-9466
Int. Cl. H03M 11/00

U.S. Cl. 341-23

8 Claims



1. A wireless remote control device so adapted as to permit changing remote control functions allocated to operation keys, comprising:

- a body having a wireless transmitter for transmitting at least one of audio and video control signals;
- an operation panel on the body equipped with a plural number of operation keys;
- a function switching means for changing the functions of said operation keys;
- at least one movable panel arranged pivotably to cover said operation panel, so composed as to permit operating said operation keys from an upper side of said movable panel

and having markings imprinted on the surface thereof to indicate the functions of said operation keys; and
a switching operation means capable of switching said function switching means to the function mode displayed on said movable panel in conjunction with rotation of said movable panel.

4,878,056

KEY INPUT CIRCUIT

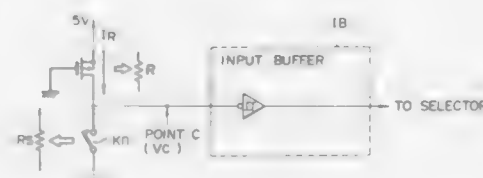
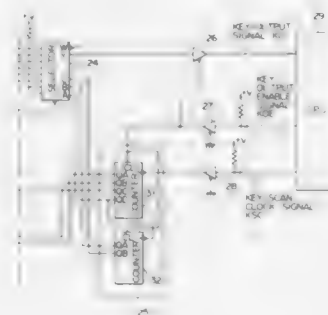
Noriyuki Isoda, and Yuji Okamoto, both of Sagami, Japan, assignors to Topre Corporation, Tokyo, Japan

Filed Aug. 12, 1987, Ser. No. 84,191

Claims priority, application Japan, Oct. 29, 1986, 61-255780
Int. Cl. G06F 3/00

U.S. Cl. 341-26

17 Claims



1. A key input circuit for use in a keyboard, comprising:
 - a plurality of key switches;
 - a plurality of signal-output means connected to said key switches, for outputting electrical signals when said key switches are turned on, each of said signal-output means including resistor means connected to a corresponding key switch and a power supply, and input buffer means coupled to a connection point of said resistor means and said key switch, a resistance of said resistor means increasing in correspondence with increments of a contact resistance of said key switch;
 - counter means for receiving and counting clock signals supplied at predetermined intervals;
 - scanning means for receiving output data from said counter means and scanning said signal-output means in accordance with output data of said counter means, thereby to output said electrical signals;
 - determining means for generating said clock signals, receiving the electrical signal from said scanning means, and determining which key switch has been turned on, in accordance with how many clock signals has been generated before the electrical signal is received; and
 - reset means for resetting said counter means at a desired time.

4,878,057

TYPEWRITER KEYBOARD

Harry W. Kompanek, Santa Barbara, and Rickey H. Ming, Ventura, both of Calif., assignors to KDC Corporation, Carpinteria, Calif.

Continuation of Ser. No. 417,524, Sep. 13, 1982, abandoned. This application Feb. 13, 1987, Ser. No. 14,461

The portion of the term of this patent subsequent to Apr. 12, 2005, has been disclaimed.

Int. Cl. G06F 3/02; H03M 11/00

U.S. Cl. 341-34

51 Claims



1. In combination,
 - a housing constructed of a depressible material to define individual areas for depression to identify individual indicia,
 - a hard electrically insulating material adhered to the housing at the individual areas of the housing and depressible to transmit strains produced in the housing by the depression of housing at the individual areas in the housing,
 - a plurality of thin sheets of an electrically insulating material each attached to the hard insulating material at positions corresponding to the individual areas in the housing and depressible to transmit strains,
 - a plurality of thin sheets of an electrically conductive member each adhered to an individual one of the electrically insulating sheets at one of the individual areas of the housing and depressible to transmit strains, and
 - a plurality of crystals having first and second flat surfaces, each of the crystals having first and second flat surfaces, each of the crystals being adhered at its first flat surface to an individual one of the electrically conductive sheets at one of the individual areas of the housing and being depressible to produce an electrical signal at the second flat surface in accordance with such depression.

4,878,058

MULTI-PROTOCOL DATA CONVERSION

William M. Needles, Arlington, Tex., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Jun. 14, 1988, Ser. No. 206,504

Int. Cl. H03M 1/36

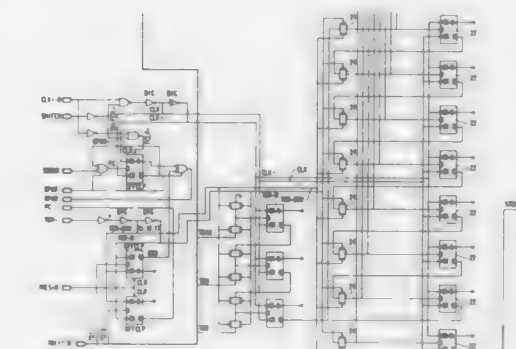
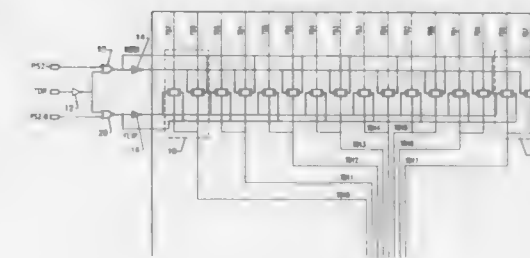
U.S. Cl. 341-101

5 Claims

3. Circuitry for reordering the sequence of a plurality of data bits having a first big sequence, the circuitry comprising:

- (a) means comprising a plurality of two-to-one multiplexers corresponding to the plurality of data bits, each of the multiplexers receiving as inputs both a data bit from the

first bit sequence and a corresponding data bit from a second bit sequence; and



- (b) steering means for selecting as output data of the multi-plexer means either data having the first bit sequence or data having the second bit sequence.

4,878,059

FARFIELD/NEARFIELD TRANSMISSION/RECEPTION ANTENNA

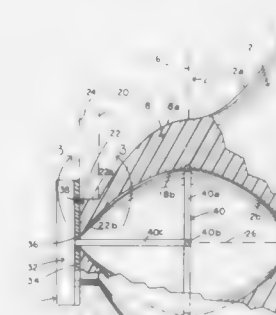
Tex Yuki, Baker, Oreg., assignor to Spatial Communications, Inc., Baker, Oreg.

Filed Aug. 19, 1983, Ser. No. 524,533

Int. Cl. H01Q 19/06

U.S. Cl. 343-753

3 Claims



1. A nearfield/farfield, transmission/reception antenna for electromagnetic radiation of a selected wavelength, said antenna having a transmission/reception axis, and comprising

a nearfield/farfield converter antenna portion having a body of revolution which is symmetrical with respect to said axis, and which is bounded by rear and front planes substantially normal to said axis, with inner and outer surfaces of revolution in said body extending between said planes, said inner surface, where it intersects a radial plane containing and extending to one side only of said axis, describing a curvilinear line defined by the equation $R_{\theta_1} = A_1 \cos \theta_1$, where R_{θ_1} is the distance of said line from said axis, A_1 is a constant relating to the propagation velocity in air of radiation at the selected operating wavelength for the antenna, and θ_1 is the angle in degrees progressing from zero degrees away from said rear plane toward said front plane, and said outer surface, where it intersects the same radial plane, describing another curvilinear line defined by the equation $R_{\theta_2} = A_2 \sec \theta_1$, where R_{θ_2} is the distance of said other line from said axis, and A_2 is a constant relating to the propagation velocities both in air, and in the material forming said body of revolution, at said selected operating frequency, said inner and outer surfaces diverging progressively toward said front plane,

a generally circular, planar, ring-like, conductive, driven expense, having a nominal circumference substantially equaling said selected wavelength, and a nominal diameter substantially equaling $2A_1$, said expense generally occupying said rear plane in a position symmetric with respect to said axis, and
electromagnetic/electrostatic shield means distributed generally as a layer over said outer surface, impervious to radiation at said selected wavelength.

4,878,060

MICROWAVE PLANE ANTENNA WITH SUSPENDED SUBSTRATE SYSTEM OF LINES AND METHOD FOR MANUFACTURING A COMPONENT

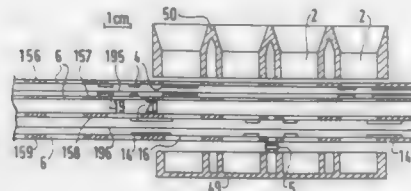
Pascal Barbier, Saint Maurice; Francis Falgat, and Alain Sorel, both of Evreux, all of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 9, 1986, Ser. No. 939,583

Claims priority, application France, Dec. 20, 1985, 85 18923
Int. Cl.⁴ H01Q 13/02

U.S. Cl. 343-778

10 Claims



1. A planar high-frequency antenna including, in order:
 - a rigid block of material having a plurality of openings therethrough bounded by conductive surfaces defining respective waveguides;
 - a first flexible sheet having openings therethrough aligned with the openings in the rigid block and bounded by conductive surfaces defining continuations of the respective waveguides;
 - a second flexible sheet of dielectric material bearing a network of strip conductors having ends terminating in the waveguides;
 - a third flexible sheet having openings therethrough aligned with the openings in the first flexible sheet and bounded by conductive surfaces defining continuations of the respective waveguides; and
 - a rigid chassis for supporting the sheets;
- said antenna further including a first pattern of separating studs disposed between the first and second sheets, and a corresponding second pattern of separating studs disposed between the second and third sheets, said patterns of studs

being deposited on respective ones of the flexible sheets and being arranged to inflexibly secure the second flexible sheet between solid portions of the rigid block and the rigid chassis.

4,878,061

BROADBAND WIDE FLARE RIDGED MICROWAVE HORN ANTENNA

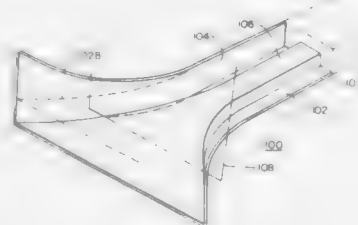
Marwan E. Nusair; Michael D. Valentine, and Stephen R. Scholl, all of Cincinnati, Ohio, assignors to Valentine Research, Inc., Cincinnati, Ohio

Filed Nov. 25, 1988, Ser. No. 275,973

Int. Cl.⁴ H01Q 13/02

U.S. Cl. 343-786

9 Claims



1. A fast-flared rectangular horn antenna for use in a microwave detector and extending from a waveguide to an open aperture comprises:

an upwardly flared top wall;
a downwardly flared bottom wall;
outwardly flared side walls extending between said bottom wall and said top wall, the curvature and the first derivative of the curvature of the flares of said top, bottom and side walls being continuous; and
a flared and vanishing first ridge formed into said bottom wall, centered between said side walls and originating at the waveguide, the curvature and the first derivative of the curvature of the flare of said first ridge being continuous and sized such that said first ridge vanishes by melding into said bottom wall and said side walls at vanishing points within a common cross sectional plane taken along said antenna.

4,878,062

GLOBAL POSITION SATELLITE ANTENNA

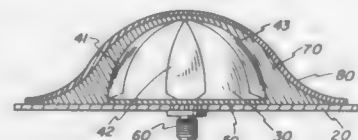
Tyson S. Craven, Boca Raton, and Pushpa M. Choriymakal, Plantation, both of Fla., assignors to Dayton-Granger, Inc., Ft. Lauderdale, Fla.

Filed Jul. 28, 1988, Ser. No. 226,018

Int. Cl.⁴ H01Q 1/42, 21/26

U.S. Cl. 343-872

8 Claims



1. A global position satellite receiving antenna having circular polarization and high gain near the horizon and a low standing wave ratio comprising,
 - a planar base member,
 - a hemisphere of high dielectric constant material placed on said base member,
 - four substantially identical antenna elements in contact with said hemisphere at substantially equal intervals, each of said elements having a base portion positioned near but insulated from said base member, and an apex portion positioned near the axis of said hemisphere,

power divider circuit means connected to said antenna elements for combining the received signals, and means for improving the axial ratio of the received signals at low angles of radiation with respect to the plane of said base member.

4,878,063

MULTICOLOR PRINTING APPARATUS AND METHOD HAVING VERNIER DETECTION/CORRECTION SYSTEM FOR ADJUSTING COLOR SEPARATION PLANES

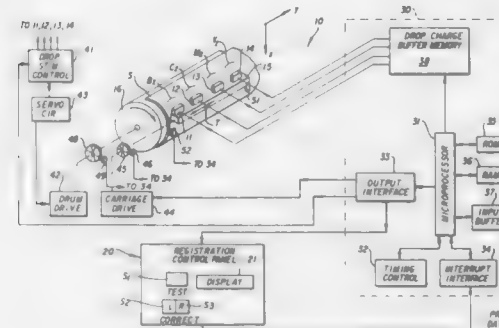
James A. Katerberg, Kettering, Ohio, assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 5, 1988, Ser. No. 280,058

Int. Cl.⁴ G01D 18/00; G03G 13/01; H04N 1/46

U.S. Cl. 346-1.1

9 Claims



3. In apparatus for printing multicolor images of the kind having first and second color printing subsystems, a control system for detecting and correcting misregistration of the different color separation planes of those subsystems, said method comprising:

(a) means for controlling said first subsystem to print, on a test sheet, a first test array comprising of M parallel lines that are uniformly spaced along a first direction N adjustment steps apart;
(b) means for controlling said second subsystem to print, on said test sheet, a second test array comprising of M parallel lines marks that are: (i) uniformly spaced along said first direction N+1 adjustment steps apart and (ii) predeterminedly juxtaposed with respect to said first test array such that, when registration of said subsystems is correct, base registration lines of said first and second test arrays are aligned; and
(c) means for adjusting the relative position of said subsystems' printout, along said first direction, an amount based on which juxtaposed line pair of said two test array printouts are in best alignment.

4,878,064

CONTINUOUS INK JET STIMULATION ADJUSTMENT BASED ON OVERDRIVE DETECTION

James A. Katerberg, Kettering; Robert L. Wint, Trottwood, and Richard A. Lewis, Miamisburg, all of Ohio, assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 31, 1988, Ser. No. 264,738

Int. Cl.⁴ G01D 18/00

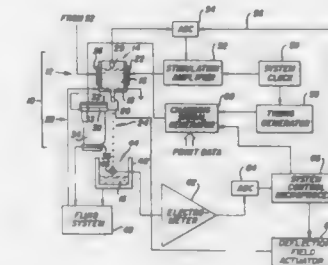
U.S. Cl. 346-75

8 Claims

1. In ink jet printing apparatus of the kind having orifice means for forming ink jet filaments directed toward a print zone and stimulation means for imposing energy pulses of predetermined frequency to effect drop stream formation from said jet filaments, an improved stimulation control system comprising:

(a) detecting means, including a test charge electrode located downstream from the overdrive inception point of stimulated filaments and an electrometer located to inter-

cept charged drops, for detecting a base stimulation amplitude that produces the minimum-filament-length condition for said jet filaments; and



- (b) control means, responsive to said detecting means, for adjusting said stimulation means to a nominal operating amplitude that is a predetermined fraction of said detected base stimulation amplitude.

4,878,065

THERMAL PRINTING CONTROL CIRCUIT

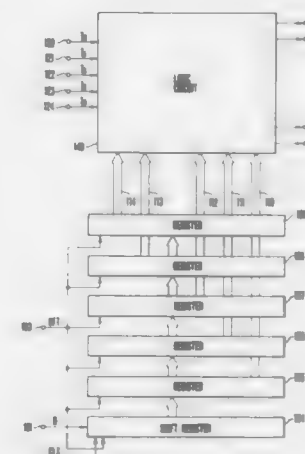
Itaru Fukushima, Tokyo; Takashi Okamoto, and Hisashi Deguchi, both of Kyoto, all of Japan, assignors to NEC Corporation, Tokyo and Sasumu Corporation, Ltd., Kyoto, both of Japan

Filed Aug. 26, 1988, Ser. No. 236,808

Claims priority, application Japan, Aug. 28, 1987, 62-214810
Int. Cl.⁴ G01D 15/10

U.S. Cl. 346-76 PH

3 Claims



1. A thermal printing control circuit comprising:
 - a first serial/parallel shift register for receiving serial image data to be serially printed and for temporarily storing the serial image data;
 - a second parallel register group comprising a plurality of stages for storing image data corresponding to several previous print lines;
 - a thermal head having heating elements corresponding to bits of printing data which are to be printed and are stored in a first stage of said second register group;
 - a first logic gate group for calculating logic formulas t_0 , t_A , t_B , t_C and t_D by using a plurality of sequentially input fundamental timing signals (T_0 , T_A , T_B , T_C , T_D) for balancing heat energy of the heating elements of said thermal head in accordance with the printing data of the previous several lines stored in said second register group, and the printing data to be printed; and

a second logic gate group for calculating
 $T = t_0 + t_A + t_B + t_C + t_D$,
 the logic formulas t_0 , t_A , t_B , t_C , and t_D being defined by:

$$t_0 = R_{n,n} \cdot T_0$$

$$t_A = R_{n,n} \cdot (R_{n-1,n}) \cdot T_A$$

$$t_B = R_{n,n} \cdot (R_{n-2,n} \cdot R_{n-1,n-1} \cdot R_{n-1,n+1}) \cdot T_B$$

$$t_C = R_{n,n} \cdot (R_{n-2,n-1} \cdot R_{n-3,n} \cdot R_{n-2,n+1}) \cdot T_C$$

$$t_D = R_{n,n} \cdot$$

$$(R_{n-2,n-2} \cdot R_{n-3,n-1} \cdot R_{n-4,n} \cdot R_{n-3,n+1} \cdot R_{n-2,n+2}) \cdot T_D$$

3. A thermal printing control circuit comprising:

a plurality of integrated circuits each of which can control N thermal print elements; and
 connecting means for connecting said plurality of integrated circuits to each other;

said integrated circuit including:

a (N+M)-bit first shift register for receiving and storing a series of serial printing image data to be printed by said N thermal print elements, where M is larger than one;

a second register, constituted by a plurality of (N+M)-bit registers for storing contents of said first shift register by parallelly and sequentially shifting and receiving the contents thereof, for storing printing history data of a plurality of cycles of said N thermal print elements; and

a logic circuit for performing a logic operation by using the printing history data of the plurality of cycles of said N thermal print elements, the printing history data being stored in said second shift register, and externally supplied control timing data and for generating drive signals representing voltage waveforms to be applied to said N thermal print elements in a current cycle, wherein

said connecting means connects an input terminal of said first shift register of one of said integrated circuit to intermediate bit outputs of said first shift registers of other integrated circuits.

4,878,066

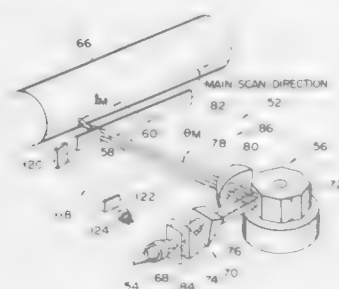
BEAM SCANNER WITH DISTORTION CORRECTION
 Takashi Shiraiishi, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 16, 1988, Ser. No. 245,207

Claims priority, application Japan, Sep. 18, 1987, 62-232344
 Int. Cl.⁴ G01D 15/14; H04N 1/024

U.S. Cl. 346-108

14 Claims



1. An optical apparatus for an image forming apparatus for forming an image on an image carrier, comprising:
 means for emitting a light beam;
 means for scanning the light beam emitted by said emitting means in a first direction on said image carrier; and
 correction means for correcting distortion of the light beam scanned by said scanning means, said correction means having a correction lens in which power for focusing the light beam in a second direction perpendicular to the first

direction is larger than power for focusing the light beam in the first direction.

4,878,067

LASER RECORDER WITH STABLE FILM FEED AUXILIARY SCANNING

Mitsutoshi Yagoto; Akiyoshi Hamada; Masayuki Mino, all of Toyokawa; Yutaka Tanaka, Kawasaki, and Yutaka Watanabe, Tokyo, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

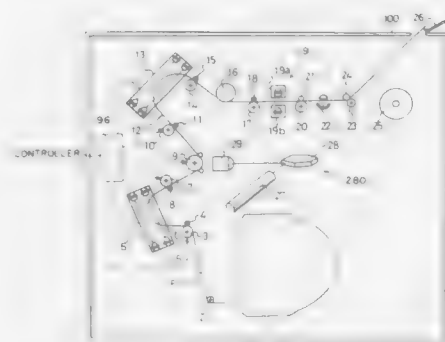
Continuation of Ser. No. 41,077, Apr. 21, 1987, abandoned. This application Nov. 4, 1988, Ser. No. 267,668

Claims priority, application Japan, Apr. 22, 1986, 61-92861; Apr. 22, 1986, 61-92862; Apr. 22, 1986, 61-92863; Apr. 22, 1986, 61-92864

Int. Cl.⁴ G01D 9/42

U.S. Cl. 346-108

10 Claims



1. A laser recorder comprising;

a housing;

a film feeding unit for feeding a film stored in a roll, disposed in said housing;

a film take-up unit disposed in said housing to form a film path extending between said film feeding unit and said film take-up unit;

a main driving unit for driving the film for running at a fixed speed, disposed on said film path extending between said film feeding unit and said film take-up unit, said main driving unit includes a main driving roller for driving the film in contact with the outer circumference of said roller so as to draw out the film from said film feeding unit, at least two pressure rollers for pressing the film against the outer circumference of said main driving roller, a DC servomotor for driving said main driving roller, and film delivery rollers being driven at a slightly slower speed than said main driving roller, thereby functioning as resistance in contact with the film when said film is drawn out from said film feeding unit onto said film path extending between said film feeding unit, and

an image information recording unit having a laser optical system, for scanning the film by a laser beam across the width of the film being held and driven by said main driving unit.

4,878,068
BEAM RECORDER HAVING A VARYING BEAM INTENSITY FOR MAINTAINING A TRUE REPRODUCED IMAGE

Yoshiyuki Suzuki, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

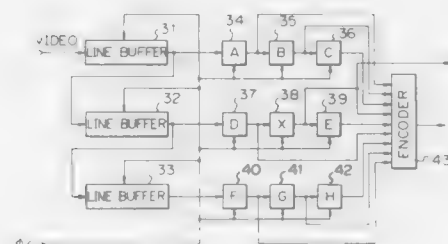
Filed Sep. 1, 1987, Ser. No. 91,773

Claims priority, application Japan, Sep. 8, 1986, 61-209709

Int. Cl.⁴ G01D 9/42; H04N 1/21

U.S. Cl. 346-108

13 Claims



C	B	A
E	X	D
H	G	F

1. A beam recorder comprising:

image signal input means;

modulation means for modulating a recording beam in accordance with an image signal supplied from said input means; and

discrimination means for discriminating a characteristic of the image signal supplied from said input means, wherein said discrimination means includes memory means for receiving the image data from said input means for each pixel and for storing data of a pixel under consideration and data of adjacent pixels, and said discrimination means discriminates whether the pixel under consideration is a pixel adjacent to a line or not in accordance with the pixel under consideration and the adjacent pixels, said discrimination means discriminating whether the pixel under consideration is adjacent to a line or not in a plurality of directions; and

wherein said modulation means controls a drive current for emitting the beam to change an intensity of the beam in accordance with a discrimination result of said discrimination means.

4,878,069

INK JET RECORDING APPARATUS WITH AN INK TANK-CARRIAGE CONFIGURATION FOR INCREASING USEABLE SPACE

Takehiko Kiyohara, Zama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 82,946, Aug. 10, 1987, abandoned, which is a continuation of Ser. No. 752,538, Jul. 8, 1985, abandoned. This application Aug. 26, 1988, Ser. No. 237,641

Claims priority, application Japan, Jul. 9, 1984, 59-140744
 Int. Cl.⁴ G01D 15/16; B41J 3/04

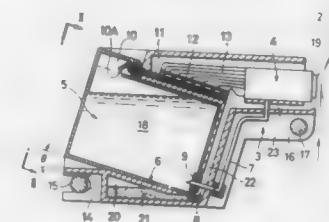
U.S. Cl. 346-140 R

16 Claims

1. An ink jet recording apparatus having a recording head carried on a carriage adapted to move along a recording mate-

rial and an ink container for storing ink, said ink container having a foreside and a rearside relative to an outlet port of said ink container, ink being introduced into said recording head so as to be injected through an ink discharging orifice toward said recording material by activating an energy generator disposed on said recording head in response to a recording signal, said energy generator serving to generate energy which is utilized for the purpose of discharging ink, and said ink container being replaceably fitted into said carriage in an inclined state such that its rearside is raised above its foreside, wherein:

said ink container has a folding portion adapted to be folded



by breakage when it is fitted into said carriage, said folding portion, in a folded state, serving to establish communication between the interior of said ink container and the outside atmosphere,

said carriage is provided with a thrust portion for breaking said folding portion under the effect of a thrusting force provided by said thrust portion, said thrust portion of said carriage including a communication tube through which communication is established between the interior of the said ink container and the outside atmosphere, and one end of said communication tube is in communication with an ink absorbing material on a bottom surface of said carriage.

4,878,070

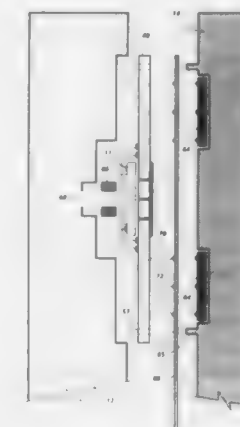
THERMAL INK JET PRINT CARTRIDGE ASSEMBLY
 Thomas E. Watrobski, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 17, 1988, Ser. No. 258,957

Int. Cl.⁴ G01D 15/16; B41J 3/04

U.S. Cl. 346-140 R

8 Claims



1. An ink jet printing device for a drop-on-demand thermal ink jet printer, the printing device including an ink supply cartridge having a printhead mounted within the cartridge, said printhead being of the type having a plurality of parallel channels, each channel being supplied with ink and having one open end which serves as an ink droplet ejecting nozzle, a

heating element being positioned in each channel a predetermined distance from the nozzle, ink droplets being ejected from the nozzles by the selective application of the current pulses to the heating elements in response to electrical signals from a remote source, the heating elements transferring thermal energy to the ink in contact therewith causing the formation and collapse of temporary vapor bubbles that expel the ink droplets, said printing device further comprising a first electrode board bonded to said printhead and mechanically connected to said cartridge, said first electrode board providing electrical connection between said heating elements and a plurality of terminals located at discrete points on both surfaces of said first board, said printing device further comprising a second electrode board in mechanical and electrical contact with said first board, said second board providing electrical connection between said first board terminals and said remote source.

4,878,071

PAPER TRANSPORT AND PAPER STABILIZING SYSTEM FOR A MULTICOLOR ELECTROSTATIC PLOTTER

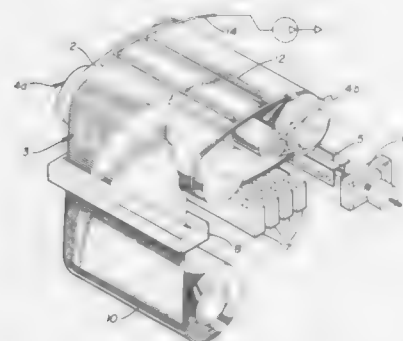
Andreas Bibl, Los Altos; John Higginson, Santa Clara, and Deane Gardner, Cupertino, all of Calif., assignors to Raster-graphics, Inc., Sunnyvale, Calif.

Filed Mar. 11, 1988, Ser. No. 166,716

Int. Cl.⁴ G01D 15/00

U.S. Cl. 346—153.1

16 Claims



1. An improved multipass high resolution electrostatic plotter, printer or the like incorporating a transport belt means for invariant registration of a recording material with respect to a writing head comprising:

- a record material;
- writing means disposed for printing information on record material;
- toning assembly means operatively connected with said writing means enabling said writing means to selectively apply color fluid to said record material;
- transport means including a belt having an attach means for providing a vacuum to the entire surface of said record material adjacent said belt such that said record material is registered in invariant alignment with respect to said writing means and said toning assembly means;
- drive means for passing said transport means past said writing means and said toning assembly means.

4,878,072

LED AGE CORRECTION MEANS

Hans Reinten, Velden, Netherlands, assignor to OCE-Nederland B.V., Venlo, Netherlands

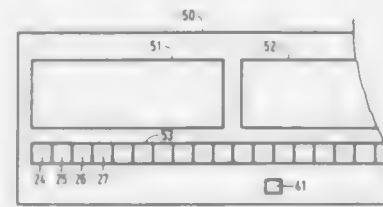
Filed Sep. 8, 1988, Ser. No. 241,941

Claims priority, application Netherlands, Sep. 11, 1987, #702166

Int. Cl.⁴ G01D 15/00

U.S. Cl. 346—154

6 Claims



1. An exposure device for line and imagewise exposure of a photosensitive layer, comprising:
 - a. an array of LED's;
 - b. a control device connected to said LED array to energize each LED individually for a variable time per image line by means of an absolute correction number;
 - c. a memory means connected to said control device and including a first table for storing the relative intensity of each LED and an aging table for storing for each individual LED the light intensity thereof measured by said light-sensor; and
 - d. at least one light-sensor smaller than said array of LED's, said sensor being located a fixed distance from said LED array for measuring the relative light intensity of each individual LED connected to said control device;
 whereby said control device determines a new absolute correction number for each LED based on said data stored in said aging table and corresponding data in said first table.

4,878,073

TRANSPARENT SLIDE PROTECTIVE CONTAINER

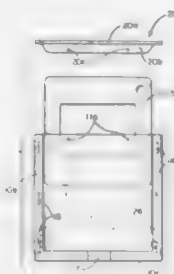
Gary A. Hoonsbeek, Minneapolis, Minn., assignor to Image Innovations, Inc., Edina, Minn.

Filed Aug. 1, 1988, Ser. No. 226,856

Int. Cl.⁴ G03B 21/64

U.S. Cl. 353—120

4 Claims



1. A container for individual photographic slides, said container comprising a pair of spaced apart transparent semi-rigid plastic side panels defining an open top but positively connected along at least the side edges thereof to define a slide receiving pocket therebetween, a removable cover closing said open top with means for releasably holding the top in closed position to close the top of said pocket, said cover having a generally T-shaped cross-section with a depending tongue portion, said tongue portion being received in the open top with interfitting means formed along the upper marginal edge

of at least one of the side panels and said tongue portion to hold the top in closed position.

4,878,074

DYNAMIC PARTICULATE OBSERVATION APPARATUS

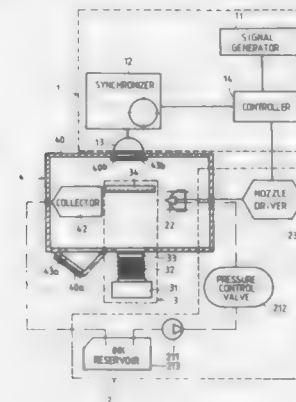
Ye-Yin Peng, Hsinchu Hsien, Taiwan, assignor to Industrial Technology Research Institute, Taiwan, Taiwan

Filed Jun. 6, 1988, Ser. No. 204,566

Int. Cl.⁴ G03B 29/00; G01P 3/38, 3/40

U.S. Cl. 354—76

7 Claims



1. A dynamic particulate observation apparatus comprising:
 - a black box having an internal space enclosed therewithin, which shields said space from the infiltration of light from outside;
 - means for generating particles moving across said black box;
 - means for emitting flash light within said black box at a predetermined frequency; and
 - means for recording the images of the particles generated by said generating means when said emitting means emits flashlights,
 said emitting means comprising:
 - a signal generator for generating signals at a predetermined frequency;
 - a controller coupled to said signal generator for receiving signals from said signal generator and generating signals at predetermined timing;
 - a flash synchronizer coupled to said controller for receiving signals from said controller and generating signals at a predetermined time lag of signals from said controller; and
 - a flash bulb coupled to said synchronizer and emitting flashlight simultaneously.

4,878,075

CAMERA APPARATUS FOR PREVENTING DOUBLE EXPOSURE

James W. Cannon, Penfield, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 7, 1988, Ser. No. 254,907

Int. Cl.⁴ G03B 1/12, 17/24

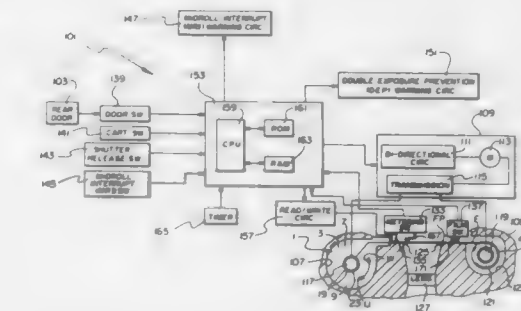
U.S. Cl. 354—173.1

3 Claims

1. An improved photographic camera wherein a motorized film transport is operated in a prewind mode to continuously advance successive unexposed frames of a filmstrip from a light-tight cassette across a focal plane of an objective lens to a film take-up, without exposing the film frames at said focal plane, and is operated in a rewind mode to position respective unexposed frames for exposure at the focal plane and to return them individually to the cassette following each exposure, and wherein the improvement comprises:

read/write means responsive to exposure of respective film frames at said focal plane for providing corresponding film encodements along the filmstrip to indicate each film

frame is exposed, and for sensing the presence or absence of a film encodement for a film frame to determine whether that particular frame is exposed; and control means responsive to said read/write means sensing the absence of a film encodement for a film frame for allowing said film transport to continue to operate in the prewind mode, and responsive to the read/write means



sensing the presence of a film encodement for a film frame for operating the film transport in the rewind mode to return only that particular frame to the cassette, whereby when a cassette containing a filmstrip which is partially exposed is loaded in said camera said control means will operate said film transport to position the next-available unexposed frame of the filmstrip for exposure at said focal plane.

4,878,076

EXPOSURE CONTROLLING SYSTEM AND INTERCHANGEABLE LENS THEREFOR

Nobuyuki Taniguchi; Toshihiko Kanasaki; Hiromu Mukai; Hisashi Tokumaru, and Tokuji Ishida, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 193,761, May 13, 1988. This

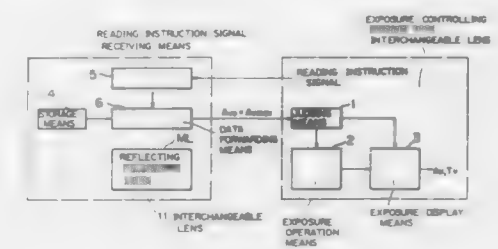
application Mar. 20, 1989, Ser. No. 362,454

Claims priority, application Japan, May 15, 1987, 62-119200; May 19, 1987, 62-121480

Int. Cl.⁴ G03B 17/17, 7/20

U.S. Cl. 354—286

4 Claims



1. An exposure controlling system for an interchangeable lens, comprising a reading means for reading data regarding aperture values of said interchangeable lens from said interchangeable lens, a light measuring means, and means responsive to outputs of said reading means and said light measuring means for finding, when said interchangeable lens is an ordinary lens, a combination of an aperture value and an exposure time to which said ordinary lens can be controlled to provide an appropriate exposure and indicating the aperture value and the exposure time thereon and for finding, when said interchangeable lens is a cata-dioptric lens, and exposure time for a fixed aperture value of said cata-dioptric lens which time provides an appropriate exposure and indicating the fixed aperture value and the exposure time thereon.

4,878,077

MOTOR DRIVE AND CONTROL APPARATUS FOR A CAMERA

Hiroshi Maeno, Hachioji; Aizawa Miyazawa, Mitaka, and Aizawa Maruyama, Yokohama, all of Japan, assignors to Olympus Optical Company Ltd., Japan

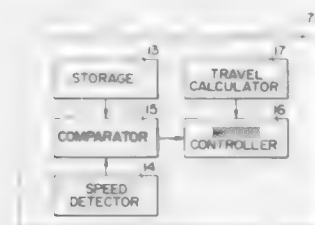
Filed Sep. 28, 1988, Ser. No. 250,385

Claims priority, application Japan, Sep. 29, 1987, 62-244954; Feb. 9, 1988, 63-027903

Int. Cl.⁴ G03B 3/00

U.S. Cl. 354—400

23 Claims



8. A motor drive and control apparatus for an automatic focus adjusting unit of a camera comprising a motor for driving a taking lens to an in-focus position in response to an output from focus detecting means; speed detecting means for detecting the speed of movement of the taking lens as it is driven by the motor; storage means for storing an optimum deceleration curve used to stop the taking lens at a target position; lens control means for comparing the speed of movement of the lens against the deceleration curve to control the movement of the taking lens to the in-focus position in conformity with the deceleration curve; and motor on limit means operative adjacent to a target position in a zone adjacent to the deceleration curve to be activated by a signal from the speed detecting means while the motor is on.

4,878,078

FOCUS DETECTING DEVICE AND METHOD OF MAKING SAME

Takeshi Koyama; Keiji Ohtaka, both of Tokyo, and Yasuo Suda, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

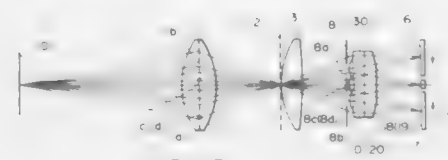
Filed May 4, 1988, Ser. No. 190,171

Claims priority, application Japan, May 14, 1987, 62-117627

Int. Cl.⁴ G03B 3/00

U.S. Cl. 354—402

11 Claims



1. A device for detecting the focus adjusted state of an objective lens, comprising:
a first member having a plurality of pairs of lens portions for forming, from the image formed by the objective lens, a pair of secondary images whose relative position varies in conformity with the focus adjusted state of the objective lens;
a second member rotatively adjusted relative to the first member and having first and second planar surfaces, said first planar surface differing in angle of inclination from said second planar surface; and
a plurality of sensing means for sensing a pair of light distributions corresponding to said secondary images, said

sensing means having a plurality of photoelectric conversion elements.

4,878,079

FOCUS DETECTING DEVICE

Masataka Hamada, Osaka; Toshihiko Kanasaki, Sakai; Toru Matsui, Sakai, and Yukio Maekawa, Sakai, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

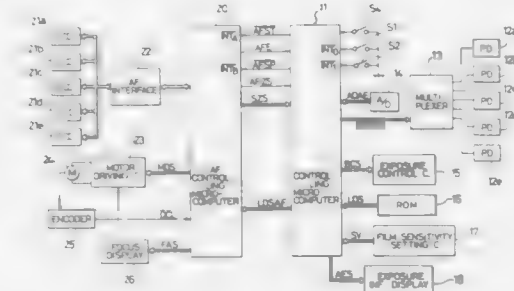
Continuation of Ser. No. 85,410, Aug. 14, 1987, Pat. No. 4,768,052. This application Aug. 1, 1988, Ser. No. 226,932

Claims priority, application Japan, Aug. 18, 1986, 61-191682

Int. Cl.⁴ G03B 3/00

U.S. Cl. 354—402

18 Claims



1. A focus detection device for use in a camera system including an objective lens, comprising:
means for measuring the luminance distribution of a plurality of divided areas of an objective field to be photographed to produce a plurality of luminance distribution signals in correspondence to said areas;
means for producing a plurality of correction data signals each relating to aberrations of the objective lens in each area; and
means for performing a focus detection calculation on the basis of the plurality of luminance distribution signals and the plurality of correction data signals to produce a resultant focus detection signal.

4,878,080

CAMERA ZOOM LENS AUTOMATIC MAGNIFICATION APPARATUS

Takanichi Takehana; Osamu Murayama; Hideaki Nakajima; Masatoshi Yamada, all of Okaya, and Makoto Hamada, Nagano, all of Japan, assignors to Chinon Kabushiki Kaisha, Japan

Filed Aug. 15, 1988, Ser. No. 232,100

Claims priority, application Japan, Mar. 14, 1988, 63-59885

Int. Cl.⁴ G03B 3/10

U.S. Cl. 354—403

2 Claims



1. A camera zoom lens automatic magnification apparatus for automatically changing the focal length of a zoom lens according to a subject to be photographed comprising a zoom lens driving device for changing the focal length of the zoom lens; a range finding device which measures distances to at least three points on the subject—at the center, to the left and

to the right—in the angle of view; and a control device which controls the zoom lens driving device according to the output of the range finding device, the control device consisting of a first decision means to decide which point is the nearest by comparing the distances to each point measured by the range finding device, a second decision means which, based on the lens focal length corresponding to the closest distance as found by the first decision means and on the depth of field for that focal length, checks if there is any other point's distance that is within the depth of field for that focal length, a third decision means which determines the zoom ratio according to a predetermined program using the result of the second decision means, and an output means which drives the zoom lens driving device according to the third decision means.

4,878,081

EXPOSURE CONTROL DEVICE FOR A CAMERA

Daisuke Kishida, Yokohama, and Saburo Sasaki, Tokyo, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

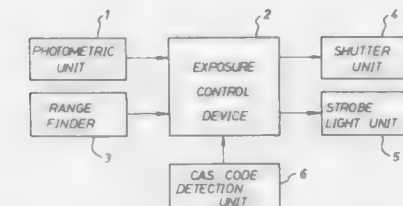
Filed Aug. 22, 1988, Ser. No. 234,528

Claims priority, application Japan, Aug. 24, 1987, 62-127444

Int. Cl.⁴ G03B 7/16, 15/05

U.S. Cl. 354—414

5 Claims



1. An exposure control device for a camera having a photometric unit for measuring brightness of an object and its ambient brightness individually, a range finding unit for measuring a distance from the device to the object, and a strobe light unit, said device comprising:

backlight detecting means for detecting whether the object is in a backlight condition or not on the basis of the brightness of the object and its ambient brightness measured by the photometric unit; and
means for allowing the strobe light to flash in either case the brightness of the object measured by the photometric unit is smaller than a predetermined brightness or the object is detected to be in the backlight condition by the backlight detecting means, if the distance from the device to the object measured by the range finding unit is smaller than a predetermined distance, and for lengthening an exposure time without allowing the strobe light to flash within the limits of a predetermined time in case the object is detected to be in the backlight condition by the backlight detecting means, if the distance from the device to the object measured by the range finding unit is larger than the predetermined distance.

4,878,082

AUTOMATIC IMAGE DENSITY CONTROL APPARATUS

Kouji Matsushita; Keigo Tange, and Shizuo Yuge, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Mar. 10, 1988, Ser. No. 166,209

Claims priority, application Japan, Mar. 12, 1987, 62-57476

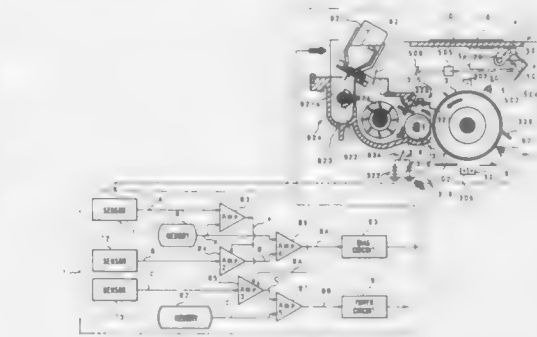
Int. Cl.⁴ G03B 15/00

U.S. Cl. 355—208

39 Claims

1. An automatic image density control apparatus comprising:
a photosensitive member,
a charging means for charging a surface of said photosensitive member at a predetermined potential,
an exposing means for partly erasing the charge on the

surface of said photosensitive member to form a reference latent image on the surface of said photosensitive member charged by said charging means,
a developing means for contacting a developer to the surface of said photosensitive member to develop said reference latent image,
a non-developing portion forming means for forming the non-developing portion on the surface of said photosensitive member to which the developer is not stuck,
a first density detecting means for detecting and outputting the density of said non-developing portion,
an image information generating means for outputting a value associated with an output value obtained by said



first density detecting means and a preset non-developing portion reference value,
a second density detecting means for detecting and outputting the image density of a reference real image developed from the reference latent image,
a correcting means for correcting the outputted value obtained by said second density detecting means according to the outputted value from said image information generating means, and
a density control means for comparing the outputted value from said correcting means with the preset reference value to control the image density according to its compared result.

4,878,083

PRESSURE DEVELOPING DEVICE IN IMAGE RECORDING APPARATUS

Kiyoharu Hayakawa, and Takashi Tomizawa, both of Aichi, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

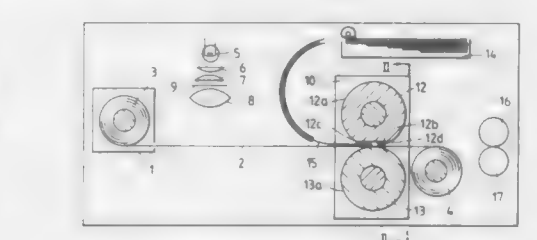
Filed Jul. 20, 1988, Ser. No. 221,612

Claims priority, application Japan, Jul. 21, 1987, 62-112494

Int. Cl.⁴ G03B 27/32, 27/52

U.S. Cl. 355—27

6 Claims



1. In an image recording apparatus of the type in which a color image on an image carrying sheet is recorded on a developer sheet wherein said color image is formed as a latent image on a photosensitive and pressure-sensitive recording sheet upon exposure to light which bears said color image, and said

latent image is developed into a visible color image and transferred onto said developer sheet superposed on said photosensitive and pressure-sensitive recording sheet by a pressure developing device, said device comprising a pair of rollers, each of said pair of rollers being rotatable about its own axis and having a first surface area on its periphery wherein each of said first surface areas are in pressure contact with each other to pressure develop said latent image and transfer said visible color image when said photosensitive and pressure-sensitive recording sheet and said developer sheet held in superposed relation are passed through a nip between said first surface areas, and at least one of said pair of rollers having a second surface area on its periphery, said second surface area extending axially of said roller wherein said second surface is free from pressure contact with another roller.

4,878,084

METHOD AND DEVICE FOR FEEDING SHEET IN IMAGE RECORDING APPARATUS

Kiyoharu Hayakawa, Ama; Yumio Matsumoto, Kasugai; Masashi Ueda, Nagoya; Akira Sago, Nagoya, and Osamu Tagaki, Nagoya, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

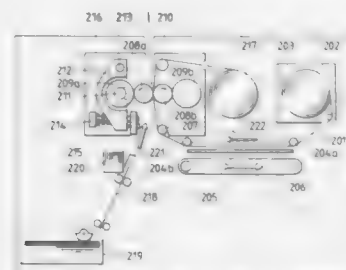
Filed Jan. 3, 1988, Ser. No. 201,915

Claims priority, application Japan, Jan. 8, 1987, 62-142552; Dec. 15, 1987, 62-191017

Int. Cl.⁴ G03B 27/32, 27/52

U.S. Cl. 355—27

6 Claims



1. A device for feeding an image recording sheet so as to overlap said image recording sheet with a light-exposed sheet which carries a latent image recorded thereon in an image recording apparatus, said image recording apparatus including an exposure unit for light-exposure to said sheet for forming said latent image; and a pressure developing unit disposed downstream of said exposure unit at which said light-exposed sheet and said image recording sheet are overlappingly pressed; said device for feeding comprising:

- stop means for temporarily preventing said image recording sheet from being fed to said developing unit;
- driving means for selectively allowing said image recording sheet to pass therethrough in response to movement of said light-exposed sheet; and,
- a sheet guide for guiding travel of said image recording sheet toward said pressure developing unit, a downstream end of said guide being disposed in a vicinity of an outlet end of said exposure unit, said stop means being disposed at said sheet guide and adapted to abut against a leading edge of said image recording sheet; and a movable roller movably disposed with respect to said sheet guide and positioned at an upstream side of said stop means, said driving means being connected to said movable roller, said movable roller providing a first position for effectuating said stop means to prevent said image recording sheet from moving, and providing a second position for incapacitating said stop means.

4,878,085 CYLINDER AND HUB LOCKING METHOD AND APPARATUS

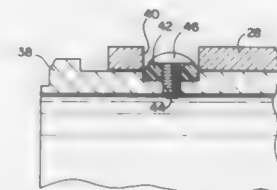
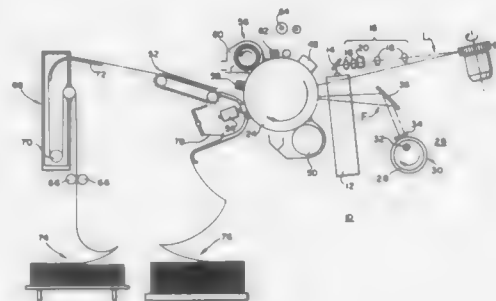
Leonard Ward, Melbourne, and George Darnofall, West Melbourne, both of Fla., assignors to Storage Technology Corporation, Louisville, Colo.

Filed Apr. 28, 1987, Ser. No. 43,486

Int. Cl.⁴ G03B 27/22, 27/58

U.S. Cl. 355—47

8 Claims



6. A forms overlay station for projecting an image of a film negative to a photoconductor drum of a laser electrophotographic printer, wherein the photoconductor drum is rotatable at a constant speed, comprising:

- a transparent drum for mounting the film negative, said transparent drum having a predetermined inside diameter and a predetermined wall thickness, and also having formed therein at each end thereof a plurality of holes spaced equidistantly radially thereabout, said plurality of holes having an equal diameter;
- light means, mounted within said transparent drum, for projecting the image therefrom;
- drive means for rotating said transparent drum synchronously with the photoconductor drum, said drive means including a pair of drive hubs, each of which has an outside diameter that is slip fit within said predetermined inside diameter of said transparent drum at respective ends thereof, and each of which includes a plurality of holes that are counterbored to a preselected depth and are of the same diameter as said holes in said transparent drum, each said counterbored hole juxtaposed to a respective one of said holes in said transparent drum;
- a motor coupled to rotate said drive hubs; and
- a plurality of O-rings and screw means for coupling said transparent drum to said drive hubs through said juxtaposed holes, wherein each said O-ring has an outside diameter substantially equal to the diameter of said juxtaposed holes and a thickness of about twice said preselected depth, said screw means compressing said O-rings in said juxtaposed holes whereby said compressed O-rings in shear, absorb torque loading between said drive hubs and said transparent drum.

4,878,086 FLAT PANEL DISPLAY DEVICE AND MANUFACTURING OF THE SAME

Junji Isohata, Tokyo; Masao Totsuka, Ohmiya, and Yoshiharu Nakamura, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

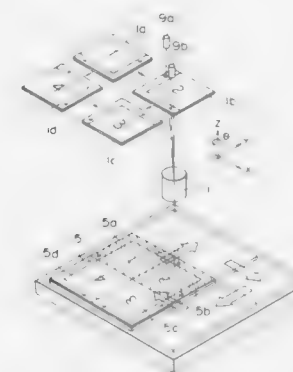
Division of Ser. No. 203,558, Jun. 1, 1988, Pat. No. 4,814,830, which is a continuation of Ser. No. 129,363, Nov. 30, 1987, abandoned, which is a continuation of Ser. No. 838,824, Mar. 12, 1986, abandoned. This application Mar. 20, 1988, Ser. No. 326,108

Claims priority, application Japan, Apr. 1, 1985, 60-068736; Apr. 17, 1985, 60-81840

Int. Cl.⁴ G03B 27/32, 27/44

U.S. Cl. 355—77

1 Claim



1. A method of exposure usable with an optical projection system, for manufacture of a flat panel display device, comprising the steps of:

- providing first and second masks having different mask patterns, including a display element forming pattern;
 - placing a workpiece having a surface on a movable stage;
 - moving the movable stage so that two-dimensionally arrayed different portions of the workpiece surface are placed, in sequence, at an exposure station at which the portion of the workpiece surface placed thereat can be patterningly exposed by projection by the optical projection system; and
 - handling the first and second masks and selecting a pattern to be projected by the optical projection system upon the portion of the workpiece surface placed at the exposure station,
- wherein the moving of the movable stage is so interrelated to the handling of the first and second masks and the selection of the pattern to be projected that under the influence of the optical projection system plural display element forming patterns are printed two-dimensionally on a first region of the workpiece surface while plural driving element forming patterns are printed on a second region of the workpiece surface outside of the first region.

4,878,087

IMAGE FORMING APPARATUS WITH JAM REMOVAL MECHANISM

Toshiyuki Sakai, and Toshio Sakata, both of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jan. 12, 1988, Ser. No. 143,042

Claims priority, application Japan, Jan. 13, 1987, 62-6910

Int. Cl.⁴ G03G 15/00, 21/00; B65H 29/00, 7/02

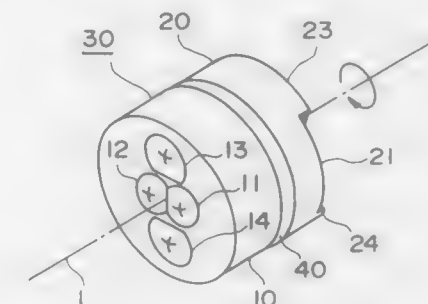
U.S. Cl. 355—207

3 Claims

1. An image forming apparatus for forming images on a single sheet a plural number of times by feeding the sheet again to an image forming unit after an image is formed on one side of the sheet by said image forming unit, said image forming apparatus including:

- an apparatus body in which said image forming unit is incor-

porated, said apparatus body having a feeding unit which stores sheets to be fed into the image forming unit; a sheet reversing unit, assembled with said apparatus body, having a discharge section, which receives sheets with images formed thereon; a primary passage to guide each sheet from said feeding unit to said discharge section through said image forming unit; a secondary passage branching from a downstream end of said primary passage in said sheet reversing unit and extending up to an upstream end of the said primary passage to guide each sheet which has passed said image forming unit again up to said image forming unit, said secondary passage in said sheet reversing unit having a sheet removing area which includes a guide plate capable of being opened to expose the interior of the secondary passage to



the exterior of the sheet reversing unit to permit the removal of the sheet present in the interior; a detecting means disposed in said secondary passage to detect a jammed sheet present in the secondary passage; a re-feed unit disposed within said apparatus body, forming a port of said secondary passage and provided with a drive means for driving each sheet present in the secondary passage forward toward the upstream end of said primary passage and also driving it backward toward the downstream end of the primary passage; and a control means which controls said drive means so that when said detecting means detects a jam in the secondary passage of said re-feed unit, the jammed sheet is moved backward up to said sheet removing area in the said sheet reversing unit.

4,878,088

DEVELOPING UNIT OF ELECTROPHOTOGRAPHIC APPARATUS

Akio Nakanishi, Funabashi; Toshio Hino, Tokyo; Yoshio Iino, Yokohama; Kazuhisa Suetani, Kawasaki; Yoji Houki, Tokyo, and Hirotochi Ikuta, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

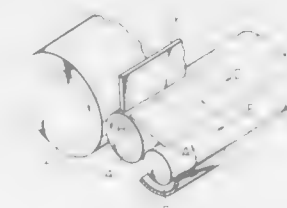
Filed Jul. 1, 1986, Ser. No. 880,920

Claims priority, application Japan, Jul. 2, 1985, 60-145087; Ser. 12, 1985, 60-140011[U]

Int. Cl.⁴ G03G 15/08

U.S. Cl. 355—244

14 Claims



1. A developing unit for developing an electrostatic latent

image formed on an image forming member, by adsorbing electrostatic powder developer, transferred by a developing roller, onto the latent image, comprising:

- a stirring roller having a screw provided with paddles, each having a helix angle with respect to an axis of the screw, said screw transferring said powder developer stored in a developer casing toward said developing roller and to the circumference thereof to supply said powder developer for said developing roller, wherein said screw is provided with approximately eight paddles, each being twisted by approximately 180° over the total length of said screw;
- a blade for regulating a layer thickness of said powder developer which is transferred to said image forming member by said developing roller; and
- a flow regulating plate for biasing a flow of said powder developer, which has been removed by said blade and returned to said developer casing due to the force of gravity, in a direction opposite to a direction in which the powder developer is transferred by said screw.

4,878,090

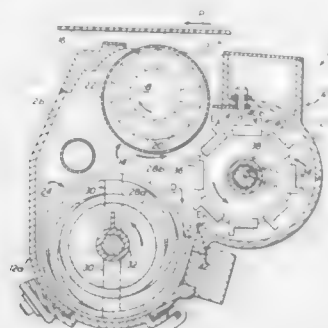
DEVELOPER STATION FOR A REPRODUCTION APPARATUS

Vladimir S. Gaslits, Rochester, and Richard A. Weitzel, Hilton, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 11, 1988, Ser. No. 230,936
Int. Cl.⁴ G03G 15/09

U.S. Cl. 355—253

14 Claims



1. In a magnetic brush developer station for an electrostatic reproduction apparatus, said developer station including a housing having a first portion adapted to contain developer material, a second portion containing a magnetic brush for applying developer material to a charge pattern bearing member, and a third portion containing a mechanism for transporting developer material from said first portion of said housing to said magnetic brush, said transporting mechanism comprising:

- a roller;
- means, located about the periphery of said roller, for picking up a quantity of developer material;
- means for mounting said roller in said third portion of said housing for rotation about the longitudinal axis thereof within a portion of the interior wall of said housing in order to transport developer material from said first portion of said housing to said magnetic brush, said wall portion being a segment of a cylinder whose axis is offset in relation to the longitudinal axis of said roller so that said pickup means, in the direction of rotation of said roller, is closest to said wall at the entrance portion thereto and farthest from said wall at the exit portion thereto whereby compaction of developer material is substantially prevented.

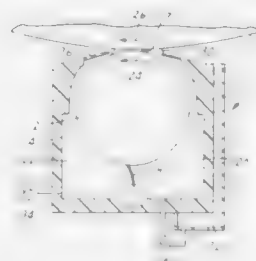
VACUUM REMOVAL OF LIQUID TONER FROM A RECORD MEMBER

George G. Lunde, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 23, 1988, Ser. No. 235,948
Int. Cl.⁴ G03G 15/10

U.S. Cl. 355—256

5 Claims



1. A development apparatus for the application of liquid toner to the surface of an electrographic record bearing member, comprising:

- a development electrode in spaced, operative liquid toner applying proximity to said record bearing member;
- a shroud surrounding said developing electrode and including a blade extending into said space between said development electrode and said record bearing member;
- means for providing a continuous supply of said liquid toner and forcing said liquid toner into said space between said development electrode and said record member;
- means associated with said shroud for removing said liquid toner from said space including a source of vacuum for drawing air around said blade in addition to removing said liquid toner from said space, wherein;
- said blade is positioned with respect to said record member so as to cause said air drawn around said blade to strike said record member and remove excess liquid toner from the surface of said record member.

4,878,091

MULTICOLOR IMAGE FORMING APPARATUS

Shizuo Morita; Kazuaki Hayakawa; Kunio Ito; Shunji Matsuo; Masakazu Fukuchi, and Noboru Hatakeyama, all of Hachioji, Japan, assignors to Konica Corporation, Tokyo, Japan

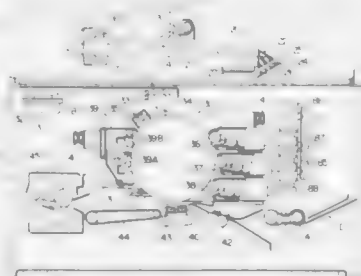
Filed Sep. 15, 1988, Ser. No. 244,935

Claims priority, application Japan, Sep. 17, 1987, 62-234494; Oct. 26, 1987, 62-270553

Int. Cl.⁴ G03G 15/08, 15/01

U.S. Cl. 355—260

13 Claims



1. A multicolor image forming apparatus comprising an apparatus body, a plurality of developing devices for forming a multicolor image, a plurality of resupply devices for replenishing toner particles to each of said developing devices, and a

support member for integrally supporting said plurality of developing devices, wherein said support member integrally supporting said plurality of developing devices is mounted detachably on said apparatus body, and each of said developing devices and each of said resupply devices corresponding to each of said developing devices are automatically connected to and disconnected from each other, when said support member is inserted into and withdrawn from the apparatus body.

4,878,092

METHOD OF CONTROLLING A FIXING UNIT OF AN IMAGE FORMING APPARATUS

Atsushi Arai, Ichikawa, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

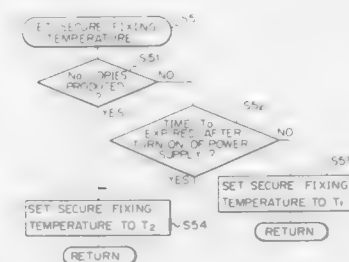
Filed May 27, 1988, Ser. No. 199,870

Claims priority, application Japan, May 29, 1987, 62-83622[U]

Int. Cl.⁴ G03G 15/20

U.S. Cl. 355—285

6 Claims



1. In a method of controlling a fixed unit which is installed in a copier which includes a fixing roller and a pressing roller and in which copier said fixing unit is operated to fix a toner image on a sheet of copy paper when the fixing roller is at a secure fixing temperature defined as a lower limit at temperatures above which the toner image can be satisfactorily fixed, the improvement comprising:

- selectively establishing at least two temperatures as secure fixing temperatures of the fixing unit in dependence on at least one predetermined condition.

4,878,093

DUAL ROLL CLEANING APPARATUS FOR CHARGE RETENTIVE SURFACE

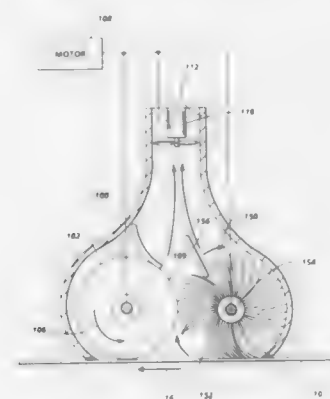
Cyril G. Edmunds, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 3, 1988, Ser. No. 258,264

Int. Cl.⁴ G03G 15/00

U.S. Cl. 355—296

9 Claims



1. Reproduction apparatus including a charge retentive surface; image forming means for forming a latent image on the

charge retentive surface; developing means for developing the latent image with toner; transfer means for transferring the developed toner image from the charge retentive surface to a support surface; and cleaning means for removing residual toner and debris from the charge retentive surface, said cleaning means comprising:

- a cleaning housing;
- a brush cleaning roll journaled for rotating movement within said housing and supported in cleaning relationship with the charge retentive surface;
- an abrading foam cleaning roll journaled for rotating movement within said housing and supported in cleaning relationship with the charge retentive surface;
- said foam cleaning roll arranged downstream from said brush cleaning roll member;
- drive means for moving each of said foam cleaning roll and brush cleaning roll in said rotating movement, whereby movement thereof allows said foam cleaning roll and brush cleaning roll to collect toner and debris from the charge retentive surface;
- means for removing toner from said foam cleaning roll and brush cleaning roll in said rotating movement, for transport to an output.

4,878,094

SELF-POWERED ELECTRONIC COMPONENT AND MANUFACTURING METHOD THEREFOR

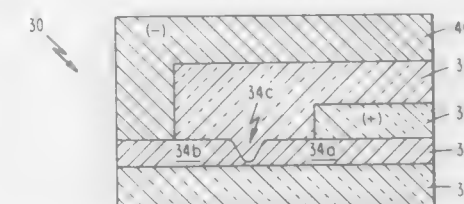
Minko Balkanski, 2 Avenue Camoens, 75016 Paris, France

Filed Mar. 30, 1988, Ser. No. 175,311

Int. Cl.⁴ H01L 39/22

U.S. Cl. 357—5

5 Claims



1. A self-powered semiconductor component, comprising: a semiconductor substrate; layers of semiconductor materials having different electrical conductivities and together forming an electronic component; and a microbattery integrated with said component, said microbattery comprising: (a) a layer of an alkali metal which provides a source of ions and forms the negative electrode of the microbattery; (b) a layer of an intercalation compound capable of inserting ions issued from the alkali metal and forming the positive electrode of the battery; and (c) a layer of an ion-superconducting solid electrolyte glass of high ionic conductivity forming a separator between said alkali metal and intercalation compound layers.

4,878,095

SEMICONDUCTOR DEVICE IN PARTICULAR A HOT ELECTRON TRANSISTOR

Simon J. Bending, and Elmar Böckenhoff, both of Leonberg, Fed. Rep. of Germany, assignors to Wissenschaften e.V., Göttingen, Fed. Rep. of Germany

Filed Nov. 9, 1987, Ser. No. 118,504

Claims priority, application European Pat. Off., Jun. 11, 1987, 87116451

Int. Cl.⁴ H01L 29/80

U.S. Cl. 357—16

31 Claims

31. An epitaxially grown compositional semiconductor de-

first subset of cells sharing a first common source and a first common control gate;
 a second subset of said plurality of EEPROM cells, each of said second subset of cells sharing said first common source and a second common control gate;
 a first erase select transistor having a source coupled to said first common source, a gate coupled to said first common gate, and a drain coupled to an erase conductor; and
 a second erase select transistor having a source coupled to said first common source, a gate coupled to said second common control gate and a drain coupled to said erase conductor.

4,878,102

CHARGE-COUPLED DEVICE

Jacobus G. C. Bakker, and Leonard J. M. Esser, both of Eindhoven, Netherlands, assignors to U.S. Philips Corp., New York, N.Y.

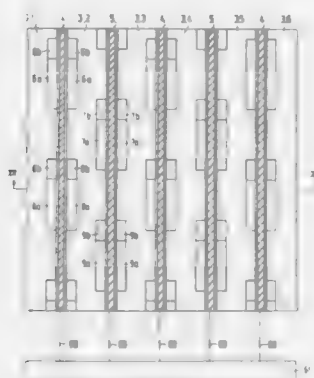
Continuation of Ser. No. 30,945, Mar. 26, 1987, abandoned. This application Nov. 18, 1988, Ser. No. 274,653

Claims priority, application Netherlands, Mar. 27, 1986, 86207166

Int. Cl.⁴ H01L 29/78, 27/14, 29/06

U.S. Cl. 357—24

9 Claims



1. A charge-coupled semiconductor device comprising:

a charge transport channel at a major surface of a semiconductor body and in which discrete charge packets can be transported in successive steps from a first position at one end of the channel to a second position at the other end thereof, such channel having regions therein for storing such discrete charge packets; and

electrodes adjacent such storage regions for transferring charge packets from said first position to said second position in response to alternating control voltages applied to such electrodes;

characterized in that:

said electrodes consist of first and second continuous elongated conductive strips coextensively disposed on opposite sides of the charge transport channel and extending along a plurality of storage regions;

said storage regions in the charge transport channel are progressively situated on opposite sides of such channel between said first position and said second position, and extend transversely into said channel to a depth less than half the thickness thereof, thereby leaving a central region of said channel unobstructed between said first position and said second position; and

the charge transport channel has a thickness and doping concentration such that when said alternating control voltages are applied to said electrodes and electrical field is produced in said transport channel in a direction from said first position to said second position.

4,878,103

CHARGE TRANSFER MEMORY AND FABRICATION METHOD THEREOF

Yvon Cazaux, Grenoble; Didier Hernalt, Seyssinet; Yves Themoz, Grenoble, and Pierre Blanchard, Echiroles, all of France, assignors to Thomson-CSF, Paris, France

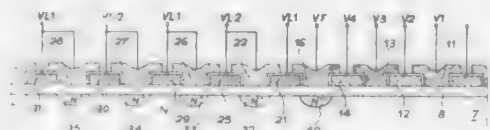
Filed Jan. 17, 1989, Ser. No. 297,651

Claims priority, application France, Jan. 19, 1988, 88 00542

Int. Cl.⁴ H01L 29/78; G11C 19/28

U.S. Cl. 357—24

2 Claims



1. A charge transfer memory comprising a succession of charge transfer shift registers said to have "four phases and two levels of electrodes" and a register for the reading of the charges of the shift registers, said to have "two phases and three levels of electrodes", said shift registers and said reading register being made on a semiconductor substrate, with a first type of doping, supporting a semiconductor layer with a second type of doping, said layer being itself covered with an insulating layer, each shift register further comprising, parallel to a first axis, successive groups of electrodes, each group comprising four electrodes for the transfer and storage of charges, in contact with the insulating layer, to make the charges flow in a pre-determined direction, through transfer potentials and potential wells appearing under these electrodes, in relation with the four phases of cyclical voltages with identical values, respectively applied to the electrodes of each group, the charges being thus conveyed to an end of the shift register which ends in a final transfer electrode, carried to a pre-determined potential, said reading register comprising, along a second axis, for each shift register, and in order to make the charges flow always in one and the same direction along the second axis, at least one pair of reading electrodes, said pair being in contact with the insulating layer and comprising a reading storage electrode, contiguous to the final electrode of the shift register considered, and a reading transfer electrode contiguous to the reading storage electrode corresponding to the shift register considered, said reading transfer electrode being also contiguous to a reading storage electrode corresponding to a final electrode of a shift register adjacent to the considered register in said succession of shift registers, semiconductor zones with a third type of doping being made so as to respectively face the transfer electrodes of the reading register, the charges flowing in this register by means of potential wells and transfer potentials appearing beneath the successive pairs of electrodes, each pair of reading electrodes corresponding to a shift register, being supplied with a cyclical voltage having equal values but in phase opposition with a cyclical voltage supplying the pair of reading electrodes of the adjacent shift register in said succession, wherein each shift register further has a zone with a fourth type of doping made in the layer with the second type of doping, facing the final electrode.

4,878,104

OPTICALLY PUMPED QUANTUM COUPLED DEVICES

Mark A. Reed, Dallas, and Gary A. Frazier, Garland, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 19, 1985, Ser. No. 725,030

Int. Cl.⁴ H01L 27/14, 45/00, 29/205, 29/78

U.S. Cl. 357—30

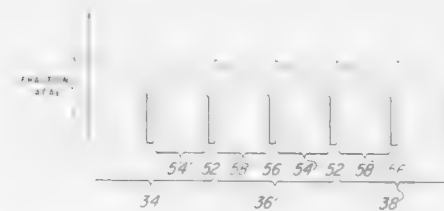
16 Claims

1. An electronic charge transfer device, comprising:

(a) a semiconductor substrate, said substrate having an energy band edge in a first direction in said substrate charac-

terized by a series of substantial variations, said variations creating unidirectional electric field-free drift or tunneling; and

(b) a source of light, said source directed at said substrate



and having photon energies comparable to or greater than the energies associated with said variations, whereby absorption of photons from said source pumps carriers in said energy band through the potentials associated with said variations in said first direction.

4,878,105

SEMICONDUCTOR DEVICE HAVING WIRING LAYER COMPOSED OF SILICON FILM AND ALUMINUM FILM WITH IMPROVED CONTACT STRUCTURE THEREOF

Noboru Hirakawa, and Yasukazu Inoue, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

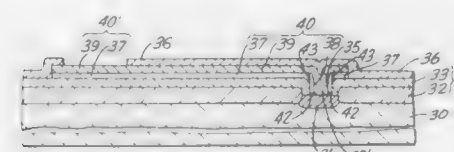
Filed May 20, 1988, Ser. No. 196,389

Claims priority, application Japan, May 21, 1987, 62-125221

Int. Cl.⁴ H01L 29/34, 29/04, 23/48

U.S. Cl. 357—59

8 Claims



1. A semiconductor device, comprising a monocrystalline silicon substrate having a major surface and an impurity region, an insulating layer formed on said major surface of said substrate and having an upper surface, said insulating layer being provided with a contact hole such that said contact hole is formed by an enclosing side wall made of said insulating layer and that said contact hole exposes part of said impurity region of said substrate, a thin insulating film having a ring plan shape and formed on a peripheral portion of said part of said impurity region within said contact hole, said thin insulating film having an upper surface, and a wiring layer formed on said insulating layer and electrically connected to said part of said impurity region, said wiring layer including a first polycrystalline silicon film having a first section having a first width and a second section having a second width greater than said first width and being formed continually with said first section of said first polycrystalline silicon film, a second polycrystalline silicon film doped with impurity atoms and having a ring plan shape and formed on said side wall made of said insulating layer and on said thin insulating film within said contact hole, and an aluminum film having first, second and third sections, said first section of said aluminum film having a width equal to said first width and being formed just on and in contact with said first section of said first polycrystalline silicon film, said second section of said aluminum film having a width equal to said second width and being formed continually with said first section of said aluminum film and being formed just on and in contact with said second section of said first polycrystalline silicon film to form a bonding pad with said second section of said first polycrystalline silicon film, and said third section of said aluminum film being formed continually with said first

section of said aluminum film and being formed on said second polycrystalline silicon film and directly in contact with a center portion of said part of said impurity region enclosed by said peripheral portion within said contact hole.

4,878,106

SEMICONDUCTOR CIRCUIT PACKAGES FOR USE IN HIGH POWER APPLICATIONS AND METHOD OF MAKING THE SAME

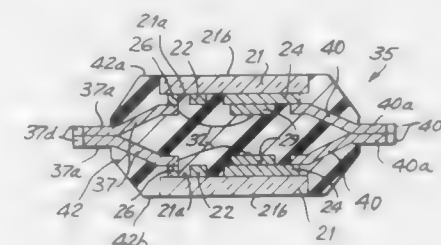
Klaus Sachs, Osterode/Harz, Fed. Rep. of Germany, assignor to Anton Piller GmbH & Co. KG, Osterode/Harz, Fed. Rep. of Germany

Continuation of Ser. No. 936,797, Dec. 2, 1986, abandoned. This application May 6, 1988, Ser. No. 191,841

Int. Cl.⁴ H01L 23/30, 23/18, 23/34

U.S. Cl. 357—72

11 Claims



1. A semiconductor circuit package for use in high power applications; said package comprising:

(a) first and second substrate plates each having (i) a first flat face, (ii) a second flat face parallel to said first flat face, and (iii) an outwardly directed peripheral edge face, said substrate plates being arranged in spaced, substantially parallel relation to each other with said first flat faces thereof directed toward each other and with said second flat faces thereof directed away from each other, at least one of said substrate plates on said first flat face thereof having affixed thereto a respective plurality of discrete planar conductor layers, and at least one of said substrate plates at said first flat face thereof carrying semiconductor circuit means electrically connected to one or more of said planar conductor layers;

(b) leads extending laterally of said substrate plates, each lead having (i) an outward end region adapted to be electrically connected to exterior circuit components, and (ii) an inward end region affixed to a respective one of said planar conductor layers; and

(c) a transfer molded body of thermosetting semiconductor grade molding compound filling the space between said substrate plates and encapsulating said first flat faces of said substrate plates, said conductor layers, said semiconductor circuit means and said inward end regions of said leads, said outward end regions of said leads and said second flat faces of said first and second substrate plates being free of molding compound;

(d) said package by virtue of its construction being resistant to thermally induced bending of said substrate plates both during and at all times subsequent to the molding of said body of molding compound;

(e) whereby said second flat face of each of said first and second substrate plates remains substantially flat and substantially parallel to said second flat face of the other of said first and second substrate plates, and the package is adapted for full-surface contact of each substrate plate at said second flat face thereof with a respective heat sink.

an electronic type endoscope means including, an elongated insertable portion, light guide means for transferring an illumination light which has been supplied to an incident end thereof and for emitting said light from a light-emitting end thereof disposed at a forward end of said insertable portion, an objective lens system disposed at the forward end of said insertable portion for forming an image of an object, and a solid state image element for photoelectrically converting the image formed by said objective lens system;

a field sequential type light source including, a lamp for emitting light with a wavelength in a visible range,

a rotary color filter having a rotary frame on which a plurality of openings and a plurality of light shielding portions are provided in a circumferential direction, said plurality of light shielding portions including one light shielding portion which is longer in length than remaining light shielding portions, and a plurality of color transmitting filters which transmit a light with different wavelengths, said plurality of color transmitting filters being respectively mounted on said openings, and

rotating means for driving said rotary color filter, said field sequential type light source to supply to said incident end of said light guide means illumination light which has passed through said color transmitting filters sequentially positioned in an optical path of a light by a drive of said rotating means;

a signal processing means including,

a driver circuit for applying to said solid state imaging element a drive signal used to read out signals therefrom, and

video signal processing means for processing signals which have been read out from said solid state imaging element by application of said drive signal to generate a predetermined video signal; and

a color monitor for displaying said predetermined video signal which has been output from said video signal processing means.

4,878,113

ENDOSCOPE APPARATUS

Kazunari Nakamura, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

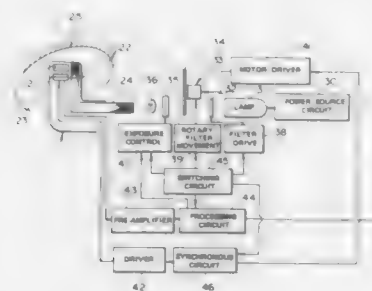
Filed Aug. 10, 1988, Ser. No. 230,540

Claims priority, application Japan, Aug. 11, 1987, 62-200294; Feb. 8, 1988, 63-026839

Int. Cl.⁴ A61B 1/04, 1/06

U.S. Cl. 358—98

28 Claims



1. An endoscope apparatus comprising:
An endoscope body having an elongate insertable part having an observing window in the tip part and an image forming optical system forming an object image by receiving a light returning from the object and entering through said observing window;
an imaging means imaging the object image formed by said image forming optical system;
a first wavelength range separating means separating the object image into images in a plurality of wavelength

ranges in response to a simultaneous type color imaging system;

a second wavelength range separating means separating the object image into images in a plurality of wavelength ranges of a combination different from said first wavelength range separating means, all pixels of said imaging means corresponding to this second wavelength range separating means being included in all pixels of said imaging means corresponding to said first wavelength range separating means;

a signal processing means processing signals for said imaging means in response to the respective wavelength ranges separated by said first wavelength range separating means or said second wavelength range separating means; and

a switching means switching said first wavelength range separating means and said second wavelength range separating means.

4,878,114

METHOD AND APPARATUS FOR ASSESSING SURFACE ROUGHNESS

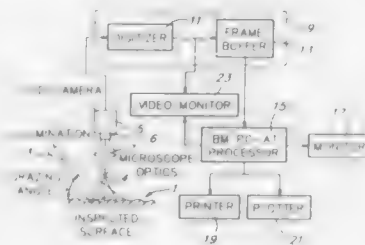
Van-Minh Huyah, and Francis M. Luk, both of Windsor, Canada, assignors to University of Windsor, Windsor, Canada

Filed May 10, 1988, Ser. No. 192,699

Int. Cl.⁴ H04N 7/00, 7/18

U.S. Cl. 358—106

11 Claims



1. A processor based optical system for assessing the roughness of a planar surface of a manufactured product; said system comprising:
a source of illumination adjustable to illuminate an area of said planar surface;
a video camera, having an input lens and an output means, said camera being mountable above said area such that said input lens is trained on said area to provide an analog output representative of surface characteristics of said area;
frame grabber means, having an input means connected to said output means of said video camera, said frame grabber means digitizing said analog output to provide digital signals corresponding to said analog output;
processor means for performing an analysis of said digital signals and providing a parameter indicative of said roughness;
and further including a video monitor having a first input terminal and a second input terminal;
said first input terminal of said video monitor being connected to an output of said frame grabber means;
said second input terminal being connected to an output of said processor means.

4,878,115

DYNAMIC CORONARY ROADMAPPING

Jonathan L. Elton, Lexington, Ky., assignor to University of Kentucky Research Foundation, Lexington, Ky.

Filed Sep. 25, 1987, Ser. No. 101,074

Int. Cl.⁴ H04N 5/32

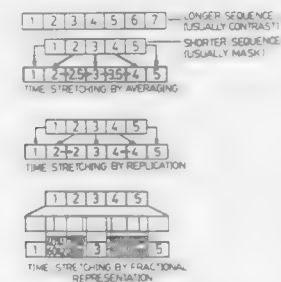
U.S. Cl. 358—111

13 Claims

1. Method for producing a dynamic coronary artery system roadmap of a patient comprising the steps of:

recording and storing a dynamic visual image of a beating heart for a cardiac cycle so as to create a mask sequence; injecting a visual contrast medium into the coronary artery system of the patient;

recording and storing a corresponding dynamic visual image



of the beating heart for another cardiac cycle after injecting the contrast medium so as to create a contrast sequence; and subtracting the corresponding contrast sequence from the mask sequence in order to produce the roadmap sequence of the coronary artery system.

4,878,116

VECTOR LOCK-IN IMAGING SYSTEM

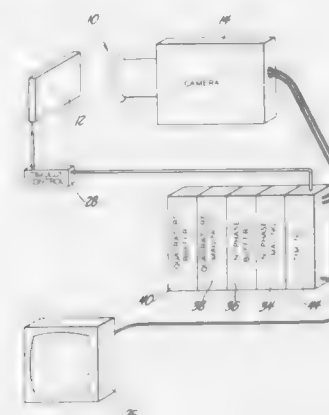
Robert L. Thomas, Huntington Woods; Pao-Kuang Kuo, Troy, and Lawrence D. Favro, Huntington Woods, all of Mich., assignors to Wayne State University, Detroit, Mich.

Filed Jun. 2, 1988, Ser. No. 202,185

Int. Cl.⁴ H04N 5/14, 5/30

U.S. Cl. 358—160

27 Claims



1. An imaging assembly for producing images synchronous with the periodicity of an object field (12), said assembly (10) comprising; reference means for producing a reference signal representing the periodicity of an object field (12), camera means (14) for detecting radiation from the object field (12) producing a video signal of the image comprising a series of pixels representing a frame of the image of the object field (12) and for producing a timing signal for each of said pixels of said frame, processor means (16) for receiving said frame of said video signal and storing said frame in synchronism with said reference signal and for averaging said stored frame with subsequently received frames having said pixels synchronous with said reference signal producing an image signal, and display means (26) for receiving said image signal and displaying the averaged image.

4,878,117

VIDEO SIGNAL MIXING UNIT FOR SIMULTANEOUSLY DISPLAYING VIDEO SIGNALS HAVING DIFFERENT PICTURE ASPECT RATIOS AND RESOLUTIONS

Kimimasa Ikehira, Hadano, Japan; Ming-Chi Wu, Taipei, and Chih-Yuan Lin, Chu-Pei Hsinchu, both of Taiwan, assignors to Ricoh Company, Ltd., Tokyo, Japan and Industrial Technology Research Institute, Taiwan, Taiwan

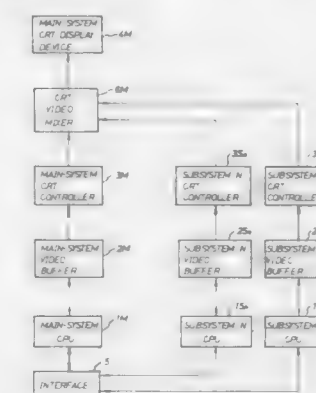
Filed Feb. 12, 1988, Ser. No. 155,511

Claims priority, application Japan, Feb. 14, 1987, 62-32226

Int. Cl.⁴ H04N 5/275

U.S. Cl. 358—183

8 Claims



1. A video signal mixing unit for simultaneously displaying a first video signal and a second video signal transmitted from a first video information source and a second video information source respectively on a single CRT display device, said first video information source having a first aspect ratio and a first resolution and being controlled by a first pixel clock and a first synchronizing signal, said CRT display device being controlled by said first pixel clock and said first synchronizing signal, said second video information source having a second aspect ratio and a second resolution different from said first resolution and being controlled by a second pixel clock and a second synchronizing signal, said video signal mixing unit comprising:
video buffer means connected to said second video information source for storing said second video signal;
third video pixel clock generating means connected to said first and second video information sources for generating, on the basis of said first and second aspect ratios, said first and second resolutions and a horizontal display time of one scanning line of said CRT display device, a third pixel clock with which said second video information source can be displayed on said CRT display device with said second aspect ratio; and
video signal selecting means connected to said first video information source, and connected to said video buffer means and said third pixel clock generating means for selectively outputting said first video signal sent from said first video information source at a rate of said first pixel clock and said second video signal transferred from said video buffer means at a rate of said third pixel clock.

4,878,119

SYSTEM FOR SYNCHRONIZING INTEGRATION PULSES WITH INTEGRATION SIGNAL IN AN ASYNCHRONOUS RASTER INPUT SCANNER

Thomas R. Belkitch, Webster; James C. Traino, Fairport, and Leon C. Williams, Penfield, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Feb. 29, 1988, Ser. No. 161,886

Int. Cl.⁴ H04N 1/04

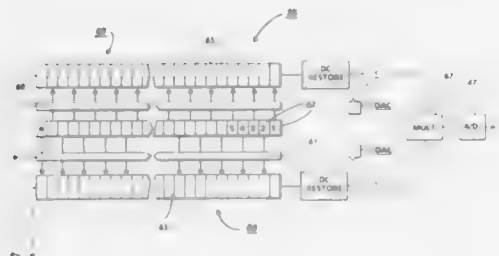
U.S. Cl. 358—471

5 Claims

1. A process for operating a scanning array asynchronously,

said array having at least one row of sensors for scanning an image viewed by the array during an integration period, and at least one shift register for receiving the image signal charges developed by the sensors following the integration period, comprising the steps of:

- generating start integration signals in response to a demand for a line of image signals;
- continuously generating at a constant clock rate integration shift pulses defining a succession of predetermined



integration intervals in synchronism with said start integration signals;

- where timing of a new start integration signal changes so that said start integration signals and said shift pulses are out of synchronism with one another, prematurely interrupting the current one of said predetermined integration intervals to start a new one of said predetermined integration intervals; and
- resetting said shift pulses so that said shift pulses are in synchronization with said new start integration signal.

4,878,120

SOLID STATE IMAGE SENSOR INCLUDING STATIC INDUCTION TRANSISTOR WITH GATE SURROUNDING SOURCE AND/OR DRAIN

Kazuya Matsumoto, and Tsutomu Nakamura, both of Ima, Japan, assignors to Olympus Optical Co., Ltd., Japan

Filed Mar. 25, 1985, Ser. No. 715,641

Claims priority, application Japan, Mar. 29, 1984, 59-525

The portion of the term of this patent subsequent to May 13, 2003, has been disclaimed.

Int. Cl.⁴ H04N 3/15; H01L 27/14

U.S. Cl. 358—213.12

20 Claims

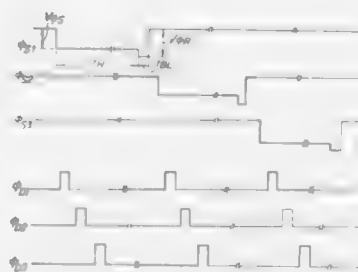
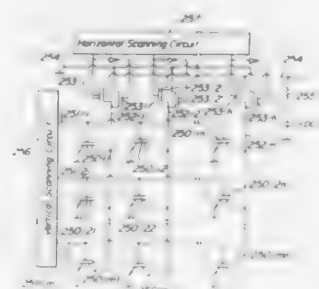
1. A solid state image pick-up element including a static induction transistor comprising:

- a substrate made of a semiconductor material having a high resistivity, or an insulating material;
- a semiconductor layer formed on said substrate;
- a source region and a drain region formed in a surface of said semiconductor layer; and
- gate means, formed in said surface of said semiconductor layer and completely surrounding at least one of said source region and said drain region, for storing photocarriers generated by light excitation, and for controlling a source-drain current flowing in parallel with the surface of said semiconductor layer according to an amount of said stored photocarriers.

12. A solid state image sensor comprising:

- a solid state image pick-up element including:
- at least one static induction transistor comprising a substrate made of a semiconductor material having a high resistivity, or an insulating material, a semiconductor layer

formed on said substrate, a source region and a drain region formed in a surface of said semiconductor layer, and gate means, formed in the surface of said semiconductor layer and completely surrounding at least one of said source region and said drain region, for storing photocarriers generated by light excitation, and for controlling a



source-drain current flowing in parallel with the surface of said semiconductor layer according to an amount of said stored photocarriers; means for reverse biasing said source region and drain region during a light signal storing period; and means for reading out a light signal stored in said solid state image pick-up element during a signal reading out period.

4,878,121

IMAGE SENSOR ARRAY FOR STILL CAMERA IMAGING WITH MULTIPLEXER FOR SEPARATING INTERLACED FILM

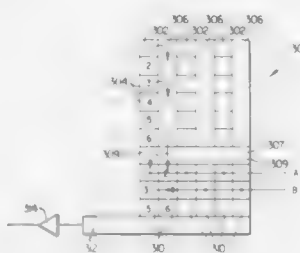
Jaroslav Hyneczek, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 9, 1987, Ser. No. 71,447

Int. Cl.⁴ H04N 5/335

U.S. Cl. 358—213.22

26 Claims



1. An imager formed at a face of a semiconductor substrate for recording a still image and for translating the still image into a selected television format, comprising: a frame transfer image array having a plurality of image cells, said image cells accumulating charge in response to

input light and arranged in a plurality of rows and columns, odd numbered ones of said rows constituting a first field and even numbered ones of said rows constituting a second field;

- a memory array having a first plurality of memory cells including first cells arranged in first memory columns for storing first field signals contained in said first field and second cells arranged in second memory columns for storing second field signals contained in said second field;
- a multiplexer coupled between the image array and the memory array for enabling transfer of groups of n charges in said first field signals to said first memory cells and like groups of n charges in said second field signals to said second memory cells; wherein n is greater than 2 and
- a readout circuit for reading out said first and said second field signals from said first and second memory cells.

4,878,122

LIGHT MODULATOR VIDEO DISPLAY APPARATUS

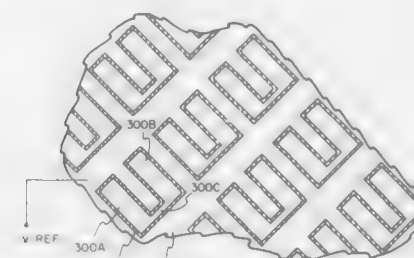
William E. Glenn, Ft. Lauderdale, Fla., assignor to New York Institute of Technology, Old Westbury, N.Y.

Filed Sep. 4, 1987, Ser. No. 94,382

Int. Cl.⁴ H04N 5/74

U.S. Cl. 358—233

40 Claims



1. In a video display apparatus for generating images represented by input video signals, said apparatus including: an array of semiconductor devices having respective electrodes to which charge is applied in accordance with the input video signals; a layer of deformable material disposed over said electrodes; a conductive/reflective layer disposed over said deformable layer; and optical means for converting deformations of the conductive/reflective layer into an image; the improvement comprising:

each of said electrodes of said array having a plurality of spaced conductive regions having respective surfaces of relatively large area in a common plane, the plurality of conductive regions of each of said electrodes being electrically connected in common by at least one conductor having, at most, a relatively small area in said plane; reference conductive regions having surfaces in said plane between the surfaces of said electrodes and separated therefrom, at least some of said reference conductive regions being electrically connected in common; and means for applying said input video signals to said electrodes of said array, and for applying at least one reference potential to said reference conductive regions.

4,878,123

IMAGE PROCESSING APPARATUS HAVING IMAGE MEMORY

Shigeo Miura; Masatomo Takahashi; Motoaki Yoshino; Tsunehiro Watanabe, all of Tokyo; Takeshi Toyama, Hiratsuka, and Taketo Takahashi, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

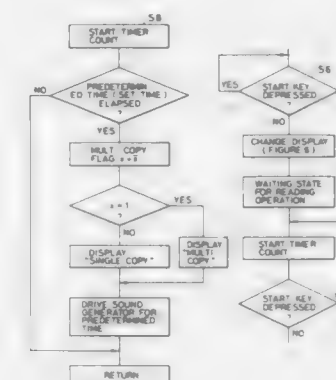
Continuation of Ser. No. 80,074, Jul. 31, 1987, abandoned. This application Dec. 27, 1988, Ser. No. 291,397

Claims priority, application Japan, Aug. 4, 1986, 61-119543[U]; Dec. 27, 1986, 61-312667

Int. Cl.⁴ H04N 1/00, 1/04

U.S. Cl. 358—401

28 Claims



1. An image processing apparatus comprising: processing means for processing image data; an image memory to store said image data; one manual switch; detecting means for detecting a time of depression of said manual switch; and selecting means for selecting whether all of the image data is stored into the image memory or not in accordance with the result of the detection of said detecting means.

4,878,124

IMAGE INCLINATION DETECTING METHOD AND APPARATUS

Shuichi Tsujimoto, and Haruo Asada, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 2, 1988, Ser. No. 227,119

Claims priority, application Japan, Sep. 25, 1987, 62-241414

Int. Cl.⁴ H04N 1/40

U.S. Cl. 358—443

20 Claims



9. An image inclination detecting apparatus for detecting an inclination of the image according to run length codes converted from image data, comprising: read control means for sequentially reading the run length codes for one scanning line from an image data storage means, and converting the run length codes into edge coordinates, the edge coordinate of each run representing a distance from a start point of the scanning line to a trailing edge of the run;

a first storage portion for storing the edge coordinates from said read control means;
 a second storage portion for storing the edge coordinates from said first storage portion;
 selecting means for reading the edge coordinates from said first and second storage portions in parallel, and selecting the edge coordinates of runs meeting the predetermined conditions;
 edge distance computing means for computing, according to the edge coordinates of the runs selected by said selecting means, distances between the leading edges or between the trailing edges of runs having predetermined positional relations and located on two adjacent scanning lines respectively;
 a storage portion for storing computed results from said edge distance computing means; and
 an inclination computing portion for computing the inclination of the image with respect to a scanning direction of a reading device according to occurrence frequencies of the computed edge distances.

4,878,125

METHOD AND APPARATUS FOR IMAGE PROCESSING WITH FEED-BACK ERROR CORRECTION

Akihiro Katayama, Kawasaki; Hidefumi Ohsawa, Urawa; Izuru Sunohara, Ichikawa; Hiroshi Hosokawa, and Masahiko Yoshimoto, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

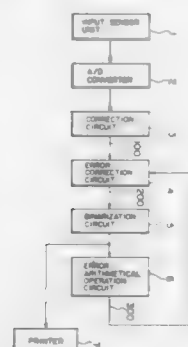
Filed Dec. 31, 1987, Ser. No. 140,029

Claims priority, application Japan, Jan. 8, 1987, 62-002670; May 21, 1987, 62-122612

Int. Cl.⁴ H04A 1/40

U.S. Cl. 358-443

18 Claims



1. An image processing apparatus comprising:
 digitizing means for digitizing image data of an objective pixel;
 process means for weighting, in order to correct error data generated in digitizing of the image data by said digitizing means, the error data and adding the weighted error data to image data of plural peripheral pixels in a periphery of the objective pixel; and
 detection means for detecting an edge direction of at least one of the peripheral pixels from the objective pixel;
 wherein said process means changes a ratio of weight of the error data for each peripheral pixel emphasize an edge, in accordance with the detected edge direction.

4,878,126

IMAGE PROCESSING APPARATUS

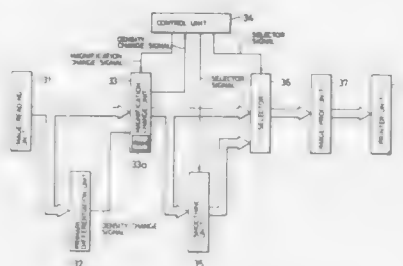
Hiroyuki Ichikawa, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 256,253, Oct. 6, 1988, abandoned, which is a continuation of Ser. No. 15,926, Feb. 18, 1987, abandoned. This application Apr. 14, 1989, Ser. No. 338,425
 Claims priority, application Japan, Feb. 19, 1986, 61-032926; Feb. 19, 1986, 64-32928

Int. Cl.⁴ H04N 1/393

U.S. Cl. 358-451

19 Claims



1. An image processing apparatus comprising:
 image data input means for inputting image data; and
 magnification changing process means for performing, on the basis of a designated magnification, a magnification changing process for the image data input by said image data input means;
 wherein said magnification changing process means has a first output mode and a second output mode, and wherein, in said first output mode, said process means performs in a first mode the magnification changing process of the input image data on the basis of the designated magnification to output first magnification-changed image data, and in said second output mode said process means performs in a second mode the magnification changing process for the input image data on the basis of the designated magnification to output second magnification-changed image data, and
 wherein said process means is capable outputting the first and second magnification-changed image data which are different from each other with respect to the same input image data and the same designated magnification.

4,878,127

LASER ENGRAVING MACHINE FOR PREPARING ROTARY SCREEN PRINTING SCREENS

Peter M. Zollman; Brendon T. Pollard, and Andrew D. Birch, all of Surrey, England, assignors to Zed Instruments Ltd., Her-
 sham, England

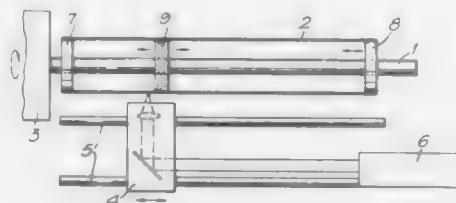
Filed Nov. 25, 1988, Ser. No. 275,997

Claims priority, application United Kingdom, Nov. 25, 1987, 8727613

Int. Cl.⁴ B23K 9/00; B05C 17/00; B41C 1/14

U.S. Cl. 358-299

10 Claims



1. A laser engraving machine for engraving rotary printing screens, said laser engraving machine including:
 a shaft having a first and second end and a longitudinal axis;

a rotary drive, said rotary drive being connected to said first end of said shaft for, in use, rotating said shaft around its longitudinal axis;
 two end ring assemblies, said end ring assemblies being mounted on said shaft and at least one of said end ring assemblies being movable along said shaft, said end ring assemblies being arranged to locate and fix opposite ends of said rotary printing screen to said shaft,
 a laser engraving device including a head movable backwards and forwards parallel to said longitudinal axis of said shaft, said laser engraving device, in use, engraving said rotary printing screen mounted on said shaft; and
 a support, said support being movable along said screen with said laser engraving head to provide local support for said screen whereby a part of said screen being engraved by said laser engraving device is supported at a constant predetermined position with respect to said head of said laser engraving device.

4,878,128

VIDEO SIGNAL REPRODUCING APPARATUS

Hiroto Yasumura; Masahide Hirasawa; Minoru Noji, all of Kanagawa; Susumu Kozuki, Tokyo; Koji Takahashi, Kanagawa; Katsuji Yoshimura, Kanagawa, and Tomohiko Sasatani, Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

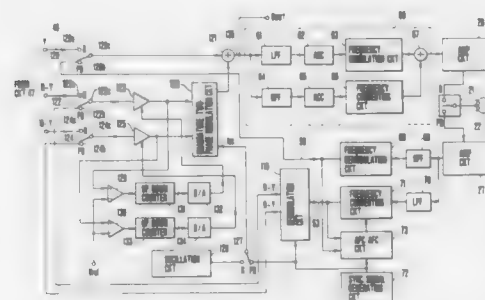
Filed May 5, 1987, Ser. No. 46,250

Claims priority, application Japan, May 12, 1986, 61-107985; May 26, 1986, 61-120883; Jun. 18, 1986, 61-141813; Jun. 18, 1986, 61-141814; Jun. 18, 1986, 61-141815; Jun. 26, 1986, 61-150207; Apr. 13, 1987, 62-91458; Apr. 13, 1987, 62-91459

Int. Cl.⁴ H04N 9/87

U.S. Cl. 358-315

5 Claims



1. A color video signal reproducing apparatus for producing a color video signal, comprising:
 (a) image sensing means arranged to pick up an image of an object and to generate, according to information on the image of said object, a first color video signal which includes a first base band color information signal;
 (b) reproducing means for reproducing a second color video signal from a record bearing medium;
 (c) color information signal forming means for forming a second base band color information signal from said second color video signal reproduced by said reproducing means;
 (d) white balance control means for controlling the white balance of said first or second base band color information signal; and
 (e) supply means for selectively supplying said first or second base band color information signal to said white balance control means.

4,878,129

METHOD FOR REPRODUCTION OF STORED VIDEO SIGNALS WITH DISK REPRODUCING APPARATUS

Shigeru Yasuda; Kenichiro Yasukawa; Tsutomu Nakamura, and Kenjiro Asami, all of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

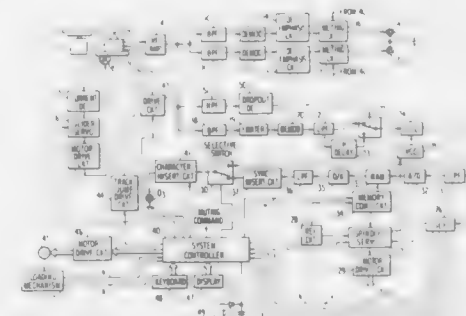
Filed Aug. 27, 1987, Ser. No. 89,795

Claims priority, application Japan, Aug. 27, 1986, 61-202316; Aug. 29, 1986, 61-203241; Aug. 29, 1986, 61-203242; Aug. 29, 1986, 61-203244

Int. Cl.⁴ H04N 5/76

U.S. Cl. 358-342

13 Claims



1. A method of setting in a pause mode a disk reproducing apparatus having a pickup apparatus for reading a disk and a mechanism for automatically loading a recording disk in the reading position, said method comprising the following steps:
 detecting a pause command;
 detecting the state of said automatic loading mechanism in response to a pause command;
 if it is found that said automatic loading mechanism is not in such a state that said recording disk is loaded in the reading position, operating said automatic loading mechanism in order to load said recording disk in said reading position, and searching for a predetermined position at which information is recorded on said disc;
 if it is found in said state detecting step that said automatic loading mechanism is in such a state that said recording disk is loaded in the reading position or following the step of operating said automatic loading mechanism to place said recording disk in the reading position, said searching step being performed only when the reproduction of information from said recording disk is suspended; and
 setting the operation of the disk reproducing apparatus in a pause mode when said pickup mechanism is proximate said predetermined position on said recording disk.

4,878,130

REPRODUCTION APPARATUS

Katsuchi Shimizu, Kunitachi; Shunichi Masuda, Tokyo; Toshiki Yagasaki, Hino, and Hisashi Sakamaki, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
 Continuation of Ser. No. 243,232, Sep. 7, 1988, abandoned, which is a continuation of Ser. No. 943,069, Dec. 18, 1986, abandoned, which is a division of Ser. No. 653,072, Sep. 21, 1984, Pat. No. 4,638,368, which is a continuation of Ser. No. 278,563, Jun. 29, 1981, abandoned. This application Mar. 6, 1989, Ser. No. 319,818

Claims priority, application Japan, Jun. 30, 1980, 55-88722; Jun. 30, 1980, 55-88723

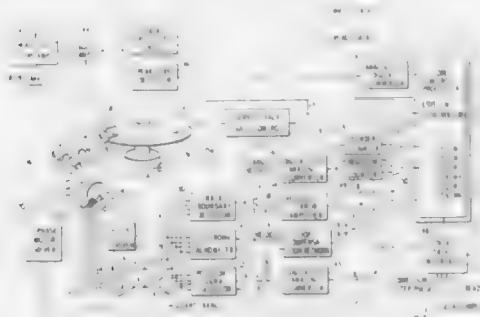
Int. Cl.⁴ H04H 7/00

U.S. Cl. 358-400

13 Claims

1. An image processing system, comprising:
 scanning means for optically scanning an original image at a given speed to produce an image signal;

with said servo information read out by said magnetic head so as to generate first, second and third deviation values, respectively; determining an offset correction value for a target track included in said data tracks in accordance with said first,



second and third deviation values and a quadratic compensation function; and positioning said magnetic head at said target track by use of said coarse positioning signal and said offset correction value.

4,878,136

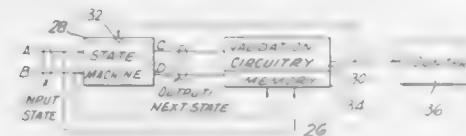
TRACK CROSSING DETECTOR

Raymond E. Sarraf, Westminster, and Daniel R. Zaharris, Longmont, both of Colo., assignors to MiniScribe Corporation, Longmont, Colo.

Filed Sep. 14, 1988, Ser. No. 244,087
Int. Cl.⁴ G11B 5/55, 21/08

U.S. Cl. 360—78.04

13 Claims



11. In a system including a record medium having a plurality of adjacent data tracks and a head movable across said record medium and positionable at a selected one of said tracks, a circuit for detecting a number of tracks crossed by said head during movement across said record medium, said circuit comprising:

- signal generating means connected to said head for generating an input signal having first, second, third and fourth ordered input states for every four tracks crossed;
 - state machine means for outputting an output signal having first, second, third and fourth ordered output states, each said input states being validly associated with a respective one of the output states; and
 - validation means responsive to said input signal and said output signal for detecting a valid track crossing upon valid association of the present output state with the present input state after a change in the input signal, and producing a clocking signal in the presence of said valid association;
- said state machine means being responsive to said clocking signal to update its output state.

4,878,137

DISK FILE DEVICE

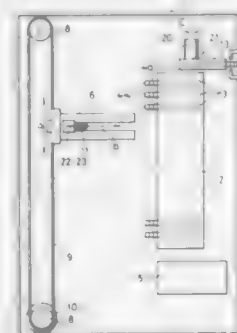
Tohru Yamashita, and Takaharu Takematsu, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 2, 1988, Ser. No. 151,665
Claims priority, application Japan, Feb. 2, 1987, 62-20440; Apr. 3, 1987, 62-81068

Int. Cl.⁴ G11B 17/22

U.S. Cl. 360—98.05

17 Claims



1. A disk file device comprising:
 - a stocker for accommodating a plurality of cartridges each holding a disk;
 - a disk recording and reproducing device for writing data on said disk and reading data therefrom;
 - a carrier for selectively supplying said cartridges from said stocker to said disk recording and reproducing device and for selectively supplying said cartridges from said disk recording and reproducing device to said stocker;
 - a casing containing said stocker, said disk recording and reproducing device and said carrier with said carrier being located between said stocker and a first portion of said casing, said casing having a cartridge supplying and receiving opening which is formed in a portion of said casing other than said first portion; and
 - a cartridge displacing mechanism including a cartridge receiving container for receiving a cartridge through said opening, and means for rotating said container so as to supply said received cartridge to said carrier.

4,878,138

RECORDING MEDIUM LOADING MECHANISM FOR GUIDING A RECORDING MEDIUM TO A RECORDING/REPRODUCING POSITION

Shigeru Ando, and Hidemi Sasaki, both of Minato, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 4, 1987, Ser. No. 128,854

Claims priority, application Japan, Dec. 4, 1986, 61-289823; Dec. 15, 1986, 61-298411

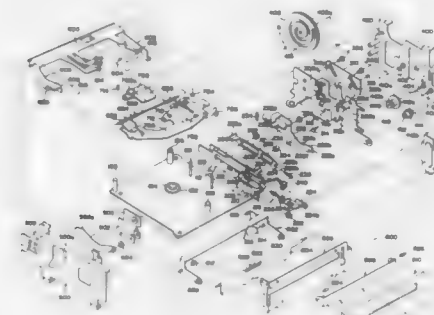
Int. Cl.⁴ G11B 17/03

U.S. Cl. 360—99.02

8 Claims

1. A recording medium loading mechanism for loading a pack containing a recording medium, comprising:
 - a pack holder provided with a substantially U-shaped guide groove for holding one side portion of the pack and adapted to guide the pack containing the recording medium to a recording or reproducing position;
 - a main arm disposed rotatably in a main body of a magnetic recording/reproducing apparatus, said main arm provided with a support portion for supporting the other side portion of the pack, and adapted to guide the pack to said recording or reproducing position;
 - pack holder moving means adapted to initially move said pack holder in the same direction as a first insertion direc-

tion of the pack and subsequently move said pack holder in a second direction which is perpendicular to the first insertion direction when loading the pack; and main arm height control means adapted to prevent said main arm from being rotated during the movement of said pack



holder in the first insertion direction but allow said main arm to be rotated simultaneously with the movement of said pack holder in the second direction so as to maintain the height of said support portion, relative to said pack holder, constant when loading the pack.

4,878,139

LOADING APPARATUS FOR A MAGNETIC DISK CARTRIDGE

Saburo Hasegawa, Hanamaki, and Elji Minal, Sagami-hara, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Division of Ser. No. 733,910, May 14, 1985, Pat. No. 4,760,476.

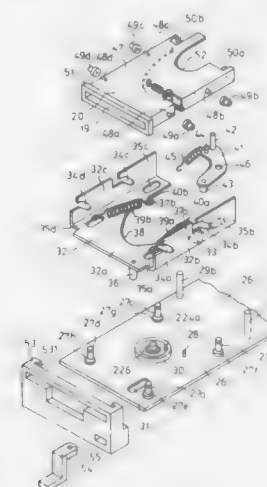
This application May 9, 1988, Ser. No. 191,969

Claims priority, application Japan, May 15, 1984, 59-96877; May 17, 1984, 59-99003; May 31, 1984, 59-111163; Jun. 12, 1984, 59-121164

Int. Cl.⁴ G11B 5/012, 17/028

U.S. Cl. 360—99.02

4 Claims



1. A loading apparatus for a magnetic disk cartridge comprising:
 - a base plate having thereon disk driving means, driven by a motor thereunder, a pair of stop pins, and a first and second end;
 - a slider which is horizontally slidably held on said base plate;
 - a cartridge holder which holds said magnetic disk cartridge therein and is vertically slidably held on said slider, said cartridge holder having a slot to receive said cartridge at a rear end thereof and a pair of guide rollers at a front end

thereof for guiding the vertical sliding of a front end part of the cartridge holder along said stop pins at said first end of said base plate; engaging means for vertically shifting the position of said cartridge holder upon a horizontal sliding of said slider induced by insertion of said cartridge into said cartridge holder; and slider driving means having a trigger lever whose position is to be shifted by insertion of said cartridge and energizing means for driving said slider at the shifting of position of said trigger lever.

4,878,140

MAGNETO-RESISTIVE SENSOR WITH OPPOSING CURRENTS FOR READING PERPENDICULARLY RECORDED MEDIA

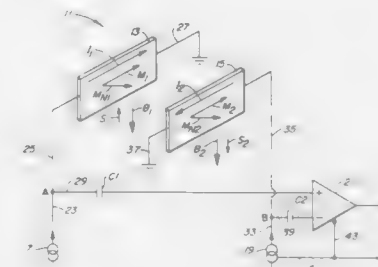
Hardayal S. Gill, Los Altos; Victor W. Hesterman, Los Altos Hills; Gloria J. Tarnopolaky, Palo Alto, and Lang T. Tran, San Jose, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jan. 21, 1988, Ser. No. 209,651

Int. Cl.⁴ G11B 5/39

U.S. Cl. 360—113

10 Claims



1. A device comprising:
 - a first magneto-resistive element having a first magnetization;
 - a second magneto-resistive element having a second magnetization, said second magnetization being parallel to said first magnetization;
 - current means for supplying a first current through said first magneto-resistive element and a second current through said second magneto-resistive element, said first and second currents being parallel and directionally opposed, said first and second magneto-resistive elements being spaced so that said first current produces a first bias field orthogonal to said second magnetization at said second magneto-resistive element and so that said second current produces a second bias field orthogonal to said first magnetization at said first magneto-resistive element, said first and second bias fields being parallel and co-directional; and
 - detector means for detecting differential changes in resistance between said magneto-resistive elements, said detector means being coupled to each of said magneto-resistive elements.

4,878,141

SOLID-PHASE WELDED MAGNETIC HEAD

Masataka Koyama, Yokohama, Japan, assignor to Victor Company of Japan, Ltd., Japan

Division of Ser. No. 802,952, Nov. 27, 1985, abandoned. This application Aug. 5, 1988, Ser. No. 228,679

Claims priority, application Japan, Dec. 1, 1984, 59-252829

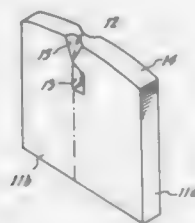
Int. Cl.⁴ G11B 5/235

U.S. Cl. 360—120

4 Claims

1. A magnetic head comprising first and second magnetic core halves held in abutment against each other and a gap-defining spacer interposed therebetween, and having an elongated tape-contact surface extending across said gap-defining

spacer, said gap-defining spacer being formed of a material having substantially the same crystal structure as the material



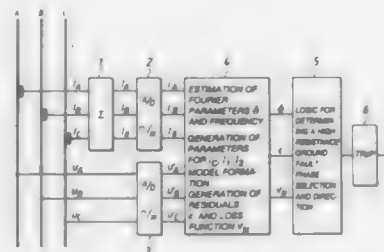
forming said first and second core halves said gap-defining spacer being solid-phase welded to said first and second core halves based on a solid-phase reaction.

4,878,142

HIGH RESISTANCE GROUND FAULT PROTECTION
Sten Bergman, and Stefan Ljung, both of Västerås, Sweden, assignors to ASEA Brown Boveri AB, Västerås, Sweden
Filed Sep. 7, 1988, Ser. No. 241,370
Claims priority, application Sweden, Sep. 16, 1987, 8703580
Int. Cl.⁴ H02H 3/26

U.S. Cl. 361—80

3 Claims



1. Protection device for high resistance ground faults in a three-phase electric power distribution network, comprising:
means for analog/digital conversion of analog signals representative of at least two phase currents and the zero sequence current of the network;
means for analog/digital conversion of analog signals representative of each of the three phase voltages;
means for estimation of the Fourier parameters of the converted phase current and phase voltage signals;
means for estimation of the frequency of the electric power distribution network;
means for the estimation of the Fourier parameters for the remaining phase current and the negative and positive sequence currents of the electric power distribution network;
means for establishing the Fourier model of the electric power distribution network using the estimated Fourier phase currents, phase voltages, frequency and the negative and positive sequence currents;
means for determining the instantaneous residuals of the electric power distribution network as the difference between the digitized values of said at least two phase currents and the Fourier model values;
means for establishing the instantaneous loss function; and
means for generating a trip signal indicating the existence of a high resistance ground fault on any of the phases of the electric power distribution network when the zero sequence current is greater than a lower limit value and simultaneously therewith said loss function has a value greater than a second lower limit value for a time longer than a lower limit time value.

4,878,143

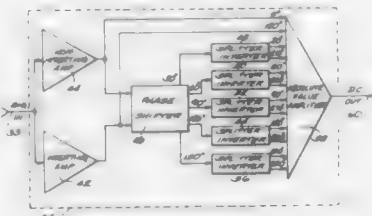
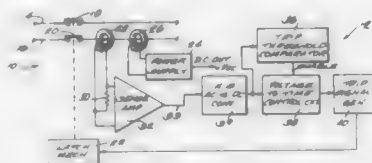
LINE CURRENT TO TIME INTERPOLATOR

Theodore T. Kalal, Wauwatosa, Wis., and Richard Kowitch, Chicago, Ill., assignors to Cooper Power Systems, Inc., Houston, Tex.

Filed Oct. 30, 1987, Ser. No. 115,530
Int. Cl.⁴ H02H 3/093

U.S. Cl. 361—94

18 Claims



1. A high speed converter circuit for developing a DC voltage indicative of the magnitude of an applied AC voltage, said converter circuit comprising:
phase shifter means for developing a plurality of replica AC voltages similar to the applied AC voltage and differing in phase from one another; and
absolute value amplifier means coupled to said phase shifter means for developing an output voltage substantially proportional to the magnitude of the one of said replica AC voltages having greatest magnitude at any instant.

4,878,144

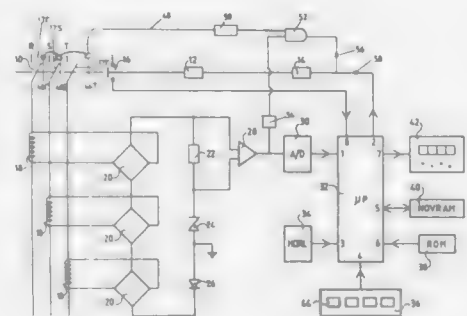
SOLID-STATE TRIP DEVICE OF A MOLDED CASE CIRCUIT BREAKER

Jean-Pierre Nebon, St. Martin-le-Vinoux, France, assignor to Merlin Gerin, France

Filed Sep. 29, 1988, Ser. No. 250,761
Claims priority, application France, Oct. 9, 1987, 87 14084
Int. Cl.⁴ H02H 3/08

U.S. Cl. 361—96

4 Claims



1. A solid-state type device of a molded case electrical circuit breaker having a pair of contacts per pole, said contacts being elastically urged into contact in the closed position of the circuit breaker, and an automatic operating mechanism on a fault, capable of causing the separation of said contacts, comprising:
sensors, which generate fault signals as a function of the currents flowing in the conductors protected by the circuit breaker;
a processing unit to which said fault signals are applied to

generate a circuit breaker tripping order, when preset thresholds are exceeded, said order being time-delayed according to the value of the fault signals; and
an arc detector associated with each pair of contacts to detect the light emitted by the arc drawn when the contacts separate, the arcing signals emitted by said arc detectors being applied to said processing unit to bring about instantaneous tripping at the same time when the fault signals exceed said preset thresholds;
wherein said processing unit comprises an AND circuit to whose inputs the fault signal and the arc signals are respectively applied.

4,878,145

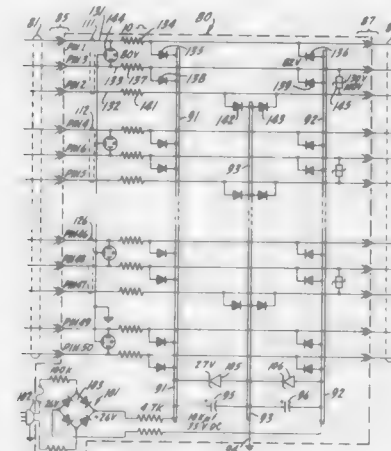
SURGE/TRANSIENT PROTECTOR FOR A PLURALITY OF DATA LINES

Melvin A. Lace, Prospect Heights, Ill., assignor to Omec Corporation, Libertyville, Ill.

Filed Nov. 21, 1988, Ser. No. 273,595
Int. Cl.⁴ H02H 3/22

U.S. Cl. 361—118

20 Claims



1. A surge/transient protector for protecting a plurality of N data lines, grouped together at a given location, on which lines data are transmitted within a given data voltage range, each data line comprising first and second data conductors and a return conductor, the protector comprising:

N data line segments each including first and second data conductor segments and a return conductor segment;
first and second connector means for connecting each of the N data line segments in series in one of the N data lines;
a positive bus, a negative bus, and a reference bus;
grounding means for connecting the reference bus to a plane of common potential;
first unidirectional coupling means coupling each data conductor segment to the positive bus;
second unidirectional coupling means coupling each data conductor segment to the negative bus;
bi-directional return coupling means coupling each return conductor segment to the reference bus;
a first large transient/surge energy storage device, connected between the positive bus and the reference bus, and having a positive threshold potential slightly larger than one-half the data voltage range;
a second large transient/surge energy storage device, connected between the negative bus and the reference bus, and having a negative threshold potential approximately equal to the positive threshold potential; and
N discharge devices, each connected to the plane of reference potential and to the first and second data conductors in one data line segment, the discharge devices having a breakdown potential much higher than the data voltage range.

4,878,146

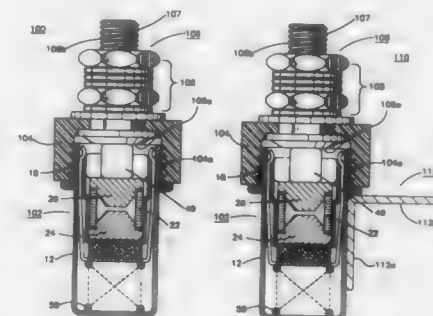
LINE PROTECTOR

Richard Kaczmarek, Chicago, Ill., assignor to Reliance Comm/Tec Corporation, Chicago, Ill.

Filed Apr. 29, 1988, Ser. No. 188,353
Int. Cl.⁴ H02H 1/04

U.S. Cl. 361—119

30 Claims



1. A line protector for a telephone line comprising:
(a) an enclosure, said enclosure comprising:
(i) a conductive housing having a first end and a second end;
(ii) surge arresting means in said housing; and
(iii) a nonconductive cap in assembled relationship with said housing, said cap enclosing said second end; and
(b) terminal post means having a shank extending outwardly from said nonconductive cap and a head in said cap, said surge arresting means communicating between said head and said housing.

4,878,147

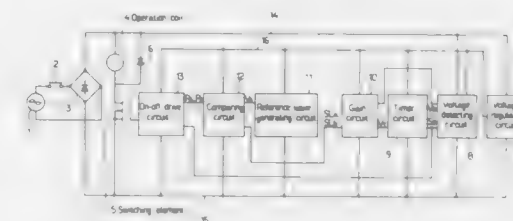
ELECTROMAGNETIC COIL DRIVE DEVICE

Sakan Oyama, Mie, and Koji Omori, Kuwana, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 28, 1988, Ser. No. 212,674
Claims priority, application Japan, Aug. 5, 1987, 62-194443
Int. Cl.⁴ H01H 47/04

U.S. Cl. 361—154

2 Claims



1. An electromagnetic drive device comprising:
(a) a bus connected to a main power supply;
(b) a constant voltage supply producing a constant reference voltage;
(c) a switch connected in series with an operation coil;
(d) a voltage detecting circuit, connected to the bus, detecting a main power supply voltage and supplying a detection voltage in accordance with the main power supply voltage;
(e) a timer producing an output signal after elapse of a time period set in the timer;
(f) a gain circuit producing a first signal which corresponds to a difference between the reference voltage and the detection voltage;
(g) a control circuit controlling the gain circuit such that closing level signal is produced from the gain circuit before elapse of the time period set in the timer and such

- that a holding level signal is produced from the gain circuit after elapse of the time period set in the timer;
- (h) a reference wave generating circuit generating a reference wave;
- (i) a comparing circuit comparing the reference wave with the closing and holding level signals, the comparing circuit generating closing pulse signals having a first predetermined period and holding pulse signals having a second predetermined period; and
- (j) a drive circuit which controls the switch in response to the closing pulse signal and the holding pulse signal.

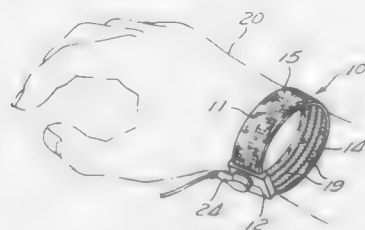
4,878,148

CROCHETED FABRIC ELASTIC WRIST BRACELET BEARING AN INTERIOR CONDUCTIVE YARN
Roland Hee, Manila, Philippines, assignor to JES, LP, Newport Beach, Calif.

Filed Jul. 22, 1987, Ser. No. 76,306
Int. Cl.⁴ H05F 3/02

U.S. Cl. 361—220

13 Claims



1. A strap for establishing electrical contact with a person's body, comprising:
- a length of crocheted material, extendable in its longitudinal direction circumferentially about a person's limb, said length of crocheted material comprising:
 - a fabric body having an upper surface and a lower surface, said fabric body comprising at least one elastic yarn forming a garter oriented in the longitudinal direction to allow the material to stretch, at least two weft yarns, each running generally perpendicular to and disposed on opposite sides of said at least one elastic yarn so as to form the said upper and lower surfaces of said fabric body and at least one warp yarn affixing said weft yarns to said elastic yarn;
 - an electrically conductive yarn hooked to said lower surface of the fabric body by the warp yarn; and
 - an electrical connector making electrical connection to the conductive yarn;
- wherein the electrically conductive yarn is disposed toward the person's limb for making electrical contact therewith; wherein the electrically insulating yarns are disposed away from the person's limb for presenting an electrically insulating surface between the person's limb and the electrically conductive yarn.

4,878,149

DEVICE FOR GENERATING IONS IN GAS STREAMS
Hans-Heinrich Stiehl, and Thomas Sebald, both of Berlin, Fed. Rep. of Germany, assignors to Sorbios Verfahrenstechnische Geräte und GmbH, Berlin, Fed. Rep. of Germany
PCT No. PCT/DE87/00048, § 371 Date Dec. 3, 1987, § 102(e) Date Dec. 3, 1987, PCT Pub. No. WO87/04873, PCT Pub. Date Aug. 13, 1987

PCT Filed Feb. 5, 1987, Ser. No. 138,092

Claims priority, application Fed. Rep. of Germany, Feb. 5, 1987, 3603947

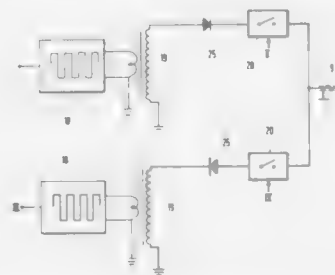
Int. Cl.⁴ H01T 23/00; H05F 3/06

U.S. Cl. 361—230

14 Claims

1. A device for generating ions in a gas stream with an electrode arrangement exposed to the gas stream and a pulsed

high voltage supply, which supplies an alternating sequence of negative and positive pulses with steep edges, characterized in that the electrode arrangement has at least one point discharge electrode and at least one counterelectrode arranged in a fixed



and clearly defined association with one another for the transit of ions therebetween and that the duration of the particular pulse corresponds to the transit time of the ions between the electrodes and the spacing of the pulses is adapted to the speed of the gas stream.

4,878,150

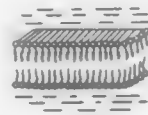
POLARIZABLE MATERIAL HAVING A LIQUID CRYSTAL MICROSTRUCTURE AND ELECTRICAL COMPONENTS PRODUCED THEREFROM
Rhyta S. Rounds, Flemington, N.J., assignor to Colgate-Palmolive Co., Piscataway, N.J.

Filed Feb. 20, 1987, Ser. No. 17,424

Int. Cl.⁴ H01G 4/06, 4/08, 9/00

U.S. Cl. 361—311

56 Claims



47. A capacitor comprising:
- at least one pair of electrodes, and between said electrodes a dielectric material comprising an amphipathic compound principally and a liquid, in the form of a liquid crystal microstructure to provide a high capacitance dielectric material.

4,878,151

ANTI-PARALLEL CAPACITOR
Michael J. Gallichio, New Milford, Conn., assignor to National Semiconductor Corporation, Sunnyvale, Calif.

Filed Apr. 10, 1987, Ser. No. 36,595

Int. Cl.⁴ H01G 4/38

U.S. Cl. 361—329

11 Claims



1. A capacitor having a low voltage coefficient comprising:
- a first capacitor having a first contact, a second contact and a polarity therebetween;
 - a second capacitor having a first contact, a second contact and a like polarity therebetween;

and wherein said first contact of said first capacitor is connected to said second contact of said second capacitor and said second contact of said first capacitor is connected to the first contact of the second capacitor.

4,878,152

MOUNTING FOR PRINTED CIRCUITS FORMING A HEAT SINK WITH CONTROLLED EXPANSION
Jean-Denis Sauzade, Juan Les Pins, and Manuel L'Hote, Venice, both of France, assignors to Thomson-CSF, Paris, France

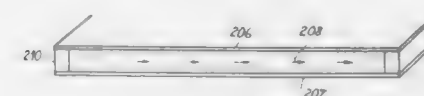
Filed Jun. 13, 1988, Ser. No. 205,960

Claims priority, application France, Jun. 16, 1987, 87 08372

Int. Cl.⁴ H05K 7/20; B32B 3/00

U.S. Cl. 361—386

6 Claims



1. A mounting for printed circuits, said mounting forming a heat sink having low heat expansion characteristics, comprising:

- (i) a central graphite layer made of compressed graphite sheets having a lateral thermal conductivity greater than 200 W/m.²°C. and a density lower than 1.4; said sheets consisting essentially of particles highly oriented in the plane of each sheet; and
- (ii) two outer layers, each made of carbon fibers bound together by a resin matrix, said outer layers displaying a high Young's modulus and sandwiching the central graphite layer.

4,878,153

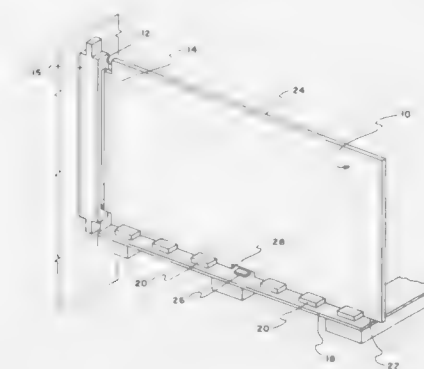
ELECTRONIC SHELF ASSEMBLY
William P. Loris, Bloomingdale, Ill., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed May 23, 1988, Ser. No. 197,373

Int. Cl.⁴ H05K 5/02

U.S. Cl. 361—394

4 Claims



1. An electronic shelf assembly for holding a plurality of electronic modules, comprising:

- first planar means for supporting the modules and having a plurality of means for guiding the modules along a first edge thereof, said means for guiding projecting out of the plane of said first means for supporting;
- means for providing an extension in a predetermined location in at least one of said means for guiding for engaging a recess in at least a first edge of the module, when the module is fully inserted in one of said means for guiding;
- second planar means having a plurality of means for guiding the module along a second edge of the module, opposed to said first edge, said means for guiding projecting out of the

plane of said second means for supporting, said means for guiding of said second means for supporting being longitudinally aligned with respective ones of the means for guiding of said first means for supporting, said second means for supporting having a predetermined convex contour perpendicular to said means for guiding and means for providing an extension projecting out of the plane of said second means for supporting in a predetermined location in at least one of said means for guiding for engaging a recess in said second edge of the module, when the modules are fully inserted in one of said means for guiding; and

rigid means extending between said first and second means for supporting for interconnecting said first and second means for supporting.

4,878,154

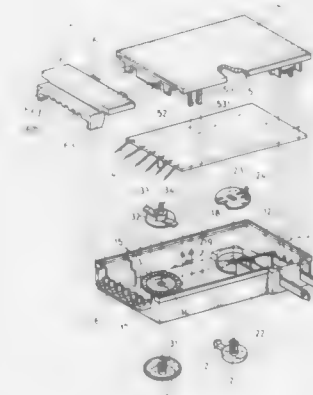
CONTROL BODY FOR CHRISTMAS TREE
Kwang N. Wang, 2F, No. 1 Lane 76, An-Ho Rd., Taipei, Taiwan

Filed Dec. 22, 1988, Ser. No. 288,679

Int. Cl.⁴ H05K 1/14

U.S. Cl. 361—395

1 Claim



1. A control body for a Christmas tree comprising:
- a circuit board having a rheostat;
 - a housing receiving therein said circuit board and including:
 - a plug seat mounting thereon two conducting pieces;
 - three engaging sets each of which includes two opposite higher triangular pieces and a lower triangular piece;
 - a base plate extended from one end of said housing and forming thereon a plurality of electric wire guiding grooves each of which is provided with three spaced radially arcuate platelets; and an annulus formed on an inner wall of said housing and regularly forming thereon a knurled surface;
 - a cover plate having three pairs of barbed legs each pair of which is capable of firmly engaging with said higher and lower triangular piece of said each set;
 - an end cover connected to said cover plate, and having a covering portion capable of being securely fixed to said base plate and providing thereunder a plurality of guiding grooves respectively corresponding to said electric wire guiding grooves;
 - a switch disk engaging with said housing for adjusting a contacting relationship between said circuit board and said conducting pieces; a coupling piece received in said housing, connected to said rheostat and including two opposite engaging pieces capable of steppedly and diametrically engaging on said knurled surface; and a rotating disk positioned outside of said housing and capable of firmly engaging with said coupling piece.

4,878,155

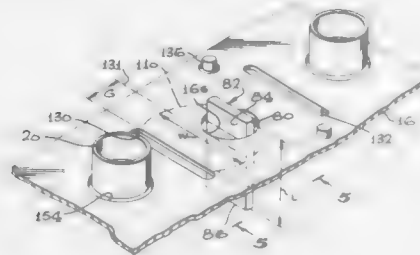
HIGH SPEED DISCRETE WIRE PIN PANEL ASSEMBLY WITH EMBEDDED CAPACITORS

Larry R. Conley, 11146 Blue Allium, Fountain Valley, Calif. 92709

Continuation-in-part of Ser. No. 100,937, Sep. 25, 1987, abandoned. This application Sep. 30, 1988, Ser. No. 252,260 Int. Cl.⁴ H05K 1/18

U.S. Cl. 361-401

12 Claims



1. A high speed logic panel comprising: a board member of insulative material having upper and lower faces; voltage and ground conductive layers, each lying on and covering a majority of one of said board member faces and forming conductive planes on corresponding board faces; said board member and conductive planes having a multiplicity of aligned capacitor-receiving through holes; a multiplicity of elongated leadless decoupling capacitors each having an elongated body with a middle and opposite ends and whose outside is insulative at said middle and which has electrically conductive layers at said ends forming capacitor terminals, each capacitor having a capacitance between said terminals, each capacitor lying in one of said holes with said terminals lying respectively adjacent to said voltage and ground conductive layers; a quantity of solder extending between each capacitor terminal and an adjacent portion of a corresponding one of said conductive planes; each capacitor includes two groups of interfitting conductive films extending in cross planes perpendicular to said conductive planes and merging with said terminals, and each quantity of solder forms a conductive path extending between a capacitor terminal and a conductive plane lying primarily in a corresponding one of said conductive planes.

4,878,156

QUICK RELEASE FOCUSING HANDLE FOR SURGICAL LIGHTS

Leonard L. Hallings, Rochester, and Richard W. Steiner, Newark, both of N.Y., assignors to MDT Corporation, Rochester, N.Y.

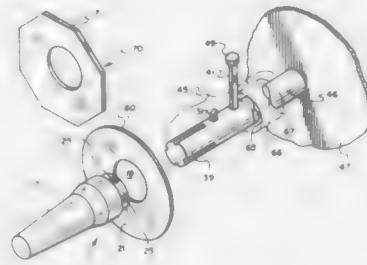
Filed Mar. 6, 1989, Ser. No. 319,048 Int. Cl.⁴ F21V 33/00

U.S. Cl. 362-109

14 Claims

1. In a surgical light of the type in which a light source is contained within a housing in cooperable association with a focusing mechanism which includes a rotatable focusing shaft, said shaft extending from said housing, thereby to provide an exposed shaft portion with a distal shaft end, said exposed shaft portion constituting means for operating said focusing mechanism by selective alternative clockwise or counterclockwise rotation, the improvement which comprises: a drive post segment, including said distal end, in operable association with a handle element with an external contact surface configured for grasping by a hand and a substantially hollow interior cavity with an entry at a first end of said handle element, said entry and cavity being configured to re-

ceive and contain, respectively, said drive post segment, said handle element including: first coupling structure adapted to connect to second coupling structure associated with said drive post segment, one of said first or second coupling structure including finger actuatable release structure constituting means for disconnecting said first and second coupling structures to thereby disconnect said handle element from said drive post segment;



- an internal drive surface configured to engage a corresponding reaction surface of said drive post segment, said drive and reaction surfaces cooperatively constituting means for transferring rotational movement of said handle element to said drive post segment; and a shield element circumscribing said entry between said contact surface and said release structure constituting means for isolating said release structure from a hand grasping said contact surface.

4,878,157

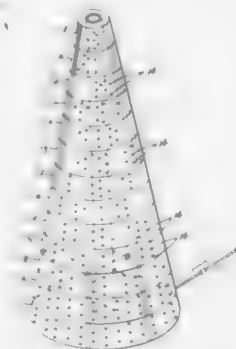
FIBER OPTIC CHRISTMAS TREE

Paul H. Koch, c/o Menhume Helicopters, 3222 Kuibo Hwy., Lihue, Hi. 96766

Filed Nov. 21, 1988, Ser. No. 274,345 Int. Cl.⁴ F21P 1/02

U.S. Cl. 362-123

4 Claims



1. A fiber optic Christmas tree comprising, a conical Christmas tree including a plurality of conical segments, each segment formed with an axially aligned cylindrical central chamber, and a plurality of light conducting conduits radially directed from said central chamber to an exterior surface of each segment, and a light source positionable axially of said Christmas tree when said segments are stacked upon one another, and a plurality of fiber optic members selectively positionable within said conduits to visually direct light from said light source through said fiber optic members, and wherein the fiber optic members are formed in a variety of colors, and

wherein a cap socket is positionable on an uppermost segment of the Christmas tree when the segments are stacked upon one another, wherein the cap socket includes an electrical socket for electrical association of the light source with a base segment wherein said base segment is positionable at the lowermost terminal end of the segments when stacked, and wherein a transparent cylindrical diffuser tube is positionable through the axial chamber of each of the plurality of segments to effect diffusion of the light source and provide stability to the stack of segments, and wherein each conical segment is defined by a parallel upper and lower surface, and wherein each upper surface includes at least one arcuate tab directed upwardly and orthogonally relative to the upper surface, and each lower surface contains a cylindrical groove to slidably receive a tab from a lowermost segment.

4,878,158

SUN VISOR ASSEMBLY FOR MOTOR VEHICLES, WITH AN ILLUMINATED REAR-VIEW MIRROR

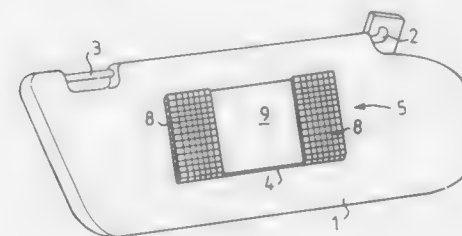
E. Gunnar Svensson, Malung, Sweden, assignor to Autopart Sweden AB, Malung, Sweden

Filed Oct. 18, 1988, Ser. No. 259,148

Claims priority, application Sweden, Oct. 28, 1987, 8704199 Int. Cl.⁴ F21V 33/00

U.S. Cl. 362-140

5 Claims



1. A sun visor assembly for a vehicle comprising an elongated visor body and a mirror and lighting assembly attached to the visor body, said mirror comprising a mirror plate the back side of which is glued directly onto the visor body, said lighting assembly comprising a lamp-holder with electrical contact means, said lighting assembly being glued directly onto the front surface of the mirror plate so as to hold an associated lamp in front of the front surface of the mirror plate, thereby making the mirror plate serve as a reflector for the lamp.

4,878,159

FLUORESCENT LAMP HAVING REMOVABLE JACKET

Ronald G. Blaisdell, Saugus, and Harold L. Hough, Beverly, both of Mass., assignors to GTE Products Corporation, Danvers, Mass.

Filed Oct. 11, 1988, Ser. No. 255,306

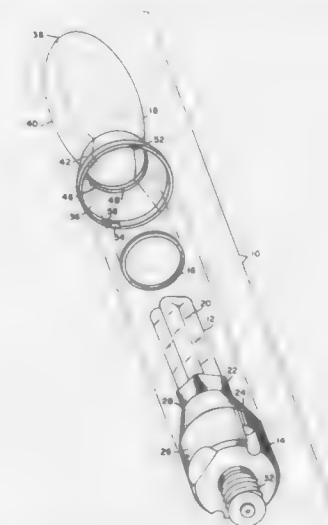
Int. Cl.⁴ F21S 3/00

U.S. Cl. 362-222

8 Claims

1. A fluorescent lamp unit comprising: a fluorescent lamp; an adapter including a housing having an upper surface, a pair of lugs protruding from said housing, and a ballast contained within said housing electrically connected to said fluorescent lamp; a compressible gasket member located on said upper surface of said adapter; and a detachable jacket member enclosing said fluorescent lamp and having an inner surface, said jacket member having a ledge protruding inwardly from said inner surface and extending radially around said jacket member; said ledge having a bearing surface for contacting said compressible

gasket member, said jacket member further including a pair of diametrically opposed grooves formed in the inner



surface of said jacket member and positioned to engage with said pair of lugs on said housing of said adapter.

4,878,160

OUTDOOR LIGHTPOLE

George W. Reneau, 6130 E. Orange St., Indianapolis, Ind. 46203, and George M. Reneau, 7845 Cullen Dr., Indianapolis, Ind. 46219

Filed Mar. 11, 1988, Ser. No. 167,095

Int. Cl.⁴ F21V 21/26

U.S. Cl. 362-269

12 Claims



1. A servicepole assembly, for mounting a servicepole on a mounting foundation pad, comprising: a fixed support means, with first holding means which hold the fixed support means to the pad and supported thereby; a secondary support means; hinge means rotatably connecting the fixed support means and the secondary support means; a servicepole; connection means for fixedly connecting the servicepole to the secondary support means; second holding means for releasably holding the servicepole and the secondary support means to the fixed support means, and in a specific relative orientation, but releasable for accommodating relative rotation of the fixed support

means and the secondary support means, to thereby permit downward swinging of the servicepole's upper end to facilitate service in a region adjacent the ground, to whatever are components carried relatively adjacent the upper end of the servicepole, in which the second holding means includes a plurality of upstanding connector members for fixed connection to the fixed support means, and the secondary support means is provided with openings through which the connector members respectively extend, and the said openings of the secondary support means are provided to be of elongated nature with reference to the size of the connector members in a direction perpendicular to the direction of the axis of the hinge means, thereby accommodating the rotation of the servicepole for its said servicing, and in which the elongation of the openings of the secondary support means is such that the openings extend fully to open at the outer edge of the secondary support means.

4,878,161

PROJECTOR-TYPE HEAD LAMP ASSEMBLY FOR VEHICLES

Yutaka Nakata, Isehara, Japan, assignor to Ichikoh Industries, Ltd., Tokyo, Japan

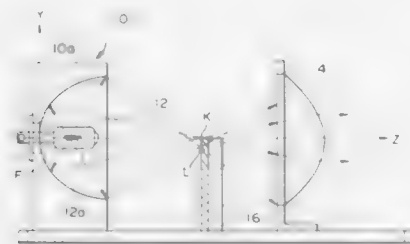
Filed Mar. 20, 1989, Ser. No. 326,076

Claims priority, application Japan, Mar. 22, 1988, 63-65638; Mar. 15, 1989, 1-60790

Int. Cl.⁴ F21V 7/00

U.S. Cl. 362-305

8 Claims



1. A projector-type head lamp assembly for use with vehicles, comprising a reflector having an inner reflection surface disposed about an optical axis, a lamp bulb having at least one axial coil filament disposed on the axis of the reflector, a convex lens disposed in front of the reflector, and a shade disposed between the reflector and convex lens and which has provided near the focus of the convex lens an optically effective edge which provides a light-dark boundary by blocking a part of the light rays projected from the lamp bulb and reflected by the inner reflection surface, wherein

- said coil axis is arranged parallelly to said optical axis of said reflector and said reflection surface is composed of a plurality of reflection surface areas of different reflection properties;
- said reflection surface area includes a first reflection area extended horizontally from the optical axis including the apex of said inner reflection surface, a second reflection surface area having at least two surface areas adjoining said first surface area at the top and bottom, respectively, of said first surface area and which are extended horizontally, and a third reflection surface area having at least two reflection areas adjoining said second reflection surface areas, respectively;
- said first to the third surface areas are formed from numerous fine surface elements contiguous smoothly to each other, said fine surface elements belonging to each of said surface areas being so oriented in different orientations, respectively, as predetermined that the incident light rays from said lamp bulb are converged to different points in the vicinity of the edge of said shade; and
- the orientations of said fine surface elements belonging to said first surface area are so determined that the incident

light rays from said lamp bulb are converged near the center of the top end of the edge of said shade, the orientations of said fine surface elements belonging to said second surface areas being so determined that the incident light rays from said lamp bulb are converged to a horizontal zone including up to a position spaced horizontally a predetermined distance from the center of the top end of the edge of said shade, and the orientations of said fine surface elements belonging to said third surface areas being so determined, correspondingly to the orientations of said fine surface elements belonging to said first reflection surface area, that the incident light rays from said lamp bulb are converged into a vertical zone including up to a position extended downward from near the center of the top end of the edge of said shade.

4,878,162

NIGHT LIGHT LAMP-SHADE

Arthur S. Wu, No. 11, Alley 8, Shiway Lane, Chung Chang Rd., Shin Ten City, Taipei Shien, Taiwan

Filed Jan. 12, 1989, Ser. No. 295,991

Int. Cl.⁴ F21V 1/06

U.S. Cl. 362-352

1 Claim



1. A night light lamp-shade comprising a main body having a pair of plugs extended and connecting with a light thereon and a lamp-shade, characterized in that the lamp-shade consists of a base, a front plate and two side plates, wherein the base is trapezoidal and provided with channels at three sides while a fourth (long) side is formed with a semi-circular aperture and mounted with three symmetrical contact members; the three plates are engaged with the channels of the base and connected with each other in use of the tabs mounted on the side plates and snap holes formed on the front plate.

4,878,163

PULSE WIDTH MODULATED INVERTER WITH HIGH-TO-LOW FREQUENCY OUTPUT CONVERTER

Ikuro Yamato, Norikazu Tokunaga, Yasuo Matsuda, and Hisao Amano, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 3, 1988, Ser. No. 201,755

Claims priority, application Japan, Jun. 5, 1987, 62-139800; Jun. 5, 1987, 62-139801

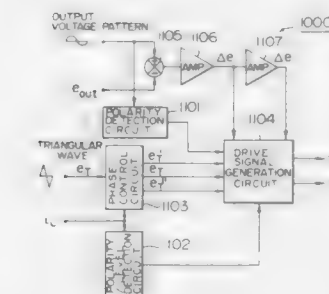
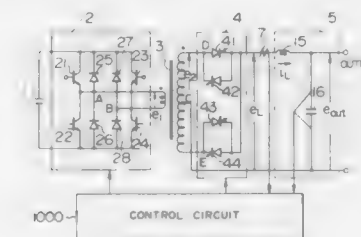
Int. Cl.⁴ H02M 5/27

U.S. Cl. 363-8

6 Claims

- A power conversion system comprising:
 - a DC power supply for supplying a predetermined DC voltage;
 - an inverter including a plurality of switching elements connected in bridge connection and a plurality of diodes connected in parallel to the switching elements for converting the DC voltage of said DC power supply into a predetermined high-frequency AC voltage;
 - a transformer including a primary winding supplied with the

- high-frequency AC voltage generated in said inverter and a secondary winding for generating a predetermined high-frequency high voltage;
- a frequency changing circuit connected to the secondary winding of said transformer and including a plurality of switching elements coupled in reverse parallel for converting the high-frequency high voltage generated in the secondary winding of said transformer into a predetermined low-frequency high voltage;
- a filter including a reactor and a capacitor for converting the low-frequency high voltage of said frequency changing circuit into a predetermined sinusoidal wave voltage;



- a detector for at least detecting the current flowing in the filter;
- first means for enabling a starting time of a short-circuiting prevention period of said inverter;
- second means for enabling a commutation period of said frequency changing circuit; and
- a control circuit means for generating a control signal and applying said control signal to said first and second means, said first and second means being responsive to said control signal for at least causing said commutation period of said frequency changing circuit to overlap said short-circuiting prevention period of said inverter.

4,878,164

POWER SUPPLY GRADUALLY DEVELOPING AN OUTPUT VOLTAGE WHEN SWITCHED ON

Alessandro Colombo, Monza, Italy, assignor to SGS-Thomson Microelectronics s.r.l., Catania, Italy

Filed Jan. 31, 1989, Ser. No. 304,796

Claims priority, application Italy, Feb. 4, 1988, 83605/88

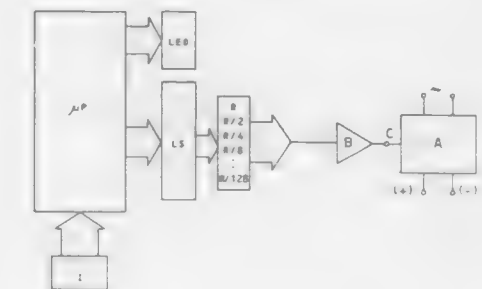
Int. Cl.⁴ H02M 7/517, 7/5375

U.S. Cl. 363-49

1 Claim

- A power supply wherein the output voltage thereof is set by applying a control voltage to a control terminal of said power supply and capable of gradually developing said output voltage, on switching-on of the power supply, from zero to a preset value, characterized by comprising
 - a microprocessing having a plurality of input and output logic gates;
 - at least a low-to-high type level shifter circuit driven by said microprocessor through at least one of said output logic gates thereof and having output terminals connected to a network of load resistors of scaled values: the highest

value resistor being connected to the most significant bit output terminal and the lowest value resistor being connected to the less significant bit output terminal of said level shifter circuit, an analog voltage signal corresponding to a digital value presented by said microprocessor at said logic gate thereof being produced across two output terminals of said network of load resistors;



- an analog buffer driven by said analog voltage signal and having an output terminal connected to said control terminal of said power supply;
- selection means, connected to an input logic gate of said microprocessor, capable of determining a certain ramp for the rising of the output voltage delivered by said power supply from zero to a preset value on switching-on of the power supply.

4,878,165

CONTROL SYSTEM WITH IMPROVED ROBUSTNESS TO DISTURBANCES

Makoto Gotou, Nishinomiya, and Shigeaki Matsubayashi, Sakai, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

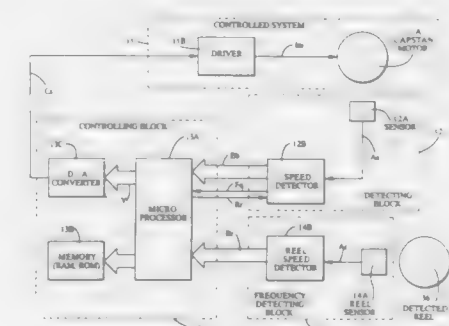
Filed Mar. 27, 1987, Ser. No. 30,610

Claims priority, application Japan, Mar. 31, 1986, 61-73504; Mar. 31, 1986, 61-73575; Apr. 25, 1986, 61-97166

Int. Cl.⁴ G05B 13/02; G11B 15/32

U.S. Cl. 364-158

24 Claims



- A control system comprising:
 - a first detecting means for detecting a controlled variable of a controlled system periodically at intervals of a detection period and for producing at each detection timing a first detected signal indicative of each detected controlled variable;
 - a second detecting means for detecting a period of a periodic fluctuation of a disturbance source disturbing the controlled system and for producing a second detected signal proportional to the period of the periodic fluctuation;
 - an error value producing means for producing from the first detected signal an error value indicative of an error of the controlled variable;
 - a memory have stored therein a plurality of stored values;

a renewing means for mixing the error value with a composite value which is produced from at least one of the plurality of stored values for obtaining a renewing value and for renewing each of the plurality of stored values sequentially and periodically by the renewing value at intervals of a renewing period proportional to the detection period of said first detecting means;

a composing means for producing the composite value at each renewing timing of said renewing means from at least one of the plurality of stored values which have been previously renewed by at least L renewing periods, wherein L is an integer which is at least equal to 2;

an output means for mixing the error value with the composite value at a predetermined mixing ratio to obtain a control signal and for supplying the controlled system with the control signal to control the controlled variable; and

a changing means responsive to the second detected signal for controlling the composing means so as to change the value of L in proportion to the second detected signal thereby reducing an influence of the fluctuation of the disturbance source on the controlled variable.

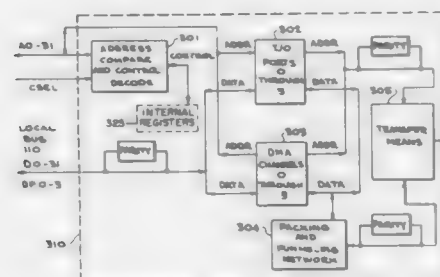
4,878,166

DIRECT MEMORY ACCESS APPARATUS AND METHODS FOR TRANSFERRING DATA BETWEEN BUSES HAVING DIFFERENT PERFORMANCE CHARACTERISTICS

William M. Johnson, San Jose; Timothy A. Olson, Sunnyvale; Drew J. Dutton, Santa Monica; Sherman Lee, Palos Verdes Estates; and David W. Stoesser, El Toro, all of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.
Filed Dec. 15, 1987, Ser. No. 133,094
Int. Cl.⁴ G06F 13/12

U.S. Cl. 364-200

44 Claims



1. Direct memory access means having a plurality of operating states each indicated by a status signal for transferring data to and from a first bus to which a first set of devices, including at least one central processing unit ("CPU"), is attached, and a second bus to which a second set of devices, having performance characteristics differing from said first set of devices, is attached, wherein the transferring of data to and from said first and second buses facilitates communication between said first and second set of devices without adversely affecting the performance of said first set of devices and said second set of devices, comprising:

- access means, operating independent of CPU intervention, coupled to said first bus and to said second bus, including at least one direct memory access channel means for determining data transfer addresses, wherein said direct memory access channel means has said plurality of operating states each of which is indicated by a status signal, and further wherein said access means is utilized for channelling direct memory access transfers from said first bus to said second bus and from said second bus to said first bus;
- means for interconnecting said first bus to said access means;
- means for interconnecting said second bus to said access means; and
- a set of internal registers included within said access

means, coupled to and receiving inputs from said first bus, wherein said set of internal registers are accessed by said direct memory access channel means for determining said data transfer addresses, where the contents of the set of internal registers are used for controlling and maintaining a given direct memory access channel operating state and the status indication associated therewith.

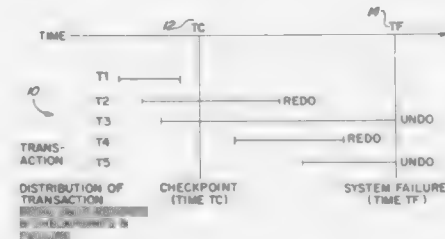
4,878,167

METHOD FOR MANAGING REUSE OF HARD LOG SPACE BY MAPPING LOG DATA DURING STATE CHANGES AND DISCARDING THE LOG DATA

Kenneth M. Kapalka, San Jose; Holly A. Rader, Morgan Hill, and Jimmy P. Strickland, Saratoga, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Jun. 30, 1986, Ser. No. 880,387
Int. Cl.⁴ G06F 15/00, 11/30

U.S. Cl. 364-200

5 Claims



4. A method, implemented on a digital computer system, for managing the reuse of space on a hard log stored on memory means in said computer system in support of forward resource recovery (FIG. 4) in a transaction-oriented system in which concurrently executing, failure-independent processes share a common hard log and one or more resources, and further wherein each transaction utilizes begin, commit, abort, redo/undo operations to bound the transaction, and in which redos ensure transaction return to the most recent commit point and undos ensure return to the transaction begin point, comprising the steps of:

- initiating the recording of log data on said memory means with a log manager in said computer system in a partitioned fashion by a unit of recovery (UR) using a begin marker on a transaction recovery stream (TRS) resident on the hard log (FIG. 8);
- using said log manager to classify and then to write and then writing to the TRS log data into subsets according to the COMMIT, ABORT, REDO, UNDO function of their role in recovery (FIGS. 6, 8, 12);
- upon a UR state change responsive to a commit operation, used said log manager to perform a one-to-n mapping of all log data in the REDO subset of the UR partition from the TRS into predeterminedly associated resource recovery streams (RRSs), and upon a UR state change responsive to an abort operation, to perform a one-to-n mapping of log data in the UNDO subset of the UR partition from the TRS into predeterminedly associated RRSs (FIGS. 9, 15, 16 for commit and FIGS. 10, 13, 14 for abort); and
- at the termination (END) of the UR state changes utilizing the RRSs, using said log manager to discard all log data identified on the hard log as belonging to the given UR partition from the TRS rendering space occupied by said discarded log data on said hard log amenable to reuse (FIGS. 11, 17-24).

BIDIRECTIONAL SERIAL TEST BUS DEVICE ADAPTED FOR CONTROL PROCESSING UNIT USING PARALLEL INFORMATION TRANSFER BUS

William M. Johnson, Leander, and Charles G. Wright, Round Rock, both of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

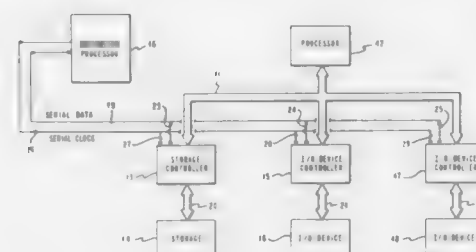
Continuation of Ser. No. 595,159, Mar. 30, 1984, abandoned.

This application Oct. 29, 1986, Ser. No. 924,118

Int. Cl.⁴ G06F 11/30, 13/40; G11C 19/00

U.S. Cl. 364-200

19 Claims



1. In a data processing system comprising a central processor providing information, a main storage unit, a storage controller connecting said processor to said storage unit by a parallel bus between said processor and controller and between said controller and main storage unit, for parallel transfer of addresses and data information, means for testing said controller and storage unit comprising:

a bidirectional serial line connected to said storage controller,

test support means connected to said bidirectional serial line for providing test address and data information to and receiving test address and data information from said bidirectional serial line and

means in said storage controller for converting said test address and data information from said bidirectional serial line for a parallel transfer to said main storage unit wherein said test address is provided to access the storage unit and individual storage locations within the main storage unit through the storage controller and the test data is provided to and received from the main storage unit and the storage controller for testing said main storage unit and said storage controller by said test support means.

4,878,169

REGION OF INTEREST TOMOGRAPHY EMPLOYING A DIFFERENTIAL SCANNING TECHNIQUE

Paul D. Toner, and Terence Taylor, Both of Deep River, Canada, assignors to Atomic Energy of Canada Limited-Energie Atomique Du Canada Limitee, Ottawa, Canada

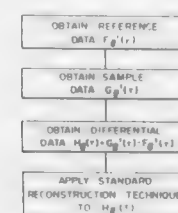
Filed Jun. 29, 1988, Ser. No. 213,131

Claims priority, application Canada, Sep. 11, 1987, 546640

Int. Cl.⁴ G06F 15/42; G05B 6/03; G01R 23/04

U.S. Cl. 364-413.19

12 Claims



1. A method of generating a computed tomographic image of a region of interest of a sample comprising obtaining reference data only for the region-of-interest of a complete reference object that is a relatively good match to the sample out-

side the region-of-interest and has a known attenuation distribution inside the region-of-interest, scanning only the region-of-interest of the sample to obtain sample data, subtracting the reference data for the region of interest from the sample data to obtain differential data, and reconstructing from the differential data a differential image of the region of interest.

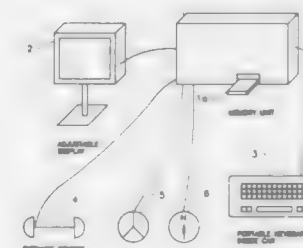
4,878,170

VEHICLE NAVIGATION SYSTEM

Elihu I. Zevi, 475 Camulus Ave., 16, Sunnyvale, Calif. 94087
Continuation-in-part of Ser. No. 27,292, Mar. 17, 1987, abandoned. This application Mar. 17, 1988, Ser. No. 169,645
Int. Cl.⁴ G06F 15/50

U.S. Cl. 364-449

36 Claims



1. A vehicle navigation system comprising:
means for storing map data representing a road network, said data comprising information about landmarks, said information comprising landmark identifiers, landmark location and landmark characteristics of said landmarks in said road network, map distances between said landmarks, and path characteristics between adjacent landmarks;
means for receiving start location data indicating vehicle start location;
means for receiving destination data indicating a desired destination;
means coupled to said map data storing means for establishing a route comprising sequence data, said sequence data indicating a sequence of landmark identifiers;
first processing means coupled to said route establishing means for receiving said sequence data and for computing sequence action data, said sequence action data comprising computed lineal distances between landmarks and status data related to an approached landmark;
distance measuring means for measuring distance travelled by said vehicle to provide measured distance data;
means for detecting vehicle movement in a distance window only around said approached landmark to provide movement data indicative of change in motion of said vehicle;
second processing means coupled at least to said first processing means, to said distance measuring means, and to said vehicle movement detecting means for receiving said movement data, said distance data and said sequence action data, for supplying output data indicative of current location or expected actions in sequence for aiding a driver of the vehicle to adhere to the route; and
output means for supplying the output data in a form discernible by the driver.

4,878,171

NUMERICAL CONTROL METHOD FOR MACHINING AN ARC ON THE CURVED SURFACE OF A CYLINDER USING INTERPOLATION OF LINEAR AND ANGULAR DATA

Nobuyuki Kiya, and Kimio Maeda, both of Hachioji, Japan, assigns to Fanuc Ltd., Minamitsuru, Japan

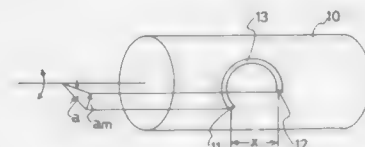
PCT No. PCT/JP87/00956, § 371 Date Jun. 29, 1988, § 102(e) Date Jun. 29, 1988, PCT Pub. No. WO88/04799, PCT Pub. Date Jun. 30, 1988

PCT Filed Dec. 9, 1987, Ser. No. 221,247

Claims priority, application Japan, Dec. 18, 1986, 61-300032 Int. Cl.⁴ G05B 19/41

U.S. Cl. 364—474.29

8 Claims



1. A numerical control method in which controls around a rotation axis and along a linear axis of a machine tool are simultaneously performed by a numerical control unit which operates in accordance with a machining program, so that a circular arc is formed on a cylindrical surface of a cylindrical workpiece, comprising the steps of:

- calculating a distance interval, in a circumferential direction of the workpiece, between a start point and an end point of a circular arc to be formed on the basis of a moving command value for the rotation axis, the moving command value being indicative of an angular interval between the start and end points of the circular arc in the circumferential direction of the workpiece and represented by a unit of angle;
- executing a circular arc interpolation processing on the calculated distance interval for the rotation axis and a moving command value for the linear axis, which is represented by a unit of length, so as to calculate a first distribution amount for the rotation axis and a second distribution amount for the linear axis, respectively;
- converting the first distribution amount into a third distribution amount which is represented by a unit of angle; and
- controlling the linear and rotation axes of the machine tool in accordance with the second and third distribution amounts, respectively.

4,878,172

FOUR-AXIS LATHE NC PROGRAM CREATION METHOD

Teruyuki Matsumura, Tokyo, Japan, assignor to Fanuc Ltd., Minamitsuru, Japan

PCT No. PCT/JP87/00203, § 371 Date Nov. 25, 1987, § 102(e) Date Nov. 25, 1987, PCT Pub. No. WO87/05845, PCT Pub. Date Oct. 8, 1987

PCT Filed Apr. 1, 1987, Ser. No. 131,192

Claims priority, application Japan, Apr. 1, 1986, 61-75301 Int. Cl.⁴ B23Q 15/00

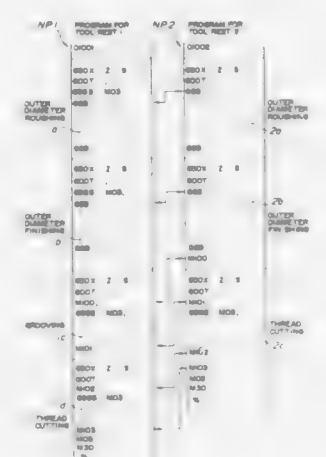
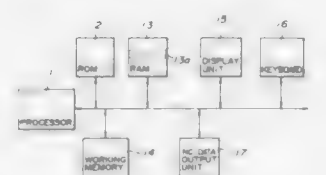
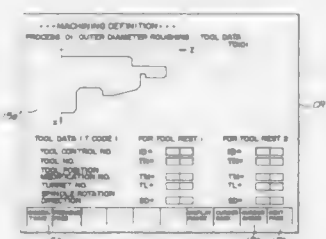
U.S. Cl. 364—191

6 Claims

1. A numerical control program creation method for a four-axis lathe, having first and second tool rests, comprising the steps of:

- displaying conversational frames corresponding to a plurality of input steps on a display unit;
- inputting data in the conversational frames, for specifying a finished profile, machining processes and tools used;
- creating first and second numerical control programs for controlling the first and second tool rests of the four-axis lathe, using the data input in step (b);

- previously inputting and storing in memory a name of a balance cutting machining process;
- checking whether the machining process to be balanced cut has been inputted in step (b);
- displaying a balance cut conversational frame, calling for tool data for both the first and second tool rests when the name of the machining process to be balance cut is input;



- inserting an execution control instruction in front of numerical control data created in step (c) for the balance cutting machining process, the execution control instruction controlling movement of one of the tool rests in symmetrical fashion in synchronism with the other of the tool rests.

4,878,173

CONTROLLER BURST MULTIPLEXOR CHANNEL INTERFACE

Kenneth S. Gockjias, Candia, N.H., assignor to Data General Corporation, Westboro, Mass.

Filed May 16, 1988, Ser. No. 194,685

Int. Cl.⁴ G06F 3/00

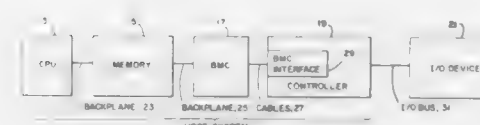
U.S. Cl. 364—200

1 Claim

1. A data processing system comprising:

- a central processor unit,
- a memory connected to said central processor unit,
- a burst multiplexor channel connected to said memory,
- a controller, and

- an interface for connecting said controller to said burst multiplexor channel, said interface including two sections,



one section handling the transfer of data and the other handling the transfer of command and status information.

4,878,174

FLEXIBLE ASIC MICROCOMPUTER PERMITTING THE MODULE MODIFICATION OF DEDICATED FUNCTIONS AND MACROINSTRUCTIONS

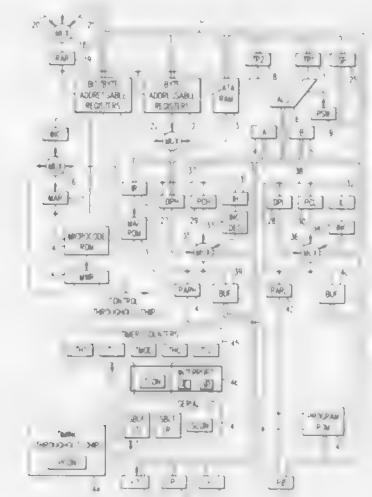
Daniel Watkins, Saratoga; Jimmy Wong, Cupertino, and Pavlina Eanghillis, Palo Alto, all of Calif., assignors to LSI Logic Corporation, Milpitas, Calif.

Filed Nov. 3, 1987, Ser. No. 116,411

Int. Cl.⁴ G06F 9/22, 13/00

U.S. Cl. 364—200

8 Claims



- A digital computer on a single substrate comprising: a bidirectional data bus; memory for the storage of data or code, said memory comprising: one or more registers used for the temporary storage of data during the operation of said digital computer; means for addressing said memory, said addressing means comprising: means for including the addresses of external device registers, not located on said substrate, within the same address space used for said memory, said means permitting the same degree of direct manipulation of said external registers as is permitted registers located on said substrate; and a central processing unit which interprets and executes macroinstructions, and which performs arithmetic and logical operations, said central processing unit coupled to said data bus, to said memory and to said addressing means, said central processing unit comprising: a microengine for controlling the operation of said computer, said microengine comprising: macroinstruction memory for storing one or more of the macroinstructions to be executed by said computer; microcode memory, said microcode memory comprising:

- ing one or more microinstructions, each of said microinstructions comprising one or more control signals to control the execution of said macroinstructions;
- means for receiving each of said macroinstructions and mapping said macroinstructions into a sequence of microinstructions, said means causing the first microinstruction of said sequence of microinstructions to be executed; and
- means for sequencing the execution of said microinstructions; and
- means for generating, independently of the operation of said data bus, the address of memory external to said substrate, and the address of the next of said macroinstructions to be executed by said microengine.

4,878,175

METHOD FOR GENERATING PATIENT-SPECIFIC FLOWSHEETS BY ADDING/DELETING PARAMETERS

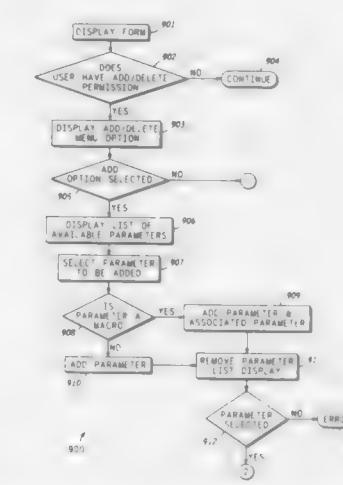
Ronald E. Norden-Paul, Peoria; Murray A. Fein, Phoenix, and Sandra L. Stewart, Phoenix, all of Ariz., assignors to Emtek Health Care Systems, Tempe, Ariz.

Filed Nov. 3, 1987, Ser. No. 116,611

Int. Cl.⁴ G06F 15/42

U.S. Cl. 364—413.01

21 Claims



- In a medical information system comprising a processing unit, a memory unit, and a terminal unit wherein said terminal unit comprises display means for displaying a patient medical information form to a terminal user and input means for said terminal user to enter patient information into said system and to provide commands to said system, a method of customizing said patient medical information form comprising:
 - providing to said system an indication of a patient identity using said input means;
 - providing to said terminal user, via said display means, said patient medical information form relating to said patient identity;
 - selecting a parameter operation, said parameter operation including adding a new parameter to said patient medical information form or deleting a selected parameter from said patient medical information form;
 - performing said parameter operation by deleting said selected parameter if said deleting parameter operation was selected in step (c); and
 - performing said parameter operation by adding said new parameter if said adding parameter operation was selected in step (c).
- In a medical information system comprising a processing unit, a memory unit, and a terminal unit wherein said terminal unit comprises display means for displaying a patient medical

said display means further exhibiting pictorial representation of the specimen layout, as described in the mathematical model, to allow an operator select a node on the layout where comparison of measured and simulated waveforms from the mathematical node and corresponding specimen node are to be made;

said simulator means outputting predicted behavioral characteristics of the circuit specimen as predicted waveforms applied to the display means along with any output waveform of the noncontact probe means acquired during said exercising; and

said display means also enabling pictorial comparison of said predicted and measured waveforms to permit identification of circuit errors causing abnormal behavior in the specimen.

10. A method for determining the cause of mal-function in an integrated circuit, comprising the steps of:

noncontact probing for detecting the magnitude of an analog waveform at a selected node site on the circuit;

storing a mathematical model of the integrated circuit based on an object clustering data structure for predicting analog and digital waveform;

storing analog measured and predicted waveforms;

storing digital stimuli waveforms;

simultaneously applying selected stimuli to the circuit observed by the noncontact probing and to the stored mathematical model underlying the simulation;

displaying a response to the stored output of the noncontact probing and to the stored simulated output of the mathematical model to portray separate waveforms for each to permit determination of whether or not the waveforms agree or disagree; and

steering the noncontact probing to additional node sites for exploring circuit behavior, incrementally until the node site indicating a mal-function by waveform disagreement is identified.

4,878,180

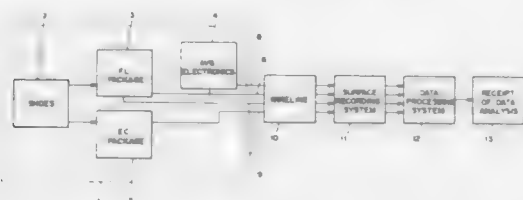
METHOD OF EVALUATING THE CONDITION OF TUBULAR GOODS

Vernie C. McWhirter, Pearland; James E. Pickett, and Norman R. Carlson, both of Houston, all of Tex., assignors to Western Atlas International, Inc., Houston, Tex.

Filed Nov. 18, 1985, Ser. No. 799,226
Int. Cl.⁴ G01N 29/04; G06F 15/20

U.S. Cl. 364—507

8 Claims



1. A method of evaluating state of deterioration due to corrosion of a string of subsurface well casing having a plurality of tubular casing lengths by passing an inspection instrument through the inside of a casing length under inspection and submitting signal outputs of said inspection instrument to a process of analysis to exclude effects of structural configuration about said casing comprising the steps of:

deriving first and second measurements from said inspection instrument;

combining said first and second measurements;

analyzing said combined measurement and excluding responses caused by said structural configuration about said casing therefrom wherein the step of analyzing said combined measurement and excluding responses caused by said structural configuration about said casing therefrom further comprises the steps of:

locating collars along said casing length under inspection;

excluding from analysis for evaluating said state of deterioration responses caused by said collars; and

analyzing remaining response for evaluating said state of deterioration of said casing;

deriving a third measurement from said inspection instrument; and

comparing said third measurement to said combined measurement to determine whether casing defects are located inside or outside of the said casing.

4,878,181

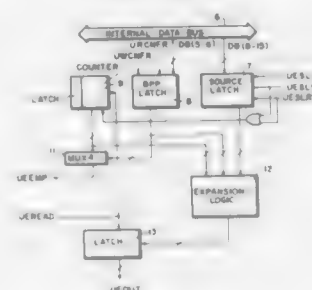
VIDEO DISPLAY CONTROLLER FOR EXPANDING MONOCHROME DATA TO PROGRAMMABLE FOREGROUND AND BACKGROUND COLOR IMAGE DATA

Craig A. MacKenna, Los Gatos, and Jan-Kwei J. Li, San Jose, both of Calif., assignors to Signetics Corporation, Calif.

Continuation-in-part of Ser. No. 931,760, Nov. 17, 1986, abandoned. This application Nov. 13, 1987, Ser. No. 121,504
Int. Cl.⁴ G06F 3/153

U.S. Cl. 364—518

10 Claims



1. A video display controller for use in a color image display system for expanding a monochrome image pattern stored in a display memory in the form of one bit per image pixel to a color image pattern having multiple bits signifying foreground and background color of each pixel, and integrating such multiple bits with the stored bit pattern to derive a corresponding color image; such video controller comprising:

a bit expander circuit including

a source latch for storing the pixel bits of a part of said monochrome image;

bits per pixel means for setting the number of bits per pixel in the expanded color image of said part of said monochrome image, to thereby define the extent of the multiple bit expansion to be performed;

source tracking means which monitor the contents of said source latch and signal when to reload said source latch from said display memory; and

expansion logic circuit means having inputs connected to outputs of said source latch, said bits per pixel means, and said source tracking means; said expansion logic circuit means having outputs at which it produces signals respectively representing the contents of said source latch and a number of consecutive bits corresponding to an expansion of the contents of said source latch, the number of consecutive bits in such expansion which correspond to each bit in the source latch being as defined by said bits per pixel means;

pattern alignment means for shifting the signals at the outputs of said expansion logic circuit means so as to correspond to the positioning of destination words stored in said display memory;

pattern generating circuit means including

a foreground color register programmable with pixel values to be substituted for "1" pixel bits of said monochrome image;

a background color register programmable with pixel values which are to be substituted for "0" pixel bits of said monochrome image;

a single-bit register programmable to control whether "0" pixel bits in said monochrome image pattern are to remain unchanged or are to be replaced by pixel values stored in said background color register;

a destination latch for temporarily storing destination words stored in said display memory; and

multiplexing means which selects among the contents of said foreground color register, said background color register and said destination latch under control of said single-bit register and said pattern alignment means; said multiplexing means having an output at which it produces new destination words for replacing destination words currently stored in said display memory; and

control means which sequence the reading of said display memory and storage of data therefrom in said source latch and in said destination latch, and the writing of said new destination words provided by said multiplexing means into said display memory.

4,878,182

MULTIPLE PIXEL GENERATOR

Michael A. Aranda, Saugerties; Timothy J. Ebberts, Shokan; Yoshio Iida, Lake Katrine; Terence W. Lindgren, Rosendale, and Taggart H. Robertson, Earlton, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 30, 1987, Ser. No. 115,451

Int. Cl.⁴ G06F 15/40

U.S. Cl. 364—518

33 Claims



1. A method for generating positioning values for a plurality of line points or pixels in a single machine cycle of a line generating system, wherein said positioning values represent the integer change in position relative to a previous pixel position necessary to represent an approximation of a linear function of at least one of the coordinates of said pixels, said method comprising:

generating error terms according to Bresenham's algorithm for each of a plurality of contiguous pixels, with the number of said contiguous pixels being equal to the number of pixels which are to be generated during said single machine cycle; and

generating, during said machine cycle, the positioning values for said plurality of pixels in a plurality of vector generators which are connected in parallel with one another and which are arranged so that each of said vector generators provides the positioning value for an associated one of said plurality of pixels, with the positioning value for each said pixel being determined, at least on part, as a function of the number of pixels being generated in one cycle and as a function of said error terms generated according to Bresenham's algorithm.

4,878,183

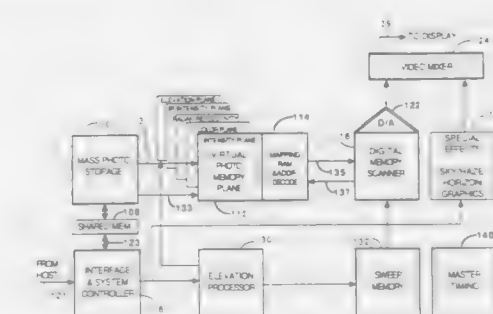
PHOTOGRAPHIC IMAGE DATA MANAGEMENT SYSTEM FOR A VISUAL SYSTEM

Ron B. Ewart, 5451 Hunter Rd., Eagan, Ohio 45323
Filed Jul. 15, 1987, Ser. No. 73,789

Int. Cl.⁴ G11C 8/00

U.S. Cl. 364—521

4 Claims



1. An image data management system for generating image data for a visual system in successive frames at a given frame rate for display on a display device in accordance with viewing data from a host central processing unit, said system comprising:

a first memory for mass storage, a second memory used as a virtual image memory, a digital memory scanner, a controller coupled to the first and second memories and to the digital memory scanner for control thereof, first address bus means and first data bus means coupled from the first memory to the second memory, second address bus means coupled from the memory scanner to the second memory, second data bus means coupled from the second memory to the digital memory scanner for transferring video data, an image display bus coupled from the digital memory scanner to the display device, and a CPU bus coupled from the host central processing unit to said controller and also to the digital memory scanner;

means for organizing the first memory in files of photo-based digitized images in an interleaved data format on a non-compressed pixel-by-pixel basis using cells at N different levels, from level 1 having least detail to level N having the highest detail, with each file comprising a given number of digital data elements at only one of said levels for one cell, and each data element having a predetermined number of bits;

means for organizing the second memory as a plurality of cells, with each cell comprising a data storage area of a size for storing one of said files in the same interleaved data format as in the first memory, and a mapping unit having mapping random access memory and address decoding logic, the mapping unit being coupled to said controller via a mapping and control signal bus for receiving decoding and control data;

wherein the CPU bus is used as means for providing said viewing data from the host central processing unit to the controller, with the viewing data including information relating to position and look angle, wherein said controller includes means for controlling the first address bus means and the first data bus means to direct transfers of the files of data from the first memory into the second memory, with only one cell of the first memory being accessed at any one time, and an entire file of data being stored in one cell of the second memory, the files stored into the second memory being determined by said viewing data, the files of data being placed into cells of the second memory which are unused or no-longer-needed cells, and wherein the controller simultaneously loads the mapping unit with appropriate decoding and control data via the mapping

and control signal bus for use by the digital memory scanner to find the interlaced data; wherein said digital memory scanner includes means for taking viewing data from the controller, using the viewing data to select a level of detail for each area of a display and to generate addresses of data required to create a display, accessing the cells of the second memory via the second address bus means, and via the mapping unit of each cell to cause video data to be transferred from the data storage areas of selected cells via the second data bus means, formatting the data for each area of a display in accordance with the level of detail selected, by interlacing the data for a number of levels from level 1 to the level of detail selected for each said area, and supplying frames of video data via the image display bus to the display means.

4,878,184

ELECTRONIC THERMOMETER WITH PREDICTING MEANS

Masamichi Okada, and Isao Kai, both of Kyoto, Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

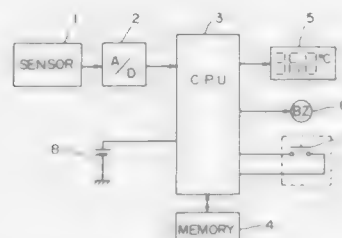
Filed Feb. 10, 1987, Ser. No. 13,295

Claims priority, application Japan, Feb. 10, 1986, 61-27318; Feb. 14, 1986, 61-31496; Feb. 21, 1986, 61-38038

Int. Cl.⁴ G06F 15/42; G01K 3/00

U.S. Cl. 364—557

5 Claims



1. An electronic thermometer comprising sensing means for sensing a temperature to be taken thereby, storage means for storing therein a measured temperature value representing the temperature sensed by said sensing means, prediction means for computing a predicted temperature value based on said measured value stored in said storage means, display means for displaying, selectively, said measured temperature value and said predicted temperature value, judging means for determining whether or not a response value, of a response curve based on data of said measured temperature value, has attained a predetermined value at which to initiate an operation for changing a state of said display means; means for comparing said measured and predicted temperature values and producing a difference value; and means for switching the displaying of said display means according to said difference value reaching a threshold.

4,878,185

DIGITAL MEASURING INSTRUMENT

Klaus-Peter Brand, Wettingen; Jürgen Kopainsky, Brugg, and Fritz Wittwer, Turgi, all of Switzerland, assignors to BBC Brown Boveri AG, Baden, Switzerland

Filed Oct. 27, 1987, Ser. No. 113,119

Claims priority, application Switzerland, Nov. 4, 1986, 4361/86

Int. Cl.⁴ G06F 15/20

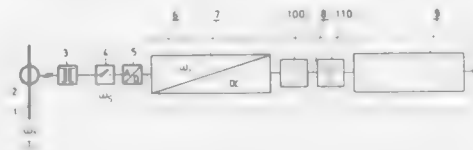
U.S. Cl. 364—572

15 Claims

1. A digital measuring instrument for processing analog output signals emitted by at least one sensor of an electrical

supply system containing harmonics, said digital measuring instrument comprising:

a sample and hold circuit for sampling the analog output signals at a predetermined sampling rate and temporarily storing the sampled values, an analog/digital converter which follows the sample and hold circuit, for digitizing the sampled and temporarily stored values of the output signals, and a digital processing unit, which is connected to the output of the analog/digital converter, for determining at least one



system-specific quantity from the digitized values of the output signals supplied, wherein the digital processing unit includes at least one block for shifting frequencies (ω_1, ω_2) of a fundamental wave and harmonics of the supply system to a direct-current signal which is proportional to at least one system-specific quantity, and at least one filter arrangement, which follows the at least one frequency shifting block, with a least one digital low-pass filter for suppressing the harmonic frequencies deviating from said direct current signal and with at least one digital band stop filter for suppressing aliasing frequencies.

4,878,186

METHOD AND CIRCUIT FOR PROCESSING NARROW BAND SIGNALS LOCATED IN A WIDE BAND HAVING DISTURBANCE

Daniel Gagnon, Montreal, Canada, assignor to Ultimage Inc., Quebec, Canada

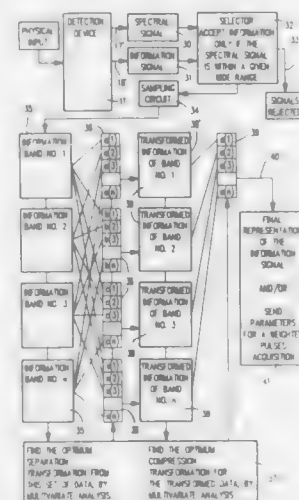
Filed Sep. 4, 1987, Ser. No. 93,997

Claims priority, application Canada, Aug. 27, 1987, 545529

Int. Cl.⁴ G06F 15/42, 15/62

U.S. Cl. 364—574

20 Claims



1. A method of processing information signals contained in a plurality of contiguous energy bands of a wide band signal generated by photon emission and containing desired information signals and undesired noise signals and wherein a radiation detector produces position signals and energy signals representative of said photon emission, said method comprising the steps of:

(i) directing said position signals in predetermined ones of a first plurality of storage banks corresponding to said con-

tiguous energy bands, said position signals being directed and cumulated into specific ones of said banks as determined by the level of its corresponding energy signal, (ii) evaluating the relation between the cumulative position signals in said storage banks by comparing the signals in each bank with every other one of said banks and rating the similarity of signals between said banks, (iii) selecting information from said cumulative position signals in each bank in accordance with said rating to minimize similarities between said cumulative position signals, (iv) transferring in a second plurality of storage banks, classified in accordance with the nature of said rated information from said first storage banks whereby to isolate desired signals from undesired noise signals known to be different in nature, and (v) weighting said signal information in said second banks to produce an interpretable signal representative of said desired information signal contained in said photon emission.

4,878,187

APPARATUS AND METHOD FOR GENERATING A SEQUENCE OF SINES OR COSINES

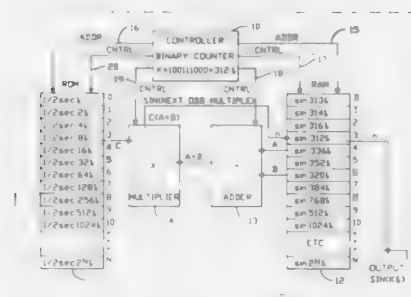
Oscar Buneman, Los Altos Hills, Calif., assignor to The Board of Trustees of the Leland Stanford Junior University, Palo Alto, Calif.

Filed Jun. 22, 1988, Ser. No. 209,947

Int. Cl.⁴ G06F 1/02

U.S. Cl. 364—721

20 Claims



1. An apparatus for generating a sequence of trigonometric functions for successive angles $K\delta$, for K equal to 1 through up to 2^N and δ equal to a constant, comprising:

a first storage array including $N+1$ storage locations addressed by addresses C , for C equal to 0 through N , the storage location addressed by C storing a value proportional to $\secant(2^C\delta)$;

a second storage array including $N+1$ storage locations addressed by addresses n , A , and B , for n equal to 0 through N , where A and B are addresses in the range on 0 to N , the storage location addressed by n storing the trigonometric function for angle $S_n\delta$, where S_n equals an odd multiple of 2^n , the odd multiple being a lowest next odd multiple in the successive angles;

a counter generating K ;

means, coupled to the first storage array and to the second storage array, for generating the trigonometric function of the lowest next odd multiple S_n for storage in the location addressed by n , in response to data in the locations addressed by A , B and C ; and

a controller, coupled to the first storage array, the second storage array, the counter, and the means for generating, for calculating the addresses n , A , B , and C in response to K , and for controlling operation of the apparatus so that for each successive angle $K\delta$, the trigonometric function stored in the location addressed by n is supplied as output in the sequence, and is replaced by the trigonometric

function of the lowest next odd multiple of S_n in the successive angles.

4,878,188

SELECTIVE ACTIVE CANCELLATION SYSTEM FOR REPETITIVE PHENOMENA

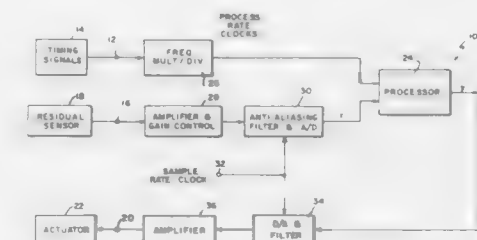
Eldon Ziegler, Jr., Columbia, Md., assignor to Noise Cancellation Tech, Columbia, Md.

Filed Aug. 30, 1988, Ser. No. 238,188

Int. Cl.⁴ G06F 15/31

U.S. Cl. 364—724.01

9 Claims



1. Repetitive phenomena cancellation controller comprising: phenomena input means for providing a phenomena signal representing a Phenomena to be cancelled; timing input means for providing a timing signal representative of a repetition rate of said phenomena; processor means, having inputs for said phenomena signal and said timing signal, for generating a cancellation signal to substantially eliminate said phenomena; output means connected to said processor means for providing a cancellation phenomena as a function of said cancellation signal; adaptive filter means, in said processor means, for generating said cancellation signal by adapting the filter means filtering characteristics as a function of said phenomena signal and timing signal; and phase means, in said processor means, for maintaining said adapting of said filtering characteristic within a 90° phase of said phenomena signal.

4,878,189

MICROCOMPUTER HAVING Z-FLAG CAPABLE OF DETECTING COINCIDENCE AT HIGH SPEED

Kazuhide Kawada, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

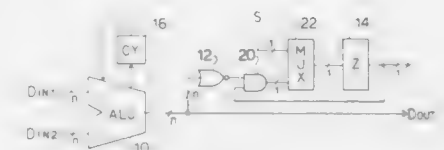
Filed Oct. 1, 1987, Ser. No. 103,320

Claims priority, application Japan, Oct. 1, 1986, 61-234924

Int. Cl.⁴ G06F 7/00

U.S. Cl. 364—736.5

7 Claims



1. A microcomputer comprising:

operation means receiving two input data for executing designated operations in sequence for the two input data, zero detection means coupled to the operation means for detecting that the result of each of the designated operations is zero, storing means coupled to the zero detection means for storing the result of zero detection, and control means coupled to the zero detection means and the storing means for controlling the storing means to indicate

that the result of operation is not zero although the zero is detected by the zero detection means after a non-zero has been detected once by the zero detection means and stored in the storing means in the sequence of the designated operations.

4,878,190

FLOATING POINT/INTEGER PROCESSOR WITH DIVIDE AND SQUARE ROOT FUNCTIONS

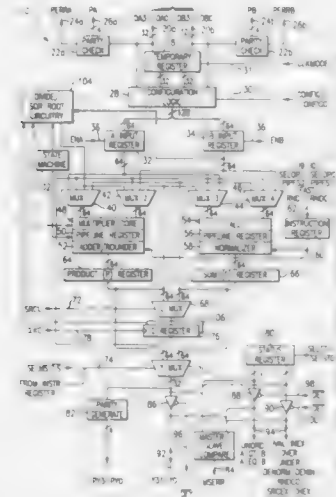
Henry M. Darley, Plano; Michael C. Gill; Dale C. Earl, both of Dallas; Dinh T. Ngo, Irving; Paul C. Wang; Maria B. L. Hipona, both of Dallas, all of Tex., and Jim Dodrill, Durham, N.C., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 29, 1988, Ser. No. 150,363

Int. Cl.⁴ G06F 7/38

U.S. Cl. 364-752

14 Claims



1. Apparatus for calculating a selected value of a quotient or a square root of an operand, comprising: multiplier circuitry having at least first and second inputs receiving first and second numeric signals respectively, said multiplier circuitry including a first portion for producing a product of the first and second numeric signals representing an approximation of the value and a second portion for producing a conversion of said product into a predetermined numeric representation; first feedback circuitry transmitting said conversion to the first input of the multiplier circuitry; and second feedback circuitry transmitting said product to the second input of said multiplier circuitry.

4,878,191

MULTIPLICATION CIRCUIT CAPABLE OF OPERATING AT A HIGH SPEED WITH A SMALL AMOUNT OF HARDWARE

Tetsuji Oguchi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Feb. 16, 1988, Ser. No. 155,771

Claims priority, application Japan, Feb. 13, 1987, 62-31026

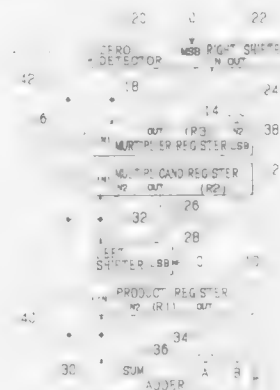
Int. Cl.⁴ G06F 7/50

U.S. Cl. 364-759

4 Claims

1. A multiplication circuit comprising: a multiplier register coupled to receive an initial value of a multiplier before start of a multiplication operation; a zero detector coupled to the multiplier register to generate a signal indicative of completion of the multiplication operation when all of predetermined bits of the multiplier register are zero; a first shifter coupled to the multiplier register to receive the bits of the multiplier register so as to shift the input data,

one bit in a direction from a more significant bit to a less significant bit, and to put "0" at its most significant bit, the first shifter rewriting the multiplier register with the shifted data having the most significant bit of "0"; a multiplicand register coupled to receive an initial value of a multiplicand before start of a multiplication operation; a second shifter coupled to the multiplicand register to receive the bits of the multiplicand register so as to shift the input data, one bit in a direction from a less significant bit to a more significant bit, and to put "0" at its least significant bit, the second shifter rewriting the multiplicand register with the shifted data having the least significant bit of "0";



a product register coupled to receive an initial value of a product before start of a multiplication operation; and an adder coupled to receive a content of the product register and a content of the multiplicand register and responding to the least significant bit of the multiplier register so as to execute an addition between the content of the product register and the content of the multiplicand register when the least significant bit of the multiplier register is "1", the adder rewriting the product register with the result of the addition, whereby the rewritings of the multiplier register, the multiplicand register and the product register are executed in parallel.

4,878,192

ARITHMETIC PROCESSOR AND DIVIDER USING REDUNDANT SIGNED DIGIT ARITHMETIC

Tamotsu Nishiyama, and Shigeo Kuninobu, both of Osaka, Japan, assignors to Matsushita Electric Industrial Co. Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 66,817, Jun. 25, 1987. This application Jul. 7, 1987, Ser. No. 70,565

Claims priority, application Japan, Jul. 11, 1986, 61-164090; Jul. 11, 1986, 61-164091

Int. Cl.⁴ G06F 7/49

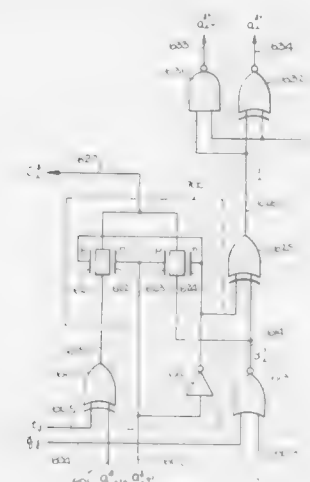
U.S. Cl. 364-768

23 Claims

1. An arithmetic processor which performs carry-propagation-free addition operations utilizing binary signed-digit arithmetic on a binary signed-digit number and a conventional binary number, each having N digits denoted by an order index i which assumes integer values ranging from 1 to N, said arithmetic processor including a plurality of redundant addition cells connected in an array, each of which performs operations on single digits of a particular order i, said redundant addition cells each comprising:

(a) an intermediate carry generating means having as inputs a 1-bit signal A_i representing the sign of the i-th digit of said signed-digit binary number, a one bit signal B_i representing the magnitude of the i-th digit of said signed digit binary number and a 1-bit signal y_i representing the i-th digit of said conventional binary number, said intermedi-

ate carry generating means determining therefrom an intermediate carry bit C_i generated by a signed-digit addition operation, and providing said intermediate carry bit C_i to said redundant addition cell which processes the (i+1)-th digit; (b) an intermediate sum generating means having as inputs said 1-bit signal B_i and said 1-bit signal y_i, and determining therefrom a 1-bit signal S_i representing the intermediate sum digit for the i-th order; and



(c) a final sum determining means having as input said 1-bit signal S_i determined by said intermediate sum generating means and a 1-bit signal C_{i-1} corresponding to the intermediate carry digit obtained from a redundant addition cell which processes the (i-1)-th digit, said final sum determining means determining therefrom a 2-bit signal representing the i-th digit of a signed-digit binary number which corresponds to the addition of the i-th order digits of said signed-digit binary number and said conventional binary number.

4,878,193

METHOD AND APPARATUS FOR ACCELERATED ADDITION OF SLICED ADDENDS

Debra Bernstein, Sudbury, and James B. Keller, Arlington, both of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Apr. 1, 1988, Ser. No. 176,594

Int. Cl.⁴ G06F 7/50

U.S. Cl. 364-768

4 Claims



3. An apparatus for performing an addition operation in a computer on sliced addends in successive microinstructions, the addends having at least a more significant slice and a least significant slice, where a more significant slice in one of the addends in successive microinstructions is a zero, said apparatus comprising: means for calculating a more significant slice sum, a more

significant slice sum + 1, and a least significant slice sum of addends of an addition operation in a successive microinstruction;

a multiplexer controlled by control signals on a select line, receiving as inputs from said means for calculating the more significant slice sum and the more significant slice sum + 1, and having an output connected to an input of said multiplexer;

a logic gate with an output connected to said select line for outputting a first control signal when:

(i) said least significant slice sum has a carry-out; (ii) first and second successive microinstructions in successive clock cycles are both add operations; and (iii) a destination of the first microinstruction is a source for the addition operation of the second microinstruction;

and outputting a second control signal when any of conditions (ii) or (iii) are not met;

wherein said multiplexer outputs: the more significant slice sum + 1 when the first control signal is outputted; and the more significant slice sum when the second control signal is outputted.

4,878,194

DIGITAL SIGNAL PROCESSING APPARATUS

Kenji Nakatsugawa, Aiko; Aiichi Katayama, Isehara, and Hitoshi Sekiya, Atsugi, all of Japan, assignors to Anritsu Corporation, Tokyo, Japan

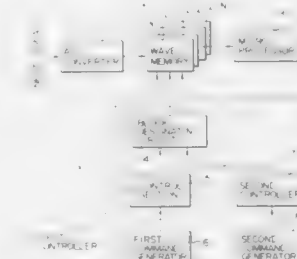
Continuation of Ser. No. 786,222, Oct. 9, 1985, abandoned. This application Mar. 7, 1988, Ser. No. 168,627

Claims priority, application Japan, Oct. 15, 1984, 59-215862

Int. Cl.⁴ G06F 3/14; H01J 29/70; G09G 1/00

U.S. Cl. 364-900

4 Claims



1. A digital signal processing apparatus, comprising: analog-to-digital (A/D) converting means for converting an input analog signal to a corresponding output digital signal;

wave memory means having n memory blocks and coupled to said A/D converting means, for storing the output digital signal in designated ones of said n memory blocks, wherein each block of said n memory blocks stores information corresponding to a waveform of the input analog signal at a give time;

block designating means coupled to said wave memory means for supplying, in a first control mode, an incremented-block-designating signal for accessing each of said n memory blocks in a determined cyclical order, and for supplying, in a second control mode, a randomly selectable, specific-block-designating signal for accessing a selected one of said n memory blocks;

first control means coupled to said wave memory means, and including said block designating means, for outputting a first control signal to said wave memory means for enabling storing and reading operations for each memory block accessed by said block designating means in said first control mode and in response to a block incremental command, wherein the output digital signal of said A/D converting means is stored into, and read out from, each block of said n memory blocks in said determined cyclical

order, each of the n memory blocks being updated after it undergoes a storing operation followed by a read-out operation, and wherein that memory block, in which an oldest output digital signal is stored, is updated to store, and subsequently read out, a newest output digital signal of the A/D converting means by operation of said first control means;

first command generating means coupled to said first control means for generating said block incremental command to access each of said n memory blocks in said cyclical order and to enable storage of the output digital signal from said A/D converting means incrementally in the n memory blocks of said wave memory means, and also to enable incrementally reading out signals stored in the n memory blocks of said wave memory means;

second control means, coupled to said wave memory means and said block designating means, for inhibiting the cyclical storing and reading operations of signals into and from, respectively, said n memory blocks, and for designating a specific block in said second control mode for enabling a reading-out operation from only the specific block so designated in response to a read-out command, said inhibition of the cyclical storing and reading operations, and the read only operation for said specific block in said second control mode, being such that signals ranging from an oldest output digital signal to a newest output digital signal as stored in said n memory blocks can be randomly selected as desired; and

second command generating means coupled to the second control means for generating said read-out command to select said designated memory block and only read out the signal stored in the designated memory block of said n memory blocks.

4,878,195

INSTRUCTION SEQUENCER FOR NETWORK STRUCTURE MICROPROCESSOR

Cristian Bocquet, Aix en Provence, France, assignor to Thomson Semiconducteurs, Paris, France

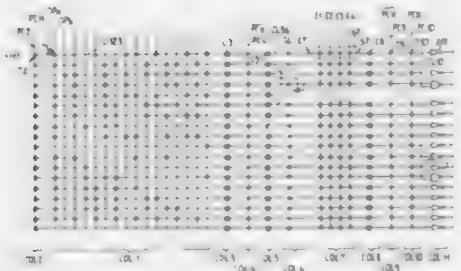
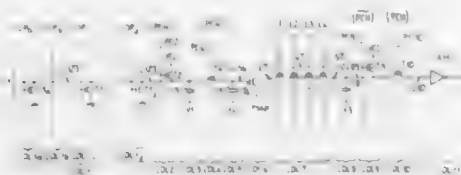
PCT No. PCT/FR86/00302, § 371 Date Apr. 30, 1987, § 102(e) Date Apr. 30, 1987, PCT Pub. No. WO87/01838, PCT Pub. Date Mar. 26, 1987

PCT Filed Sep. 10, 1986, Ser. No. 51,144

Claims priority, application France, Sep. 13, 1985, 85 13634 Int. Cl.⁴ G06F 9/22

U.S. Cl. 364—900

2 Claims



1. An instruction sequencer for a microprocessor, said sequencer having inputs for receiving binary instruction signals

and outputs for supplying control signals for controlling operation of said microprocessor, said sequencer comprising:

(a) sequencer inputs connected to input conductors which are arranged in a group of first parallel columns, each of said inputs corresponding to a respective first column of said group;

(b) wherein each of the first column of said group further comprises a plurality of decoding transistors, said decoding transistors of the group of the first parallel columns being furthermore aligned along rows perpendicular to the column direction with, each of the decoding transistor at the intersection of a given row and a given column having its gate connected to an input conductor corresponding to said column and having its drain connected to one row conductor of a first group of row conductors, each of which corresponds to a respective row of decoding transistors;

(c) wherein each of the row conductors of said first group of row conductors is connected to a respective first precharged transistors, with each of said precharged transistors having its gate controlled by a first clock signal, and further wherein each of said precharged transistors is placed along the length of a second column which is parallel to the first group of columns; and

(d) further wherein each row conductor is connected to a respective first capacitor, the first capacitors being placed along a third column which is parallel to said first and second columns;

(e) further wherein each row conductor is connected to the source of respective first sampling transistors, with each of said sampling transistors having its gate controlled by a second clock signal and having its drain connected to a row conductor of a second group of row conductors perpendicular to said columns, the first sampling transistors being furthermore placed along a fourth column which is parallel to said first, second and third columns;

(f) wherein each of first sampling transistor's drain is further connected to a second respective capacitor, wherein said second capacitors being placed along a fifth column which is parallel to the first, second and third columns;

(g) wherein each row conductor of the second group of row conductors is connected to the gate of a respective transistor taken among transistors of a sixth column parallel to said first, second, and third columns, the drain of said respective transistor being connected to an input of a respective logical controlled gate, and all the sources of said transistors of said sixth column being connected to a common point;

(h) logical controlled gates arranged along a seventh column parallel to said first and second columns, and having an output connected first to third respective capacitors, second to a second precharged transistor, and third to a second sampling transistor, said third capacitors being placed along an eighth column, the second precharged transistors being placed along a ninth column and being controlled by a third clock signal, said second sampling transistors being placed along a tenth column and being controlled by a fourth clock signal.

4,878,196

COMMUNICATIONS MANAGEMENT SYSTEM

Frederick A. Rose, Rte. 3, Box 529, Fort Atkinson, Wis. 53538

Filed Dec. 18, 1986, Ser. No. 943,565

Int. Cl.⁴ G06F 1/00

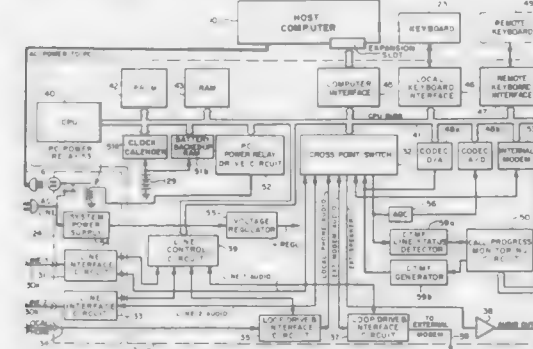
U.S. Cl. 364—900

7 Claims

1. A communications management system for use in conjunction with an externally-powered host computer for responding to communications signals on a telephone line, comprising:

a power control means in the form of a relay, said relay being electrically connected to a power source and responsive to an applied control signal for supplying operating power from said power source to the host computer;

a printed circuit board connected to said host computer, said printed circuit board including control circuit means electrically connected to said power control means for supplying said control signal to said relay to power up said host computer, said control circuit means supplying said control signal in response to receiving the communications signals on the telephone line; and



means for processing information received over said telephone line following said power up of said host computer, said means for processing including an analog-to-digital converter operatively associated with said control circuit means and storage means for retrievably storing said information within either said management system or within said host computer, said storage means being electrically connected to said analog-to-digital converter.

4,878,197

DATA COMMUNICATION APPARATUS

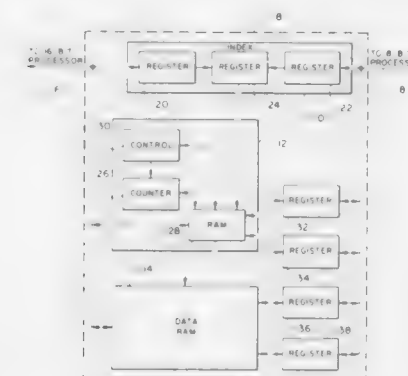
Daniel L. Nay, Rancho Palos Verdes; Darryl K. Korn, Laguna Beach, and John T. Ralph, Mission Viejo, all of Calif., assignors to Control Data Corporation, Minneapolis, Minn.

Filed Aug. 17, 1987, Ser. No. 85,812

Int. Cl.⁴ G06F 15/16; H04J 3/00

U.S. Cl. 364—900

18 Claims



1. Data communication apparatus for transferring data between first and second channels wherein the data format on the first channel is incompatible with the data format on the second channel, said apparatus comprising: index means connected to said first and second channels for receiving and processing index addresses from each of said first and second channels; first memory means having a plurality of first memory locations each containing a memory address, said first memory means being connected to said index means and being responsive to an index address to retrieve a memory address from a first memory location identified by said index address, said first memory means being connected to said first and second channels to receive memory addresses from said first and second channels, said first memory means further including first memory register means connected to said second channel for formatting memory addressing between the ad-

dress formats of said first and second channels; and second memory means having a plurality of second memory locations, said second memory means being connected to said first and second channels and to said first memory means for storing data from a selected first or second channel at a second memory location selected by the retrieved memory address and for reading data onto a selected first or second channel from a second memory location selected by the retrieved memory address.

4,878,198

STATIC RAM WITH COMMON DATA LINE EQUALIZATION

Richard S. Roy, Pleasanton, Calif., assignor to Visic, Incorporated, San Jose, Calif.

Filed Jan. 25, 1988, Ser. No. 148,279

Int. Cl.⁴ G11C 7/00, 29/00

U.S. Cl. 365—222

7 Claims



1. A static random access memory, comprising: an array of memory cells arranged in rows and columns, with the memory cells in each column coupled to a pair of differential bit lines; a multiplicity of sense amplifiers, and a pair of differential common data out lines coupled to each sense amplifier; multiplexer means for selectively coupling each said common data out line to a selected one of a predefined set of bit line pairs; equalization means coupled to each said pair of common data out lines for equalizing the voltage differential in each said pair of common data out lines; a multiplicity of address lines, and address transition detection means for generating an ATD signal when a transition occurs on any of said address lines; read access control means coupled to said equalization means and multiplexer means, for responding to said ATD signal by disabling said equalization means, enabling said multiplexer means and activating said sense amplifiers, and then disabling said multiplexer means and re-enabling said equalization means; whereby said read access control means causes said equalization means to begin equalizing each said pair of common data out lines before the end of each memory read cycle.

4,878,199

SEMICONDUCTOR MEMORY DEVICE

Yoshihisa Mizutani, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

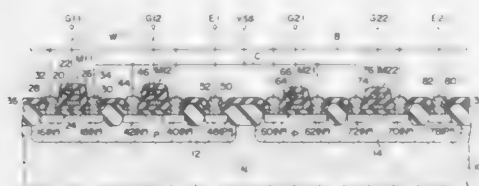
Filed Jan. 29, 1988, Ser. No. 150,052

Claims priority, application Japan, Feb. 27, 1987, 62-44509

Int. Cl.⁴ G11C 11/34; H01L 29/78

U.S. Cl. 365—185

16 Claims



1. A non-volatile semiconductor memory device comprising:

(a) a semiconductor substrate of a first conductivity type having a surface portion;

(b) memory cells formed in the surface portion of said substrate, said memory cells being divided into a certain number of cell groups, each of said memory cells comprising,

first and second semiconductor layers having the first conductivity type serving as a source and a drain of said memory cell, respectively, and

first and second conductive layers insulatively provided above said substrate and serving as a floating gate electrode and a control gate electrode of said memory cell, respectively;

(c) semiconductor well regions of a second conductivity type formed in the surface portion of said substrate to surround said cell groups respectively;

(d) well-potential controller means for applying, when a specific cell group is selected from among said memory cell groups, to said well regions of the remaining cell groups a bias voltage which changes a threshold level of said memory cell to prevent a flow of an ON current between said source and said drain, thereby inhibiting reading and writing of information in the memory cells of said remaining cell groups.

4,878,200

PRODUCT TERM SHARING/ALLOCATION IN AN EPROM ARRAY

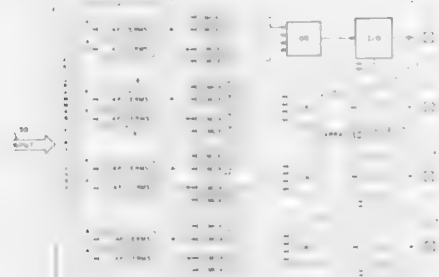
Abid Asghar, Fair Oaks, and James R. Donnell, Shingle Springs, both of Calif., assignors to Intel Corporation, Santa Clara, Calif.

Filed Dec. 30, 1987, Ser. No. 139,450

Int. Cl.⁴ G11C 7/00

U.S. Cl. 365—189.02

11 Claims



1. An erasable programmable logic device (EPLD) having a programmable memory array coupled to receive a plurality of input signals and, by providing a plurality of output signals

which depend on said input signals and information stored in said memory array, said output from said memory array coupled to a plurality of macrocells, wherein product terms are shared between adjacent macrocells, each macrocell comprising:

a first OR'ing means coupled to receive a first predetermined number of output lines from said memory array;

a second OR'ing means coupled to receive a second predetermined number of output lines from said memory array; said first and second OR'ing means each for providing an OR'ing function of its coupled predetermined number of output lines from said memory array;

a first multiplexor coupled to said first OR'ing means for receiving a first OR'ed output of said first OR'ing means;

a second multiplexor coupled to said second OR'ing means for receiving a second OR'ed output of said second OR'ing means;

said first OR'ed output of said first OR'ing means is also coupled to a subsequently adjacent macrocell;

said second OR'ed output of said second OR'ing means also is coupled to a previously adjacent macrocell;

a third multiplexor coupled to receive a second OR'ed output of said second OR'ing means of said subsequently adjacent macrocell; and

a fourth multiplexor coupled to receive a first OR'ed output of said first OR'ing means of said previously adjacent macrocell;

a third OR'ing means coupled to receive outputs of said first, second, third and fourth multiplexors such that each of said OR'ed outputs is coupled to said third OR'ing means when said respective multiplexor is selected;

an input/output (I/O) circuit coupled to receive an output of said third OR'ing means, said I/O circuit for emulating logic functions and providing an output from said macrocell.

4,878,201

SEMICONDUCTOR MEMORY DEVICE HAVING AN IMPROVED TIMING SIGNAL GENERATOR FOR THE COLUMN SELECTION CIRCUIT

Kazuo Nakaizumi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jan. 28, 1988, Ser. No. 149,269

Claims priority, application Japan, Jan. 28, 1987, 62-19298; Jan. 28, 1987, 62-19303

Int. Cl.⁴ G11C 7/00, 11/40

U.S. Cl. 365—203

4 Claims



1. A memory device comprising an output terminal, means receiving a power voltage, a first drive circuit coupled to said output terminal, said first drive circuit making said output terminal approximately the potential of said power voltage in response to a first timing signal, a first capacitive boost circuit coupled to said output terminal, said first capacitive boost circuit raising the potential at said output terminal, which is approximately at the potential of said power voltage, above said power voltage in response to a second timing signal, said second timing signal being generated after the generation of

said first timing signal, and a second capacitive boost circuit coupled to said output terminal, said second capacitive boost circuit operatively raising the potential at said output terminal above said power voltage in response to a third timing signal, said third timing signal being generated only in a write mode and after generation of said second timing signal.

4,878,202

CHARGE-COUPLED DEVICE

Arie Slob, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

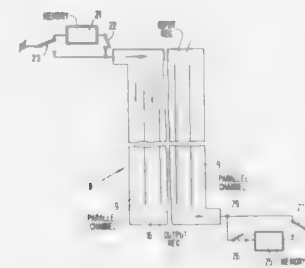
Filed Apr. 28, 1988, Ser. No. 187,612

Claims priority, application Netherlands, May 11, 1987, #701110

Int. Cl.⁴ G11C 27/00; H01L 29/76

U.S. Cl. 365—183

10 Claims



1. A charge-coupled device comprising a memory of the series-parallel-series type having a series input register and a series output register as well as a parallel section located between these registers, characterized in that the series input register is provided with an input stage comprising an additional memory, in which, when the series input register is filled with a first subline comprising a plurality of bits, at least the first bit of a second subline comprising a plurality of bits can be stored, while the bits of the first subline are transferred to the parallel section, after which the bits of said second subline are stored in the additional memory and the remaining bits of the second subline can be read into the series input register.

4,878,203

SEMICONDUCTOR NON-VOLATILE MEMORY WITH CUT-OFF CIRCUIT WHEN LEAKAGE OCCURS

Hideki Arakawa, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Sep. 19, 1988, Ser. No. 247,130

Claims priority, application Japan, Sep. 19, 1987, 62-233651

Int. Cl.⁴ G11C 7/00

U.S. Cl. 365—226

11 Claims



1. A semiconductor non-volatile memory device comprising:
a memory cell array having a memory cell including a non-volatile memory cell portion, said memory cell being

provided at each intersection of a plurality of word lines and a plurality of bit lines;

a high voltage generating circuit being supplied with an external power supply voltage and generating a high voltage required for storing data in said non-volatile memory cell portion;

a plurality of high voltage wirings, each being allocated to each of a corresponding plurality of blocks divided into units of a predetermined number of cells in said memory cell array and being commonly connected to all of said cells in a corresponding block; and

a plurality of high voltage feeding circuits operatively connected between said plurality of high voltage wirings and said high voltage generating circuit, each of said high voltage feeding circuits feeding said high voltage from said high voltage generating circuit to said cells in said corresponding block, and when a leak occurs in any one of said cells in said corresponding block, stopping the feed of said high voltage to said corresponding block.

4,878,204

METHOD FOR TRUE-AMPLITUDE DIP MOVEOUT CORRECTION

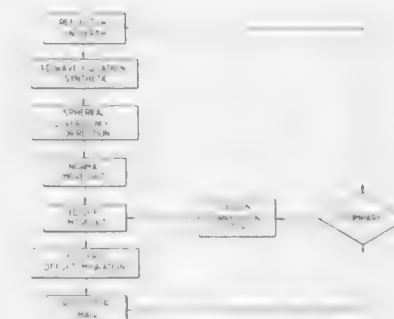
James L. Black, and Cameron B. Wason, both of Plano, Tex., assignors to Geophysical Service, Inc., Dallas, Tex.

Filed Oct. 28, 1988, Ser. No. 264,090

Int. Cl.⁴ G01V 1/36

U.S. Cl. 367—53

3 Claims



1. A method for carrying out true-amplitude dip moveout on seismic data which comprises:
selecting a reflectivity and dip for a theoretical dipping layer in three dimensions;
generating a synthetic dataset corresponding to reflection from the theoretical dipping layer using a known deconvolved source wavelet and a conventional three dimensional scalar wave equation;
correcting the synthetic dataset for spherical divergence to provide a spherical divergence corrected synthetic dataset;
correcting the spherical divergence corrected synthetic dataset for normal moveout to provide a normal moveout corrected synthetic dataset;
correcting the normal moveout corrected synthetic dataset for dip moveout using an extra degree of freedom in the dip moveout equation to provide a corrected synthetic dataset;
performing zero-offset migration on the corrected synthetic dataset to provide a migrated seismic image;
comparing the migrated seismic image with a known true-amplitude image derived from the known reflectivity and the known source wavelet from the theoretical dipping layer;
adjusting the migrated seismic image to substantially correspond to the known true-amplitude image by adjustment of the extra degree of freedom to provide a set of correction filters;

applying the correction filters during dip moveout correction operations on data from seismic surveys.

4,878,205

METHOD OF ANALYZING THE STRUCTURE OF A MEDIUM, PARTICULARLY USEFUL FOR SEISMIC PROSPECTING

Boris Gelchinsky, 12/16 Mivtza Yonatan, Kfar Sava 44 221, Israel

Filed Jul. 11, 1988, Ser. No. 217,269

Claims priority, application Israel, Jul. 23, 1987, 83306

Int. Cl.⁴ G01V 1/36

U.S. Cl. 367-61

13 Claims



1. Method of analysing the structure of a medium by means of waves reflected by inner interfaces, comprising

- generating multiple coverage data represented by traces corresponding to a plurality of source-receiver pairs distributed according to an asymmetric polynomial distribution with respect to a predetermined central point with optimal parameters which provide that all reflected events of such traces correspond to the same common reflecting point on a reflecting interface;
- correcting the recorded traces according to an optimal time delay correction which converts all reflected events to the same phase and which depends on the local parameters of wave propagation velocity V_0 at the reference level, and of radius of curvature r_0 of the wavefront emitted by a fictitious source located at the common reflecting point and coming to the central point at an angle of entry β_0 ;
- stacking said corrected recorded traces;
- repeating (a), (b) and (c) for a plurality of predetermined common reflecting points to produce a plurality of the stacked traces; and
- utilizing said stacked traces and parameters r_0 and β_0 as a function of said predetermined central point, and the time t_0 of registration of the data at this point for determining the structure of the medium.

4,878,206

METHOD AND APPARATUS FOR FILTERING NOISE FROM DATA SIGNALS

Donald S. Groono, West Hartford; Thomas M. Bryant, Avon, and Mitchell S. Gerabowitz, Wallingford, all of Conn., assignors to Teleco Oilfield Services Inc., Meriden, Conn.

Filed Dec. 27, 1988, Ser. No. 290,506

Int. Cl.⁴ G01V 1/40

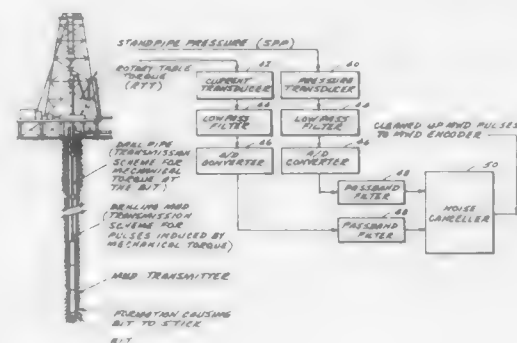
U.S. Cl. 367-83

20 Claims

1. A method of filtering noise from a data signal that is telemetered through well drilling fluid in a rotary drill string comprising the steps of:

- measuring vibration on the drill string at or near the surface to define a reference signal;

measuring the standpipe pressure of the drilling fluid in the drillstring to define a standpipe pressure (SPP) signal; and



subtracting the reference signal from said SPP to define a data signal having improved signal to noise ratio.

4,878,207

COMPOSITE SONAR TRANSDUCER FOR OPERATION AS A LOW FREQUENCY UNDERWATER ACOUSTIC SOURCE

Zdenek Jandera, Ashfield, and Ian R. Bedwell, Randwick, both of Australia, assignors to Plessey Australia Pty. Ltd., Meadowbank, Australia

PCT No. PCT/AU87/00372, § 371 Date Sep. 7, 1988, § 102(e) Date Sep. 7, 1988, PCT Pub. No. WO88/03739, PCT Pub. Date May 19, 1988

PCT Filed Nov. 4, 1987, Ser. No. 242,192

Claims priority, application Australia, Nov. 7, 1986, PH8951

Int. Cl.⁴ H04R 17/00

U.S. Cl. 367-155

16 Claims



1. A composite sonar transducer useful as an underwater acoustic source comprising:

- a head formed by a series of elemental cells of piezoceramic elements, each elemental cell comprising a cell support and first and second stacks of said piezo-ceramic elements, said first and second stacks being carried by said support, said elemental cells being positioned so as to form a planar array of elemental cells to form said head;
- said first and second stacks being arranged along two separate planes positioned about a central plane of said head, said of said first stack being positioned in a polar orientation opposite to those of said second stack;
- nodal supports positioned on said central plane between end members on said planar array; and
- support members for said head and means to connect the stacks of said piezo-ceramic elements into an electrical circuit.

4,878,208

VOLTAGE-PHASE RESPONSIVE, INVERTER DISABLE CIRCUIT FOR SYSTEM INTERCONNECTION

Nagataka Seki, Kiyoshi Ogawa, both of Tokyo, and Kihei Nakajima, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

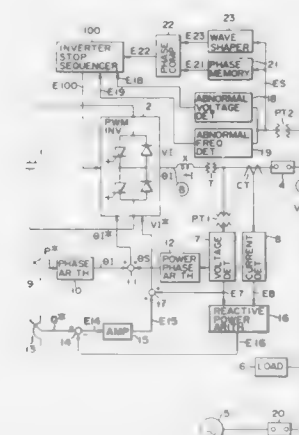
Filed Sep. 29, 1988, Ser. No. 250,853

Claims priority, application Japan, Sep. 30, 1987, 62-246143

Int. Cl.⁴ H02J 3/06

U.S. Cl. 307-87

11 Claims



1. A system interconnecting inverter apparatus comprising: an inverter, coupled to an AC power system having a system voltage, via a coupling reactor, for controlling power of said AC power;

system phase detection means for detecting a system phase signal indicating a phase of the system voltage of said AC power system in real time;

comparison phase detection means for detecting a signal indicating the phase of the system voltage of said AC power system with a predetermined delay time, and temporarily storing a result of the detection to provide a comparison phase signal; and

stop means, coupled to said inverter, said system phase detection means, and said comparison phase detection means, for phase-comparing the system phase signal and the comparison phase signal and, when a phase difference between the system phase signal and the comparison phase signal exceeds a predetermined value, stopping the operation of said inverter.

4,878,209

MACRO PERFORMANCE TEST

Robert W. Bassett, Essex Junction; William R. Griffin, Shelburne; Susan A. Murphy, South Burlington; John G. Petrovick, Jr., Colchester; James R. Varner, Essex Junction, all of Vt., and Dennis R. Whittaker, Fairfax, Va., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 17, 1988, Ser. No. 169,544

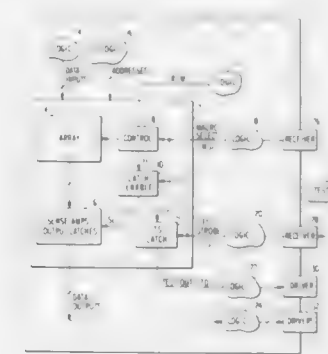
Int. Cl.⁴ G04F 8/00; G01R 15/12; G06F 11/14

U.S. Cl. 368-113

14 Claims

1. A semiconductor device having external chip circuitry, an array, means for receiving an input signal for enabling the array, and output data latches associated with the array, the device comprising:

logical gate means connected to the output data latches, thereby controlling an access time of the array; and



means for determining an on-chip delay time between a test signal and the input signal.

4,878,210

VISUALIZING METHOD FOR THREE DIMENSIONAL STANDING WAVE SOUND FIELD

Hideto Mitome, Tsukuba, Japan, assignor to Agency of Industrial Science & Technology, Ministry of International Trade & Industry, Tokyo, Japan

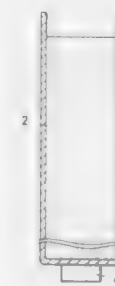
Filed Oct. 17, 1988, Ser. No. 258,763

Claims priority, application Japan, Nov. 19, 1987, 62-292640

Int. Cl.⁴ H04B 1/02

U.S. Cl. 367-137

8 Claims



1. A visualizing method for three dimensional standing wave sound field comprising:

- charging into a container equipped with an ultrasonic wave transmitter a medium consisting essentially of a liquid and a plurality of fine particles of the same density as said liquid, and
- causing said ultrasonic wave transmitter to transmit into said container ultrasonic waves of a frequency capable of forming a standing wave, whereby said fine particles are caused to move to positions where the amplitude of the sound pressure is minimum and the sound pressure distribution of the three dimensional standing wave sound field is visualized by the distribution of the fine particles.

4,878,211

METHOD AND APPARATUS FOR CORRECTING THE LOOP GAIN OF A SERVO LOOP IN ACCORDANCE WITH MEASUREMENTS DURING OPEN-LOOP OPERATION

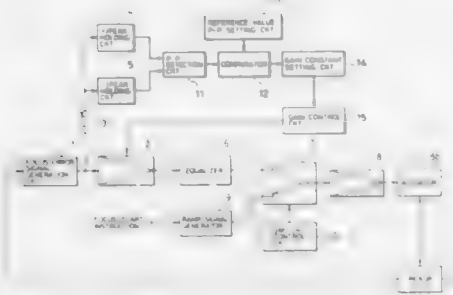
Masanori Suzuki, and Kiyoshi Tateishi, both of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan
Filed May 26, 1987, Ser. No. 53,790

Claims priority, application Japan, May 26, 1986, 61-121677; Sep. 19, 1986, 61-221680

Int. Cl.⁴ G11B 7/09

U.S. Cl. 369—44

15 Claims



1. A method of correcting a loop gain of a servo loop, said servo loop being of the type wherein an error signal is derived from signal representing the condition of an object and wherein said object is driven toward a desired condition in accordance with said error signal, said method comprising the steps of:

- opening a servo loop;
- changing the condition of said object to cause said error signal to pass through an upper peak representing a maximum error in a first direction and a lower peak of said error signal representing a maximum error in a second direction;
- detecting a peak-to-peak value of an error signal of said servo loop while said servo loop is open, wherein said peak-to-peak value represents the difference between said upper and lower peaks of said error signal;
- adjusting an amplification gain in accordance with said detected peak-to-peak value;
- closing said servo loop; and
- operating said closed servo loop including amplifying said error signal by said adjusted amplification gain.

4,878,212

OPTICAL RECORDING MEDIUM COMPRISING A MICROPOROUS POLYMER RECORDING LAYER

James E. Kuder, Fanwood, N.J., assignor to Hoechst Celanese Corporation, Somerville, N.J.

Continuation of Ser. No. 657,918, Oct. 5, 1984, abandoned. This application Feb. 22, 1988, Ser. No. 161,373

The portion of the term of this patent subsequent to Jan. 13, 2004, has been disclaimed.

Int. Cl.⁴ G11B 7/00

U.S. Cl. 369—100

20 Claims

1. An optical recording medium for the recording of information comprising:

- (i) an opaque microporous polymer layer comprised of a microporous polymer film which has been produced by a stretching technique such that the film structure contains an inherent strain, the pores of the microporous polymer film having an effective pore size less than 500 Angstroms, and wherein the microporous polymer layer collapses upon transmission of heat thereto, and
- (ii) an energy-absorbing material situated with regard to the microporous polymer so as to be able to transmit heat thereto, and which upon irradiation with a light source

transmits thermal energy to the microporous polymer layer to cause a collapse in the microporous structure of said microporous polymer layer in those areas irradiated.

4,878,213

SYSTEM FOR RECORDING AND READOUT OF INFORMATION AT ATOMIC SCALE DENSITIES AND METHOD THEREFOR

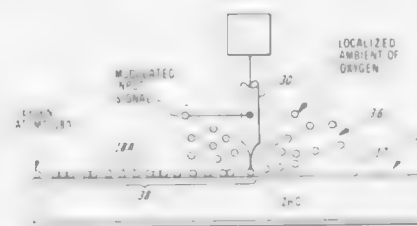
Benjamin Kazan, Los Altos, and Stig B. M. Hagstrom, Menlo Park, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 651,396, Sep. 14, 1984, abandoned. This application Oct. 3, 1988, Ser. No. 253,165

Int. Cl.⁴ G11B 9/00

U.S. Cl. 369—126

18 Claims



1. In the method of atomic scale recording and readout of information wherein a readout electrode means is scanned across the surface of a carrier having adhesion properties for an associated atomic particle, the pattern of said particles formed on said carrier representative of recorded information and comprising the steps of

- determining the topography of said carrier surface prior to recording information on the surface of said carrier by applying a voltage to said readout electrode means creating a tunnel current between said electrode means and the surface of said carrier and scanning said electrode across said carrier surface, the nonrecord output signal at said electrode comprising variations of said tunnel current at said electrode representative of said carrier surface topography,

selectively supply said atomic particles to the surface of said recording electrode means by inducing said particle to adhere to the surface thereof, the pattern of said atomic particles on the surface of said carrier representative of recorded information, determining again the topography of said carrier surface by applying a voltage to said readout electrode means creating a tunnel current between said electrode means and the surface of said carrier and scanning said electrode across said carrier surface, the record output signal at said electrode comprising variations of said tunnel current representative of the presence or absence of said atomic particles on the surface of said carrier, and

producing a resultant readout information signal having high signal-to-noise ratio by taking the identically scanned difference between said record output signal and said nonrecord output signal.

4,878,214

OBJECTIVE LENS SUPPORTING DEVICE FOR OPTICAL PICKUP

Hiroaki Hinotani, Kakuda, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed May 26, 1988, Ser. No. 199,103

Claims priority, application Japan, Sep. 8, 1987, 62-138086[U]

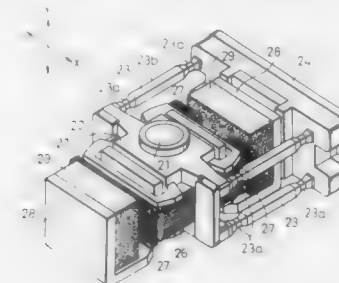
Int. Cl.⁴ G11B 7/08; G02B 7/02

U.S. Cl. 369—256

4 Claims

1. In an objective lens supporting device for an optical pickup including an objective lens opposed to an optical disc,

a lens holder for holding said objective lens, a plurality of supporting rods formed of elastic material and arranged in parallel to each other, said lens holder being operatively supported by said supporting rods, and a driving mechanism for driving said lens holder in both a direction of an optical axis of said objective lens and a direction along an information recorded surface of said optical disc; the improvement compris-



ing a pair of neck portions formed at both end portions of said each supporting rod, said each neck portion having a section such that a geometrical moment of inertia with respect to a first axis intersecting a primary axis and extending in said direction of said optical axis of said objective lens is equal to a geometrical moment of inertia with respect to a second axis intersecting said primary axis and extending in said direction along said information recorded surface of said optical disc.

4,878,215

SIGNAL SWITCHING SYSTEM

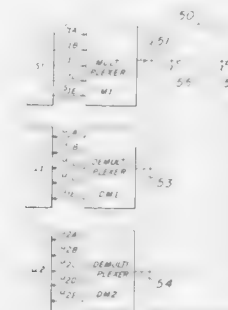
William P. Rogers, Collingswood, N.J., assignor to Telenex Corporation, Mount Laurel, N.J.

Filed Mar. 20, 1987, Ser. No. 28,604

Int. Cl.⁴ H04Q 11/04; H04J 3/12

U.S. Cl. 370—58.1

3 Claims



- 1. A signal-switching system, comprising:
- a plurality of groups of input signal lines each carrying on one of its lines a data signal and on a plurality of its other lines signals relating to said data signal
- a plurality of time multiplexers each connected to a corresponding different one of said groups of input signal lines and each producing a stream of time-multiplexed serial-bit signals corresponding to the signals on said corresponding groups of input signal lines;
- a plurality of serial-to-parallel time demultiplexing means each responsive to any of said streams of time-multiplexed serial signals supplied thereto to produce a corresponding group of separate reproduced parallel signals substantially the same as those carried by that one of said groups of input lines connected thereto;
- cross-point signal switching means connected between all of said multiplexers and all of said demultiplexers and controllable to supply any one of said streams of serial-bit signals directly, and without storage, substantially instan-

taneously from the multiplexer producing it to any selected one of said plurality of time-demultiplexing means without changing the order of bits in said streams; and means for supplying said reproduced parallel signals from each of said time-demultiplexing means to a corresponding one of said groups of signal utilization lines.

4,878,216

METHOD FOR MANAGEMENT OF LOGICAL CHANNELS FOR ISDN PACKET SERVICE

Hideo Yunoki, Tokyo, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

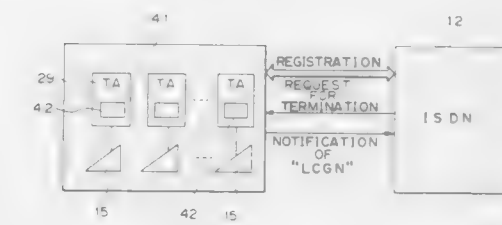
Filed Mar. 2, 1988, Ser. No. 163,096

Claims priority, application Japan, Mar. 2, 1987, 62-045167

Int. Cl.⁴ H04M 3/00

U.S. Cl. 370—60

14 Claims



1. A method for management of logical channels for packet service in an integrated services digital network used for packet communications between subscribers, where each subscriber has a number of pieces of data terminal equipment and communication packets are handled via terminal adapters, each terminal adapter provided for one piece of the data terminal equipment, said method comprising the steps of:

- (a) allotting a logical channel group number for each piece of the data terminal equipment; and
- (b) storing the logical channel group number in logical channel management memories, each corresponding to one piece of the data terminal equipment.

4,878,217

DATA OUTPUTTING DEVICE

Norimasa Nakamura, and Satoshi Kishimoto, both of Saitama, Japan, assignors to Pioneer Ansafone Manufacturing Corporation, Saitama, Japan

Filed Feb. 1, 1988, Ser. No. 150,855

Claims priority, application Japan, Jan. 30, 1987, 62-20116

Int. Cl.⁴ H04J 3/02

U.S. Cl. 370—77

5 Claims



- 1. A data outputting device for outputting a plurality of data equal in content and whose beginnings are shifted in time from one another, comprising:
- a memory for storing said data in a digital mode;
- a counter for successively providing, during each of a plural-

ity of predetermined periods, memory addresses whose number corresponds to a number of channels employed; a selection circuit means for selectively providing to said channels said data stored in said memory and read out in accordance with said addresses provided by said counter.

4,878,218
DATA TRANSMISSION METHOD AND DATA TRANSMISSION SYSTEM FREE FROM LOCAL TRAFFIC JAM

Ikuko Takada, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

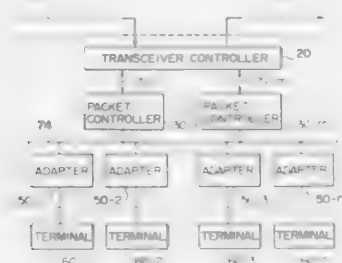
Filed Aug. 24, 1988, Ser. No. 235,553

Claims priority, application Japan, Aug. 31, 1987, 62-216659; Jun. 10, 1988, 63-142909

Int. Cl.⁴ H04J 3/26

U.S. Cl. 370-94

20 Claims



1. A data transmission system which effectively utilizes channels of a multiplexed transmission line, comprising:

a plurality of packet control means, each provided for a channel each for receiving packets to store the received packets, each packet having a priority, for calculating an average priority of the stored packets and for transmitting the stored packets through a corresponding channel; and adapter means for selecting as a destination packet control means one of said plurality of packet control means, in accordance with a priority of an object packet to be transmitted and the average priorities calculated by said plurality of packet control means, and for transmitting the object packet to said destination packet control means.

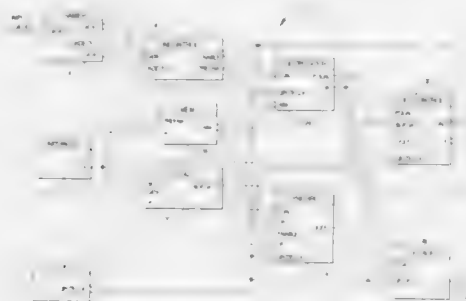
4,878,219
METHOD AND APPARATUS FOR NODES IN NETWORK TO AVOID SHRINKAGE OF AN INTERFRAME GAP
Charles W. Kaufman, Northboro; Mark F. Kempf, Stow, and Jerry D. Hutchison, Littleton, all of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Apr. 28, 1988, Ser. No. 187,208

Int. Cl.⁴ H04J 3/02, 3/24; H04B 3/36

U.S. Cl. 370-97

60 Claims



1. An output controller in a repeater node for controlling data transfers in a data communication system, the data com-

munication system including a plurality of nodes coupled in a network for transferring frames of data from a source node to a destination node through a plurality of repeater nodes, wherein the repeater node receives a plurality of bytes in a frame from an upstream node, stores the plurality of bytes in an elasticity buffer, and transmits the plurality of bytes in the frame to a downstream node, wherein a last byte of a preceding frame and a starting delimiter for a subsequent frame are separated by a preamble including at least a minimum number of idle bytes, wherein each node in the network is operated by an independent local clock, and wherein the repeater node includes an input controller, the output controller comprising:

means coupled to the elasticity buffer for transmitting bytes to the downstream node in response to a local clock signal;

means coupled to the transmitting means for indicating an idle byte is being transmitted to the downstream node;

means coupled to the idle byte indicating means for counting the number of idle bytes being transmitted to the downstream node;

control means coupled to the counting means and responsive to an indication from the input controller of receipt of the starting delimiter for the subsequent frame, for asserting a control signal to enable transmission of the starting delimiter to the downstream node in response to an idle byte count indicating that more than a threshold number of idle bytes is being transmitted to the downstream node, and for not asserting the control signal to delay transmission of the starting delimiter in response to an idle byte count indicating that the threshold number of idle bytes is being transmitted to the downstream node; and

means coupled to the control means and the transmitting means for transmitting an additional idle byte to the downstream node in response to deassertion of the control signal at times when an equal signal is received indicating the starting delimiter is ready to be output.

4,878,220
SEMICONDUCTOR MEMORY DEVICE
Kiyokazu Hashimoto, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Nov. 19, 1987, Ser. No. 123,008

Claims priority, application Japan, Nov. 19, 1986, 61-277126

Int. Cl.⁴ G06F 11/10

U.S. Cl. 371-40.1

9 Claims



1. A semiconductor memory device fabricated on a single semiconductor substrate and having a write-in mode, a read-out mode and a diagnostic mode, comprising:

(a) a check-bit producing circuit operative to produce check bits based on data bits representing a piece of data information supplied from the outside of said semiconductor memory device in said write-in mode, said check-bits being used to decide whether or not any error is introduced in said data information in said semiconductor memory device, said error being represented by an error bit;

(b) a plurality of memory cell groups each capable of storing the data bits representing said data information and the check bits produced by said check-bit producing circuit;

- (c) an error detecting circuit operative to identify at least one error bit in said data bits read out from one of said memory cell groups or in dummy bits on the basis of the data bits representing said data information stored in said one of said memory group and said check bits or alternatively on the basis of said dummy bits and to produce an output signal consisting of a plurality of data bits and representing said at least one error bit, if any, in said read-out mode or said diagnostic mode;
- (d) an error correction circuit supplied with the data bits representing said data information stored in said one of said memory cell group, said check bits in said one of said memory cell group and said output signal produced by said error detecting circuit or alternatively with said dummy bits and said output signal and operative to correct said at least one error bit in said read-out mode or said diagnostic mode; and
- (e) a test pattern producing circuit operative to supply said error detecting circuit and said error correction circuit with said dummy bits having said error bit and check bits which are produced on the basis of said data bits without said error bit, said test pattern producing circuit supplying the dummy bits to said error detecting circuit and said error correction circuit while bypassing any of said memory cell groups in said diagnostic mode.

4,878,221
ERROR-CORRECTING DECODER FOR RAPIDLY DEALING WITH BUFFER OVERFLOW
Michio Shimada, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Dec. 28, 1987, Ser. No. 138,273

Claims priority, application Japan, Dec. 25, 1986, 61-310331

Int. Cl.⁴ G06F 11/10

U.S. Cl. 371-43

6 Claims



1. An error-correcting decoder for use as a counterpart of an error-correction encoder for encoding a sequence of original information symbols into a sequence of original code symbols by production of original redundancy symbols in accordance with a predetermined rule and by addition of said redundancy symbols to the respective information symbols to form the respective code symbols, said decoder including a sequential decode controller for executing a sequential decoding algorithm on an input sequence of received code symbols corresponding to the respective original code symbols to produce a local sequence of presumed information symbols, an encoder replica for encoding said local sequence into a replica output sequence of presumed code symbols by production of presumed redundancy symbols in accordance with said predetermined rule and by addition of said presumed redundancy symbols to the respective presumed information symbols to form

the respective presumed code symbols, and a likelihood calculator responsive to said input and said replica output sequences for calculating likelihoods which said presumed code symbols have relative to the respective received code symbols, said likelihood calculator thereby producing a likelihood signal representative of said likelihoods, wherein the improvement comprises:

a position counter coupled to said sequential decode controller for counting position counts for the respective presumed information symbols in said local sequence to produce a count signal representative of said position counts; modifying means responsive to said count signal for modifying said likelihood signal into a modified signal by giving a predetermined value to the likelihoods calculated for the respective presumed redundancy symbols until said position counts reach a predetermined count after initialization of said position counter; and supplying means for supplying said modified signal to said sequential decode controller to make said modified signal control execution of said sequential decoding algorithm.

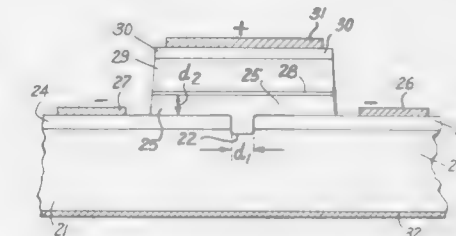
4,878,222
DIODE LASER WITH IMPROVED MEANS FOR ELECTRICALLY MODULATING THE EMITTED LIGHT BEAM INTENSITY INCLUDING TURN-ON AND TURN-OFF AND ELECTRICALLY CONTROLLING THE POSITION OF THE EMITTED LASER BEAM SPOT
David J. Lawrence, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 5, 1988, Ser. No. 228,430

Int. Cl.⁴ H01S 3/19

U.S. Cl. 372-48

30 Claims



1. A heterostructure combined semiconductor diode laser and junction field effect transistor device having a centrally located conduction path from a central exposed contact on its top surface through a centrally located semiconductor active laser region disposed between upper and lower opposite conductivity type cladding regions formed over a semiconductor substrate of the same conductivity type as the lower cladding region and having at least one laser stripe channel filled with a semiconductor composition of the same conductivity type as the lower cladding region and formed in the top surface of the substrate which supports the vertically arrayed cladding and active regions and an exposed contact on its underside; characterized in that:

first and second semiconductor barrier regions of opposite conductivity type from the substrate are interposed on opposite sides of the laser stripe channel between the lower cladding region and the substrate and electrically isolated one from the other; first and second exposed contacts are formed on the top surfaces of the respective first and second barrier regions; means for applying independently controlled bias potentials to the respective barrier regions via the first and second barrier layer contacts whereby depletion regions of independently controlled extent are established by the barrier regions in the laser stripe channel for controlling the magnitude of the current through the central conduction

path to thereby modulate the intensity of a laser light beam produced in the active region.

4,878,223

SEMICONDUCTOR LASER ARRAY DEVICE

Taiji Morimoto, Nara; Hiroyuki Hosoba, Teiri; Mitsuhiro Matsumoto, Nara; Mototaka Taneya, Tsukuba, and Sadayoshi Matsui, Teiri, all of Japan, assignors to Sharp Kabushiki Kaisha, Japan

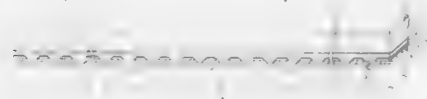
Filed Jul. 26, 1988, Ser. No. 224,558

Claims priority, application Japan, Jul. 28, 1987, 62-188279

Int. Cl.⁴ H01S 3/19

U.S. Cl. 372—50

3 Claims



1. In a semiconductor laser array device comprising a substrate with a plurality of first grooves with a given pitch, and a current blocking layer with a conductivity type that is different from that of said substrate and that is disposed on the groove-side surface of said substrate, an improved structure wherein:

said current blocking layer has a plurality of second grooves on its crystal growth surface that is opposite to the groove-side surface of said substrate;

a heterostructure multi-layered crystal is disposed on said current blocking layer, said multi-layered crystal having an active layer for laser oscillation; and

the position of each of the first grooves is shifted half a pitch from that of each of the second grooves in a central area elongated substantially along the laser oscillation direction, and wherein each of the first grooves is positioned over each of the second grooves in side areas, said second grooves reaching said substrate through said current blocking layer in said central area, which results in current paths.

4,878,224

DYE LASERS

James E. Kuder, Fanwood; James L. McGinnis, Tewksbury Twp.; Harris A. Goldberg, Colonia; Timothy R. Hart, Hoboken, and Tessie M. Che, Westfield, all of N.J., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Filed Sep. 16, 1988, Ser. No. 245,090

Int. Cl.⁴ H01S 3/22

U.S. Cl. 372—53

24 Claims

1. A dye laser consisting of a composite composition of an inorganic oxide glass monolith with a microporous structure containing an incorporated solution comprising a solvent component and a lasable dye component, and wherein the glass monolith has sealed outer surfaces.

4,878,225

CONTROLLING APPARATUS FOR LASER DIODE

Masahiko Aiba, Nara, and Yukio Mizuno, Yamatokoriyama, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 89,532, Aug. 26, 1987, abandoned. This application Mar. 20, 1989, Ser. No. 326,453

Claims priority, application Japan, Aug. 26, 1986, 61-200404; Aug. 27, 1986, 61-202467

Int. Cl.⁴ H01S 3/00

U.S. Cl. 372—38

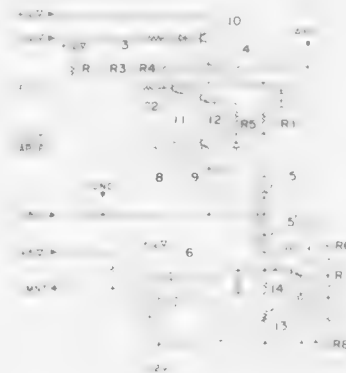
13 Claims

1. A laser diode controlling apparatus for controlling a current supplied to a laser diode that is used for printing in a laser printing apparatus provided with a monitor that monitors

light intensity of the laser diode by developing a monitoring signal related thereto, comprising:

comparing means for comparing the monitoring signal developed by the laser diode with a predetermined reference intensity signal and developing a reference signal in response thereto;

central processing means for developing a pulse signal representative of a desired light intensity level in response to said reference signal received from said comparing means; duty cycle controlling means responsive to said pulse signal for developing a duty cycle control signal having a duty



cycle related to the current to be supplied to the laser diode;

smoothing means for developing a DC analog signal by smoothing said duty cycle control signal; and

current conversion means for supplying a drive current to the laser diode related to the DC analog signal, the laser diode developing light intensity related to said drive current;

said central processing means developing said pulse signal and thereby enabling adjustment of light intensity of the laser diode only during an initialization period preceding printing by the laser diode.

4,878,226

MULTIPLE POINT REMOTE TEMPERATURE SENSING

Bryan K. McQuoid, Simsbury, Conn.; Earl J. Charlson, and Huber Graham, both of Columbia, Mo., assignors to Combustion Engineering, Inc., Windsor, Conn. and Curators of the University of Missouri, Columbia, Mo.

Continuation of Ser. No. 12,269, Feb. 9, 1987, abandoned. This application Apr. 22, 1988, Ser. No. 185,105

Int. Cl.⁴ G01K 7/16, 13/00

U.S. Cl. 374—166

29 Claims

OUTPUT TO ALARM OR PROTECTION DEVICES



1. Apparatus for sensing the temperature at a plurality of remotely located points in a predetermined sequence comprising:

elongated cable means, said cable means having a pair of opposite ends and at least a pair of access terminals at a first of the said ends thereof, said cable means including a conductor extending from each of said access terminals to the second end thereof, said cable means further including

plural spatially separated inactive segments positioned along the length thereof, said inactive segments being comprised of material which is an electrical and thermal insulator;

a plurality of spatially separated temperature responsive electrical circuit components carried by said cable means, said components being located along said cable means in regions between said inactive segments thereof, each of said components providing a signal which varies as a function of local ambient temperature;

a plurality of sensor circuits, each of said sensor circuits being juxtapositioned to and electrically connected to an associated one of said temperature responsive components, said sensor circuits each having a unique address and being responsive to an interrogating signal which includes the unique address;

means connecting each of said sensor circuits to at least a first of said cable means conductors whereby information commensurate with the signal provided by said temperature responsive components may be sampled via the sensor circuit associated therewith in response to an interrogating signal which includes the sensor circuit address; and

address signal generator means connected to said first cable means conductor via a cable means access terminal for generating interrogating signals for said sensor circuits in a predetermined sequence, each of said interrogating signals including the address of a sensor circuit whereby the information commensurate with the signals provided by said temperature responsive components will be individually available on said first cable means conductor.

4,878,227

DEVICE FOR A MODULAR POWER LASER

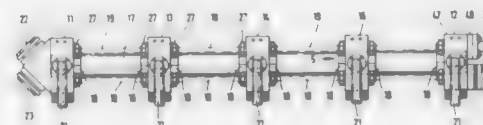
Frank Ackermann, Höhenzollstr. 13, 4000 Stuttgart; Reinhard Wollermann-Windgasse, Höhenstr. 13, 7143 Vaihingen/Enz-Riet, and Bernd Faller, Hirschlanderstr. 2, 7257 Ditzingen, all of Fed. Rep. of Germany

Filed Nov. 2, 1987, Ser. No. 115,419

Int. Cl.⁴ H01S 3/08

U.S. Cl. 372—107

5 Claims



1. A device for a modular CO₂ laser having two end-flange devices,

at least one intermediate-flange device,

at least one metallic support tube that is resistant to bending and has two end regions fixedly mounted in said two end-flange devices and a central region to which said intermediate-flange device is secured,

gas pipes between said two end-flange devices, said gas pipes having a coefficient of thermal expansion different from that of said metallic support tube and having end regions mounted in said flange devices so as to be floating in terms of thermal expansion,

at least one at most partially-transmitting mirror device at least one of said end-flange devices, said mirror device comprising a mirror and a massive support plate carrying a mounting for said mirror,

an adjusting-screw device, which comprises a reference position and two metal screws, said reference position forming an origin of X axis and Y axis coordinates and said two metal screws being situated in said X axis and Y axis respectively, said mirror being adjustable by rotation of at least one of said screws, and comprising the improvement wherein:

(a) the metal of said metallic support tube has a coefficient of thermal expansion that is not particularly low, and
(b) the metal of said metal screws has a particularly low coefficient of thermal expansion.

4,878,228

MICROWAVE RELAY STATION HAVING A COMMON STANDBY CHANNEL FOR SIGNALS OF DIFFERENT TYPES OF MODULATION

Kunihiko Takahashi, Tokyo, Japan, assignor to Nec Corporation, Japan

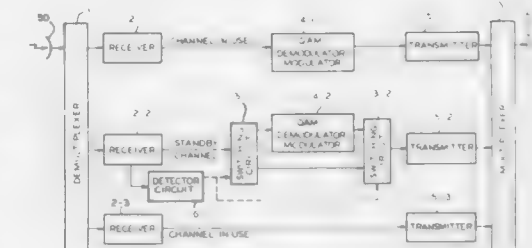
Filed Jul. 1, 1986, Ser. No. 880,789

Claims priority, application Japan, Jul. 4, 1985, 60-145715

Int. Cl.⁴ H04B 3/36, 7/17

U.S. Cl. 375—3

15 Claims



1. A microwave relay station comprising: at least first and second channels for respectively transmitting two different types of signals which are QAM and FM signals, respectively; a standby transmission channel having first and second means for respectively transmitting said two different types of signals; detection means for identifying the type of said signals appearing in said standby channel, said detection means comprising three bandpass filters respectively tuned to high, low and center frequencies of signals passing through said standby channel; measuring means responsive to the outputs of said bandpass filters for determining amplitudes of the signals at said high, low, and center frequencies; selection means responsive to said detection means for selecting one of said first and second means, whereby said standby channel becomes dedicated to the transmission of said identified type of signal; and control means responsive to said determined amplitudes for controlling said selection means.

4,878,229

FAST FRAME AND PHASE SYNCHRONIZATION APPARATUS

Kalman Szechenyi, Spiegelberg, Fed. Rep. of Germany, assignor to Alcatel N.V., Amsterdam, Netherlands

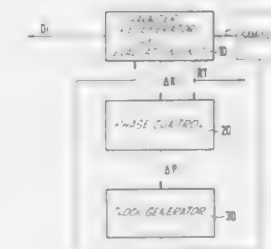
Filed Jun. 7, 1988, Ser. No. 203,672

Claims priority, application Fed. Rep. of Germany, Jun. 12, 1987, 3719659

Int. Cl.⁴ H04L 7/08

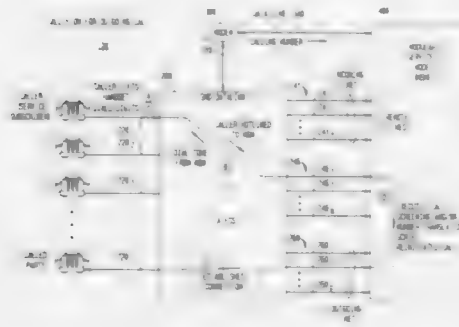
U.S. Cl. 375—14

5 Claims



1. Synchronization apparatus responsive to a digital stream

defines an enhanced service for that subscriber and taking control of said routed telephone call substantially



throughout the remainder of its duration so as to provide the enhanced service to said subscriber.

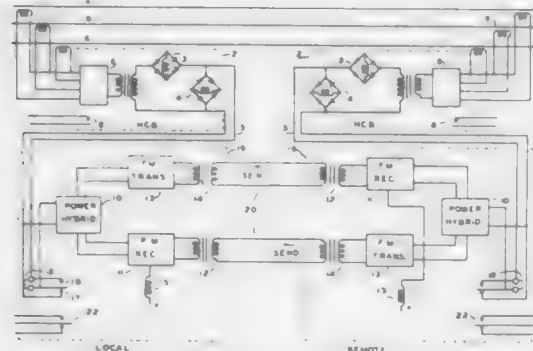
4,878,241

AUDIO FREQUENCY INTERFACE FOR DIFFERENTIAL RELAYS

Everett A. Gilbert, Montrose, Colo., assignor to Da-Tel Research Company, Incorporated, Montrose, Colo.
Filed Oct. 3, 1988, Ser. No. 252,582
Int. Cl.⁴ H04M 11/00

U.S. Cl. 379-106

3 Claims



1. A differential relaying system in an electric power network, each end comprising:

a differential relay with current transformers that detects a fault on a three phase 60 Hz power line, converts the fault currents to a single phase 60 Hz voltage output, compares the phase of this voltage to the voltage received from a similar remote relay and closes a contact for the power line phase of a fault between relays;

a power hybrid that converts the single phase output of the differential relay to a sending and a receiving port, the voltage output of the sending port being proportional to the single phase voltage output of the differential relay and the power input to the receiving port being the same as though two differential relays were connected back-to-back;

a linear FM receiver with its output connected to the above receiving port and a linear FM transmitter with its input connected to the hybrids sending port to form separate sending and receiving communication channels;

means to open the connection to the differential relay and short down the output of the hybrid for low levels of FM signal input to the FM receiver;

means to short down the voltage output of the FM receiver when the FM input signal to the receiver is not present or at a lower than desired level;

means to short down the voltage output of the FM receiver when noise appears in the received FM signal.

4,878,242

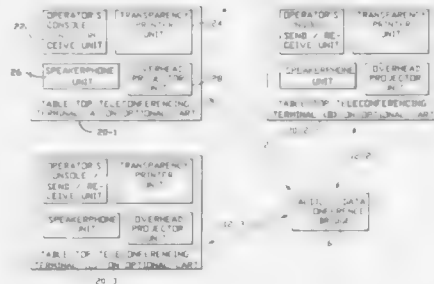
TELECONFERENCING SYSTEM

Robert M. Springer, Wyckoff, N.J.; Richard L. Schmal, Los Gatos, and Eugene H. Gavenman, Los Altos, both of Calif., assignors to Ricoh Corporation, San Jose, Calif.

Continuation-in-part of Ser. No. 890,692, Jul. 25, 1986, abandoned. This application Jul. 22, 1987, Ser. No. 76,380
Int. Cl.⁴ H04M 3/56, 11/00; H04N 1/00

U.S. Cl. 379-204

11 Claims



11. A teleconferencing system comprising three or more audiographic teleconferencing terminals, means for establishing and maintaining audio and facsimile image data communications between said teleconferencing terminals wherein said audio and facsimile image data communications are commonly established and maintained between all of said terminals through a public switched telephone network to an audio conference bridge wherein any one of said terminals can alternately act as a sending terminal or a receiving terminal during a teleconferencing session wherein each of said terminals has a single telephone line connection to said audio bridge and wherein each of said terminals includes means for transmitting said facsimile image data, where any one of said terminals can act as a sending terminal to either transmit audio information simultaneously to each of the remaining of said terminals or transmit facsimile image data simultaneously to each of the remaining of said terminals such that said remaining terminals act as receiving terminals wherein each of said terminals includes means for establishing a dual tone multi-frequency based broadcast and listen protocol when acting as a sending terminal to insure that each of said receiving terminals is connected and enabled for receiving facsimile image data and for establishing parameters for receiving facsimile image data, said sending terminal including

means for generating and transmitting said audio information and facsimile image data to each of said receiving terminals, each of said terminals including means for printing an image corresponding to said transmitted facsimile image data,

telephone speaker means for generating audible signals corresponding to said transmitted audio information, and means for acknowledging to said sending terminal receipt of protocol parameters and facsimile image data.

4,878,243

CALL FORWARDING SYSTEM AND METHOD

Kazuo Hashimoto, Tokyo, Japan, assignor to Hashimoto Corporation, Tokyo, Japan

Filed Jul. 27, 1987, Ser. No. 77,928

Claims priority, application Japan, Jul. 25, 1986, 61-174990
Int. Cl.⁴ H04M 1/64, 3/54

U.S. Cl. 379-211

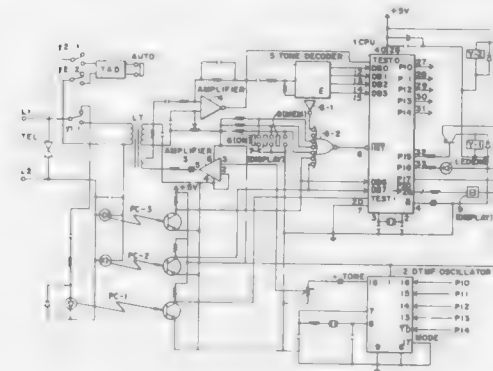
2 Claims

1. A call forwarding control apparatus for use on a subscriber telephone line connected to a central office of a type which causes a call forwarding function (1) to be activated in response to provision of a predetermined first code sequence applied together with a destination telephone number on the

line to the central office, and (2) to be deactivated in response to provision of a predetermined second code sequence on the line to the central office, and wherein the central office provides particular ring back signals in response to an incoming call when call forwarding is activated and otherwise provides usual ring back signals, said apparatus comprising:

memory means storing said predetermined first and second code sequences and having means for storing call forwarding telephone numbers;

means for prestoring in said memory means a first call forwarding telephone number and for registering said first call forwarding telephone number with the central office; means for receiving an incoming call from a caller and for detecting a hang up of said telephone upon reception by the caller of a first one of said particular ring back signals from the central office indicating that call forwarding is



activated, said hang up by the caller of said telephone cancelling forwarding of said incoming call; means responsive to said hang up detected by said receiving and detecting means for auto-dialing the caller at the prestored telephone number;

means for storing in the memory means a second call forwarding telephone number sent on the line by the caller; and means controllable by the caller for selectively (a) transferring the second call forwarding telephone number together with the predetermined first code sequence to the central office for replacing said first call forwarding telephone number therein by said second call forwarding telephone number, or (b) transferring said predetermined second code sequence to said central office for deactivating said call forwarding function.

4,878,244

ELECTRONIC HYBRID CIRCUIT

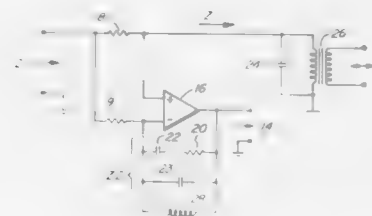
Mumtaz B. Gawargy, Nepean, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Sep. 19, 1985, Ser. No. 777,642

Int. Cl.⁴ H03B 1/58

U.S. Cl. 379-402

15 Claims



1. An electronic hybrid circuit comprising: an input port and an output port for connection to a four-wire path;

a differential amplifier having an inverting input, a non-inverting input, and an output coupled to the output port; first and second impedances each coupled between the input port and a respective one of the inputs of the differential amplifier;

means for coupling a two-wire path to a junction between the first impedance and the differential amplifier; and impedance means coupled to a junction between the second impedance and the differential amplifier, the impedance means including an inductive impedance.

4,878,245

CONTROL AND METERING SYSTEM FOR PAY TELEVISION OVER A CABLE NETWORK

Graham C. Bradley, 3200 College Avenue, Regina, Saskatchewan, Canada (S4T 1V9); Alton O. Stretten, 3615 McCallum Avenue, Regina, Saskatchewan, Canada (S4S 0S6); John P. Stretten, 14 Sussex Crescent, Regina, Saskatchewan, Canada (S4T6A2), and Rex B. Wentzel, #2 Rheims Ct., Lake St., St. Louis, Mo. 63367

Continuation-in-part of Ser. No. 823,759, Jan. 29, 1986, abandoned. This application Jan. 22, 1987, Ser. No. 5,979
Int. Cl.⁴ H04N 7/16, 7/10; H04H 1/00

U.S. Cl. 380-10

14 Claims



13. A secure pay-for-use television distribution system comprising a cable distribution network arranged to distribute subscription television and pay-for-use (PFU) television signals from a central cable station to a plurality of subscriber premises, a plurality of filter units each mounted between the cable network and a subscriber premises to control the transmission of signals to the subscriber premises, a plurality of subscriber actuable control units each for mounting in a respective subscriber premises and connectable to the respective filter unit by a cable and including a power supply means for supplying DC Voltage control signals to the respective filter unit and for receiving therefrom the transmitted signals, each said filter unit comprising inlet terminal means for connection to the cable network, outlet terminal means for connection to said line, means defining a first and a second circuit path between said inlet terminal means and said outlet terminal means, filter means in at least said first circuit path arranged to provide sufficient rejection loss to a TV channel signal so that the TV channel signal emitted from the first circuit path cannot generate a TV picture and arranged to provide a sufficient lower insertion loss to the TV channel signals so as not to interfere with the generation of a TV picture therefrom, and switching circuit means in said first and second circuit paths respective to said control signals from said control unit to open and close alternate ones of said first and second circuit paths, each subscriber control unit including an automatically resettable over-current protection device responsive to an increase in current from said power supply means beyond a predetermined maximum current to limit the current supplied from said subscriber control unit to the respective filter unit, said protection device comprising a mono-stable circuit defined by a pair of transistors one of which is normally on and the other of which is normally off, means connecting the filter unit in series with the

normally on transistor, threshold detection means for detecting the voltage across the normally on transistor and for switching on the normally off transistor when the voltage across the normally on transistor exceeds a predetermined maximum, and delay capacitor means for reducing the rate of increase of voltage across the normally on transistor.

4,878,246

METHOD AND APPARATUS FOR GENERATING ENCRYPTION/DECRYPTION KEY

Jose Pastor, Westport, and Maya R. Barton, Ridgefield, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.
Filed May 2, 1988, Ser. No. 188,866

Int. Cl.⁴ H04L 9/04

U.S. Cl. 380—44

19 Claims



3. Means for generating corresponding keys at first and second stations from an identification number ID, said key having N bits, comprising:

- means at each of said first and second stations for generating an identical first plurality of numbers, modulus A and an identical second plurality of numbers, modulus B, from ID, in accordance with a set of algorithms, wherein A and B are prime numbers, and A is greater than N-1;
- means at each station for generating identical N values y(x), mod A, from a first polynomial having said first plurality of numbers as coefficients and x as a variable, wherein x is an integer from 0 to N-1;
- means at each station for generating an identical value z(y), mod B, from a second polynomial having said second plurality of numbers as coefficients and y as a variable, corresponding to each value of y(x); and,
- means at each station for accessing a memory at addresses determined as a function of y,z corresponding to each value of x to retrieve data therein, and reordering said data as a function of the value of x to produce said key.

4,878,247

METHOD FOR THE PHOTOGRAMMETRIC PICK UP OF AN OBJECT WITH THE AID OF AT LEAST ONE OPTO-ELECTRIC SOLID-STATE SURFACE SENSOR

Wilfried Wester-Ebbinghaus, Barsinghausen; Thomas Luhmann, Hanover; Juergen Mangelndorf, Cremlingen, and Peter Pini, Brunswick, all of Fed. Rep. of Germany, assignors to Rollei Fototechnik GmbH, Brunswick, Fed. Rep. of Germany
Filed Mar. 18, 1987, Ser. No. 27,530

Claims priority, application European Pat. Off., Mar. 19, 1986, 86103748.9

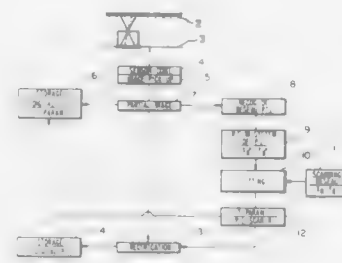
Int. Cl.⁴ G06K 9/00

U.S. Cl. 382—1

23 Claims

1. A method for the photogrammetric pick up of an object, comprising the steps of:

- (a) providing a transparent master having present thereon an image in analog form;
- (b) covering the entire image with a reseau having a predetermined point array marked thereon on which divides the reseau into a pattern of discrete, contiguous meshes, defined by a coordinate system;
- (c) serially imaging, at least one mesh at a time, the reseau and the image area underlying each mesh to provide a series of partial analog images including the reseau points and analog image portions from each mesh;



- (d) opto-electrically converting from analog to digital the analog images of said partial-images to provide corresponding digital partial-images which include the reseau points;
- (e) correlating the reseau points in each of said digital partial-images with the predetermined positions of said points in said point array to provide transformation parameters; and
- (f) converting the digital partial-images into a total image by applying said transformation parameters.

4,878,248

METHOD AND APPARATUS FOR AUTOMATICALLY RECOGNIZING LICENSE PLATE CHARACTERS

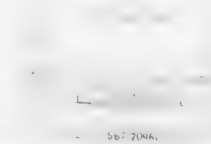
Jia-Ming Shyu; Inn-Ming Chen; Tian-Quey Lee, and Yunn-Chiang Kung, all of Hsin-Chu Hsien, Taiwan, assignors to Industrial Technology Research Institute, Hsin-Chu Hsien, Taiwan

Filed Apr. 20, 1988, Ser. No. 183,987

Int. Cl.⁴ G06K 9/00

U.S. Cl. 382—9

6 Claims



- 1. An apparatus for automatically recognizing the characters on a license plate which is fixed on a vehicle comprising: sensor/controller means for detecting said vehicle, for determining whether said vehicle has reached a predetermined position, and for releasing a trigger signal when said vehicle has reached said predetermined position, said sensor/controller including first, second, and third pairs of photosensors respectively arranged along two sides of a vehicle driving path;

an image-sampling means for sampling a vehicle image in-

cluding the image of said license plate in response to said trigger signal, and for converting said vehicle image into an electric signal, wherein said sensor/controller activates said image sampling device to indicate that said vehicle has reached a predetermined position when a light path between both said first and second pairs of photosensors is interrupted, said third photosensor pair being arranged to ascertain that said license plate is not shaded by another vehicle, wherein the distance between said first and second photosensor pairs is smaller than the length of said vehicle so that when said vehicle has reached a predetermined position, both of said first and second photosensor pairs detect the presence of said vehicle; and an image processing means, coupled to said image sampling means for receiving said electric signal, for digitizing said received electric signal, and for processing said digitized electric signal to estimate the position of said license plate, to determine the bounding edges of the characters on said license plate, to separate each character on said license plate, and to recognize each separated character.

4,878,249

PATTERN RECOGNIZING DEVICE

Toshimi Mifune; Yasuo Morooka; Hiroshi Shojima; Junko Mori, and Yasushi Fukunaga, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

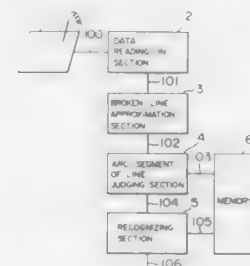
Filed Sep. 25, 1987, Ser. No. 101,124

Claims priority, application Japan, Sep. 26, 1986, 61-228829

Int. Cl.⁴ G06K 9/00

U.S. Cl. 382—13

18 Claims



- 1. A pattern recognizing device comprising: means for forming a structure pattern represented by date of a series of segments, based on a 2-dimensional pattern drawn with a single stroke, wherein said structure pattern forming means includes:
 - (1) means for detecting segments where the relation between two segments adjacent to each other is ambiguous so that it is not possible to determine whether they form an arc or a segment of line, and
 - (2) means for forming a plurality of patterns, each of which is comprised of data of a series of segments, both for the case where it is supposed that an ambiguous segment is an arc and for the case where it is supposed that an ambiguous segment is a segment of line, when at least one ambiguous segment is detected by said detecting means;
- means for storing a plurality of thesaurus structure patterns defined by data of a series of elements, each of which is at least one of an arc and a segment of line; and
- means for selecting one of said thesaurus structure patterns having the greatest similarity with a pattern obtained by said structure pattern forming means, wherein said selecting means includes:
 - (1) first selecting means for selecting a corresponding most similar one of said thesaurus structure patterns for each of said plurality of patterns obtained by said means for forming a plurality of patterns, and
 - (2) recognizing means for determining which one of said most similar thesaurus structure patterns and corre-

sponding one of said plurality of patterns have the greatest similarity.

4,878,250

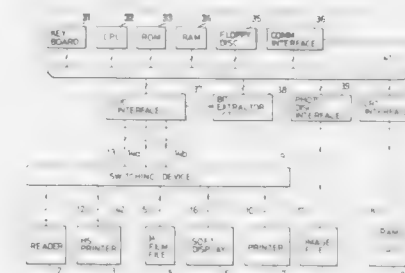
IMAGE PROCESSING SYSTEM

Masahide Kotera; Motofumi Konishi, both of Yokohama; Yoshio Ando, Chigasaki; Toshio Iwaya, Shiki; Kanou Tanaka, Yokohama; Norio Hashimoto, Tokyo; Yasutoshi Sugita, Urayasu; Yoshitaka Sano, Matsudo, and Satoshi Ono, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 48,507, May 11, 1987, abandoned, which is a continuation of Ser. No. 658,380, Oct. 5, 1984, abandoned. This application Mar. 10, 1988, Ser. No. 169,134
Claims priority, application Japan, Oct. 12, 1983, 58-191338; Oct. 12, 1983, 58-191339

Int. Cl.⁴ G06K 9/36

U.S. Cl. 382—56

9 Claims



- 1. An image processing system comprising: a bus for transmitting image data; means for generating a first form of image data representing a frame of an original image; first and second processing means, connected to said bus, for receiving and processing image data transmitted on said bus, said first processing means adapted to process said first form of the image data, and said second processing means being adapted to process a second form of the image data, said second form being different from said first form; converting means, connected to said generating means, for converting said first form of image data generated by said generating means into the second form of image data representing a frame of the original image; storage means, connected to said converting means, for storing said second form of image data output from said converting means; and transmitting means, connected to said bus, said generating means and said storage means, for intermittently transmitting a frame of said first form of image data generated by said generating means on a basis of a predetermined amount through said bus to said first processing means, while transmitting said second form of image data stored in said storage means through said bus to said second processing means in blank intervals which occur between the intermittent transmissions of a frame of said first form of image data.

4,878,251

INTERFERENCE SIGNAL SUPPRESSOR FOR A RADIO RECEIVER

Christopher K. Richardson, Romsey, England, assignor to Plessey Overseas Limited, Ilford, England

Filed Apr. 25, 1986, Ser. No. 856,327

Claims priority, application United Kingdom, Apr. 29, 1985, 8510130

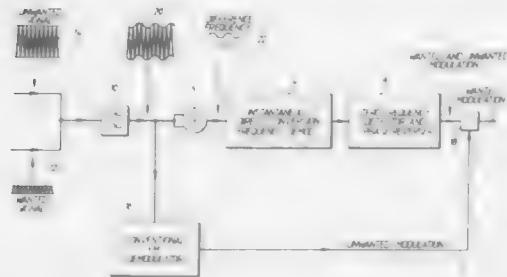
Int. Cl.⁴ H04B 1/16

U.S. Cl. 455—206

14 Claims

1. An interference suppressor and demodulation unit for a

radio receiver for suppressing an unwanted FM signal having a signal strength greater than the signal strength of a wanted FM signal, each FM signal having a respective frequency, the suppressor comprising means for providing an amplitude modulated beat signal from the wanted and unwanted FM signals, said means being coupled to a means for providing a difference frequency signal in dependence upon the amplitude modulated beat signal, a first demodulator arranged to receive the difference frequency signal and apply this through a zero frequency detector and phase reverser to provide a composite baseband



signal comprising a modulation of the wanted and unwanted FM signals, a further demodulator arranged to receive the amplitude modulated beat signal, for providing a baseband signal corresponding to the modulation of the unwanted FM signal, and a combiner coupled to the first demodulator and said further demodulator, the combiner being arranged to receive the composite baseband signal and the baseband signal for providing an output signal comprising the modulation of the wanted FM signal and in which the unwanted signal has been suppressed.

4,878,252

MODIFIED MULTI-PATH DETECTOR

Franciscus J. A. M. Sessink, Eindhoven, Netherlands, assignor to U. S. Philips Corporation, New York, N.Y.

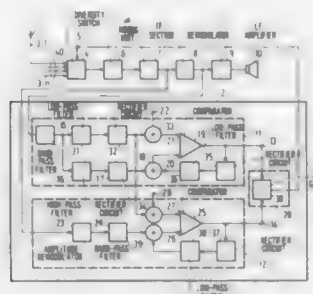
Filed Nov. 30, 1987, Ser. No. 126,382

Claims priority, application Netherlands, Dec. 18, 1986, 1986/00011

Int. Cl.⁴ H04B 1/10

U.S. Cl. 455—276

5 Claims



1. A receiver for angle-modulated signals, coming from one or a plurality of antennas, comprising a diversity switch having a signal input connected to at least one antenna, a signal output and a control input for selecting at the signal output an angle-modulated signal by means of a control signal on the control input, and comprising a multi-path detector coupled to the signal output and connected to the control input for supplying the control signal to the control input when the multi-path detector detects multi-path distortion in the selected signal, the multi-path detector comprising a threshold arrangement coupled to the output of the diversity switch for generating a threshold voltage having an amplitude value depending on the frequency swing of the angle-modulated signal, characterized in that the threshold voltage has an amplitude value instantaneously varying with the frequency swing of the angle-modulated signal, and in that said multi-path detector has a sensitivity the variation of which instantaneously corresponds to the variation of the amplitude value of the threshold voltage.

neously varying with the frequency swing of the angle-modulated signal, and in that said multi-path detector has a sensitivity the variation of which instantaneously corresponds to the variation of the amplitude value of the threshold voltage.

4,878,253

PLANAR MONOLITHIC MILLIMETER WAVE MIXER

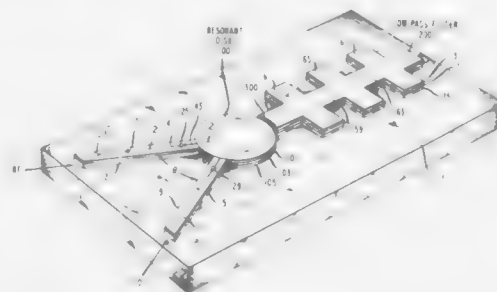
Samuel Dixon, Jr., Neptune, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 31, 1988, Ser. No. 176,125

Int. Cl.⁴ H04B 1/26

U.S. Cl. 455—327

1 Claim



1. A monolithic waveguide mixer device comprising: a pair of arms connected respectively to a source of incident RF power and a local oscillator; said arms containing a layer of semi-insulating gallium arsenide deposited upon a metallic ground plane and covered with a conductive layer; said arms having in-situ Schottky barrier diodes monolithically integrated in the arms such that said diodes are oriented in opposite directions respective to one another; and a resonant disk abutting said arms and composed of a layer of semi-insulating gallium arsenide sandwiched between two gold layers; said arms separated by angle theta (θ) such that theta (θ) should be no smaller than one-quarter the guide wavelength; and said resonant disk gap-coupled to a low-pass filter.

4,878,254

COMPACT SIGNAL ENHANCER

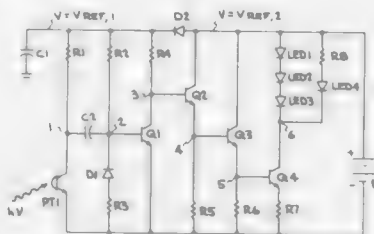
David Richardson, 2588 Knightsbridge La., Santa Clara, Calif. 95050

Filed Dec. 30, 1986, Ser. No. 947,853

Int. Cl.⁴ H04B 9/00

U.S. Cl. 455—601

12 Claims



1. An electronic network for receipt, enhancement and re-broadcast of an electromagnetic signal, the network comprising:

- a source of ground reference voltage;
- a first source of positive voltage;
- a second source of positive voltage;

- a first capacitor of capacitance substantially 47 microfarads, with a first capacitor terminal connected to ground and second capacitor terminal connected to the first source of positive voltage;
- a first resistor of resistance substantially 150 Ohms with a first resistor terminal connected to the first positive voltage source;
- photosensitive means having a collector connected to a second terminal of the first resistor and having an emitter connected to the ground reference voltage;
- a second capacitor of capacitance substantially 1-10 nanofarads, with a first capacitor terminal connected to the collector of the photosensitive means;
- a second resistor of resistance substantially 3 megaohms, with a first resistor terminal connected to the first positive voltage source and with a second resistor terminal connected to a second terminal of the second capacitor;
- a first diode with one terminal connected to the second terminal of the second capacitor;
- a third resistor of resistance substantially 36 kilo-ohms, with a first resistor terminal connected to the anode of the first diode and with a second resistor terminal connected to the ground reference voltage;
- a fourth resistor of resistance substantially 820 kilo-ohms,

- with a first resistor terminal connected to the first positive voltage source;
- a first transistor with its collector connected to a second terminal of the fourth resistor, its base connected to the second terminal of the second capacitor, and its emitter connected to the ground reference voltage;
- a second diode with its cathode connected to the first positive voltage source and its anode connected to the second positive voltage source;
- a second transistor with its base operatively associated with the collector of the first-transistor; a fifth resistor of resistance substantially one Ohm, with a first resistor terminal connected to the emitter of the second transistor, and with the second resistor terminal connection to the ground reference voltage;
- a light emitting diode with its anode connected to the second positive voltage source and its cathode operatively associated with the collector of the second transistor; and
- a battery or other voltage source, providing voltage of substantially four volts or more, with its high voltage terminal connected to the second positive voltage source and its low voltage terminal connected to the ground reference voltage.

DESIGNS

OCTOBER 31, 1989

304,255

BRASSIERE

Shiela Guss, Saddle Brook, N.J., assignor to Playtex Apparel, Inc., Stamford, Conn.

Filed Jul. 23, 1986, Ser. No. 889,580

Term of patent 14 years

U.S. Cl. D2—24



304,257

DICKEY AND HOOD COMBINATION

Larry R. Dorning, 104 W. Washington St., Paris, Tenn. 38242

Filed Jun. 2, 1986, Ser. No. 869,922

Term of patent 14 years

U.S. Cl. D2—181



304,258

FOOTBALL JERSEY

Hal D. Mitchell, Rolla, Mo., and James D. Gardner, Knoxville, Tenn., assignors to Figgie International Inc., Willoughby, Ohio

Filed Jan. 23, 1987, Ser. No. 6,595

Term of patent 14 years

U.S. Cl. D2—217



304,256

BUNTING BAG

Theresa D. McEntee, 116 Roselawn Ave., Toronto, Ontario, Canada (M4R 1E7)

Filed Nov. 17, 1986, Ser. No. 931,192

Claims priority, application Canada, Jun. 23, 1986, 23-06-86-1

Term of patent 14 years

U.S. Cl. D2—25



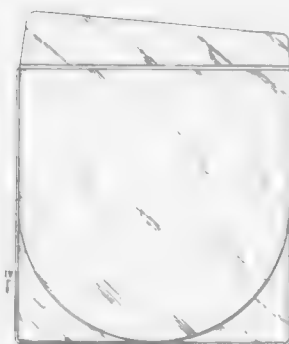
304,259
SHOE SOLE

Kiyotaka Nakano, Kurume, Japan, assignor to Nippon Rubber Co., Ltd., Tokyo, Japan
Filed Feb. 10, 1987, Ser. No. 13,265
Claims priority, application Japan, Sep. 5, 1986, 61-35300
Term of patent 14 years
U.S. Cl. D2—320



304,261
RECORD HOLDER

George C. H. Cheung, Hong Kong, Hong Kong, assignor to Tak Ming Industrial Co., Kowloon, Hong Kong
Filed May 22, 1986, Ser. No. 866,110
Claims priority, application United Kingdom, Nov. 22, 1985, 1030642
Term of patent 14 years
U.S. Cl. D3—35



304,260
TELESCOPIC UMBRELLA STICK FOR COLLAPSIBLE UMBRELLAS

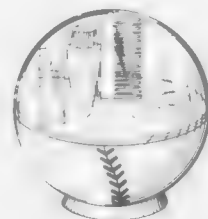
Tilman Schultes, and Joachim Seidel, both of Solingen, Fed. Rep. of Germany, assignors to Kortenbach Verwaltungs- und Beteiligungsgesellschaft mbH & Co., Solingen, Fed. Rep. of Germany

Filed Feb. 3, 1986, Ser. No. 825,438
Term of patent 14 years
U.S. Cl. D3—10



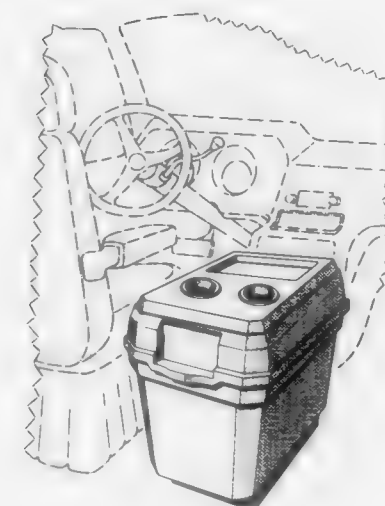
304,262
TOILETRY KIT

David W. Mays, 3018 Kingsley Rd., Shaker Heights, Ohio 44122
Filed Jul. 17, 1986, Ser. No. 886,448
Term of patent 14 years
U.S. Cl. D3—39



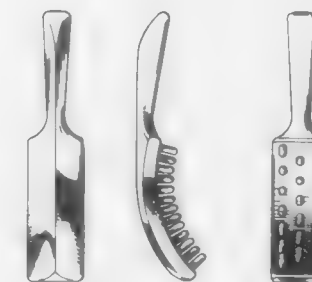
304,263
COMBINED AUTOMOTIVE CONSOLE AND LITTER CONTAINER

Donald R. Mull, 823 Holloway St., Alcoa, Tenn. 37701
Continuation-in-part of Ser. No. 659,082, Dec. 14, 1984. This application May 12, 1986, Ser. No. 862,575
Term of patent 14 years
U.S. Cl. D3—40



304,265
HAIRBRUSH

Michael Boweter, Corvallis, Oreg., assignor to NUWAVE Products Ltd, Santa Barbara, Calif.
Filed May 22, 1987, Ser. No. 52,956
Term of patent 14 years
U.S. Cl. D4—136



304,266
SOFA

Richard Frinier, Long Beach, Calif., assignor to Brown Jordan Company, El Monte, Calif.
Filed Jul. 3, 1985, Ser. No. 752,240
The portion of the term of this patent subsequent to Jul. 5, 2002, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—381



304,264
CARRYING CASE

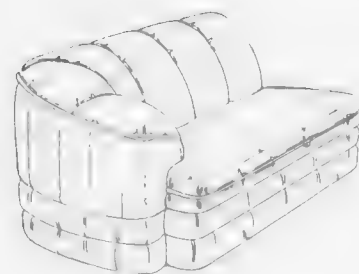
Paul K. Peregrine, 1541 Platte St., Denver, Colo. 80202, and Scott A. Seamans, 660 Quince Cir., Boulder, Colo. 80302
Division of Ser. No. 840,725, Feb. 28, 1986. This application Feb. 13, 1989, Ser. No. 309,229
Term of patent 14 years
U.S. Cl. D3—50



304,267
SOFA

Frank A. Warren, Denville, N.J., assignor to Universal Furniture Industries, Inc., High Point, N.C.
Filed Nov. 12, 1986, Ser. No. 929,659
Term of patent 14 years

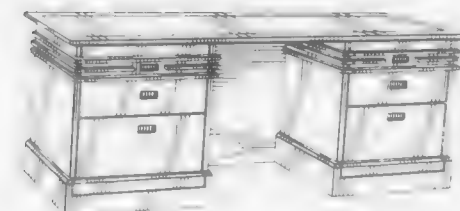
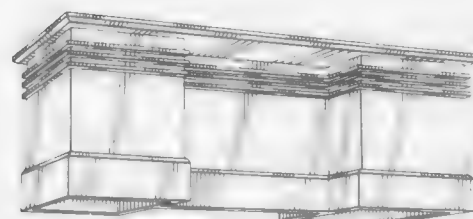
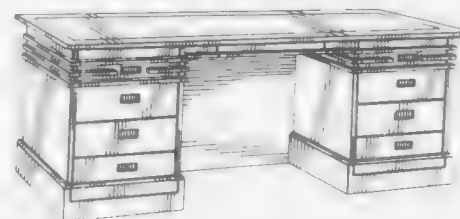
U.S. Cl. D6—381

304,268
DESK

Inger Bartlett, 57 Chestnut Park Road, Toronto, Ontario, Canada (M4W 1W7)
Filed Oct. 21, 1985, Ser. No. 789,697

Claims priority, application Canada, Aug. 2, 1985, 02-08-85-8
Term of patent 14 years

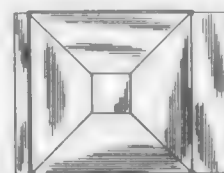
U.S. Cl. D6—428



304,269

PROTECTIVE HOLDER FOR A BEVERAGE
Scott W. Sandgren, 8817 W. River Rd., Brooklyn Park, Minn.
Filed Jun. 9, 1986, Ser. No. 872,454

Term of patent 14 years
U.S. Cl. D6—432



304,270

ADJUSTABLE KEYBOARD SUPPORT STAND
Howard B. Goldman, 246 Ashford Ave., Tonawanda, N.Y. 14150
Filed Nov. 17, 1986, Ser. No. 931,151
Term of patent 14 years

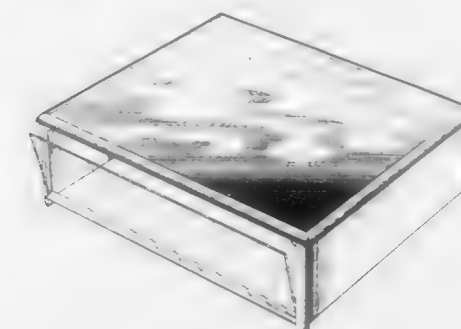
U.S. Cl. D6—462



304,271

AUDIO VIDEO COMPONENT DUST COVER
Van K. Johnson, 7005 Meadow Park North, North Richland Hills, Tex. 76180
Filed Nov. 19, 1986, Ser. No. 932,902

Term of patent 14 years
U.S. Cl. D6—470



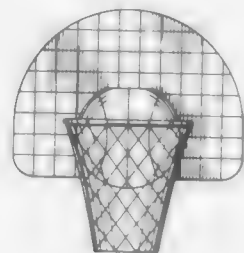
304,272

WALL MOUNTED PLANTER

Ada M. Brown, 3240 Prospect, Flint, Mich. 48504
Filed Nov. 30, 1987, Ser. No. 126,682

Term of patent 14 years

U.S. Cl. D6—557



304,273

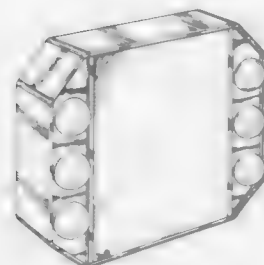
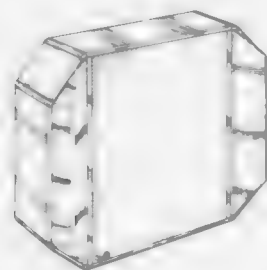
MIRRORED CABINET

Heinz G. Baus, 35 Wartbodenstrasse, CH-3626 Hünibach-Thun,
Switzerland

Filed Aug. 17, 1987, Ser. No. 85,657

Term of patent 14 years

U.S. Cl. D6—559



304,274

COMBINED MIRRORRED CABINET AND LIGHTS

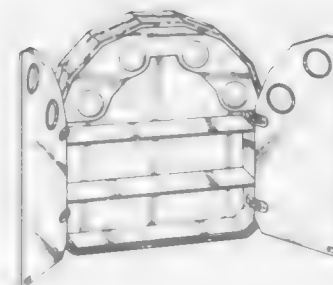
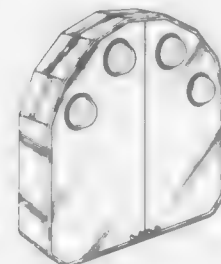
Heinz G. Baus, 35 Wartbodenstrasse, CH-3626 Hünibach-Thun,
Switzerland

Filed Aug. 17, 1987, Ser. No. 85,693

Claims priority, application World Int. Prop. O., Mar. 16,
1987, DM/008330

Term of patent 14 years

U.S. Cl. D6—561



304,275

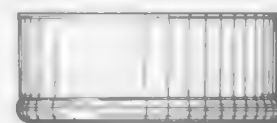
BOWL

Val A. Kiefer, 11333 20th Ave. NE, Seattle, Wash. 98125

Filed Dec. 29, 1986, Ser. No. 947,497

Term of patent 14 years

U.S. Cl. D7—23



304,276

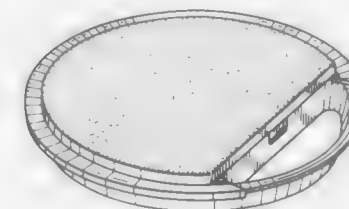
CUTTING BOARD OR THE LIKE

Martin J. Wolff, North Providence, and Larry G. Zimmerman,
North Smithfield, both of R.I., assignors to Dart Industries
Inc., Deerfield, Ill.

Filed Jul. 17, 1986, Ser. No. 887,843

Term of patent 14 years

U.S. Cl. D7—46



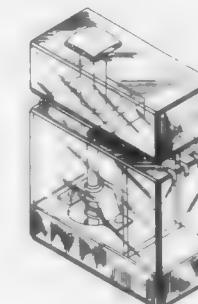
304,278

CONDIMENT MILL

William E. Bounds, P.O. Box 1547, Torrance, Calif. 90505
Filed Jun. 17, 1986, Ser. No. 875,657

Term of patent 14 years

U.S. Cl. D7—53



304,279

CONDIMENT SHAKER

J. Craig Colquitt, 9331 Barrington Blvd., Knoxville, Tenn. 37922

Filed Nov. 21, 1986, Ser. No. 933,595

Term of patent 14 years

U.S. Cl. D7—56



304,277

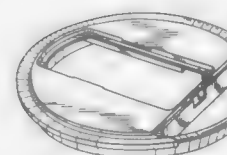
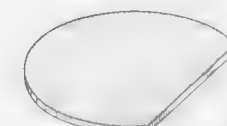
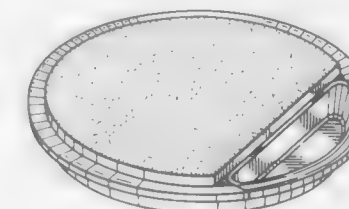
COMBINED FOOD CUTTING BOARD AND MEASURING CUP OR THE LIKE

Martin J. Wolff, North Providence, and Larry G. Zimmerman,
North Smithfield, both of R.I., assignors to Dart Industries
Inc., Deerfield, Ill.

Filed Jul. 23, 1986, Ser. No. 889,482

Term of patent 14 years

U.S. Cl. D7—46



304,280

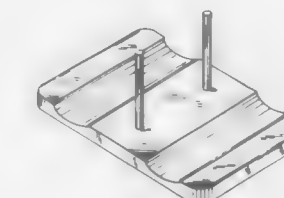
COMBINED POT LID AND UTENSIL HOLDER

Mark A. Leighton, 2200 Fifth Ave., Helena, Mont. 59601

Filed Feb. 20, 1987, Ser. No. 16,860

Term of patent 14 years

U.S. Cl. D7—73



304,281

MICROWAVE OVEN

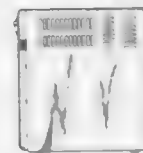
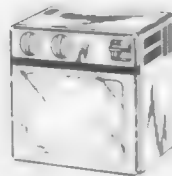
Masahito Naito, Kokubunji; Toshiro Higo, Hino; Tetsuro Aobori, Kunitachi; Eichi Kubota, Tokyo, and Takeichi Obata, Hino, all of Japan, assignors to Hitachi Heating Appliances Co., Ltd., Kashiwa, Japan

Filed Jun. 20, 1986, Ser. No. 876,393

Claims priority, application Japan, Dec. 26, 1985, 60-54316

Term of patent 14 years

U.S. Cl. D7—351



304,283

SYRUP PUMP FOR BEVERAGE DISPENSING

William S. Credle, Jr., Stone Mountain, Ga., assignor to The Coca-Cola Company, Atlanta, Ga.

Filed May 2, 1986, Ser. No. 859,878

Term of patent 14 years

U.S. Cl. D7—397



304,282

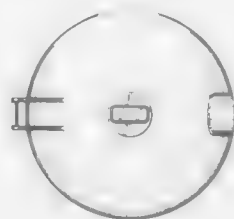
CONTAINER LID

Bryan A. Feimer, Parma; Henry G. Roethel, Ravenna, and Raymond P. Kowalics, Solon, all of Ohio, assignors to The Meyer Company, Cleveland, Ohio

Filed May 2, 1986, Ser. No. 859,242

Term of patent 14 years

U.S. Cl. D7—391



304,284

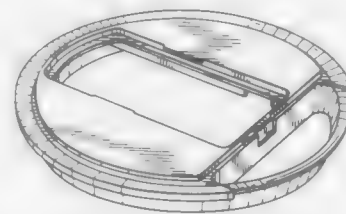
FOOD GRATER FRAME OR THE LIKE

Martin J. Wolff, North Providence, and Larry G. Zimmerman, North Smithfield, both of R.I., assignors to Dart Industries Inc., Deerfield, Ill.

Filed Jul. 17, 1986, Ser. No. 887,410

Term of patent 14 years

U.S. Cl. D7—412



304,285

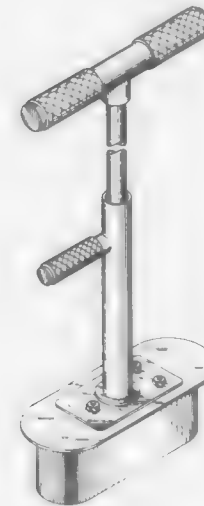
DIVOT REPLACER FOR GOLF COURSE MAINTENANCE

John E. Schreiber, 19 York Rd., Glenmont, N.Y. 12077

Filed Oct. 29, 1987, Ser. No. 114,372

Term of patent 14 years

U.S. Cl. D8—1



304,287

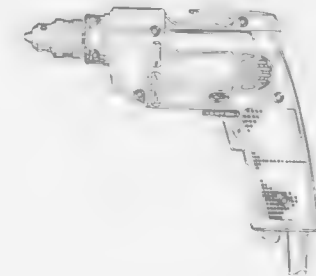
ELECTRIC DRILL OR SIMILAR ARTICLE

Donald W. Zarwelle, Lutherville, Md., assignor to Black & Decker Inc., Newark, Del.

Filed Aug. 7, 1987, Ser. No. 83,412

Term of patent 14 years

U.S. Cl. D8—68



304,288

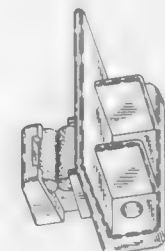
KNIFE SHARPENER

Raymond A. Young, 2615 SE. Courtney Sp. 8, Milwaukie, Oreg. 97131

Continuation-in-part of Ser. No. 107,530, Oct. 13, 1987. This application Nov. 30, 1987, Ser. No. 126,681

Term of patent 14 years

U.S. Cl. D8—93



304,286

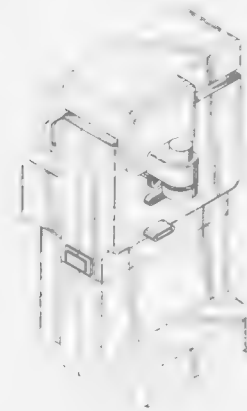
ELECTRIC CAN OPENER WITH VERTICAL HEIGHT ADJUSTMENT

George Schmidt, Douglaston, N.Y., assignor to Farberware Inc., Bronx, N.Y.

Filed Apr. 4, 1986, Ser. No. 850,369

Term of patent 14 years

U.S. Cl. D8—36



304,289

LETTER OPENER

Chester E. Kirk, 3537 NW. Mink Pl., Corvallis, Oreg. 97330

Filed Apr. 3, 1986, Ser. No. 847,827

Term of patent 14 years

U.S. Cl. D8—102



304,290

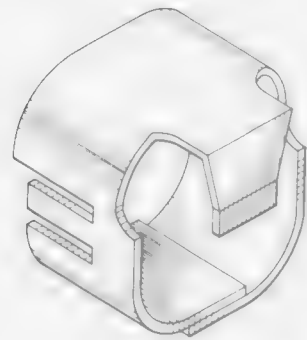
AUTOMOBILE STEERING COLUMN LOCK

James E. Wright, 1244 Elson Rd., Chester Township, Delaware County, Pa. 19015

Filed May 18, 1988, Ser. No. 195,531

Term of patent 14 years

U.S. Cl. D8—330



304,293

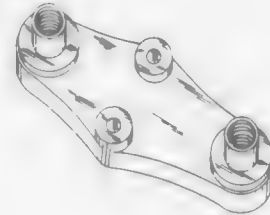
SOLDERABLE MOUNT FOR AN ELECTRONIC DEVICE

Alfred F. McCarthy, Belmont, N.H., assignor to Aavid Engineering, Inc., Laconia, N.H.

Filed May 30, 1986, Ser. No. 869,072

Term of patent 14 years

U.S. Cl. D8—349



304,291

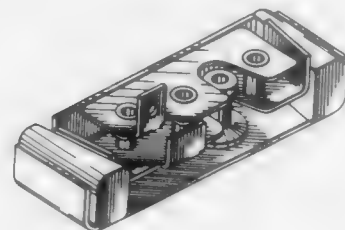
COMBINED LATCH HOUSING AND INTERENGAGEABLE STRIKE PLATE

Lee S. Weiserman, Medina, and Joel T. Vargns, Middleburg Heights, both of Ohio, assignors to The Eastern Company, Cleveland, Ohio

Filed Oct. 16, 1987, Ser. No. 109,421

Term of patent 14 years

U.S. Cl. D8—331



304,294

COMBINED CONTAINER AND INTEGRAL FLEXIBLE FUNNEL

Dale Grenda, 1110 Marshall Ave., South Milw., Wis. 53172

Filed Apr. 18, 1986, Ser. No. 856,125

Term of patent 14 years

U.S. Cl. D9—337



304,292

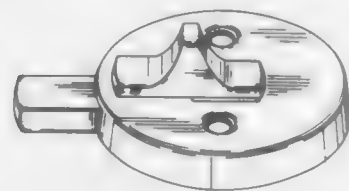
SURFACE MOUNTED LATCH BOLT

Louis G. Bobrowski, Berlin, Conn., assignor to The Stanley Works, New Britain, Conn.

Filed Dec. 9, 1987, Ser. No. 130,662

Term of patent 14 years

U.S. Cl. D8—341



304,295

FOLDING CONTAINER

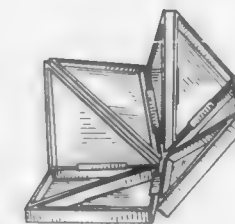
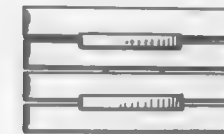
Kichinosake Yamanaka, Tokyo, Japan, assignor to Kabushiki Kaisha Bandai d/b/a Bandai Co., Ltd., Tokyo, Japan

Filed Jul. 2, 1987, Ser. No. 69,595

Claims priority, application Japan, Jan. 29, 1987, 62-3305

Term of patent 14 years

U.S. Cl. D9—341



304,297

BOTTLE

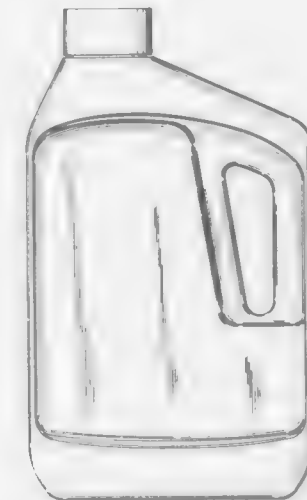
Umberto D. I. Segati, Brussels, Belgium, assignor to Colgate-Palmolive Company, Piscataway, N.J.

Filed Mar. 31, 1988, Ser. No. 176,812

The portion of the term of this patent subsequent to Aug. 22, 2003, has been disclaimed.

Term of patent 14 years

U.S. Cl. D9—376



304,296

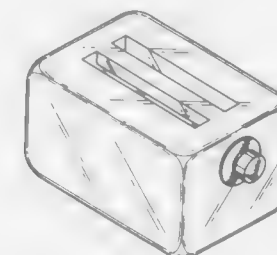
COMBINED BOTTLE AND HANDLE

Robert Wilson, 1344 Carver Pl., Hamilton, Ohio 45011, and Wayne Hayes, 95 Walnut Pl., Springboro, Ohio 45066

Filed Jul. 29, 1986, Ser. No. 890,352

Term of patent 14 years

U.S. Cl. D9—374



304,298

COMBINED BOTTLE AND CAP

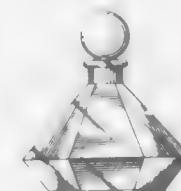
Roger Bannister, London, England, assignor to Helix Fragrances Inc., Toronto, Canada

Filed Aug. 1, 1986, Ser. No. 891,670

Claims priority, application Canada, May 14, 1986, 14-05-86-11

Term of patent 14 years

U.S. Cl. D9—386



304,299

PUNCTURABLE TRANSPARENT CONTAINER

Mitsunori Sakamoto, 9-28-8-323, Seijo, Setagaya-Ku, Tokyo 157, Japan

Filed Apr. 14, 1986, Ser. No. 851,687

Term of patent 14 years

U.S. Cl. D9—425



304,300

CONTAINER BLANK

Richard T. Duke, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Feb. 6, 1986, Ser. No. 826,702

Term of patent 14 years

U.S. Cl. D9—433



304,302

CAN END

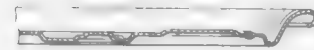
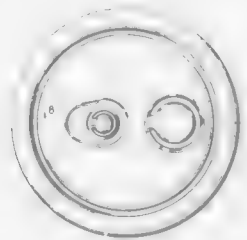
Alan G. Dall, Warrandyte, and Peter L. Revill, Middle Park, both of Australia, assignors to The Broken Hill Proprietary Company Limited, Victoria, Australia

Filed Dec. 4, 1985, Ser. No. 804,639

Claims priority, application Australia, Jun. 5, 1985, 1531/85; Jul. 17, 1985, 1909/85

Term of patent 14 years

U.S. Cl. D9—438



304,303

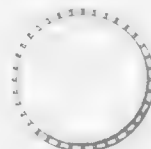
CONTAINER CAP

Charles W. Hurst, and Gates M. Moss, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Feb. 6, 1986, Ser. No. 826,703

Term of patent 14 years

U.S. Cl. D9—453



304,301

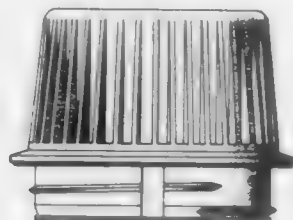
MEASURING CUP CLOSURE

Gates M. Moss, and Samuel Ross, both of Cincinnati, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Feb. 26, 1986, Ser. No. 836,616

Term of patent 14 years

U.S. Cl. D9—436



304,304

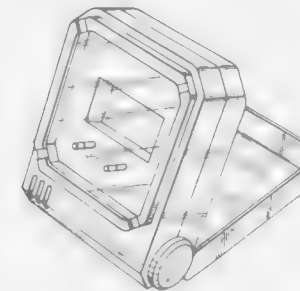
FLIP UP MODULAR DIGITAL CLOCK FOR AUTOMOBILE CONTROL PANELS

Pierre Charet, and Duke Kraal, both of Miami, Fla., assignors to Rally Manufacturing, Inc., Miami, Fla.

Filed May 7, 1986, Ser. No. 860,778

Term of patent 14 years

U.S. Cl. D10—15



304,305

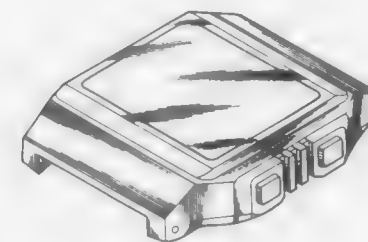
WRIST WATCH

Takashi Morishima, Fussa, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Nov. 24, 1986, Ser. No. 934,322

Term of patent 14 years

U.S. Cl. D10—38



304,306

COMPUTERIZED MULTIPLE FUNCTION BICYCLE METER

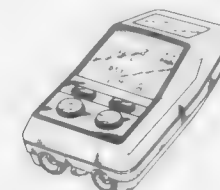
Joe Kagayama, Osaka, Japan, assignor to Cat Eye Co., Ltd., Osaka, Japan

Filed Dec. 31, 1986, Ser. No. 948,292

Claims priority, application Japan, Sep. 2, 1986, 61-034694

Term of patent 14 years

U.S. Cl. D10—46



304,307

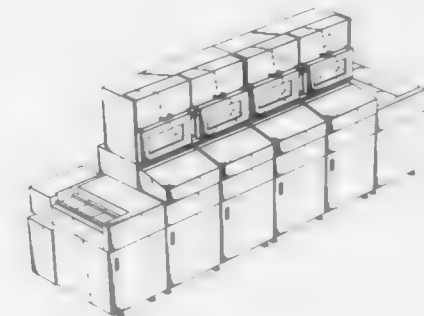
AUTOMATIC CHEMICAL ANALYZER

Yawara Nagai, Hachioji; Shigeru Yoshinari, Tokyo, and Masao Ushikubo, Hachioji, all of Japan, assignors to Olympus Optical Co., Ltd., Japan

Filed Apr. 16, 1986, Ser. No. 852,917

Term of patent 14 years

U.S. Cl. D10—81



304,308

WEIGHING SCALES

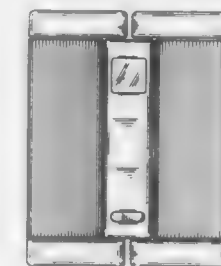
Shinichi Morooka, Osaka, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Oct. 14, 1986, Ser. No. 918,811

Claims priority, application Japan, Apr. 14, 1986, 61-13891

Term of patent 14 years

U.S. Cl. D10—92



304,309

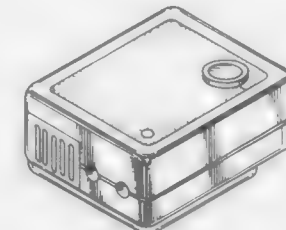
TRANSMITTER CASE

Dennis L. Vorles, Valley Center, Calif., assignor to F. B. Nutter Enterprises, Inc., San Bernardino, Calif.

Filed Mar. 25, 1986, Ser. No. 845,828

Term of patent 14 years

U.S. Cl. D10—106



304,310

EMERGENCY RADIO SIGNAL TRANSMITTER

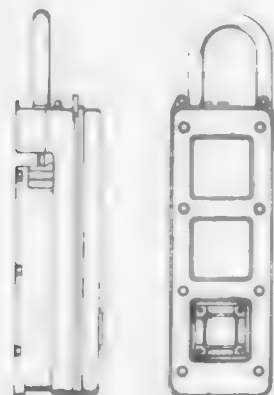
René Calia, Pantin, France, assignor to Aerospatiale Societe Nationale Industrielle, Paris, France

Filed Oct. 9, 1986, Ser. No. 917,375

Claims priority, application Int'l Pat. Institute, Apr. 21, 1986, U.S. Cl. D11-48 DM/006 816

Term of patent 14 years

U.S. Cl. D10-106



304,313

BROOCH

Elaine Foster, 35 E. Ninth St., Apt. 33, New York, N.Y. 10003

Filed Aug. 28, 1986, Ser. No. 901,479

Term of patent 14 years



304,311

POP-UP TIMING DEVICE

DuWayne C. Radke, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jun. 6, 1986, Ser. No. 871,597

Term of patent 14 years

U.S. Cl. D10-109



304,314

LINK ELEMENT

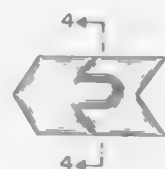
Paolo Bulgari, Rome, Italy, assignor to Partecipazioni Bulgari S.p.A., Rome, Italy

Filed Apr. 30, 1987, Ser. No. 44,109

Claims priority, application Italy, Oct. 31, 1986, 36207-B/86

Term of patent 14 years

U.S. Cl. D11-93



304,312

NECKLACE

Paolo Bulgari, Rome, Italy, assignor to Partecipazioni Bulgari S.p.A., Rome, Italy

Filed Apr. 30, 1987, Ser. No. 44,122

Claims priority, application Italy, Oct. 31, 1986, 36214/86[U]

Term of patent 14 years

U.S. Cl. D11-13



304,315

LINK ELEMENT

Paolo Bulgari, Rome, Italy, assignor to Partecipazioni Bulgari S.p.A., Rome, Italy

Filed Apr. 30, 1987, Ser. No. 44,128

Claims priority, application Italy, Oct. 31, 1986, 36199-B/86

Term of patent 14 years

U.S. Cl. D11-93



304,316

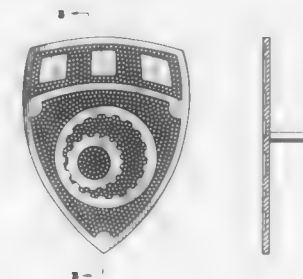
BADGE OR THE LIKE

Ralph Ferricelli, 313 Oradell Ave., Paramus, N.J. 07652, and Raymond Gonzalez, 169 Jane St., Englewood, N.J. 07631

Filed Oct. 9, 1987, Ser. No. 106,708

Term of patent 14 years

U.S. Cl. D11-99



304,318

PLANT BOX

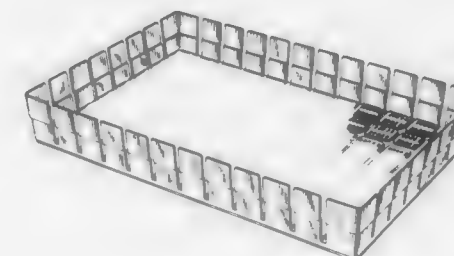
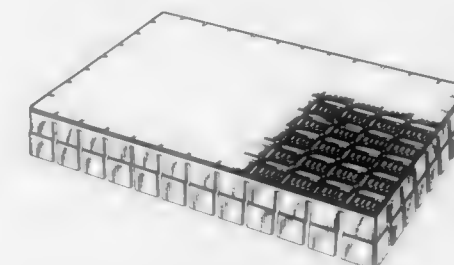
Leo Tervo, Suonenjoki; Matti Jouppi, and Ville Paasonen, both of Jyväskylä, all of Finland, assignors to Vapo Oy, Finland

Filed Mar. 4, 1987, Ser. No. 21,442

Claims priority, application Finland, Sep. 4, 1986, 864/86

Term of patent 14 years

U.S. Cl. D11-155



304,317

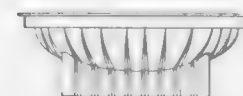
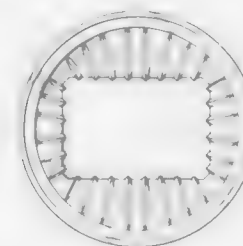
FLORAL CONTAINER

Curtis D. Wagner, Houston, Tex., assignor to Ivex of Delaware, Inc., Houston, Tex.

Filed Mar. 23, 1987, Ser. No. 29,490

Term of patent 14 years

U.S. Cl. D11-153



304,319

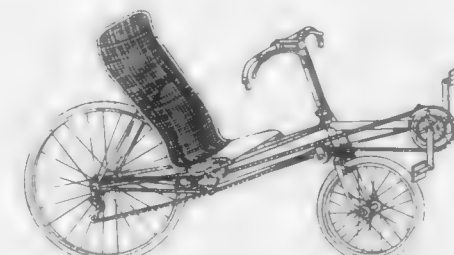
RECLINANT BICYCLE

Tim Brummer, 1308 W. Willow Ave., Lompoc, Calif. 93436

Filed Dec. 5, 1983, Ser. No. 557,949

Term of patent 14 years

U.S. Cl. D12-111



304,320
TIRE

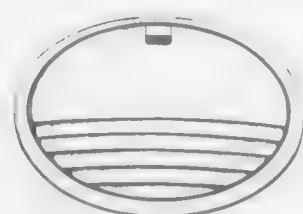
Mark L. Bonko, Hartsville, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Jan. 30, 1987, Ser. No. 9,400
Term of patent 14 years
U.S. Cl. D12—151



304,321

FRONT FACE OF A VEHICLE HUB CAP

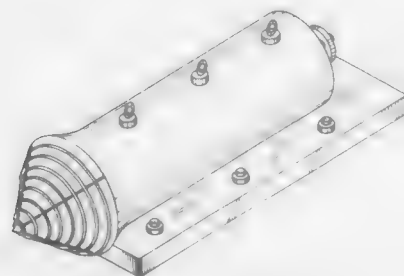
Wolfgang Benke, Offenbach, Fed. Rep. of Germany, assignor to Westfälische Metall Industrie KG Huco & Co., Lippstadt, Fed. Rep. of Germany
Filed Mar. 31, 1986, Ser. No. 846,283
Claims priority, application Fed. Rep. of Germany, Sep. 30, 1985, MR 539
Term of patent 14 years
U.S. Cl. D12—204



304,322

UNDERWATER DYNAMOELECTRIC MACHINE

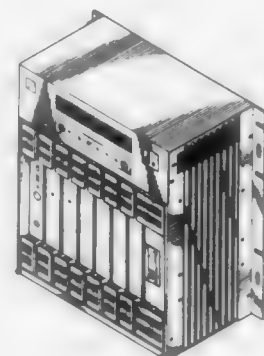
Willis A. Meier, 8704 Zellwood Dr., St. Louis, Mo. 63123
Filed Apr. 22, 1985, Ser. No. 725,778
Term of patent 14 years
U.S. Cl. D13—3



304,323

MODULAR COMPUTER

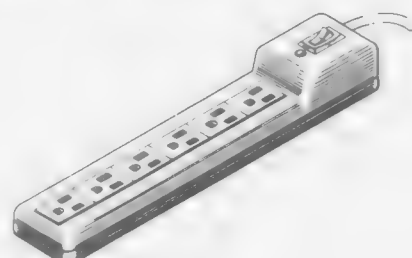
William V. Cranston, III; Randall W. Martin, both of Boca Raton, and Mark A. Young, Lake Worth, all of Fla., assignors to International Business Machines Corp., Armonk, N.Y.
Filed Sep. 25, 1986, Ser. No. 910,515
Term of patent 14 years
U.S. Cl. D13—12



304,324

MULTI-OUTLET CENTER

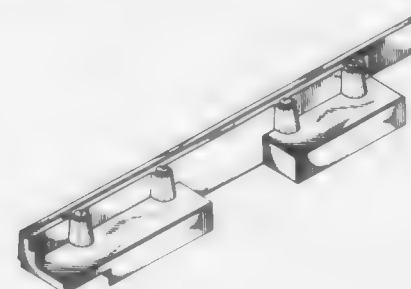
Robert H. Lovett, Eden Prairie; Jay J. Kakuk, Plymouth, and Bart T. Ellison, Chanhassen, all of Minn., assignors to The Toro Company, Minneapolis, Minn.
Filed Feb. 6, 1987, Ser. No. 14,002
Term of patent 14 years
U.S. Cl. D13—30



304,325

ENCLOSURE FOR WIRES INTERCONNECTING ELECTRONIC EQUIPMENT MODULES

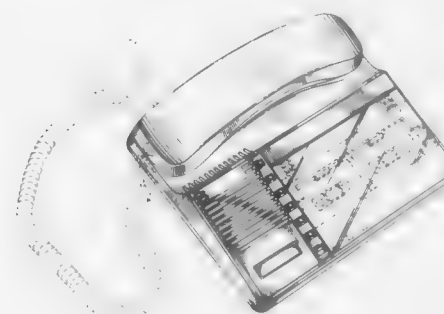
Floyd J. Pushelberg, Ottawa, Canada; James A. Rintala, Livonia, and Leo B. Koziol, Canton, both of Mich., assignors to Northern Telecom Limited, Montreal, Canada
Filed Nov. 13, 1985, Ser. No. 805,103
Term of patent 14 years
U.S. Cl. D13—40



304,326

COMBINATION TELEPHONE SET AND ANSWERING MACHINE

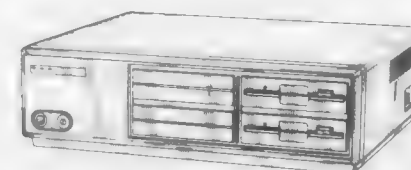
George Perkins, Eugene, Oreg., assignor to TeleQuest, Inc., San Diego, Calif.
Filed Mar. 6, 1987, Ser. No. 22,953
Term of patent 14 years
U.S. Cl. D14—141



304,327

MICROPROCESSOR

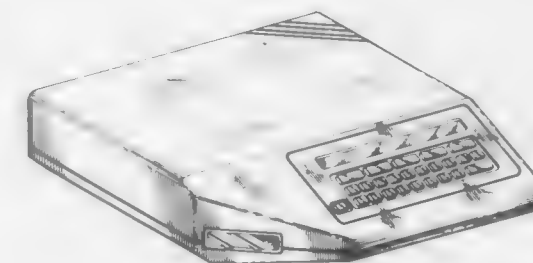
Katsuji Kagayama, Nara; Benito Mishihiro, Osaka; Yoshihiko Sugiyama, Nara, and Ikuo Nishimura, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Aug. 21, 1986, Ser. No. 898,556
Claims priority, application Japan, Mar. 31, 1986, 61-11669; Apr. 18, 1986, 61-14633
Term of patent 14 years
U.S. Cl. D14—100



304,328

DATA TERMINAL OR SIMILAR ARTICLE

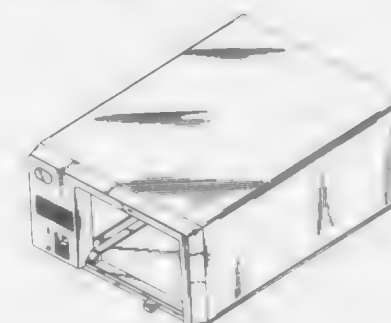
Albert L. Nagele, Wilmette, Ill., assignor to Motorola, Inc., Schaumburg, Ill.
Filed Apr. 2, 1987, Ser. No. 33,549
Term of patent 14 years
U.S. Cl. D14—100



304,329

POWER UNIT COVER FOR A PORTABLE HARDFILE STORAGE DEVICE

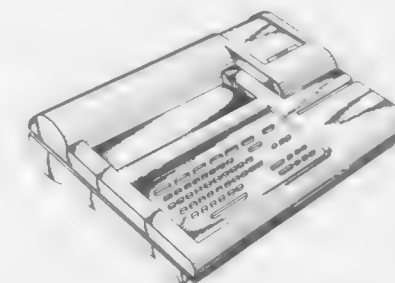
David W. Hill, Rochester, Minn., and Margaret C. Sweeney, Georgetown, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Sep. 26, 1988, Ser. No. 249,466
Term of patent 14 years
U.S. Cl. D14—100



304,330

ELECTRIC TELLER TERMINAL

Gerard Biotteau, Saint Pierre Montlimart, France, assignor to Societe T.B.S. Industrie (SARL), Saint Pierre Montlimart, France
Filed Mar. 11, 1986, Ser. No. 838,599
Term of patent 14 years
U.S. Cl. D14—105



304,331

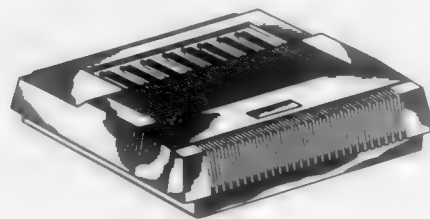
**CLUSTER CONTROLLER FOR INPUT/OUTPUT
SUBSYSTEM**

Lonnie C. Pogue, and Olav Kok, both of San Diego, Calif.,
assignors to Systech Corporation, San Diego, Calif.

Filed Jul. 2, 1986, Ser. No. 881,467

Term of patent 14 years

U.S. Cl. D14—107



304,334

VIDEO TAPE RECORDER

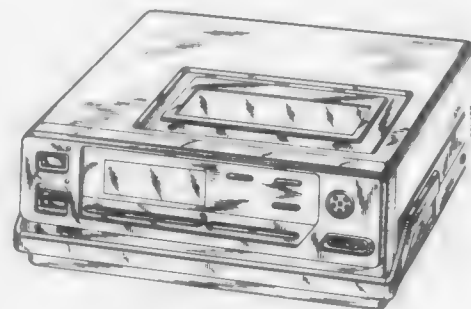
Toshio Ohya, and Sadaoyoshi Ishida, both of Tokyo, Japan,
assignors to Sony Corporation, Tokyo, Japan

Filed Oct. 10, 1985, Ser. No. 786,075

Claims priority, application Japan, May 21, 1985, 60-21031

Term of patent 14 years

U.S. Cl. D14—135



304,335

OPTICAL DISK STORAGE DEVICE

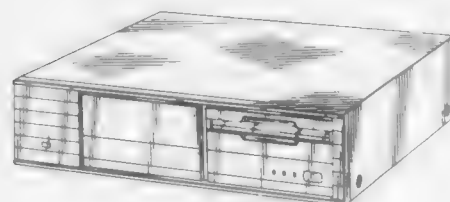
Kunio Hara, Chiba, Japan, assignor to Kabushiki Kaisha To-
shiba, Kawasaki, Japan

Filed Feb. 27, 1987, Ser. No. 20,321

Claims priority, application Japan, Sep. 1, 1986, 61-33961

Term of patent 14 years

U.S. Cl. D14—109



304,336

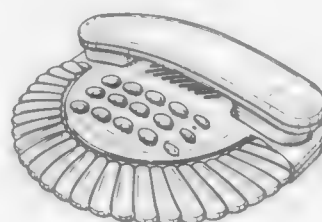
TELEPHONE SET

Jim Chen, No. 166, Sec. 1, Chung-Shan Rd., Yung-Ho City,
Taipei, Taiwan

Filed Jun. 9, 1988, Ser. No. 204,401

Term of patent 14 years

U.S. Cl. D14—142



304,333

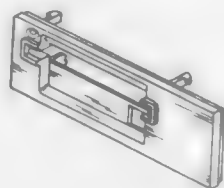
DISKETTE DRIVE FRONT PANEL

Paul A. Kerezman, Royal Palm Beach; Walter B. Koteff, West
Palm Beach, and Alfred A. Stricker, Pompano Beach, all of
Fla., assignors to International Business Machines Corpora-
tion, Armonk, N.Y.

Filed Mar. 7, 1986, Ser. No. 835,305

Term of patent 14 years

U.S. Cl. D14—114



304,336

HANDSET TELEPHONE

George J. Vigil, 1725 Santa Fe River Rd., Santa Fe, N. Mex.
87501

Filed Jul. 18, 1988, Ser. No. 224,138

Term of patent 14 years

U.S. Cl. D14—143



304,337

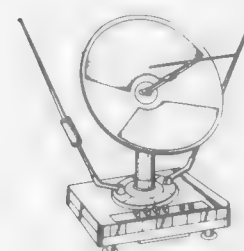
INDOOR ANTENNA

Geo-Bang Tai, Taipei, Taiwan, assignor to King Feng Co. Ltd.,
Taipei, Taiwan

Filed May 19, 1986, Ser. No. 864,898

Term of patent 14 years

U.S. Cl. D14—235



304,339

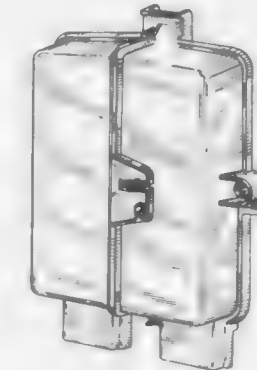
TELEPHONE NETWORK INTERFACE APPARATUS

Thomas J. Collins, Wall; Pina Schneider, Ocean Township;
Anthony L. Nieves, Bradley Beach, and Thomas G. Graham,
Ocean, all of N.J., assignors to Keptel, Inc., Tinton Falls, N.J.

Filed Dec. 30, 1987, Ser. No. 139,427

Term of patent 14 years

U.S. Cl. D14—240



304,338

**COMMUNICATIONS EQUIPMENT KEYBOARD
HOUSING**

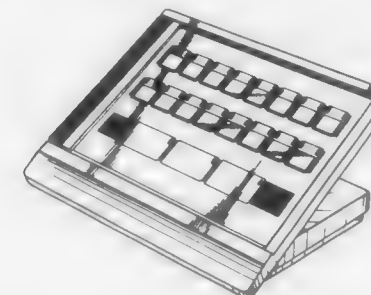
William J. Sermon, London, England, assignor to British Tele-
communications, Great Britain

Filed Feb. 17, 1987, Ser. No. 15,607

Claims priority, application United Kingdom, Aug. 18, 1986,
1036164

Term of patent 14 years

U.S. Cl. D14—240



304,340

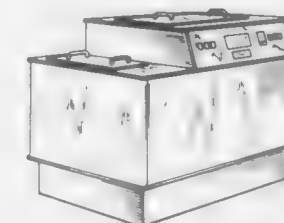
**MACHINE FOR DEHYDRATING PHOTOGRAPHIC
CHEMICALS**

James A. DeLucuw, River Hills, and Raymond E. Sims, Hales
Corners, both of Wis., assignors to Arkay Corporation, Mil-
waukee, Wis.

Filed Jun. 8, 1987, Ser. No. 59,462

Term of patent 14 years

U.S. Cl. D15—199



304,341

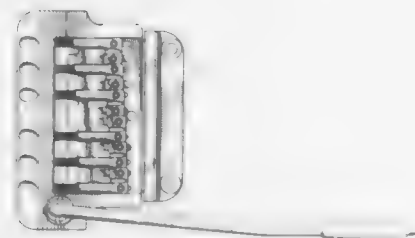
BRIDGE ASSEMBLY FOR GUITARS

Charles A. Gressett, Jr., Brea; Charles H. Todd, III, La Habra, and John F. Page, La Mirada, all of Calif., assignors to Fender Musical Instruments Corporation, Brea, Calif.

Filed May 6, 1983, Ser. No. 492,349

Term of patent 14 years

U.S. Cl. D17—21



304,343

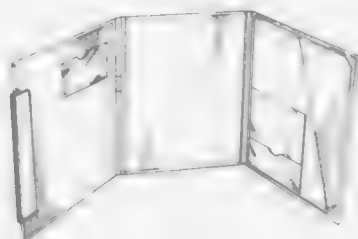
THREE-SIDED MAGNETIC FOLIO

Ghanshyam H. Popat, Alta Loma; Tien-Tsung Chen, Claremont; Christopher H. Binkley, Rancho Palos, and K. Fou Tsai, Rowland Hts., all of Calif., assignors to Avery International, Pasadena, Calif.

Filed May 28, 1986, Ser. No. 869,112

Term of patent 14 years

U.S. Cl. D19—26



304,344

DEVICE FOR MARKING TEXTILES AND TEXTILE-LIKE MATERIALS

Linda R. Thatcher, 2994 W. 1800 South, Logan, Cache County, Utah 84301

Filed Aug. 6, 1986, Ser. No. 893,882

Term of patent 14 years

U.S. Cl. D19—36



304,342

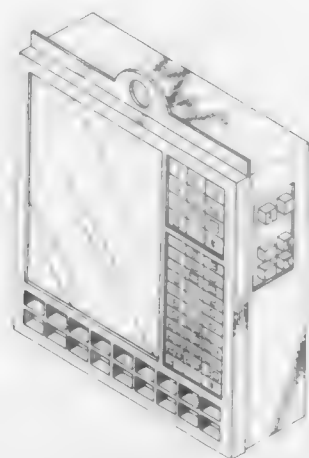
COMBINED TALKING CALENDAR AND THERMOMETER

Willie Harpe, 675 W. Maths St., Deland, Fla. 32720

Filed Sep. 18, 1986, Ser. No. 909,092

Term of patent 14 years

U.S. Cl. D19—21



304,345

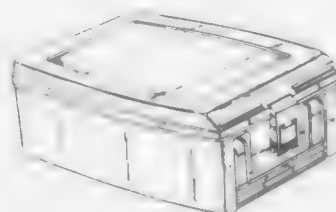
UTILITY FILE

Kenneth C. Foran, Wooster, and Thomas J. David, Worthington, both of Ohio, assignors to Rubbermaid Incorporated, Wooster, Ohio

Filed Aug. 7, 1986, Ser. No. 894,241

Term of patent 14 years

U.S. Cl. D19—75



304,346

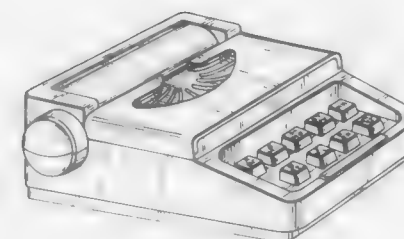
TELEPHONE INDEX UNIT

May Fung, Hong Kong, Hong Kong, assignor to ETNA Products Co. Inc., New York, N.Y.

Filed Oct. 10, 1986, Ser. No. 917,822

Term of patent 14 years

U.S. Cl. D19—76



304,348

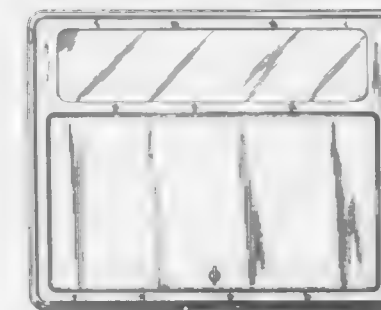
WEATHERIZED DISPLAY BOARD FOR CONSTRUCTION SITES

Gary D. Dunn, 2080 Sandpiper, Palm Harbor, Fla. 34683

Continuation of Ser. No. 920,532, Oct. 20, 1986, abandoned, and a continuation of Ser. No. 125,958, Nov. 27, 1987, Pat. No. 4,821,440. This application Dec. 16, 1988, Ser. No. 285,912

Term of patent 14 years

U.S. Cl. D20—10



304,347

PAPER WEIGHT

William O. Murtagh, Toledo, Ohio, assignor to Gerity Products, Inc., Toledo, Ohio

Filed Jul. 8, 1986, Ser. No. 883,505

Term of patent 14 years

U.S. Cl. D19—97



304,349

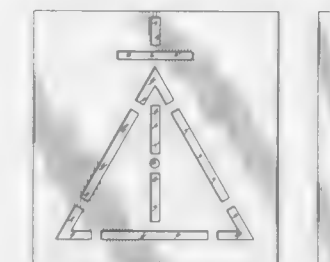
ELECTRONIC DISPLAY PANEL

Jean P. Leger, 11 Deachel Dr., Rochester, N.Y. 14626

Filed Feb. 27, 1987, Ser. No. 19,865

Term of patent 14 years

U.S. Cl. D20—12



304,350

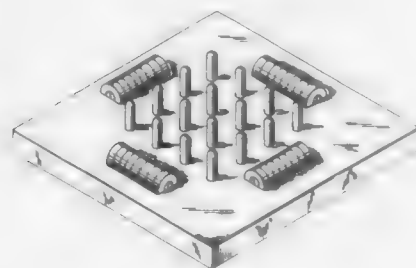
COMBINED GAME BOARD AND GAME PIECES

J. R. Arbogast, 107 Tallowood Dr., Hammond, La. 70401

Filed Jun. 21, 1988, Ser. No. 879,150

Term of patent 14 years

U.S. Cl. D21-14



304,353

CONSTRUCTION TOY LINK

Dennis Moe, 2344 State Hwy. 16, La Crosse, Wis. 54601

Filed Jan. 23, 1987, Ser. No. 6,594

Term of patent 14 years

U.S. Cl. D21-108



304,354

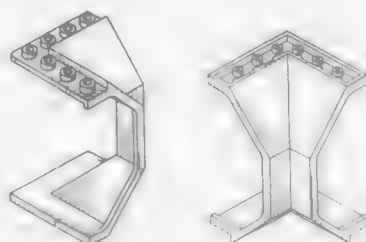
INTERNALLY CURVED TOY WALL ELEMENT

Jens N. Knudsen, Billund, Denmark, assignor to Interlego A.G., Switzerland

Filed Dec. 2, 1987, Ser. No. 127,883

Term of patent 14 years

U.S. Cl. D21-108



304,351

PNEUMATIC DICE AGITATOR

Mario Restaino, 1871 S/W 83rd Ter., Ft. Lauderdale, Fla. 33324

Filed Oct. 14, 1986, Ser. No. 918,874

Term of patent 14 years

U.S. Cl. D21-41



304,352

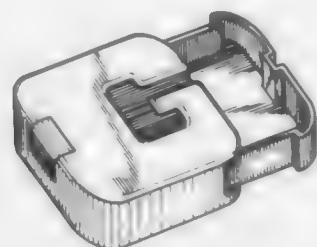
SIMULATIVE TOY BOX

Hiroshi Ukisu, Matsudo, Japan, assignor to Epoch Company, Ltd., Tokyo, Japan

Filed May 20, 1988, Ser. No. 196,339

Term of patent 14 years

U.S. Cl. D21-59



304,355

SIMULATIVE TOY STAPLER

Hiroshi Ukisu, Matsudo, Japan, assignor to Epoch Company, Ltd., Tokyo, Japan

Filed May 20, 1988, Ser. No. 196,336

Term of patent 14 years

U.S. Cl. D21-120



304,356

CHILD'S DOLL FIGURE OR SIMILAR ARTICLE

Larry E. Potter, 430 W. Ave. C, and Richard S. Potter, 420 Clair Center, both of McPherson, Kans. 67460

Filed Oct. 23, 1986, Ser. No. 922,564

Term of patent 14 years

U.S. Cl. D21-166



304,358

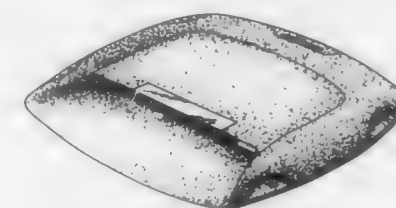
BASEBALL PITCHING PRACTICE PLATFORM

Robert L. Wright, Des Moines, Iowa, assignor to Creative Athletic Products and Services, Inc., Des Moines, Iowa

Filed Jan. 9, 1987, Ser. No. 1,989

Term of patent 14 years

U.S. Cl. D21-199



304,360

COASTER

Norman R. Curry, 3493 Rubens Court, Burlington, Ontario, Canada (L7N 3K3)

Filed Nov. 25, 1986, Ser. No. 934,990

Claims priority, application Canada, May 27, 1986, 27-05-96-3

Term of patent 14 years

U.S. Cl. D21-227



304,358

STAIR CLIMBING EXERCISE APPARATUS

Timothy O. Armstrong, Bellevue, Wash.; John W. Bull, Irvine, Calif., and David B. Smith, Bellevue, Wash., assignors to Precor Incorporated, Bothell, Wash.

Continuation-in-part of Ser. No. 12,119, Feb. 6, 1987. This application Oct. 21, 1987, Ser. No. 109,103

Term of patent 14 years

U.S. Cl. D21-195



304,361

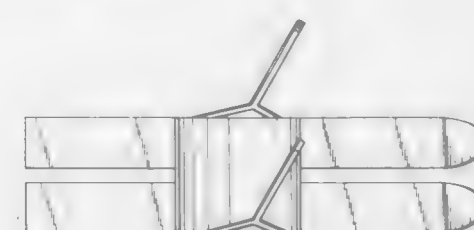
NOVELTY SKI SEAT

George M. Colclasure, Oklahoma City, Okla., assignor to Laid Back Enterprises, Inc., Oklahoma City, Okla.

Filed Apr. 8, 1986, Ser. No. 850,906

Term of patent 14 years

U.S. Cl. D21-230



304,362

FISHING HAND CASTER

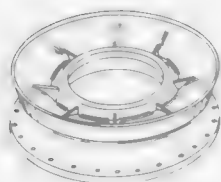
Alexander S. Corrie, 36 Manilla Street, East Brisbane, Australia (4169)

Filed Mar. 2, 1987, Ser. No. 20,680

Claims priority, application Australia, Nov. 14, 1986, 7492/86

Term of patent 14 years

U.S. Cl. D22—137



304,364

AIR CONDITIONER

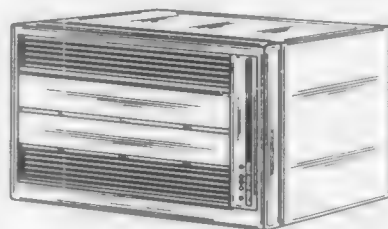
Hiroshi Moritani, Osaka, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Nov. 25, 1987, Ser. No. 125,449

Claims priority, application Japan, Jun. 5, 1987, 62-23231

Term of patent 14 years

U.S. Cl. D23—353



304,365

AIR CONDITIONER

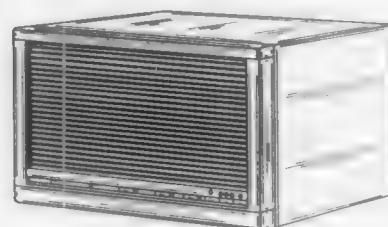
Hiroshi Moritani, Osaka, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Nov. 25, 1987, Ser. No. 125,450

Claims priority, application Japan, May 29, 1987, 62-22490

Term of patent 14 years

U.S. Cl. D23—353



304,363

WATER FILTER

Clarence W. Ruesch, Palos Hills, Ill., assignor to Reliable Metal Stamping Co., Inc., Franklin Park, Ill.

Filed Apr. 6, 1987, Ser. No. 35,171

Term of patent 14 years

U.S. Cl. D23—209



304,366

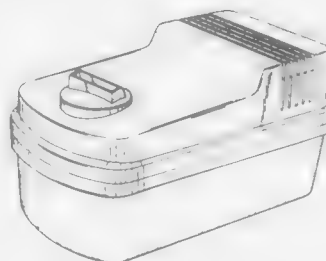
HUMIDIFIER

Kenneth A. Meyers, Reedsburg, Wis., assignor to Gerber Products Company, Fremont, Mich.

Filed Nov. 23, 1987, Ser. No. 124,181

Term of patent 14 years

U.S. Cl. D23—356



304,367

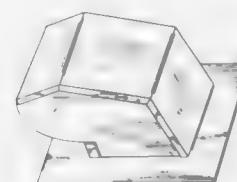
EXHAUST ROOF CAP

Francis Sase, 3 Colonial St., East Northport, N.Y. 11731

Filed Jul. 31, 1987, Ser. No. 79,920

Term of patent 14 years

U.S. Cl. D23—373



304,370

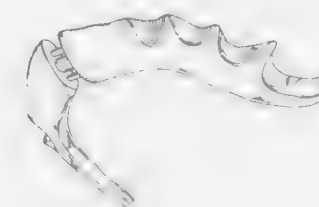
ORTHODONTIC APPLIANCE

Grant R. N. Bowbeer, 606 W. Stadium Blvd., Ann Arbor, Mich. 48103

Filed Jul. 31, 1987, Ser. No. 79,913

Term of patent 14 years

U.S. Cl. D24—10



304,368

ELECTRIC FAN

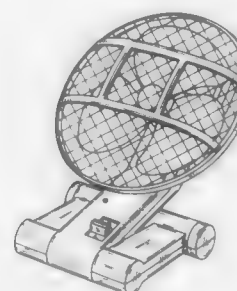
Akio Suzuki, Osaka, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Apr. 11, 1987, Ser. No. 48,652

Claims priority, application Japan, Nov. 11, 1986, 61-44539

Term of patent 14 years

U.S. Cl. D23—382



304,371

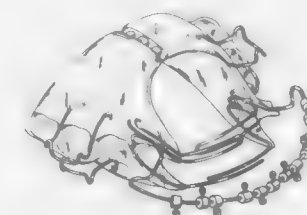
ORTHODONTIC APPLIANCE

John A. Collins, Jr., 1116 Mishawaka Ave., South Bend, Ind. 46615

Filed Apr. 23, 1987, Ser. No. 41,367

Term of patent 14 years

U.S. Cl. D24—10



304,372

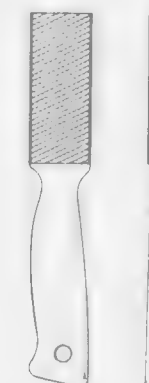
SURGICAL BONE RASP

Bernie B. Berry, Jr., 5315 E. Pleasant Run Pkwy., S. Dr., Indianapolis, Ind. 46219

Filed May 12, 1987, Ser. No. 48,789

Term of patent 14 years

U.S. Cl. D24—26



304,369

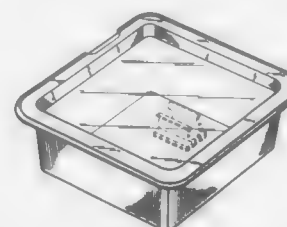
REACTION TRAY FOR MEMBRANE HYBRIDIZATIONS

Sharon S. Challberg, Boyds, and Randall Kiser, Frederick, both of Md., assignors to Life Technologies, Inc., Gaithersburg, Md.

Filed May 11, 1987, Ser. No. 49,074

Term of patent 14 years

U.S. Cl. D24—8



304,373

FEMALE URINAL

Rosalie Floyd, 105-110 Skaha Place, Penticton, Canada (V2A 7L1) Louis Manno, 8 Putnam Ct., Holmdel, N.J. 07733

Filed Aug. 26, 1986, Ser. No. 901,154
Term of patent 14 years

U.S. Cl. D24—54



304,375

ROUNDED STAIRCASE BALUSTIN

Filed Nov. 6, 1987, Ser. No. 117,699

Term of patent 14 years

U.S. Cl. D25—38



304,376

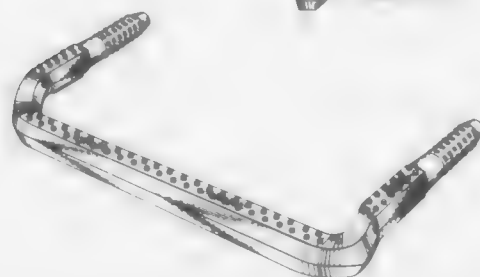
MANHOLE STEP

Michael K. Robertson, Tualatin, Oreg., assignor to Lane International Corporation, Tualatin, Oreg.

Filed Sep. 29, 1987, Ser. No. 102,576

Term of patent 14 years

U.S. Cl. D25—69



304,374

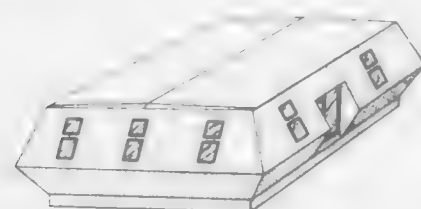
BUILDING STRUCTURE

William Reed, P.O. Box 1267, Marathon, Fla. 33050

Filed Jan. 12, 1987, Ser. No. 2,259

Term of patent 14 years

U.S. Cl. D25—33



304,377

FLUORESCENT LAMP

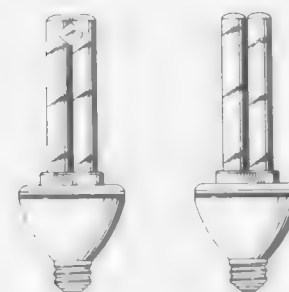
Toshiharu Fujita; Hiroyoshi Yamazaki; Noriyuki Maeda; Kazutaka Shimizu; Norihiko Tanaka; Yoshihiro Domon; Kiyoshi Iwasawa; Mitsuyuki Futatsugi; Fuminobu Takizawa; Masakatsu Suzuki, and Makoto Kosaka, all of Kamakura, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 19, 1986, Ser. No. 909,338

Claims priority, application Japan, Mar. 20, 1986, 61-10346; May 9, 1986, 61-17419; May 9, 1986, 61-17420; May 9, 1986, 61-17421

Term of patent 14 years

U.S. Cl. D26—3



304,379

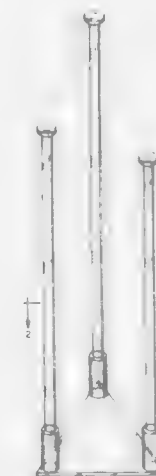
BASE FOR MULTIPLE CANDLE LAMPS

Mary A. Chappellet, Pritchard Hill, St. Helena, Calif. 94574

Filed Jan. 3, 1986, Ser. No. 816,152

Term of patent 14 years

U.S. Cl. D26—9



304,380

SLIDING HEADLIGHT

Francois Bailly, Haras Lesseirille, 95510 Aincourt, France

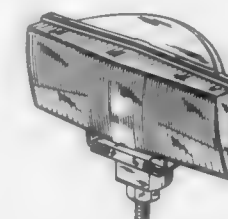
Filed Jul. 9, 1986, Ser. No. 883,840

Claims priority, application France, Jan. 31, 1986, 86 0478

The portion of the term of this patent subsequent to Sep. 12, 2003, has been disclaimed.

Term of patent 14 years

U.S. Cl. D26—29



304,378

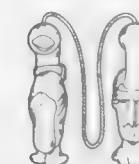
PAIR OF LINKED CANDLES

Michael C. B. Lam, Ground Floor, Kwai Bo Industrial Building, 40 Wong Chuk Hang Road, Aberdeen, Hong Kong

Filed Aug. 28, 1986, Ser. No. 901,547

Term of patent 14 years

U.S. Cl. D26—7



304,381

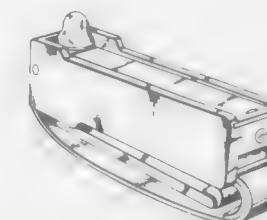
STRAPPED MINIATURE FLASHLIGHT

Andrew E. Campbell, 1127 Ridge Rd., Fawnskin, Calif. 92333

Filed Oct. 16, 1986, Ser. No. 919,862

Term of patent 14 years

U.S. Cl. D26—37



304,382

MULTICOLORED TOOTHPASTE

Raymond L. Mohrle, Denville, N.J., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed Dec. 18, 1985, Ser. No. 810,151

Term of patent 14 years

U.S. Cl. D28—8.1



304,383

COMB ATTACHMENT OR THE LIKE FOR HOLDING PERMANENT WAVE PAPER

Lowell C. Babcock, 22014 Anthony Rd., Marengo, Ill. 60152

Filed Aug. 4, 1986, Ser. No. 892,404

Term of patent 14 years

U.S. Cl. D28—34



304,384

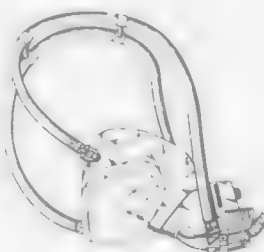
COMBINED RESPIRATORY MASK AND INFLATABLE HEAD STRAPS

Guy G. A. Derobert, Gambais, France, assignor to Intertechnique S.A., Plaisir, France

Filed Aug. 21, 1986, Ser. No. 898,626

Term of patent 14 years

U.S. Cl. D29—9



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 31ST DAY OF OCTOBER, 1989

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

- A. H. Robins Company, Incorporated: See—
Naylor, Robert J.; and Naylor, Brenda, 4,877,794, Cl. 514-305.000.
- A/S Ferrosan: See—
Drejer, Jorgen; and Jakobsen, Palle, 4,877,799, Cl. 514-317.000.
- A/S Finsam International Inc.: See—
Albrigtsen, Rolf H.; and Samuelsen, Per R., 4,877,046, Cl. 137-107.000.
- Aardelite Holding B.V.: See—
Loggers, Hendrik, 4,877,453, Cl. 106-118.000.
- Aaton, R.G.: See—
Beauviala, Jean-Pierre, 4,877,200, Cl. 242-205.000.
- AB Volvo: See—
Andersson, Lars; and Andersson, Sven, 4,876,907, Cl. 74-331.000.
- Abbaschian, Gholamreza J.: See—
Barnes, Albert L.; Clere, Thomas M.; Abbaschian, Gholamreza J.; and Wheeler, Douglas J., 4,876,941, Cl. 89-36.020.
- Abbeneyen, Willy N. V.: See—
Willemsens, Karel S.; Abbeneyen, Willy N. V.; and Criel, Frans B., 4,877,639, Cl. 427-13.000.
- Abbott Laboratories: See—
Hayes, Donald J.; Wallace, David B.; Verlee, Donald J.; and Houseman, Kenneth R., 4,877,745, Cl. 436-166.000.
- Abe, Yoshiaki: See—
Nakagawa, Koji; Takagi, Takeo; Abe, Yoshiaki; and Sakai, Haruki, 4,877,370, Cl. 415-148.000.
- Abe, Yoshio: See—
Fuyama, Moriaki; Tamura, Katsumi; Taguchi, Kazuo; Onisawa, Kenichi; Sato, Akira; Hashimoto, Kenichi; Nakayama, Takahiro; and Abe, Yoshio, 4,877,994, Cl. 313-503.000.
- Abrams, Jack S.: See—
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Conway, Jean M.; and McInnes, Peter R., 4,877,031, Cl. 128-344.000.
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Valentini, Robert F.; Aebischer, Patrick; and Galletti, Pierre M., 4,877,029, Cl. 128-334.00R.
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Avondoglio, Leo, 4,877,431, Cl. 55-321.000.
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Mitome, Hideto, 4,878,210, Cl. 367-137.000.
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Peters, Manfred; Becker, Manfred; Wingender, Kaspar; Kaluschke, Thomas; and Klotzer, Sieghart, 4,877,722, Cl. 430-559.000.
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Willemsens, Karel S.; Abbeneyen, Willy N. V.; and Criel, Frans B., 4,877,639, Cl. 427-13.000.
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Kensaly, Dean R.; and Aittama, Robert W., 4,877,001, Cl. 123-519.000.
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Yamamoto, Yasuhiro; Miwa, Teiji; and Ajima, Tadashi, 4,876,786, Cl. 29-429.000.
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Miwa, Harufumi; Kashiwada, Minoru; and Goto, Ikuo, 4,877,583, Cl. 422-73.000.
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- Akimoto, Kunio: See—
Takagiwa, Hiroyuki; Takahashi, Jiro; Shiroe, Meizo; Akimoto, Kunio; and Uchida, Masafumi, 4,877,704, Cl. 430-99.000.
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Murakata, Chikara; Sato, Akira; Kasai, Masaji; Kobayashi, Eiji; Morimoto, Makoto; and Akinaga, Shiro, 4,877,776, Cl. 514-43.000.
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Sakaki, Mamoru; Arai, Ryuichi; Akiya, Takashi; Toganoh, Shigeo; Higuma, Masahiko; Eto, Naonobu; Mouri, Hidemasa; Tobita, Michiaki; Ishida, Masahiko; and Kono, Shunzo, 4,877,680, Cl. 428-332.000.
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Åström, Bert; and Nygård, Olof, 4,876,961, Cl. 102-254.000.
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De Brock, Raoul, 4,877,392, Cl. 425-371.000.
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Hudson, Tom J.; McIntyre, John; Tremblay, Pierre; Allaire, Claude; and Gnyra, Bohdan, 4,877,507, Cl. 204-243.00R.
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Szechenyi, Kalman, 4,878,229, Cl. 375-14.000.
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Heller, Heinz; and Waigand, Roland, 4,876,894, Cl. 73-756.000.

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Mudzhiri, Levan A.; Alkhazashvili, Gia G.; Kalatozhvili, Elena I.; Chelkurishvili, Gia O.; Brekhan, Izrail I.; Bulanov, Alexander E.; and Polozhentseva, Mira I., 4,877,772, Cl. 514-23.000.
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Hudson, Tom J.; McIntyre, John; Tremblay, Pierre; Allaire, Claude; and Gnyra, Bohdan, 4,877,507, Cl. 204-243.00R.
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Arabia, F. Gene; Shkedi, Zvi; and Brandt, Randy L., 4,876,892, Cl. 73-718.000.
- Brownell, Peter, 4,877,527, Cl. 210-489.000.
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Delbe, Emmanuel; Gillet, Francois; Serot, Etienne; Chifflet, Raymond; Allio, Roland; Jeantin, Philippe; Del Fabro, Gilbert; and Forella, Guy, 4,877,229, Cl. 271-2.000.
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Schulze, Matthias, 4,878,052, Cl. 340-825.690.
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Hinotani, Hiroaki, 4,878,214, Cl. 369-256.000.
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Lo, Ying-Cheng, 4,877,393, Cl. 425-383.000.
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Kelly, Patrick M.; Howlett, Robert E.; Pomeroy, Paul A.; and Alvarez, Dennis A., 4,876,837, Cl. 52-287.000.
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Kilper, John J., 4,877,111, Cl. 184-15.100.
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Yamato, Ikuo; Tokunaga, Norikazu; Matsuda, Yasuo; and Amano, Hisao, 4,878,163, Cl. 363-8.000.
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Asato, Goro; and France, Donald J., 4,877,888, Cl. 549-264.000.
- American National Can Company: See—
Shepard, Mary E.; Galloway, Deane E.; and Lind, Keith D., 4,877,684, Cl. 428-475.800.
- American Recreation Products, Inc.: See—
Cantwell, Robert R.; Halleman, Raymond F.; and Zumsteg, Deborah M., 4,877,044, Cl. 135-104.000.
- American Standard Inc.: See—
Beasley, John A., 4,877,014, Cl. 126-116.00R.
- American Telephone & Telegraph AT&T Technologies, Inc.: See—
Bleich, Larry L.; Roberts, Joni A.; and Zerba, Stephen T., 4,877,645, Cl. 427-117.000.
- American Telephone and Telegraph Company: See—
Halemane, Thirumala R.; and Korotky, Steven K., 4,877,952, Cl. 250-213.00A.
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Rolloff, Paul D.; and Lamb, Reginald T., 4,876,758, Cl. 12-142.00N.
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Sawers, Marvin E.; Harting, Tyler F., Jr.; and McMaster, Lee P., 4,877,682, Cl. 428-412.000.
- AMP Incorporated: See—
Tanigawa, Junichi; and Kikuchi, Shoji, 4,877,409, Cl. 439-31.000.
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Gomes, Gary D., 4,877,981, Cl. 307-555.000.
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Bible, Matthew; Lesage, Marc; and Falconer, Ian, 4,876,886, Cl. 73-151.500.
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- Andermo, Nils I., to Mitutoyo Corporation. Capacitive type measurement transducer with improved electrode arrangement, 4,878,013, Cl. 324-61.00R.
- Anderson, Carl. Mobile scaffolding system and scaffold support, 4,877,107, Cl. 182-17.000.
- Anderson, Weston A., to Varian Associates, Inc. High intensity x-ray source using bellows, 4,878,235, Cl. 378-136.000.
- Anderson, Lars; and Andersson, Sven, to AB Volvo. Motor vehicle gearbox, 4,876,907, Cl. 74-331.000.
- Andersson, Lars-Olof; Forsman, Nanna; Larsen, Kerstin E. I.; Lundin, Annelie B.; Pavlu, Bohdan; Sandberg, Inga H.; and Sewerin, Karin M., to Kabinivtrum AB. Biologically active fragments of human antihemophilic factor and method for preparation thereof, 4,877,614, Cl. 424-101.000.
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Kotera, Masahide; Konishi, Motofumi; Ando, Yoshio; Iwaya, Tohshio; Tanaka, Kanou; Hashimoto, Norio; Sugita, Yasutoshi; Sano, Yoshitaka; and Ono, Satoshi, 4,878,250, Cl. 382-56.000.
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Schierling, Roland; and Geyer, Werner, 4,876,999, Cl. 123-252.000.
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- Anthony, Vivienne M.; Clough, John M.; and Godfrey, Christopher A., to Imperial Chemical Industries PLC. Chemical compounds, 4,877,811, Cl. 514-522.000.
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Knapp, Gunter; and Schalk, Andreas, 4,877,999, Cl. 315-248.000.
- Anton Piller GmbH & Co. KG: See—
Sachs, Klaus, 4,878,106, Cl. 357-72.000.
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Tsuiji, Masayoshi; Nakagawa, Akira; Inoue, Hisataka; Hachiya, Terumi; Tanoue, Yoshihiro; Ikesue, Kouichi; Saita, Masaru; Mizoguchi, Takenobu; Aoki, Testuo; Sato, Hironobu; and Noda, Kanji, 4,877,876, Cl. 544-133.000.
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Kanamaru, Tatsuya; Nakayama, Motohiro; Arai, Katutoshi; Suzuki, Shinichi; and Naka, Ryoichi, 4,877,494, Cl. 204-28.000.
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Sakaki, Mamoru; Arai, Ryuichi; Akiya, Takashi; Toganoh, Shigeo; Higuma, Masahiko; Eto, Naonobu; Mouri, Hidemasa; Tobita, Michiaki; Ishida, Masahiko; and Kono, Shunzo, 4,877,680, Cl. 428-332.000.
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Harper, Stephen D., 4,877,906, Cl. 568-621.000.
- Ardaillon, Pierre; Autant, Pierre; Bourrain, Paul; and Cartillier, Andre, to Rhone-Poulenc Sante. Compositions for coating feedstuff additives for ruminants and feedstuff additives thus coated, 4,877,621, Cl. 424-498.000.
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- Arimatsu, Seiji: See—
Tsunoda, Tahahiro; Yamaoka, Tsuguo; and Arimatsu, Seiji, 4,877,714, Cl. 430-270.000.
- Arizona Board of Regents: See—
Bernstein, Gary; Ferry, David K.; and Liu, Wenping, 4,877,716, Cl. 430-309.000.
- Armstrong Rubber Company, The: See—
Szymo, Walter; and Valaitis, Joseph W., 4,877,469, Cl. 156-123.000.
- Armstrong World Industries, Inc.: See—
Bohm, Walter J.; Brubaker, Richard A.; Garman, Shelly N.; Hoeffel, Lewis K.; Ko, Kenneth K.; and Tymon, Thomas M., 4,877,484, Cl. 162-103.000.
- Arndt, Peter J.: See—
Siol, Werner; Heil, Ernst; Wenzel, Franz; Arndt, Peter J.; and Terbrack, Ulrich, 4,877,853, Cl. 526-329.700.
- Aronowitz, Jack L.; and Terminiello, Louis, to Technimed Corporation. Assay kit including an analyte test strip and a color comparator, 4,877,580, Cl. 422-58.000.
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Gabriel, Robert; Aronson, Michael P.; and Steyn, Peter L., 4,877,544, Cl. 252-99.000.
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- Asada, Haruo: See—
Tsujimoto, Shuichi; and Asada, Haruo, 4,878,124, Cl. 358-443.000.
- Asahi Glass Company, Ltd.: See—
Morimoto, Takeaki; and Endoh, Eiji, 4,877,508, Cl. 204-290.00R.
- Asahi Kasei Kogyo Kabushiki Kaisha: See—
Okuno, Osamu; and Sugiyama, Shigeru, 4,877,308, Cl. 350-276.00R.
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Maeda, Shigeyoshi; Asai, Tsunetoshi; Asano, Hidejiro; and Taguchi, Haruyoshi, 4,877,664, Cl. 428-35.900.
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Yasuda, Shigeru; Yasukawa, Kenichiro; Nakamura, Tautomu; and Asami, Kenitiro, 4,878,129, Cl. 358-342.000.
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Maeda, Shigeyoshi; Asai, Tsunetoshi; Asano, Hidejiro; and Taguchi, Haruyoshi, 4,877,664, Cl. 428-35.900.
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Bergman, Sten; and Ljung, Stefan, 4,878,142, Cl. 361-80.000.
- Asghar, Abid; and Donnell, James R., to Intel Corporation. Product term sharing/allocation in an EPROM array, 4,878,200, Cl. 365-189.020.
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Higuchi, Kumao; Morinaga, Akio; Seshimo, Masahiro; and Saito, Hitoshi, 4,877,665, Cl. 428-36.100.
- Ashland Oil, Inc.: See—
Hettinger, William P.; and Beck, H. Wayne, 4,877,514, Cl. 208-120.000.
- Ashlock Company: See—
Cimperman, Fred J., 4,876,954, Cl. 99-545.000.
- ASICS Corporation: See—
Teranishi, Mitsui; Watanabe, Yasuo; and Takeuchi, Akira, 4,878,176, Cl. 364-468.000.
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Fierkens, Richardus H. J.; and Pas, Ireneus J. T. M., 4,877,387, Cl. 425-116.000.
- Asmo Co., Ltd.: See—
Yamase, Tokuhiko, 4,877,926, Cl. 200-19.00R.
- Aso, Tohiyuki; and Ishibashi, Tamotsu, to Fanuc Ltd. Wire cut electrodischarge machine tool, 4,877,935, Cl. 219-69.120.
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Halemane, Thirumala R.; and Korotky, Steven K., 4,877,952, Cl. 250-213.00A.
- Atkins, Judy M.; Comfort, Benjamin J.; and Liebelt, Ralph A., to Smith & Nephew, Inc. Method and device for detection of tissue infiltration, 4,877,034, Cl. 128-664.000.
- Atlantic Richfield Company: See—
Williamson, George C., 4,877,354, Cl. 405-157.000.
- Atomic Energy of Canada Limited-Energie Atomique Du Canada Limitee: See—
Toner, Paul D.; and Taylor, Terence, 4,878,169, Cl. 364-413.190.
- Attwood Corporation: See—
Whitley, Warwick M., II, 4,877,152, Cl. 220-374.000.
- Audeh, Costandi A., to Mobil Oil Corporation. Use of polysulfide treated molecular sieves to remove mercury from liquefied hydrocarbons, 4,877,515, Cl. 208-251.00R.
- Ausnit, Steven, to Minigrip, Inc. Method of and apparatus for packaging product masses in a form, fill and seal machine, 4,876,842, Cl. 53-410.000.
- Austin, Robert C. Preparation of plastic extrudate containing an additive, 4,877,568, Cl. 264-211.210.
- Autant, Pierre: See—
Ardaillon, Pierre; Autant, Pierre; Bourrain, Paul; and Cartillier, Andre, 4,877,621, Cl. 424-498.000.
- Autojoukko OY: See—
Nuutio, Erkki, 4,877,103, Cl. 180-259.000.
- Automatisme et Robotique Appliques -A.R.A.: See—
Ripert, Victor L., 4,877,228, Cl. 269-156.000.
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Leigh-Monstevens, Keith V.; and Nix, Richard A., 4,878,041, Cl. 340-479.000.
- Autopart Sweden AB: See—
Svensson, E. Gunnar, 4,878,158, Cl. 362-140.000.
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Reynaud, Jean M., 4,878,054, Cl. 340-975.000.
- Avondoglio, Leo, to Aerocology Incorporated. Radial impingement separator, 4,877,431, Cl. 55-321.000.
- Awax S.r.l.: See—
Cappi, Angelo, 4,877,478, Cl. 156-555.000.
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Yasui, Yasuyoshi; and Azuma, Hitoshi, 4,876,921, Cl. 74-710.500.
- B.O.C.S.A.: See—
Zalkin, Daniel, 4,877,023, Cl. 128-204.210.
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Roussel, Michel; and Baffreau, Daniel, 4,877,452, Cl. 106-97.000.
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Pastor, Jose; and Barton, Maya R., 4,878,246, Cl. 380-44.000.
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Jones, Marshall G.; and Batra, Prem N., 4,877,175, Cl. 228-102.000.
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McGinniss, Vincent D.; and Preston, Joseph R., 4,877,988, Cl. 310-306.000.
- Baucom, Walter H., to Datamain 2000, Inc. Device for holding cups, cans, and similar articles in vehicles, 4,877,164, Cl. 224-42.440.
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Bauer, Hans-Peter; and Bauer, Hans J., 4,877,115, Cl. 188-322.150.
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Kausch, Michael; Buysch, Hans-Josef; Schroer, Hans; and Suling, Carlhans, 4,877,825, Cl. 524-101.000.
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Elbe, Hans-Ludwig; Dutzmann, Stefan; and Reinecke, Paul, 4,877,446, Cl. 71-92.000.
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Schwirllich, Ingo; Woditsch, Peter; and Koch, Wolfgang, 4,877,596, Cl. 423-348.000.
Weismuller, Joachim; Berg, Dieter; Hanssler, Gerd; and Reinecke, Paul, 4,877,786, Cl. 514-236.800.
- Bayha, Heiner: See—
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- BBC Brown Boveri AG: See—
Brand, Klaus-Peter; Kopainsky, Jurgen; and Wittwer, Fritz, 4,878,185, Cl. 364-572.000.
Mathews, Hans-Gunter; and Schafheitle, Oskar, 4,878,037, Cl. 333-254.000.
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Duffour, Henri; Martin, Serge; and Studer, Ernst, 4,877,928, Cl. 200-144.000.
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Buxbaum, Lothar; and Stessel, Helmut, 4,877,420, Cl. 51-309.000.
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- Becher, Karl: See—
Carpinella, Ralph; and Becher, Karl, 4,876,782, Cl. 29-234.000.
- Beck, Andreas; and Nanko, Norbert. Device for the widening of blood vessels, 4,877,030, Cl. 128-343.000.
- Beck, Dilman A.; and Beck, Susan E. Combination food server and container lid support, 4,877,609, Cl. 426-87.000.
- Beck, H. Wayne: See—
Hettinger, William P.; and Beck, H. Wayne, 4,877,514, Cl. 208-120.000.
- Beck, Susan E.: See—
Beck, Dilman A.; and Beck, Susan E., 4,877,609, Cl. 426-87.000.
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Burns, James A., 4,877,520, Cl. 210-94.000.
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Jandera, Zdenek; and Bedwell, Ian R., 4,878,207, Cl. 367-155.000.
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Milner, Peter H., 4,877,783, Cl. 514-194.000.
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Otto, Werner; Beese, Ulrich; and Schmidt, Martin, 4,877,150, Cl. 220-304.000.
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Lin, Steve M.; and Rizzo, Joseph F., 4,878,240, Cl. 379-67.000.
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Guenther, Kenneth L.; Rabindran, Karavattuvetil G.; Faber, Thomas J.; and Abrams, Jack S., 4,877,346, Cl. 400-624.000.
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Samreth, Soth; Bellamy, Francois; and Millet, Jean, 4,877,808, Cl. 514-432.000.
- Belliotti, Thomas R.; Connor, David T.; Flynn, Daniel L.; Kostlan, Catherine R.; and Nies, Donald E., to Warner-Lambert Company. Process of preparing pyrazoles, isoxazoles and analogs thereof having activity as 5-lipoxygenase inhibitors, 4,877,881, Cl. 548-240.000.
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Vollmann, Hansjoerg W.; Wong, George S. K.; and Bellville, Dennis, 4,877,697, Cl. 430-20.000.
- Beloit Corporation: See—
Rodal, Jose J. A., 4,877,472, Cl. 156-184.000.
Wedel, Gregory L., 4,876,803, Cl. 34-117.000.
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Friesen, Dwayne T.; and Obligin, Alan S., 4,877,528, Cl. 210-500.290.
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Knuchel, Pierre; and Nollez, Jacques, 4,877,055, Cl. 137-568.000.
- Benjamin F. Du Pont: See—
du Pont, Benjamin F.; and Sukeforth, Carl J., 4,877,407, Cl. 434-302.000.
- Benzie, Paul. Magnetic automatic reset animal trap, 4,876,821, Cl. 43-69.000.
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Kantor, Edward A.; Berci, George; and Storz, Karl, 4,877,016, Cl. 128-6.000.
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- Beresford Packaging, Inc.: See—
Snowdon, Michael; and Shapiro, Jay, 4,877,473, Cl. 156-204.000.
- Berg, Dieter: See—
Weismuller, Joachim; Berg, Dieter; Hanssler, Gerd; and Reinecke, Paul, 4,877,786, Cl. 514-236.800.
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- Bergman, Andrew: See—
Neuman, Arnold I.; Heidt, Thomas D.; Bergman, Andrew; and Wickstead, James, 4,877,954, Cl. 250-222.200.
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Bertness, Theodore A.; and Lipoma, Samuel P., 4,877,536, Cl. 210-712.000.
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Hall, Dale R.; and Keller, Dennis J., 4,877,856, Cl. 528-44.790.
- Bhagavatula, Venkata A., to Corning Incorporated. Few-mode/single-mode fiber, 4,877,304, Cl. 350-96.290.
- Bianchini, Gregory M.: See—
Holt, J. Birch; Kingman, Donald D.; and Bianchini, Gregory M., 4,877,759, Cl. 501-96.000.
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Carmichael, Maurice; and Binatena, Janis, 4,877,043, Cl. 134-57.00R.
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- Bio-Rad Laboratories, Inc.: See—
Chen, Jin-Hai, 4,877,510, Cl. 204-299.00R.
Ragsdale, Charles W., 4,878,008, Cl. 323-271.000.
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DiLuzio, Nicholas R., 4,877,777, Cl. 514-54.000.
- Biotech Connections, Inc.: See—
Vedros, Neylan A.; and Liu, Te-ning E., 4,877,613, Cl. 424-92.000.
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Rudnick, Dieter; Kothe, Norbert; Dichtelmuller, Herbert; Piechaczek, Detlef; Stephan, Wolfgang; and Schleussner, Hans, 4,877,866, Cl. 530-387.000.
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Zollman, Peter M.; Pollard, Brendon T.; and Birch, Andrew D., 4,878,127, Cl. 358-299.000.
- Birkle, Siegfried: See—
Gehring, Johann; and Birkle, Siegfried, 4,876,801, Cl. 34-9.000.
- Birmingham Bolt Company, Inc.: See—
White, Claude C., 4,876,877, Cl. 72-388.000.
- Bishop, Louis, Jr.: See—
Fairchild, Paul W.; Clancy, Jim L.; Fields, William G.; Bishop, Louis, Jr.; and Fly, Mark W., 4,876,949, Cl. 98-40.100.
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Peil, Archie W.; and Bishop, Thomas R., 4,877,217, Cl. 251-1.300.
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Jansma, Donald; and Stemm, Howard W., 4,877,040, Cl. 131-189.000.
- Bitsch, Harald: See—
Flaig, Heinz; Neumann, Udo; Hasselmann, Heinz; Zacharias, Karl; Horbach, Rainer; and Bitsch, Harald, 4,877,987, Cl. 310-209.000.
- Black, James L.; and Wason, Cameron B., to Geophysical Service, Inc. Method for true-amplitude dip moveout correction, 4,878,204, Cl. 367-53.000.
- Black, Kathleen A.: See—
Bigelis, Ramunas; and Black, Kathleen A., 4,877,728, Cl. 435-68.000.
- Black, Lin. Cable stripping device, 4,876,792, Cl. 30-90.900.
- Blaha, James R.: See—
Bangs, Edmund R.; Longinow, Nicholas E.; and Blaha, James R., 4,877,940, Cl. 219-124.340.
- Blaidell, Ronald G.; and Hough, Harold L., to GTE Products Corporation. Fluorescent lamp having removable jacket, 4,878,159, Cl. 362-222.000.
- Blake, Gregory L. Bag loader and bag for beverage cans, 4,877,068, Cl. 141-390.000.
- Blanc, Michael: See—
Pekar, Gary W.; Mason, Jack W.; and Blanc, Michael, 4,876,800, Cl. 33-784.000.
- Blanchard, Pierre: See—
Cazaux, Yvon; Herault, Didier; Thenoz, Yves; and Blanchard, Pierre, 4,878,103, Cl. 357-24.000.
- Bleich, Larry L.; Roberts, Joni A.; and Zerba, Stephen T., to American Telephone & Telegraph AT&T Technologies, Inc. Methods of and apparatus for applying a coating material to elongated material, 4,877,645, Cl. 427-117.000.
- Blount, Inc.: See—
Calkins, Eugene E.; and Petrovich, Michael V., 4,876,796, Cl. 30-383.000.
- Blust, Dale K.: See—
Rockerath, John L.; and Blust, Dale K., 4,877,655, Cl. 427-430.100.
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Bending, Simon J.; and Bockenhoff, Elmar, 4,878,095, Cl. 357-16.000.
- Bocquet, Cristian, to Thomson Semiconducteurs. Instruction sequencer for network structure microprocessor, 4,878,195, Cl. 364-900.000.
- Boeing Company, The: See—
Desjardins, Rene A., 4,877,375, Cl. 416-134.00A.
McCowan, Peter D.; and Meredith, Brent R., 4,877,471, Cl. 156-181.000.
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Pryor, James N.; Bogdanor, James M.; and Welsh, William A., 4,877,765, Cl. 502-408.000.
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- Bolduc, Wendy. Coin operated infant changing table, 4,876,970, Cl. 108-35.000.
- Bolla, Istvan: See—
Grimm, Istvan; Stenczinger, Sandor; Bolla, Istvan; and Csanyi, Istvan, 4,876,790, Cl. 29-603.000.
- Bona, Constantin: See—
Berger, Frank M.; Bona, Constantin; and Lechevalier, Mary P., 4,877,612, Cl. 424-92.000.
- Boninger, Michael: See—
Tomei, L. David; Cornhill, Fred; Jagadeesh, Jogikall; and Boninger, Michael, 4,877,966, Cl. 250-458.100.
- Bonnemair, Bruno; Lautrou, Jean; and Meyer, Dominique, to Guerbet S.A. Lysine salt of the gadolinium-dota complex and its diagnostic applications, 4,877,600, Cl. 424-4.000.
- Bonnay, Peter: See—
Neu Jozsef; Csantos, Imre; Varga, Andras; Suranyi, Robert; Ilovai, Zoltan; Gaal, Sandor; Karsai, Jozsef; Sebastyen, Endre; Gardi, Eva; Siki, Karoly; Toth, Istvan; Gal, Gusztav; Csaba, Tarpai, Gyula; Bonnyay, Peter; and Santha, Pal, 4,877,893, Cl. 558-86.000.
- Bontenbal, Pieter J., to Shell Oil Company. Method and apparatus for installing a flowline near the waterbottom, 4,877,356, Cl. 405-169.000.
- Boots Company, PLC, The: See—
Davies, Roy V., 4,877,793, Cl. 514-301.000.
- Bott, John A. Vehicle article carrier, 4,877,168, Cl. 224-321.000.
- Botti, Edoardo; Torazzina, Aldo; and Stefani, Fabrizio, to S-Thomson Microelectronics S.p.A. Amplifier stage with collector output, 4,878,032, Cl. 330-263.000.
- Bottino, Becky J.: See—
Reno, John M.; and Bottino, Becky J., 4,877,868, Cl. 530-390.000.
- Bougher, Jerry D., to Indiana Mills & Manufacturing, Inc. Anti-creep cam bar, 4,876,770, Cl. 24-170.000.
- Bourrain, Paul: See—
Ardailon, Pierre; Autant, Pierre; Bourrain, Paul; and Cartillier, Andre, 4,877,621, Cl. 424-498.000.
- Bourrier, Pierre: See—
Irigoyen, Marc E.; and Bourrier, Pierre, 4,876,836, Cl. 52-263.000.
- Bowen Tools, Inc.: See—
Peil, Archie W.; and Bishop, Thomas R., 4,877,217, Cl. 251-1.300.
- Bowles, Roger A.: See—
Kenny, Brian P.; and Bowles, Roger A., 4,877,560, Cl. 261-35.000.
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Boylan, Elizabeth S.; Boylan, Robert J.; Groupe, Vincent; and Simpson, Robert W., 4,877,616, Cl. 424-123.000.
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- Budinger, William D. Method and apparatus for determination and display of critical gas supply information. 4,876,903, Cl. 73-865.100.
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Ardailon, Pierre; Autant, Pierre; Bourrain, Paul; and Cartillier, Andre, 4,877,621, Cl. 424-498.000.
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Fuse, Takahiro; and Yamagishi, Koji, 4,878,047, Cl. 340-784.000.
Shinohara, Isao, 4,876,938, Cl. 84-611.000.
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Van Pelt, Norman, 4,877,355, Cl. 405-159.000.
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Brauer, Melvin; and Simone, Dominic, 4,877,455, Cl. 106-244.000.
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Muller, Niklaus, 4,877,937, Cl. 219-121.590.
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Gross, William H.; and Cecil, James B., 4,878,034, Cl. 330-298.000.
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Moses, John M., 4,877,530, Cl. 210-511.000.
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Meyer, Armin, 4,878,111, Cl. 358-75.000.
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Evans, Samuel, 4,877,824, Cl. 524-83.000.
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Stein, Franz, 4,876,912, Cl. 74-535.000.
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Fairchild, Paul W.; Claney, Jim L.; Fields, William G.; Bishop, Louis, Jr.; and Fly, Mark W., 4,876,949, Cl. 98-40.100.
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Kobayashi, Shigetoshi, 4,877,925, Cl. 200-5.00A.
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Leopoldi, Norbert, 4,877,277, Cl. 292-347.000.
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Renzulli, Francesco; Del Gaudio, Antonio; and Renzulli, Piero, 4,877,410, Cl. 8-94.120.
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Goleczka, Joseph; Harris, Walter; and Pringle, John, 4,877,418, Cl. 44-600.000.
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Cody, George D.; Elzinga, Eugene R., Jr.; Callegari, Andrew J.; and Cohen, Roger W., 4,877,488, Cl. 201-1.000.
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Velan, Baruch; Cohen, Sara; Grosfeld, Haim; and Shafferman, Avigdor, 4,877,865, Cl. 530-351.000.
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Lai, Kuo-Yann, 4,877,546, Cl. 252-174.170.
Rounds, Rhyta S., 4,878,150, Cl. 361-311.000.
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McQuoid, Bryan K.; Charlson, Earl J.; and Graham, Huber, 4,878,226, Cl. 374-166.000.
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Zorini, Luigi O., 4,876,862, Cl. 66-207.000.
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Atkins, Judy M.; Comfort, Benjamin J.; and Liebelt, Ralph A., 4,877,034, Cl. 128-664.000.
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Raab, John J., 4,877,942, Cl. 219-225.000.
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Bragaw, Chester G., Jr.; Concannon, Thomas P.; and Davis, Robert F., 4,877,683, Cl. 428-421.000.
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Bellotti, Thomas R.; Connor, David T.; Flynn, Daniel L.; Kostlan, Catherine R.; and Nies, Donald E., 4,877,881, Cl. 548-240.000.
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Byrd, William A.; Oman, Joel E.; and Connors, William, 4,877,985, Cl. 310-86.000.
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Vinas I Nogueles, Jose M., 4,877,632, Cl. 426-502.000.
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Muller, Friedhelm; and Ruthenberg, Klaus, 4,877,328, Cl. 366-76.000.
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Walter, John, 4,877,054, Cl. 137-560.000.
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Nay, Daniel L.; Korn, Darryl K.; and Ralph, John T., 4,878,197, Cl. 364-900.000.
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Kalal, Theodore T.; and Kowitch, Richard, 4,878,143, Cl. 361-94.000.
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Franklin, Harlow; Cooper, William J.; and Deschenes, Charles L., 4,877,172, Cl. 227-67.000.
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Bruggeman, Rudyard J.; and Carscallen, Gregory A., 4,876,875, Cl. 72-199.000.
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Caillat, Jean-Luc M.; Weatherston, Roger C.; and Bush, James W., 4,877,382, Cl. 418-55.000.
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Kar, Gitimoy, 4,877,306, Cl. 350-96.330.
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Gibbons, Robert C.; and Cottle, Wilbur W., 4,877,317, Cl. 350-559.000.
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Smith, Charles G.; and Cottrell, Terence B. F., 4,877,427, Cl. 55-136.000.
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Karpuk, Michael E.; and Cowley, Scott W., 4,876,989, Cl. 123-3.000.
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Crace, Robert J., 4,877,417, Cl. 44-535.000.
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Willemaens, Karel S.; Abbeneyen, Willy N. V.; and Criel, Frans B., 4,877,639, Cl. 427-13.000.
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O'Brien, Denise M.; and Croce, Carlo P., 4,876,843, Cl. 53-410.000.
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Kirjanov, Alexander S.; and Herlant, Michel A., 4,877,538, Cl. 252-8.700.
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Watson, P. Keith; Morrison, Ian D.; and Croucher, Melvin D., 4,877,698, Cl. 430-45.000.
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Malaker, Stephen F., 4,877,434, Cl. 62-6.000.
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Grimm, Istvan; Stenczinger, Sandor; Bolla, Istvan; and Csanyi, Istvan, 4,876,790, Cl. 29-603.000.
- Castlos, Imre: See—
Neu Jozsef; Csatos, Imre; Varga, Andras; Suranyi, Robert; Ilovai, Zoltan; Gaal, Sandor; Karsai, Jozsef; Sebestyen, Endre; Gardi, Eva; Siki, Karoly; Toth, Istvan; Gal, Guszt/e,acu/a/ v; Dombay, Zsolt; Grega nee Toth, Mrs. Erzsabet; Pavlicsak, Csaba; Tarpai, Gyula; Bonnyay, Peter; and Santha, Pal, 4,877,893, Cl. 558-86.000.
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Baker, Joseph R.; Golland, Wesley A.; Mullens, Paul A.; and Trimble, Roger B., 4,877,179, Cl. 232-7.000.
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McGovern, Terrence P.; Flath, Robert A.; and Cunningham, Roy T., 4,877,607, Cl. 424-84.000.
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Petrucchi, Raymond M.; Taylor, Bruce G.; Giordano, Edward C.; Padiall, James M.; and Palmer, Carl, 4,877,521, Cl. 210-171.000.
- Cuomo, John: See—
Christensen, Joel R.; Cuomo, John; and Levitt, George, 4,877,440, Cl. 71-90.000.
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Dieu, Bernard; and CuQ, Jean, 4,877,625, Cl. 426-250.000.
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Pugh, J. Robert; and Matherly, James F., 4,877,182, Cl. 236-44.000.
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Robey, Herbert L., 4,877,519, Cl. 210-86.000.
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Platt, Paul E., 4,877,978, Cl. 307-473.000.
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Wolner, J. Thomas, 4,877,110, Cl. 182-232.000.
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Yaver, Perry N., 4,877,657, Cl. 428-31.000.
- Da-Tel Research Company, Incorporated: See—
Gilbert, Everett A., 4,878,241, Cl. 379-106.000.
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Murabayashi, Katsuyoshi; and Mitani, Katsuyoshi, 4,877,816, Cl. 521-92.000.
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Muto, Takashi, 4,877,696, Cl. 428-645.000.
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Tamura, Sinji; Kubo, Motonobu; and Kashiwagi, Masato, 4,877,859, Cl. 528-129.000.
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Alt, Claus-Christian; Gobel, Rudolf; Koch, Heinz; Niechoj, Wolfgang; Grossmann, Theodor; and Deffner, Felix, 4,877,258, Cl. 277-212.000.
- Daimler-Benz AG: See—
Schuster, Hans-Dieter; Noller, Christoph; Wollenraup, Gottfried; Kreeb, Reiner; and Huss, Roland, 4,877,339, Cl. 384-218.000.
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Abthoff, Joerg; Schuster, Hans-Dieter; Langer, Hans-Joachim; Strohm, Erwin; Gabler, Rolf; and Schulte, Roland, 4,876,852, Cl. 60-275.000.
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Ward, Leonard; and Darnofall, George, 4,878,085, Cl. 355-47.000.
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Moore, James A.; Dasheff, Andrew N.; and Kaufman, Frank B., 4,877,718, Cl. 430-326.000.
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Goekjian, Kenneth S., 4,878,173, Cl. 364-200.000.
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Baucom, Walter H., 4,877,164, Cl. 224-42.440.
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Bragaw, Chester G., Jr.; Concannon, Thomas P.; and Davis, Robert F., 4,877,683, Cl. 428-421.000.
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Fukushima, Itaru; Okamoto, Takashi; and Deguchi, Hisashi, 4,878,065, Cl. 346-76.000.
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Klingel, Reinhard; and Manner, Reinhard, 4,877,595, Cl. 423-335.000.
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Clemence, Francois; Le Martret, Odile; Delevallee, Françoise; and Fortin, Michel, 4,877,796, Cl. 514-311.000.
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Renzulli, Francesco; Del Gaudio, Antonio; and Renzulli, Piero, 4,877,410, Cl. 8-94.120.
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Clanet, Frank; and Dellerm, Anne, 4,877,156, Cl. 222-386.500.
- Dempsky, Mark A.: See—
Gottesman, Jeffrey L.; Dempsey, Mark A.; Koch, Donald E.; and Rattan, Dev R., 4,878,048, Cl. 340-825.010.
- Denboer, Anthony J. Grinding and polishing apparatus. 4,876,826, Cl. 51-125.000.
- Dennison Manufacturing Company: See—
Franklin, Harlow; Cooper, William J.; and Deschenes, Charles L., 4,877,172, Cl. 227-67.000.
- Deno, Koji: See—
Matsui, Isamu; Ohashi, Kenji; and Deno, Koji, 4,877,194, Cl. 242-35.60R.
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- Derving, Jackie, to Tetra Pak International AB. Valve unit. 4,877,160, Cl. 222-494.000.
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Franklin, Harlow; Cooper, William J.; and Deschenes, Charles L., 4,877,172, Cl. 227-67.000.
- DeShaw, Steven: See—
Tuttle, Gary M.; and DeShaw, Steven, 4,877,352, Cl. 405-104.000.
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Kasner, Clayton S., 4,877,218, Cl. 251-61.300.
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Suzuki, Yasuhiro; Remington, Jack S.; Desmonts, Georges; and Thulliez, Philippe, 4,877,726, Cl. 435-7.000.
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Dziobek, Frank; and Mollenhoff, Horst, 4,877,423, Cl. 55-27.000.
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- Develco, Inc.: See—
Rorden, Louis H.; and Moore, T. Charles, 4,878,053, Cl. 340-853.000.
- Devir, Daniel D., to GTE Products Corporation. Electric lamp having conductors with means formed therein for removing contact surface material. 4,877,992, Cl. 313-318.000.
- de Week, Alain L.: See—
Maly, Friedrich E.; de Week, Alain L.; and Henderson, David, 4,877,742, Cl. 436-65.000.
- Dewitz, Thomas S., to Shell Oil Company. Stripping and depressurization of solids and gas mixture. 4,877,419, Cl. 48-197.00R.
- Diatron Corporation: See—
Dandliker, Walter B.; Barr, Howard S.; Katzenstein, Henry S.; and Watson, Keith R., 4,877,965, Cl. 250-458.100.
- Dichtelmuller, Herbert: See—
Rudnick, Dieter; Kothe, Norbert; Dichtelmuller, Herbert; Piechaczek, Detlef; Stephan, Wolfgang; and Schleussner, Hans, 4,877,866, Cl. 530-387.000.
- Didier-Werke AG: See—
Eschmann, Friedrich; and Streuber, Christian, 4,877,013, Cl. 126-110.000.
- Diederich, Walter J., to TPV Energy Systems, Inc. Gas mantle technology. 4,877,553, Cl. 252-492.000.
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Bowen, Richard E.; and Diepholz, David L., 4,877,512, Cl. 204-435.000.
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Bernstein, Debra; and Keller, James B., 4,878,193, Cl. 364-768.000.
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- Dimopoulos, George: See—
Makris, Luke; and Dimopoulos, George, 4,877,132, Cl. 206-364.000.
- Dinnissen, Johannes H. A.: See—
Jacobs, Gerardus M. H. M.; and Dinnissen, Johannes H. A., 4,877,231, Cl. 271-3.100.
- Dir, Gary A.: See—
Seachman, Ned J.; Taillie, Joseph P.; and Dir, Gary A., 4,877,310, Cl. 350-347.00E.
- Director General Agency of Industrial Science and Technology: See—
Ishikawa, Toshikazu; Tokutomi, Katsuya; and Imai, Yoshikazu, 4,877,643, Cl. 427-57.000.
- Director of National Institute of Agrobiological Resources: See—
Urushizaki, Suet; Ohta, Yasuo; Sato, Mamoru; Sakai, Fukumi; and Nishiyama, Koushi, 4,877,730, Cl. 435-132.000.
- Dislich, Helmut: See—
Hinz, Paul; Dislich, Helmut; and Weber, Gerhard, 4,877,668, Cl. 428-68.000.
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- Dittmar, Walter: See—
Kampe, Klaus-Dieter; Raether, Wolfgang; and Dittmar, Walter, 4,877,878, Cl. 544-368.000.
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- Do, Tai H.: See—
McCorkle, Daniel J.; and Do, Tai H., 4,877,271, Cl. 285-39.000.
- Doane, Leland R. Device for supporting objects on a vehicle door. 4,877,284, Cl. 296-153.000.
- Dobeli, Heinz; and Hochuli, Frich, to Hoffmann-La Roche Inc. Metal chelate resins. 4,877,830, Cl. 525-54.300.
- Dodrill, Jim: See—
Darley, Henry M.; Gill, Michael C.; Earl, Dale C.; Ngo, Dinh T.; Wang, Paul C.; Hipona, Maria B. L.; and Dorrill, Jim, 4,878,190, Cl. 364-752.000.
- Doering, John P., to Texaco, Inc. Rectangular bottle for motor oil and like fluids. 4,877,142, Cl. 215-1.00C.
- Dohi, Hidehiko: See—
Tanigawa, Motoshi; Dohi, Hidehiko; Nishimura, Takashi; Ichikawa, Kouji; and Koishi, Tetsuo, 4,877,071, Cl. 152-165.000.
- Doi, Masaharu: See—
Fukuda, Kenichi; Mori, Takashi; Kurauchi, Yasuhiro; Doi, Masaharu; and Suematsu, Tetsuya, 4,877,498, Cl. 204-86.000.
- Dolan, James G.: See—
Buriks, Rudolf S.; and Dolan, James G., 4,877,842, Cl. 252-344.000.
- Dolomitwerke GmbH: See—
Chmiel, Max; and Prange, Rainer, 4,877,761, Cl. 501-109.000.
- Dombay, Zsolt: See—
Neu Jozsef; Csatos, Imre; Varga, Andras; Suranyi, Robert; Ilovai, Zoltan; Gaal, Sandor; Karsai, Jozsef; Sebestyen, Endre; Gardi, Eva; Siki, Karoly; Toth, Istvan; Gal, Guszt/e,acu/a/ v; Dombay, Zsolt; Grega nee Toth, Mrs. Erzsabet; Pavlicsak, Csaba; Tarpai, Gyula; Bonnyay, Peter; and Santha, Pal, 4,877,893, Cl. 558-86.000.
- Domigan, Charles N., to Butler Manufacturing Company. Double adjustable duct support. 4,876,834, Cl. 52-126.200.
- Donati, Jean R.; Guttmann, Daniele; Rouillon, Yves; Paul, Pierre S.; and Zacharie, Guy, to Electricite de France (Service National). Structural parts of austenitic nickel-chromium-iron alloy. 4,877,465, Cl. 148-428.000.
- Donnell, James R.: See—
Asghar, Abid; and Donnell, James R., 4,878,200, Cl. 365-189.020.
- Donohue, R. Michael: See—
Walbridge, Van J.; and Donohue, R. Michael, 4,877,422, Cl. 55-20.000.
- Dopaco, Inc.: See—
Eisman, Larry, 4,877,178, Cl. 229-114.000.
- Dory, Thomas S., to Olin Corporation. Process for plasma depositing silicon nitride and silicon dioxide films onto a substrate. 4,877,641, Cl. 427-38.000.
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Kaper, Louris; Klammer, Roelof; and Noomer, Pieter J., 4,877,631, Cl. 426-422.000.
- Dow Chemical Company, The: See—
Beaver, Richard N.; and Morris, Gregory J. E., 4,877,499, Cl. 204-98.000.
- Beyer, Douglas E., 4,877,826, Cl. 524-377.000.
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- Shurtum, Robert P.; and Darby, Elaine B., 4,877,857, Cl. 528-95.000.
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Garow, Michael A. P., 4,877,879, Cl. 544-402.000.
- Dowell Australia Limited: See—
Sassella, Christopher D., 4,876,864, Cl. 70-89.000.
- Sassella, Christopher D.; Whitney, John R.; and McGeehan, Harold K., 4,877,227, Cl. 269-43.000.
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Hinds, Robert B.; Hutchinson, Charles B., Jr.; and Dowell, James S., 4,877,386, Cl. 425-110.000.
- Downey, John H. Dynamic hair grooming appliance. 4,877,042, Cl. 132-212.000.

- Draegerwerk Aktiengesellschaft: See—**
Sauerbaum, Thomas; and Kahning, Stefan, 4,877,329, Cl. 374-28.000.
- Draf, Rolf: See—**
Von Jordan, Wenzel; Draf, Rolf; Grone, Dieter; and Sauer, Harald, 4,877,598, Cl. 423-640.000.
- Drejer, Jorgen; and Jakobsen, Palle, to A/S Ferrosan. Method of treating calcium overload in brain cells of mammals.** 4,877,799, Cl. 514-317.000.
- Dresser-Rand Company: See—**
Bandukwalla, Phiroze, 4,877,369, Cl. 415-148.000.
Bandukwalla, Phiroze, 4,877,373, Cl. 415-208.400.
- Dresser U.K. Limited, A British Company: See—**
Smith, Charles G.; and Cottrell, Terence B. F., 4,877,427, Cl. 55-136.000.
- Drews, Wolf-Dietrich; Van Der Linden, Klaus; Ruttel, Martin; and Friedrich, Jürgen, to Siemens Aktiengesellschaft. Ultrasonic pocket atomizer.** 4,877,989, Cl. 310-323.000.
- Driggers, Roberts H. Method for installing and removing a fireplace insert.** 4,876,785, Cl. 29-426.300.
- Droke, A. Farrel: See—**
Fagan, John E.; and Droke, A. Farrel, 4,876,934, Cl. 83-879.000.
- Drost, Stephan: See—**
Schmidt, Helmut; Hutter, Frank; Haas, Karl-Heinz; Obermeier, Ernst; Steger, Ulrich; Endres, Hanns-Erik; and Drost, Stephan, 4,878,015, Cl. 324-71.500.
- Droste, Timothy A.: See—**
Crandall, Scott R.; Droste, Timothy A.; and Rosen, Stanley D., 4,876,923, Cl. 74-732.000.
- Du Pont Canada Inc.: See—**
Chu, Kenneth C., 4,877,840, Cl. 525-240.000.
- Duffour, Henri; Martin, Serge; and Studer, Ernst, to BBC Brown Boveri Ltd. Release mechanism for a high speed circuit breaker.** 4,877,928, Cl. 200-144.00R.
- Duffy, James J., to Ford Motor Company. Electronically controlled variable assist power steering system.** 4,877,099, Cl. 180-142.000.
- Duke University: See—**
Wilson, James F.; George, Rhett T., Jr.; and Chen, Zhenhai, 4,876,944, Cl. 91-35.000.
- Duley, Walter W.; and Kinsman, Grant. Means of enhancing laser processing efficiency of metals.** 4,877,939, Cl. 219-121.760.
- Dunlop Limited, A British Company: See—**
Shaw, Michael, 4,877,252, Cl. 273-232.000.
- Dunlop, Vance A.: See—**
Eggiman, J. Michael; and Dunlop, Vance A., 4,878,042, Cl. 340-439.000.
- Dupont, Andrea C.: See—**
Rzeszutski, Wacław J.; Guzewska, Maria E.; Carter, John P.; Adams, Theodore C., Jr.; Concannon, Thomas P.; and Kaiser, Carl, 4,877,779, Cl. 514-63.000.
- du Pont, Benjamin F.; and Sukeforth, Carl J., to Benjamin F. Du Pont. Stackable blocks.** 4,877,407, Cl. 434-302.000.
- Du Pont de Nemours, E. I., and Company: See—**
Bragaw, Chester G., Jr.; Concannon, Thomas P.; and Davis, Robert F., 4,877,683, Cl. 428-421.000.
- Brittelli, David R., 4,877,892, Cl. 549-552.000.**
- Buckmaster, Marlin D.; and Randa, Stuart K., 4,877,815, Cl. 521-85.000.**
- Christensen, Joel R.; Cuomo, John; and Levitt, George, 4,877,440, Cl. 71-90.000.**
- Hillemann, Craig L., 4,877,442, Cl. 71-92.000.**
- Ling, Lorraine B.; and Ng, Thomas K., 4,877,731, Cl. 435-142.000.**
- Merchant, Abid N.; Gorski, Robert A.; and Burke, Kenneth C., 4,877,545, Cl. 252-171.000.**
- Scopellano, Angelo G., 4,877,775, Cl. 514-41.000.**
- Yau, Wallace W., 4,876,882, Cl. 73-55.000.**
- Durant, Michael B.: See—**
Kuhn, Lawrence H.; and Durant, Michael B., 4,877,294, Cl. 303-9.000.
- Durbin, Dennis A.: See—**
Danielson, Arvin D.; and Durbin, Dennis A., 4,877,949, Cl. 235-462.000.
- Dutton, Drew J.: See—**
Johnson, William M.; Olson, Timothy A.; Dutton, Drew J.; Lee, Sherman; and Stoerner, David W., 4,878,166, Cl. 364-200.000.
- Dutzmann, Stefan: See—**
Elbe, Hans-Ludwig; Dutzmann, Stefan; and Reinecke, Paul, 4,877,446, Cl. 71-92.000.
- Dyckerhoff & Widmann Aktiengesellschaft: See—**
Aicher, Max; Jungwirth, Dieter; Klein, Hans-Wilhelm; and Ruswurm, Dieter, 4,877,463, Cl. 148-12.00B.
- Dyer, Gerald P., to United Technologies Corporation. Densimeter.** 4,876,880, Cl. 73-32.00R.
- Dziobek, Frank; and Mollenhoff, Horst, to Deutsche Babcock Werke Aktiengesellschaft. Method and device for cooling flue dust.** 4,877,423, Cl. 55-27.000.
- E. R. Squibb and Sons, Inc.: See—**
Steer, Peter L.; and Steer, Graham E., 4,876,788, Cl. 29-508.000.
- Earl, Dale C.: See—**
Darley, Henry M.; Gill, Michael C.; Earl, Dale C.; Ngo, Dinh T.; Wang, Paul C.; Hipona, Maria B. L.; and Dodrill, Jim, 4,878,190, Cl. 364-752.000.
- Easler, Timothy E.: See—**
Fee, Darrell C.; Poeppel, Roger B.; Easler, Timothy E.; and Dees, Dennis W., 4,877,506, Cl. 204-242.000.
- Eastern Company, The: See—**
Pastva, John V., 4,877,276, Cl. 292-218.000.
- Eastman Christensen Company: See—**
Tibbitts, Gordon A., 4,877,096, Cl. 175-410.000.
- Eastman Kodak Company: See—**
Cannon, James W., 4,878,075, Cl. 354-173.100.
Chen, Chung Y.; Riecke, Edgar E.; Harbison, Kenneth G.; and Chapman, Derek D., 4,877,724, Cl. 430-621.000.
Devaney, Mark J., Jr.; and Wannenwetsch, Edward H., 4,877,586, Cl. 422-101.000.
Diehl, Donald R.; and Reed, Ralph C., 4,877,721, Cl. 430-522.000.
Fagerburg, David R.; Watkins, Joseph J.; and Lawrence, Paul B., 4,877,851, Cl. 525-537.000.
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Glocker, David A.; Hatwar, Tukaram K.; McIntire, Gregory Lynn; Rao, Srinivas T.; and Stinson, Douglas G., 4,877,690, Cl. 428-627.000.
Guslits, Vladimir S.; and Weitzel, Richard A., 4,878,089, Cl. 355-253.000.
Katerberg, James A., 4,878,063, Cl. 346-1.100.
Katerberg, James A.; Wint, Robert L.; and Lewis, Richard A., 4,878,064, Cl. 346-75.000.
Lawrence, David J., 4,878,222, Cl. 372-48.000.
Mickle, Donald A. G.; and Wu, Tai-Wing, 4,877,810, Cl. 514-456.000.
Muszak, Martin F., 4,876,926, Cl. 81-3.200.
Yamazaki, Shunpei, 4,878,097, Cl. 357-58.000.
Young, Ralph H.; and May, John W., 4,877,699, Cl. 430-54.000.
- Eaton Corporation: See—**
Fletcher, Melvern W.; and Wylie, David G., 4,876,924, Cl. 74-745.000.
Oltean, Jerry M.; and Goodwin, Paul E., 4,877,048, Cl. 137-225.000.
- Ebberts, Timothy J.: See—**
Aranda, Michael A.; Ebberts, Timothy J.; Iida, Yoshio; Lindgren, Terence W.; and Robertson, Taggart H., 4,878,182, Cl. 364-518.000.
- Ebeling, Wolfgang, to Turmag Turbo-Maschinen-Ag Nusse & Grafer. Rock drilling machine, especially for underground mining.** 4,877,094, Cl. 175-170.000.
- Eberhardt, Thomas E. Apparatus for treating bodies of water.** 4,877,524, Cl. 210-242.100.
- Ebert, George W., to Home Fashions, Inc. Vertical coextruded pearlescent louver for vertical blinds.** 4,877,077, Cl. 160-236.000.
- ECIA - Equipements Et Composants Pour L'Industrie Automobile: See—**
Escaravage, Gerard, 4,877,287, Cl. 297-417.000.
- Eckel, Hans-Joachim; and Warych, Hans, to Signode System GmbH. Edge protector.** 4,877,673, Cl. 428-172.000.
- Ecoffey, Olivier; Mueller, Theodore; and Sigg, Hans, to Meseltron S.A. Pneumatic ring gauge.** 4,876,883, Cl. 73-37.500.
- Edmunds, Cyril G., to Xerox Corporation. Dual roll cleaning apparatus for charge retentive surface.** 4,878,093, Cl. 355-296.000.
- Eduard Kusters Maschinenfabrik GmbH & Co. KG: See—**
Schrora, Gunter; Brendel, Bernhard; and Hartmann, Werner, 4,877,331, Cl. 374-153.000.
- Edwards, Bruce W.: See—**
Edwards, D. Brandon; Edwards, Bruce W.; Howard, Ian D.; and Ives, Donald H., 4,877,316, Cl. 350-537.000.
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Edwards, D. Brandon; Edwards, Bruce W.; Howard, Ian D.; and Ives, Donald H., 4,877,316, Cl. 350-537.000.
- Egerton, Gary W.: See—**
Martin, Gregory C.; and Egerton, Gary W., 4,876,885, Cl. 73-129.000.
- Eggiman, J. Michael; and Dunlop, Vance A., to Eggiman, J. Michael. Apparatus for flashing vehicle lights to warn of engine stall.** 4,878,042, Cl. 340-439.000.
- Eichenberger, Peter, to Ford Motor Company. Dual range infinitely variable transmission.** 4,876,920, Cl. 74-689.000.
- Eickmann, Karl. Combustion engine for solid block fuel.** 4,876,850, Cl. 60-39.464.
- Eisman, Larry, to Dopaco, Inc. Paperboard foldable carton.** 4,877,178, Cl. 229-114.000.
- Ekstrom, Philip A.: See—**
Fralick, Richard D.; and Ekstrom, Philip A., 4,876,818, Cl. 43-7.000.
- Elantec: See—**
Gross, William H.; and Cecil, James B., 4,878,034, Cl. 330-298.000.
- Elbe, Hans-Ludwig; Dutzmann, Stefan; and Reinecke, Paul, to Bayer Aktiengesellschaft. Pesticides based on pyrimidine derivatives.** 4,877,446, Cl. 71-92.000.
- Electricite de France (Service National): See—**
Donati, Jean R.; Guttman, Daniele; Rouillon, Yves; Paul, Pierre S.; and Zacharie, Guy, 4,877,465, Cl. 148-428.000.
- Electro-Plasma, Inc.: See—**
Muehlberger, Erich; and Sickinger, Albert, 4,877,640, Cl. 427-34.000.
- Elf France: See—**
Trema, Daniel, 4,877,097, Cl. 180-357.000.
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- Elliott, Arthur J.: See—**
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- Ellisor, Milton W., Jr.: See—**
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- Elscint Ltd.: See—**
Granot, Joseph, 4,878,021, Cl. 324-309.000.
- Eltech Systems Corporation: See—**
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- Eltek, S.p.A.: See—**
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- Elzinga, Eugene R., Jr.: See—**
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- Emmons, William D.; and Winkle, Mark R., to Rohm and Haas Company. Electrophoretically depositable photosensitive polymer composition.** 4,877,818, Cl. 522-26.000.
- Emori, Yasuyoshi; Ohsaki, Hiroshi; and Nomura, Ikuo, to Jidosha Kiki Co., Ltd. Hydraulic reaction force apparatus for power steering system.** 4,877,100, Cl. 180-143.000.
- Emtek Health Care Systems: See—**
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- Enami, Yasushi, to Bridgestone Corporation. Apparatus for adjusting a water level of a lock.** 4,877,351, Cl. 405-86.000.
- Endoh, Eiji: See—**
Morimoto, Takeshi; and Endoh, Eiji, 4,877,508, Cl. 204-290.00R.
- Endrenyi, Frank, Jr.; and Hankins, Larry W., to Collins & Aikman Corporation. Tufted pile fabric.** 4,877,669, Cl. 428-88.000.
- Endres, Hanns-Erik: See—**
Schmidt, Helmut; Hutter, Frank; Haas, Karl-Heinz; Obermeier, Ernst; Steger, Ulrich; Endres, Hanns-Erik; and Drost, Stephan, 4,878,015, Cl. 324-71.500.
- Energy Conservation Partnership, Ltd.: See—**
Johnson, Arthur F., 4,876,986, Cl. 122-20.00B.
- Energy Research Corporation: See—**
Baker, Bernard S., 4,877,693, Cl. 429-19.000.
- Engelhardt, Fritz; Hintermeier, Karl; Muller, Manfred; Munch, Norbert; and Wagener, Hans, to Cassella Aktiengesellschaft. Methylolated and optionally etherified urethanes containing fluoroalkyl ligands.** 4,877,540, Cl. 252-8.750.
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- Ennghillis, Pavlina: See—**
Watkins, Daniel; Wong, Jimmy; and Ennghillis, Pavlina, 4,878,174, Cl. 364-200.000.
- Enomoto, Masayuki; Nagano, Eiki; Haga, Toru; Morita, Kouichi; and Sato, Ryo, to Sumitomo Chemical Company, Limited. Tetrahydroindazole-benzoxazines and use.** 4,877,444, Cl. 71-92.000.
- Entreprise Gagneraud Pere & Fils: See—**
Roussel, Michel; and Baffreau, Daniel, 4,877,452, Cl. 106-97.000.
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- Epperly, William R.; and Sullivan, James C., to Fuel Tech, Inc. Process for the reduction of nitrogen oxides in an effluent using sugar.** 4,877,591, Cl. 423-235.000.
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Lanigan Jr., John J.; Glickman, Myron; and Ermel, Bernard A., 4,877,365, Cl. 414-459.000.
- Erosion Protection Devices, Incorporated: See—**
Greene, Richard M., 4,877,349, Cl. 405-27.000.
- Escaravage, Gerard, to ECIA - Equipements Et Composants Pour L'Industrie Automobile. Device for adjusting the position of an armrest of an automobile vehicle seat.** 4,877,287, Cl. 297-417.000.
- Eschmann, Friedrich; and Streuber, Christian, to Didier-Werke AG. Hot blast stove installation.** 4,877,013, Cl. 126-110.000.
- Esser, Leonard J. M.: See—**
Bakker, Jacobus G. C.; and Esser, Leonard J. M., 4,878,102, Cl. 357-24.000.
- Esser, Wolfgang; and Jung, Peter, to Nixdorf Computer AG. Voltage source having preset values for source voltage and internal resistance.** 4,878,009, Cl. 323-275.000.
- Estavoyer, Jacques: See—**
Cherbuy, Bernard; and Estavoyer, Jacques, 4,877,341, Cl. 400-119.000.
- Eszakmagyarorszag Vegyimuvek: See—**
Neu Jozsef; Csatos, Imre; Varga, Andras; Suranyi, Robert; Ilvay, Zoltan; Gaal, Sandor; Karsai, Jozsef; Sebestyen, Endre; Gardi, Eva; Siki, Karoly; Toth, Istvan; Gal, Guszt/e,acu/a/ v; Dombay, Zsolt; Grega nee Toth, Mrs. Erzebet; Pavlicsak, Csaba; Tarpai, Gyula; Bonnyay, Peter; and Santha, Pal, 4,877,893, Cl. 558-86.000.
- Etani, Tadao: See—**
Honda, Sumio; Ogata, Taizo; and Etani, Tadao, 4,876,839, Cl. 53-137.000.
- Etat Francais as represented by the Delegeue general pour l'armement: See—**
Dasse, Gerard, 4,877,466, Cl. 149-108.600.
- Etat Francais Represente par le Ministre des PTT: See—**
Thioulouse, Pascal; and Solomon, Ionel, 4,877,995, Cl. 313-507.000.
- Ethyl Corporation: See—**
Broemmelsiek, H. Eugene; Lee, Raymond; and Lanier, Carroll W., 4,877,563, Cl. 264-26.000.
- Gatto, Vincent J., 4,877,902, Cl. 568-23.000.**
- Eto, Kazumi: See—**
Tanaka, Hiroshi; Murata, Yasukiyo; and Eto, Kazumi, 4,876,861, Cl. 62-279.000.
- Eto, Naonobu: See—**
Sakaki, Mamoru; Arai, Ryuichi; Akiya, Takashi; Toganoh, Shigeo; Higuma, Masahiko; Eto, Naonobu; Mouri, Hidemasa; Tobita, Michiaki; Ishida, Masahiko; and Kono, Shunzo, 4,877,680, Cl. 428-332.000.
- Etter, Hans: See—**
Hauri, Bernhard; and Etter, Hans, 4,877,324, Cl. 356-251.000.
- Evans, Samuel, to Ciba-Geigy Corporation. Sulfur-containing compounds as antioxidants for lubricants and elastomers.** 4,877,824, Cl. 524-83.000.
- Ewart, Ron B. Photographic image data management system for a visual system.** 4,878,183, Cl. 364-521.000.
- Exxon Research and Engineering Company: See—**
Chung, Tze-Chiang, 4,877,846, Cl. 525-369.000.
Cody, George D.; Elzinga, Eugene R., Jr.; Callegari, Andrew J.; and Cohen, Roger W., 4,877,488, Cl. 201-1.000.
Goetsch, Duane A.; and Say, Geoffrey R., 4,877,550, Cl. 252-373.000.
Wisotsky, Max J.; and Metro, Stephen J., 4,877,541, Cl. 252-47.500.
- Eyidentify, Inc.: See—**
Hill, Robert V., 4,877,322, Cl. 351-221.000.
- Faber, Thomas J.: See—**
Guenther, Kenneth L.; Rabindran, Karavattuvelil G.; Faber, Thomas J.; and Abrams, Jack S., 4,877,346, Cl. 400-624.000.
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Stenudd, Sven G. V., 4,877,342, Cl. 400-121.000.
- Fagan, John E.; and Droke, A. Farrel, to Burford Corp. Computerized bread splitter.** 4,876,934, Cl. 83-879.000.
- Fagerburg, David R.; Watkins, Joseph J.; and Lawrence, Paul B., to Eastman Kodak Company. Blends of copoly(arylene sulfide) and poly(arylene sulfide).** 4,877,851, Cl. 525-537.000.
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- Fahey, William F.: See—**
Zetmeisl, Michael J.; and Fahey, William F., 4,877,578, Cl. 422-14.000.
- Fairchild, Paul W.; Clancy, Jim L.; Fields, William G.; Bishop, Louis, Jr.; and Fly, Mark W., to Thermo-Aire Systems, Inc. Low temperature air induction diffuser.** 4,876,949, Cl. 98-40.100.
- Falconbridge Limited: See—**
Bulatovic, Srdjan; and Jessup, Tim M., 4,877,517, Cl. 209-167.000.
- Falconer, Ian: See—**
Bible, Matthew; Lesage, Marc; and Falconer, Ian, 4,876,886, Cl. 73-151.500.
- Falgat, Francis: See—**
Barbier, Pascal; Falgat, Francis; and Sorel, Alain, 4,878,060, Cl. 343-778.000.
- Falicoff, Waqidi; Delano, Richard; and Raseman, Chad J. Light transmitting or reflective sheet responsive to temperature variations.** 4,877,675, Cl. 428-204.000.
- Faller, Bernd: See—**
Ackermann, Frank; Wollermann-Windgasse, Reinhard; and Faller, Bernd, 4,878,227, Cl. 372-107.000.
- Falloon, David R. Tossing game.** 4,877,256, Cl. 273-400.000.
- Fanselow, Dan L.: See—**
Ko, Su-sen; and Fanselow, Dan L., 4,877,037, Cl. 128-756.000.
- Fanuc Ltd.: See—**
Aso, Toshiyuki; and Ishibashi, Tamotsu, 4,877,935, Cl. 219-69.120.
Inaba, Yoshiharu; and Tokunaga, Shigeo, 4,877,388, Cl. 425-150.000.
Kiya, Nobuyuki; and Maeda, Kimio, 4,878,171, Cl. 364-474.290.
Matsumura, Teruyuki, 4,878,172, Cl. 364-191.000.
Torii, Nobutoshi; Mizuno, Hitoshi; and Iwasaki, Kyoji, 4,877,973, Cl. 307-147.000.
- Farah, Victor. Device for carrying bags, particularly refuse bags.** 4,877,207, Cl. 248-97.000.
- Faron, Michael F.; and Srinivasan, Ramji, to University of Akron. Method of polymerizing α,ω -diynes.** 4,877,917, Cl. 585-416.000.
- Farraj, Hefetz. Amusement device with playing pieces rearrangeable in slots.** 4,877,248, Cl. 273-153.00S.
- Farrar, Jeffrey: See—**
Conti-Ramsden, John N.; Powell, Richard L.; Young, Brian D.; Farrar, Jeffrey; and Brown, Debra K., 4,877,839, Cl. 525-200.000.
- Faust, Wayne. Putting device.** 4,877,251, Cl. 273-194.00A.
- Favro, Lawrence D.: See—**
Thomas, Robert L.; Kuo, Pao-Kuang; and Favro, Lawrence D., 4,878,116, Cl. 358-160.000.
- Fee, Darrell C.; Poeppel, Roger B.; Easler, Timothy E.; and Dees, Dennis W. Monolithic solid electrolyte oxygen pump.** 4,877,506, Cl. 204-242.000.
- Fein, Michael E., to Tencor Instruments. High brightness and viewed gas discharge lamp.** 4,877,997, Cl. 313-634.000.

- Fein, Michael E.: See—
Chadwick, Curt H.; Sholes, Robert R.; Greene, John D.; Tucker, Francis D., III; Fein, Michael E.; Jann, P. C.; Harvey, David J.; and Bell, William, 4,877,326, Cl. 356-394.000.
- Fein, Murray A.: See—
Norden-Paul, Ronald E.; Fein, Murray A.; and Stewart, Sandra L., 4,878,175, Cl. 364-413.010.
- Felix, Willi, to Jos. Hunkeler Ltd. Window letter, 4,877,177, Cl. 229-92.300.
- Felt, George R.; Multhaus, Donna K.; and Wagle, Sudhakar S., to Rorer Pharmaceutical Corporation. Product-dispensing method and apparatus, 4,876,891, Cl. 73-426.000.
- Feltz, Kevin L.; Richardson, Glenn A.; and Burrell, Jonathan C., to Allied-Signal Inc. Shut off/pressure regulating valve for turbine engine, 4,876,857, Cl. 60-734.000.
- Ferber, Hubert P.: See—
Binder, Dieter; Rovensky, Franz; and Ferber, Hubert P., 4,877,809, Cl. 514-444.000.
- Ferrant, Richard: See—
Bergemont, Albert; and Ferrant, Richard, 4,877,483, Cl. 156-653.000.
- Ferry, David K.: See—
Bernstein, Gary; Ferry, David K.; and Liu, Wenping, 4,877,716, Cl. 430-309.000.
- Festo KG: See—
Stoll, Kurt; and Muller, Lothar, 4,876,945, Cl. 92-5.00R.
Stoll, Kurt, 4,877,058, Cl. 137-625.480.
- Fields, William G.: See—
Fairchild, Paul W.; Clancy, Jim L.; Fields, William G.; Bishop, Louis, Jr.; and Fly, Mark W., 4,876,949, Cl. 98-40.100.
- Fierkens, Richardus H. J.; and Pas, Irenus J. T. M., to ASM Fico Tooling, b.v. Automatic continuously cycleable molding system, 4,877,387, Cl. 425-116.000.
- Figgie International Inc.: See—
Rockersath, John L.; and Blust, Dale K., 4,877,655, Cl. 427-430.100.
- Finduck S.r.l.: See—
Mannato, Pietro, 4,876,863, Cl. 70-64.000.
- Finic, B.V.: See—
Resi di Cervia, Arturo L., 4,877,358, Cl. 405-267.000.
- Finley, John W.: See—
Klemann, Lawrence P.; Finley, John W.; and Scimone, Anthony, 4,877,871, Cl. 536-124.000.
- Fiorenzano, Alintor, Jr. Sterilization system by means of high thermal gradient ducts, 4,877,990, Cl. 219-381.000.
- Fiorina, Jean-Noel: See—
Moreau, Philippe; and Fiorina, Jean-Noel, 4,878,026, Cl. 324-547.000.
- Firestone Tire & Rubber Company, The: See—
Siegenthaler, Karl J., 4,877,468, Cl. 156-111.000.
- Fischer, Bernd F.: See—
Muehnik, Boris J.; and Fischer, Bernd F., 4,877,666, Cl. 428-64.000.
- Fisher, David A., to STC PLC. Data transmission system, 4,878,232, Cl. 375-111.000.
- Fisher, Ronaldo L.: See—
Hachler, Ronald M., Jr.; Smith, Gaylord D.; Weber, John H.; Fisher, Ronaldo L.; Gaul, David J.; and Hinz, Jay W., 4,877,435, Cl. 65-1.000.
- Flaig, Heinz; Neumann, Udo; Hasselmann, Heinz; Zacharias, Karl; Horbach, Rainer; and Bittsch, Harald; to Mannesmann AG. Motor with axially displaceable rotor, 4,877,987, Cl. 310-209.000.
- Flanigen, Edith M.: See—
Mercer, William C.; Coughlin, Peter K.; McLeod, Donald, Jr.; and Flanigen, Edith M., 4,876,890, Cl. 73-336.500.
- Flath, Robert A.: See—
McGovern, Terrence P.; Flath, Robert A.; and Cunningham, Roy T., 4,877,607, Cl. 424-84.000.
- Fleming, Paul D.; and O'Day, David L., to W & F Manufacturing, Inc. Door latch and deadbolt assembly, 4,876,866, Cl. 70-379.00R.
- Fletcher, Melvina W.; and Wylie, David G., to Eaton Corporation. Extended range splitter type compound transmission, 4,876,924, Cl. 74-745.000.
- Fliermans, Carl B., to United States of America, Energy. Aerobic microorganism for the degradation of chlorinated aliphatic hydrocarbons, 4,877,736, Cl. 435-183.000.
- Flodt, Helmut, to Telefunken electronic GmbH. Solar cell module, 4,877,460, Cl. 136-244.000.
- Floyd, Terry S.; and Hargett, Wyatt P., Jr., to CEM Corporation. Digestion and sterilization methods and apparatus, 4,877,624, Cl. 426-241.000.
- Fly, Mark W.: See—
Fairchild, Paul W.; Clancy, Jim L.; Fields, William G.; Bishop, Louis, Jr.; and Fly, Mark W., 4,876,949, Cl. 98-40.100.
- Flynn, Daniel L.: See—
Bellotti, Thomas R.; Connor, David T.; Flynn, Daniel L.; Kostian, Catherine R.; and Nies, Donald E., 4,877,881, Cl. 548-240.000.
- Fontaine, Jean P. L., to Goodyear Tire & Rubber Company, The. Tread for left and right vehicle tires, 4,877,072, Cl. 152-209.00R.
- Fontaine, Suzanne: See—
Vora, Rohitkumar H.; Khanna, Dinesh N.; and Fontaine, Suzanne, 4,877,653, Cl. 427-385.500.
- Ford Aerospace & Communications Corporation: See—
Vincze, Arpad D., 4,878,030, Cl. 330-149.000.
- Ford, David B.; Lynch, James E.; and Rateike, Leroy R., to National-Oilwell. Spring actuated power swivel support rollers, 4,877,093, Cl. 175-113.000.
- Ford Motor Company: See—
Crandall, Scott R.; Droste, Timothy A.; and Rosen, Stanley D., 4,876,923, Cl. 74-732.000.
Duffy, James J., 4,877,099, Cl. 180-142.000.
Eichenberger, Peter, 4,876,920, Cl. 74-689.000.
Hyde, James P., 4,877,147, Cl. 220-85.0VR.
Kenealy, Dean R.; and Aittama, Robert W., 4,877,001, Cl. 123-519.000.
- Fordonal, S.A.: See—
Vega-Noverola, Armando; Prieto Soto, Jose M.; Noguera, Fernando P.; Mauri, Jacinto M.; and Spickett, Robert G. W., 4,877,780, Cl. 514-161.000.
- Forella, Guy: See—
Delbe, Emmanuel; Gillet, Francois; Serot, Etienne; Chifflet, Raymond; Allio, Roland; Jeantin, Philippe; Del Fabro, Gilbert; and Forella, Guy, 4,877,229, Cl. 271-2.000.
- Formasari, Paolo, to Eltek, S.p.A. Pneumatic, water leakage safety device for washing machines, 4,877,049, Cl. 137-312.000.
- Forsman, Nanna: See—
Anderson, Lars-Olof; Forsman, Nanna; Larsen, Kerstin E. I.; Lundin, Annelie B.; Pavla, Bohdan; Sandberg, Inga H.; and Sewerin, Karin M., 4,877,614, Cl. 424-101.000.
- Fortin, Michel: See—
Clemence, Francois; Le Martret, Odile; Delevallee, Françoise; and Fortin, Michel, 4,877,796, Cl. 514-311.000.
- Foster, David W., to Soft Vac, Inc. Portable appliance cover, 4,876,762, Cl. 15-247.000.
- Postex Corporation of Japan: See—
Tamura, Shigeki, 4,878,040, Cl. 338-158.000.
- Foty, Michael J.: See—
Campion, Neil P.; Foty, Michael J.; and Novak, Richard P., 4,876,783, Cl. 29-401.100.
- Fournier Innovation et Synergie: See—
Samreth, Soth; Bellamy, Francois; and Millet, Jean, 4,877,808, Cl. 514-432.000.
- Fox, Jeffrey L.: See—
Higuchi, William I.; Fox, Jeffrey L.; and Powell, G. Lynn, 4,877,401, Cl. 433-215.000.
- Foxboro Company, The: See—
DeCarlo, Joseph P.; and Kegal, Thomas M., 4,876,897, Cl. 73-861.040.
- Fralick, Richard D.; and Ekstrom, Philip A., to Northwest Marine Technology, Inc. Marked fishing net and method for making same, 4,876,818, Cl. 43-7.000.
- France, Donald J.: See—
Asato, Goro; and France, Donald J., 4,877,888, Cl. 549-264.000.
- Francis, Raymond L. Backgammon score tower, 4,877,247, Cl. 273-148.00R.
- Frank, Glenn R.; and Stewart, Edward T., Jr., to Robert Thomas Ltd. Dental equipment cleaning apparatus and method, 4,877,399, Cl. 433-25.000.
- Frank, Walter C., to Union Camp Corporation. Process for preparing polyalkyl tetrahydronaphthalenes, 4,877,910, Cl. 585-411.000.
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- Frank, Walter C., to Union Camp Corporation. Process for preparing polyalkyl tetrahydronaphthalenes, 4,877,916, Cl. 585-411.000.
- Frank, Wolfgang: See—
Golob, Jurgen; and Franke, Wolfgang, 4,877,191, Cl. 241-92.000.
- Franklin, Harlow; Cooper, William J.; and Deschenes, Charles L., to Dennison Manufacturing Company. Dispensing of attachments, 4,877,172, Cl. 227-67.000.
- Fraunhofer-Gesellschaft zur Förderung der angewandten Forschung e.V.: See—
Schmidt, Helmut; Hutter, Frank; Haas, Karl-Heinz; Obermeier, Ernst; Steger, Ulrich; Endres, Hanns-Erik; and Drost, Stephan, 4,878,015, Cl. 324-71.500.
- Frazier, Gary A.: See—
Reed, Mark A.; and Frazier, Gary A., 4,878,104, Cl. 357-30.000.
- Freeman, Dean W., to Texas Instruments Incorporated. In situ doped polysilicon using tertiary butyl phosphine, 4,877,753, Cl. 437-101.000.
- French, Craig P.: See—
French, Paul H.; and French, Craig P., 4,877,293, Cl. 298-17.00R.
- French, Paul H.; and French, Craig P. Load bridging dump trailer, 4,877,293, Cl. 298-17.00R.
- Frick, Roger L.: See—
Schulte, John P.; Orth, Kelly M.; Frick, Roger L.; Westfield, Brian L.; and Paschke, Randy K., 4,878,012, Cl. 324-60.0CD.
- Fricke, Eberhard; and Fricke, Marie S. Hand and arm restraint, 4,877,038, Cl. 128-869.000.
- Fricke, Marie S.: See—
Fricke, Eberhard; and Fricke, Marie S., 4,877,038, Cl. 128-869.000.
- Friedman, Frank A.: See—
Kelley, James O.; Stumpf, William E.; and Friedman, Frank A., 4,876,835, Cl. 52-239.000.

- Friedrich, Jurgen: See—
Drews, Wolf-Dietrich; Van Der Linden, Klaus; Ruttel, Martin; and Friedrich, Jurgen, 4,877,989, Cl. 310-323.000.
- Friesen, Dwayne T.; and Obligin, Alan S., to Bend Research, Inc. Siloxane-grafted membranes, 4,877,528, Cl. 210-500.290.
- Fritz Bauer and Sohne OHG: See—
Bauer, Hans-Peter; and Bauer, Hans J., 4,877,115, Cl. 188-322.150.
- Froger, Guy: See—
Chevallier, Marc; and Froger, Guy, 4,877,272, Cl. 285-111.000.
- Froment, Jean-Paul; and Palau, Joseph, to S.A. Des Etablissements Staubli (France). Device for coupling heddle frames to the transmission elements of a mechanism for forming the shed, 4,877,060, Cl. 139-82.000.
- Frost, Rodney I., to Corning Incorporated. Mini-monolith substrate, 4,877,766, Cl. 502-439.000.
- Fuel Tech, Inc.: See—
Epperly, William R.; O'Leary, John H.; Sullivan, James C.; and Sprague, Barry N., 4,877,590, Cl. 423-235.000.
Epperly, William R.; and Sullivan, James C., 4,877,591, Cl. 423-235.000.
- Fuji Electric Co., Ltd.: See—
Kuroda, Masami; Hattori, Yoshimasa; Furusho, Noboru; and Sugata, Yoshinobu, 4,877,703, Cl. 430-76.000.
Morioka, Takayuki; Motoyama, Nobuyuki; Hoshikawa, Hiroshi; Takahashi, Takeo; Suzuki, Sizu; Ishikawa, Tuiyoshi; Toyoshi, Takanori; and Ueda, Toshio, 4,877,558, Cl. 252-626.000.
- Fuji Oil Company, Limited: See—
Koyano, Tetsuo; Sagi, Nobuo; Izumi, Tsugio; Fujita, Setsuya; Murata, Tadahiko; Hachiya, Iwao; and Mori, Hiroyuki, 4,877,636, Cl. 426-607.000.
- Fuji Pack System Ltd.: See—
Takamura, Yoshiyuki, 4,876,840, Cl. 53-137.000.
- Fuji Photo Film Co., Ltd.: See—
Agano, Toshitaka; and Nakajima, Nobuyoshi, 4,877,958, Cl. 250-327.200.
Ando, Shigeru; and Sasaki, Hidemi, 4,878,138, Cl. 360-99.020.
Aoi, Toshiaki; Maemoto, Kazuo; Kamiya, Akihiko; and Misu, Hiroshi, 4,877,711, Cl. 430-176.000.
Higashi, Tatsuji; and Kita, Nobuyuki, 4,877,719, Cl. 430-326.000.
Hirano, Shigeo; Inoue, Noriyuki; and Heki, Tatsuo, 4,877,723, Cl. 430-598.000.
Hosoi, Noriyuki, 4,877,708, Cl. 430-126.000.
Ishikawa, Minoru, 4,877,710, Cl. 430-138.000.
Namiki, Tomizo; Suzuki, Kazuo; and Shinozaki, Fumiaki, 4,877,712, Cl. 430-256.000.
Oda, Shobei; Seshimoto, Osamu; Sueyoshi, Tohru; and Amano, Hiroyuki, 4,877,582, Cl. 422-68.000.
Ono, Shuji, 4,877,955, Cl. 250-239.000.
Sato, Kozo; Ohno, Shigeru; and Yamada, Sumito, 4,877,720, Cl. 430-512.000.
- Yazawa, Kenichiro; Seshimoto, Osamu; Kitajima, Masao; and Kondo, Asaji, 4,877,579, Cl. 422-56.000.
- Fujimoto, Hitoshi; and Masuda, Hisao, to Mitsubishi Denki Kabushiki Kaisha. Wire bonding apparatus, 4,877,173, Cl. 228-1.100.
- Fujimoto, Tadayuki: See—
Yasukawa, Takeshi; Onishi, Masayoshi; and Fujimoto, Tadayuki, 4,876,948, Cl. 92-99.000.
- Fujimoto, Ted. T.: See—
Swithenbank, Colin; and Fujimoto, Ted. T., 4,877,897, Cl. 560-021.000.
- Fujisaki, Kunio, to Hitachi, Ltd. IC card having a function to exclude erroneous recording, 4,877,945, Cl. 235-379.000.
- Fujisawa, Hidemitsu: See—
Hattori, Michinobu; Fujisawa, Hidemitsu; and Kusaura, Akio, 4,877,667, Cl. 428-64.000.
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Takaya, Takao; Masugi, Takashi; Takasugi, Hisashi; and Kochi, Hiromu, 4,877,873, Cl. 544-227.000.
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- Fujita, Setsuya: See—
Koyano, Tetsuo; Sagi, Nobuo; Izumi, Tsugio; Fujita, Setsuya; Murata, Tadahiko; Hachiya, Iwao; and Mori, Hiroyuki, 4,877,636, Cl. 426-607.000.
- Fujitsu Limited: See—
Arakawa, Hideki, 4,878,203, Cl. 365-226.000.
Kokado, Masayuki, 4,877,977, Cl. 307-455.000.
Nakanishi, Akio; Hino, Toshio; Iino, Yoshio; Suetani, Kazuhisa; Houki, Yoji; and Ikuta, Hiroto, 4,878,088, Cl. 355-244.000.
Suzuki, Toshihiro; Todokoro, Yasuyuki; and Komenou, Kazunari, 4,877,717, Cl. 430-321.000.
Yunoki, Hideo, 4,878,216, Cl. 370-60.000.
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Ogawa, Toshiaki; Fujiwara, Nobuo; Kawai, Kenji; Shibano, Teruo; Morita, Hiroshi; and Nishioka, Kyusaku, 4,877,509, Cl. 204-298.000.
- Fukao, Masami: See—
Suzukamo, Gohfu; and Fukao, Masami, 4,877,918, Cl. 585-664.000.
- Fukasawa, Eiichi: See—
Okudaira, Shigenori; Irie, Takefumi; Uchida, Hiroshi; Fukasawa, Eiichi; Kobayashi, Kazuhiko; and Yamaguchi, Masanori, 4,877,445, Cl. 75-0.50B.
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Morita, Saizuo; Hayakawa, Kazushi; Ito, Kunio; Matsuo, Shunji; Fukuchi, Masakazu; and Hatakeyama, Noboru, 4,878,091, Cl. 355-260.000.
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Matsumoto, Susumu; Ohta, Hiroki; Yamada, Masahiro; Higashino, Yoshiaki; and Fukuchi, Toshiaki, 4,877,804, Cl. 514-342.000.
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Mifune, Toshimi; Morooka, Yasuo; Shojima, Hiroshi; Mori, Junko; and Fukunaga, Yasushi, 4,878,249, Cl. 382-13.000.
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Jinno, Osamu; and Fukuoka, Tatsuhiko, 4,877,813, Cl. 525-146.000.
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Yamamoto, Isamu; and Fukushima, Jiro, 4,877,756, Cl. 437-209.000.
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Fujita, Minoru; and Fukushima, Yoichi, 4,877,713, Cl. 430-270.000.
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Creagh, Linda T.; Fulton, Steven F.; Hoisington, Paul A.; Paulson, Bruce A.; Schaffer, Robert R.; and Spehrley, Charles W., Jr., 4,877,676, Cl. 428-204.000.
- Funderingstechnieken Verstraeten B.V.: See—
Verstraeten, Alexander J., 4,877,357, Cl. 405-267.000.
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Suzuki, Akinori; Kajita, Toshio; and Furushima, Masakazu, 4,877,447, Cl. 71-103.000.
- Furusho, Noboru: See—
Kuroda, Masami; Hattori, Yoshimasa; Furusho, Noboru; and Sugata, Yoshinobu, 4,877,703, Cl. 430-76.000.
- Furuta, Akihiko: See—
Watanabe, Tsutomu; and Furuta, Akihiko, 4,877,497, Cl. 204-55.100.
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Miura, Tohru; Nagata, Teruyuki; Okazaki, Koju; Furuya, Masayuki; and Nishida, Emiko, 4,877,907, Cl. 568-721.000.
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Itoh, Kunio; Shiobara, Toshio; Futatsumori, Koji; Tomiyoshi, Kazutoshi; and Shimizu, Hisashi, 4,877,822, Cl. 523-433.000.
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- G. D. Searle & Co.: See—
Hanson, Gunnar J.; and Baran, John S., 4,877,785, Cl. 514-224.200.
- G-P Manufacturing Co., Inc.: See—
Price, Robert A., 4,877,268, Cl. 280-851.000.
- Gaal, Sander: See—
Neu Jozsef; Csantos, Imre; Varga, Andras; Suranyi, Robert; Ilovai, Zoltan; Gaal, Sander; Karsai, Jozsef; Sebestyen, Endre; Gardi, Eva; Siki, Karoly; Toth, Istvan; Gal, Guszt/eacu/a/ v; Dombay, Zsolt; Grega nec Toth, Mrs. Erzsébet; Pavlicsák, Csaba; Tarpai, Gyula; Bonnyay, Peter; and Santha, Pal, 4,877,893, Cl. 558-86.000.
- Gabler, Rolf: See—
Abthoff, Joerg; Schuster, Hans-Dieter; Langer, Hans-Joachim; Strohm, Erwin; Gabler, Rolf; and Schulte, Roland, 4,876,852, Cl. 60-275.000.
- Gabor, Szoradi; and Sandor, Nagy, to BRG Mechatronikai Vallalat. Method for charging nickel-cadmium batteries and circuit arrangement for carrying out the method, 4,878,007, Cl. 320-14.000.
- Gabriel, Robert; Aronson, Michael P.; and Steyn, Peter L., to Lever Brothers Company. Oxidation stable surfactants, 4,877,544, Cl. 252-99.000.
- Gabriel, William L.; and Meditz, Reinhold. Collated nail strip, 4,877,135, Cl. 206-344.000.
- GAF Corporation: See—
Gershenson, Moshe; and Moskowitz, Mark L., 4,877,198, Cl. 242-74.000.
- Gagnon, Daniel, to Ultimage Inc. Method and circuit for processing narrow band signals located in a wide band having disturbance, 4,878,186, Cl. 364-574.000.

- Gal, Guszt/e,acu/a/ v: See—
 Neu Jozsef; Csantos, Imre; Varga, Andras; Suranyi, Robert; Ilovai, Zoltan; Gaal, Sandor; Karsai, Jozsef; Sebestyen, Endre; Gardi, Eva; Siki, Karoly; Toth, Istvan; Gal, Guszt/e,acu/a/ v; Dombay, Zsolt; Grega nee Toth, Mrs. Erzsebet; Pavlicsak, Csaba; Tarpai, Gyula; Bonnyay, Peter; and Santha, Pal, 4,877,893, Cl. 558-86.000.
- Galitello, Kenneth A., Jr. Two stroke cycle engine. 4,876,991, Cl. 123-46.00E.
- Galletti, Pierre M.: See—
 Valentini, Robert F.; Aebischer, Patrick; and Galletti, Pierre M., 4,877,029, Cl. 128-334.00R.
- Galichio, Michael J., to National Semiconductor Corporation. Anti-parallel capacitor. 4,878,151, Cl. 361-329.000.
- Galloway, Deane E.: See—
 Shepard, Mary E.; Galloway, Deane E.; and Lind, Keith D., 4,877,684, Cl. 428-475.800.
- Game Time, Inc.: See—
 Shannon, William H., 4,877,236, Cl. 272-33.00R.
- Ganesan, Pasupathy: See—
 Smith, Gaylord D.; Tassen, Curtis S.; Ganesan, Pasupathy; and Wheeler, Jack M., 4,877,461, Cl. 148-11.50N.
- Gansow, Michael A. P., to Dow Chemical (Nederland) B.V. Preparation of polyether compositions. 4,877,879, Cl. 544-402.000.
- Garbo, Greta M.: See—
 Morgan, Alan R.; Selman, Steven H.; Garbo, Greta M.; and Keck, Rick W., 4,877,872, Cl. 540-145.000.
- Gardi, Eva: See—
 Neu Jozsef; Csantos, Imre; Varga, Andras; Suranyi, Robert; Ilovai, Zoltan; Gaal, Sandor; Karsai, Jozsef; Sebestyen, Endre; Gardi, Eva; Siki, Karoly; Toth, Istvan; Gal, Guszt/e,acu/a/ v; Dombay, Zsolt; Grega nee Toth, Mrs. Erzsebet; Pavlicsak, Csaba; Tarpai, Gyula; Bonnyay, Peter; and Santha, Pal, 4,877,893, Cl. 558-86.000.
- Gardner, Deane: See—
 Bibl, Andreas; Higginson, John; and Gardner, Deane, 4,878,071, Cl. 346-153.100.
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 Disselkoen, Allen D., Jr.; Gargiulo, Robert F.; Haywood, James E.; Heise, Keith H.; Holcomb, Darrell H.; Kramer, Stuart C.; Miller, Gregory R.; Nicholson, Jeffrey S.; Olinger, Jeffrey J.; and Spenny, Curtis H., 4,877,202, Cl. 244-122.00A.
- Garman, Shelly N.: See—
 Bohm, Walter J.; Brubaker, Richard A.; Garman, Shelly N.; Hosfeld, Lewis K.; Ko, Kenneth K.; and Tymon, Thomas M., 4,877,484, Cl. 162-103.000.
- Gartner, Georg F.; and Lydtin, Hans-Jurgen, to U.S. Philips Corp. Method of manufacturing electrically conductive molded bodies by plasma-activated chemical deposition from the gaseous phase. 4,877,642, Cl. 427-38.000.
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 Gary, Lonnie F., 4,877,209, Cl. 248-205.300.
- Gatto, Vincent J., to Ethyl Corporation. Polythiobisphenol process. 4,877,902, Cl. 568-23.000.
- Gaul, David J.: See—
 Haeblerle, Ronald M., Jr.; Smith, Gaylord D.; Weber, John H.; Fisher, Ronaldo L.; Gaul, David J.; and Hinze, Jay W., 4,877,435, Cl. 65-1.000.
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 Springer, Robert M.; Schmal, Richard L.; and Gavenman, Eugene H., 4,878,242, Cl. 379-204.000.
- Gawargy, Mumtaz B., to Northern Telecom Limited. Electronic hybrid circuit. 4,878,244, Cl. 379-402.000.
- Gebruder Junghans GmbH: See—
 Schillinger, Wolfgang; Halssig, Andreas; and Zehnder, Wolfgang, 4,876,960, Cl. 102-249.000.
- Gefroh, James A.; and Hattman, Fredric J., to RM Base Company. Accessible areaway system. 4,876,833, Cl. 52-107.000.
- Geheeb, Norbert: See—
 Mayer, Ernst; Geheeb, Norbert; and Kohler, Uwe, 4,876,996, Cl. 123-90.510.
- Gehring, Johann; and Birkle, Siegfried, to Siemens Aktiengesellschaft. Method and means for drying bulk goods. 4,876,801, Cl. 34-9.000.
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- Geibel, Jon F.; and Nesheiwat, Afif, to Phillips Petroleum Company. Buffer wash of polyarylene sulfides. 4,877,850, Cl. 525-471.000.
- Gelchinsky, Boris. Method of analyzing the structure of a medium, particularly useful for seismic prospecting. 4,878,205, Cl. 367-61.000.
- Gelinas, Robert C., Jr. Apparatus for retaining a ball. 4,877,166, Cl. 224-223.000.
- General DataComm, Inc.: See—
 Sorrentino, Gregory, 4,877,364, Cl. 411-337.000.
- General Electric Company: See—
 Aloi, Anthony J.; Bernard, Robert R.; and Proulx, Edward A., 4,876,940, Cl. 89-33.160.
- Jones, Marshall G.; and Batra, Prem N., 4,877,175, Cl. 228-102.000.
- Maresca, Louis M., 4,877,848, Cl. 525-423.000.
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- Stein, Judith; and Leonard, Tracey M., 4,877,828, Cl. 524-728.000.
- General Motors Corporation: See—
 Koromilas, Constantinos A., 4,877,385, Cl. 418-197.000.
- Logan, James L., 4,877,279, Cl. 293-121.000.
- Genetics Institute, Inc.: See—
 Clark, Steven C.; Ciarletta, Agnes B.; and Yang, Yu-Chung, 4,877,729, Cl. 435-68.000.
- Wang, Elizabeth A.; Wozney, John M.; and Rosen, Vicki, 4,877,864, Cl. 530-324.000.
- Genodman, Yury: See—
 Solomon, Frank; Genodman, Yury; and Irizarry, Jaime, 4,877,694, Cl. 429-27.000.
- Geophysical Service, Inc.: See—
 Black, James L.; and Wason, Cameron B., 4,878,204, Cl. 367-53.000.
- George, Rhett T., Jr.: See—
 Wilson, James F.; George, Rhett T., Jr.; and Chen, Zhenhai, 4,876,944, Cl. 91-35.000.
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 Schnur, Joel M.; Price, Ronald; Yager, Paul; Schoen, Paul; Georgier, Jacques H.; and Singh, Alok, 4,877,501, Cl. 204-157.640.
- Geppert, Helmut. Frame for band conveying devices. 4,877,127, Cl. 198-860.300.
- Gerber, Reinhold: See—
 Rush, Jonathan E.; Scalvini, Phillip D.; and Gerber, Reinhold, 4,877,151, Cl. 206-514.000.
- Gergely, Gerhard; Gergely, Irmgard; and Gergely, Thomas. Process and means for the heat treatment of powdery or granulate material. 4,876,802, Cl. 34-15.000.
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 Gergely, Gerhard; Gergely, Irmgard; and Gergely, Thomas, 4,876,802, Cl. 34-15.000.
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 Gergely, Gerhard; Gergely, Irmgard; and Gergely, Thomas, 4,876,802, Cl. 34-15.000.
- Gershenson, Moshe; and Moskowitz, Mark L., to GAF Corporation. Device for grounding conductive film. 4,877,198, Cl. 242-74.000.
- Gershonowitz, Mitchell S.: See—
 Grosso, Donald S.; Bryant, Thomas M.; and Gershonowitz, Mitchell S., 4,878,206, Cl. 367-83.000.
- Geyer, Werner: See—
 Schierling, Roland; and Geyer, Werner, 4,876,999, Cl. 123-252.000.
- Gibbons, Robert C.; and Cottle, Wilbur W., to Texas Instruments Incorporated. Dual field of view catadioptric optical system. 4,877,317, Cl. 350-559.000.
- Gibson, Michael A.: See—
 Stahl, Charles R.; Gibson, Michael A.; and Knudsen, Christian W., 4,876,780, Cl. 29-157.400.
- Gidon, Georges M.: See—
 Riou, Claude R.; and Gidon, Georges M., 4,877,686, Cl. 428-514.000.
- Giglia, Salvatore: See—
 Bikson, Benjamin; and Giglia, Salvatore, 4,877,421, Cl. 55-16.000.
- Gilbert, Everett A., to Da-Tel Research Company, Incorporated. Audio frequency interface for differential relays. 4,878,241, Cl. 379-106.000.
- Gill, Hardayal S.; Hesterman, Victor W.; Tarnopolsky, Giora J.; and Tran, Lung T., to Hewlett-Packard Company. Magneto-resistive sensor with opposing currents for reading perpendicularly recorded media. 4,878,140, Cl. 360-113.000.
- Gill, Michael C.: See—
 Darley, Henry M.; Gill, Michael C.; Earl, Dale C.; Ngo, Dinh T.; Wang, Paul C.; Hipona, Maria B. L.; and Dodrill, Jim, 4,878,190, Cl. 364-752.000.
- Gillanders, Andrew M.: See—
 Vu, Cung; Martin, Timothy J.; Gillanders, Andrew M.; and Sbaiti, Bassam, 4,877,829, Cl. 524-729.000.
- Gillet, Francois: See—
 Delbe, Emmanuel; Gillet, Francois; Serot, Etienne; Chifflet, Raymond; Allio, Roland; Jeantin, Philippe; Del Fabro, Gilbert; and Forella, Guy, 4,877,229, Cl. 271-2.000.
- Ginnow-Markert, Harmut: See—
 Lamboy, Peter; Steigerwald, Franz; Zulauf, Karlheinz; and Ginnow-Markert, Harmut, 4,877,065, Cl. 141-18.000.
- Giordano, David A.: See—
 Neville, Donald G.; Giordano, David A.; and Hogan, Mark R., 4,877,106, Cl. 181-224.000.
- Giordano, Edward C.: See—
 Petrucci, Raymond M.; Taylor, Bruce G.; Giordano, Edward C.; Padiall, James M.; and Palmer, Carl, 4,877,521, Cl. 210-171.000.
- Givati, Izhak, to Shkabar Investments Ltd. Plastic clip particularly useful as a clothes pin. 4,876,771, Cl. 24-298.000.
- Givaudan Corporation: See—
 Naegeli, Peter, 4,877,904, Cl. 568-374.000.
- GK Technologies, Inc.: See—
 Walbridge, Van J.; and Donohue, R. Michael, 4,877,422, Cl. 55-20.000.
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- Glanvall, Rune, to Stal Refrigeration AB. Control system for controlling the internal volume in a rotary compressor. 4,877,380, Cl. 417-310.000.
- Glasstech International L.P.: See—
 Nitschke, David B., 4,877,437, Cl. 65-287.000.
- Glenn, William E., to New York Institute of Technology. Light modulator video display apparatus. 4,878,122, Cl. 358-233.000.

- Glickman, Myron: See—
 Lanigan Jr., John J.; Glickman, Myron; and Ermel, Bernard A., 4,877,365, Cl. 414-459.000.
- Glidden Company, The: See—
 Reising, John C.; and Miles, David E., 4,877,837, Cl. 525-100.000.
- Toman, Perry A., 4,877,838, Cl. 525-107.000.
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- Gnyra, Bohdan: See—
 Hudson, Tom J.; McIntyre, John; Tremblay, Pierre; Allaire, Claude; and Gnyra, Bohdan, 4,877,507, Cl. 204-243.00R.
- Gobel, Rudolf: See—
 Alt, Claus-Christian; Gobel, Rudolf; Koch, Heinz; Niechoj, Wolfgang; Grossmann, Theodor; and Deffner, Felix, 4,877,258, Cl. 277-212.0FB.
- Goble, Rowland H. Multipurpose structure. 4,877,237, Cl. 272-54.000.
- Godfrey, Christopher A.: See—
 Anthony, Vivienne M.; Clough, John M.; and Godfrey, Christopher A., 4,877,811, Cl. 514-522.000.
- Goekjian, Kenneth S., to Data General Corporation. Controller burst multiplexer channel interface. 4,878,173, Cl. 364-200.000.
- Goetsch, Duane A.; and Say, Geoffrey R., to Exxon Research and Engineering Company. Synthesis gas preparation and catalyst therefor. 4,877,550, Cl. 252-373.000.
- Goggin, Philip E. Gas well discharge velocity dissipator. 4,877,084, Cl. 166-75.100.
- Goldberg, Harris A.: See—
 Kuder, James E.; McGinnis, James L.; Goldberg, Harris A.; Hart, Timothy R.; and Che, Tessie M., 4,878,224, Cl. 372-53.000.
- Goldstein, Mark E.: See—
 Govang, James A.; and Goldstein, Mark E., 4,877,137, Cl. 206-597.000.
- Goleczka, Joseph; Harris, Walter; and Pringle, John, to Coal Industry (Patents) Limited. Briquette treatment process. 4,877,418, Cl. 44-600.000.
- Golland, Wesley A.: See—
 Baker, Joseph R.; Golland, Wesley A.; Mullens, Paul A.; and Trimble, Roger B., 4,877,179, Cl. 232-7.000.
- Golob, Jurgen; and Franke, Wolfgang, to Braun Aktiengesellschaft. Shredding or slicing tool arrangement for cutting food material, in particular for food processors. 4,877,191, Cl. 241-92.000.
- Gomes, Gary D., to Ampex Corporation. Precision device for soft clipping AC and DC signals. 4,877,981, Cl. 307-555.000.
- Goodwin, Paul E.: See—
 Oltean, Jerry M.; and Goodwin, Paul E., 4,877,048, Cl. 137-225.000.
- Goodyear Tire & Rubber Company, The: See—
 Fontaine, Jean F. L., 4,877,072, Cl. 152-209.00R.
- Hopper, Roger J.; Shah, Niranjan V.; and Ryba, Steven M., 4,877,901, Cl. 564-82.000.
- Parks, Carl R.; and Burlett, Donald J., 4,877,845, Cl. 525-346.000.
- Thise, Marie R.; and Reuter, Rene F., 4,877,073, Cl. 152-451.000.
- Gordon Belt Scrapers, Inc.: See—
 Gordon, James R., 4,877,125, Cl. 198-836.000.
- Gordon, James R., to Gordon Belt Scrapers, Inc. Conveyor skirtboard mounting assembly. 4,877,125, Cl. 198-836.000.
- Gordon, Robert L.: See—
 Bernstein, Linda A.; and Gordon, Robert L., 4,877,932, Cl. 219-10.55E.
- Gorski, Robert A.: See—
 Merchant, Abid N.; Gorski, Robert A.; and Burke, Kenneth C., 4,877,545, Cl. 252-171.000.
- Gosselink, Eugene P.: See—
 Maldonado, Rene; Trinh, Toan; and Gosselink, Eugene P., 4,877,896, Cl. 560-14.000.
- Goto, Hiroshi: See—
 Moriya, Yasuo; Suzuki, Nobuyoshi; and Goto, Hiroshi, 4,877,841, Cl. 525-286.000.
- Goto, Ikuo: See—
 Miwa, Harufumi; Kashiwada, Minoru; and Goto, Ikuo, 4,877,583, Cl. 422-73.000.
- Goto, Tatsuo: See—
 Namikoshi, Hajime; and Goto, Tatsuo, 4,877,617, Cl. 424-409.000.
- Gotou, Makoto; and Matsubayashi, Shigeaki, to Matsushita Electric Industrial Co., Ltd. Control system with improved robustness to disturbances. 4,878,165, Cl. 364-158.000.
- Gottesman, Jeffrey L.; Dempsy, Mark A.; Koch, Donald E.; and Rattan, Dev R., to Rockwell International Corporation. Channel redundancy in a digital loop carrier system. 4,878,048, Cl. 340-825.010.
- Gould Inc.: See—
 Lach, Lawrence E.; and Ohoka, Mikiharu, 4,877,976, Cl. 307-450.000.
- Govang, James A.; and Goldstein, Mark E., to Stanley Works, The. Display package module for promotional display use. 4,877,137, Cl. 206-597.000.
- Graham, Huber: See—
 McQuoid, Bryan K.; Charlson, Earl J.; and Graham, Huber, 4,878,226, Cl. 374-166.000.
- Graham, James H.: See—
 Michaud, Gerard H.; Graham, James H.; and Stout, Roger P., 4,876,791, Cl. 29-840.000.
- Gramet, Jean C.: See—
 O'Nion, Geoffrey; and Gramet, Jean C., 4,876,978, Cl. 114-230.000.
- Granot, Joseph, to Elscint Ltd. Magnetic resonance spectroscopy studies of restricted volumes. 4,878,021, Cl. 324-309.000.
- Graphoplast S.p.A.: See—
 Piana, Ivana; and Piana, Silvano, 4,876,810, Cl. 40-316.000.
- Gray, Kenneth P., to Carner Corporation. Apparatus and method for manufacturing plate fin coils of different configurations. 4,876,779, Cl. 29-157.30R.
- Greco, George M.: See—
 Ricketts, John; and Greco, George M., 4,876,888, Cl. 73-319.000.
- Greene, John D.: See—
 Chadwick, Curt H.; Sholes, Robert R.; Greene, John D.; Tucker, Francis D., III; Fein, Michael E.; Jann, P. C.; Harvey, David J.; and Bell, William, 4,877,326, Cl. 356-394.000.
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- Gregory, Joseph A.; and Schaum, David L., to International Business Machines Corporation. Tilt/swivel display base. 4,877,204, Cl. 248-298.000.
- Grey, Donald M., to Grey Technologies, Inc. Field crop harvesting, carton packaging and packed carton handling machine and method. 4,876,844, Cl. 53-458.000.
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- Griffin, Gregory L.: See—
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- Griffin, William R.: See—
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- Grim, Michael, to Yakima Products, Inc. Self-tightening vehicle roof rack. 4,877,169, Cl. 224-331.000.
- Grimm, Duane: See—
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- Grimm, Istvan; Stenczinger, Sandor; Bolla, Istvan; and Csanyi, Istvan, to Budapesti Radiotechnikai Gyar. Magnetic information recording and/or reading head with increased wear-resistant properties and a method for manufacturing the same. 4,876,790, Cl. 29-603.000.
- Grina, Larry D.: See—
 Kapuscinski, Maria M.; Grina, Larry D.; Jones, Ronald E.; and Sung, Rodney L., 4,877,415, Cl. 44-62.000.
- Liu, Christopher S.; Clarke, Donald J.; and Grina, Larry D., 4,877,834, Cl. 525-66.000.
- Grobmyer, Louis R.: See—
 Impink, Albert J., Jr.; Langford, Francis L., Jr.; Grobmyer, Louis R.; and Luinetti, William K., 4,877,575, Cl. 376-216.000.
- Grone, Dieter: See—
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- Grosfeld, Haim: See—
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- Gross, Heinz, to Rohm GmbH Chemische Fabrik. Process for the production of a hollow chamber plate of synthetic material. 4,877,474, Cl. 156-244.130.
- Gross, Jonathan, to Mobil Oil Corporation. Method and apparatus for measuring and controlling blow-up of a foam sheet in a thermoformer oven. 4,877,564, Cl. 264-40.600.
- Gross, William H.; and Cecil, James B., to Elantec. Digital protection circuit and method for linear amplifier. 4,878,034, Cl. 330-298.000.
- Grossmann, Theodor: See—
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- Groupe, Vincent: See—
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- Grundemann, Egon: See—
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- Grundfos International A/S: See—
 Jensen, Niels D.; and Svarre, Erik, 4,877,372, Cl. 415-199.100.
- Grushkin, Bernard; Chang, Hui; and Ruhland, John G., to Xerox Corporation. Imaging processes with cold pressure fixable toner compositions. 4,877,707, Cl. 430-106.600.
- Grzesik, Ulrich: See—
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- Devir, Daniel D., 4,877,992, Cl. 313-318.000.
- Mizuhara, Howard; and Huebel, Eugene, 4,877,692, Cl. 428-673.000.

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- Guenther, Werner: See—
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- Gulko, George M.: See—
Martin, Michael C.; McCracken, Beth E.; and Gulko, George M., 4,876,987, Cl. 122-504.200.
- Gullickson, Zan, to Kebo Alta Industries Ltd. Reciprocating implement. 4,877,090, Cl. 172-102.000.
- Gunter Horst Rohm: See—
Rohm, Gunter H.; and Pesch, Karl, 4,877,259, Cl. 279-123.000.
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- Gupta, Krishanu: See—
Bogen, Daniel; and Gupta, Krishanu, 4,877,035, Cl. 128-673.000.
- Guslits, Vladimir S.; and Weitzel, Richard A., to Eastman Kodak Company. Developer station for a reproduction apparatus. 4,878,089, Cl. 355-253.000.
- Guternuth, Paul. Separator for gaseous fluids. 4,877,430, Cl. 55-269.000.
- Gutschmidt, Alan. Tubular conduit for transporting traveling textile yarn. 4,877,170, Cl. 226-196.000.
- Guttmann, Daniele: See—
Donati, Jean R.; Guttmann, Daniele; Rouillon, Yves; Paul, Pierre S.; and Zacharie, Guy, 4,877,465, Cl. 148-428.000.
- Guzewski, Maria E.: See—
Rzesutarski, Wacław J.; Guzewska, Maria E.; Carter, John P.; Adams, Theodore C.; Dupont, Andrea C.; and Kaiser, Carl, 4,877,779, Cl. 514-63.000.
- Haas, Karl-Heinz: See—
Schmidt, Helmut; Hutter, Frank; Haas, Karl-Heinz; Obermeier, Ernst; Steger, Ulrich; Endres, Hanns-Erik; and Drost, Stephan, 4,878,015, Cl. 324-71.500.
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- Hachiya, Iwao: See—
Koyano, Tetsuo; Sagi, Nobuo; Izumi, Tsugio; Fujita, Setsuya; Murata, Tadahiko; Hachiya, Iwao; and Mori, Hiroyuki, 4,877,636, Cl. 426-607.000.
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- Hachiya, Terumi: See—
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- Hackett, Jeffrey K., to Hackett, Jeffrey K. Load leveling shock absorber. 4,877,223, Cl. 267-64.170.
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- Haerle, Ronald M., Jr.; Smith, Gaylord D.; Weber, John H.; Fisher, Ronelto L.; Gaul, David J.; and Hinz, Jay W., to Inco Alloys International, Inc.; and Owens-Corning Fiberglass Corporation. Mechanically alloyed nickel-cobalt-chromium-iron composition of matter and glass fiber method and apparatus for using same. 4,877,435, Cl. 65-1.000.
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- Hagemeyer, Bruce A., to Rolscreen Company. Panel joint. 4,876,838, Cl. 52-455.000.
- Hagihara, Hisao; Banno, Takayuki; Miya, Shigenori; and Tanaka, Norio, to Toyo Radiator Co., Ltd. Method of manufacturing a motor-cycle radiator. 4,876,778, Cl. 29-157.30A.
- Hagikura, Hirofumi; and Kawamoto, Haruki, to Nihon Radiator Co., Ltd. Drive control device for motor actuator in automobile air conditioner. 4,878,001, Cl. 318-446.000.
- Hagiwara, Toshiyuki: See—
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- Hagstrom, Stig B. M.: See—
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- Hahn, Alfred; and Vogel, Georg, to Siemens Aktiengesellschaft. Apparatus for non-contacting disintegration of concretions. 4,877,017, Cl. 128-24.00A.
- Haire, William M.; and Pou, Celestino, to Hydrocarbon Sciences, Inc. Oil characteristic improvement process and device therefor. 4,877,513, Cl. 208-106.000.
- Hait, Paul W., to Pyromid, Inc. Outdoor cooking unit with disposable component. 4,877,010, Cl. 126-9.00A.
- Halemane, Thirumala R.; and Korotky, Steven K., to American Telephone and Telegraph Company; and AT&T Bell Laboratories. Fiber cavity optical memory with optical storage and readout. 4,877,952, Cl. 250-213.00A.
- Hall, Dale R.; and Keller, Dennis J., to BF Goodrich Company. The Soft thermoplastic polyurethane for blown film application. 4,877,856, Cl. 528-44.790.
- Hall, Mark J.; Powers, Joseph R.; and Wood, William A., to Dow Chemical Company. The Stabilizer concentrate. 4,877,821, Cl. 523-351.000.
- Halleman, Raymond F.: See—
Cantwell, Robert R.; Halleman, Raymond F.; and Zumsteg, Deborah M., 4,877,044, Cl. 135-104.000.
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Priest, Mark A., 4,877,956, Cl. 250-259.000.
- Zunkel, Gary D., 4,877,086, Cl. 166-106.000.
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- Halssig, Andreas: See—
Schilling, Wolfgang; Halssig, Andreas; and Zehnder, Wolfgang, 4,876,960, Cl. 102-249.000.
- Halvorsen, Svein T.: See—
Strandli, Kare R.; and Halvorsen, Svein T., 4,876,964, Cl. 102-499.000.
- Ham, Cornelis L. G.: See—
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- Overweg, Johannes A.; and Ham, Cornelis L. G., 4,878,024, Cl. 324-319.000.
- Hamada, Akiyoshi: See—
Yagoto, Mitsutoshi; Hamada, Akiyoshi; Mino, Masayuki; Tanaka, Yutaka; and Watanabe, Yutaka, 4,878,067, Cl. 346-108.000.
- Hamada, Hisanori: See—
Shimokawa, Masao; and Hamada, Hisanori, 4,877,067, Cl. 141-129.000.
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Takehana, Takamichi; Murayama, Osamu; Nakajima, Hideaki; Yamada, Masatoshi; and Hamada, Makoto, 4,878,080, Cl. 354-403.000.
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Iga, Katsumi; Hamaguchi, Naoru; and Ogawa, Yasuaki, 4,877,561, Cl. 264-4.300.
- Hamanaka, Toshiyuki, to NGK Insulators, Ltd. Cordierite honeycomb structural body and method of producing the same. 4,877,670, Cl. 428-116.000.
- Hamlin Incorporated: See—
Reneau, Daniel R., 4,877,927, Cl. 200-61.45M.
- Hanada, Koji; Sawamura, Masashi; Yoshikawa, Takeshi; Nihashi, Hiroyuki; and Tanaka, Tsuneo, to Toyo Ink Manufacturing Co., Ltd. Heat-sensitive transfer material. 4,877,681, Cl. 428-336.000.
- Handelsman, Jo; Mester, Ellen H.; and Wunderlich, Lynn, to Wisconsin Alumni Research Foundation. Biological control of damping off and root rot and inoculum preparation therefor. 4,877,738, Cl. 435-252.500.
- Handy Chemicals Ltd.: See—
Haase, Dieter; and Spiratos, Nelu, 4,877,597, Cl. 423-556.000.
- Hankins, Larry W.: See—
Endrenyi, Frank, Jr.; and Hankins, Larry W., 4,877,669, Cl. 428-88.000.
- Hannen, Reiner; and Vermeulen, Norbert, to MSK-Verpackungs-Systeme Gesellschaft. Apparatus for producing hot gas for the shrinkage of synthetic resin foils. 4,877,012, Cl. 126-79.00R.
- Hansen, John B.: See—
Biere, Helmut; Huth, Andreas; Rahtz, Dieter; Schmiechen, Ralph; Seidelmann, Dieter; Stephens, David N.; Engelstoft, Mogens; and Hansen, John B., 4,877,792, Cl. 514-292.000.
- Hanshim Kikagaku Kabushiki Kaisha: See—
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- Hanson, Donald W. Tracheostomy tube valve apparatus. 4,877,025, Cl. 128-207.160.
- Hanson, Gunnar J.; and Baran, John S., to G. D. Searle & Co. Non-peptidyl beta-succinamidoacyl aminodiol as anti-hypertensive agents. 4,877,785, Cl. 514-224.200.
- Hanssler, Gerd: See—
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- Harasym, Michael F., to Vesuvius Crucible Company. Telescoping device for unplugging a vessel discharge port. 4,877,161, Cl. 222-591.000.
- Harbeck, Gerold J. Automatically-releasable pipe-attachment device. 4,877,216, Cl. 249-207.000.
- Harben, Grover S., III; and Clark, Leonard G. Vent cleaning apparatus and method for poultry. 4,876,767, Cl. 17-11.000.
- Harbison, Kenneth G.: See—
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- Harden, Bonnie J. Method and apparatus for dispersing cremated remains. 4,877,203, Cl. 244-136.000.
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- Haring, Ulrich, to Ciba-Geigy Corporation. Corrosion inhibitor. 4,877,552, Cl. 252-392.000.
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- Harp, Emogene. Method of treating soybeans. 4,877,637, Cl. 426-634.000.
- Harpell, Gary A.: See—
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- Harris, Carl B., to Thomas Smith Co. Inc. Valve handle. 4,877,050, Cl. 137-315.000.
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- Harris, Robert S., to Stant Inc. Vacuum controlled vapor recovery system. 4,877,146, Cl. 220-85.0VR.
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Rash, Mark S.; Harrison, Nicholas D.; and Butler, F. Prince, 4,878,238, Cl. 379-62.000.
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Vork, Donald J., 4,876,951, Cl. 98-107.000.
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- Hart, Timothy R.: See—
Kuder, James E.; McGinnis, James L.; Goldberg, Harris A.; Hart, Timothy R.; and Che, Tessie M., 4,878,224, Cl. 372-53.000.
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- Hartsfield, Ben W. Competitive computer educational game. 4,877,408, Cl. 434-350.000.
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- Hartwell Corporation, The: See—
Poe, L. Richard, 4,877,274, Cl. 292-113.000.
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Chadwick, Curt H.; Sholes, Robert R.; Greene, John D.; Tucker, Francis D., III; Fein, Michael E.; Jann, P. C.; Harvey, David J.; and Bell, William, 4,877,326, Cl. 356-394.000.
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- Hashimoto Corporation: See—
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- Hashimoto, Kenichi: See—
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- Hashimoto, Kiyokazu, to NEC Corporation. Semiconductor memory device. 4,878,220, Cl. 371-40.100.
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Limon, Bernard, 4,876,904, Cl. 73-866.000.
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- Hastasider Metal S.R.L.: See—
Bussolino, Romolo, 4,876,784, Cl. 29-402.060.
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Azegami, Kiyotaka; Tayama, Suehiro; Yamamoto, Naoki; Yanagase, Akira; and Hatakeyama, Hiroki, 4,877,687, Cl. 428-520.000.
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Morita, Shizuo; Hayakawa, Kazushi; Ito, Kunio; Matsuo, Shunji; Fukuchi, Masakazu; and Hatakeyama, Noboru, 4,878,091, Cl. 355-260.000.
- Hattman, Fredric J.: See—
Gefroh, James A.; and Hattman, Fredric J., 4,876,833, Cl. 52-107.000.
- Hattori, Michinobu; Fujisawa, Hidemitsu; and Kusaura, Akio, to Mitsubishi Denki Kabushiki Kaisha. Optical disc with inhibited thermal distortion. 4,877,667, Cl. 428-64.000.
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Kuroda, Masami; Hattori, Yoshimasa; Furusho, Noboru; and Sugata, Yoshinobu, 4,877,703, Cl. 430-76.000.
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Glocker, David A.; Hatwar, Tukaram K.; McIntire, Gregory Lynn; Rao, Srinivas T.; and Stinson, Douglas G., 4,877,690, Cl. 428-627.000.
- Hauri, Bernhard; and Etter, Hans, to Kern & Co. AG. Optical sighting device with illuminated aiming mark. 4,877,324, Cl. 356-251.000.
- Havemann, Robert H., to Texas Instruments Incorporated. Bipolar process for forming shallow NPN emitters. 4,877,748, Cl. 437-31.000.
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- Hayasaki, Koichi, to Nissan Motor Co., Ltd. Hydraulic control system for automatic automotive transmission. 4,876,925, Cl. 74-868.000.
- Hayashi, Eiichi: See—
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- Hayashi, Mishio, to Advantest Corporation. Data pattern synchronizer. 4,878,233, Cl. 375-116.000.
- Hayashi, Nobuaki. Method of reinforcing a guitar neck. 4,877,070, Cl. 144-364.000.
- Hayashi, Torahiko, to Rheon Automatic Machinery Co. Method for producing composite food having a controlled composition of materials. 4,877,623, Cl. 426-231.000.
- Hayashi, Yoshiaki; Itakura, Takeshi; Kato, Toyoji; and Koshidaka, Yukio, to Yoshino Kogyosho Co., Ltd. Pressure resistant bottle-shaped container. 4,877,141, Cl. 215-1.00C.
- Hayes, Donald J.; Wallace, David B.; Verlee, Donald J.; and Houseman, Kenneth R., to Abbott Laboratories. Apparatus and process for reagent fluid dispensing and printing. 4,877,745, Cl. 436-166.000.
- Haynes, Kenneth A. Game apparatus. 4,877,245, Cl. 273-110.000.
- Haywood, James E.: See—
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- Hehl, Karl. Locking apparatus for locking a detachably mounted plasticizing cylinder of a plasticizing unit in operative position to a carrying block of an injection unit of an injection molding machine. 4,877,389, Cl. 425-190.000.
- Heidt, Thomas D.: See—
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- Heil, Ernst: See—
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- Heisson, Gary J. Fluid waste transporter. 4,877,261, Cl. 280-47.260.
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- Helm, Charles W.; and Koval, Vernon E., to Teleco Oilfield Services Inc. Near bit offset stabilizer. 4,877,092, Cl. 175-74.000.
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- Hendricks, David. Foot deodorant. 4,877,605, Cl. 424-65.000.
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- Ploog, Uwe; and Uphues, Guenter, 4,877,539, Cl. 252-8.800.
- Wilsberg, Heinz-Manfred; and Puchta, Rolf, 4,877,556, Cl. 252-544.000.
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- Herauld, Didier: See—
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- Hercules Incorporated: See—
Cowan, Patrick J., 4,877,820, Cl. 523-222.000.
- Lukacs, Alexander, III, 4,877,551, Cl. 252-378.00R.
- Herlant, Michel A.: See—
Kirjanov, Alexander S.; and Herlant, Michel A., 4,877,538, Cl. 252-8.700.
- Herman Miller, Inc.: See—
Kelley, James O.; Stumpf, William E.; and Friedman, Frank A., 4,876,835, Cl. 52-239.000.
- Herrera, Mauro. Cart car chair. 4,877,289, Cl. 297-250.000.
- Herrera, Randy G.: See—
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- Herriau, Jean P.: See—
Huignard, Jean P.; and Herriau, Jean P., 4,877,312, Cl. 350-354.000.
- Herring, Robert H.: See—
Varghese, Alexander P.; and Herring, Robert H., 4,877,153, Cl. 220-469.000.
- Hesterman, Victor W.: See—
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- Hettinger, William P.; and Beck, H. Wayne, to Ashland Oil, Inc. Carbo-metallic oil conversion process and catalysts. 4,877,514, Cl. 208-120.000.
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- Heusquin, Guy; and Heusquin, Anke. Device for indicating hydroculture-related values. 4,878,043, Cl. 340-521.000.
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Williamson, Herman L.; and Schuster, Michael M., 4,877,363, Cl. 411-43.000.
- Hickman, James A. A. Glazing unit alarm system. 4,878,044, Cl. 340-550.000.
- Hicks, Darrell D.: See—
Keene, Donna L.; and Hicks, Darrell D., 4,877,502, Cl. 204-181.700.
- Hida, Yukio: See—
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- Hiechst Celanese Corporation: See—
Vollmann, Hansjoerg W.; Wong, George S. K.; and Bellville, Dennis, 4,877,697, Cl. 430-20.000.
- Higashi, Tatsuji; and Kita, Nobuyuki, to Fuji Photo Film Co., Ltd. Process for preparing image-bearing plates. 4,877,719, Cl. 430-326.000.
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- Higer, Gary; and Mintz, Michael L. Emergency airway surgical device. 4,877,021, Cl. 128-200.760.
- Higginson, John: See—
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- Higuma, Masahiko: See—
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- Hill, Troy D. Bow-mountable blind. 4,876,817, Cl. 43-1.000.
- Hillemann, Craig L., to Du Pont de Nemours, E. I., and Company. Herbicidal sulfonamides. 4,877,442, Cl. 71-92.000.
- Hillis, W. Daniel, to Thinking Machines Corporation. Unsynchronized multispectral video filtering system with filter identification sensor within field of view and video signal responsive. 4,878,109, Cl. 358-42.000.
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Lee, Paul R.; and Hingsbergen, Joseph P., 4,877,758, Cl. 501-24.000.
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Engelhardt, Fritz; Hintermeier, Karl; Muller, Manfred; Munch, Norbert; and Wagener, Hans, 4,877,540, Cl. 252-8.750.
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Berecz, Imre; Schultz, Dennis; and Hinton, Dennis L., 4,877,362, Cl. 411-34.000.
- Hinz, Paul; Dislich, Helmut; and Weber, Gerhard, to Schott Glaswerke. Pressure vessel sight glasses. 4,877,668, Cl. 428-68.000.
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Haeberle, Ronald M., Jr.; Smith, Gaylord D.; Weber, John H.; Fisher, Ronelido L.; Gaul, David J.; and Hinze, Jay W., 4,877,435, Cl. 65-1.000.
- Hipona, Maria B. L.: See—
Darley, Henry M.; Gill, Michael C.; Earl, Dale C.; Ngo, Dinh T.; Wang, Paul C.; Hipona, Maria B. L.; and Dodrill, Jim, 4,878,190, Cl. 364-752.000.
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- Hirai, Yutaka: See—
Matsuyama, Jinsho; Hirai, Yutaka; Ueki, Masao; and Sakai, Akira, 4,877,650, Cl. 427-248.100.
- Hiraide, Takao: See—
Tanaka, Susumu; Sato, Masaaki; Kaeriyama, Kyoji; Suda, Yoshio; and Hiraide, Takao, 4,877,852, Cl. 526-256.000.
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Komori, Akihiro; and Hirano, Muneyoshi, 4,877,076, Cl. 160-107.000.
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- Hirata, Kiminori: See—
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- Hiro, Masaaki; Kimura, Tomohiro; Tanaka, Hisami; Kashimura, Noboru; Tanaka, Shigemori; Tohma, Hitoshi; and Hisamura,

- Masafumi, to Canon Kabushiki Kaisha. Photosensitive member for electrophotography. 4,877,701, Cl. 430-59.000.
- Hirochi, Kumiko; Kitabatake, Makoto; and Yamazaki, Osamu, to Matsushita Electric Industrial Co., Ltd. Wear-protected device. 4,877,677, Cl. 428-216.000.
- Hirose, Masayoshi: See—
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- Hisamitsu Pharmaceutical Co., Inc.: See—
Tsuiji, Masayoshi; Nakagawa, Akira; Inoue, Hisataka; Hachiya, Terumi; Tanoue, Yoshihiro; Ikese, Kouichi; Saita, Masaru; Mizoguchi, Takenobu; Aoki, Testuo; Sato, Hironobu; and Nodo, Kanji, 4,877,876, Cl. 544-133.000.
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Hiro, Masaaki; Kimura, Tomohiro; Tanaka, Hisami; Kashimura, Noboru; Tanaka, Shigemori; Tohma, Hitoshi; and Hisamura, Masafumi, 4,877,701, Cl. 430-59.000.
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Suzuki, Hiroaki; Kataoka, Yoshiyuki; Murase, Michio; Inoue, Kotaro; Sumida, Isao; Yamanari, Shozo; Matsumoto, Masaki; Miura, Satoshi; and Hashimoto, Koji, 4,877,574, Cl. 376-216.000.
- Hitachi Koki Company, Limited: See—
Watahiki, Shinichi; Itoh, Nobuhiko; Ihata, Nobuo; and Miyasaka, Masao, 4,877,344, Cl. 400-124.000.
- Hitachi, Ltd.: See—
Fujisaki, Kunio, 4,877,945, Cl. 235-379.000.
- Fukuda, Takuya; Mochizuki, Yasuhiro; Momma, Naohiro; Takahashi, Shigeru; Suzuki, Noboru; Sonobe, Tadasi; Chiba, Kiyosi; and Suzuki, Kazuo, 4,876,983, Cl. 118-722.000.
- Fuyama, Moriaki; Tamura, Katsumi; Taguchi, Kazuo; Onisawa, Kenichi; Sato, Akira; Hashimoto, Kenichi; Nakayama, Takahiro; and Abe, Yoshio, 4,877,994, Cl. 313-503.000.
- Kobayashi, Jyunichi, 4,877,936, Cl. 219-85.220.
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- Nakagawa, Koji; Takagi, Takeo; Abe, Yoshiaki; and Sakai, Haruki, 4,877,370, Cl. 415-148.000.
- Obata, Takeshi; and Kobayashi, Hideaki, 4,876,847, Cl. 57-100.000.
- Ogasa, Takaaki, 4,877,993, Cl. 313-414.000.
- Ohtsu, Eiichi, 4,877,081, Cl. 165-30.000.
- Suzuki, Hiroaki; Kataoka, Yoshiyuki; Murase, Michio; Inoue, Kotaro; Sumida, Isao; Yamanari, Shozo; Matsumoto, Masaki; Miura, Satoshi; and Hashimoto, Koji, 4,877,574, Cl. 376-216.000.
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- Hitofude, Yoshi: See—
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Dobeli, Heinz; and Hochuli, Frich, 4,877,830, Cl. 525-54.300.
- Hodgkins, David H.; and Janik, Leon P., to Stanadyne Automotive Corp. Spray nozzle assembly for piston cooling. 4,876,990, Cl. 723-41.350.
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Kampe, Klaus-Dieter; Raether, Wolfgang; and Dittmar, Walter, 4,877,878, Cl. 544-368.000.
- Kienter, Otto; and Burk, Klaus, 4,877,133, Cl. 206-416.000.
- Vollmann, Hansjoerg W.; Wong, George S. K.; and Bellville, Dennis, 4,877,697, Cl. 430-20.000.
- Hoechst Celanese Corporation: See—
Gupta, Balaram, 4,877,843, Cl. 525-344.000.
- Keene, Donna L.; and Hicks, Darrell D., 4,877,502, Cl. 204-181.700.
- Kuder, James E., 4,878,212, Cl. 369-100.000.
- Kuder, James E.; McGinnis, James L.; Goldberg, Harris A.; Hart, Timothy R.; and Che, Tessie M., 4,878,224, Cl. 372-53.000.
- Rafalko, Joseph J., 4,877,849, Cl. 525-433.000.
- Teng, Chia-Chi; and Stuetz, Dagobert E., 4,877,298, Cl. 350-96.140.
- Vora, Rohitkumar H.; Khanna, Dinesh N.; and Fontaine, Suzanne, 4,877,653, Cl. 427-385.500.
- Hoefelmayr, Tilman. Temple. 4,877,062, Cl. 139-294.000.
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- Hoerich, Michael R., to Timken Company. The Process for deriving the contact geometry for raceways and rollers of a roller bearing. 4,877,340, Cl. 384-571.000.
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Cohen, Noal, 4,877,890, Cl. 549-407.000.
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- Hogan, Mark R.: See—
Neville, Donald G.; Giordano, David A.; and Hogan, Mark R., 4,877,106, Cl. 181-224.000.
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- Holden, W. Bruce. Eye-shielding glasses. 4,877,320, Cl. 351-44.000.
- Holmlund, Erling S.: See—
Jansson, Gunnar B.; and Holmlund, Erling S., 4,877,746, Cl. 436-518.000.
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- Holtslander, Roger A., to Wolf Engineering Corporation. Proportional firing circuit. 4,878,011, Cl. 323-319.000.
- Home Fashions, Inc.: See—
Ebert, George W., 4,877,077, Cl. 160-236.000.
- Homeier, Ronald F.: See—
Anthony, James R.; Merrick, David; Homeier, Ronald F.; and Lortz, Allan R., 4,876,772, Cl. 24-637.000.
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Noguchi, Kunio; Koike, Yuzuru; and Toshimits, Kazushige, 4,877,006, Cl. 123-589.000.
- Wazaki, Yoshio; and Kudo, Keisuke, 4,877,273, Cl. 290-40.00C.
- Yamagata, Tetsuo, 4,878,045, Cl. 340-556.000.
- Honda Giken Kogyo Kabushiki Kaisha: See—
Asanuma, Nobuyoshi, 4,877,098, Cl. 180-79.100.
- Mugikura, Norio, 4,877,105, Cl. 181-141.000.
- Nakajima, Toyohito; and Mieno, Toshiyuki, 4,877,511, Cl. 204-406.000.
- Otohe, Yutaka; and Kishi, Noriyuki, 4,876,995, Cl. 123-90.120.
- Shimizu, Yasuo, 4,878,004, Cl. 318-599.000.
- Yamamoto, Yasuhiro; Miwa, Teiji; and Ajima, Tadashi, 4,876,786, Cl. 29-429.000.
- Honda, Sumio; Ogata, Taizo; and Etani, Tadao, to Japan Tobacco Inc./Tokyo Automatic Machinery Works Ltd. Apparatus for applying seal-strips to packages travelling on a conveyor. 4,876,839, Cl. 53-137.000.
- Honeywell Inc.: See—
Lee, James C., 4,877,504, Cl. 204-192.110.
- Walker, Charles S., 4,877,982, Cl. 307-571.000.
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- Honma, Kanehito; Yokoi, Tsutomu; and Tani, Hiroji, to Murata Manufacturing Co., Ltd. Resistance paste. 4,877,554, Cl. 252-511.000.
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- Hoonsbeen, Gary A., to Image Innovations, Inc. Transparent slide protective container. 4,878,073, Cl. 353-120.000.
- Hopper, Roger J.; Shah, Niranjana V.; and Ryba, Steven M., to Good-year Tire & Rubber Company. The Process for synthesizing N,N'-dithiobis(sulfonamides). 4,877,901, Cl. 564-82.000.
- Hopper, William R. Touch sensitive indicating light. 4,878,107, Cl. 357-72.000.
- Horbach, Rainer: See—
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- Hori, Hisanobu, to Matsushita Electric Industrial Co., Ltd. Margin setting means for a printer. 4,877,345, Cl. 400-342.000.
- Hori, Manabu: See—
Iemura, Ryuichi; Hori, Manabu; Ohtaka, Hiroshi; Sukamoto, Takayuki; Hara, Hideaki; and Ito, Keizo, 4,877,790, Cl. 514-260.000.
- Hori, Masaaki, to Brother Kogyo Kabushiki Kaisha. Serial printer having means for controlling print head in relation to carriage movement. 4,877,343, Cl. 400-121.000.
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Uematsu, Hiroaki; and Imanishi, Shinji, 4,877,492, Cl. 204-1.00T.
- Hormann, Michael: See—
Tushaus, Hans-Joachim; and Hormann, Michael, 4,876,868, Cl. 72-42.000.
- Horsch, Joachim, to J. I. Case Company. Hydraulic control system for a tractor transmission. 4,877,116, Cl. 192-3.570.
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Kniebel, Charles J.; Schieffer, Virgil; and Bredt, Robert C., 4,877,117, Cl. 192-85.00A.
- Hosfeld, Lewis K.: See—
Bohm, Walter J.; Brubaker, Richard A.; Garman, Shelly N.; Hosfeld, Lewis K.; Ko, Kenneth K.; and Tymon, Thomas M., 4,877,484, Cl. 162-103.000.
- Hoshikawa, Hiroshi: See—
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- Hosking, Jeannette T. Drinking-beaker assembly. 4,877,119, Cl. 206-459.000.
- Hosoba, Hiroyuki: See—
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- Hosoi, Noriyuki, to Fuji Photo Film Co., Ltd. Encapsulated electrostatic toner and method for use thereof. 4,877,708, Cl. 430-126.000.

- Hosokawa, Hiroshi: See—
Katayama, Akihiro; Ohsawa, Hidefumi; Sunohara, Izuru; Hosokawa, Hiroshi; and Yoshimoto, Masahiko, 4,878,125, Cl. 358-443.000.
- Hotta, Tomio: See—
Imamura, Humihiro; and Hotta, Tomio, 4,876,953, Cl. 99-280.000.
- Hough, Harold L.: See—
Blaisdell, Ronald G.; and Hough, Harold L., 4,878,159, Cl. 362-222.000.
- Houki, Yoji: See—
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- House, Wayne D.; and Myers, David J., to W. L. Gore & Associates, Inc. Rapidly recoverable PTFE and process therefore, 4,877,661, Cl. 428-34.900.
- Houseman, Kenneth R.: See—
Hayes, Donald J.; Wallace, David B.; Verlee, Donald J.; and Houseman, Kenneth R., 4,877,745, Cl. 436-166.000.
- Howard, Ian D.: See—
Edwards, D. Brandon; Edwards, Bruce W.; Howard, Ian D.; and Ives, Donald H., 4,877,316, Cl. 350-537.000.
- Howell, Richard L., Jr. Augering apparatus and drilling rig, 4,877,091, Cl. 173-89.000.
- Howie, Robin M., to Coal Industry (Patents) Limited. Environmental protective garment, 4,876,746, Cl. 2-69.000.
- Howland, Frank S. Anti-tip wheelchair accessory, 4,877,260, Cl. 280-304.100.
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Kelly, Patrick M.; Howlett, Robert E.; Pomeroy, Paul A.; and Alvarez, Dennis A., 4,876,837, Cl. 52-287.000.
- Hrinda, Michael E.: See—
Lee, Ted C. K.; and Hrinda, Michael E., 4,877,608, Cl. 424-85.800.
- Hsieh, Gerald W. Running and cycling shoe, 4,876,808, Cl. 36-131.000.
- Hsieh, Ning; and Kuo, Clinton C. Single transistor cell for electrically-erasable programmable read-only memory and array thereof, 4,878,101, Cl. 357-23.500.
- Hsue, Ching-Wen, to American Telephone and Telegraph Company. Method and apparatus for distributing a signal, 4,877,971, Cl. 307-11.000.
- Huddleston, David A., to Nalco Chemical Company. Hydrocarbon geller and method for making the same, 4,877,894, Cl. 558-113.000.
- Hudson, John L. High speed differential unit, 4,876,918, Cl. 74-650.000.
- Hudson, Tom J.; McIntyre, John; Tremblay, Pierre; Allaire, Claude; and Gnyra, Bohdan, to Alcan International Limited. Linings for aluminum reduction cells, 4,877,507, Cl. 204-243.00R.
- Huebel, Eugene: See—
Mizuhara, Howard; and Huebel, Eugene, 4,877,692, Cl. 428-673.000.
- Hughes Aircraft Company: See—
Wong, Joseph S., 4,878,033, Cl. 330-277.000.
- Huignard, Jean P.; and Herriau, Jean P., to Thomson-CSF. Bistable optical photorefractive crystal device, 4,877,312, Cl. 350-354.000.
- Hummel, Werner: See—
Kula, Maria-Regina; Hummel, Werner; Schutte, Horst; and Leuchterberger, Wolfgang, 4,877,734, Cl. 435-228.000.
- Hunter, Donald W. Valve device for P.S.A. or R.P.S.A. systems, 4,877,429, Cl. 55-162.000.
- Huss, Roland: See—
Schuster, Hans-Dieter; Noller, Christoph; Wollenraup, Gottfried; Kreeb, Reiner; and Huss, Roland, 4,877,339, Cl. 384-218.000.
- Hutchins, Paul: See—
Griffin, Lamar H.; and Hutchins, Paul, 4,877,108, Cl. 182-68.000.
- Hutchinson, Charles B., Jr.: See—
Hinds, Robert B.; Hutchinson, Charles B., Jr.; and Dowell, James S., 4,877,386, Cl. 425-110.000.
- Hutchinson, Francis G.: See—
Churchill, Jeffrey R.; and Hutchinson, Francis G., 4,877,606, Cl. 424-78.000.
- Hutchison, Jerry D.: See—
Kaufman, Charles W.; Kempf, Mark F.; and Hutchison, Jerry D., 4,878,219, Cl. 370-97.000.
- Huth, Andreas: See—
Biere, Helmut; Huth, Andreas; Rahtz, Dieter; Schmichen, Ralph; Seidelmann, Dieter; Stephens, David N.; Engelstoft, Mogens; and Hansen, John B., 4,877,792, Cl. 514-292.000.
- Huther, Werner: See—
Sikorski, Siegfried; and Huther, Werner, 4,877,376, Cl. 416-207.000.
- Hutter, Frank: See—
Schmidt, Helmut; Hutter, Frank; Haas, Karl-Heinz; Obermeier, Ernst; Steger, Ulrich; Endres, Hanns-Erik; and Drost, Stephan, 4,878,015, Cl. 324-71.500.
- Huyer, Johannes N., to Vermeulen-Hollandia Octrooien II B.V. Open roof construction for a vehicle, 4,877,285, Cl. 296-216.000.
- Huyuh, Van-Minh; and Luk, Francis M., to University of Windsor. Method and apparatus for assessing surface roughness, 4,878,114, Cl. 358-106.000.
- Hyde, James P., to Ford Motor Company. Tank comprising embedded flanged conduit, 4,877,147, Cl. 220-85.0VR.
- Hydrocarbon Sciences, Inc.: See—
Haire, William M.; and Pou, Celestino, 4,877,513, Cl. 208-106.000.
- Hynes, Jaroslav, to Texas Instruments Incorporated. Image sensor array for still camera imaging with multiplexer for separating interlaced fields, 4,878,121, Cl. 358-213.220.
- I.W. Industries, Inc.: See—
Antonello, Frank, 4,876,749, Cl. 4-295.000.
- Snow, Richard K.; and Ellisor, Milton W., Jr., 4,876,896, Cl. 73-827.000.
- Ichihashi, Tadashi; and Kawamura, Masunori, to Kowa Company Ltd. Slit lamp microscope, 4,877,321, Cl. 351-214.000.
- Ichikawa, Hiroyuki, to Canon Kabushiki Kaisha. Image processing apparatus, 4,878,126, Cl. 358-451.000.
- Ichikawa, Kouji: See—
Tanigawa, Motoaki; Dohi, Hidehiko; Nishimura, Takashi; Ichikawa, Kouji; and Koishi, Tetsuo, 4,877,071, Cl. 152-165.000.
- Ichikawa Woolen Textile Co., Ltd.: See—
Yarita, Takao; Komori, Hideo; Ogasawara, Koji; and Takami, Hiroaki, 4,877,061, Cl. 139-224.00R.
- Ichikoh Industries, Ltd.: See—
Nakata, Yutaka, 4,878,161, Cl. 362-305.000.
- Ichinose, Hiroshi: See—
Mizusaki, Sigenobu; Matsushita, Hajime; Ishiguro, Shigeo; Ichinose, Hiroshi; and Izumi, Akira, 4,877,909, Cl. 568-880.000.
- ICI Americas Inc.: See—
Woolard, Frank X., 4,877,880, Cl. 548-190.000.
- Ide, Russell D. Piston ring, 4,877,257, Cl. 277-206.00A.
- Idemitsu Kosan Co., Ltd.: See—
Hachiya, Satoshi; Uchida, Shunji; and Hashimoto, Kenji, 4,877,858, Cl. 528-100.000.
- Iemura, Ryuichi; Hori, Manabu; Ohtaka, Hiroshi; Sukamoto, Takayuki; Hara, Hideaki; and Ito, Keizo, to Kanebo Limited. Quinazoline derivative, processes for its production, and cerebral dysfunction remedying agent comprising it as active ingredient, 4,877,790, Cl. 514-260.000.
- Ieoka, Shoichi, to Olympus Optical Co., Ltd. Electronic type endoscope apparatus for use in NTSC/PAL systems, 4,878,112, Cl. 358-98.000.
- Iga, Katsumi; Hamaguchi, Naoru; and Ogawa, Yasuaki, to Takeda Chemical Industries, Ltd. Method of producing liposome, 4,877,561, Cl. 264-4.300.
- Igersheim, Françoise: See—
Costantini, Michel; and Igersheim, Françoise, 4,877,903, Cl. 568-342.000.
- Ihata, Nobuo: See—
Watahiki, Shinichi; Itoh, Nobuhiko; Ihata, Nobuo; and Miyasaka, Masao, 4,877,344, Cl. 400-124.000.
- Iida, Kazuyoshi: See—
Mizuno, Keiichi; and Iida, Kazuyoshi, 4,877,136, Cl. 206-521.000.
- Iida, Yoshio: See—
Aranda, Michael A.; Ebbens, Timothy J.; Iida, Yoshio; Lindgren, Terence W.; and Robertson, Taggart H., 4,878,182, Cl. 364-518.000.
- Iino, Yoshio: See—
Nakanishi, Akio; Hino, Toshio; Iino, Yoshio; Suetani, Kazuhisa; Houki, Yoji; and Ikuta, Hirotohi, 4,878,088, Cl. 355-244.000.
- Ishiki, Naotsugu; Okano, Shigetou; and Mishima, Shiro, to Yamato Kosan Co., Ltd. Heat exchanging system, 4,876,856, Cl. 60-671.000.
- IIT Research Institute: See—
Bangs, Edmund R.; Longinow, Nicholas E.; and Blaha, James R., 4,877,940, Cl. 219-124.340.
- Ikebe, Takashi; and Takigawa, Masuhiko, to Masuhiko Takigawa. Device for deodorizing and drying portion between toes, 4,877,018, Cl. 128-81.00R.
- Ikeda Bussan Co., Ltd.: See—
Yamauchi, Yoshihiko, 4,877,282, Cl. 296-65.100.
- Ikehira, Kimimasa; Wu, Ming-Chi; and Liu, Chih-Yuan, to Ricoh Company, Ltd.; and Industrial Technology Research Institute. Video signal mixing unit for simultaneously displaying video signals having different picture aspect ratios and resolutions, 4,878,117, Cl. 358-183.000.
- Ikenaga, Osamu; and Watanabe, Susumu, to Kabushiki Kaisha Toshiba. Method for drawing a desired circuit pattern using charged particle beam, 4,878,177, Cl. 364-489.000.
- Ikenaga, Toshiharu: See—
Yamashita, Yoshikazu; and Ikenaga, Toshiharu, 4,877,121, Cl. 198-475.100.
- Ikesue, Kouichi: See—
Tsuiji, Masayoshi; Nakagawa, Akira; Inoue, Hisataka; Hachiya, Terumi; Tanoue, Yoshihiro; Ikesue, Kouichi; Saita, Masaru; Mizoguchi, Takenobu; Aoki, Tetsuo; Sato, Hironobu; and Noda, Kanji, 4,877,876, Cl. 544-133.000.
- Ikoma, Kazuhiko: See—
Okuno, Akiyasu; Watanabe, Masakazu; and Ikoma, Kazuhiko, 4,877,760, Cl. 501-98.000.
- Ikuta, Hirotohi: See—
Nakanishi, Akio; Hino, Toshio; Iino, Yoshio; Suetani, Kazuhisa; Houki, Yoji; and Ikuta, Hirotohi, 4,878,088, Cl. 355-244.000.
- Ilovai, Zoltan: See—
Neu Jozsef; Csontos, Imre; Varga, Andras; Suranyi, Robert; Ilovai, Zoltan; Gaal, Sandor; Karsai, Jozsef; Sebestyen, Endre; Gardi, Eva; Siki, Karoly; Toth, Istvan; Gal, Gábor; v. Dombay, Zolt; Grega nee Toth, Mrs. Erzsebet; Pavliscak, Csaba; Tarpai, Gyula; Bonnyay, Peter; and Santha, Pal, 4,877,893, Cl. 558-86.000.
- Image Innovations, Inc.: See—
Hoonsbeen, Gary A., 4,878,073, Cl. 353-120.000.
- Imai, Yoshikazu: See—
Ishikawa, Toshikatsu; Tokutomi, Katsuya; and Imai, Yoshikazu, 4,877,643, Cl. 427-57.000.
- Imamura, Humihiro; and Hotta, Tomio, to Kabushiki Kaisha Toshiba. Siphon coffee maker, 4,876,953, Cl. 99-280.000.

- Imamura, Shigeyuki: See—
Takahashi, Mamoru; Imamura, Shigeyuki; and Takada, Masaki, 4,877,733, Cl. 435-190.000.
- Imanishi, Shinji: See—
Uematsu, Hiroaki; and Imanishi, Shinji, 4,877,492, Cl. 204-1.00T.
- Imperial Chemical Industries PLC: See—
Anthony, Vivienne M.; Clough, John M.; and Godfrey, Christopher A., 4,877,811, Cl. 514-522.000.
- Churchill, Jeffrey R.; and Hutchinson, Francis G., 4,877,606, Cl. 424-78.000.
- Conti-Ramaden, John N.; Powell, Richard L.; Young, Brian D.; Farrar, Jeffrey; and Brown, Debra K., 4,877,839, Cl. 525-200.000.
- Taylor, Stephen C., 4,877,740, Cl. 435-253.300.
- Waugh, Kenneth C.; and Chinchin, Godfrey C., 4,877,743, Cl. 436-116.000.
- Impink, Albert J., Jr.; Langford, Francis L., Jr.; Grobmyer, Louis R.; and Luinetti, William K., to Westinghouse Electric Corp. Core reactivity validation computer and method, 4,877,575, Cl. 376-216.000.
- INA Walzager Schaeffler KG: See—
Mayer, Ernst; Geheeb, Norbert; and Kohler, Uwe, 4,876,996, Cl. 123-90.510.
- Speil, Walter; Schusel, Bolko; and Schmidt, Dieter, 4,876,994, Cl. 123-90.500.
- Zorn, Helmut; and Schaeffler, Georg, 4,876,997, Cl. 123-90.520.
- Inaba, Yoshiharu; and Tokunaga, Shigeo, to Fanuc Ltd. Mold clamping apparatus in an injection molding machine, 4,877,388, Cl. 425-150.000.
- Inco Alloys International, Inc.: See—
Haebler, Ronald M., Jr.; Smith, Gaylord D.; Weber, John H.; Fisher, Ronaldo L.; Gaul, David J.; and Hinze, Jay W., 4,877,435, Cl. 65-1.000.
- Smith, Gaylord D.; Tassen, Curtis S.; Ganesan, Pasupathy; and Wheeler, Jack M., 4,877,461, Cl. 148-11.50N.
- Indiana Mills & Manufacturing, Inc.: See—
Anthony, James R.; Merrick, David; Homeier, Ronald F.; and Lortz, Allan R., 4,876,772, Cl. 24-637.000.
- Bougher, Jerry D., 4,876,770, Cl. 24-170.000.
- Industrial Technology Research Institute: See—
Ikehira, Kimimasa; Wu, Ming-Chi; and Liu, Chih-Yuan, 4,878,117, Cl. 358-183.000.
- Peng, Yu-Yin, 4,878,074, Cl. 354-76.000.
- Shyu, Jia-Ming; Chen, Inn-Ming; Lee, Tian-Quey; and Kung, Yunn-Chiang, 4,878,248, Cl. 382-9.000.
- Infanti Chair Manufacturing Corp.: See—
Infanti, Vittorio, 4,876,969, Cl. 108-24.000.
- Infanti, Vittorio, to Infanti Chair Manufacturing Corp. Rolling display table for ice sculptures and the like, 4,876,969, Cl. 108-24.000.
- Inoue, Eiichi; Shimizu, Isamu; and Komatsu, Toshiyuki, to Canon Kabushiki Kaisha. Image forming member for electrophotography, 4,877,709, Cl. 430-128.000.
- Inoue, Hisataka: See—
Tsuiji, Masayoshi; Nakagawa, Akira; Inoue, Hisataka; Hachiya, Terumi; Tanoue, Yoshihiro; Ikesue, Kouichi; Saita, Masaru; Mizoguchi, Takenobu; Aoki, Tetsuo; Sato, Hironobu; and Noda, Kanji, 4,877,876, Cl. 544-133.000.
- Inoue, Kazuo: See—
Chikamune, Kaoru; Tokuda, Manabu; Inoue, Kazuo; Utsunomiya, Kyoshi; and Hitofude, Yoshii, 4,877,456, Cl. 106-270.000.
- Inoue, Kotaro: See—
Suzuki, Hiroaki; Kataoka, Yoshiyuki; Murase, Michio; Inoue, Kotaro; Sumida, Isao; Yamanari, Shozo; Matsumoto, Masaki; Miura, Satoshi; and Hashimoto, Koji, 4,877,574, Cl. 376-216.000.
- Inoue, Noriyuki: See—
Hirano, Shigeo; Inoue, Noriyuki; and Heki, Tatsuo, 4,877,723, Cl. 430-598.000.
- Inoue, Yasukazu: See—
Hirakawa, Noboru; and Inoue, Yasukazu, 4,878,105, Cl. 357-59.000.
- Institut Français du Pétrole: See—
Wittirsch, Christian, 4,877,095, Cl. 175-237.000.
- Institut Katalizator Sibirskogo Otdelenia Akademii Nauk SSSR: See—
Matros, Jury S.; Chumachenko, Viktor A.; Zudilina, Ljudmila J.; Noskov, Alexander S.; and Bugdan, Evgeny S., 4,877,592, Cl. 423-245.100.
- Institute of Gas Technology: See—
Khinkis, Mark J., 4,877,449, Cl. 75-20.00R.
- Intel Corporation: See—
Asghar, Abid; and Donnell, James R., 4,878,200, Cl. 365-189.020.
- International Business Machines Corporation: See—
Aranda, Michael A.; Ebbens, Timothy J.; Iida, Yoshio; Lindgren, Terence W.; and Robertson, Taggart H., 4,878,182, Cl. 364-518.000.
- Bassett, Robert W.; Griffin, William R.; Murphy, Susan A.; Petrovick, John G., Jr.; Varner, James R.; and Whittaker, Dennis R., 4,878,209, Cl. 368-113.000.
- Bruhn, Peter H., 4,877,174, Cl. 228-5.100.
- Gregory, Joseph A.; and Schaum, David L., 4,877,204, Cl. 248-298.000.
- Johnson, William M.; and Wright, Charles G., 4,878,168, Cl. 364-200.000.
- Kapulka, Kenneth M.; Rader, Holly A.; and Strickland, Jimmy P., 4,878,167, Cl. 364-200.000.
- Moore, James A.; Dasheff, Andrew N.; and Kaufman, Frank B., 4,877,718, Cl. 430-326.000.
- Phelps, Douglas W., Jr.; and Ward, William C., 4,878,108, Cl. 357-81.000.
- International Flavors & Fragrances Inc.: See—
Stypula, Richard J., 4,877,628, Cl. 426-302.000.
- Stypula, Richard J.; and Buckholz, Lawrence, Jr., 4,877,629, Cl. 426-302.000.
- Zampino, Michael J.; Wilson, Richard A.; Mookherjee, Braja D.; and Niel, Jean C., 4,877,769, Cl. 512-11.000.
- International Paper Company: See—
Bernstein, Linda A.; and Gordon, Robert L., 4,877,932, Cl. 219-10.55E.
- International Rectifier Corporation: See—
Nilarp, Anders, 4,878,099, Cl. 357-71.000.
- Intevop, S. A.: See—
Lon, Jesus R.; Rivas, Olegario; and Zirczy, Geza N., 4,877,542, Cl. 252-62.000.
- Inti Corporation: See—
Vince, Paul W., 4,877,659, Cl. 428-34.100.
- Inui, Masaki: See—
Nagano, Shuji; and Inui, Masaki, 4,876,919, Cl. 74-650.000.
- Invivo Research, Inc.: See—
Nelson, John R.; and Lehman, Thomas F., 4,877,197, Cl. 242-68.700.
- Irie, Takefumi: See—
Okudaira, Shigenori; Irie, Takefumi; Uchida, Hiroshi; Fukasawa, Eiichi; Kobayashi, Kazuhiko; and Yamaguchi, Masanori, 4,877,445, Cl. 75-0.50B.
- Irigoyen, Marc E.; and Bourrier, Pierre. Support and attachment system for long-span beams, 4,876,836, Cl. 52-263.000.
- Irizarry, Jaime: See—
Solomon, Frank; Genodman, Yury; and Irizarry, Jaime, 4,877,694, Cl. 429-27.000.
- Iscar Ltd.: See—
Nessel, Eliezer, 4,876,932, Cl. 82-158.000.
- Ishibashi, Tamotsu: See—
Aso, Toshiyuki; and Ishibashi, Tamotsu, 4,877,935, Cl. 219-69.120.
- Ishida, Kyoko; and Kodama, Shinya, to Mazda Motor Corporation. Dies for forging gear-shaped part made of sheet metal, 4,876,876, Cl. 72-348.000.
- Ishida, Masahiko: See—
Sakaki, Mamoru; Arai, Ryuichi; Akiya, Takashi; Toganoh, Shigeo; Higuma, Masahiko; Eto, Naonobu; Mouri, Hidemasa; Tobita, Michiaki; Ishida, Masahiko; and Kono, Shunzo, 4,877,680, Cl. 428-332.000.
- Ishida, Shunichi: See—
Yanagawa, Moriyo; Ishida, Shunichi; Ogura, Ken; and Saito, Yushi, 4,877,496, Cl. 204-44.200.
- Ishida, Tokuji: See—
Taniguchi, Nobuyuki; Karasaki, Toshihiko; Mukai, Hiromu; Tokumaru, Hisashi; and Ishida, Tokuji, 4,878,076, Cl. 354-286.000.
- Ishiguro, Shigeo: See—
Mizusaki, Sigenobu; Matsushita, Hajime; Ishiguro, Shigeo; Ichinose, Hiroshi; and Izumi, Akira, 4,877,909, Cl. 568-880.000.
- Ishii, Masami: See—
Kato, Yukihiro; Ishii, Masami; Yabuno, Ryohei; and Oka, Tetsuo, 4,876,893, Cl. 73-726.000.
- Ishikawa, Masanobu: See—
Nishikawa, Masumi; and Ishikawa, Masanobu, 4,876,910, Cl. 74-493.000.
- Ishikawa, Minoru, to Fuji Photo Film Co., Ltd. Method for forming an image comprising adherence of the image-receiving and image-forming material, 4,877,710, Cl. 430-138.000.
- Ishikawa, Toshikatsu; Tokutomi, Katsuya; and Imai, Yoshikazu, to Director General Agency of Industrial Science and Technology. Process for producing preformed wire from silicon carbide fiber-reinforced aluminum, 4,877,643, Cl. 427-57.000.
- Ishikawa, Tsyoshi: See—
Morioka, Takayuki; Motoyama, Nobuyuki; Hoshikawa, Hiroshi; Takahashi, Takeo; Suzuki, Sizuo; Ishikawa, Tsyoshi; Toyoshi, Takanori; and Uede, Toshio, 4,877,558, Cl. 252-626.000.
- Ishioka, Hidenori: See—
Matsuda, Kenji; Togashi, Kenji; Umemura, Hiroyuki; Okada, Tetsuji; Ishioka, Hidenori; and Aoki, Katsuyuki, 4,877,183, Cl. 236-49.300.
- Isidoro, Guido. Control mechanism for controlling the water supply in an irrigation system and similar, operating by means of pressure pulses, 4,877,047, Cl. 137-119.000.
- Isobe, Tami: See—
Yokomori, Kiyoshi; and Isobe, Tami, 4,877,301, Cl. 350-96.190.
- Isobe, Toshifumi: See—
Maruyama, Hiroyuki; Kishimoto, Tadao; Isobe, Toshifumi; and Yokobori, Jun, 4,878,110, Cl. 358-75.000.
- Isoda, Noriyuki; and Okamoto, Yuji, to Topre Corporation. Key input circuit, 4,878,056, Cl. 341-26.000.
- Isohata, Junji; Totsuka, Masao; and Nakamura, Yoshiharu, to Canon Kabushiki Kaisha. Flat panel display device and manufacturing of the same, 4,878,086, Cl. 355-77.000.
- Isonaga, Eiji: See—
Kawano, Minoru; Simizu, Katsumi; Isonaga, Eiji; and Kurata, Shigeo, 4,877,874, Cl. 540-606.000.
- Isoyama, Toyoshio: See—
Sawada, Shinichi; Matsushita, Tetsuya; and Isoyama, Toyoshio, 4,877,549, Cl. 252-299.630.
- Itakura, Takeshi: See—
Hayashi, Yoshiaki; Itakura, Takeshi; Kato, Toyoji; and Koshidaka, Yukio, 4,877,141, Cl. 215-1.00C.

ITM Industrial Technology & Machines AG: See—
Tuma, Martin, 4,876,813, Cl. 42-50.000.
Ito, Atsushi: See—
Murakami, Tokumichi; Nishida, Masami; and Ito, Atsushi, 4,878,230, Cl. 375-27.000.
Ito, Hiroo, to Kabushiki Kaisha Serutekuno. Process for producing open-cell polyethylene foam materials and the resultant product. 4,877,814, Cl. 521-79.000.
Ito, Keizo: See—
Iemura, Ryuichi; Hori, Manabu; Ohtaka, Hiroshi; Sukamoto, Takayuki; Hara, Hideaki; and Ito, Keizo, 4,877,790, Cl. 514-260.000.
Ito, Kunio: See—
Morita, Shizuo; Hayakawa, Kazushi; Ito, Kunio; Matsuo, Shunji; Fukuchi, Masakazu; and Hatakeyama, Noboru, 4,878,091, Cl. 355-260.000.
Ito, Yasutoshi: See—
Toshiaki, Kikuchi; Mochizuki, Toshihiro; Ito, Yasutoshi; and Yamana, Tohru, 4,877,214, Cl. 248-483.000.
Itoh, Kunio; Shiohara, Toshiro; Futatsumori, Koji; Tomiyoshi, Kazutoshi; and Shimizu, Hisashi, to Shin-Etsu Chemical Co., Ltd. Epoxy resin composition. 4,877,822, Cl. 523-433.000.
Itoh, Nobuhiko: See—
Watahiki, Shinichi; Itoh, Nobuhiko; Ihata, Nobuo; and Miyasaka, Masao, 4,877,344, Cl. 400-124.000.
ITT SWF Auto-Electric GmbH: See—
Scholl, Wolfgang, 4,877,186, Cl. 239-75.000.
Iuchi, Yasuaki, to Toyoda Gosei Co., Ltd. Steering wheel. 4,876,915, Cl. 74-552.000.
Ives, Donald H.: See—
Edwards, D. Brandon; Edwards, Bruce W.; Howard, Ian D.; and Ives, Donald H., 4,877,316, Cl. 350-537.000.
Iwamoto, Tadao: See—
Marume, Yoshihiro; and Iwamoto, Tadao, 4,877,215, Cl. 249-109.000.
Iwasaki, Keisuke: See—
Takakura, Masaki; Hayasaka, Hideto; Takemura, Hideo; Izumi, Masao; Iwasaki, Keisuke; Noguchi, Yoji; Yamane, Yasukuni; and Kako, Noritoshi, 4,878,178, Cl. 364-521.000.
Iwasaki, Kyoji: See—
Torii, Nobutoshi; Mizuno, Hitoshi; and Iwasaki, Kyoji, 4,877,973, Cl. 307-147.000.
Iwaya, Toshio: See—
Kotera, Masahide; Konishi, Motofumi; Ando, Yoshio; Iwaya, Toshio; Tanaka, Kanou; Hashimoto, Norio; Sugita, Yasutoshi; Sano, Yoshitaka; and Ono, Satoshi, 4,878,250, Cl. 382-56.000.
Izumi, Akira: See—
Mizusaki, Sigenobu; Matsushita, Hajime; Ishiguro, Shigeo; Ichinose, Hiroshi; and Izumi, Akira, 4,877,909, Cl. 568-880.000.
Izumi, Masao: See—
Takakura, Masaki; Hayasaka, Hideto; Takemura, Hideo; Izumi, Masao; Iwasaki, Keisuke; Noguchi, Yoji; Yamane, Yasukuni; and Kako, Noritoshi, 4,878,178, Cl. 364-521.000.
Izumi, Tsugio: See—
Koyano, Tetsuo; Sagi, Nobuo; Izumi, Tsugio; Fujita, Setsuya; Murata, Tadahiko; Hachiya, Iwao; and Mori, Hiroyuki, 4,877,636, Cl. 426-607.000.
Izumihara, Yoshikazu: See—
Kakehi, Nobuo; Takahashi, Yuzuru; Higuchi, Norio; Izumihara, Yoshikazu; Matsumoto, Hiromi; and Uehori, Yuji, 4,876,874, Cl. 72-199.000.
Izumisawa, Yoshiaki: See—
Tamara, Akio; and Izumisawa, Yoshiaki, 4,877,900, Cl. 562-413.000.
J B Group, Inc.: See—
Krueger, Ronald G., 4,877,470, Cl. 156-177.000.
J. B. Two Corporation: See—
Hobson, Richard S.; and Potter, David, 4,877,286, Cl. 297-195.000.
J. I. Case Company: See—
Horsch, Joachim, 4,877,116, Cl. 192-3.570.
J.M. Huber Corporation: See—
Hinds, Robert B.; Hutchinson, Charles B., Jr.; and Dowell, James S., 4,877,386, Cl. 425-110.000.
J.M. Voith GmbH: See—
Kade, Werner; and Rahmig, Hermann, 4,877,486, Cl. 162-336.000.
J. R. Simplot Co.: See—
Bierman, Laurence W.; Lopez, Michael L.; and Perkins, James E., III, 4,877,594, Cl. 423-321.000.
Jackson, Melvin R. Low density high strength alloys of Nb-Ti-Al for use at high temperatures. 4,877,576, Cl. 420-426.000.
Jackson, O. L. Extension for compacting device. 4,876,955, Cl. 100-219.000.
Jacobs, Gerardus M. H. M.; and Dinnissen, Johannes H. A., to OCE-Nederland B.V. Device for feeding and discharging originals in sheet form. 4,877,231, Cl. 271-3.100.
Jagadeesh, Jogikal: See—
Tomei, L. David; Cornhill, Fred; Jagadeesh, Jogikal; and Boninger, Michael, 4,877,966, Cl. 250-458.100.
Jagenberg Aktiengesellschaft: See—
Heymanns, Willi, 4,877,196, Cl. 242-66.000.
Jakobsen, Palle: See—
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James, Jewell P. W. Apparatus for playing billiards or pool. 4,877,242, Cl. 273-2.000.
James, Leslie G.; and Old, Michael J., to British Nuclear Fuels Plc. Flasks for radioactive materials. 4,877,969, Cl. 250-507.100.

Jamroz, Richard E.: See—
Lindauer, Thomas W.; and Jamroz, Richard E., 4,876,968, Cl. 105-415.000.
Jandera, Zdenek; and Bedwell, Ian R., to Plessey Australia Pty. Ltd. Composite sonar transducer for operation as a low frequency underwater acoustic source. 4,878,207, Cl. 367-155.000.
Janik, Leon P.: See—
Hodgkins, David H.; and Janik, Leon P., 4,876,990, Cl. 723-41.350.
Jann, P. C.: See—
Chadwick, Curt H.; Sholes, Robert R.; Greene, John D.; Tucker, Francis D., III; Fein, Michael E.; Jann, P. C.; Harvey, David J.; and Bell, William, 4,877,326, Cl. 356-394.000.
Janome Sewing Machine Company Limited: See—
Ando, Takumi; and Kawasato, Takayuki, 4,876,977, Cl. 112-445.000.
Jansch, Manfred, to Weatherford Oil Tool GmbH. Apparatus for testing the gas-tightness of joints between hollow bodies. 4,876,884, Cl. 73-49.100.
Jansma, Donald; and Stemm, Howard W., to Bissell Health Care Corporation. Cigarette holder with filter modifier, and related method. 4,877,040, Cl. 131-189.000.
Jansson, Gunnar B.; and Holmlund, Erling S., to Pharmacia AB. Methods of assaying out assays for lipoproteins and apolipoproteins. 4,877,746, Cl. 436-518.000.
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Tsuda, Yusuke; Kurata, Takashi; Suzuki, Yoshinobu; and Yamamoto, Yuji, 4,877,835, Cl. 525-67.000.
Japan Tobacco Inc.: See—
Mizusaki, Sigenobu; Matsushita, Hajime; Ishiguro, Shigeo; Ichinose, Hiroshi; and Izumi, Akira, 4,877,909, Cl. 568-880.000.
Japan Tobacco Inc./Tokyo Automatic Machinery Works Ltd.: See—
Honda, Sumio; Ogata, Taizo; and Etani, Tadao, 4,876,839, Cl. 53-137.000.
Jeantin, Philippe: See—
Delbe, Emmanuel; Gillet, Francois; Serot, Etienne; Chifflet, Raymond; Allio, Roland; Jeantin, Philippe; Del Fabro, Gilbert; and Forella, Guy, 4,877,229, Cl. 271-2.000.
Jensen, Janet R. Method and means for securing palletized materials. 4,876,841, Cl. 53-399.000.
Jensen, Niels D.; and Svarre, Erik, to Grundfos International A/S. Multi-stage rotary pump. 4,877,372, Cl. 415-199.100.
Jernigan, Thomas K.: See—
Brower, David; and Jernigan, Thomas K., 4,876,976, Cl. 112-262.300.
JES, LP: See—
Hee, Roland, 4,878,148, Cl. 361-220.000.
Jessup, Tim M.: See—
Bulatovic, Srdjan; and Jessup, Tim M., 4,877,517, Cl. 209-167.000.
Jidosha Kiki Co., Ltd.: See—
Emori, Yasuyoshi; Ohsaki, Hiroshi; and Nomura, Ikuo, 4,877,100, Cl. 180-143.000.
Jinno, Osamu; and Fukuoka, Tatsuhiro, to Taiho Kogyo Co., Ltd. Bearing resin material. 4,877,813, Cl. 525-146.000.
John Fluke Mfg. Co., Inc.: See—
Cok, Steven P., 4,878,231, Cl. 375-80.000.
Johnsen, Stanley W.: See—
McIntyre, Raymond D.; and Johnsen, Stanley W., 4,877,961, Cl. 250-397.000.
Johnson, Arthur F., to Energy Conservation Partnership, Ltd. Heat regenerator to recover both sensible and heat of condensation of flue gases. 4,876,986, Cl. 122-20.000.
Johnson, Frank M. Method of identification of rolled-up sheets of material. 4,876,809, Cl. 40-309.000.
Johnson, Howard R. Magnetic force generating method and apparatus. 4,877,983, Cl. 310-12.000.
Johnson, Todd W.; and Brizuela, Corazon C., to Minnesota Mining and Manufacturing Company. Flexible filter bag and method of fabrication. 4,877,526, Cl. 210-448.000.
Johnson, William C.; and Richardson, Hubert, Jr., to Tecumseh Products Company. Compressor shaft collar through port for pressure equalization between fluid pockets. 4,877,381, Cl. 418-55.000.
Johnson, William M.; Olson, Timothy A.; Dutton, Drew J.; Lee, Sherman; and Stoener, David W., to Advanced Micro Devices, Inc. Direct memory access apparatus and methods for transferring data between buses having different performance characteristics. 4,878,166, Cl. 364-200.000.
Johnson, William M.; and Wright, Charles G., to International Business Machines Corporation. Bidirectional serial test bus device adapted for control processing unit using parallel information transfer bus. 4,878,168, Cl. 364-200.000.
Johnston, William T. Exhaust heated trailer. 4,877,184, Cl. 237-12.300.
Jones, Marshall G.; and Batra, Prem N., to General Electric Company. Laser debidding of microelectronic solder joints. 4,877,175, Cl. 228-102.000.
Jones, Ronald E.: See—
Kapusinski, Maria M.; Grina, Larry D.; Jones, Ronald E.; and Sung, Rodney L., 4,877,415, Cl. 44-62.000.
Jones, Teddy L., to Sundstrand Corporation. Non-jamming actuator system. 4,876,906, Cl. 74-89.150.
Jos. Hunkeler Ltd.: See—
Felix, Willi, 4,877,177, Cl. 229-92.300.
Jung, Peter: See—
Esser, Wolfgang; and Jung, Peter, 4,878,009, Cl. 323-275.000.
Jungwirth, Dieter: See—
Aicher, Max; Jungwirth, Dieter; Klein, Hans-Wilhelm; and Rutschwurm, Dieter, 4,877,463, Cl. 148-12.000.

Junkert, Kenneth G.: See—
Wahl, William; and Junkert, Kenneth G., 4,878,016, Cl. 324-73.000.
Jurgens, Lothar, to Precitronic Gesellschaft fur Feinmechanik und Electronic mbh. Process, and device for firing and battle simulation. 4,877,403, Cl. 434-24.000.
Kabivitrum AB: See—
Andersson, Lars-Olof; Forsman, Nanna; Larsen, Kerstin E. I.; Lundin, Annelie B.; Pavlu, Bohdan; Sandberg, Inga H.; and Sewerin, Karin M., 4,877,614, Cl. 424-101.000.
Kabushiki Kaisha Asahi Kinzoku Kogyo: See—
Kaneko, Toshio, 4,876,872, Cl. 72-133.000.
Kabushiki Kaisha Daikin Seisakusho: See—
Koshimo, Masahiko, 4,876,922, Cl. 74-731.000.
Kabushiki Kaisha Honda Rokku: See—
Yamagata, Tetsuo, 4,878,045, Cl. 340-556.000.
Kabushiki Kaisha Kawai Gakki Seisakusho: See—
Kitagawa, Hiroshi, 4,876,935, Cl. 84-627.000.
Kabushiki Kaisha Kobe Seiko Sho: See—
Honma, Masahiro; Maruyama Tokujii; Okada, Masashi; and Hida, Yukio, 4,877,941, Cl. 219-130.210.
Saeiki, Chikara; and Nishibe, Minoru, 4,876,869, Cl. 72-68.000.
Kabushiki Kaisha Kyoritsu: See—
Kuno, Toshio; Shindo, Yoshikazu; Kuno, Yukio; Ueno, Takeshi; Torimi, Akira; and Mori, Yoji, 4,876,952, Cl. 98-121.200.
Kabushiki Kaisha Serutekuno: See—
Ito, Hiroo, 4,877,814, Cl. 521-79.000.
Kabushiki Kaisha Tokai Rika Denki Seisakusho: See—
Kawase, Toshihiro; and Sano, Sachiya, 4,877,931, Cl. 200-308.000.
Kabushiki Kaisha Toshiba: See—
Ikenaga, Osamu; and Watanabe, Susumu, 4,878,177, Cl. 364-489.000.
Imamura, Humihiko; and Hotta, Tomio, 4,876,953, Cl. 99-280.000.
Kitamoto, Manabu, 4,876,859, Cl. 62-117.000.
Mizutani, Yoshihisa, 4,878,199, Cl. 365-185.000.
Oyama, Sakan; and Omori, Koji, 4,878,147, Cl. 361-154.000.
Saito, Tamio; and Yoshihara, Kunio, 4,878,098, Cl. 357-68.000.
Seki, Nagataka; Ogawa, Kiyoshi; and Nakajima, Kihei, 4,878,208, Cl. 307-87.000.
Shirai, Koji; and Kawamura, Ken, 4,878,096, Cl. 357-42.000.
Shiraishi, Takashi, 4,878,066, Cl. 346-108.000.
Takada, Ikuo, 4,878,218, Cl. 370-94.000.
Tanaka, Hiroshi; Murata, Yasukiyo; and Eto, Kazumi, 4,876,861, Cl. 62-279.000.
Tsujimoto, Shuichi; and Asada, Haruo, 4,878,124, Cl. 358-443.000.
Ueno, Masaji, 4,877,975, Cl. 307-443.000.
Yamamoto, Mikio, 4,877,953, Cl. 250-214.000.
Kabushiki Kaisha Kibun: See—
Kiuchi, Hiroshi; Murata, Katsumi; Murakami, Kazuo; Kusakabe, Isao; and Kobayashi, Hideyuki, 4,877,622, Cl. 426-46.000.
Kabushiki Kaisha Kibun Foodchemifa: See—
Kiuchi, Hiroshi; Murata, Katsumi; Murakami, Kazuo; Kusakabe, Isao; and Kobayashi, Hideyuki, 4,877,622, Cl. 426-46.000.
Kaczmarek, Richard, to Reliance Comm/Tec Corporation. Line protector. 4,878,146, Cl. 361-119.000.
Kade, Werner; and Rahmig, Hermann, to J.M. Voith GmbH. Headbox for paper machine with hollow expanding member for profile bar adjustment. 4,877,486, Cl. 162-336.000.
Kaeriyama, Kyoji: See—
Tanaka, Susumu; Sato, Masaaki; Kaeriyama, Kyoji; Suda, Yoshio; and Hiraike, Takao, 4,877,852, Cl. 526-256.000.
Kah, Carl L. C., Jr. Multi-voltage motor and timer clock. 4,878,006, Cl. 318-770.000.
Kahning, Stefan: See—
Sauerbaum, Thomas; and Kahning, Stefan, 4,877,329, Cl. 374-28.000.
Kai, Isao: See—
Okada, Masamichi; and Kai, Isao, 4,878,184, Cl. 364-557.000.
Ota, Hiroyuki; and Kai, Isao, 4,877,333, Cl. 374-169.000.
Kaiser Aerospace & Electronics Corporation: See—
Kalmanash, Michael H., 4,877,307, Cl. 350-132.000.
Kaiser, Carl: See—
Rzeszotarski, Wacław J.; Guzewska, Maria E.; Carter, John P.; Adams, Theodore C.; Dupont, Andrea C.; and Kaiser, Carl, 4,877,779, Cl. 514-63.000.
Kajita, Toshio: See—
Suzuki, Akinori; Kajita, Toshio; and Furushima, Masakazu, 4,877,447, Cl. 71-103.000.
Kakehi, Nobuo; Takahashi, Yuzuru; Higuchi, Norio; Izumihara, Yoshikazu; Matsumoto, Hiromi; and Uehori, Yuji, to Nippon Steel Corporation. Method of hot rolling steel strip with deformed sections. 4,876,874, Cl. 72-199.000.
Kakinuma, Koichiro: See—
Ando, Makoto; Kakinuma, Koichiro; Sawa, Masahiko; Ohmuro, Hideaki; and Ohryo, Akira, 4,877,946, Cl. 235-380.000.
Kako, Noritoshi: See—
Takakura, Masaki; Hayasaka, Hideto; Takemura, Hideo; Izumi, Masao; Iwasaki, Keisuke; Noguchi, Yoji; Yamane, Yasukuni; and Kako, Noritoshi, 4,878,178, Cl. 364-521.000.
Kalain, Terry M.: See—
Yusko, Edward M., Jr.; Brown, Cal R.; Kalain, Terry M.; and Williams, Peter C., 4,877,053, Cl. 137-556.000.
Kalal, Theodore T.; and Kowitch, Richard, to Cooper Power Systems, Inc. Line current to time interpolator. 4,878,143, Cl. 361-94.000.
Kalamazoo Holdings, Inc.: See—
Todd, Paul H., Jr., 4,877,635, Cl. 426-542.000.

Kalatozishvili, Elena I.: See—
Mudzhiri, Levan A.; Alkhazashvili, Gia G.; Kalatozishvili, Elena I.; Chelkurishvili, Gia O.; Brekman, Izrail I.; Bulanov, Alexandr E.; and Polozhentseva, Mira I., 4,877,772, Cl. 514-23.000.
Kalmanash, Michael H., to Kaiser Aerospace & Electronics Corporation. Stereoscopic display. 4,877,307, Cl. 350-132.000.
Kaluschke, Thomas: See—
Peters, Manfred; Becker, Manfred; Wingender, Kaspar; Kaluschke, Thomas; and Klotzer, Sieghart, 4,877,722, Cl. 430-559.000.
Kambe, Shigemitsu; and Miyafuji, Hideaki, to Nippon Petrochemicals Company, Limited. Ethylenic thermoplastic resin composition. 4,877,663, Cl. 428-35.500.
Kamiya, Akihiko: See—
Aoi, Toshiaki; Macmoto, Kazuo; Kamiya, Akihiko; and Misu, Hiroshi, 4,877,711, Cl. 430-176.000.
Kampe, Klaus-Dieter; Raether, Wolfgang; and Dittmar, Walter, to Hoechst Aktiengesellschaft. 2-azolyimethyl-2-aryl-1,3-dioxolanes and the salts thereof, processes for the preparation thereof, agents containing same, and the use thereof. 4,877,878, Cl. 544-368.000.
Kanamaru, Tatsuya; Nakayama, Motohiro; Arai, Katutoshi; Suzuki, Shinichi; and Naka, Ryoichi, to Nippon Steel Corporation. Corrosion resistant plated steel strip and method for producing same. 4,877,494, Cl. 204-28.000.
Kanamori, Iwao, to Olympus Optical Co., Ltd. Objective lens system for endoscopes. 4,877,314, Cl. 350-422.000.
Kanebo Limited: See—
Iemura, Ryuichi; Hori, Manabu; Ohtaka, Hiroshi; Sukamoto, Takayuki; Hara, Hideaki; and Ito, Keizo, 4,877,790, Cl. 514-260.000.
Kiyohara, Kazuo; Hagiwara, Toshiyuki; Nakadate, Takanori; Harada, Ichiya; Noguchi, Kentaro; Sakae, Shigeru; and Okuma, Kazuhiro, 4,877,819, Cl. 523-200.000.
Kaneko, Ichiro: See—
Kobayashi, Kenji; Kaneko, Ichiro; Kobayashi, Masahiro; and Nakano, Shinji, 4,877,535, Cl. 210-701.000.
Kaneko, Toshio, to Kabushiki Kaisha Asahi Kinzoku Kogyo. Method and apparatus for manufacturing curved pipe. 4,876,872, Cl. 72-133.000.
Kanesbige, Ryouosuke; and Mizui, Kinya, to Mitsui Petrochemical Industries, Ltd. Lubricating oil composition. 4,877,557, Cl. 252-56.000.
Kanno, Kimio, to Toyota Iron Works Co., Ltd. Parking-brake operating device. 4,876,914, Cl. 74-538.000.
Kansai Paint Company, Ltd.: See—
Maeda, Shigeyoshi; Aai, Tsunetoshi; Asano, Hidejiro; and Taguchi, Haruyoshi, 4,877,664, Cl. 428-35.900.
Kansas State University Research Foundation: See—
Klabunde, Kenneth J., 4,877,647, Cl. 427-123.000.
Kantor, Edward A.; Berci, George; and Storz, Karl. Video endoscopic microscope. 4,877,016, Cl. 128-6.000.
Kao, Heng-er Y. Engineering constructive load cell. 4,876,895, Cl. 73-761.000.
Kaper, Louis; Klammer, Roelof; and Noomer, Pieter J., to Douwe Egberts Koninklijke Tabaksfabriek-Koffiebranderijen-Theehandel N.V. Process for recovering caffeine absorbed in activated carbon, and a process for decaffeinating coffee. 4,877,631, Cl. 426-422.000.
Kappes, Kenneth C., to Milprint, Inc. Direct overwrap for bar soap. 4,877,674, Cl. 428-192.000.
Kapulka, Kenneth M.; Rader, Holly A.; and Strickland, Jimmy P., to International Business Machines Corporation. Method for managing reuse of hard log space by mapping log data during state changes and discarding the log data. 4,878,167, Cl. 364-200.000.
Kapusinski, Maria M.; Grina, Larry D.; Jones, Ronald E.; and Sung, Rodney L., to Texaco Inc. Hydrocarbon compositions containing polyolefin graft polymers. 4,877,415, Cl. 44-62.000.
Kar, Gittimoy, to Corning Glass Works. Coated optical waveguide fibers. 4,877,306, Cl. 350-96.330.
Karasaki, Toshihiko: See—
Hamada, Masataka; Karasaki, Toshihiko; Matsui, Toru; and Makawa, Yukio, 4,878,079, Cl. 354-402.000.
Taniguchi, Nobuyuki; Karasaki, Toshihiko; Mukai, Hiromu; Tokumaru, Hisashi; and Ishida, Tokujii, 4,878,076, Cl. 354-286.000.
Karhu-Titan Oy: See—
Tiittola, Antti-Jussi; and Pohja, Kari, 4,876,807, Cl. 36-114.000.
Karita, Mitsui, to Shinko Electric Co., Ltd. Door apparatus with magnetic support. 4,876,765, Cl. 16-102.000.
Karna, Juhani; and Pahlman, Heikki, to Sunds Defibrator Jylha Oy. Method and device for measuring the distance between the discs of a refiner using a measurement of the magnetic flux induced between the discs. 4,878,020, Cl. 324-207.000.
Karpuk, Michael E.; and Cowley, Scott W., to Technology Development Associates, Inc. Enhanced performance of alcohol fueled engine during cold conditions. 4,876,989, Cl. 123-3.000.
Karsai, Jozsef: See—
Neu Jozsef; Csatos, Imre; Varga, Andras; Suranyi, Robert; Ilovai, Zoltan; Gaal, Sandor; Karsai, Jozsef; Sebestyen, Endre; Gardi, Eva; Siki, Karoly; Toth, Istvan; Gal, Gusztav; a/v; Dombay, Zsolt; Grega nee Toth, Mrs. Erzsébet; Pavliacsak, Csaba; Tarpai, Gyula; Bonnyay, Peter; and Santha, Pal, 4,877,893, Cl. 558-86.000.
Kasahara, Yoshiki, to Yamaha Corporation. Remote control device. 4,878,055, Cl. 341-23.000.

- Kasai, Masaji: See—
Murakata, Chikara; Sato, Akira; Kasai, Masaji; Kobayashi, Eiji; Morimoto, Makoto; and Akinaga, Shiro, 4,877,776, Cl. 514-43.000.
- Kasanami, Tohru: See—
Tani, Hiroji; Kasanami, Tohru; and Yokoi, Tsutomu, 4,877,565, Cl. 264-105.000.
- Kashida, Motokazu: See—
Masui, Toshiyuki; Kashida, Motokazu; Takahashi, Koji; and Nagasawa, Kenichi, 4,878,134, Cl. 360-77.150.
- Kashimura, Noboru: See—
Hiro, Masaaki; Kimura, Tomohiro; Tanaka, Hisami; Kashimura, Noboru; Tanaka, Shigemori; Tohma, Hitoshi; and Hisamura, Masafumi, 4,877,701, Cl. 430-59.000.
- Kashiwada, Minoru: See—
Miwa, Harufumi; Kashiwada, Minoru; and Goto, Ikuo, 4,877,583, Cl. 422-73.000.
- Kashiwagi, Masato: See—
Tamaru, Sinji; Kubo, Motonobu; and Kashiwagi, Masato, 4,877,859, Cl. 528-129.000.
- Kashiwazaki, Tomoyuki: See—
Okawa, Kazuyoshi; Moriya, Kazumasa; Kashiwazaki, Tomoyuki; Kawashima, Hiroshi; and Murakawa, Yoshitaka, 4,876,966, Cl. 104-290.000.
- Kasner, Clayton S., to Design Improvement Corporation. Drain valve device. 4,877,218, Cl. 251-61.300.
- Kataoka, Yoshiyuki: See—
Suzuki, Hiroaki; Kataoka, Yoshiyuki; Murase, Michio; Inoue, Kotaro; Sumida, Isao; Yamanari, Shozo; Matsumoto, Masaki; Miura, Satoshi; and Hashimoto, Koji, 4,877,574, Cl. 376-216.000.
- Katayama, Aiichi: See—
Nakatsugawa, Kenji; Katayama, Aiichi; and Sekiya, Hitoshi, 4,878,194, Cl. 364-900.000.
- Katayama, Akihiro: See—
Ohsawa, Hidefumi; Sunohara, Izuru; Hosokawa, Hiroshi; and Yoshimoto, Masahiko, to Canon Kabushiki Kaisha. Method and apparatus for image processing with feedback error correction. 4,878,125, Cl. 358-443.000.
- Katerberg, James A., to Eastman Kodak Company. Multicolor printing apparatus and method having vernier detection/correction system for adjusting color separation planes. 4,878,063, Cl. 346-1.100.
- Katerberg, James A.; Wint, Robert L.; and Lewis, Richard A., to Eastman Kodak Company. Continuous ink jet stimulation adjustment based on overdrive detection. 4,878,064, Cl. 346-75.000.
- Kato, Satoshi: See—
Aiki, Shigetaka; Kobayashi, Kiyonori; and Kato, Satoshi, 4,876,917, Cl. 74-574.000.
- Kato, Toyoji: See—
Hayashi, Yoshiaki; Itakura, Takeshi; Kato, Toyoji; and Koshidaka, Yukio, 4,877,141, Cl. 215-1.000.
- Kato, Yukihiko; Ishii, Masami; Yabuno, Ryohei; and Oka, Tetsuo, to Aisin Seiki Kabushiki Kaisha. Strain gauges for the pressure sensor. 4,876,893, Cl. 73-726.000.
- Katsumata, Yukio: See—
Miike, Akira; Katsumata, Yukio; and Tatano, Toshio, 4,877,727, Cl. 435-24.000.
- Katzenstein, Henry S.: See—
Dandliker, Walter B.; Barr, Howard S.; Katzenstein, Henry S.; and Watson, Keith R., 4,877,965, Cl. 250-458.100.
- Kaufman, Charles W.; Kempf, Mark F.; and Hutchison, Jerry D., to Digital Equipment Corporation. Method and apparatus for nodes in network to avoid shrinkage of an interframe gap. 4,878,219, Cl. 370-97.000.
- Kaufman, Frank B.: See—
Moore, James A.; Dasheff, Andrew N.; and Kaufman, Frank B., 4,877,718, Cl. 430-326.000.
- Kausch, Michael; Buysch, Hans-Josef; Schroer, Hans; and Suling, Carlhans, to Bayer Aktiengesellschaft. Elastane fibers stabilized against environmental influences. 4,877,825, Cl. 524-101.000.
- Kaveah, Sheldon; Prevorsek, Dusan C.; and Harpell, Gary A., to Allied-Signal Inc. Method for preparing heat set fabrics. 4,876,774, Cl. 28-166.000.
- Kawada, Kazuhide, to NEC Corporation. Microcomputer having Z-flag capable of detecting coincidence at high speed. 4,878,189, Cl. 364-736.500.
- Kawai, Hiroyuki; and Nakagawa, Shinichi, to Mitsubishi Denki Kabushiki Kaisha. Clock generator which generates a non-overlap clock having fixed pulse width and changeable frequency. 4,877,974, Cl. 307-269.000.
- Kawai, Hiroyuki: See—
Umezawa, Hamao, deceased; Tatsuta, Kuniaki; Kawai, Hiroyuki; and Nakajima, Shohachi, 4,877,870, Cl. 536-6.400.
- Kawai, Kenji: See—
Ogawa, Toshiaki; Fujiwara, Nobuo; Kawai, Kenji; Shibano, Teruo; Morita, Hiroshi; and Nishioka, Kyusaku, 4,877,509, Cl. 204-298.000.
- Kawamoto, Haruki: See—
Hagikura, Hirofumi; and Kawamoto, Haruki, 4,878,001, Cl. 318-446.000.
- Kawamura, Ken: See—
Shirai, Koji; and Kawamura, Ken, 4,878,096, Cl. 357-42.000.
- Kawamura, Masunori: See—
Ichihashi, Tadashi; and Kawamura, Masunori, 4,877,321, Cl. 351-214.000.
- Kawamura, Shuzo, to Murata Kikai Kabushiki Kaisha. Package inspecting apparatus. 4,877,967, Cl. 250-461.100.
- Kawano, Minoru; Simizu, Katsumi; Isonaga, Eiji; and Kurata, Shigeo, to Ube Industries, Ltd. Process for producing N-aminohexamethyleneimine. 4,877,874, Cl. 540-606.000.
- Kawasaki Jukogyo Kabushiki Kaisha: See—
Tatebayashi, June; Takada, Tomoaki; Hayashi, Kimitaka; and Kumagai, Chikanori, 4,877,397, Cl. 432-106.000.
- Kawato, Takayuki: See—
Ando, Takumi; and Kawato, Takayuki, 4,876,977, Cl. 112-445.000.
- Kawase, Toshihiro; and Sano, Sachiya, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Switch having a visible indicator. 4,877,931, Cl. 200-308.000.
- Kawashima, Hiroshi: See—
Okawa, Kazuyoshi; Moriya, Kazumasa; Kashiwazaki, Tomoyuki; Kawashima, Hiroshi; and Murakawa, Yoshitaka, 4,876,966, Cl. 104-290.000.
- Kawate, Keith W.: See—
Strott, Douglas B.; and Kawate, Keith W., 4,876,899, Cl. 73-862.330.
- Kay Chemical Company: See—
Cockrell, John R., Jr.; and Thekkekkandam, Joseph T., 4,877,459, Cl. 134-40.000.
- Cockrell, John R., Jr., 4,877,691, Cl. 428-688.000.
- Kazan, Benjamin; and Hagstrom, Stig B. M., to Xerox Corporation. System for recording and readout of information at atomic scale densities and method therefor. 4,878,213, Cl. 369-126.000.
- KDC Corporation: See—
Kompanek, Harry W.; and Ming, Rickey H., 4,878,057, Cl. 341-34.000.
- Kearfott Guidance & Navigation Corporation: See—
Shernoff, Donald L., 4,877,311, Cl. 356-350.000.
- Keck, Rick W.: See—
Morgan, Alan R.; Selman, Steven H.; Garbo, Greta M.; and Keck, Rick W., 4,877,872, Cl. 540-145.000.
- Keene, Donna L.; and Hicks, Darrell D., to Hoechst Celanese Corporation. Poly(epoxide) coatings containing a mannich base of a hydroxystyrene containing polymer. 4,877,502, Cl. 204-181.700.
- Kegal, Thomas M.: See—
DeCarlo, Joseph P.; and Kegal, Thomas M., 4,876,897, Cl. 73-861.040.
- Keho Alta Industries Ltd.: See—
Gullickson, Zan, 4,877,090, Cl. 172-102.000.
- Keller, Dennis J.: See—
Hall, Dale R.; and Keller, Dennis J., 4,877,856, Cl. 528-44.790.
- Keller, James B.: See—
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- Kelley, James L.: See—
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- Kelley, James O.; Stumpf, William E.; and Friedman, Frank A., to Herman Miller, Inc. Work space management system. 4,876,835, Cl. 52-239.000.
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- Kerdix, Inc.: See—
Muehnik, Boris J.; and Fischer, Bernd F., 4,877,666, Cl. 428-64.000.
- Kern & Co. AG: See—
Hauri, Bernhard; and Ester, Hans, 4,877,324, Cl. 356-251.000.
- Kerr Machinery Corporation: See—
Putt, Francis G., 4,877,371, Cl. 415-169.100.
- Kesling, Peter C., to TP Orthodontics, Inc. Bracket for permitting tipping and limiting uprighting. 4,877,398, Cl. 433-8.000.
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Vora, Rohitkumar H.; Khanna, Dinesh N.; and Fontaine, Suzanne, 4,877,653, Cl. 427-385.500.
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- Kikuchi, Shoji: See—
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- Kim, Myun H. Container with an opening device comprising a guide strip and tear band. 4,877,139, Cl. 206-617.000.
- Kimball, John: See—
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- Kimbrell, William C., Jr.: See—
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- Kimura, Norio: See—
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- Kin, Inc.: See—
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- Kinast, Robert A.: See—
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- Kinsman, Grant: See—
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- Kirjanov, Alexander S.; and Herlant, Michel A., to Crompton & Knowles Corporation. Sulfomethylated stain blocking agents. 4,877,538, Cl. 252-8.700.
- Kishi, Noriyuki: See—
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- Kishida, Daisuke; and Sasaki, Saburo, to Ricoh Company, Ltd. Exposure control device for a camera. 4,878,081, Cl. 354-414.000.
- Kishida, Kazuo; Toyooka, Yutaka; and Mikami, Yoshiyuki, to Mitsubishi Rayon Company Limited. Process for producing a low gloss thermoplastic resin. 4,877,844, Cl. 525-316.000.
- Kishimoto, Satoshi: See—
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Yates, John T., Jr.; Griffin, Gregory L.; and Kiskinova, Maya, 4,877,584, Cl. 422-88.000.
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Kuraahina, Yoshikazu; Miyata, Hiroshi; and Momose, Den-ichi, 4,877,795, Cl. 514-306.000.
- Kita, Nobuyuki: See—
Higashi, Tatsuji; and Kita, Nobuyuki, 4,877,719, Cl. 430-326.000.
- Kitabatake, Makoto: See—
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- Kitagawa, Hiroshi, to Kabushiki Kaisha Kawai Gakki Seisakusho. Electronic musical instrument. 4,876,935, Cl. 84-627.000.
- Kitajima, Masao: See—
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- Kitamoto, Manabu, to Kabushiki Kaisha Toshiba. Multi-type air conditioner system with starting control for parallel operated compressors therein. 4,876,859, Cl. 62-117.000.
- Kitano, Kisei; Ushioda, Makoto; Uchida, Manabu; and Suzuki, Toshiharu, to Chisso Corporation. Liquid crystal composition. 4,877,548, Cl. 252-299.630.
- Kiuchi, Hiroshi; Murata, Katsumi; Murakami, Kazuo; Kusakabe, Isao; and Kobayashi, Hideyuki, to Kabushiki Kaisha Kibun; and Kabushiki Kaisha Kibun Foodchemifa. Process for producing food material. 4,877,622, Cl. 426-46.000.
- Kiya, Nobuyuki; and Maeda, Kimio, to Fanuc Ltd. Numerical control method for machining an arc on the curved surface of a cylinder using interpolation of linear and angular data. 4,878,171, Cl. 364-474.290.
- Kiyohara, Kazuo; Hagiwara, Toshiyuki; Nakadate, Takanori; Harada, Ichiya; Noguchi, Kentaro; Sakae, Shigeru; and Okuma, Kazuhiro, to Konica Corporation; and Kanebo Ltd. Process for producing polyester resin composition. 4,877,819, Cl. 523-200.000.
- Kiyohara, Takehiko, to Canon Kabushiki Kaisha. Ink jet recording apparatus with an ink tank-carriage configuration for increasing useable space. 4,878,069, Cl. 346-140.00R.
- KLA Instruments Corporation: See—
Chadwick, Curt H.; Sholes, Robert R.; Greene, John D.; Tucker, Francis D., III; Fein, Michael E.; Jann, P. C.; Harvey, David J.; and Bell, William, 4,877,326, Cl. 356-394.000.
- Klabunde, Kenneth J., to Kansas State University Research Foundation. Method of coating substrates with solvated clusters of metal particles. 4,877,647, Cl. 427-123.000.
- Klamer, Roelof: See—
Kaper, Louis; Klamer, Roelof; and Noomer, Pieter J., 4,877,631, Cl. 426-422.000.
- Klauke, Erich: See—
Schwamborn, Michael; Klauke, Erich; Schmidt, Robert R.; Santel, Hans-Joachim; and Strang, Robert H., 4,877,443, Cl. 71-92.000.
- Klein, David C. Test tube cassette system and cassettes for use therein. 4,877,134, Cl. 206-443.000.
- Klein, Hans-Wilhelm: See—
Aicher, Max; Jungwirth, Dieter; Klein, Hans-Wilhelm; and Rus-swurm, Dieter, 4,877,463, Cl. 148-12.00B.
- Klemann, Lawrence P.; Finley, John W.; and Scimone, Anthony, to Nabisco Brands, Inc. Synthesis of sucrose polyester. 4,877,871, Cl. 536-124.000.
- Klenter, Otto; and Burk, Klaus, to Hoechst Aktiengesellschaft. End wall of moldable material for a wound roll. 4,877,133, Cl. 206-416.000.
- Kliene, Ronald Ian: See—
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- Kligman, Albert M. Methods for treatment of sundamaged human skin with retinoids. 4,877,805, Cl. 514-381.000.
- Klingels, Hermann, to MTU Motoren- und Turbinen-Union München GmbH. Gas turbine propulsion unit with a gas generator. 4,876,849, Cl. 60-39.161.
- Klingel, Reinhard; and Manner, Reinhard, to Degussa Aktiengesellschaft. Method of compressing pyrogenically prepared silicic acid. 4,877,595, Cl. 423-335.000.
- Klotzer, Sieghart: See—
Peters, Manfred; Becker, Manfred; Wingender, Kaspar; Kaluschke, Thomas; and Klotzer, Sieghart, 4,877,722, Cl. 430-559.000.
- Knapp, Gunter; and Schalk, Andreas, to Anton Paar KG. Method and apparatus for producing an hf-induced noble-gas plasma. 4,877,999, Cl. 315-248.000.
- Knapp, James H.; Carney, George F.; and Carney, Francis J., to Motorola Inc. Nitride removal method. 4,877,482, Cl. 156-643.000.
- Knepper, Hans-Reinhard. Process and installation for the automatic control of a utility vehicle. 4,878,003, Cl. 318-587.000.
- Kniebel, Charles J.; Schieffler, Virgil; and Bredt, Robert C., to Horton Industries, Inc. Rotational control apparatus. 4,877,117, Cl. 192-85.00A.
- Knuchel, Pierre; and Nollez, Jacques, to Bendix France. Leakage device for the drainage of a diaphragm accumulator. 4,877,055, Cl. 137-568.000.
- Knudsen, Christian W.: See—
Stahl, Charles R.; Gibson, Michael A.; and Knudsen, Christian W., 4,876,780, Cl. 29-157.400.
- Ko, Kenneth K.: See—
Bohrn, Walter J.; Brubaker, Richard A.; Garman, Shelly N.; Hosfeld, Lewis K.; Ko, Kenneth K.; and Tymon, Thomas M., 4,877,484, Cl. 162-103.000.
- Ko, Su-sen; and Fenselow, Dan L., to Minnesota Mining and Manufacturing Company. Tissue or mucus sampling device. 4,877,037, Cl. 128-756.000.
- Ko, Yee-Lee. Process for improving the color of prawns, shrimp and lobsters. 4,877,633, Cl. 426-506.000.
- Kobayashi, Eiji: See—
Murakata, Chikara; Sato, Akira; Kasai, Masaji; Kobayashi, Eiji; Morimoto, Makoto; and Akinaga, Shiro, 4,877,776, Cl. 514-43.000.
- Kobayashi, Hideaki: See—
Obata, Takeshi; and Kobayashi, Hideaki, 4,876,847, Cl. 57-100.000.
- Kobayashi, Hideyuki: See—
Kiuchi, Hiroshi; Murata, Katsumi; Murakami, Kazuo; Kusakabe, Isao; and Kobayashi, Hideyuki, 4,877,622, Cl. 426-46.000.
- Kobayashi, Ichiji; and Sakata, Motohide, to Mizota Industrial Co., Ltd. Pumping system for gates. 4,877,537, Cl. 210-747.000.
- Kobayashi, Jyunichi, to Hitachi, Ltd. Soldered structure of fine wire, and method of and apparatus for soldering fine wire. 4,877,936, Cl. 219-85.220.
- Kobayashi, Kazuhiko: See—
Okudaira, Shigenori; Irie, Takefumi; Uchida, Hiroshi; Fukasawa, Eiichi; Kobayashi, Kazuhiko; and Yamaguchi, Masanori, 4,877,445, Cl. 75-0.50B.
- Kobayashi, Kenji; Kaneko, Ichiro; Kobayashi, Masahiro; and Nakano, Shinji, to Kurita Water Industries, Ltd.; and Otsuka Chemical Co., Ltd. Iron dispersant for boiler water. 4,877,535, Cl. 210-701.000.
- Kobayashi, Kiyonori: See—
Aiki, Shigetaka; Kobayashi, Kiyonori; and Kato, Satoshi, 4,876,917, Cl. 74-574.000.
- Kobayashi, Masahiro: See—
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- Kobayashi, Mitsuo, to Nippo Kabushiki Kaisha. Document stand. 4,877,212, Cl. 248-444.100.
- Kobayashi, Shigetoshi, to Clarion Co., Ltd. Multi-stage push button switch device. 4,877,925, Cl. 200-5.00A.
- Koch, Donald E.: See—
Gottesman, Jeffrey L.; Dempsey, Mark A.; Koch, Donald E.; and Rattan, Dev R., 4,878,048, Cl. 340-825.010.
- Koch, Heinz: See—
Alt, Claus-Christian; Gobel, Rudolf; Koch, Heinz; Niechoj, Wolfgang; Grossmann, Theodor; and Deffner, Felix, 4,877,258, Cl. 277-212.0FB.
- Koch, Horst; and Ziegler, Walter, to BASF Aktiengesellschaft. Light sensitive recording element having a photopolymerizable relief-form-

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- Koch, Paul H. Fiber optic christmas tree. 4,878,157, Cl. 362-123.000.
- Koch, Wolfgang: See—
Schwirlitz, Ingo; Woditsch, Peter; and Koch, Wolfgang, 4,877,596, Cl. 423-348.000.
- Kochi, Hiromu: See—
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- Kodama, Akinori; and Takahashi, Takeshi, to Showa Denko Kabushiki Kaisha. Scored container top. 4,877,149, Cl. 220-267.000.
- Kodama, Shinya: See—
Ishida, Kyoso; and Kodama, Shinya, 4,876,876, Cl. 72-348.000.
- Kohda, Toichi: See—
Yatsuda, Hiromi; Takeuchi, Yoshihiko; Kohda, Toichi; and Yoshikawa, Shokichi, 4,878,036, Cl. 333-195.000.
- Kohler, Tilman L. Fluid dispensing apparatus. 4,877,158, Cl. 222-400.800.
- Kohler, Uwe: See—
Mayer, Ernst; Geheeb, Norbert; and Kohler, Uwe, 4,876,996, Cl. 123-90.510.
- Kohne, Bernd: See—
Praefcke, Klaus; Kohne, Bernd; and Stephan, Werner, 4,877,220, Cl. 252-299.610.
- Kohshin Seimitsu Kikai Kabushiki Kaisha: See—
Ando, Manabu, 4,876,974, Cl. 112-240.000.
- Koike, Yuzuru: See—
Noguchi, Kunio; Koike, Yuzuru; and Toshimits, Kazushige, 4,877,006, Cl. 123-589.000.
- Koishi, Tetsuo: See—
Tanigawa, Motoaki; Dohi, Hidehiko; Nishimura, Takashi; Ichikawa, Kouji; and Koishi, Tetsuo, 4,877,071, Cl. 152-165.000.
- Koji, Ito: See—
Toshio, Kamimura; and Koji, Ito, 4,877,052, Cl. 137-512.300.
- Kokado, Masayuki, to Fujitsu Limited. ECL circuit having an improved emitter follower output circuit. 4,877,977, Cl. 307-455.000.
- Kolacek, Ivo. Adjustable stop member. 4,877,359, Cl. 409-218.000.
- Komatsu, Toshiyuki: See—
Inoue, Eiichi; Shimizu, Isamu; and Komatsu, Toshiyuki, 4,877,709, Cl. 430-128.000.
- Komenou, Kazunari: See—
Suzuki, Toshihiro; Todokoro, Yasuyuki; and Komenou, Kazunari, 4,877,717, Cl. 430-321.000.
- Komori, Akihiro; and Hirano, Muneyoshi, to Yoshida Kogyo K. K. Screen unit with built-in blind. 4,877,076, Cl. 160-107.000.
- Komori, Hideo: See—
Yarita, Takao; Komori, Hideo; Ogasawara, Koji; and Takami, Hiroaki, 4,877,061, Cl. 139-224.000.
- Kompanek, Harry W.; and Ming, Rickey H., to KDC Corporation. Typewriter keyboard. 4,878,057, Cl. 341-34.000.
- Kondo, Asaji: See—
Yazawa, Kenichiro; Seshimoto, Osamu; Kitajima, Masao; and Kondo, Asaji, 4,877,579, Cl. 422-56.000.
- Kondo, Masatsune; Ogura, Kiyoshi; and Kuramoto, Koiti, to Sumitomo Naugatuck Co., Ltd. Heat resistant copolymer composition. 4,877,833, Cl. 525-64.000.
- Konica Corporation: See—
Kiyohara, Kazuto; Hagiwara, Toshiyuki; Nakadate, Takanori; Harada, Ichiji; Noguchi, Kentaro; Sakae, Shigeru; and Okuma, Kazuhiro, 4,877,819, Cl. 523-200.000.
- Morita, Shizuo; Hayakawa, Kazushi; Ito, Kunio; Matsuo, Shunji; Fukuchi, Masakazu; and Hatakeyama, Noboru, 4,878,091, Cl. 355-260.000.
- Konishi, Junkichi; and Shiraiishi, Yasuhiro, to Nissan Motor Company, Limited. Height control system in automotive suspension system with feature of capability of height adjustment in lock condition of drive wheel and power train. 4,877,263, Cl. 280-707.000.
- Konishi, Motofumi: See—
Kotera, Masahide; Konishi, Motofumi; Ando, Yoshio; Iwaya, Toshio; Tanaka, Kanou; Hashimoto, Norio; Sugita, Yasutoshi; Sano, Yoshitaka; and Ono, Satoshi, 4,878,250, Cl. 382-56.000.
- Konishihiro Photo Industry Co., Ltd.: See—
Maruyama, Hiroyuki; Kishimoto, Tadao; Isobe, Toshifumi; and Yokobori, Jun, 4,878,110, Cl. 358-75.000.
- Takagiwa, Hiroyuki; Takahashi, Jiro; Shiroye, Meizo; Akimoto, Kunio; and Uchida, Masafumi, 4,877,704, Cl. 430-99.000.
- Kono, Shunzo: See—
Sakaki, Mamoru; Arai, Ryuichi; Akiya, Takashi; Toganoh, Shigeo; Higuma, Masahiko; Eto, Naonobu; Mouri, Hidemasa; Tobita, Michiaki; Ishida, Masahiko; and Kono, Shunzo, 4,877,680, Cl. 428-332.000.
- Kopainsky, Jurgen: See—
Brand, Klaus-Peter; Kopainsky, Jurgen; and Wittwer, Fritz, 4,878,185, Cl. 364-572.000.
- Kopmels, Pieter J. M.: See—
van Calster, Freerk R.; Kopmels, Pieter J. M.; and Ter Burg, Antonius W. M., 4,877,126, Cl. 198-847.000.
- Korn, Darryl K.: See—
Nay, Daniel L.; Korn, Darryl K.; and Ralph, John T., 4,878,197, Cl. 364-900.000.
- Koromilas, Constantinos A., to General Motors Corporation. Positive displacement rotary mechanism. 4,877,385, Cl. 418-197.000.
- Korotky, Steven K.: See—
Halemane, Thirumala R.; and Korotky, Steven K., 4,877,952, Cl. 250-213.00A.
- Koshidaka, Yukio: See—
Hayashi, Yoshiaki; Itakura, Takeshi; Kato, Toyoji; and Koshidaka, Yukio, 4,877,141, Cl. 215-1.00C.
- Koshimo, Masahiko, to Kabushiki Kaisha Daikin Seisakusho. Stepless speed-change power transmission for vehicle. 4,876,922, Cl. 74-731.000.
- Koshy, K. Thomas: See—
Cazera, Alexander R.; and Koshy, K. Thomas, 4,877,782, Cl. 514-186.000.
- Koslowski, Gunter; and Utscheid, Georg, to ROFA Rosenheimer Forderanlagen GmbH. Device for the centering of a rail in elevator stations of electric overhead trolley conveyors. 4,876,965, Cl. 104-127.000.
- Kostlan, Catherine R.: See—
Bellotti, Thomas R.; Connor, David T.; Flynn, Daniel L.; Kostlan, Catherine R.; and Nies, Donald E., 4,877,881, Cl. 548-240.000.
- Kotera, Masahide; Konishi, Motofumi; Ando, Yoshio; Iwaya, Toshio; Tanaka, Kanou; Hashimoto, Norio; Sugita, Yasutoshi; Sano, Yoshitaka; and Ono, Satoshi, to Canon Kabushiki Kaisha. Image processing system. 4,878,250, Cl. 382-56.000.
- Kothe, Norbert: See—
Rudnick, Dieter; Kothe, Norbert; Dichtelmuller, Herbert; Piechaczek, Detlef; Stephan, Wolfgang; and Schleussner, Hans, 4,877,866, Cl. 530-387.000.
- Kouchi, Toshihito: See—
Okada, Takao; Kouchi, Toshihito; Mishima, Shuzo; Ogawa, Haruo; Morita, Seizo; and Mikoshiba, Nobuo, 4,877,957, Cl. 250-306.000.
- Kouno, Kenji: See—
Masu, Masanobu; Yoshioka, Hiroshi; Kouno, Kenji; Nomura, Isao; and Yamamiya, Kazuo, 4,877,847, Cl. 525-397.000.
- Kovacs, Marta: See—
Nagy, Gabor; Neumann, Gyorgy; Kovacs, Marta; and Strompl, Andras, 4,877,199, Cl. 242-201.000.
- Koval, Vernon E.: See—
Helm, Charles W.; and Koval, Vernon E., 4,877,092, Cl. 175-74.000.
- Kowa Company Ltd.: See—
Ichihashi, Tadashi; and Kawamura, Masunori, 4,877,321, Cl. 351-214.000.
- Kowitch, Richard: See—
Kalal, Theodore T.; and Kowitch, Richard, 4,878,143, Cl. 361-94.000.
- Koyama, Hiroyasu: See—
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- Koyama, Masataka, to Victor Company of Japan, Ltd. Solid-phase welded magnetic head. 4,878,141, Cl. 360-120.000.
- Koyama, Takeshi; Ohtaka, Keiji; and Suda, Yasuo, to Canon Kabushiki Kaisha. Focus detecting device and method of making same. 4,878,078, Cl. 354-402.000.
- Koyano, Tetsuo; Sagi, Nobuo; Izumi, Tsugio; Fujita, Setsuya; Murata, Tadahiko; Hachiya, Iwao; and Mori, Hiroyuki, to Meiji Seika Kaisha, Ltd.; and Fuji Oil Company, Limited. Chocolate and chocolate additive. 4,877,636, Cl. 426-607.000.
- Kozak, Burton. Portable screw driver having flexible extension shaft. 4,876,929, Cl. 81-57.430.
- Kozikowski, Barbara A.: See—
Degenhardt, Charles R.; and Kozikowski, Barbara A., 4,877,603, Cl. 424-57.000.
- Kozuki, Susumu: See—
Yasumura, Hiroto; Hirasawa, Masahide; Noji, Minoru; Kozuki, Susumu; Takahashi, Koji; Yoshimura, Katsuji; and Sasatani, Tomohiko, 4,878,128, Cl. 358-315.000.
- Kraemer, Carolyn, to Weed Instruments Co., Inc. Apparatus and method for providing a strain-resistant resistance temperature detector. 4,878,039, Cl. 338-26.000.
- Kramer, Stuart C.: See—
Disselkoe, Allen D., Jr.; Gargiulo, Robert F.; Haywood, James E.; Heise, Keith H.; Holcomb, Darrell H.; Kramer, Stuart C.; Miller, Gregory R.; Nicholson, Jeffrey S.; Olinger, Jeffrey J.; and Spenny, Curtis H., 4,877,202, Cl. 244-122.00A.
- Krause, Elke: See—
Ballschuh, Detlef; Seibt, Horst; Ohme, Roland; Rusche, Jochen; Gruendemann, Egon; and Krause, Elke, 4,877,885, Cl. 548-570.000.
- Krause, Joachim: See—
Weber, Georg; Scheuble, Bernhard; and Krause, Joachim, 4,877,547, Cl. 252-299.610.
- Kreeb, Reiner: See—
Schuster, Hans-Dieter; Noller, Christoph; Wollenraup, Gottfried; Kreeb, Reiner; and Huss, Roland, 4,877,339, Cl. 384-218.000.
- Kropkowsky, James. Mixing and dispensing apparatus for game. 4,877,246, Cl. 273-144.00R.
- Krueger, Lorena L. Combination bar code and mark-sense reader. 4,877,948, Cl. 235-449.000.
- Krueger, Ronald G., to J B Group, Inc. Method for the production of bias fabrics. 4,877,470, Cl. 156-177.000.
- Kryazhevskikh, Nikolai F.: See—
Shishkin, Viktor V.; Kryazhevskikh, Nikolai F.; and Shapovalov, Yuri P., 4,876,946, Cl. 92-93.000.
- Kubinec, James J., to Advanced Micro Devices, Inc. Time variant drive circuit for high speed bus driver to limit oscillations or ringing on a bus. 4,877,980, Cl. 307-542.000.
- Kubis, Leon S., to Northern Telecom Limited. Soldering pins into printed circuit boards. 4,877,176, Cl. 228-173.500.

- Kubo, Motonobu: See—
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Sasaki, Isao; Kushi, Kenji; and Taguchi, Nobuyoshi, 4,877,922, Cl. 528-272.000.
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Lafon, Louis, 4,877,812, Cl. 514-630.000.
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Popescu, Ian C.; and Lange, Rainer, 4,877,059, Cl. 137-637.100.
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Impink, Albert J., Jr.; Langford, Francis L., Jr.; Grobmyer, Louis R.; and Luinetti, William K., 4,877,575, Cl. 376-216.000.
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Broemmelsiek, H. Eugene; Lee, Raymond; and Lanier, Carroll W., 4,877,563, Cl. 264-26.000.
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Bonnemais, Bruno; Lautrou, Jean; and Meyer, Dominique, 4,877,600, Cl. 424-4.000.
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Fagerburg, David R.; Watkins, Joseph J.; and Lawrence, Paul B., 4,877,851, Cl. 525-537.000.

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Brasch, William R., 4,877,450, Cl. 106-1.260.

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Lee, Raymond: See—
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Johnson, William M.; Olson, Timothy A.; Dutton, Drew J.; Lee, Sherman; and Stoenner, David W., 4,878,166, Cl. 364-200.000.

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Shyu, Jia-Ming; Chen, Inn-Ming; Lee, Tian-Quey; and Kung, Yunn-Chiang, 4,878,248, Cl. 382-9.000.

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Leinbaas, Werner: See—
Schelz, Andrea, 4,876,878, Cl. 72-450.000.

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Buneman, Oscar, 4,878,187, Cl. 364-721.000.

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LeMay, Patrick: See—
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Lemberger, Ronald F.: See—
Ditzler, Lee C.; Lemberger, Ronald F.; and Slezak, Cynthia L., 4,877,588, Cl. 422-186.190.

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Stein, Judith; and Leonard, Tracey M., 4,877,828, Cl. 524-728.000.

Leopoldi, Norbert, to Cloverline, Inc., The. Lever adapter for door knobs. 4,877,277, Cl. 292-347.000.

Lesage, Marc: See—
Bible, Matthew; Lesage, Marc; and Falconer, Ian, 4,876,886, Cl. 73-151.500.

Leuchtenberger, Wolfgang: See—
Kula, Maria-Regina; Hummel, Werner; Schutte, Horst; and Leuchtenberger, Wolfgang, 4,877,734, Cl. 435-228.000.

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Gabriel, Robert; Aronson, Michael P.; and Steyn, Peter L., 4,877,544, Cl. 252-99.000.

Levitt, George: See—
Christensen, Joel R.; Cuomo, John; and Levitt, George, 4,877,440, Cl. 71-90.000.

Lewis, Richard A.: See—
Katerberg, James A.; Wint, Robert L.; and Lewis, Richard A., 4,878,064, Cl. 346-75.000.

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Sauzade, Jean-Denis; and L'Hote, Manuel, 4,878,152, Cl. 361-386.000.

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MacKenna, Craig A.; and Li, Jan-Kwei J., 4,878,181, Cl. 364-58.000.

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Atkins, Judy M.; Comfort, Benjamin J.; and Liebelt, Ralph A., 4,877,034, Cl. 128-664.000.

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Heinze, Roland; and Liess, Hans-Dieter, 4,877,032, Cl. 128-419.0PG.

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Bright, Clarence K., 4,876,768, Cl. 17-64.000.

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Shepard, Mary E.; Galloway, Deane E.; and Lind, Keith D., 4,877,684, Cl. 428-475.800.

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Van Meter, Larry W., 4,876,751, Cl. 4-431.000.

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Aman, Martin, 4,877,338, Cl. 384-26.000.

Lion Corporation: See—
Uematsu, Michio; and Suganuma, Nobuo, 4,877,602, Cl. 424-49.000.

Liou, Tian-I: See—
Teng, Chih-Sieh; Liou, Tian-I; and Chun-Min, Hiekyung, 4,877,751, Cl. 437-47.000.

Lipoma, Samuel P.: See—
Bertness, Theodore A.; and Lipoma, Samuel P., 4,877,536, Cl. 210-712.000.

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Davis, Leo W., 4,877,222, Cl. 267-64.130.

Lischynsky, Steve J.: See—
Caldwell, Kevin G.; Lischynsky, Steve J.; and Bagi, Elza V., 4,877,303, Cl. 350-96.210.

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Mahabadi, Hadi K.; Ng, Tie H.; Listigovera, Nancy A.; and Martin, Trevor I., 4,877,706, Cl. 430-106.600.

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Little, Vernetta: See—
Little, Johnny L.; and Little, Vernetta, 4,877,283, Cl. 296-100.000.

Litton Systems, Inc.: See—
Nilsson, Boo, 4,877,573, Cl. 156-610.000.

Liu, Chih-Yuan: See—
Ikehiro, Kimimasa; Wu, Ming-Chi; and Liu, Chih-Yuan, 4,878,117, Cl. 358-183.000.

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Vedros, Neylan A.; and Liu, Te-ning E., 4,877,613, Cl. 424-92.000.

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Bernstein, Gary; Ferry, David K.; and Liu, Wenping, 4,877,716, Cl. 430-309.000.

Ljung, Stefan: See—
Bergman, Sten; and Ljung, Stefan, 4,878,142, Cl. 361-80.000.

Lloyd, Ian, to Nautical Services Pty. Ltd. Electronic control and dosing system for desalinators. 4,877,489, Cl. 202-181.000.

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Lockheed Corporation: See—
Marrache, Albert A.; and Snipes, Frank C., Jr., 4,876,973, Cl. 112-121.160.

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Loggers, Hendrik, to Aardelite Holding B.V. Process of pretreating a pozzolanic material for increasing the pozzolanic properties of said material. 4,877,453, Cl. 106-118.000.

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Longinow, Nicholas E.: See—
Bangs, Edmund R.; Longinow, Nicholas E.; and Blaha, James R., 4,877,940, Cl. 219-124.340.

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Cassola, Adrian; Kwok, John C.; Robinson, Keith J.; Smith, Brian H. A.; and Longuet, Michel, 4,877,832, Cl. 525-64.000.

Lonza Ltd.: See—
Meul, Thomas, 4,877,884, Cl. 548-544.000.

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Bierman, Laurence W.; Lopez, Michael L.; and Perkins, James E., III, 4,877,594, Cl. 423-321.00S.

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Lortz, Allan R.: See—
Anthony, James R.; Merrick, David; Homeier, Ronald F.; and Lortz, Allan R., 4,876,772, Cl. 24-637.000.

Lovey, Raymond G.; and Elliott, Arthur J., to Schering Corporation. 1-Aryl-1-(1H-azol-1-ylalkyl)-1,3-dihydroisobenzofurans, related derivatives and pharmaceutical compositions thereof useful as antifungals. 4,877,801, Cl. 548-336.000.

LSI Logic Corporation: See—
Watkins, Daniel; Wong, Jimmy; and Enghillia, Pavlina, 4,878,174, Cl. 364-200.000.

LTV Aerospace and Defense Company: See—
Pekar, Gary W.; Mason, Jack W.; and Blanc, Michael, 4,876,800, Cl. 33-784.000.

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Law, David J. C.; and Panesar, Lakhbir S., 4,877,005, Cl. 123-458.000.

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Wester-Ebbinghaus, Wilfried; Luhmann, Thomas; Mangelsdorf, Juergen; and Pini, Peter, 4,878,247, Cl. 382-1.000.

Luinetti, William K.: See—
Impink, Albert J., Jr.; Langford, Francis L., Jr.; Grobmyer, Louis R.; and Luinetti, William K., 4,877,575, Cl. 376-216.000.

Luisi, James A.: See—
Larsen, Robert P.; Hoelke, Steven T.; and Luisi, James A., 4,878,179, Cl. 364-490.000.

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Huynh, Van-Minh; and Luk, Francis M., 4,878,114, Cl. 358-106.000.

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Loew, Dieter; Schuster, Otto; and Lukas, H., 4,877,620, Cl. 424-451.000.

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Shaw, Allan; and Luxton, Russell E., 4,876,858, Cl. 62-93.000.

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Lundin, Annelie B.: See—
Anderson, Lars-Olof; Forsman, Nanna; Larsen, Kerstin E. I.; Lundin, Annelie B.; Pavlu, Bohdan; Sandberg, Inga H.; and Sewerin, Karin M., 4,877,614, Cl. 424-101.000.

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Maninger, Loren L.; New, David A.; and Lundvall, Carl L., II, 4,877,998, Cl. 315-15.000.

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Luttmer, Joseph D.: See—
York, Rudy L.; Luttmer, Joseph D.; Smith, Patricia B.; and Davis, Cecil J., 4,877,757, Cl. 437-235.000.

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Luxton, Russell E.: See—
Shaw, Allan; and Luxton, Russell E., 4,876,858, Cl. 62-93.000.

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MacKenna, Craig A.; and Li, Jan-Kwei J., to Signetics Corporation. Video display controller for expanding monochrome data to programmable foreground and background color image data. 4,878,181, Cl. 364-518.000.

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Maekawa, Yukio: See—
Hamada, Masataka; Katsuki, Toshihiko; Matsui, Toru; and Maekawa, Yukio, 4,878,079, Cl. 354-402.000.

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Colwell, Robert A.; and Stone, Thomas W., 4,877,984, Cl. 310-66.000.

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Maier, Konrad, to Von Roll, AG. Cast shafts, particularly camshafts. 4,876,916, Cl. 74-567.000.

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Main, W. Eric, to Motorola, Inc. Class B variable gain control circuit. 4,878,031, Cl. 330-254.000.

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Malaker, Stephen F., to Cryodynamics, Inc. Cryogenic refrigerator. 4,877,434, Cl. 62-6.000.

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Maldonado, Rene; Trinh, Toan; and Gosselink, Eugene P., to Procter & Gamble Company. The. Sulfoaroyl end-capped ester of oligomers suitable as soil-release agents in detergent compositions and fabric-conditioner articles. 4,877,896, Cl. 560-14.000.

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Maninger, Loren L.; New, David A.; and Lundvall, Carl L., II, to RCA Licensing Corp. Color display system having an electron gun with dual electrode modulation. 4,877,998, Cl. 315-15.000.

Mannato, Pietro, to Finduck S.r.l. Lock particularly adapted for bags, brief-bags, or the like. 4,876,863, Cl. 70-64.000.

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Klingbe, Reinhard; and Manner, Reinhard, 4,877,595, Cl. 423-335.000.

Manner, Warren R., to Manner, Warren R. Ribbon wrapped intrinsic opening plastic package. 4,877,145, Cl. 220-83.000.

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Flaig, Heinz; Neumann, Udo; Hasselmann, Heinz; Zacharias, Karl; Horbach, Rainer; and Bitch, Harald, 4,877,987, Cl. 310-209.000.

Marcum, Bruce; and Reynolds, Robert C., to Pacific Clam Pty. Ltd. Method of and apparatus for breeding and/or raising shell fish such as giant clams. 4,876,985, Cl. 119-4.000.

Maresca, Louis M., to General Electric Company. Thermoplastic blends containing polyamide and epoxy functional compound. 4,877,848, Cl. 525-423.000.

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Rzeszutarski, Wacław J.; Guzewska, Maria E.; Carter, John P.; Adams, Theodore C.; Dupont, Andrea C.; and Kaiser, Carl, 4,877,779, Cl. 514-63.000.

Maria, Nicholas P.: See—
Tsaprazia, Edward; Maria, Nicholas P.; and Montague, Charles, 4,878,019, Cl. 324-204.000.

Markowitz, Steven. Window shade assembly. 4,877,075, Cl. 160-84.100.

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Maruyama, Hiroyuki; Kishimoto, Tadao; Isobe, Toshifumi; and Yokobori, Jun, to Konishiroku Photo Industry Co., Ltd. Color image processing apparatus which accurately registers multiple color images by counting pulses from a timer reset by a drum index signal. 4,878,110, Cl. 358-75.000.

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Pekar, Gary W.; Mason, Jack W.; and Blanc, Michael, 4,876,800, Cl. 33-784.000.

Masu, Masanobu; Yoshioka, Hiroshi; Kouno, Kenzi; Nomura, Isao; and Yamamiya, Kazuo, to Mitsubishi Gas Chemical Company, Inc. Polyphenylene ether resin composition. 4,877,847, Cl. 525-397.000.

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Fujimoto, Hitoshi; and Masuda, Hisao, 4,877,173, Cl. 228-1.100.

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Shimizu, Katsuchi; Masuda, Shunichi; Yagasaki, Toshiaki; and Sakamaki, Hisashi, 4,878,130, Cl. 358-400.000.

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Masuhiko Takigawa: See—
Ikebe, Takashi; and Takigawa, Masuhiko, 4,877,018, Cl. 128-81.00R.

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Matherly, James F.: See—
Pugh, J. Robert; and Matherly, James F., 4,877,182, Cl. 236-44.00C.

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Gotou, Makoto; and Matsubayashi, Shigeaki, 4,878,165, Cl. 364-158.000.

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with gate surrounding source and/or drain. 4,878,120, Cl. 358-213.120.

Matsumoto, Masaki: See—
Suzuki, Hiroaki; Kataoka, Yoshiyuki; Murase, Michio; Inoue, Kotaro; Sumida, Isao; Yamanari, Shozo; Matsumoto, Masaki; Miura, Satoshi; and Hashimoto, Koji, 4,877,574, Cl. 376-216.000.

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Matsumoto, Susumu; Ohta, Hiroki; Yamada, Masahiro; Higashino, Yoshiaki; and Fukuchi, Toshiaki, to Mitsubishi Chemical Industries Limited. Thiadiazole derivative, and insecticidal and miticidal composition containing the derivative as the effective ingredient. 4,877,804, Cl. 514-342.000.

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Hayakawa, Kiyoharu; Matsumoto, Yumio; Ueda, Masashi; Sago, Akira; and Tagaki, Osamu, 4,878,084, Cl. 355-27.000.

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Matsuo, Shunji: See—
Morita, Shizuo; Hayakawa, Kazushi; Ito, Kunio; Matsuo, Shunji; Fukuchi, Masakazu; and Hatakeyama, Noboru, 4,878,091, Cl. 355-260.000.

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Gotou, Makoto; and Matsubayashi, Shigeaki, 4,878,165, Cl. 364-158.000.

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Hori, Hisanobu, 4,877,345, Cl. 400-342.000.

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Uchida, Masami; and Minamide, Seiko, 4,877,475, Cl. 156-273.700.

Yuhaku, Satoru; Nakatani, Seiichi; and Nishimura, Tutomu, 4,877,555, Cl. 252-512.000.

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Okamizu, Shigeo, 4,877,066, Cl. 141-96.000.

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Parsades, Heinrich H., 4,877,883, Cl. 548-375.000.

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Pucci, Michael J.; and Kunka, Blair S., 4,877,634, Cl. 426-531.000.

Vandenbergh, Peter A.; and Kunka, Blair S., 4,877,615, Cl. 424-115.000.

Microline Inc.: See—
de Laforcade, Hughes, 4,877,026, Cl. 128-305.000.

Micron Technology Inc.: See—
Chapman, John W., 4,877,525, Cl. 210-289.000.

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Wolf, Jerry M., 4,877,476, Cl. 156-307.300.

Mieno, Toshiyuki: See—
Nakajima, Toyohide; and Mieno, Toshiyuki, 4,877,511, Cl. 204-406.000.

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Milke, Akira; Katsumata, Yukio; and Tatano, Toshio, to Kyowa Medex Co., Ltd. Substrate for determining leucine aminopeptidase or gamma-glutamyltranspeptase activity. 4,877,727, Cl. 435-24.000.

Mikami, Yoshiyuki: See—
Kishida, Kazuo; Toyooka, Yutaka; and Mikami, Yoshiyuki, 4,877,844, Cl. 525-316.000.

Miki, Toshihiro: See—
Ohsaki, Saburo; Takahashi, Taketo; and Miki, Toshihiro, 4,877,962, Cl. 250-442.100.

Mikoshiba, Nobuo: See—
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Milano, Reed. Paper pick-up device. 4,877,280, Cl. 294-99.200.

Miles, David E.: See—
Reising, John C.; and Miles, David E., 4,877,837, Cl. 525-100.000.

Miles, Grant: See—
Miles, John R., deceased; Miles, Mildred L., heir; and Miles, Grant, 4,877,318, Cl. 350-569.000.

Miles Inc.: See—
Bigelia, Ramunas; and Black, Kathleen A., 4,877,728, Cl. 435-68.000.
Miles, John R., deceased; by Miles, Mildred L., heir; and Miles, Grant. Ultra-short optical system for binoculars. 4,877,318, Cl. 350-569.000.
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Disselkoen, Allen D., Jr.; Gargiulo, Robert F.; Haywood, James E.; Heise, Keith H.; Holcomb, Darrell H.; Kramer, Stuart C.; Miller, Gregory R.; Nicholson, Jeffrey S.; Olinger, Jeffrey J.; and Spenny, Curtis H., 4,877,202, Cl. 244-122.00A.
Miller, Murrell T., to ACRAVAC. Conveyor system and method for transporting materials. 4,877,124, Cl. 198-711.000.
Miller, Ray R. Belt and drum-type press with supplemental nip loading means. 4,877,487, Cl. 162-360.100.
Millet, Jean: See—
Samreth, Soth; Bellamy, Francois; and Millet, Jean, 4,877,808, Cl. 514-432.000.
Milliken Research Corporation: See—
Hines, John B.; and Harris, Jeffery R., 4,877,411, Cl. 8-403.000.
Kuhn, Hans H.; and Kimbrell, William C., Jr., 4,877,646, Cl. 427-121.000.
Milner, Peter H., to Beecham Group p.l.c. β -lactam antibacterial agents. 4,877,783, Cl. 514-194.000.
Milprint, Inc.: See—
Kappes, Kenneth C., 4,877,674, Cl. 428-192.000.
Min-Jenn, Liaw. Container for storing and sterilizing a kitchen-use chopping board. 4,877,963, Cl. 250-455.100.
Minai, Eiji: See—
Hasegawa, Saburo; and Minai, Eiji, 4,878,139, Cl. 360-99.020.
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Minamikawa, Masayasu; Onabe, Yoshiaki; and Ono, Masanao, to NGK Insulators, Ltd. Process for measuring contour configurations of articles defined by numerous cylindrical surface portions. 4,877,970, Cl. 250-560.000.
Ming, Rickey H.: See—
Kompanek, Harry W.; and Ming, Rickey H., 4,878,057, Cl. 341-34.000.
Minigrip, Inc.: See—
Aasnit, Steven, 4,876,842, Cl. 53-410.000.
MiniScribe Corporation: See—
Sarraf, Raymond E.; and Zaharris, Daniel R., 4,878,136, Cl. 360-78.040.
Ministry of International Trade and Industry: See—
Tanaka, Susumu; Sato, Masaaki; Kaeriyama, Kyoji; Suda, Yoshio; and Hiraide, Takao, 4,877,852, Cl. 526-256.000.
Minnesota Mining and Manufacturing Company: See—
Arens, Robert P., 4,877,253, Cl. 273-240.000.
Johnson, Todd W.; and Brizuela, Corazon C., 4,877,526, Cl. 210-448.000.
Ko, Su-sen; and Faselow, Dan L., 4,877,037, Cl. 128-756.000.
Lunde, George G., 4,878,090, Cl. 355-256.000.
Mino, Masayuki: See—
Yagoto, Mitsutoshi; Hamada, Akiyoshi; Mino, Masayuki; Tanaka, Yutaka; and Watanabe, Yutaka, 4,878,067, Cl. 346-108.000.
Minolta Camera Kabushiki Kaisha: See—
Hamada, Masataka; Karasaki, Toshihiko; Matsui, Toru; and Makawa, Yukio, 4,878,079, Cl. 354-402.000.
Matsushita, Kouji; Tange, Keigo; and Yuge, Shizuo, 4,878,082, Cl. 355-208.000.
Sakai, Toshiyuki; and Sakata, Toshio, 4,878,087, Cl. 355-207.000.
Taniguchi, Nobuyuki; Karasaki, Toshihiko; Mukai, Hiromu; Tokumaru, Hisashi; and Ishida, Tokuji, 4,878,076, Cl. 354-286.000.
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Mintz, Michael L.: See—
Higer, Gary; and Mintz, Michael L., 4,877,021, Cl. 128-200.760.
Mirwaldt, Ulrich: See—
Clarke, Peter G.; Mirwaldt, Ulrich; and Wandel, Dietmar, 4,877,572, Cl. 264-555.000.
Mishima, Shiro: See—
Ishiki, Naotsugu; Okano, Shigetou; and Mishima, Shiro, 4,876,856, Cl. 60-671.000.
Mishima, Shuzo: See—
Okada, Takao; Kouchi, Toshihito; Mishima, Shuzo; Ogawa, Haruo; Morita, Seizo; and Mikoshiba, Nobuo, 4,877,957, Cl. 250-306.000.
Missalla, Manfred F. Pot hanger. 4,877,210, Cl. 248-318.000.
Misu, Hiroshi: See—
Aoi, Toshiaki; Maemoto, Kazuo; Kamiya, Akihiko; and Misu, Hiroshi, 4,877,711, Cl. 430-176.000.
Mita Industrial Co., Ltd.: See—
Miyamoto, Eiichi; Mutou, Nariaki; and Nakazawa, Tooru, 4,877,702, Cl. 430-72.000.
Mitani, Katsuyoshi: See—
Murabayashi, Katsuyoshi; and Mitani, Katsuyoshi, 4,877,816, Cl. 521-92.000.
Mitome, Hideto, to Agency of Industrial Science & Technology, Ministry of International Trade & Industry. Visualizing method for three dimensional standing wave sound field. 4,878,210, Cl. 367-137.000.
Mitsubishi Chemical Industries Limited: See—
Matsumoto, Susumu; Ohta, Hiroki; Yamada, Masahiro; Higashino, Yoshiaki; and Fukuchi, Toshiaki, 4,877,804, Cl. 514-342.000.

Tamaru, Akio; and Izumisawa, Yoshiaki, 4,877,900, Cl. 562-413.000.
Mitsubishi Denki Kabushiki Kaisha: See—
Fujimoto, Hitoshi; and Masuda, Hisao, 4,877,173, Cl. 228-1.100.
Hattori, Michinobu; Fujisawa, Hidemitsu; and Kusaura, Akio, 4,877,667, Cl. 428-64.000.
Kawai, Hiroyuki; and Nakagawa, Shinichi, 4,877,974, Cl. 307-269.000.
Matsuda, Kenji; Togashi, Kenji; Umemura, Hiroyuki; Okada, Tetsuji; Ishioka, Hidenori; and Aoki, Katsuyuki, 4,877,183, Cl. 236-49.300.
Murakami, Tokumichi; Nishida, Masami; and Ito, Atsushi, 4,878,230, Cl. 375-27.000.
Ochiai, Hajime; and Morihara, Kenji, 4,878,049, Cl. 371-5.500.
Ogawa, Toshiaki; Fujiwara, Nobuo; Kawai, Kenji; Shibano, Teruo; Morita, Hiroshi; and Nishioka, Kyusaku, 4,877,509, Cl. 204-298.000.
Ohsaki, Saburo; Takahashi, Taketo; and Miki, Toshihiro, 4,877,962, Cl. 250-442.100.
Okumura, Yoshinori, 4,877,750, Cl. 437-47.000.
Shimizu, Yuzuru, 4,877,986, Cl. 310-153.000.
Shimomura, Setsuhiro; and Nishiyama, Ryoji, 4,877,002, Cl. 123-339.000.
Shimomura, Setsuhiro; and Nishimura, Yukinobu, 4,877,003, Cl. 123-339.000.
Togane, Hikohiro, 4,877,543, Cl. 252-62.640.
Yamamoto, Isamu; and Fukushima, Jiro, 4,877,756, Cl. 437-209.000.
Yamashita, Tohru; and Takematsu, Takaharu, 4,878,137, Cl. 360-98.050.
Yasukawa, Takeshi; Onishi, Masayoshi; and Fujimoto, Tadayuki, 4,876,948, Cl. 92-99.000.
Yoshizumi, Yasuji; and Matsuoka, Yoshiyuki, 4,877,567, Cl. 264-153.000.
Mitsubishi Gas Chemical Company, Inc.: See—
Masu, Masanobu; Yoshioka, Hiroshi; Kouno, Kenji; Nomura, Isao; and Yamamiya, Kazuo, 4,877,847, Cl. 525-397.000.
Suzuki, Akinori; Kajita, Toshio; and Furushima, Masakazu, 4,877,447, Cl. 71-103.000.
Mitsubishi Jidosha Kogyo Kabushiki Kaisha: See—
Nishizawa, Hiroyuki, 4,877,004, Cl. 123-432.000.
Mitsubishi Paper Mills, Ltd.: See—
Senoo, Hideaki; Yamasaki, Takeshi; Satoh, Yasuo; and Sugaya, Mamoru, 4,877,688, Cl. 428-522.000.
Mitsubishi Rayon Company, Ltd.: See—
Azegami, Kiyotaka; Tayama, Suehiro; Yamamoto, Naoki; Yanagase, Akira; and Hatakeyama, Hiroki, 4,877,687, Cl. 428-520.000.
Hongo, Masafumi; Shigemitsu, Hideyuki; Yamamoto, Naoki; and Yanagase, Akira, 4,877,831, Cl. 525-63.000.
Kishida, Kazuo; Toyooka, Yutaka; and Mikami, Yoshiyuki, 4,877,844, Cl. 525-316.000.
Sasaki, Isao; Kushi, Kenji; and Taguchi, Nobuyoshi, 4,877,922, Cl. 528-272.000.
Mitsubishi Shindoh Co., Ltd.: See—
Futatsuka, Rensei; Chiba, Synu-ichi; and Sakakibara, Tadao, 4,877,577, Cl. 420-473.000.
Mitsui Petrochemical Industries, Ltd.: See—
Kaneshige, Ryosuke; and Mizui, Kinya, 4,877,557, Cl. 252-56.00S.
Tojo, Tetsuo; Nakahara, Takashi; Otawa, Yasuhiko; and Okamoto, Katsuo, 4,877,817, Cl. 521-142.000.
Mitsui Toatsu Chemicals, Incorporated: See—
Miura, Tohru; Nagata, Teruyuki; Okazaki, Koju; Furuya, Masayuki; and Nishida, Emiko, 4,877,907, Cl. 568-721.000.
Mittelhauser, Bernhard. External mirror for a vehicle. 4,877,319, Cl. 350-604.000.
Mitutoyo Corporation: See—
Anderno, Nils I., 4,878,013, Cl. 324-61.00R.
Mitzmacher, Harry. Electric wire connector with built-in stripper and strip gauge. 4,877,924, Cl. 174-87.000.
Miura, Satoshi: See—
Suzuki, Hiroaki; Katsoka, Yoshiyuki; Murase, Michio; Inoue, Kotaro; Sumida, Isao; Yamanari, Shozo; Matsumoto, Masaki; Miura, Satoshi; and Hashimoto, Koji, 4,877,574, Cl. 376-216.000.
Miura, Shigeo; Takahashi, Masamoto; Yoshino, Motoaki; Watanabe, Tsunehiro; Toyama, Takeshi; and Takahashi, Taketo, to Canon Kabushiki Kaisha. Image processing apparatus having image memory. 4,878,123, Cl. 358-401.000.
Miura, Tohru; Nagata, Teruyuki; Okazaki, Koju; Furuya, Masayuki; and Nishida, Emiko, to Mitsui Toatsu Chemicals, Incorporated. Preparation process of 4,4'-biphenol, precursor of same and preparation process of precursor. 4,877,907, Cl. 568-721.000.
Miwa, Harufumi; Kashiwada, Minoru; and Goto, Ikuro, to Ajinomoto Company, Inc. Fluorescent analyzer. 4,877,583, Cl. 422-73.000.
Miwa, Kazunori, to Nissan Motor Co., Ltd. Thin layer EL panel. 4,877,968, Cl. 250-484.100.
Miwa, Teiji: See—
Yamamoto, Yasuhiro; Miwa, Teiji; and Ajima, Tadashi, 4,876,786, Cl. 29-429.000.
Miya, Shigenori: See—
Hagihara, Hisao; Banno, Takayuki; Miya, Shigenori; and Tanaka, Norio, 4,876,778, Cl. 29-157.30A.
Miyabori, Toru: See—
Kinoshita, Mikio; Ohta, Wasaburo; and Miyabori, Toru, 4,876,984, Cl. 118-723.000.
Miyafuji, Hideaki: See—
Kambe, Shigemitsu; and Miyafuji, Hideaki, 4,877,663, Cl. 428-35.500.

Miyakawa, Shinji: See—
Tanahashi, Haruhiko; Tsukamoto, Yoshikazu; and Miyakawa, Shinji, 4,877,262, Cl. 280-668.000.
Miyamoto, Eiichi; Mutou, Nariaki; and Nakazawa, Tooru, to Mita Industrial Co., Ltd. Electrophotographic sensitive material. 4,877,702, Cl. 430-72.000.
Miyasaka, Masao: See—
Watahiki, Shinichi; Itoh, Nobuhiko; Ihata, Nobuo; and Miyasaka, Masao, 4,877,344, Cl. 400-124.000.
Miyata, Hiroshi: See—
Kurashina, Yoshikazu; Miyata, Hiroshi; and Momose, Den-ichi, 4,877,795, Cl. 514-306.000.
Miyazaki, Akira: See—
Tada, Tetsuya; Nagasaka, Masumi; Teratani, Tatsuo; Miyazaki, Akira; and Takahashi, Junji, 4,877,101, Cl. 180-177.000.
Miyazawa, Azuma: See—
Maeno, Hitoshi; Miyazawa, Azuma; and Maruyama, Astushi, 4,878,077, Cl. 354-400.000.
Mizoguchi, Takenobu: See—
Tsuji, Masayoshi; Nakagawa, Akira; Inoue, Hisataka; Hachiya, Terumi; Tanoue, Yoshihiro; Ikuse, Kouichi; Saita, Masaru; Mizoguchi, Takenobu; Aoki, Tetsuo; Sato, Hironobu; and Noda, Kanji, 4,877,876, Cl. 544-133.000.
Mizota Industrial Co., Ltd.: See—
Kobayashi, Ichiji; and Sakata, Motohide, 4,877,537, Cl. 210-747.000.
Mizuhara, Howard; and Huebel, Eugene, to GTE Products Corporation. Clad system for brazing to alumina. 4,877,692, Cl. 428-673.000.
Mizui, Kinya: See—
Kaneshige, Ryosuke; and Mizui, Kinya, 4,877,557, Cl. 252-56.00S.
Mizuno, Hitoshi: See—
Torii, Nobutoshi; Mizuno, Hitoshi; and Iwasaki, Kyoji, 4,877,973, Cl. 307-147.000.
Mizuno, Keiichi; and Iida, Kazuyoshi, to Bridgestone Corporation. Vibration free container for transportation. 4,877,136, Cl. 206-521.000.
Mizuno, Yukio: See—
Aiba, Masahiko; and Mizuno, Yukio, 4,878,225, Cl. 372-38.000.
Mizusaki, Sigenobu; Matsushita, Hajime; Ishiguro, Shigeo; Ichinose, Hiroshi; and Izumi, Akira, to Japan Tobacco, Inc. Process for reducing aldehydes or ketones. 4,877,909, Cl. 568-880.000.
Mizutani, Yoshihisa, to Kabushiki Kaisha Toshiba. Semiconductor memory device. 4,878,199, Cl. 365-185.000.
MKS Instruments, Inc.: See—
Day, Christopher C., 4,877,051, Cl. 137-486.000.
Mobil Oil Company: See—
Valyocak, Ernest W., 4,877,593, Cl. 423-306.000.
Mobil Oil Corporation: See—
Audeh, Costandi A., 4,877,515, Cl. 208-251.00R.
Chen, Nai Y.; and Walsh, Dennis E., 4,877,581, Cl. 585-751.000.
Gross, Jonathan, 4,877,564, Cl. 264-40.600.
Mochizuki, Toshihiro: See—
Toshiaki, Kikuchi; Mochizuki, Toshihiro; Ito, Yasutoshi; and Yamana, Tohru, 4,877,214, Cl. 248-483.000.
Mochizuki, Yasuhiro: See—
Fukuda, Takuya; Mochizuki, Yasuhiro; Momma, Naohiro; Takahashi, Shigeru; Suzuki, Noboru; Sonobe, Tadasi; Chiba, Kiyosi; and Suzuki, Kazuo, 4,876,983, Cl. 118-722.000.
Modine Manufacturing Company: See—
Saperstein, Z. Philip, 4,877,083, Cl. 165-176.000.
Mollenhoff, Horst: See—
Dziobek, Frank; and Mollenhoff, Horst, 4,877,423, Cl. 55-27.000.
Momma, Naohiro: See—
Fukuda, Takuya; Mochizuki, Yasuhiro; Momma, Naohiro; Takahashi, Shigeru; Suzuki, Noboru; Sonobe, Tadasi; Chiba, Kiyosi; and Suzuki, Kazuo, 4,876,983, Cl. 118-722.000.
Momose, Den-ichi: See—
Kurashina, Yoshikazu; Miyata, Hiroshi; and Momose, Den-ichi, 4,877,795, Cl. 514-306.000.
Montague, Charles: See—
Tsaprazia, Edward; Maris, Nicholas P.; and Montague, Charles, 4,878,019, Cl. 324-204.000.
Mookherjee, Braja D.: See—
Zampino, Michael J.; Wilson, Richard A.; Mookherjee, Braja D.; and Niel, Jean C., 4,877,769, Cl. 512-11.000.
Mooney, Charles W.: See—
Urbish, Glenn F.; Mullen, William B., III; and Mooney, Charles W., 4,877,569, Cl. 264-221.000.
Moore, James A.; Dasheff, Andrew N.; and Kaufman, Frank B., to Rennselaer Polytechnic Institute; and International Business Machines Corporation. Positive-working photosensitive polyimide operated by photo induced molecular weight changes. 4,877,718, Cl. 430-326.000.
Moore, T. Charles: See—
Rorden, Louis H.; and Moore, T. Charles, 4,878,053, Cl. 340-853.000.
Moreau, Philippe; and Fiorina, Jean-Noel, to Merlin Gerin. Measuring circuit of the DC component of the current flowing through the primary winding of the output transformer of an inverter. 4,878,026, Cl. 324-547.000.
Morgan, Alan R.; Selman, Steven H.; Garbo, Greta M.; and Keck, Rick W., to University of Toledo, The. Production and use of dimers of hematoporphyrin, purpurins, chlorines and purpurin- and chlorin-complexes. 4,877,872, Cl. 540-145.000.

Mori, Hiroyuki: See—
Koyano, Tetsuo; Sagi, Nobuo; Izumi, Taugio; Fujita, Setsuya; Murata, Tadahiko; Hachiya, Iwao; and Mori, Hiroyuki, 4,877,636, Cl. 426-607.000.
Mori, Junko: See—
Mifune, Toshihiko; Morooka, Yasuo; Shojima, Hiroshi; Mori, Junko; and Fukunaga, Yasushi, 4,878,249, Cl. 382-13.000.
Mori, Takashi: See—
Fukuda, Kenichi; Mori, Takashi; Kurachi, Yasuhiro; Doi, Masaharu; and Suematsu, Tetsuya, 4,877,498, Cl. 204-86.000.
Mori, Tatsuya; Ohsumi, Tadashi; Nakamura, Shigeo; Maeda, Kiyoto; Nishida, Sumio; and Takano, Hiroto, to Sumitomo Chemical Company Ltd. Fungicidal substituted carboxylic acid derivatives. 4,877,441, Cl. 71-90.000.
Mori, Toru, to Oki Electric Industry Co., Ltd. Transaction processing system. 4,877,947, Cl. 235-381.000.
Mori, Yoji: See—
Kuno, Toshio; Shindo, Yoshikazu; Kuno, Yukio; Ueno, Takeshi; Torimi, Akira; and Mori, Yoji, 4,876,952, Cl. 98-121.200.
Moriyama, Kenji: See—
Ochiai, Hajime; and Morihara, Kenji, 4,878,049, Cl. 371-5.500.
Morimoto, Makoto: See—
Murakata, Chikara; Sato, Akira; Kasai, Masaji; Kobayashi, Eiji; Morimoto, Makoto; and Akinaga, Shiro, 4,877,776, Cl. 514-43.000.
Morimoto, Taiji; Hosoba, Hiroyuki; Matsumoto, Mitsuhiro; Taneya, Mototaka; and Matsui, Sadayoshi, to Sharp Kabushiki Kaisha. Semiconductor laser array device. 4,878,223, Cl. 372-50.000.
Morimoto, Takeshi; and Endoh, Eiji, to Asahi Glass Company, Ltd. Highly durable cathode of low hydrogen overvoltage and method for manufacturing the same. 4,877,508, Cl. 204-290.00R.
Morin, Normand. Conveyor belt scrapers. 4,877,122, Cl. 198-499.000.
Morinaga, Akio: See—
Higuchi, Kumao; Morinaga, Akio; Seshimo, Masahiro; and Saito, Hitoshi, 4,877,665, Cl. 428-36.100.
Morioka, Takayuki; Motoyama, Nobuyuki; Hoshikawa, Hiroshi; Takahashi, Takeo; Suzuki, Sizu; Ishikawa, Teyoshi; Toyoshi, Takanori; and Uede, Toshio, to Fuji Electric Co., Ltd. Method of treating radioactive ion-exchange resins by oxidative decomposition. 4,877,558, Cl. 252-626.000.
Morita, Hiroshi: See—
Ogawa, Toshiaki; Fujiwara, Nobuo; Kawai, Kenji; Shibano, Teruo; Morita, Hiroshi; and Nishioka, Kyusaku, 4,877,509, Cl. 204-298.000.
Morita, Kouichi: See—
Enomoto, Masayuki; Nagano, Eiki; Haga, Toru; Morita, Kouichi; and Sato, Ryo, 4,877,444, Cl. 71-92.000.
Morita, Seizo: See—
Okada, Takao; Kouchi, Toshihito; Mishima, Shuzo; Ogawa, Haruo; Morita, Seizo; and Mikoshiba, Nobuo, 4,877,957, Cl. 250-306.000.
Morita, Shizuo; Hayakawa, Kazuaki; Ito, Kunio; Matsuo, Shunji; Fukuchi, Masakazu; and Hatakeyama, Noboru, to Konica Corporation. Multicolor image forming apparatus. 4,878,091, Cl. 355-260.000.
Moriya, Kazumasa: See—
Okawa, Kazuyoshi; Moriya, Kazumasa; Kashiwazaki, Tomoyuki; Kawashima, Hiroshi; and Murakawa, Yoshitaka, 4,876,966, Cl. 104-290.000.
Moriya, Yasuo; Suzuki, Nobuyoshi; and Goto, Hiroshi, to Nippon Oil and Fats Co., Ltd. Graft polymerization preformer and method of manufacturing the same. 4,877,841, Cl. 525-286.000.
Morooka, Yasuo: See—
Mifune, Toshihiko; Morooka, Yasuo; Shojima, Hiroshi; Mori, Junko; and Fukunaga, Yasushi, 4,878,249, Cl. 382-13.000.
Morris, Gregory J. E.: See—
Beaver, Richard N.; and Morris, Gregory J. E., 4,877,499, Cl. 204-98.000.
Morrison, Donald R. Braking system for a motorized dumping vehicle. 4,877,104, Cl. 180-308.000.
Morrison, Ian D.: See—
Watson, P. Keith; Morrison, Ian D.; and Croucher, Melvin D., 4,877,698, Cl. 430-45.000.
Mortreux, Andre: See—
Petit, Michele; Mortreux, Andre; Petit, Francis; and Buono, Gerard, 4,877,908, Cl. 568-814.000.
Moses, John M., to CF Systems Corporation. Liquid CO₂/cosolvent extraction. 4,877,530, Cl. 210-511.000.
Moskowitz, Mark L.: See—
Gershenson, Moshe; and Moskowitz, Mark L., 4,877,198, Cl. 242-74.000.
Motiwala, Mohammad I., to Boeing Company, The. Fastener head elevation measuring apparatus. 4,877,138, Cl. 209-601.000.
Motoren-und Turbinen-Union Munchen GmbH: See—
Sikorski, Siegfried; and Huthner, Werner, 4,877,376, Cl. 416-207.000.
Motorola Inc.: See—
Knapp, James H.; Carney, George F.; and Carney, Francis J., 4,877,482, Cl. 156-643.000.
Main, W. Eric, 4,878,031, Cl. 330-254.000.
Urbish, Glenn F.; Mullen, William B., III; and Mooney, Charles W., 4,877,569, Cl. 264-221.000.
Motoyama, Nobuyuki: See—
Morioka, Takayuki; Motoyama, Nobuyuki; Hoshikawa, Hiroshi; Takahashi, Takeo; Suzuki, Sizu; Ishikawa, Teyoshi; Toyoshi, Takanori; and Uede, Toshio, 4,877,558, Cl. 252-626.000.
Mouri, Hidemasa: See—
Sakaki, Mamoru; Arai, Ryuichi; Akiya, Takashi; Toganoh, Shigeo; Higuma, Masahiko; Eto, Naonobu; Mouri, Hidemasa; Tobita,

- Michiaki; Ishida, Masahiko; and Kono, Shunzo, 4,877,680, Cl. 428-332.000.
- Mrkla, Louis. Grate bar element for a sliding grate furnace for garbage incineration. 4,876,972, Cl. 110-298.000.
- MSK-Verpackungs-Systeme Gesellschaft: See—
Hannea, Reiner; and Vermeulen, Norbert, 4,877,012, Cl. 126-79.00K.
- Mt. Fury Company: See—
Pope, Daniel F., 4,876,881, Cl. 73-53.000.
- MTU Motoren- und Turbinen-Union Munchen GmbH: See—
Klingels, Hermann, 4,876,849, Cl. 60-39.161.
- Muchnik, Boris J.; and Fischer, Bernd F., to Kerdix, Inc. Magneto-optic substrates. 4,877,666, Cl. 428-64.000.
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- Mugikura, Norio, to Honda Giken Kogyo Kabushiki Kaisha. Rear speaker unit for a motor vehicle. 4,877,105, Cl. 181-141.000.
- Mukai, Hiromu: See—
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- Mullen, Robert S. Door opening apparatus and method of using same. 4,876,927, Cl. 81-15.900.
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- Mullens, Paul A.: See—
Baker, Joseph R.; Golland, Wesley A.; Mullens, Paul A.; and Trimble, Roger B., 4,877,179, Cl. 232-7.000.
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- Munch, Norbert: See—
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Whitmore, Roger W.; Munns, Andrew G.; and Lane, David W., 4,876,776, Cl. 29-25.350.
- Munson, Arthur E.: See—
Walton, Jim M.; and Munson, Arthur E., 4,876,979, Cl. 114-258.000.
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- Murakami Kaimeido Co., Ltd.: See—
Toshiaki, Kikuchi; Mochizuki, Toshihiro; Ito, Yasutoshi; and Yamana, Tohru, 4,877,214, Cl. 248-483.000.
- Murakami, Kazuo: See—
Kiuchi, Hiroshi; Murata, Katsumi; Murakami, Kazuo; Kusakabe, Isao; and Kobayashi, Hideyuki, 4,877,622, Cl. 426-46.000.
- Murakami, Tokumichi; Nishida, Masami; and Ito, Atsushi, to Mitsubishi Denki Kabushiki Kaisha. Amplitude-adaptive vector quantization system. 4,878,230, Cl. 375-27.000.
- Murakata, Chikara; Sato, Akira; Kassi, Masaji; Kobayashi, Eiji; Morimoto, Makoto; and Akinaga, Shiro, to Kyowa Hakko Kogyo Co., Ltd. K-252 compounds. 4,877,776, Cl. 514-43.000.
- Murakawa, Yoshitaka: See—
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- Murase, Michio: See—
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- Murata Kikai Kabushiki Kaisha: See—
Kawamura, Shuzo, 4,877,967, Cl. 250-461.100.
- Matsui, Isamu; Ohashi, Kenji; and Deno, Koji, 4,877,194, Cl. 242-01.00K.
- Murata Manufacturing Co., Ltd.: See—
Honma, Kanehito; Yokoi, Tsutomu; and Tani, Hiroji, 4,877,554, Cl. 252-511.000.
- Tani, Hiroji; Kasanami, Tohru; and Yokoi, Tsutomu, 4,877,565, Cl. 264-105.000.
- Murata, Tadahiko: See—
Koyano, Tetsuo; Sagi, Nobuo; Izumi, Tsugio; Fujita, Setsuya; Murata, Tadahiko; Hachiya, Iwao; and Mori, Hiroyuki, 4,877,636, Cl. 426-607.000.
- Murata, Yasukiyo: See—
Tanaka, Hiroshi; Murata, Yasukiyo; and Eto, Kazumi, 4,876,861, Cl. 62-279.000.
- Murayama, Osamu: See—
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- Muro, Hideo, to Nissan Motor Company, Limited. Photosensitive position sensor. 4,877,951, Cl. 250-211.00J.
- Murphy, Susan A.: See—
Bassett, Robert W.; Griffin, William R.; Murphy, Susan A.; Petrovick, John G., Jr.; Varner, James R.; and Whittaker, Dennis R., 4,878,209, Cl. 368-113.000.
- Mushiro, Takeshi: See—
Kimura, Kiyoshi; Ogasawara, Takashi; and Mushiro, Takeshi, 4,877,784, Cl. 514-227.800.
- Muszak, Martin F., to Eastman Kodak Company. Stopper remover apparatus. 4,876,926, Cl. 81-3.200.
- Muto, Takashi, to Daido Metal Company. Composite sliding structure. 4,877,696, Cl. 428-645.000.
- Mutou, Nariaki: See—
Miyamoto, Eiichi; Mutou, Nariaki; and Nakazawa, Tooru, 4,877,702, Cl. 430-72.000.
- Myers, David J.: See—
House, Wayne D.; and Myers, David J., 4,877,661, Cl. 428-34.900.
- Myers, Herman A., to Radia-Cam Inc. Variable mechanical advantage device utilizing a radial cam. 4,876,794, Cl. 30-252.000.
- Nabisco Brands, Inc.: See—
Klemann, Lawrence P.; Finley, John W.; and Scimone, Anthony, 4,877,871, Cl. 536-124.000.
- Nabulon, Werner, to Rieter Machine Works Ltd. Method for continuously crimping thermoplastic filaments. 4,877,570, Cl. 264-282.000.
- Naegeli, Peter, to Givaudan Corporation. Bicyclic ketones as odorants and flavorants. 4,877,904, Cl. 568-374.000.
- Nagano, Eiki: See—
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- Nagano, Shuji; and Inui, Masaki, to Toyota Jidosha Kabushiki Kaisha. Power transfer device for four-wheel drive. 4,876,919, Cl. 74-650.000.
- Nagaoka, Hisayuki; Zenbayashi, Michio; and Shimizu, Chiyoiki, to Toshiba Silicone Co., Ltd. Siloxane-amide block copolymer and process for producing the same. 4,877,855, Cl. 528-26.000.
- Nagasaka, Masumi: See—
Tada, Tetsuya; Nagasaka, Masumi; Teratani, Tatsuo; Miyazaki, Akira; and Takahashi, Junji, 4,877,101, Cl. 180-177.000.
- Nagasawa, Kenichi: See—
Masui, Toshiyuki; Kashida, Motokazu; Takahashi, Koji; and Nagasawa, Kenichi, 4,878,134, Cl. 360-77.150.
- Nagasawa, Makoto: See—
Makino, Toshihiko; and Nagasawa, Makoto, 4,878,135, Cl. 360-78.040.
- Nagata, Teruyuki: See—
Miura, Tohru; Nagata, Teruyuki; Okazaki, Koju; Furuya, Masayuki; and Nishida, Emiko, 4,877,907, Cl. 568-721.000.
- Nagy, Gabor; Neumann, Gyorgy; Kovacs, Marta; and Strompl, Andras, to BRG Mechatronikai Vallalat. Tape-conveying system for forward and backward playing magnetic tape recorder and/or playback unit. 4,877,199, Cl. 242-201.000.
- Naka, Ryoichi: See—
Kanamaru, Tatsuya; Nakayama, Motohiro; Arai, Katutoshi; Suzuki, Shinichi; and Naka, Ryoichi, 4,877,494, Cl. 204-28.000.
- Nakadate, Takanori: See—
Kiyohara, Kazuto; Hagiwara, Toshiyuki; Nakadate, Takanori; Harada, Ichio; Noguchi, Kenaro; Sakae, Shigeru; and Okuma, Kazuhiro, 4,877,819, Cl. 523-200.000.
- Nakagawa, Akira: See—
Tsuiji, Masayoshi; Nakagawa, Akira; Inoue, Hisataka; Hachiya, Terumi; Tanoue, Yoshihiro; Ikesue, Kouichi; Saita, Masaru; Mizoguchi, Takenobu; Aoki, Tetsuo; Sato, Hironobu; and Noda, Kanji, 4,877,876, Cl. 544-133.000.
- Nakagawa, Koji; Takagi, Takeo; Abe, Yoshiaki; and Sakai, Haruki, to Hitachi, Ltd. Diffuser for centrifugal compressor. 4,877,370, Cl. 415-148.000.
- Nakagawa, Shinichi: See—
Kawai, Hiroyuki; and Nakagawa, Shinichi, 4,877,974, Cl. 307-269.000.
- Nakahara, Takashi: See—
Tojo, Tetsuo; Nakahara, Takashi; Otawa, Yasuhiko; and Okamoto, Katsuo, 4,877,817, Cl. 521-142.000.
- Nakaizumi, Kazuo, to NEC Corporation. Semiconductor memory device having an improved timing signal generator for the column selection circuit. 4,878,201, Cl. 365-203.000.
- Nakajima, Hideaki: See—
Takehana, Takamichi; Murayama, Osamu; Nakajima, Hideaki; Yamada, Masatoshi; and Hamada, Makoto, 4,878,080, Cl. 354-403.000.
- Nakajima, Kihci: See—
Seki, Nagataka; Ogawa, Kiyoshi; and Nakajima, Kihci, 4,878,208, Cl. 307-87.000.

- Nakajima, Nobuyoshi: See—
Agano, Toshitaka; and Nakajima, Nobuyoshi, 4,877,958, Cl. 250-327.200.
- Nakajima, Shohachi: See—
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- Nakajima, Toyohi; and Mieno, Toshiyuki, to Honda Giken Kogyo Kabushiki Kaisha. Oxygen concentration-sensing device. 4,877,511, Cl. 204-406.000.
- Nakamura, Kazunari, to Olympus Optical Co., Ltd. Endoscope apparatus. 4,878,113, Cl. 358-98.000.
- Nakamura, Norimasa; and Kishimoto, Satoshi, to Pioneer Ansafone Manufacturing Corporation. Data outputting device. 4,878,217, Cl. 370-77.000.
- Nakamura, Shigeo: See—
Mori, Tatsuya; Ohsumi, Tadashi; Nakamura, Shigeo; Maeda, Kiyoto; Nishida, Sumio; and Takano, Hirota, 4,877,441, Cl. 71-90.000.
- Nakamura, Tsutomu: See—
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- Yasuda, Shigeru; Yasukawa, Kenichiro; Nakamura, Tsutomu; and Asami, Kenjiro, 4,878,129, Cl. 358-342.000.
- Nakamura, Yoshiharu: See—
Isohata, Junji; Totsuka, Masao; and Nakamura, Yoshiharu, 4,878,086, Cl. 355-77.000.
- Nakanishi, Aki; Hino, Toshio; Iino, Yoshio; Suetani, Kazuhisa; Houki, Yoji; and Ikuta, Hirotsu, to Fujitsu Limited. Developing unit of electrophotographic apparatus. 4,878,088, Cl. 355-244.000.
- Nakanishi, Tomoyuki, to Omron Tateisi Electronics Co. Paper discharge apparatus. 4,877,232, Cl. 271-10.000.
- Nakano, Shinji: See—
Kobayashi, Kenji; Kaneko, Ichiro; Kobayashi, Masahiro; and Nakano, Shinji, 4,877,535, Cl. 210-701.000.
- Nakaoki, Ariyoshi: See—
Aratani, Katsuhisa; Nakaoki, Ariyoshi; and Tanaka, Tomiji, 4,878,132, Cl. 360-59.000.
- Nakata, Yutaka, to Ichihok Industries, Ltd. Projector-type head lamp assembly for vehicles. 4,878,161, Cl. 362-305.000.
- Nakatani, Seiichi: See—
Yuhaku, Satoru; Nakatani, Seiichi; and Nishimura, Tutomu, 4,877,555, Cl. 252-512.000.
- Nakatsugawa, Kenji; Katayama, Aiichi; and Sekiya, Hitoshi, to Anritsu Corporation. Digital signal processing apparatus. 4,878,194, Cl. 364-900.000.
- Nakayama, Motohiro: See—
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- Nakayama, Takahiro: See—
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- Nakazawa, Tooru: See—
Miyamoto, Eiichi; Mutou, Nariaki; and Nakazawa, Tooru, 4,877,702, Cl. 430-72.000.
- Nalco Chemical Company: See—
Huddleston, David A., 4,877,894, Cl. 558-113.000.
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- Namikoshi, Hajime; and Goto, Tatsuo, to Daicel Chemical Industries Ltd. Fungicidal and bactericidal method. 4,877,617, Cl. 424-409.000.
- Nanko, Norbert: See—
Beck, Andreas; and Nanko, Norbert, 4,877,030, Cl. 128-343.000.
- Nathasingh, Davidson: See—
Silgailis, John; Nathasingh, Davidson; and Bruckner, Christopher A., 4,877,464, Cl. 148-108.000.
- National Oilwell: See—
Ford, David B.; Lynch, James E.; and Rateike, Leroy R., 4,877,093, Cl. 175-113.000.
- National Research Development Corporation: See—
Costall, Brenda, 4,877,800, Cl. 514-328.000.
- Schram, Cornelius J., 4,877,516, Cl. 209-155.000.
- National Semiconductor Corporation: See—
Gallichio, Michael J., 4,878,151, Cl. 361-329.000.
- Needles, William M., 4,878,058, Cl. 341-101.000.
- Teng, Chih-Sieh; Liou, Tian-I; and Chun-Min, Hiekyung, 4,877,751, Cl. 437-47.000.
- Nautical Services Pty. Ltd.: See—
Lloyd, Ian, 4,877,489, Cl. 202-181.000.
- Naveau, Jean M. G.: See—
Lanza, Emmanuel; and Naveau, Jean M. G., 4,877,863, Cl. 528-486.000.
- Navistar International Transportation Corp.: See—
Kuhn, Lawrence H.; and Durant, Michael B., 4,877,294, Cl. 303-9.000.
- Nay, Daniel L.; Korn, Darryl K.; and Ralph, John T., to Control Data Corporation. Data communication apparatus. 4,878,197, Cl. 364-900.000.
- Naylor, Brenda: See—
Naylor, Robert J.; and Naylor, Brenda, 4,877,794, Cl. 514-305.000.
- Naylor, Robert J.; and Naylor, Brenda, to A. H. Robins Company, Incorporated. 2-Alkoxy-n(1-azabicyclo(2.2.2)oct-3-yl) benzamide and thio benzamide compositions and the use thereof to treat schizophrenia. 4,877,794, Cl. 514-305.000.
- Naylor, Timothy d.: See—
Meldrum, Ian G.; and Naylor, Timothy d., 4,877,533, Cl. 210-640.000.
- Neon, Jean-Pierre, to Merlin Gerin. Solid-state trip device of a molded case circuit breaker. 4,878,144, Cl. 361-96.000.
- NEC Corporation: See—
Fukushima, Itaru; Okamoto, Takashi; and Deguchi, Hisashi, 4,878,065, Cl. 346-76.0PH.
- Hashimoto, Kiyokazu, 4,878,220, Cl. 371-40.100.
- Hirakawa, Noboru; and Inoue, Yasukazu, 4,878,105, Cl. 357-59.000.
- Kawada, Kazuhide, 4,878,189, Cl. 364-736.500.
- Makino, Toshihiko; and Nagasawa, Makoto, 4,878,135, Cl. 360-78.040.
- Nakaizumi, Kazuo, 4,878,201, Cl. 365-203.000.
- Oguchi, Tetsuji, 4,878,191, Cl. 364-759.000.
- Shimada, Michio, 4,878,221, Cl. 371-43.000.
- Takahashi, Kunihiko, 4,878,228, Cl. 375-3.000.
- Needles, William M., to National Semiconductor Corporation. Multi-protocol data conversion. 4,878,058, Cl. 341-101.000.
- Negishi, Kozaburo, to Sanden Corporation. Refrigerator with variable volume independently cooled storage chambers. 4,876,860, Cl. 62-179.000.
- Neighbors, Ralph P.; and Riden, Joseph R., to Chevron Research Company. Use of tricyclodecane-3,4,7,8-tetracarboxylic acid derivatives as anti-murine tumor agents. 4,877,806, Cl. 514-410.000.
- Nelson, John R.; and Lehman, Thomas F., to Invivo Research, Inc. Instrument housing with improved paper feed. 4,877,197, Cl. 242-68.700.
- NeoRx Corporation: See—
Reno, John M.; and Bottino, Becky J., 4,877,868, Cl. 530-390.000.
- Nesheiwat, Afif: See—
Geibel, Jon F.; and Nesheiwat, Afif, 4,877,850, Cl. 525-471.000.
- Nessel, Eliezer, to Iscar Ltd. Cutting tool holder. 4,876,932, Cl. 82-158.000.
- Neste Oy: See—
Bergstrom, Christer; and Palmgren, Tor H., 4,877,685, Cl. 428-500.000.
- Nestec S.A.: See—
Ritter, Joseph, 4,877,188, Cl. 239-135.000.
- Neu Jozsef; Csontos, Imre; Varga, Andras; Suranyi, Robert; Illovi, Zoltan; Gaal, Sandor; Karsai, Jozsef; Sebestyen, Endre; Gardi, Eva; Siki, Karoly; Toth, Istvan; Gal, Guszt/eacu/a/ v; Dombay, Zsolt; Grega nec Toth, Mrs. Erzebet; Pavlicsak, Csaba; Tarpai, Gyula; Bonnyay, Peter; and Santha, Pal, to Eszakmagyarorszag Vegyimuvek. Process for the preparation of 2-(O-alkyl)-2-thio-1,3,2-oxathio-phospholanes. 4,877,893, Cl. 558-86.000.
- Neuman, Arnold I.; Heidt, Thomas D.; Bergman, Andrew; and Wickstead, James, to Neuman, Arnold I. Light counting system for convex articles. 4,877,954, Cl. 250-222.200.
- Neumann, Gyorgy: See—
Nagy, Gabor; Neumann, Gyorgy; Kovacs, Marta; and Strompl, Andras, 4,877,199, Cl. 242-201.000.
- Neumann, Udo: See—
Flaig, Heinz; Neumann, Udo; Hasselmann, Heinz; Zacharias, Karl; Horbach, Rainer; and Birtsch, Harald, 4,877,987, Cl. 310-209.000.
- Neurath, Alexander R.; and Strick, Nathan, to New York Blood Center, Inc. Immunoassays for antibodies which bind to the acquired immunodeficiency virus. 4,877,725, Cl. 435-5.000.
- Neville, Donald G.; Giordano, David A.; and Hogan, Mark R., to Carrier Corporation. Sound-attenuating discharge apparatus for a packaged terminal air conditioner. 4,877,106, Cl. 181-224.000.
- New, David A.: See—
Maninger, Loren L.; New, David A.; and Lundvall, Carl L., II, 4,877,998, Cl. 315-15.000.
- New England Deaconess Hospital Corporation: See—
Lees, Robert S., 4,877,599, Cl. 424-1.100.
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Neurath, Alexander R.; and Strick, Nathan, 4,877,725, Cl. 435-5.000.
- New York Institute of Technology: See—
Glenn, William E., 4,878,122, Cl. 358-233.000.
- Newhouse, Mark A.; Nolan, Daniel A.; and Weidman, David L., to Corning Incorporated. Non-adiabatically-tapered connector. 4,877,300, Cl. 350-96.150.
- Newstetter, Robert, to Chocolate Pix, Inc. Candy planter. 4,876,824, Cl. 47-66.000.
- Ng, Thomas K.: See—
Ling, Lorraine B.; and Ng, Thomas K., 4,877,731, Cl. 435-142.000.
- Ng, Tie H.: See—
Mahabadi, Hadi K.; Ng, Tie H.; Listigovers, Nancy A.; and Martin, Trevor I., 4,877,706, Cl. 430-106.600.
- NGK Insulators, Ltd.: See—
Hamanaka, Toshiyuki, 4,877,670, Cl. 428-116.000.
- Minamikawa, Masayasu; Onabe, Yoshiaki; and Ono, Masanao, 4,877,970, Cl. 250-560.000.
- NGK Spark Plug Co., Ltd.: See—
Okuno, Akiyasu; Watanabe, Masakazu; and Ikoma, Kazuhiko, 4,877,760, Cl. 501-98.000.
- Ngo, Dinh T.: See—
Darley, Henry M.; Gill, Michael C.; Earl, Dale C.; Ngo, Dinh T.; Wang, Paul C.; Hipona, Maria B. L.; and Dordill, Jim, 4,878,190, Cl. 364-752.000.
- Nguyen, Bich N.: See—
Carp, Stuart L.; Swain, Howard L.; and Nguyen, Bich N., 4,878,027, Cl. 328-15.000.

- Nicholson, Jeffrey S.: See—
Dimeleko, Allen D., Jr.; Gargiulo, Robert F.; Haywood, James E.; Heise, Keith H.; Holcomb, Darrell H.; Kramer, Stuart C.; Miller, Gregory R.; Nicholson, Jeffrey S.; Olinger, Jeffrey J.; and Spenny, Curtis H., 4,877,202, Cl. 244-122.00A.
- Nick Vaccaro International: See—
Vaccaro, Nicola, 4,876,756, Cl. 5-455.000.
- Nickles, Daniel R.: See—
DeBraul, Stanley J.; and Nickles, Daniel R., 4,877,265, Cl. 280-756.000.
- Niechoj, Wolfgang: See—
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- Niel, Jean C.: See—
Zampino, Michael J.; Wilson, Richard A.; Mookherjee, Braja D.; and Niel, Jean C., 4,877,769, Cl. 512-11.000.
- Nies, Donald E.: See—
Bellotti, Thomas R.; Connor, David T.; Flynn, Daniel L.; Kostlan, Catherine R.; and Nies, Donald E., 4,877,881, Cl. 548-240.000.
- Nihashi, Hiroyuki: See—
Hanada, Koji; Sawamura, Masashi; Yoshikawa, Takeshi; Nihashi, Hiroyuki; and Tanaka, Tsuneo, 4,877,681, Cl. 428-336.000.
- Nihon Musen Kabushiki Kaisha: See—
Yatsuda, Hiromi; Takeuchi, Yoshihiko; Kohda, Toichi; and Yoshikawa, Shokichi, 4,878,036, Cl. 333-195.000.
- Nihon Radiator Co., Ltd.: See—
Hagikura, Hirofumi; and Kawamoto, Haruki, 4,878,001, Cl. 318-446.000.
- Nike, Inc.: See—
Robinson, John R.; and Richard, Daniel J., 4,876,806, Cl. 36-114.000.
- Nikko Co., Ltd.: See—
Aoki, Dai, 4,877,240, Cl. 273-1.0GA.
- Nilarp, Anders, to International Rectifier Corporation. Metallizing system for semiconductor wafers. 4,878,099, Cl. 357-71.000.
- Nilsson, Boo, to Litton Systems, Inc. Substrate holder for wafers during MBE growth. 4,877,573, Cl. 156-610.000.
- Nilsson, Hans-Arne, to Saab Instruments Aktiebolag. Anti-aircraft sight. 4,876,942, Cl. 89-41.220.
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Kobayashi, Mitsuo, 4,877,212, Cl. 248-444.100.
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- Nippon Mining Co., Ltd.: See—
Lach, Lawrence E.; and Ohoka, Mikiharu, 4,877,976, Cl. 307-450.000.
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- Nippon Petrochemicals Company, Limited: See—
Kambe, Shigemitsu; and Miyafuji, Hideaki, 4,877,663, Cl. 428-35.500.
- Nippon Seiro Company, Limited: See—
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- Nippon Shinyaku Co., Ltd.: See—
Kimura, Kiyoshi; Ogasawara, Takashi; and Mushiroy, Takeshi, 4,877,784, Cl. 514-227.800.
- Nippon Steel Corporation: See—
Kakchi, Nobuo; Takahashi, Yuzuru; Higuchi, Norio; Izumihara, Yoshikazu; Matsumoto, Hiromi; and Uehori, Yuji, 4,876,874, Cl. 72-199.000.
- Kanamara, Tatsuya; Nakayama, Motohiro; Arai, Katutoshi; Suzuki, Shinichi; and Naka, Ryoichi, 4,877,494, Cl. 204-28.000.
- Maeda, Shigeyoshi; Asai, Tsunetoshi; Asano, Hidejiro; and Taguchi, Haruyoshi, 4,877,664, Cl. 428-35.900.
- Nishibe, Minoru: See—
Seki, Chikara; and Nishibe, Minoru, 4,876,869, Cl. 72-68.000.
- Nishida, Emiko: See—
Mura, Tohru; Nagata, Teruyuki; Okazaki, Koji; Furuya, Masayuki; and Nishida, Emiko, 4,877,907, Cl. 568-721.000.
- Nishida, Konosuke; Hada, Mitsue; and Hiki, Shozo, to Nishida, Konosuke; Hada, Mitsue; and Hanshim Kikagaku Kabushiki Kaisha. Adsorbent for removing water- or air-borne contaminants. 4,877,534, Cl. 210-691.000.
- Nishida, Masami: See—
Murakami, Tokumichi; Nishida, Masami; and Ito, Atsushi, 4,878,230, Cl. 375-27.000.
- Nishida, Sumio: See—
Mori, Tatsuya; Ohsumi, Tadashi; Nakamura, Shigeo; Maeda, Kiyoto; Nishida, Sumio; and Takano, Hirotaka, 4,877,441, Cl. 71-90.000.
- Nishikawa, Masumi; and Ishikawa, Masanobu, to Aisin Seiki Kabushiki Kaisha. Tilting steering apparatus. 4,876,910, Cl. 74-493.000.
- Nishikawa Rubber Co., Ltd.: See—
Marume, Yoshihiro; and Iwamoto, Tadao, 4,877,215, Cl. 249-109.000.
- Nishimura, Takashi: See—
Tanigawa, Motohiko; Dohi, Hidehiko; Nishimura, Takashi; Ichikawa, Kouji; and Koishi, Tetsuo, 4,877,071, Cl. 152-165.000.
- Nishimura, Tutomu: See—
Yuhaku, Satoru; Nakatani, Seiichi; and Nishimura, Tutomu, 4,877,555, Cl. 252-512.000.
- Nishimura, Yukinobu: See—
Shimomura, Setsuhiro; and Nishimura, Yukinobu, 4,877,003, Cl. 123-339.000.
- Nishioka, Kyusaku: See—
Ogawa, Tohiaki; Fujiwara, Nobuo; Kawai, Kenji; Shibano, Teruo; Morita, Hiroshi; and Nishioka, Kyusaku, 4,877,509, Cl. 204-298.000.
- Nishiyama, Koushi: See—
Urushizaki, Suet; Ohta, Yasuo; Sato, Mamoru; Sakai, Fukumi; and Nishiyama, Koushi, 4,877,730, Cl. 435-132.000.
- Nishiyama, Ryoji: See—
Shimomura, Setsuhiro; and Nishiyama, Ryoji, 4,877,002, Cl. 123-339.000.
- Nishiyama, Tamotsu; and Kuninobu, Shigeo, to Matsushita Electric Industrial Co. Ltd. Arithmetic processor and divider using redundant signed digit arithmetic. 4,878,192, Cl. 364-768.000.
- Nishizawa, Hiroyuki, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Internal combustion engine for a vehicle. 4,877,004, Cl. 123-432.000.
- Nissan Chemical Industries: See—
Taniguchi, Masakazu; Hirose, Masayoshi; Baba, Masatoshi; Hirata, Kiminori; and Ochiai, Yoshinori, 4,877,787, Cl. 514-247.000.
- Nissan Motor Co., Ltd.: See—
Hayasaki, Koichi, 4,876,925, Cl. 74-868.000.
- Konishi, Junkichi; and Shirashi, Yasuhiro, 4,877,263, Cl. 72-707.000.
- Kurihara, Kenji, 4,876,911, Cl. 74-502.100.
- Miwa, Kazunori, 4,877,968, Cl. 250-484.100.
- Muro, Hideo, 4,877,951, Cl. 250-211.000.
- Nissin Flour Milling Co., Ltd.: See—
Satoh, Hiroaki; Koyama, Hiroyasu; Suzuki, Yoshikuni; Sugai, Toshiji; and Watanabe, Koichi, 4,877,797, Cl. 514-314.000.
- Nitschke, David B., to Glasstech International L.P. Vacuum platen for sharp bends. 4,877,437, Cl. 65-287.000.
- Nix, Richard A.: See—
Leigh-Monstevens, Keith V.; and Nix, Richard A., 4,878,041, Cl. 340-479.000.
- Nixdorf Computer AG: See—
Esser, Wolfgang; and Jung, Peter, 4,878,009, Cl. 323-275.000.
- NKK Corporation: See—
Watanabe, Tautomu; and Furuta, Akihiko, 4,877,497, Cl. 204-55.100.
- Nobel Kemi AB: See—
Olsson, Mats, 4,876,962, Cl. 102-288.000.
- Nobile, John R.; Ross, William A.; and Toth, William D., to Pitney Bowes Inc. Drive system for rotary printing apparatus including improved means for locking and unlocking the apparatus. 4,876,959, Cl. 101-233.000.
- Noda, Iwao: See—
Hirabayashi, Masaya; and Noda, Iwao, 4,877,402, Cl. 433-218.000.
- Nodo, Kanji: See—
Tsuiji, Masayoshi; Nakagawa, Akira; Inoue, Hisataka; Hachiya, Terumi; Tanoue, Yoshihiro; Ikesue, Kouichi; Saita, Masaru; Mizoguchi, Takenobu; Aoki, Testuo; Sato, Hironobu; and Noda, Kanji, 4,877,876, Cl. 544-133.000.
- Nofre, Claude; Tinti, Jean M.; and Chatzopoulos, Faroudja O., to Universite Claude Bernard - Lyon 1. Glycine and β alanine derivatives as sweetening agents. 4,877,895, Cl. 558-413.000.
- Nogami, Ikuo; Yamaguchi, Takamasa; Oka, Masahide; and Shirafuji, Hideo, to Takeda Chemical Industries, Ltd. Process for producing 2-keto-L-gulonic acid. 4,877,735, Cl. 435-138.000.
- Noguchi, Kentaro: See—
Kiyohara, Kazuo; Hagiwara, Toshiyuki; Nakadate, Takanori; Harada, Ichia; Noguchi, Kentaro; Sakae, Shigeru; and Okuma, Kazuhiro, 4,877,819, Cl. 523-200.000.
- Noguchi, Kunio; Koike, Yuzuru; and Toshimits, Kazushige, to Honda Giken Kogyo K.K. Air-fuel ratio control method for internal combustion engines. 4,877,006, Cl. 123-589.000.
- Noguchi, Takeshi; Takano, Kazuya; and Kikuchi, Takashi, to Bridge-stone Corp. Vibration isolator. 4,877,225, Cl. 267-140.100.
- Noguchi, Yoiji: See—
Takakura, Masaki; Hayasaki, Hideto; Takemura, Hideo; Izumi, Masao; Iwasaki, Keisuke; Noguchi, Yoiji; Yamane, Yasukuni; and Kako, Noritoshi, 4,878,178, Cl. 364-521.000.
- Noguera, Fernando P.: See—
Vega-Noverola, Armando; Prieto Soto, Jose M.; Noguera, Fernando P.; Mauri, Jacinto M.; and Spickett, Robert G. W., 4,877,780, Cl. 514-161.000.
- Noise Cancellation Tech: See—
Ziegler, Eldon, Jr., 4,878,188, Cl. 364-724.010.
- Noji, Minoru: See—
Yasumura, Hiroto; Hirasawa, Masahide; Noji, Minoru; Kozuki, Susumu; Takahashi, Koji; Yoshimura, Katsuj; and Sasatani, Tomohiko, 4,878,128, Cl. 358-315.000.
- Nolan, Daniel A.: See—
Newhouse, Mark A.; Nolan, Daniel A.; and Weidman, David L., 4,877,300, Cl. 350-96.150.
- Noller, Christoph: See—
Schuster, Hans-Dieter; Noller, Christoph; Wollenraup, Gottfried; Kreeb, Reiner; and Huss, Roland, 4,877,339, Cl. 384-218.000.
- Nollez, Jacques: See—
Knuchel, Pierre; and Nollez, Jacques, 4,877,055, Cl. 137-568.000.

- Nomura, Ikuo: See—
Emori, Yasuyoshi; Ohsaki, Hiroshi; and Nomura, Ikuo, 4,877,100, Cl. 180-143.000.
- Nomura, Isao: See—
Masu, Masanobu; Yoshioka, Hiroshi; Kouno, Kenji; Nomura, Isao; and Yamamiya, Kazuo, 4,877,847, Cl. 525-397.000.
- Nomura, Yoshihisa: See—
Shirai, Kenji; and Nomura, Yoshihisa, 4,876,853, Cl. 60-547.100.
- Noomer, Pieter J.: See—
Kaper, Louis; Klammer, Roelof; and Noomer, Pieter J., 4,877,631, Cl. 426-422.000.
- Norand Corporation: See—
Danielson, Arvin D.; and Durbin, Dennis A., 4,877,949, Cl. 235-462.000.
- Norden-Paul, Ronald E.; Fein, Murray A.; and Stewart, Sandra L., to Emtek Health Care Systems. Method for generating patient-specific flowsheets by adding/deleting parameters. 4,878,175, Cl. 364-413.010.
- Norman, John A. T.; and Stevens, Robert E., to Air Products and Chemicals, Inc. Novel metal-diketone absorbents for carbon monoxide. 4,877,425, Cl. 55-68.000.
- Norsolor: See—
Petit, Michele; Mortreux, Andre; Petit, Francis; and Buono, Gerard, 4,877,908, Cl. 568-814.000.
- Northern Telecom Limited: See—
Caldwell, Kevin G.; Lischynsky, Steve J.; and Bagi, Elza V., 4,877,303, Cl. 350-96.210.
- Gawargy, Mumtaz B., 4,878,244, Cl. 379-402.000.
- Kubis, Leon S., 4,877,176, Cl. 228-173.500.
- Marsden, Eric P.; and Checkland, John A., 4,877,467, Cl. 156-51.000.
- Northwest Marine Technology, Inc.: See—
Fralick, Richard D.; and Ekstrom, Philip A., 4,876,818, Cl. 43-7.000.
- Noskov, Alexandr S.: See—
Matros, Jury S.; Chumachenko, Viktor A.; Zudilina, Ljudmila J.; Noskov, Alexandr S.; and Bugdan, Evgeny S., 4,877,592, Cl. 423-245.100.
- Novak, Howard L.; and Zook, Lee M., to USBI Company. Methods for grit blasting with a u.v. detectable material. 4,877,638, Cl. 427-8.000.
- Novak, Richard P.: See—
Campion, Neil P.; Foty, Michael J.; and Novak, Richard P., 4,876,783, Cl. 29-401.100.
- Nunogaki, Yoshiaki, to Sanki Engineering, Ltd. Centrifugal counter-current distribution chromatography. 4,877,523, Cl. 210-198.200.
- Nusair, Marwan E.; Valentine, Michael D.; and Scholl, Stephen R., to Valentine Research, Inc. Broadband wide flare ridged microwave horn antenna. 4,878,061, Cl. 343-786.000.
- Nutrilite Products, Inc.: See—
Leitz, Richard E. A.; and Pusateri, Donald J., 4,877,627, Cl. 426-285.000.
- Nuutio, Erkki, to Autojoukko OY. Power transmission apparatus. 4,877,103, Cl. 180-259.000.
- Nygards, Olof: See—
Astrom, Bert; and Nygards, Olof, 4,876,961, Cl. 102-254.000.
- Oak Ridge Associated Universities: See—
Simpson, Michael L., 4,878,014, Cl. 324-71.300.
- Obata, Takeshi; and Kobayashi, Hideaki, to Hitachi, Ltd. Ring spinning machine. 4,876,847, Cl. 57-100.000.
- Obermeier, Ernst: See—
Schmidt, Helmut; Hutter, Frank; Haas, Karl-Heinz; Obermeier, Ernst; Steger, Ulrich; Endres, Hanns-Erik; and Drost, Stephan, 4,878,015, Cl. 324-71.500.
- Obligin, Alan S.: See—
Friesen, Dwayne T.; and Obligin, Alan S., 4,877,528, Cl. 210-500.290.
- O'Brien, Denise M.; and Croce, Carlo P., to Warner-Lambert Company. Tamper indicator for a blister package and method of assembly. 4,876,843, Cl. 53-410.000.
- OCE-Nederland B.V.: See—
Jacobs, Gerardus M. H. M.; and Dinnissen, Johannes H. A., 4,877,231, Cl. 271-3.100.
- Reinten, Hans, 4,878,072, Cl. 346-154.000.
- Ochiai, Hajime; and Morihara, Kenji, to Mitsubishi Denki Kabushiki Kaisha. Information transmission system for railway vehicles. 4,878,049, Cl. 371-5.500.
- Ochiai, Yoshinori: See—
Taniguchi, Masakazu; Hirose, Masayoshi; Baba, Masatoshi; Hirata, Kiminori; and Ochiai, Yoshinori, 4,877,787, Cl. 514-247.000.
- Ocker, Herbert; and Wehrich, Gerhard, to Werner & Pfleiderer GmbH. Degassification device for a screw extruder which processes plastic material. 4,877,390, Cl. 425-203.000.
- O'Connor, Chadwell. Water cooled incinerator. 4,876,971, Cl. 110-246.000.
- O'Connor, Joseph G.: See—
Liang, Rong-Chang; Kintz, Karl A.; O'Connor, Joseph G.; and Adair, Paul C., 4,877,767, Cl. 503-212.000.
- Oda, Shohei; Seshimoto, Osamu; Sueyoshi, Tohru; and Amano, Hiroyuki, to Fuji Photo Film Co., Ltd. Chemical sensor device with field effect transistor. 4,877,582, Cl. 422-68.000.
- O'Day, David L.: See—
Fleming, Paul D.; and O'Day, David L., 4,876,866, Cl. 70-379.00R.
- Ogasa, Takaki, to Hitachi, Ltd. Inline type color picture tube having coma distortion correcting mechanism. 4,877,993, Cl. 313-414.000.
- Ogasawara, Koji: See—
Yarita, Takao; Komori, Hideo; Ogasawara, Koji; and Takami, Hiroaki, 4,877,061, Cl. 139-224.00R.
- Ogasawara, Takashi: See—
Kimura, Kiyoshi; Ogasawara, Takashi; and Mushiroy, Takeshi, 4,877,784, Cl. 514-227.800.
- Ogata, Taizo: See—
Honda, Sumio; Ogata, Taizo; and Etani, Tadao, 4,876,839, Cl. 53-137.000.
- Ogawa, Haruo: See—
Okada, Takao; Kouchi, Toshihito; Mishima, Shuzo; Ogawa, Haruo; Morita, Seizo; and Mikoshiba, Nobuo, 4,877,957, Cl. 250-306.000.
- Ogawa, Kiyoshi: See—
Seki, Nagataka; Ogawa, Kiyoshi; and Nakajima, Kihei, 4,878,208, Cl. 307-87.000.
- Ogawa, Toshiaki; Fujiwara, Nobuo; Kawai, Kenji; Shibano, Teruo; Morita, Hiroshi; and Nishioka, Kyusaku, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor wafer treating apparatus utilizing a plasma. 4,877,509, Cl. 204-298.000.
- Ogawa, Yasuaki: See—
Iga, Katsumi; Hamaguchi, Naoru; and Ogawa, Yasuaki, 4,877,561, Cl. 264-4.300.
- Oguchi, Tetsuji, to NEC Corporation. Multiplication circuit capable of operating at a high speed with a small amount of hardware. 4,878,191, Cl. 364-759.000.
- Ogura, Jayme H.: See—
Rodrigues, Renato S.; and Ogura, Jayme H., 4,877,088, Cl. 166-342.000.
- Ogura, Ken: See—
Yanagawa, Moriyuki; Ishida, Shunichi; Ogura, Ken; and Saito, Yushi, 4,877,496, Cl. 204-44.200.
- Ogura, Kiyoshi: See—
Kondo, Masatsune; Ogura, Kiyoshi; and Kuramoto, Koiti, 4,877,833, Cl. 525-64.000.
- O'Hare, Louis R. Nitrogen fixation by electric arc and catalyst. 4,877,589, Cl. 422-186.240.
- Ohashi, Kenji: See—
Matsui, Isamu; Ohashi, Kenji; and Deno, Koji, 4,877,194, Cl. 242-35.60R.
- Ohio State University Research Foundation: See—
Tomei, L. David; Cornhill, Fred; Jagadeesh, Jogikal; and Boninger, Michael, 4,877,966, Cl. 250-458.100.
- Ohme, Roland: See—
Ballschuh, Detlef; Seibt, Horst; Ohme, Roland; Rusche, Jochen; Gruendemann, Egon; and Krause, Elke, 4,877,885, Cl. 548-570.000.
- Ohmuro, Hideaki: See—
Ando, Makoto; Kakinuma, Koichiro; Sawa, Masahiko; Ohmuro, Hideaki; and Ohryo, Akira, 4,877,946, Cl. 235-380.000.
- Ohno, Shigeru: See—
Sato, Kozo; Ohno, Shigeru; and Yamada, Sumito, 4,877,720, Cl. 430-512.000.
- Ohoka, Mikiharu: See—
Lach, Lawrence E.; and Ohoka, Mikiharu, 4,877,976, Cl. 307-450.000.
- Ohryo, Akira: See—
Ando, Makoto; Kakinuma, Koichiro; Sawa, Masahiko; Ohmuro, Hideaki; and Ohryo, Akira, 4,877,946, Cl. 235-380.000.
- Ohsaki, Hiroshi: See—
Emori, Yasuyoshi; Ohsaki, Hiroshi; and Nomura, Ikuo, 4,877,100, Cl. 180-143.000.
- Ohsaki, Saburo; Takahashi, Taketo; and Miki, Toshihiro, to Mitsubishi Denki Kabushiki Kaisha. Ion implantation method. 4,877,962, Cl. 250-442.100.
- Ohsawa, Hideo: See—
Katayama, Akihiro; Ohsawa, Hideo; Sunohara, Izuru; Hosokawa, Hiroshi; and Yoshimoto, Masahiko, 4,878,125, Cl. 358-443.000.
- Ohsumi, Tadashi: See—
Mori, Tatsuya; Ohsumi, Tadashi; Nakamura, Shigeo; Maeda, Kiyoto; Nishida, Sumio; and Takano, Hirotaka, 4,877,441, Cl. 71-90.000.
- Ohta, Hiroki: See—
Matsumoto, Susumu; Ohta, Hiroki; Yamada, Masahiro; Higashino, Yoshiaki; and Fukuchi, Toshiki, 4,877,804, Cl. 514-342.000.
- Ohta, Wasaburo: See—
Kinoshita, Mikio; Ohta, Wasaburo; and Miyabori, Toru, 4,876,984, Cl. 118-723.000.
- Ohta, Yasuo: See—
Urushizaki, Suet; Ohta, Yasuo; Sato, Mamoru; Sakai, Fukumi; and Nishiyama, Koushi, 4,877,730, Cl. 435-132.000.
- Ohtaka, Hiroshi: See—
Iemura, Ryuichi; Hori, Manabu; Ohtaka, Hiroshi; Sukamoto, Takayuki; Hara, Hideaki; and Ito, Keizo, 4,877,790, Cl. 514-260.000.
- Ohtaka, Keiji: See—
Koyama, Takeshi; Ohtaka, Keiji; and Suda, Yasuo, 4,878,078, Cl. 354-402.000.
- Ohtsu, Eiichi, to Hitachi, Ltd. Air-conditioning apparatus for automobiles. 4,877,081, Cl. 165-30.000.
- Oiwa, Thomas Y., to Raychem Corporation. Sealing device for elongate heater. 4,877,943, Cl. 219-538.000.
- Oka, Masahide: See—
Nogami, Ikuo; Yamaguchi, Takamasa; Oka, Masahide; and Shirafuji, Hideo, 4,877,735, Cl. 435-138.000.
- Oka, Tetsuo: See—
Kato, Yukihiko; Ishii, Masami; Yabuno, Ryohei; and Oka, Tetsuo, 4,876,893, Cl. 73-726.000.

Okabe, Kunio. Rotary mechanism for three-dimensional volumetric change. 4,877,379, Cl. 418-51.000.
 Okada, Masamichi; and Kai, Isao, to Omron Tateisi Electronics Co. Electronic thermometer with predicting means. 4,878,184, Cl. 364-557.000.
 Okada, Masashi: See—
 Honma, Masahiro; Maruyama Tokuji; Okada, Masashi; and Hida, Yukio, 4,877,941, Cl. 219-130.210.
 Okada, Takao; Kouchi, Toshihito; Mishima, Shuzo; Ogawa, Haruo; Morita, Seizo; and Mikoshiba, Nobuo, to Olympus Optical Co., Ltd. Scanning type tunnel microscope. 4,877,957, Cl. 250-306.000.
 Okada, Tetsuji: See—
 Matsuda, Kenji; Togashi, Kenji; Umemura, Hiroyuki; Okada, Tetsuji; Ishioka, Hidenori; and Aoki, Katsuyuki, 4,877,183, Cl. 236-49.300.
 Okamizu, Shigeo, to Mazda Motor Manufacturing (USA) Corporation. Apparatus for filling transmission fluid into transmissions. 4,877,066, Cl. 141-96.000.
 Okamoto, Katsuo: See—
 Tojo, Tetsuo; Nakahara, Takashi; Otawa, Yasuhiko; and Okamoto, Katsuo, 4,877,817, Cl. 521-142.000.
 Okamoto, Takashi: See—
 Fukushima, Itaru; Okamoto, Takashi; and Deguchi, Hisashi, 4,878,065, Cl. 346-76.0PH.
 Okamoto, Yuji: See—
 Isoda, Noriyuki; and Okamoto, Yuji, 4,878,056, Cl. 341-26.000.
 Okamura Corporation: See—
 Yamashita, Yoshikazu; and Ikenaga, Toshiharu, 4,877,121, Cl. 198-475.100.
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 Ishiki, Naotsugu; Okano, Shigetou; and Mishima, Shiro, 4,876,856, Cl. 60-671.000.
 Okawa, Kazuyoshi; Moriya, Kazumasa; Kashiwazaki, Tomoyuki; Kawashima, Hiroshi; and Murakawa, Yoshitaka. Transport control system with linear motor drive. 4,876,966, Cl. 104-290.000.
 Okayama, Tetsuro, to Uegaki Beika Kabushiki Kaisha. Rice cookie and method for producing same. 4,877,630, Cl. 426-302.000.
 Okazaki, Koju: See—
 Miura, Tohru; Nagata, Teruyuki; Okazaki, Koju; Furuya, Masayuki; and Nishida, Emiko, 4,877,907, Cl. 568-721.000.
 Oki Electric Industry Co., Ltd.: See—
 Mori, Toru, 4,877,947, Cl. 235-381.000.
 Yamato, Osamu; and Takino, Tetsuji, 4,877,493, Cl. 204-15.000.
 Okudaira, Shigenori; Irie, Takefumi; Uchida, Hiroshi; Fukasawa, Eiichi; Kobayashi, Kazuhiko; and Yamaguchi, Masanori, to Toho Titanium Co., Ltd. Method for producing a metal from its halide. 4,877,445, Cl. 75-0.50B.
 Okuma, Kazuhiko: See—
 Kiyohara, Kazuto; Hagiwara, Toshiyuki; Nakadate, Takanori; Harada, Ichiji; Noguchi, Kentaro; Sakae, Shigeru; and Okuma, Kazuhiko, 4,877,819, Cl. 523-200.000.
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 Okuno, Akiyasu; Watanabe, Masakazu; and Ikoma, Kazuhiko, to NGK Spark Plug Co., Ltd. Aluminum nitride sintered body with high thermal conductivity and process for producing same. 4,877,760, Cl. 501-98.000.
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 Old, Michael J.: See—
 James, Leslie G.; and Old, Michael J., 4,877,969, Cl. 250-507.100.
 O'Leary, John H.: See—
 Epperly, William R.; O'Leary, John H.; Sullivan, James C.; and Sprague, Barry N., 4,877,590, Cl. 423-235.000.
 Olin Corporation: See—
 Dory, Thomas S., 4,877,641, Cl. 427-38.000.
 Dory, Thomas S., 4,877,651, Cl. 427-255.000.
 Olinger, Jeffrey J.: See—
 Disselkoen, Allen D., Jr.; Gargiulo, Robert F.; Haywood, James E.; Heise, Keith H.; Holcomb, Darrell H.; Kramer, Stuart C.; Miller, Gregory R.; Nicholson, Jeffrey S.; Olinger, Jeffrey J.; and Spenny, Curtis H., 4,877,202, Cl. 244-122.00A.
 Olson, Elwin N. Sling bow. 4,877,007, Cl. 124-22.000.
 Olson, Timothy A.: See—
 Johnson, William M.; Olson, Timothy A.; Dutton, Drew J.; Lee, Sherman; and Stoener, David W., 4,878,166, Cl. 364-200.000.
 Olsson, Mats, to Nobel Kemi AB. Propellant charge for cannons and a method of producing such a charge. 4,876,962, Cl. 102-288.000.
 Oltean, Jerry M.; and Goodwin, Paul E., to Eaton Corporation. Wheel end valve for central tire inflation system. 4,877,048, Cl. 137-225.000.
 Olympus Optical Co., Ltd.: See—
 Ieoka, Shoichi, 4,878,112, Cl. 358-98.000.
 Kanamori, Iwao, 4,877,314, Cl. 350-422.000.
 Maeno, Hitoshi; Miyazawa, Azuma; and Maruyama, Astushi, 4,878,077, Cl. 354-400.000.
 Matsumoto, Kazuya; and Nakamura, Tsutomu, 4,878,120, Cl. 358-213.120.
 Nakamura, Kazunari, 4,878,113, Cl. 358-98.000.
 Okada, Takao; Kouchi, Toshihito; Mishima, Shuzo; Ogawa, Haruo; Morita, Seizo; and Mikoshiba, Nobuo, 4,877,957, Cl. 250-306.000.
 Oman, Joel E.: See—
 Byrd, William A.; Oman, Joel E.; and Connors, William, 4,877,985, Cl. 310-86.000.

Omori, Koji: See—
 Oyama, Sakan; and Omori, Koji, 4,878,147, Cl. 361-154.000.
 Omron Tateisi Electronics Co.: See—
 Fukuma, Yasumichi, 4,877,930, Cl. 200-302.200.
 Nakanishi, Tomoyuki, 4,877,232, Cl. 271-10.000.
 Okada, Masamichi; and Kai, Isao, 4,878,184, Cl. 364-557.000.
 Ota, Hiroyuki; and Kai, Isao, 4,877,333, Cl. 374-169.000.
 Onabe, Yoshiaki: See—
 Minamikawa, Masayasu; Onabe, Yoshiaki; and Ono, Masanao, 4,877,970, Cl. 250-560.000.
 Oneac Corporation: See—
 Lace, Melvin A., 4,878,145, Cl. 361-118.000.
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Padiall, James M.: See—
 Petrucci, Raymond M.; Taylor, Bruce G.; Giordano, Edward C.; Padiall, James M.; and Palmer, Carl, 4,877,521, Cl. 210-171.000.
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 Pahlman, Heikki: See—
 Karma, Juhani; and Pahlman, Heikki, 4,878,020, Cl. 324-207.000.
 Palau, Joseph: See—
 Froment, Jean-Paul; and Palau, Joseph, 4,877,060, Cl. 139-82.000.
 Palmer, Carl: See—
 Petrucci, Raymond M.; Taylor, Bruce G.; Giordano, Edward C.; Padiall, James M.; and Palmer, Carl, 4,877,521, Cl. 210-171.000.
 Palmgren, Tor H.: See—
 Bergstrom, Christer; and Palmgren, Tor H., 4,877,685, Cl. 428-500.000.
 Panesar, Lakhbir S.: See—
 Law, David J. C.; and Panesar, Lakhbir S., 4,877,005, Cl. 123-458.000.
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 Peppiatt, Harry R., 4,877,336, Cl. 383-8.000.
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 Parrish, Deborah. Total back support system. 4,876,755, Cl. 5-431.000.
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 Fierkens, Richardus H. J.; and Pas, Ireneus J. T. M., 4,877,387, Cl. 425-116.000.
 Paschke, Randy K.: See—
 Schulte, John P.; Orth, Kelly M.; Frick, Roger L.; Westfield, Brian L.; and Paschke, Randy K., 4,878,012, Cl. 324-60.0CD.
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 Pates, John: See—
 Larson, Gordon; and Pates, John, 4,877,148, Cl. 220-90.200.
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 Paul, Marius A.; and Paul, Ana, 4,876,988, Cl. 123-1.00A.
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 Donati, Jean R.; Guttmann, Daniele; Rouillon, Yves; Paul, Pierre S.; and Zacharie, Guy, 4,877,465, Cl. 148-428.000.
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 Creagh, Linda T.; Fulton, Steven F.; Hoisington, Paul A.; Paulson, Bruce A.; Schaffer, Robert R.; and Spehrley, Charles W., Jr., 4,877,676, Cl. 428-204.000.
 Pavliscsak, Csaba: See—
 Neu Jozsef; Csatlós, Imre; Varga, Andras; Suranyi, Robert; Ilovai, Zoltan; Gaal, Sándor; Karsai, József; Sebestyen, Endre; Gardi, Eva; Siki, Karoly; Toth, Istvan; Gal, Guszt/eacu/a/ v; Dombay, Zsolt; Grega nee Toth, Mrs. Erzsébet; Pavliscsak, Csaba; Tarpai, Gyula; Bonnyay, Peter; and Santha, Pal, 4,877,893, Cl. 558-86.000.
 Pavlu, Bohdan: See—
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 PCR, Inc.: See—
 Wilson, Michael E., 4,877,654, Cl. 427-387.000.
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 Peil, Archie W.; and Bishop, Thomas R., to Bowen Tools, Inc. Fail-safe blowout preventer. 4,877,217, Cl. 251-1.300.
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 Pengilly, Eric A. Transmission with plural torque transmission paths. 4,876,908, Cl. 74-410.000.
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Peppiatt, Harry R., to Paramount Packaging Corporation. Bottom loaded duplex bag having a handle and method of making same. 4,877,336, Cl. 383-8.000.
 Perkins, James E., III: See—
 Bierman, Laurence W.; Lopez, Michael L.; and Perkins, James E., III, 4,877,594, Cl. 423-321.005.
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 Perlman, Daniel, to Brandeis University. Dilution pipette device. 4,877,585, Cl. 422-100.000.
 Persson, Peter. Trouble finder for testing an electrical system of a vehicle for short-circuiting. 4,878,025, Cl. 324-503.000.
 Pesch, Karl: See—
 Rohm, Gunter H.; and Pesch, Karl, 4,877,259, Cl. 279-123.000.
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 Petit, Francis: See—
 Petit, Michele; Mortreux, Andre; Petit, Francis; and Buono, Gerard, 4,877,908, Cl. 568-814.000.
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 Rodrigues, Renato S.; and Ogura, Jayme H., 4,877,088, Cl. 166-342.000.
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 Buriks, Rudolf S.; and Dolan, James G., 4,877,842, Cl. 252-344.000.
 Zetlmeisl, Michael J.; and Fahey, William F., 4,877,578, Cl. 422-14.000.
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 Calkins, Eugene E.; and Petrovich, Michael V., 4,876,796, Cl. 30-383.000.
 Petrovick, John G., Jr.: See—
 Bassett, Robert W.; Griffin, William R.; Murphy, Susan A.; Petrovick, John G., Jr.; Varner, James R.; and Whittaker, Dennis R., 4,878,209, Cl. 368-113.000.
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 Pezzoli, Luigi, to Vilminore Officine Meccaniche S.P.A. Device for the automatic control of the weft yarn feed in air looms. 4,877,064, Cl. 139-435.000.
 Pfaff Industriemaschinen GmbH: See—
 Braun, Oskar, 4,876,975, Cl. 112-260.000.
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 Pharmacia AB: See—
 Jansson, Gunnar B.; and Holmlund, Erling S., 4,877,746, Cl. 436-518.000.
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 Phillips, Edwin D. Connector for tapered glass joints. 4,877,270, Cl. 285-18.000.
 Phillips Petroleum Company: See—
 Bresson, Clarence R., 4,877,518, Cl. 209-167.000.
 Geibel, Jon F.; and Nesheiwat, Afif, 4,877,850, Cl. 525-471.000.
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 Piana, Ivana; and Piana, Silvano, 4,876,810, Cl. 40-316.000.
 Picanol N.V.: See—
 Verhulst, Jozef, 4,877,063, Cl. 139-435.000.
 Pickart, Loren R., to ProCyt Corporation. Chemical derivatives of GHL-Cu. 4,877,770, Cl. 514-18.000.
 Pickett, James E.: See—
 McWhirter, Vernie C.; Pickett, James E.; and Carlson, Norman R., 4,878,180, Cl. 364-507.000.
 Piechaczek, Detlef: See—
 Rudnick, Dieter; Kothe, Norbert; Dichtelmüller, Herbert; Piechaczek, Detlef; Stephan, Wolfgang; and Schleussner, Hans, 4,877,866, Cl. 530-387.000.
 Pini, Peter: See—
 Wester-Ebbinghaus, Wilfried; Luhmann, Thomas; Mangelsdorf, Juergen; and Pini, Peter, 4,878,247, Cl. 382-1.000.
 Pioneer Ansafone Manufacturing Corporation: See—
 Nakamura, Norimasa; and Kishimoto, Satoshi, 4,878,217, Cl. 370-77.000.
 Pioneer Electronic Corporation: See—
 Suzuki, Masanori; and Tateishi, Kiyoshi, 4,878,211, Cl. 369-44.000.
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Carpenter, Thomas O.; and Pitha, Josef, 4,877,778, Cl. 514-58.000
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Nobile, John R.; Ross, William A.; and Toth, William D., 4,876,959, Cl. 101-233.000
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Lindsay, Richard D., 4,877,448, Cl. 75-10.210
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- Plessey Australia Pty. Ltd.: See—
Jandera, Zdenek; and Bedwell, Ian R., 4,878,207, Cl. 367-155.000
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Richardson, Christopher K., 4,878,251, Cl. 455-206.000
Stewart, William J., 4,877,747, Cl. 436-525.000
Taylor, Peter J., 4,877,377, Cl. 417-89.000
Whitmore, Roger W.; Munns, Andrew G.; and Lane, David W., 4,876,776, Cl. 29-25.350
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- Plumley, Stephen C.: Cutting table, 4,877,069, Cl. 144-286.00R
- Plurichene Anstalt: See—
Page, Philip R.; and Villax, Ivan, 4,877,559, Cl. 552-204.000
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Mattick, Michael J., 4,876,829, Cl. 52-2.000
- Poe, L. Richard, to Hartwell Corporation: The Trigger lock cam, 4,877,274, Cl. 292-113.000
- Poeppel, Roger B.: See—
Fee, Darrell C.; Poeppel, Roger B.; Easler, Timothy E.; and Dees, Dennis W., 4,877,506, Cl. 204-242.000
- Poetsch, Elke; and Casuti, Michael, to Merck Patent Gesellschaft mit Beschränkter Haftung: Process for the preparation of D-(+)-biotin, 4,877,882, Cl. 548-303.000
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Tiittola, Antti-Jussi; and Pohja, Kari, 4,876,807, Cl. 36-114.000
- Poignant, Jean Claude: See—
Lavielle, Gilbert; and Poignant, Jean Claude, 4,877,788, Cl. 514-252.000
- Polidor, Jaromir J., to Vesuvius Crucible Company: Plasma spray coated ceramic bodies and method of making same, 4,877,705, Cl. 428-34.600
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Zollman, Peter M.; Pollard, Brendon T.; and Birch, Andrew D., 4,878,127, Cl. 358-299.000
- Polozhentseva, Mira I.: See—
Mudzhiri, Levon A.; Alkhasashvili, Gia G.; Kalatozhvili, Elena I.; Chekunshvili, Gia O.; Brekman, Izrail I.; Bulanov, Alexander E.; and Polozhentseva, Mira I., 4,877,772, Cl. 514-23.000
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Quigg, Fred L., 4,877,749, Cl. 437-41.000
- Polymer Dynamics Technology, Inc.: See—
Peoples, William J., 4,876,805, Cl. 36-43.000
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- Polytec Gesellschaft für Analysen, Mess- & Regel- Technik mbH & Co.: See—
Weule, Hartmut; and Reichling, Bernhard, 4,877,325, Cl. 356-373.000
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Kelly, Patrick M.; Howlett, Robert E.; Pomeroy, Paul A.; and Alvarez, Dennis A., 4,876,837, Cl. 52-287.000
- Pop-Limited: See—
Cha, Tongil, 4,877,566, Cl. 264-118.000
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- Potter, David: See—
Hobson, Richard S.; and Potter, David, 4,877,286, Cl. 297-195.000
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Haire, William M.; and Pou, Celestino, 4,877,513, Cl. 208-106.000
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Higuchi, William I.; Fox, Jeffrey I.; and Powell, G. Lynn, 4,877,401, Cl. 433-215.000
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Conti-Ramsden, John N.; Powell, Richard L.; Young, Brian D.; Farrar, Jeffrey; and Brown, Debra K., 4,877,839, Cl. 525-200.000
- Powers, Joseph R.: See—
Hall, Mark J.; Powers, Joseph R.; and Wood, William A., 4,877,821, Cl. 523-351.000
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Leatherman, Dennis D.; Rechlicz, Thomas; and Schwarz, Richard A., 4,877,679, Cl. 428-224.000
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Chmiel, Max; and Prange, Rainer, 4,877,761, Cl. 501-109.000
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Jurgens, Lothar, 4,877,403, Cl. 434-24.000
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McGinniss, Vincent D.; and Preston, Joseph R., 4,877,988, Cl. 310-306.000
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Kavesh, Sheldon; Prevorsek, Dusan C.; and Harpell, Gary A., 4,876,774, Cl. 28-166.000
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- Price, Ronald: See—
Schnur, Joel M.; Price, Ronald; Yager, Paul; Schoen, Paul; Georger, Jacques H.; and Singh, Alok, 4,877,501, Cl. 204-157.640
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- Prieto Soto, Jose M.: See—
Vega-Noverola, Armando; Prieto Soto, Jose M.; Noguera, Fernando P.; Mauri, Jacinto M.; and Spickett, Robert G. W., 4,877,780, Cl. 514-161.000
- Pringle, John: See—
Goleczka, Joseph; Harris, Walter; and Pringle, John, 4,877,418, Cl. 44-600.000
- Process Automation Business, Inc.: See—
Carson, Keith J., 4,877,485, Cl. 162-263.000
- Procter & Gamble Company, The: See—
Degenhardt, Charles R.; and Kozikowski, Barbara A., 4,877,603, Cl. 424-57.000
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Pickart, Loren R., 4,877,770, Cl. 514-18.000
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Campion, Neil P.; Foty, Michael J.; and Novak, Richard P., 4,876,783, Cl. 29-401.100
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Shih, Meng-Fu; Cochran, Mark D.; and Macdonald, Richard D., 4,877,737, Cl. 435-235.000
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- Puchta, Rolf: See—
Wilsberg, Heinz-Manfred; and Puchta, Rolf, 4,877,556, Cl. 252-544.000
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- Pullig, Joe G., Jr.: Manually operated spear apparatus, 4,877,085, Cl. 166-98.000
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Martin, Gregory C.; and Egerton, Gary W., 4,876,885, Cl. 73-129.000
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Leitz, Richard E. A.; and Pusateri, Donald J., 4,877,627, Cl. 426-285.000
- Putt, Francis G., to Kerr Machinery Corporation: Pump, 4,877,371, Cl. 415-169.100
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Hant, Paul W., 4,877,010, Cl. 126-9.00A
- Quaglia, James A.: Jamb saw, 4,876,793, Cl. 30-122.000
- Quigg, Fred L., to Polyfet Re Devices, Inc.: Method of forming a low loss FET, 4,877,749, Cl. 437-41.000
- Raab, John J., to Conair Corporation: Thermally-insulated curling iron, 4,877,942, Cl. 219-225.000
- Rabindran, Karavattuveetil G.: See—
Guenther, Kenneth L.; Rabindran, Karavattuveetil G.; Faber, Thomas J.; and Abrams, Jack S., 4,877,346, Cl. 400-624.000
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Kapulka, Kenneth M.; Rader, Holly A.; and Strickland, Jimmy P., 4,878,167, Cl. 364-200.000
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Myers, Herman A., 4,876,794, Cl. 30-252.000
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Kampe, Klaus-Dieter; Raether, Wolfgang; and Dittmar, Walter, 4,877,878, Cl. 544-368.000
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Kade, Werner; and Rahmig, Hermann, 4,877,486, Cl. 162-336.000

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Buckmaster, Marlin D.; and Randa, Stuart K., 4,877,815, Cl. 521-85.000
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- Rao, Srinivas T.: See—
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Falicoff, Waqidi; Delano, Richard; and Raseman, Chad J., 4,877,675, Cl. 428-204.000
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Bibl, Andreas; Higginson, John; and Gardner, Deane, 4,878,071, Cl. 346-153.100
- Rateike, Leroy R.: See—
Ford, David B.; Lynch, James E.; and Rateike, Leroy R., 4,877,093, Cl. 175-113.000
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Gottseman, Jeffrey L.; Dempsey, Mark A.; Koch, Donald E.; and Rattan, Dev R., 4,878,048, Cl. 340-825.010
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- Overbergh, Noel M. M.; and Vansant, Jan L. M. F. G., 4,877,660, Cl. 428-34.900
- RCA Licensing Corp.: See—
Maninger, Loren L.; New, David A.; and Lundvall, Carl L., II, 4,877,998, Cl. 315-15.000
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Pasternak, Mordechai; Bartels, Craig R.; and Reale, John, Jr., 4,877,529, Cl. 210-500.370
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Leatherman, Dennis D.; Rechlicz, Thomas; and Schwarz, Richard A., 4,877,679, Cl. 428-224.000
- Reed, Fred D., Jr.: Transdermal drug delivery device, 4,877,618, Cl. 434-448.000
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- Reed, Ralph C.: See—
Diehl, Donald R.; and Reed, Ralph C., 4,877,721, Cl. 430-522.000
- Reichling, Bernhard: See—
Weule, Hartmut; and Reichling, Bernhard, 4,877,325, Cl. 356-373.000
- Reifenhauser GmbH & Co. Maschinenfabrik: See—
Reifenhauser, Hans, 4,877,571, Cl. 264-512.000
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- Reimer, Bernd: See—
Lutz, Manfred; and Reimer, Bernd, 4,877,700, Cl. 430-58.000
- Reinecke, Paul: See—
Elbe, Hans-Ludwig; Dutzmann, Stefan; and Reinecke, Paul, 4,877,446, Cl. 71-92.000
- Weismüller, Joachim; Berg, Dieter; Hansler, Gerd; and Reinecke, Paul, 4,877,786, Cl. 514-236.800
- Reinten, Hans, to OCE-Nederland B.V.: LED age correction means, 4,878,072, Cl. 346-154.000
- Reising, John C.; and Miles, David E., to Glidden Company: The Epoxy functional and silicone thermosetting powder coatings, 4,877,837, Cl. 525-100.000
- Reiter Machine Works, Ltd.: See—
Schlepper, Walter; and Stachel, Christoph, 4,876,769, Cl. 19-105.000
- Reliance Comm/Tec Corporation: See—
Kaczmarek, Richard, 4,878,146, Cl. 361-119.00A
- Remington, Jack S.: See—
Suzuki, Yasuhiro; Remington, Jack S.; Desmonts, Georges; and Thulliez, Philippe, 4,877,726, Cl. 435-7.000
- Reneau, Daniel R., to Hamlin Incorporated: Extended dwell shock sensing device, 4,877,927, Cl. 200-61.45M
- Reneau, George M.: See—
Reneau, George W.; and Reneau, George M., 4,878,160, Cl. 162-269.000
- Reneau, George W.; and Reneau, George M.: Outdoor lightpole, 4,878,160, Cl. 362-269.000
- Rennselaer Polytechnic Institute: See—
Moore, James A.; Daseff, Andrew N.; and Kaufman, Frank B., 4,877,718, Cl. 430-326.000
- Reno, John M.; and Bottino, Becky J., to NeoRx Corporation: Radionuclide antibody coupling, 4,877,868, Cl. 530-390.000
- Renzulli, Francesco; Del Gaudio, Antonio; and Renzulli, Piero, to CO.GE.IT. S.R.L. - Costruzioni Generali Italiane: Process for tanning fish skin, 4,877,410, Cl. 8-94.120
- Renzulli, Piero: See—
Renzulli, Francesco; Del Gaudio, Antonio; and Renzulli, Piero, 4,877,410, Cl. 8-94.120
- Resch, Reinhard: See—
Leiber, Heinz; and Resch, Reinhard, 4,877,296, Cl. 303-115.000
- Research Frontiers Incorporated: See—
Saxe, Robert L.; and Thompson, Robert L., 4,877,313, Cl. 350-391.000
- Research Institute of Palo Alto Medical Foundation: See—
Suzuki, Yasuhiro; Remington, Jack S.; Desmonts, Georges; and Thulliez, Philippe, 4,877,726, Cl. 435-7.000
- Resi di Cervia, Arturo L., to Fimic, B.V.: Method and apparatus of constructing a novel underground impervious barrier, 4,877,358, Cl. 405-267.000
- Restle, Serge: See—
Shroot, Braham; Hensby, Christopher; Maignan, Jean; Lang, Gerard; Restle, Serge; and Colin, Michel, 4,877,789, Cl. 514-255.000
- Reuter, Rene F.: See—
Thise, Marie R.; and Reuter, Rene F., 4,877,073, Cl. 152-451.000
- Resnord Inc.: See—
McCorkle, Daniel J.; and Do, Tai H., 4,877,271, Cl. 285-39.000
- Rey, Miguel A.: See—
Trinidad, Antonio; Zayas Luna, Victor M.; and Rey, Miguel A., 4,876,865, Cl. 70-203.000
- Reynaud, Jean M., to Avions Marcel Dassault - Breguet Aviation: Method and device for representing the horizon on board an aircraft, 4,878,054, Cl. 340-975.000
- Reynolds, Robert C.: See—
Marcum, Bruce; and Reynolds, Robert C., 4,876,985, Cl. 119-4.000
- Rhee, Seung J.; and Simpson, Larry L., to Union Carbide Chemicals and Plastics Company Inc.: Fluidized bed polymerization reactors, 4,877,587, Cl. 422-135.000
- Rheon Automatic Machinery Co.: See—
Hayaishi, Torahiko, 4,877,623, Cl. 426-231.000
- Rhodes, Michael L. P., to AE PLC: Pistons with bearing lands, 4,876,947, Cl. 92-187.000
- Rhodes, Robert B., to Shell Oil Company: Viscosity index improver and composition containing same, 4,877,836, Cl. 525-89.000
- Rhone-Poulenc Chimie: See—
Costantini, Michel; and Igersheim, Francoise, 4,877,903, Cl. 568-342.000
- Rhone-Poulenc Sante: See—
Ardailon, Pierre; Autant, Pierre; Bourrain, Paul; and Cartillier, Andre, 4,877,621, Cl. 424-498.000
- Ribi ImmunoChem Research Inc.: See—
Cantrell, John L., 4,877,611, Cl. 424-88.000
- Ricciardelli, Robert H.: Fiber optic light mode mixer, 4,877,305, Cl. 350-96.300
- Richard, Daniel J.: See—
Robinson, John R.; and Richard, Daniel J., 4,876,806, Cl. 36-114.000
- Richards, Lee E.: Knee pads, 4,876,745, Cl. 2-24.000
- Richardson, Christopher K., to Plessey Overseas Limited: Interference signal suppressor for a radio receiver, 4,878,251, Cl. 455-206.000
- Richardson, David: Compact signal enhancer, 4,878,254, Cl. 455-601.000
- Richardson, Glenn A.: See—
Feltz, Kevin L.; Richardson, Glenn A.; and Burrell, Jonathan C., 4,876,857, Cl. 60-734.000
- Richardson, Hubert, Jr.: See—
Johnson, William C.; and Richardson, Hubert, Jr., 4,877,381, Cl. 418-55.000
- Richer, LeRoy L., to Vestar, Inc.: Liposomal vesicles for intraperitoneal administration of therapeutic agents, 4,877,619, Cl. 424-450.000
- Ricketts, John; and Grecu, George M.: Thickness monitor for floated sludge, 4,876,888, Cl. 73-319.000
- Ricoh Company, Ltd.: See—
Arai, Atsushi, 4,878,092, Cl. 355-285.000
- Ikehira, Kimimasa; Wu, Ming-Chi; and Liu, Chih-Yuan, 4,878,117, Cl. 358-183.000
- Kinoshita, Mikio; Ohta, Wasaburo; and Miyabori, Toru, 4,876,984, Cl. 118-723.000
- Kishida, Daisuke; and Sasaki, Saburo, 4,878,081, Cl. 354-414.000
- Yokomori, Kiyoshi; and Isobe, Tami, 4,877,301, Cl. 350-96.190
- Ricoh Corporation: See—
Springer, Robert M.; Schmal, Richard L.; and Gavenman, Eugene H., 4,878,242, Cl. 379-204.000
- Riden, Joseph R.: See—
Neighbors, Ralph P.; and Riden, Joseph R., 4,877,806, Cl. 514-410.000
- Riecke, Edgar E.: See—
Chen, Chung Y.; Riecke, Edgar E.; Harbison, Kenneth G.; and Chapman, Derek D., 4,877,724, Cl. 430-621.000

- Rieter Machine Works Ltd.: See—
Nabulon, Werner, 4,877,570, Cl. 264-282.000.
- Riley, Gilbert N.; Holodnak, Richard S.; and Malin, Richard A., to Pitney Bowes Inc. Removable postage meter having an indicia cover. 4,876,956, Cl. 101-91.000.
- Rion, Claude R.; and Gidon, Georges M., to Societe Anonyme: Aus-sedat-Rey. Recording sheet for ink-jet printing and process for its preparation. 4,877,686, Cl. 428-514.000.
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- Rival, Marc, to Merlin Gerin. Breaking device for multipole electrical circuit breaker with multiple contacts. 4,877,929, Cl. 200-146.00R.
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Lon, Jesus R.; Rivas, Olegario; and Zirczy, Geza N., 4,877,542, Cl. 252-62.000.
- Rives, Robert L.: See—
Ditty, Jeffrey L.; Rives, Robert L.; Schanding, James T.; and Burka, Eric S., 4,876,787, Cl. 29-430.000.
- Rizzo, Joseph F.: See—
Lin, Steve M.; and Rizzo, Joseph F., 4,878,240, Cl. 379-67.000.
- RM Base Company: See—
Gefroh, James A.; and Hattman, Fredric J., 4,876,833, Cl. 52-107.000.
- Robert Thomas Ltd.: See—
Frank, Glenn R.; and Stewart, Edward T., Jr., 4,877,399, Cl. 433-25.000.
- Roberts, Joni A.: See—
Bleich, Larry L.; Roberts, Joni A.; and Zerba, Stephen T., 4,877,645, Cl. 427-117.000.
- Robertson, Harry W., IV, to Westvaco Corporation. Method and apparatus for unloading vapor adsorbers. 4,877,426, Cl. 55-74.000.
- Robertson, Taggart H.: See—
Aranda, Michael A.; Ebberts, Timothy J.; Iida, Yoshio; Lindgren, Terence W.; and Robertson, Taggart H., 4,878,182, Cl. 364-518.000.
- Robey, Herbert L., to Cyanide Destruct Systems, Inc. Reactor and heat exchanger system for cyanide waste water treatment. 4,877,519, Cl. 210-86.000.
- Robinson, John R.; and Richard, Daniel J., to Nike, Inc. Asymmetric shoe. 4,876,806, Cl. 36-114.000.
- Robinson, Keith J.: See—
Cassola, Adrian; Kwok, John C.; Robinson, Keith J.; Smith, Brian H. A.; and Longuet, Michel, 4,877,832, Cl. 525-64.000.
- Robinson, Larry A.; and Robinson, Richard R., to Tidel Systems, Inc. Currency sorter and storage device. 4,877,235, Cl. 271-279.000.
- Robinson, Richard R.: See—
Robinson, Larry A.; and Robinson, Richard R., 4,877,235, Cl. 271-279.000.
- Robinson, William L., to United States of America, Army. 3-D packaging of focal plane assemblies. 4,877,752, Cl. 437-51.000.
- Rockerath, John L.; and Blust, Dale K., to Figgie International Inc. Ball holding and cementing apparatus and method. 4,877,655, Cl. 427-430.100.
- Rockwell International Corporation: See—
Gottesman, Jeffrey L.; Dempsey, Mark A.; Koch, Donald E.; and Rattan, Dev R., 4,878,048, Cl. 340-825.010.
- Larsen, Robert P.; Hoelke, Steven T.; and Luisi, James A., 4,878,179, Cl. 364-490.000.
- Loria, William P., 4,878,153, Cl. 361-394.000.
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- Yeh, Pochi A., 4,877,297, Cl. 350-3.680.
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- Rodrigues, Renato S.; and Ogura, Jayme H., to Petroleo Brasileiro S.A. -Petrobras. Process and equipment for oil well drilling and completing operations in deep water. 4,877,088, Cl. 166-342.000.
- ROFA Rosenheimer Forderanlagen GmbH: See—
Koslowski, Gunter; and Uttascheid, Georg, 4,876,965, Cl. 104-127.000.
- Rogers, William P., to Telenex Corporation. Signal switching system. 4,878,215, Cl. 370-58.100.
- Rohm GmbH: See—
Siol, Werner; Heil, Ernst; Wenzel, Franz; Arndt, Peter J.; and Terbrack, Ulrich, 4,877,853, Cl. 526-329.700.
- Rohm GmbH Chemische Fabrik: See—
Gross, Heinz, 4,877,474, Cl. 156-244.130.
- Rohm, Gunter H.; and Pesch, Karl, to Gunter Horst Rohm. Power-driven chuck. 4,877,259, Cl. 279-123.000.
- Rohm and Haas Company: See—
Emmons, William D.; and Winkle, Mark R., 4,877,818, Cl. 522-26.000.
- Switbank, Colin; and Fujimoto, Ted. T., 4,877,897, Cl. 104-021.000.
- Rohr, Wolfgang: See—
Becker, Rainer; and Rohr, Wolfgang, 4,877,887, Cl. 549-253.000.
- Rollei Fototechnik GmbH: See—
Wester-Ebbinghaus, Wilfried; Luhmann, Thomas; Mangelsdorf, Juergen; and Pini, Peter, 4,878,247, Cl. 382-1.000.
- Rolloff, Paul D.; and Lamb, Reginald T., to Amfit Inc. System and method for forming custom-made shoe inserts. 4,876,758, Cl. 12-142.00N.
- Rolscreen Company: See—
Hagemeyer, Bruce A., 4,876,831, Cl. 52-455.000.
- Romano, Antonio, to Campagnolo S.p.A. Gear selector for bicycle speed gears. 4,876,913, Cl. 74-535.000.
- Roquette Freres: See—
Leleu, Jean-Bernard; and LeMay, Patrick, 4,877,889, Cl. 549-292.000.
- Rorden, Louis H.; and Moore, T. Charles, to Develco, Inc. Actuation method. 4,878,053, Cl. 340-853.000.
- Rorer Pharmaceutical Corporation: See—
Felt, George R.; Multhaupt, Donna K.; and Wagle, Sudhakar S., 4,876,891, Cl. 73-426.000.
- Lee, Ted C. K.; and Hrinda, Michael E., 4,877,608, Cl. 424-85.800.
- Rose, Frederick A. Communications management system. 4,878,196, Cl. 364-900.000.
- Rosemount Inc.: See—
Schulte, John P.; Orth, Kelly M.; Frick, Roger L.; Westfield, Brian L.; and Paschke, Randy K., 4,878,012, Cl. 324-60.0CD.
- Rosen, Stanley D.: See—
Crandall, Scott R.; Droste, Timothy A.; and Rosen, Stanley D., 4,876,923, Cl. 74-732.000.
- Rosen, Vicki: See—
Wang, Elizabeth A.; Wozney, John M.; and Rosen, Vicki, 4,877,864, Cl. 530-324.000.
- Ross, William A.: See—
Nobile, John R.; Ross, William A.; and Toth, William D., 4,876,959, Cl. 101-233.000.
- Rossouw, Jan H.: See—
Rossouw, Pieter J.; and Rossouw, Jan H., 4,877,192, Cl. 241-275.000.
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- Rothbard, Robert. Basketball hoop and net apparatus. 4,877,241, Cl. 273-1.50R.
- Rouillon, Yves: See—
Donati, Jean R.; Guttman, Daniele; Rouillon, Yves; Paul, Pierre S.; and Zacharie, Guy, 4,877,465, Cl. 148-428.000.
- Rounds, Rhyta S., to Colgate-Palmolive Co. Polarizable material having a liquid crystal microstructure and electrical components produced therefrom. 4,878,150, Cl. 361-311.000.
- Roussel, Michel; and Baffreau, Daniel, to Entreprise Gagneraud Pere & Fils; and Total Compagnie Francaise des Petroles. Compound cement, more particularly usable in bore holes. 4,877,452, Cl. 106-97.000.
- Roussel Uclaf: See—
Clemence, Francois; Le Martret, Odile; Delevallee, Francoise; and Fortin, Michel, 4,877,796, Cl. 514-311.000.
- Rovensky, Franz: See—
Binder, Dieter; Rovensky, Franz; and Ferber, Hubert P., 4,877,809, Cl. 514-444.000.
- Rowlette, John R.: See—
Wu, Jeff C.; Williams, Richard T.; Rowlette, John R.; Brooks, Charles P.; and Zimmerman, Richard H., 4,877,644, Cl. 427-53.100.
- Roy, Richard S., to Visic, Incorporated. Static ram with common data line equalization. 4,878,198, Cl. 365-222.000.
- Rudeen, Richard D. Roof ventilator. 4,876,950, Cl. 98-42.210.
- Rudnick, Dieter; Kothe, Norbert; Dichtelmuller, Herbert; Piechaczek, Detlef; Stephan, Wolfgang; and Schleussner, Hans, to Biotest Pharma GmbH. Method of producing a virus safe, storage-stable, and intravenously tolerable immunoglobulin-G preparation. 4,877,866, Cl. 530-387.000.
- Ruesch, James R. Apparatus and methods for measuring the density of an unknown fluid using a Coriolis meter. 4,876,879, Cl. 73-32.00A.
- Ruhland, John G.: See—
Grushkin, Bernard; Chang, Hui; and Ruhland, John G., 4,877,707, Cl. 430-106.600.
- Runyon, John F. Folding modular building structure. 4,876,831, Cl. 52-70.000.
- Rusche, Jochen: See—
Ballschuh, Detlef; Seibt, Horst; Ohme, Roland; Rusche, Jochen; Gruendemann, Egon; and Krause, Elke, 4,877,885, Cl. 548-570.000.
- Rush, Jonathan E.; Scalvini, Phillip D.; and Gerber, Reinhold. Snap-on lid and mold for making the lid. 4,877,151, Cl. 206-514.000.
- Russwurm, Dieter: See—
Aicher, Max; Jungwirth, Dieter; Klein, Hans-Wilhelm; and Russwurm, Dieter, 4,877,463, Cl. 148-12.00B.
- Ruthenberg, Klaus: See—
Muller, Friedhelm; and Ruthenberg, Klaus, 4,877,328, Cl. 366-76.000.
- Ruttel, Martin: See—
Drews, Wolf-Dietrich; Van Der Linden, Klaus; Ruttel, Martin; and Friedrich, Jurgen, 4,877,989, Cl. 310-323.000.
- Ryba, Steven M.: See—
Hopper, Roger J.; Shah, Niranjan V.; and Ryba, Steven M., 4,877,901, Cl. 564-82.000.
- Ryham, Rolf, to Ahlstromforetagen Svenska AB. Process and apparatus for cooling a fluid. 4,877,080, Cl. 165-2.000.
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- S.G.S. Thomson Microelectronics, S.A.: See—
Bergemont, Albert; and Ferrant, Richard, 4,877,483, Cl. 156-653.000.
- S-Thomas Microelectronics S.p.A.: See—
Botti, Edoardo; Torazzina, Aldo; and Stefani, Fabrizio, 4,878,032, Cl. 330-263.000.
- Saab Instruments Aktiebolag: See—
Nilsson, Hans-Arne, 4,876,942, Cl. 89-41.220.
- Sachs, Klaus, to Anton Piller GmbH & Co. KG. Semiconductor circuit packages for use in high power applications and method of making the same. 4,878,106, Cl. 357-72.000.
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- Saggers, Michael J. Vibratory diaphragm pumps. 4,877,378, Cl. 417-299.000.
- Sagi, Nobuo: See—
Koyano, Tetsuo; Sagi, Nobuo; Izumi, Tsugio; Fujita, Setsuya; Murata, Tadahiko; Hachiya, Iwao; and Mori, Hiroyuki, 4,877,636, Cl. 426-607.000.
- Sago, Akira: See—
Hayakawa, Kiyoharu; Matsumoto, Yumio; Ueda, Masashi; Sago, Akira; and Tagaki, Osamu, 4,878,084, Cl. 355-27.000.
- Sahakian, Jack A., to W. L. Gore & Associates, Inc. Sensors for detecting and locating liquid leaks. 4,877,923, Cl. 174-11.00R.
- Saint-Amand, Elmer F. Swab transport system. 4,877,036, Cl. 128-749.000.
- Saita, Masaru: See—
Tsuiji, Masayoshi; Nakagawa, Akira; Inoue, Hisataka; Hachiya, Terumi; Tanoue, Yoshihiro; Ikese, Kouichi; Saita, Masaru; Mizoguchi, Takenobu; Aoki, Tetsuo; Sato, Hironobu; and Noda, Kanji, 4,877,876, Cl. 544-133.000.
- Saito, Hitoshi: See—
Higuchi, Kumao; Morinaga, Akio; Seshimo, Masahiro; and Saito, Hitoshi, 4,877,665, Cl. 428-36.100.
- Saito, Tamio; and Yoshihara, Kunio, to Kabushiki Kaisha Toshiba. Semiconductor integrated circuit device. 4,878,098, Cl. 357-68.000.
- Saito, Yushi: See—
Yanagawa, Moriyo; Ishida, Shunichi; Ogura, Ken; and Saito, Yushi, 4,877,496, Cl. 204-44.200.
- Saitou, Shirou: See—
Tanaka, Yoshio; and Saitou, Shirou, 4,877,964, Cl. 250-455.100.
- Sakae, Shigeru: See—
Kiyohara, Kazuto; Hagiwara, Toshiyuki; Nakadate, Takanori; Harada, Ichiji; Noguchi, Kentaro; Sakae, Shigeru; and Okuma, Kazuhiro, 4,877,819, Cl. 523-200.000.
- Sakai, Akira: See—
Matayama, Jinsho; Hirai, Yutaka; Ueki, Masao; and Sakai, Akira, 4,877,650, Cl. 427-248.100.
- Sakai, Fukumi: See—
Urushizaki, Suet; Ohta, Yasuo; Sato, Mamoru; Sakai, Fukumi; and Nishiyama, Kouichi, 4,877,730, Cl. 435-132.000.
- Sakai, Haruki: See—
Nakagawa, Koji; Takagi, Takeo; Abe, Yoshiaki; and Sakai, Haruki, 4,877,370, Cl. 415-148.000.
- Sakai, Shigekazu, to Tokai Shoji Co., Ltd.; and Tokai Seiki Co., Ltd. Apparatus for applying an emulsion screen film of screen-printing. 4,876,957, Cl. 101-128.400.
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- Sakakibara, Tadao: See—
Futatsuka, Rensei; Chiba, Synu-ichi; and Sakakibara, Tadao, 4,877,577, Cl. 420-473.000.
- Sakamaki, Hisashi: See—
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- Sakata, Motohide: See—
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- Sakata, Toshio: See—
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- Samsung Electronics Co., Ltd.: See—
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- Samuelson, Per R.: See—
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- Sandberg, Inga H.: See—
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- Sanden Corporation: See—
Negishi, Kozaburo, 4,876,860, Cl. 62-179.000.
- Tamura, Yasuji, 4,877,118, Cl. 192-103.00R.
- Sandhaus, Jeffrey, to Vastech Medical Products Inc. Apparatus for effecting occlusion of the vas deferens. 4,877,028, Cl. 128-326.000.
- Sandor, Nagy: See—
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- Sandoz Ltd.: See—
Carney, Robert L.; and Brown, Thomas L., 4,877,899, Cl. 560-262.000.
- Pedrazzi, Reinhard, 4,877,412, Cl. 8-437.000.
- Sanki Engineering, Ltd.: See—
Nunogaki, Yoshiaki, 4,877,523, Cl. 210-198.200.
- Sano, Sachiya: See—
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- Sano, Yoshitaka: See—
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- Santel, Hans-Joachim: See—
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- Schwamborn, Michael; Klauke, Erich; Schmidt, Robert R.; Santel, Hans-Joachim; and Strang, Robert H., 4,877,443, Cl. 71-92.000.
- Santha, Pal: See—
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- Saperstein, Z. Philip, to Modine Manufacturing Company. Braze heat exchanger and method of making the same. 4,877,083, Cl. 165-176.000.
- Sarraf, Raymond E.; and Zaharris, Daniel R., to MiniScribe Corporation. Track crossing detector. 4,878,136, Cl. 360-78.040.
- Sasaki, Hidemi: See—
Ando, Shigeru; and Sasaki, Hidemi, 4,878,138, Cl. 360-99.020.
- Sasaki, Isao; Kushi, Kenji; and Taguchi, Nobuyoshi, to Mitsubishi Rayon Company, Ltd. Composition easily dyeable with sublimable dyes. 4,877,922, Cl. 528-272.000.
- Sasaki, Saburo: See—
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- Sassella, Christopher D., to Dowell Australia Limited. Combination lock. 4,876,864, Cl. 70-89.000.
- Sassella, Christopher D.; Whitney, John R.; and McGeehan, Harold K., to Dowell Australia Ltd. Apparatus for machining a work piece and a jig assembly for holding the work piece. 4,877,227, Cl. 269-43.000.
- Sato, Akira: See—
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- Murakata, Chikara; Sato, Akira; Kasai, Masaji; Kobayashi, Eiji; Morimoto, Makoto; and Akinaga, Shiro, 4,877,776, Cl. 514-43.000.
- Sato, Hironobu: See—
Tsuiji, Masayoshi; Nakagawa, Akira; Inoue, Hisataka; Hachiya, Terumi; Tanoue, Yoshihiro; Ikese, Kouichi; Saita, Masaru; Mizoguchi, Takenobu; Aoki, Tetsuo; Sato, Hironobu; and Noda, Kanji, 4,877,876, Cl. 544-133.000.
- Sato, Kozo; Ohno, Shigeru; and Yamada, Sumito, to Fuji Photo Film Co., Ltd. Silver halide photographic material. 4,877,720, Cl. 430-512.000.
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- Sato, Ryo: See—
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- Satoh, Hiroaki; Koyama, Hiroyasu; Suzuki, Yoshikuni; Sugai, Toshiji; and Watanabe, Koichi, to Nishin Flour Milling Co., Ltd. 1,4-Dihydroxydipyrone derivatives and pharmaceutical compositions containing same. 4,877,797, Cl. 514-314.000.
- Satoh, Yasuo: See—
Senoo, Hideaki; Yamasaki, Takeshi; Satoh, Yasuo; and Sugaya, Mamoru, 4,877,688, Cl. 428-522.000.
- Sauer, Harald: See—
Von Jordan, Wenzel; Draf, Rolf; Grone, Dieter; and Sauer, Harald, 4,877,598, Cl. 423-640.000.
- Sauerbaum, Thomas; and Kahning, Stefan, to Draegerwerk Aktiengesellschaft. Method and apparatus for measuring the dew point of a gas. 4,877,329, Cl. 374-28.000.
- Sauers, Marvin E.; Hartsing, Tyler F., Jr.; and McMaster, Lee P., to Amoco Corporation. Laminates containing coextruded scrap. 4,877,682, Cl. 428-412.000.
- Saulle, Lorenzo, to Stacos di Saulle Lorenzo e Pontarollo Luciana s.n.c. Dispenser for fluid products. 4,877,157, Cl. 222-387.000.
- Saulnier, Gary J.; Herrera, Randy G.; and Thiel, Timothy E., to General Electric Company. Complex digital sampling converter for demodulator. 4,878,029, Cl. 329-341.000.

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Sawa, Masahiko: See—
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Sawamura, Masashi: See—
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Saze, Robert L.; and Thompson, Robert L., to Research Frontiers Incorporated. Light-polarizing materials and suspensions thereof. 4,877,313, Cl. 350-391.000.

Say, Geoffrey R.: See—
Goetsch, Duane A.; and Say, Geoffrey R., 4,877,550, Cl. 252-373.000.

Sbaiti, Bassam: See—
Vu, Cong; Martin, Timo; Hy J.; Gillanders, Andrew M.; and Sbaiti, Bassam, 4,877,829, Cl. 524-729.000.

Scalvini, Philip D.: See—
Rush, Jonathan E.; Scalvini, Philip D.; and Gerber, Reinhold, 4,877,151, Cl. 206-514.000.

Schaeffler, Georg: See—
Zorn, Helmut; and Schaeffler, Georg, 4,876,997, Cl. 123-90.520.

Schaffer, Robert R.: See—
Cragg, Linda T.; Fulton, Steven F.; Hoisington, Paul A.; Paulson, Bruce A.; Schaffer, Robert R.; and Spehrley, Charles W., Jr., 4,877,676, Cl. 428-204.000.

Schafheitel, Oskar: See—
Mathews, Hans-Gunter; and Schafheitel, Oskar, 4,878,037, Cl. 333-254.000.

Schalk, Andreas: See—
Knapp, Gunter; and Schalk, Andreas, 4,877,999, Cl. 315-248.000.

Schallner, Otto: See—
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Schanding, James T.: See—
Ditty, Jeffrey L.; Rives, Robert L.; Schanding, James T.; and Burke, Eric S., 4,876,787, Cl. 29-430.000.

Schaum, David L.: See—
Gregory, Joseph A.; and Schaum, David L., 4,877,204, Cl. 548-399.000.

Scheibli, Peter: See—
Sire, Jean-Marie; and Scheibli, Peter, 4,877,413, Cl. 8-543.000.

Scheitz, Andrea; and Leinhaas, Werner. Press with hydro-mechanical drive. 4,876,878, Cl. 72-450.000.

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Biere, Helmut; Huth, Andreas; Rahtz, Dieter; Schmiechen, Ralph; Seidelmann, Dieter; Stephens, David N.; Engelstoft, Mogens; and Hansen, John B., 4,877,792, Cl. 514-292.000.

Maly, Friedrich E.; de Week, Alain L.; and Henderson, David, 4,877,742, Cl. 436-65.000.

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Lovey, Raymond G.; and Elliott, Arthur J., 4,877,801, Cl. 548-336.000.

Schell, Lazlo, to Swing-Matic AB. Rocker mechanism with a locking facility. 4,877,290, Cl. 297-270.000.

Scheuble, Bernhard: See—
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Kniebel, Charles J.; Schieffer, Virgil; and Bredt, Robert C., 4,877,117, Cl. 192-85.00A.

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Schlepf, Walter; and Staeheli, Christoph, to Reiter Machine Works, Ltd. Regulation of processing stages of a fiber processing installation. 4,876,769, Cl. 19-105.000.

Schleussner, Hans: See—
Rudnick, Dieter; Kothe, Norbert; Dichtelmüller, Herbert; Piechaczek, Detlef; Stephan, Wolfgang; and Schleussner, Hans, 4,877,866, Cl. 530-387.000.

Schlossman, Mitchell L. Method of incorporating cosmetic pigments and bases into products containing oil and water phases. 4,877,604, Cl. 424-64.000.

Schmal, Richard L.: See—
Springer, Robert M.; Schmal, Richard L.; and Gavenman, Eugene H., 4,878,242, Cl. 379-204.000.

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Haftmann, Johannes; and Schmeykal, Rudolf, 4,877,347, Cl. 400-479.000.

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Speil, Walter; Schuseil, Bolko; and Schmidt, Dieter, 4,876,994, Cl. 123-90.500.

Schmidt, Helmut; Hutter, Frank; Haas, Karl-Heinz; Obermeier, Ernst; Steger, Ulrich; Endres, Hanns-Erik; and Drost, Stephan, to Fraunhofer-Gesellschaft zur Förderung der angewandten Forschung e.V. Sensors for selectively determining liquid-phase or gas-phase compo-

nents using a heteropolysiloxane sensitive layer. 4,878,015, Cl. 324-71.500.

Schmidt, Martin: See—
Otto, Werner; Beese, Ulrich; and Schmidt, Martin, 4,877,150, Cl. 535-386.000.

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Schmiechen, Ralph: See—
Biere, Helmut; Huth, Andreas; Rahtz, Dieter; Schmiechen, Ralph; Seidelmann, Dieter; Stephens, David N.; Engelstoft, Mogens; and Hansen, John B., 4,877,792, Cl. 514-292.000.

Schnur, Joel M.; Price, Ronald; Yager, Paul; Schoen, Paul; Georger, Jacques H.; and Singh, Alok. Process for fabrication of lipid microstructures. 4,877,501, Cl. 204-157.640.

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Nusair, Marwan E.; Valentine, Michael D.; and Scholl, Stephen R., 4,878,061, Cl. 343-786.000.

Scholl, Wolfgang, to ITT SWF Auto-Electric GmbH. Windshield washing system, especially for motor vehicles. 4,877,186, Cl. 239-75.000.

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Hinz, Paul; Dislich, Helmut; and Weber, Gerhard, 4,877,668, Cl. 728-48.000.

Schram, Cornelius J., to National Research Development Corporation. Manipulating particulate matter. 4,877,516, Cl. 209-155.000.

Schreuders, Hans G.: See—
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Schroer, Hans: See—
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Schubach, Frank: See—
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Popescu, Ian C.; and Lange, Rainer, 4,877,059, Cl. 137-637.100.

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Schulte, Roland: See—
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Schultz, Dennis: See—
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Williamson, Herman L.; and Schuster, Michael M., 4,877,363, Cl. 411-43.000.

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Kula, Maria-Regina; Hummel, Werner; Schutte, Horst; and Leuchtenberger, Wolfgang, 4,877,734, Cl. 435-228.000.

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Leatherman, Dennis D.; Rechlicz, Thomas; and Schwarz, Richard A., 4,877,679, Cl. 428-224.000.

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Lackner, John R., 4,877,432, Cl. 55-375.000.

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Wang, Yun-Chie; and Scott, Paul H., 4,878,028, Cl. 328-55.000.

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Sebald, Thomas: See—
Stiehl, Hans-Henrich; and Sebald, Thomas, 4,878,149, Cl. 361-230.000.

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Biere, Helmut; Huth, Andreas; Rahtz, Dieter; Schmiechen, Ralph; Seidelmann, Dieter; Stephens, David N.; Engelstoft, Mogens; and Hansen, John B., 4,877,792, Cl. 514-292.000.

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Selling, John A.: See—
LaHaye, Peter G.; and Selling, John A., 4,877,781, Cl. 514-179.000.

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Morgan, Alan R.; Selman, Steven H.; Garbo, Greta M.; and Keck, Rick W., 4,877,872, Cl. 540-145.000.

Selz, Mark E.: See—
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Fukuda, Takeshi; Yamazaki, Shunpei; and Sugawara, Akira, 4,877,481, Cl. 156-643.000.

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Arzenti, Thomas E.; and Senger, Robert D., 4,876,871, Cl. 72-122.000.

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Seppa, Ilkka: See—
Perkola, Markku; and Seppa, Ilkka, 4,877,424, Cl. 55-52.000.

Sermon, S.A.: See—
Vinas I Nogueiros, Jose M., 4,877,632, Cl. 426-502.000.

Serot, Etienne: See—
Delbe, Emmanuel; Gillet, Francois; Serot, Etienne; Chifflet, Raymond; Allio, Roland; Jeanin, Philippe; Del Fabro, Gilbert; and Forella, Guy, 4,877,229, Cl. 271-2.000.

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Fukuda, Takuya; Mochizuki, Yasuhiro; Momma, Naohiro; Takahashi, Shigeru; Suzuki, Noboru; Sonobe, Tadasi; Chiba, Kiyosi; and Suzuki, Kazuo, 4,876,983, Cl. 118-722.000.

Seshimo, Masahiro: See—
Higuchi, Kumao; Morinaga, Akio; Seshimo, Masahiro; and Saito, Hitoshi, 4,877,665, Cl. 428-36.100.

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Oda, Shohei; Seshimoto, Osamu; Sueyoshi, Tohru; and Amano, Hiroyuki, 4,877,582, Cl. 422-68.000.

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Becker, Rainer; Seufert, Walter; Buschmann, Ernst; and Bruchner, Christiane, 4,877,891, Cl. 549-416.000.

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Andersson, Lars-Olof; Forsman, Nanna; Larsen, Kerstin E. I.; Lundin, Annelie B.; Pavlu, Bohdan; Sandberg, Inga H.; and Sewerin, Karin M., 4,877,614, Cl. 424-101.000.

SGS-Thomson Microelectronics s.r.l.: See—
Colombo, Alessandro, 4,878,164, Cl. 363-49.000.

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Velan, Baruch; Cohen, Sara; Grosfeld, Haim; and Shafferman, Avigdor, 4,877,865, Cl. 530-351.000.

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Hopper, Roger J.; Shah, Niranjani V.; and Ryba, Steven M., 4,877,901, Cl. 564-82.000.

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Givati, Izhak, 4,876,771, Cl. 24-298.000.

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Snowdon, Michael; and Shapiro, Jay, 4,877,473, Cl. 156-204.000.

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Aiba, Masahiko; and Mizuno, Yukio, 4,878,225, Cl. 372-38.000.

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Shaw, Michael, to Dunlop Limited a British Company. Golf balls. 4,877,252, Cl. 273-232.000.

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Wilson, John R. H.; and Haddock, Ernest, 4,877,802, Cl. 514-365.000.

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Bontenbal, Pieter J., 4,877,356, Cl. 405-169.000.

Dewitz, Thomas S., 4,877,419, Cl. 48-197.00R.

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van Broekhoven, Adrianus M.; and Wife, Richard L., 4,877,860, Cl. 528-392.000.

Van Doorn, Johannes A.; and Wife, Richard L., 4,877,861, Cl. 528-392.000.

Shepard, Mary E.; Galloway, Deane E.; and Lind, Keith D., to American National Can Company. Nylon carrier for polymer concentrate, and films and packages made with the concentrate. 4,877,684, Cl. 428-475.800.

Sherman, Fred P., to Baker Cummins Pharmaceuticals, Inc. Method of treatment for interstitial cystitis. 4,877,791, Cl. 514-282.000.

Sheroff, Donald I., to Kearsfoot Guidance & Navigation Corporation. Laser power monitoring optics for a ring laser gyroscope. 4,877,311, Cl. 356-350.000.

Shibano, Teruo: See—
Ogawa, Toshiaki; Fujiwara, Nobuo; Kawai, Kenji; Shibano, Teruo; Morita, Hiroshi; and Nishioka, Kyusaku, 4,877,509, Cl. 204-298.000.

Shibata, Kensuke: See—
Yaso, Masao; Suzuki, Yukio; Shibata, Kensuke; and Hayashi, Eiichi, 4,877,875, Cl. 544-116.000.

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Shih, Meng-Fu; Cochran, Mark D.; and Macdonald, Richard D., to PruTech Research and Development Partnership. Attenuated pseudorabies virus which has a deletion in at least a portion of a repeat sequence and vaccine containing same. 4,877,737, Cl. 435-235.000.

Shikoku Kakoki Co., Ltd.: See—
Shimokawa, Masao; and Hamada, Hisanori, 4,877,067, Cl. 141-129.000.

Shimada, Michio, to NEC Corporation. Error-correcting decoder for rapidly dealing with buffer overflow. 4,878,221, Cl. 371-43.000.

Shimizu, Chiyuki: See—
Nagaoka, Hisayuki; Zenbayashi, Michio; and Shimizu, Chiyuki, 4,877,855, Cl. 528-26.000.

Shimizu, Hisashi: See—
Itoh, Kunio; Shiobara, Toshio; Futatsumori, Koji; Tomivoshi, Kazutoshi; and Shimizu, Hisashi, 4,877,822, Cl. 523-433.000.

Shimizu, Isamu: See—
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Shimizu, Katsuchi; Masuda, Shunichi; Yagasaki, Toshiaki; and Sakamaki, Hisashi, to Canon Kabushiki Kaisha. Reproduction apparatus. 4,878,130, Cl. 358-400.000.

Shimizu, Yasuo, to Honda Giken Kogyo Kabushiki Kaisha. Motor-operated power steering apparatus. 4,878,004, Cl. 318-599.000.

Shimizu, Yuzuru, to Mitsubishi Denki Kabushiki Kaisha. Rotor of magnetic generator. 4,877,986, Cl. 310-153.000.

Shimokawa, Masao, and Hamada, Hisanori, to Shikoku Kakoki Co., Ltd. Apparatus for distributedly filling particulate or granular material into containers. 4,877,067, Cl. 141-129.000.

Shimomura, Setsuhiro, and Nishiyama, Ryoji, to Mitsubishi Denki Kabushiki Kaisha. Electronic control device for internal-combustion engines. 4,877,002, Cl. 123-339.000.

Shimomura, Setsuhiro, and Nishimura, Yukinobu, to Mitsubishi Denki Kabushiki Kaisha. RPM control device for internal combustion engine. 4,877,003, Cl. 123-339.000.

Shin-Etsu Chemical Co., Ltd.: See—

Itoh, Kunio; Shiobara, Toshio; Futatsumori, Koji; Tomiyoshi, Kazutoshi; and Shimizu, Hisashi, 4,877,822, Cl. 523-433.000.

Shin-Etsu Polymer Co., Ltd.: See—

Hasegawa, Masamitsu; Tamura, Satoshi; Wakashima, Takashi; and Sugiyama, Isao, 4,877,678, Cl. 428-216.000.

Shindo, Yoshikazu: See—

Kuno, Toshio; Shindo, Yoshikazu; Kuno, Yukio; Ueno, Takeshi; Torimi, Akira; and Mori, Yoji, 4,876,952, Cl. 98-121.200.

Shinko Electric Co., Ltd.: See—

Karita, Mitsui, 4,876,765, Cl. 16-102.000.

Shinohara, Isao, to Casio Computer Co., Ltd. Electronic musical instrument with automatic performing function. 4,876,938, Cl. 84-611.000.

Shinozaki, Fumiaki: See—

Namiki, Tomizo; Suzuki, Kazuo; and Shinozaki, Fumiaki, 4,877,712, Cl. 430-256.000.

Shinpo Kabushiki Kaisha: See—

Yamada, Takeshi, 4,877,015, Cl. 126-299.00R.

Shiobara, Toshio: See—

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Shirafuji, Hideo: See—

Nogami, Ikuo; Yamaguchi, Takamasa; Oka, Masahide; and Shirafuji, Hideo, 4,877,735, Cl. 435-138.000.

Shirai, Kenji, and Nomura, Yoshihisa, to Toyota Jidosha Kabushiki Kaisha. Tandem master cylinder with booster piston at pedal-remote end of master cylinder and with booster-pressure responsive reservoir valve for forward brake circuit. 4,876,853, Cl. 60-547.100.

Shirai, Koji, and Kawamura, Ken, to Kabushiki Kaisha Toshiba. Semiconductor device IC with DMOS using self-aligned back gate region. 4,878,096, Cl. 357-42.000.

Shiraishi, Takashi, to Kabushiki Kaisha Toshiba. Beam scanner with distortion correction. 4,878,066, Cl. 346-108.000.

Shiraishi, Yasuhiro: See—

Konishi, Junkichi; and Shiraishi, Yasuhiro, 4,877,263, Cl. 280-707.000.

Shirose, Meizo: See—

Takagiwa, Hiroyuki; Takahashi, Jiro; Shirose, Meizo; Akimoto, Kunio; and Uchida, Masafumi, 4,877,704, Cl. 430-99.000.

Shurtum, Robert P.; and Darby, Elaine B., to Dow Chemical Company. The Preparation of epoxy resins. 4,877,857, Cl. 528-95.000.

Shishkin, Viktor V.; Kryazhevskikh, Nikolai F.; and Shapovalov, Jury P. Flexible hose pump. 4,876,946, Cl. 92-93.000.

Shkedi, Zvi: See—

Arabia, F. Gene; Shkedi, Zvi; and Brandt, Randy L., 4,876,892, Cl. 73-718.000.

Shojima, Hiroshi: See—

Mifune, Toshimi; Morooka, Yasuo; Shojima, Hiroshi; Mori, Junko; and Fukunaga, Yasushi, 4,878,249, Cl. 382-13.000.

Sholes, Robert R.: See—

Chadwick, Curt H.; Sholes, Robert R.; Greene, John D.; Tucker, Francis D., III; Fein, Michael E.; Jann, P. C.; Harvey, David J.; and Bell, William, 4,877,326, Cl. 356-394.000.

Short, James N.: See—

McDaniel, Max P.; and Short, James N., 4,877,763, Cl. 502-117.000.

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Kodama, Akinori; and Takahashi, Takeshi, 4,877,149, Cl. 220-267.000.

Shreiner, Thomas A., to Construction Specialties, Inc. Floor mat with rigid rails joined by living hinges. 4,877,672, Cl. 428-156.000.

Shroet, Braham; Hensby, Christopher; Maignan, Jean; Lang, Gerard; Restle, Serge; and Colin, Michel, to Centre International de Recherches Dermatologiques dite C.I.R.D. Eicosatriynoic acid esters and amides and their application in pharmaceutical and cosmetic practice. 4,877,789, Cl. 514-255.000.

Shull, James A. Mailbox signalling apparatus. 4,877,180, Cl. 232-35.000.

Shyu, Jia-Ming; Chen, Inn-Ming; Lee, Tian-Quey; and Kung, Yunn-Chiang, to Industrial Technology Research Institute. Method and apparatus for automatically recognizing license plate characters. 4,878,248, Cl. 382-9.000.

Sickinger, Albert: See—

Muehlberger, Erich; and Sickinger, Albert, 4,877,640, Cl. 427-34.000.

Siegenthaler, Karl J., to Firestone Tire & Rubber Company, The. Hot tire forming method. 4,877,468, Cl. 156-111.000.

Siemens Aktiengesellschaft: See—

Drewe, Wolfgang; Van Der Linden, Klaus; Ruttel, Martin; and Friedrich, Jürgen, 4,877,989, Cl. 310-323.000.

Gehring, Johann; and Birkle, Siegfried, 4,876,801, Cl. 34-9.000.

Hahn, Alfred; and Vogel, Georg, 4,877,017, Cl. 128-24.00A.

Heinze, Roland; and Liesa, Hans-Dieter, 4,877,032, Cl. 128-419.0PG.

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Pfeiffer, Joachim; Guenther, Werner; Muetter, Manfred; and Heubeck, Erich, 4,878,234, Cl. 378-40.000.

Sigg, Hans: See—

Ecoffey, Olivier; Mueller, Theodore; and Sigg, Hans, 4,876,883, Cl. 73-37.500.

Signetics Corporation: See—

MacKenna, Craig A.; and Li, Jan-Kwei J., 4,878,181, Cl. 364-518.000.

Signode System GmbH: See—

Eckel, Hans-Joachim; and Warych, Hans, 4,877,673, Cl. 428-172.000.

Siki, Karoly: See—

Neu Jozsef; Csontos, Imre; Varga, Andras; Suranyi, Robert; Ilovai, Zoltan; Gaal, Sandor; Karai, Jozsef; Sebestyen, Endre; Gardi, Eva; Siki, Karoly; Toth, Istvan; Gal, Gusztav; Dombay, Zsolt; Grega nec Toth, Mrs. Erzebet; Pavliscsak, Csaba; Tarpai, Gyula; Bonnyay, Peter; and Santha, Pal, 4,877,893, Cl. 558-86.000.

Sikorski, Siegfried; and Huther, Werner, to Motoren-und Turbinen-Union Munchen GmbH. Attachment of a rotor blade of fiber reinforced plastic to a metal rotor hub. 4,877,376, Cl. 416-207.000.

Silgailis, John; Nathasingh, Davidson; and Bruckner, Christopher A., to Allied-Signal Inc. Rapid magnetic annealing of amorphous metal in molten tin. 4,877,464, Cl. 148-108.000.

Simizu, Katsumi: See—

Kawano, Minoru; Simizu, Katsumi; Isonaga, Eiji; and Kurata, Shigeo, 4,877,874, Cl. 540-606.000.

Simone, Dominic: See—

Brauer, Melvin; and Simone, Dominic, 4,877,455, Cl. 106-244.000.

Simpson, Larry L.: See—

Rhee, Seung J.; and Simpson, Larry L., 4,877,587, Cl. 422-135.000.

Simpson, Michael L., to Oak Ridge Associated Universities. Ion beam profile scanner having symmetric detector surface to minimize capacitance noise. 4,878,014, Cl. 324-71.300.

Simpson, Robert W.: See—

Boylan, Elizabeth S.; Boylan, Robert J.; Groupe, Vincent; and Simpson, Robert W., 4,877,616, Cl. 424-123.000.

Singh, Alok: See—

Schnur, Joel M.; Price, Ronald; Yager, Paul; Schoen, Paul; Georger, Jacques H.; and Singh, Alok, 4,877,501, Cl. 204-157.640.

Single Buoy Moorings Inc.: See—

O'Nion, Geoffrey; and Gramet, Jean C., 4,876,978, Cl. 114-230.000.

Siol, Werner; Heil, Ernst; Wenzel, Franz; Arndt, Peter J.; and Terbrack, Ulrich, to Rohm GmbH. Polymethyl methacrylate molding compounds. 4,877,853, Cl. 526-329.700.

Sire, Jean-Marie; and Scheibli, Peter, to Ciba-Geigy Corporation. Process for the end-to-end dyeing of cellulosic fibres. 4,877,413, Cl. 8-543.000.

Slattery, Gordon C., to Brunswick Corporation. Fuel system with vapor bypass of oil-fuel mixer halting oil pumping. 4,876,993, Cl. 123-73.0AD.

Slezak, Cynthia L.: See—

Ditzler, Lee C.; Lemberger, Ronald F.; and Slezak, Cynthia L., 4,877,588, Cl. 422-186.190.

Slob, Arie, to U.S. Philips Corporation. Charge-coupled device. 4,878,202, Cl. 365-183.000.

Slocum, Alexander: See—

Heatzig, Eric; Slocum, Alexander; and Thurston-Slocum, Debra, 4,878,002, Cl. 318-568.200.

Smith, Brian H. A.: See—

Cassola, Adrian; Kwok, John C.; Robinson, Keith J.; Smith, Brian H. A.; and Longuet, Michel, 4,877,832, Cl. 525-64.000.

Smith, Charles A. Rolled web holder. 4,877,195, Cl. 242-55.200.

Smith, Charles G.; and Cottrell, Terence B. F., to Dresser U.K. Limited, A British Company. Dry electrostatic precipitator. 4,877,427, Cl. 55-136.000.

Smith, Gaylord D.; Tassen, Curtis S.; Ganesan, Pasupathy; and Wheeler, Jack M., to Inco Alloys International, Inc. Nickel-base alloy. 4,877,461, Cl. 148-11.50N.

Smith, Gaylord D.: See—

Haeberle, Ronald M., Jr.; Smith, Gaylord D.; Weber, John H.; Fisher, Ronaldo L.; Gaul, David J.; and Hinze, Jay W., 4,877,435, Cl. 65-1.000.

Smith & Nephew, Inc.: See—

Atkins, Judy M.; Comfort, Benjamin J.; and Liebelt, Ralph A., 4,877,034, Cl. 128-664.000.

Smith, Patricia B.: See—

York, Rudy L.; Luttmer, Joseph D.; Smith, Patricia B.; and Davis, Cecil J., 4,877,757, Cl. 437-235.000.

Smith, Ralston M.: See—

Sobhani, Seyd M.; and Smith, Ralston M., 4,877,972, Cl. 307-43.000.

Smith, Stephen J., to United Technologies Corporation. Mounting a cathode ray tube for a heads-up display system. 4,878,046, Cl. 340-705.000.

Snelgrove, R. Vernon: See—

Cipriano, Robert A.; Snelgrove, R. Vernon; and McCullough, Francis P., Jr., 4,877,695, Cl. 429-102.000.

Snipes, Frank C., Jr.: See—

Marrache, Albert A.; and Snipes, Frank C., Jr., 4,876,973, Cl. 112-121.160.

Snow, Richard K.; and Ellisor, Milton W., Jr., to I.W. Industries, Inc. Method of testing protective encapsulation of structural members. 4,876,896, Cl. 73-827.000.

Snowdon, Michael; and Shapiro, Jay, to Beresford Packaging, Inc. Method of making a bag pack. 4,877,473, Cl. 156-204.000.

Sobhani, Seyd M.; and Smith, Ralston M., to Boeing Company, The. Fault tolerant modular power supply system. 4,877,972, Cl. 307-43.000.

Sobotowski, Rafal A., to Standard Oil Company. Crankshaft phasing mechanism. 4,876,992, Cl. 123-48.00R.

Societe Anonyme: Aussedat-Rey: See—

Riou, Claude R.; and Gidon, Georges M., 4,877,686, Cl. 428-514.000.

S.A. Des Etablissements Staubli (France): See—

Froment, Jean-Paul; and Palau, Joseph, 4,877,060, Cl. 139-82.000.

Societe anonyme dite: Compagnie Generale D'Automatisme CGA-HBS: See—

Delbe, Emmanuel; Gillet, Francois; Serot, Etienne; Chifflet, Raymond; Allio, Roland; Jeantin, Philippe; Del Fabro, Gilbert; and Forella, Guy, 4,877,229, Cl. 271-2.000.

Societe Anonyme: Societe Europeenne De Propulsion: See—

Chevallier, Marc; and Froger, Guy, 4,877,272, Cl. 285-111.000.

Societe Anonymes dite: SOGELERG: See—

Comte, Gilles; and Viode, Andre, 4,877,056, Cl. 137-599.000.

Societe De Prospection Et D'Inventions Techniques: See—

Almeras, Roland, 4,877,171, Cl. 227-10.000.

Societe Nouvelle Auxim: See—

Comte, Gilles; and Viode, Andre, 4,877,056, Cl. 137-599.000.

Soft Vac, Inc.: See—

Foster, David W., 4,876,762, Cl. 15-247.000.

Solomon, Frank; Genodman, Yury; and Irizarry, Jaime, to Eltech Systems Corporation. Gas diffusion electrode. 4,877,694, Cl. 429-27.000.

Solomon, Ionel: See—

Thioulouse, Pascal; and Solomon, Ionel, 4,877,995, Cl. 313-507.000.

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Solyfob Fonctions: See—

Lambert, Joel, 4,877,213, Cl. 248-451.000.

Somerville, Dean S.; and Stokkeland, Curtis T. Grain cleaner. 4,877,039, Cl. 460-97.000.

Sonobe, Tadasi: See—

Fukuda, Takuya; Mochizuki, Yasuhiro; Momma, Naohiro; Takahashi, Shigeru; Suzuki, Noboru; Sonobe, Tadasi; Chiba, Kiyosi; and Suzuki, Kazuo, 4,876,983, Cl. 118-722.000.

Sony Corporation: See—

Ando, Makoto; Kakinuma, Koichiro; Sawa, Masahiko; Ohmuro, Hideaki; and Ohryo, Akira, 4,877,946, Cl. 235-380.000.

Aratani, Katsuhisa; Nakaoki, Ariyoshi; and Tanaka, Tomiji, 4,878,132, Cl. 360-59.000.

Sorbios Verfahrenstechnische Gerate und GmbH: See—

Stiehl, Hans-Henrich; and Sebal, Thomas, 4,878,149, Cl. 361-230.000.

Soref, Richard A.: See—

Lorenzo, Joseph P.; and Soref, Richard A., 4,877,299, Cl. 350-96.140.

Sorel, Alain: See—

Barbier, Pascal; Falgat, Francis; and Sorel, Alain, 4,878,060, Cl. 343-778.000.

Sorensen, Stephen M., to Merrell Dow Pharmaceuticals Inc. Treatment of fibromyalgia. 4,877,798, Cl. 514-317.000.

Sorrentino, Gregory, to General DataComm. Inc. Captive screw and assembly. 4,877,364, Cl. 411-337.000.

Sotelo, Santiago. Kit and method for using kit to re-finish plastered constructions. 4,877,648, Cl. 427-140.000.

Sparling, Robert D., II; and Vachon, Gerard L., to Davidson Textron Inc. Washable mask process. 4,877,652, Cl. 427-264.000.

Spatial Communications, Inc.: See—

Yukl, Tex, 4,878,059, Cl. 343-753.000.

Spectra, Inc.: See—

Creagh, Linda T.; Fulton, Steven F.; Hoisington, Paul A.; Paulson, Bruce A.; Schaffer, Robert R.; and Sphrely, Charles W., Jr., 4,877,676, Cl. 428-204.000.

Spectra-Tech, Inc.: See—

Messerschmidt, Robert G.; and Sting, Donald W., 4,877,960, Cl. 250-341.000.

Sphrely, Charles W., Jr.: See—

Creagh, Linda T.; Fulton, Steven F.; Hoisington, Paul A.; Paulson, Bruce A.; Schaffer, Robert R.; and Sphrely, Charles W., Jr., 4,877,676, Cl. 428-204.000.

Speil, Walter; Schusel, Bolko; and Schmidt, Dieter, to INA Walzlager Schaeffler KG. Hydraulic play compensation element. 4,876,994, Cl. 123-90.500.

Spenny, Curtis H.: See—

Disselkoe, Allen D., Jr.; Gargiulo, Robert F.; Haywood, James E.; Heise, Keith H.; Holcomb, Darrell H.; Kramer, Stuart C.; Miller, Gregory R.; Nicholson, Jeffrey S.; Olinger, Jeffrey J.; and Spenny, Curtis H., 4,877,202, Cl. 244-122.00A.

Spetsialnoe Konstruktoro-Technologicheskoe Bjuro Katalizatorov S Optym Zavodom (Skib Katalizatorov): See—

Matros, Jury S.; Chumachenko, Viktor A.; Zudilina, Ljudmila J.; Noskov, Alexandr S.; and Bugdan, Evgeny S., 4,877,592, Cl. 423-245.100.

Spickett, Robert G. W.: See—

Vega-Noverola, Armando; Prieto Soto, Jose M.; Noguera, Fernando P.; Mauri, Jacinto M.; and Spickett, Robert G. W., 4,877,780, Cl. 514-161.000.

Spinello, Robert P., to Spinello, Robert P. Hypodermic syringe needle destroying and sterilizing apparatus and method. 4,877,934, Cl. 219-68.000.

Spiral Systems, Inc.: See—

Campbell, Jephtha E., 4,876,901, Cl. 73-863.000.

Spiratos, Nelu: See—

Haase, Dieter; and Spiratos, Nelu, 4,877,597, Cl. 423-556.000.

Sprague, Barry N.: See—

Epperly, William R.; O'Leary, John H.; Sullivan, James C.; and Sprague, Barry N., 4,877,590, Cl. 423-235.000.

Springer, Robert M.; Schmal, Richard L.; and Gavenman, Eugene H., to Ricoh Corporation. Teleconferencing system. 4,878,242, Cl. 379-204.000.

Srinivasan, Ramji: See—

Faron, Michael F.; and Srinivasan, Ramji, 4,877,917, Cl. 585-416.000.

Stacos di Saulle Lorenzo e Pontarollo Luciana s.n.c.: See—

Saulle, Lorenzo, 4,877,157, Cl. 222-387.000.

Stacheli, Christoph: See—

Schlepper, Walter; and Stacheli, Christoph, 4,876,769, Cl. 19-105.000.

Stagg, Malcolm J.; Stern, Eric P.; and Vidyarthi, Sunil, to BPCO, Inc. Reducing shrinkage of phenolic foam composites. 4,877,671, Cl. 428-139.000.

Stahl, Charles R.; Gibson, Michael A.; and Knudsen, Christian W., to Carbotech, Inc. Double wall vacuum tubing and method of manufacture. 4,876,780, Cl. 29-157.400.

Stal Refrigeration AB: See—

Glanvall, Rune, 4,877,380, Cl. 417-310.000.

Stanadyne Automotive Corp.: See—

Hodgkins, David H.; and Janik, Leon P., 4,876,990, Cl. 723-41.350.

Standard Oil Company, The: See—

Glaeser, Linda C.; Brazdil, James F., Jr.; and Toft, Mark A., 4,877,764, Cl. 502-209.000.

Papazios, Christos; Shaw, Wilfrid G.; and Callahan, James L., 4,877,898, Cl. 560-208.000.

Sobotowski, Rafal A., 4,876,992, Cl. 123-48.00R.

Stanley Works, The: See—

Govang, James A.; and Goldstein, Mark E., 4,877,137, Cl. 206-597.000.

Stant Inc.: See—

Harris, Robert S., 4,877,146, Cl. 220-85.0VR.

State of Israel, Prime Minister's Office, Israel Institute for Biological Research: See—

Velan, Baruch; Cohen, Sara; Grosfeld, Haim; and Shafferman, Avigdor, 4,877,865, Cl. 530-351.000.

STC PLC: See—

Fisher, David A., 4,878,232, Cl. 375-111.000.

Steele, Joseph A.; and Byrd, Kenneth A., to Burlington Industries, Inc. Yarn sheet transfer system. 4,876,775, Cl. 28-190.000.

Steer, Graham E.: See—

Steer, Peter L.; and Steer, Graham E., 4,876,788, Cl. 29-508.000.

Steer, Peter L.; and Steer, Graham E., to E. R. Squibb and Sons, Inc. Method of making a leakproof connection about the outlet tube of a liquid containment bag. 4,876,788, Cl. 29-508.000.

Stefani, Fabrizio: See—

Botti, Edoardo; Torazzina, Aldo; and Stefani, Fabrizio, 4,878,032, Cl. 330-263.000.

Steger, Ulrich: See—

Schmidt, Helmut; Hutter, Frank; Haas, Karl-Heinz; Obermeier, Ernst; Steger, Ulrich; Endres, Hanns-Erik; and Drost, Stephan, 4,878,015, Cl. 324-71.500.

Steigerwald, Franz: See—

Lamboy, Peter; Steigerwald, Franz; Zulauf, Karlheinz; and Ginnow-Markert, Harmut, 4,877,065, Cl. 141-18.000.

Stein, Franz, to Claas Ohg. Switching mechanism for driving self-propelling agricultural machines. 4,876,912, Cl. 74-535.000.

Stein, Judith; and Leonard, Tracey M., to General Electric Company. Self-bonding silicone caulking compositions. 4,877,828, Cl. 524-728.000.

Steiner, Gerd; Himmele, Walter; Buschmann, Ernst; Teschendorf, Hans-Juergen; and Weifenbach, Harald, to BASF Aktiengesellschaft. 5-phenyl-1,2,3a,4,5,9b-hexahydro-3H-benz(e)indoles preparation and use thereof as drugs. 4,877,807, Cl. 514-411.000.

Steiner, Richard W.: See—

Hallings, Leonard L.; and Steiner, Richard W., 4,878,156, Cl. 362-109.000.

Stemm, Howard W.: See—

Jansma, Donald; and Stemm, Howard W., 4,877,040, Cl. 131-189.000.

Stenczinger, Sandor: See—

Grimm, Istvan; Stenczinger, Sandor; Bolla, Istvan; and Csanyi, Istvan, 4,876,790, Cl. 29-603.000.

Stenudd, Sven G. V., to Facit Aktiebolag. Method of moving print elements in printheads and a printhead with moving mechanism for print elements. 4,877,342, Cl. 400-121.000.

Stephan, Werner: See—

Praefcke, Klaus; Kohne, Bernd; and Stephan, Werner, 4,877,220, Cl. 252-299.610.

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Rudnick, Dieter; Kothe, Norbert; Dichtelmuller, Herbert; Piechaczek, Detlef; Stephan, Wolfgang; and Schleussner, Hans, 4,877,866, Cl. 530-387.000.

- Stephens, David N.: See—
Biere, Helmut; Huth, Andreas; Rahtz, Dieter; Schmichen, Ralph; Seidelmann, Dieter; Stephens, David N.; Engelstoft, Mogens; and Hansen, John B., 4,877,792, Cl. 514-292.000.
- Sterling Plastic & Rubber Products, Inc.: See—
DeRosa, Angelo; and McKenna, Kevin D., 4,877,361, Cl. 410-112.000.
- Stern, Eric P.: See—
Stagg, Malcolm J.; Stern, Eric P.; and Vidyarthi, Sunil, 4,877,671, Cl. 428-139.000.
- Stessel, Helmut: See—
Buxbaum, Lothar; and Stessel, Helmut, 4,877,420, Cl. 51-309.000.
- Stetter, Jorg: See—
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- Stevens, Robert E.: See—
Norman, John A. T.; and Stevens, Robert E., 4,877,425, Cl. 55-68.000.
- Stewart, Edward T., Jr.: See—
Frank, Glenn R.; and Stewart, Edward T., Jr., 4,877,399, Cl. 433-25.000.
- Stewart, Jeff: Multi-wheeled vehicle suspension and drive mechanism, 4,877,102, Cl. 180-217.000.
- Stewart, John V.: Shower valve, 4,877,181, Cl. 236-12.170.
- Stewart, Mark R.: System of modules for composing alphanumeric, 4,877,405, Cl. 434-160.000.
- Stewart, Sandra L.: See—
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- Stewart, William J.: To Plessey Overseas Limited. Optical assay: method and apparatus, 4,877,747, Cl. 436-525.000.
- Steyn, Peter L.: See—
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- Stiehl, Hans-Henrich; and Sebald, Thomas, to Sorbios Verfahrenstechnische Geräte und GmbH. Device for generating ions in gas streams, 4,878,149, Cl. 361-230.000.
- Stillwagon, W. C.: Method and apparatus for inspecting a high speed web, 4,877,323, Cl. 356-23.000.
- Sting, Donald W.: See—
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- Stinson, Douglas G.: See—
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- Stirling, Thomas E.: See—
Haentjens, Walter D.; and Stirling, Thomas E., 4,877,532, Cl. 210-629.000.
- Stoerner, David W.: See—
Johnson, William M.; Olson, Timothy A.; Dutton, Drew J.; Lee, Sherman; and Stoerner, David W., 4,878,166, Cl. 364-200.000.
- Stokkeland, Curtis T.: See—
Somerville, Dean S.; and Stokkeland, Curtis T., 4,877,039, Cl. 460-97.000.
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- Stoll, Kurt, to Festo KG. Spool valve, 4,877,058, Cl. 137-625.480.
- Stone, Thomas W.: See—
Colwell, Robert A.; and Stone, Thomas W., 4,877,984, Cl. 310-66.000.
- Storage Technology Corporation: See—
Ward, Leonard; and Darnoff, George, 4,878,085, Cl. 355-47.000.
- Storz, Karl: See—
Kantor, Edward A.; Bercl, George; and Storz, Karl, 4,877,016, Cl. 128-6.000.
- Stout, Roger P.: See—
Michaud, Gerard H.; Graham, James H.; and Stout, Roger P., 4,876,791, Cl. 29-840.000.
- Strand Art Co., Inc.: See—
Strand, Victor, 4,877,159, Cl. 222-484.000.
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Schwamborn, Michael; Klauke, Erich; Schmidt, Robert R.; Santel, Hans-Joachim; and Strang, Robert H., 4,877,443, Cl. 71-92.000.
- Stretten, Alton O.: See—
Bradley, Graham C.; Stretten, Alton O.; Stretten, John P.; and Wentzel, Rex B., 4,878,245, Cl. 380-10.000.
- Stretten, John P.: See—
Bradley, Graham C.; Stretten, Alton O.; Stretten, John P.; and Wentzel, Rex B., 4,878,245, Cl. 380-10.000.
- Streuber, Christian: See—
Eschmann, Friedrich; and Streuber, Christian, 4,877,013, Cl. 126-110.000.
- Strick, Nathan: See—
Neurath, Alexander R.; and Strick, Nathan, 4,877,725, Cl. 435-5.000.
- Strickland, Jimmy P.: See—
Kapulka, Kenneth M.; Rader, Holly A.; and Strickland, Jimmy P., 4,878,167, Cl. 364-200.000.
- Strickland, Joyce M.: Baby bottle caddy, 4,877,128, Cl. 206-170.000.
- Strohmer, Erwin: See—
Abthoff, Joerg; Schuster, Hans-Dieter; Langer, Hans-Joachim; Strohmer, Erwin; Gabler, Rolf; and Schulte, Roland, 4,876,852, Cl. 60-275.000.
- Åstrom, Bert; and Nygård, Olof, to Aktiebolaget Bofors. Fuze, 4,876,961, Cl. 102-254.000.
- Strompl, Andras: See—
Nagy, Gabor; Neumann, Gyorgy; Kovacs, Marta; and Strompl, Andras, 4,877,199, Cl. 242-201.000.
- Strott, Douglas B.; and Kawate, Keith W., to Texas Instruments Incorporated. Torque sensing device, 4,876,899, Cl. 73-862.330.
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Duffour, Henri; Martin, Serge; and Studer, Ernst, 4,877,928, Cl. 200-144.00R.
- Stuetz, Dagobert E.: See—
Teng, Chia-Chi; and Stuetz, Dagobert E., 4,877,298, Cl. 350-96.140.
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Kelley, James O.; Stumpf, William E.; and Friedman, Frank A., 4,876,835, Cl. 52-239.000.
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Koyama, Takeaki; Ohtaka, Keiji; and Suda, Yasuo, 4,878,078, Cl. 354-402.000.
- Suda, Yoshio: See—
Tanaka, Susumu; Sato, Masaaki; Kaeriyama, Kyoji; Suda, Yoshio; and Hiraide, Takao, 4,877,852, Cl. 526-256.000.
- Suematsu, Tetsuya: See—
Fukuda, Kenichi; Mori, Takashi; Kurauchi, Yasuhiro; Doi, Masaharu; and Suematsu, Tetsuya, 4,877,498, Cl. 204-86.000.
- Suetani, Kazuhisa: See—
Nakanishi, Akio; Hino, Toshio; Iino, Yoshio; Suetani, Kazuhisa; Houki, Yoji; and Ikuta, Hirotohi, 4,878,088, Cl. 355-244.000.
- Sueyoshi, Tohru: See—
Oda, Shohci; Seshimoto, Osamu; Sueyoshi, Tohru; and Amano, Hiroyuki, 4,877,582, Cl. 422-68.000.
- Sugai, Toshiiji: See—
Satoh, Hiroaki; Koyama, Hiroyasu; Suzuki, Yoshikuni; Sugai, Toshiiji; and Watanabe, Koichi, 4,877,797, Cl. 514-314.000.
- Suganuma, Nobuo: See—
Uematsu, Michio; and Suganuma, Nobuo, 4,877,602, Cl. 424-49.000.
- Sugata, Yoshinobu: See—
Kuroda, Masami; Hattori, Yoshimasa; Furusho, Noboru; and Sugata, Yoshinobu, 4,877,703, Cl. 430-76.000.
- Sugawara, Akira: See—
Fukuda, Takeshi; Yamazaki, Shunpei; and Sugawara, Akira, 4,877,481, Cl. 156-643.000.
- Sugaya, Mamoru: See—
Senoo, Hideaki; Yamasaki, Takeshi; Satoh, Yasuo; and Sugaya, Mamoru, 4,877,688, Cl. 428-522.000.
- Sugita, Heiji, to Sugita Wire Mfg. Co., Ltd. Process for producing oil quench hardening and tempering and hard drawn steel wire of shaped section, 4,877,462, Cl. 148-12.00B.
- Sugita Wire Mfg. Co., Ltd.: See—
Sugita, Heiji, 4,877,462, Cl. 148-12.00B.
- Sugita, Yasutoshi: See—
Kotera, Masahide; Konishi, Motofumi; Ando, Yoshio; Iwaya, Toshio; Tanaka, Kanou; Hashimoto, Norio; Sugita, Yasutoshi; Sano, Yoshitaka; and Ono, Satoshi, 4,878,250, Cl. 382-56.000.
- Sugiyama, Isao: See—
Hasegawa, Masamitsu; Tamura, Satoshi; Wakashima, Takashi; and Sugiyama, Isao, 4,877,678, Cl. 428-216.000.
- Sugiyama, Shigeru: See—
Okuno, Osamu; and Sugiyama, Shigeru, 4,877,308, Cl. 350-276.00R.
- Sukamoto, Takayuki: See—
Iemura, Ryuichi; Hori, Manabu; Ohtaka, Hiroshi; Sukamoto, Takayuki; Hara, Hideaki; and Ito, Keizo, 4,877,790, Cl. 514-260.000.
- Sukeforth, Carl J.: See—
du Pont, Benjamin F.; and Sukeforth, Carl J., 4,877,407, Cl. 434-302.000.
- Suling, Carlhans: See—
Kausch, Michael; Buysch, Hans-Josef; Schroer, Hans; and Suling, Carlhans, 4,877,825, Cl. 524-101.000.
- Sullivan, James C.: See—
Epperly, William R.; O'Leary, John H.; Sullivan, James C.; and Sprague, Barry N., 4,877,590, Cl. 423-235.000.
- Epperly, William R.; and Sullivan, James C., 4,877,591, Cl. 423-235.000.
- Sumida, Isao: See—
Suzuki, Hiroaki; Kataoka, Yoshiyuki; Murase, Michio; Inoue, Kotaro; Sumida, Isao; Yamanari, Shozo; Matsumoto, Masaki; Miura, Satoshi; and Hashimoto, Koji, 4,877,574, Cl. 376-216.000.
- Sumitomo Chemical Company, Limited: See—
Enomoto, Masayuki; Nagano, Eiki; Haga, Toru; Morita, Kouichi; and Sato, Ryo, 4,877,444, Cl. 71-92.000.

- Mori, Tatsuya; Ohsami, Tadashi; Nakamura, Shigeo; Maeda, Kiyoto; Nishida, Sumio; and Takano, Hirotaka, 4,877,441, Cl. 71-90.000.
- Suzukamo, Gohfu; and Fukao, Masami, 4,877,918, Cl. 585-664.000.
- Sumitomo Electric Industries, Ltd.: See—
Yoshino, Masato, 4,877,295, Cl. 303-109.000.
- Sumitomo Naugatuck Co., Ltd.: See—
Kondo, Masatsune; Ogura, Kiyoshi; and Kuramoto, Koiti, 4,877,833, Cl. 525-64.000.
- Sumitomo Rubber Industries, Ltd.: See—
Tanigawa, Motoshi; Dohi, Hidehiko; Nishimura, Takashi; Ichikawa, Kouji; and Koishi, Tetsuo, 4,877,071, Cl. 152-165.000.
- Sun Refining and Marketing Company: See—
Lush, Richard A.; and Tsao, Hsiang-Wei, 4,877,920, Cl. 585-EE1.000.
- Sunds Defibrator Jylha Oy: See—
Karna, Juhani; and Pahlman, Heikki, 4,878,020, Cl. 324-207.000.
- Sundstrand Corporation: See—
Jones, Teddy L., 4,876,906, Cl. 74-89.150.
- Owens, William R., 4,876,854, Cl. 60-641.800.
- Sundstrand Heat Transfer, Inc.: See—
Hill, David T., 4,877,087, Cl. 165-181.000.
- Sung, Rodney L.: See—
Kapuscinaki, Maria M.; Grina, Larry D.; Jones, Ronald E.; and Sung, Rodney L., 4,877,415, Cl. 44-62.000.
- Sunohara, Izuru: See—
Katayama, Akihiro; Ohsawa, Hidefumi; Sunohara, Izuru; Hosokawa, Hiroshi; and Yoshimoto, Masahiko, 4,878,125, Cl. 358-443.000.
- Sunstrand Corp.: See—
Tysver, John D.; and Grimm, Duane, 4,877,120, Cl. 192-141.000.
- Suntory Limited: See—
Maeda, Shigeyoshi; Asai, Tsunetoshi; Asano, Hidejiro; and Taguchi, Haruyoshi, 4,877,664, Cl. 428-35.900.
- Suranyi, Robert: See—
Neu Jozsef; Csathos, Imre; Varga, Andras; Suranyi, Robert; Ilvay, Zoltan; Gaal, Sandor; Karasi, Jozsef; Sebestyen, Endre; Gardi, Eva; Siki, Karoly; Toth, Istvan; Gal, Guszt/c,acu/a/ v; Dombay, Zolt; Grega nee Toth, Mrs. Erzebet; Pavliscsak, Csaba; Tarpai, Gyula; Bonnyay, Peter; and Santha, Pal, 4,877,893, Cl. 158-86.000.
- Susumu Corporation, Ltd.: See—
Fukushima, Itaru; Okamoto, Takashi; and Deguchi, Hisashi, 4,878,065, Cl. 346-76.0PH.
- Suzukamo, Gohfu; and Fukao, Masami, to Sumitomo Chemical Company, Ltd. Process for preparing internal olefins, 4,877,918, Cl. 585-664.000.
- Suzuki, Akinori; Kajita, Toshio; and Furushima, Masakazu, to Mitsubishi Gas Chemical Company, Inc. Method and composition for increasing harvests of crops, 4,877,447, Cl. 71-103.000.
- Suzuki, Hideo, to Yamaha Corporation. Apparatus for producing rhythmically aligned tones from stored wave data, 4,876,937, Cl. 14-812.000.
- Suzuki, Hiroaki; Kataoka, Yoshiyuki; Murase, Michio; Inoue, Kotaro; Sumida, Isao; Yamanari, Shozo; Matsumoto, Masaki; Miura, Satoshi; and Hashimoto, Koji, to Hitachi, Ltd.; and Hitachi Engineering Co., Ltd. Method of and apparatus for controlling power of natural circulation reactor, 4,877,574, Cl. 376-216.000.
- Suzuki, Kazuo: See—
Fukuda, Takuya; Mochizuki, Yasuhiro; Momma, Naohiro; Takahashi, Shigeru; Suzuki, Noboru; Sonobe, Tadasi; Chiba, Kiyosi; and Suzuki, Kazuo, 4,876,983, Cl. 118-722.000.
- Namiki, Tomizo; Suzuki, Kazuo; and Shinozaki, Fumiaki, 4,877,712, Cl. 430-256.000.
- Suzuki, Masanori; and Tateishi, Kiyoshi, to Pioneer Electronic Corporation. Method and apparatus for correcting the loop gain of a servo loop in accordance with measurements during open-loop operation, 4,878,211, Cl. 369-44.000.
- Suzuki, Noboru: See—
Fukuda, Takuya; Mochizuki, Yasuhiro; Momma, Naohiro; Takahashi, Shigeru; Suzuki, Noboru; Sonobe, Tadasi; Chiba, Kiyosi; and Suzuki, Kazuo, 4,876,983, Cl. 118-722.000.
- Suzuki, Nobuyoshi: See—
Moriya, Yasuo; Suzuki, Nobuyoshi; and Goto, Hiroshi, 4,877,841, Cl. 525-286.000.
- Suzuki, Shinichi: See—
Kanamaru, Tatsuya; Nakayama, Motohiro; Arai, Katutoshi; Suzuki, Shinichi; and Naka, Ryoichi, 4,877,494, Cl. 204-28.000.
- Suzuki, Sizuo: See—
Morioka, Takayuki; Motoyama, Nobuyuki; Hoshikawa, Hiroshi; Takahashi, Takeo; Suzuki, Sizuo; Ishikawa, Toyoshi; Toyoshi, Takanori; and Ueda, Toshiko, 4,877,558, Cl. 252-626.000.
- Suzuki, Toshiharu: See—
Kitano, Kisei; Ushioda, Makoto; Uchida, Manabu; and Suzuki, Toshiharu, 4,877,548, Cl. 252-299.630.
- Suzuki, Toshihiro; Todokoro, Yasuyuki; and Komenou, Kazunari, to Fujitsu Limited. Process for the production of optical elements, 4,877,717, Cl. 430-321.000.
- Suzuki, Yasuhiro; Remington, Jack S.; Desmonts, Georges; and Thuliez, Philippe, to Research Institute of Palo Alto Medical Foundation. Method for the detection of acute-phase toxoplasma infection, 4,877,726, Cl. 435-7.000.
- Suzuki, Yasutomo: See—
Sakata, Tsuguhide; Taguchi, Tomishige; Kimura, Norio; Tsuruno, Kunio; and Suzuki, Yasutomo, 4,878,131, Cl. 360-37.100.
- Suzuki, Yoshikuni: See—
Satoh, Hiroaki; Koyama, Hiroyasu; Suzuki, Yoshikuni; Sugai, Toshiiji; and Watanabe, Koichi, 4,877,797, Cl. 514-314.000.
- Suzuki, Yoshinobu: See—
Tsuda, Yusuke; Kurata, Takashi; Suzuki, Yoshinobu; and Yamamoto, Yuji, 4,877,835, Cl. 525-67.000.
- Suzuki, Yoshiyuki, to Canon Kabushiki Kaisha. Beam recorder having a varying beam intensity for maintaining a true reproduced image, 4,878,068, Cl. 346-108.000.
- Suzuki, Yukio: See—
Yaso, Masao; Suzuki, Yukio; Shibata, Kensuke; and Hayashi, Eiichi, 4,877,875, Cl. 544-116.000.
- Yaso, Masao; Suzuki, Yukio; Shibata, Kensuke; and Hayashi, Eiichi, 4,877,877, Cl. 544-354.000.
- Svarre, Erik: See—
Jensen, Niels D.; and Svarre, Erik, 4,877,372, Cl. 415-199.100.
- Svensson, E. Gunnar, to Autopart Sweden AB. Sun visor assembly for motor vehicles, with an illuminated rear-view mirror, 4,878,158, Cl. 362-140.000.
- Swain, Howard L.: See—
Carp, Stuart L.; Swain, Howard L.; and Nguyen, Bich N., 4,878,027, Cl. 328-15.000.
- SWF Auto-Electric GmbH: See—
Andrei-Alexandru, Marcel; Bayha, Heiner; Bruhn, Rainer; and Maier, Iris, 4,876,909, Cl. 74-411.500.
- Swing-Matic AB: See—
Schell, Laszlo, 4,877,290, Cl. 297-270.000.
- Swiss Aluminium Ltd.: See—
Widrig, Jakob; and Wulff, Gunther, 4,876,825, Cl. 49-502.000.
- Swithenbank, Colin; and Fujimoto, Ted T., to Rohm and Haas Company. 4-Trifluoromethyl-4'-nitrodiphenyl ethers, 4,877,897, Cl. 560-021.000.
- Szabados, Rudolph J.: See—
Berg, Lloyd; Wendt, Knig M., and Szabados, Rudolph J., 4,877,490, Cl. 203-15.000.
- Szechenyi, Kalman, to Alcatel N.V. Fast frame and phase synchronization apparatus, 4,878,229, Cl. 375-14.000.
- Szys, Walter; and Valaitis, Joseph W., to Armstrong Rubber Company, The. Reinforced tire curing bladder and method for using same, 4,877,469, Cl. 156-123.000.
- Ta Triumph-Adler Aktiengesellschaft: See—
Haftmann, Johannes; and Schmeikal, Rudolf, 4,877,347, Cl. 400-478.000.
- Tada, Tetsuya; Nagasaka, Masumi; Teratani, Tatsuo; Miyazaki, Akira; and Takahashi, Junji, to Toyota Jidosha Kabushiki Kaisha; and Fujitsu Ten Limited. Constant-speed control device for a vehicle, 4,877,101, Cl. 180-177.000.
- Tagaki, Osamu: See—
Hayakawa, Kiyoharu; Matsumoto, Yumio; Ueda, Masashi; Sago, Akira; and Tagaki, Osamu, 4,878,084, Cl. 355-27.000.
- Taguchi, Haruyoshi: See—
Maeda, Shigeyoshi; Asai, Tsunetoshi; Asano, Hidejiro; and Taguchi, Haruyoshi, 4,877,664, Cl. 428-35.900.
- Taguchi, Kazuo: See—
Fuyama, Moriaki; Tamura, Katsumi; Taguchi, Kazuo; Onisawa, Kenichi; Sato, Akira; Hashimoto, Kenichi; Nakayama, Takahiro; and Abe, Yoshio, 4,877,994, Cl. 313-503.000.
- Taguchi, Nobuyoshi: See—
Sasaki, Isao; Kuishi, Kenji; and Taguchi, Nobuyoshi, 4,877,922, Cl. 528-272.000.
- Taguchi, Tomishige: See—
Sakata, Tsuguhide; Taguchi, Tomishige; Kimura, Norio; Tsuruno, Kunio; and Suzuki, Yasutomo, 4,878,131, Cl. 360-37.100.
- Tahara, Yoshinori, to Meisan Co., Ltd. Slitter holder having clamping mechanism for slitter blade support rod, 4,876,933, Cl. 83-482.000.
- Tai Yu Enterprise Co., Ltd.: See—
Lin, Chia-Hui, 4,877,045, Cl. 135-20.00M.
- Taig, Alistair G., to Allied-Signal Inc. One-way clutch preventing back drive of reversible motor, 4,877,113, Cl. 188-82.840.
- Taiho Kogyo Co., Ltd.: See—
Jinno, Osamu; and Fukuoka, Tatsuhiko, 4,877,813, Cl. 525-146.000.
- Taillie, Joseph P.: See—
Seachman, Ned J.; Taillie, Joseph P.; and Dir, Gary A., 4,877,310, Cl. 350-347.00E.
- Takada, Ikuko, to Kabushiki Kaisha Toshiba. Data transmission method and data transmission system free from local traffic jam, 4,878,218, Cl. 370-94.000.
- Takada, Masaki: See—
Takahashi, Mamoru; Imamura, Shigeyuki; and Takada, Masaki, 4,877,733, Cl. 435-190.000.
- Takada, Tomoaki: See—
Tatebayashi, Jun; Takada, Tomoaki; Hayashi, Kimitaka; and Kumagai, Chikanori, 4,877,397, Cl. 432-106.000.
- Takagi, Shigeyuki, to Teijin Seiki Co., Ltd. Servo system, 4,878,005, Cl. 318-621.000.
- Takagi, Takeo: See—
Nakagawa, Koji; Takagi, Takeo; Abe, Yoshiaki; and Sakai, Haruki, 4,877,370, Cl. 415-148.000.
- Takagiwa, Hiroyuki; Takahashi, Jiro; Shirose, Meizo; Akimoto, Kunio; and Uchida, Masafumi, to Konishiroku Photo Industry Co., Ltd. Process for developing latent electrostatic image using toner containing polyester resin, 4,877,704, Cl. 430-99.000.
- Takahashi, Jiro: See—
Takagiwa, Hiroyuki; Takahashi, Jiro; Shirose, Meizo; Akimoto, Kunio; and Uchida, Masafumi, 4,877,704, Cl. 430-99.000.

Takahashi, Junji: See—
Tada, Tetsuya; Nagasaka, Masumi; Teratani, Tatsuo; Miyazaki, Akira; and Takahashi, Junji, 4,877,101, Cl. 180-177.000.

Takahashi, Koji: See—
Masui, Toshiyuki; Kashida, Motokazu; Takahashi, Koji; and Nagasawa, Kenichi, 4,878,134, Cl. 360-77.150.
Yasumura, Hiroto; Hirasawa, Masahide; Noji, Minoru; Kozuki, Susumu; Takahashi, Koji; Yoshimura, Katsuji; and Sasatani, Tomohiko, 4,878,128, Cl. 358-315.000.

Takahashi, Kunihiro, to Nec Corporation. Microwave relay station having a common standby channel for signals of different types of modulation. 4,878,228, Cl. 375-3.000.

Takahashi, Mamoru; Imamura, Shigeyuki; and Takada, Masaki, to Toyo Jozo Kabushiki Kaisha. Glucose dehydrogenase and its production. 4,877,733, Cl. 435-190.000.

Takahashi, Masatomo: See—
Miura, Shigeo; Takahashi, Masatomo; Yoshino, Motoaki; Watanabe, Tsunehiro; Toyama, Takeshi; and Takahashi, Taketo, 4,878,123, Cl. 358-401.000.

Takahashi, Shigeru: See—
Fukuda, Takuya; Mochizuki, Yasuhiro; Momma, Naohiro; Takahashi, Shigeru; Suzuki, Noboru; Sonobe, Tadasi; Chiba, Kiyosi; and Suzuki, Kazuo, 4,876,983, Cl. 118-722.000.

Takahashi, Takeo: See—
Morioka, Takayuki; Motoyama, Nobuyuki; Hoshikawa, Hiroshi; Takahashi, Takeo; Suzuki, Sizuo; Ishikawa, Toshiyoshi; Toyoshi, Takanori; and Ueda, Toshio, 4,877,558, Cl. 252-626.000.

Takahashi, Takeshi: See—
Kodama, Akinori; and Takahashi, Takeshi, 4,877,149, Cl. 220-267.000.

Takahashi, Taketo: See—
Miura, Shigeo; Takahashi, Masatomo; Yoshino, Motoaki; Watanabe, Tsunehiro; Toyama, Takeshi; and Takahashi, Taketo, 4,878,123, Cl. 358-401.000.
Ohsaki, Saburo; Takahashi, Taketo; and Miki, Toshihiro, 4,877,962, Cl. 250-442.100.

Takahashi, Yuzuru: See—
Kakehi, Nobuo; Takahashi, Yuzuru; Higuchi, Norio; Izumihara, Yoshikazu; Matsumoto, Hiromi; and Uehori, Yuji, 4,876,874, Cl. 72-199.000.

Takakura, Masaki; Hayasaki, Hideto; Takemura, Hideo; Izumi, Masao; Iwasaki, Keisuke; Noguchi, Yoji; Yamane, Yasukuni; and Kako, Noritoshi, to Sharp Kabushiki Kaisha. Image processing device. 4,878,178, Cl. 364-521.000.

Takamatsu, Toshiaki, to Sharp Kabushiki Kaisha. Color liquid crystal display unit. 4,877,309, Cl. 350-337.000.

Takami, Hiroaki: See—
Yarita, Takao; Komori, Hideo; Ogasawara, Koji; and Takami, Hiroaki, 4,877,061, Cl. 139-224.00R.

Takamura, Yoshiyuki, to Fuji Pack System Ltd. Bag covering apparatus. 4,876,840, Cl. 53-137.000.

Takano, Hirotaka: See—
Mori, Tatsuya; Ohsumi, Tadashi; Nakamura, Shigeo; Maeda, Kiyoto; Nishida, Sumio; and Takano, Hirotaka, 4,877,441, Cl. 71-90.000.

Takano, Kazuya: See—
Noguchi, Takeshi; Takano, Kazuya; and Kikuchi, Takasini, 4,877,225, Cl. 267-140.100.

Takase, Muneaki: See—
Cai, Jun-Chao; and Takase, Muneaki, 4,877,803, Cl. 514-227.800.

Takasugi, Hisashi: See—
Takaya, Takao; Masugi, Takashi; Takasugi, Hisashi; and Kochi, Hiromu, 4,877,873, Cl. 544-227.000.

Takaya, Takao; Masugi, Takashi; Takasugi, Hisashi; and Kochi, Hiromu, to Fujisawa Pharmaceutical Co., Ltd. Syn-isomer of 3,7-disubstituted-3-cephem-4-carboxylic acid compounds and processes for the preparation thereof. 4,877,873, Cl. 544-227.000.

Takeda Chemical Industries, Ltd.: See—
Iga, Katsumi; Hamaguchi, Naoru; and Ogawa, Yasuaki, 4,877,561, Cl. 264-4.300.

Togami, Ikuo; Yamaguchi, Takamasa; Oka, Masahide; and Shirafuji, Hideo, 4,877,735, Cl. 435-138.000.

Takehana, Takamichi; Murayama, Osamu; Nakajima, Hideaki; Yamada, Masatoshi; and Hamada, Makoto, to Chionon Kabushiki Kaisha. Camera zoom lens automatic magnification apparatus. 4,878,080, Cl. 354-403.000.

Takematsu, Takaharu: See—
Yamashita, Tohru; and Takematsu, Takaharu, 4,878,137, Cl. 360-78.000.

Takemura, Hideo: See—
Takakura, Masaki; Hayasaki, Hideto; Takemura, Hideo; Izumi, Masao; Iwasaki, Keisuke; Noguchi, Yoji; Yamane, Yasukuni; and Kako, Noritoshi, 4,878,178, Cl. 364-521.000.

Takeuchi, Akira: See—
Teranishi, Mitsui; Watanabe, Yasuo; and Takeuchi, Akira, 4,878,176, Cl. 364-468.000.

Takeuchi, Yoshihiko: See—
Yatsuda, Hiromi; Takeuchi, Yoshihiko; Kohda, Toichi; and Yoshikawa, Shokichi, 4,878,036, Cl. 333-195.000.

Takigawa, Masuhiko: See—
Ikebe, Takashi; and Takigawa, Masuhiko, 4,877,018, Cl. 128-81.00R.

Takimoto, Hiroyuki, to Canon Kabushiki Kaisha. Information signal reproducing apparatus in which a plurality of heads are selectively used. 4,878,133, Cl. 360-64.000.

Takino, Tetsuji: See—
Yamato, Osamu; and Takino, Tetsuji, 4,877,493, Cl. 204-15.000.

Talley Automotive Products, Inc.: See—
Cuevas, Jess, 4,877,264, Cl. 280-731.000.

Tamaru, Akio; and Izumisawa, Yoshiaki, to Mitsubishi Chemical Industries Limited. Process for preparing terephthalic acid of high quality. 4,877,900, Cl. 562-413.000.

Tamaru, Sinji; Kubo, Motonobu; and Kashiwagi, Masato, to Daikin Industries, Ltd. Fluorine-containing novolak resin and derivative thereof. 4,877,859, Cl. 528-129.000.

Tamura, Akihiko: See—
Yazaki, Jinichi; and Tamura, Akihiko, 4,877,662, Cl. 428-36.700.

Tamura, Katsumi: See—
Fuyama, Moriaki; Tamura, Katsumi; Taguchi, Kazuo; Onisawa, Kenichi; Sato, Akira; Hashimoto, Kenichi; Nakayama, Takahiro; and Abe, Yoshio, 4,877,994, Cl. 313-503.000.

Tamura, Satoshi: See—
Hasegawa, Masamitsu; Tamura, Satoshi; Wakashima, Takashi; and Sugiyama, Isao, 4,877,678, Cl. 428-216.000.

Tamura, Shigeki, to Foxtek Corporation of Japan. Variable resistor. 4,878,040, Cl. 338-158.000.

Tamura, Yasuji, to Sanden Corporation. Slip detecting device for apparatus driven by a prime mover. 4,877,118, Cl. 192-103.00R.

Tanahashi, Haruhiko; Tsukamoto, Yoshikazu; and Miyakawa, Shinji, to Tokai Rubber Industries, Ltd.; and Toyota Jidosha Kabushiki Kaisha. Cylindrical upper support for shock absorber. 4,877,262, Cl. 280-424.000.

Tanaka, Hiroshi; Murata, Yasuaki; and Eto, Kazumi, to Kabushiki Kaisha Toshiba. Defrost-water vaporizer of a refrigerator. 4,876,861, Cl. 62-279.000.

Tanaka, Hisami: See—
Hiro, Masaaki; Kimura, Tomohiro; Tanaka, Hisami; Kashimura, Noboru; Tanaka, Shigemori; Tohma, Hitoshi; and Hisamura, Masafumi, 4,877,701, Cl. 430-59.000.

Tanaka, Kanou: See—
Kotera, Masahide; Konishi, Motofumi; Ando, Yoshio; Iwaya, Toshio; Tanaka, Kanou; Hashimoto, Norio; Sugita, Yasutoshi; Sano, Yoshitaka; and Ono, Satoshi, 4,878,230, Cl. 382-56.000.

Tanaka, Norio: See—
Hagihara, Hisao; Banno, Takayuki; Miya, Shigenori; and Tanaka, Norio, 4,876,778, Cl. 29-157.30A.

Tanaka, Shigemori: See—
Hiro, Masaaki; Kimura, Tomohiro; Tanaka, Hisami; Kashimura, Noboru; Tanaka, Shigemori; Tohma, Hitoshi; and Hisamura, Masafumi, 4,877,701, Cl. 430-59.000.

Tanaka, Susumu; Sato, Masaaki; Kaeriyama, Kyoji; Suda, Yoshio; and Hiraide, Takao, to Agency of Industrial Science and Technology; and Ministry of International Trade and Industry. Thiophene derivative polymer and a polymer composition thereof. 4,877,852, Cl. 526-256.000.

Tanaka, Tomiji: See—
Aratani, Katsuhisa; Nakaoki, Ariyoshi; and Tanaka, Tomiji, 4,878,132, Cl. 360-59.000.

Tanaka, Tsuneo: See—
Hanada, Koji; Sawamura, Masashi; Yoshikawa, Takeshi; Nishashi, Hiroyuki; and Tanaka, Tsuneo, 4,877,681, Cl. 428-336.000.

Tanaka, Yoshio; and Saitou, Shirou, to Kureha Chemical Industry Co., Ltd. Ultraviolet sterilizing apparatus. 4,877,964, Cl. 250-455.100.

Tanaka, Yutaka: See—
Yagoto, Mitsutoshi; Hamada, Akiyoshi; Mino, Masayuki; Tanaka, Yutaka; and Watanabe, Yutaka, 4,878,067, Cl. 346-108.000.

Taneya, Mototaka: See—
Morimoto, Taiji; Hosoba, Hiroyuki; Matsumoto, Mitsuhiro; Taneya, Mototaka; and Matsui, Sadayoshi, 4,878,223, Cl. 372-50.000.

Tange, Keigo: See—
Matsushita, Kouji; Tange, Keigo; and Yuge, Shizuo, 4,878,082, Cl. 355-208.000.

Tani, Hiroji; Kasanami, Tohru; and Yokoi, Tsutomu, to Murata Manufacturing Co., Ltd. Method of manufacturing circuit component such as stator for variable resistor. 4,877,565, Cl. 264-105.000.

Tani, Hiroji: See—
Honma, Kanehito; Yokoi, Tsutomu; and Tani, Hiroji, 4,877,554, Cl. 252-511.000.

Tanigawa, Junichi; and Kikuchi, Shoji, to AMP Incorporated. Hinged electrical connector. 4,877,409, Cl. 439-31.000.

Tanigawa, Motoaki; Dohi, Hidehiko; Nishimura, Takashi; Ichikawa, Kouji; and Koishi, Tetsuo, to Sumitomo Rubber Industries, Ltd. Three layer cushion tire. 4,877,071, Cl. 152-165.000.

Taniguchi, Masakazu; Hirose, Masayoshi; Baba, Masatoshi; Hirata, Kiminori; and Ochiai, Yoshinori, to Nissan Chemical Industries. Benzylthio pyridazinone derivatives, preparation thereof, and insecticidal acaricidal, fungicidal compositions. 4,877,787, Cl. 514-247.000.

Taniguchi, Nobuyuki; Karasaki, Toshihiko; Mukai, Hiromu; Tokumaru, Hisashi; and Ishida, Tokuji, to Minolta Camera Kabushiki Kaisha. Exposure controlling system and interchangeable lens therefor. 4,878,076, Cl. 354-286.000.

Tanoue, Yoshihiro: See—
Tsuiji, Masayoshi; Nakagawa, Akira; Inoue, Hisataka; Hachiya, Terumi; Tanoue, Yoshihiro; Ikese, Kouichi; Saita, Masaru; Mizoguchi, Takenobu; Aoki, Tetsuo; Sato, Hironobu; and Noda, Kanji, 4,877,876, Cl. 544-133.000.

Tarnopolsky, Giora J.: See—
Gill, Hardayal S.; Hesterman, Victor W.; Tarnopolsky, Giora J.; and Tran, Lung T., 4,878,140, Cl. 360-113.000.

Tarpai, Gyula: See—
Nou Jozsef; Csontos, Imre; Varga, Andras; Suranyi, Robert; Ilovai, Zoltan; Gaal, Sandor; Karsai, Jozsef; Sebestyen, Endre; Gardi, Eva; Siki, Karoly; Toth, Istvan; Gal, Gusztav; Dombay, Zsolt; Grega, nee Toth, Mrs. Erzsébet; Pavlicsak, Csaba; Tarpai, Gyula; Bonnyay, Peter; and Santha, Pal, 4,877,893, Cl. 558-86.000.

Tassen, Curtis S.: See—
Smith, Gaylord D.; Tassen, Curtis S.; Ganesan, Pasupathy; and Wheeler, Jack M., 4,877,461, Cl. 148-11.50N.

Tatano, Toshio: See—
Miike, Akira; Katsumata, Yukio; and Tatano, Toshio, 4,877,727, Cl. 435-24.000.

Tatebayashi, June; Takada, Tomoaki; Hayashi, Kimitaka; and Kumagai, Chikanori, to Kawasaki Jukogyo Kabushiki Kaisha. Plant for manufacturing cement clinker. 4,877,397, Cl. 432-106.000.

Tateishi, Kiyoshi: See—
Suzuki, Masanori; and Tateishi, Kiyoshi, 4,878,211, Cl. 369-44.000.

Tatsuta, Kuniaki: See—
Umezawa, Hamao, deceased; Tatsuta, Kuniaki; Kawai, Hiroyuki; and Nakajima, Shobachi, 4,877,870, Cl. 536-6.400.

Taut Inc.: See—
McFarlane, Richard H., 4,877,394, Cl. 425-567.000.

Tayama, Suehiro: See—
Azeгами, Kiyotaka; Tayama, Suehiro; Yamamoto, Naoki; Yanagase, Akira; and Hatakeyama, Hiroki, 4,877,687, Cl. 428-520.000.

Tayco Developments, Inc.: See—
Taylor, Paul H., 4,877,114, Cl. 188-285.000.
Taylor, Paul H., 4,877,226, Cl. 267-196.000.

Taylor, Bruce G.: See—
Petrucchi, Raymond M.; Taylor, Bruce G.; Giordano, Edward C.; Padiali, James M.; and Palmer, Carl, 4,877,521, Cl. 210-171.000.

Taylor, Jim. Automatic ball pitcher. 4,877,243, Cl. 273-26.00R.

Taylor, Larry G.: See—
Ray, Donald K.; and Taylor, Larry G., 4,878,236, Cl. 379-37.000.

Taylor, Paul H., to Tayco Developments, Inc. Adjustable fluid amplified shock absorber. 4,877,114, Cl. 188-285.000.

Taylor, Paul H., to Tayco Developments, Inc. Fluid shock absorber constructions. 4,877,226, Cl. 267-196.000.

Taylor, Peter J., to Plessey Overseas Limited. Rotary pump system. 4,877,377, Cl. 417-89.000.

Taylor, Stephen C., to Imperial Chemical Industries plc. Production of cells. 4,877,740, Cl. 435-253.300.

Taylor, Terence: See—
Toner, Paul D.; and Taylor, Terence, 4,878,169, Cl. 364-413.190.

Taylor, William P. Reclining chair. 4,877,291, Cl. 297-321.000.

TD Quilting Machinery: See—
Brower, David; and Jernigan, Thomas K., 4,876,976, Cl. 112-262.300.

Teague, Ralph T., Jr., to Yale Security Inc. Closer having door position indicator. 4,876,764, Cl. 16-71.000.

Technimed Corporation: See—
Aronowitz, Jack L.; and Terminiello, Louis, 4,877,580, Cl. 422-58.000.

Technology Development Associates, Inc.: See—
Karpuk, Michael E.; and Cowley, Scott W., 4,876,989, Cl. 123-3.000.

Tecron Industries Limited: See—
Wilson, Keith Andrew; and Kline, Ronald Ian, 4,877,562, Cl. 264-22.000.

Tecumseh Products Company: See—
Johnson, William C.; and Richardson, Hubert, Jr., 4,877,381, Cl. 418-55.000.

Teh Yor Industrial Co., Ltd.: See—
Chun-cheng, Huang, 4,876,795, Cl. 30-254.000.

Teijin Seiki Co., Ltd.: See—
Takagi, Shigeyuki, 4,878,005, Cl. 318-621.000.
Toshio, Kamimura; and Koji, Ito, 4,877,052, Cl. 137-512.300.

Teleco Oilfield Services Inc.: See—
Grosso, Donald S.; Bryant, Thomas M.; and Gershonowitz, Mitchell S., 4,878,206, Cl. 367-83.000.

Helm, Charles W.; and Koval, Vernon E., 4,877,092, Cl. 175-74.000.

Telefind Corp.: See—
Andros, Andrew A.; Campana, Thomas J., Jr.; Thelen, Gary F.; and Kinast, Robert A., 4,878,051, Cl. 340-825.440.

Telefunken electronic GmbH: See—
Flodl, Helmut, 4,877,460, Cl. 136-244.000.

Telene Corporation: See—
Rogers, William P., 4,878,215, Cl. 370-58.100.

Telephone Connection, The: See—
Solomon, Merrill; and Kimball, John, 4,878,239, Cl. 379-67.000.

Tencor Instruments: See—
Fein, Michael E., 4,877,997, Cl. 313-634.000.

Teng, Chia-Chi; and Stuetz, Dagobert E., to Hoechst Celanese Corporation. Thin film waveguide electrooptic modulator. 4,877,298, Cl. 350-96.140.

Teng, Chih-Sieh; Liou, Tian-I; and Chun-Min, Hsiekyung, to National Semiconductor Corporation. Method of forming an N+ poly-to-N+ silicon capacitor structure utilizing a deep phosphorous implant. 4,877,751, Cl. 437-47.000.

Teranishi, Mitsui; Watanabe, Yasuo; and Takeuchi, Akira, to ASICS Corporation. Production process control system. 4,878,176, Cl. 364-468.000.

Teratani, Tatsuo: See—
Tada, Tetsuya; Nagasaka, Masumi; Teratani, Tatsuo; Miyazaki, Akira; and Takahashi, Junji, 4,877,101, Cl. 180-177.000.

Terbrack, Ulrich: See—
Siol, Werner; Heil, Ernst; Wenzel, Franz; Arndt, Peter J.; and Terbrack, Ulrich, 4,877,853, Cl. 526-329.700.

Ter Burg, Antonius W. M.: See—
van Calker, Freerk R.; Koppels, Pieter J. M.; and Ter Burg, Antonius W. M., 4,877,126, Cl. 198-847.000.

Terminiello, Louis: See—
Aronowitz, Jack L.; and Terminiello, Louis, 4,877,580, Cl. 422-58.000.

Terrill, Rufus O. Sight mounting platform for colt M-16/AR-15 rifle. 4,876,815, Cl. 42-100.000.

Teschendorf, Hans-Juergen: See—
Steiner, Gerd; Himmele, Walter; Buschmann, Ernst; Teschendorf, Hans-Juergen; and Weifenbach, Harald, 4,877,807, Cl. 514-411.000.

Tetra Pak International AB: See—
Derving, Jackie, 4,877,160, Cl. 222-494.000.

Texaco, Inc.: See—
Doering, John P., 4,877,142, Cl. 215-1.00C.
Kapusinski, Maria M.; Grina, Larry D.; Jones, Ronald E.; and Sung, Rodney L., 4,877,415, Cl. 44-62.000.
Liu, Christopher S.; Clarke, Donald J.; and Grina, Larry D., 4,877,834, Cl. 525-66.000.
Martin, Michael C.; McCracken, Beth E.; and Gulko, George M., 4,876,987, Cl. 122-504.200.
Pasternak, Mordechai; Bartels, Craig R.; and Reale, John, Jr., 4,877,529, Cl. 210-500.370.

Texas Instruments Incorporated: See—
Darley, Henry M.; Gill, Michael C.; Earl, Dale C.; Ngo, Dinh T.; Wang, Paul C.; Hipona, Maria B. L.; and Dondri, Jim, 4,878,190, Cl. 364-752.000.
Freeman, Dean W., 4,877,753, Cl. 437-101.000.
Gibbons, Robert C.; and Cottle, Wilbur W., 4,877,317, Cl. 350-559.000.
Havemann, Robert H., 4,877,748, Cl. 437-31.000.
Hynecek, Jaroslav, 4,878,121, Cl. 358-213.220.
McDavid, James M., 4,878,100, Cl. 357-23.300.
Reed, Mark A.; and Frazier, Gary A., 4,878,104, Cl. 357-30.000.
Rodder, Mark S., 4,877,755, Cl. 437-200.000.
Strott, Douglas B.; and Kawate, Keith W., 4,876,899, Cl. 73-862.330.

York, Rudy L.; Luttmer, Joseph D.; Smith, Patricia B.; and Davis, Cecil J., 4,877,757, Cl. 437-235.000.

Thannisch, Klaus, to Zeller Plastik Koehn, Graebner & Co. Plastic threaded sleeve. 4,877,144, Cl. 215-330.000.

Thatcher, Alan J. Spin trimming machine with object positioning. 4,876,930, Cl. 62-46.000.

Thekkelkandam, Joseph T.: See—
Cockrell, John R., Jr.; and Thekkelkandam, Joseph T., 4,877,459, Cl. 134-40.000.

Thelen, Gary F.: See—
Andros, Andrew A.; Campana, Thomas J., Jr.; Thelen, Gary F.; and Kinast, Robert A., 4,878,051, Cl. 340-825.440.

Thenoz, Yves: See—
Cazaux, Yvon; Herault, Didier; Thenoz, Yves; and Blanchard, Pierre, 4,878,103, Cl. 357-24.000.

Thermo-Aire Systems, Inc.: See—
Fairchild, Paul W.; Clancy, Jim L.; Fields, William G.; Bishop, Louis, Jr.; and Fly, Mark W., 4,876,949, Cl. 98-40.100.

Thiel, Timothy E.: See—
Saulnier, Gary J.; Herrera, Randy G.; and Thiel, Timothy E., 4,878,029, Cl. 329-341.000.

Thinking Machines Corporation: See—
Hillis, W. Daniel, 4,878,109, Cl. 358-42.000.

Thioulouse, Pascal; and Solomon, Ionel, to Etat Francais Represente par le Ministre des PTT. Electroluminescent display device using hydrogenated and carbonated amorphous silicon. 4,877,993, Cl. 313-507.000.

Thise, Marie R.; and Reuter, Rene F., to Goodyear Tire & Rubber Company. The cables and tires reinforced by said cables. 4,877,073, Cl. 152-451.000.

Thomas, Robert L.; Kuo, Pao-Kuang; and Favro, Lawrence D., to Wayne State University. Vector lock-in imaging system. 4,878,116, Cl. 358-160.000.

Thomas Smith Co. Inc.: See—
Harris, Carl B., 4,877,050, Cl. 137-315.000.

Thompson, Robert I.: See—
Saxe, Robert L.; and Thompson, Robert I., 4,877,313, Cl. 350-391.000.

Thompson, Stanley C. Golf club head and method of strengthening same. 4,877,249, Cl. 273-169.000.

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Deffayet, Jean, 4,876,963, Cl. 102-387.000.

Thomson-CSF: See—
Cazaux, Yvon; Herault, Didier; Thenoz, Yves; and Blanchard, Pierre, 4,878,103, Cl. 357-24.000.
Huignard, Jean P.; and Heriau, Jean P., 4,877,312, Cl. 350-354.000.
Sauzade, Jean-Denis; and L'Hote, Manuel, 4,878,152, Cl. 361-386.000.

Thomson Semiconducteurs: See—
Bocquet, Cristian, 4,878,195, Cl. 364-900.000.

Thorn Emi Electronics Limited: See—
Bradford, William R., 4,877,315, Cl. 350-451.000.

Thrall Car Manufacturing Company: See—
Lindauer, Thomas W.; and Jamroz, Richard E., 4,876,968, Cl. 105-415.000.

Thulliez, Philippe: See—
Suzuki, Yasuhiro; Remington, Jack S.; Desmonts, Georges; and Thulliez, Philippe, 4,877,726, Cl. 435-7.000.

Thurston-Slocum, Debra: See—
Heatzig, Eric; Slocum, Alexander; and Thurston-Slocum, Debra, 4,878,002, Cl. 318-568.200.

Thyme Tech Co., Ltd.: See—
Yano, Kazuo, 4,877,219, Cl. 251-149.200.

Tibbitts, Gordon A., to Eastman Christensen Company. Replaceable cutter using internal ductile metal receptacles, 4,877,096, Cl. 175-410.000.

Tidel Systems, Inc.: See—
Robinson, Larry A.; and Robinson, Richard R., 4,877,235, Cl. 271-279.000.

Tiitola, Antti-Jussi; and Pohja, Kari, to Karhu-Titan Oy. Shoe, method for manufacturing the same, and sole blank therefor, 4,876,807, Cl. 36-114.000.

Tillotson Ltd.: See—
Kenny, Brian P.; and Bowles, Roger A., 4,877,560, Cl. 261-35.000.

Timken Company, The: See—
Hoeprich, Michael R., 4,877,340, Cl. 384-571.000.

Timperi, Juikka; Vesala, Reijo; and Vikman, Vesa, to Ahlstrom Corporation. Fluidizing centrifugal pump, 4,877,368, Cl. 415-143.000.

Tinti, Jean M.: See—
Nofre, Claude; Tinti, Jean M.; and Chatzopoulos, Faroudja O., 4,877,895, Cl. 558-413.000.

Tobita, Michiaki: See—
Sakaki, Mamoru; Arai, Ryuichi; Akiya, Takashi; Toganoh, Shigeo; Higuma, Masahiko; Eto, Naonobu; Mouri, Hidemasa; Tobita, Michiaki; Ishida, Masahiko; and Kono, Shunzo, 4,877,680, Cl. 428-332.000.

Todd, Paul H., Jr., to Kalamazoo Holdings, Inc. Herb flavoring and/or antioxidant composition and process, 4,877,635, Cl. 426-542.000.

Todokoro, Yasuyuki: See—
Suzuki, Toshihiro; Todokoro, Yasuyuki; and Komenou, Kazunari, 4,877,717, Cl. 430-321.000.

Toei, Junichi; and Baba, Nobuyuki, to Tosho Corporation. Liquid supply apparatus, 4,877,522, Cl. 210-198.200.

Toft, Mark A.: See—
Glaser, Linda C.; Brazdil, James F., Jr.; and Toft, Mark A., 4,877,764, Cl. 502-209.000.

Togane, Hikohiro, to Mitsubishi Denki Kabushiki Kaisha. Low loss oxide magnetic material, 4,877,543, Cl. 252-62.640.

Toganoh, Shigeo: See—
Sakaki, Mamoru; Arai, Ryuichi; Akiya, Takashi; Toganoh, Shigeo; Higuma, Masahiko; Eto, Naonobu; Mouri, Hidemasa; Tobita, Michiaki; Ishida, Masahiko; and Kono, Shunzo, 4,877,680, Cl. 428-332.000.

Togashi, Kenji: See—
Matsuda, Kenji; Togashi, Kenji; Umemura, Hiroyuki; Okada, Tetsuji; Ishioka, Hidenori; and Aoki, Katsuyuki, 4,877,183, Cl. 236-49.300.

Tohma, Hitoshi: See—
Hiro, Masaki; Kimura, Tomohiro; Tanaka, Hisami; Kashimura, Noboru; Tanaka, Shigemori; Tohma, Hitoshi; and Hisamura, Masafumi, 4,877,701, Cl. 430-59.000.

Toho Titanium Co., Ltd.: See—
Okudaira, Shigenori; Irie, Takefumi; Uchida, Hiroshi; Fukasawa, Eiichi; Kobayashi, Kazuhiko; and Yamaguchi, Masanori, 4,877,445, Cl. 75-0.50B.

Tojo, Tetsuo; Nakahara, Takashi; Otawa, Yasuhiko; and Okamoto, Katsuo, to Mitsui Petrochemical Industries, Ltd. Chlorinated rubber, 4,877,817, Cl. 521-142.000.

Tokai Rubber Industries, Ltd.: See—
Tanahashi, Haruhiko; Tsukamoto, Yoshikazu; and Miyakawa, Shinji, 4,877,262, Cl. 280-668.000.

Tokai Seiki Co., Ltd.: See—
Sakai, Shigekazu, 4,876,957, Cl. 101-128.400.

Tokai Shoji Co., Ltd.: See—
Sakai, Shigekazu, 4,876,957, Cl. 101-128.400.

Tokuda, Manabu: See—
Chikamune, Kaoru; Tokuda, Manabu; Inoue, Kazuo; Utsunomiya, Kyoshi; and Hitofude, Yoshii, 4,877,456, Cl. 106-270.000.

Tokumaru, Hisashi: See—
Taniguchi, Nobuyuki; Karasaki, Toshihiko; Mukai, Hiromu; Tokumaru, Hisashi; and Ishida, Tokuji, 4,878,076, Cl. 354-286.000.

Tokunaga, Norikazu: See—
Yamato, Ikuo; Tokunaga, Norikazu; Matsuda, Yasuo; and Amano, Hisao, 4,878,163, Cl. 363-8.000.

Tokunaga, Shigeo: See—
Inaba, Yoshiharu; and Tokunaga, Shigeo, 4,877,388, Cl. 425-150.000.

Tokutomi, Katsuya: See—
Ishikawa, Toshikatsu; Tokutomi, Katsuya; and Imai, Yoshikazu, 4,877,643, Cl. 427-57.000.

Tokuyama Soda Kabushiki Kaisha: See—
Hattori, Norikazu; Urabe, Sunao; and Kusumoto, Koshi, 4,877,854, Cl. 528-15.000.

Tokyo Gas Kabushiki Kaisha: See—
Higuchi, Kuma; Morinaga, Akio; Seshimo, Masahiro; and Saito, Hitoshi, 4,877,665, Cl. 428-36.100.

Toman, Perry A., to Glidden Company. The. High solids coatings with reactive epoxy ester diluent, 4,877,838, Cl. 525-107.000.

Tomei, L. David; Cornhill, Fred; Jagadeesh, Jogikal; and Boninger, Michael, to Ohio State University Research Foundation. Method and apparatus for the measurement of low-level laser-induced fluorescence, 4,877,966, Cl. 250-458.100.

Tomiyoshi, Kazutoshi: See—
Itoh, Kunio; Shiobara, Toshio; Futatsumori, Koji; Tomiyoshi, Kazutoshi; and Shimizu, Hisashi, 4,877,822, Cl. 523-433.000.

Tomizawa, Takashi: See—
Hayakawa, Kiyoharu; and Tomizawa, Takashi, 4,878,083, Cl. 355-27.000.

Toner, Paul D.; and Taylor, Terence, to Atomic Energy of Canada Limited-Energie Atomique Du Canada Limitee. Region of interest tomography employing a differential scanning technique, 4,878,169, Cl. 364-413.190.

Topre Corporation: See—
Isoda, Noriyuki; and Okamoto, Yuji, 4,878,056, Cl. 341-26.000.

Torazina, Aldo: See—
Botti, Edoardo; Torazina, Aldo; and Stefani, Fabrizio, 4,878,032, Cl. 330-263.000.

Torii, Nobutoshi; Mizuno, Hitoshi; and Iwasaki, Kyoji, to Fanuc Ltd. Apparatus for dealing with cables in industrial robots, 4,877,973, Cl. 307-147.000.

Torimi, Akira: See—
Kuno, Toshio; Shindo, Yoshikazu; Kuno, Yukio; Ueno, Takeshi; Torimi, Akira; and Mori, Yoji, 4,876,952, Cl. 98-121.200.

Torras, Robert M., to Kut Kwick Corporation. Mower with tandem pumps, 4,876,846, Cl. 56-11.900.

Torras, Robert M.: See—
Sturgill, James D., 4,876,845, Cl. 56-6.000.

Torre, Joseph J., to Pacific Atlantic Products, Ltd. Temperature sensing system, 4,877,330, Cl. 374-136.000.

Toshiaki, Kikuchi; Mochizuki, Toshihiro; Ito, Yasutoshi; and Yamana, Tohru, to Murakami Kaimeido Co., Ltd. Holding device of mirror element for rearview mirror, 4,877,214, Cl. 248-483.000.

Toshiba Silicone Co., Ltd.: See—
Nagaoka, Hisayuki; Zenbayashi, Michio; and Shimizu, Chiyuki, 4,877,855, Cl. 528-26.000.

Toshimitsu, Kazushige: See—
Noguchi, Kunio; Koike, Yuzuru; and Toshimitsu, Kazushige, 4,877,006, Cl. 123-589.000.

Toshio, Kamimura; and Koji, Ito, to Teijin Seiki Co., Ltd. Check valve, 4,877,052, Cl. 137-512.300.

Tosho Corporation: See—
Toei, Junichi; and Baba, Nobuyuki, 4,877,522, Cl. 210-198.200.

Total Compagnie Francaise des Petroles: See—
Roussel, Michel; and Baffreau, Daniel, 4,877,452, Cl. 106-97.000.

Toth, Istvan: See—
Neu Jozsef; Csontos, Imre; Varga, Andras; Suranyi, Robert; Illovi, Zoltan; Gaal, Sandor; Karsai, Jozsef; Sebestyen, Endre; Gardi, Eva; Siki, Karoly; Toth, Istvan; Gal, Guszt/eacu/a/ v; Dombay, Zsolt; Grega nec Toth, Mrs. Ersebet; Pavliscsak, Csaba; Tarpai, Gyula; Bonnyay, Peter; and Santha, Pal, 4,877,893, Cl. 558-86.000.

Toth, William D.: See—
Nobile, John R.; Ross, William A.; and Toth, William D., 4,876,959, Cl. 101-233.000.

Totsuka, Masao: See—
Isobata, Junji; Totsuka, Masao; and Nakamura, Yoshiharu, 4,878,086, Cl. 355-77.000.

Townsend Industries, Inc.: See—
Townsend, Robert T., 4,876,958, Cl. 101-175.000.

Townsend, Robert T., to Townsend Industries, Inc. Swing apparatus for an offset press auxiliary print unit, 4,876,958, Cl. 101-175.000.

Toyama, Takeshi: See—
Miura, Shigeo; Takahashi, Masatomo; Yoshino, Motoaki; Watanabe, Tsunehiro; Toyama, Takeshi; and Takahashi, Taketo, 4,878,123, Cl. 358-401.000.

Toyo Ink Manufacturing Co., Ltd.: See—
Hanada, Koji; Sawamura, Masashi; Yoshikawa, Takeshi; Nishashi, Hiroyuki; and Tanaka, Tsuneo, 4,877,681, Cl. 428-336.000.

Toyo Jozo Kabushiki Kaisha: See—
Takahashi, Mamoru; Imamura, Shigeyuki; and Takada, Masaki, 4,877,733, Cl. 435-190.000.

Yaso, Masao; Suzuki, Yukio; Shibata, Kensuke; and Hayashi, Eiichi, 4,877,875, Cl. 544-116.000.

Yaso, Masao; Suzuki, Yukio; Shibata, Kensuke; and Hayashi, Eiichi, 4,877,877, Cl. 544-354.000.

Toyo Radiator Co., Ltd.: See—
Hagihara, Hisao; Banno, Takayuki; Miya, Shigenori; and Tanaka, Norio, 4,876,778, Cl. 29-157.30A.

Toyo Seikan Kaisha, LTD.: See—
Yazaki, Jinichi; and Tamura, Akihiko, 4,877,662, Cl. 428-36.700.

Toyo Soda Manufacturing Co., Ltd.: See—
Fukuda, Kenichi; Mori, Takashi; Kurauchi, Yasuhiro; Doi, Masaharu; and Suematsu, Tetsuya, 4,877,498, Cl. 204-86.000.

Toyoda Gosei Co., Ltd.: See—
Iuchi, Yasuaki, 4,876,915, Cl. 74-552.000.

Toyoda Iron Works Co., Ltd.: See—
Kanno, Kimio, 4,876,914, Cl. 74-538.000.

Toyooka, Yutaka: See—
Kishida, Kazuo; Toyooka, Yutaka; and Mikami, Yoshiyuki, 4,877,844, Cl. 525-316.000.

Toyoshi, Takanori: See—
Morioka, Takayuki; Motoyama, Nobuyuki; Hoshikawa, Hiroshi; Takahashi, Takeo; Suzuki, Sizuo; Ishikawa, Teyoshi; Toyoshi, Takanori; and Uede, Toshio, 4,877,558, Cl. 252-626.000.

Toyota Jidosha Kabushiki Kaisha: See—
Aiki, Shigetaka; Kobayashi, Kiyonori; and Kato, Satoshi, 4,876,917, Cl. 74-574.000.

Nagano, Shuji; and Inui, Masaki, 4,876,919, Cl. 74-650.000.

Shirai, Kenji; and Nomura, Yoshihisa, 4,876,853, Cl. 60-547.100.

Tada, Tetsuya; Nagasaka, Masami; Teratani, Tatsuo; Miyazaki, Akira; and Takahashi, Junji, 4,877,101, Cl. 180-177.000.

Tanahashi, Haruhiko; Tsukamoto, Yoshikazu; and Miyakawa, Shinji, 4,877,262, Cl. 280-668.000.

Yasui, Yasuyoshi; and Azuma, Hitoshi, 4,876,921, Cl. 74-710.500.

TP Orthodontics, Inc.: See—
Kelling, Peter C., 4,877,398, Cl. 433-8.000.

TPV Energy Systems, Inc.: See—
Diederich, Walter J., 4,877,553, Cl. 252-492.000.

Traino, James C.: See—
Beikirch, Thomas R.; Traino, James C.; and Williams, Leon C., 4,878,119, Cl. 358-471.000.

Tran, Lung T.: See—
Gill, Hardayal S.; Hesterman, Victor W.; Tarnopolsky, Giora J.; and Tran, Lung T., 4,878,140, Cl. 360-113.000.

Transpec Inc.: See—
Lamparter, Ronald C.; and Brown, Robert J., 4,877,266, Cl. 280-762.000.

Travisano, Frank P. Tamper evident indicating means, 4,877,143, Cl. 215-230.000.

Trayner, Brian T., to British Aerospace Public Limited Company. Ballistic projectiles, 4,877,201, Cl. 244-3.210.

Trema, Daniel, to Elf France. Support and suspension arm for a driving wheel, 4,877,097, Cl. 180-357.000.

Tremblay, Pierre: See—
Hudson, Tom J.; McIntyre, John; Tremblay, Pierre; Allaire, Claude; and Gnyra, Bohdan, 4,877,507, Cl. 204-243.00R.

Tri-Star Manufacturing & Service, Inc.: See—
Scriven, Rick R., 4,877,221, Cl. 266-272.000.

Trimble, Roger B.: See—
Baker, Joseph R.; Golland, Wesley A.; Mullens, Paul A.; and Trimble, Roger B., 4,877,179, Cl. 232-7.000.

Trineco: See—
Ditzler, Lee C.; Lemberger, Ronald F.; and Slezak, Cynthia L., 4,877,588, Cl. 422-186.190.

Trinh, Toan: See—
Maldonado, Rene; Trinh, Toan; and Gosselink, Eugene P., 4,877,896, Cl. 560-14.000.

Trinidad, Antonio; Zayas Luna, Victor M.; and Rey, Miguel A. Automobile anti-theft, brake-locking device, 4,876,865, Cl. 70-203.000.

Triplett, Melvin W. Target illuminating aiming system, 4,876,816, Cl. 42-103.000.

Trop, Moshe, to Weintraub, Morton. Continuous automatic snow and ice prevention and clearing of automobile front and rear windows, 4,877,458, Cl. 134-5.000.

Troubridge, William C. Crossbow trigger mechanism, 4,877,008, Cl. 124-25.000.

Trowbridge, John C.; and Breazeale, Jack D., to United Technologies Corporation. Coating of boron particles, 4,877,649, Cl. 427-215.000.

Tsai, James T. Circuit protection device, 4,878,038, Cl. 337-107.000.

Tsao, Hsiang-Wei: See—
Lush, Richard A.; and Tsao, Hsiang-Wei, 4,877,920, Cl. 585-823.000.

Tsaprazis, Edward; Maris, Nicholas P.; and Montague, Charles, to Aerquip Corporation. Electrical sensing system for measuring ferrous particles within a fluid with temperature compensation circuit, 4,878,019, Cl. 324-204.000.

Tsuda, Yusuke; Kurata, Takashi; Suzuki, Yoshinobu; and Yamamoto, Yuji, to Japan Synthetic Rubber Co., Ltd. Thermoplastic resin composition, 4,877,835, Cl. 525-67.000.

Tsuji, Masayoshi; Nakagawa, Akira; Inoue, Hisataka; Hachiya, Terumi; Tanoue, Yoshihiro; Ikessue, Kouichi; Saita, Masaru; Mizoguchi, Takenobu; Aoki, Tetsuo; Sato, Hironobu; and Noda, Kanji, to Hisamitsu Pharmaceutical Co., Inc. Novel indenothiazole derivative and process for preparing the same, 4,877,876, Cl. 544-133.000.

Tsujimoto, Shuichi; and Asada, Haruo, to Kabushiki Kaisha Toshiba. Image inclination detecting method and apparatus, 4,878,124, Cl. 358-443.000.

Tsukamoto, Yoshikazu: See—
Tanahashi, Haruhiko; Tsukamoto, Yoshikazu; and Miyakawa, Shinji, 4,877,262, Cl. 280-668.000.

Tsunoda, Tahahiro; Yamaoka, Tsuguo; and Arimatsu, Seiji, to Nippon Paint Company. Photosensitive aqueous emulsion resin composition of polystyrene or styrene copolymer particles containing photosensitive material, 4,877,714, Cl. 430-270.000.

Tsuruno, Kunio: See—
Sakata, Tsuguhide; Taguchi, Tomishige; Kimura, Norio; Tsuruno, Kunio; and Suzuki, Yasutomo, 4,878,131, Cl. 360-37.100.

Tucker, Francis D., III: See—
Chadwick, Curt H.; Sholes, Robert R.; Greene, John D.; Tucker, Francis D., III; Fein, Michael E.; Jann, P. C.; Harvey, David J.; and Bell, William, 4,877,326, Cl. 356-394.000.

Tull, Richard H., to MGM Petro Equipment & Enviro Services, Inc. Spill protecting apparatus, 4,877,155, Cl. 222-108.000.

Tuma, Martin, to ITM Industrial Technology & Machines AG. Magazine for firearms, 4,876,813, Cl. 42-50.000.

Turmag Turbo-Maschinen-Ag Nusse & Grafer: See—
Ebeling, Wolfgang, 4,877,094, Cl. 175-170.000.

Turner, Leola E. B. Pharmaceutical preparation, 4,877,773, Cl. 514-23.000.

Tushaus, Hans-Joachim; and Hormann, Michael, to W. C. Heraeus GmbH. Method for forming an object of metal by cold pressing, 4,876,868, Cl. 72-42.000.

Tuttle, Gary M.; and DeShaw, Steven, to Waterman Industries, Inc. Method and apparatus for control of an upstream water level, 4,877,352, Cl. 405-104.000.

Tymon, Thomas M.: See—
Bohrn, Walter J.; Brubaker, Richard A.; Garman, Shelly N.; Hosfeld, Lewis K.; Ko, Kenneth K.; and Tymon, Thomas M., 4,877,484, Cl. 162-103.000.

Tysver, John D.; and Grimm, Duane, to Sunstrand Corp. Actuator mechanism having adjustable stop, 4,877,120, Cl. 192-141.000.

Ube Industries, Ltd.: See—
Kawano, Minoru; Simizu, Katsumi; Isonaga, Eiji; and Kurata, Shigeo, 4,877,874, Cl. 540-606.000.

Uchida, Hiroshi: See—
Okudaira, Shigenori; Irie, Takefumi; Uchida, Hiroshi; Fukasawa, Eiichi; Kobayashi, Kazuhiko; and Yamaguchi, Masanori, 4,877,445, Cl. 75-0.50B.

Uchida, Manabu: See—
Kitano, Kisei; Ushioda, Makoto; Uchida, Manabu; and Suzuki, Toshiharu, 4,877,548, Cl. 252-299.630.

Uchida, Masafumi: See—
Takagiwa, Hiroyuki; Takahashi, Jiro; Shirosue, Meizo; Akimoto, Kunio; and Uchida, Masafumi, 4,877,704, Cl. 430-99.000.

Uchida, Masami; and Minamide, Seiko, to Matsushita Electric Industrial Co., Ltd. Method for producing information storage disk, 4,877,475, Cl. 156-273.700.

Uchida, Shunji: See—
Hachiya, Satoshi; Uchida, Shunji; and Hashimoto, Kenji, 4,877,858, Cl. 528-100.000.

Ueda, Masashi: See—
Hayakawa, Kiyoharu; Matsumoto, Yumio; Ueda, Masashi; Sago, Akira; and Tagaki, Osamu, 4,878,084, Cl. 355-27.000.

Uede, Toshio: See—
Morioka, Takayuki; Motoyama, Nobuyuki; Hoshikawa, Hiroshi; Takahashi, Takeo; Suzuki, Sizuo; Ishikawa, Teyoshi; Toyoshi, Takanori; and Uede, Toshio, 4,877,558, Cl. 252-626.000.

Uegaki Beika Kabushiki Kaisha: See—
Okayama, Tetsuro, 4,877,630, Cl. 426-302.000.

Uehori, Yuji: See—
Kakehi, Nobuo; Takahashi, Yuzuru; Higuchi, Norio; Izumihara, Yoshikazu; Matsumoto, Hiromi; and Uehori, Yuji, 4,876,874, Cl. 72-199.000.

Uekama, Kaneto: See—
Pitha, Josef; Harman, Mitchell; and Uekama, Kaneto, 4,877,774, Cl. 514-26.000.

Ueki, Masao: See—
Matsuyama, Jinsho; Hirai, Yutaka; Ueki, Masao; and Sakai, Akira, 4,877,650, Cl. 427-248.100.

Uematsu, Hiroaki; and Imanishi, Shinji, to Horiba, Ltd. Method of measuring electrolyte in blood and urine by electrode method, 4,877,492, Cl. 204-1.00T.

Uematsu, Michio; and Suganuma, Nobuo, to Lion Corporation. Transparent dentifrices, 4,877,602, Cl. 424-49.000.

Ueno, Masaji, to Kabushiki Kaisha Toshiba. Logic circuit having an output signal with a gentle leading edge, 4,877,975, Cl. 307-443.000.

Ueno, Takeshi: See—
Kuno, Toshio; Shindo, Yoshikazu; Kuno, Yukio; Ueno, Takeshi; Torimi, Akira; and Mori, Yoji, 4,876,952, Cl. 98-121.200.

Ultimage Inc.: See—
Gagnon, Daniel, 4,878,186, Cl. 364-574.000.

Umemura, Hiroyuki: See—
Matsuda, Kenji; Togashi, Kenji; Umemura, Hiroyuki; Okada, Tetsuji; Ishioka, Hidenori; and Aoki, Katsuyuki, 4,877,183, Cl. 236-49.300.

Umezawa, Hamao, deceased (by Umezawa, Kazuo, heir); Tatsuta, Kuniaki; Kawai, Hiroyuki; and Nakajima, Shohachi, to Kirin Beer Kabushiki Kaisha. Process for producing 10-hydroxyanthracenes, 4,877,870, Cl. 536-6.400.

Umezawa, Kazuo, heir: See—
Umezawa, Hamao, deceased; Tatsuta, Kuniaki; Kawai, Hiroyuki; and Nakajima, Shohachi, 4,877,870, Cl. 536-6.400.

Union Camp Corporation: See—
Frank, Walter C., 4,877,910, Cl. 585-411.000.

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Ream, Bernard C., 4,877,886, Cl. 549-230.000.

Rhee, Seung J.; and Simpson, Larry L., 4,877,587, Cl. 422-135.000.

Union Carbide Corporation: See—
Bikson, Benjamin; and Giglia, Salvatore, 4,877,421, Cl. 55-16.000.

Union Oil Company of California: See—
Ward, John W.; and Carlson, Timothy L., 4,877,762, Cl. 502-77.000.

Young, Donald C., 4,877,869, Cl. 536-35.000.

United States of America

- Administrator, National Aeronautics and Space Administration: See—
Collins, Earl R., Jr., 4,877,082, Cl. 165-104.260.
Onstott, Joseph W., 4,877,689, Cl. 428-607.000.
- Agriculture: See—
McGovern, Terrence P.; Flath, Robert A.; and Cunningham, Roy T., 4,877,607, Cl. 424-84.000.
- Air Force: See—
Babcock, James L.; and McGlasson, David L., 4,877,741, Cl. 436-8.000.
Dissekoen, Allen D., Jr.; Gargiulo, Robert F.; Haywood, James E.; Heise, Keith H.; Holcomb, Darrell H.; Kramer, Stuart C.; Miller, Gregory R.; Nicholson, Jeffrey S.; Olinger, Jeffrey J.; and Spenny, Curtis H., 4,877,202, Cl. 244-122.00A.
Lorenzo, Joseph P.; and Soref, Richard A., 4,877,299, Cl. 350-96.140.
- Army: See—
Dixon, Samuel, Jr., 4,878,253, Cl. 455-327.000.
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- Energy: See—
Fiermans, Carl B., 4,877,736, Cl. 435-183.000.
- Health and Human Services: See—
Pitha, Josef; Harman, Mitchell; and Uekama, Kaneto, 4,877,774, Cl. 514-26.000.
- Navy: See—
Walton, Jim M.; and Munson, Arthur E., 4,876,979, Cl. 114-258.000.
- U.S. Philips Corp.: See—
Bakker, Jacobus G. C.; and Esser, Leonard J. M., 4,878,102, Cl. 357-24.000.
Barbier, Pascal; Falgat, Francis; and Sorel, Alain, 4,878,060, Cl. 343-778.000.
Callsea, Georg H.; and Kindler, George U. P., 4,876,905, Cl. 73-866.500.
Gartner, Georg F.; and Lydtin, Hans-Jurgen, 4,877,642, Cl. 427-38.000.
Overweg, Johannes A.; and Ham, Cornelis L. G., 4,878,023, Cl. 324-318.000.
Overweg, Johannes A.; and Ham, Cornelis L. G., 4,878,024, Cl. 324-319.000.
Peek, Hermann L., 4,877,754, Cl. 437-195.000.
Rau, Hans; and De Jongh, Petrus F., 4,877,938, Cl. 219-121.590.
Schurmann, Erich; and Grzesik, Ulrich, 4,877,302, Cl. 350-96.210.
Sempel, Adrianus, 4,877,979, Cl. 307-520.000.
Sessink, Franciscus J. A. M., 4,878,252, Cl. 455-276.000.
Slob, Arie, 4,878,202, Cl. 365-183.000.
van Houwelingen, Dirk; and Warringa, Jozephus J. M., 4,877,996, Cl. 313-592.000.
- United Technologies Corporation: See—
Dyer, Gerald P., 4,876,880, Cl. 73-32.00R.
Smith, Stephen J., 4,878,046, Cl. 340-705.000.
Trowbridge, John C.; and Breazeale, Jack D., 4,877,649, Cl. 427-215.000.
- Universite Claude Bernard - Lyon I: See—
Nofre, Claude; Tinti, Jean M.; and Chatzopoulos, Faroudja O., 4,877,895, Cl. 558-413.000.
- University of Akron: See—
Farona, Michael F.; and Srinivasan, Ramji, 4,877,917, Cl. 585-416.000.
- University of California, The Regents of the: See—
Carlson, Joseph W., 4,878,022, Cl. 324-318.000.
Holt, J. Birch; Kingman, Donald D.; and Bianchini, Gregory M., 4,877,759, Cl. 501-96.000.
Lindow, Steven E., 4,877,438, Cl. 71-79.000.
- University of Kentucky Research Foundation, The: See—
Chang, Shih-Ling, 4,877,744, Cl. 436-162.000.
Elion, Jonathan L., 4,878,115, Cl. 358-111.000.
- University of Missouri, Curators of the: See—
McQuoid, Bryan K.; Carlson, Earl J.; and Graham, Huber, 4,878,226, Cl. 374-166.000.
- University of New Mexico: See—
McNeil, John R.; and Wilson, Scott R., 4,877,479, Cl. 156-626.000.
- University of Pennsylvania, Trustees of the: See—
Bogen, Daniel; and Gupta, Krishanu, 4,877,035, Cl. 128-673.000.
- University of Toledo, The: See—
Morgan, Alan R.; Selman, Steven H.; Garbo, Greta M.; and Keck, Rick W., 4,877,872, Cl. 540-145.000.
- University of Utah: See—
Higuchi, William I.; Fox, Jeffrey I.; and Powell, G. Lynn, 4,877,401, Cl. 433-215.000.
- University of Windsor: See—
Huyh, Van-Minh; and Luk, Francis M., 4,878,114, Cl. 358-106.000.
- UOP: See—
Mercer, William C.; Coughlin, Peter K.; McLeod, Donald, Jr.; and Flanigen, Edith M., 4,876,890, Cl. 73-336.500.
Schmidt, Robert J., 4,877,919, Cl. 585-748.000.
- Uphues, Guenter: See—
Ploog, Uwe; and Uphues, Guenter, 4,877,539, Cl. 252-8.800.
- Upjohn Company, The: See—
Cazera, Alexander R.; and Koshy, K. Thomas, 4,877,782, Cl. 514-186.000.
- Urabe, Sumao: See—
Hattori, Norikazu; Urabe, Sunao; and Kusumoto, Koichi, 4,877,854, Cl. 528-15.000.
- Urbish, Glenn F.; Mullen, William B., III; and Mooney, Charles W., to Motorola, Inc. Method of making a one-piece injection molded battery contact assembly, 4,877,569, Cl. 264-221.000.
- Urushizaki, Suco; Ohta, Yasuo; Sato, Mamoru; Sakai, Fukumi; and Nishiyama, Koushi, to Director of National Institute of Agrobiological Resources. Microbiological method for producing ethylene, 4,877,730, Cl. 435-132.000.
- USBI Company: See—
Novak, Howard L.; and Zook, Lee M., 4,877,638, Cl. 427-8.000.
- USG Interiors, Inc.: See—
Kelly, Patrick M.; Howlett, Robert E.; Pomeroy, Paul A.; and Alvarez, Dennis A., 4,876,837, Cl. 52-287.000.
- Ushioda, Makoto: See—
Kitano, Kisei; Ushioda, Makoto; Uchida, Manabu; and Suzuki, Toshiharu, 4,877,548, Cl. 252-299.630.
- Utsunomiya, Kyoshi: See—
Chikamune, Kaoru; Tokuda, Manabu; Inoue, Kazuo; Utsunomiya, Kyoshi; and Hitofude, Yoshii, 4,877,456, Cl. 106-270.000.
- Utscheid, Georg: See—
Koslowski, Gunter; and Utscheid, Georg, 4,876,965, Cl. 104-127.000.
- Vaccaro, Nicola, to Nick Vaccaro International. Air mattress, 4,876,756, Cl. 5-455.000.
- Vachon, Gerard L.: See—
Sparling, Robert D., II; and Vachon, Gerard L., 4,877,652, Cl. 427-264.000.
- Valaitis, Joseph W.: See—
Szymas, Walter; and Valaitis, Joseph W., 4,877,469, Cl. 156-123.000.
- Valentine, Michael D.: See—
Nusair, Marwan E.; Valentine, Michael D.; and Scholl, Stephen R., 4,878,061, Cl. 343-786.000.
- Valentine Research, Inc.: See—
Nusair, Marwan E.; Valentine, Michael D.; and Scholl, Stephen R., 4,878,061, Cl. 343-786.000.
- Valentini, Robert F.; Aebischer, Patrick; and Galletti, Pierre M., to Brown University Research Foundation. Semipermeable nerve guidance channels, 4,877,029, Cl. 128-334.00R.
- Valley, Harold J. Retainer for door handle, 4,877,278, Cl. 292-350.000.
- Valmont S.A.: See—
Dieu, Bernard; and CuQ, Jean, 4,877,625, Cl. 426-250.000.
- Valyocak, Ernest W., to Mobil Oil Company. Synthesis of crystalline aluminophosphate composition, 4,877,593, Cl. 423-306.000.
- van Broekhoven, Adrianus M.; and Wife, Richard L., to Shell Oil Company. Catalytic copolymerization of carbon monoxide/olefin with ketone/alcohol diluent, 4,877,860, Cl. 528-392.000.
- van Calker, Freerk R.; Koppels, Pieter J. M.; and Ter Burg, Antonius W. M., to Akzo nv. Conveyor belt, 4,877,126, Cl. 198-847.000.
- Van Cleve, Craig B.: See—
Cage, Donald R.; and Van Cleve, Craig B., 4,876,898, Cl. 73-861.380.
- Vandenbergh, Peter A.; and Kunka, Blair S., to Microlife Technics, Inc. Antifungal product, 4,877,615, Cl. 424-115.000.
- Van Der Groep, Lambertus A. Polymer composition, a process for producing a polymer composition, and the use of such a polymer composition, 4,877,827, Cl. 524-477.000.
- Van Der Linden, Klaus: See—
Dreus, Wolf-Dietrich; Van Der Linden, Klaus; Ruttel, Martin; and Friedrich, Jurgen, 4,877,989, Cl. 310-323.000.
- Van Doorn, Johannes A.; and Wife, Richard L., to Shell Oil Company. Carbon monoxide/olefin polymerization with disubstituted 1,3-bis phosphino propane, 4,877,861, Cl. 528-392.000.
- van Houwelingen, Dirk; and Warringa, Jozephus J. M., to U.S. Philips Corporation. Electron tube with control electrode remote from anode, 4,877,996, Cl. 313-592.000.
- Vaniglia, Milo M., to Cincinnati Milacron Inc. Redirect roller apparatus for fiber placement machine, 4,877,193, Cl. 242-7.210.
- Van Meter, Larry W., to LineTech, Inc. Automatic toilet flush control system, 4,876,751, Cl. 4-431.000.
- Vann, William C. Fishing planer, 4,876,820, Cl. 43-43.130.
- Van Pelt, Norman, to Casper Colosimo & Son, Inc. Underwater cable laying system, 4,877,355, Cl. 405-159.000.
- Vansant, Jan L. M. F. G.: See—
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Roy, Richard S., 4,878,198, Cl. 365-222.000.
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Devaney, Mark J., Jr.; and Wannenwetsch, Edward H., 4,877,586, Cl. 422-101.000.
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Phelps, Douglas W., Jr.; and Ward, William C., 4,878,108, Cl. 357-81.000.
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Bellioti, Thomas R.; Connor, David T.; Flynn, Daniel L.; Kostlan, Catherine R.; and Nies, Donald E., 4,877,881, Cl. 548-240.000.
O'Brien, Denise M.; and Croce, Carlo P., 4,876,843, Cl. 53-410.000.
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Warren, Bruce A.; and Webb, Dana L., 4,877,404, Cl. 434-118.000.
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Eckel, Hans-Joachim; and Warych, Hans, 4,877,673, Cl. 428-172.000.

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Black, James L.; and Wason, Cameron B., 4,878,204, Cl. 367-53.000.
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Lineback, Cecil, 4,877,190, Cl. 241-5.000.
- Watahiki, Shinichi; Itoh, Nobuhiko; Ihata, Nobuo; and Miyasaka, Masao, to Hitachi Koki Company, Limited. Impact printer temperature control device. 4,877,344, Cl. 400-124.000.
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Okuno, Akiyasu; Watanabe, Masakazu; and Ikoma, Kazuhiko, 4,877,760, Cl. 501-98.000.
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Fukuwatari, Ichiro; and Watanabe, Seiji, 4,877,123, Cl. 198-619.000.
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Ikenaga, Osamu; and Watanabe, Susumu, 4,878,177, Cl. 164-479.000.
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Miura, Shigeo; Takahashi, Masatomo; Yoshino, Motoaki; Watanabe, Tsunehiro; Toyama, Takeshi; and Takahashi, Taketo, 4,878,123, Cl. 358-401.000.
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- Watanabe, Yasuo: See—
Teranishi, Mitsuji; Watanabe, Yasuo; and Takeuchi, Akira, 4,878,176, Cl. 364-468.000.
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Yagoto, Mitsutoshi; Hamada, Akiyoshi; Mino, Masayuki; Tanaka, Yutaka; and Watanabe, Yutaka, 4,878,067, Cl. 346-108.000.
- Wate, John E.: Outdoor cover assembly. 4,876,830, Cl. 51-29.000.
- Waterman Industries, Inc.: See—
Tuttle, Gary M.; and DeShaw, Steven, 4,877,352, Cl. 405-104.000.
- Watkins, Daniel; Wong, Jimmy; and Enghill, Paulina, to LSI Logic Corporation. Flexible ASIC microcomputer permitting the module modification of dedicated functions and macroinstructions. 4,878,174, Cl. 364-200.000.
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Fagerburg, David R.; Watkins, Joseph J.; and Lawrence, Paul B., 4,877,851, Cl. 525-537.000.
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Wren, John J., 4,877,601, Cl. 424-10.000.
- Watrobaki, Thomas E., to Xerox Corporation. Thermal ink jet print cartridge assembly. 4,878,070, Cl. 346-140.00R.
- Watson, Keith R.: See—
Dandliker, Walter B.; Barr, Howard S.; Katzenstein, Henry S.; and Watson, Keith R., 4,877,965, Cl. 250-458.100.
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- Watts, James L.: Corrugated energy absorber. 4,877,224, Cl. 267-140.000.
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Vendely, John A.; and Badger, David M., 4,878,035, Cl. 332-101.000.
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Thomas, Robert L.; Kuo, Pao-Kuang; and Favro, Lawrence D., 4,878,116, Cl. 358-160.000.
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- Weatherford Oil Tool GmbH: See—
Jansch, Manfred, 4,876,884, Cl. 73-49.100.
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Caillat, Jean-Luc M.; Weatherston, Roger C.; and Bush, James W., 4,877,382, Cl. 418-55.000.
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Warren, Bruce A.; and Webb, Dana L., 4,877,404, Cl. 434-118.000.
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- Weber, Gerhard: See—
Hinz, Paul; Dislich, Helmut; and Weber, Gerhard, 4,877,668, Cl. 331-68.000.
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- Weber, John H.: See—
Haeberle, Ronald M., Jr.; Smith, Gaylord D.; Weber, John H.; Fisher, Ronaldo L.; Gaul, David J.; and Hinz, Jay W., 4,877,435, Cl. 65-1.000.
- Wedel, Gregory L., to Beloit Corporation. Dryer apparatus for drying a web. 4,876,803, Cl. 34-117.000.
- Weed Instruments Co., Inc.: See—
Kraemer, Carolyn, 4,878,039, Cl. 338-26.000.
- Weidman, David L.: See—
Newhouse, Mark A.; Nolan, Daniel A.; and Weidman, David L., 4,877,300, Cl. 350-96.150.
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Steiner, Gerd; Himmele, Walter; Buschmann, Ernst; Teschendorf, Hans-Juergen; and Weifenbach, Harald, 4,877,807, Cl. 514-411.000.
- Wehrich, Gerhard: See—
Ocker, Herbert; and Wehrich, Gerhard, 4,877,390, Cl. 425-203.000.
- Weintraub, Morton: See—
Trop, Moshe, 4,877,458, Cl. 134-5.000.
- Weiss, Hans-Peter: See—
Plachetta, Christoph; McKee, Graham E.; and Weiss, Hans-Peter, 4,877,823, Cl. 524-80.000.
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- Weitzel, Richard A.: See—
Gulita, Vladimir S.; and Weitzel, Richard A., 4,878,089, Cl. 355-253.000.
- Welch, Donald G.; and Barton, Randall N.: Adjustable sawhorse and scaffold. 4,877,109, Cl. 182-183.000.
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Lamboy, Peter; Steigerwald, Franz; Zulauf, Karlheinz; and Ginnow-Markert, Harmut, 4,877,065, Cl. 141-18.000.
- Wella, Robert A.: Reclosable self-opening can end. 4,877,129, Cl. 230-269.000.
- Welsh, William A.: See—
Pryor, James N.; Bogdanor, James M.; and Welsh, William A., 4,877,765, Cl. 502-408.000.
- Wendt, Kraig M.: See—
Berg, Lloyd; Wendt, Kraig M.; and Szabados, Rudolph J., 4,877,490, Cl. 203-15.000.
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- Wentzel, Rex B.: See—
Bradley, Graham C.; Stretten, Alton O.; Stretten, John P.; and Wentzel, Rex B., 4,878,245, Cl. 380-10.000.
- Wenzel, Franz: See—
Siol, Werner; Heil, Ernst; Wenzel, Franz; Arndt, Peter J.; and Terbrack, Ulrich, 4,877,853, Cl. 526-329.700.
- Werner & Pfleiderer GmbH: See—
Ocker, Herbert; and Wehrich, Gerhard, 4,877,390, Cl. 425-203.000.
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- Western Atlas International, Inc.: See—
Burns, Robert W., 4,877,089, Cl. 166-377.000.
- McWhirter, Vernie C.; Pickett, James E.; and Carlson, Norman R., 4,878,180, Cl. 364-507.000.
- Western Industries, Inc.: See—
Kufirin, Fred W., 4,877,185, Cl. 239-242.000.
- Westfield, Brian L.: See—
Schulte, John P.; Orth, Kelly M.; Frick, Roger L.; Westfield, Brian L.; and Paschke, Randy K., 4,878,012, Cl. 324-60.00C.
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Arzenti, Thomas E.; and Senger, Robert D., 4,876,871, Cl. 72-122.000.
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- Long, Lawrence J.; and Henrickson, James A., 4,877,079, Cl. 164-402.000.
- Westvaco Corporation: See—
Robertson, Harry W., IV, 4,877,426, Cl. 55-74.000.
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- Whatmore, Roger W.; Munna, Andrew G.; and Lane, David W., to Plessey Overseas Limited. Method of making piezoelectric composites. 4,876,776, Cl. 29-25.350.
- Wheeler, Douglas J.: See—
Barnes, Albert L.; Clere, Thomas M.; Abbaschian, Gholamreza J.; and Wheeler, Douglas J., 4,876,941, Cl. 89-36.020.
- Wheeler, Jack M.: See—
Smith, Gaylord D.; Tassen, Curtis S.; Ganesan, Pasupathy; and Wheeler, Jack M., 4,877,461, Cl. 148-11.50N.
- White, Claude C., to Birmingham Bolt Company, Inc. Portable tool for bending roof bolts for insertion in mine roof openings. 4,876,877, Cl. 72-388.000.
- White, Hollis N., Jr.: Device having a sealed control opening and an orbiting valve. 4,877,383, Cl. 418-61.300.
- White, James N.: Flying insect control unit using lights and adhesives. 4,876,822, Cl. 43-113.000.
- Whiteman, Marvin E., Jr.: Mortar mixing drum. 4,877,327, Cl. 288-48.000.
- Whitey Co.: See—
Yuako, Edward M., Jr.; Brown, Cal R.; Kalain, Terry M.; and Williams, Peter C., 4,877,053, Cl. 137-556.000.
- Whitley, Warwick M., II, to Attwood Corporation. Fuel tank vent. 4,877,152, Cl. 220-374.000.
- Whitney, John R.: See—
Sasella, Christopher D.; Whitney, John R.; and McGeehan, Harold K., 4,877,227, Cl. 269-43.000.

- Whittaker, Dennis R.: See—
Bassett, Robert W.; Griffin, William R.; Murphy, Susan A.; Petrovick, John G., Jr.; Varner, James R.; and Whittaker, Dennis R., 4,878,209, Cl. 368-113.000.
- Wickstead, James: See—
Neuman, Arnold I.; Heidt, Thomas D.; Bergman, Andrew; and Wickstead, James, 4,877,954, Cl. 250-222.200.
- Widrig, Jakob; and Wulff, Gunther, to Swiss Aluminium Ltd. Vehicle door. 4,876,825, Cl. 49-502.000.
- Wife, Richard L.: See—
van Broekhoven, Adrianus M.; and Wife, Richard L., 4,877,860, Cl. 528-392.000.
- Van Doorn, Johannes A.; and Wife, Richard L., 4,877,861, Cl. 528-392.000.
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- Willemsens, Karel S.; Abbeney, Willy N. V.; and Criel, Frans B., to Agfa-Gevaert N.V. Coating method. 4,877,639, Cl. 427-13.000.
- Williams, Bruce T.: High speed D.C. non-contacting electrostatic voltage follower. 4,878,017, Cl. 324-109.000.
- Williams, Christopher G.: Irrigation system. 4,877,189, Cl. 239-749.000.
- Williams, Leon C.: See—
Beikirch, Thomas R.; Traino, James C.; and Williams, Leon C., 4,878,119, Cl. 358-471.000.
- Williams, Peter C.: See—
Yuako, Edward M., Jr.; Brown, Cal R.; Kalain, Terry M.; and Williams, Peter C., 4,877,053, Cl. 137-556.000.
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McDaniel, Max P.; and Short, James N., 4,877,763, Cl. 502-117.000.
- Williams, Richard T.: See—
Wu, Jeff C.; Williams, Richard T.; Rowlette, John R.; Brooks, Charles P.; and Zimmerman, Richard H., 4,877,644, Cl. 427-53.100.
- Williams, Robert D.: Gutter assembly. 4,876,827, Cl. 52-12.000.
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- Willice, George W.: Barbecue pit. 4,877,011, Cl. 126-25.00R.
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Grim, Michael, 4,877,169, Cl. 224-331.000.

Yale Security Inc.: See—
Teague, Ralph T., Jr., 4,876,764, Cl. 16-71.000.

Yamada, Masahiro: See—
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Masu, Masanobu; Yoshioka, Hiroshi; Kouno, Kenzi; Nomura, Isao; and Yamamiya, Kazuo, 4,877,847, Cl. 525-397.000.

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Komori, Akihiro; and Hirano, Muneyoshi, 4,877,076, Cl. 160-107.000.

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Saito, Tami; and Yoshihara, Kunio, 4,878,098, Cl. 357-68.000.

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Donati, Jean R.; Guttman, Daniele; Rouillon, Yves; Paul, Pierre S.; and Zacharie, Guy, 4,877,465, Cl. 148-428.000.

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Sarras, Raymond E.; and Zaharris, Daniel R., 4,878,136, Cl. 360-78.040.

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Trinidad, Antonio; Zayas Luna, Victor M.; and Rey, Miguel A., 4,876,865, Cl. 70-203.000.

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Zollman, Peter M.; Pollard, Brendon T.; and Birch, Andrew D., 4,878,127, Cl. 358-299.000.

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Schillinger, Wolfgang; Halssig, Andreas; and Zehnder, Wolfgang, 4,876,960, Cl. 102-249.000.

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Thanisch, Klaus, 4,877,144, Cl. 215-330.000.

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Cai, Jun-Chao; and Takase, Muneaki, 4,877,803, Cl. 514-227.800.

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Bleich, Larry L.; Roberts, Joni A.; and Zerba, Stephen T., 4,877,645, Cl. 427-117.000.

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Koch, Horst; and Ziegler, Walter, 4,877,715, Cl. 430-271.000.

Zimmerman, Harold, Level with illuminated bubble vials, 4,876,798, Cl. 33-348.200.

Zimmerman, Karen M., Garment hanger accessory, 4,877,163, Cl. 223-93.000.

Zimmerman, Richard H.: See—
Wu, Jeff C.; Williams, Richard T.; Rowlette, John R.; Brooks, Charles P.; and Zimmerman, Richard H., 4,877,644, Cl. 427-53.100.

Ziolo, Ronald F., to Xerox Corporation, Processes for the preparation of copper oxide superconductors, 4,877,768, Cl. 505-1.000.

Zirczy, Geza N.: See—
Lon, Jesus R.; Rivas, Olegario; and Zirczy, Geza N., 4,877,542, Cl. 252-62.000.

Zollman, Peter M.; Pollard, Brendon T.; and Birch, Andrew D., to Zed Instruments Ltd., Laser engraving machine for preparing rotary screen printing screens, 4,878,127, Cl. 358-299.000.

Zook, Lee M.: See—
Novak, Howard L.; and Zook, Lee M., 4,877,638, Cl. 427-8.000.

Zorini, Luigi O., to Comez S.P.A., Control device for threading tubes in crochet balloon looms, 4,876,862, Cl. 66-207.000.

Zorloni, Riccardo, Ionic air cleaner for homes and motor vehicles, 4,877,428, Cl. 55-139.000.

Zorn, Helmut; and Schaeffler, Georg, to INA Walzlager Schaeffler KG, Self-adjusting hydraulic valve tappet, 4,876,997, Cl. 123-90.520.

Zudilina, Ljudmila J.: See—
Matros, Jury S.; Chumachenko, Viktor A.; Zudilina, Ljudmila J.; Noskov, Alexander S.; and Bugdan, Evgeny S., 4,877,592, Cl. 423-245.100.

Zulauf, Karlheinz: See—
Lamboy, Peter; Steigerwald, Franz; Zulauf, Karlheinz; and Ginnow-Markert, Harmut, 4,877,065, Cl. 141-18.00R.

Zumsteg, Deborah M.: See—
Cantwell, Robert R.; Hallemann, Raymond F.; and Zumsteg, Deborah M., 4,877,044, Cl. 135-104.000.

Zunkel, Gary D., to Halliburton Company, Pressure limiter for a down-hole pump and testing apparatus, 4,877,086, Cl. 166-106.000.

501 AVL Gesellschaft für Verbrennungskraftmaschinen und Messtechnik GmbH: See—
Wunsche, Peter, 4,876,998, Cl. 123-198.00E.

LIST OF REISSUE PATENTEEES

TO WHOM

PATENTS WERE ISSUED ON THE 31ST DAY OF OCTOBER, 1989

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

- Chao, Chien C.: See—
Sherman, John D.; and Chao, Chien C., Re. 33,105, Cl. 536-127.000.
Kioritz & Corporation: See—
Nagashima, Akira, Re. 33,103, Cl. 210-172.000.
Malot, James J.: See—
Visser, Melvin J.; and Malot, James J., Re. 33,102, Cl. 166-267.000.
Nagashima, Akira, to Kioritz & Corporation. Strainer. Re. 33,103, Cl. 210-172.000.
Sherman, John D.; and Chao, Chien C., to UOP. Separation of mannose by selective adsorption on zeolitic molecular sieves. Re. 33,105, Cl. 536-127.000.
Taylor, Peter C. Rock climbing adjustable chock. Re. 33,104, Cl. 248-231.200.
UOP: See—
Sherman, John D.; and Chao, Chien C., Re. 33,105, Cl. 536-127.000.
Upjohn Company, The: See—
Visser, Melvin J.; and Malot, James J., Re. 33,102, Cl. 166-267.000.
Visser, Melvin J.; and Malot, James J., to Upjohn Company, The. Removal of volatile contaminants from the vadose zone of contaminated ground. Re. 33,102, Cl. 166-267.000.

LIST OF DESIGN PATENTEEES

- Aavid Engineering, Inc.: See—
McCarthy, Alfred F., 304,293, Cl. D8-349.000.
Aerospatiale Societe Nationale Industrielle: See—
Calis, Rene., 304,310, Cl. D10-106.000.
Aobori, Tetsuro: See—
Naito, Masahito; Higa, Toshiro; Aobori, Tetsuro; Kubota, Eiichi; and Obata, Takeichi, 304,281, Cl. D7-351.000.
Arbogast, J. R. Combined game board and game pieces. 304,350, 10-31-89, Cl. D21-14.000.
Arkay Corporation: See—
DeLeeuw, James A.; and Sims, Raymond E., 304,340, Cl. D15-199.000.
Armstrong, Timothy O.; Bull, John W.; and Smith, David B., to Precor Incorporated. Stair climbing exercise apparatus. 304,358, 10-31-89, Cl. D21-195.000.
Avery International: See—
Popat, Ghanshyam H.; Chen, Tien-Tsung; Binkley, Christopher H.; and Tsai, K. Fou, 304,343, Cl. D19-26.000.
Babcock, Lowell C. Comb attachment or the like for holding permanent wave paper. 304,383, 10-31-89, Cl. D28-34.000.
Bailey, Francois. Sliding headlight. 304,380, 10-31-89, Cl. D26-29.000.
Bannister, Roger, to Helix Fragrances Inc. Combined bottle and cap. 304,298, 10-31-89, Cl. D9-386.000.
Bartlett, Inger. Desk. 304,268, 10-31-89, Cl. D6-428.000.
Baus, Heinz G. Mirrored cabinet. 304,273, 10-31-89, Cl. D6-559.000.
Baus, Heinz G. Combined mirrored cabinet and lights. 304,274, 10-31-89, Cl. D6-561.000.
Benke, Wolfgang, to Westfälische Metall Industrie KG Huec & Co. Front face of a vehicle hub cap. 304,321, 10-31-89, Cl. D12-204.000.
Berry, Bernie B., Jr. Surgical bone rasp. 304,372, 10-31-89, Cl. D24-26.000.
Binkley, Christopher H.: See—
Popat, Ghanshyam H.; Chen, Tien-Tsung; Binkley, Christopher H.; and Tsai, K. Fou, 304,343, Cl. D19-26.000.
Biotteau, Gerard, to Societe T.B.S. Industrie (SARL). Electric teller terminal. 304,330, 10-31-89, Cl. D14-105.000.
Black & Decker Inc.: See—
Zurwelle, Donald W., 304,287, Cl. D8-68.000.
Bobrowski, Louis G., to Stanley Works, The. Surface mounted latch bolt. 304,292, 10-31-89, Cl. D8-341.000.
Bonko, Mark L., to Goodyear Tire & Rubber Company, The. Tire. 304,320, 10-31-89, Cl. D12-151.000.
Bounds, William E. Condiment mill. 304,278, 10-31-89, Cl. D7-53.000.
Bowbeer, Grant R. N. Orthodontic appliance. 304,370, 10-31-89, Cl. D24-10.000.
Boweter, Michael, to NUWAVE Products Ltd. Hairbrush. 304,265, 10-31-89, Cl. D4-136.000.
British Telecommunications: See—
Sermon, William J., 304,338, Cl. D14-240.000.
Broken Hill Proprietary Company Limited, The: See—
Dalli, Alan G.; and Revill, Peter L., 304,302, Cl. D9-438.000.
Brown, Ada M. Wall mounted planter. 304,272, 10-31-89, Cl. D6-557.000.
Brown Jordan Company: See—
Frimier, Richard, 304,266, Cl. D6-381.000.
Brummer, Tim. Recumbent bicycle. 304,319, 10-31-89, Cl. D12-111.000.
Bulgari, Paolo, to Partecipazioni Bulgari S.p.A. Necklace. 304,312, 10-31-89, Cl. D11-13.000.
Bulgari, Paolo, to Partecipazioni Bulgari S.p.A. Link element. 304,314, 10-31-89, Cl. D11-93.000.
Bulgari, Paolo, to Partecipazioni Bulgari S.p.A. Link element. 304,315, 10-31-89, Cl. D11-93.000.
Bull, John W.: See—
Armstrong, Timothy O.; Bull, John W.; and Smith, David B., 304,358, Cl. D21-195.000.
Calis, Rene., to Aerospatiale Societe Nationale Industrielle. Emergency radio signal transmitter. 304,310, 10-31-89, Cl. D10-106.000.
Campbell, Andrew E. Strapped miniature flashlight. 304,381, 10-31-89, Cl. D26-37.000.
Casio Computer Co., Ltd.: See—
Morishima, Takashi, 304,305, Cl. D10-38.000.
Cat Eye Co., Ltd.: See—
Kagayama, Joe, 304,306, Cl. D10-46.000.
Challberg, Sharon S.; and Kiser, Randall, to Life Technologies, Inc. Reaction tray for membrane hybridizations. 304,369, 10-31-89, Cl. D24-8.000.
Chappellet, Mary A. Base for multiple candle lamps. 304,379, 10-31-89, Cl. D26-9.000.
Charet, Pierre; and Kraai, Duke, to Rally Manufacturing, Inc. Flip up modular digital clock for automobile control panels. 304,304, 10-31-89, Cl. D10-15.000.
Chen, Jim. Telephone set. 304,335, 10-31-89, Cl. D14-142.000.
Chen, Tien-Tsung: See—
Popat, Ghanshyam H.; Chen, Tien-Tsung; Binkley, Christopher H.; and Tsai, K. Fou, 304,343, Cl. D19-26.000.
Cheung, George C. H., to Tak Ming Industrial Co. Record holder. 304,261, 10-31-89, Cl. D3-35.000.
Coca-Cola Company, The: See—
Credle, William S., Jr., 304,283, Cl. D7-397.000.
Colclasure, George M., to Laid Back Enterprises, Inc. Novelty ski seat. 304,361, 10-31-89, Cl. D21-230.000.
Colgate-Palmolive Company: See—
Segati, Umberto D. I., 304,297, Cl. D9-376.000.
Collins, John A., Jr. Orthodontic appliance. 304,371, 10-31-89, Cl. D24-10.000.
Collins, Thomas J.; Schneider, Pina; Nieves, Anthony L.; and Graham, Thomas G., to Keptel, Inc. Telephone network interface apparatus. 304,339, 10-31-89, Cl. D14-240.000.
Colquitt, J. Craig. Condiment shaker. 304,279, 10-31-89, Cl. D7-56.000.
Corrie, Alexander S. Fishing hand caster. 304,362, 10-31-89, Cl. D22-137.000.
Cranston, William V., III; Martin, Randall W.; and Young, Mark A., to International Business Machines Corp. Modular computer. 304,323, 10-31-89, Cl. D13-12.000.
Creative Athletic Products and Services, Inc.: See—
Wright, Robert L., 304,359, Cl. D21-199.000.
Credle, William S., Jr., to Coca-Cola Company, The. Syrup pump for beverage dispensing. 304,283, 10-31-89, Cl. D7-397.000.
Curry, Norman R. Coaster. 304,360, 10-31-89, Cl. D21-227.000.
Dalli, Alan G.; and Revill, Peter L., to Broken Hill Proprietary Company Limited, The. Can end. 304,302, 10-31-89, Cl. D9-438.000.
Dart Industries Inc.: See—
Wolff, Martin J.; and Zimmerman, Larry G., 304,276, Cl. D7-46.000.
Wolff, Martin J.; and Zimmerman, Larry G., 304,277, Cl. D7-46.000.
Wolff, Martin J.; and Zimmerman, Larry G., 304,284, Cl. D7-412.000.
David, Thomas J.: See—
Foran, Kenneth C.; and David, Thomas J., 304,345, Cl. D19-75.000.

PI 62

LIST OF DESIGN PATENTEEES

PI 63

- DeLeeuw, James A.; and Sims, Raymond E., to Arkay Corporation. Machine for dehydrating photographic chemicals. 304,340, 10-31-89, Cl. D15-199.000.
Derobert, Guy G. A., to Intertechnique S.A. Combined respiratory mask and inflatable head straps. 304,384, 10-31-89, Cl. D29-9.000.
Domon, Yoshihiro: See—
Fujita, Toshiharu; Yamazaki, Hiroyoshi; Maeda, Noriyuki; Shimizu, Kazutaka; Tanaka, Norihiko; Domon, Yoshihiro; Iwasawa, Kiyoshi; Futatsugi, Mitsuyuki; Takizawa, Fuminobu; Suzuki, Masakatsu; and Kosaka, Makoto, 304,377, Cl. D26-3.000.
Dorning, Larry R. Dickey and hood combination. 304,257, 10-31-89, Cl. D2-181.000.
Duke, Richard T., to Procter & Gamble Company, The. Container blank. 304,300, 10-31-89, Cl. D9-433.000.
Dunn, Gary D. Weatherized display board for construction sites. 304,348, 10-31-89, Cl. D20-10.000.
Eastern Company, The: See—
Weinerman, Lee S.; and Vargus, Joel T., 304,291, Cl. D8-331.000.
Ellson, Bart T.: See—
Lovett, Robert H.; Kakuk, Jay J.; and Ellson, Bart T., 304,324, Cl. D13-30.000.
Epoch Company, Ltd.: See—
Ukisu, Hiroshi, 304,355, Cl. D21-120.000.
Epoch Company, Ltd.: See—
Ukisu, Hiroshi, 304,352, Cl. D21-59.000.
ETNA Products Co. Inc.: See—
Fung, May, 304,346, Cl. D19-76.000.
F. B. Nutter Enterprises, Inc.: See—
Vories, Dennis L., 304,309, Cl. D10-106.000.
Farberware Inc.: See—
Schmidt, George, 304,286, Cl. D8-34.000.
Feimer, Bryan A.; Roethel, Henry G.; and Kowalica, Raymond P., to Meyer Company, The. Container lid. 304,282, 10-31-89, Cl. D7-391.000.
Fender Musical Instruments Corporation: See—
Gressett, Charles A., Jr.; Todd, Charles H., III; and Page, John F., 304,341, Cl. D17-21.000.
Figgie International Inc.: See—
Mitchell, Hal D.; and Gardner, James D., 304,258, Cl. D2-217.000.
Floyd, Rosalie. Female urinal. 304,373, 10-31-89, Cl. D24-54.000.
Foran, Kenneth C.; and David, Thomas J., to Rubbermaid Incorporated. Utility file. 304,345, 10-31-89, Cl. D19-75.000.
Foster, Elaine. Brooch. 304,313, 10-31-89, Cl. D11-48.000.
Frimier, Richard, to Brown Jordan Company. Sofa. 304,266, 10-31-89, Cl. D6-381.000.
Fujita, Toshiharu; Yamazaki, Hiroyoshi; Maeda, Noriyuki; Shimizu, Kazutaka; Tanaka, Norihiko; Domon, Yoshihiro; Iwasawa, Kiyoshi; Futatsugi, Mitsuyuki; Takizawa, Fuminobu; Suzuki, Masakatsu; and Kosaka, Makoto, to Mitsubishi Denki Kabushiki Kaisha. Fluorescent lamp. 304,377, 10-31-89, Cl. D26-3.000.
Fung, May, to ETNA Products Co. Inc. Telephone index unit. 304,346, 10-31-89, Cl. D19-76.000.
Futatsugi, Mitsuyuki: See—
Fujita, Toshiharu; Yamazaki, Hiroyoshi; Maeda, Noriyuki; Shimizu, Kazutaka; Tanaka, Norihiko; Domon, Yoshihiro; Iwasawa, Kiyoshi; Futatsugi, Mitsuyuki; Takizawa, Fuminobu; Suzuki, Masakatsu; and Kosaka, Makoto, 304,377, Cl. D26-3.000.
Gardner, James D.: See—
Mitchell, Hal D.; and Gardner, James D., 304,258, Cl. D2-217.000.
Gerber Products Company: See—
Meyers, Kenneth A., 304,366, Cl. D23-356.000.
Gerity Products, Inc.: See—
Murtagh, William O., 304,347, Cl. D19-97.000.
Goldman, Howard B. Adjustable keyboard support stand. 304,270, 10-31-89, Cl. D6-462.000.
Gonzalez, Raymond: See—
Perriocelli, Ralph; and Gonzalez, Raymond, 304,316, Cl. D11-19.000.
Goodyear Tire & Rubber Company, The: See—
Bonko, Mark L., 304,320, Cl. D12-151.000.
Graham, Thomas G.: See—
Collins, Thomas J.; Schneider, Pina; Nieves, Anthony L.; and Graham, Thomas G., 304,339, Cl. D14-240.000.
Grenda, Dale. Combined container and integral flexible funnel. 304,294, 10-31-89, Cl. D9-337.000.
Gressett, Charles A., Jr.; Todd, Charles H., III; and Page, John F., to Fender Musical Instruments Corporation. Bridge assembly for guitars. 304,341, 10-31-89, Cl. D17-21.000.
Guss, Shiela, to Playtex Apparel, Inc. Brassiere. 304,255, 10-31-89, Cl. D2-24.000.
Hara, Kunio, to Kabushiki Kaisha Toshiba. Optical disk storage device. 304,332, 10-31-89, Cl. D14-109.000.
Harpe, Willie. Combined talking calendar and thermometer. 304,342, 10-31-89, Cl. D19-21.000.
Hayes, Wayne: See—
Wilson, Robert; and Hayes, Wayne, 304,296, Cl. D9-374.000.
Helix Fragrances Inc.: See—
Bannister, Roger, 304,298, Cl. D9-386.000.
Higa, Toshiro: See—
Naito, Masahito; Higa, Toshiro; Aobori, Tetsuro; Kubota, Eiichi; and Obata, Takeichi, 304,281, Cl. D7-351.000.
Hill, David W.; and Sweeney, Margaret C., to International Business Machines Corporation. Power unit cover for a portable hardfile storage device. 304,329, 10-31-89, Cl. D14-100.000.
Hitachi Heating Appliances Co., Ltd.: See—
Naito, Masahito; Higa, Toshiro; Aobori, Tetsuro; Kubota, Eiichi; and Obata, Takeichi, 304,281, Cl. D7-351.000.
Hurst, Charles W.; and Moss, Gates M., to Procter & Gamble Company, The. Container cap. 304,303, 10-31-89, Cl. D9-453.000.
Interlego A.G.: See—
Knudsen, Jens N., 304,354, Cl. D21-108.000.
International Business Machines Corp.: See—
Cranston, William V., III; Martin, Randall W.; and Young, Mark A., 304,323, Cl. D13-12.000.
Hill, David W.; and Sweeney, Margaret C., 304,329, Cl. D14-100.000.
Kerezman, Paul A.; Koteff, Walter B.; and Stricker, Alfred A., 304,333, Cl. D14-114.000.
Intertechnique S.A.: See—
Derobert, Guy G. A., 304,384, Cl. D29-9.000.
Ishida, Sadayoshi: See—
Ohya, Toshio; and Ishida, Sadayoshi, 304,334, Cl. D14-135.000.
Ives of Delaware, Inc.: See—
Wagner, Curtis D., 304,317, Cl. D11-153.000.
Iwasawa, Kiyoshi: See—
Fujita, Toshiharu; Yamazaki, Hiroyoshi; Maeda, Noriyuki; Shimizu, Kazutaka; Tanaka, Norihiko; Domon, Yoshihiro; Iwasawa, Kiyoshi; Futatsugi, Mitsuyuki; Takizawa, Fuminobu; Suzuki, Masakatsu; and Kosaka, Makoto, 304,377, Cl. D26-3.000.
Johnson, Van K. Audio video component dust cover. 304,271, 10-31-89, Cl. D6-470.000.
Jouppi, Matti: See—
Tervo, Leo; Jouppi, Matti; and Paasonen, Ville, 304,318, Cl. D11-155.000.
Kabushiki Kaisha Bandai d/b/a Bandai Co., Ltd.: See—
Yamanaka, Kichinosuke, 304,295, Cl. D9-341.000.
Kabushiki Kaisha Toshiba: See—
Hara, Kunio, 304,332, Cl. D14-109.000.
Kagayama, Joe, to Cat Eye Co., Ltd. Computerized multiple function bicycle meter. 304,306, 10-31-89, Cl. D10-46.000.
Kagayama, Katsuji; Mishiro, Benito; Sugiyama, Yoshihiko; and Nishimura, Ikuo, to Matsushita Electric Industrial Co., Ltd. Microprocessor. 304,327, 10-31-89, Cl. D14-100.000.
Kakuk, Jay J.: See—
Lovett, Robert H.; Kakuk, Jay J.; and Ellson, Bart T., 304,324, Cl. D13-30.000.
Keptel, Inc.: See—
Collins, Thomas J.; Schneider, Pina; Nieves, Anthony L.; and Graham, Thomas G., 304,339, Cl. D14-240.000.
Kerezman, Paul A.; Koteff, Walter B.; and Stricker, Alfred A., to International Business Machines Corporation. Diskette drive front panel. 304,333, 10-31-89, Cl. D14-114.000.
Kiefer, Val A. Bowl. 304,275, 10-31-89, Cl. D7-23.000.
King Feng Co. Ltd.: See—
Tai, Guo-Bang, 304,337, Cl. D14-235.000.
Kirk, Chester E. Letter opener. 304,289, 10-31-89, Cl. D8-102.000.
Kiser, Randall: See—
Challberg, Sharon S.; and Kiser, Randall, 304,369, Cl. D24-8.000.
Knudsen, Jens N., to Interlego A.G. Internally curved toy wall element. 304,354, 10-31-89, Cl. D21-108.000.
Kok, Olav: See—
Pogue, Lonnie C.; and Kok, Olav, 304,331, Cl. D14-107.000.
Kortenbach Verwaltungs-und Beteiligungsgesellschaft mbH & Co.: See—
Schultes, Tilmann; and Seidel, Joachim, 304,260, Cl. D3-10.000.
Kosaka, Makoto: See—
Fujita, Toshiharu; Yamazaki, Hiroyoshi; Maeda, Noriyuki; Shimizu, Kazutaka; Tanaka, Norihiko; Domon, Yoshihiro; Iwasawa, Kiyoshi; Futatsugi, Mitsuyuki; Takizawa, Fuminobu; Suzuki, Masakatsu; and Kosaka, Makoto, 304,377, Cl. D26-3.000.
Koteff, Walter B.: See—
Kerezman, Paul A.; Koteff, Walter B.; and Stricker, Alfred A., 304,333, Cl. D14-114.000.
Kowalica, Raymond P.: See—
Feimer, Bryan A.; Roethel, Henry G.; and Kowalica, Raymond P., 304,282, Cl. D7-391.000.
Koziol, Leo B.: See—
Pushelberg, Floyd J.; Rintala, James A.; and Koziol, Leo B., 304,325, Cl. D13-40.000.
Kraai, Duke: See—
Charet, Pierre; and Kraai, Duke, 304,304, Cl. D10-15.000.
Kubota, Eiichi: See—
Naito, Masahito; Higa, Toshiro; Aobori, Tetsuro; Kubota, Eiichi; and Obata, Takeichi, 304,281, Cl. D7-351.000.
Laid Back Enterprises, Inc.: See—
Colclasure, George M., 304,361, Cl. D21-230.000.
Lam, Michael C. B. Pair of linked candles. 304,378, 10-31-89, Cl. D26-7.000.
Lane International Corporation: See—
Robertson, Michael K., 304,376, Cl. D25-69.000.
Leger, Jean P. Electronic display panel. 304,349, 10-31-89, Cl. D20-12.000.
Leighton, Mark A. Combined pot lid and utensil holder. 304,280, 10-31-89, Cl. D7-73.000.
Life Technologies, Inc.: See—
Challberg, Sharon S.; and Kiser, Randall, 304,369, Cl. D24-8.000.
Lovett, Robert H.; Kakuk, Jay J.; and Ellson, Bart T., to Toro Company, The. Multi-outlet center. 304,324, 10-31-89, Cl. D13-30.000.

- Maeda, Noriyuki: See—
Fujita, Toshiharu; Yamazaki, Hiroyoshi; Maeda, Noriyuki; Shimizu, Kazutaka; Tanaka, Norihiko; Domon, Yoshihiro; Iwasawa, Kiyoshi; Futatsugi, Mitsuyuki; Takizawa, Fuminobu; Suzuki, Masakatsu; and Kosaka, Makoto, 304,377, Cl. D26-3.000.
- Maez, Sidney W. Bicycle exercise stand. 304,357, 10-31-89, Cl. D21-194.000.
- Manzo, Louis. Rounded staircase baluster. 304,375, 10-31-89, Cl. D25-38.000.
- Martin, Randall W.: See—
Cranston, William V., III; Martin, Randall W.; and Young, Mark A., 304,323, Cl. D13-12.000.
- Matsushita Electric Industrial Co., Ltd.: See—
Kagayama, Katsuji; Mishihiro, Benito; Sugiyama, Yoshihiko; and Nishimura, Ikuo, 304,327, Cl. D14-100.000.
- Mays, David W. Toilet kit. 304,262, 10-31-89, Cl. D3-39.000.
- McCarthy, Alfred F., to Aavid Engineering, Inc. Solderable mount for an electronic device. 304,293, 10-31-89, Cl. D8-349.000.
- McEntee, Theresa D. Bunting bag. 304,256, 10-31-89, Cl. D2-25.000.
- Meier, Willis A. Underwater dynamoelectric machine. 304,322, 10-31-89, Cl. D13-3.000.
- Meyer Company, The: See—
Feimer, Bryan A.; Roethel, Henry G.; and Kowalics, Raymond P., 304,282, Cl. D7-391.000.
- Meyers, Kenneth A., to Gerber Products Company. Humidifier. 304,366, 10-31-89, Cl. D23-356.000.
- Minnesota Mining and Manufacturing Company: See—
Radke, DuWayne C., 304,311, Cl. D10-109.000.
- Mishihiro, Benito: See—
Kagayama, Katsuji; Mishihiro, Benito; Sugiyama, Yoshihiko; and Nishimura, Ikuo, 304,327, Cl. D14-100.000.
- Mitchell, Hal D.; and Gardner, James D., to Figgie International Inc. Football jersey. 304,258, 10-31-89, Cl. D2-217.000.
- Mitsubishi Denki Kabushiki Kaisha: See—
Fujita, Toshiharu; Yamazaki, Hiroyoshi; Maeda, Noriyuki; Shimizu, Kazutaka; Tanaka, Norihiko; Domon, Yoshihiro; Iwasawa, Kiyoshi; Futatsugi, Mitsuyuki; Takizawa, Fuminobu; Suzuki, Masakatsu; and Kosaka, Makoto, 304,377, Cl. D26-3.000.
- Moe, Dennis. Construction toy link. 304,353, 10-31-89, Cl. D21-108.000.
- Mohrle, Raymond L., to Warner-Lambert Company. Multicolored toothpaste. 304,382, 10-31-89, Cl. D28-8.100.
- Morishima, Takashi, to Casio Computer Co., Ltd. Wrist Watch. 304,305, 10-31-89, Cl. D10-38.000.
- Moritani, Hiroshi, to Sharp Kabushiki Kaisha. Air conditioner. 304,364, 10-31-89, Cl. D23-353.000.
- Moritani, Hiroshi, to Sharp Kabushiki Kaisha. Air conditioner. 304,365, 10-31-89, Cl. D23-353.000.
- Morooka, Shinichi, to Sharp Kabushiki Kaisha. Weighing scales. 304,308, 10-31-89, Cl. D10-92.000.
- Moss, Gates M.; and Rosa, Samuel, to Procter & Gamble Company. The Measuring cup closure. 304,301, 10-31-89, Cl. D9-436.000.
- Moss, Gates M.: See—
Hurst, Charles W.; and Moss, Gates M., 304,303, Cl. D9-453.000.
- Motorola, Inc.: See—
Nagele, Albert L., 304,328, Cl. D14-100.000.
- Mull, Donald R. Combined automotive console and litter container. 304,263, 10-31-89, Cl. D3-40.000.
- Murtagh, William O., to Gerity Products, Inc. Paper weight. 304,347, 10-31-89, Cl. D19-97.000.
- Nagai, Yawara; Yoshinari, Shigeru; and Ushikubo, Masao, to Olympus Optical Co., Ltd. Automatic chemical analyzer. 304,307, 10-31-89, Cl. D10-81.000.
- Nagele, Albert L., to Motorola, Inc. Data terminal or similar article. 304,328, 10-31-89, Cl. D14-100.000.
- Naito, Masahito; Higa, Toshiro; Aobori, Tetsuro; Kubota, Eiichi; and Obata, Takeichi, to Hitachi Heating Appliances Co., Ltd. Microwave oven. 304,281, 10-31-89, Cl. D7-351.000.
- Nakano, Kiyotaka, to Nippon Rubber Co., Ltd. Shoe sole. 304,259, 10-31-89, Cl. D2-320.000.
- Nieves, Anthony L.: See—
Collins, Thomas J.; Schneider, Pina; Nieves, Anthony L.; and Graham, Thomas G., 304,339, Cl. D14-240.000.
- Nippon Rubber Co., Ltd.: See—
Nakano, Kiyotaka, 304,259, Cl. D2-320.000.
- Nishimura, Ikuo: See—
Kagayama, Katsuji; Mishihiro, Benito; Sugiyama, Yoshihiko; and Nishimura, Ikuo, 304,327, Cl. D14-100.000.
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Pushelberg, Floyd J.; Rintala, James A.; and Koziol, Leo B., 304,325, Cl. D13-40.000.
- NUWAVE Products Ltd.: See—
Bowater, Michael, 304,265, Cl. D4-136.000.
- Obata, Takeichi: See—
Naito, Masahito; Higa, Toshiro; Aobori, Tetsuro; Kubota, Eiichi; and Obata, Takeichi, 304,281, Cl. D7-351.000.
- Ohya, Toshio; and Ishida, Sadayoshi, to Sony Corporation. Video tape recorder. 304,334, 10-31-89, Cl. D14-135.000.
- Olympus Optical Co., Ltd.: See—
Nagai, Yawara; Yoshinari, Shigeru; and Ushikubo, Masao, 304,307, Cl. D10-81.000.
- Paasonen, Ville: See—
Tervo, Leo; Jouppi, Matti; and Paasonen, Ville, 304,318, Cl. D11-155.000.
- Page, John F.: See—
Gressett, Charles A., Jr.; Todd, Charles H., III; and Page, John F., 304,341, Cl. D17-21.000.
- Partecipazioni Bulgari S.p.A.: See—
Bulgari, Paolo, 304,312, Cl. D11-13.000.
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- Peregrine, Paul K.; and Seamans, Scott A. Carrying case. 304,264, 10-31-89, Cl. D3-50.000.
- Perkins, George, to TeleQuest, Inc. Combination telephone set and answering machine. 304,326, 10-31-89, Cl. D14-141.000.
- Perricelli, Ralph; and Gonzalez, Raymond. Badge or the like. 304,316, 10-31-89, Cl. D11-99.000.
- Playtex Apparel, Inc.: See—
Guss, Shiela, 304,255, Cl. D2-24.000.
- Pogue, Lonnie C.; and Kok, Olav, to Systech Corporation. Cluster controller for Input/Output subsystem. 304,331, 10-31-89, Cl. D14-107.000.
- Popat, Ghanshyam H.; Chen, Tien-Tsung; Binkley, Christopher H.; and Tsai, K. Fou, to Avery International. Three-sided magnetic folio. 304,343, 10-31-89, Cl. D19-26.000.
- Potter, Larry E.; and Potter, Richard S. Child's doll figure or similar article. 304,356, 10-31-89, Cl. D21-166.000.
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- Precor Incorporated: See—
Armstrong, Timothy O.; Bull, John W.; and Smith, David B., 304,358, Cl. D21-195.000.
- Procter & Gamble Company, The: See—
Duke, Richard T., 304,300, Cl. D9-433.000.
- Hurst, Charles W.; and Moss, Gates M., 304,303, Cl. D9-453.000.
- Moss, Gates M.; and Rosa, Samuel, 304,301, Cl. D9-436.000.
- Pushelberg, Floyd J.; Rintala, James A.; and Koziol, Leo B., to Northern Telecom Limited. Enclosure for wires interconnecting electronic equipment modules. 304,325, 10-31-89, Cl. D13-40.000.
- Radke, DuWayne C., to Minnesota Mining and Manufacturing Company. Pop-up timing device. 304,311, 10-31-89, Cl. D10-109.000.
- Rally Manufacturing, Inc.: See—
Charet, Pierre; and Kraai, Duke, 304,304, Cl. D10-15.000.
- Reed, William. Building structure. 304,374, 10-31-89, Cl. D25-33.000.
- Reliable Metal Stamping Co., Inc.: See—
Ruesch, Clarence W., 304,363, Cl. D23-209.000.
- Restaino, Mario. Pneumatic dice agitator. 304,351, 10-31-89, Cl. D21-41.000.
- Revill, Peter L.: See—
Dalli, Alan G.; and Revill, Peter L., 304,302, Cl. D9-438.000.
- Rintala, James A.: See—
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- Robertson, Michael K., to Lane International Corporation. Manhole step. 304,376, 10-31-89, Cl. D25-69.000.
- Roethel, Henry G.: See—
Feimer, Bryan A.; Roethel, Henry G.; and Kowalics, Raymond P., 304,282, Cl. D7-391.000.
- Rosa, Samuel: See—
Moss, Gates M.; and Rosa, Samuel, 304,301, Cl. D9-436.000.
- Rubbermaid Incorporated: See—
Foran, Kenneth C.; and David, Thomas J., 304,345, Cl. D19-75.000.
- Ruesch, Clarence W., to Reliable Metal Stamping Co., Inc. Water filter. 304,363, 10-31-89, Cl. D23-209.000.
- Saas, Francis. Exhaust roof cap. 304,367, 10-31-89, Cl. D23-373.000.
- Sakamoto, Mitsunori. Punctureable transparent container. 304,299, 10-31-89, Cl. D9-425.000.
- Sandgren, Scott W. Protective holder for a beverage. 304,269, 10-31-89, Cl. D6-432.000.
- Schmidt, George, to Farberware Inc. Electric can opener with vertical height adjustment. 304,286, 10-31-89, Cl. D8-36.000.
- Schneider, Pina: See—
Collins, Thomas J.; Schneider, Pina; Nieves, Anthony L.; and Graham, Thomas G., 304,339, Cl. D14-240.000.
- Schreiber, John E. Divot replacer for golf course Maintenance. 304,285, 10-31-89, Cl. D8-1.000.
- Schultes, Tilmann; and Seidel, Joachim, to Kortenbach Verwaltungs- und Beteiligungsgesellschaft mbH & Co. Telescopic umbrella stick for collapsible umbrellas. 304,260, 10-31-89, Cl. D3-10.000.
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Peregrine, Paul K.; and Seamans, Scott A., 304,264, Cl. D3-50.000.
- Segati, Umberto D. I., to Colgate-Palmolive Company. Bottle. 304,297, 10-31-89, Cl. D9-376.000.
- Seidel, Joachim: See—
Schultes, Tilmann; and Seidel, Joachim, 304,260, Cl. D3-10.000.
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Moritani, Hiroshi, 304,364, Cl. D23-353.000.
- Moritani, Hiroshi, 304,365, Cl. D23-353.000.
- Morooka, Shinichi, 304,308, Cl. D10-92.000.
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- Shimizu, Kazutaka: See—
Fujita, Toshiharu; Yamazaki, Hiroyoshi; Maeda, Noriyuki; Shimizu, Kazutaka; Tanaka, Norihiko; Domon, Yoshihiro; Iwasawa, Kiyoshi; Futatsugi, Mitsuyuki; Takizawa, Fuminobu; Suzuki, Masakatsu; and Kosaka, Makoto, 304,377, Cl. D26-3.000.
- Sims, Raymond E.: See—
DeLeeuw, James A.; and Sims, Raymond E., 304,340, Cl. D15-199.000.
- Smith, David B.: See—
Armstrong, Timothy O.; Bull, John W.; and Smith, David B., 304,358, Cl. D21-195.000.

- Societe T.B.S. Industrie (SARL): See—
Biotteau, Gerard, 304,330, Cl. D14-105.000.
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Ohya, Toshio; and Ishida, Sadayoshi, 304,334, Cl. D14-135.000.
- Stanley Works, The: See—
Bobrowski, Louis G., 304,292, Cl. D8-341.000.
- Stricker, Alfred A.: See—
Kerezman, Paul A.; Koteff, Walter B.; and Stricker, Alfred A., 304,333, Cl. D14-114.000.
- Sugiyama, Yoshihiko: See—
Kagayama, Katsuji; Mishihiro, Benito; Sugiyama, Yoshihiko; and Nishimura, Ikuo, 304,327, Cl. D14-100.000.
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- Sweeney, Margaret C.: See—
Hill, David W.; and Sweeney, Margaret C., 304,329, Cl. D14-100.000.
- Systech Corporation: See—
Pogue, Lonnie C.; and Kok, Olav, 304,331, Cl. D14-107.000.
- Tai, Guo-Bang, to King Feng Co. Ltd. Indoor antenna. 304,337, 10-31-89, Cl. D14-235.000.
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Cheung, George C. H., 304,261, Cl. D3-35.000.
- Takizawa, Fuminobu: See—
Fujita, Toshiharu; Yamazaki, Hiroyoshi; Maeda, Noriyuki; Shimizu, Kazutaka; Tanaka, Norihiko; Domon, Yoshihiro; Iwasawa, Kiyoshi; Futatsugi, Mitsuyuki; Takizawa, Fuminobu; Suzuki, Masakatsu; and Kosaka, Makoto, 304,377, Cl. D26-3.000.
- Tanaka, Norihiko: See—
Fujita, Toshiharu; Yamazaki, Hiroyoshi; Maeda, Noriyuki; Shimizu, Kazutaka; Tanaka, Norihiko; Domon, Yoshihiro; Iwasawa, Kiyoshi; Futatsugi, Mitsuyuki; Takizawa, Fuminobu; Suzuki, Masakatsu; and Kosaka, Makoto, 304,377, Cl. D26-3.000.
- TeleQuest, Inc.: See—
Perkins, George, 304,326, Cl. D14-141.000.
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- Todd, Charles H., III: See—
Gressett, Charles A., Jr.; Todd, Charles H., III; and Page, John F., 304,341, Cl. D17-21.000.
- Toro Company, The: See—
Lovett, Robert H.; Kakuk, Jay J.; and Ellison, Bart T., 304,324, Cl. D13-30.000.
- Tsai, K. Fou: See—
Popat, Ghanshyam H.; Chen, Tien-Tsung; Binkley, Christopher H.; and Tsai, K. Fou, 304,343, Cl. D19-26.000.
- Ukisu, Hiroshi, to Epoch Company, Ltd. Simulative toy box. 304,352, 10-31-89, Cl. D21-59.000.
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- Universal Furniture Industries, Inc.: See—
Warren, Frank A., 304,267, Cl. D6-381.000.
- Ushikubo, Masao: See—
Nagai, Yawara; Yoshinari, Shigeru; and Ushikubo, Masao, 304,307, Cl. D10-81.000.
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Tervo, Leo; Jouppi, Matti; and Paasonen, Ville, 304,318, Cl. D11-155.000.
- Vargus, Joel T.: See—
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- Vigil, George J. Handset telephone. 304,336, 10-31-89, Cl. D14-143.000.
- Vories, Dennis L., to F. B. Nutter Enterprises, Inc. Transmitter case. 304,309, 10-31-89, Cl. D10-106.000.
- Wagner, Curtis D., to Ives of Delaware, Inc. Floral container. 304,317, 10-31-89, Cl. D11-153.000.
- Warner-Lambert Company: See—
Mohrle, Raymond L., 304,382, Cl. D28-8.100.
- Warren, Frank A., to Universal Furniture Industries, Inc. Sofa. 304,267, 10-31-89, Cl. D6-381.000.
- Weinerman, Lee S.; and Vargus, Joel T., to Eastern Company, The. Combined latch housing and interengageable strike plate. 304,291, 10-31-89, Cl. D8-331.000.
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Benke, Wolfgang, 304,321, Cl. D12-204.000.
- Wilson, Robert; and Hayes, Wayne. Combined bottle and handle. 304,296, 10-31-89, Cl. D9-374.000.
- Wolff, Martin J.; and Zimmerman, Larry G., to Dart Industries Inc. Cutting board or the like. 304,276, 10-31-89, Cl. D7-46.000.
- Wolff, Martin J.; and Zimmerman, Larry G., to Dart Industries Inc. Combined food cutting board and measuring cup or the like. 304,277, 10-31-89, Cl. D7-46.000.
- Wolff, Martin J.; and Zimmerman, Larry G., to Dart Industries Inc. Food grater frame or the like. 304,284, 10-31-89, Cl. D7-412.000.
- Wright, James E. Automobile steering column lock. 304,290, 10-31-89, Cl. D8-330.000.
- Wright, Robert L., to Creative Athletic Products and Services, Inc. Baseball pitching practice platform. 304,359, 10-31-89, Cl. D21-199.000.
- Yamanaka, Kichinosuke, to Kabushiki Kaisha Bandai d/b/a Bandai Co., Ltd. Folding container. 304,295, 10-31-89, Cl. D9-341.000.
- Yamazaki, Hiroyoshi: See—
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- Yoshinari, Shigeru: See—
Nagai, Yawara; Yoshinari, Shigeru; and Ushikubo, Masao, 304,307, Cl. D10-81.000.
- Young, Mark A.: See—
Cranston, William V., III; Martin, Randall W.; and Young, Mark A., 304,323, Cl. D13-12.000.
- Young, Raymond A. Knife sharpener. 304,288, 10-31-89, Cl. D8-93.000.
- Zimmerman, Larry G.: See—
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- Zurwelle, Donald W., to Black & Decker Inc. Electric drill or similar article. 304,287, 10-31-89, Cl. D8-68.000.

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Winchel, Joseph, 7,052, Cl. 21.000.
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de Ruiter, Gijbert, 7,051, Cl. 9.000.

de Ruiter, Gijbert, to de Ruiter's Nieuwe Rozen B.V. Miniature rose
plant, 7,051, 10-31-89, Cl. 9.000.
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Buram, 7,052, 10-31-89, Cl. 21.000.

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ISSUED OCTOBER 31, 1989

NOTE.—First number, class; second number, subclass; third number, patent number

24	4,876,745	15	4,876,802	101	4,876,848	502.1	4,876,911	118	4,877,453	673	4,877,035
69	4,876,746	117	4,876,803	39.161	4,876,849	535	4,876,912	131	4,877,454	749	4,877,036
168	4,876,747	7.8	4,876,804	39.464	4,876,850	538	4,876,913	244	4,877,455	756	4,877,037
		43	4,876,805	275	4,876,851	567	4,876,914	270	4,877,456	869	4,877,038
213	4,876,748	114	4,876,806	547.1	4,876,853	574	4,876,917	277	4,877,457		
295	4,876,749	131	4,876,807	641.8	4,876,854	650	4,876,918	24	4,876,969	189	4,877,040
420.4	4,876,750		4,876,808	671	4,876,855	689	4,876,919	35	4,876,970	270	4,877,041
431	4,876,751	101	4,876,809	734	4,876,857	710.5	4,876,921				
542	4,876,752	316	4,876,810			731	4,876,922	246	4,876,971	212	4,877,042
	4,876,753	101	4,876,811			732	4,876,923	298	4,876,972		
546	4,876,754	101	4,876,812			745	4,876,924			5	4,877,458
						868	4,876,925			57 R	4,877,459
431	4,876,755	101	4,876,813					121.16	4,876,973		
455	4,876,756	101	4,876,814					240	4,876,974		
		100	4,876,815			0.5 B	4,877,445	260	4,876,975		
158	4,876,757	103	4,876,816			10.21	4,877,448	262.3	4,876,976	20 M	4,877,045
						20 R	4,877,449	445	4,876,977	104	4,877,044
94.12	4,877,410	CLASS 43									
403	4,877,411	1	4,876,817			3.2	4,876,926	230	4,876,978	244	4,877,460
437	4,877,412	7	4,876,818			15.9	4,876,927	258	4,876,979		
543	4,877,413	26	4,876,819			20	4,876,928	364	4,876,980	CLASS 137	
		43.13	4,876,820			57.43	4,876,929				
142 N	4,876,758	113	4,876,821					173	4,876,981	107	4,877,046
		114	4,876,822							119	4,877,047
			4,876,823					406	4,876,982	225	4,877,048
16.5	4,876,759	51	4,877,414					722	4,876,983	312	4,877,049
		62	4,877,415					723	4,876,984	315	4,877,050
97 B	4,876,760	535	4,877,416							486	4,877,051
104.061	4,876,761	600	4,877,417			482	4,876,933			512.3	4,877,052
247	4,876,762		4,877,418			879	4,876,934			556	4,877,053
329	4,876,763	197 R	4,877,419					4	4,876,985	560	4,877,054
						611	4,876,938			568	4,877,055
71	4,876,764	103	4,877,420			612	4,876,936	20 B	4,876,986	599	4,877,056
102	4,876,765					627	4,876,937	504.2	4,876,987	625.48	4,877,057
114 R	4,876,766						4,876,935			637.1	4,877,059
		197 R	4,877,419								
11	4,876,767	103	4,877,421					1 A	4,876,988	82	4,877,060
64	4,876,768							3	4,876,989	224 R	4,877,061
		103	4,876,825					46 E	4,876,991	294	4,877,062
CLASS 19								48 R	4,876,992	435	4,877,063
105	4,876,769	125	4,876,826					73 AD	4,876,993		4,877,064
		309	4,877,420					90.12	4,876,995	CLASS 141	
170	4,876,770							90.5	4,876,994	18	4,877,065
298	4,876,771	12	4,876,827					90.51	4,876,996	96	4,877,066
637	4,876,772	23	4,876,828					90.52	4,876,997	18	4,877,067
		29	4,876,830					198 E	4,876,998	129	4,877,068
23.1	4,876,773	70	4,876,831			5 R	4,876,945	252	4,876,999		
		79.1	4,876,832			93	4,876,946	292	4,877,000	286 R	4,877,069
166	4,876,774	107	4,876,833			99	4,876,948	339	4,877,002	364	4,877,070
190	4,876,775	126.2	4,876,834			187	4,876,947		4,877,004		
		129	4,876,835					432	4,877,005		
25.35	4,876,776	23	4,876,836			40.1	4,876,949	458	4,877,006	11.5 N	4,877,461
132	4,876,777	263	4,876,837			42.21	4,876,950	519		12 B	4,877,462
157.3 A	4,876,778	287	4,876,838			107	4,876,951	589			4,877,463
157.3 R	4,876,779	455	4,876,838			121.2	4,876,952			108	4,877,464
173	4,876,780									428	4,877,465
234	4,876,781	137	4,876,839							CLASS 149	
240.1	4,876,782									108.6	4,877,466
402.06	4,876,783	137	4,876,840								
423.3	4,876,784	103	4,876,841							CLASS 152	
429	4,876,785	410	4,876,842							165	4,877,071
430	4,876,786		4,876,843							209 R	4,877,072
508	4,876,787	455	4,876,844							451	4,877,073
560	4,876,788									CLASS 156	
560	4,876,789	16	4,877,421							51	4,877,467
603	4,876,790	20	4,877,422							111	4,877,468
840	4,876,791	27	4,877,423							123	4,877,469
		52	4,877,424							177	4,877,470
		68	4,877,425							181	4,877,471
90.9	4,876,792	134	4,877,426							184	4,877,472
122	4,876,793	76	4,877,427							204	4,877,473
252	4,876,794	139	4,877,428							244.13	4,877,474
254	4,876,795	162	4,877,429							273.7	4,877,475
383	4,876,796	199	4,877,430							307.3	4,877,476
388	4,876,797	321	4,877,431							406.4	4,877,477
		375	4,877,432							510	4,877,478
			4,877,433							610	4,877,479
348.2	4,876,798									626	4,877,480
366	4,876,799									635	4,877,481
784	4,876,800									643	4,877,482
										653	4,877,483
9	4,876,801	100	4,876,847							84.1	4,877,074
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CLASSIFICATION OF PATENTS

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4,877,774	4,877,253	36 :	4,877,589	4,876,944	4,877,336	4,877,404
4,877,779	4,877,504		Re.33,105	4,877,034	4,877,375	4,877,419
4,877,829	4,877,526		4,876,749	4,877,104	4,877,393	4,877,499
4,877,950	4,877,948		4,876,777	4,877,170	4,877,406	4,877,695
4,878,188	4,878,012		4,876,779	4,877,182	4,877,425	4,877,741
4,876,897	4,878,073		4,876,780	4,877,291	4,877,472	4,877,745
4,876,899	4,878,090		4,876,824	4,877,448	4,877,484	4,877,748
4,877,026	4,877,148	28 :	4,876,842	4,877,459	4,877,524	4,877,753
4,877,050	4,877,978		4,876,900	4,877,644	4,877,532	4,877,755
4,877,051	4,876,760	29 :	4,876,926	4,877,691	4,877,538	4,877,757
4,877,102	4,876,817		4,876,928	4,876,798	4,877,575	4,877,836
4,877,172	4,876,949		4,876,969	4,877,039	4,877,593	4,877,857
4,877,261	4,877,044		4,877,028	4,876,834	4,877,610	4,877,894
4,877,299	4,877,111		4,877,075	4,876,837	4,877,672	4,878,039
4,877,353	4,877,165		4,877,106	4,876,901	4,877,679	4,878,051
4,877,405	4,877,256		4,877,107	4,876,941	4,877,683	4,878,058
4,877,421	4,877,283		4,877,114	4,876,992	4,877,705	4,878,100
4,877,454	4,877,414		4,877,139	4,877,053	4,877,805	4,878,104
4,877,480	4,877,578		4,877,164	4,877,184	4,877,818	4,878,121
4,877,530	4,877,842		4,877,175	4,877,202	4,877,892	4,878,168
4,877,553	4,877,490	30 :	4,877,198	4,877,218	4,877,896	4,878,180
4,877,585	4,877,491		4,877,204	4,877,276	4,877,897	4,878,190
4,877,599	4,877,611		4,877,226	4,877,340	4,877,906	4,878,204
4,877,656	4,876,750	31 :	4,877,233	4,877,350	4,877,910	4,878,096
4,877,729	4,877,145		4,877,234	4,877,382	4,877,911	4,877,401
4,877,839	4,877,645		4,877,247	4,877,432	4,877,912	4,876,940
4,877,848	4,877,470	32 :	4,877,260	4,877,437	4,877,913	4,878,108
4,877,864	4,877,980		4,877,300	4,877,476	4,877,914	4,878,209
4,878,002	4,877,652	33 :	4,877,304	4,877,503	4,877,915	4,876,789
4,878,010	4,877,676		4,877,306	4,877,603	4,877,916	4,877,167
4,878,109	4,877,992		4,877,310	4,877,758	4,877,971	4,877,316
4,878,159	4,878,173		4,877,311	4,877,764	4,877,998	4,877,426
4,878,193	4,876,754	34 :	4,877,313	4,877,767	4,878,019	4,877,501
4,878,219	4,876,755		4,877,349	4,877,798	4,878,237	4,877,502
4,878,310	Re.33,102		4,876,774	4,877,837	4,878,265	4,877,608
4,876,766	4,876,793		4,876,793	4,877,838	4,877,829	4,877,983
4,876,768	4,876,843		4,876,768	4,877,845	4,877,257	4,878,238
4,876,809	4,876,967		4,876,809	4,877,856	4,877,473	4,876,804
4,876,823	4,877,080		4,876,823	4,877,872	4,877,527	4,876,814
4,876,830	4,877,143		4,876,830	4,877,898	4,877,653	4,876,818
4,876,835	4,877,151		4,876,835	4,877,901	4,876,820	4,876,881
4,876,920	4,877,246		4,876,920	4,877,917	4,876,888	4,877,138
4,876,923	4,877,270		4,876,923	4,877,929	4,876,918	4,877,189
4,876,951	4,877,298		4,876,951	4,877,988	4,877,411	4,877,242
4,877,001	4,877,361		4,877,001	4,878,061	4,877,457	4,877,281
4,877,040	4,877,434		4,877,040	4,878,063	4,877,605	4,877,335
4,877,066	4,877,455		4,877,066	4,878,064	4,877,624	4,877,337
4,877,068	4,877,464		4,877,068	4,878,183	4,877,646	4,877,395
4,877,099	4,877,488		4,877,099	4,878,186	4,878,236	4,877,471
4,877,113	4,877,515		4,877,113	4,878,236	4,877,014	4,877,487
4,877,147	4,877,520		4,877,147	4,878,286	4,877,251	4,877,770
4,877,168	4,877,541		4,877,168	4,878,286	4,877,408	4,877,781
4,877,187	4,877,544		4,877,187	4,878,286	4,877,417	4,877,868
4,877,221	4,877,546		4,877,221	4,878,286	4,877,669	4,877,972
4,877,266	4,877,581		4,877,266	4,878,286	4,877,851	4,877,982
4,877,279	4,877,587		4,877,279	4,878,286	4,877,862	4,878,013
4,877,288	4,877,604		4,877,288	4,878,286	4,878,014	4,878,231
4,877,330	4,877,628		4,877,330	4,878,286	4,876,800	4,877,435
4,877,371	4,877,629		4,877,371	4,878,286	4,876,819	4,877,461
4,877,381	4,877,682		4,877,381	4,878,286	4,876,886	4,877,815
4,877,385	4,877,769		4,877,385	4,878,286	4,876,887	4,877,886
4,877,485	4,877,801		4,877,485	4,878,286	4,876,896	4,878,038
4,877,635	4,877,843		4,877,635	4,878,286	4,876,987	4,876,803
4,877,657	4,877,846		4,877,657	4,878,286	4,876,791	4,876,811
4,877,782	4,877,849		4,877,782	4,878,286	4,877,089	4,876,891
4,877,821	4,877,871		4,877,821	4,878,286	4,877,108	4,876,993
4,877,826	4,877,888		4,877,826	4,878,286	4,877,142	4,877,057
4,877,881	4,877,890		4,877,881	4,878,286	4,877,174	4,877,185
4,877,984	4,877,921		4,877,984	4,878,286	4,877,205	4,877,265
4,878,011	4,877,942		4,878,011	4,878,286	4,877,209	4,877,293
4,878,041	4,877,952		4,878,041	4,878,286	4,877,217	4,877,305
4,878,116	4,878,048		4,878,116	4,878,286	4,877,222	4,877,626
4,876,783	4,878,150		4,876,783	4,878,286	4,877,224	4,877,241
4,876,831	4,878,212		4,876,831	4,878,286	4,877,241	4,877,684
4,876,950	4,878,215		4,876,950	4,878,286	4,877,289	4,877,738
4,877,025	4,878,224		4,877,025	4,878,286	4,877,317	4,877,927
4,877,037	4,878,240		4,877,037	4,878,286	4,877,354	4,878,143
4,877,110	4,878,242		4,877,110	4,878,286	4,877,386	4,878,196
4,877,117	4,878,253		4,877,117	4,878,286	4,877,400	4,877,084
4,877,223	4,877,479		4,877,223	4,878,286		

DESIGN PATENTS

06 :	304,266	304,348	26 :	304,272	304,375	304,300	304,277
	304,278	304,351		304,370	304,382	304,301	304,284
	304,309	304,374	27 :	304,269	304,336	304,303	304,257
	304,319	304,283		304,311	304,357	304,320	304,263
	304,331	304,328	36 :	304,324	304,270	304,345	304,279
	304,341	304,363		304,329	304,285	304,347	304,271
	304,343	304,383	29 :	304,258	304,286	304,361	304,317
	304,379	304,371		304,322	304,313	304,265	304,344
	304,381	304,372	30 :	304,280	304,349	304,288	304,275
08 :	304,264	304,359		304,293	304,367	304,289	304,358
09 :	304,292	304,356	34 :	304,255	304,262	304,326	304,294
12 :	304,304	304,350		304,267	304,282	304,376	304,340
	304,323	304,287		304,316	304,291	304,290	304,353
	304,333	304,369		304,339	304,296	304,276	304,366

PLANT PATENTS

06 :	7,052				
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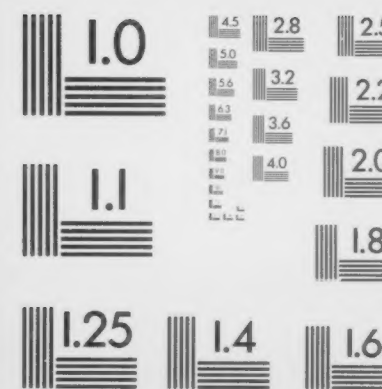
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Robert A. Mosbacher, *Secretary*
PATENT AND TRADEMARK OFFICE
Donald J. Quigg, *Commissioner*

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